DEATHACE

# HONDA

## SERVICE MANUAL

2008

**CBR1000RR**

# LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

| ITEM | | STANDARD | SERVICE LIMIT |
|---|---|---|---|
| Engine oil capacity | After draining | 2.8 liters (3.0 US qt, 2.5 Imp qt) | – |
| | After oil filter change | 3.0 liters (3.2 US qt, 2.6 Imp qt) | – |
| | After disassembly | 3.7 liters (3.9 US qt, 3.3 Imp qt) | – |
| Recommended engine oil | | Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil<br>API service classification: SG or Higher<br>JASO T 903 standard: MA<br>Viscosity: SAE 10W-30 | – |
| Oil pressure at EOP switch | | 590 kPa (6.0 kgf/cm², 86 psi) at 6,000 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 | Except California type | GQ23C |
| | California type | GQ23B |
| Idle speed | | 1,200 ± 100 rpm |
| Throttle grip freeplay | | 2 – 5 mm (1/16 – 3/16 in) |
| IAT sensor resistance (at 20°C/68°F) | | 1 – 4 kΩ |
| Fuel injector resistance (at 20°C /68°F) | Primary injector | 11 – 13 Ω |
| | Secondary injector | 11 – 13 Ω |
| PAIR control solenoid valve resistance (at 20°C/68°F) | | 23 – 27 Ω |
| IDC solenoid valve resistance (at 20°C/68°F) | | 28 – 32 Ω |
| CKP sensor peak voltage (at 20°C/68°F) | | 0.7 V minimum |
| Fuel pressure at idle | | 343 kPa (3.5 kgf/cm², 50 psi) |
| Fuel pump flow (at 12 V) | | 167 cm³ (5.6 US oz, 5.9 Imp oz) minimum/10 seconds |

# COOLING SYSTEM SPECIFICATIONS

| ITEM | | SPECIFICATIONS |
|---|---|---|
| Coolant capacity | Radiator and engine | 3.0 liters (3.2 US qt, 2.6 Imp qt) |
| | Reserve tank | 0.34 liter (0.36 US qt, 0.30 Imp qt) |
| Radiator cap relief pressure | | 108 – 137 kPa (1.1 – 1.4 kgf/cm², 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 | | Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing silicate free corrosion inhibitors |
| Standard coolant concentration | | 1:1 (mixture with distilled water) |

**HYDRAULIC BRAKE**

| ITEM | Q'TY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS |
|---|---|---|---|---|
| Reserve tank stopper plate screw | 2 | 4 | 1.2 (0.1, 0.9) | |
| Front brake lever pivot bolt | 1 | 6 | 1.0 (0.1, 0.7) | Apply silicone grease to the sliding surface. |
| Front brake lever pivot nut | 1 | 6 | 6.0 (0.6, 4.4) | |
| Front brake light switch screw | 1 | 4 | 1.2 (0.1, 0.9) | |
| Front master cylinder holder bolt | 2 | 6 | 12 (1.2, 9) | |
| Front brake caliper mounting bolt | 4 | 10 | 45 (4.6, 33) | ALOC bolt; replace with a new one. |
| Front brake reserve tank stay bolt | 1 | 6 | 12 (1.2, 9) | |
| Rear master cylinder push rod lock nut | 1 | 8 | 18 (1.8, 13) | |
| Rear master cylinder mounting nut | 2 | 6 | 10 (1.0, 7) | |
| Front brake caliper pad pin | 4 | 10 | 15 (1.5, 11) | |
| Rear brake caliper pad pin | 1 | 10 | 18 (1.8, 13) | |
| Brake hose oil bolt | 5 | 10 | 34 (3.5, 25) | |
| Front brake hose clamp nut | 1 | 6 | 10 (1.0, 7) | |
| Front brake hose 3-way joint bolt | 1 | 6 | 10 (1.0, 7) | |
| Front brake caliper bleed valve | 2 | 8 | 8.0 (0.8, 5.9) | |
| Rear brake caliper bleed valve | 1 | 8 | 6.0 (0.6, 4.4) | |
| Rear brake hose clamp bolt | 1 | 5 | 4.2 (0.4, 3.1) | |
| Heat guard mounting screw | 2 | 5 | 4.2 (0.4, 3.1) | |

**ELECTRIC STARTER**

| ITEM | Q'TY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS |
|---|---|---|---|---|
| Starter motor terminal nut | 1 | 6 | 12 (1.2, 9) | |
| Starter motor setting bolt | 2 | 5 | 4.0 (0.4, 3.0) | ALOC bolt; replace with a new one. |
| Negative brush mounting screw | 1 | 5 | 3.7 (0.4, 2.7) | |

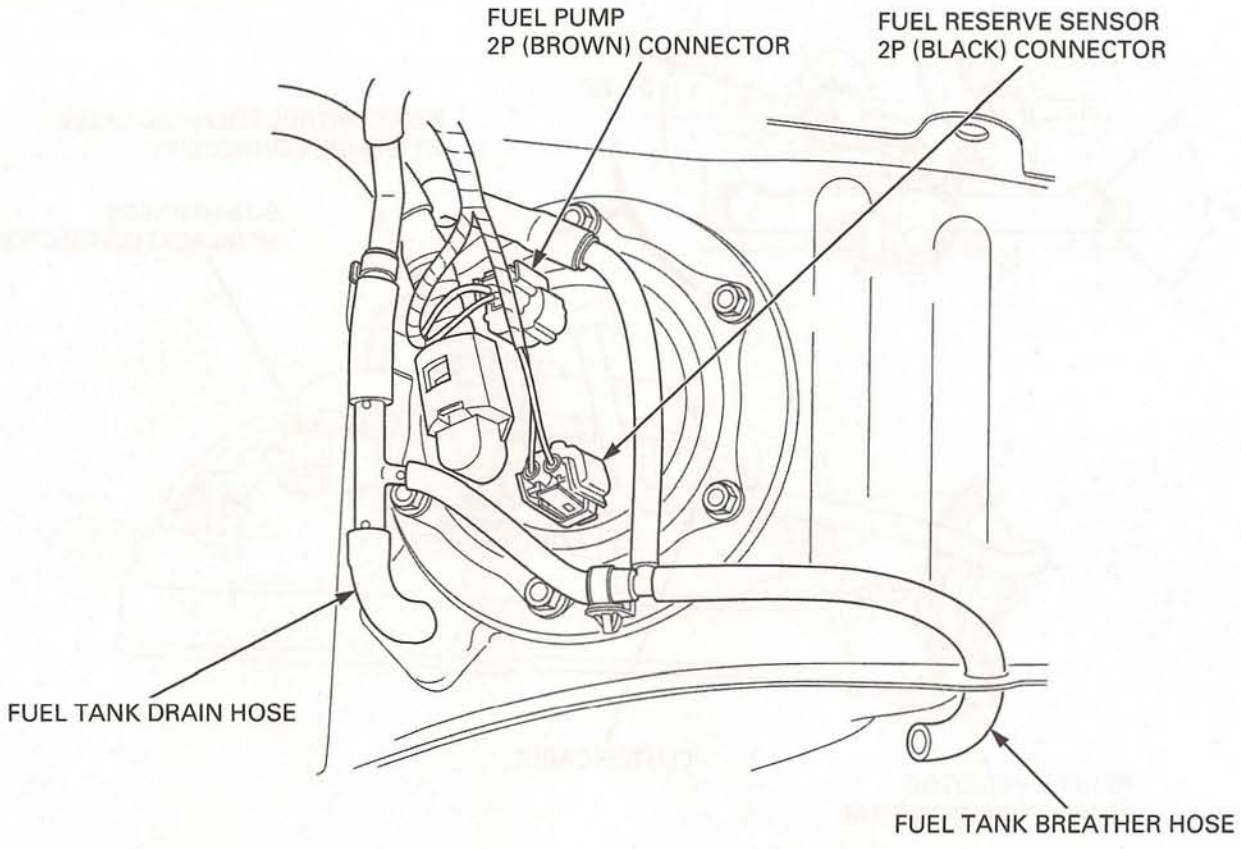
**LIGHTS/METERS/SWITCHES**

| 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) | |
| Combination meter screw | 8 | 5 | 1.0 (0.1, 0.7) | |
| Ignition switch mounting bolt | 2 | 8 | 26 (2.7, 19) | Replace with a new one. |
| Sidestand switch mounting bolt | 1 | 6 | 10 (1.0, 7) | ALOC bolt; replace with a new one. |
| Right handlebar switch housing screw | 2 | 4 | 0.9 (0.09, 0.7) | |
| Clutch switch mounting screw | 1 | 3 | 0.6 (0.06, 0.4) | ALOC screw; replace with a new one. |
| Combination meter stay mounting bolt | 2 | 8 | 32 (3.3, 24) | |

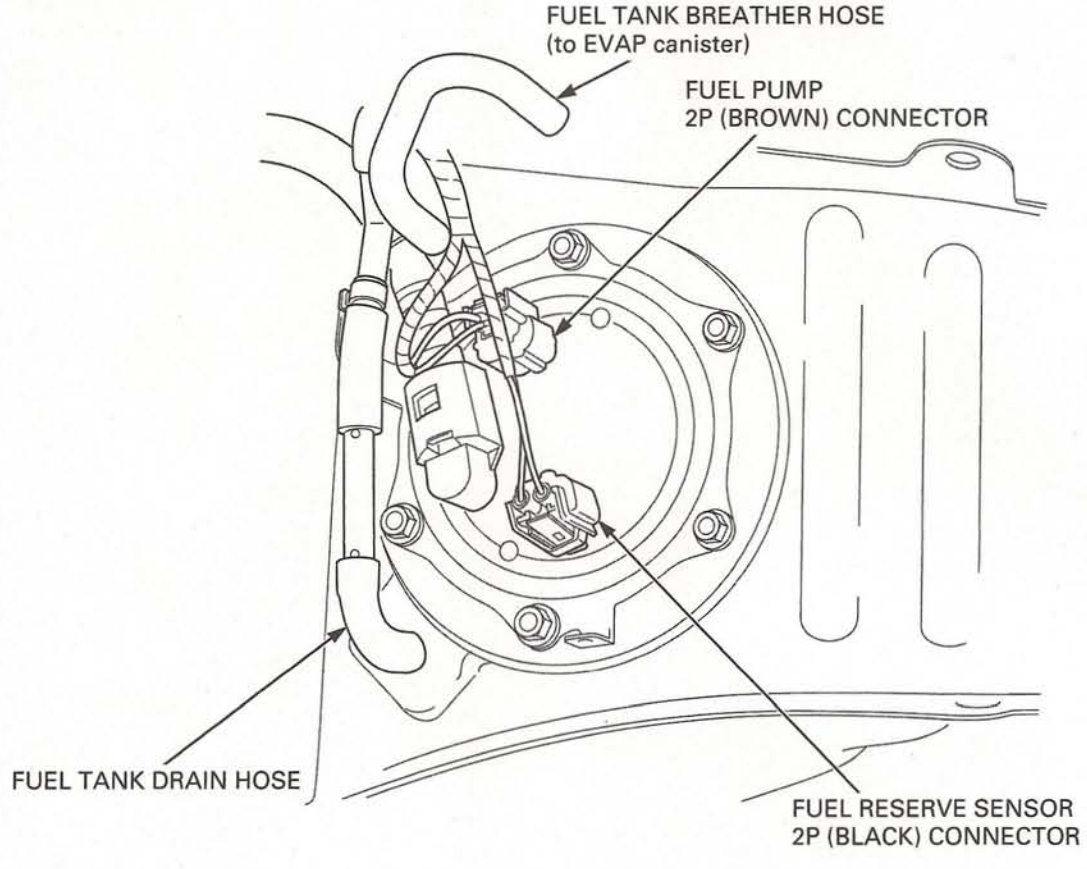
**OTHERS**

| ITEM | Q'TY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS |
|---|---|---|---|---|
| Sidestand pivot bolt | 1 | 10 | 10 (1.0, 7) | |
| Sidestand pivot nut | 1 | 10 | 29 (3.0, 21) | |
| Sidestand spring hook bolt | 1 | 8 | 21.5 (2.2, 16) | |
| Gearshift pedal pivot bolt | 1 | 8 | 22 (2.2, 16) | |

**EXCEPT CALIFORNIA TYPE:**




**CALIFORNIA TYPE:**



# EMISSION CONTROL SYSTEMS

## EXHAUST EMISSION REQUIREMENT

The U.S. Environmental Protection Agency (EPA), California Air Resources Board (CARB) and Transport Canada require manufacturers to certify that their motorcycles comply with applicable emissions standards during their useful life, when operated and maintained according to the instructions provided.

## NOISE EMISSION REQUIREMENT

The EPA also requires that motorcycles built after January 1, 1983 comply with applicable noise emission standards for one year or 3,730 miles (6,000 km) after the time of sale to the ultimate purchaser, when operated and maintained according to the instructions provided.

## WARRANTY COMPLIANCE

Compliance with the terms of the Distributor's Limited Warranty for Honda Motorcycle Emission Control Systems is necessary in order to keep the emissions system warranty in effect.

## SOURCE OF EMISSIONS

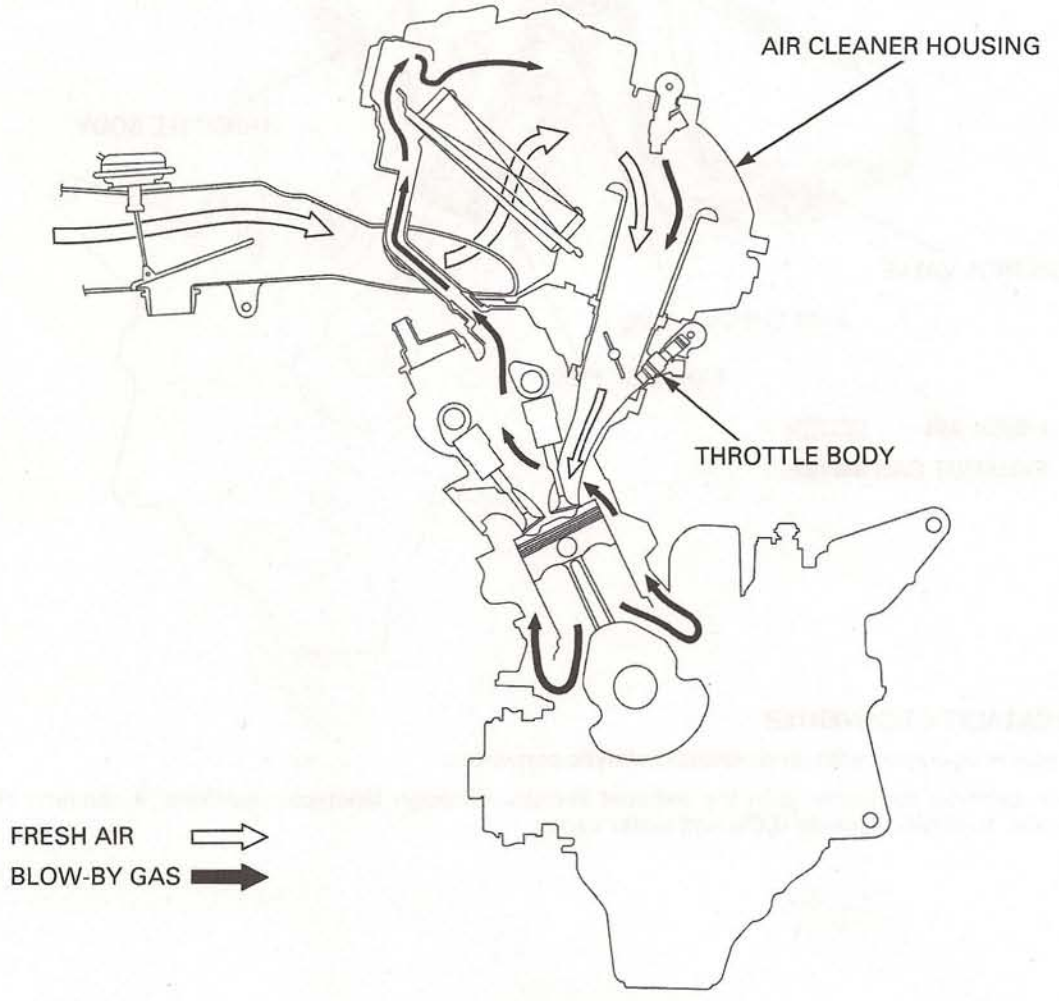
The combustion process produces carbon monoxide (CO), oxides of nitrogen ($NO_X$) and hydrocarbons (HC). Control of carbon monoxide, oxides of nitrogen and hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subject to sunlight. Carbon monoxide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

Honda Motor Co., Ltd. utilizes various system (page 1-38) 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 housing and throttle body.

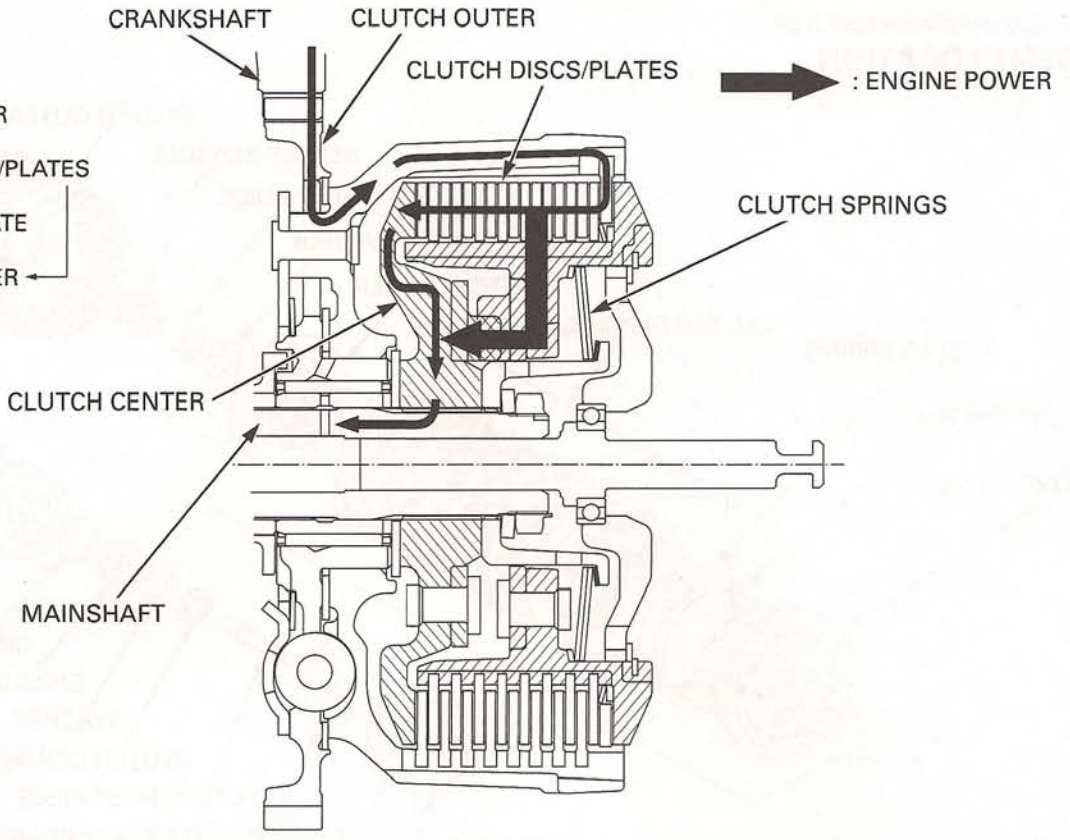


## CLUTCH MECHANISM

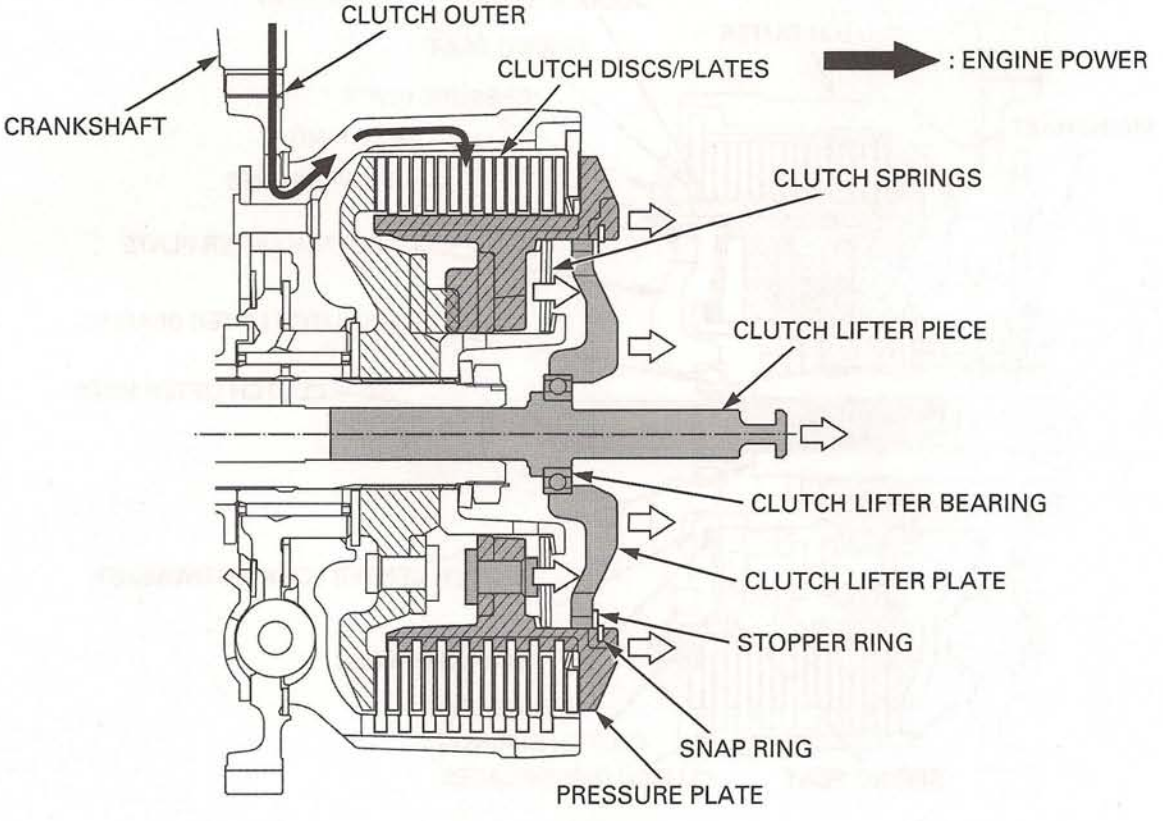
### OPERATION

When the clutch lever is released, the engine power is transmitted from the crankshaft to mainshaft as follows:

CRANKSHAFT
↓
CLUTCH OUTER
↓
CLUTCH DISCS/PLATES
↓
PRESSURE PLATE
↓
CLUTCH CENTER
↓
MAINSHAFT




When the clutch lever is applied, the pressure plate is lifted off from the clutch discs and the engine power is cut from the crankshaft to mainshaft.



# UPPER INNER COVER

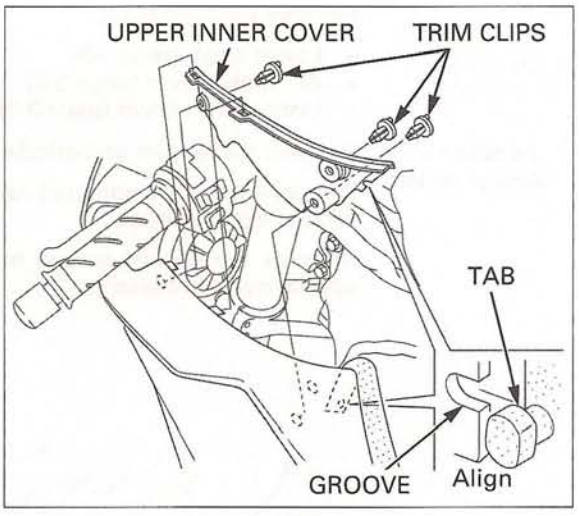
## REMOVAL/INSTALLATION

Remove the trim clips.

Release the groove from the rubber tab and remove the upper inner cover.

*Be careful not to damage the tabs.*

Installation is in the reverse order of removal.




# LOWER COWL

## REMOVAL/INSTALLATION

Release the hoses from the lower cowl.

*Be careful not to damage the tabs and grooves.*

Remove the screws and special screws.

Release the front side grooves from the middle cowl tabs.

Slide the lower cowl rearward and remove the lower cowl downward.

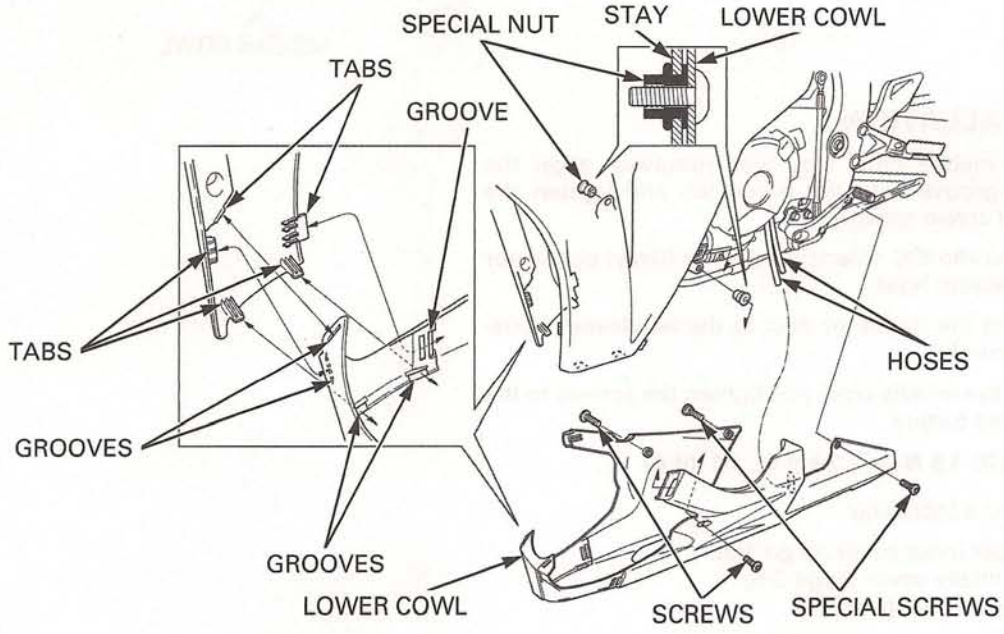
Remove the special nuts from the stays.

Installation is in the reverse order of removal.

**TORQUE:**

**Lower cowl mounting screw:**
**1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**

**Lower cowl mounting special screw:**
**10 N·m (1.0 kgf·m, 7 lbf·ft)**



# REAR FENDER A

## REMOVAL/INSTALLATION

Remove the nuts, bolts and number plate bracket.

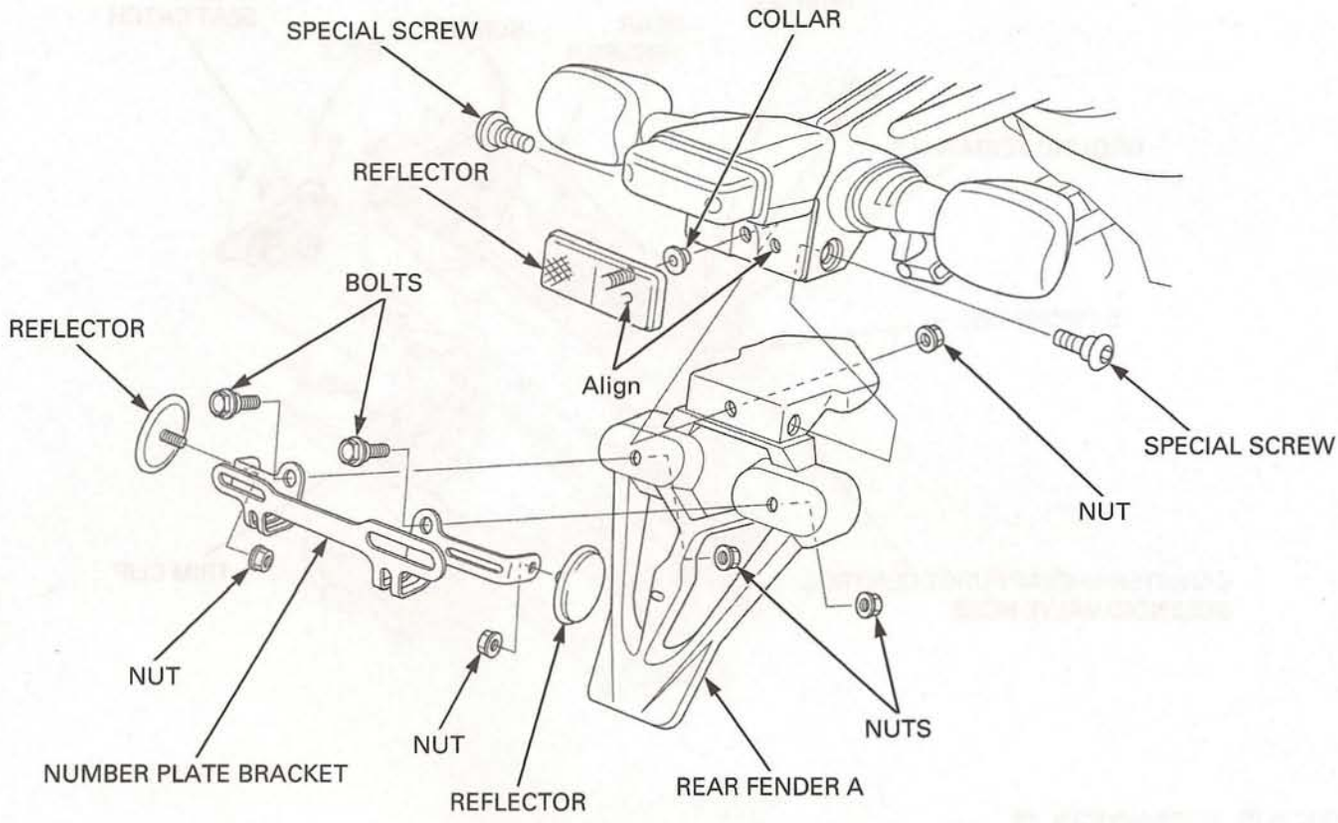
Remove the nuts and reflectors from the number plate bracket.

Remove the special screws.

Remove the nut, reflector, collar and rear fender A.

Installation is in the reverse order of removal.

- Align the reflector tab with the license light stay hole.




# REAR FENDER B

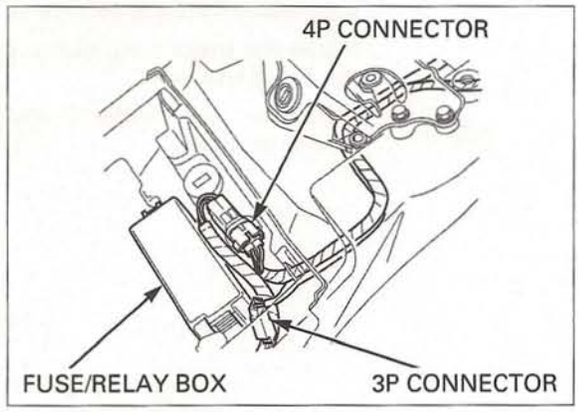
## REMOVAL/INSTALLATION

Remove the following:

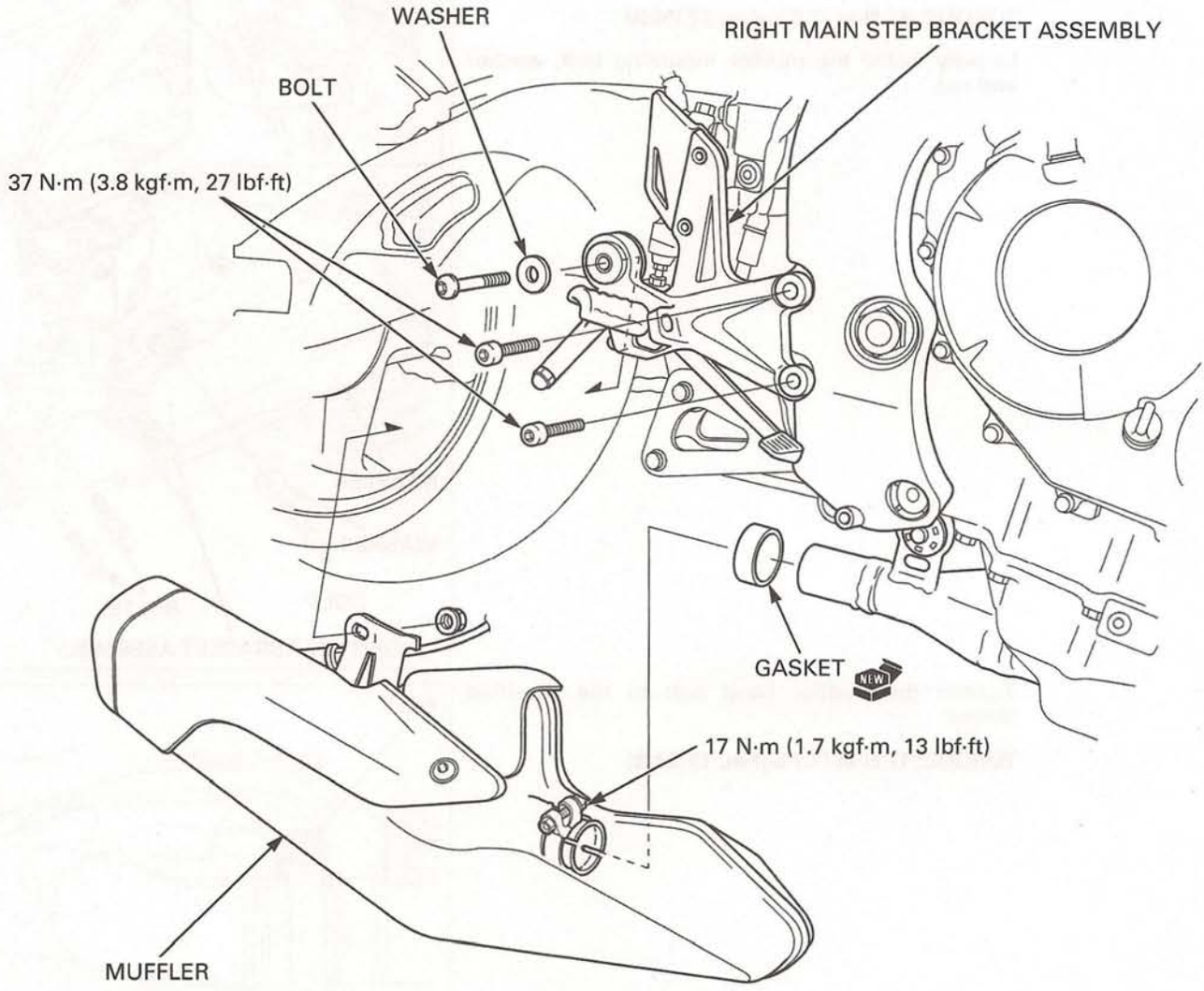
- Rear seat cowl (page 3-8)
- Fuel tank (page 6-51)
- Battery (page 17-6)
- Regulator/rectifier (page 17-9)
- Starter relay switch (page 19-14)
- EGCA (page 6-79)

Disconnect the brake/tail light 3P (Natural) and sub harness 4P (Black) connectors.

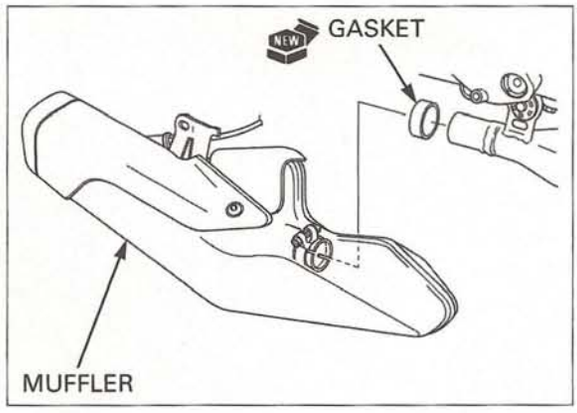
Remove the fuse/relay box from the rear fender B.



## INSTALLATION




Install a new gasket and the muffler to the exhaust pipe.

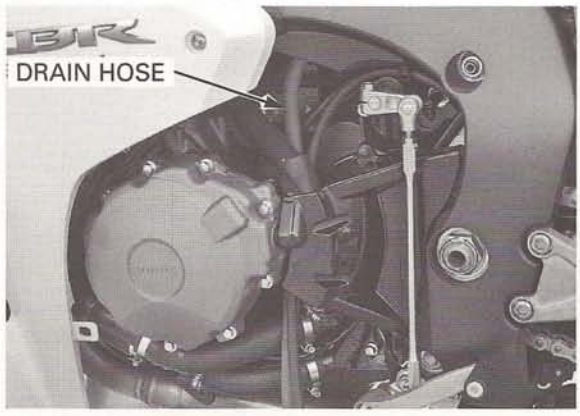


# FUEL LINE

## FUEL TANK LIFTING

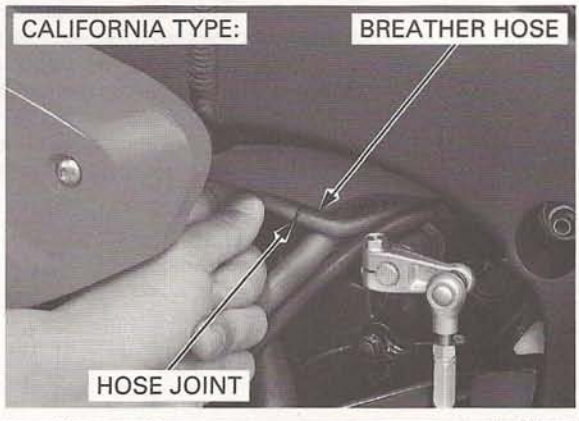
Remove the top shelter (page 3-7).

Release the fuel tank drain hose.



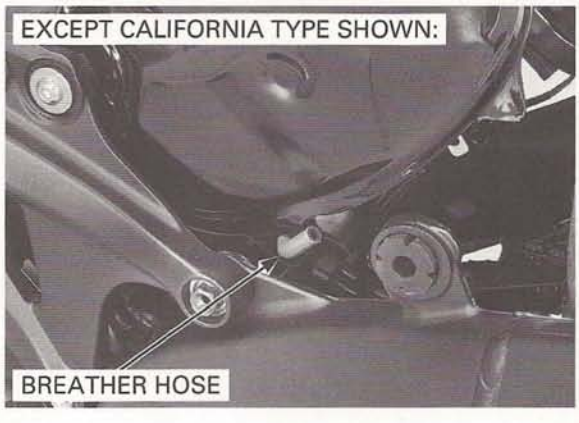

Remove the fuel tank mounting bolts and collars.


*California type:* Disconnect the fuel tank breather hose at hose joint.




*Except California type:* Lift the fuel tank front end and disconnect the fuel tank breather hose.

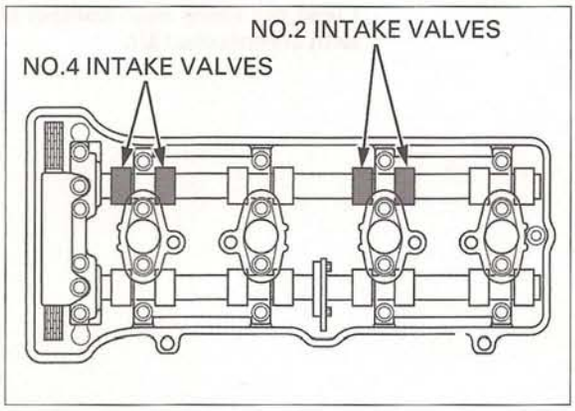
*California type:* Lift the fuel tank front end.



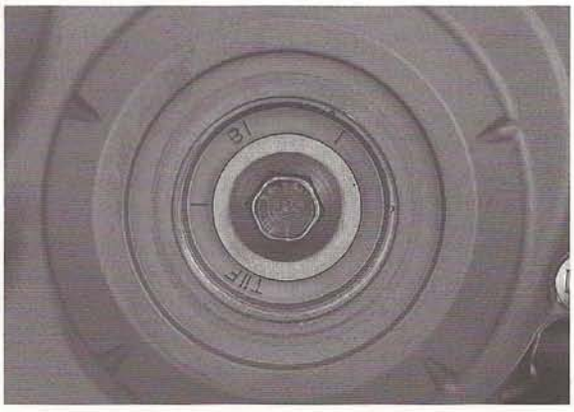
*Record the clearance for each valve for reference in shim selection if adjustment is required.*

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

**VALVE CLEARANCE:**
**IN: 0.16 ± 0.03 mm (0.006 ± 0.001 in)**



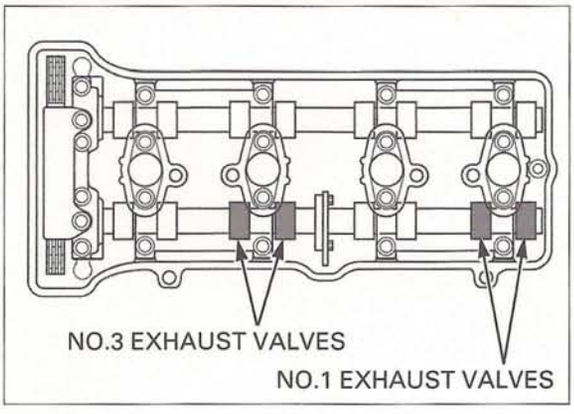

Turn the crankshaft clockwise 1/2 turn (180°).



*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: 0.30 ± 0.03 mm (0.012 ± 0.001 in)**




## ADJUSTMENT

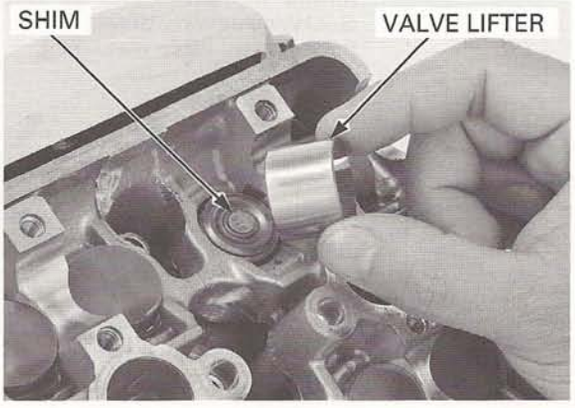
NOTE:
Use genuine Honda parts shims specific to this model for replacement. In case of wrong shims usage, the intake valve titanium surface may be damaged.

*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 9-9).

Remove the valve lifters and shims.

- The 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.



Remove the muffler (page 3-24).

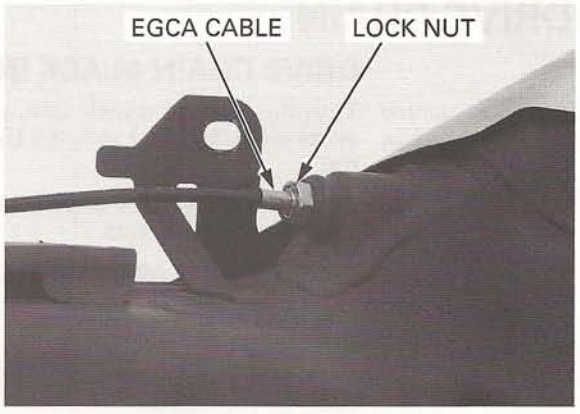
Loosen the lock nut and adjust the EGCA cable length with the ECV closed position.

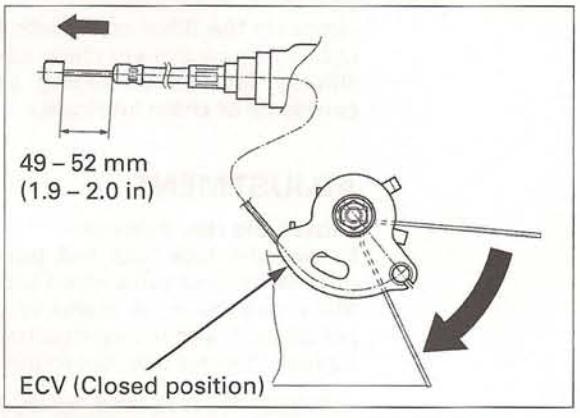
- Keep the EGCA cable straight when adjust the cable length.
- Check the length of the EGCA cable with the ECV closed position while pulling the EGCA cable.

**STANDARD LENGTH: 49 – 52 mm (1.9 – 2.0 in)**

Tighten the EGCA cable lock nut to the specified torque.

**TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**

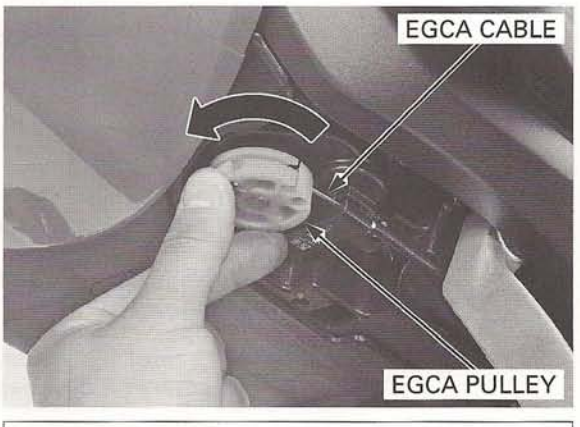


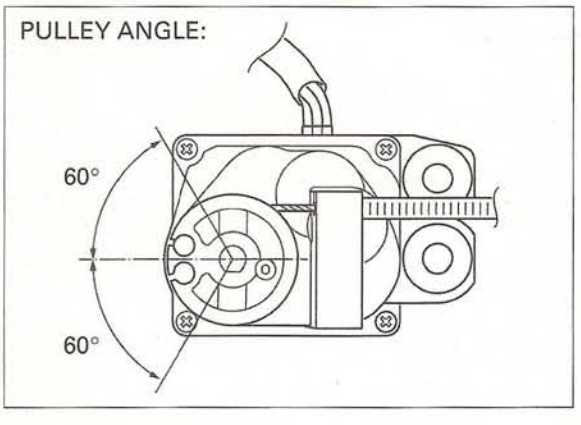




Connect the EGCA cable to the EGCA pulley.

Turn the EGCA pulley counterclockwise to the specified angle as shown.

Installation is in the reverse order of removal.



# SIDESTAND

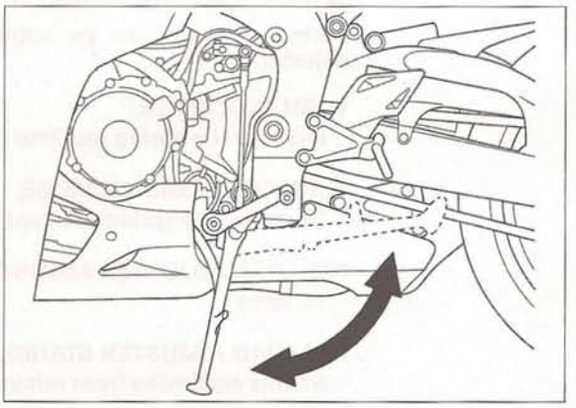
Check the sidestand spring for damage or loss of tension.
Check the sidestand for movement and lubricate the sidestand pivot if necessary.

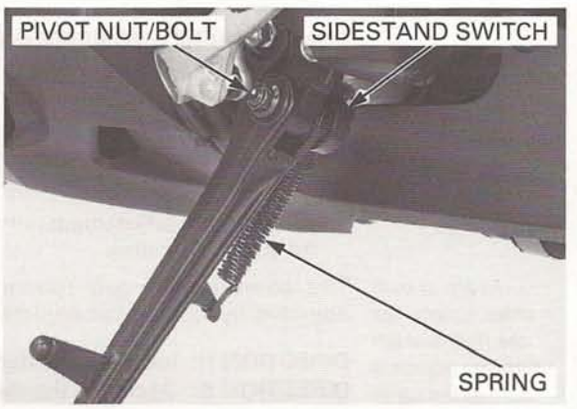
**TORQUE:**
**Sidestand pivot bolt: 10 N·m (1.0 kgf·m, 7 lbf·ft)**
**Sidestand pivot nut: 29 N·m (3.0 kgf·m, 21 lbf·ft)**

Check the sidestand ignition cut-off system:

- Sit astride the motorcycle and raise the sidestand.
- Start the engine with the transmission in neutral, then, with the clutch lever fully squeezed, shift the transmission into gear.
- 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 20-20).






# SUSPENSION

## FRONT SUSPENSION INSPECTION

Check the action of the forks by operating the front brakes and compressing the front suspension several times.
Check the entire assembly for signs of leaks, damage or loose fasteners.

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

Replace damaged components that cannot be repaired.
Tighten all nuts and bolts.

For fork service (page 14-22).

# OIL PRESSURE INSPECTION

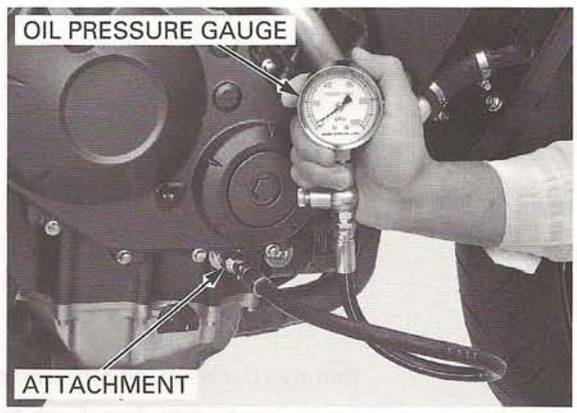
*If the oil pressure indicator remains on while the engine is running, check the indicator system (page 20-14) before checking the oil pressure.*

Remove the EOP switch (page 20-14).

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** | **07406-0030000 or equivalent commercially available** |




Check the engine oil level (page 4-17).

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.

**Standard:**
**590 kPa (6.0 kgf/$cm^2$, 86 psi) at 6000 rpm/ (80°C/176°F)**

Stop the engine and remove the tools.

Install the EOP switch (page 20-14).

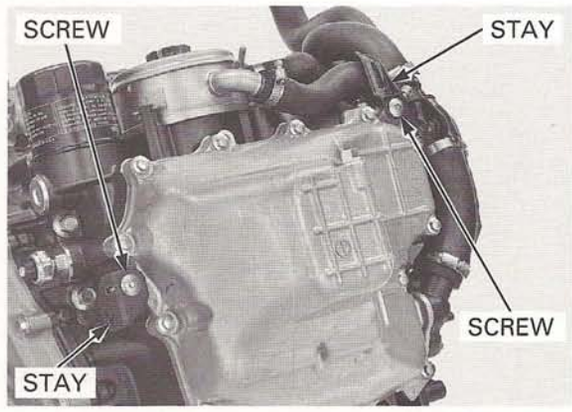
# OIL PUMP

## REMOVAL

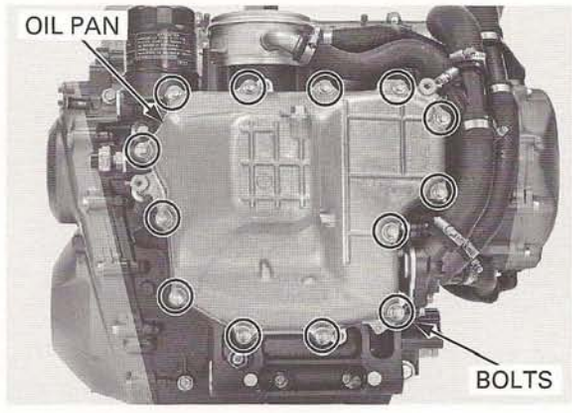
Drain the engine oil (page 4-18).

Remove the exhaust pipe (page 3-31).

Remove the screws and lower cowl stays.

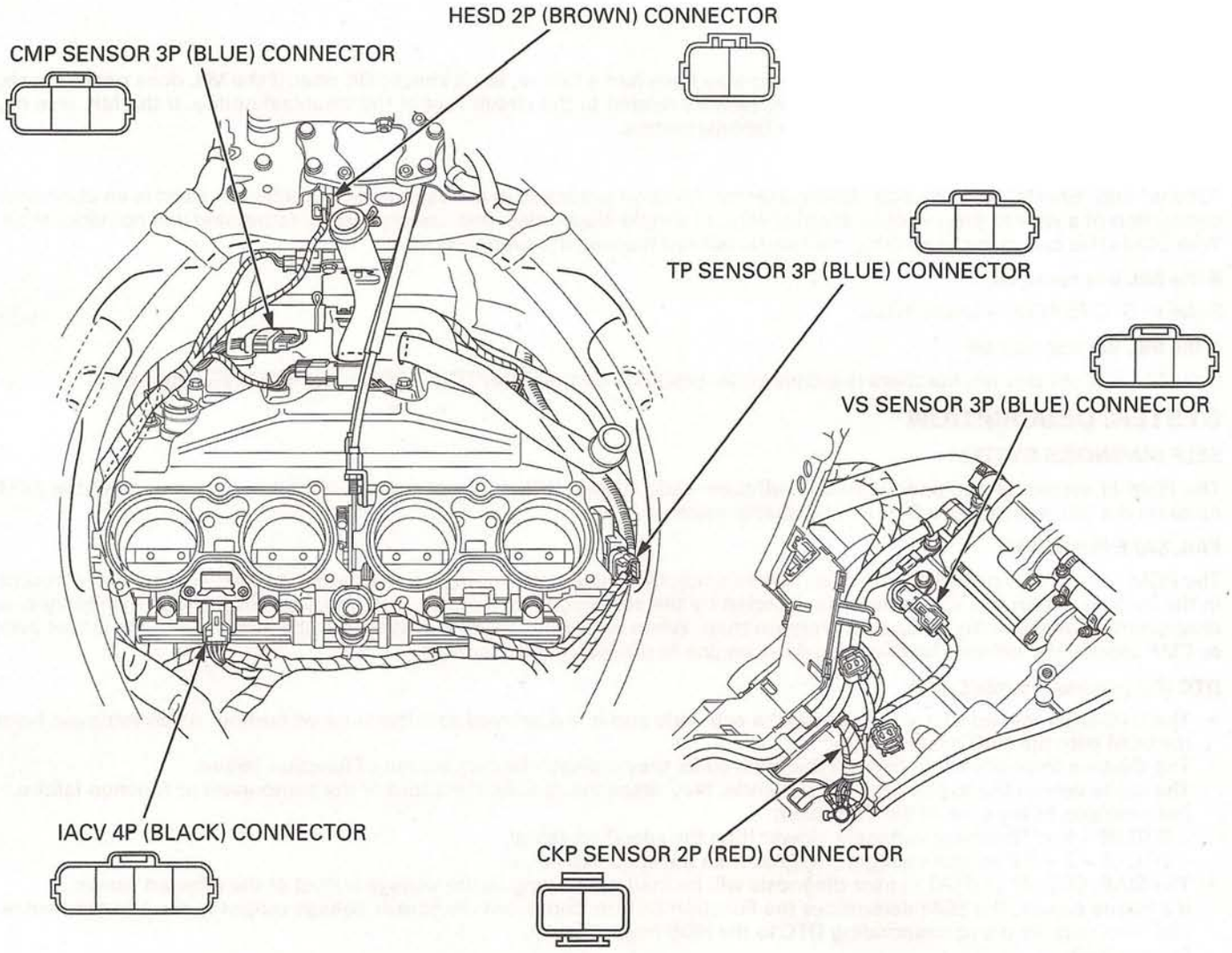



Remove the bolts and oil pan.

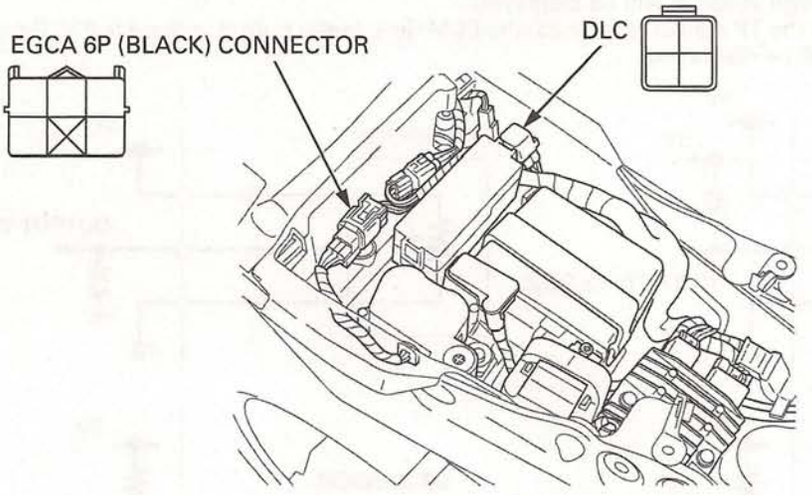


# 6. FUEL SYSTEM (PGM-FI)

NOTE: Remove the air cleaner housing (page 6-52).




NOTE: Remove the seat (page 3-6).



3. **ECT Sensor Resistance Inspection**

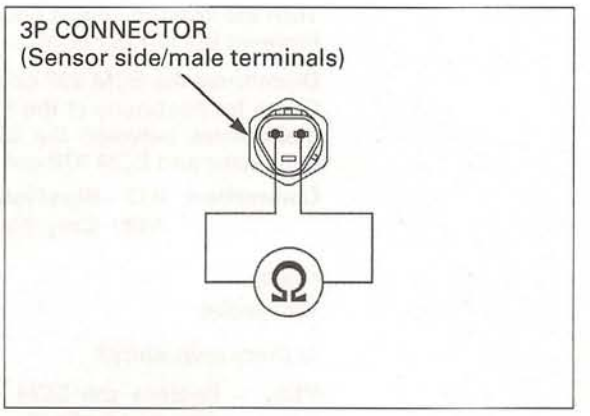
   Measure the resistance at the ECT sensor terminals.

   **Connection: Blue/yellow – Gray/black**
   **Standard: 2.3 – 2.6 kΩ (20°C/68°F)**
   **(Sensor side terminals)**

   ***Is the resistance within 2.3 – 2.6 kΩ?***

   **YES** – Replace the ECM with a known good one, and recheck.

   **NO** – Faulty ECT sensor




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

   Turn the ignition switch OFF.

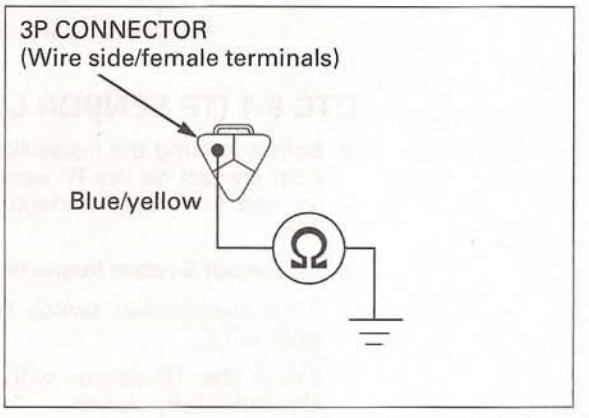
   Check for continuity between the ECT sensor 3P (Gray) connector at the wire side and ground.

   **Connection: Blue/yellow – Ground**

   ***Is there continuity?***

   **YES** – Short circuit in Blue/yellow wire

   **NO** – Replace the ECM with a known good one, and recheck.




## DTC 7-2 (ECT SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the ECT sensor 3P (Gray) 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.

   ***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 (Gray) connector.
   Connect the ECT sensor 3P (Gray) connector terminals with a jumper wire.

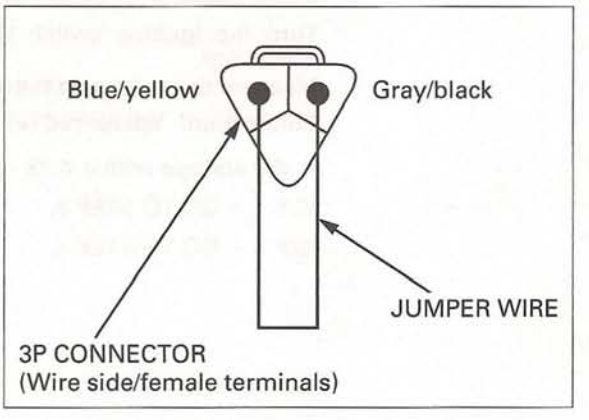
   **Connection: Blue/yellow – Gray/black**

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

   ***Is about 0 V indicated?***

   **YES** – Inspect the ECT sensor (page 20-13).

   **NO** – GO TO STEP 3.



3. **CMP Sensor Input Voltage Inspection**

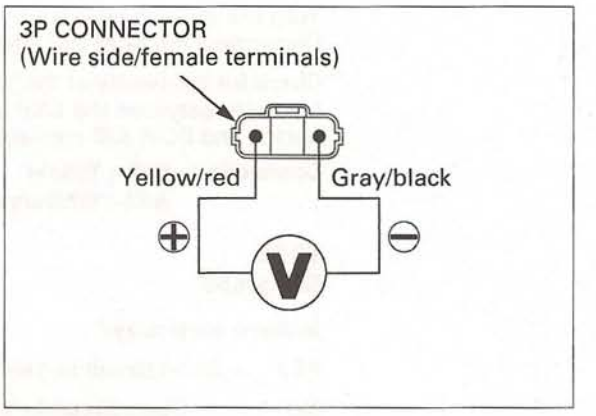
Measure the voltage at the wire side.

**Connection: Yellow/red (+) – Gray/black (–)**

***Is the voltage within 4.75 – 5.25 V?***

**YES** – Faulty CMP sensor

**NO** – • Open circuit in Yellow/red wire
• Open circuit in Gray/black wire




4. **CMP Sensor signal line open Circuit Inspection**

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

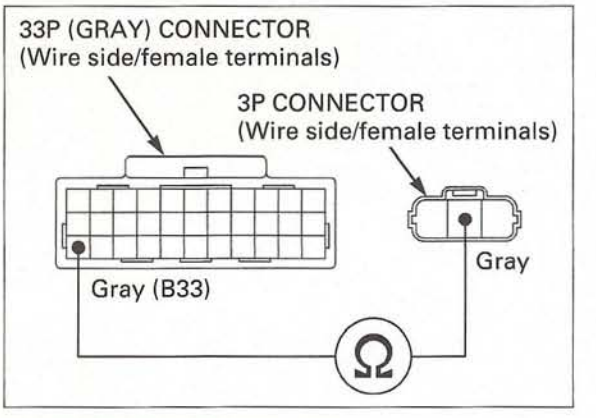
Check for continuity at the Gray wire between the CMP sensor 3P (Blue) connector and ECM 33P (Gray) connector.

**Connection: B33 – Gray**

***Is there continuity?***

**YES** – Replace the ECM with a known good one, and recheck.

**NO** – Open circuit in Gray wire




## DTC 19-1 (CKP SENSOR)

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

1. **CKP Sensor Peak Voltage Inspection**

Turn the ignition switch OFF.
Disconnect the CKP sensor 2P (Red) connector.

Turn the ignition switch ON.
Crank the engine and measure the CKP sensor peak voltage at the CKP sensor 2P (Red) connector.

**Connection: Yellow (+) – White/yellow (–)**
**(Sensor side terminals)**

**TOOL:**

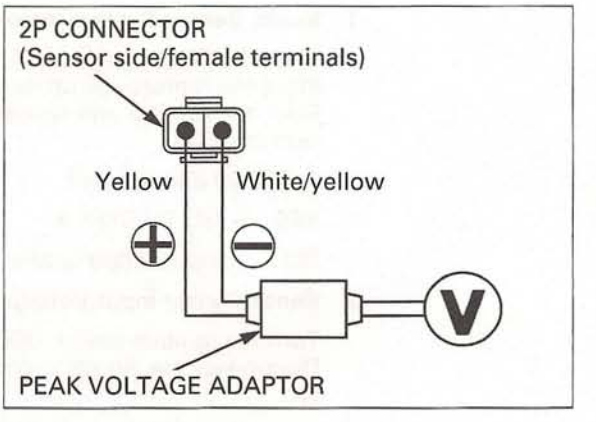
| | |
|---|---|
| **IgnitionMate peak voltage tester** | **MTP07-0286 (U.S.A. only) or** |
| **Peak voltage adaptor** | **07HGJ-0020100 (Not available in U.S.A.)** |

**with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)**

***Is the voltage more than 0.7 V (20°C/68°F)?***

**YES** – GO TO STEP 2.

**NO** – Faulty CKP sensor

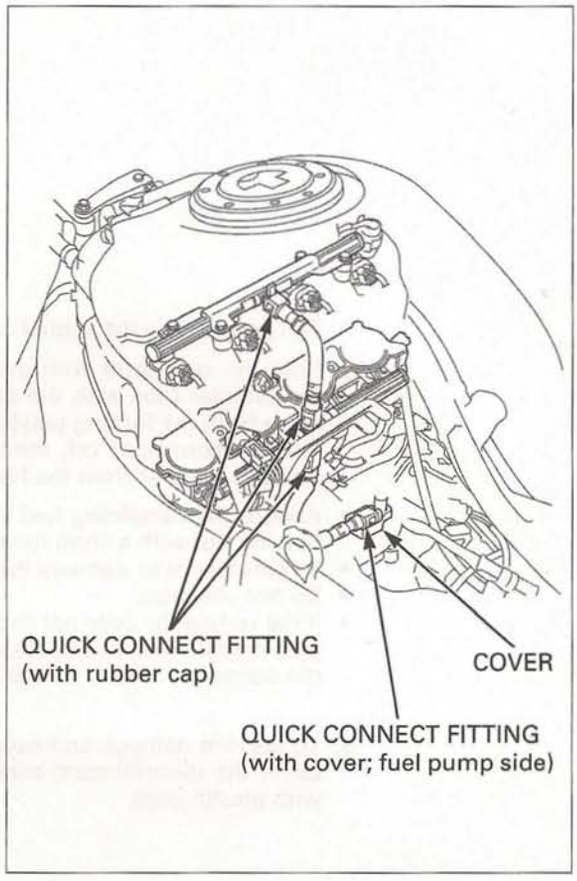


# FUEL LINE INSPECTION

## QUICK CONNECT FITTING LOCATION

The quick connect fittings are located as shown.

NOTE:
The quick connect fitting cover is only installed on the fuel pump side joint. The rubber caps are installed in the other quick connect fittings.



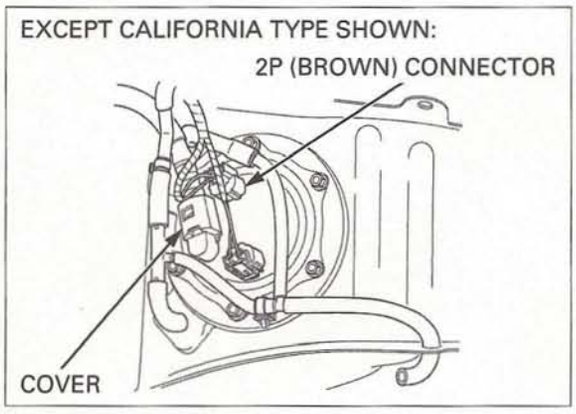

## FUEL PRESSURE RELIEVING/QUICK CONNECT FITTING REMOVAL

- Before disconnecting the fuel hose, relieve pressure from the system as follows.

1. Turn the ignition switch OFF.

   Lift and support the fuel tank (page 4-5).

   Remove the quick connect fitting cover (fuel pump side only).
2. Disconnect the fuel pump 2P (Brown) 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).

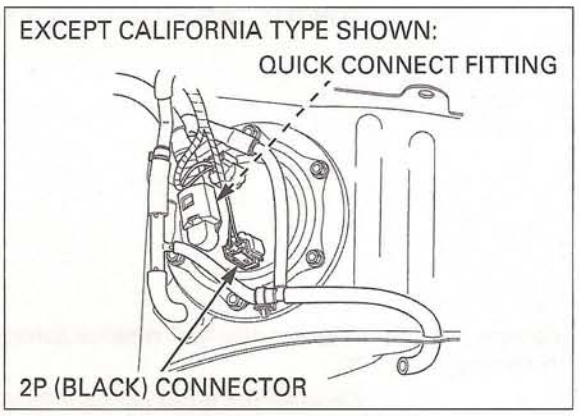


# FUEL TANK

## REMOVAL

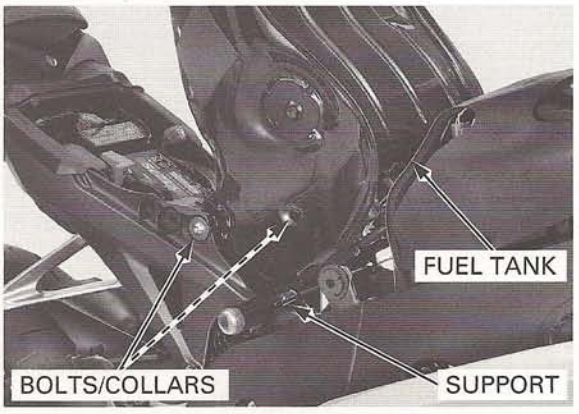
Relieve the fuel pressure (page 6-41) and disconnect the quick connect fitting from the fuel tank.

Disconnect the fuel reserve sensor 2P (Black) connector.

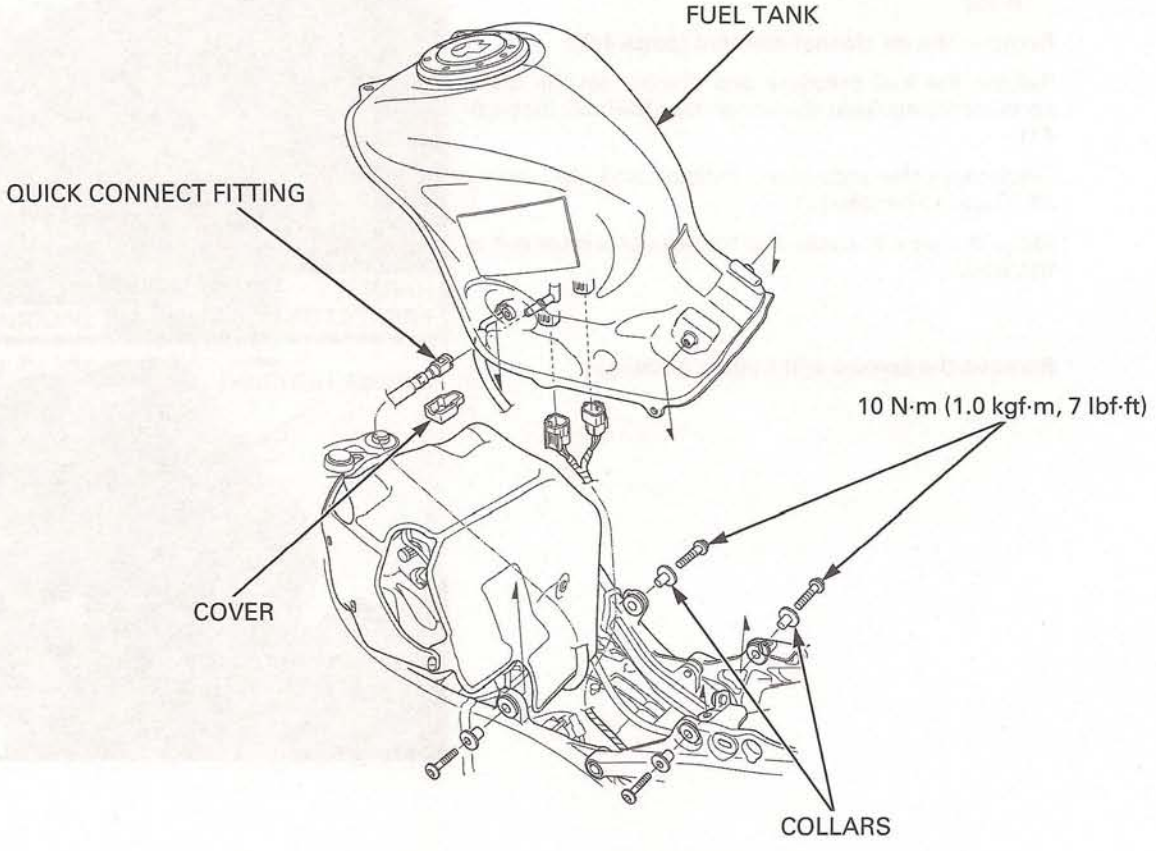


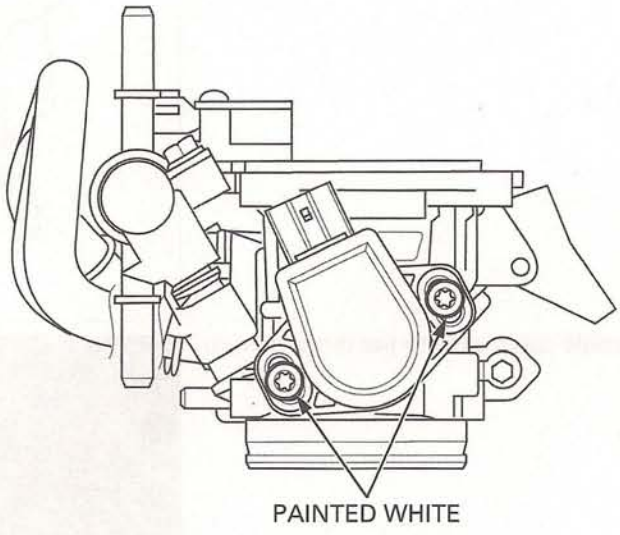

Remove the support, fuel tank pivot bolts, collars and fuel tank.

For fuel pump unit removal (page 6-48).

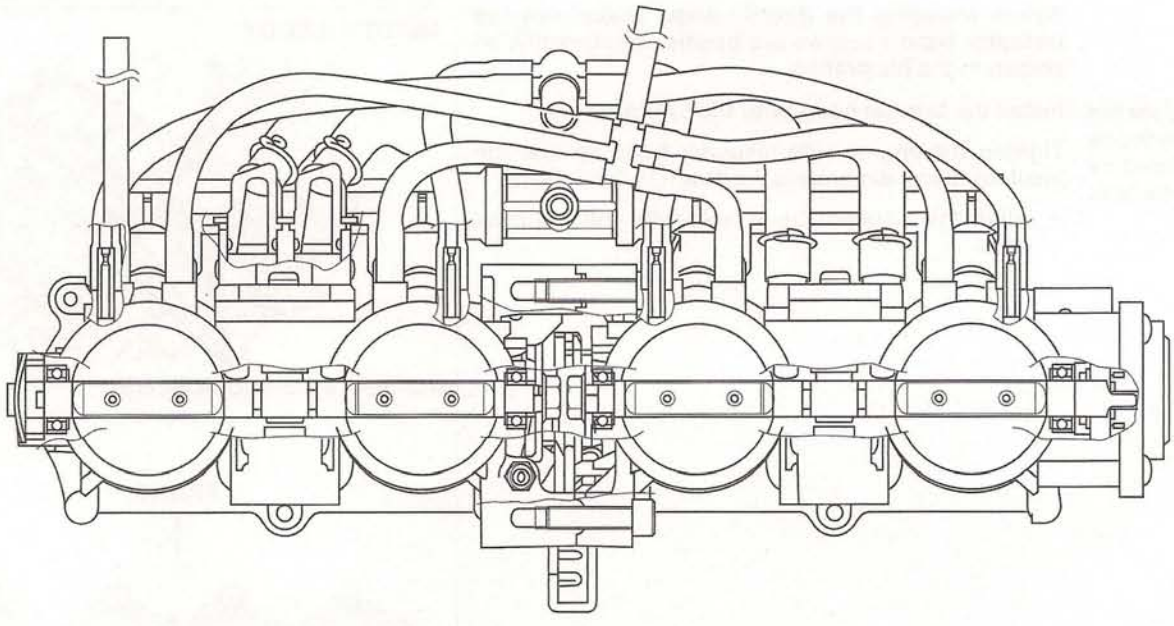



## INSTALLATION






## THROTTLE BODY VACUUM HOSE ROUTING (CALIFORNIA TYPE)



# CMP SENSOR

## REMOVAL/INSTALLATION

Remove the air cleaner housing (page 6-52).

Disconnect the CMP sensor 3P (Blue) connector.

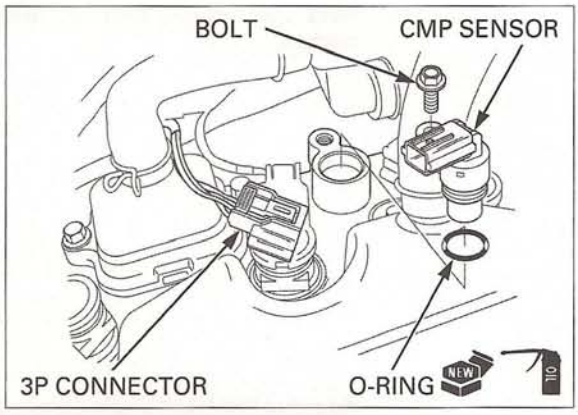
Remove the bolt, CMP sensor and O-ring from the cylinder head cover.

Apply oil to a new O-ring and install it onto the CMP sensor.
Install the CMP sensor on to the cylinder head.

Tighten the bolt securely.

Connect the CMP sensor 3P (Blue) connector.

Install the air cleaner housing (page 6-54).




# BANK ANGLE SENSOR

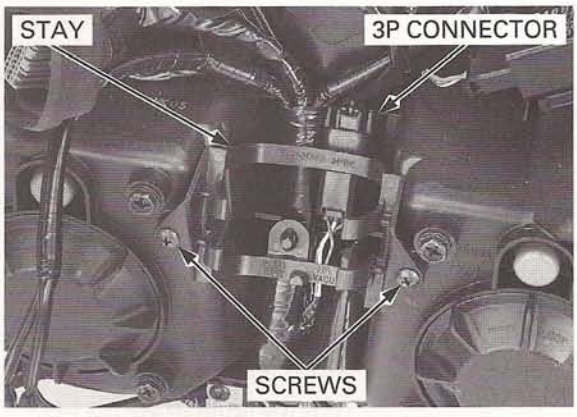
## REMOVAL/INSTALLATION

Remove the upper cowl (page 3-13).

Remove the vacuum chamber.


Remove the screws and vacuum chamber stay.

Remove the bank angle sensor 3P (Black) connector from the stay.



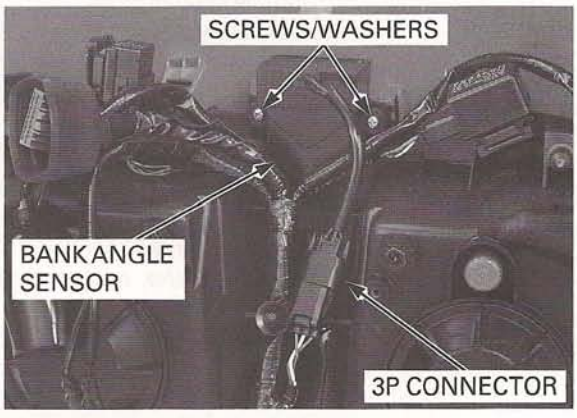

Disconnect the bank angle sensor 3P (Black) connector.

Remove the screws, washers and bank angle sensor from the front cowl.

Installation is in the reverse order of removal.

**TORQUE:**

**Bank angle sensor mounting screw:**
**1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)**

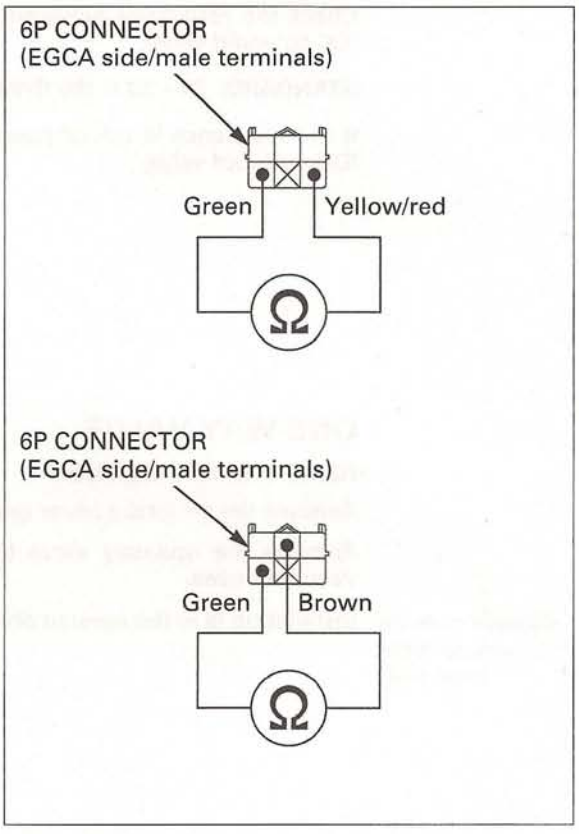


Measure the resistance between the EGCA 6P (Black) connector terminals.

**Connection: Yellow/red – Green**
**Standard: 3.5 – 6.5 kΩ**

**Connection: Brown – Green**
**Standard: 0 – 5 kΩ**

If the resistance is out of range, replace the EGCA.




# INTAKE AIR DUCT CONTROL

## INTAKE AIR DUCT VALVE DIAPHRAGM

### INSPECTION

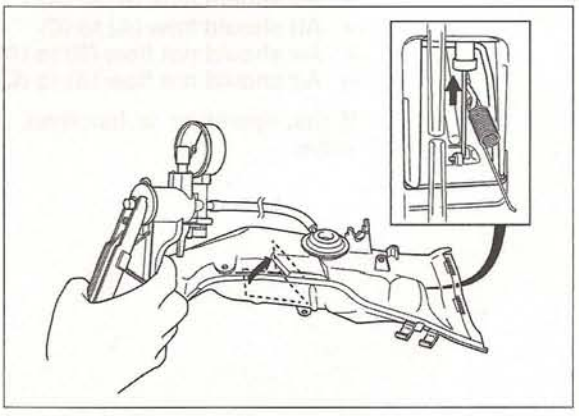
Remove the intake air duct from the middle cowl (page 3-11).

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)**

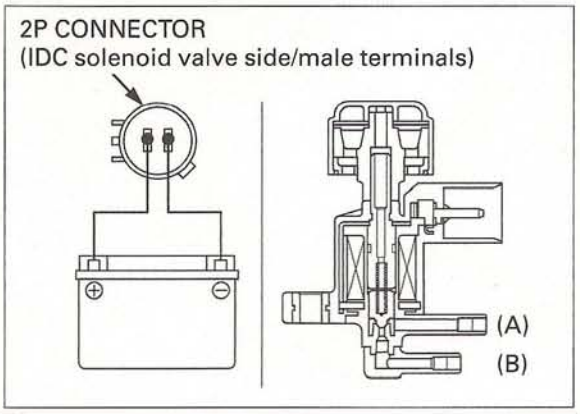
The vacuum should hold and the air duct valve should remain open.



## 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 terminal.

**Connection: White terminal (+) – Yellow terminal (–)**



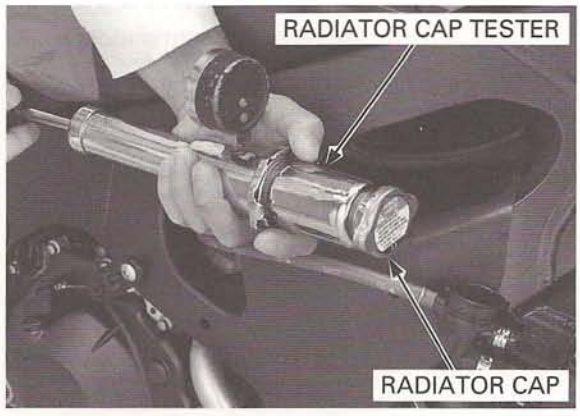
## RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the radiator cap (page 7-5).

*Before installing the cap in the tester, wet the sealing surfaces.*

Pressure test the radiator cap.
Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or 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)**

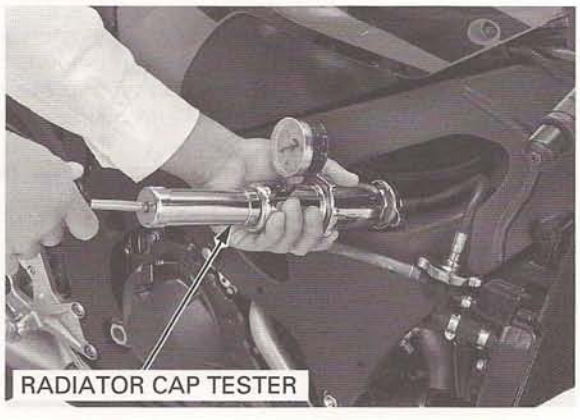



Pressure the radiator, engine and hoses, and check for leaks.

**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.



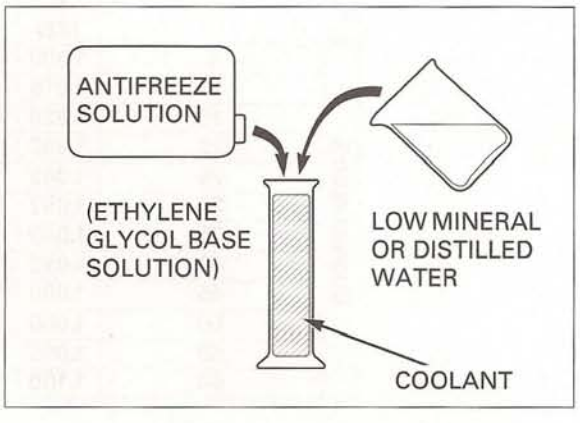

# COOLANT REPLACEMENT

## PREPARATION

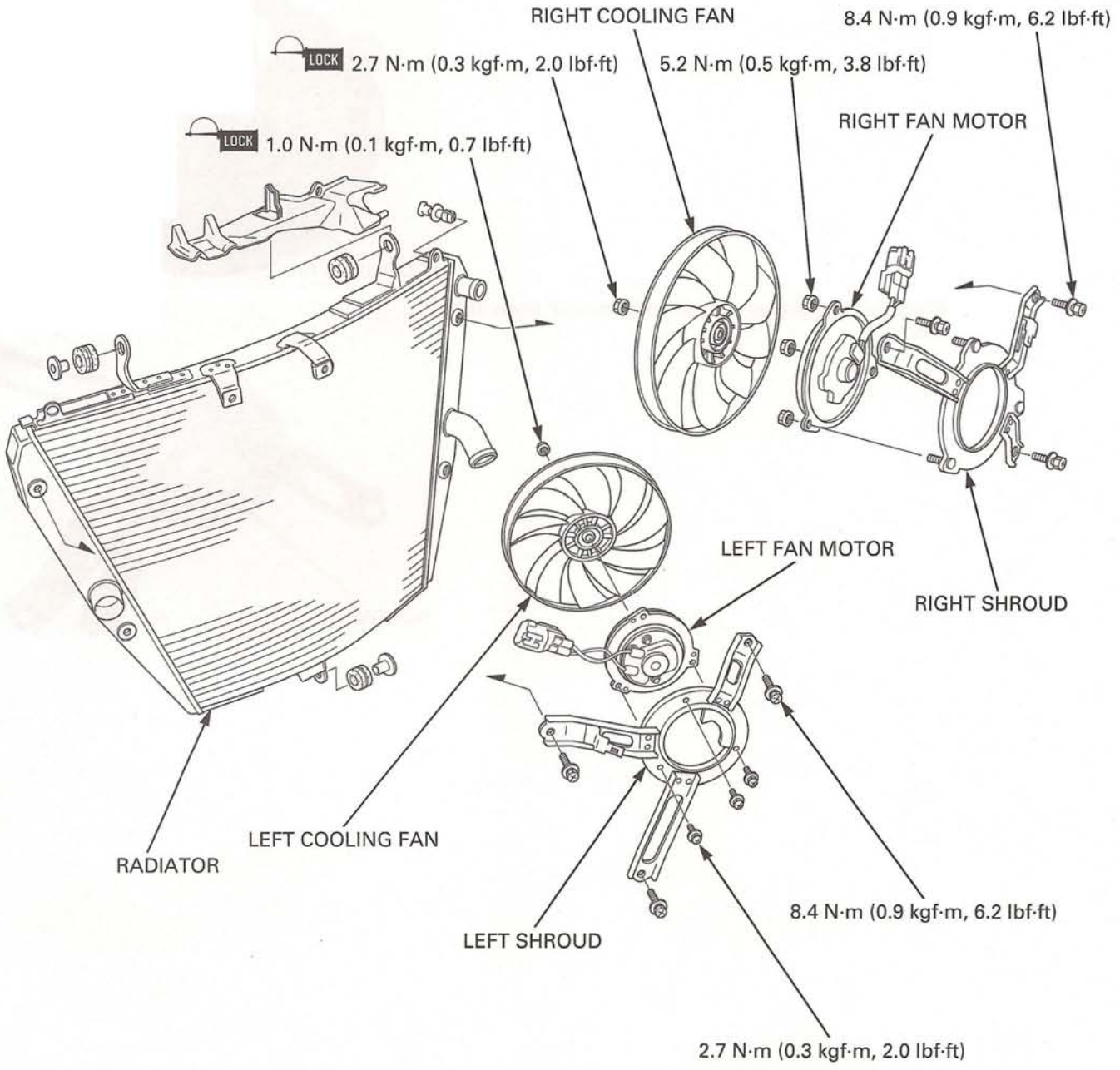
- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance change the coolant regularly as specified in the maintenance schedule.
- Mix only distilled, low mineral water with the antifreeze.

**RECOMMENDED ANTIFREEZE:**
**Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing silicate free corrosion inhibitors**

**RECOMMENDED MIXTURE:**
**1:1 (mixture with distilled water)**



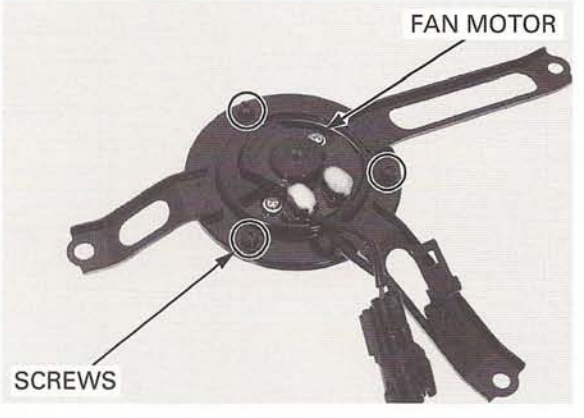
## ASSEMBLY



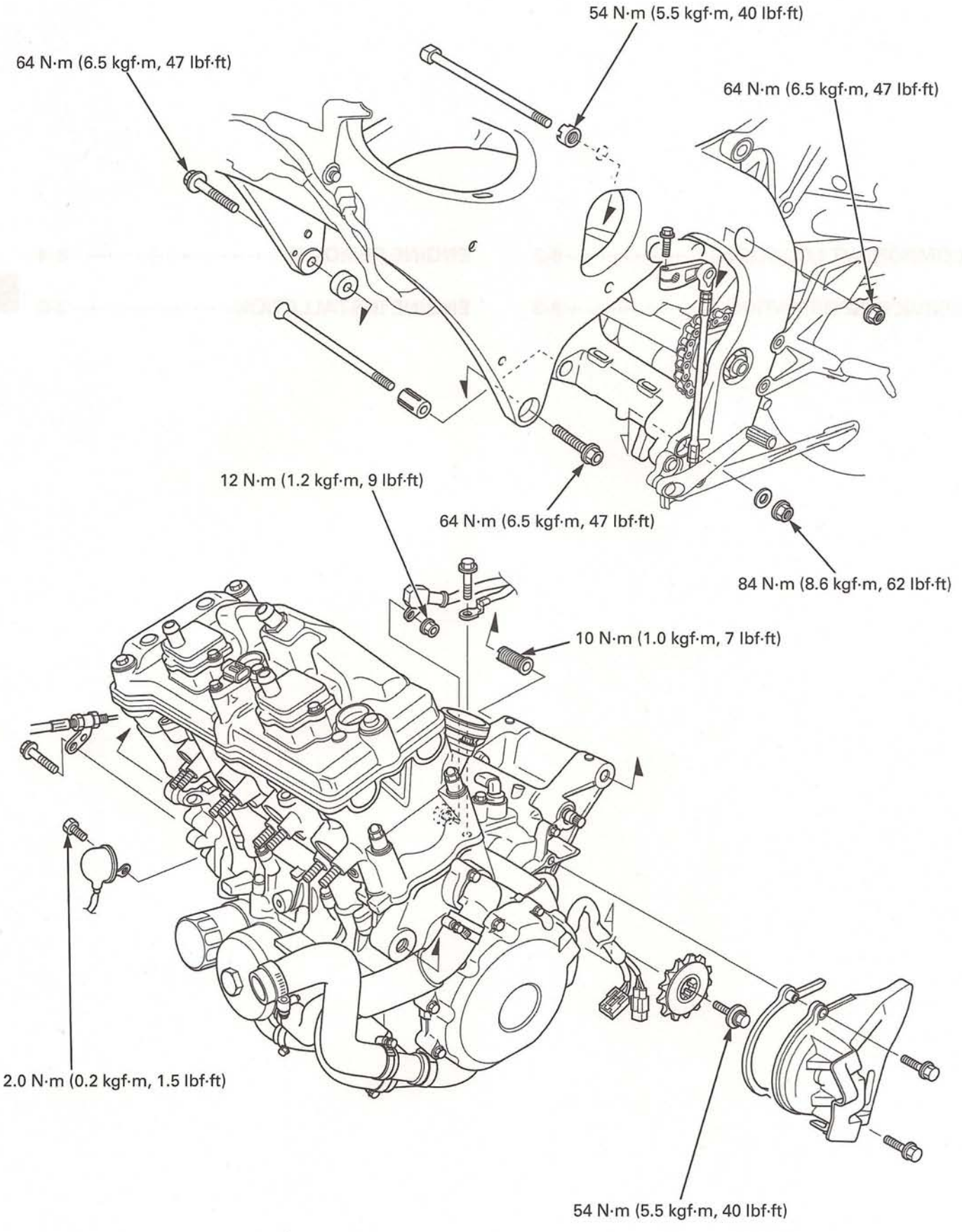

**Left fan motor**

Install the left fan motor onto the shroud and tighten the screws to the specified torque.

**TORQUE: 2.7 N·m (0.3 kgf·m, 2.0 lbf·ft)**



# COMPONENT LOCATION



*Correctly route the wires (page 1-20).*

Install the battery negative (–) cable and tighten the bolt securely.

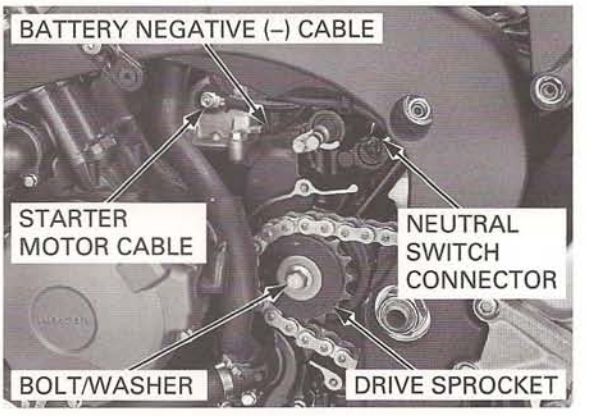
Connect the stater motor cable and tighten the nut to the specified torque.

**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

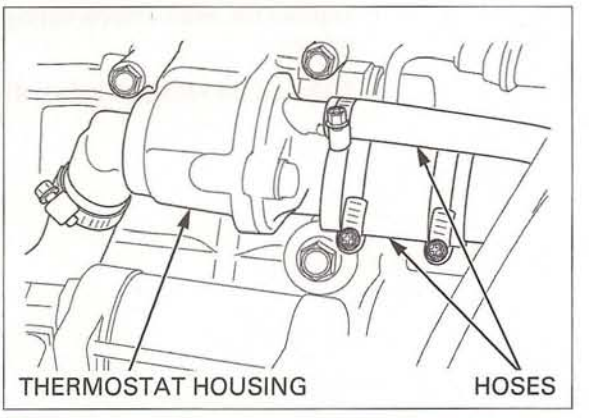
Install the drive sprocket with its marks facing out.

Install the washer and drive sprocket bolt, then tighten the bolt to the specified torque.

**TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)**

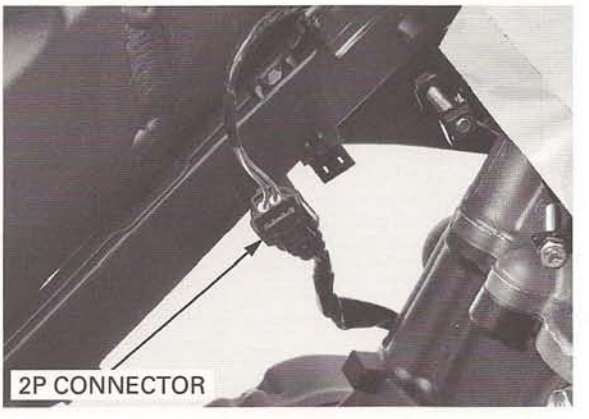



Connect the water hoses to the thermostat housing securely.

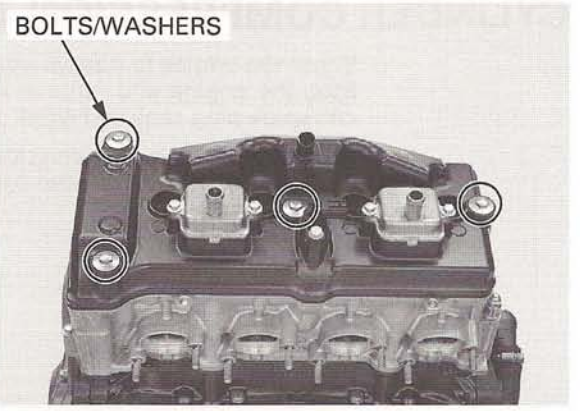



Connect the knock sensor 3P (Blue) and ECT sensor 3P (Gray) connectors.


Connect the sidestand switch 2P (Black) connector.



Remove the cylinder head cover bolts and washers.

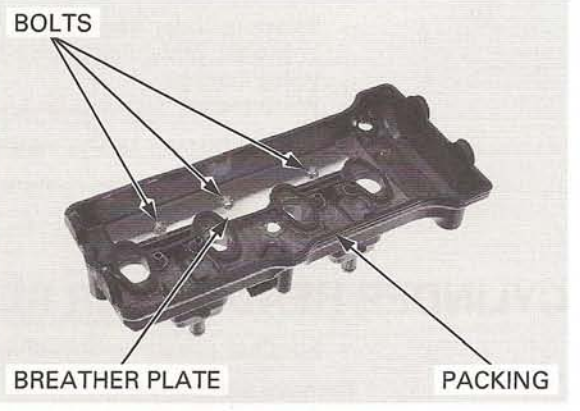



Remove the cylinder head cover from the cylinder head.

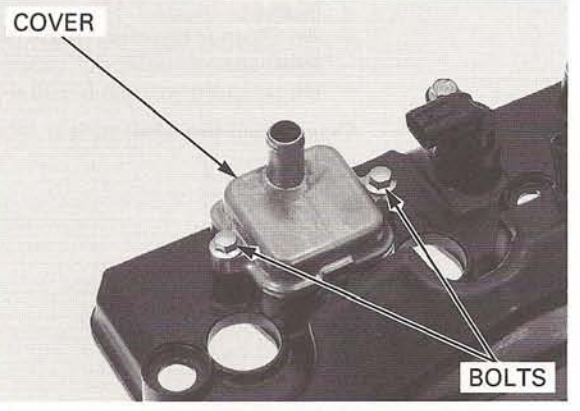

## CYLINDER HEAD COVER DISASSEMBLY

Remove the cylinder head cover packing.

Remove the bolts and breather plate.




Remove the bolts and PAIR check valve cover.



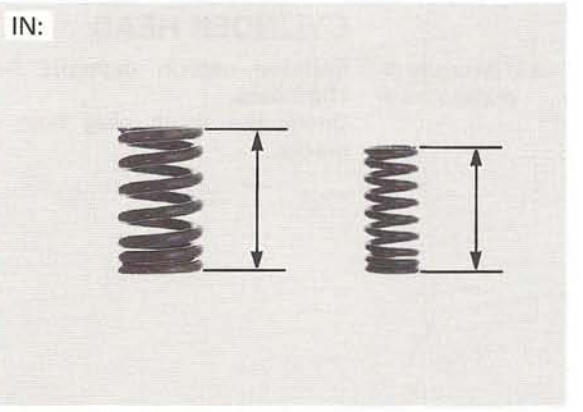
## VALVE SPRING

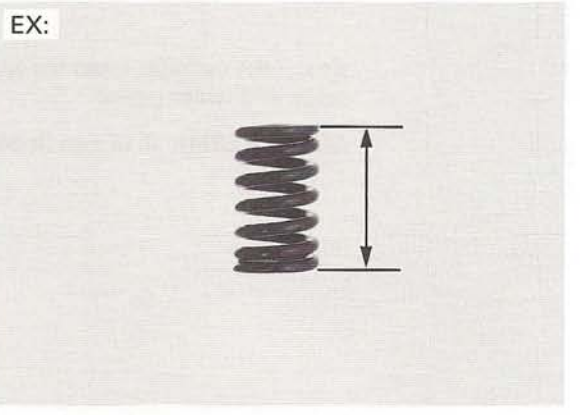
Measure the free length of the inner and outer valve springs.

**SERVICE LIMITS:**

**IN: Inner: 34.5 mm (1.36 in)**
**Outer: 38.2 mm (1.50 in)**
**EX: 38.9 mm (1.53 in)**

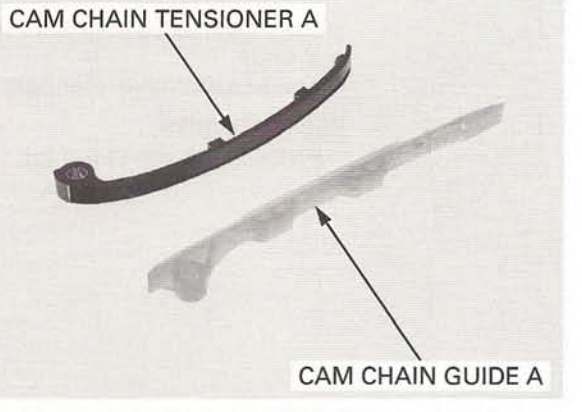
Replace the springs if they are shorter than the service limits.



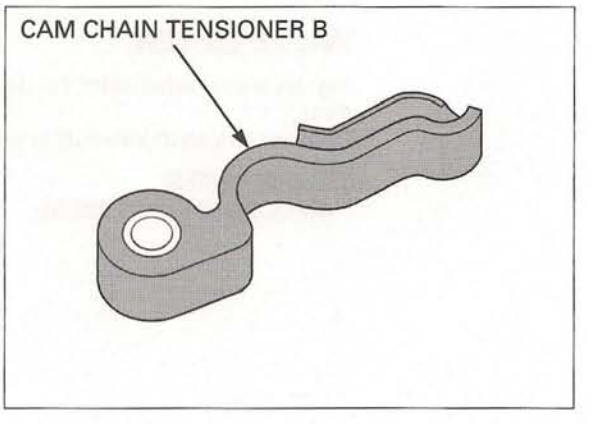




## CAM CHAIN TENSIONER/CAM CHAIN GUIDE

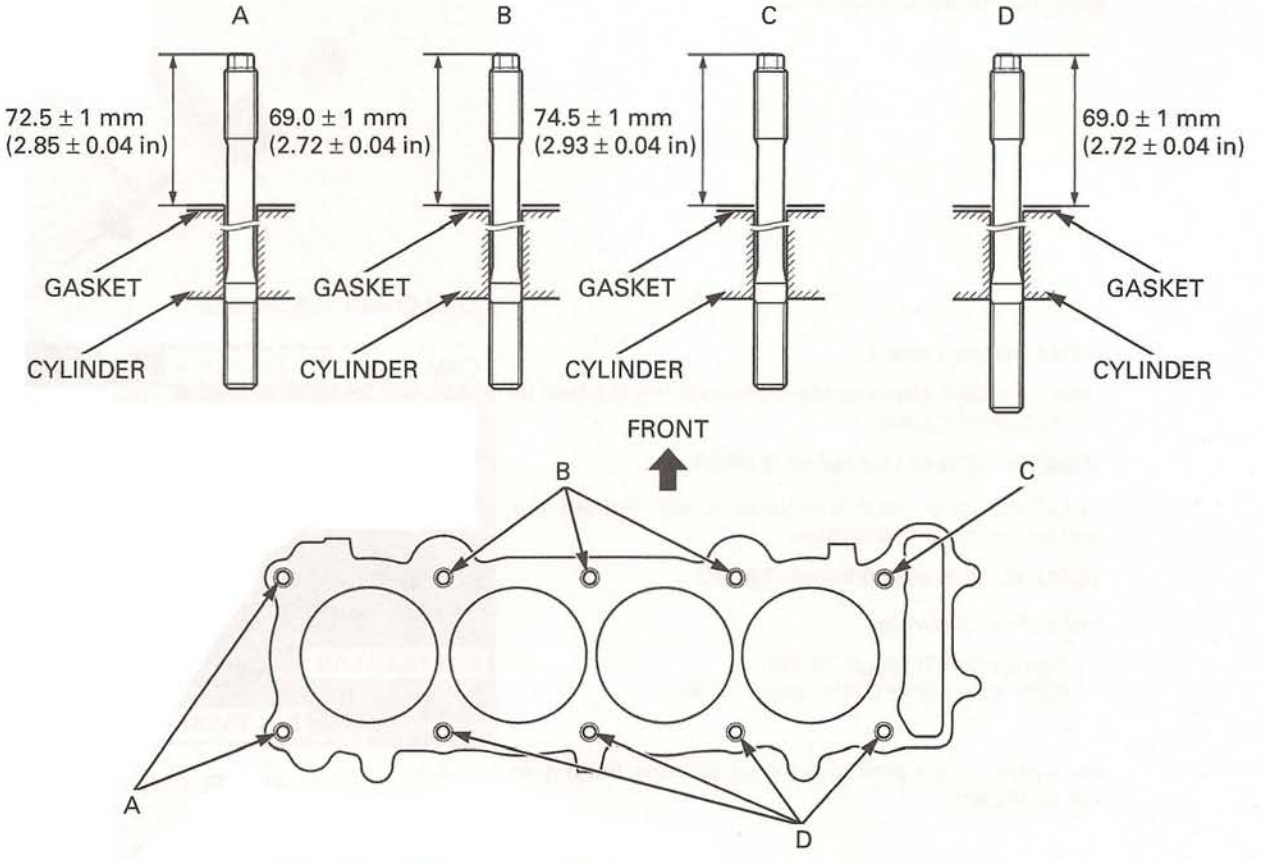
Inspect the cam chain tensioner A and cam chain guide A for excessive wear or damage, replace them if necessary.



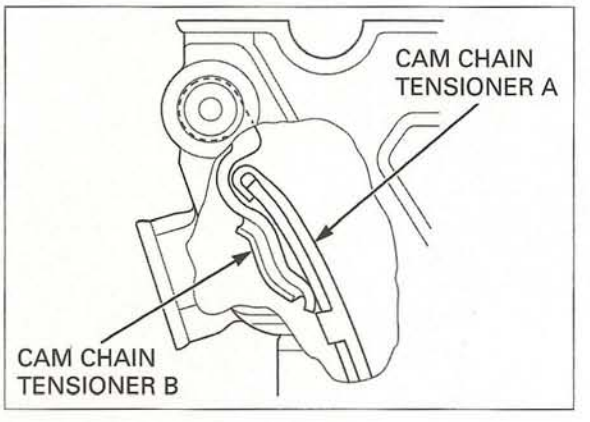

Inspect the cam chain tensioner B for excessive wear or damage, replace it if necessary.



Check that the cylinder stud bolt height from the bolt head to cylinder gasket surface is within specification.




Install the cylinder head onto the cylinder block while aligning the cam chain tensioner A and B as shown.

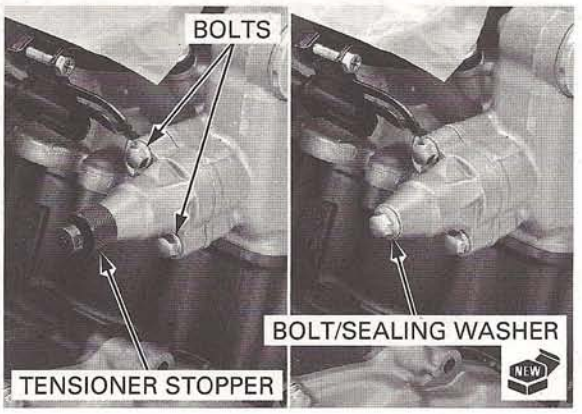


Install and tighten the bolts securely.

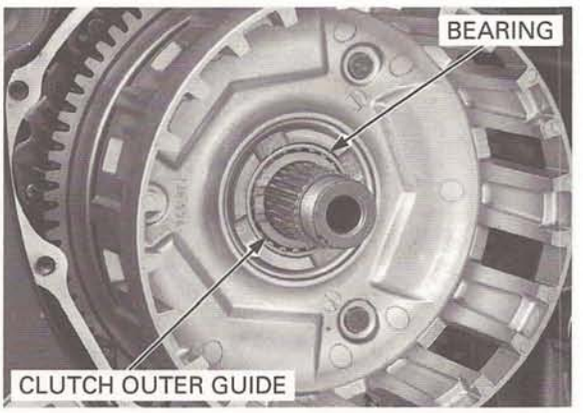
Remove the tensioner stopper.

Install a new sealing washer and tighten the sealing bolt securely.

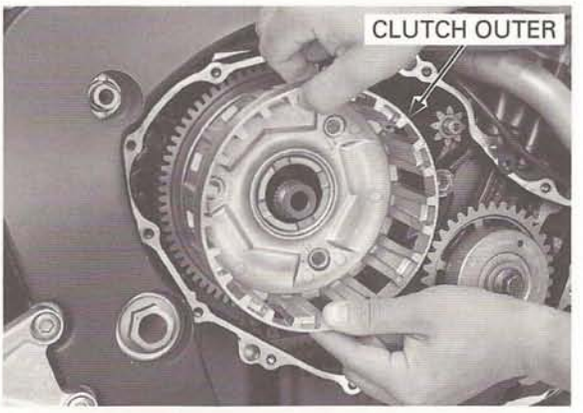
Remove the support and close the fuel tank (page 4-7).



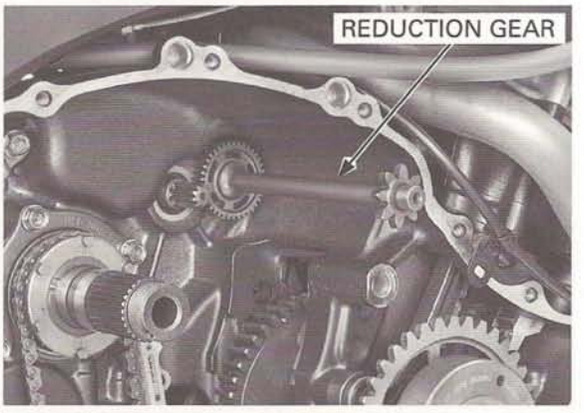
Remove the clutch outer guide and needle bearing.




Remove the clutch outer.

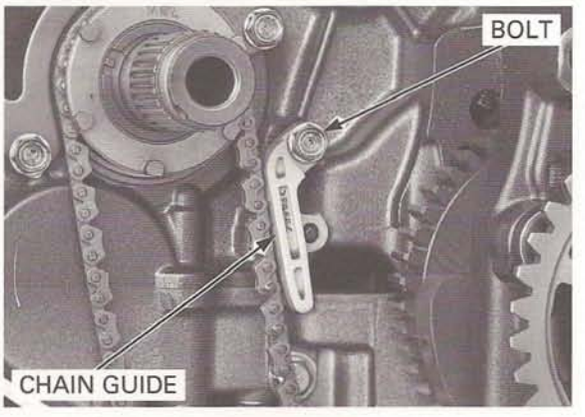



Remove the starter reduction gear from the crankcase.

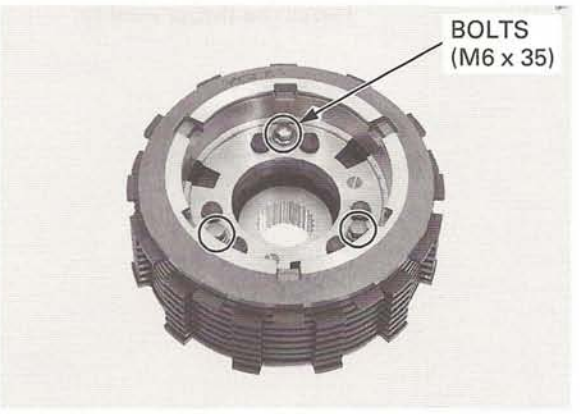



*Be careful not to drop the parts into the oil pan.*

Remove the bolt and oil pump drive chain guide.

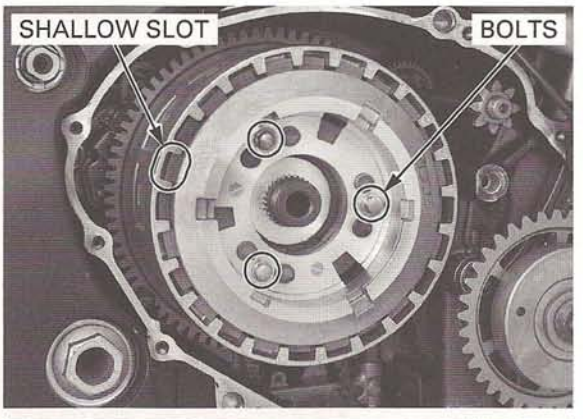


Loosely install the setting bolts (M6 x 35) as shown.

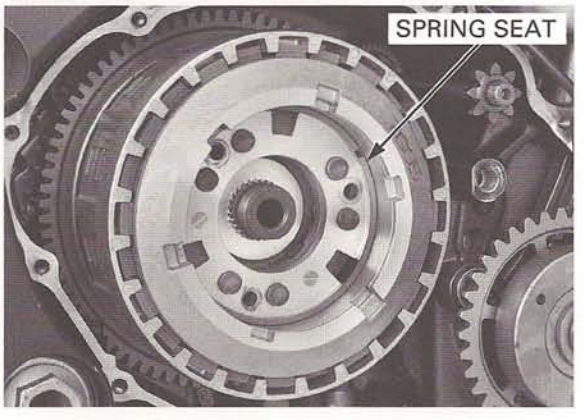



Install the clutch disc assembly by aligning its tabs of outside clutch disc A into the clutch outer shallow slots.

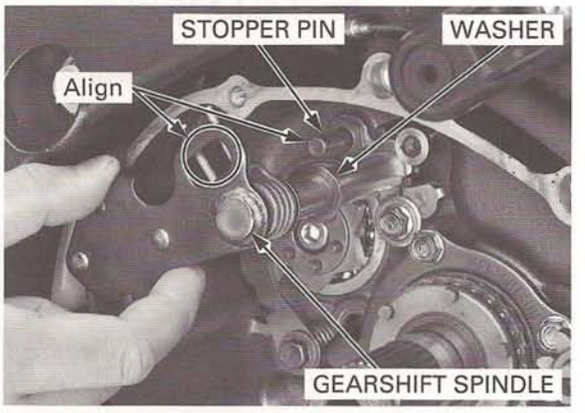
Remove the setting bolts.




Install the spring seat.

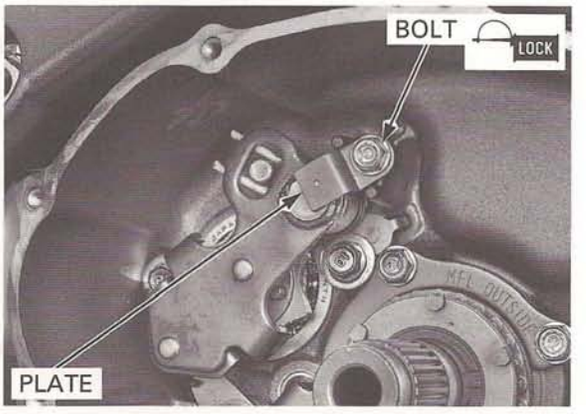


Install the thrust washer and gearshift spindle into the crankcase while aligning the spring ends with the stopper pin.




Apply locking agent to the setting plate bolt threads (page 1-18).
Install the setting plate and tighten the bolt to the specified torque.

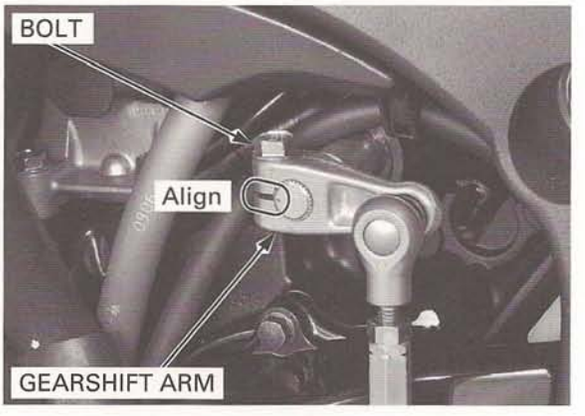
**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**




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.

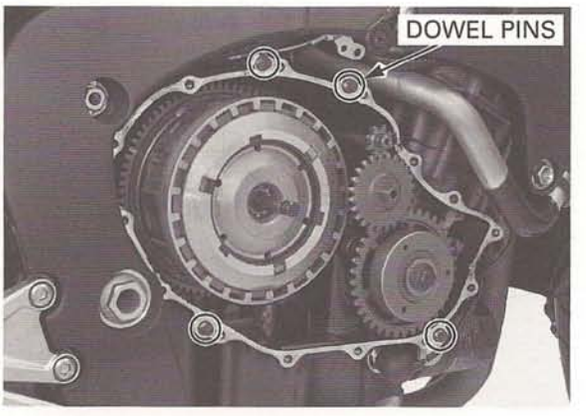
Install the following:

- Clutch (page 10-17)
- Right crankcase cover (page 10-30)




# RIGHT CRANKCASE COVER INSTALLATION

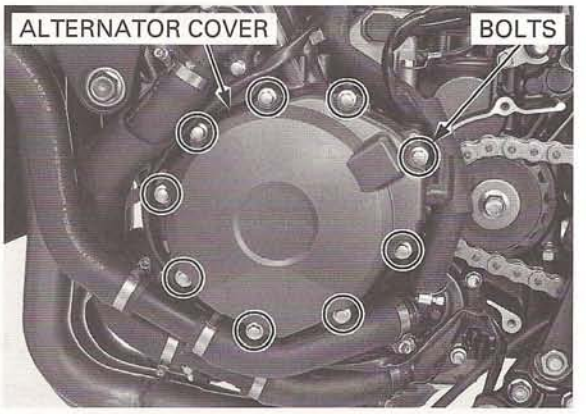
Install the four dowel pins.



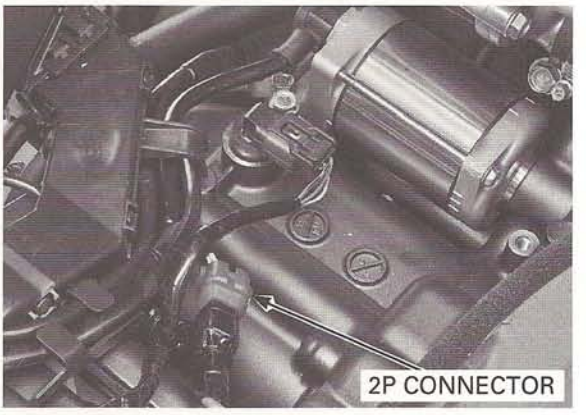
*The alternator cover (stator) is magnetically attracted to the flywheel, be careful during installation.*

Install the alternator cover and bolts.

Tighten the bolts in a crisscross pattern in two or three steps securely.




Connect the CKP sensor 2P (Red) connector.



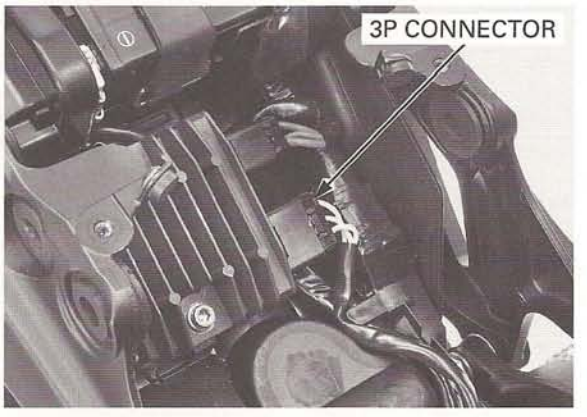

Connect the alternator 3P (Black) connector.

Install the following:

- Drive sprocket cover (page 4-28)
- Left middle cowl (page 3-10)
- Fuel tank (page 6-51)

After installation, add the recommended engine oil to the specified level.

Check the engine oil level (page 4-17).



Check the mainshaft and countershaft for abnormal wear or damage.

Measure the mainshaft O.D. at the M5 gear.

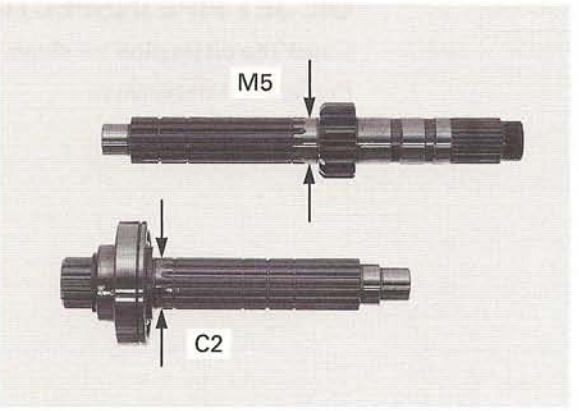
**SERVICE LIMIT: 27.957 mm (1.1007 in)**

Measure the countershaft O.D. at the C2 gear.

**SERVICE LIMIT: 29.960 mm (1.1795 in)**

Calculate the gear bushing-to-shaft clearance.

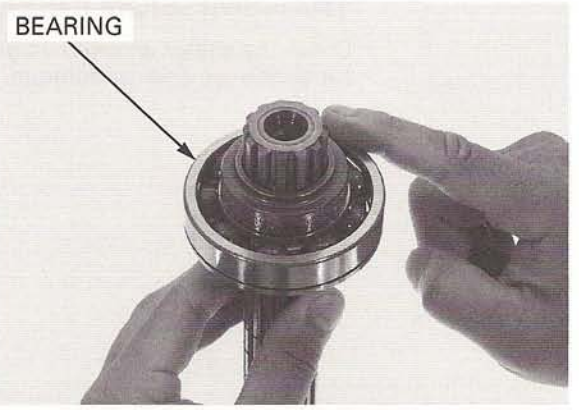
**SERVICE LIMITS:**
**M5: 0.06 mm (0.002 in)**
**C2: 0.06 mm (0.002 in)**




**Countershaft bearing**

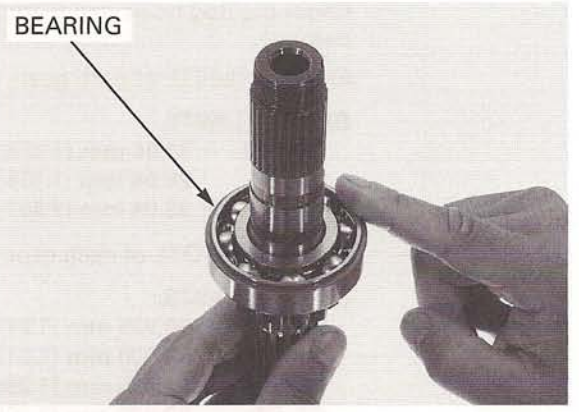
Turn the outer race of countershaft bearing with your finger.
The bearing should turn smoothly and quietly.
Also check that the bearing inner race fits tightly on the countershaft.
Replace the countershaft, collar, and bearing as an assembly, if the race does not turn smoothly, quietly, or if the inner race fits loosely on the countershaft.

- The countershaft bearing cannot be replaced. If the countershaft bearing is faulty, replace the countershaft as an assembly.

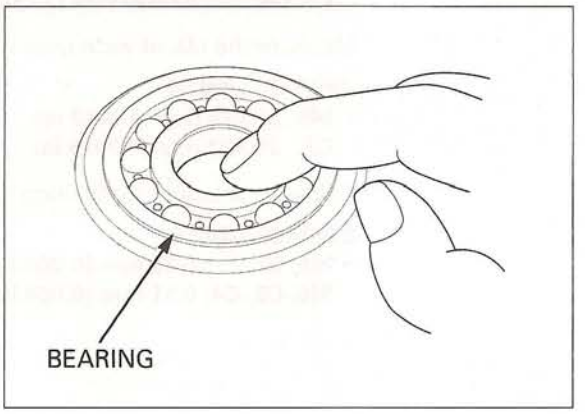



**Mainshaft bearing**

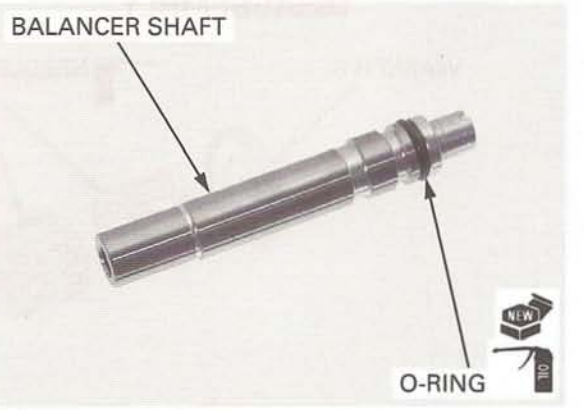
Temporarily install the right mainshaft bearing onto the mainshaft.
Turn the outer race of the left mainshaft bearing with your finger.
The bearing should turn smoothly and quietly.
Also check that the inner race of the bearing fits tightly on the mainshaft.
Replace the bearing if the inner race does not turn smoothly, quietly, or if the inner race fits loosely on the mainshaft.




Turn the inner race of the left mainshaft bearing with your finger.
The bearing should turn smoothly and quietly.
Also check that the outer race of the bearing fits tightly in the crankcase.
Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fits loosely in the crankcase.



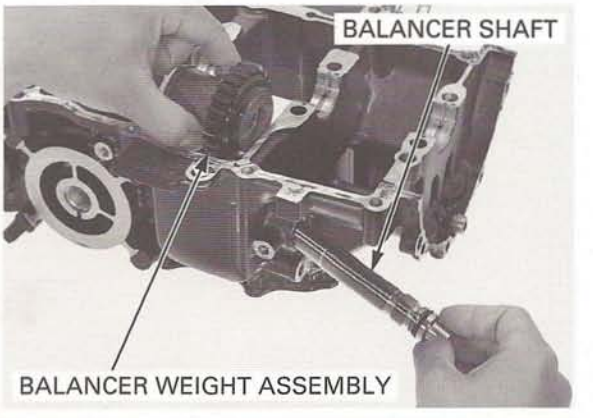
Apply oil to a new O-ring and install it to the balancer shaft groove.



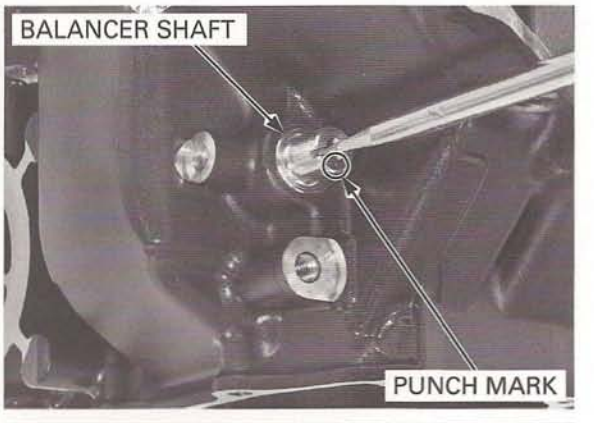

## INSTALLATION

Install the balancer weight into the lower crankcase.

Install the balancer shaft.




Turn the balancer shaft and position the punch mark on the shaft facing down.



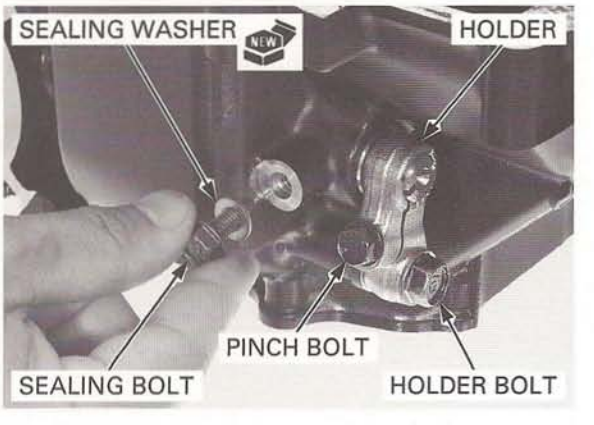

Install the balancer shaft holder.

Install the balancer holder bolt and balancer holder pinch bolt.

Install a new sealing washer and sealing bolt.

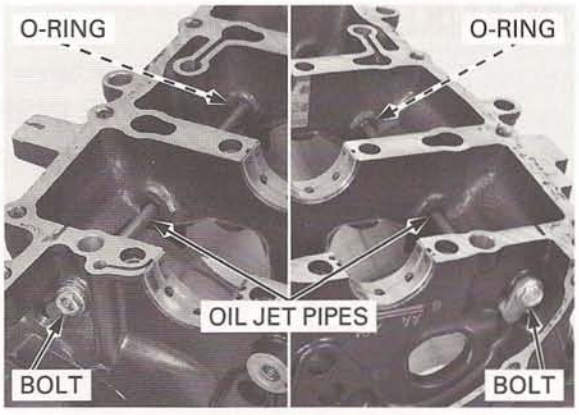
Assemble the crankcase halves (page 12-22).

Adjust the backlash (page 12-21).



Remove the bolts, oil jet pipes and O-rings from the upper crankcase.

Clean the oil jet pipes in solvent thoroughly.

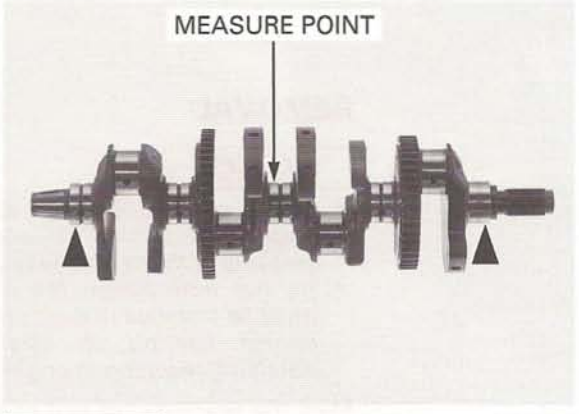



## INSPECTION

Support the crankshaft at 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)**

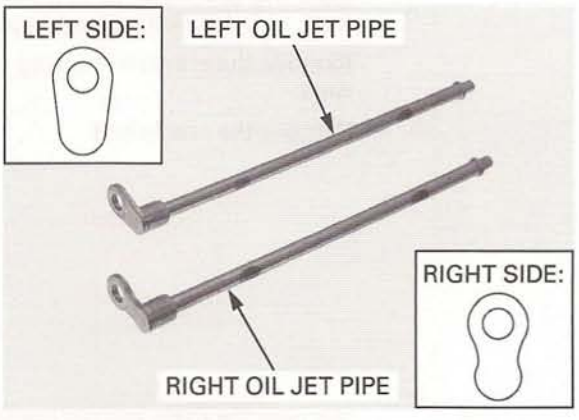
Check the primary drive gear and balancer drive gear teeth for abnormal wear or damage.




*Always replace the O-rings when the oil jet pipes are removed.*

Inspect the oil jet pipes for clogs, bending or damage.

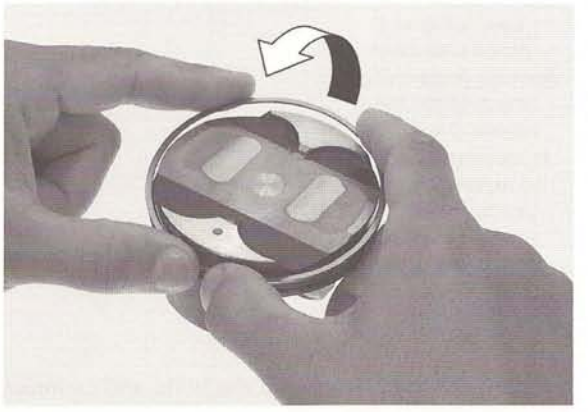
Replace them if necessary.



## PISTON DISASSEMBLY

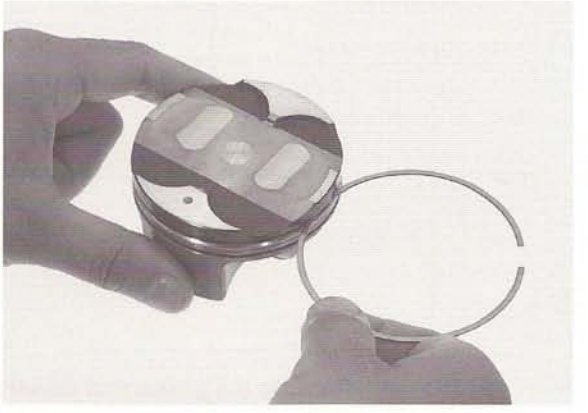
*Be careful not to damage the piston ring by spreading the ends too far.*

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 free movement by rotating them in their grooves. The rings should be able to move freely 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:**

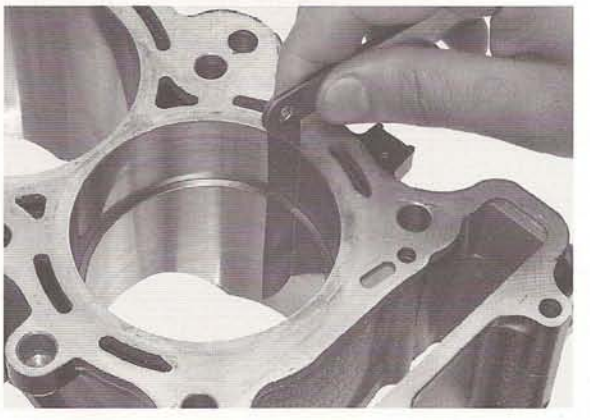
| | |
|---|---|
| **Top:** | **0.120 mm (0.0050 in)** |
| **Second:** | **0.075 mm (0.0030 in)** |

*Push the rings into the cylinder with the top of the piston to be sure they are squarely positioned in the cylinder.*

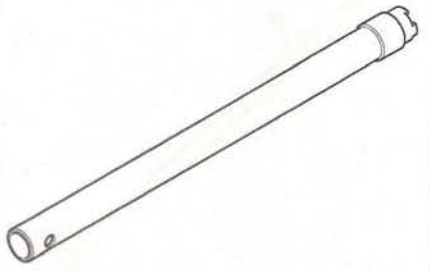
Insert the piston ring squarely into the top of the cylinder and measure the ring end gap.

**SERVICE LIMITS:**

| | |
|---|---|
| **Top:** | **0.52 mm (0.020 in)** |
| **Second:** | **0.74 mm (0.029 in)** |
| **Oil (side rail):** | **1.00 mm (0.040 in)** |

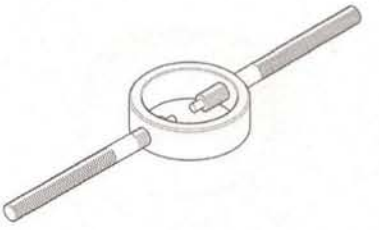


Fork damper holder
07YMB-MCF0101



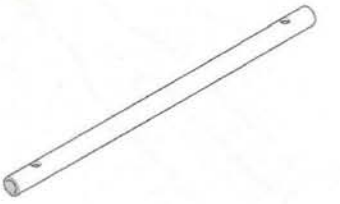
or 07YMB-MCFA100 (U.S.A. only)

Spring collar holder
070MF-MBZC110



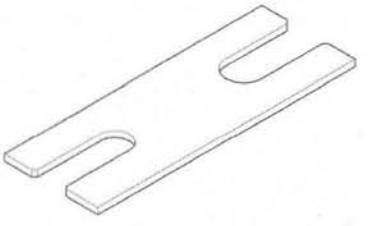
NOTE:
This tool is a part of fork damper install set (P/N 070MF-MBZC100) (Not available in U.S.A.)

Damper rod holder
070MF-MBZC120



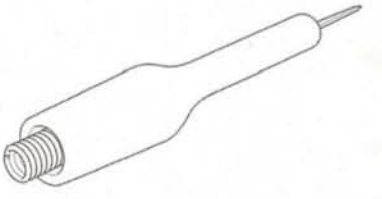
NOTE:
This tool is a part of fork damper install set (P/N 070MF-MBZC100) (Not available in U.S.A.) or 070MF-MBZA120

Stopper plate
070MF-MBZC130



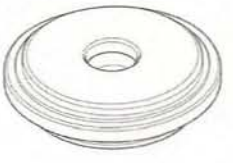
NOTE:
This tool is a part of fork damper install set (P/N 070MF-MBZC100) (Not available in U.S.A.)

Test probe
07ZAJ-RDJA110



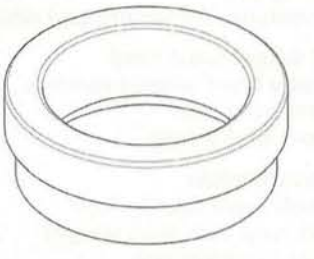
HDS pocket tester
TDS3557-0112-01 (U.S.A. only)

Main bearing driver attachment
07946-ME90200

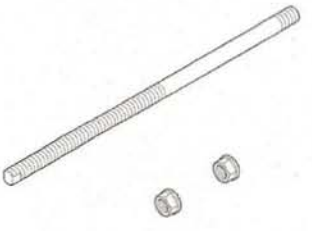


Fork seal driver weight
07947-KA50100

Oil seal driver
07965-MA60000

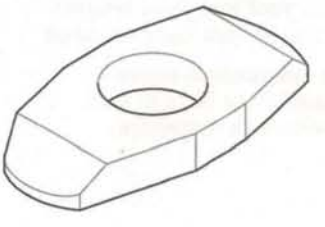


Installer shaft
07VMF-KZ30200



Installer attachment (2 required)
07VMF-MAT0200

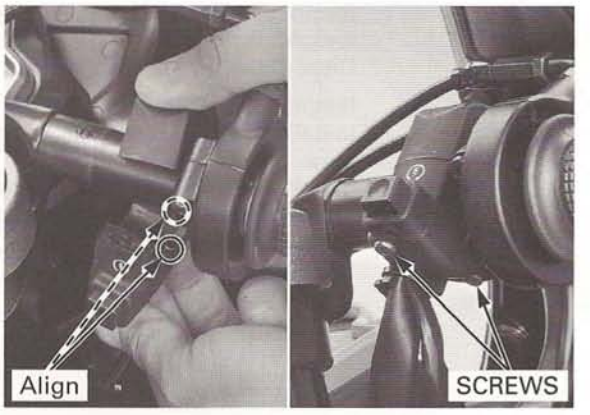
Remover attachment
07AMF-MELA200 (U.S.A. only)



Install the right handlebar switch housing by aligning its locating pin with the hole in the handlebar.

Tighten the forward screw first, then the rear screw to the specified torque.

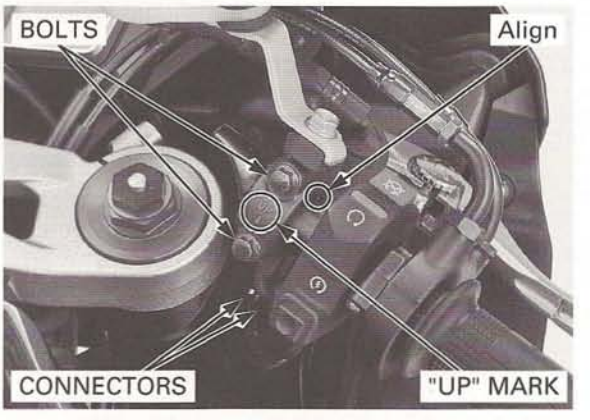
**TORQUE: 0.9 N·m (0.09 kgf·m, 0.7 lbf·ft)**




Install the master cylinder by aligning the end of the master cylinder with the punch mark on the handlebar.
Install the master cylinder holder with its "UP" mark facing up.
Tighten the upper bolt first, then the lower bolt.

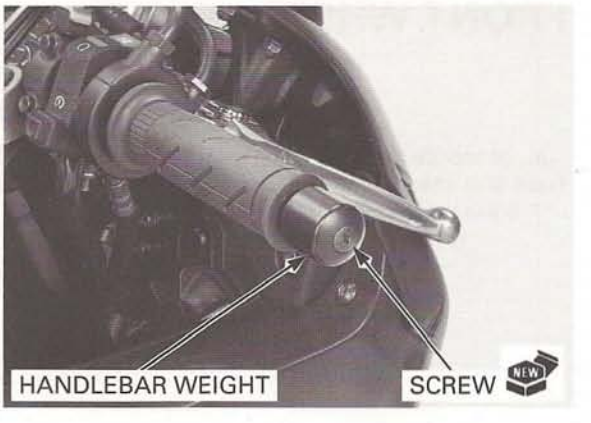
**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

Connect the front brake switch wire connectors.




Install the right handlebar weight and tighten a new screw to the specified torque.

**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**

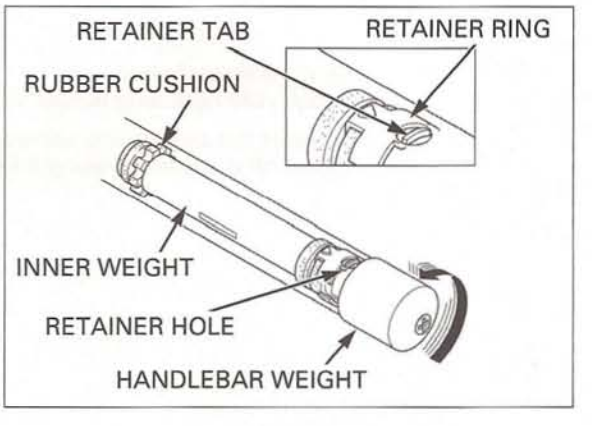



### HANDLEBAR WEIGHT REPLACEMENT

Remove the left grip and throttle pipe from the handlebar.
Straighten the weight retainer tab by the screwdriver or punch.

*Apply lubricant spray through the tab locking hole to the rubber for easy removal.*

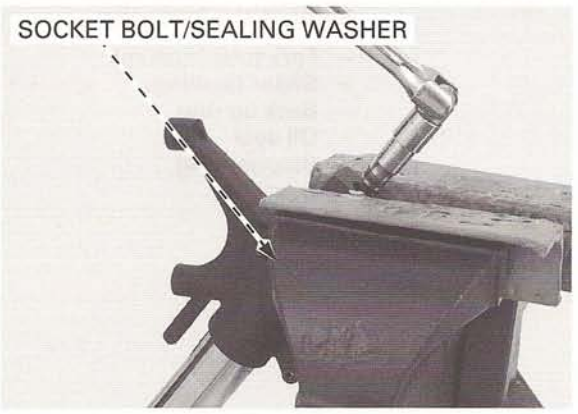
Temporarily install the handlebar weight and screw, then remove the inner weight by turning the handlebar weight.



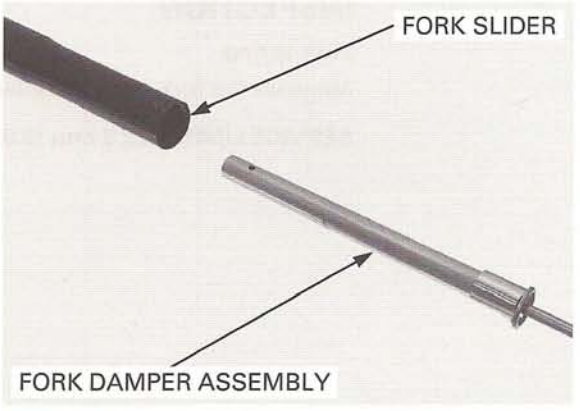
Hold the axle holder in a vise with soft jaws or a shop towel.
Hold the fork damper with the special tool, then remove the fork socket bolt and sealing washer.

**TOOL:**

| | |
|---|---|
| **Fork damper holder** | **07YMB-MCF0101 or 07YMB-MCFA100 (U.S.A. only)** |



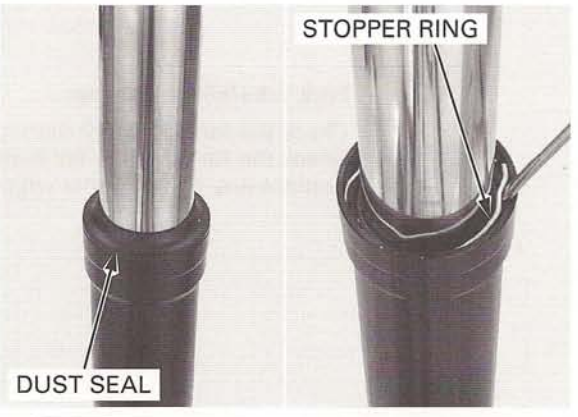

Remove the fork damper assembly from the fork slider.



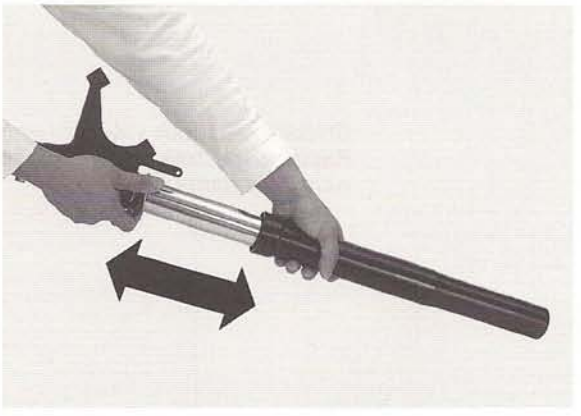

Remove the dust seal.

*Do not scratch the fork tube sliding surface.*

Remove the oil seal 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.



Straighten the lock washer tabs.

Remove the lock nut and lock washer.

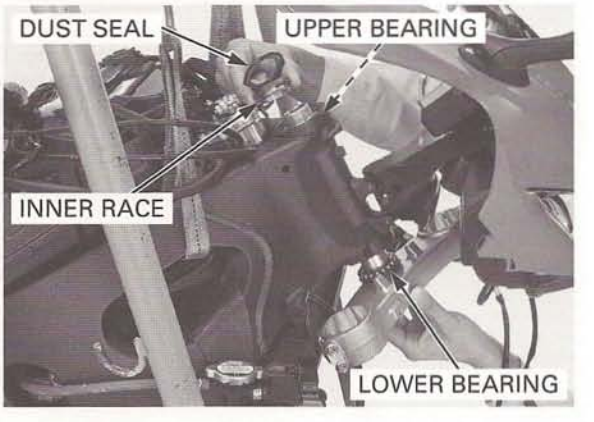

Remove the steering stem adjusting nut using the special tool.

**TOOL:**

| | |
|---|---|
| **Steering stem socket** | **07HMA-MR70100** |


Remove the following:

- Dust seal
- Upper bearing inner race
- Upper bearing
- Steering stem
- Lower bearing




## BEARING REPLACEMENT

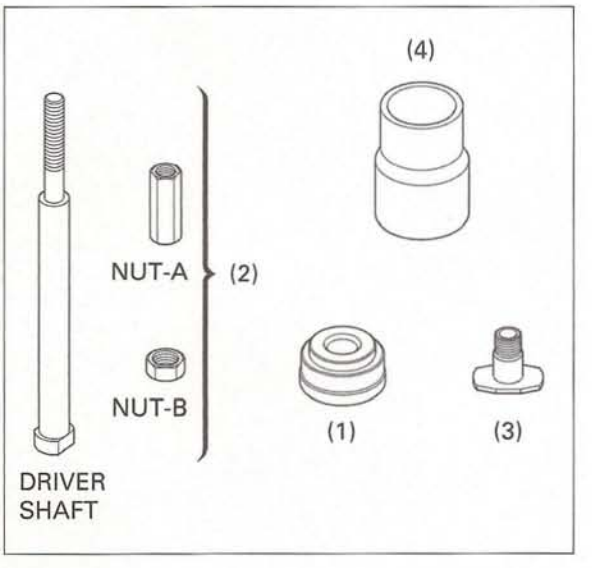
*Always replace the bearings and races as a set.*

Replace the races using the special tools as described in the following procedure.

**Except U.S.A.:**

**TOOLS: (Not available in U.S.A.)**

| | |
|---|---|
| **(1) Driver attachment (2 required)** | **07NMF-MT70120** |
| **(2) Driver shaft assembly** | **07946-KM90301** |
| **(3) Bearing remover** | **07NMF-MT70110** |
| **(4) Assembly base** | **07946-KM90600** |



# 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 15-17).
- 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 APPLICATION".
- Use genuine Honda replacement bolts and nuts for all suspension pivot and mounting point.
- For brake system information (page 16-4).

## SPECIFICATIONS

Unit: mm (in)

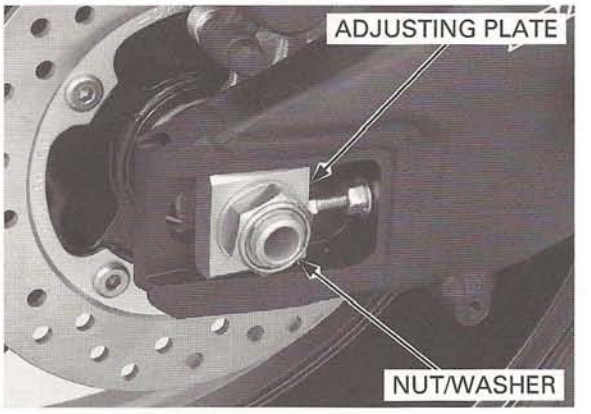
| ITEM | | | STANDARD | SERVICE LIMIT |
|---|---|---|---|---|
| Minimum tire tread depth | | | – | 2.0 (0.08) |
| Cold tire pressure | Driver only | | 290 kPa (2.90 kgf/cm$^2$, 42 psi) | – |
| | Driver and passenger | | 290 kPa (2.90 kgf/cm$^2$, 42 psi) | – |
| Axle runout | | | – | 0.2 (0.01) |
| Wheel 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 | DID50VA11-116YB | – |
| | | RK | RK50HFOZ6-116LJFZ | – |
| | Slack | | 25 – 35 (1.0 – 1.4 in) | – |
| Shock absorber | Spring pre-load adjuster standard position | | Position 4 | – |
| | Rebound damping adjuster initial setting | | 2-1/4 turns out from full hard | – |
| | Compression damping adjuster initial setting | | 2 turns out from full hard | – |

## TORQUE VALUES

| | | |
|---|---|---|
| Rear brake disc bolt | 42 N·m (4.3 kgf·m, 31 lbf·ft) | ALOC bolt; replace with a new one. |
| Driven sprocket nut | 64 N·m (6.5 kgf·m, 47 lbf·ft) | U-nut |
| Rear axle nut | 113 N·m (11.5 kgf·m, 83 lbf·ft) | U-nut |
| Shock absorber mounting nut | 44 N·m (4.5 kgf·m, 32 lbf·ft) | U-nut |
| Shock link nut | 44 N·m (4.5 kgf·m, 32 lbf·ft) | U-nut |
| Shock arm-to-swingarm nut | 44 N·m (4.5 kgf·m, 32 lbf·ft) | U-nut |
| Drive chain slider bolt | 9.0 N·m (0.9 kgf·m, 6.6 lbf·ft) | ALOC bolt; replace with a new one. |
| Drive chain case bolt | 12 N·m (1.2 kgf·m, 9 lbf·ft) | |
| Swingarm pivot nut | 113 N·m (11.5 kgf·m, 83 lbf·ft) | U-nut |
| Rear brake hose clamp screw | 4.2 N·m (0.4 kgf·m, 3.1 lbf·ft) | |

Install the adjusting plate, washer and rear axle nut.

Adjust the drive chain slack (page 4-26).




# SUSPENSION LINKAGE

## REMOVAL

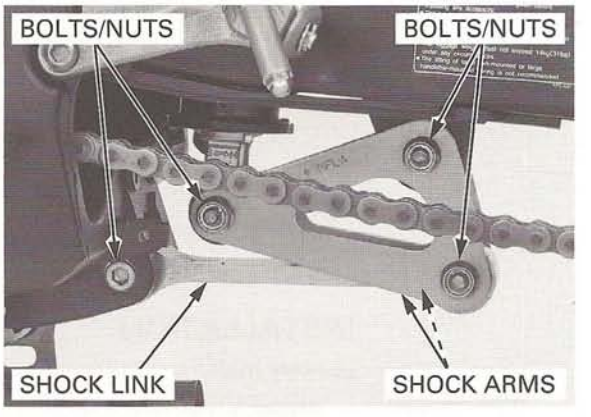
Remove the muffler (page 3-24).

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

*Support the rear wheel securely.*

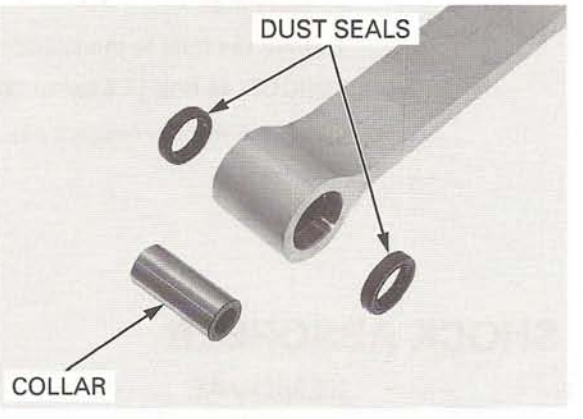
Remove the following:

- Bolts/nuts
- Shock link
- Shock arms




## SHOCK LINK BEARING REPLACEMENT

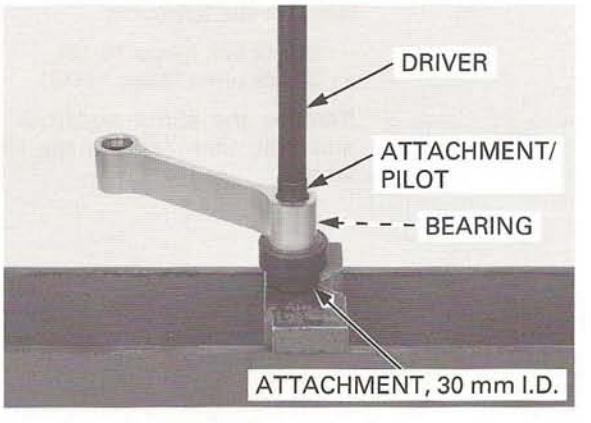
Remove the pivot collar and dust seals.



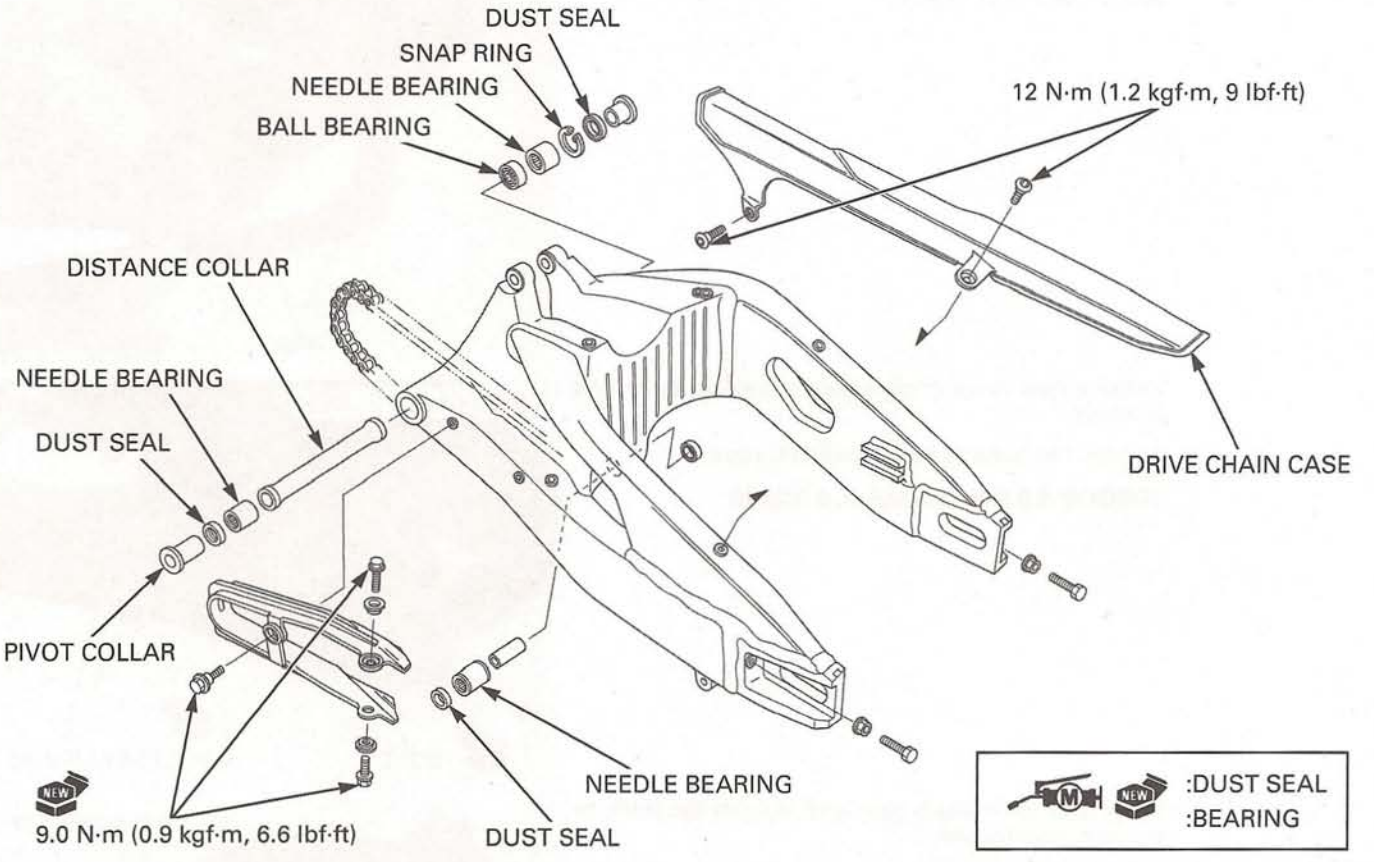

Press the needle bearings out of the shock link using the special tools.

**TOOLS:**

| | |
|---|---|
| **Driver** | **07949-3710001** |
| **Attachment, 22 x 24 mm** | **07746-0010800** |
| **Pilot, 17 mm** | **07746-0040400** |
| **Attachment, 30 mm I.D.** | **07746-0030300** |

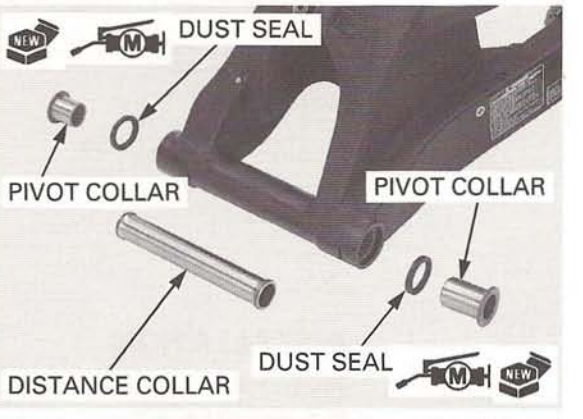


## ASSEMBLY

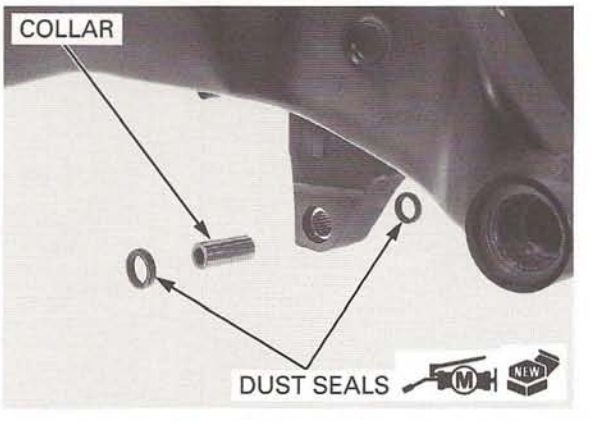



Apply molybdenum disulfide grease to new dust seal lips.

Install the distance collar, dust seals and pivot collars to the swingarm.




Apply molybdenum disulfide grease to new dust seal lips, then install the dust seals and collar into the swingarm.



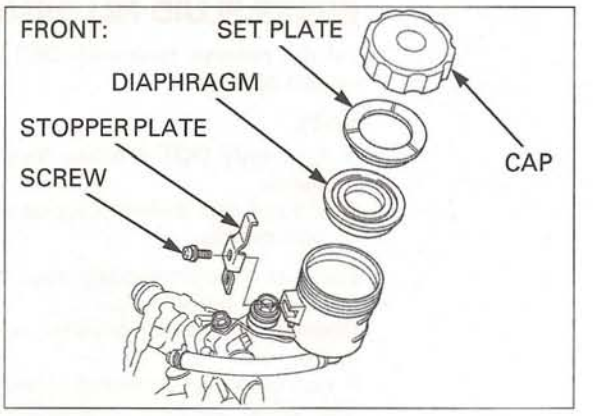
*Front:* Perform air bleeding for the other side bleed valve.

Fill each reserve tank to the upper level with DOT 4 brake fluid from a sealed container.

Reinstall the diaphragm and set plate.

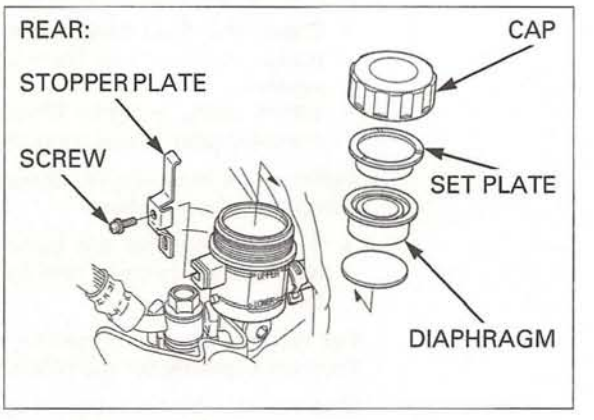
*Front:* Install the reserve tank cap, stopper plate and tighten the screw to the specified torque.

**TORQUE: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)**




*Rear:* Install the reserve tank cap, stopper plate and tighten the screw to the specified torque.

**TORQUE: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)**



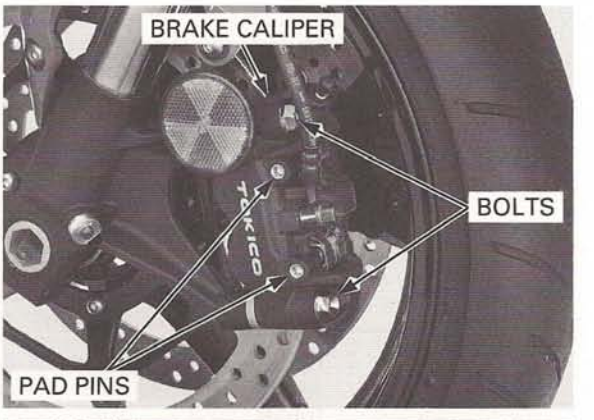

# BRAKE PAD/DISC

## FRONT BRAKE PAD REPLACEMENT

*While servicing the front and rear brake calipers, do not let them hang from the brake hose.*

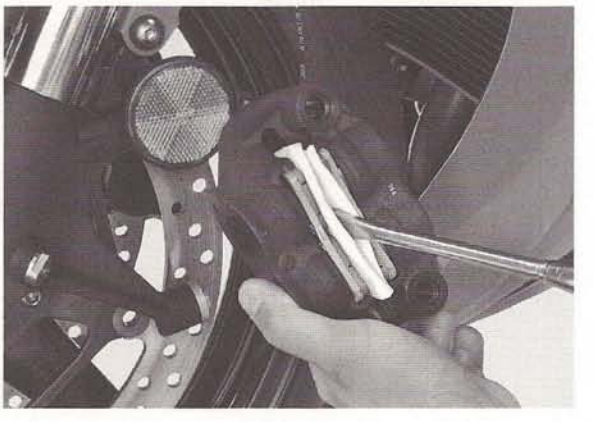
Loosen the pad pins.
Remove the caliper mounting bolts and brake caliper.

Discard the brake caliper mounting bolts.




*Check the brake fluid level in the brake master cylinder reserve tank, as this operation causes the level to rise.*

Push the caliper pistons all the way in to allow installation of new brake pads.



# REAR MASTER CYLINDER

**NOTICE**

*Spilled fluid can damage painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

## REMOVAL

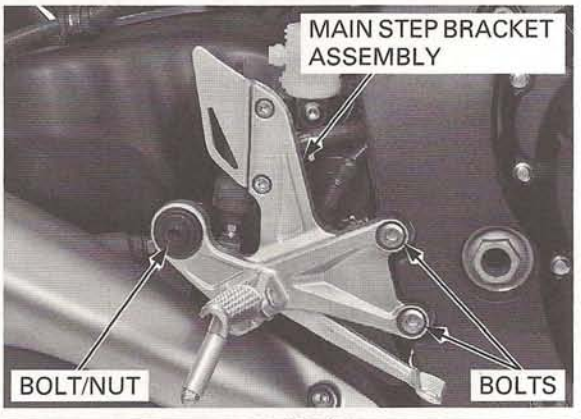
Drain the rear brake hydraulic system (page 16-6).

Remove the brake hose oil bolt, sealing washers and brake hose eyelet joint.


*Support the muffler securely.*

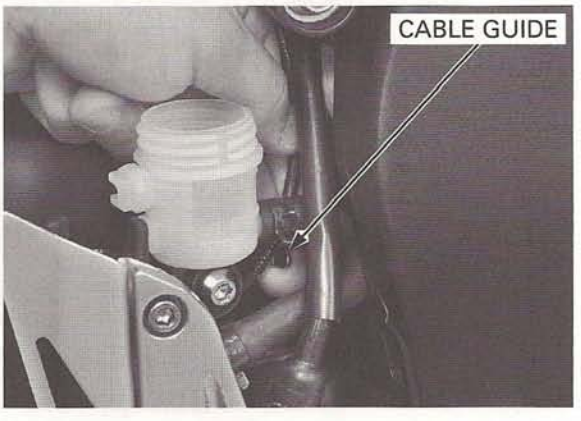
Remove the muffler mounting nut and bolt.

Remove the bolts and right main step bracket assembly from the frame.



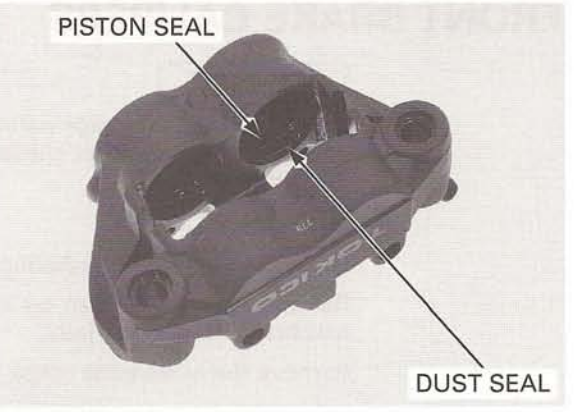

*Be careful not to damage the EGCA cable.*

Release the EGCA cable from the cable guide.



*Be careful not to damage the piston sliding surface.*

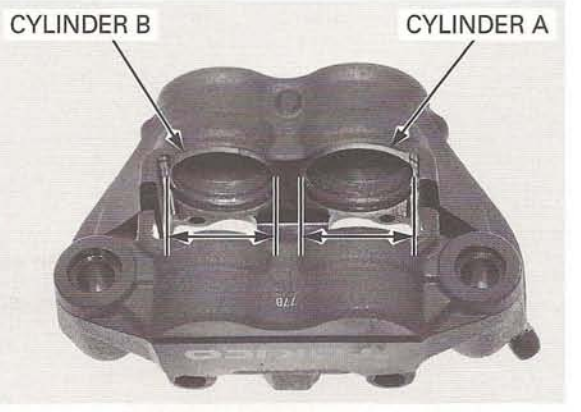
Push the dust seals and piston seals in and lift them out.
Clean the seal grooves with clean brake fluid.




## INSPECTION

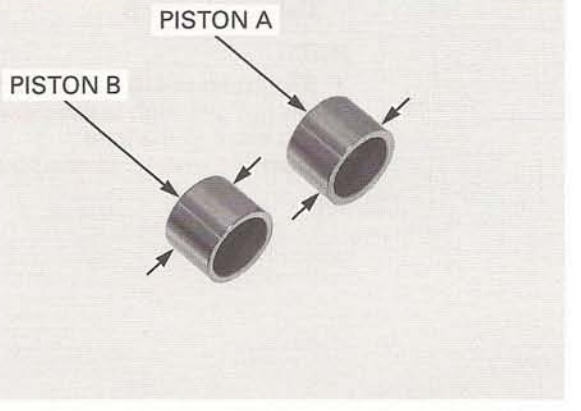
Check the caliper cylinder for scoring or other damage.
Measure the caliper cylinder I.D.

**SERVICE LIMITS:**
**Cylinder A: 32.130 mm (1.2650 in)**
**Cylinder B: 30.330 mm (1.1941 in)**




Check the caliper pistons for scratches, scoring or other damage.
Measure the O.D. of each caliper piston.

**SERVICE LIMITS:**
**Piston A: 31.967 mm (1.2585 in)**
**Piston B: 30.167 mm (1.1877 in)**



# 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: BM210 or BATTERY MATE or equivalent**

   ***Is the battery in good condition?***

   **NO** – Faulty battery

   **YES** – GO TO STEP 2.

2. **CURRENT LEAKAGE TEST**

   Install the battery (page 17-6).

   Check the battery current leakage 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 CONNECTED**

   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)?***

   **NO** – Faulty charging coil

   **YES** – GO TO STEP 5.

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 (page 17-7)**

   ***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

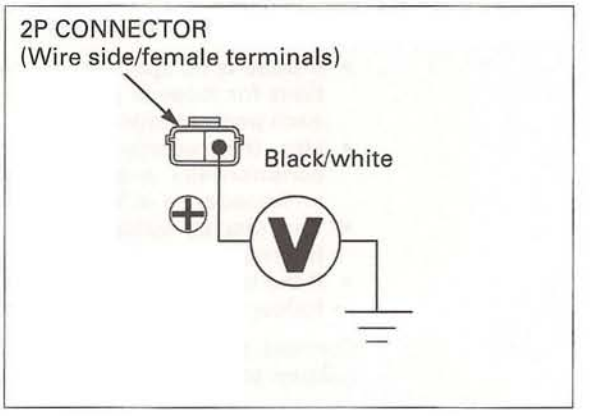
   **NO** – • Open circuit in related wire
   • Loose or poor contacts of related terminal

Disconnect the direct ignition coil 2P (White) connector.

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

Measure the initial voltage.

**Connection: Black/white (+) – Ground (–)**
**Standard: Battery voltage**




## CKP SENSOR 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.

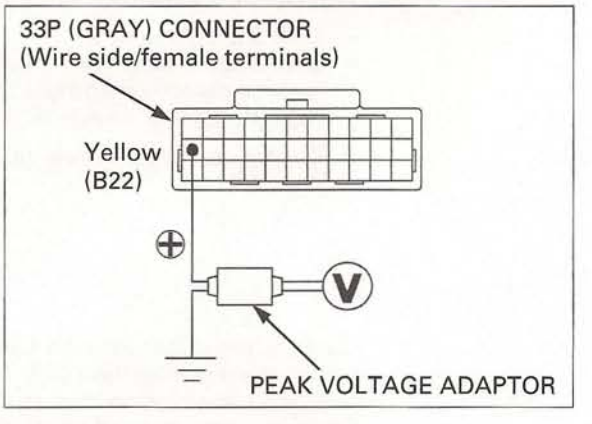
Lift and support the fuel tank (page 4-5).

Disconnect the ECM 33P (Gray) connector from the ECM.


Connect the peak voltage tester or peak voltage adaptor probes to the connector terminal of the wire side.

**TOOLS:**
**IgnitionMate peak voltage tester MTP07-0286 (U.S.A. only) or**
**Peak voltage adaptor 07HGJ-0020100 (Not available in U.S.A.)**
**with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)**
**Test probe 07ZAJ-RDJA110**

**Connection: B22 (+) – Ground (–)**




Crank the engine and read the peak voltage.

**PEAK VOLTAGE: 0.7 V minimum**

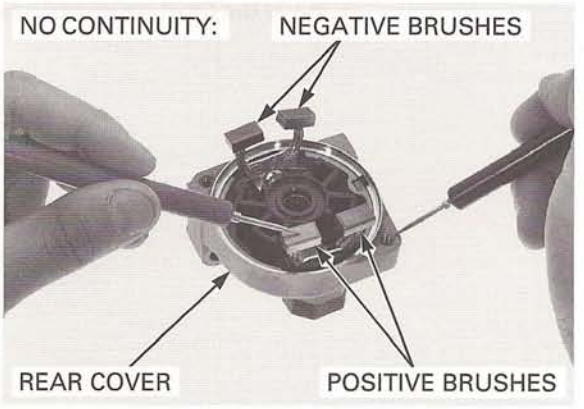
If the peak voltage measured at ECM connector is abnormal, measure the peak voltage at the CKP sensor connector.

Check for continuity between positive brushes (terminal bolt side) and rear cover.

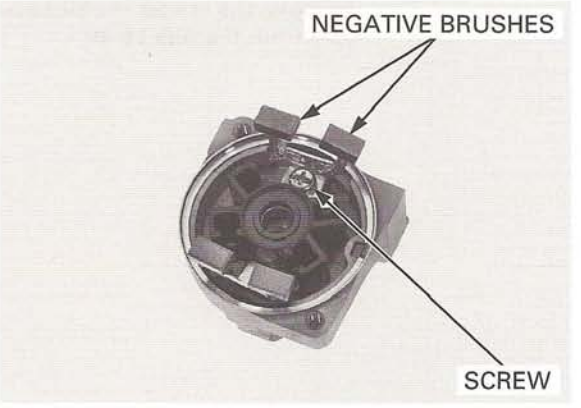
There should be no continuity.

Check for continuity between positive and negative brushes.

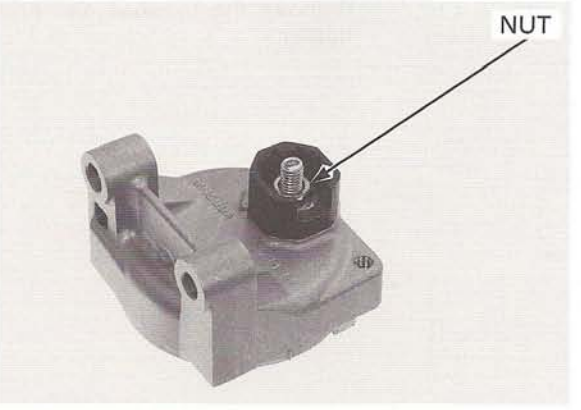
There should be no continuity.



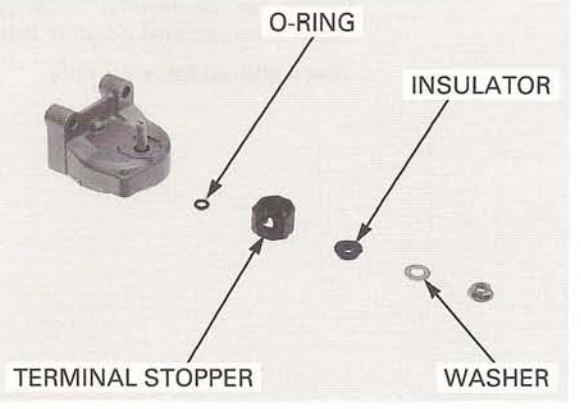

Remove the screw and negative brushes.



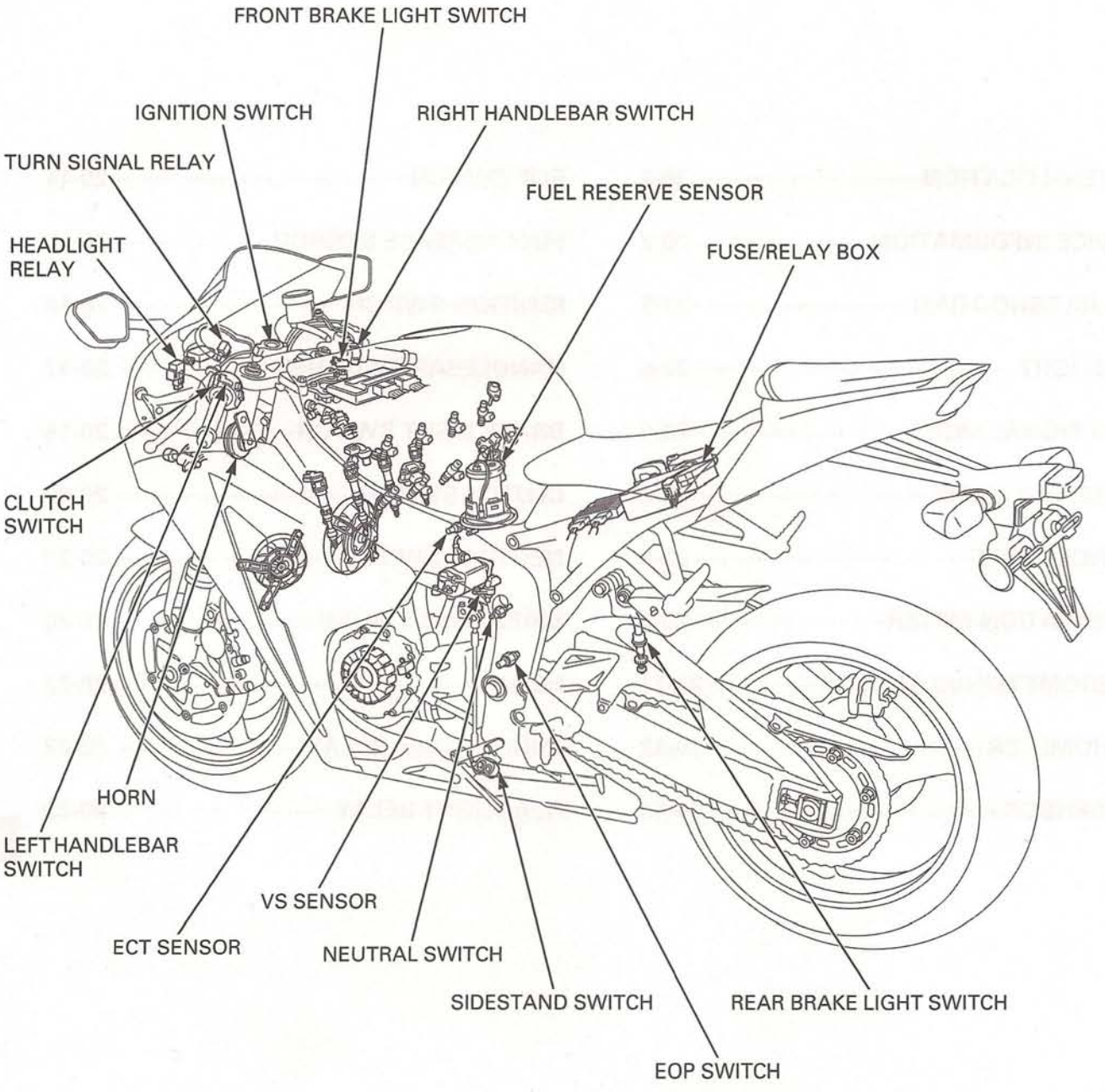

Remove the terminal nut.




Remove the washer, insulator, terminal stopper and O-ring.



# SYSTEM LOCATION

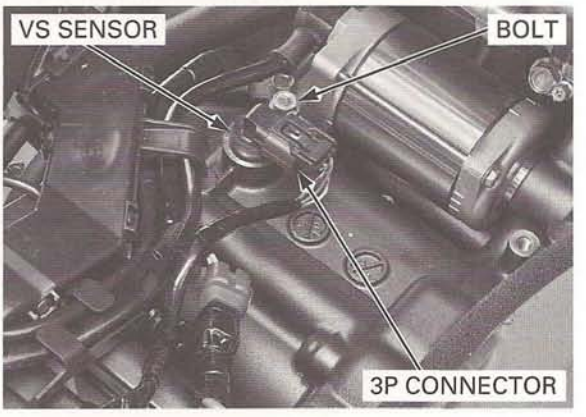


Apply oil to the O-ring and install it to the VS sensor.
Install the VS sensor to the crankcase.


Tighten the VS sensor mounting bolt securely and connect the VS sensor 3P (Blue) connector.

*California type:* Install the EVAP purge control solenoid valve (page 6-84).

Remove the support and close the fuel tank (page 4-7).



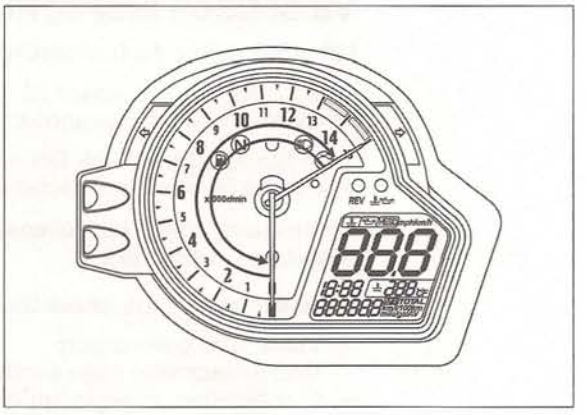

# TACHOMETER

## SYSTEM INSPECTION

- Check for loose or poor contact terminals at the combination meter 20P (Gray) and sub harness 20P (Black) connectors.

Turn the ignition switch ON, check that the tachometer needle moves to full scale and then returns to zero.

If the needle does not show initial function, check the combination meter power input line (page 20-8).

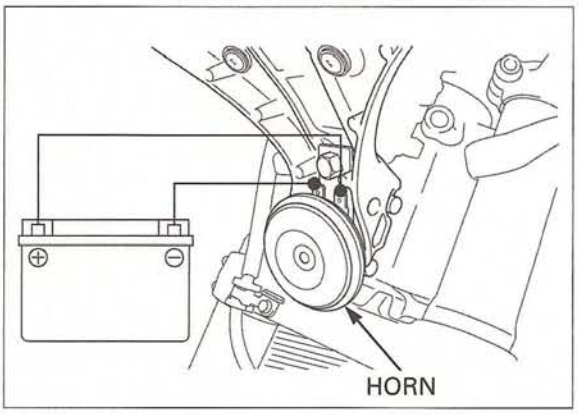


# HORN

## INSPECTION

Remove the upper cowl (page 3-13).

Connect a 12 V battery to the horn terminal directly. The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



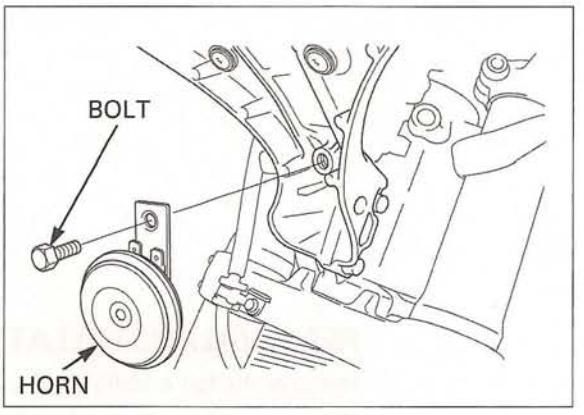

## REMOVAL/INSTALLATION

Remove the upper cowl (page 3-13).

Remove the bolt and horn.

*Correctly route the wire (page 1-20).*

Installation is in the reverse order of removal.




# TURN SIGNAL RELAY

## INSPECTION

1. **Related Circuit Inspection**

*Support the upper cowl securely.*

Remove the upper cowl (page 3-13) with sub harness 20P (Black) and 8P (Black) connectors connected.

Check the following:

- Burned bulb or non-specified wattage
- Blown fuse (MAIN 30 A, STOP/HORN 10 A)
- Ignition switch (page 20-16) and turn signal switch (page 20-18) function
- Loose connector

***Are the above items in good condition?***

**NO** – Replace or repair the failed part(s).

**YES** – GO TO STEP 2.