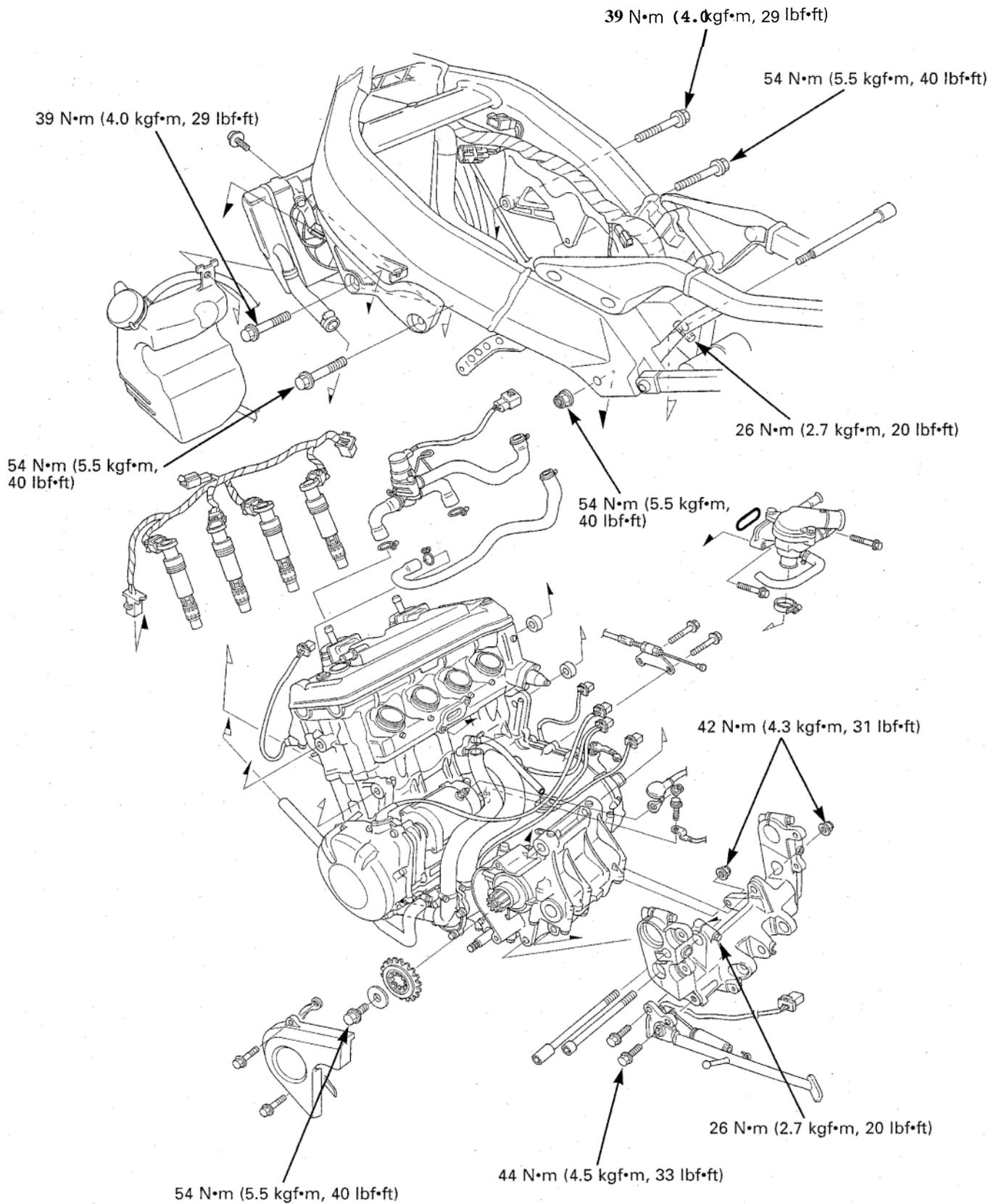


# ENGINE REMOVAL/INSTALLATION



# 7. ENGINE REMOVAL/INSTALLATION

<b>SERVICE INFORMATION</b>	<b>7-1</b>	<b>ENGINE INSTALLATION</b>	<b>7-7</b>
<b>LOWER BRACKET REMOVAL</b>	<b>7-2</b>	<b>LOWER BRACKET INSTALLATION</b>	<b>7-12</b>
<b>ENGINE REMOVAL</b>	<b>7-3</b>		

## SERVICE INFORMATION

### GENERAL

- During engine removal and installation, support the motorcycle using a hoist or equivalent.
- Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.

### NOTICE

*Do not use the oil filter as a jacking point.*

- The following components can be serviced with the engine installed in the frame.
  - Alternator (Section 10)
  - Camshaft (Section 8)
  - Clutch (Section 9)
  - Gearshift linkage (Section 9)
  - Oil cooler (Section 4)
  - Oil pump (Section 4)
  - Shift forks/shift drum (Section 9)
  - Water pump (Section 6)

**7**

ITEM		SPECIFICATIONS
Engine dry weight		61.2 kg (134.9 lbs)
Coolant capacity	Radiator and engine	3.1 liter (3.3 US qt, 2.7 Imp qt)
Engine oil capacity	At disassembly	4.0 liter (4.2 US qt, 3.5 Imp qt)

### TORQUE VALUES

Lower bracket mounting nut, 10 mm	42 N•m (4.3 kgf•m, 31 lbf•ft)	U-nut, see page 7-12
Lower bracket mounting pinch bolt	26 N•m (2.7 kgf•m, 20 lbf•ft)	
Engine hanger bolt (front)	39 N•m (4.0 kgf•m, 29 lbf•ft)	See page 7-7
Engine hanger bolt (middle)	54 N•m (5.5 kgf•m, 40 lbf•ft)	
Engine hanger nut (rear)	54 N•m (5.5 kgf•m, 40 lbf•ft)	
Rear engine hanger pinch bolt	26 N•m (2.7 kgf•m, 20 lbf•ft)	
Swingarm pivot nut	118 N•m (12.0 kgf•m, 87 lbf•ft)	
Swingarm pivot pinch bolt	26 N•m (2.7 kgf•m, 20 lbf•ft)	
Side stand bracket bolt	44 N•m (4.5 kgf•m, 33 lbf•ft)	ALOC bolt
Drive sprocket special bolt	54 N•m (5.5 kgf•m, 40 lbf•ft)	

### TOOL

Rod holder, 24 x 27 mm	07930-KA50100
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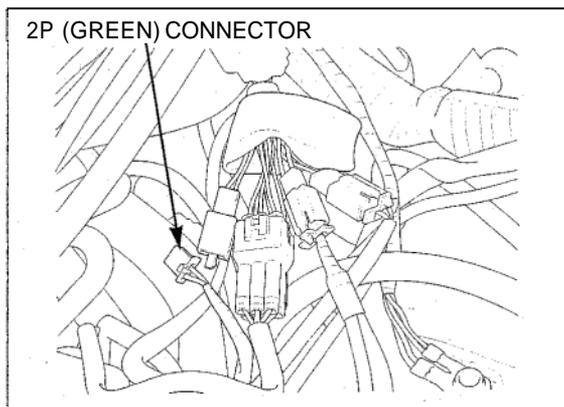
## LOWER BRACKET REMOVAL

Open and support the front end of the fuel tank (page 3-4).

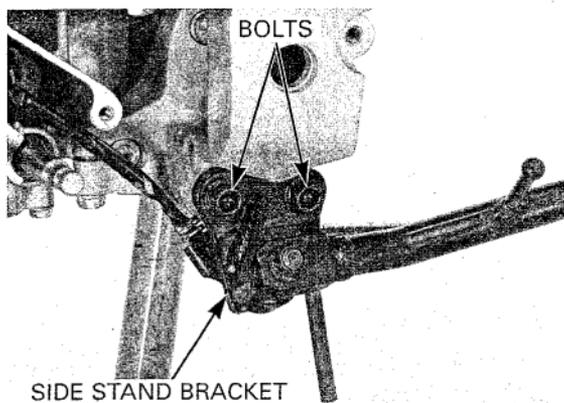
Remove the following:

- Muffler/exhaust pipe (page 2-13)
- Suspension linkage (page 14-9)
- Rear shock absorber (page 14-11)
- Swingarm (page 14-14)

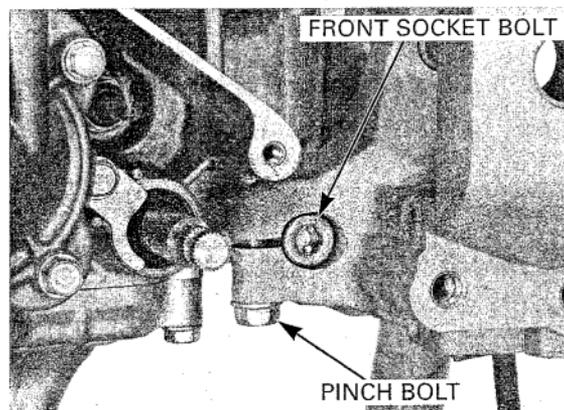
Disconnect the side stand 2P (Green) connector.



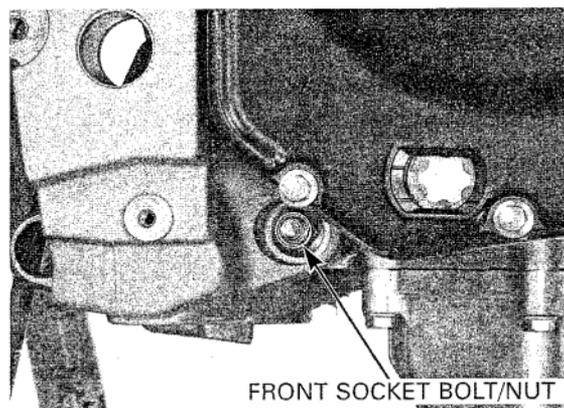
Remove the bolts and side stand bracket assembly.



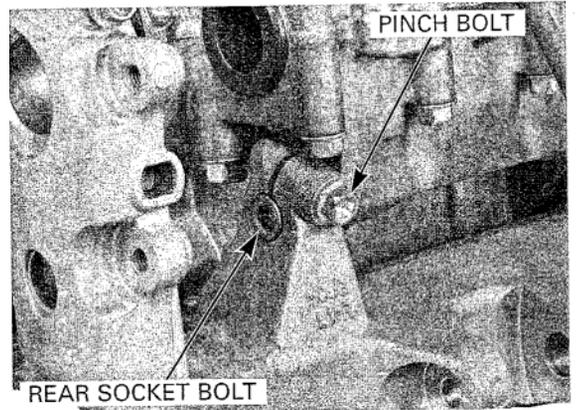
Loosen the lower bracket front pinch bolt.



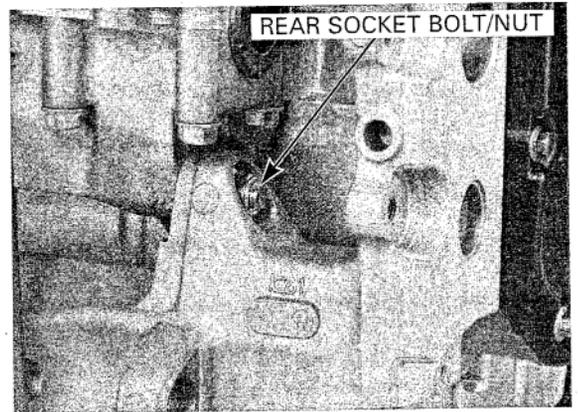
Remove the lower bracket front socket bolt and nut.



Loosen the lower bracket rear pinch bolt.



Remove the lower bracket rear socket bolt and nut, then remove the lower bracket from the engine.

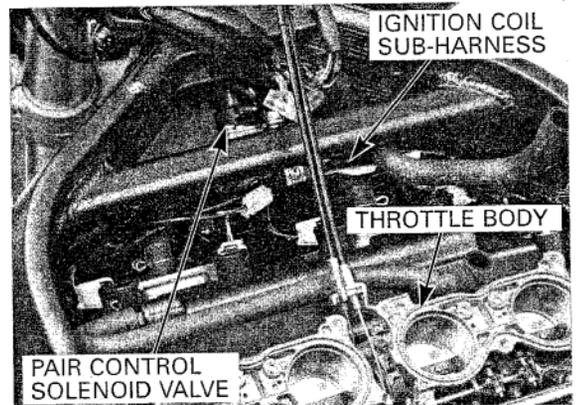


## ENGINE REMOVAL

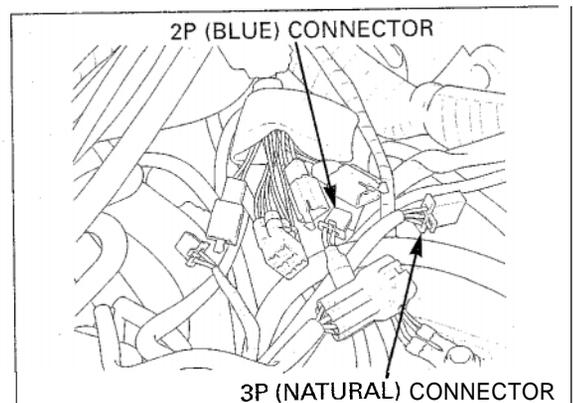
Drain the engine oil (page 3-15).  
Drain the coolant (page 6-4).

Remove the following:

- Fuel tank (page 5-59)
- EGCV and air intake valve servo motor (page 5-95)
- Throttle body (page 5-67)
- Lower bracket (page 7-2)
- PAIR control solenoid valve assembly (page 5-88)
- Ignition coil/spark plug sub-harness

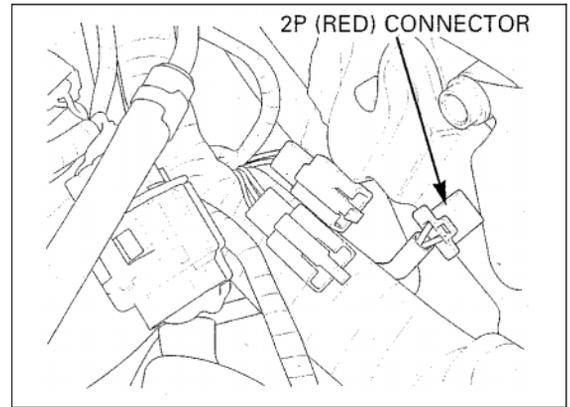


Disconnect the speed sensor 3P (Natural) connector and engine sub-harness 2P (Blue) connector

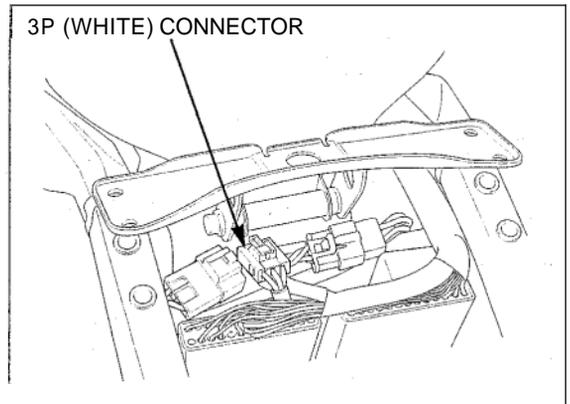


# ENGINE REMOVAL/INSTALLATION

Disconnect the Ignition pulse generator 2P (Red) connector.

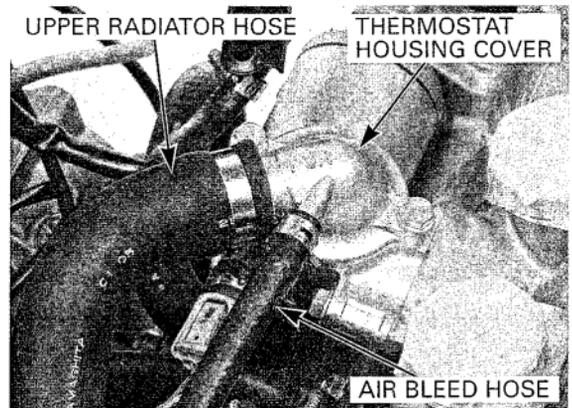


Disconnect the alternator 3P (White) connector.



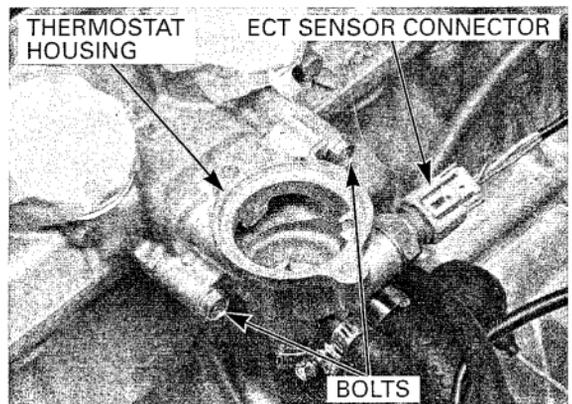
Disconnect the air bleed hose and upper radiator hose from the thermostat housing cover.

Remove the thermostat housing cover and thermostat (page 6-6).

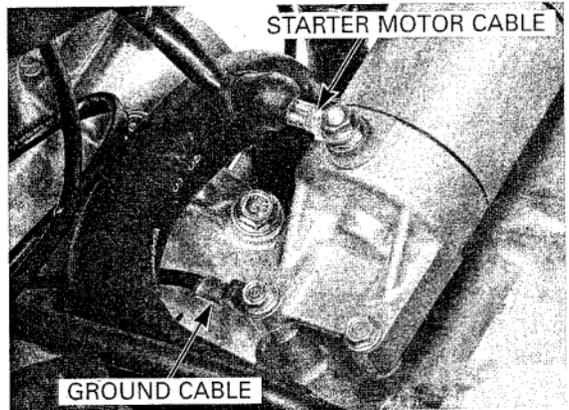


Disconnect the ECT sensor connector.

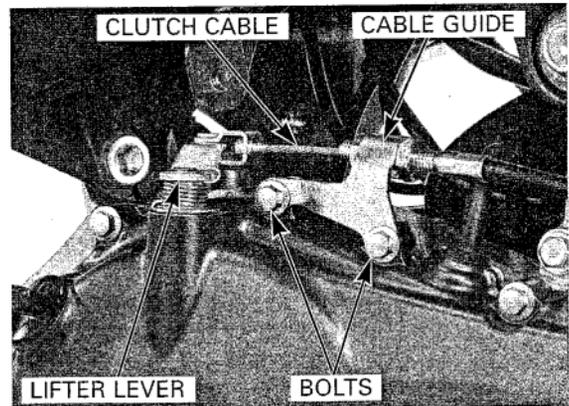
Remove the bolts and thermostat housing from the cylinder head.



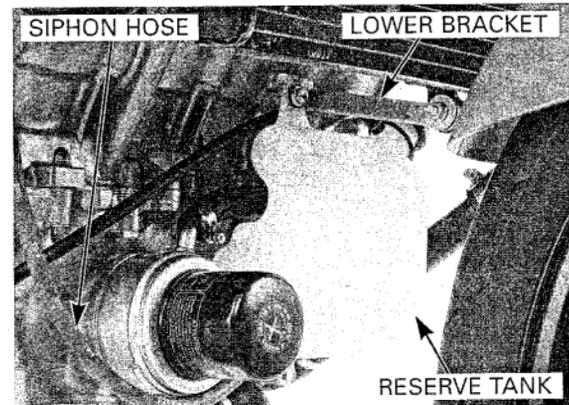
Remove the starter motor mounting bolt and starter motor ground cable.  
Remove the terminal nut and starter motor cable.



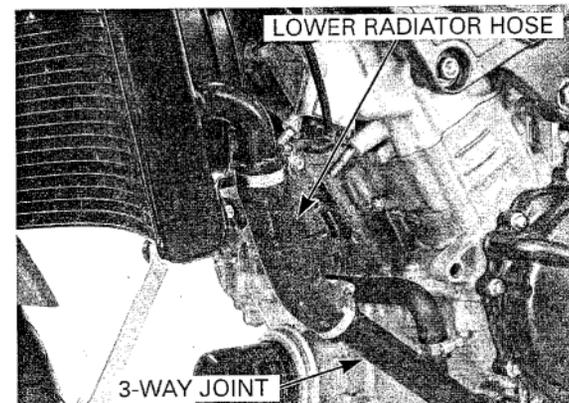
Remove the bolts and clutch cable guide, then disconnect the clutch cable from the clutch lifter lever.



Remove the radiator lower mounting bracket bolt/nut.  
Disconnect the siphon hose from the radiator reserve tank.  
Remove the bolts, radiator reserve tank and radiator lower mounting bracket.



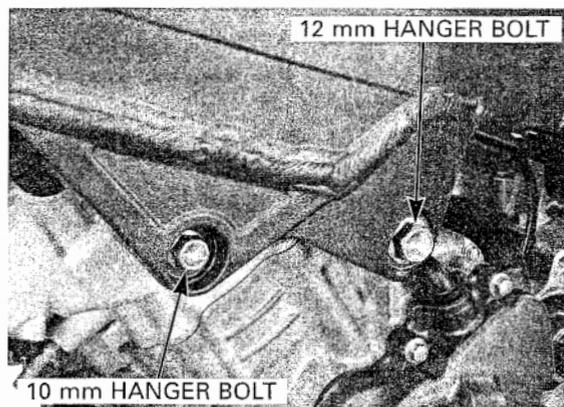
Disconnect the lower radiator hose from the radiator hose three-way joint.



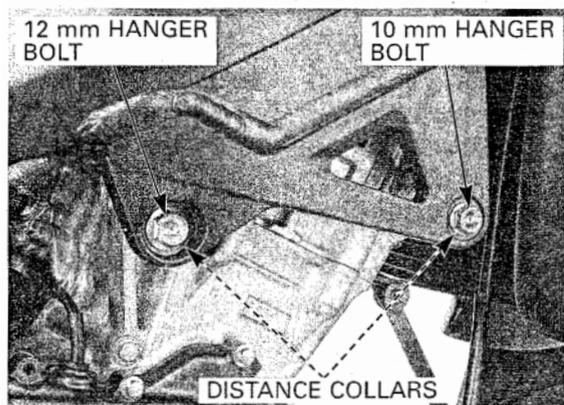
## ENGINE REMOVAL/INSTALLATION

Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.

Remove left side of the front (10 mm) and middle (12 mm) engine hanger bolts.



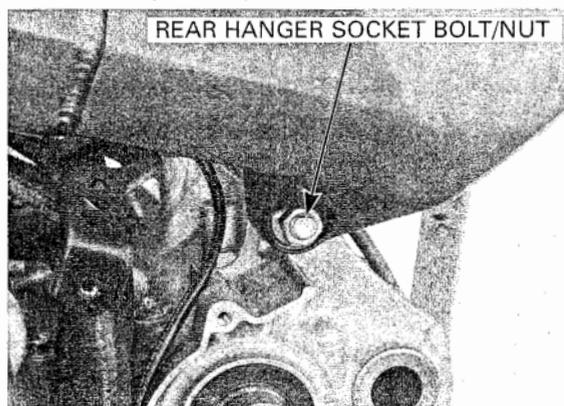
Remove the right side of the front (10 mm) and middle (12 mm) engine hanger bolts and distance collars.



Loosen the rear engine hanger pinch bolt.

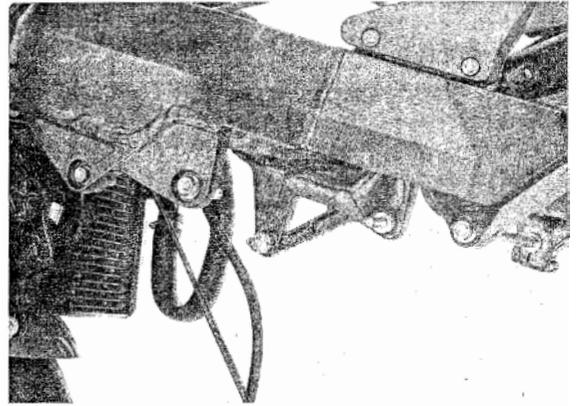


Remove the rear engine hanger socket bolt and nut, then remove the engine from the frame.



## ENGINE INSTALLATION

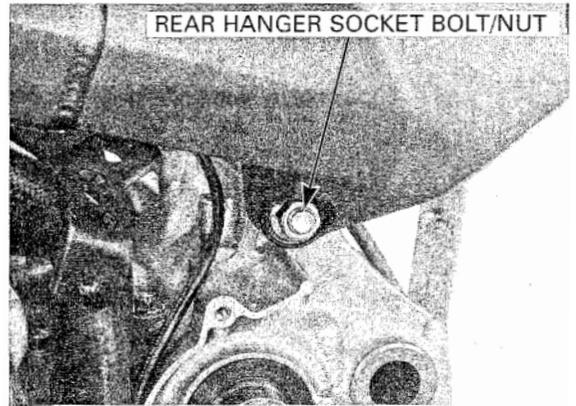
- Note the direction of the hanger bolts.
- Use a floor jack or other adjustable support to carefully maneuver the engine into place.



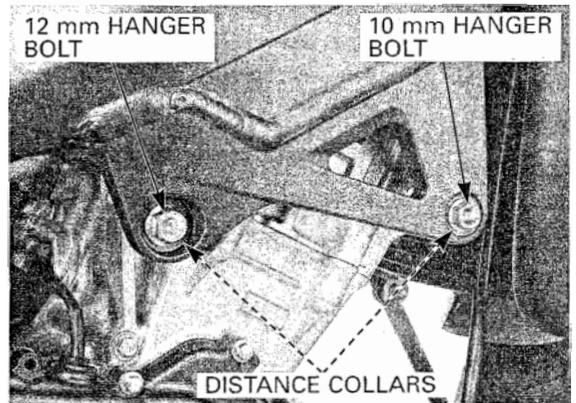
*Be careful not to damage the cam chain tensioner lifter*

Install the engine into the frame.

Install the rear engine hanger socket bolt and nut.



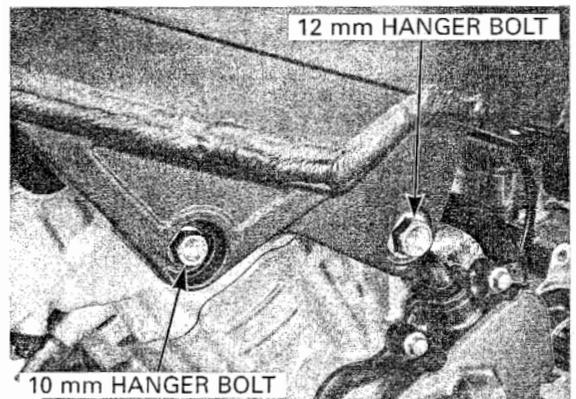
Install the right side of the front (10 mm) and middle (12 mm) engine hanger bolts with the distance collars.



Install the left side of the front (10 mm) and middle (12 mm) engine hanger bolts.

### **NOTICE**

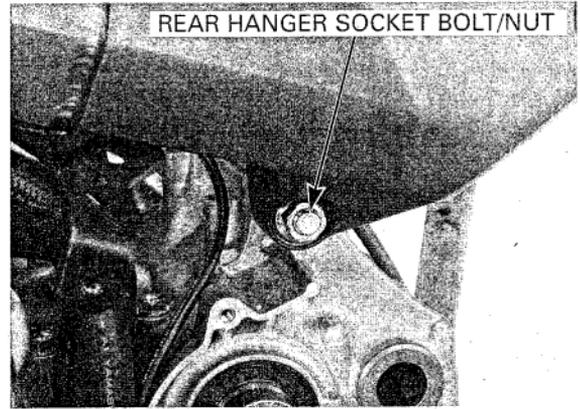
*Install the right and left front engine hanger bolts in their proper locations. Improper installation will damage the cylinder head.*



## ENGINE REMOVAL/INSTALLATION

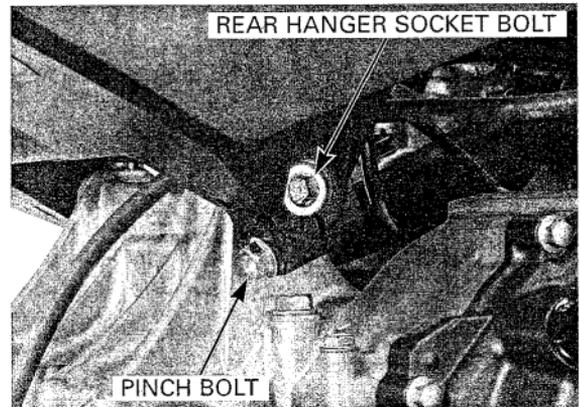
Hold the rear engine hanger socket bolt, then tighten the nut to the specified torque.

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



Tighten the rear engine hanger pinch bolt to the specified torque.

**TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)**

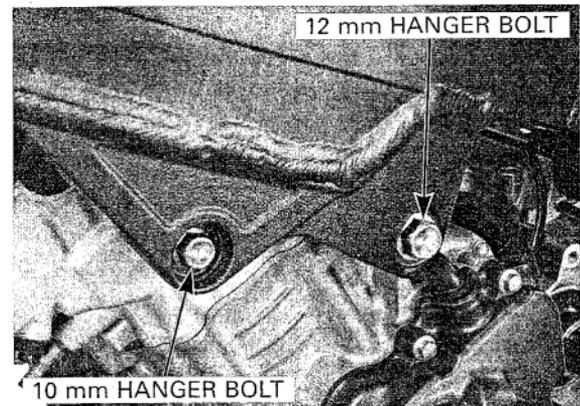


Tighten the left side of the front (10 mm) and middle (12 mm) engine hanger bolt to the specified torque.

**TORQUE:**

**Front (10 mm): 39 N·m (4.0 kgf·m, 29 lbf·ft)**

**Middle (12 mm): 54 N·m (5.5 kgf·m, 40 lbf·ft)**

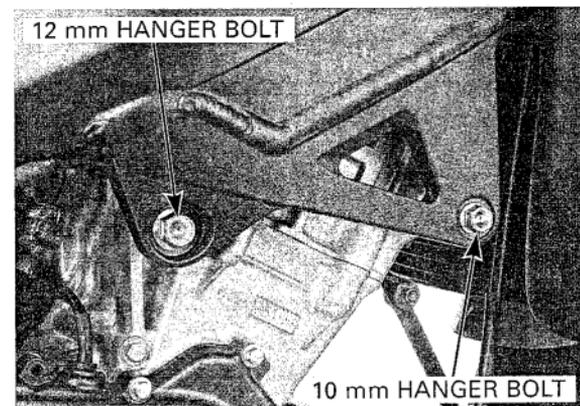


Tighten the right side of the front (10 mm) and middle (12 mm) engine hanger bolt to the specified torque.

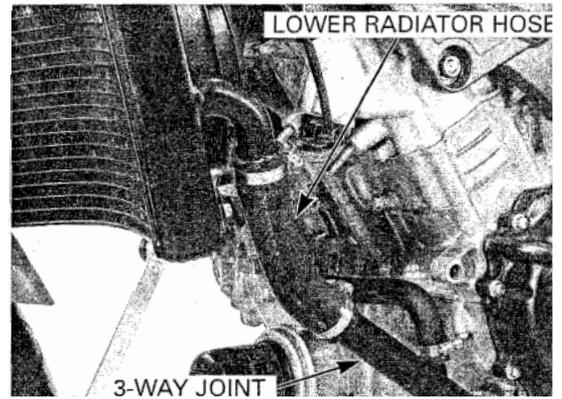
**TORQUE:**

**Front (10 mm): 39 N·m (4.0 kgf·m, 29 lbf·ft)**

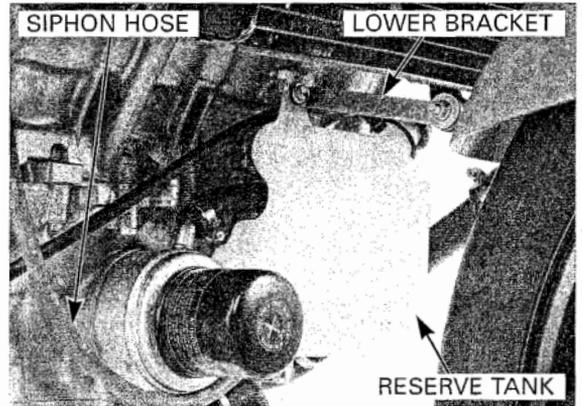
**Middle (12 mm): 54 N·m (5.5 kgf·m, 40 lbf·ft)**



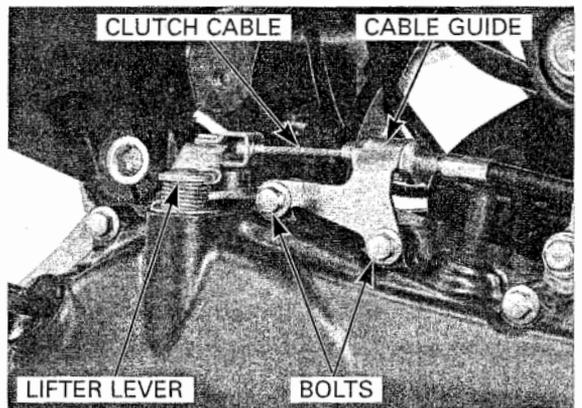
Connect the lower radiator hose to the radiator hose three-way joint and tighten the hose band screw.



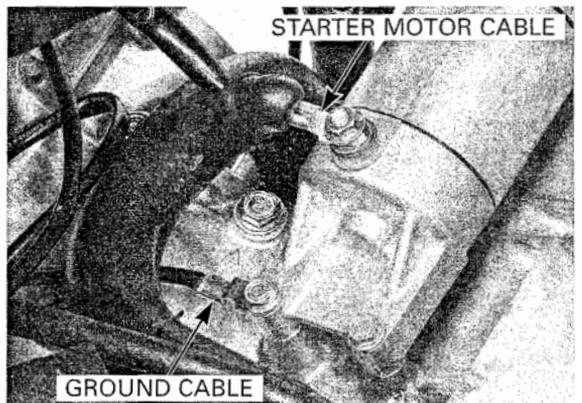
Install the radiator reserve tank and mounting bolts, then tighten the bolts. Connect the siphon hose to the reserve tank. Install the radiator lower mounting bolt/nut, then tighten the nut securely.



Connect the clutch cable end to the clutch lifter lever. Install the clutch cable guide to the right crankcase cover and tighten the mounting bolts securely.

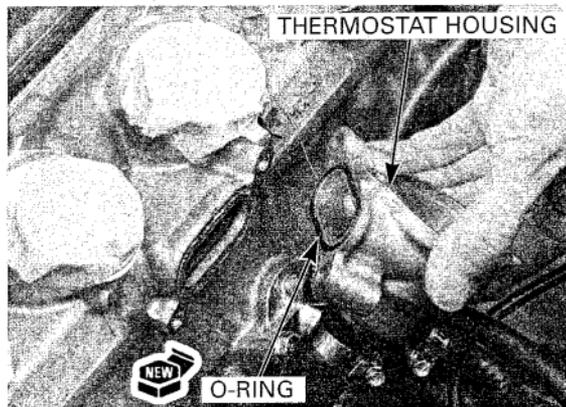


Connect the starter motor ground cable. Install and tighten the starter motor mounting bolt. Connect the starter motor cable to the motor terminal. Install and tighten the terminal nut.



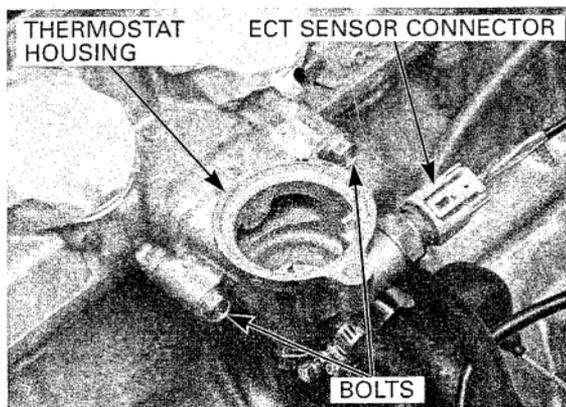
## ENGINE REMOVAL/INSTALLATION

install a new O-ring into the thermostat housing groove.  
Install the thermostat housing to the cylinder head.



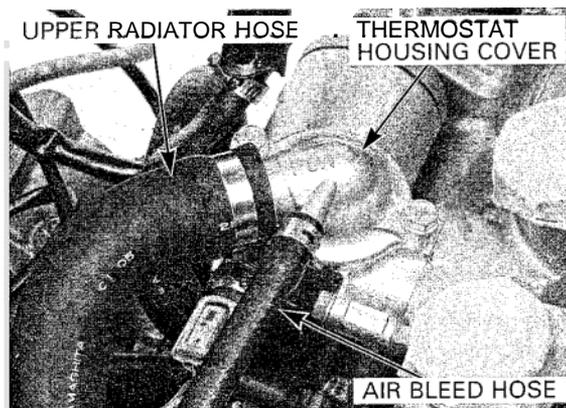
Install and tighten the thermostat housing mounting bolts.

Connect the ECT sensor connector.

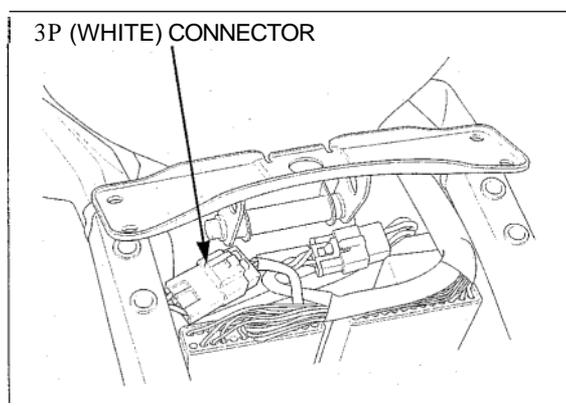


Install the thermostat and thermostat housing cover (page 6-7).

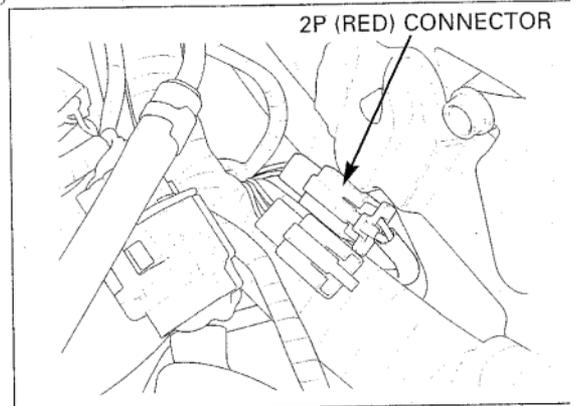
Connect the air bleed hose and upper radiator hose to the thermostat housing cover and tighten the hose band screw.



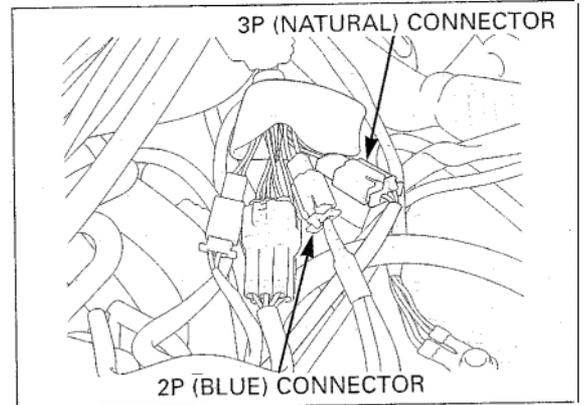
Route the alternator wire and connect the alternator 3P (White) connector.



Connect the ignition pulse generator 2P (Red) connector.



Connect the speed sensor 3P (Natural) connector and engine sub-harness 2P (Blue) connector

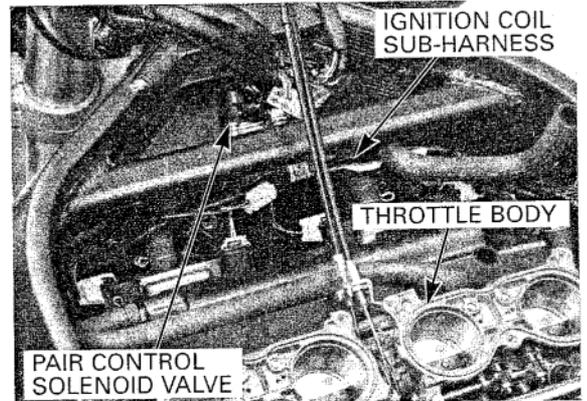


Install the following:

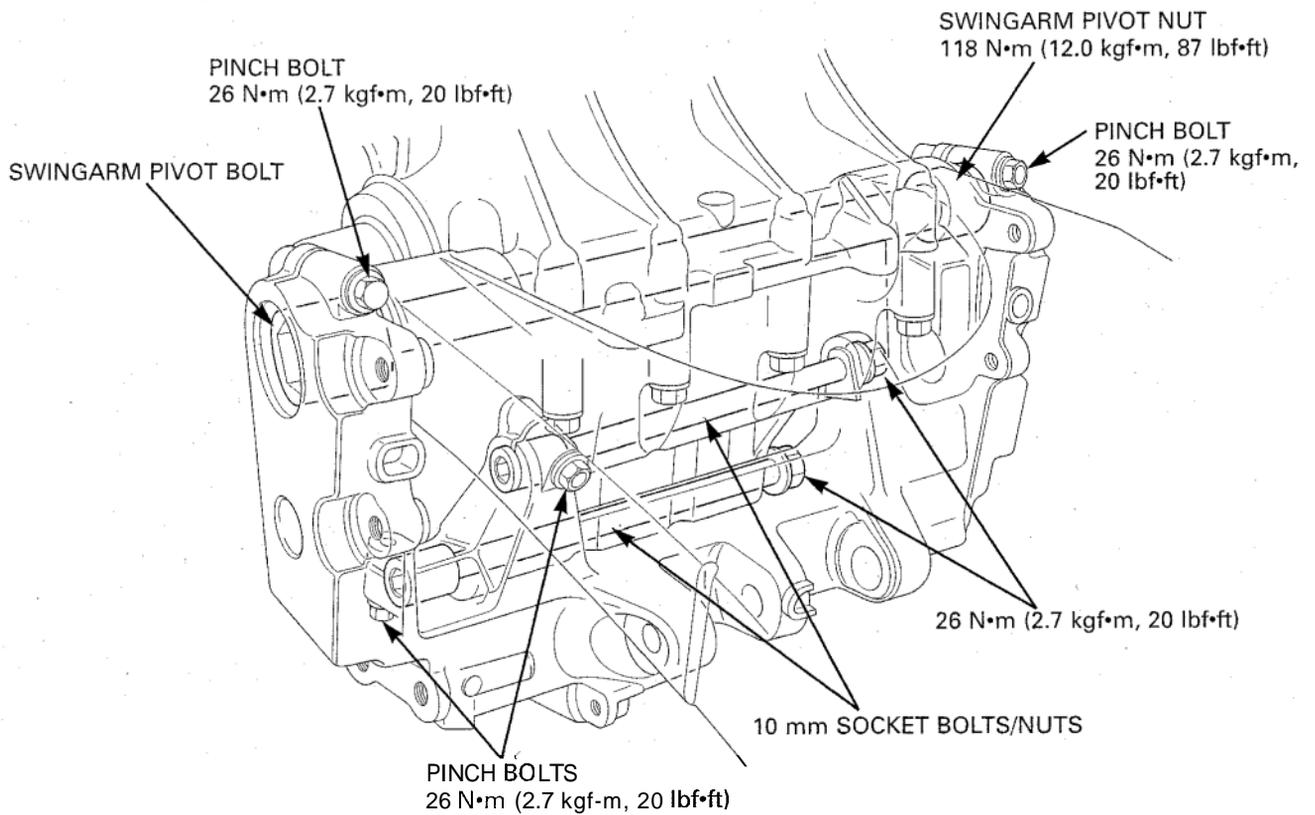
- Ignition coil/spark plug sub-harness
- PAIR control solenoid valve assembly (page 5-88)
- Lower bracket (page 7-12)
- Throttle body (page 5-71)
- EGCV and air intake valve servo motor (page 5-96)
- Fuel tank (page 5-61)

Add the recommended engine oil to the proper level (page 3-16).

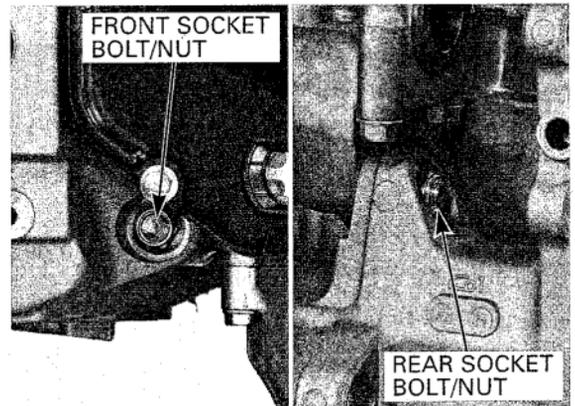
Fill the cooling system with the recommended coolant and bleed any air (page 6-5).



**LOWER BRACKET INSTALLATION**



Install the lower bracket onto the engine. Temporarily install the front and rear 10 mm bolts and nuts. Temporarily tighten the 10 mm nuts.



Install the swingarm (page 14-23).

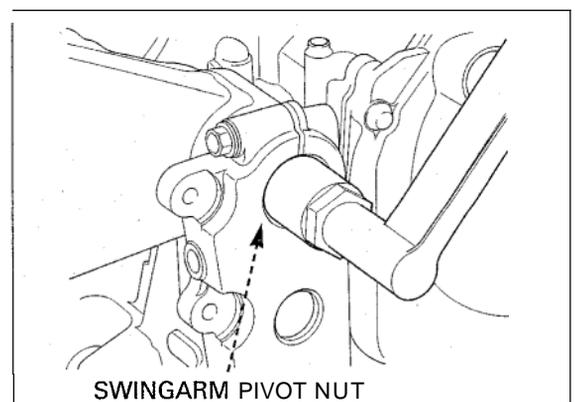
Hold the swingarm pivot bolt using the special tool, then tighten the pivot nut to the specified torque.

**TOOL**  
**Rod holder, 24 x 27 mm**      **07930-KA50100**

**TORQUE: 118 N•m (12.0 kgf•m, 87 lbf•ft)**

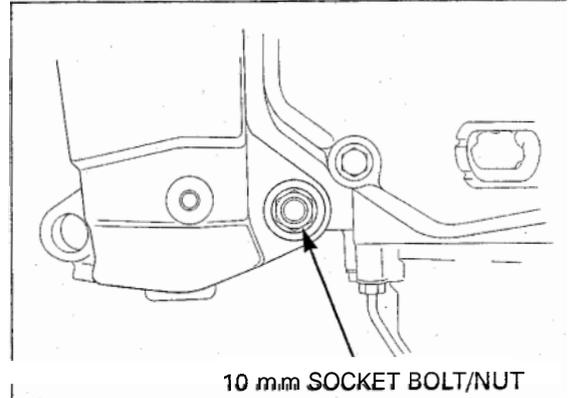
Tighten the swingarm pivot pinch bolt to the specified torque.

**TORQUE: 26 N•m (2.7 kgf•m, 20 lbf•ft)**



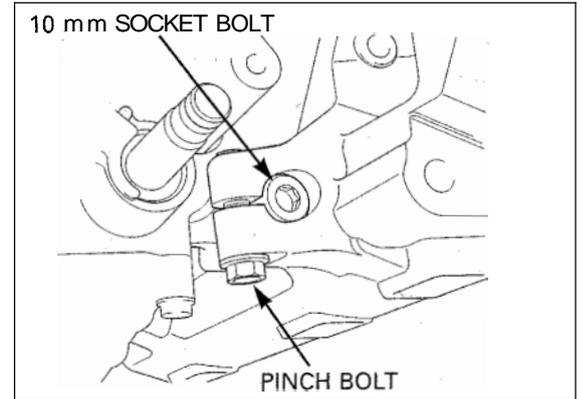
Tighten the front 10 mm socket bolt and nut to the specified torque.

**TORQUE: 42 N·m (4.3 kgf-m, 31 lbf·ft)**



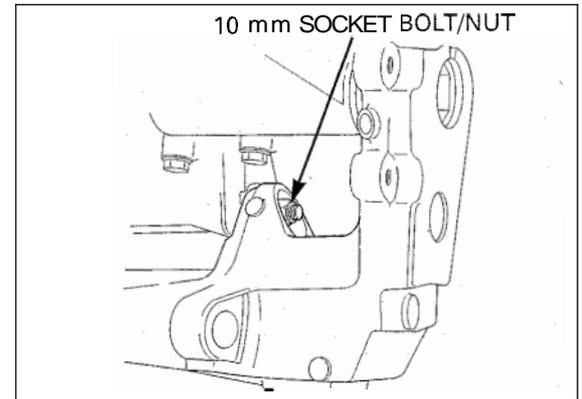
Tighten the front pinch bolt to the specified torque.

**TORQUE: 26 N·m (2.7 kgf-m, 20 lbf·ft)**



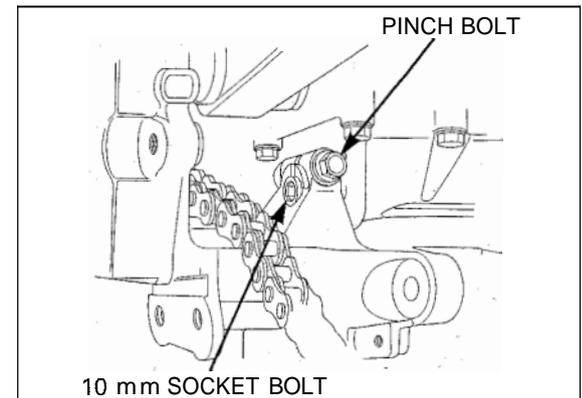
Hold the rear 10 mm socket bolt and tighten the nut to the specified torque.

**TORQUE: 42 N·m (4.3 kgf-m, 31 lbf·ft)**



Tighten the rear pinch bolt to the specified torque.

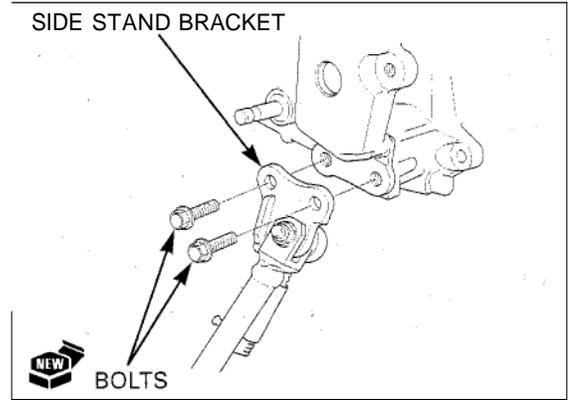
**TORQUE: 26 N·m (2.7 kgf-m, 20 lbf·ft)**



## ENGINE REMOVAL/INSTALLATION

Install the side stand bracket assembly, tighten the new bolts to the specified torque.

**TORQUE: 44 N•m (4.5 kgf•m, 33 lbf•ft)**



Route the side stand wire properly, connect the side stand switch 2P (Green) connector.

Install the following:

- Rear shock absorber (page 14-13)
- Suspension linkage (page 14-11)
- Muffler/exhaust pipe (page 2-16)

