

ENGINE REMOVAL AND INSTALLATION (1200 4-TEC)

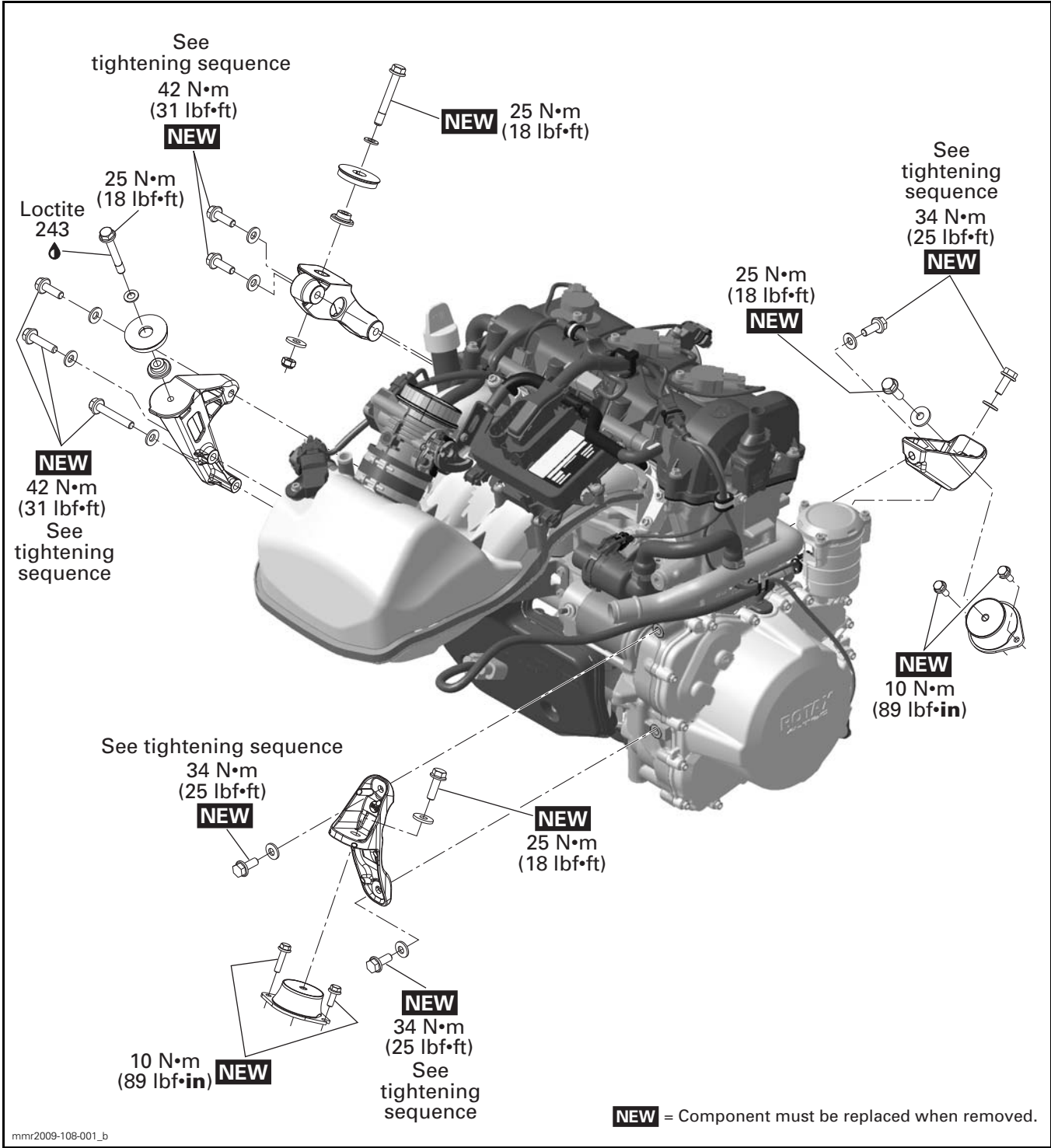
SERVICE TOOLS

Description	Part Number	Page
ENGINE LIFTING TOOL	529 036 151	3, 9, 12

SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 243 (BLUE).....	293 800 060	11

Subsection XX (ENGINE REMOVAL AND INSTALLATION (1200 4-TEC))



GENERAL

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 when removed (e.g.: locking tabs, elastic stop nuts, cotter pin, etc.) must be replaced with new ones.

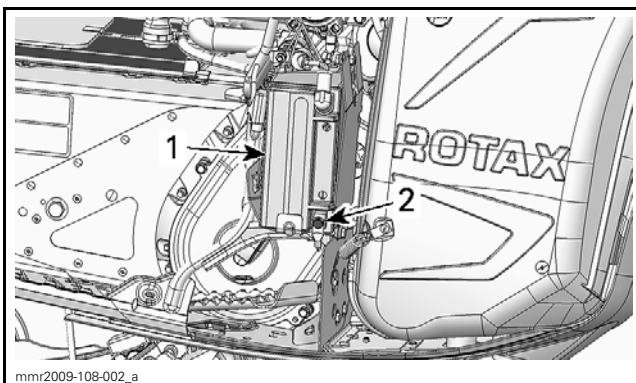
NOTICE Hoses, cables and locking ties removed during a procedure must be reinstalled as per factory standards.

PROCEDURES

ENGINE

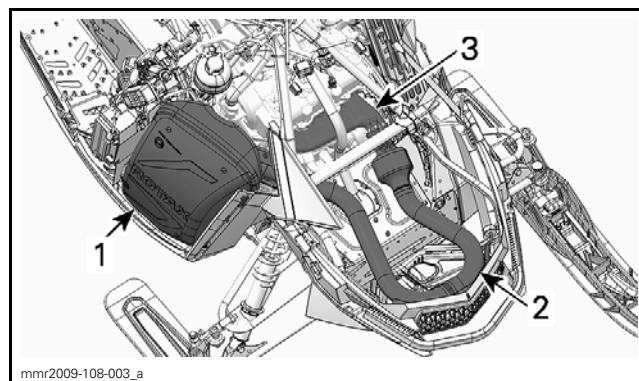
Engine Removal

1. Place vehicle at workstation that will have access to an engine-lifting hoist.
2. Refer to *BODY* subsection and remove:
 - LH and RH side panels
 - Hood
 - Front bottom pan cover
 - Console
 - Gauge support
 - Seat(s).
3. Remove the fuel tank. Refer to *FUEL TANK AND FUEL PUMP* subsection.
4. Remove the negative (–) cable from battery.



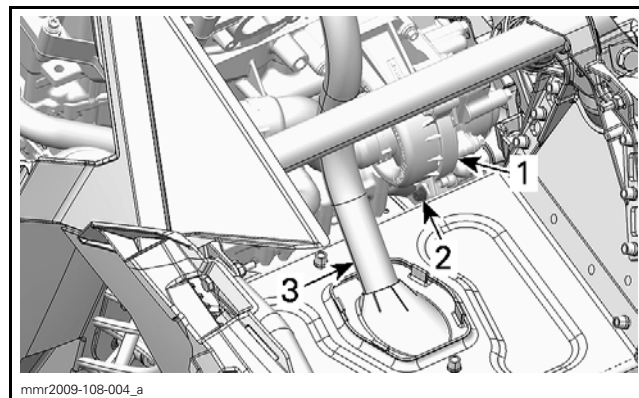
mmr2009-108-002_a
1. Battery
2. Negative cable

5. Refer to *EXHAUST SYSTEM* subsection and remove:
 - Muffler
 - Exhaust pipe
 - Exhaust manifold.



mmr2009-108-003_a
1. Muffler
2. Exhaust pipe
3. Exhaust manifold

6. Remove the cooling drain screw located on water pump to drain the cooling system. Refer to *COOLING SYSTEM* subsection.



mmr2009-108-004_a
1. Water pump
2. Drain screw
3. Steering column

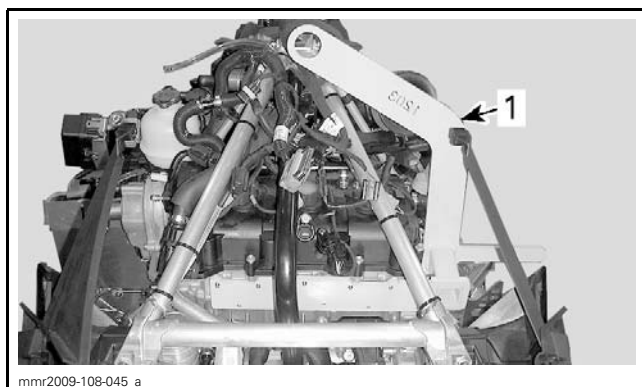
7. Remove the drive pulley. Refer to *DRIVE PULLEY* subsection.
8. Remove the driven pulley. Refer to *DRIVEN PULLEY AND COUNTERSHAFT* subsection.
9. Use the ENGINE LIFTING TOOL (P/N 529 036 151).
 - 9.1 Install the tool instead of exhaust manifold.



529036151

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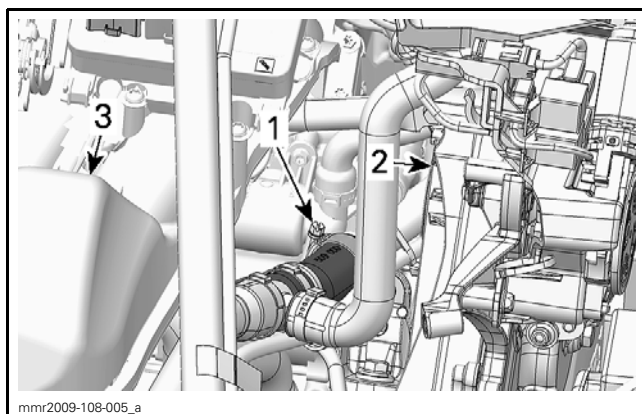
- 9.2 Using exhaust manifold nuts, secure the tool.



1. Engine lifting tool

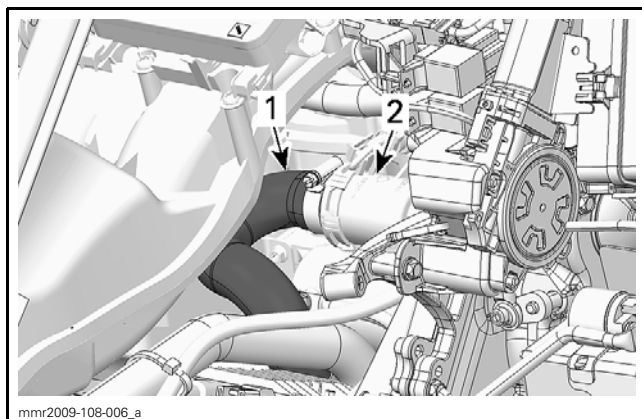
- 9.3 Install a hoist.

10. Behind chaincase, disconnect the engine inlet coolant hose.



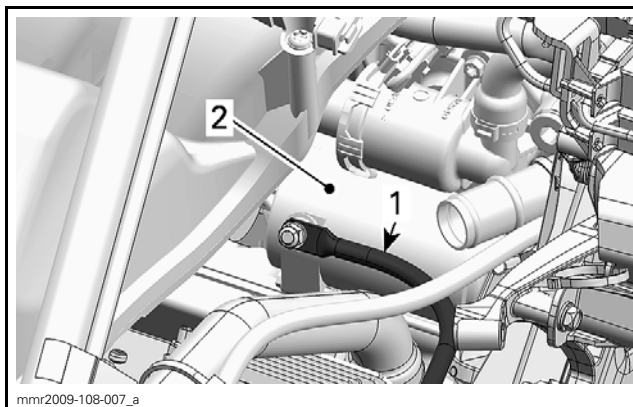
1. Remove this clamp
2. Chaincase
3. Intake manifold

11. Disconnect the engine coolant outlet hose from thermostat.



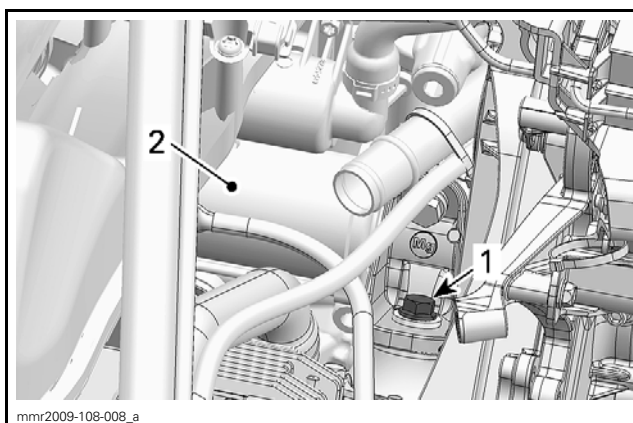
1. Remove this clamp
2. Thermostat

12. Remove starter cable from starter.



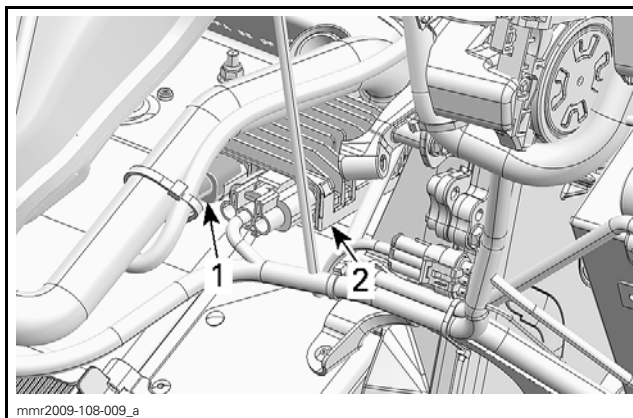
1. Starter cable
2. Starter

13. Remove the RH rear engine rubber mount screw.



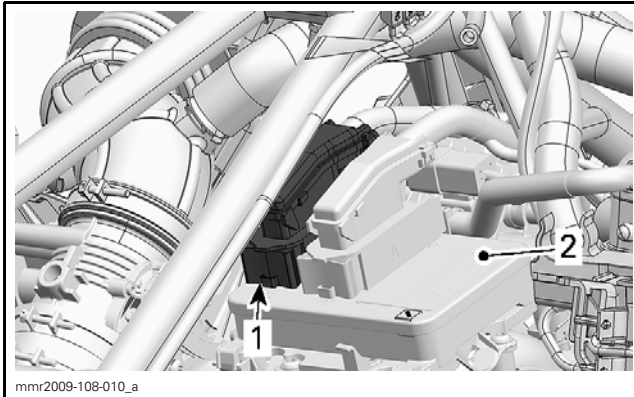
1. Engine rubber mount screw
2. Starter

14. Unplug the magneto connector from the voltage regulator.



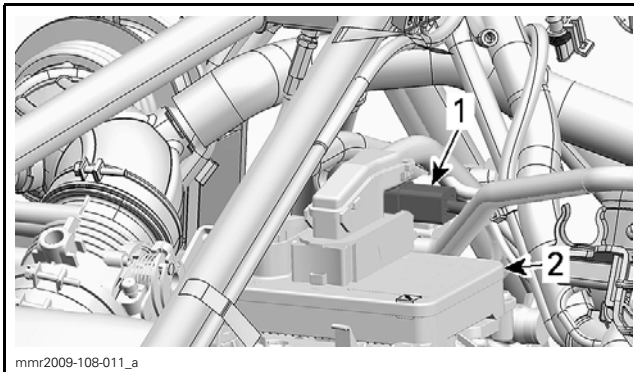
1. Magneto connector
2. Voltage regulator

15. Unplug the connector B from the ECM.



1. B connector
2. ECM

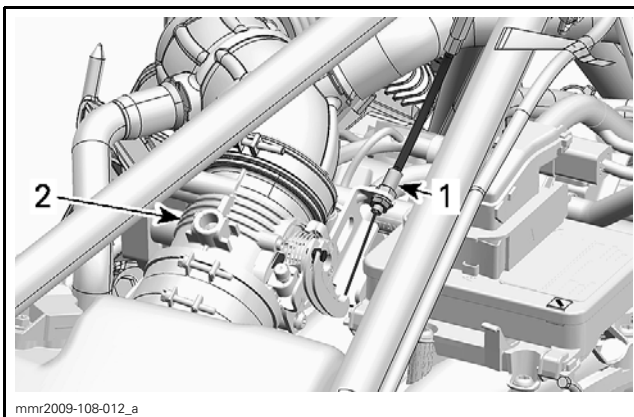
16. Unplug the engine connector.



1. Engine connector
2. ECM

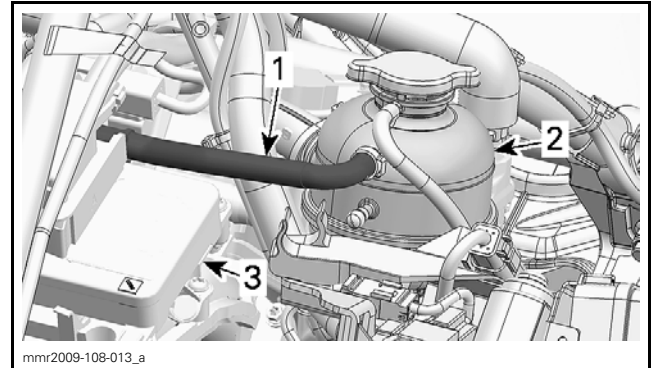
17. Cut locking ties securing the harness of ECM connector B to ECM support.

18. Detach the throttle cable from the throttle body.



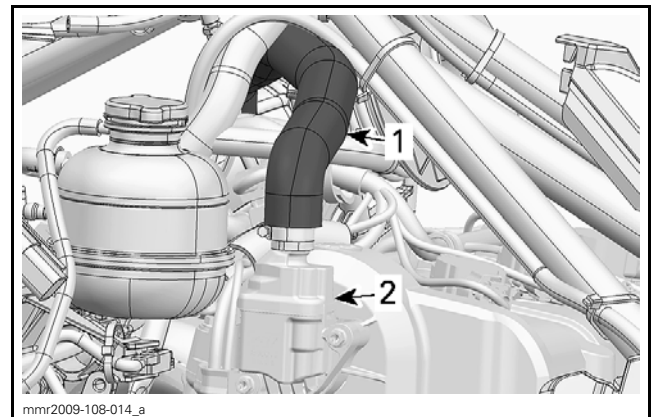
1. Throttle cable
2. Throttle body

19. Disconnect the throttle body heating hose from the coolant reservoir.



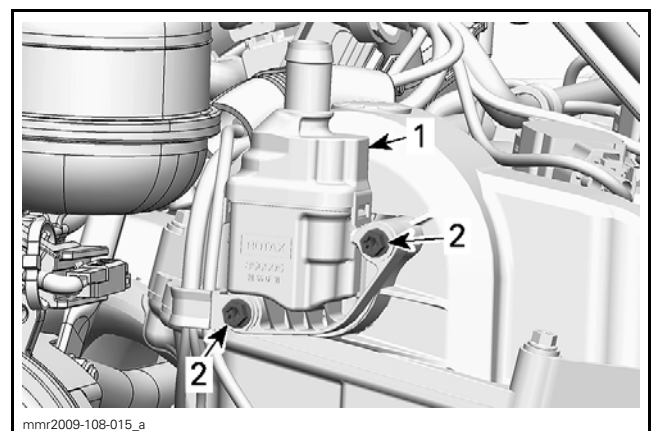
1. Throttle body heating hose
2. Coolant reservoir
3. ECM

20. Disconnect hose from breather.



1. Breather hose
2. Breather

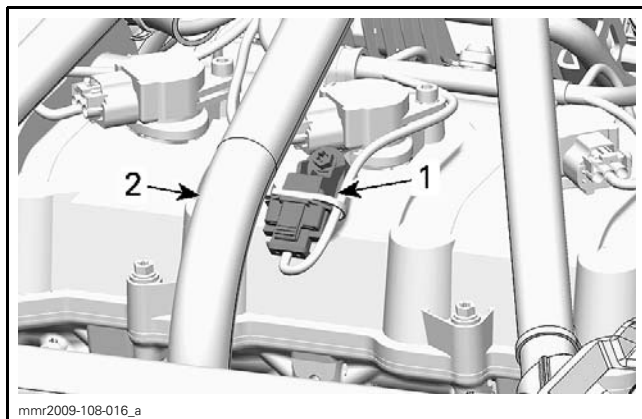
21. Remove breather from engine.



1. Breather
2. Remove these screws

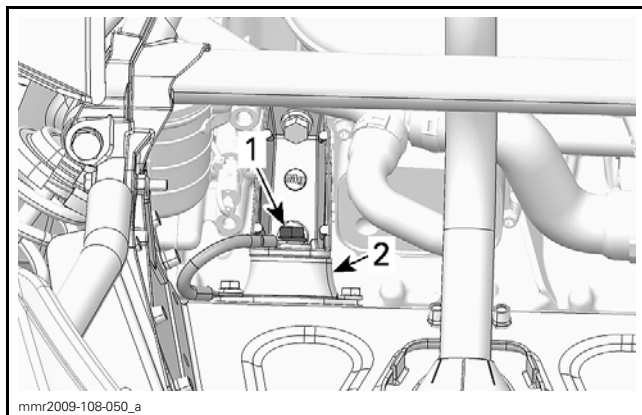
22. Remove screw securing the camshaft position sensor (CAPS) then move the sensor aside.

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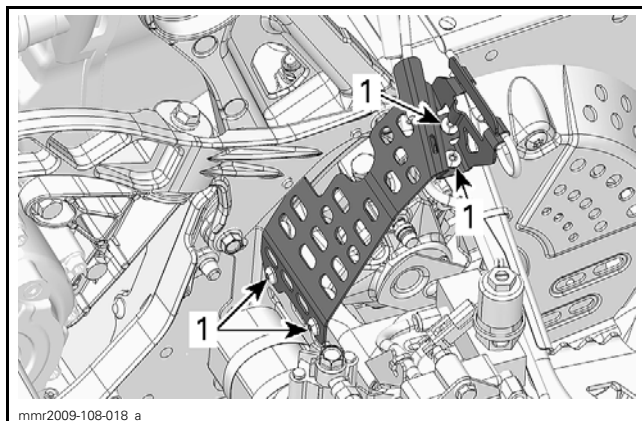
1. CAPS sensor
2. Steering column

23. Remove screw securing the front RH engine support to engine rubber mount.



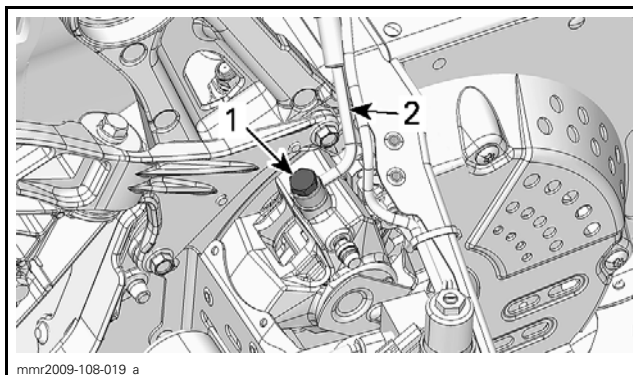
1. Engine support screw
2. Engine rubber mount

24. Remove the caliper protector.



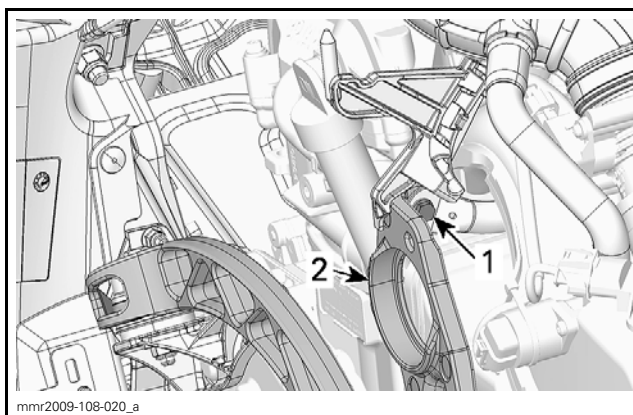
1. Caliper protector screws

25. Remove the Banjo fitting then move the brake hose aside. Discard sealing washers.



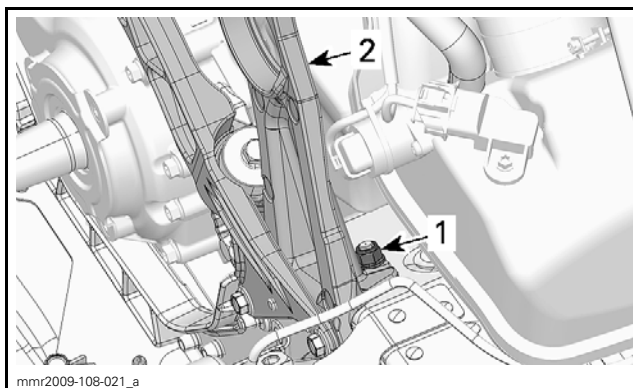
1. Banjo fitting
2. Brake hose

26. Remove the screw securing the top of the countershaft bearing support.



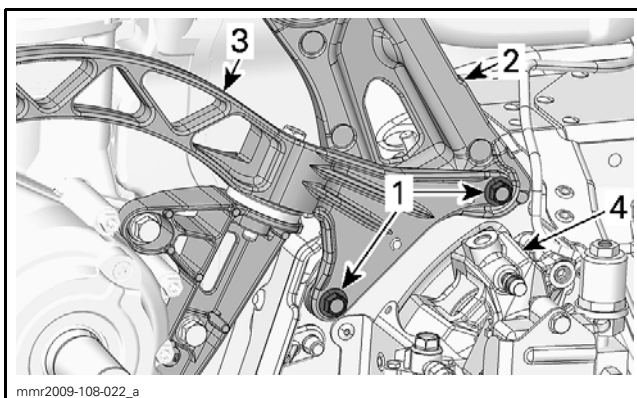
1. Countershaft bearing support upper screw
2. Countershaft bearing support

27. Loosen nut retaining the bottom of countershaft bearing support to frame.



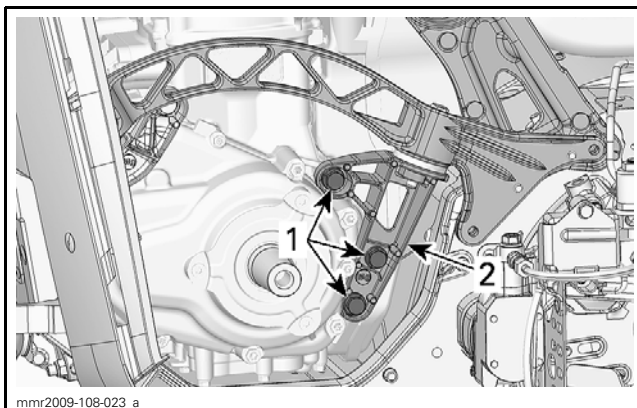
1. Countershaft bearing support lower nut
2. Countershaft bearing support

28. Remove both screws retaining the brace and the countershaft bearing support to frame.



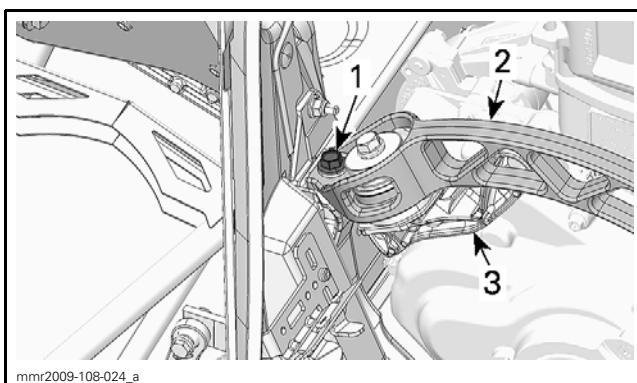
1. Remove these screws
2. Countershaft bearing support
3. Brace

29. Remove screws and washers securing the rear engine support to engine.



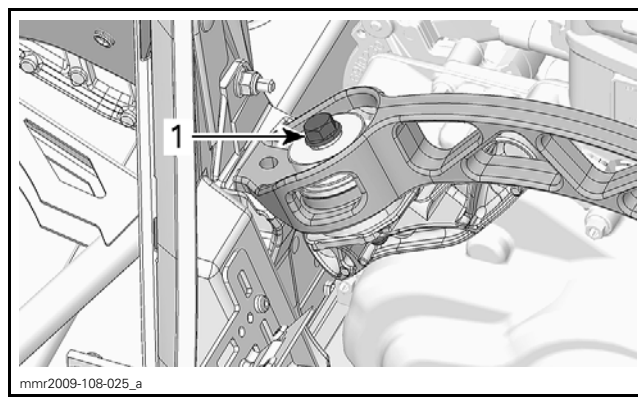
1. Rear engine support screws
2. Rear engine support

30. Remove screw and washer retaining brace to frame (front engine side).



1. Brace screw
2. Brace
3. Front engine support

31. Unscrew the engine front rubber mount.



1. Engine rubber mount bolt

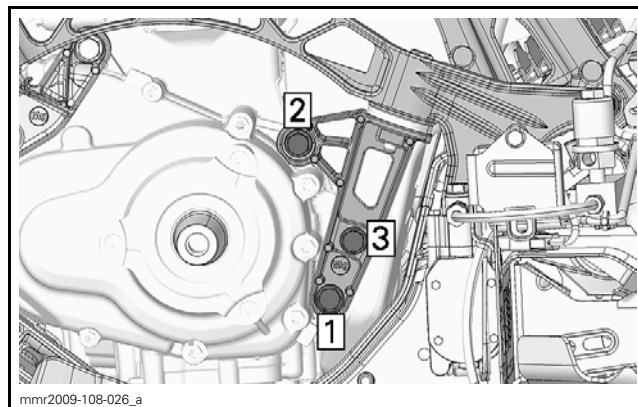
32. Remove the brace with countershaft bearing support and rear engine support.

33. Lift engine and slide it out of vehicle.

Engine Installation

To install the engine, reverse the removal procedure. However, pay attention to the following.

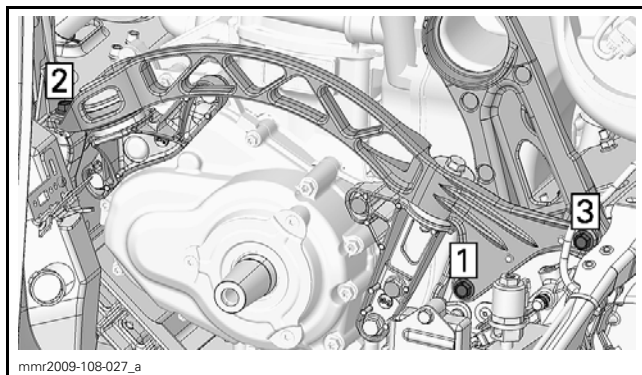
1. Install **NEW** self-locking screws where required, refer to exploded view at the beginning of this subsection.
2. Install all retaining fasteners (bolt, screw and nut) before beginning the tightening sequence.
3. Tighten fasteners in this order:
 - 3.1 LH rear engine support screws.



TIGHTENING SEQUENCE

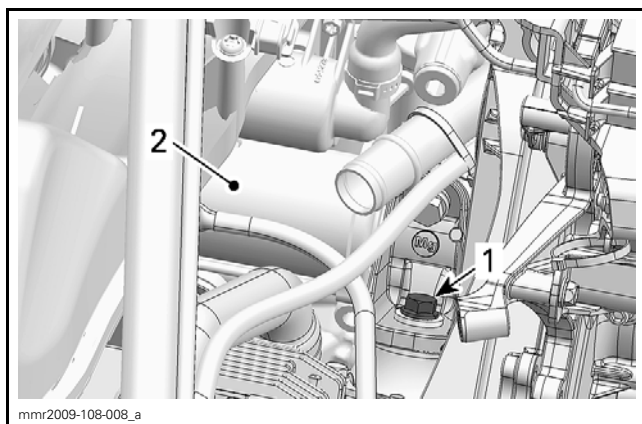
- 3.2 Brace retaining screws.

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TIGHTENING SEQUENCE

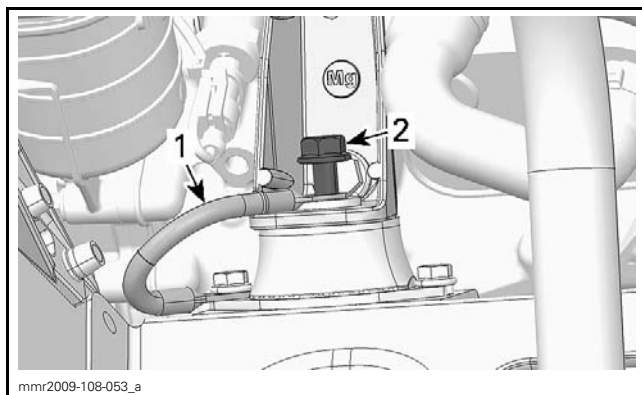
3.3 RH rear engine rubber mount screw.



1. Engine rubber mount screw
2. Starter

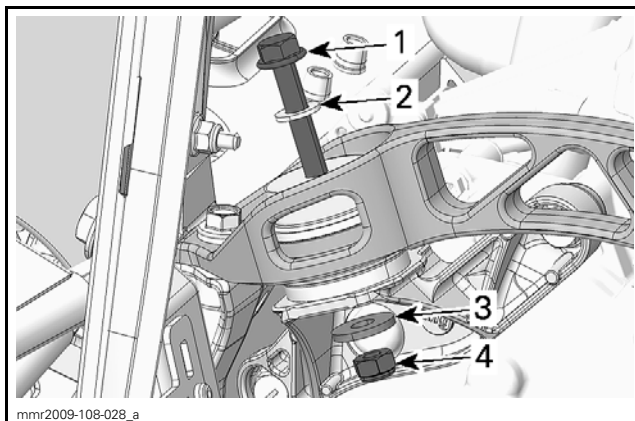
3.4 RH front engine support screw.

NOTE: Do not forget the ground cable.



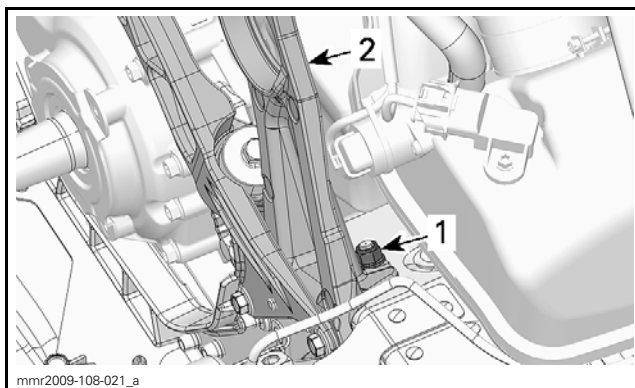
1. Ground cable
2. Engine support screw

3.5 LH front engine rubber mount bolt. Note position of parts.



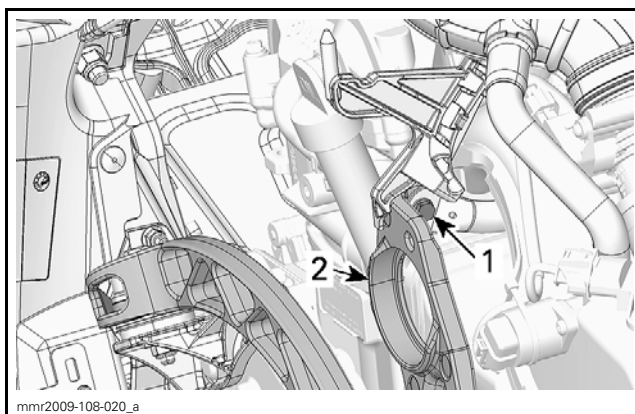
1. Bolt
2. Small flat washer
3. Large flat washer with Teflon
4. Nut

4. Tighten lower nut retaining the countershaft bearing support to frame.



1. Lower nut
2. Countershaft bearing support

5. Install the upper screw securing the countershaft bearing support.



1. Top screw
2. Countershaft bearing support

6. Install all other removed parts.

ENGINE SUPPORTS

Engine Support Inspection

Check if engine supports are cracked, bent or damaged. Replace if necessary.

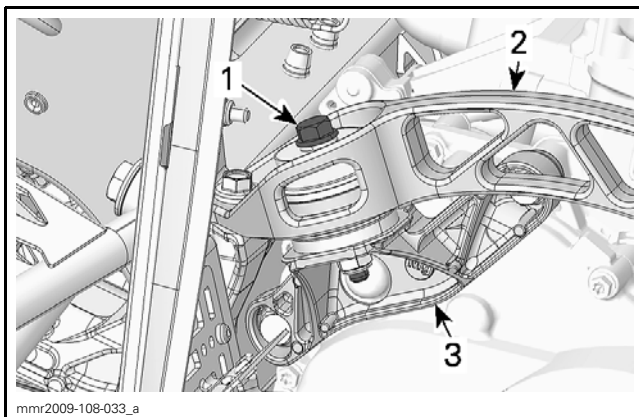
Engine Support Removal

NOTE: Remove the exhaust manifold and install the ENGINE LIFTING TOOL (P/N 529 036 151) before beginning the engine support removal procedure.



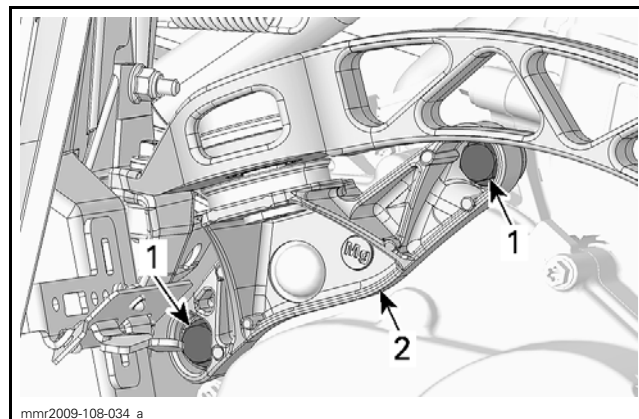
PTO Side Front Engine Support

1. Remove drive and driven pulleys. Refer to *DRIVE SYSTEM AND BRAKE* section.
2. Remove and discard bolt securing the engine rubber mount to front engine support.



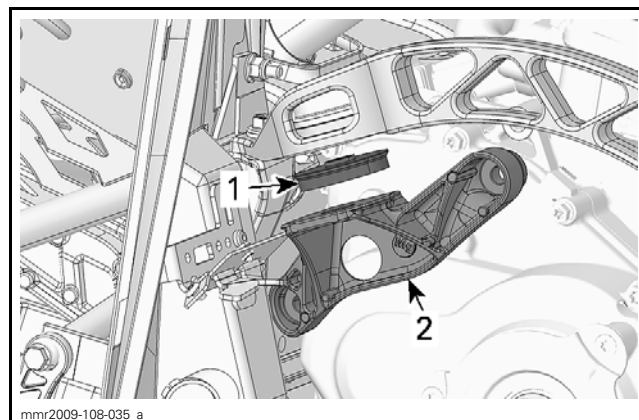
1. Engine rubber mount bolt
2. Brace
3. Engine support

3. Remove screws and washers securing the front engine support to engine. To reach the front screw, use the following tools:
 - A 1/4 inch drive ratchet
 - A long extension adaptor
 - An universal joint
 - A short 13 mm socket.



1. Front engine support screws
2. Engine support

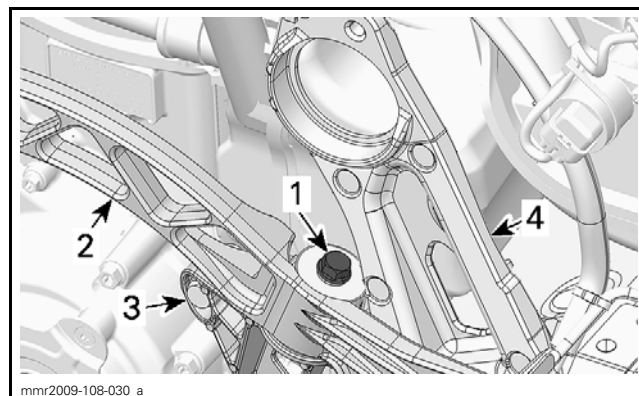
4. Discard engine support screws.
5. Remove the engine stopper and the engine support.



1. Engine stopper
2. Front engine support

PTO Side Rear Engine Support

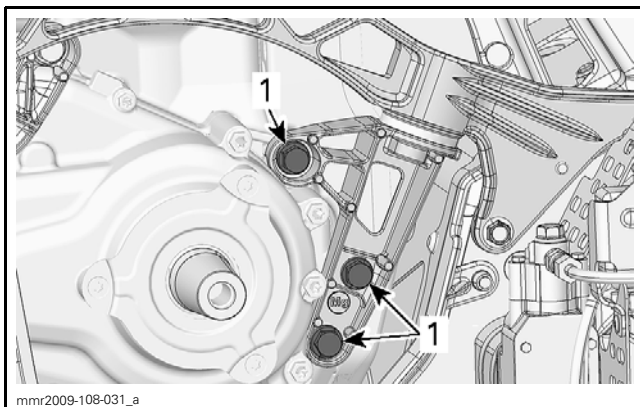
1. Remove drive and driven pulleys. Refer to *DRIVE SYSTEM AND BRAKE* section.
2. Loosen bolt securing the rear engine rubber mount to rear engine support.



1. Engine rubber mount bolt
2. Brace
3. Engine support
4. Countershaft bearing support

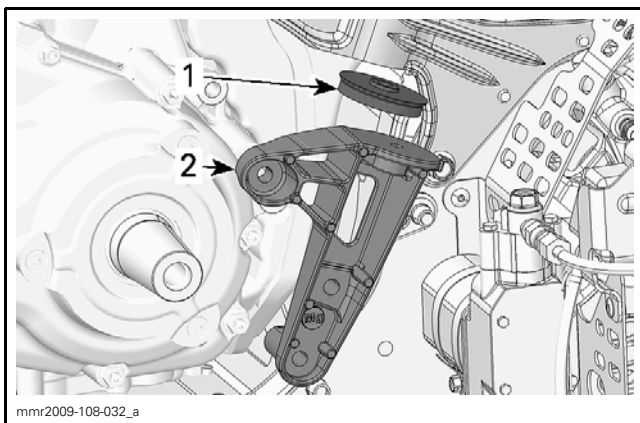
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3. Remove screws and washers securing the rear engine support to engine. Discard engine support screws.



1. Rear engine support screws

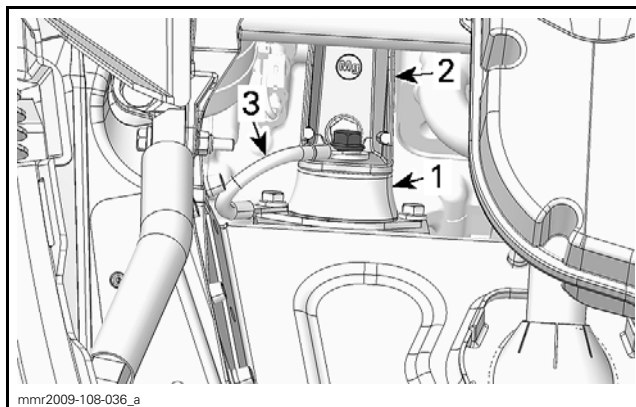
4. Remove the engine stopper and the engine support.



1. Engine stopper
2. Rear engine support

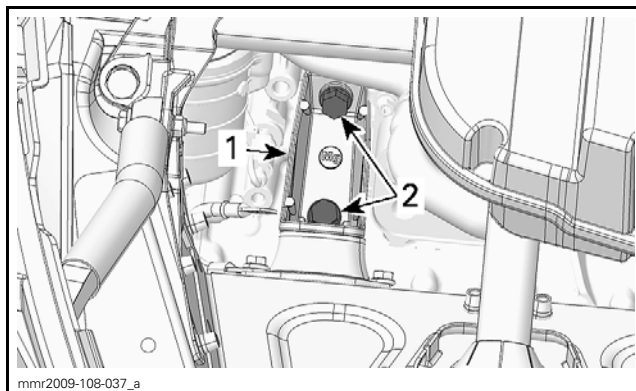
MAG Side Front Engine Support

1. Remove exhaust pipe to make room. Refer to *EXHAUST SYSTEM* subsection.
2. Remove and discard screw securing the ground cable and the front engine support to engine rubber mount.



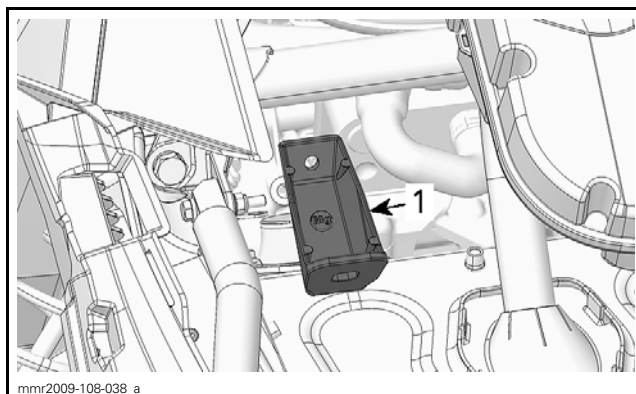
1. Rubber mount
2. Engine support
3. Ground cable

3. Remove and discard both screws retaining the engine support to engine.



1. Engine support
2. Engine support screws

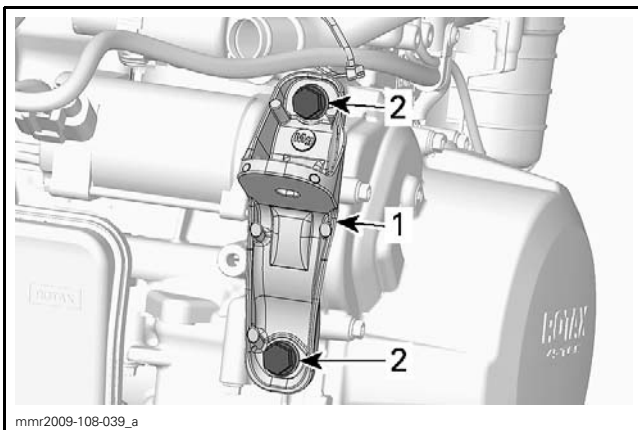
4. Remove engine support.



1. Engine support

MAG Side Rear Engine Support

1. Remove engine from vehicle. Refer to *ENGINE REMOVAL* in this subsection.
2. Remove and discard both engine support screws.

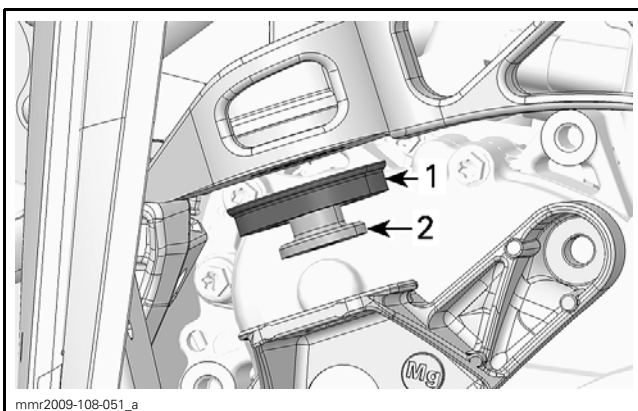


1. Engine support
2. Engine support screws

Engine Support Installation

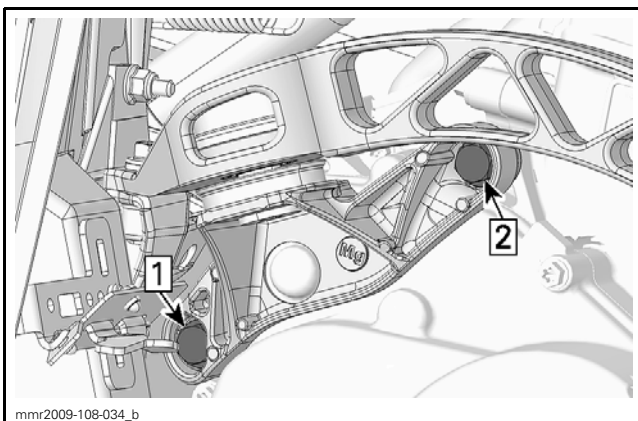
PTO Side Front Engine Support

1. Install the engine stopper and bushing.



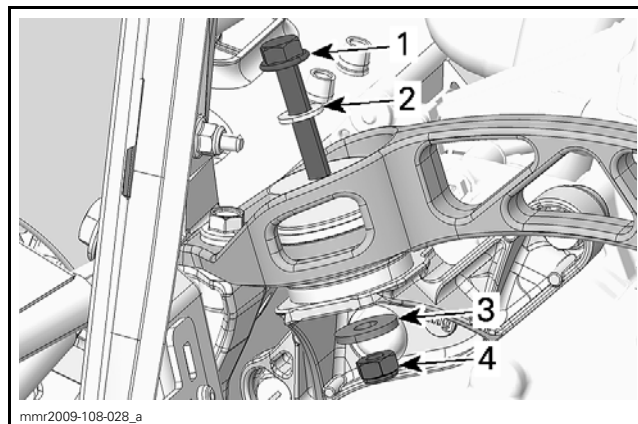
1. Engine stopper
2. Engine stopper bushing

2. Install loosely 2 **NEW** engine support screws and a **NEW** engine rubber mount bolt.
3. Tighten the lower engine support screw then the upper one.



TIGHTENING SEQUENCE

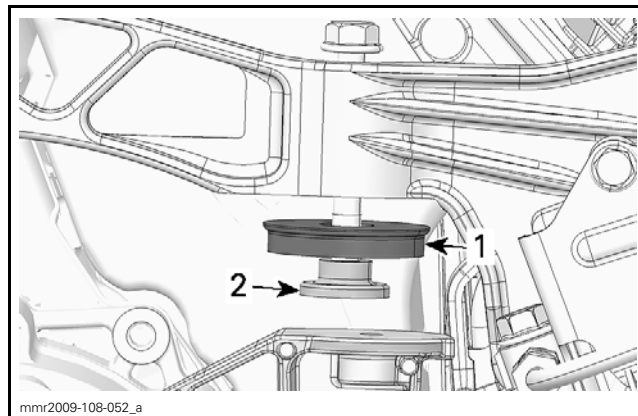
4. Make sure bolt and washer are installed in proper order then tighten the engine rubber mount bolt.



1. Bolt
2. Small flat washer
3. Large flat washer
4. Nut

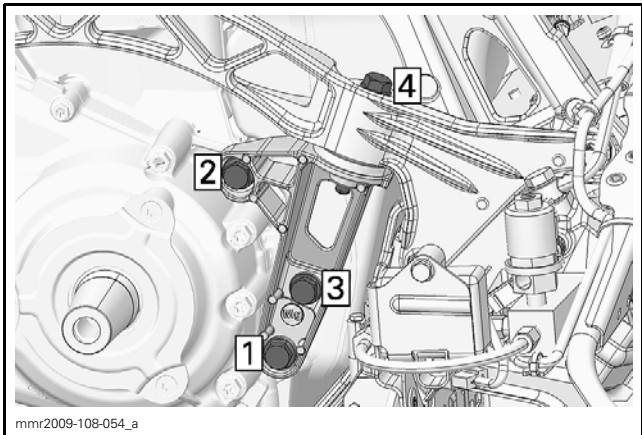
PTO Side Rear Engine Support

1. Apply LOCTITE 243 (BLUE) (P/N 293 800 060) on threads of engine rubber mount bolt.
2. Install the engine stopper and bushing.



1. Engine stopper
2. Engine stopper bushing

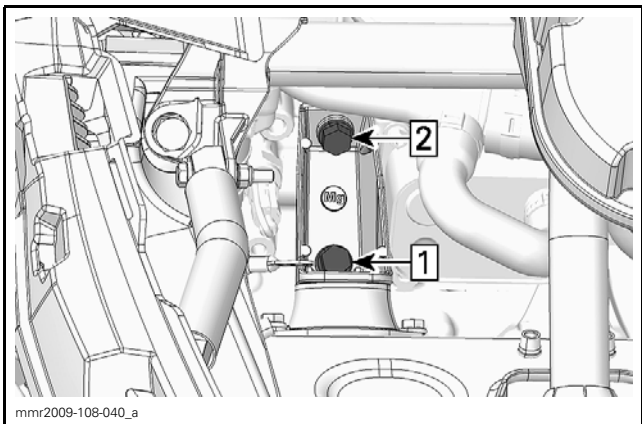
3. Install loosely the engine rubber mount bolt.
4. Install 3 **NEW** engine support screws.
5. Tighten fasteners in this order.



TIGHTENING SEQUENCE

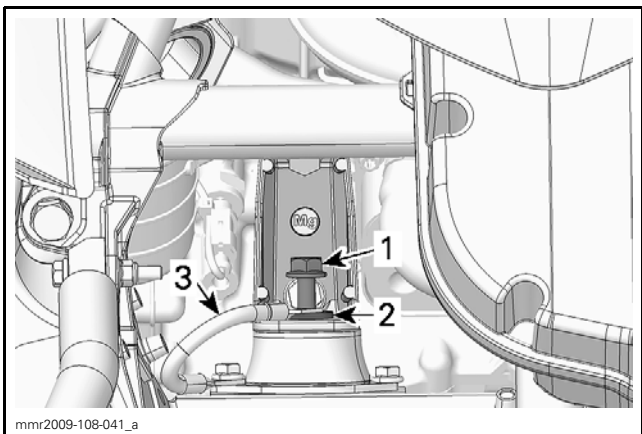
MAG Side Front Engine Support

- 1. Install 2 NEW engine support screws.
- 2. Tighten them by beginning with the lower one.



TIGHTENING SEQUENCE

- 3. Install a NEW engine rubber mount screw. Do not forget the ground cable.

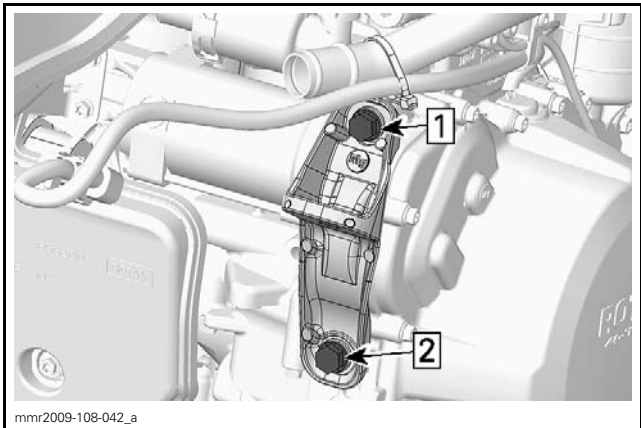


- 1. Engine rubber mount screw
- 2. Washer
- 3. Ground cable

MAG Side Rear Engine Support

- 1. Install 2 NEW engine support screws.

- 2. Tighten them using this sequence.



TIGHTENING SEQUENCE

- 3. Install the engine into vehicle. Refer to *ENGINE INSTALLATION* in this subsection.

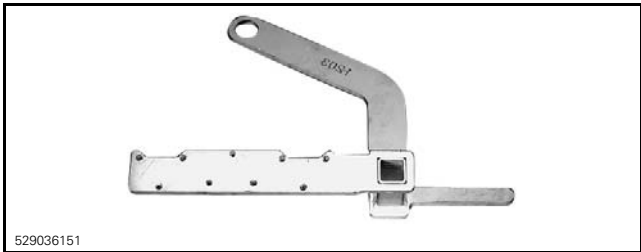
ENGINE RUBBER MOUNT

Engine Rubber Mount Inspection

Check rubber mounts. Replace them if brittle, cracked or damaged.

Engine Rubber Mount Removal

NOTE: Remove the exhaust manifold and install the ENGINE LIFTING TOOL (P/N 529 036 151) before beginning the engine rubber mount removal procedure.

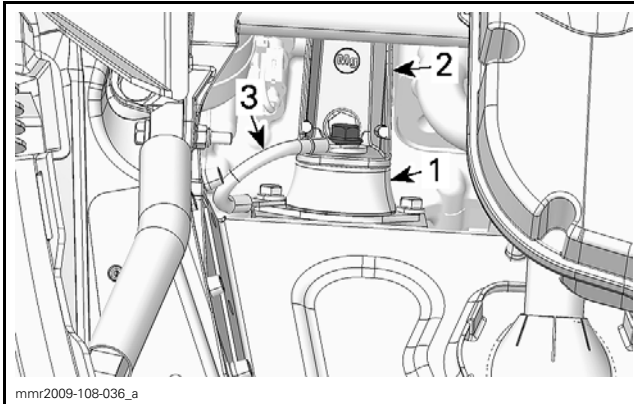


PTO Side Engine Rubber Mounts

The engine rubber mounts located on the brace are not available separately. Replace the brace when an engine rubber mount must be replaced. Refer to *PTO SIDE BRACE* in *FRAME* subsection.

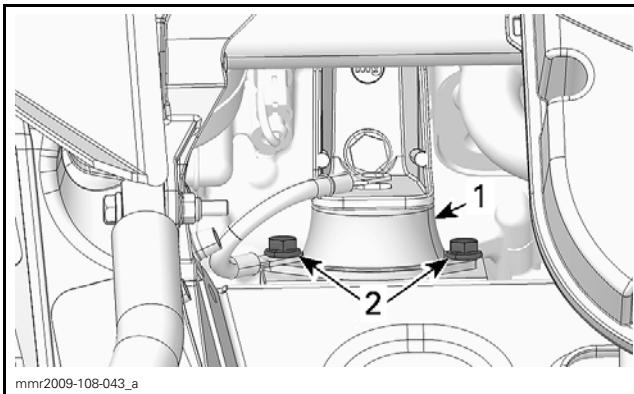
MAG Side Front Engine Rubber Mount

- 1. Remove the exhaust pipe. Refer to *EXHAUST SYSTEM* subsection.
- 2. Remove and discard screw securing the ground cable and the front engine support to engine rubber mount.



1. Rubber mount
2. Engine support
3. Ground cable

3. Remove screws securing the engine rubber mount to frame.

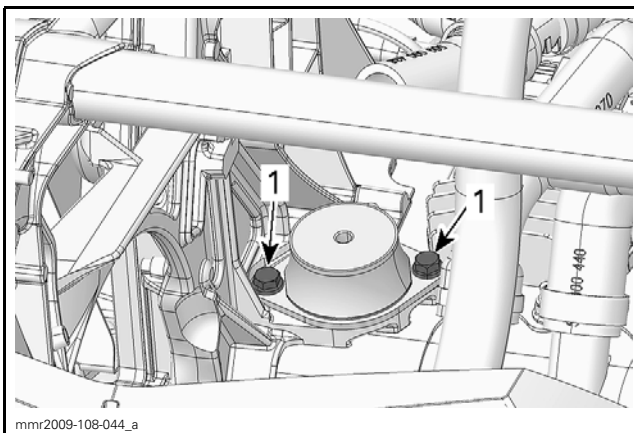


1. Engine rubber mount
2. Retaining screws

4. Remove the engine rubber mount.

MAG Side Rear Engine Rubber Mount

1. Remove engine from vehicle. Refer to *ENGINE REMOVAL* in this subsection.
2. Remove and discard both engine rubber mount screws.



1. Engine rubber mount screws

Engine Rubber Mount Installation

The installation is the reverse of the removal procedure.