

# 8. ENGINE REMOVAL/INSTALLATION

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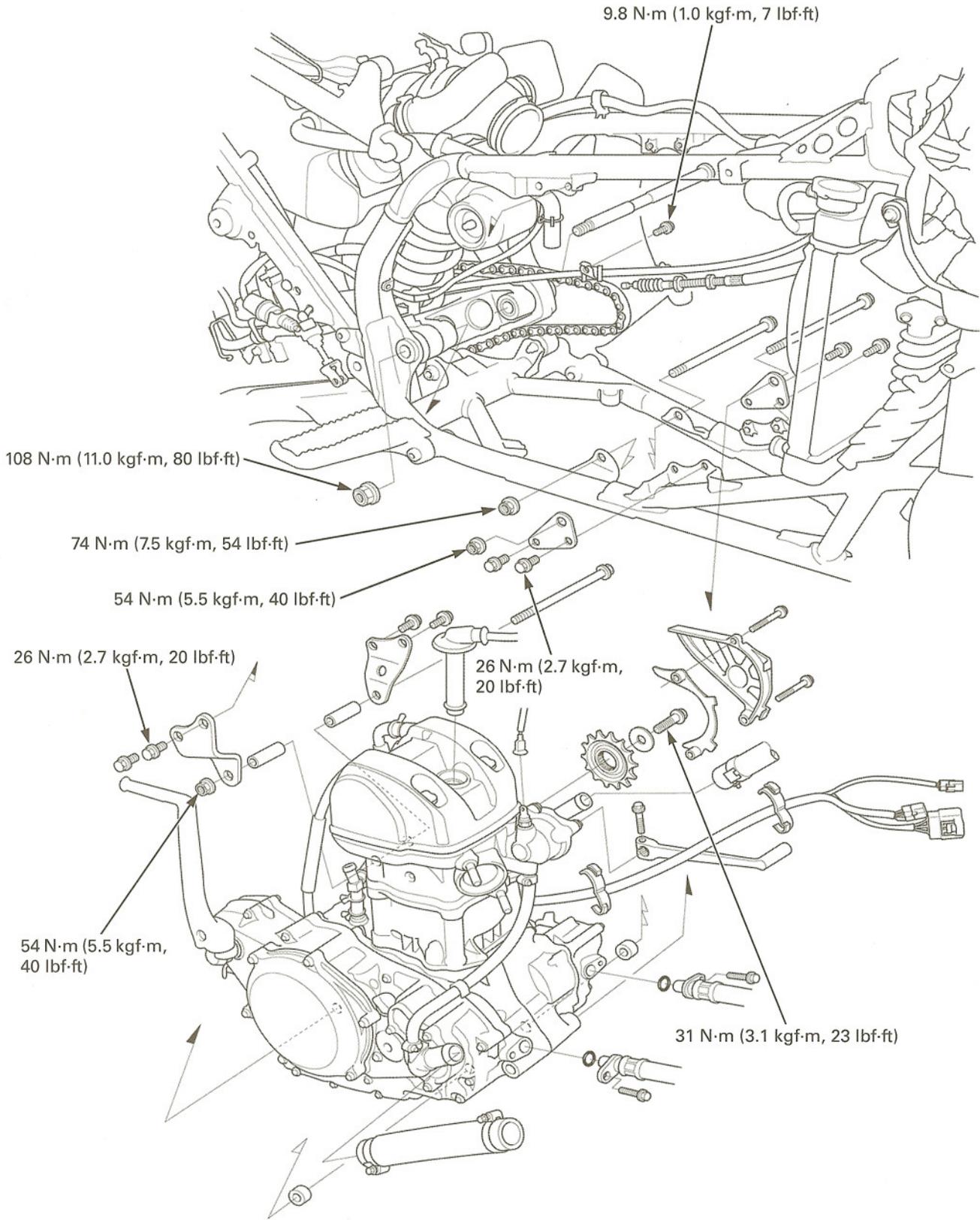
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**SYSTEM COMPONENTS**



**SERVICE INFORMATION**

**GENERAL**

- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- The following components require engine removal for service:
  - transmission (page 12-13)
  - crankshaft (page 12-17)

**SPECIFICATIONS**

ITEM		SPECIFICATIONS
Engine dry weight		34.7 kg (76.8 lbs)
Engine oil capacity	After draining	0.78 liters (0.82 US qt, 0.67 Imp qt)
	After filter change	0.82 liter (0.87 US qt, 0.72 Imp qt)
	After disassembly	1.20 liters (1.27 US qt, 1.06 Imp qt)
Transmission oil capacity	After draining	0.55 liters (0.58 US qt, 0.48 Imp qt)
	After disassembly	0.65 liters (0.69 US qt, 0.57 Imp qt)
Coolant capacity (radiator and engine)		1.5 liters (1.6 US qt, 1.3 Imp qt)

**TORQUE VALUES**

Drive sprocket bolt	31 N·m (3.2 kgf·m, 23 lbf·ft)
Upper engine hanger nut	54 N·m (5.5 kgf·m, 40 lbf·ft)
Upper engine hanger plate bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
Front engine hanger nut	54 N·m (5.5 kgf·m, 40 lbf·ft)
Front engine hanger plate bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
Lower engine hanger nut	74 N·m (7.5 kgf·m, 54 lbf·ft)
Swingarm pivot nut	108 N·m (11.0 kgf·m, 80 lbf·ft)
Parking brake cable clamp bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)

ALOC bolt: replace with a new one.

## ENGINE REMOVAL/INSTALLATION

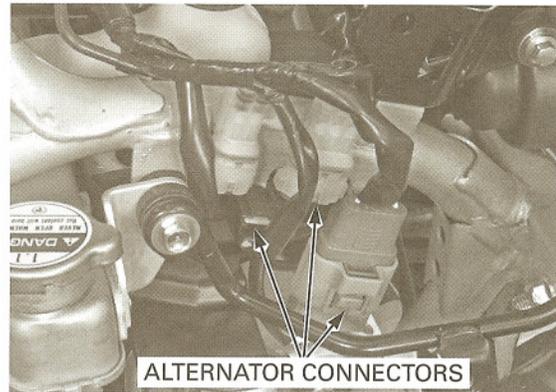
### ENGINE REMOVAL

Drain the engine oil (page 4-12).  
Drain the transmission oil (page 4-15).  
Drain the coolant (page 7-7).

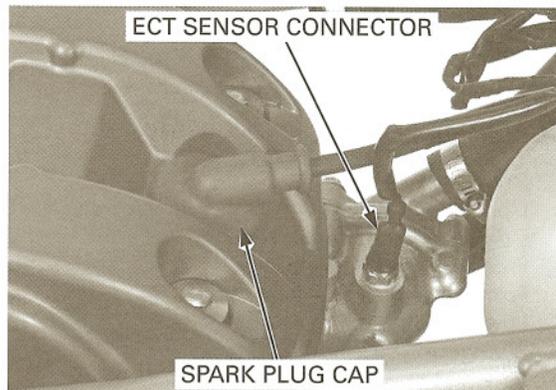
Remove the following:

- exhaust system (page 3-7)
- carburetor (page 6-6)
- heat guard plate (page 3-7)
- brake pedal (page 15-27)

Disconnect the alternator connectors.

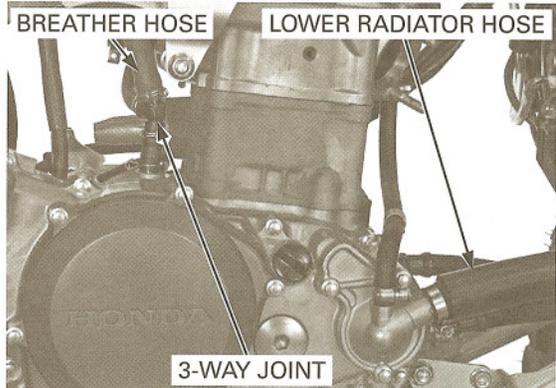


Disconnect the spark plug cap and engine coolant temperature (ECT) sensor connector.



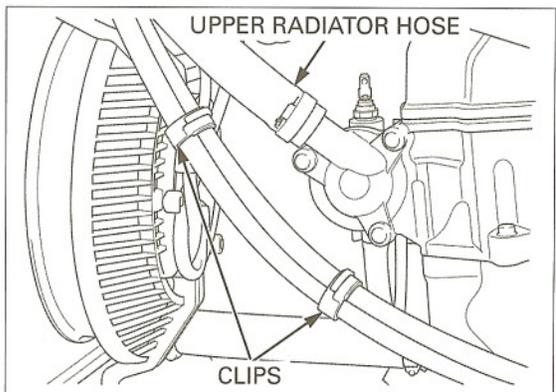
Disconnect the crankcase breather hose from the 3-way joint.

Loosen the hose band screw and disconnect the lower radiator hose from the water pump cover.

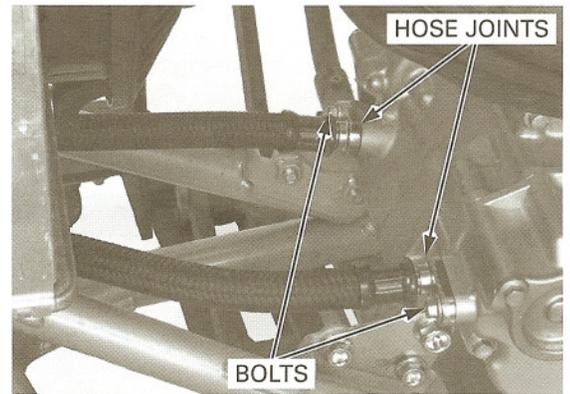


Loosen the hose band screw and disconnect the upper radiator hose from the thermostat cover.

Remove the two cable clips.

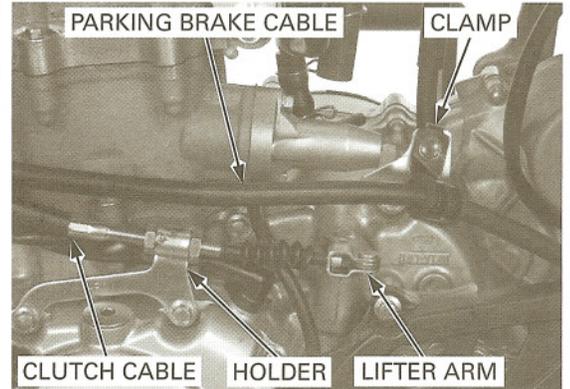


Remove the two bolts, oil cooler hose joints and O-rings.



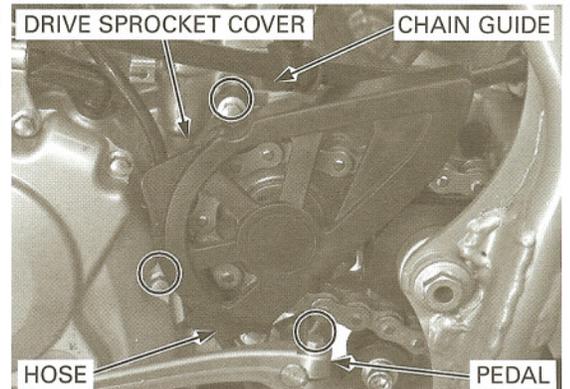
Remove the bolt and parking brake cable clamp from the stay.

Loosen the clutch cable lock nut and disconnect the clutch cable from the lifter arm. Remove the clutch cable adjusting nut and the clutch cable from the cable holder.



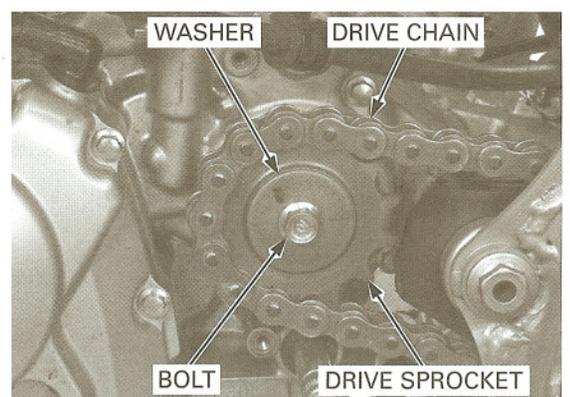
Remove the pinch bolt and gearshift pedal from the gearshift spindle.

Remove the two bolts, drive sprocket cover with the carburetor drain hose, and the drive chain guide.



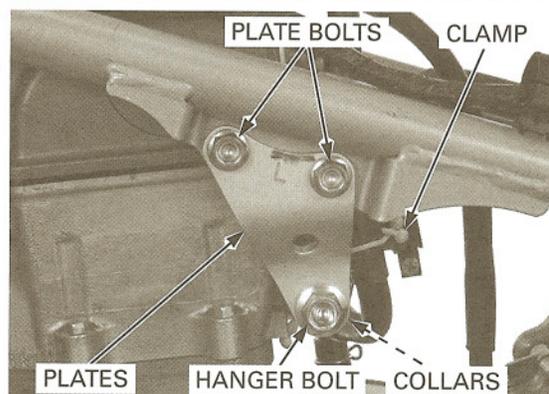
Turn the rear axle bearing holder to obtain maximum drive chain slack (page 4-18).

Remove the bolt, washer and drive sprocket from the countershaft. Remove the drive sprocket from the drive chain.

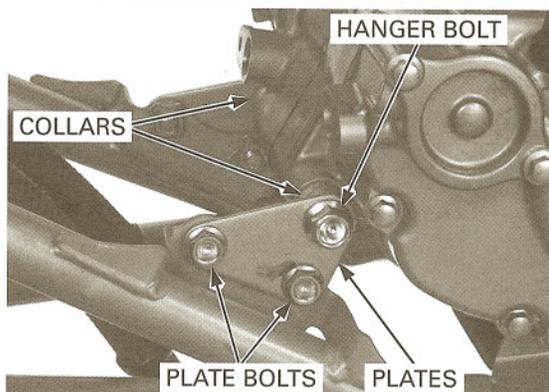


## ENGINE REMOVAL/INSTALLATION

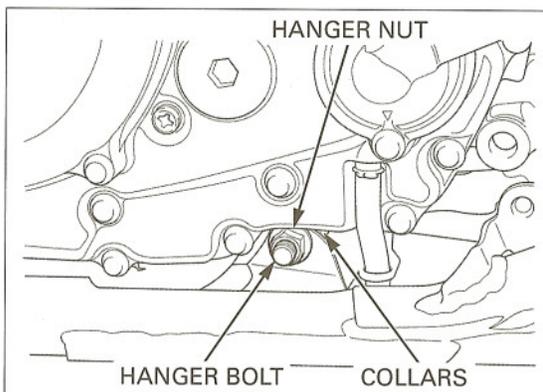
Remove the upper engine hanger nut, bolt, two collars and crankcase breather hose clamp.  
Remove the engine hanger plate bolts and hanger plates.



Remove the front engine hanger nut, bolt and two collars.  
Remove the engine hanger plate bolts and hanger plates.



Remove the lower engine hanger nut, bolt and two collars.



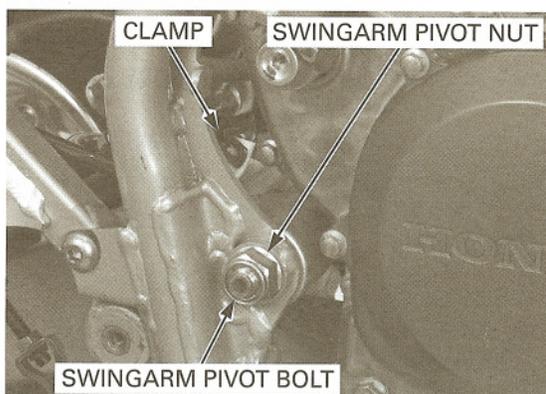
Support the frame with a floor jack or other suitable support.

Remove the rear brake light switch wire from the clamp.

Remove the swingarm pivot nut and bolt.

Remove the engine out of the frame to the right side.

Reinstall the swingarm pivot bolt and nut so the chassis can be moved and stored safely.



**ENGINE INSTALLATION**

**NOTE:**

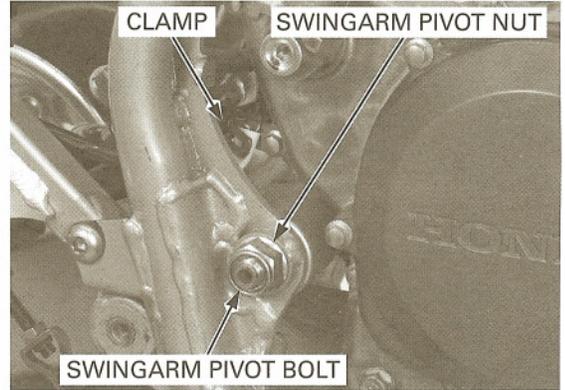
- Route the wires, cables and hoses properly (page 1-17).

*Before installing the engine, make sure that the pivot collars are installed into the swingarm pivots.*

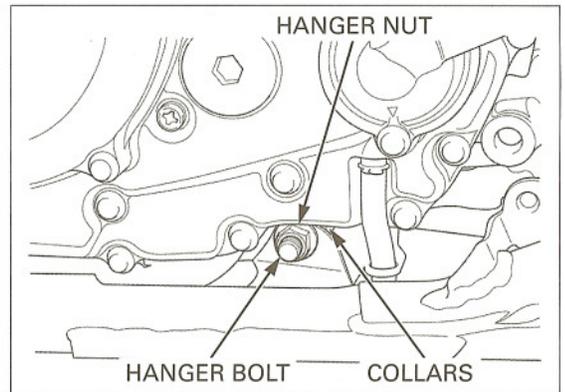
Install the engine into the frame from the right side.

Install the swingarm pivot bolt and nut.

Install the rear brake light switch wire into the clamp.

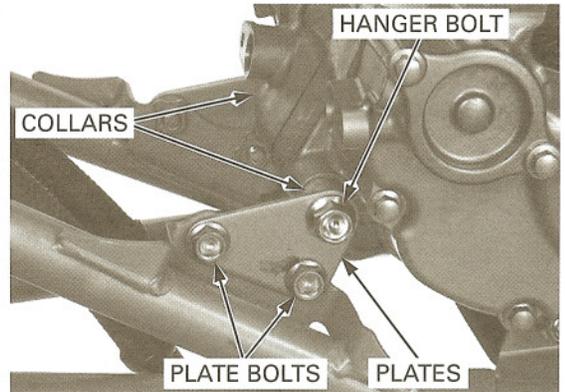


Install the two collars, lower engine hanger bolt and nut.



Install the front engine hanger plates and loosely install the bolts.

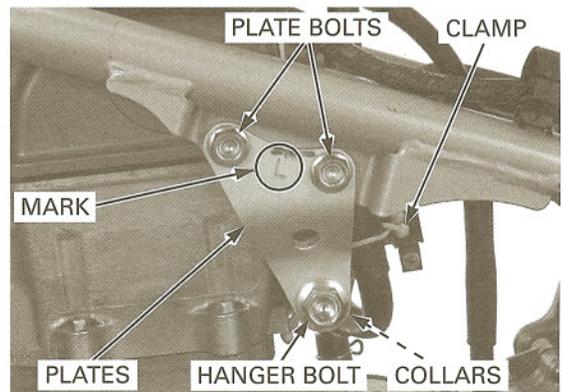
Install the collars, front engine hanger bolt and nut.



*The upper engine hanger plates are identified by the "L" (left) and "R" (right) marks on them.*

Install the upper engine hanger plates and loosely install the bolts.

Install the crankcase breather hose clamp, collars, upper engine hanger bolt and nut.

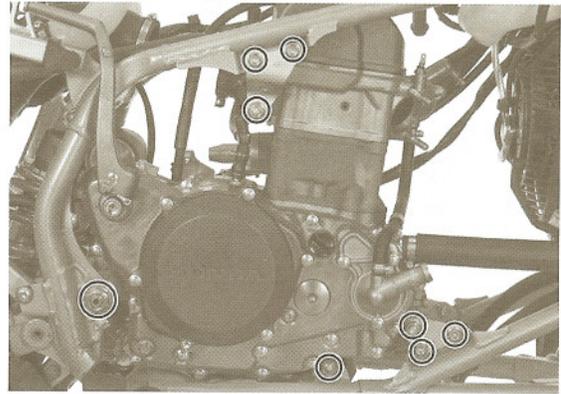


## ENGINE REMOVAL/INSTALLATION

Tighten the swingarm pivot nut, engine hanger nuts and hanger plate bolts.

### TORQUE:

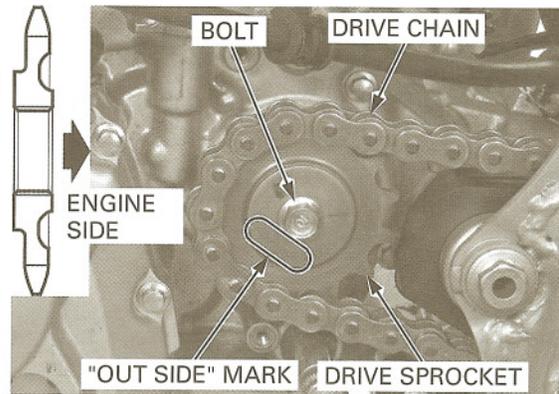
- Swingarm pivot nut:  
108 N·m (11.0 kgf·m, 80 lbf·ft)
- Lower engine hanger nut:  
74 N·m (7.5 kgf·m, 54 lbf·ft)
- Front engine hanger nut:  
54 N·m (5.5 kgf·m, 40 lbf·ft)
- Front engine hanger plate bolt:  
26 N·m (2.7 kgf·m, 20 lbf·ft)
- Upper engine hanger nut:  
54 N·m (5.5 kgf·m, 40 lbf·ft)
- Upper engine hanger plate bolt:  
26 N·m (2.7 kgf·m, 20 lbf·ft)



*Note the direction of the drive sprocket as shown.*

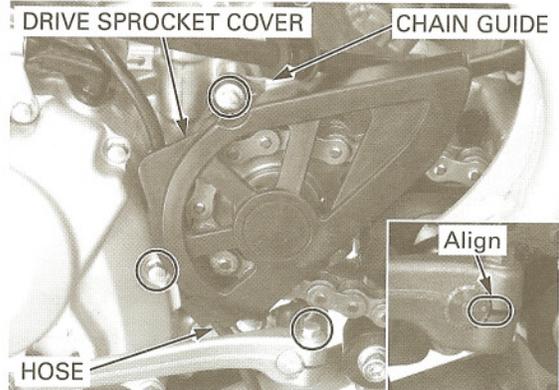
Install the drive sprocket onto the drive chain.  
Install the drive sprocket onto the countershaft.  
Install the washer with the "OUT SIDE" mark facing out and tighten the bolt.

**TORQUE: 31 N·m (3.2 kgf·m, 23 lbf·ft)**



Install the drive chain guide and drive sprocket cover with the carburetor drain hose, and tighten the two bolt securely.

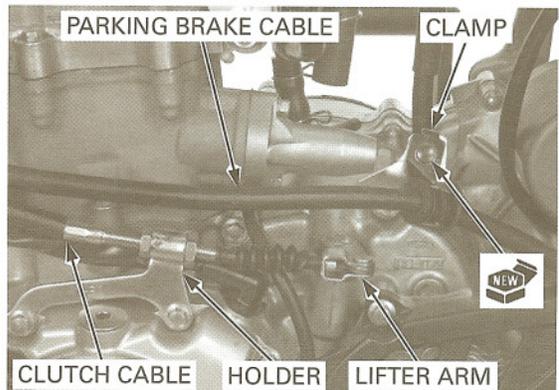
Install gearshift pedal onto the gearshift spindle by aligning the slit with the punch mark.  
Install the pinch bolt and tighten it securely.



Install the clutch cable into the cable holder.  
Install the clutch cable adjusting nut onto the cable.  
Connect the clutch cable to the lifter arm.

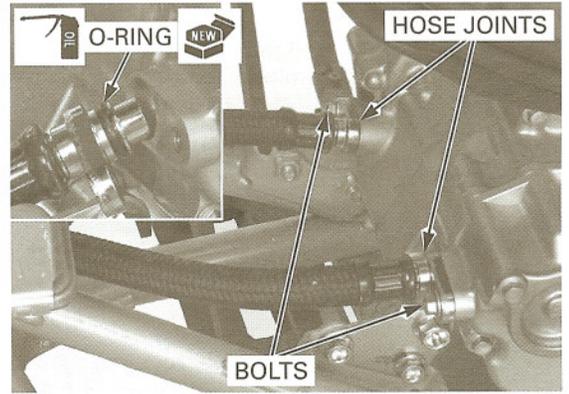
Install parking brake cable clamp onto the stay with a new bolt and tighten the bolt.

**TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)**



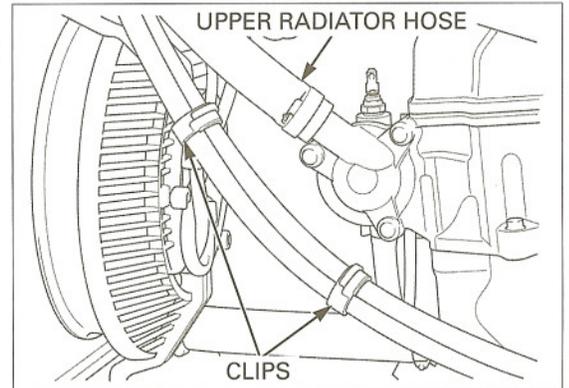
## ENGINE REMOVAL/INSTALLATION

Coat new O-rings with oil and install them onto the oil cooler hose joints.  
Install the oil cooler hose joints onto the engine and tighten the bolts securely.



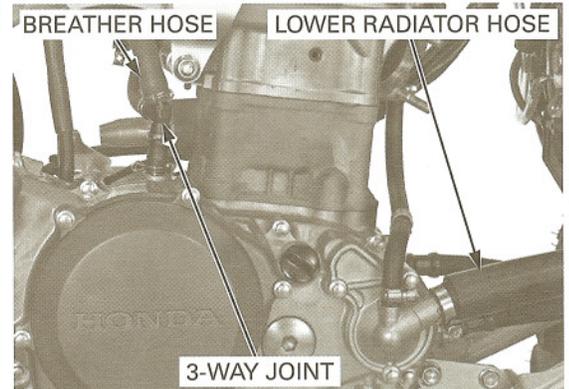
Install the two cable clips.

Connect the upper radiator hose to the thermostat cover and tighten the hose band screw securely.

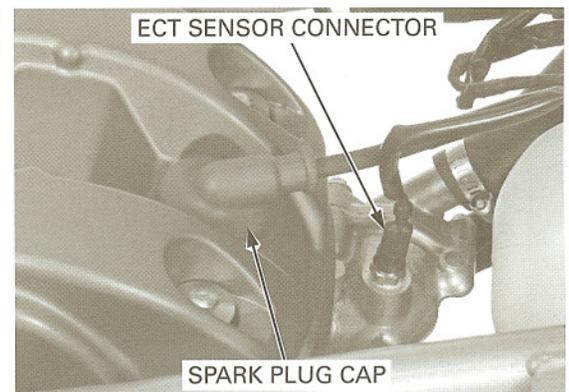


Connect the lower radiator hose to the water pump cover and tighten the hose band screw securely.

Connect the crankcase breather hose to the 3-way joint.



Install the spark plug cap onto the plug and connect the connector to the engine coolant temperature (ECT) sensor.



## ENGINE REMOVAL/INSTALLATION

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Connect the alternator connectors.

Install the following:

- brake pedal (page 15-27)
- heat guard plate (page 3-7)
- carburetor (page 6-21)
- exhaust system (page 3-8)

Fill the crankcase with the recommended engine oil (page 4-12).

Fill the transmission with the recommended transmission oil (page 4-15).

Fill and bleed the cooling system (page 7-7).

Adjust the following:

- drive chain slack (page 4-18)
- parking brake lever free play (page 4-25)
- clutch lever free play (page 4-26)

