

INTRODUCTION

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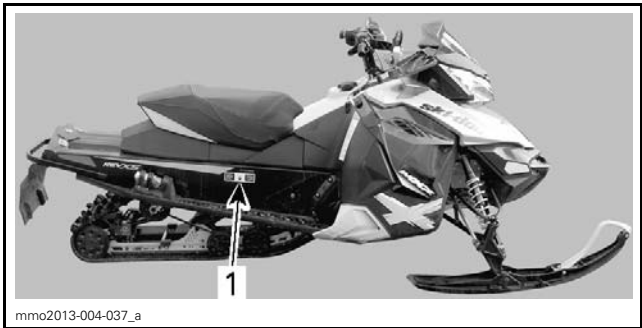
The information and component/system descriptions contained in this manual are correct at time of writing. BRP however, maintains a policy of continuous improvement of its products without imposing upon itself any obligation to install them on products previously manufactured.

Due to late changes, there may be some differences between the manufactured product and the description and/or specifications in this document.

BRP reserves the right at any time to discontinue or change specifications, designs, features, models or equipment without incurring obligation.

VEHICLE INFORMATION

VEHICLE IDENTIFICATION NUMBER (VIN)



TYPICAL  
1. Vehicle identification number

Identification Number Description

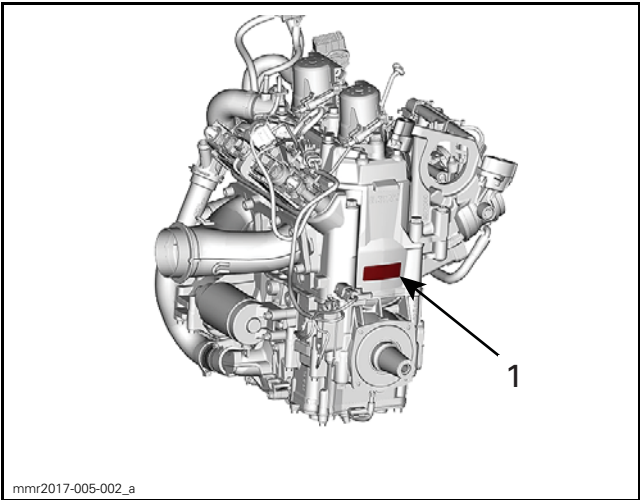
2BPS	LSAB	9	A	1	000001
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Model number

Model year: A = 2010  
B = 2011  
C = 2012  
etc.

Serial number

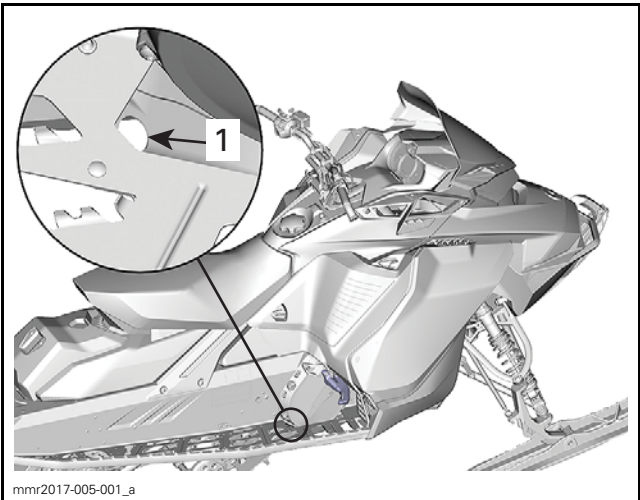
ENGINE IDENTIFICATION NUMBER (EIN)



850 E-TEC  
1. Engine serial number

SNOWMOBILE LIFTING

To lift the snowmobile securely, it is important to place the hooks of the lifting tool into the reinforcement holes of the footrests.



1. Reinforced holes in footrest

**NOTICE** Do not use footrest opening or steering column to lift the snowmobile. Frame or steering system could be seriously damaged.

### GENERAL

This subsection provides general maintenance instructions. Where detailed instructions for disassembly or reassembly is required, refer to the applicable subsection.

### PROCEDURES

#### ENGINE

##### Cleaning and Lubricating the Rewind Starter

Refer to *REWIND STARTER ASSEMBLY* in *REWIND STARTER* subsection.

**NOTICE** It is of the utmost importance that the rewind starter spring be lubricated periodically using MOLYKOTE PG 54 (P/N 420 899 763). The use of standard multipurpose grease could result in rewind starter malfunction under very cold temperatures and component life will be shortened.

##### Cleaning the 3D RAVE Valve

**NOTICE** It is very important to perform *3D RAVE VALVE SYNCHRONIZATION* whenever link bar is removed. Refer to *RAVE* subsection.

Clean carbon deposits as required.

Thoroughly clean all *RAVE VALVES* components and cylinder slots.

Use a clean rag when cleaning the valve.

**NOTE:** Do not use any solvents or cleaners for cleaning the cylinder slots. Fluids can cause corrosion of the cylinder bore which may result in severe engine damage.

##### Inspecting the Rubber Mount

Check rubber mounts for cracks or other damages.

##### Adjusting the Engine Stopper

Refer to *REMOVING AND INSTALLING THE ENGINE* subsection.

#### EXHAUST SYSTEM

##### Inspecting the Exhaust System

Check the following components for leaks, cracks, or other damages:

- Springs and retainers
- Exhaust system mounts
- Muffler

- Tuned pipe
- Donut gaskets
- Shields
- Manifold.

#### LUBRICATION SYSTEM

##### Inspecting and Cleaning the Oil Injection Pump Strainer

Refer to *OIL INJECTION PUMP* in *LUBRICATION SYSTEM* subsection.

##### Lubricating the Engine

##### Engine Storage Mode (Summerization Function)

Refer to applicable *GAUGE* subsection as procedure varies depending on the gauge.

#### COOLING SYSTEM

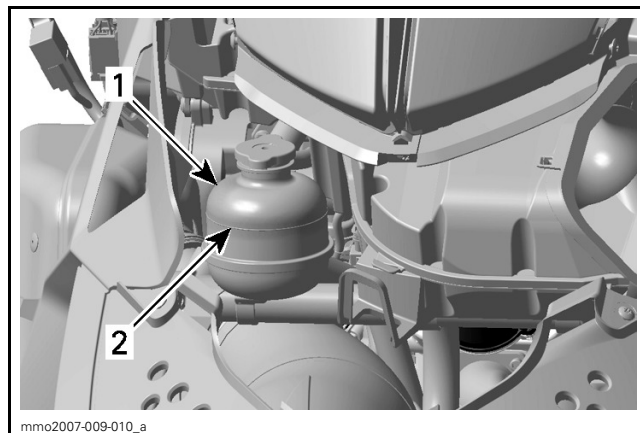
##### **WARNING**

Never open coolant tank cap when engine is hot.

##### Verifying the Engine Coolant Level

Check coolant level at room temperature with the cap removed. Liquid should be at cold level line (engine cold) of coolant tank.

**NOTE:** When checking level at low temperature it may be slightly lower than the mark.



TYPICAL

1. Coolant tank
2. COLD LEVEL line

##### Verifying the Engine Coolant Strength

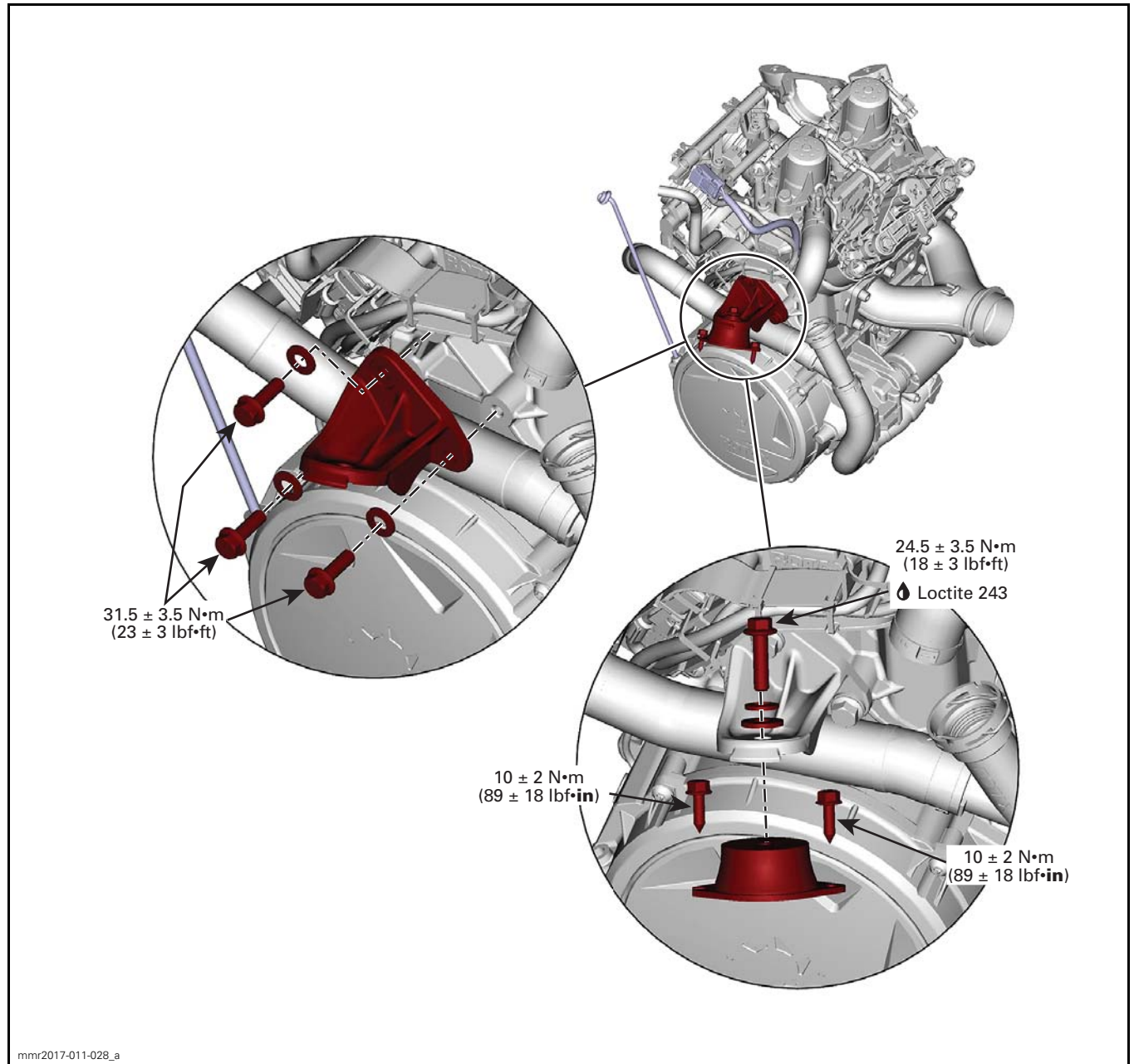
Remove pressure cap.

Use an antifreeze tester to test coolant strength.

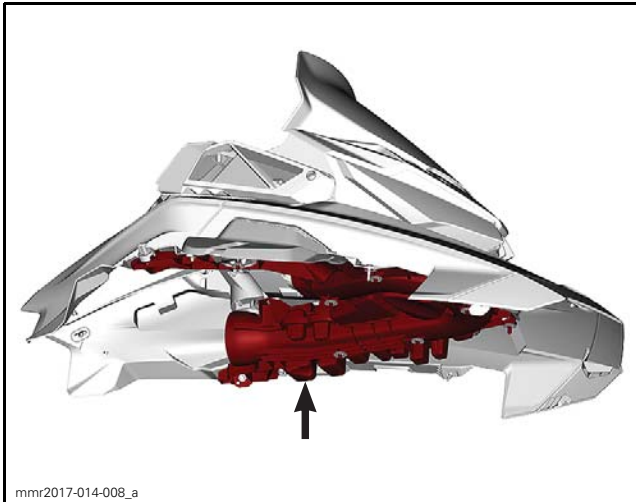
# ENGINE REMOVAL AND INSTALLATION

## SERVICE TOOLS

Description	Part Number	Page
ENGINE LIFTING HOOK.....	529 035 829 .....	9
ENGINE LIFTING TOOL .....	529 036 402 .....	9
UPPER GEAR RETAINING TOOL.....	529 036 110 .....	7



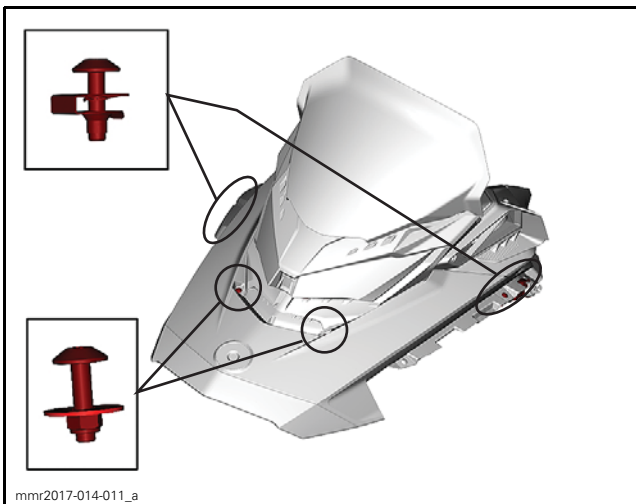
## SECONDARY AIR INTAKE SILENCER



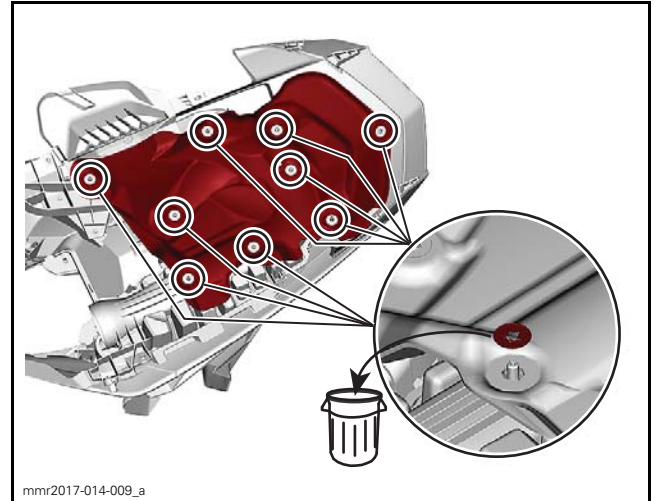
### Removing the Secondary Air Intake Silencer

Referring to the *BODY* subsection, remove the upper body module.

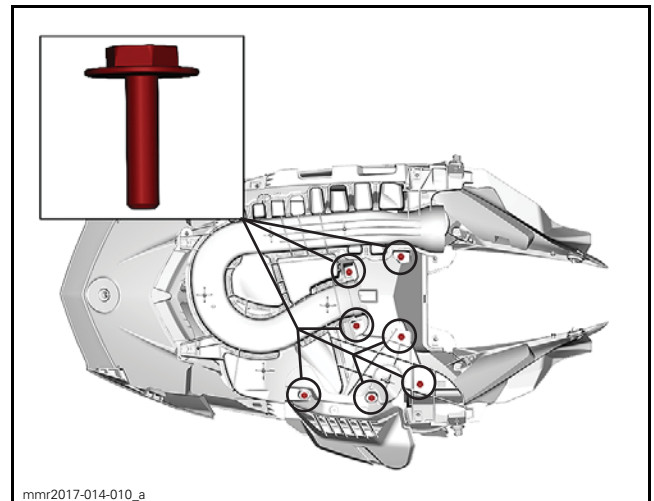
Remove the following screws.



Turn the upper body module upside down and remove the soundproofing panel.



Remove fasteners retaining secondary air intake silencer to upper body module.



### Installing the Secondary Air Intake Silencer

The installation is the reverse of the removal procedure.

Tighten Taptite screw to specification.

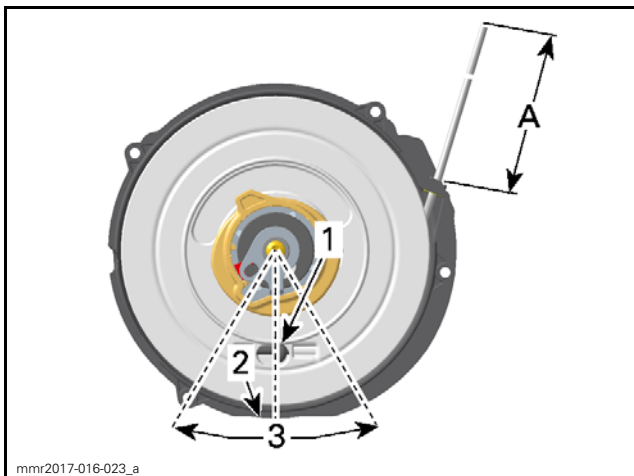
TIGHTENING TORQUE	
Taptite screw	8 N•m ± 0.5 N•m (71 lbf•in ± 4 lbf•in)

After completion, check if the pawl lock engages and the rope is pulled back completely after releasing the rope.

## Installing the Rewind Starter

1. Loosen the temporary knot.
2. Check correct rope length:
  - 2.1 Pull out rope until recess for knot in the rope sheave is within the specified range.
  - 2.2 Measure rope length.

MINIMUM ROPE LENGTH
275 mm (10.8 in)



1. Knot
2. Bottom side of rewind starter
3. Range of ± 30°

If rope is too short replace rope, refer to *REWIND STARTER ROPE REPLACEMENT* in this subsection.

3. Lock rope near rewind starter housing.

REQUIRED TOOL	
SMALL HOSE PINCHER (P/N 295 000 076)	



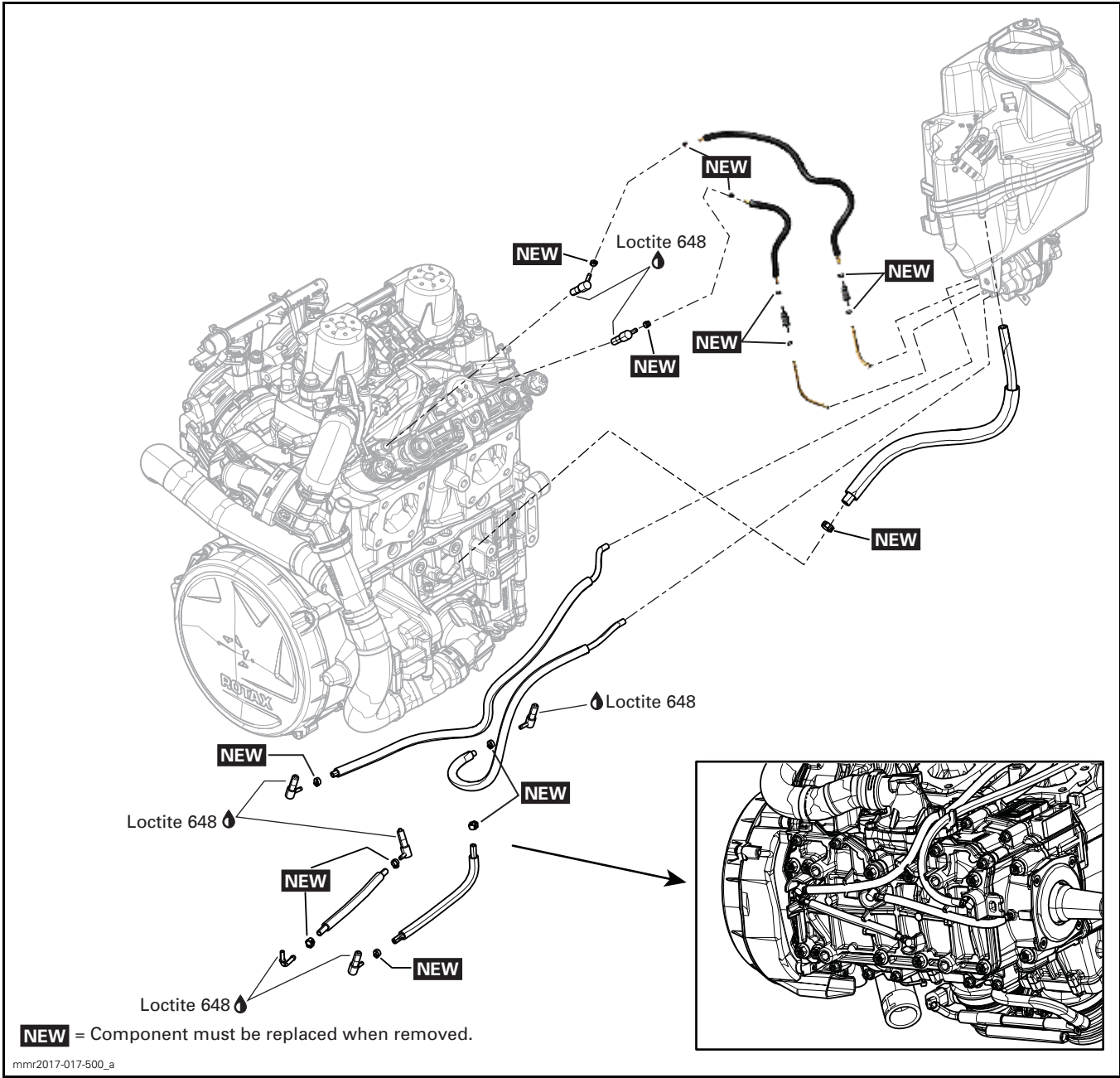
4. Reinstall rewind starter assembly on engine.

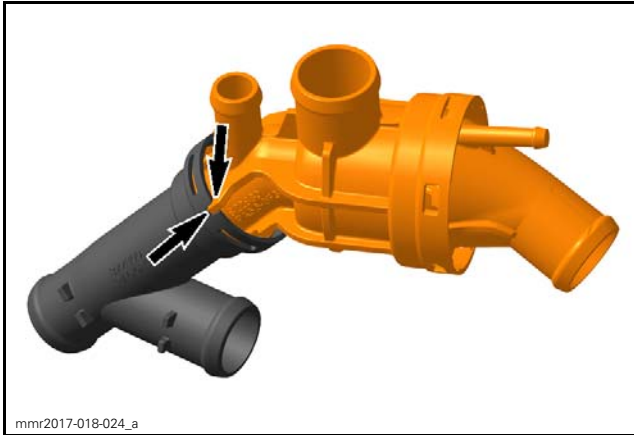
TIGHTENING TORQUE	
Rewind starter retaining screws	9 N•m ± 0.6 N•m (80 lbf•in ± 5 lbf•in)

5. Thread starter rope through console.
6. Install handle, refer to *INSTALLING THE STARTER HANDLE* in this subsection.

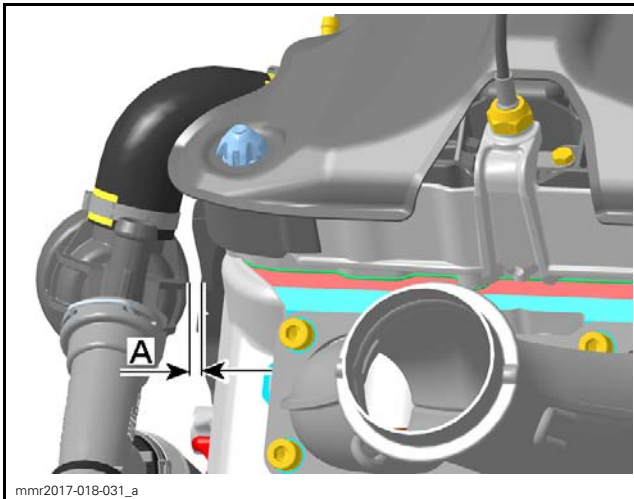


CHECK VALVES AND OIL HOSES





After installation ensure proper distance of thermostat housing to the cylinder block and exhaust manifold.



A. 5 mm ± 2 mm (.2 in ± .08 in)

Properly refill cooling system. Refer to *COOLING SYSTEM REFILL AND BLEEDING* in *PERIODIC MAINTENANCE PROCEDURES* subsection.

## COOLANT TANK CAP

Using a pressure cap tester, check the relief pressure of coolant tank cap.

If the test failed, install a new 110 kPa (16 PSI) cap.

**NOTICE** Do not install a tank cap exceeding the recommended pressure.

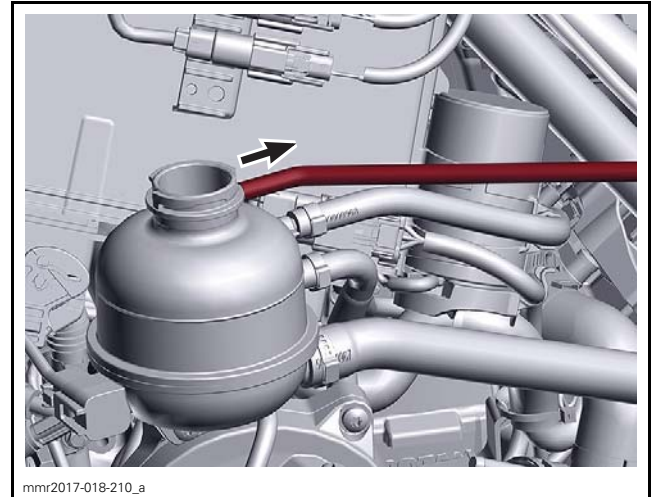
## COOLANT TEMPERATURE SENSOR (CTS)

To test and replace the CTS, refer to *E-TEC DIRECT FUEL INJECTION* subsection.

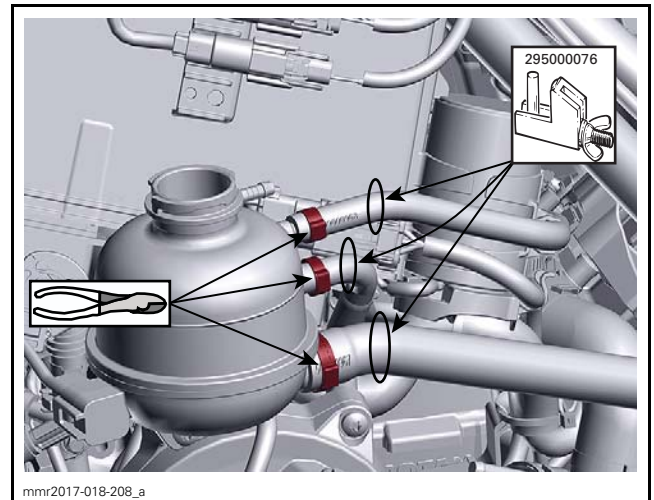
## COOLANT TANK

### Removing the Coolant Tank

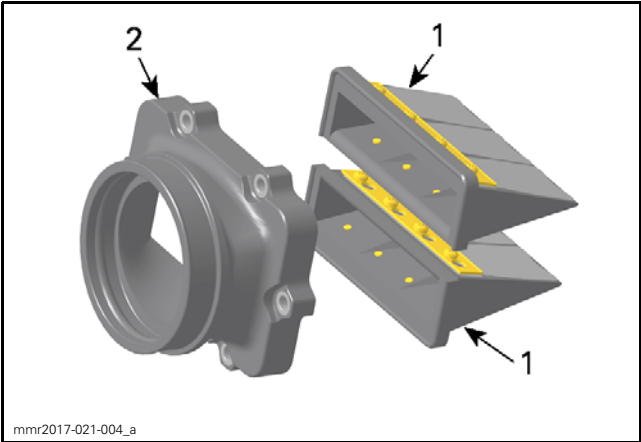
1. Remove the RH side panel.
2. Siphon the coolant tank.
3. Unplug the upper vent hose.



4. Block the three lower coolant hoses with pinchers.
5. Cut Oetiker clamps and remove coolant hoses from coolant tank.



6. Disconnect the oil level sensor connector.



1. Reed valves  
2. Intake adapter

Inspecting the Reed Valve

Check reed valve for proper tightness.  
Check blades for breakouts at their end tips. In case of breakouts replace it.  
There must not be any play between blade and valve body when exerting a finger pressure on blade at blade stopper location.  
In case of a play, turn blade upside down and recheck.

TIGHTENING TORQUE	
Reed valve blade screws	1.5 N•m ± 0.3 N•m (13 lbf•in ± 3 lbf•in)

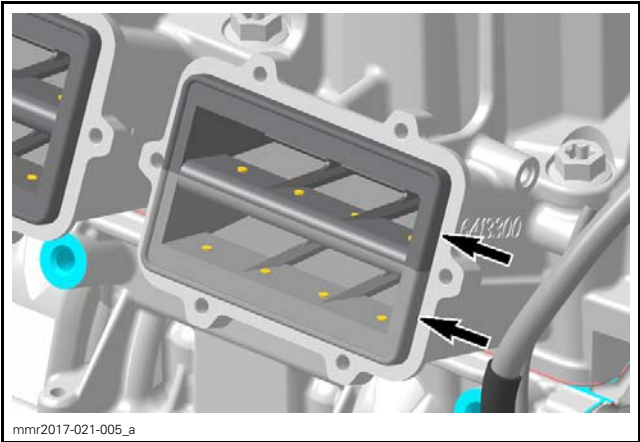
If there is still a play, replace blade and/or reed valve assembly.

Installing the Reed Valve

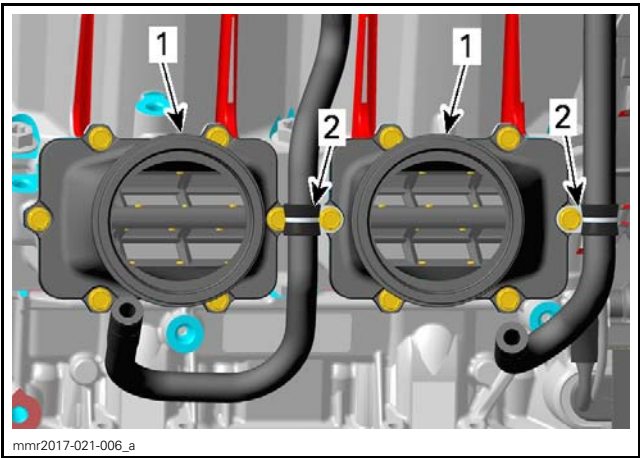
The installation is the reverse of the removal procedure. However, pay attention to the following.  
Blades have a curved shape. Install with their curve facing reed block.

TIGHTENING TORQUE	
Reed valve blade screws	1.5 N•m ± 0.3 N•m (13 lbf•in ± 3 lbf•in)

Ensure to position reed valves so that they rest flat in intake opening.



Ensure to position intake adapter as shown.  
Install clamps as shown in the illustration.



1. Intake adapter  
2. Clamps

Tighten intake adapter retaining screws to specification.

TIGHTENING TORQUE	
Intake adapter retaining screws	6 N•m ± 0.4 N•m (53 lbf•in ± 4 lbf•in)

COVER

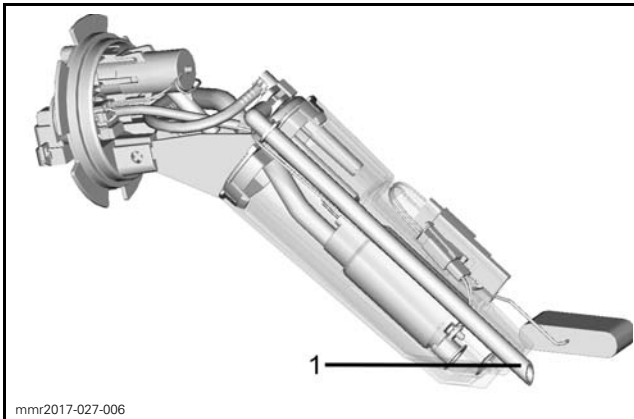
Removing the Cover

Carefully lift cover until rubber caps come off from distance screw.



### Fuel Pickup

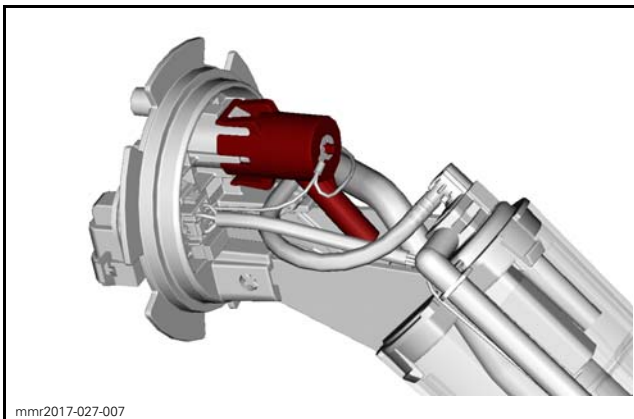
Fuel enters the fuel pump reservoir from either a check valve at the bottom of the fuel pump reservoir, or from a remote pickup in the rear portion of the fuel tank.



1. Remote pickup

### Fuel Pressure Regulator

An integrated fuel pressure regulator is mounted on the fuel pump flange. It is basically a spring loaded valve that opens and closes the path of fuel returning to the tank, thus maintaining a constant fuel pressure in the system.



#### FUEL PRESSURE

Approximately 303 kPa (44 PSI) at 2000 RPM  
(will be lower at idle)

Fuel pressure should drop less than 35 kPa (5 PSI) when engine stops running.

If a leak is present, pressure will continue to drop within the first minute after engine stops running.

### Fuel Tank Vent

The fuel tank is vented through a combination type check valve that allows ambient air pressure to enter fuel tank at all times.

As fuel is consumed by the engine, a negative pressure would occur in the fuel tank. This could eventually prevent the fuel pump from drawing enough fuel. The **negative pressure relieve function** of the valve allows the higher outside air pressure in.

If pressure builds up and exceeds 2.0 kPa to 4.8 kPa (.3 PSI to .7 PSI) in the fuel tank, the check valve opens and lets the excess pressure vent out of the tank.

### Fuel Filters

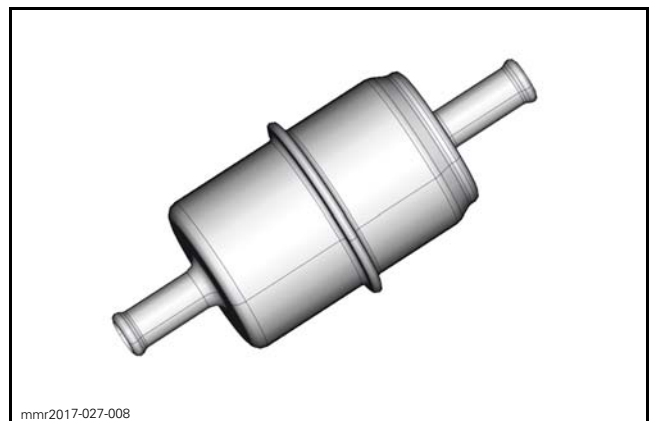
#### Fuel Pump Pre-Filter

A fuel pump pre-filter is used at the electric fuel pump inlet. It is a replaceable nylon mesh filter located within the fuel pump module housing (fuel pump reservoir).



The fuel pump pre-filter protects the fuel pump and prevents clogging of the fuel passages within the fuel pump module.

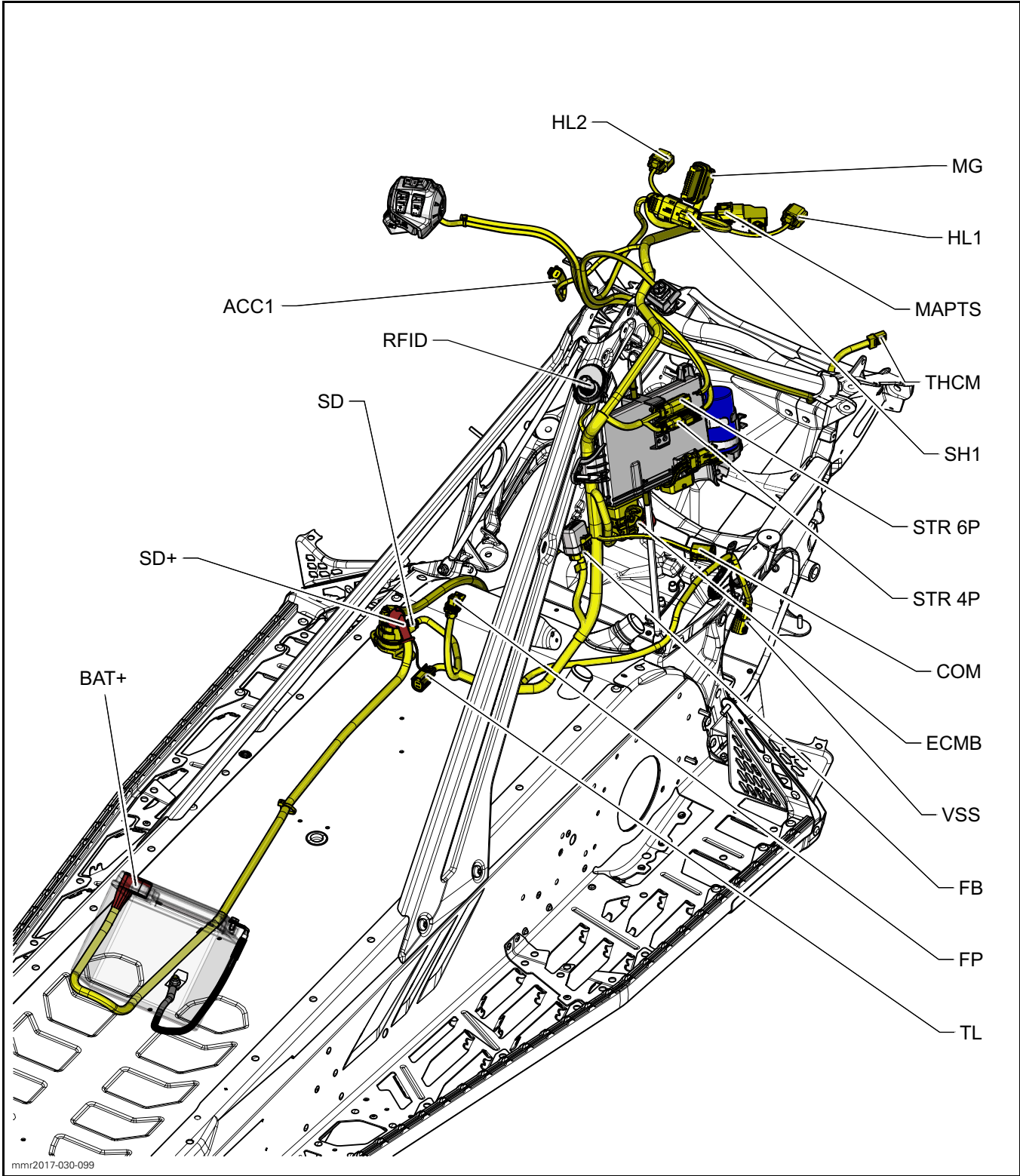
#### In-Line Fuel Filter

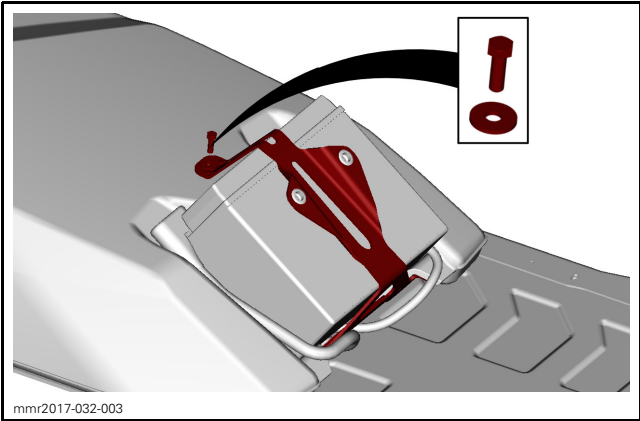


An in-line filter on the supply side is located between the fuel pump and the ECM.

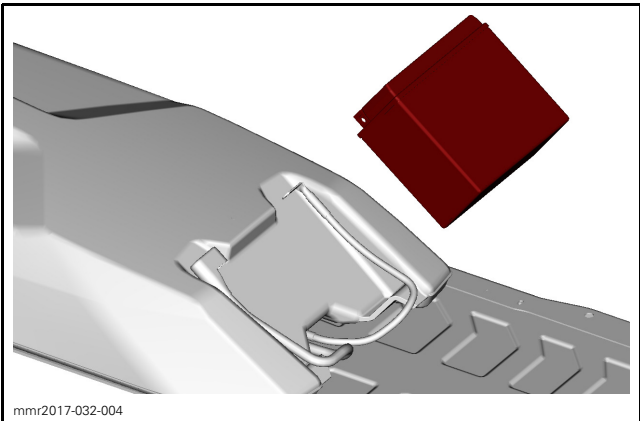
It is a replaceable metallic canister type filter used to deliver dirt-free fuel to the injectors.

REV G4 CROSS-COUNTRY (WITH BATTERY) CHASSIS HARNESS





5. Remove battery.



Installing Battery

TIGHTENING TORQUE	
Battery terminals (positive and negative)	10 N•m ± 2 N•m (89 lbf•in ± 18 lbf•in)
Battery hold down bracket	5 N•m ± 0.5 N•m (44 lbf•in ± 4 lbf•in)
Battery cover retaining screws	7 N•m ± 1 N•m (62 lbf•in ± 9 lbf•in)

VOLTAGE REGULATOR/  
RECTIFIER

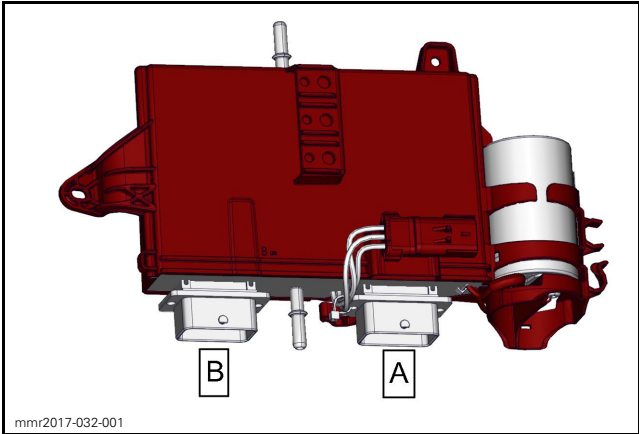
Description

The voltage regulator/rectifier is integrated within the ECM. It receives alternating current (AC) from the magneto which it rectifies and regulates to 55 Vdc.

On a single pull start with the engine between 250 and 500 RPM, the magneto, is capable of producing 30-40 Vdc.

55 Vdc Output

ECMB CONNECTOR
pins M1, M2, M4




Testing Continuity  
(Voltage Regulator/Rectifier)

Due to internal circuitry, there is no static test available to check continuity.

Testing 55 Vdc Voltage  
Output with B.U.D.S.  
(Voltage Regulator/Rectifier)

1. Raise vehicle so that the track is off the ground and can turn freely.

**WARNING**

Ensure vehicle track is completely raised off ground. If the track should come into contact with the ground when the engine is at 5000 RPM, equipment damage and severe injury may result.

2. Remove RH side panel, refer to *BODY* subsection.

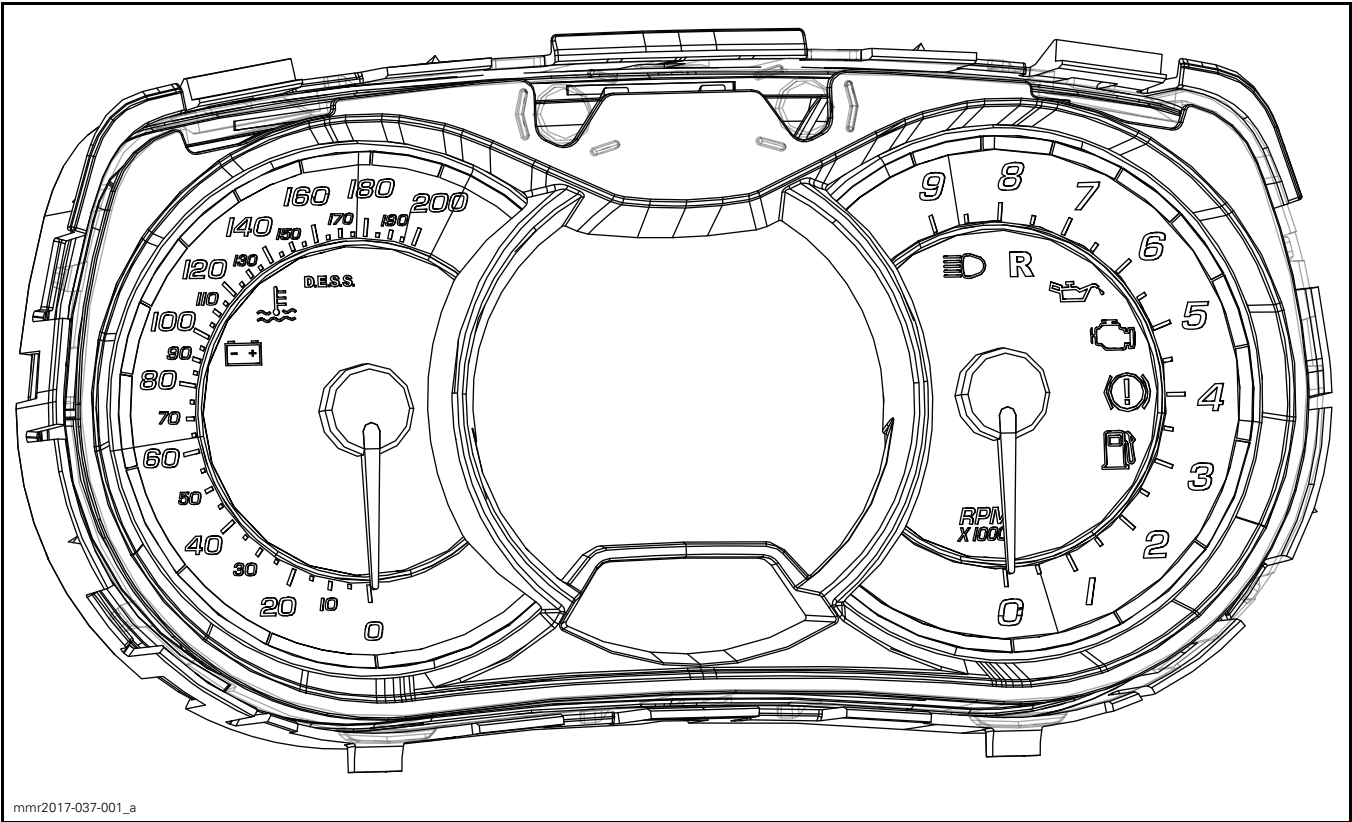
Procedure When Engine Cannot be Started

1. Install the following tools to supply power to the 12 Vdc circuits for this test. Refer to *COMMUNICATION TOOLS AND B.U.D.S.* subsection for proper connections.
  - POWER INTERFACE (P/N 515 177 223)
  - 12 V BATTERY SUPPLY CABLE (P/N 529 035 997)
  - 12 volts battery.
2. Select the **Measurements** page.
3. Read the voltage on the **55V System Circuit** meter in B.U.D.S. as the engine is turning over.

# GAUGE (ANALOG/DIGITAL)

## SERVICE TOOLS

Description	Part Number	Page
12 V BATTERY SUPPLY CABLE .....	529 035 997 .....	2, 4
POWER INTERFACE .....	515 177 223 .....	2, 4



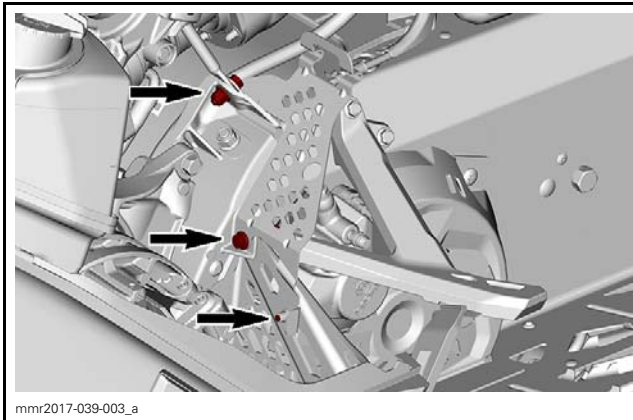
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## DRIVE BELT GUARD SUPPORT

### Removing the Drive Belt Guard Support

1. Remove the drive belt guard.
2. Remove screws securing the support to vehicle.



### Installing the Drive Belt Guard Support

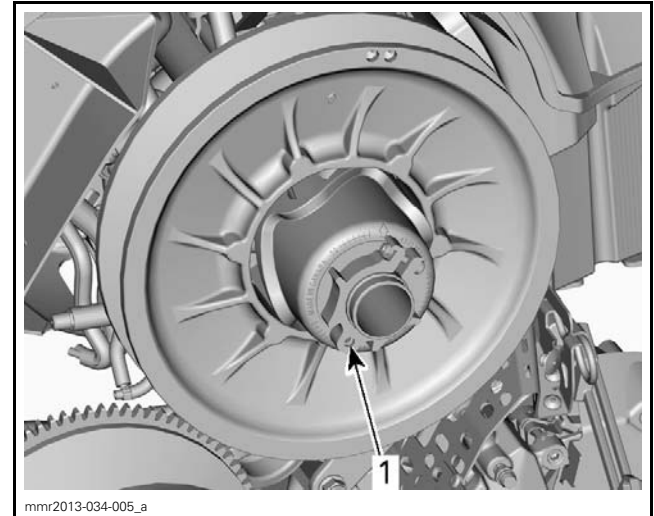
The installation is the reverse of the removal procedure. However pay attention to the following.

TIGHTENING TORQUE	
Drive belt guard support Torx screw	3.3 N•m ± 0.2 N•m (29 lbf•in ± 2 lbf•in)
Hexagonal flange elastic nut	10 N•m ± 2 N•m (89 lbf•in ± 18 lbf•in)

## DRIVE BELT

### Removing the Drive Belt

1. Remove tether cord cap from engine cut-off switch.
2. Remove LH side panel.
3. Remove drive belt guard, refer to *REMOVING THE DRIVE BELT GUARD*.
4. Insert the driven pulley expander provided in the tool kit in the threaded hole on the adjuster hub as illustrated.



1. PULLEY expander to be installed here - on Adjuster hub

5. Open the driven pulley by screwing the tool in.
6. Remove the belt by slipping it over the top of the driven pulley, then out of the drive pulley.

### Inspecting the Drive Belt

Inspect belt for:

- Cracks
- Fraying
- Abnormal wear (uneven wear, wear on one side, missing cogs, torn fabric).

If abnormal wear is noted, the probable cause could be:

- Pulley misalignment
- Excessive RPM with frozen track
- Fast starts without warm-up period
- Scratched or rusty sheave
- Oil on belt
- Distorted spare belt.

Check drive belt width. Replace the drive belt if its width is under minimum recommended specification.

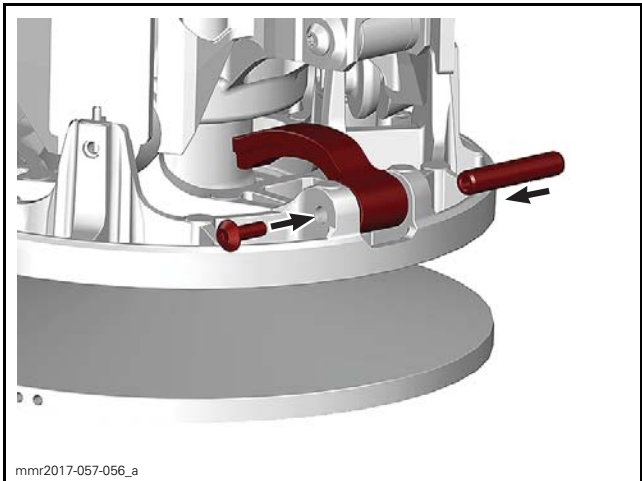
DRIVE BELT WIDTH	
NEW	WEAR LIMIT
38.3 mm (1.508 in)	35.9 mm (1.413 in)

### Installing the Drive Belt

1. If necessary, open the driven pulley, refer to *REMOVING THE DRIVE BELT*.
2. Insert drive belt in the drive pulley, then pull it over the driven pulley.

**NOTICE** Do not force or use tools to pry the belt into place, as this could cut or break the cords in the belt.

Subsection XX (pDRIVE PULLEY WITHOUT CLICKER)



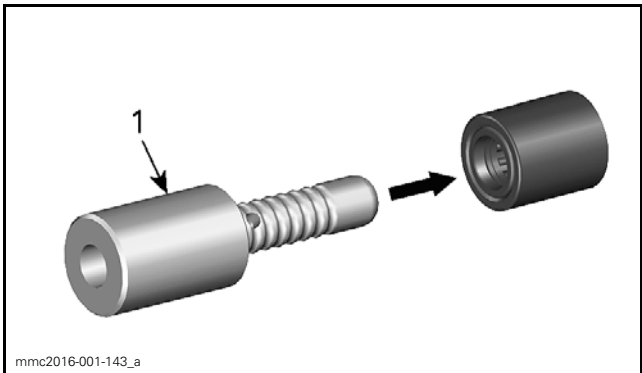
TIGHTENING TORQUE	
Axle screw	5 N•m ± 0.5 N•m (44 lbf•in ± 4 lbf•in)

**Roller**  
Lubricate the roller bearing.

REQUIRED SERVICE PRODUCT
ISOFLEX GREASE TOPAS NB 52 (P/N 293 550 021)

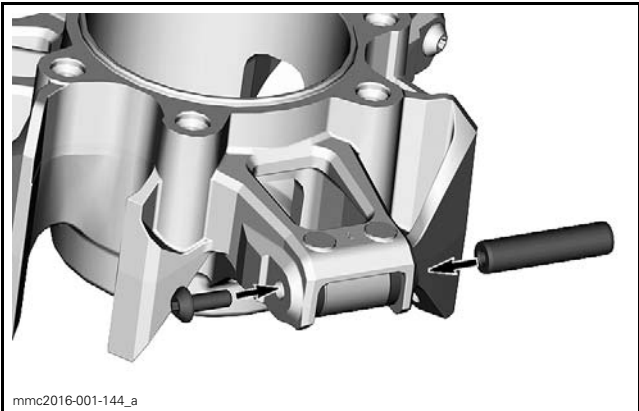
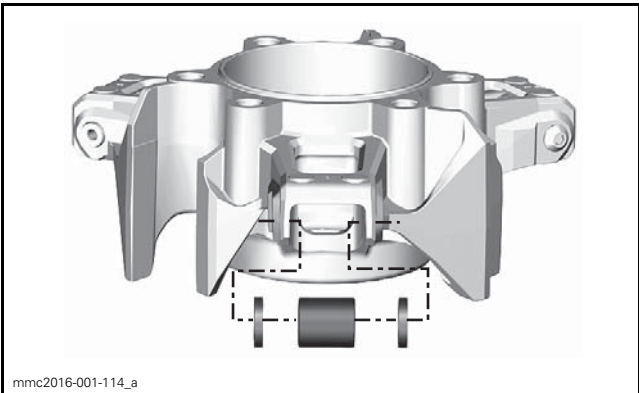
REQUIRED TOOL	
GREASE INJECTOR (P/N 529 036 376)	

**NOTE:** A threaded end is required on the grease gun for using the grease injector.



1. GREASE INJECTOR (P/N 529 036 376)

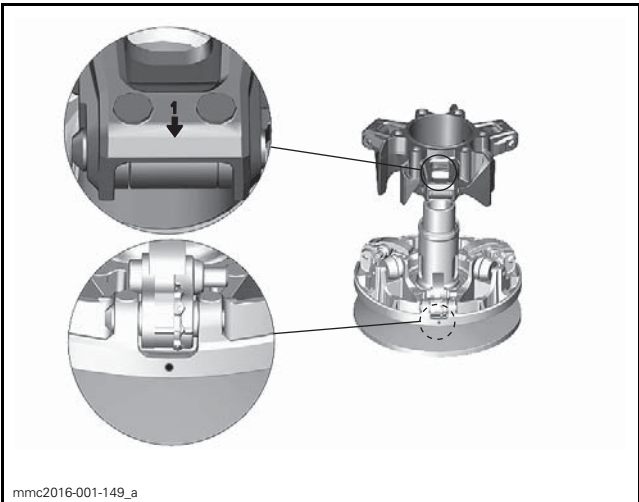
Install roller.



TIGHTENING TORQUE	
Roller axle screw	5 N•m ± 0.5 N•m (44 lbf•in ± 4 lbf•in)

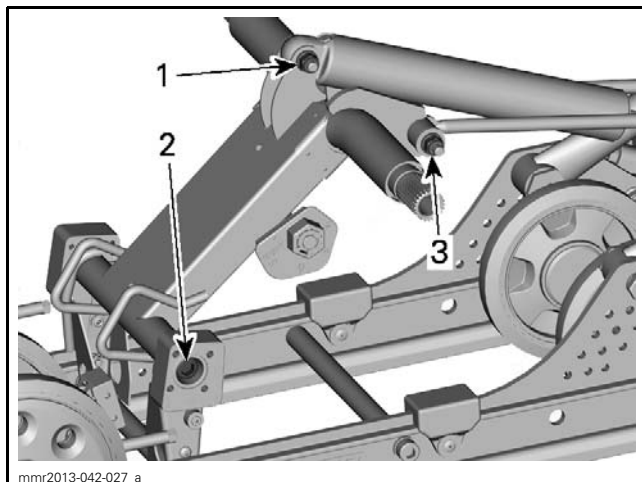
**Spider**  
Install the spider on the sliding sheave by aligning the indexing marks.

- Spider - the arrow on the arms #1, just above the roller.
- Sliding sheave - the dot on the external side of the sheave.



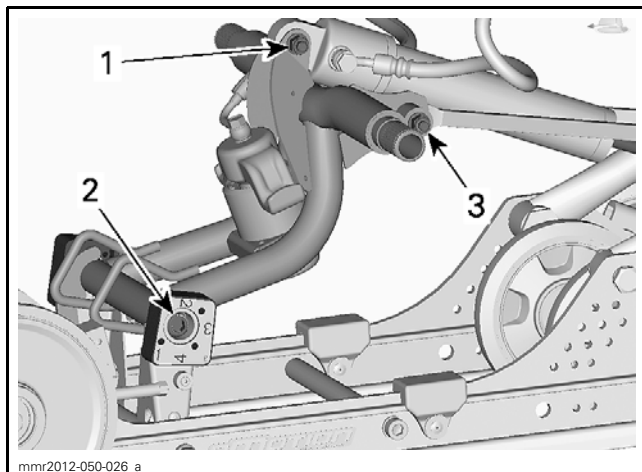
TYPICAL

## Subsection XX (REAR SUSPENSION (rMOTION))



### MODELS WITHOUT QUICK ADJUST SYSTEM

1. Rear shock to rear arm bolt
2. Coupling blocks retaining screw
3. Rear arm to throttle rods bolt



### QUICK ADJUST SYSTEM

1. Rear shock to rear arm bolt
2. Coupling blocks retaining screw
3. Rear arm to throttle rods bolt

3. Remove rear arm from the vehicle.

## Installing Rear Arm

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

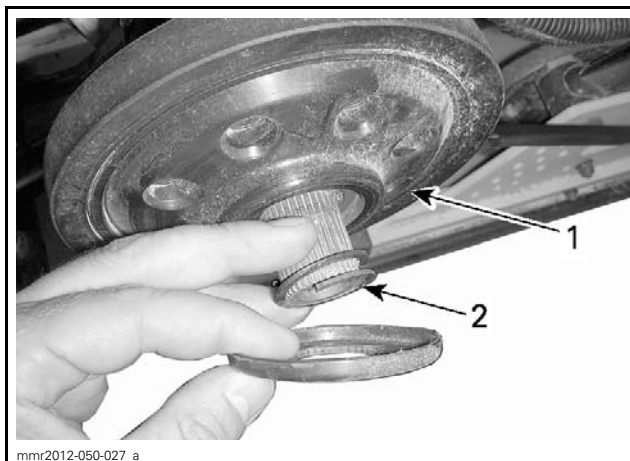
### *rMotion Without Quick Adjust System*

Place rear arm grease fitting towards the front of the vehicle.

### *All Models*

Install coupling block with new socket screws.

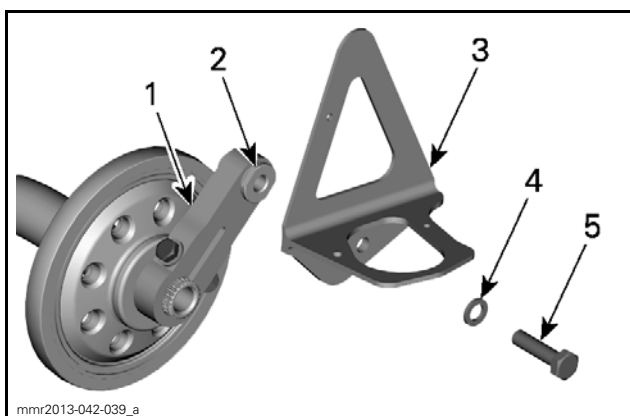
Install upper idler wheels as shown.



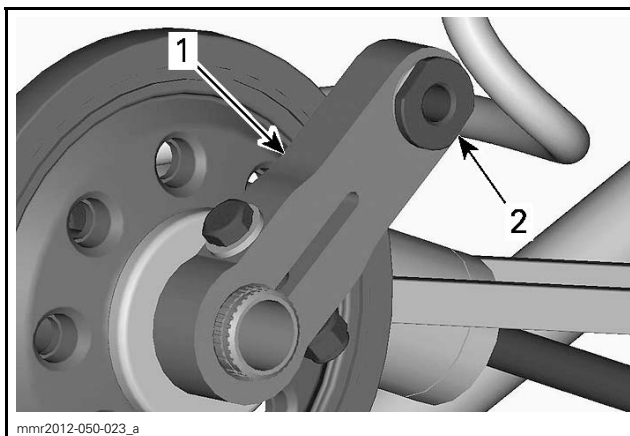
1. Convex side out
2. Spring between wheel and plastic cover

Install rear arm connecting rod inserts with the shoulder outwards.

Install circlip.



1. Connecting rod
2. Shoulder outwards
3. Support
4. Washer
5. Retaining screw



1. Connecting rod
2. Shoulder outwards

Install new connecting rod retaining screws.