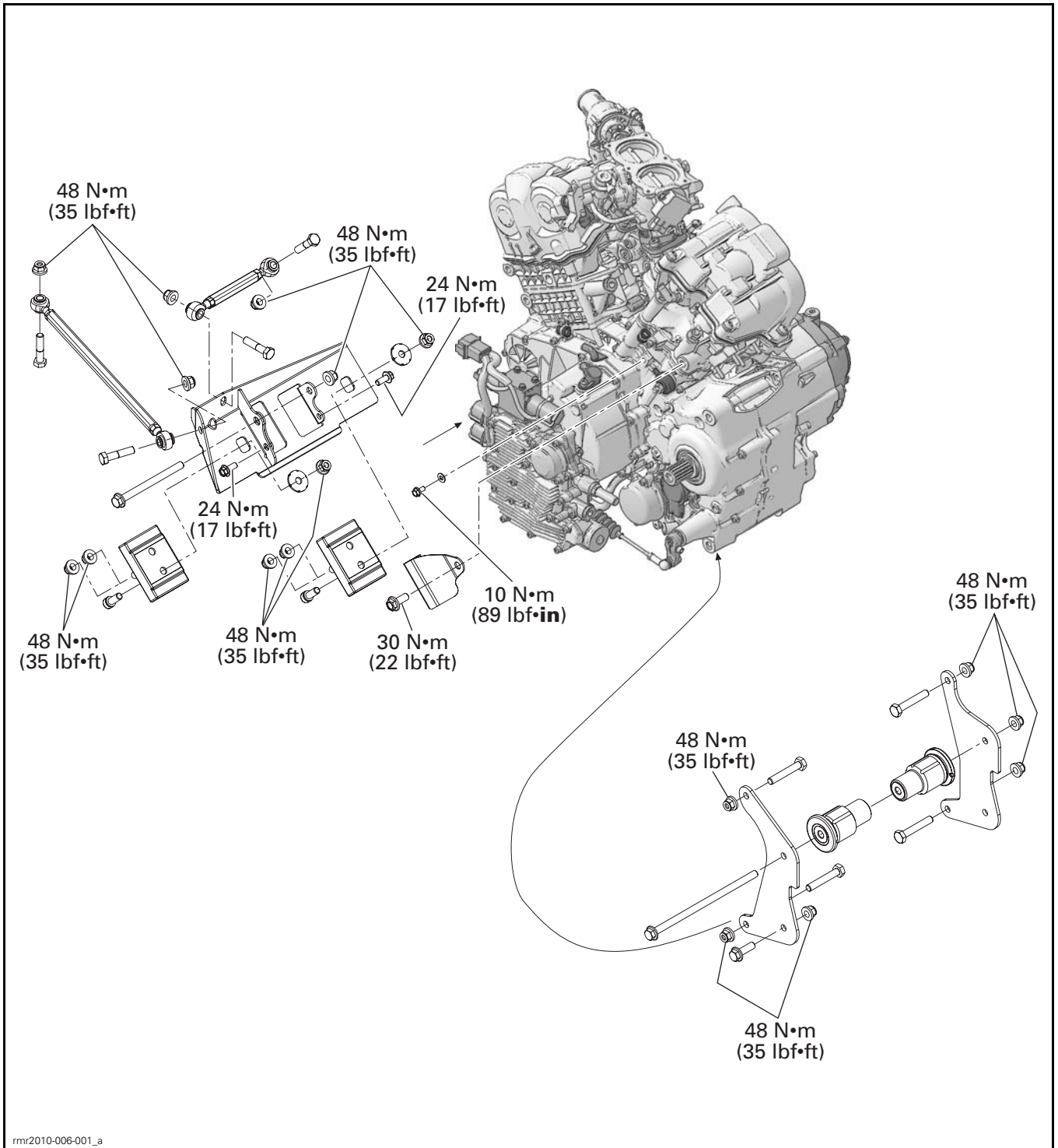


ENGINE REMOVAL AND INSTALLATION

SERVICE TOOLS

Description	Part Number	Page
BLIND HOLE BEARING PULLER SET.....	529 036 117	11
ENGINE LIFTING TOOL	529 036 181	7, 9-10



rmr2010-006-001_a

GENERAL

⚠ CAUTION To avoid potential burns, let engine and exhaust system cool down.

During assembly/installation, use the torque values and service products as in the exploded view.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must be strictly adhered to. Locking devices (e.g.: locking tabs, elastic stop nuts, cotter pins, etc.) must be replaced with new ones.

NOTICE Hoses, cables or locking ties removed during the procedure must be reinstalled as per factory standard.

PROCEDURES

ENGINE

Preparation for Engine Removal

Place vehicle on a workstation that will have access to an engine-lifting hoist.

Disconnect the BLACK (-) cable from battery, then the RED (+) cable.

⚠ WARNING

Always disconnect battery cables exactly in the specified order, the BLACK (-) cable first. It is recommended to disconnect electrical connections prior to disconnecting fuel lines.

Remove the following panels (refer to *BODY* for procedure):

- Both top side panels
- Both rear panels
- Both middle side panels
- Both bottom side panels (rear and front)
- Front storage compartment
- Glove box
- Central panel.

Drain oil (engine and oil tank). Refer to *LUBRICATION SYSTEM* subsection.

Drain engine coolant. Refer to *COOLING SYSTEM* subsection.

Remove muffler and catalytic converter. Refer to *EXHAUST SYSTEM* subsection.

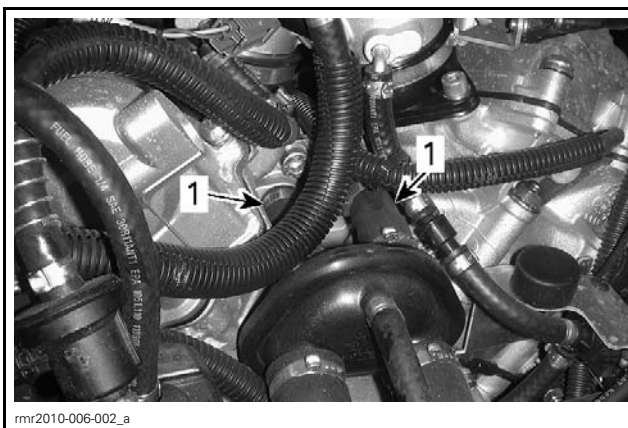
Remove both lateral supports. Refer to *FRAME* subsection.

Remove the air filter housing and the resonator. Refer to *AIR INTAKE SYSTEM* subsection.

Release drive belt tension. Refer to *DRIVE BELT AND REAR WHEEL* subsection.

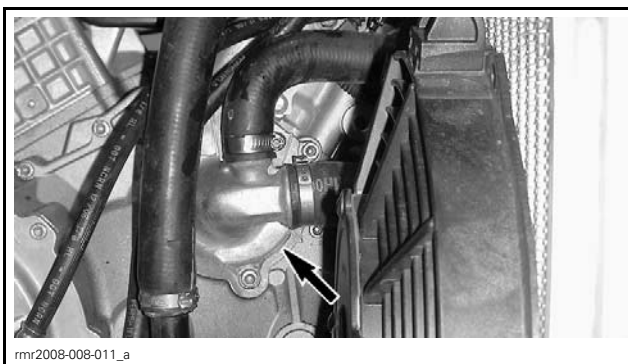
On Right Side of Vehicle:

1. Disconnect the coolant hoses from cylinder heads.



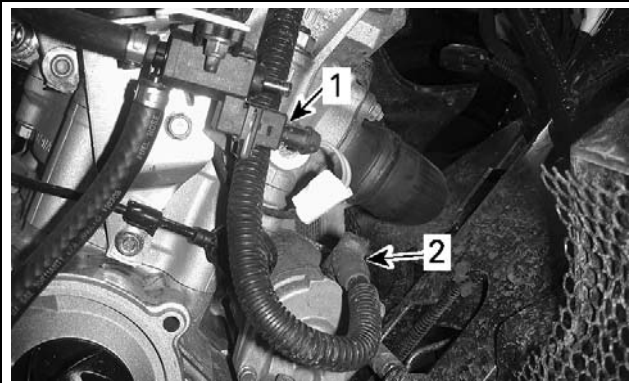
1. Coolant hoses

2. Remove screws retaining water pump cover.



3. Unplug the clutch actuation valve connector.
4. Remove the starter cable from the starter.

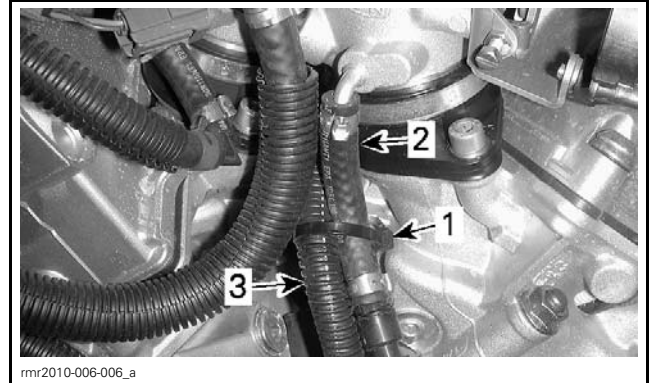
Subsection XX (ENGINE REMOVAL AND INSTALLATION)



rmr2010-006-003_a

1. Clutch actuation valve connector
2. Starter cable

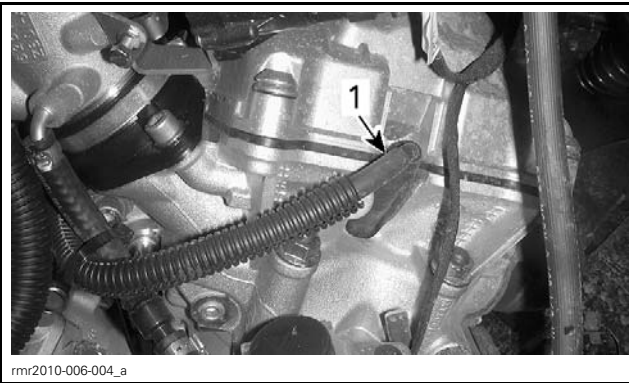
5. Unplug spark plug cable from the front cylinder head.



rmr2010-006-006_a

1. Cut this locking tie
2. Clutch activation valve hose
3. Spark plug cable

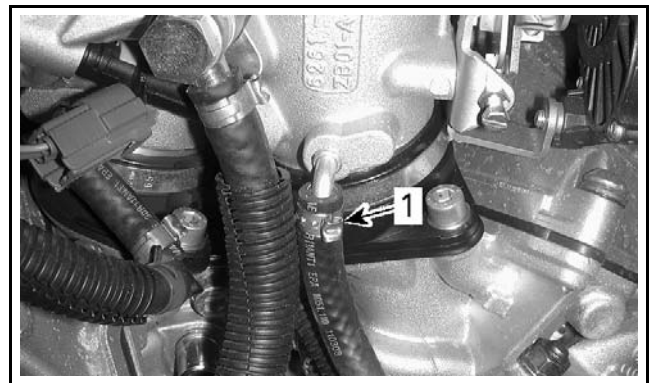
8. Disconnect the clutch actuation valve hose from throttle body.



rmr2010-006-004_a

1. Spark plug cable

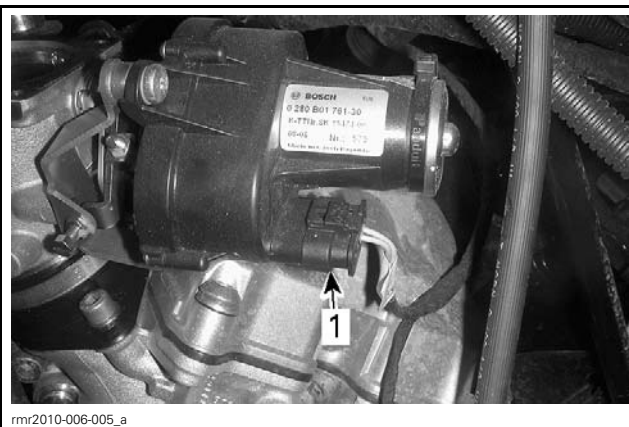
6. Unplug the electric throttle actuator (ETA) connector.



rmr2010-006-007_a

1. Cut this Oetiker clamp

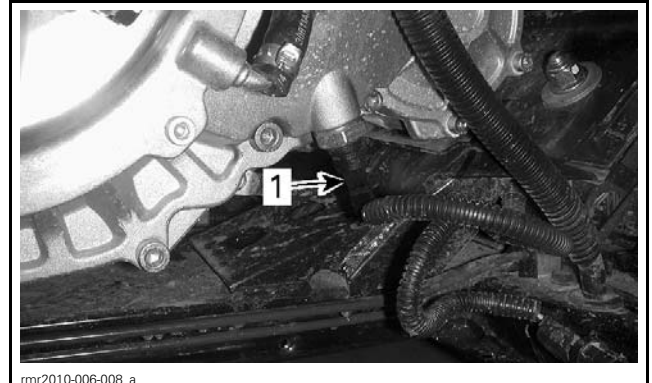
9. Unplug the oil pressure switch



rmr2010-006-005_a

1. ETA connector

7. Cut locking tie attaching spark plug cable and clutch actuation valve hose.

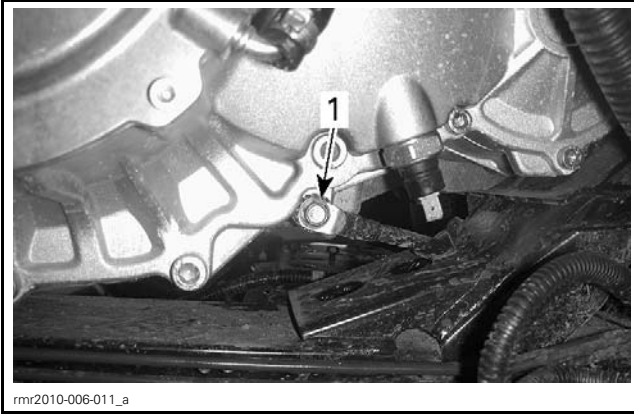


rmr2010-006-008_a

1. Oil pressure switch

10. Remove ground wire from engine.

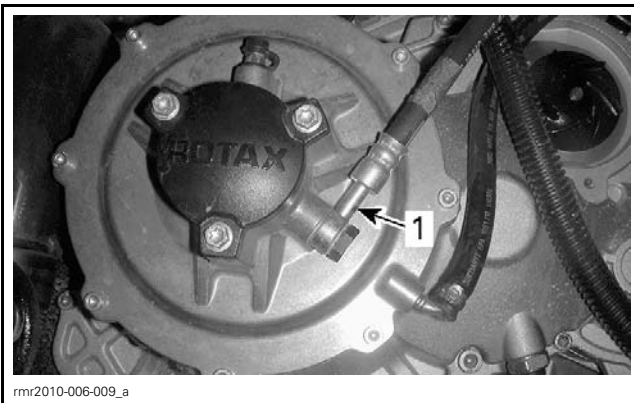
Subsection XX (ENGINE REMOVAL AND INSTALLATION)



1. Ground wire screw

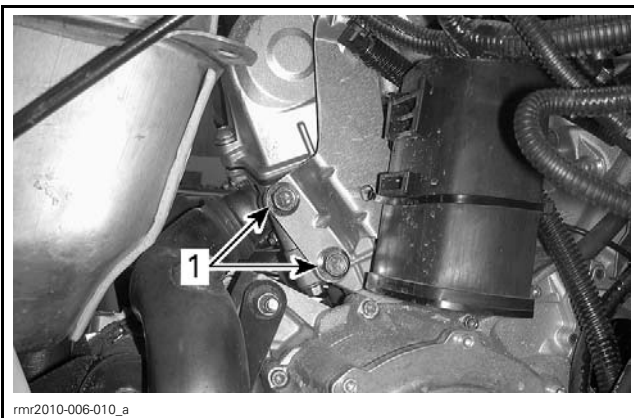
11. On **SM5** models, disconnect clutch hose and discard sealing washers.

NOTE: Place a container under clutch hose to recover the clutch fluid.



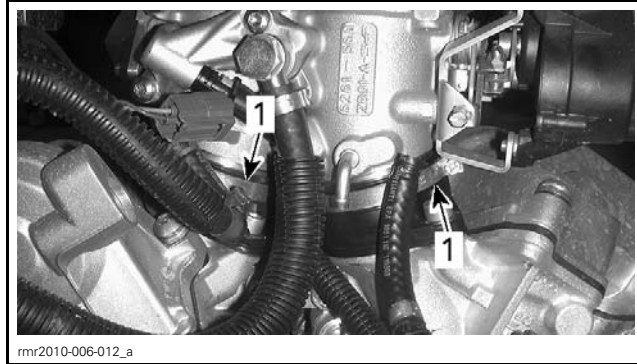
1. Clutch hose

12. Remove screws retaining the EVAP canister to cylinder.



1. EVAP canister support screws

13. Loosen clamps securing throttle body to intake adapters.

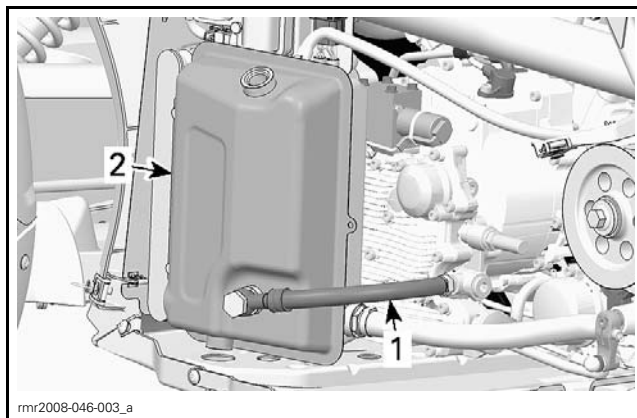


1. Retaining clamps

14. Lift throttle body and attach it against the top frame member.

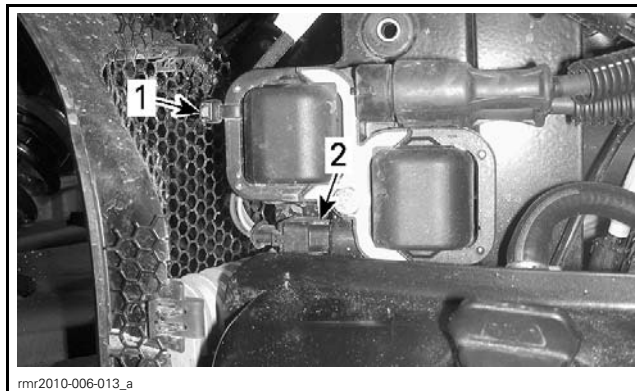
On left side of vehicle:

1. On **SE5** models, detach the clutch servo hose from the bottom of oil tank.



1. Clutch servo hose
2. Oil tank

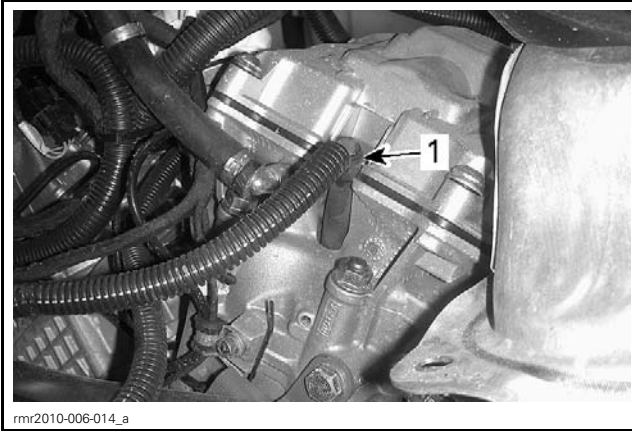
2. Cut locking tie retaining ignition coil wire and unplug ignition coil connector.



1. Cut this locking tie
2. Ignition coil connector

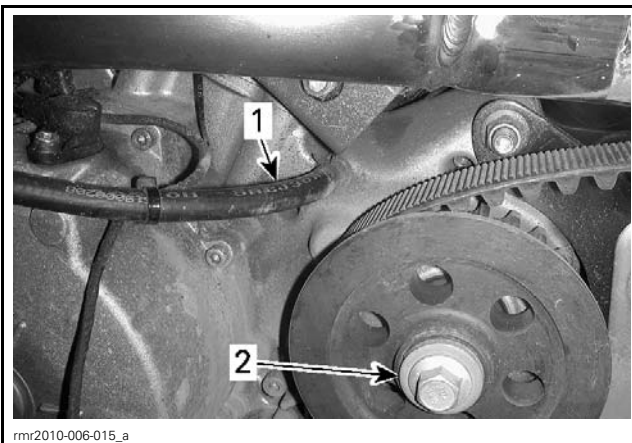
3. Unplug spark plug cable from the front cylinder head.

Subsection XX (ENGINE REMOVAL AND INSTALLATION)



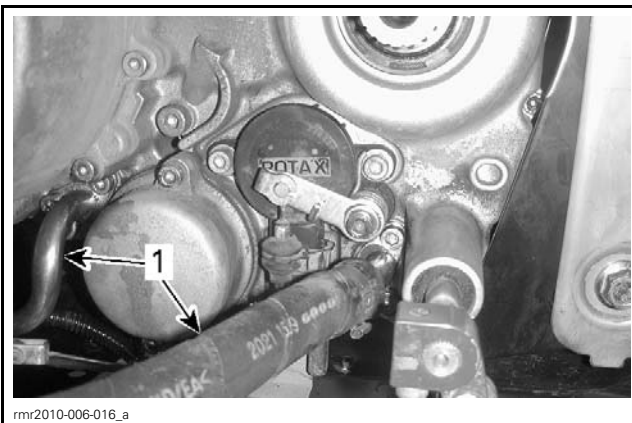
1. Spark plug cable

4. Disconnect the oil tank vent from crankcase.
5. Remove the front sprocket and move drive belt rearward. Refer to *GEARBOX* subsection for procedure.



1. Oil tank vent
2. Front sprocket screw

6. Remove both oil hose connectors from crankcase.

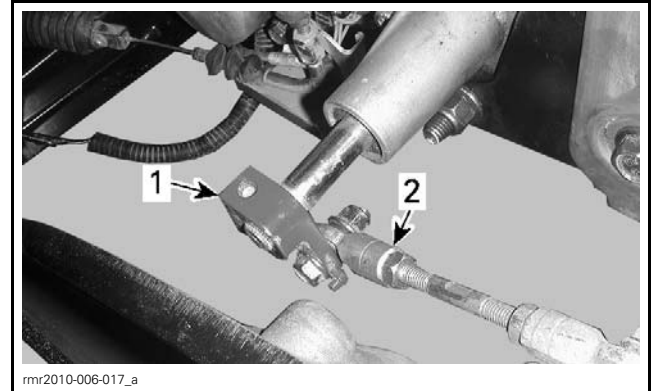


1. Oil hoses

7. Remove the oil tank and oil cooler with the ignition coil.

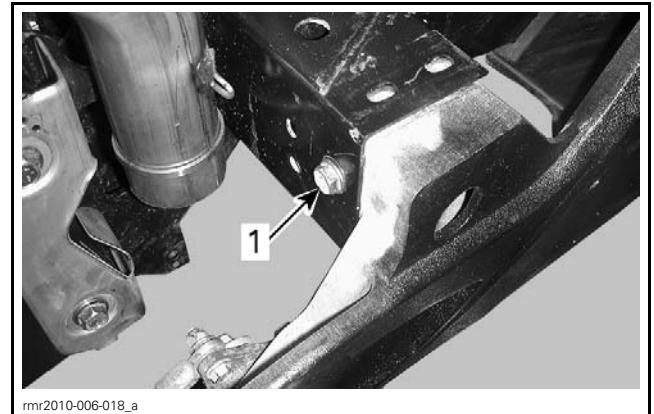
8. Remove the LH footrest.

- 8.1 Remove bolt retaining shifting link to shifting block.



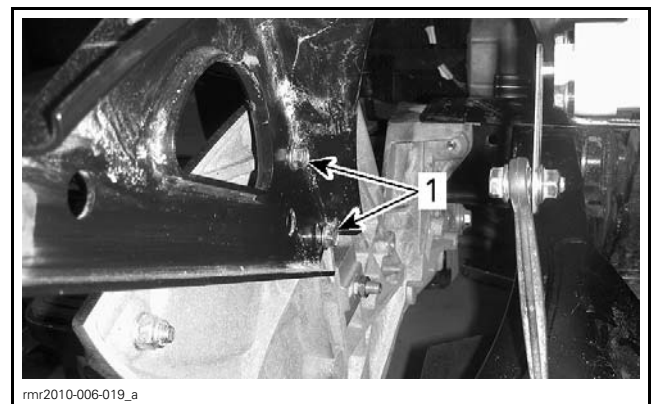
1. Shifting block
2. Shifting link

- 8.2 Remove screw securing the middle of the footrest to frame.



1. Retaining screw

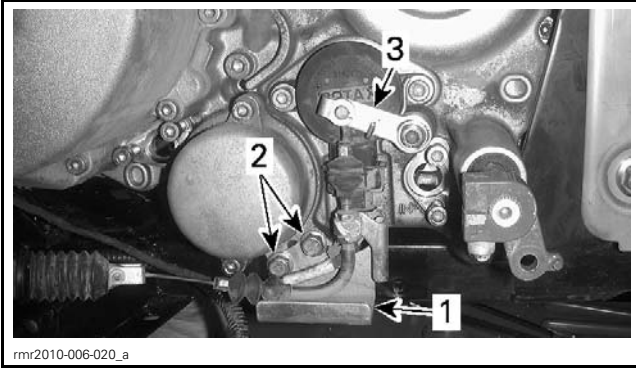
- 8.3 Remove both screws securing the rear of footrest to footrest support.



1. Rear retaining screws

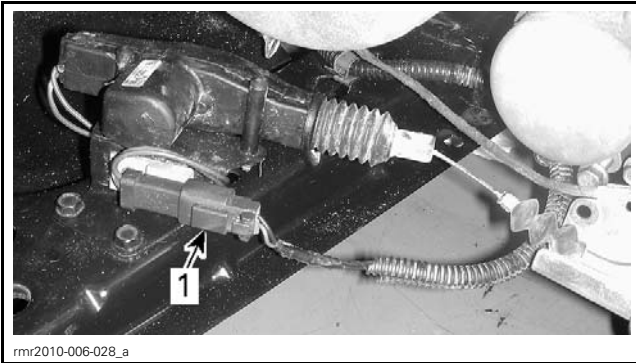
9. Remove screws retaining reverse cable support to engine and detach the end of the cable from the reverse lever.

Subsection XX (ENGINE REMOVAL AND INSTALLATION)



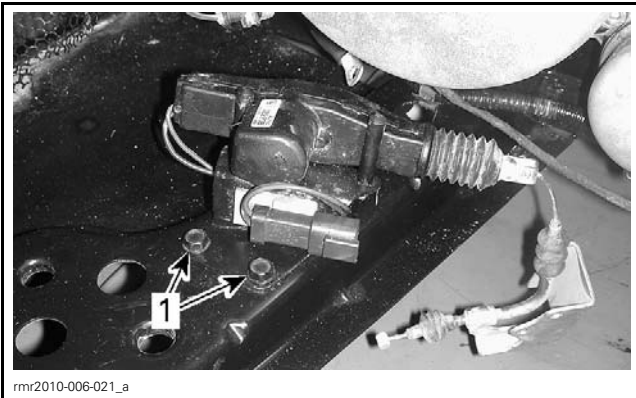
1. Reverse cable support
2. Retaining screws
3. Reverse lever

10. Unplug the reverse actuator.



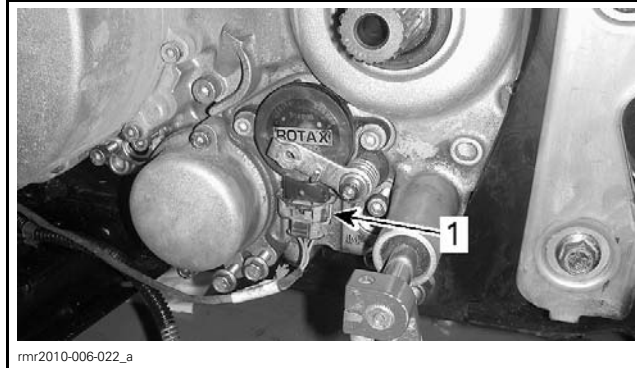
1. Reverse actuator connector

11. Remove screws retaining the reverse actuator to frame.

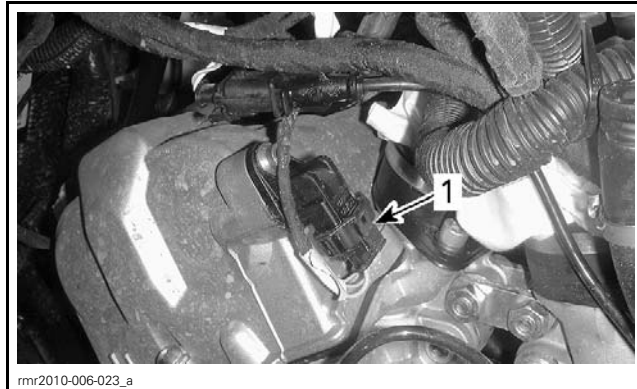


1. Reverse actuator screws

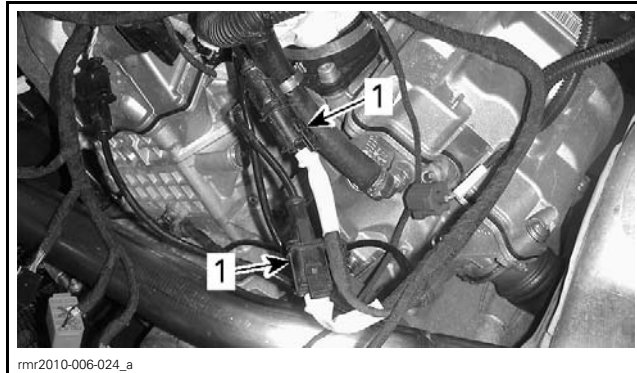
12. Unplug the following sensors.



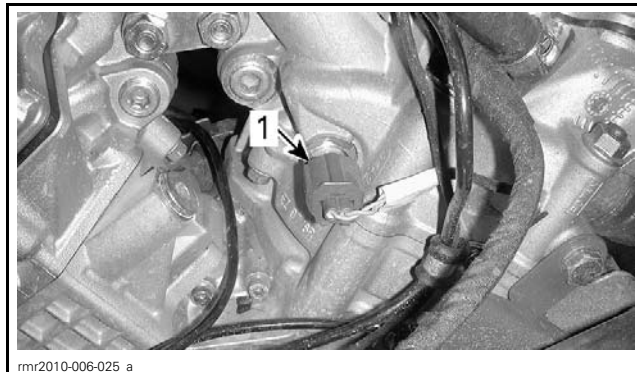
1. Gearbox position sensor (GBPS)



1. Camshaft position sensor (CAPS)



1. Both knock sensors (KS)

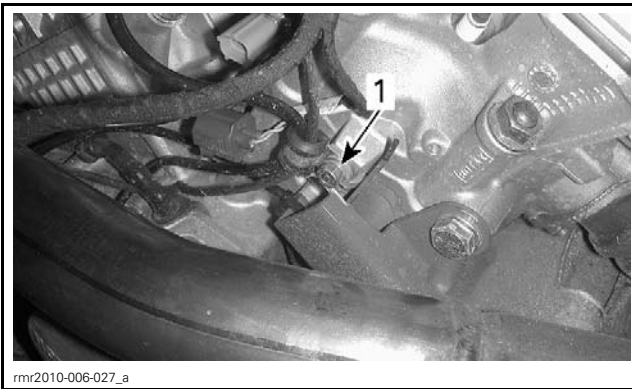


1. Coolant temperature sensor (CTS)



1. Crankshaft position sensor (CPS)

13. Detach clamp retaining knock sensor wires to engine.

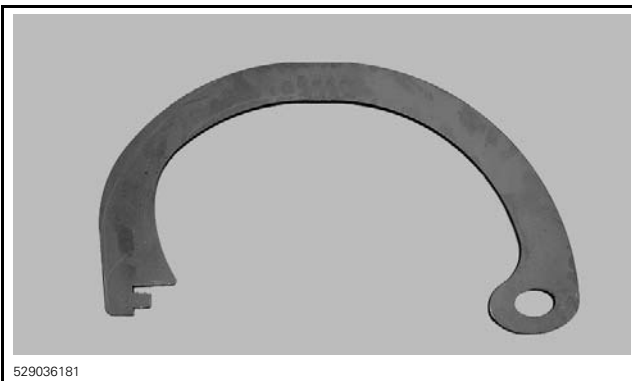


1. Clamp retaining screw

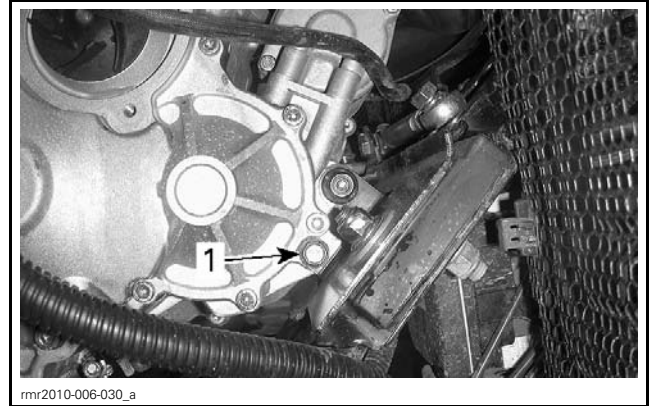
Lifting Engine

1. Install the lifting tool.

- 1.1 Turn the handlebar fully LH to avoid damaging it with lifting tool.
- 1.2 Install the hook of the ENGINE LIFTING TOOL (P/N 529 036 181) between cylinder heads.

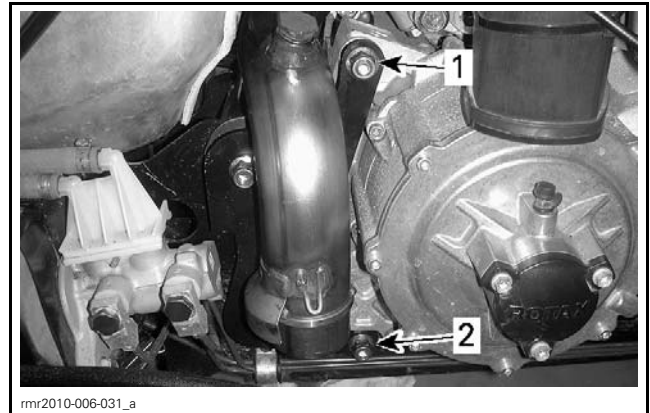


2. On RH side of the vehicle, remove the front lower engine bolt.



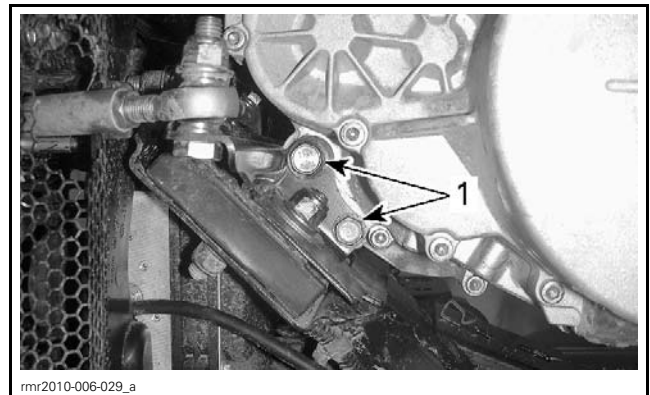
1. Right lower engine bolt

3. Remove engine support bolts.



1. Upper engine support bolt
2. Lower engine support bolt

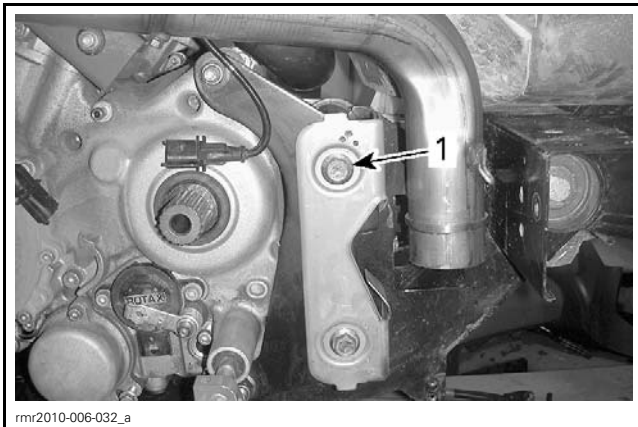
4. On the LH side of engine, remove both front engine bolts.



1. Left front engine bolts

5. Remove the rear upper engine bolt.

Subsection XX (ENGINE REMOVAL AND INSTALLATION)



1. Rear upper engine bolt

6. Remove the rear engine support on the RH side of vehicle.

7. Lift engine slowly and remove it from vehicle.

Engine Installation

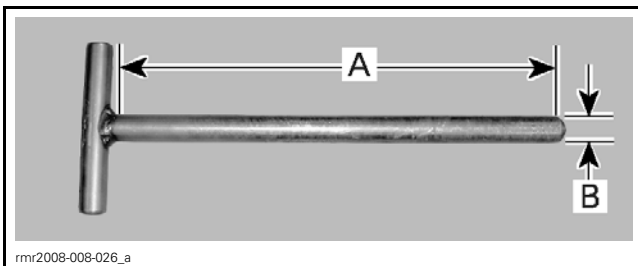
The installation is the reverse of the removal procedure. However, pay attention to the following.

NOTE: Prior to install engine, inspect condition of engine mounts.

Position engine in chassis.

Install the engine mounts shield.

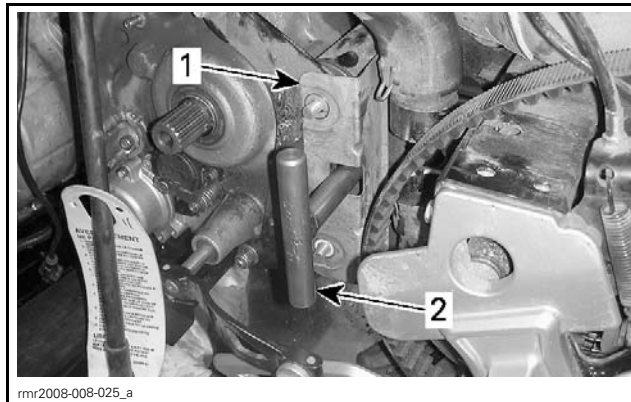
Install an alignment pin (homemade tool) through engine supports and chassis to align the engine.



ALIGNMENT PIN — HOMEMADE TOOL

A. Approximately 400 mm (16 in)

B. 19 mm (3/4 in)



TYPICAL

1. Engine mounts shield

2. Alignment pin

Lean engine against alignment pin.

Install all mounting bolts and mounting nuts.

Torque mounting bolts and mounting nuts to 48 N•m (35 lbf•ft).

Remove alignment pin.

Install all other removed parts.

Final Assembly

Make sure coolant and oil drain plugs are reinstalled and tight.

Fill cooling system. Refer to *COOLING SYSTEM* subsection.

Fill engine with the recommended oil and required quantity. Refer to *LUBRICATION SYSTEM* subsection.

Reconnect battery.

⚠ WARNING

Connect RED (+) cable then BLACK (-) cable. Always connect RED (+) cable in first.

Start engine and let it reach its operating temperature.

Stop engine and check coolant and oil levels. Refill as necessary.

Align and adjust tension of drive belt. Refer to *DRIVE BELT AND REAR WHEEL* subsection.

Test drive vehicle to confirm proper operation.

ENGINE MOUNTS

Engine Mounts Removal

Front Rubber Mounts

Refer to *BODY* subsection to remove the following parts:

- Both top side panels

Subsection XX (ENGINE REMOVAL AND INSTALLATION)

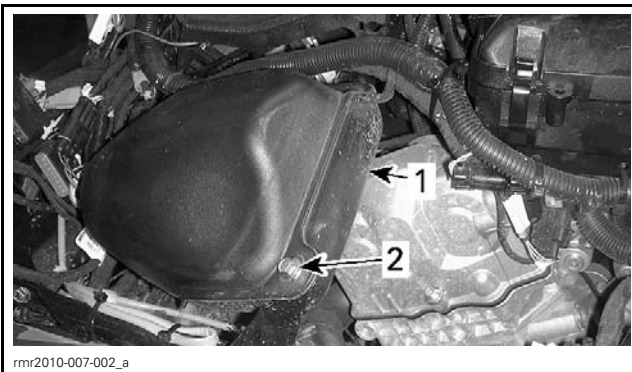
- Both middle side panels
- Both bottom side panels (rear and front)
- Glove box
- Central panel.

Release drive belt tension. Refer to *DRIVE BELT AND REAR WHEEL* subsection.

Move oil tank and oil cooler (for LH side) or radiator (for RH side) aside to make room.

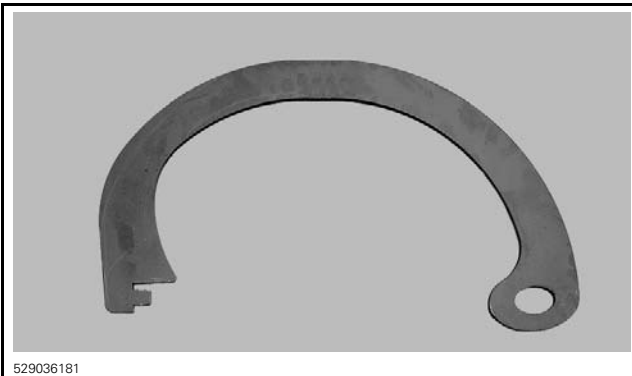
Remove the air filter housing cover.

On left side, remove retaining bolt securing resonator.

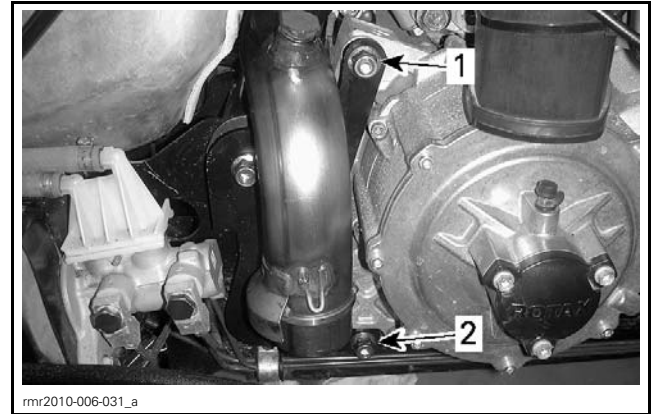


1. Resonator
2. Resonator retaining bolt

Install the ENGINE LIFTING TOOL (P/N 529 036 181).

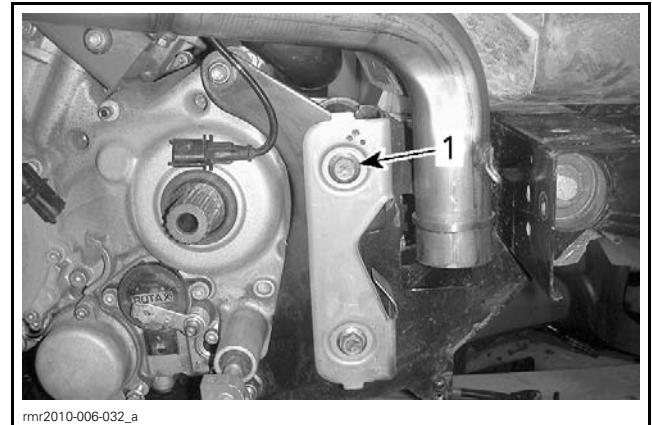


On RH side of the vehicle, remove engine support bolts.



1. Upper engine support bolt
2. Lower engine support bolt

On the LH side of engine, remove the rear upper engine bolt.



1. Rear upper engine bolt

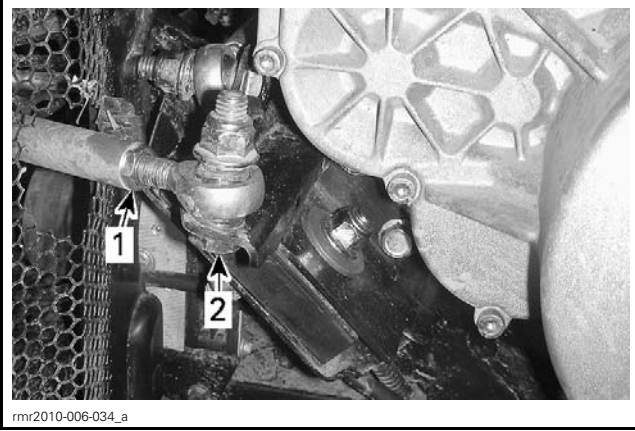
Loosen both jam nuts of longitudinal tie rod.

Remove bolt securing the longitudinal tie-rod to front engine support.



1. Front jam nut

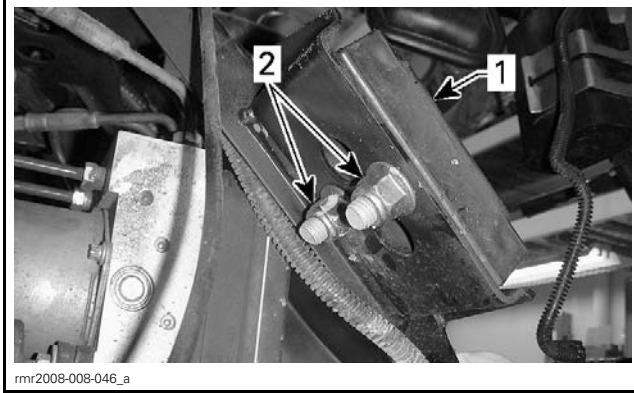
Subsection XX (ENGINE REMOVAL AND INSTALLATION)



TYPICAL

1. Rear jam nut
2. Tie-rod retaining bolt

Remove nuts securing the front engine support.



1. Front rubber mount
2. Remove these nuts

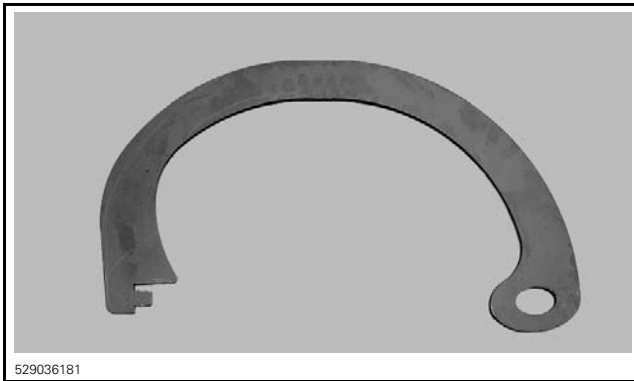
Rear Rubber Mounts

Refer to *BODY* subsection to remove the following parts:

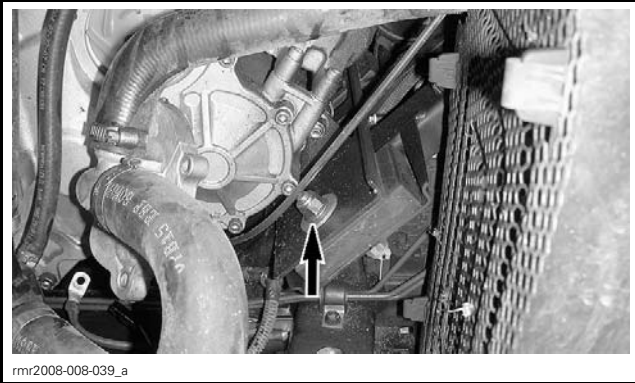
- Both top side panels
- Both middle side panels
- Both bottom side panels
- Glove box
- Central panel.

Release drive belt tension. Refer to *DRIVE BELT AND REAR WHEEL* subsection.

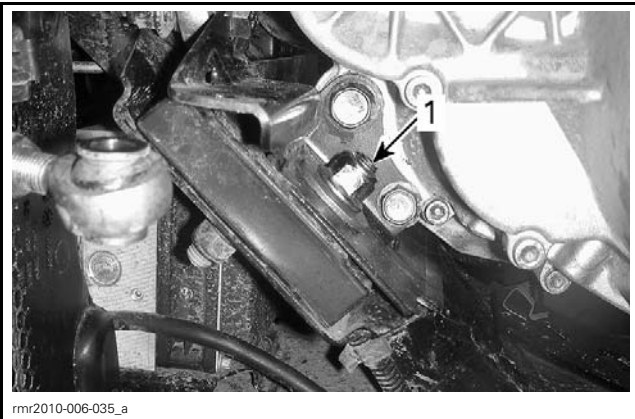
Install the ENGINE LIFTING TOOL (P/N 529 036 181).



1. Remove engine support bolts.



RH SIDE OF VEHICLE



TYPICAL

1. Left front engine support bolt

Lift the engine just enough to free the front of engine.

Unscrew nuts retaining front rubber mount on frame.



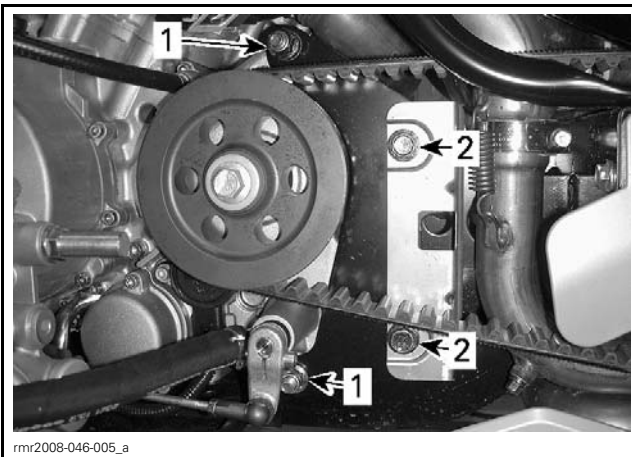
rmr2010-006-031_a

1. Upper engine support bolt
2. Lower engine support bolt



rmr2008-046-007

TYPICAL



rmr2008-046-005_a

TYPICAL - LH REAR ENGINE SUPPORT

1. Engine support nuts
2. Engine support bolts

Using the BLIND HOLE BEARING PULLER SET (P/N 529 036 117), remove rear rubber mounts.



529036117

Engine Mounts Installation

The installation is the reverse of the removal procedure. However, pay attention to the following.

Front Rubber Mounts

Install rubber mount.

Tighten nuts to 48 N•m (35 lbf•ft).

Tighten all engine bolts.

Fingertight longitudinal tie-rod until any play is removed, Hold tie-rod and torque both jam nuts.

Rear Rubber Mounts

Insert rubber mount into tube and align the tab with the recess on tube.

Using a plastic hammer, insert rubber mount into tube.