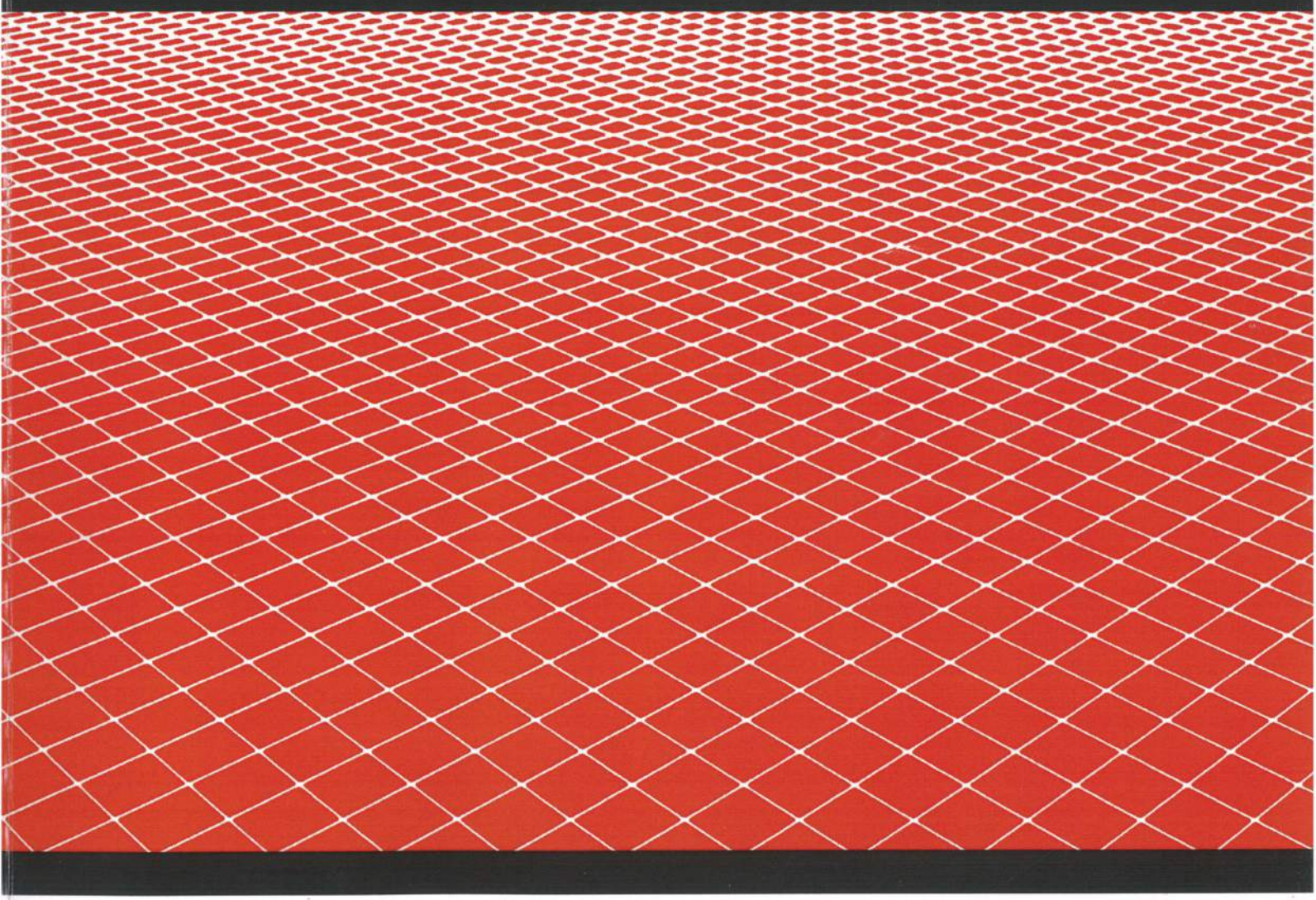
HONDA

SHOP MANUAL
CB600F/FA



CB600F/FA7

TYPE CODE

• Throughout this manual, the following abbreviations are used to identify individual model.

CODE	AREA TYPE
E	U.K.
F	France
ED	EUROPEAN DIRECT SALES (Belgium, Denmark, Germany, Greece, Italy, Luxemburg, Austria, Portugal, Finland, Sweden, Switzerland, Czech, Slovakia, Norway, Iceland, Russia, Poland, Slovenia, Croatia, Latvia, Macedonia, Romania, Bulgaria, Ukraine, Israel, Ireland)
SP	Spain, Hungary
II ED	EUROPEAN DIRECT SALES II (Belgium, Denmark, Germany, Greece, Italy, Luxemburg, Austria, Portugal, Finland, Sweden, Switzerland, Czech, Slovakia, Norway, Iceland, Russia, Poland, Slovenia, Croatia, Latvia, Macedonia, Romania, Bulgaria, Ukraine, Israel)
II F	France II

A Few Words About Safety

Service Information

The service and repair information contained in this manual is intended for use by qualified, professional technicians. Attempting service or repairs without the proper training, tools, and equipment could cause injury to you or others. It could also damage the vehicle or create an unsafe condition.

This manual describes the proper methods and procedures for performing service, maintenance, and repairs. Some procedures require the use of specially designed tools and dedicated equipment. Any person who intends to use a replacement part, service procedure or a tool that is not recommended by Honda, must determine the risks to their personal safety and the safe operation of the vehicle.

If you need to replace a part, use genuine Honda parts with the correct part number or an equivalent part. We strongly recommend that you do not use replacement parts of inferior quality.

For Your Customer's Safety

Proper service and maintenance are essential to the customer's safety and the reliability of the vehicle. Any error or oversight while servicing a vehicle can result in faulty operation, damage to the vehicle, or injury to others.

⚠WARNING

Improper service or repairs can create an unsafe condition that can cause your customer or others to be seriously hurt or killed.

Follow the procedures and precautions in this manual and other service materials carefully.

For Your Safety

Because this manual is intended for the professional service technician, we do not provide warnings about many basic shop safety practices (e.g., Hot parts–wear gloves). If you have not received shop safety training or do not feel confident about your knowledge of safe servicing practice, we recommended that you do not attempt to perform the procedures described in this manual.

Some of the most important general service safety precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing service and repair procedures. Only you can decide whether or not you should perform a given task.

⚠WARNING

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

Make sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and using safety equipment. When performing any service task, be especially careful of the following:

- Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
- Protect your eyes by using proper safety glasses, goggles or face shields any time you hammer, drill, grind, pry or work around pressurized air or liquids, and springs or other stored-energy components. If there is any doubt, put on eye protection.
- Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
- Protect yourself and others whenever you have the vehicle up in the air. Any time you lift the vehicle, either with a hoist or a jack, make sure that it is always securely supported. Use jack stands.

Make sure the engine is off before you begin any servicing procedures, unless the instruction tells you to do otherwise. This will help eliminate several potential hazards:

- Carbon monoxide poisoning from engine exhaust. Be sure there is adequate ventilation whenever you run the engine.
- Burns from hot parts or coolant. Let the engine and exhaust system cool before working in those areas.
- Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers and clothing are out of the way.

Gasoline vapors and hydrogen gases from batteries are explosive. To reduce the possibility of a fire or explosion, be careful when working around gasoline or batteries.

- Use only a nonflammable solvent, not gasoline, to clean parts.
- Never drain or store gasoline in an open container.
- Keep all cigarettes, sparks and flames away from the battery and all fuel-related parts.

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the CB600F/FA.

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition.

Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

Sections 1, 2 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections. Section 4 through 21 describe parts of the motorcycle, grouped according to location.

Find the section you want on this page, then turn to the table of contents on the first page of the section.

Most sections start with an assembly or system illustration, service information and troubleshooting for the section. The subsequent pages give detailed procedure.

If you don't know the source of the trouble, go to section 23 Troubleshooting.

Your safety, and the safety of others, is very important. To help you make informed decisions we have provided safety messages and other information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing this vehicle.
You must use your own good judgement.
You will find important safety information in a variety of forms including:

- Safety Labels – on the vehicle
- Safety Messages – preceded by a safety alert symbol ⚠ and one of three signal words, DANGER, WARNING, or CAUTION.
  These signal words mean:

⚠DANGER You WILL be KILLED or SERIOUSLY HURT if you don't follow instructions.

⚠WARNING You CAN be KILLED or SERIOUSLY HURT if you don't follow instructions.

⚠CAUTION You CAN be HURT if you don't follow instructions.

- Instructions – how to service this vehicle correctly and safely.

As you read this manual, you will find information that is preceded by a **NOTICE** symbol. The purpose of this message is to help prevent damage to your vehicle, other property, or the environment.

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Honda Motor Co., Ltd.
SERVICE PUBLICATION OFFICE

CONTENTS

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SYMBOLS

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it would be explained specifically in the text without the use of the symbols.

	Replace the part(s) with new one(s) before assembly.
	Use recommended engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1: 1).
	Use multi-purpose grease (Lithium based multi-purpose grease NLGI #2 or equivalent).
	Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® BR-2 plus manufactured by Dow Corning U.S.A. Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® G-n Paste manufactured by Dow Corning U.S.A. Honda Moly 60 (U.S.A. only) Rocol ASP manufactured by Rocol Limited, U.K. Rocol Paste manufactured by Sumico Lubricant, Japan
	Use silicone grease.
	Apply a locking agent. Use a middle strength locking agent unless otherwise specified.
	Apply sealant.
	Use DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use Fork or Suspension Fluid.

1. GENERAL INFORMATION

SERVICE RULES

1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that don't meet Honda's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown in the Cable and Harness Routing (page 1-23).

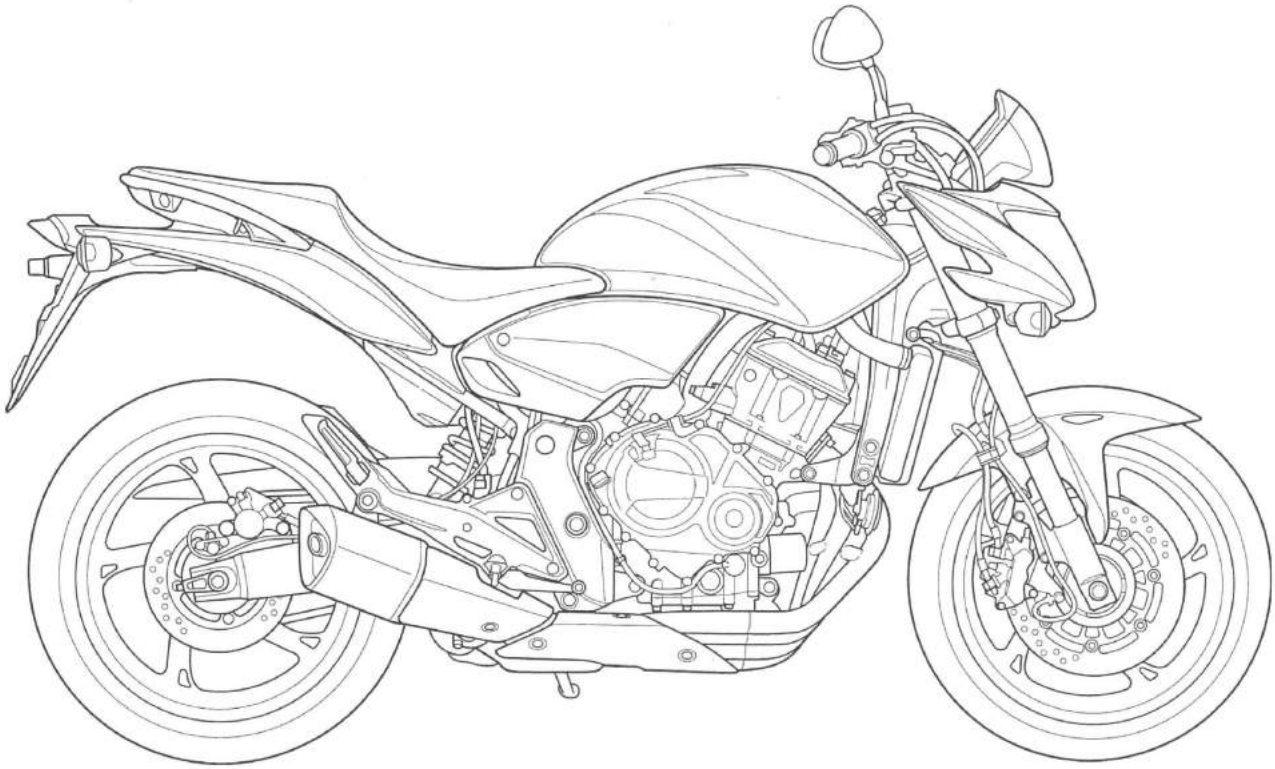
ABBREVIATION

Throughout this manual, the following abbreviations are used to identify the respective parts or systems.

Abbrev. term	Full term
ABS	Anti-lock Brake System
CKP sensor	Crankshaft Position sensor
DLC	Data Link Connector
DTC	Diagnostic Trouble Code
ECM	Engine Control Module
ECT sensor	Engine Coolant Temperature sensor
EEPROM	Electrically Erasable Programmable Read Only Memory
EOP switch	Engine Oil Pressure switch
HDS	Honda Diagnostic System
HISS	Honda Ignition Security System
IACV	Idle Air Control Valve
IAT sensor	Intake Air Temperature sensor
IDC solenoid valve	Intake Duct Control solenoid valve
MAP sensor	Manifold Absolute Pressure sensor
MIL	Malfunction Indicator Lamp
PAIR	Pulsed Secondary Air Injection
PCV	Proportional Control Valve
PGM-FI	Programmed Fuel Injection
SCS connector	Service Check Short connector
TP sensor	Throttle Position sensor
VS sensor	Vehicle Speed sensor

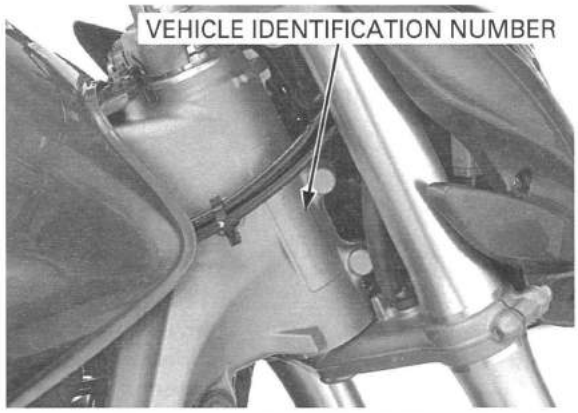
MODEL IDENTIFICATION

CB600FA Shown:

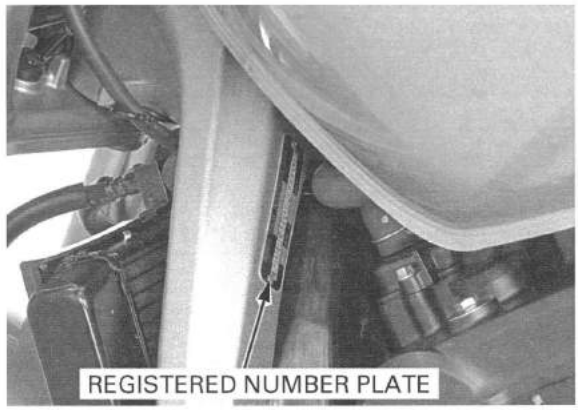


SERIAL NUMBERS

The Vehicle Identification Number (V.I.N) is stamped on the right side of the steering head.

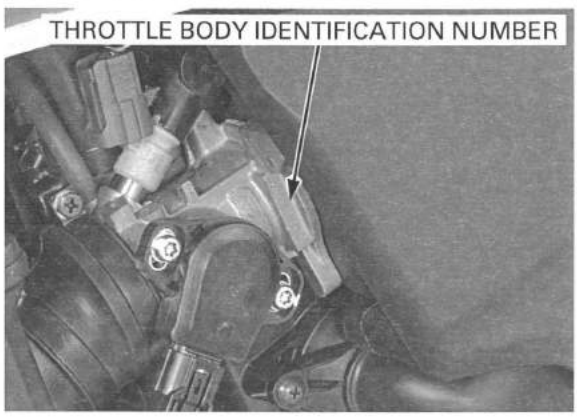


The registered number plate is located on left side of the frame tube.



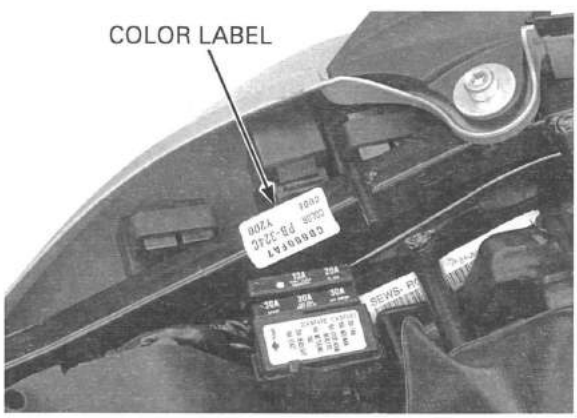
The engine serial number is stamped on the right side of the upper crankcase.

The throttle body identification number is stamped on the left side of the throttle body.



LABEL

The color label is attached on the sub-frame under the seat. When ordering color-coded parts, always specify the designated color code.



GENERAL SPECIFICATIONS

ITEM			SPECIFICATIONS
DIMENSIONS	Overall length		2,085 mm (82.1 in)
	Overall width		760 mm (29.9 in)
	Overall height		1,090 mm (42.9 in)
	Wheelbase		1,435 mm (56.5 in)
	Seat height		800 mm (31.5 in)
	Ground clearance		135 mm (5.3 in)
	Curb weight	CB600F:	198 kg (437 lbs)
		CB600FA:	205 kg (452 lbs)
	Maximum weight capacity		188 kg (414 lbs)
FRAME	Frame type		Diamond type
	Front suspension		Telescopic fork
	Front axle travel		109 mm (4.3 in)
	Rear suspension		Swingarm
	Rear axle travel		128 mm (5.0 in)
	Front tire size		120/70ZR17M/C (58W)
	Rear tire size		180/55ZR17M/C (73W)
	Front tire brand	Bridgestone	BT012F RADIAL J
		Michelin	Pilot POWER E
	Rear tire brand	Bridgestone	BT012R RADIAL J
		Michelin	Pilot POWER E
	Front brake		Hydraulic double disc
	Rear brake		Hydraulic single disc
	Caster angle		25° 00′
	Trail length		99 mm (3.9 in)
	Fuel tank capacity		19.0 liter (5.02 US gal, 4.18 Imp gal)
ENGINE	Cylinder arrangement		4 cylinders in-line, inclined 30° from vertical
	Bore and stroke		67.0 x 42.5 mm (2.64 x 1.67 in)
	Displacement		599.3 cm^3 (36.56 cu-in)
	Compression ratio		12.0 : 1
	Valve train		Chain driven, DOHC
	Intake valve opens:	at 1 mm (0.04 in) lift	17° BTDC
	Intake valve closes:	at 1 mm (0.04 in) lift	33° ABDC
	Exhaust valve opens:	at 1 mm (0.04 in) lift	40° BBDC
	Exhaust valve closes:	at 1 mm (0.04 in) lift	5° ATDC
	Lubrication system		Forced pressure and wet sump
	Oil pump type		Trochoid
	Cooling system		Liquid cooled
	Air filtration		Paper element
	Engine dry weight		57.7 kg (127.2 lbs)
	Firing order		1 - 2 - 4 - 3
FUEL DELIVERY SYSTEM	Type		PGM-FI (Programmed Fuel Injection)
	Throttle bore		36 mm (1.4 in)
DRIVE TRAIN	Clutch system		Multi-plate, wet
	Clutch operation system		Cable operating
	Transmission		Constant mesh, 6-speeds
	Primary reduction		2.111 (76/36)
	Final reduction		2.688 (43/16)
	Gear ratio	1st	2.750 (33/12)
		2nd	1.938 (31/16)
		3rd	1.556 (28/18)
		4th	1.348 (31/23)
		5th	1.208(29/24)
		6th	1.095 (23/21)
	Gearshift pattern		1 - N - 2 - 3 - 4 - 5 - 6

ITEM		SPECIFICATIONS
ELECTRICAL	Ignition system	Computer-controlled digital transistorized with electric advance
	Starting system	Electric starter motor
	Charging system	Triple phase output alternator
	Regulator/rectifier	SCR shorted/triple phase, full wave rectification
	Lighting system	Battery

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	2.7 liter (2.9 US qt, 2.4 Imp qt)	–
	After oil filter change	2.8 liter (3.0 US qt, 2.5 Imp qt)	–
	After disassembly	3.5 liter (3.7 US qt, 3.1 Imp qt)	–
Engine oil		Suggested oil: Honda "4-stroke motorcycle oil" or an equivalent Oil recommendation: API classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 standard: MA	–
Oil pressure at EOP switch		496 kPa (5.1 kgf/cm^2, 72 psi) at 6,000 min^{-1} (rpm)/(80°C/176°F)	–
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.35 (0.014)
	Side clearance	0.04 – 0.09 (0.002 – 0.004)	0.17 (0.007)

FUEL SYSTEM (PGM-FI) SPECIFICATIONS

ITEM	SPECIFICATIONS
Throttle body identification number	GQ3CA
Idle speed	1,350 ± 100 min^{-1} (rpm)
Throttle grip freeplay	2 – 6 mm (1/16 – 1/4 in)
IAT sensor resistance (at 20°C/68°F)	1 – 4 kΩ
ECT sensor resistance (at 20°C/68°F)	2.3 – 2.6 kΩ
Fuel injector resistance (at 20°C /68°F)	11 – 13 Ω
PAIR control solenoid valve resistance (at 20°C/68°F)	23 – 27 Ω
CKP sensor peak voltage (at 20°C/68°F)	0.7 V minimum
Fuel pressure at idle	343 kPa (3.5 kgf/cm^2, 50 psi)
Fuel pump flow (at 12 V)	189 cm^3 (6.4 US oz, 6.7 Imp oz) minimum/10 seconds

COOLING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.90 liter (3.06 US qt, 2.55 Imp qt)
	Reserve tank	0.38 liter (0.4 US qt, 0.33 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm^2, 16 – 20 psi)
Thermostat	Begin to open	80 – 84 °C (176 – 183 °F)
	Fully open	95 °C (203 °F)
	Valve lift	8 mm (0.3 in) minimum
Recommended antifreeze		High quality ethylene glycol antifreeze containing corrosion protection inhibitors
Standard coolant concentration		1:1 mixture with distilled water

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,304 kPa (13.3 kgf/cm², 189 psi) at 350 min⁻¹ (rpm)	–
Valve clearance		IN	0.20 ± 0.03 (0.008 ± 0.001)	–
		EX	0.28 ± 0.03 (0.011 ± 0.001)	–
Camshaft	Cam lobe height	IN	36.24 – 36.32 (1.427 – 1.430)	36.22 (1.426)
		EX	35.42 – 35.50 (1.394 – 1.398)	35.40 (1.394)
	Runout		–	0.05 (0.002)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Valve lifter	Valve lifter O.D.		25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)
	Valve lifter bore I.D.		26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)
Valve, valve guide	Valve stem O.D.	IN	3.975 – 3.990 (0.1565 – 0.1571)	3.965 (0.1561)
		EX	3.965 – 3.980 (0.1561 – 0.1567)	3.955 (0.1557)
	Valve guide I.D.		4.000 – 4.012 (0.1575 – 0.1580)	4.04 (0.159)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.075 (0.0030)
		EX	0.020 – 0.047 (0.0008 – 0.0019)	0.085 (0.0033)
	Valve guide projection above cylinder head	IN	17.1 – 17.4 (0.67 – 0.69)	–
		EX	13.3 – 13.6 (0.52 – 0.54)	–
	Valve seat width		0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length		IN	40.19 (1.582)	39.4 (1.55)
		EX	39.76 (1.565)	39.0 (1.54)
Cylinder head warpage			–	0.10 (0.004)

CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever freeplay		10 – 20 (3/8 – 13/16)	–
Clutch	Spring free length	48.2 (1.90)	47.2 (1.86)
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.6 (0.10)
	Plate warpage	–	0.30 (0.012)
Clutch outer guide	I.D.	24.993 – 25.003 (0.9840 – 0.9844)	25.013 (0.9848)
	O.D.	34.996 – 35.004 (1.3778 – 1.3781)	34.986 (1.3774)
Primary driven gear I.D.		41.000 – 41.016 (1.6142 – 1.6148)	41.026 (1.6152)
Oil pump drive sprocket guide	I.D.	25.000 – 25.021 (0.9843 – 0.9851)	25.031 (0.9855)
	O.D.	34.950 – 34.975 (1.3760 – 1.3770)	34.940 (1.3756)
Oil pump drive sprocket I.D.		35.025 – 35.145 (1.3789 – 1.3837)	35.155 (1.3841)
Mainshaft O.D. at clutch outer guide		24.980 – 24.990 (0.9835 – 0.9839)	24.960 (0.9827)
Mainshaft O.D. at oil pump drive sprocket guide		24.980 – 24.990 (0.9835 – 0.9839)	24.960 (0.9827)
Starter idle gear	Gear I.D.	10.013 – 10.035 (0.3942 – 0.3951)	10.05 (0.396)
	Shaft O.D.	9.991 – 10.000 (0.3933 – 0.3937)	9.98 (0.393)
Starter driven gear boss O.D.		45.657 – 45.673 (1.7975 – 1.7981)	45.642 (1.7969)

CRANKCASE/TRANSMISSION SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Shift fork	I.D.		12.000 – 12.018 (0.4724 – 0.4731)	12.03 (0.474)
	Claw thickness		5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)
Shift fork shaft O.D.			11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)
Transmission	Gear I.D.	M5, M6	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C1	24.000 – 24.021 (0.9449 – 0.9457)	26.04 (1.025)
		C2, C3, C4	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
	Gear busing O.D.	M5, M6	27.959 – 27.980 (1.1007 – 1.1016)	27.94 (1.100)
		C2	30.955 – 30.980 (1.2187 – 1.2197)	30.94 (1.218)
		C3, C4	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
	Gear-to-bushing clearance	M5, M6	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C2	0.020 – 0.070 (0.0008 – 0.0028)	0.10 (0.004)
		C3, C4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Gear bushing I.D.	M5	24.985 – 25.006 (0.9837 – 0.9845)	25.016 (0.9849)
		C2	27.985 – 28.006 (1.1018 – 1.1026)	28.021 (1.1032)
	Mainshaft O.D.	at M5	24.967 – 24.980 (0.9830 – 0.9835)	24.96 (0.983)
	Countershaft O.D.	at C2	27.967 – 27.980 (1.1011 – 1.1016)	27.96 (1.101)
	Bushing to shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)
		C2	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)

CRANKSHAFT/PISTON/CYLINDER SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance		0.15 – 0.30 (0.006 – 0.012)	0.35 (0.014)
	Crankpin bearing oil clearance		0.028 – 0.052 (0.0011 – 0.0020)	0.06 (0.002)
	Main journal bearing oil clearance		0.020 – 0.038 (0.0008 – 0.0015)	0.05 (0.002)
	Runout		–	0.05 (0.002)
Piston, piston rings	Piston O.D. at 6 (0.2) from bottom		66.965 – 66.985 (2.6364 – 2.6372)	66.90 (2.634)
	Piston pin bore I.D.		16.002 – 16.008 (0.6300 – 0.6302)	16.02 (0.631)
	Piston pin O.D.		15.994 – 16.000 (0.6297 – 0.6299)	15.98 (0.629)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)
	Piston ring end gap	Top	0.10 – 0.20 (0.004 – 0.008)	0.4 (0.02)
		Second	0.21 – 0.31 (0.008 – 0.012)	0.5 (0.02)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	1.0 (0.04)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.060 (0.0012 – 0.0024)	0.10 (0.004)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.08 (0.003)
Cylinder	I.D.		67.000 – 67.015 (2.6378 – 2.6384)	67.10 (2.642)
	Out of round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.10 (0.004)
Cylinder-to-piston clearance			0.015 – 0.050 (0.0006 – 0.0022)	0.10 (0.004)
Connecting rod small end I.D.			16.030 – 16.044 (0.6311 – 0.6317)	16.05 (0.632)
Connecting rod-to-piston pin clearance			0.030 – 0.050 (0.0012 – 0.0020)	0.07 (0.003)

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	1.5 (0.06)
Cold tire pressure	Driver only	250 kPa (2.50 kgf/cm^2, 36 psi)	–
	Driver and passenger	250 kPa (2.50 kgf/cm^2, 36 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel balance weight		–	60 g (2.1oz) max.
Fork	Spring free length	245.7 (9.67)	240.8 (9.48)
	Fork tube runout	–	0.20 (0.008)
	Recommended fork fluid	Honda ULTRA CUSHION OIL 10W or equivalent	–
	Fluid level	70 (2.8)	–
	Fluid capacity	494 ± 2.5 cm^3 (16.7 ± 0.08 US oz, 17.4 ± 0.09 Imp oz)	–
Steering head bearing pre-load		8.8 – 13.7 N (0.9 – 1.4 kgf, 2.0 – 3.1 lbf)	–

REAR WHEEL/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Minimum tire tread depth			–	2.0 (0.08)
Cold tire pressure	Driver only		290 kPa (2.90 kgf/cm^2, 42 psi)	–
	Driver and passenger		290 kPa (2.90 kgf/cm^2, 42 psi)	–
Axle runout			–	0.2 (0.01)
Wheel rim runout	Radial		–	2.0 (0.08)
	Axial		–	2.0 (0.08)
Wheel balance weight			–	60 g (2.1 oz) max.
Drive chain	Size/link	DID	DID525VM2-118LE	–
		REGINA	REG525ZRPB-118L	–
	Slack		30 – 40 (1-3/16 – 1-9/16)	–
Shock absorber spring pre-load adjuster standard position			Position 2	–

HYDRAULIC BRAKE SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Front	Specified brake fluid		DOT 4	–
	Brake disc thickness		4.3 – 4.7 (0.17 – 0.19)	3.5 (0.14)
	Brake disc runout		–	0.30 (0.012)
	Master cylinder I.D.		12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Master piston O.D.		12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
	Caliper cylinder I.D.	CB600FA:	22.650 – 22.700 (0.8917 – 0.8937)	22.710 (0.8941)
		CB600F:	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
	Caliper piston O.D.	CB600FA:	22.585 – 22.618 (0.8892 – 0.8905)	22.560 (0.8882)
		CB600F:	25.318 – 25.368 (0.9968 – 0.9987)	25.310 (0.9965)
Rear	Specified brake fluid		DOT 4	–
	Brake disk thickness		4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)
	Brake disc runout		–	0.30 (0.012)
	Master cylinder I.D.	CB600FA:	17.460 – 17.503 (0.6874 – 0.6891)	17.515 (0.6896)
		CB600F:	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Master piston O.D.	CB600FA:	17.417 – 17.444 (0.6857 – 0.6868)	17.405 (0.6852)
		CB600F:	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
	Caliper cylinder I.D.	CB600FA:	38.180 – 38.230 (1.5031 – 1.5051)	38.24 (1.506)
		CB600F:	30.23 – 30.28 (1.190 – 1.192)	30.29 (1.193)
	Caliper piston O.D.	CB600FA:	38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.500)
		CB600F:	30.148 – 30.198 (1.1869 – 1.1889)	30.14 (1.187)

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Capacity		12 V – 8.6 Ah
	Current leakage		2.0 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.8 A/5 – 10 h
		Quick	4.5 A/1 h
Alternator	Capacity		0.333 kW/5,000 min^{-1} (rpm)
	Charging coil resistance (20°C/68°F)		0.1 – 1.0 Ω

IGNITION SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	NGK	CR9EH-9
	DENSO	U27FER9
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage		100 V minimum
CKP sensor peak voltage		0.7 V minimum
Ignition timing ("F"mark)		5° BTDC at idle

ELECTRIC STARTER SPECIFICATION

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.0 (0.47)	6.5 (0.26)

LIGHTS/METERS/SWITCHES SPECIFICATIONS

ITEM			SPECIFICATIONS
Bulbs	Headlight	Hi	12 V – 55 W
		Lo	12 V – 55 W
	Position light		12 V – 5 W x 2
	Brake/tail light		LED
	License light		12 V – 5 W
	Turn signal light		12 V – 21 W x 4
	Instrument light		LED
	Turn signal indicator		LED
	High beam indicator		LED
	Neutral indicator		LED
	MIL		LED
	Warning indicator		LED
	Immobilizer system (HISS) indicator		LED
	ABS indicator (CB600FA)		LED
Fuse	Main fuse		30 A
	PGM-FI/IGN fuse		20 A
	Sub fuse		10 A x 4, 20 A x 2
	ABS main fuse (CB600FA)		10 A
	ABS fail-safe relay fuse (CB600FA)		30 A
	ABS motor fuse (CB600FA)		30 A
Tachometer peak voltage			10.5 V minimum
ECT sensor resistance		80 °C (176 °F)	2.1 – 2.6 kΩ
		120 °C (248 °F)	0.65 – 0.73 kΩ

STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm hex bolt and nut	5.2 (0.5, 3.8)	5 mm screw	4.2 (0.4, 3.1)
6 mm hex bolt and nut	10 (1.0, 7)	6 mm screw	9.0 (0.9, 6.6)
8 mm hex bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head, small flange)	10 (1.0, 7)
10 mm hex bolt and nut	34 (3.5, 25)	6 mm flange bolt (8 mm head, large flange)	12 (1.2, 9)
12 mm hex bolt and nut	54 (5.5, 40)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
		8 mm flange bolt and nut	27 (2.8, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

ENGINE & FRAME TORQUE VALUES

- Torque specifications listed below are for important fasteners.
- Others should be tightened to standard torque values listed above.

ENGINE

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spark plug	4	10	16 (1.6, 12)	
Timing hole cap	1	45	18 (1.8, 13)	Apply grease to the threads.
Engine oil filter cartridge	1	20	26 (2.7, 19)	Apply engine oil to the threads and O-ring.
Oil filter boss	1	20	See page 3-15	Apply a locking agent to the threads.
Engine oil drain bolt	1	12	30 (3.1, 22)	

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump assembly bolt	3	6	12 (1.2, 9)	CT bolt
Oil pump driven sprocket bolt	1	6	15 (1.5, 11)	Apply a locking agent to the threads.
Oil cooler bolt	1	20	59 (6.0, 44)	Apply engine oil to the threads.
Oil pipe A mounting bolt	2	6	12 (1.2, 9)	Apply a locking agent to the threads.

FUEL SYSTEM (PGM-FI)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
ECT sensor	1	12	23 (2.3, 17)	
Insulator band screw (Throttle body side)	4	5	See page 5-84	
Insulator band screw (Cylinder head side)	4	5	See page 5-75	
Fuel rail mounting bolt	4	6	5.1 (0.5, 3.8)	
IACV setting plate screw	2	4	2.1 (0.2, 1.5)	
IACV joint screw	1	4	2.1 (0.2, 1.5)	

COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Water pump assembly bolt	2	6	12 (1.2, 9)	CT bolt
Water pump impeller bolt	1	6	12 (1.2, 9)	
Thermostat housing cover bolt	2	6	12 (1.2, 9)	CT bolt

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Drive sprocket bolt	1	10	54 (5.5, 40)	

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head mounting bolt	10	9	47 (4.8, 35)	Apply molybdenum oil solution to the threads and seating surface.
Camshaft holder flange bolt	20	6	12 (1.2, 9)	Apply engine oil to the threads and seating surface.
Cylinder head cover bolt	4	6	10 (1.0, 7)	
PAIR check valve cover bolt	4	6	12 (1.2, 9)	CT bolt
Cam sprocket bolt	4	7	20 (2.0, 15)	Apply a locking agent to the threads.
Cam chain tensioner A pivot bolt	1	6	12 (1.2, 9)	Apply a locking agent to the threads.
Cam chain tensioner B pivot bolt	1	10	20 (2.0, 15)	Apply a locking agent to the threads.
Cam chain guide A bolt	1	6	12 (1.2, 9)	
Bleeding joint	1	8	12 (1.2, 9)	Apply a locking agent to the threads.
Exhaust pipe stud bolt	8	8	See page 2-15	

CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch center lock nut	1	22	128 (13.1, 94)	Apply engine oil to the threads and seating surface. Stake.
Clutch spring bolt	5	6	12 (1.2, 9)	
Starter clutch outer mounting bolt	1	10	83 (8.5, 61)	Apply engine oil to the threads and seating surface.
Shift drum center socket bolt	1	8	23 (2.3, 17)	Apply a locking agent to the threads.
Shift drum stopper arm pivot bolt	1	6	12 (1.2, 9)	Apply a locking agent to the threads.
Gearshift spindle return spring pin	1	8	22 (2.2, 16)	

ALTERNATOR

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Stator wire clamp flange bolt	1	6	12 (1.2, 9)	CT bolt
Flywheel flange bolt	1	10	113 (11.5, 83)	Apply engine oil to the threads and seating surface.
Stator mounting socket bolt	4	6	12 (1.2, 9)	

CRANKCASE/TRANSMISSION

ITEM		Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Mainshaft bearing set plate bolt		3	6	12 (1.2, 9)	Apply a locking agent to the threads.
Shift drum bearing set bolt		2	6	12 (1.2, 9)	Apply a locking agent to the threads.
Crankcase	6 mm bolt	15	6	12 (1.2, 9)	
	8 mm bolt	1	8	24 (2.4, 18)	
	8 mm bolt (main journal)	10	8	15 (1.5, 11) + 120°	See page 11-16 Replace with a new one.
	10 mm bolt	1	10	39 (4.0, 29)	

CRANKSHAFT/PISTON/CYLINDER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Connecting rod bearing cap nut	8	7	26 (2.7, 19)	Apply engine oil to the threads and seating surface.

ELECTRIC STARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter motor terminal nut	1	6	10 (1.0, 7)	

LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
EOP switch	1	PT 1/8	12 (1.2, 9)	Apply sealant to the threads.
EOP switch wire terminal bolt	1	4	2.0 (0.2, 1.5)	
Neutral switch	1	10	12 (1.2, 9)	

FRAME

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Exhaust pipe joint nut	8	7	12 (1.2, 9)	
Exhaust pipe/muffler mounting nut	3	8	22 (2.2, 16)	
Exhaust pipe/muffler protector socket bolt	6	6	12 (1.2, 9)	
Muffler band bolt	1	8	22 (2.2, 16)	
Grab rail socket bolt	4	8	27 (2.8, 20)	
Rear center lower cowl screw	2	6	4.0 (0.4, 3)	
Front fender mounting bolt	4	6	12 (1.2, 9)	
Side cover socket bolt	2	6	4.0 (0.4, 3)	
Seat rail upper mounting nut	1	10	39 (4.0, 29)	
Seat rail lower mounting bolt	2	10	39 (4.0, 29)	

FUEL SYSTEM (PGM-FI)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel tank rear mounting nut	1	6	12 (1.2, 9)	
Fuel filler cap mounting bolt	3	4	1.8 (0.2, 1.3)	
Fuel pump mounting nut	7	6	12 (1.2, 9)	See page 5-57
Air cleaner housing screw	9	6	3.5 (0.4, 2.6)	

COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Radiator upper mounting bolt	2	6	3.5 (0.4, 2.6)	
Fan motor mounting bolt	3	5	5.0 (0.5, 3.7)	
Fan motor shroud mounting bolt	4	6	8.4 (0.9, 6.2)	

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front engine hanger nut	4	10	49 (5.0, 36)	
Front engine mounting bolt	2	12	59 (6.0, 44)	
Rear engine hanger nut	2	10	49 (5.0, 36)	
Rear engine mounting nut	2	12	59 (6.0, 44)	
Swingarm pivot bracket nut	2	10	69 (7.0, 51)	

FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Handlebar holder bolt	4	8	27 (2.8, 20)	
Clutch lever pivot bolt	1	6	1.0 (0.1, 0.7)	
Clutch lever pivot nut	1	6	6.0 (0.6, 4.4)	
Steering stem adjusting lock nut	1	26	See page 13-37	
Steering stem adjusting nut	1	26	26 (2.7, 19)	Apply engine oil to the threads.
Steering stem nut	1	24	103 (10.5, 76)	
Bottom bridge pinch bolt	2	10	39 (4.0, 29)	
Top bridge pinch bolt	2	8	22 (2.2, 16)	
Fork bolt	2	44	34 (3.5, 25)	
Fork bolt lock nut	2	10	20 (2.0, 15)	
Fork socket bolt	2	8	20 (2.0, 15)	Apply a locking agent to the threads.
Front axle pinch bolt	2	8	22 (2.2, 16)	
Front axle bolt	1	14	59 (6.0, 44)	
Front brake disc mounting bolt	12	6	20 (2.0, 15)	ALOC bolt; replace with a new one.
Front pulser ring mounting bolt (CB600FA)	3	5	7.0 (0.7, 5.2)	ALOC bolt; replace with a new one.

REAR WHEEL/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Drive chain case mounting bolt	2	6	12 (1.2, 9)	
Rear axle nut	1	18	98 (10.0, 72)	U-nut
Rear brake disc mounting bolt	4	8	42 (4.3, 31)	ALOC bolt; replace with a new one.
Driven sprocket nut	5	12	108 (11.0, 80)	
Shock absorber mounting nut	2	10	42 (4.3, 31)	U-nut
Swingarm pivot nut	1	18	98 (10.0, 72)	U-nut
Footpeg holder mounting bolt	4	8	37 (3.8, 27)	
Drive chain slider bolt	2	6	9.0 (0.9, 6.6)	ALOC bolt; replace with a new one.
Rear pulser ring mounting bolt (CB600FA)	4	5	7.0 (0.7, 5.2)	ALOC bolt; replace with a new one.

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake hose oil bolt				
CB600FA:	6	10	34 (3.5, 25)	
CB600F:	5	10	34 (3.5, 25)	
Front brake caliper mounting bolt	4	8	30 (3.1, 22)	ALOC bolt; replace with a new one.
Caliper bleed valve				
CB600FA:	4	8	5.4 (0.6, 4.0)	
CB600F:	3	8	5.4 (0.6, 4.0)	
Brake pad pin	3	10	17 (1.7, 13)	
Pad pin plug (CB600F)	2	10	2.5 (0.3, 1.8)	
Rear brake caliper bolt (CB600FA)	1	8	22 (2.2, 16)	ALOC bolt; replace with a new one.
Front master cylinder holder bolt	2	6	12 (1.2, 9)	
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Brake lever pivot bolt	1	6	1.0 (0.1, 0.7)	Apply silicone grease to the sliding surface.
Brake lever pivot nut	1	6	5.9 (0.6, 4.4)	
Front brake light switch screw	1	4	1.2 (0.1, 0.9)	
Rear master cylinder mounting bolt	2	6	12 (1.2, 9)	
Rear master cylinder reservoir hose joint screw	1	4	1.5 (0.2, 1.1)	Apply a locking agent to the threads.
Rear master cylinder push rod joint nut	1	8	17 (1.7, 13)	
Rear brake fluid reservoir mounting bolt	1	6	10 (1.0, 7)	
Front brake hose clamp bolt				
CB600FA:	4	6	10 (1.0, 7)	
CB600F:	1	6	12 (1.2, 9)	ALOC bolt; replace with a new one.
Front brake hose stay mounting bolt	1	6	12 (1.2, 9)	
Rear brake hose guide screw	2	5	4.2 (0.4, 3.1)	

ABS (Anti-lock Brake System): CB600FA

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake pipe joint nut	14	10	14 (1.4, 10)	Apply brake fluid to the threads.
PCV mounting bolt	2	6	12 (1.2, 9)	
Delay valve mounting bolt	2	6	12 (1.2, 9)	

LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Ignition switch mounting bolt	2	8	25 (2.5, 18)	One-way bolt
License light mounting nut	2	5	1.7 (0.2, 1.3)	
Rear turn signal mounting nut	2	6	5.0 (0.5, 3.7)	
Combination meter socket bolt	3	4	0.5 (0.1, 0.4)	
Combination meter assembly screw	9	5	1.0 (0.1, 0.7)	

OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Sidestand pivot bolt	1	10	15 (1.5, 11)	
Sidestand pivot nut	1	10	39 (4.0, 29)	
Sidestand bracket socket bolt	2	10	55 (5.6, 41)	
Gearshift pedal link pivot bolt	1	8	27 (2.8, 20)	
Gearshift arm pinch bolt	1	6	20 (2.0, 15)	
Ignition coil stay mounting nut	4	6	3.5 (0.4, 2.6)	
Pair solenoid valve stay mounting nut	2	6	3.5 (0.4, 2.6)	

LUBRICATION & SEAL POINTS

ENGINE

MATERIAL	LOCATION	REMARKS
Liquid sealant (Three Bond 1207B or equivalent)	Crankcase mating surface	See page 11-15
	Oil pan mating surface	See page 4-7
	Right crankcase cover mating surface	See page 9-25
	Alternator cover mating surface	See page 10-7
	EOP switch threads	See page 4-5
	Right crankcase cover wire grommet	
	Alternator cover wire grommet	
Liquid sealant (Three Bond 5211C or equivalent)	Cylinder head semi-circular cut-out	See page 8-31
Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	Main journal bearing surface	
	Piston pin sliding surface	
	Connecting rod bearing surface	Do not apply seating surface of the connecting rod bolt
	Connecting rod small end inner surface	
	Crankshaft thrust surface	
	Camshaft lobes, journals and thrust surface	Do not apply mating surface of the camshaft holder
	Valve stem (valve guide sliding surface)	
	Valve lifter outer sliding surface	
	Clutch outer/primary driven gear sliding surface	
	Clutch outer guide sliding surface	
	Oil pump drive sprocket and collar sliding surface	
	M3/4, C5, C6 shifter gear (shift fork grooves)	
	Starter reduction gear shaft sliding surface	
	Starter idle gear shaft sliding surface	
	Water pump shaft thrust washer sliding surface	
	Cylinder head mounting bolt threads and seating surface	
Engine oil	Piston and piston ring sliding surface	
	Oil strainer packing whole surface	
	Clutch disc whole surface	
	Starter one-way clutch sliding surface	
	Flywheel bolt threads and seating surface	
	Clutch center lock nut threads and seating surface	
	Oil filter cartridge threads and O-ring surface	
	Camshaft holder bolt threads and seating surface	
	Connecting rod bolt/nut threads and seating surface	
	Oil cooler bolt threads and sealing washer seating surface	
	Each gear teeth and rotating surface	
	Each bearing rolling surface	
	Each O-ring whole surface	
	Other rotating area and sliding surface	
Multi-purpose grease	Timing hole cap threads	
	Each oil seal lips	

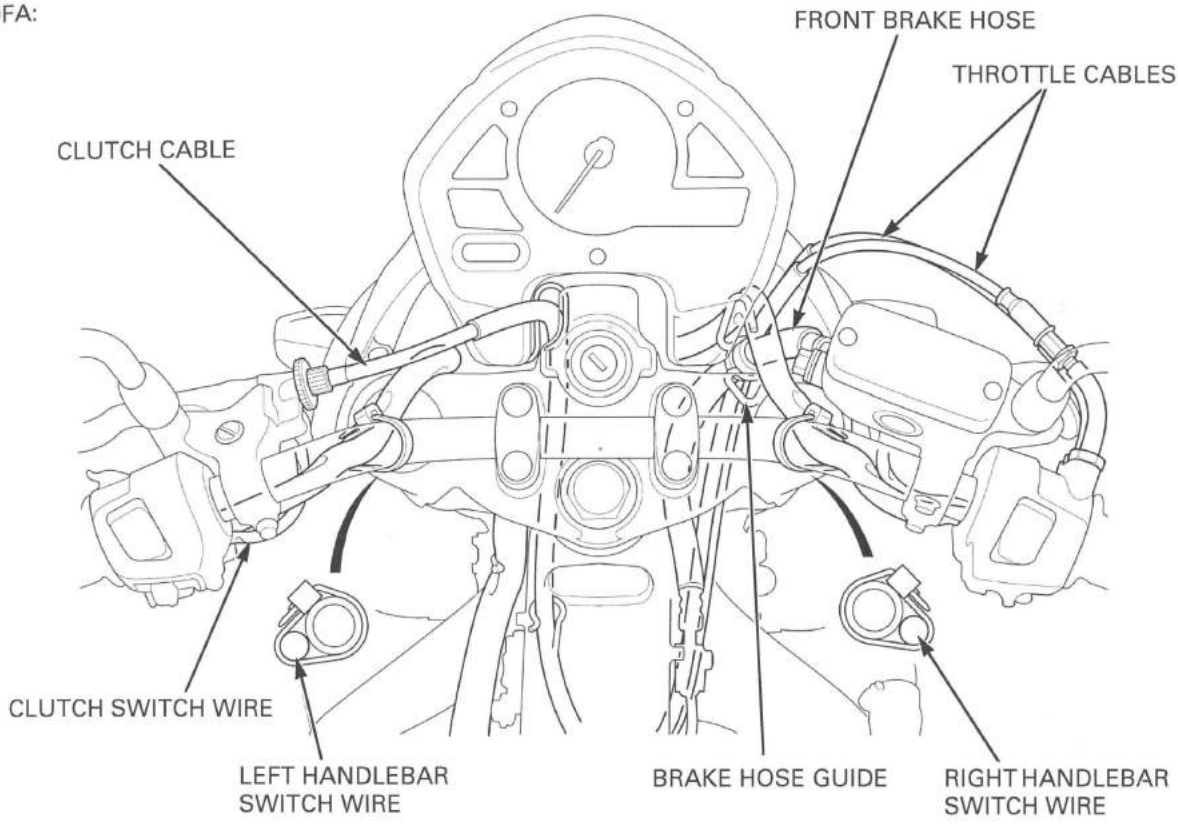
MATERIAL	LOCATION	REMARKS
Locking agent	Oil level finder plate bolt threads	Coating width: 6.5 ± 1 mm
	Oil pump driven sprocket bolt threads	Coating width: 6.5 ± 1 mm
	Shift drum bearing setting bolt threads	Coating width: 6.5 ± 1 mm
	Mainshaft bearing set plate bolt threads	Coating width: 6.5 ± 1 mm
	Cam sprocket bolt threads	Coating width: 6.5 ± 1 mm
	Shift drum center bolt threads	Coating width: 6.5 ± 1 mm
	Cam chain tensioner A pivot bolt threads	Coating width: 6.5 ± 1 mm
	Cam chain tensioner B pivot bolt threads	Coating width: 6.5 ± 1 mm
	Oil filter boss threads (stud side)	Coating width: 6.5 ± 1 mm
	Oil pipe A/B bolt threads	Coating width: 6.5 ± 1 mm
	Oil pump chain guide A/B bolt threads	Coating width: 6.5 ± 1 mm
	Spindle plate bolt threads	Coating width: 6.5 ± 1 mm
	Spindle set plate bolt threads	Coating width: 6.5 ± 1 mm
	Shift drum stopper arm pivot bolt threads	Coating width: 6.5 ± 1 mm
	Bleeding joint threads	Coating width: 6.5 ± 1 mm

FRAME

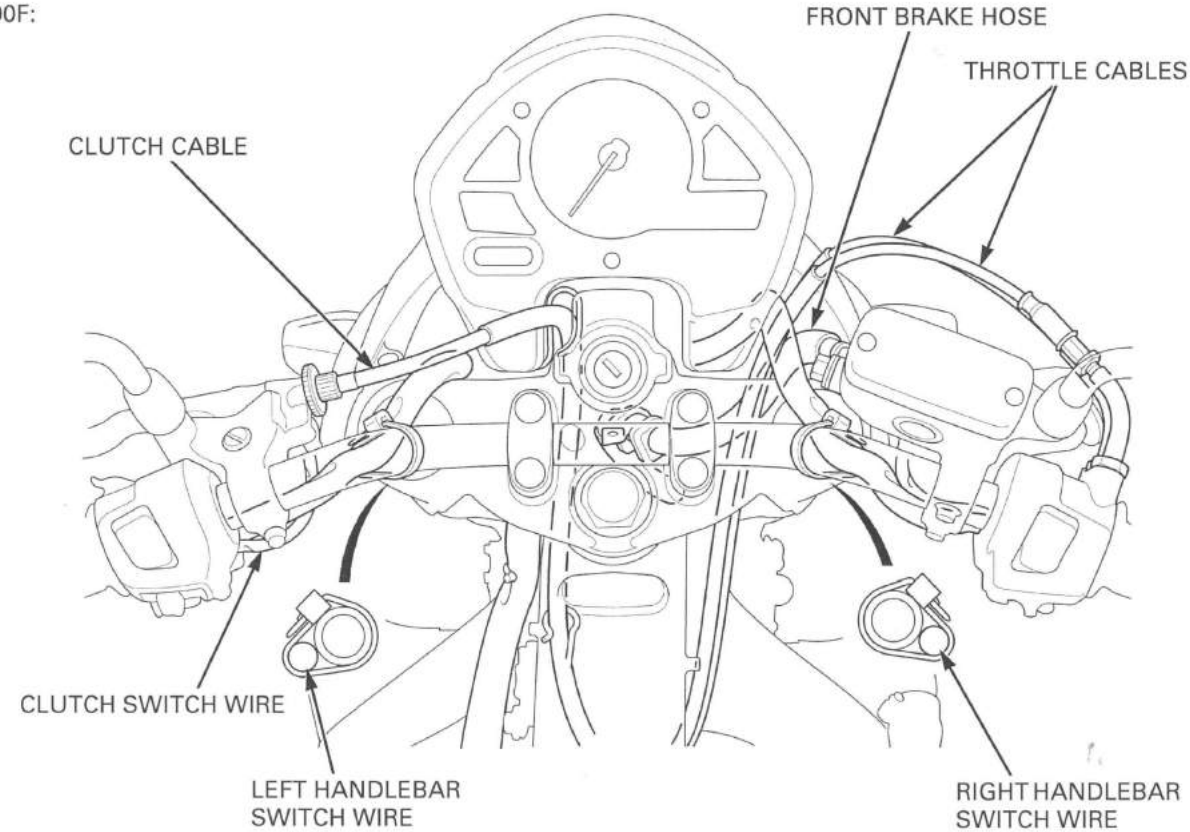
MATERIAL	LOCATION	REMARKS
Multi-purpose grease	Sidestand pivot sliding area Throttle cable end Clutch lever pivot sliding area Driver footpeg sliding area Passenger footpeg sliding area Gearshift pedal link tie-rod ball joints Gearshift pedal pivot sliding area Rear brake pedal pivot sliding area Rear wheel hub O-ring and sleeve (driven flange contact area) Front wheel dust seal lips Rear wheel dust seal lips Seat lock cable end	
Lithium based multi-purpose grease with extreme pressure (Shell Alvania EP2 or equivalent)	Swingarm pivot bearings Swingarm pivot dust seal lips Shock absorber pivot dust seal lips Shock absorber pivot needle bearing	
Urea based multi-purpose grease with extreme pressure agent (example: EXCELITE EP2 manufactured by KYODO YUSHI, Japan), Shell Stamina EP2 or equivalent	Upper and lower steering head bearing Steering head dust seal lips	Apply 3 – 5 g each
Molybdenum paste	Shock absorber spring adjuster cam sliding area	
Engine oil	Steering head bearing adjusting nut threads	
Cable lubricant	Throttle cable A, B casing inside Clutch cable outer inside	
Honda bond A, Honda hand grip cement, Cemedine #540 or equivalent	Handlebar grip rubber inside	
Silicone grease	Brake caliper main and sub slide pin sliding surfaces Brake caliper pin boot inside Brake pad pin stopper ring Front brake lever pivot Front brake lever-to-master piston contact area Rear master cylinder push rod-to-master piston contact area Rear master cylinder push rod boot inside Brake caliper dust seals	Apply 0.4 g each Apply 0.1 g Apply 0.1 g Apply 0.1 g Apply 0.1 g
DOT 4 brake fluid	Master cylinder inside Brake master pistons and cups Brake caliper pistons and piston seals Brake pipe threads (CB600FA)	
Fork fluid	Fork cap O-ring Fork dust seal and oil seal lips	
Locking agent	Rear master cylinder reservoir hose joint screw threads Fork socket bolt threads Front brake lever socket bolt threads Brake caliper pad retainer	

CABLE & HARNESS ROUTING

CB600FA:



CB600F:



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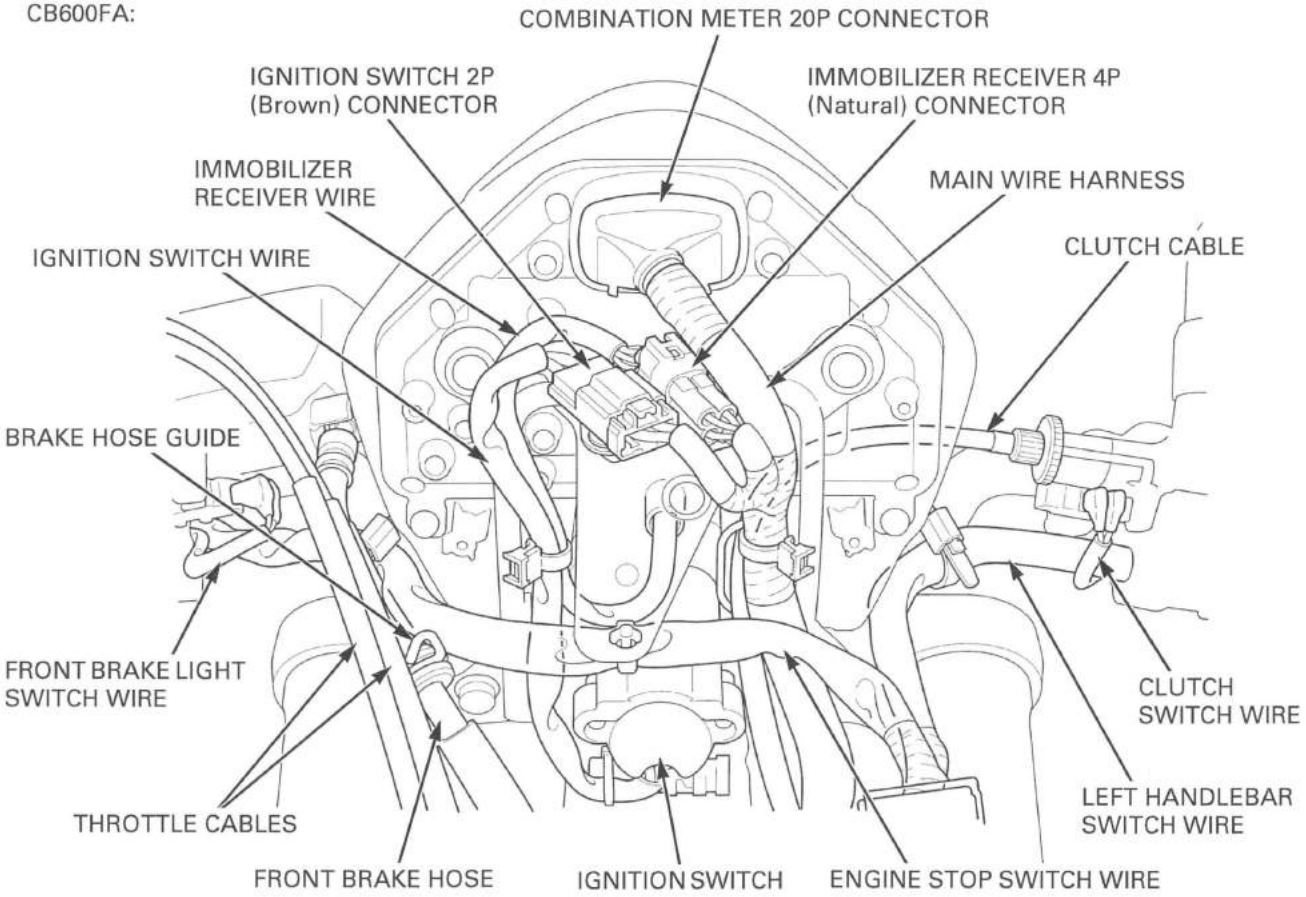

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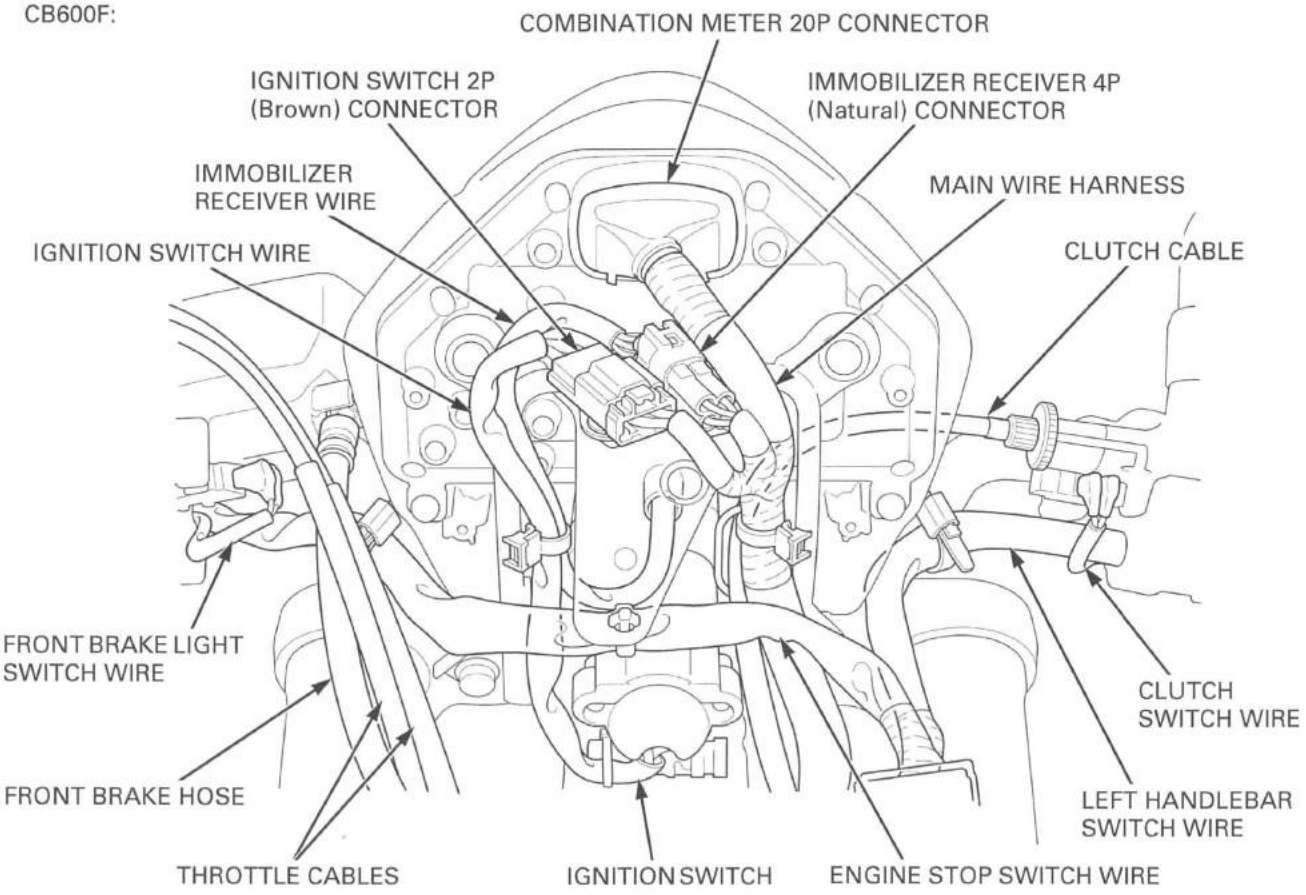
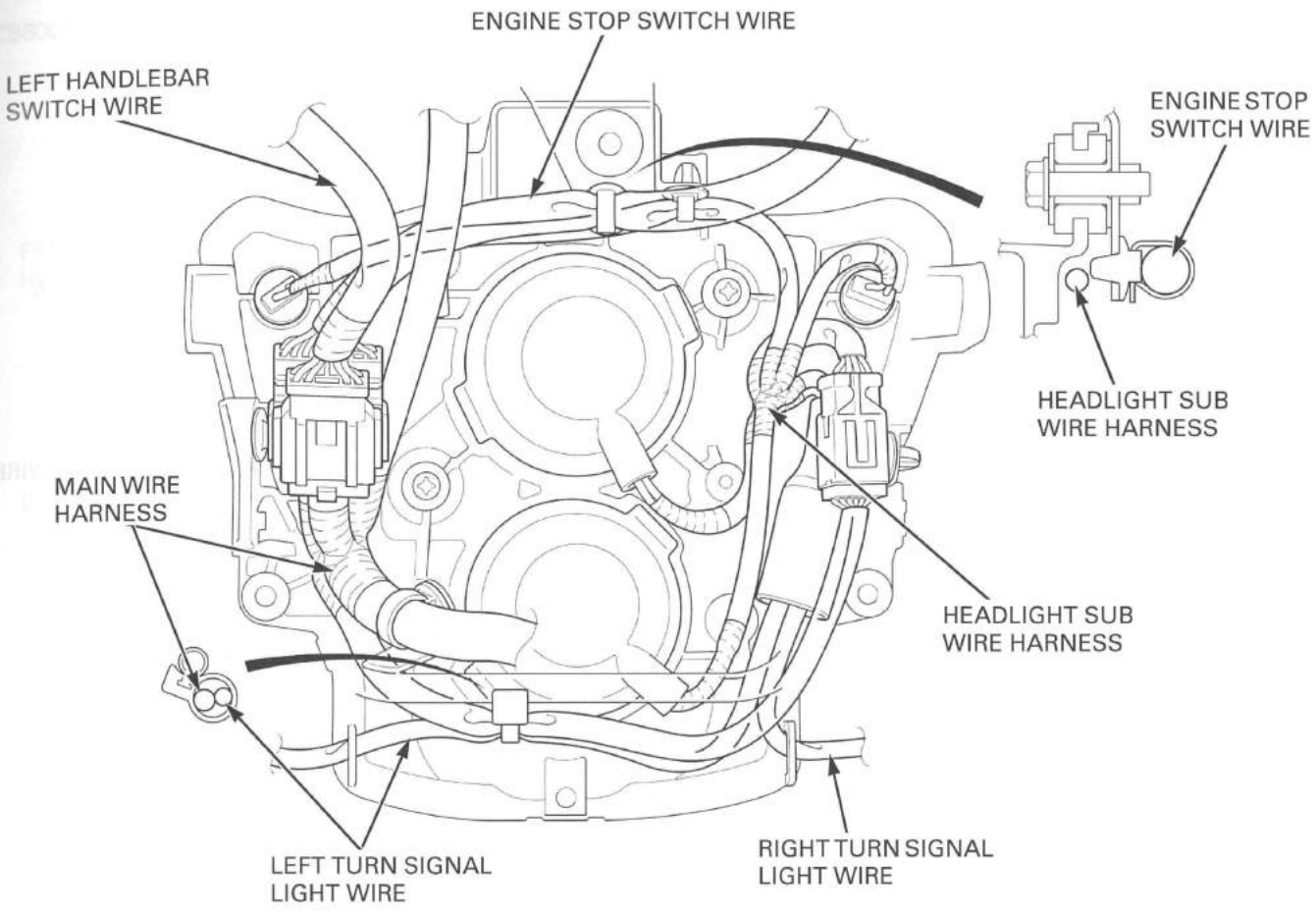
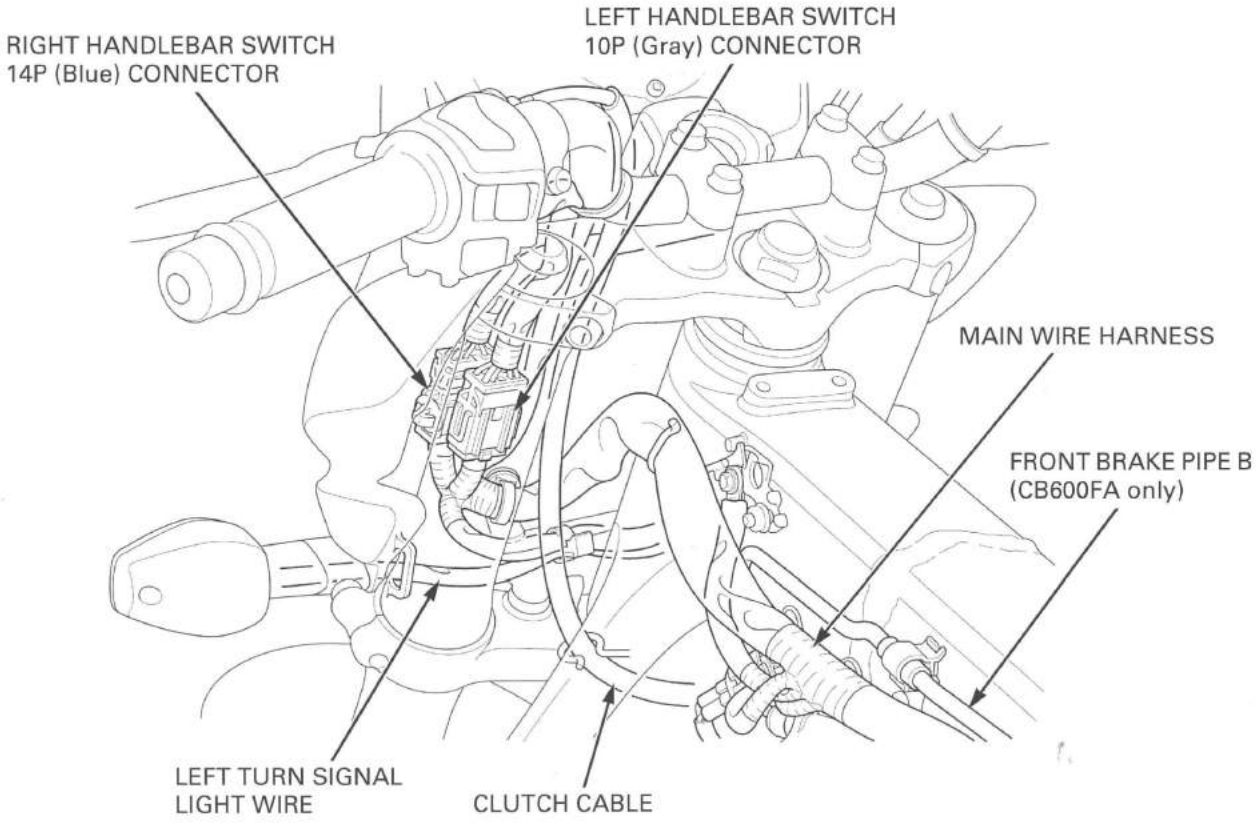
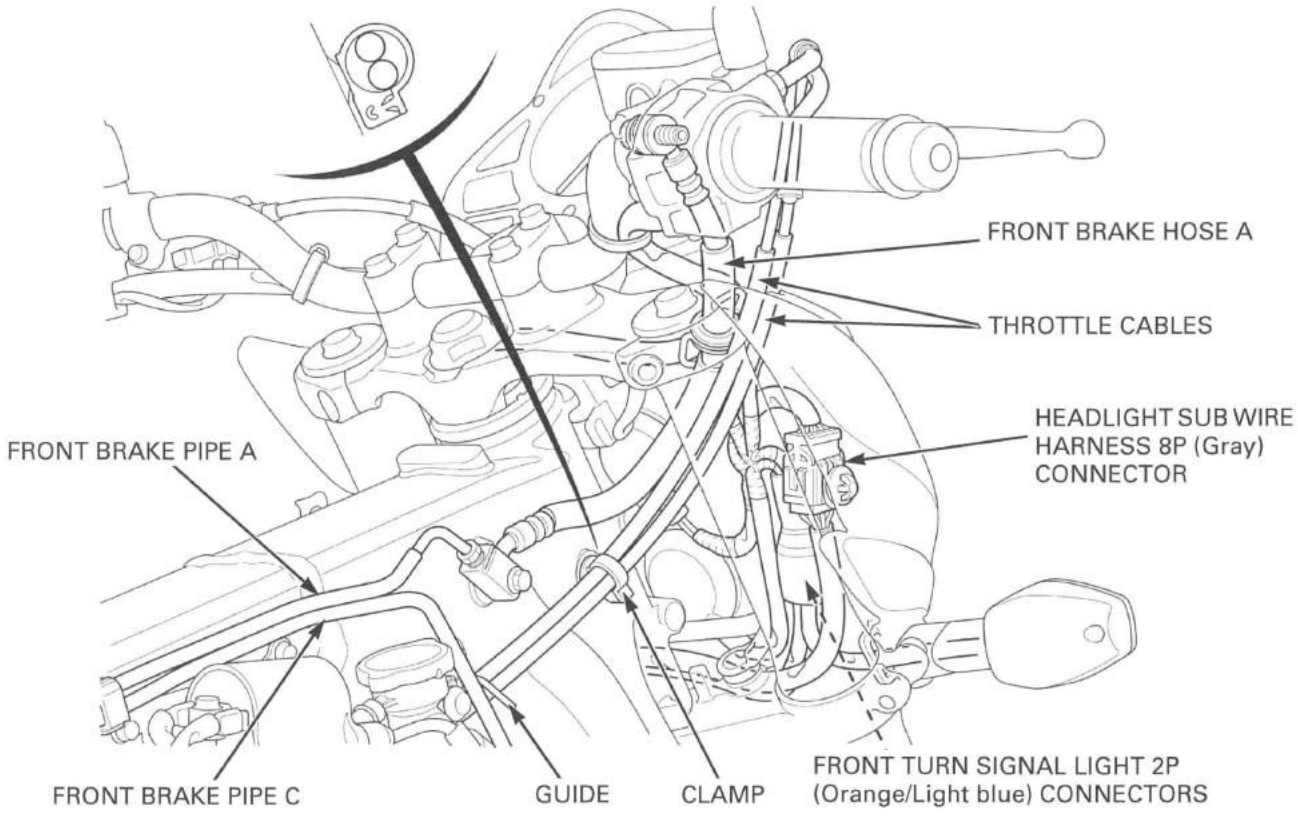



ENGINE STOP SWITCH WIRE
LEFT HANDLEBAR SWITCH WIRE
ENGINE STOP SWITCH WIRE
HEADLIGHT SUB WIRE HARNESS
MAIN WIRE HARNESS
HEADLIGHT SUB WIRE HARNESS
LEFT TURN SIGNAL LIGHT WIRE
RIGHT TURN SIGNAL LIGHT WIRE


RIGHT HANDLEBAR SWITCH 14P (Blue) CONNECTOR
LEFT HANDLEBAR SWITCH 10P (Gray) CONNECTOR
MAIN WIRE HARNESS
FRONT BRAKE PIPE B (CB600FA only)
LEFT TURN SIGNAL LIGHT WIRE
CLUTCH CABLE

CB600FA:



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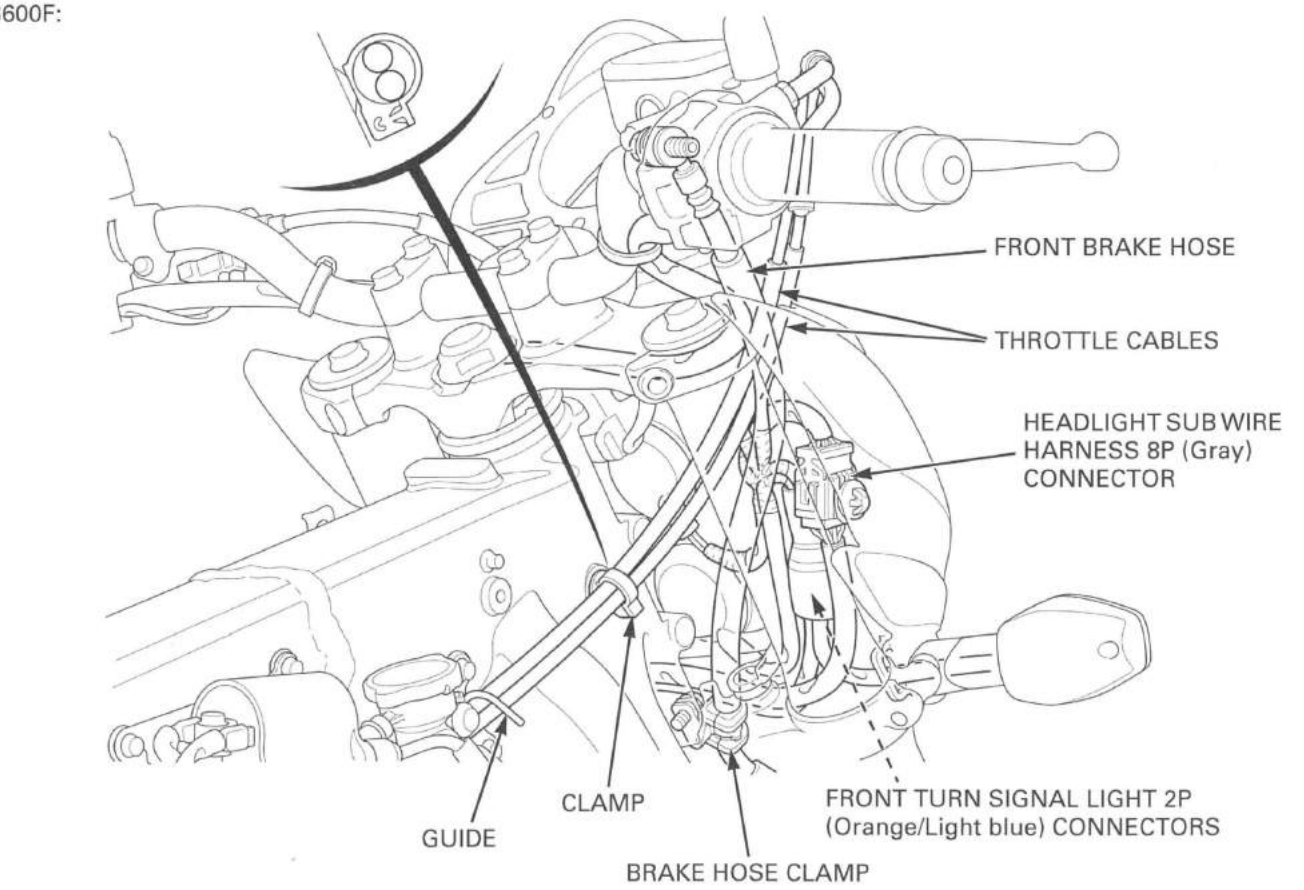

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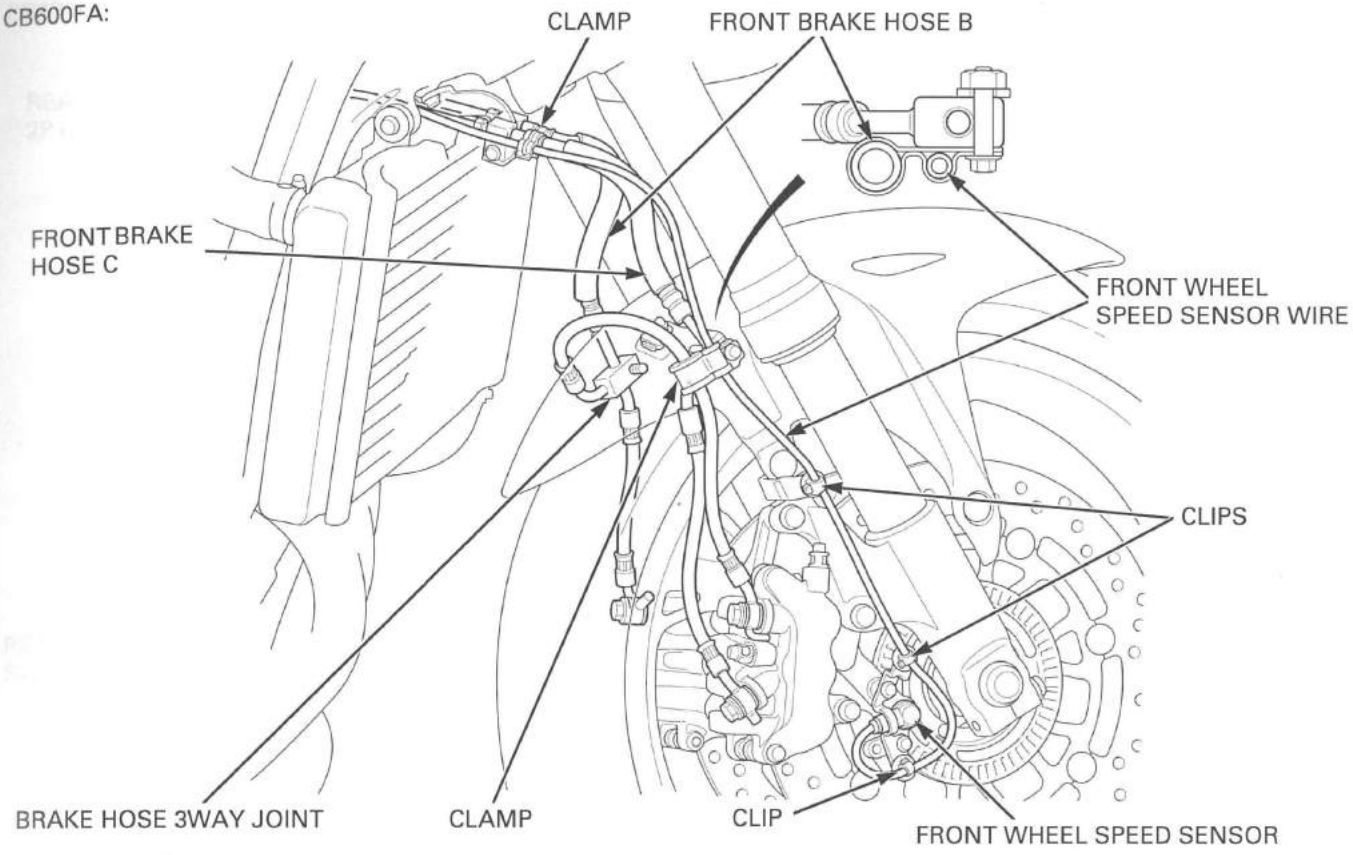

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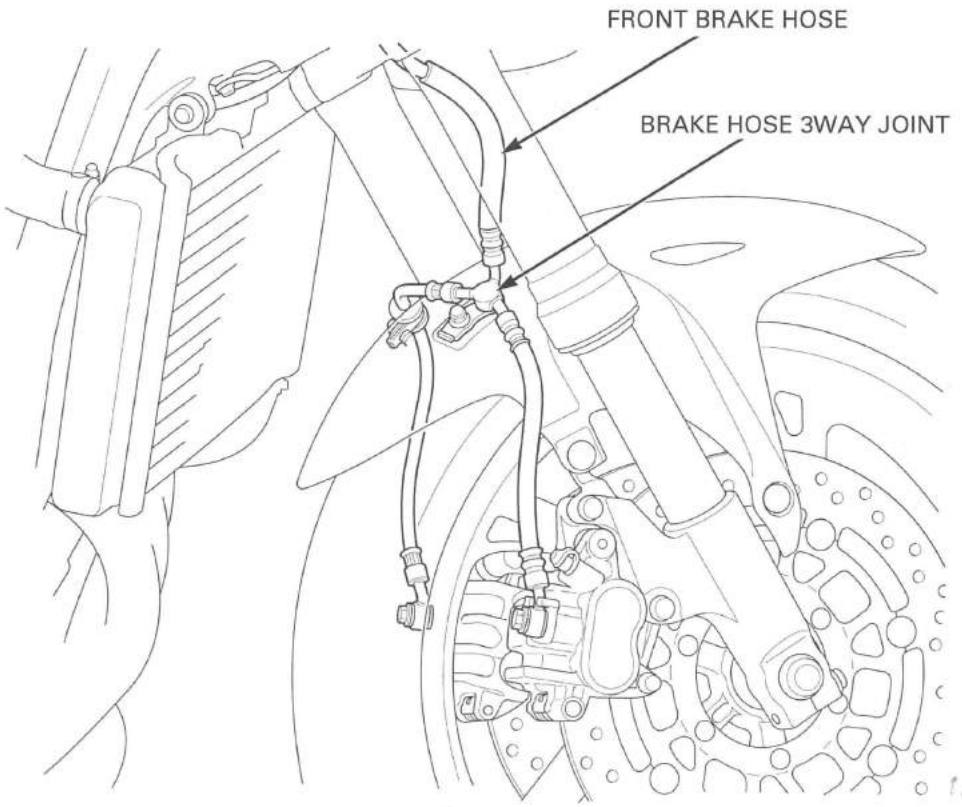
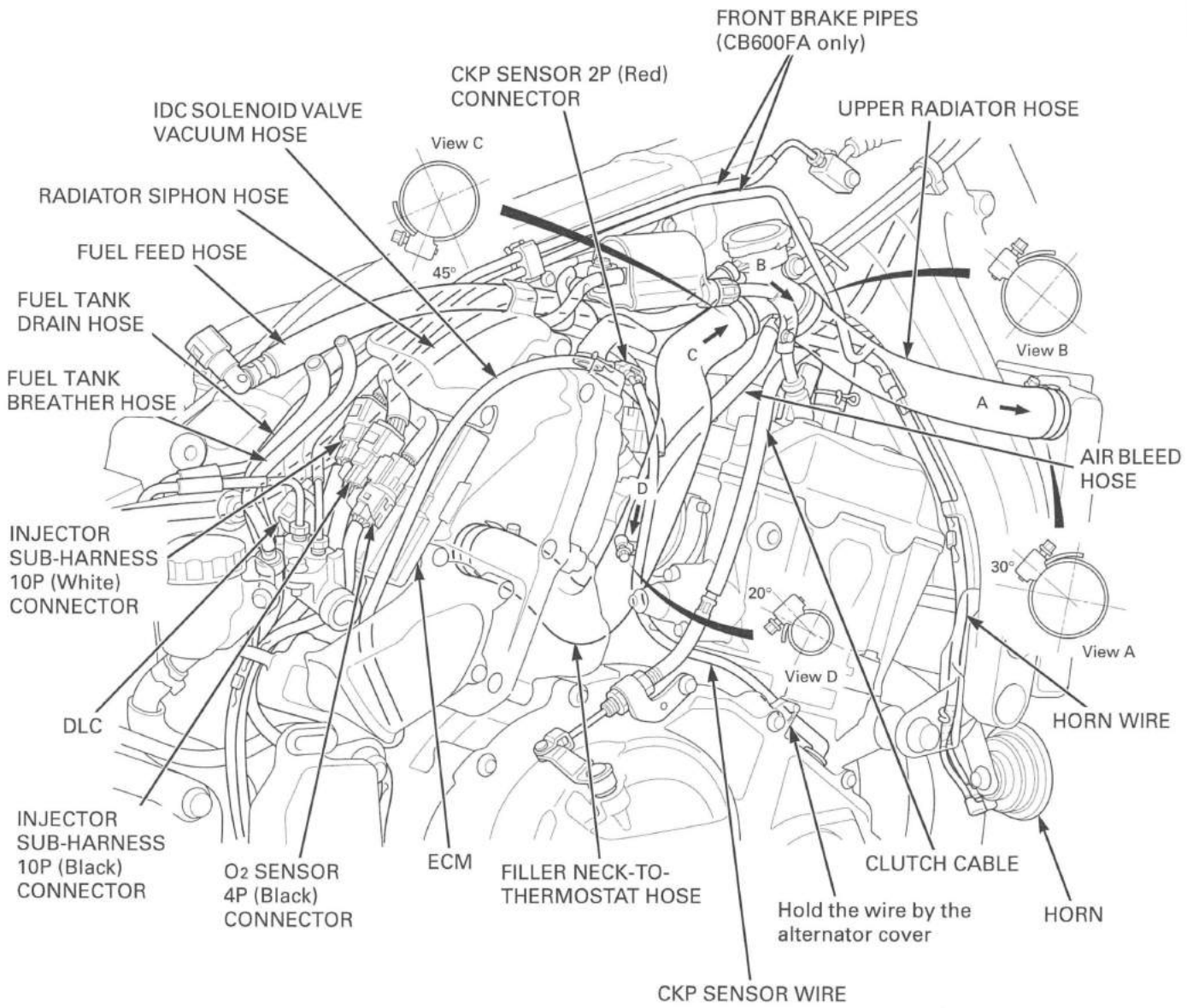
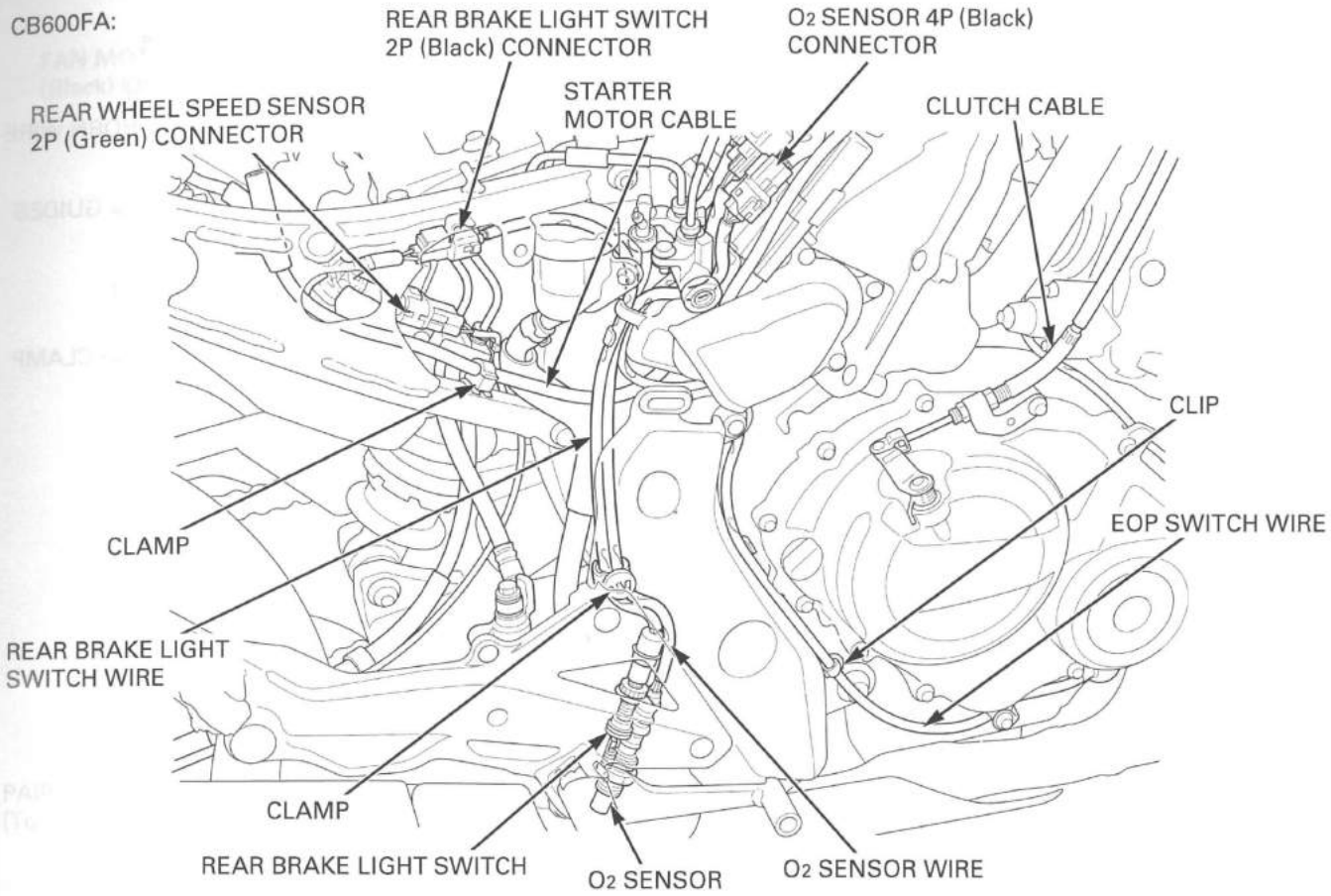



FRONT BRAKE PIPES
(CB600FA only)
CKP SENSOR 2P (Red)
CONNECTOR
IDC SOLENOID VALVE
VACUUM HOSE
UPPER RADIATOR HOSE
View C
RADIATOR SIPHON HOSE
FUEL FEED HOSE
45°
B
FUEL TANK
DRAIN HOSE
C
View B
FUEL TANK
BREATHER HOSE
A
AIR BLEED
HOSE
D
INJECTOR
SUB-HARNESS
10P (White)
CONNECTOR
30°
20°
View A
View D
DLC
HORN WIRE
INJECTOR
SUB-HARNESS
10P (Black)
CONNECTOR
O2 SENSOR
4P (Black)
CONNECTOR
ECM
FILLER NECK-TO-
THERMOSTAT HOSE
CLUTCH CABLE
Hold the wire by the
alternator cover
HORN
CKP SENSOR WIRE

CB600FA:



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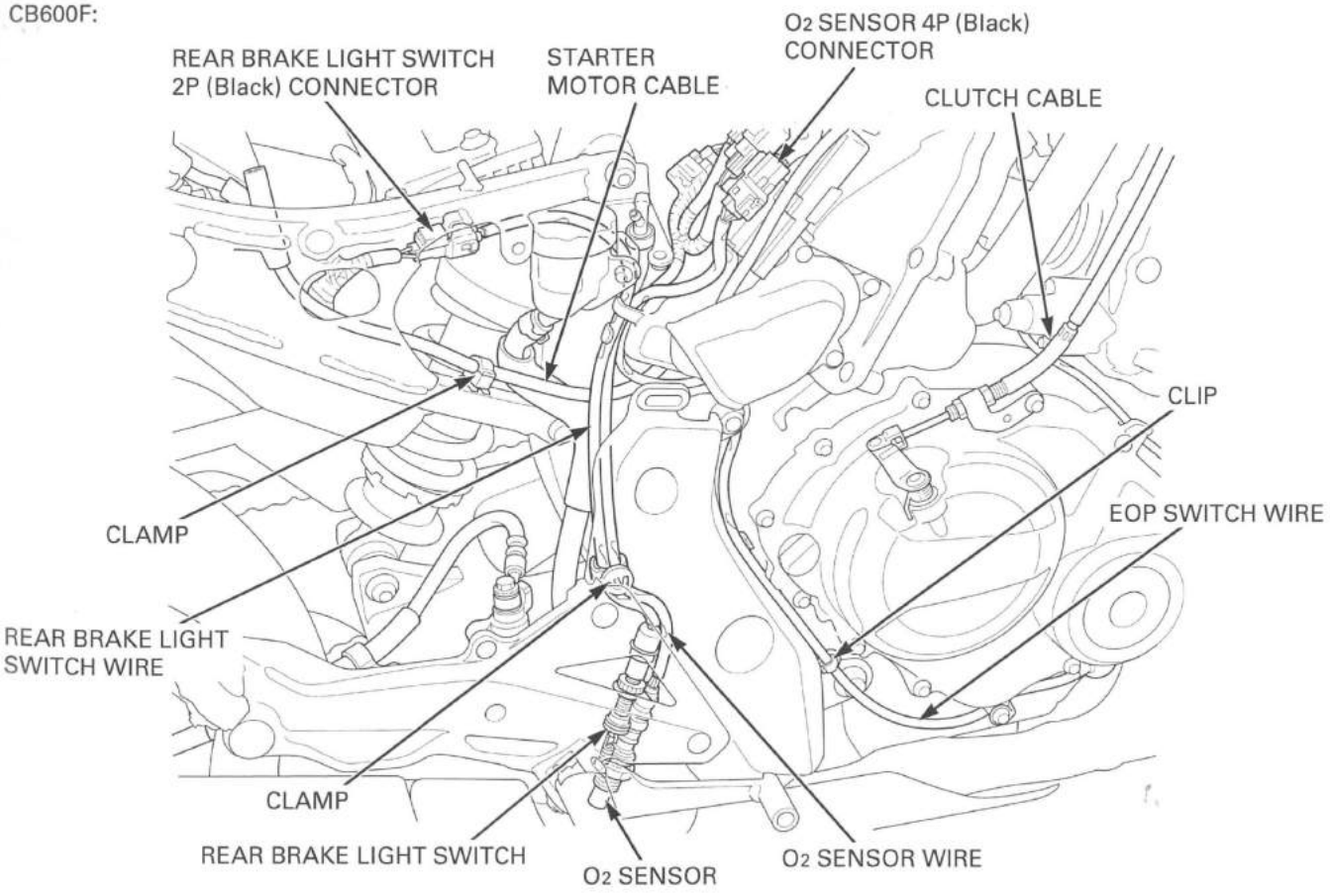
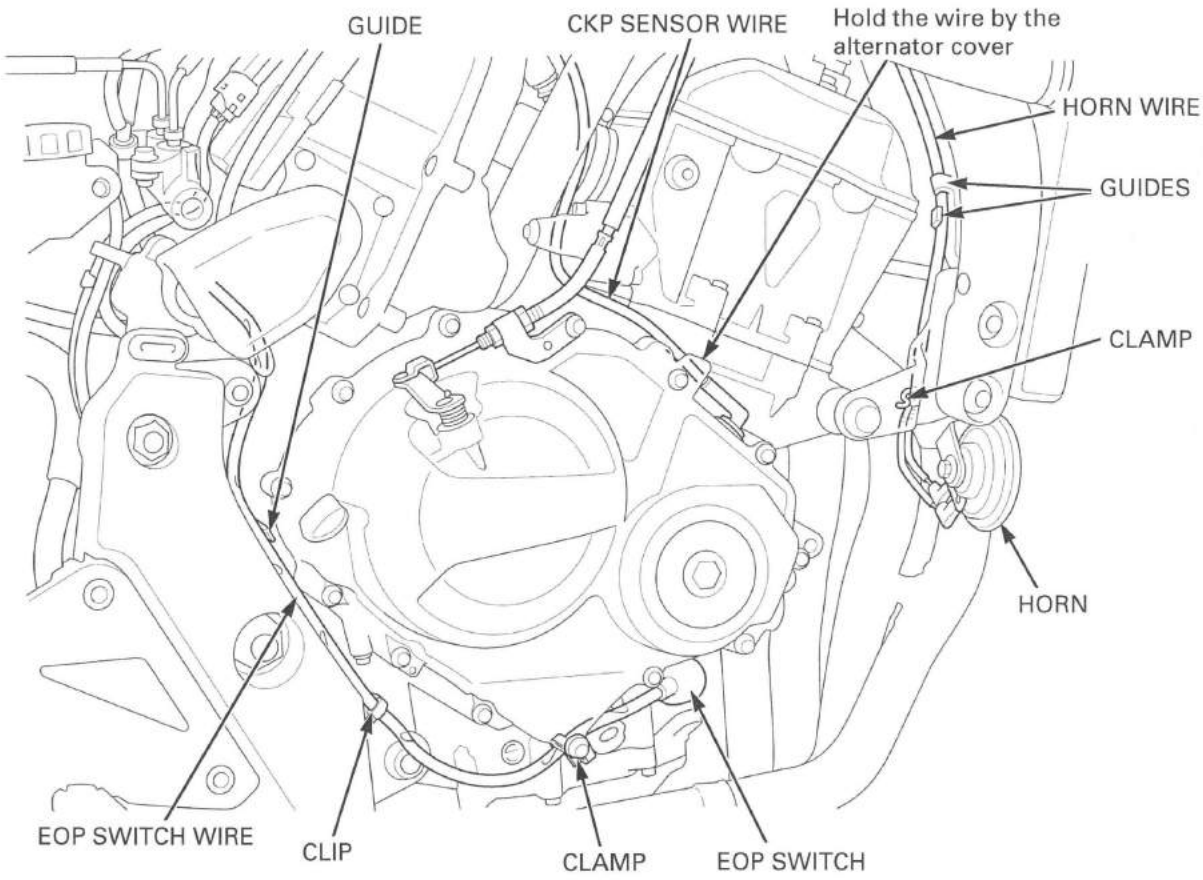
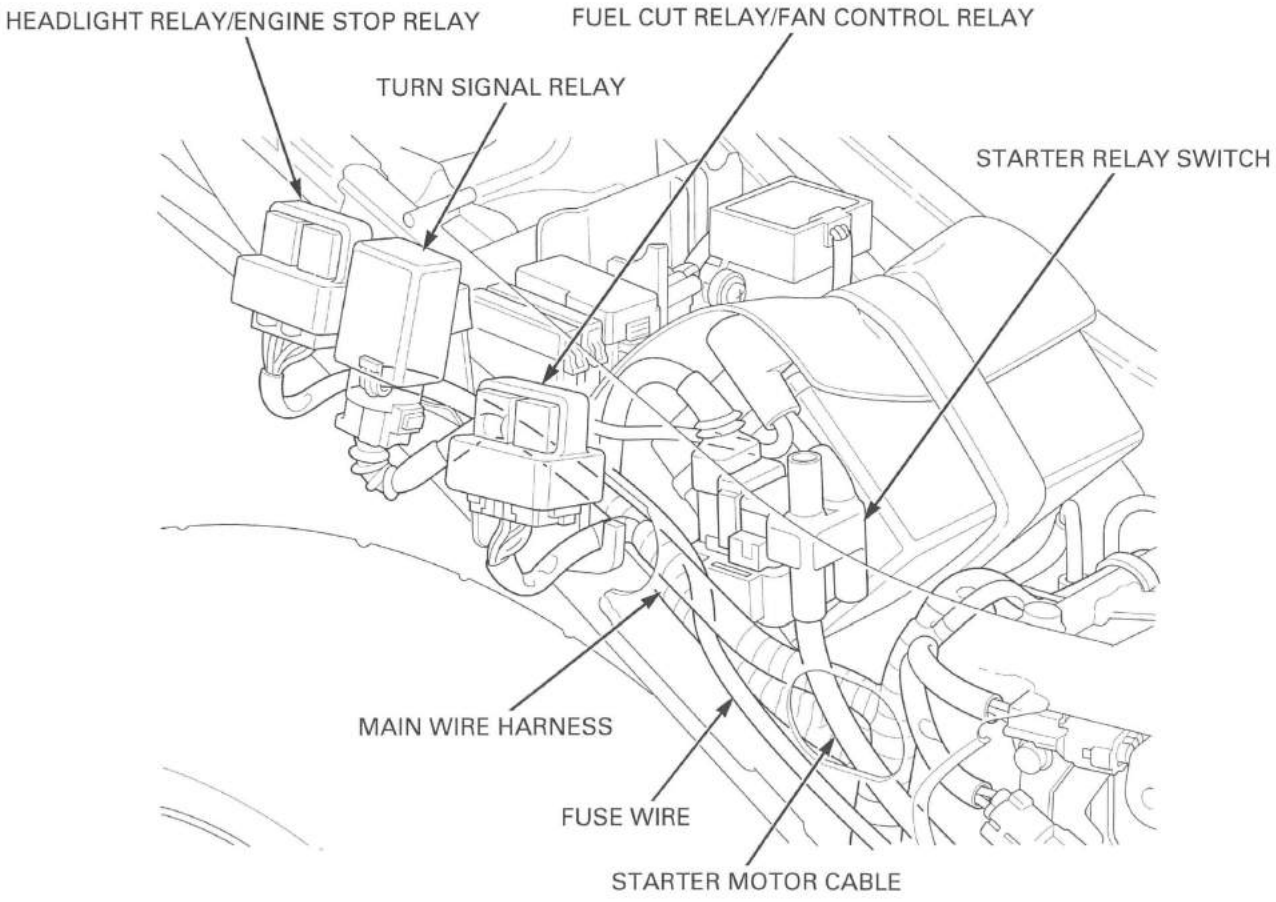
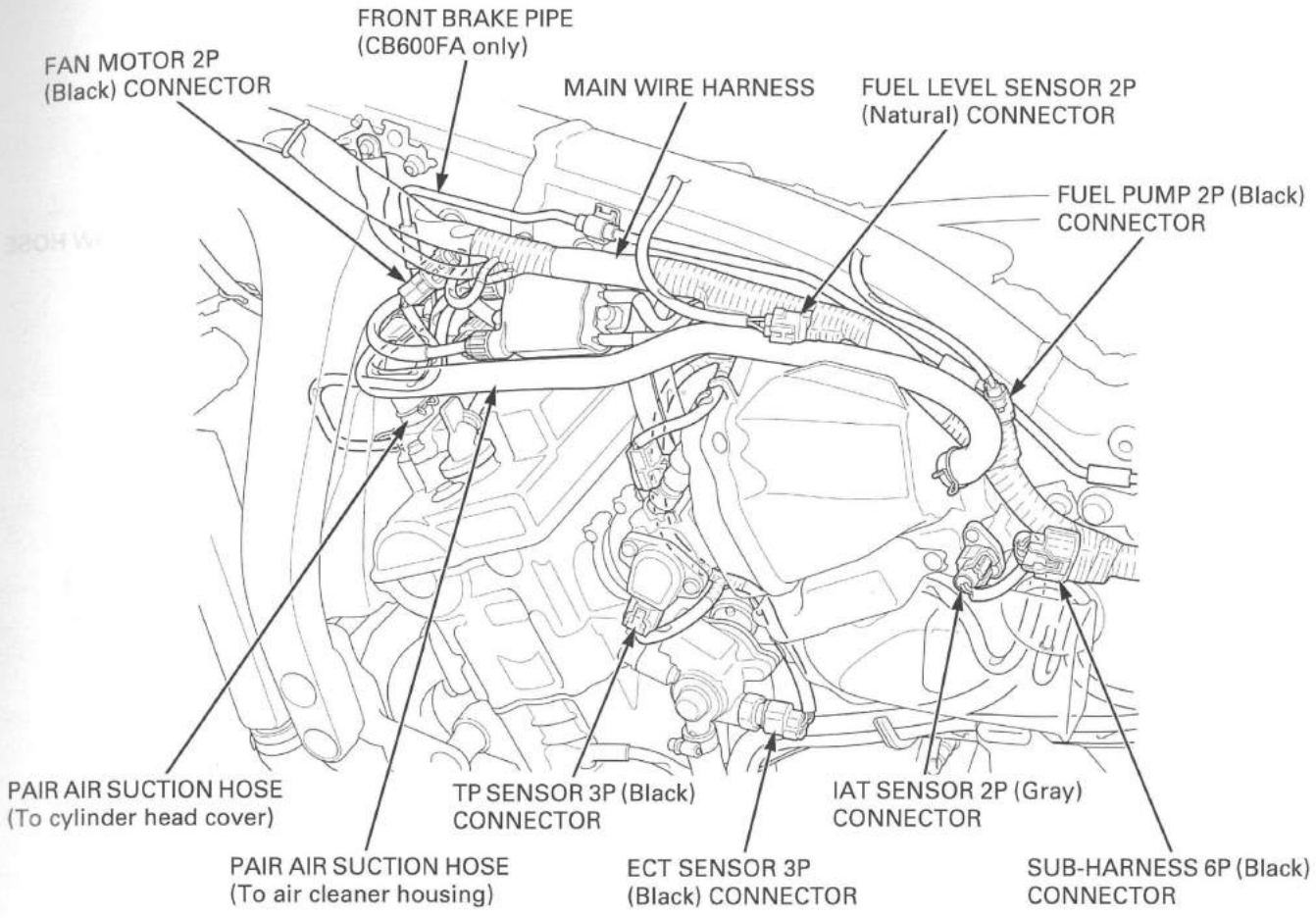
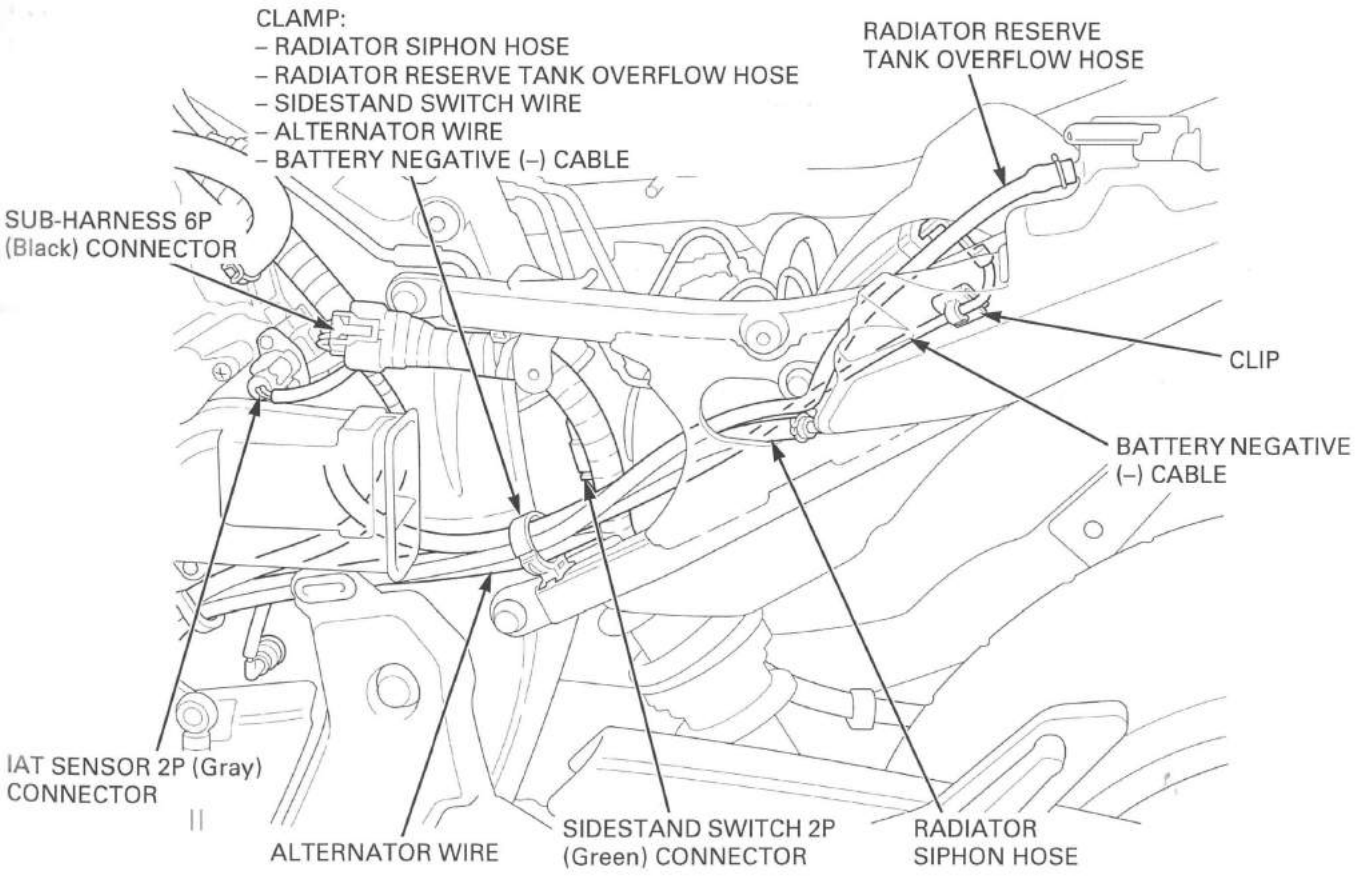
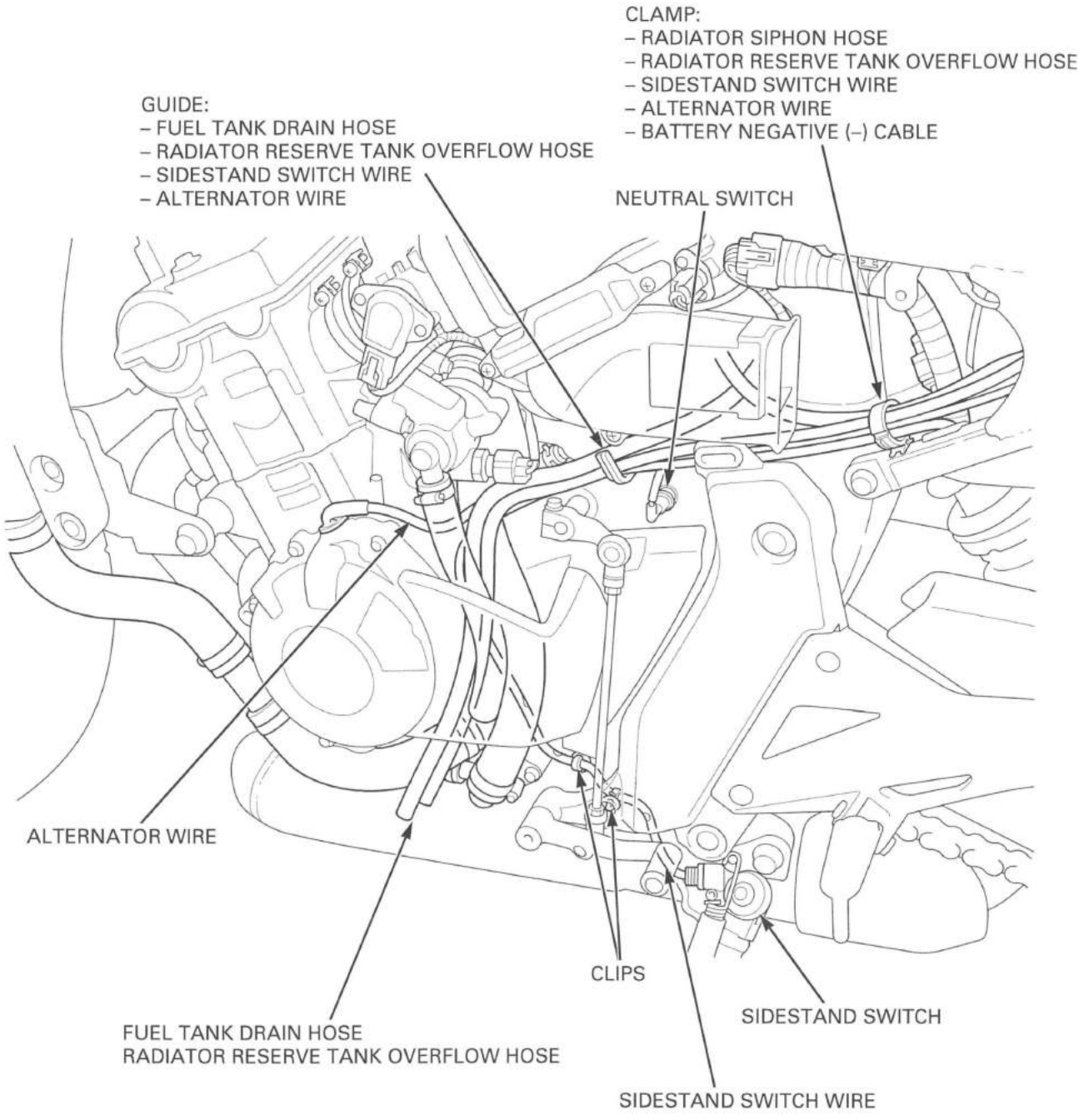


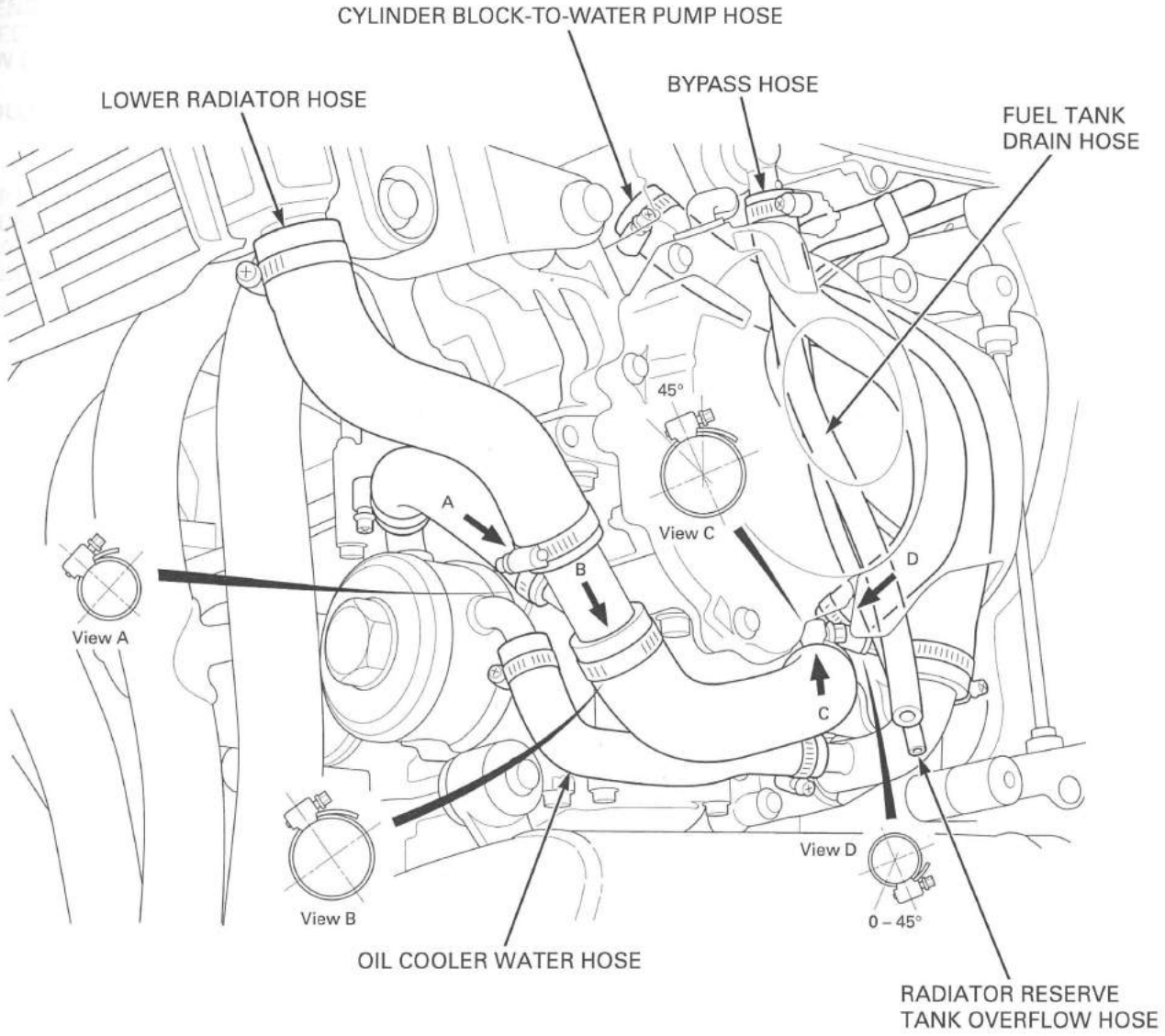

GUIDE
CKP SENSOR WIRE
Hold the wire by the alternator cover
HORN WIRE
GUIDES
CLAMP
HORN
EOP SWITCH WIRE
CLIP
CLAMP
EOP SWITCH


HEADLIGHT RELAY/ENGINE STOP RELAY
FUEL CUT RELAY/FAN CONTROL RELAY
TURN SIGNAL RELAY
STARTER RELAY SWITCH
MAIN WIRE HARNESS
FUSE WIRE
STARTER MOTOR CABLE

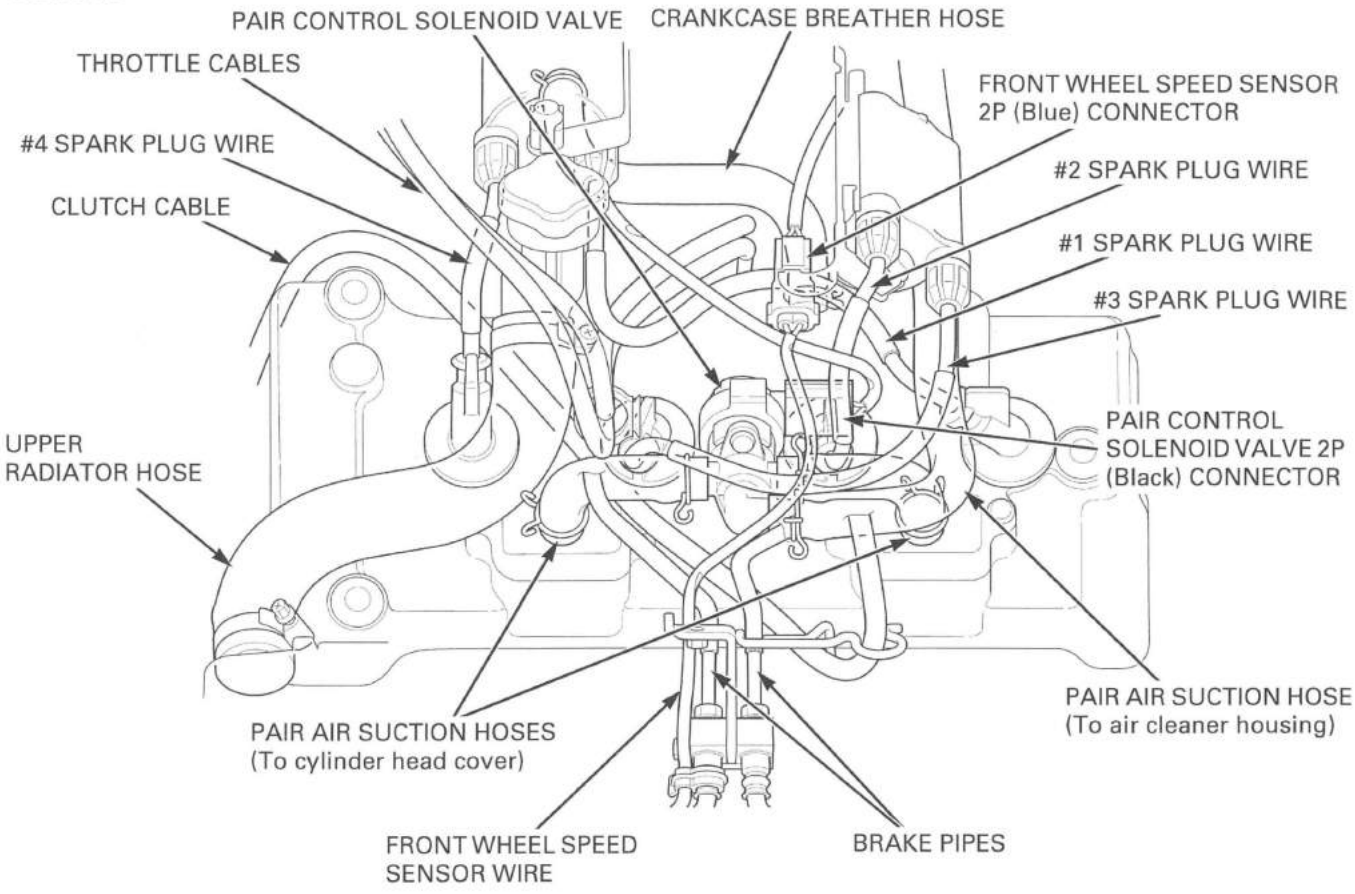

FRONT BRAKE PIPE
(CB600FA only)
FAN MOTOR 2P
(Black) CONNECTOR
MAIN WIRE HARNESS
FUEL LEVEL SENSOR 2P
(Natural) CONNECTOR
FUEL PUMP 2P (Black)
CONNECTOR
PAIR AIR SUCTION HOSE
(To cylinder head cover)
TP SENSOR 3P (Black)
CONNECTOR
IAT SENSOR 2P (Gray)
CONNECTOR
PAIR AIR SUCTION HOSE
(To air cleaner housing)
ECT SENSOR 3P
(Black) CONNECTOR
SUB-HARNESS 6P (Black)
CONNECTOR


CLAMP:
– RADIATOR SIPHON HOSE
– RADIATOR RESERVE TANK OVERFLOW HOSE
– SIDESTAND SWITCH WIRE
– ALTERNATOR WIRE
– BATTERY NEGATIVE (–) CABLE
RADIATOR RESERVE
TANK OVERFLOW HOSE
SUB-HARNESS 6P
(Black) CONNECTOR
CLIP
BATTERY NEGATIVE
(–) CABLE
IAT SENSOR 2P (Gray)
CONNECTOR
ALTERNATOR WIRE
SIDESTAND SWITCH 2P
(Green) CONNECTOR
RADIATOR
SIPHON HOSE


CLAMP:
– RADIATOR SIPHON HOSE
– RADIATOR RESERVE TANK OVERFLOW HOSE
– SIDESTAND SWITCH WIRE
– ALTERNATOR WIRE
– BATTERY NEGATIVE (–) CABLE
GUIDE:
– FUEL TANK DRAIN HOSE
– RADIATOR RESERVE TANK OVERFLOW HOSE
– SIDESTAND SWITCH WIRE
– ALTERNATOR WIRE
NEUTRAL SWITCH
ALTERNATOR WIRE
CLIPS
SIDESTAND SWITCH
FUEL TANK DRAIN HOSE
RADIATOR RESERVE TANK OVERFLOW HOSE
SIDESTAND SWITCH WIRE


CYLINDER BLOCK-TO-WATER PUMP HOSE
LOWER RADIATOR HOSE
BYPASS HOSE
FUEL TANK DRAIN HOSE
45°
A
B
C
D
View A
View B
View C
View D
0 – 45°
OIL COOLER WATER HOSE
RADIATOR RESERVE TANK OVERFLOW HOSE

CB600FA:



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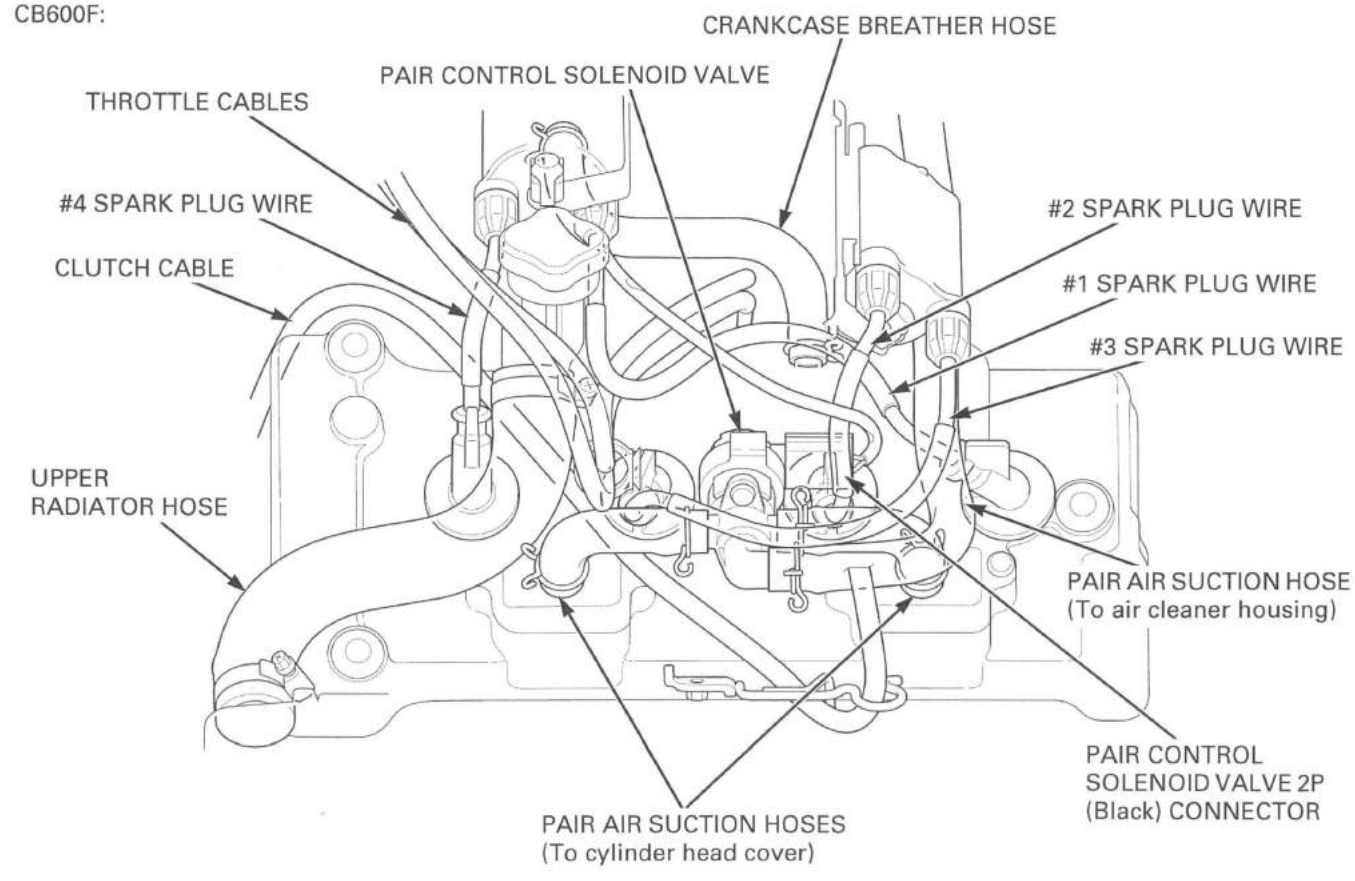
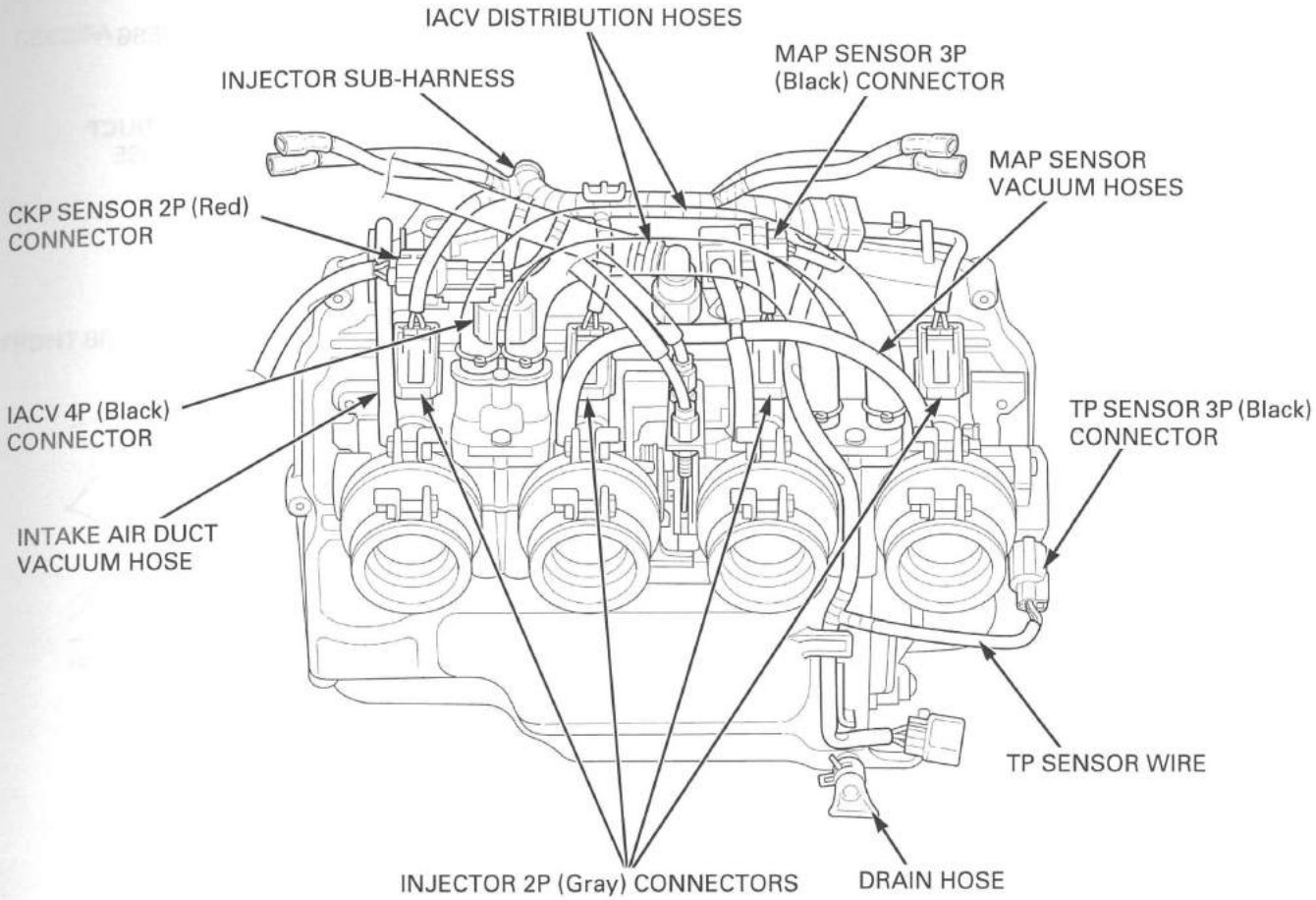
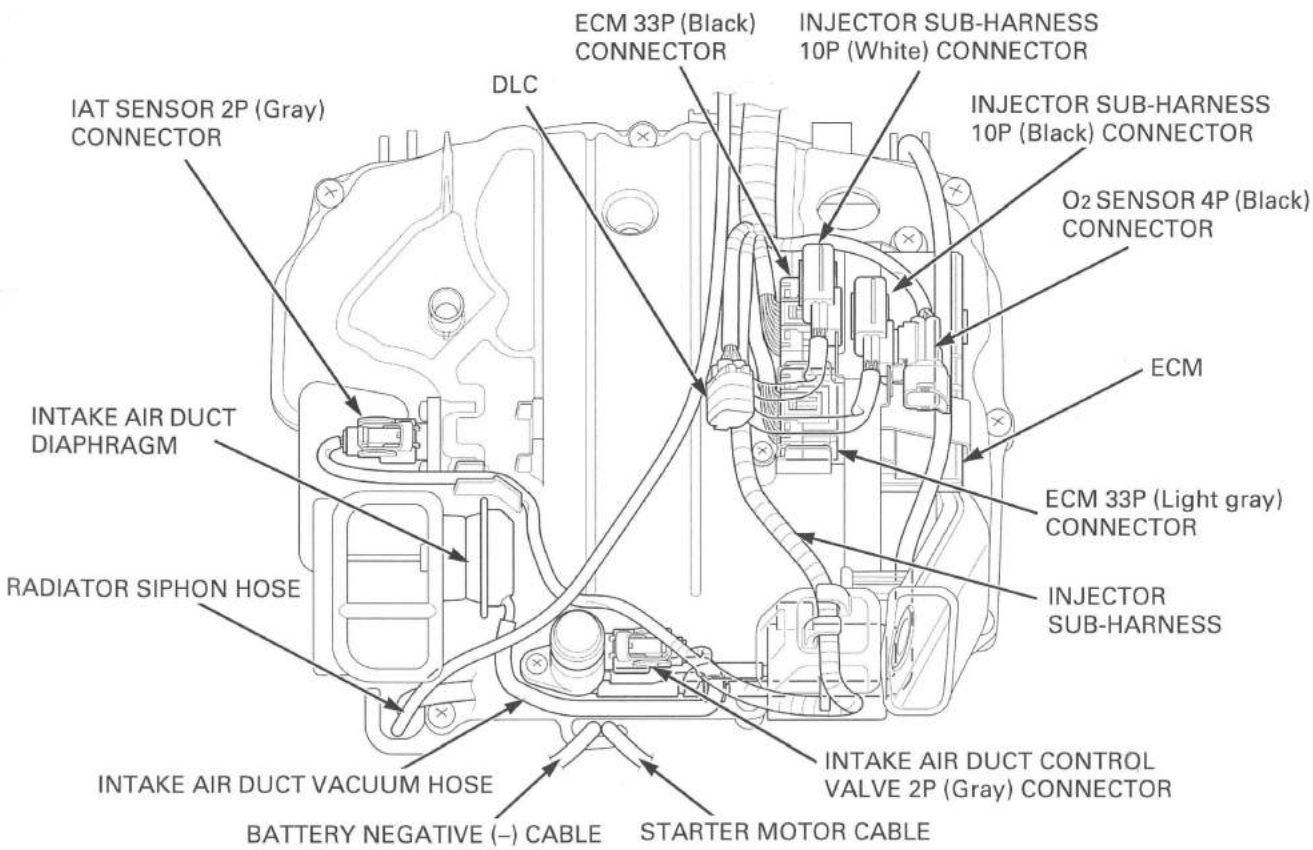
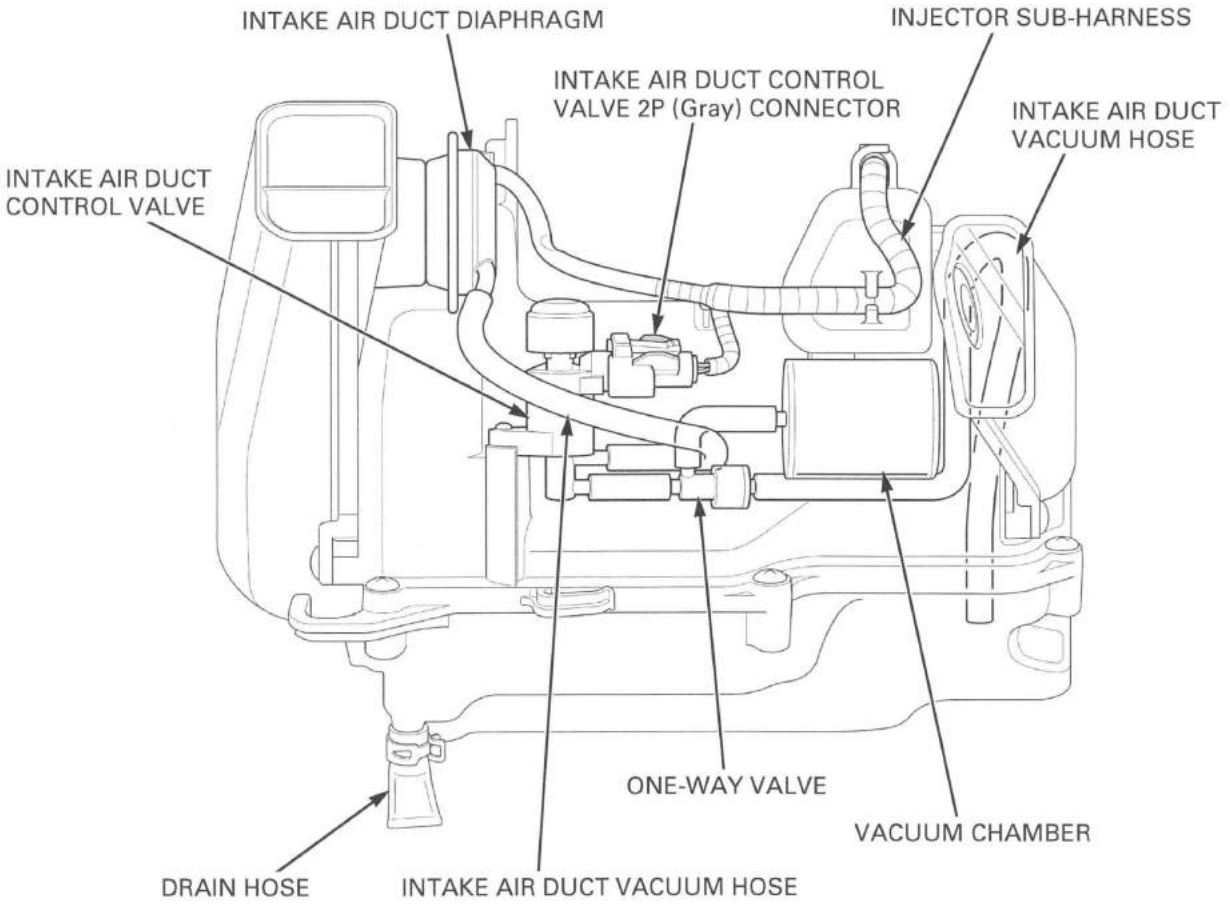
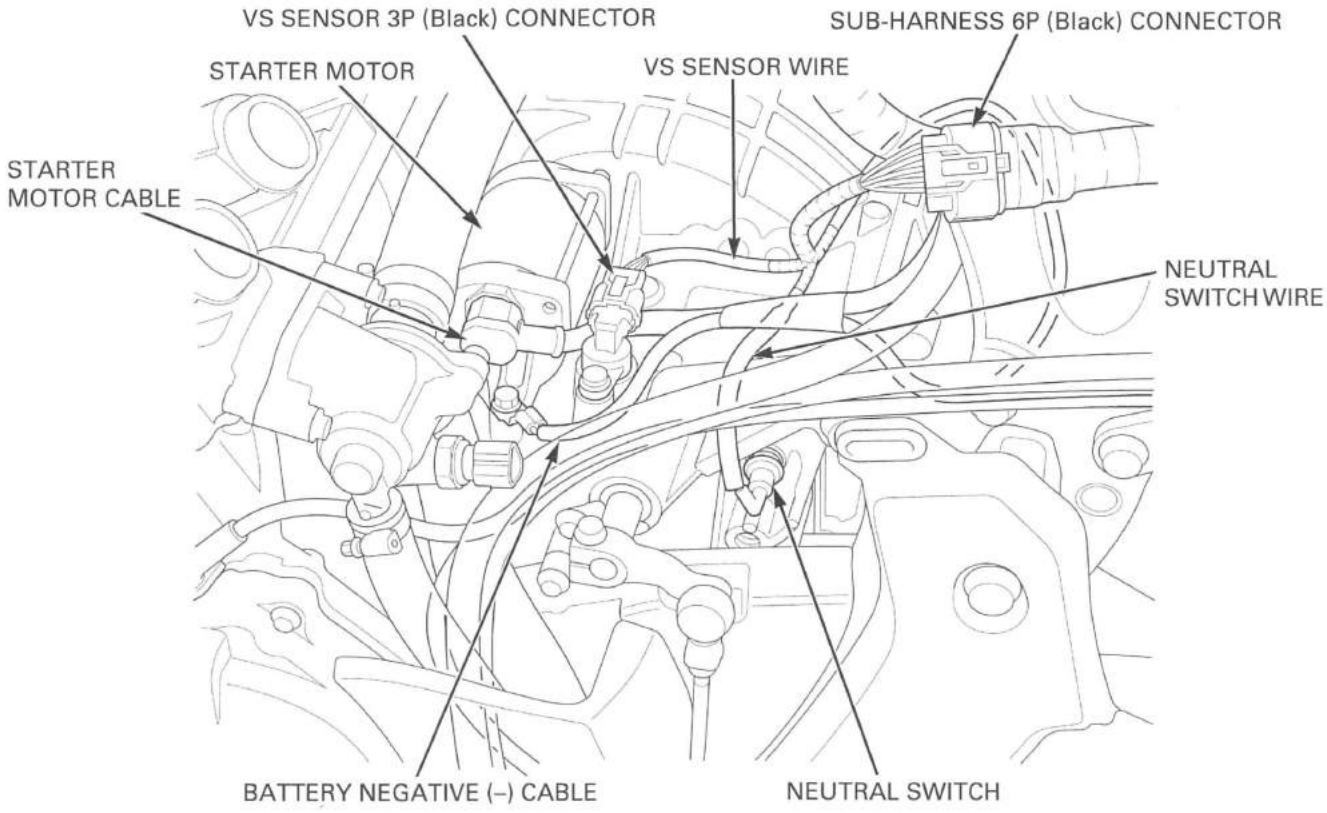


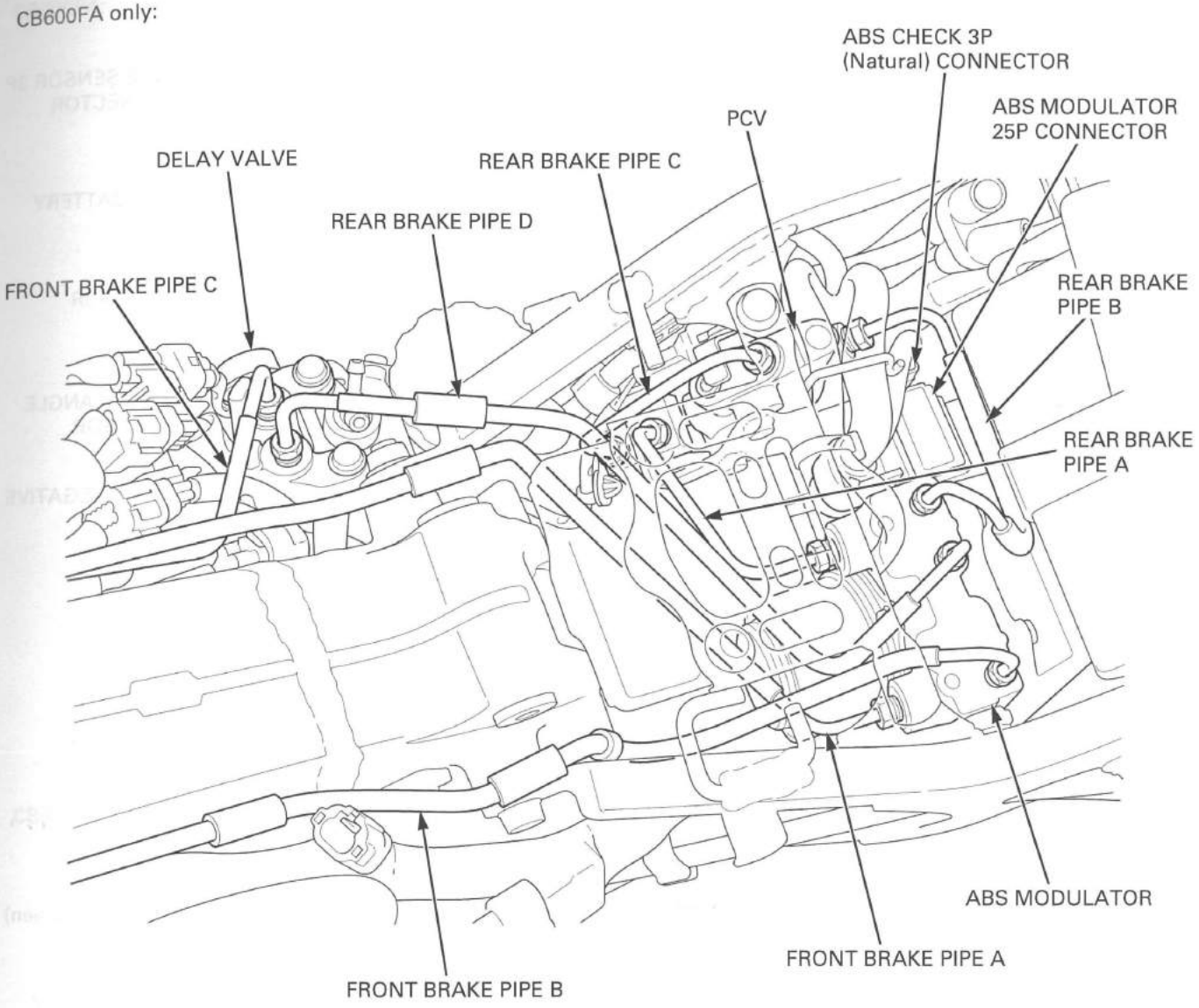

IACV DISTRIBUTION HOSES
INJECTOR SUB-HARNESS
MAP SENSOR 3P (Black) CONNECTOR
MAP SENSOR VACUUM HOSES
CKP SENSOR 2P (Red) CONNECTOR
IACV 4P (Black) CONNECTOR
INTAKE AIR DUCT VACUUM HOSE
TP SENSOR 3P (Black) CONNECTOR
TP SENSOR WIRE
INJECTOR 2P (Gray) CONNECTORS
DRAIN HOSE


ECM 33P (Black) CONNECTOR
INJECTOR SUB-HARNESS 10P (White) CONNECTOR
DLC
IAT SENSOR 2P (Gray) CONNECTOR
INJECTOR SUB-HARNESS 10P (Black) CONNECTOR
O2 SENSOR 4P (Black) CONNECTOR
ECM
INTAKE AIR DUCT DIAPHRAGM
ECM 33P (Light gray) CONNECTOR
RADIATOR SIPHON HOSE
INJECTOR SUB-HARNESS
INTAKE AIR DUCT CONTROL VALVE 2P (Gray) CONNECTOR
INTAKE AIR DUCT VACUUM HOSE
BATTERY NEGATIVE (–) CABLE
STARTER MOTOR CABLE


INTAKE AIR DUCT DIAPHRAGM
INJECTOR SUB-HARNESS
INTAKE AIR DUCT CONTROL VALVE 2P (Gray) CONNECTOR
INTAKE AIR DUCT VACUUM HOSE
INTAKE AIR DUCT CONTROL VALVE
ONE-WAY VALVE
VACUUM CHAMBER
DRAIN HOSE
INTAKE AIR DUCT VACUUM HOSE


VS SENSOR 3P (Black) CONNECTOR
SUB-HARNESS 6P (Black) CONNECTOR
STARTER MOTOR
VS SENSOR WIRE
STARTER MOTOR CABLE
NEUTRAL SWITCH WIRE
BATTERY NEGATIVE (–) CABLE
NEUTRAL SWITCH

CB600FA only:



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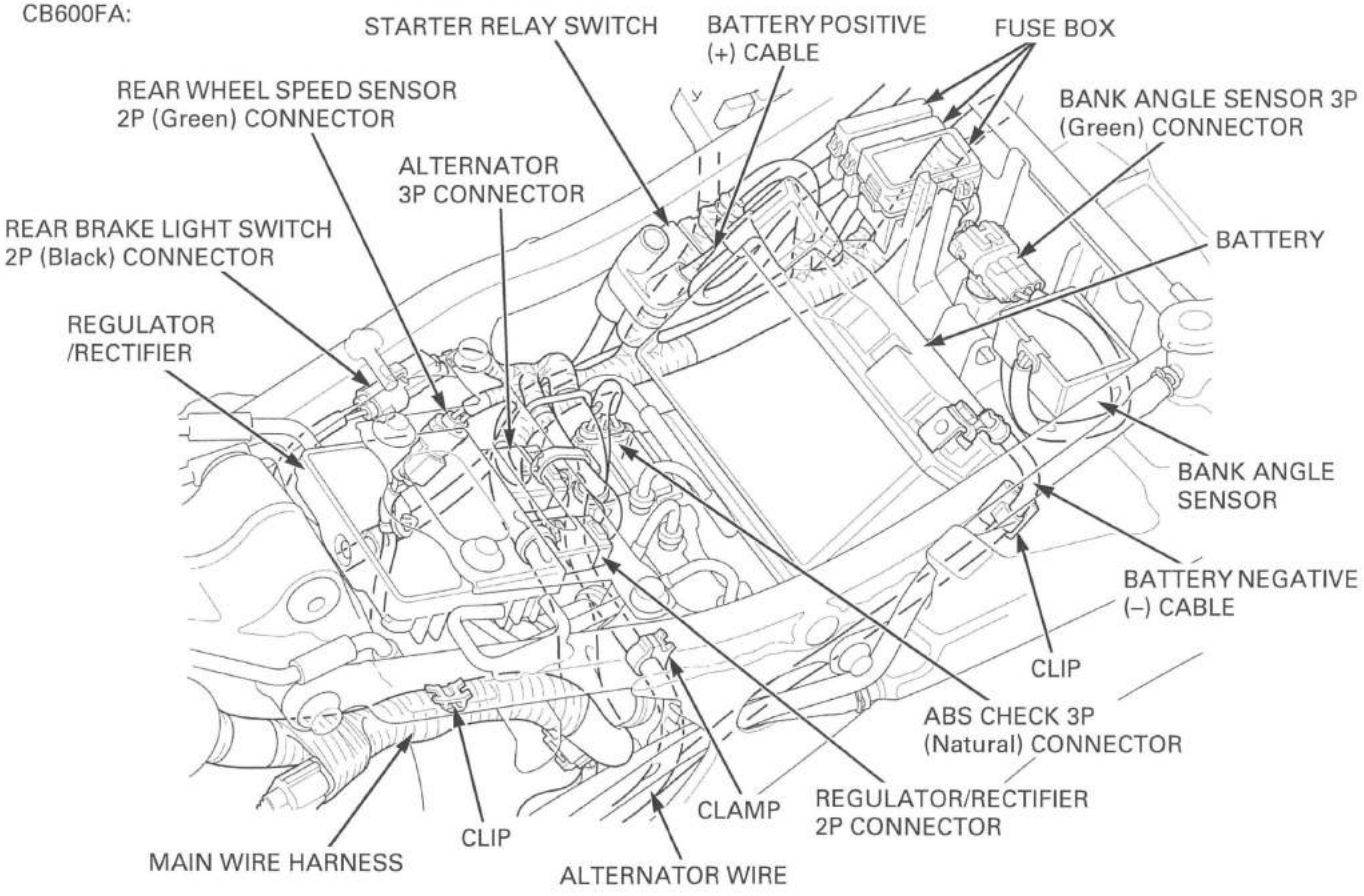

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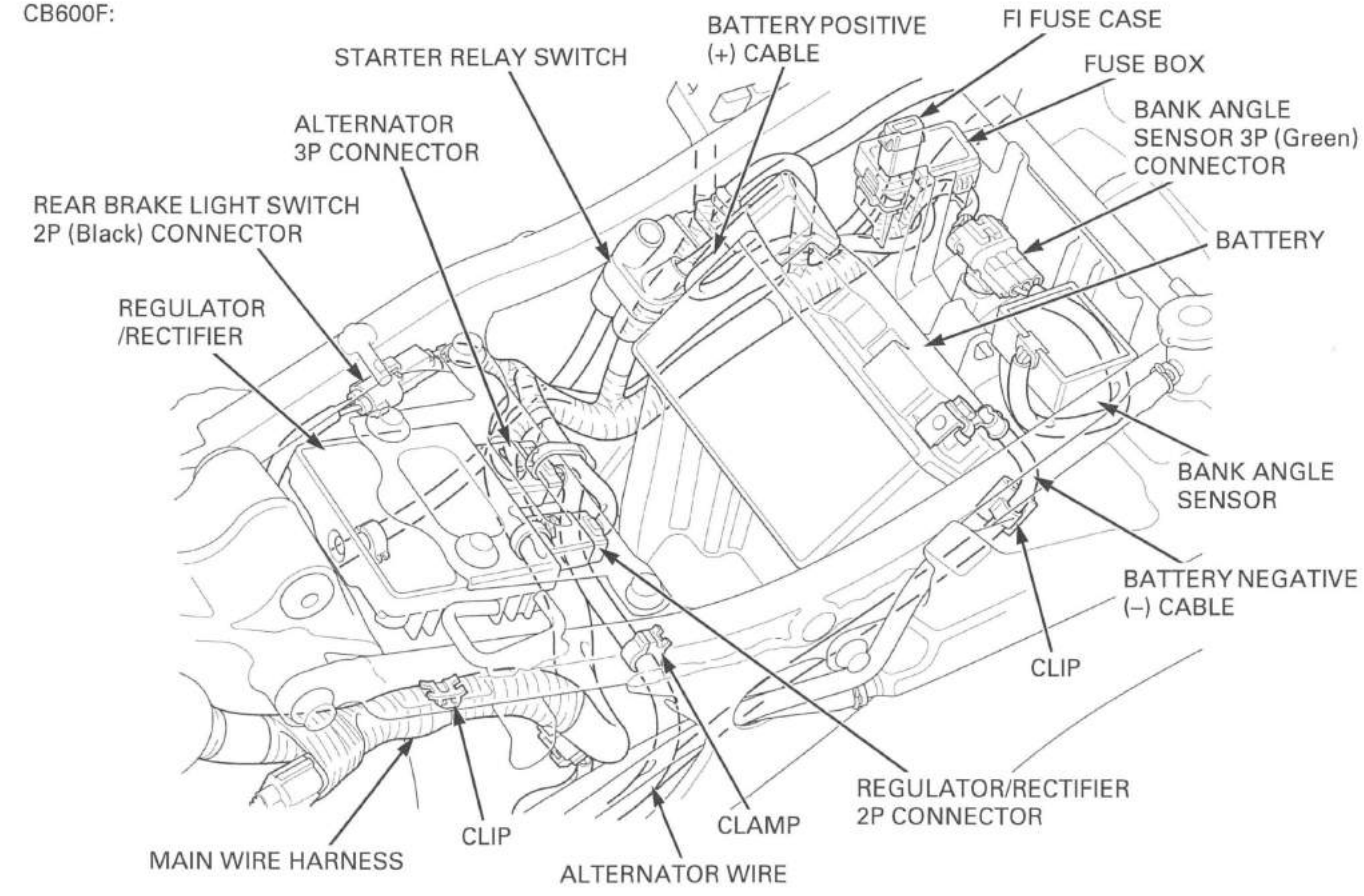

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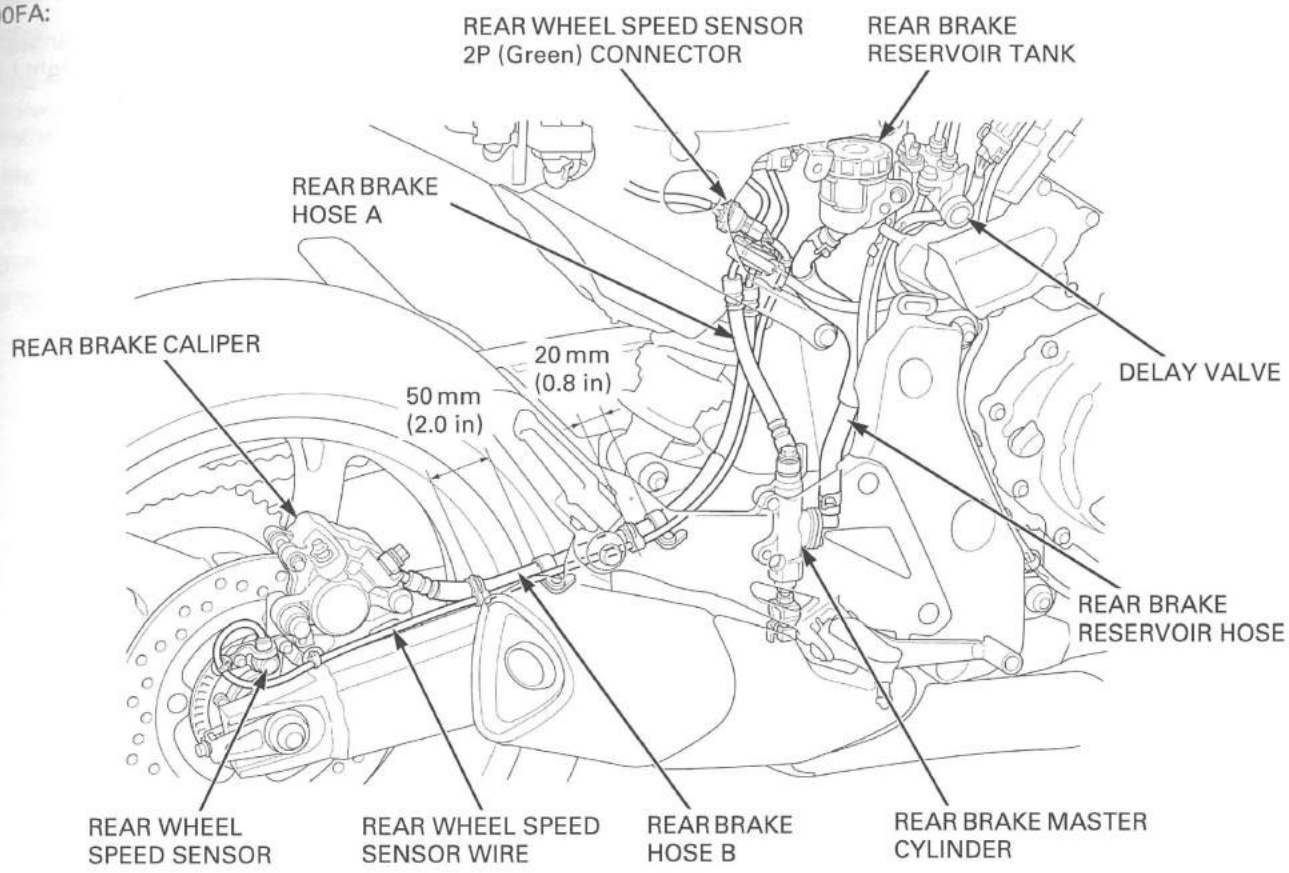

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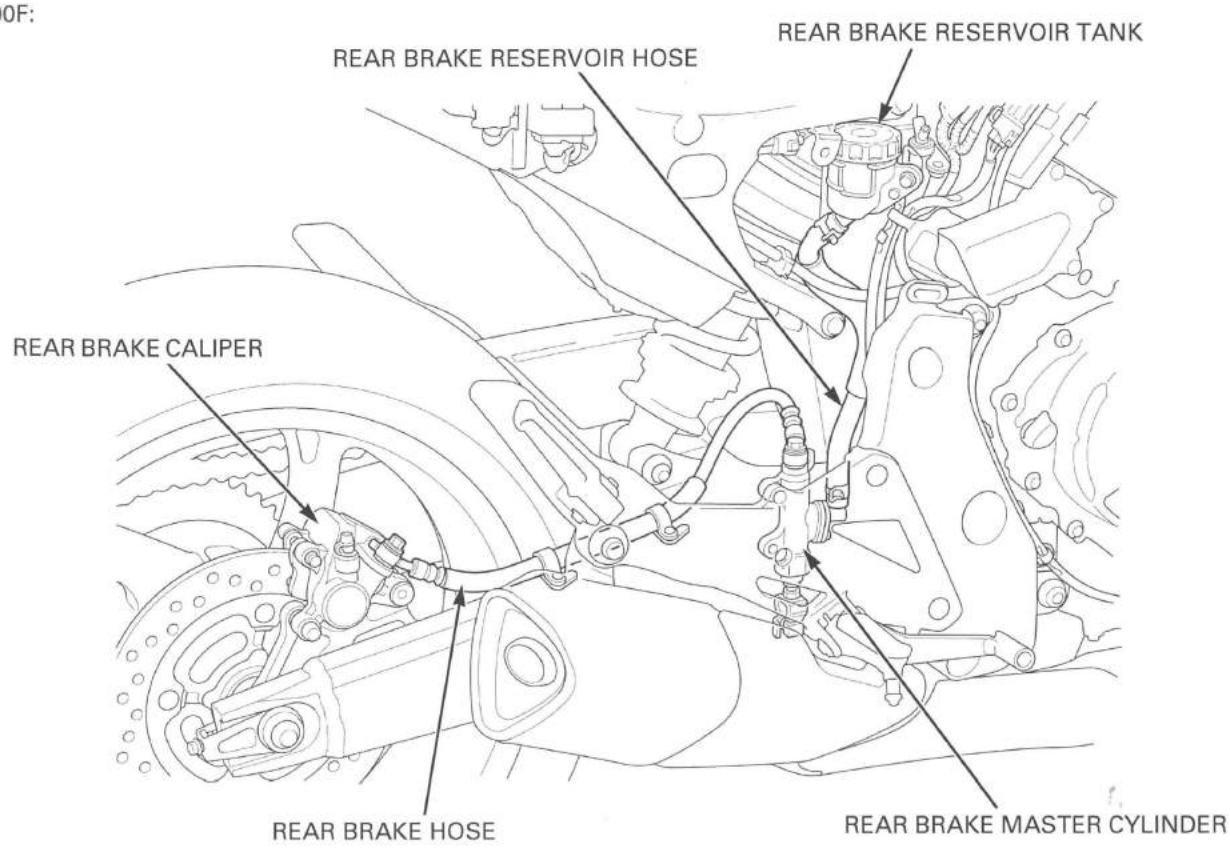
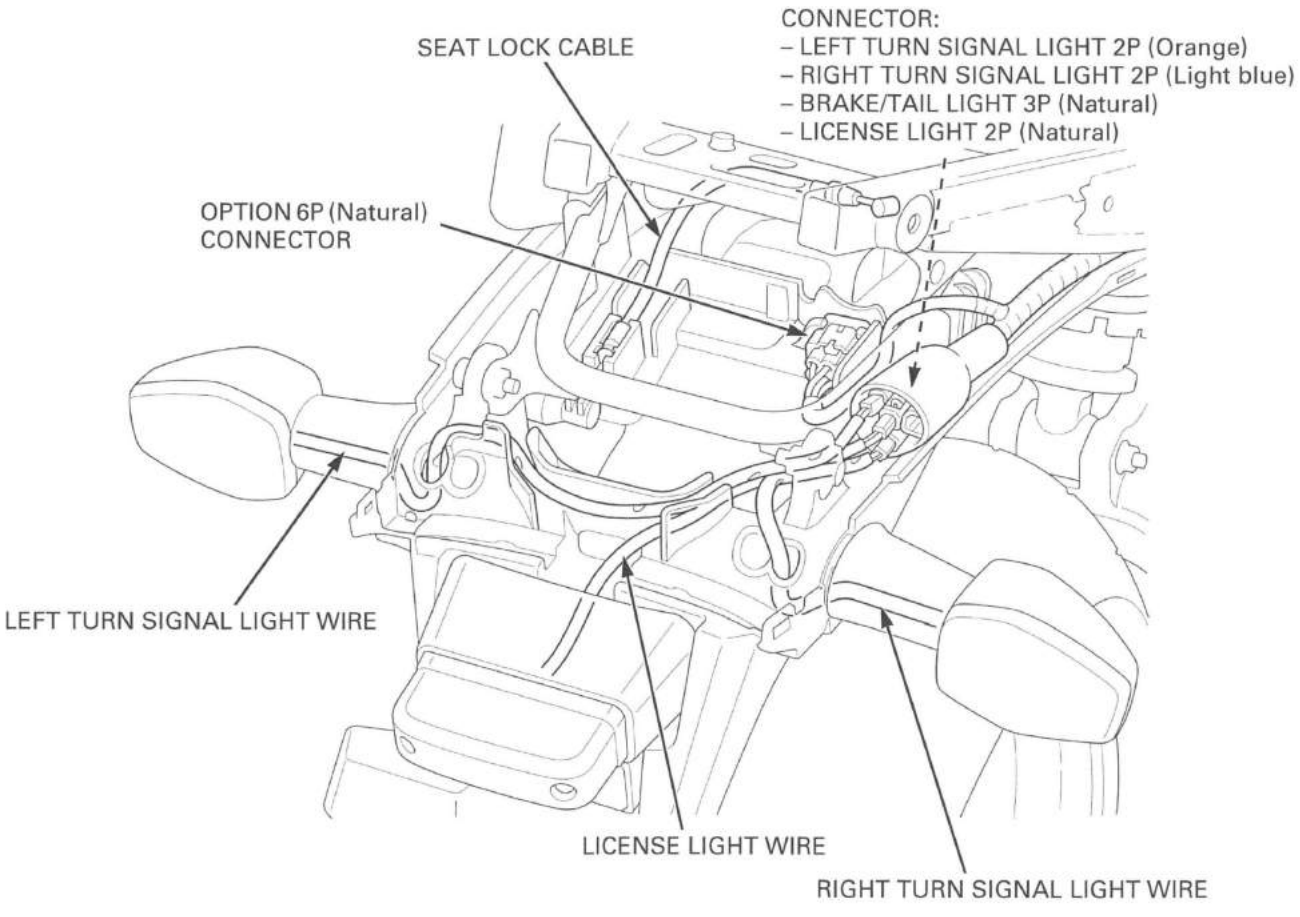
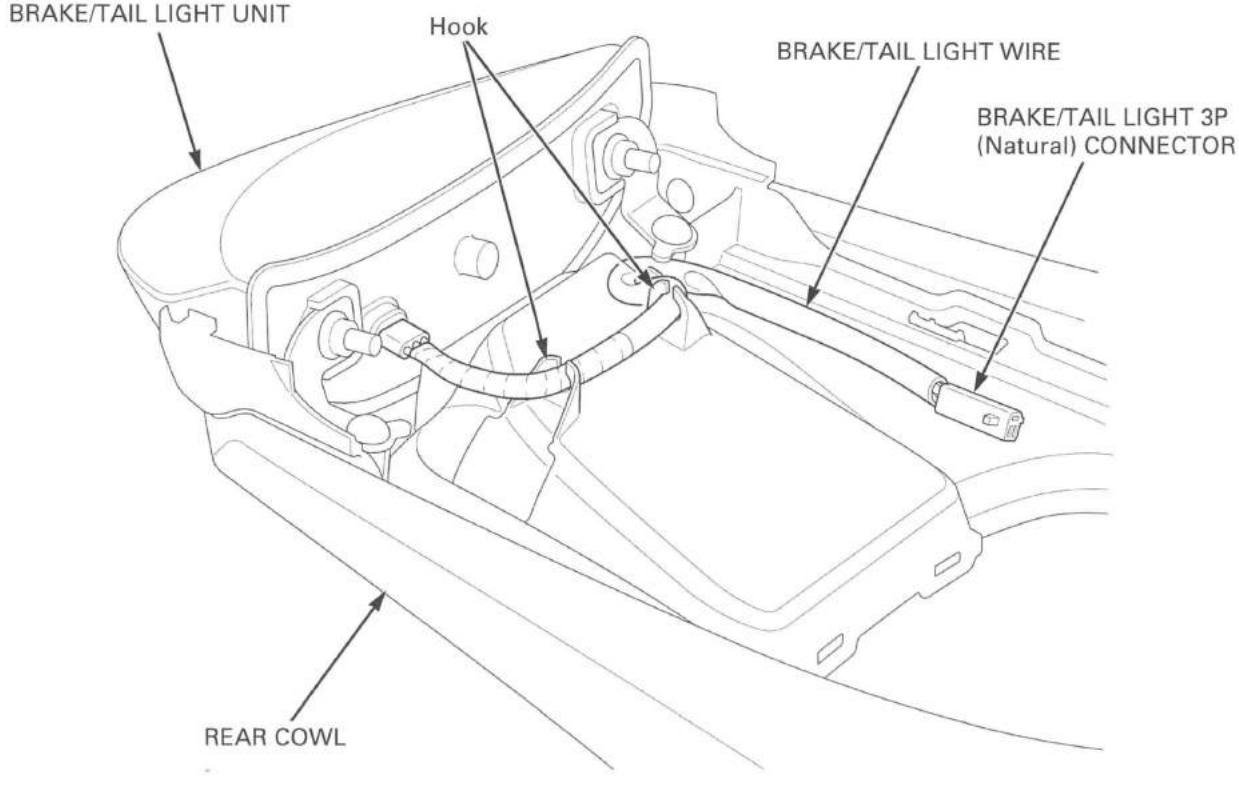



SEAT LOCK CABLE
CONNECTOR:
– LEFT TURN SIGNAL LIGHT 2P (Orange)
– RIGHT TURN SIGNAL LIGHT 2P (Light blue)
– BRAKE/TAIL LIGHT 3P (Natural)
– LICENSE LIGHT 2P (Natural)
OPTION 6P (Natural) CONNECTOR
LEFT TURN SIGNAL LIGHT WIRE
LICENSE LIGHT WIRE
RIGHT TURN SIGNAL LIGHT WIRE


BRAKE/TAIL LIGHT UNIT
Hook
BRAKE/TAIL LIGHT WIRE
BRAKE/TAIL LIGHT 3P (Natural) CONNECTOR
REAR COWL

EMISSION CONTROL SYSTEMS

SOURCE OF EMISSIONS

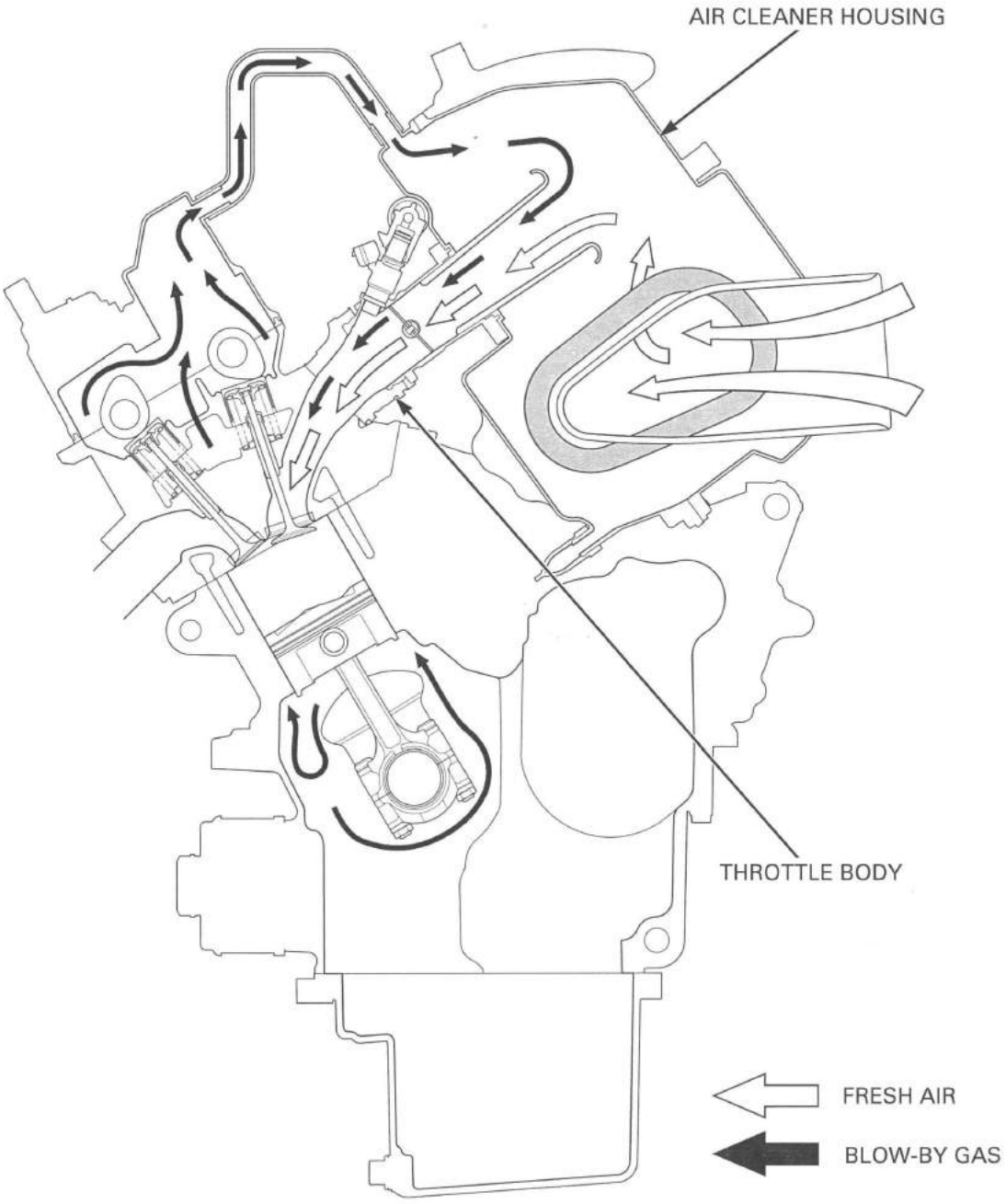
The combustion process produces carbon monoxide (CO), oxides of nitrogen (NOx) and hydrocarbons (HC). Control of carbon monoxide, oxides of nitrogen and hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subject to sunlight. Carbon monoxide does not react in the same way, but it is toxic.

Honda Motor Co., Ltd. utilizes various systems to reduce carbon monoxide, oxides of nitrogen and hydrocarbons.

CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere.

Blow-by gas is returned to the combustion chamber through the air cleaner and throttle body.



EXHAUST EMISSION CONTROL SYSTEM

The exhaust emission control system is composed of a pulse secondary air supply system, a three-way catalytic converter and PGM-FI system.

No adjustment should be made for the exhaust emission control system. The exhaust emission control system is separate from the crankcase emission control system.

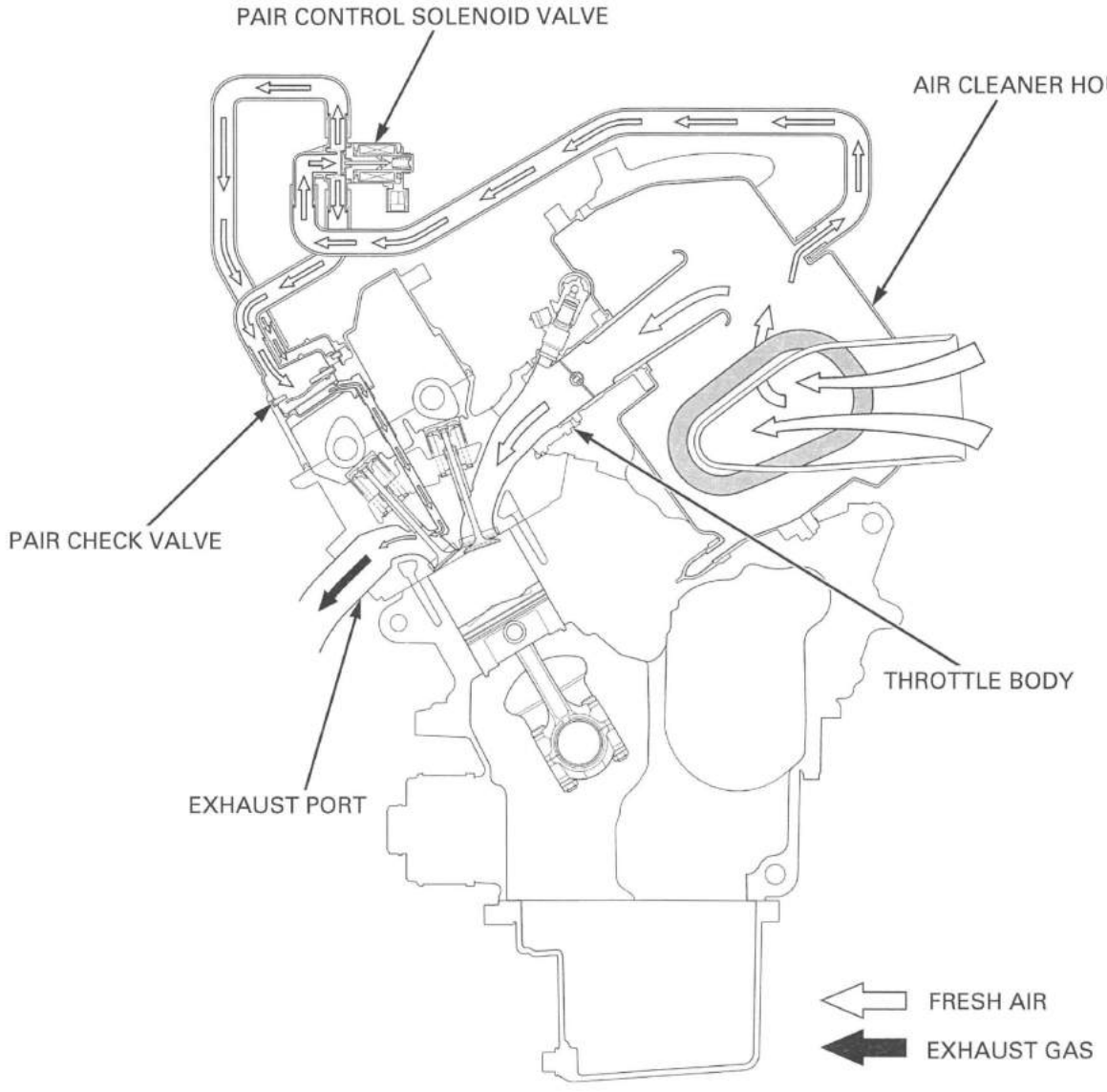
SECONDARY AIR SUPPLY SYSTEM

The pulse secondary air supply system introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port by the function of the PAIR control valve.

This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapor.

The reed valve prevents reverse air flow through the system. The PAIR control valve is operated by the solenoid valve. The solenoid valve is controlled by the PGM-FI unit, and the fresh air passage is opened/closed according the running condition.

No adjustments to the secondary air supply system should be made, although periodic inspection of the components is recommended.



THREE-WAY CATALYTIC CONVERTER

This motorcycle is equipped with a three-way catalytic converter.

The three-way catalytic converter is in the exhaust system. Through chemical reactions, they convert HC, CO and NOx in the engine's exhaust to carbon dioxide (CO_2), nitrogen (N_2) and water vapor.

No adjustment to these systems should be made although periodic inspection of the components is recommended.

NOISE EMISSION CONTROL SYSTEM

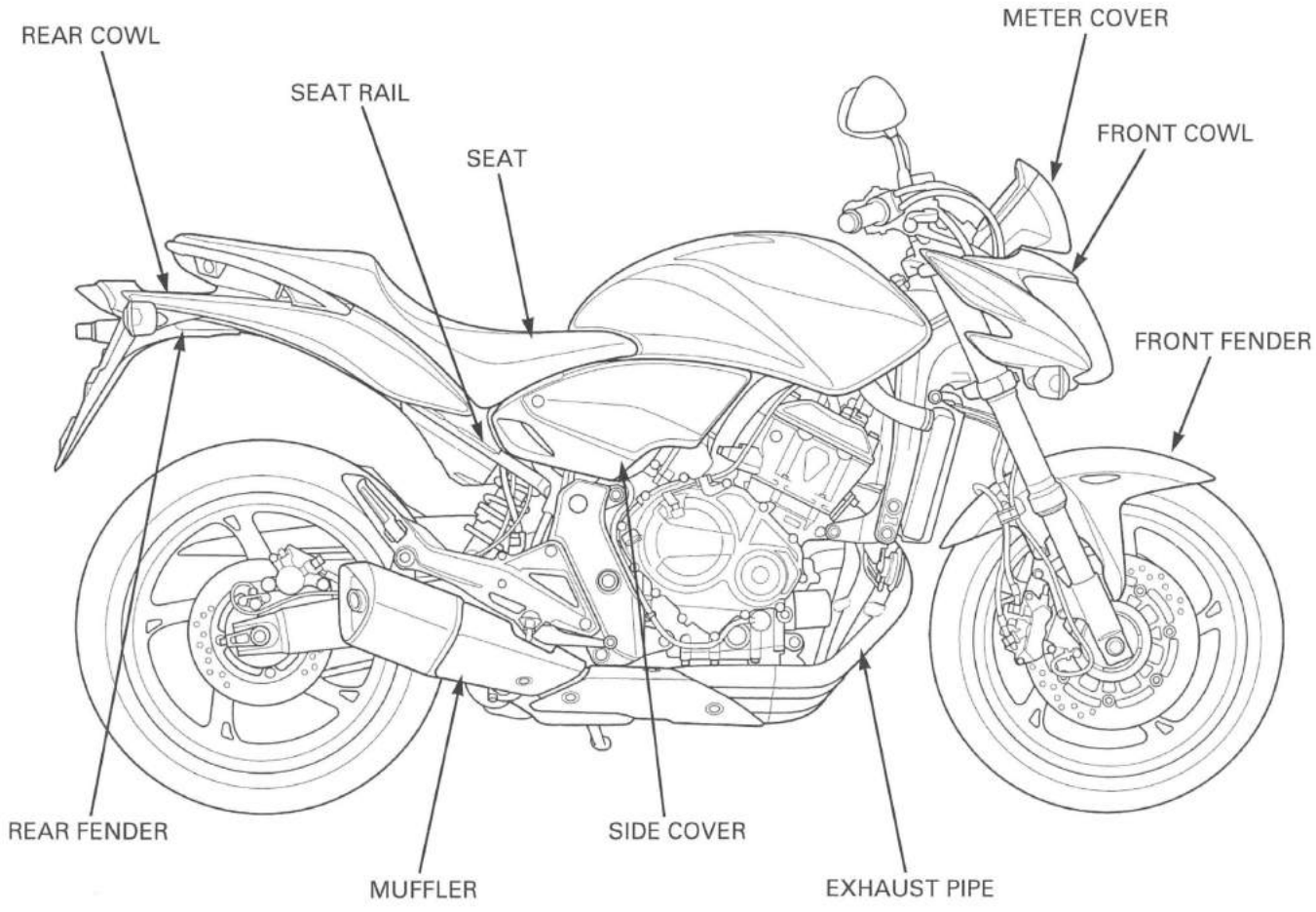
TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED: Local law may prohibit the following acts or the causing there of: (1) The removal or rendering inoperative by any person, other than for purposes of maintenance, repair or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use; (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW:

1. Removal of, or puncturing of the muffler, baffles, header pipes or any other component which conducts exhaust gases.
2. Removal of, or puncturing of any part of the intake system.
3. Lack of proper maintenance.
4. Replacing any moving parts of the vehicle, or parts of the exhaust or intake system, with parts other then those specified by the manufacturer.

2. FRAME/BODY PANELS/EXHAUST SYSTEM

BODY PANEL LOCATIONS



SERVICE INFORMATION

GENERAL

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- This section covers removal and installation of the body panels and exhaust system.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.
- Always replace the exhaust pipe gaskets after removing the exhaust pipe from the engine.
- When installing the exhaust system, loosely install all of the exhaust pipe fasteners. Always tighten the exhaust clamps first, then tighten the mounting fasteners. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Exhaust pipe joint nut	12 N·m (1.2 kgf·m, 9 lbf·ft)
Exhaust pipe/muffler mounting nut	22 N·m (2.2 kgf·m, 16 lbf·ft)
Exhaust pipe/muffler protector socket bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Muffler band bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)
Grab rail socket bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)
Rear center lower cowl screw	4.0 N·m (0.4 kgf·m, 3 lbf·ft)
Front fender mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Side cover socket bolt	4.0 N·m (0.4 kgf·m, 3 lbf·ft)
Seat rail upper mounting nut	39 N·m (4.0 kgf·m, 29 lbf·ft)
Seat rail lower mounting bolt	39 N·m (4.0 kgf·m, 29 lbf·ft)
Delay valve mounting bolts	12 N·m (1.2 kgf·m, 9 lbf·ft)
Rear brake fluid reservoir mounting bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)

TROUBLESHOOTING

Excessive exhaust noise
- Broken exhaust system
- Exhaust gas leak

Poor performance
- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

SEAT

REMOVAL/INSTALLATION

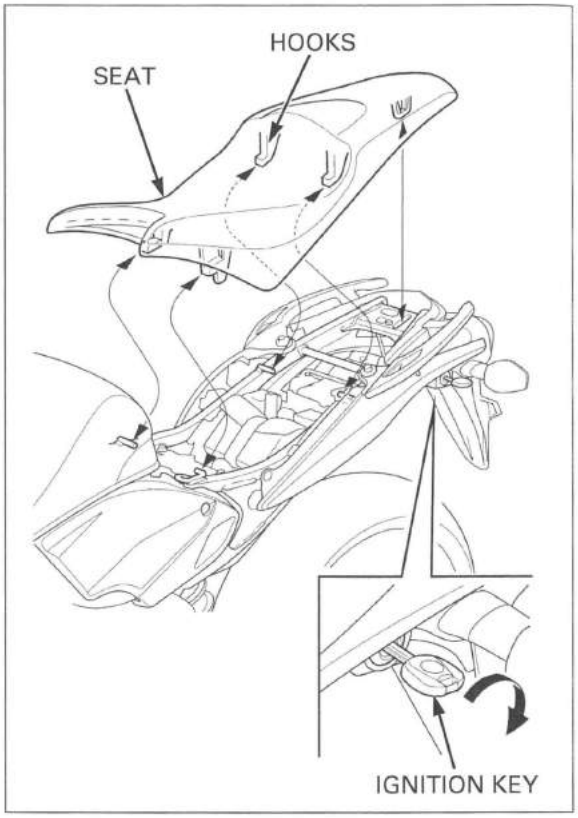
Unlock the seat with the ignition key.

Remove the seat backward while releasing the seat hooks.

Install the seat with inserting the hooks into the frame.

Push the seat forward, then push down to lock it.

After installation, make sure that the seat is installed properly by moving the seat.



SIDE COVER

REMOVAL/INSTALLATION

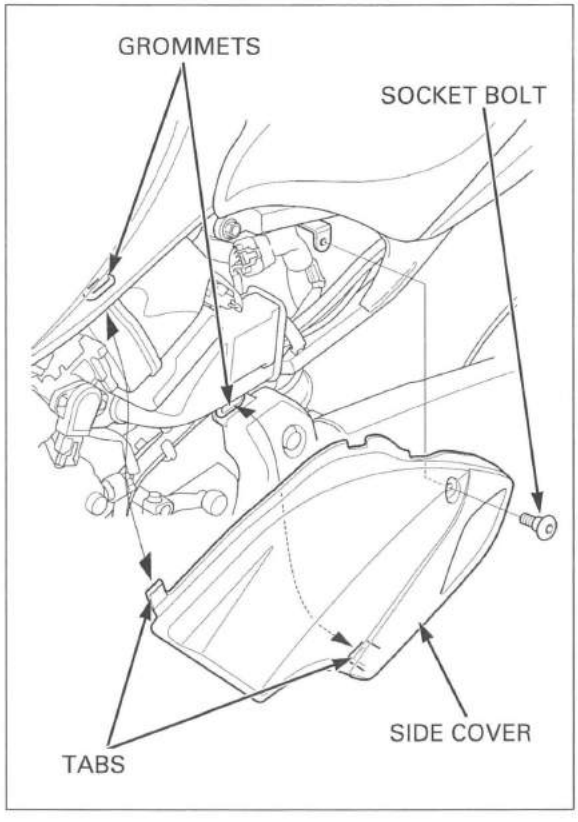
Remove the socket bolt.

Release the tabs from the swingarm pivot bracket and fuel tank grommets, then remove the side cover.

Install the side cover aligning its tabs with the grommets in the swingarm pivot bracket and fuel tank.

Install and tighten the socket bolt to the specified torque.

TORQUE: 4.0 N·m (0.4 kgf·m, 3 lbf·ft)



FRONT COWL

REMOVAL/INSTALLATION

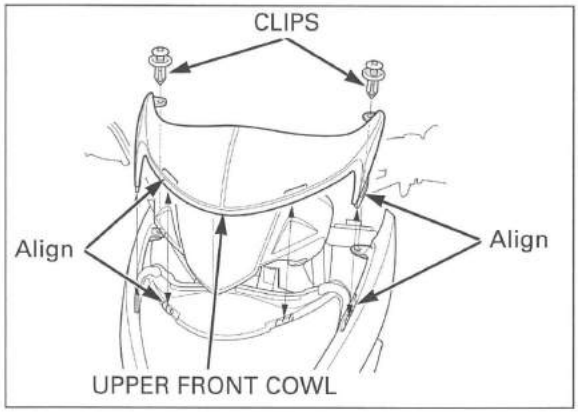
UPPER FRONT COWL

Remove the clips.

Carefully release the tabs of the upper front cowl from the right/left front cowls, then remove the upper front cowl.

Installation is in the reverse order or removal.

Align the hooks of cowl with the bosses of headlight unit.



RIGHT/LEFT FRONT COWLS

Remove the upper front cowl (page 2-5).

Remove the socket bolts.

Release the bosses of right/left front cowls from the grommets of headlight unit.

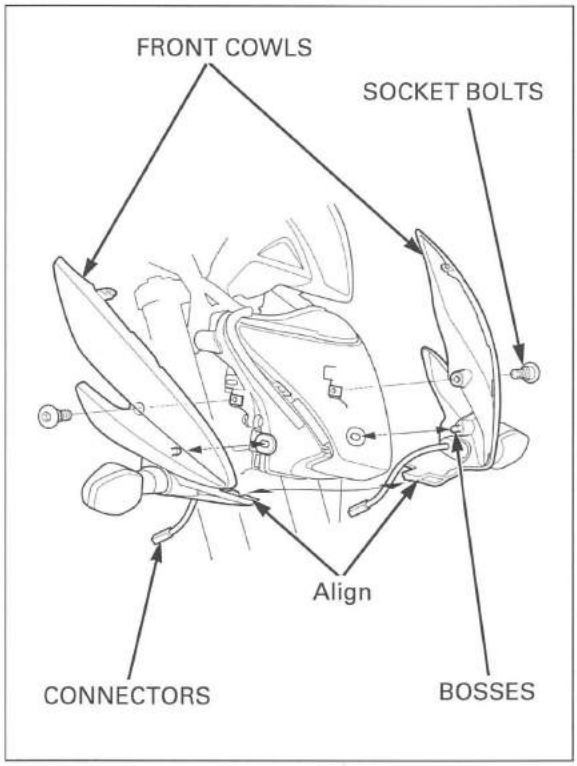
Disconnect the right front turn signal 2P (Light blue) and left front turn signal 2P (Orange) connectors.

Carefully release the tabs of each front cowl, then remove the right/left front cowls.

Installation is in the reverse order or removal.

NOTE:

- Route the right/left turn signal wires properly (page 1-23).
- When installing the right/left front cowls, align each tab of the cowls.



METER COVER

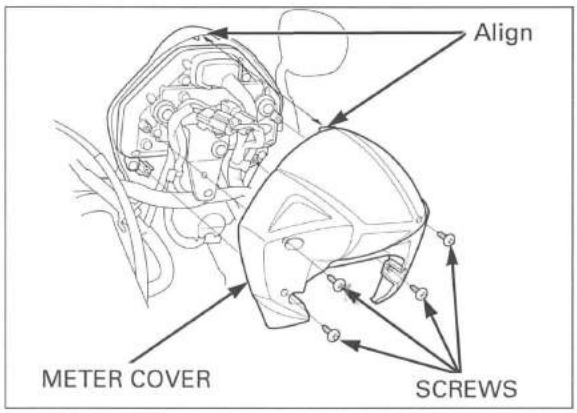
REMOVAL/INSTALLATION

Remove the headlight (page 20-6).

Remove the screws and meter cover.

Install the meter cover, aligning its tab with the guide of upper cover.

Tighten the screws securely.

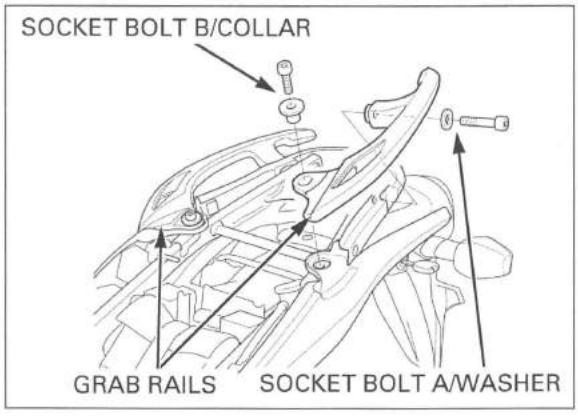


REAR COWL

REMOVAL

Remove the seat (page 2-4).

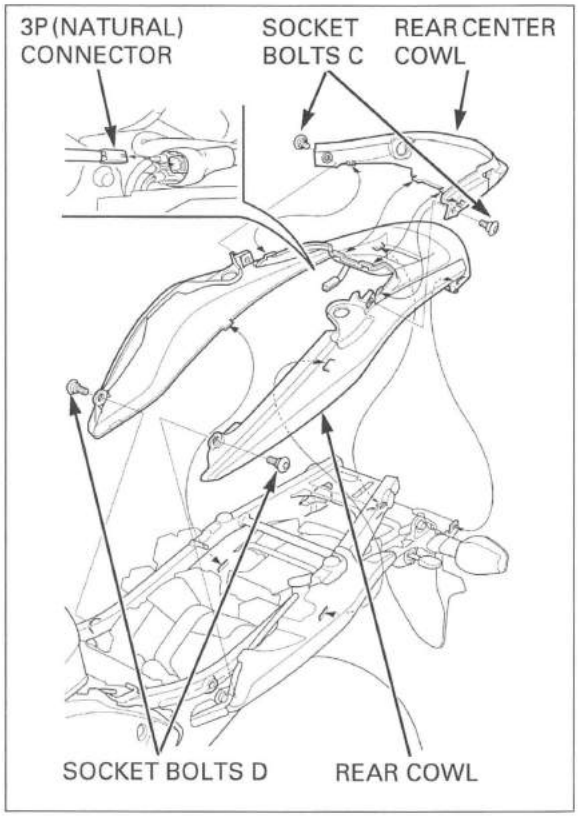
Remove the socket bolts A and washers.
Remove the socket bolts B, collars and grab rails.



Remove the socket bolts C.
Carefully release the tabs of the rear center cowl from the rear cowl, then remove the rear center cowl.

Disconnect the brake/tail light 3P (Natural) connector.

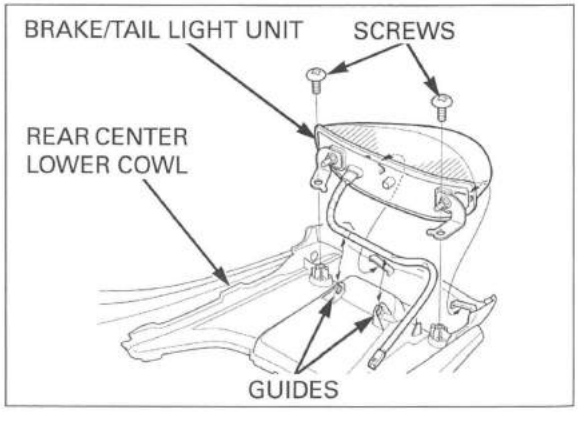
Remove the socket bolts D.
Carefully release the tabs of the rear cowl from the rear fender, then remove the rear cowl.



DISASSEMBLY/ASSEMBLY

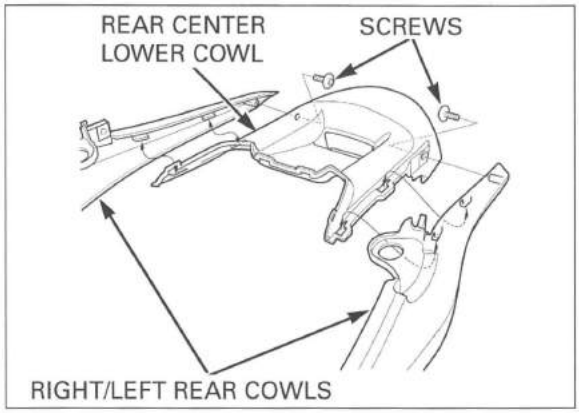
Remove the screws.
Remove the brake/tail light unit, releasing its tabs from the slits of rear center lower cowl.

Release the brake/tail light wire from the guides.



Remove the cowl screws.

Carefully release the tabs of the right/left rear cowls from the rear center lower cowl, then remove the rear cowls.



While installing the brake/tail light unit, route the wire harness properly (page 1-23).

Assembly is in the reverse order of disassembly.

Tighten the cowl screws to the specified torque.

TORQUE: 4.0 N·m (0.4 kgf·m, 3 lbf·ft)

INSTALLATION

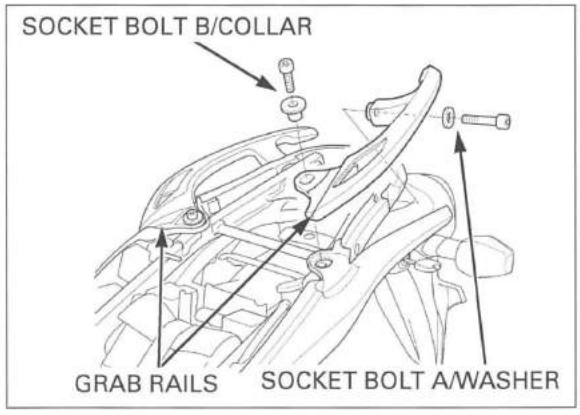
Install the rear cowl in the reverse order of removal.

Install the grab rails, collars and socket bolts B. Install the washers and socket bolts A.

Tighten the socket bolts to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Install the seat (page 2-4).



FRONT FENDER

REMOVAL/INSTALLATION

Remove the front brake hose clamp cap nuts.

Remove the mounting bolts, washers and collars.

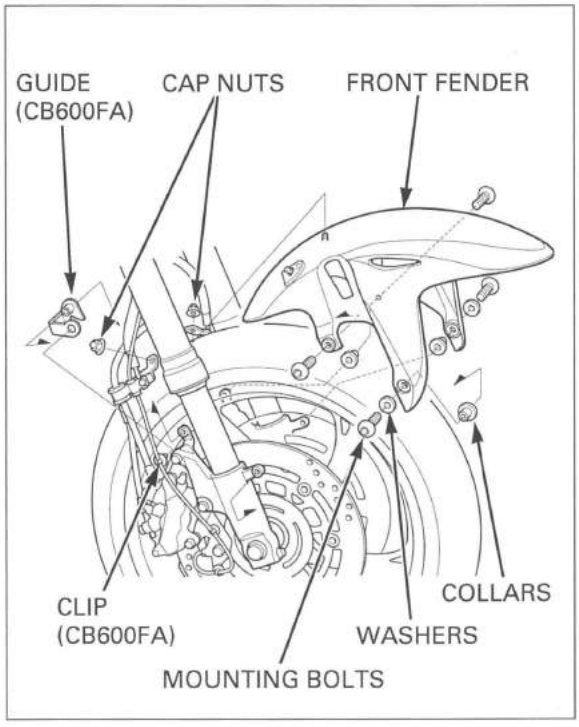
CB600FA only: Release the front wheel speed sensor wire clip from the sensor guide, then remove the sensor guide from the front fender.

Be careful not to scratch the front fender when removing it between the front forks. Remove the front fender forward.

Install the removed parts in the reverse order of removal.

Tighten the front fender mounting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



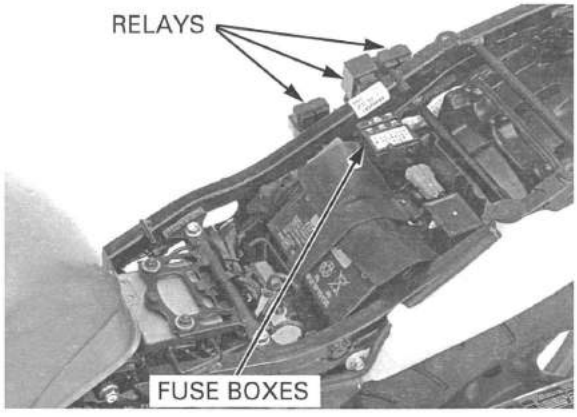
REAR FENDER

REMOVAL

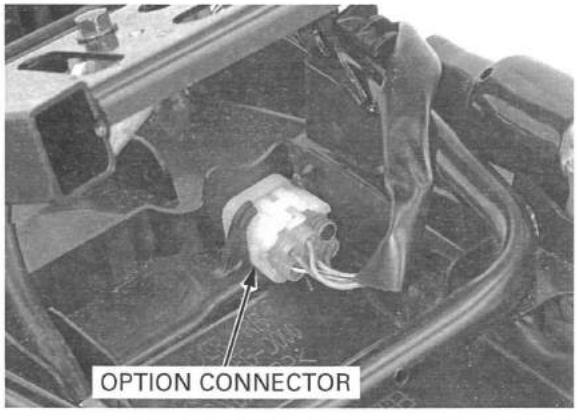
Remove the following:

- rear cowl (page 2-6)
- battery (page 17-6)
- bank angle sensor (page 5-94)
- starter relay switch (page 19-16)

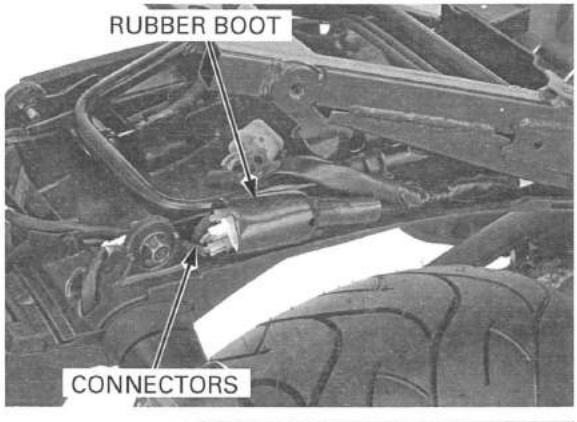
Remove the fuse boxes, fan control/fuel cut relays, turn signal relay and engine stop/headlight relays from the rear fender.



Release the option connector from the rear fender.

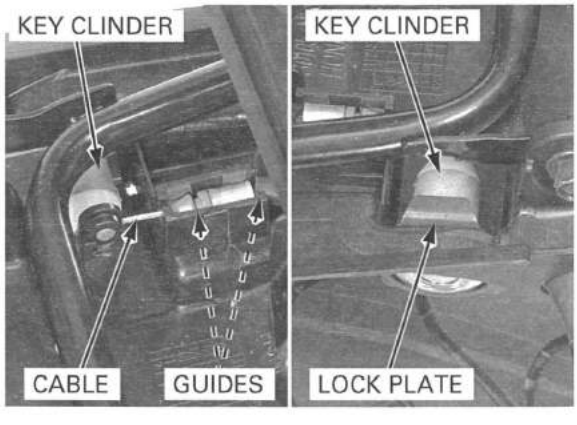


Slide the rubber boot off the connectors.
Disconnect the license light 2P (Natural), right rear turn signal 2P (Light blue) and left rear turn signal 2P (Orange) connectors.

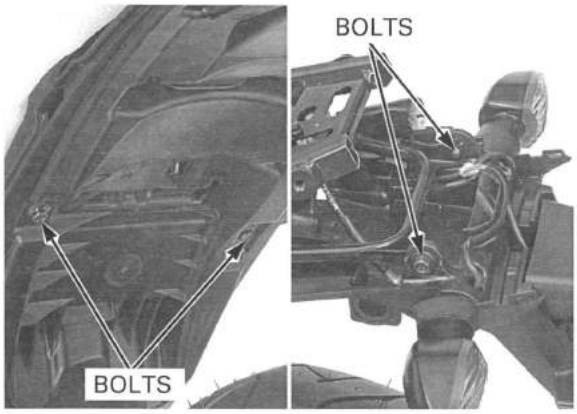


Release the seat lock cable from the cable guides.
Disconnect the seat lock cable from the seat lock key cylinder.

Pull up the lock plate, then remove the seat lock key cylinder from the rear fender.

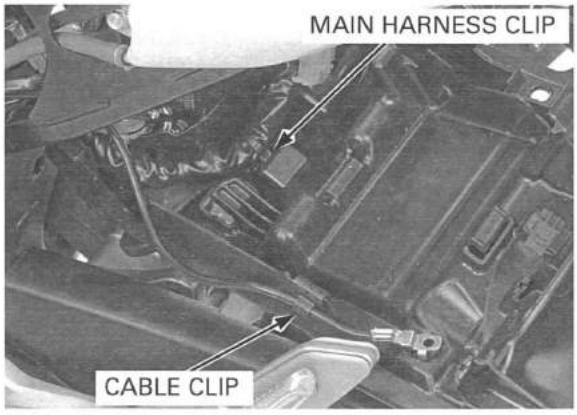


Remove the mounting bolts.



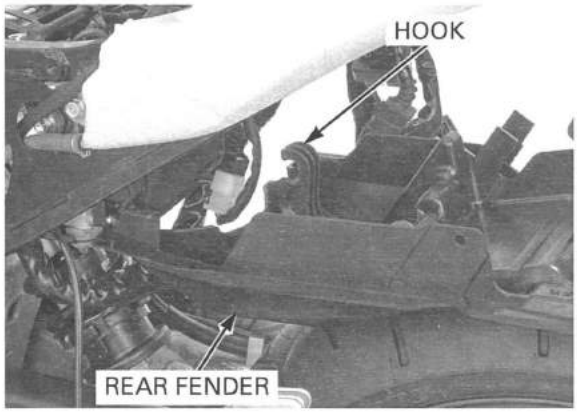
Release the battery negative (-) cable clip from the rear fender.

Release the main harness clip from the rear fender.



Release the hook of the rear fender from the frame brace.

Remove the rear fender backward.

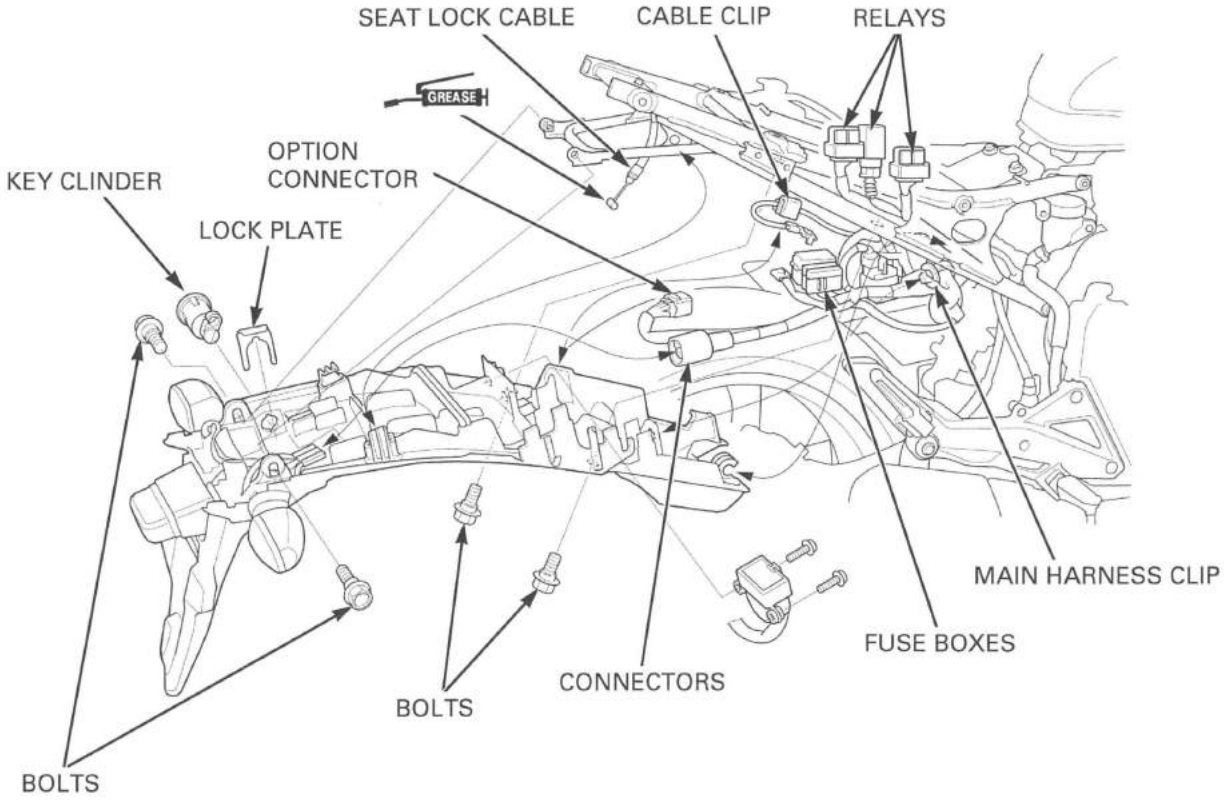


INSTALLATION

Installation is in the reverse order or removal.

NOTE:

- While installing the rear fender, route the wire harness properly (page 1-23).
- When connecting the seat lock cable, apply grease to the cable end.



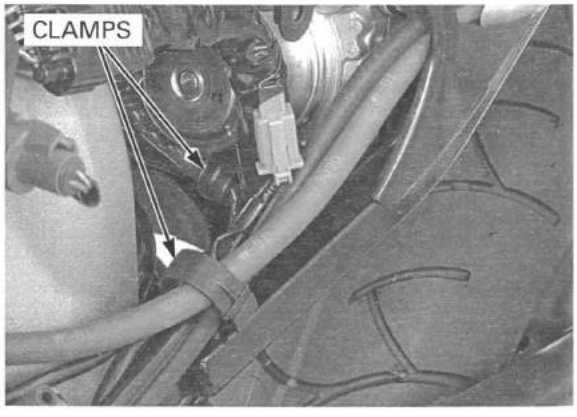
SEAT RAIL

REMOVAL

Remove the following:

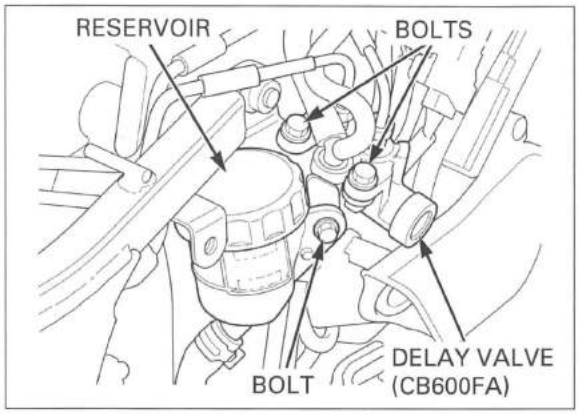
- rear fender (page 2-8)
- ABS modulator; CB600FA (page 16-26)
- radiator reserve tank (page 6-17)
- regulator/rectifier (page 17-9)

Release the alternator wire from the clamp.
Release the radiator hoses, alternator wire, side-stand switch wire and battery negative (-) cable from the clamp.

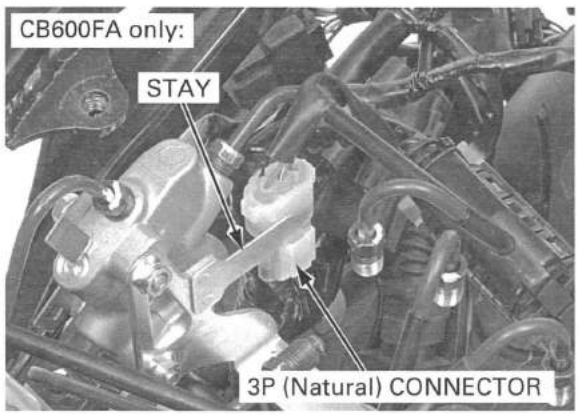


Remove the bolt and rear brake fluid reservoir.

CB600FA only: Remove the delay valve mounting bolts.



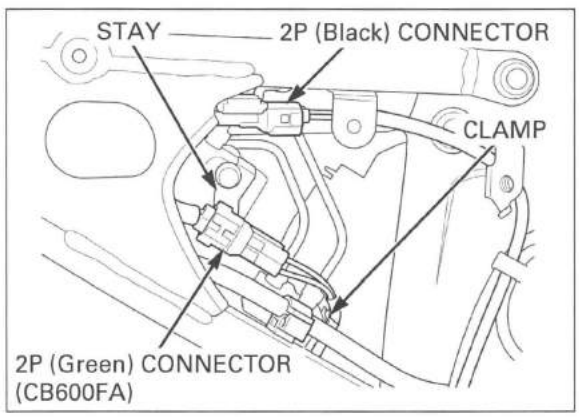
CB600FA only: Release the ABS service check 3P (Natural) connector from the PCV stay.



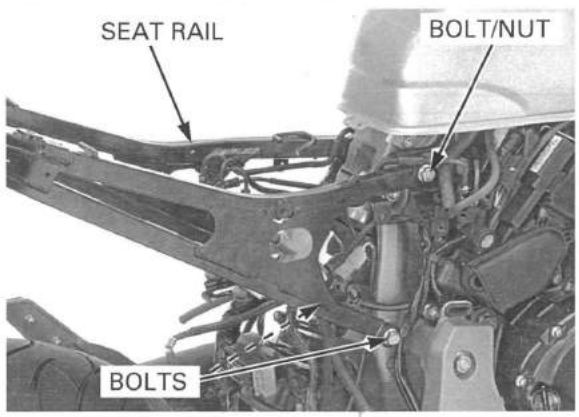
CB600FA only: Release the rear wheel speed sensor 2P (Green) connector from the PCV stay.

Release the rear brake light switch 2P (Black) connector from the seat rail.

Release the starter motor cable from the clamp.



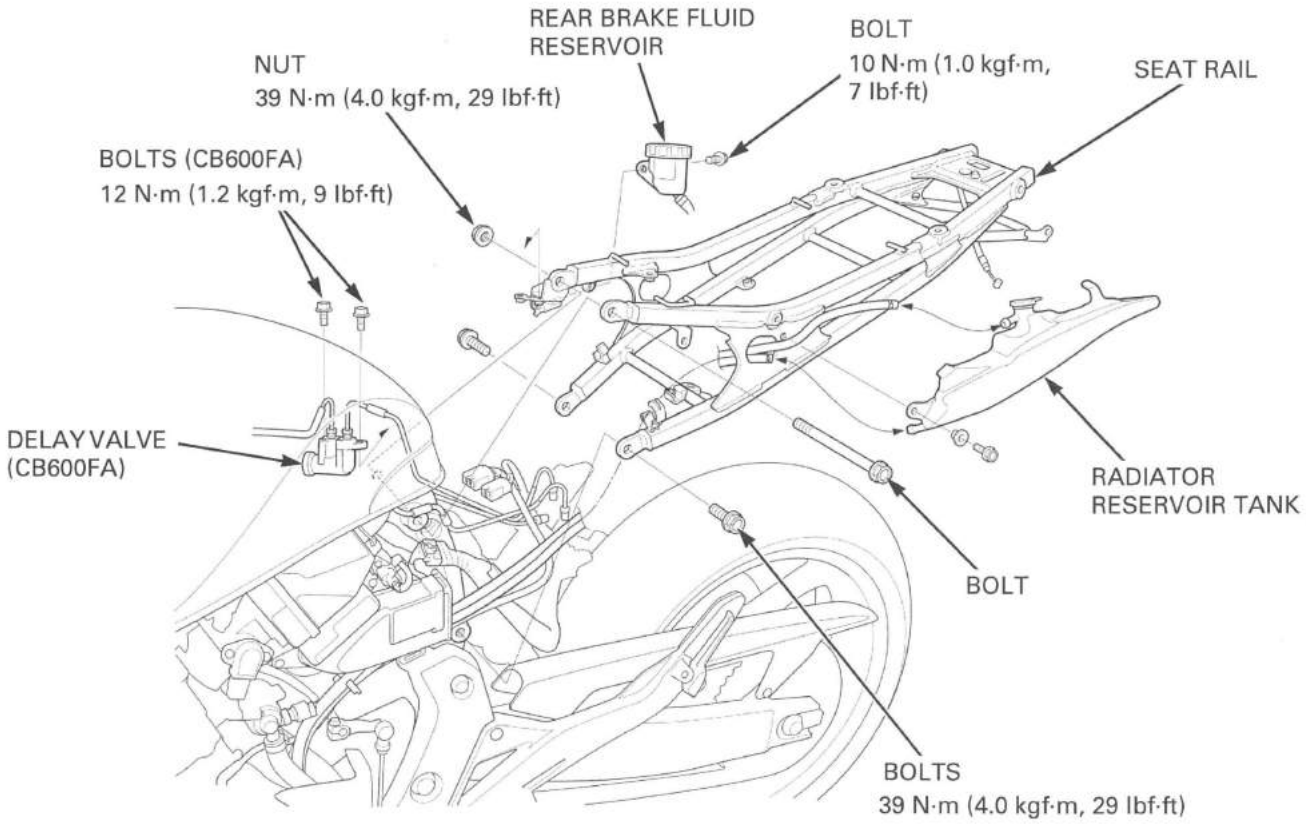
Remove the lower mounting bolts.
Remove the upper mounting bolt/nut, then remove the seat rail backward.



INSTALLATION

Installation is in the reverse order or removal.

NOTE:
While installing the seat rail, route the wire harness properly (page 1-23).



Tighten the mounting nut and bolts to the specified torque.

TORQUE:
Upper mounting nut:
39 N·m (4.0 kgf·m, 29 lbf·ft)
Lower mounting bolts:
39 N·m (4.0 kgf·m, 29 lbf·ft)
Delay valve mounting bolts (CB600FA):
12 N·m (1.2 kgf·m, 9 lbf·ft)
Rear brake fluid reservoir mounting bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)

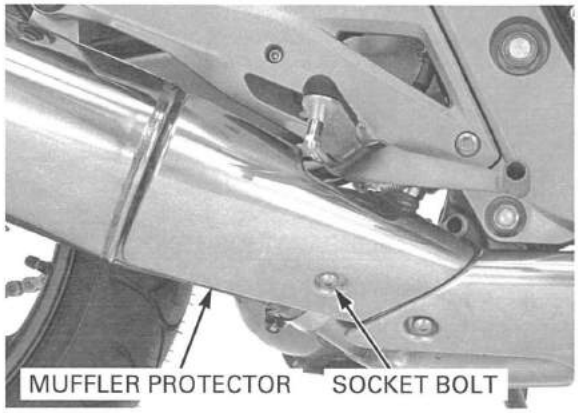
EXHAUST SYSTEM

REMOVAL

MUFFLER

Remove the socket bolt.

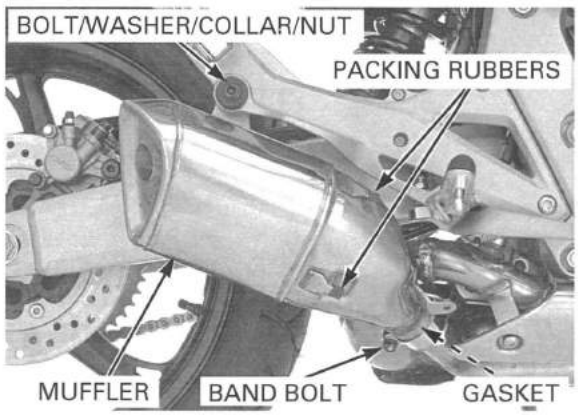
Remove the muffler protector, releasing its slits off the stays.



Remove the packing rubbers from the stays.

Loosen the muffler band bolt.

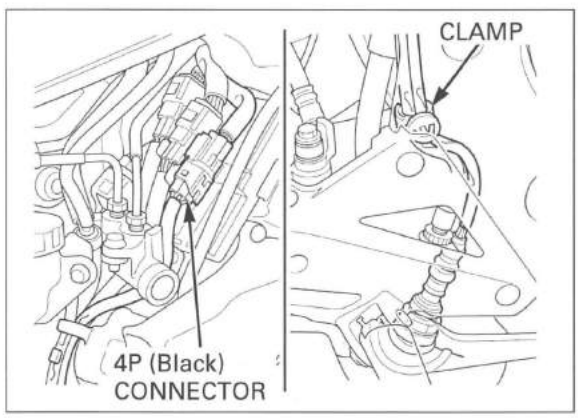
Remove the muffler mounting bolt/nut, washer and collar.
Remove the muffler and gasket.



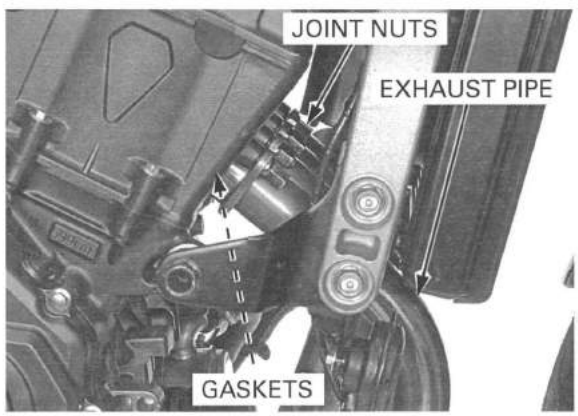
EXHAUST PIPE

Remove the right side cover (page 2-4).

Disconnect the O_2 sensor 4P (Black) connector.
Release the O_2 sensor wire from the clamp.



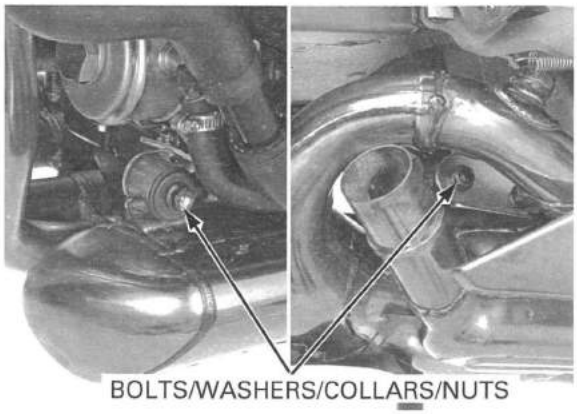
Remove the exhaust pipe joint nuts.
Remove the exhaust pipe and gaskets.



Remove the exhaust pipe mounting bolts/nuts, washers and collars.

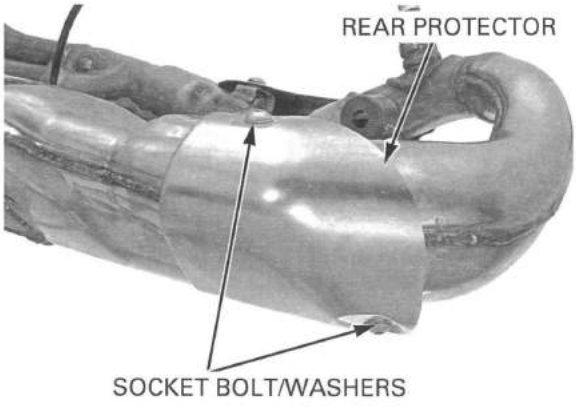
Carefully release the O_2 sensor wire from the frame.

Remove the exhaust pipe.

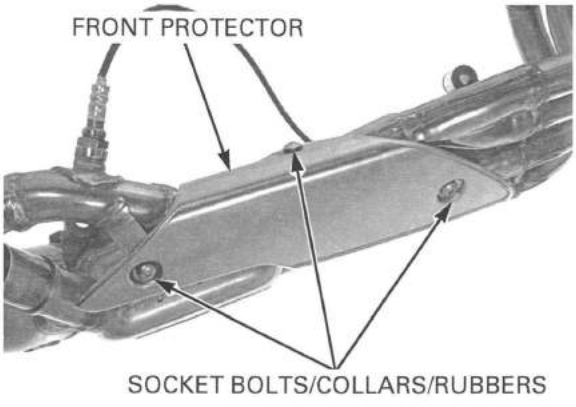


DISASSEMBLY/ASSEMBLY

Remove the socket bolts, washers and rear protector.

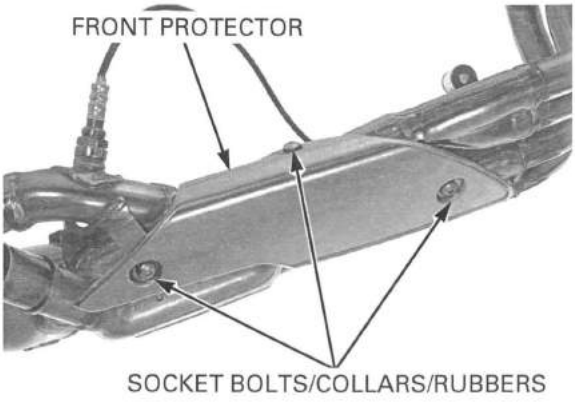


Remove the socket bolts, collars, rubbers and front protector.



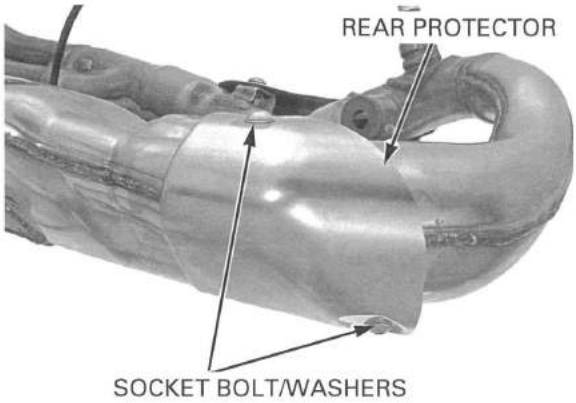
Install the front protector with the rubbers and collars.
Tighten the socket bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

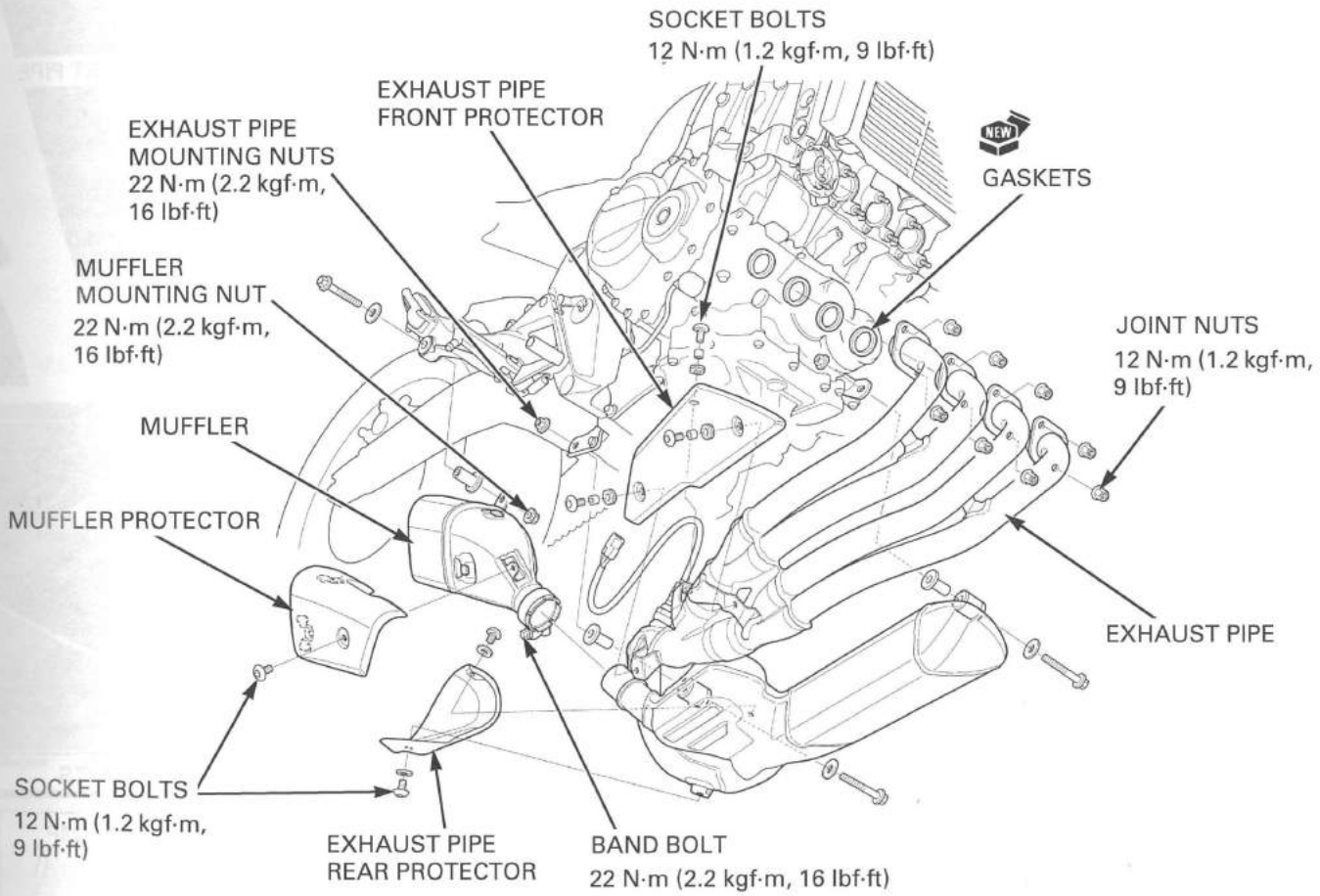


Install the rear protector with the socket bolts and washers.
Tighten the socket bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



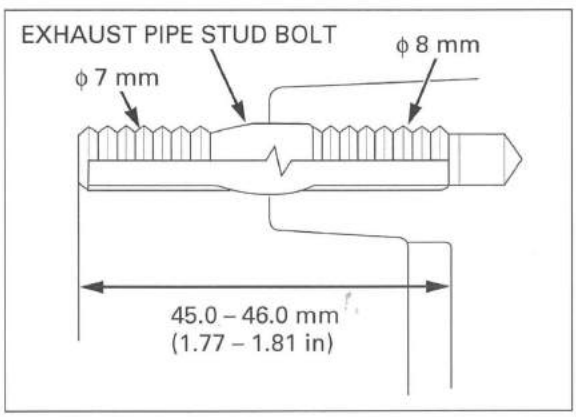
INSTALLATION



EXHAUST PIPE

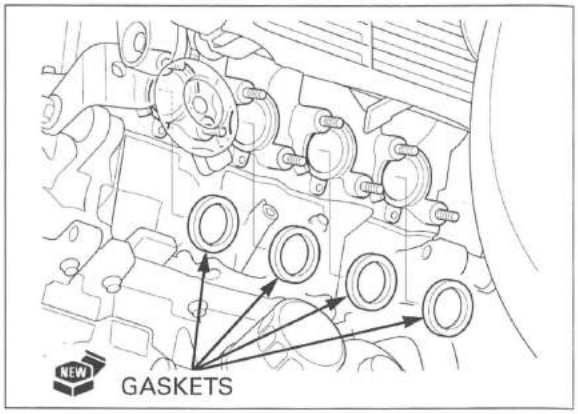
Check that the exhaust pipe stud bolt protrusion from the exhaust port is specified length as shown.

SPECIFIED LENGTH: 45.0 – 46.0 mm (1.77 – 1.81 in)



Always replace the gaskets with new ones.

Install new gaskets to the exhaust ports.



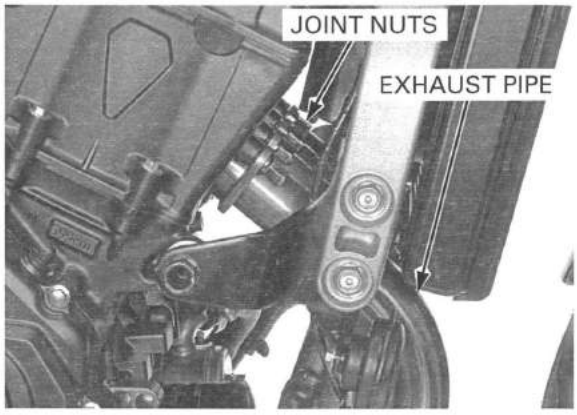
Refer to "CABLE & HARNESS ROUTING" (page 1-23).

Route the O_2 sensor wire properly and install the exhaust pipe.

Temporarily install the exhaust pipe joint nuts, exhaust pipe mounting bolts, collars, washers and nuts.

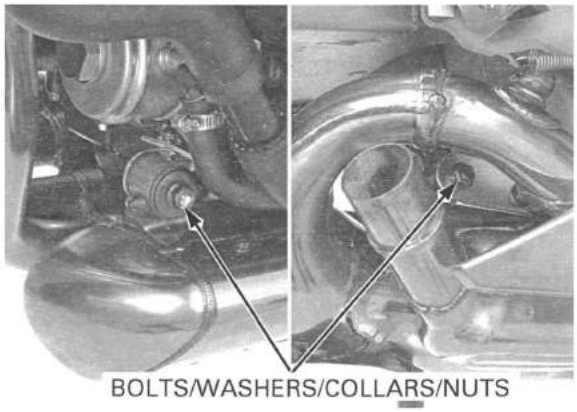
Tighten the exhaust pipe joint nuts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



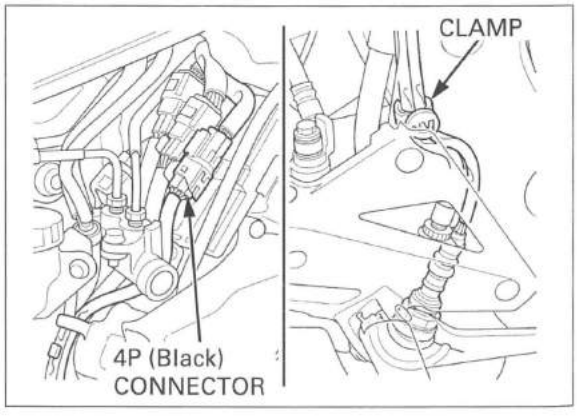
Tighten the exhaust pipe mounting nuts to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



Secure the O_2 sensor wire with clamp.
Connect the O_2 sensor 4P (Black) connector.

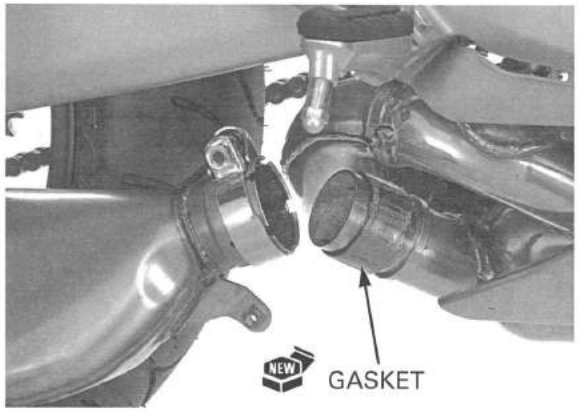
Install the right side cover (page 2-4).



MUFFLER

Install a new gasket onto the exhaust pipe.

Install the muffler to the exhaust pipe.



Install the muffler mounting bolt/nut, washer and collar.

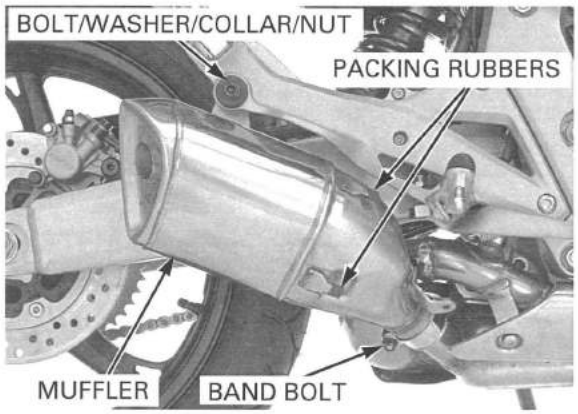
Tighten the muffler mounting nut to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

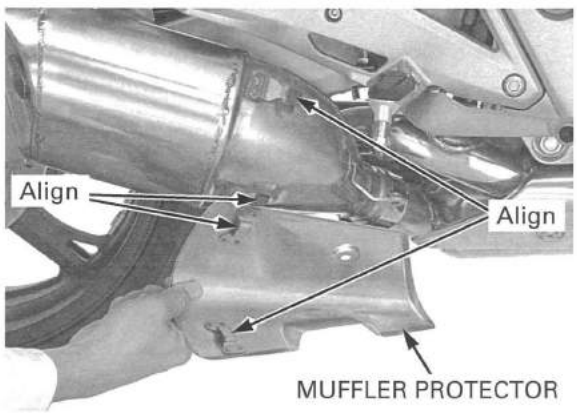
Tighten the muffler band bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Install the packing rubbers to the stays certainly.

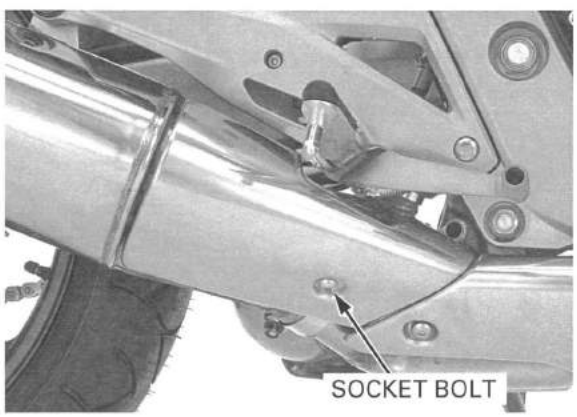


Install the muffler protector, aligning its slits with the stays of the muffler.



Install and tighten the socket bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



3. MAINTENANCE

SERVICE INFORMATION

GENERAL

- Place the motorcycle on level ground before starting any work.
- Gasoline is extremely flammable and is explosive under certain conditions.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.
- The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in and enclosed area.

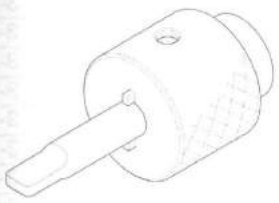
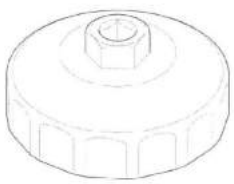
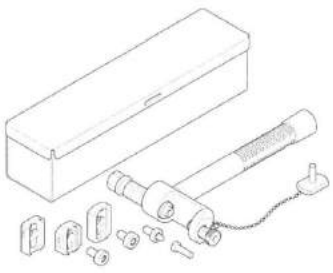
SPECIFICATIONS

ITEM			SPECIFICATIONS
Throttle grip freeplay			2 – 6 mm (1/16 – 1/4 in)
Spark plug	NGK		CR9EH-9
	DENSO		U27FER9
Spark plug gap			0.80 – 0.90 mm (0.031 – 0.035 in)
Valve clearance	IN		0.20 ± 0.03 mm (0.008 ± 0.001 in)
	EX		0.28 ± 0.03 mm (0.011 ± 0.001 in)
Engine oil capacity	After draining		2.7 liter (2.9 US qt, 2.4 Imp qt)
	After oil filter change		2.8 liter (3.0 US qt, 2.5 Imp qt)
Engine oil			Suggested oil: Honda "4-stroke motorcycle oil" or an equivalent Oil recommendation: API classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 standard: MA
Engine idle speed			1,350 ± 100 min^{-1} (rpm)
Drive chain slack			30 – 40 mm (1-3/16 – 1-9/16 in)
Recommended brake fluid			DOT 4
Clutch lever freeplay			10 – 20 mm (3/8 – 13/16 in)
Tire size		Front	120/70ZR17M/C (58W)
		Rear	180/55ZR17M/C (73W)
Tire brand	Bridgestone	Front	BT012F RADIAL J
		Rear	BT012R RADIAL J
	Michelin	Front	Pilot POWER E
		Rear	Pilot POWER E
Tire air pressure	Driver only	Front	250 kPa (2.50 kgf/cm^2, 36 psi)
		Rear	290 kPa (2.90 kgf/cm^2, 42 psi)
	Driver and passenger	Front	250 kPa (2.50 kgf/cm^2, 36 psi)
		Rear	290 kPa (2.90 kgf/cm^2, 42 psi)
Minimum tire tread depth		Front	1.5 mm (0.06 in)
		Rear	2.0 mm (0.08 in)

TORQUE VALUES

Spark plug	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Timing hole cap	18 N·m (1.8 kgf·m, 13 lbf·ft)	Apply grease to the threads.
Engine oil drain bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	
Engine oil filter cartridge	26 N·m (2.7 kgf·m, 19 lbf·ft)	Apply engine oil to the threads and O-ring.
Rear axle nut	98 N·m (10.0 kgf·m, 72 lbf·ft)	U-nut
Drive sprocket bolt	54 N·m (5.5 kgf·m, 40 lbf·ft)	
Driven sprocket nut	108 N·m (11.0 kgf·m, 80 lbf·ft)	
Front master cylinder reservoir cap screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)	
Rear brake fluid reservoir mounting bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Rear master cylinder push rod joint nut	17 N·m (1.7 kgf·m, 13 lbf·ft)	

TOOLS

Tensioner stopper 070MG-0010100	Oil filter wrench 07HAA-PJ70101	Drive chain tool set 07HMH-MR10103
		

MAINTENANCE SCHEDULE

Perform the Pre-ride inspection in the Owner's Manual at each scheduled maintenance period.

I: Inspect and Clean, Adjust, Lubricate or Replace if necessary. C: Clean. R: Replace. A: Adjust. L: Lubricate.

The following items require some mechanical knowledge. Certain items (particularly those marked * and **) may require more technical information and tools. Consult an authorized Honda dealer.

	ITEMS	FREQUENCY WHICHEVER COMES FIRST ⇩	⇨ ODOMETER READING (NOTE 1)								REFER TO PAGE
			X1,000 km	1	6	12	18	24	30	36	
			X1,000 mi	0.6	4	8	12	16	20	24	
			Months		6	12	18	24	30	36	
*	FUEL LINE					I		I		I	3-5
*	THROTTLE OPERATION					I		I		I	3-6
	AIR CLEANER	NOTE2					I			I	3-7
	CRANKCASE BREATHER	NOTE3			C	C	C	C	C	C	3-7
	SPARK PLUG					I		R		I	3-8
*	VALVE CLEARANCE							I			3-9
	ENGINE OIL			R		R		R		R	3-14
	ENGINE OIL FILTER			R		R		R		R	3-14
	RADIATOR COOLANT	NOTE4				I		I		R	3-17
*	COOLING SYSTEM					I		I		I	3-17
*	SECONDARY AIR SUPPLY SYSTEM					I		I		I	3-18
	DRIVE CHAIN			EVERY 1,000 km (600 mi) I, L							3-19
	DRIVE CHAIN SLIDER					I		I		I	3-23
	BRAKE FLUID	NOTE4			I	I	R	I	I	R	3-24
	BRAKE PAD WEAR				I	I	I	I	I	I	3-25
	BRAKE SYSTEM			I		I		I		I	3-26
*	BRAKE LIGHT SWITCH					I		I		I	3-27
*	HEADLIGHT AIM					I		I		I	3-27
	CLUTCH SYSTEM			I	I	I	I	I	I	I	3-27
	SIDESTAND					I		I		I	3-28
*	SUSPENSION					I		I		I	3-28
*	NUTS, BOLTS, FASTENERS			I		I		I		I	3-30
**	WHEELS/TIRES					I		I		I	3-30
**	STEERING HEAD BEARINGS			I		I		I		I	3-30

* Should be serviced by an authorized Honda dealer, unless the owner has proper tools and service data and is mechanically qualified.

** In the interest of safety, we recommended these items be serviced only by an authorized Honda dealer

Honda recommends that an authorized Honda dealer should road-test the motorcycle after each periodic maintenance is carried out.

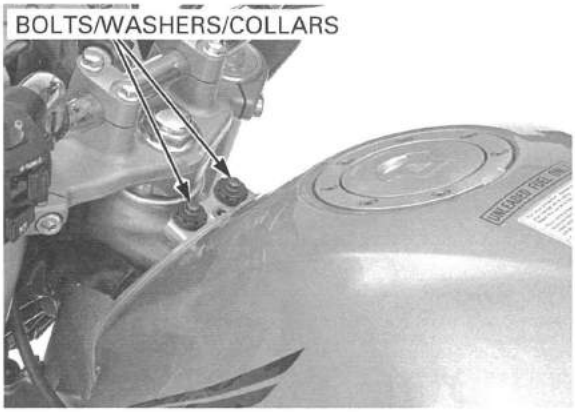
NOTES:
1. At higher odometer readings, repeat at the frequency interval established here.
2. Service more frequently when riding in unusually wet or dusty areas.
3. Service more frequently when riding in rain or at full throttle.
4. Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.

FUEL LINE

Remove the following:

- seat (page 2-4)
- side covers (page 2-4)

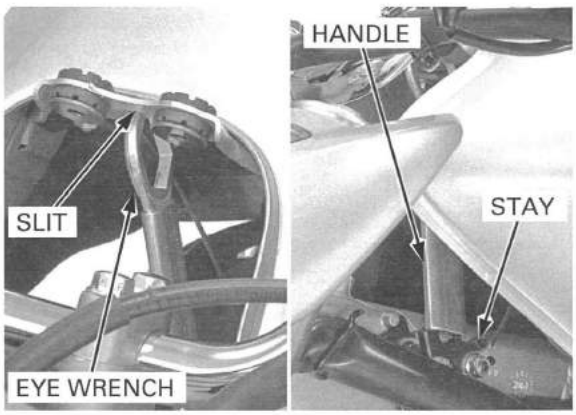
Remove the fuel tank front mounting bolts/washers and collars.



Lift the fuel tank and support it using the equipped tools (eye wrench and handle) as shown.

NOTE:

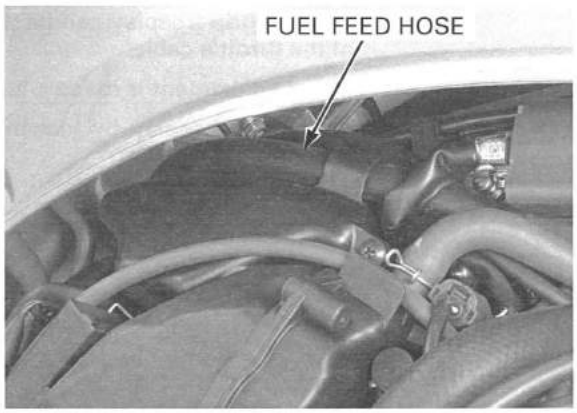
- Support the fuel tank mount bracket slit with the eye wrench and hook the handle on the stay of the frame as shown.



Check the fuel lines for deterioration, damage or leakage, replace the fuel line if necessary (page 5-61).

Check the fuel rails and injectors for damage or leakage, replace them if necessary (page 5-85).

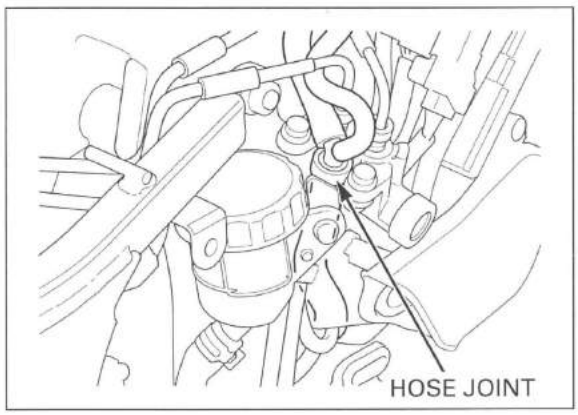
Check the fuel pump mounting area for leakage, replace the fuel pump packing if necessary (page 5-55).



Remove a support tools, then lower the fuel tank.

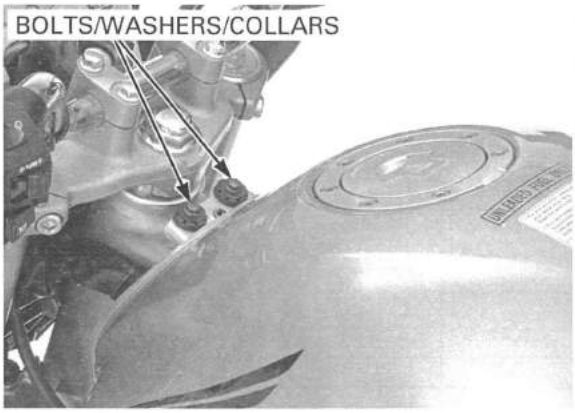
NOTICE

- *Route the hoses, wires and harness properly (page 1-23).*
- *Be careful not to damage the harness and hoses.*
- *After installing the fuel tank, make sure the drain, breather and fuel hoses are not kinked or bound.*
- *Check the hose joint for loose or disconnection.*



Install the fuel tank front mounting bolts/washers and collars.
Tighten the fuel tank mounting bolts securely.

Install the removed parts in the reverse order of removal.



THROTTLE OPERATION

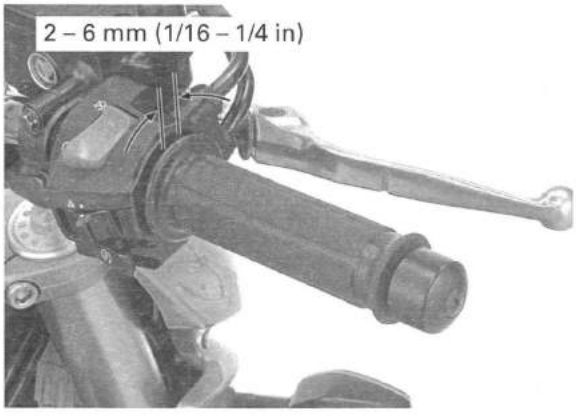
Check for smooth throttle grip full opening and automatic full closing in all steering positions.

Check the throttle cables and replace them if they are deteriorated, kinked or damaged.

Lubricate the throttle cables, if throttle operation is not smooth.

Measure a freeplay at the throttle grip flange.

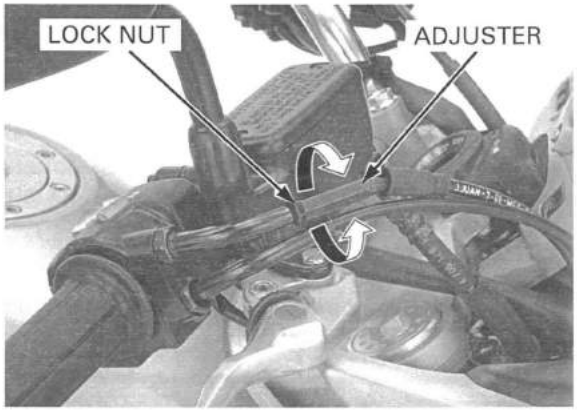
FREEPLAY: 2 – 6 mm (1/16 – 1/4 in)



Throttle grip freeplay can be adjusted at either end of the throttle cable.

Minor adjustment is made with the upper adjuster.

Adjust the freeplay by loosening the lock nut and turning the adjuster.



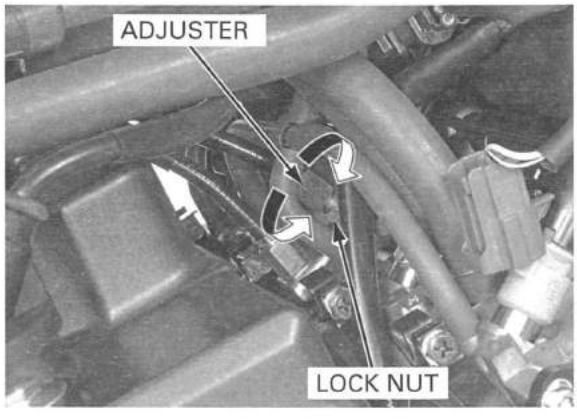
Major adjustment is made with the lower adjuster.

Lift and support the fuel tank (page 3-5).

Adjust the freeplay by loosening the lock nut and turning the adjuster.
After adjustment, tighten the lock nut securely.

Remove the support tool, then install and tighten the fuel tank front mounting bolts (page 3-6).

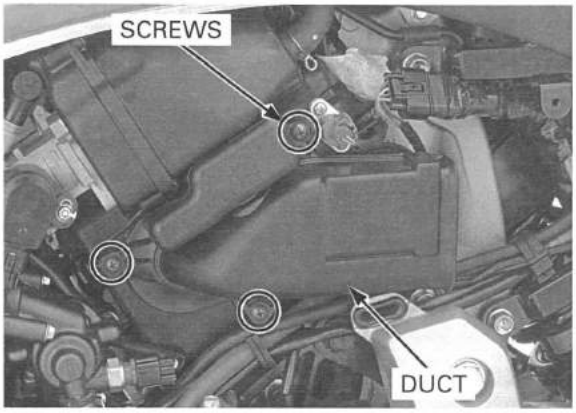
Recheck the throttle operation.
Replace any damaged parts, if necessary.



AIR CLEANER

Remove the left side cover (page 2-4).

Remove the air cleaner duct mounting screws. Remove the air cleaner duct without disconnecting the vacuum hose.

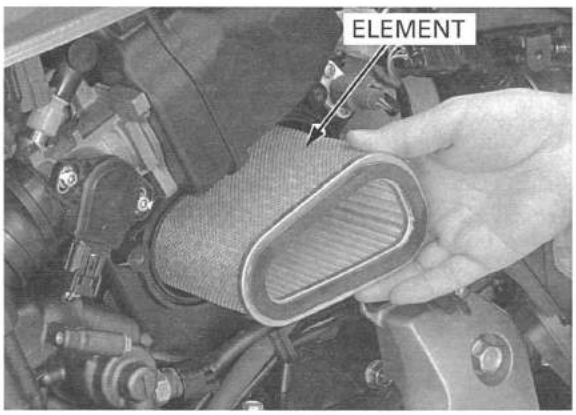


Remove and inspect the air cleaner element in accordance with the maintenance schedule (page 3-4).

Clean the air cleaner element with compressed air from outside of the element.

Install the air cleaner element with its opening facing out.

Install the removed parts in the reverse order of removal.



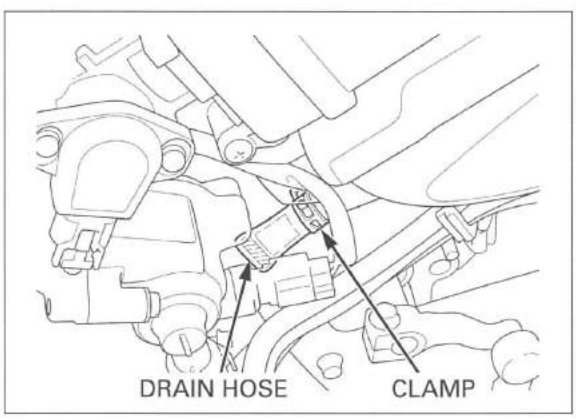
CRANKCASE BREATHER

NOTE:

- Service more frequently when ridden in rain, at full throttle, or after the motorcycle is washed or overturned. Service if the deposit level can be seen in the drain hose.

Remove the left side cover (page 2-4).

Remove the crankcase breather drain hose and drain the deposits into a suitable container, then reinstall the drain hose with the hose clamp.



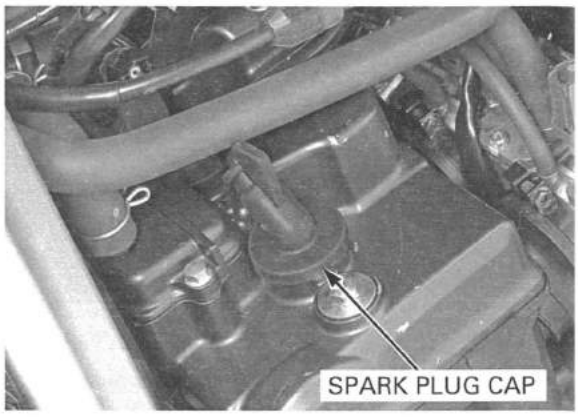
SPARK PLUG

REMOVAL

Lift and support the fuel tank (page 3-5).

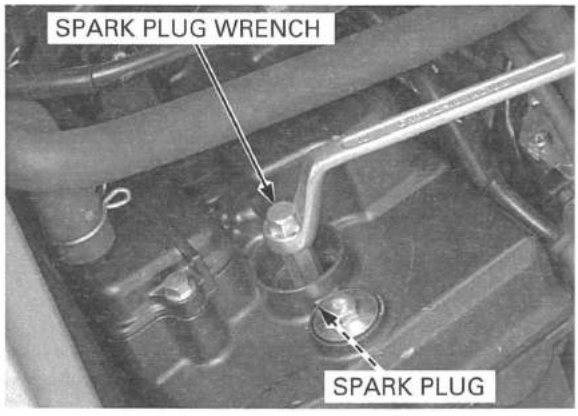
Clean around the spark plug bases with compressed air before removing, and be sure that no debris is allowed to enter the combustion chamber.

Disconnect the spark plug caps from the spark plugs.



Remove the spark plugs using a equipped spark plug wrench or an equivalent tool.

Inspect or replace as described in the maintenance schedule (page 3-4).



INSPECTION

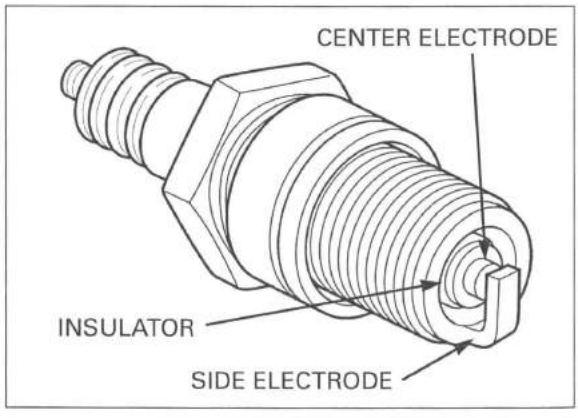
Check the following:

- insulator for damage
- electrodes for wear
- burning condition, coloration

Replace the spark plugs if necessary.

SPECIFIED SPARK PLUG:
NGK: CR9EH-9
DENSO: U27FER9

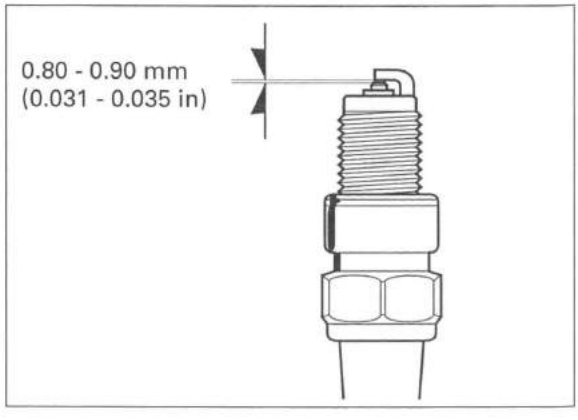
Clean the spark plug electrodes with a wire brush or special plug cleaner.



Check the gap between the center and side electrodes with a wire-type feeler gauge.

If necessary, adjust the gap by bending the side electrodes carefully.

SPARK PLUG GAP: 0.80 – 0.90 mm (0.031 – 0.035 in)



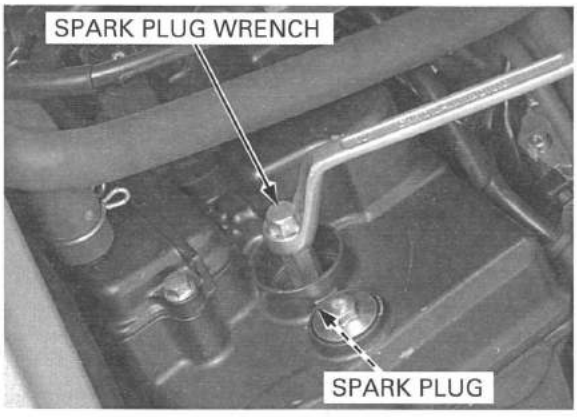
INSTALLATION

Install the spark plugs by hand and tighten them to the specified torque with the spark plug wrench.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Install the spark plug caps.

Install the removed parts in the reverse order.



VALVE CLEARANCE

INSPECTION

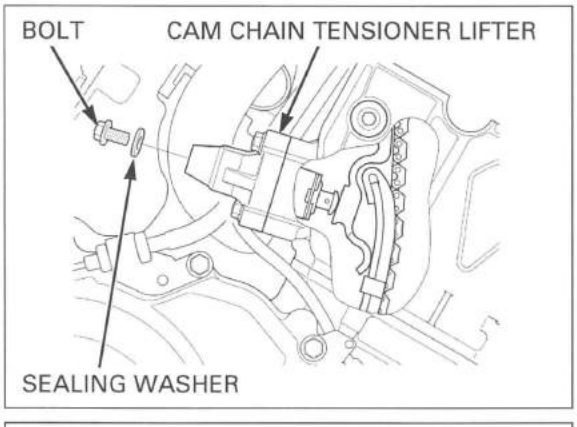
NOTE:

Check the engine idle speed (page 5-90) after the valve clearance inspection.

Inspect and adjust the valve clearance while the engine is cold (below 35°C/ 95°F)

Remove the cylinder head cover (page 8-6).

Remove the cam chain tensioner lifter sealing bolt and sealing washer.

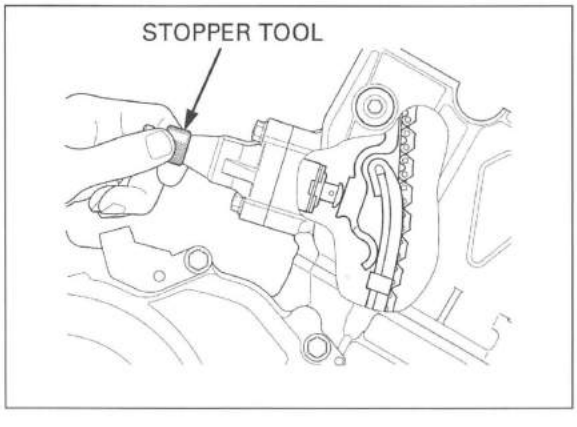


Failure to release the cam chain tensioner will result in inaccurate valve clearance reading.

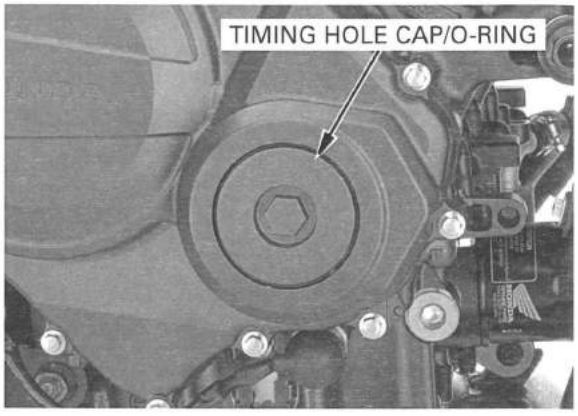
Turn the cam chain tensioner lifter shaft fully in (clockwise) and secure it using the special tool to prevent damaging the cam chain.

TOOL:

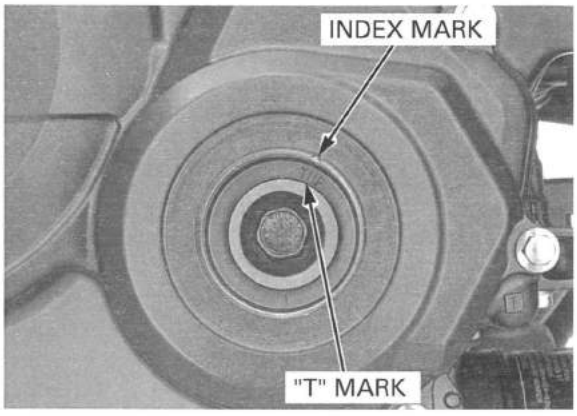
Tensioner stopper 070MG-0010100



Remove the timing hole cap and O-ring.

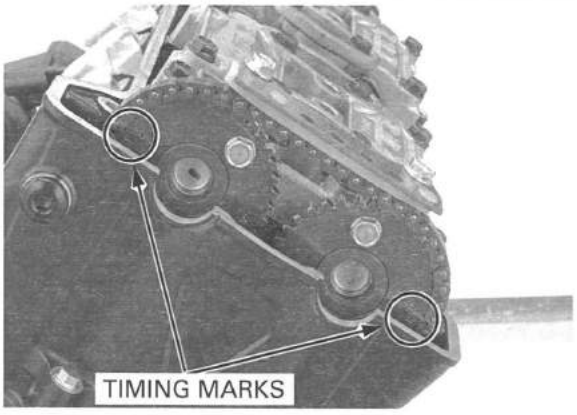


Turn the crankshaft clockwise, align the "T" mark on the CKP sensor rotor with the index mark on the right crankcase cover.

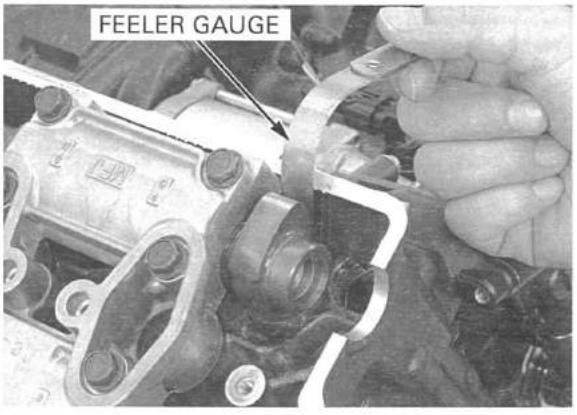


The timing marks ("IN" and "EX") on the cam sprockets must be flush with the cylinder head surface and facing outward as shown.

If the timing marks on the cam sprocket facing inward, turn the crankshaft clockwise one full turn (360°) and realign the timing marks with the cylinder head surface so they are facing outward.



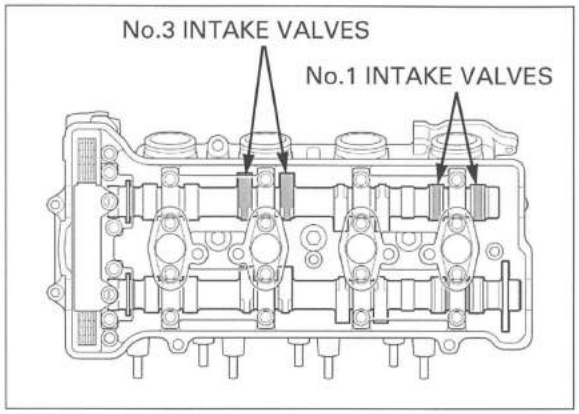
Insert the feeler gauge between the valve lifter and the cam lobe.



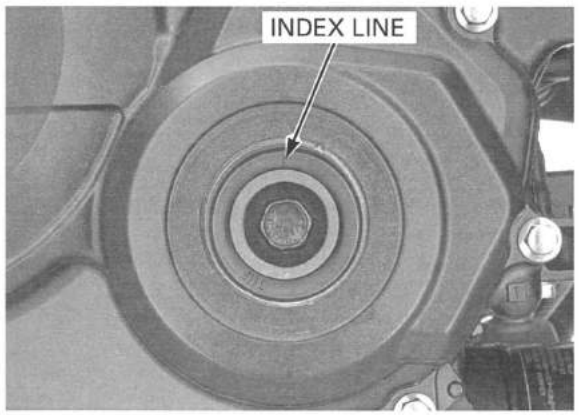
Record the clearance for each valve for reference in shim selection if adjustment is required.

Check the valve clearance for the No.1 and No.3 cylinder intake valves using a feeler gauge.

VALVE CLEARANCE:
IN: 0.20 ± 0.03 mm (0.008 ± 0.001 in)



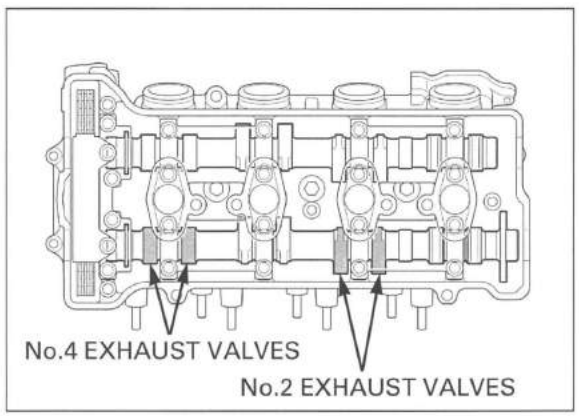
Turn the crankshaft clockwise 1/2 turn (180°), align the index line on the CKP sensor rotor so that it is facing up as shown.



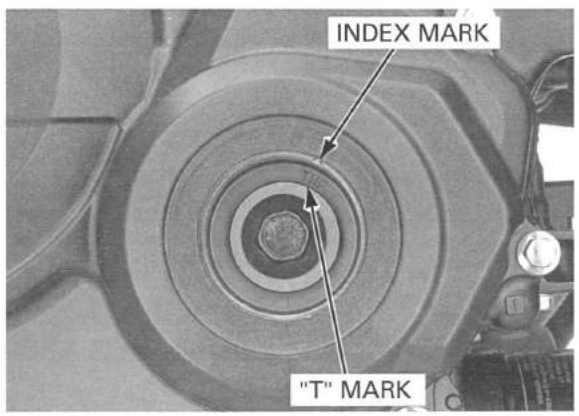
Record the clearance for each valve for reference in shim selection if adjustment is required.

Check the valve clearance for the No.2 and No.4 cylinder exhaust valves using a feeler gauge.

VALVE CLEARANCE:
EX: 0.28 ± 0.03 mm (0.011 ± 0.001 in)



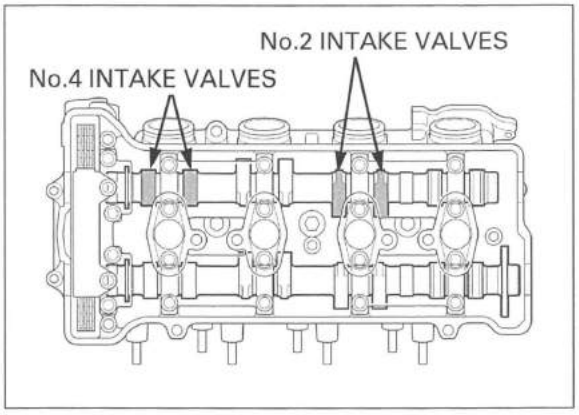
Turn the crankshaft clockwise 1/2 turn (180°), align the "T" mark on the CKP sensor rotor with the index mark on the right crankcase cover.



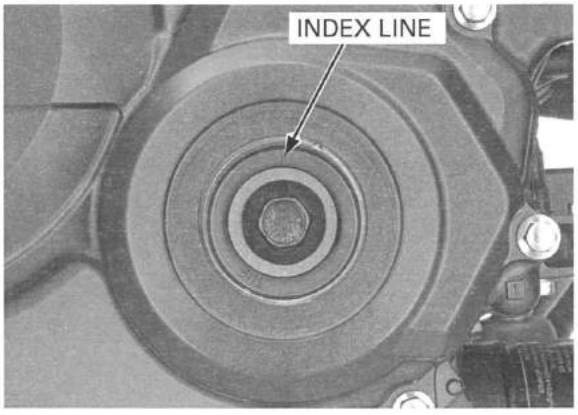
Record the clearance for each valve for reference in shim selection if adjustment is required.

Check the valve clearance for the No.2 and No.4 cylinder intake valves using feeler gauge.

VALVE CLEARANCE:
IN: 0.20 ± 0.03 mm (0.008 ± 0.001 in)



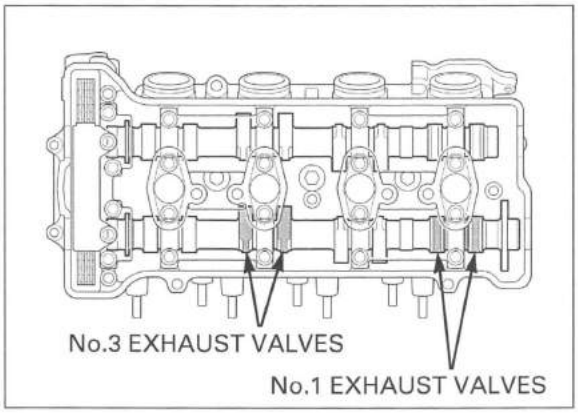
Turn the crankshaft clockwise 1/2 turn (180°), align the index line on the CKP sensor rotor so that it is facing up as shown.



Record the clearance for each valve for reference in shim selection if adjustment is required.

Check the valve clearance for the No.1 and No.3 cylinder exhaust valves using a feeler gauge.

VALVE CLEARANCE:
EX: 0.28 ± 0.03 mm (0.011 ± 0.001 in)



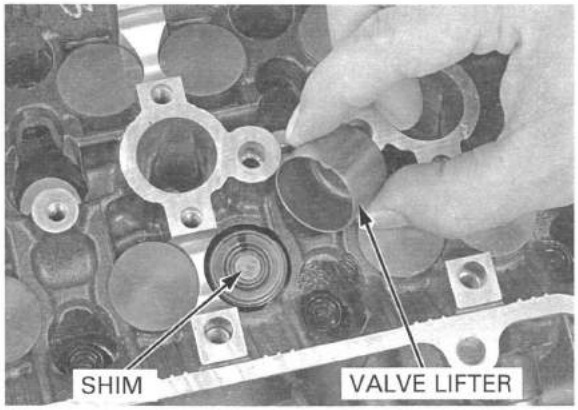
ADJUSTMENT

It is not necessary to remove the cam sprocket from the camshaft except when replacing the camshaft and/or cam sprocket.

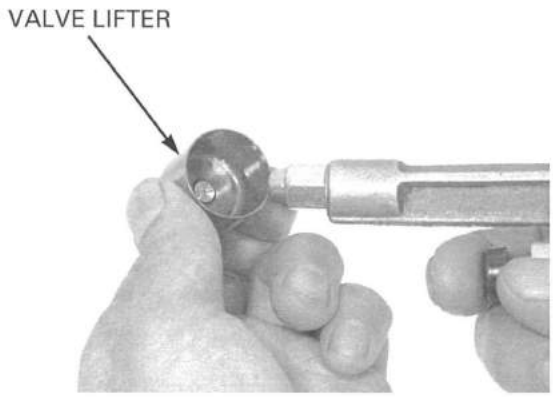
Remove the camshafts (page 8-8).

Remove the valve lifters and shims.

- Shim may stick to the inside of the valve lifter. Do not allow the shims to fall into the crankcase.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.
- The shims can be easily removed with a tweezers or magnet.

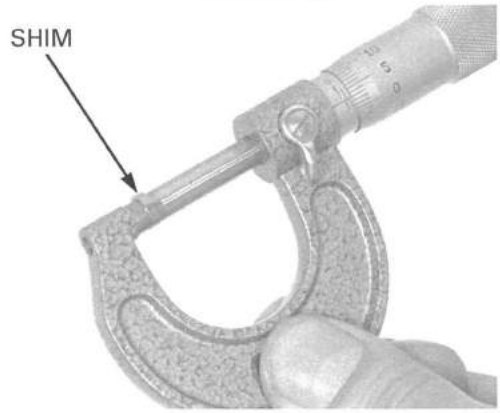


Clean the valve shim contact area in the valve lifter with compressed air.



Sixty-nine different thickness shims are available from the thinnest 1.200 mm thickness shim to the thickest 2.900 mm thickness shim in intervals of 0.025 mm.

Measure the shim thickness and record it.

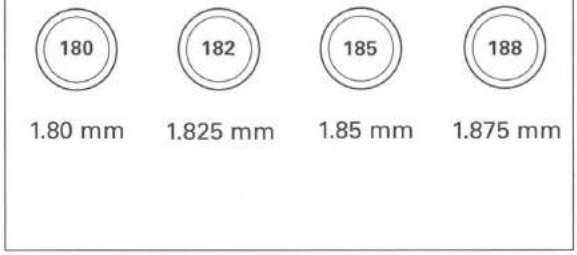


Calculate the new shim thickness using the equation below.

A = (B – C) + D

A: New shim thickness
B: Recorded valve clearance
C: Specified valve clearance
D: Old shim thickness

- Make sure of the correct shim thickness by measuring the shim by micrometer.
- Reface the valve seat if carbon deposit result in a calculated dimension of over 2.900 mm.



Install the shims and valve lifters in their original locations

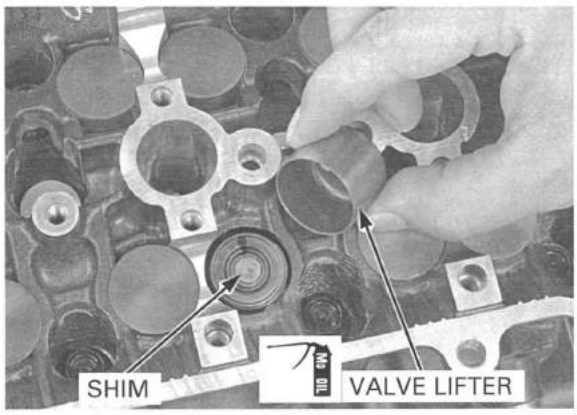
Install the newly selected shim on the valve retainer.

Apply molybdenum disulfide oil to the valve lifters.

Install the valve lifters into the valve lifter holes.

Install the camshaft (page 8-26).

Rotate the camshafts by rotating the crankshaft clockwise several times.
Recheck the valve clearance.

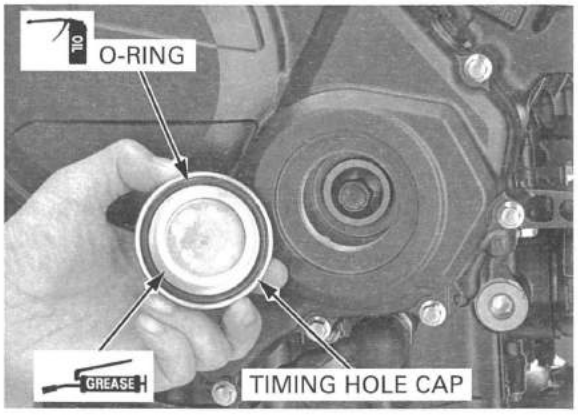


Check that the O-ring is in good condition, replace if necessary.

Apply engine oil to the timing hole cap O-ring.
Apply grease to the timing hole cap threads.

Install and tighten the timing hole cap to the specified torque.

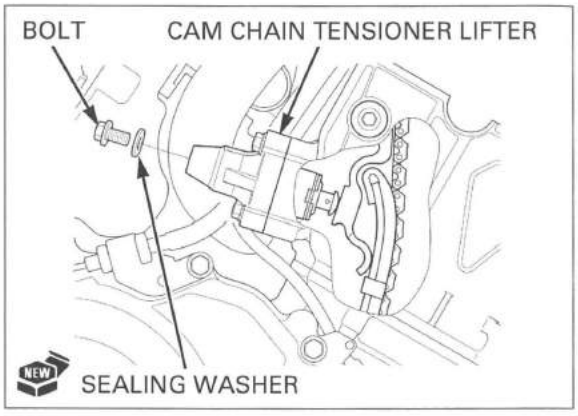
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



Remove the cam chain tensioner stopper tool.

Install a new sealing washer and cam chain tensioner lifter sealing bolt.
Tighten the bolt securely.

Install the cylinder head cover (page 8-31).



ENGINE OIL/OIL FILTER

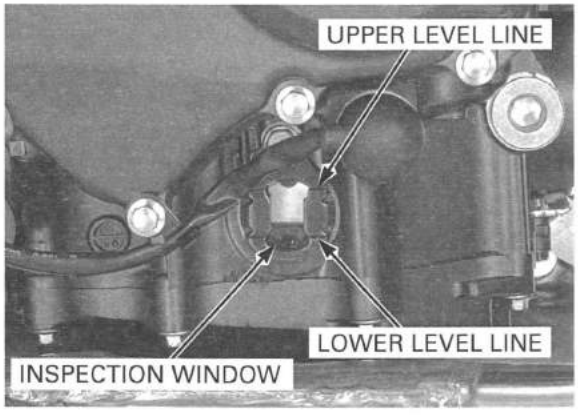
OIL LEVEL INSPECTION

Place the motorcycle on the level ground with its sidestand.

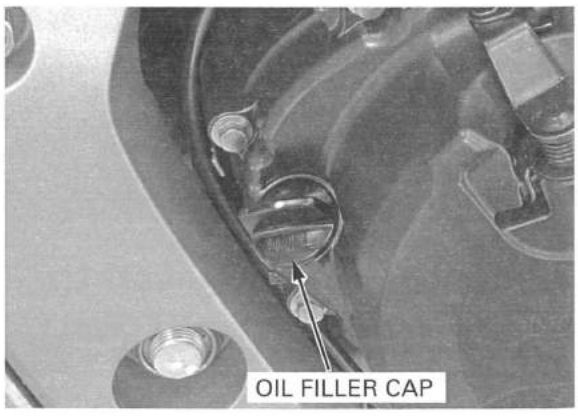
Start the engine and let it idle for 3 – 5 minutes.
Stop the engine and wait 2 – 3 minutes.
Hold the motorcycle in an upright position.

Check the oil level through the inspection window.

If the level is below the lower level line, fill the crankcase with the recommended oil up to the upper level line as following procedures.



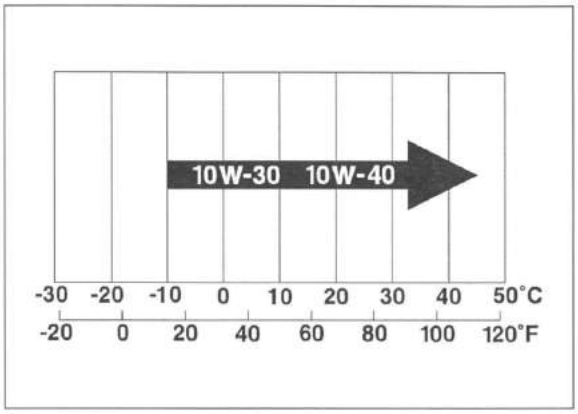
Remove the oil filler cap.



Fill the recommended engine oil up to the upper level line.

Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.

SUGGESTED OIL:
Honda "4-stroke motorcycle oil" or an equivalent
OIL RECOMMENDATION:
API classification: SG or higher (except oils labeled energy conserving on the circular API service label)
Viscosity: SAE 10W-30
JASO T 903 standard: MA



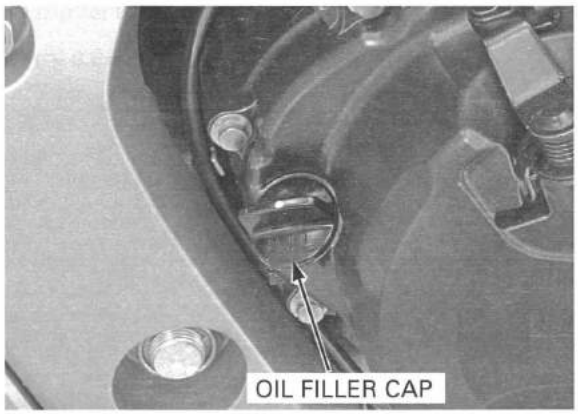
Reinstall the oil filler cap.

ENGINE OIL & FILTER CHANGE

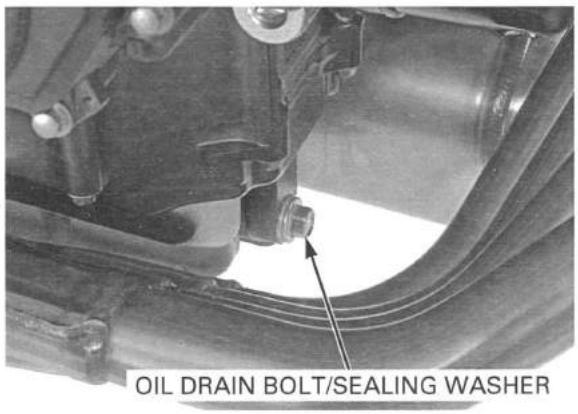
Change the oil with the engine warm and the motorcycle on level ground to assure complete draining

Start the engine and let it idle for 3 – 5 minutes.
Stop the engine and wait 2 – 3 minutes.

Stop the engine and remove the oil filler cap.

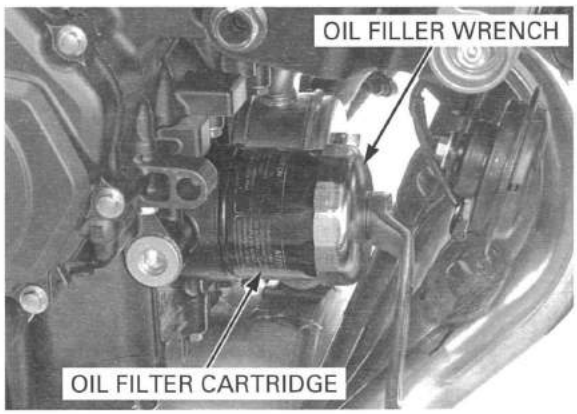


Remove the drain bolt and sealing washer, then drain the oil completely.



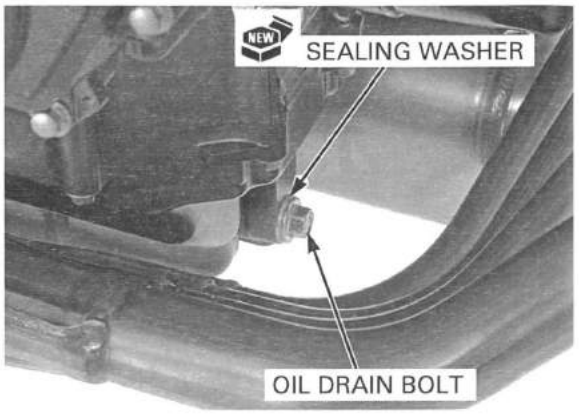
Remove and discard the oil filter cartridge using the special tool.

TOOL:
Oil filter wrench 07HAA-PJ70101



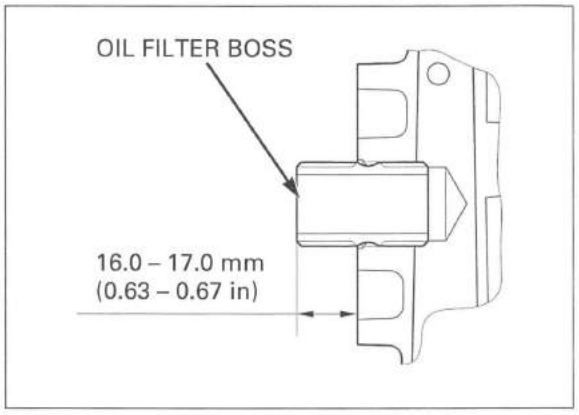
Replace the sealing washer with a new one.
Install and tighten the drain bolt to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

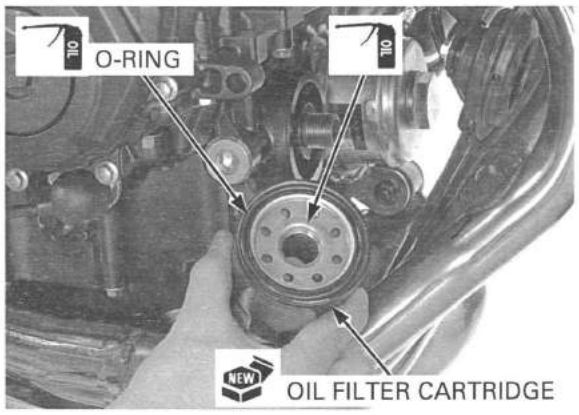


Check that the oil filter boss protrusion from the crankcase is specified length as shown.

SPECIFIED LENGTH: 16.0 – 17.0 mm (0.63 – 0.67 in)



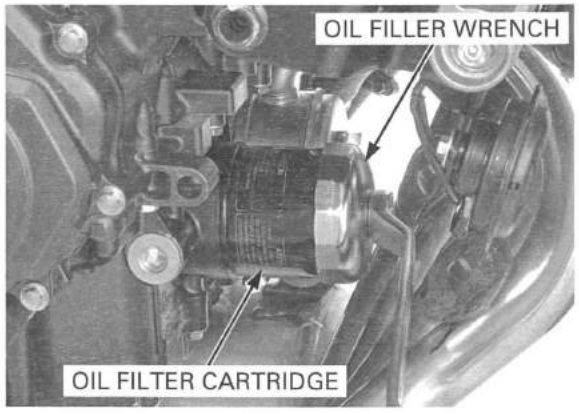
Apply clean engine oil to new oil filter cartridge threads and O-ring.



Install the new oil filter and tighten it to the specified torque.

TOOL:
Oil filter wrench **07HAA-PJ70101**

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)



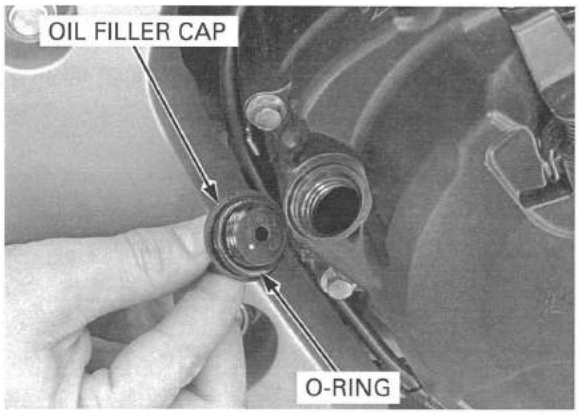
Fill the crankcase with recommended engine oil (page 3-15).

OIL CAPACITY:
2.7 liter (2.9 US qt, 2.4 Imp qt) after draining
2.8 liter (3.0 US qt, 2.5 Imp qt) after oil filter change

Check that the O-ring on the oil filler cap is in good condition, and replace it if necessary.
Install the oil filler cap.

Recheck the oil level (page 3-14).

Make sure there are no oil leaks.



RADIATOR COOLANT

Remove the seat (page 2-4).

Check the coolant level of the reserve tank with the engine running at normal operating temperature.

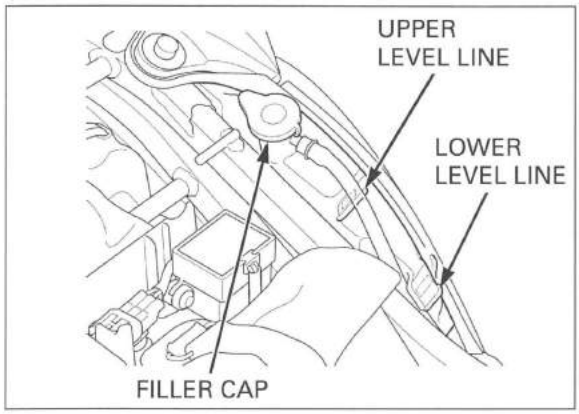
The level should be between the "UPPER" and "LOWER" level lines on a level surface.

If necessary, add recommended coolant.

RECOMMENDED ANTIFREEZE:
High quality ethylene glycol antifreeze containing corrosion protection inhibitors.

Remove the reserve tank filler cap and fill to the "UPPER" level line with 50/50 mixture of distilled water and antifreeze.

Reinstall the filler cap.
Install the seat (page 2-4).

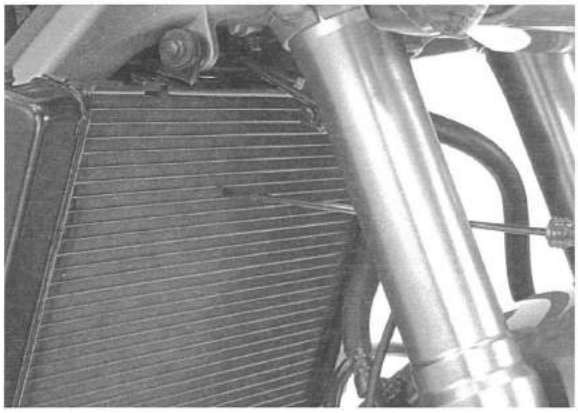


COOLING SYSTEM

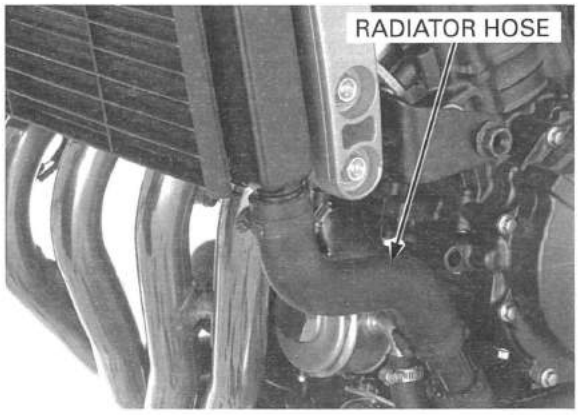
Check the radiator air passages for clogging or damage.

Remove the radiator grill.
Straighten bend fins with a small, flat blade screw driver and remove insects, mud or other obstructions with compressed air or low water pressure.

Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.

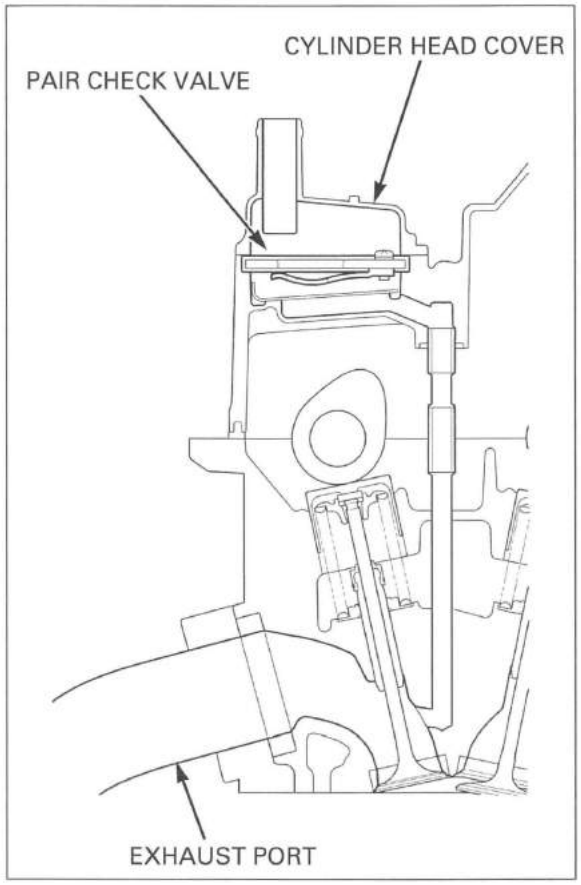


Inspect the radiator hoses for cracks or deterioration, and replace if necessary.
Check the tightness of all hose clamps and fasteners.



SECONDARY AIR SUPPLY SYSTEM

- This model is equipped built-in secondary air supply system. The PAIR system is located on the cylinder head cover.
- The PAIR system introduces filtered air into exhaust gases in the exhaust port. The secondary air is drawn into the exhaust port whenever there is negative pressure pulse in the exhaust system. This charged secondary air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water.

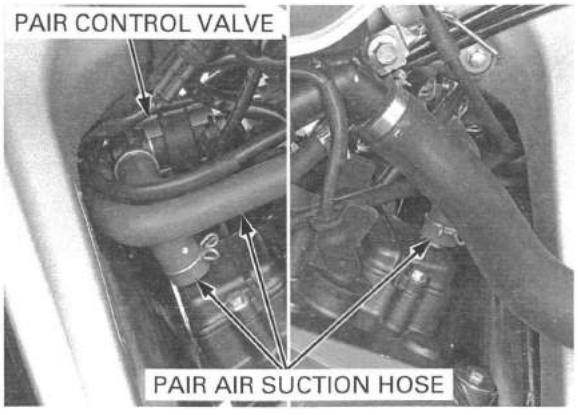


Lift and support the fuel tank (page 3-5).

If the hoses show any signs of heat damage, inspect the PAIR check valves for damage.

Check the PAIR air suction hoses between the PAIR control solenoid valve and cylinder head cover for deterioration, damage or loose connections. Make sure that the hoses are not cracked.

Check the PAIR air suction hose between the air cleaner housing and PAIR control solenoid valve for deterioration, damage or loose connections.
Make sure that the hoses are not kinked, pinched or cracked.



DRIVE CHAIN

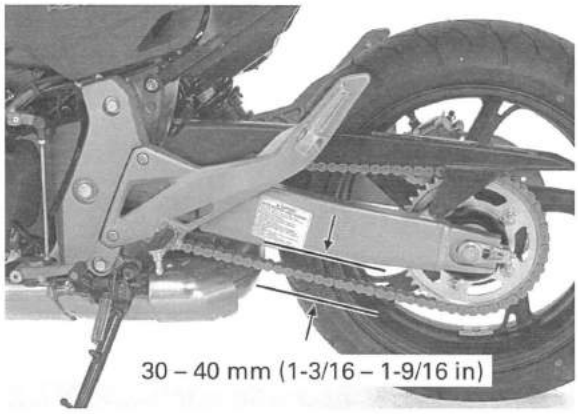
DRIVE CHAIN SLACK INSPECTION

Never inspect and adjust the drive chain while the engine is running.

Turn the ignition switch OFF, place the motorcycle on its sidestand and shift the transmission into neutral.

Check the slack in the drive chain lower run midway between the sprockets.

CHAIN SLACK: 30 – 40 mm (1-3/16 – 1-9/16 in)



NOTICE

Excessive chain slack, 50 mm (2.0 in) or more, may damage the frame.

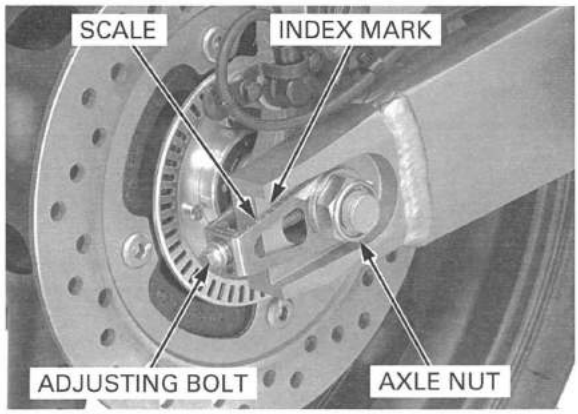
Lubricate the drive chain with #80 – 90 gear oil or chain lubricant designed specifically for use with O-ring chains. Wipe off the excess oil or chain lubricant.

ADJUSTMENT

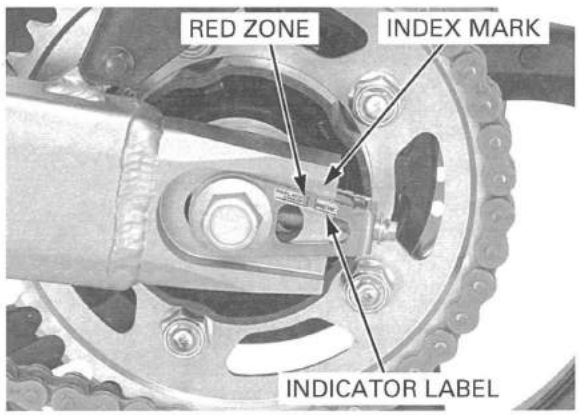
Loosen the rear axle nut.
Turn both adjusting bolts until the correct drive chain slack is obtained.
Make sure the scales on both adjusting plates are aligned with the index marks of the swingarm.

Tighten the rear axle nut to the specified torque.

TORQUE: 98 N·m (10.0 kgf·m, 72 lbf·ft)

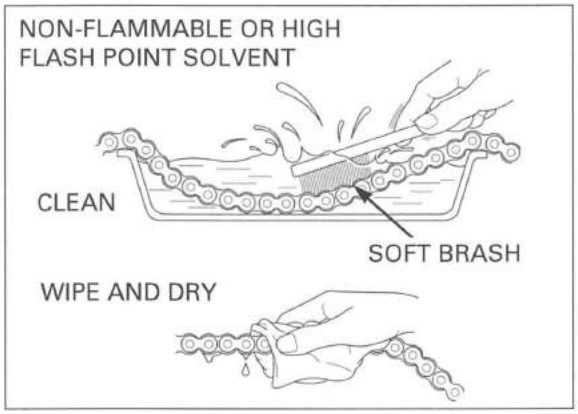


Recheck the drive chain slack and free wheel rotation.
Lubricate the drive chain with #80 – 90 gear oil or drive chain lubricant designed specifically for use with O-ring chains. Wipe off the excess oil or chain lubricant.
Check the drive chain wear indicator label attached on the left drive chain adjusting plate.
If the swingarm index mark reaches red zone of the indicator label, replace the drive chain with a new one (page 3-21).

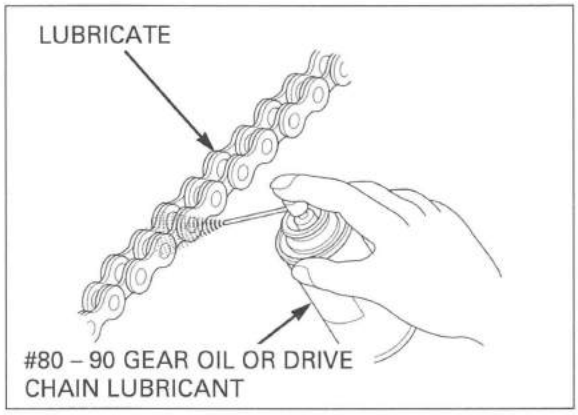


CLEANING AND LUBRICATION

Clean the chain with non-flammable or high flash point solvent and wipe it dry.
Be sure the chain has dried completely before lubricating.
Inspect the drive chain for possible damage or wear. Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable.
Installing a new chain on badly worn sprockets will cause the new chain to wear quickly.
Inspect and replace sprocket as necessary.

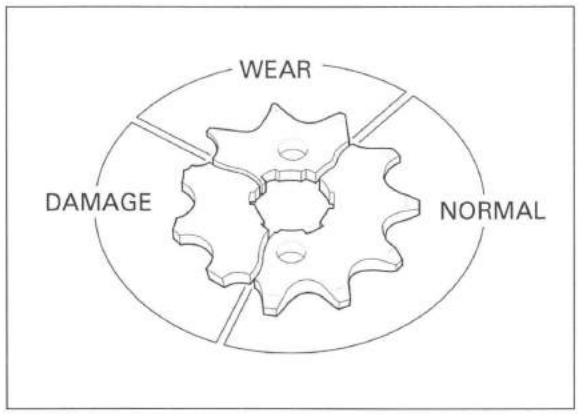


Lubricate the drive chain with #80 – 90 gear oil or drive chain lubricant designed specifically for use with O-ring chains. Wipe off the excess oil or chain lubricant.



SPROCKETS INSPECTION

Inspect the drive and driven sprocket teeth for wear or damage, replace if necessary.
Never use a new drive chain on worn sprockets.
Both chain and sprockets must be in good condition, or the new replacement chain will wear rapidly.

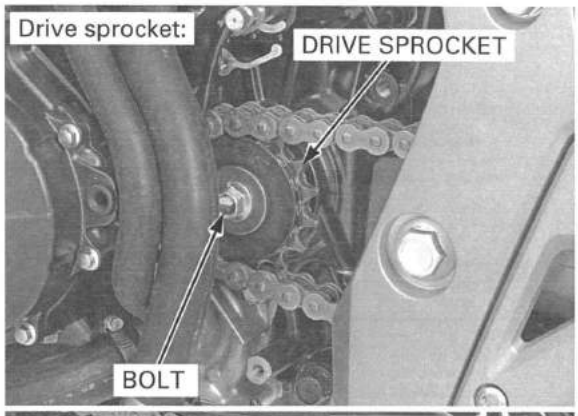


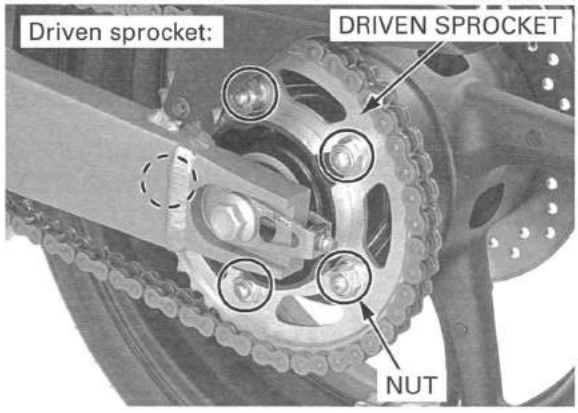
Remove the crankcase rear cover (page 7-4).

Check the attaching bolt and nuts on the drive and driven sprockets.

Tighten the bolt or nut to the specified torque if necessary.

TORQUE:
Drive sprocket bolt: 54 N·m (5.5 kg·m, 40 lbf·ft)
Driven sprocket nut: 108 N·m (11.0 kgf·m, 80 lbf·ft)





REPLACEMENT

This motorcycle uses a drive chain with a staked master link.

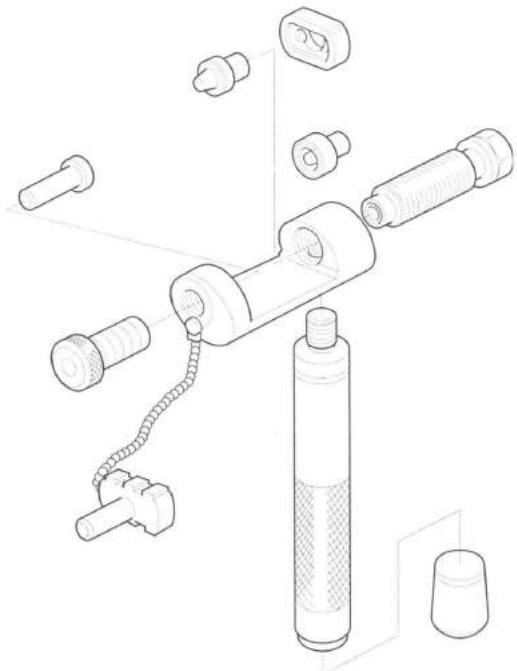
Loosen the drive chain (page 3-19).

When using the special tool, follow the manufacturer's instruction.

Assemble the special tool as shown.

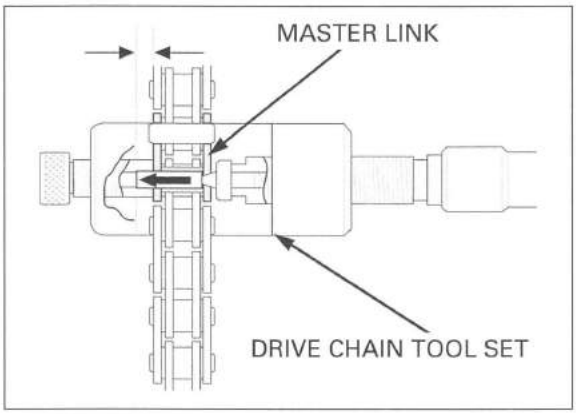
TOOL:
Drive chain tool set 07HMH-MR10103

DRIVE CHAIN TOOL SET:



Locate the crimped pin ends of the master link from the outside of the chain, and remove the link with the drive chain tool set.

Remove the drive chain.

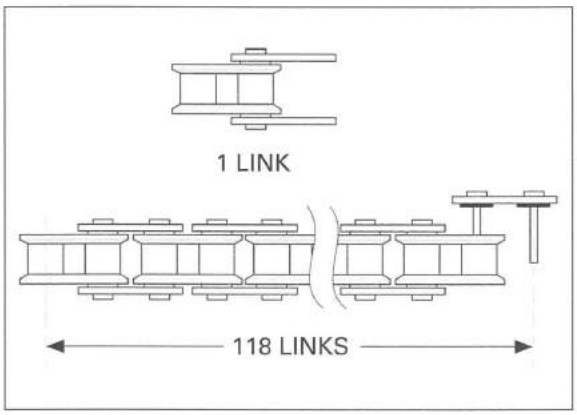


Include the master link when you count the drive chain links.

Remove the excess drive chain links from the new drive chain with the drive chain tool set.

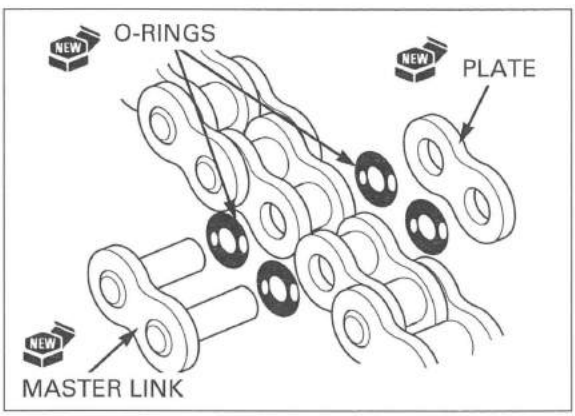
STANDARD LINKS: 118 LINKS

REPLACEMENT CHAIN
DID: DID525VM2-118LE

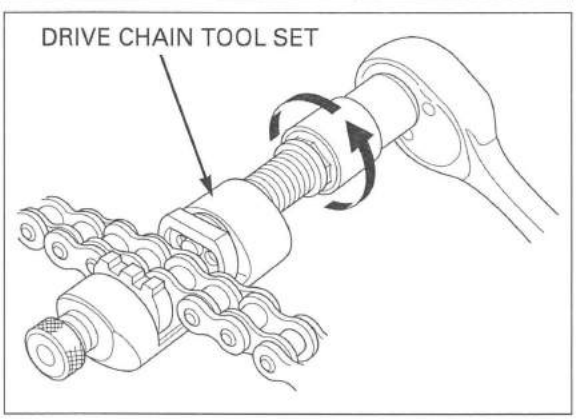


Never reuse the old drive chain, master link, master link plate and O-rings.

Insert a new master link with new O-rings from the inside of the drive chain, and install the new plate and O-rings with the identification mark facing the outside.



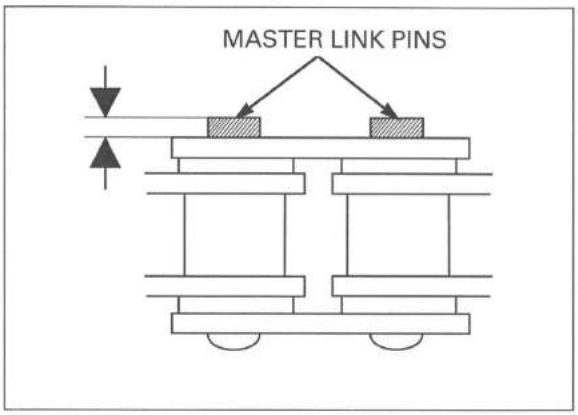
Assemble and set the drive chain tool set.



Make sure that the master link pins are installed properly.
Measure the master link pin length projected from the plate.

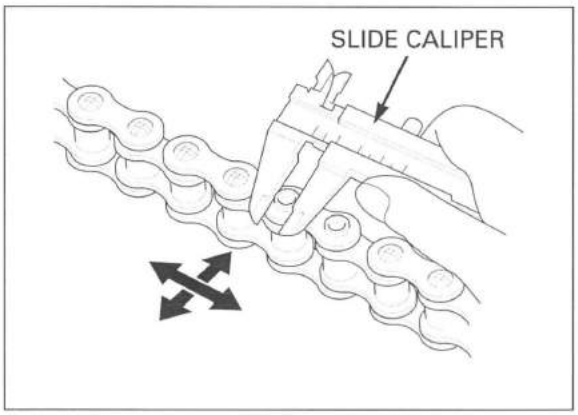
STANDARD LENGTH:
1.15 – 1.55 mm (0.045 – 0.061 in)

Stake the master link pins.



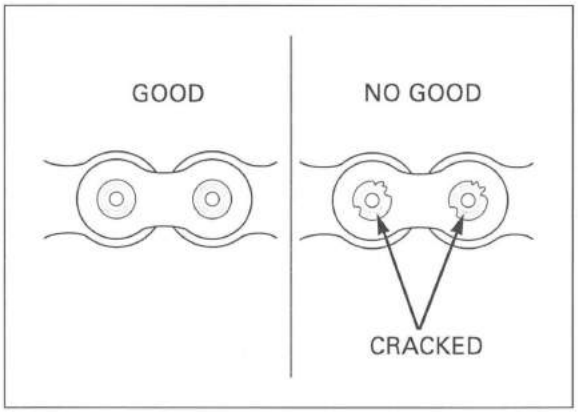
Make sure that the pins are staked properly by measuring the diameter of the staked area using a slide caliper.

DIAMETER OF THE STAKED AREA:
5.50 – 5.80 mm (0.217 – 0.228 in)



A drive chain with a clip-type master link must not be used.

After staking, check the staked area of the master link for cracks.
If there is any cracking, replace the master link, O-rings and plate.

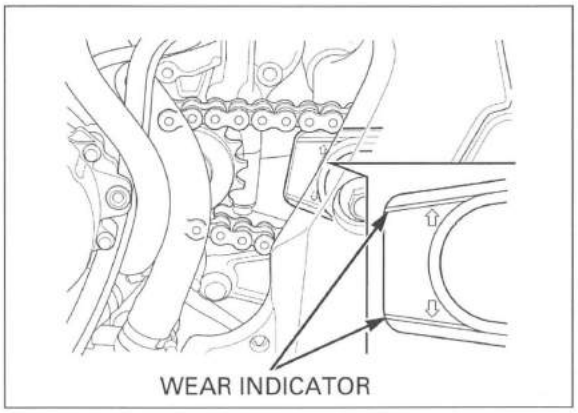


DRIVE CHAIN SLIDER

Remove the crankcase rear cover (page 7-4).

Inspect the drive chain slider for excessive wear or damage.

If it is worn to the wear indicator, replace the drive chain slider (page 14-19).



BRAKE FLUID

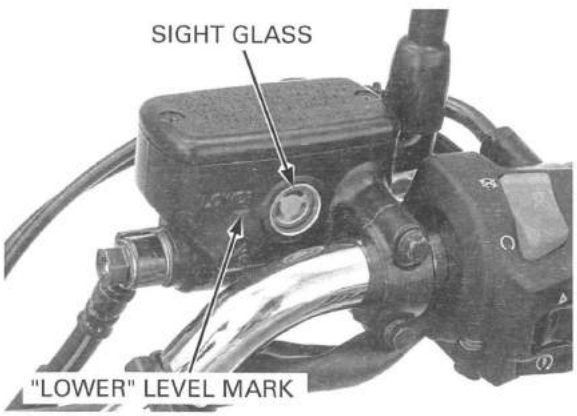
NOTICE

- *Do not mix different types of fluid, as they are not compatible with each other.*
- *Do not allow foreign material to enter the system when filling the reservoir.*
- *Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.*

When the fluid level is low, check the brake pads for wear (page 3-25).
A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper piston is pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 3-26).

FRONT BRAKE

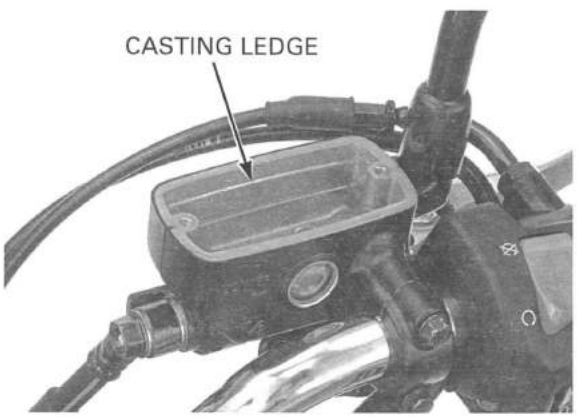
Turn the handlebar to the left so the reservoir is level and check the front brake reservoir fluid level through the sight glass.



If the fluid level is near the "LOWER" level mark, remove the reservoir cap, set plate and diaphragm, and fill the reservoir with DOT 4 brake fluid from a sealed container to the casting ledge.

Install the diaphragm, set plate and reservoir cap, and tighten the cap screws.

TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)



REAR BRAKE

Support the motorcycle upright on a level surface.

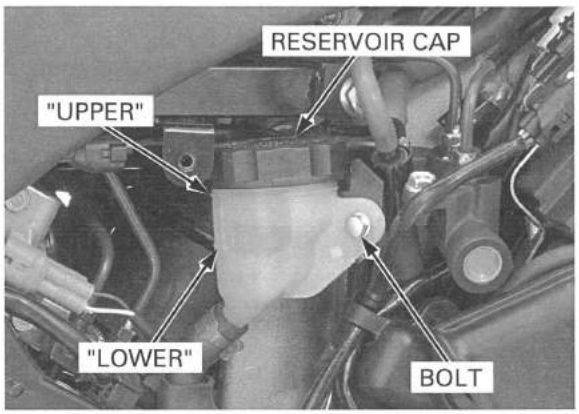
Remove the right side cover (page 2-4).

Check the fluid level in the rear brake fluid reservoir. If the level is near the "LOWER" level line, remove the mounting bolt and the reservoir cap, and fill the reservoir with DOT 4 brake fluid from a sealed container to the "UPPER" level line.
Install the reservoir cap with the diaphragm and set plate.

Install the reservoir onto the frame and tighten the mounting bolt.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the right side cover (page 2-4).



BRAKE PAD WEAR

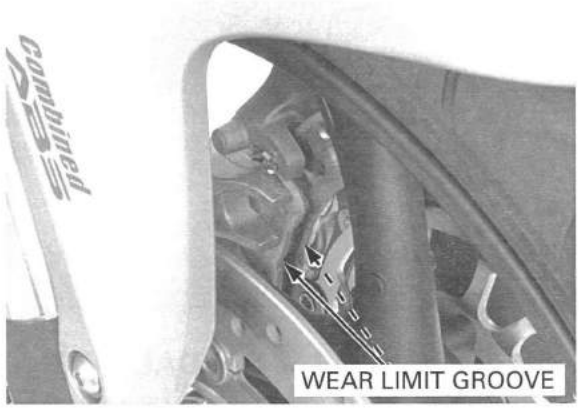
FRONT BRAKE PADS

Check the brake pad for wear.

Replace the brake pads if either pad is worn to the bottom of wear limit groove.

Refer to brake pad replacement:

- CB600FA (page 15-15)
- CB600F (page 15-16)



REAR BRAKE PADS

Check the brake pad for wear.

Replace the brake pads if either pad is worn to the bottom of wear limit groove.

Refer to brake pad replacement:

- CB600FA (page 15-17)
- CB600F (page 15-19)

BRAKE SYSTEM

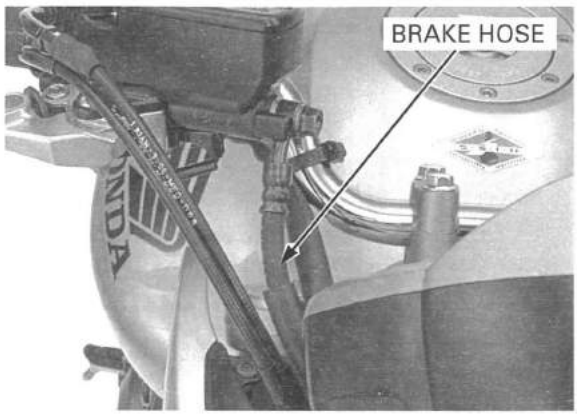
INSPECTION

Firmly apply the brake lever or pedal, and check that no air has entered the system.
If the lever or pedal feels soft or spongy when operated, bleed the air from the system.

Inspect the brake hose and fittings for deterioration, cracks and signs of leakage.
Tighten any loose fittings.
Replace hoses and fittings as required.

Refer the procedure for brake bleeding:

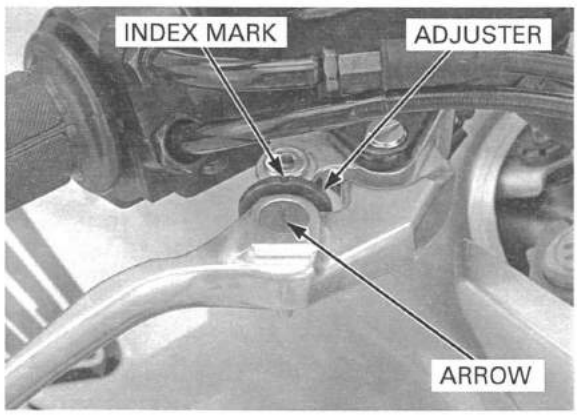
- CB600FA (page 15-7)
- CB600F (page 15-13)



BRAKE LEVER ADJUSTMENT

Align the index mark on the adjuster with the arrow on the brake lever.

The distance between the top of the brake lever and the grip can be adjusted by turning the adjuster.

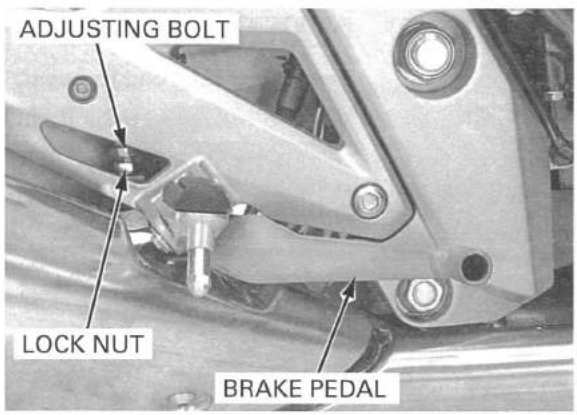


BRAKE PEDAL HEIGHT ADJUSTMENT

Loosen the lock nut and turn the master cylinder push rod to obtain the desired pedal height.

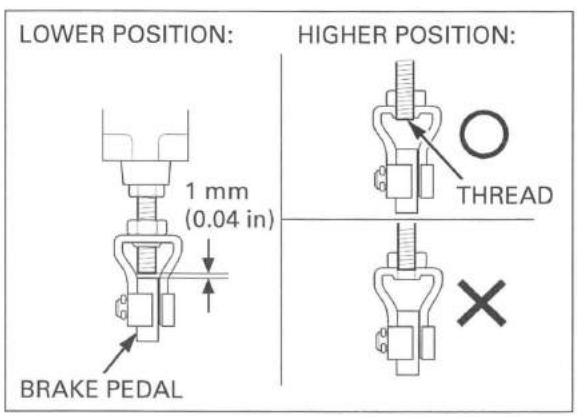
After adjustment, hold the adjusting bolt and tighten the lock nut.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)



If the brake pedal is adjusted to the lower position, make sure that the clearance between the lower end of the push rod and the brake pedal does not fall below 1 mm (0.04 in).

If the brake pedal is adjusted to the higher position, make sure that the lower end of the push rod thread is visible inside the joint.



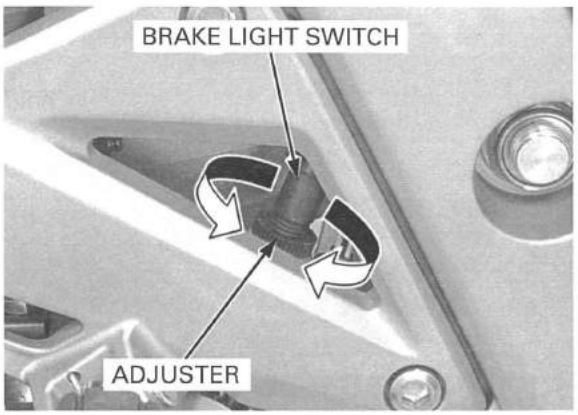
BRAKE LIGHT SWITCH

The front brake light switch does not require adjustment.

Adjust the brake light switch so that the brake light comes on just prior to the brake actually being engaged.

If the light fails to come on, adjust the switch so that the light comes on at the proper time.

Hold the switch body and turn the adjuster. Do not turn the switch body.



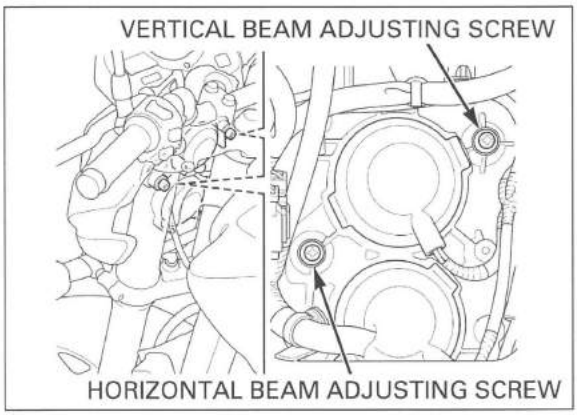
HEADLIGHT AIM

Adjust the headlight aim as specified by local laws and regulations.

Place the motorcycle on a level surface.

Adjust the headlight aim vertically by turning the vertical beam adjusting screw.
A clockwise rotation moves the beam up and counterclockwise rotation moves the beam down.

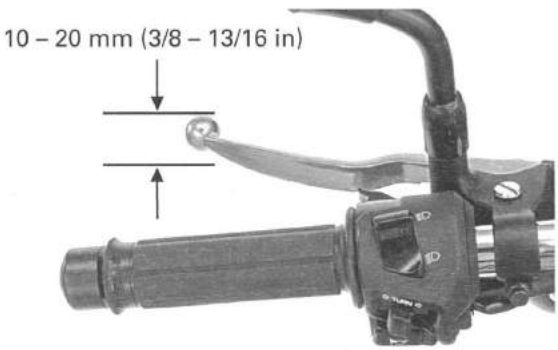
Adjust the headlight aim horizontally by turning the horizontal beam adjusting screw.
A clockwise rotation moves the beam toward the right and counterclockwise rotation moves the beam toward the left.



CLUTCH SYSTEM

Measure the clutch lever freeplay at the end of the clutch lever.

FREEPLAY: 10 – 20 mm (3/8 – 13/16 in)



Minor adjustment is made using the upper adjuster at the clutch lever.

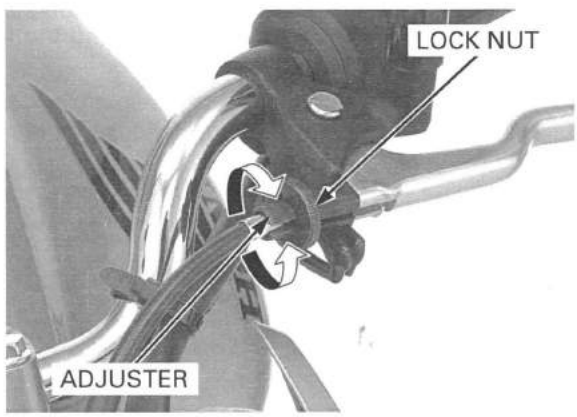
Loosen the lock nut and turn the adjuster.

NOTICE

The adjuster may be damaged if it is positioned too far out, leaving minimal thread engagement.

If the adjuster is threaded out near its limit and the correct freeplay cannot be obtained, turn the adjuster all the way in and back out one turn.

Tighten the lock nut while holding the adjuster and make a major adjustment as described as follow.

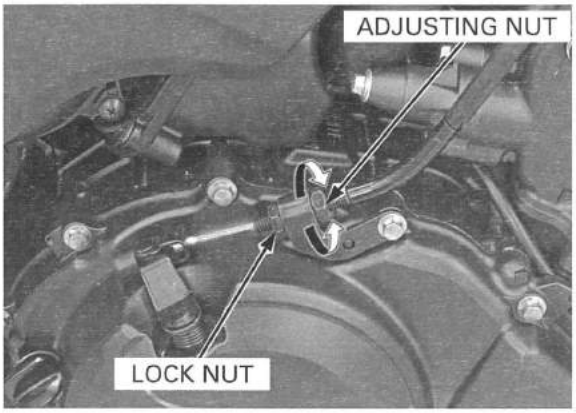


Major adjustment is performed at the clutch lifter lever.

Loosen the lock nut and turn the adjusting nut to adjust the freeplay.

Tighten the lock nut while holding the adjusting nut.

If proper freeplay cannot be obtained, or the clutch slips during test ride, disassemble and inspect the clutch (page 9-6).

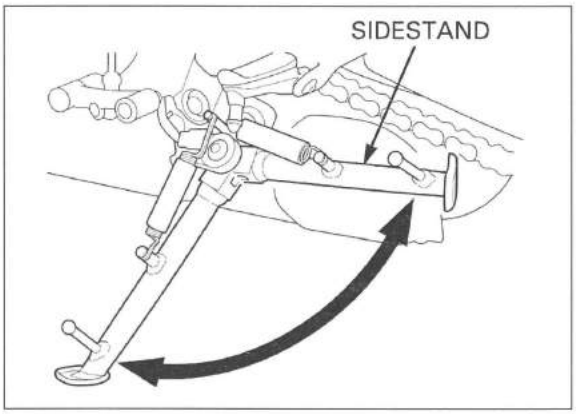


SIDESTAND

Support the motorcycle on a level surface.

Check the sidestand spring for damage or loss of tension.

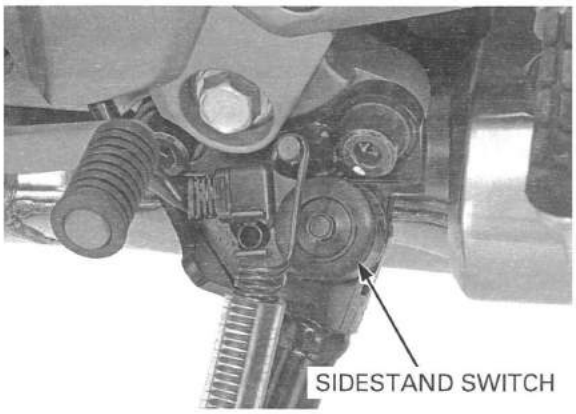
Check the sidestand for smooth movement and lubricate the sidestand pivot if necessary.



Check the sidestand ignition cut-off system:

- Sit astride the motorcycle and raise the sidestand.
- Start the engine with the transmission in neutral, then shift the transmission into gear, with the clutch lever squeezed.
- Move the sidestand full down.
- The engine should stop as the sidestand is lowered.

If there is a problem with the system, check the sidestand switch (page 20-23).



SUSPENSION

FRONT SUSPENSION INSPECTION

Check the action of the forks by operating the front brakes and compressing the front suspension several times.

Check the front suspension assembly for signs of leaks, damage or loose fasteners.

Loose, worn or damaged suspension parts impair motorcycles stability and control.

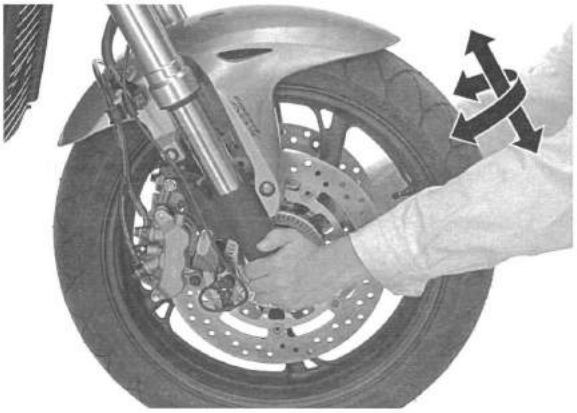
Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

Refer to the fork service (page 13-21).

Check for worn steering stem bearings by grabbing the front fork leg and attempting to move the front fork side to side.

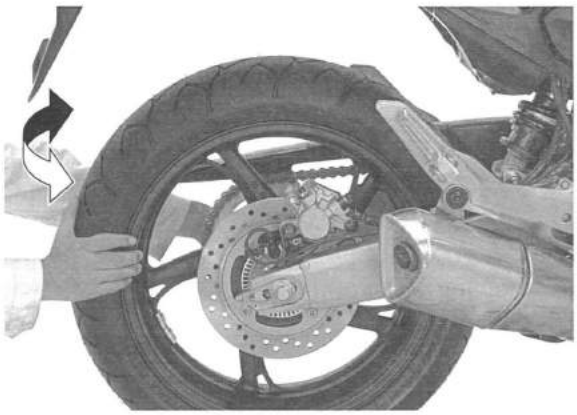
Replace the steering head bearings if any looseness is noted (page 13-31).



REAR SUSPENSION INSPECTION

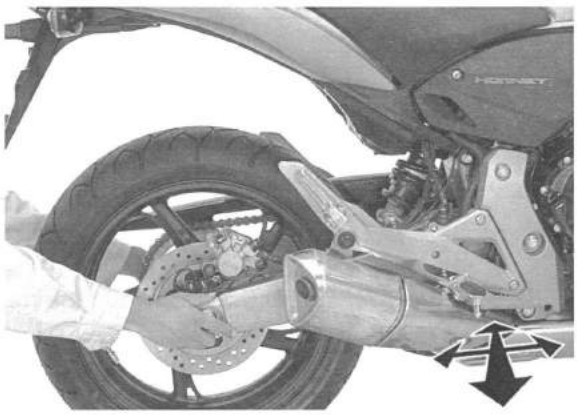
Support the motorcycle using a hoist or equivalent tool and raise the rear wheel off the ground.

Hold the swingarm and move the rear wheel sideways with force to see if the wheel bearings are worn.



Check for worn swingarm bearings by grabbing the rear swingarm and attempting to move the swingarm side to side.

Replace the bearings if any are looseness is noted (page 14-18).



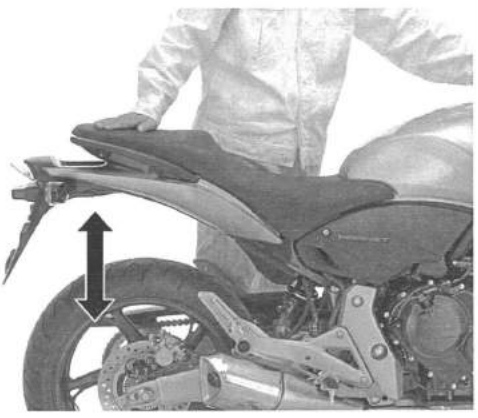
Check the action of the shock absorber by compressing it several times.

Check the entire shock absorber assembly for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

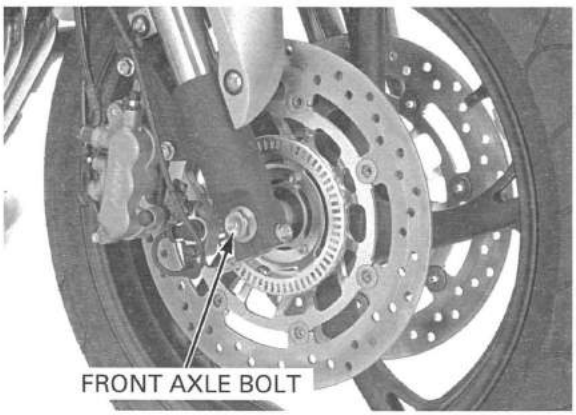
Refer to the shock absorber service (page 14-14).



NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their specified torque values (page 1-13).

Check that all hose clamps and cable stays are in place and properly secured.

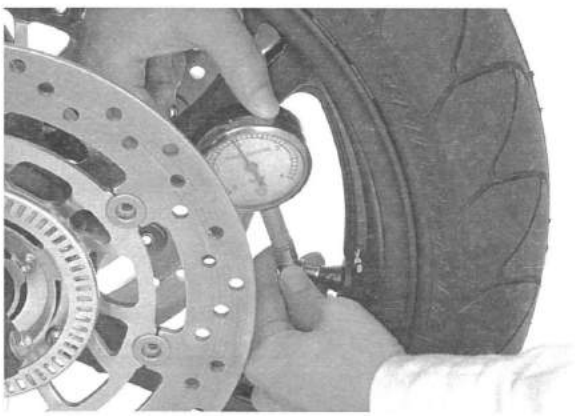


WHEELS/TIRES

Tire pressure should be checked when the tires are COLD.

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

	FRONT	REAR
Tire pressure	250 kPa (2.50 kgf/cm^2, 36 psi)	290 kPa (2.90 kgf/cm^2, 42 psi)
Tire size	120/70ZR17M/C (58W)	180/55ZR17M/C (73W)
Tire bland: Bridgestone	BT012F RADIAL J	BT012R RADIAL J
Tire bland: Michelin	Pilot POWER E	Pilot POWER E



Check the tires for cuts, embedded nails, or other damage.

Check the wheel for trueness:

- front wheel (page 13-14)
- rear wheel (page 14-7)

Measure the tread depth at the center of the tires. Replace the tires when the tread depth reaches the following limits.

MINIMUM TREAD DEPTH:
FRONT: 1.5 mm (0.06 in)
REAR: 2.0 mm (0.08 in)

STEERING HEAD BEARINGS

Check that the control cables do not interfere with handlebar rotation.

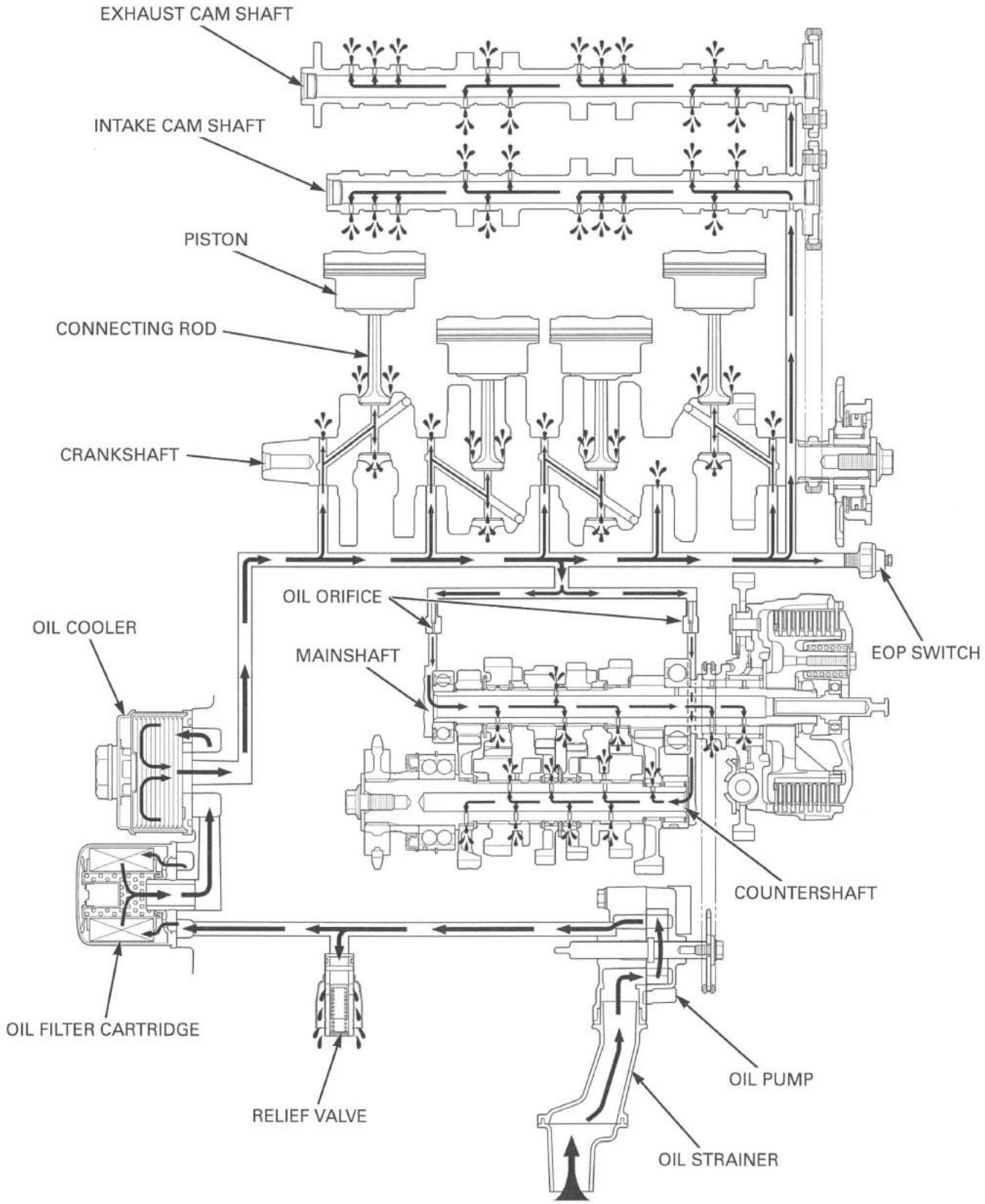
Support the motorcycle using a safety stand or hoist securely and raise the front wheel off the ground.

Check that the handlebar moves freely from side to side and there is any abnormal play at the steering head bearings.

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 13-31).

4. LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

⚠ CAUTION

Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

- The oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks and that oil pressure is correct.

SPECIFICATIONS

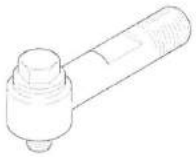
Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	2.7 liter (2.9 US qt, 2.4 Imp qt)	–
	After oil filter change	2.8 liter (3.0 US qt, 2.5 Imp qt)	–
	After disassembly	3.5 liter (3.7 US qt, 3.1 Imp qt)	–
Engine oil		Suggested oil: Honda "4-stroke motorcycle oil" or an equivalent Oil recommendation: API classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 standard: MA	–
Oil pressure at EOP switch		496 kPa (5.1 kgf/cm^2, 72 psi) at 6,000 min^{-1} (rpm)/(80°C/176°F)	–
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.35 (0.014)
	Side clearance	0.04 – 0.09 (0.002 – 0.004)	0.17 (0.007)

TORQUE VALUES

Engine oil drain bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	
Engine oil filter cartridge	26 N·m (2.7 kgf·m, 19 lbf·ft)	Apply engine oil to the threads and O-ring.
Oil filter boss	See page 3-15	Apply locking agent to the threads.
Oil pump driven sprocket bolt	15 N·m (1.5 kgf·m, 11 lbf·ft)	Apply a locking agent to the threads.
Oil pump assembly bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	CT bolt
Oil cooler bolt	59 N·m (6.0 kgf·m, 44 lbf·ft)	Apply engine oil to the threads.
EOP switch	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply sealant to the threads.
EOP switch wire terminal bolt	2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)	
Oil pipe A mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.

TOOLS

Oil pressure gauge 07506-3000001  or equivalent commercially available	Oil pressure gauge attachment 07510-4220100  or equivalent commercially available

TROUBLE SHOOTING

Oil level too low
- Oil consumption
- External oil leak
- Worn piston rings
- Improperly installed piston rings
- Worn cylinders
- Worn stem seals
- Worn valve guide

Low oil pressure
- Oil level low
- Clogged oil strainer
- Internal oil leak
- Incorrect oil being used

No oil pressure
- Oil level too low
- Oil pressure relief valve stuck open
- Broken oil pump drive chain
- Broken oil pump drive or driven sprocket
- Damaged oil pump
- Internal oil leak

High oil pressure
- Oil pressure relief valve stuck closed
- Clogged oil filter, gallery or metering orifice
- Incorrect oil being used

Oil contamination
- Oil or filter not changed often enough
- Worn piston rings

Oil emulsification
- Blown cylinder head gasket
- Leaky coolant passage
- Entry of water

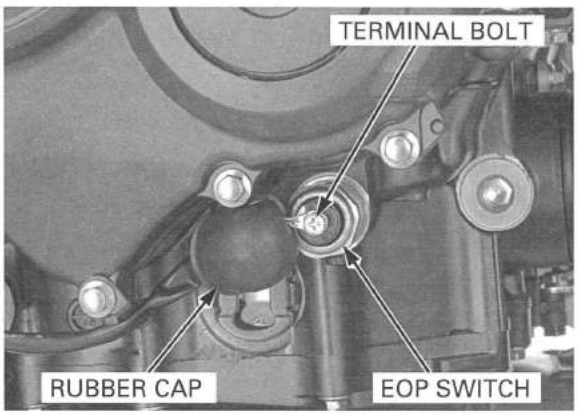
OIL PRESSURE INSPECTION

If the oil pressure indicator light remains on while the engine is running, check the indicator system before checking the oil pressure.

Remove the rubber cap from the EOP switch.

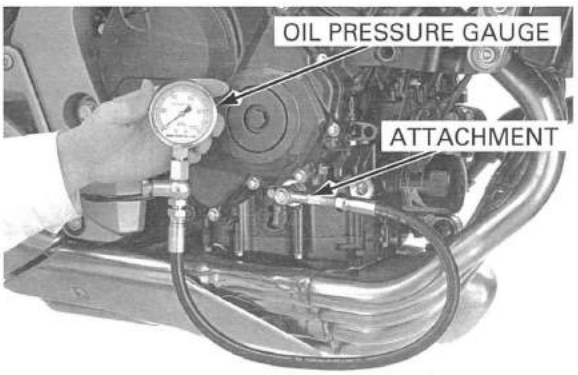
Remove the terminal bolt and disconnect the EOP switch wire.

Remove the EOP switch while holding the switch base.



Install the oil pressure gauge attachment to the switch base.

Connect the oil pressure gauge to the oil pressure gauge attachment.



TOOLS:

Oil pressure gauge set	**07506-3000001 or equivalent commercially available**
Oil pressure gauge attachment	**07510-4220100 or equivalent commercially available**

Check the oil level and add the recommended oil if necessary (page 3-15).

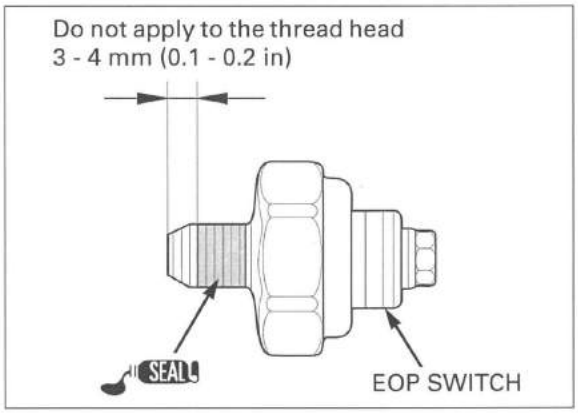
Warm the engine to normal operating temperature (approximately 80°C/176°F) and increase the engine speed to 6,000 min^{-1} (rpm) and read the oil pressure.

OIL PRESSURE:

496 kPa (5.1 kgf/cm^2, 72 psi) at 6,000 min^{-1} (rpm)/ (80°C/176°F)

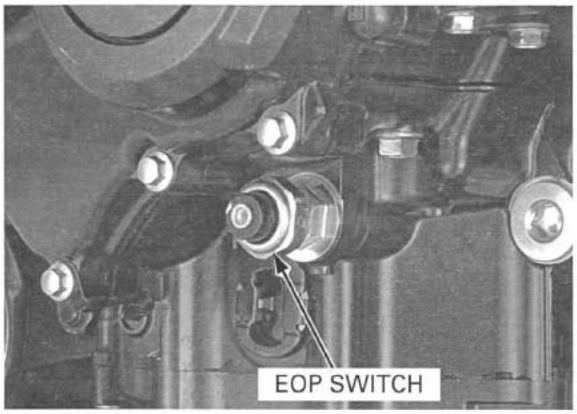
Stop the engine and remove the tools.

Apply a sealant to the EOP switch threads as shown.



Install and tighten the EOP switch to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

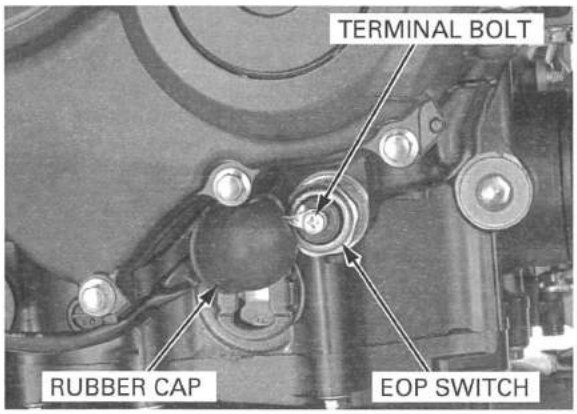


Connect the EOP switch wire and tighten the terminal bolt to the specified torque.

TORQUE: 2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

Instal the rubber cap securely.

Start the engine.
Check that the oil pressure indicator goes off after one or two seconds. If the oil pressure indicator stays on, stop the engine immediately and determine the cause (page 20-16).



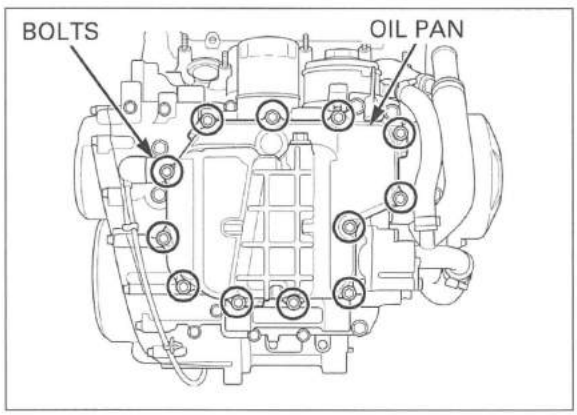
OIL STRAINER/PRESSURE RELIEF VALVE

REMOVAL

Drain the engine oil (page 3-15).
Remove the exhaust pipe (page 2-13).

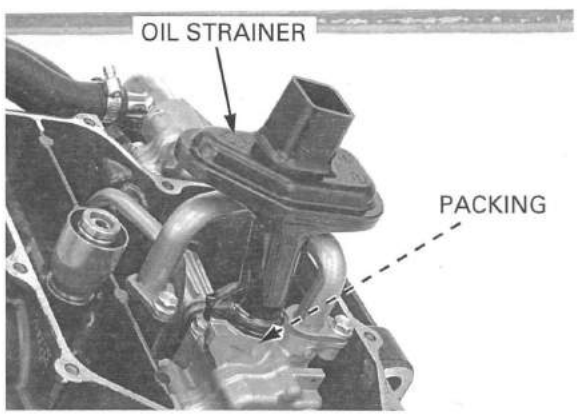
Loosen the bolts in a crisscross pattern in two or three steps.

Remove the flange bolts and the oil pan.

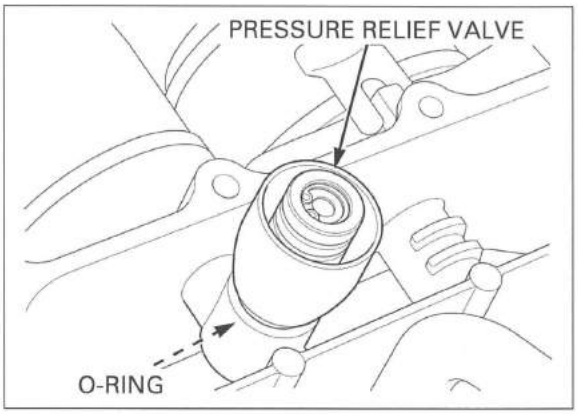


Remove the oil strainer and packing.

Clean the oil strainer screen.



Remove the pressure relief valve and O-ring.

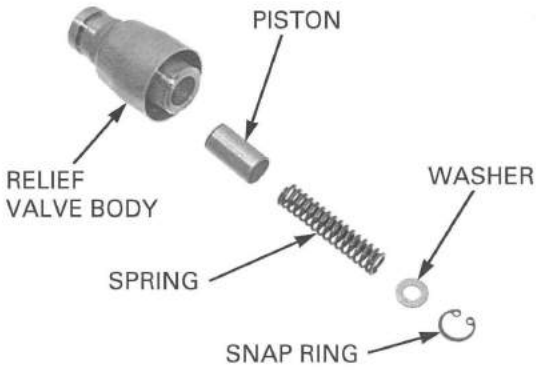


INSPECTION

Check the operation of the pressure relief valve by pushing on the piston.
Disassemble the pressure relief valve by removing the snap ring.

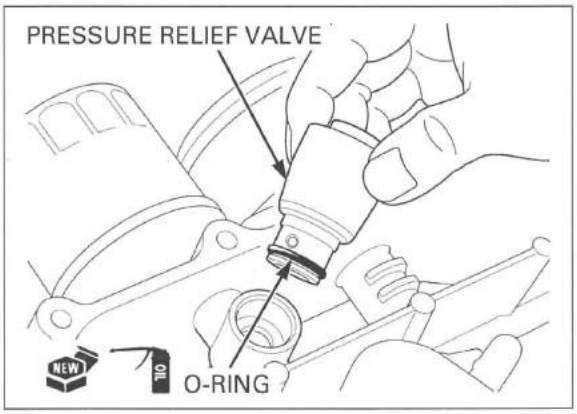
Inspect the piston for wear, unsmooth movement or damage.
Inspect the spring for fatigue or damage.

Assemble the pressure relief valve in the reverse order of disassembly.

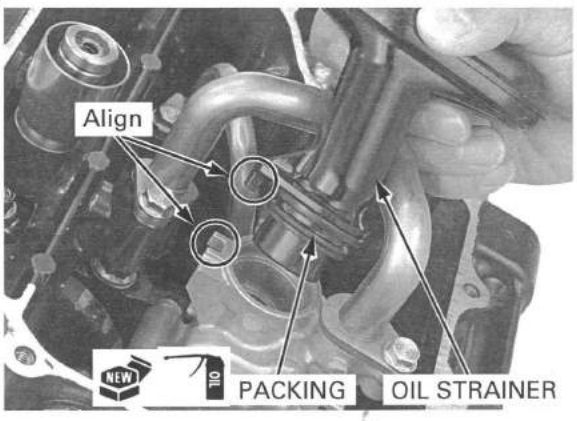


INSTALLATION

Apply engine oil to a new O-ring and install it onto the pressure relief valve.
Install the pressure relief valve to the crankcase.



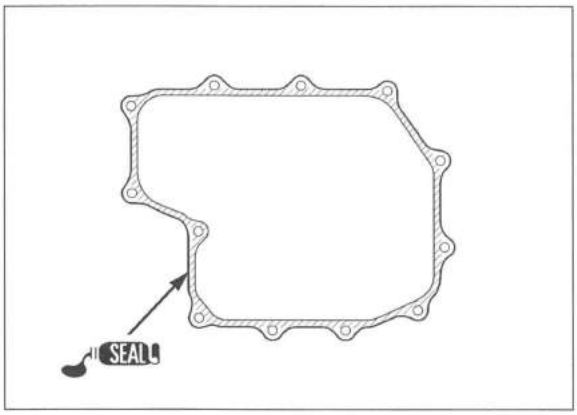
Apply engine oil to a new packing and install it onto the oil strainer flange.
Install the oil strainer to the oil pump while aligning the oil strainer boss with the groove of the oil pump.



Clean the oil pan mating surface thoroughly.

Do not apply more sealant than necessary.

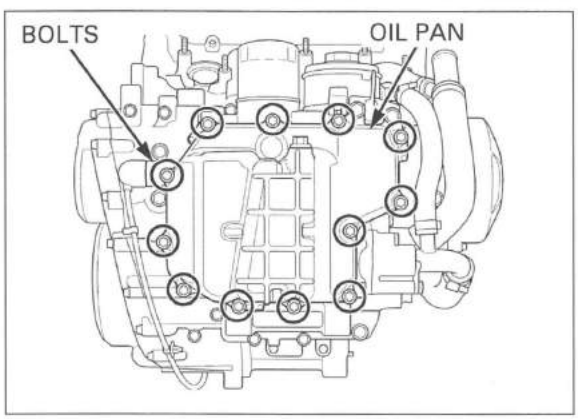
Apply sealant (Three Bond 1207B or an equivalent) to the mating surface.



Install the oil pan onto the lower crankcase.
Install the flange bolts.
Tighten the bolts in a crisscross pattern in two or three steps.

Install the exhaust pipe (page 2-15).
Fill the crankcase with the recommended oil (page 3-15).

After installation, check that there are no oil leaks.



OIL PUMP

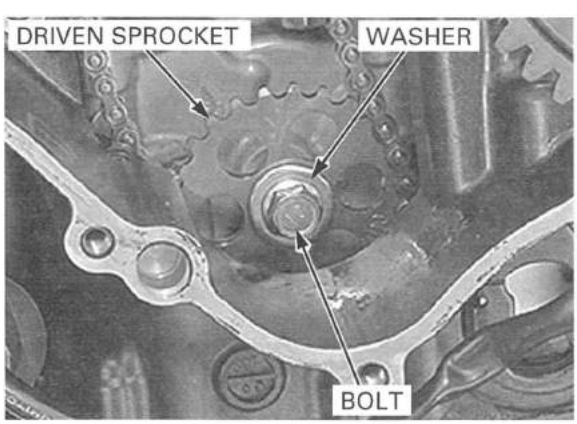
REMOVAL

Drain the engine oil (page 3-15).

Remove the following:

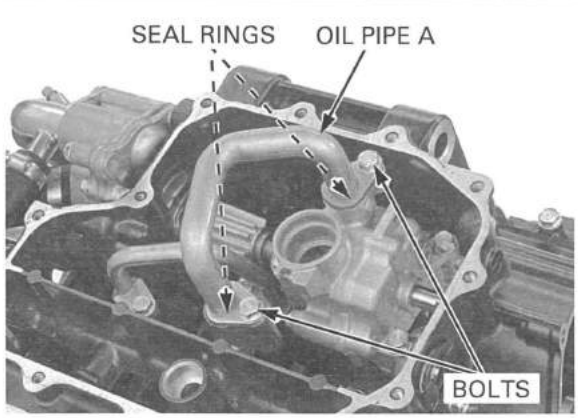
- right crankcase cover (page 9-5)
- oil pan/oil strainer (page 4-6)

Remove the bolt, washer and oil pump driven sprocket.

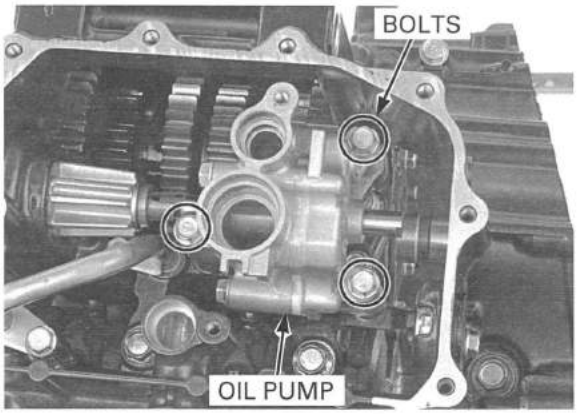


Remove the bolts, oil pipe A and seal rings.

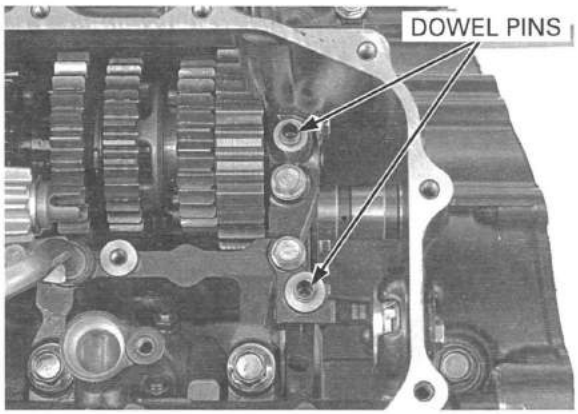
Clean the oil pipe A thoroughly.



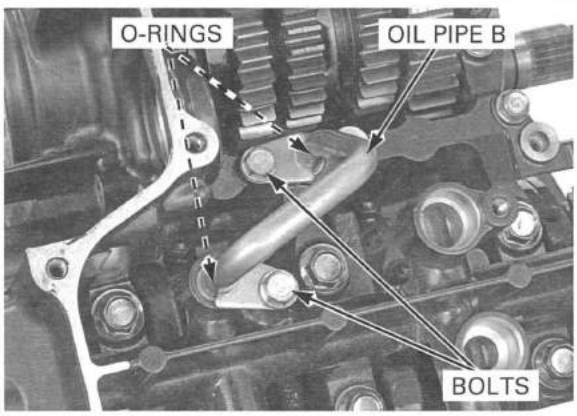
Remove the bolts and oil pump assembly.



Remove the dowel pins.

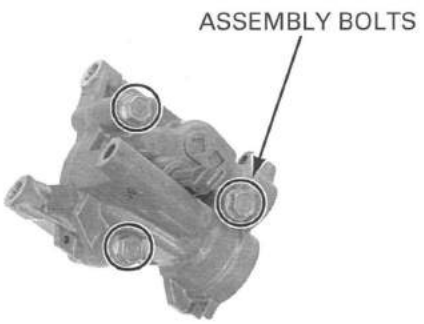


Remove the bolts, oil pipe B and O-rings.
Clean the oil pipe B thoroughly.

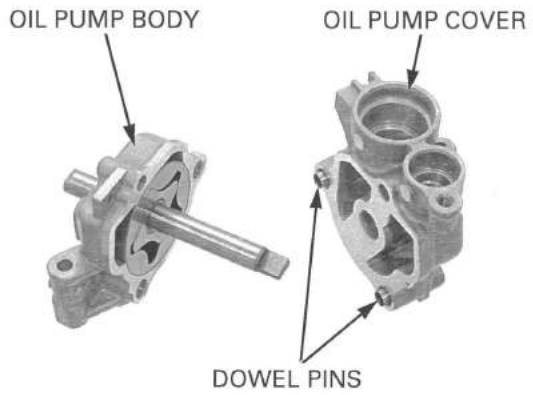


DISASSEMBLY

Remove the oil pump assembly bolts.

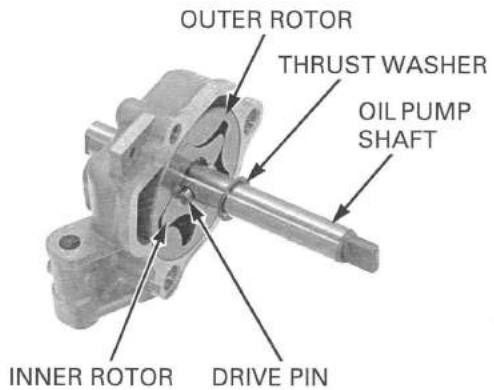


Remove the oil pump cover and dowel pins.



Remove the thrust washer, drive pin, oil pump shaft, outer rotor and inner rotor from the oil pump body.

Clean all disassembly parts thoroughly.



INSPECTION

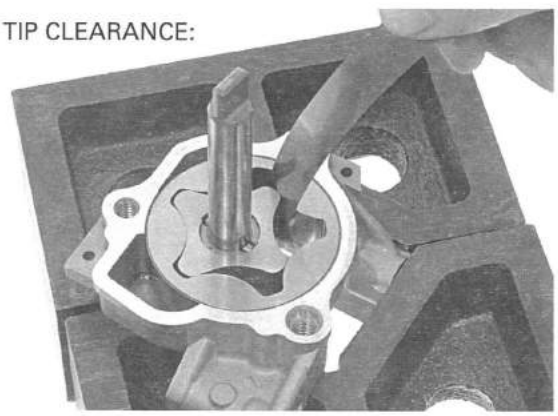
If any portion of the oil pump is worn beyond the service limit, replace the oil pump as an assembly.

Temporarily install the outer and inner rotors into the oil pump body.
Temporarily install the drive pin and oil pump shaft.

Measure the rotor tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)

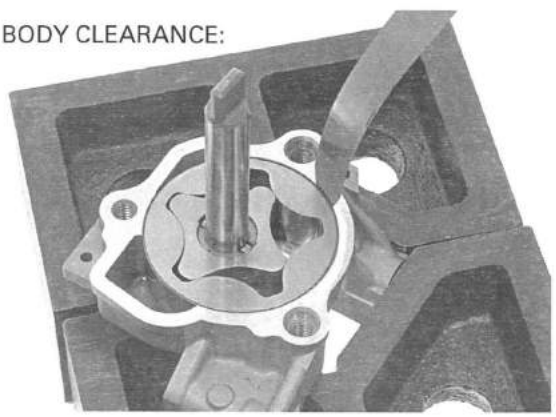
TIP CLEARANCE:



Measure the pump body clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)

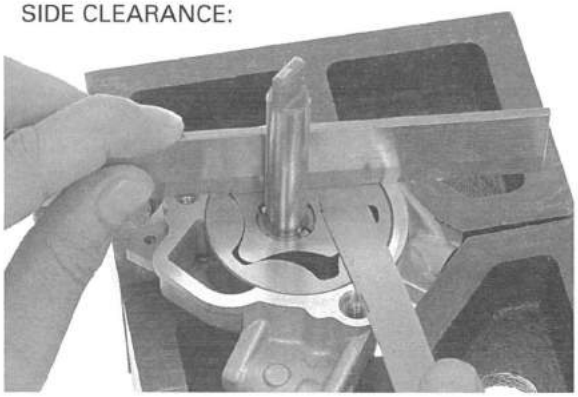
BODY CLEARANCE:



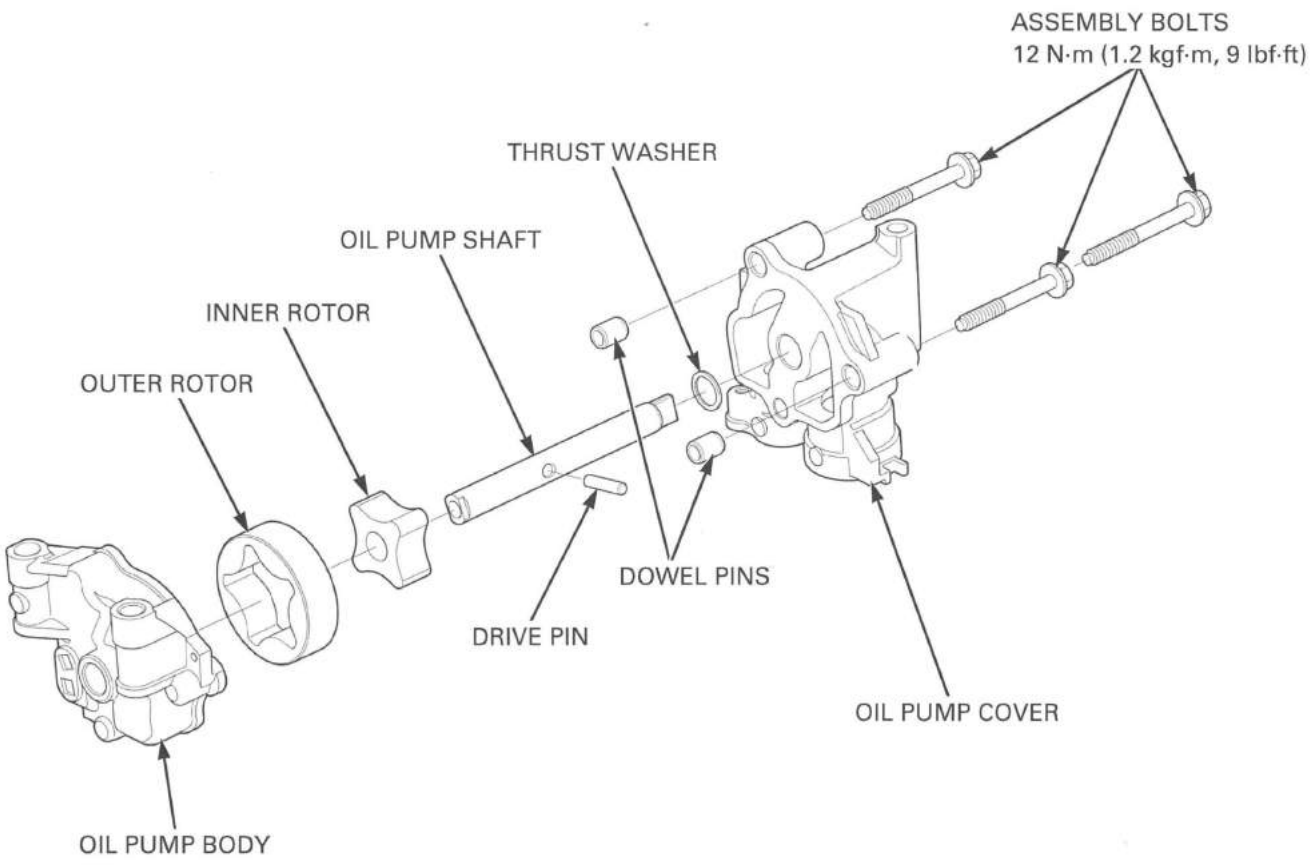
Measure the side clearance using a straight edge and feeler gauge.

SERVICE LIMIT: 0.17 mm (0.007 in)

SIDE CLEARANCE:



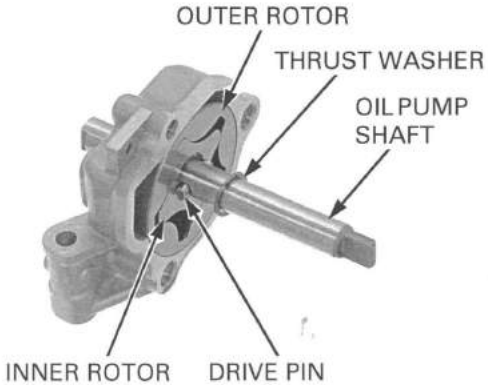
ASSEMBLY



Dip all parts in clean engine oil.
Install the outer rotor into the oil pump body.
Install the inner rotor into the outer rotor with its drive pin groove facing the oil pump cover.

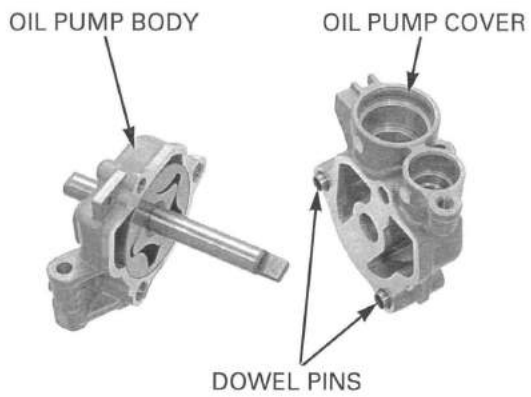
Install the oil pump shaft through the inner rotor and oil pump body.
Install the drive pin into the hole in the oil pump shaft and align the drive pin with the groove in the inner rotor.

Install the thrust washer.



Install the dowel pins into the oil pump cover.

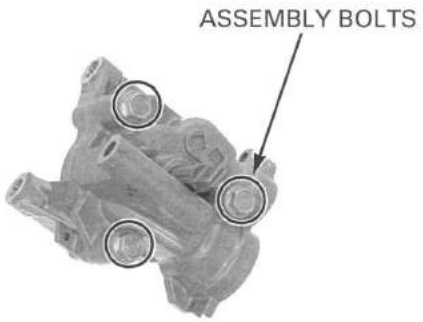
Install the oil pump cover to the oil pump body.



Install and tighten the oil pump assembly bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Check the oil pump operation by turning the pump shaft.
If necessary, reassemble the oil pump.

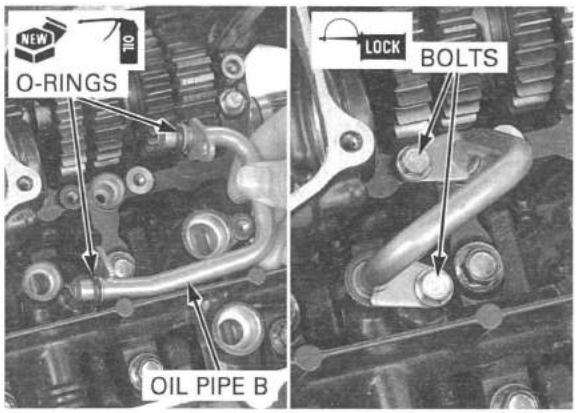


INSTALLATION

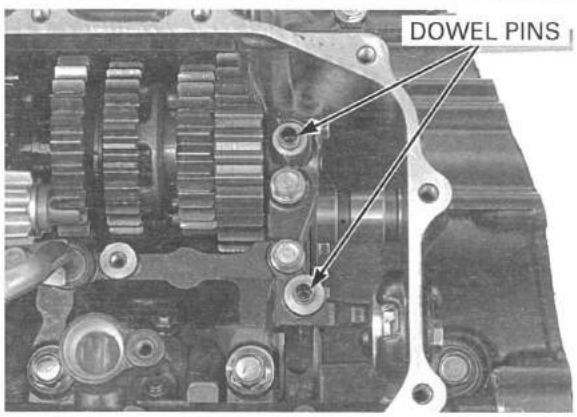
Apply engine oil to new O-rings and install them onto the oil pipe B.

Apply a locking agent to the oil pipe B mounting bolt threads.

Install the oil pipe B and tighten the bolts securely.

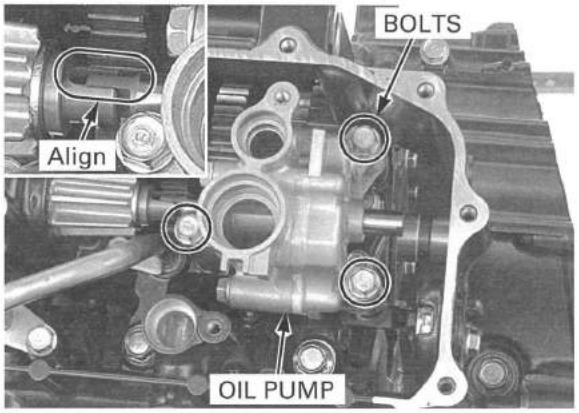


Install the dowel pins to the crankcase.



Install the oil pump assembly onto the crankcase while aligning the oil pump shaft lug with the water pump shaft groove by turning the oil pump shaft.

Tighten the bolts securely.



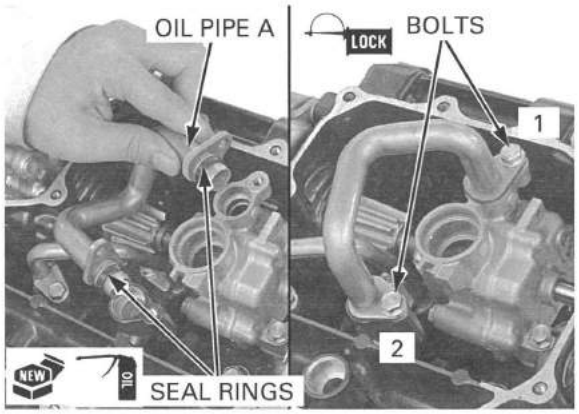
Apply engine oil to new seal rings and install them onto the oil pipe A.

Apply a locking agent to the oil pipe A mounting bolt threads.

Install the oil pipe A and tighten the bolts in the order as shown.

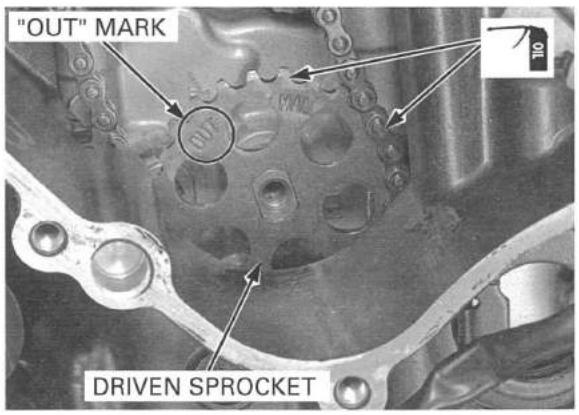
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

- First tighten the No.1 bolt, then tighten the No.2 bolt.



Apply engine oil to the oil pump driven sprocket teeth and drive chain

Install the driven sprocket with its "OUT" mark facing out.



Apply a locking agent to the oil pump driven sprocket bolt threads.

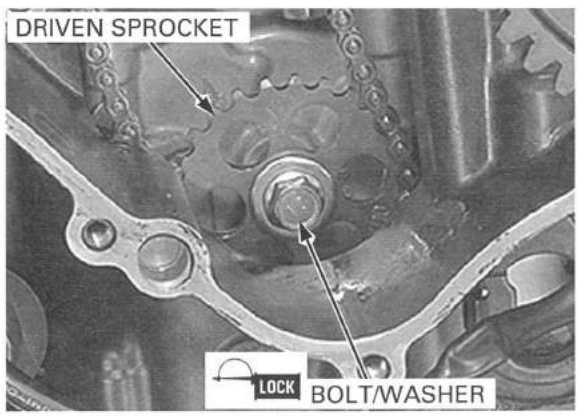
Install and tighten the driven sprocket bolt/washer to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Install the following:

- oil pan/oil strainer (page 4-7)
- right crankcase cover (page 9-25)

After installation, fill the crankcase with the recommended oil (page 3-15).
Check the oil pressure (page 4-5).
Check that there is no oil leaks.

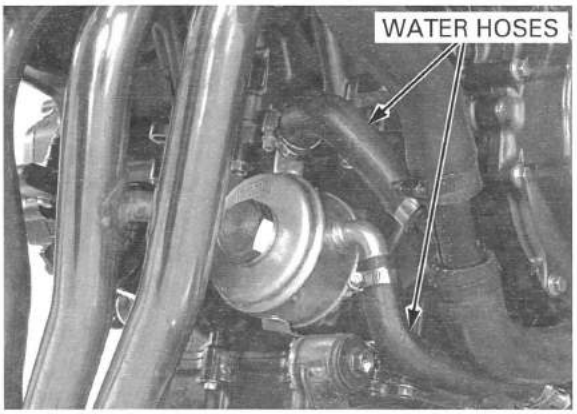


OIL COOLER

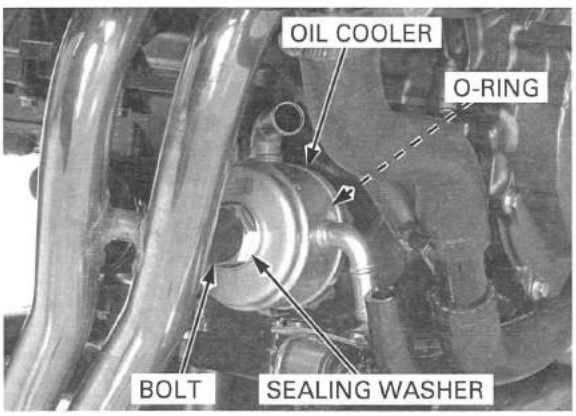
REMOVAL

Drain the engine oil (page 3-15).
Drain the coolant from the system (page 6-7).

Loosen the hose band screws and disconnect the oil cooler water hoses from the oil cooler.

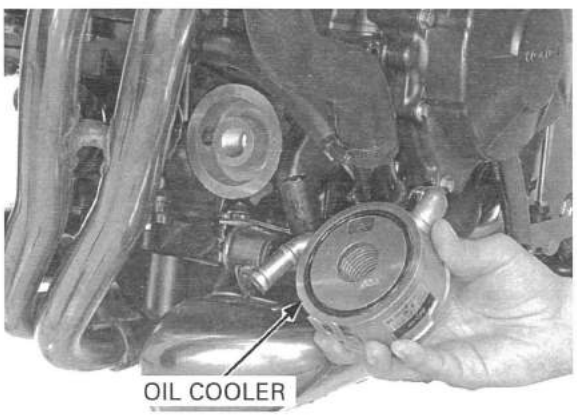


Remove the bolt, sealing washer and the oil cooler.
Remove the O-ring from the oil cooler.



INSPECTION

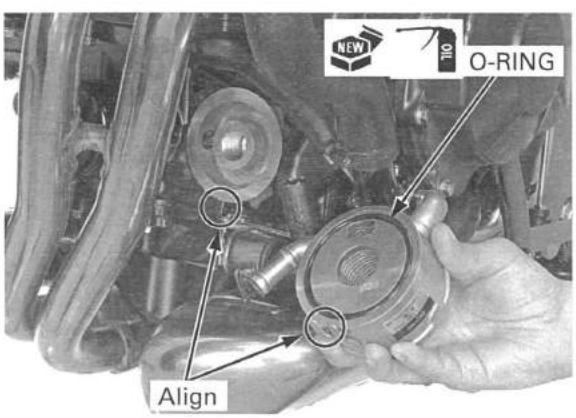
Check the oil cooler for damage.



INSTALLATION

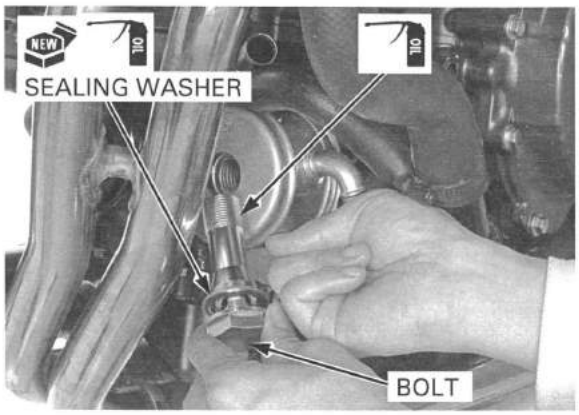
Apply engine oil to a new O-ring and install it into the oil cooler groove.

Install the oil cooler to the crankcase by aligning its groove with the crankcase boss.



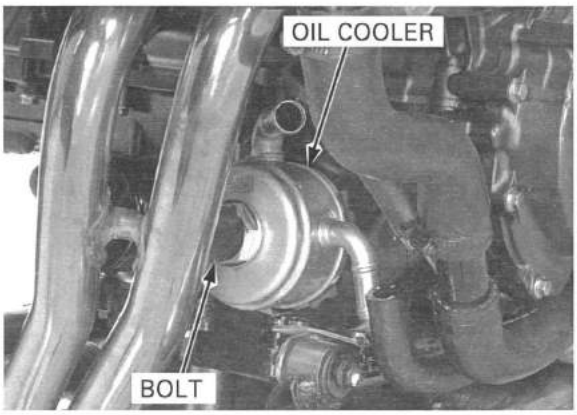
Apply engine oil to the oil cooler bolt threads and a new sealing washer seating surface.

Install the sealing washer and oil cooler bolt.



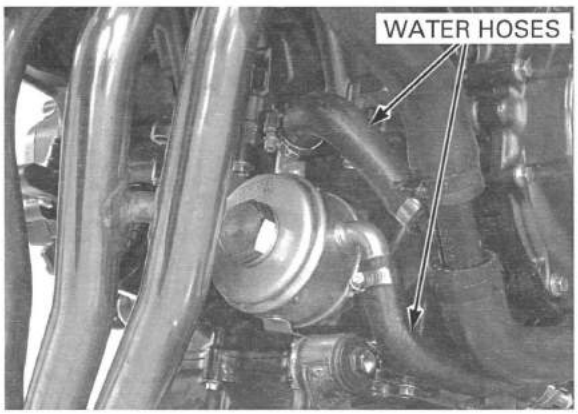
Hold the oil cooler by your hand and tighten the bolts to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)



Connect the oil cooler water hoses to the oil cooler and tighten the hose clamp screws securely.

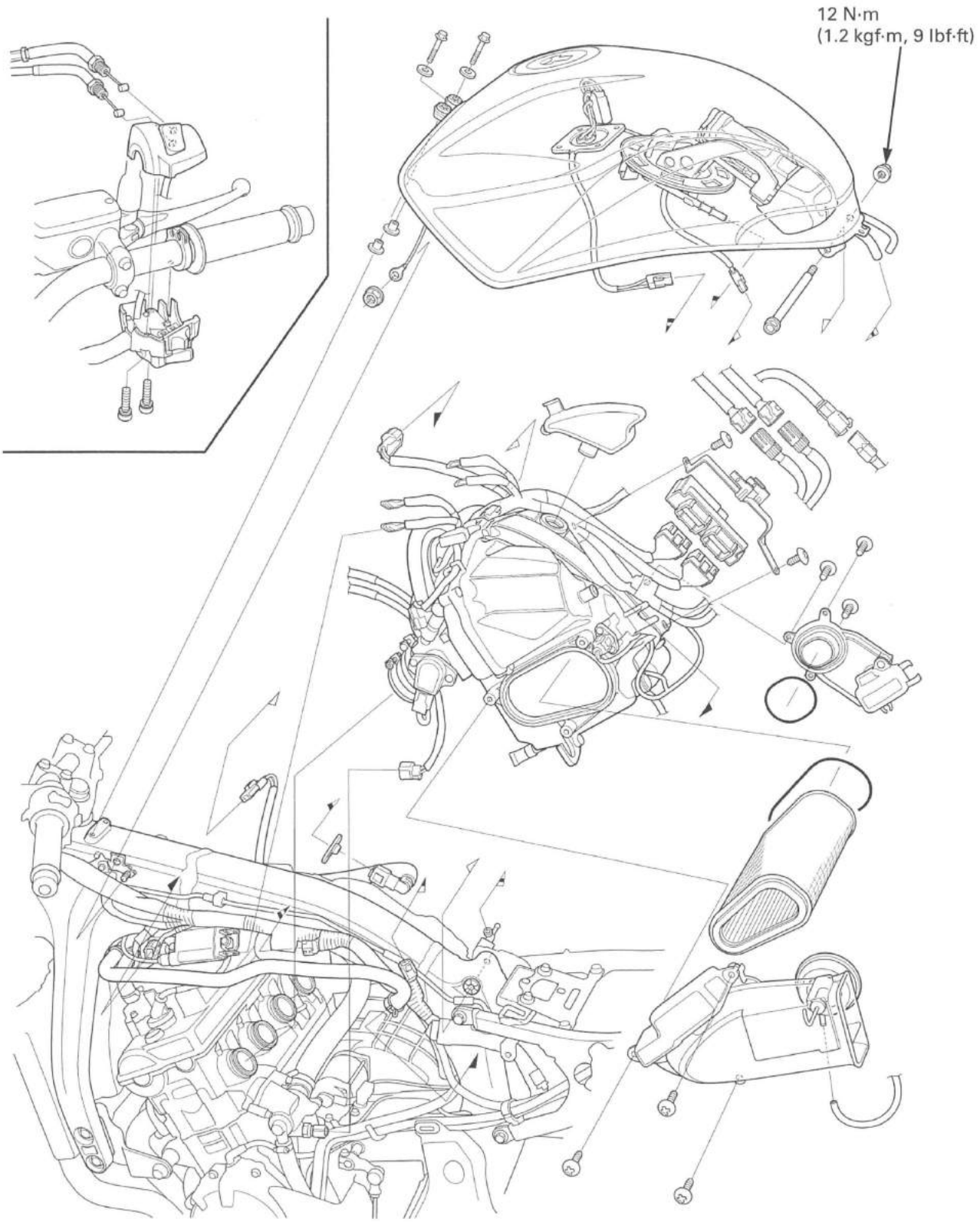
Fill the crankcase with the recommended oil (page 3-17).
Fill the cooling system and bleed any air (page 6-7).
Check that there is no oil leaks.



5. FUEL SYSTEM (PGM-FI)

5

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- Before disconnecting the fuel feed hose, relieve fuel pressure from the system by disconnecting the quick connect fitting of the fuel tank.
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.
- Do not apply commercially available carburetor cleaners to the inside of the throttle bore.
- Do not snap the throttle valve from full open to full close after the throttle cable has been removed. It may cause incorrect idle operation.
- Seal the intake manifold ports with tape or a clean cloth to keep dirt and debris from entering the engine after the throttle body has been removed.
- Do not damage the throttle body. It may cause incorrect throttle and idle valve synchronization.
- Prevent dirt and debris from entering the throttle bore and air passages after the throttle body has been removed. Clean them using compressed air if necessary.
- The throttle body is factory pre-set. Do not disassemble in a way other than shown in this manual.
- Do not loosen or tighten the white painted bolts, nuts and screws of the throttle body. Loosening or tightening them can cause throttle and idle valve synchronization failure.
- The parts of the throttle body not shown in this manual should not be disassembled.
- Always replace the packing when the fuel pump is removed.
- A faulty PGM-FI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- The VS sensor sends digital pulse signal to the ECM and computation. Refer to procedures for VS sensor inspection.
  - DTC troubleshooting
  - MIL troubleshooting
- When disassembling the fuel system parts, note the location of the O-rings. Replace them with new ones upon reassembly.
- Use a digital tester for PGM-FI system inspection.
- Refer to the fuel level sensor inspection (page 20-18).

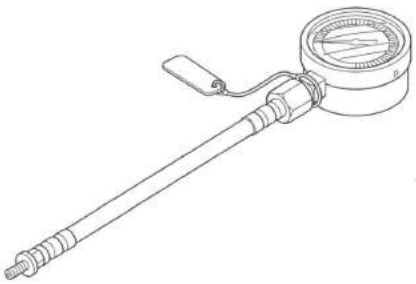
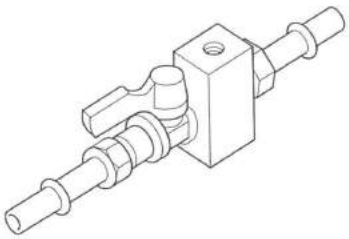
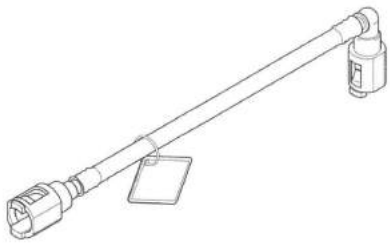
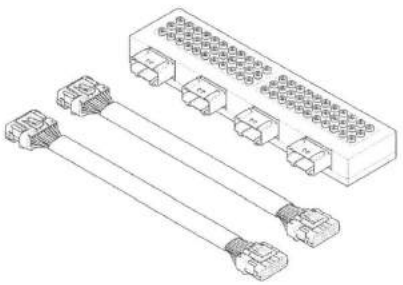
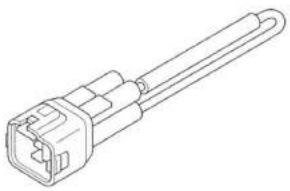
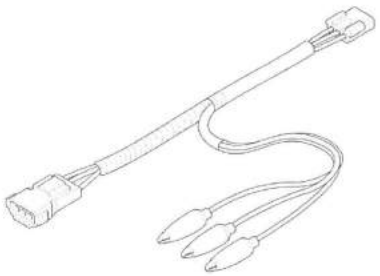
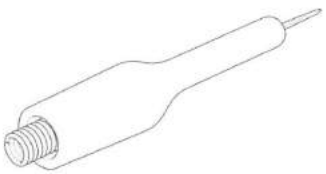
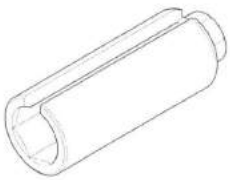
SPECIFICATIONS

ITEM	SPECIFICATIONS
Throttle body identification number	GQ3CA
Idle speed	1,350 ± 100 min^{-1} (rpm)
Throttle grip freeplay	2 – 6 mm (1/16 – 1/4 in)
IAT sensor resistance (at 20°C/68°F)	1 – 4 kΩ
ECT sensor resistance (at 20°C/68°F)	2.3 – 2.6 kΩ
Fuel injector resistance (at 20°C /68°F)	11 – 13 Ω
PAIR control solenoid valve resistance (at 20°C/68°F)	23 – 27 Ω
CKP sensor peak voltage (at 20°C/68°F)	0.7 V minimum
Fuel pressure at idle	343 kPa (3.5 kgf/cm^2, 50 psi)
Fuel pump flow (at 12 V)	189 cm^3 (6.4 US oz, 6.7 Imp oz) minimum/10 seconds

TORQUE VALUES

ECT sensor	23 N·m (2.3 kgf·m, 17 lbf·ft)
Insulator band screw (Throttle body side)	See page 5-84
Insulator band screw (Cylinder head side)	See page 5-75
Fuel rail mounting bolt	5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)
IACV setting plate screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
IACV joint screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Air cleaner housing screw	3.5 N·m (0.4 kgf·m, 2.6 lbf·ft)

TOOLS

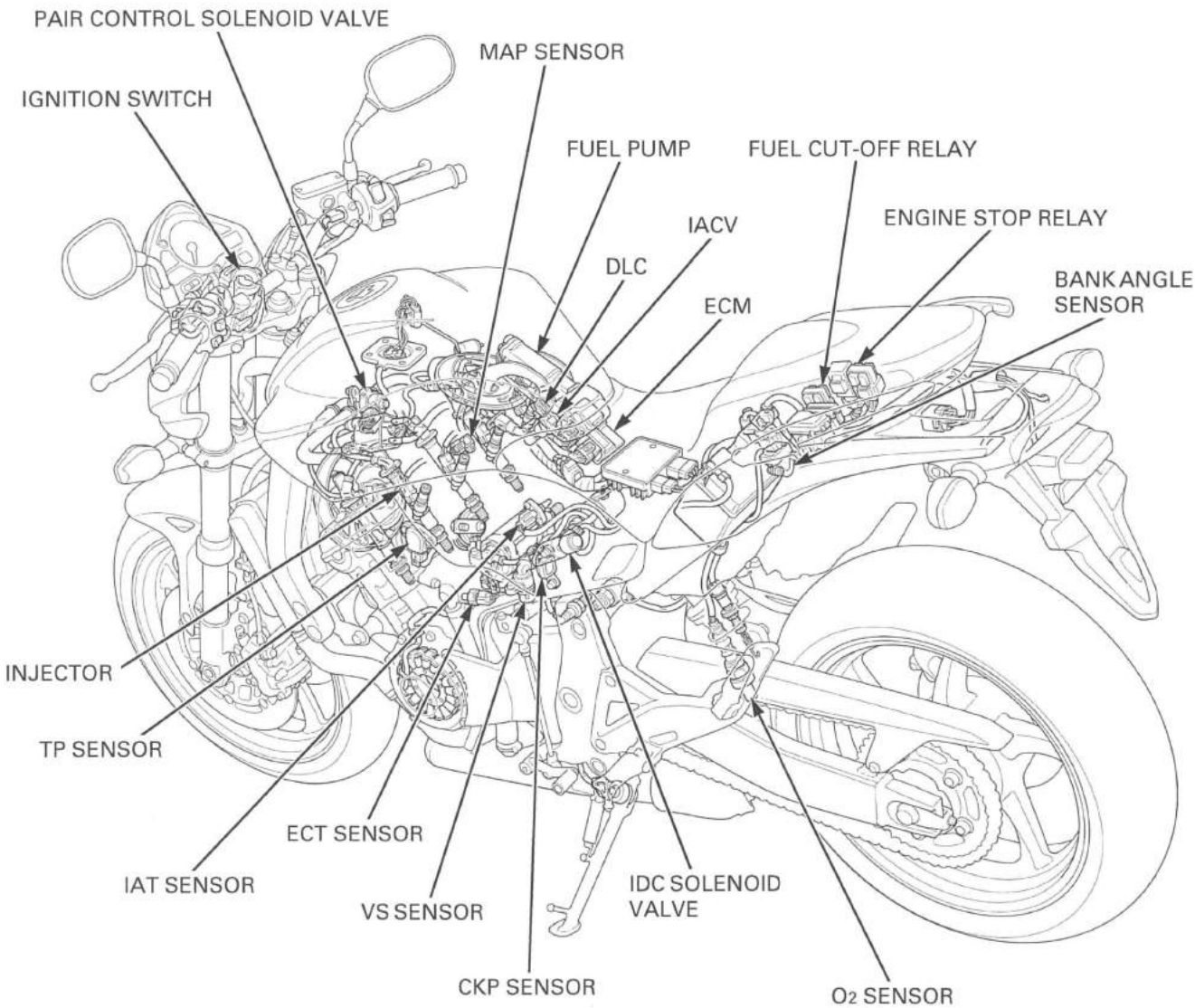
Fuel pressure gauge 07406-0040004 	Pressure gauge manifold 07ZAJ-S5A0111 	Pressure gauge hose attachment C 07ZAJ-S7C0100 
Pressure gauge hose attachment A 07ZAJ-S5A0120 	Fuel attachment joint C 07ZAJ-S7C0200 	ECM test harness 33P 070MZ-MCA0100 
SCS connector 070PZ-ZY30100 	Inspection test harness 07GMJ-ML80100 	Test probe 07ZAJ-RDJA110 
O_2 sensor wrench 07LAA-PT50101 		

PGM-FI SYMPTOM TROUBLESHOOTING

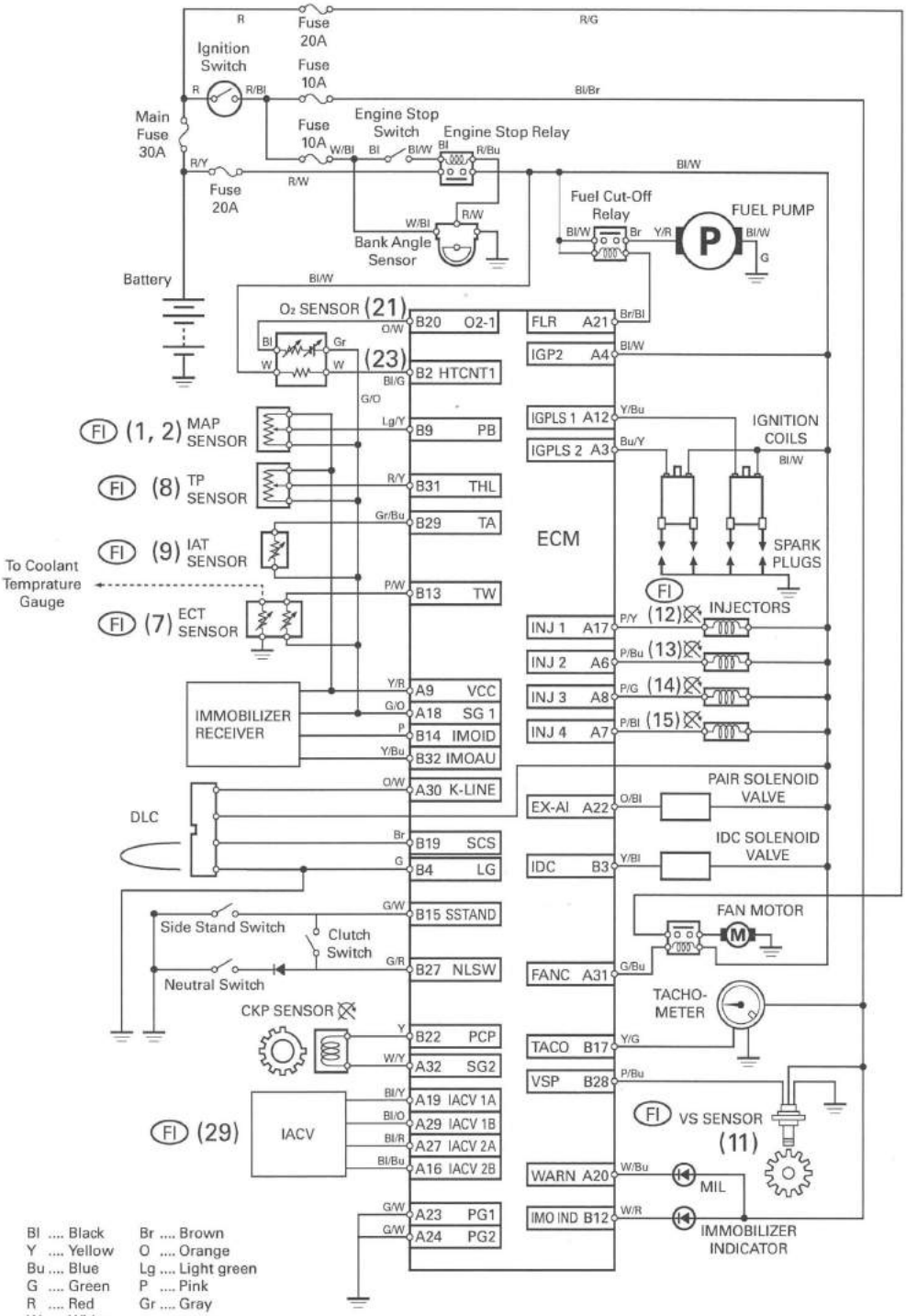
When the motorcycle has one of these symptoms, check the DTC or MIL blinking, refer to the DTC index (page 5-16) and begin the appropriate troubleshooting procedure. If there are no DTC/MIL blinking stored in the ECM memory, do the diagnostic procedure for the symptom, in sequence listed below, until you find cause.

Symptom	Diagnosis procedure	Also check for
Engine cranks but won't start (No DTC and MIL blinking)	1. Crank the starter for more than ten seconds and check the DTC (page 5-13) and execute the troubleshooting according to the DTC. 2. Inspect the fuel supply system (page 5-51).	• No fuel to injector – Clogged fuel filter – Pinched or clogged fuel feed hose – Pinched or clogged fuel tank breather hose – Faulty fuel pump – Faulty fuel pump circuits • Intake air leak • Contaminated/deteriorated fuel • Faulty fuel injector • IACV stuck • Faulty ignition system
Engine cranks but won't start (No fuel pump operation sound when the turning the ignition ON)	1. ECM power/ground circuits malfunction (page 5-96) 2. Inspect the fuel supply system (page 5-51).	• Open circuit in the power input and/or ground wire of the ECM • Faulty bank angle sensor or related circuit • Faulty engine stop relay or related circuit • Faulty engine stop switch or related circuit • Blown FI/IGN fuse (20 A) • Blown STARTER/BANK ANGLE SENSOR fuse (10 A)
Engine stalls, hard to start, rough idling	1. Check the idle speed. 2. Check the IACV. 3. Inspect the fuel supply system (page 5-51).	• Restricted fuel feed hose • Contaminated/deteriorated fuel • Intake air leak • Faulty IACV • Restricted fuel tank breather hose • Faulty ignition system
Afterburn when engine braking is used	Check the PAIR system (page 5-98).	• Faulty PAIR system – Faulty PAIR control solenoid valve – Faulty PAIR check valve – Clogged hose of the PAIR system • Faulty ignition system
Backfiring or misfiring during acceleration	Check the ignition system.	• Faulty ignition system
Poor performance (driveability) and poor fuel economy	1. MAP sensor and its hoses connection. 2. Inspect the fuel supply system (page 5-51).	• Pinched or clogged fuel feed hose • Faulty pressure regulator (fuel pump) • Faulty injector • Faulty ignition system • Faulty MAP sensor • Pinched or clogged MAP sensor hose
Idle speed is below specifications or fast idle too low (No DTC and MIL blinking)	1. Check the idle speed. 2. Check the IACV.	• IACV stuck closed • Faulty fuel supply system • Faulty ignition system
Idle speed is above specifications or fast idle too high (No DTC and MIL blinking)	1. Check the idle speed. 2. Check the throttle operation and grip freeplay. 3. Check the IACV.	• IACV stuck opened • Faulty ignition system • Intake air leak • Engine top end problem • Air cleaner condition
MIL stays ON but no DTCs set, or MIL never comes ON at all	Troubleshoot the MIL circuit (page 5-50).	• Faulty MIL circuit
MIL stays ON at all (No DTC set)	Inspect the DLC circuit.	• Short circuit in the DLC related wire

PGM-FI SYSTEM LOCATION



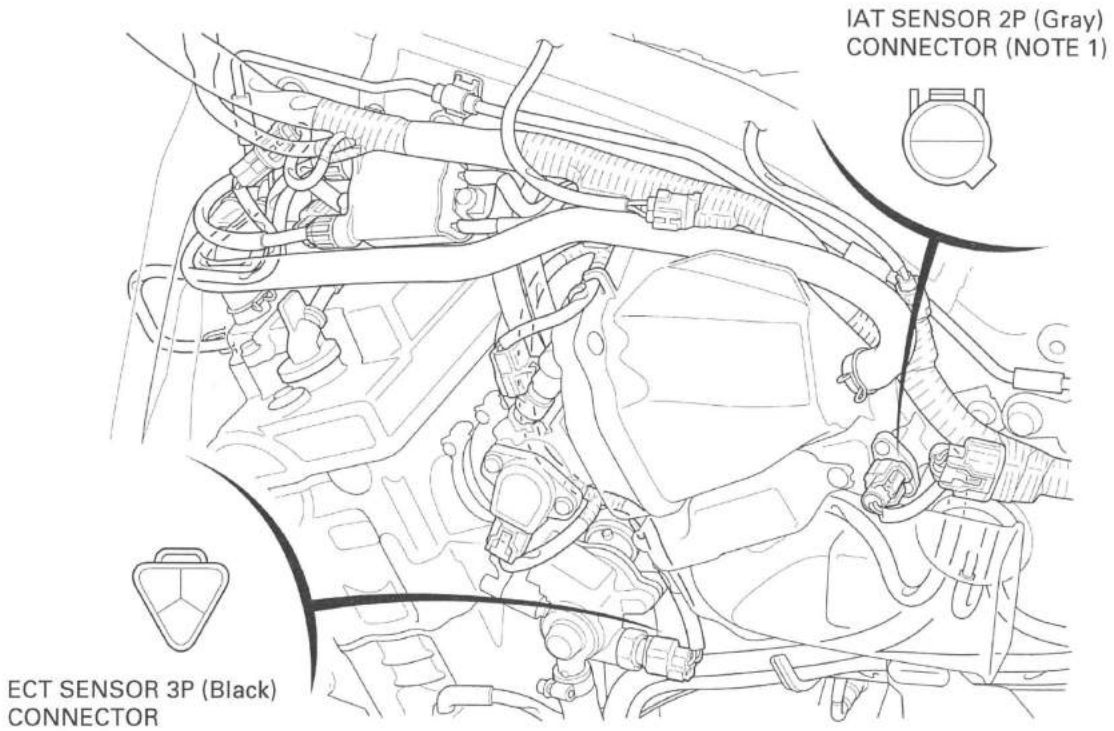
PGM-FI SYSTEM DIAGRAM



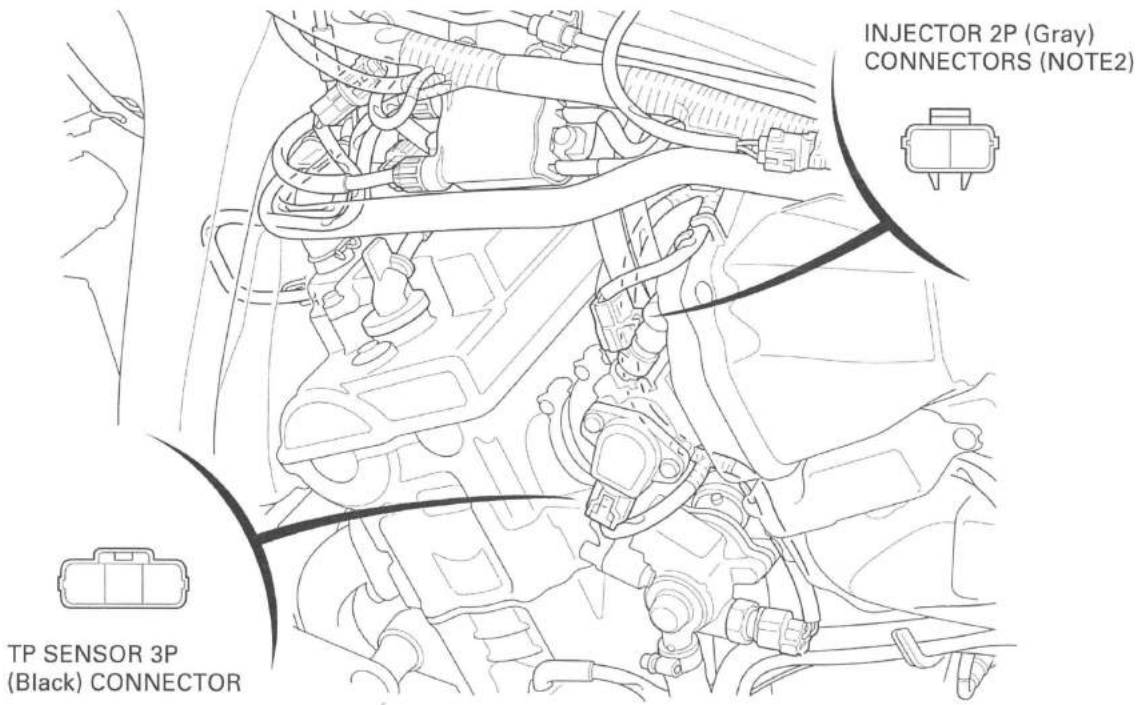
FI ( ) = DTC/MIL number

PGM-FI CONNECTOR LOCATIONS

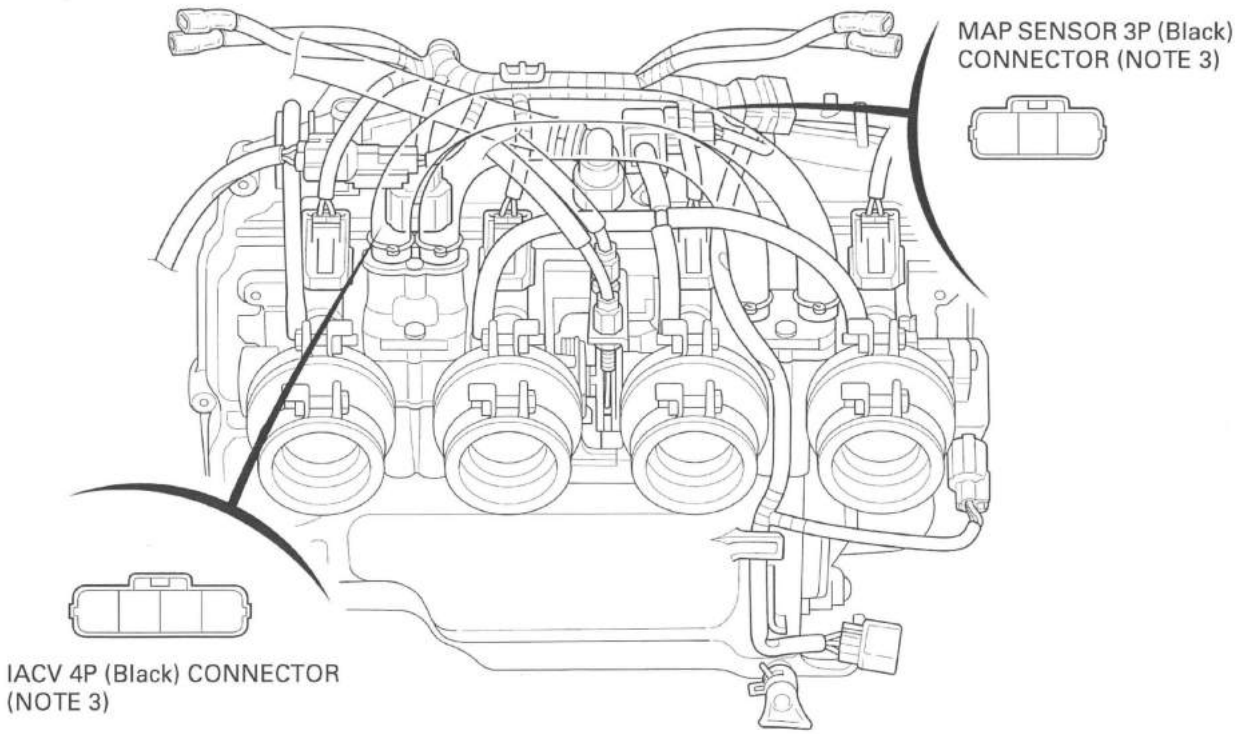
NOTE 1: Remove the left side cover (page 2-4).

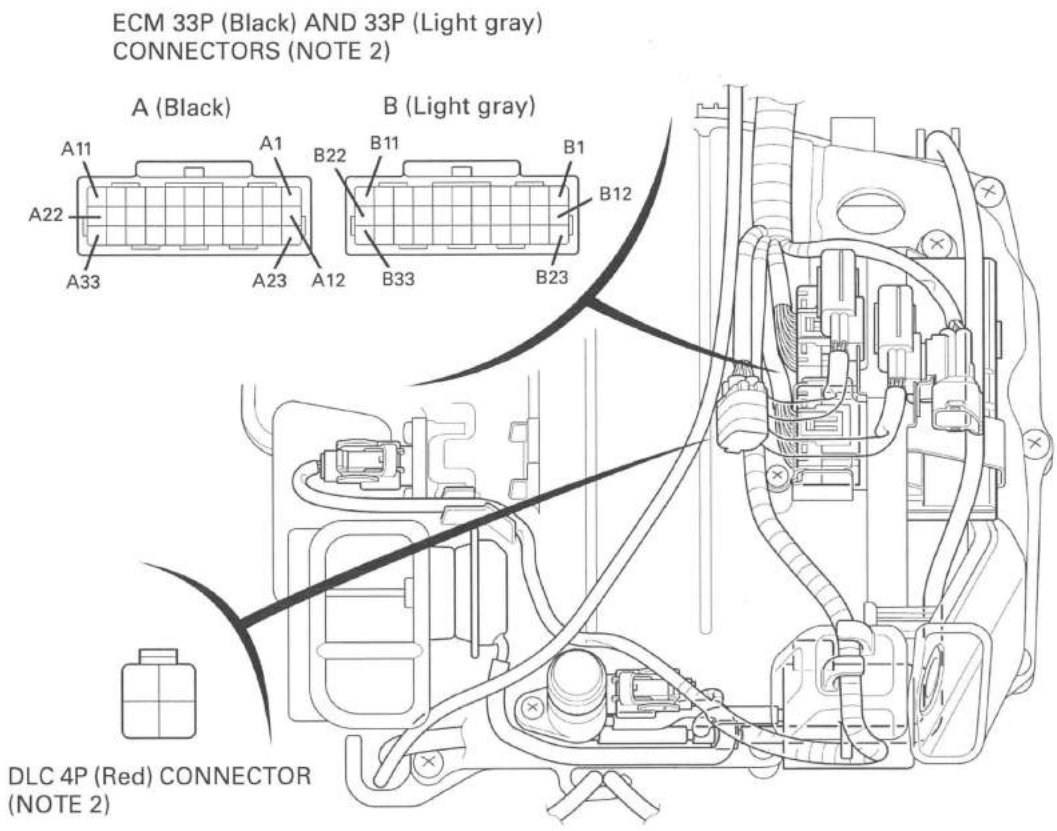


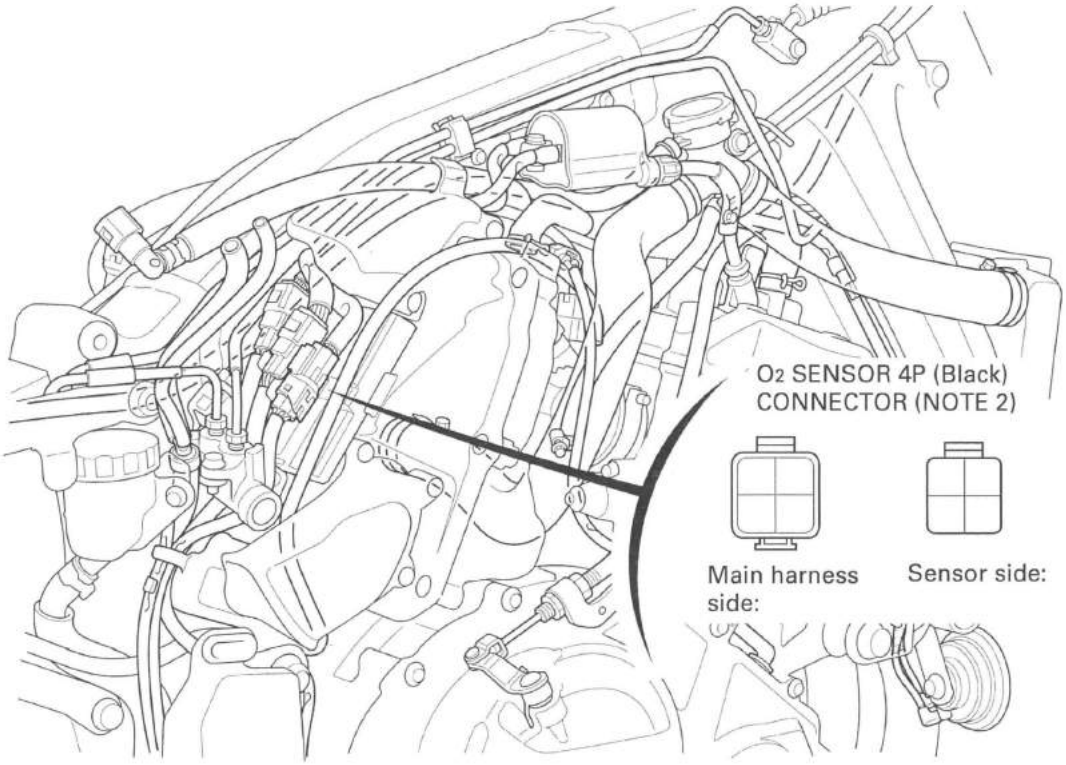
NOTE 2: Lift and support the fuel tank (page 3-5).

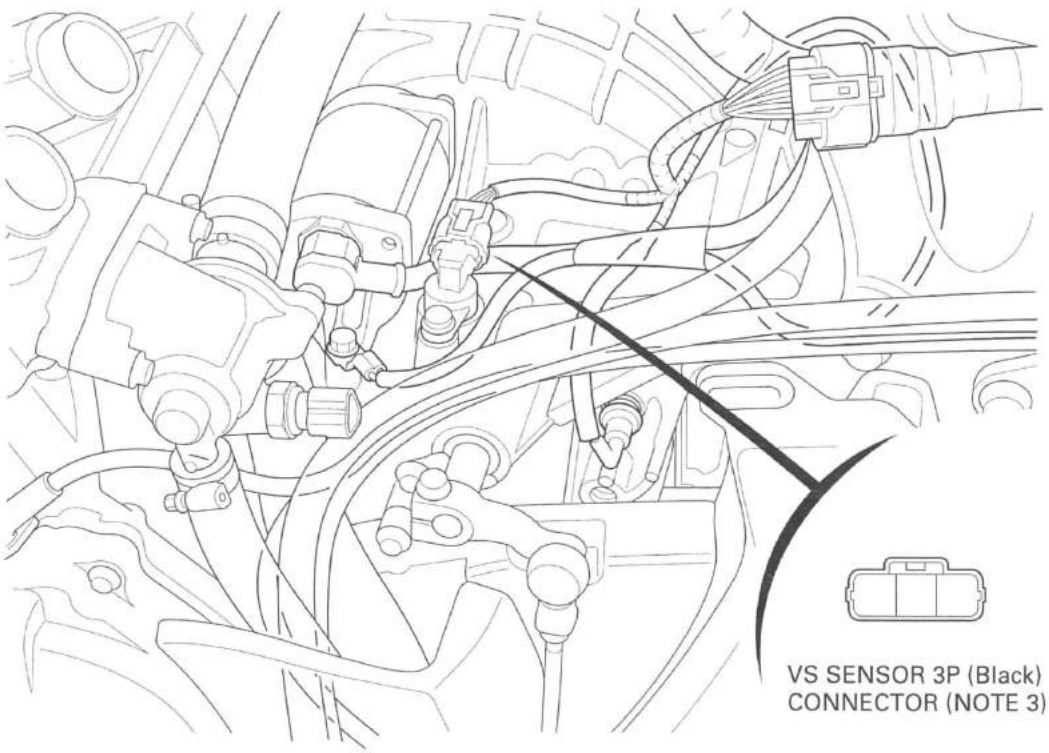


NOTE 3: Remove the air cleaner housing (page 5-61).






O2 SENSOR 4P (Black)
CONNECTOR (NOTE 2)
Main harness side:
Sensor side:


VS SENSOR 3P (Black)
CONNECTOR (NOTE 3)

PGM-FI TROUBLESHOOTING INFORMATION

GENERAL TROUBLESHOOTING

Intermittent Failure

The term "intermittent failure" means a system may have had a failure, but it checks OK now. If the MIL does not come on, check for poor contact or loose pins at all connectors related to the circuit that of the troubleshooting. If the MIL was on, but then went out, the original problem may be intermittent.

Opens and Shorts

"Opens" and "Shorts" are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something will not work at all. With ECMs this can something mean something work, but not the way it's supposed to.

If the MIL has come on

Refer to DTC READOUT (page 5-13).

If the MIL did not stay on

If the MIL did not stay on, but there is a driveability problem, do the SYMPTOM TROUBLESHOOTING (page 5-5).

SYSTEM DESCRIPTION

SELF-DIAGNOSIS SYSTEM

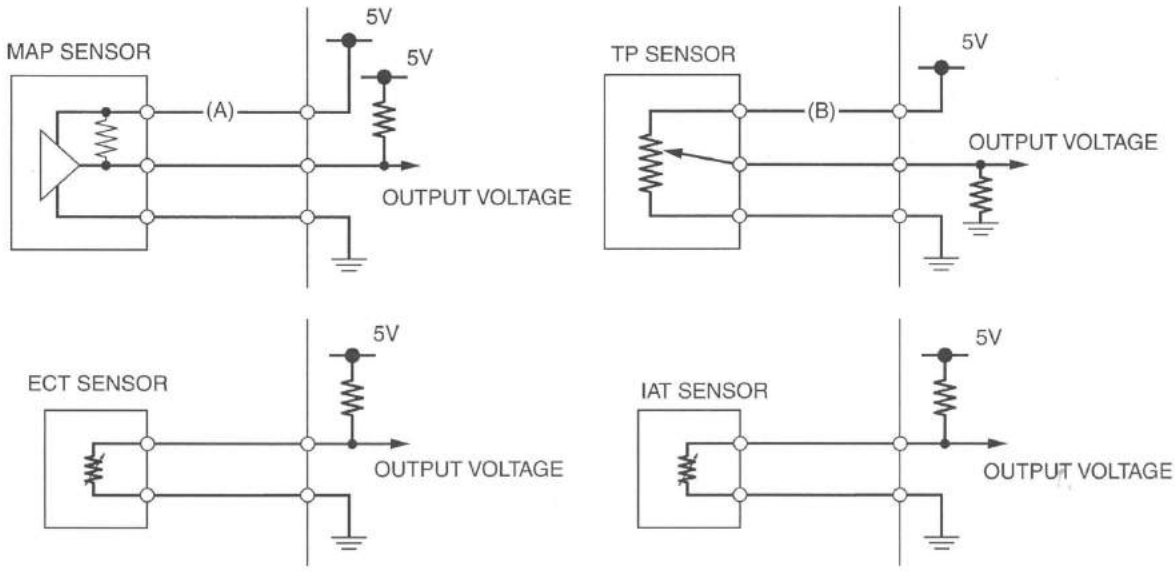
The PGM-FI system is equipped with the self-diagnostic system. When any abnormality occurs in the system, the ECM turns on the MIL and stores a DTC in its erasable memory.

FAIL-SAFE FUNCTION

The PGM-FI system is provided with a fail-safe function to secure a minimum running capability even when there is trouble in the system. When any abnormality is detected by the self-diagnosis function, running capability is maintained by pre-programed value in the simulated program map. When any abnormality is detected in the injector(s) and/or CKP sensor, the fail-safe function stops the engine to protect it from damage.

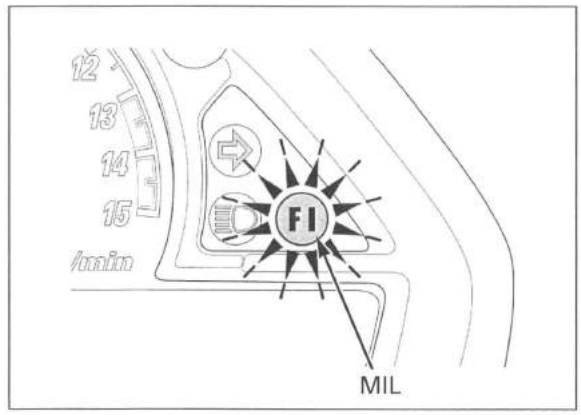
DTC (Diagnostic Trouble Code)

- The DTC is composed of a main code and a sub code and it is displayed as a hyphenated number when retrieved from the ECM with the HDS pocket tester.
  The digits in front of the hyphen are the main code, they indicate the component of function failure.
  The digits behind the hyphen are the sub code, they detail the specific symptom of the component or function failure.
  For example, in the case of the TP sensor:
  - DTC 08 – 1 = (TP sensor voltage) – (lower than the specified value)
  - DTC 08 – 2 = (TP sensor voltage) – (higher than the specified value).
- The MAP, ECT, TP and IAT sensor diagnosis will be made according to the voltage output of the affected sensor.
  If a failure occurs, the ECM determines the Function Failure, compares the sensor voltage output to the standard value, and then outputs the corresponding DTC to the HDS Pocket Tester.
  For example:
  - If the input voltage line (A) on the MAP sensor is opened, the ECM detects the output voltage is about 5 V, then the DTC 1-2 (MAP sensor circuit high voltage) will be displayed.
  - If the input voltage line (B) on the TP sensor is opened, the ECM detects the output voltage is 0 V, then the DTC 8-1 (TP sensor circuit low voltage) will be displayed.



MIL Blink Pattern

- If the HDS pocket tester is not available, DTC can be read from the ECM memory by the MIL blink pattern.
- The number of MIL blinks is the equivalent the main code of the DTC (the sub code cannot be displayed by the MIL).
- The MIL will blink the current DTC, in case the ECM detects the problem at present, when the ignition switch ON or idling with the sidestand down. The MIL will stay ON when the engine speed is over 5,000 min^{-1} (rpm) or with the sidestand up.
- The MIL has two types of blinks, a long blink and short blink. The long blinking lasts for 1.3 seconds, the short blinking lasts for 0.5 seconds. One long blink is the equivalent of ten short blinks. For example, when two long blinks are followed by five short blinks, the MIL is 25 (two long blinks = 20 blinks, plus five short blinks).
- When the ECM stores more than one DTC, the MIL will indicate them by blinking in the order from the lowest number to highest number.



MIL Check

When the ignition switch is turned ON and engine stop switch "○", the MIL will stay on for a few seconds, then go off. If the MIL does not come on, troubleshoot the MIL circuit (page 5-50).

CURRENT DTC/FREEZE DTC

The DTC is indicated in two ways according to the failure status.

- In case the ECM detects the problem at present, the MIL will come on and the MIL will start to blink as its DTC when the sidestand is lowered. It is possible to readout the MIL blink pattern as the current DTC.
- In case the ECM does not detect any problem at present but has a problem stored in its memory, the MIL will not light and blink. If it is necessary to retrieve the past problem, readout the freeze DTC by following the DTC readout procedure (page 5-13).

HDS POCKET TESTER INFORMATION

- The HDS can readout the DTC, freeze data, current data and other ECM condition.

How to connect the HDS Pocket Tester

Turn the ignition switch to OFF.
Lift and support the fuel tank (page 3-5).

Remove the dummy connector from the DLC.
Connect the HDS pocket tester to the DLC.

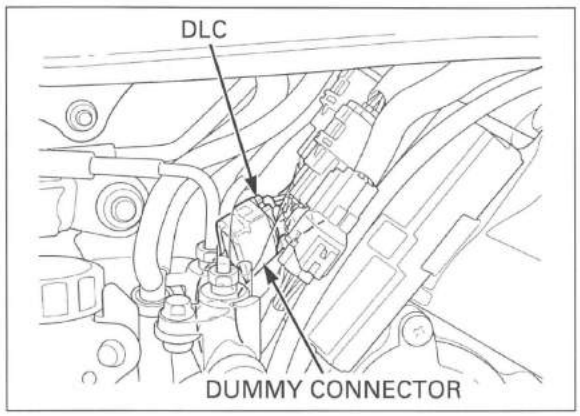
Turn the ignition switch ON and engine stop switch "❍", check the DTC and freeze data.

NOTE:

- Freeze data indicates the engine conditions when the first malfunction was detected.

ECM reset

The HDS can reset the ECM data including the DTC, freeze data and some learning memory.



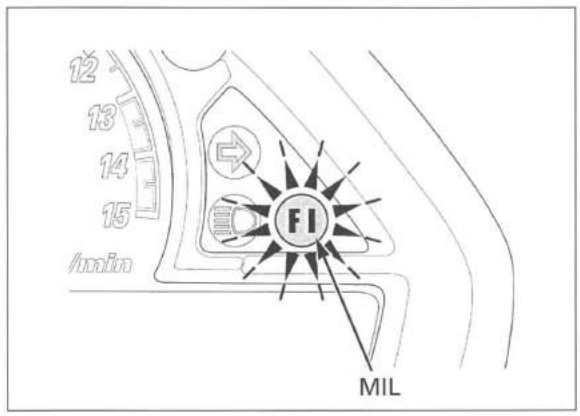
DTC READOUT

Start the engine and check the MIL.

- If the engine will not start, turn the starter motor for more than 10 seconds and check that the MIL blinks.
- When the ignition switch is turned ON, the MIL will stay on for a few seconds, then go off.

If the MIL stays on or blinks, connect the HDS Pocket Tester to the DLC (page 5-13).
Read the DTC, freeze data and follow the troubleshooting index (page 5-16).

To read the DTC with the MIL blinking, refer to the following procedure.



Reading DTC with the MIL

Turn the ignition switch to OFF.
Lift and support the fuel tank (page 3-5).

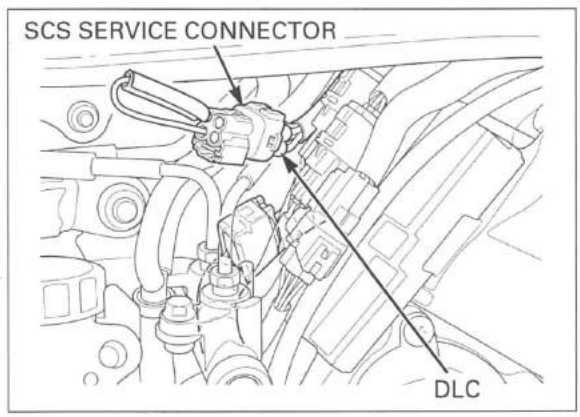
Remove the dummy connector and short DLC terminals using the special tool.

TOOL:
SCS connector **070PZ-ZY30100**

CONNECTION: Brown – Green

Turn the ignition switch ON and engine stop switch "❍", read, note the MIL blinks and refer to the troubleshooting index (page 5-16).

NOTE:
If the ECM has any DTC in its memory, the MIL will start blinking.



CLEARING DTC

Connect the HDS Pocket Tester to the DLC (page 5-13).

Clear the DTC with the HDS while the engine is stopped.

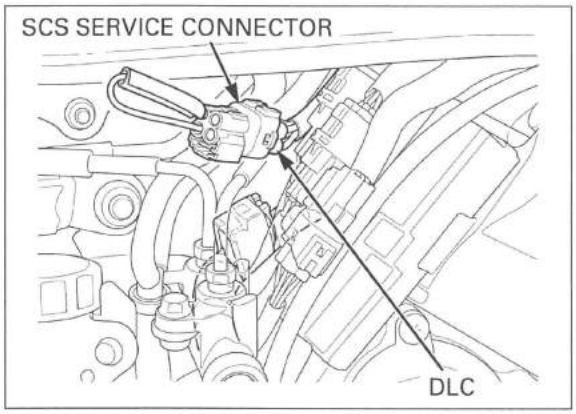
To clear the DTC without HDS, refer to the following procedure.

How to clear the DTC with SCS connector

1. Lift and support the fuel tank (page 3-5).
2. Turn the ignition switch to OFF.
3. Make sure the engine stop switch is turned to "○".
   Remove the dummy connector and short the Brown and Green wire terminals of the DLC using the special tool.

   TOOL:
   SCS connector **070PZ-ZY30100**

   CONNECTION: Brown – Green
4. Turn the ignition switch to ON.
5. Remove the special tool wire from the DLC.
6. The MIL will light for approximately 5 seconds. While the MIL lights, short the DLC terminals again with the special tool. The self-diagnostic memory is erased if the malfunction indicator goes off and starts blinking.



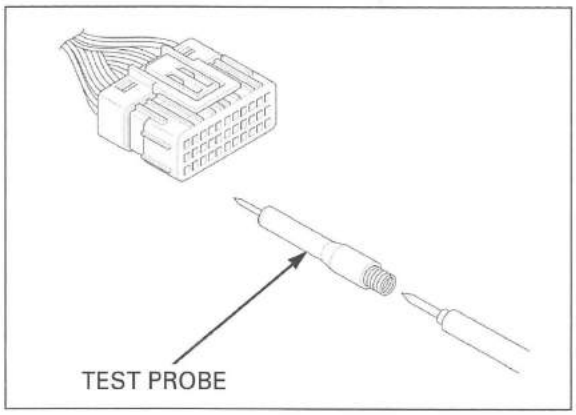
NOTE:
- The DLC must be jumped while the MIL lights. If not, the MIL will not start blinking.
- Note that the self-diagnostic memory cannot be erased if the ignition switch is turned to "OFF" before the MIL starts blinking.

CIRCUIT INSPECTION

INSPECTION AT ECM CONNECTOR

- Always clean around and keep any foreign material away from the ECM connector before disconnecting it.
- A faulty PGM-FI system is often related to poorly connected or corroded terminals. Check those connections before proceeding.
- In testing at ECM connector (wire harness side) terminal, always use the test probe. Insert the test probe into the connector terminal, then attach the digital multimeter probe to the test probe.

TOOL:
Test probe **07ZAJ-RDJA110**

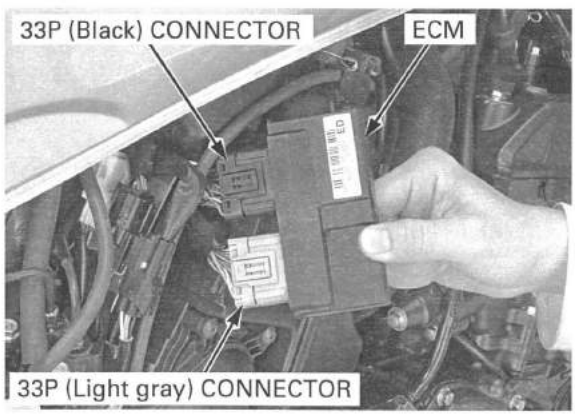


TEST HARNESS CONNECTION

Turn the ignition switch to "OFF".

Lift and support the fuel tank (page 3-5).

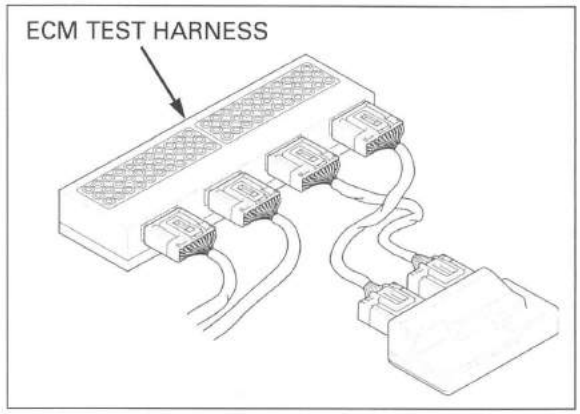
Pull out the ECM from the stay.
Disconnect the ECM 33P (Black and Light gray) connectors from the ECM.



Connect the ECM test harness between the main wire harness and the ECM.

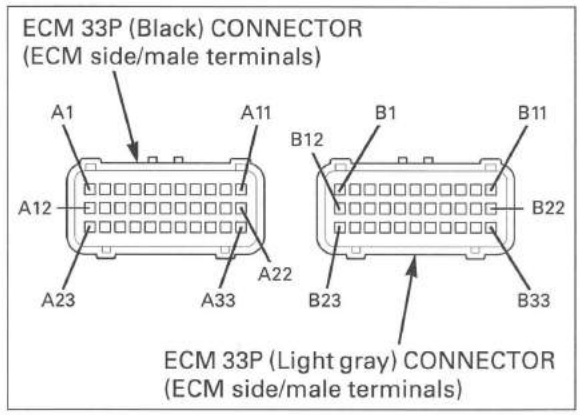
TOOL:

ECM test harness 33P	**070MZ-MCA0100**

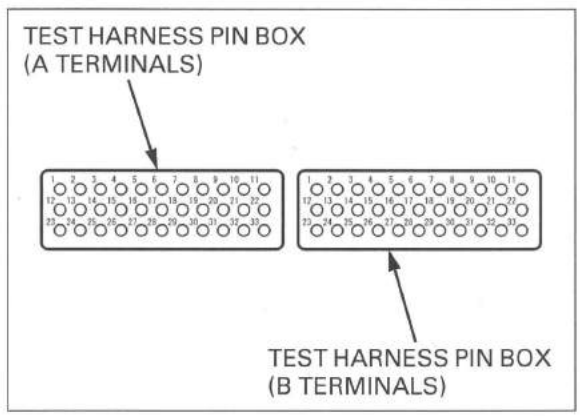


TEST HARNESS TERMINAL LAYOUT

The ECM connector terminals are numbered as shown in this illustration.



The ECM test harness terminals are same layout as for the ECM connector terminals as shown.



DTC INDEX

DTC (MIL blinks)	Function Failure	Symptom/Fail-safe function	Refer to (DTC)	Refer to (MIL)
1-1 (1)	MAP sensor circuit low voltage (less than 0.2 V) • MAP sensor or its circuit malfunction	• Engine operates normally • Fail-safe value: 760 mmHg/ 1,013 hPa	5-17	5-36
1-2 (1)	MAP sensor circuit high voltage (more than 3.9 V) • Loose or poor contact of the MAP sensor connector • MAP sensor or its circuit malfunction	• Engine operates normally • Fail-safe value: 760 mmHg/ 1,013 hPa	5-18	
2-1 (2)	MAP sensor hose connection • Disconnection or poor connection of the MAP sensor hoses • MAP sensor malfunction	• Engine operates normally	5-20	5-37
7-1 (7)	ECT sensor circuit low voltage (less than 0.07 V) • ECT sensor or its circuit malfunction	• Hard start at a low temperature • Fail-safe value: 95°C/203°F • Cooling fan turns on	5-21	5-38
7-2 (7)	ECT sensor circuit high voltage (more than 4.93 V) • Loose or poor contact of the ECT sensor connector • ECT sensor or its circuit malfunction	• Hard start at a low temperature • Fail-safe value: 95°C/203°F • Cooling fan turns on	5-22	
8-1 (8)	TP sensor circuit low voltage (less than 0.3 V) • Loose or poor contact of the TP sensor connector • TP sensor or its circuit malfunction	• Poor engine acceleration • Fail-safe value: 0°	5-23	5-40
8-2 (8)	TP sensor circuit high voltage (more than 4.93 V) • TP sensor or its circuit malfunction	• Poor engine acceleration • Fail-safe value: 0°	5-25	
9-1 (9)	IAT sensor circuit low voltage (less than 0.07 V) • IAT sensor or its circuit malfunction	• Engine operates normally • Fail-safe value: 35°C/95°F	5-26	5-42
9-2 (9)	IAT sensor circuit high voltage (more than 4.93 V) • Loose or poor contact of the IAT sensor connector • IAT sensor or its circuit malfunction	• Engine operates normally • Fail-safe value: 35°C/95°F	5-27	
11-1 (11)	VS sensor no signal • Loose or poor contact of the VS sensor connector • VS sensor or its circuit malfunction	• Engine operates normally	5-28	5-43
12-1 (12)	No. 1 injector circuit malfunction • Loose or poor contact of the injector connector • Injector or its circuit malfunction	• Engine does not start • Injectors, fuel pump and ignition shut down	5-29	5-45
13-1 (13)	No. 2 injector circuit malfunction • Loose or poor contact of the injector connector • Injector or its circuit malfunction	• Engine does not start • Injectors, fuel pump and ignition shut down	5-31	5-46
14-1 (14)	No. 3 injector circuit malfunction • Loose or poor contact of the injector connector • Injector or its circuit malfunction	• Engine does not start • Injectors, fuel pump and ignition shut down	5-31	5-46
15-1 (15)	No. 4 injector circuit malfunction • Loose or poor contact of the injector connector • Injector or its circuit malfunction	• Engine does not start • Injectors, fuel pump and ignition shut down	5-31	5-46
21-1 (21)	O_2 sensor malfunction • Loose or poor contact of the O_2 sensor connector • O_2 sensor or its circuit malfunction	• Engine operates normally	5-31	5-47
23-1 (23)	O_2 sensor heater circuit malfunction • Loose or poor contact of the O_2 sensor connector • O_2 sensor heater or its circuit malfunction	• Engine operates normally	5-32	5-48
29-1 (29)	IACV circuit malfunction • Loose or poor contact of the IACV connector • IACV or its circuit malfunction	• Engine stalls, hard to start, rough idling	5-34	5-49
33-2 (–)	EEPROM in ECM malfunction • Faulty ECM	• Engine operates normally • Does not hold the self-diagnosis data	5-35	–

DTC TROUBLESHOOTING

DTC 1-1 (MAP SENSOR LOW VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the MAP sensor 3P (Black) connector and ECM 33P connectors, then recheck the DTC.

1. **MAP Sensor System Inspection**

   Turn the ignition switch ON and engine stop switch "◯".
   Check the MAP sensor with the HDS pocket tester.

   Is about 0 V indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **MAP Sensor Input Voltage Inspection**

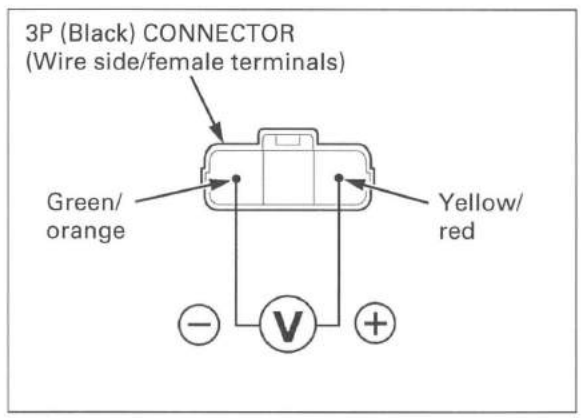
   Turn the ignition switch OFF.
   Disconnect the MAP sensor 3P (Black) connector.

   Turn the ignition switch ON and engine stop switch "◯".
   Measure the voltage at the wire harness side.
   CONNECTION: Yellow/red (+) – Green/orange (–)

   Is the voltage within 4.75 – 5.25 V?

   YES – GO TO STEP 4.

   NO – GO TO STEP 3.



3. **MAP Sensor Input Line Inspection**

   Turn the ignition switch OFF.
   Disconnect the ECM 33P (Black) connector.

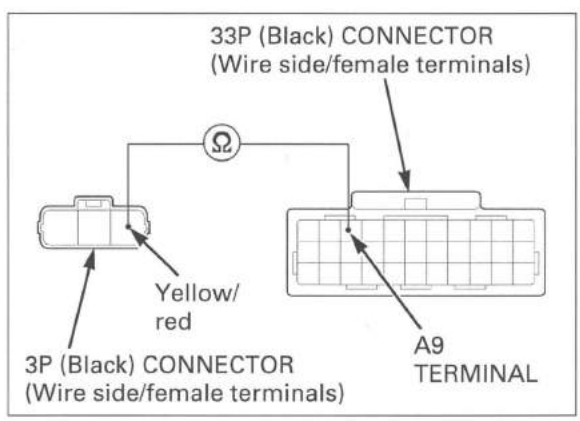
   Check for continuity at the Yellow/red wire between the MAP sensor 3P (Black) connector terminal and the ECM 33P (Black) connector.
   CONNECTION: A9 – Yellow/red

   TOOL:
   Test probe **07ZAJ-RDJA110**

   Is there continuity?

   YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

   NO – Open circuit in Yellow/red wire



4. **MAP Sensor Output Line Short Circuit Inspection**

   Turn the ignition switch OFF.

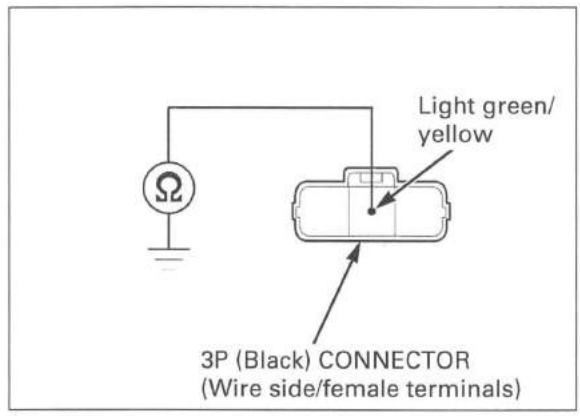
   Check for continuity between the MAP sensor 3P (Black) connector terminal of the wire harness side and ground.

   CONNECTION: Light green/yellow – Ground

   Is there continuity?

   YES – Short circuit in Light green/yellow wire

   NO – GO TO STEP 5.



5. **MAP Sensor Inspection**

   Replace the MAP sensor with a known good one (page 5-93).
   Clear the ECM self-diagnosis memory data (page 5-14).
   Turn the ignition switch ON and engine stop switch "◯".

   Check the MAP sensor with the HDS pocket tester.

   Is DTC 1-1 indicated?

   YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

   NO – Faulty original MAP sensor

DTC 1-2 (MAP SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the MAP sensor 3P (Black) connector and ECM 33P connectors, then recheck the DTC.

1. **MAP Sensor System Inspection 1**

   Turn the ignition switch ON and engine stop switch "◯".

   Check the MAP sensor with the HDS pocket tester.

   Is about 5 V indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **MAP Sensor System Inspection 2**

Turn the ignition switch OFF.

Disconnect the MAP sensor 3P (Black) connector.
Connect the MAP sensor terminals at the wire harness side with a jumper wire.

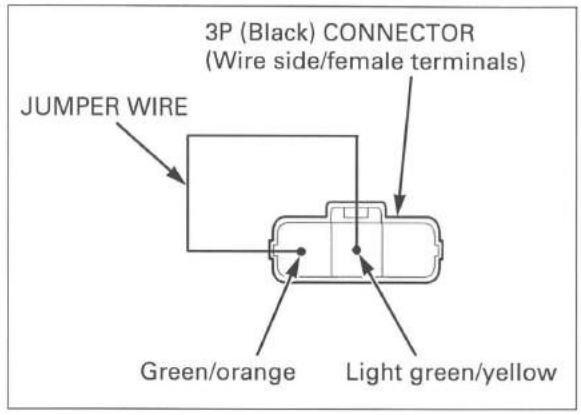
CONNECTION: Light green/yellow – Green/orange

Turn the ignition switch ON and engine stop switch "◯".
Check the MAP sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Faulty MAP sensor

NO – GO TO STEP 3.



3. **MAP Sensor Input Voltage Inspection**

Turn the ignition switch OFF.
Remove the jumper wire.

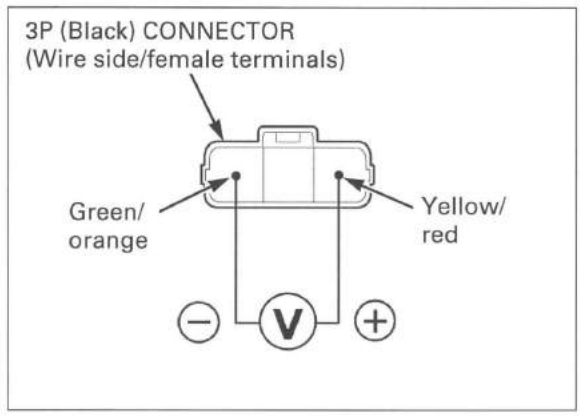
Turn the ignition switch ON and engine stop switch "◯".
Measure the voltage at the wire harness side.

CONNECTION: Yellow/red (+) – Green/orange (–)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 4.

NO – • Open circuit in Yellow/red wire
• Open circuit in Green/orange wire



4. **MAP Sensor Output Line Open Circuit Inspection**

Disconnect the ECM 33P (Light gray) connector.
Check for continuity at the Light green/yellow wire between the MAP sensor 3P (Black) connector terminal and the ECM 33P (Light gray) connector.

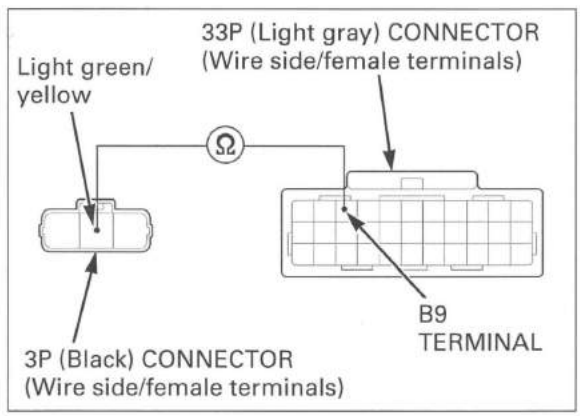
CONNECTION: B9 – Light green/yellow

TOOL:
Test probe **07ZAJ-RDJA110**

Is there continuity?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

NO – Open circuit in Light green/yellow wire



DTC 2-1 (MAP SENSOR HOSE CONNECTION)

- Before starting the inspection, check for loose or poor contact on the MAP sensor 3P (Black) connector and ECM 33P connectors, then recheck the DTC.

1. **MAP Sensor System Inspection**

   Turn the ignition switch ON and engine stop switch "◯".

   Start the engine and check the MAP sensor with the HDS pocket tester at idle speed.

   Is the reading changed?

   YES – Intermittent failure

   NO – GO TO STEP 2.

2. **MAP sensor hose inspection**

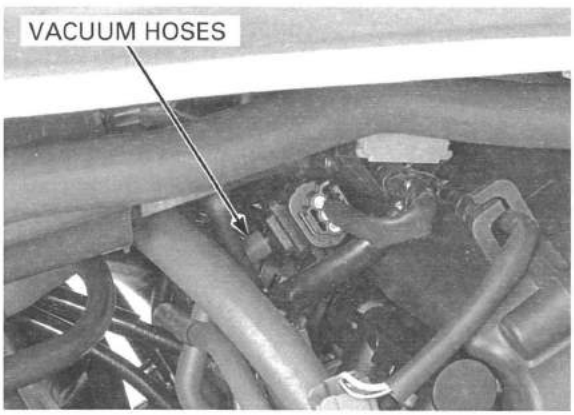
   Turn the ignition switch OFF.

   Check for connection and installation of the MAP sensor vacuum hose.

   Is the MAP sensor vacuum hose connection correct?

   YES – GO TO STEP 3.

   NO – Correct the hose installation



3. **MAP Sensor System Inspection**

   Replace the MAP sensor with a known good one (page 5-93).
   Turn the ignition switch ON and engine stop switch "◯".

   Start the engine and check the MAP sensor with the HDS pocket tester at idle speed.

   Is the reading changed?

   YES – Faulty original MAP sensor

   NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

DTC 7-1 (ECT SENSOR LOW VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the ECT sensor 3P (Black) connector and ECM 33P connectors, then recheck the DTC.

1. **ECT Sensor System Inspection**

   Turn the ignition switch ON and engine stop switch "○".

   Check the ECT sensor with the HDS pocket tester.

   Is about 0 V indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **ECT Sensor Inspection**

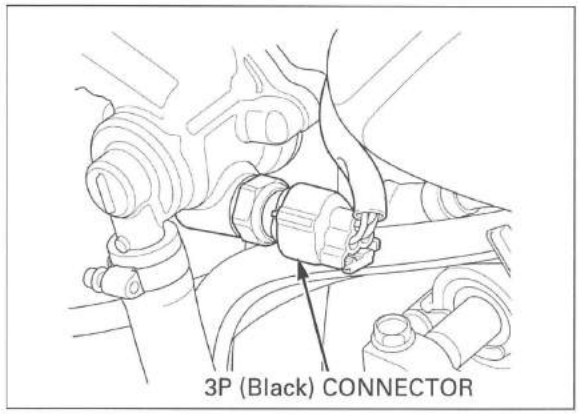
   Turn the ignition switch OFF.
   Disconnect the ECT sensor 3P (Black) connector.

   Turn the ignition switch ON and engine stop switch "○".
   Check the ECT sensor with the HDS pocket tester.

   Is about 0 V indicated?

   YES – GO TO STEP 4.

   NO – GO TO STEP 3.



3. **ECT Sensor Resistance Inspection**

   Turn the ignition switch OFF.

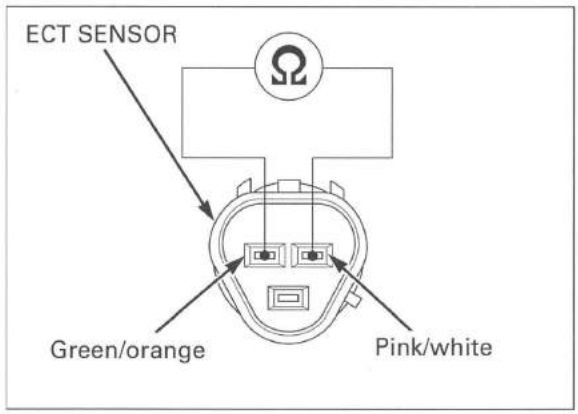
   Measure the resistance at the ECT sensor terminals.

   CONNECTION: Pink/white – Green/orange
   STANDARD: 2.3 – 2.6 kΩ (20°C/68°F)

   Is the resistance within 2.3 – 2.6 kΩ?

   YES – Replace the ECM with a new one, and recheck; refer to Key Registration Procedures (page 21-6)

   NO – Faulty ECT sensor.



4. **ECT Sensor Short Circuit Inspection**

   Turn the ignition switch OFF.

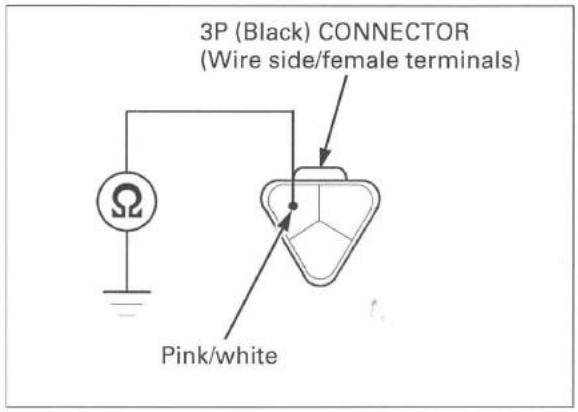
   Check for continuity between the ECT sensor 3P (Black) connector terminal of the wire harness side and ground.

   CONNECTION: Pink/white – Ground

   Is there continuity?

   YES – Short circuit in Pink/white wire

   NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)



DTC 7-2 (ECT SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the ECT sensor 3P (Black) connector and ECM 33P connectors, then recheck the DTC.

1. **ECT Sensor System Inspection**

   Turn the ignition switch ON and engine stop switch "◯".

   Check the ECT sensor with the HDS pocket tester.

   Is about 5 V indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **ECT Sensor Inspection**

   Turn the ignition switch OFF.

   Disconnect the ECT sensor 3P (Black) connector. Connect the ECT sensor terminals with a jumper wire.

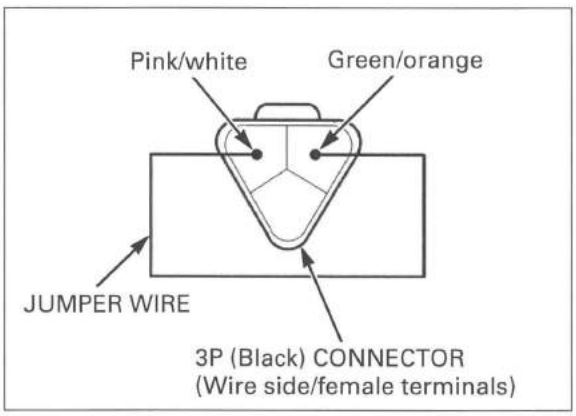
   CONNECTION: Pink/white – Green/orange

   Turn the ignition switch ON and engine stop switch "◯".
   Check the ECT sensor with the HDS pocket tester.

   Is about 0 V indicated?

   YES – Inspect the ECT sensor (page 20-15).

   NO – GO TO STEP 3.



3. **ECT Sensor Output Line Inspection**

   Turn the ignition switch OFF.
   Remove the jumper wire.

   Disconnect the ECM 33P connectors.
   Check the continuity between the ECM connectors and ECT sensor connector of the wire harness side.

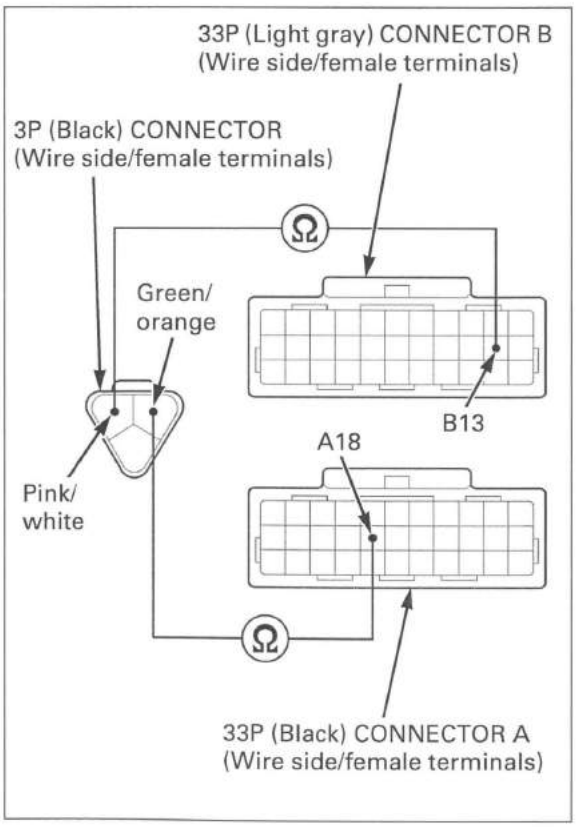
   CONNECTION: B13 – Pink/white
   A18 – Green/orange

   TOOL:
   Test probe **07ZAJ-RDJA110**

   Are there continuities?

   YES – Replace the ECM with new one, and recheck; refer to Key Registration Procedures (page 21-6)

   NO – • Open circuit in Pink/white wire
   • Open circuit in Green/orange wire



DTC 8-1 (TP SENSOR LOW VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the TP sensor 3P (Black) connector and ECM 33P connectors, then recheck the DTC.

1. **TP Sensor System Inspection**

   Turn the ignition switch ON and engine stop switch "◯".

   Check the TP sensor with the HDS when the throttle fully closed.

   Is about 0 V indicated?

   YES – GO TO STEP 3.

   NO – GO TO STEP 2.

2. **TP Sensor Inspection**

   Check the TP sensor voltage is increasing uninterrupted when moving the throttle from fully closed to fully opened using the data list menu of the HDS pocket tester.

   Does the voltage increase continuously?

   YES – Intermittent failure

   NO – Faulty TP sensor

3. **TP Sensor Input Voltage Inspection**

   Turn the ignition switch OFF.
   Disconnect the TP sensor 3P (Black) connector.

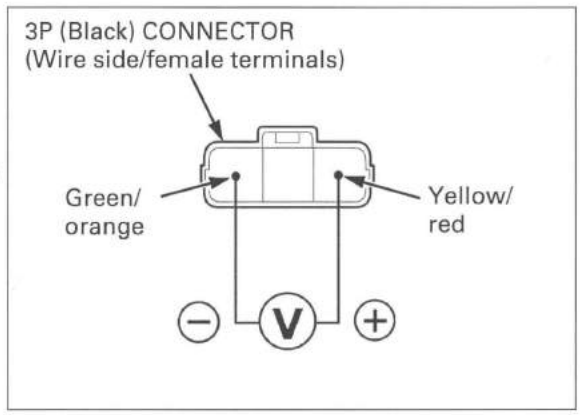
   Turn the ignition switch ON and engine stop switch "◯".
   Measure the voltage at the wire harness side.

   CONNECTION: Yellow/red (+) – Green/orange (–)

   Is the voltage within 4.75 – 5.25 V?

   YES – GO TO STEP 5.

   NO – GO TO STEP 4.



4. **TP Sensor Circuit Inspection**

   Turn the ignition switch OFF.
   Disconnect the ECM 33P (Black) connector.

   Check the continuity at the Yellow/red wire between the TP sensor 3P (Black) connector terminal and the ECM 33P (Black) connector.

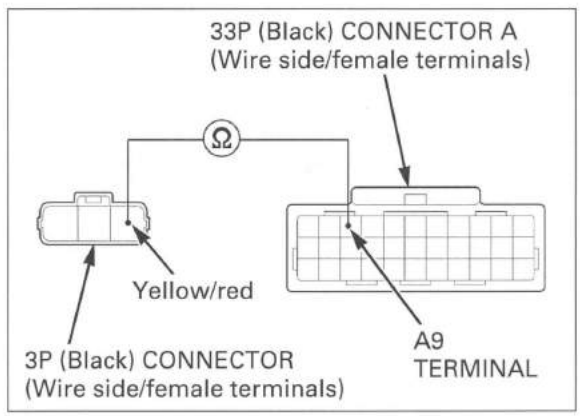
   CONNECTION: A9 – Yellow/red

   TOOL:
   Test probe **07ZAJ-RDJA110**

   Is there continuity?

   YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

   NO – Open circuit in Yellow/red wire



5. **TP Sensor Output Line Open Circuit Inspection**

Turn the ignition switch OFF.
Disconnect the ECM 33P (Light gray) connector.

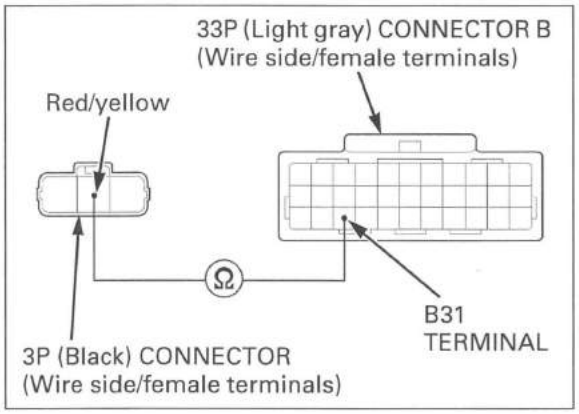
Check for continuity at the Red/yellow wire between the TP sensor 3P (Black) connector terminal and the ECM 33P (Light gray) connector.

CONNECTION: B31 – Red/yellow

Is there continuity?

YES – GO TO STEP 6.

NO – Open circuit in Red/yellow wire



6. **TP Sensor Output Line Short Circuit Inspection**

Connect the ECM 33P (Light gray) connector.

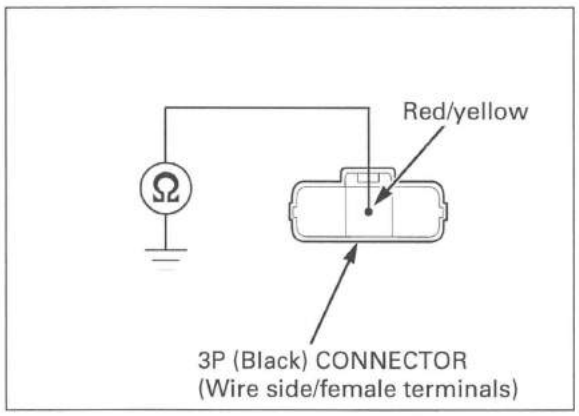
Check for continuity between the TP sensor 3P connector terminal of the wire harness side and ground.

CONNECTION: Red/yellow – Ground

Is there continuity?

YES – Short circuit in Red/yellow wire

NO – GO TO STEP 7.



7. **TP Sensor Inspection**

Replace the throttle body (page 5-81).
Clear the ECM self-diagnosis memory data (page 5-14).
Turn the ignition switch ON and engine stop switch "◯".

Check the TP sensor with the HDS pocket tester.

Is DTC 8-1 indicated?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

NO – Faulty original TP sensor

DTC 8-2 (TP SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the TP sensor 3P (Black) connector and ECM 33P connectors, then recheck the DTC.

1. **TP Sensor System Inspection**

   Turn the ignition switch ON and engine stop switch "○".

   Check the TP sensor with the HDS pocket tester.

   Is about 5 V indicated?

   YES – GO TO STEP 3.

   NO – GO TO STEP 2.

2. **TP Sensor Inspection**

   Check the TP sensor voltage is increasing uninterrupted when moving the throttle from fully closed to fully opened using the data list menu of the HDS pocket tester.

   Does the voltage increase continuously?

   YES – Intermittent failure

   NO – Faulty TP sensor

3. **TP Sensor Resistance Inspection**

   Turn the ignition switch OFF.

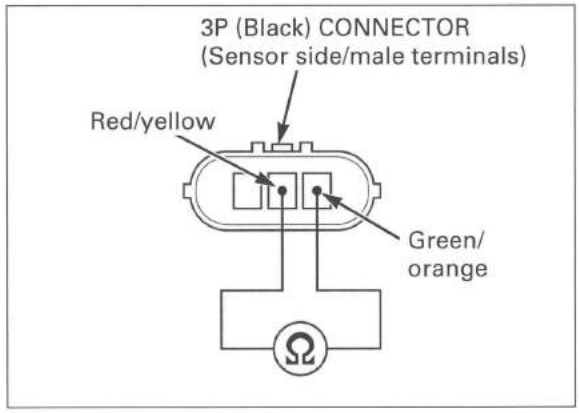
   Disconnect the TP sensor 3P (Black) connector. Measure the resistance at the TP sensor side.

   CONNECTION: Red/yellow – Green/orange

   Is the resistance within 0.5 – 1.5 kΩ?

   YES – GO TO STEP 4.

   NO – Faulty TP sensor



4. **TP Sensor Input Voltage Inspection**

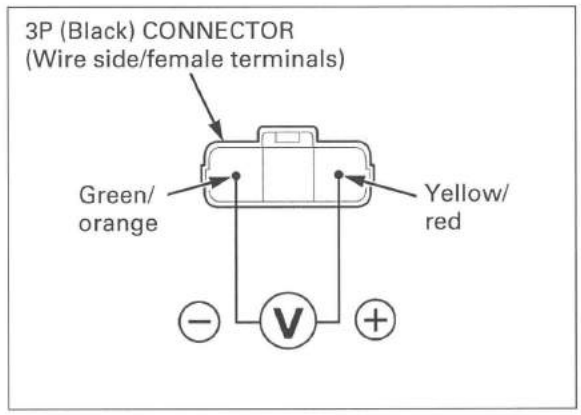
   Turn the ignition switch ON and engine stop switch "○".
   Measure the voltage at the wire harness side.

   CONNECTION: Yellow/red (+) – Green/orange (–)

   Is the voltage within 4.75 – 5.25 V?

   YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

   NO – Open circuit in Green/orange wire



DTC 9-1 (IAT SENSOR LOW VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the IAT sensor 2P (Gray) connector and ECM 33P connectors, then recheck the DTC.

1. **IAT Sensor System Inspection**

   Turn the ignition switch ON and engine stop switch "◯".

   Check the IAT sensor with the HDS pocket tester.

   Is about 0 V indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **IAT Sensor Inspection**

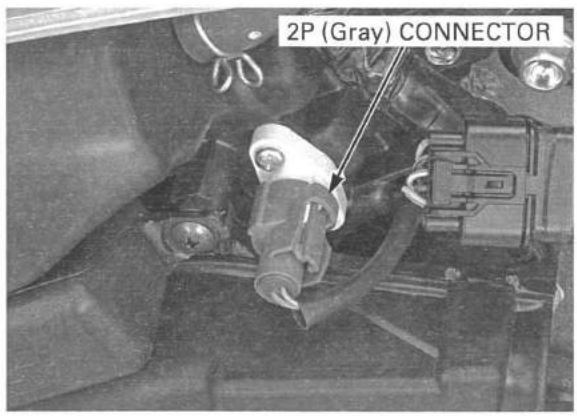
   Turn the ignition switch OFF.
   Disconnect the IAT sensor 2P (Gray) connector.

   Turn the ignition switch ON and engine stop switch "◯".
   Check the IAT sensor with the HDS pocket tester.

   Is about 0 V indicated?

   YES – GO TO STEP 3.

   NO – Faulty IAT sensor



3. **IAT Sensor Output Line Short Circuit Inspection**

   Turn the ignition switch OFF.

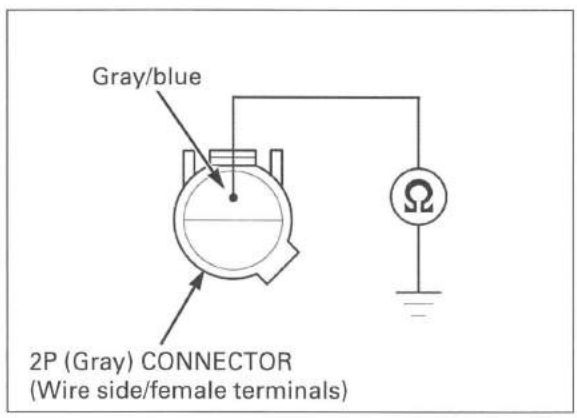
   Check for continuity between the IAT sensor 2P (Gray) connector terminal of the wire harness side and ground.

   CONNECTION: Gray/blue – Ground

   Is there continuity?

   YES – Short circuit in Gray/blue wire

   NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)



DTC 9-2 (IAT SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the IAT sensor 2P (Gray) connector and ECM 33P connectors, then recheck the DTC.

1. IAT Sensor System Inspection

Turn the ignition switch ON and engine stop switch "◯".

Check the IAT sensor with the HDS pocket tester.

Is about 5 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. IAT Sensor Inspection

Turn the ignition switch OFF.

Disconnect the IAT sensor 2P (Gray) connector. Connect the IAT sensor terminals with a jumper wire.

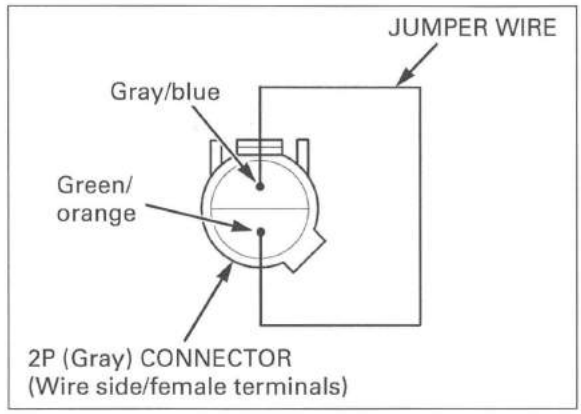
CONNECTION: Gray/blue – Green/orange

Turn the ignition switch ON and engine stop switch "◯".
Check the IAT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Faulty IAT sensor

NO – GO TO STEP 3.



3. IAT Sensor Output Line Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P connectors.

Check the continuity at the Gray/blue and Green/orange wire between the IAT sensor 2P (Gray) connector terminals and the ECM 33P connectors.

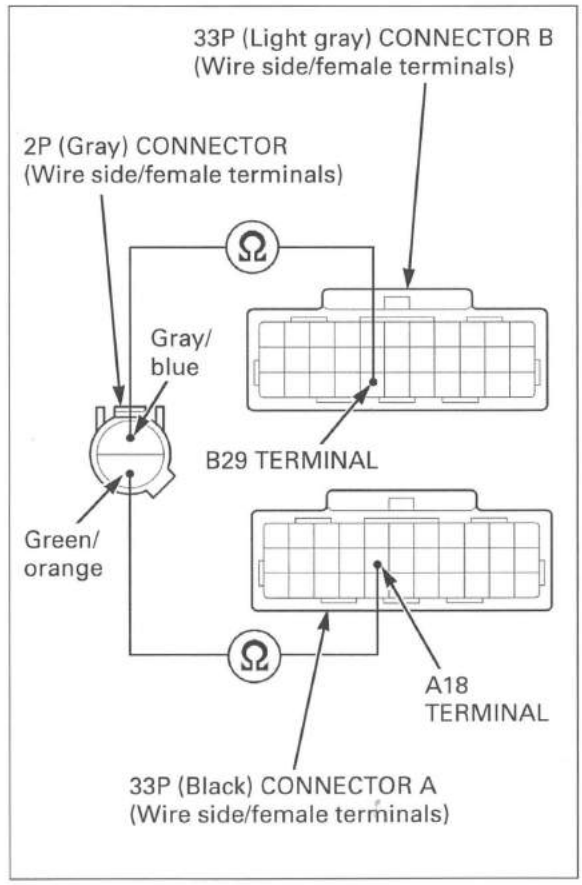
CONNECTION: B29 – Gray/blue
A18 – Green/orange

TOOL:
Test probe **07ZAJ-RDJA110**

Are there continuities?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

NO – • Open circuit in Gray/blue wire
• Open circuit in Green/orange wire



DTC 11-1 (VS SENSOR)

- Before starting the inspection, check for loose or poor contact on the VS sensor 3P (Black) connector and ECM 33P connectors, then recheck the DTC.

1. **VS Sensor System Inspection**

   Support the motorcycle securely, raise the rear wheel off the ground.
   Start the engine and shift the transmission into gear.

   Check the VS sensor with the HDS pocket tester at 10 km/h.

   Check the VS sensor with the HDS pocket tester at 10 km/h.

   YES – Intermittent failure

   NO – GO TO STEP 2.

2. **Combination Meter Inspection**

   Check for operation of combination meter.

   Does the combination meter operate normally?

   YES – Open or short circuit in Pink/blue wire

   NO – GO TO STEP 3.

3. **VS Sensor Input Voltage Inspection**

   Turn the ignition switch OFF.

   Disconnect the VS sensor 3P (Black) connector.

   Turn the ignition switch ON and engine stop switch "○".

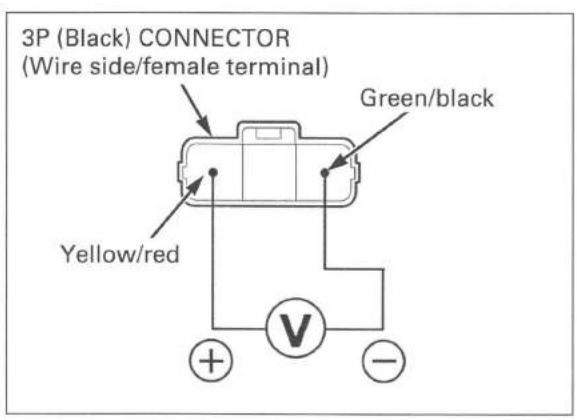
   Measure the voltage at the VS sensor connector of the wire harness side.

   CONNECTION: Yellow/red (+) – Green/black (–)

   Is there battery voltage?

   YES – GO TO STEP 4.

   NO – • Open or short circuit in the Yellow/red wire
   • Open circuit in the Green/black wire



4. **VS Sensor Pulse Line Open Circuit Inspection**

   Turn the ignition switch OFF.
   Disconnect the ECM 33P (Light gray) connector.

   Check the continuity between the ECM 33P (Light gray) connector terminal and VS sensor 3P (Black) connector terminal of the wire harness side.

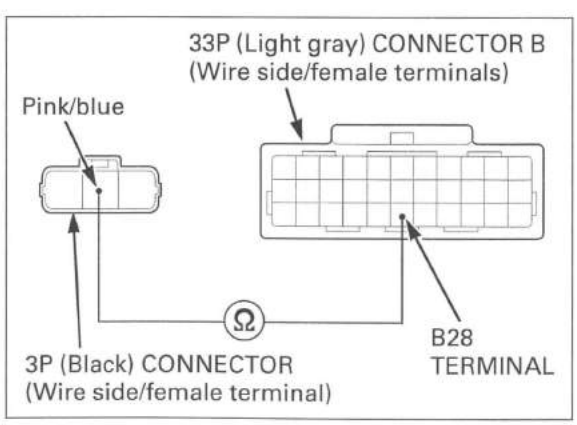
   CONNECTION: B28 – Pink/blue

   TOOL:
   Test probe **07ZAJ-RDJA110**

   Is there continuity?

   YES – GO TO STEP 5.

   NO – Open circuit in Pink/blue wire



5. VS Sensor Pulse Line Short Circuit Inspection

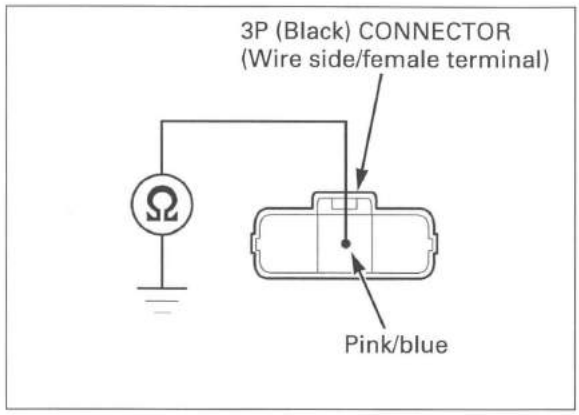
Check for continuity between the VS sensor 3P (Black) connector of the wire harness side and body ground.

CONNECTION: Pink/blue – Ground

Is there continuity?

YES – Short circuit in Pink/blue wire

NO – Faulty VS sensor



DTC 12-1 (No.1 INJECTOR)

- Before starting the inspection, check for loose or poor contact on the injector 2P (Gray) connectors and ECM 33P connectors, then recheck the DTC.

DTC	INJECTOR	POWER INPUT LINE	SIGNAL LINE	SIGNAL AT ECM
12-1	No.1	Black/White	Pink/yellow	A17
13-1	No.2	Black/White	Pink/blue	A6
14-1	No.3	Black/White	Pink/green	A8
15-1	No.4	Black/White	Pink/black	A7

1. Injector System Inspection

Clear the ECM self-diagnosis memory data (page 5-14).
Turn the ignition switch ON and engine stop switch "❍", then start the engine and check the injector with the HDS pocket tester.

Is the DTC 12-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. Injector Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the injector 2P (Gray) connector.

Turn the ignition switch ON and engine stop switch "❍".

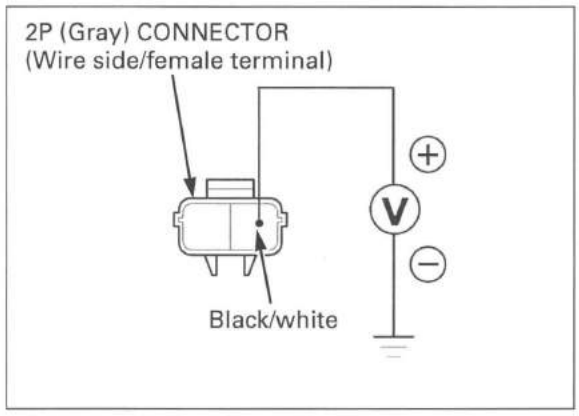
Measure the voltage between the injector 2P (Gray) connector of the wire harness side and ground.

CONNECTION: Black/white (+) – Ground (–)

Is there battery voltage?

YES – GO TO STEP 3.

NO – Open or short circuit in Black/white wire



3. **Injector Resistance Inspection**

Turn the ignition switch OFF.

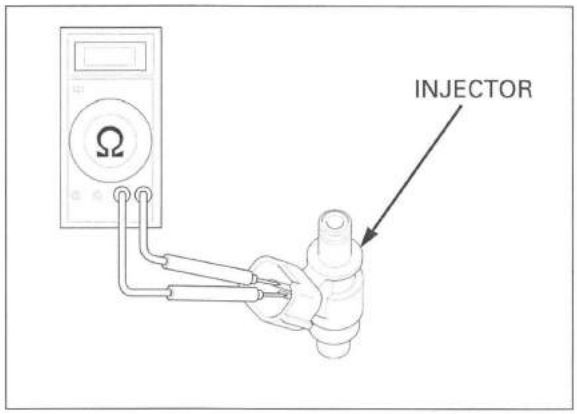
Measure the resistance of the injector connector terminals.

STANDARD: 11 – 13 Ω (20 °C/68 °F)

Is the resistance within 11 – 13 Ω (20°C/68°F)?

YES – GO TO STEP 4.

NO – Faulty injector



4. **Injector Signal Line Open Circuit Inspection**

Disconnect the ECM 33P (Black) connector.
Check the continuity between the ECM 33P (Black) connector and injector 2P (Gray) connector of the wire harness side.

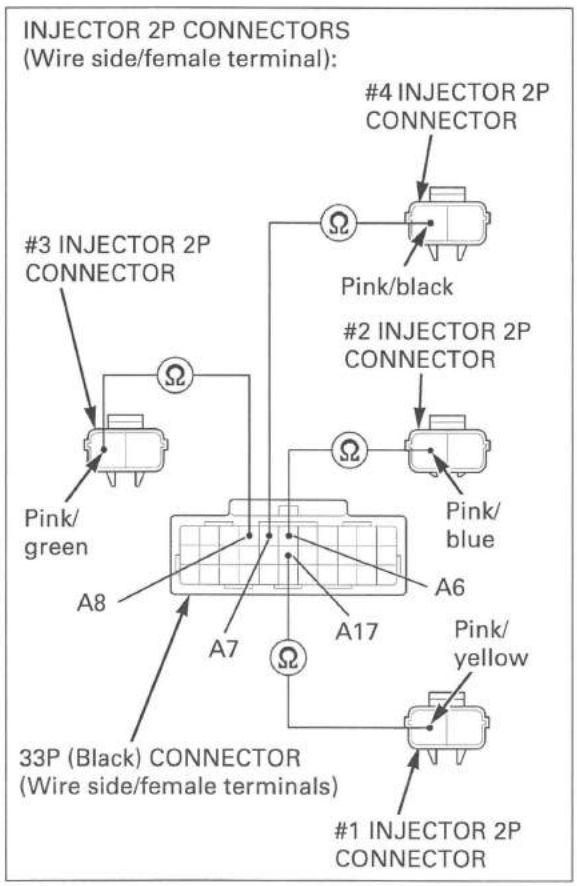
CONNECTION: SIGNAL LINE – SIGNAL LINE

TOOL:
Test probe **07ZAJ-RDJA110**

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in SIGNAL line wire



5. **Injector Signal Line Short Circuit Inspection**

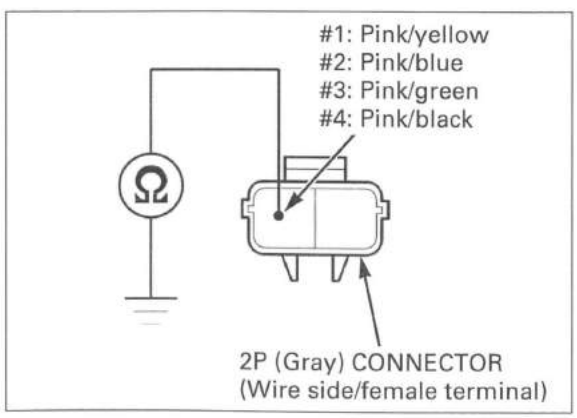
Check for continuity between the injector 2P (Gray) connector and ground.

CONNECTION: SIGNAL LINE – Ground

Is there continuity?

YES – Short circuit in SIGNAL LINE wire

NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)



DTC 13-1 (No.2 INJECTOR)

(page 5-29)

DTC 14-1 (No.3 INJECTOR)

(page 5-29)

DTC 15-1 (No.4 INJECTOR)

(page 5-29)

DTC 21-1 (O_2 SENSOR)

- Before starting the inspection, check for loose or poor contact on the O_2 sensor 4P (Black) connector and ECM 33P connectors, then recheck the DTC.

1. **O_2 Sensor System Inspection**

   Start the engine and warm up the engine up to coolant temperature is 80 °C (176 °F).

   Test-ride the motorcycle and check the O_2 sensor with the HDS pocket tester.

   STANDARD: 0.1 V – 0.3 V

   Is the voltage as specified?

   YES – Check the fuel pressure (page 5-54). If the system is correct, GO TO STEP 4.

   NO – GO TO STEP 2.

2. **O_2 Sensor Open Circuit Inspection**

   Turn the ignition switch OFF.

   Disconnect the ECM 33P connectors and O_2 sensor 4P (Black) connector.

   Check the continuity between the ECM 33P connectors of the wire harness side and O_2 sensor 4P (Black) connector of the wire harness side.

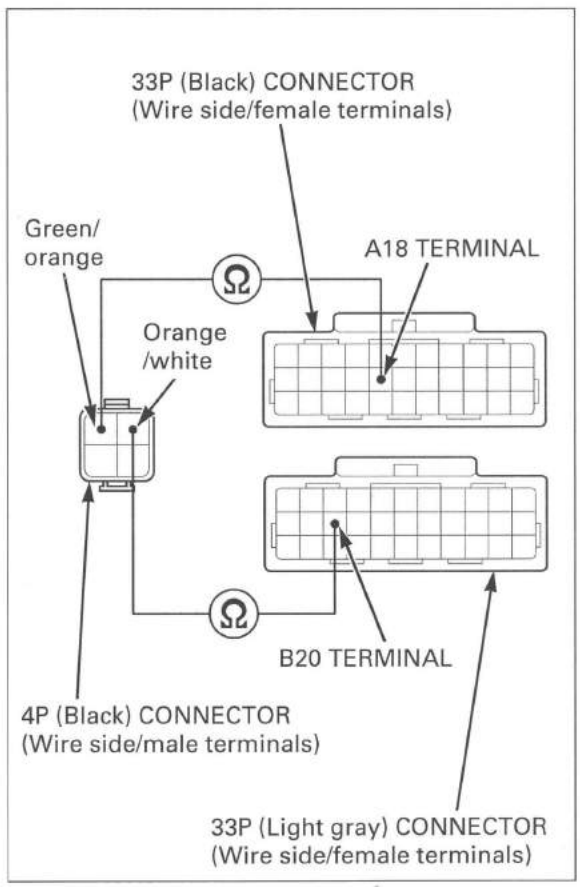
   CONNECTION: A18 – Green/orange
   B20 – Orange/white

   TOOL:
   Test probe **07ZAJ-RDJA110**

   Are there continuities?

   YES – GO TO STEP 3.

   NO – • Open circuit in Green/orange wire
   • Open circuit in Orange/white wire



3. **O_2 Sensor Short Circuit Inspection**

Connect the O_2 sensor 4P (Black) connector.

Check for continuity between the ECM 33P (Light gray) connector of the wire harness side and ground.

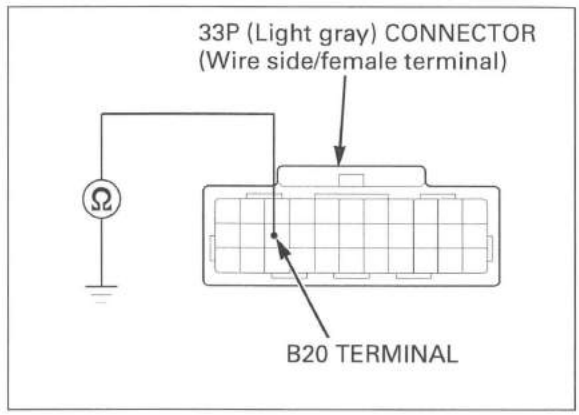
CONNECTION: B20 – Ground

TOOL:
Test probe **07ZAJ-RDJA110**

Is there continuity?

YES – Short circuit in the Orange/white wire

NO – GO TO STEP 4.



4. **O_2 Sensor Inspection**

Connect the ECM 33P connectors.
Replace the O_2 sensor with a known good one (page 5-100).

Clear the ECM self-diagnosis memory data (page 5-14).

Start the engine and warm the engine up to coolant temperature is 80 °C (176 °F).

Test-ride the motorcycle and check the O_2 sensor with the HDS pocket tester.

Is the DTC 21-1 indicated?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

NO – Faulty original O_2 sensor

DTC 23-1 (O_2 SENSOR HEATER)

- Before starting the inspection, check for loose or poor contact on the O_2 sensor 4P (Black) connector and ECM 33P connectors, then recheck the DTC.

1. **O_2 Sensor Heater System Inspection**

Clear the ECM self-diagnosis memory data (page 5-14).

Start the engine and check the O_2 sensor heater with the HDS pocket tester.

Is the DTC 23-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. O_2 Sensor Heater Resistance Inspection

Turn the ignition switch OFF.

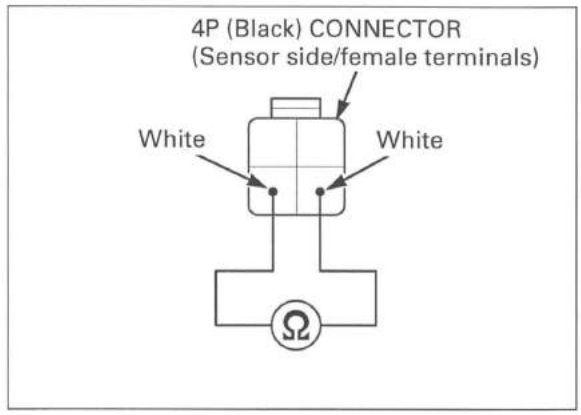
Disconnect the O_2 sensor 4P (Black) connector and measure the resistance at the O_2 sensor connector terminals of the sensor side.

CONNECTION: White – White

Is the resistance within 10 – 40 Ω (20°C/68°F)?

YES – GO TO STEP 3.

NO – Faulty O_2 sensor



3. O_2 Sensor Heater Power Input Line Inspection

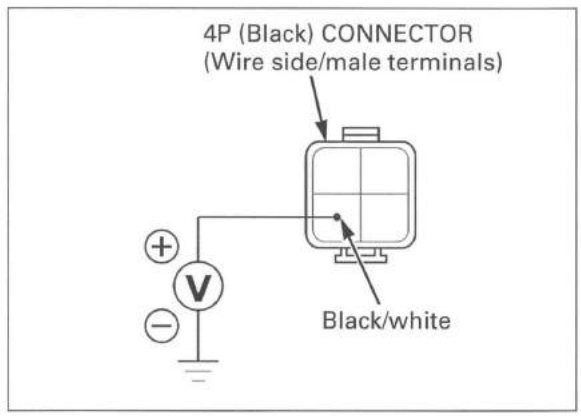
Turn the ignition switch ON and engine stop switch "○".
Measure the voltage between O_2 sensor 4P (Black) connector of the wire harness side and ground.

CONNECTION: Black/white (+) – Ground (–)

Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in the Black/white wire



4. O_2 Sensor Heater Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Light gray) connector. Check the continuity between the ECM 33P (Light gray) connector and O_2 sensor 4P (Black) connector of the wire harness side.

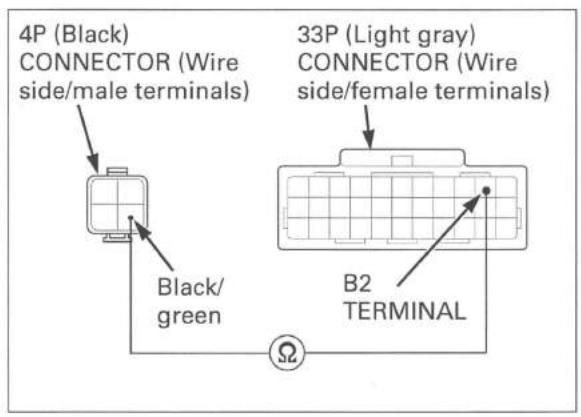
CONNECTION: B2 – Black/green

TOOL:
Test probe **07ZAJ-RDJA110**

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Black/green wire



5. O_2 Sensor Heater Short Circuit Inspection 2

Connect the ECM 33P (Light gray) connector.

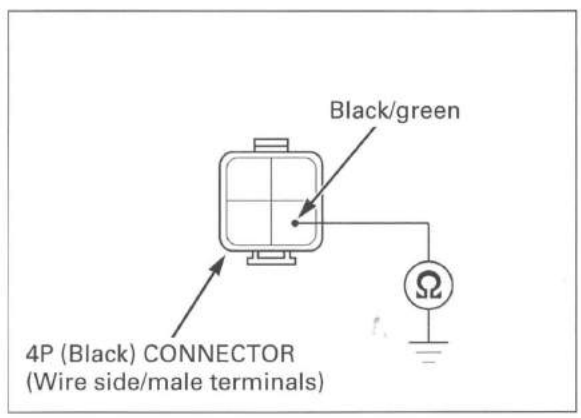
Check for continuity between the O_2 sensor heater 4P (Black) connector of the wire harness side and ground.

CONNECTION: Black/green – Ground

Is there continuity?

YES – Short circuit in Black/green wire

NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)



DTC 29-1 (IACV)

- Before starting the inspection, check for loose or poor contact on the IACV 4P (Black) connector and ECM 33P connectors, then recheck the DTC.

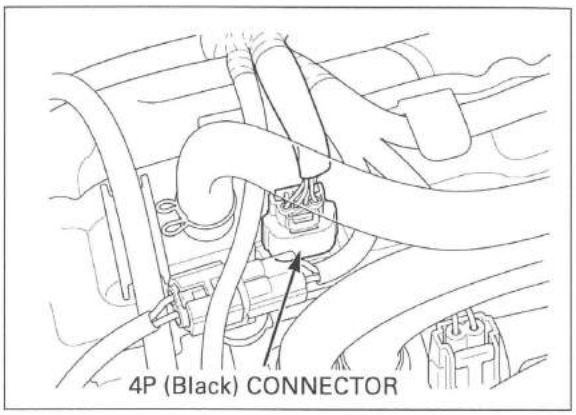
1. Recheck DTC

Clear the ECM self-diagnosis memory data (page 5-14).
Start the engine and check the IACV with the HDS pocket tester.

Is the DTC 29-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure



2. IACV Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the IACV 4P (Black) connector.

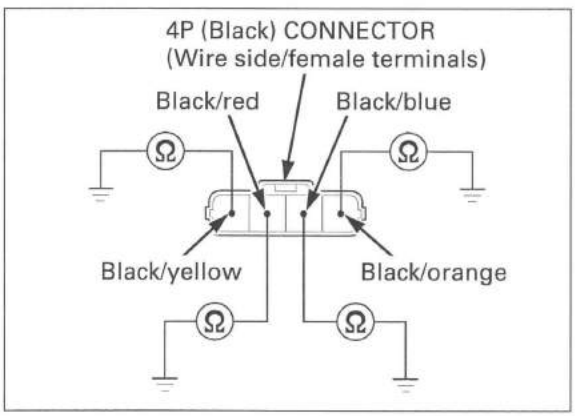
Check for continuities between the IACV 4P (Black) connector and ground.

CONNECTION: Black/yellow – Ground
Black/red – Ground
Black/blue – Ground
Black/orange – Ground

Are there continuities?

YES – • Short circuit in Black/yellow or Black/orange wire
• Short circuit in Black/red or Black/blue wire

NO – GO TO STEP 3.



3. IACV Circuit Continuity Inspection

Disconnect the ECM 33P (Black) connector.
Check the continuities between the ECM 33P (Black) connector terminals and the IACV 4P (Black) connector terminals.

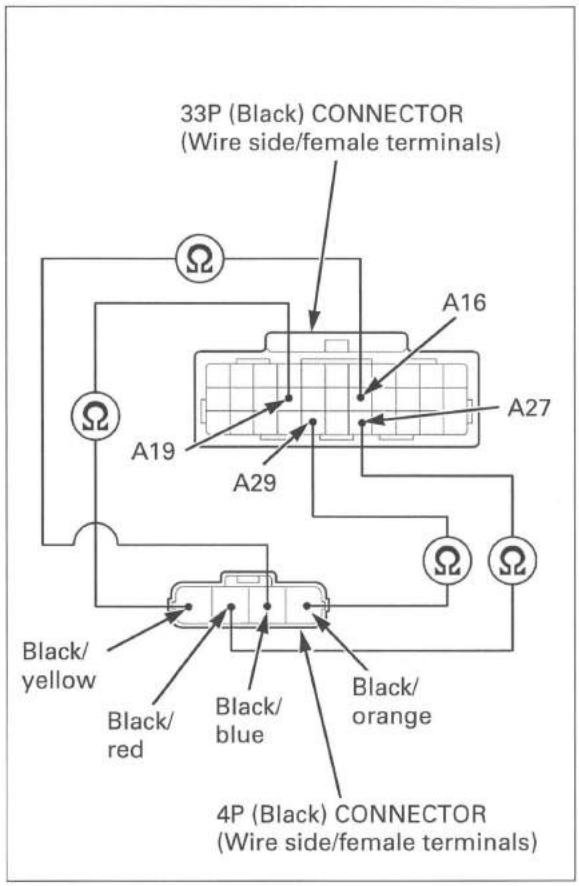
CONNECTION: A19 – Black/yellow
A27 – Black/red
A16 – Black/blue
A29 – Black/orange

TOOL:
Test probe **07ZAJ-RDJA110**

Are there continuities?

YES – GO TO STEP 4.

NO – • Open circuit in Black/yellow or Black/red wire
• Open circuit in Black/blue or Black/orange wire



4. IACV Resistance Inspection

Measure the resistance at the IACV 4P (Black) connector terminals.

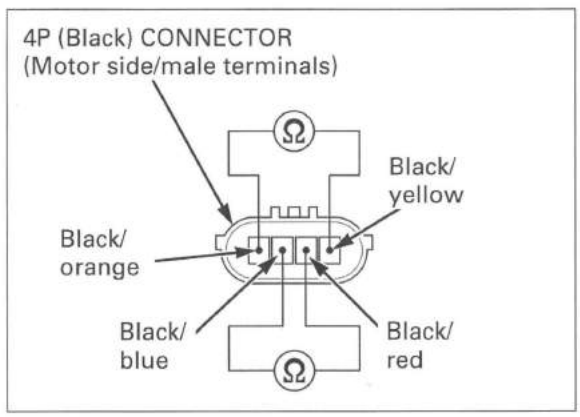
CONNECTION: Black/yellow – Black/orange
Black/red – Black/blue

STANDARD: 99 – 121 Ω (20 °C/68 °F)

Is the resistance within 99 – 121 Ω (20°C/68°F)?

YES – Replace the ECM with new one, and recheck; refer to Key Registration Procedures (page 21-6)

NO – Faulty IACV



DTC 33-2 (EEPROM)

1. Recheck DTC

Clear the ECM self-diagnosis memory data (page 5-14).
Turn the ignition switch ON and engine stop switch "◯".
Recheck the ECM EEPROM

Is the DTC 33-2 indicated?

YES – Replace the ECM with new one, and recheck; refer to Key Registration Procedures (page 21-6)

NO – Intermittent failure

MIL TROUBLESHOOTING

MIL 1 BLINK (MAP SENSOR)

- Before starting the inspection, check for loose or poor contact on the MAP sensor 3P (Black) connector and ECM 33P connectors, then recheck the MIL blinking.

1. MAP Sensor Output Voltage Inspection

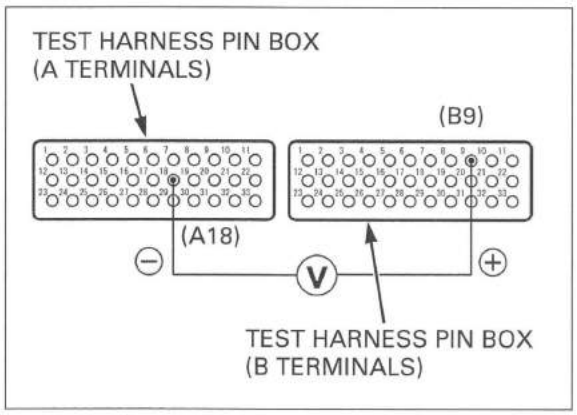
Turn the ignition switch OFF.
Connect the ECM test harness to ECM connectors (page 5-14).
Turn the ignition switch ON and engine stop switch "◯".
Measure the voltage at the test harness terminals.

CONNECTION: B9 (+) – A18 (–)

Is the voltage within 2.7 – 3.1 V?

YES – Intermittent failure

NO – • About 5 V
GO TO STEP 2.
• About 0 V
GO TO STEP 3.



2. MAP Sensor Output Line Inspection

Turn the ignition switch OFF.
Disconnect the MAP sensor 3P (Black) connector.

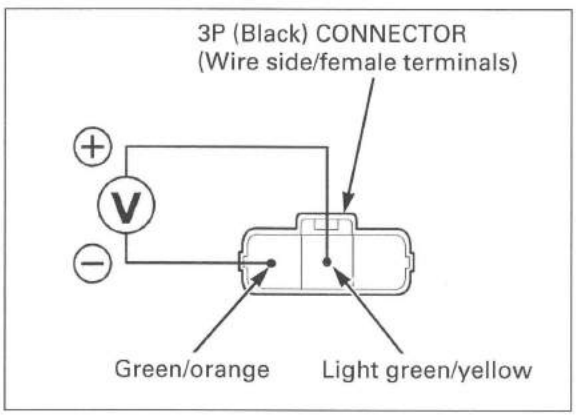
Turn the ignition switch ON and engine stop switch "◯".
Measure the voltage at the wire harness side.

CONNECTION: Light green/yellow (+) – Green/orange (–)

Is the voltage within 2.7 – 3.1 V?

YES – Faulty MAP sensor

NO – • Open circuit in Light green/yellow wire
• Open circuit in Green/orange wire



3. MAP Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the MAP sensor 3P (Black) connector.

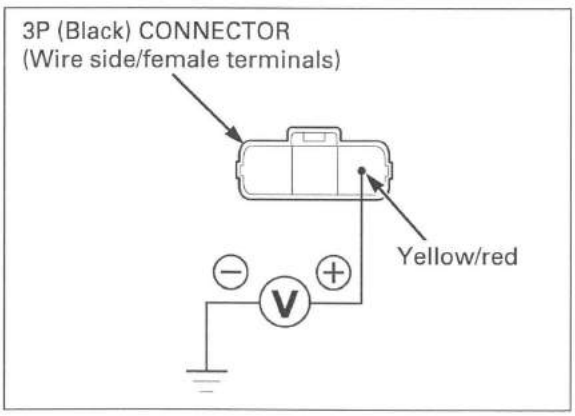
Turn the ignition switch ON and engine stop switch "◯".
Measure the voltage at the wire harness side.

CONNECTION: Yellow/red (+) – Ground (–)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 4.

NO – GO TO STEP 5.



4. **MAP Sensor Output Line Short Circuit Inspection**

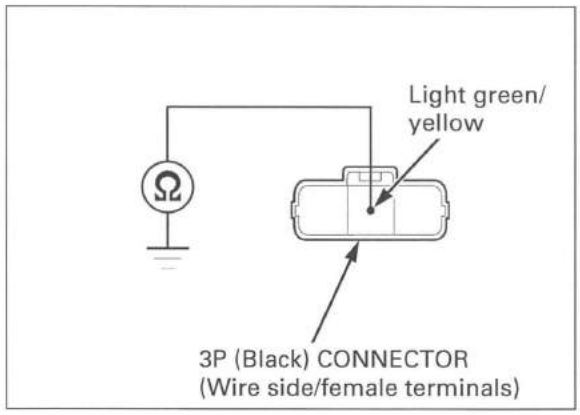
Turn the ignition switch OFF.
Check for continuity between the MAP sensor 3P (Black) connector terminal of the wire harness side and ground.

CONNECTION: Light green/yellow – Ground

Is there continuity?

YES – Short circuit in Light green/yellow wire

NO – Faulty MAP sensor



5. **MAP Sensor Input Line Inspection**

Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector.

Check the continuity at the Yellow/red wire between the MAP sensor 3P (Black) connector terminal and test harness terminal.

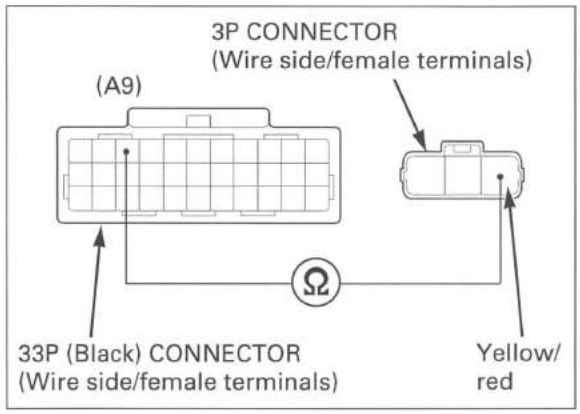
CONNECTION: A9 – Yellow/red

TOOL:
Test probe **07ZAJ-RDJA110**

Is there continuity?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

NO – Open circuit in Yellow/red wire



MIL 2 BLINKS (MAP SENSOR HOSE CONNECTION)

- Before starting the inspection, check for loose or poor contact on the MAP sensor 3P (Black) connector and ECM 33P connectors, then recheck the MIL blinking.

1. **MAP Sensor Hose Inspection**

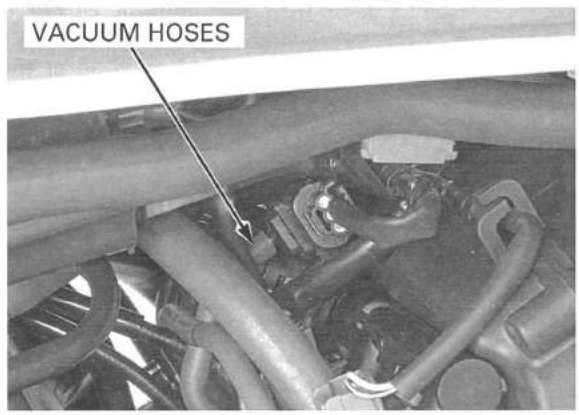
Turn the ignition switch OFF.

Check the connection and installation of the MAP sensor vacuum hoses.

Is the MAP sensor hose connection correct?

YES – GO TO STEP 2.

NO – Correct the hose connection or installation



2. MAP Sensor Output Voltage Inspection

Connect the ECM test harness to ECM connectors (page 5-14).

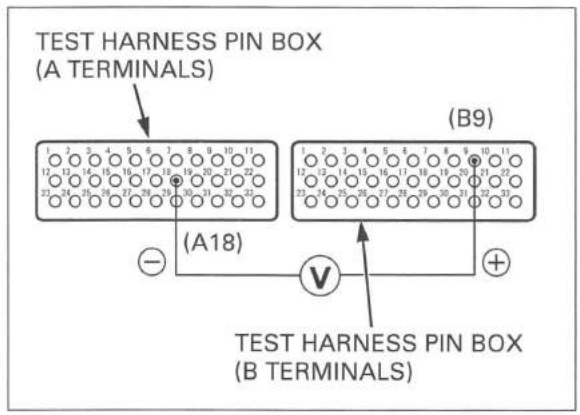
Turn the ignition switch ON and engine stop switch "◯".
Measure the voltage at the test harness terminals.
The MAP sensor voltage should be changed after engine started.

CONNECTION: B9 (+) – A18 (–)

Is the voltage within 2.7 – 3.1 V?

YES – GO TO STEP 3.

NO – Faulty MAP sensor



3. MAP Sensor Output Voltage Inspection At Idle

Start the engine.

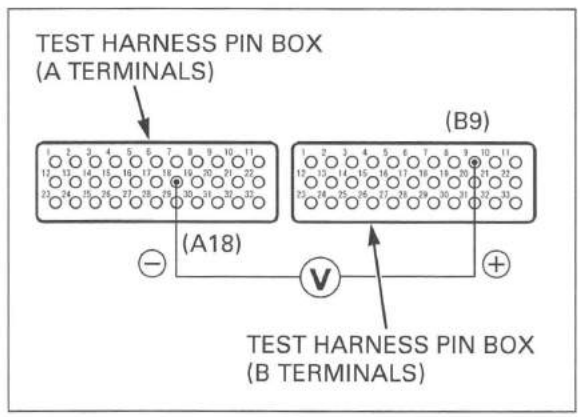
Measure the voltage at the test harness terminals.

CONNECTION: B9 (+) – A18 (–)
STANDARD: 2.7 V maximum

Is the voltage less than 2.7 V?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

NO – Faulty MAP sensor



MIL 7 BLINKS (ECT SENSOR)

- Before starting the inspection, check for loose or poor contact on the ECT sensor 3P (Black) connector and ECM 33P connectors, then recheck the MIL blinking.

1. ECT Sensor Output Voltage Inspection

Turn the ignition switch OFF.
Connect the test harness to ECM 33P connectors (page 5-14).

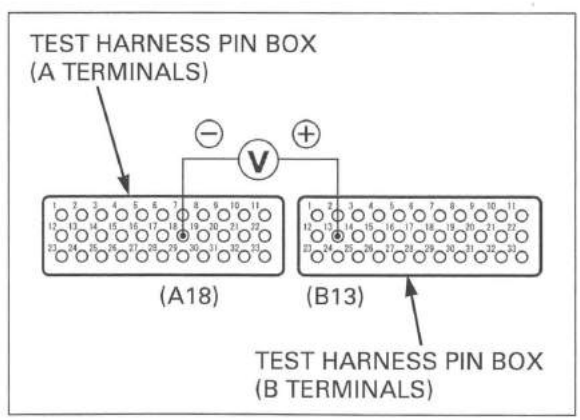
Turn the ignition switch ON and engine stop switch "◯".
Measure the voltage at the test harness terminals.

CONNECTION: B13 (+) – A18 (–)
STANDARD: 2.7 – 3.1 V (20°C/68°F)

Is the voltage within 2.7 – 3.1 V?

YES – Intermittent failure

NO – GO TO STEP 2.



2. ECT Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the ECT sensor 3P (Black) connector.

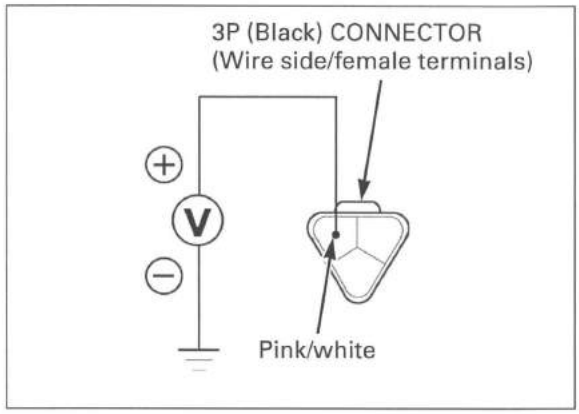
Turn the ignition switch ON and engine stop switch "◯".
Measure the voltage at the test harness terminal and ground.

CONNECTION: Pink/white (+) – Ground (–)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 3.

NO – GO TO STEP 4.



3. ECT Sensor Resistance Inspection

Turn the ignition switch OFF.

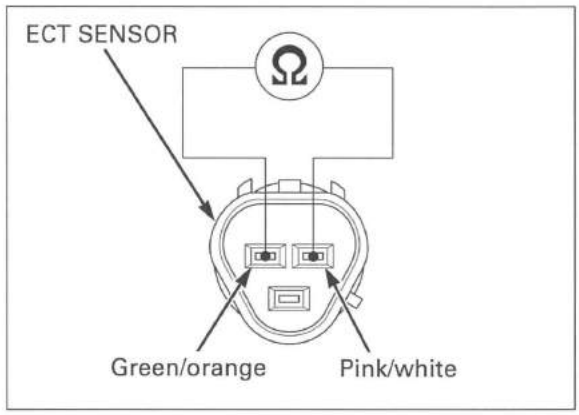
Measure the resistance at the ECT sensor terminals.

CONNECTION: Pink/white – Green/orange (Sensor side terminals)
STANDARD: 2.3 – 2.6 kΩ (20°C/68°F)

Is the resistance within 2.3 – 2.6 kΩ (20°C/68°F)?

YES – GO TO STEP 4.

NO – Faulty ECT sensor.



4. ECT Sensor Open Circuit Inspection

Turn the ignition switch OFF.

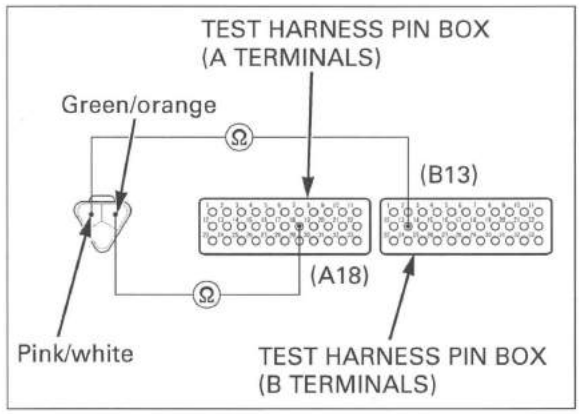
Check the continuity between the test harness terminals and ECT sensor 3P (Black) connector of the wire harness side.

CONNECTION: B13 – Pink/white
A18 – Green/orange

Is there continuity?

YES – GO TO STEP 5.

NO – • Open circuit in Pink/white wire
• Open circuit in Green/orange wire



5. ECT Sensor Short Circuit Inspection

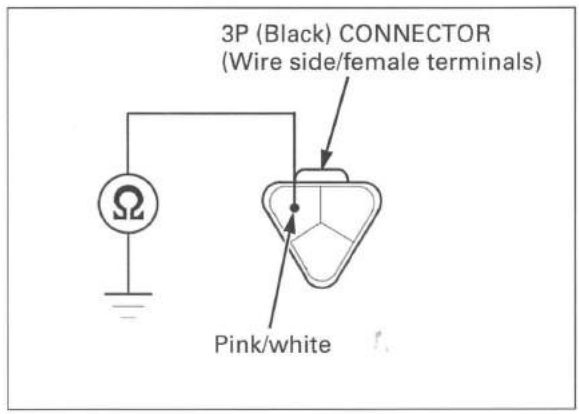
Check for continuity between the ECT sensor 3P (Black) connector of the wire harness side and ground.

CONNECTION: Pink/white – Ground

Is there continuity?

YES – Short circuit in Pink/white wire

NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)



MIL 8 BLINKS (TP SENSOR)

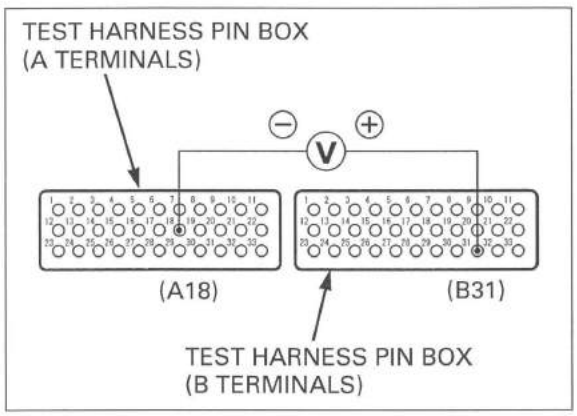
- Before starting the inspection, check for loose or poor contact on the TP sensor 3P (Black) connector and ECM 33P connectors, then recheck the MIL blinking.

1. TP Sensor Output Voltage

Turn the ignition switch OFF.
Connect the ECM test harness to ECM connectors (page 5-14).

Turn the ignition switch ON and engine stop switch "◯".
Measure the TP sensor output voltage at the test harness terminals.

CONNECTION: B31 (+) – A18 (–)
STANDARD: *0.4 – 0.6 V (throttle fully closed)
***4.2 – 4.8 V (throttle fully opened)**



NOTE:

- A voltage marked * refers to the value of the ECM output voltage (STEP 3) when the voltage reading shows 5 V.
  When the ECM output voltage reading shows other than 5 V, derive the TP sensor output voltage at the test harness as follows:
  In the case of the ECM output voltage is 4.75 V:
  0.4 X 4.75/5.0 = 0.38 V
  0.6 X 4.75/5.0 = 0.57 V
  Thus, the solution is "0.38 – 0.57 V" with the throttle fully closed.
  Replace 0.4 and 0.6 with 4.2 and 4.8 respectively, in the above equations to determine the throttle fully opened range.

Is there standard voltage?

YES – Intermittent failure

NO – GO TO STEP 2.

2. TP Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the TP sensor 3P (Black) connector.

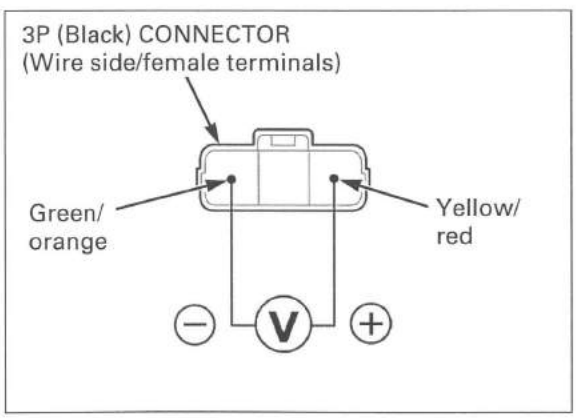
Turn the ignition switch ON and engine stop switch "◯".
Measure the voltage at the wire harness side.

CONNECTION: Yellow/red (+) – Green/orange (–)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 4.

NO – GO TO STEP 3.



3. ECM Output Voltage Inspection

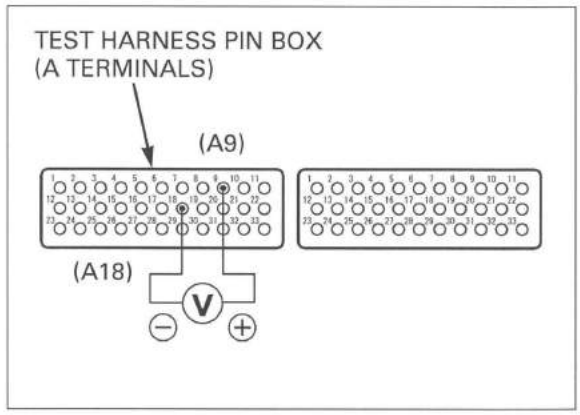
Turn the ignition switch ON and engine stop switch "◯".
Measure the voltage at the test harness terminals.

CONNECTION: A9 (+) – A18 (–)

Is the voltage within 4.75 – 5.25 V?

YES – • Open circuit in Yellow/red wire
• Open circuit in Green/orange wire

NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)



4. TP Sensor Output Line Inspection

Turn the ignition switch OFF.

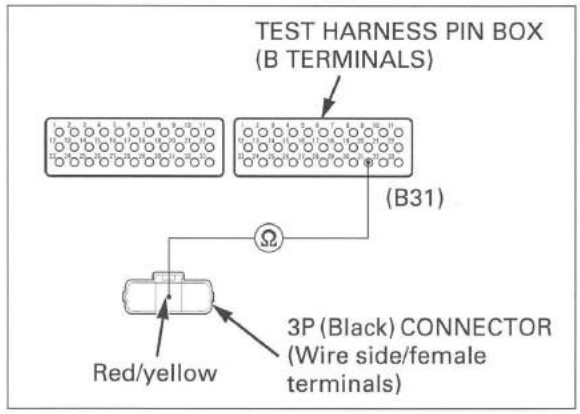
Check the continuity between the TP sensor 3P (Black) connector terminal of the wire harness side and the test harness terminal.

CONNECTION: Red/yellow – B31

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Red/yellow wire



5. TP Sensor Output Line Short Circuit Inspection

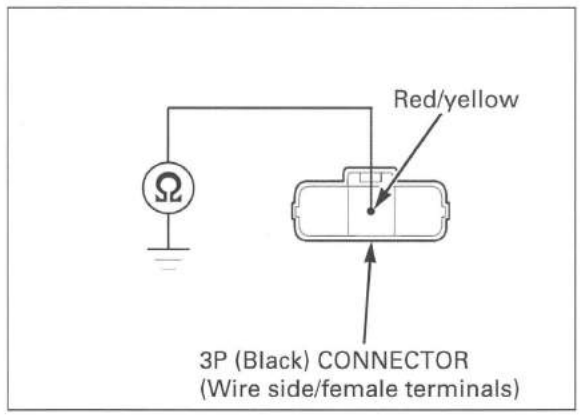
Check for continuity between the TP sensor 3P (Black) connector terminal of the wire harness side and ground.

CONNECTION: Red/yellow – Ground

Is there continuity?

YES – Short circuit in Red/yellow wire

NO – Faulty TP sensor



MIL 9 BLINKS (IAT SENSOR)

- Before starting the inspection, check for loose or poor contact on the IAT sensor 2P (Gray) connector and ECM 33P connectors, then recheck the MIL blinking.

1. IAT Sensor Output Voltage Inspection

Turn the ignition switch OFF.
Connect the ECM test harness to ECM connectors (page 5-14).

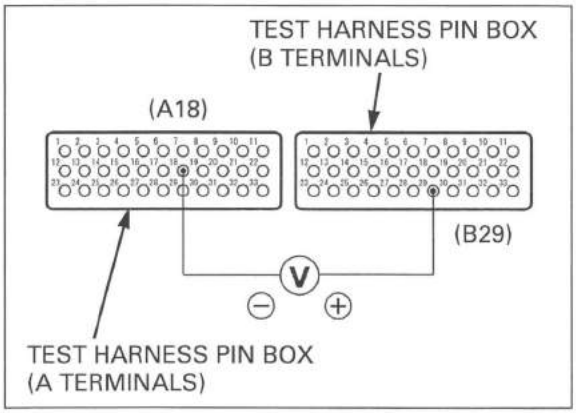
Turn the ignition switch ON and engine stop switch "◯".
Measure the voltage at the test harness terminals.

CONNECTION: B29 (+) – A18 (–)
STANDARD: 2.7 – 3.1 V (20°C/68°F)

Is the voltage within 2.7 – 3.1 V?

YES – Intermittent failure

NO – GO TO STEP 2.



2. IAT Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the IAT sensor 2P (Gray) connector.

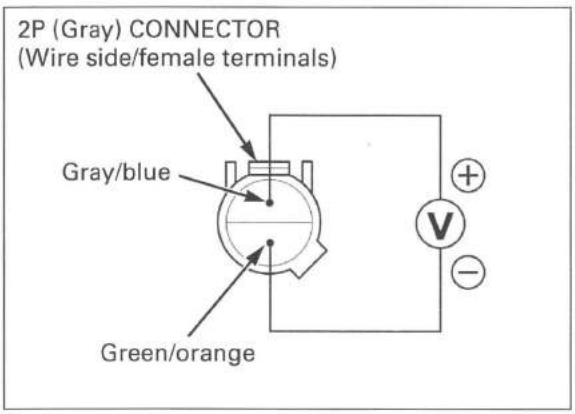
Turn the ignition switch ON and engine stop switch "◯".
Measure the voltage at the wire harness side of IAT sensor connector.

CONNECTION: Gray/blue (+) – Green/orange (–)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 3.

NO – GO TO STEP 4.



3. IAT Sensor Resistance Inspection

Turn the ignition switch OFF.

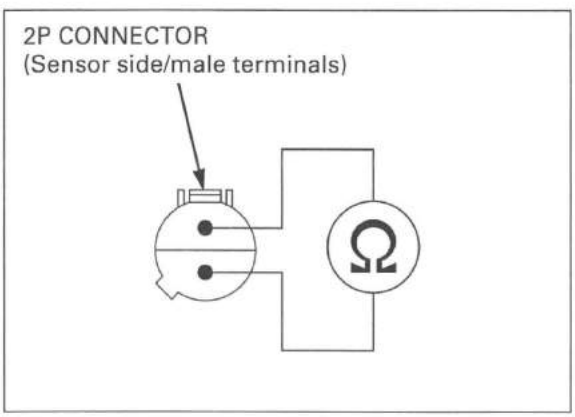
Measure the resistance at the IAT sensor terminals (at 20 – 30°C/68 – 86°F).

STANDARD: 1 – 4 kΩ (20 – 30°C/68 – 86°F)

Is the resistance within 1 – 4 kΩ?

YES – GO TO STEP 4.

NO – Faulty IAT sensor.



4. IAT Sensor Open Circuit Inspection

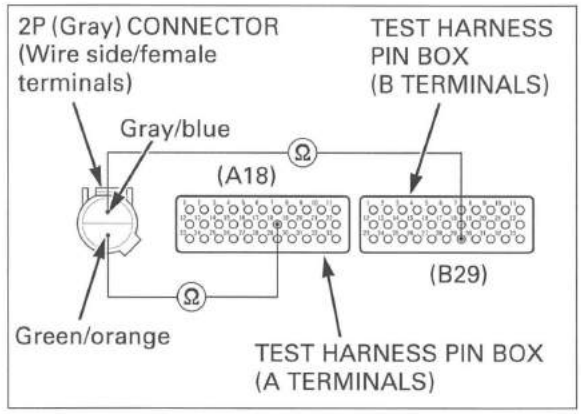
Turn the ignition switch OFF.
Check for continuity at the Gray/blue and Green/orange wires between the IAT sensor 2P (Gray) connector terminal and the test harness terminals.

CONNECTION: Gray/blue – B29
Green/orange – A18

Are there continuities?

YES – GO TO STEP 5.

NO – • Open circuit in Gray/blue wire
• Open circuit in Green/orange wire



5. IAT Sensor Output Line Short Circuit Inspection

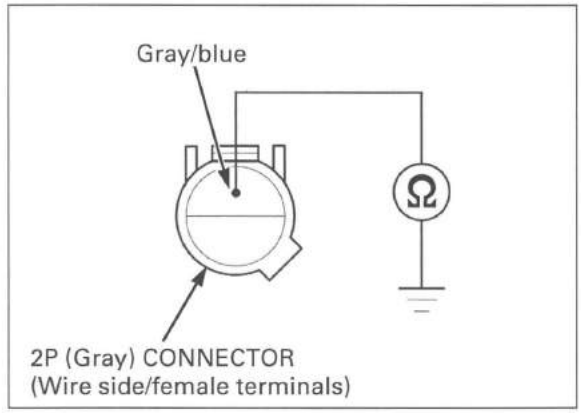
Check for continuity between the IAT sensor 2P (Gray) connector terminal of the wire harness side and ground.

CONNECTION: Gray/blue – Ground

Is there continuity?

YES – Short circuit in Gray/blue wire

NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)



MIL 11 BLINKS (VS SENSOR)

- Before starting the inspection, check for loose or poor contact on the VS sensor 3P (Black) connector and ECM 33P connectors, then recheck the MIL blinking.

1. VS Sensor Pulse Inspection

Turn the ignition switch OFF.
Connect the ECM test harness to the ECM connectors (page 5-14).

Support the motorcycle securely, raise the rear wheel off the ground.
Turn the ignition switch ON and engine stop switch "○".

Shift the transmission into gear.

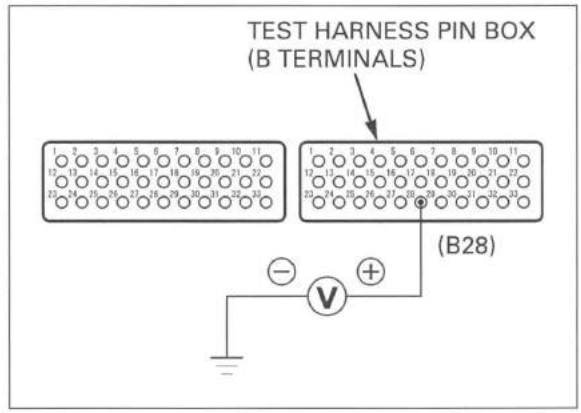
Measure the voltage at the test harness terminals while slowly turning the rear wheel by hand.

CONNECTION: B28 (+) – Ground (–)
STANDARD: Repeat 0 to 5 V

Is there standard voltage?

YES – Intermittent failure

NO – GO TO STEP 2.



2. **Combination Meter Inspection**

   Check for operation of combination meter.

   Does the combination meter operate normally?

   YES – Open or short circuit in Pink/blue wire between the VS sensor and ECM.

   NO – GO TO STEP 3.

3. **VS Sensor Input Voltage Inspection**

   Turn the ignition switch OFF.
   Disconnect the VS sensor 3P (Black) connector.

   Turn the ignition switch ON and engine stop switch "○".

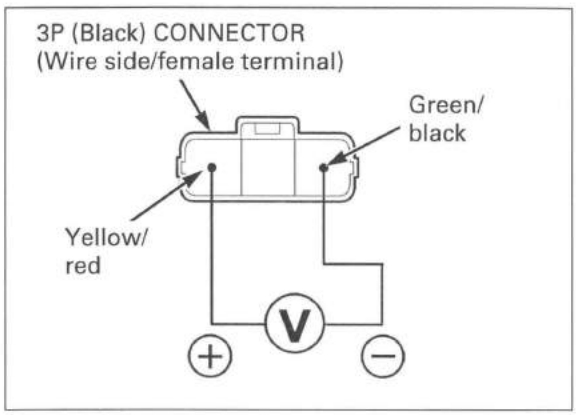
   Measure the voltage at the VS sensor connector of the wire harness side.

   CONNECTION: Yellow/red (+) – Green/black (–)

   Is there battery voltage?

   YES – GO TO STEP 4.

   NO – • Open circuit in Yellow/red wire
   • Open circuit in Green/black wire



4. **VS Sensor Pulse Line Open Circuit Inspection**

   Turn the ignition switch OFF.

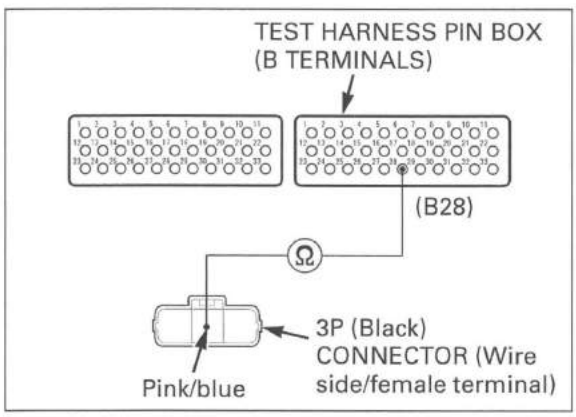
   Check the continuity between the test harness terminal and VS sensor connector of the wire harness side.

   CONNECTION: B28 – Pink/blue

   Is there continuity?

   YES – GO TO STEP 5.

   NO – Open circuit in Pink/blue wire



5. **VS Sensor Pulse Line Short Circuit Inspection**

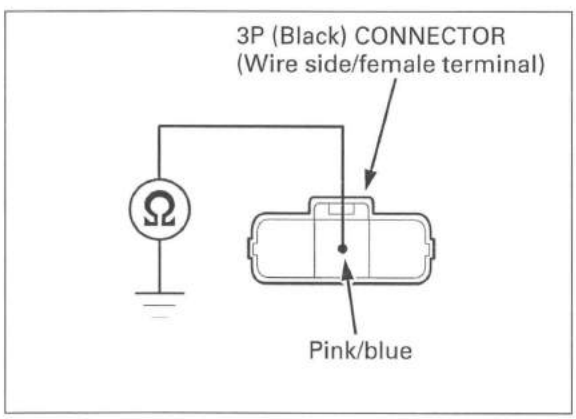
   Check for continuity between the VS sensor connector and the ground.

   CONNECTION: Pink/blue – Ground

   Is there continuity?

   YES – Short circuit in the Pink/blue wire

   NO – Inspect the VS sensor (page 20-13)



MIL 12 BLINKS (No.1 INJECTOR)

- Before starting the inspection, check for loose or poor contact on the injector 2P (Gray) connectors and ECM 33P connectors, then recheck the MIL blinking.

MIL	INJEC-TOR	POWER INPUT LINE	SIGNAL LINE	SIGNAL AT ECM
12	No.1	Black/white	Pink/yellow	A17
13	No.2	Black/white	Pink/blue	A6
14	No.3	Black/white	Pink/green	A8
15	No.4	Black/white	Pink/black	A7

1. Injector Input Voltage Inspection

Disconnect the injector 2P (Gray) connector.
Turn the ignition switch ON and engine stop switch to "◯".

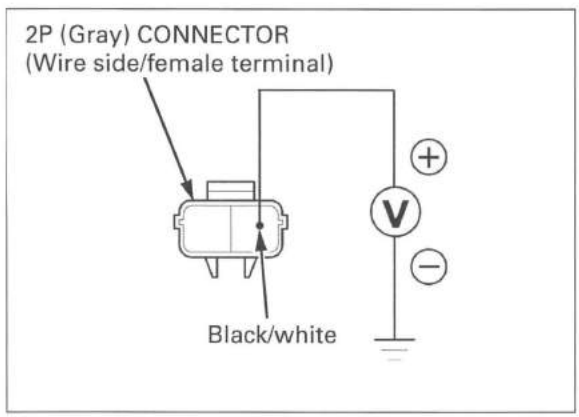
Measure the voltage between the injector 2P (Gray) connector of the wire harness side and ground.

CONNECTION: Black/white (+) – Ground (–)

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open circuit in Black/white wire



2. Injector Resistance Inspection

Turn the ignition switch OFF.

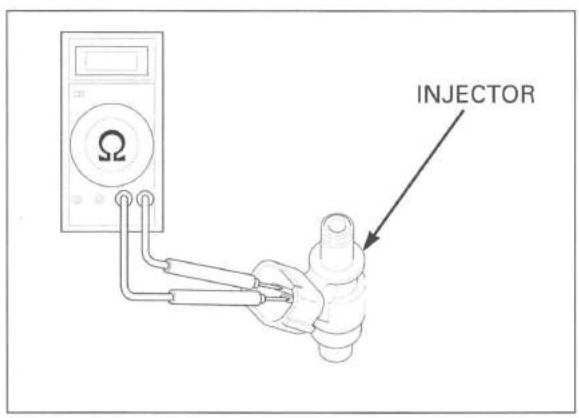
Measure the resistance of the injector connector terminals.

STANDARD: 11 – 13 Ω (20 °C/68 °F)

Is the resistance within 11 – 13 Ω (20°C/68°F)?

YES – GO TO STEP 3.

NO – Faulty injector



3. Injector Signal Line Open Circuit Inspection

Connect the ECM test harness to the ECM connectors (page 5-14).

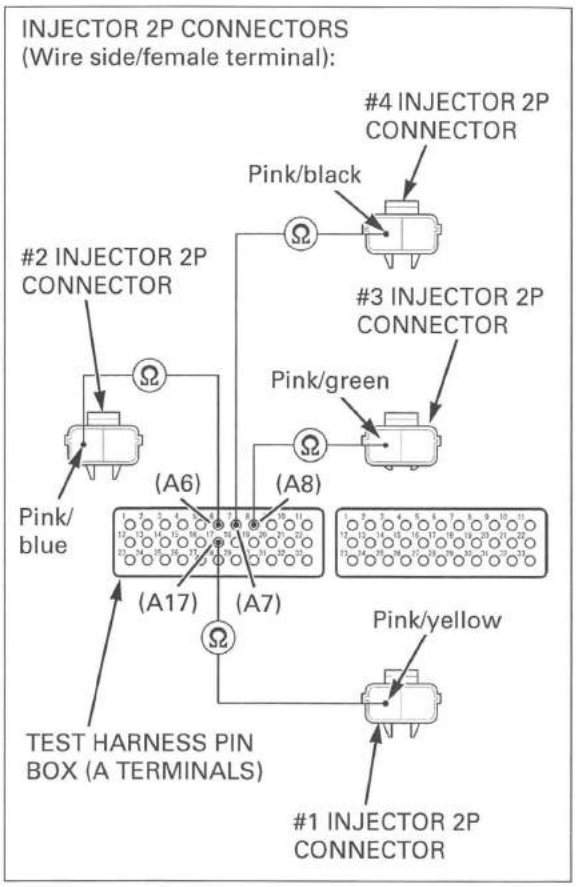
Connect the continuity between the test harness terminal and injector 2P (Gray) connector of the wire harness side.

CONNECTION: SIGNAL LINE – SIGNAL LINE

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in SIGNAL line wire



4. Injector Signal Line Short Circuit Inspection

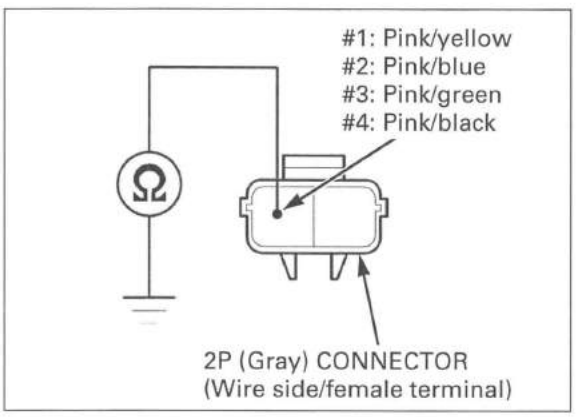
Check for continuity between the injector 2P (Gray) connector of the wire harness side and ground.

CONNECTION: SIGNAL LINE – Ground

Is there continuity?

YES – Short circuit in SIGNAL line wire

NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)



MIL 13 BLINKS (No.2 INJECTOR)

(page 5-45)

MIL 14 BLINKS (No.3 INJECTOR)

(page 5-45)

MIL 15 BLINKS (No.4 INJECTOR)

(page 5-45)

MIL 21 BLINKS (O_2 SENSOR)

- Before starting the inspection, check for loose or poor contact on the O_2 sensor 4P (Black) connector and ECM 33P connectors, then recheck the MIL blinking.

1. **O_2 Sensor System Inspection**

   Start the engine and warm it up to coolant temperature is 80 °C (176 °F).

   Test-ride the motorcycle and recheck the MIL blinking.

   Is the MIL 21 blinks?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **O_2 Sensor Open Circuit Inspection**

   Turn the ignition switch OFF.
   Connect the ECM test harness to the ECM connectors (page 5-14).

   Disconnect the O_2 sensor 4P (Black) connector.

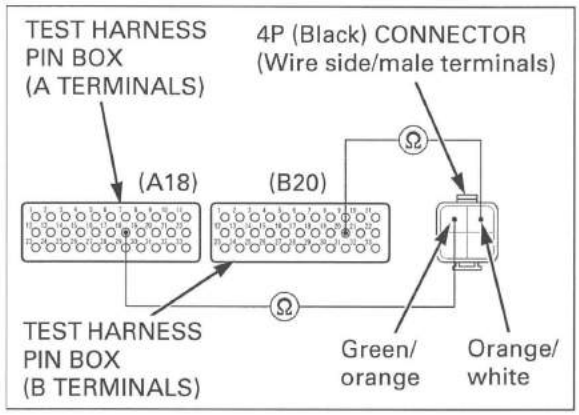
   Check the continuity between the test harness terminals and the O_2 sensor connector terminals of the wire harness side.

   CONNECTION: B20 – Orange/white
   A18 – Green/orange

   Are there continuities?

   YES – GO TO STEP 3.

   NO – • Open circuit in Orange/white wire
   • Open circuit in Green/orange wire



3. **O_2 Sensor Short Circuit Inspection**

   Connect the O_2 Sensor 4P (Black) connector.

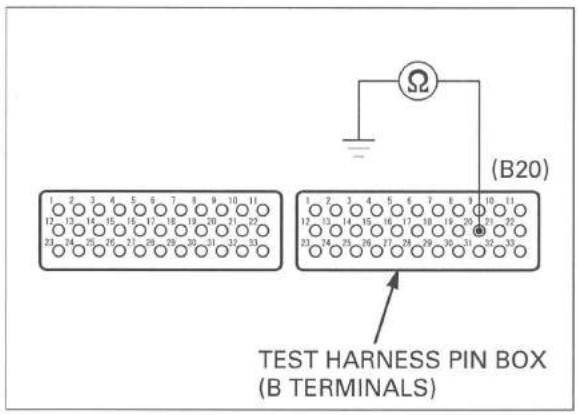
   Check for continuity between the test harness terminal and ground.

   CONNECTION: B20 – Ground

   Is there continuity?

   YES – Short circuit in the Orange/white wire

   NO – GO TO STEP 4.



4. **O_2 Sensor Inspection**

   Replace the O_2 sensor with a known good one (page 5-100).

   Start the engine and warm it up until the coolant temperature is 80 °C (176 °F).

   Test-ride the motorcycle and recheck the MIL blinking.

   Is the MIL 21 blinks?

   YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

   NO – Faulty original O_2 sensor

MIL 23 BLINKS (O_2 SENSOR HEATER)

- Before starting the inspection, check for loose or poor contact on the O_2 sensor 4P (Black) connector and ECM 33P connectors, then recheck the MIL blinking.

1. O_2 Sensor Heater Resistance Inspection

Turn the ignition switch OFF.

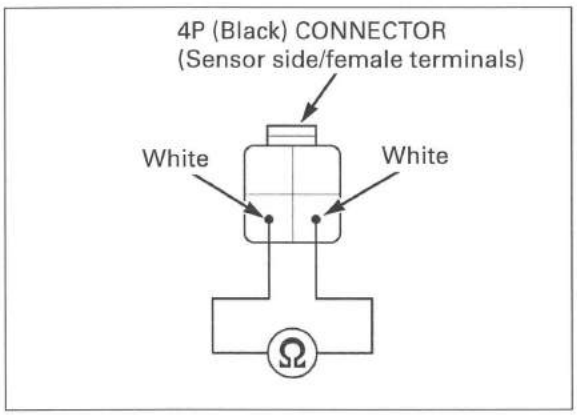
Disconnect the O_2 sensor 4P (Black) connector. Measure the resistance at the sensor side connector white wire terminals.

CONNECTION: White – White

Is the resistance within 10 – 40 Ω (20°C/68°F)?

YES – GO TO STEP 2.

NO – Faulty O_2 sensor



2. O_2 Sensor Heater Open Circuit Inspection 1

Turn the ignition switch ON and engine stop switch "◯".

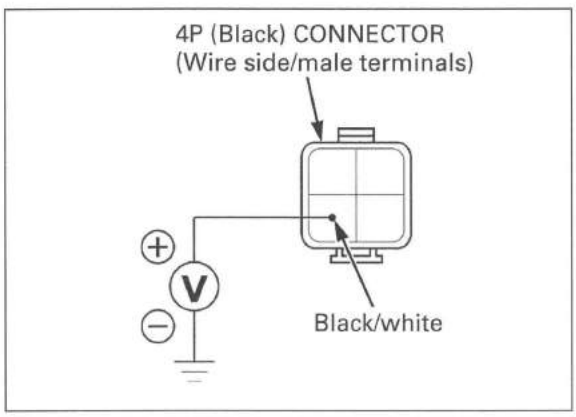
Measure the voltage at the O_2 sensor 4P (Black) connector of the wire harness side.

CONNECTION: Black/white (+) – Ground (–)

Is there battery voltage?

YES – GO TO STEP 3.

NO – Open circuit in Black/white wire



3. O_2 Sensor Heater Open Circuit Inspection 2

Turn the ignition switch OFF.
Connect the ECM test harness to the ECM connectors (page 5-14).

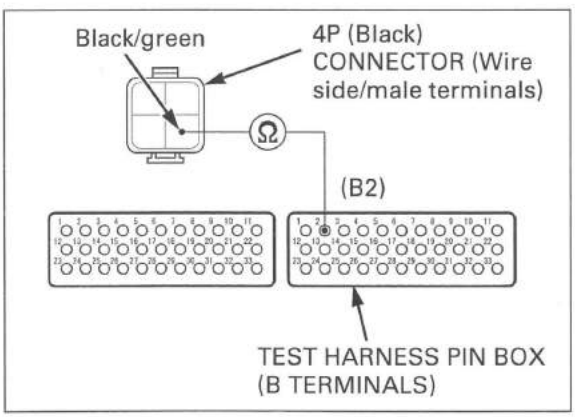
Check the continuity between the test harness terminal and O_2 sensor 4P (Black) connector of the wire harness side.

CONNECTION: B2 – Black/green

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in Black/green wire



4. O_2 Sensor Heater Short Circuit Inspection

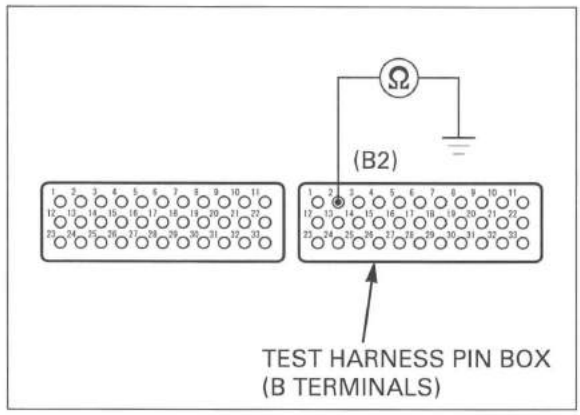
Check for continuity between the test harness terminals and ground.

CONNECTION: B2 – Ground

Is there continuity?

YES – Short circuit in the Black/green wire

NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)



MIL 29 BLINKS (IACV)

- Before starting the inspection, check for loose or poor contact on the IACV 4P (Black) connector and ECM 33P connectors, then recheck the MIL blinking.

1. IACV Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the IACV 4P (Black) connector.

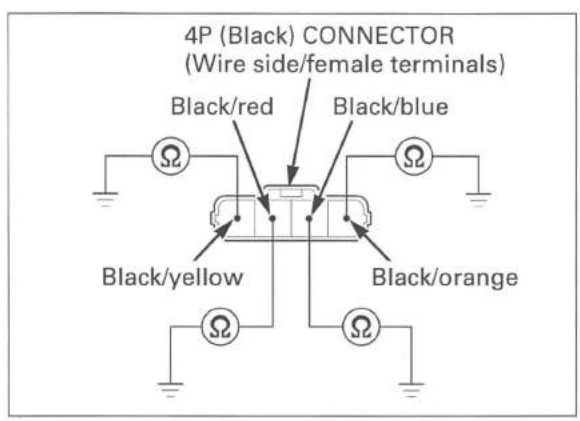
Check for continuities between the IACV 4P (Black) connectors and ground.

CONNECTION: Black/yellow – Ground
Black/red – Ground
Black/blue – Ground
Black/orange – Ground

Are there continuities?

YES – • Short circuit in Black/yellow or Black/orange wire
• Short circuit in Black/red or Black/blue wire

NO – GO TO STEP 2.



2. IACV Circuit Continuity Inspection

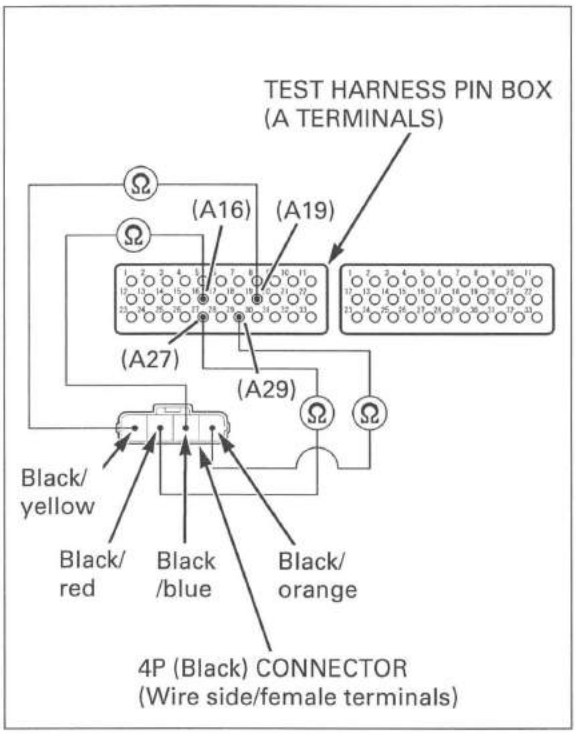
Connect the ECM test harness to the ECM connectors (page 5-14).
Check the continuities between the test harness and the IACV 4P (Black) connector.

CONNECTION: A19 – Black/yellow
A27 – Black/red
A16 – Black/blue
A29 – Black/orange

Are there continuities?

YES – GO TO STEP 3.

NO – • Open circuit in Black/yellow or Black/orange wire
• Open circuit in Black/red or Black/blue wire



3. IACV Resistance Inspection

Connect the IACV 4P connector.
Measure the resistance at the test harness terminals.

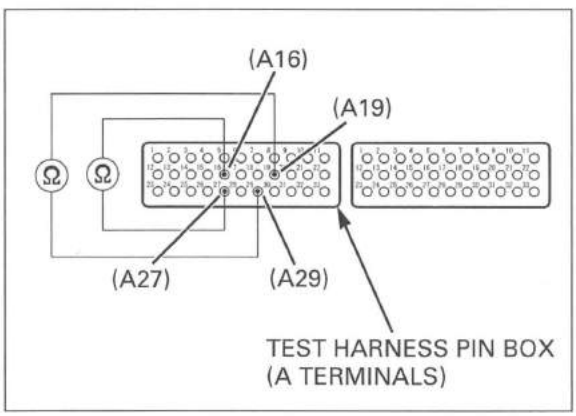
CONNECTION: A19 – A29
A16 – A27

STANDARD: 99 – 121 Ω (20 °C/68 °F)

Is the resistance within 99 – 121 Ω (20 °C/68 °F)?

YES – Replace the ECM with a new one, and recheck; refer to Key Registration Procedures (page 21-6)

NO – Faulty throttle body (IACV)



MIL CIRCUIT TROUBLESHOOTING

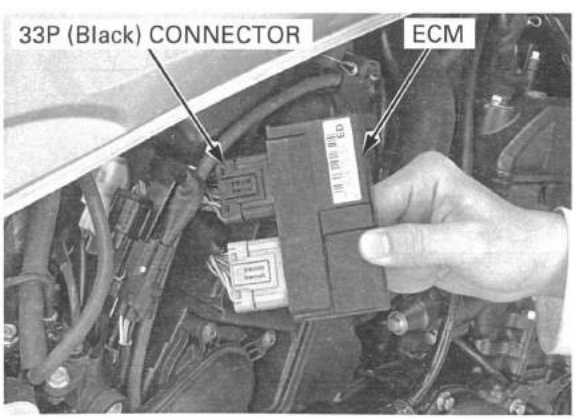
If the engine can be started but the MIL does not come on when the ignition switch is turned "ON" and the engine stop switch is in "❍", check as follows:

Check for operation of the combination meter function properly.

- If they do not function, check the combination meter power input line (page 20-12).
- If they function properly, check as follows:

Pull out the ECM from the stay (page 5-14).

Turn the ignition switch to "OFF", disconnect the ECM 33P (Black) connector.

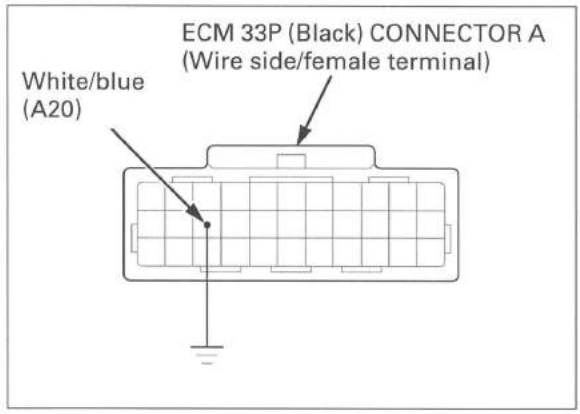


Ground the White/blue wire terminal of the wire harness side connector with a jumper wire.

TOOL:
Test probe **07ZAJ-RDJA110**

Turn the ignition switch to "ON", the MIL should come on.

- If the MIL comes on, replace the ECM with a new one and recheck the MIL indication.
  Refer to Key Registration Procedures (page 21-6)
- If the MIL does not come on, check for open circuit in the White/blue wire between the combination meter and ECM.
  If the wire is OK, replace the combination meter (page 20-10).



FUEL LINE INSPECTION

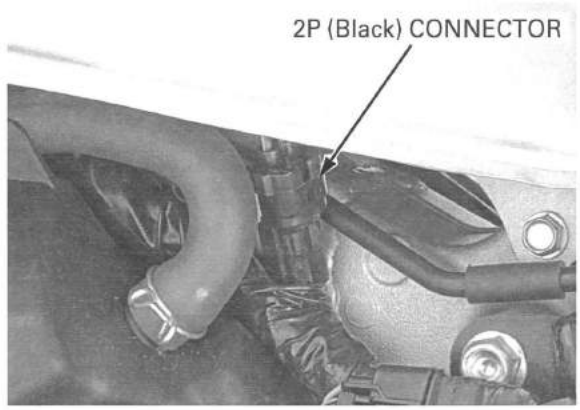
FUEL PRESSURE RELIEVING/QUICK CONNECT FITTING REMOVAL

- Before disconnecting fuel feed hose, relieve pressure from the system as following procedures.

1. Turn the ignition switch OFF.

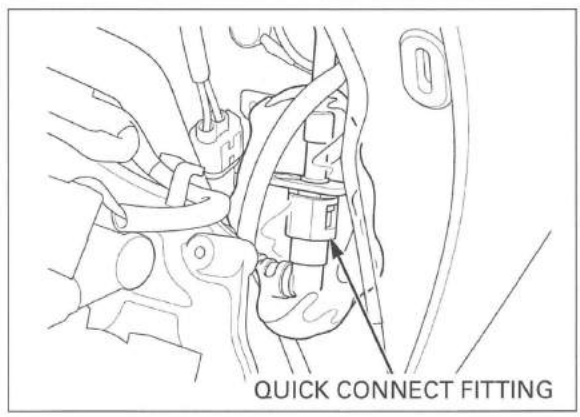
   Lift and support the fuel tank (page 3-5).

2. Disconnect the fuel pump 2P (Black) connector.
3. Start the engine, and let it idle until the engine stalls.
4. Turn the ignition switch OFF.
5. Disconnect the battery negative (–) cable (page 17-6).



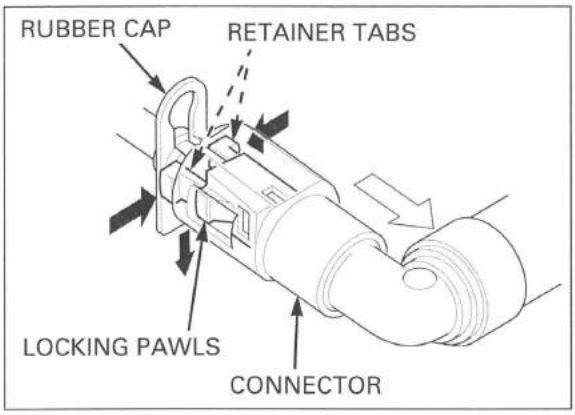
6. Check the fuel quick connect fitting for dirt, and clean if necessary.

   Place a shop towel over the quick connect fitting.

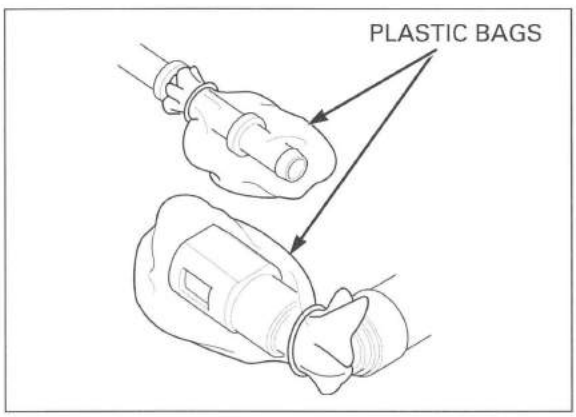


7. Pull and release the rubber cap from the retainer.
8. Hold the connector with one hand and squeeze the retainer tabs with the other hand to release them from the locking pawls.
   Pull the connector off, then remove the rubber cap and retainer from the fuel joint.

- Prevent the remaining fuel in the fuel feed hose from following out with a shop towel.
- Be careful not to damage the hose or other parts.
- Do not use tools.
- If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes of easily.



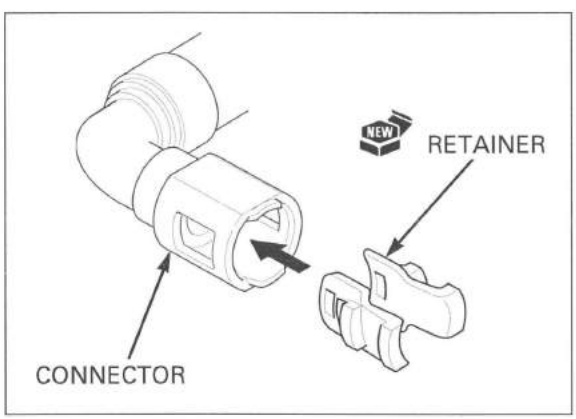
9. To prevent damage and keep foreign matter out, cover the disconnected connector and fuel joint end with the plastic bags.



QUICK CONNECT FITTING INSTALLATION

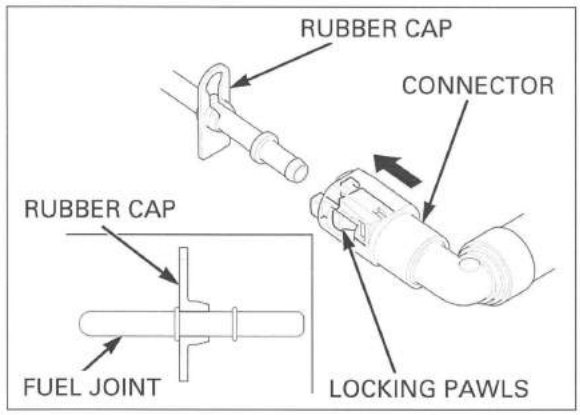
- Always replace the retainer of the quick connect fitting when the fuel feed hose is disconnected.
- If any damage or cut-out on the rubber cap, replace it with a new one.
- Do not bent or twist fuel feed hose.

1. Insert a new retainer into the connector.

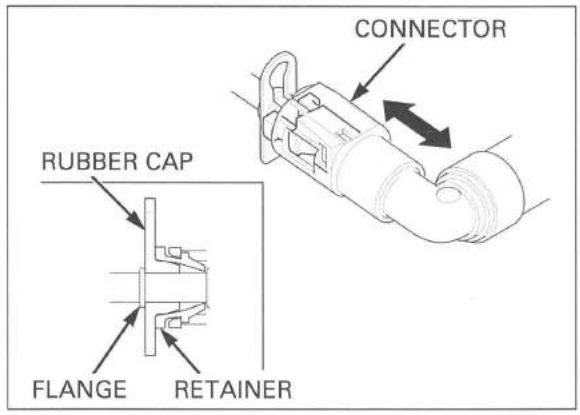


2. Install the rubber cap and seat it onto the fuel joint flange as shown.
   Align the quick connect fitting with the fuel joint and align the new retainer locking pawls with the connector grooves.
   Then press the quick connect fitting onto the fuel joint until both retainer pawls lock with a "CLICK".

   If it is hard to connect, put a small amount of engine oil on the joint end.



3. Make sure the connection is secure and that the pawls are firmly locked into place; check visually and by pulling the connector.
4. Make sure the rubber cap is in place (between the flange and retainer tab).



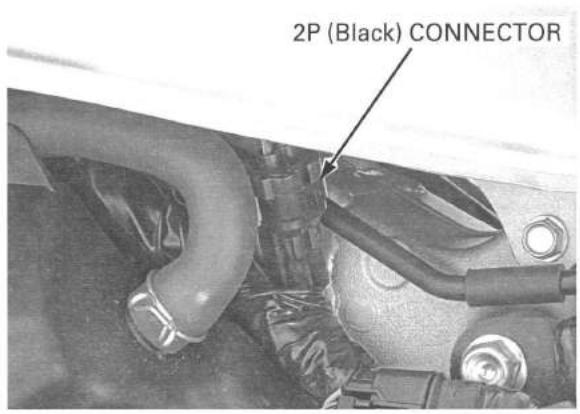
5. Connect the fuel pump 2P (Black) connector and clamp the wire.
6. Connect the battery negative (–) cable to the battery.

Do not start the engine.

7. Turn the ignition switch ON and engine stop switch "○".

   The fuel pump will run for about 2 seconds, and fuel pressure will rise.
   Repeat 2 or 3 times, and check that there is no leakage in the fuel supply system.

   Remove the support tool, then install and tighten the fuel tank front mounting bolts (page 3-6).



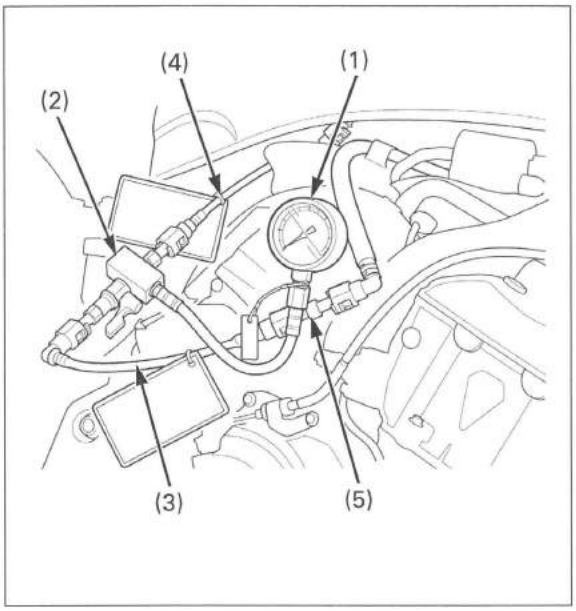
FUEL PRESSURE TEST

Relieve the fuel pressure and disconnect the quick connect fitting (page 5-51).

Attach the fuel pressure gauge, attachments and manifold.

TOOLS:

(1): Fuel pressure gauge	**07406-0040004**
(2): Pressure gauge manifold	**07ZAJ-S5A0111**
(3): Pressure gauge hose attachment A	**07ZAJ-S5A0120**
(4): Pressure gauge hose attachment C	**07ZAJ-S7C0100**
(5): Fuel attachment joint C	**07ZAJ-S7C0200**



Temporally connect the battery negative (–) cable to the battery.
Connect the fuel pump 2P (Black) connector.
Start the engine and let it idle.
Read the fuel pressure.

STANDARD: 343 kPa (3.5 kgf/cm², 50 psi)

If the fuel pressure is higher than specified, replace the fuel pump assembly (faulty fuel pump or fuel pressure regulator).
If the fuel pressure is lower than specified, inspect the following:

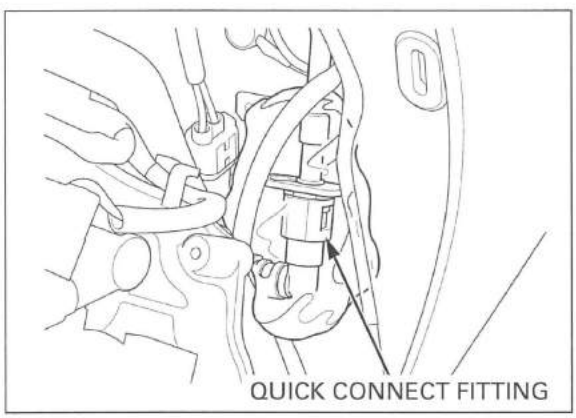
- fuel line leaking
- pinched or clogged fuel feed hose or fuel tank breather hose
- fuel pump (page 5-55)
- clogged fuel filter (Assembly of the fuel pump: page 5-56)

Wrap a shop towel around the attachment to soak up any spilled fuel.

After inspection, relieve the fuel pressure by disconnecting the quick connect fitting (page 5-51).

Remove the fuel pressure gauge, attachment, joint and manifold from the fuel pump.

Connect the quick connect fitting (page 5-52).

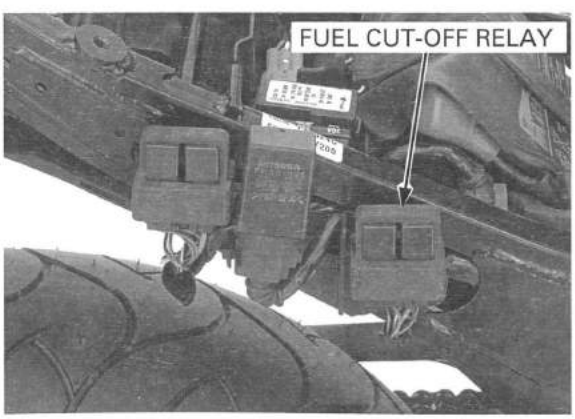


FUEL FLOW INSPECTION

Remove the rear cowl (page 2-6).

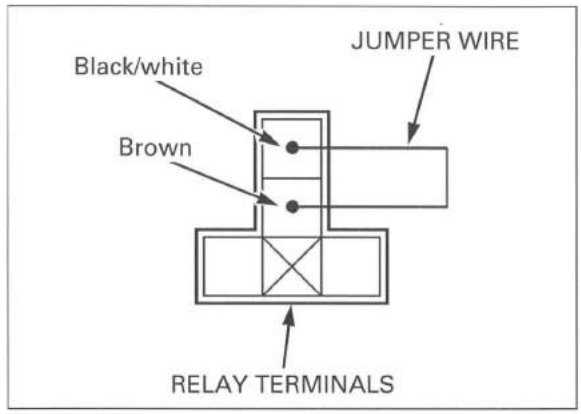
Remove the fuel cut-off relay from the rubber holder.

Disconnect the fuel cut-off relay connector.



Jump the Brown and Black/white wire terminals of the wire harness side using a jumper wire.

- Place an approved gasoline container and drain the gasoline.
- Wipe off spilled out gasoline.

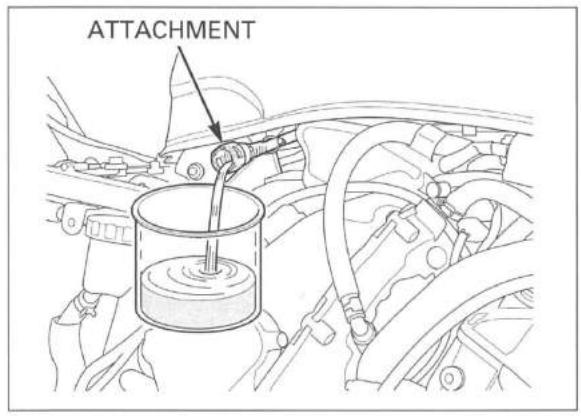


Disconnect the quick connect fitting from the fuel joint (page 5-51).
Attach the hose attachment to the fuel joint.

TOOL:
Pressure gauge hose attachment C **07ZAJ-S7C0100**

Turn the ignition switch ON for 10 seconds.
Measure the amount of fuel flow.

Amount of fuel flow:
189 cm³ (6.4 US oz, 6.7 Imp oz) minimum /10 seconds at 12 V



If the fuel flow is less than specified, inspect the following:
- pinched or clogged fuel hose
- fuel pump unit (page 5-55)

Remove the hose attachment from the fuel joint and connect the quick connect fitting (page 5-52).

FUEL PUMP

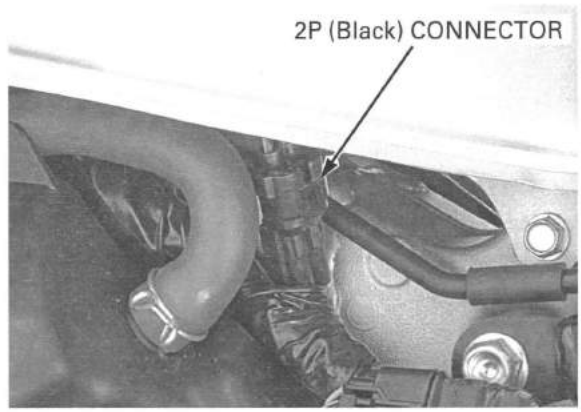
INSPECTION

Turn the ignition switch ON and confirm that the fuel pump operates for a few seconds.
If the fuel pump does not operate, inspect as follow:

Turn the ignition switch OFF.

Lift and support the fuel tank (page 3-5).

Disconnect the fuel pump unit 2P (Black) connector.



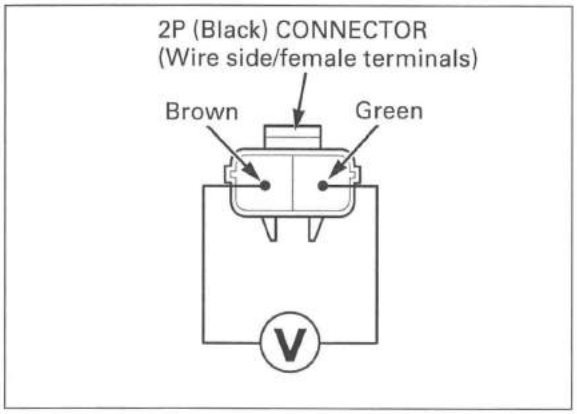
Turn the ignition switch ON and measure the voltage between the terminals.

CONNECTION: Brown (+) – Green (–)

There should be battery voltage for a few seconds.

If there is battery voltage a few seconds, replace the fuel pump unit.

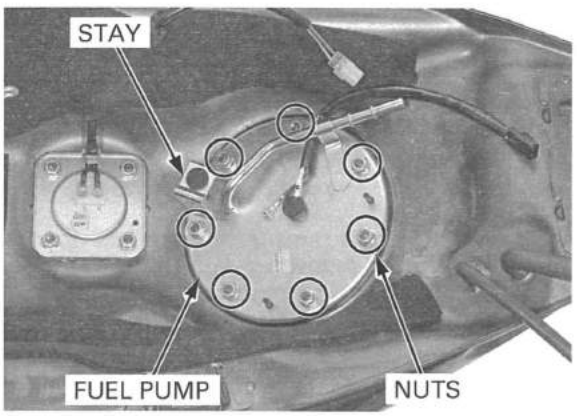
If there is no battery voltage, inspect the following:
- main fuse 30A
- sub fuse 20A (FI/Ignition)
- sub fuse 10A (Bank angle sensor)
- engine stop switch (page 20-21)
- fuel cut-off relay (page 5-58)
- engine stop relay (page 5-95)
- bank angle sensor (page 5-94)
- ECM (page 5-96)



REMOVAL

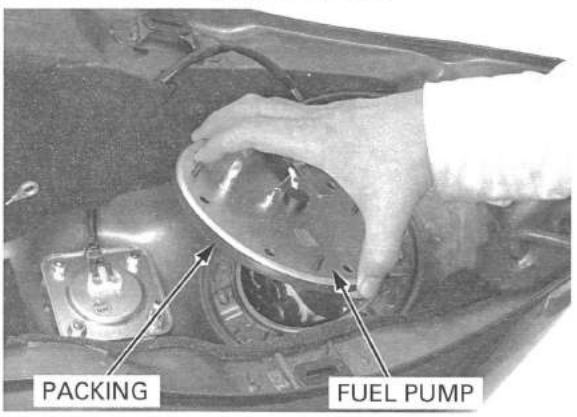
Remove the fuel tank (page 5-58).

Remove the fuel pump unit mounting nuts and stay.

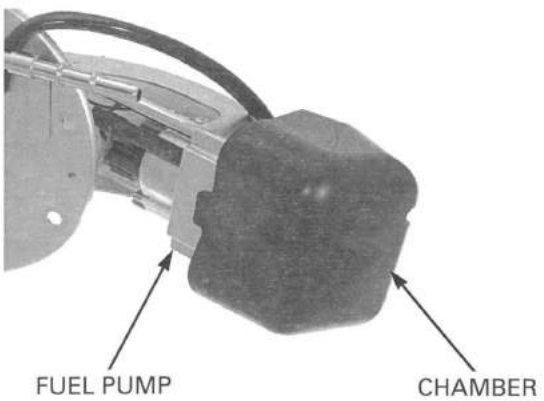


Be careful not to damage the pump wire.

Remove the fuel pump unit and packing.



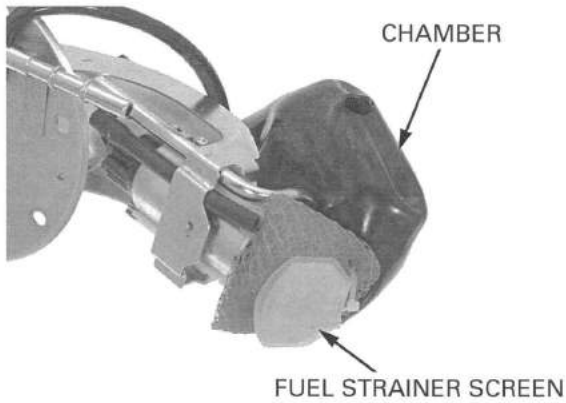
Remove the fuel pump chamber from fuel pump unit.



INSPECTION

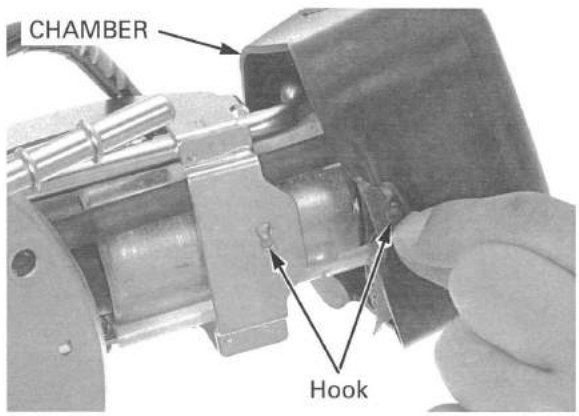
Check the fuel pump unit and chamber for wear or damage, replace them as an assembly if necessary.

Clean the fuel strainer screen with non-flammable or high flash point solvent.



INSTALLATION

Install the fuel pump chamber, hooking its tab to the hole of fuel pump unit.

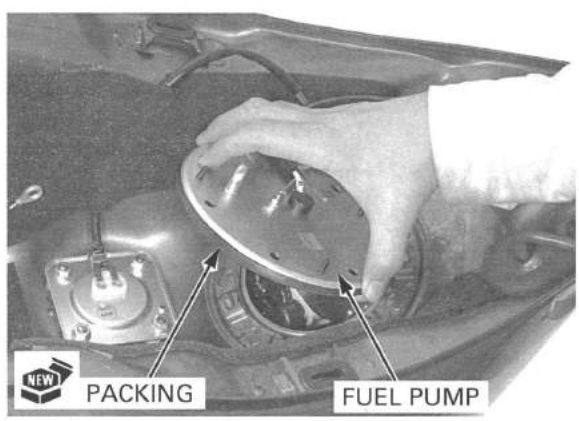


Always replace the packing with a new one.

Place a new packing onto the fuel pump unit.

Be careful not to damage the pump wire.

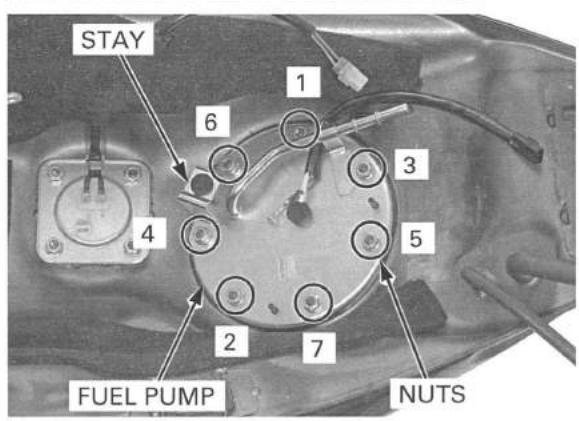
Install the fuel pump unit into the fuel tank.



Install the fuel pump mounting nuts with the stay. Tighten the nuts in the specified sequence as shown.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the fuel tank (page 5-59).



FUEL CUT-OFF RELAY

INSPECTION

Disconnect the fuel cut-off relay connector (page 5-54).

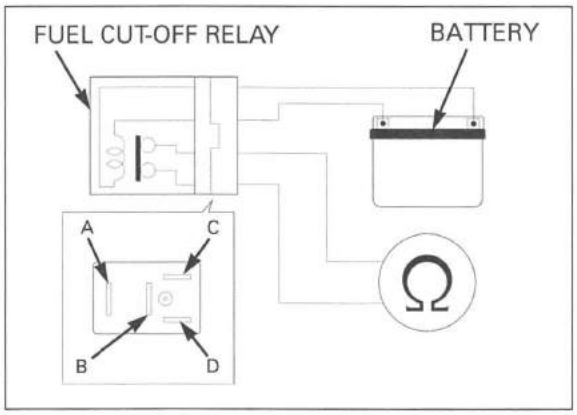
Connect the ohmmeter to the fuel cut-off relay connector terminals.

CONNECTION: A – B

Connect the 12 V battery to the following fuel cut-off relay connector terminals.

CONNECTION: C – D

There should be continuity only when the 12 V battery is connected. If there is no continuity when the 12 V battery is connected, replace the fuel cut-off relay.

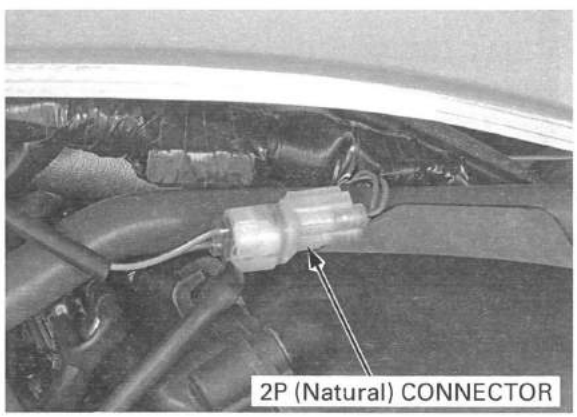


FUEL TANK

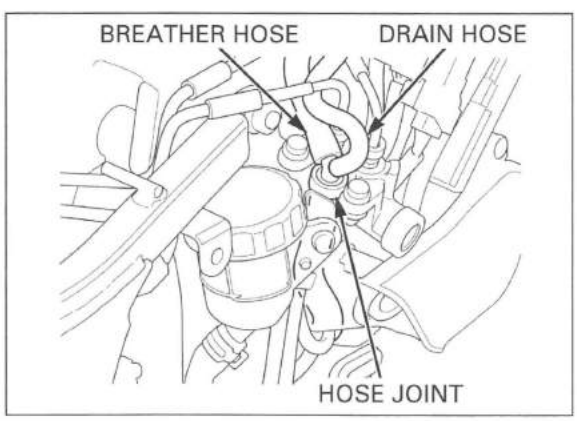
REMOVAL

Relieve the fuel pressure and disconnect the quick connect fitting from the fuel tank (page 5-51).

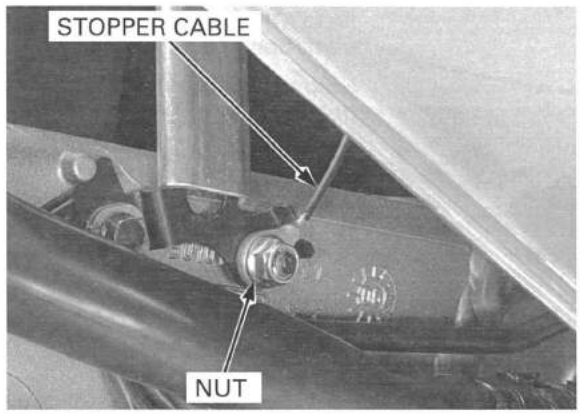
Disconnect the fuel level sensor 2P (Natural) connector.



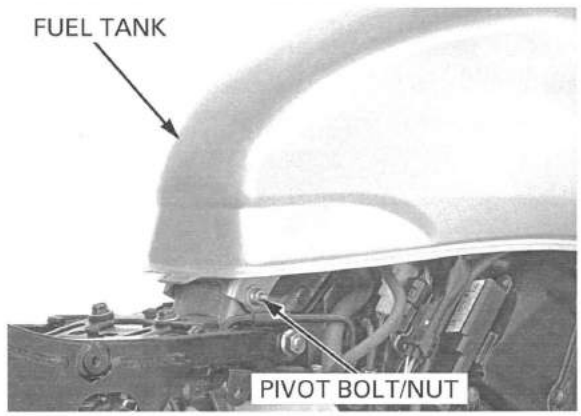
Disconnect the fuel tank drain hose and breather hose from the hose joint.



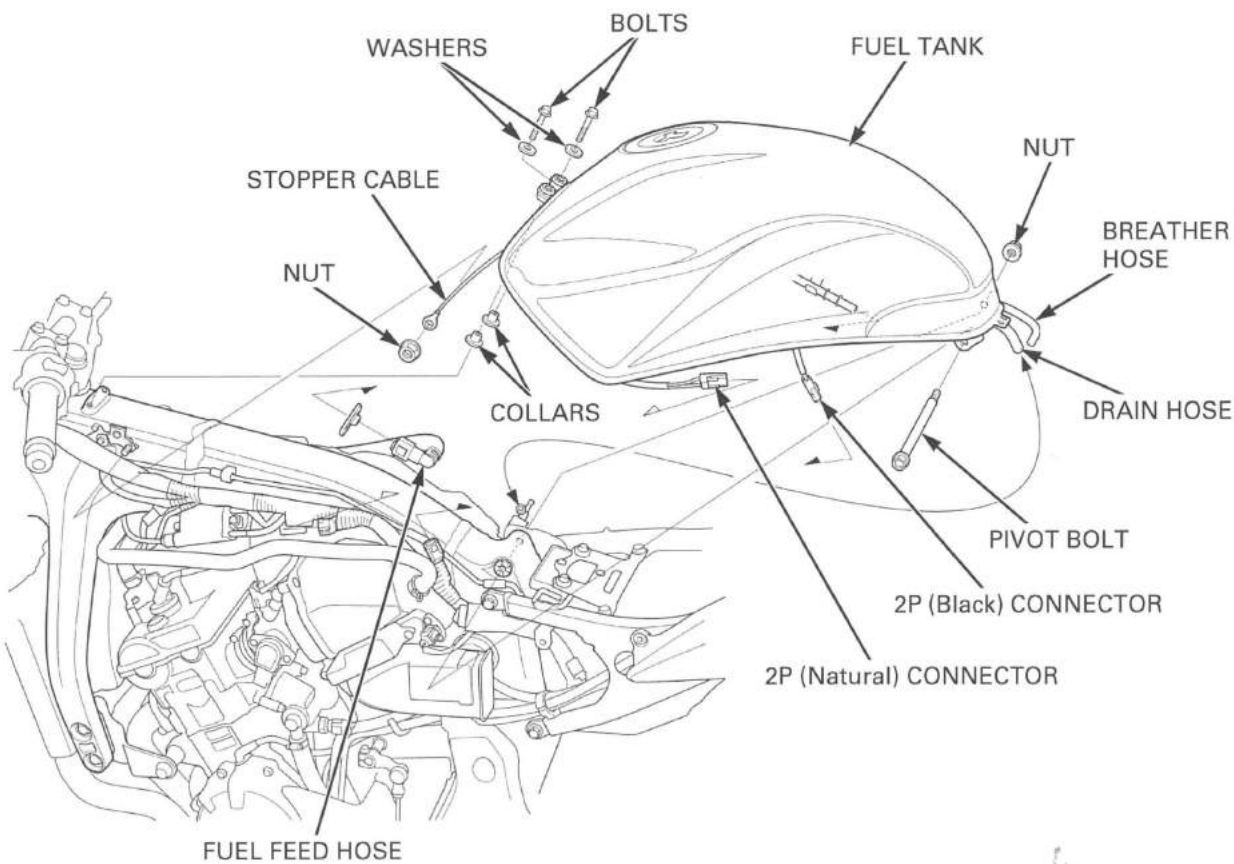
Remove the nut and fuel tank stopper cable.



Remove the nut and pivot bolt, then remove the fuel tank.



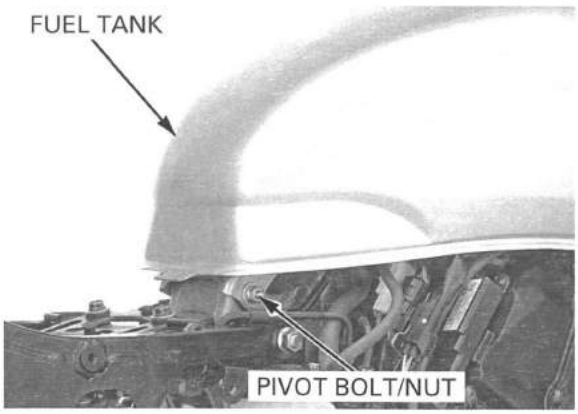
INSTALLATION



Install the fuel tank onto the frame, then install the pivot bolt and nut.

Hold the pivot bolt and tighten the nut to the specified torque.

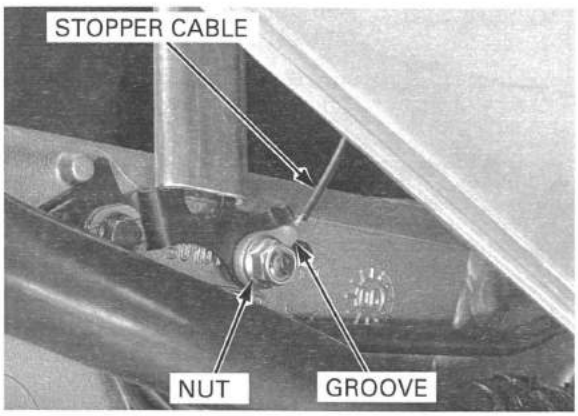
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Lift and support the fuel tank (page 3-5).

Connect the fuel tank stopper cable through the stopper groove of stay.

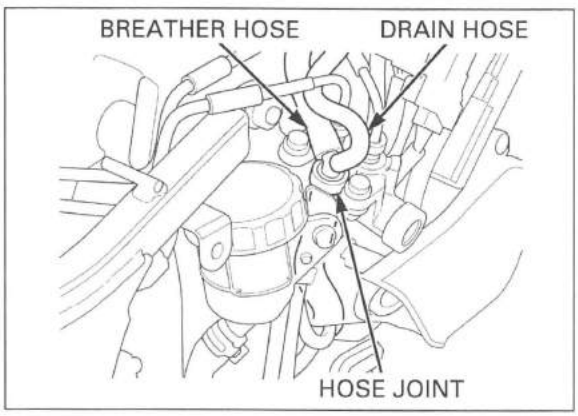
Install and tighten the nut securely.



Connect the fuel tank drain hose and breather hose to the hose joint.

NOTICE

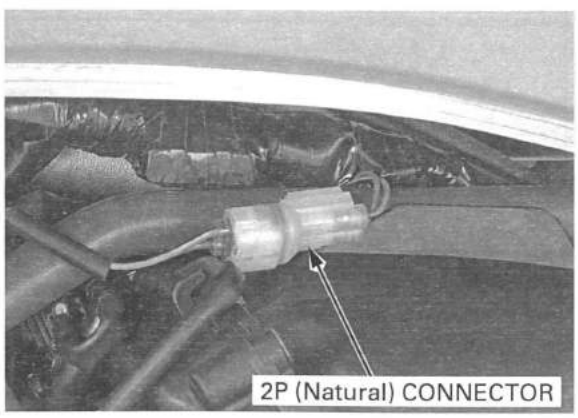
- *Route the hoses, wires and harness properly (page 1-23).*
- *Be careful not to damage the harness and hoses.*
- *After installing the fuel tank, make sure the drain, breather and fuel hoses are not kinked or bound.*



Connect the fuel level sensor 2P (Natural) connector.

Connect the quick connect fitting (page 5-52).

Remove the support tool, then install and tighten the fuel tank front mounting bolts (page 3-6).

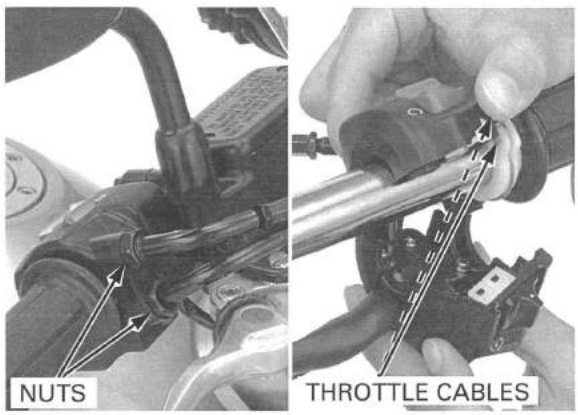


AIR CLEANER HOUSING

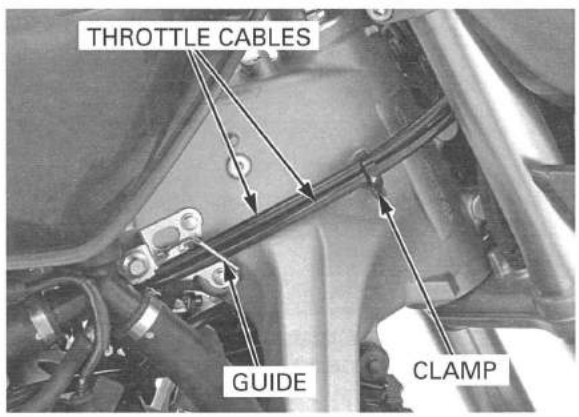
REMOVAL

Make the throttle cable freeplay at the handlebar side (page 3-6).

Loosen the throttle cable nuts fully.
Disconnect the throttle cables from the throttle pipe.

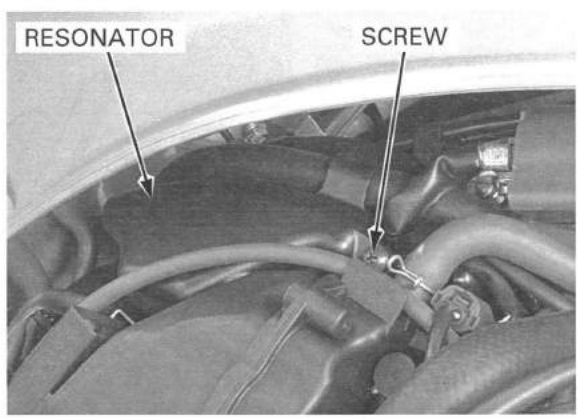


Release the throttle cables from the clamp and guide.

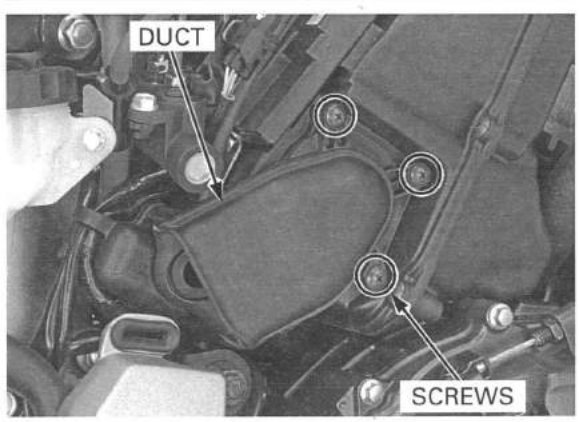


Relieve the fuel pressure and disconnect the quick connect fitting from the fuel tank (page 5-51).

Remove the screw and right front resonator.



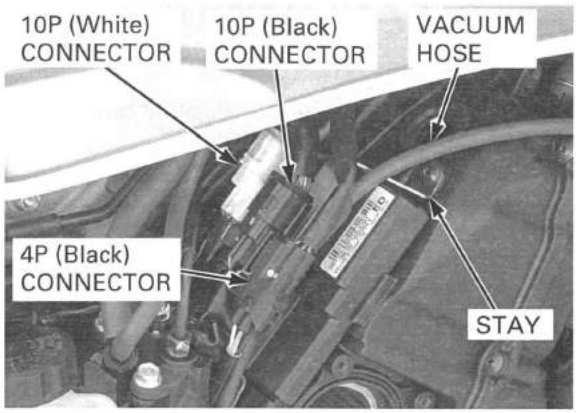
Remove the screws and right air cleaner duct from the air cleaner housing.



Release the IDC solenoid valve vacuum hose from the ECM.

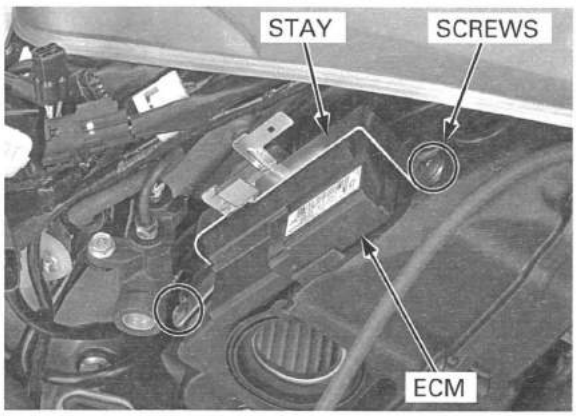
Release the connectors from the ECM stay.

Disconnect the injector sub-harness 10P (Black) and 10P (White) connectors, and O_2 sensor 4P (Black) connector.

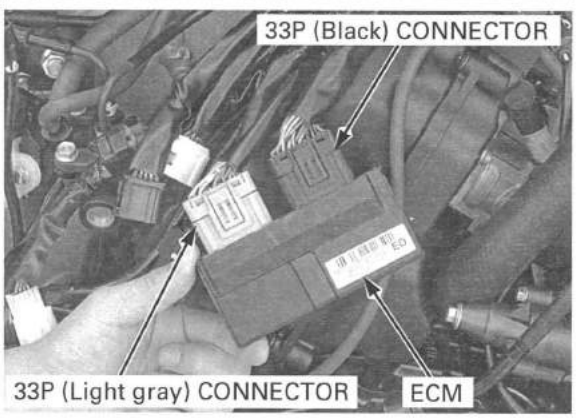


Remove the screws and ECM stay.

Pull out the ECM from the air cleaner housing.

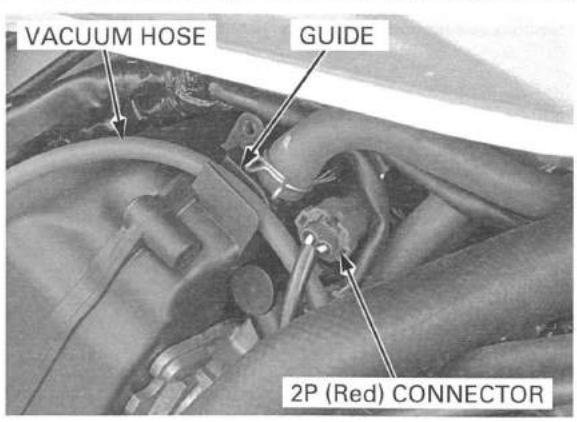


Disconnect the ECM 33P (Black and Light gray) connectors from the ECM.

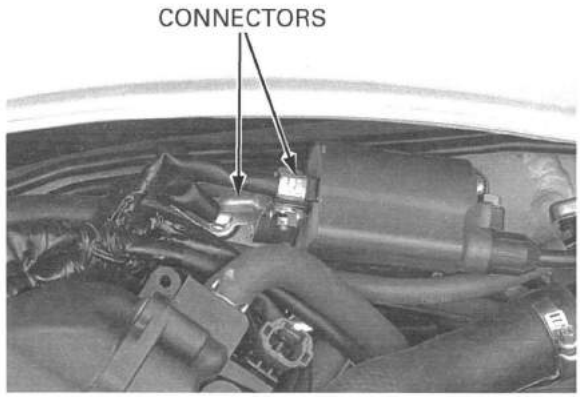


Disconnect the CKP sensor 2P (Red) connector.

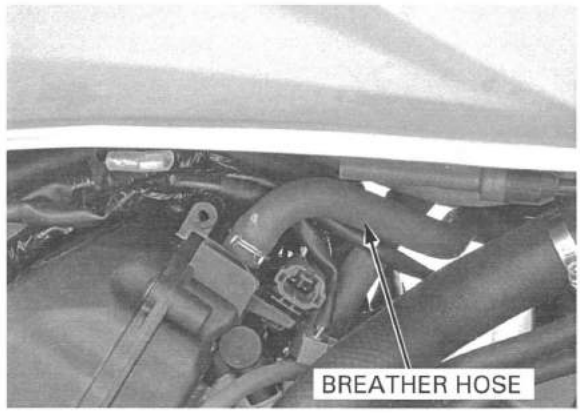
Release the IDC solenoid valve vacuum hose from the guide of air cleaner housing.



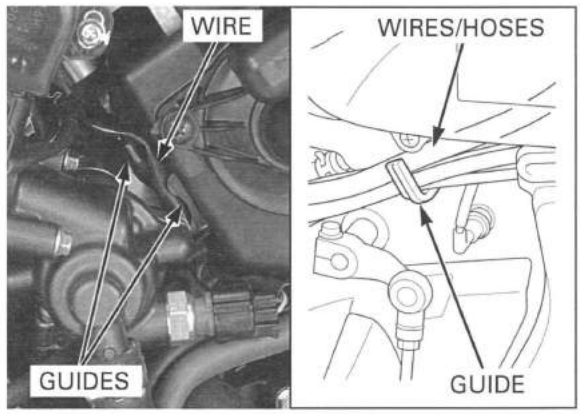
Disconnect the #1/#4 ignition coil connectors.



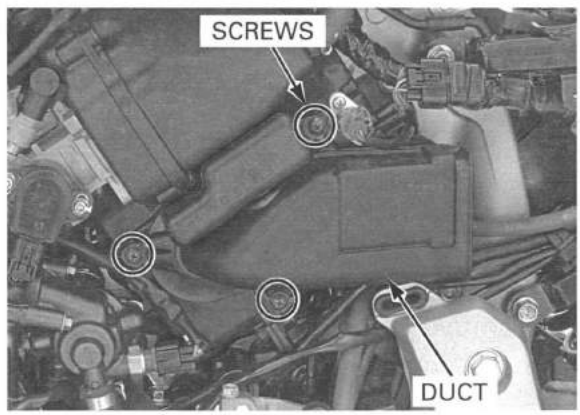
Disconnect the crankcase breather hose from the air cleaner housing.



Release the wires and hoses from the guides of air cleaner housing.

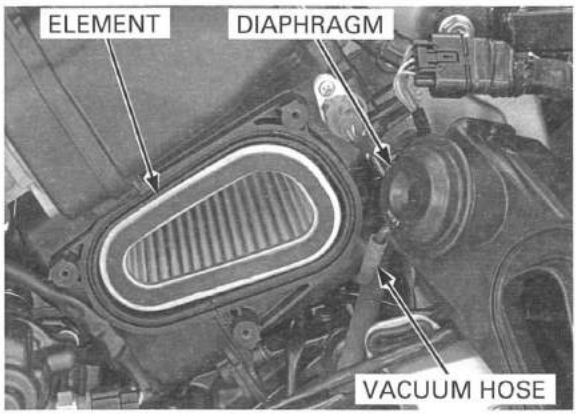


Remove the screws and left air cleaner duct from the air cleaner housing.

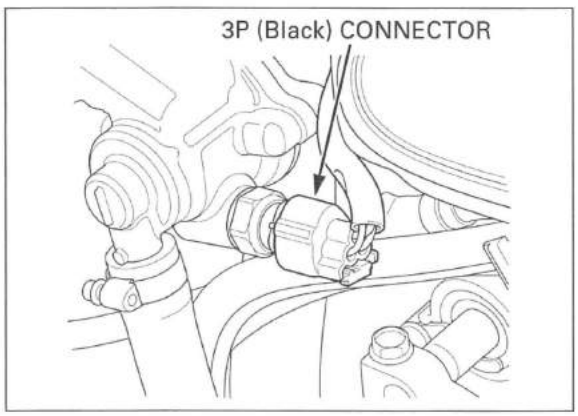


Disconnect the vacuum hose from the diaphragm.

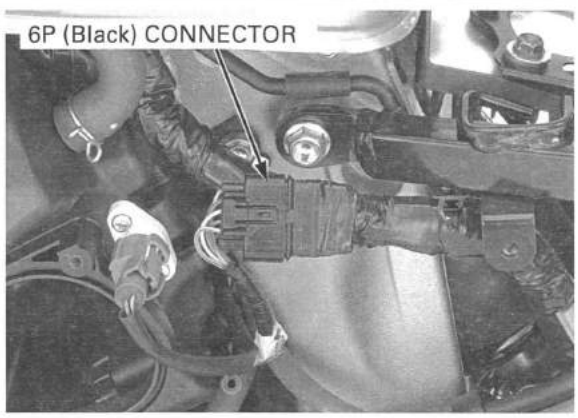
Remove the air cleaner element.



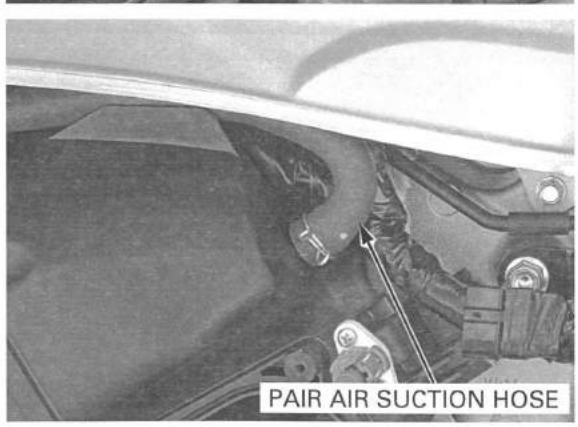
Disconnect the ECT sensor 3P (Black) connector.



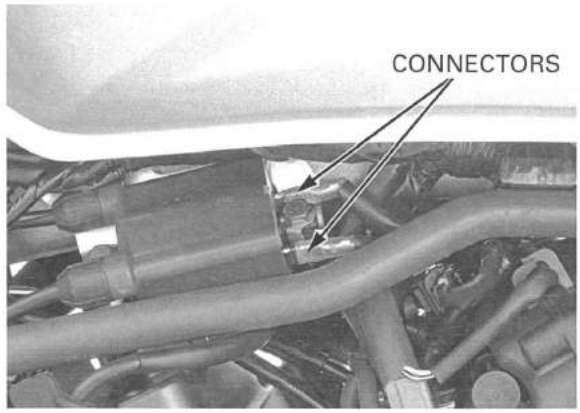
Disconnect the sub-harness 6P (Black) connector.



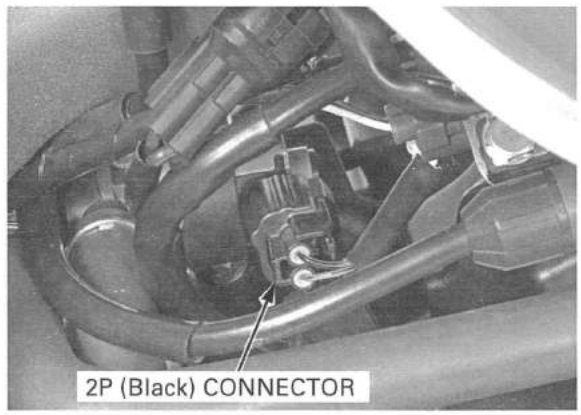
Disconnect the PAIR air suction hose from the air cleaner housing.



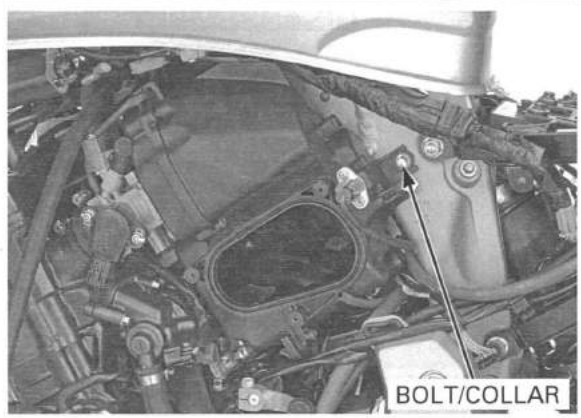
Disconnect the #2/#3 ignition coil connectors.



Disconnect the PAIR control solenoid valve 2P (Black) connector.

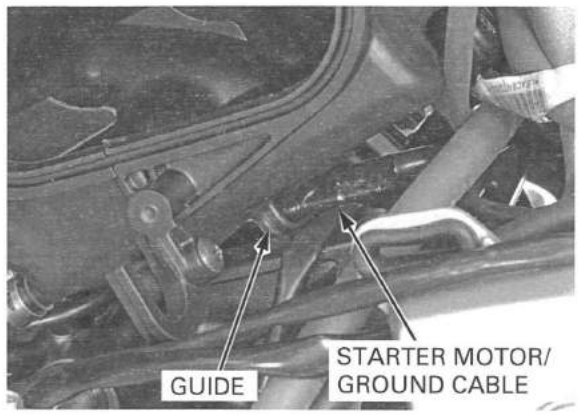


Remove the mounting bolt and collar.



Loosen the throttle body insulator bands (cylinder head side).

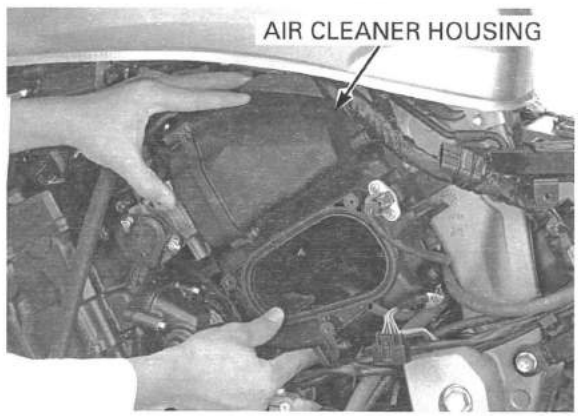
Release the starter motor/ground cable from the guide of air cleaner housing.



Release the throttle cables from the frame, then pull out the air cleaner housing with the throttle body to the left side.

NOTICE

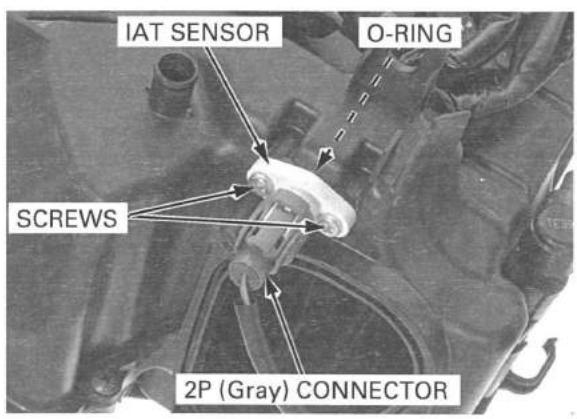
Be careful not to damage the harness and hoses.



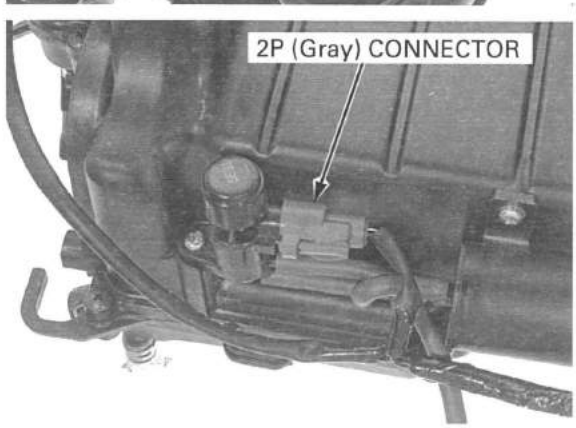
DISASSEMBLY

Disconnect the IAT sensor 2P (Gray) connector.

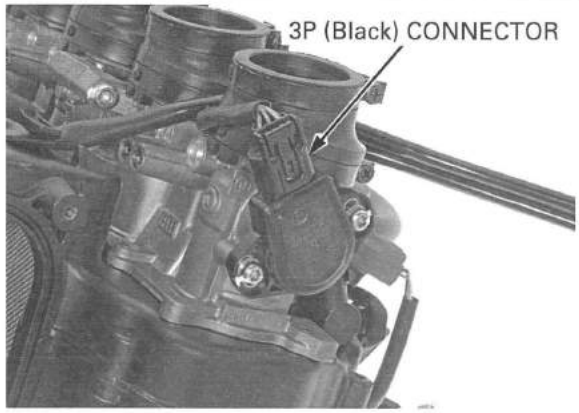
Remove the screws, IAT sensor and O-ring.



Disconnect the IDC solenoid valve 2P (Gray) connector.

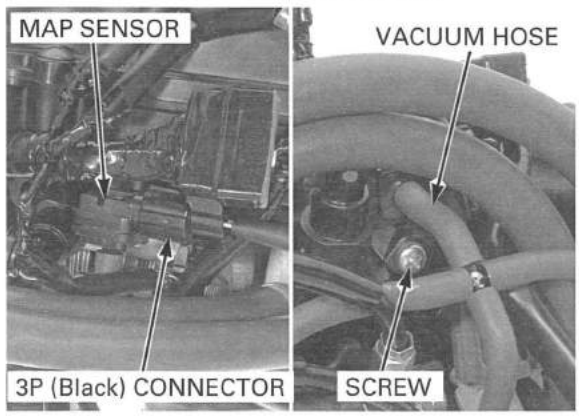


Disconnect the TP sensor 3P (Black) connector.



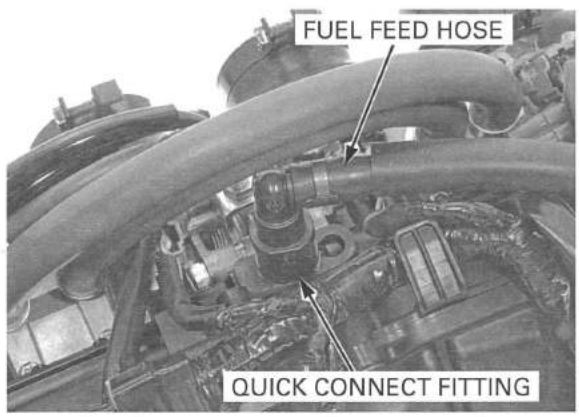
Disconnect the MAP sensor 3P (Black) connector.

Disconnect the vacuum hose from the MAP sensor. Remove the screw and MAP sensor from the air cleaner housing.

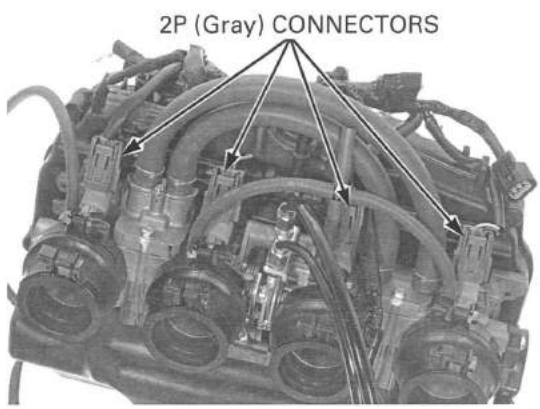


Disconnect the quick connect fitting from the fuel rail (page 5-51).

Remove the fuel feed hose.

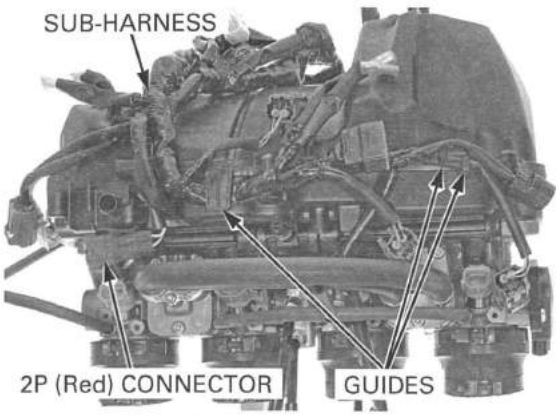


Disconnect the injector 2P (Gray) connectors.



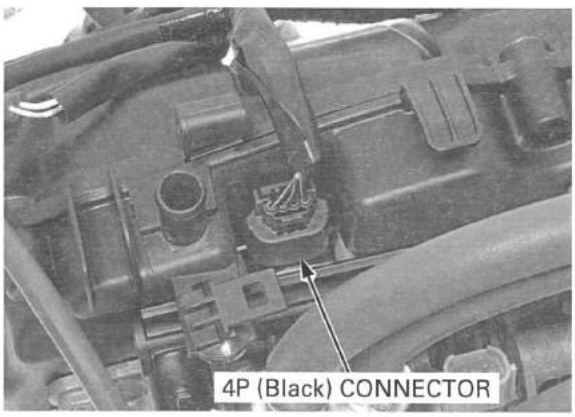
Release the CKP sensor 2P (Red) connector from the stay.

Release the injector sub-harness from the guides.



Disconnect the IACV 4P (Black) connector.

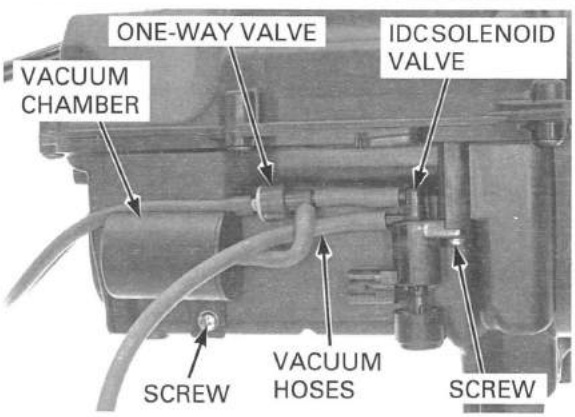
Remove the injector sub-harness from the air cleaner housing.



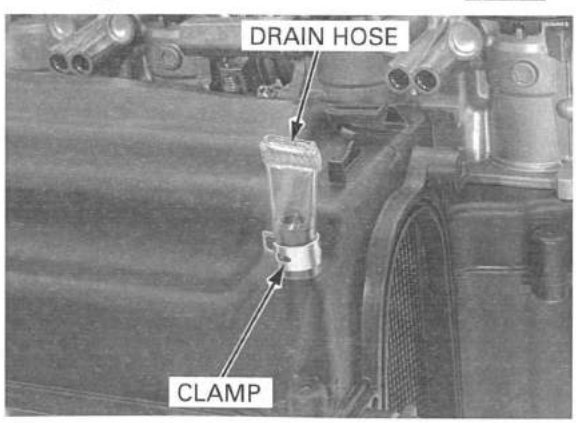
Disconnect the vacuum hoses and remove the screw and IDC solenoid valve.

Disconnect the vacuum hose, then remove the screw and vacuum chamber.

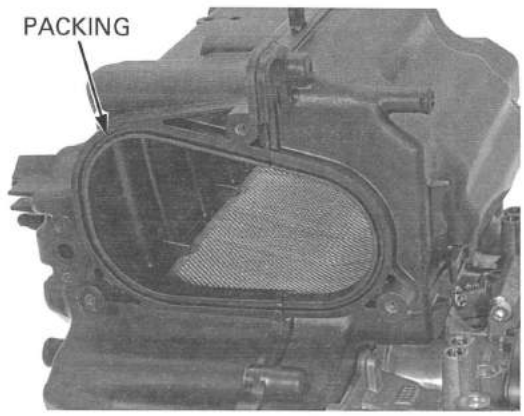
Remove the vacuum hoses from the one-way valve.



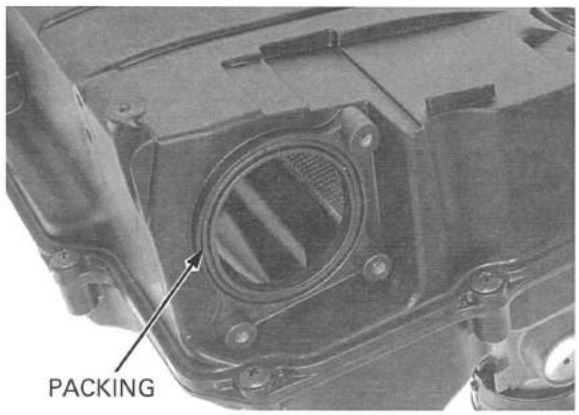
Remove the hose clamp and crankcase breather drain hose.



Remove the left air cleaner duct packing.



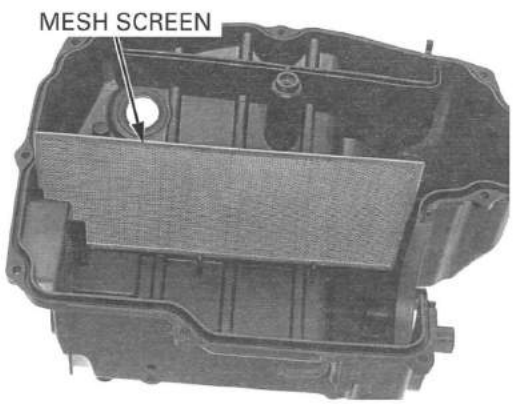
Remove the right air cleaner duct packing.



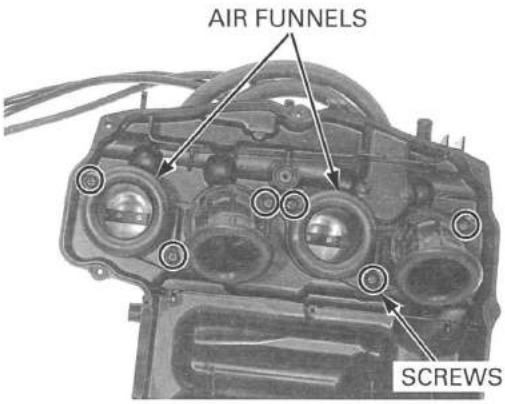
Remove the screws and upper air cleaner housing.

Remove the mesh screen from the upper air cleaner housing.

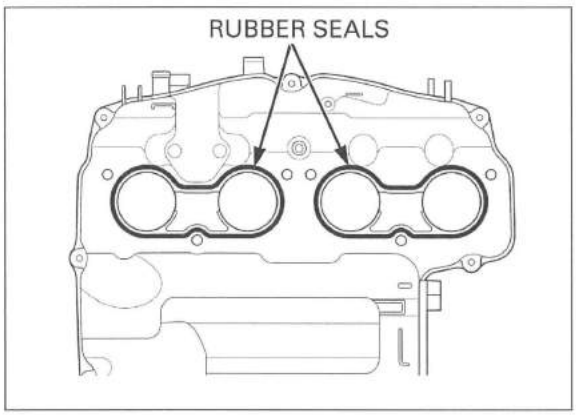
Clean the mesh screen with compressed air.



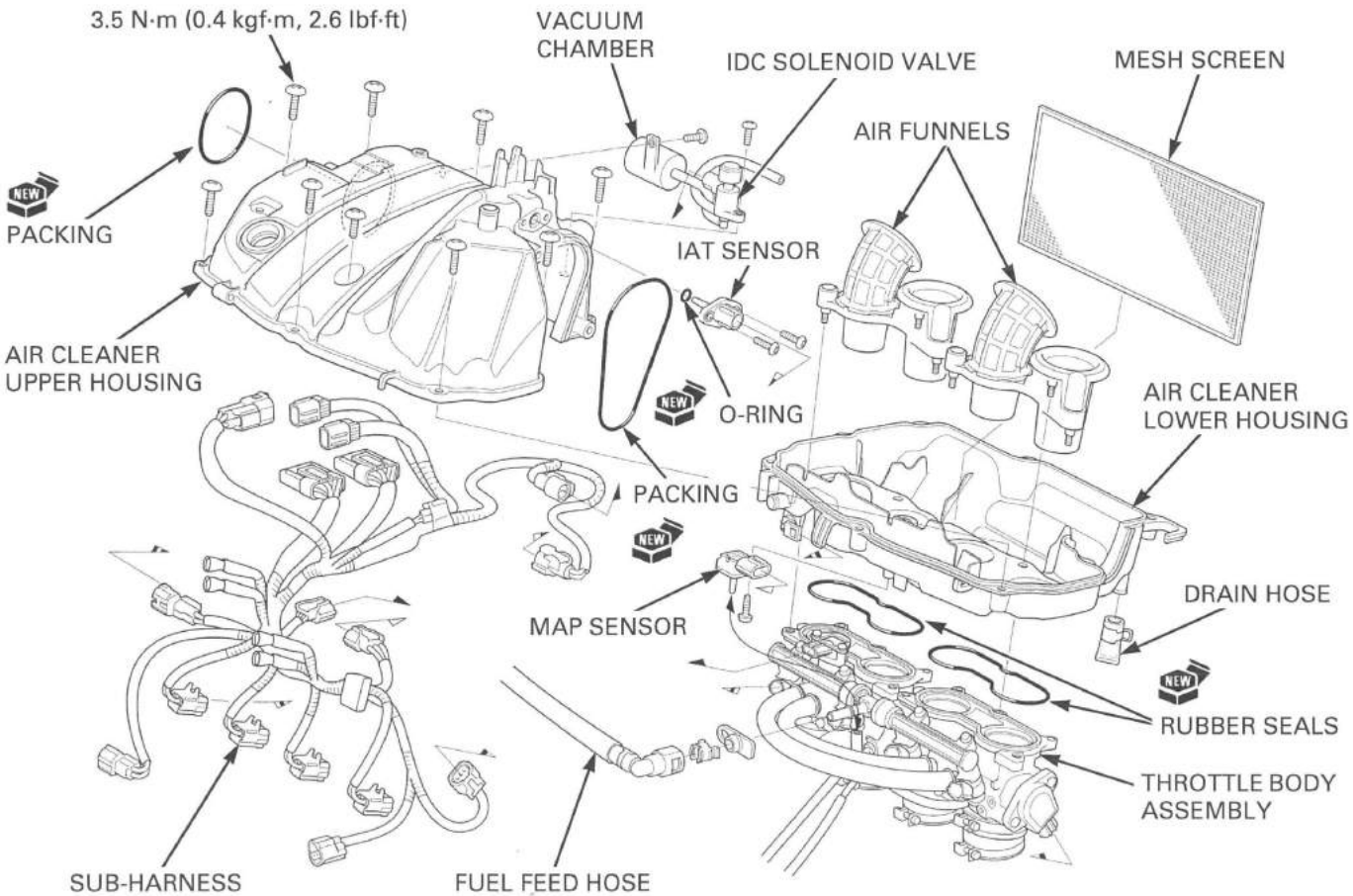
Loosen the screws, then remove the air funnels and throttle body from the lower air cleaner housing.



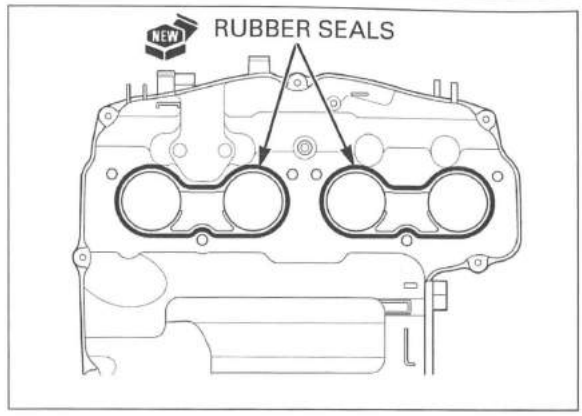
Remove the rubber seals from the lower air cleaner housing.



ASSEMBLY

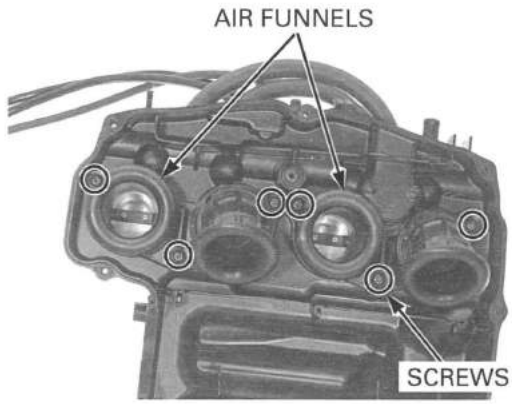


Install new rubber seals into the lower air cleaner housing.

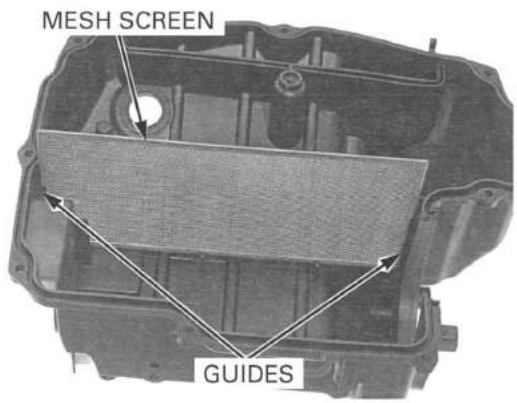


Install the lower air cleaner housing onto the throttle body, then install the air funnels.

Tighten the air funnel screws securely.



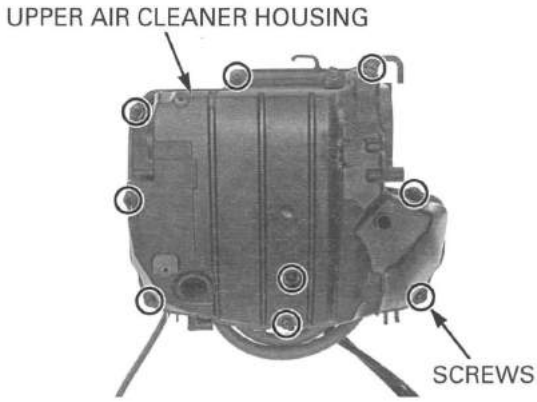
Install the mesh screen by aligning with the guides of upper air cleaner housing.



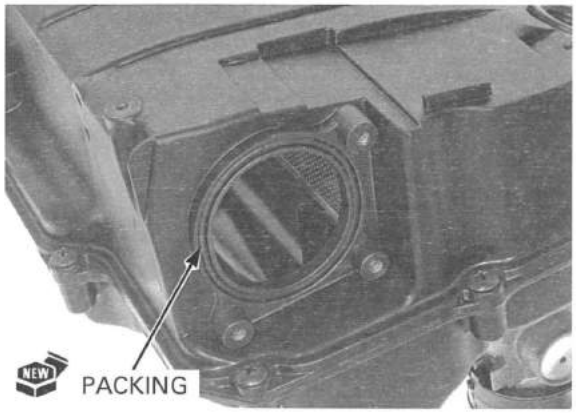
Install the upper air cleaner housing onto the lower housing.

Install and tighten the screws to the specified torque.

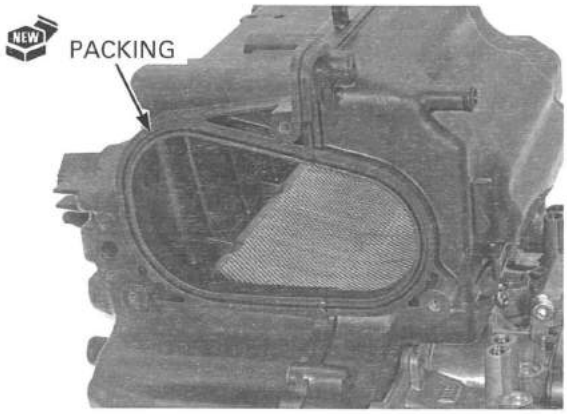
TORQUE: 3.5 N·m (0.4 kgf·m, 2.6 lbf·ft)



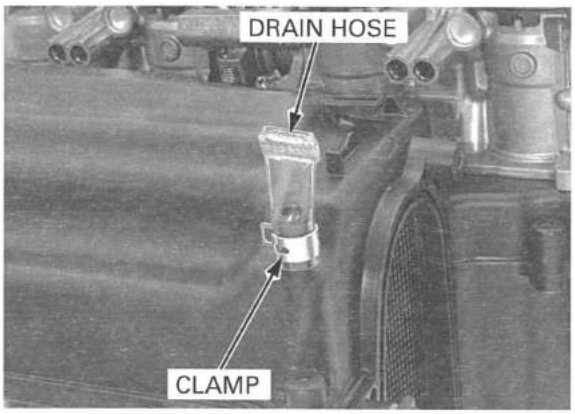
Install a new right air cleaner duct packing into the groove on the housing.



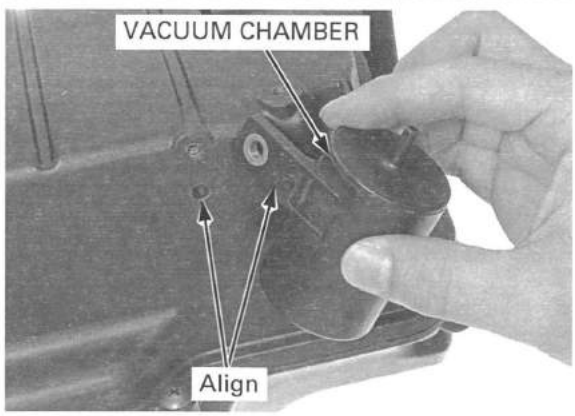
Install a new left air cleaner duct packing into the groove on the housing.



Install the crankcase breather drain hose with hose clamp.



Install the vacuum chamber, aligning its boss with the hole of air cleaner housing.



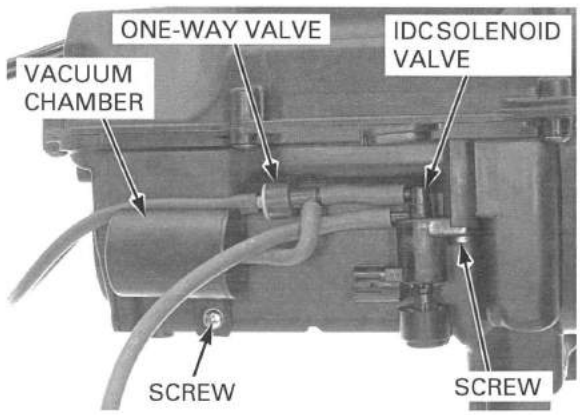
Tighten the vacuum chamber screw securely.

Install the IDC solenoid valve and tighten the screw securely.

Connect the vacuum hoses to the one-way valve.

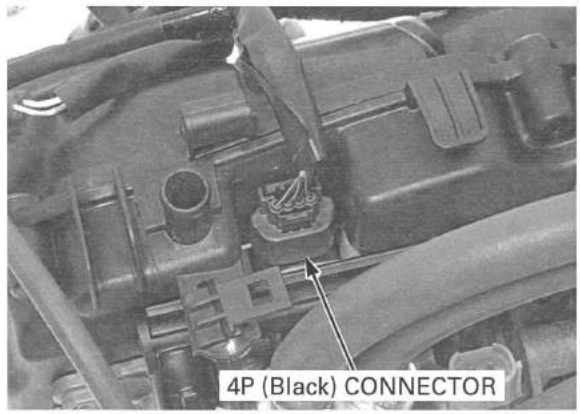
Refer to "CABLE & HARNESS ROUTING" (page 1-23)

Route the vacuum hoses and connect them to the IDC solenoid valve and vacuum chamber.



Install the injector sub-harness on the air cleaner housing.

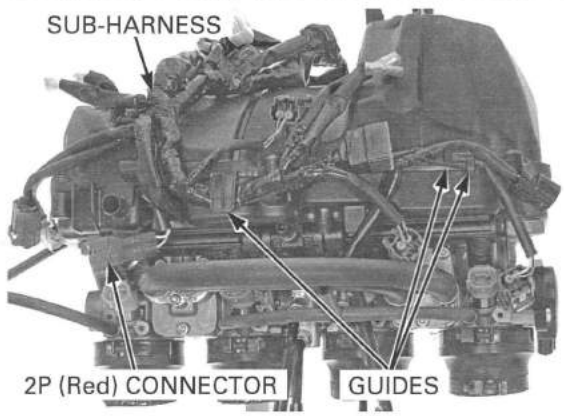
Connect the IACV 4P (Black) connector.



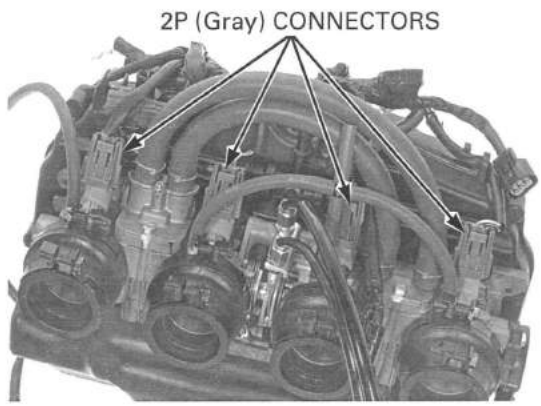
Refer to "CABLE & HARNESS ROUTING" (page 1-23)

Route the injector sub-harness through the guides of the air cleaner housing.

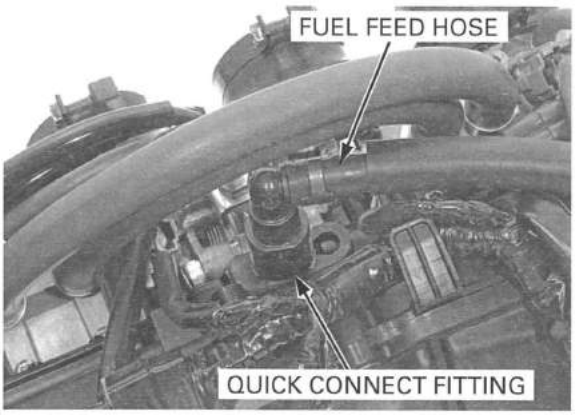
Attach the CKP sensor 2P (Red) connector to the stay.



Connect the injector 2P (Gray) connectors.

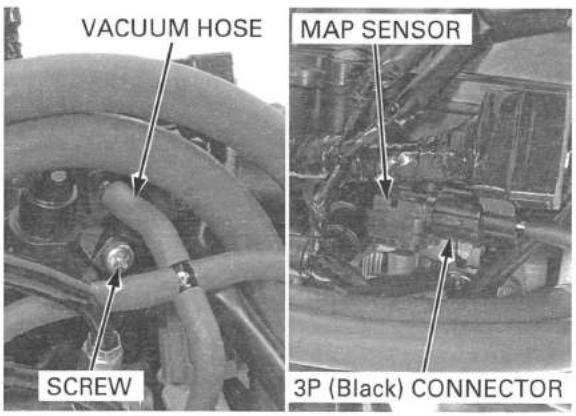


Install the fuel feed hose and connect the quick connect fitting to the fuel rail (page 5-52).

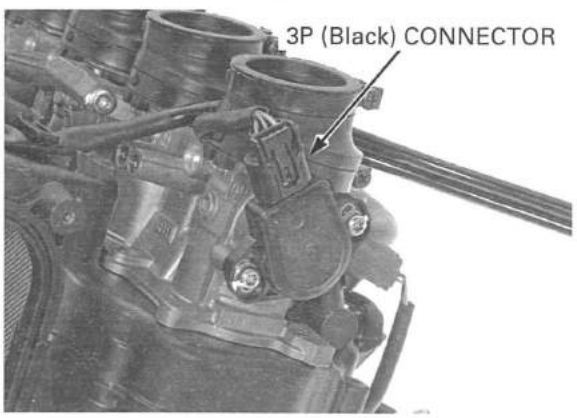


Install the MAP sensor and tighten the screw securely.
Connect the MAP sensor vacuum hose.

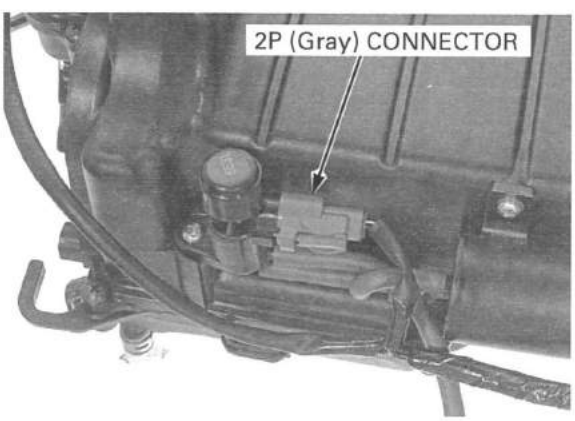
Connect the MAP sensor 3P (Black) connector.



Connect the TP sensor 3P (Black) connector.

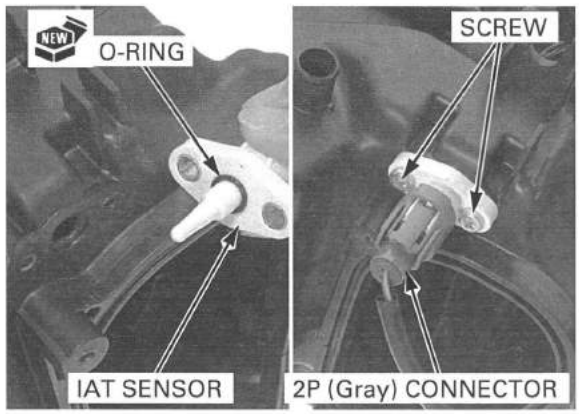


Connect the IDC solenoid valve 2P (Gray) connector.



Install the IAT sensor with a new O-ring and tighten the screws securely.

Connect the IAT sensor 2P (Gray) connector.



INSTALLATION

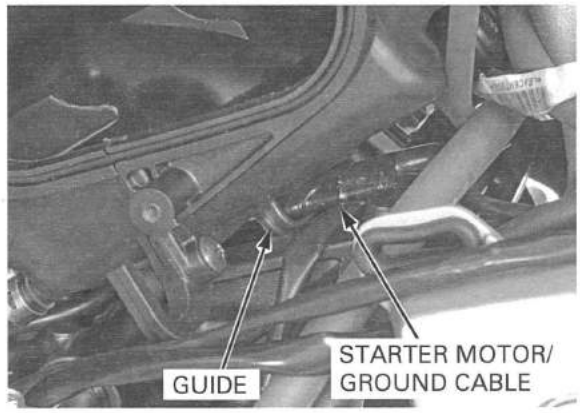
Refer to "CABLE & HARNESS ROUTING" (page 1-23)

Route the throttle cables to the frame properly, then install the air cleaner housing with the throttle body from the left side.

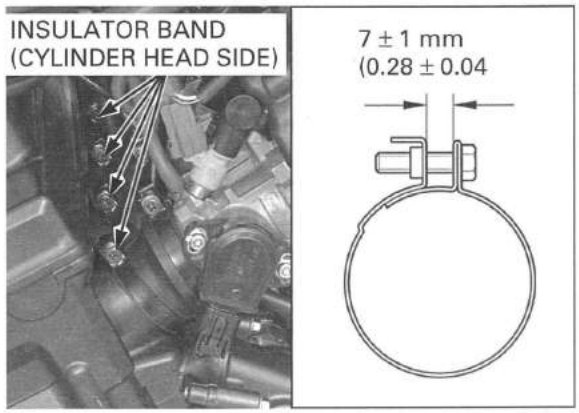
NOTICE

- *Be careful not to damage the harness and hoses.*
- *Make sure each insulator is firmly installed to the intake port.*

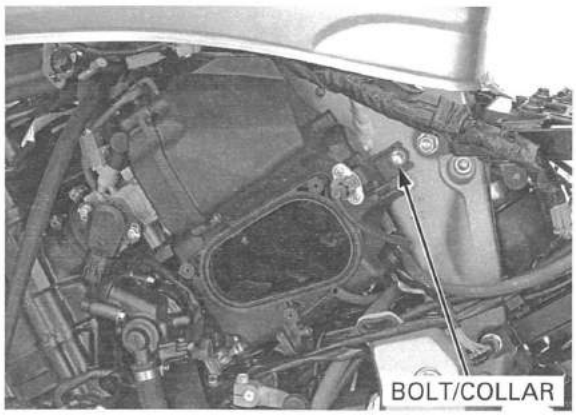
Route the starter motor/ground cable to the guide of air cleaner housing.



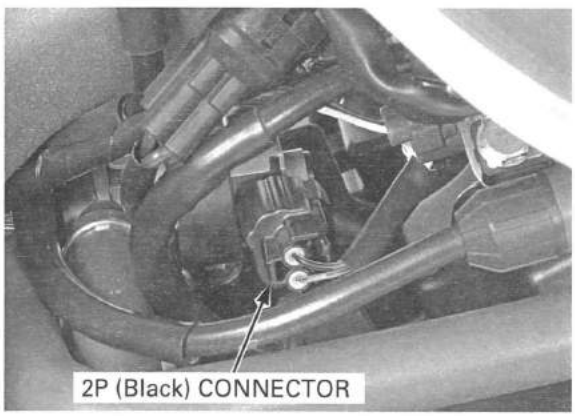
Tighten the insulator band screws (cylinder head side) so that the interval of the band ends is 7 ± 1 mm (0.28 ± 0.04 in).



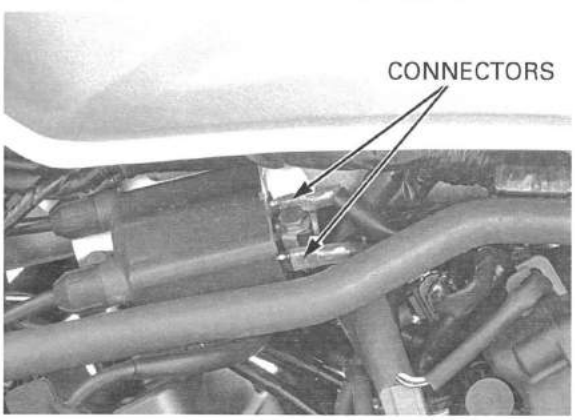
Install mounting bolt with the collar, then tighten the bolt securely.



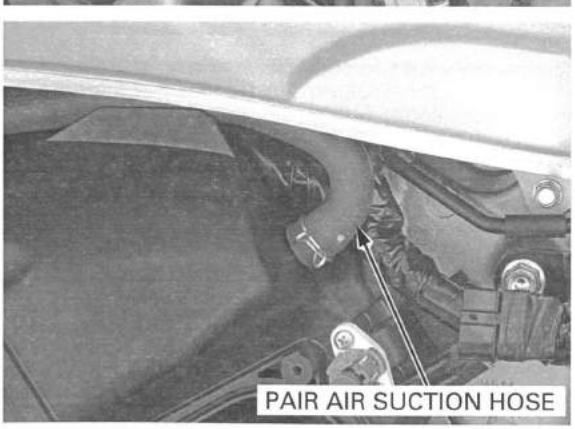
Connect the PAIR control solenoid valve 2P (Black) connector.



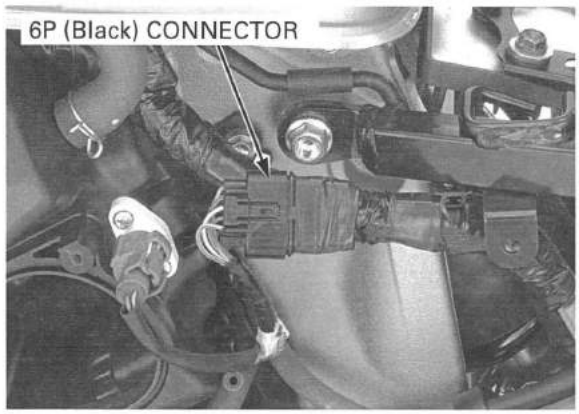
Connect the #2/#3 ignition coil connectors.



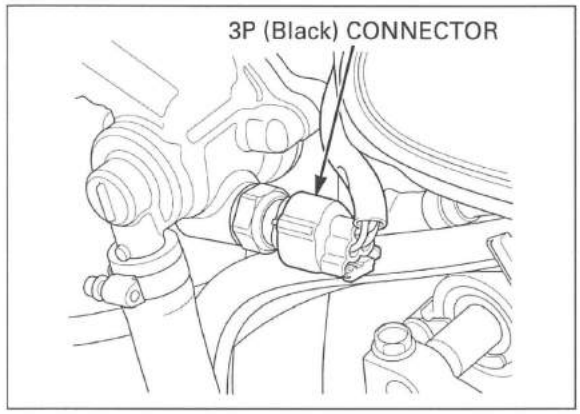
Connect the PAIR air suction hose to the air cleaner housing.



Connect the sub-harness 6P (Black) connector.

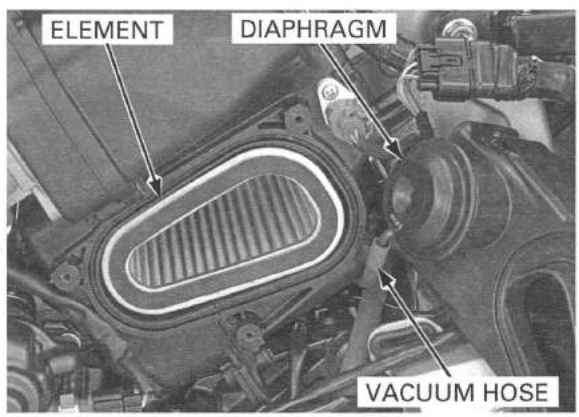


Connect the ECT sensor 3P (Black) connector.



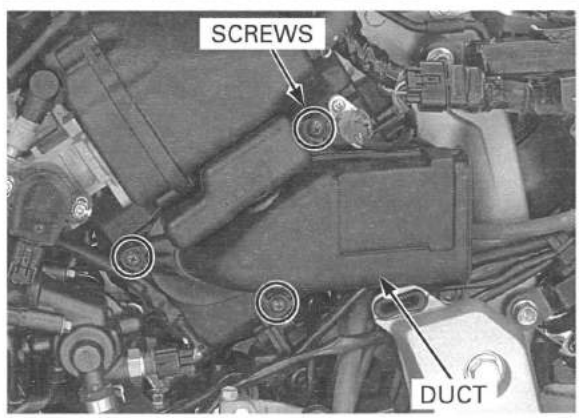
Install the air cleaner element.

Connect the vacuum hose to the diaphragm.



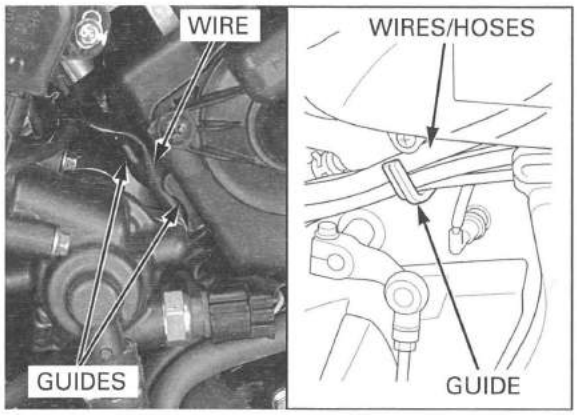
Install the left air cleaner duct to the air cleaner housing.

Tighten the screws securely.

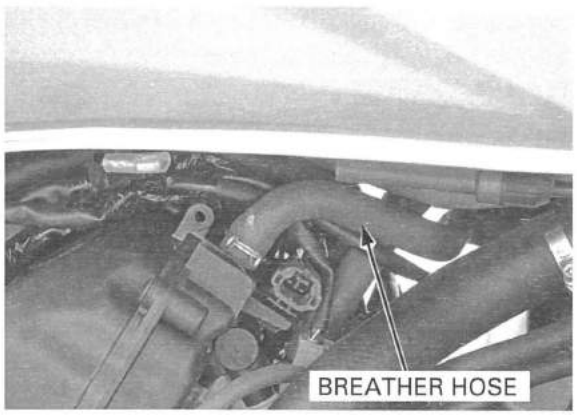


Refer to "CABLE & HARNESS ROUTING" (page 1-23)

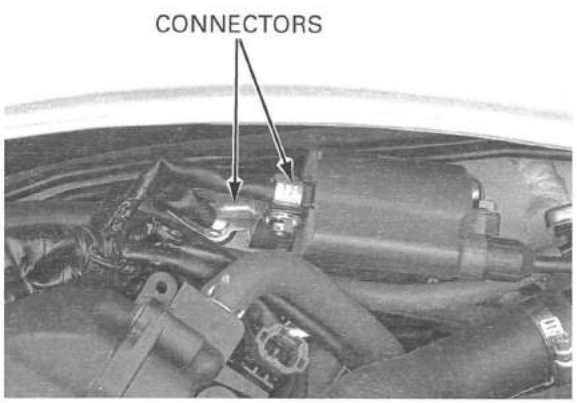
Route the wires and hoses to the guides of air cleaner housing.



Connect the crankcase breather hose to the air cleaner housing.

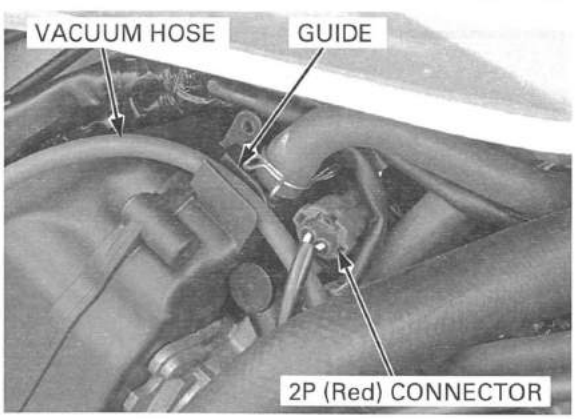


Connect the #1/#4 ignition coil connectors.

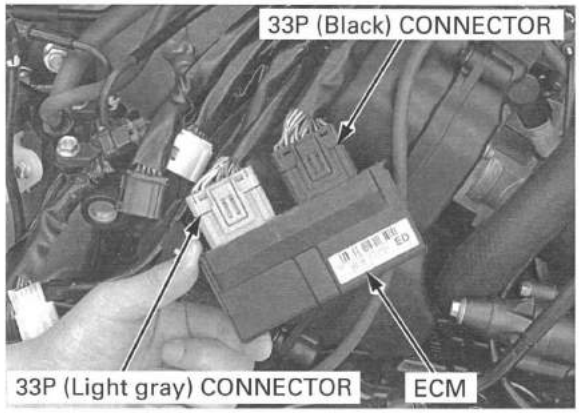


Route the IDC solenoid valve vacuum hose to the guide of air cleaner housing.

Connect the CKP sensor 2P (Red) connector.

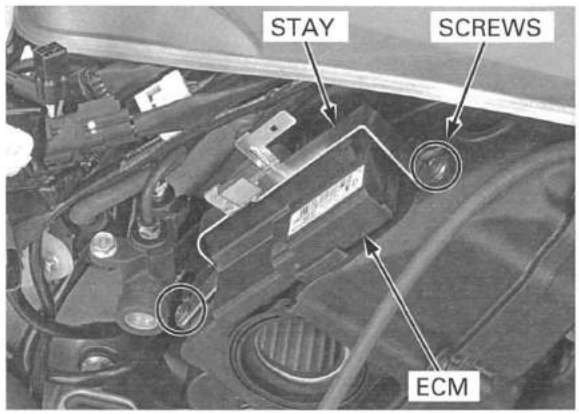


Connect the ECM 33P (Black and Light gray) connectors to the ECM.



Install the ECM on the air cleaner housing.

Install the ECM stay with the screws, then tighten the screws securely.

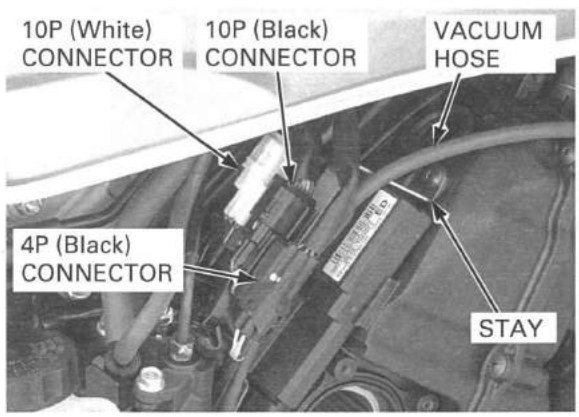


Route the wires properly (page 1-23).

Connect the injector sub-harness 10P (Black) and 10P (White) connectors, and O_2 sensor 4P (Black) connector.

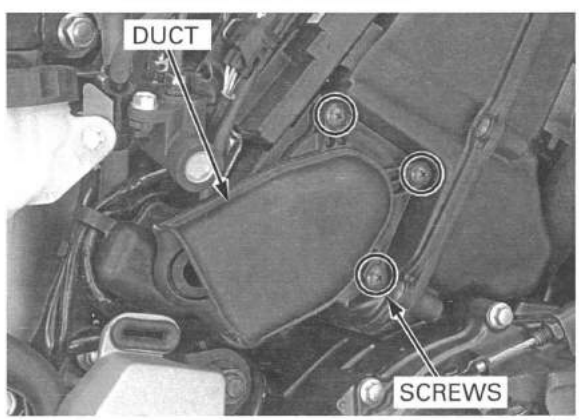
Attach the connectors to the ECM stay securely.

Route the IDC solenoid valve vacuum hose onto the ECM.



Install the right air cleaner duct to the air cleaner housing.

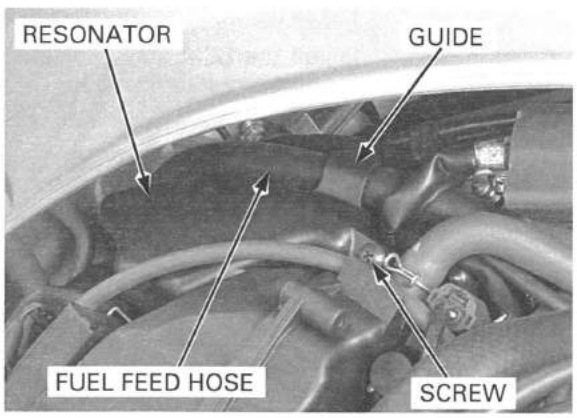
Tighten the screws securely.



Refer to "CABLE & HARNESS ROUTING" (page 1-23)

Route the wires to the guide of rear resonator.

Install the right front resonator and tighten the screw securely.



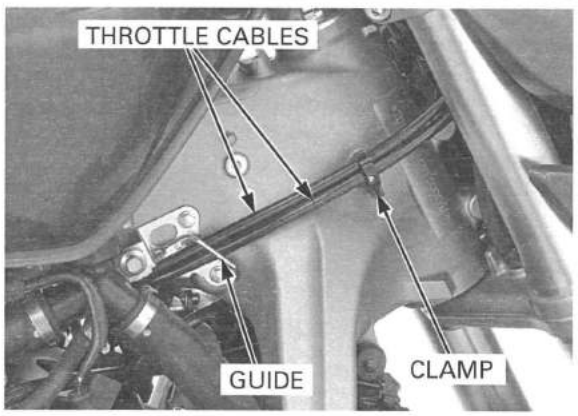
Refer to "CABLE & HARNESS ROUTING" (page 1-23)

Route the fuel feed hose to the guide of front resonator.

Connect the quick connect fitting to the fuel tank (page 5-52).

Remove the support tool, then install and tighten the fuel tank front mounting bolts (page 3-6).

Secure the throttle cables with the clamp and route them to the guide.



Refer to "CABLE & HARNESS ROUTING" (page 1-23)

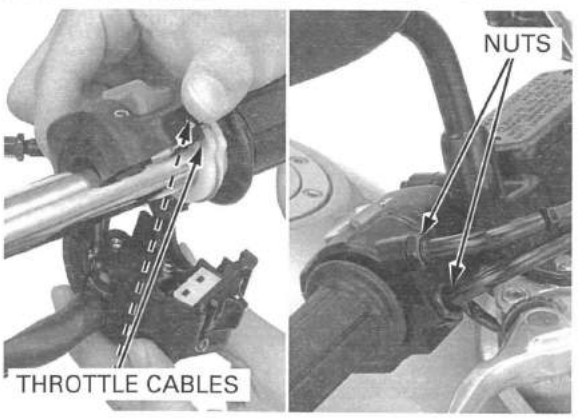
Route the throttle cables properly.

Connect the throttle cables to the throttle pipe.

Install the right handlebar switch housing (page 13-10).

Tighten the nuts securely.

Check the throttle operation and grip freeplay (page 3-6).

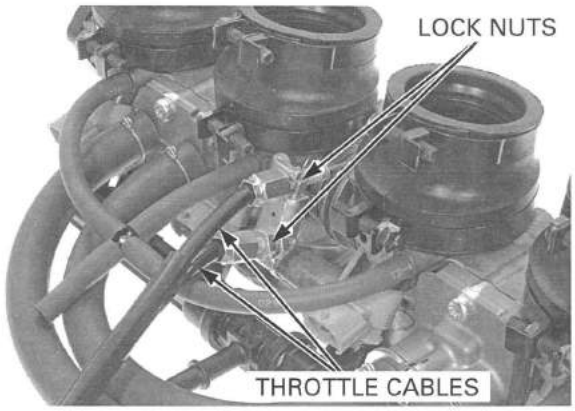


THROTTLE BODY

REMOVAL

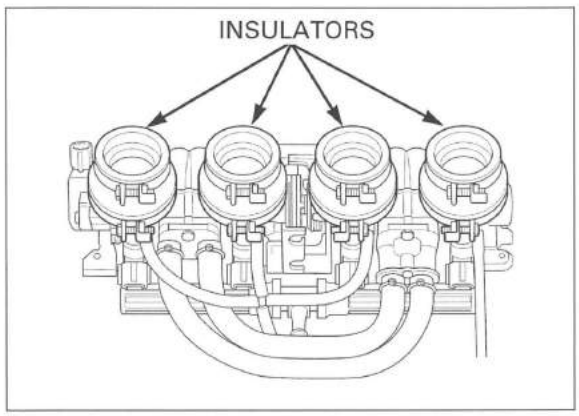
Remove the throttle body from the air cleaner housing (page 5-66).

Loosen the lock nuts and disconnect the throttle cables from the throttle drum.



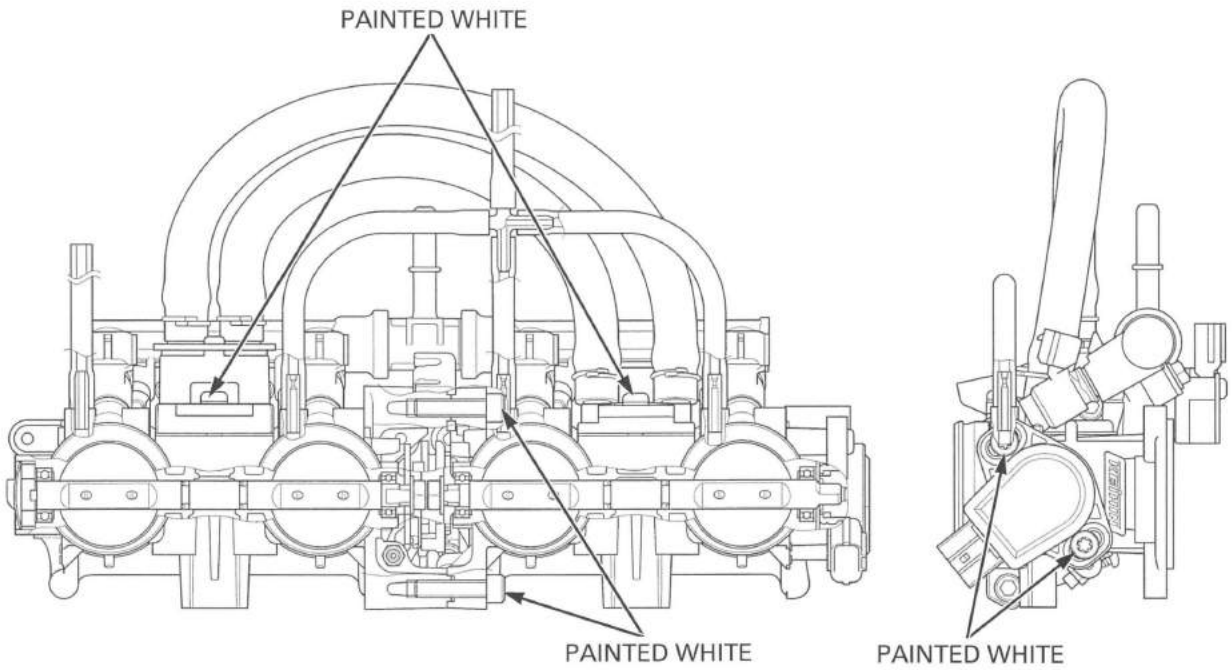
Loosen the insulator band screws and remove the insulators.

NOTE:
Mark each insulator to be sure of their insulator bands direction for reassembly.

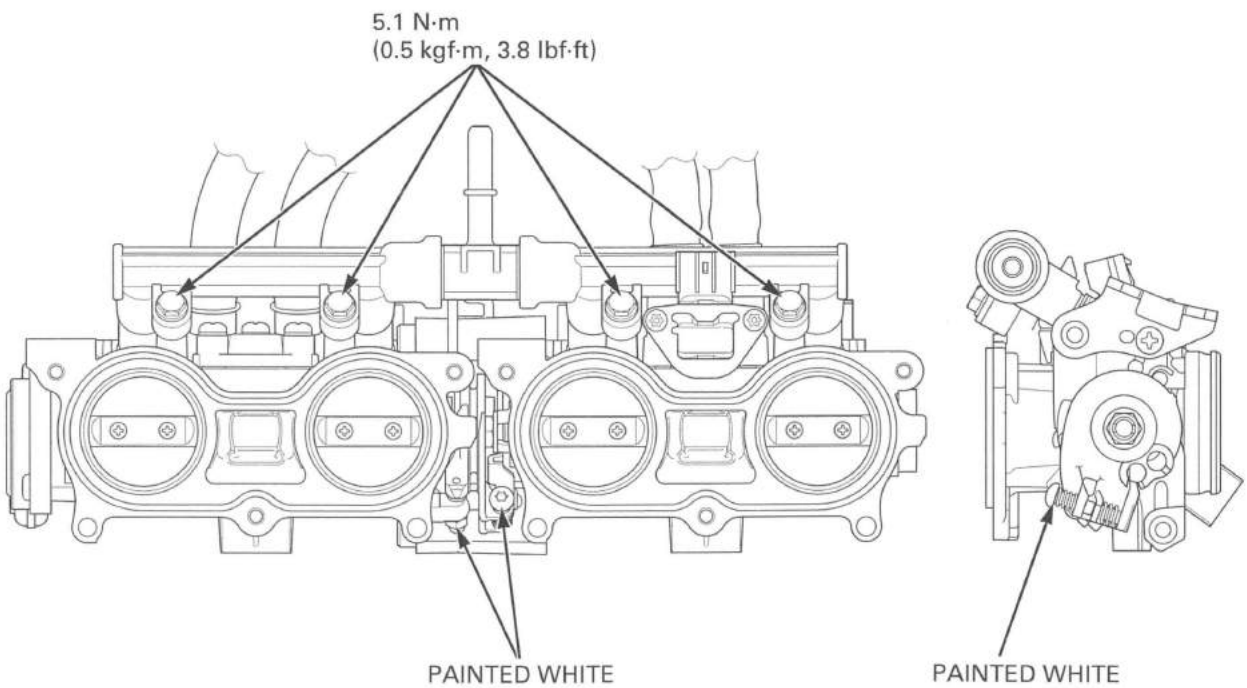


- Do not damage the throttle body. It may cause incorrect throttle and idle valve synchronization.
- The throttle body is factory pre-set. Do not disassemble in a way other than shown in this manual.
- Do not loosen or tighten the white painted bolts, nut and screws of the throttle body. Loosening or tightening them can cause throttle valve and idle control failure.

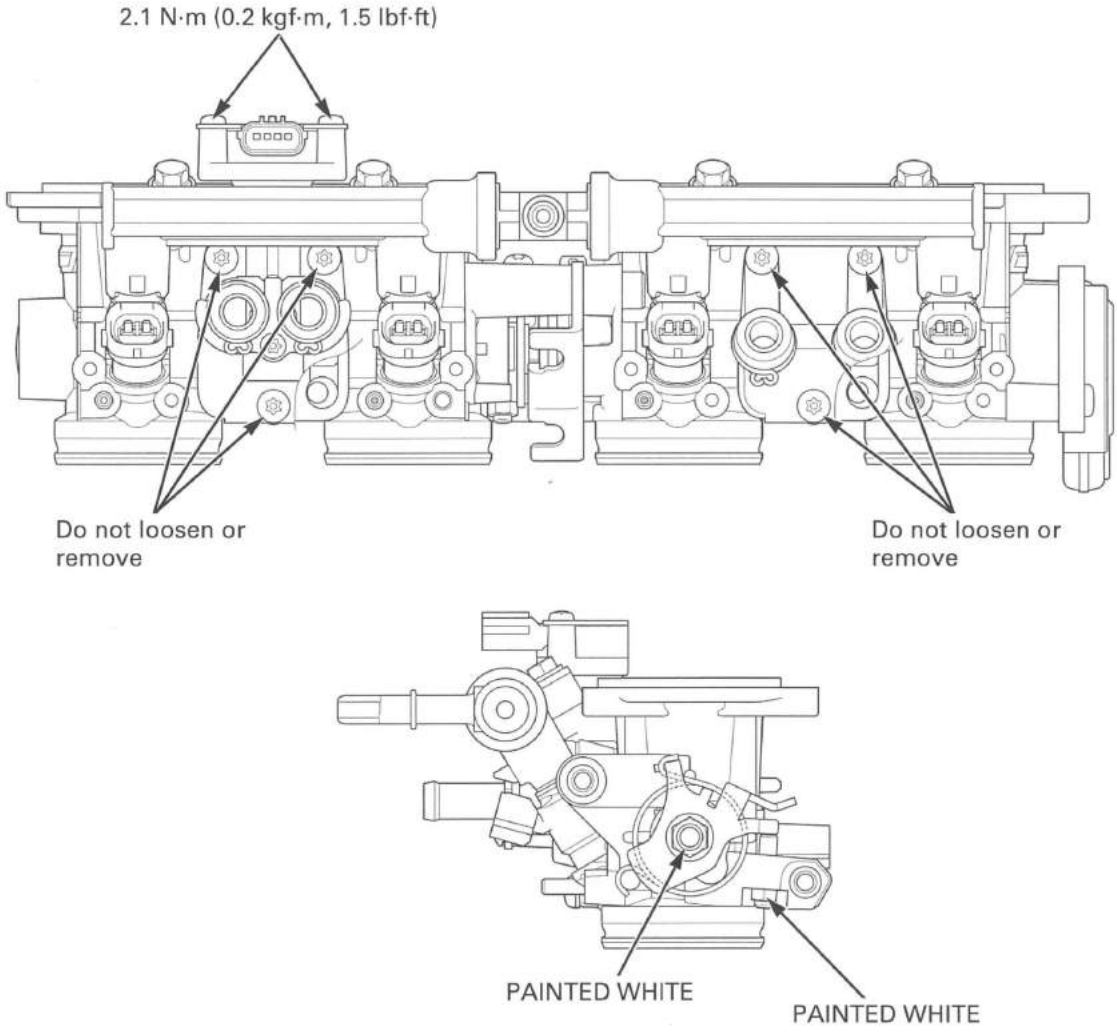
Viewed from cylinder head side and throttle sensor side:



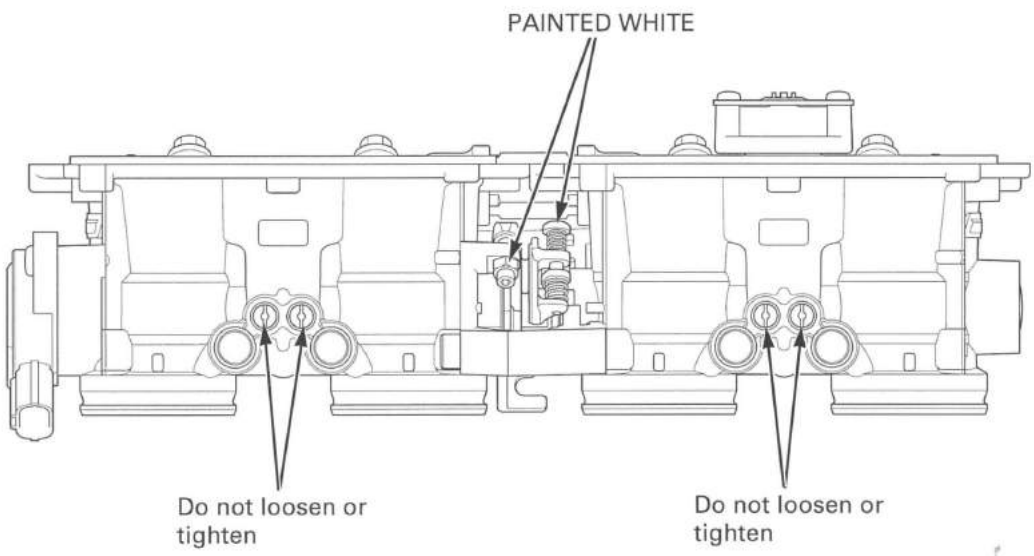
Viewed from air cleaner housing side and throttle drum side:



Viewed from top and throttle drum side:



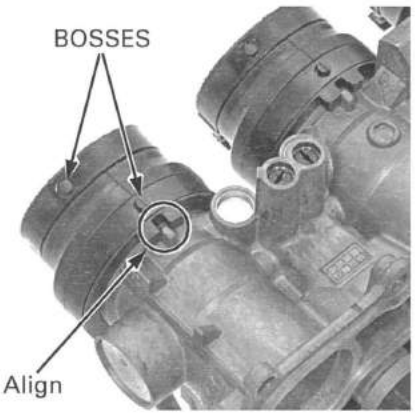
Viewed from bottom:



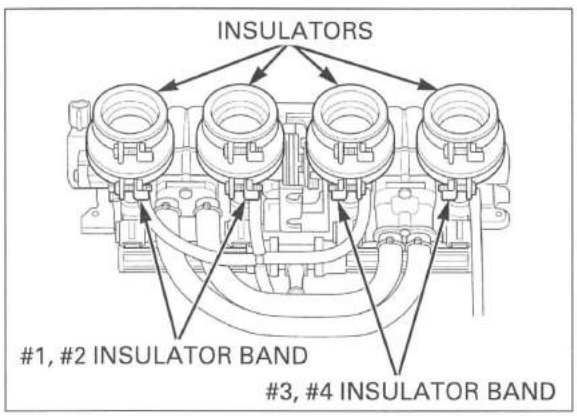
INSTALLATION

Install each insulator onto the throttle body while aligning its groove with the lug on the throttle body.

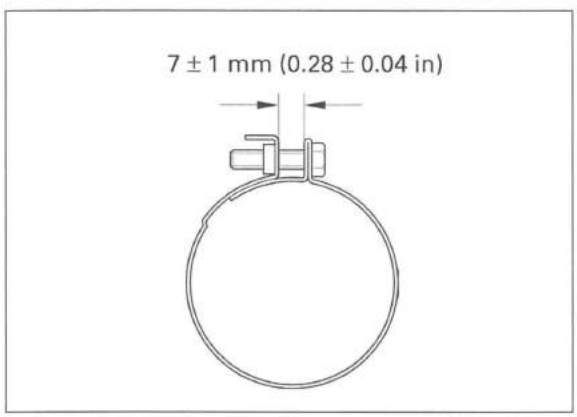
Align the hole on each insulator band with the boss on the insulator.



Confirm the direction of the insulator band screws as shown.

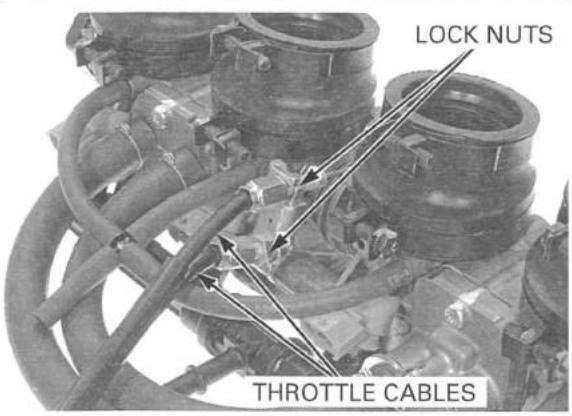


Tighten the throttle body side insulator band screws so that the width between the band ends is 7 ± 1 mm (0.28 ± 0.04 in).



Connect the throttle cables and tighten the lock nuts.

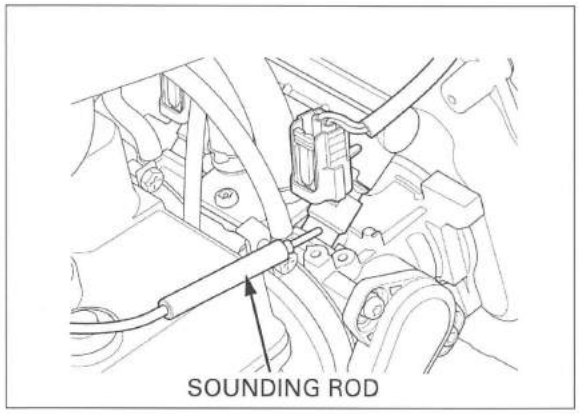
Install the throttle body onto the air cleaner housing (page 5-70).



INJECTOR

INSPECTION

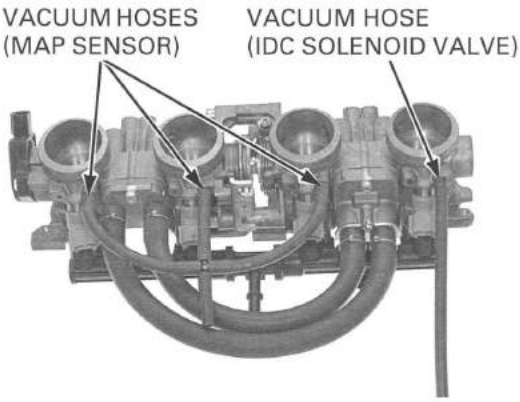
Start the engine and let it idle.
Confirm the injector operating sounds with a sounding rod or stethoscope.



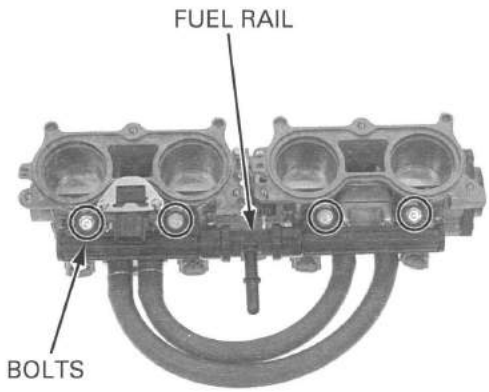
REMOVAL

Remove the throttle body (page 5-81).

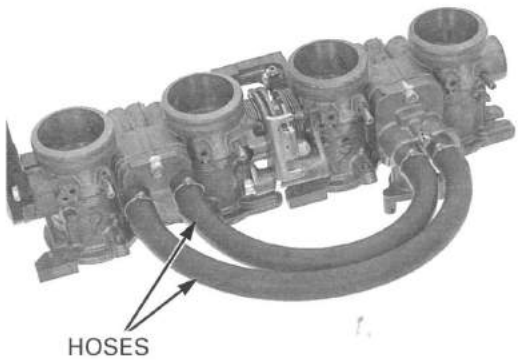
Disconnect the MAP sensor vacuum hoses and IDC solenoid valve vacuum hose.



Remove the bolts and fuel rail.

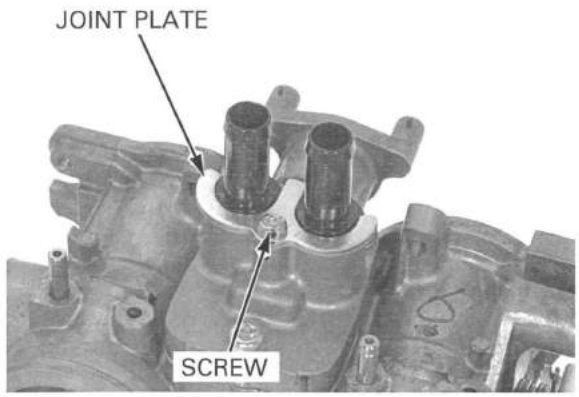


Disconnect the IACV distribution hoses.

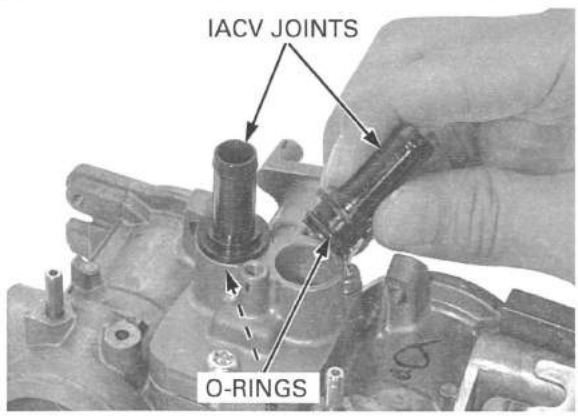


Do not loosen the IACV cover screws.

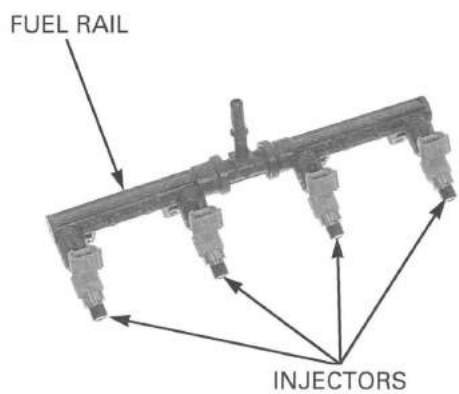
Remove the screw and joint plate.



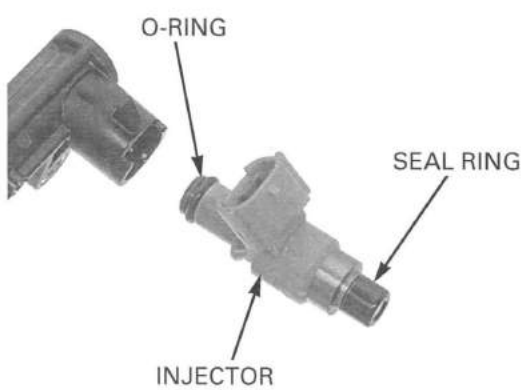
Remove the IACV joints and O-rings.



Remove the injectors from the fuel rail.

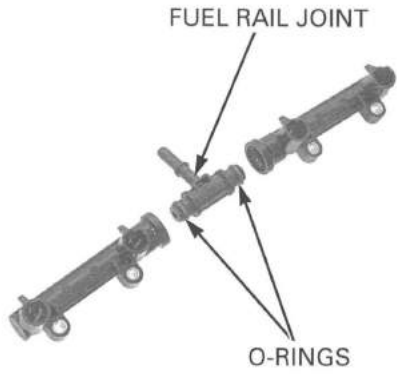


Remove the seal ring and O-ring from each injector.

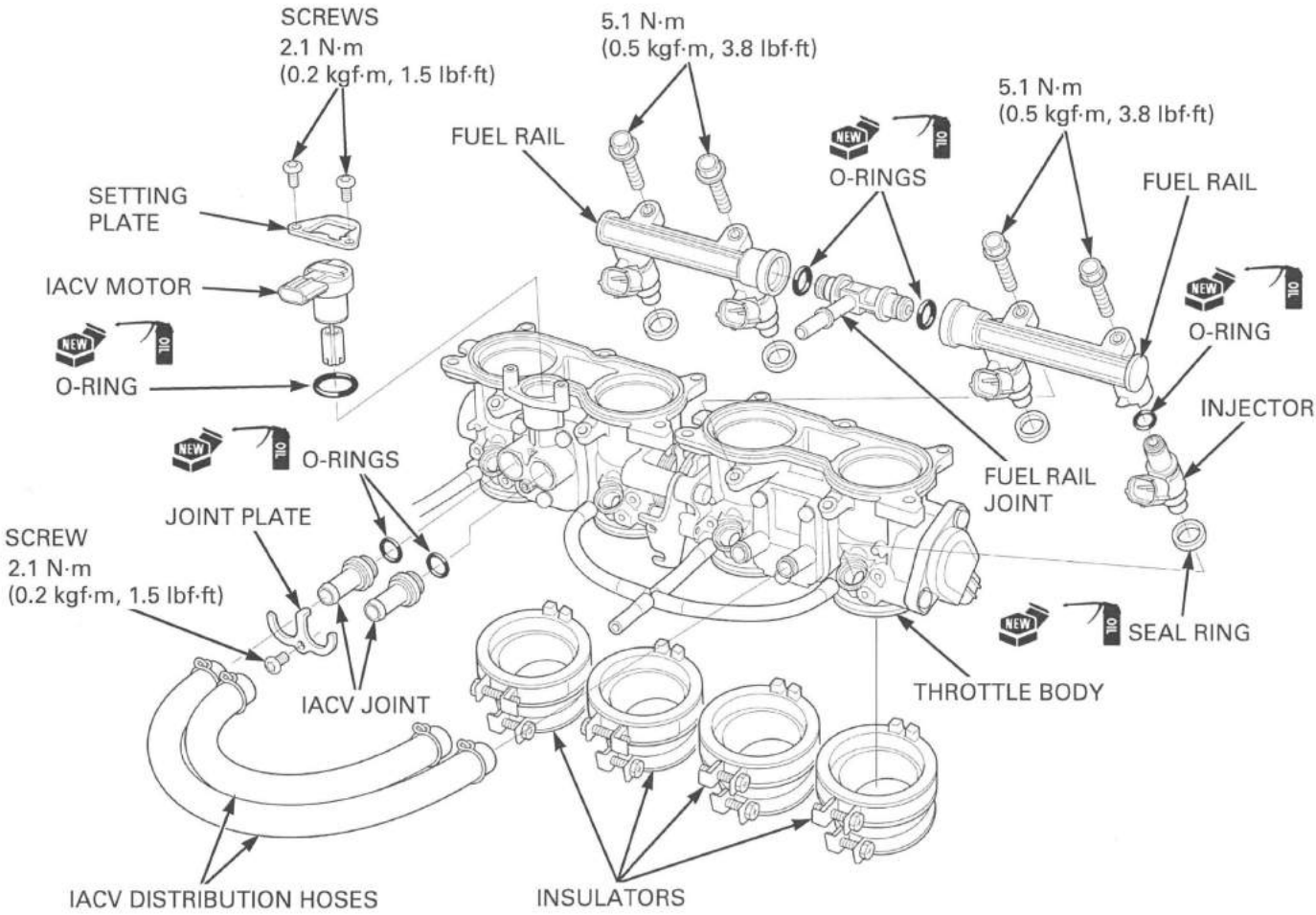


Remove the fuel rail joint.

Remove the O-rings from the fuel rail joint.



INSTALLATION

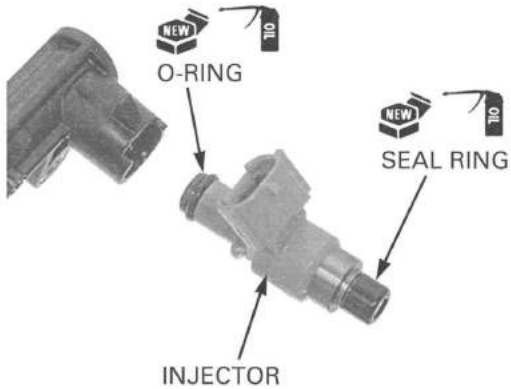


Apply oil to new O-rings of the fuel rail joint.

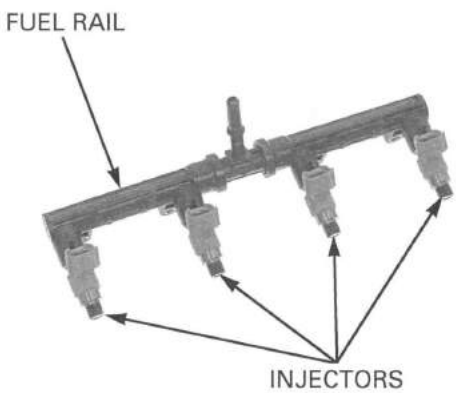
Install the O-rings onto the fuel rail joint.

Apply small amount of engine oil to new seal rings and O-rings.

Install the seal ring and O-ring to each injector.

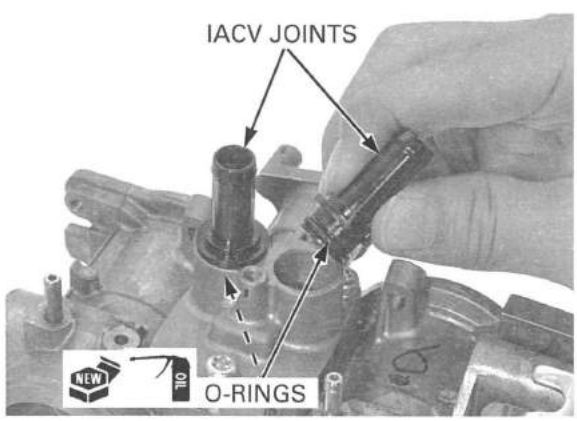


Install the injectors to the fuel rail.



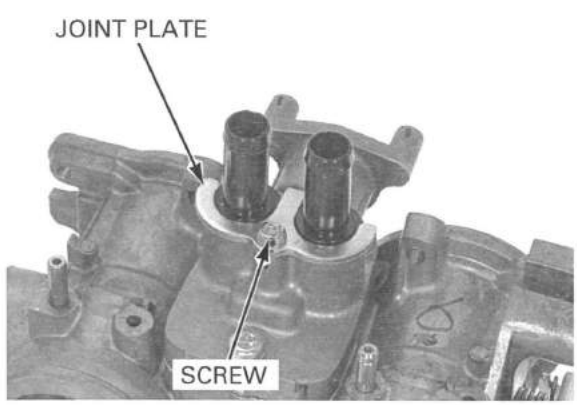
Apply oil to new O-rings and install them to the IACV joints.

Install the IACV joints to the throttle body.

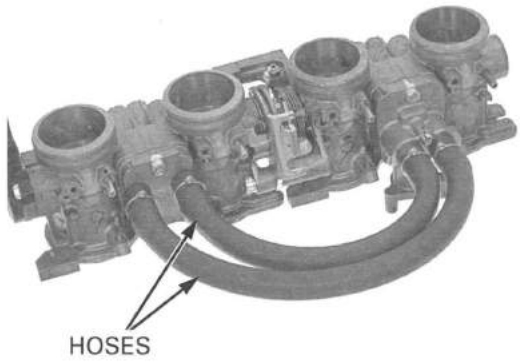


Install the joint plate and tighten the screw to the specified torque.

TORQUE: 2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)



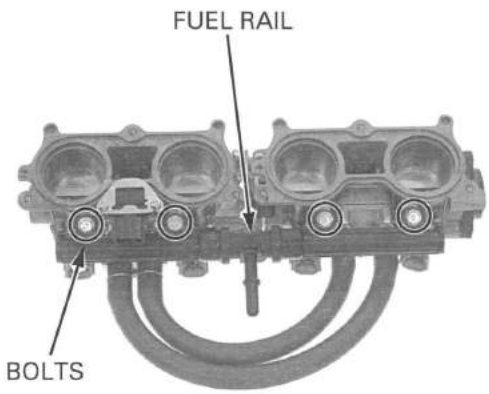
Connect the IACV distribution hoses.



Install the injectors with the fuel rail.

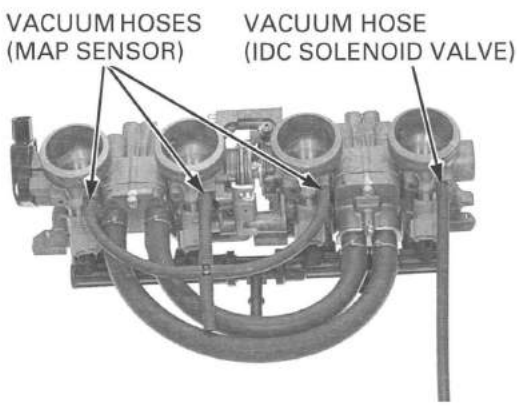
Install and tighten the bolts to the specified torque.

TORQUE: 5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)



Connect the MAP sensor vacuum hoses and IDC solenoid valve air hoses.

Install the throttle body to the air cleaner housing (page 5-70).



ENGINE IDLE SPEED

IDLE SPEED INSPECTION

NOTE:

- Inspect the idle speed after all other engine maintenance items have been performed and are within specifications.
- Before checking the idle speed, inspect the following items.
  - No DTC and MIL blinking.
  - spark plug condition (page 3-8).
  - air cleaner condition (page 3-7).
- The engine must be warm for accurate idle speed inspection.
- This system eliminates the need for manual idle speed adjustment compared to previous designs.
- Use a tachometer with graduations of 50 min^{-1} (rpm) or smaller that will accurately indicate a 50 min^{-1} (rpm) change.

Lift and support the fuel tank (page 3-5).

Start the engine and warm it up to coolant temperature 80 °C (176 °F), then check the idle speed.

ENGINE IDLE SPEED: 1,350 ± 100 min^{-1} (rpm)

If the idle speed is out of the specification, check the following:

- throttle operation and throttle grip freeplay (page 3-6).
- intake air leak or engine top-end problem (page 8-3).
- IACV operation (page 5-90).

IACV

INSPECTION

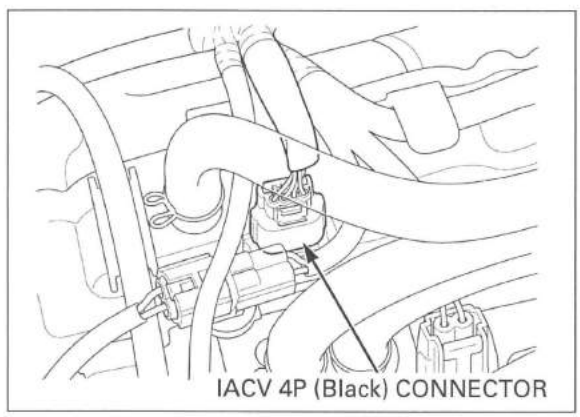
The IACV is installed on the throttle body and is operated by the step motor. When the ignition switch is turned ON, the IACV operates for a few seconds.

Check the step motor operating (beep) sound with the ignition switch turned ON.

NOTE:

The IACV operation can be checked visually as follows:

- Remove the IACV (page 5-91).
  Connect the 4P (Black) connector to the IACV, then turn the ignition switch ON.

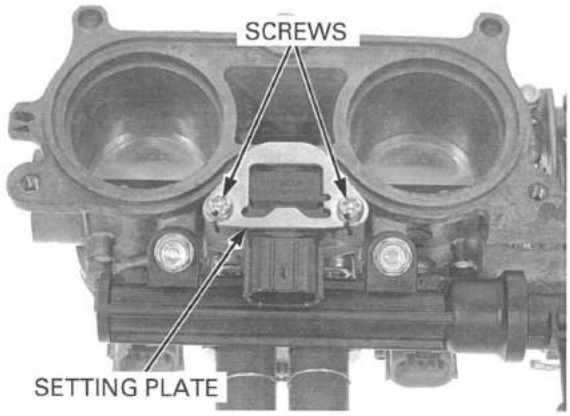

IACV 4P (Black) CONNECTOR

REMOVAL

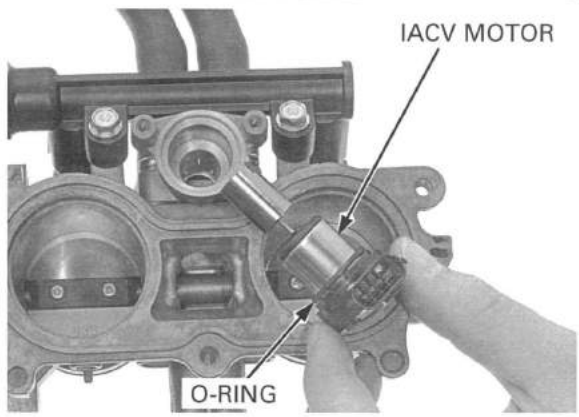
- Always clean the throttle body before the IACV removal to prevent dirt and debris from entering the IACV passage.

Remove the throttle body (page 5-85).

Remove the screws and setting plate.

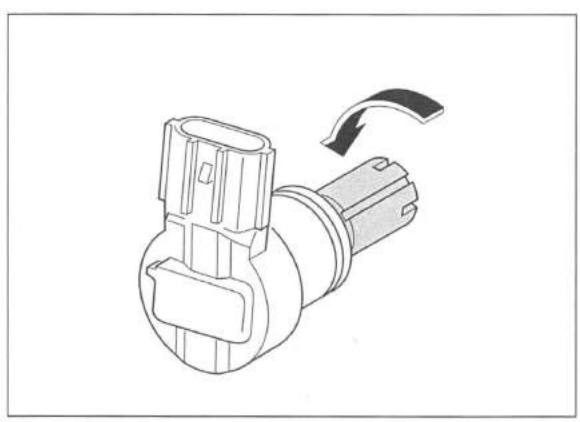


Remove the IACV motor and O-ring.



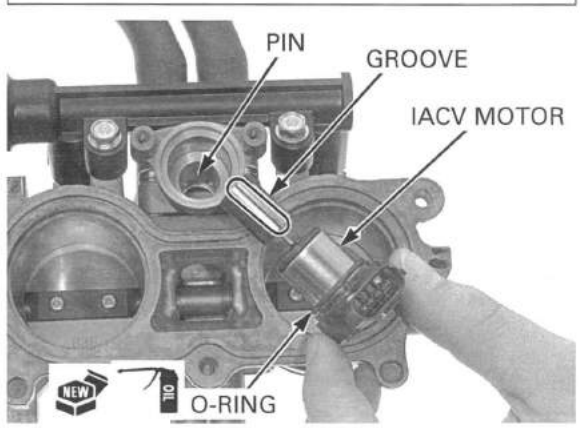
INSTALLATION

Turn the slide valve clockwise until lightly seated on IACV.

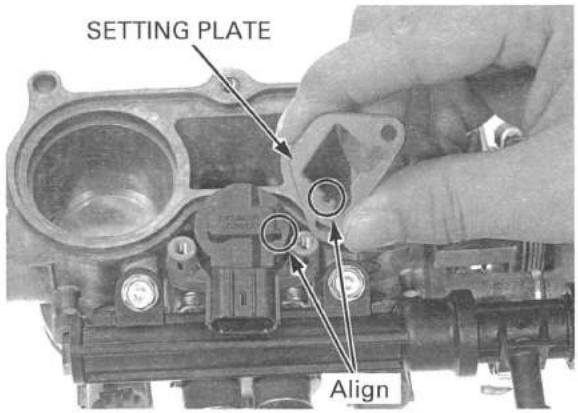


Apply oil to new O-ring and install it to the IACV motor.

Install the IACV motor, aligning its groove with the pin inside the motor housing.



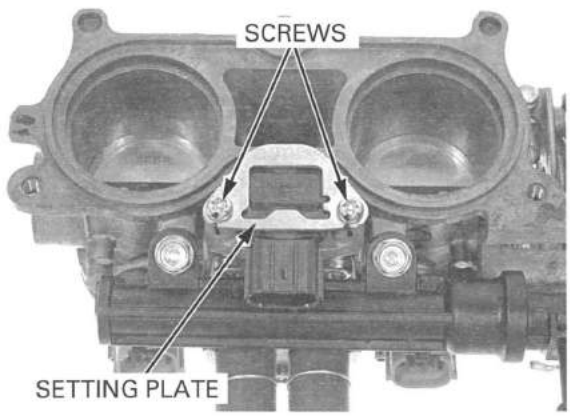
Install the setting plate while aligning the cut-out with the lug on the IACV motor.



Install the screws and tighten them to the specified torque.

TORQUE: 2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)

Install the throttle body (page 5-70).



MAP SENSOR

OUTPUT VOLTAGE INSPECTION

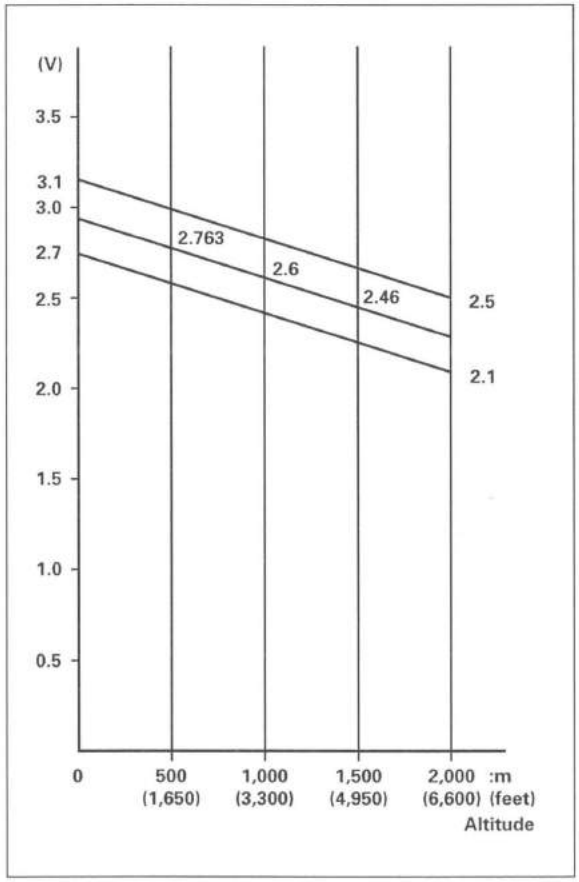
Connect the test harness to the ECM connectors (page 5-14).

Measure the voltage at the test harness terminals (page 5-36).

CONNECTION: B9 (+) – A18 (–)

STANDARD: 2.7 – 3.1 V

The MAP sensor output voltage (above) is measured under the standard atmosphere (1 atm = 1,013 hPa).
The MAP sensor output voltage is affected by the distance above sea level, because the output voltage is changed by atmosphere.
Check the sea level measurement and be sure that the measured voltage falls within the specified value.



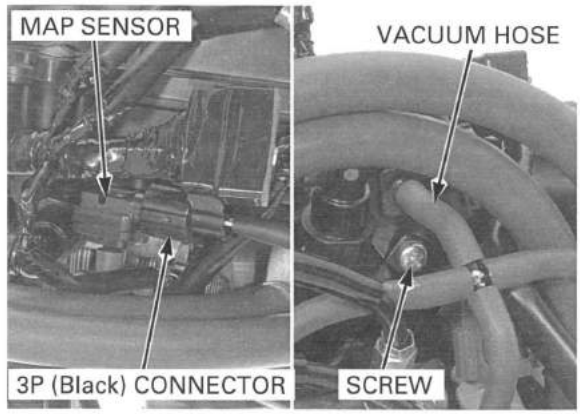
REMOVAL/INSTALLATION

Remove the air cleaner housing (page 5-61).

Disconnect the MAP sensor 3P (Black) connector.
Disconnect the vacuum hose from the MAP sensor.

Remove the screw and MAP sensor.

Installation is in the reverse order of removal.

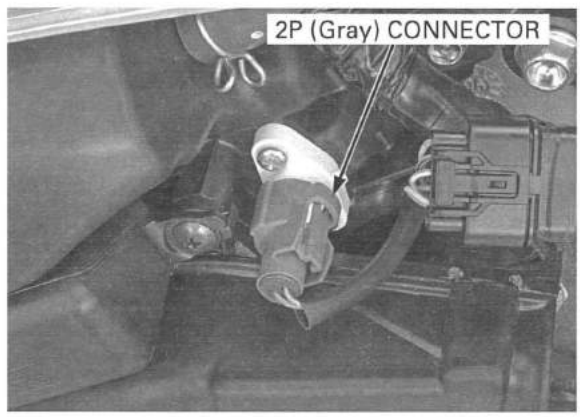


IAT SENSOR

REMOVAL/INSTALLATION

Remove the left side cover (page 2-4).

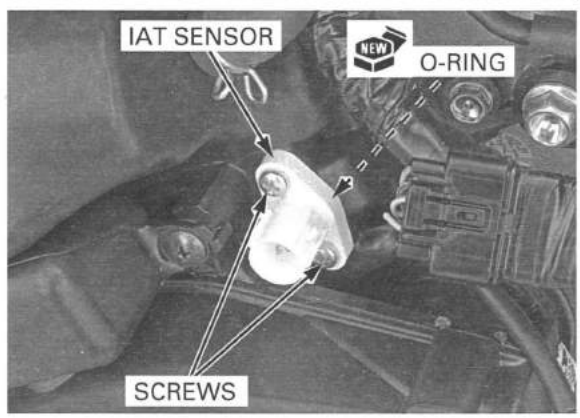
Disconnect the IAT sensor 2P (Gray) connector.



Remove the screws and IAT sensor from the air cleaner housing.

Always replace the O-ring with a new one.

Installation is in the reverse order of removal.



ECT SENSOR

REMOVAL/INSTALLATION

Replace the ECT sensor while the engine is cold.

Drain the coolant from the system (page 6-7).

Disconnect the 3P (Black) connector from the ECT sensor.

Remove the ECT sensor and sealing washer.

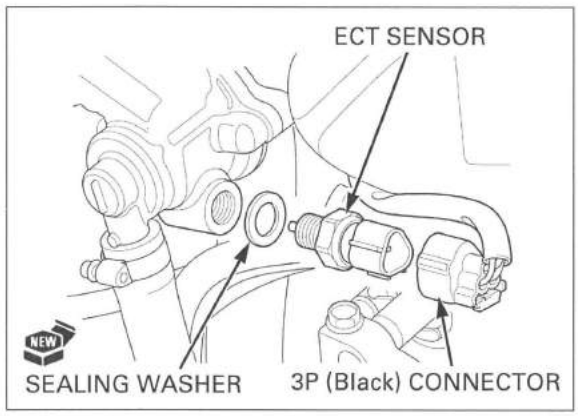
Always replace a sealing washer with a new one.

Install a new sealing washer and ECT sensor.
Tighten the ECT sensor to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Connect the ECT sensor 3P (Black) connector.

Fill the cooling system with recommended coolant (page 6-7).

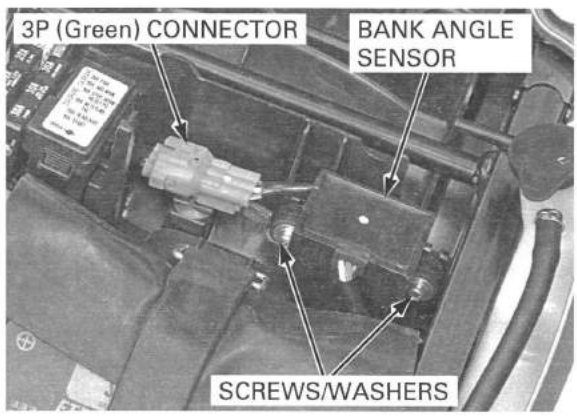


BANK ANGLE SENSOR

REMOVAL/INSTALLATION

Remove the seat (page 2-4).

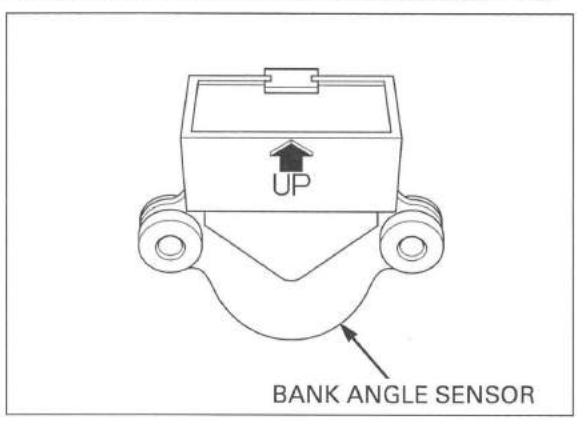
Disconnect the 3P (Green) connector.
Remove the screws, washers and bank angle sensor.



Install the bank angle sensor with its "UP" mark facing up.

Installation is in the reverse order of removal.

Tighten the mounting screws securely.

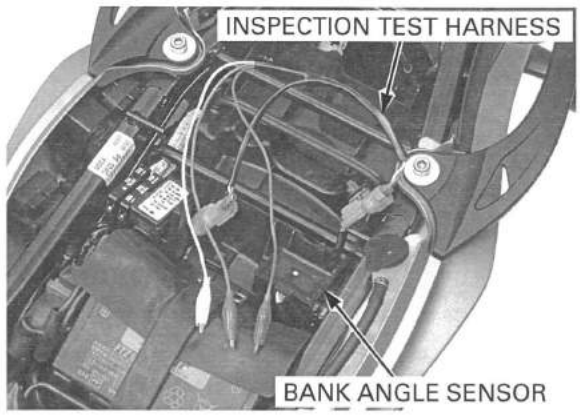


INSPECTION

Remove the seat (page 2-4).

Disconnect the bank angle sensor 3P (Green) connector and connect the special tool between the connectors.

TOOL:
Inspection test harness **07GMJ-ML80100**



Turn the ignition switch ON and engine stop switch "○".

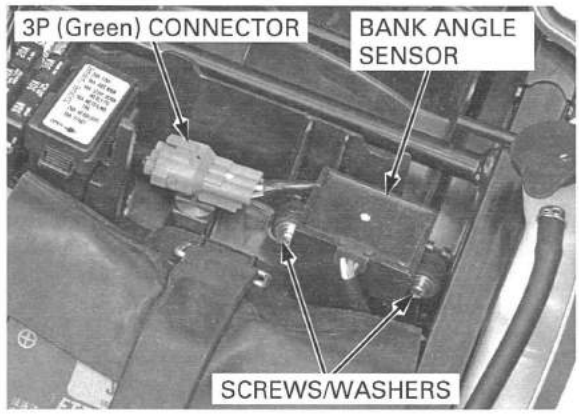
Measure the voltage between the following terminals of the test harness.

TERMINAL	STANDARD
White clip (+) – Red clip (–)	Battery voltage
Green clip (+) – Red clip (–)	0 – 1 V

Turn the ignition switch OFF and remove the inspection test harness.

Connect the bank angle sensor 3P (Green) connector.

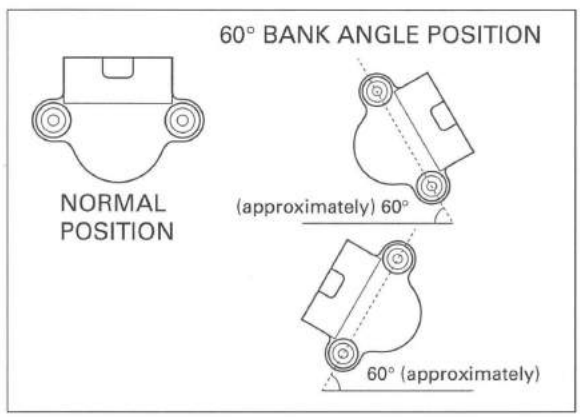
Remove the screws, washers and the bank angle sensor.



Place the bank angle sensor horizontal as shown, and turn the ignition switch ON and engine stop switch "○".
The bank angle sensor is normal if the engine stop relay clicks and power supply is closed.

Incline the bank angel sensor approximately 60 degrees to the left or right with keeping the ignition switch ON and engine stop switch "○".
The bank angle sensor is normal if the engine stop relay clicks and power supply is open.

If you repeat this test, first turn the ignition switch OFF, then turn the ignition switch ON and engine stop switch "○".



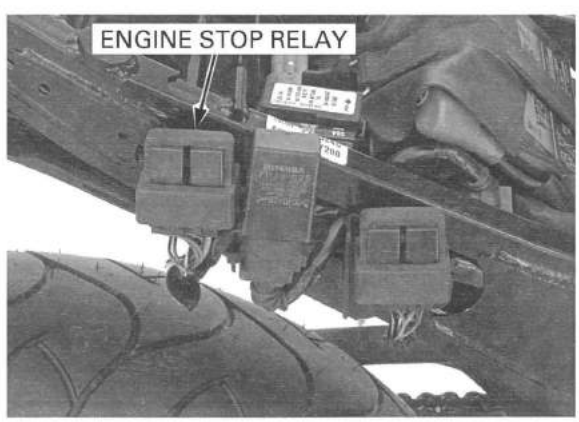
ENGINE STOP RELAY

INSPECTION

Remove the rear cowl (page 2-6).

Remove the engine stop relay from the rubber holder.

Disconnect the engine stop relay connector.



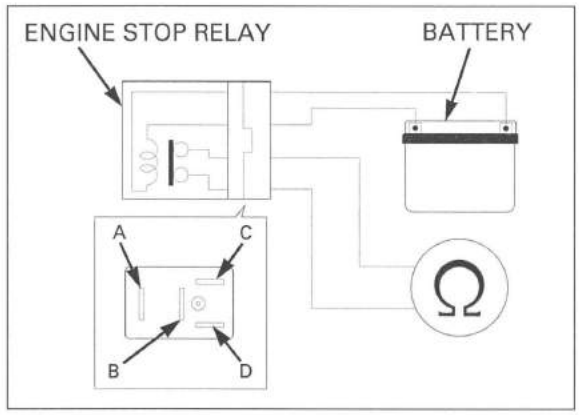
Connect the ohmmeter to the engine stop relay connector terminals.

CONNECTION: A – B

Connect a 12 V battery to the following engine stop relay connector terminals.

CONNECTION: C (+) – D (–)

There should be continuity only when the 12 V battery is connected.
If there is no continuity when the 12 V battery is connected, replace the engine stop relay.



ECM

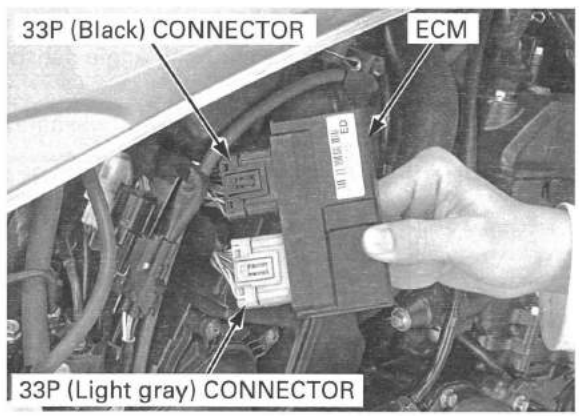
REMOVAL/INSTALLATION

Turn the ignition switch to "OFF".
Lift and support the fuel tank (page 3-5).

Pull out the ECM from the stay.
Disconnect the 33P (Black and Light gray) connectors from the ECM.

Installation is in the reverse order of removal.

NOTE:
After replacing the ECM, register the new transponder keys (page 21-6).



ECM POWER/GROUND LINE INSPECTION

ENGINE DOES NOT START (No DTC and MIL blinking)

1. **ECM Power Input Voltage Inspection**

   - Before starting the inspection, check for loose or poor contact on the ECM 33P connectors and recheck the MIL blinking.

   Disconnect the ECM 33P (Black) connector.

   Turn the ignition switch ON and engine stop switch "⟳".
   Measure the voltage at the ECM 33P (Black) connector terminal and ground.

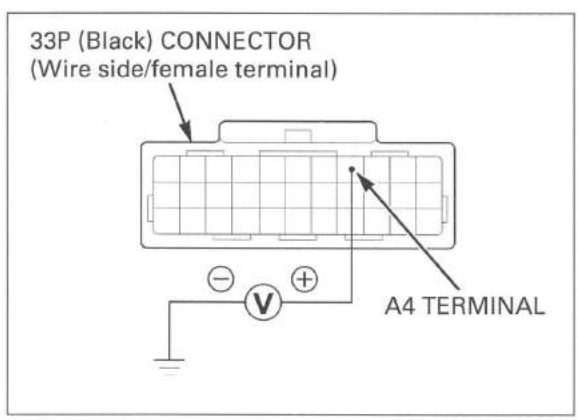
   TOOL:
   Test probe **07ZAJ-RDJA110**

   CONNECTION: A4 (+) – Ground (–)

   Is there battery voltage?

   YES – GO TO STEP 2.

   NO – GO TO STEP 3.



2. ECM Ground Line Inspection

Turn the ignition switch OFF.
Check the continuity between the ECM 33P (Black) connector terminals and ground.

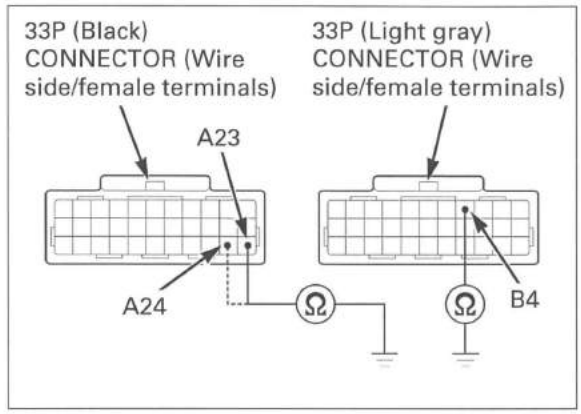
TOOL:
Test probe **07ZAJ-RDJA110**

CONNECTION: A23 – Ground
A24 – Ground
B4 – Ground

Are there continuities?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

NO – Open circuit in Green/white (A23 or A24) wires or Green wire (B4)



3. Engine Stop Relay Inspection 1

Turn the ignition switch OFF.
Remove the engine stop relay from the relay connector (page 5-95).

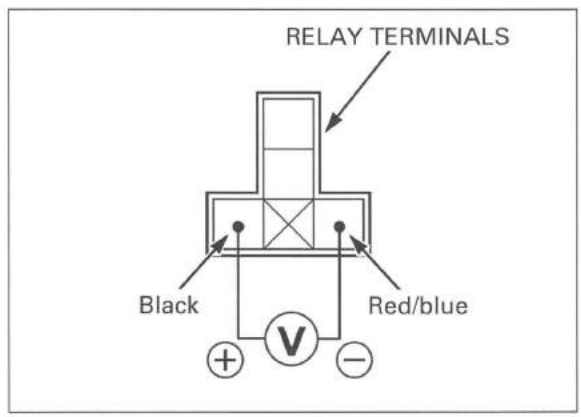
Turn the ignition switch ON and engine stop switch "○".
Measure the voltage at the engine stop relay connector terminals.

CONNECTION: Black (+) – Red/blue (–)

Is there battery voltage?

YES – GO TO STEP 4.

NO – Inspect the bank angle sensor (page 5-95).



4. Engine Stop Relay Inspection 2

Turn the ignition switch OFF.
Jump the engine stop relay connector terminals with jumper wire.

CONNECTION: Red/white – Black/white

Turn the ignition switch ON and engine stop switch "○".
Measure the voltage at the ECM 33P (Black) connector terminal and ground.

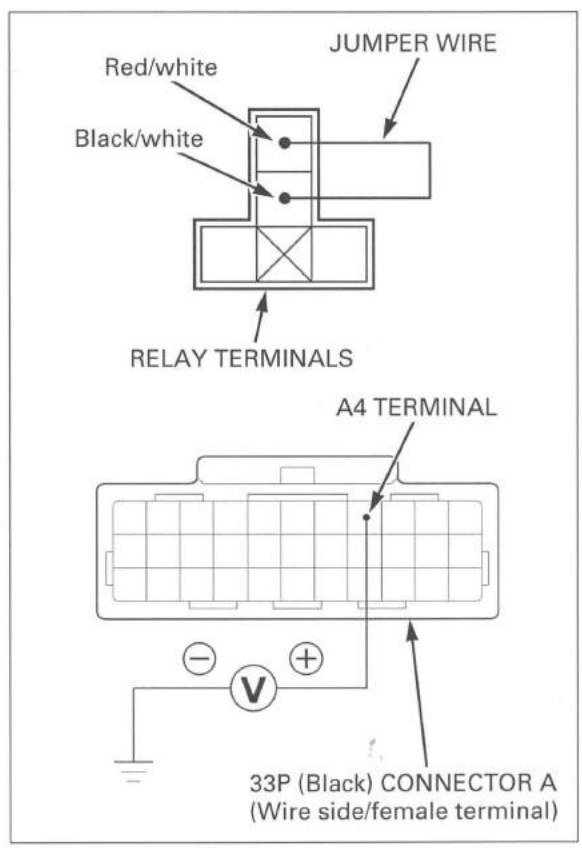
CONNECTION: A4 (+) – Ground (–)

TOOL:
Test probe **07ZAJ-RDJA110**

Is there battery voltage?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 21-6)

NO – Open circuit in power input line (Black/white or Red/white) between the battery and ECM



SECONDARY AIR SUPPLY SYSTEM

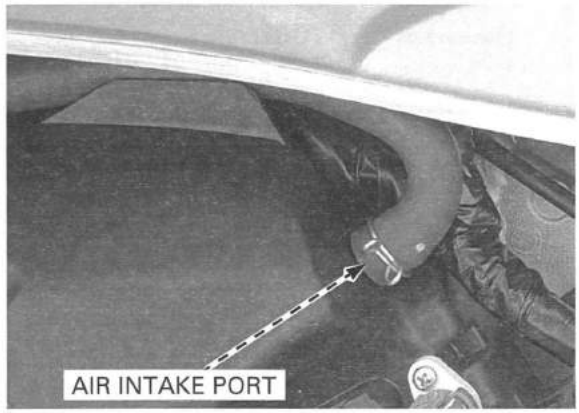
SYSTEM INSPECTION

Start the engine and warm it up until the coolant temperature is 80 °C (176 °F).

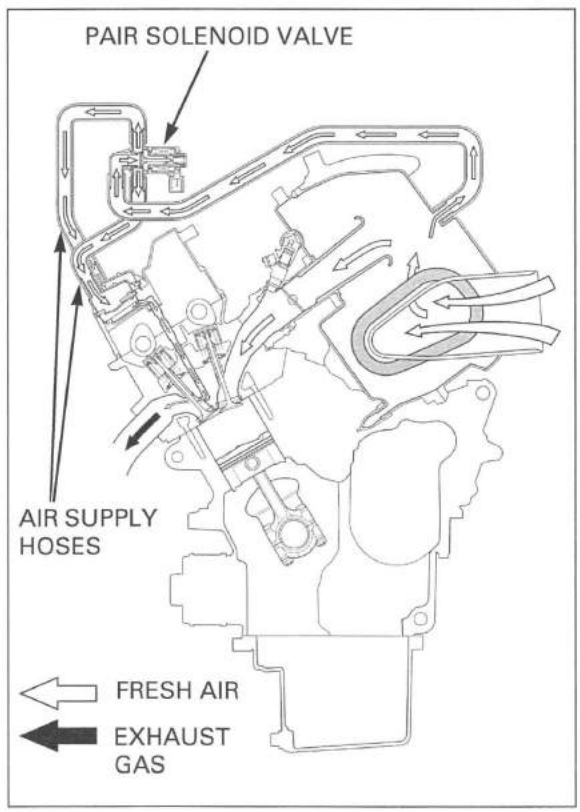
Stop the engine.

Lift and support the fuel tank (page 3-5).

Disconnect the air supply hose from the air cleaner housing.
Check that the secondary air intake port is clean and free of carbon deposits.
Check the PAIR check valves if the port is carbon fouled (page 8-7).



Start the engine and open the throttle slightly to be certain that the air sucked in through the air supply hose.
If the air is not drawn in, check the air supply hoses for clogs and the PAIR solenoid valve.

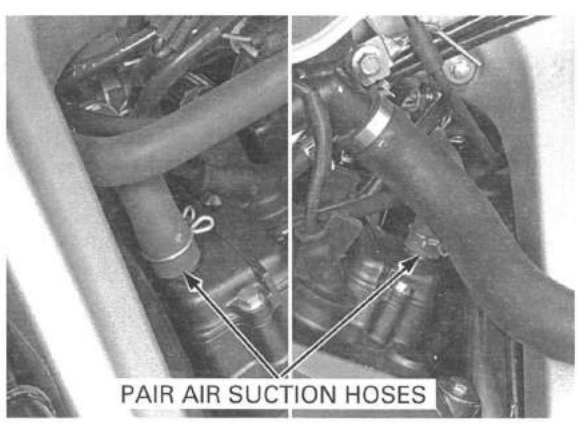


PAIR CONTROL SOLENOID VALVE

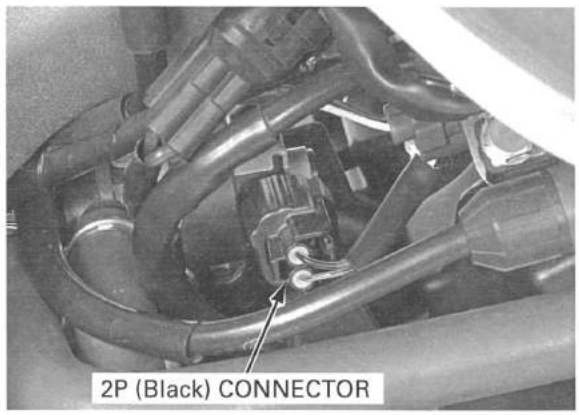
Removal/Installation

Lift and support the fuel tank (page 3-5).

Disconnect the right and left PAIR air suction hoses from the cylinder head cover.

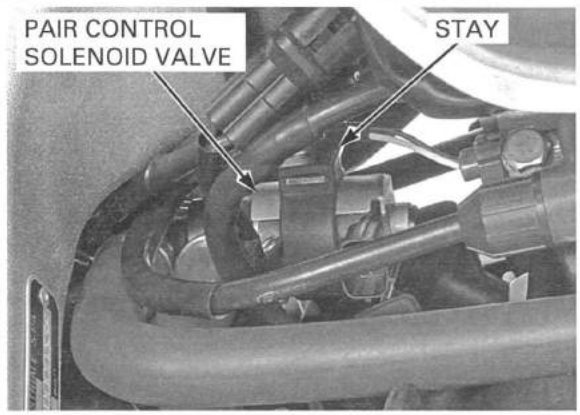


Disconnect the PAIR control solenoid valve 2P (Black) connector.



Pull the PAIR control solenoid valve out the stay.

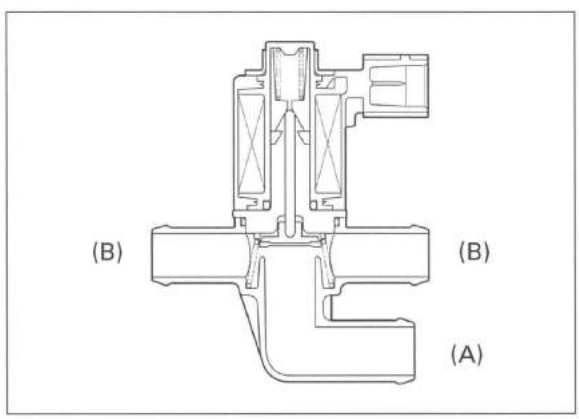
Installation is in the reverse order of removal.



Inspection

Remove the PAIR control solenoid valve.

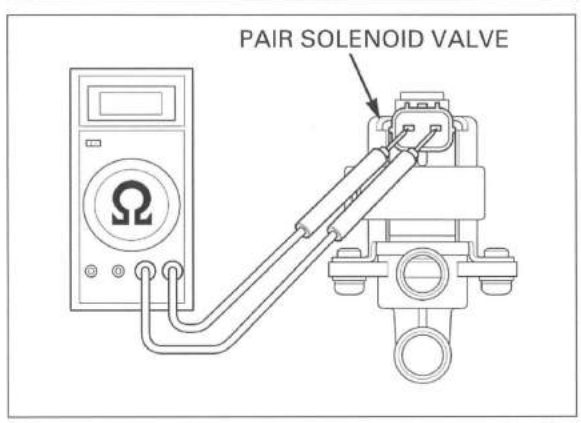
Check that air flows (A) to (B) when the 12 V battery is connected to the PAIR control solenoid valve terminals. Air should not flow (A) to (B) when the battery is disconnected.



Check the resistance between the terminals of the PAIR control solenoid valve.

STANDARD: 23 – 27 Ω (20 °C/68 °F)

If the resistance is out of specification, replace the PAIR control solenoid valve.

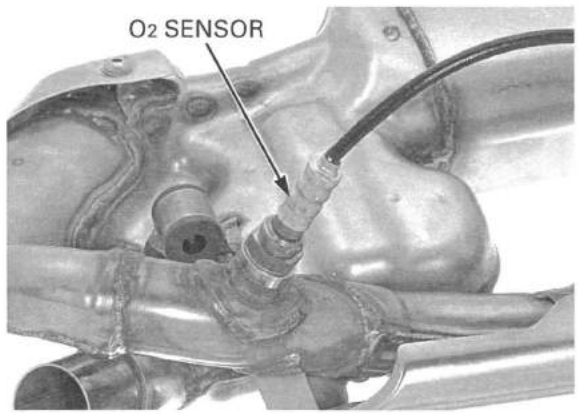


O_2 SENSOR

REMOVAL/INSTALLATION

- Handle the O_2 sensor with care.
- Do not get grease, oil or other materials in the O_2 sensor air hole, or it may be damaged.
- Do not service the O_2 sensor while it is hot.

Remove the exhaust pipe (page 2-13).



Remove the O_2 sensor using the special tool.

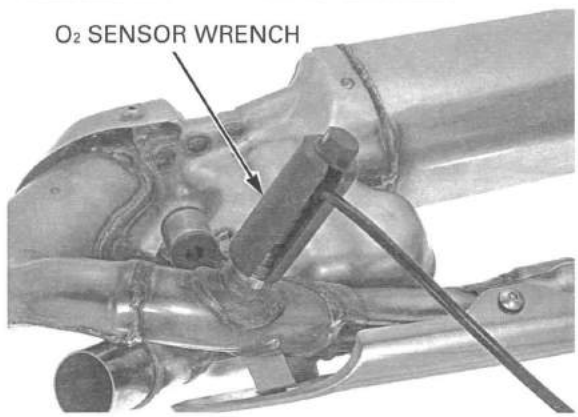
TOOL:

O_2 sensor wrench	**07LAA-PT50101**

- Be careful not to damage the sensor wire.
- Do not use an impact wrench while removing or installing the O_2 sensor, or it may be damaged.

Install the O_2 sensor onto the exhaust pipe and tighten it securely.

Install the exhaust pipe (page 2-15).



INTAKE AIR DUCT

INTAKE AIR DUCT VALVE DIAPHRAGM

Inspection

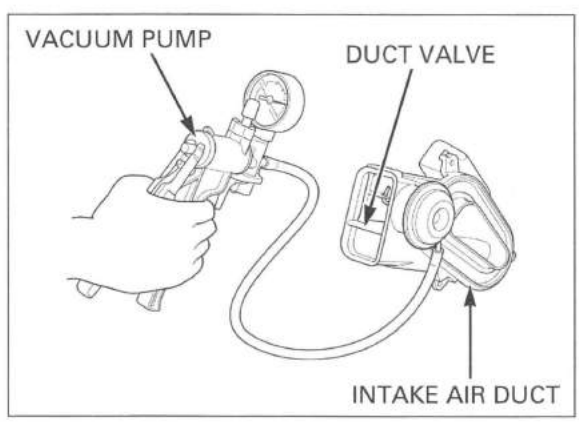
Remove the left intake air duct from the air cleaner housing (page 5-63).

Disconnect the vacuum hose from the diaphragm.

Connect a vacuum pump to the diaphragm and apply specified vacuum.

SPECIFIED VACUUM: 250 mm Hg (9.8 in Hg)

The vacuum should hold and the duct valve should remain open.

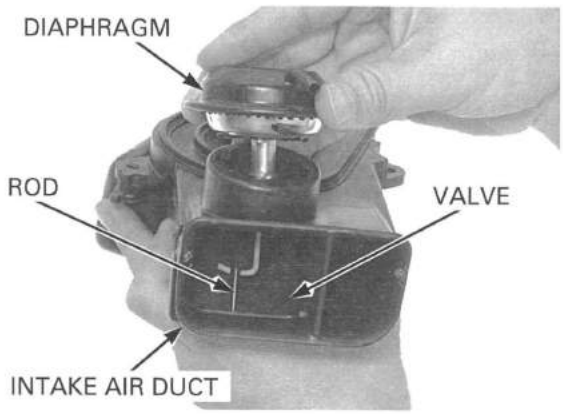


Removal/Installation

Remove the left intake air duct from the air cleaner housing (page 5-63).

Disconnect the vacuum hose from the diaphragm. Turn the diaphragm counterclockwise and unhook the diaphragm rod from the duct valve.

Installation is in the reverse order of removal.

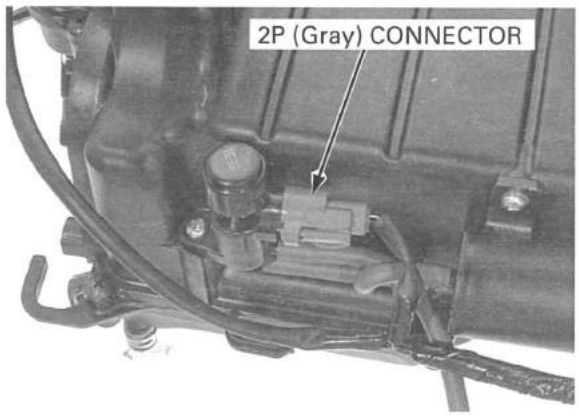


IDC SOLENOID VALVE

Removal/Installation

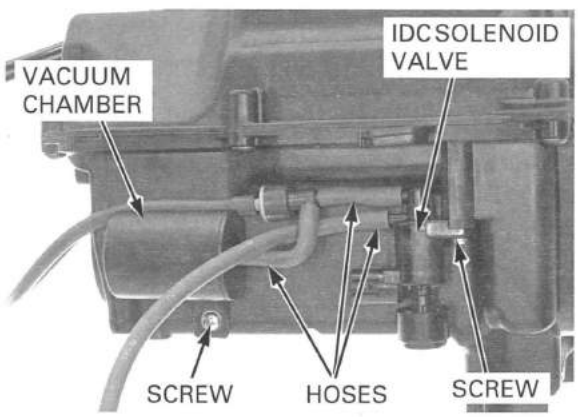
Remove the air cleaner housing (page 5-61).

Disconnect the IDC solenoid valve 2P (Gray) connector.



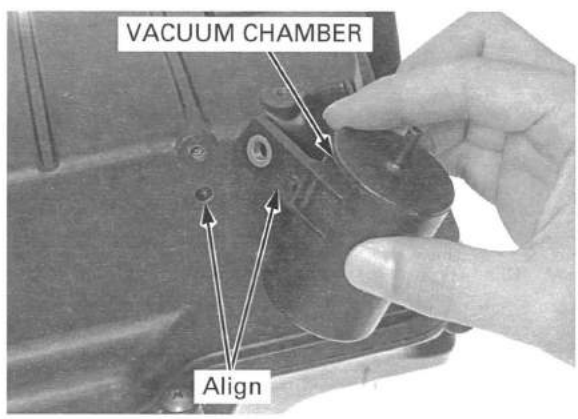
Disconnect the vacuum hoses and remove the screw and IDC solenoid valve.

Disconnect the vacuum hose and remove the screw and vacuum chamber.



Installation is in the reverse order of removal.

Align the vacuum chamber boss with the hole on the air cleaner housing.

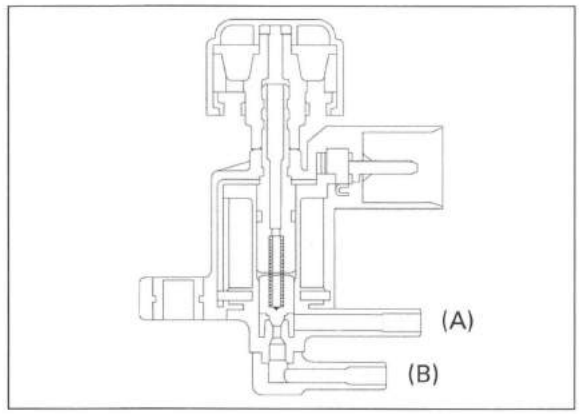


Inspection

Remove the IDC solenoid valve.

Check that the air should flow (A) to (B), only when the 12 V battery is connected to the IDC solenoid valve terminals.

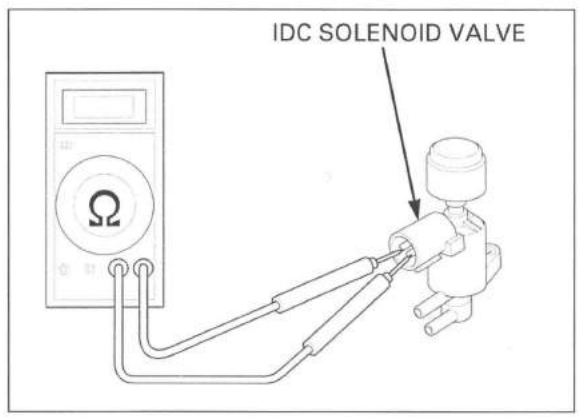
CONNECTION:
Battery (+) terminal – Black/white terminal
Battery (–) terminal – Yellow/black terminal



Check the resistance between the terminals of the IDC solenoid valve.

STANDARD: 28 – 32 Ω (20 °C/68 °F)

If the resistance is out of specification, replace the IDC solenoid valve.



ONE-WAY VALVE

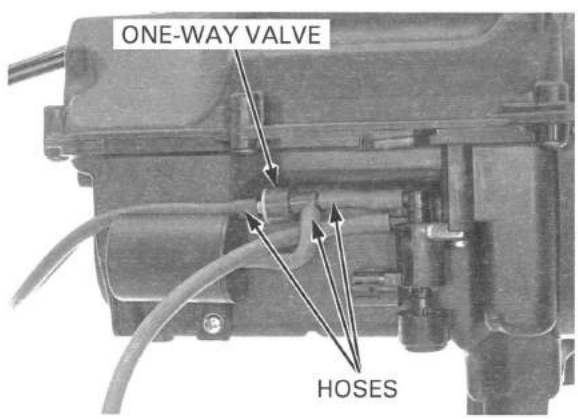
Removal/Installation

Remove the air cleaner housing (page 5-61).

Remove the one-way valve by disconnecting the vacuum hoses.

Route the vacuum hoses correctly.

Installation is in the reverse order of removal.

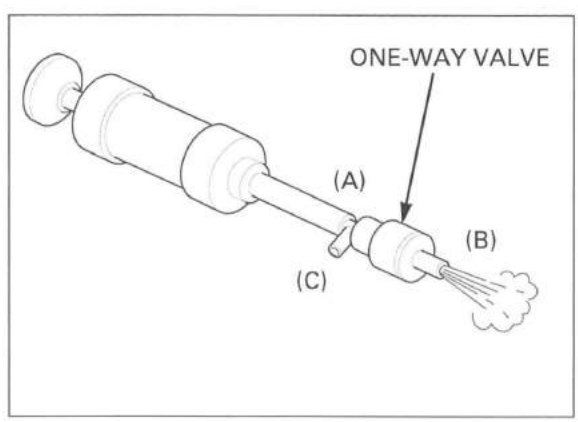


Inspection

Check the one-way valve operation as follows:

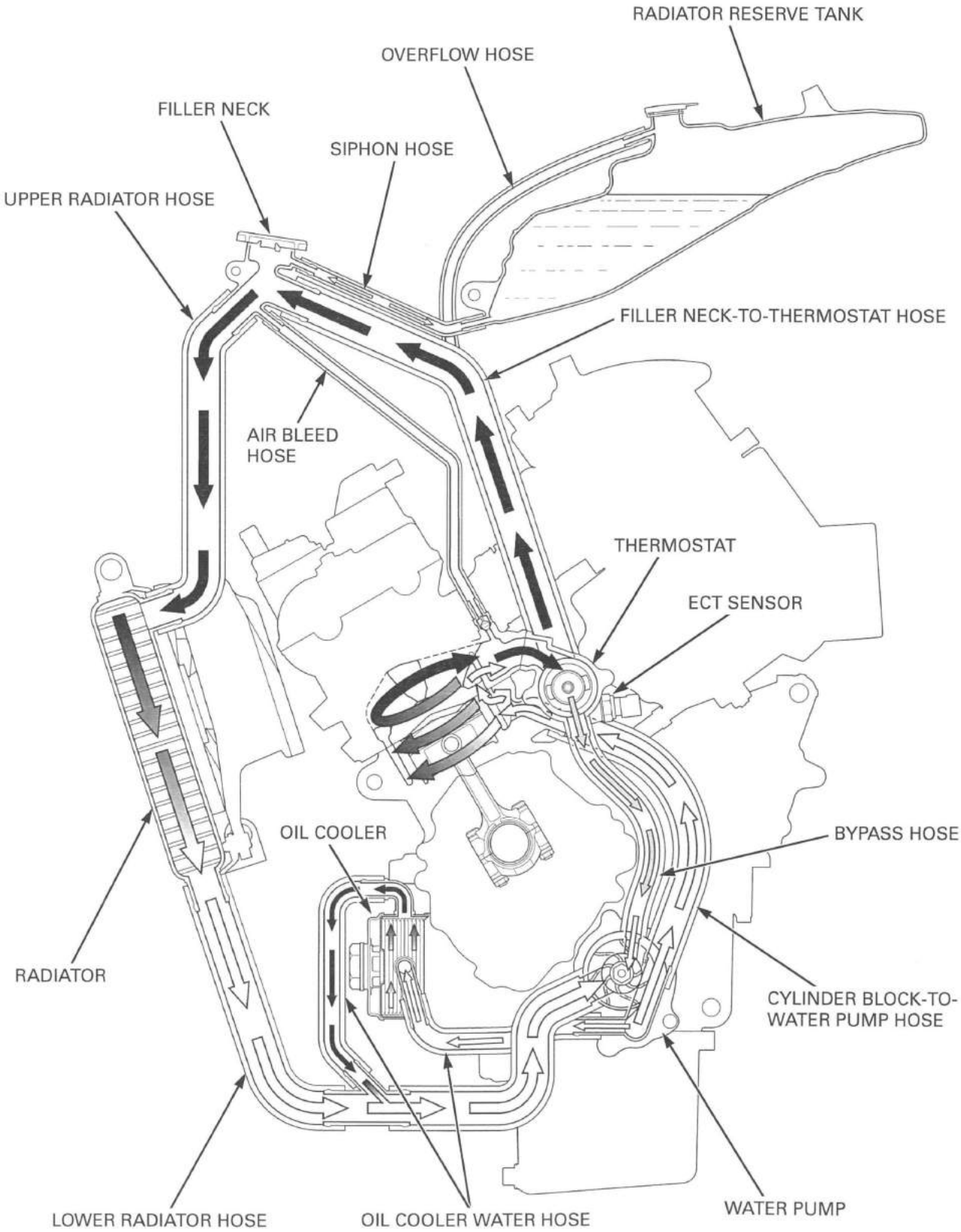
- Air should flow (A) to (B)
- Air should flow (A) to (C)
- Air should not flow (B) to (A)
- Air should not flow (B) to (C)

If the operation is incorrect, replace the one-way valve.



6. COOLING SYSTEM

SYSTEM FLOW PATTERN



SERVICE INFORMATION

GENERAL

⚠ WARNING

Removing the radiator cap while the engine is hot can allow the coolant to spray out, seriously scalding you. Always let the engine and radiator cool down before removing the radiator cap.

NOTICE

Using coolant with silicate inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.

- Add cooling system at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester
- Refer to the ECT sensor inspection (page 20-15).

SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.90 liter (3.06 US qt, 2.55 Imp qt)
	Reserve tank	0.38 liter (0.4 US qt, 0.33 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm^2, 16 – 20 psi)
Thermostat	Begin to open	80 – 84 °C (176 – 183 °F)
	Fully open	95 °C (203 °F)
	Valve lift	8 mm (0.3 in) minimum
Recommended antifreeze		High quality ethylene glycol antifreeze containing corrosion protection inhibitors
Standard coolant concentration		1:1 mixture with distilled water

TORQUE VALUES

Water pump assembly bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	CT bolt
Water pump impeller bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Thermostat housing cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	CT bolt
Radiator upper mounting bolt	3.5 N·m (0.4 kgf·m, 2.6 lbf·ft)	
Fan motor mounting bolt	5.0 N·m (0.5 kgf·m, 3.7 lbf·ft)	
Fan motor shroud mounting bolt	8.4 N·m (0.9 kgf·m, 6.2 lbf·ft)	

TROUBLESHOOTING

Engine temperature too high
- Faulty temperature gauge or ECT sensor
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator,hoses or water jacket
- Air in system
- Faulty cooling fan motor
- Faulty fan motor relay
- Faulty water pump

Engine temperature too low
- Faulty temperature gauge or ECT sensor
- Thermostat stuck open
- Faulty cooling fan motor relay

Coolant leak
- Faulty water pump mechanical seal
- Deteriorated O-rings
- Faulty radiator cap
- Damaged or deteriorated cylinder head gasket
- Loose hose connection or clamp
- Damaged or deteriorated hose

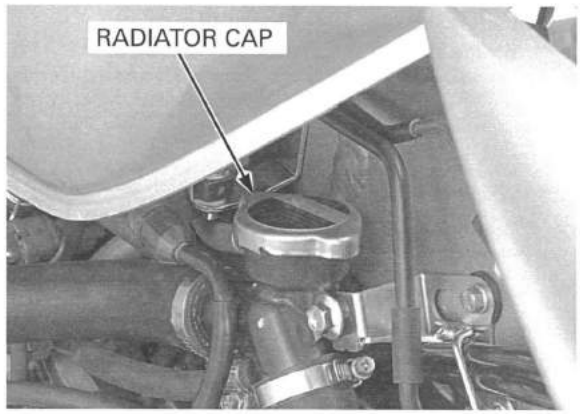
SYSTEM TESTING

COOLANT (HYDROMETER TEST)

Lift and support the fuel tank (page 3-5).

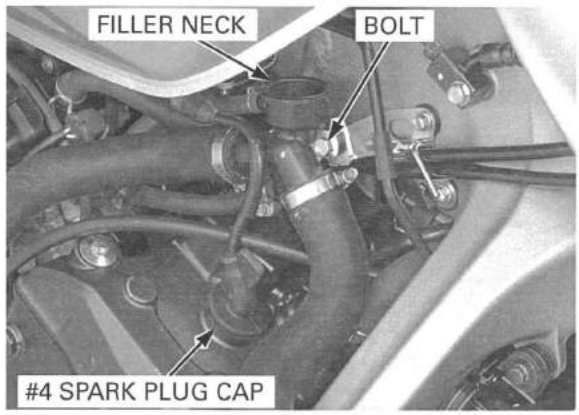
Always let the engine and radiator cool down before removing the radiator cap.

Remove the radiator cap.



Disconnect the #4 spark plug cap.

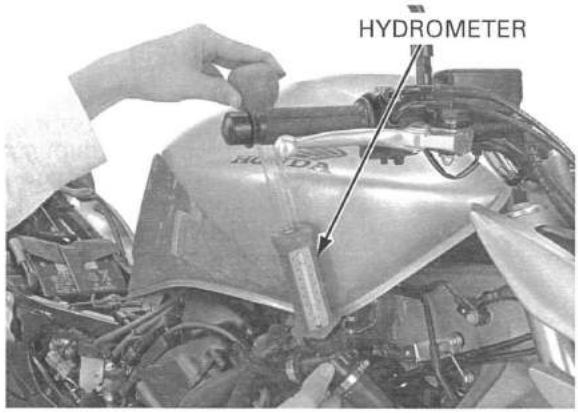
Remove the bolt and pull out the filler neck.



Test the coolant gravity using a hydrometer (see below for "Coolant gravity chart").

For maximum corrosion protection, a 50 – 50% solution of ethylene glycol and distilled water is recommended (page 6-6).

Look for contamination and replace the coolant if necessary.



COOLANT GRAVITY CHART

		Coolant temperature °C (°F)										
		0 (32)	5 (41)	10 (50)	15 (59)	20 (68)	25 (77)	30 (86)	35 (95)	40 (104)	45 (113)	50 (122)
Coolant ratio%	5	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.999	0.997
	10	1.018	1.017	1.017	1.016	1.015	1.014	1.013	1.011	1.009	1.007	1.005
	15	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
	20	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
	25	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
	30	1.053	1.052	1.051	1.047	1.046	1.045	1.043	1.041	1.038	1.035	1.032
	35	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
	40	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
	45	1.080	1.078	1.076	1.074	1.072	1.069	1.066	1.063	1.060	1.057	1.054
	50	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
	55	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
	60	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Before installing the cap in the tester, wet the sealing surfaces.

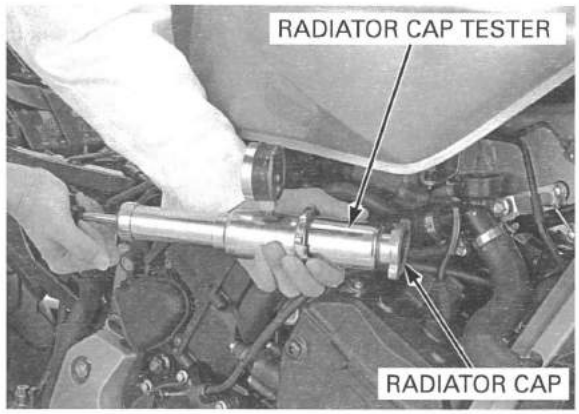
Remove the radiator cap (page 6-5).

Pressure test the radiator cap.

Replace the radiator cap if it does not hold pressure, or if relief pressure is too high too low.

It must hold specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:
108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)

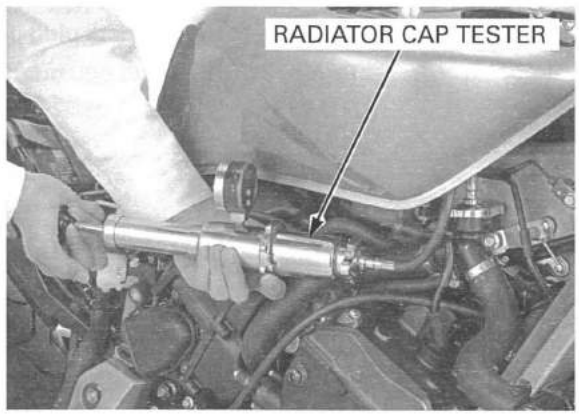


Pressure the radiator, engine and hoses, and check for leaks.

NOTICE

Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm², 20 psi).

Repair or replace components if the system will not hold specified pressure for at least 6 seconds.



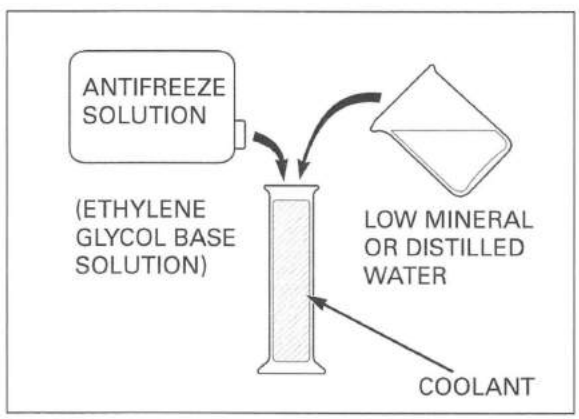
COOLANT REPLACEMENT

PREPARATION

- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance change the coolant regularly as specified in the maintenance schedule.
- Mix only distilled, low mineral water with the antifreeze.

RECOMMENDED ANTIFREEZE:
High quality ethylene glycol antifreeze containing corrosion protection inhibitors

RECOMMENDED MIXTURE:
1:1 (Distilled water and antifreeze)



REPLACEMENT/AIR BLEEDING

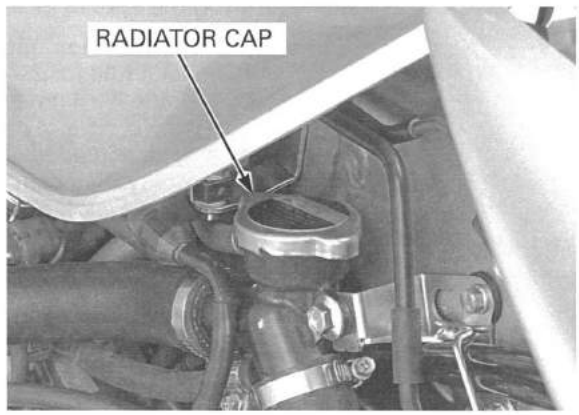
NOTE:

- When filling the system or reserve tank with coolant, or checking the coolant level, place the motorcycle in a vertical position on a flat, level surface.

Lift and support the fuel tank (page 3-5).

Always let the engine and radiator cool down before removing the radiator cap.

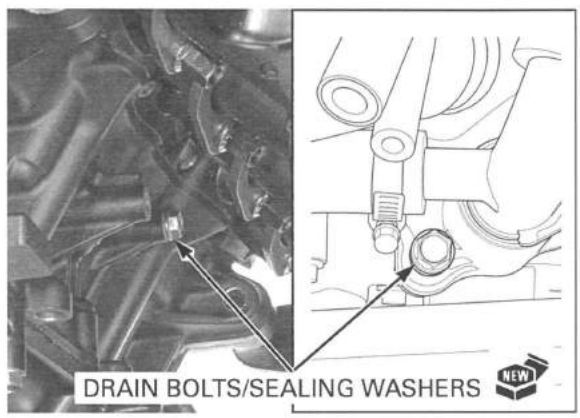
Remove the radiator cap.



Remove the water pump drain bolt, sealing washer and drain the coolant.

Remove the cylinder drain bolt, sealing washer and drain the coolant from the cylinder.

Reinstall the drain bolts with new sealing washers. Tighten the drain bolts securely.

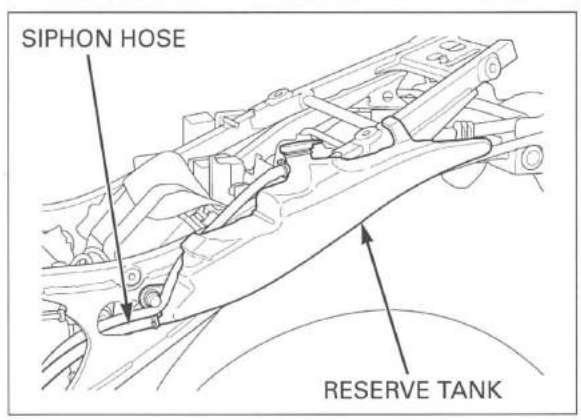


Remove the rear cowl (page 2-6).

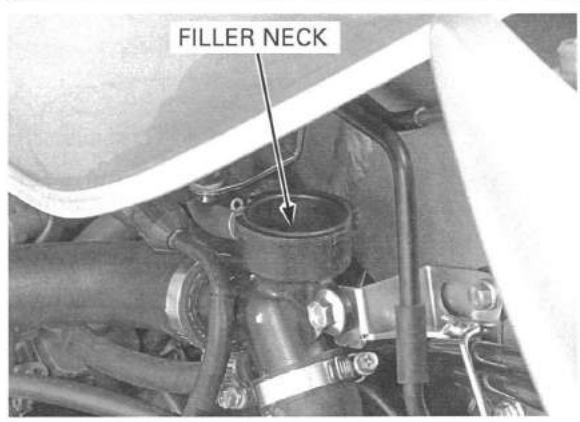
Disconnect the siphon hose from the reserve tank and drain the reserve tank coolant.

Empty the coolant and rinse the inside of the reserve tank with water.

Connect the siphon hose to the reserve tank.



Fill the system with the recommended coolant through the filler opening up to filler neck.



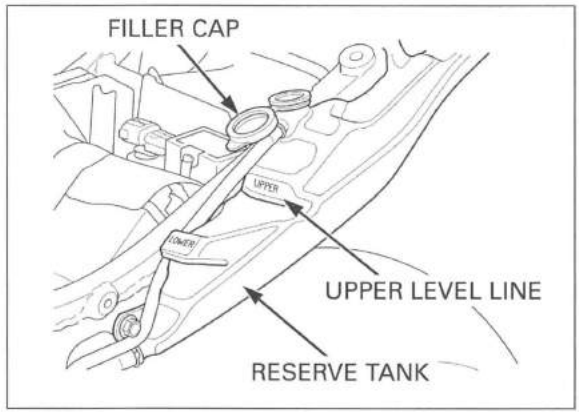
Remove the radiator reserve tank cap and fill the reserve tank to the upper level line.

Bleed air from the system as follow:

1. Shift the transmission into neutral. Start the engine and let it idle for 2 – 3 minutes.
2. Snap the throttle 3 – 4 times to bleed air from the system.
3. Stop the engine and add coolant up to the proper level if necessary. Reinstall the radiator cap.
4. Check the level of coolant in the reserve tank and fill to the upper level if it is low.

Install the radiator reserve tank cap.

Install the rear cowl (page 2-7).
Lower the fuel tank and install the front mounting bolts (page 3-5).



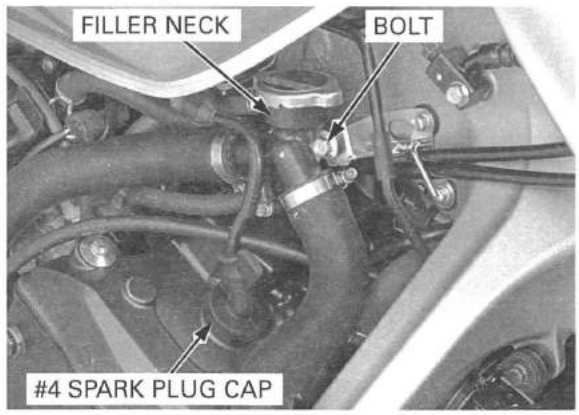
THERMOSTAT

REMOVAL

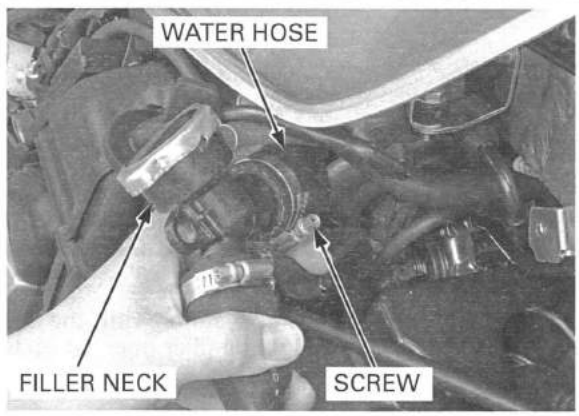
Drain the coolant (page 6-7).
Lift and support the fuel tank (page 3-5).

Disconnect the #4 spark plug cap.

Remove the bolt and pull out the filler neck.



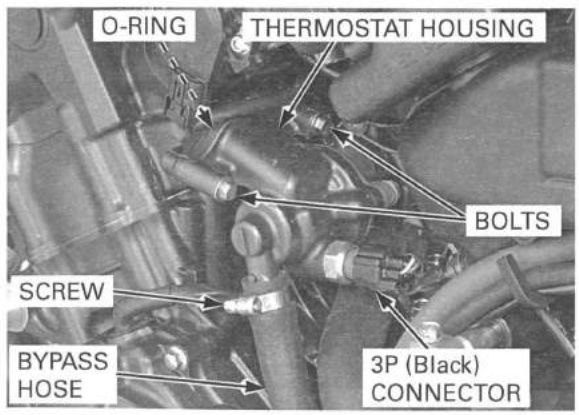
Loosen the hose band screw and disconnect the water hose from the filler neck.



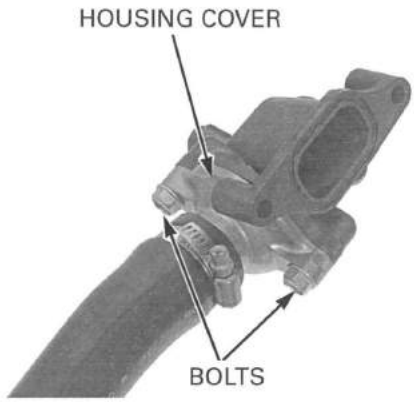
Disconnect the ETC sensor 3P (Black) connector.

Loosen the hose band screw and disconnect the bypass hose from the thermostat housing.

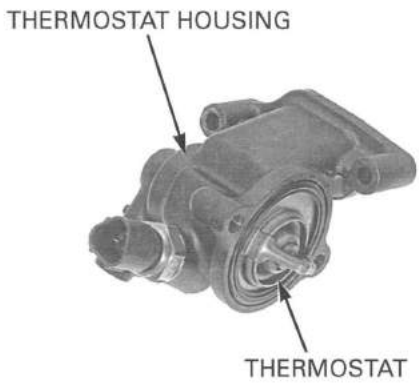
Remove the bolts, thermostat housing and O-ring.



Remove the bolts and thermostat housing cover.



Remove the thermostat from the housing.

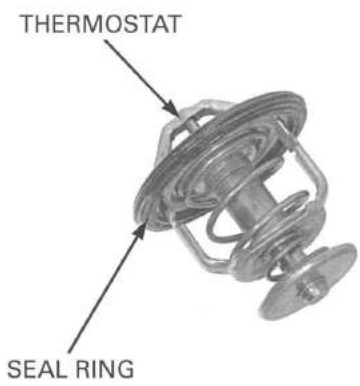


INSPECTION

Wear insulated gloves and adequate eye protection.

Keep flammable materials away from the electric heating element.

Visually inspect the thermostat for damage.
Check for damage of seal ring.



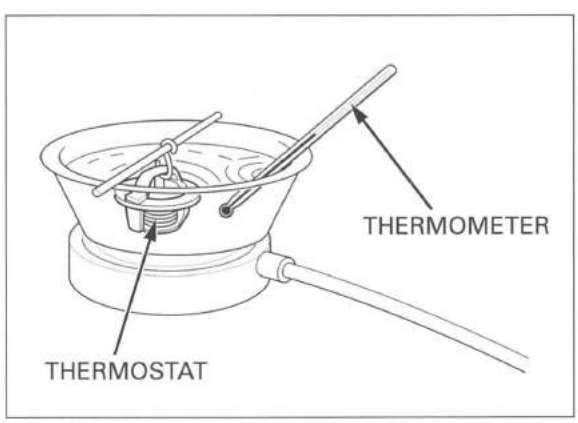
Do not let the thermostat or thermometer touch the pan, or you will get false reading.

Heat the water with an electric heating element to operating temperature for 5 minutes.
Suspend the thermostat in heated water to check its operation.

Replace the thermostat if the valve stays open at room temperature, or if it responds at temperatures other than those specified.

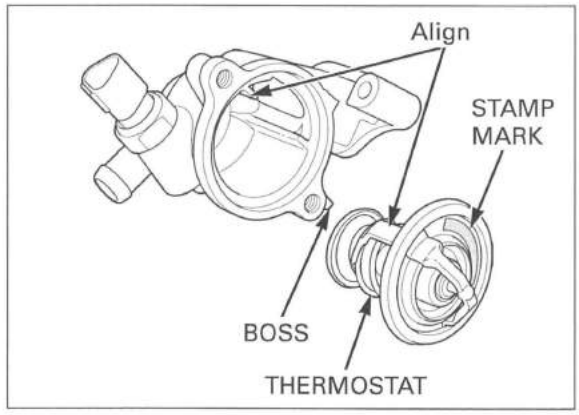
THERMOSTAT OPERATING TEMPERATURE (BEGIN TO OPEN):
80 – 84 °C (176 – 183 °F)

VALVE LIFT:
8 mm (0.3 in) minimum at 95 °C (203 °F)



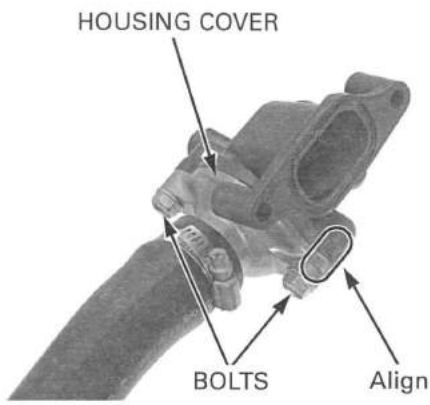
INSTALLATION

Align the direction of the thermostat stamp mark with the boss of housing.
Install the thermostat into the housing by aligning the body with the groove of the housing.

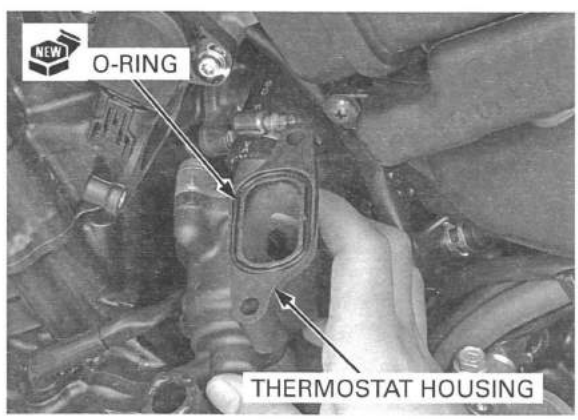


Install the thermostat housing cover to the housing by aligning the bosses of housing and cover.
Tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



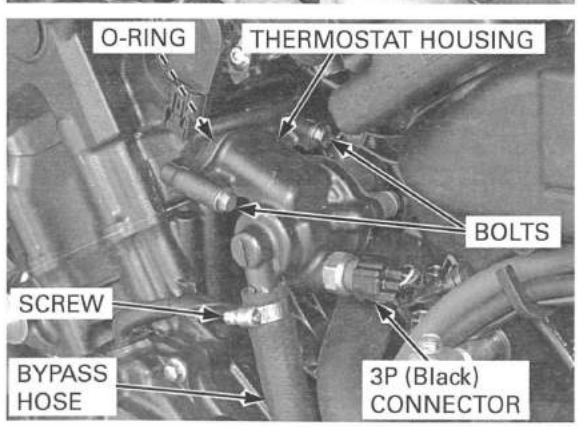
Install a new O-ring to the thermostat housing groove.



Install the thermostat housing to the cylinder head and tighten the bolts securely.

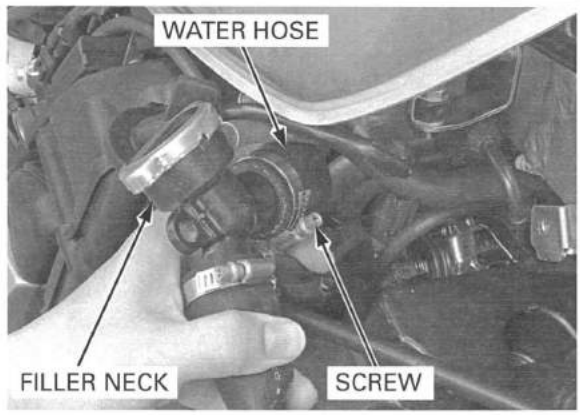
Connect the bypass hose to the thermostat housing and tighten the hose band screw securely.

Connect the ETC sensor 3P (Black) connector.



Refer to "CABLE & HARNESS ROUTING" (page 1-23)

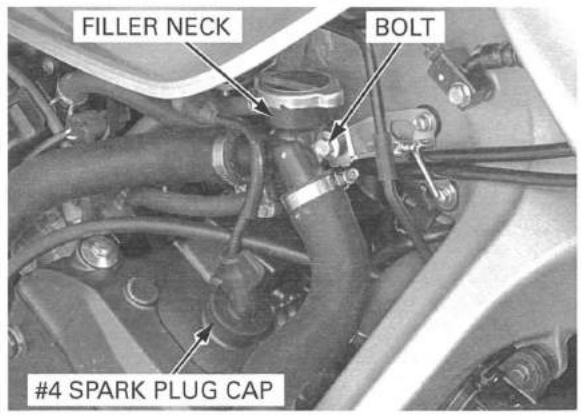
Route the water hose properly and connect the water hose to the filler neck.
Tighten the hose band screw securely.



Install the filler neck and tighten the bolt securely.

Connect the #4 spark plug cap securely.

Lower the fuel tank and install the front mounting bolts (page 3-5).
Fill the system with recommended coolant and bleed the air (page 6-7).

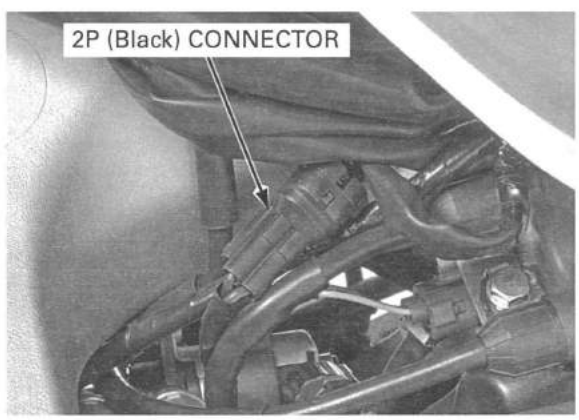


RADIATOR

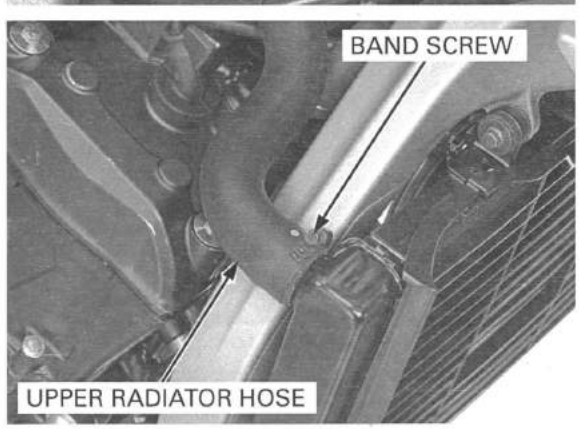
REMOVAL

Drain the coolant (page 6-7).
Lift and support the fuel tank (page 3-5).

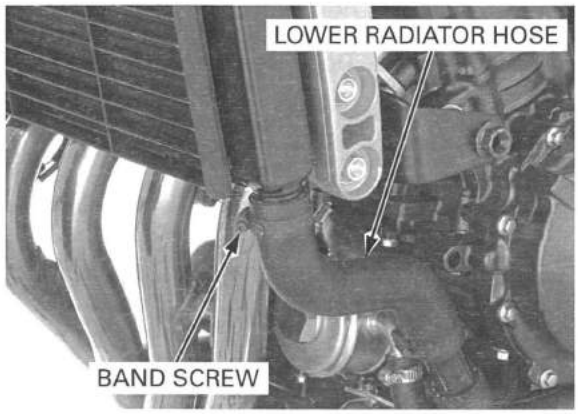
Disconnect the fan motor 2P (Black) connector.



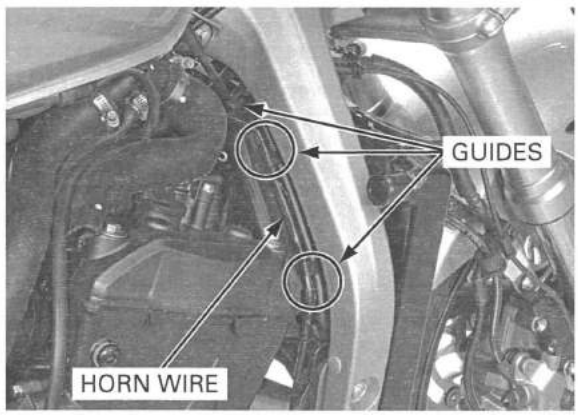
Loosen the hose band screw and disconnect the upper radiator hose.



Loosen the hose band screw and disconnect the lower radiator hose.



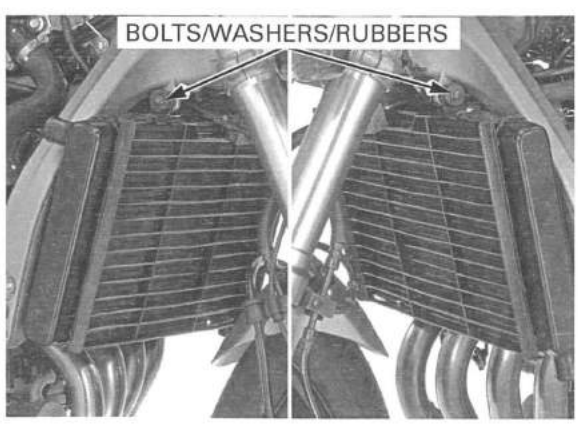
Release the horn wire from the guide of fan motor shroud.



Remove the lower mounting bolt, washer and mounting rubber.

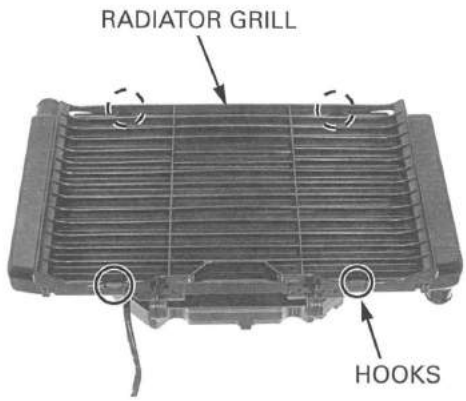
Be careful not to damage the radiator fins.

Remove the upper mounting bolts, washers and mounting rubbers, then remove the radiator assembly.

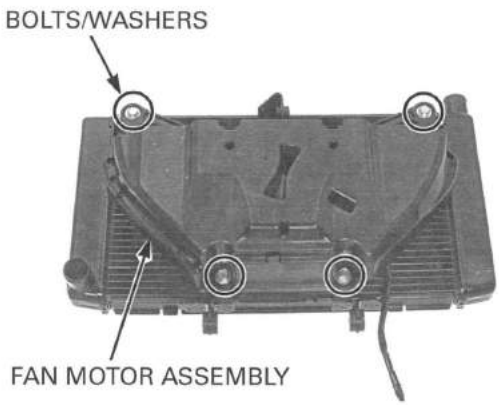


DISASSEMBLY

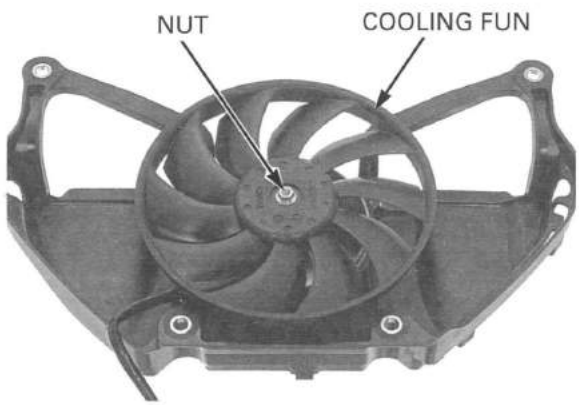
Release the hooks from the tabs on the radiator and remove the radiator grill.



Remove the mounting bolts, washers and cooling fan motor assembly from the radiator.

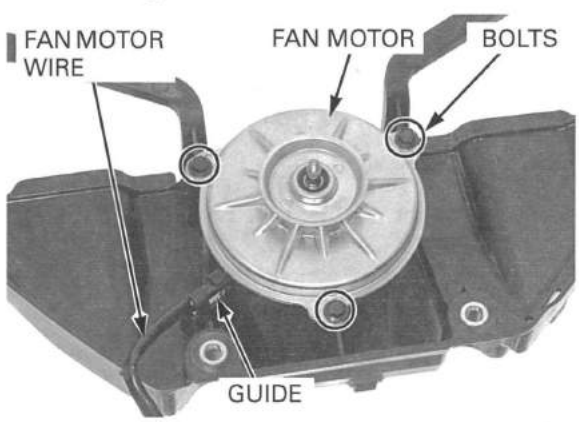


Remove the nut and cooling fan.

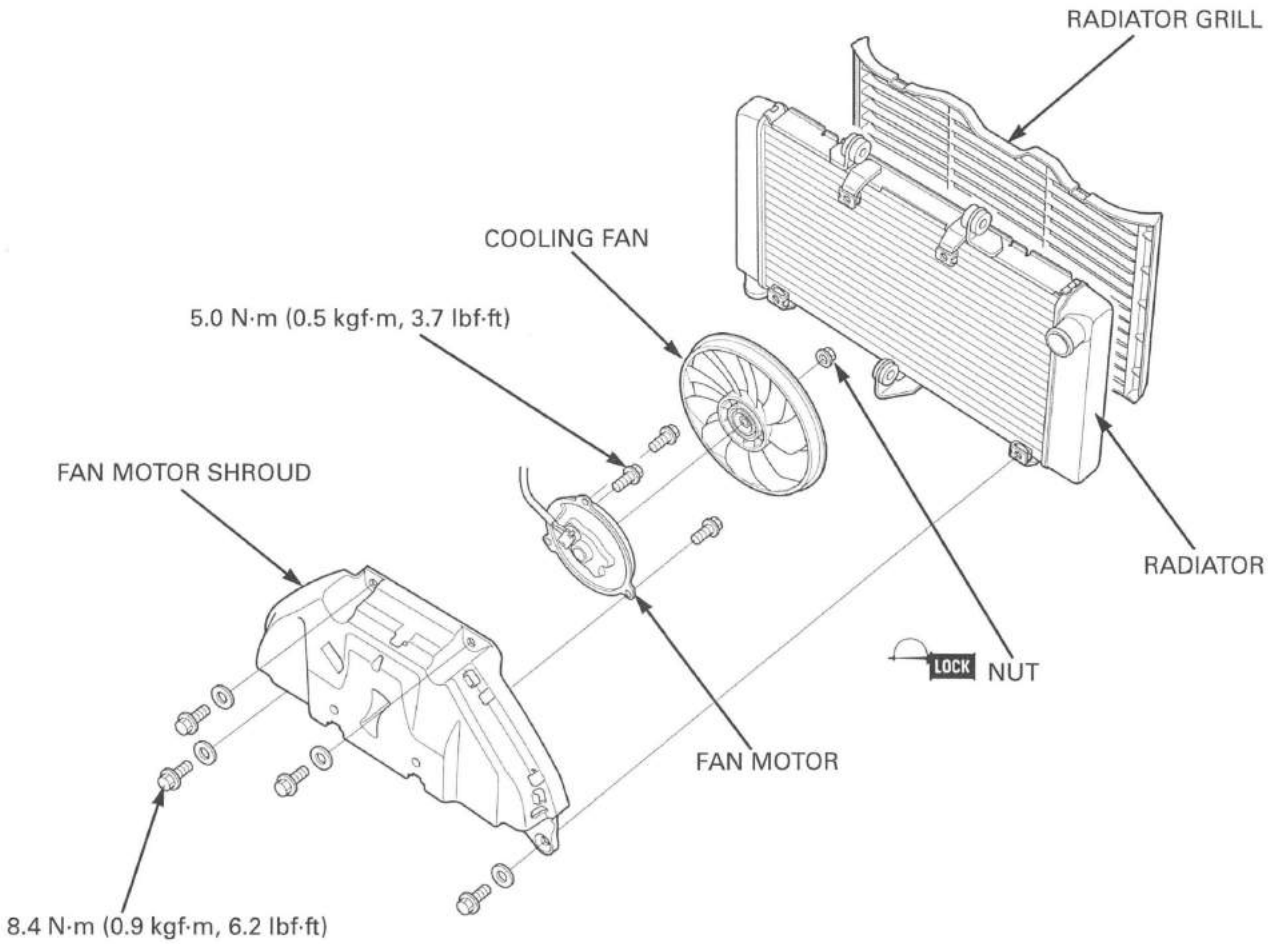


Release the fan motor wire from the guide of fan motor shroud.

Remove the mounting bolts and fan motor from the fan motor shroud.



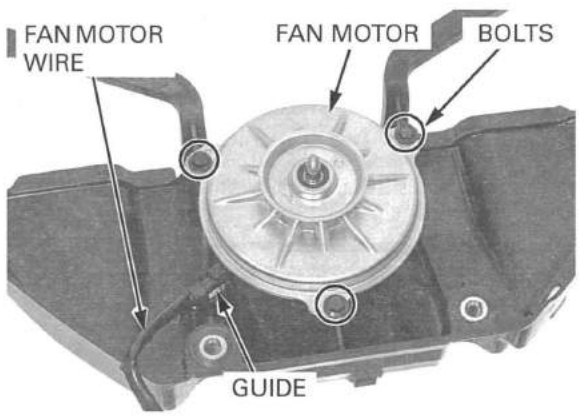
ASSEMBLY



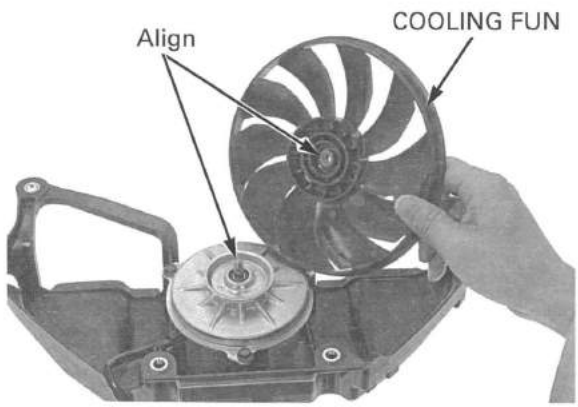
Install the fan motor onto the fan motor shroud and tighten the mounting bolts to the specified torque.

TORQUE: 5.0 N·m (0.5 kgf·m, 3.7 lbf·ft)

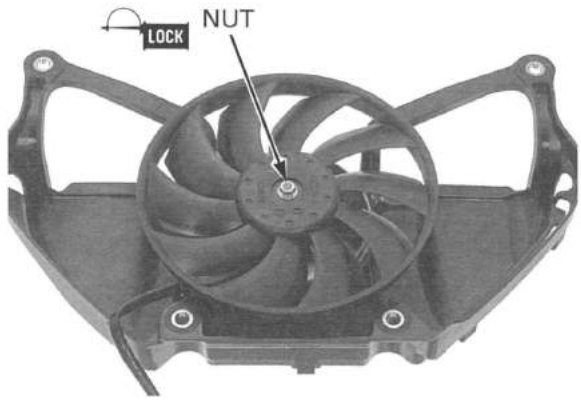
Route the fan motor wire through the guide of fan motor shroud.



Install the cooling fan onto the fan motor shaft by aligning the flat surfaces.



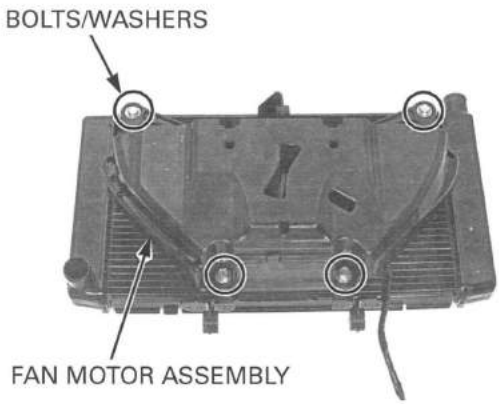
Apply a locking agent to the cooling fan nut threads. Install and tighten the nut securely.



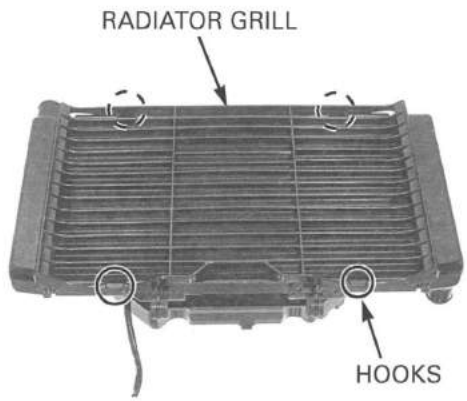
Install the cooling fan motor assembly onto the radiator.

Install the mounting bolts with washers and tighten the bolts to the specified torque.

TORQUE: 8.4 N·m (0.9 kgf·m, 6.2 lbf·ft)



Install the radiator grill while aligning the tabs to hooks on the radiator.

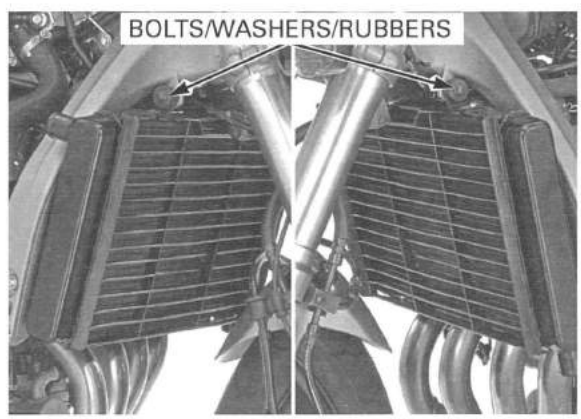


INSTALLATION

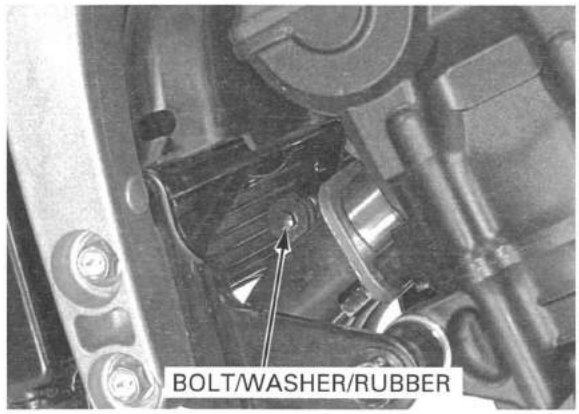
Be careful not to damage the radiator fins.

Install the radiator assembly with the mounting rubbers, washers and upper mounting bolts. Tighten the bolts to the specified torque.

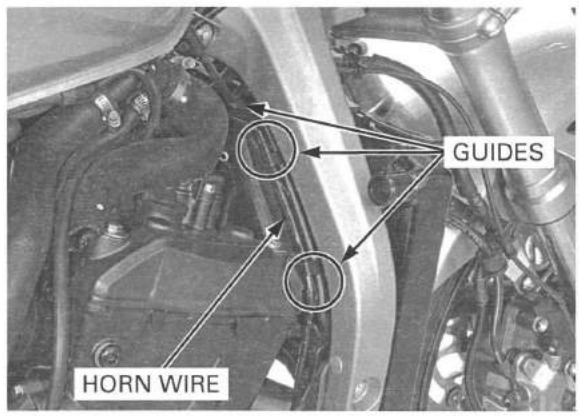
TORQUE: 3.5 N·m (0.4 kgf·m, 2.6 lbf·ft)



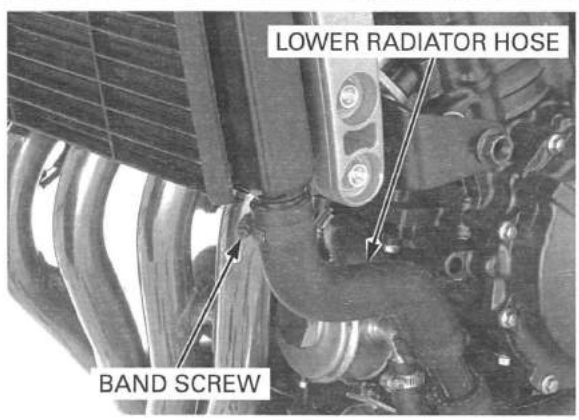
Install the lower mounting bolt with mounting rubber and washer.



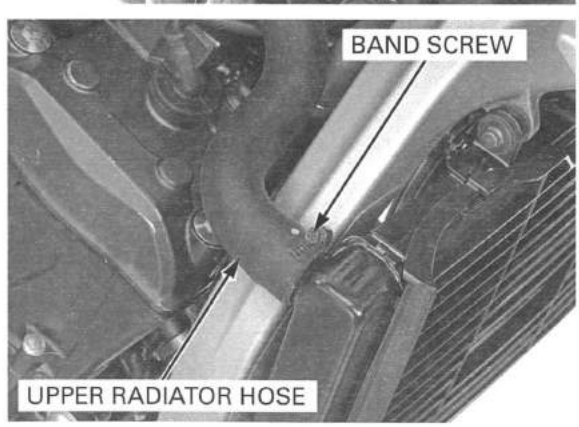
Route the horn wire through the guide of fan motor shroud.



Connect the lower radiator hose and tighten the hose band screw (page 6-21).

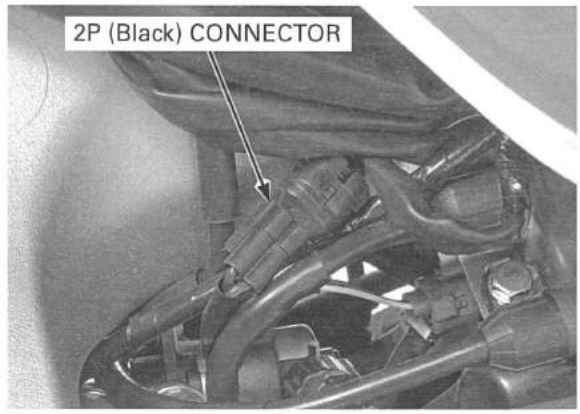


Connect the upper radiator hose and tighten the hose band screw (page 6-21).



Connect the fan motor 2P (Black) connector.

Lower the fuel tank and install the front mounting bolts (page 3-5).
Fill the system with recommended coolant (page 6-6).



RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

Remove the rear cowl (page 2-6).

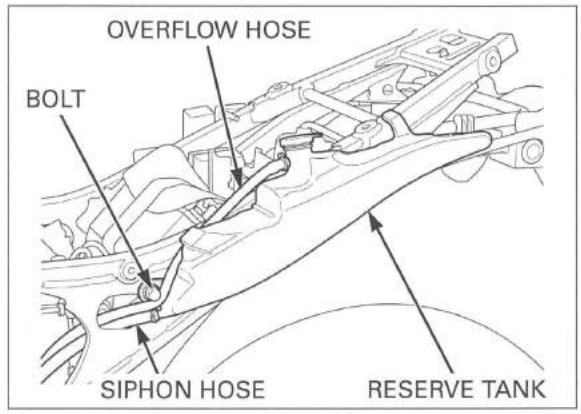
Disconnect the siphon hose and overflow hose from the reserve tank.

Remove the bolt and radiator reserve tank.

Installation is in the reverse order of removal.

Route the hoses properly (page 1-23).

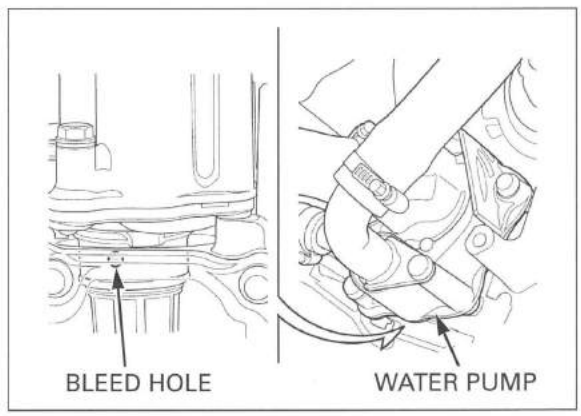
Fill the reserve tank with coolant (page 6-7).



WATER PUMP

MECHANICAL SEAL INSPECTION

Check for signs of coolant leakage. A small amount of "weeping" from the bleed hole is normal.

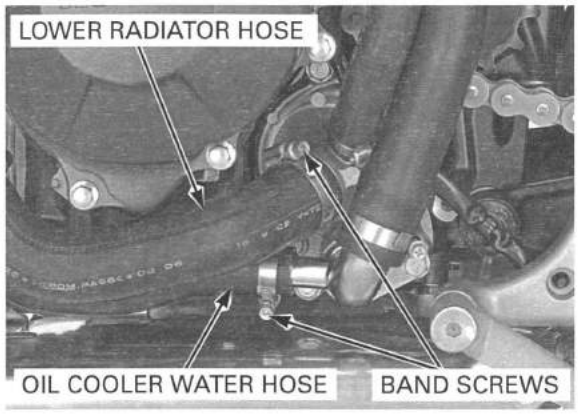


REMOVAL

Drain the coolant (page 6-7).
Remove the crankcase rear cover (page 7-4).

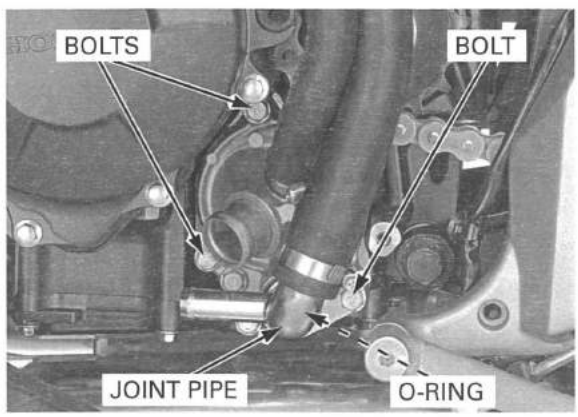
Loosen the hose band screw and disconnect the lower radiator hose from the water pump cover.

Loosen the hose band screw and disconnect the oil cooler water hose from the joint pipe.



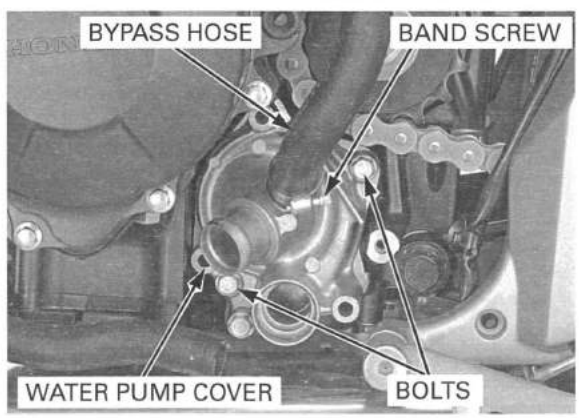
Remove the bolt, joint pipe and O-ring.

Remove the mounting bolts.



Loosen the hose band screw and disconnect the bypass hose from the water pump cover.

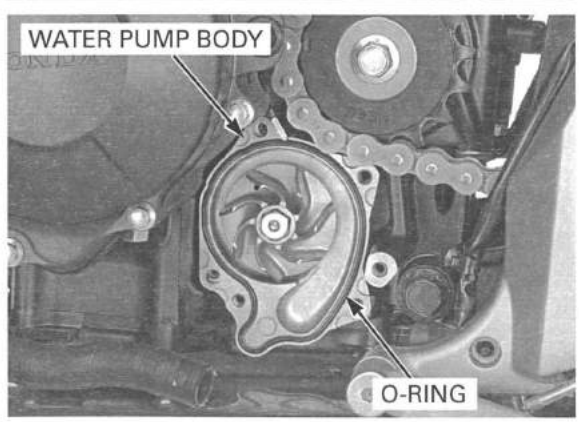
Remove the assembly bolts and water pump cover.



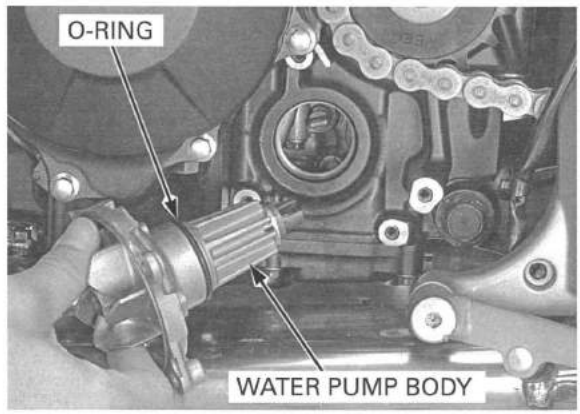
Remove the O-ring from the water pump body.

Do not disassemble the water pump body.

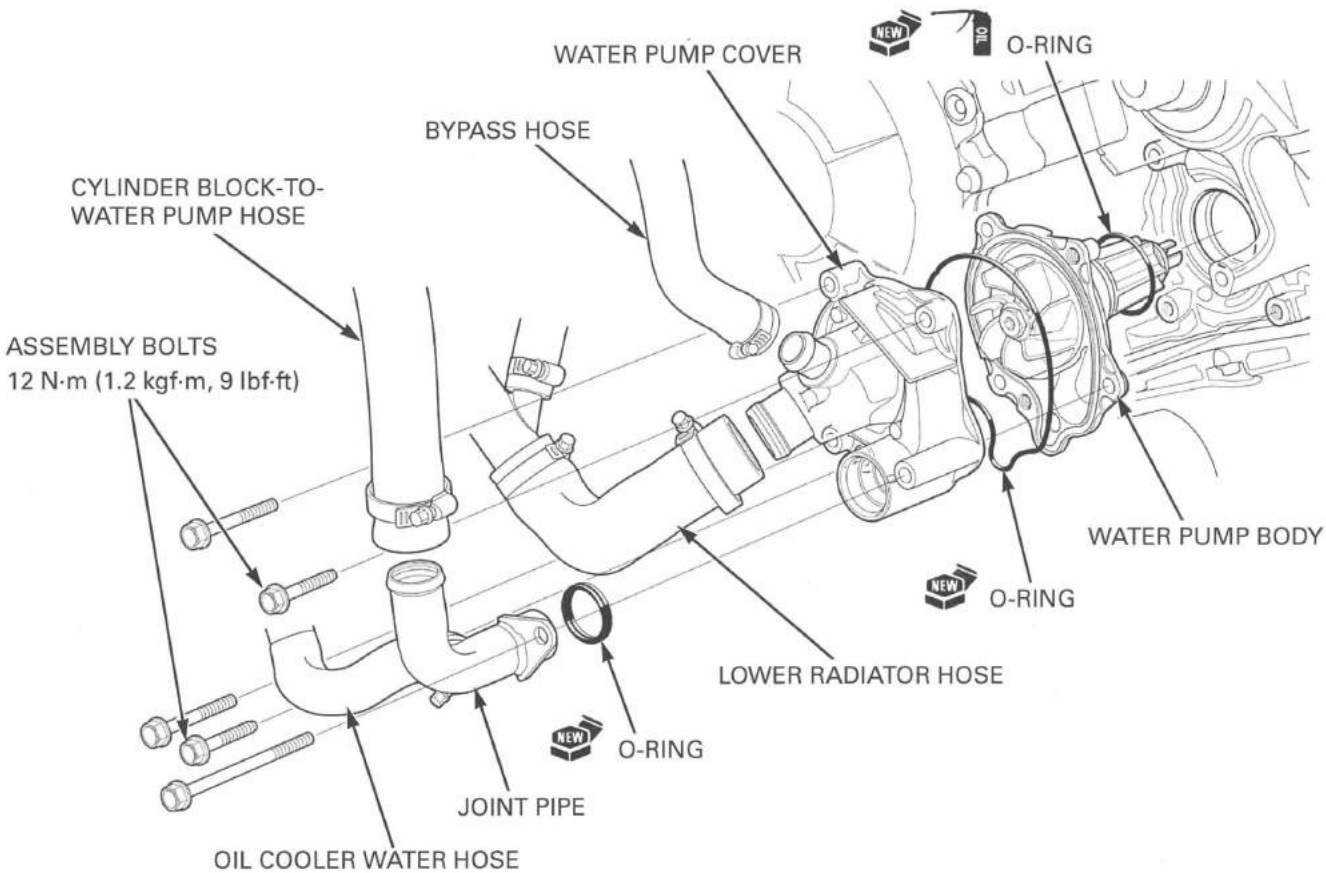
Remove the water pump body from the crankcase.



Remove the O-ring from the water pump body.

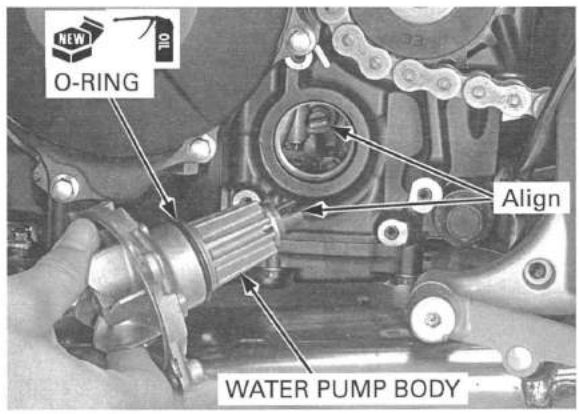


INSTALLATION

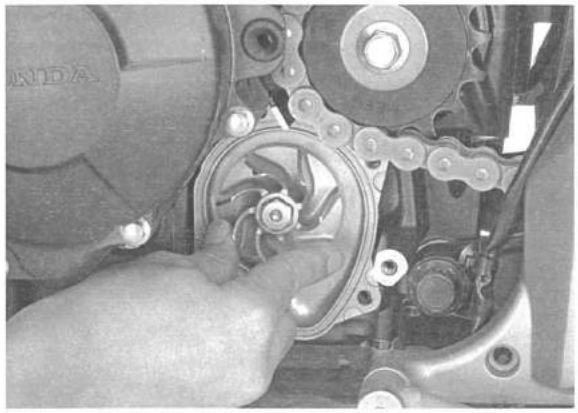


Apply engine oil to a new O-ring and install it onto the stepped portion of the water pump body.

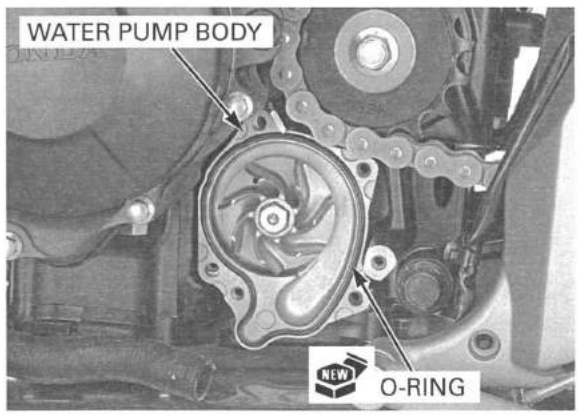
Install the water pump body into the crankcase while aligning the water pump shaft groove with the oil pump shaft end by turning the water pump impeller.



Align the mounting bolt holes in the water pump and crankcase and make sure the water pump is securely installed.



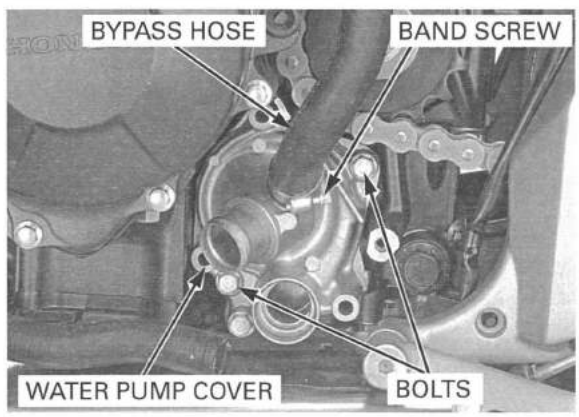
Install a new O-ring into the groove in the water pump body.



Install the water pump cover and assembly bolts. Tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

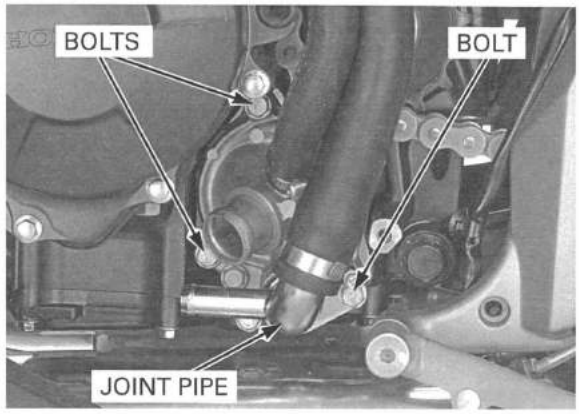
Connect the bypass hose, then tighten the hose band screw (page 6-21).



Install a new O-ring to the joint pipe.

Tighten the mounting bolts securely.

Install the joint pipe to the water pump cover and tighten the bolt securely.

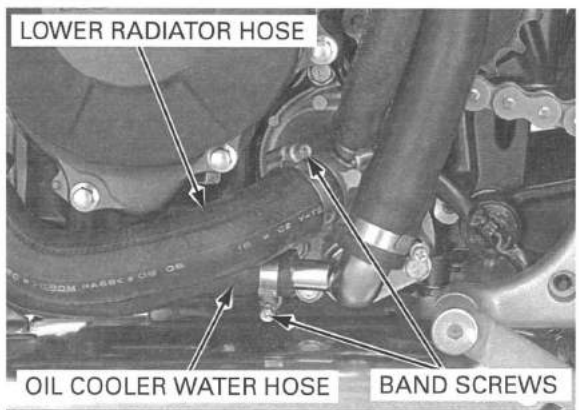


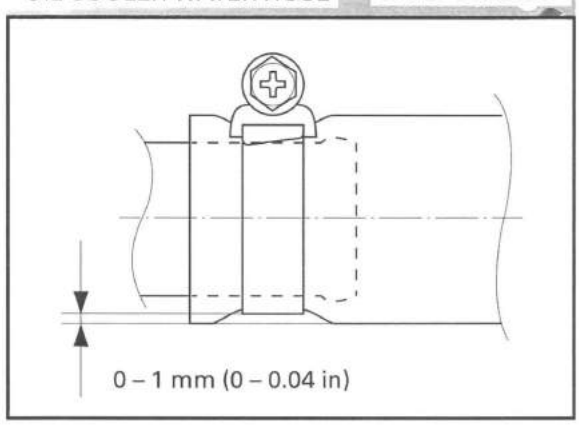
Connect the lower radiator hose and oil cooler water hose.
Tighten the hose band screws as shown.

Install the crankcase rear cover (page 7-15).

Fill the system with recommended coolant and bleed the air (page 6-7).

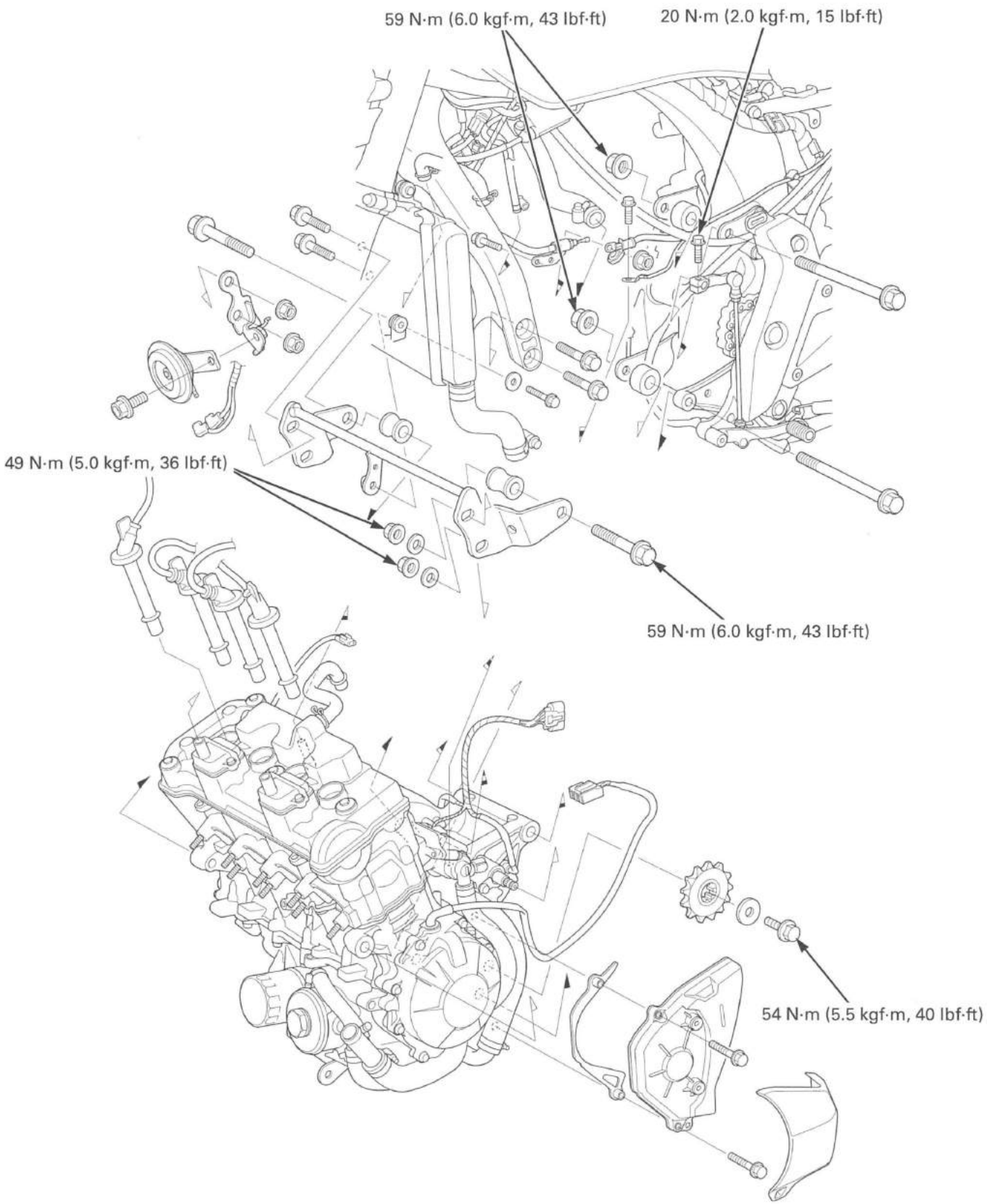
Start the engine and check for coolant leaks.





7. ENGINE REMOVAL/INSTALLATION

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- A hoist or equivalent is required to support the motorcycle when removing and installing the engine.
- A floor jack or other adjustable support is required to support and maneuver the engine.

NOTICE

Do not use the oil filter and oil cooler as a jacking point.

- The following components can be serviced with the engine installed in the frame.
  - Alternator (page 10-4)
  - Clutch (page 9-6)
  - Starter clutch (page 9-17)
  - Gearshift linkage (page 9-22)
  - Camshaft (page 8-8)
  - Oil cooler (page 4-14)
  - Oil pump (page 4-8)
  - Water pump (page 6-17)
  - Cylinder head (page 8-12)
  - Valves (page 8-18)
- The following components require engine removal for service.
  - Crankshaft (page 12-5)
  - Piston/cylinder (page 12-14)
  - Shift fork/shift drum/transmission (page 11-6)
- When installing the engine, be sure to tighten the engine mounting fasteners to the specified torque in the specified sequence. If you mistake the torque or sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the correct sequence.

SERVICE DATA

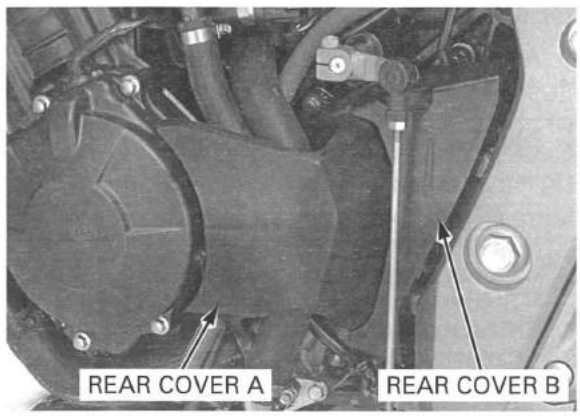
ITEM	SPECIFICATIONS
Engine dry weight	57.7 kg (127.2 lbs)
Engine oil capacity (After disassembly)	3.5 liter (3.7 US qt, 3.1 Imp qt)
Coolant capacity (Radiator and engine)	2.90 liter (3.06 US qt, 2.55 Imp qt)

TORQUE VALUES

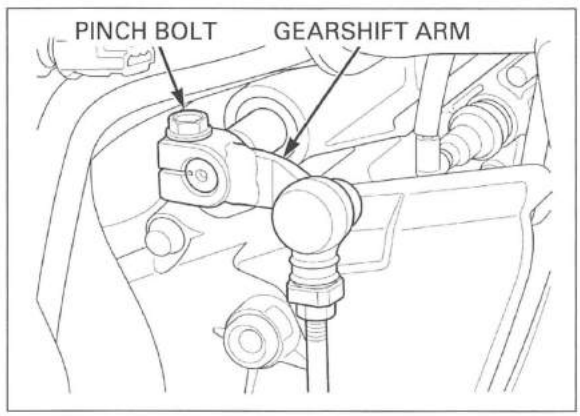
Front engine hanger nut	49 N·m (5.0 kgf·m, 36 lbf·ft)
Front engine mounting bolt	59 N·m (6.0 kgf·m, 44 lbf·ft)
Rear engine hanger nut	49 N·m (5.0 kgf·m, 36 lbf·ft)
Rear engine mounting nut	59 N·m (6.0 kgf·m, 44 lbf·ft)
Swingarm pivot bracket nut	69 N·m (7.0 kgf·m, 51 lbf·ft)
Drive sprocket bolt	54 N·m (5.5 kgf·m, 40 lbf·ft)
Starter motor terminal nut	10 N·m (1.0 kgf·m, 7 lbf·ft)
Gearshift arm pinch bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)

CRANKCASE REAR COVER REMOVAL

Remove the crankcase rear cover A, releasing its bosses from the grommets of rear cover B.

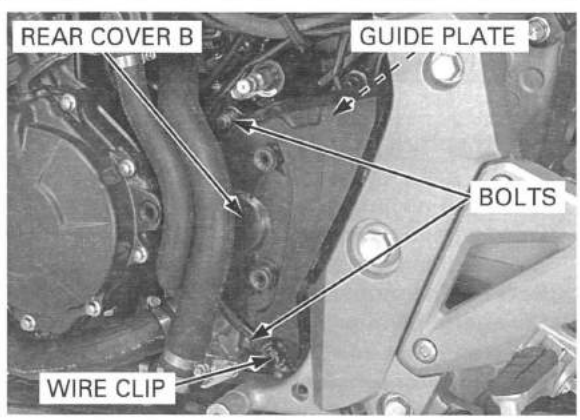


Remove the pinch bolt and disconnect the gearshift arm from the gearshift spindle.



Release the sidestand switch wire clip from the rear cover B.

Remove the bolts, rear cover B and drive chain guide plate.



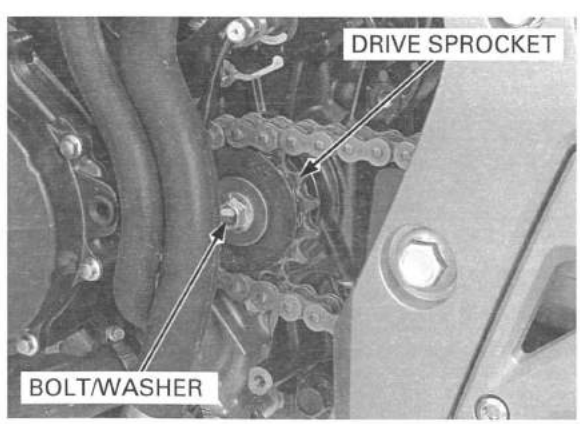
ENGINE REMOVAL

Remove the following:

- exhaust pipe (page 2-13)
- air cleaner housing (page 5-61)
- crankcase rear cover (page 7-4)

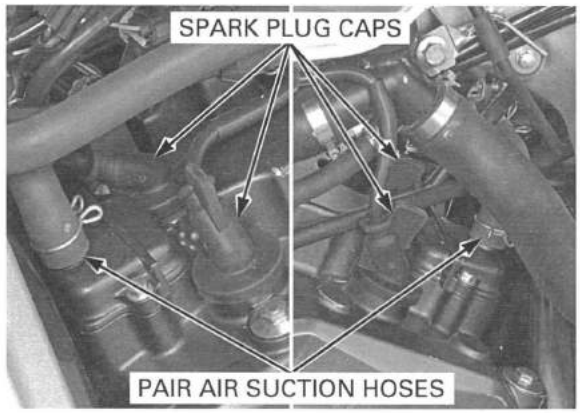
Loosen the rear axle nut.
Turn the drive chain adjusting bolts make the drive chain slack fully (page 3-19).

Remove the drive sprocket bolt, washer and drive sprocket.



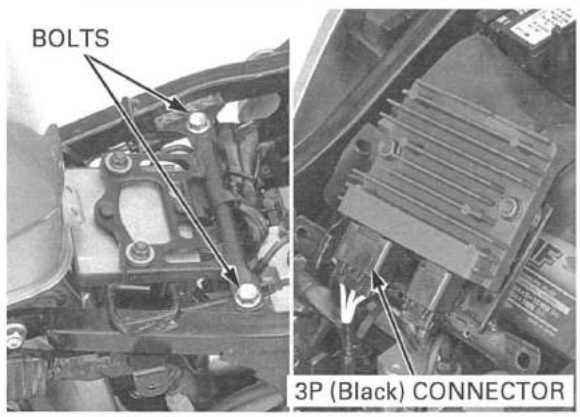
Disconnect the spark plug caps.

Disconnect the PAIR air suction hoses from the cylinder head cover.

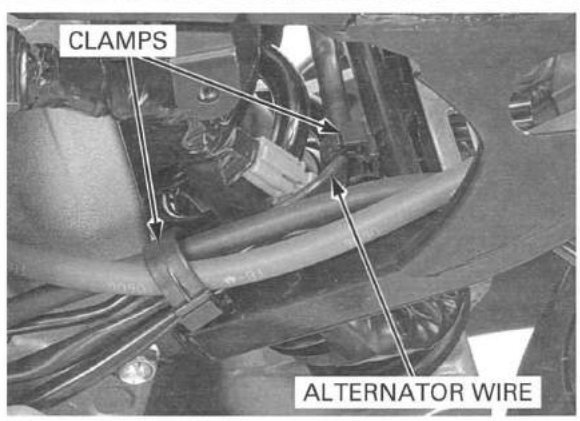


Remove the stay bolts.

Disconnect the alternator 3P (Black) connector.

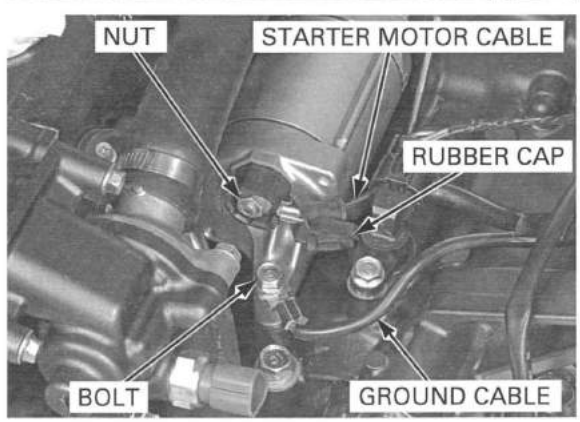


Release the alternator wire from the clamps.

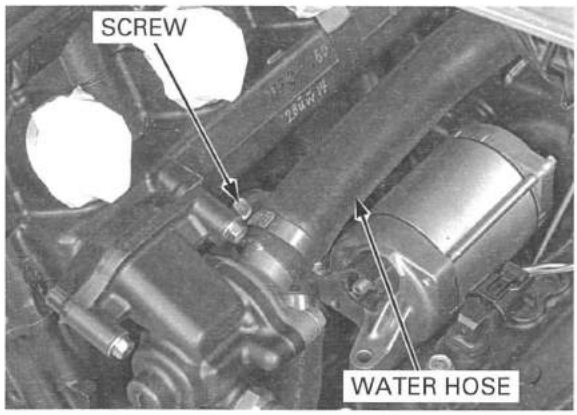


Open the rubber cap, then remove the terminal nut and disconnect the starter motor cable from the starter motor.

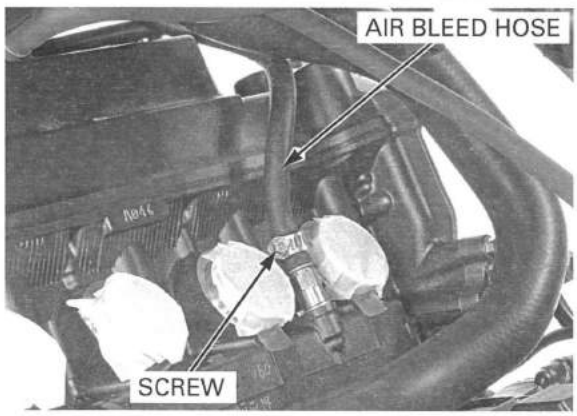
Remove the starter motor mounting bolt and disconnect the ground cable.



Loosen the hose band screw and disconnect the water hose from the thermostat housing cover.

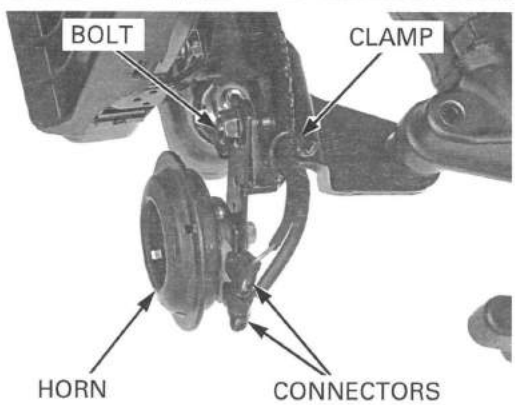


Loosen the hose band screw and disconnect the air bleed hose from the hose joint on the cylinder head.



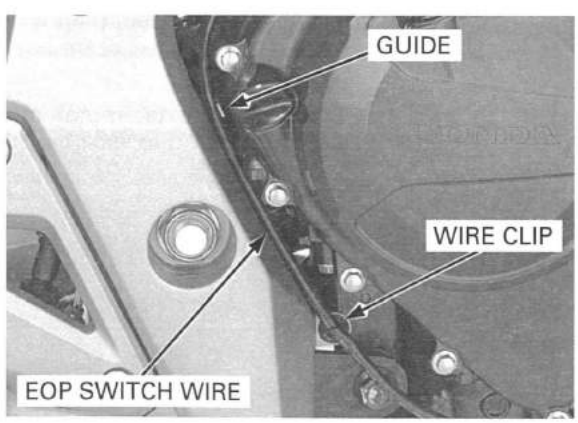
Disconnect the horn wire connectors, then release the horn wire from the stay clamp.

Remove the mounting bolt and horn.

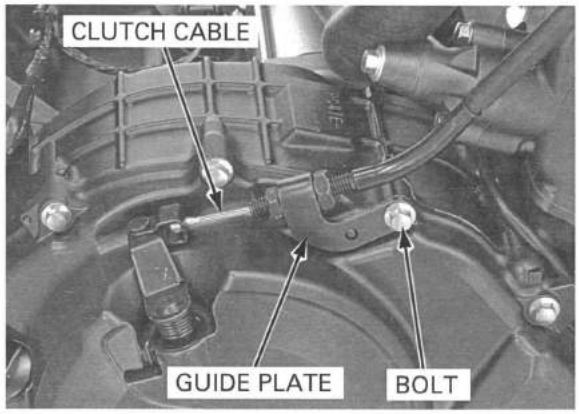


Release the EOP switch wire from the guide of pivot bracket.

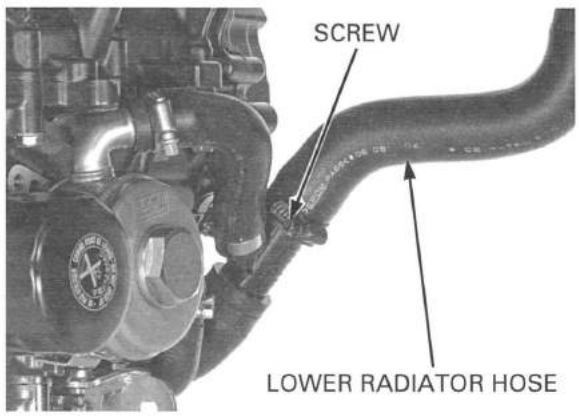
Release the EOP switch wire clip from the pivot bracket.



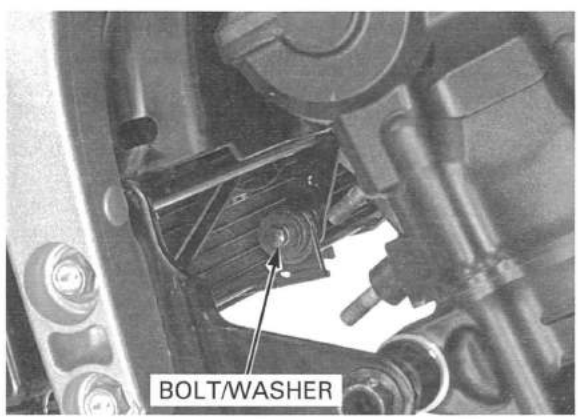
Remove the bolt, clutch cable guide plate, then disconnect the clutch cable from the clutch lifter lever.



Loosen the hose band screw and disconnect the lower radiator hose from the hose joint.

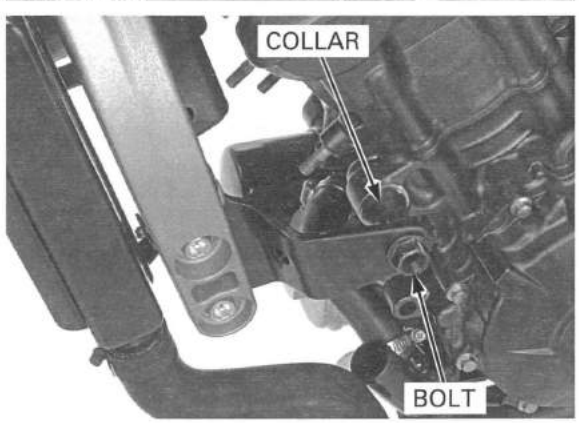


Remove the radiator lower mounting bolt and washer.

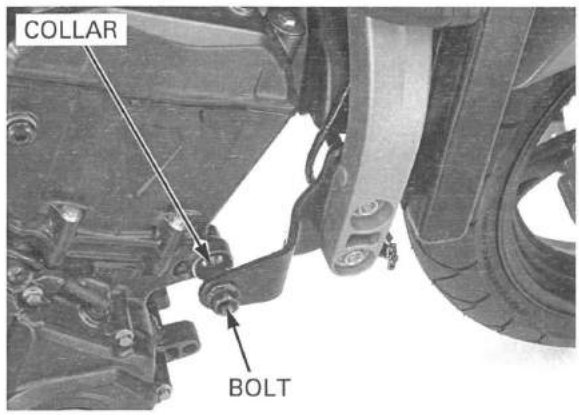


Support the engine using a jack or other adjustable support.

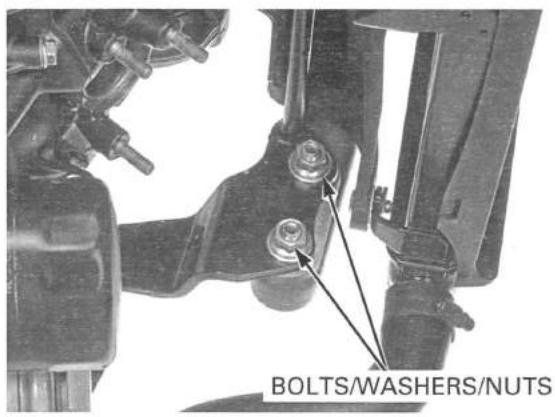
Remove the left front engine mounting bolt and collar.



Remove the right front engine mounting bolt and collar.

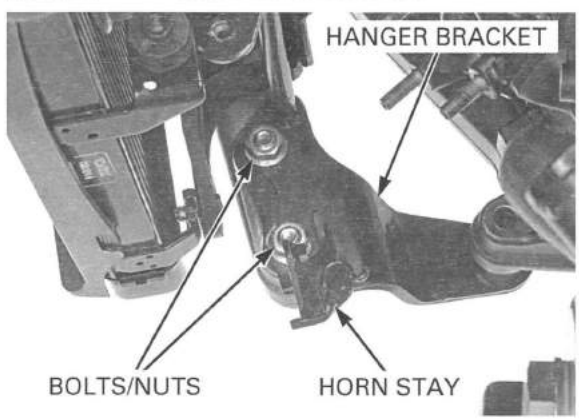


Remove the left front engine hanger bracket bolts, washers and nuts.

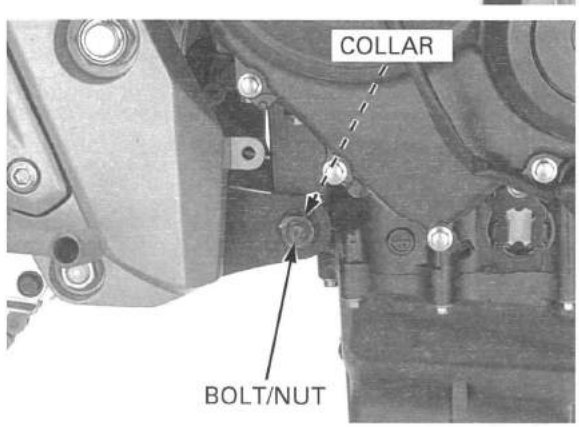


Remove the right front engine hanger bracket bolts, nuts and horn stay.

Remove the front engine hanger bracket from the frame.

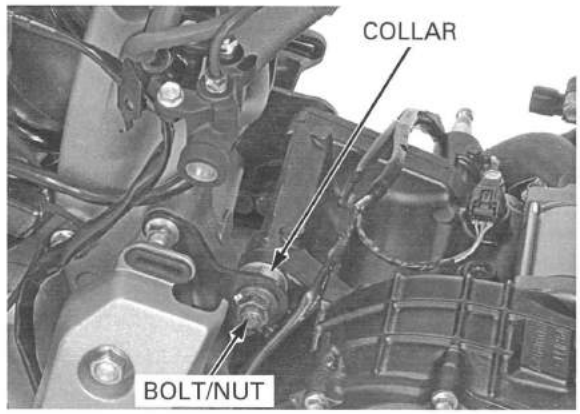


Remove the rear lower engine mounting bolt/nut and collar.



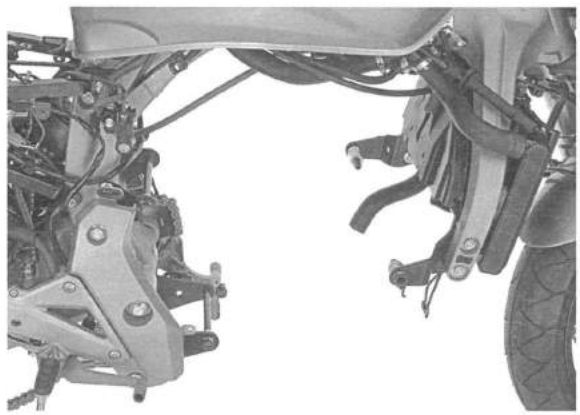
Remove the rear upper engine mounting bolt/nut and collar.

Carefully lower the adjustable support, then remove the engine from the frame.



ENGINE INSTALLATION

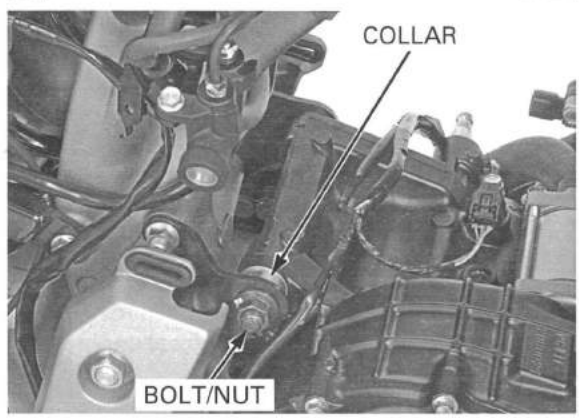
- Note the direction of the mounting bolts/collars.
- The jack height must be continually adjusted to relieve stress from the mounting fasteners.
- Route the wire and cables properly (page 1-23).



Carefully install the engine into the frame.

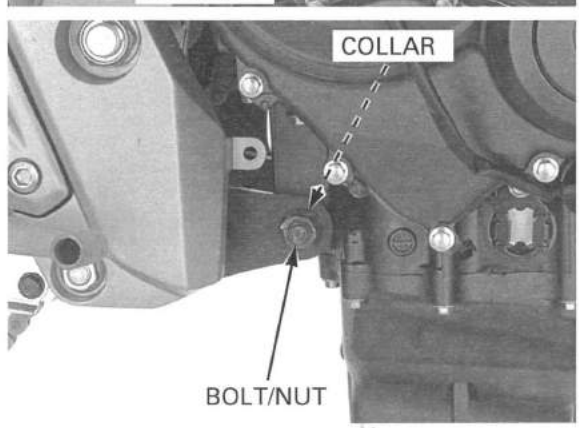
Install the collar onto the right side engine mount.

Install the rear upper engine mounting bolt from the left side and install the collar between the engine and rear engine hanger.
Install the upper engine mounting nut.



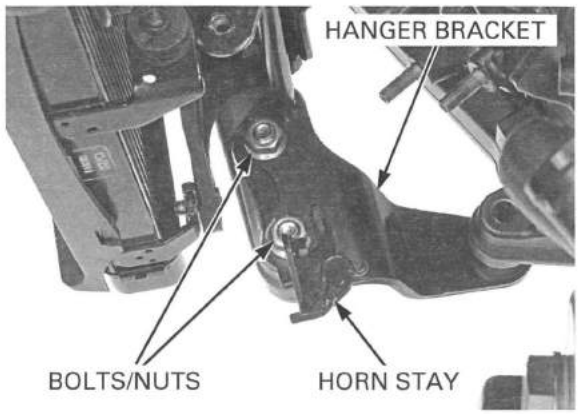
Install the collar onto the right side engine mount.

Install the rear lower engine mounting bolt from the left side and install the collar between the engine and rear engine hanger.
Install the lower engine mounting nut.

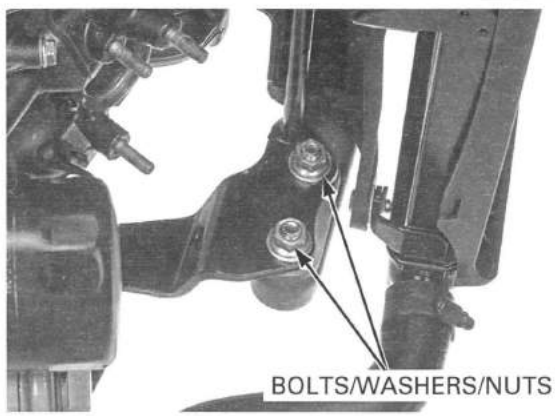


Install the front engine hanger bracket to the frame.

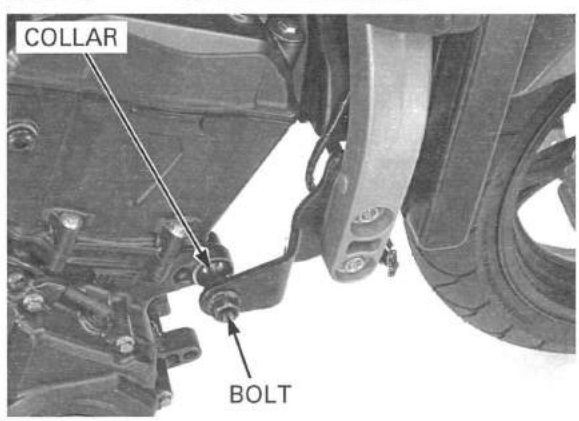
Install the right front engine hanger bracket bolts, horn stay and nuts.



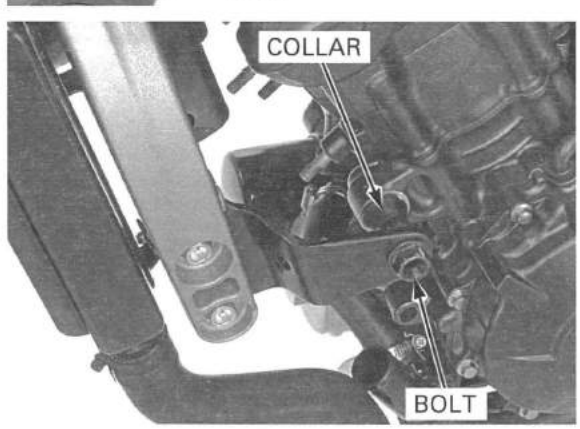
Install the left front engine hanger bracket bolts, washers and nuts.



Install the right front engine mounting bolt and collar.

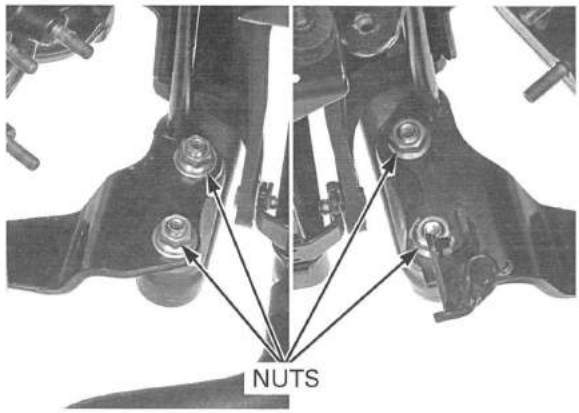


Install the left front engine mounting bolt and collar.



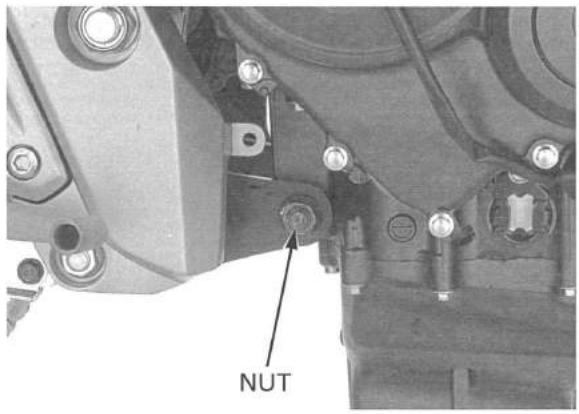
Tighten the right and left front engine hanger bracket nuts to the specified torque.

TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)



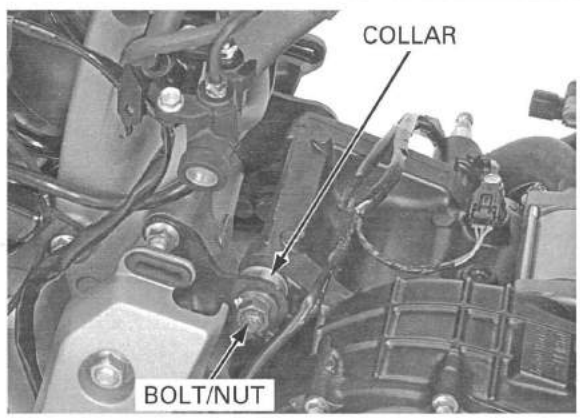
Tighten the lower engine mounting nut to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)



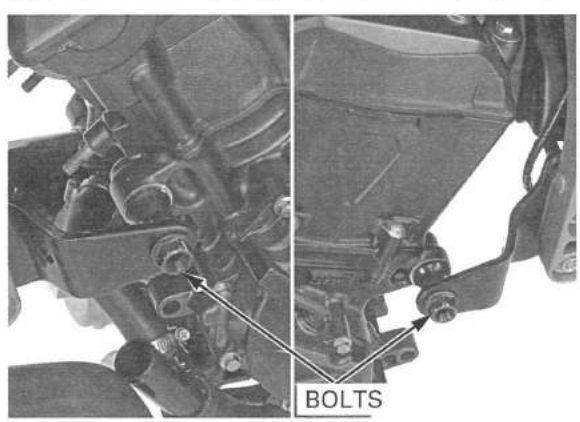
Tighten the upper engine mounting nut to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)



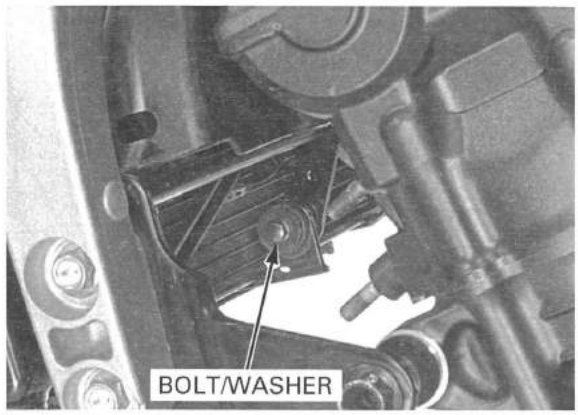
Tighten the right and left front engine mounting bolts to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

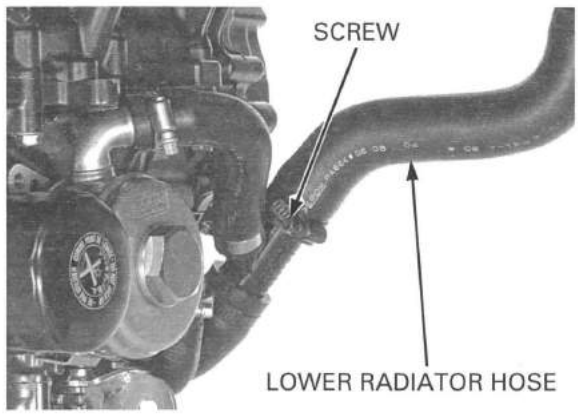


Mount the radiator with the mounting bolt and washer to the front engine hanger.

Tighten the mounting bolt securely.

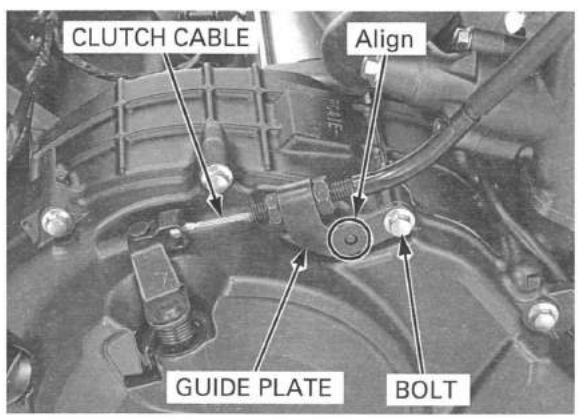


Connect the lower radiator hose to the hose joint and tighten the hose band screw securely.



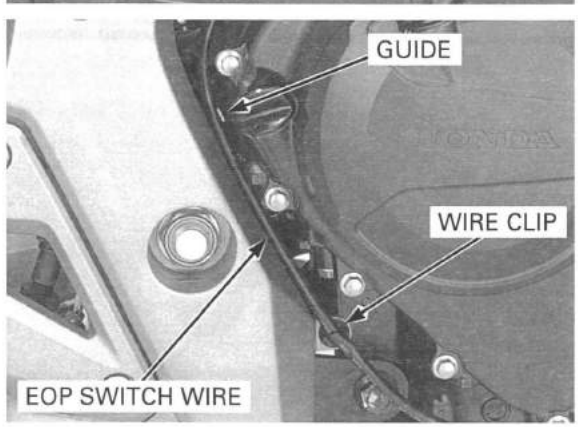
Connect the clutch cable to the clutch lifter lever.

Install the clutch cable guide plate, aligning its hole with the boss of right crankcase cover and tighten the bolt.



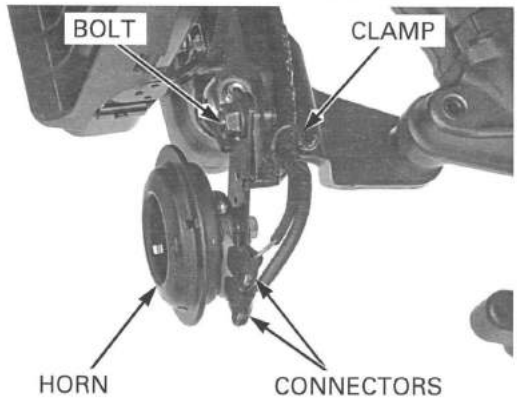
Attach the EOP switch wire clip to the pivot bracket.

Route the EOP switch wire to the guide of pivot bracket.

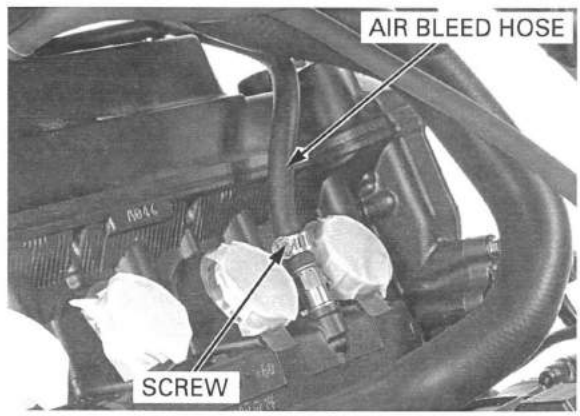


Install the horn and tighten the bolt securely.

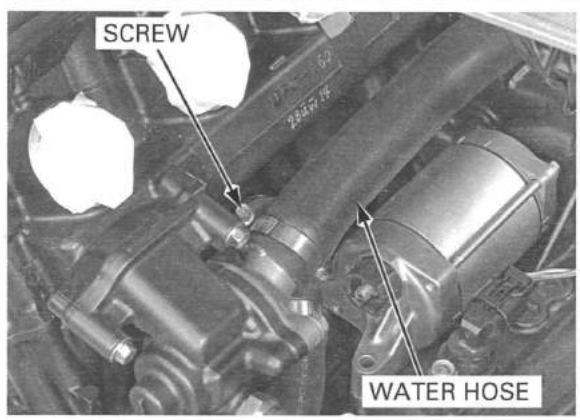
Route the horn wire through the stay clamp and connect the horn wire connectors to the horn.



Connect the air bleed hose to the hose joint on the cylinder head and tighten the hose band screw securely.



Connect the water hose to the thermostat housing cover and tighten the hose band screw securely.



Refer to "CABLE & HARNESS ROUTING" (page 1-23)

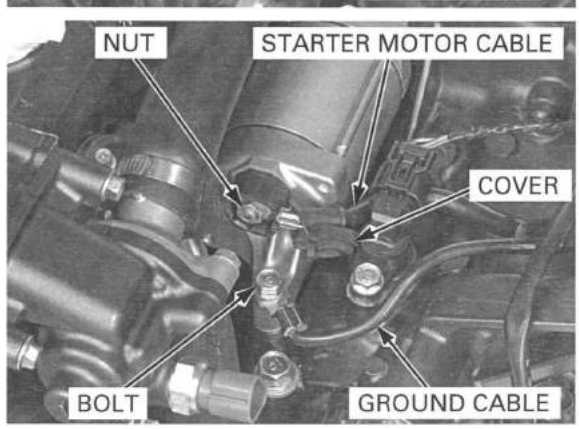
Route the starter motor cable and ground cable.

Tighten the starter motor mounting bolts with the ground cable.

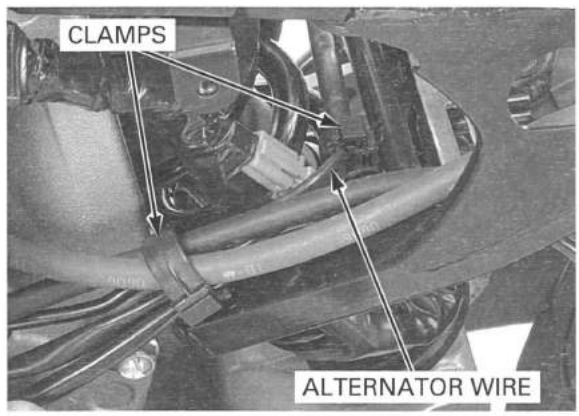
Connect the starter motor cable, then tighten the terminal nut to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the rubber cap securely.

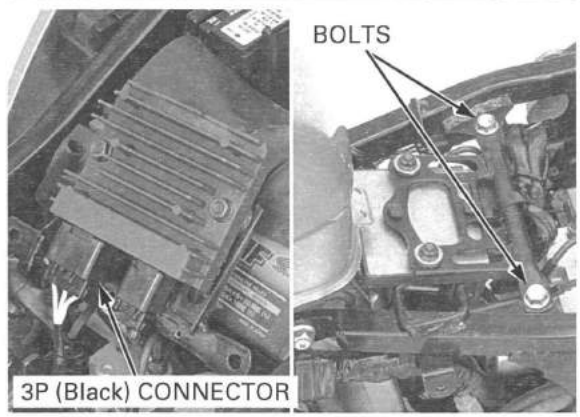


Secure the alternator wire with the clamps.



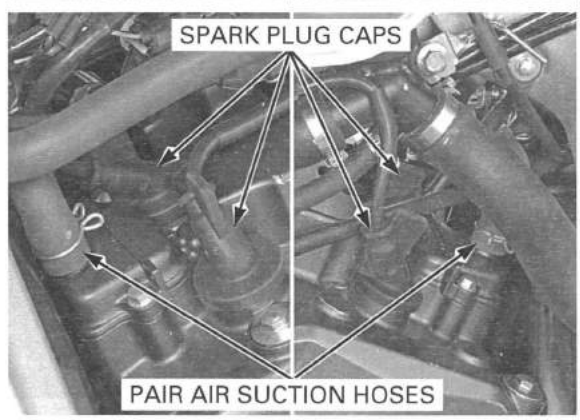
Connect the alternator 3P (Black) connector.

Install the regulator/rectifier and tighten the stay bolts securely.



Connect the PAIR air suction hoses to the cylinder head cover.

Connect the spark plug caps securely.



Install the drive sprocket with its "15T" mark facing out.

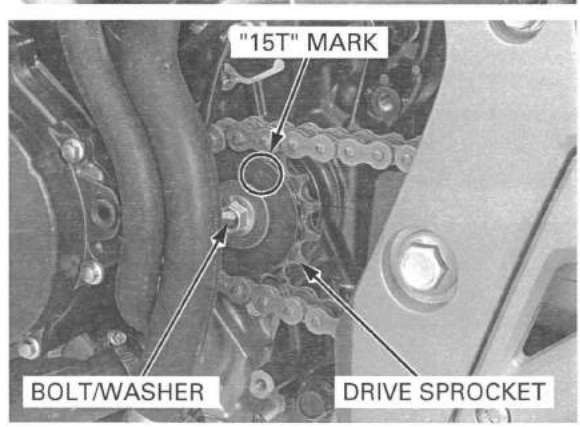
Install the washer and drive sprocket bolt.

Tighten the drive sprocket bolt to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

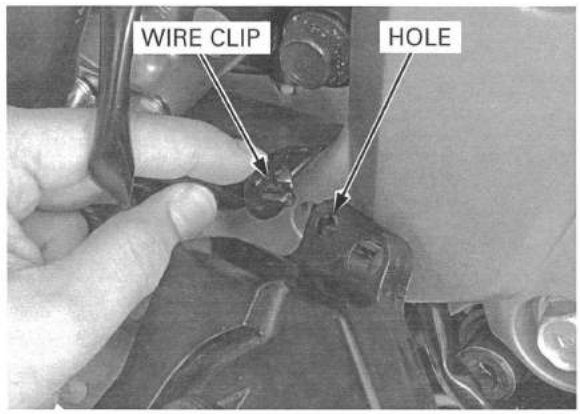
Install the following:

- crankcase rear cover (page 7-15)
- air cleaner housing (page 5-75)
- exhaust pipe (page 2-15)

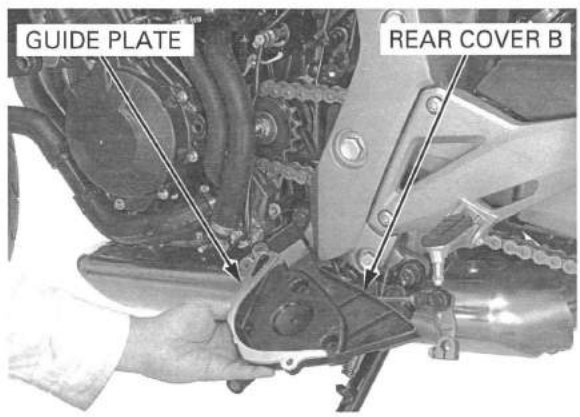


CRANKCASE REAR COVER INSTALLATION

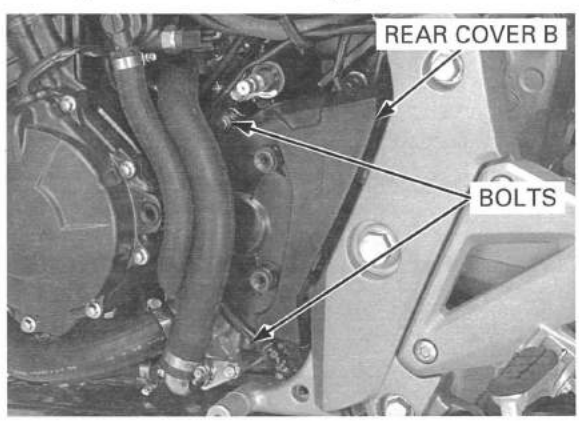
Set the sidestand switch wire clip to the hole of rear cover B.



Set the drive chain guide plate onto the rear cover B.

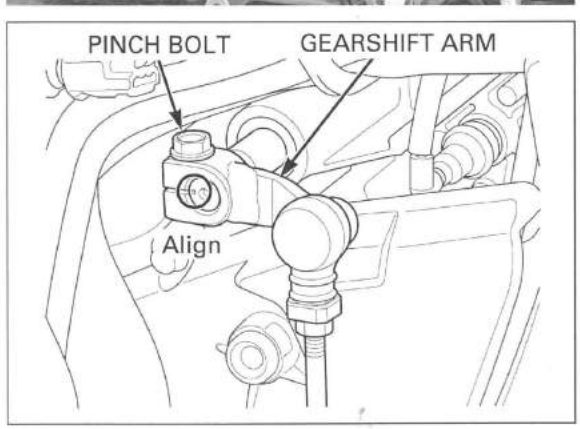


Install the drive chain guide plate/rear cover B and tighten the bolts securely.

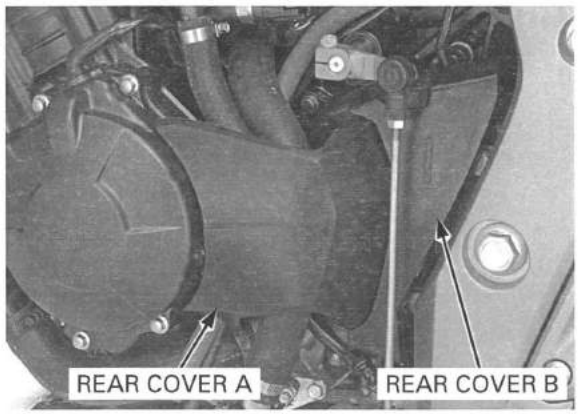


Install the gearshift arm, aligning its slit with the punch mark on the gearshift spindle.
Install and tighten the pinch bolt to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

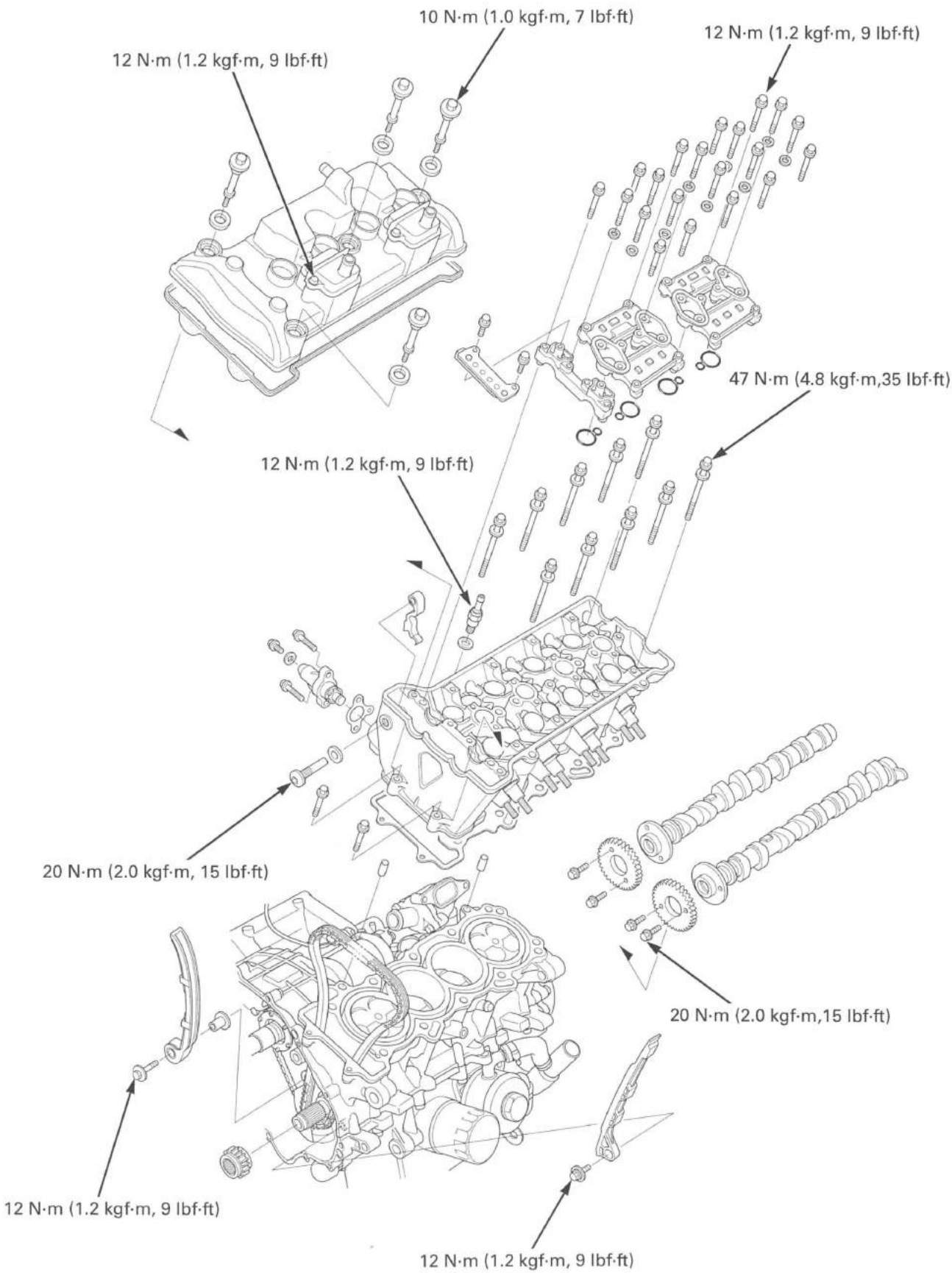


Install the rear cover A, aligning its bosses with the grommets of rear cover B.



8. CYLINDER HEAD/VALVES

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves and camshaft.
- The camshaft and cylinder head services can be done with the engine installed in the frame.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling cylinder head.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

SPECIFICATIONS

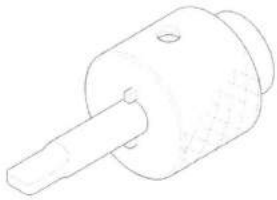
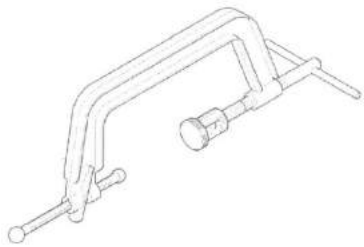
Unit: mm (in)

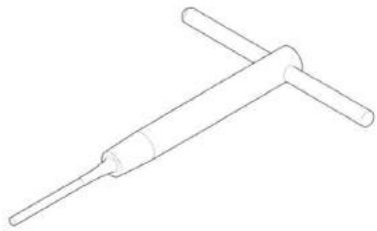
ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,304 kPa (13.3 kgf/cm^2, 189 psi) at 350 min^{-1} (rpm)	–
Valve clearance		IN	0.20 ± 0.03 (0.008 ± 0.001)	–
		EX	0.28 ± 0.03 (0.011 ± 0.001)	–
Camshaft	Cam lobe height	IN	36.24 – 36.32 (1.427 – 1.430)	36.22 (1.426)
		EX	35.42 – 35.50 (1.394 – 1.398)	35.40 (1.394)
	Runout		–	0.05 (0.002)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Valve lifter	Valve lifter O.D.		25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)
	Valve lifter bore I.D.		26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)
Valve, valve guide	Valve stem O.D.	IN	3.975 – 3.990 (0.1565 – 0.1571)	3.965 (0.1561)
		EX	3.965 – 3.980 (0.1561 – 0.1567)	3.955 (0.1557)
	Valve guide I.D.		4.000 – 4.012 (0.1575 – 0.1580)	4.04 (0.159)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.075 (0.0030)
		EX	0.020 – 0.047 (0.0008 – 0.0019)	0.085 (0.0033)
	Valve guide projection above cylinder head	IN	17.1 – 17.4 (0.67 – 0.69)	–
		EX	13.3 – 13.6 (0.52 – 0.54)	–
	Valve seat width		0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length		IN	40.19 (1.582)	39.4 (1.55)
		EX	39.76 (1.565)	39.0 (1.54)
Cylinder head warpage			–	0.10 (0.004)

TORQUE VALUES

Cylinder head mounting bolt	47 N·m (4.8 kgf·m, 35 lbf·ft)	Apply molybdenum disulfide oil to the threads and seating surface.
Camshaft holder flange bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply engine oil to the threads and seating surface.
Cylinder head cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Breather plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	CT bolt/Apply a locking agent to the threads.
PAIR check valve cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	CT bolt
Cam sprocket bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)	Apply a locking agent to the threads.
Cam chain tensioner A pivot bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Cam chain tensioner B pivot bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)	Apply a locking agent to the threads.
Cam chain guide A bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Bleeding joint	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Spark plug	16 N·m (1.6 kgf·m, 12 lbf·ft)	

TOOLS

Compression gauge attachment 07RMJ-MY50100  or equivalent commercially available.	Tensioner stopper 070MG-0010100 	Valve spring compressor 07757-0010000 
Valve spring compressor attachment 07959-KM30101 	Tappet hole protector 07HMG-MR70002 	Valve guide driver 07GMD-KT70100 
Valve guide driver 07743-0020000 	Valve guide reamer, 4.008 mm 07MMH-MV90100 	Valve seat cutter, 29 mm (45° IN) 07780-0010300  or equivalent commercially available.
Valve seat cutter, 24 mm (45° EX) 07780-0010600  or equivalent commercially available.	Flat cutter, 29 mm (32° IN) 07780-0013400  or equivalent commercially available.	Flat cutter, 24 mm (32° EX) 07780-0012500  or equivalent commercially available.

Interior cutter, 30 mm (60° IN) 07780-0014000  or equivalent commercially available.	Interior cutter, 24 mm (60° EX) 070PH-Z0D0100  or equivalent commercially available.	Cutter holder, 4.0 mm 07781-0010500  or equivalent commercially available.

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problem can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather hose. If the hose is smoky, check for a seized piston ring (page 12-15).

Compression too low, hard starting or poor performance at low speed
- Valves:
  - Incorrect valve adjustment
  - Burned or bent valve
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
- Cylinder head:
  - Leaking or damaged head gasket
  - Warped or cracked cylinder head
- Worn cylinder, piston or piston rings (page 12-15)

Compression too high, overheating or knocking
- Excessive carbon build-up on piston crown or on combustion chamber

Excessive smoke
- Cylinder head:
  - Worn valve stem or valve guide
  - Damaged stem seal
- Worn cylinder, piston or piston rings (page 12-15)

Excessive noise
- Cylinder head:
  - Incorrect valve adjustment
  - Sticking valve or broken valve spring
  - Damaged or worn camshaft
  - Loose or worn cam chain
  - Worn or damaged cam chain
  - Worn or damaged cam chain tensioner
  - Worn cam sprocket teeth
- Worn cylinder, piston or piston rings (page 12-15)

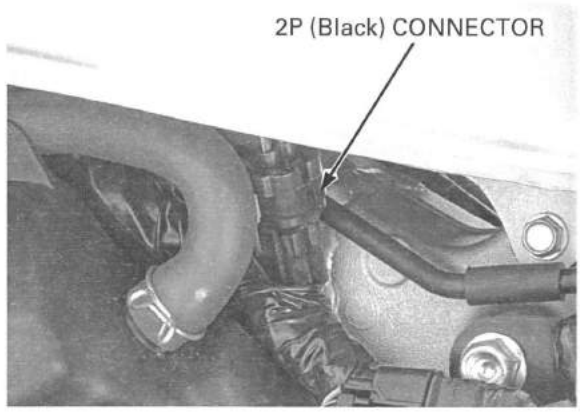
Rough idle
- Low cylinder compression

CYLINDER COMPRESSION TEST

Warm the engine to normal operating temperature. Stop the engine and remove the all spark plug caps and spark plugs (page 3-8).

Lift and support the fuel tank (page 3-5).

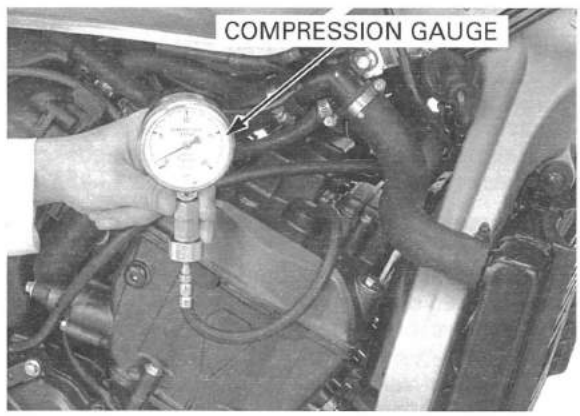
Disconnect the fuel pump unit 2P (Black) connector.



Install a compression gauge into the spark plug hole.

TOOL:

Compression gauge attachment	**07RMJ-MY50100 or equivalent commercially available**



Open the throttle all the way and crank the engine with the starter motor until the gauge reading stops rising.

The maximum reading is usually reached within 4 – 7 seconds.

Compression pressure:
1,304 kPa (13.3 kgf/cm², 189 psi) at 350 min⁻¹ (rpm)

Low compression can be caused by:
- Blown cylinder head gasket
- Improper valve adjustment
- Valve leakage
- Worn piston rings or cylinder

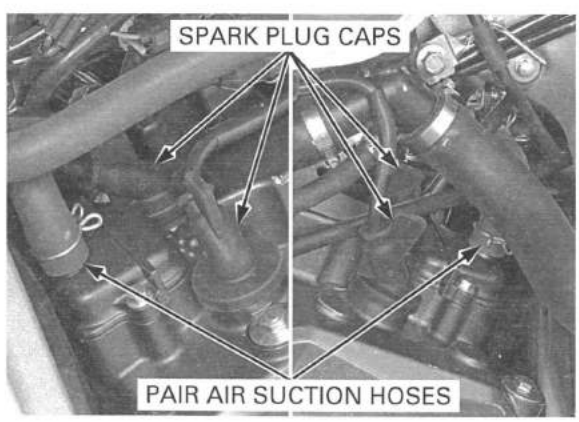
High compression can be caused by:
- Carbon deposits in combustion chamber or on piston head

CYLINDER HEAD COVER REMOVAL

Remove the fuel tank (page 5-58).

Disconnect the spark plug caps.

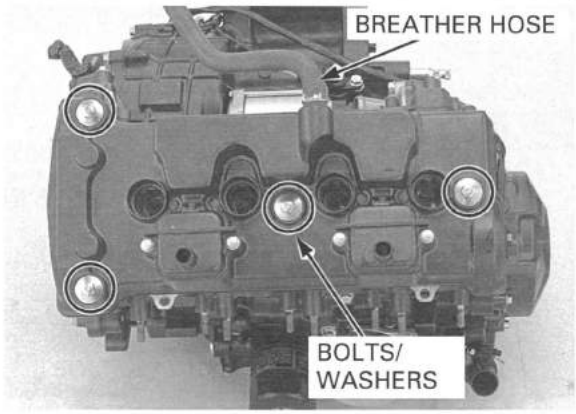
Disconnect the PAIR air suction hoses from the cylinder head cover.



Disconnect the crankcase breather hose from the cylinder head cover.

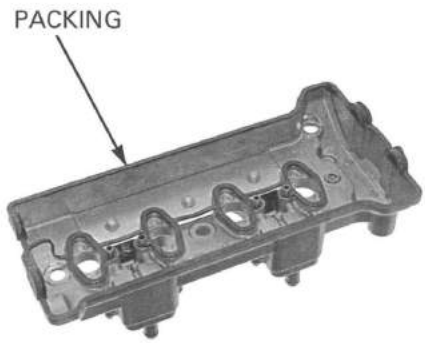
Remove the cylinder head cover bolts and washers.

Remove the cylinder head cover from the cylinder head.

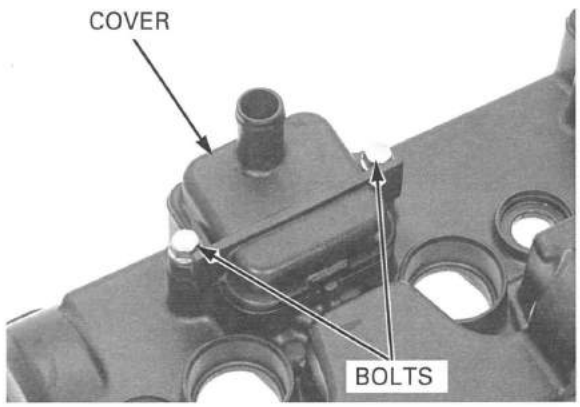


CYLINDER HEAD COVER DISASSEMBLY

Remove the cylinder head cover packing.

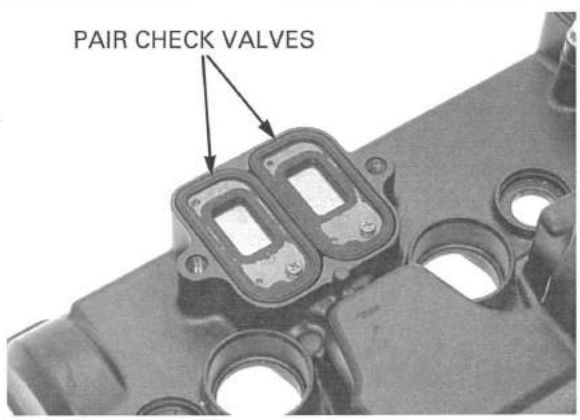


Remove the bolts and PAIR check valve cover.

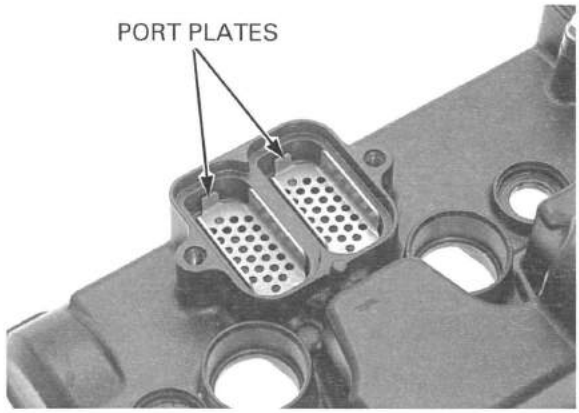


Remove the PAIR check valves from the cylinder head cover.

Check the PAIR check valve for wear or damage, replace if necessary.



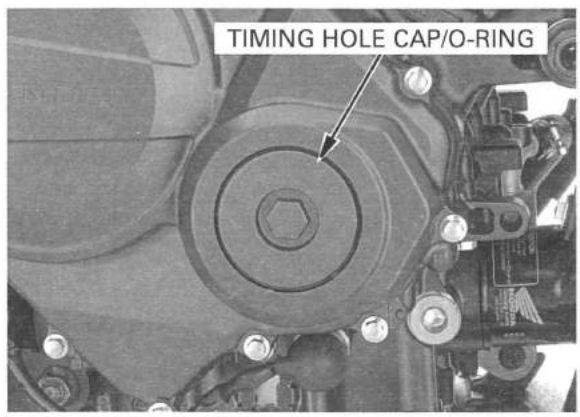
Remove the port plates from the cylinder head cover.



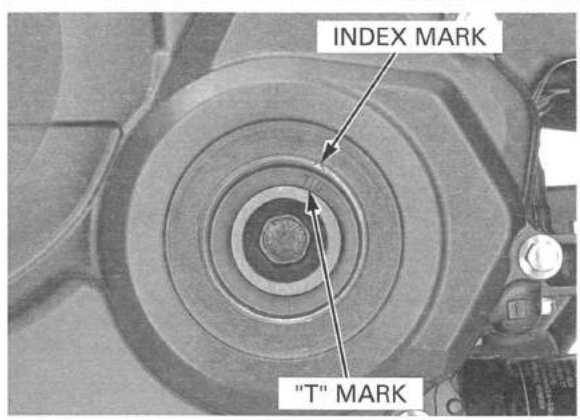
CAMSHAFT REMOVAL

Remove the cylinder head cover (page 8-6).

Remove the timing hole cap and O-ring.

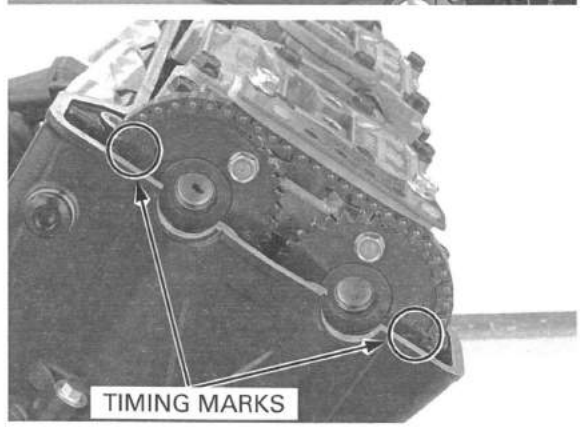


Turn the crankshaft clockwise, align the "T" mark on the CKP sensor rotor with the index mark on the right crankcase cover.



The timing marks ("IN" and "EX") on the cam sprockets must be flush with the cylinder head surface and facing outward as shown.

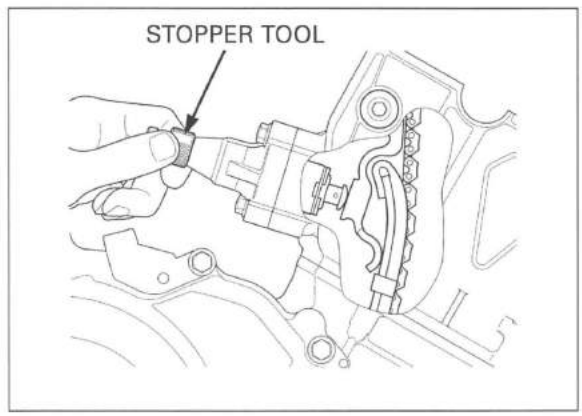
If the timing marks on the cam sprocket are facing inward, turn the crankshaft clockwise one full turn (360°) and realign the timing marks with the cylinder head surface so they are facing outward.



Remove the cam chain tensioner lifter sealing bolt and sealing washer.

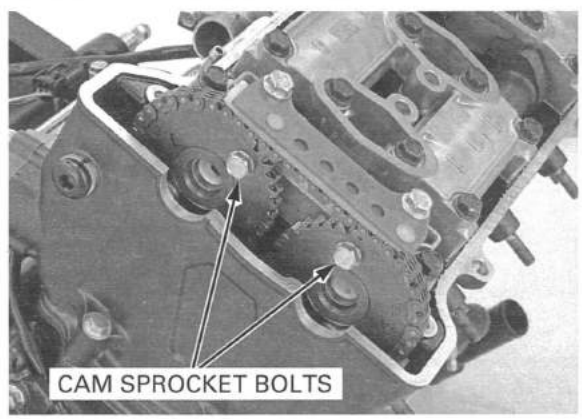
Turn the cam chain tensioner lifter shaft fully in (clockwise) and secure it using the special tool to prevent damaging the cam chain.

TOOL:
Tensioner stopper **070MG-0010100**



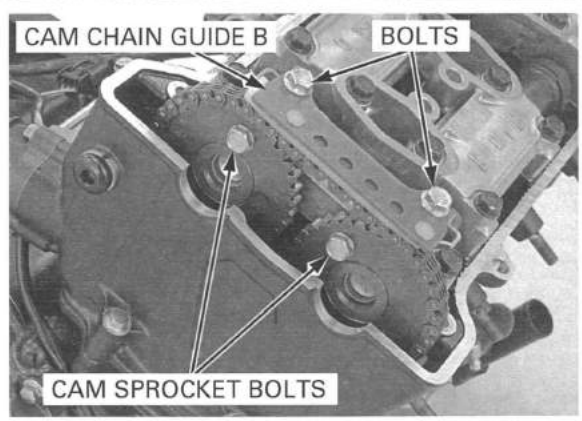
It is not necessary to remove the cam sprocket from the camshaft except when replacing the camshaft and/or cam sprocket.

If you plan to replace the camshaft and/or cam sprocket, loosen the cam sprocket bolts as follows:

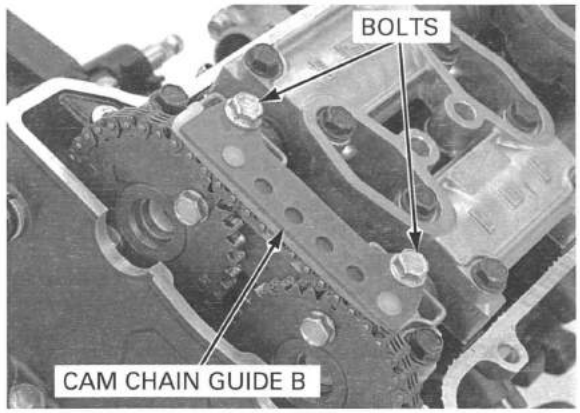


Be careful not to drop the cam sprocket bolts and cam sprocket into the crankcase.

- Remove the cam sprocket bolts from the intake and exhaust camshafts.
- Turn the crankshaft clockwise one full turn (360°), remove the other cam sprocket bolts from the camshafts.
- Remove the bolts and cam chain guide B.
- Remove the cam sprockets from the camshafts.



Remove the bolts and cam chain guide B.



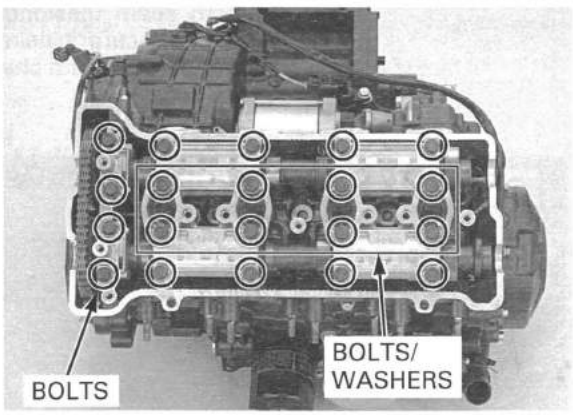
Suspend the cam chain with a piece of wire to prevent the chain from falling into the crankcase.

Loosen and remove the camshaft holder bolts/washers, then remove the camshaft holders and camshafts.

NOTE:

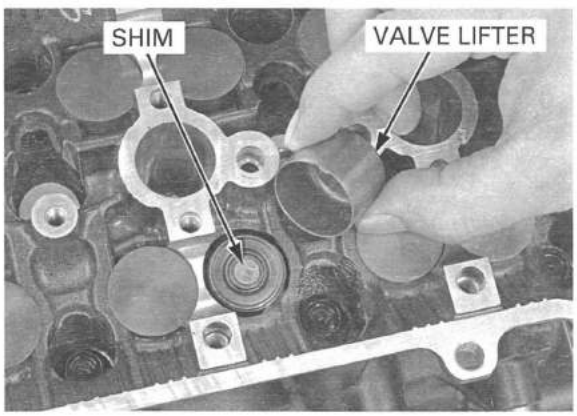
From outside to inside, loosen the bolts in a criss-cross pattern in several steps or the camshaft holder might break.

Do not forcibly remove the dowel pins from the camshaft holders.



Remove the valve lifters and shims.

- Be careful not to damage the valve lifter bore.
- Shim may stick to the inside of the valve lifter. Do not allow the shims to fall into the crankcase.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.
- The shims can be easily removed with a tweezers or magnet.



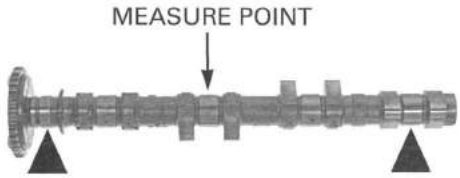
INSPECTION

CAMSHAFT

Check the cam and journal surfaces of the camshaft for scoring, scratches or evidence of insufficient lubrication.
Check the oil holes in the camshaft for clogging.

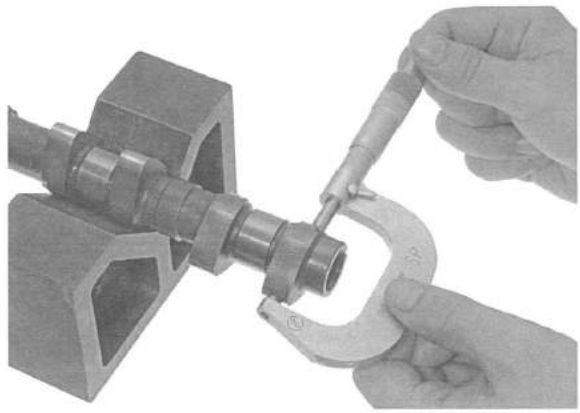
Support both sides of the camshaft (at journals) with V-blocks and check the camshaft run out with a dial gauge.

SERVICE LIMIT: 0.05 mm (0.002 in)



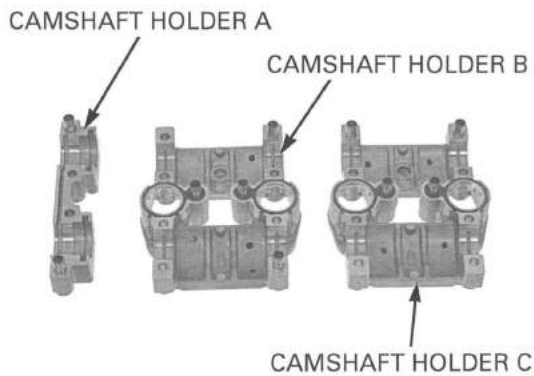
Using a micrometer, measure each cam lobe height.

SERVICE LIMITS:
IN: 36.22 mm (1.426 in)
EX: 35.40 mm (1.394 in)



CAMSHAFT HOLDERS

Inspect the bearing surface of the each camshaft holder for scoring, scratches, or evidence of insufficient lubrication.
Inspect the oil orifices of the holders for clogging.



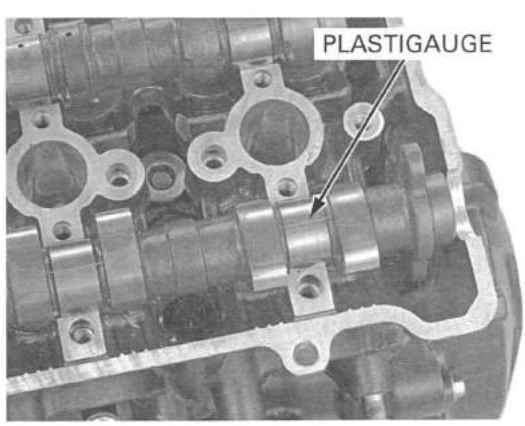
CAM CHAIN GUIDE B

Inspect the cam chain slipper surface of the cam chain guide B for wear or damage.

CAMSHAFT OIL CLEARANCE

Do not rotate the camshaft when using plastigauge.

Wipe any oil from the journals of the camshaft, cylinder head and camshaft holders.
Lay a strip of plastigauge lengthwise on top of each camshaft journal.



Be sure the dowel pins in the cam shaft holder align the holes in the cylinder head.

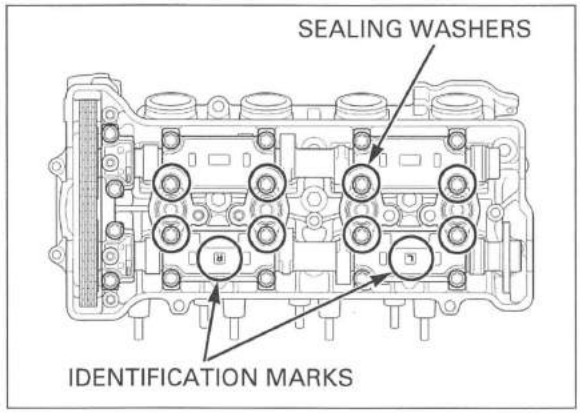
Install the each camshaft holder to the correct locations with the identification marks.

- No mark: right camshaft holder
- "R" mark: center camshaft holder
- "L" mark: left camshaft holder

Apply engine oil to the threads and seating surfaces of the camshaft holder bolts.

Install the twenty holder bolts with the eight sealing washers.

Finger tighten the bolts.



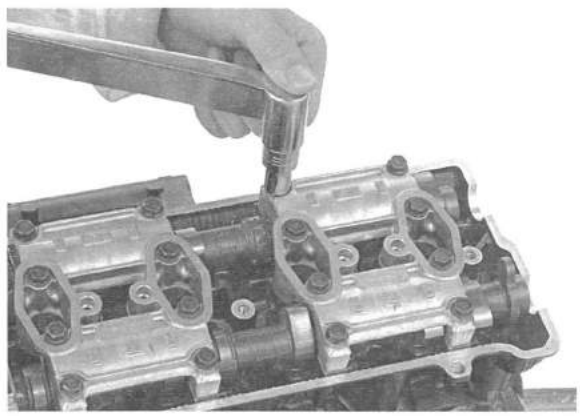
Gradually tighten the camshaft holder bolts until the camshaft holders lightly contact the cylinder head surface.

NOTICE

Failure to tighten the camshaft holder in a criss-cross pattern might cause a camshaft holder to break.

Tighten all camshaft holder bolts in the numerical order cast on the camshaft holders.

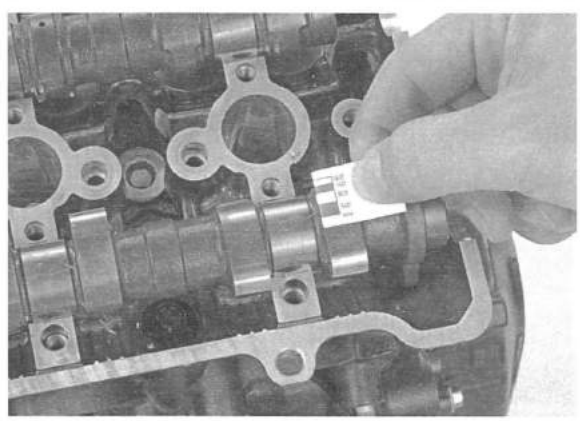
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Remove the camshaft holders and measure the width of each plastigauge.
The widest thickness determines the oil clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

When the service limits are exceeded, replace the camshaft and recheck the oil clearance.
Replace the cylinder head and camshaft holders as a set if the clearance still exceeds the service limit.



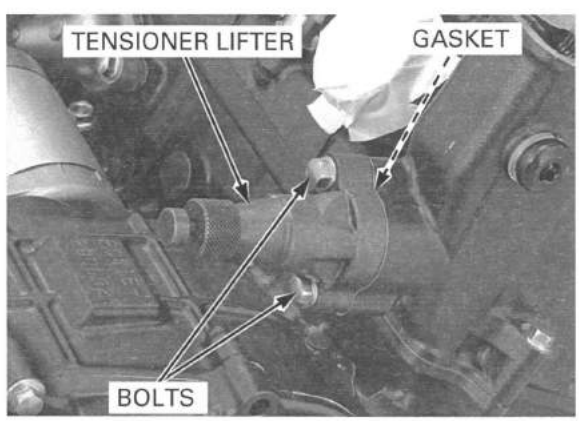
CYLINDER HEAD REMOVAL

Drain the coolant (page 6-6).

Remove the following:

- exhaust system (page 2-13).
- air cleaner housing (page 5-61)
- thermostat housing (page 6-8)
- camshaft (page 8-8)

Remove the bolts, cam chain tensioner lifter and gasket.

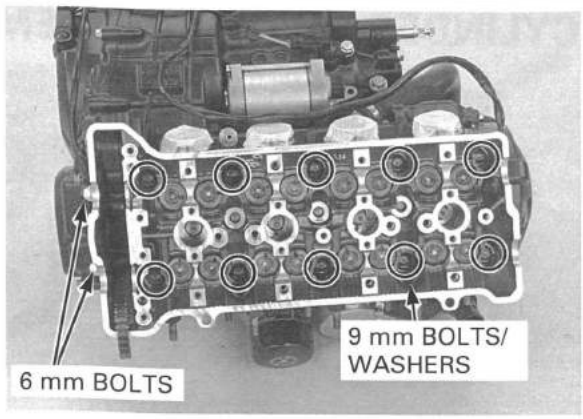


Remove the two 6 mm bolts.

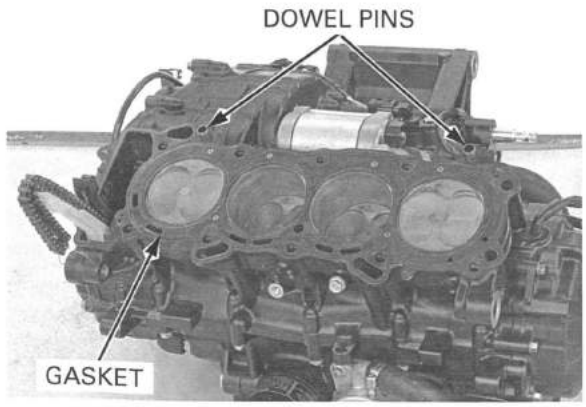
Loosen the 9 mm bolts in a crisscross pattern in two or three steps.

Remove the ten 9 mm bolts/washers.

Remove the cylinder head.



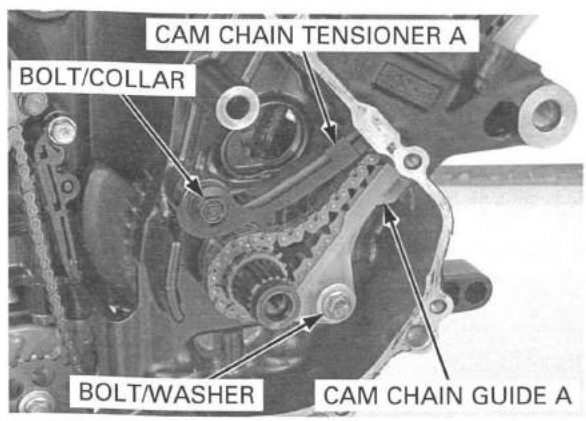
Remove the gasket and dowel pins.



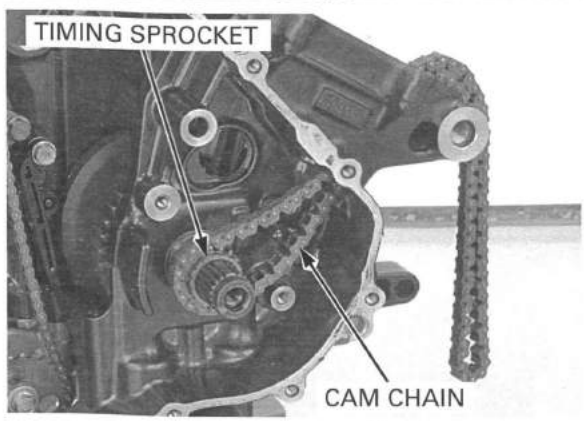
Remove the following:

- right crankcase cover (page 9-5)
- starter clutch (page 9-17)

Remove the bolt, washer and cam chain guide A.
Remove the bolt, cam chain tensioner A and collar.



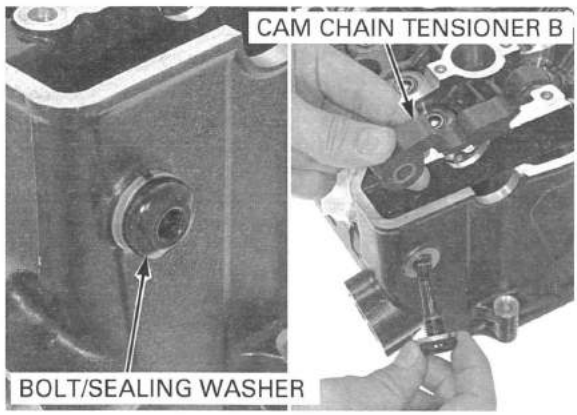
Remove the cam chain and timing sprocket from the crankshaft.



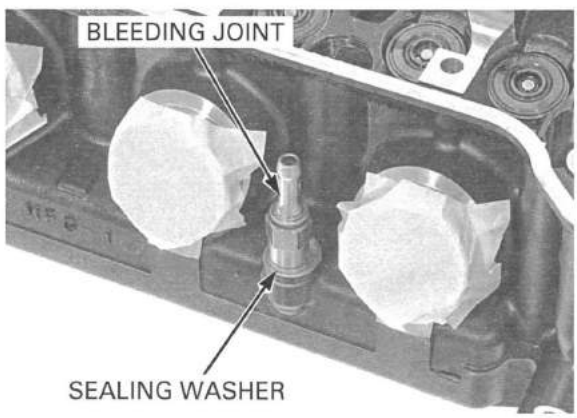
CYLINDER HEAD DISASSEMBLY

Remove the cylinder head (page 8-12).

Remove the bolt, sealing washer and cam chain tensioner B from the cylinder head.



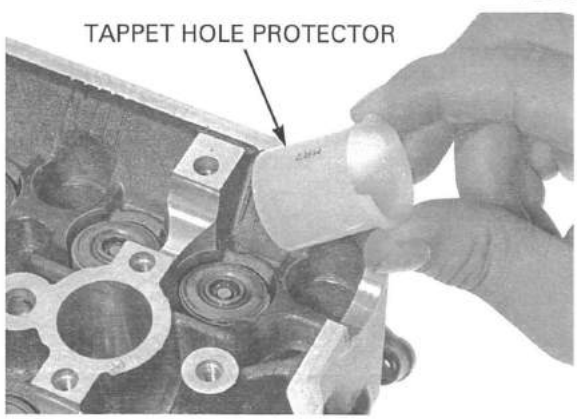
Remove the bleeding joint, sealing washer from the cylinder head.



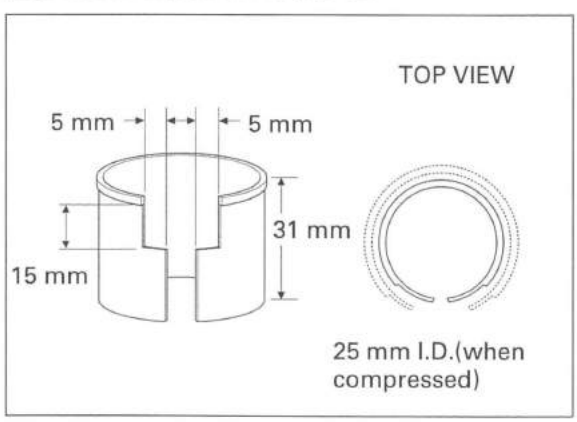
Remove the spark plugs from the cylinder head.

Install the tappet hole protector into the valve lifter bore.

TOOL:
Tappet hole protector **07HMG-MR70002**



An equivalent tool can easily be made from a plastic 35 mm film container as shown.

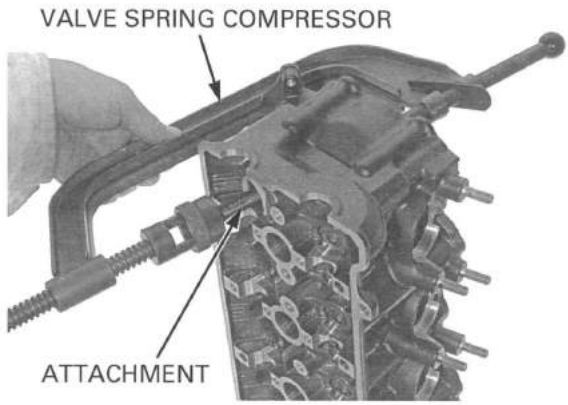


To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

Remove the valve spring cotters using the special tools as shown.

TOOLS:

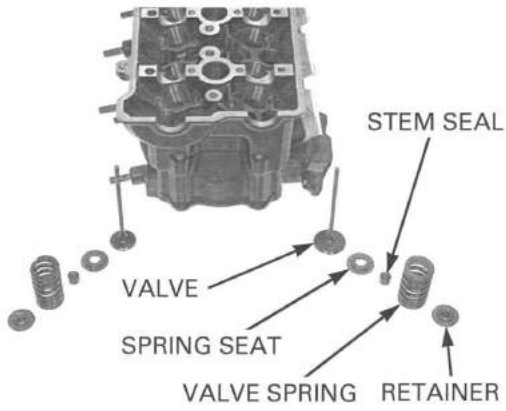
Valve spring compressor	**07757-0010000**
Valve spring compressor attachment	**07959-KM30101**



Mark all parts during disassembly so they can be placed back in their original locations.

Remove the following:

- spring retainer
- valve spring
- valve
- stem seal
- valve spring seat



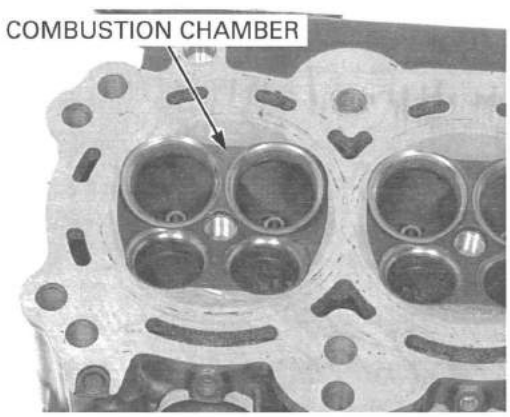
CYLINDER HEAD INSPECTION

CYLINDER HEAD

Avoid damaging the gasket surface.

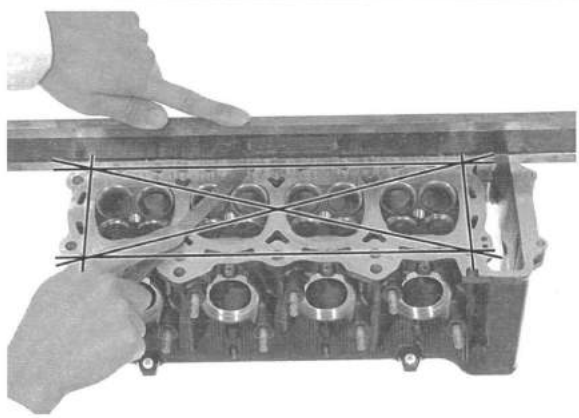
Remove carbon deposits from the combustion chambers.

Check the spark plug hole and valve areas for cracks.



Check the cylinder head for warpage with a straight edge and feeler gauge.

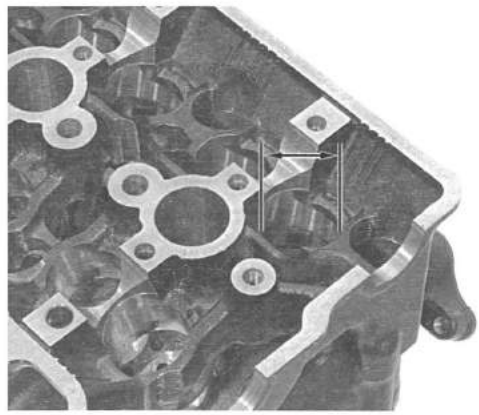
SERVICE LIMIT: 0.10 mm (0.004 in)



VALVE LIFTER BORE

Inspect each valve lifter bore for scratches or abnormal wear.
Measure the each valve lifter bore I.D.

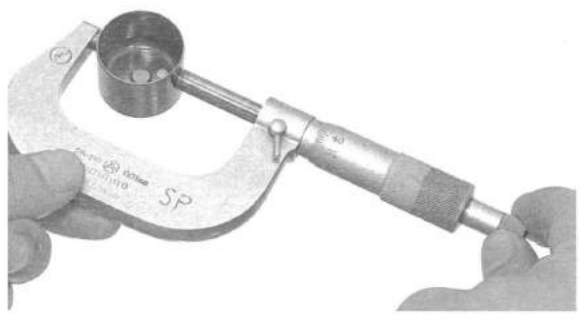
SERVICE LIMIT: 26.04 mm (1.025 in)



VALVE LIFTER

Inspect each valve lifter for scratches or abnormal wear.
Measure the each valve lifter O.D.

SERVICE LIMIT: 25.97 mm (1.022 in)

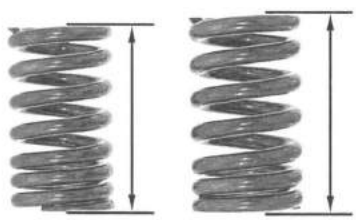


VALVE SPRING

Measure the free length of the valve springs.

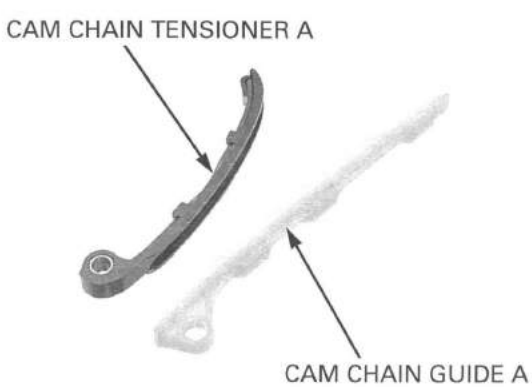
SERVICE LIMITS:
IN: 39.4 mm (1.55 in)
EX: 39.0 mm (1.54 in)

Replace the springs if they are shorter than the service limits.

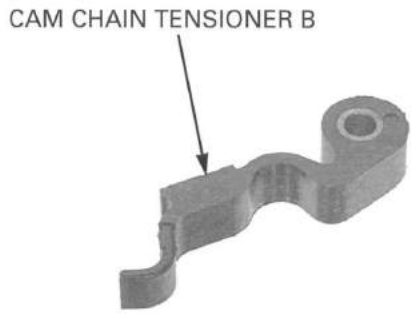


CAM CHAIN TENSIONER/CAM CHAIN GUIDE

Inspect the cam chain tensioner A and cam chain guide A for excessive wear or damage, replace them if necessary.

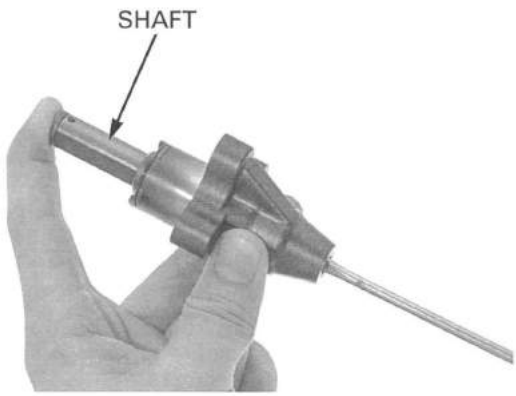


Inspect the cam chain tensioner B for excessive wear or damage, replace it if necessary.



CAM CHAIN TENSIONER LIFTER

Check the cam chain tensioner lifter operation as follows.
The tensioner shaft should no go into the body when it is pushed.
When it is turned clockwise with the cam chain tensioner holder or a screwdriver, the tensioner shaft should be pulled into the body. The shaft spring out of the body as soon as the stopper tool is released.



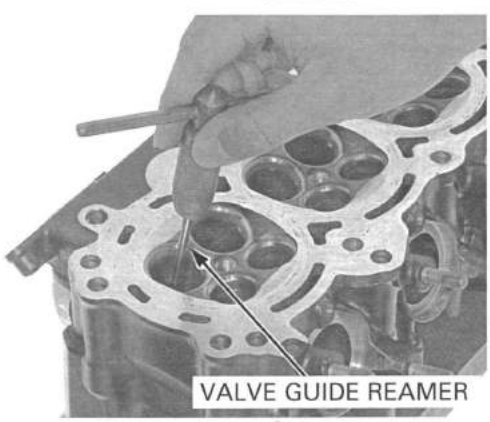
VALVE/VALVE GUIDE

Check that the valve moves smoothly in the guide.
Inspect each valve for bending, burning or abnormal stem wear.
Measure and record each valve stem O.D.

SERVICE LIMITS:
IN: 3.965 mm (0.1561 in)
EX: 3.955 mm (0.1557 in)

Ream the guides to remove any carbon deposits before checking clearances.
Insert the reamer from the combustion chamber side of the cylinder head and always rotate the reamer clockwise.

TOOL:
Valve guide reamer, 4.008 mm 07MMH-MV90100

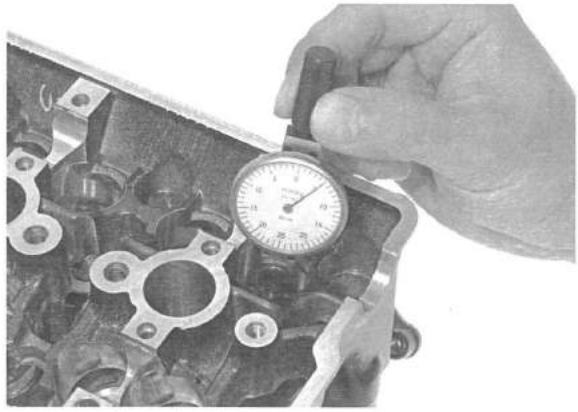


Measure and record each valve guide I.D.

SERVICE LIMITS: IN/EX: 4.04 mm (0.159 in)

Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

SERVICE LIMITS:
IN: 0.075 mm (0.0030 in)
EX: 0.085 mm (0.0033 in)



Reface the valve seats whenever the valve guides are replaced (page 8-20).

If the stem-to-guide clearance is out of standard, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so, replace any guides as necessary and ream to fit.
If the stem-to-guide clearance exceeds the service limit with the new guides, replace the valves and guides.

VALVE GUIDE REPLACEMENT

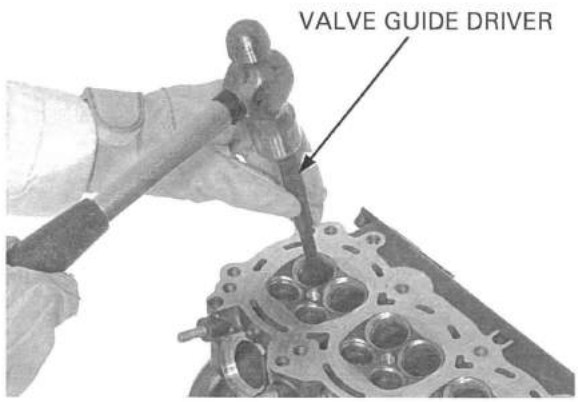
Chill the replacement valve guides in the freezer section of a refrigerator for about an hour.

Do not use a torch to heat the cylinder head; it may cause warping.

Heat the cylinder head to 100 – 150°C (212 – 300°F) with a hot plate or oven.
To avoid burns, wear heavy gloves when handling the heated cylinder head.

Support the cylinder head and drive out the valve guides from combustion chamber side of the cylinder head.

TOOL:
Valve guide driver 07GMD-KT701000

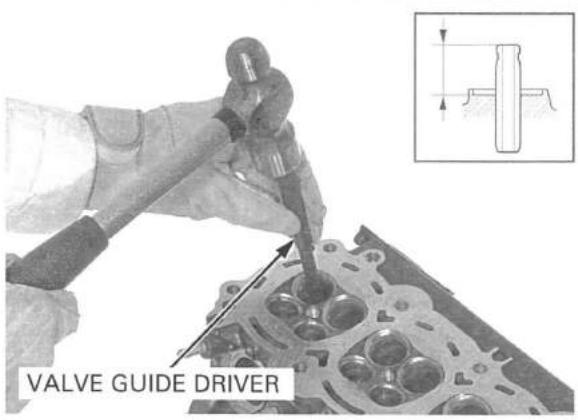


Drive in the guides to the specified depth from the top of the cylinder head.

SPECIFIED DEPTH:
IN: 17.1 – 17.4 mm (0.67 – 0.69 in)
EX: 13.3 – 13.6 mm (0.52 – 0.54 in)

TOOL:
Valve guide driver 07GMD-KT70100

Let the cylinder head cool to room temperature.

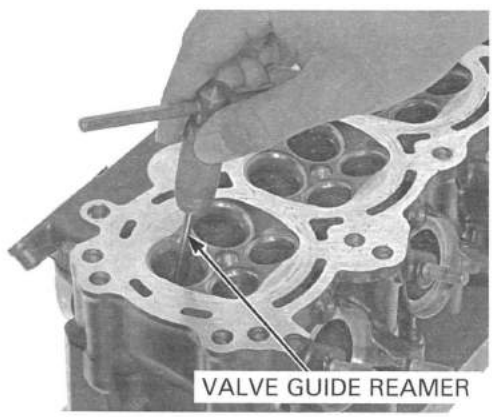


Use cutting oil on the reamer during this operation.

Ream the new valve guides after installation.
Insert the reamer from the combustion chamber side of the head and also always rotate the reamer clockwise.

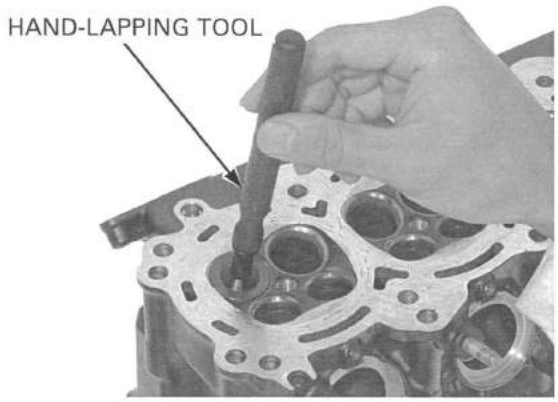
TOOL:
Valve guide reamer, 4.008 mm 07MMH-MV90100

Clean the cylinder head thoroughly to remove any metal particles.
Reface the valve seat (page 8-20).



VALVE SEAT INSPECTION/REFACING

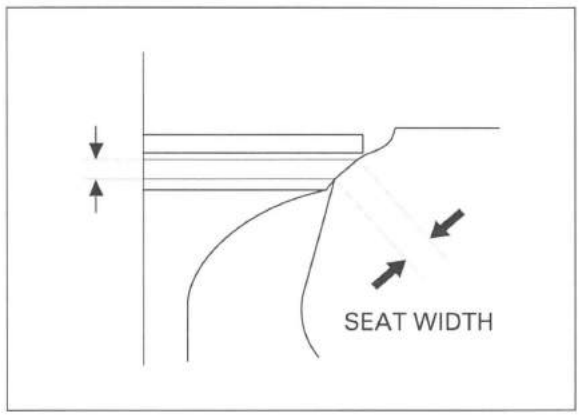
Clean the intake and exhaust valves thoroughly to remove carbon deposits.
Apply a light coating of Prussian Blue to the valve seats.
Tap the valves and seats using a rubber hose or other hand-lapping tool.



Remove the valve and inspect the valve seat face. The valve seat contact should be within the specified width and even all around the circumference.

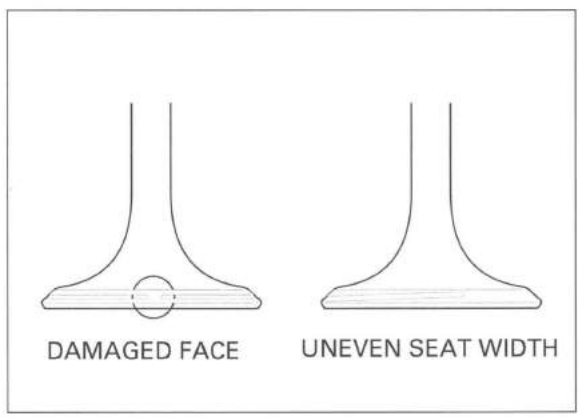
STANDARD:
IN/EX: 0.90 – 1.10 mm (0.035 – 0.043 in)
SERVICE LIMIT:
IN/EX: 1.5 mm (0.06 in)

If the seat width is not within specification, reface the valve seat (page 8-20).



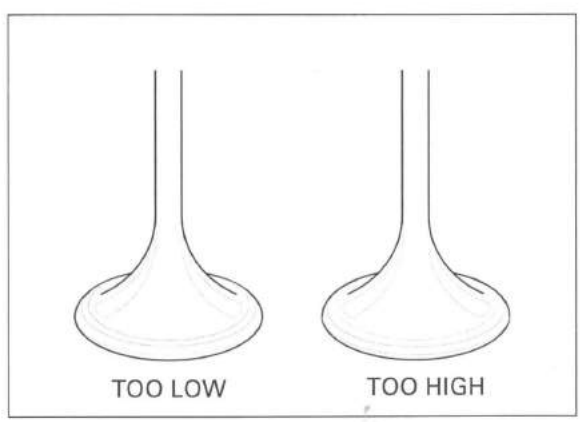
Inspect the valve seat face for:

- Uneven seat width:
  – Replace the valve and reface the valve seat.
- Damaged face:
  – Replace the valve and reface the valve seat.



The valves cannot be ground. If a valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

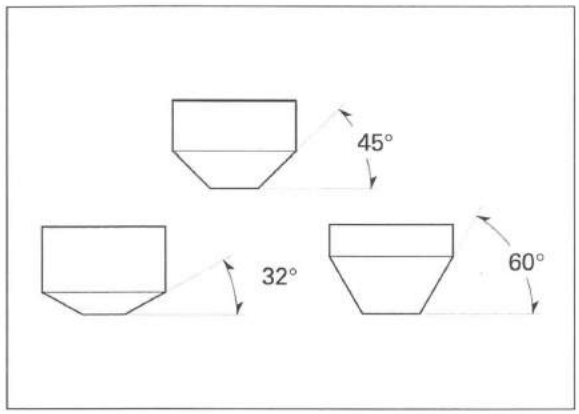
- Contact area (too high or too low)
  – Reface the valve seat.



VALVE SEAT REFACING

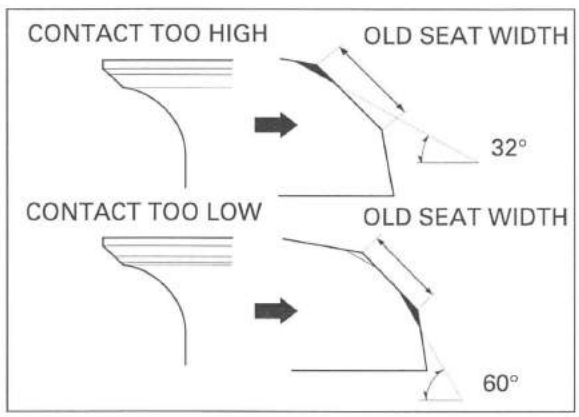
Follow the refacing manufacturer's operating instructions.

Valve seat cutters/grinders or equivalent valve seat refacing equipment are recommended to correct worn valve seats.



If the contact area is too high on the valve, the seat must be lowered using a 32-degree flat cutter.

If the contact area is too low on the valve, the seat must be raised using a 60-degree interior cutter.

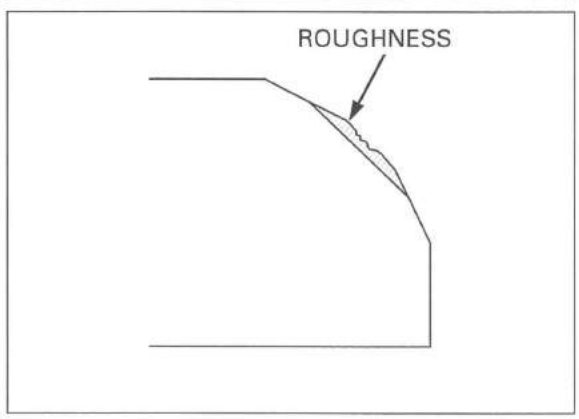


Reface the seat with a 45-degree cutter whenever a valve guide is replaced.

Use a 45-degree cutter to remove any roughness or irregularities from the seat.

TOOLS:

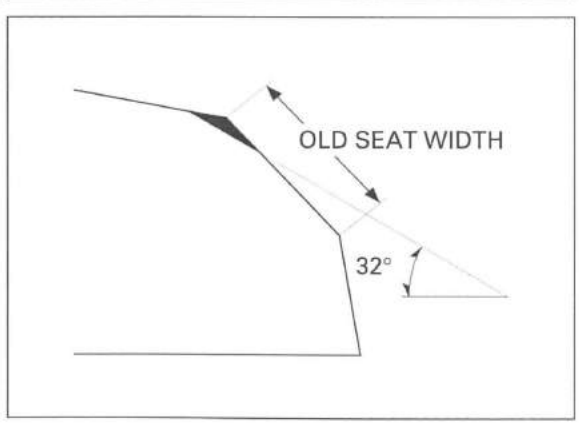
Seat cutter, 29 mm (IN)	**07780-0010300**
Seat cutter, 24 mm (EX)	**07780-0010600**
Cutter holder, 4.0 mm	**07781-0010500 or equivalent commercially available**



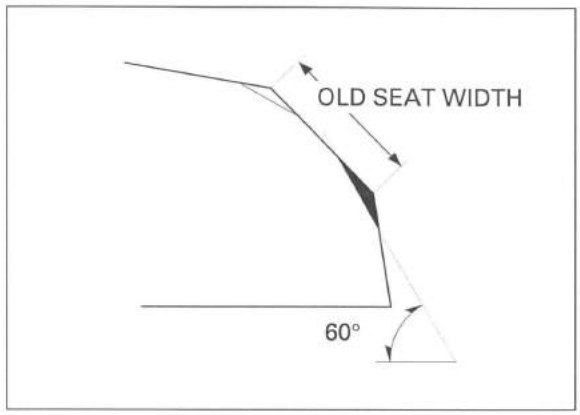
Use a 32-degree cutter to remove the top 1/4 of the existing valve seat material.

TOOLS:

Flat cutter, 29 mm (IN)	**07780-0013400**
Flat cutter, 24 mm (EX)	**07780-0012500**
Cutter holder, 4.0 mm	**07781-0010500 or equivalent commercially available**



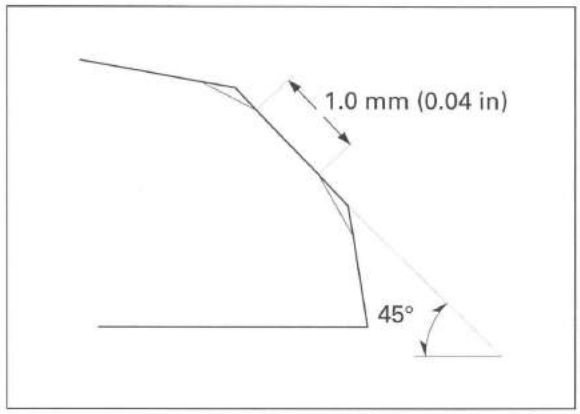
Use a 60-degree cutter to remove the bottom 1/4 of the old seat.



TOOLS:

Interior cutter, 30 mm (IN)	**07780-0014000**
Interior cutter, 24 mm (EX)	**070PH-Z0D0100**
Cutter holder, 4.0 mm	**07781-0010500 or equivalent commercially available**

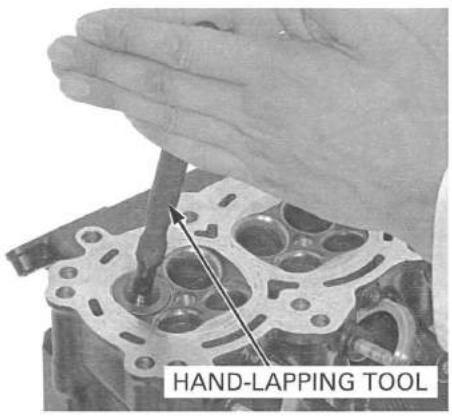
Using a 45-degree seat cutter, cut the seat to the proper width.
Make sure that all pitting and irregularities are removed.
Refinish if necessary.



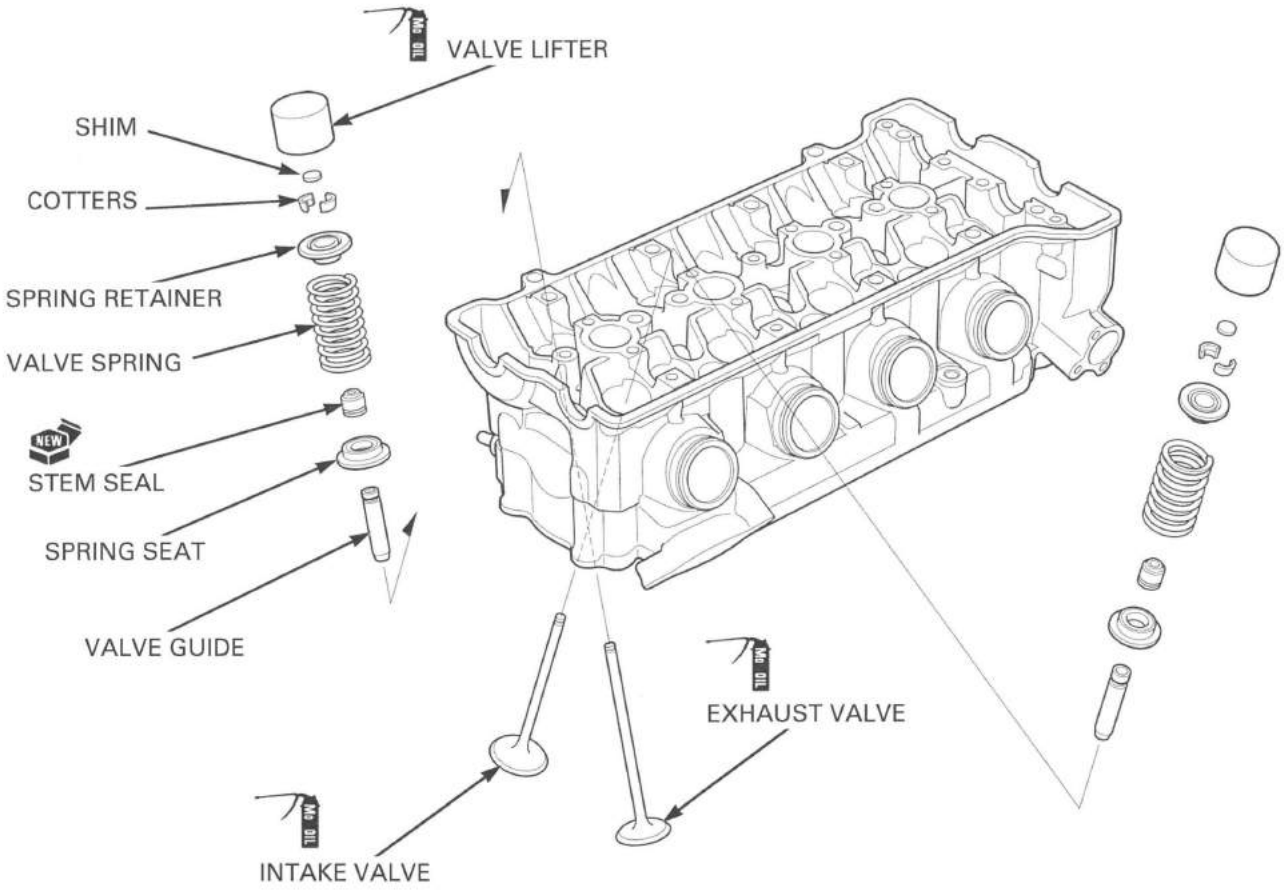
After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Do not allow lapping compound to enter the guides.

After lapping, wash all residual compound off the cylinder head and valve.



CYLINDER HEAD ASSEMBLY

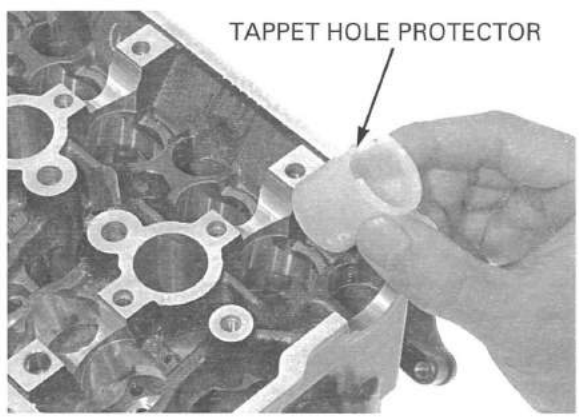


Blow through all oil passages in the cylinder head with compressed air.

Install the tappet hole protector into the valve lifter bore.

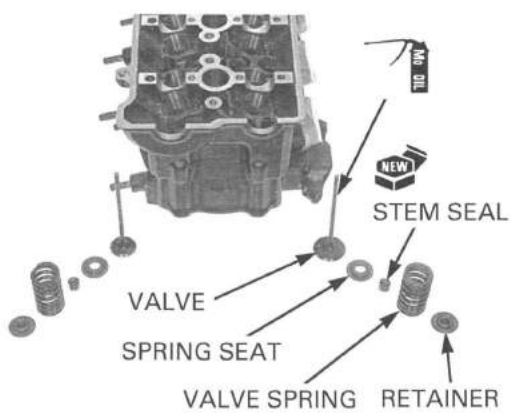
TOOL:

Tappet hole protector **07HMG-MR70002 or refer to page 8-14 for alternative tool**



Install the valve spring seats.
Install the new stem seals.

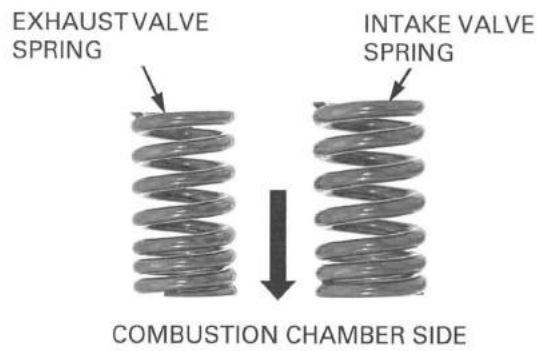
Lubricate the valve stems with molybdenum oil solution.
Insert the valve into the valve guide while turning it slowly to avoid damage to the stem seal.



The exhaust valve springs has a green paint marks and the intake valve springs has gray paint marks.

Install the valve springs with the tightly wound coils facing the combustion chamber.

Install the valve spring retainer.



Grease the cotters to ease installation.

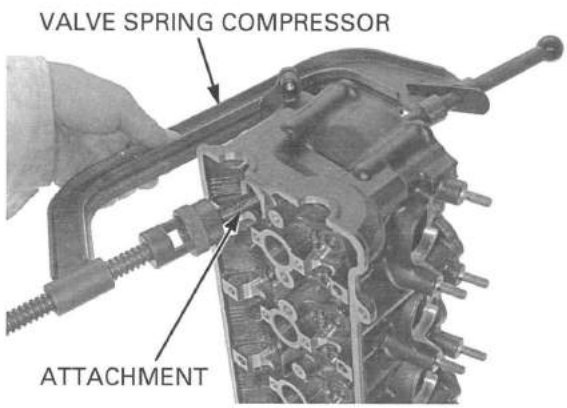
Install the valve cotters using the special tool as shown.

NOTE:

To prevent loss of tension, do not compress the valve spring more than necessary.

TOOLS:

Valve spring compressor	**07757-0010000**
Valve spring compressor attachment	**07959-KM30101**

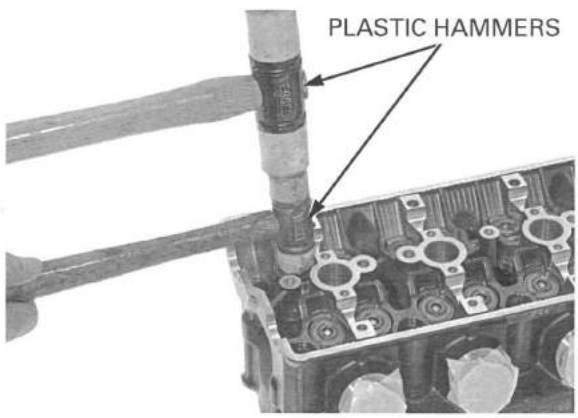


Support the cylinder head above the work bench surface to prevent possible valve damage.

Tap the valve stems gently with two plastic hammers as shown to seat the cotters firmly.

Install and tighten the spark plugs.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

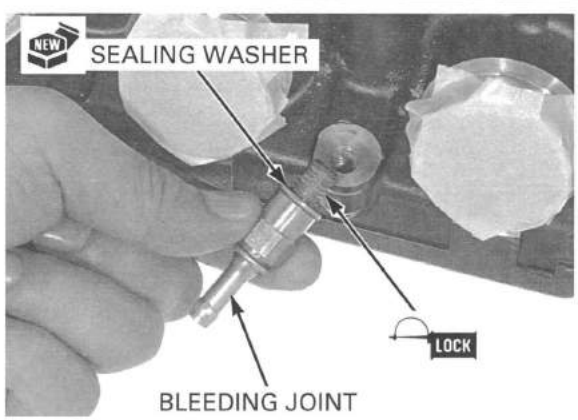


Apply a locking agent to the bleeding joint threads.

Install the bleeding joint with a new sealing washer to the cylinder head.

Tighten the bleeding joint to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

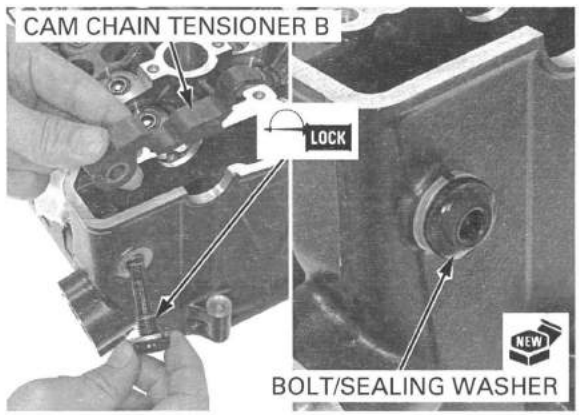


Apply a locking agent to the cam chain tensioner B pivot bolt threads.

Install a new sealing washer, bolt and cam chain tensioner B as shown.

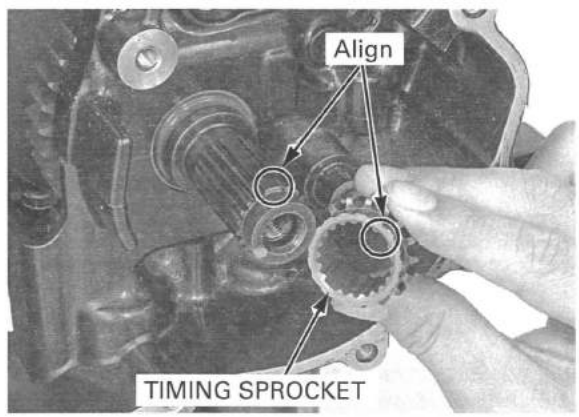
Tighten the cam chain tensioner B pivot bolt to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

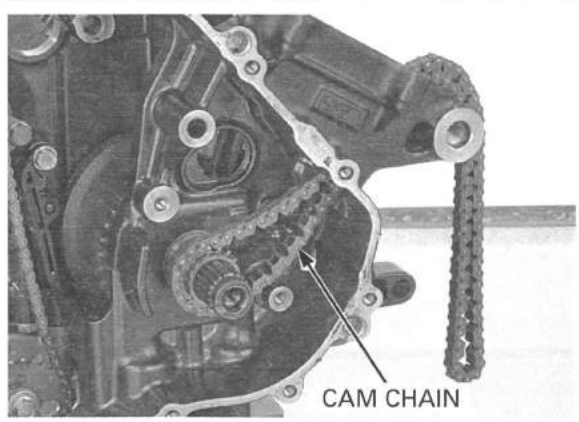


CYLINDER HEAD INSTALLATION

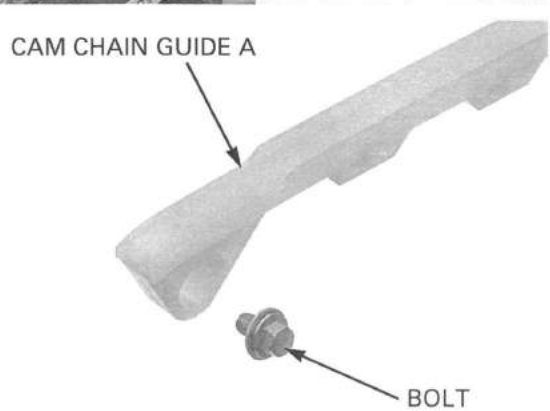
Install the timing sprocket by aligning the wide teeth between the crankshaft and sprocket.



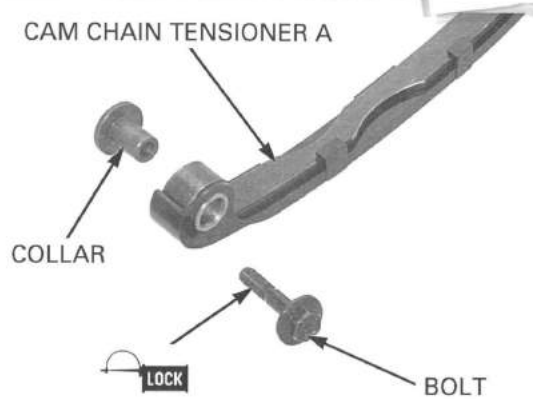
Install the cam chain.



Install the cam chain guide A and bolt.



Apply a locking agent to the cam chain tensioner pivot bolt threads.
Install the collar, cam chain tensioner A and bolt.



Tighten the cam chain guide A bolt to the specified torque.

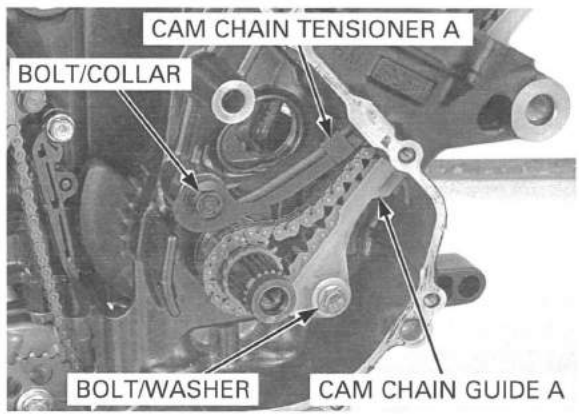
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Tighten the cam chain tensioner A pivot bolt to the specified torque.

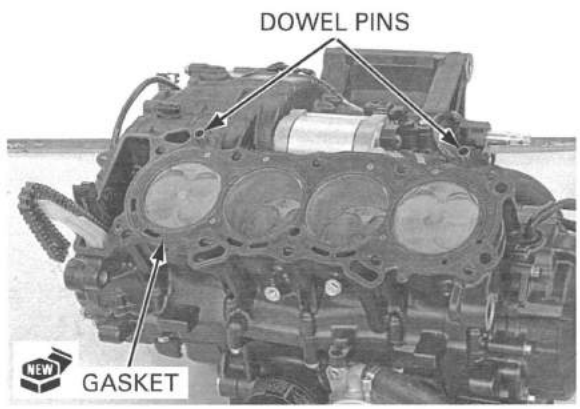
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the following:

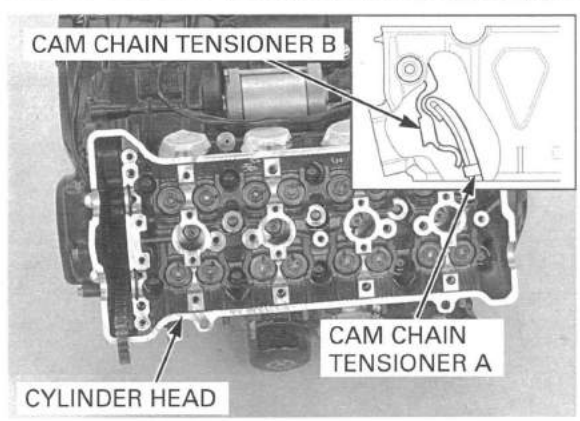
- starter clutch (page 9-21)
- right crankcase cover (page 9-25)



Install the dowel pins and a new cylinder head gasket as shown.



Install the cylinder head onto the cylinder block while aligning the cam chain tensioner A and B as shown.



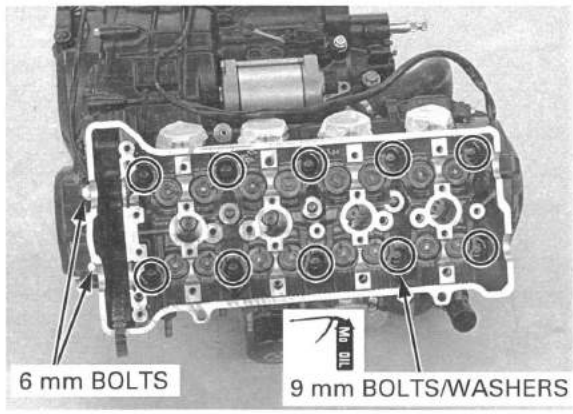
Apply molybdenum disulfide oil solution to the threads and seating surface of the 9 mm bolts/washers and install them.

Install the two 6 mm flange bolts.

Tighten the 9 mm bolts in a crisscross pattern in two or three steps to the specified torque.

TORQUE: 47 N·m (4.8 kgf·m, 35 lbf·ft)

Tighten the 6 mm flange bolts securely.

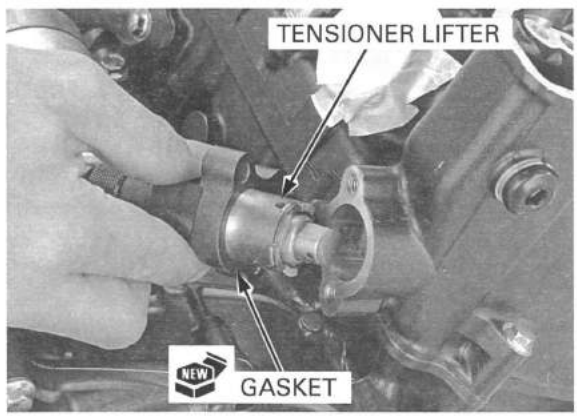


Install the cam chain tensioner lifter onto the cylinder head with a new gasket.

Install and tighten the bolts securely.

Install the following:

- camshaft (page 8-26)
- thermostat housing (page 6-10)
- air cleaner housing (page 5-75)
- exhaust system (page 2-15)

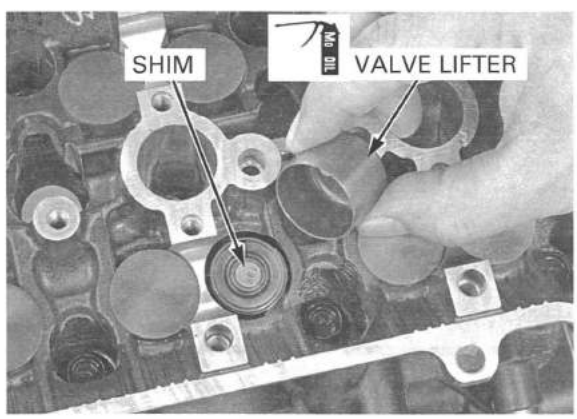


CAMSHAFT INSTALLATION

Apply molybdenum oil solution to the outer surface of the each valve lifter.

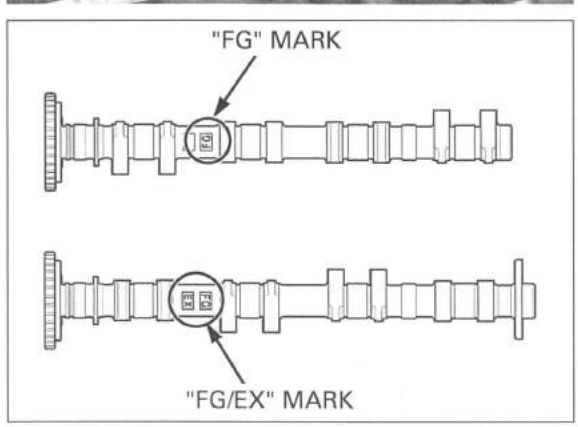
Install the shims and valve lifters in their original locations.

Install the shims on the retainers and valve lifters into the valve lifter bores.



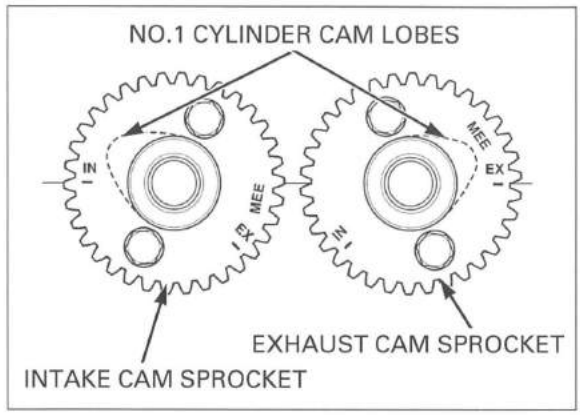
The each camshaft has identification mark.

- "FG": Intake camshaft
- "FG/EX": Exhaust camshaft

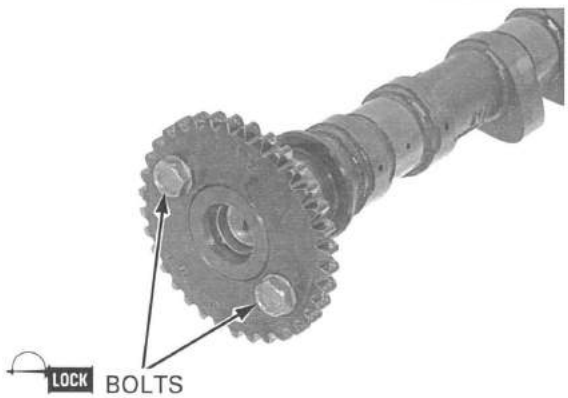


If the cam sprockets are removed, install the cam sprockets onto the camshafts.

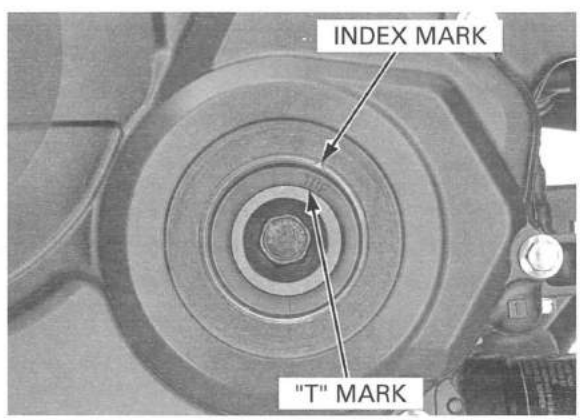
- Install the intake cam sprocket with the timing mark (IN) facing outward and the No.1 cam lobes facing up and out as shown.
- Install the exhaust cam sprocket with the timing mark (EX) facing outward and the No.1 cam lobes facing up and out as shown.



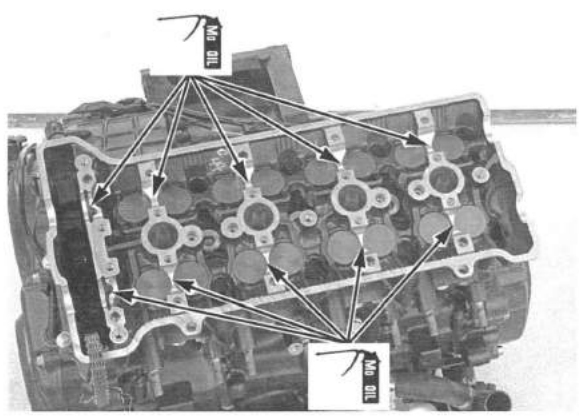
Clean and apply a locking agent to the cam sprocket bolt threads.
Install the cam sprocket bolts.



Turn the crankshaft clockwise and align the "T" mark on the CKP sensor rotor with the index mark on the right crankcase cover.

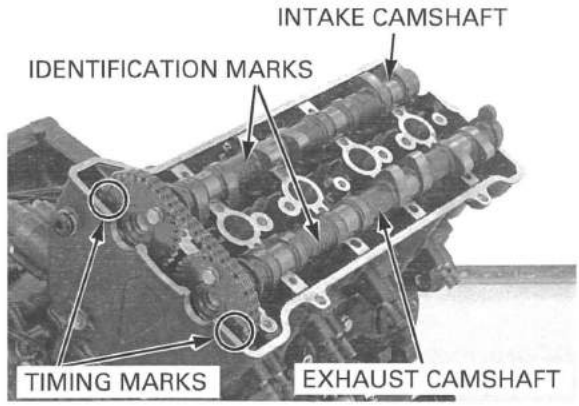


Apply molybdenum oil solution to the camshaft journal of the cylinder head.

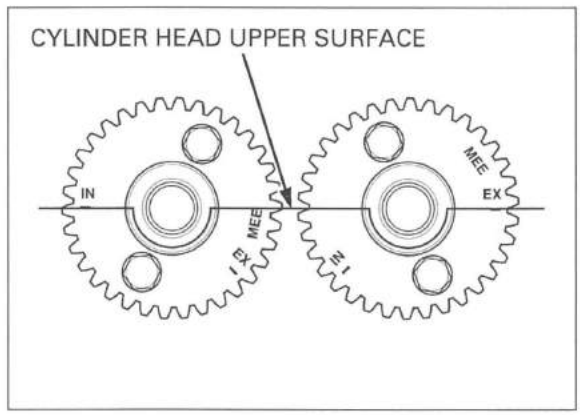


Install the cam chain over the cam sprockets and then install the intake and exhaust camshafts.

- Install the each camshaft to the correct locations with the identification marks.
  "FG": Intake camshaft
  "FG/EX": Exhaust camshaft

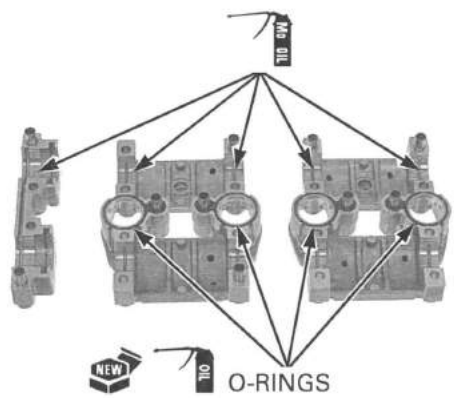


- Make sure that the timing marks on the cam sprockets are facing outward and flush with the cylinder head upper surface as shown.



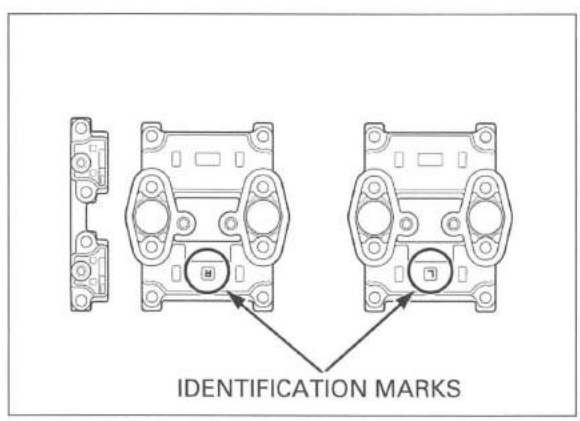
Coat new O-rings with oil and install them into the grooves in the camshaft holders.

Apply molybdenum oil solution to the camshaft journals of the camshaft holders.



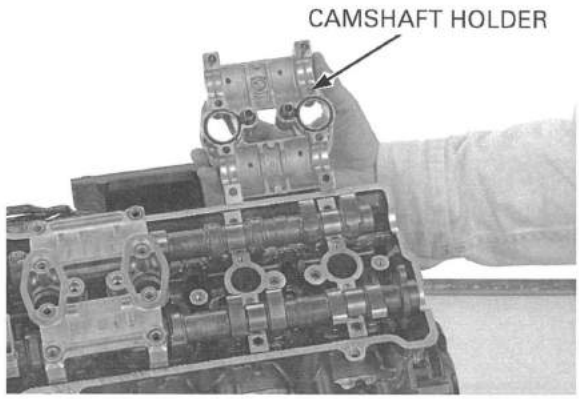
Note the correct locations with the identification marks as shown.

- No mark: right camshaft holder
- "R" mark: center camshaft holder
- "L" mark: left camshaft holder



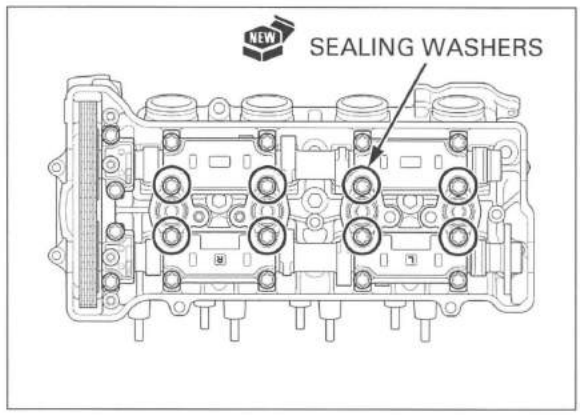
Be sure to align the dowel pins in the camshaft holder align properly with the holes in the cylinder head properly.

Install the each camshaft holder onto the camshafts.



Apply engine oil to the threads and seating surfaces of the camshaft holder bolts.
Install the twenty holder bolts with new eight sealing washers as shown.

Finger tighten the bolts.



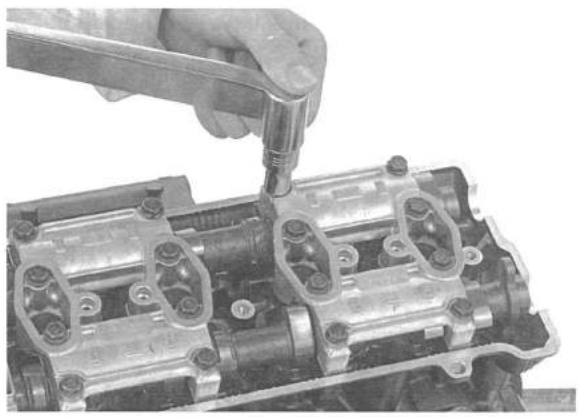
Gradually tighten the camshaft holder bolts until the camshaft holders lightly contact the cylinder head surface.

NOTICE

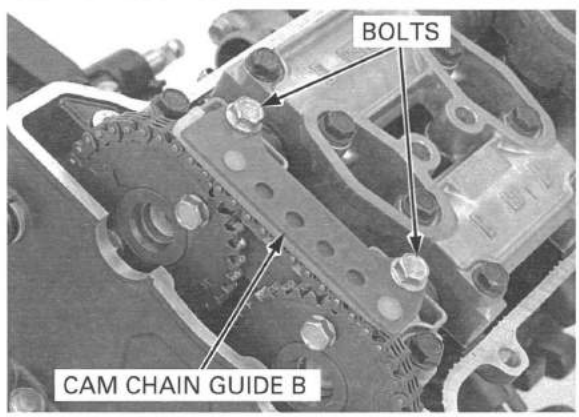
Failure to tighten the camshaft holder in a criss-cross pattern might cause a camshaft holder to break.

Tighten all camshaft holder bolts in the numerical order cast on the camshaft holders.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



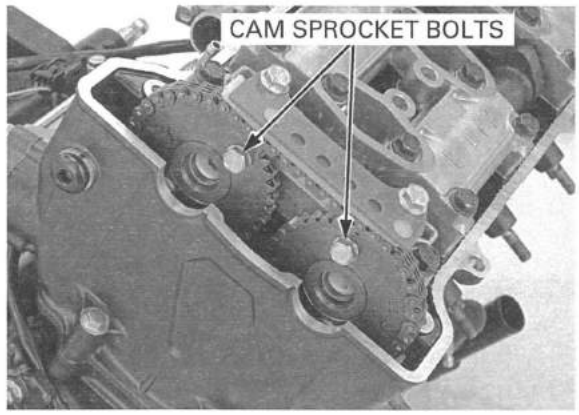
Install the cam chain guide B, and tighten the bolts.



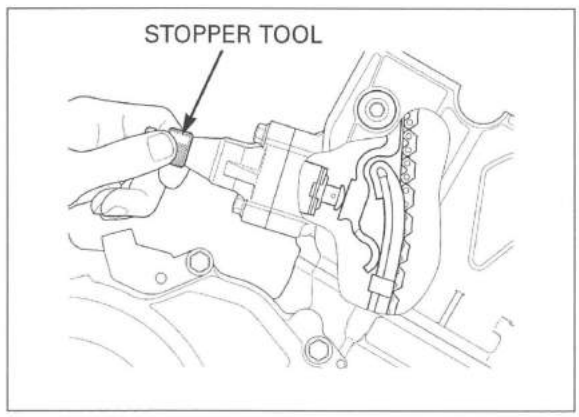
In case the cam sprockets were removed, tighten the cam sprocket bolts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

Turn the crankshaft clockwise one full turn (360°) and tighten the other cam sprocket bolts.

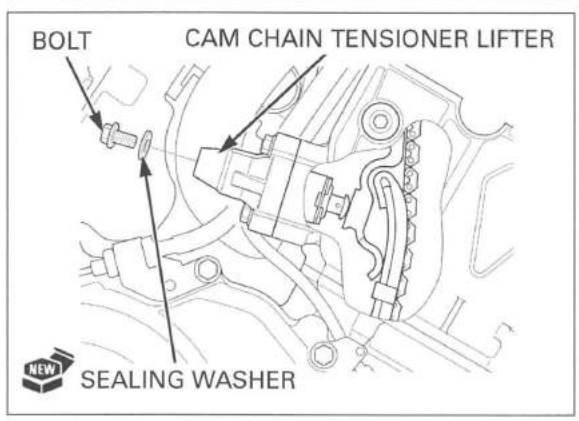


Remove the stopper tool from the cam chain tensioner lifter.



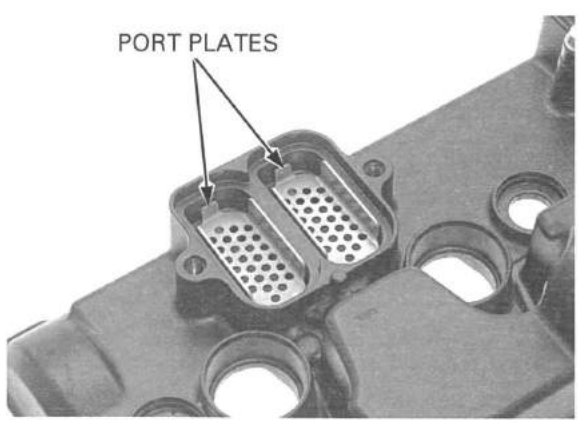
Install a new sealing washer and tighten the sealing bolt.

Recheck the valve timing.

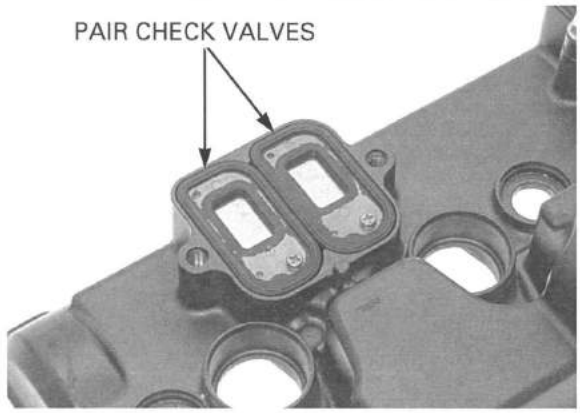


CYLINDER HEAD COVER ASSEMBLY

Install the PAIR check valve port plates into the cylinder head cover.

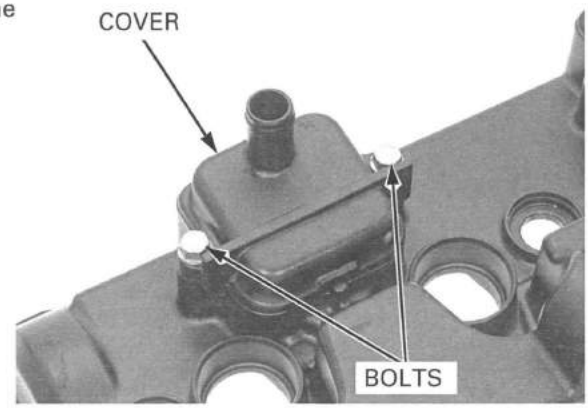


Install the PAIR check valves into the cylinder head cover.



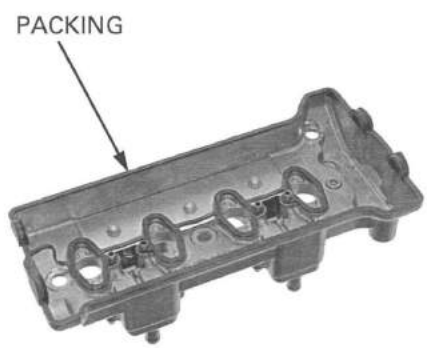
Install the PAIR check valve cover and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

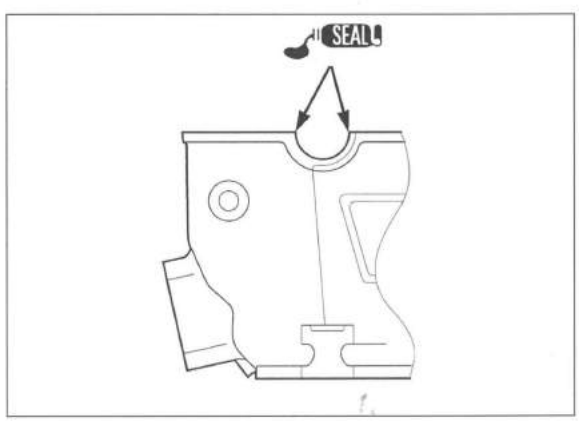


CYLINDER HEAD COVER INSTALLATION

Install the cylinder head packing into the groove of the cylinder head cover.

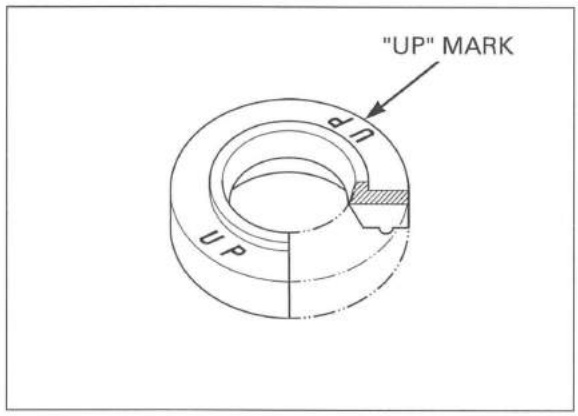


Apply sealant to the cylinder head semi-circular cut-outs as shown.



Install the cylinder head cover onto the cylinder head.

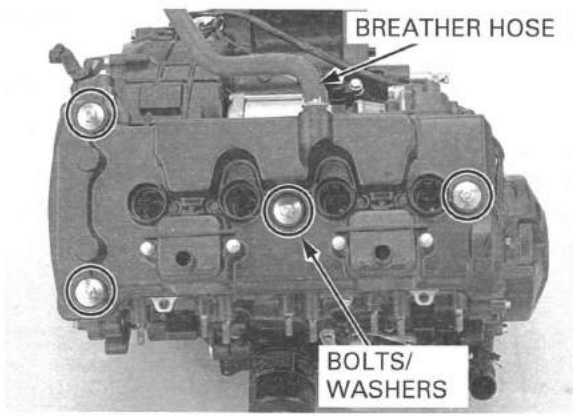
Install the washers to the cylinder head cover with their "UP" mark facing up.



Install and tighten the cylinder head cover bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Connect the crankcase breather hose to the cylinder head cover.

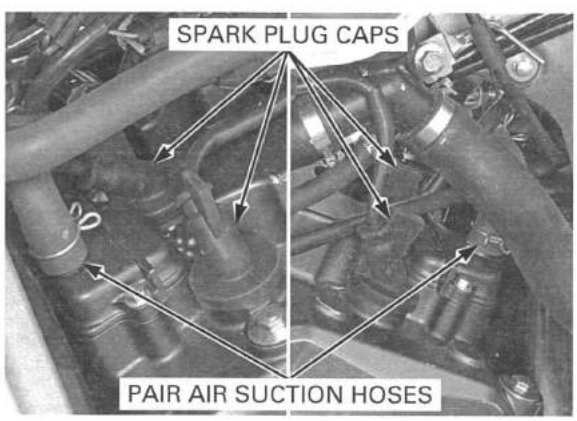


Route the hoses, wires properly (page 1-23).

Connect the PAIR air suction hoses to the cylinder head cover.

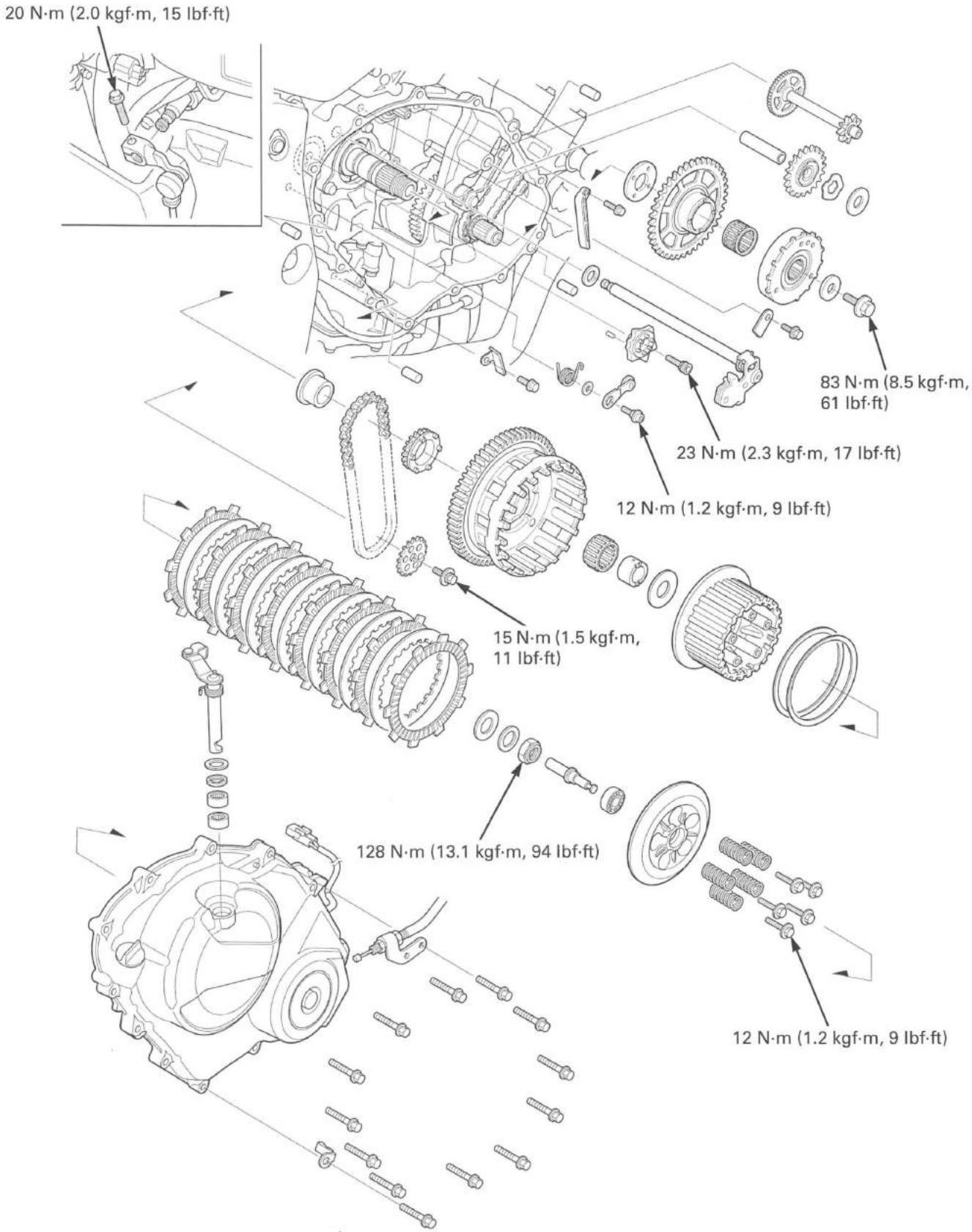
Connect the spark plug caps securely.

Install the fuel tank (page 5-59).



9. CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the clutch, starter clutch and gearshift linkage. All service can be done with the engine installed in the frame.
- Engine oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the engine oil level before servicing the clutch system.

SPECIFICATIONS

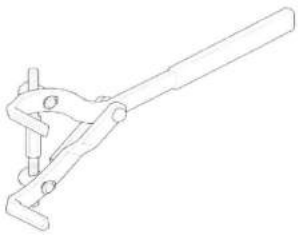
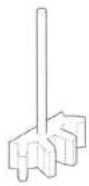
Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever freeplay		10 – 20 (3/8 – 13/16)	–
Clutch	Spring free length	48.2 (1.90)	47.2 (1.86)
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.6 (0.10)
	Plate warpage	–	0.30 (0.012)
Clutch outer guide	I.D.	24.993 – 25.003 (0.9840 – 0.9844)	25.013 (0.9848)
	O.D.	34.996 – 35.004 (1.3778 – 1.3781)	34.986 (1.3774)
Primary driven gear I.D.		41.000 – 41.016 (1.6142 – 1.6148)	41.026 (1.6152)
Oil pump drive sprocket guide	I.D.	25.000 – 25.021 (0.9843 – 0.9851)	25.031 (0.9855)
	O.D.	34.950 – 34.975 (1.3760 – 1.3770)	34.940 (1.3756)
Oil pump drive sprocket I.D.		35.025 – 35.145 (1.3789 – 1.3837)	35.155 (1.3841)
Mainshaft O.D. at clutch outer guide		24.980 – 24.990 (0.9835 – 0.9839)	24.960 (0.9827)
Mainshaft O.D. at oil pump drive sprocket guide		24.980 – 24.990 (0.9835 – 0.9839)	24.960 (0.9827)
Starter idle gear	Gear I.D.	10.013 – 10.035 (0.3942 – 0.3951)	10.05 (0.396)
	Shaft O.D.	9.991 – 10.000 (0.3933 – 0.3937)	9.98 (0.393)
Starter driven gear boss O.D.		45.657 – 45.673 (1.7975 – 1.7981)	45.642 (1.7969)

TORQUE VALUES

Clutch center lock nut	128 N·m (13.1 kgf·m, 94 lbf·ft)	Apply engine oil to the threads and seating surface. Stake.
Clutch spring bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Oil pump driven sprocket bolt	15 N·m (1.5 kgf·m, 11 lbf·ft)	Apply a locking agent to the threads.
Starter clutch outer mounting bolt	83 N·m (8.5 kgf·m, 61 lbf·ft)	Apply engine oil to the threads and seating surface.
Shift drum center socket bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)	Apply a locking agent to the threads.
Shift drum stopper arm pivot bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Gearshift spindle return spring pin	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Gearshift arm pinch bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)	

TOOLS

Clutch center holder 07724-0050002  or equivalent commercially available	Gear holder, M2.5 07724-0010100 

TROUBLESHOOTING

Clutch lever too hard to pull in
- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing
- Clutch lifter piece installed improperly

Clutch slips when accelerating
- Worn clutch disc
- Weak clutch springs
- Engine oil mixed with molybdenum or graphite additive

Clutch will not disengage or motorcycle creeps with clutch disengaged
- Clutch plate warped
- Loose clutch center lock nut
- Oil level too high
- Improper oil viscosity
- Damaged clutch lifter mechanism
- Clutch lifter piece installed improperly

Hard to shift
- Improper clutch operation
- Improper oil viscosity
- Bent shift fork
- Bent shift fork shaft (page 11-8)
- Bent fork claw (page 11-8)
- Damaged gearshift cam (page 11-8)
- Loose stopper plate bolt
- Damaged stopper plate and pin
- Damaged gearshift spindle

Transmission jumps out of gear
- Worn shift drum stopper arm
- Weak or broken shift drum stopper arm return spring
- Loose stopper plate bolt
- Bent shift fork shaft
- Damaged gearshift cam (page 11-8)
- Damaged or bent shift forks (page 11-8)
- Worn gear engagement dogs or slots (page 11-8)

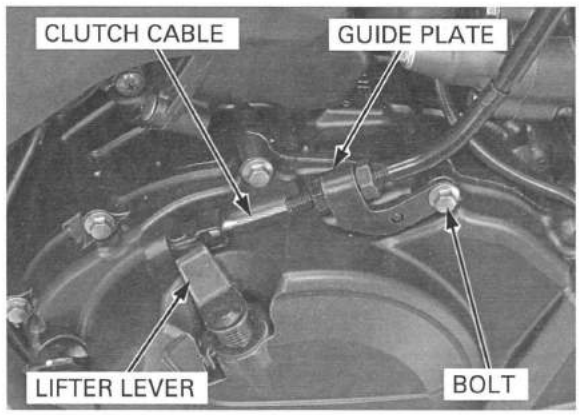
Gearshift pedal will not return
- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

Engine does not turn
- Faulty starter clutch
- Damaged reduction gear/shaft
- Damaged idle gear/shaft

RIGHT CRANKCASE COVER REMOVAL

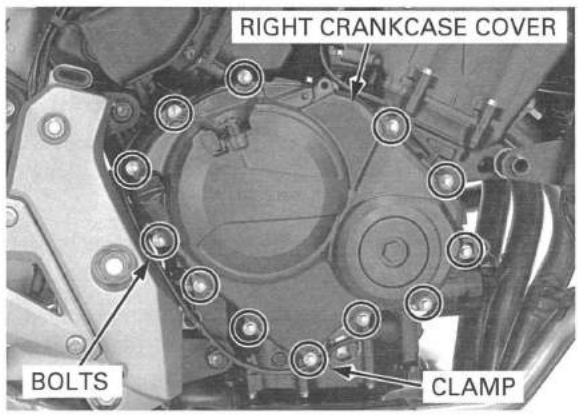
Drain the engine oil (page 3-15).

Remove the bolt and clutch cable guide plate, then disconnect the clutch cable end from the clutch lifter lever.



Release the EOP switch wire from the clamp.

Remove the right crankcase cover bolts and clamp.

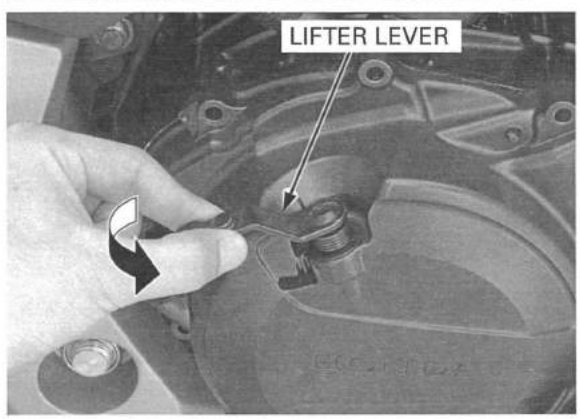


The lifter lever spindle is engaged with the clutch lifter piece inside of the right crankcase cover.

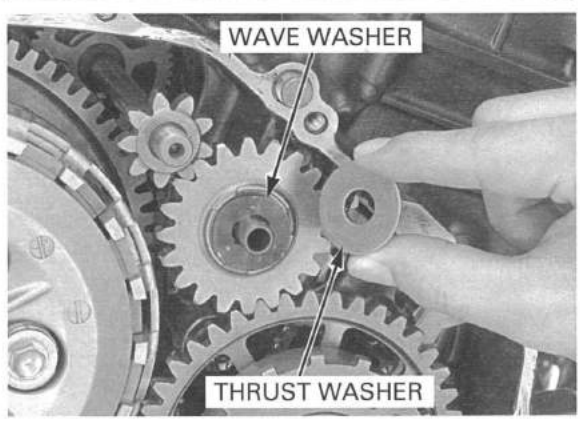
Remove the right crankcase cover while turning the clutch lifter lever counterclockwise to disengage the lifter lever spindle from the lifter piece.

NOTE:

Be careful not to drop the thrust/wave washers into the crankcase when removing the right crankcase cover.



Remove the thrust washer and wave washer from the starter idle gear.

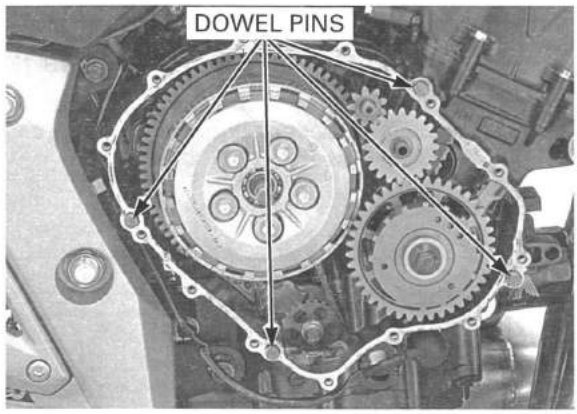


Remove the dowel pins.

Clean any sealant off from the right crankcase cover mating surfaces.

NOTE:

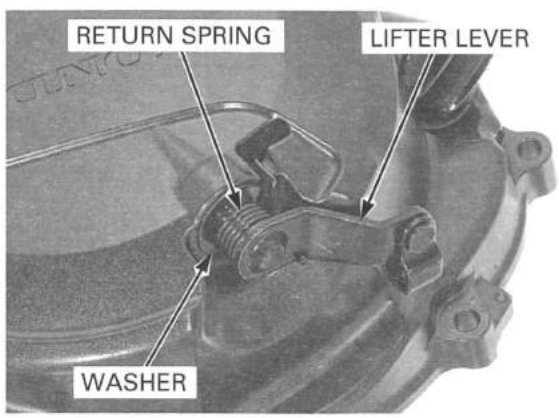
Do not turn the crankshaft counterclockwise after removing the right crankcase cover to prevent the starter reduction gear from damage.



CLUTCH LIFTER LEVER

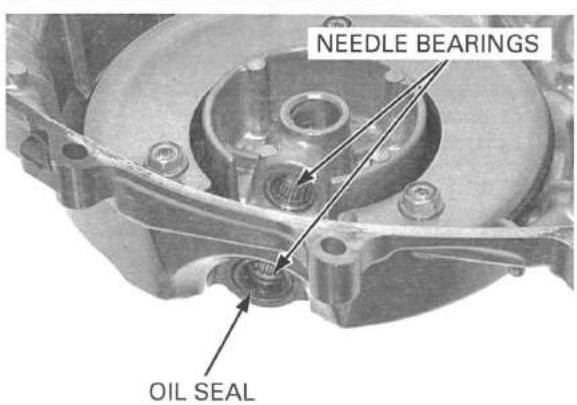
Remove the clutch lifter lever, return spring and washer from the right crankcase cover.

Check the lifter lever spindle for wear or damage.
Check the return spring for fatigue or damage.



Check the lifter lever oil seal and needle bearings for wear or damage.

Install the clutch lifter lever with the washer and spring in the reverse order of removal.

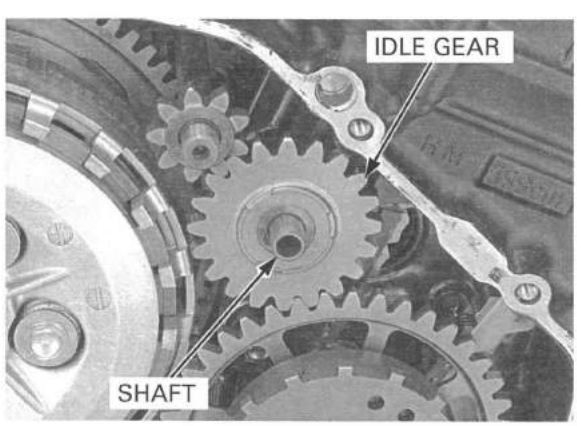


CLUTCH

REMOVAL

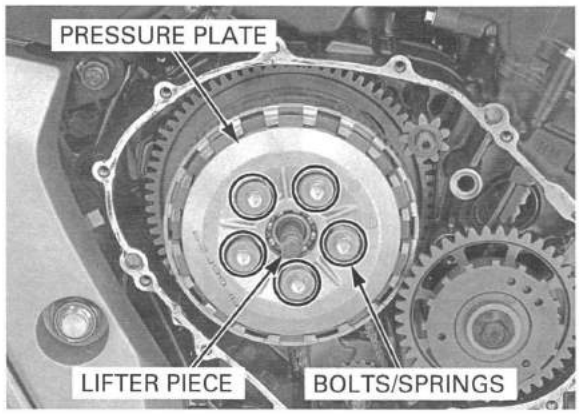
Remove the right crankcase cover (page 9-5).

Remove the starter idle gear and shaft.



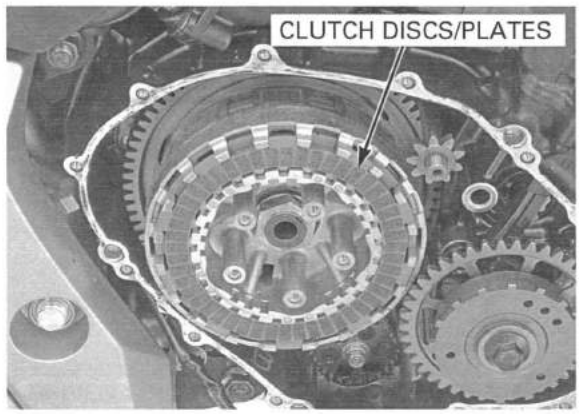
Remove the clutch spring bolts, springs in a criss-cross pattern in two to three steps, then remove the pressure plate.

Remove the clutch lifter piece from the lifter bearing.

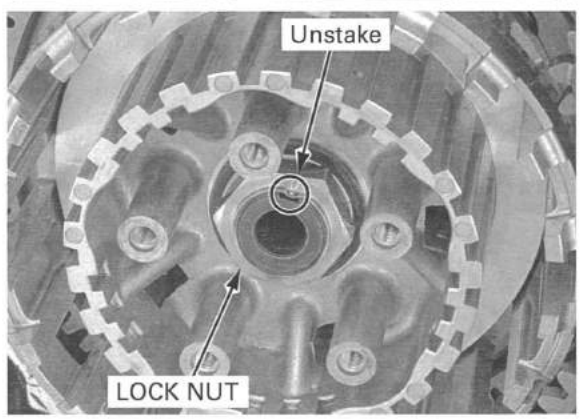


Remove the following:

- clutch disc A
- six clutch discs
- seven clutch plates
- clutch disc B
- judder spring
- spring seat



Unstake the clutch center lock nut.

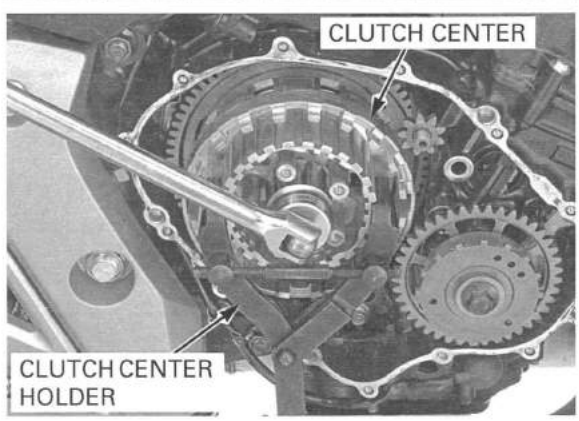


Hold the clutch center with the special tool and remove the clutch center lock nut.

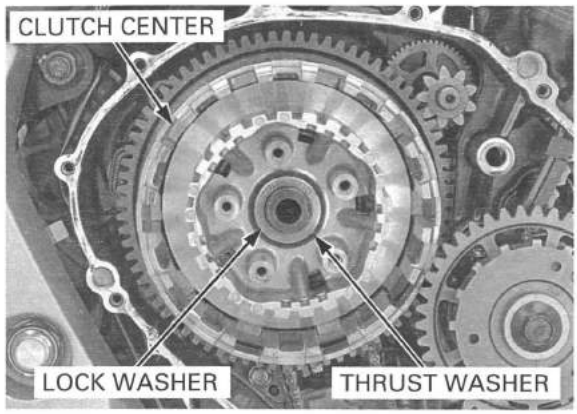
TOOL:

Clutch center holder	**07724-0050002 or equivalent commercially available**

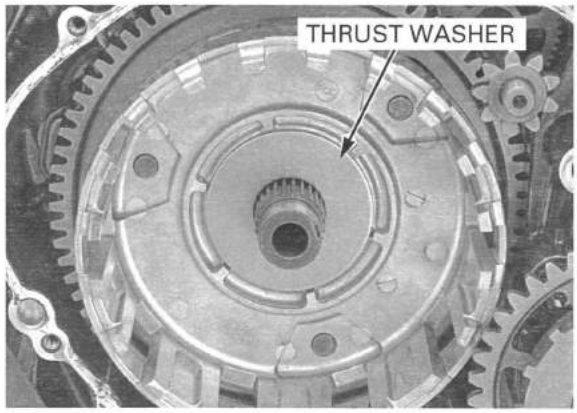
Discard the lock nut.



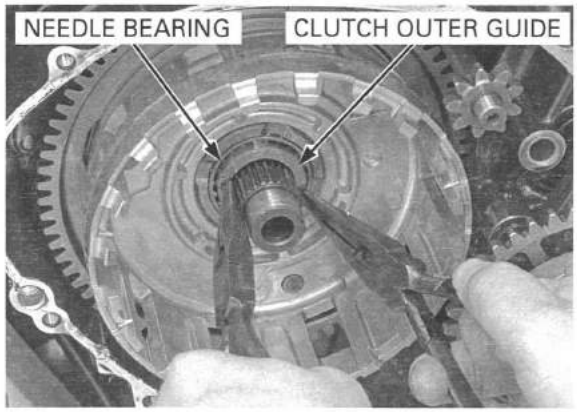
Remove the lock washer, thrust washer and clutch center.



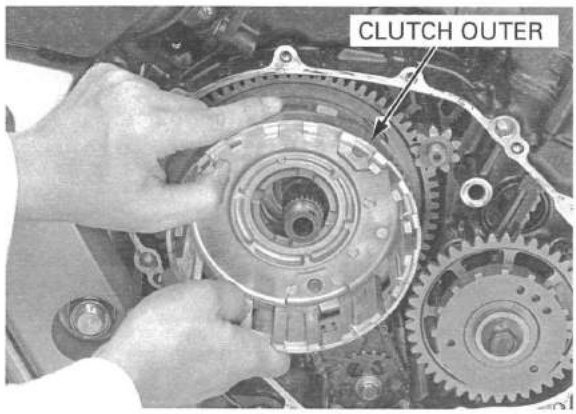
Remove the thrust washer.



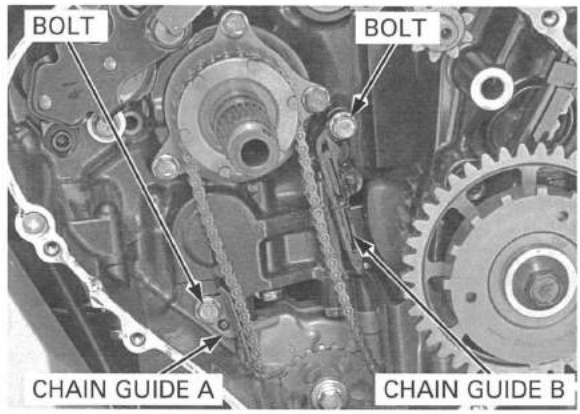
Remove the clutch outer guide and needle bearing.



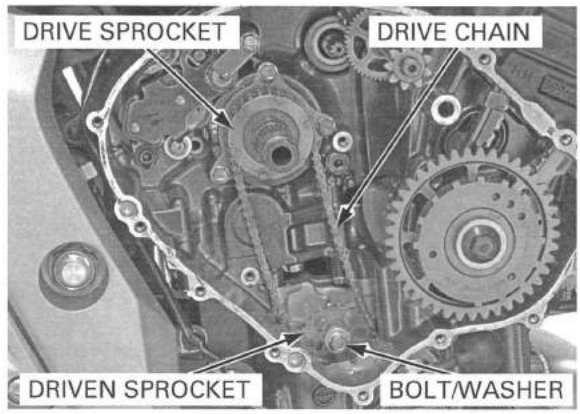
Remove the clutch outer.



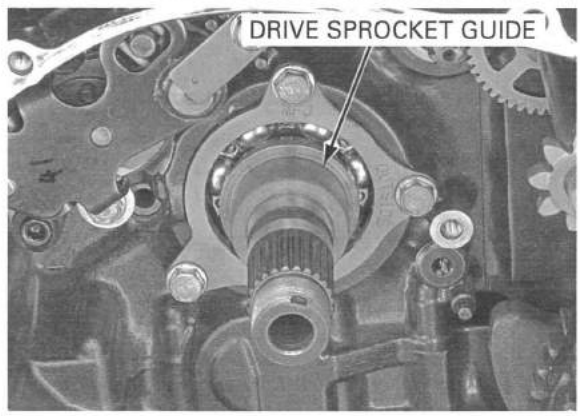
Remove the bolts, oil pump drive chain guide A and chain guide B.



Remove the oil pump driven sprocket bolt and washer.
Remove the oil pump drive/driven sprocket and drive chain as an assembly.



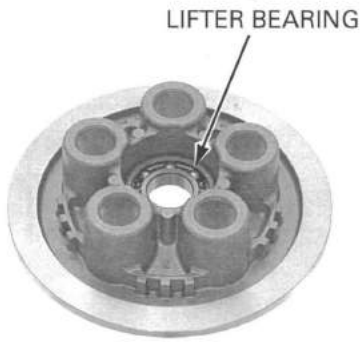
Remove the oil pump drive sprocket guide.



INSPECTION

Clutch lifter bearing

Turn the inner race of the lifter bearing with your finger.
The bearing should turn smoothly and freely without excessive play.
If necessary, replace the bearing.

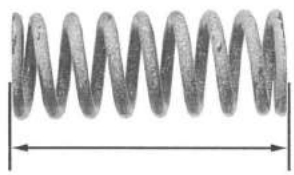


Clutch spring

Replace the clutch springs as a set.

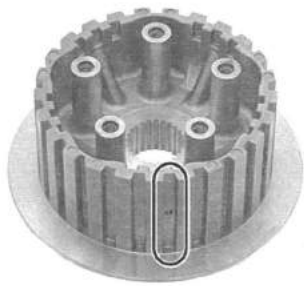
Measure the clutch spring free length.

SERVICE LIMIT: 47.2 mm (1.86 in)



Clutch center

Check the grooves of the clutch center for damage or wear caused by the clutch plates.
Replace it if necessary.



Clutch lifter piece

Check the clutch lifter piece for damage or abnormal wear.

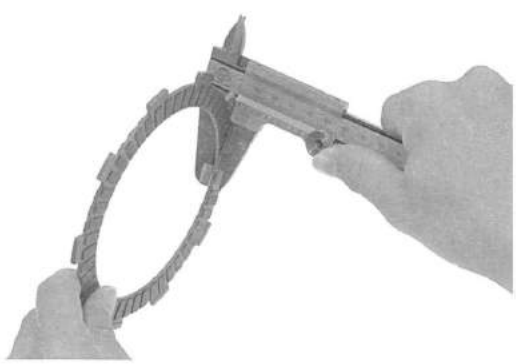
Clutch disc

Replace the clutch discs and plates as a set.

Replace the clutch discs if they show signs of scoring or discoloration.

Measure the disc thickness of each disc.

SERVICE LIMIT: 2.6 mm (0.10 in)

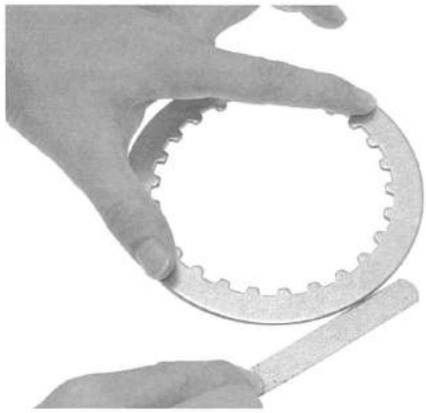


Clutch plate

Replace the clutch discs and plates as a set.

Check the plates for discoloration.
Check the plate warpage on a surface plate using a feeler gauge.

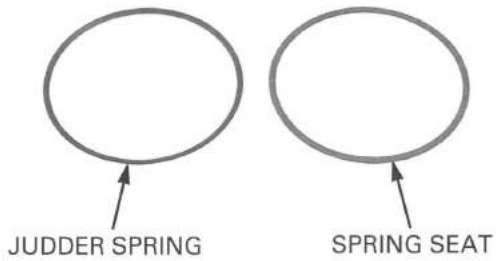
SERVICE LIMIT: 0.30 mm (0.012 in)



Judder spring/spring seat

Check the judder spring and spring seat for deformation, warpage or damage; replace as necessary.

- A damaged or warped spring seat will cause the judder spring to be pressed unevenly.
- A damaged judder spring also causes the weak contact between the discs and plates or uneven disc/plate contact.



Clutch outer/primary driven gear

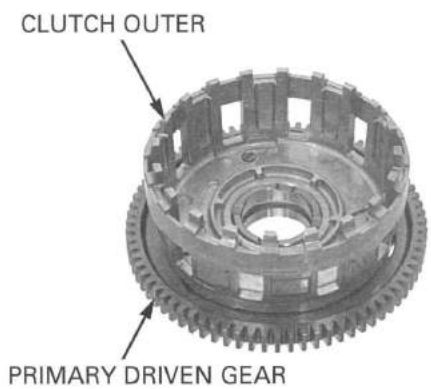
Check the slots of the clutch outer for damage or wear caused by the clutch discs.

Check the primary driven gear for abnormal wear or damage.

Measure the I.D. of the primary driven gear.

SERVICE LIMIT: 41.026 mm (1.6152 in)

Replace the clutch outer assembly if necessary.

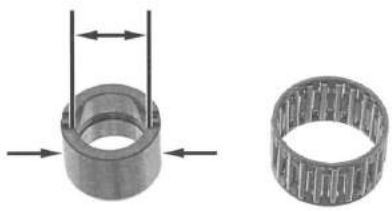


Clutch outer guide/needle bearing

Measure the O.D. and I.D. of the clutch outer guide.

SERVICE LIMITS:
O.D.: 34.986 mm (1.3774 in)
I.D.: 25.013 mm (0.9848 in)

Check the needle bearing turns smoothly and quietly.
Replace the bearing if necessary.



Oil pump drive sprocket guide

Measure the O.D. and I.D. of the oil pump drive sprocket guide.

SERVICE LIMITS:
O.D.: 34.940 mm (1.3756 in)
I.D.: 25.031 mm (0.9855 in)

Oil pump drive sprocket

Check the oil pump drive sprocket for abnormal wear or damage.

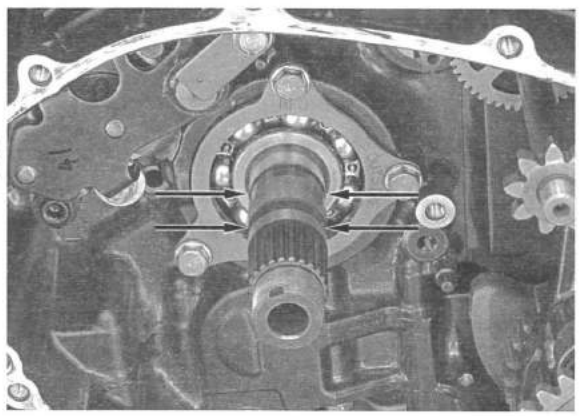
Measure the I.D. of the oil pump drive sprocket.

SERVICE LIMIT: 35.155 mm (1.3841 in)

Mainshaft

Measure the mainshaft O.D. at clutch outer guide and oil pump drive sprocket guide sliding surfaces.

SERVICE LIMITS:
Oil pump drive sprocket guide position: 24.960 mm (0.9827 in)
Clutch outer guide position: 24.960 mm (0.9827 in)

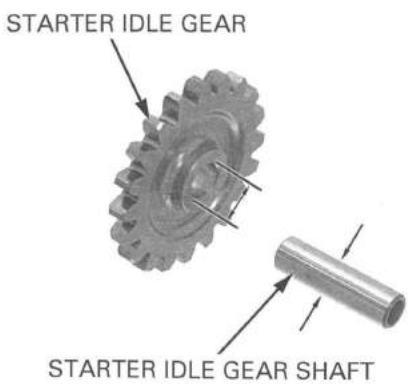


Starter idle gear/idle gear shaft

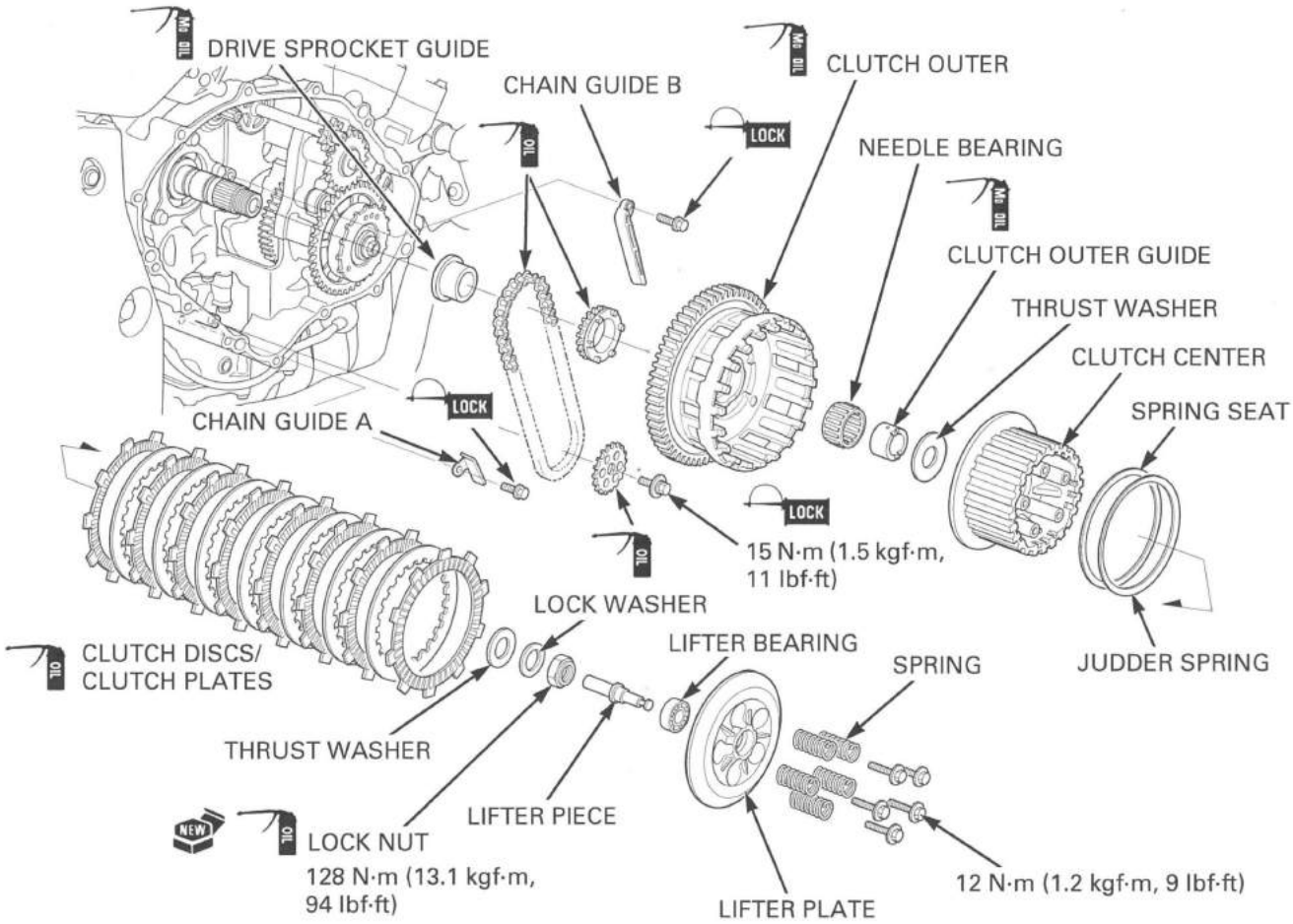
Check the starter idle gear and shaft for wear or damage.

Measure the starter idle gear I.D. and shaft O.D.

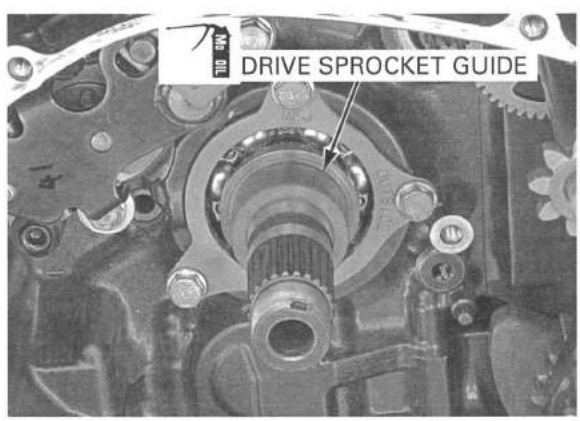
SERVICE LIMITS:
Shaft O.D.: 9.98 mm (0.393 in)
Gear I.D.: 10.05 mm (0.396 in)



INSTALLATION



Apply molybdenum oil solution to the oil pump drive sprocket guide sliding surface and install it to the mainshaft.



Apply oil to the oil pump drive/driven sprocket teeth and drive chain.

Install the oil pump driven sprocket with its "OUT" mark facing out.

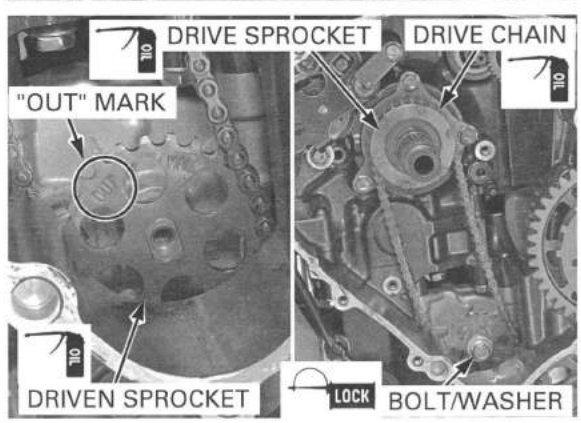
Install the oil pump drive/driven sprocket and drive chain as an assembly.

Apply a locking agent to the oil pump driven sprocket bolt threads.

Be careful not to drop the parts into the oil pan.

Install the oil pump driven sprocket bolt, washer and tighten the bolt to the specified torque.

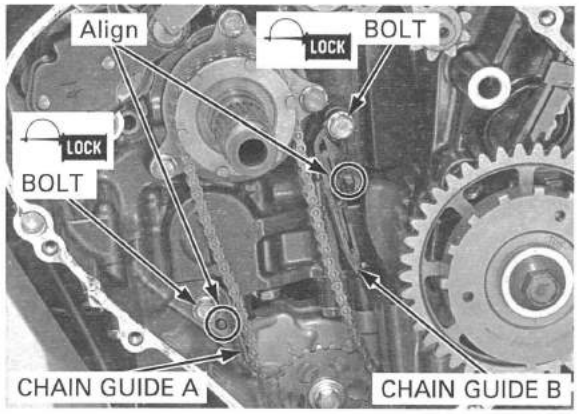
TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)



Be careful not to drop the parts into the oil pan.

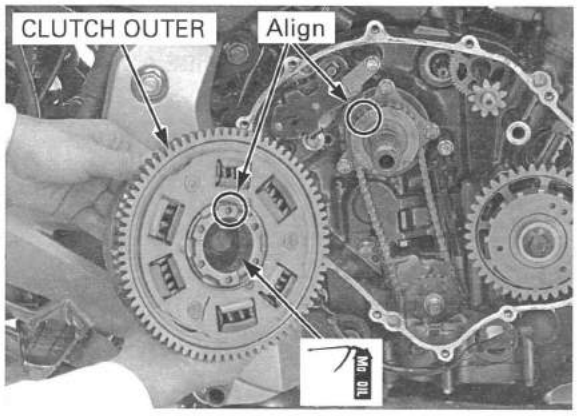
Apply a locking agent to the oil pump drive chain guide mounting bolts threads.

Install the oil pump drive chain guide A/B, aligning each hole with each boss of crankcase.
Tighten the bolts securely.



Apply molybdenum oil solution to the clutch outer sliding surface.

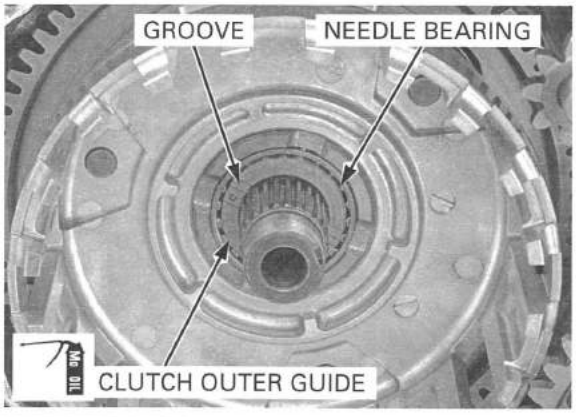
Install the clutch outer while aligning the tabs of the oil pump drive sprocket with holes of the clutch outer.



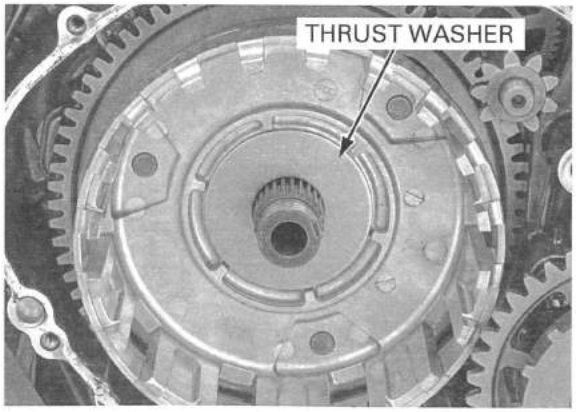
Apply molybdenum oil solution to the clutch outer guide sliding surface.

Install the clutch outer guide with its grooves facing out.

Install the clutch outer guide and needle bearing onto the mainshaft.

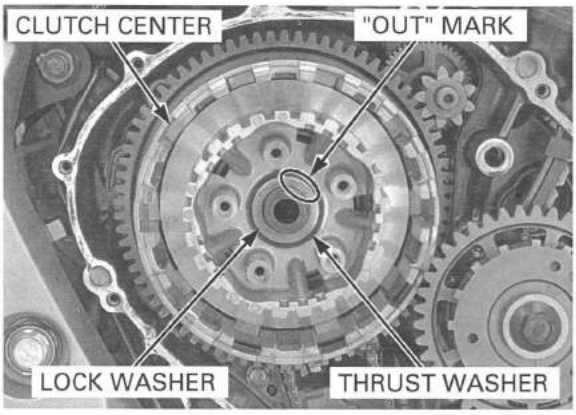


Install the thrust washer.



Install the clutch center and thrust washer.

Install the lock washer with its "OUT" mark facing out.



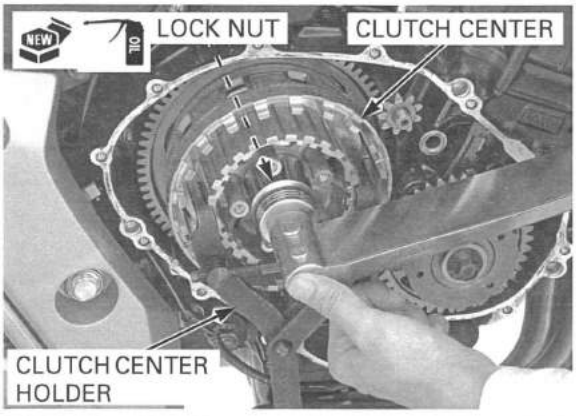
Apply engine oil to the threads and seating surface of a new clutch center lock nut, then install it onto the mainshaft.

Hold the clutch center with the special tool and tighten the lock nut to the specified torque.

TOOL:

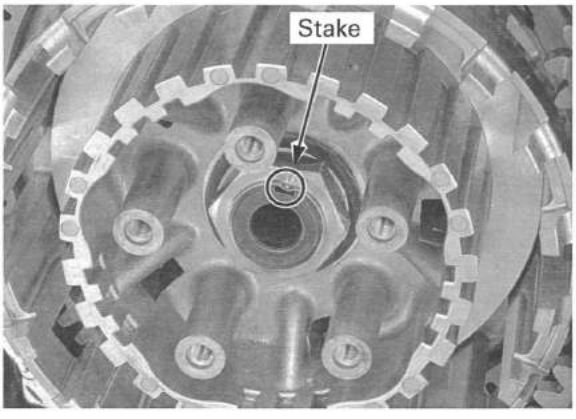
Clutch center holder	**07724–0050002 or equivalent commercially available**

TORQUE: 128 N·m (13.1 kgf·m, 94 lbf·ft)

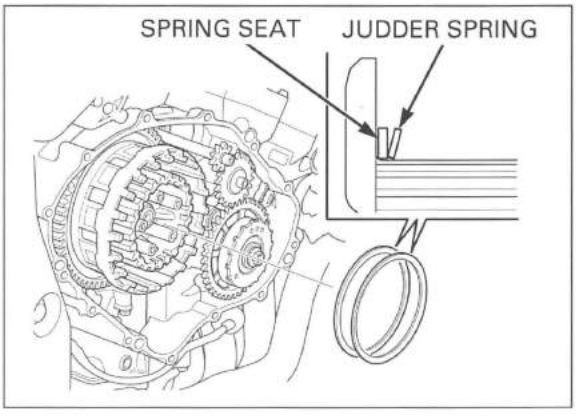


Be careful not to damage the mainshaft threads.

Stake the lock nut into the mainshaft groove with a punch.



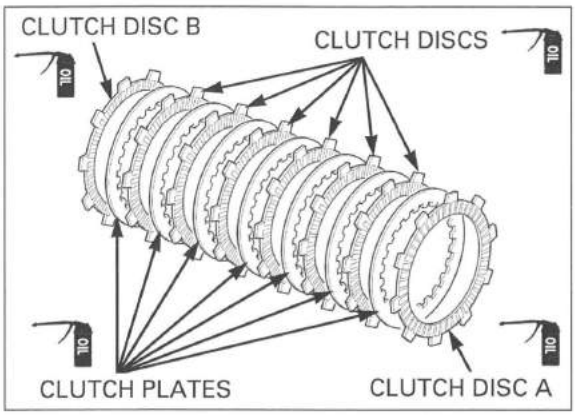
Install the spring seat and judder spring onto the clutch center as shown.



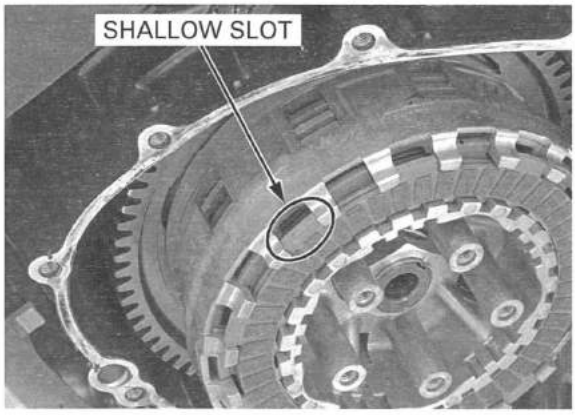
Coat the clutch discs and plates with clean engine oil.

Install the clutch disc B (larger I.D. disc) into the clutch outer.

Stack the six clutch discs, seven plates and clutch disc A alternately.

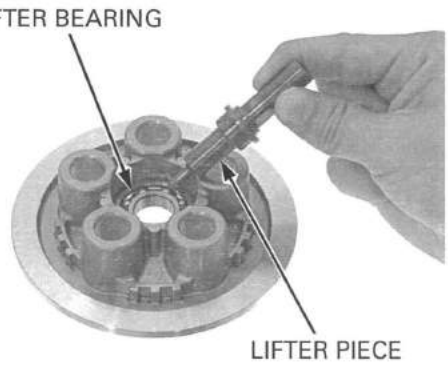


Install the tabs of outside clutch disc A into the shallow slots of the clutch outer.



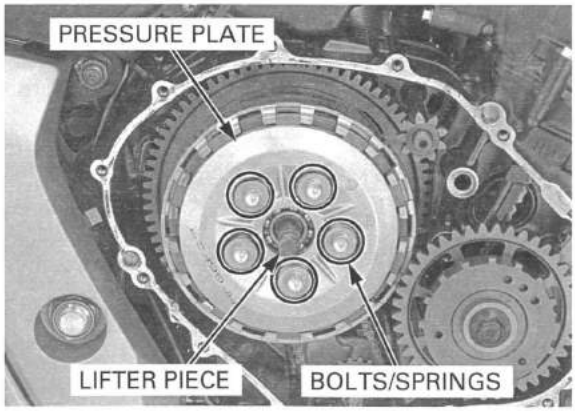
Install the lifter bearing into the pressure plate.

Install the clutch lifter piece into the lifter bearing.



Install the pressure plate.
Install the clutch springs and spring bolts.
Tighten the bolts to the specified torque in a criss-cross pattern in two to three steps.

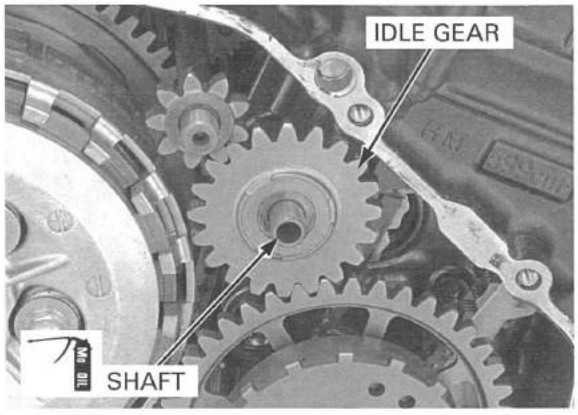
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Apply molybdenum oil solution to the starter idle gear shaft sliding surface.

Install the starter idle gear and shaft.

Install the right crankcase cover (page 9-25).

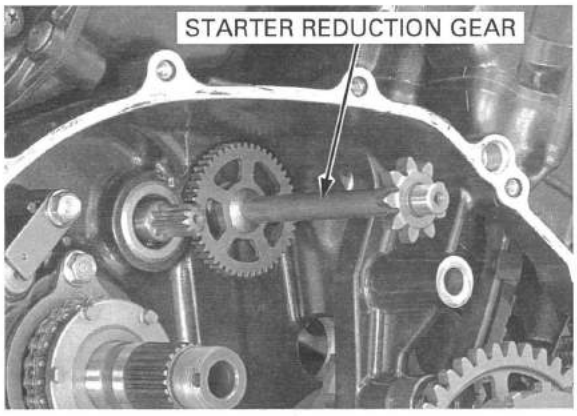


STARTER CLUTCH

REMOVAL

Remove the clutch (page 9-6).

Remove the starter reduction gear from the crankcase.



Temporarily install the following:

- starter idle gear
- starter idle gear shaft

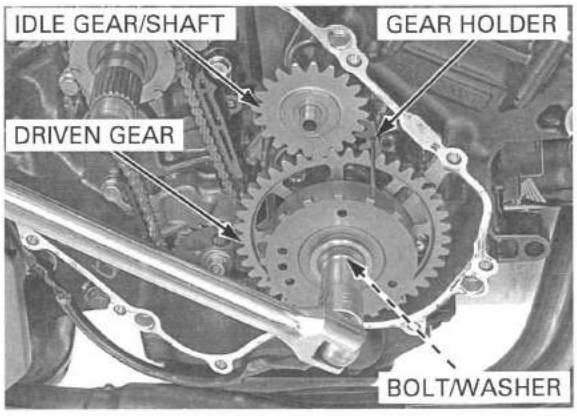
Insert the gear holder between the starter idle gear and driven gear as shown.

TOOL:

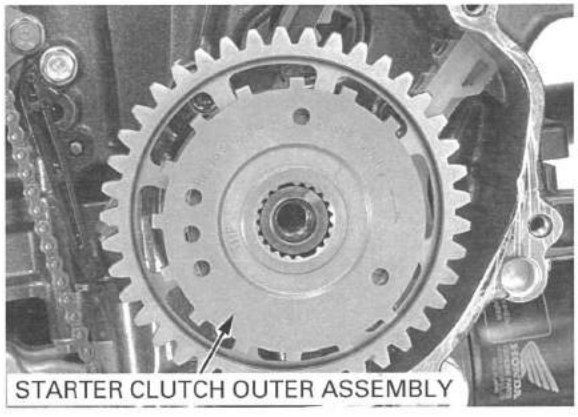
Gear holder, M2.5 07724-0010100

Remove the starter clutch mounting bolt and washer.

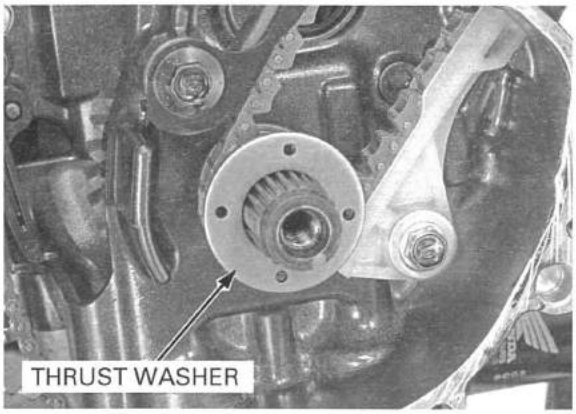
Remove the temporarily installed parts.



Remove the starter clutch outer assembly.

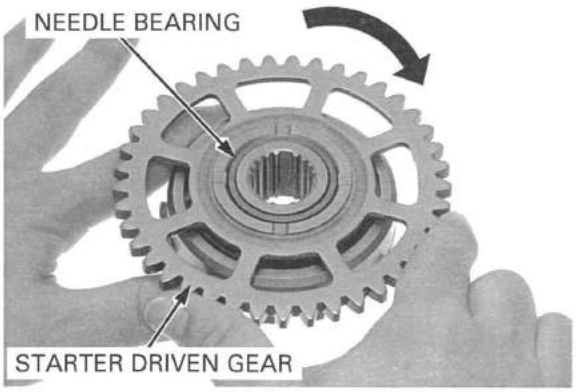


Remove the thrust washer.



INSPECTION

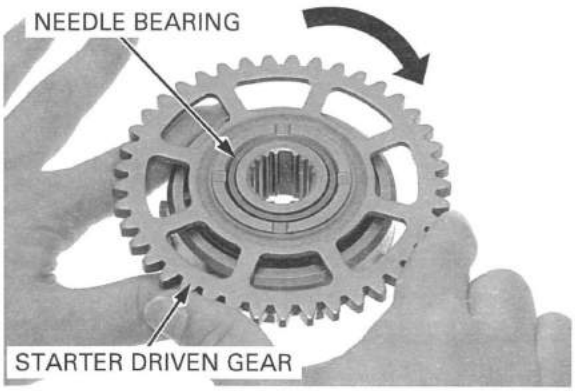
Check the operation of the one-way clutch by turning the driven gear.
You should be able to turn the driven gear clockwise smoothly, but the gear should not turn counterclockwise.



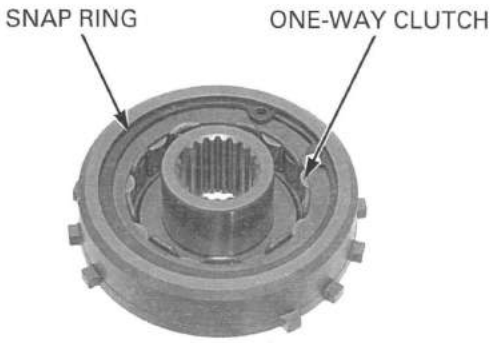
DISASSEMBLY

Remove the starter driven gear by turning it clockwise.

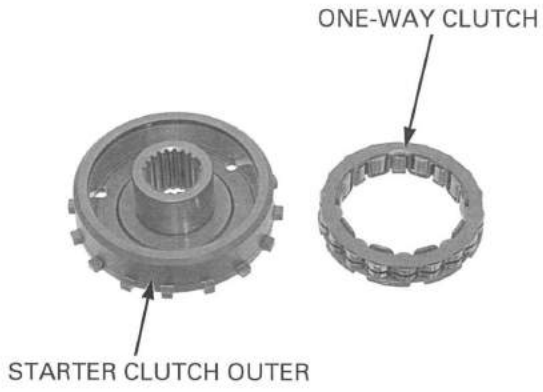
Remove the needle bearing.



Remove the snap ring and one-way clutch.



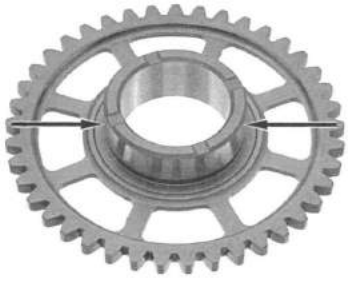
Check the starter clutch outer inner surface and one-way clutch for abnormal wear or damage and replace them if necessary.



Check the starter driven gear for abnormal wear or damage.

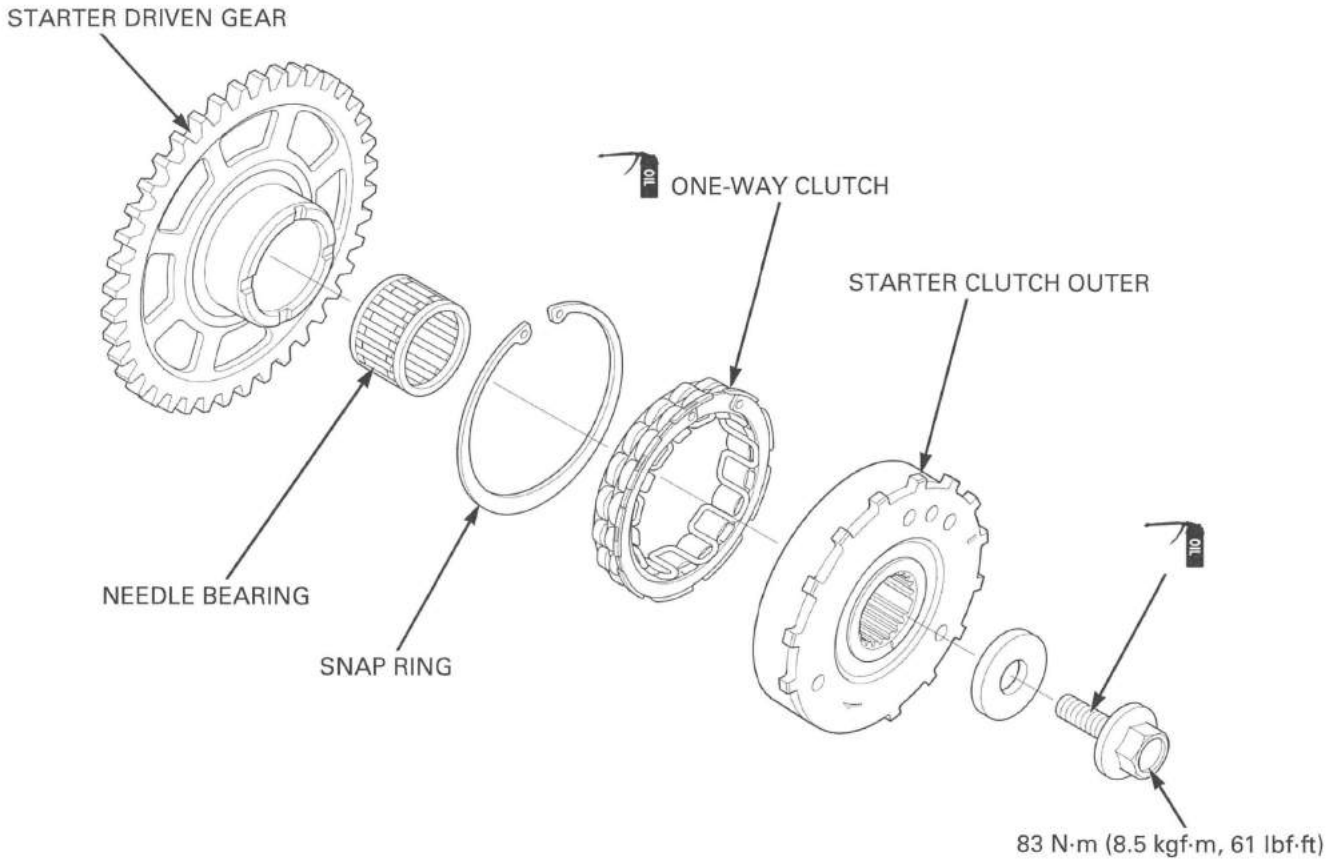
Measure the starter driven gear boss O.D.

SERVICE LIMIT: 45.642 mm (1.7969 in)

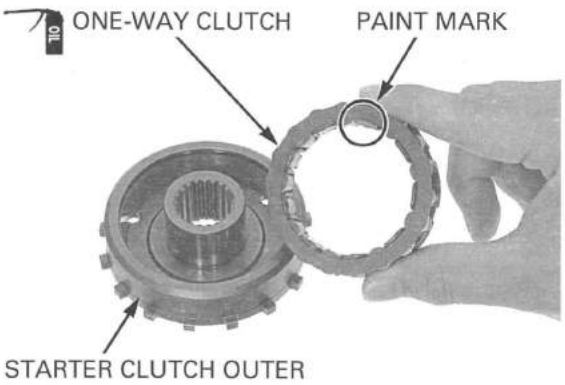


Check the starter reduction gear for wear or damage and replace it if necessary.

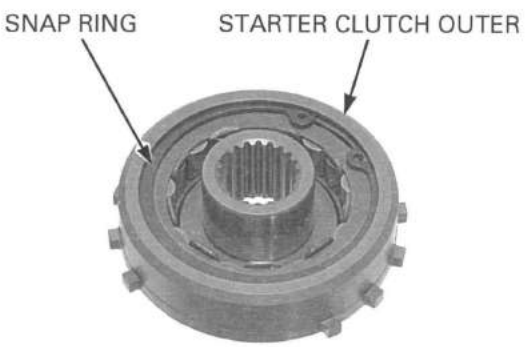
ASSEMBLY



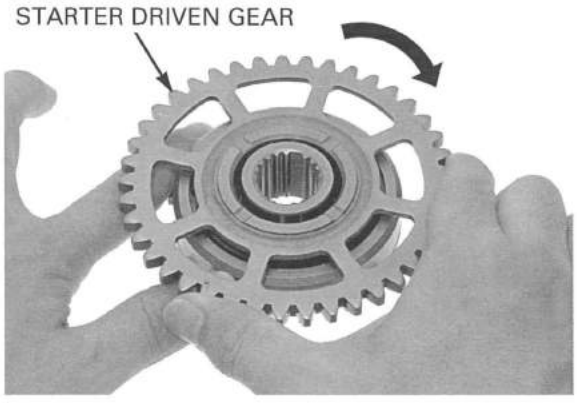
Apply engine oil to the one-way clutch.
Install the one-way clutch into the starter clutch outer with its paint mark facing out.



Install the snap ring into the starter clutch outer groove securely.

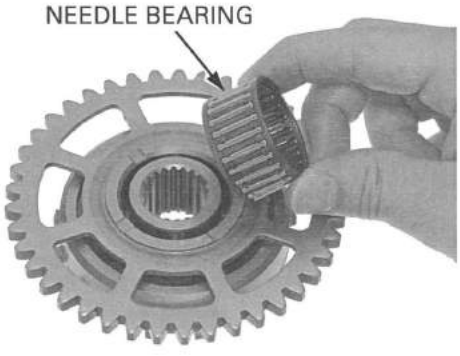


Install the starter driven gear into the starter clutch outer while turning the starter driven gear clockwise.



Install the needle bearing into the starter clutch outer.

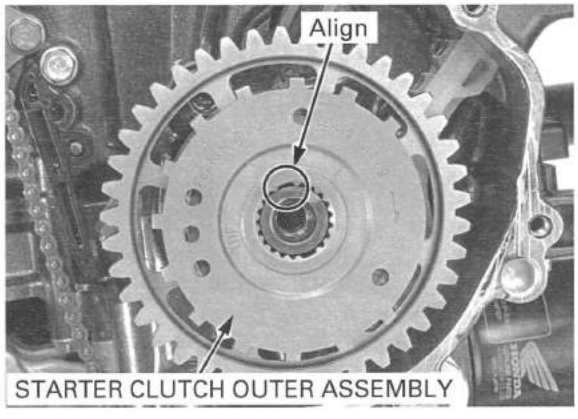
Recheck the one-way clutch operation (page 9-18).



INSTALLATION

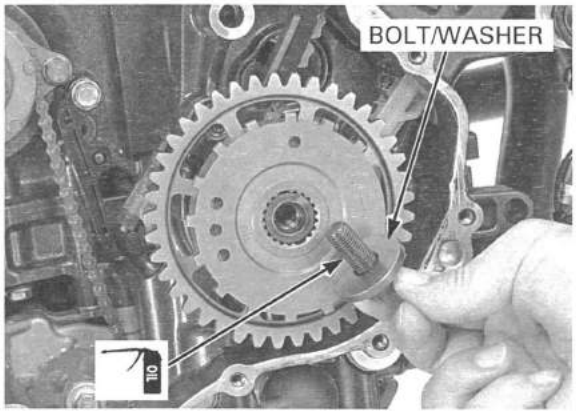
Install the thrust washer into the crankshaft.

Install the starter clutch outer assembly into the crankshaft while aligning the tab of the crankshaft with the wide groove of the starter clutch assembly.



Apply engine oil to the starter clutch mounting bolt threads and seating surface.

Install the washer and starter clutch mounting bolt.



Temporarily install the following:

- oil pump drive sprocket guide
- oil pump drive sprocket
- clutch outer
- clutch outer guide
- clutch outer needle bearing

Be careful not to drop the gear holder into the crankcase.

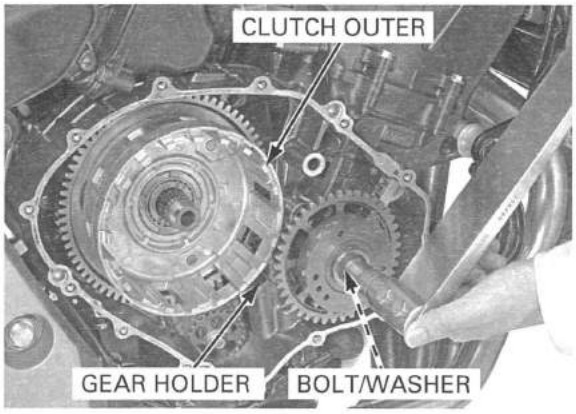
Attach the gear holder between the primary drive gear and driven gear.

TOOL:

Gear holder, M2.5	**07724-0010100**

Tighten the starter clutch mounting bolt to the specified torque.

TORQUE: 83 N·m (8.5 kgf·m, 61 lbf·ft)

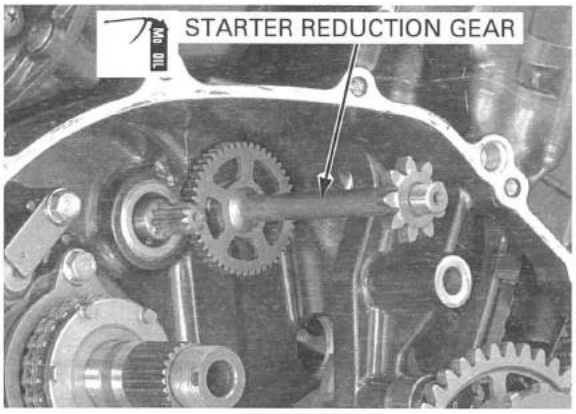


Remove the temporarily installed parts.

Apply molybdenum oil solution to the starter reduction gear sliding surface.

Install the starter reduction gear into the crankcase.

Install the clutch (page 9-13).



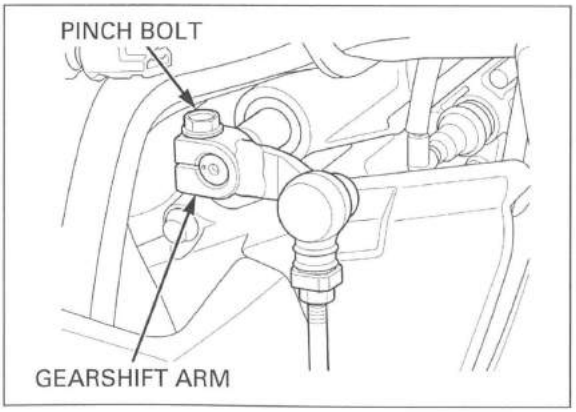
GEARSHIFT LINKAGE

REMOVAL

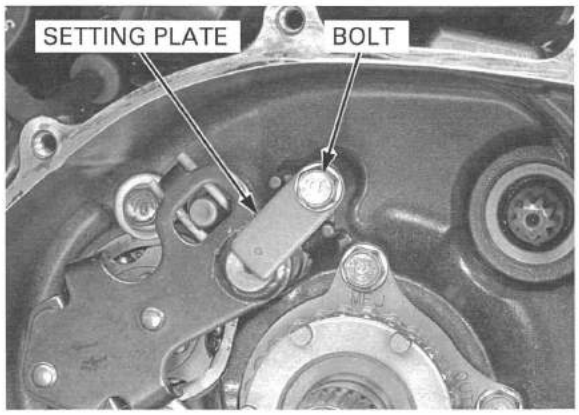
Remove the following:

- right crankcase cover (page 9-5)
- clutch (page 9-6)

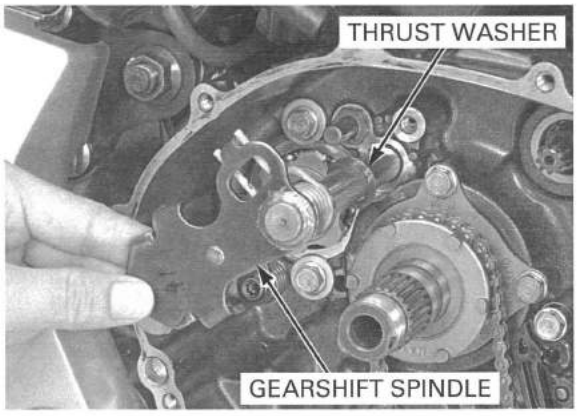
Remove the pinch bolt and disconnect the gearshift arm from the gearshift spindle.



Remove the bolt and setting plate.

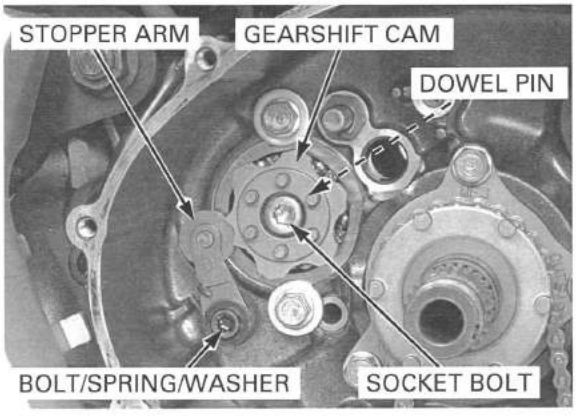


Pull the gearshift spindle assembly and thrust washer out of the crankcase.



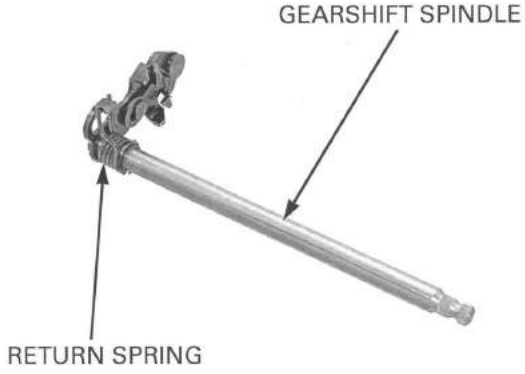
Remove the following:

- stopper arm pivot bolt
- stopper arm
- return spring
- washer
- shift drum center socket bolt
- gearshift cam
- dowel pin



INSPECTION

Check the gearshift spindle for wear, damage or bending.
Check the return spring for fatigue or damage.



INSTALLATION

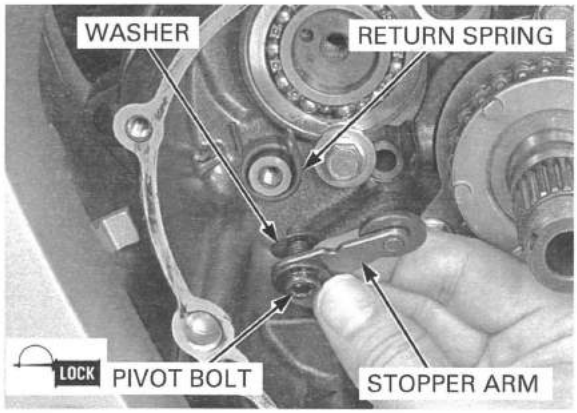
Apply a locking agent to the stopper arm pivot bolt threads.

Install the following:

- washer
- return spring
- stopper arm
- pivot bolt

Tighten the stopper arm pivot bolt to the specified torque.

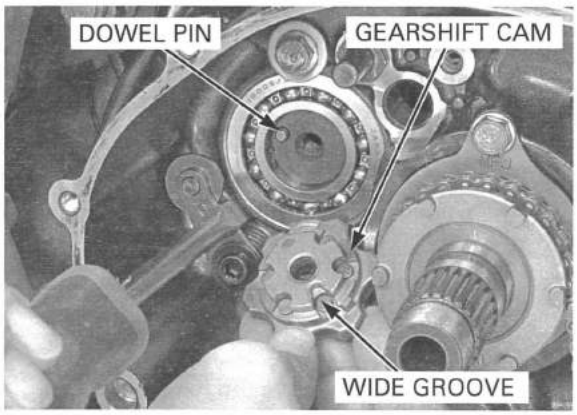
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the dowel pin onto the shift drum.

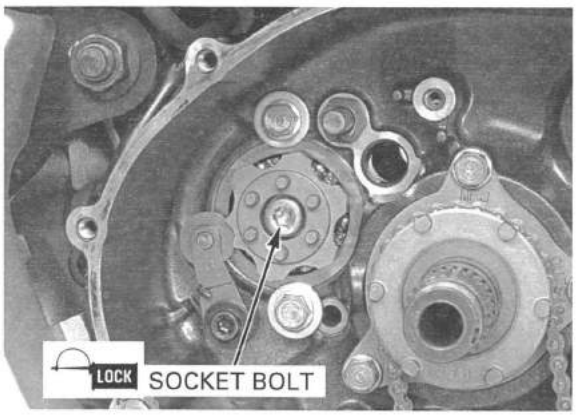
Align the dowel pin on the shift drum with the wide groove on the gearshift cam.

Install the gearshift cam while holding the stopper arm using a screwdriver as shown.

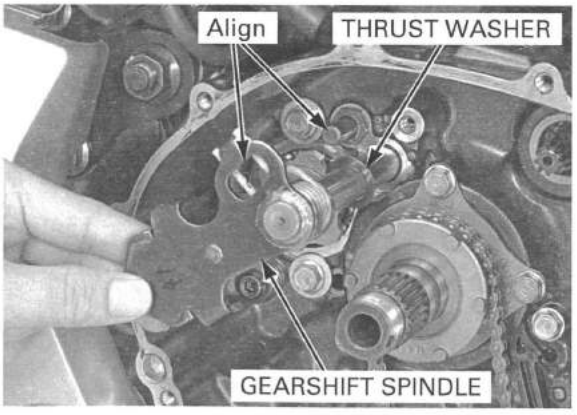


Apply a locking agent to the shift drum center socket bolt threads.
Tighten the socket bolt to the specified torque.

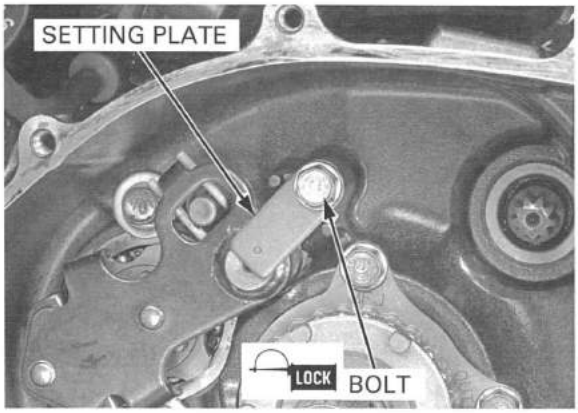
TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Install the thrust washer and gearshift spindle assembly into the crankcase while aligning the spring ends with the crankcase stopper pin.



Apply a locking agent to the setting plate bolt threads.
Install the setting plate and tighten the bolt securely.



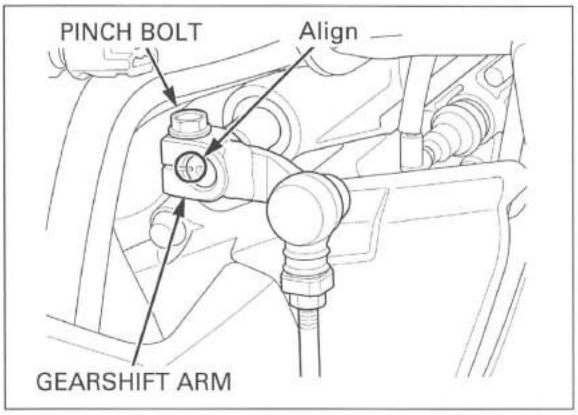
Install the gearshift arm to the gearshift spindle, aligning the arm slit with the punch mark on the gearshift spindle.

Install and tighten the pinch bolt to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

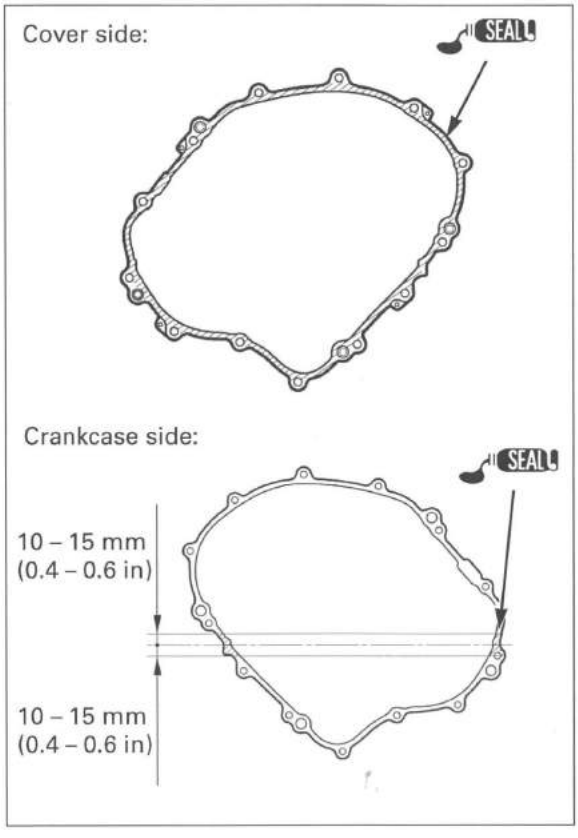
Install the following:

- clutch (page 9-13)
- right crankcase cover (page 9-25)

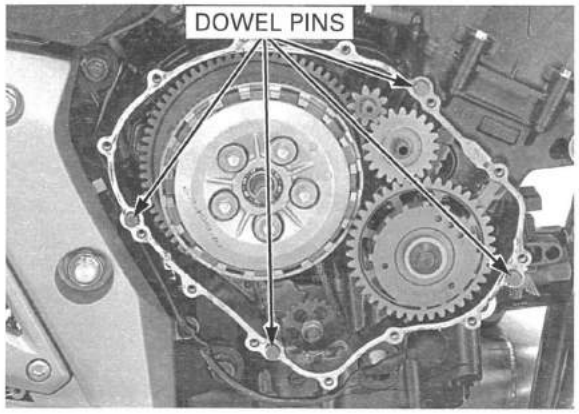


RIGHT CRANKCASE COVER INSTALLATION

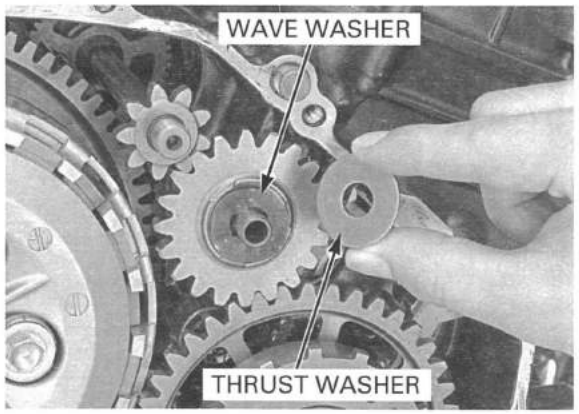
Apply sealant to the mating surfaces of the right crankcase cover and crankcase.



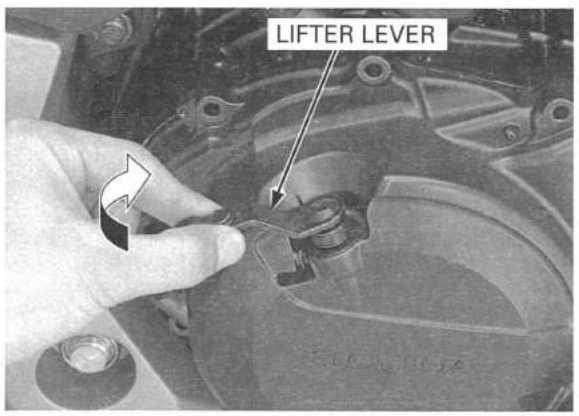
Install the dowel pins.



Install the wave washer and thrust washer onto the starter idle gear.



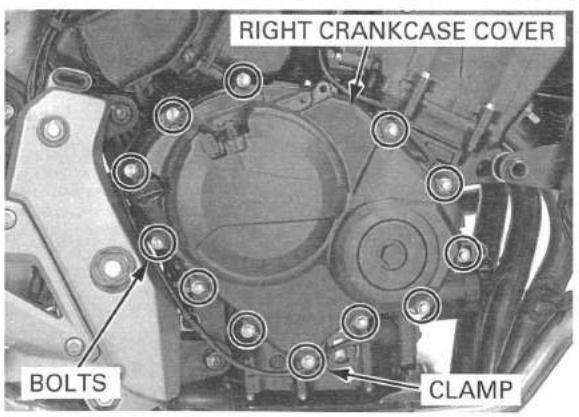
Install the right crankcase cover while turning the lifter lever clockwise to engage the lifter lever spindle groove with the lifter piece flange.



Install the right crankcase cover bolts with the clamp.

Tighten the right crankcase cover bolts crisscross pattern in two to three steps.

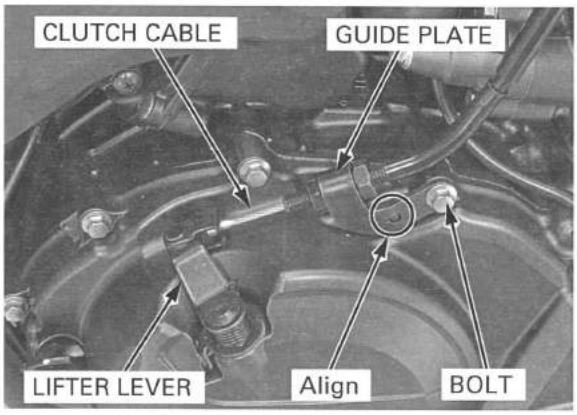
Secure the EOP switch wire with the clamp.



Connect the clutch cable end to the clutch lifter lever.

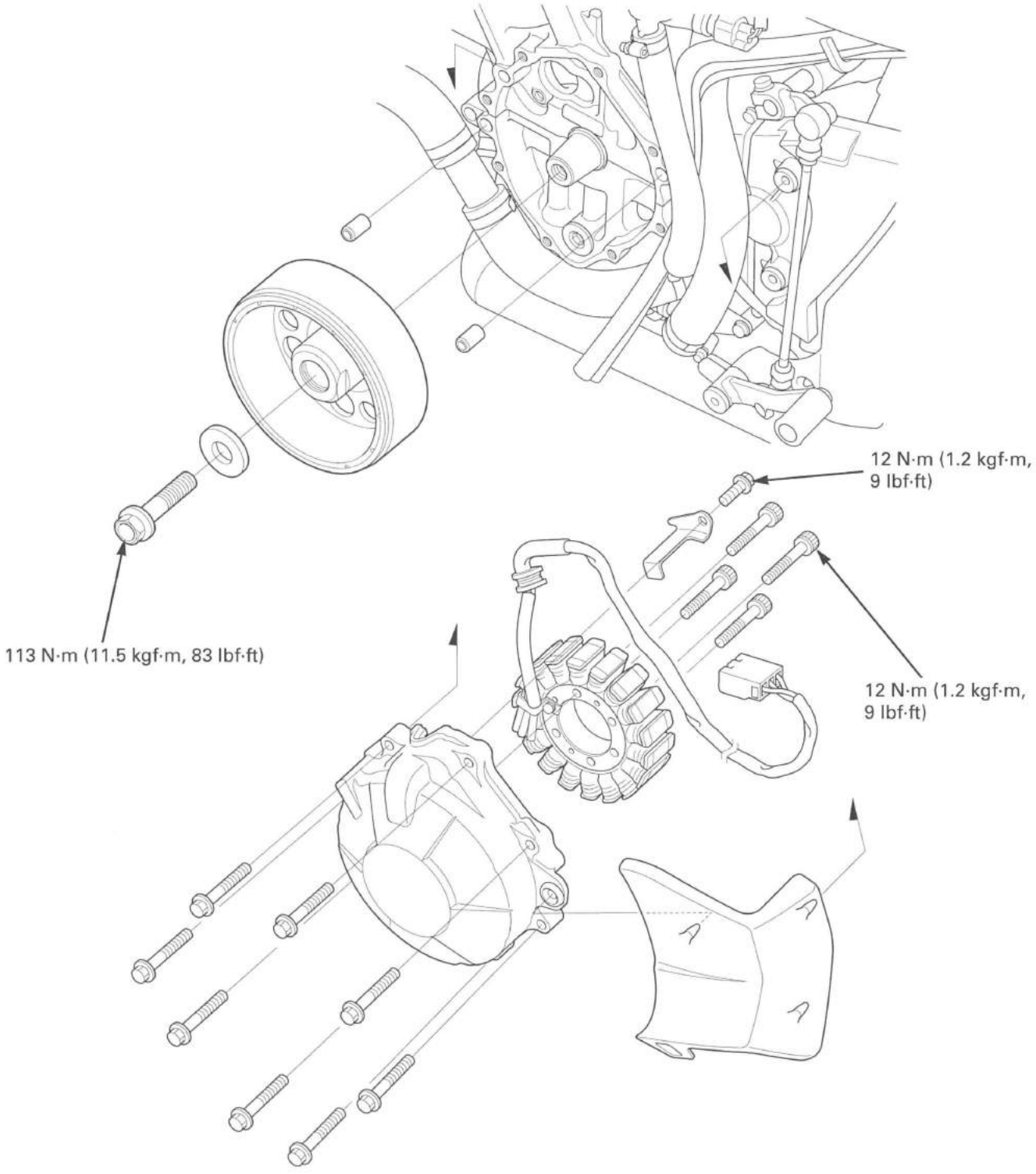
Install the clutch cable guide plate, aligning its hole with the boss of right crankcase cover.
Tighten the bolt securely.

Add the recommended engine oil (page 3-15).
Adjust the clutch lever freeplay (page 3-27).



10. ALTERNATOR

COMPONENT LOCATION



SERVICE INFORMATION

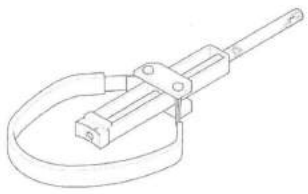
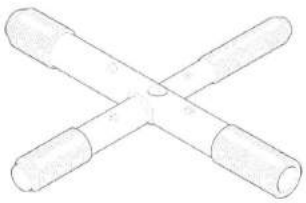
GENERAL

- This section covers service of the alternator stator and flywheel. All service can be done with the engine installed in the frame.
- Refer to procedures for alternator stator inspection (page 17-8).
- Refer to procedures for starter motor servicing (page 19-6).

TORQUE VALUES

Stator mounting socket bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Flywheel flange bolt	113 N·m (11.5 kgf·m, 83 lbf·ft)	Apply engine oil to the threads and seating surface.
Stator wire clamp flange bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	CT bolt

TOOLS

Flywheel holder 07725-0040001  or equivalent commercially available.	Rotor puller 07733-0020001 

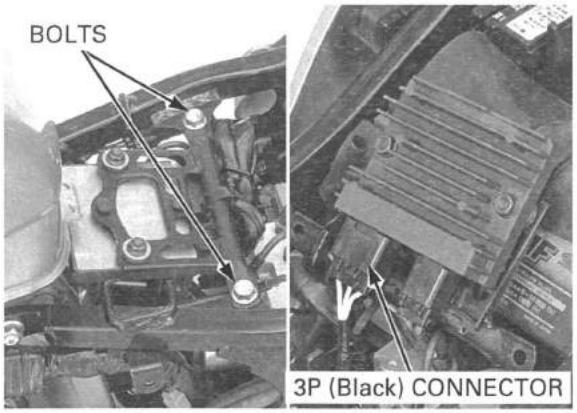
ALTERNATOR COVER REMOVAL

Remove the following:

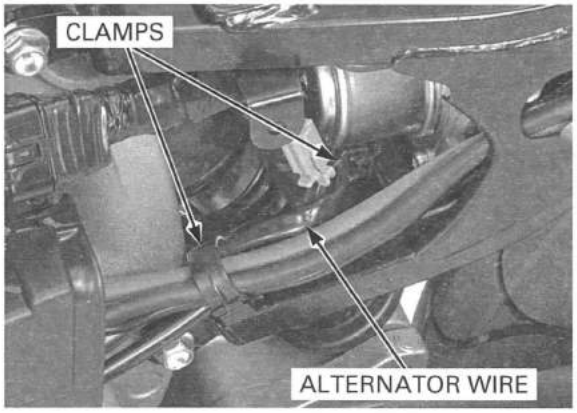
- seat (page 2-4)
- left side cover (page 2-4)
- crankcase rear cover A (page 7-4)

Remove the regulator/rectifier stay bolts.

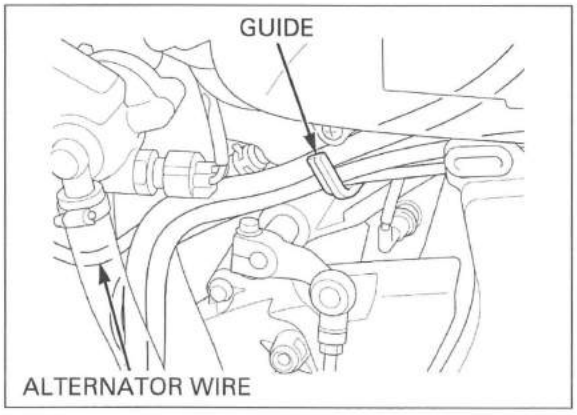
Disconnect the alternator 3P (Black) connector.



Release the alternator wire from the clamps.



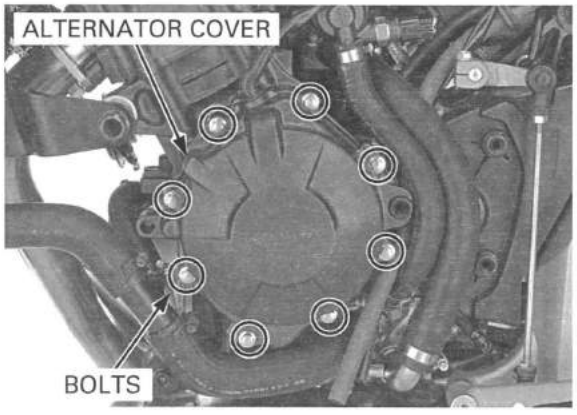
Unhook the alternator wire from the guide.



The alternator cover (stator) is magnetically attached to the flywheel, be careful during removal.

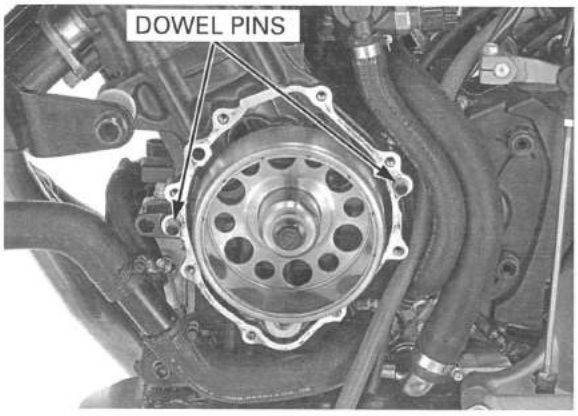
Remove the bolts and alternator cover.

- Engine oil will run out when the alternator cover is removed. Set a clean oil pan under the engine and add the recommended oil to the specified level after installation.



Remove the dowel pins.

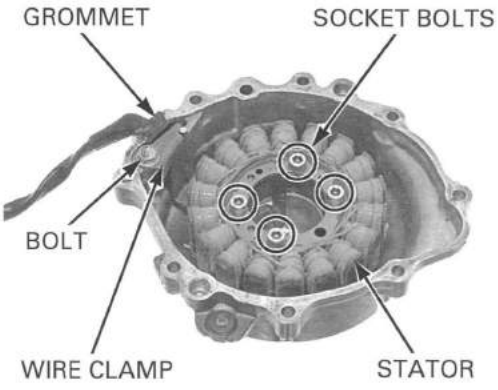
Clean any sealant off from the alternator cover mating surfaces.



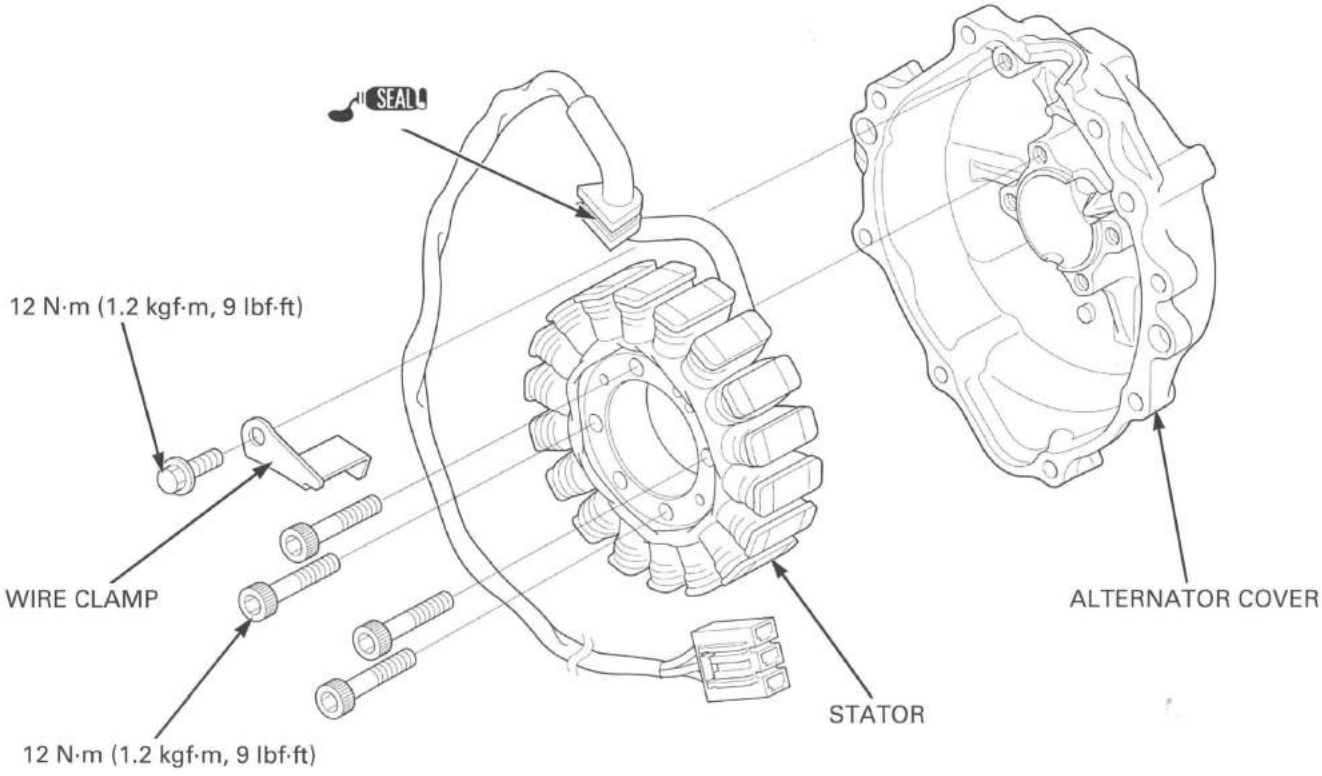
STATOR

REMOVAL

Remove the bolt and stator wire clamp.
Remove the alternator wire grommet from the alternator cover.
Remove the socket bolts and stator.



INSTALLATION



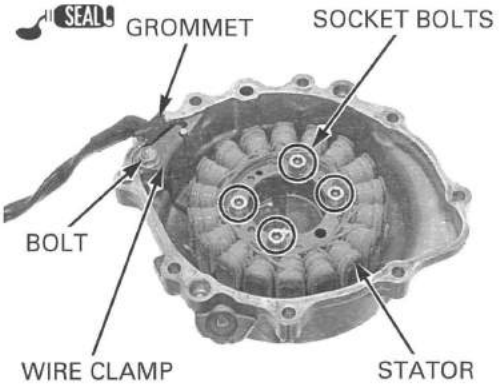
Install the stator to the alternator cover.
Install and tighten the socket bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Apply sealant to the wire grommet, then install it into the alternator cover groove securely.

Install the wire clamp and tighten the flange bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



FLYWHEEL

REMOVAL

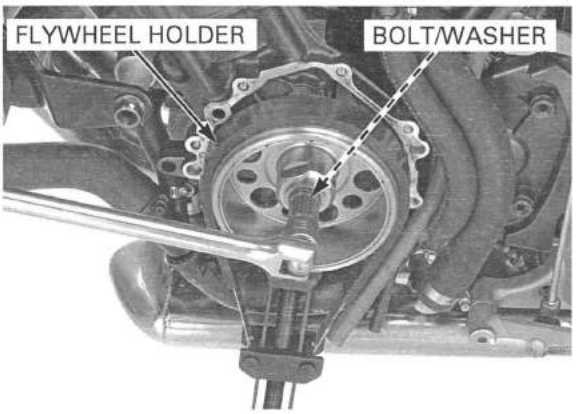
Remove the alternator cover (page 10-4).

Hold the flywheel using the special tool, then remove the flywheel bolt.

TOOL:

Flywheel holder	**07725-0040001 or equivalent commercially available**

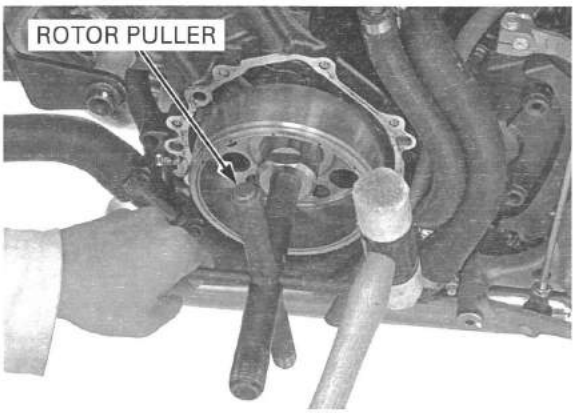
Remove the washer.



Remove the flywheel using the special tool.

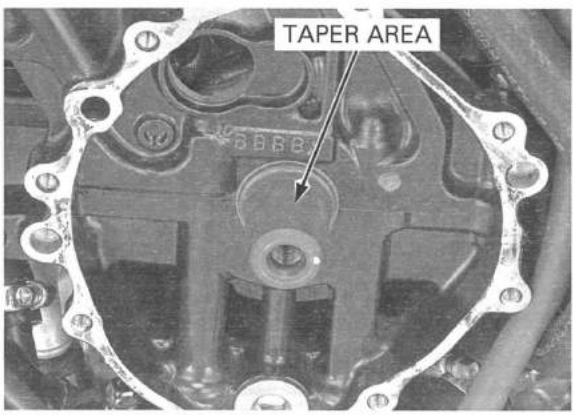
TOOL:

Rotor puller	**07733-0020001**



INSTALLATION

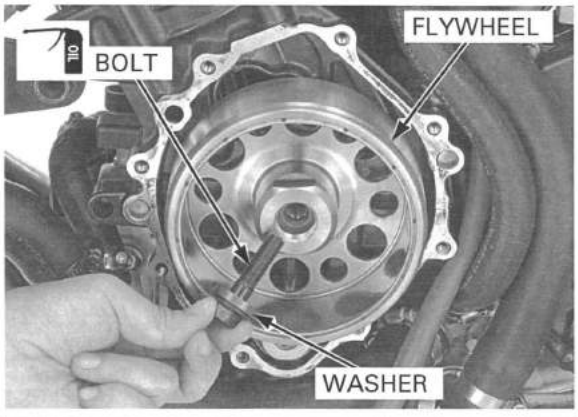
Clean any oil off from the crankshaft taper area.



Install the flywheel to the crankshaft.

Apply engine oil to the flywheel bolt threads and seating surface.

Install the washer and flywheel bolt.

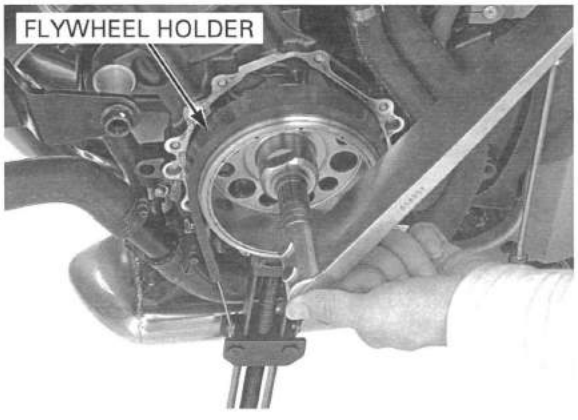


Hold the flywheel using the special tool, then tighten the bolt to the specified torque.

TOOL:

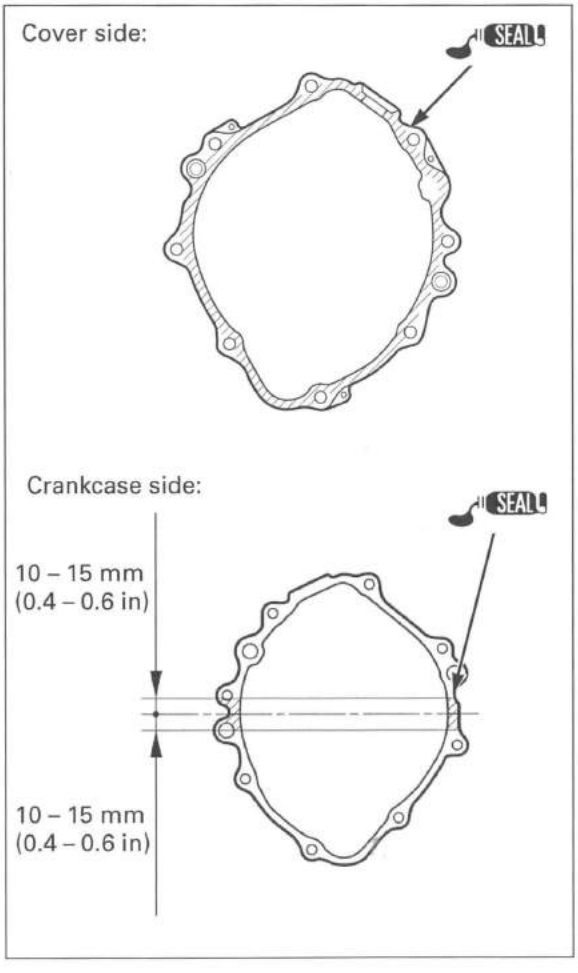
Flywheel holder	**07725-0040001 or equivalent commercially available**

TORQUE: 113 N·m (11.5 kgf·m, 83 lbf·ft)

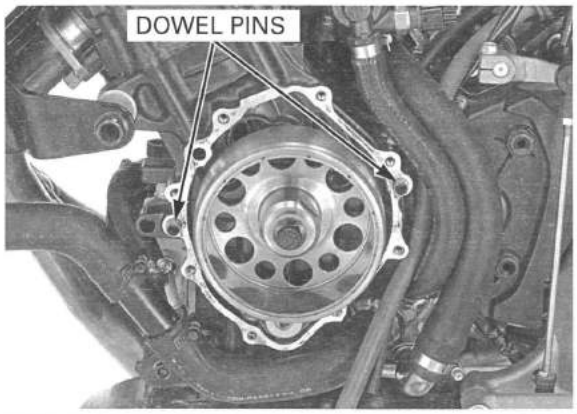


ALTERNATOR COVER INSTALLATION

Apply sealant to the mating surfaces of the alternator cover and crankcase.



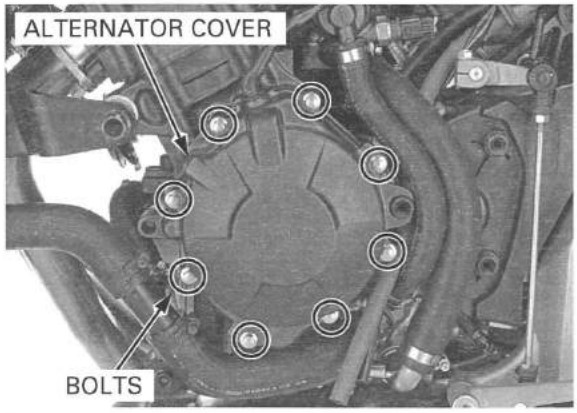
Install the dowel pins.



The alternator cover (stator) is magnetically attached to the flywheel, be careful during installation.

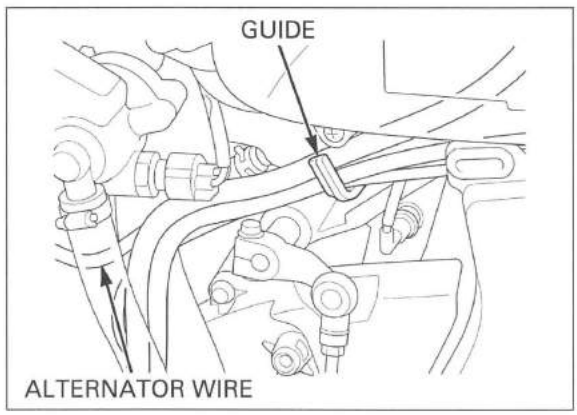
Install the alternator cover.

Install and tighten the bolts in a crisscross pattern in two or three steps securely.

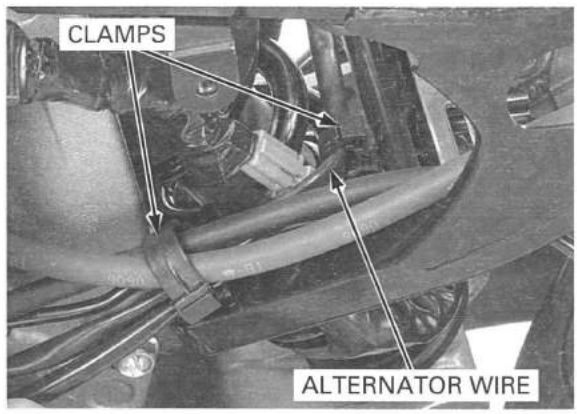


Refer to "CABLE & HARNESS ROUTING" (page 1-23)

Route the alternator wire and hook the alternator wire on the guide.



Secure the alternator wire with the clamps.

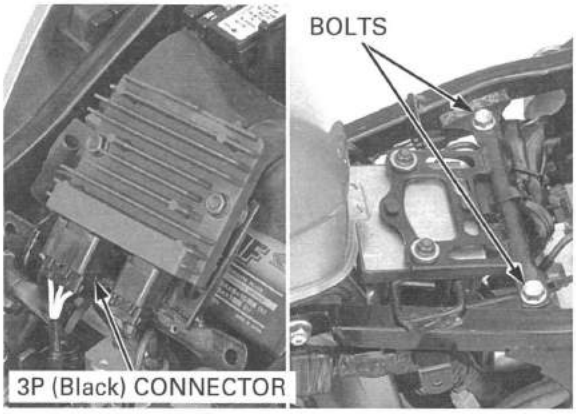


Connect the alternator 3P (Black) connector.

Install the regulator/rectifier and tighten the bolts securely.

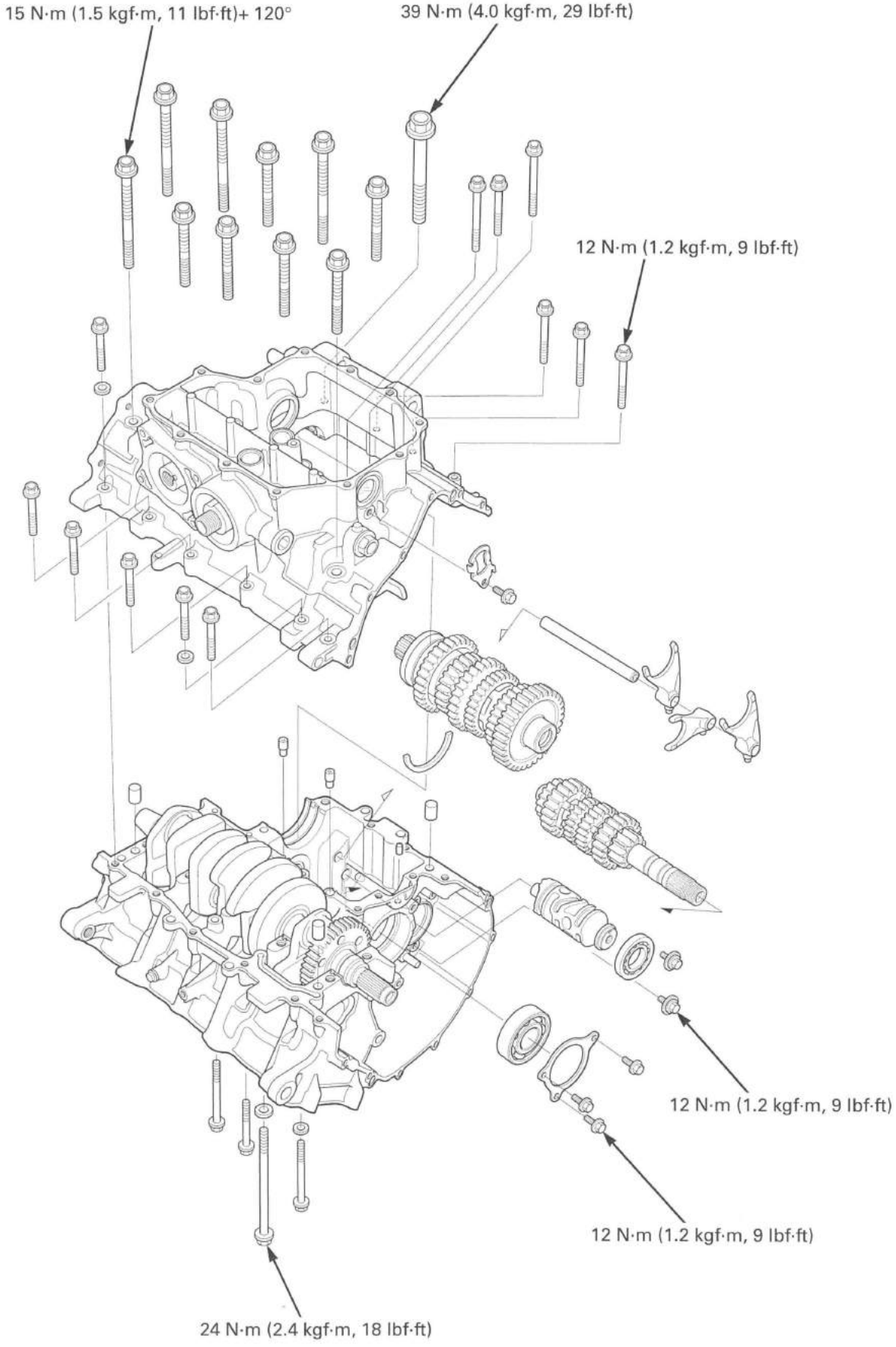
Install the following:

- crankcase rear cover A (page 7-15)
- left side cover (page 2-4)
- seat (page 2-4)



11. CRANKCASE/TRANSMISSION

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the following:
  - Transmission
  - Crankshaft (page 12-5)
  - Piston/connecting rod/cylinder (page 12-14)
- The following components must be removed before separating the crankcase:
  - Engine (page 7-4)
  - Clutch (page 9-6)
  - Gearshift linkage (page 9-22)
  - Starter clutch (page 9-17)
  - Flywheel (page 10-6)
  - Cylinder head (page 8-12)
  - Oil pan (page 4-6)
  - Oil pump (page 4-8)
  - Oil cooler (page 4-14)
  - Starter motor (page 19-6)
  - Water pump (page 6-18)
  - EOP switch (page 4-5)
  - VS sensor (page 20-14)
  - Neutral switch (page 20-23)
- Be careful not to damage the crankcase mating surfaces when servicing.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.

SPECIFICATIONS

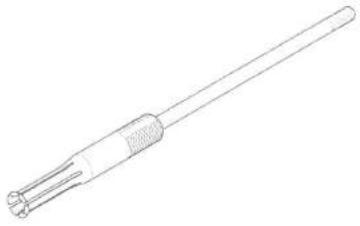
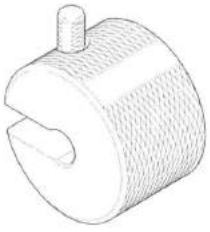
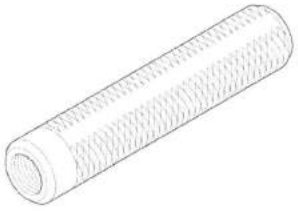
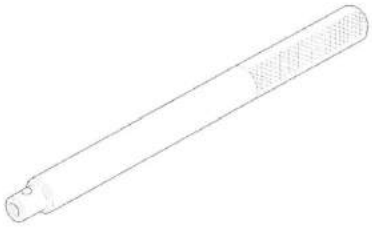
Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Shift fork	I.D.		12.000 – 12.018 (0.4724 – 0.4731)	12.03 (0.474)
	Claw thickness		5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)
Shift fork shaft O.D.			11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)
Transmission	Gear I.D.	M5, M6	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C1	24.000 – 24.021 (0.9449 – 0.9457)	26.04 (1.025)
		C2, C3, C4	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
	Gear busing O.D.	M5, M6	27.959 – 27.980 (1.1007 – 1.1016)	27.94 (1.100)
		C2	30.955 – 30.980 (1.2187 – 1.2197)	30.94 (1.218)
		C3, C4	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
	Gear-to-bushing clearance	M5, M6	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C2	0.020 – 0.070 (0.0008 – 0.0028)	0.10 (0.004)
		C3, C4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Gear bushing I.D.	M5	24.985 – 25.006 (0.9837 – 0.9845)	25.016 (0.9849)
		C2	27.985 – 28.006 (1.1018 – 1.1026)	28.021 (1.1032)
	Mainshaft O.D.	at M5	24.967 – 24.980 (0.9830 – 0.9835)	24.96 (0.983)
	Countershaft O.D.	at C2	27.967 – 27.980 (1.1011 – 1.1016)	27.96 (1.101)
	Bushing to shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)
		C2	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)

TORQUE VALUES

Mainshaft bearing set plate bolt		12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Shift drum bearing set bolt		12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Crankcase	6 mm bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
	8 mm bolt	24 N·m (2.4 kgf·m, 18 lbf·ft)	
	8 mm bolt (main journal bolt)	15 N·m (1.5 kgf·m, 11 lbf·ft) + 120°	See page 11-16 Replace with a new one.
	10 mm bolt	39 N·m (4.0 kgf·m, 29 lbf·ft)	

TOOLS

Bearing remover set, 20 mm 07936-3710600 	Remover weight 07741-0010201 	Bearing remover handle 07936-3710100 
Driver 07949-3710001 	Attachment, 42 x 47 mm 07746-0010300 	Pilot, 20 mm 07746-0040500 

TROUBLESHOOTING

Hard to shift
- Improper clutch operation
- Incorrect engine oil weight
- Bent shift fork
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum cam groove
- Bent gearshift spindle

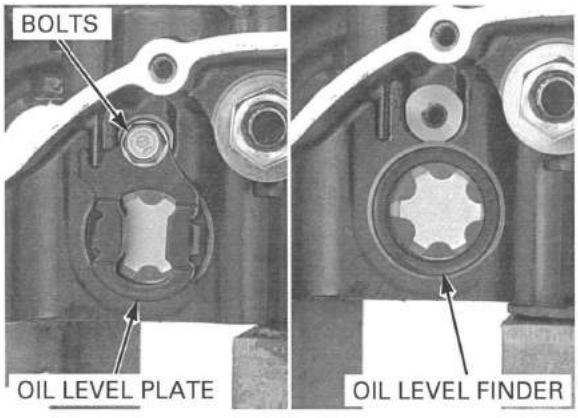
Transmission jumps out of gear
- Worn gear dogs
- Worn gear shifter groove
- Bent shift fork shaft
- Broken shift drum stopper arm (page 9-23)
- Broken shift drum stopper arm spring (page 9-23)
- Worn or bent shift forks
- Broken gearshift spindle return spring (page 9-23)

Excessive engine noise
- Worn or damaged transmission gear
- Worn or damaged transmission bearings

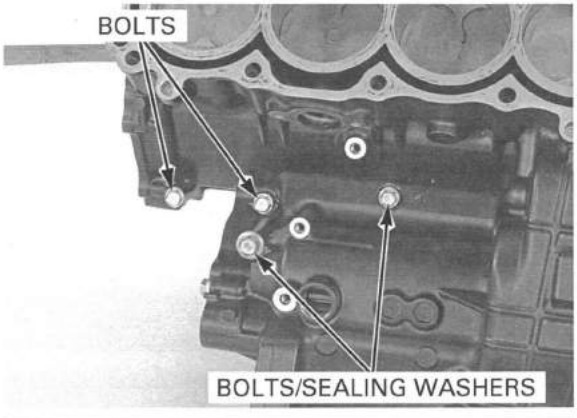
CRANKCASE SEPARATION

Refer to Service Information for removal of necessary parts before separating the crankcase (page 11-3).

Remove the bolt, oil level plate and oil level finder from the crankcase.

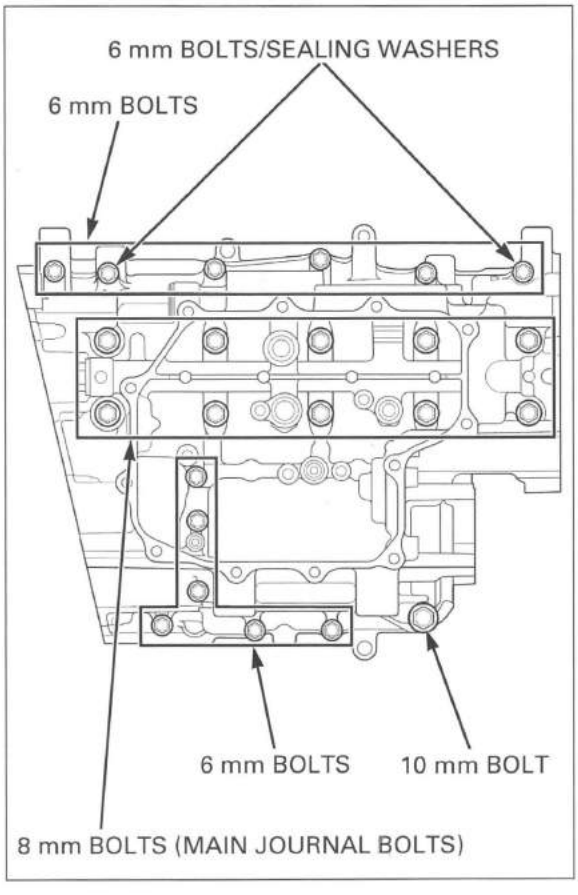


Remove the bolts and sealing washers.



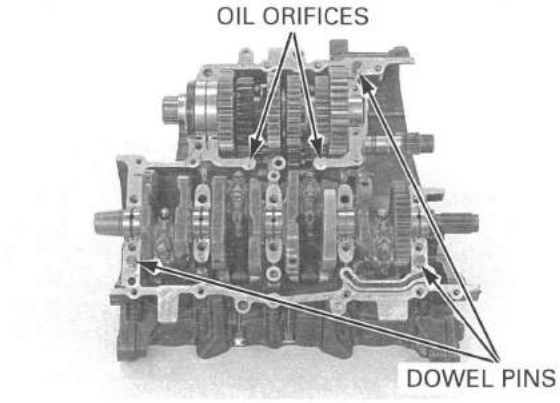
Place the engine upside down.
Loosen the 10 mm bolt and 6 mm bolts in a crisscross pattern in two to three steps.
Loosen the 8 mm bolts (main journal bolts) in a crisscross pattern in two to three steps, then remove the bolts and sealing washers.

Separate the lower crankcase from the upper crankcase.



Remove the dowel pins and oil orifices.

Clean any sealant off from the crankcase mating surface.

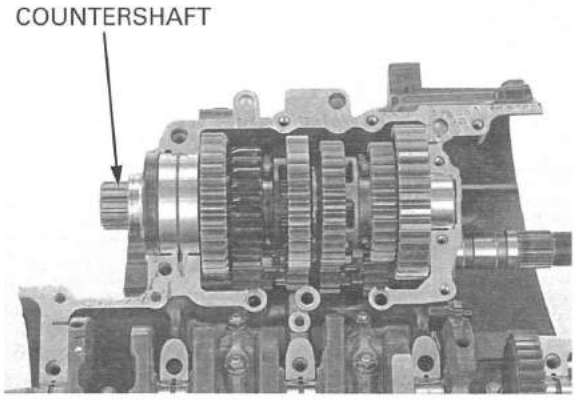


SHIFT FORK/SHIFT DRUM/ TRANSMISSION

REMOVAL/DISASSEMBLY

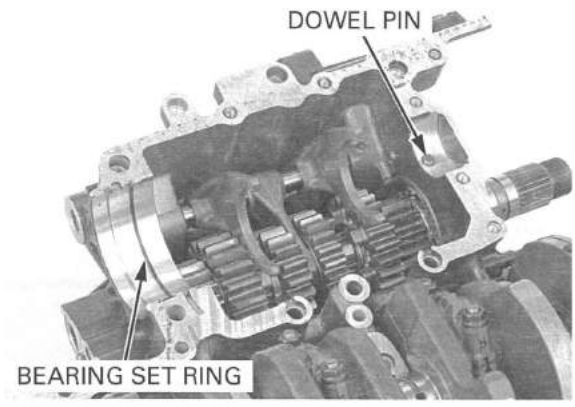
Separate the crankcase halves (page 11-5).

Remove the countershaft assembly.

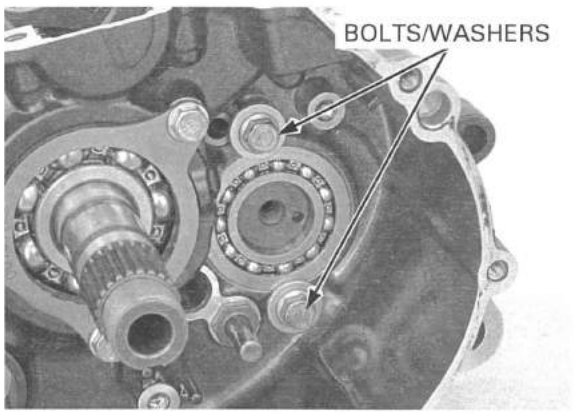


Remove the dowel pin and countershaft bearing set ring.

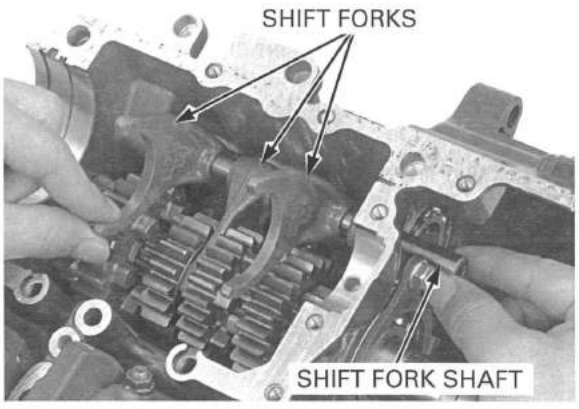
Disassemble the countershaft.
Clean all disassembled parts in solvent thoroughly.



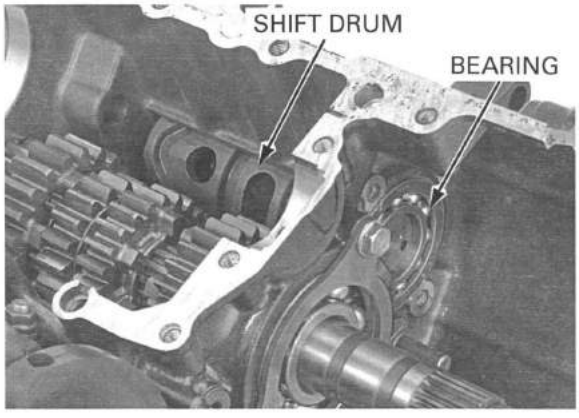
Remove the shift drum bearing set bolts/washers.



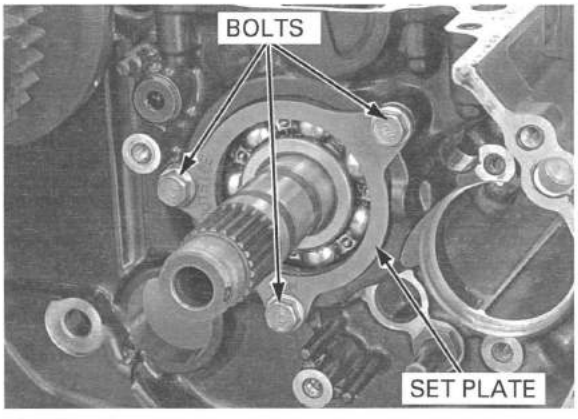
Remove the fork shaft and shift forks.



Remove the shift drum and shift drum bearing.

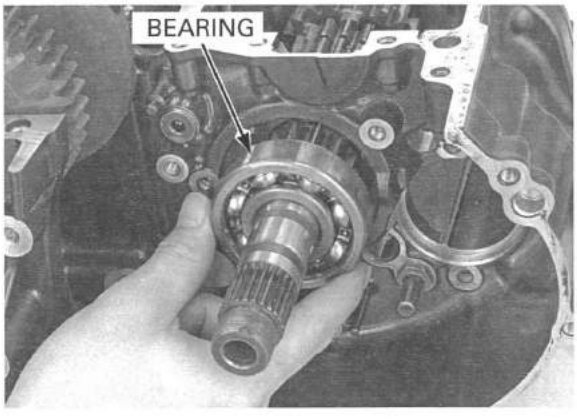


Remove the bolts and mainshaft bearing set plate.



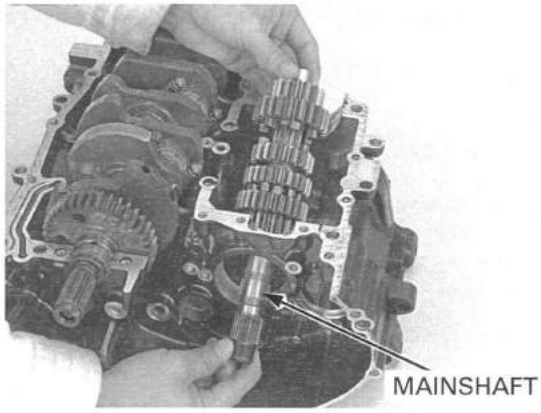
Remove the mainshaft bearing from the crankcase.

Check the mainshaft bearing for smooth rotation, abnormal wear or damage.



Remove the mainshaft assembly.

Disassemble the mainshaft.
Clean all disassembled parts in solvent thoroughly.



SHIFT DRUM/SHIFT FORK INSPECTION

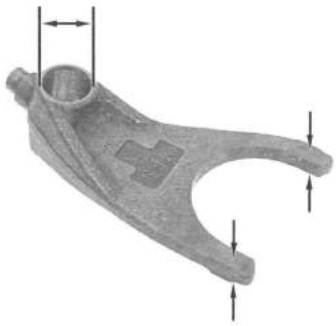
Check the shift fork guide pin for abnormal wear or damage

Measure the shift fork I.D.

SERVICE LIMIT: 12.03 mm (0.474 in)

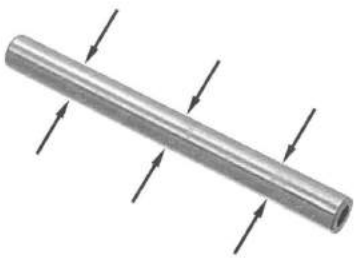
Measure the shift fork claw thickness.

SERVICE LIMIT: 5.9 mm (0.23 in)



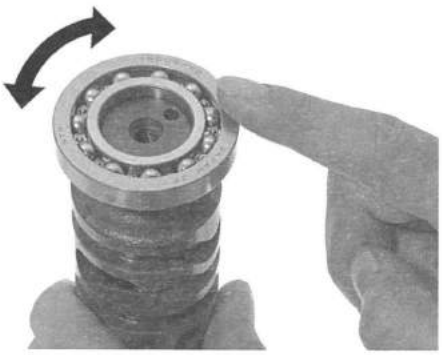
Measure the shift fork shaft O.D.

SERVICE LIMIT: 11.95 mm (0.470 in)



Inspect the shift drum guide grooves for abnormal wear or damage.

Turn the outer race of the shift drum bearing with your finger.
The bearing should turn smoothly and freely without excessive play.
Also check that the bearing inner race fits tightly on the shift drum.
If necessary, replace the bearing.

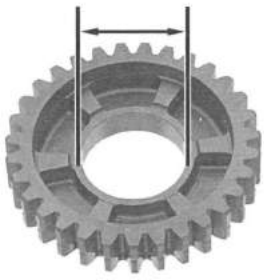


TRANSMISSION INSPECTION

Check the gear shifter groove for abnormal wear or damage.

Check the gear dogs, dog holes and teeth for abnormal wear or lack of lubrication.

Measure the I.D. of each gear.

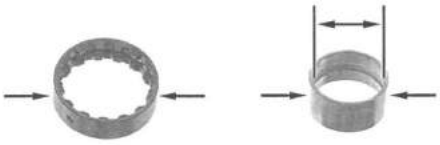


SERVICE LIMITS:
M5, M6: 28.04 mm (1.104 in)
C1: 26.04 mm (1.025 in)
C2, C3, C4: 31.04 mm (1.222 in)

Measure the O.D. of each gear bushing.

SERVICE LIMITS:
M5, M6: 27.94 mm (1.100 in)
C2: 30.94 mm (1.218 in)
C3, C4: 30.93 mm (1.218 in)

Measure the I.D. of each gear bushing.



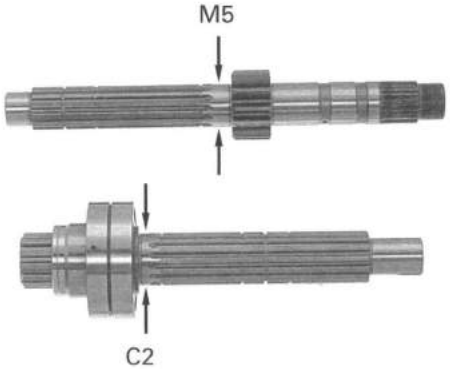
SERVICE LIMITS:
M5: 25.016 mm (0.9849 in)
C2: 28.021 mm (1.1032 in)

Calculate the gear-to-bushing clearance.

SERVICE LIMITS:
M5, M6: 0.10 mm (0.004 in)
C2: 0.10 mm (0.004 in)
C3, C4: 0.11 mm (0.004 in)

Check the mainshaft and countershaft for abnormal wear or damage.

Measure the mainshaft O.D. at the M5 gear.



SERVICE LIMIT: 24.96 mm (0.983 in)

Measure the countershaft O.D. at the C2 gear.

SERVICE LIMIT: 27.96 mm (1.101 in)

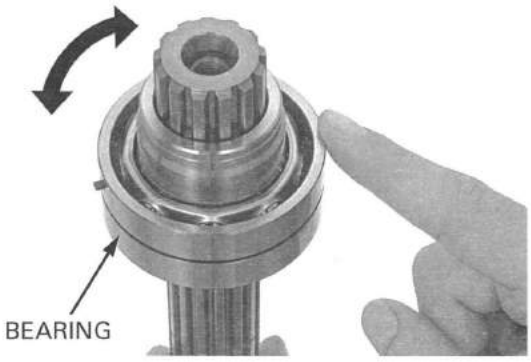
Calculate the gear bushing-to-shaft clearance.

SERVICE LIMITS:
M5: 0.06 mm (0.002 in)
C2: 0.06 mm (0.002 in)

Countershaft bearing

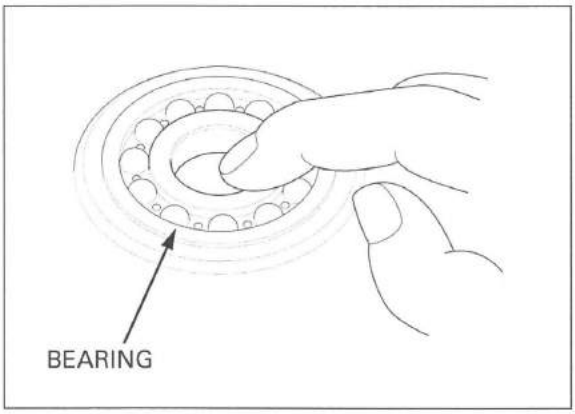
Turn the outer race of countershaft bearing with your finger.
The bearing should turn smoothly and quietly.
Also check that the bearing inner race fits tightly on the shaft.
Replace the countershaft, collar, and bearing as an assembly, if the race does not turn smoothly, quietly, or fits loosely on the countershaft.

- The countershaft bearing cannot be replaced. If the countershaft bearing is faulty, replace the countershaft as an assembly.



Mainshaft bearing

Turn the inner race of the mainshaft bearings with your finger.
The bearings should turn smoothly and quietly.
Also check that the outer race of the bearing fits tightly in the crankcase.
Replace the bearings if the inner race does not turn smoothly, quietly, or if the outer race fit loosely in the crankcase.



MAINSHAFT BEARING REPLACEMENT

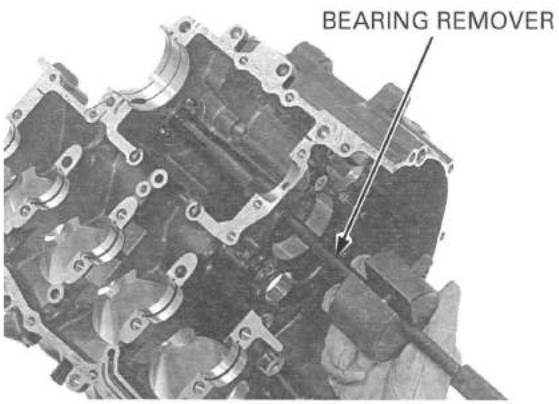
Remove the following:

- crankshaft (page 12-5)
- piston (page 12-14)

Remove the mainshaft bearing using the special tools as shown.

TOOLS:

Bearing remover set, 20 mm	**07936-3710600**
Remover weight	**07741-0010201**
Remover handle	**07936-3710100**

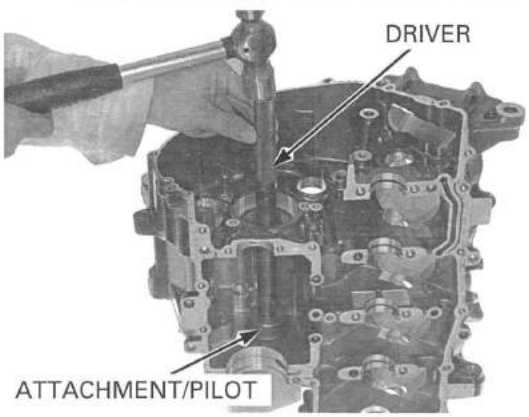


Drive in a new bearing squarely with the marking side facing up.

Drive a new bearing into the crankcase using the special tools.

TOOLS:

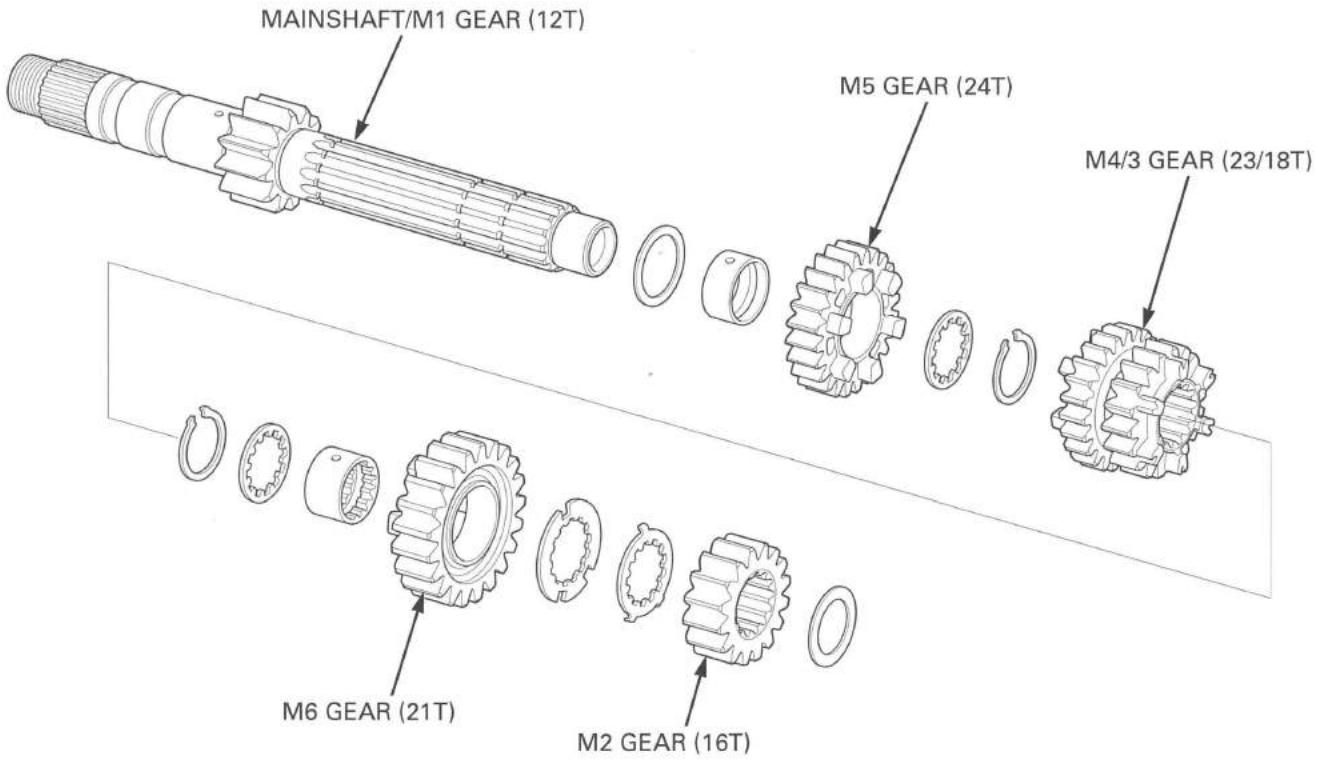
Driver	**07949-3710001**
Attachment, 42 x 47 mm	**07746-0010300**
Pilot, 20 mm	**07746-0040500**

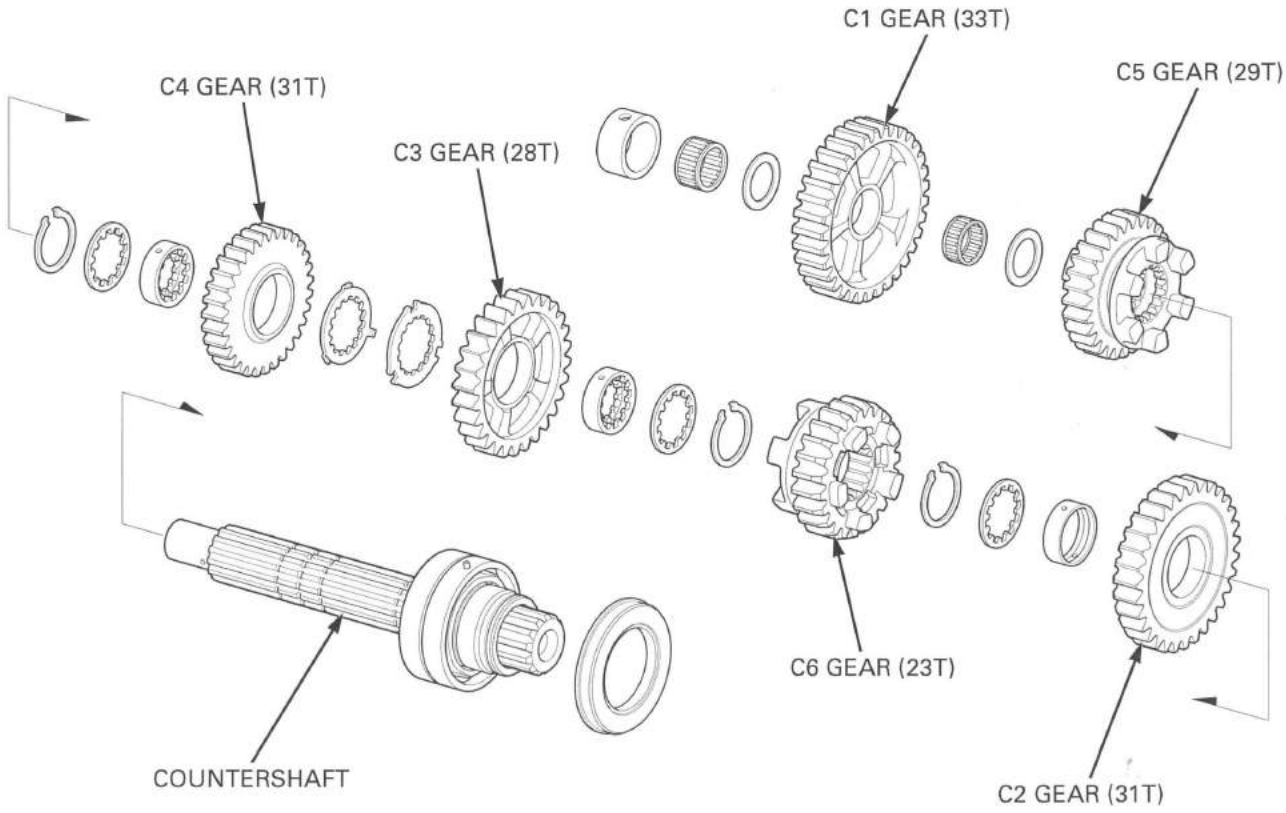


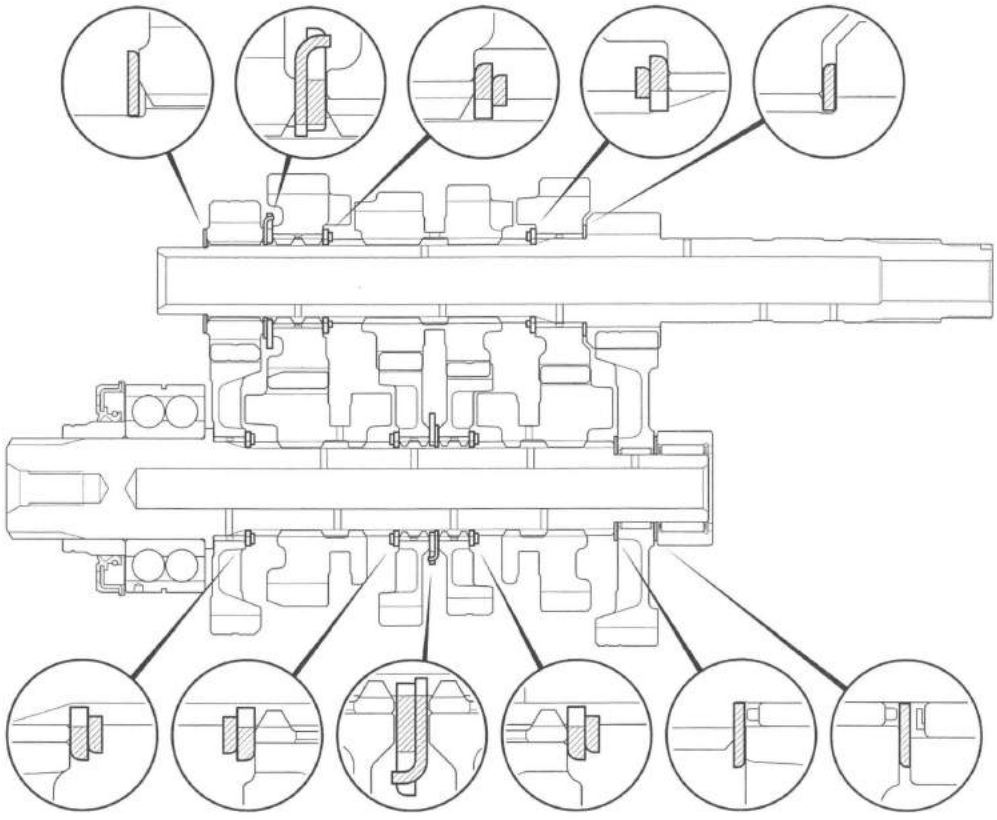
TRANSMISSION ASSEMBLY

Apply molybdenum oil solution to the gear teeth, sliding surface, shifter grooves and bushings.

Assemble the mainshaft and countershaft.

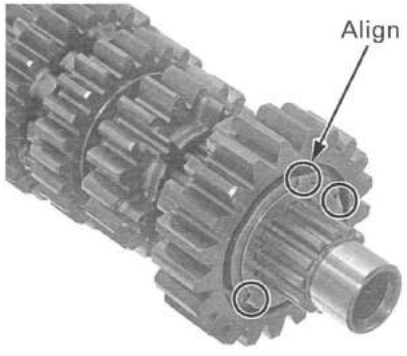




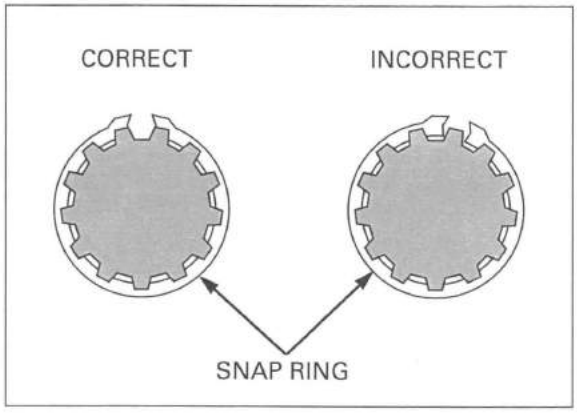


Assemble the transmission gear and shafts.

- Coat each gear with clean engine oil and check for smooth movement.
- Align the lock washer tabs with the spline washer grooves.

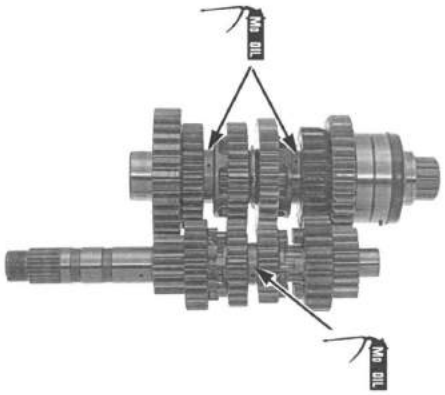


- Always install the thrust washer and snap ring with the chamfered (rolled) edge facing away from the thrust load.
- Install the snap ring so that its end gap aligns with the groove of the splines.
- Make sure that the snap ring is fully seated in the shaft groove after installing it.

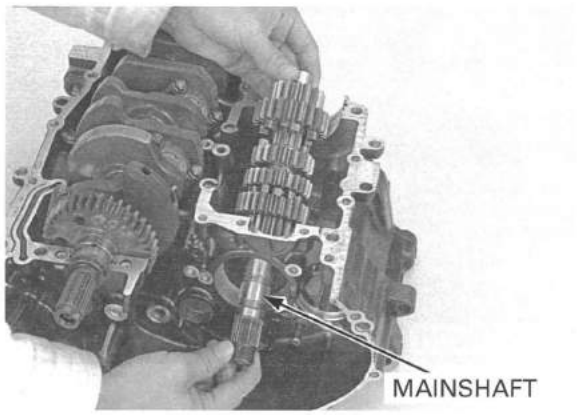


INSTALLATION

Apply molybdenum oil solution to the shift fork grooves in the M3/4, C5 and C6 gear.

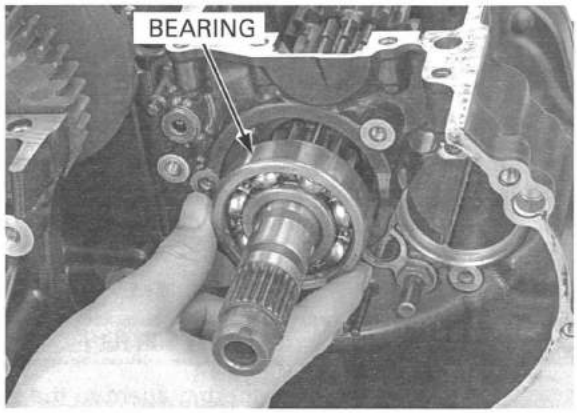


Install the mainshaft into the crankcase.



Install the bearing into the crankcase with the marked side facing out.

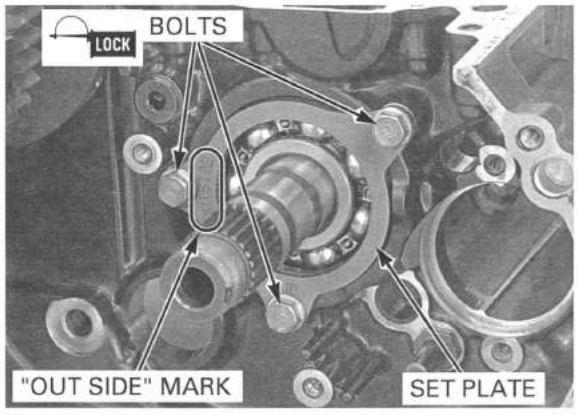
Install the mainshaft bearing into the crankcase.



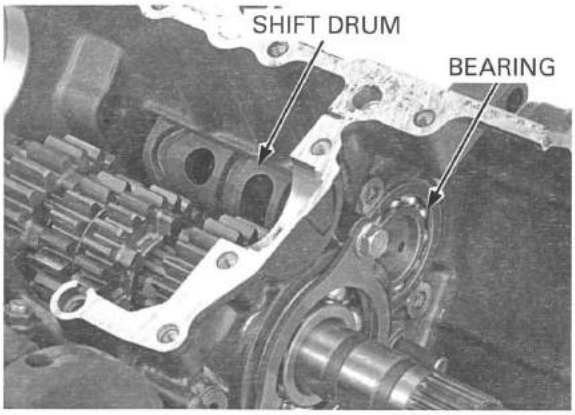
Apply a locking agent to the set plate bolt threads. Install the mainshaft bearing set plate with its "OUT SIDE" mark facing out.

Tighten the set plate bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

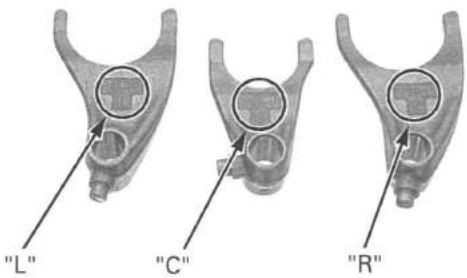


Install the shift drum and shift drum bearing into the crankcase.

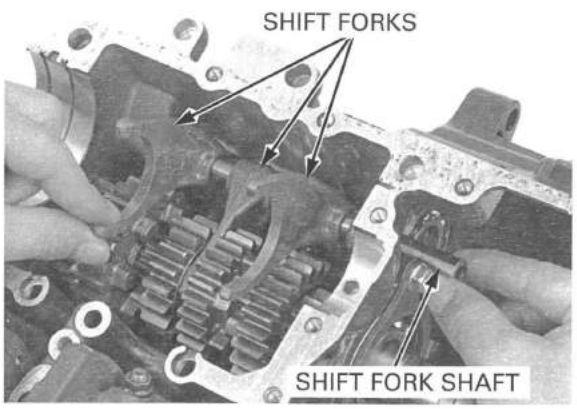


The shift forks have the following identification marks:

- "L" for left
- "R" for right
- "C" for center



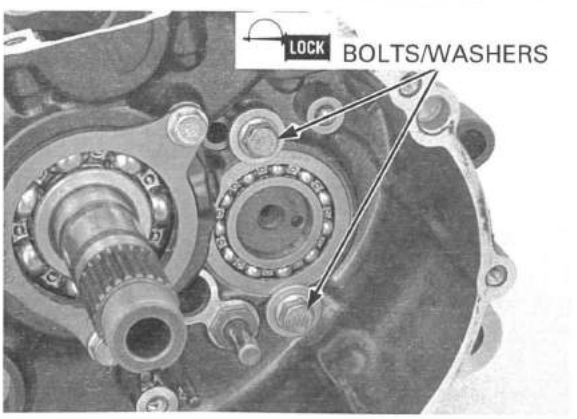
Install the shift forks into the shift drum guide grooves with the identification marks facing toward the right side of the engine and insert the fork shaft.



Apply a locking agent to the shift drum bearing set bolt threads.

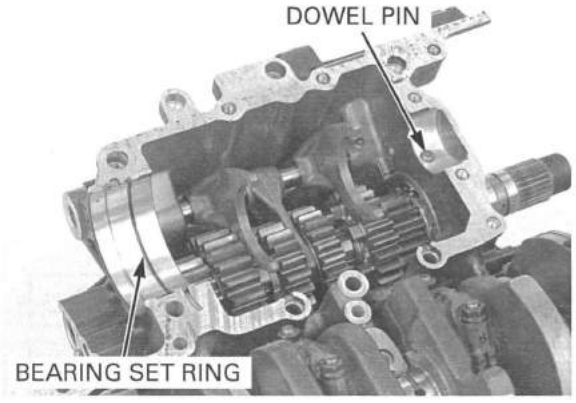
Tighten the bolts/washers to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

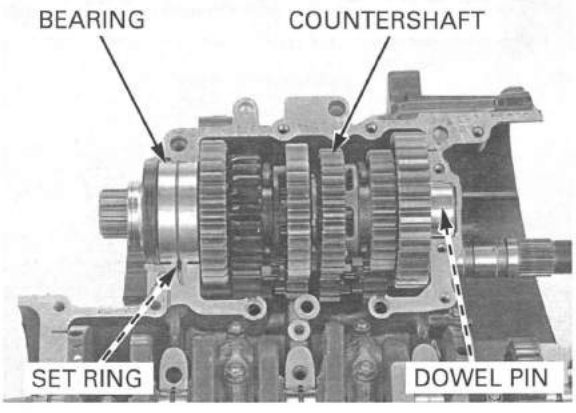


Install the dowel pin in the upper crankcase hole.

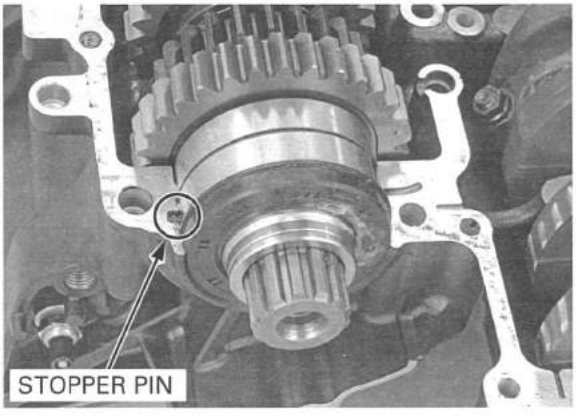
Install the countershaft bearing set ring into the upper crankcase groove.



Install the countershaft by aligning the countershaft bearing groove with the set ring on the crankcase, and bearing cap hole with the dowel pin.



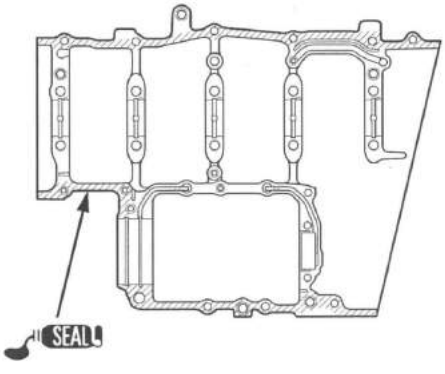
Also align the countershaft bearing stopper pin with the groove in the crankcase.



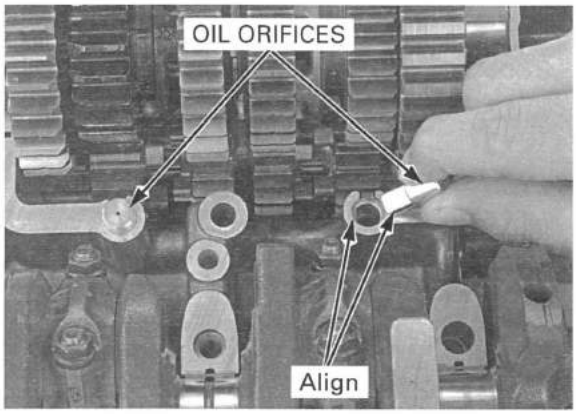
CRANKCASE ASSEMBLY

Apply a light, but thorough, coating of liquid sealant to the crankcase mating surface.

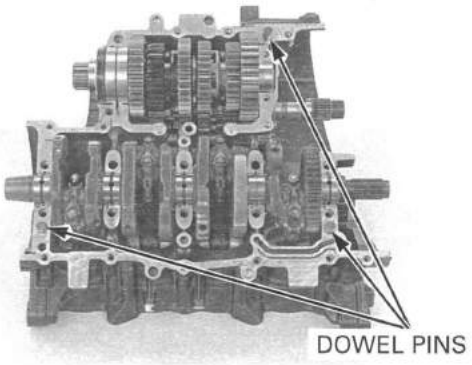
Do not apply sealant to the crankcase 8 mm bolt (main journal bolt) area and the oil passage area as shown.



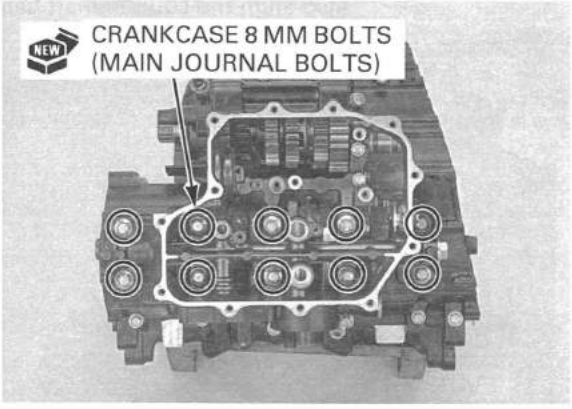
Install the oil orifices, aligning its cut-out with the groove of upper crankcase.



Install the dowel pins in the upper crankcase.



- Tighten the crankcase 8 mm bolts (main journal bolts) using the Plastic Region Tightening Method described below.
- Do not reuse the crankcase 8 mm bolts (main journal bolts), because the correct axial tension will not be obtained.
- The crankcase 8 mm bolts (main journal bolts) are pre-coated with an oil additive for axial tension stability. Do not remove the oil additive from the new 8 mm bolts (main journal bolts) surface.



Install the lower crankcase onto the upper crankcase.

Install new crankcase 8 mm bolts (main journal 8 mm bolts).
Loosely install all the crankcase bolts.

PLASTIC REGION TIGHTENING METHOD:

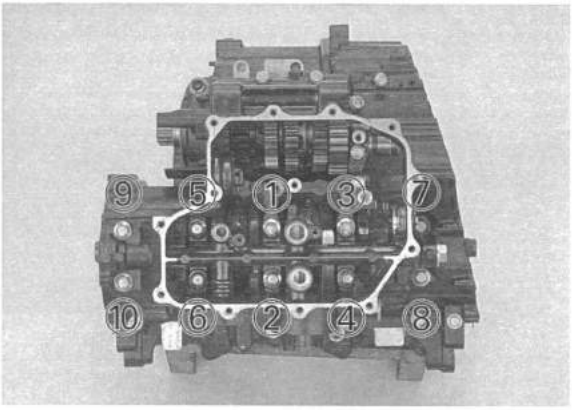
Make sure the upper and lower crankcase are seated securely.

Tighten the crankcase 8 mm bolts (main journal bolts) as follow:

Tighten the crankcase 8 mm bolts (main journal bolts) in numerical order in the illustration in two to three steps to the specified torque.

Further tighten the crankcase 8 mm bolts (main journal bolts) 120-degrees.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft) + 120°

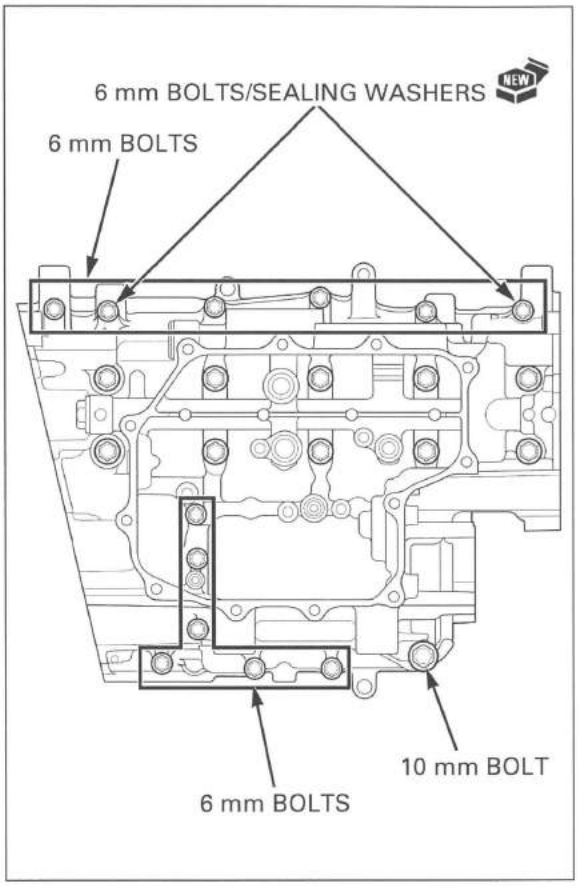


Tighten the 10 mm bolt to the specified torque.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

From the inside to outside, tighten the 6 mm bolts/ sealing washers to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Place the engine with the lower side down.

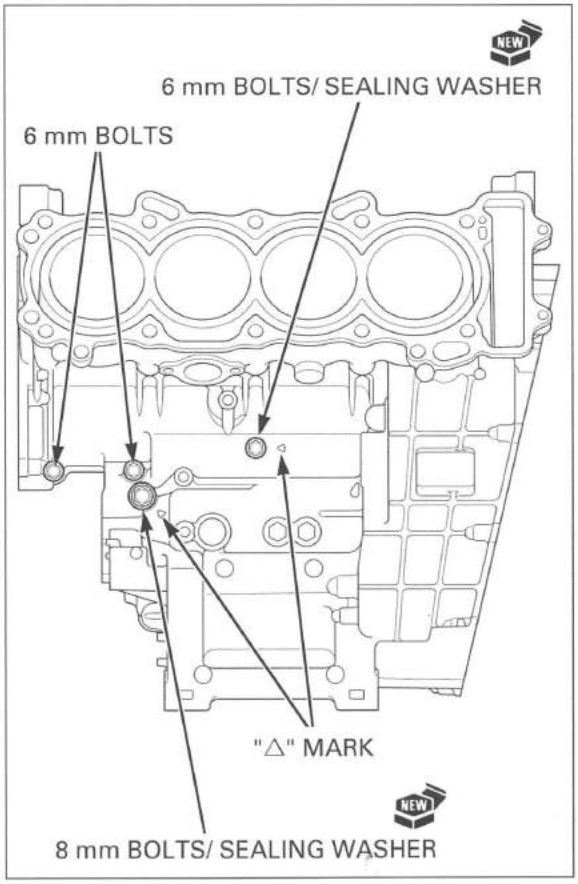
The sealing washer locations are indicated on the upper crankcase using the "△" mark.

Install the 6 mm bolts with a new sealing washer. Tighten the 6 mm bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the 8 mm bolt with a new sealing washer. Tighten the 8 mm bolt to the specified torque.

TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)



When installing a new oil level finder, do not press the clear surface.

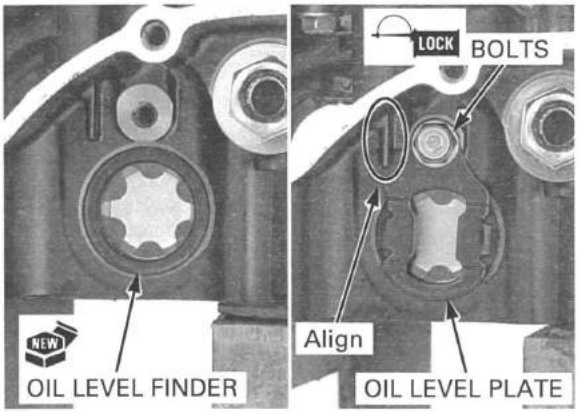
Install a new oil level finder into the crankcase securely.

Apply a locking agent to the oil level plate bolt threads.

Align the oil level plate groove with the crankcase tab.

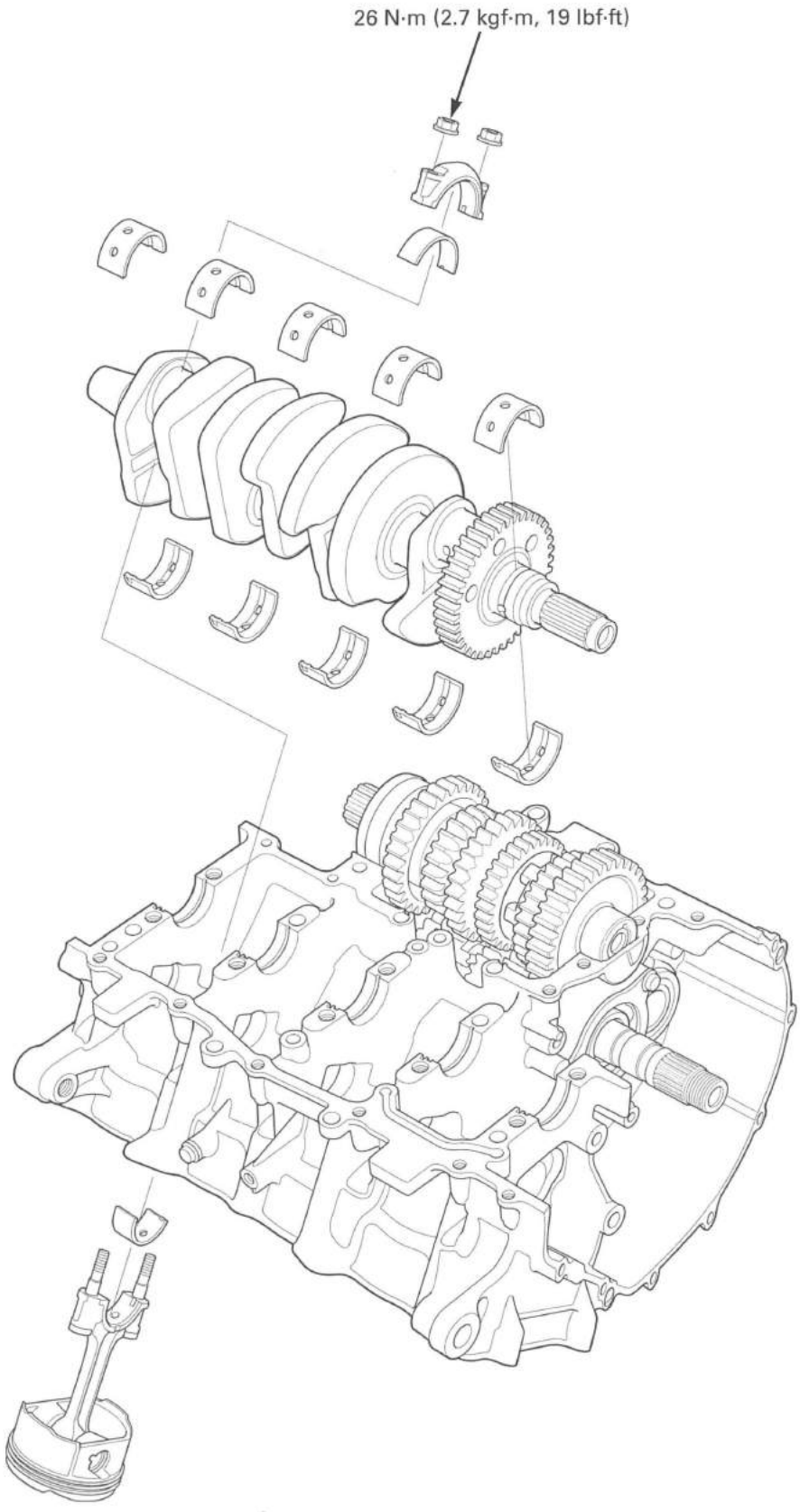
Install the oil level plate and tighten the bolt securely.

Install the removed parts in the reverse order of removal.



12. CRANKSHAFT/PISTON/CYLINDER

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft, cylinder and piston/connecting rod. Refer to procedures for crankcase separation (page 11-5).
- Mark and store the connecting rods, bearing caps and bearing inserts to be sure of their correct locations for reassembly.
- The crankpin and main journal bearing inserts are select fit and are identified by color codes. Select replacement bearings from the code tables. After selecting new bearings, recheck the oil clearance with a plastigauge. Incorrect oil clearance can cause major engine damage.
- Clean the oil jets in the upper crankcase with compressed air before installing the pistons.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance		0.15 – 0.30 (0.006 – 0.012)	0.35 (0.014)
	Crankpin bearing oil clearance		0.028 – 0.052 (0.0011 – 0.0020)	0.06 (0.002)
	Main journal bearing oil clearance		0.020 – 0.038 (0.0008 – 0.0015)	0.05 (0.002)
	Runout		–	0.05 (0.002)
Piston, piston rings	Piston O.D. at 6 (0.2) from bottom		66.965 – 66.985 (2.6364 – 2.6372)	66.90 (2.634)
	Piston pin bore I.D.		16.002 – 16.008 (0.6300 – 0.6302)	16.02 (0.631)
	Piston pin O.D.		15.994 – 16.000 (0.6297 – 0.6299)	15.98 (0.629)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)
	Piston ring end gap	Top	0.10 – 0.20 (0.004 – 0.008)	0.4 (0.02)
		Second	0.21 – 0.31 (0.008 – 0.012)	0.5 (0.02)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	1.0 (0.04)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.060 (0.0012 – 0.0024)	0.10 (0.004)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.08 (0.003)
Cylinder	I.D.		67.000 – 67.015 (2.6378 – 2.6384)	67.10 (2.642)
	Out of round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.10 (0.004)
Cylinder-to-piston clearance			0.015 – 0.050 (0.0006 – 0.0022)	0.10 (0.004)
Connecting rod small end I.D.			16.030 – 16.044 (0.6311 – 0.6317)	16.05 (0.632)
Connecting rod-to-piston pin clearance			0.030 – 0.05 (0.0012 – 0.0020)	0.07 (0.003)

TORQUE VALUES

Connecting rod bearing cap nut	26 N·m (2.7 kgf·m, 19 lbf·ft)	Apply engine oil to the threads and seating surface.
Crankcase 8 mm bolt (main journal bolt)	15 N·m (1.5 kgf·m, 11 lbf·ft) + 120°	See page 11-16 Replace with a new one.

TROUBLESHOOTING

Cylinder compression is too low, hard to starting or poor performance at low speed
- Leaking cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston

Cylinder compression too high, overheating or knocking
- Excessive carbon built-up on piston head or combustion chamber

Excessive smoke
- Worn cylinder, piston or piston ring
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

Abnormal noise
- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Worn cylinder, piston or piston rings
- Worn main journal bearings
- Worn crankpin bearings

Engine vibration
- Excessive crankshaft runout

CRANKSHAFT

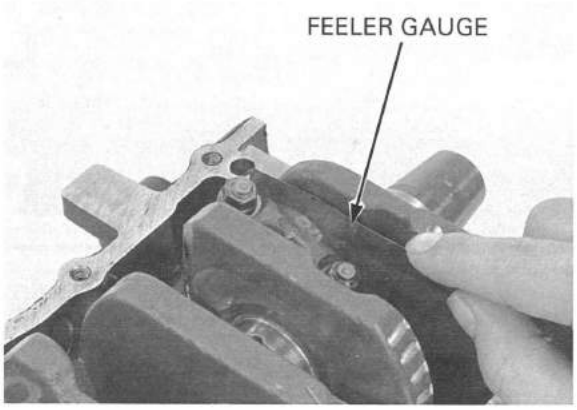
Separate the crankcase halves (page 11-5).

SIDE CLEARANCE INSPECTION

Measure the connecting rod side clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)

If the clearance exceeds the service limit, replace the connecting rod.
Recheck and if still out of limit, replace the crankshaft.



REMOVAL

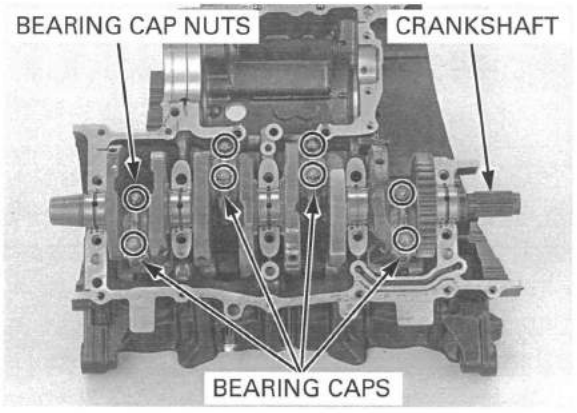
NOTICE

- *Before removal, position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod.*
- *Do not interchange the bearing inserts. they must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.*

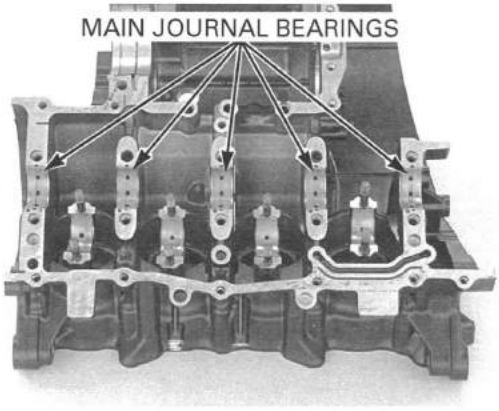
Mark the bearing caps and bearings as you remove them to indicate the correct cylinder for reassembly.

Remove the connecting rod bearing cap nuts and bearing caps.
Tap the side of the cap lightly if the bearing cap is hard to remove.

Remove the crankshaft.



Remove the main journal bearings from both the crankcase halves.

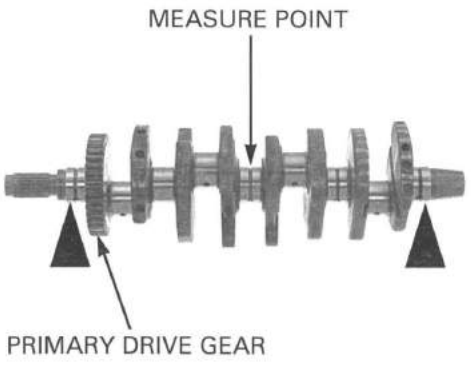


INSPECTION

Support the crankshaft on both end journals.
Set a dial gauge on the center main journal of the crankshaft.
Rotate the crankshaft two revolutions and read the runout.

SERVICE LIMIT: 0.05 mm (0.002 in)

Check the primary drive gear teeth for abnormal wear or damage.



INSTALLATION

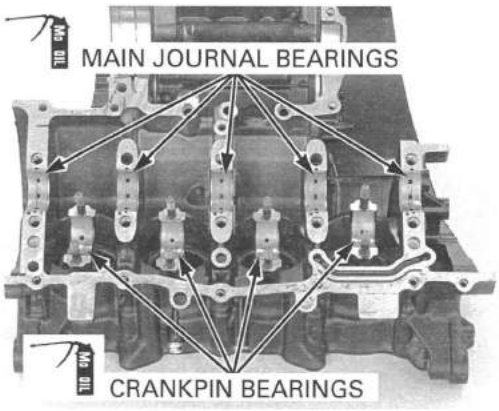
Apply molybdenum oil solution to the main journal bearing sliding surfaces on the upper crankcase and the crankpin bearing sliding surfaces on the connecting rods.

The bearing tabs should be aligned with the grooves in the crankcase.

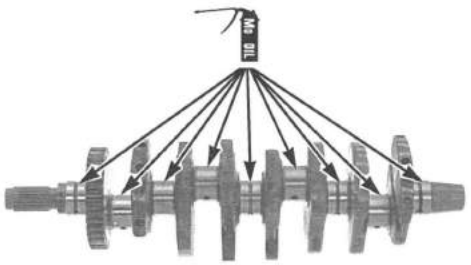
Install the main journal bearings into the upper crankcase.

NOTICE

Do not interchange the bearing inserts. they must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.



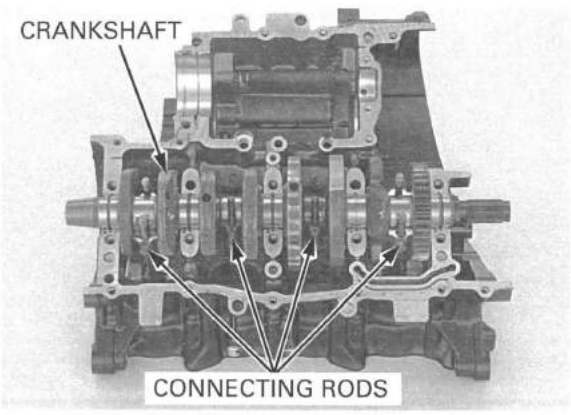
Apply molybdenum oil solution to the thrust surfaces of the crankshaft as shown.



NOTICE

Position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod.

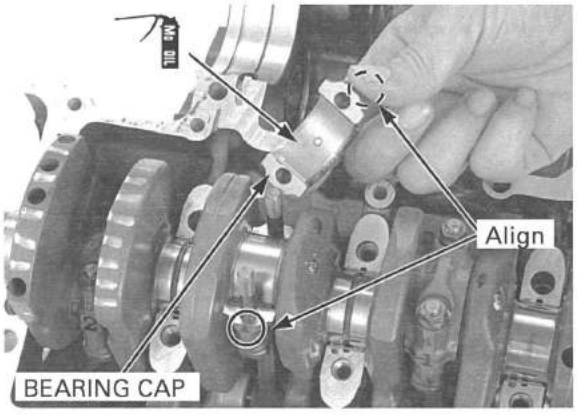
Install the crankshaft onto the upper crankcase.
Set the connecting rods onto the crankpins.



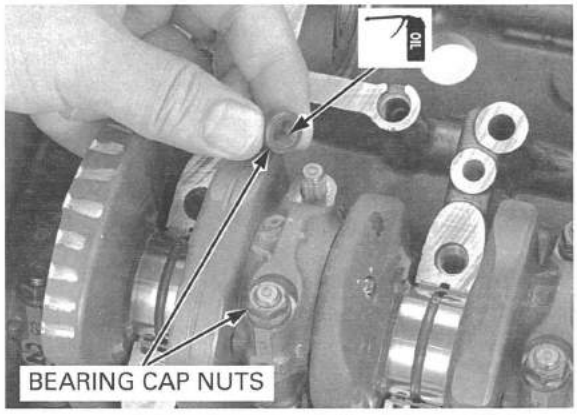
Apply molybdenum oil solution to the crankpin bearing sliding surfaces on the connecting rod bearing caps.

Install the connecting rod bearing caps by aligning the I.D. code on the connecting rod and bearing cap.

Be sure each part is installed in its original position, as noted during removal.



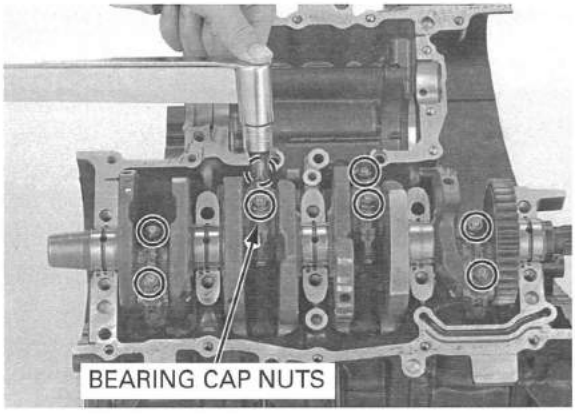
Apply engine oil to the connecting rod bearing cap nut threads and seating surfaces, and install them.



Tighten the nuts in two or three steps alternately, then tighten the nuts to the specified torque.

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)

Assemble the upper and lower crankcase (page 11-15).



MAIN JOURNAL BEARING

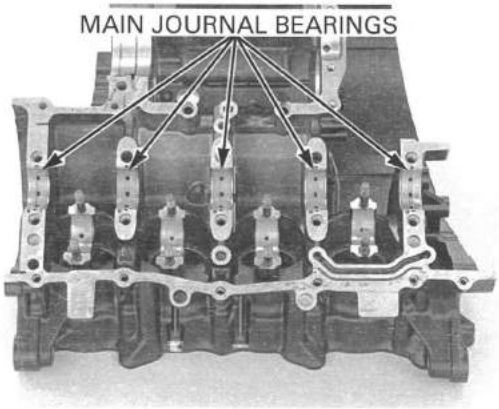
NOTICE

Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

Remove the crankshaft (page 12-5).

BEARING INSPECTION

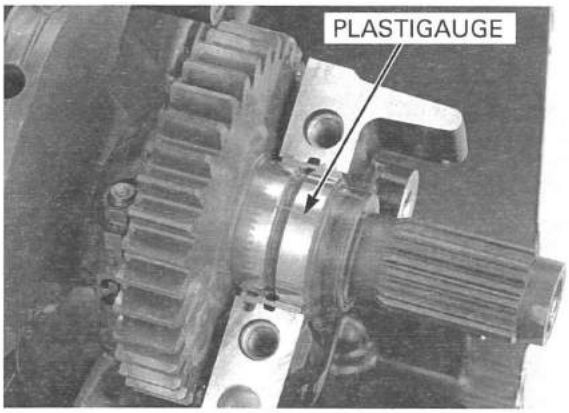
Inspect the main journal bearing inserts on the upper and lower crankcase halves for unusual wear or peeling.
Check the bearing tabs for damage.



OIL CLEARANCE INSPECTION

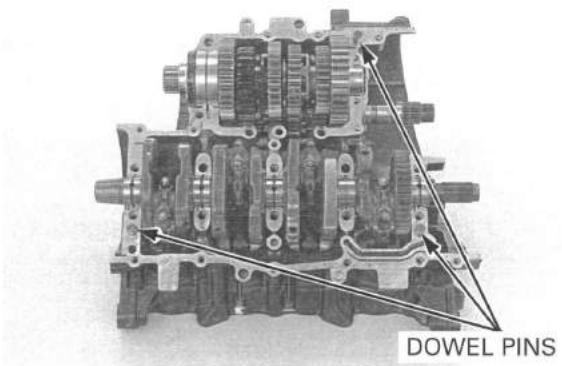
Clean off any oil from the bearing inserts and main journals.
Install the crankshaft onto the upper crankcase.
Put a strip of plastigauge lengthwise on each main journal avoiding the oil hole.

- Do not rotate the crankshaft during inspection.



Install the dowel pins in the upper crankcase.

Install the lower crankcase onto the upper crankcase.



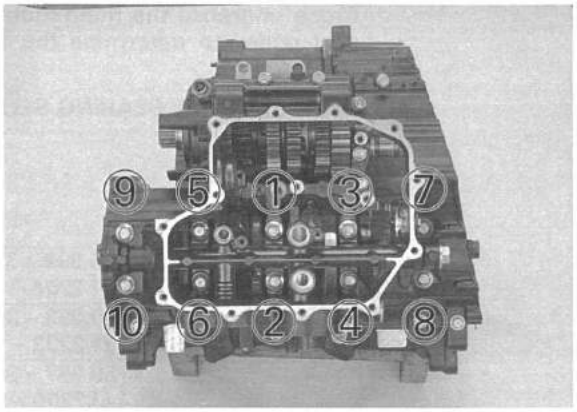
PLASTIC REGION TIGHTENING METHOD:

Install the crankcase 8 mm bolts (main journal 8 mm bolts).
Loosely install all the crankcase bolts.
Make sure the upper and lower crankcase are seated securely.

Tighten the crankcase 8 mm bolts (main journal bolts) as follow:

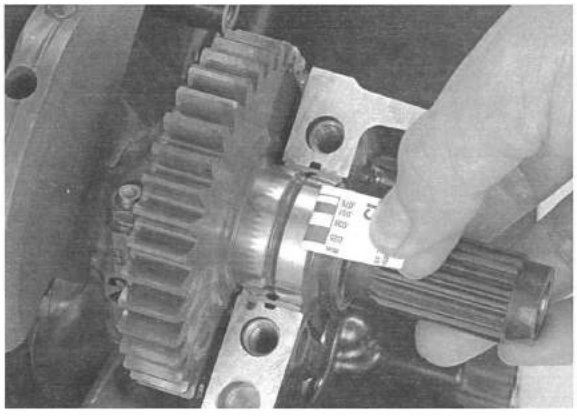
Tighten the crankcase 8 mm bolts (main journal bolts) in numerical order in the illustration in two to three steps to the specified torque.

Further tighten the crankcase 8 mm bolts (main journal bolts) 120-degrees.



TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft) + 120°

Remove the crankcase 8 mm bolts (main journal bolts) and lower crankcase, measure the compressed plastigauge at its widest point on each main journal to determine the oil clearance.



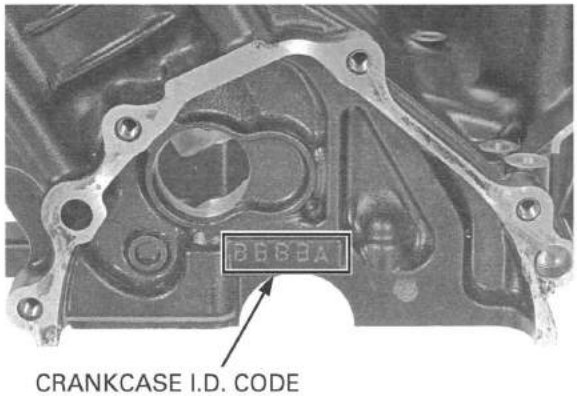
SERVICE LIMIT: 0.05 mm (0.002 in)

If the oil clearance exceeds the service limit, select a replacement bearing.

BEARING SELECTION

Letters (A, B or C) on the left side of upper crankcase are the codes for the bearing support I.D.s from left to right.

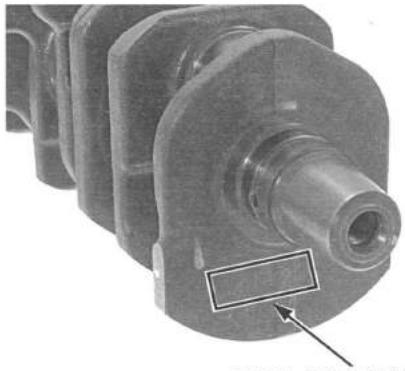
Record the crankcase bearing support I.D. code letters from the pad on the left side of the upper crankcase as shown.



CRANKCASE I.D. CODE

Numbers (1, 2 or 3) on the crank weight are the codes for the main journal O.D.s from left to right.

Record the corresponding main journal O.D. code numbers from the crank weight.



MAIN JOURNAL O.D. CODE

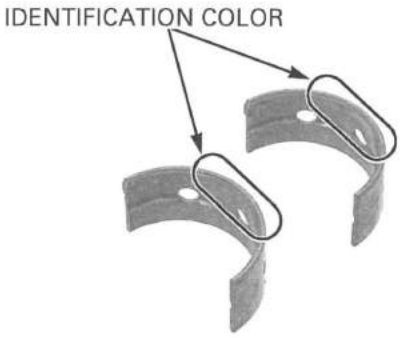
Cross reference the main journal and bearing support codes to determine the replacement bearing color code.

MAIN JOURNAL BEARING SELECTION TABLE:

			BEARING SUPPORT I.D.CODE		
			A	B	C
			34.000 – 34.006 mm (1.3386 – 1.3388 in)	34.006 – 34.012 mm (1.3388 – 1.3391 in)	34.012 – 34.018 mm (1.3391 – 1.3393 in)
MAIN JOURNAL O.D. CODE	1	30.999 – 31.005 mm (1.2204 – 1.2207 in)	Pink	Yellow	Green
	2	30.993 – 30.999 mm (1.2202 – 1.2204 in)	Yellow	Green	Brown
	3	30.987 – 30.993 mm (1.2200 – 1.2202 in)	Green	Brown	Black

BEARING THICKNESS:

Black: **Thickest**
Brown:
Green: ↕
Yellow:
Pink: **Thinnest**

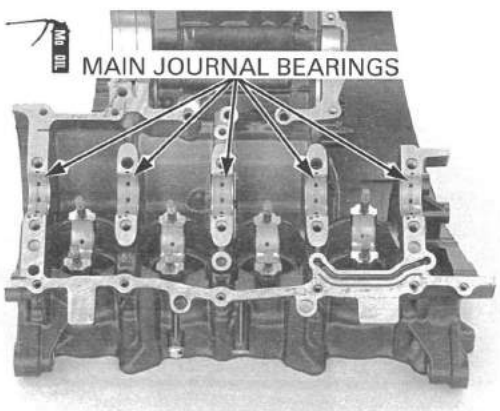


NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces and crankcase bearing supports.
Apply molybdenum oil solution to the main journal bearing sliding surfaces on the upper crankcase.
Install the main journal bearing inserts onto the crankcase bearing supports, aligning each tabs with each grooves.



CRANKPIN BEARING

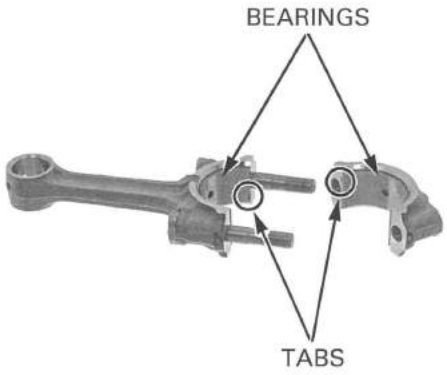
NOTICE

Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

Remove the crankshaft (page 12-5).

BEARING INSPECTION

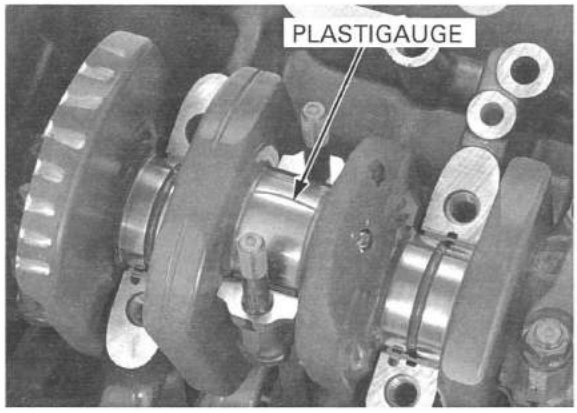
Check the bearing inserts for unusual wear or peeling.
Check the bearing tabs for damage.



OIL CLEARANCE INSPECTION

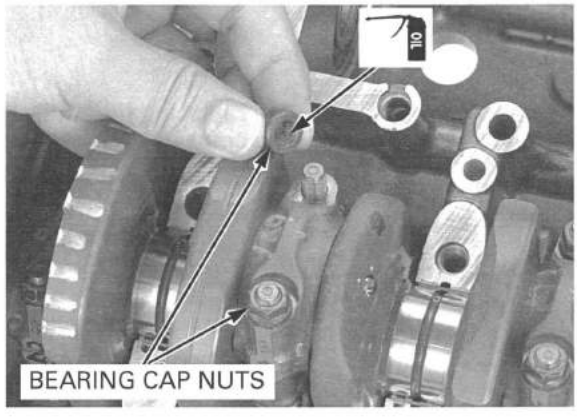
Clean off any oil from the bearing inserts and crankpins.
Carefully install the crankshaft onto the upper crankcase.
Set the connecting rods onto the crankpins.
Put a strip of plastigauge lengthwise on each crankpin avoiding the oil hole.

- Do not rotate the crankshaft during inspection.



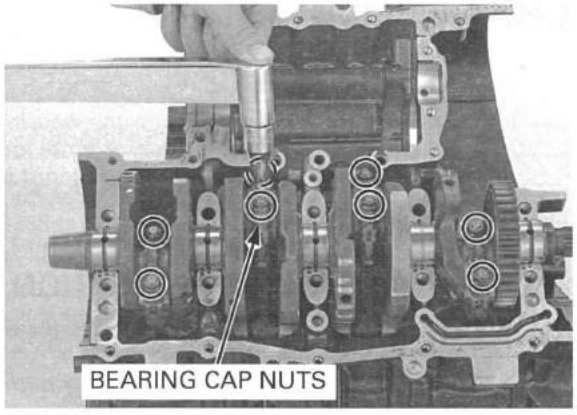
Carefully install the connecting rod bearing caps by aligning the I.D. code.

Apply engine oil to the connecting rod bearing cap nut threads and seating surfaces, and install them.



Tighten the nuts in two or three steps alternately, then tighten the nuts to the specified torque.

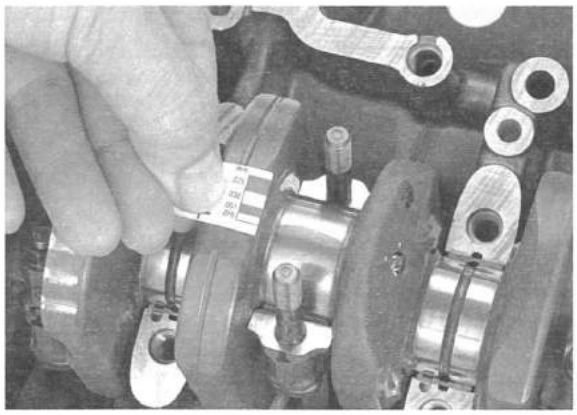
TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)



Remove the bearing caps and measure the compressed plastigauge at its widest point on the crankpin to determine the oil clearance.

SERVICE LIMIT: 0.06 mm (0.002 in)

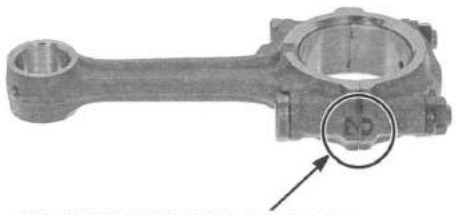
If the oil clearance exceeds the service limit, select the correct replacement bearings.



BEARING SELECTION

Numbers (1 or 2) on the connecting rods are the codes for the connecting rod I.D.

Record the connecting rod I.D. code number (1 or 2) or measure the I.D. with the connecting rod bearing cap installed without bearing inserts.



Letters (A or B) on the crankweight are the codes for the crankpin O.D.s from left to right.

If you are replacing the crankshaft, record the corresponding crankpin O.D. code letter (A or B).

If you are reusing the crankshaft, measure the crankpin O.D. with the micrometer.

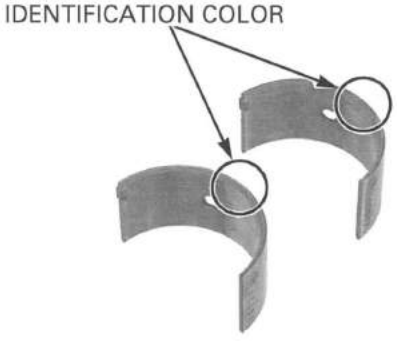
Cross-reference the connecting rod and crankpin codes to determine the replacement bearing color.

CRANKPIN BEARING SELECTION TABLE:

			CONNECTING ROD I.D.CODE	
			1	2
			33.500 – 33.508 mm (1.3189 – 1.3192 in)	33.508 – 33.516 mm (1.3192 – 1.3195 in)
CRANK PIN O.D.CODE	A	30.995 – 31.003 mm (1.2203 – 1.2206 in)	Yellow	Green
	B	30.984 – 30.995 mm (1.2198 – 1.2203 in)	Green	Brown

BEARING THICKNESS:

Brown: **Thickest**
Green: ↕
Yellow: **Thinnest**

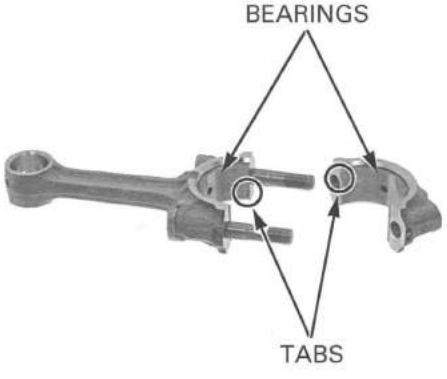


NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces, connecting rod bearing cap and connecting rod.
Install the crankpin bearing inserts onto the bearing cap and connecting rod, aligning each tab with each groove.



PISTON/CYLINDER

PISTON/CONNECTING ROD REMOVAL

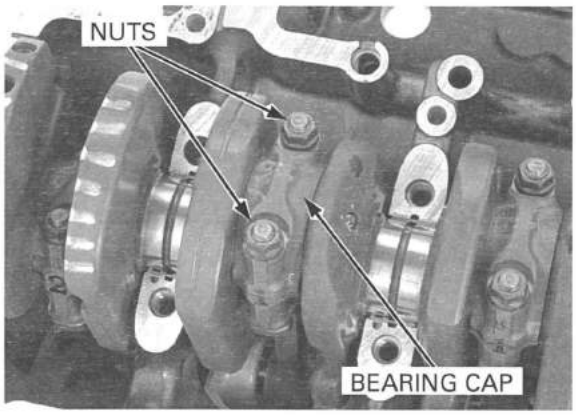
NOTICE

- *This motorcycle is equipped with aluminum cylinder sleeves. Before piston removal, place a clean shop towel around the connecting rod to prevent damaging the cylinder sleeve.*
- *Do not try to remove the piston/connecting rod assembly from bottom of the cylinder; the assembly will get stuck in the gap between the cylinder liner and the upper crankcase.*
- *Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.*

Separate the crankcase halves (page 11-5).

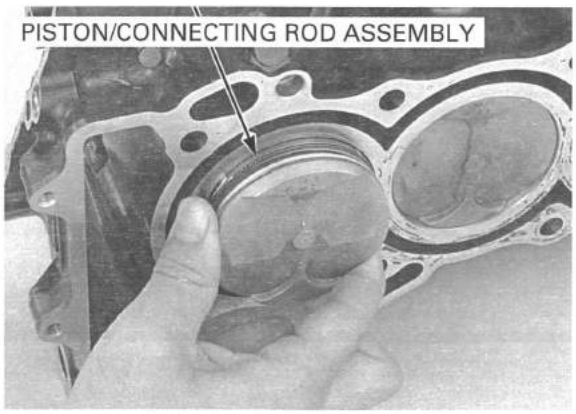
Mark all parts as you remove them to indicate the correct cylinder for reassembly.

Remove the nuts and connecting rod bearing caps.



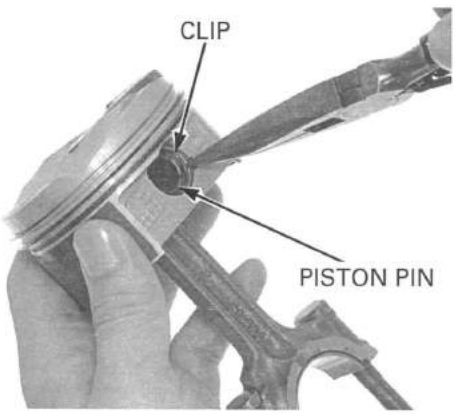
Do not try to remove the connecting rod/piston assembly from the bottom of the cylinder; the assembly will be locked so that the oil ring expands in the gap between the cylinder liner and the upper crankcase.

Remove the piston/connecting rod assembly from the top of the cylinder.



PISTON REMOVAL

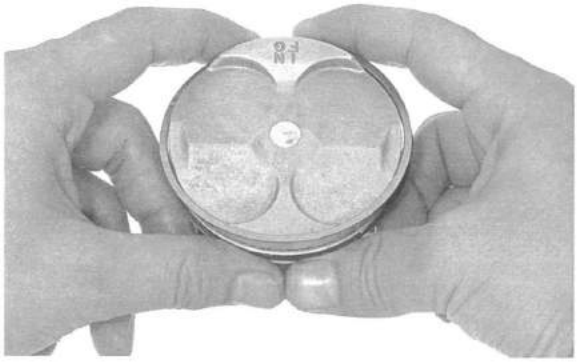
Remove the piston pin clip with pliers.
Push the piston pin out of the piston and connecting rod, and remove the piston.



PISTON DISASSEMBLY

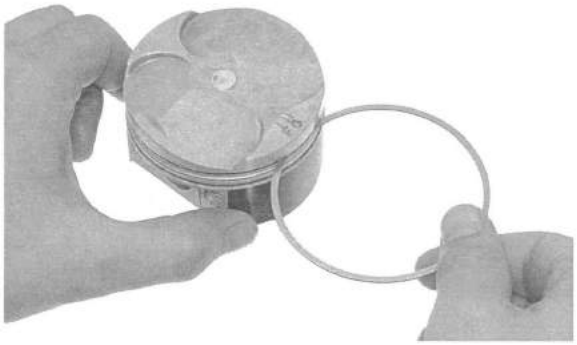
Be careful not to damage the piston ring by spreading the ends too far.

Spread each piston ring ends and remove them by lifting up at a point opposite the gap.



Never use a wire brush; it will scratch the groove.

Clean carbon deposits from the piston ring grooves with a ring that will be discarded.



PISTON INSPECTION

Inspect the piston rings for movement by rotating the rings. The rings should be able to move in their grooves without catching.

Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the ring-to-ring groove clearance.

SERVICE LIMITS:

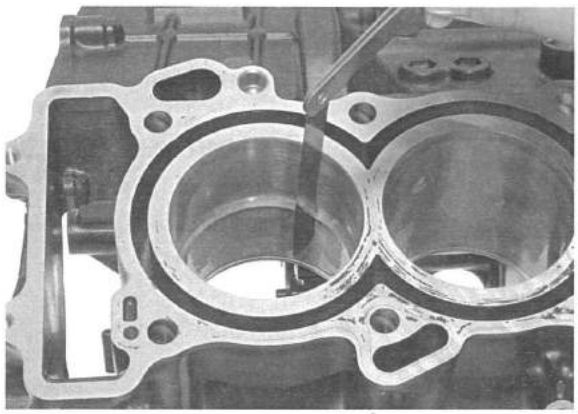
Top:	**0.10 mm (0.004 in)**
Second:	**0.08 mm (0.003 in)**

Push the rings into the cylinder with the top of the piston to be sure they are squarely in the cylinder.

Insert the piston ring squarely into the top of the cylinder and measure the ring end gap.

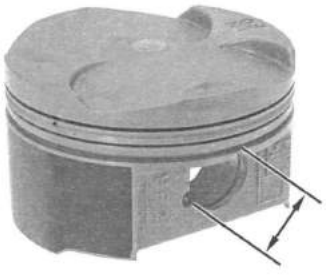
SERVICE LIMITS:

Top:	**0.4 mm (0.02 in)**
Second:	**0.5 mm (0.02 in)**
Oil (side rail):	**1.0 mm (0.04 in)**



Measure the piston pin bore.

SERVICE LIMIT: 16.02 mm (0.631 in)

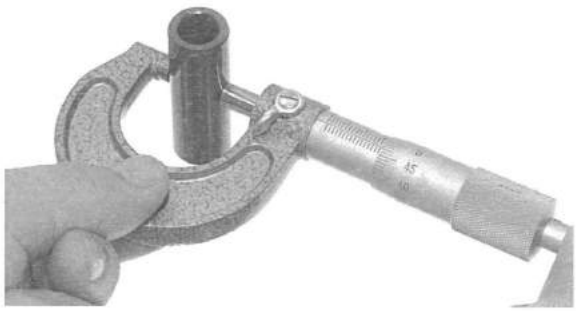


Measure the O.D. of the piston pin.

SERVICE LIMIT: 15.98 mm (0.629 in)

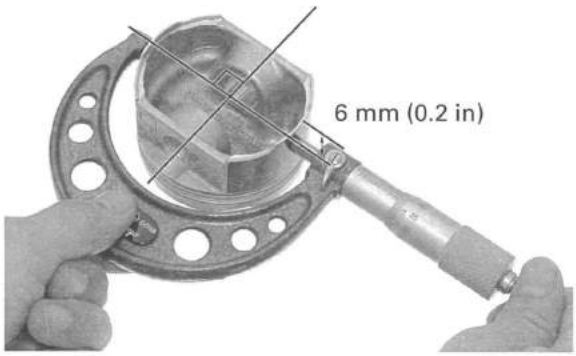
Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.04 mm (0.002 in)



Measure the diameter of the piston at 6 mm (0.2 in) from the bottom and 90 degrees to the piston pin hole.

SERVICE LIMIT: 66.90 mm (2.634 in)



CONNECTING ROD INSPECTION

Measure the connecting rod small end I.D.

SERVICE LIMIT: 16.05 mm (0.632 in)

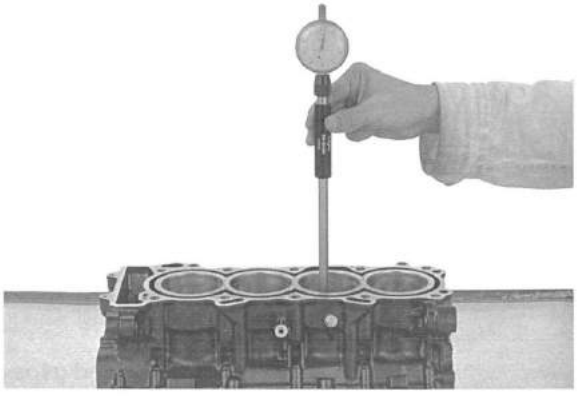
Calculate the connecting rod-to-piston pin clearance.

SERVICE LIMIT: 0.07 mm (0.003 in)

CYLINDER INSPECTION

Inspect the cylinder bore for wear or damage.
Measure the cylinder I.D. in X and Y axis at three levels.
Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 67.10 mm (2.642 in)

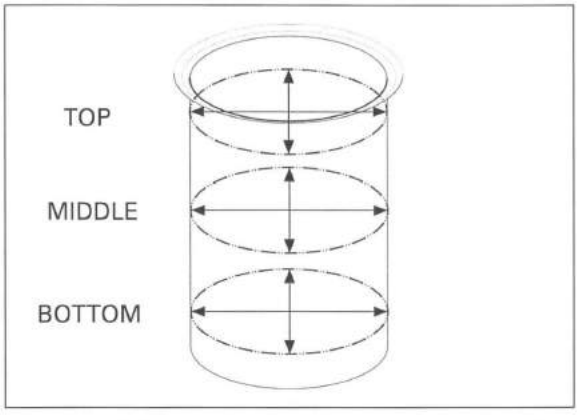


Calculate the piston-to-cylinder clearance.
Take a maximum reading to determine the clearance.
Refer to the procedures for measurement of the piston O.D. (page 12-16).

SERVICE LIMIT: 0.10 mm (0.004 in)

Calculate the taper and out-of-round at three levels in X and Y axis. Take the maximum reading to determine them.

SERVICE LIMITS:
Taper: 0.10 mm (0.004 in)
Out-of-round: 0.10 mm (0.004 in)



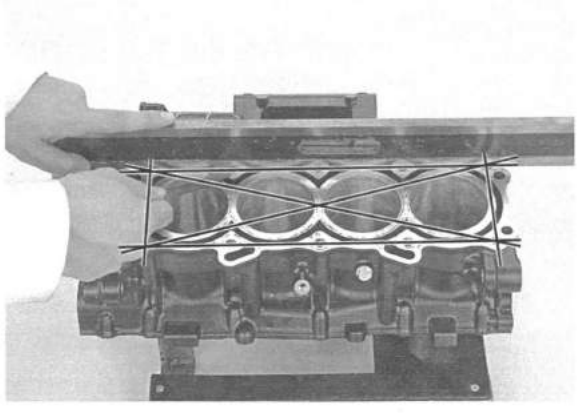
The cylinder must be rebored and an oversize piston fitted if the service limits are exceeded.

The following oversize piston is available:
0.25 mm (0.010 in)

The piston to cylinder clearance for the oversize piston must be: 0.015 – 0.050 mm (0.0006 – 0.0020 in).

Inspect the top of the cylinder for warpage.

SERVICE LIMIT: 0.10 mm (0.004 in)



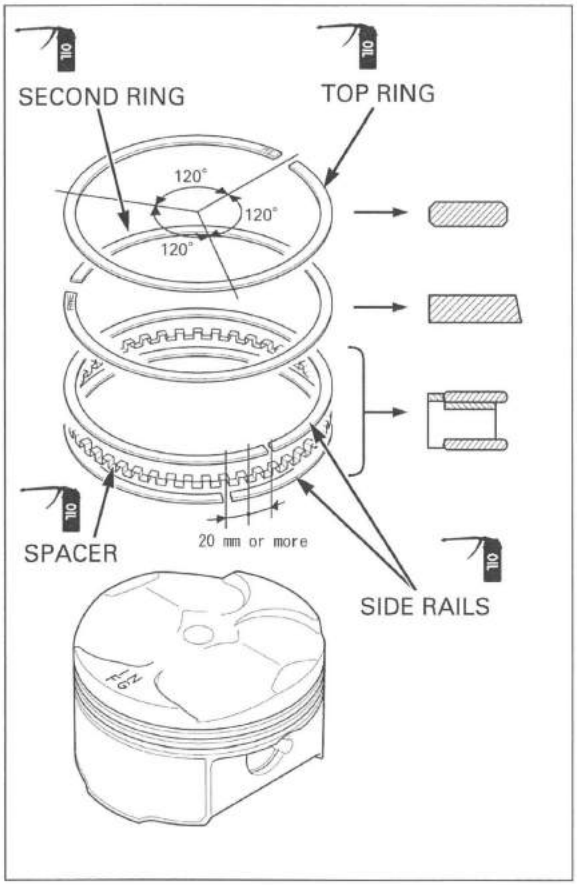
PISTON ASSEMBLY

Clean the piston ring grooves thoroughly and install the piston rings.

- Apply engine oil to the piston rings.
- Avoid piston and piston ring damage during installation.
- Install the piston rings with the marking (RE: top ring, RNE: second ring) facing up.
- Do not mix the top and second rings; top ring is narrower than the second ring in width.
- To install the oil ring, install the spacer first, then install the side rails.

Stagger the piston ring end gaps 120° apart from each other.
Stagger the side rail end gaps as shown.

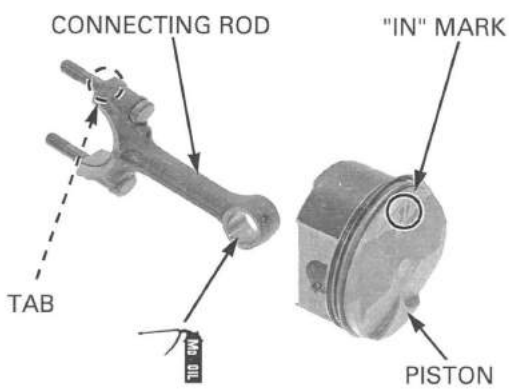
After installation, the rings should rotate freely in the ring groove.



PISTON INSTALLATION

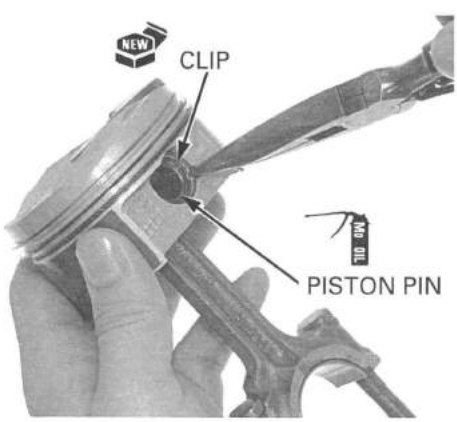
Apply molybdenum oil solution to the connecting rod small end inner surfaces and piston pin outer surfaces.

Assemble the piston and connecting rod with the journal bearing tab facing to the piston "IN" mark.



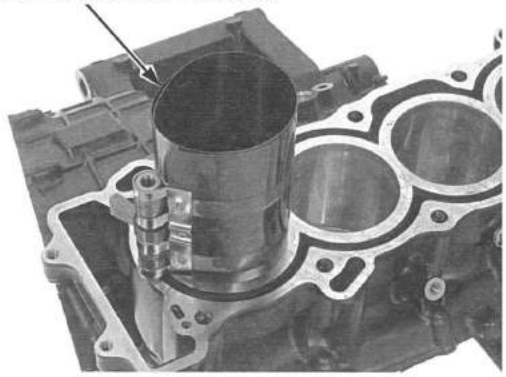
Install the piston pin and secure it using new piston pin clips.

- Make sure that the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cut-out.



Coat the cylinder walls, pistons and piston rings with engine oil.

PISTON RING COMPRESSOR



Install the piston/connecting rod assembly with the piston "IN" mark facing the intake side.

Install the piston/connecting rod assemblies into the cylinders using a commercially available piston ring compressor tool.
When reusing the connecting rods, they must be installed in their original locations.

NOTICE

- *While installing the piston, be careful not to damage the top surface of the cylinder, especially around the cylinder bore.*
- *Be careful not to damage the cylinder sleeve and crankpin with the connecting rod.*

Make sure the piston ring compressor tool sits flush on the top surface of the cylinder.

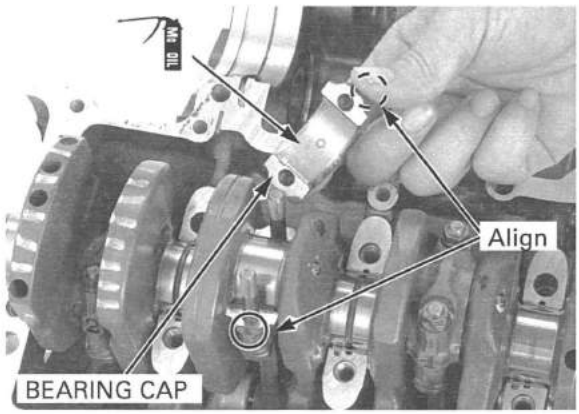
Use the handle of a plastic hammer or equivalent tool to tap the piston into the cylinder.

Install the crankshaft (page 12-6).

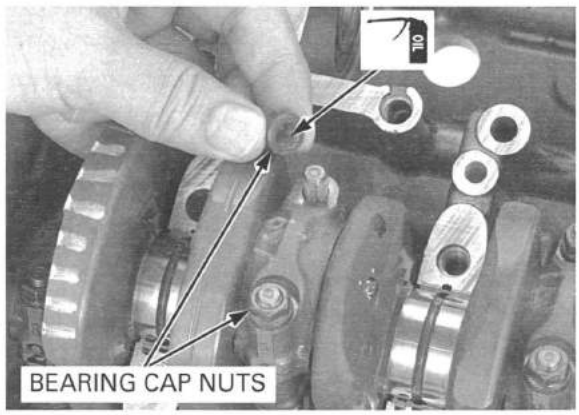
Apply molybdenum oil solution to the crankpin bearing sliding surfaces on the connecting rod bearing caps.

Install the connecting rod bearing caps by aligning the I.D. code on the connecting rod and bearing cap.

Be sure each part is installed in its original position, as noted during removal.



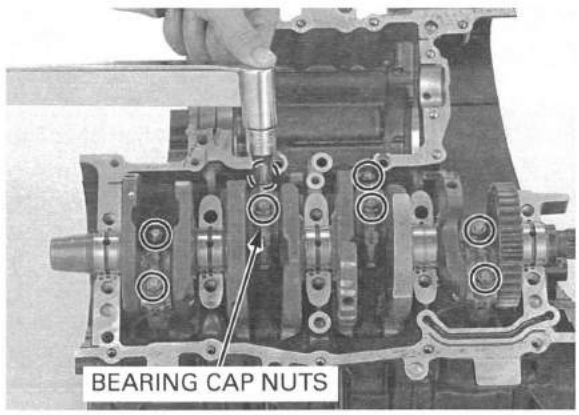
Apply engine oil to the connecting rod bearing cap nut threads and seating surfaces, and install them.



Tighten the bolts in two or three steps alternately, then tighten the nuts to the specified torque.

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)

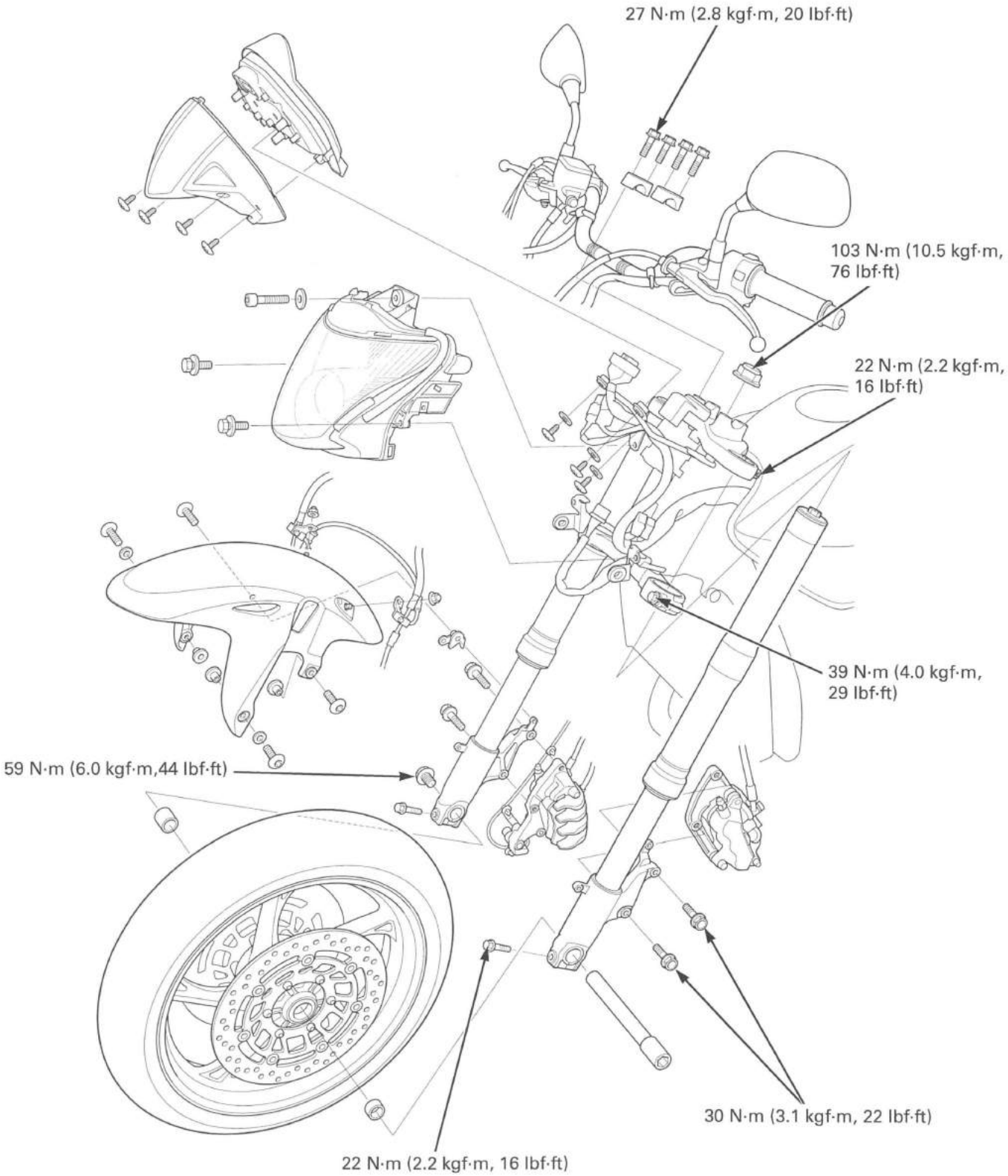
Assemble the crankcase halves (page 11-15).



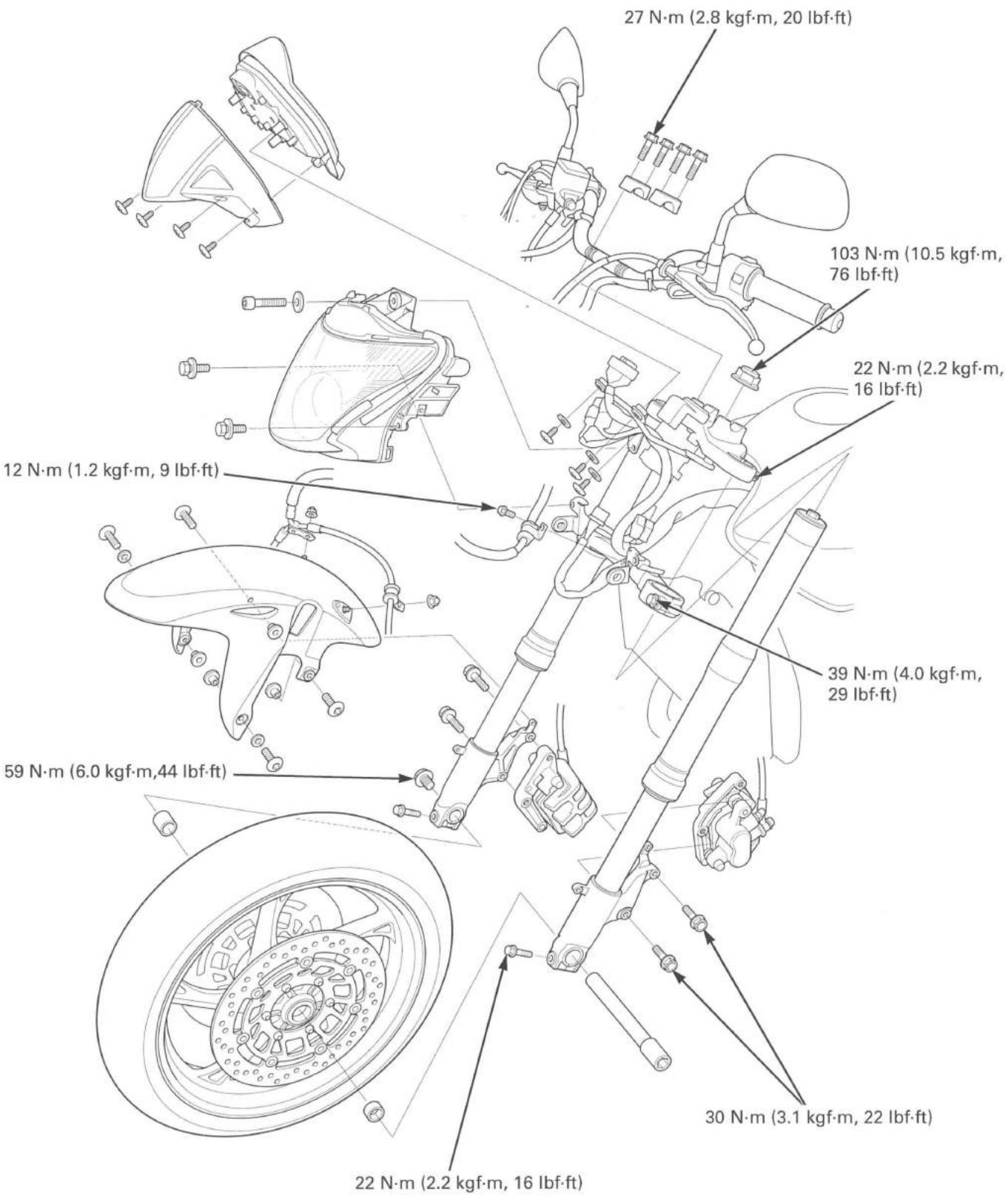
13. FRONT WHEEL/SUSPENSION/STEERING

COMPONENT LOCATION

CB600FA:



CB600F:


27 N·m (2.8 kgf·m, 20 lbf·ft)
103 N·m (10.5 kgf·m, 76 lbf·ft)
22 N·m (2.2 kgf·m, 16 lbf·ft)
12 N·m (1.2 kgf·m, 9 lbf·ft)
39 N·m (4.0 kgf·m, 29 lbf·ft)
59 N·m (6.0 kgf·m,44 lbf·ft)
30 N·m (3.1 kgf·m, 22 lbf·ft)
22 N·m (2.2 kgf·m, 16 lbf·ft)

SERVICE INFORMATION

GENERAL

- When servicing the front wheel, fork or steering stem, support the motorcycle using a safety stand or hoist.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After the front wheel installation, check the brake operation by applying the brake lever.
- Refer to the brake system information (page 15-4).
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".

SPECIFICATIONS

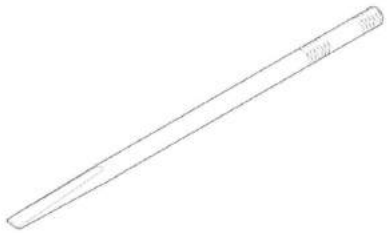
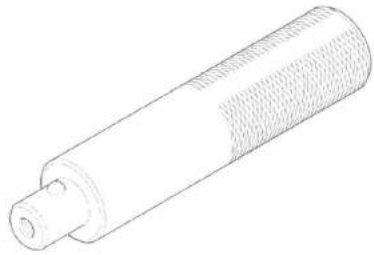
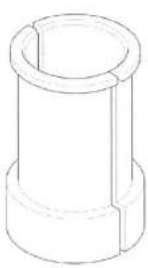
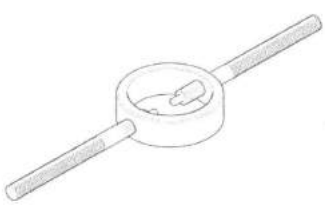
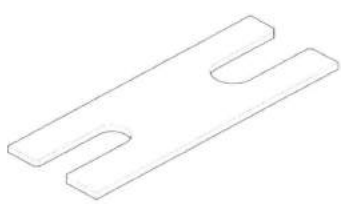
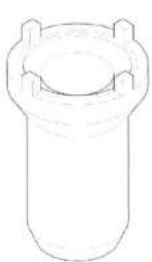
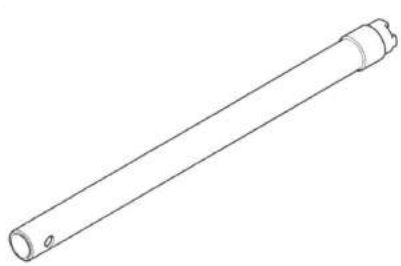
Unit: mm (in)

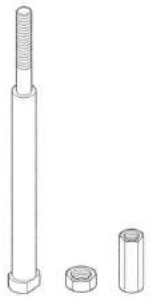
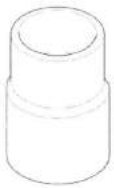
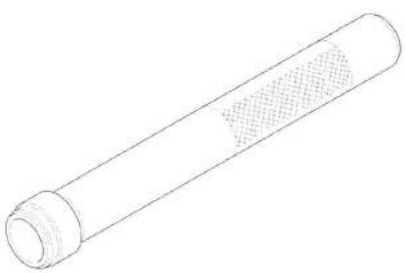
ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	1.5 (0.06)
Cold tire pressure	Driver only	250 kPa (2.50 kgf/cm^2, 36 psi)	–
	Driver and passenger	250 kPa (2.50 kgf/cm^2, 36 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel balance weight		–	60 g (2.1oz) max.
Fork	Spring free length	245.7 (9.67)	240.8 (9.48)
	Pipe runout	–	0.20 (0.008)
	Recommended fork fluid	Honda Ultra Cushion Oil 10W or equivalent	–
	Fluid level	70 (2.8)	–
	Fluid capacity	494 ± 2.5 cm^3 (16.7 ± 0.08 US oz, 17.4 ± 0.09 Imp oz)	–
Steering head bearing pre-load		8.8 – 13.7 N (0.9 – 1.4 kgf, 2.0 – 3.1 lbf)	–

TORQUE VALUES

Handlebar holder bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)	
Steering stem adjusting lock nut	See page 13-37	
Steering stem adjusting nut	26 N·m (2.7 kgf·m, 19 lbf·ft)	Apply engine oil to the threads.
Steering stem nut	103 N·m (10.5 kgf·m, 76 lbf·ft)	
Bottom bridge pinch bolt	39 N·m (4.0 kgf·m, 29 lbf·ft)	
Top bridge pinch bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Fork bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Fork bolt lock nut	20 N·m (2.0 kgf·m, 15 lbf·ft)	
Fork socket bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)	Apply a locking agent to the threads.
Front axle pinch bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Front axle bolt	59 N·m (6.0 kgf·m, 44 lbf·ft)	
Front brake disc mounting bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)	ALOC bolt; replace with a new one.
Front brake master cylinder holder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt; replace with a new one.
Front brake hose clamp bolt		
CB600FA:	10 N·m (1.0 kgf·m, 7 lbf·ft)	
CB600F:	12 N·m (1.2 kgf·m, 9 lbf·ft)	ALOC bolt; replace with a new one.
Front pulser ring mounting bolt (CB600FA)	7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)	ALOC bolt; replace with a new one.

TOOLS

Bearing remover shaft 07GGD-0010100  or 07746-0050100	Bearing remover head, 20 mm 07746-0050600 	Driver 07749-0010000 
Attachment, 42 X 47 mm 07746-0010300 	Pilot, 20 mm 07746-0040500 	Fork seal driver weight 07KMD-KZ30100 
Oil seal driver attachment 07RMD-MW40100 	Spring collar holder 070MF-MBZC110  NOTE This tool is a part of fork damper install set (P/N 070MF-MBZC100).	Stopper plate 070MF-MBZC130  NOTE This tool is a part of fork damper install set (P/N 070MF-MBZC100).
Fork damper holder 070MF-MBZC120  NOTE This tool is a part of fork damper install set (P/N 070MF-MBZC100).	Steering stem socket 07916-3710101 	Fork damper holder attachment 07YMB-MCF0101 

Driver shaft assembly 07946-KM90301 	Bearing remover, A 07946-KM90401 	Assembly base 07946-KM90600 
Driver attachment (upper) 070MF-MCJ0100 	Driver attachment (lower) 070MF-MCJ0200 	Bearing remover, B 07NMF-MT70110 
Steering stem driver 07946-MB00000 		

TROUBLESHOOTING

Hard steering
- Steering head bearing adjustment nut too tight
- Faulty or damaged steering head bearings
- Bent steering stem
- Faulty tire
- Insufficient tire pressure

Steers to one side or does not track straight
- Damaged or loose steering head bearings
- Bent forks
- Bent axle
- Bent frame
- Wheel installed incorrectly
- Worn or damaged wheel bearings
- Worn or damaged swingarm pivot bearings

Front wheel wobbling
- Bent rim
- Worn or damaged front wheel bearings
- Faulty tire
- Unbalanced front tire and wheel

Front wheel turns hard
- Faulty front wheel bearing
- Bent front axle
- Front brake drag

Soft suspension
- Insufficient fluid in fork
- Incorrect fork fluid weight
- Weak fork springs
- Insufficient tire pressure

Hard suspension
- Bent fork tubes
- To much fluid in fork
- Incorrect fork fluid weight
- Clogged fork fluid passage

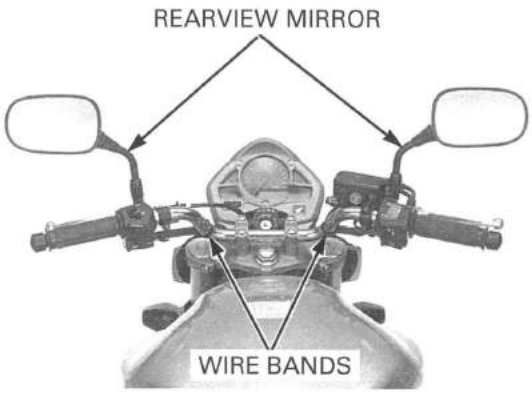
Front suspension noise
- Insufficient fluid in fork
- Loose fork fasteners

HANDLEBAR

REMOVAL

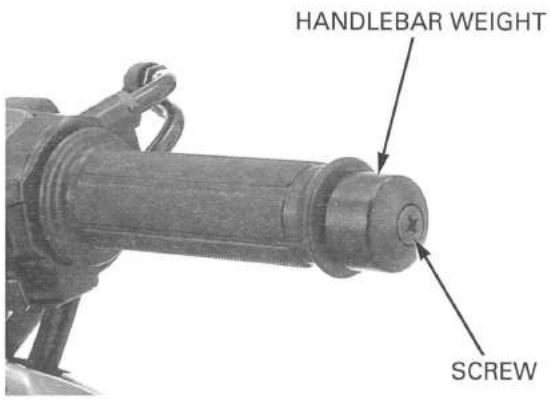
Remove the rearview mirrors.

Remove the wire bands.



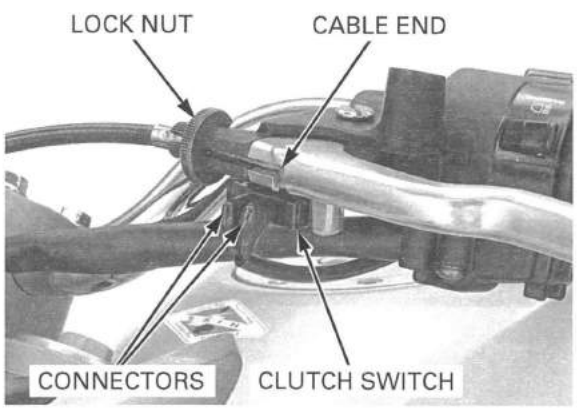
For inner weight replacement, see page 13-14.

Hold the handlebar weights and remove the screws, then remove both handlebar weights from the handlebar.

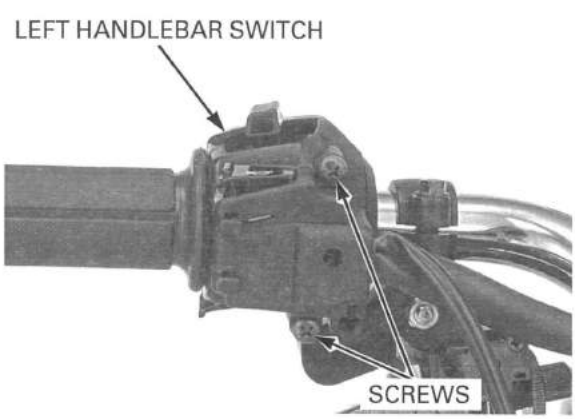


Disconnect the clutch switch wire connectors from the switch.

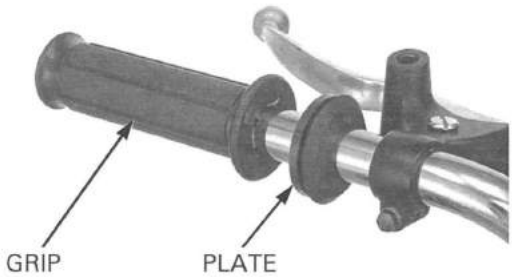
Loosen the lock nut and disconnect the clutch cable end from the clutch lever.



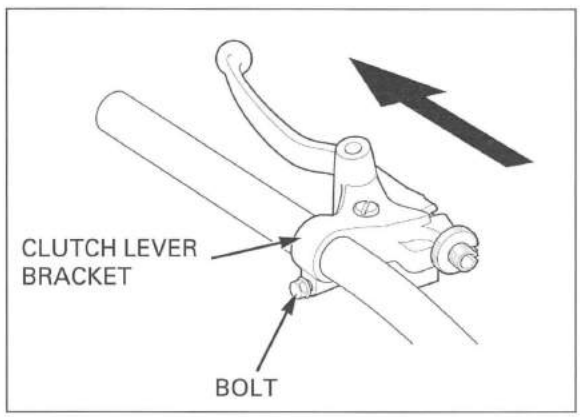
Remove the screws and left handlebar switch.



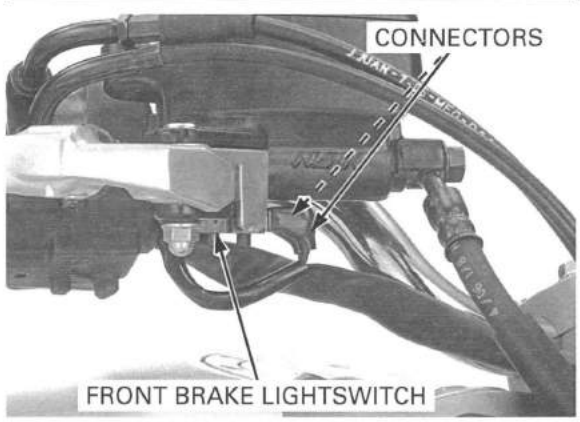
Remove the left handle grip and switch housing plate.



Loosen the bolt and remove clutch lever bracket from the handlebar.

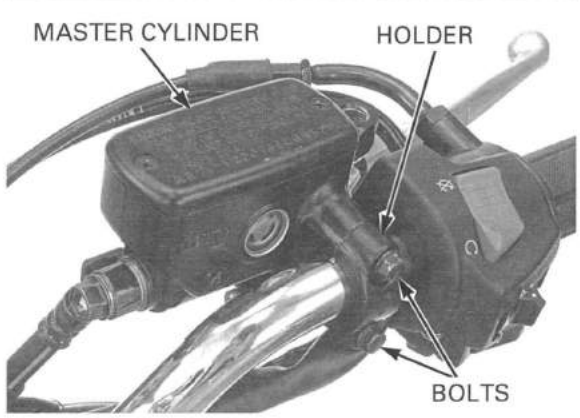


Disconnect the front brake light switch wire connectors from the switch.

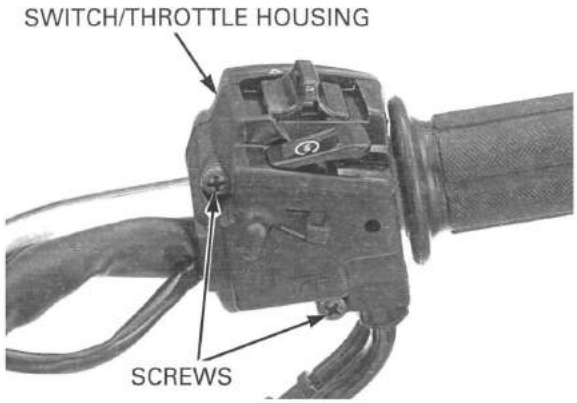


Keep the brake master cylinder upright to prevent air from entering the hydraulic system

Remove the master cylinder holder bolts, holder and master cylinder assembly.

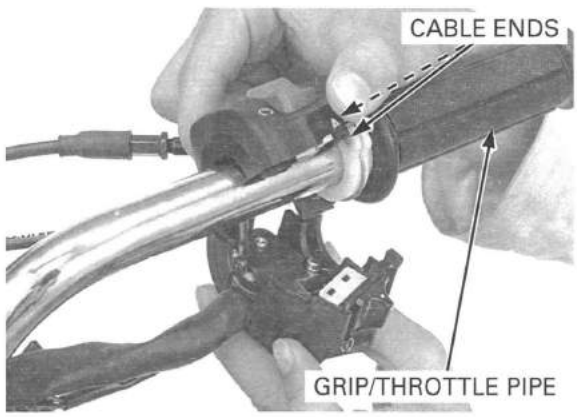


Remove the right handlebar switch/throttle housing screws.



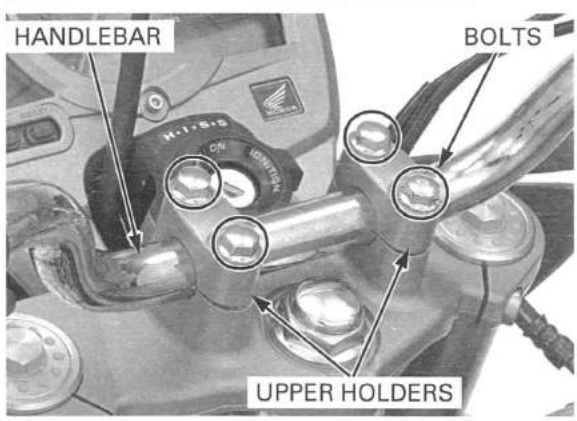
Disconnect the throttle cable ends from the throttle pipe and remove the right handlebar switch/throttle housing.

Remove the right handlebar grip/throttle pipe.



Remove the bolts and handlebar upper holders.

Remove the handlebar.



INSTALLATION

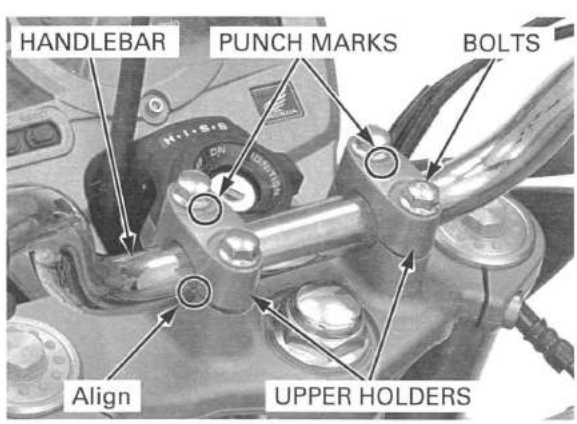
Place the handlebar on the lower holders aligning the punch mark on the handlebar with the edge of the lower holder.

Install the handlebar upper holders with its punch marks facing forward.

Install the holder bolts.

Tighten the front bolts first, then tighten the rear bolts to the specified torque.

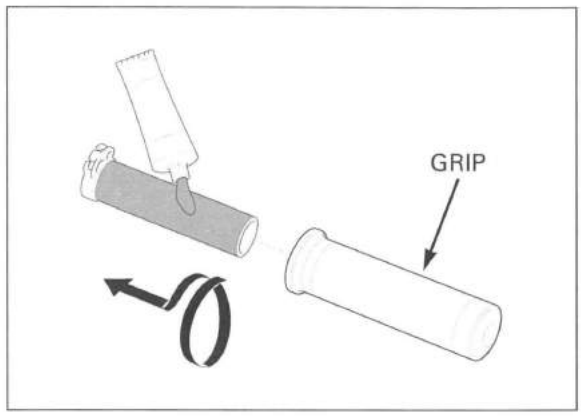
TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Apply Honda Bond A, Honda hand grip cement or equivalent to the inside surface of the right handlebar grip and to the clean surfaces of the throttle pipe.

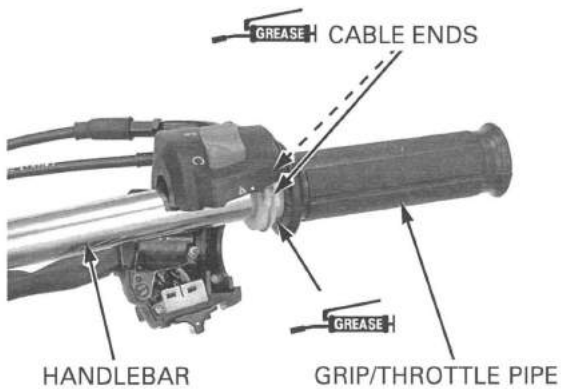
Allow the adhesive to dry for 1 hour before using.

Wait 3–5 minutes and install the grip. Rotate the grip for even application of the adhesive.

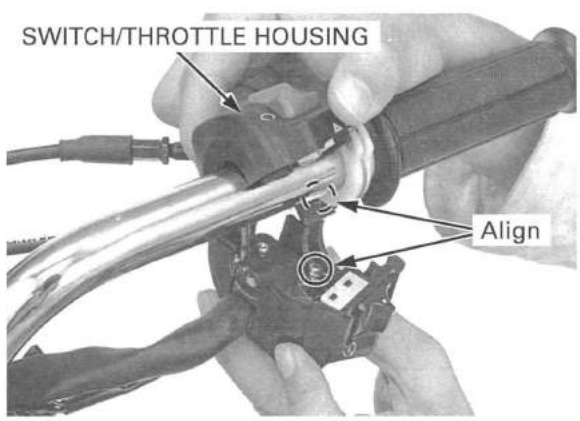


Apply grease to the throttle pipe flange groove and sliding areas.
Connect the throttle cables to the throttle pipe flange.

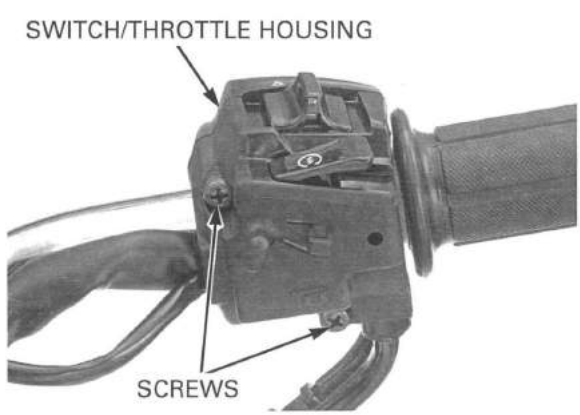
Install the throttle pipe onto the handlebar.



Install the right handlebar switch/throttle housing aligning its location pin with the hole in the handlebar.

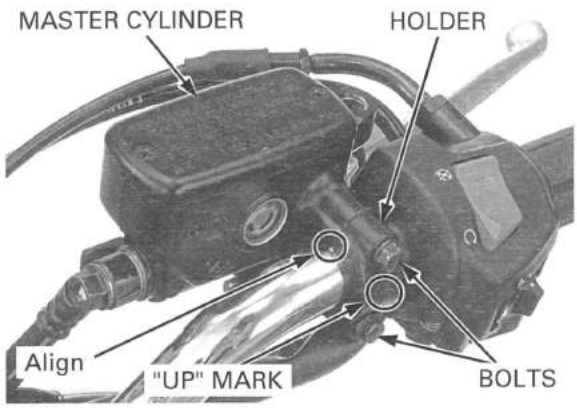


Tighten the forward screw first, then the rear screw.

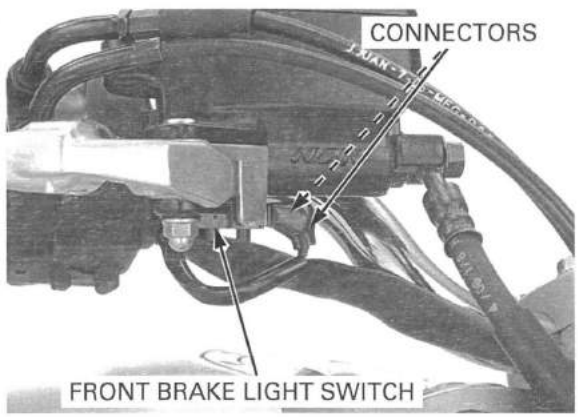


Install the master cylinder by aligning the edge of the master cylinder with the punch mark on the handlebar.
Install the master cylinder holder with the "UP" mark facing up.
Tighten the upper bolt first, the lower bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Connect the front brake light switch wire connectors.



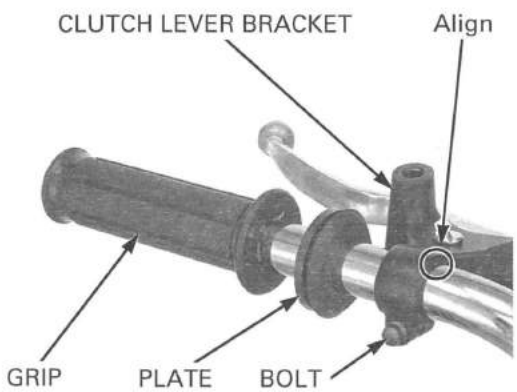
Install the clutch lever bracket by aligning the punch marks on the handlebar and bracket.
Tighten the bolt securely.

Install the switch housing plate.

Apply Honda Bond A, Honda hand grip cement or equivalent to the inside surface of the left handlebar grip and to the clean surfaces of the handlebar.

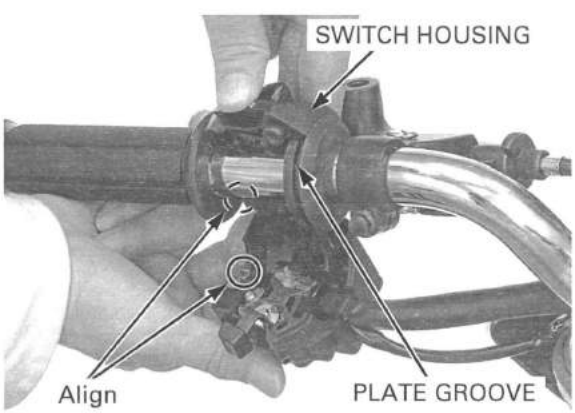
Allow the adhesive to dry for 1 hour before using.

Wait 3–5 minutes and install the grips. Rotate the grips for even application of the adhesive.

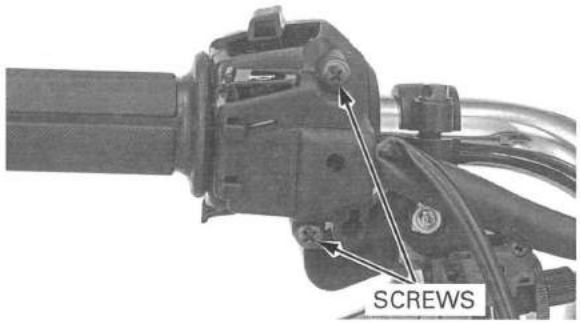


Set the left handlebar switch housing into the switch housing plate groove.

Install the left handlebar switch housing aligning its locating pin with the hole in the handlebar.

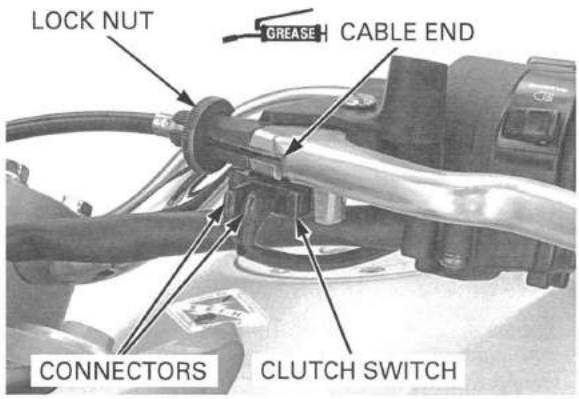


Tighten the forward screw first, then the rear screw.

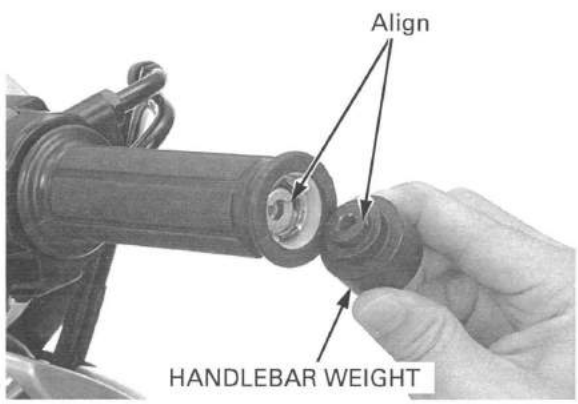


Apply grease to the clutch cable end.
Connect the clutch cable end to the clutch lever and tighten the lock nut.

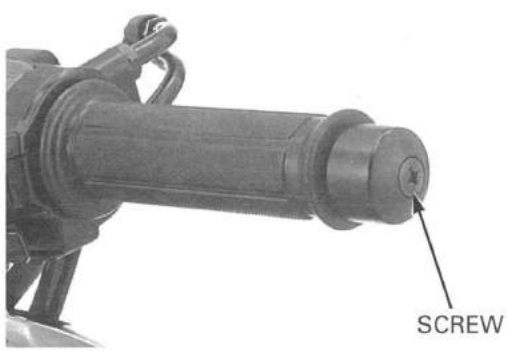
Connect the clutch switch wire connectors.



Install both handlebar weights onto the inner weights, aligning each cut-out of the weights.



Tighten the screws while holding the weights securely.

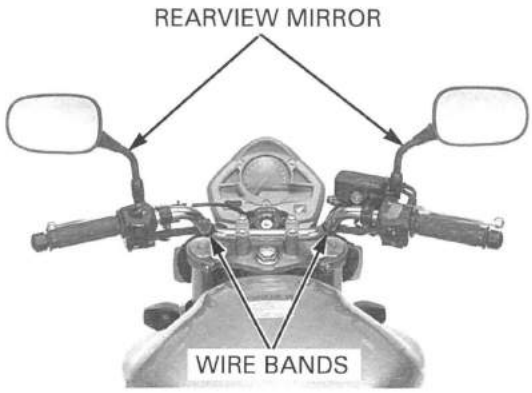


Secure the handlebar switch wires with the wire bands.

Install the rearview mirrors.

Check the following:

- throttle operation and grip freeplay (page 3-6)
- clutch operation and lever freeplay (page 3-27)



HANDLEBAR INNER WEIGHT REPLACEMENT

Remove the left handlebar grip and throttle grip.

Straighten the retainer tab with a screwdriver or punch.

Apply lubricant spray through the tab locking hole for easy removal.

Temporarily install the handlebar weight and screw, then remove the inner weight by turning the handlebar weight.
Remove the handlebar weight, retainer and rubber cushions from the inner weight.
Discard the retainer.

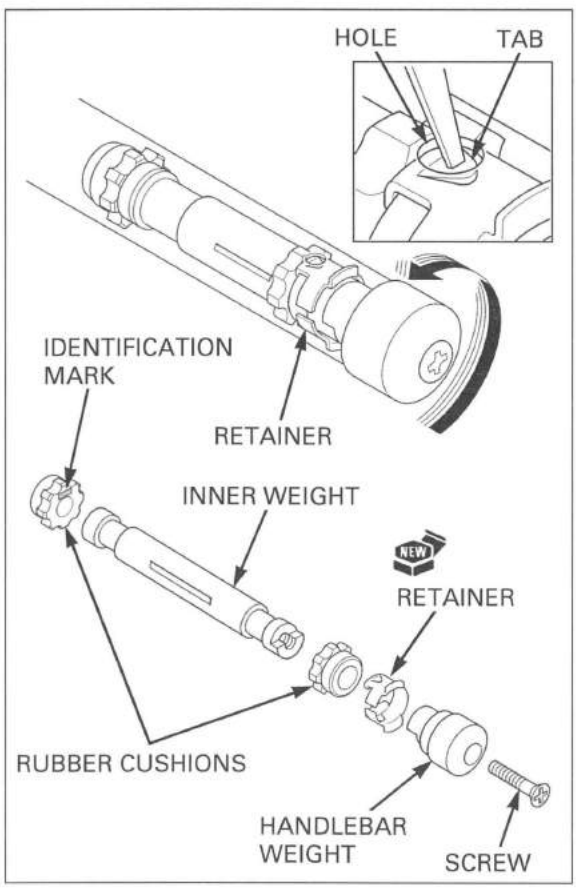
Install the rubber cushion with identification mark to the inward of inner weight.

Install the rubber cushions onto the inner weight.

Install the new retainer onto the inner weight, aligning the flats each other. Tighten the screw while holding the weight securely.

Insert the weight assembly into the handlebar.
Turn the handlebar weight and hook the retainer tab with the hole in the handlebar.

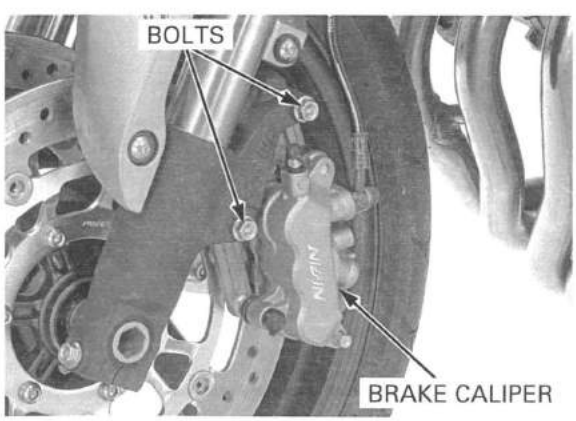
Install the left handlebar grip and throttle grip.



FRONT WHEEL

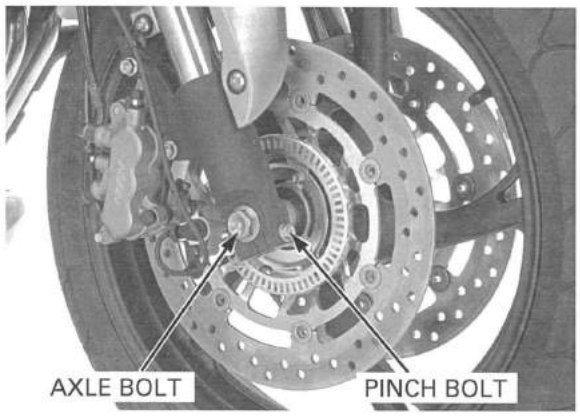
REMOVAL

Remove the mounting bolts and left brake caliper.



Remove the axle bolt and loosen the right axle pinch bolt.

Support the motorcycle securely using a hoist or equivalent and raise the front wheel off the ground.



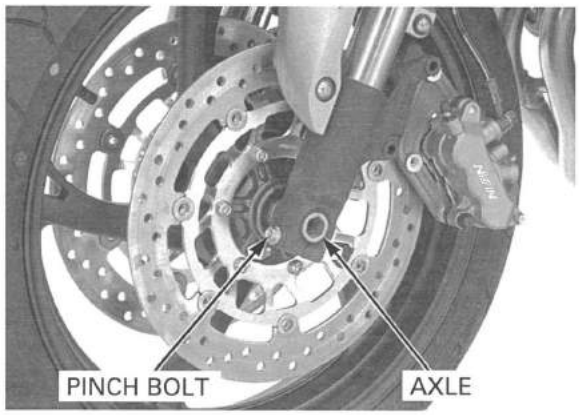
Loosen the left axle pinch bolt.

CB600FA: Be careful not to damage the speed sensor on the brake caliper.

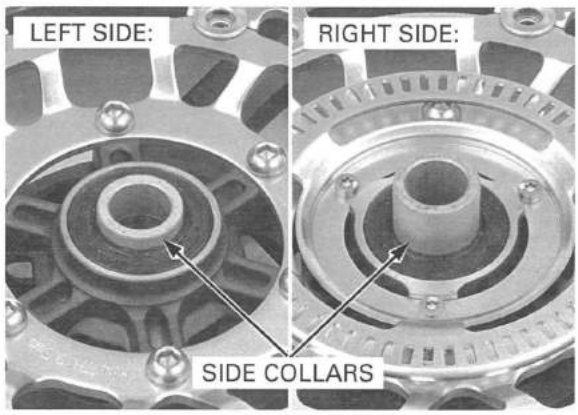
Pull the front axle out and remove the front wheel.

NOTE:

- Do not operate the brake lever after removing the wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.



Remove the side collars.

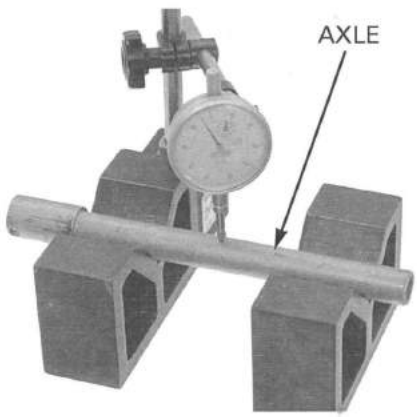


INSPECTION

Axle

Set the axle in V-block and measure the runout. Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)



Wheel bearing

Turn the inner race of each bearing with your finger.

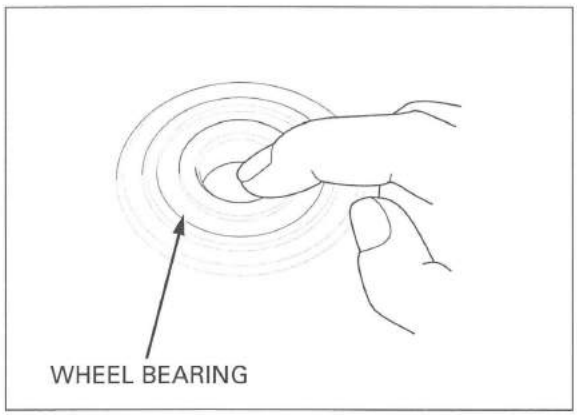
The bearings should turn smoothly and quietly.

Also check that the bearing outer race fits tightly in the hub.

Replace the bearings in pairs.

Remove and discard the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.

Replace new bearings, if necessary (page 13-17).



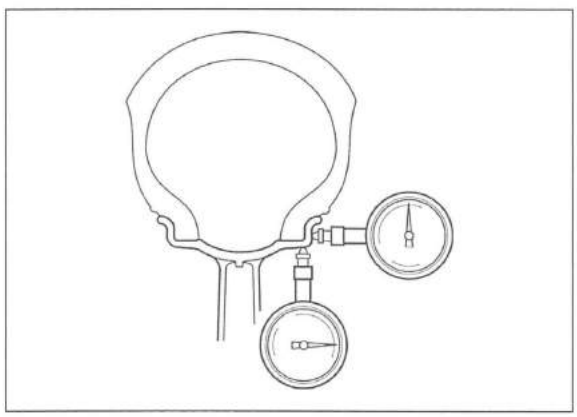
Wheel rim runout

Check the rim runout by placing the wheel in a turning stand.

Spin the wheel by hand, and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

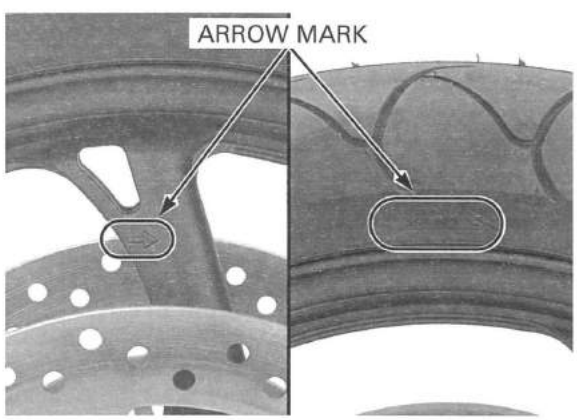
SERVICE LIMITS:
Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)



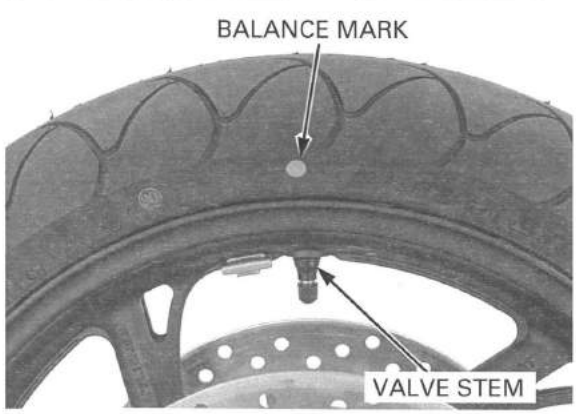
Wheel balance

NOTE:

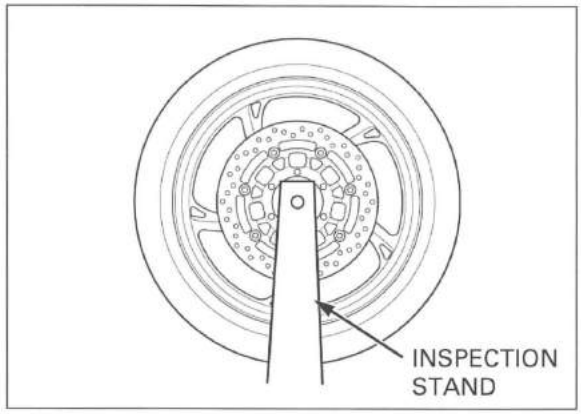
- Mount the tire with the arrow mark facing in the direction of rotation.



- The wheel balance must be checked when the tire is remounted.
- For optimum balance, the tire balance mark (light mass point: a paint dot on the side wall) must be located next to the valve stem. Remount the tire if necessary.



Mount the wheel, tire and brake disc (and pulser ring; CB600FA) assembly on an inspection stand.
Spin the wheel, allow it to stop, and mark the lowest (heaviest) part of the wheel with chalk.
Do this two or three times to verify the heaviest area.
If the wheel is balanced, it will not stop consistently in the same position.



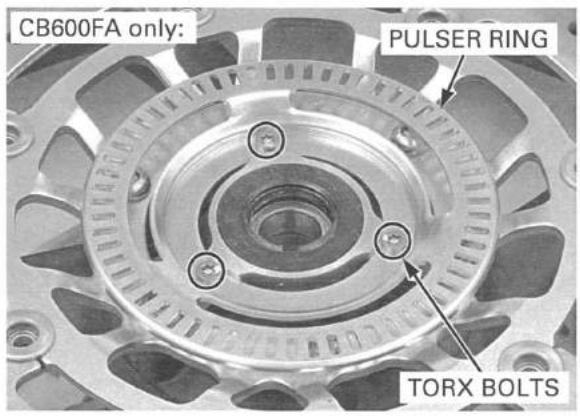
To balance the wheel, install a balance weight on the lightest side of the rim, on the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun.
Do not add more than 60 g (2.1 oz) to the front wheel.

NOTE:

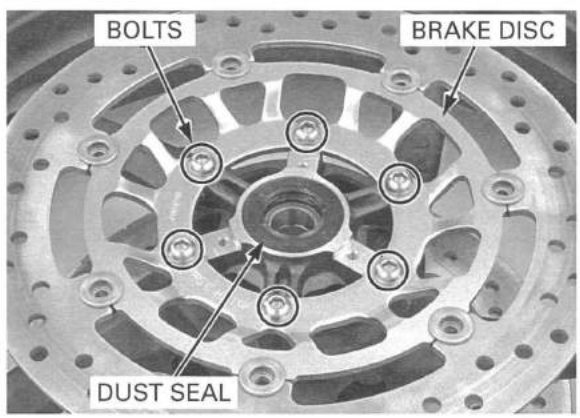
- This model is equipped with a new shape balance weight made of zinc spelter. This balance weight is incompatible with the conventional one in case of installation to the wheel.

DISASSEMBLY

CB600FA only: Remove the torx bolts and speed sensor pulser ring.



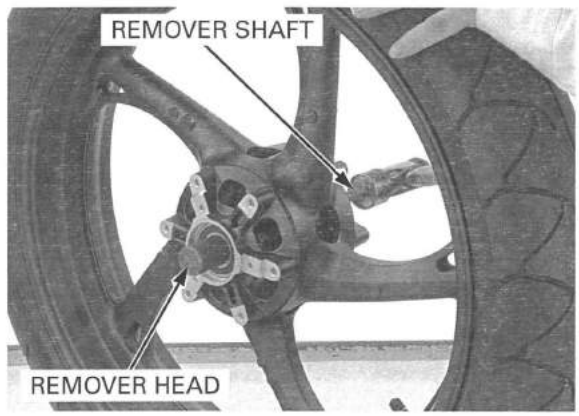
Remove the bolts and brake discs.
Remove the dust seals.



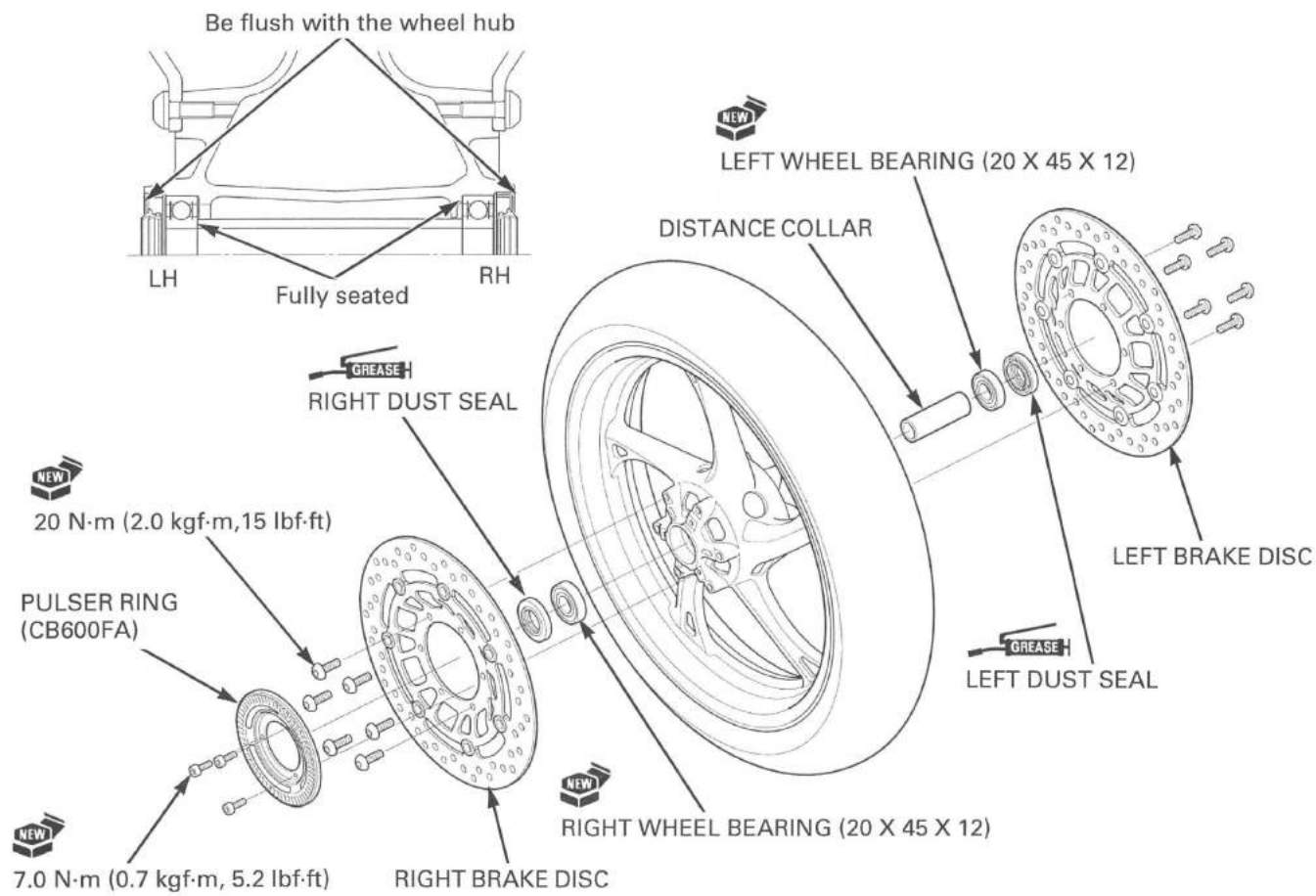
Install the bearing remover head into the bearing. From the opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover head, 20 mm	**07746-0050600**
Bearing remover shaft	**07GGD-0010100 or 07746-0050100**



ASSEMBLY



Never install the old bearings. Once the bearings has been removed, the bearing must be replaced with new ones.

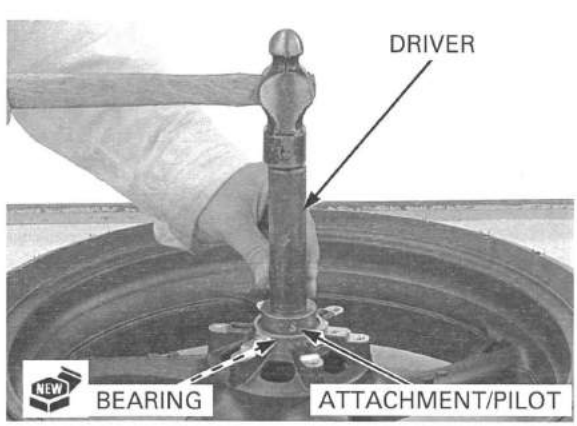
Drive in a new right bearing squarely with the marked side facing up until it is fully seated using the special tool.

TOOLS:

Driver	**07749-0010000**
Attachment, 42 X 47 mm	**07746-0010300**
Pilot, 20 mm	**07746-0040500**

Install the distance collar.

Using the same tools, drive in the left bearing squarely with the marked side facing up until it is fully seated on the distance collar.

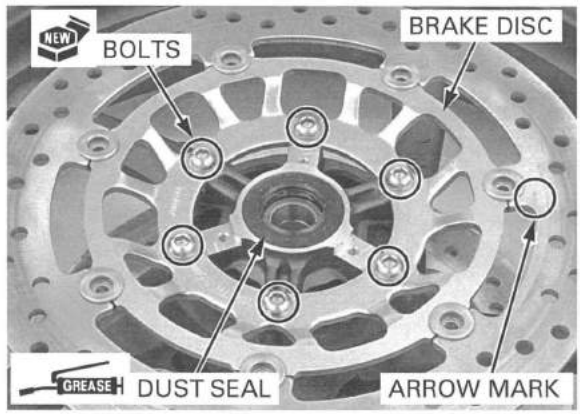


Do not get grease on the brake discs or stopping power will be reduced.

Install the brake discs with the arrow mark facing in the normal rotating direction.
Install and tighten new mounting bolts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

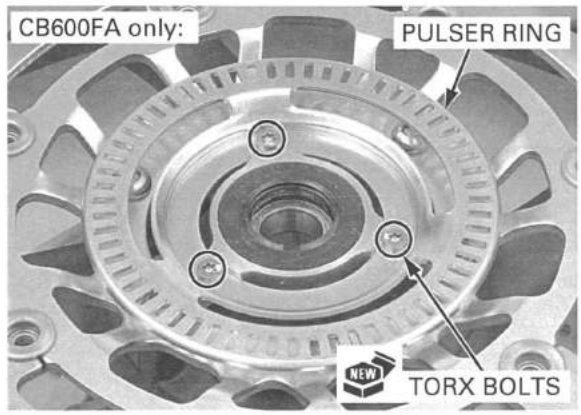
Apply grease to the dust seal lips and install the dust seals until they are flush with the wheel hub.



CB600FA only:

Install the speed sensor pulser ring onto the right wheel hub.
Install the new torx bolts and tighten them to the specified torque.

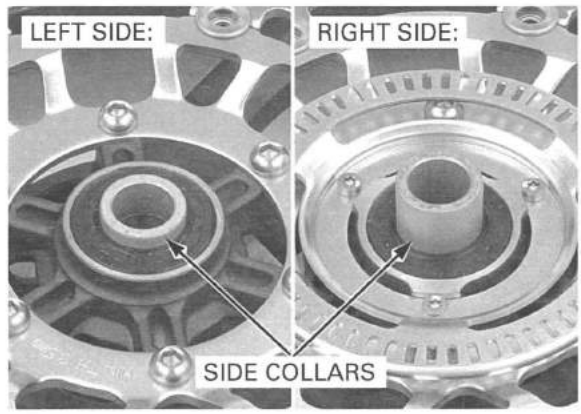
TORQUE: 7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)



INSTALLATION

The right side collar is longer than the left side collar.

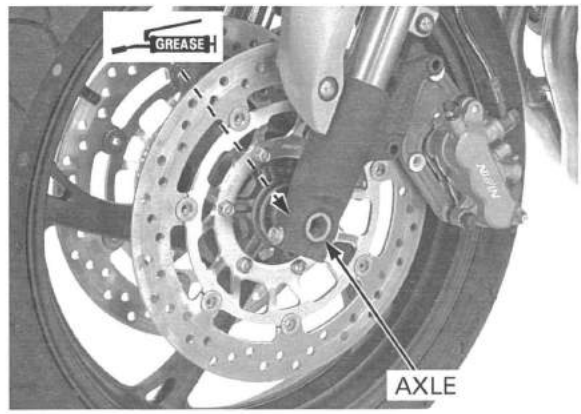
Install the side collars.



Coat the axle surface with thin layer of grease.

Be careful not to damage the brake pads and wheel speed sensor (CB600FA).

Place the wheel between the fork legs so that the right brake disc is positioned between the brake pads.
Insert the axle from the left side until its end is flush with the outer surface of the left fork leg.

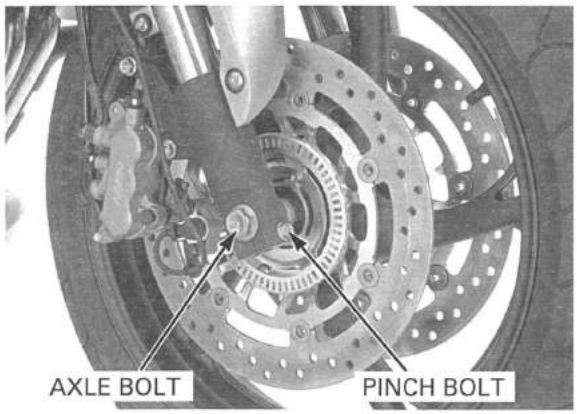


Hold the axle and tighten the axle bolt to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

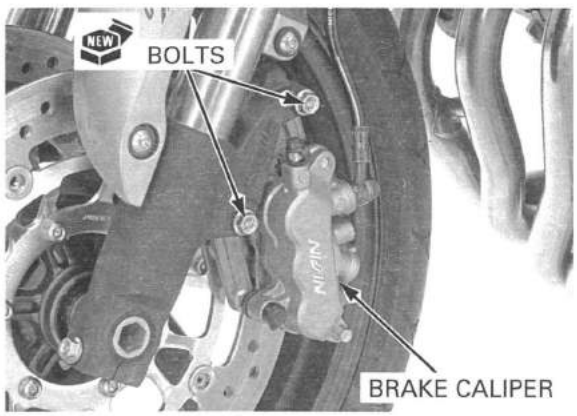
Tighten the right axle pinch bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



Install the left brake caliper and tighten new mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

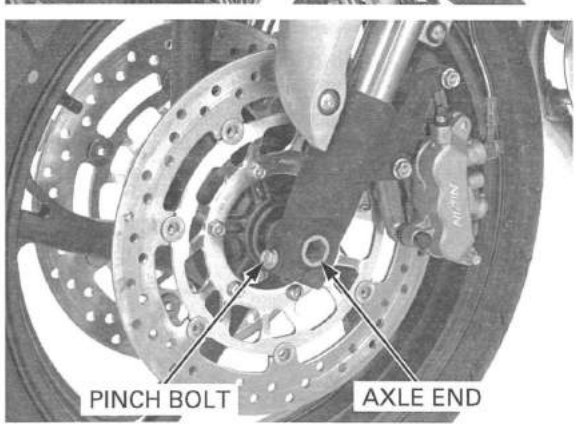


With the front brake applied, pump the fork up and down several times to seat the axle and check brake operation by applying the brake lever.

Make sure that the front axle end is flush with the outer surface of the left fork leg.
Tighten the left axle pinch bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

CB600FA only: Check the front wheel speed sensor air gap (page 16-24).



FORK

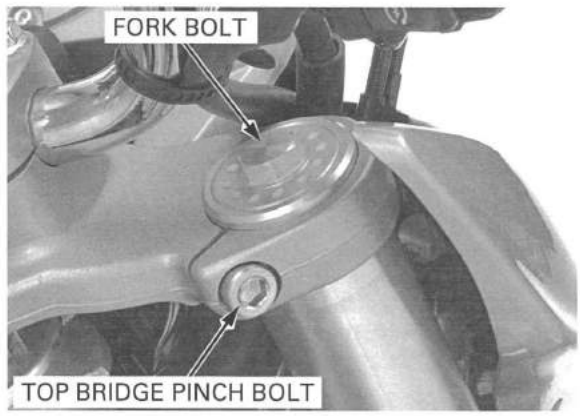
REMOVAL

Remove the following:

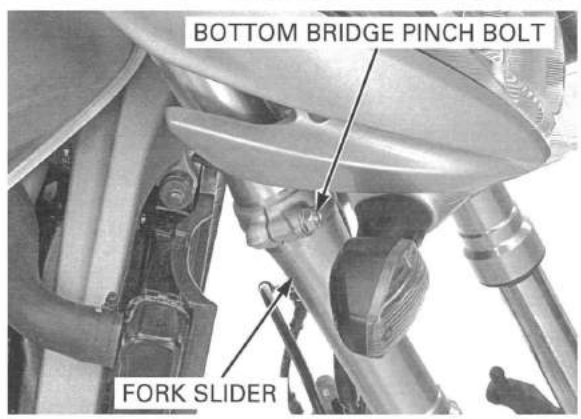
- front wheel (page 13-14)
- front brake calipers
  - CB600FA (page 15-33)
  - CB600F (page 15-37)
- front fender (page 2-7)

Loosen the fork top bridge pinch bolt.

If it is necessary to disassemble the front fork, loosen the fork bolt at this moment.

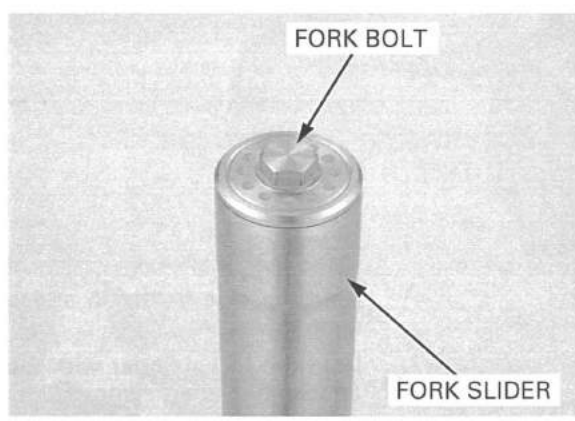


Loosen the fork bottom bridge pinch bolt, remove the fork slider from the fork top bridge and steering stem.



DISASSEMBLY

Remove the front fork bolt from the fork slider.

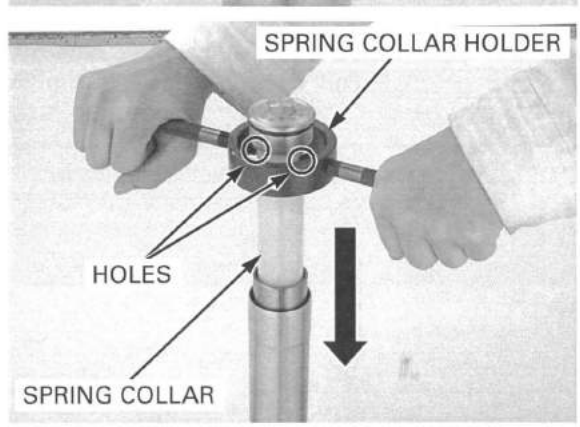


Be careful not to damage the spring collar holes.

Set the spring collar holder to the spring collar holes.

TOOL:
Spring collar holder 070MF-MBZC110

Compress the spring collar with the spring collar holder.

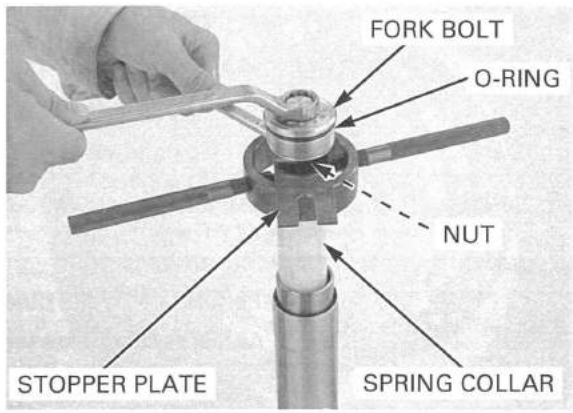


Insert the stopper plate between the nut and the spring collar.

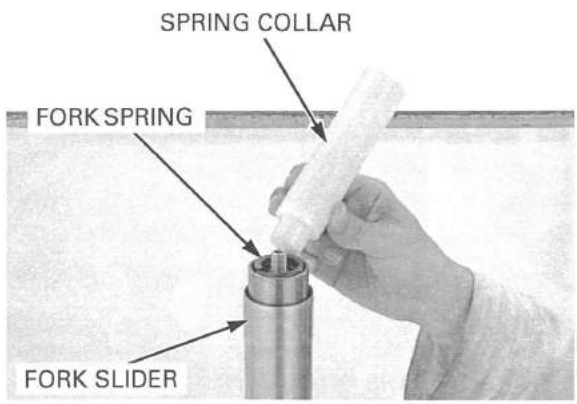
TOOL:
Stopper plate 070MF-MBZC130

Loosen the lock nut with holding the front fork bolt.

Remove the front fork bolt and O-ring.

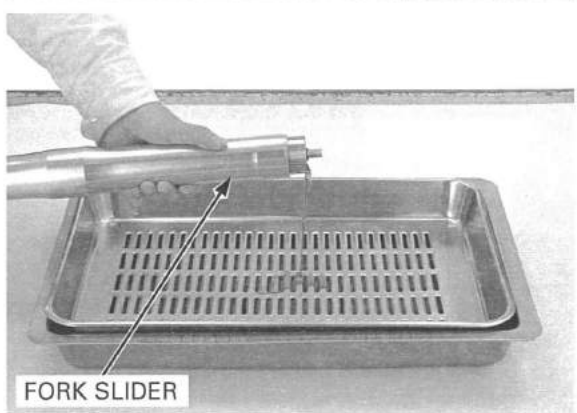


Remove the spring collar and fork spring from the fork slider.



Pour out the fork fluid by pumping the fork slider several times.

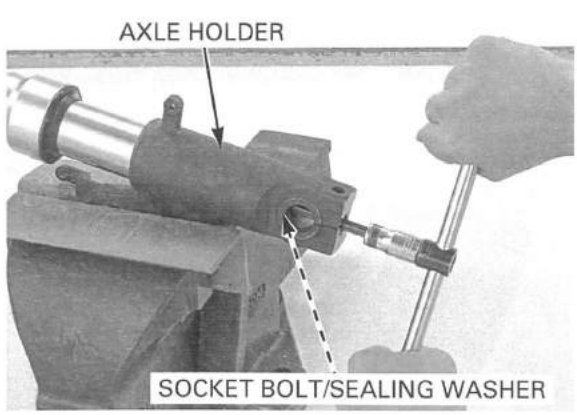
And also pour out the fork fluid from the fork damper by pumping the fork damper rod several times.



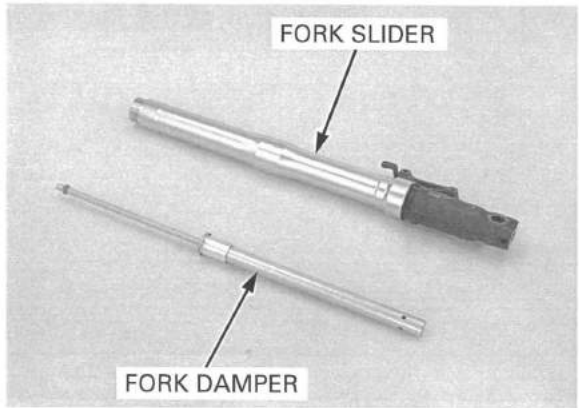
Hold the axle holder in a vice with soft jaws or a shop towel.

Hold the fork damper with the fork damper holder attachment, then remove the fork socket bolt and sealing washer.

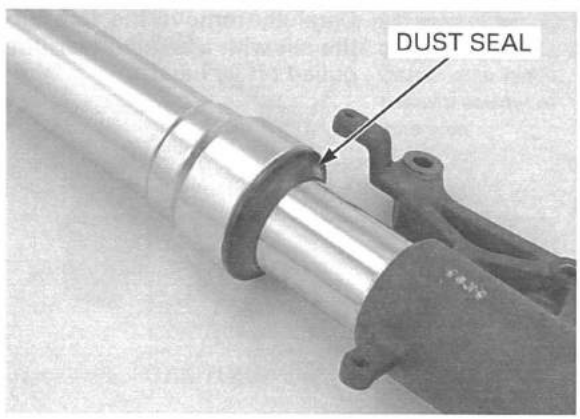
TOOL:
Fork damper holder attachment 07YMB-MCF0101



Remove the fork damper from the fork slider.

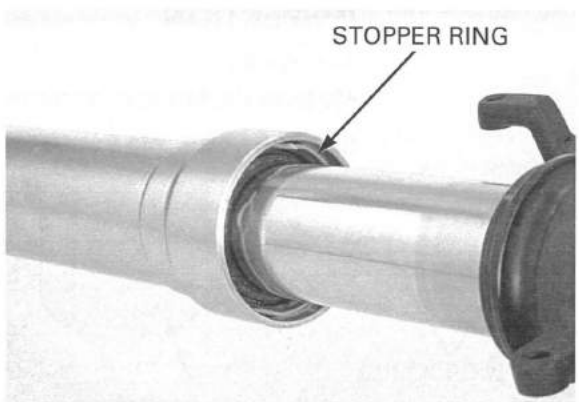


Remove the dust seal.

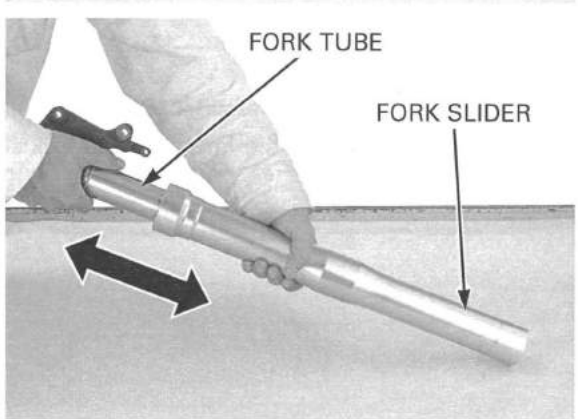


Do not scratch the fork tube sliding surface.

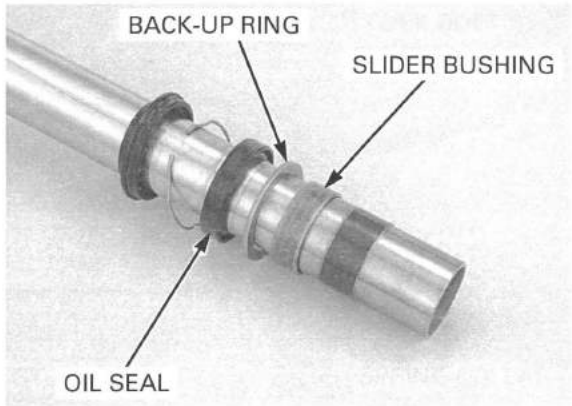
Remove the stopper ring.



Pull the fork tube out until you feel resistance from the slider bushing. Then move it in and out, tapping the bushing lightly until the fork tube separates from the fork slider.
The slider bushing will be forced out by the fork tube bushing.

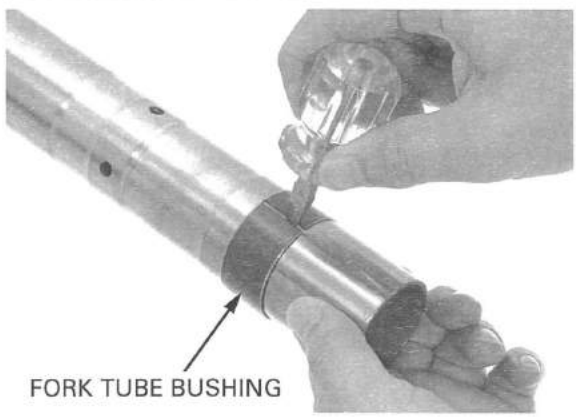


Remove the oil seal, back-up ring and slider bushing from the fork tube.



Do not remove the fork tube bushing unless it necessary to replace it with a new one.

Carefully remove the fork tube bushing by prying the slit with a screwdriver until the bushing can be pulled off by hand.

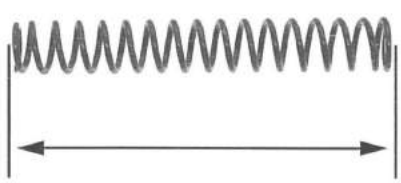


INSPECTION

Fork spring

Measure the fork spring free length.

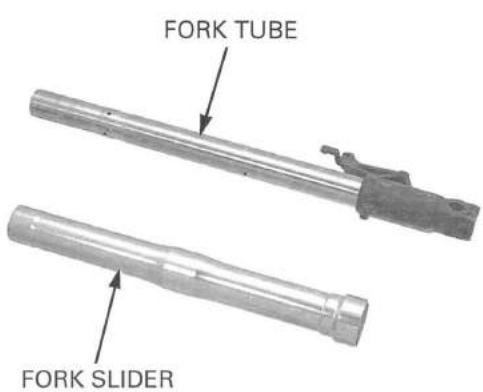
SERVICE LIMIT: 240.8 mm (9.48 in)



Fork tube/slider

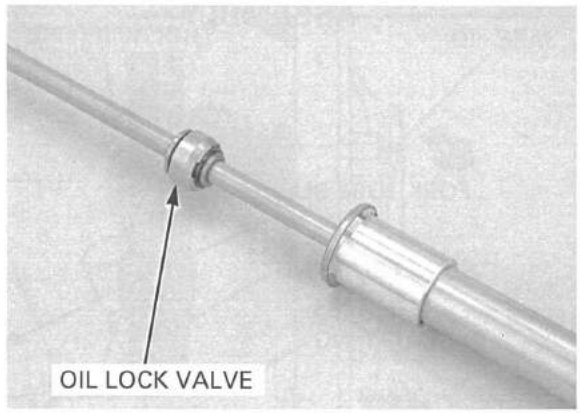
Check the fork tube and fork slider for score marks, scratches, or excessive or abnormal wear.

Replace any components which are worn or damaged.



Check the oil lock valve for wear or damage.

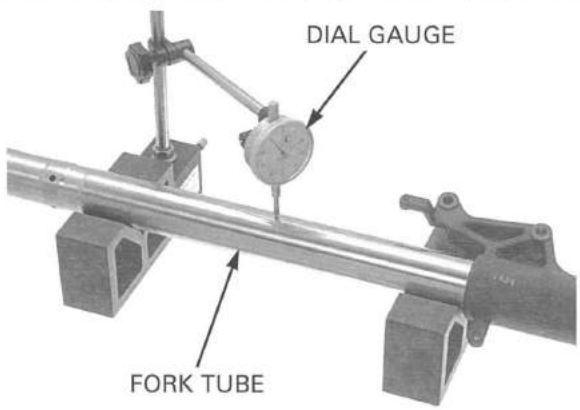
Replace the fork damper, if any components is damaged.



Place the fork tube in V-block and measure the runout.

Actual runout is 1/2 of the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)

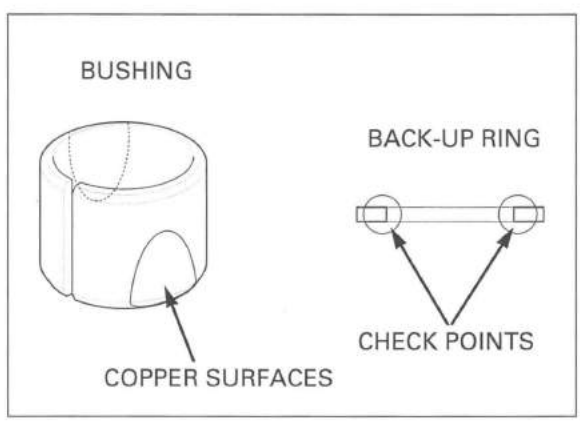


Fork tube bushing/slider bushing/back-up ring

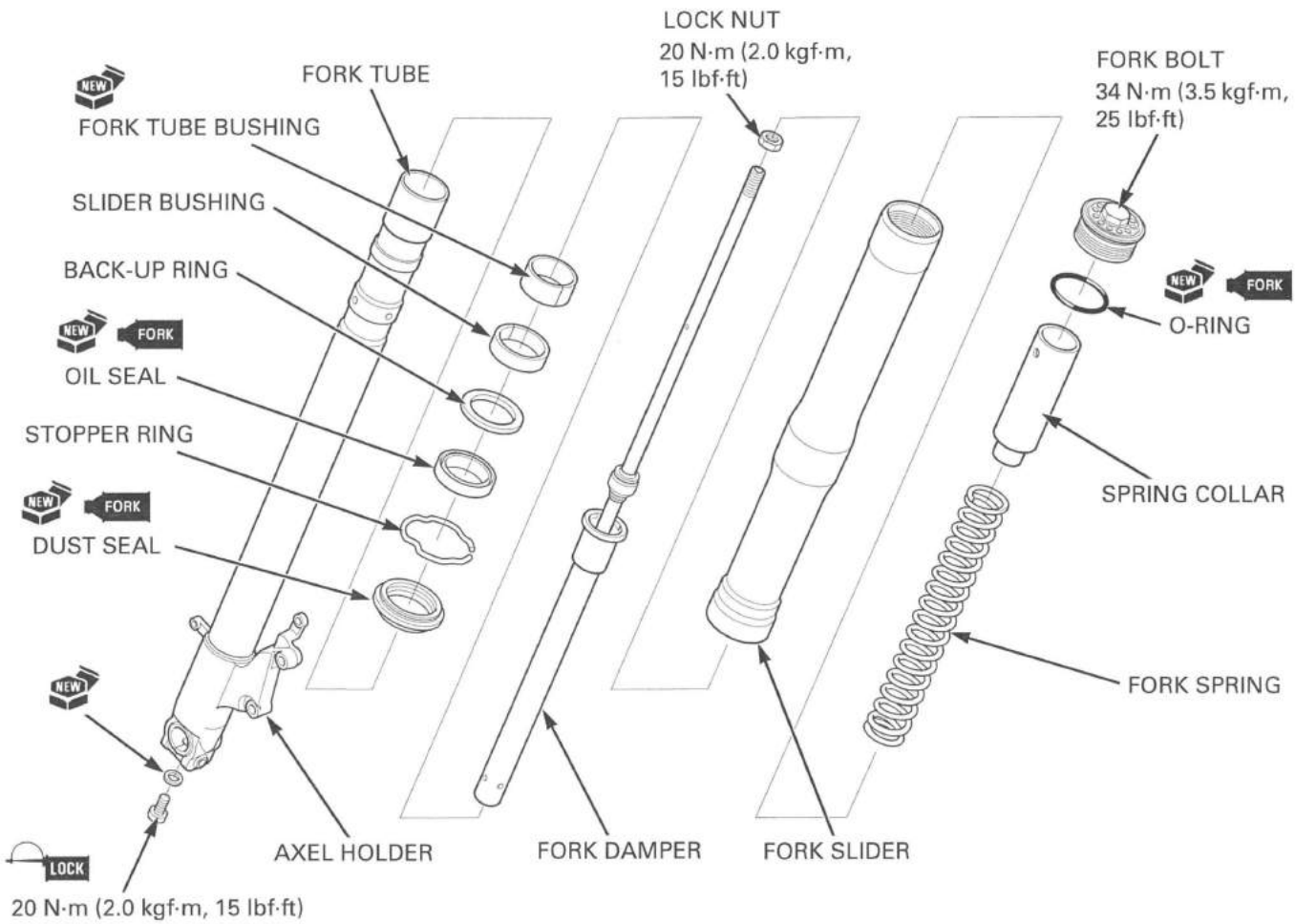
Visually inspect the slider and fork tube bushings.

Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

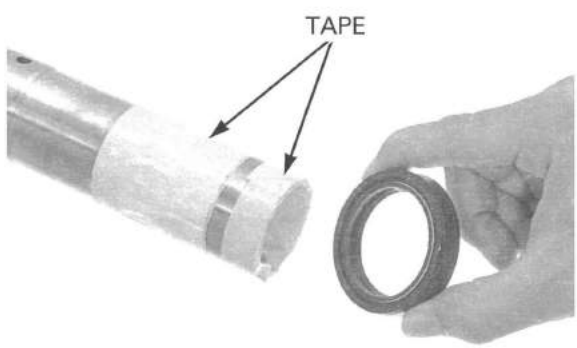
Check the back-up ring; replace it if there is any distortion at the points shown.



ASSEMBLY



- Before assembly, wash all parts with a high flash or non-flammable solvent and wipe them dry.
- When installing the fork dust seal and the oil seal, wrap the edge and groove of the fork tube with a tape.



Apply fork fluid to new dust seal lips and new oil seal lips.

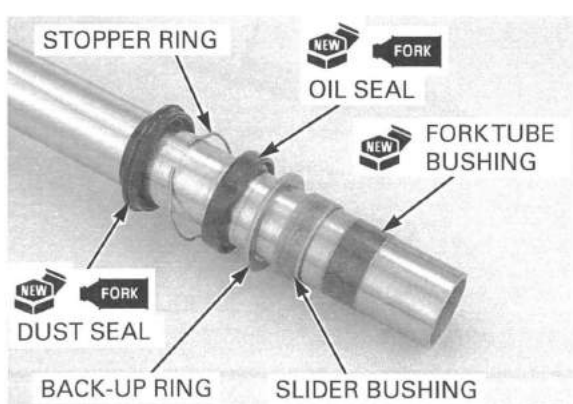
Install the oil seal with its marked side facing toward the axle holder.

Install the dust seal, stopper ring and oil seal.

Remove the burrs from the slider bushing mating surface, being careful not to peel off the coating.

Install the back-up ring, slider bushing and a new fork tube bushing.

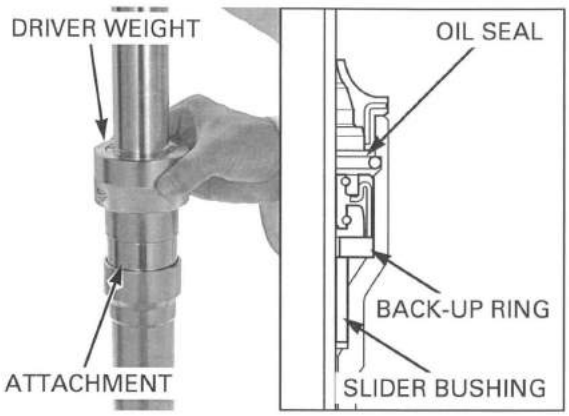
Install the fork tube into the fork slider.



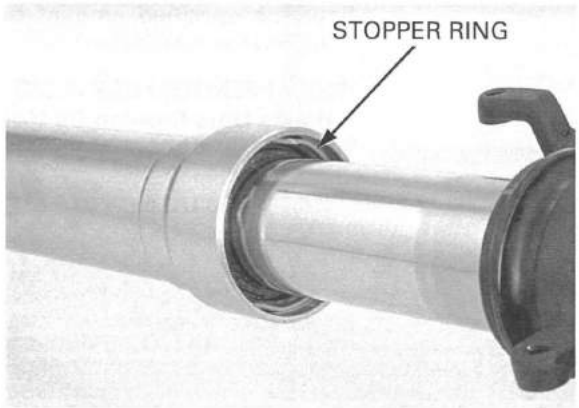
Drive the oil seal in using the special tools.

TOOLS:

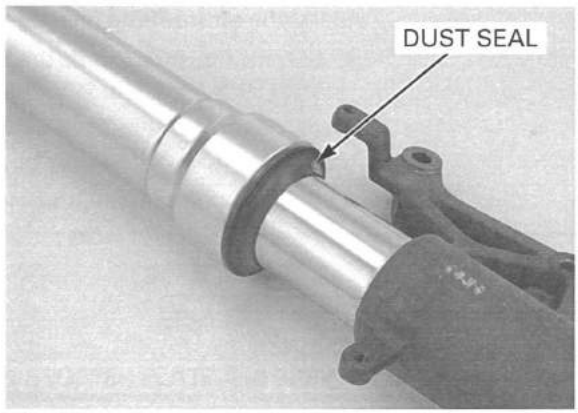
Fork seal driver weight	**07KMD-KZ30100**
Oil seal driver attachment	**07RMD-MW40100**



Install the stopper ring into the fork slider groove securely.



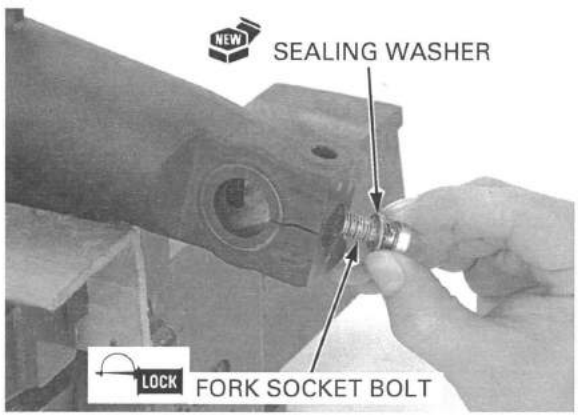
Install the dust seal.



Install the fork damper into the fork slider.

Apply a locking agent to the fork socket bolt threads.

Install the socket bolt with a new sealing washer.

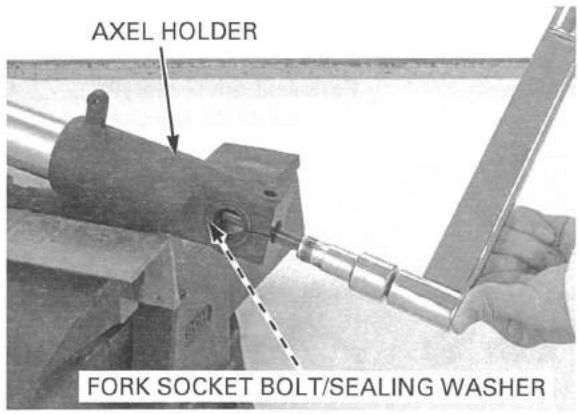


Hold the axle holder in a vise with soft jaws or a shop towel.

Hold the fork damper with fork damper holder attachment then tighten the fork socket bolt to the specified torque.

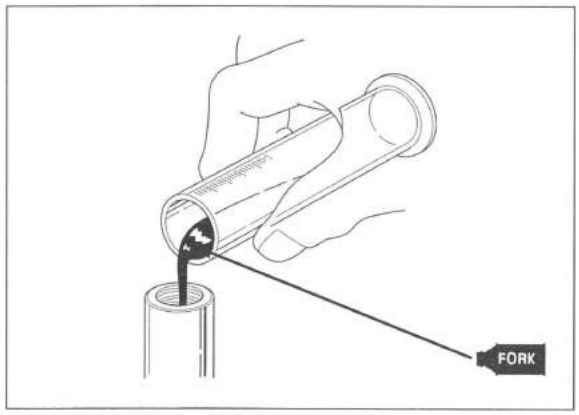
TOOL:
Fork damper holder attachment 07YMB-MCF0101

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



Pour the specified amount of recommended fork fluid into the fork slider.

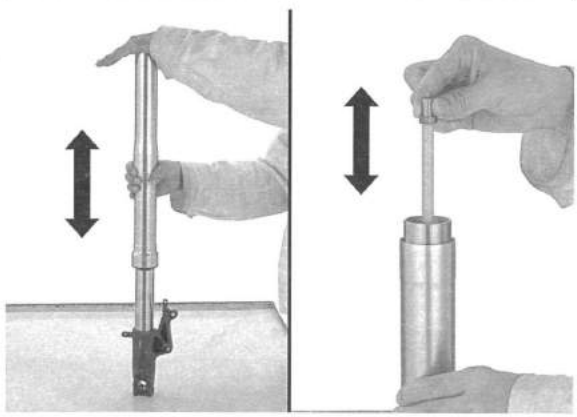
RECOMMENDED FORK FLUID:
Honda Ultra Cushion Oil 10W or equivalent
FORK FLUID CAPACITY:
494 ± 2.5 cm³
(16.7 ± 0.08 US oz, 17.4 ± 0.09 Imp oz)



Bleed the air from the fork leg as follows.

1. Extend the fork, cover the top of the fork slider with your hand and compress the fork leg slowly.
2. Remove your hand and extend the fork slowly.

   Repeat above procedure 2 or 3 times.
3. Pump the fork damper rod slowly 8 - 10 times.

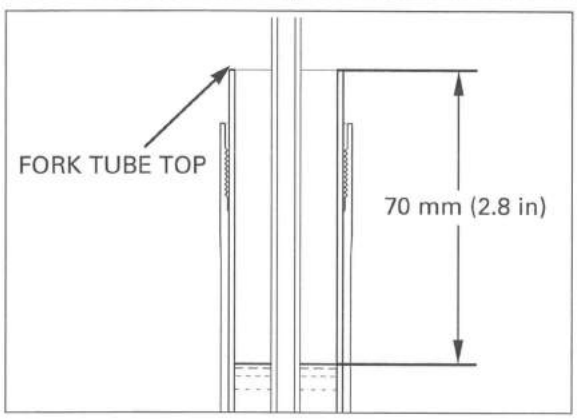


Be sure that the oil level is the same in the both forks.

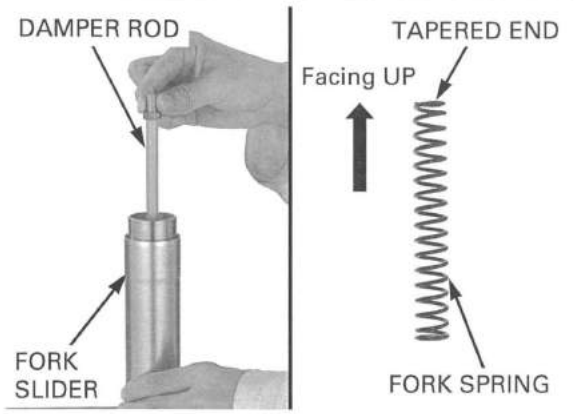
Slowly push the slider, gently seat the dust seal onto axle holder and leave it for 5 minutes.

After the oil level stabilizes, measure the oil level from top of the fork tube.

FORK OIL LEVEL: 70 mm (2.8 in)



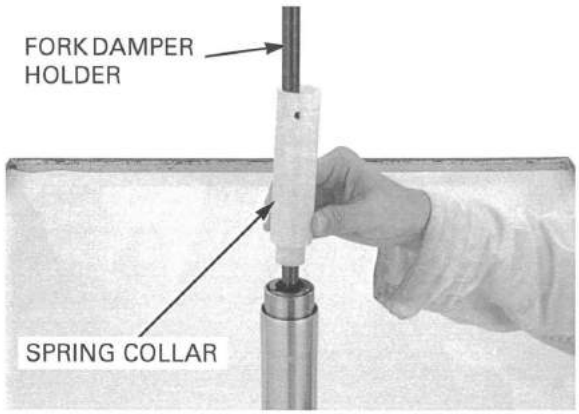
Pull the fork damper rod up and install the fork spring with the tapered end facing up into the fork slider.



Attach the fork damper holder to the fork damper.

TOOL:
Fork damper holder 070MF-MBZC120

Install the fork spring collar.



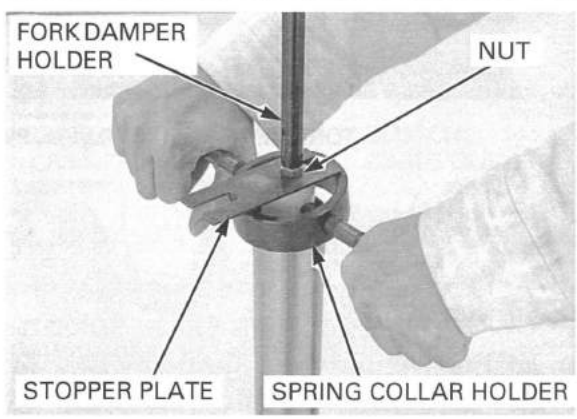
Set the spring collar holder to the spring collar holes.

TOOL:
Spring collar holder 070MF-MBZC110

Compress the spring collar with the spring collar holder while pulling up the fork damper holder.
Install the stopper plate between the nut and the spring collar.

TOOL:
Stopper plate 070MF-MBZC130

Remove the fork damper holder.



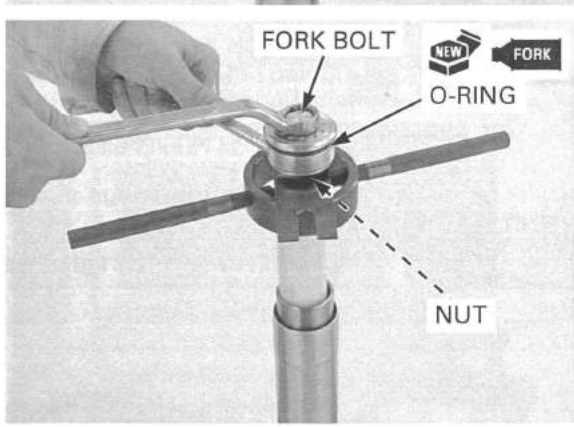
Apply fork fluid to a new O-ring and install it to the fork bolt.

Install the front fork bolt to the fork damper.

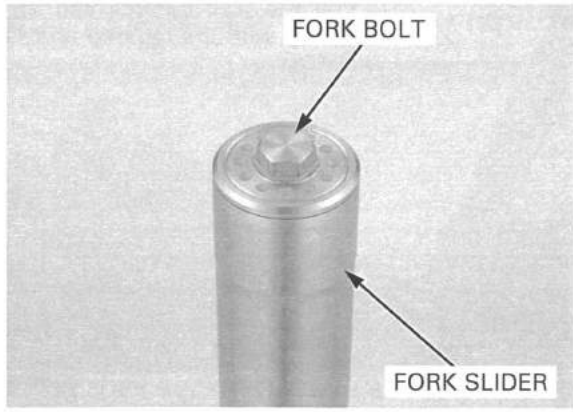
Tighten the lock nut to the specified torque with holding the fork bolt.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

Remove the stopper plate and the spring collar holder.

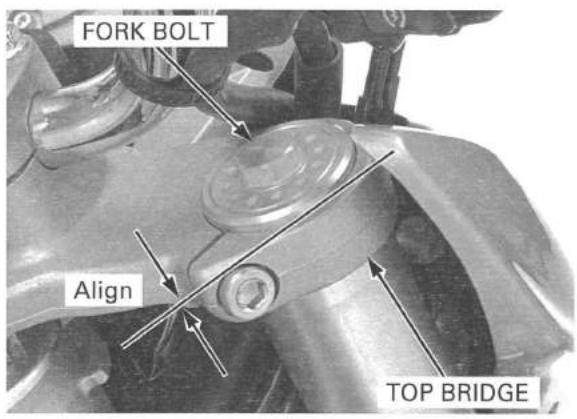


Install the front fork bolt to the fork slider.



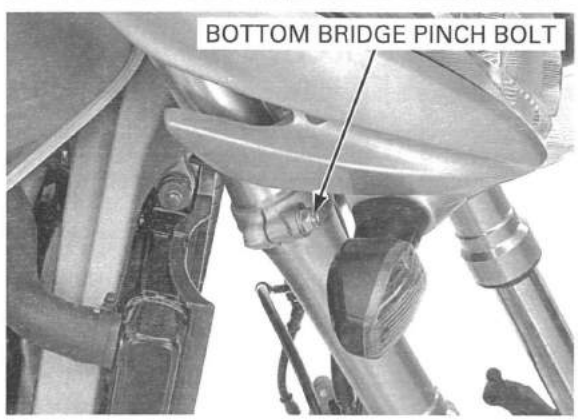
INSTALLATION

Install the fork leg through the steering stem and top bridge.
Align the top end of the fork slider with the upper surface of the top bridge.



Tighten the bottom bridge pinch bolt to the specified torque.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)



Tighten the fork bolt to the specified torque if it was removed.

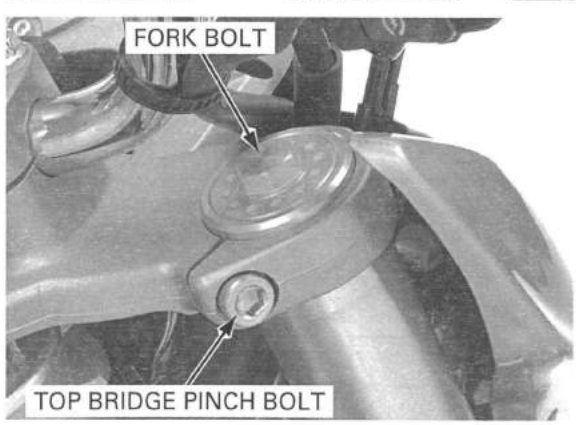
TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Tighten the top bridge pinch bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Install the following:

- front fender (page 2-7)
- front brake calipers
  - CB600FA (page 15-36)
  - CB600F (page 15-41)
- front wheel (page 13-19)



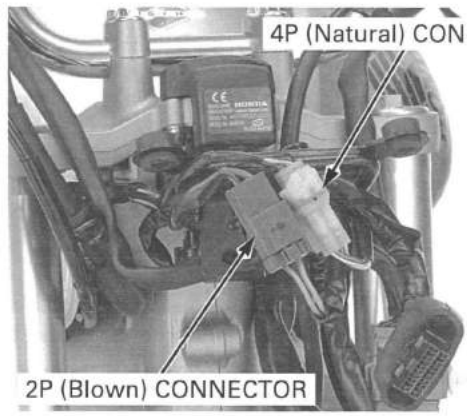
STEERING STEM

REMOVAL

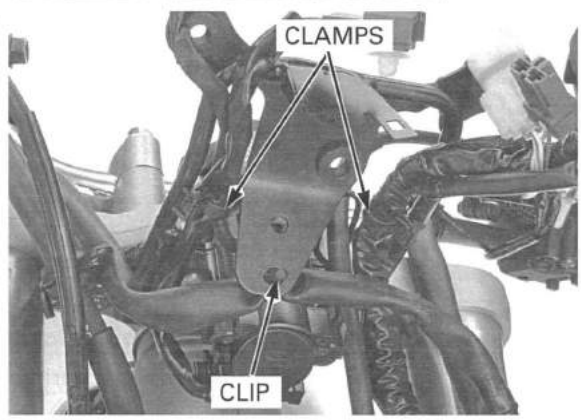
Remove the following:

- headlight unit (page 20-6)
- combination meter (page 20-10)
- front wheel (page 13-14)

Release the immobilizer receiver 4P (Natural) and ignition switch 2P (Blown) connectors from the meter stay, then disconnect the connectors.



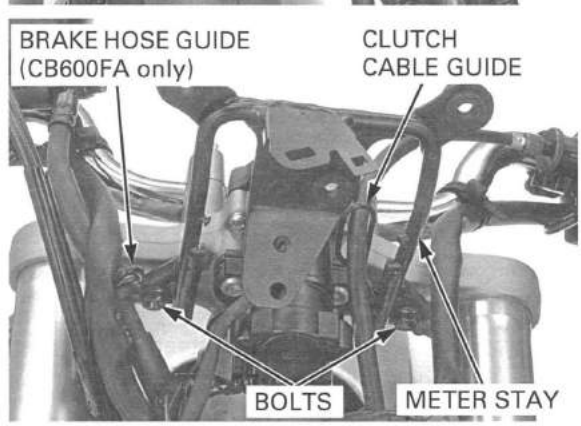
Release the engine stop switch wire clip from the meter stay.
Release the immobilizer receiver, ignition switch wires clamp (right side) and main harness wire clamp (left side) from the meter stay.



CB600FA only: Release the front brake hose from the guide of meter stay.

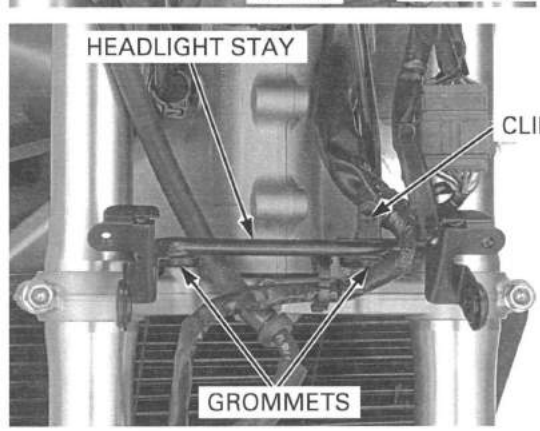
Release the clutch cable from the guide of meter stay.

Remove the bolts and meter stay from the top bridge.

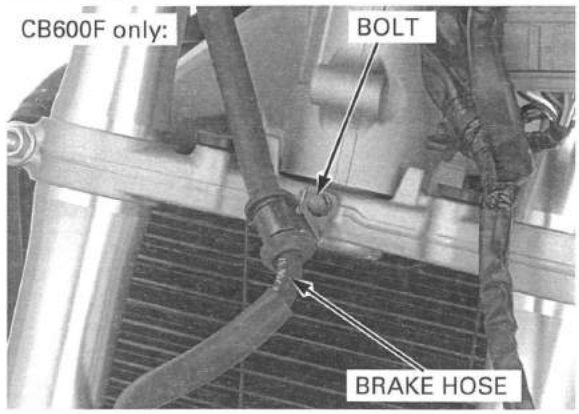


Release the main harness wire clip from the headlight stay.

Remove the headlight stay, releasing the stay boss from the steering stem grommets.



CB600F only: Remove the bolt and front brake hose from the steering stem.

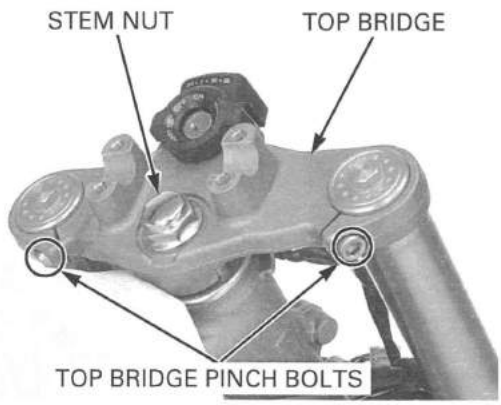


Remove the handlebar (page 13-8).

Remove the steering stem nut.

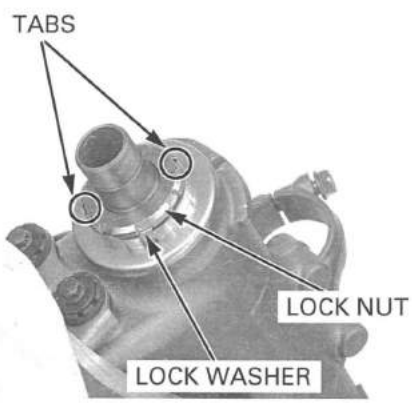
Loosen the fork top bridge pinch bolts and remove the top bridge.

Remove the forks (page 13-21).



Straighten the tabs of the lock washer.

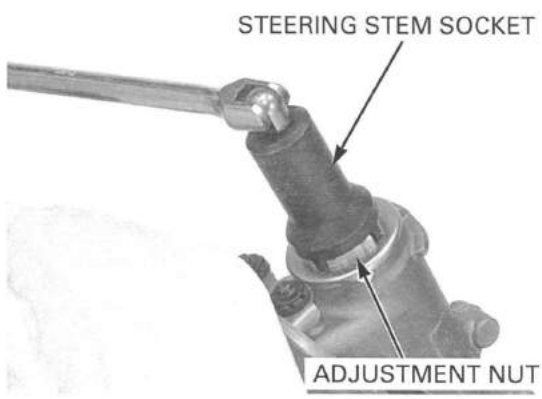
Remove the steering bearing adjustment nut lock nut and lock washer.



Remove the steering stem bearing adjustment nut using the special tool.

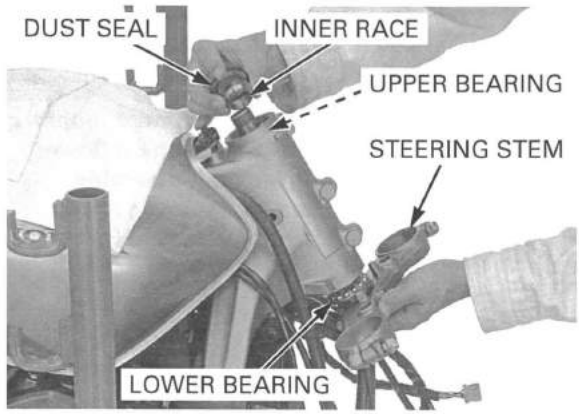
TOOL:

Steering stem socket	**07916-3710101**



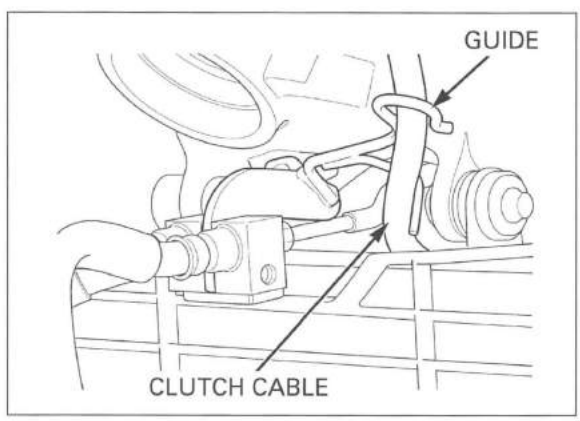
Remove the following:

- dust seal
- upper bearing inner race
- upper bearing
- steering stem
- lower bearing



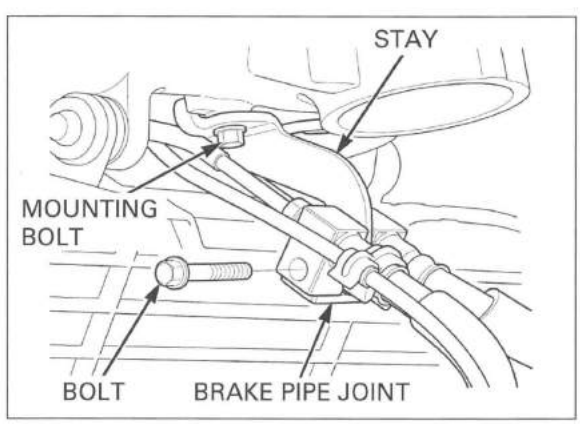
OUTER RACE REPLACEMENT

CB600FA only: Release the clutch cable from the guide.



CB600FA only: Be careful not to bend or damage the brake pipes.

Remove the bolt and separate the brake pipe joint.
Remove the mounting bolt and stay.

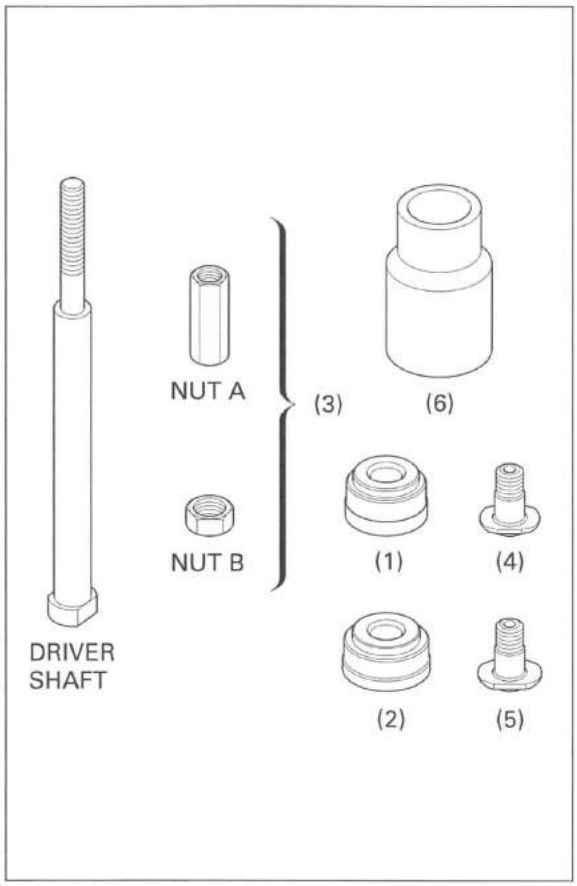


Always replace the bearings and races as a set.

Replace the races using the special tools as described in the following procedure.

TOOLS:

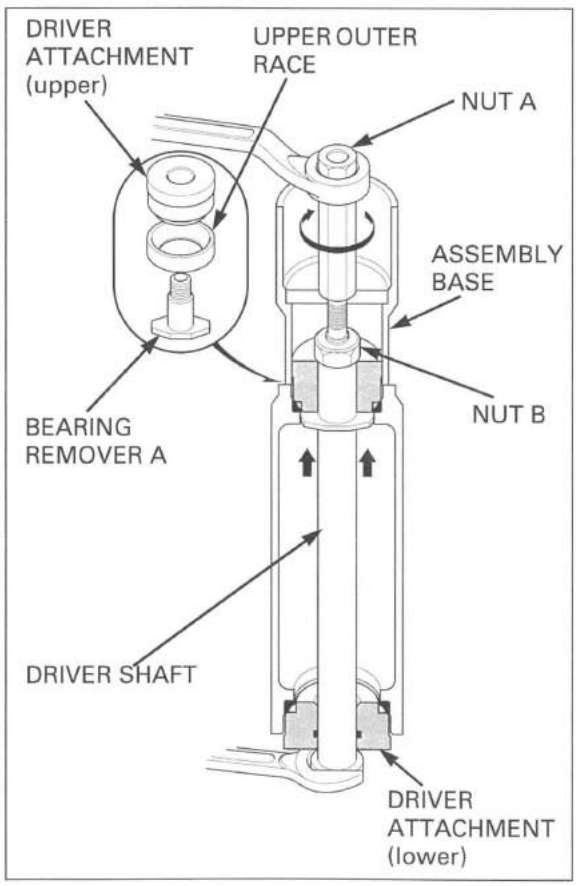
(1) Driver attachment (upper)	**070MF-MCJ0100**
(2) Driver attachment (lower)	**070MF-MCJ0200**
(3) Driver shaft assembly	**07946-KM90301**
(4) Bearing remover, A	**07946-KM90401**
(5) Bearing remover, B	**07NMF-MT70110**
(6) Assembly base	**07946-KM90600**



Note the installation direction of the assembly base; the small I.D. side facing the upper attachment.

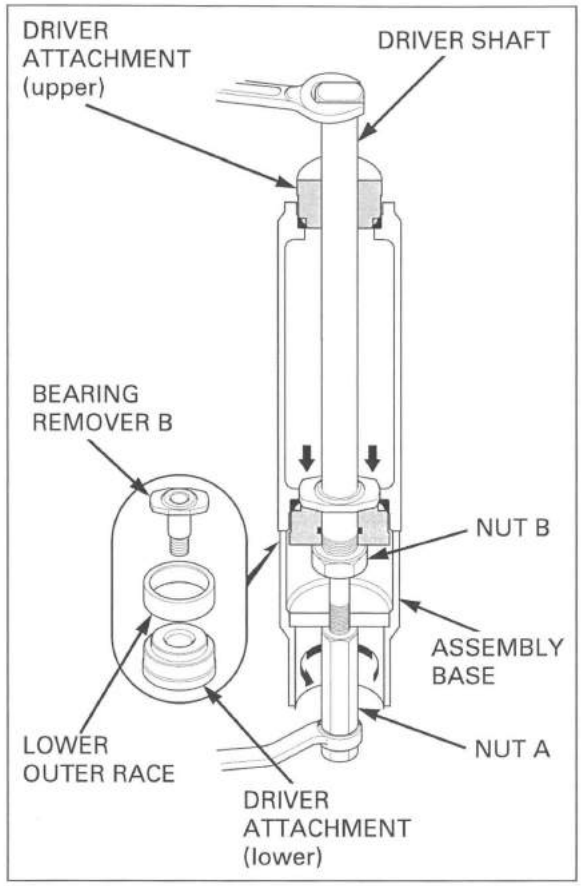
Install the special tools into the steering head as shown.

Align the bearing remover A with the grooves in the steering head.
Lightly tighten the nut B with a wrench.
Holding the driver shaft with a wrench, turn the nut A gradually to remove the upper outer race.



Note the installation direction of the assembly base; the large I.D. side facing the lower attachment. Be careful not to bend or damage the brake pipes (CB600FA only).

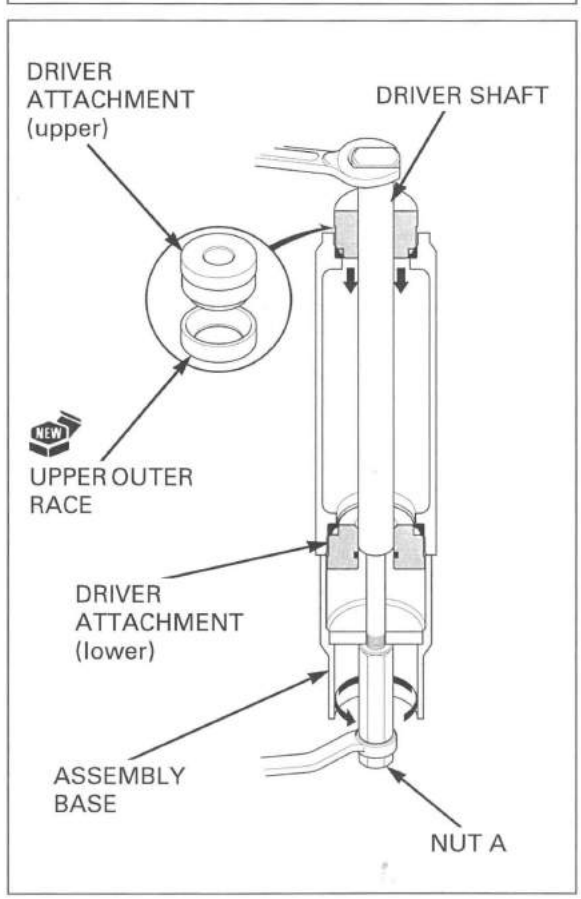
Install the special tools into the steering head as shown and remove the lower outer race using the same procedure as for the upper outer race.



Remove any burrs from the outer race installation surface of the steering head.

Note the installation direction of the assembly base; the large I.D. side facing the lower attachment. Be careful not to bend or damage the brake pipes (CB600FA only).

Install a new upper outer race with the special tools as shown.
Hold the driver shaft with a wrench and turn the nut A gradually until upper outer race is fully seated.

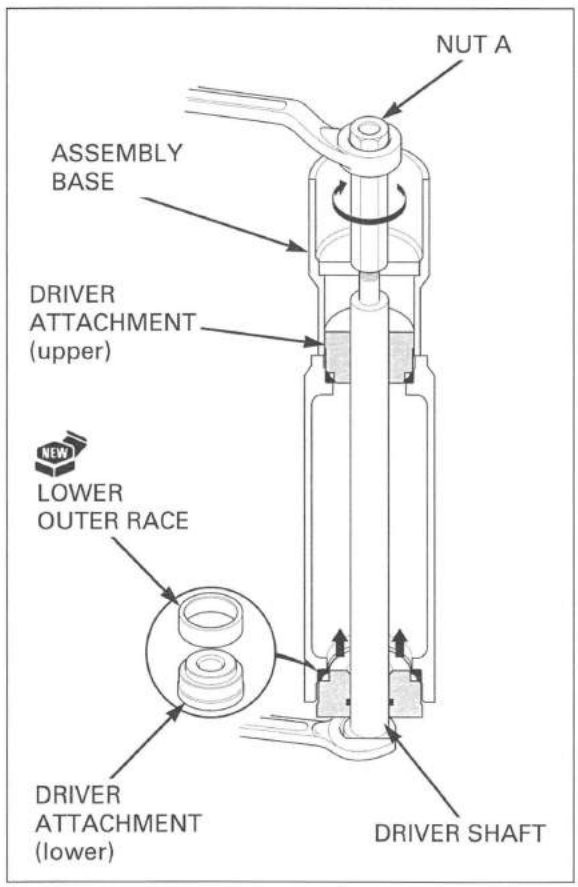


Remove any burrs from the outer race installation surface of the steering head.

ote the installation direction of the ssembly base; the small I.D. side facing the upper attachment.

Install a new lower outer race with the special tools as shown.
Hold the driver shaft with a wrench and turn the nut A gradually until lower outer race is fully seated.

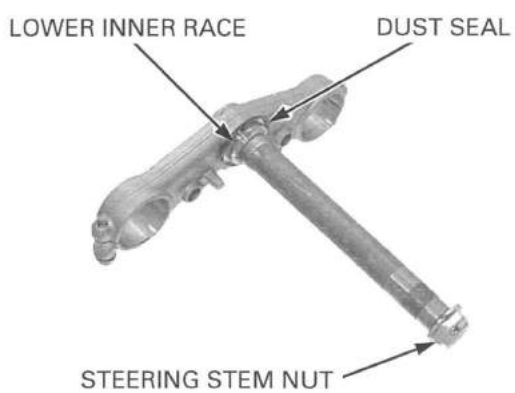
CB600FA only: Install the removed parts in the reverse order of removal.



LOWER INNER RACE REPLACEMENT

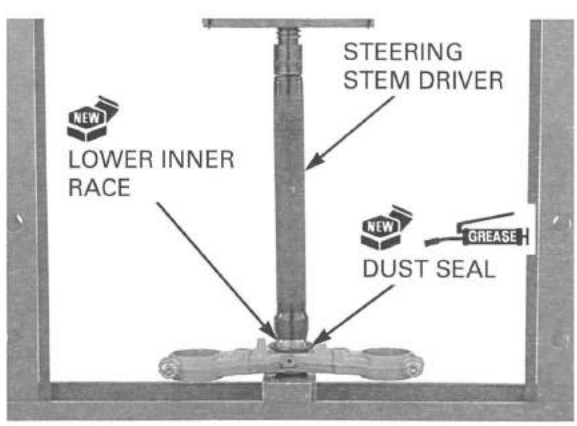
Temporarily install the steering stem nut onto the stem to prevent the threads from being damaged when removing the lower bearing inner race from the stem.

Remove the lower bearing inner race with a chisel or equivalent tool, being careful not to damage the stem.
Remove the dust seal.

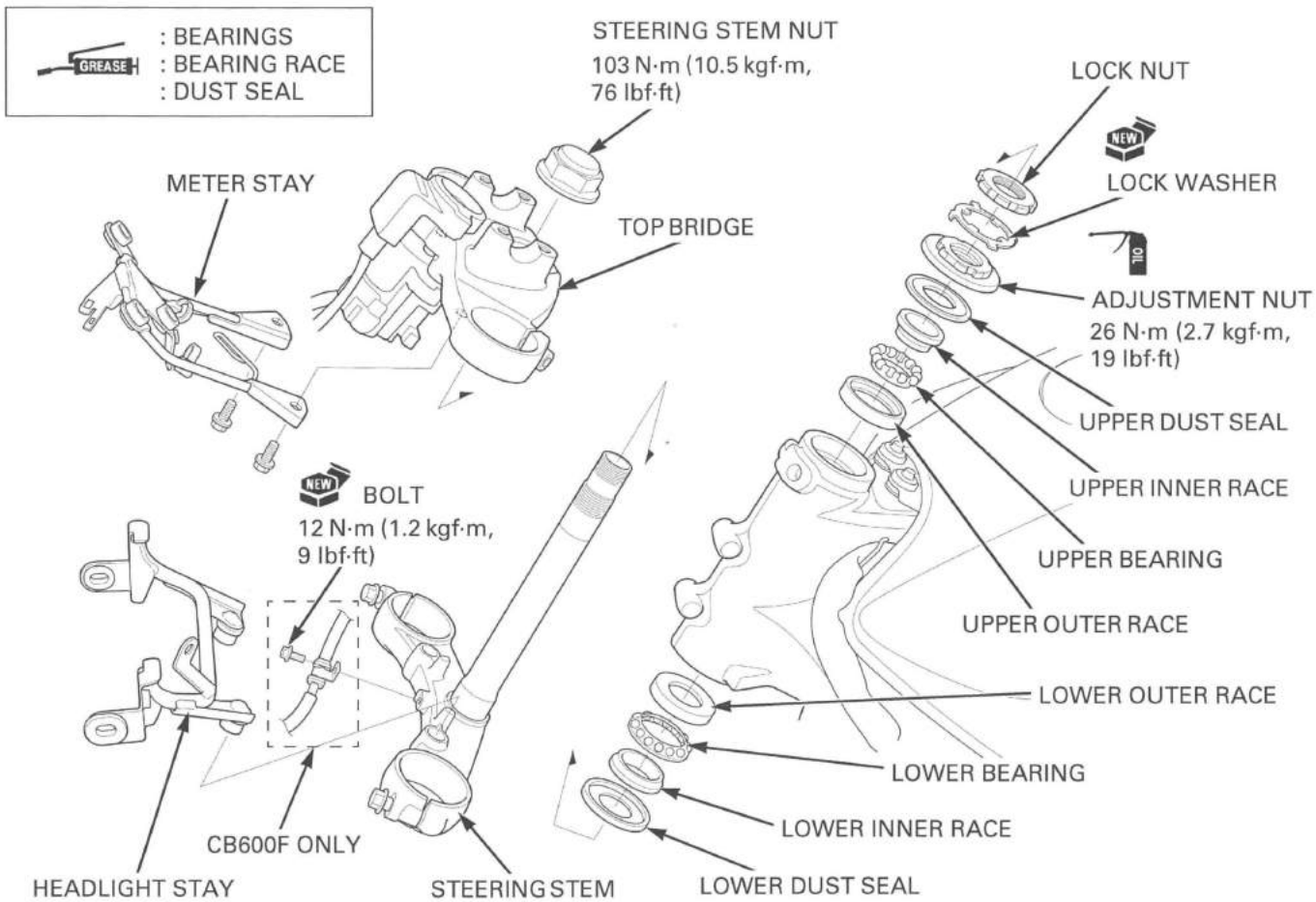


Apply grease to a new dust seal lips and install it over the steering stem.
Install a new lower bearing inner race using a special tool and a hydraulic press.

TOOL:
Steering stem driver 07946-MB00000



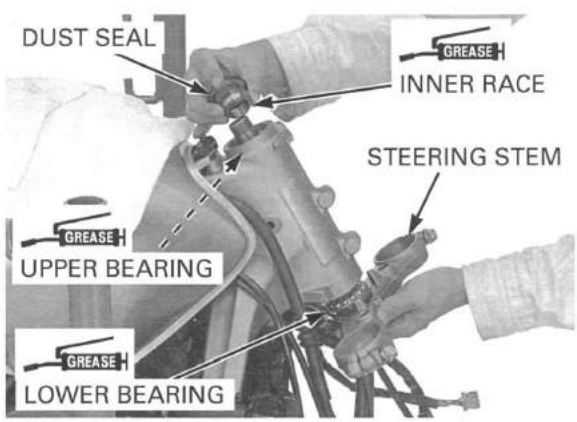
INSTALLATION



Apply grease to upper and lower bearings and bearing races.

Install the lower bearing onto the steering stem.
Insert the steering stem into the steering head pipe.

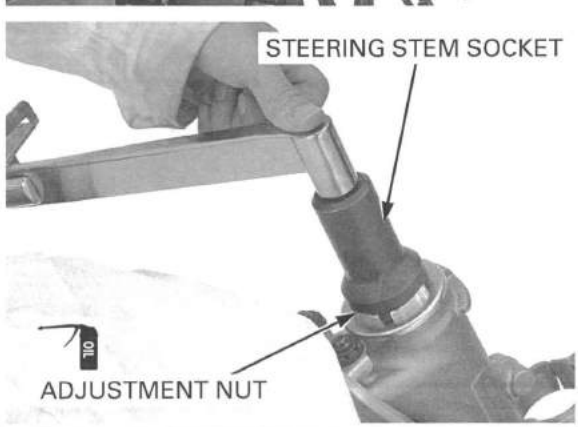
Install upper bearing, inner race and dust seal.



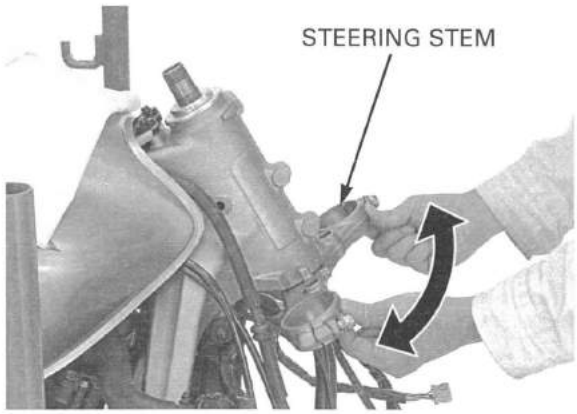
Apply engine oil to the bearing adjustment nut threads.
Install and tighten the stem bearing adjustment nut to the initial torque.

TOOL:
Steering stem socket 07916-3710101

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)



Move the steering stem right and left, lock-to-lock, five times to seat the bearings.
Make sure that the steering stem moves smoothly, without play or binding.

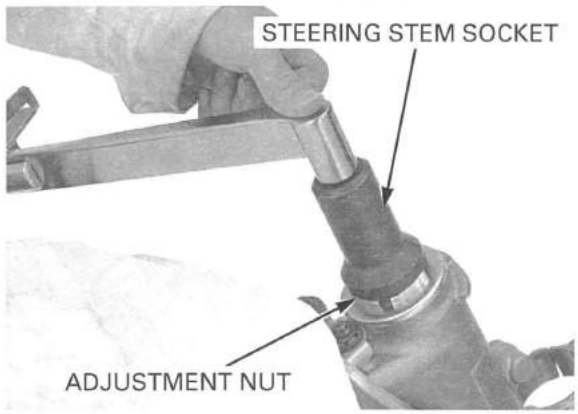


Retighten the bearing adjusting nut to the specified torque.

TOOL:
Steering stem socket 07916-3710101

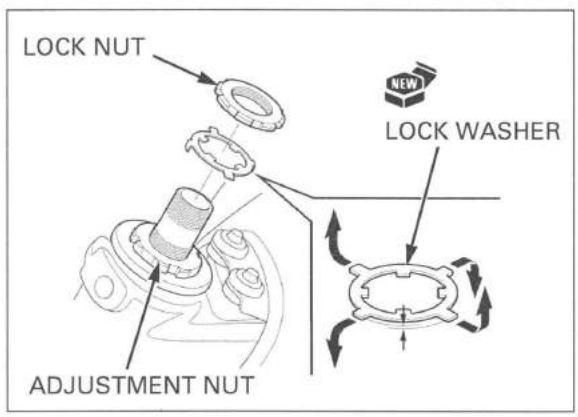
TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)

Recheck that the steering stem moves smoothly without play or binding.



Install a new lock washer onto the steering stem.

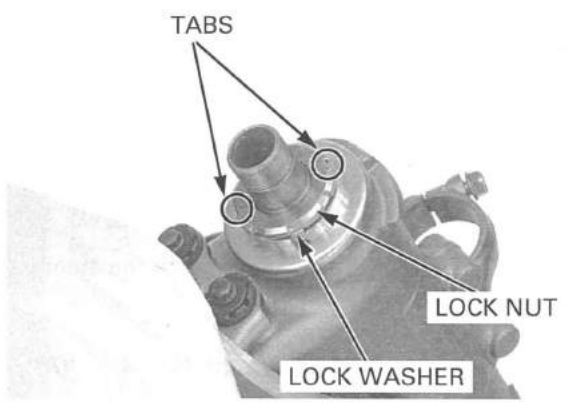
Align the tabs of the lock washer with the grooves in the adjustment nut and bend two opposite tabs (shorter) down into the adjustment nut groove.



Do not over tightness lock nut until lock washer being flat.

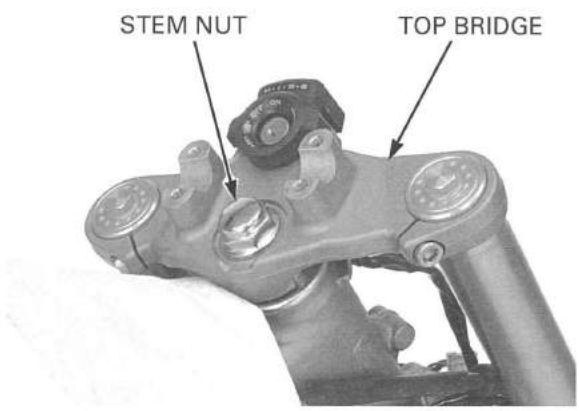
Install and finger tighten the lock nut, further finger tighten the lock nut within 1/4 turn (90°) enough to align its grooves with the lock washer tabs.

Bend the lock washer tabs up into the lock nut groove.



Install the top bridge and steering stem nut.

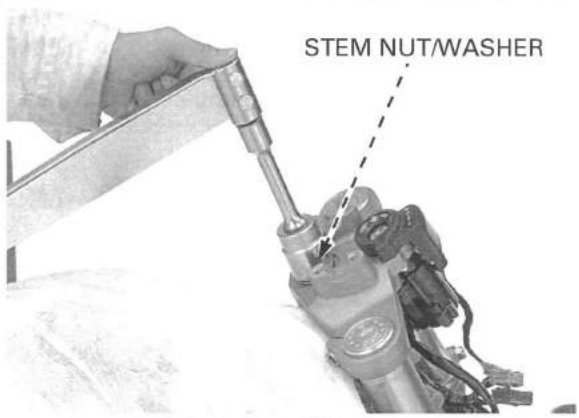
Install the fork legs (page 13-30).



Tighten the steering stem nut to the specified torque.

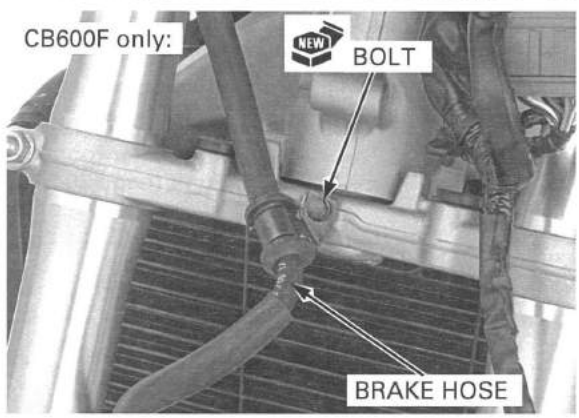
TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

Install the handlebar (page 13-10).



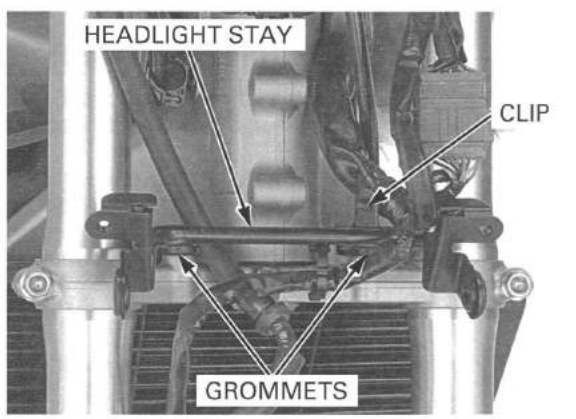
CB600F only: Install the front brake hose with a new bolt and tighten the bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the headlight stay to the steering stem, aligning the stay boss with the stem grommets.

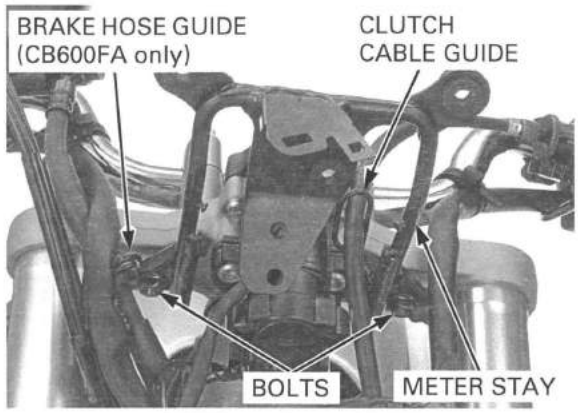
Attach the main harness wire clip to the headlight stay.



Install the meter stay and tighten the bolts securely.

Route the clutch cable to the guide of meter stay.

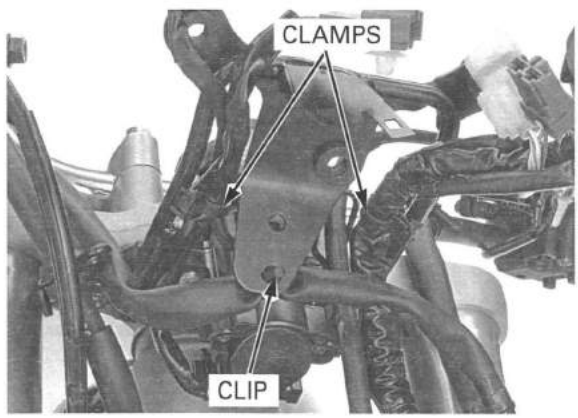
CB600FA only: Route the front brake hose to the guide of meter stay.



Route the hoses, wires and cables properly (page 1-23).

Attach the immobilizer receiver, ignition switch wires clamp and main harness wire clamp to the meter stay.

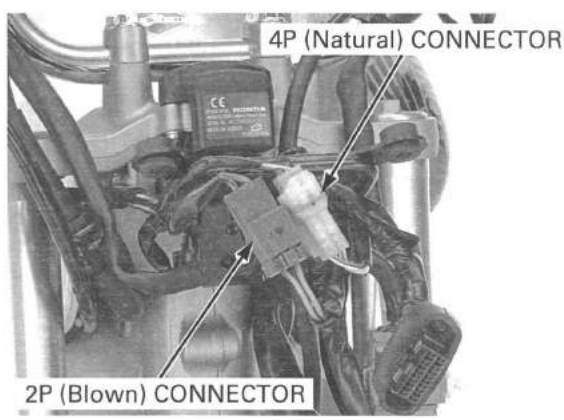
Attach the engine stop switch wire clip to the meter stay.



Connect the immobilizer receiver 4P (Natural) and ignition switch 2P (Blown) connectors.

Install the following:

- front wheel (page 13-19)
- combination meter (page 20-10)
- headlight unit (page 20-6)

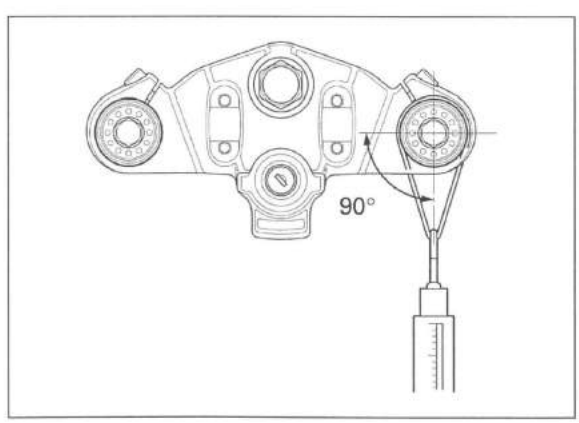


STEERING HEAD BEARING PRE-LOAD

Support the motorcycle securely using safety stands or a hoist and raise the front wheel off the ground.
Position the steering stem straight ahead.
Hook a spring scale to the fork tube between the fork top and bottom bridges.
Make sure there is no cable, wire harness or hoses interference.
Pull the spring scale keeping it at a right angle to the steering stem.
Read the scale at the point where the steering stem just starts to move.

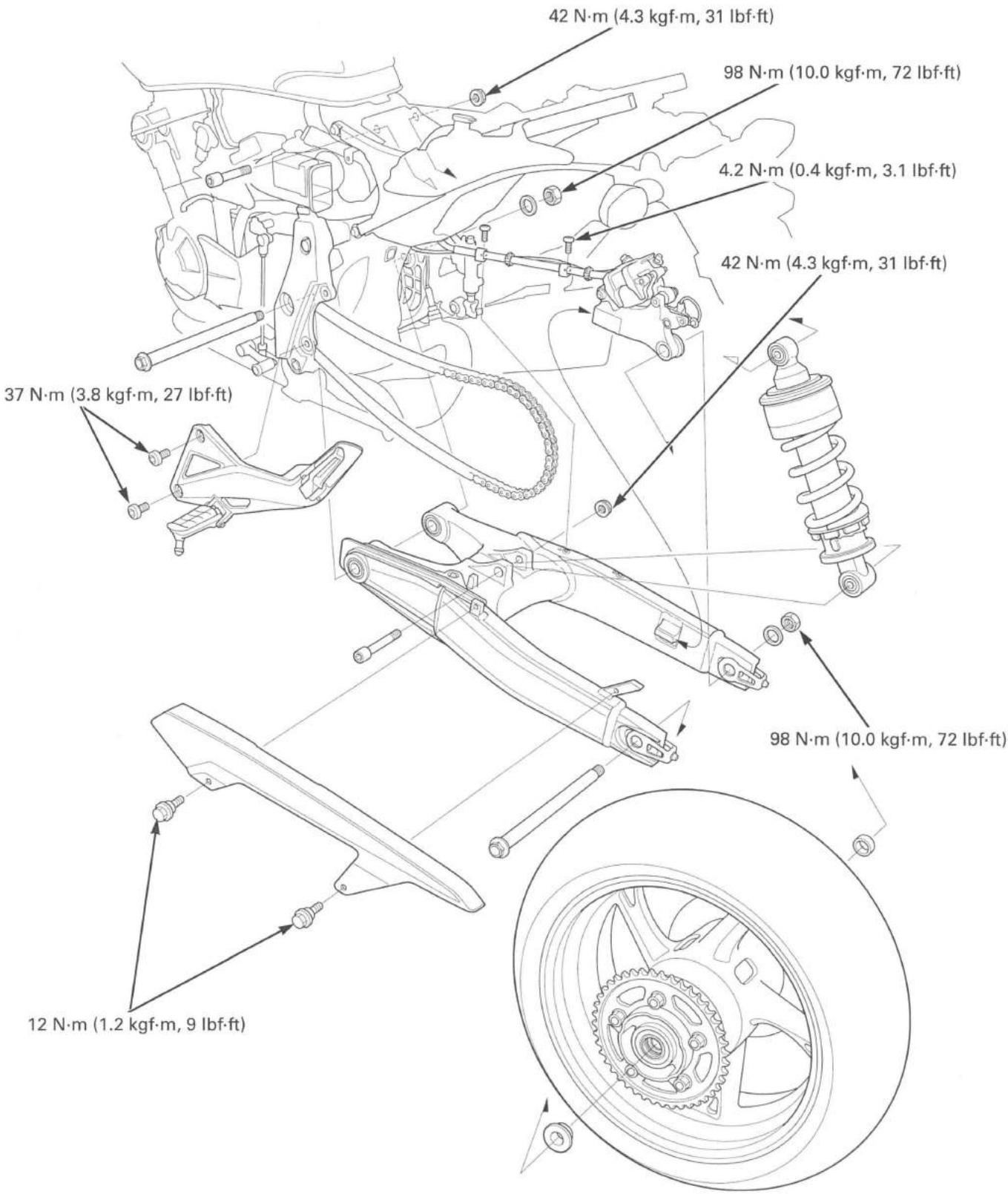
STEERING BEARING PRE-LOAD:
8.8 – 13.7 N (0.9 – 1.4 kgf, 2.0 – 3.1 lbf)

If the readings do not fall within the limits, readjust the steering bearing adjustment.



14. REAR WHEEL/SUSPENSION

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After the rear wheel installation, check the brake operation by applying the brake pedal.
- The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.
- Before disposal of the shock absorber, release the nitrogen (page 14-16).
- When servicing the rear wheel and suspension, support the motorcycle using a safety stand or hoist.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".
- Use genuine Honda replacement bolts and nuts for all suspension pivot and mounting point.
- Refer to the brake system information (page 15-4).

SPECIFICATIONS

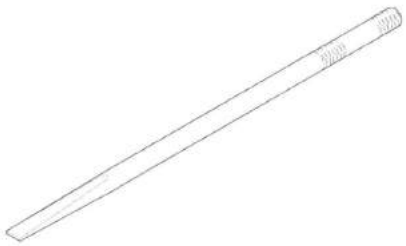
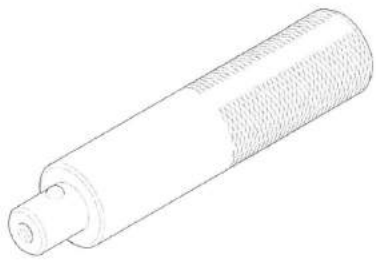
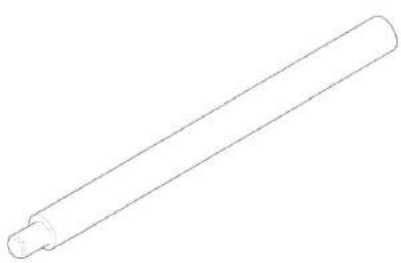
Unit: mm (in)

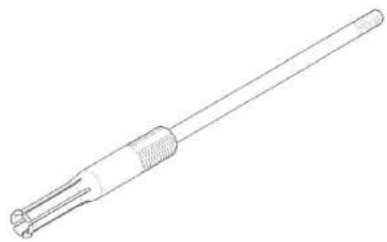
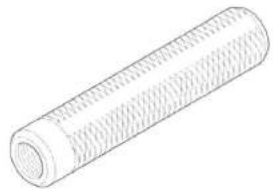
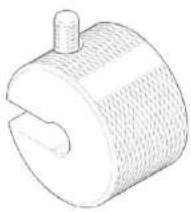
ITEM			STANDARD	SERVICE LIMIT
Minimum tire tread depth			–	2.0 (0.08)
Cold tire pressure	Driver only		290 kPa (2.90 kgf/cm^2, 42 psi)	–
	Driver and passenger		290 kPa (2.90 kgf/cm^2, 42 psi)	–
Axle runout			–	0.2 (0.01)
Wheel rim runout	Radial		–	2.0 (0.08)
	Axial		–	2.0 (0.08)
Wheel balance weight			–	60 g (2.1 oz) max.
Drive chain	Size/link	DID	DID525VM2-118LE	–
		REGINA	REG525ZRPB-118L	–
	Slack		30 – 40 (1-3/16 – 1-9/16)	–
Shock absorber spring pre-load adjuster standard position			Position 2	–

TORQUE VALUES

Drive chain case mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Rear axle nut	98 N·m (10.0 kgf·m, 72 lbf·ft)	U-nut
Rear brake disc mounting bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)	ALOC bolt: replace with a new one.
Driven sprocket nut	108 N·m (11.0 kgf·m, 80 lbf·ft)	
Shock absorber mounting nut	42 N·m (4.3 kgf·m, 31 lbf·ft)	U-nut
Swingarm pivot nut	98 N·m (10.0 kgf·m, 72 lbf·ft)	U-nut
Swingarm pivot bracket nut	69 N·m (7.0 kgf·m, 51 lbf·ft)	
Drive chain slider bolt	9.0 N·m (0.9 kgf·m, 6.6 lbf·ft)	ALOC bolt: replace with a new one.
Rear pulser ring mounting bolt (CB600FA)	7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)	ALOC bolt: replace with a new one.
Footpeg holder mounting bolt	37 N·m (3.8 kgf·m, 27 lbf·ft)	
Rear brake hose guide screw	4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)	
Rear brake fluid reservoir mounting bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	

TOOLS

Bearing remover shaft 07GGD-0010100  or 07746-0050100	Bearing remover head, 20 mm 07746-0050600 	Driver 07749-0010000 
Attachment, 32 X 35 mm 07746-0010100 	Attachment, 42 X 47 mm 07746-0010300 	Attachment, 52 X 55 mm 07746-0010400 
Attachment, 24 X 26 mm 07746-0010700 	Pilot, 17 mm 07746-0040400 	Pilot, 20 mm 07746-0040500 
Pilot, 22 mm 07746-0041000 	Driver shaft 07946-MJ00100 	Attachment, 28 X 30 mm 07946-1870100 

Attachment, 22 X 24 mm 07746-0010800 	Bearing remover shaft, 20 mm 07936-3710600 	Remover shaft handle 07936-3710100 
Remover weight 07741-0010201 	Needle bearing remover attachment 07HMC-MR70100 	Outer driver attachment 07ZMD-MBW0200 
Attachment, 37 X 40 mm 07746-0010200 	Pilot, 28 mm 07JAD-PH80400 	

TROUBLESHOOTING

Soft suspension
- Weak shock absorber spring
- Incorrect suspension adjustment
- Oil leakage from damper unit
- Insufficient tire pressure

Stiff suspension
- Incorrect suspension adjustment
- Damaged rear suspension pivot bearings
- Bent damper rod
- Incorrect swingarm pivot fasteners tightening
- Tire pressure too high

Rear wheel wobbling
- Bent rim
- Worn or damaged rear wheel bearings
- Faulty rear tire
- Unbalanced rear tire and wheel
- Insufficient rear tire pressure
- Faulty swingarm pivot bearings

Rear wheel hard to turn
- Faulty rear wheel bearings
- Bent rear axle
- Rear brake drag
- Drive chain too tight

Rear suspension noise
- Faulty rear shock absorber
- Loose rear suspension fasteners
- Worn rear suspension pivot bearings

REAR WHEEL

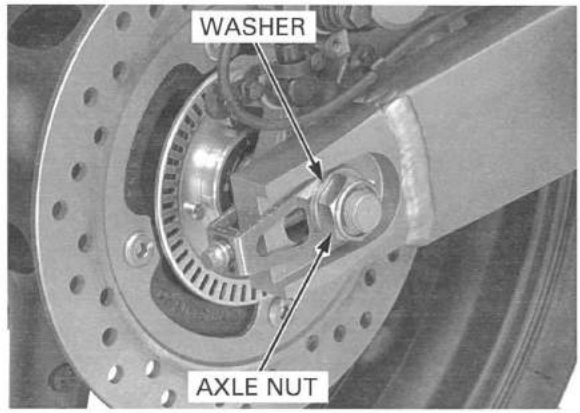
REMOVAL

Loosen the rear axle nut.

Support the motorcycle using a safety stand or a hoist, raise the rear wheel off the ground.

Adjust the drive chain slack fully (page 3-19).

Remove the axle nut and washer.



Push the rear wheel forward.
Remove the rear axle.

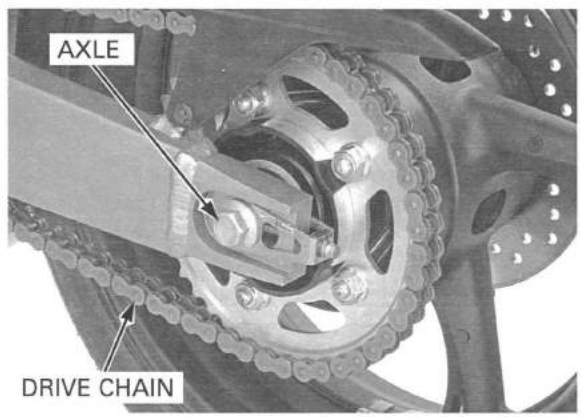
Derail the drive chain from the driven sprocket.

CB600FA: Be careful not to damage the speed sensor on the brake caliper.

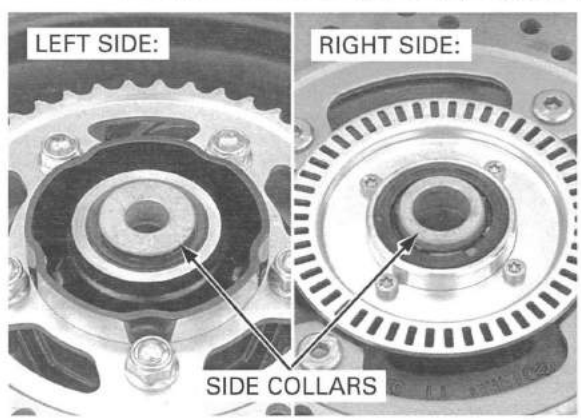
Remove the rear wheel.

NOTE:

- Do not operate the brake pedal after removing the wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.



Remove the side collars.

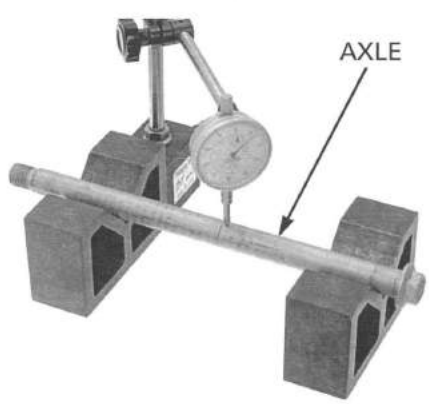


INSPECTION

Axle

Place the axle in V-blocks and measure the runout. Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)

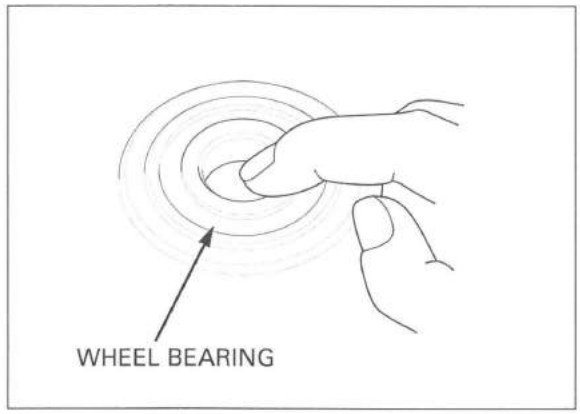


Wheel bearing

Turn the inner race of each bearing with your finger. Bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Replace the wheel bearings in pairs.

Remove and discard the bearings if the races do not turn smoothly and quietly, or if they fit loosely in the hub.



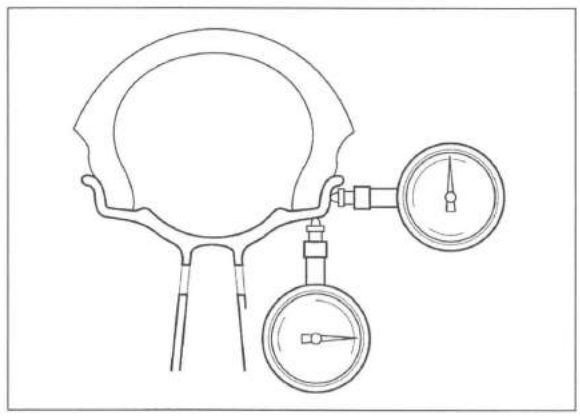
Wheel rim runout

Check the rim runout by placing the wheel in a turning stand.

Spin the wheel slowly and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

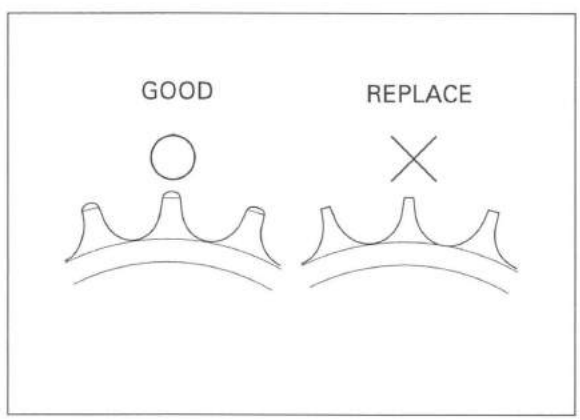
SERVICE LIMITS:
Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)



Driven sprocket

Check the condition of the final driven sprocket teeth.
Replace the sprocket if worn or damaged.

- If the final driven sprocket requires replacement, inspect the drive chain and drive sprocket.
- Never install a new drive chain on a worn sprocket or a worn chain on new sprockets. Both chain and sprocket must be in good condition or the replacement chain or sprocket will wear rapidly.

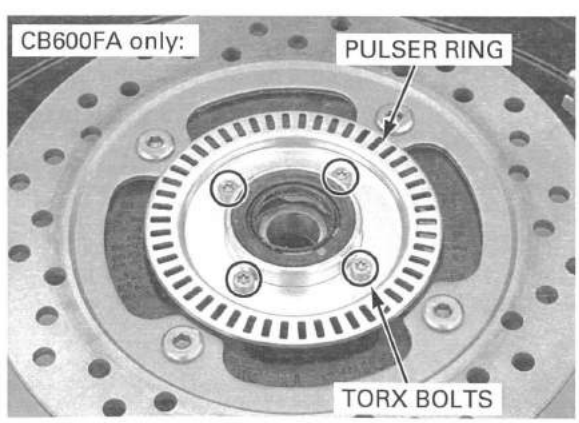


Wheel balance

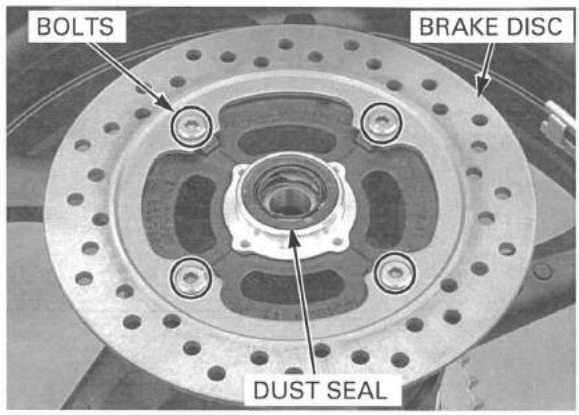
Refer to the wheel balance servicing (page 13-16).

DISASSEMBLY

CB600FA only: Remove the torx bolts and speed sensor pulser ring.

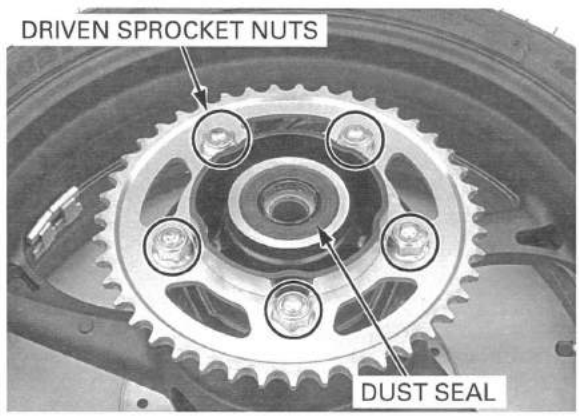


Remove the bolts and brake disc.
Remove the right dust seal.

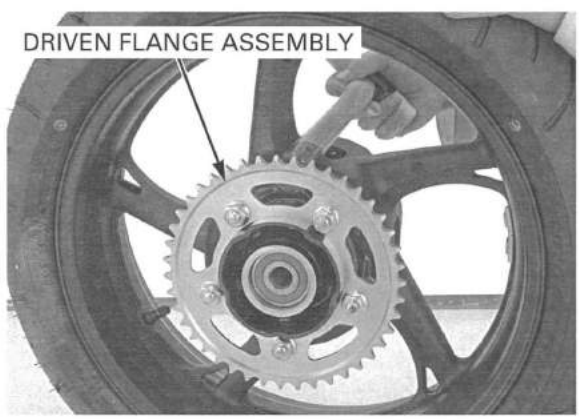


If you will be disassemble the driven flange, loosen the driven sprocket nuts before removing the driven flange from the wheel hub.

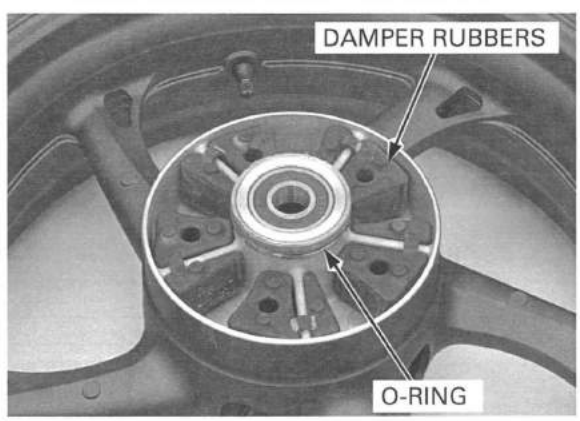
Remove the left dust seal.



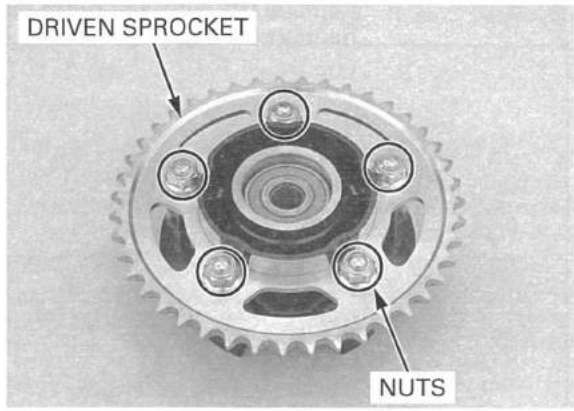
Remove the driven flange assembly from the left wheel hub.



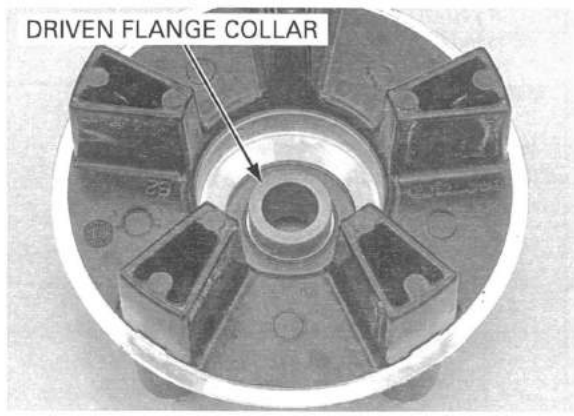
Remove the wheel damper rubbers.
Remove the O-ring.



Remove the nuts and driven sprocket.



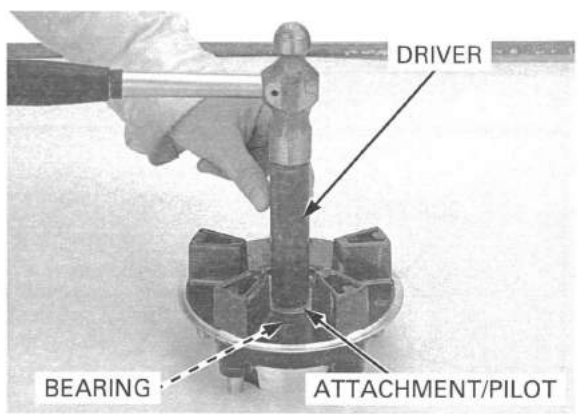
Remove the driven flange collar.



Drive out the driven flange bearing using the special tool.

TOOLS:

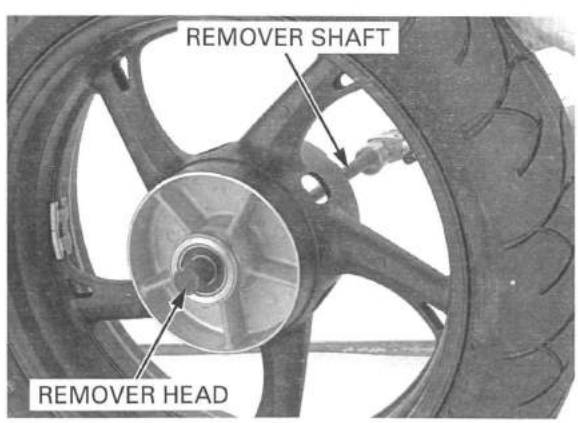
Driver	**07749-0010000**
Attachment, 42 X 47 mm	**07746-0010300**
Pilot, 22 mm	**07746-0041000**



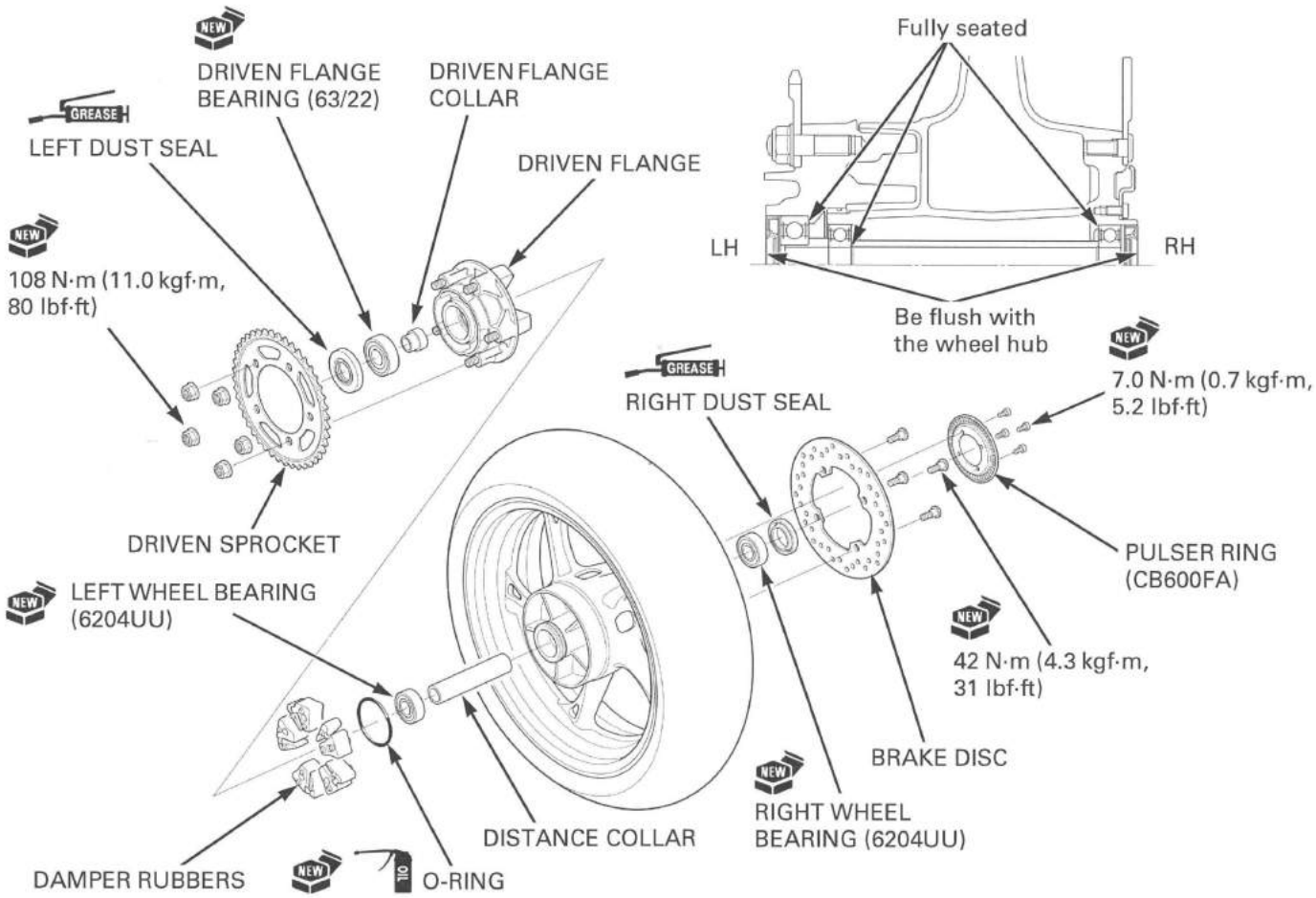
Install the bearing remover head into the bearing. From the opposite side install the bearing remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover head, 20 mm	**07746-0050600**
Bearing remover shaft	**07GGD-0010100 or 07746-0050100**



ASSEMBLY



Never install the old bearings, once the bearings has been removed, the bearing must be replaced with new ones.

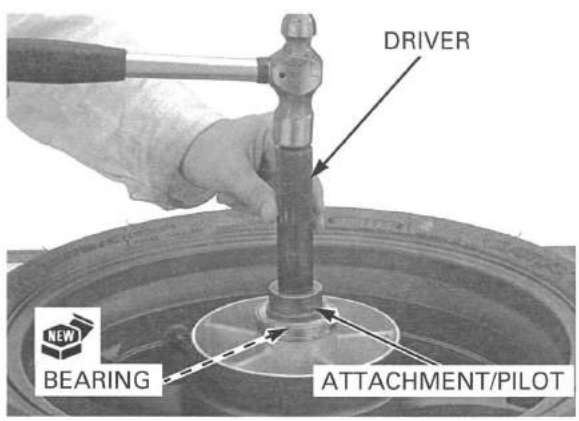
Drive in a new right wheel bearing squarely with its marked side facing up until it is fully seated using the special tool.

TOOLS:

Driver	**07749-0010000**
Attachment, 42 X 47 mm	**07746-0010300**
Pilot, 20 mm	**07746-0040500**

Install the distance collar

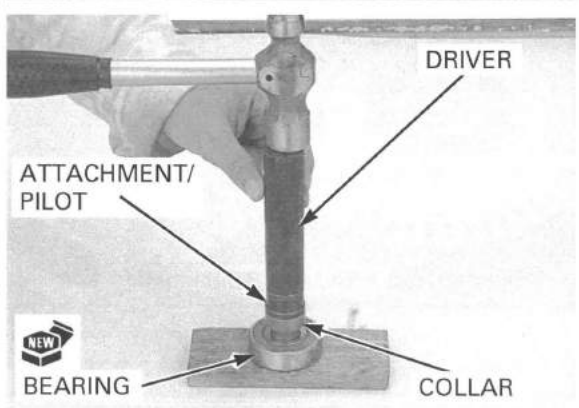
Using the same tools, drive in new left wheel bearing squarely with its marked side facing out, until it is fully seated on the distance collar.



Place a new driven flange bearing onto the suitable base with its marking facing down.
Drive the driven flange collar in a new driven flange bearing until it is fully seated using the special tools.

TOOLS:

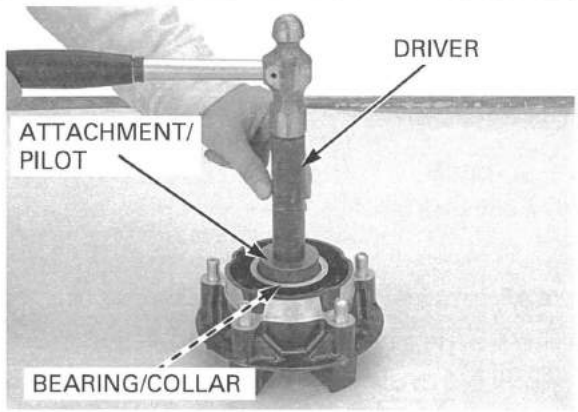
Driver	**07749-0010000**
Attachment, 28 X 30 mm	**07946-1870100**
Pilot, 20 mm	**07746-0040500**



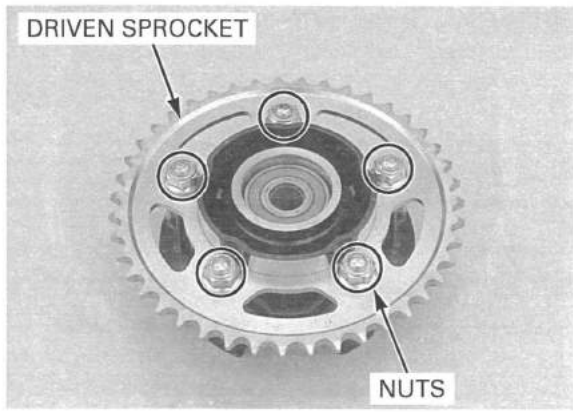
Drive the driven flange bearing/collar into the driven flange using the special tools.

TOOLS:

Driver	**07749-0010000**
Attachment, 52 X 55 mm	**07746-0010400**
Pilot, 20 mm	**07746-0040500**



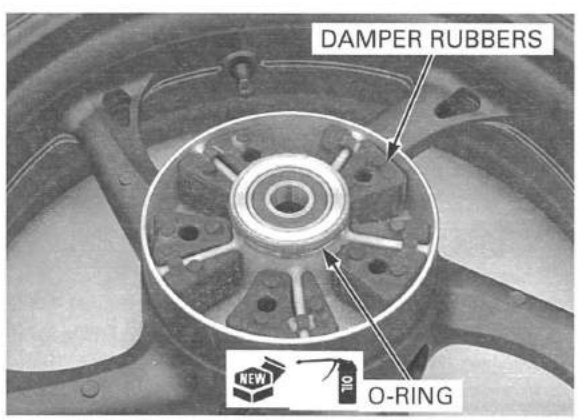
Install the driven sprocket and tighten the nuts temporarily.



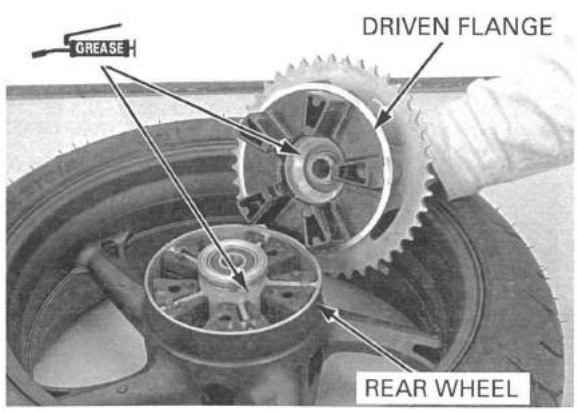
Replace the damper rubbers as a set.

Install the wheel damper rubbers into the wheel hub.

Apply engine oil to a new O-ring and install it into the groove of the wheel hub.



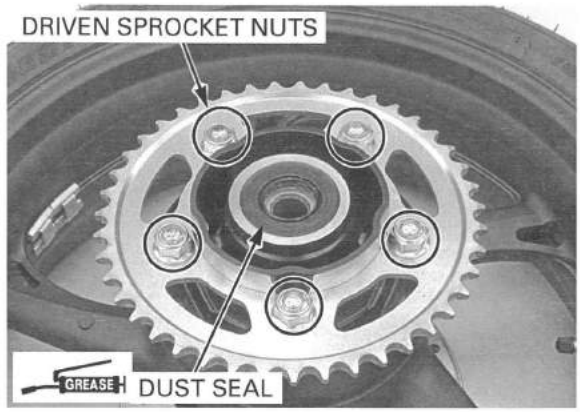
Apply grease to the driven flange and rear wheel hub contact area.
Install the driven flange assembly into the left wheel hub.



If the driven sprocket was removed, tighten the nuts to the specified torque.

TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)

Apply grease to the dust seal lips and install the dust seal until it is flush with the driven flange.

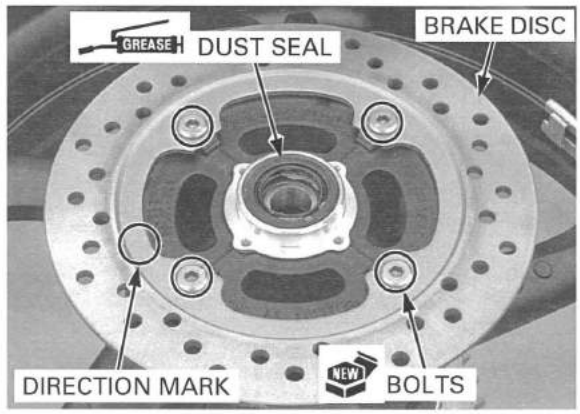


Install the brake disc with its rotating direction mark facing out.
Install and tighten new bolts to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

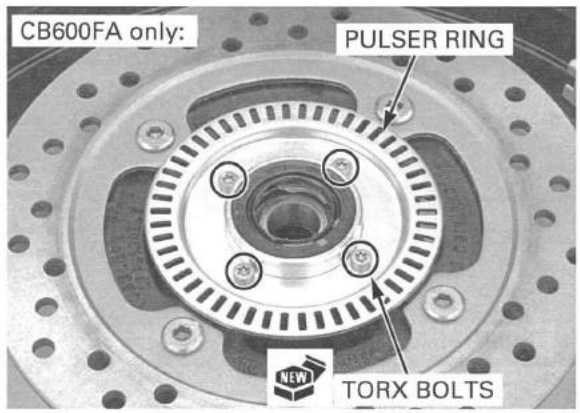
Do not get grease on the brake disc or stopping power will be reduced.

Apply grease to the dust seal lips and install the dust seal until it is flush with the wheel hub.



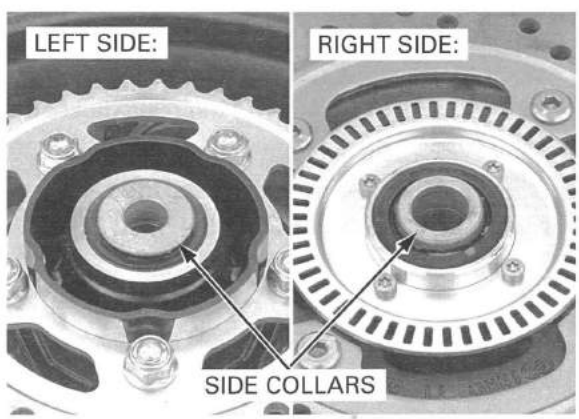
CB600FA only: Install the speed sensor pulser ring onto the right wheel hub.
Install the new torx bolts and tighten them to the specified torque.

TORQUE: 7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)

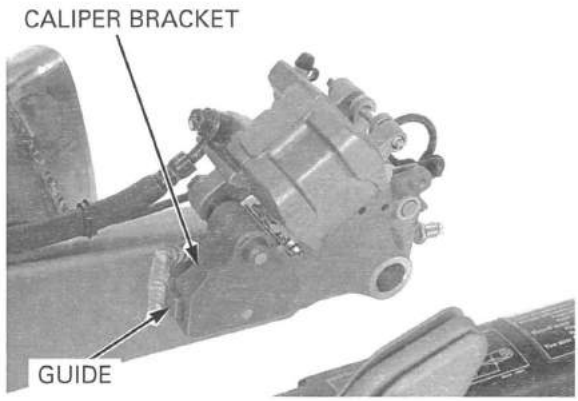


INSTALLATION

Install the side collars.



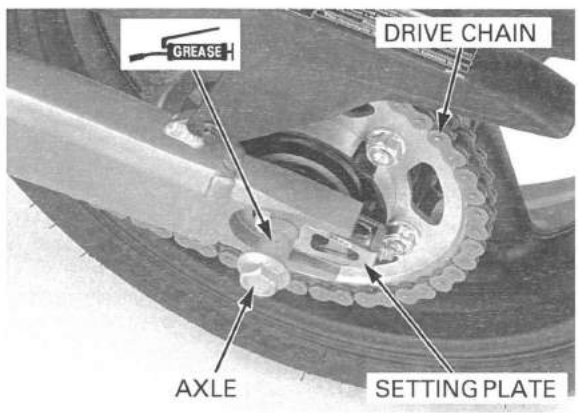
Install the rear brake caliper bracket onto the guide of the swingarm.



Be careful not to damage the brake pads and speed sensor (CB600FA).

Coat the axle surface with thin layer of grease.

Place the rear wheel in the swingarm so the brake disc is positioned between the brake pads.
Install the drive chain over the driven sprocket.
Install the axle from the left side through the setting plate, swingarm, wheel and caliper bracket.

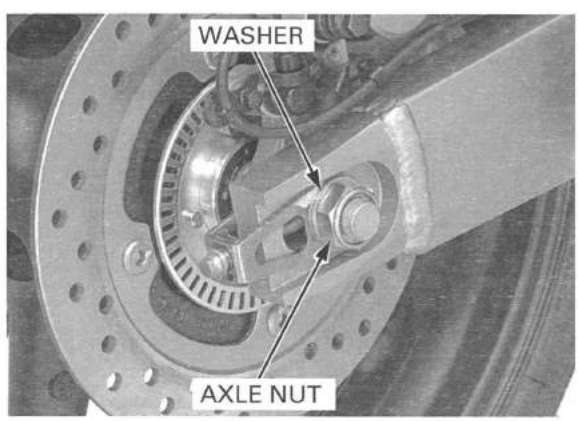


Install the washer and axle nut.

Adjust the drive chain slack (page 3-19).

Tighten the axle nut to the specified torque.

TORQUE: 98 N·m (10.0 kgf·m, 72 lbf·ft)



SHOCK ABSORBER

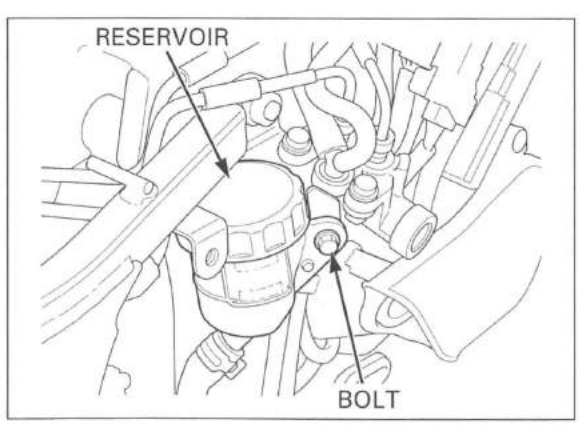
REMOVAL

Support the motorcycle using a safety stand or a hoist, raise the rear wheel off the ground.

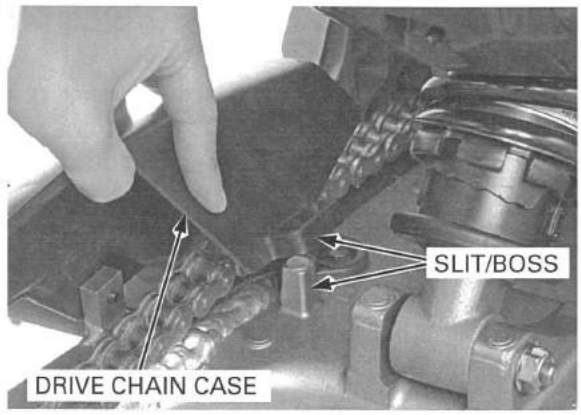
Remove the following:

- side covers (page 2-4)
- rear wheel (page 14-7)

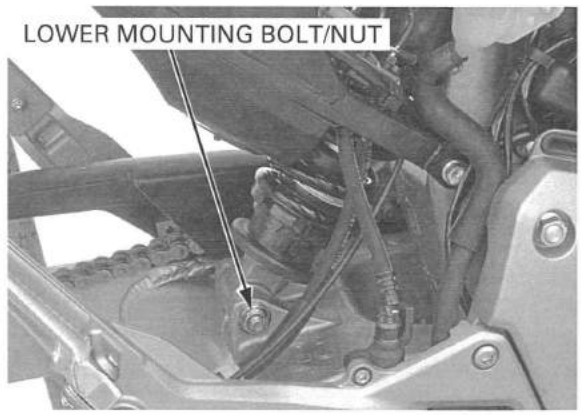
Remove the bolt and rear brake fluid reservoir.



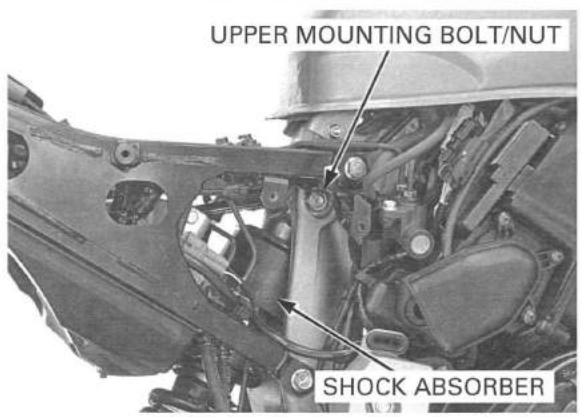
Release the drive chain case slit from the boss of swingarm.



Remove the shock absorber lower mounting bolt/nut.



Remove the shock absorber upper mounting bolt/nut and the shock absorber.

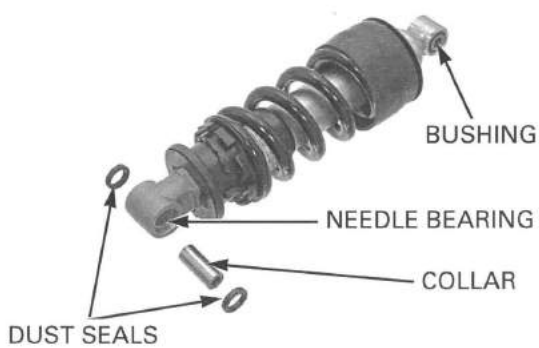


INSPECTION

Check the damper unit for leakage or other damage.
Check the upper bushing for wear or damage.
Replace the shock absorber assembly if necessary.

Remove the dust seals and lower pivot collar.
Check the dust seals, pivot collar and needle bearing for wear or damage.

If the shock absorber is replaced, refer to shock absorber disposal procedure (page 14-16).



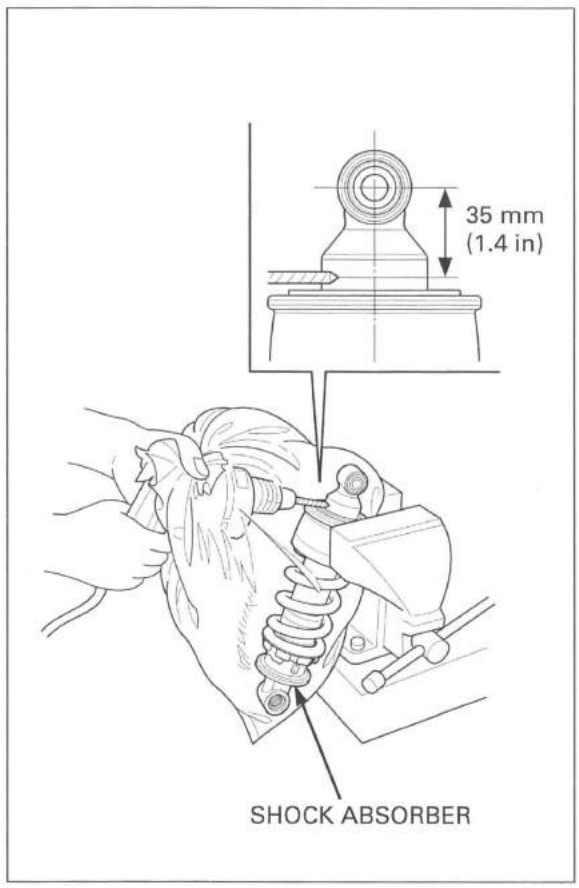
SHOCK ABSORBER DISPOSAL PROCEDURE

Center punch the damper case to mark the drilling point.

Wrap the shock absorber inside a plastic bag.
Support the shock absorber upright in a vise as shown.
Through the open end of the bag, insert a drill motor with a sharp 2 - 3 mm (5/64 - 1/8 in) drill bit.

Point the valve away from you to prevent debris getting in your eyes.

Hold the bag around the drill motor and briefly run the drill motor inside the bag; this will inflate the bag with air from the motor and help keep the bag from getting caught in the bit when you start.

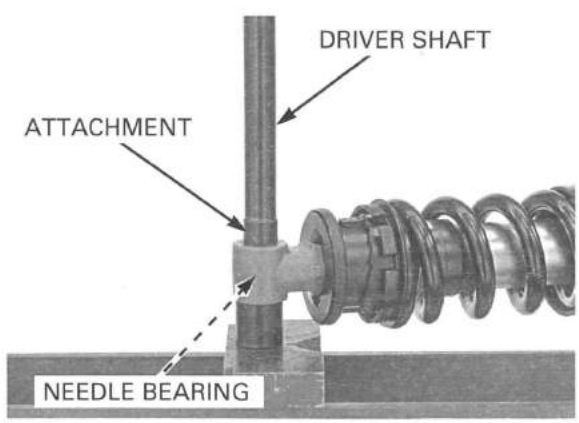


BEARING REPLACEMENT

Press the needle bearing out of the lower pivot using the special tools and a hydraulic press.

TOOLS:

Driver shaft	**07946-MJ00100**
Attachment, 22 x 24 mm	**07746-0010800**

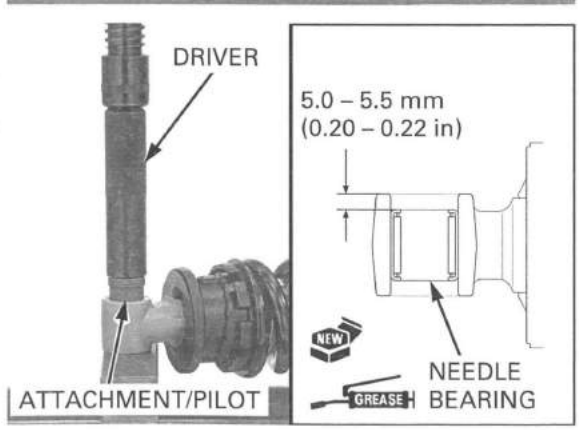


Apply grease to a new needle bearing.

Carefully press the bearing in the pivot until the depth from the pivot outer surface is 5.0 – 5.5 mm (0.20 – 0.22 in), using the special tools and a hydraulic press.

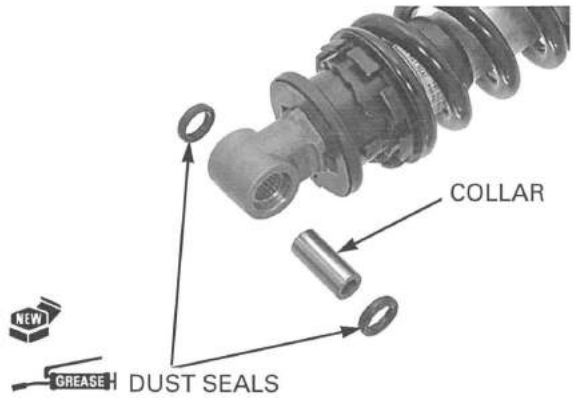
TOOLS:

Driver	**07749-0010000**
Attachment, 22 x 24 mm	**07746-0010800**
Pilot, 17 mm	**07746-0040400**



Make sure the needle rollers in the bearing are in position.

Apply grease to new dust seal lips.
Install the dust seals with the flat surface facing out until they are flush with the lower pivot surface.
Install the pivot collar.

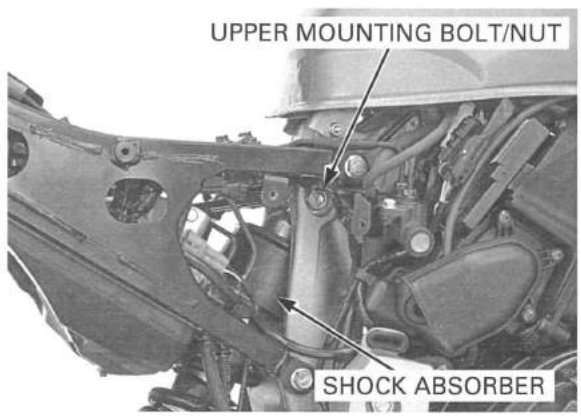


INSTALLATION

Install the shock absorber into the frame.

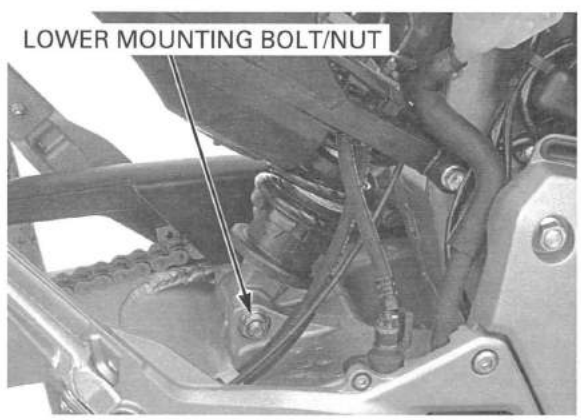
Install the upper mounting bolt from the left side and install the nut.
Tighten the nut to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 21 lbf·ft)

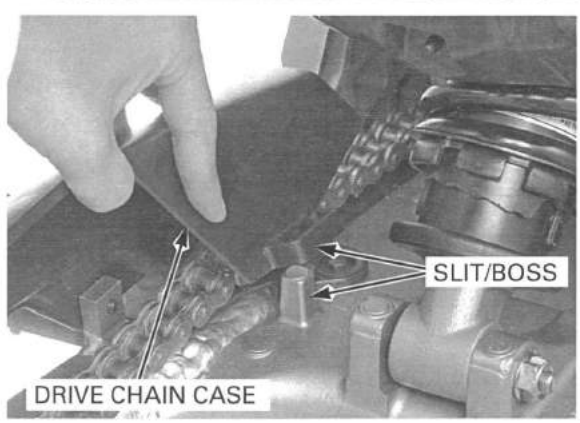


Install the lower mounting bolt from the left side and install the nut.
Tighten the nut to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 21 lbf·ft)



Insert the drive chain case slit into the boss of swingarm.

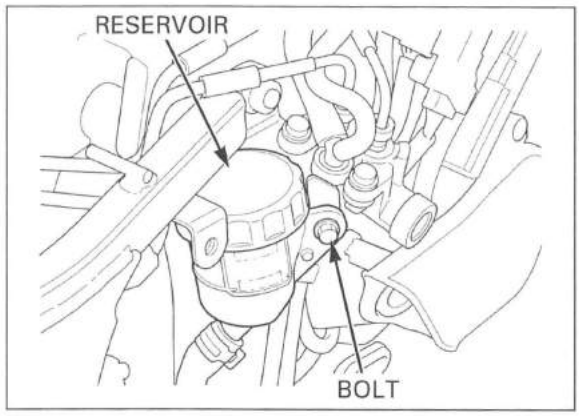


Install the rear brake fluid reservoir and tighten the bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the following:

- rear wheel (page 14-13)
- side covers (page 2-4)



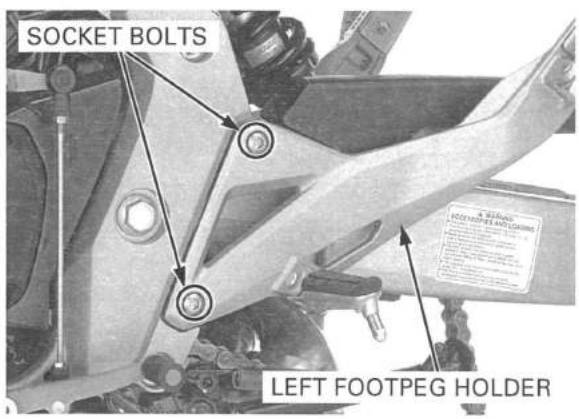
SWINGARM

REMOVAL

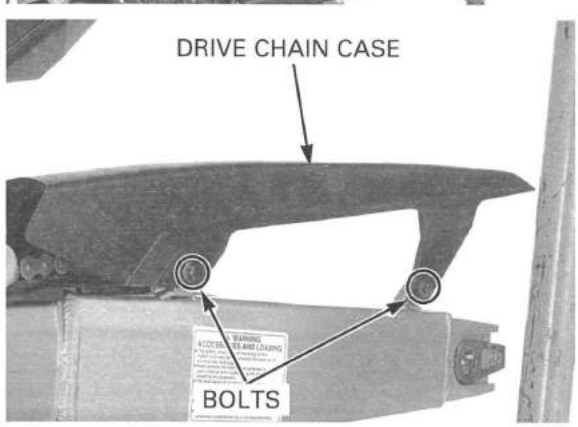
Support the motorcycle using a safety stand or a hoist, raise the rear wheel off the ground.

Remove the rear wheel (page 14-7).

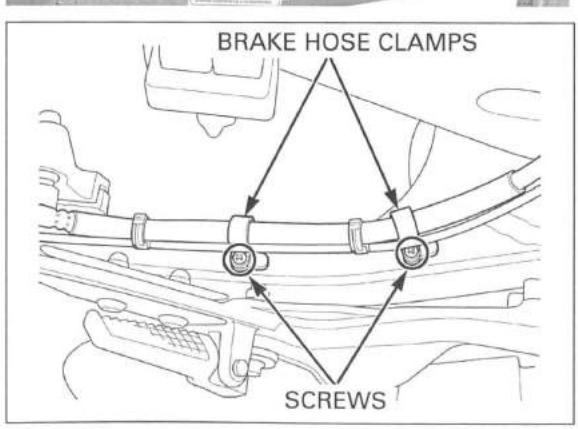
Remove the socket bolts and left footpeg holder.



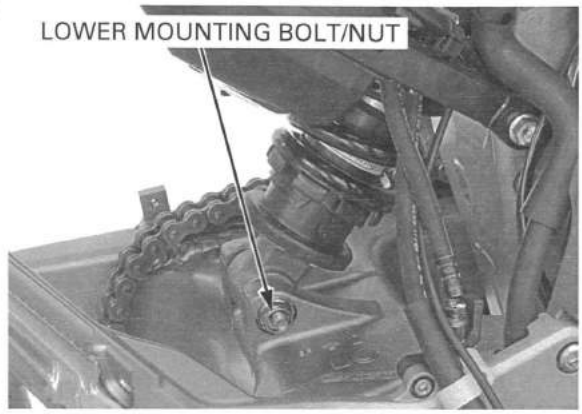
Remove the bolts and drive chain case.



Remove the brake hose clamp screws.

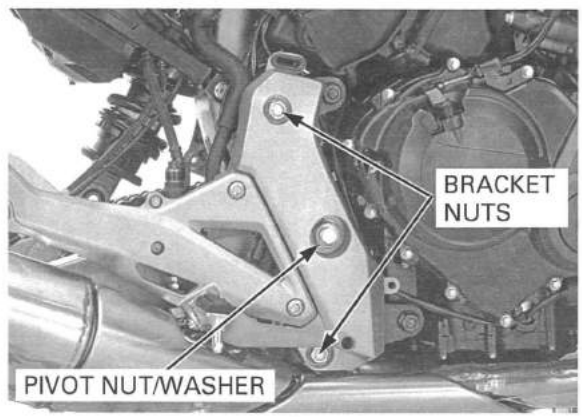


Remove the shock absorber lower mounting bolt/nut.



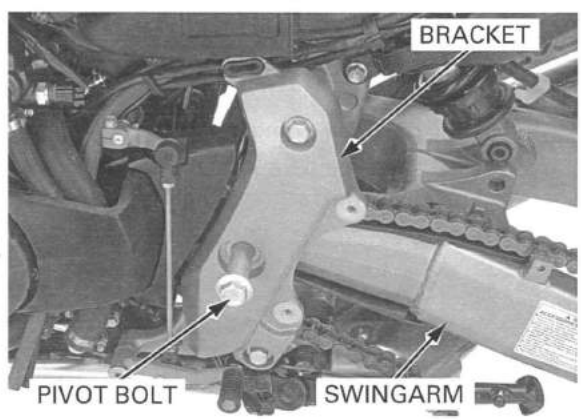
Loosen the pivot bracket nuts.

Remove the swingarm pivot nut and washer.



Slightly pull the pivot bracket outward.

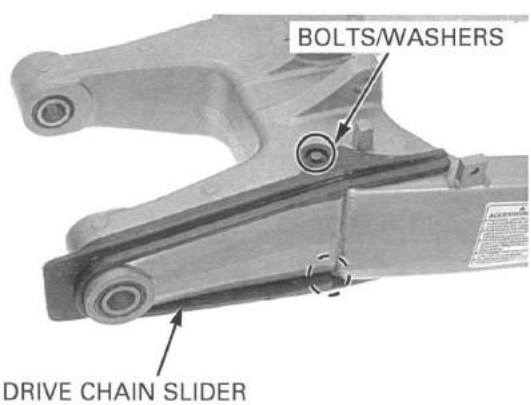
Remove the swingarm pivot bolt and swingarm.



DISASSEMBLY/INSPECTION

Remove the bolts, washers and drive chain slider.

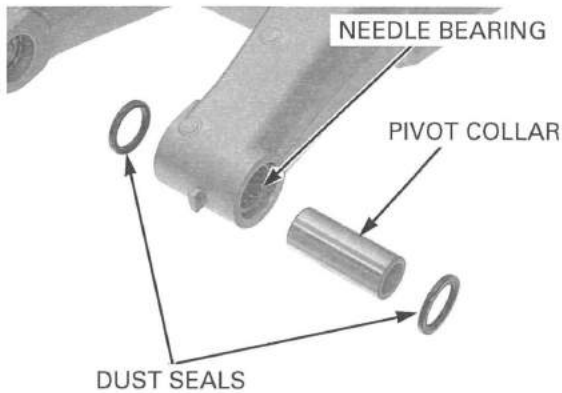
Check the drive chain slider for wear or damage. Replace if necessary.



Remove the pivot collar and dust seals from the swingarm left pivot.

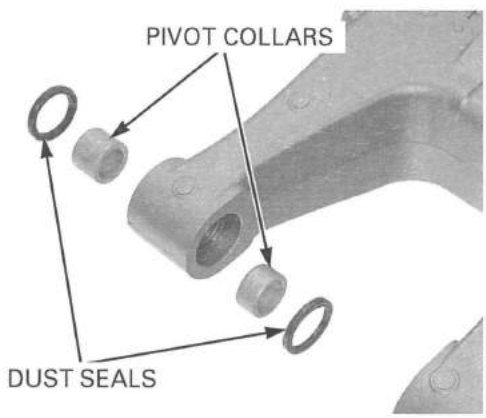
Check the dust seals and collar for damage or fatigue.

Check the needle bearing for damage.



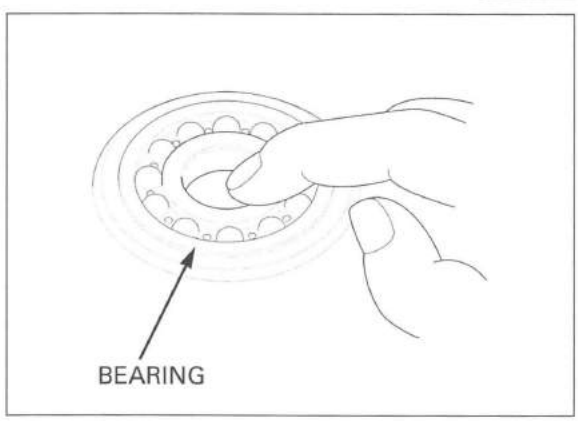
Remove the pivot collars and dust seals from the swingarm right pivot.

Check the dust seals and collars for damage or fatigue.



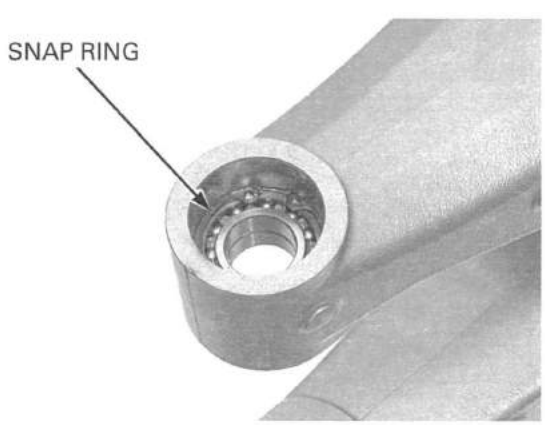
Turn the inner race of right pivot bearings with your finger.
The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the swingarm pivot.

Remove and discard the bearings if the races do not turn smoothly and quietly, or if they fit loosely in the swingarm pivot.



PIVOT BEARING REPLACEMENT

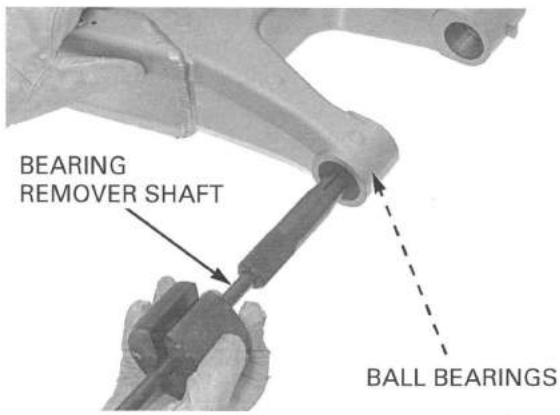
Remove the snap ring from the swingarm right pivot.



Remove the right pivot radial ball bearings out using the special tool.

TOOLS:

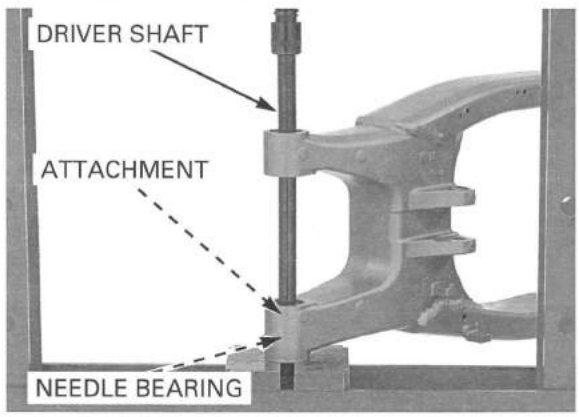
Bearing remover shaft, 20 mm	**07936-3710600**
Remover shaft handle	**07936-3710100**
Remover weight	**07741-0010201**



Press the left pivot needle bearing out using the special tools and a hydraulic press.

TOOLS:

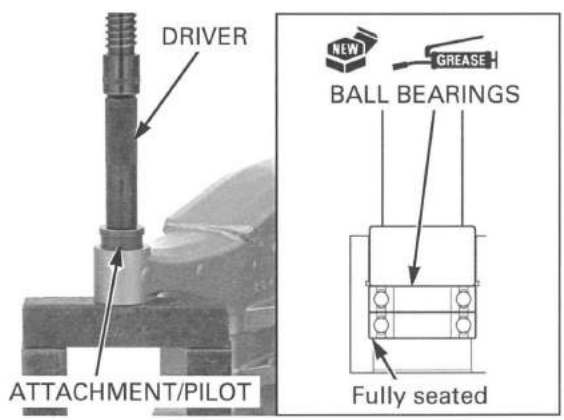
Needle bearing remover attachment	**07HMC-MR70100**
Driver shaft	**07946-MJ00100**



Pack new ball bearings with grease.
Press the ball bearings into the swingarm right pivot until they are fully seated, using the special tools and a hydraulic press.

TOOLS:

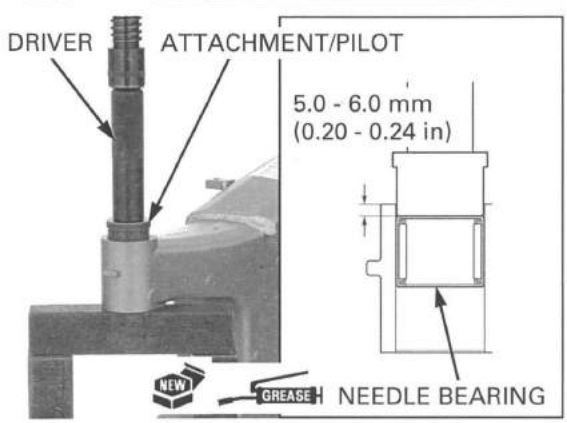
Driver	**07749-0010000**
Outer driver attachment	**07ZMD-MBW0200**
Pilot, 20 mm	**07746-0040500**



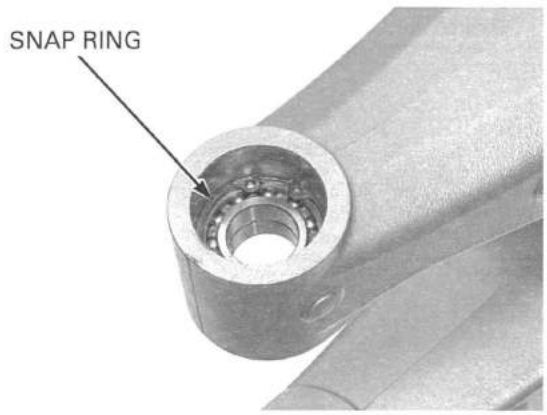
Pack a new needle bearing with grease.
Press the needle bearing into the swingarm left pivot until the depth from the swingarm outer surface is 5.0 - 6.0 mm (0.20 - 0.24 in) using the special tools and a hydraulic press.

TOOLS:

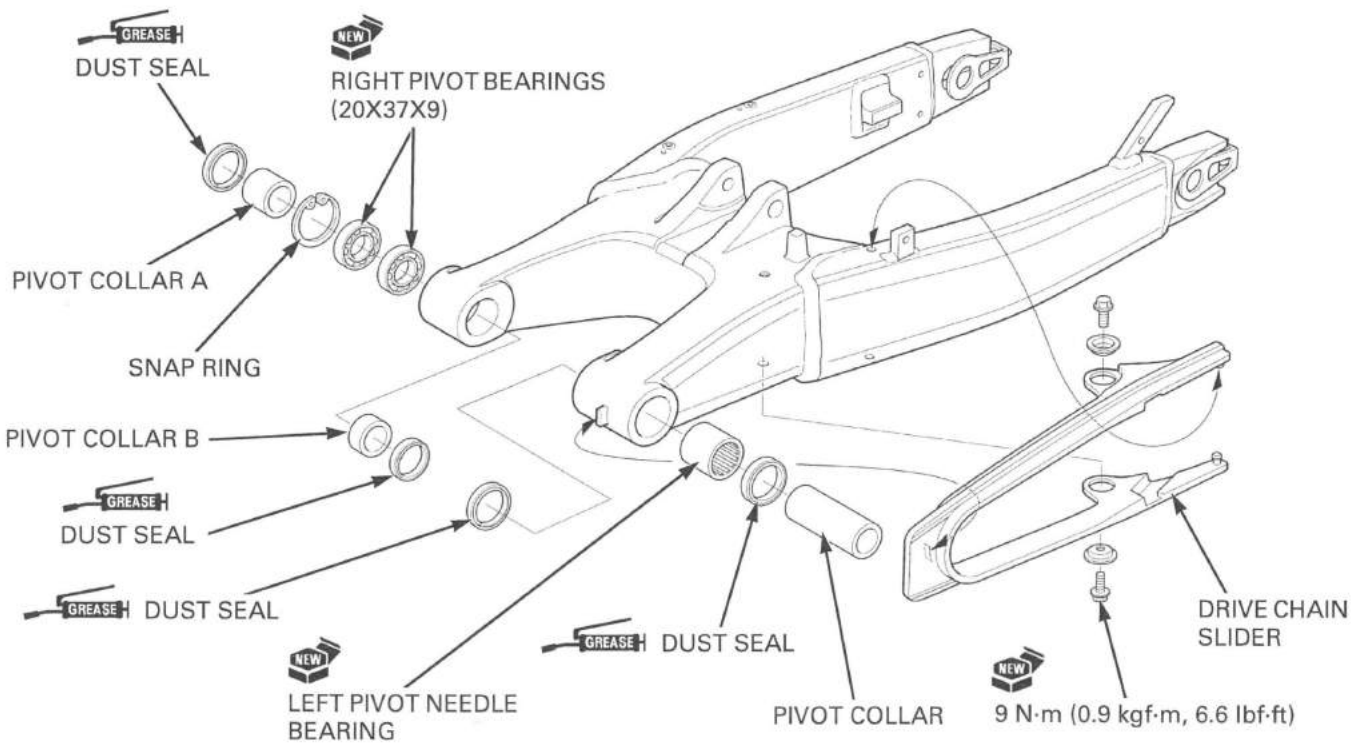
Driver	**07749-0010000**
Attachment, 37 X 40 mm	**07746-0010200**
Pilot, 28 mm	**07JAD-PH80400**



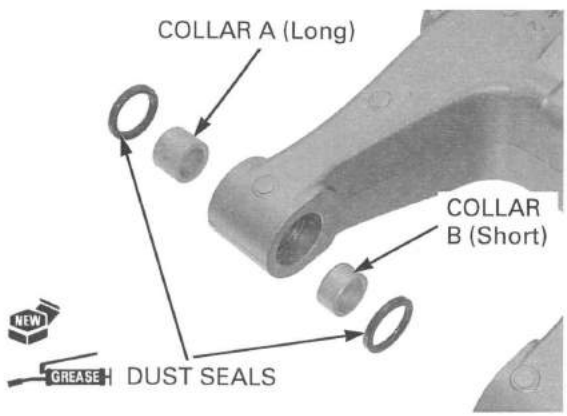
Install the snap ring into the right swingarm pivot groove securely.



ASSEMBLY

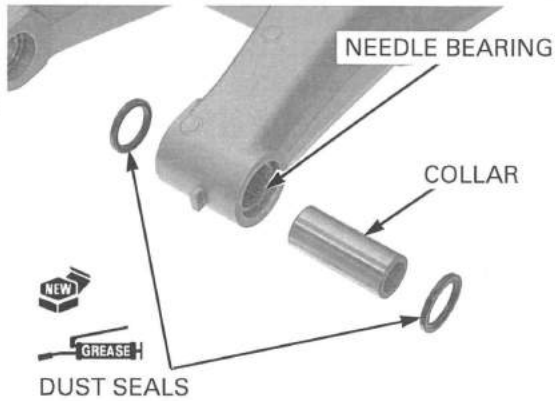


Apply grease to new dust seal lips.
Install the dust seals with the flat surface facing out until they are flush with the pivot outer surface.
Install the swingarm right pivot collars (A and B) as shown.



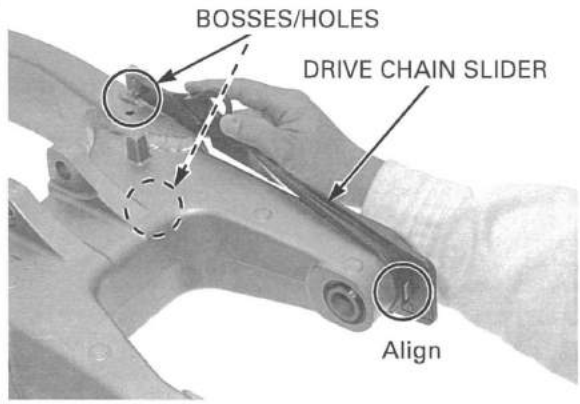
Make sure the needle rollers in the bearing are in position.

Apply grease to new dust seal lips.
Install the dust seals with the flat surface facing out until they are flush with the pivot outer surface.
Install the pivot collar.



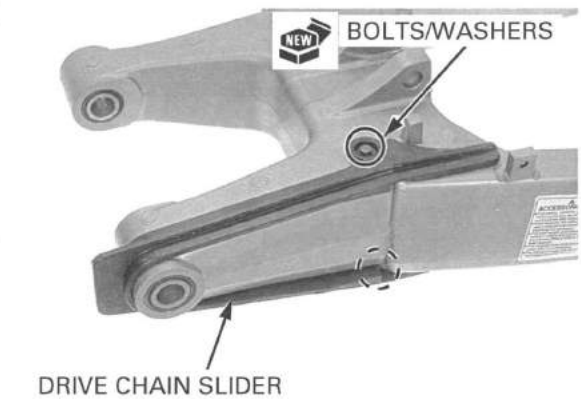
Install the drive chain slider, aligning the slit with the lug on the swingarm.

Install the drive chain slider bosses into the holes in the swingarm.



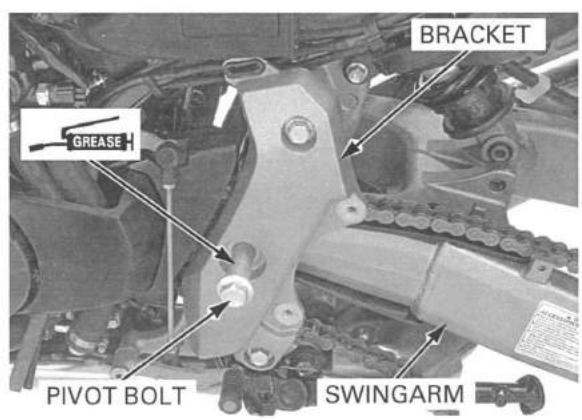
Install new drive chain slider bolts with washers and tighten them to the specified torque.

TORQUE: 9.0 N·m (0.9 kgf·m, 6.6 lbf·ft)



INSTALLATION

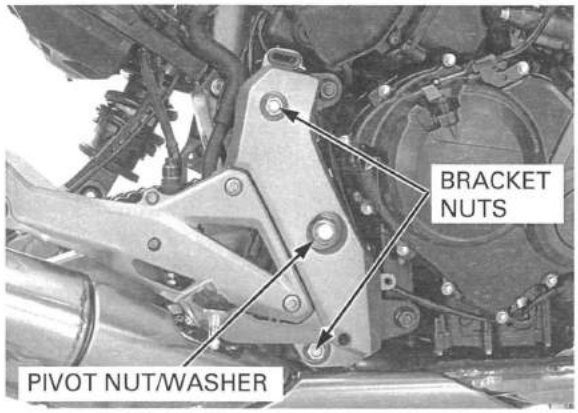
Apply thin coat of grease to the swingarm pivot bolt surface.
Install the swingarm into the frame.
Install the swingarm pivot bolt from the left side.



Install the washer and swingarm pivot nut.

Tighten the pivot bracket nuts to the specified torque.

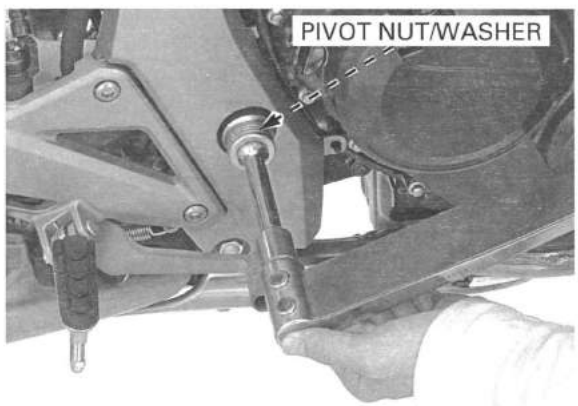
TORQUE: 69 N·m (7.0 kgf·m, 51 lbf·ft)



Tighten the swingarm pivot nut to the specified torque.

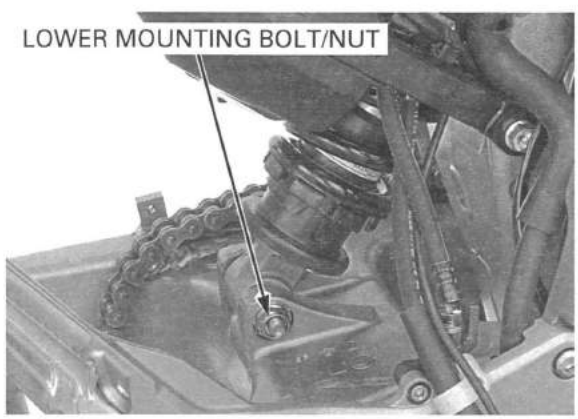
TORQUE: 98 N·m (10.0 kgf·m, 72 lbf·ft)

Move the swingarm up and down several times and make sure it moves smoothly.

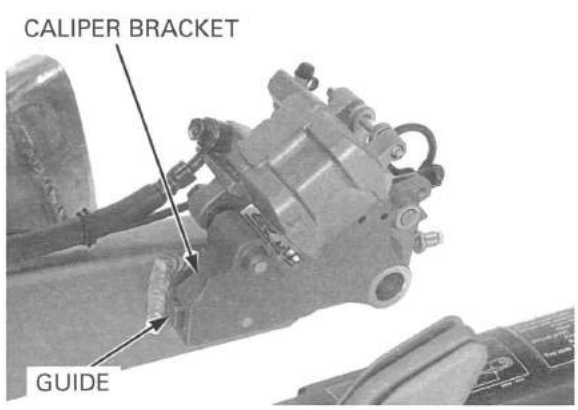


Install the shock absorber lower mounting bolt/nut, then tighten the nut to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

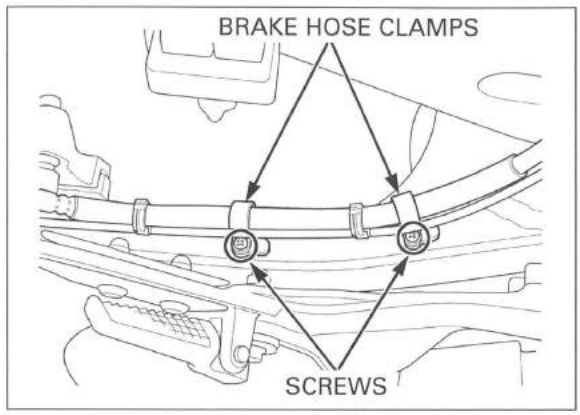


Route the brake hose properly, then install the rear brake caliper bracket onto the guide of the swingarm.

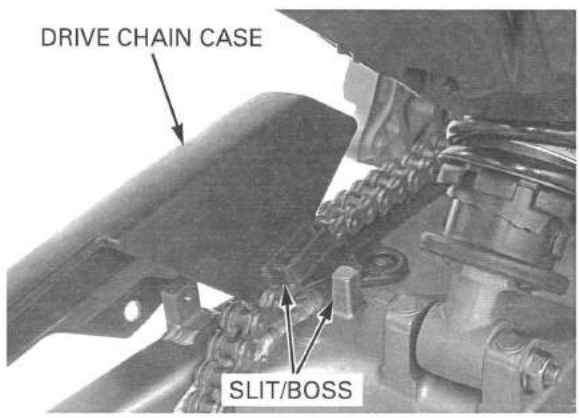


Install the brake hose clamps and tighten the screws to the special torque.

TORQUE: 4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)

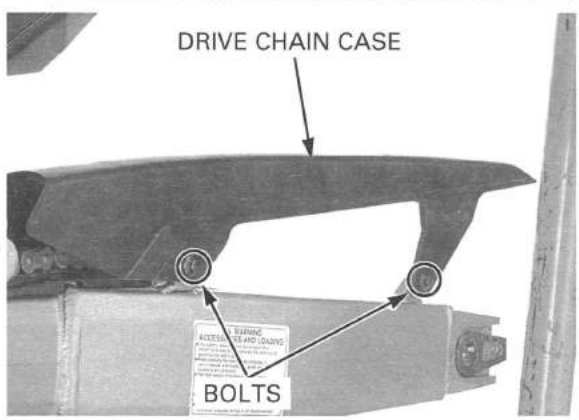


Install the drive chain case aligning its slit with the boss on the swingarm.



Tighten the drive chain case bolts to the specified torque.

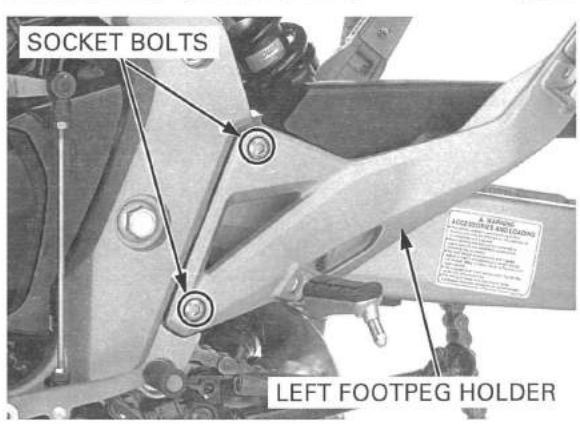
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the left footpeg holder and tighten the bolts to the specified torque.

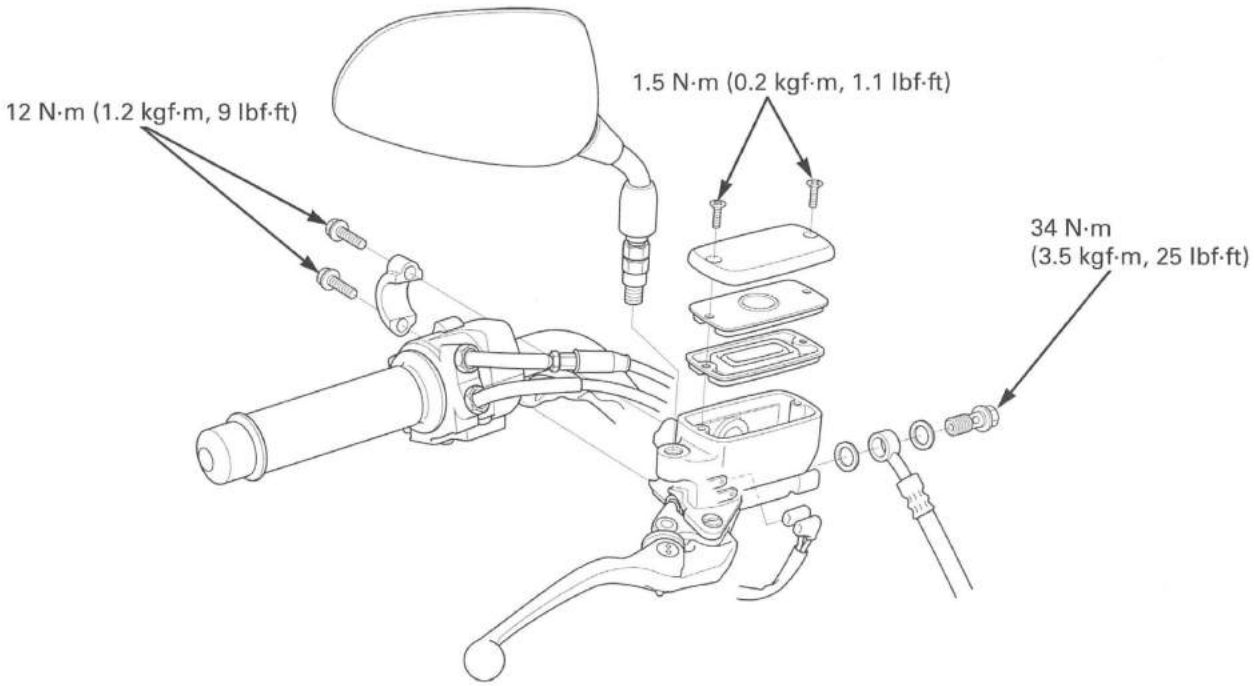
TORQUE: 37 N·m (3.8 kgf·m, 27 lbf·ft)

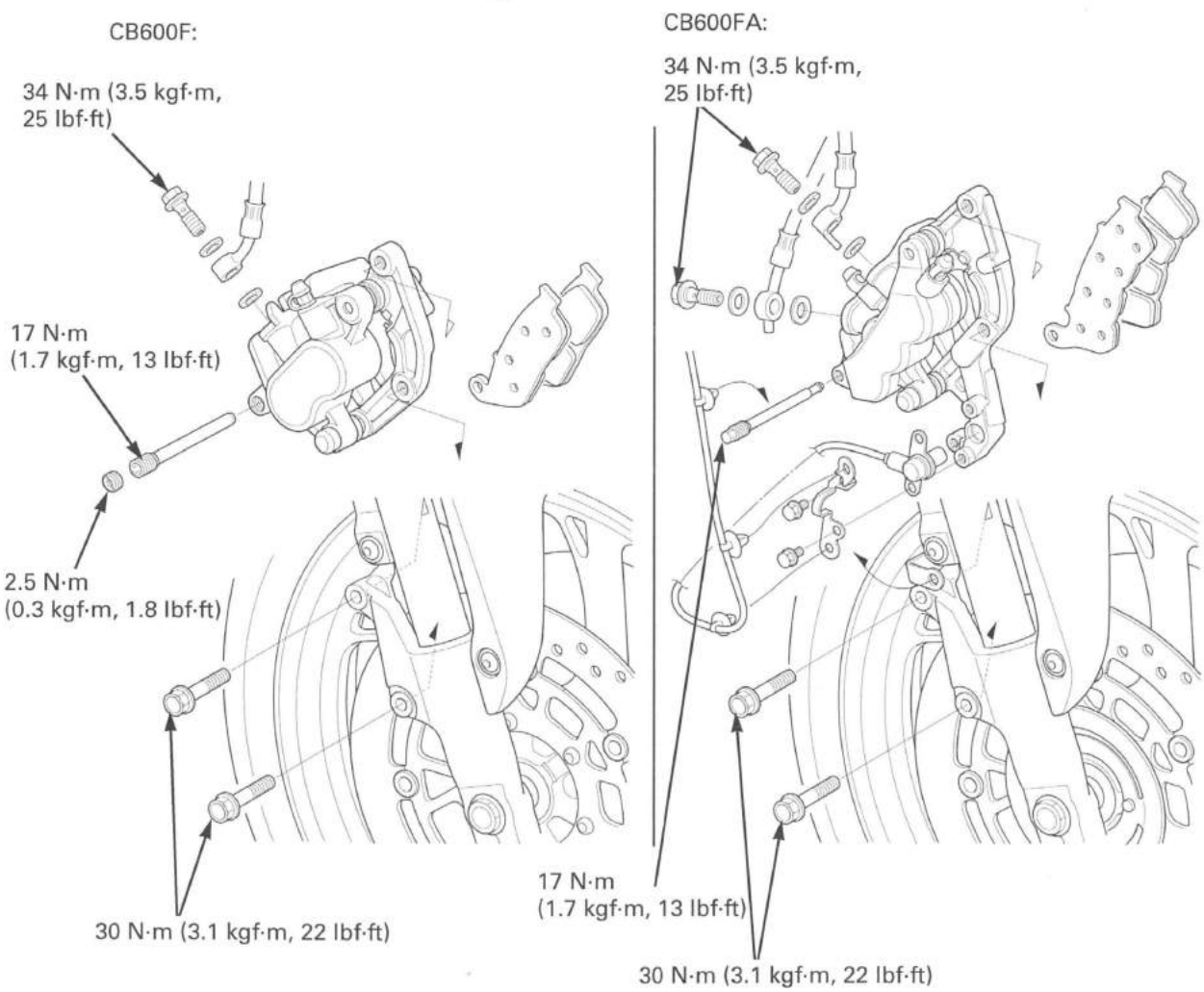
Install the rear wheel (page 14-13).

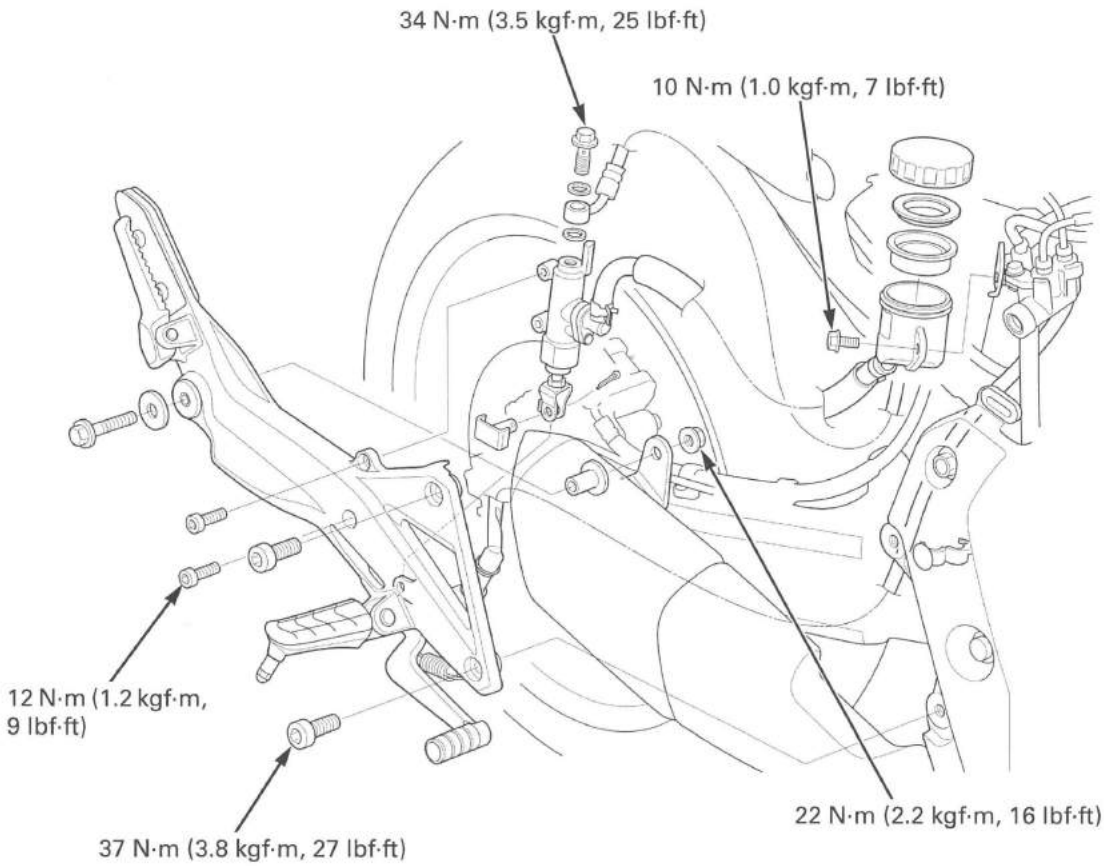


15. HYDRAULIC BRAKE

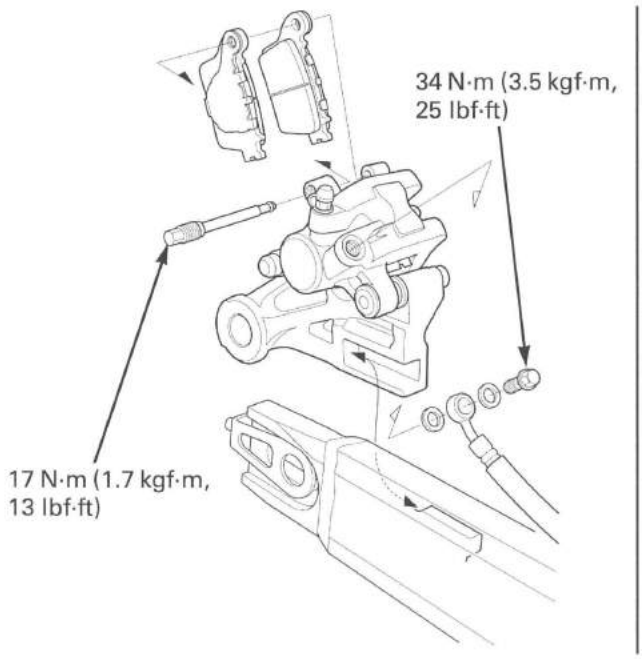
SYSTEM COMPONENTS



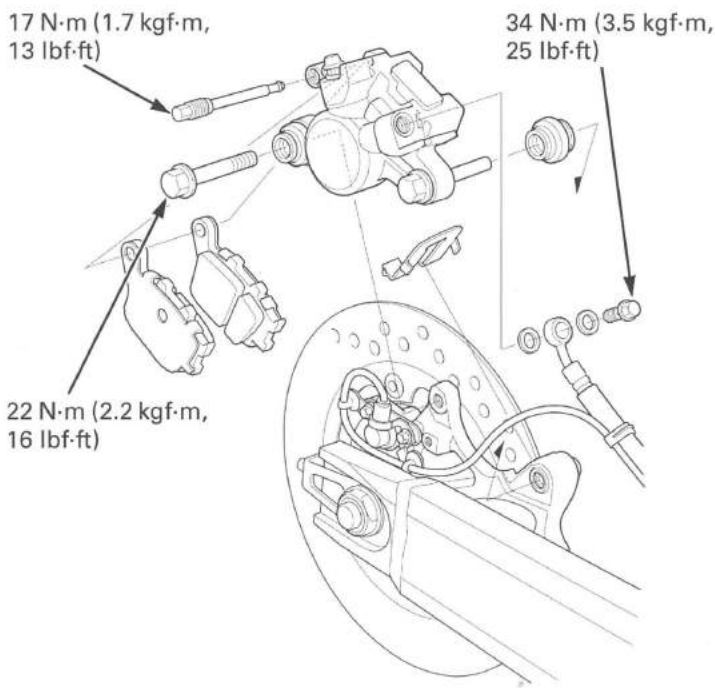




CB600F:



CB600FA:



SERVICE INFORMATION

GENERAL

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use and OSHA-approved vacuum cleaner.

NOTICE

Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is horizontal first.

- This section covers service of the conventional brake components of the brake system. For Anti-lock Brake System (ABS) service, see page 16-4.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Never allow contaminates (e.g., dirt, water) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid as they may not be compatible.
- Always check brake operation before riding the motorcycle.

SPECIFICATIONS

Unit: mm (in)

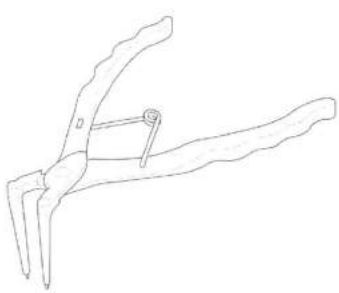
ITEM			STANDARD	SERVICE LIMIT
Front	Specified brake fluid		DOT 4	–
	Brake disc thickness		4.3 – 4.7 (0.17 – 0.19)	3.5 (0.14)
	Brake disc runout		–	0.30 (0.012)
	Master cylinder I.D.		12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Master piston O.D.		12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
	Caliper cylinder I.D.	CB600FA:	22.650 – 22.700 (0.8917 – 0.8937)	22.710 (0.8941)
		CB600F:	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
	Caliper piston O.D.	CB600FA:	22.585 – 22.618 (0.8892 – 0.8905)	22.560 (0.8882)
		CB600F:	25.318 – 25.368 (0.9968 – 0.9987)	25.310 (0.9965)
Rear	Specified brake fluid		DOT 4	–
	Brake disk thickness		4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)
	Brake disc runout		–	0.30 (0.012)
	Master cylinder I.D.	CB600FA:	17.460 – 17.503 (0.6874 – 0.6891)	17.515 (0.6896)
		CB600F:	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Master piston O.D.	CB600FA:	17.417 – 17.444 (0.6857 – 0.6868)	17.405 (0.6852)
		CB600F:	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
	Caliper cylinder I.D.	CB600FA:	38.180 – 38.230 (1.5031 – 1.5051)	38.24 (1.506)
		CB600F:	30.23 – 30.28 (1.190 – 1.192)	30.29 (1.193)
	Caliper piston O.D.	CB600FA:	38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.500)
		CB600F:	30.148 – 30.198 (1.1869 – 1.1889)	30.14 (1.187)

TORQUE VALUES

Brake hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt; replace with a new one.
Caliper bleed valve	5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)	
Brake pad pin	17 N·m (1.7 kgf·m, 13 lbf·ft)	
Pad pin plug (CB600F)	2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)	
Rear brake caliper bolt (CB600FA)	22 N·m (2.2 kgf·m, 16 lbf·ft)	ALOC bolt; replace with a new one.
Front master cylinder holder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Front master cylinder reservoir cap screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)	
Brake lever pivot bolt	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)	Apply silicone grease to the sliding surface.
Brake lever pivot nut	5.9 N·m (0.6 kgf·m, 4.4 lbf·ft)	
Front brake light switch screw	1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)	
Rear master cylinder mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Rear master cylinder reservoir hose joint screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)	Apply a locking agent to the threads.
Rear master cylinder push rod lock nut	17 N·m (1.7 kgf·m, 13 lbf·ft)	
Rear brake fluid reservoir mounting bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Front brake hose clamp bolt (CB600FA)	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Front brake hose clamp bolt (CB600F)	12 N·m (1.2 kgf·m, 9 lbf·ft)	ALOC bolt; replace with a new one.
Front brake hose stay mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Rear brake hose guide screw	4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)	
Muffler mounting nut	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Footpeg holder mounting bolt	37 N·m (3.8 kgf·m, 27 lbf·ft)	

TOOL

Snap ring pliers
07914-SA50001



TROUBLESHOOTING

Brake lever/pedal soft or spongy
- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seals
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Contaminated master cylinder
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master piston
- Bent brake lever/pedal

Brake lever/pedal hard
- Clogged/restricted fluid passage
- Sticking/worn caliper piston
- Sticking/worn master piston
- Caliper not sliding properly
- Worn caliper piston seals
- Bent brake lever/pedal

Brake drag
- Contaminated brake pad/disc
- Misaligned wheel
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking caliper piston

BRAKE FLUID REPLACEMENT/AIR BLEEDING (CB600FA)

BRAKE FLUID DRAINING

NOTICE

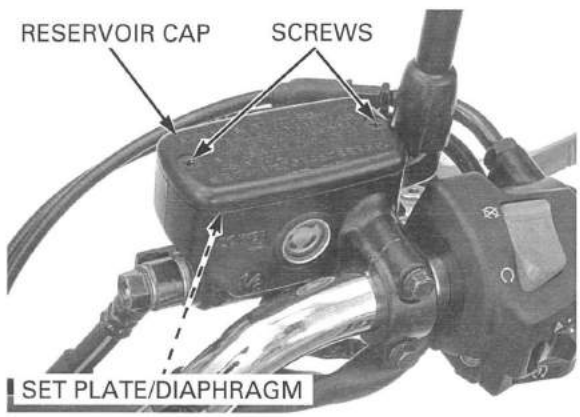
Spilled fluid can damage painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

NOTE:

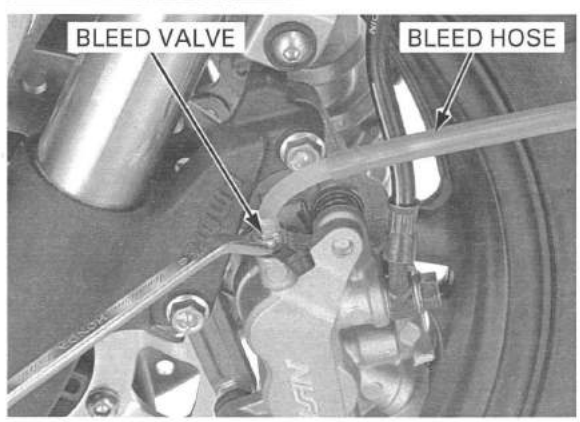
- Do not allow foreign material to enter the system when filling the reservoir.
- When using a commercially available brake bleeder, follow the manufacturer's operating instructions.

Lever Brake Line:

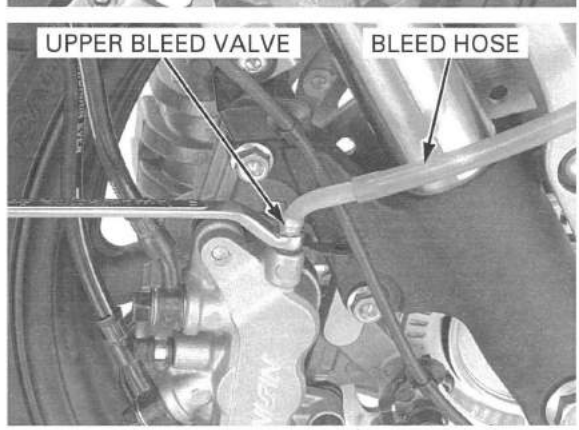
Turn the handlebar to the left until the front master cylinder reservoir is level before removing the reservoir cap.
Remove the screws, reservoir cap, set plate and diaphragm.



Connect a bleed hose to the left caliper bleed valve.
Loosen the bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.



Connect a bleed hose to the right caliper upper bleed valve.
Loosen the upper bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.

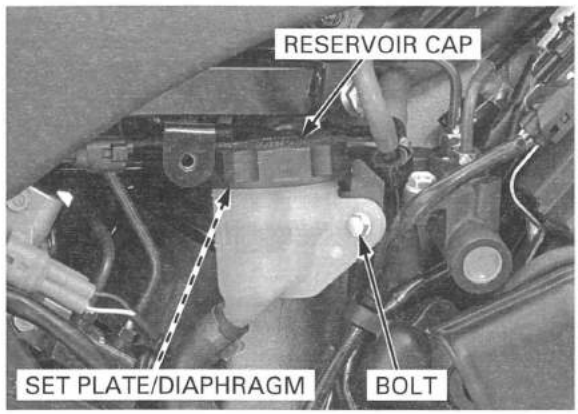


Pedal (Combined) Brake Line:

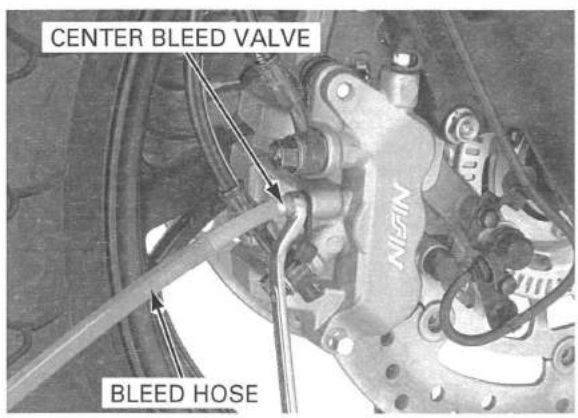
Remove the right side cover (page 2-4).

Remove the reservoir mounting bolt.
Remove the reservoir cap, set plate and diaphragm.

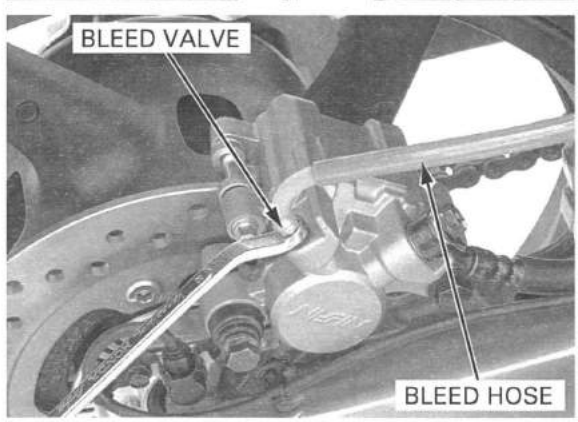
Secure the reservoir with the mounting bolt.



Connect a bleed hose to the right front caliper center bleed valve.
Loosen the center bleed valve and pump the brake pedal until no more fluid flows out of the bleed valve.



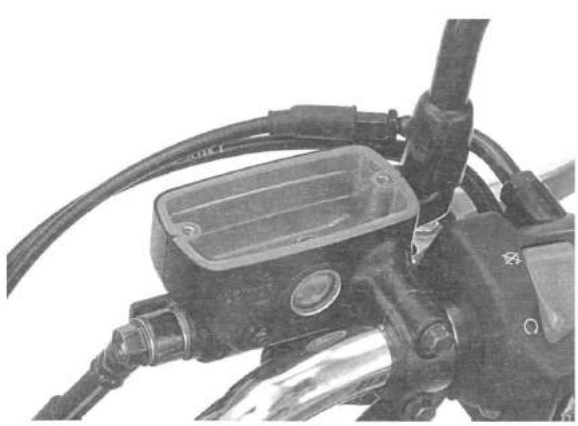
Connect a bleed hose to the rear caliper bleed valve.
Loosen the bleed valve and pump the brake pedal until no more fluid flows out of the bleed valve.



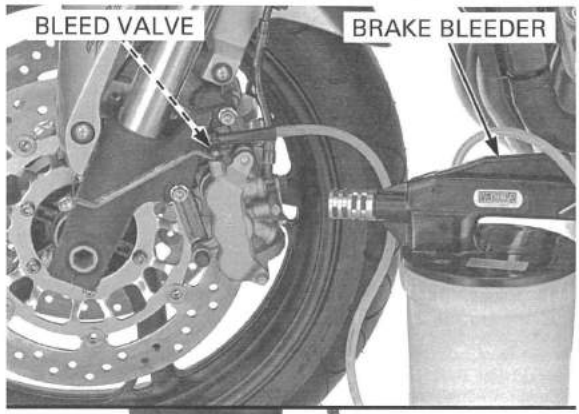
FRONT BRAKE FLUID FILLING/AIR BLEEDING

Close the bleed valves.

Fill the reservoir with DOT 4 brake fluid from a sealed container.



Connect a commercially available brake bleeder to the left caliper bleed valve.
Operate the brake bleeder and loosen the bleed valve.

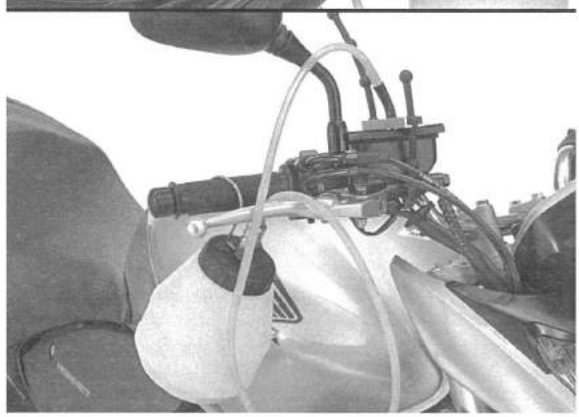


NOTE:

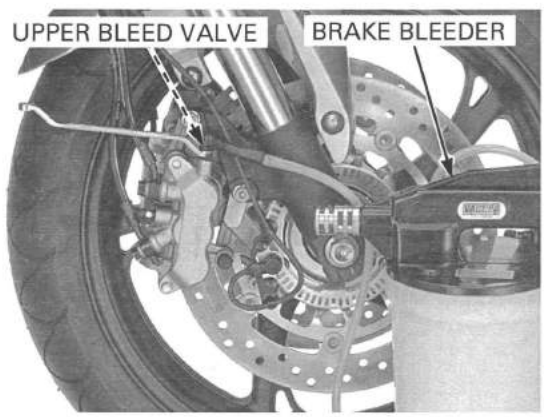
- If an automatic refill system is not used, add brake fluid when the fluid level in the reservoir is low.
- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.
- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)



Connect a commercially available brake bleeder to the right caliper upper bleed valve.
Operate the brake bleeder and loosen the bleed valve.



Close the bleed valve to the specified torque.

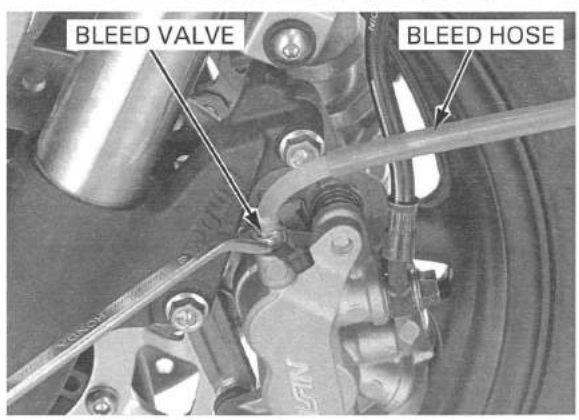
TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

Perform the bleeding procedure until the system is completely flushed/bled.

Operate the brake lever. If it is still spongy, bleed the system again.

If a brake bleeder is not available, use the following procedure:

Fill the reservoir with DOT 4 brake fluid from a sealed container.
Connect a bleed hose to the left caliper bleed valve.
Pressurize the system with the brake lever until lever resistance is felt.



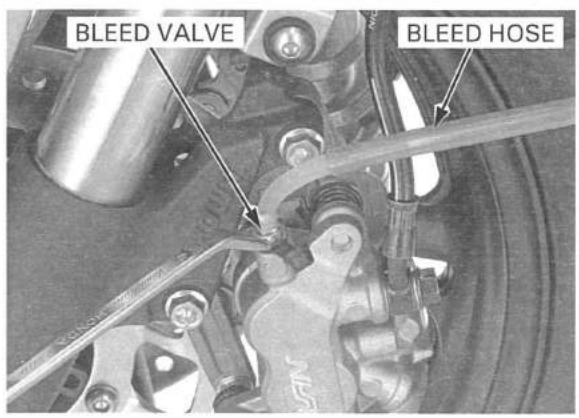
1. Squeeze the brake lever, open the bleed valve 1/4 of a turn and then close it.
2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

- Do not release the lever until the bleed valve has been closed.

Repeat steps 1. and 2. until air bubbles do not appear in the bleed hose.

After bleeding the air completely, tighten the bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)



Fill the reservoir with DOT 4 brake fluid from a sealed container.

Connect a bleed hose to the right caliper upper bleed valve.

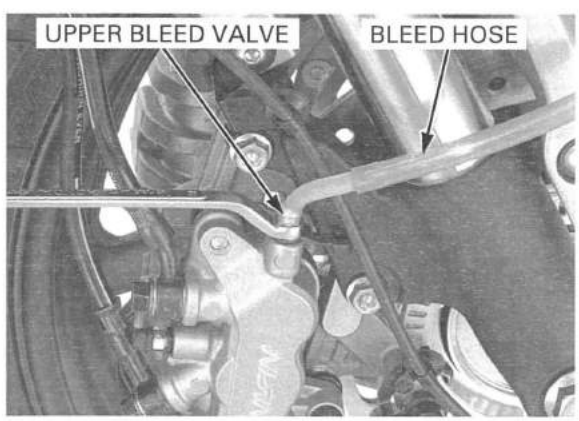
1. Squeeze the brake lever, open the bleed valve 1/4 of a turn and then close it.
2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

- Do not release the lever until the bleed valve has been closed.

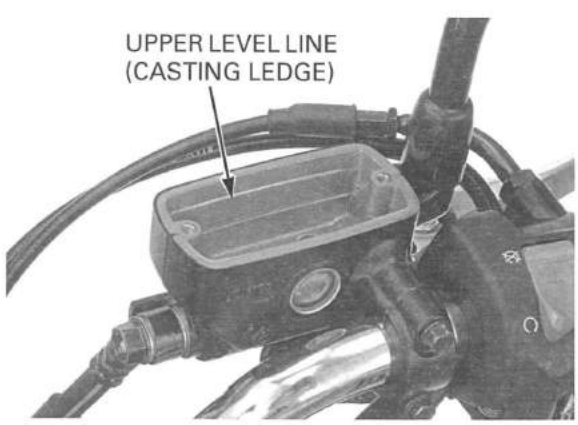
Repeat steps 1. and 2. until air bubbles do not appear in the bleed hose.

After bleeding the air completely, tighten the bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

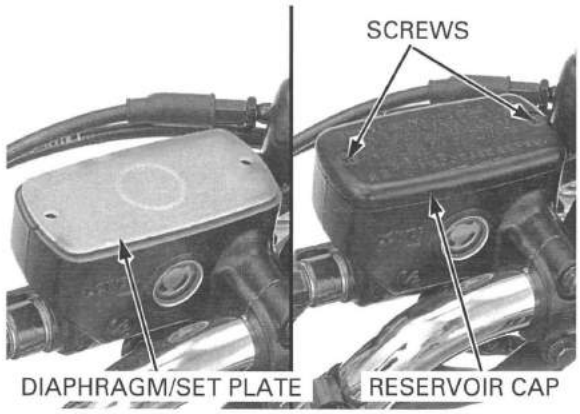


Fill the reservoir to the upper level line (casting ledge) with DOT 4 brake fluid.



Install the diaphragm and set plate.
Install the reservoir cap and tighten the screws to the specified torque.

TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)



REAR (COMBINED) BRAKE FLUID FILLING/AIR BLEEDING

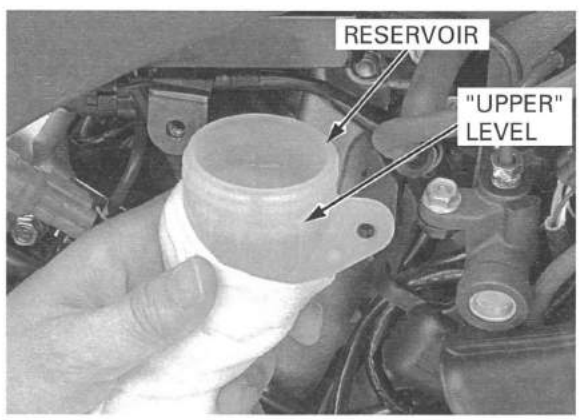
Brake Fluid Feeding:

Add fluid and bleed any air from the pedal brake line in the sequence as follow:

1. Right front brake caliper center bleed valve
2. Rear brake caliper bleed valve

Fill the reservoir with DOT 4 brake fluid from a sealed container.

Operate the brake pedal several times to bleed any air from the master cylinder.

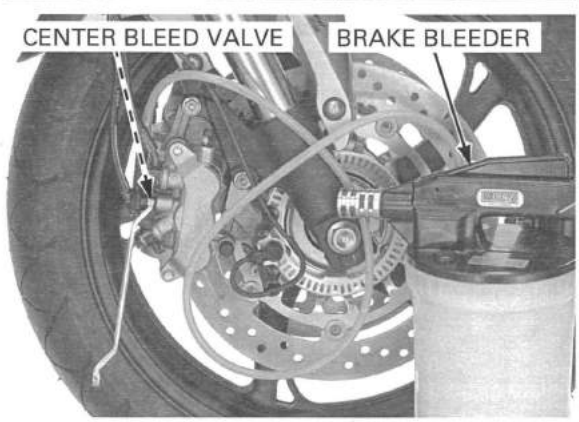


Connect a commercially available brake bleeder to the right front caliper center bleed valve.

NOTE:

- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

1. Operate the brake bleeder and loosen the right front caliper center bleed valve. Add fluid when the fluid level in the master cylinder is low to prevent drawing air into the system.
2. Repeat the above procedures until a sufficient amount of fluid flows out of the caliper center bleed valve.

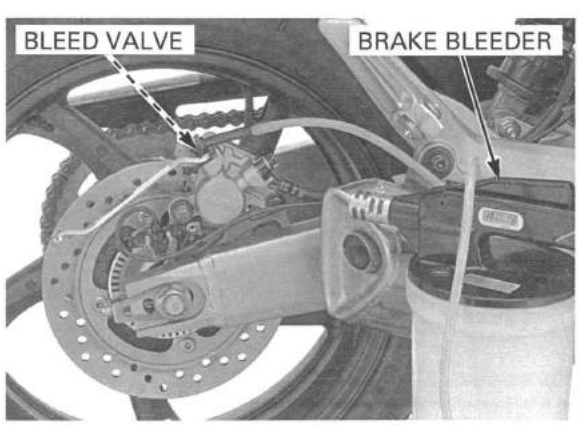


It is not problem if the fluid flowing out from the center bleed valve contains air bubbles because the lines will be bled later (page 15-12).

Connect a commercially available brake bleeder to the rear caliper bleed valve.

Repeat above step 1. and 2. for rear caliper bleed valve.

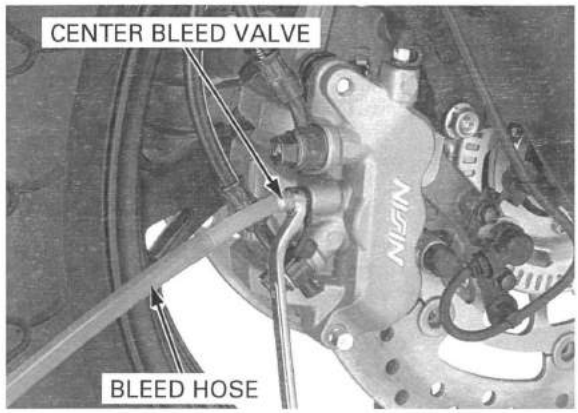
Bleed the hydraulic system (page 15-12).



If a brake bleeder is not available, perform the following procedure.

Connect a bleed hose to the right front caliper center bleed valve.

1. Pump the brake pedal several (5 – 10) times quickly, then push the brake pedal all the way down, loosen the right front caliper center bleed valve 1/4 of a turn.
   Wait several seconds and close the bleed valve.
   Release the brake pedal slowly and wait several seconds after it reaches the end of its travel.
2. Repeat the above procedures until a sufficient amount of the fluid flows out from the right front caliper center bleed valve.

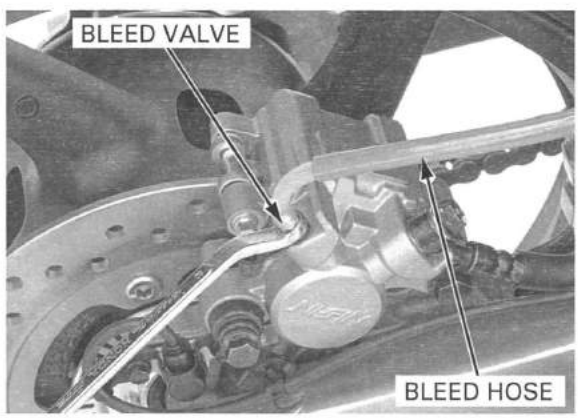


It is not a problem if the fluid flowing out from the right front caliper center bleed valve contains air bubbles because the lines will be bled later (page 15-12).

Connect a bleed hose to the rear caliper bleed valve.

Repeat above steps 1. and 2. for the rear caliper lower bleed valve.

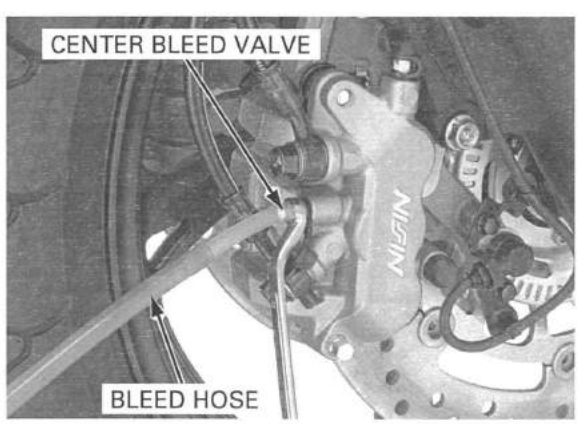
Bleed the hydraulic system (page 15-12).



Air Bleeding:

Connect a bleed hose to the right front caliper center bleed valve.

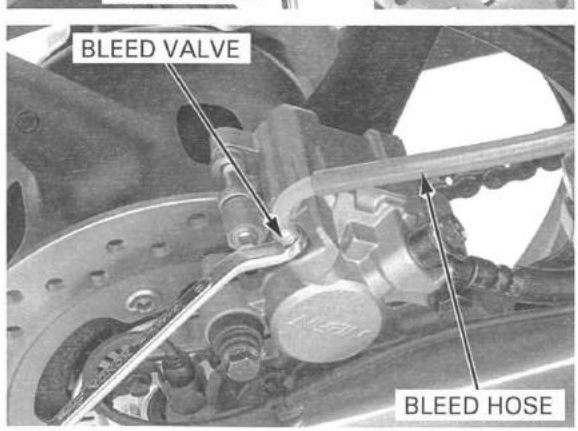
1. Pump the brake pedal several (5 – 10) times quickly, then push the brake pedal all the way down, loosen the right front caliper center bleed valve 1/4 of a turn.
   Wait several seconds and close the bleed valve.
   Release the brake pedal slowly and wait several seconds after it reaches the end of its travel.
2. Repeat the above procedures until air bubbles do not appear in the transparent hose.



Connect a bleed hose to the rear caliper bleed valve.

Repeat above step 1. and 2. for the rear caliper bleed valve.

Note that you may feel strong resistance on the rear (combined) brake pedal during pumping when bleeding air from the caliper. This symptom is caused by the PCV function. Be sure to apply the brake pedal fully.



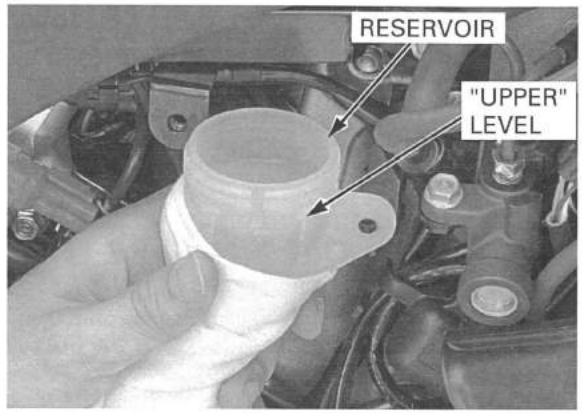
After there are no more air bubbles in the fluid, repeat the air bleeding procedure about two or three times at each bleed valve.

Make sure the bleed valves are closed and operate the brake pedal. If it still feels spongy, bleed the system again.

After bleeding the air completely, tighten the bleed valves to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

Fill the reservoir to the "UPPER" level with DOT 4 brake fluid.

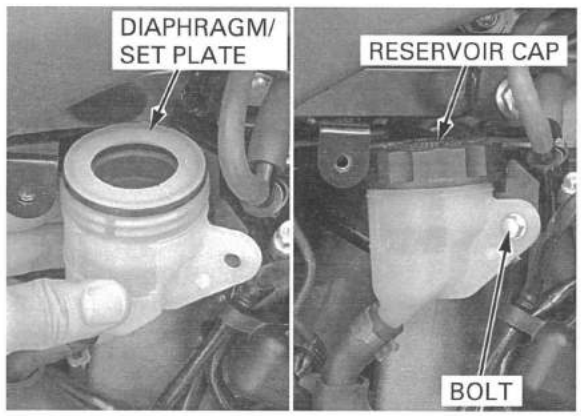


Install the diaphragm, set plate and reservoir cap.

Install the reservoir onto the frame and tighten the mounting bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the right side cover (page 2-4).



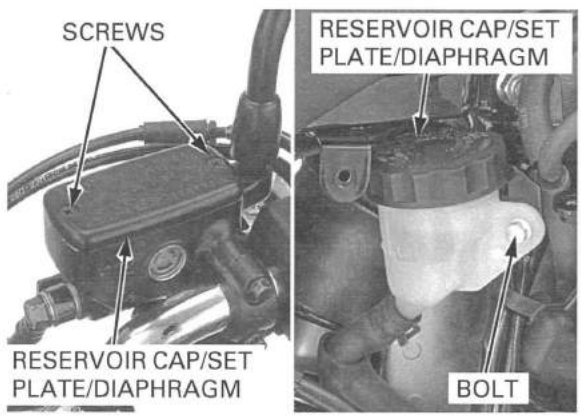
BRAKE FLUID REPLACEMENT/AIR BLEEDING (CB600F)

BRAKE FLUID DRAINING

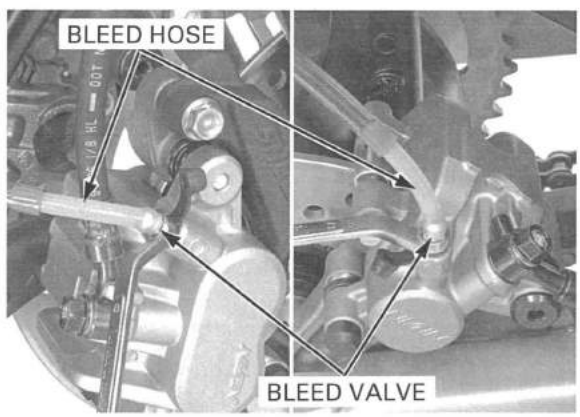
Front brake: Turn the handlebar to the left until the front master cylinder reservoir is level before removing the reservoir cap.
Remove the screws, reservoir cap, set plate and diaphragm.

Rear brake: Remove the right side cover (page 2-4).

Remove the reservoir mounting bolt.
Remove the reservoir cap, set plate and diaphragm.
Secure the reservoir with the mounting bolt.



Connect a bleed hose to the brake caliper bleed valve.
Loosen the bleed valve and pump the brake lever/pedal until no more fluid flows out of the bleed valve.



BRAKE FLUID FILLING/AIR BLEEDING

Close the bleed valve.

Fill the reservoir with DOT 4 brake fluid from a sealed container.

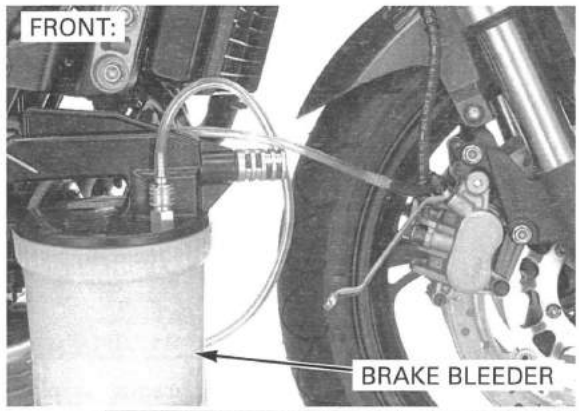
Connect a commercially available brake bleeder to the bleed valve.
Operate the brake bleeder and loosen the bleed valve.

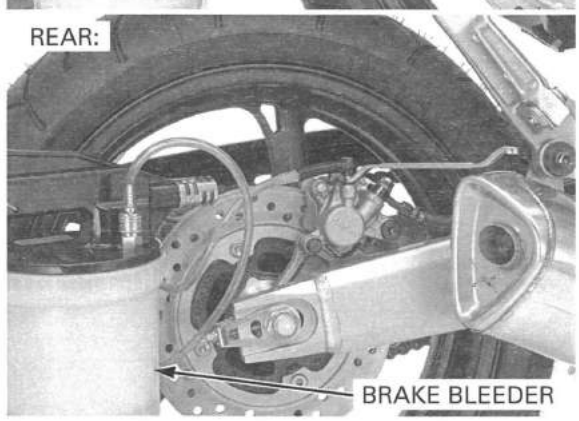
NOTE:

- If an automatic refill system is not used, add brake fluid when the fluid level in the reservoir is low.
- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.
- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Perform the bleeding procedure until the system is completely flushed/bled.

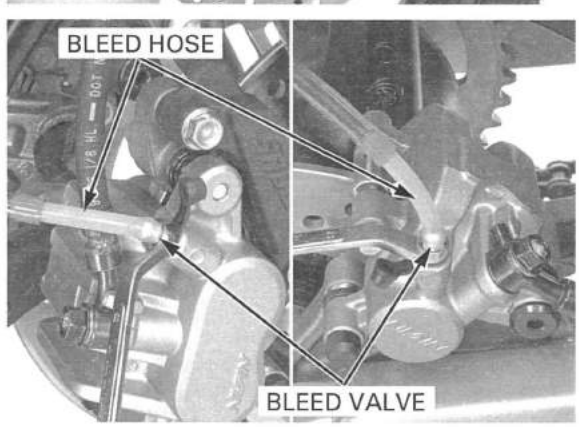
Close the bleed valve and operate the brake lever/pedal. If it still feels spongy, bleed the system again.





If a brake bleeder is not available, use the following procedure:

Connect a bleed hose to the bleed valve.



Pressurize the system with the brake lever/pedal until resistance is felt.

1. Squeeze the brake lever (depress the brake pedal), open the bleed valve 1/4 of a turn and then close it.
2. Release the brake lever/pedal slowly and wait several seconds after it reaches the end of its travel.
3. Repeat steps 1. and 2. until air bubbles do not appear in the bleed hose.

After there are no more air bubbles in the fluid, repeat the air bleeding procedure about two or three times at each bleed valve.
Make sure the bleed valves are closed and operate the brake lever/pedal. If it still feels spongy, bleed the system again.

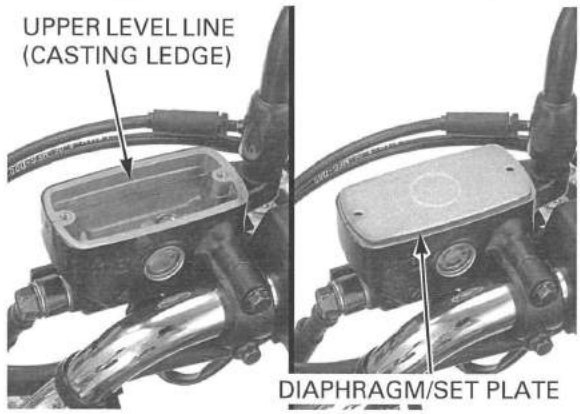
After bleeding the air completely, tighten the bleed valves to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

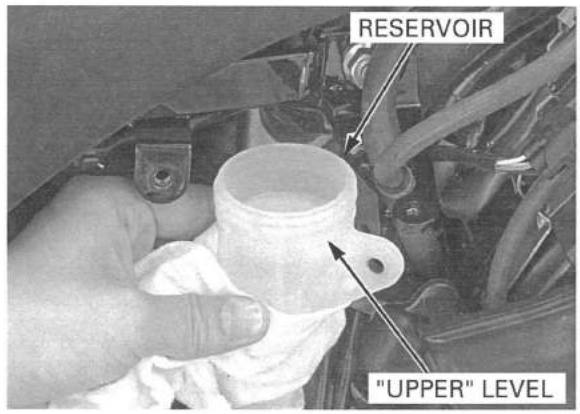
Fill the front brake reservoir to the upper level line (casting ledge) with DOT 4 brake fluid.

Install the diaphragm, set plate and reservoir cap, then tighten the screws to the specified torque.

TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)



Fill the rear brake reservoir to the upper level line with DOT 4 brake fluid.

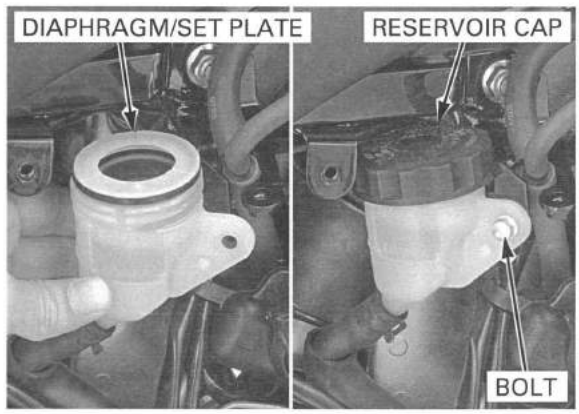


Install the diaphragm, set plate and reservoir cap.

Install the reservoir onto the frame and tighten the mounting bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the right side cover (page 2-4).

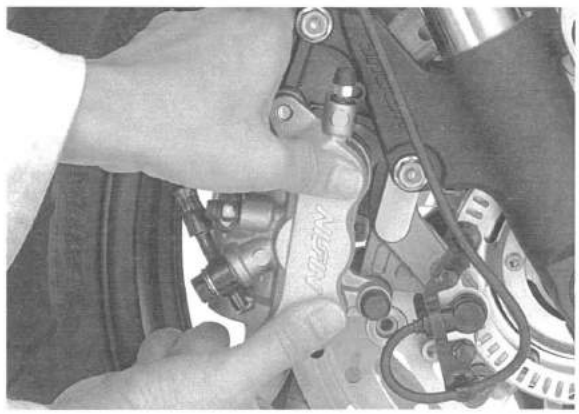


BRAKE PAD/DISC

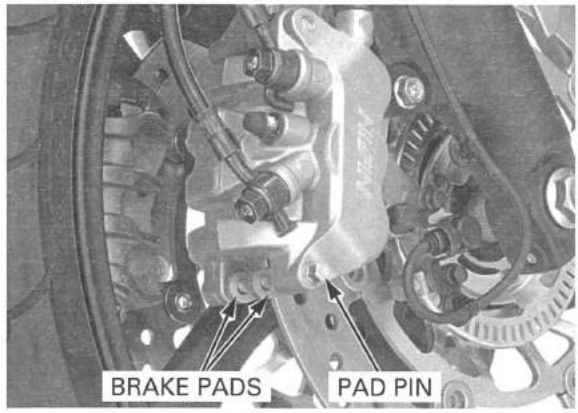
FRONT BRAKE PAD REPLACEMENT (CB600FA)

Check the brake fluid level in the reservoir as this operation causes the level to rise.

Push the caliper pistons all the way in to allow installation of new brake pads by pushing the caliper body inward.



Loosen the pad pin.
Pull the pad pin out of the caliper body while holding the brake pads.

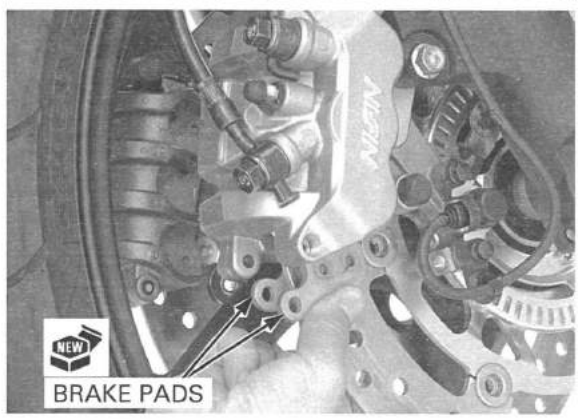


Remove the brake pads.

Make sure that the pad spring is in place.

Always replace the brake pads in pairs to ensure even disc pressure.

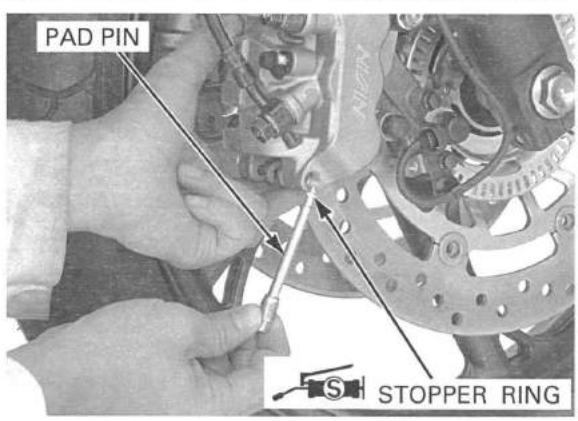
Install new brake pads into the caliper so their ends rest into the pad retainer on the bracket properly.



Coat the stopper ring on the pad pin end with the silicone grease.
Install the pad pin by pushing in the pads against the pad spring to align the pad pin holes in the pads and caliper body.
Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

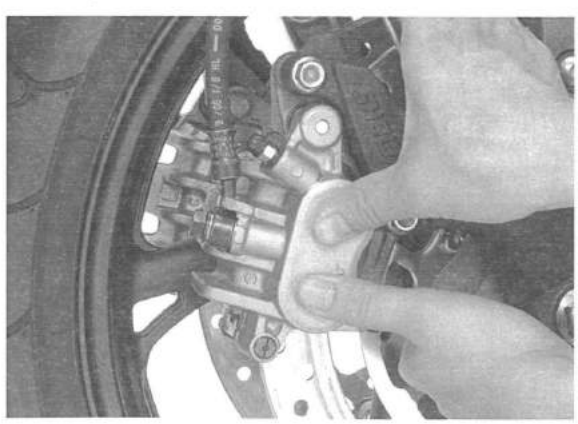
Operate the brake lever to seat the caliper pistons against the pads.



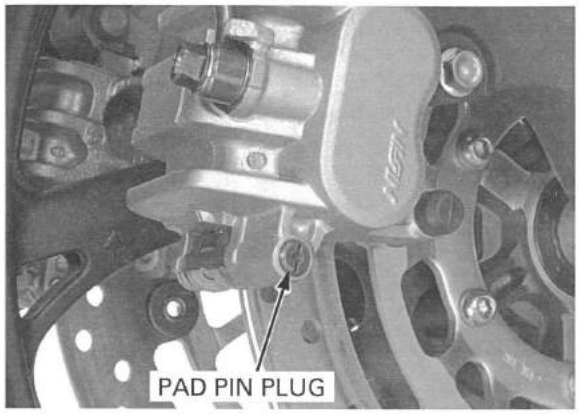
FRONT BRAKE PAD REPLACEMENT (CB600F)

Check the brake fluid level in the reservoir as this operation causes the level to rise.

Push the caliper pistons all the way in to allow installation of new brake pads by pushing the caliper body inward.



Remove the pad pin plug.



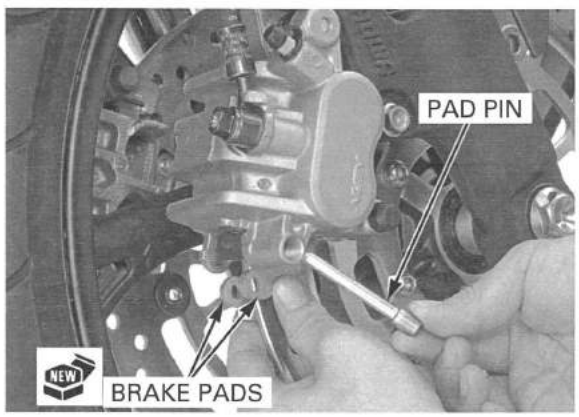
Remove the pad pin and brake pads.

Make sure that the pad spring is in place.

Always replace the brake pads in pairs to assure even disc pressure.

Install the new brake pads.

Push the brake pads against the pad spring, then install the pad pin.



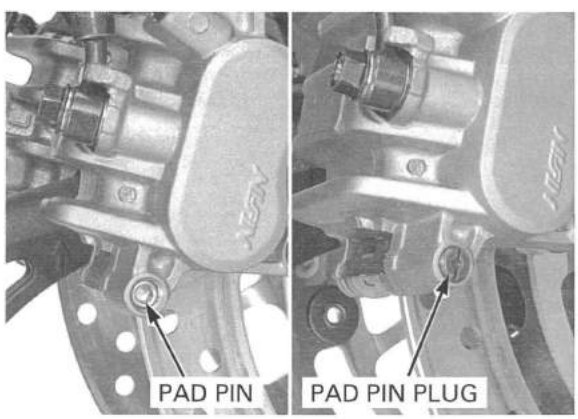
Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

Install the pad pin plug and tighten it to the specified torque.

TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)

Operate the brake lever to seat the caliper pistons against the pads.



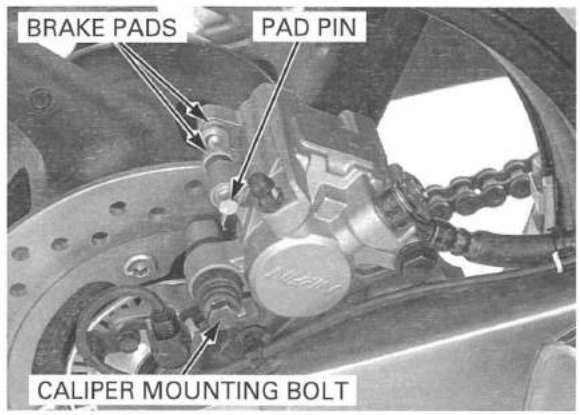
REAR BRAKE PAD REPLACEMENT (CB600FA)

Check the brake fluid level in the reservoir as this operation causes the level to rise.

Push the caliper piston all the way in to allow installation of new brake pads by pushing the caliper body inward.

Loosen the pad pin.
Remove the caliper mounting bolt.

Pull the pad pin out of the caliper body while holding the brake pads.

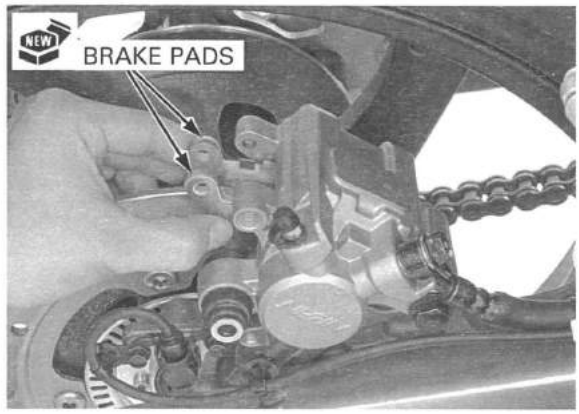


Pivot the caliper up.
Remove the brake pads.

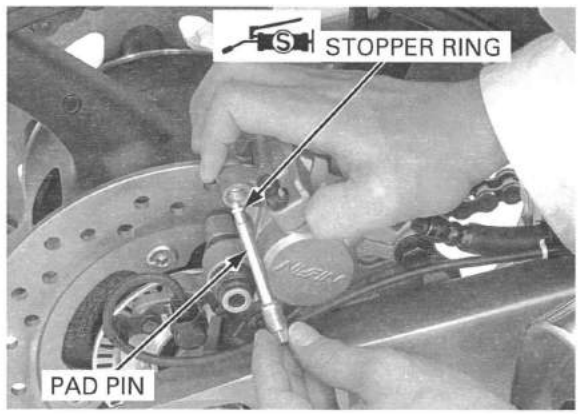
Make sure that the pad spring is in place.

Always replace the brake pads in pairs to assure even disc pressure.

Install new brake pads into the caliper so their ends rest into the pad retainer on the bracket properly.



Coat the stopper ring on the pad pin end with the silicone grease.
Install the pad pin by pushing in the pads against the pad spring to align the pad pin holes in the pads and caliper body.



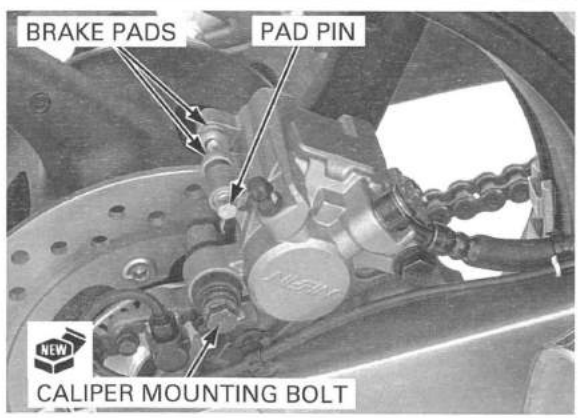
Install and tighten a new caliper mounting bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

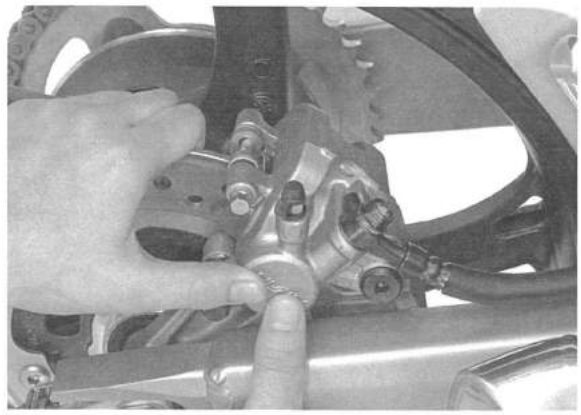
Operate the brake pedal to seat the caliper piston against the pads.



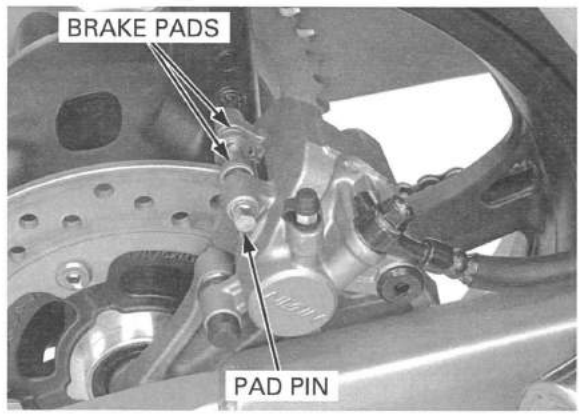
REAR BRAKE PAD REPLACEMENT (CB600F)

Check the brake fluid level in the reservoir as this operation causes the level to rise.

Push the caliper piston all the way in to allow installation of new brake pads by pushing the caliper body inward.



Loosen the pad pin.
Pull the pad pin out of the caliper body while holding the brake pads.

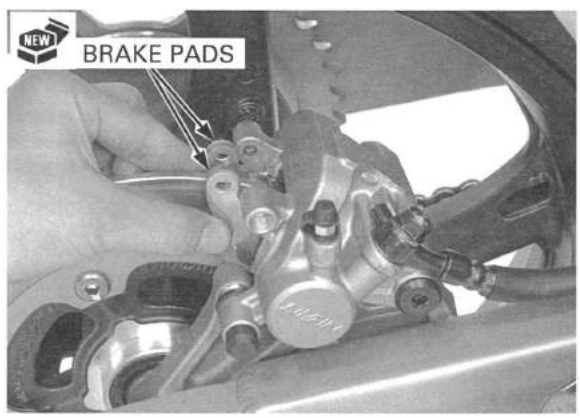


Remove the brake pads.

Make sure that the brake pad spring is in place.

Always replace the brake pads in pairs to assure even disc pressure.

Install new brake pads into the caliper so their ends rest into the pad retainer on the bracket properly.

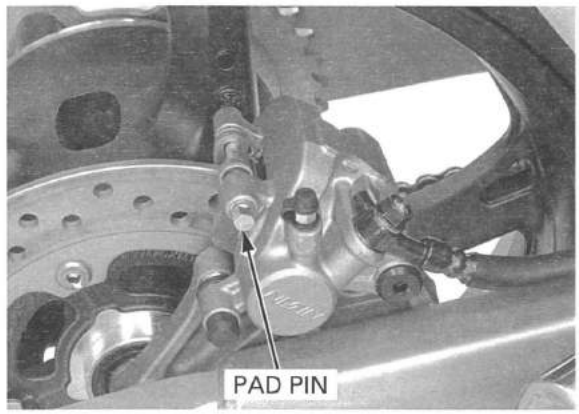


Coat the stopper ring on the pad pin end with the silicone grease.
Install the pad pin by pushing in the pads against the pad spring to align the pad pin holes in the pads and caliper body.

Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

Operate the brake pedal to seat the caliper piston against the pads.

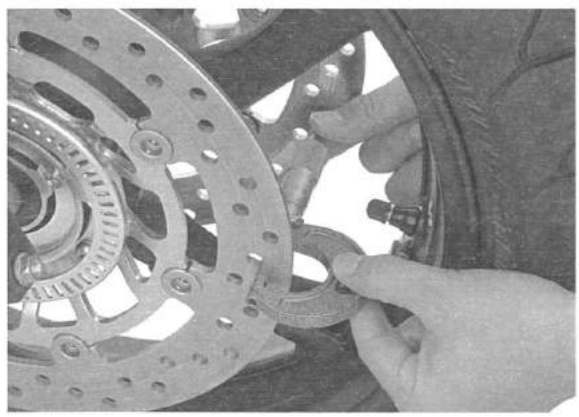


BRAKE DISC INSPECTION

Visually inspect the disc for damage or cracks.

Measure the brake disc thickness at several points.

SERVICE LIMITS: Front: 3.5 mm (0.14 in)
Rear: 4.0 mm (0.16 in)



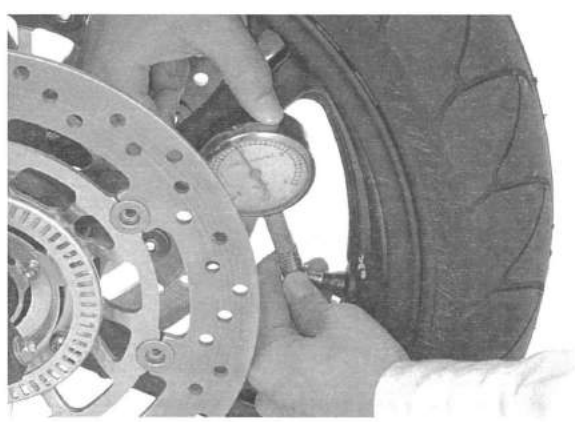
Measure the brake disc warpage with a dial indicator.

SERVICE LIMIT: Front/Rear: 0.30 mm (0.012 in)

Check the wheel bearing for excessive play, if the warpage exceeds the service limit.
Replace the brake disc if the bearings are normal.

Refer to brake disc replacement:

- front brake disc(page 13-14)
- rear brake disc (page 14-7)



FRONT MASTER CYLINDER

REMOVAL

NOTE:

- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

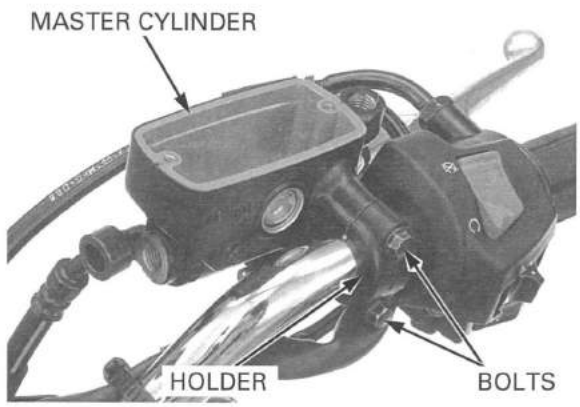
Drain the brake fluid from the front brake hydraulic system (page 15-7).

Disconnect the brake light switch wire connectors.

When removing the oil bolt, cover the end of the hose to prevent contamination.

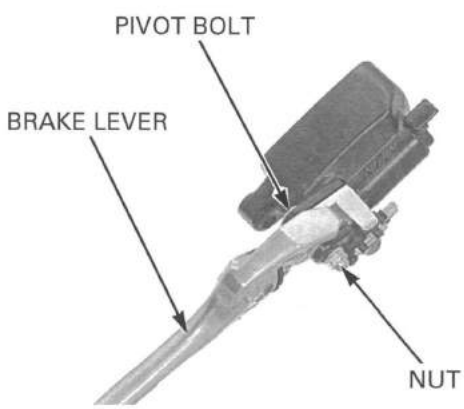
Remove the brake hose oil bolt and sealing washers.

Remove the bolts from the master cylinder holder and remove the master cylinder assembly.

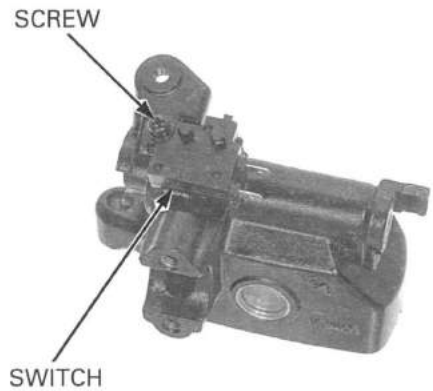


DISASSEMBLY

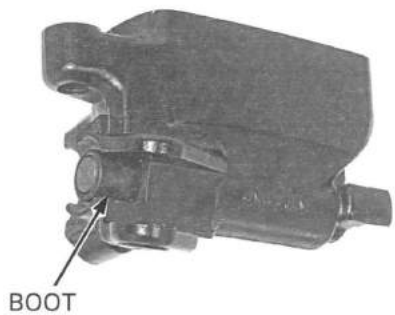
Remove the nut, pivot bolt and brake lever.



Remove the screw and brake light switch.



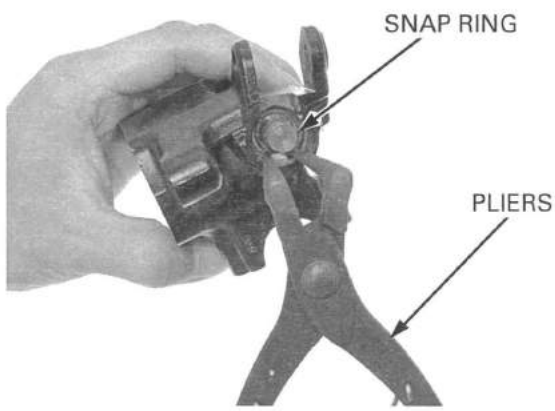
Remove the boot.



Remove the snap ring from the master cylinder body using the special tool.

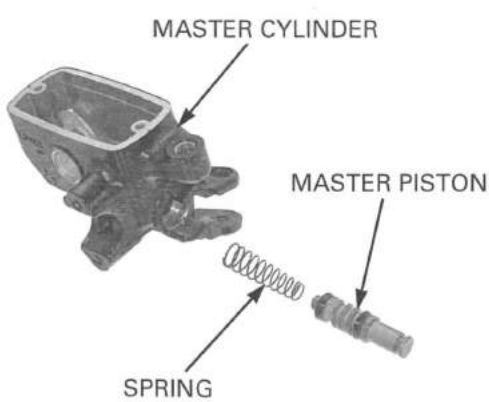
TOOL:

Snap ring pliers	**07914-SA50001**



Remove the master piston and spring.

Clean the inside of the master cylinder, reservoir and the master piston in clean brake fluid.



INSPECTION

Check the piston cups and boot for wear, deterioration or damage.
Check the spring for fatigue or damage.
Check the master cylinder and piston for scoring, scratches or damage.

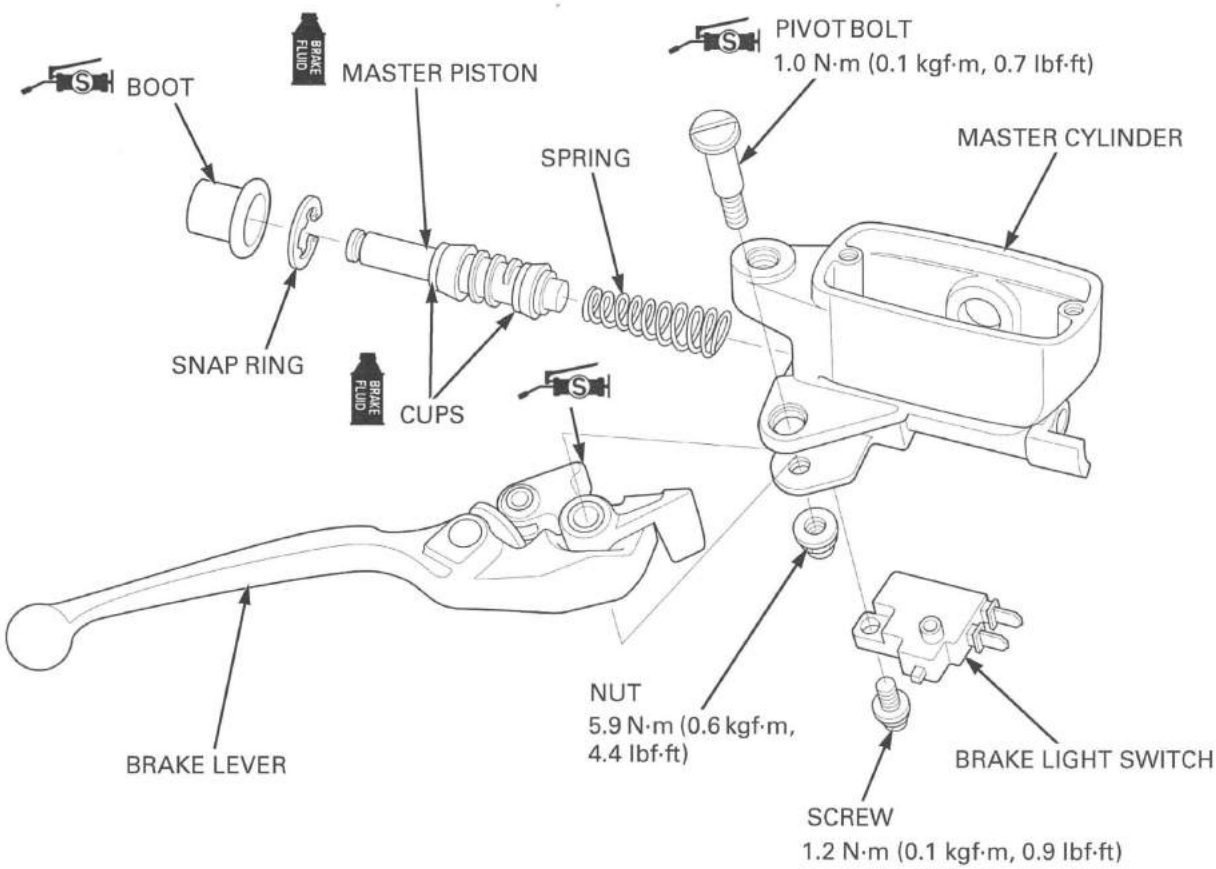
Measure the master cylinder I.D.

SERVICE LIMIT: 12.755 mm (0.5022 in)

Measure the master piston O.D.

SERVICE LIMIT: 12.645 mm (0.4978 in)

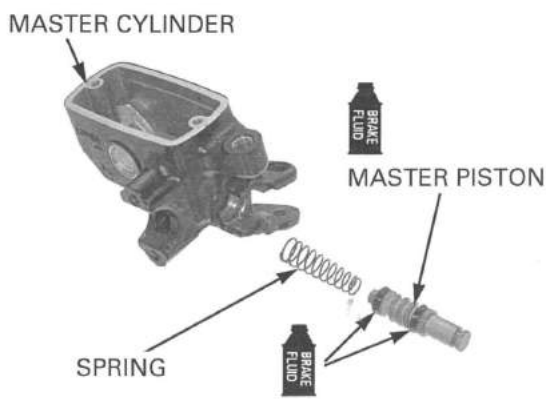
ASSEMBLY



Coat the master piston and piston cups with clean brake fluid.
Install the spring onto the piston end.

Do not allow the piston cup lips to turn inside out.

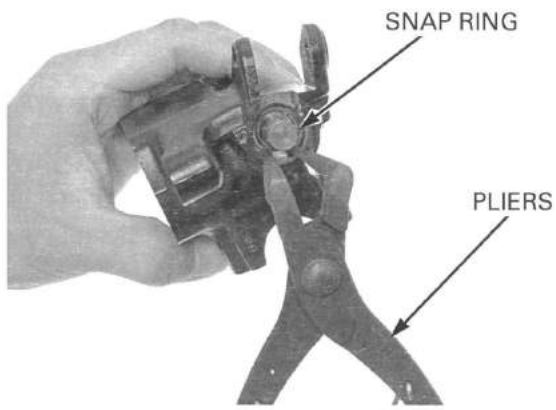
Install the master piston with the spring into the master cylinder.



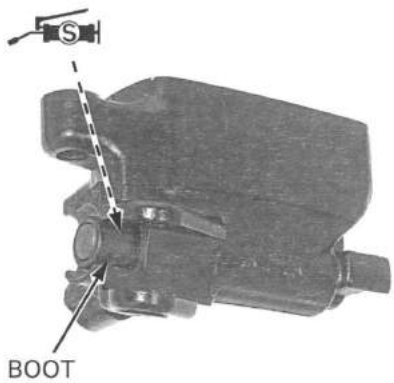
Make sure the snap ring is firmly seated in the groove.

Install the snap ring into the groove in the master cylinder.

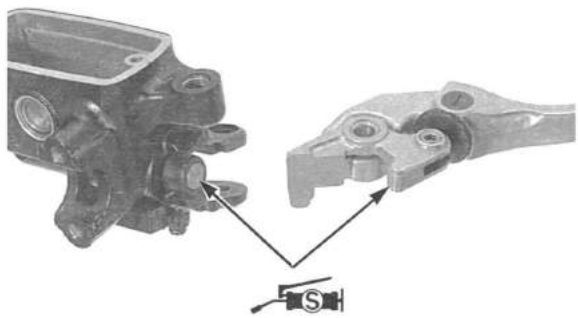
TOOL:
Snap ring pliers **07914-SA50001**



Apply silicone grease inside the boot.
Install the boot into the master cylinder and the piston groove.

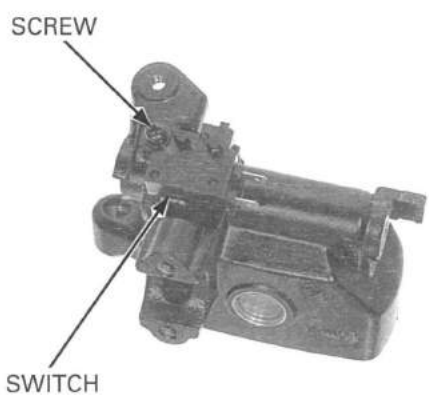


Apply silicone grease to the brake lever contacting surface of the master piston.



Install the brake light switch and tighten the screw.

TORQUE: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)

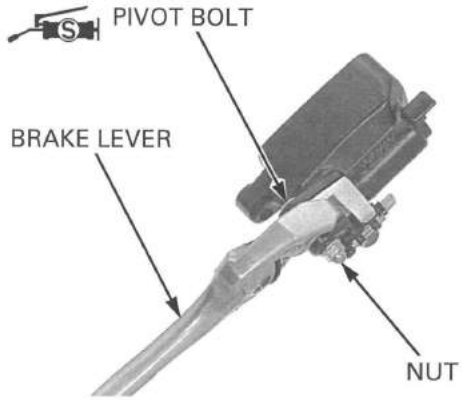


Apply silicone grease to the brake lever pivot bolt sliding surface.
Install the brake lever and pivot bolt, and tighten it.

TORQUE: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)

Install the nut and tighten it while holding the pivot bolt.

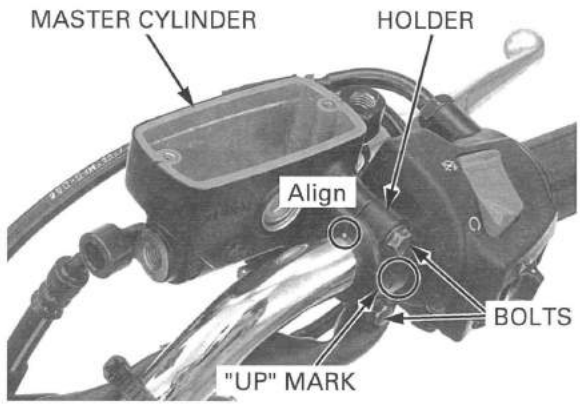
TORQUE: 5.9 N·m (0.6 kgf·m, 4.4 lbf·ft)



Install the master cylinder holder with its "UP" mark facing up.

Install the master cylinder, holder and bolts.
Align the edge of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first, then the lower bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Connect the brake hose to the master cylinder with the oil bolt and new sealing washers.
Tighten the oil bolt while holding the hose eyelet against the stopper.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Connect the brake light switch wire connectors.

Fill and bleed the hydraulic system:

- CBF600FA (page 15-7)
- CBF600F (page 15-13)

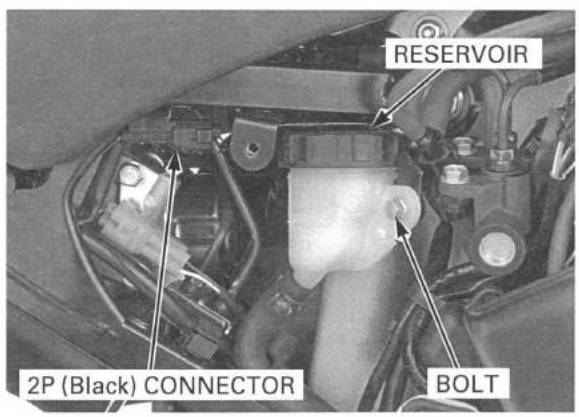
REAR MASTER CYLINDER/BRAKE PEDAL

REMOVAL

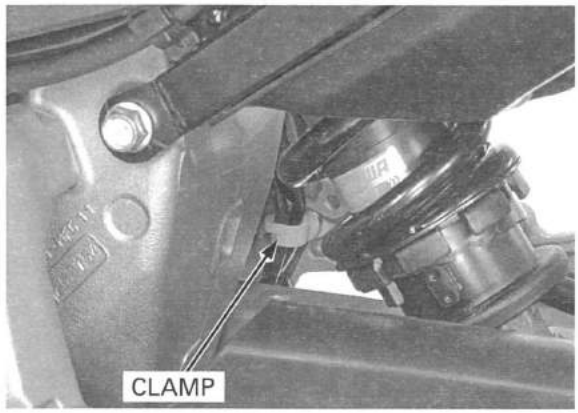
Drain the fluid from the brake hydraulic system (page 15-7).

Remove the bolt and rear brake fluid reservoir.

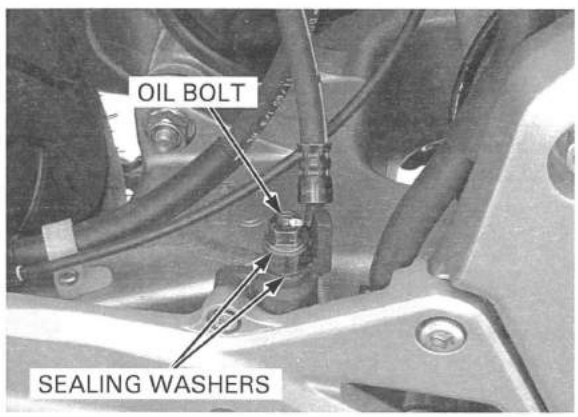
Disconnect the rear brake light switch 2P (black) connector.



Release the rear brake light switch wire from the clamp of footpeg bracket.

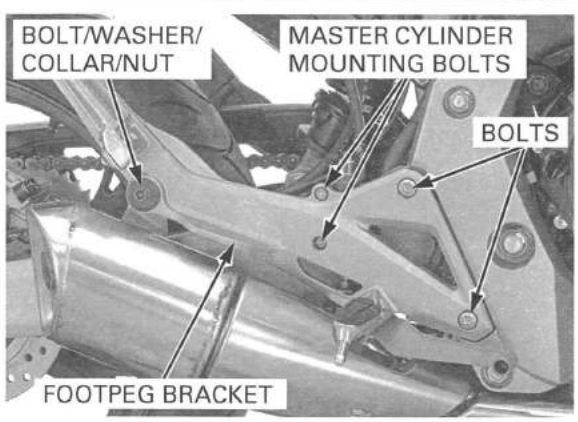


Remove the oil bolt and sealing washers.

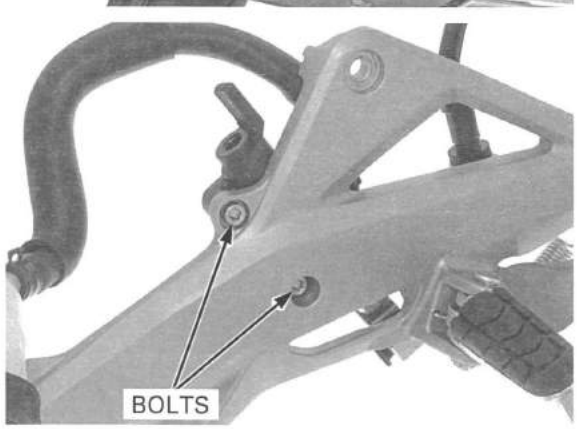


Remove the muffler mounting bolt/nut, washer and collar.

Loosen the rear master cylinder mounting bolts. Remove the bolts and footpeg bracket.

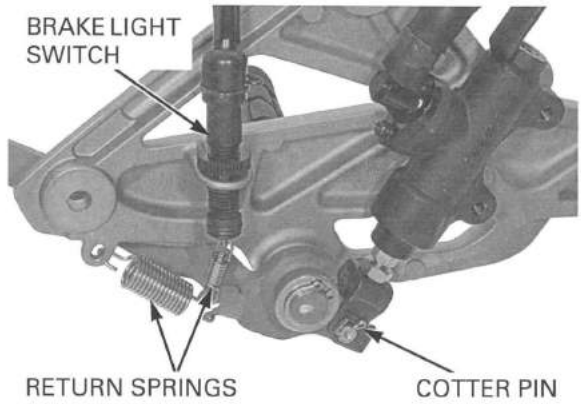


Remove the rear master cylinder mounting bolts.

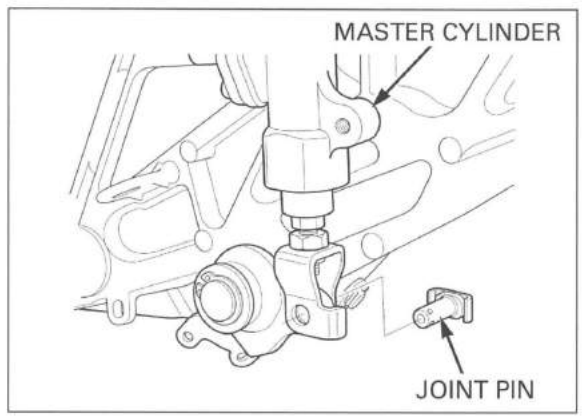


Remove the return springs.
Remove the rear brake light switch.

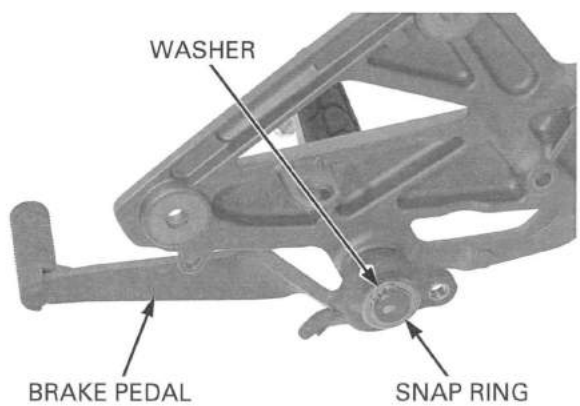
Remove the cotter pin.



Remove the joint pin and rear master cylinder.

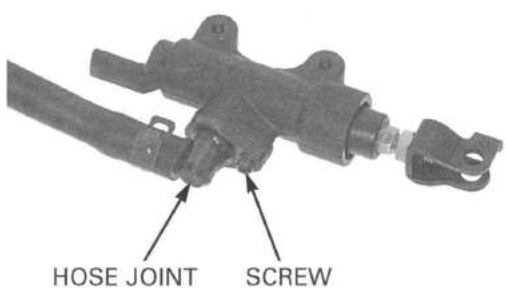


Remove the snap ring, washer and brake pedal.



MASTER CYLINDER DISASSEMBLY

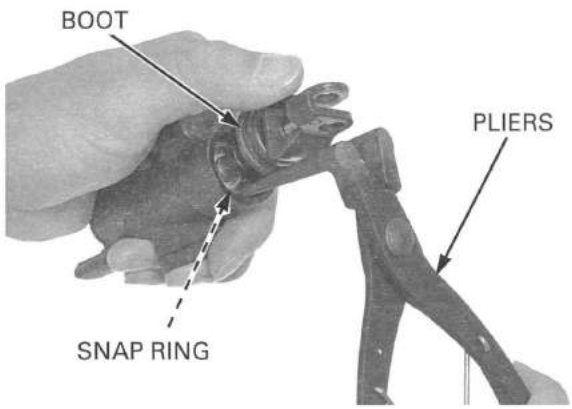
Remove the screw and reservoir hose joint.



Pull the boot out of the master cylinder and remove the snap ring using the special tool.

TOOL:
Snap ring pliers **07914-SA50001**

Remove the push rod, master piston, primary cup and spring.

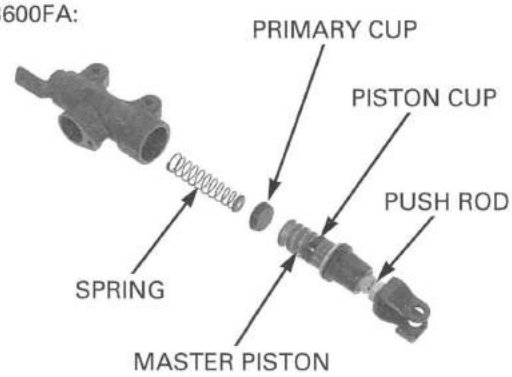


INSPECTION

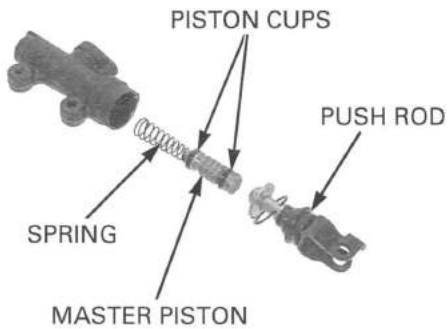
Clean inside of the master cylinder and the master piston with clean brake fluid.

Check the piston cups and boot for wear, deterioration or damage.
Check the spring for damage.
Check the master cylinder and piston for scoring, scratches or damage.

CB600FA:



CB600F:



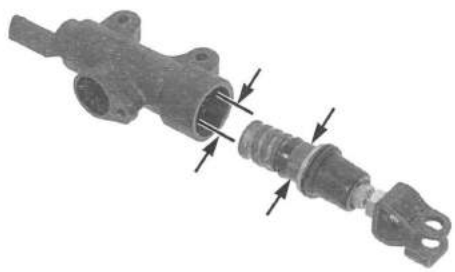
CB600FA: Measure the master cylinder I.D.

SERVICE LIMIT: 17.515 mm (0.6896 in)

Measure the master piston O.D.

SERVICE LIMIT: 17.405 mm (0.6852 in)

CB600FA:



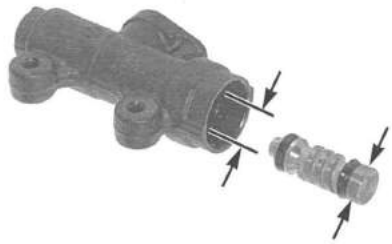
CB600F: Measure the master cylinder I.D.

SERVICE LIMIT: 12.755 mm (0.5022 in)

Measure the master piston O.D.

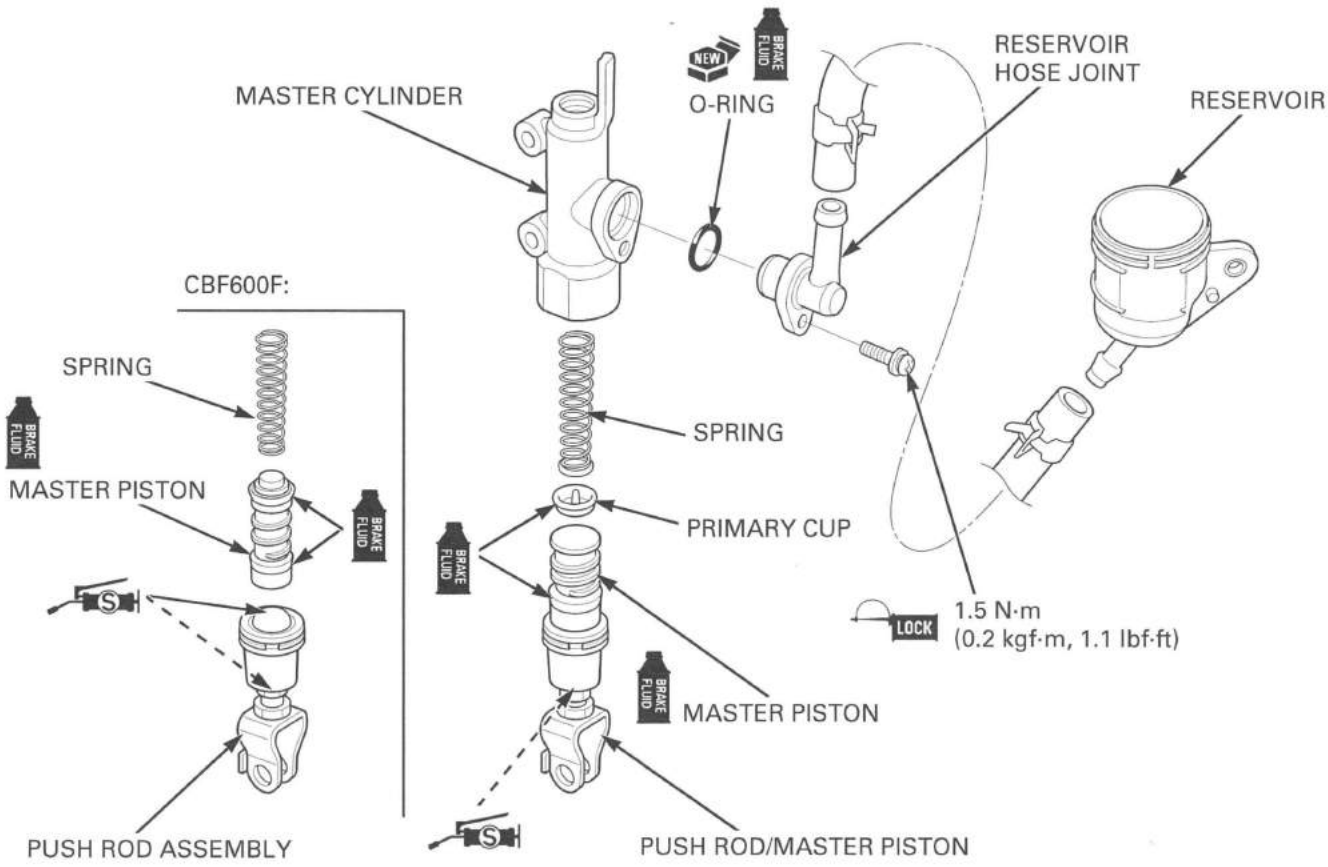
SERVICE LIMIT: 12.645 mm (0.4978 in)

CB600F:



MASTER CYLINDER ASSEMBLY

CB600FA shown:

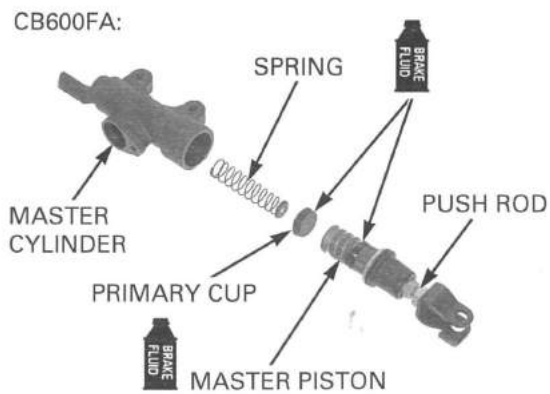


CB600FA: Coat the master piston and piston cups with clean brake fluid.
Install the primary cup onto the spring.

Do not allow the piston cup lips to turn inside out.

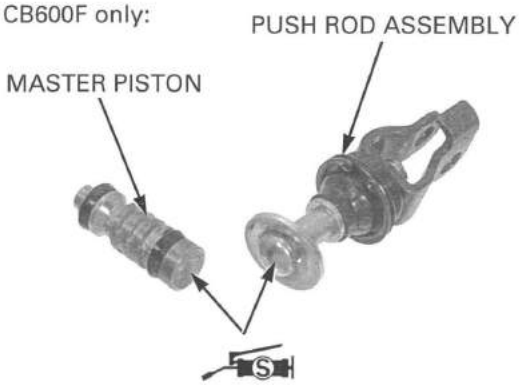
Install the spring and master piston with the push rod into the master cylinder.

CB600FA:



CB600F only: Apply silicone grease to the piston contacting surface of the push rod.

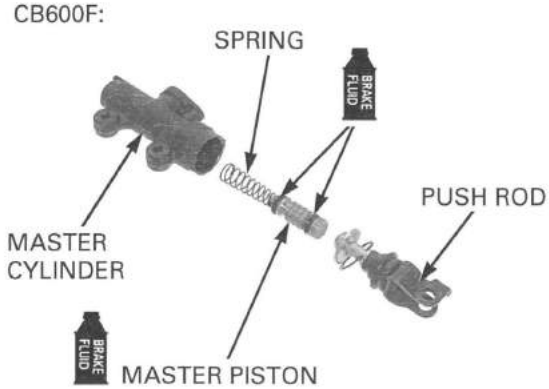
CB600F only:



CB600F: Coat the master piston and piston cups with clean brake fluid.
Install the spring onto the master piston.

Do not allow the piston cup lips to turn inside out. Install the spring/master piston with the push rod into the master cylinder.

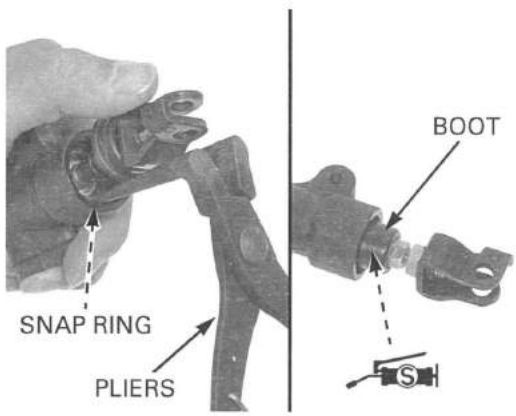
CB600F:



Make sure the snap ring is firmly seated in the groove. Install the snap ring into the groove in the master cylinder.

TOOL:
Snap ring pliers **07914-SA50001**

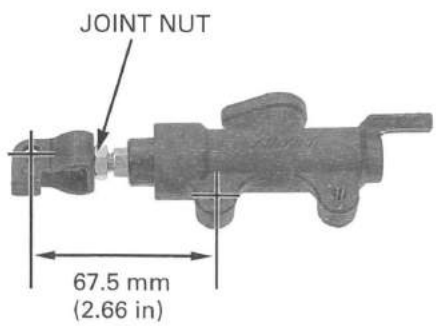
Apply silicone grease to the boot inside, and install the boot into the master cylinder.



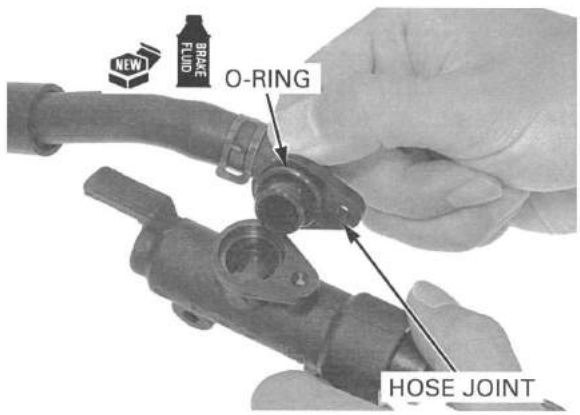
If the push rod joint is reinstalled, adjust the push rod length so that the distance between the centers of the master cylinder lower mounting bolt hole and joint pin hole is 67.5 mm (2.66 in).

After adjustment, tighten the joint nut to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

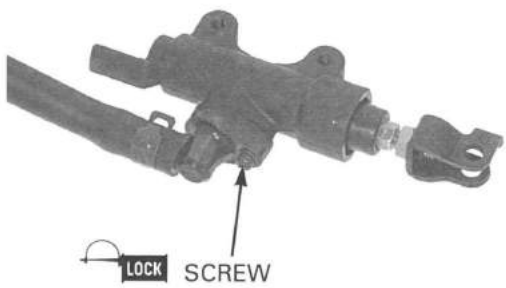


Coat a new O-ring with brake fluid and install it onto the reservoir hose joint. Install the hose joint into the master cylinder.



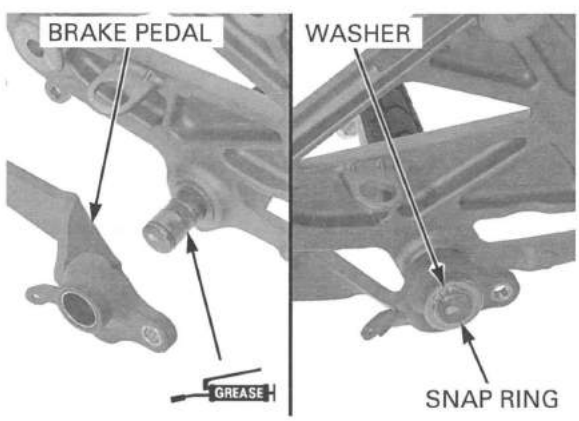
Apply a locking agent to the hose joint screw threads.
Install the screw and tighten it to the specified torque.

TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)

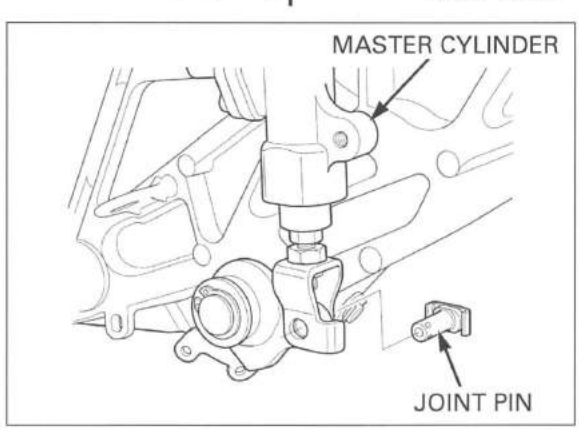


INSTALLATION

Apply grease to the groove in the pedal pivot.
Install the brake pedal and secure it with the washer and snap ring.

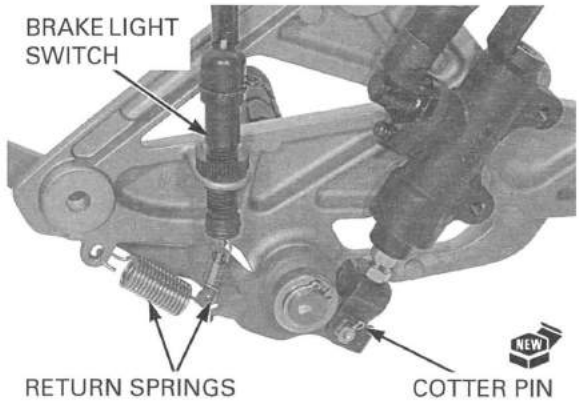


Install the master cylinder onto the pedal with the joint pin.

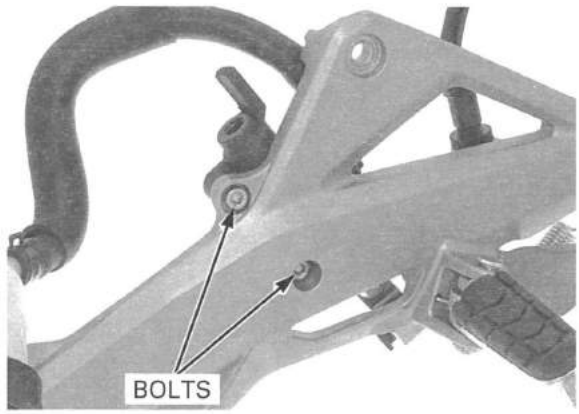


Secure the master cylinder with a new cotter pin.

Install the rear brake light switch into the stay on the bracket.
Install the switch spring and brake pedal return spring in the direction as shown.



Install the rear master cylinder mounting bolts.



Install the right footpeg bracket and mounting bolts, then tighten the bolts to the specified torque.

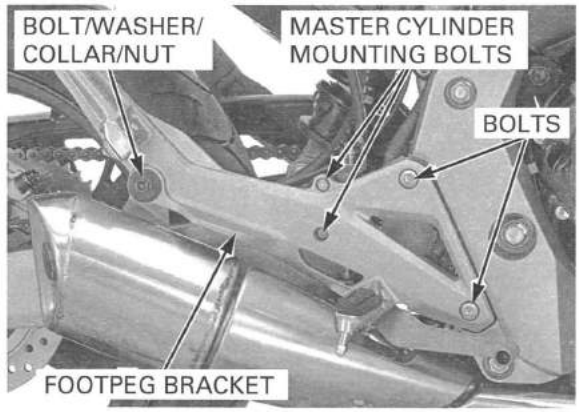
TORQUE: 37 N·m (3.8 kgf·m, 27 lbf·ft)

Tighten the master cylinder mounting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the muffler mounting bolt/nut, washer and collar.
Tighten the muffler mounting nut to the specified torque.

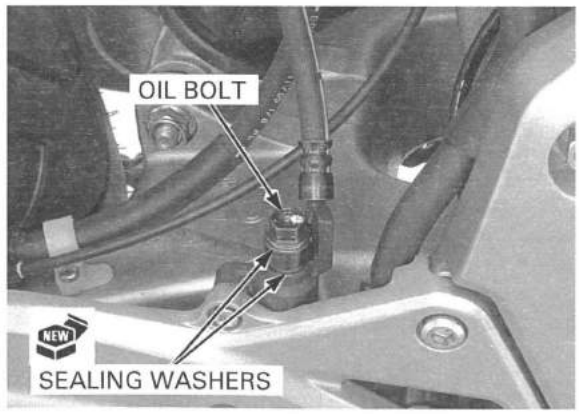
TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



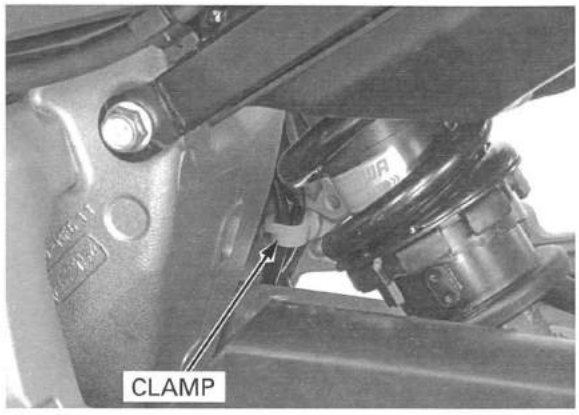
Connect the brake hose to the rear master cylinder with the oil bolt and new sealing washers.

Tighten the oil bolt while holding the stopper of the hose eyelet against the master cylinder.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



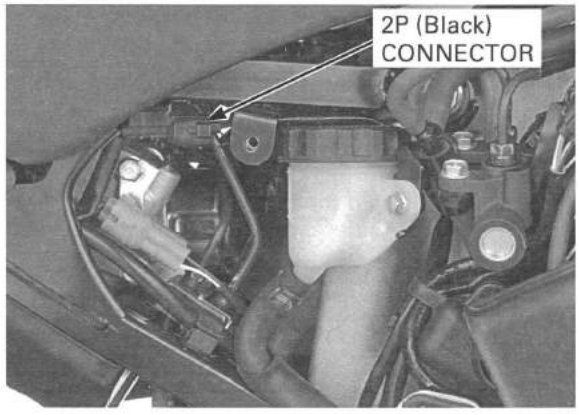
Secure the brake light switch wire with the clamp.



Connect the rear brake light switch 2P (black) connector.

Fill and bleed the hydraulic system:

- CB600FA (page 15-7)
- CB600F (page 15-13)



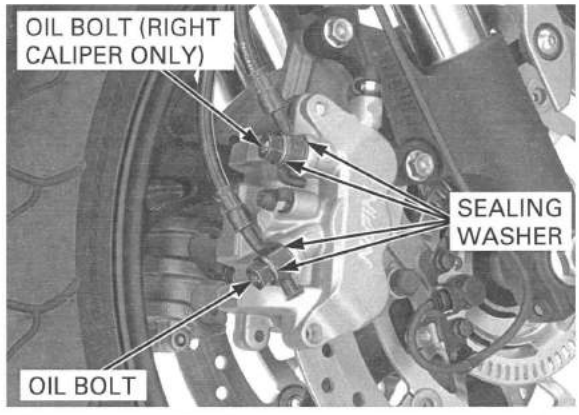
FRONT BRAKE CALIPER (CB600FA)

REMOVAL

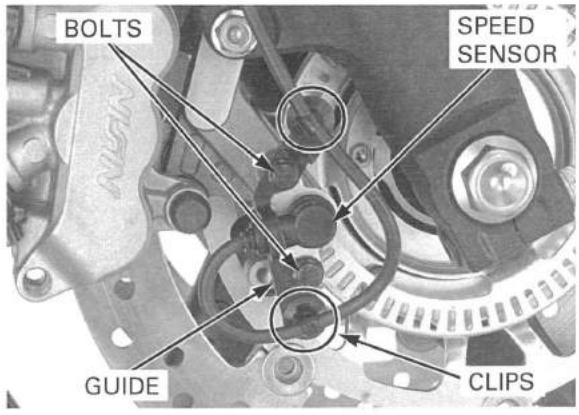
Drain the brake fluid from the hydraulic system (page 15-7).
Remove the brake pads (page 15-15).

When removing the oil bolt, cover the end of the hose to prevent contamination.

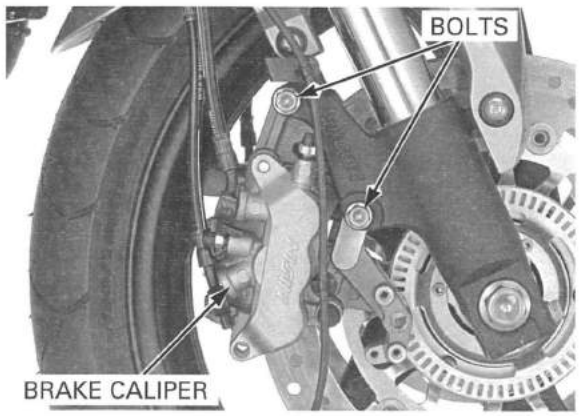
Remove the oil bolts and sealing washers.



Right caliper only: Release the sensor wire clips from the guide.
Remove the mounting bolts, guide and wheel speed sensor from the caliper bracket.



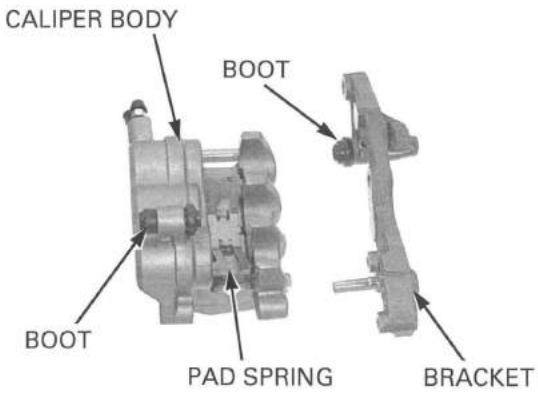
Remove the mounting bolts and brake caliper.



DISASSEMBLY

Remove the caliper bracket from the caliper body.
Remove the pad spring and bracket pin boot from the caliper body.
Remove the caliper pin boot from the caliper bracket.

If the caliper pin boot and bracket pin boot are hard, damaged or deteriorated, replace them with new ones.



Place a shop towel over the pistons.

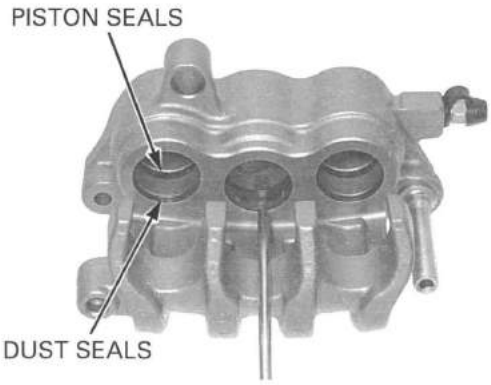
Do not use high pressure air or bring the nozzle too close the inlet.

Position the caliper body with the pistons facing down and apply small squirts of air pressure to the fluid inlet to remove the pistons.

Be careful not to damage the piston sliding surface.

Push the dust seals and piston seals in and lift them out.

Clean the seal grooves, caliper cylinders and pistons with clean brake fluid.



INSPECTION

Check the caliper cylinders and pistons for scoring, scratches or damage.

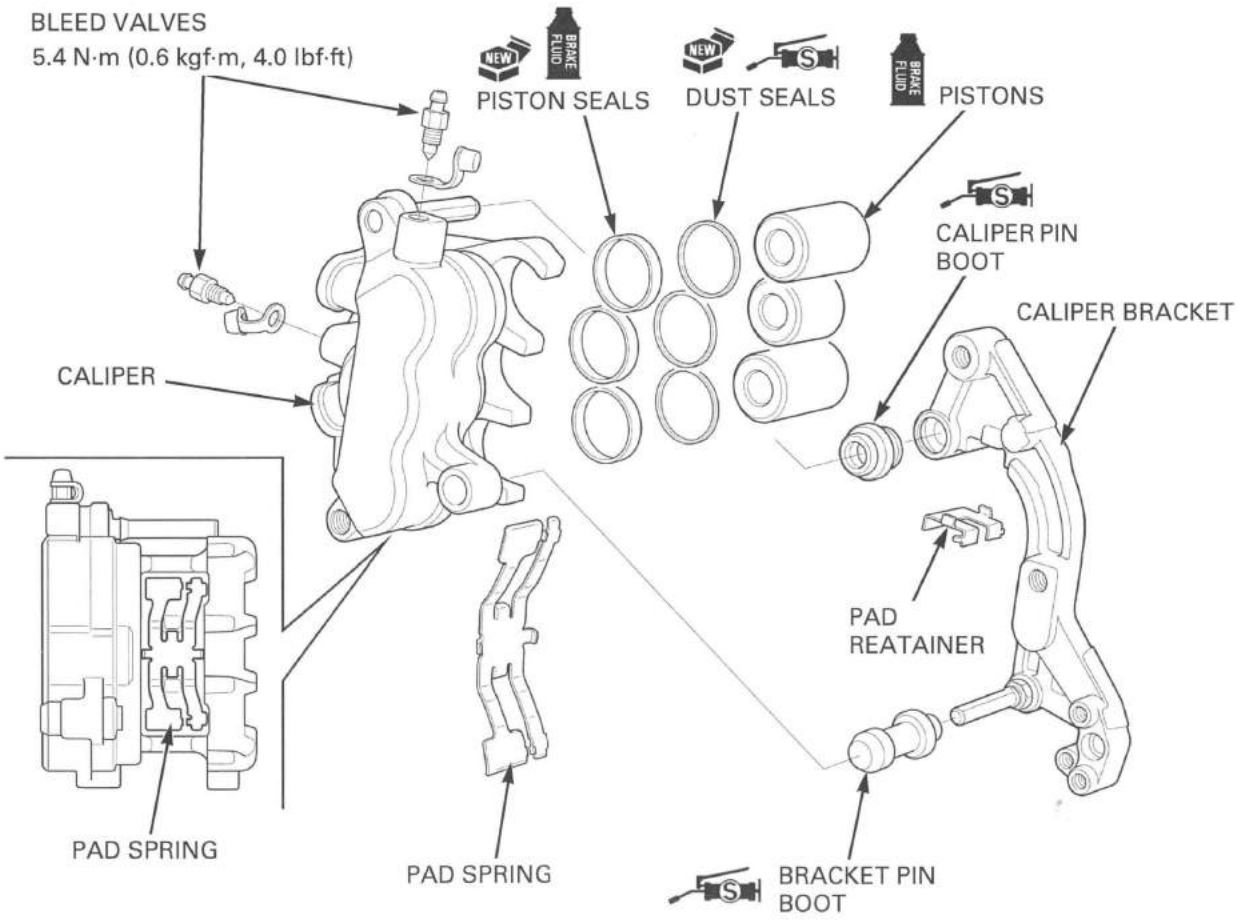
Measure each caliper cylinder I.D.

SERVICE LIMIT: 22.710 mm (0.8941 in)

Measure each caliper piston O.D.

SERVICE LIMIT: 22.560 mm (0.8882 in)

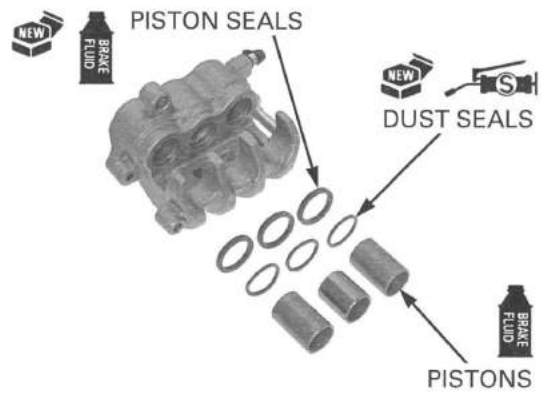
ASSEMBLY



Coat new piston seals with clean brake fluid and install them into the seal grooves in the caliper.
Coat new dust seals with silicone grease and install them into the seal grooves in the caliper.

Install the shorter piston into the center cylinder.

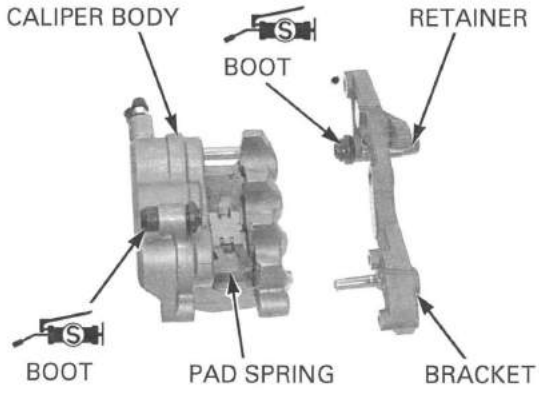
Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the opening toward the pads.



Install the boots into the caliper and bracket.

Note the installation direction of the pad spring.

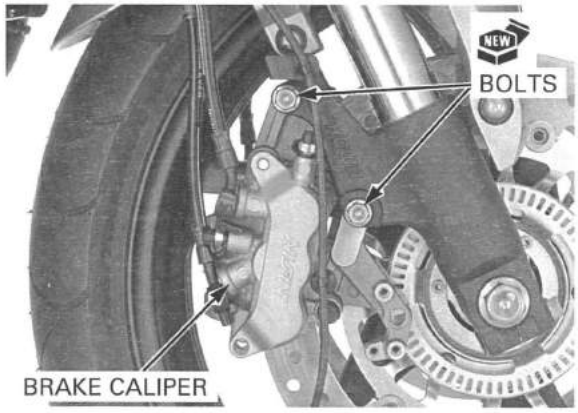
Install the pad spring onto the caliper body properly.
Check that the pad retainer is in place on the caliper bracket.
Apply silicone grease to the inside of the boots and the slide pins.
Install the caliper bracket over the caliper body.



INSTALLATION

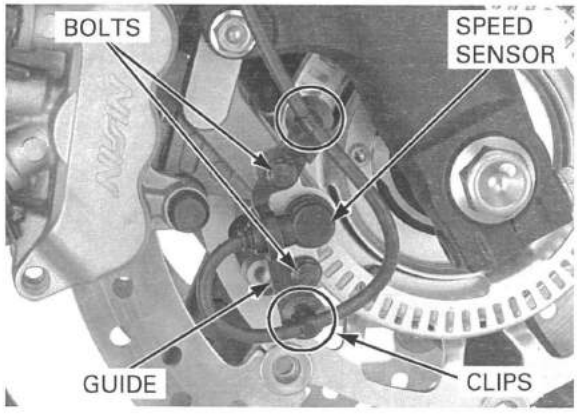
Install the brake caliper with new mounting bolts.
Tighten the mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



Right caliper only:

Install the wheel speed sensor and guide to the caliper bracket.
Tighten the mounting bolts securely.
Install the sensor wire clips to the guide.

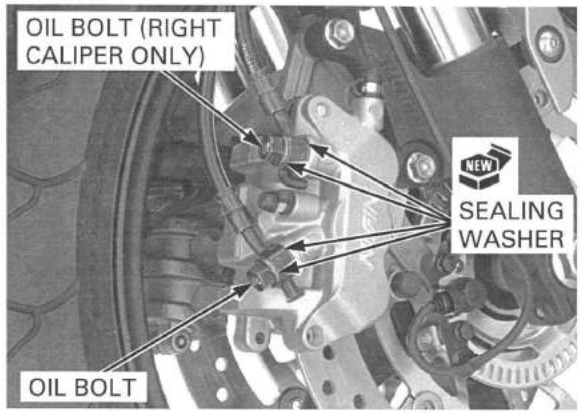


Connect the brake hoses to the caliper with the oil bolts and new sealing washers.
Push the stopper or the brake hose eyelet joint against the caliper body, then tighten the oil bolts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the brake pads (page 15-15).
Fill and bleed the hydraulic system (page 15-7).

After installation, check the air gap (page 16-24).

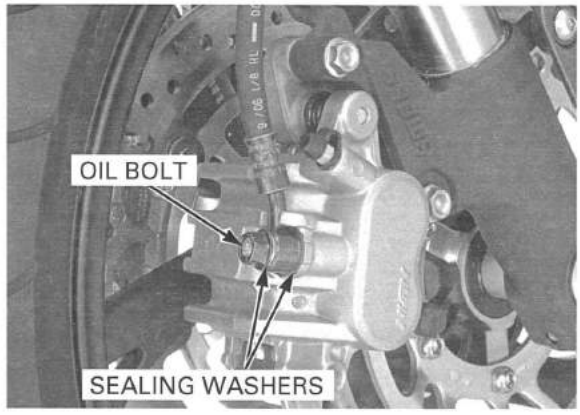


FRONT BRAKE CALIPER (CB600F)

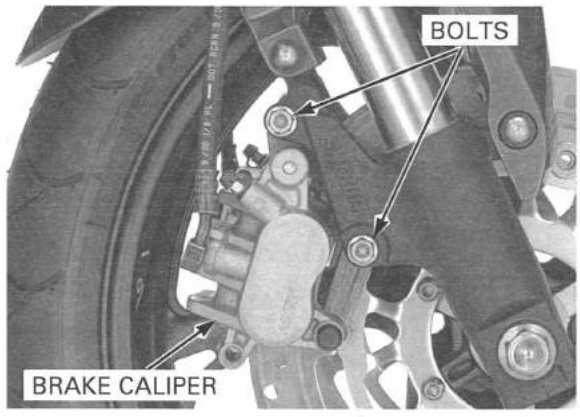
REMOVAL

Drain the brake fluid from the front brake hydraulic system (page 15-13).
Remove the brake pads (page 15-16).

Remove the oil bolt and sealing washers.

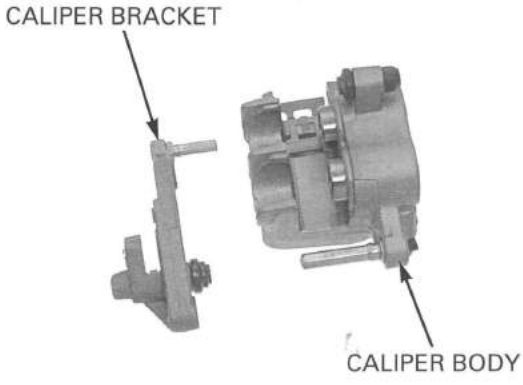


Remove the mounting bolts and brake caliper.



DISASSEMBLY

Remove the caliper bracket from the caliper body.

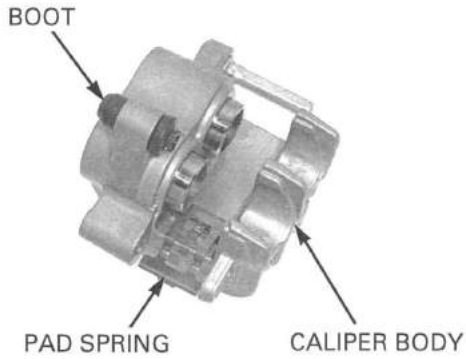


Remove the caliper pin boot from the caliper bracket.

If the caliper pin boot is hard or deteriorated, replace it with a new one.

Remove the pad spring and bracket pin boot from the caliper body.

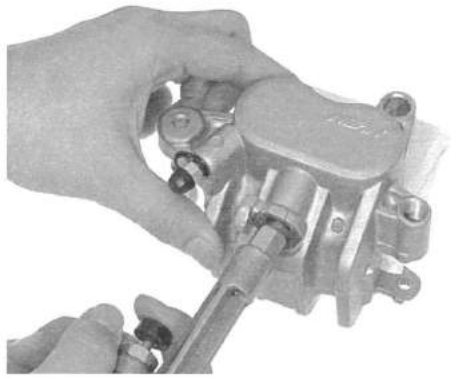
If the bracket pin boot is hard or deteriorated, replace it with a new one.



Place a shop towel over the pistons.

Do not use high pressure air or bring the nozzle too close to the inlet.

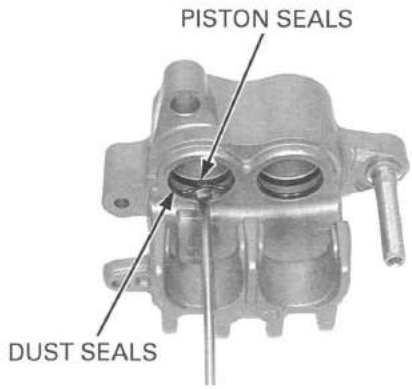
Position the caliper body with the pistons facing down and apply small squirts of air pressure to the fluid inlet to remove the pistons.



Be careful not to damage the piston sliding surface.

Push the dust seals and piston seals in and lift them out.

Clean the seal grooves, caliper cylinders and pistons with clean brake fluid.



INSPECTION

Check the caliper cylinders and pistons for scoring, scratches or damage.

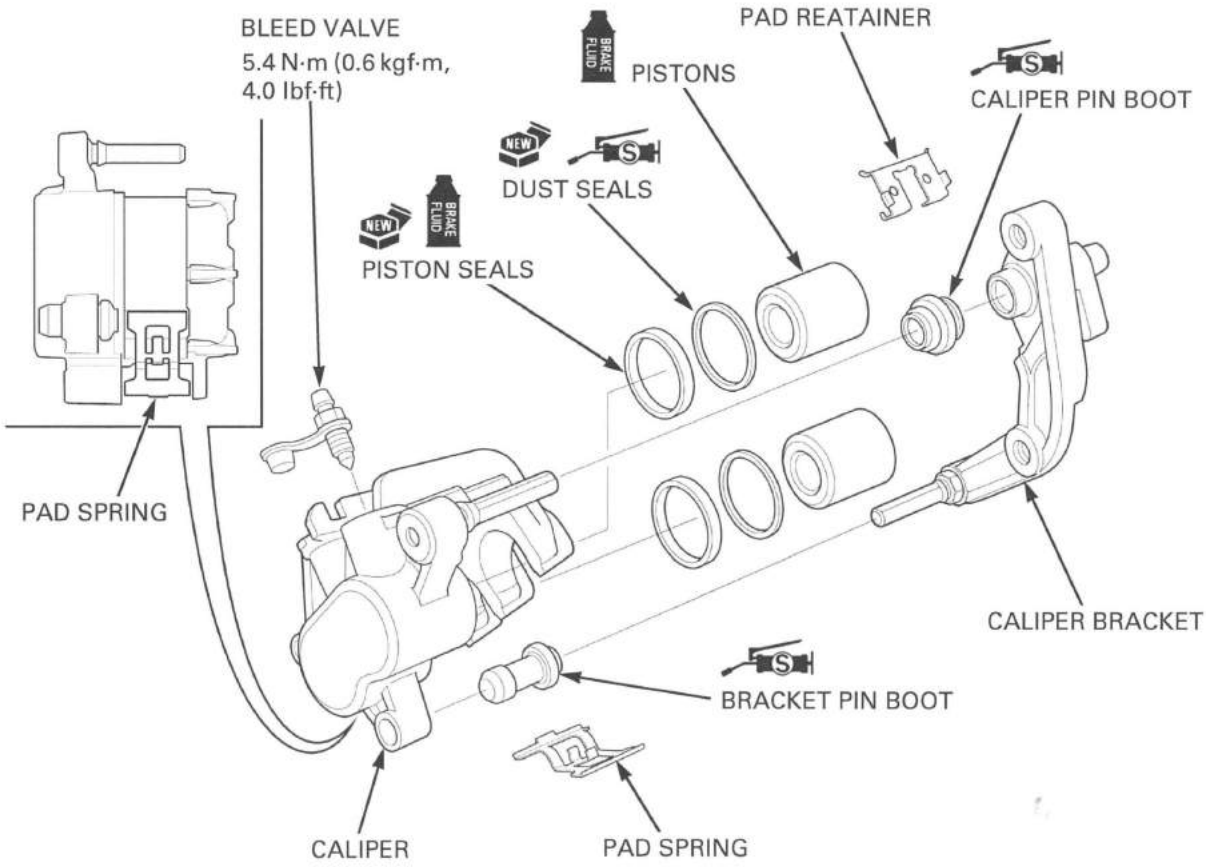
Measure each caliper cylinder I.D.

SERVICE LIMIT: 25.460 mm (1.0024 in)

Measure each caliper piston O.D.

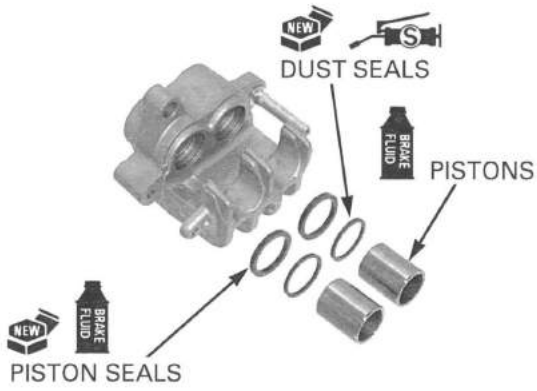
SERVICE LIMIT: 25.310 mm (0.9965 in)

ASSEMBLY



Coat new piston seals with clean brake fluid and install them into the seal grooves in the caliper.
Coat new dust seals with silicone grease and install them into the seal grooves in the caliper.

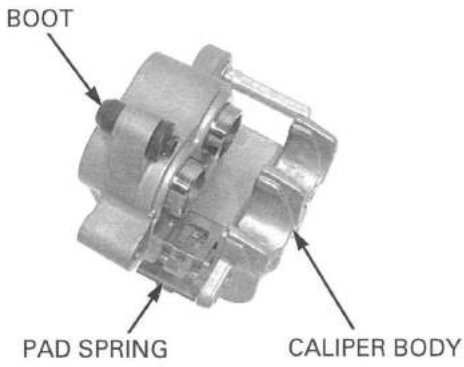
Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the opening toward the pads.



Note the installation direction of the pad spring.

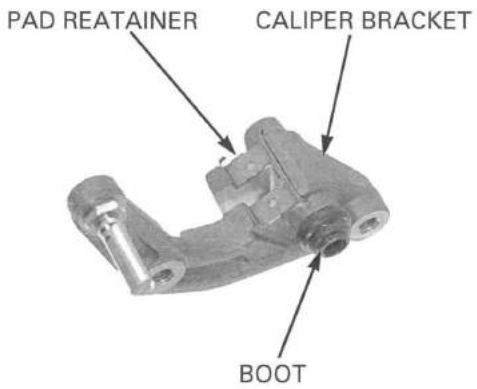
Install the pad spring in the caliper body.

Install the bracket pin boot into the caliper body.

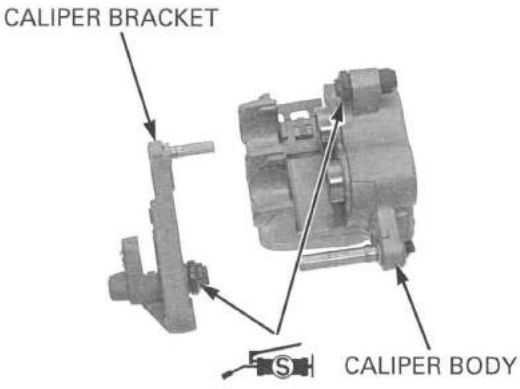


Check that the pad retainer is in place on the caliper bracket.

Install the caliper pin boot into the caliper bracket.



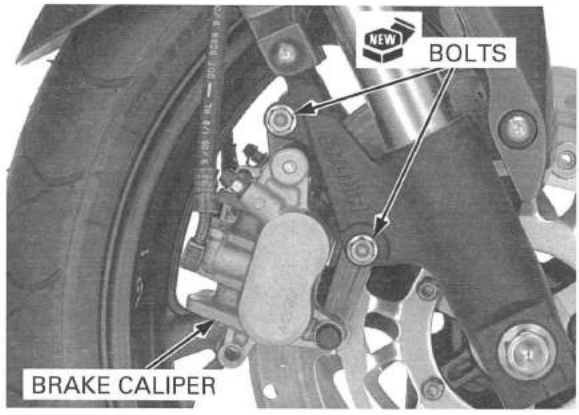
Apply silicone grease to the inside of the boots and the slide pins.
Install the caliper bracket over the caliper body.



INSTALLATION

Install the brake caliper with new mounting bolts. Tighten the mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

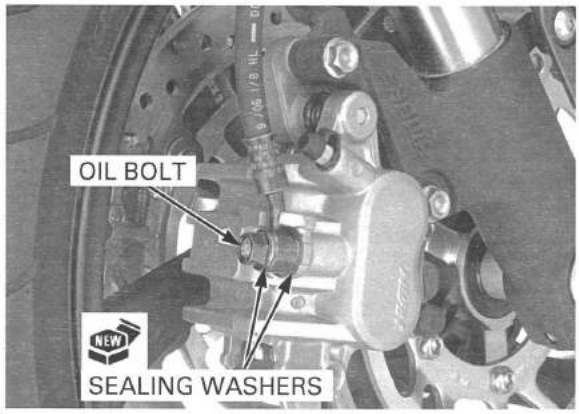


Hold the brake hose in the stopper groove on the caliper.

Connect the brake hose to the caliper with the oil bolt and new sealing washers.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the hydraulic system (page 15-14).



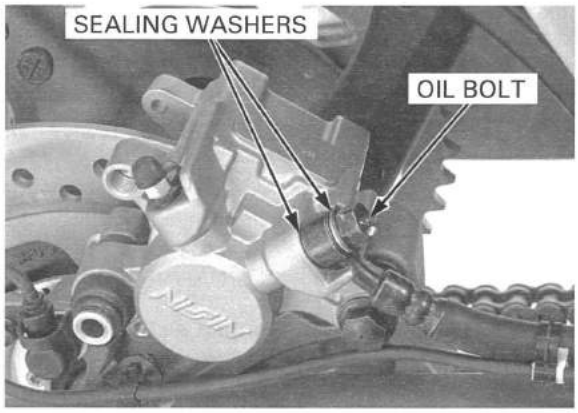
REAR BRAKE CALIPER (CB600FA)

REMOVAL

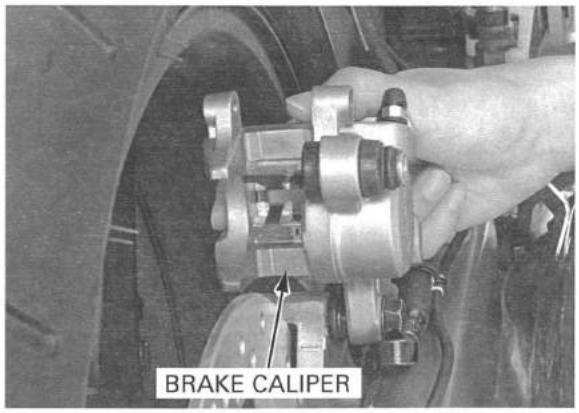
Drain the brake fluid from the hydraulic system (page 15-7).
Remove the rear brake pads (page 15-17).

When removing the oil bolt, cover the end of the hose to prevent contamination.

Remove the brake hose oil bolt and sealing washers.



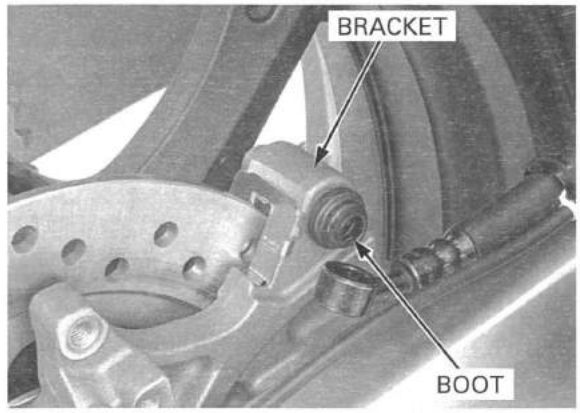
Pivot the caliper up and slide it outward, then remove it from the caliper bracket.



DISASSEMBLY

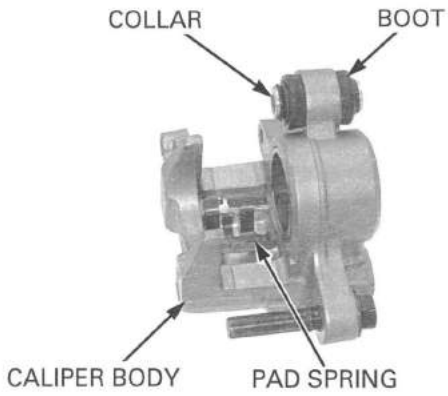
Remove the slide pin boot from the caliper bracket.

If the boot is hard, damaged or deteriorated, replace it with a new one.



Remove the pad spring, collar and bracket pin boot from the caliper body.

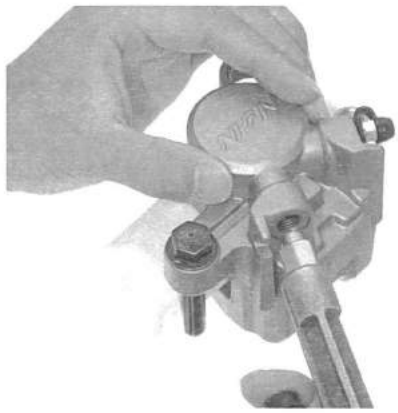
If the boot is hard, damaged or deteriorated, replace it with a new one.



Place a shop towel over the piston.

Do not use high pressure air or bring the nozzle too close the inlet.

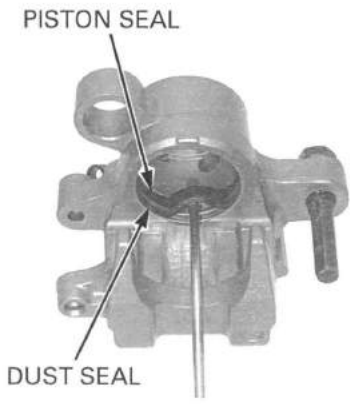
Position the caliper body with the piston facing down and apply small squirts of air pressure to the fluid inlet to remove the piston.



Be careful not to damage the piston sliding surface.

Push the dust seal and piston seal in and lift them out.

Clean the seal grooves, caliper cylinder and piston with clean brake fluid.



INSPECTION

Check the caliper cylinders and pistons for scoring, scratches or damage.

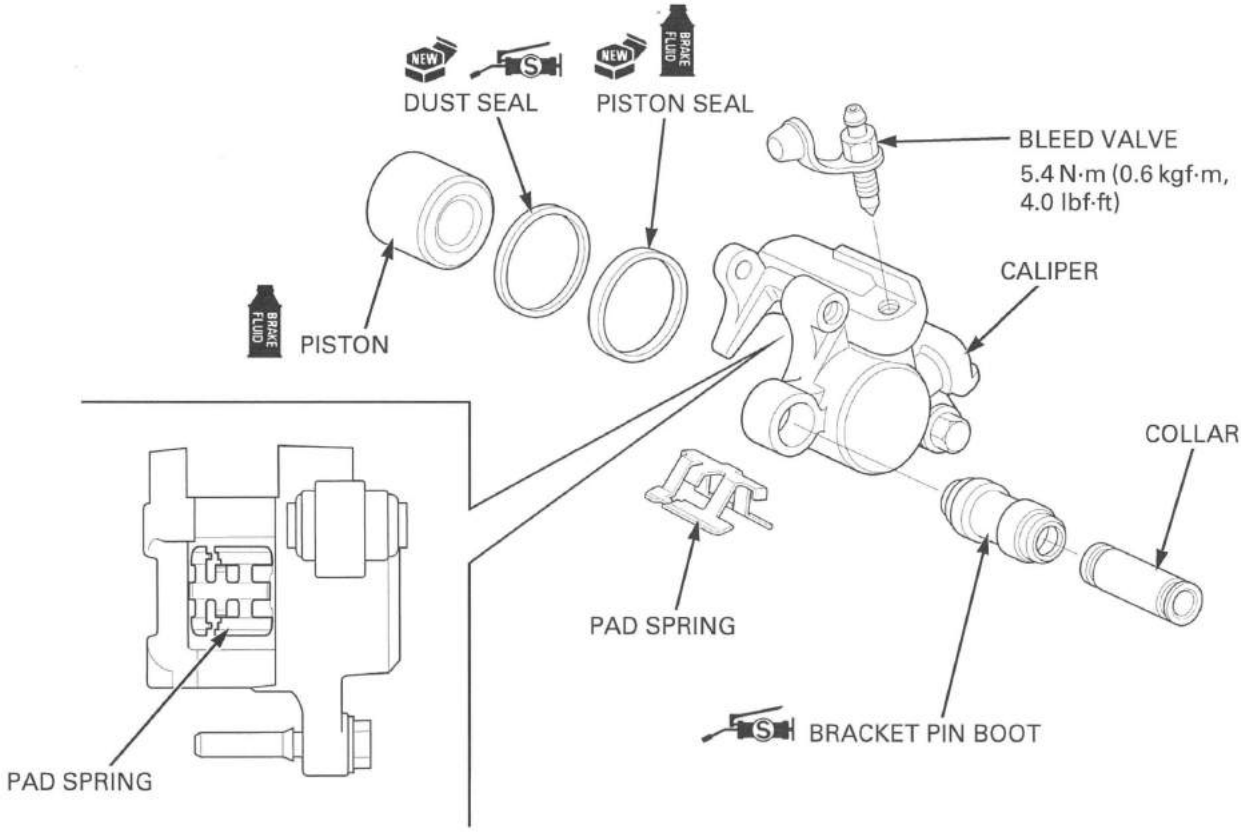
Measure each caliper cylinder I.D.

SERVICE LIMIT: 38.24 mm (1.506 in)

Measure each caliper piston O.D.

SERVICE LIMIT: 38.09 mm (1.500 in)

ASSEMBLY

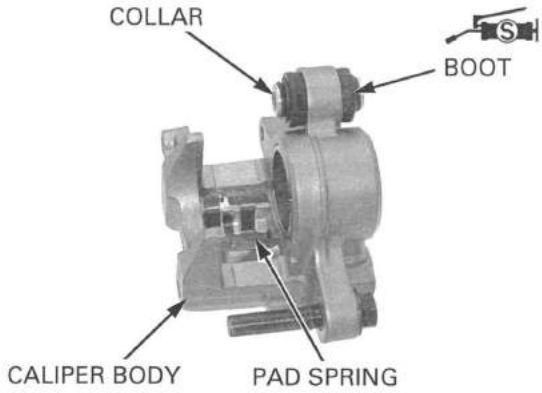


Coat a new piston seal with clean brake fluid and install it in the seal groove in the caliper body.
Coat a new dust seal with silicone grease and install it in the seal groove in the caliper body.

Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with the opening toward the pads.

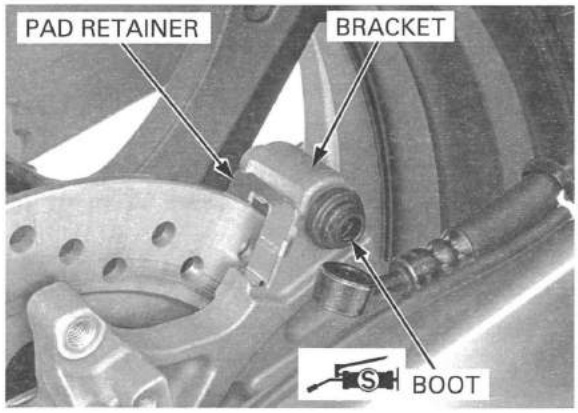
Apply silicone grease to the inside of bracket pin boot.
Install the boot and collar into the caliper body.

Install the pad spring onto the caliper body properly as shown.



Check that the pad retainer is in place on the caliper bracket.

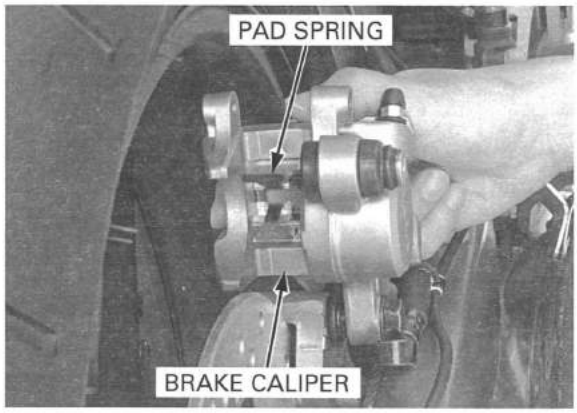
Apply silicone grease to the inside of slide pin boot and install the boot into the bracket.



INSTALLATION

Be careful not to come the pad spring off from the caliper.

Install the caliper main slide pin into the boot on the caliper bracket.

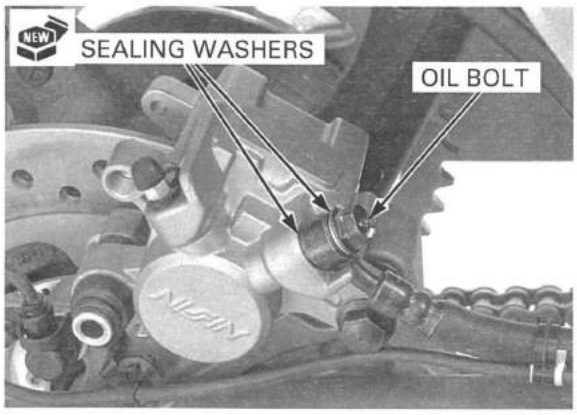


Hold the brake hose in the stopper groove on the caliper.

Connect the brake hose to the caliper with the oil bolt and new sealing washers.
Then tighten the oil bolts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the brake pads (page 15-17).
Fill and bleed the brake hydraulic system (page 15-7).

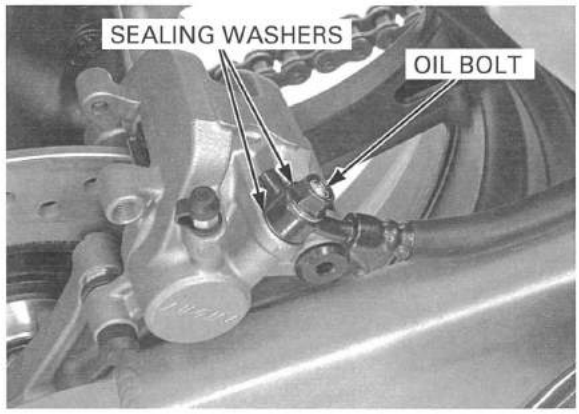


REAR BRAKE CALIPER (CB600F)

REMOVAL

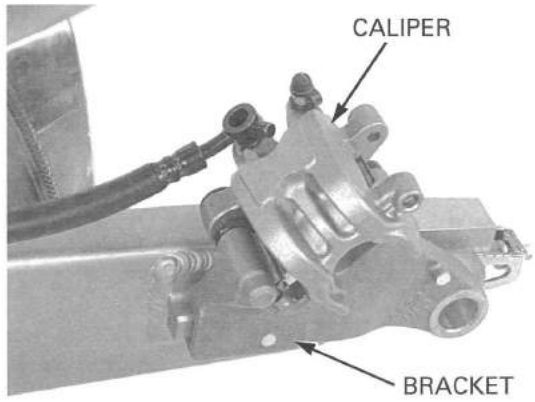
Drain the rear brake hydraulic system (page 15-13).
Remove the rear brake pads (page 15-19).

Remove the oil bolt and sealing washers.



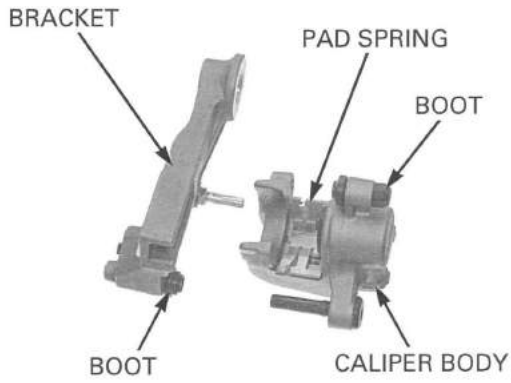
Remove the rear wheel (page 14-7).

Remove the rear brake caliper with the caliper bracket.



DISASSEMBLY

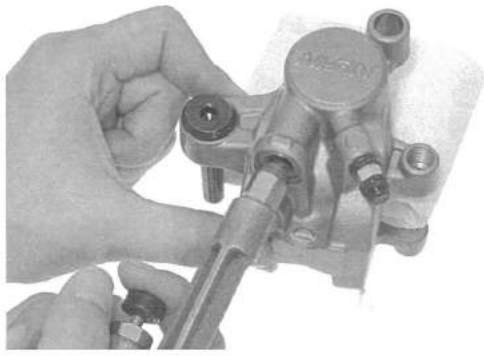
Remove the caliper bracket from the caliper body.
Remove the pad spring and bracket pin boot from the caliper body.
Remove the caliper pin boot from the caliper bracket.
If the boots are hard, damaged or deteriorated, replace them with new ones.



Place a shop towel over the piston.

Do not use high pressure air or bring the nozzle too close to the inlet.

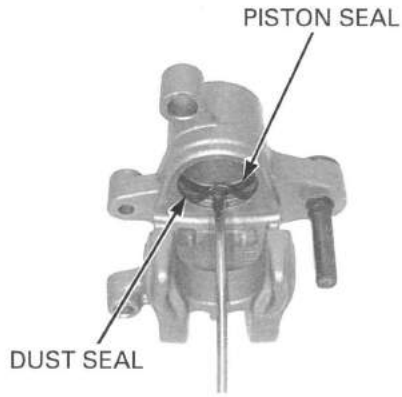
Position the caliper body with the piston down and apply small squirts of air pressure to the fluid inlet to remove the piston.



Be careful not to damage the piston sliding surface.

Push the dust seal and piston seal in and lift them out.

Clean the seal grooves, caliper cylinder and piston with clean brake fluid.



INSPECTION

Check the caliper cylinder and piston for scoring, scratches or damage.

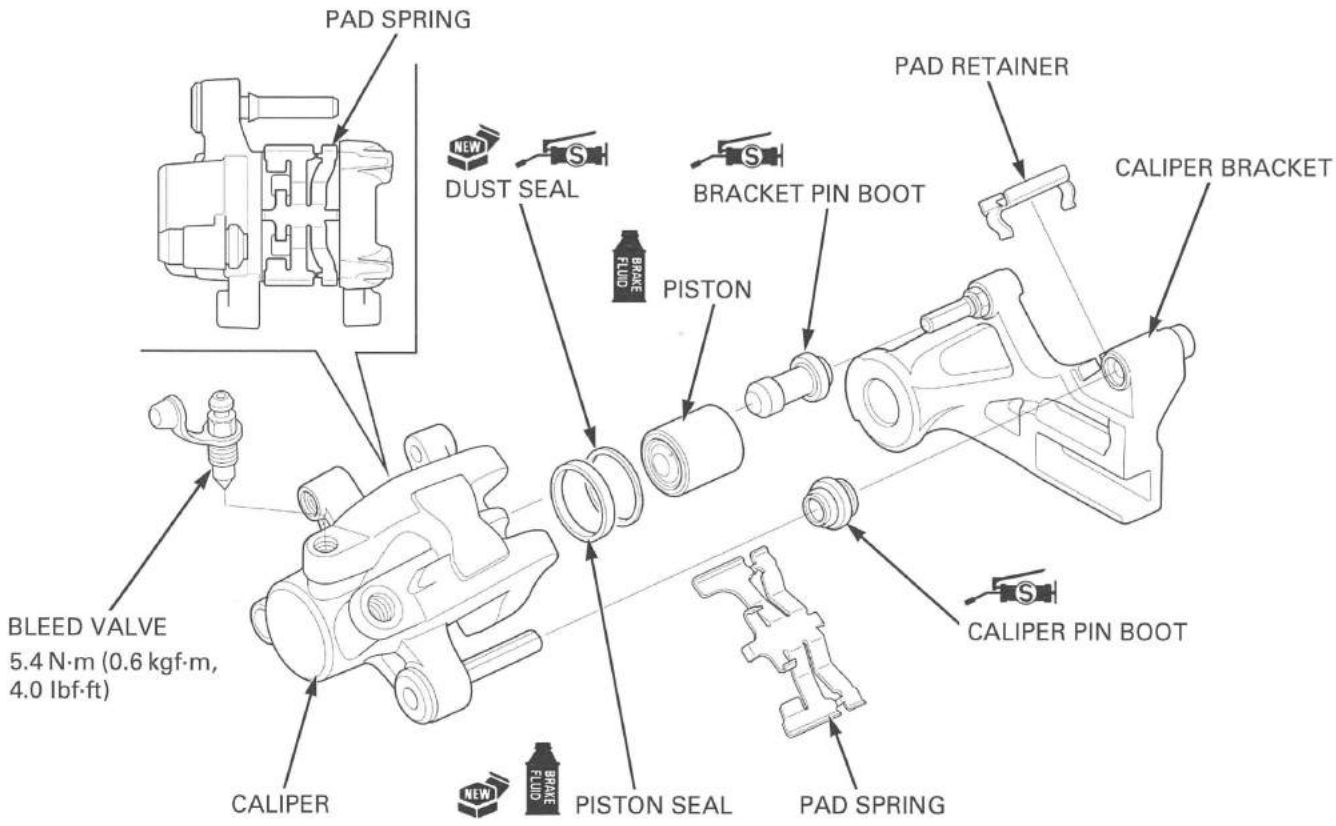
Measure the caliper cylinder I.D.

SERVICE LIMIT: 30.29 mm (1.193 in)

Measure the caliper piston O.D.

SERVICE LIMIT: 30.14 mm (1.187 in)

ASSEMBLY

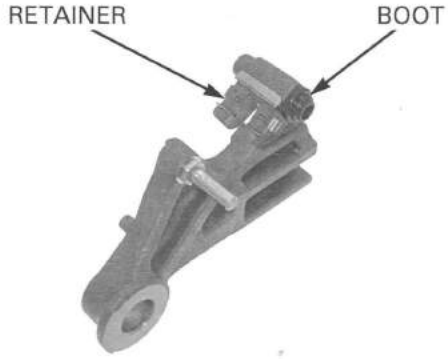


Coat a new piston seal with clean brake fluid and install it in the seal groove in the caliper.
Coat a new dust seal with silicone grease and install it in the seal groove in the caliper.

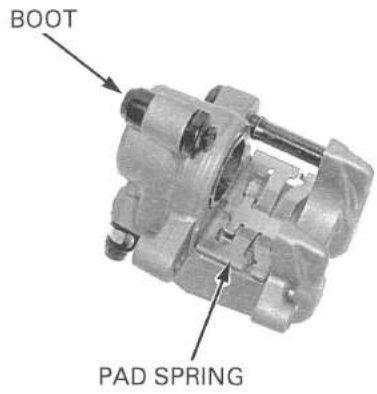
Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with the opening toward the pads.

Check that the pad retainer is in place on the caliper bracket.

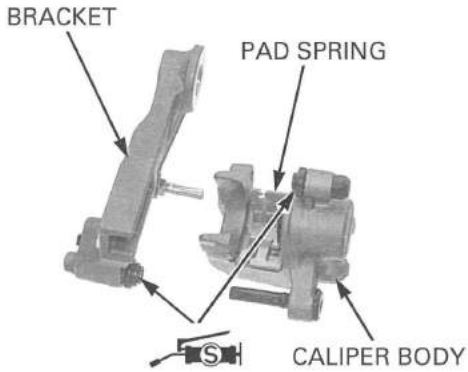
Install the boot into the caliper bracket.



Install the boot into the caliper.
Install the pad spring onto the caliper body properly as shown.



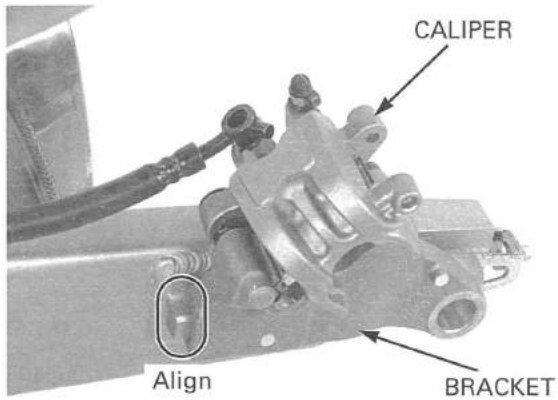
Apply silicone grease to the inside of the boots and the slide pins.
Install the caliper bracket over the caliper body.



INSTALLATION

Install the rear brake caliper by aligning the caliper bracket groove with the lug on the swingarm.

Install the rear wheel (page 14-13).

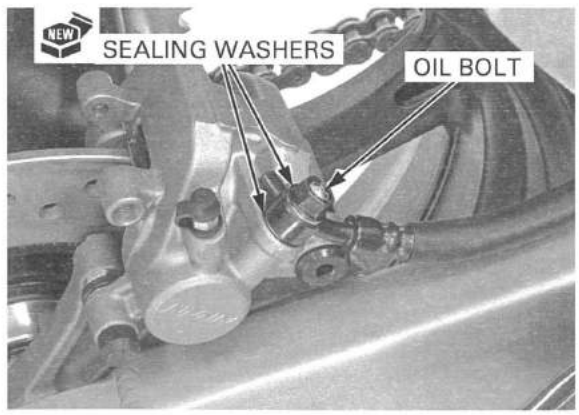


Connect the brake hose to the rear caliper with the oil bolt and new sealing washers.

Push the stopper on the brake hose eyelet joint against the caliper body, then tighten the oil bolt to the specified torque.

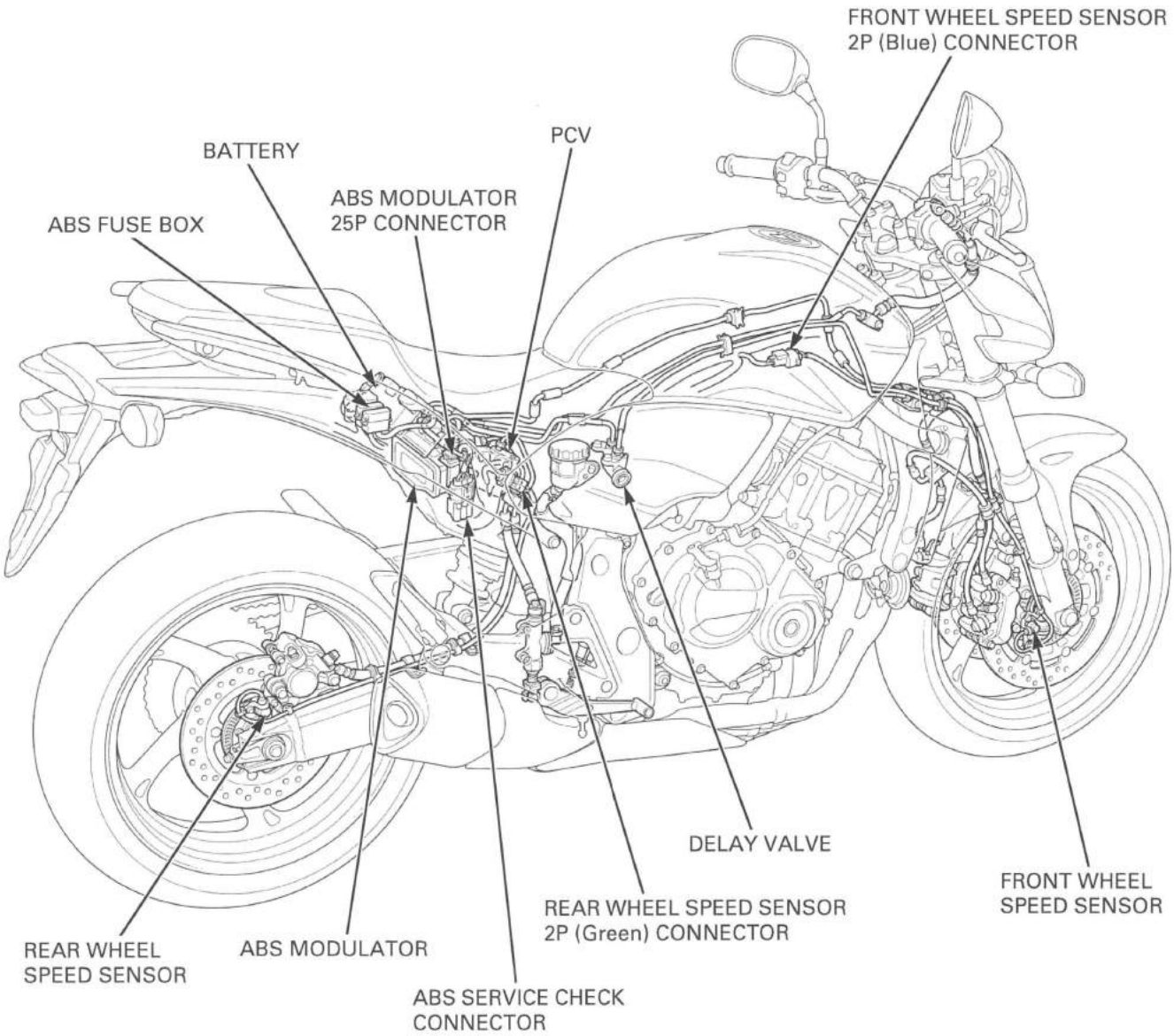
TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the rear brake pads (page 15-19).
Fill and bleed the rear hydraulic system (page 15-14).

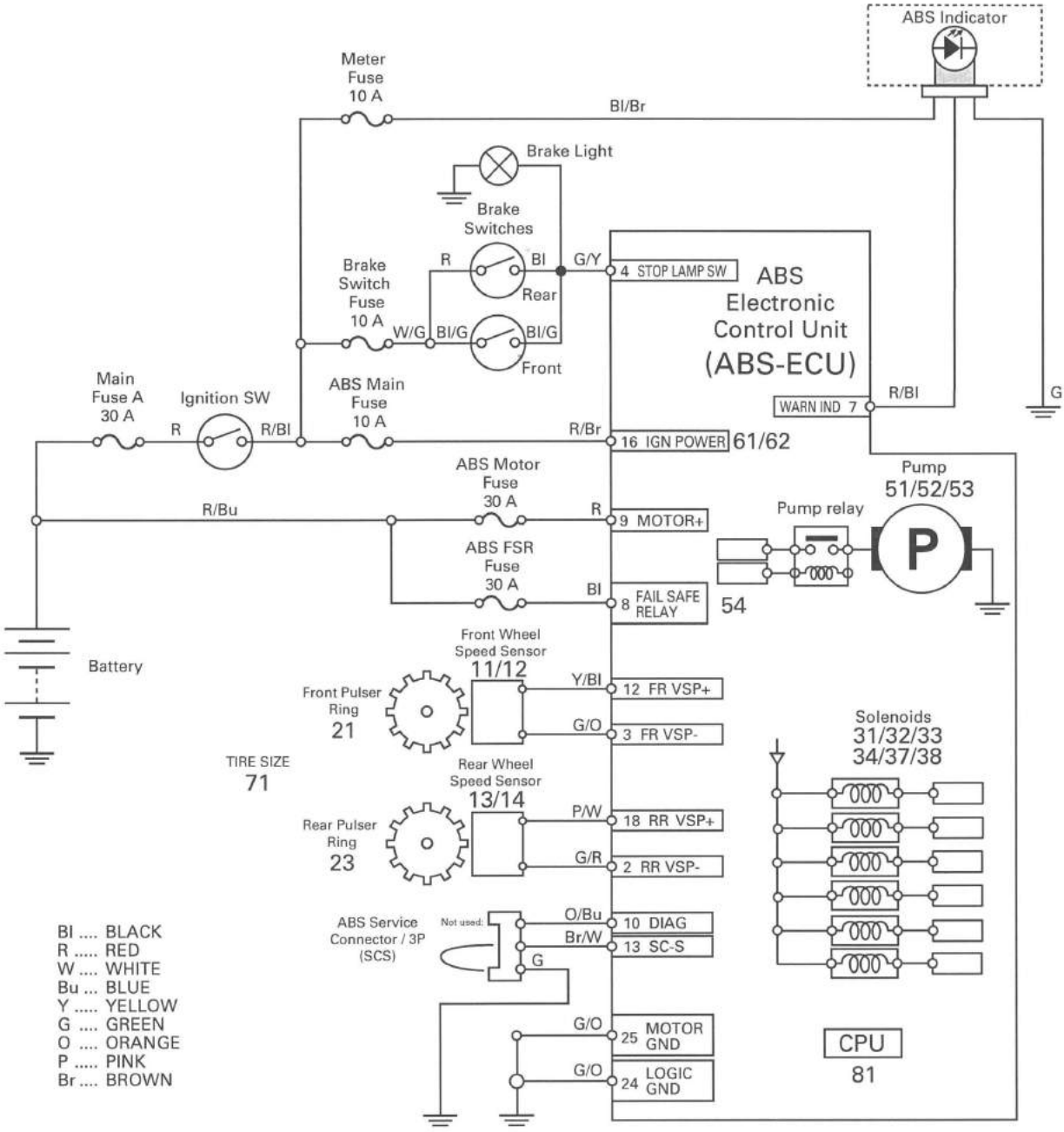


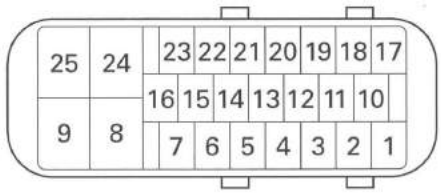
16. ANTI-LOCK BRAKE SYSTEM (ABS; CB600FA)

ABS SYSTEM LOCATION



ABS SYSTEM DIAGRAM





ABS MODULATOR 25P CONNECTOR
(Modulator side/male terminals)

SERVICE INFORMATION

GENERAL

- This section covers service of the Anti-lock Brake System (ABS). For conventional brake service, see page 15-2.
- When the ABS control unit detects a problem, it stops the ABS function and switches back to the conventional brake operation, and the ABS indicator blinks or stays on. Take care during the test ride.
- Troubles not resulting from a faulty ABS (e.g. brake disc squeak, unevenly worn brake pad) cannot be recognized by the ABS diagnosis system.
- Read "ABS Troubleshooting information" carefully, inspect and troubleshoot the ABS system according to the Diagnostic Troubleshooting. Observe each step of the procedures one by one. Write down the problem code and probable faulty part before starting diagnosis and troubleshooting.
- After troubleshooting, erase the problem code and perform the pre-start self-diagnosis to be sure that the ABS indicator is operating normally.
- When the wheel speed sensor and/or pulser ring is replaced, check the clearance (air gap) between both components.
- The ABS control unit (ECU) is mounted on the modulator (the modulator with the built-in ECU). Do not disassemble the ABS modulator. Replace the ABS modulator as an assembly when the it is faulty.
- The ABS modulator may be damaged if dropped. Also if a connector is disconnected when current is flowing, the excessive voltage may damage the control unit. Always turn off the ignition switch before servicing.
- Be careful not to damage the wheel speed sensor and pulser ring when removing and installing the wheel.
- The following color codes are used throughout this section.

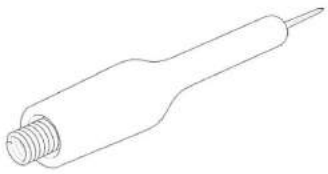
Bu = Blue	G = Green	Lg = Light Green	R = Red
Bl = Black	Gr = Gray	O = Orange	W = White
Br = Brown	Lb = Light Blue	P = Pink	Y = Yellow

TORQUE VALUES

Brake pipe joint nut	14 N·m (1.4 kgf·m, 10 lbf·ft)	Apply brake fluid to the threads.
PCV mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Delay valve mounting bolt	12 N·m (1.2 kgf·m 9 lbf·ft)	

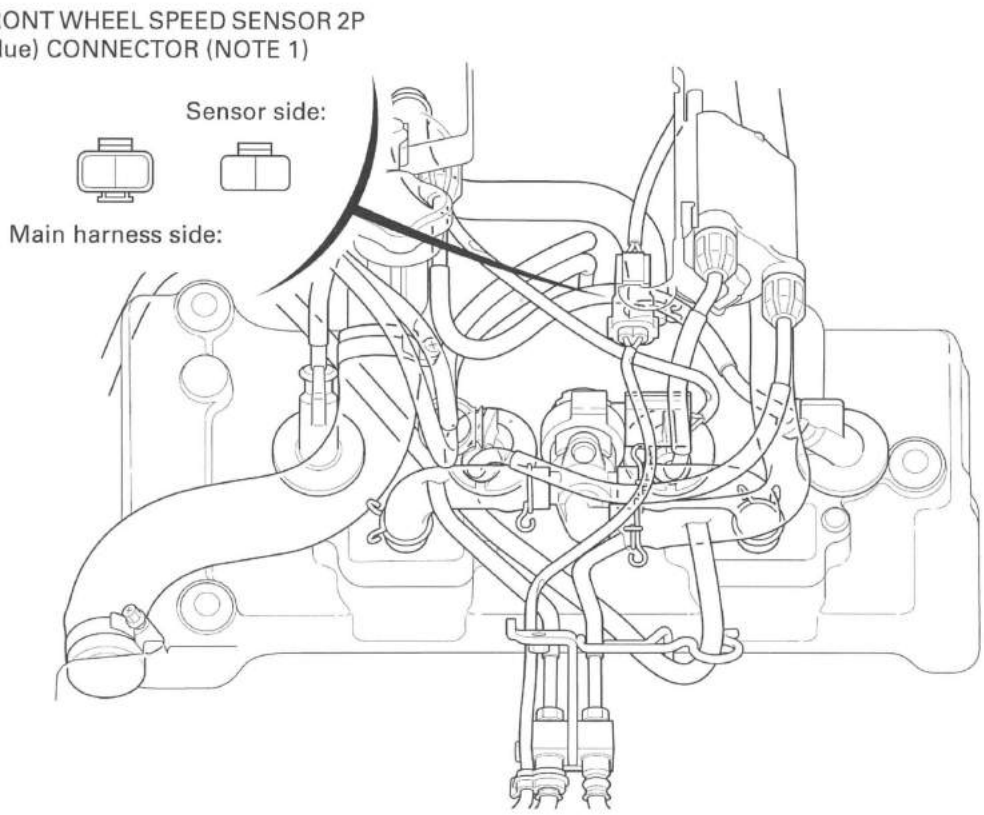
TOOL

Test probe
07ZAJ-RDJA110

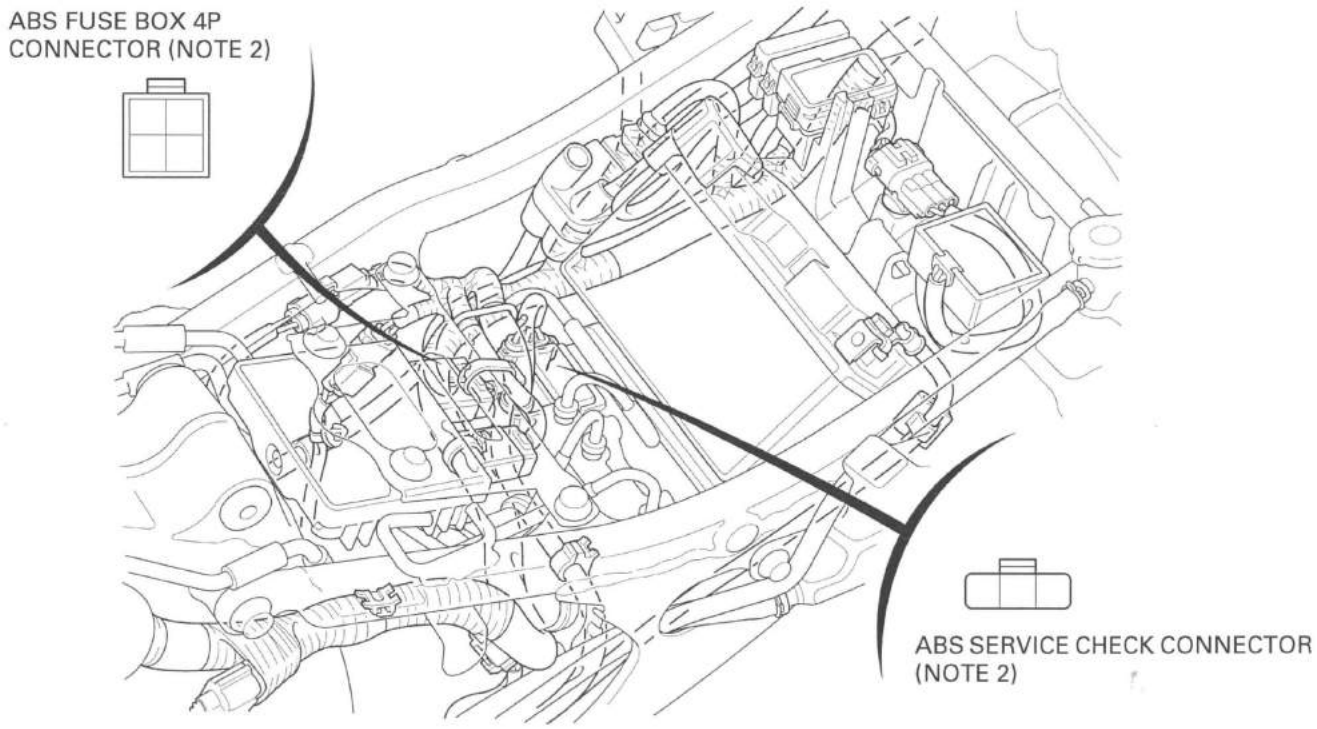


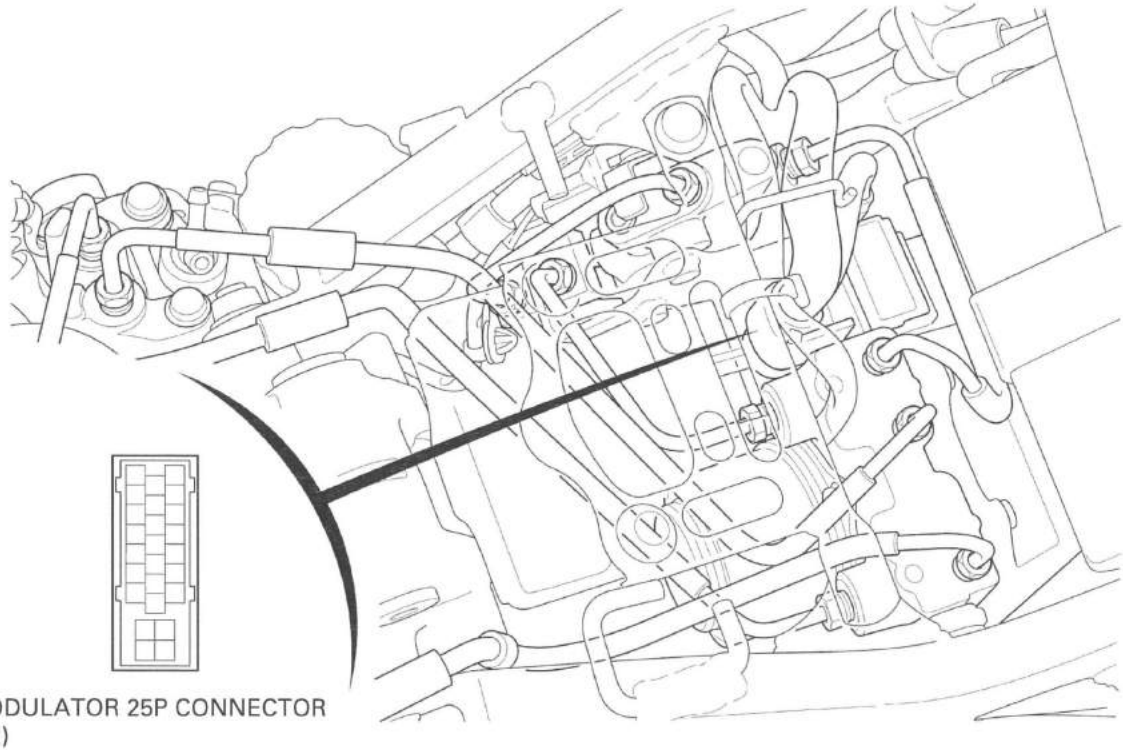
ABS CONNECTOR LOCATIONS

NOTE 1: Lift and support the fuel tank (page 3-5).



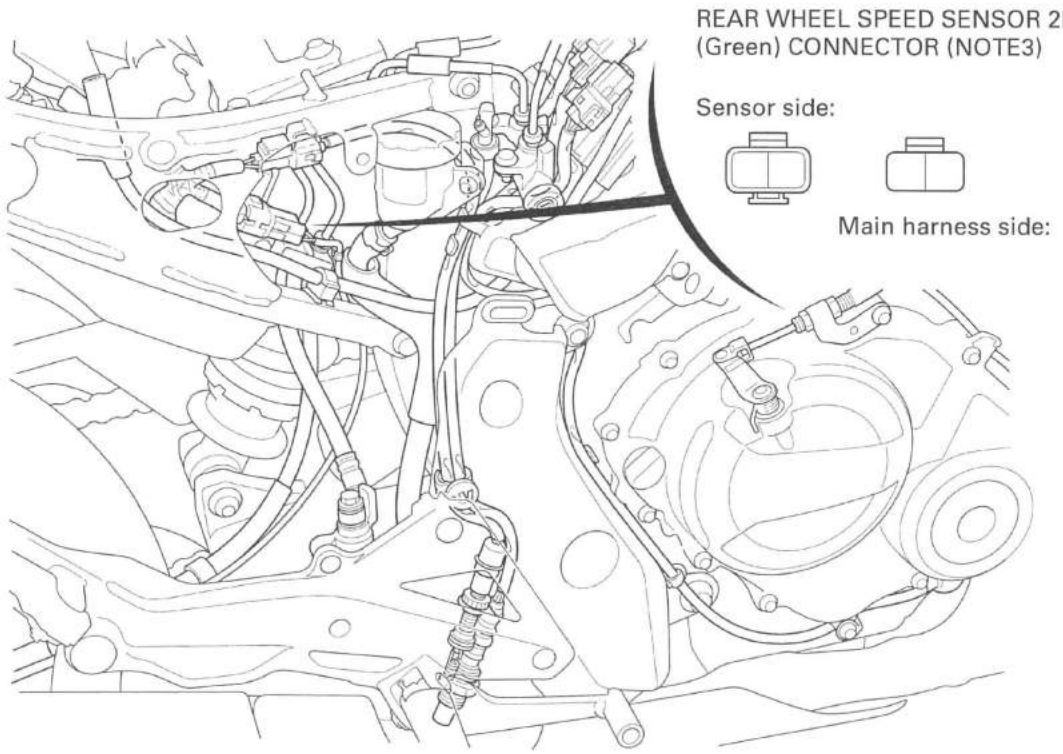
NOTE 2: Remove the seat (page 2-4).





ABS MODULATOR 25P CONNECTOR
(NOTE 2)

NOTE 3: Remove the right side cover (page 2-4).



REAR WHEEL SPEED SENSOR 2P
(Green) CONNECTOR (NOTE3)

Sensor side:

Main harness side:

ABS TROUBLESHOOTING INFORMATION

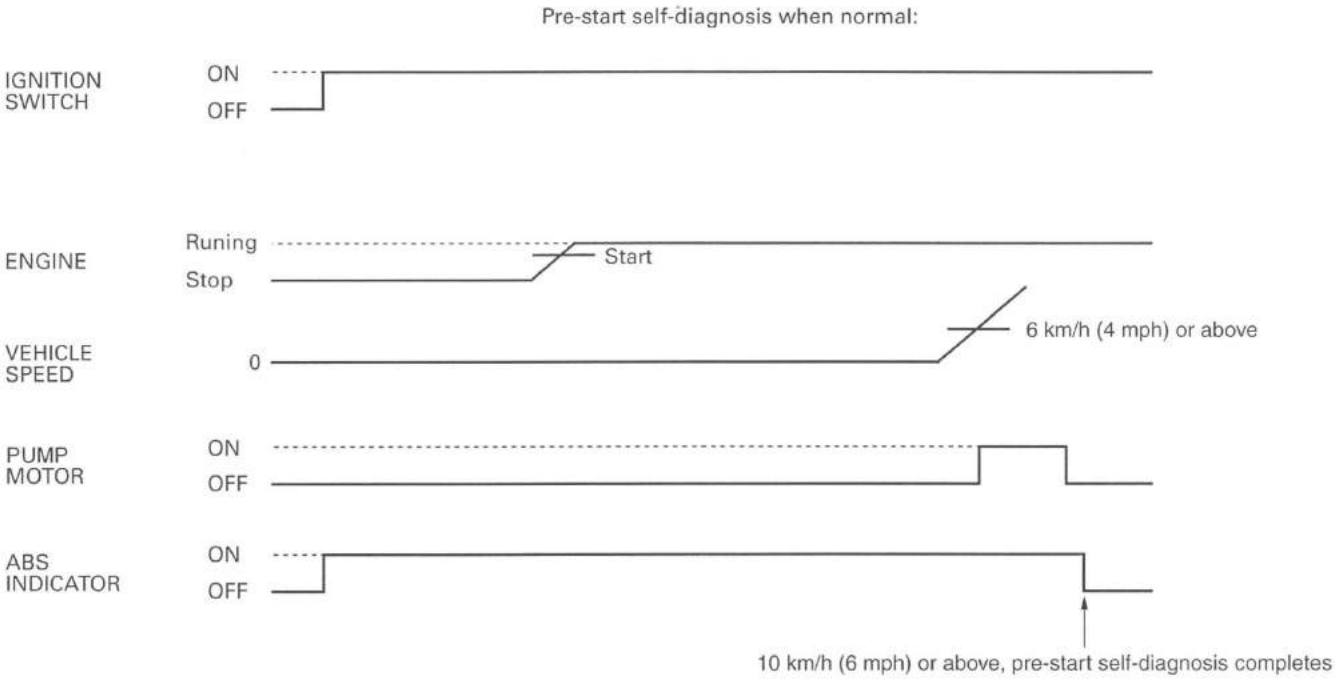
SYSTEM DESCRIPTION

ABS PRE-START SELF-DIAGNOSIS SYSTEM

The ABS pre-start self-diagnosis system diagnoses the electrical system as well as the operating status of the modulator. When there is any abnormality, the problem and the problematic part can be detected by outputting the problem code.

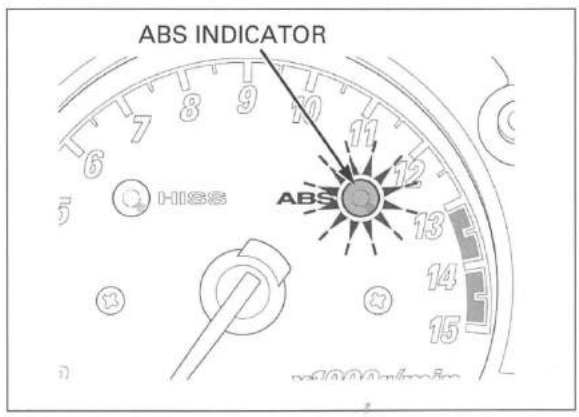
When the vehicle speed is approximately 6 km/h (4 mph) or more, the wheel speed sensor signal is sent to the ABS control unit, then the pre-start self-diagnosis system operates the pump motor (inside the modulator) and detects whether the hydraulic operation is normal, and it completes the pre-start self-diagnosis.

When the ABS is normal, the ABS indicator goes off just after a road speed of 10 km/h (6 mph) indicating that the diagnosis is completed.
If a problem is detected, the ABS indicator blinks or comes on and stays on to notify the rider of the problem. The self-diagnosis is also made while the motorcycle is running, and the indicator blinks when a problem is detected.
When the indicator blinks, the cause of the problem can be identified by retrieving the problem code following the specified retrieval procedure (page 16-8).



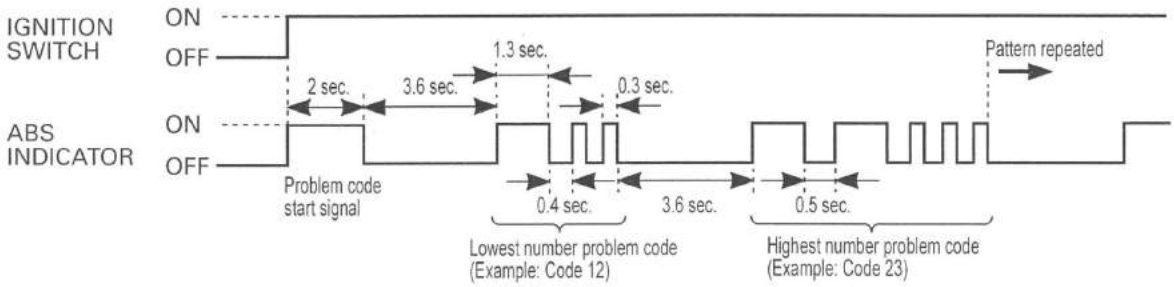
PRE-START SELF-DIAGNOSIS PROCEDURE (Daily check)

1. Turn the ignition switch to "ON".
2. Make sure the ABS indicator comes on.
3. Start the engine.
4. Ride the motorcycle and increase the vehicle speed to approximately 10 km/h (6 mph).
5. The ABS is normal if the ABS indicator goes off.



PROBLEM CODE INDICATION PATTERN

- The ABS indicator indicates the problem code by blinking a specified number of times.
  The indicator has two types of blinks, a long blink and short blink. The long blink lasts for 1.3 seconds, the short blink lasts for 0.3 seconds. When two long blinks occur, and three short blinks, that problem code is 23 (two long blinks = 20 blinks, three short blinks = 3 blinks). Then, go to the troubleshooting and see problem code 23.
- When the ABS control unit stores some problem codes, the ABS indicator shows the problem codes in the order from the lowest number to highest number. For example, when the indicator indicates code 12, then indicates code 23, two failures have occurred.



When the problem code is not stored:

PROBLEM CODE READOUT

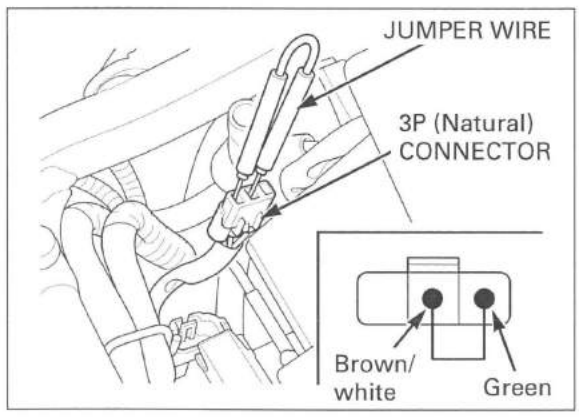
NOTE:

- The problem code is not erased by turning the ignition switch to "OFF" while the problem code is being output. Note that turning the ignition switch to "ON" again does not indicate the problem code. To show the problem code again, repeat the problem code retrieval procedures from the beginning.
- After diagnostic troubleshooting, erase the problem code(s) and perform the pre-start self-diagnosis to be sure that there is no problem in the ABS indicator (indicator is operating normally).

1. Remove the seat (page 2-4).

   Remove the dummy connector from the ABS service check 3P (Natural) connector.
   Short the wire terminals of the service check connector with a jumper wire with the ignition switch turned to "OFF".

   CONNECTION: Brown/white – Green

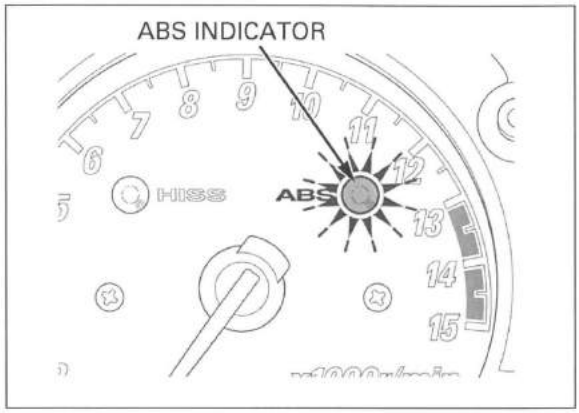


Do not apply the front or rear brake during retrieval.

2. Turn the ignition switch to "ON". The ABS indicator should come on 2 seconds (start signal) (then goes off 3.6 seconds) and starts problem code indication.

   The problem code is indicated by the number of the times of the indicator blinking.

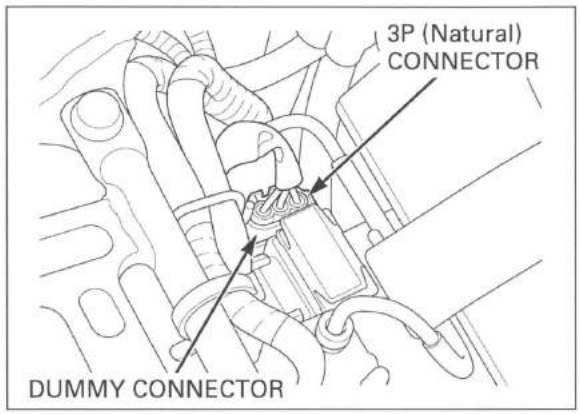
   If the problem code is not stored, the ABS indicator stays on.



3. Turn the ignition switch to "OFF" and remove the jumper wire.

   Connect the 3P (Natural) connector to the dummy connector.

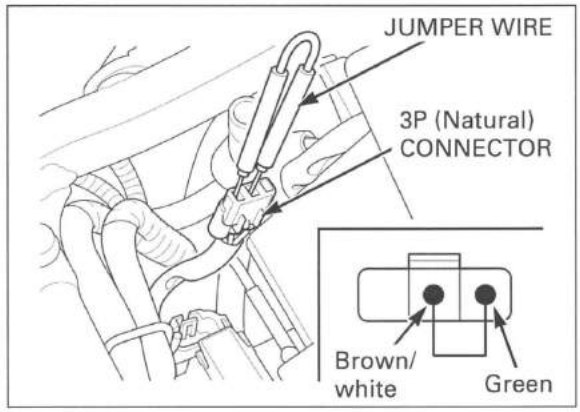
   Install the seat (page 2-4).



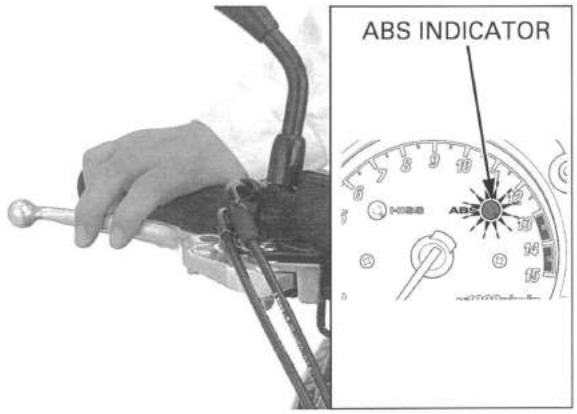
CLEARING PROBLEM CODE

1. Short the wire terminals of the service check connector with a jumper wire with the ignition switch turned to "OFF" in the same manner as retrieval.

   CONNECTION: Brown/white – Green



2. Turn the ignition switch to "ON" while squeezing the brake lever. The ABS indicator should come on 2 seconds and go off.
3. Release the brake lever immediately after the ABS indicator is off. The ABS indicator should come on.
4. Squeeze the brake lever immediately after the ABS indicator is on. The ABS indicator should go off.
5. Release the brake lever immediately after the ABS indicator is off.
   When code erasure is complete, the ABS indicator blinks 2 times and stays on.
6. Turn the ignition switch to "OFF".



ABS PROBLEM CODE INDEX

NOTE:

- The ABS indicator might blink in the following cases. Correct the faulty part.
  - Incorrect tire pressure.
  - Tires not recommended for the motorcycle were installed (incorrect tire size).
  - Deformation of the wheel or tire.
- The ABS indicator might blink while riding under the following conditions. This is temporary failure. Erase the problem code and perform the pre-start self-diagnosis. The ABS is normal if the indicator goes off. Ask the rider for the riding conditions in detail when the motorcycle is brought in for inspection.
  - The motorcycle has continuously run bumpy roads.
  - The front wheel leaves the ground for a long time when riding (wheelie).
  - Only either the front or rear wheel rotates.
  - The ABS operates continuously.
  - The ABS control unit has been disrupted by an extremely powerful radio wave (electromagnetic interference).

Problem Code	Function failure	Detection		Symptom/Fail-safe function	Refer to
		A	B		
–	ABS indicator circuit malfunction • Indicator related wires			• ABS indicator never come ON at all	16-21
				• ABS indicator stays ON at all	16-21
11	Front wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	○	○	• Stops ABS operation	16-11
12	Front wheel speed sensor malfunction • Wheel speed sensor or related wires • Electrical noise/intermittent interruption		○	• Stops ABS operation	16-11
13	Rear wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	○	○	• Stops ABS operation	16-13
14	Rear wheel speed sensor • Wheel speed sensor or related wires • Electrical noise/intermittent interruption		○	• Stops ABS operation	16-13
21	Front speed sensor pulse • Pulser ring or wheel speed sensor		○	• Stops ABS operation	16-11
23	Rear speed sensor pulse • Pulser ring or wheel speed sensor		○	• Stops ABS operation	16-13
31	Solenoid valve malfunction	○	○	• Stops ABS operation	16-15
32					
33					
34					
37					
38					
41	Front wheel lock • Riding condition • Wheel speed sensor or related wires		○	• Stops ABS operation	16-11
42					
43	Rear wheel lock • Riding condition • Wheel speed sensor or related wires		○	• Stops ABS operation	16-13
51	Motor lock	○	○	• Stops ABS operation	16-15
52	Motor stuck OFF	○	○	• Stops ABS operation	
53	Motor stuck ON	○	○	• Stops ABS operation	
54	Fail-safe relay circuit malfunction	○	○	• Stops ABS operation	16-17
61	Power supply voltage low	○	○	• Stops ABS operation	16-19
62	Power supply voltage high	○	○	• Stops ABS operation	
71	Incorrect tire size		○	• Stops ABS operation	16-20
81	CPU (ABS control unit)	○	○	• Stops ABS operation	16-20

(A) Pre-start self-diagnosis (page 16-7)

(B) Ordinary self-diagnosis: diagnoses while the motorcycle is running (after pre-start self-diagnosis)

ABS TROUBLESHOOTING

NOTE:

- Perform inspection with the ignition switch turned to "OFF", unless otherwise specified.
- Refer to the ABS Connector Locations (page 16-5). All connector diagrams in the troubleshooting are viewed from the terminal side.
- Use a fully charged battery. Do not diagnose with a charger connected to the battery.
- When the ABS modulator assembly is detected to be faulty, recheck the wire harness and connector connections closely before replacing it.
- After troubleshooting, erase the problem code (page 16-9).
  Perform the pre-start self-diagnosis to be sure that the ABS indicator is operating normally (page 16-7).

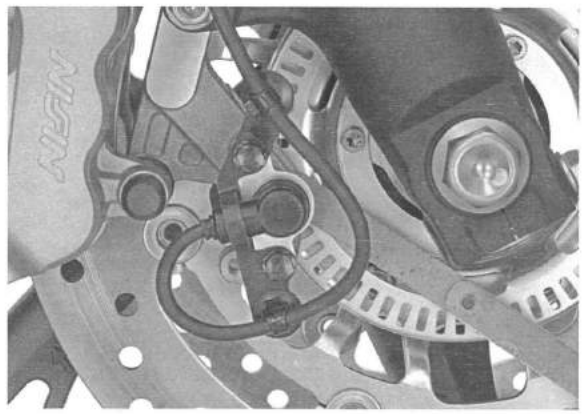
PROBLEM CODE 11, 12, 21, 41 or 42 (Front Wheel Speed Sensor)

NOTE:

- The ABS indicator might blink under unusual riding or conditions (page 16-10). This is temporary failure. Erase the problem code and perform the pre-start self-diagnosis before troubleshooting. The ABS is normal if the indicator goes off.
- If the problem code 41 is indicated, check the front brake for drag.

1. Speed Sensor Air Gap Inspection

Measure the air gap between the wheel speed sensor and pulser ring (page 16-24).



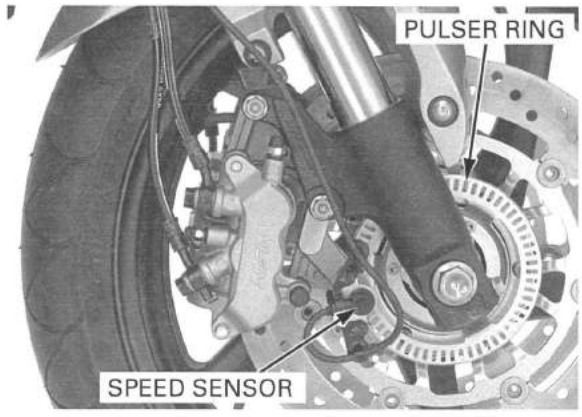
Is the air gap correct?

YES – GO TO STEP 2.

NO – Check each part for deformation and looseness and correct accordingly. Recheck the air gap.

2. Speed Sensor Condition Inspection

Inspect the area around the speed sensor:
Check that there is iron or other magnetic deposits between the pulser ring and wheel speed sensor, and the pulser ring slots for obstructions.
Check installation condition of the pulser ring or wheel speed sensor for looseness.
Check the pulser ring and sensor tip for deformation or damage (e.g., chipped pulser ring teeth).



Are the sensor and pulser ring in good condition?

YES – GO TO STEP 3.

NO – Remove any deposits. Install properly or replace faulty part.

3. **Speed Sensor Line Short Circuit Inspection (at control unit side)**

Lift and support the fuel tank (page 3-5).

Disconnect the ABS modulator 25P connector and the speed sensor 2P (Blue) connector.
Check for continuity between the Yellow/black wire terminal of the connector and ground, and between the Green/orange #3 wire terminal of the connector and ground.

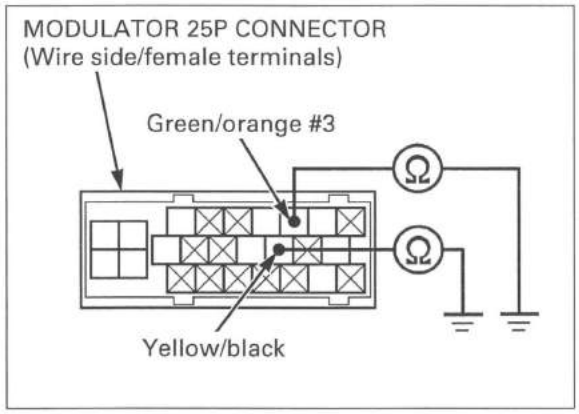
TOOL:
Test probe **07ZAJ-RDJA110**

CONNECTION: Yellow/black – Ground
Green/orange #3 – Ground

Is there continuity?

YES – Short circuit in wire between the ABS modulator and speed sensor.

NO – GO TO STEP 4.



4. **Speed Sensor Line Short Circuit Inspection (at sensor side)**

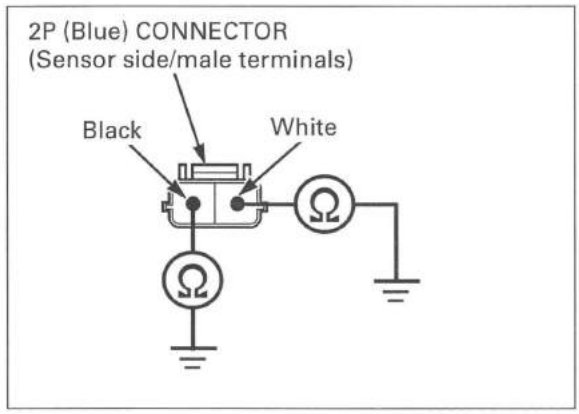
Check for continuity between each terminal (Black and White) of the sensor side 2P connector and ground in the same manner as the previous step.

CONNECTION: Black – Ground
White – Ground

Is there continuity?

YES – Faulty front wheel speed sensor.

NO – GO TO STEP 5.



5. **Speed Sensor Line Open Circuit Inspection**

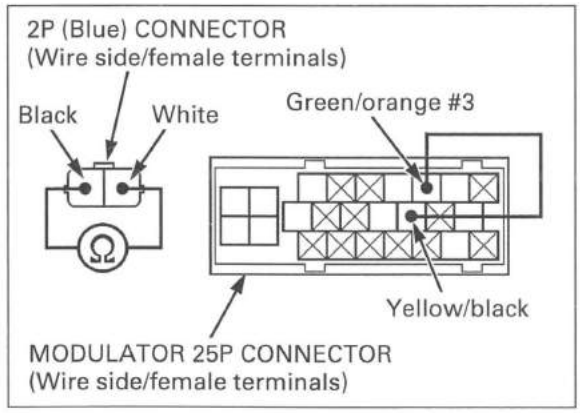
Short the Yellow/black and Green/orange #3 wire terminals of the 25P connector with a jumper wire.
Check for continuity between the terminals of the wire harness side sensor 2P (Blue) connector.

CONNECTION: Black – White

Is there continuity?

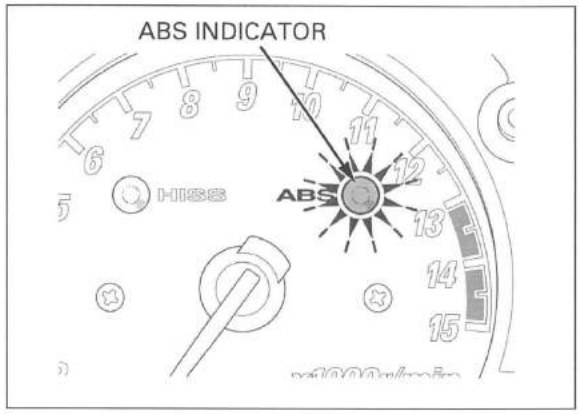
YES – GO TO STEP 6.

NO – Open circuit in wire between the ABS modulator and speed sensor.



6. Failure Reproduction with a New Speed Sensor

Replace the front wheel speed sensor with a new one (page 16-24).
Connect the ABS modulator 25P connector.
Erase the problem code (page 16-9).
Perform the pre-start self-diagnosis and check the ABS indicator (page 16-7).



Dose the indicator blink?

YES – Faulty ABS modulator.

NO – Faulty removed wheel speed sensor.

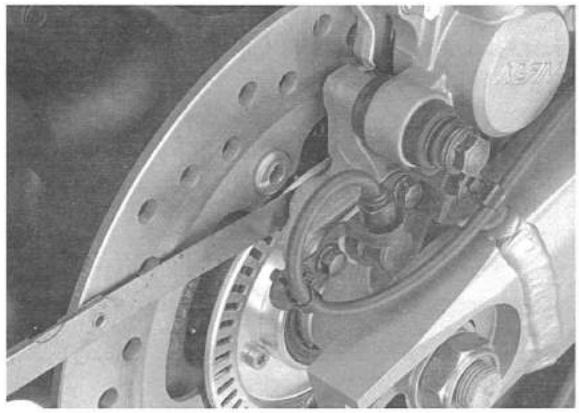
PROBLEM CODE 13, 14, 23 or 43 (Rear Wheel Speed Sensor)

NOTE:

- The ABS indicator might blink under unusual riding or conditions (page 16-10). This is temporary failure. Erase the problem code and perform the pre-start self-diagnosis before troubleshooting. The ABS is normal if the indicator goes off.
- If the problem code 43 is indicated, check the rear brake for drag.

1. Speed Sensor Air Gap Inspection

Measure the air gap between the speed sensor and pulser ring (page 16-24).



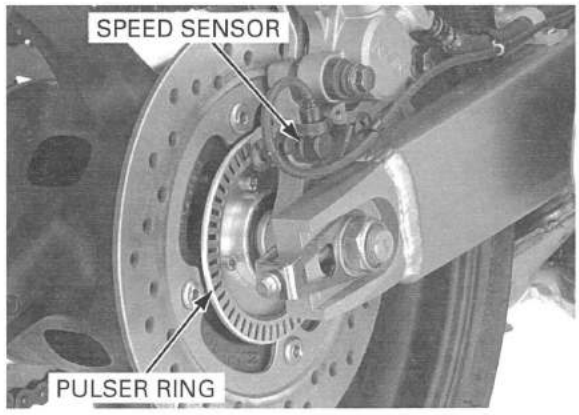
Is the air gap correct?

YES – GO TO STEP 2.

NO – Check each part for deformation and looseness and correct accordingly. Recheck the air gap.

2. Speed Sensor Condition Inspection

Inspect the area around the speed sensor:
Check that there is iron or other magnetic deposits between the pulser ring and wheel speed sensor, and the pulser ring slots for obstructions.
Check installation condition of the pulser ring or wheel speed sensor for looseness.
Check the pulser ring and sensor tip for deformation or damage (e.g., chipped pulser ring teeth).



Are the sensor and pulser ring in good condition?

YES – GO TO STEP 3.

NO – Remove any deposits. Install properly or replace faulty part.

3. **Speed Sensor Line Short Circuit Inspection (at control unit side)**

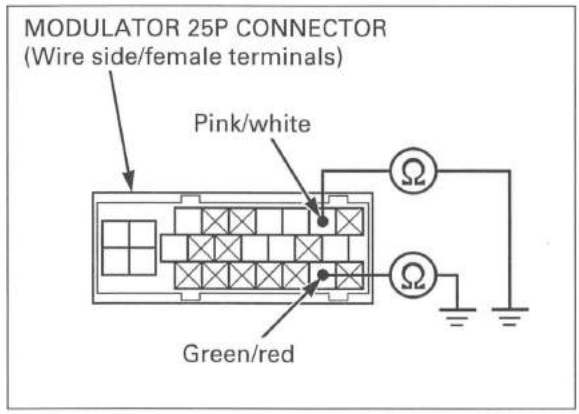
Remove the following:

- seat (page 2-4)
- right side cover (page 2-4)

Disconnect the ABS modulator 25P connector and the speed sensor 2P (Green) connector.
Check for continuity between the Pink/white wire terminal of the connector and ground, and between the Green/red wire terminal of the connector and ground.

TOOL:
Test probe **07ZAJ-RDJA110**

CONNECTION: Pink/white – Ground
Green/red – Ground



Is there continuity?

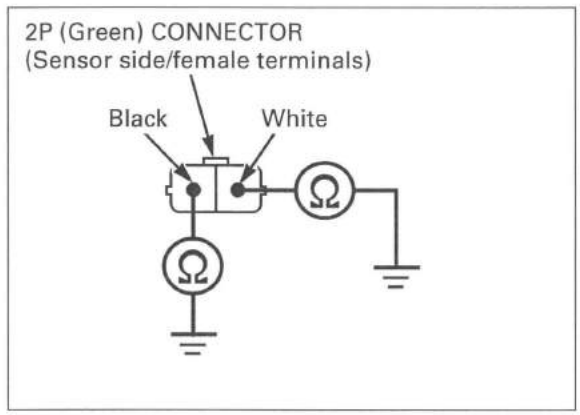
YES – Short circuit in wire between the ABS modulator and speed sensor.

NO – GO TO STEP 4.

4. **Speed Sensor Line Short Circuit Inspection (at sensor side)**

Check for continuity between each terminal (Black and White) of the sensor side 2P connector and ground in the same manner as the previous step.

CONNECTION: Black – Ground
White – Ground



Is there continuity?

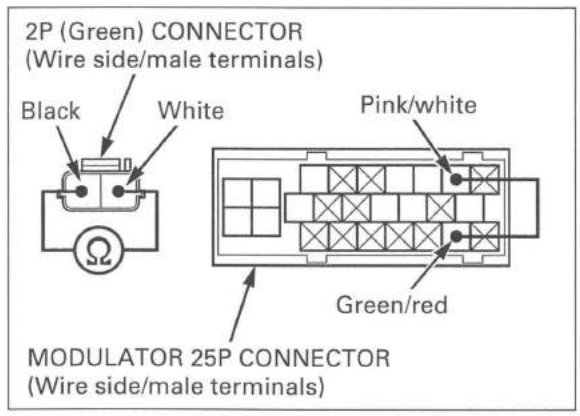
YES – Faulty rear wheel speed sensor.

NO – GO TO STEP 5.

5. **Speed Sensor Line Open Circuit Inspection**

Short the Pink/white and Green/red wire terminals of the 25P connector with a jumper wire.
Check for continuity between the terminals of the wire harness side sensor 2P (Green) connector.

CONNECTION: Black – White



Is there continuity?

YES – GO TO STEP 6.

NO – Open circuit in wire between the ABS modulator and speed sensor.

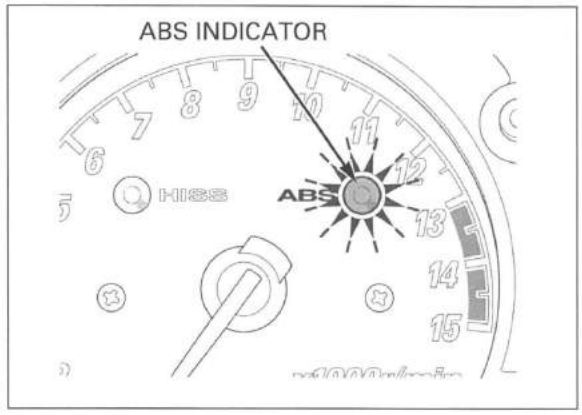
6. Failure Reproduction with a New Speed Sensor

Replace the rear wheel speed sensor with new one (page 16-24).
Connect the ABS modulator 25P connector.
Erase the problem code (page 16-9).
Perform the pre-start self-diagnosis and check the ABS indicator (page 16-7).

Dose the indicator blink?

YES – Faulty ABS modulator.

NO – Faulty removed wheel speed sensor.



PROBLEM CODE 31, 32, 33, 34, 37 or 38 (Solenoid Valve)

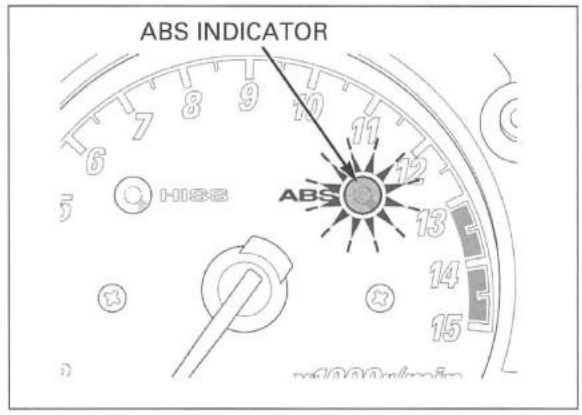
1. Failure Reproduction

Erase the problem code (page 16-9).
Perform the pre-start self-diagnosis (page 16-7).
Retrieve the problem code (page 16-8).

Does the indicator indicate the code "31, 32, 33 or 34"?

YES – Faulty ABS modulator.

NO – Normal (problem code is not stored; temporary failure).



PROBLEM CODE 51, 52 or 53 (Pump Motor)

1. Fuse Inspection

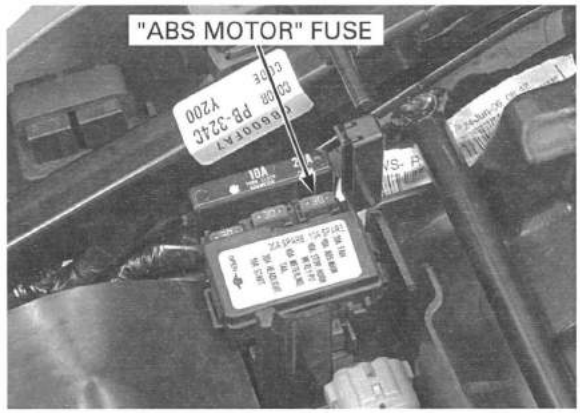
Remove the seat (page 2-4).

Check the "ABS MOTOR" fuse (30A) in the ABS fuse box for blown.

Is the fuse blown?

YES – GO TO STEP 2.

NO – GO TO STEP 3.



2. **Motor Power Input Line Short Circuit Inspection**

Disconnect the ABS modulator 25P connector.
Check for continuity between the Red wire terminal of the 25P connector and ground with "ABS MOTOR" fuse removed.

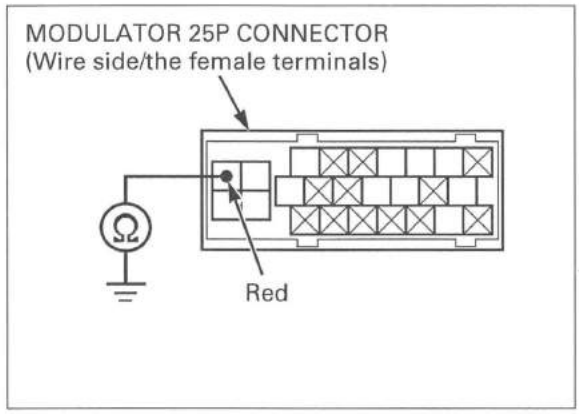
TOOL:
Test probe **07ZAJ-RDJA110**

CONNECTION: Red – Ground

Is there continuity?

YES – Short circuit in Red wire between the fuse box and ABS modulator.

NO – Temporary failure (install a spare fuse and recheck from the first step)



3. **Motor Power Input Line Open Circuit Inspection (at control unit side)**

Install the "ABS MOTOR" fuse.
Disconnect the ABS modulator 25P connector.
Measure the voltage between Red wire terminal (+) of the 25P connector and ground (–). There should be battery voltage at all times.

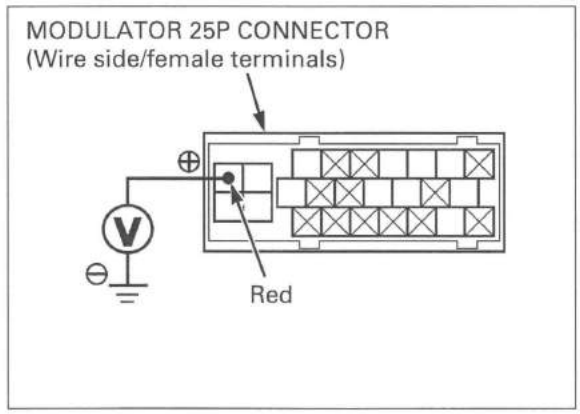
TOOL:
Test probe **07ZAJ-RDJA110**

CONNECTION: Red (+) – Ground (–)

Is there battery voltage?

YES – GO TO STEP 5.

NO – GO TO STEP 4.



4. **Motor Power Input Line Open Circuit Inspection (at fuse box side)**

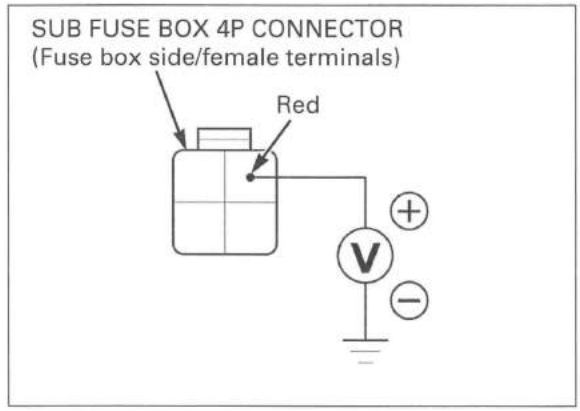
Disconnect the sub fuse box 4P connector.
Measure the voltage between Red wire terminal (+) of the fuse box side 4P connector and ground (–). There should be battery voltage at all times.

CONNECTION: Red (+) – Ground (–)

Is there battery voltage?

YES – Open circuit in Red wire between the fuse box and control unit.

NO – Open circuit in Red wire between the battery and fuse box 4P connector.



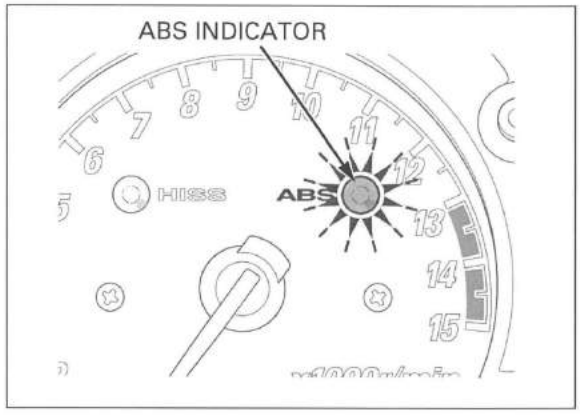
5. Failure Reproduction

Connect the ABS modulator 25P connector.
Erase the problem code (page 16-9).
Perform the pre-start self-diagnosis (page 16-7).
Retrieve the problem code (page 16-8).

Does the indicator indicate the code "51, 52, or 53"?

YES – Faulty ABS modulator.

NO – Normal (problem code is not stored; temporary failure).



PROBLEM CODE 54 (Fail-safe Relay)

1. Fuse Inspection

Remove the seat (page 2-4).

Check the "ABS FAIL-SAFE RELAY" fuse (30A) in the ABS fuse box for blown.

Is the fuse blown?

YES – GO TO STEP 2.

NO – GO TO STEP 3.

2. Relay Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 25P connector.
Check for continuity between the Black wire terminal of the 25P connector and ground with "ABS FAIL-SAFE RELAY" fuse removed.

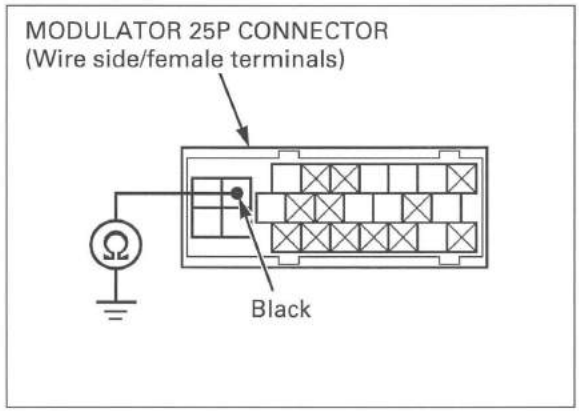
TOOL:
Test probe **07ZAJ-RDJA110**

CONNECTION: Black – Ground

Is there continuity?

YES – Short circuit in Black wire between the fuse box and ABS modulator.

NO – Temporary failure (install a spare fuse and recheck from the first step)



3. Relay Power Input Line Open Circuit Inspection (at control unit side)

Install the "ABS FAIL-SAFE RELAY" fuse.
Disconnect the ABS modulator 25P connector.
Measure the voltage between Black wire terminal (+) of the 25P connector and ground (–). There should be battery voltage at all times.

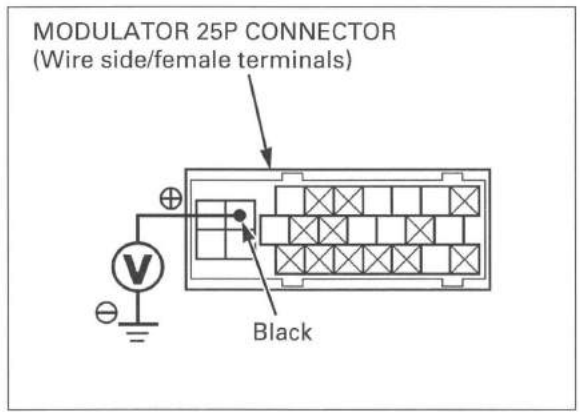
TOOL:
Test probe **07ZAJ-RDJA110**

CONNECTION: Black (+) – Ground (–)

Is there battery voltage?

YES – GO TO STEP 5.

NO – GO TO STEP 4.



4. Relay Power Input Line Open Circuit Inspection (at fuse box side)

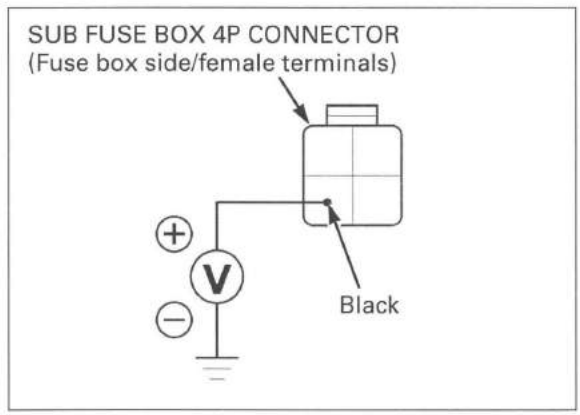
Disconnect the sub fuse box 4P connector.
Measure the voltage between Black wire terminal (+) of the fuse box side 4P connector and ground (–). There should be battery voltage at all times.

CONNECTION: Black (+) – Ground (–)

Is there battery voltage?

YES – Open circuit in Black wire between the fuse box and control unit.

NO – Open circuit in Black wire between the battery and fuse box 4P connector.



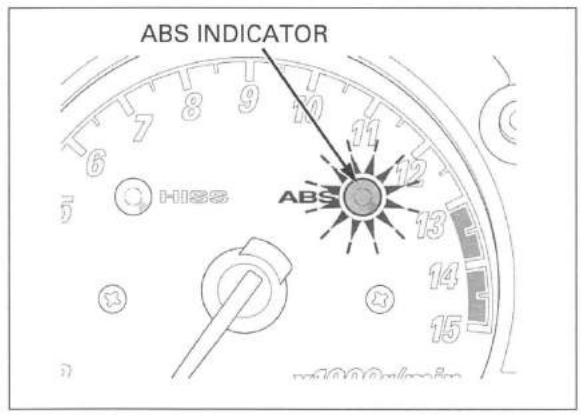
5. Failure Reproduction

Connect the ABS modulator 25P connector.
Erase the problem code (page 16-9).
Perform the pre-start self-diagnosis (page 16-7).
Retrieve the problem code (page 16-8).

Does the indicator indicate the code "54"?

YES – Faulty ABS modulator.

NO – Normal (problem code is not stored; temporary failure).



PROBLEM CODE 61 or 62 (Power Circuit)

1. **Fuse Inspection**

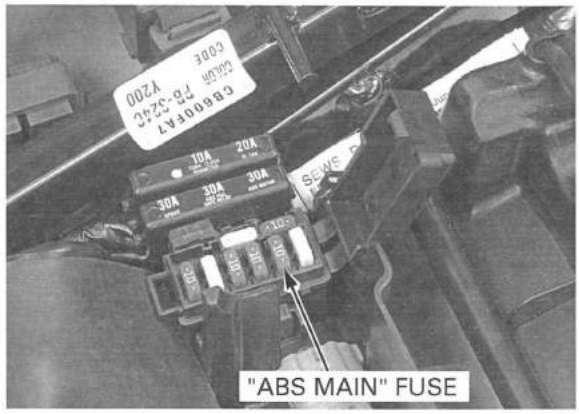
   Remove the seat (page 2-4).

   Check the "ABS MAIN" fuse (10A) in the ABS main fuse box for blown.

   Is the fuse blown?

   YES – GO TO STEP 2.

   NO – GO TO STEP 3.



2. **Power Input Line Short Circuit Inspection**

   Disconnect the ABS modulator 25P connector.
   Check for continuity between the Red/brown wire terminal of the 25P connector and ground with "ABS MAIN" fuse removed.

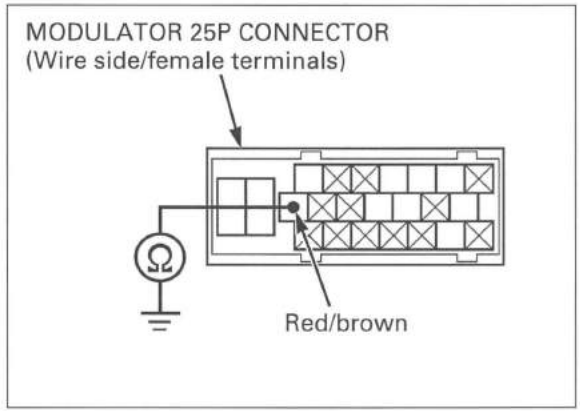
   TOOL:
   Test probe **07ZAJ-RDJA110**

   CONNECTION: Red/blown – Ground

   Is there continuity?

   YES – Short circuit in Red/brown wire between the fuse box and ABS modulator.

   NO – Temporary failure (install a spare fuse and recheck from the first step)



3. **Power Input Line Open Circuit Inspection**

   Install the ABS main fuse.
   Disconnect the ABS modulator 25P connector.
   Measure the voltage between the Red/brown wire terminal of 25P connector and ground.
   There should be battery voltage with the ignition switch turned to "ON".

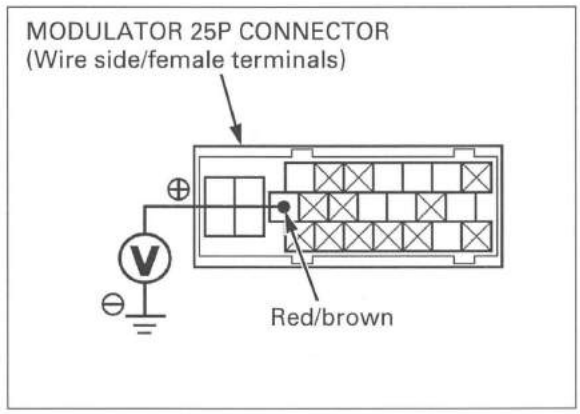
   TOOL:
   Test probe **07ZAJ-RDJA110**

   CONNECTION: Red/blown (+) – Ground (–)

   Is there battery voltage?

   YES – GO TO STEP 4.

   NO – • Open circuit in Red/brown or Red/black wire between the ignition switch and control unit.
   • If the wire is OK, check the charging system (page 17-2).



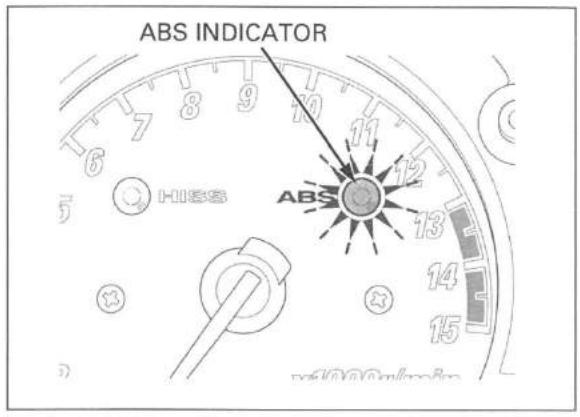
4. **Failure Reproduction**

Connect the ABS modulator 25P connector.
Erase the problem code (page 16-9).
Perform the pre-start self-diagnosis (page 16-7).
Retrieve the problem code (page 16-8).

Does the indicator indicate the code "61 or 62"?

YES – Faulty ABS modulator.

NO – Normal (problem code is not stored; temporary failure).



PROBLEM CODE 71 (Tire Size)

NOTE:

- Check the following and correct the faulty part.
  - Incorrect tire pressure.
  - Tires not recommended for the motorcycle were installed (incorrect tire size).
  - Deformation of the wheel or tire.

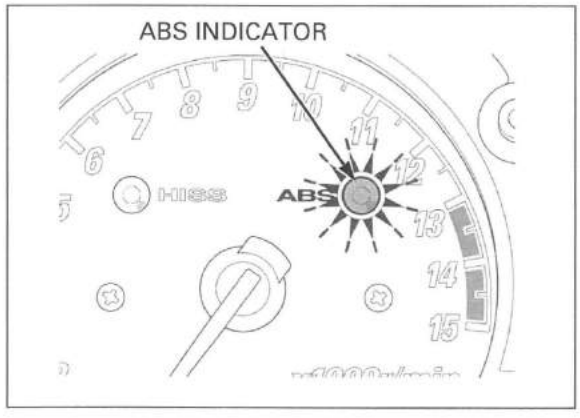
1. **Failure Reproduction**

If the above items are normal, recheck the problem code indication:
Erase the problem code (page 16-9).
Perform the pre-start self-diagnosis (page 16-7).
Retrieve the problem code (page 16-8).

Does the indicator indicate the code "71"?

YES – Faulty ABS modulator.

NO – Normal (problem code is not stored; temporary failure).



PROBLEM CODE 81 (CPU; ABS Control Unit)

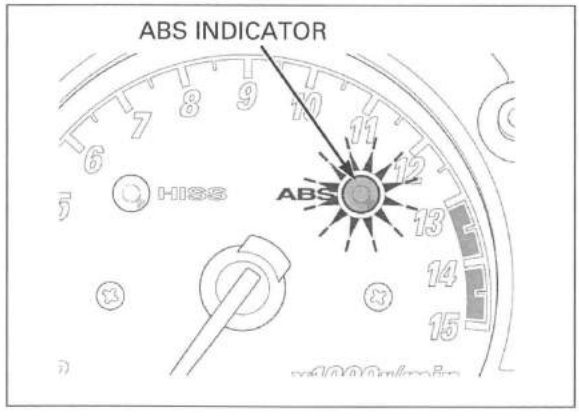
1. **Failure Reproduction**

Erase the problem code (page 16-9).
Perform the pre-start self-diagnosis (page 16-7).
Retrieve the problem code (page 16-8).

Does the indicator indicate the code "81"?

YES – Faulty ABS modulator.

NO – Normal (problem code is not stored; temporary failure).



ABS INDICATOR CIRCUIT TROUBLESHOOTING

ABS INDICATOR DOES NOT COME ON (when the ignition switch turned to "ON")

1. **Combination Meter Power/Ground Line Inspection**

   Check the combination meter power and ground lines (page 20-12).

   Are the wires normal?

   YES – GO TO STEP 2.

   NO – Open circuit in related wires.

2. **Indicator Operation Inspection**

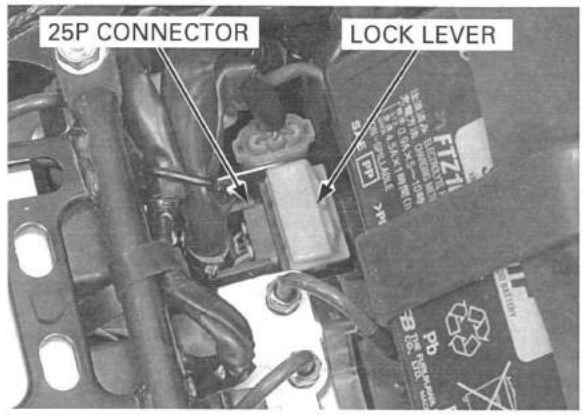
   Remove the seat (page 2-4).

   Pull the lock lever up and disconnect the ABS modulator 25P connector.
   Turn the ignition switch to "ON" and check the ABS indicator.

   Does the indicator come on?

   YES – Faulty ABS modulator.

   NO – GO TO STEP 3.



3. **Indicator Signal Line Short Circuit Inspection**

   Remove the meter cover (page 2-5).

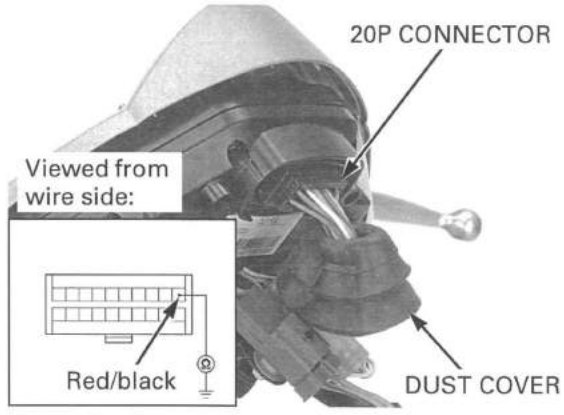
   Remove the dust cover.
   With the connector connected, check for continuity between the Red/black wire terminal of the harness side connector and ground.

   CONNECTION: Red/black – Ground

   Is there continuity?

   YES – Short circuit in Red/black wire between the combination meter and ABS modulator.

   NO – Faulty combination meter.



ABS INDICATOR STAYS ON (Indicator does not go off when the motorcycle is running, and Problem Code is not indicated by the retrieval procedure)

1. **Fuse Inspection**

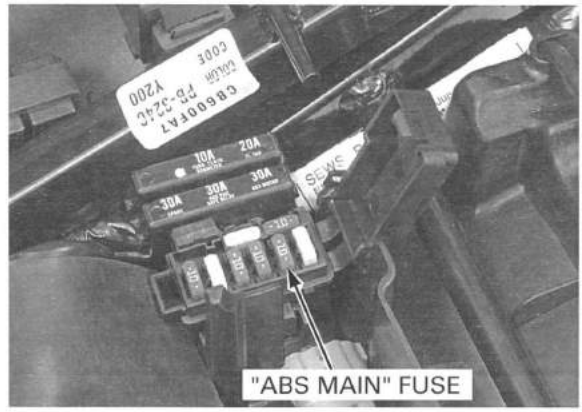
   Remove the seat (page 2-4).

   Check the "ABS MAIN" fuse (10A) in the ABS main fuse box for blown.

   Is the fuse blown?

   YES – GO TO STEP 2.

   NO – GO TO STEP 3.



2. Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 25P connector.
Check for continuity between the Red/brown wire terminal of the 25P connector and body ground with "ABS MAIN" fuse removed.

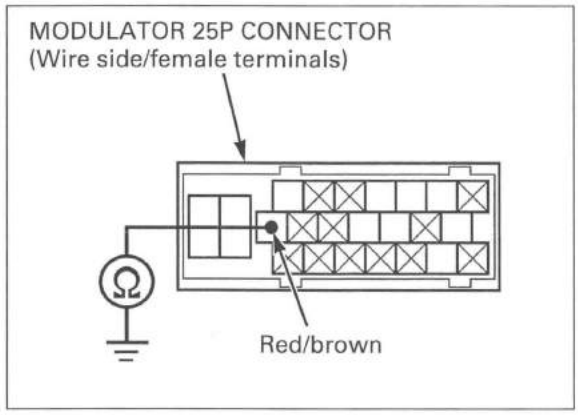
TOOL:
Test probe **07ZAJ-RDJA110**

CONNECTION: Red/blown – Ground

Is there continuity?

YES – Short circuit in Red/brown wire.

NO – Temporary failure (install a spare fuse and recheck from the first step).



3. Power Input Line Open Circuit Inspection

Install the "ABS MAIN" fuse.
Disconnect the ABS modulator 25P connector.
Measure the voltage between the Red/brown wire terminal of the 25P connector and body ground.
There should be battery voltage with the ignition switch turned to "ON".

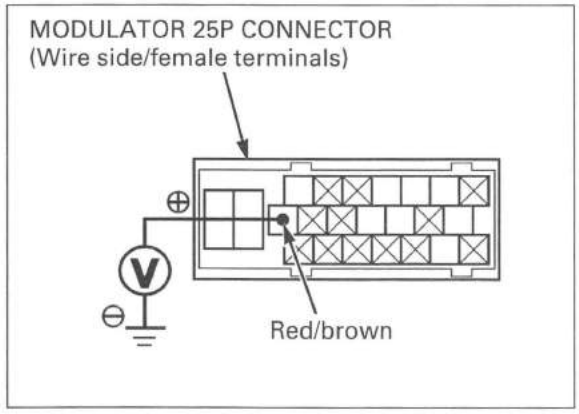
TOOL:
Test probe **07ZAJ-RDJA110**

CONNECTION: Red/blown (+) – Ground (–)

Is there battery voltage?

YES – GO TO STEP 4.

NO – • Open circuit in Red/brown wire between the ignition switch and ABS modulator.
• If the wire is OK, check the charging system (page 17-7).



4. Service Check Line Short Circuit Inspection

Check for continuity between the Brown/white wire terminal of the 25P connector and body ground.

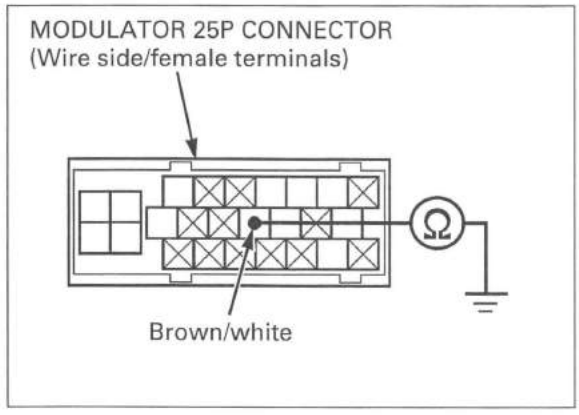
TOOL:
Test probe **07ZAJ-RDJA110**

CONNECTION: Blown/white – Ground

Is there continuity?

YES – Short circuit in Brown/white wire between the service check connector and ABS modulator.

NO – GO TO STEP 5.



5. Indicator Operation Inspection

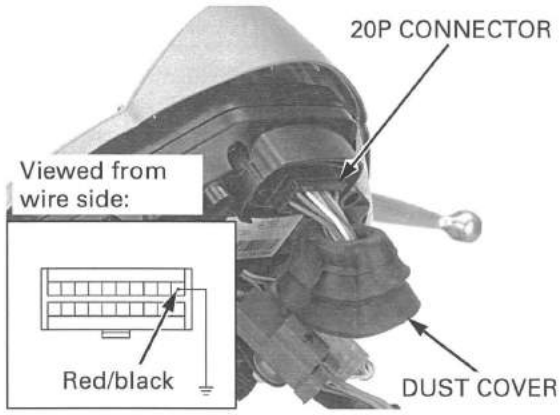
Remove the meter cover (page 2-5).

Remove the dust cover.
With the connector connected, short the Red/black wire terminal of the combination meter 20P connector and ground with a jumper wire.
Check the ABS indicator with the ignition switch turned to "ON".

Does it go off?

YES – GO TO STEP 6.

NO – Faulty combination meter.



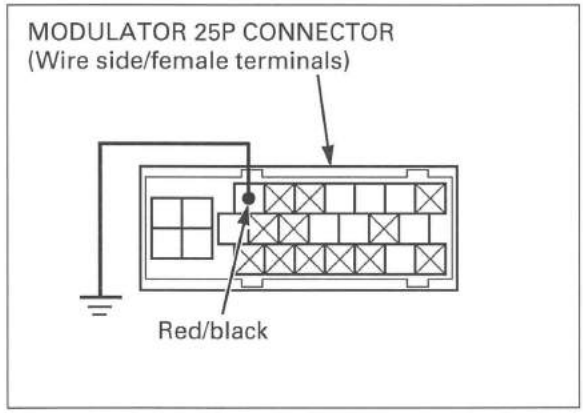
6. Indicator Signal Line Open Circuit Inspection

Remove the jumper wire from the combination meter 20P connector.
Short the Red/black wire terminal of the 25P connector and ground with a jumper wire.
Check the ABS indicator with the ignition switch turned to "ON".

Does it go off?

YES – GO TO STEP 7.

NO – Open circuit in Red/black wire between the combination meter and ABS modulator.



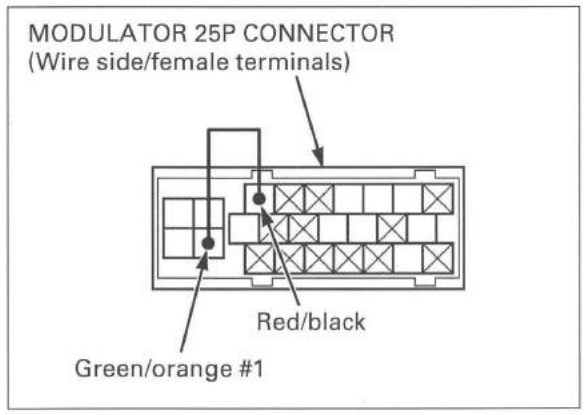
7. Logic Ground Line Open Circuit Inspection

Remove a jumper wire from the ABS modulator 25P connector.
Short the Red/black and Green/orange #1 wire terminals of the 25P connector with a jumper wire.
Check the ABS indicator with the ignition switch turned to "ON".

Does it go off?

YES – • Faulty ABS modulator.

NO – • Open circuit in Green/orange wire between the ABS modulator and body ground.



WHEEL SPEED SENSOR

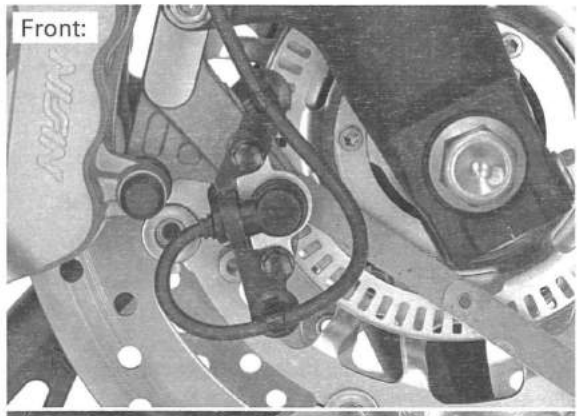
AIR GAP INSPECTION

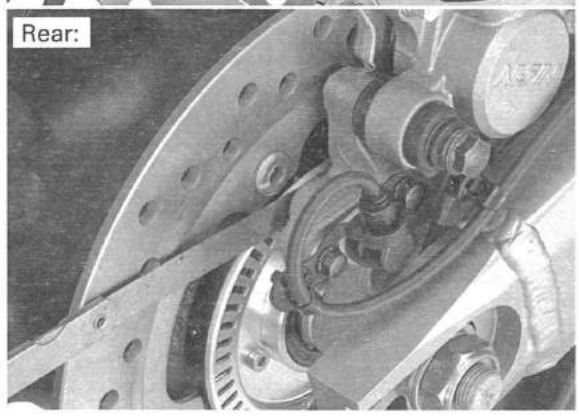
Support the motorcycle securely using a hoist or equivalent and raise the wheel off the ground.

Measure the clearance (air gap) between the sensor and pulser ring at several points by turning the wheel slowly.
It must be within specification.

STANDARD: 0.2 – 1.2 mm (0.01 - 0.05 in)

The sensor air gap cannot be adjusted.
If it is not within specification, check each installation part for deformation, looseness and damage.



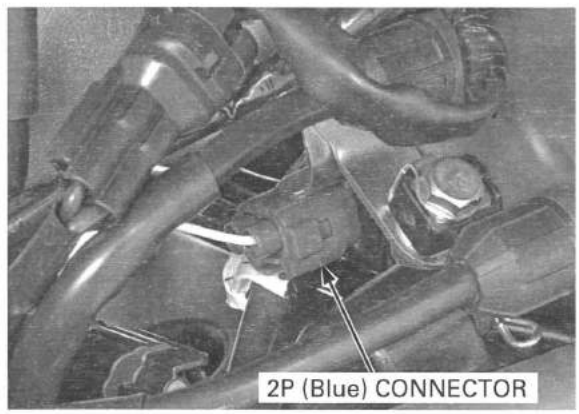


REPLACEMENT

FRONT WHEEL SPEED SENSOR

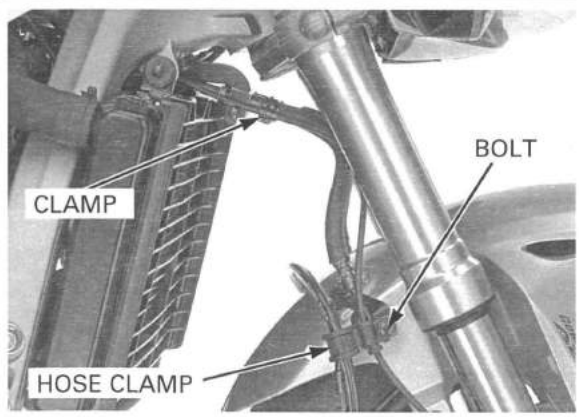
Lift and support the fuel tank (page 3-5).

Disconnect the front wheel speed sensor 2P (Blue) connector.



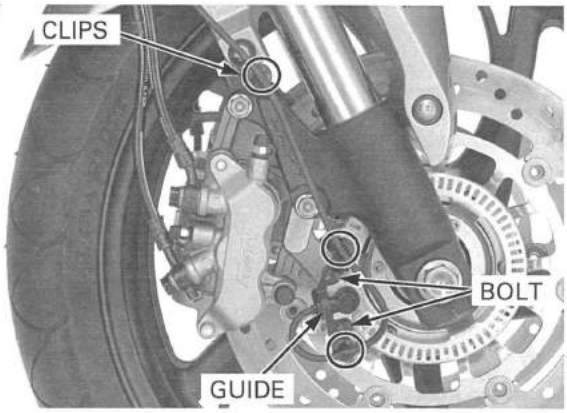
Release the sensor wire from the clamp.

Remove the bolt and release the sensor wire from the hose clamp.



Release the sensor wire clips.

Remove the wheel speed sensor mounting bolts and guide.



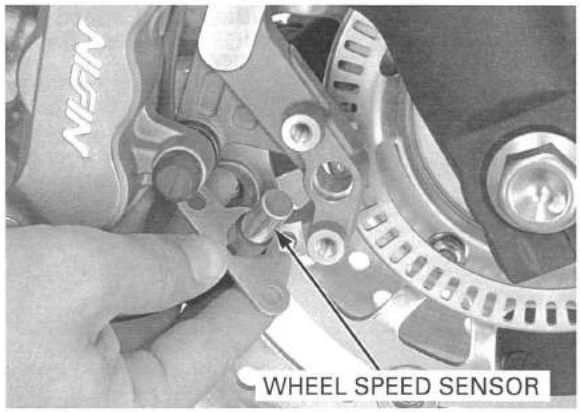
Remove the wheel speed sensor from the caliper bracket.

Clean around the mounting area of the caliper bracket thoroughly, and be sure that no foreign material is allowed to enter the mounting hole.

Route the sensor wire properly (page 1-23).

Install a new speed sensor in the reverse order of removal.

After installation, check the air gap (page 16-24).

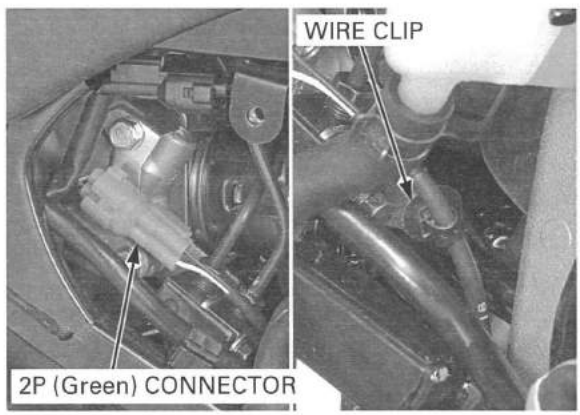


REAR WHEEL SPEED SENSOR

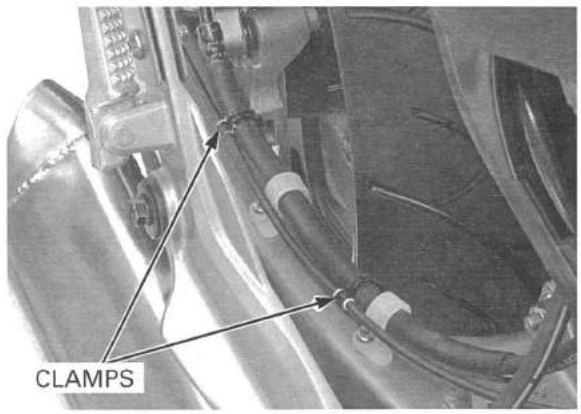
Remove the right side cover (page 2-4).

Disconnect the rear wheel speed sensor 2P (Green) connector.

Release the sensor wire clip from the PCV stay.

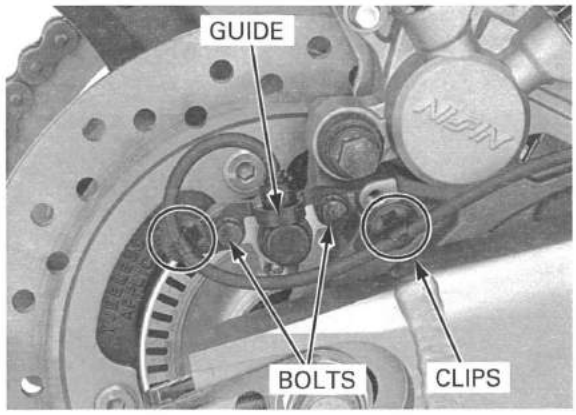


Release the sensor wire from the clamps.



Release the sensor wire clips from the caliper bracket.

Remove the wheel speed sensor mounting bolts and guide.



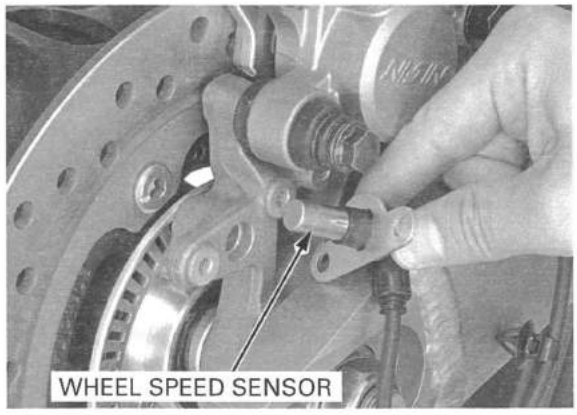
Remove the wheel speed sensor from the caliper bracket.

Clean around the mounting area of the caliper bracket thoroughly, and be sure that no foreign material is allowed to enter the mounting hole.

Route the sensor wire properly (page 1-23).

Install a new speed sensor in the reverse order of removal.

After installation, check the air gap (page 16-24).



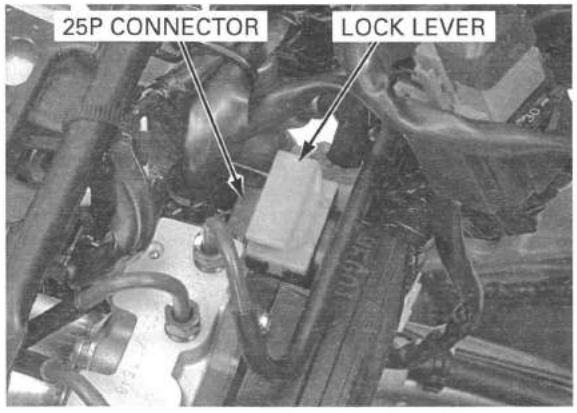
ABS MODULATOR

REMOVAL

Drain the brake fluid from the front and rear hydraulic systems (page 15-7).

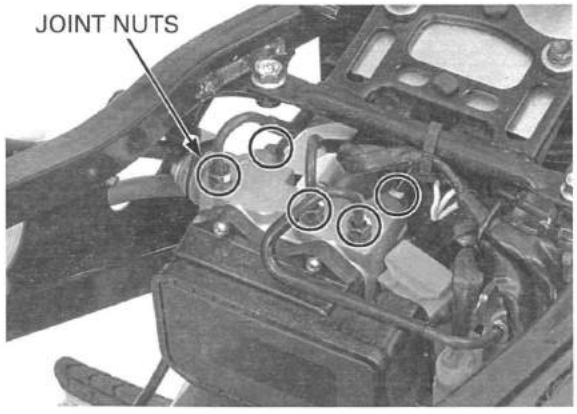
Remove the rear fender (page 2-8).

Pull the lock lever up and disconnect the ABS modulator 25P connector.

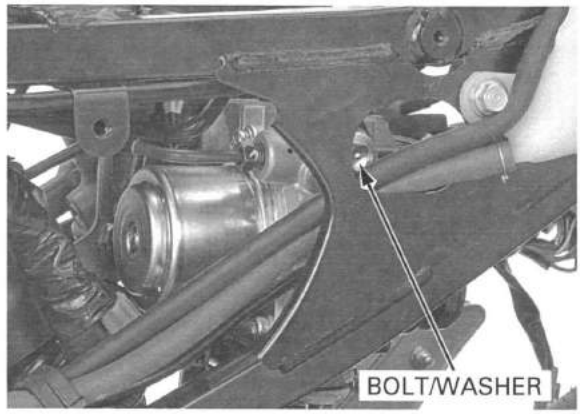


When loosening the joint nuts, cover the end of the brake pipes to prevent contamination.

Loosen the brake pipe joint nuts and disconnect the brake pipes.



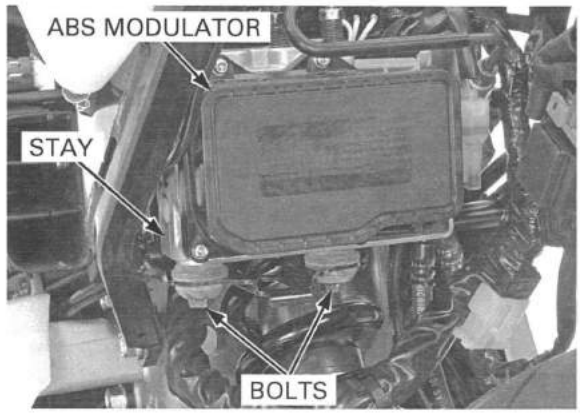
Remove the modulator side mounting bolt/washer.



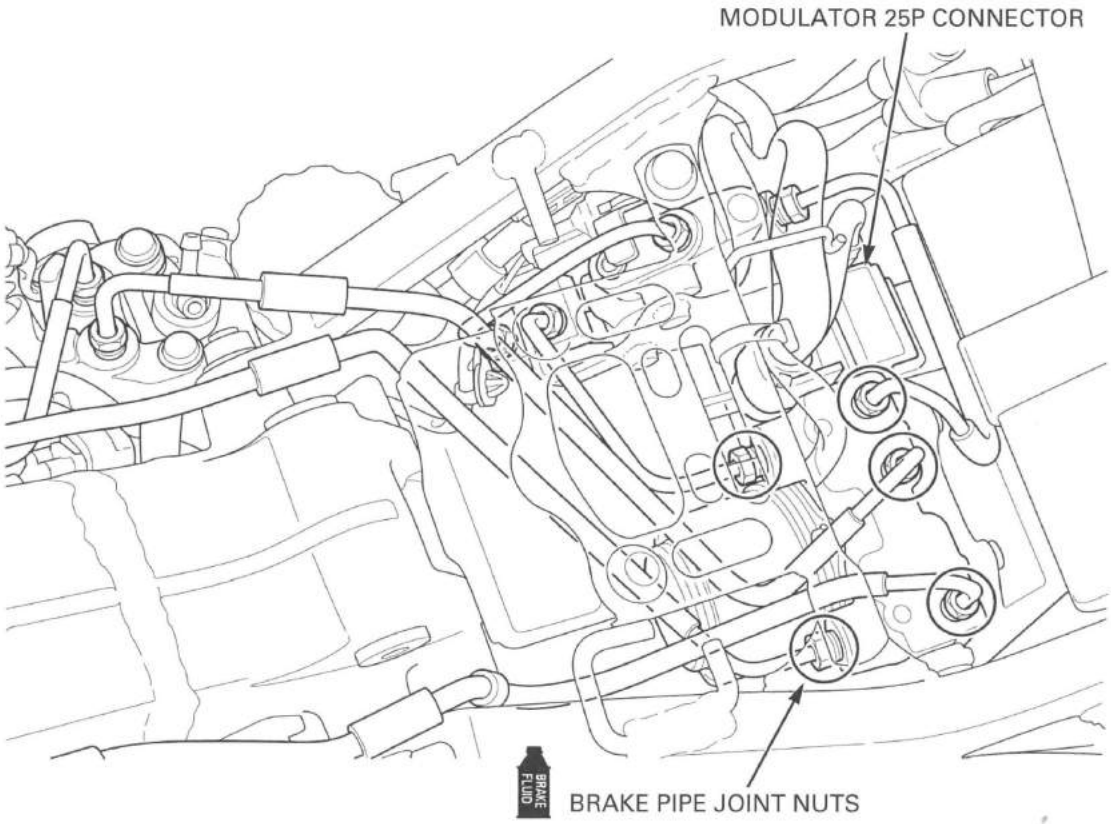
Remove the modulator lower mounting bolts.

Be careful not to bend or damage the brake pipes during removal.

Remove the ABS modulator from the stay (so the modulator is not interfere with the brake pipes).



INSTALLATION



Installation is in the reverse order of removal by loosely tightening all the fasteners.

NOTE:

- Apply brake fluid to the brake pipe joint nut threads.

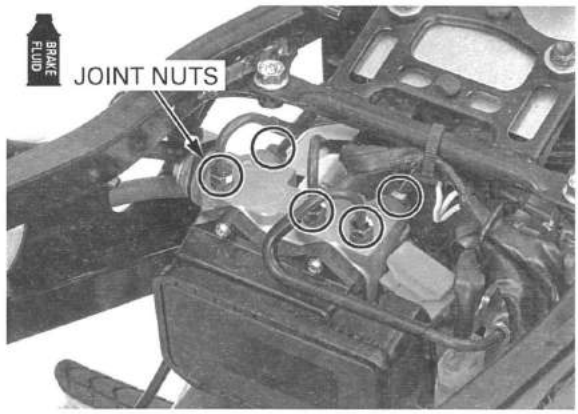
Tighten the modulator lower mounting bolt and side mounting bolt/washer securely.

Tighten the brake pipe joint nuts to the specified torque.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Install the rear fender (page 2-10).

Fill and bleed the hydraulic systems (page 15-7).



PCV

REMOVAL/INSTALLATION

Remove the ABS modulator (page 16-26).

Remove the brake pipe joint nuts.
Remove the mounting bolts and the PCV.

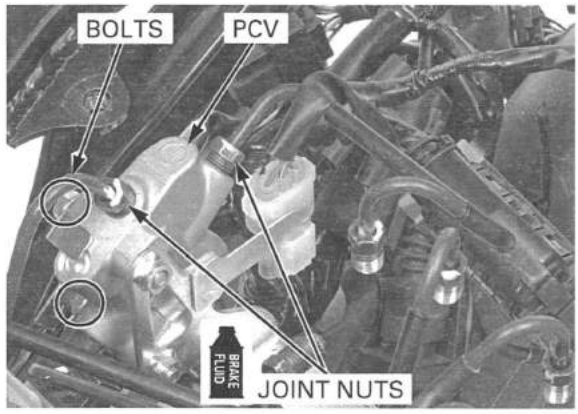
Apply brake fluid to the brake pipe joint nut threads.

Installation is in the reverse order of removal.

TORQUE:

Brake pipe joint nut:
14 N·m (1.4 kgf·m, 10 lbf·ft)

PCV mounting bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)



DELAY VALVE

REMOVAL/INSTALLATION

Drain the brake fluid from the front and rear hydraulic systems (page 15-7).

Remove the right side cover (page 2-4).

Remove the brake pipe joint nuts.
Remove the mounting bolts and the delay valve.

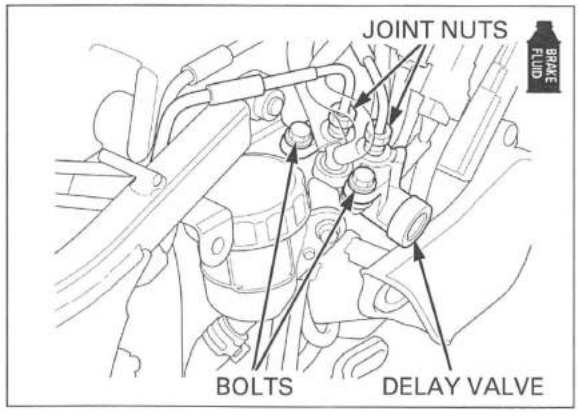
Apply brake fluid to the brake pipe joint nut threads.

Installation is in the reverse order of removal.

TORQUE:

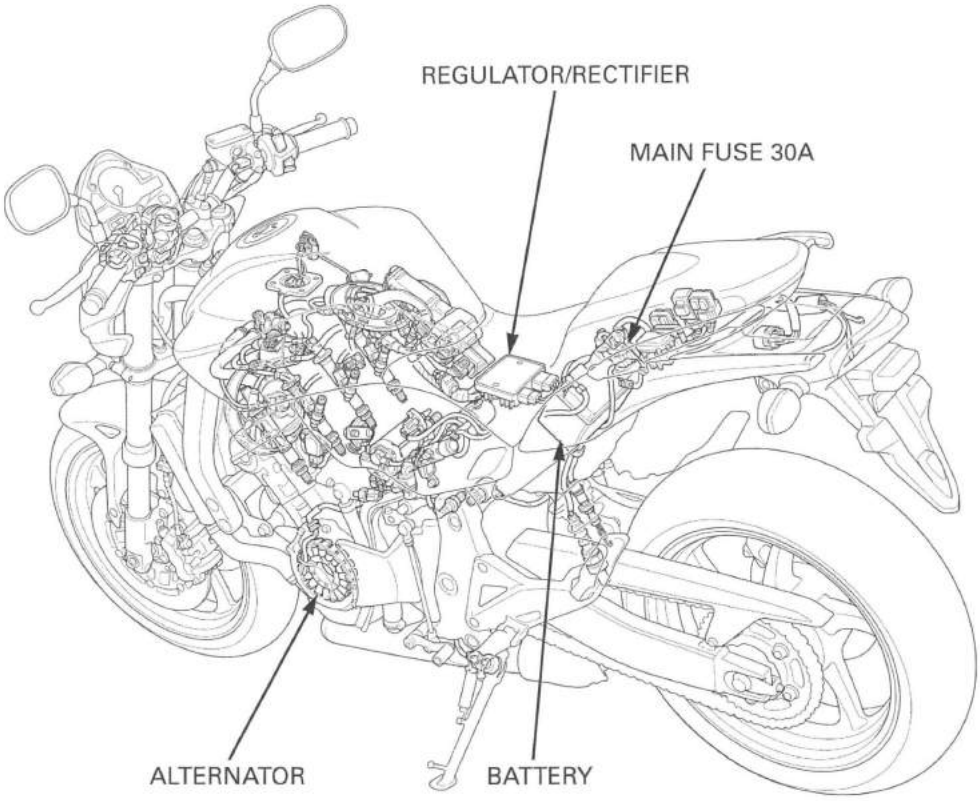
Brake pipe joint nut:
14 N·m (1.4 kgf·m, 10 lbf·ft)

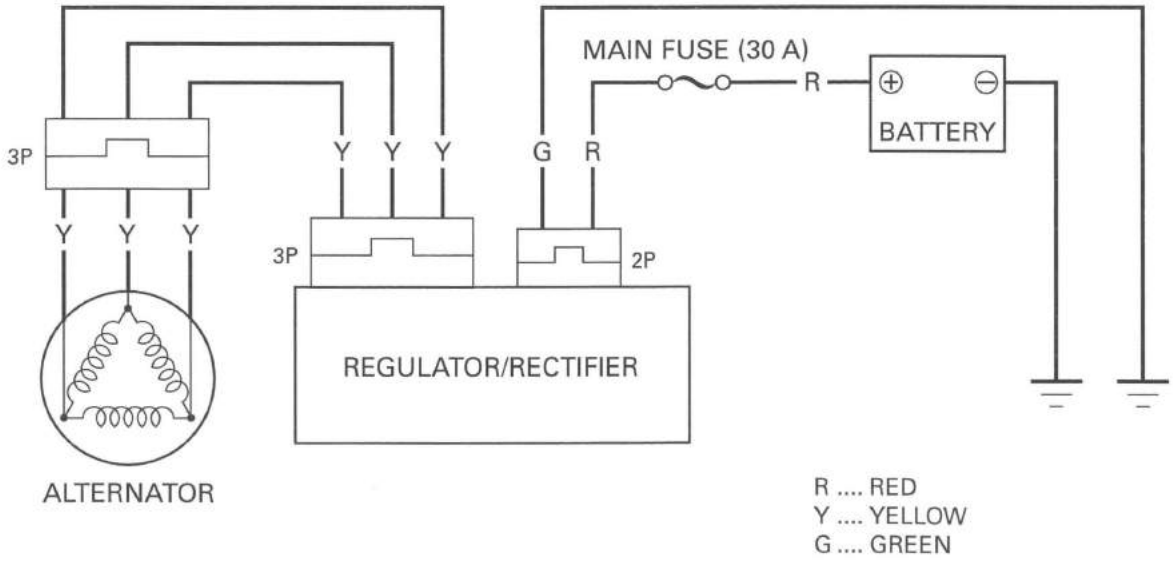
Delay valve mounting bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)



17. BATTERY/CHARGING SYSTEM

SYSTEM DIAGRAM





SERVICE INFORMATION

GENERAL

⚠ WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
  - If electrolyte gets on your skin, flush with water.
  - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
  - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a call a physician immediately.

NOTICE

- *Always turn OFF the ignition switch before disconnecting any electrical component.*
- *Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.*

- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The maintenance free battery must be replaced when it reaches the end of its service life.
- The battery can be damaged if overcharged or undercharged, or if left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2–3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight ON for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every two weeks to prevent sulfation from occurring.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 17-5).
- For battery charging, do not exceed the charging current and time specified on the battery. Use of excessive current or charging time may damage the battery.
- If the battery terminals were disconnected, the data showing the possible travel distance will be reset. After the connection of battery terminals, the data will be indicated in quotation marks ("---").
- Refer to procedures for alternator removal and disassembly (page 10-4).

BATTERY CHARGING

- Turn power ON/OFF at the charger, not at the battery terminal.
- For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.
- Quick charging should only be done in an emergency; slow charging is preferred.

BATTERY TESTING

Refer to the instructions in the Operation Manual for the recommended battery tester for details about battery testing. The recommended battery tester puts a "load" on the battery so that the actual battery condition can be measured.

Recommended battery tester BM-210 or BATTERY MATE or equivalent

SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Capacity		12 V – 8.6 Ah
	Current leakage		2.0 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.8 A/5 – 10 h
		Quick	4.5 A/1 h
Alternator	Capacity		0.333 kW/5,000 min^{-1} (rpm)
	Charging coil resistance (20°C/68°F)		0.1 – 1.0 Ω

TROUBLESHOOTING

BATTERY IS DAMAGED OR WEAK

1. **BATTERY TEST**

   Remove the battery (page 17-6).

   Check the battery condition using the recommended battery tester.

   RECOMMENDED BATTERY TESTER:
   BM-210 or BATTERY MATE or equivalent

   Is the battery in good condition?

   YES – GO TO STEP 2.

   NO – Faulty battery

2. **CURRENT LEAKAGE TEST**

   Install the battery (page 17-6).

   Check the battery current leakage test (Leak test; page 17-7).

   Is the current leakage below 2.0 mA?

   YES – GO TO STEP 4.

   NO – GO TO STEP 3.

3. **CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTOR**

   Disconnect the regulator/rectifier connector and recheck the battery current leakage.

   Is the current leakage below 2.0 mA?

   YES – Faulty regulator/rectifier

   NO – • Shorted wire harness
   • Faulty ignition switch

4. **ALTERNATOR CHARGING COIL INSPECTION**

   Check the alternator charging coil (page 17-8).

   Is the alternator charging coil resistance within 0.1 – 1.0 Ω (20°C/68°F)?

   YES – GO TO STEP 5.

   NO – Faulty charging coil

5. **CHARGING VOLTAGE INSPECTION**

   Measure and record the battery voltage using a digital multimeter (page 17-6).

   Start the engine.

   Measure the charging voltage (page 17-7).

   Compare the measurement to result of the following calculation.

   STANDARD: Measured BV < Measured CV < 15.5 V
   · BV = Battery Voltage (page 17-6)
   · CV = Charging Voltage

   Is the measured charging voltage within the standard voltage?

   YES – Faulty battery

   NO – GO TO STEP 6.

6. **REGULATOR/RECTIFIER SYSTEM INSPECTION**

   Check the voltage and resistance at the regulator/rectifier connector (page 17-8).

   Are the results of checked voltage and resistance correct?

   YES – Faulty regulator/rectifier

   NO – • Open circuit in related wire
   • Loose or poor contacts of related terminal
   • Shorted wire harness

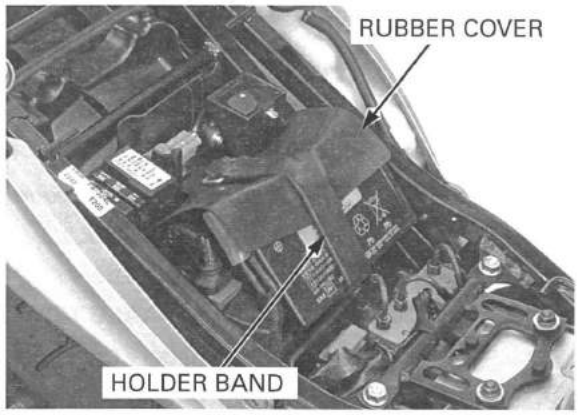
BATTERY

REMOVAL/INSTALLATION

Always turn the ignition switch OFF before removing the battery.

Remove the seat (page 2-4).

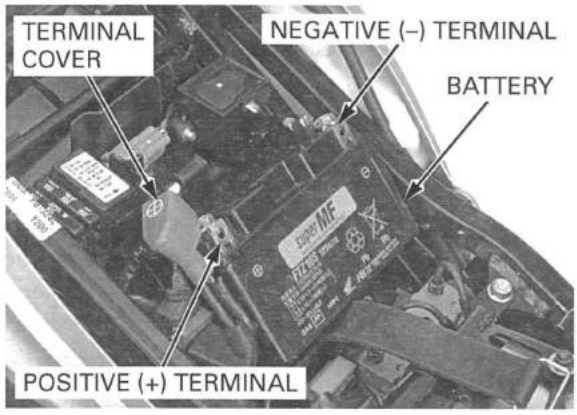
Unhook the battery holder band and remove the rubber cover.



Remove the negative terminal screw, then disconnect the negative cable from the battery negative terminal.

Remove the positive terminal cover.
Remove the positive terminal screw, then disconnect the positive cable from the battery positive terminal.

Remove the battery.



Connect the positive terminal first and then the negative cable.

Installation is in the reverse order of removal.

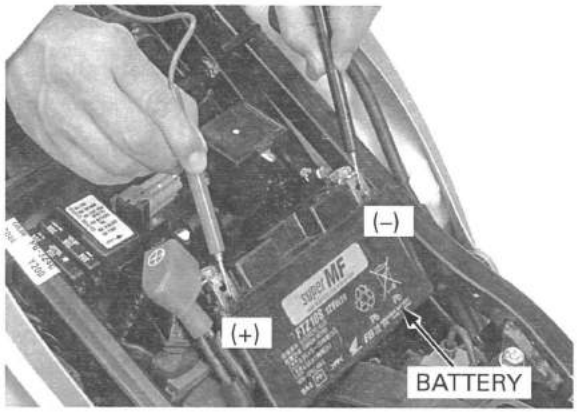
After installing the battery, coat the terminals with clean grease.

VOLTAGE INSPECTION

Measure the battery voltage using a digital multimeter.

VOLTAGE (20°C/68°F):
Fully charged: 13.0 – 13.2 V
Under charged: Below 12.3 V

TOOL:
Digital multimeter Commercially available



CHARGING SYSTEM INSPECTION

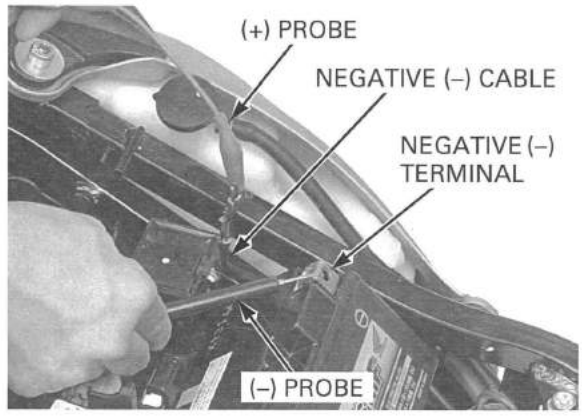
CURRENT LEAKAGE INSPECTION

Remove the seat (page 2-4).

Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.

Turn the ignition switch OFF and disconnect the negative battery cable from the battery.
Connect the ammeter (+) probe to the negative cable and the ammeter (–) probe to the battery (–) terminal.
With the ignition switch OFF, check for current leakage.

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition on. A sudden surge of current may blow out the fuse in the tester.



SPECIFIED CURRENT LEAKAGE: 2.0 mA max.

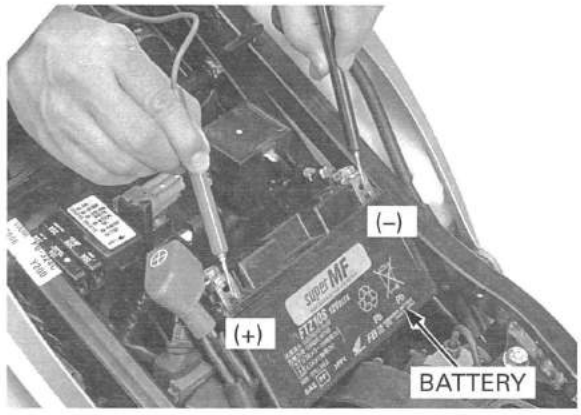
If current leakage exceeds the specified value, a shorted circuit is likely.
Locate the short by disconnecting connections one by one and measuring the current.

CHARGING VOLTAGE INSPECTION

Be sure the battery is in good condition before performing this test.

Warm up the engine to normal operating temperature.
Stop the engine, and connect the multimeter between the positive and negative terminals of the battery.

NOTE:
To prevent a short, make absolutely certain which are the positive and negative terminals or cable.



Restart the engine.
With the headlight on Hi beam, measure the voltage on the multimeter when the engine runs at 5,000 min^{-1} (rpm).

STANDARD:

Measured BV < Measured CV < 15.5 V

· BV = Battery Voltage (page 17-6)

· CV = Charging Voltage

ALTERNATOR CHARGING COIL

INSPECTION

It is not necessary to remove the stator coil to make this test.

Disconnect the alternator 3P (Black) connector (page 17-9).

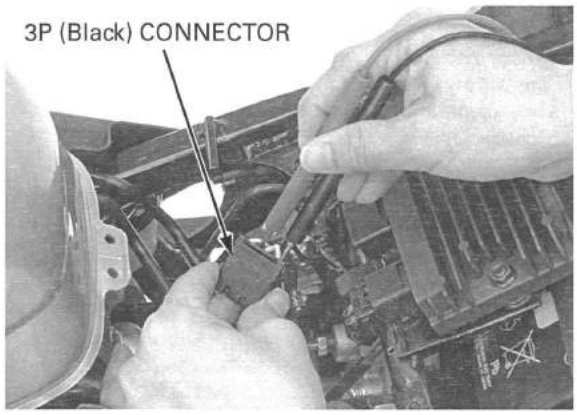
Check the resistance between all three Yellow terminals.

STANDARD: 0.1 – 1.0 Ω (at 20°C/68°F)

Check for continuity between all three Yellow terminals and ground.

There should be no continuity.

If readings are far beyond the standard, or if any wire has continuity to ground, replace the alternator stator (page 10-5).

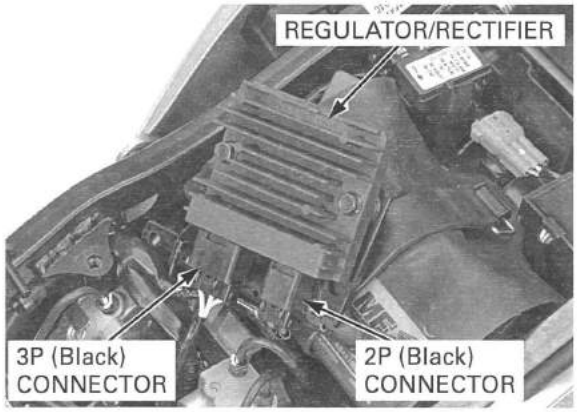


REGULATOR/RECTIFIER

SYSTEM INSPECTION

Disconnect the regulator/rectifier 2P (Black) and alternator 3P (Black) connectors (page 17-9).

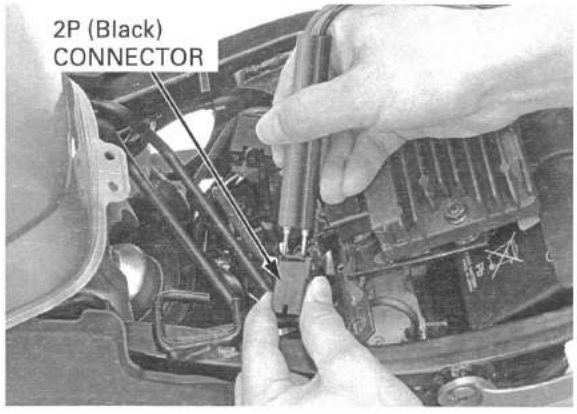
Check connectors for loose contact or corroded terminals.



If the regulated voltage reading (page 17-7) is out of the specification, measure the voltage between connector terminals (wire harness side) as follows:

Item	Terminal	Specification
Battery charging line	Red (+) and Green (-)	Battery voltage should register
Charging coil line	Yellow and Yellow	0.1 – 1.0 Ω at (20°C/68°F)
Ground line	Green and ground	Continuity should exist

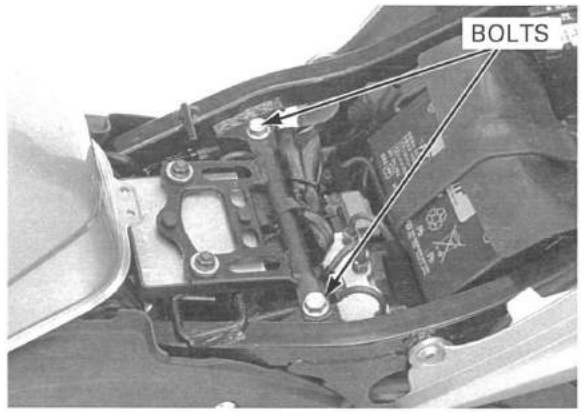
If all components of the charging system are normal and there are no loose connections at the regulator/rectifier connectors, replace the regulator/rectifier unit.



REMOVAL/INSTALLATION

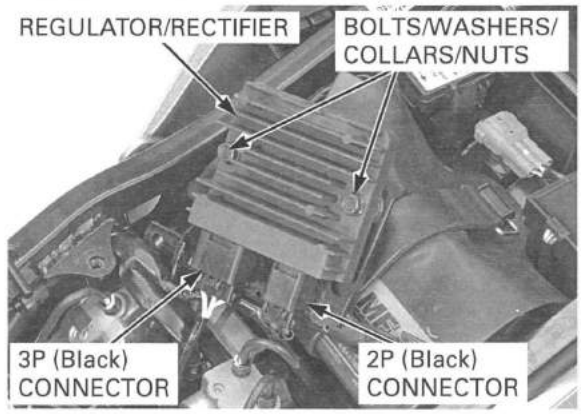
Remove the seat (page 2-4).

Remove the stay bolts.



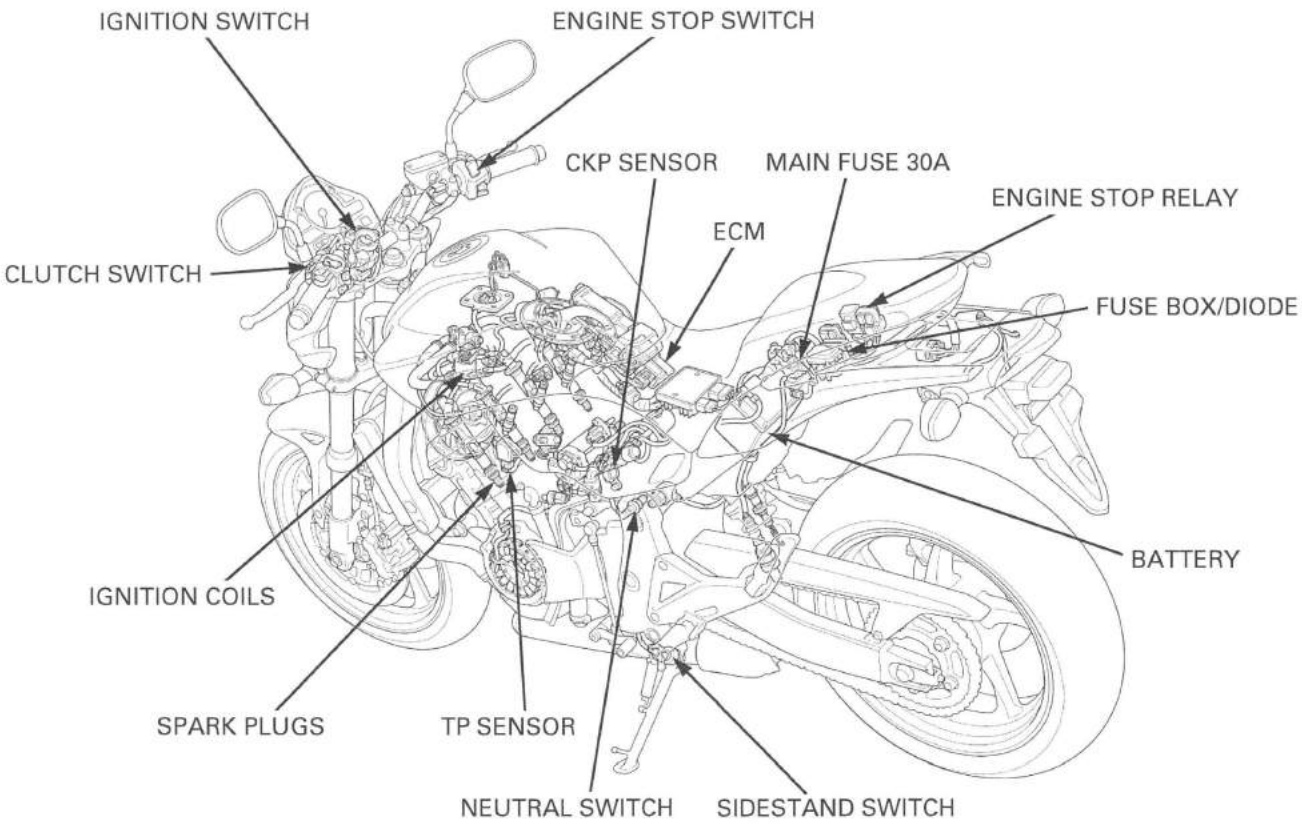
Disconnect the regulator/rectifier 2P (Black) and alternator 3P (Black) connectors.
Remove the mounting bolts, washers, collars, nuts and regulator/rectifier from the stay.

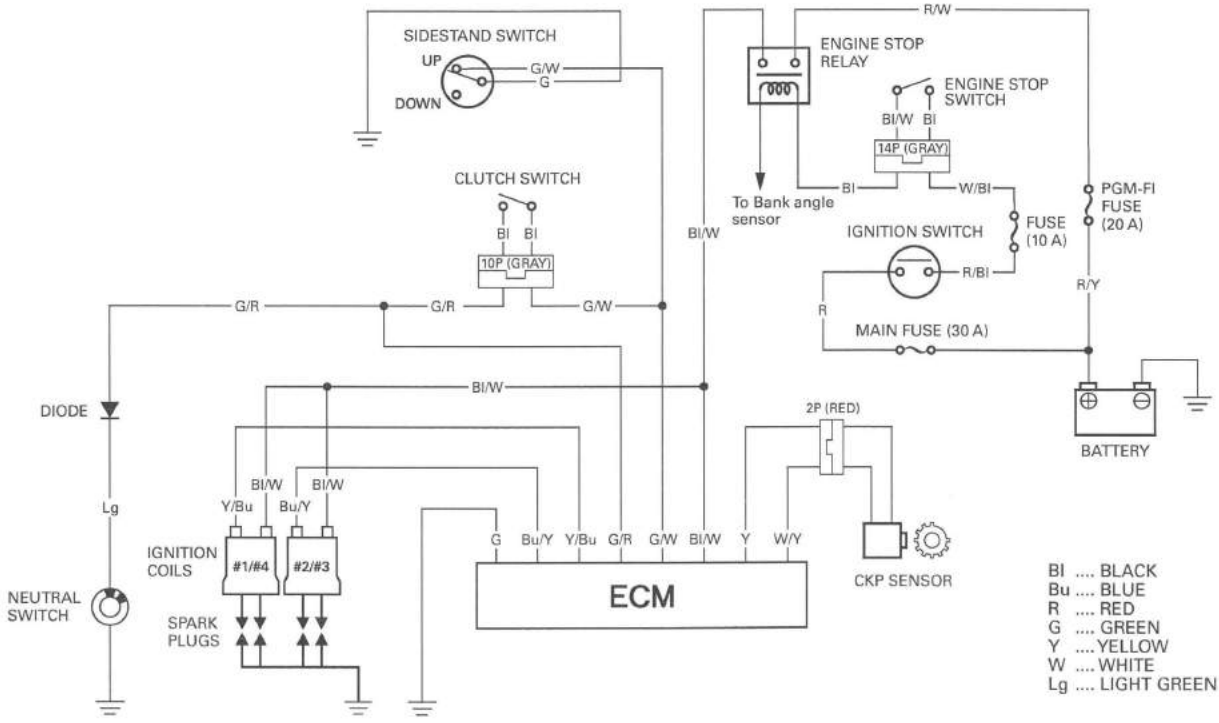
Install the regulator/rectifier in the reverse order of removal.



18. IGNITION SYSTEM

SYSTEM DIAGRAM





SERVICE INFORMATION

GENERAL

NOTICE

- *The ECM may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the ignition switch before servicing.*
- *Use spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.*

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting sequence (page 18-4).
- This motorcycle's Ignition Control Module (ICM) is built into the ECM.
- The ignition timing does not normally need to be adjusted since the ECM is factory preset.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding. Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug.
- Refer to the following components informations.
  - ECM (page 5-96).
  - Sidestand switch (page 20-23)
  - Engine stop relay (page 5-95)
  - Engine stop switch (page 20-20)
  - Ignition switch (page 20-19)
  - Clutch switch (page 20-22)

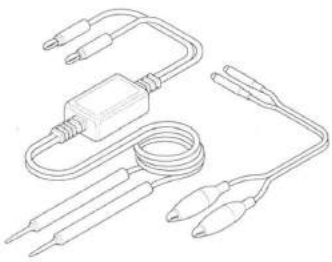
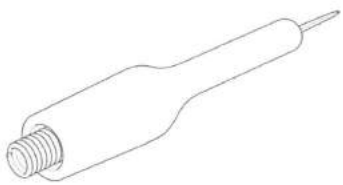
SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	NGK	CR9EH-9
	DENSO	U27FER9
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage		100 V minimum
CKP sensor peak voltage		0.7 V minimum
Ignition timing ("F"mark)		5° BTDC at idle

TORQUE VALUES

Timing hole cap	18 N·m (1.8 kgf·m, 13 lbf·ft)	Apply grease to the threads.
Spark plug	16 N·m (1.6 kgf·m, 12 lbf·ft)	

TOOLS

Imrie diagnostic tester (model 625) or Peak voltage adaptor 07HGJ-0020100  with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)	Test probe 07ZAJ-RDJA110 

TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - Faulty spark plug
  - Loose spark plug cap connection
  - Loose ignition coil connectors
  - Water got into the spark plug cap (shorting the ignition coil secondary voltage)
- If there is no spark at any cylinder, temporarily exchange the ignition coil with the other good one and perform the spark test. If there is spark, the exchanged ignition coil is faulty.
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch turned ON and engine stop switch turned "○" (When the engine is not cranked by the starter motor).

No spark at all plugs

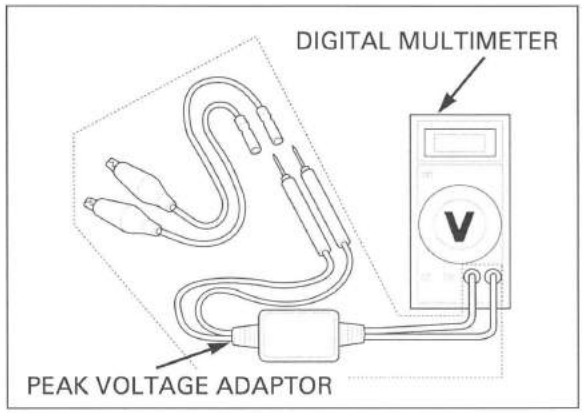
	Unusual condition	Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with the ignition ON and engine stop switch turned "○" (other electrical components are normal).	1. Faulty engine stop relay. 2. An open circuit in Black/white wire between the ignition coil and engine stop relay. 3. Loose or poor connect of the ignition coil connectors, or an open circuit in primary coil (Check at the ECM connector). 4. Faulty ECM (in case when the initial voltage is normal while disconnecting ECM connectors).
	Initial voltage is normal, but it drops down to 2 – 4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections. 2. Undercharged battery. 3. No voltage between the Black/white (+) and body ground (–) at the ECM connector or loosen ECM connection. 4. An open circuit or loose connection in Green wire. 5. An open circuit or loose connection in Yellow/blue or Blue/yellow wires between the ignition coils and ECM. 6. Short circuit in ignition primary coil. 7. Faulty sidestand switch or neutral switch. 8. An open circuit or loose connection in No.7 related circuit wires. – Sidestand switch line: Green/white wire – Neutral switch line:Light green or Green/red wires 9. Faulty CKP sensor (measure the peak voltage). 10. Faulty ECM (in case when above No. 1 - 9 are normal).
	Initial voltage is normal, but no peak voltage while cranking the engine.	1. Faulty peak voltage adaptor connections. 2. Faulty peak voltage adaptor. 3. Faulty CKP sensor (Measure the peak voltage). 4. Faulty ECM (in case when above No.1- 3 are normal).
	Initial voltage is normal, but peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Faulty CKP sensor (Measure the peak voltage). 3. Cranking speed is too low (battery under charged). 4. The sampling timing of the tester and measured pulse were not synchronized (system is normal if measured voltage is over the standard voltage at least once). 5. Faulty ECM (in case when above No. 1 – 4 are normal).
	Initial and peak voltage are normal, but does not spark.	1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil (s).
CKP sensor	Peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (battery undercharged). 3. The sampling timing of the tester and measured pulse were not synchronized (system is normal if measured voltage is over the standard voltage at least once). 4. Faulty CKP sensor (in case when above No. 1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty CKP sensor.

IGNITION SYSTEM INSPECTION

- If there is no spark at any plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use recommended digital multimeter or commercially available digital multimeter with an impedance of 10 MΩ/DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If the Imrie diagnostic tester (model 625) is used, follow the manufacture's instruction.

Connect the peak voltage tester or peak voltage adaptor to the digital multimeter.

TOOLS:
Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 MΩ/DCV minimum)

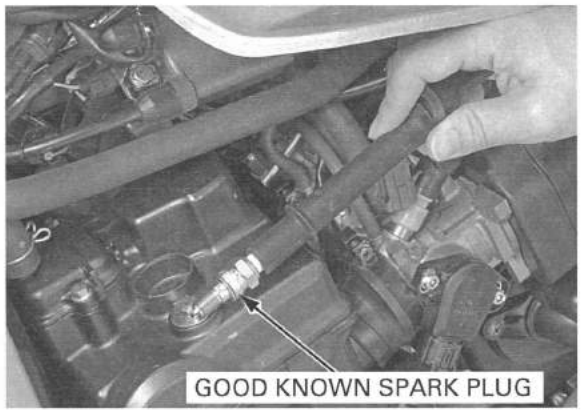


IGNITION COIL PRIMARY PEAK VOLTAGE

- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

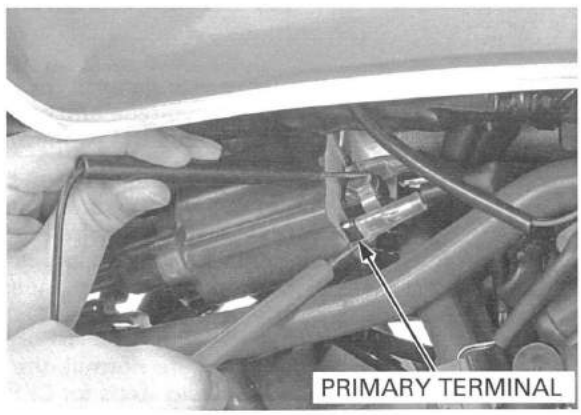
Disconnect the spark plug caps from the spark plugs (page 3-8).

Shift the transmission into neutral.
Connect a known good spark plug to the spark plug cap and ground the spark plug to the cylinder head as done in a spark test.



With the ignition coil primary wire connected, connect the peak voltage adaptor or peak voltage tester to the ignition coil primary wire terminals.

CONNECTION:
#1/#4 coil:
Yellow/blue (+) - body ground (–)
#2/#3 coil:
Blue/yellow (+) - body ground (–)



Avoid touching the spark plugs and tester probes to prevent electric shock.

Turn the ignition switch ON and engine stop switch "○".
Check for initial voltage at this time.
The battery voltage should be measured.
If the initial voltage cannot be measured, check the power supply circuit (refer to the troubleshooting, page 18-4).

Shift the transmission into neutral.
Crank the engine with the starter motor and read ignition coil primary peak voltage.

PEAK VOLTAGE: 100V minimum

If the peak voltage is abnormal, refer to the troubleshooting chart (page 18-4).

CKP SENSOR PEAK VOLTAGE

- Check all system connection before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

Disconnect the ECM 33P (Black and Light gray) connectors from the ECM (page 5-96).

Connect the peak voltage tester or peak voltage adaptor probes to the ECM connector terminals of the wire harness side.

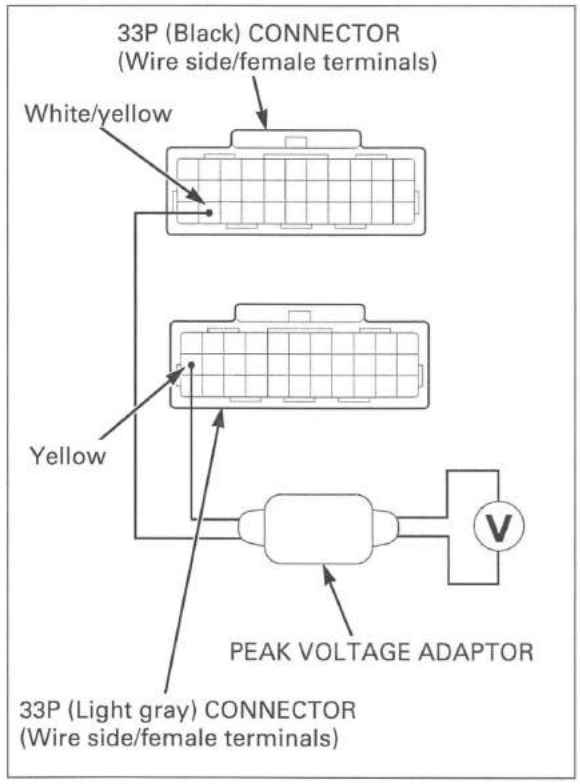
TOOLS:
Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)
Test probe 07ZAJ-RDJA110

CONNECTION:
Yellow (+) – White/yellow (–)

Crank the engine with the starter motor and read the peak voltage.

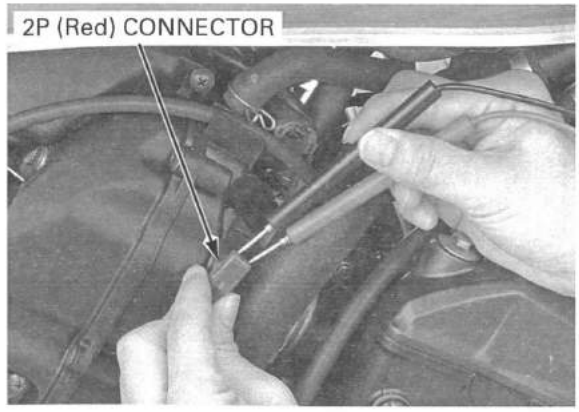
PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at ECM 33P connectors is abnormal, measure the peak voltage at the CKP sensor connector.



Disconnect the CKP sensor 2P (Red) connector and connect the tester probes to the terminal (Yellow and White/yellow).
In the same manner as at the ECM connectors, measure the peak voltage and compare it to the voltage measured at the ECM connectors.

- If the peak voltage measured at the ECM is abnormal and the one measured at the CKP sensor is normal, the wire harness has an open circuit or loose connection.
- If both peak voltage measured are abnormal, check each item in the troubleshooting chart (page 18-4).
  If all items are normal, the CKP sensor is faulty. See following steps for CKP sensor replacement.



CKP SENSOR

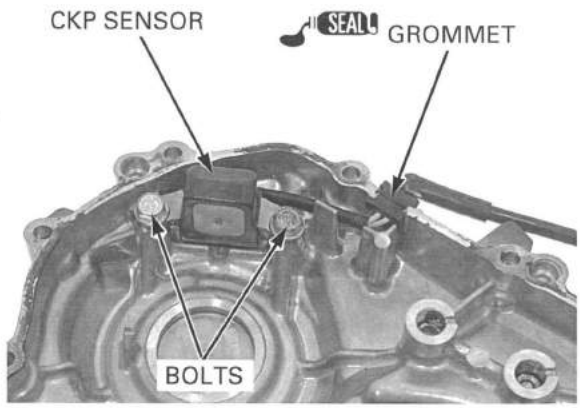
REPLACEMENT

Remove the right crankcase cover (page 9-5).

Remove the wire grommet from the cover.
Remove the bolts and CKP sensor.

Install the new CKP sensor and tighten the mounting bolts securely.
Route the CKP sensor wire into the groove of the right crankcase cover.
Apply sealant to the grommet seating surface and install the grommet into the cover groove properly.

Install the right crankcase cover (page 9-25).



IGNITION COIL

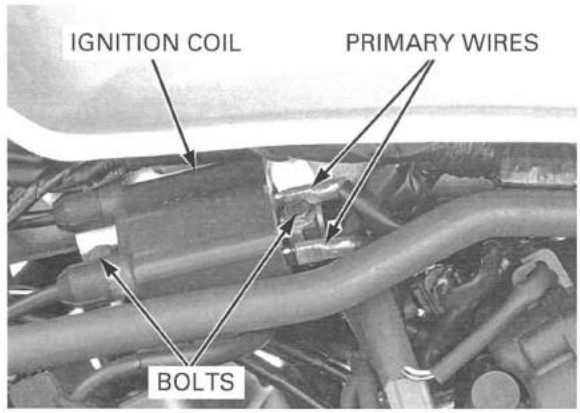
REMOVAL/INSTALLATION

Disconnect the spark plug caps from the spark plugs (page 3-8).

Disconnect the ignition coil primary wires from the ignition coil.
Remove the bolts and ignition coil.

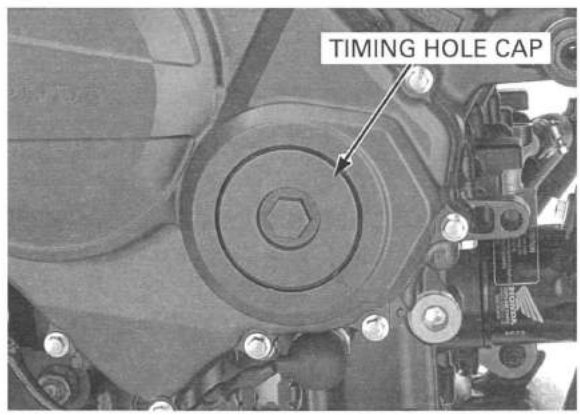
Route the spark plug wires properly (page 1-23).

Installation is in the reverse order of removal.



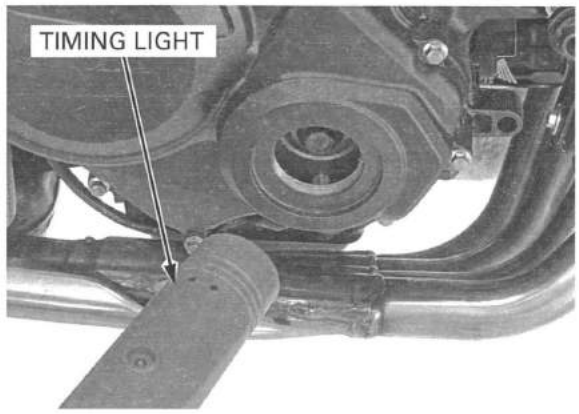
IGNITION TIMING

Warm up the engine.
Stop the engine and remove the timing hole cap.



Read the instructions for timing light operation.

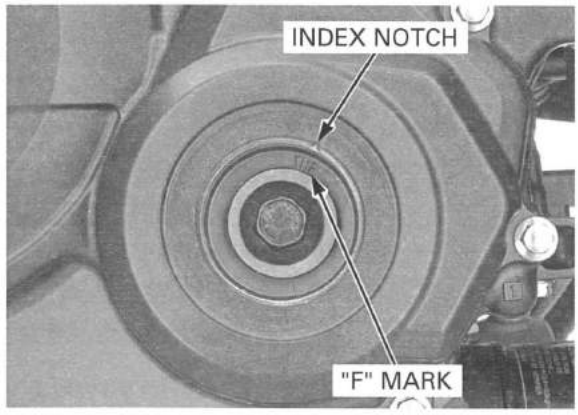
Connect the timing light to the No.1 spark plug wire.



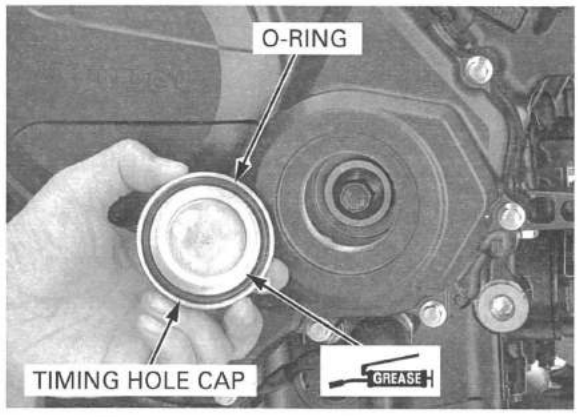
Start the engine and let it idle.

IDLE SPEED: 1,300 ± 100 min^{-1} (rpm)

The ignition timing is correct if the "F" mark on the CKP sensor rotor aligns with the index notch on the right crankcase cover at idle.

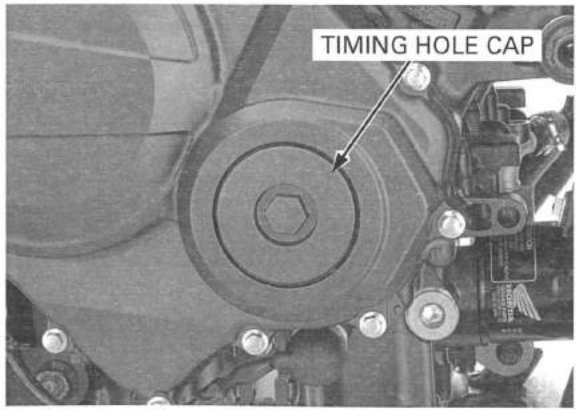


Check the O-ring is in good condition, replace if necessary.
Apply grease to the timing hole cap threads and install the O-ring and timing hole cap.



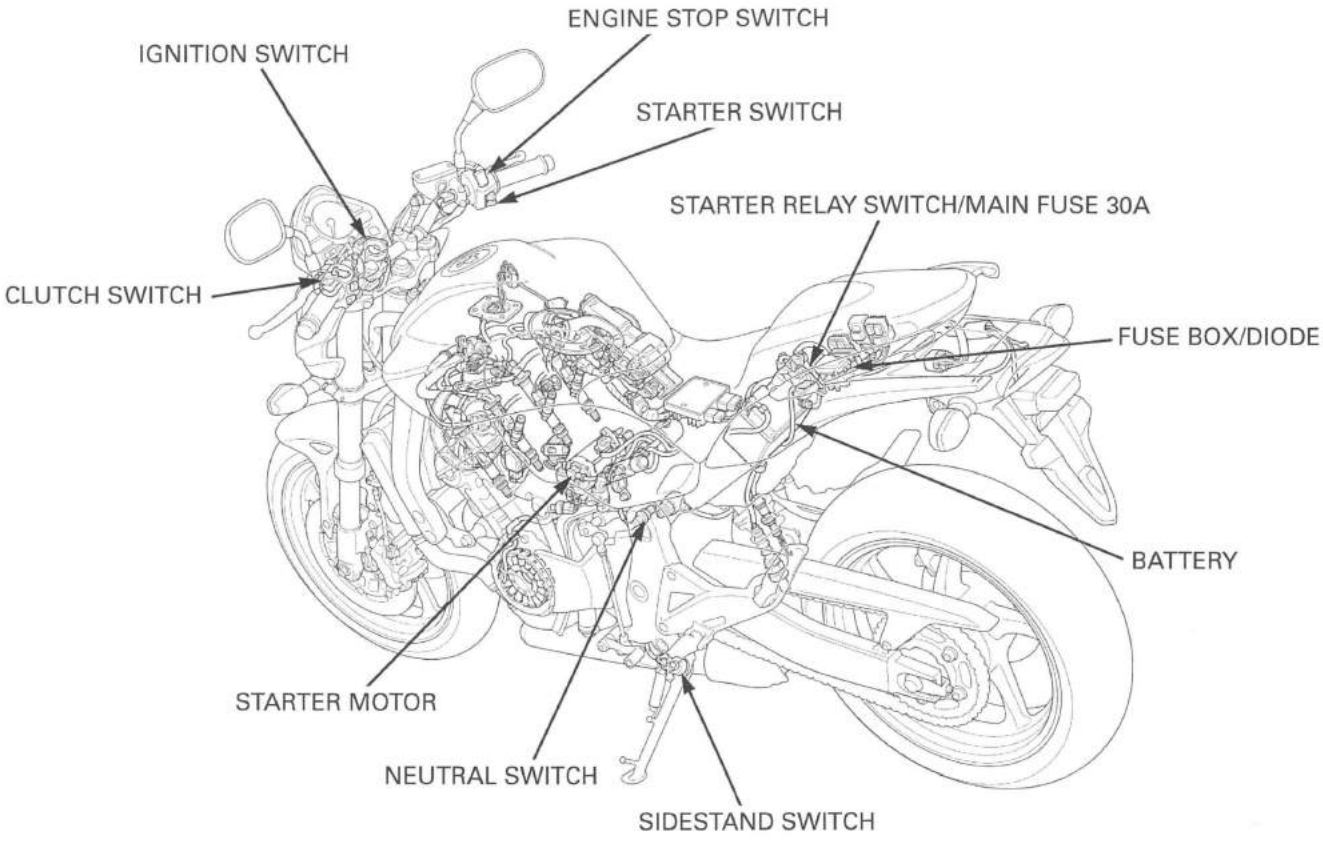
Tighten the timing hole cap to the specified torque.

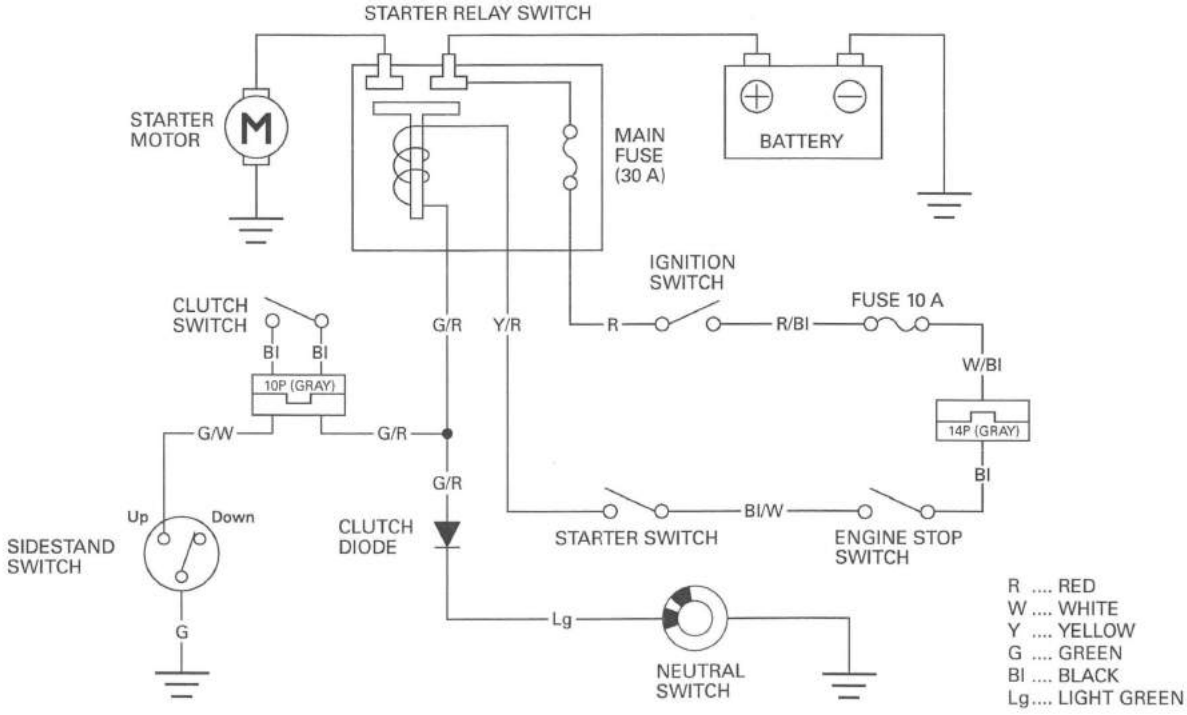
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



19. ELECTRIC STARTER

SYSTEM DIAGRAM





SERVICE INFORMATION

GENERAL

NOTICE

If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.

- Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.
- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting flow chart (page 19-4).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- Refer to the procedure for starter clutch servicing (page 9-17).
- Refer to the following components informations.
  - Ignition switch (page 20-19)
  - Engine stop switch (page 20-20)
  - Starter switch (page 20-20)
  - Neutral switch (page 20-23)
  - Sidestand switch (page 20-23)
  - Clutch switch (page 20-22)

SPECIFICATION

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.0 (0.47)	6.5 (0.26)

TORQUE VALUE

Starter motor terminal nut	10 N·m (1.0 kgf·m, 7 lbf·ft)

TROUBLESHOOTING

Starter motor does not turn

1. **Fuse Inspection**

   Check for blown main fuse or sub fuse.

   Did the fuse blow?

   YES – Replace the fuse

   NO – GO TO STEP 2.

2. **Battery Inspection**

   Make sure the battery is fully charged and in good condition.

   Is the battery in good condition?

   YES – GO TO STEP 3.

   NO – Replace the battery (page 17-6)

3. **Starter Relay switch operation**

   Check the starter relay switch operation.
   You should hear the relay "CLICK" when the starter switch button is depressed.

   Did the starter relay "CLICK"?

   YES – GO TO STEP 4.

   NO – GO TO STEP 5.

4. **Starter Motor Inspection**

   Apply battery voltage to the starter motor directly and check the operation.

   Did the starter motor turn?

   YES –
   - Poorly connected starter motor cable
   - Faulty starter relay switch (page 19-15)

   NO – Faulty starter motor (page 19-6)

5. **Relay Coil Ground Wire Lines Inspection**

   Disconnect the starter relay switch connector, and check the relay coil ground wire lines as below for continuity:

   1. Green/red terminal-clutch switch diode – neutral switch line (with the transmission in neutral and clutch lever released).
   2. Green/red terminal-clutch switch – sidestand switch line (in any gear except neutral, and with the clutch lever pulled in and the sidestand up).

   Is there continuity?

   YES – GO TO STEP 6.

   NO –
   - Faulty neutral switch (page 20-23)
   - Faulty clutch diode (page 19-17)
   - Faulty clutch switch (page 20-22)
   - Faulty sidestand switch (page 20-23)
   - Loose or poor contact connector
   - Open circuit in wire harness

6. **Starter Relay Voltage Inspection**

   Connect the starter relay switch connector.

   With the ignition switch ON and the starter switch pushed, measure the starter relay voltage at the starter switch connector (between Yellow/red (+) and ground (–)).

   Is the starter relay switch operation correct?

   YES – GO TO STEP 7.

   NO –
   - Faulty ignition switch (page 20-19)
   - Faulty starter switch (page 20-20)
   - Faulty engine stop switch (page 20-20)
   - Loose or poor contact connector
   - Open circuit in wire harness

7. **Starter Relay Switch Continuity Inspection**

   Disconnect the starter relay switch 4P connector.

   Connect a fully charged 12 V battery positive wire to the relay switch Yellow/red wire terminal and negative wire to the Green/red wire terminal.
   Check the continuity between the starter relay switch large terminals while the battery connected.

   Is there continuity?

   YES – Loose or poor contact of the starter relay switch 4P connector

   NO – Faulty starter relay switch

The starter motor turns when the transmission is in neutral, but does not turn with the transmission in any position except neutral, with the sidestand up and the clutch lever pulled in.

1. **Clutch Switch Inspection**

   Check the clutch switch operation (page 20-22).

   Is the clutch switch operation normal?

   YES – GO TO STEP 2.

   NO – Faulty clutch switch

2. **Sidestand Switch Inspection**

   Check the sidestand switch operation (page 20-23).

   Is the sidestand switch operation normal?

   YES – • Open circuit in wire harness
   • Loose or poor contact connector

   NO – Faulty sidestand switch

Starter motor turns engine slowly
- Low battery voltage
- Poorly connected battery terminal cables
- Poorly connected starter motor cable
- Faulty starter motor
- Poor connected battery ground cable

Starter motor turns, but engine does not turn
- Starter motor is running backwards
  - Starter motor assembled improperly
  - Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty starter driven gear, idle gear and/or reduction gear

Starter relay switch "Clicks", but engine does not turn over
- Crankshaft does not turn due to engine problems

STARTER MOTOR

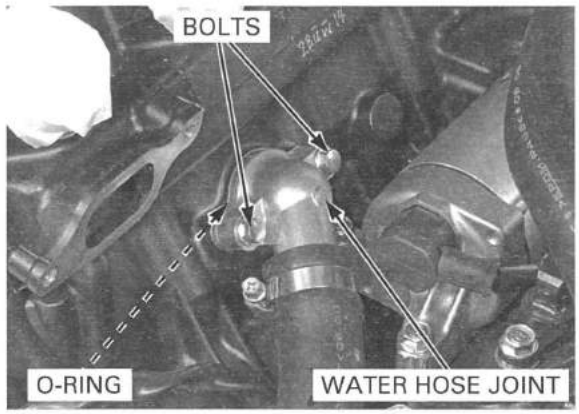
REMOVAL

- With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.

Remove the following:

- air cleaner housing (page 5-61)
- thermostat (page 6-8)

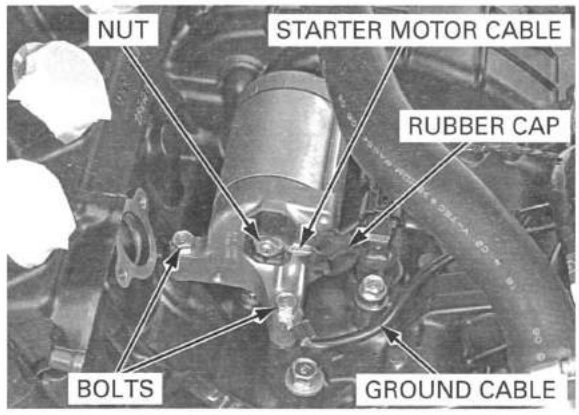
Remove the bolts, water hose joint and O-ring.



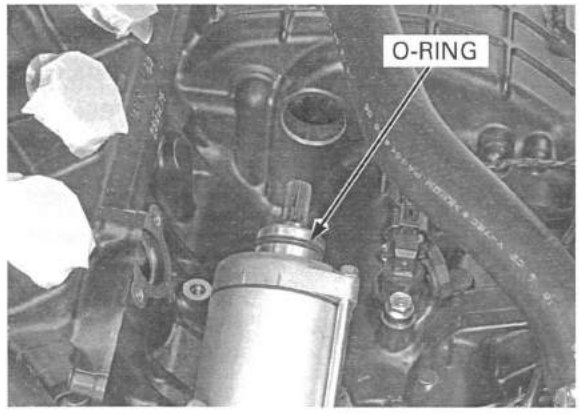
Open the rubber cap, then remove the terminal nut and starter motor cable from the starter motor.

Remove the starter motor mounting bolts and ground cable.

Pull the starter motor out of the crankcase.

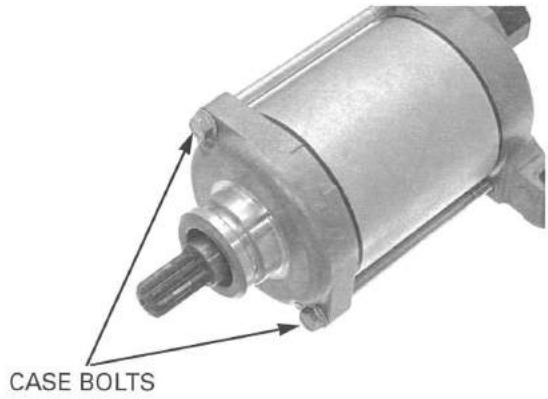


Remove the O-ring from the starter motor.

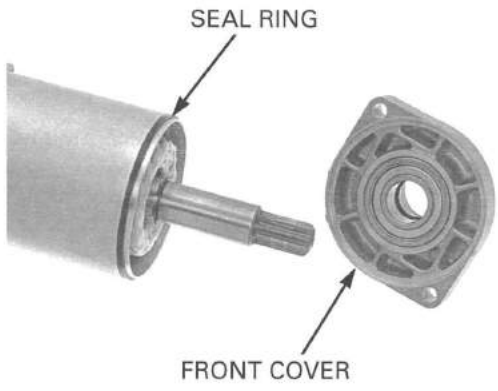


DISASSEMBLY

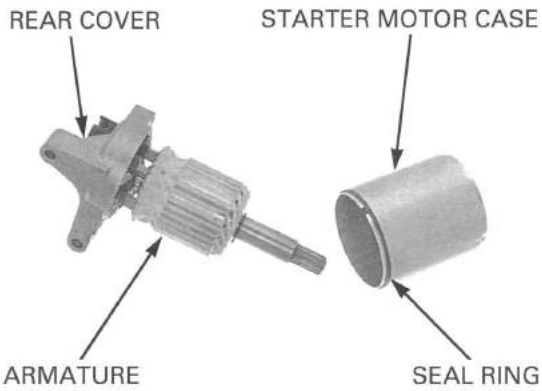
Remove the starter motor case bolts.



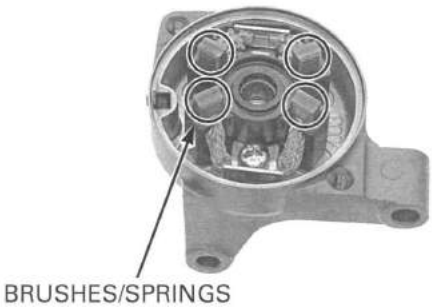
Remove the front cover and seal ring.



Remove the starter motor case and seal ring.
Remove the armature from the rear cover.



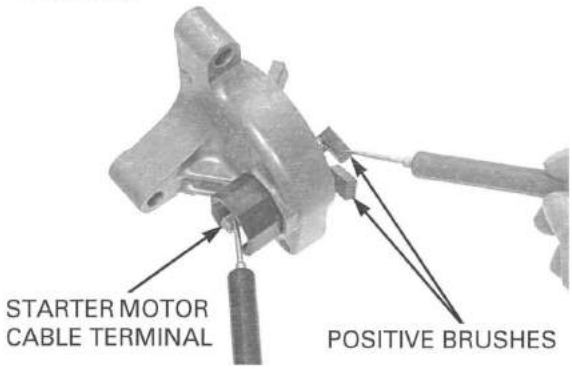
Remove the brushes and springs from the brush holder.



Check for continuity between starter motor cable terminal and positive brushes.

There should be continuity.

Continuity:



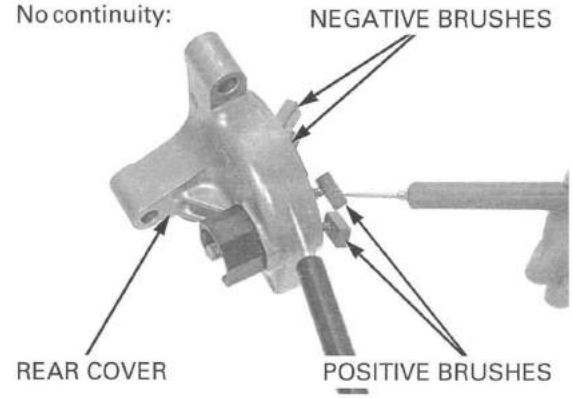
Check for continuity between positive brushes (terminal bolt side) and rear cover.

There should be no continuity.

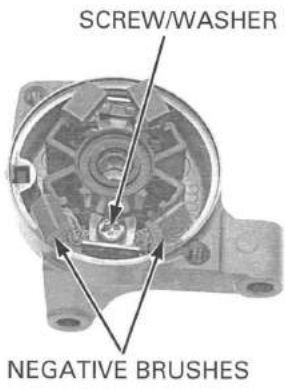
Check for continuity between positive and negative brushes.

There should be no continuity.

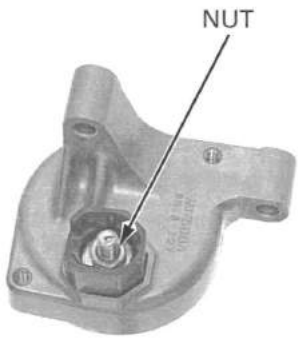
No continuity:



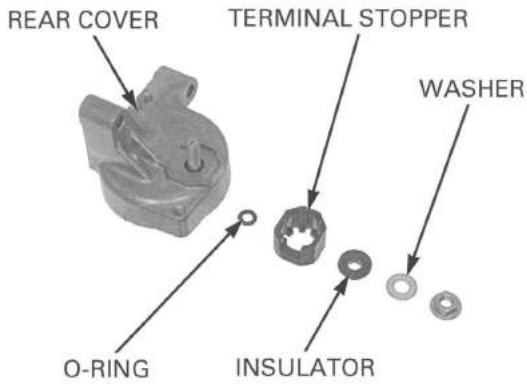
Remove the screw/washer and negative brushes.



Remove the terminal nut.

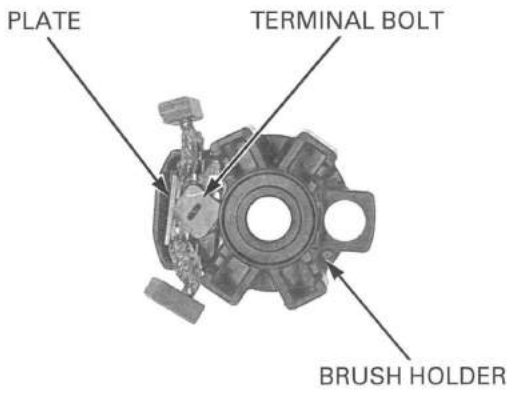


Remove the washer, insulator, terminal stopper and O-ring from the rear cover.

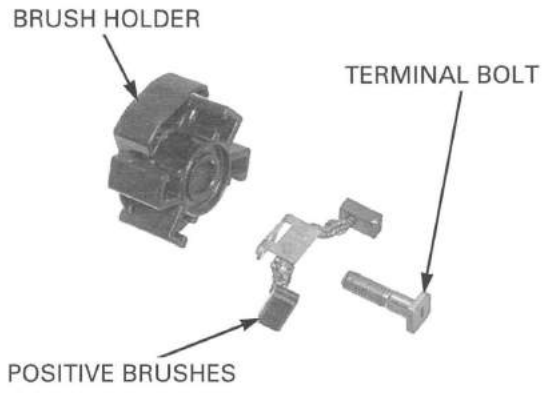


Remove the brush holder assembly from the rear cover.

Release the brush plate from the brush holder by turning the terminal bolt.



Disassemble the terminal bolt, positive brushes and brush holder.



INSPECTION

Measure each brush length.

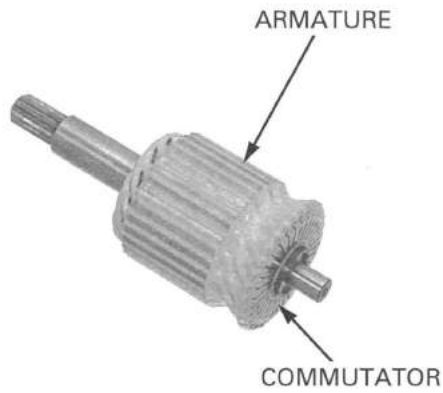
SERVICE LIMIT: 6.5 mm (0.26 in)

Check the commutator for damage or abnormal wear.

Do not use emery or sand paper on the commutator.

Check the commutator bar for discoloration.
Clean the metallic debris off between commutator bars.

Replace the armature with a new one if necessary.

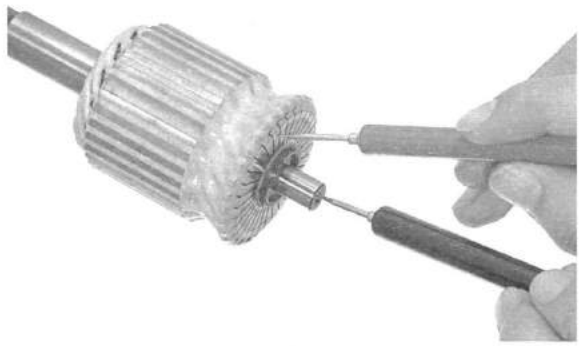


Check for continuity between pairs of commutator bars.
There should be continuity.

Continuity:

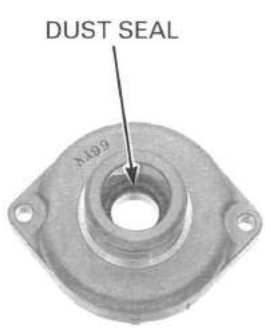
Check for continuity between each individual commutator bar and armature shaft.
There should be no continuity.

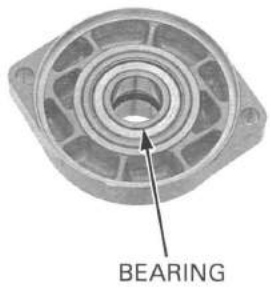
No continuity:



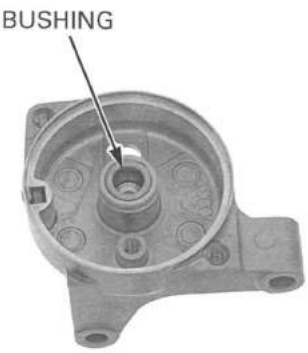
Check the dust seal for deterioration, wear or damage.

Turn the inner race of the starter motor bearing with your finger.
The bearing should turn smoothly and quietly.
Also check that the outer race of the bearing fits tightly in the front cover.

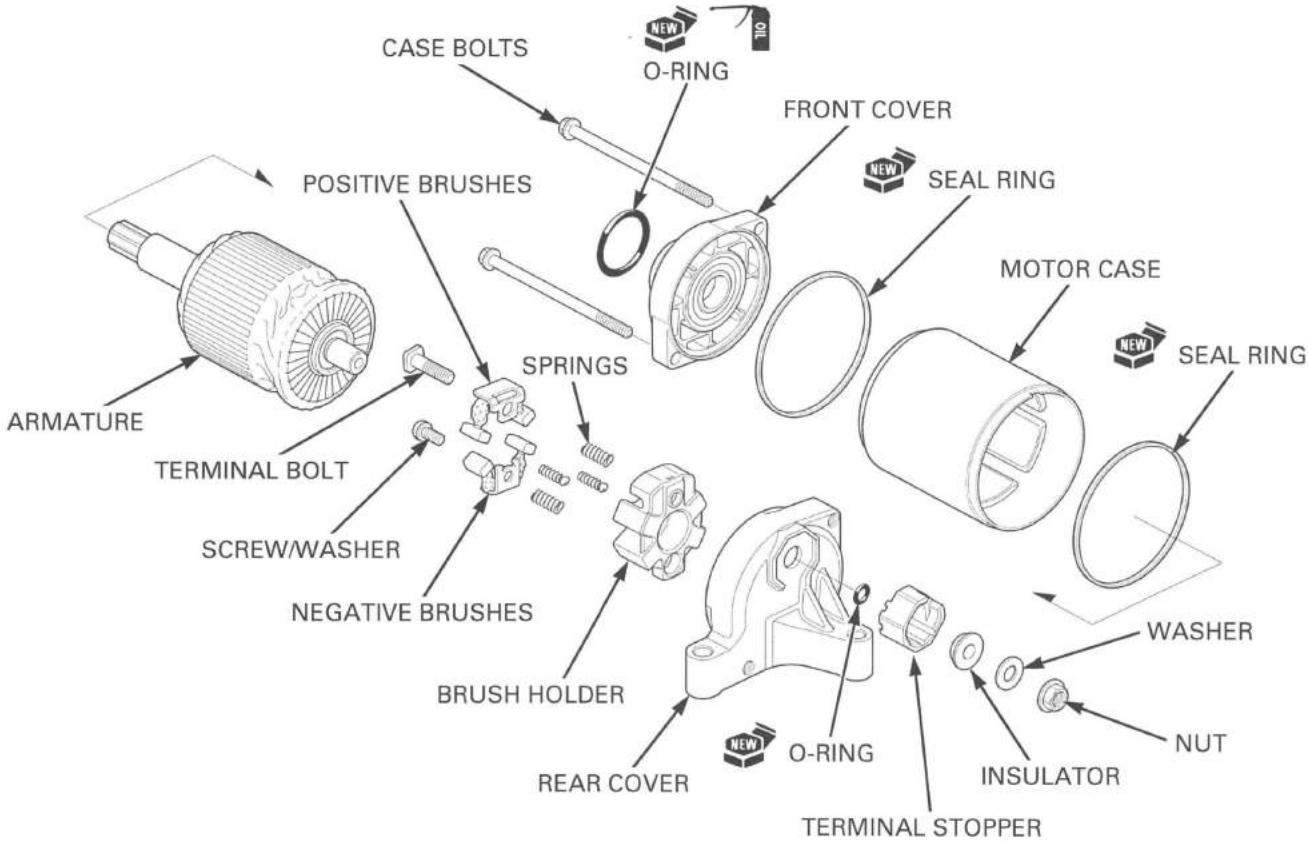




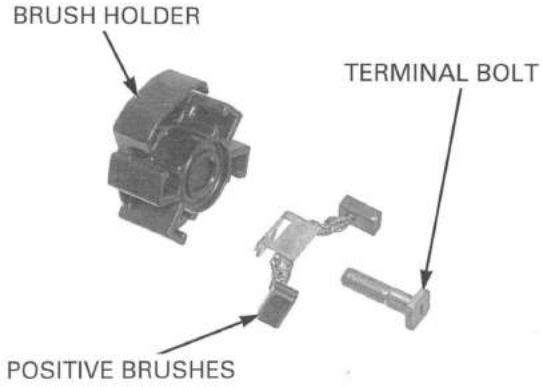
Check the bushing of the rear cover for wear or damage.



ASSEMBLY

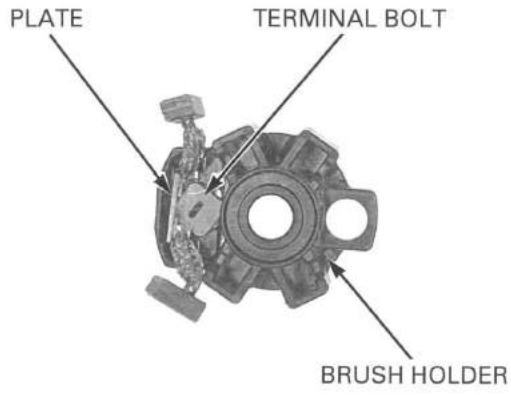


Assemble the brush holder, positive brushes and terminal bolt.

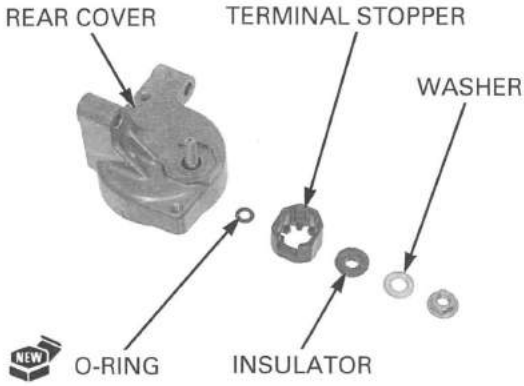


Lock the brush plate to the brush holder by turning the terminal bolt.

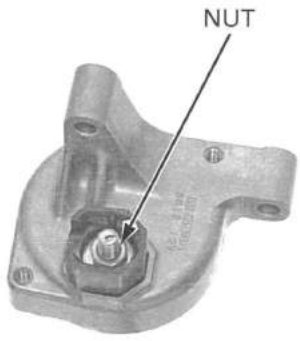
Install the brush holder assembly into the rear cover.



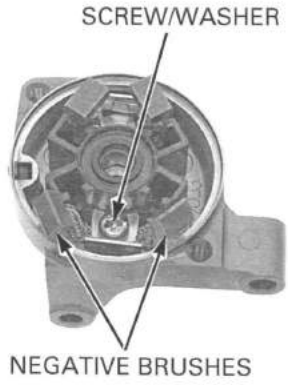
Install a new O-ring, terminal stopper, insulator and washer.



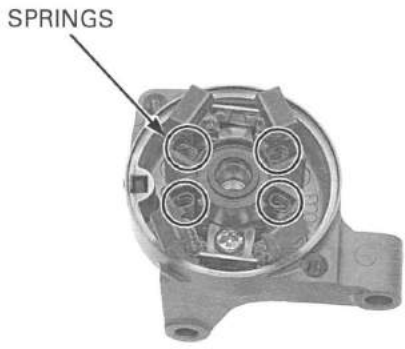
Install and tighten the terminal nut securely.



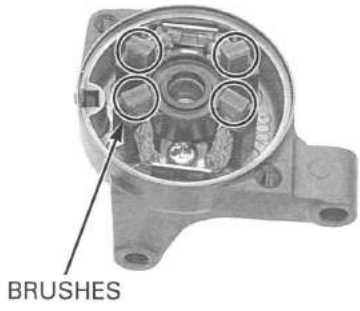
Install the negative brushes and screw/washer and tighten the screw securely.



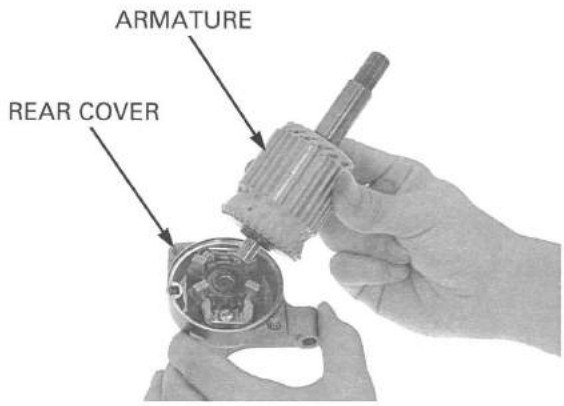
Install the brush springs to the brush holder.



Set the brushes to the brush holder.



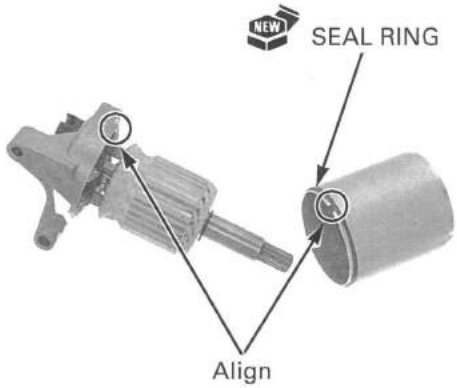
Install the armature to the rear cover.



Install a new seal ring to the starter motor case. Install the starter motor case with its groove with the tab on the rear cover.

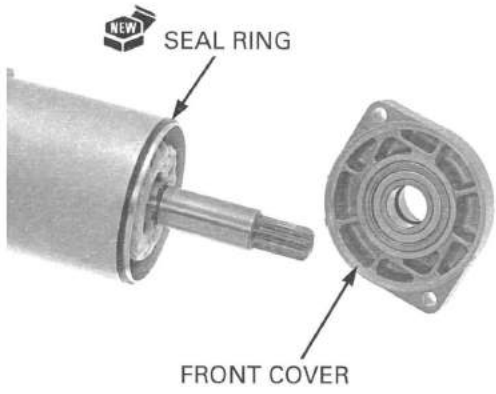
NOTICE

The coil may be damaged if the magnet pulls the armature against the case.

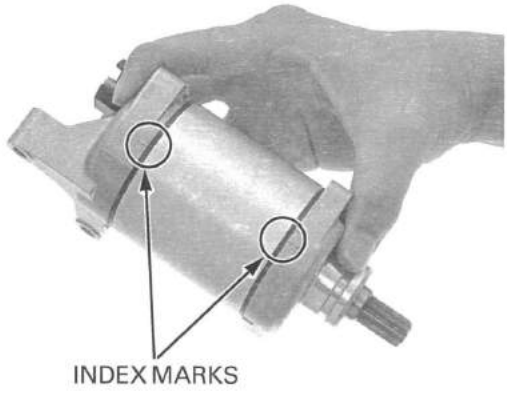


Install a new seal ring to the starter motor case.
Install the front cover to the starter motor case.

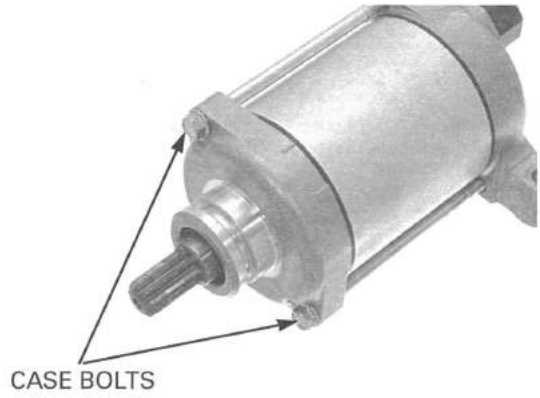
NOTE:
When installing the front cover, take care to prevent damaging the oil seal lip with the armature shaft.



Align the index marks on the front cover, starter motor case and rear cover.

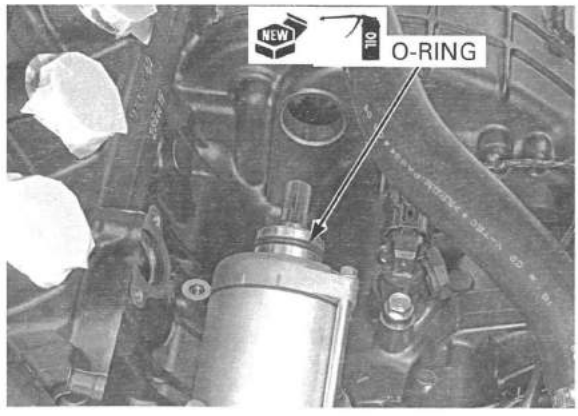


Tighten the case bolts securely.



INSTALLATION

Apply oil to a new O-ring and install it to the starter motor groove.



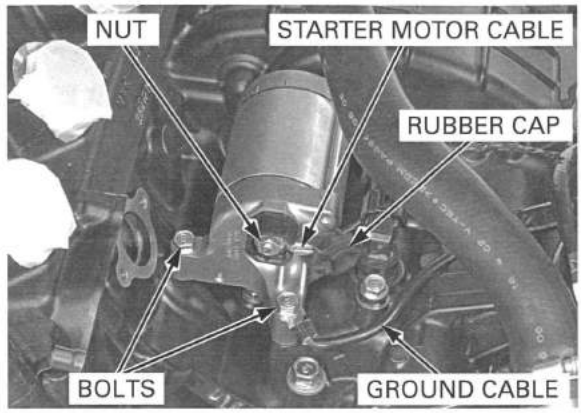
Install the starter motor into the crankcase.

Route the wires properly (page 1-23).

Install the ground cable and mounting bolts, and tighten the bolts securely.
Install the starter motor cable, then tighten the terminal nut to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the rubber cap securely.



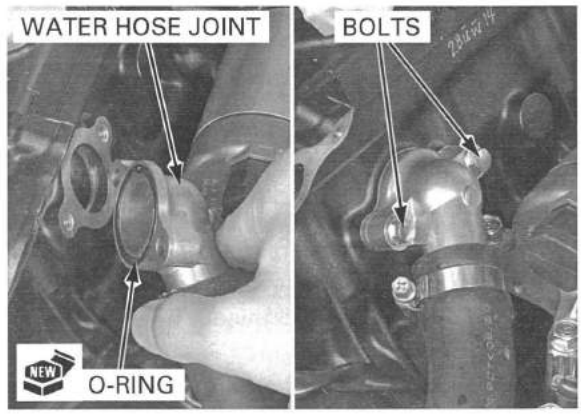
Install a new O-ring into the groove of the water hose joint.

Install the water hose joint to the cylinder block. Tighten the bolts securely.

Install the following:

- thermostat (page 6-10)
- air cleaner housing (page 5-75)

Connect the battery negative cable.



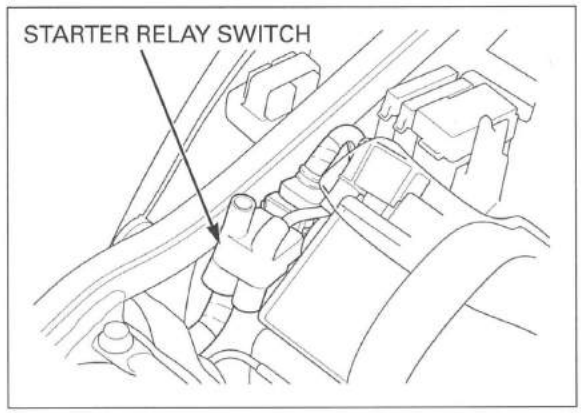
STARTER RELAY SWITCH

OPERATION INSPECTION

Remove the seat (page 2-4).

Shift the transmission into neutral.
Turn the ignition switch ON and engine stop switch "○".
Press the starter switch button.
The coil is normal if the starter relay switch clicks.

If you don't hear the switch "click", inspect the relay switch using the procedure below.

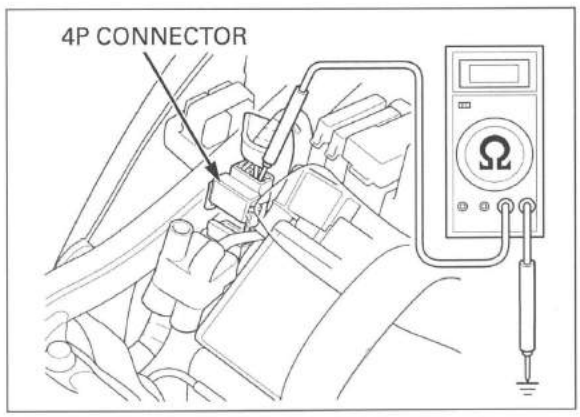


GROUND LINE INSPECTION

Disconnect the starter relay switch 4P connector.

Check for continuity between the Green/red wire (ground line) and ground.

If there is continuity when the transmission is in neutral and clutch lever released or when the clutch lever pulled and the side stand up, the ground circuit is normal (In neutral, there is a slight resistance due to the diode).

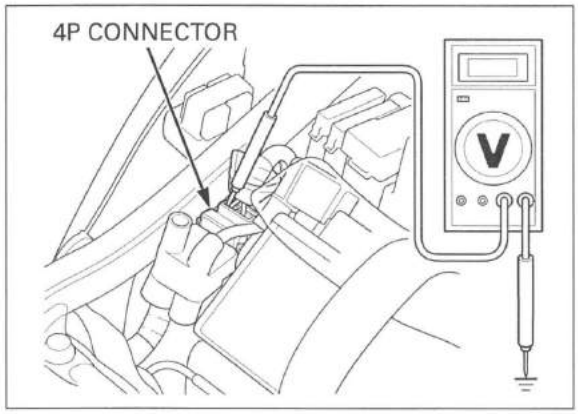


STARTER RELAY VOLTAGE INSPECTION

Connect the starter relay switch 4P connector.

Shift the transmission into neutral.
Measure the voltage between the Yellow/red wire terminal (+) and body ground (–).

If the battery voltage appears only when the starter switch is pushed with the ignition switch ON and engine stop switch "○", it is normal.



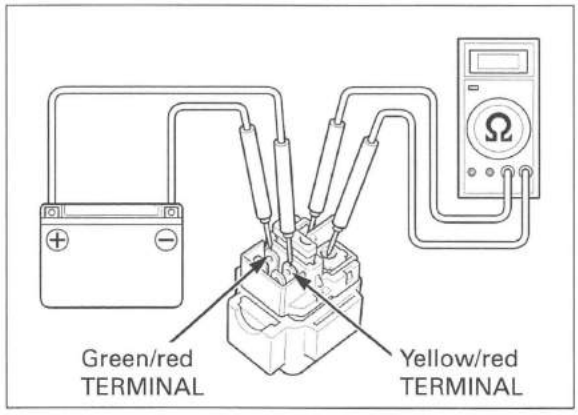
CONTINUITY INSPECTION

Disconnect the 4P connector, battery(+) cable and starter motor cable from the starter relay switch.

Connect a fully charged 12 V battery positive wire to the relay switch Yellow/red wire terminal and negative wire to the Green/red wire terminal.

Connect an ohmmeter to the starter relay switch large terminals.

There should be continuity between the large terminals when the battery is connected, and no continuity when the battery is disconnected.

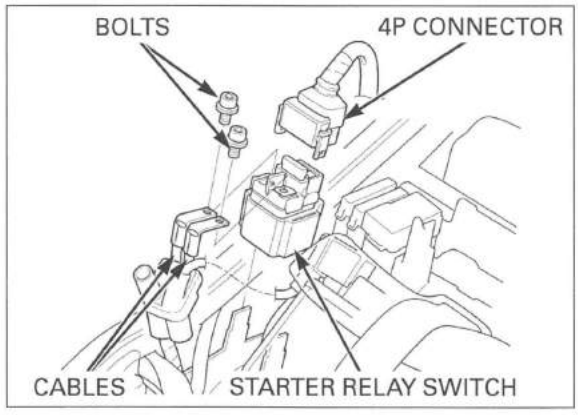


REMOVAL/INSTALLATION

Remove the seat (page 2-4).

Disconnect the starter relay switch 4P connector.
Remove the terminal bolts and disconnect the starter relay switch cables.
Pull the starter relay switch out from the stay.

Installation is in the reverse order of removal.



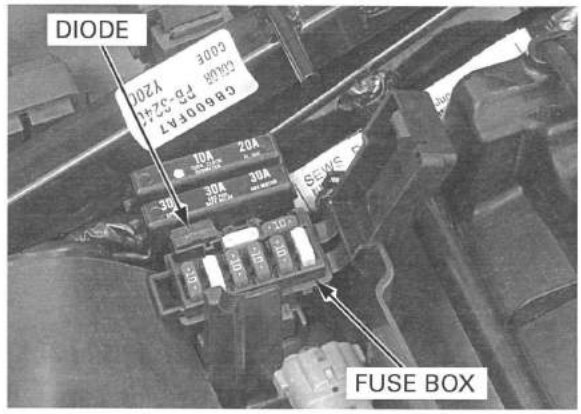
DIODE

REMOVAL/INSTALLATION

Remove the seat (page 2-4).

Open the fuse box and remove the diode.

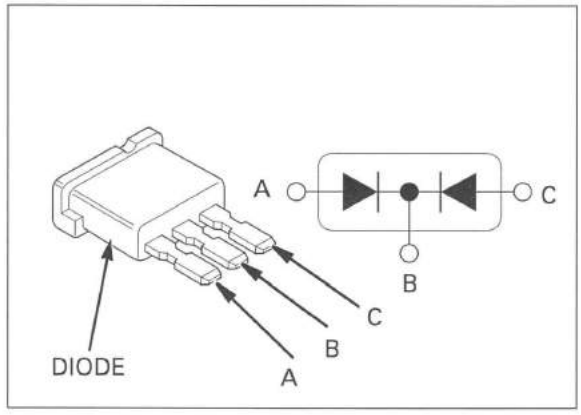
Install the diode in the reverse order of removal.



INSPECTION

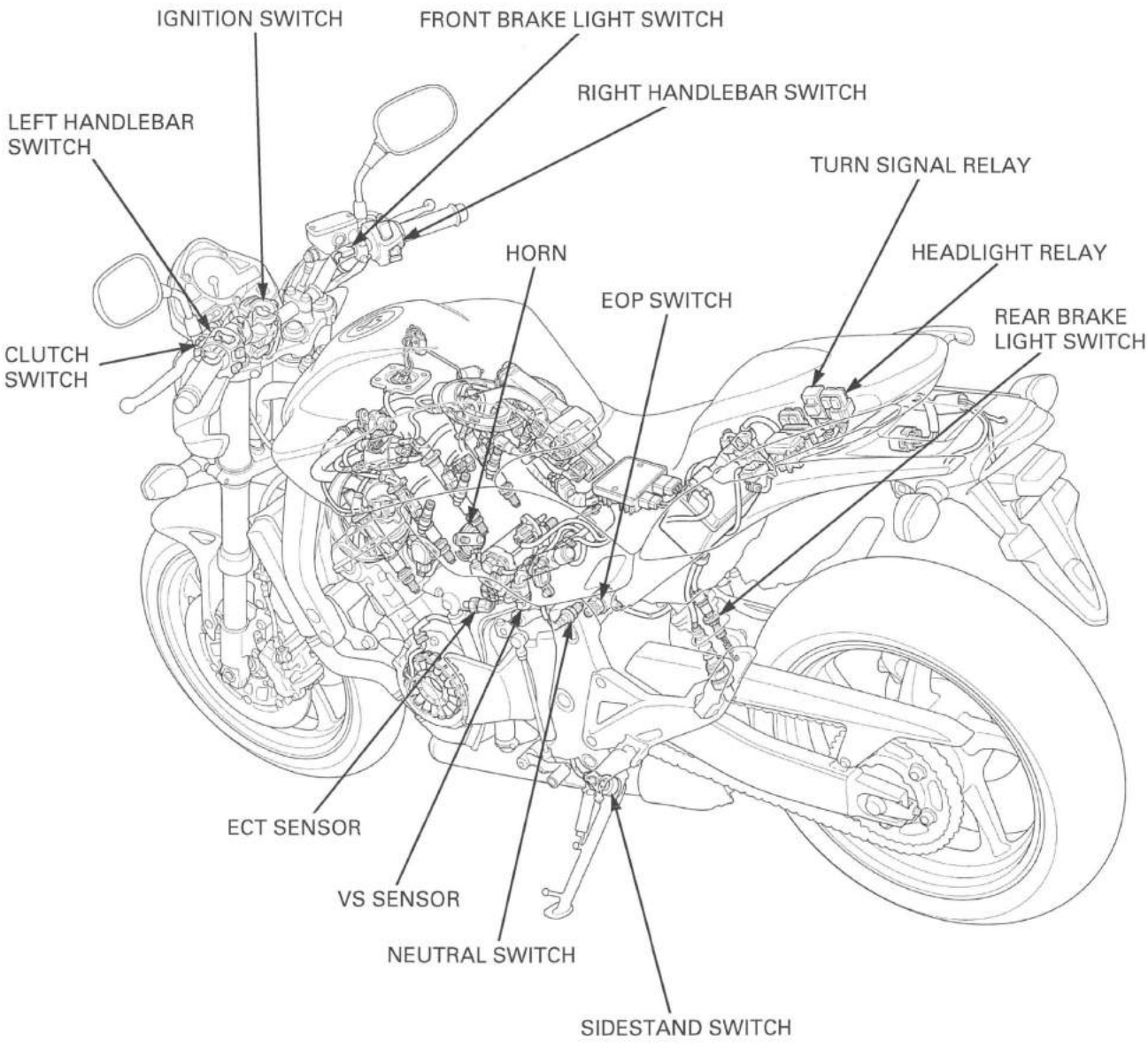
Check for continuity between the diode terminals. When there is continuity, a small resistance value will register.

If there is continuity, in one direction, the diode is normal.



20. LIGHTS/METER/SWITCHES

SYSTEM LOCATION



SERVICE INFORMATION

GENERAL

NOTICE

- *A halogen headlight bulb becomes very hot while the headlight is ON, and remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.*
- *Note the following when replacing the halogen headlight bulb.*
  - *Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause is to fail.*
  - *If you touch the bulb with your bare hands, clean it with a cloth moistened with denatured alcohol to prevent its early failure.*
  - *Be sure to install the dust cover after replacing the bulb.*
- Use an electric heating element to heat the water/coolant mixture for the ECT sensor inspection. Keep flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes are used throughout this section.

Bu: Blue	G: Green	Lg: Light Green	R: Red
Bl: Black	Gr: Gray	O: Orange	W: White
Br: Brown	Lb: Light Blue	P: Pink	Y: Yellow

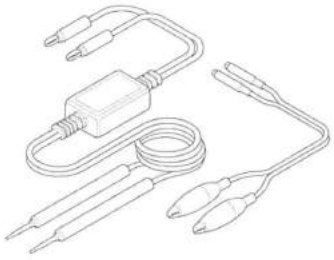
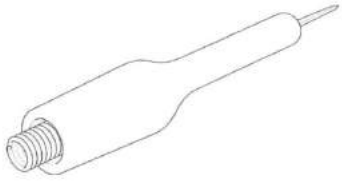
SPECIFICATIONS

ITEM			SPECIFICATIONS
Bulbs	Headlight	Hi	12 V – 55 W
		Lo	12 V – 55 W
	Position light		12 V – 5 W x 2
	Brake/tail light		LED
	License light		12 V – 5 W
	Turn signal light		12 V – 21 W x 4
	Instrument light		LED
	Turn signal indicator		LED
	High beam indicator		LED
	Neutral indicator		LED
	MIL		LED
	Warning indicator		LED
	Immobilizer system (HISS) indicator		LED
	ABS indicator (CB600FA)		LED
Fuse	Main fuse		30 A
	PGM-FI/IGN fuse		20 A
	Sub fuse		10 A x 4, 20 A x 2
	ABS main fuse (CB600FA)		10 A
	ABS fail-safe relay fuse (CB600FA)		30 A
	ABS motor fuse (CB600FA)		30 A
Tachometer peak voltage			10.5 V minimum
ECT sensor resistance		80 °C (176 °F)	2.1 – 2.6 kΩ
		120 °C (248 °F)	0.65 – 0.73 kΩ

TORQUE VALUES

EOP switch	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply sealant to the threads.
EOP switch wire terminal bolt	2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)	
Neutral switch	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Ignition switch mounting bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)	One-way bolt
ECT sensor	23 N·m (2.3 kgf·m, 17 lbf·ft)	
License light mounting nut	1.7 N·m (0.2 kgf·m, 1.3 lbf·ft)	
Rear turn signal mounting nut	5.0 N·m (0.5 kgf·m, 3.7 lbf·ft)	
Combination meter socket bolt	0.5 N·m (0.1 kgf·m, 0.4 lbf·ft)	
Combination meter assembly screw	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)	

TOOLS

Imrie diagnostic tester (model 625) or Peak voltage adaptor 07HGJ-0020100  with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)	Test probe 07ZAJ-RDJA110 

TROUBLESHOOTING

VS SENSOR/SPEEDOMETER

The speedometer and odometer/trip meter indicates "– – – –".

Faulty EEPROM in ECM

The odometer/trip meter operate normally, but the speedometer does not operate
Faulty speedometer in combination meter

The speedometer operate normally, but the odometer/trip meter does not operate
Faulty odometer/trip meter in combination meter

The speedometer operates abnormally

1. **Fuse Inspection**

   Check for blown main fuse or sub fuse.

   Is the fuse blown?

   YES – Replace the fuse

   NO – GO TO STEP 2.

2. **Battery Inspection**

   Make sure the battery is fully charged and in good condition.

   Is the battery in good condition?

   YES – GO TO STEP 3.

   NO – Replace the battery

3. **VS Sensor Power Input Voltage Inspection (VS Sensor Side)**

   Check for loose or poor contact of the VS sensor 3P (Black) connector.

   With the ignition switch ON, and measure the voltage at the VS sensor connector Yellow/red terminal.

   Is there Battery Voltage?

   YES – GO TO STEP 4.

   NO – • Loose or poor contact of related terminals
   • Open circuit in Yellow/red wires between the combination meter and VS sensor

4. **VS Sensor Power Input Voltage Inspection (Combination Meter Side)**

   Check for loose or poor contact of the combination meter 20P (Black) connector.

   With the ignition switch ON, and measure the voltage at bottom of the combination meter 20P (Black) connector terminal.

   Is there Battery Voltage?

   YES – GO TO STEP 5.

   NO – • Loose or poor contact of related terminals
   • Faulty combination meter

5. **VS Sensor Signal Line Inspection**

   With the ignition switch OFF, check for continuity of the Pink/blue wire between the terminals of the VS sensor and speedometer.

   Is there continuity?

   YES – GO TO STEP 6.

   NO – Open circuit in Pink/blue wire

6. **VS Sensor Signal Inspection**

   Support the motorcycle using a hoist or other support to raise the rear wheel off the ground.

   Measure the output voltage (sensor signal) at the combination meter with the ignition switch is ON while slowly turning the rear wheel by your hand (page 20-13).

   Standard: Repeat 0 to 5 V

   Is the voltage as specified?

   YES – Faulty speedometer

   NO – Faulty VS sensor

HEADLIGHT

REMOVAL/INSTALLATION

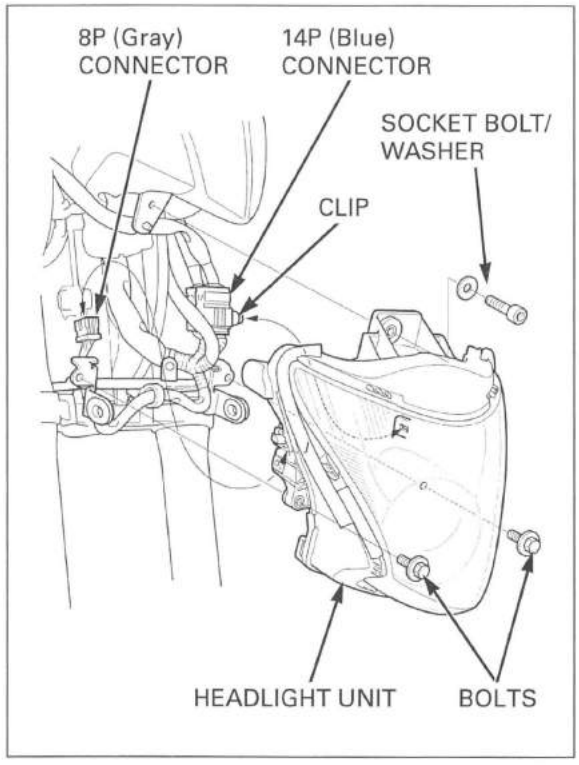
Remove the front cowl (page 2-5).

Remove the mounting bolts.
Disconnect the headlight 8P (Gray) connector and release the right handlebar switch 14P (Blue) connector clip from the headlight unit.

Remove the socket bolt, washer and headlight unit.

Installation is in the reverse order of removal.

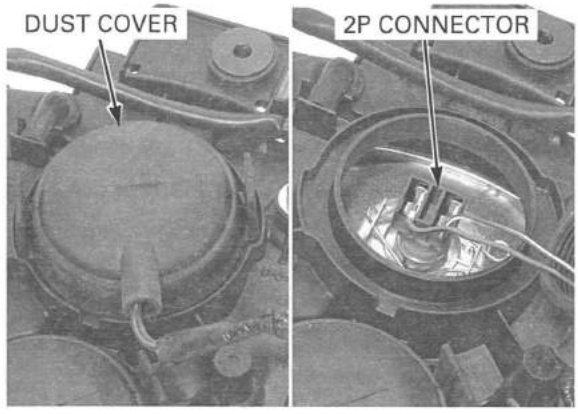
Route the wires properly (page 1-27).



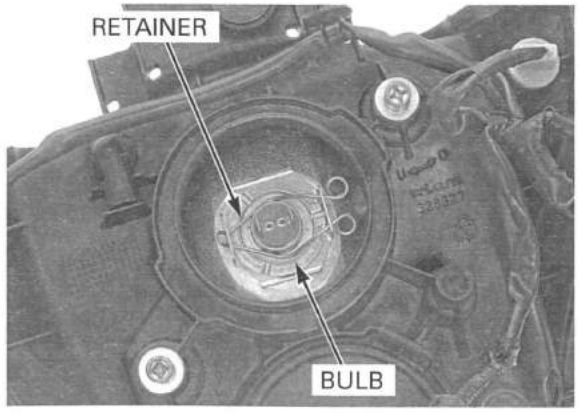
BULB REPLACEMENT

Remove the headlight unit (page 20-6).

Remove the dust cover.
Disconnect the headlight bulb 2P connector.

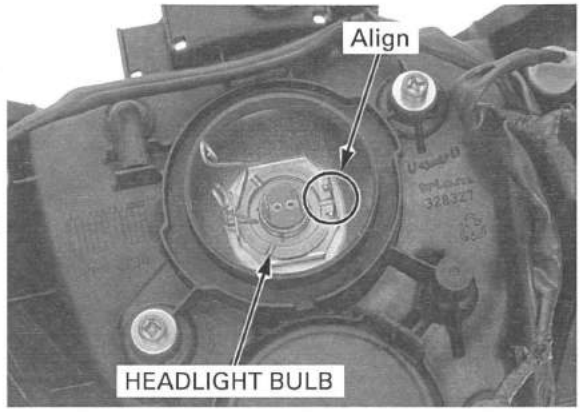


Unhook the bulb retainer and remove the headlight bulb.



Install the headlight bulb aligning its tab with the groove in the headlight unit.

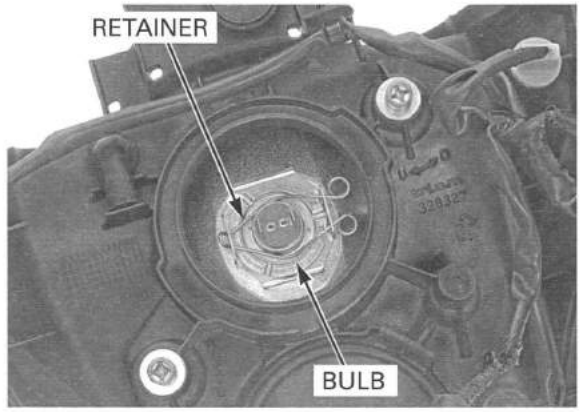
If you touch the bulb with your bare hands, clean it with cloth moistened with denatured alcohol to prevent early bulb failure.



NOTICE

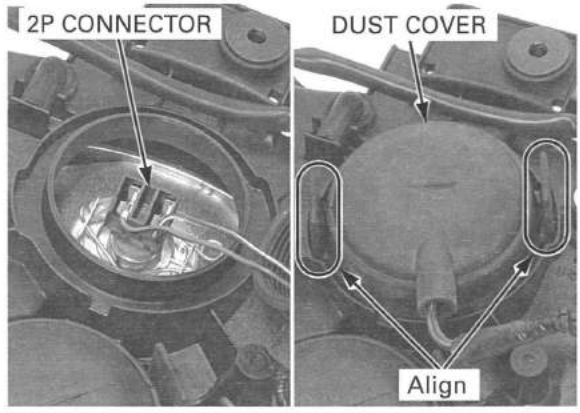
Avoid touching the halogen headlight bulb. Finger prints can create hot spots that cause a bulb to break.

Hook the bulb retainer properly.



Connect the headlight bulb 2P connector.
Install the dust cover, aligning its tabs with groove of headlight unit.

Install the headlight unit (page 20-6).



POSITION LIGHT

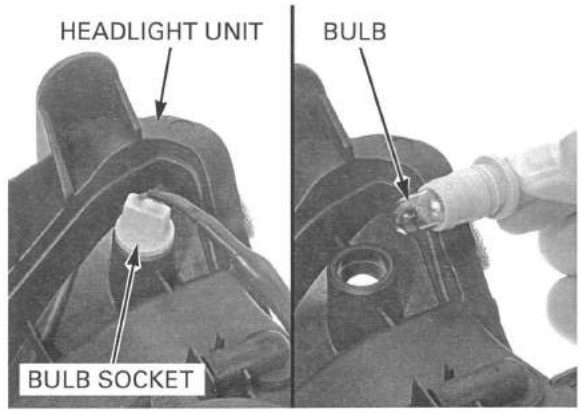
BULB REPLACEMENT

Remove the headlight unit (page 20-6).

Remove the bulb socket/position light bulb from the headlight unit.

Remove the position light bulb from the bulb socket.

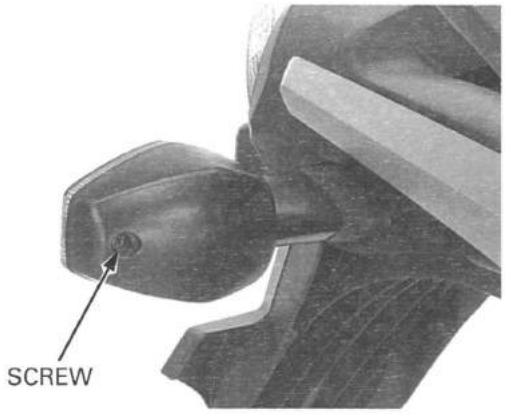
Installation is in the reverse order of removal.



TURN SIGNAL LIGHT

BULB REPLACEMENT

Remove the screw.



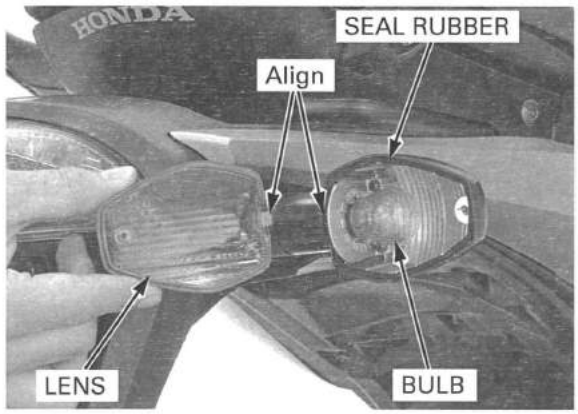
Remove the turn signal lens and seal rubber.

While pushing in, turn the bulb counterclockwise to remove it and replace with a new one.

Check the seal rubber for fatigue or damage and replace it if necessary.

At installation, align the tab of the turn signal lens with the slit of the turn signal unit.

Install the turn signal lens in the reverse order of removal.



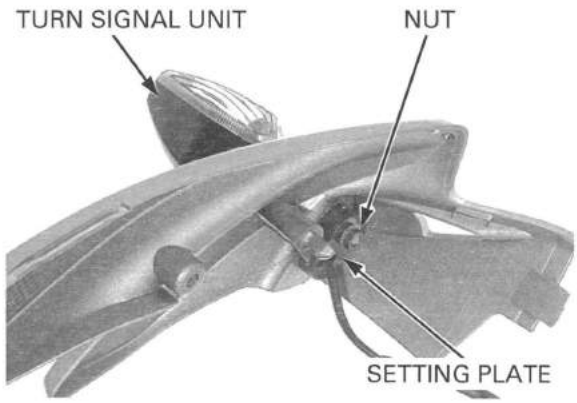
REMOVAL/INSTALLATION

FRONT TURN SIGNAL LIGHT

Remove the front cowl (page 2-5).

Remove the mounting nut, setting plate and turn signal unit.

Installation is in the reverse order of removal.



REAR TURN SIGNAL LIGHT

Remove the rear cowl (page 2-6).

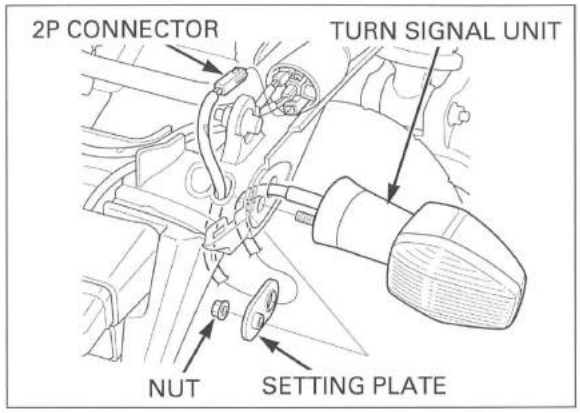
Disconnect the rear turn signal light 2P connector.

Remove the mounting nut, setting plate and turn signal unit.

Installation is in the reverse order of removal.

Tighten the mounting nut to the specified torque.

TORQUE: 5.0 N·m (0.5 kgf·m, 3.7 lbf·ft)



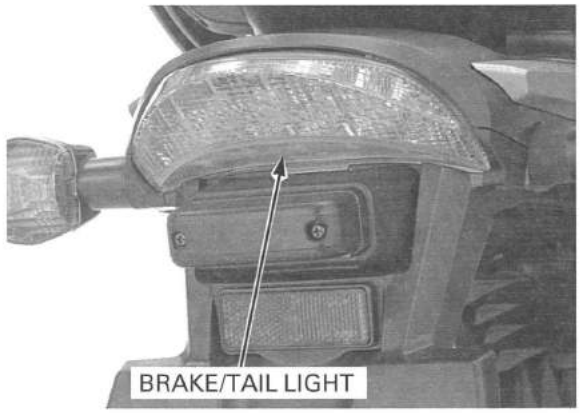
BRAKE/TAIL LIGHT

INSPECTION

Turn the ignition switch ON, and check the tail light operation.
Check that all LED in the brake/tail light unit illuminate with the front brake lever and/or rear brake pedal applied.

If any LED does not turn on, replace the brake/tail light assembly (page 2-6).

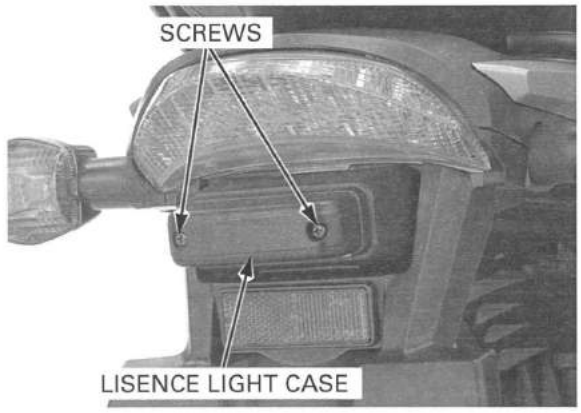
- For brake/tail light removal/installation (page 2-6).



LICENSE LIGHT

BULB REPLACEMENT

Remove the screws and license light case.



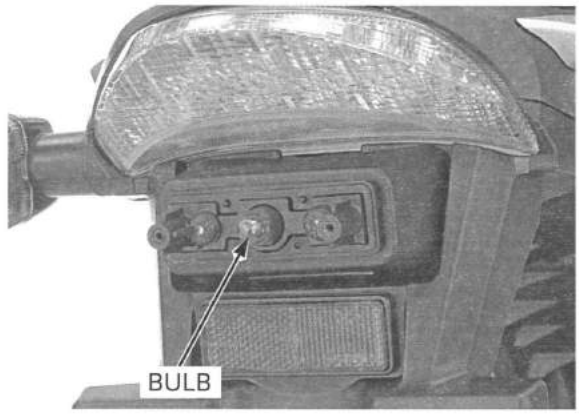
Do not turn the bulb while removing it.

Pull out the license light bulb and replace it with a new one.

Install the license light case in the reverse order of removal.

Tighten the screws to the specified torque.

TORQUE: 1.7 N·m (0.2 kgf·m, 1.3 lbf·ft)



COMBINATION METER

REMOVAL/INSTALLATION

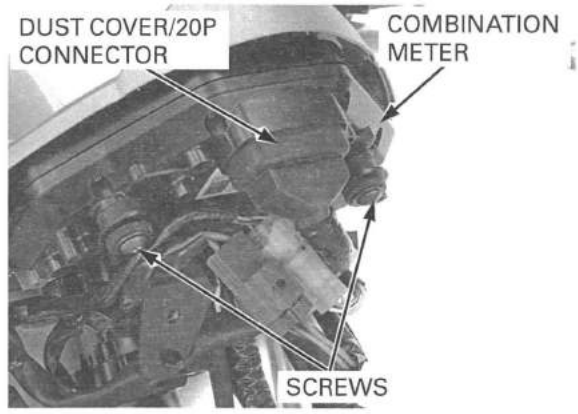
Remove the following:

- headlight unit (page 20-6)
- meter cover (page 2-5)

Remove the dust cover and disconnect the combination 20P connector.

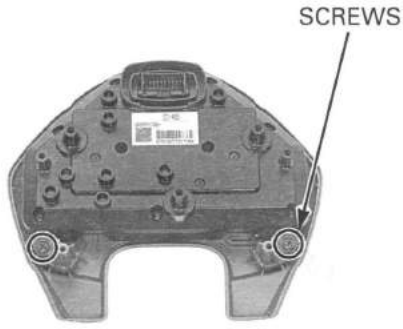
Remove the screws and combination meter.

Install the combination meter in the reverse order of the removal.

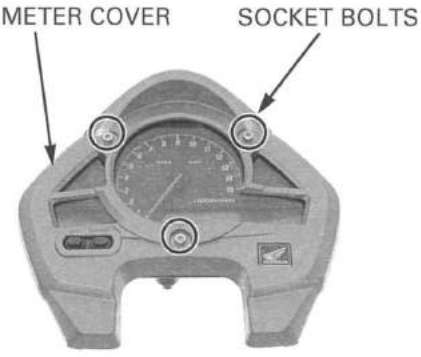


DISASSEMBLY

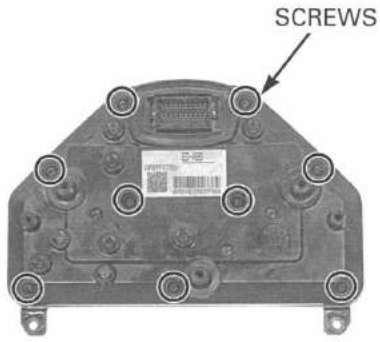
Remove the upper meter cover screws.



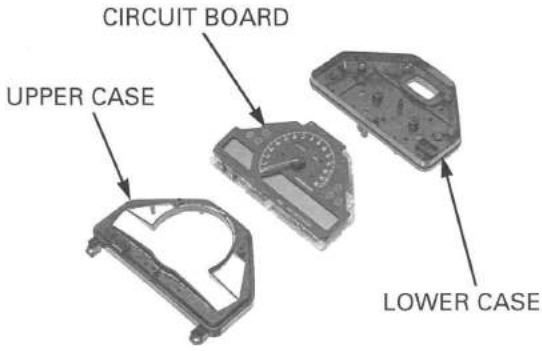
Remove the socket bolts and upper meter cover.



Remove the combination meter assembly screws.

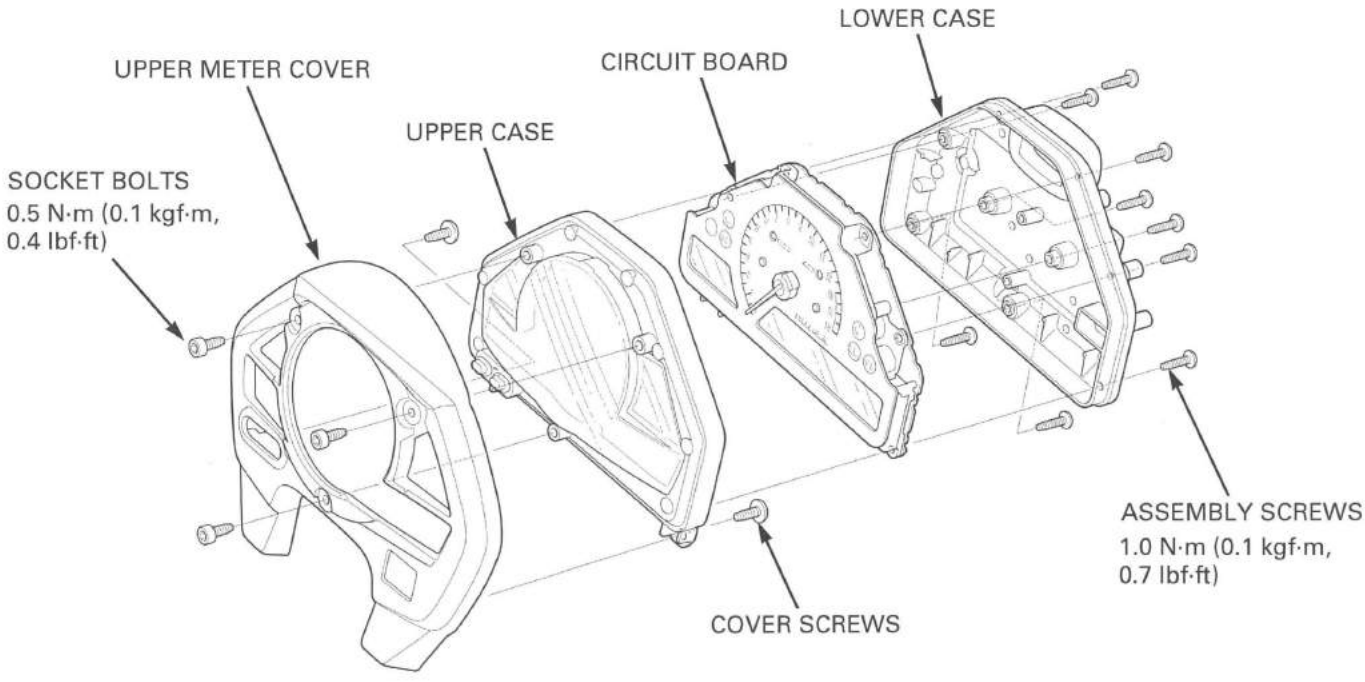


Disassemble the combination meter to the upper, lower case and the circuit board.



ASSEMBLY

Assemble the combination meter in the reverse order of disassembly.



Tighten the combination meter screws and bolts to the specified torque.

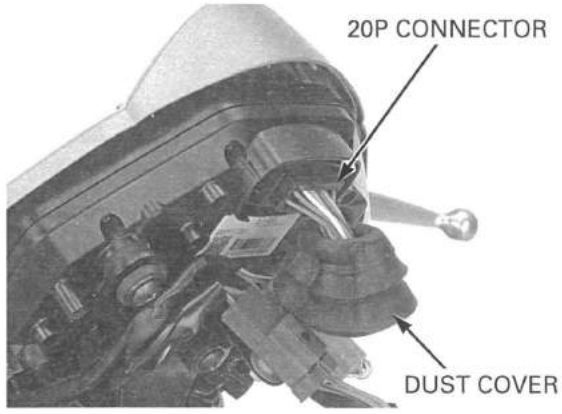
TORQUE:
Combination meter socket bolt:
0.5 N·m (0.1 kgf·m, 0.4 lbf·ft)
Combination meter assembly screw:
1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)

POWER/GROUND LINE INSPECTION

If any indication in the combination meter is abnormal, check the following item.

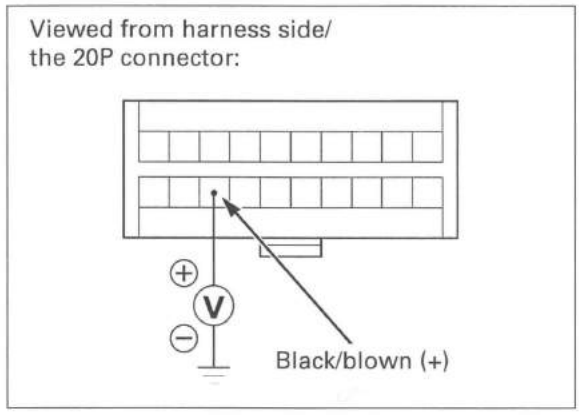
Remove the meter cover (page 2-5).
Remove the dust cover.

Check the following at the wire harness side connector terminals of the combination meter.



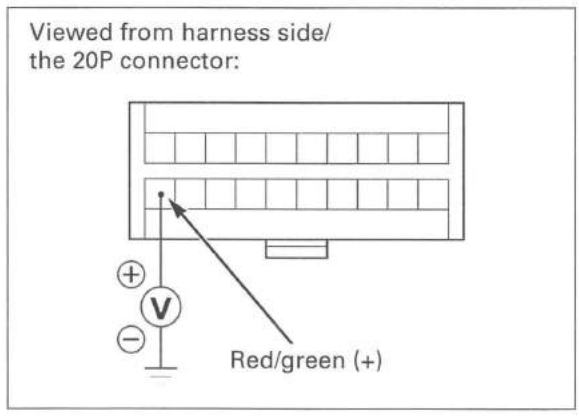
Power input line

Measure the voltage between the Black/brown wire terminal (+) and body ground (–).
There should be battery voltage with the ignition switch ON.
If there is no voltage, check for open circuit in Black/brown wire.



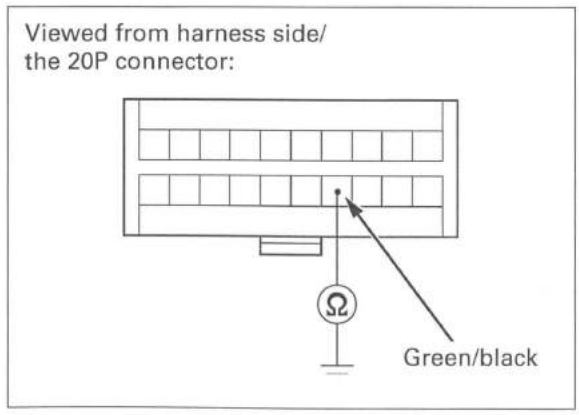
Back-up voltage line

Measure the voltage between the Red/green wire terminal (+) and body ground (–).
There should be battery voltage at all times.
If there is no voltage, check for open circuit in Red/green wire.



Ground line

Measure the continuity between the Green/black wire terminal and body ground.
There should be continuity.
If there is no continuity, check for open circuit in Green/black wire.



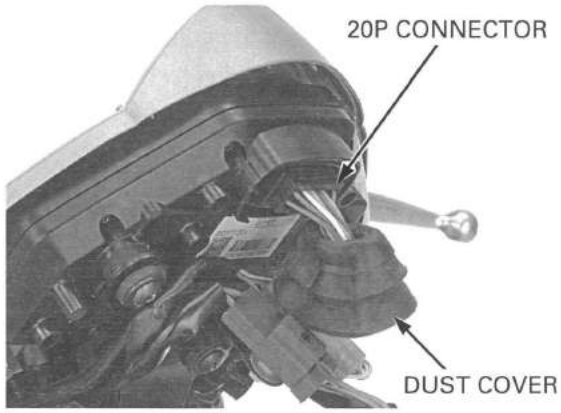
VS SENSOR

SYSTEM INSPECTION

Check that the indicators function properly.
If they do not function, perform the power and ground line inspection of the combination meter (page 20-12).

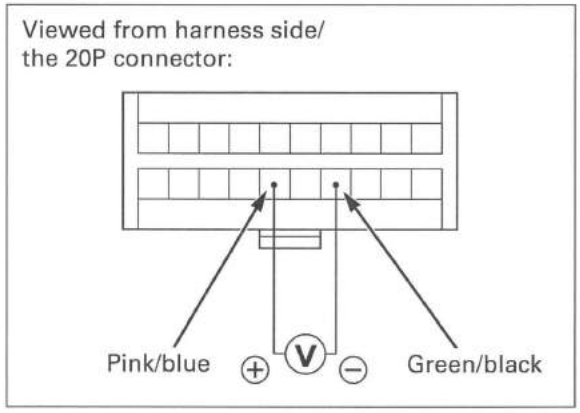
Remove the meter cover (page 2-5).
Remove the dust cover.

Support the motorcycle securely using a safety stand or hoist, and raise the rear wheel off the ground.



Shift the transmission into neutral and turn the ignition switch ON.
Measure the voltage between the Pink/blue (+) and Green/black (–) wire terminals of the wire harness side connector.
Slowly turn the rear wheel by hand.
There should be 0 to 5 V pulse voltage.

- If pulse voltage appears, replace the combination meter circuit board (page 20-10).
- If pulse voltage does not appear, check for open or short circuit in the Pink/blue and Green/black wires.
  If the wire are OK, check the VS sensor (page 20-13).



VS SENSOR INSPECTION

Remove the air cleaner housing (page 5-61).

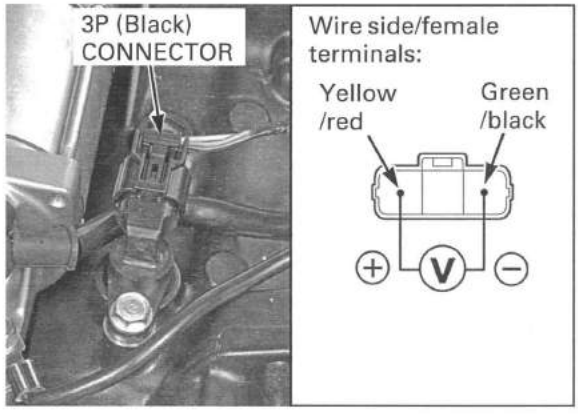
Disconnect the VS sensor 3P (Black) connector.
Turn the ignition switch to ON and measure the voltage between the Yellow/red (+) and Green/black (–) wire terminals at the harness side 3P connector.

CONNECTION: Yellow/red (+) – Green/black (–)
STANDARD: Battery voltage

There should be battery voltage.

If there is no voltage, check for open circuit in related wires.

If the speedometer does not operate, check the speedometer inspection (page 20-12).
Then check the VS sensor power line inspection.
If the speedometer and wire harness between the speedometer and VS sensor are normal, replace the VS sensor (page 20-14).

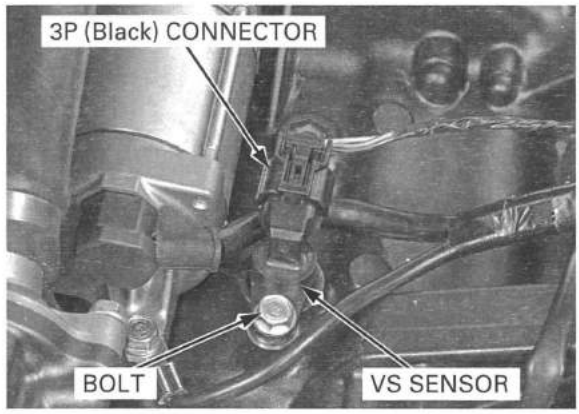


REMOVAL/INSTALLATION

Remove the air cleaner housing (page 5-61).

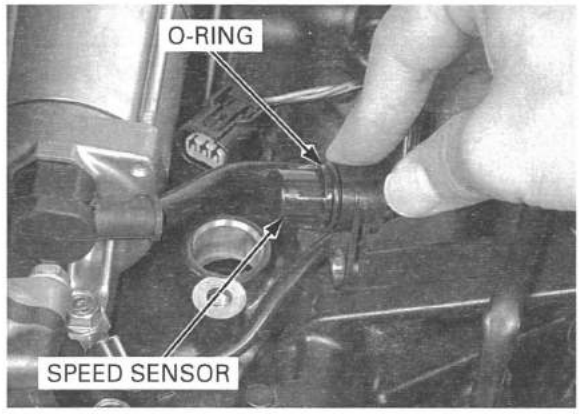
Disconnect the VS sensor 3P (Black) connector.

Remove the bolt and VS sensor.



Check the O-ring is in good condition, replace if necessary.

Installation is in the reverse order of removal.

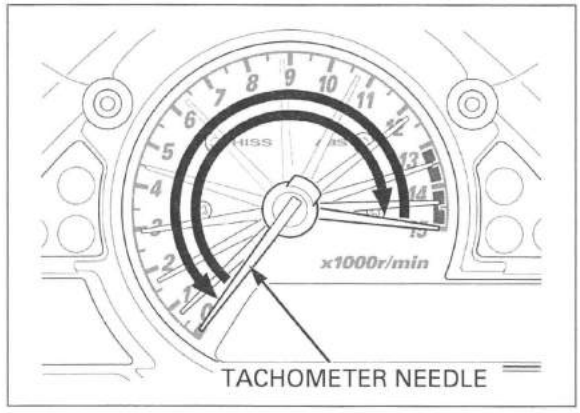


TACHOMETER

SYSTEM INSPECTION

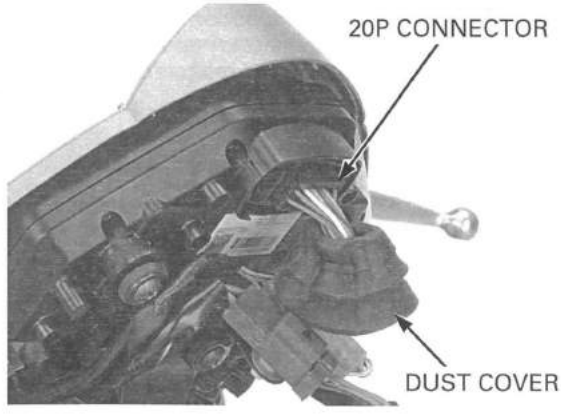
When the ignition switch is turned ON, check that the tachometer needle moves to full scale and then returns to zero.

If the needle does not show initial function, check for combination meter power input line (page 20-12).



Remove the meter cover (page 2-5).
Remove the dust cover.

Check for loose or poor contact terminals at the combination meter 20P connector.



Connect the peak voltage adaptor or Imrie diagnostic tester probe to the combination meter 20P connector Yellow/green (+) and Green/black (–) terminals.

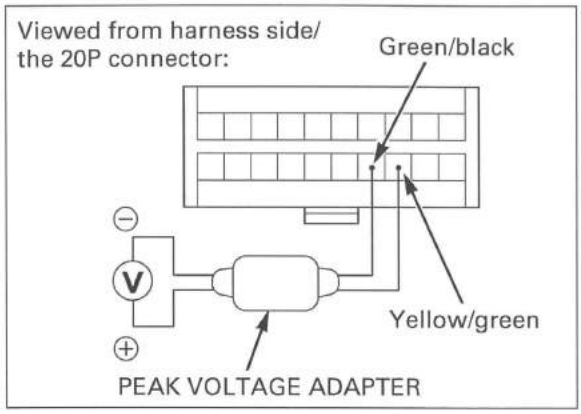
TOOLS:
Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimedia (impedance 10 MΩ/DCV minimum)

CONNECTION: Yellow/green (+) – Green/black (-)

Start the engine and measure the tachometer input peak voltage.

PEAK VOLTAGE: 10.5 V minimum

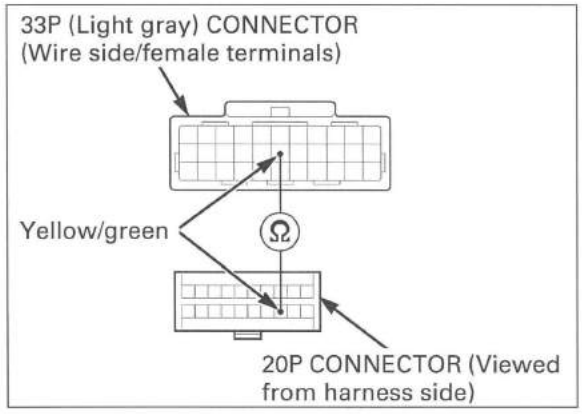
If the peak voltage is normal, replace the combination meter circuit board (page 20-10).
If the measured value is below 10.5 V, replace the ECM (page 5-96).



If the value is 0 V, check for continuity between the combination meter 20P connector and ECM 33P (Light gray) connector Yellow/green terminals.

TOOL:
Test probe 07ZAJ-RDJA110

If there is no continuity, check the wire harness for an open circuit.
If there is continuity, replace the ECM (page 5-96).



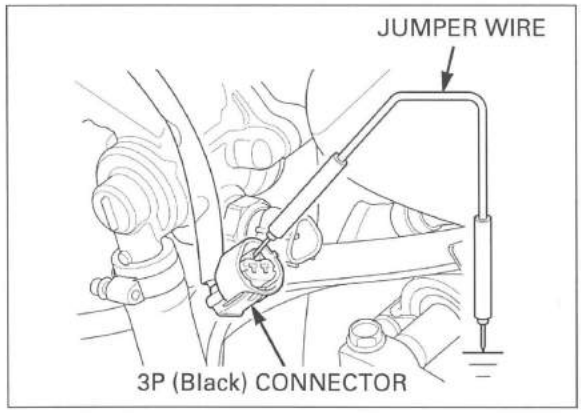
ENGINE COOLANT TEMPERATURE INDICATOR/ECT SENSOR

SYSTEM INSPECTION

If the engine coolant temperature indicates too high or too low temperature in spite of normal engine coolant temperature, inspect the following.

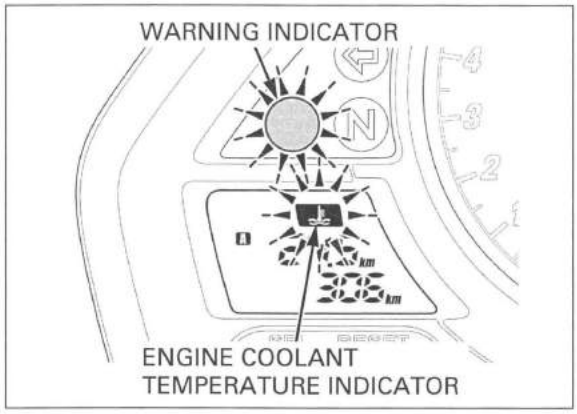
Disconnect the ECT sensor 3P (Black) connector from the sensor.

Ground the Green/blue wire terminal of the ECT sensor 3P connector wire harness side with a jumper wire.



Turn the ignition switch to "ON" and check the engine coolant temperature and warning indicators.

- If the engine coolant temperature and warning indicators light as over heat (shown in the right illustration), inspect the ECT sensor (page 20-16).
- If the engine coolant temperature and warning indicators do not light, check the following.
  - Open circuit in the ECT sensor (Green/blue) wire
  - Faulty combination meter



ECT SENSOR INSPECTION

Remove the ECT sensor (page 5-94).

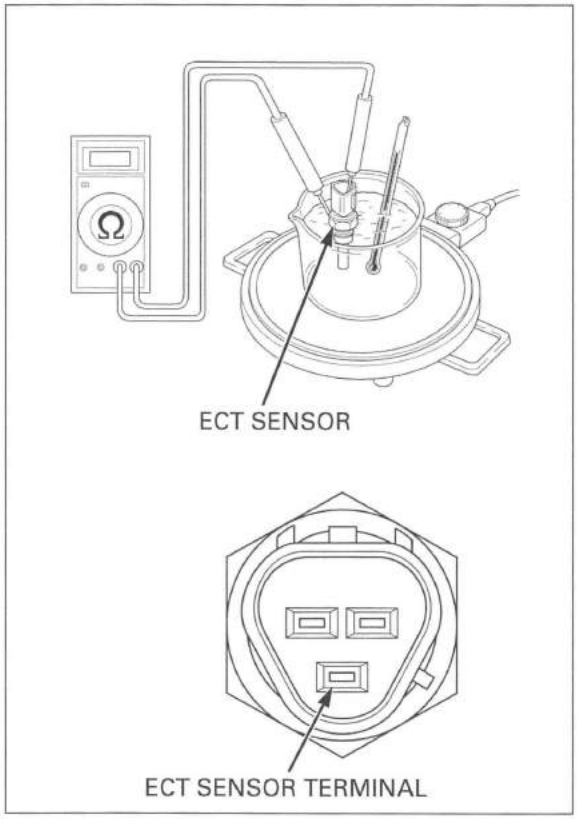
Suspend the ECT sensor in a pan of coolant (1:1 mixture) an electric heating element and measure the resistance through the sensor as the coolant heats up.

- Soak the ECT sensor in coolant up to its threads with at least 40 mm (1.6 in) from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer or ECT sensor touch the pan.

Replace the sensor if it is out of specification by more than 10% at any temperature listed.

Temperature	80°C (68°F)	120°C (248°F)
Resistance	2.1 – 2.6 kΩ	0.65 – 0.73 kΩ

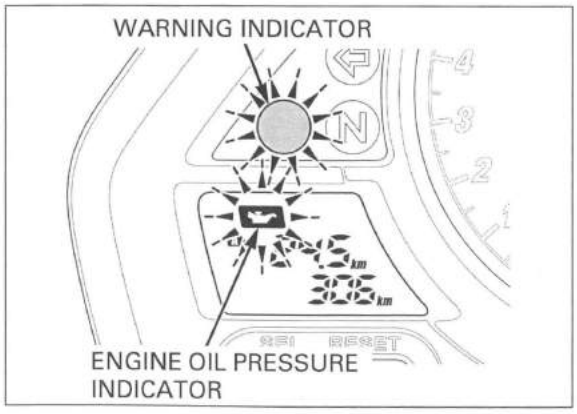
Install the ECT sensor (page 5-94).



ENGINE OIL PRESSURE INDICATOR/ EOP SWITCH

INSPECTION

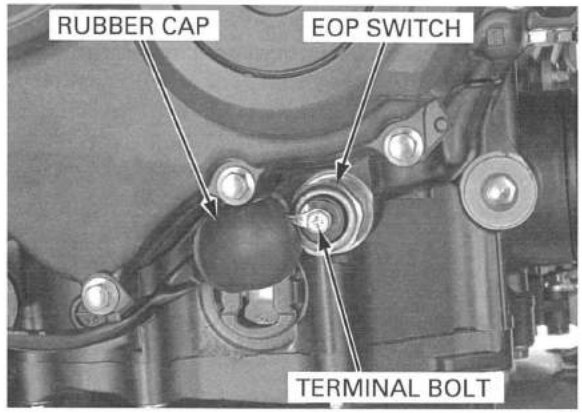
If the engine oil pressure and warning indicators stay on while the engine running in spite of the normal engine oil condition and level, check the following.



Remove the rubber cap, and disconnect the EOP switch wire by removing the terminal bolt.

Start the engine, check that the engine oil pressure and warning indicators.

- If the indicators come on, check the following.
  - Short circuit in the EOP switch (Blue/red) wire
  - Faulty combination meter
- If the indicators do not come on, replace the EOP switch.

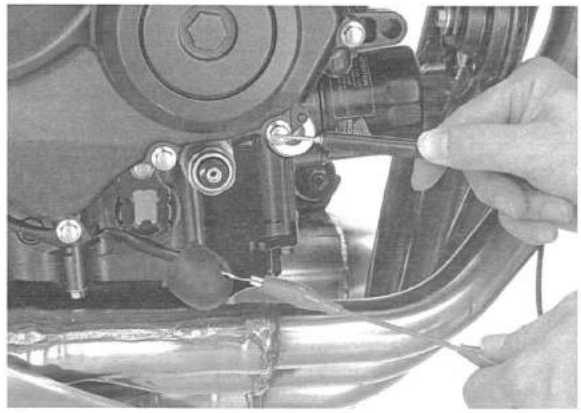


If the engine oil pressure and warning indicators do not function, check the following:

Remove the rubber cap, and disconnect the EOP switch wire by removing the terminal bolt.
Ground the wire terminal to the engine using a jumper wire.

Start the engine and check the engine oil pressure and warning indicators.

- If the indicators come on, replace the EOP switch.
- If the indicators still do not function, check the following:
  - open circuit in the EOP switch (Blue/red) wire
  - faulty combination meter

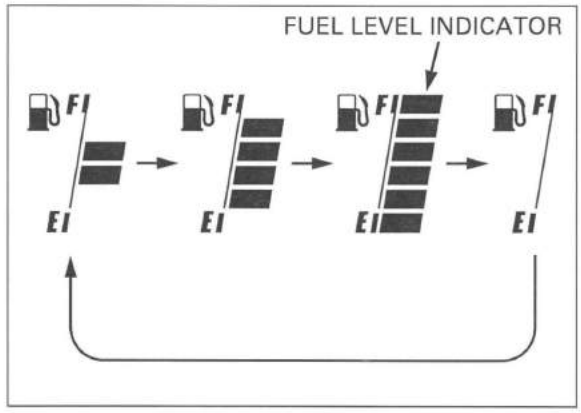


FUEL LEVEL INDICATOR

SYSTEM INSPECTION

OPEN CIRCUIT IN THE FUEL LEVEL SYSTEM

If the fuel level indicator indicates as shown in the right illustration, there are some open circuits in the fuel level indicator system. Check the open circuit as follows.

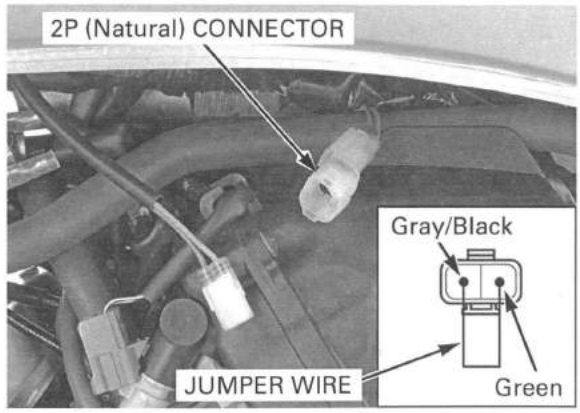


Lift and support the fuel tank (page 3-5).

Jump the Gray/black and Green wire terminals of the fuel level sensor 2P (Natural) connector with harness side using a jumper wire.

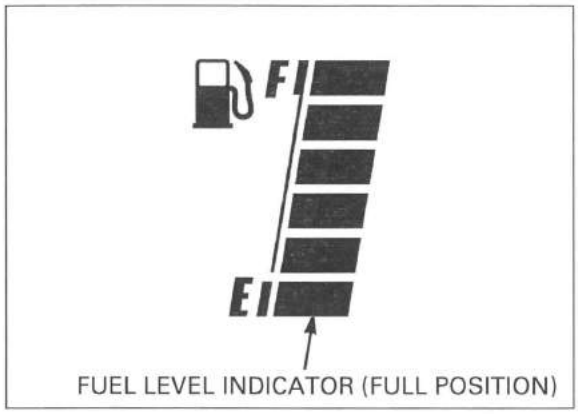
Turn the ignition switch to "ON" and check the fuel level indicator.

- If the fuel level indicator still indicates as open circuit indication, check the following.
  - Open circuit in the Gray/black and Green wires between the combination meter and the fuel level sensor
  - Faulty combination meter circuit board (page 20-10)
- If the indicator indicates as "FULL", inspect the fuel level sensor.



SHORT CIRCUIT IN THE FUEL LEVEL SYSTEM

If the fuel level indicator indicates the right illustration (full fuel level) in spite of an empty fuel level, check the fuel level system for short circuit.



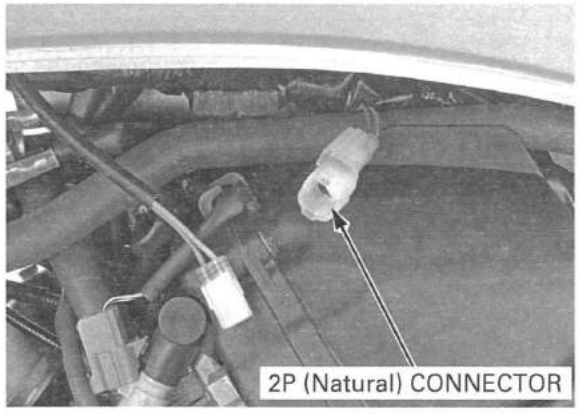
FUEL LEVEL INDICATOR (FULL POSITION)

Lift and support the fuel tank (page 3-5).

Disconnect the fuel level sensor 2P (Natural) connector.

Turn the ignition switch to "ON".

- If the fuel level indicator indicates as open circuit indication, inspect the fuel level sensor.
- If the indicator indicates as "FULL", check the following.
  - Short circuit in the Gray/black wire between the combination meter and the fuel level sensor
  - Faulty combination meter circuit board (page 20-10)



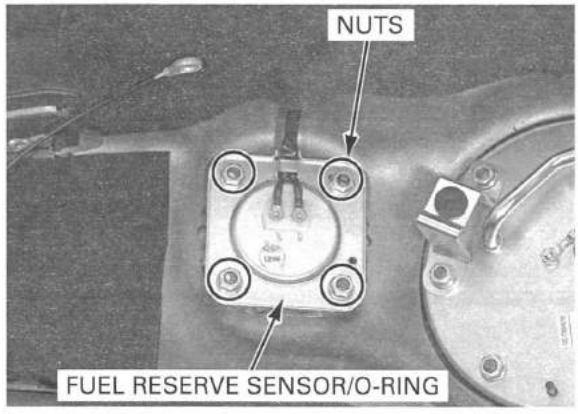
FUEL LEVEL SENSOR

REMOVAL/INSTALLATION

Remove the fuel tank (page 5-58).

Be careful not to damage or bend the reserve sensor arm.

Remove the nuts, fuel reserve sensor and O-ring.

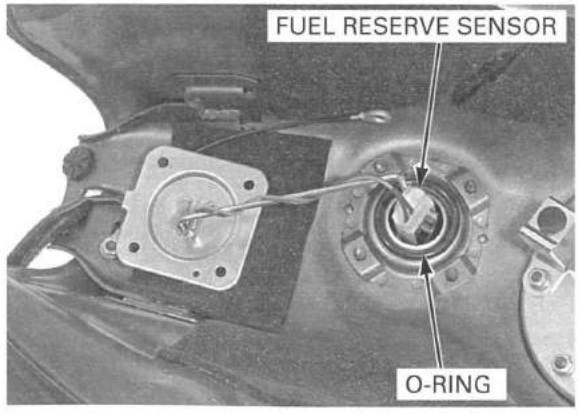


Check the O-ring is in good condition and replace if necessary.

Be careful not to damage or bend the reserve sensor arm.

Install the fuel reserve sensor into the fuel tank.

Installation is in the reverse order of removal.

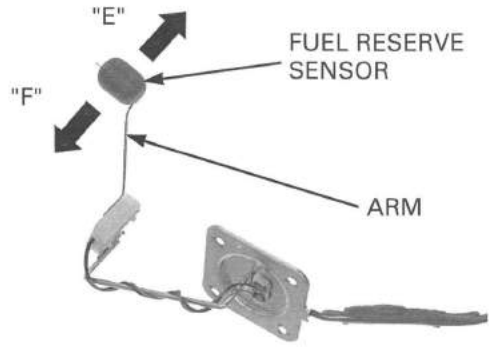


INSPECTION

Check the fuel level sensor and arm for damage.

Measure the resistance at the fuel level sensor 2P (Natural) connector terminal with moving the float at the top "F" and bottom "E" position.

	TOP "F"	BOTTOM "E"
Resistance	8 – 12 Ω	234 – 240 Ω

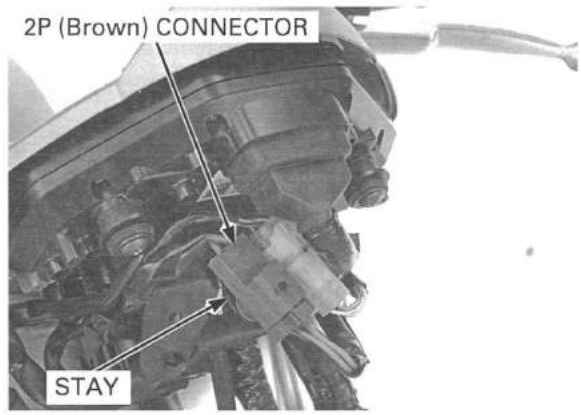


IGNITION SWITCH

INSPECTION

Remove the headlight unit (page 20-6).

Release the ignition switch 2P (Blown) connector from the meter stay.
Disconnect the ignition switch 2P (Brown) connector.



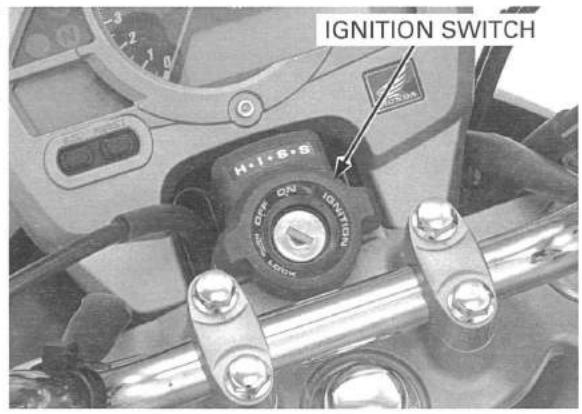
Check for continuity between the wire terminals of the ignition switch connector in each switch position.

Continuity should exist between the color coded wires as follows:

IGNITION SWITCH:

	BAT 1	IG	BAT 2	HAZ	KEY
HAZ			○—○	○—○	KEY ON
ON	○—○		○—○	○—○	KEYON
OFF					KEY OFF
LOCK					KEY OFF LOCK PIN

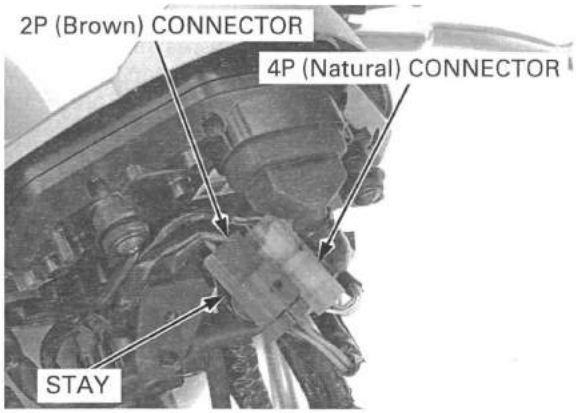
COMMON



REMOVAL/INSTALLATION

Remove the headlight unit (page 20-6).

Release the immobilizer receiver 4P (Natural) and ignition switch 2P (Blown) connectors from the meter stay.
Disconnect the ignition switch 2P (Brown) connector.

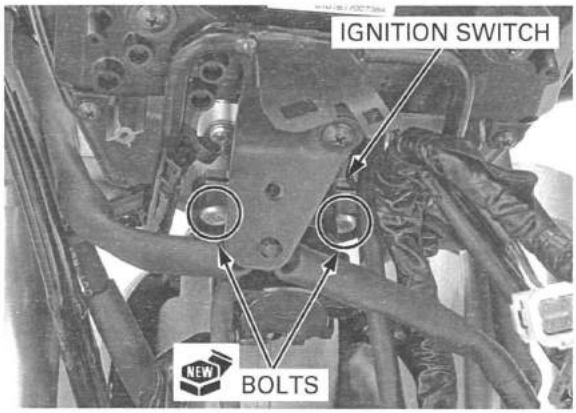


Remove the bolts and ignition switch.

Install the ignition switch to the top bridge.
Tighten new ignition switch mounting bolts to the specified torque.

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)

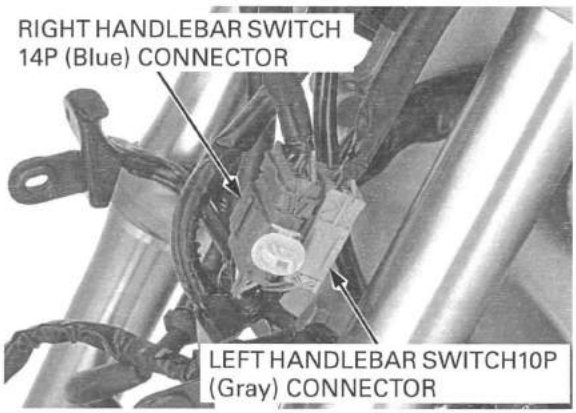
Install the removed parts in the reverse order of removal.



HANDLEBAR SWITCHES

Remove the headlight unit (page 20-6).

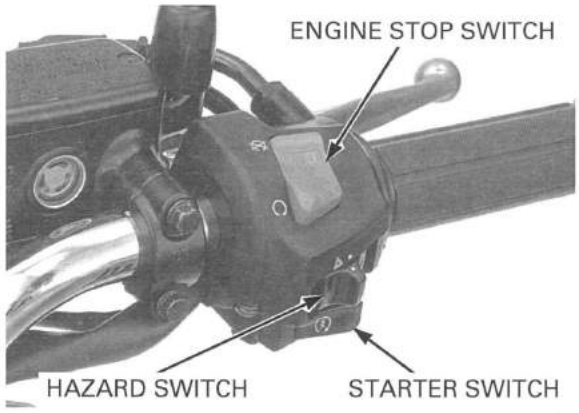
Disconnect the handlebar switch (Blue and Gray) connectors.



RIGHT HANDLEBAR SWITCH

Check for right handle switch continuity between the wire terminals of the handlebar switch connector.

Continuity should exist between the terminals as follows:



RIGHT HANDLEBAR SWITCH:

ENGINE STOP SWITCH

	IG	BAT2
OFF		
RUN	○—○	
COLOR	Bl/W	Bl

STARTER SWITCH

	ST	IG	BAT4	HL
FREE			○—○	
PUSH	○—○			
COLOR	Y/R	Bl/W	Bl/R	Bu/W

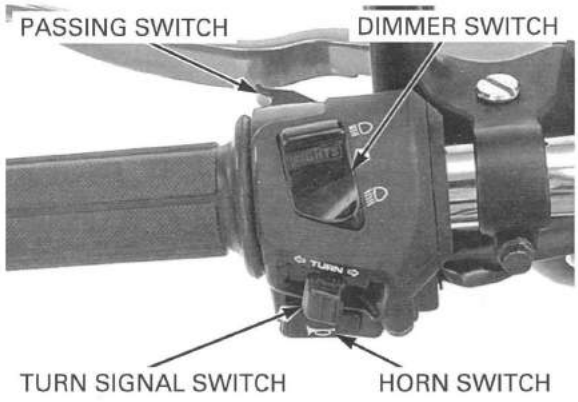
HAZARD SWITCH

	W	R	L
OFF			
ON	○—○—○		
COLOR	Gr	Lb	O

LEFT HANDLEBAR SWITCH

Check for left handle switch continuity between the wire terminals of the handlebar switch connector.

Continuity should exist between the terminals as follows:



LEFT HANDLEBAR SWITCH:

TURN SIGNAL SWITCH

	W	R	L
R	○—○		
N			
L	○———○		
COLOR	Gr	Lb	O

PASSING SWITCH

	BAT4	Hi
FREE		
PUSH	○—○	
COLOR	Bu/W	

DIMMER SWITCH

	HL	Lo	Hi
Lo	○—○		
(N)	○—○—○		
Hi	○———○		
COLOR	Bu/W		Bu

HORN SWITCH

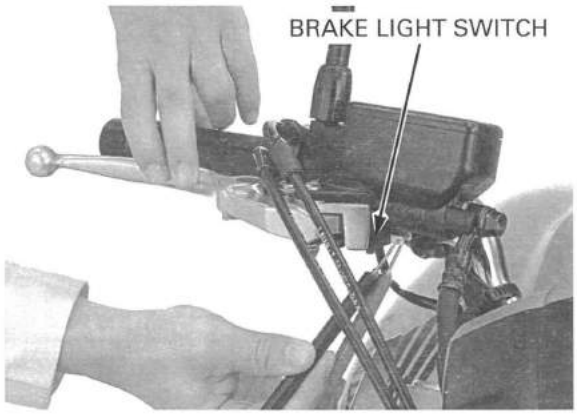
	Ho	BAT3
FREE		
PUSH	○—○	
COLOR	Lg	Bl/G

BRAKE LIGHT SWITCH

FRONT

Disconnect the front brake light switch connectors and check for continuity between the terminals.

There should be continuity with the brake lever applied, and there should be no continuity with the brake lever is released.

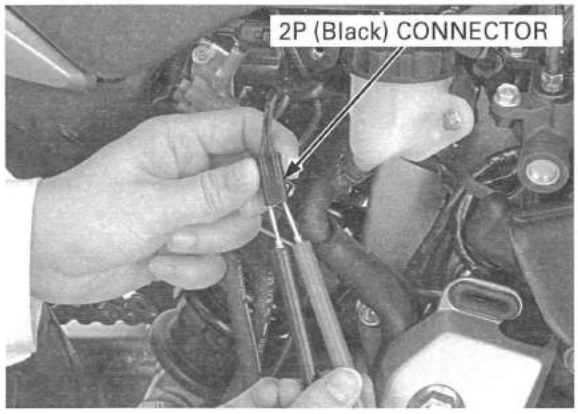


REAR

Remove the right side cover (page 2-4).

Disconnect the rear brake light switch 2P (Black) connector and check for continuity between the terminals.

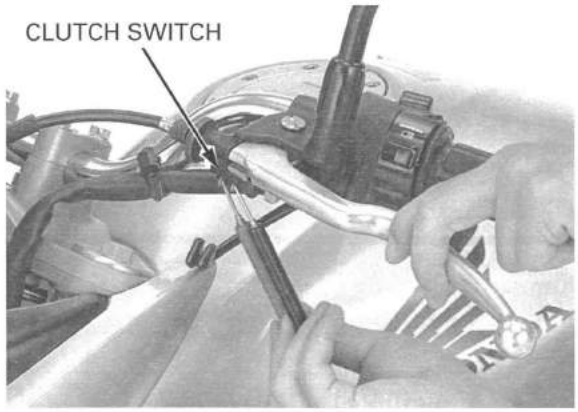
There should be continuity with the brake pedal applied, and there should be no continuity with the brake pedal is released.



CLUTCH SWITCH

Disconnect the clutch switch connectors and check for continuity between the terminals.

There should be continuity with the clutch lever applied, and there should be no continuity with the clutch lever is released.



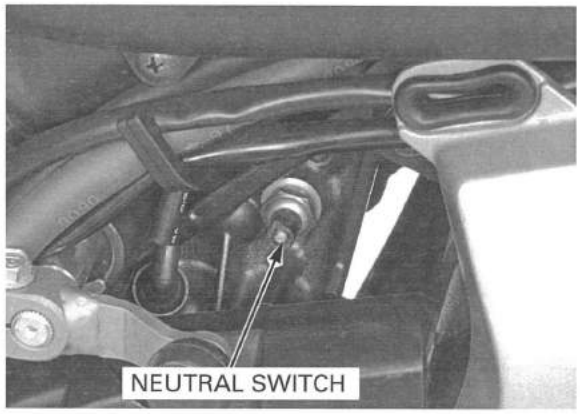
NEUTRAL SWITCH

INSPECTION

Disconnect the neutral switch connector from the switch.

Shift the transmission into neutral and check for continuity between the neutral switch terminal and ground.

There should be continuity with the transmission is in neutral, and no continuity when the transmission is into gear.



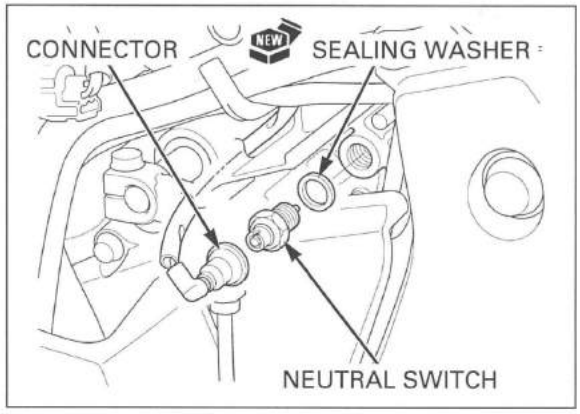
REMOVAL/INSTALLATION

Disconnect the neutral switch connector from the switch.
Remove the neutral switch and sealing washer.

Install the neutral switch with a new sealing washer. Tighten the neutral switch to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the neutral switch connector to the switch.

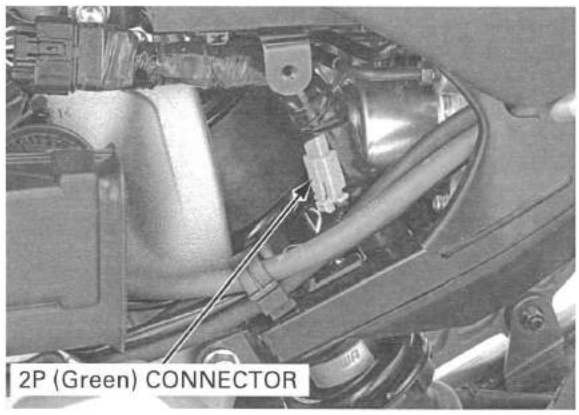


SIDESTAND SWITCH

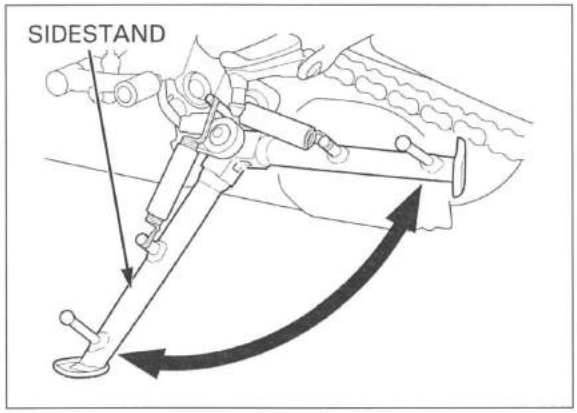
INSPECTION

Remove the left side cover (page 2-4).

Disconnect the sidestand switch 2P (Green) connector.



Check for continuity between the wire terminals of the sidestand switch 2P (Green) connector.
Continuity should exist only when the sidestand is UP.

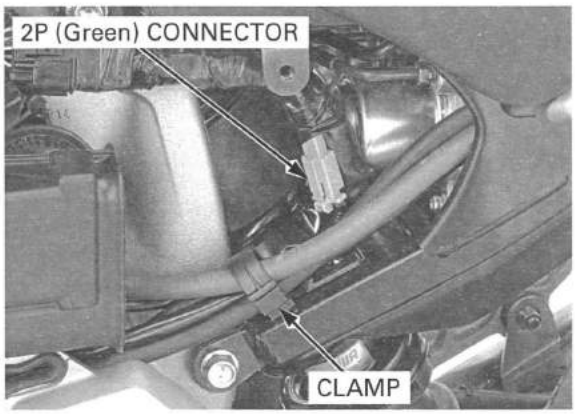


REMOVAL/INSTALLATION

Remove the left side cover (page 2-4).

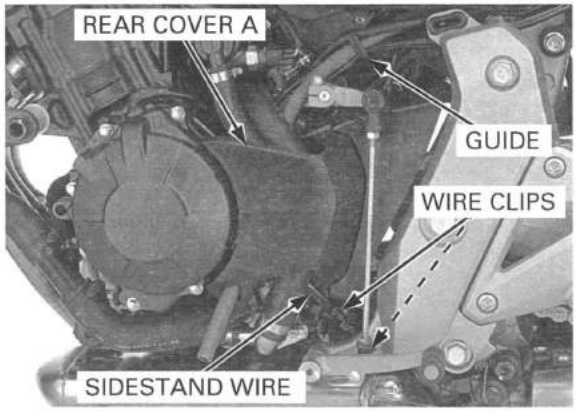
Disconnect the sidestand switch 2P (Green) connector.

Release the sidestand switch wire from the clamp.



Remove the crankcase rear cover A.

Unhook the sidestand wire from the guide.
Release the sidestand wire clips from the crankcase rear cover B and left pivot bracket.

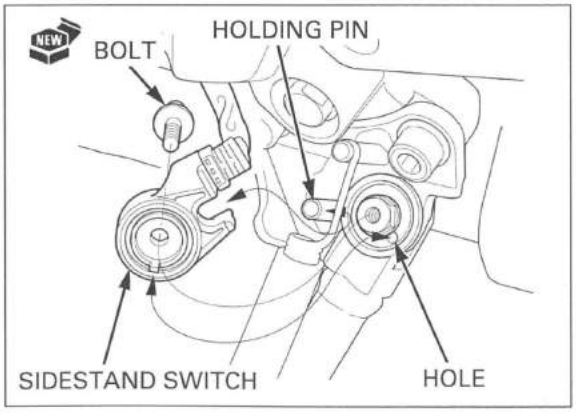


Remove the bolt and sidestand switch.

Install the sidestand switch by aligning the switch pin with the sidestand hole and the switch groove with the holding pin.
Secure the sidestand switch with a new bolt.

Install the removed parts in the reverse order of removal.

Route the sidestand wire properly (page 1-23).

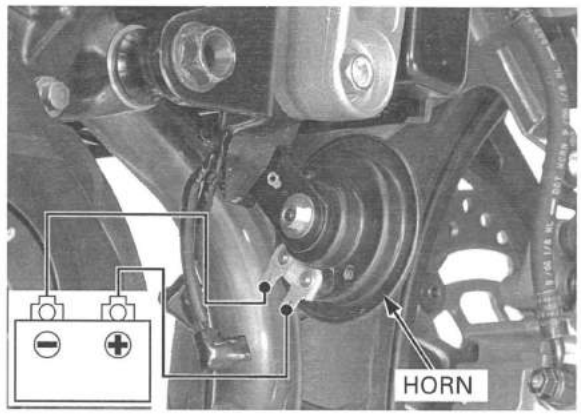


HORN

INSPECTION

Disconnect the wire connectors from the horn.

Connect the 12V battery to the horn terminal directly and check the horn sound.

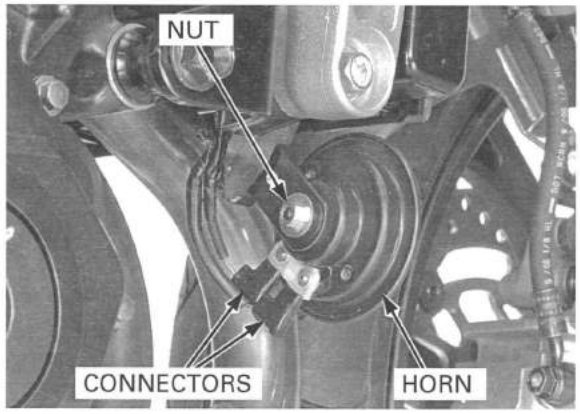


REMOVAL/INSTALLATION

Disconnect the wire connectors from the horn.

Remove the nut and horn.

Installation is in the reverse order of removal.



TURN SIGNAL RELAY

INSPECTION

1. **Related Circuit Inspection**

   Check the following:
   - burned bulb or non-specified wattage
   - blown fuse
   - ignition switch and turn signal switch function
   - loose connectors

   Check for the above items.

   Are the above items in good condition?

   YES – GO TO STEP 2.

   NO – Replace or repair the malfunction part(s)

2. **Turn Signal Circuit Inspection**

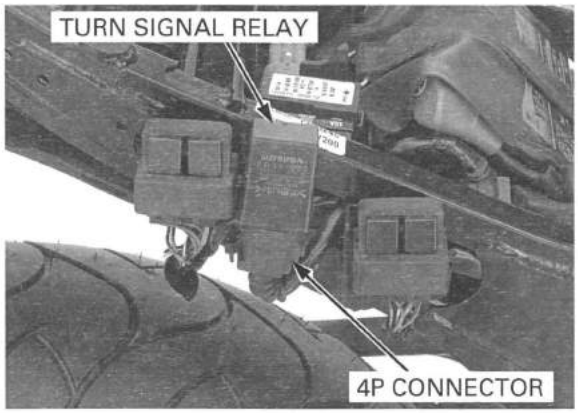
Remove the rear cowl (page 2-6).

Disconnect the turn signal 4P connector and short the Gray and White/green terminals of the wire harness side connector with a jumper wire. Turn the ignition switch ON and check the turn signal light by turning the turn signal switch on.

Does the light come on?

YES – GO TO STEP 3.

NO – Open circuit in related wires



3. **Ground Line Inspection**

Check the continuity between the 4P connector Green terminal and ground.

Is there continuity?

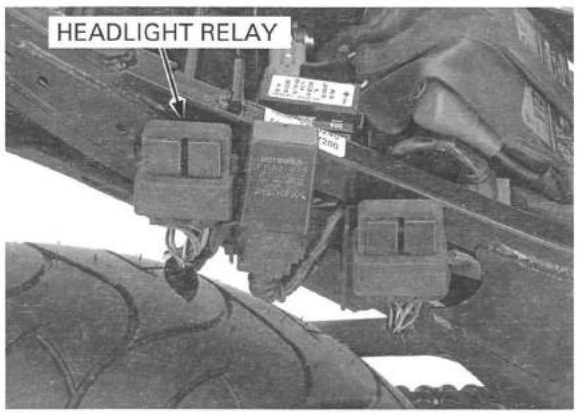
YES – • Faulty turn signal relay
• Loose or poor contact of the connector terminals

NO – Open circuit in Green wire

HEADLIGHT RELAY

Remove the rear cowl (page 2-6).

Remove the headlight relay from the rubber holder. Disconnect the headlight relay 4P connector.



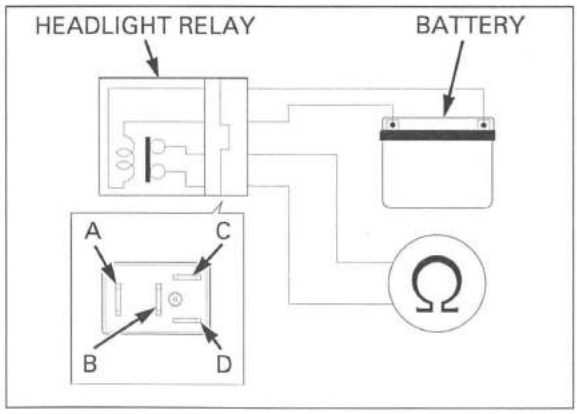
Connect the ohmmeter to the headlight relay connector terminals.

CONNECTION: A (Black/red) – B (Blue/black)

Connect the 12 V battery to the following headlight relay connector terminals.

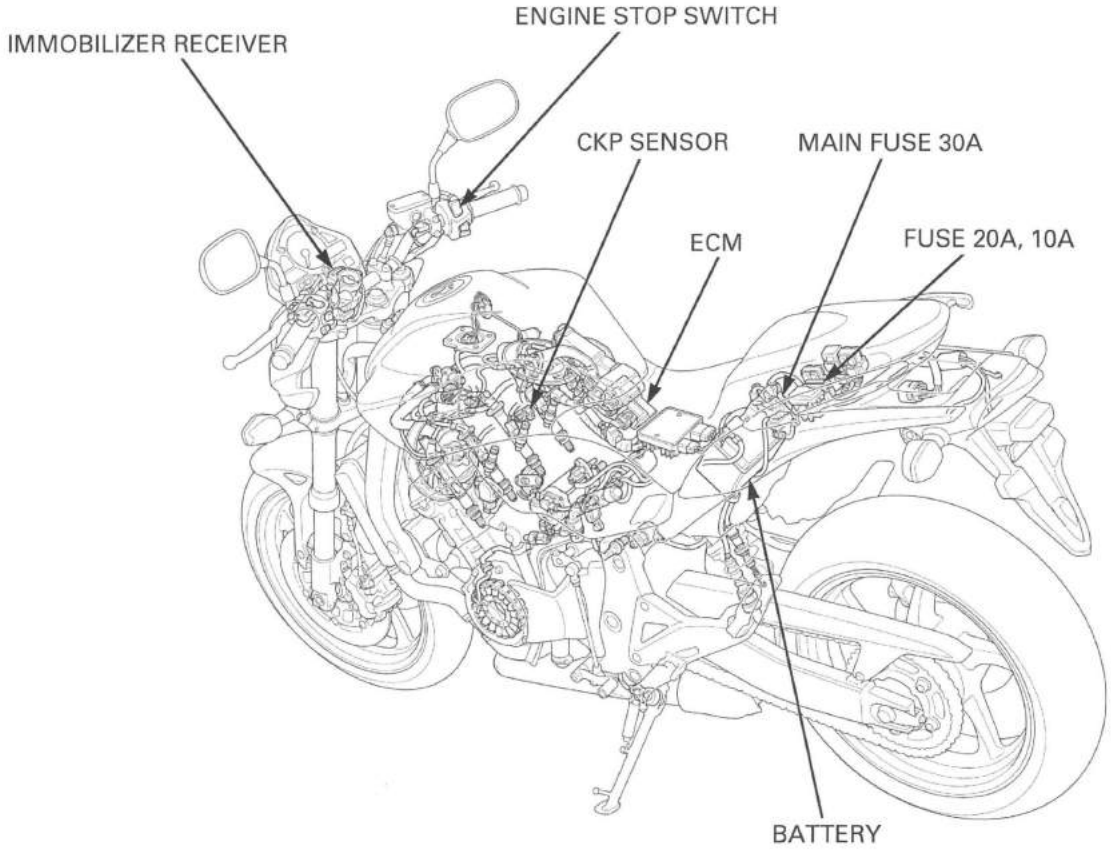
CONNECTION: C (Blue) – D (Green)

There should be continuity when the 12 V battery is connected.
If there is no continuity when the 12 V battery is connected, replace the headlight relay.

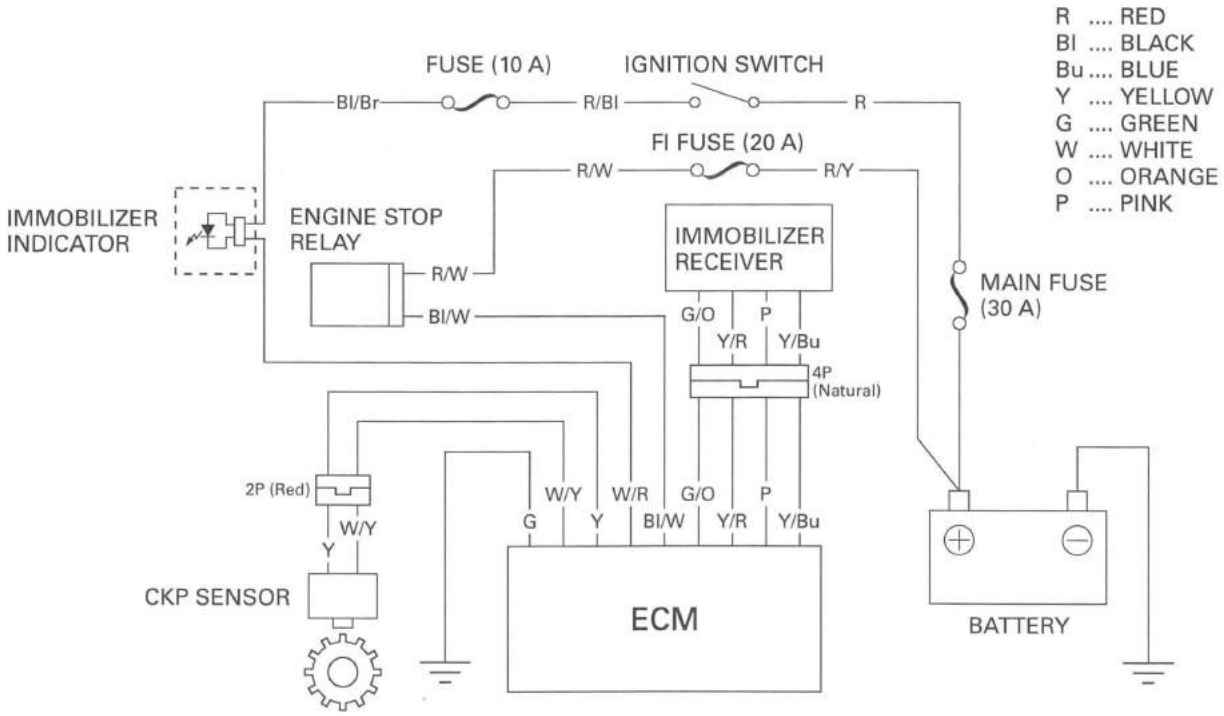


21. IMMOBILIZER SYSTEM (HISS)

COMPONENT LOCATION



SYSTEM DIAGRAM

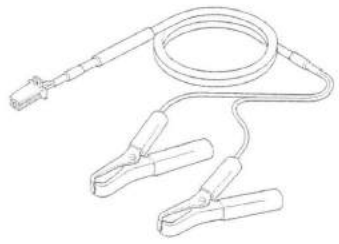
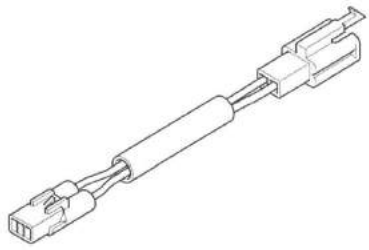
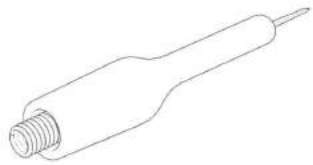


SERVICE INFORMATION

GENERAL

- HISS is the abbreviation of Honda Ignition Security System.
- When checking the immobilizer system (HISS), follow the steps in the troubleshooting (page 21-9).
- Keep the immobilizer key away from the other vehicle's immobilizer key when using it. The jamming of the key code signal may occur and the proper operation of the system will be obstructed.
- The key has built-in electronic part (transponder). Do not drop and strike the key against a hard material object, and do not leave the key on the dashboard in the car, etc. where the temperature will rise. Do not leave the key in the water for a prolonged time such as by washing the clothes.
- The ECM as well as the transponder keys must be replaced if all transponder keys have been lost.
- The system does not function with a duplicated key unless the code is registered into the transponder with the immobilizer system (HISS).
- The ECM can store up to four key codes. (The four keys can be registered.)
- Do not modify the immobilizer system as it can cause the system failure. (The engine cannot be started.)
- For ignition system inspection (page 18-5).
- For ignition switch servicing (page 20-19).

TOOLS

Inspection harness 07XMZ-MBW0101 	Test harness adaptor 070MZ-MEC0101 	Test probe 07ZAJ-RDJA110 

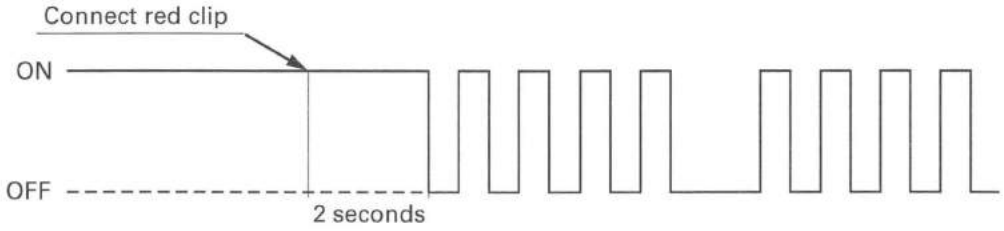
KEY REGISTRATION PROCEDURES

When the key has been lost, or additional spare key is required:

1. Obtain a new transponder key.
2. Grind the key in accordance with the shape of the original key.
3. Apply 12 V battery voltage to the CKP sensor lines of the ECM using the special tool (page 21-7).
4. Turn the ignition switch to "ON" with the original key. The immobilizer indicator comes on and it remains on.

- The code of the original key recognized by the ECM.
- If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 21-7).

5. Disconnect the red clip of the inspection adaptor from the battery positive (+) terminal for two seconds or more, then connect it again. The indicator remains on for approx. two seconds, then it blinks four times repeatedly.

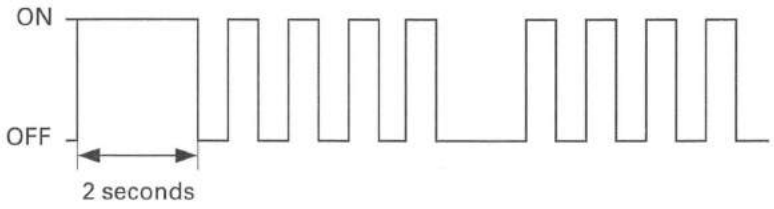


- The immobilizer system (HISS) enters the registration mode. Registrations of all key except the original key inserted in the ignition switch are cancelled. (Registration of the lost key or spare key is cancelled.)

NOTE:

- The spare key must be registered again.

6. Turn the ignition switch to "OFF" and remove the key.
7. Turn the ignition switch to "ON" with a new key or the spare key. (Never use the key registered in previous steps.) The indicator comes on for two seconds then it blinks four times repeatedly.



- The new key or spare key is registered in the ECM.
- If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 21-8).

NOTE:

- Keep the other transponder key away from the immobilizer receiver more than 50 mm (2.0 in).

8. Repeat the steps 6 and 7 when you continuously register an other new key.

NOTE:

- The ECM can store up to four key codes. (The four keys can be registered.)

9. Turn the ignition switch to "OFF", remove the inspection adaptor and connect the CKP sensor 2P (Red) connector.
10. Turn the ignition switch to "ON" with the registered key.

- The immobilizer system (HISS) returns to the normal mode.

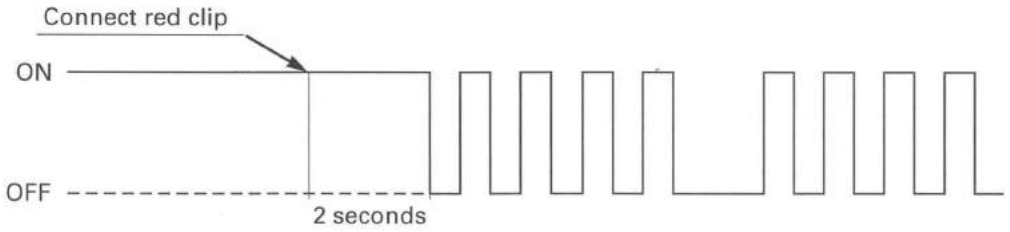
11. Check that the engine can be started using all registered key.

When the ignition switch is faulty (ignition switch replacement):

1. Obtain a new ignition switch and two new transponder keys.
2. Remove the ignition switch (page 20-19).
3. Apply 12 V battery voltage to the CKP sensor lines of the ECM using the special tool (page 21-7).
4. Set the original (registered) key near the immobilizer receiver so that the transponder in the key can communicate with the receiver.
5. Connect a new ignition switch to the wire harness. Turn the ignition switch to "ON" with a new transponder key. (keep the ignition switch away from the receiver.) The immobilizer indicator comes on and it remains on.

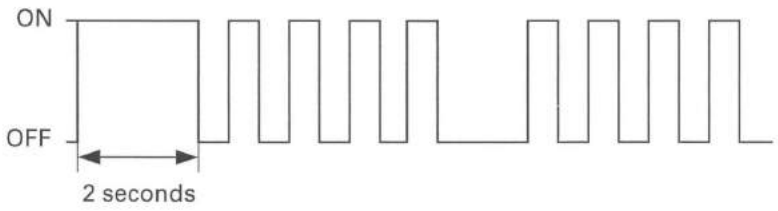
- The code of the original key recognized by the ECM.
- If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 21-7).

6. Disconnect the red clip of the inspection adaptor from the battery positive (+) terminal for two seconds or more, then connect it again. The indicator remains on for approx. two seconds then it blinks four times repeatedly.



- The immobilizer system (HISS) enters the registration mode. Registrations of all key except the original key set near the receiver are cancelled.

7. Turn the ignition switch to "OFF" and remove the key.
8. Install the ignition switch (page 20-19).
9. Turn the ignition switch to "ON" with a first new key. The indicator comes on for two seconds then it blinks four times repeatedly.



- The first key is registered in the ECM.
- If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 21-8).

10. Turn the ignition switch to "OFF" and disconnect the red clip of the inspection adaptor from the battery positive (+) terminal.
11. Turn the ignition switch to "ON" (with the first key registered in step 9). The immobilizer indicator comes on for two seconds then it goes off.

- The immobilizer system (HISS) returns to the normal mode.

12. Turn the ignition switch to "OFF" and connect the red clip of the inspection adaptor to the battery positive (+) terminal.
13. Turn the ignition switch to "ON" (with the first key registered in step 9). The immobilizer indicator comes on and it remains on.

- The code of the first key is recognized by the ECM.
- If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 21-7).

14. Disconnect the red clip of the inspection adaptor from the battery positive (+) terminal for two seconds or more, then connect it again. The indicator remains on for approx. two seconds then it blinks four times repeatedly.

- The immobilizer system (HISS) enters the registration mode. Registration of the original key used in step 4 is cancelled.

15. Turn the ignition switch to "OFF" and remove the key.

16. Turn the ignition switch to "ON" with a second new key. (Never use the key registered in step 9.) The indicator comes on for two seconds then it blinks four times repeatedly.

- The second key is registered in the ECM.
- If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 21-8).

NOTE:

- Keep the other transponder key away from the immobilizer receiver more than 50 mm (2.0 in).

17. Repeat the steps 15 and 16 when you continuously register the other new key.

NOTE:

- The ECM can store up to four key codes. (The four keys can be registered.)

18. Turn the ignition switch to "OFF", remove the inspection adaptor and connect the CKP sensor 2P (Red) connector.

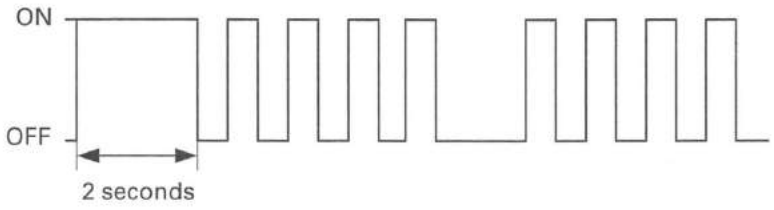
19. Turn the ignition switch to "ON" with the registered key.

- The immobilizer system (HISS) returns to the normal mode.

20. Check that the engine can be started using all registered keys.

When all keys have been lost, or the ECM is faulty:

1. Obtain a new ECM and two new transponder keys.
2. Grind the keys in accordance with the shape of the original key (or use the key number plate when all keys have been lost).
3. Replace the ECM with a new one (page 5-96).
4. Turn the ignition switch to "ON" with a first new key. The immobilizer indicator comes on for two seconds, then it blinks four times repeatedly.



- The first key is registered in the ECM.
- If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 21-8).

5. Turn the ignition switch to "OFF" and remove the first key.
6. Turn the ignition switch to "ON" with a second new key. The immobilizer indicator comes on for two seconds, then it blinks four times repeatedly.

- The second key is registered in the ECM.
- If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 21-8).

7. Turn the ignition switch to "OFF" and remove the second key.

- The system (ECM) will not enter the normal mode unless the two keys are registered in ECM.
- The third new key cannot be continuously registered. When it is necessary to register the third key, follow the procedures "When the key has been lost, or additional key is required" (page 21-4).

8. Check that the engine can be started using all registered keys.

HISS DIAGNOSTIC INFORMATION

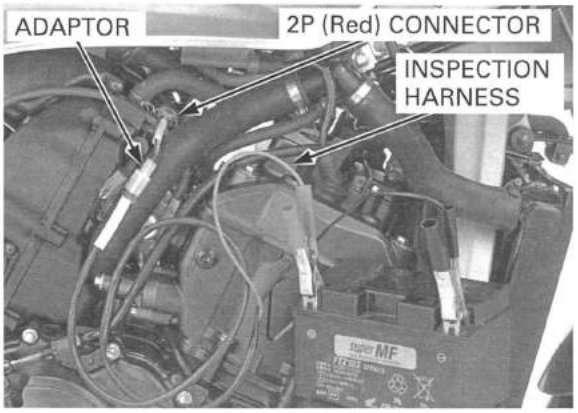
Lift and support the fuel tank (page 3-5).
Disconnect the CKP sensor 2P (Red) connector.

Connect the inspection adaptor to the wire harness side connector.

TOOLS:

Inspection harness	**07XMZ-MBW0101**
Test harness adaptor	**070MZ-MEC0101**

Connect the Red clip of the adaptor to the 12 V battery positive (+) terminal and green clip to the negative (–) terminal.



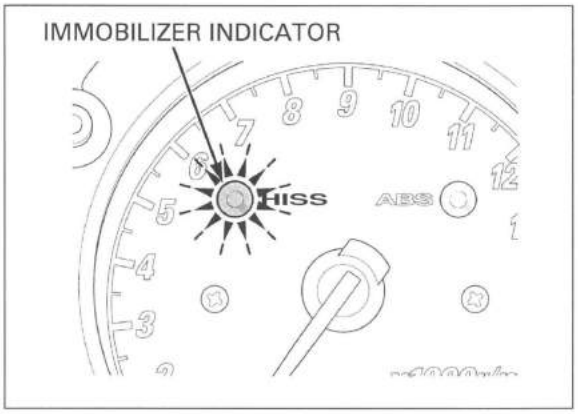
Turn the ignition switch to "ON" with the properly registered key.

The immobilizer indicator will come on for approx. ten seconds then it will start blinking to indicate the diagnostic code if the system is abnormal.

The blinking frequency is repeated.

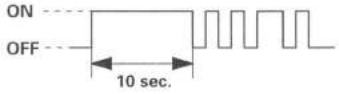
NOTE:

- The immobilizer indicator remains on when the system is normal. (The system is in the normal mode and the diagnostic code does not appear.)

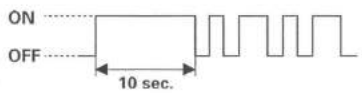


HISS DIAGNOSTIC CODE

When the system (ECM) enters the diagnostic mode from the normal mode:

BLINKING PATTERN	SYMPTOM	PROBLEM	PROCEDURE
	ECM data is abnormal.	Faulty ECM	Replace the ECM.
	Code signals cannot send or receive.	Faulty immobilizer receiver or wire harness	Follow the trouble-shooting (page 21-9).
	Identification code is disagree.	Jamming by the other transponder	Keep the other vehicle's transponder key away from the immobilizer receiver more than 50 mm (2.0 in).
	Secret code is disagree.		

When the system (ECM) enters the diagnostic mode from the registration mode:

BLINKING PATTERN	SYMPTOM	PROBLEM	PROCEDURE
	Registration is overlapped.	The key is already registered properly.	Use a new key or cancelled key.
	Code signals cannot send or receive.	Communication fails.	Follow the trouble-shooting (page 21-9).
	Registration is impossible.	The key is already registered on the other system.	Use a new key.

TROUBLESHOOTING

The immobilizer indicator comes on for approx. two seconds then it goes off, when the ignition switch is turned to "ON" with the properly registered key and the immobilizer system (HISS) functions normally. If there is any problem or the properly registered key is not used, the indicator will remains on.

Immobilizer indicator does not come on when the ignition switch is turned to "ON"

1. **Fuse Inspection**

   Check the sub-fuse (10 A).

   Is the fuse blown?

   YES – Replace the fuse.

   NO – GO TO STEP 2.

2. **Combination Meter Inspection**

   Check that the neutral indicator comes on with the ignition switch ON.

   Does the indicator come on?

   YES – GO TO STEP 4.

   NO – GO TO STEP 3.

3. **Combination Meter Power Input line Inspection**

   Check the power input line (Black/brown wire) at the combination meter connector (page 21-12).

   Is the voltage specified value?

   YES – Faulty combination meter

   NO – • Open circuit in Black/brown wire
   • Open circuit in Green/black wire

4. **Immobilizer Indicator Line Inspection At The ECM Connector**

   Check the immobilizer indicator line (White/red wire) at the ECM connector (page 21-13).

   Is the voltage specified value?

   YES – GO TO STEP 6.

   NO – GO TO STEP 5.

5. **Immobilizer Indicator Line Inspection At The Combination Meter Connector**

   Check the immobilizer indicator line (White/red wire) at the combination meter connector (page 21-12).

   Is the voltage specified value?

   YES – Faulty combination meter

   NO – Open circuit in White/red wire

6. **Power Input Line Inspection At The ECM Connector**

   Check the power input line (Black/white wire) at the ECM connector (page 21-13).

   Is the voltage specified value?

   YES – GO TO STEP 7.

   NO – • Open circuit in Black/white wire
   • Faulty engine stop relay
   • Blown FI fuse (20 A)
   • Open circuit in Red/yellow or Red/white wire between the battery and engine stop relay

7. **Ground Line Inspection At The ECM Connector**

   Check the ground lines (Green and Green/white wires) at the ECM connector (page 21-13).

   Is there continuity?

   YES – • Loose or poor ECM connector contact
   • Faulty ECM

   NO – Open circuit in Green or Green/white wire

Immobilizer indicator remains on with the ignition switch to "ON"

1. **Immobilizer Receiver Jamming Inspection**

   Check that there is any metal obstruction or the other vehicle's transponder key near the immobilizer receiver and key.

   Is there any metal obstruction or the other transponder key?

   YES – Remove it and recheck.

   NO – GO TO STEP 2.

2. **First Transponder Key Inspection**

   Turn the ignition switch to "ON" with the spare transponder key and check the immobilizer indicator. The indicator should come on for 2 seconds then go off.

   Is there indicator go off?

   YES – Faulty first transponder key

   NO – GO TO STEP 3.

3. **Diagnostic Code Inspection**

   Perform the diagnostic code indication procedure (page 21-7) and check that the immobilizer indicator comes on then it starts blinking.

   Is there indicator Blinks or Stay Lit?

   BLINKS–Read the diagnostic code (page 21-7).

   STAY LIT–GO TO STEP 4.

4. **Immobilizer Indicator Line Inspection At The ECM Connector**

   Check the immobilizer indicator line (White/red wire) at the ECM connector (page 21-13).

   Is the voltage specified?

   YES – GO TO STEP 5.

   NO – Short circuit in the White/red wire.

5. **CKP Sensor Line Inspection**

   Check the CKP sensor lines (Yellow and White/yellow wires) between the ECM and CKP sensor connectors (page 21-14).

   Is there continuity?

   YES – Faulty the ECM.

   NO –
   - Open circuit in the Yellow wire.
   - Open circuit in the White/yellow wire

Diagnostic code ⌐¬⌐¬⌐ is indicated (Code signals cannot send or receive)

1. **Immobilizer Receiver Power Input Line Inspection**

   Check the power input line (Yellow/red) at the immobilizer receiver connector (page 21-14).

   Is there approx. 5 V?

   YES – GO TO STEP 2.

   NO – Open or short circuit in the Yellow/red wire.

2. **Immobilizer Receiver Ground Line Inspection**

   Check the ground line (Green/orange) at the immobilizer receiver connector (page 21-14).

   Is there continuity?

   YES – GO TO STEP 3.

   NO – Open circuit in the Green/orange wire.

3. **Immobilizer Receiver Signal Line Inspection**

   Check the signal lines (Pink and Yellow/blue) between the immobilizer receiver and ECM connectors (page 21-15).

   Are the wires normal?

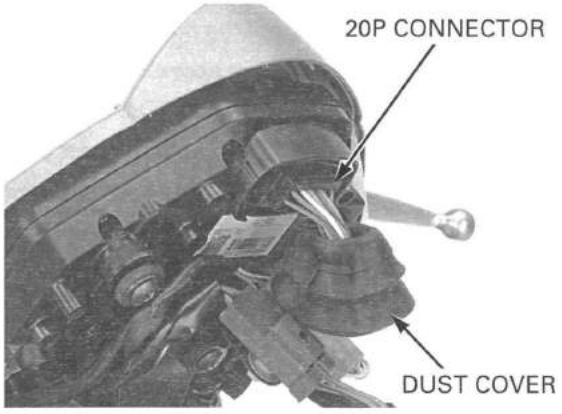
   YES – Faulty the immobilizer receiver.

   NO – • Open or short circuit in Pink wire.
   • Open or short circuit in Yellow/blue wire.

IMMOBILIZER INDICATOR

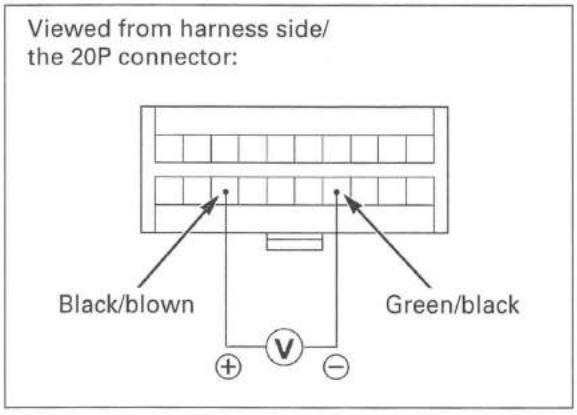
Remove the meter cover (page 2-5).

Perform the following inspections with the combination meter 20P connector connected.



POWER INPUT LINE INSPECTION

Measure the voltage between the Black/brown (+) and Green/black (–) wire terminals.
There should be battery voltage when the ignition switch is turned to "ON".



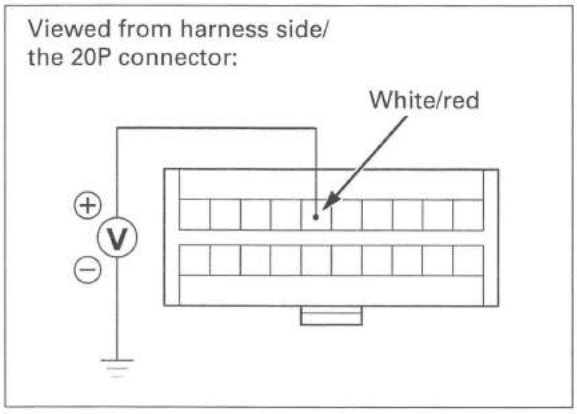
IMMOBILIZER INDICATOR LINE INSPECTION

Measure the voltage between the White/red wire terminal (+) and ground (–).

There should be battery voltage when the ignition switch is turned to "ON".

NOTE:

- There should be no voltage for approx. two seconds after the ignition switch is turned to "ON", then the battery voltage should appear, if the system is normal.

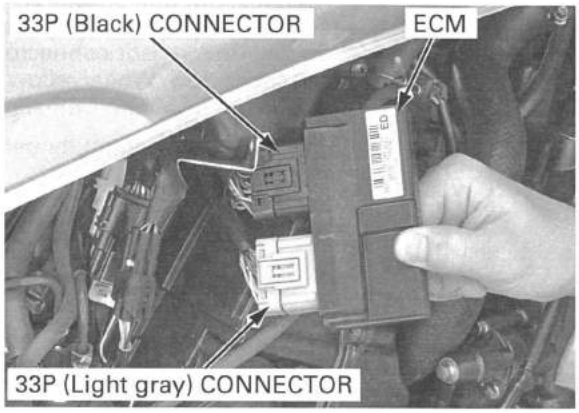


ECM

Lift and support the fuel tank (page 3-5).
Pull out the ECM from the stay (page 5-96).

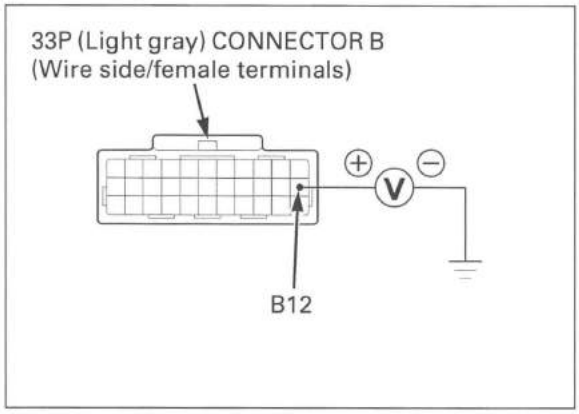
Disconnect the ECM 33P (Black and Light gray) connectors.
Perform the following inspections at the wire harness side connector.

TOOL:
Test probe **07ZAJ-RDJA110**



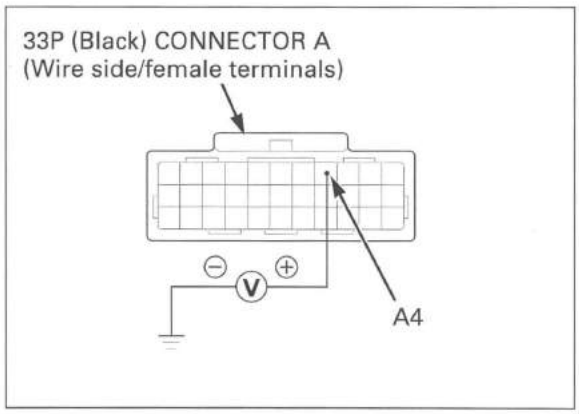
IMMOBILIZER INDICATOR LINE INSPECTION

Measure the voltage between the B12 (White/red) wire terminal (+) and ground (–).
There should be battery voltage when the ignition switch is turned to "ON".



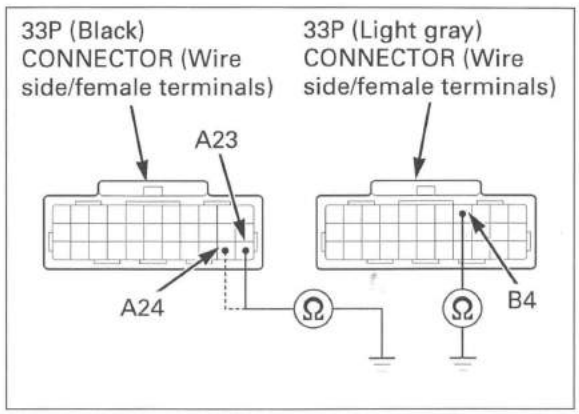
POWER INPUT LINE INSPECTION

Measure the voltage between the A4 (Black/white) wire terminal (+) and ground (–).
There should be battery voltage when the ignition switch is turned to "ON".



GROUND LINE INSPECTION

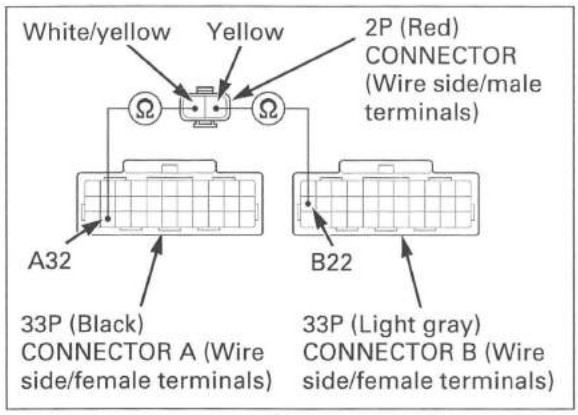
Check the continuity between the B4 (Green) wire terminal and ground.
Also check the continuity between the A23 and A24 (Green/white) wire terminals and ground.
There should be continuity at all times.



CKP SENSOR LINE INSPECTION

Disconnect the CKP sensor 2P (Red) connector.
Check the Yellow wire for continuity between the ECM and CKP sensor connectors.
Also check the White/yellow wire for continuity between the ECM and CKP sensor connectors

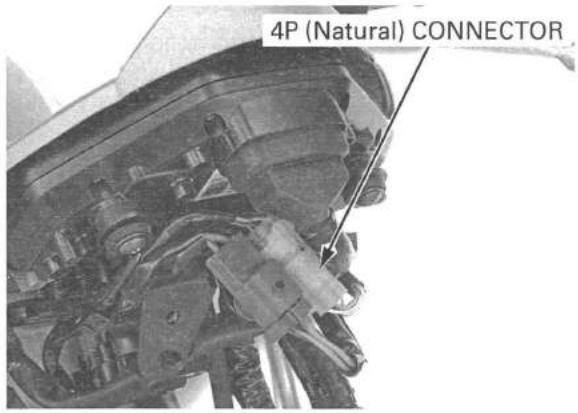
There should be continuity between the same color wire terminals.



IMMOBILIZER RECEIVER

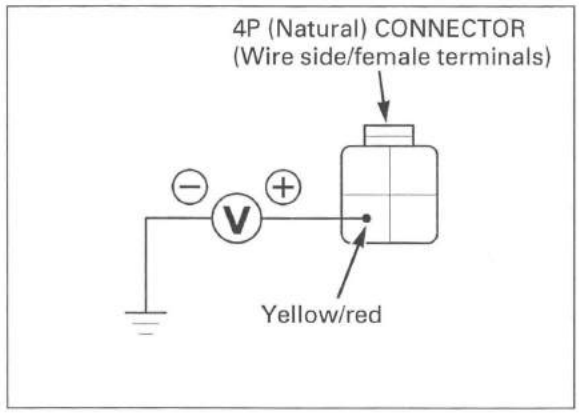
Remove the headlight unit (page 20-6).

Disconnect the immobilizer receiver 4P (Natural) connector.
Perform the following inspections at the wire harness side connector.



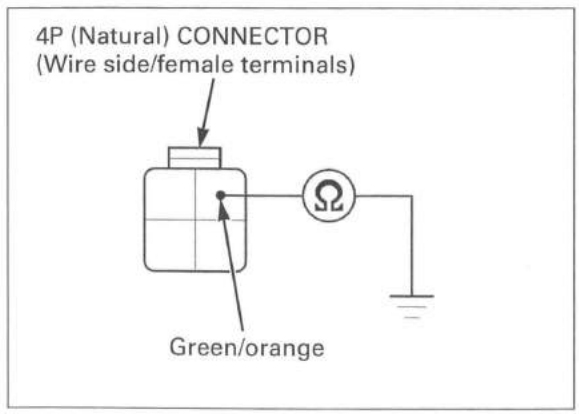
POWER INPUT LINE INSPECTION

Measure the voltage between the Yellow/red wire terminal (+) and ground (–).
There should be approx. 5 V when the ignition switch is turned to "ON".



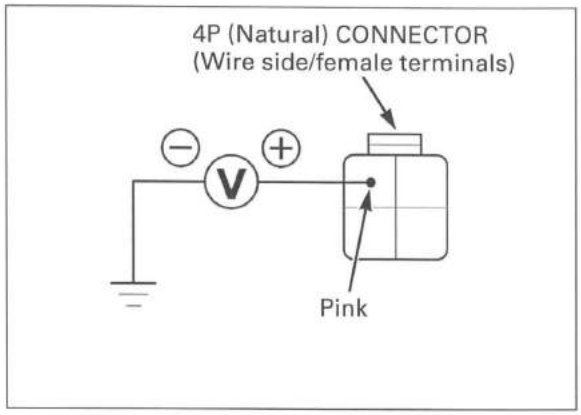
GROUND LINE INSPECTION

Check for continuity between the Green/orange wire terminal and ground.
There should be continuity at all times.



SIGNAL LINE INSPECTION

Measure the voltage between the Pink wire terminal (+) and ground (–).
There should be approx. 5 V when the ignition switch is turned to "ON".

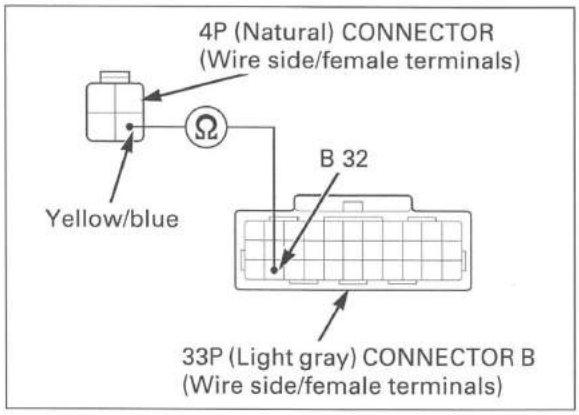


Disconnect the ECM 33P (Light gray) connector (page 21-13).
Check the Yellow/blue wire for continuity between the immobilizer receiver and ECM connectors.

TOOL:
Test probe **07ZAJ-RDJA110**

There should be continuity.

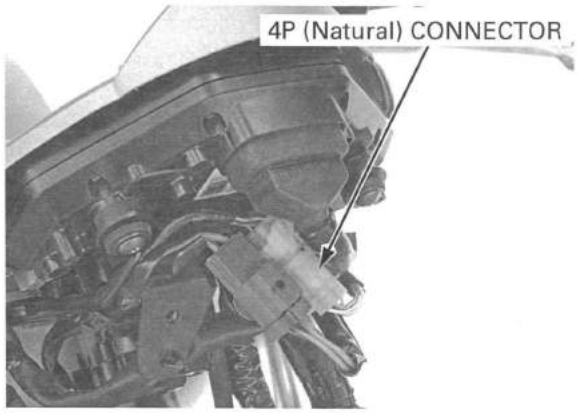
Check for continuity between the Yellow/blue wire terminal and ground.
There should be no continuity.



REPLACEMENT

Remove the headlight unit (page 20-6).

Disconnect the immobilizer receiver 4P (Natural) connector.

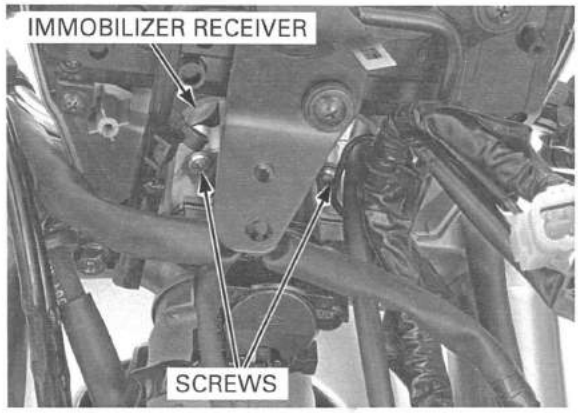


Remove the screws and the immobilizer receiver.

Install a new receiver and tighten the screws securely.

Route the receiver wire properly (page 1-23).

Install the removed parts in the reverse order of removal.



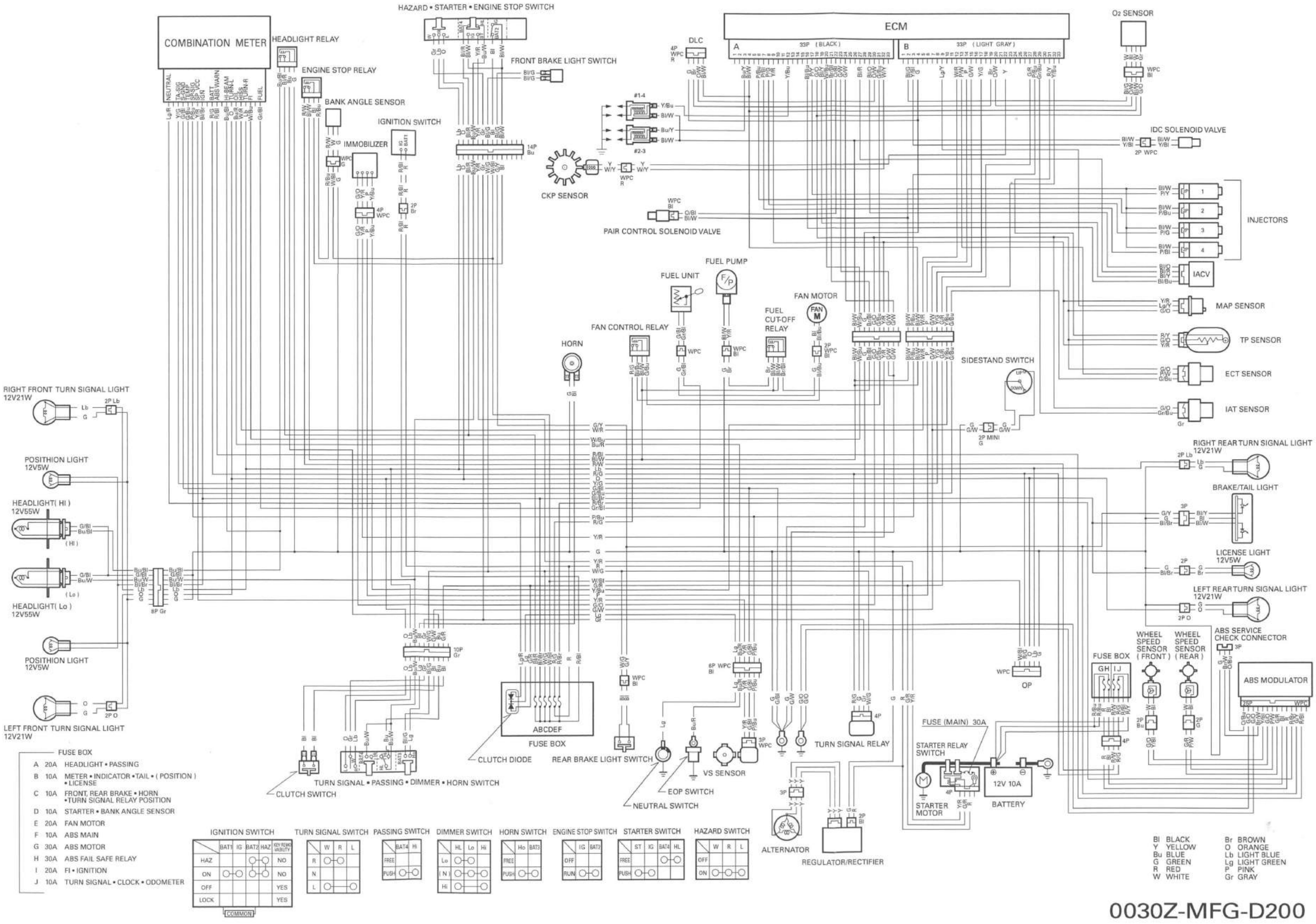
REQUIRED PARTS FOR PROBLEM

Problem	Replacement parts				
	Transponder Key	Immobilizer receiver	ECM	Ignition switch	*Accessory lock and key
One key has been lost, or additional spare key is required	○				
All key have been lost, or ECM is faulty	○		○		
Immobilizer receiver is faulty		○			
Ignition switch is faulty	○			○	
*Accessory lock is faulty					○

*Accessory lock means the seat lock and fuel fill cap.

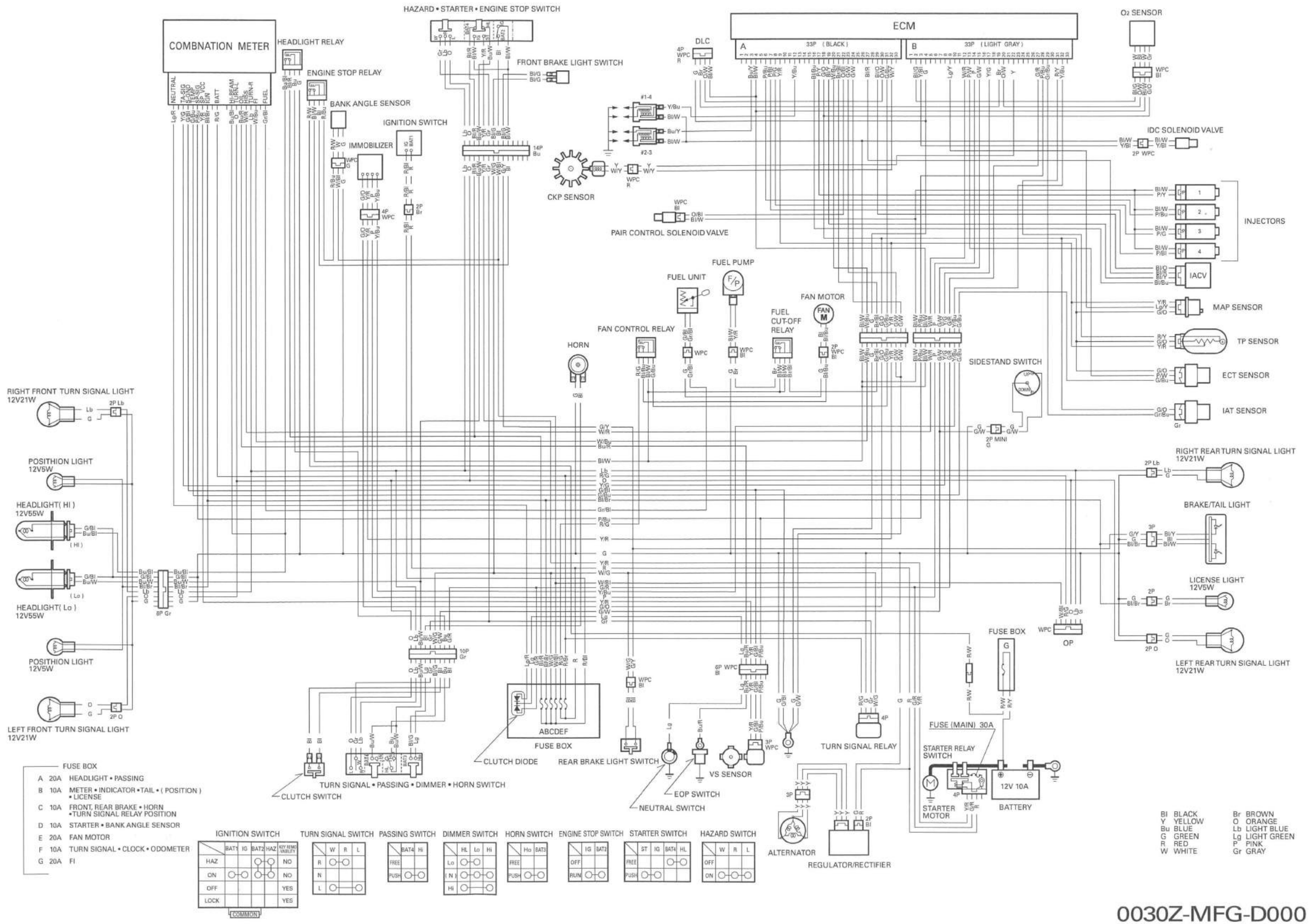
22. WIRING DIAGRAMS

CB600FA



0030Z-MFG-D200

CB600F



0030Z-MFG-D000

23. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START

1. **Spark Plug Inspection**

   Remove and inspect spark plugs.

   Are the spark plugs in good condition?

   YES – GO TO STEP 2.

   NO – • Incorrect spark plug heat range
   • Incorrect spark plug gap
   • Dirty air cleaner

2. **Spark Test**

   Perform spark test.

   Are there good sparks?

   YES – GO TO STEP 3.

   NO – • Loose or disconnected ignition system wires
   • Faulty ignition coil
   • Broken or shorted spark plug wire
   • Faulty CKP sensor
   • Faulty engine stop switch
   • Faulty ignition switch
   • Faulty ECM

3. **Fuel Pump Inspection**

   Check for operation of the fuel pump and inspect the fuel flow.

   Is the fuel pump unit normal?

   YES – GO TO STEP 4.

   NO – Faulty fuel pump unit (page 5-55).

4. **PGM-FI System Inspection**

   Check the PGM-FI system.

   Is the PGM-FI system normal?

   YES – GO TO STEP 5.

   NO – Faulty PGM-FI system (page 5-11).

5. **Cylinder compression Inspection**

   Test the cylinder compression (page 8-6).

   Is the compression as specified?

   YES – GO TO STEP 6.

   NO – • Improper valve clearance
   • Valve stuck open
   • Worn cylinder and piston rings
   • Damaged cylinder head gasket
   • Seized valve
   • Improper valve timing

6. **Engine Start Condition**

   Start by following normal procedure.

   Did the engine start but stops?

   YES – • Leaking insulators or air cleaner housing
   • Faulty starter valves
   • Improper ignition timing (Faulty ECM or CKP sensor)
   • Contaminated fuel

ENGINE LACKS POWER

1. **Drive Train Inspection**

   Raise wheel off the ground and spin by hand.

   Did the wheel spin freely?

   YES – GO TO STEP 2.

   NO – • Brake dragging
   • Worn or damaged wheel bearings

2. **Tire Pressure Inspection**

   Check the tire pressure.

   Are the tire pressures correct?

   YES – GO TO STEP 3.

   NO – • Faulty tire valve
   • Punctured tire

3. **Clutch Inspection**

   Accelerate rapidly, shift from first to second.

   Did the engine speed change accordingly when clutch is released?

   YES – GO TO STEP 4.

   NO – • Clutch slipping
   • Worn clutch discs/plates
   • Warped clutch discs/plates
   • Weak clutch spring
   • Additive in engine oil

4. **Engine Performance Inspection**

   Accelerate lightly.

   Did the Engine speed increase?

   YES – GO TO STEP 5.

   NO – • Dirty air cleaner
   • Restricted fuel flow
   • Clogged muffler

5. **Spark Plug Inspection**

   Remove and inspect spark plugs.

   Are the spark plugs in good condition?

   YES – GO TO STEP 6.

   NO – • Plugs not serviced frequently enough
   • Incorrect spark plug heat range
   • Incorrect spark plug gap

6. **Engine Oil Inspection**

   Check the oil level and condition.

   Is the engine oil good condition?

   YES – GO TO STEP 7.

   NO – • Oil level too high
   • Oil level too low
   • Contaminated oil

7. **Ignition Timing Inspection**

   Check the ignition timing.

   Is the ignition timing as specified?

   YES – GO TO STEP 8.

   NO – • Faulty ECM
   • Faulty CKP sensor
   • Improper valve timing

8. **Cylinder compression Inspection**

   Test the cylinder compression (page 8-6).

   Is the compression as specified?

   YES – GO TO STEP 9.

   NO – • Valve clearance too small
   • Worn cylinder and piston rings
   • Damaged cylinder head gasket
   • Improper valve timing

9. **Fuel Pump Inspection**

   Inspect the fuel flow.

   Is the fuel pump unit normal?

   YES – GO TO STEP 10.

   NO – Faulty fuel pump unit (page 5-55).

10. **PGM-FI System Inspection**

    Check the PGM-FI system.

    Is the PGM-FI system normal?

    YES – GO TO STEP 11.

    NO – Faulty PGM-FI system (page 5-11).

11. **lubrication Inspection**

    Remove cylinder head cover and inspect lubrication.

    Is the Valve train lubricated properly?

    YES – GO TO STEP 12.

    NO – • Faulty oil pump
    • Faulty pressure relief valve
    • Clogged oil strainer
    • Clogged oil passage

12. **Over Heating Inspection**

    Check for engine over heating.

    Is the engine over heating?

    YES – • Coolant level too low
    • Fan motor not working
    • Thermostat stuck closed
    • Excessive carbon build-up in combustion chamber
    • Use of poor quality fuel
    • Wrong type of fuel
    • Clutch slipping

    NO – GO TO STEP 13.

13. **Engine Knocking Inspection**

    Accelerate or run at high speed.

    Is the engine knocking?

    YES – • Worn piston and cylinder
    • Wrong type of fuel
    • Thermostat stuck closed
    • Excessive carbon build-up in combustion chamber
    • Ignition timing too advance (Faulty ECM)
    • Faulty CKP sensor

    NO – • Engine does not knock

POOR PERFORMANCE AT LOW AND IDLE SPEED

1. **Spark Plug Inspection**

   Remove and inspect spark plugs.

   Are the spark plugs in good condition?

   YES – GO TO STEP 2.

   NO – • Plugs not serviced frequently enough
   • Incorrect spark plug heat range
   • Incorrect spark plug gap

2. **Ignition Timing Inspection**

   Check the ignition timing.

   Is the ignition timing as specified?

   YES – GO TO STEP 3.

   NO – • Faulty ECM
   • Faulty CKP sensor
   • Faulty VS sensor
   • Improper valve timing

3. **Fuel Pump Inspection**

   Inspect the fuel flow.

   Is the fuel pump unit normal?

   YES – GO TO STEP 4.

   NO – Faulty fuel pump unit (page 5-55).

4. **PGM-FI System Inspection**

   Check the PGM-FI system.

   Is the PGM-FI system normal?

   YES – GO TO STEP 5.

   NO – Faulty PGM-FI system (page 5-11).

5. **IACV Inspection**

   Check the IACV operation (page 5-90).

   Does the IACV operates normally?

   YES – GO TO STEP 6.

   NO – Faulty IACV.

6. **Intake Pipes Leaking Inspection**

   Check for leaks at the insulators or air cleaner housing.

   Are there leaks?

   YES – • Loose insulator
   • Damaged insulator
   • Damaged air cleaner housing

POOR PERFORMANCE AT HIGH SPEED

1. **Ignition Timing Inspection**

   Check the ignition timing.

   Is the ignition timing as specified?

   YES – GO TO STEP 2.

   NO – • Faulty ECM
   • Faulty CKP sensor
   • Faulty VS sensor
   • Improper valve timing

2. **Fuel Pump Inspection**

   Inspect the fuel flow.

   Is the fuel pump unit operation normal?

   YES – GO TO STEP 3.

   NO – Faulty fuel pump unit (page 5-55).

3. **PGM-FI System Inspection**

   Check the PGM-FI system.

   Is the PGM-FI system normally?

   YES – GO TO STEP 4.

   NO – Faulty PGM-FI system (page 5-11).

4. **Valve Timing Inspection**

   Check the valve timing (page 8-28).

   Is the valve timing correct?

   YES – GO TO STEP 5.

   NO – Camshafts not installed properly

5. **Valve Spring Inspection**

   Check the valve springs.

   Is the valve spring free length as specified?

   YES – Not weak

   NO – Faulty valve springs

POOR HANDLING

Steering is heavy
- Steering stem adjusting nut too tight
- Damaged steering head bearings
- Insufficient tire pressure

Either wheel is wobbling
- Excessive wheel bearing play
- Bent rim
- Swingarm pivot bearing excessively worn
- Bent frame

The motorcycle pulls to one side
- Front and rear wheel not aligned
- Faulty shock absorber
- Bent fork
- Bent swingarm
- Bent axle
- Bent frame

HONDA

The Power of Dreams

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