

EXHAUST SYSTEM

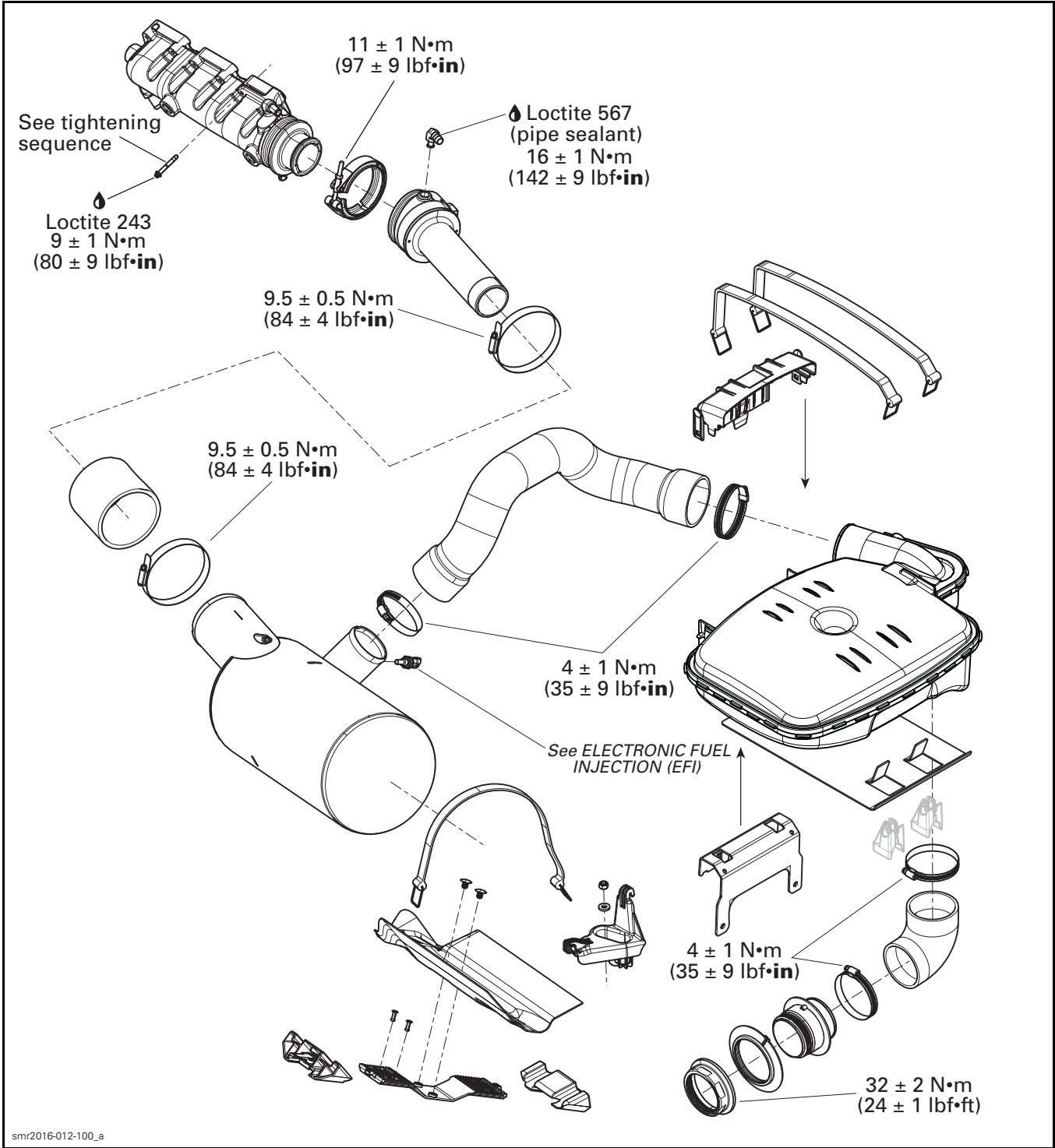
SERVICE TOOLS

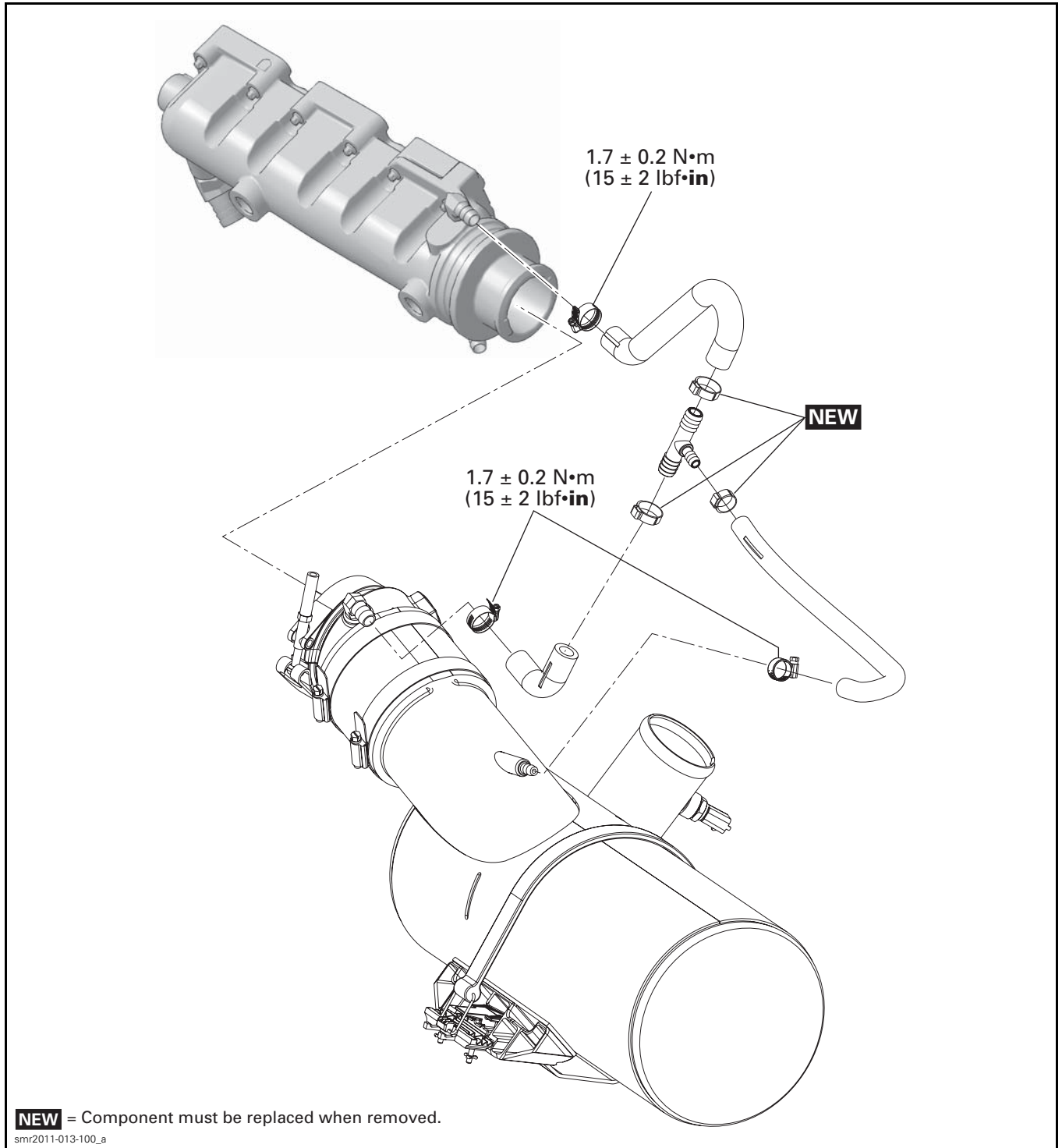
Description	Part Number	Page
FLUSHING CONNECTOR ADAPTER	295 500 473	6

SERVICE PRODUCTS

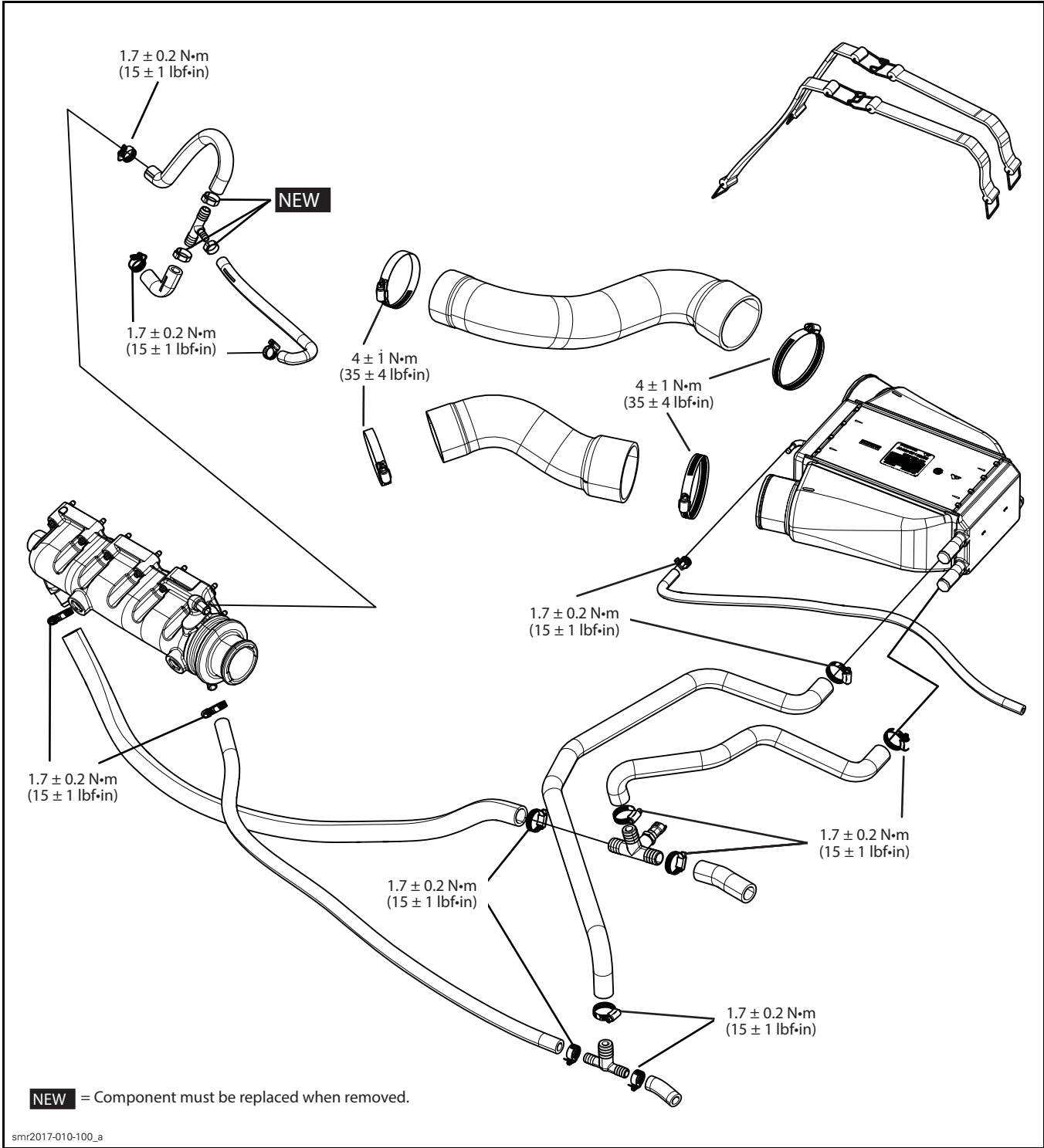
Description	Part Number	Page
P80 GRIP-IT	296 000 406	13

Subsection XX (EXHAUST SYSTEM)





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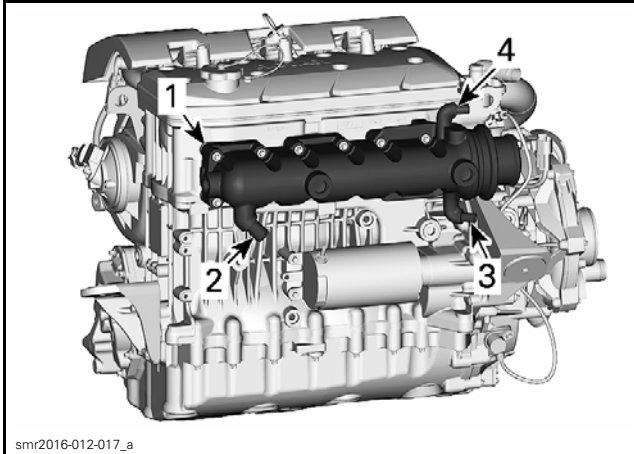
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GENERAL

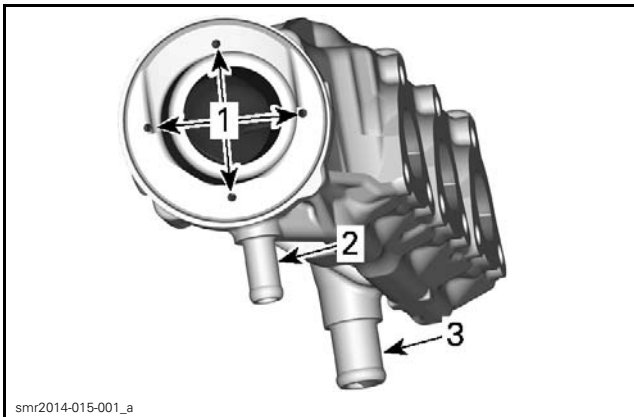
SYSTEM DESCRIPTION

The exhaust system is cooled by water provided by a pressurized area in the jet pump (open loop system).

Water exits exhaust manifold through holes to inject water in muffler.



- smr2016-012-017_a
1. Exhaust manifold
 2. Exhaust manifold water inlet
 3. Exhaust manifold water outlet (to hull)
 4. Exhaust manifold water outlet (to exhaust pipe and muffler)



EXHAUST MANIFOLD

- smr2014-015-001_a
1. Injection holes
 2. Manifold outlet to jet pump support
 3. Manifold inlet from jet pump support

Water is evacuated through the exhaust outlet in transom area.

Exhaust System Technical Specifications

TYPE	Total Loss Cooling System (TLCS)
WATER FLOW	Flow from jet pump (no water pump)
TEMPERATURE CONTROL	Calibrated outlet fittings (no thermostat)
SYSTEM BLEEDING	Self-bleed type
SYSTEM DRAINING	Self-drain type

MAINTENANCE

EXHAUST SYSTEM FLUSHING

Flushing the exhaust system with fresh water is essential to neutralize corroding effects of salt or other chemical products present in water. It will help to clean up sand, salt, shells or other particles in water jackets (exhaust system, intercooler and hoses).

Exhaust system flushing should be performed when the watercraft is not expected to be used further the same day or when the watercraft is stored for any extended time.

NOTICE Failure to flush the system, when necessary, will severely damage intercooler and exhaust system. Make sure engine operates during entire procedure.

⚠ WARNING

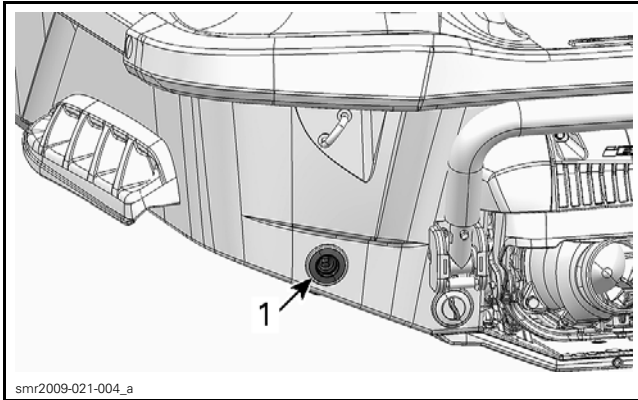
Perform these operations in a well ventilated area. Certain components in the engine compartment may be very hot. Direct contact may result in skin burn. Do not touch any electrical part or jet pump area when engine is running.

⚠ WARNING

When operating the engine while the watercraft is out of the water, the heat exchanger in the ride plate may become very hot. Avoid any contact with ride plate as burns may occur.

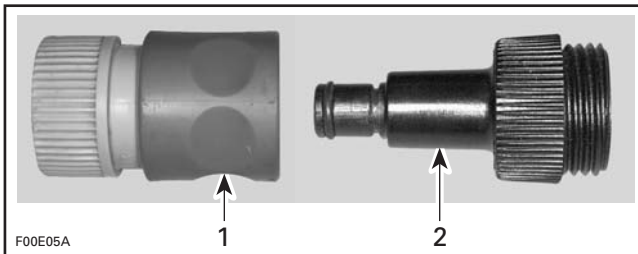
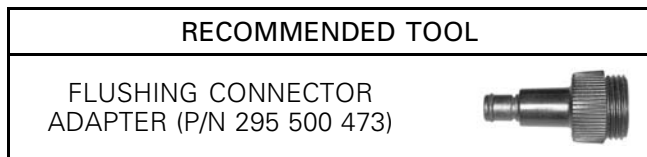
Connect a garden hose to connector located at the rear of watercraft. Do not open water tap yet.

Subsection XX (EXHAUST SYSTEM)



1. Water inlet connector

NOTE: The following tool is recommended when a quick connect adapter is used to ease garden hose installation.



1. Quick connect adapter
2. Flushing connector adapter

To flush the exhaust system, start the engine then immediately open the water tap.

NOTICE Always start the engine before opening the water tap. Open water tap immediately after engine is started to prevent overheating. Never run engine without supplying water to the exhaust system when watercraft is out of water.

Run the engine about 20 seconds at a fast idle between 4000 - 5000 RPM.

NOTICE Never run engine longer than 2 minutes. Drive line seal has no cooling when watercraft is out of water.

Ensure water flows out of jet pump while flushing. Close the water tap, then stop the engine.

NOTICE Always close the water tap before stopping the engine.

Disconnect the garden hose.

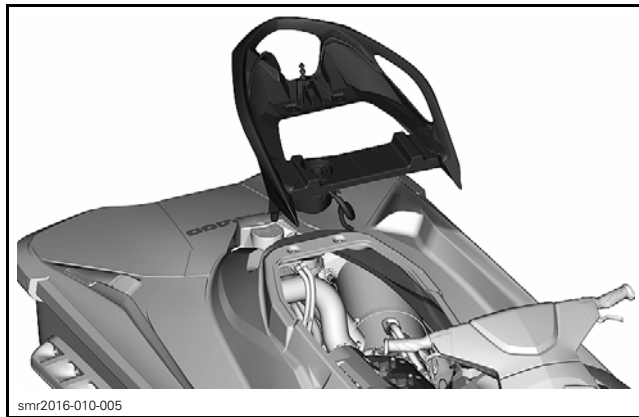
NOTICE Remove flushing connector adapter after operation (if used).

PROCEDURES

MUFFLER

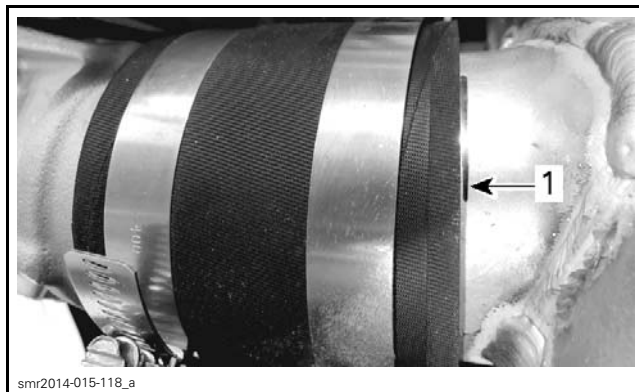
CAUTION Certain components in the engine compartment may be very hot. Let exhaust system cool down prior to removing parts.

Removing the Muffler

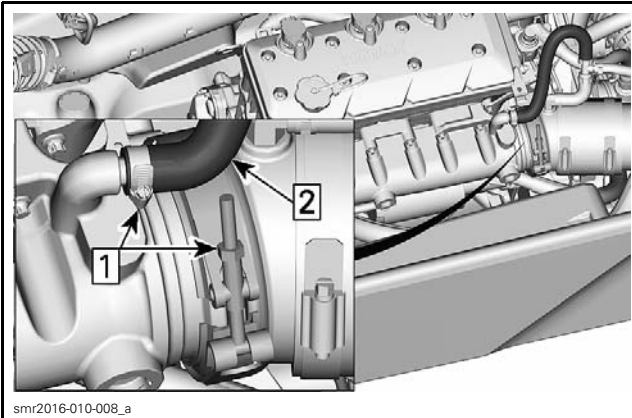


Set aside the coolant reservoir.

Mark manifold to muffler hose location on muffler.



NOTICE Do not use pneumatic or electrical tools as seizure may occur.



Inspecting the Muffler

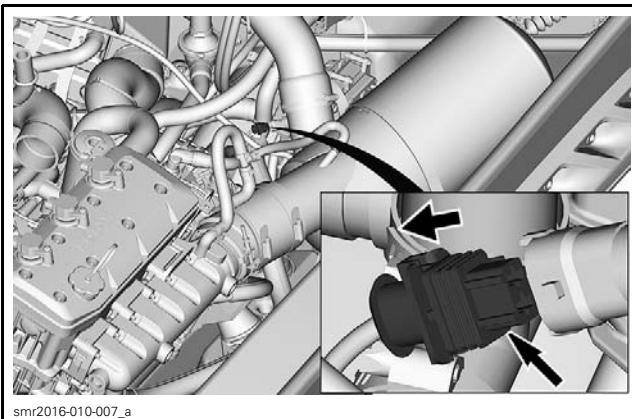
Check muffler for:

- Cracks
- Corrosion
- Other damages.

Check if exhaust hose is:

- Brittle
- Hard
- Cracked
- Otherwise damaged.

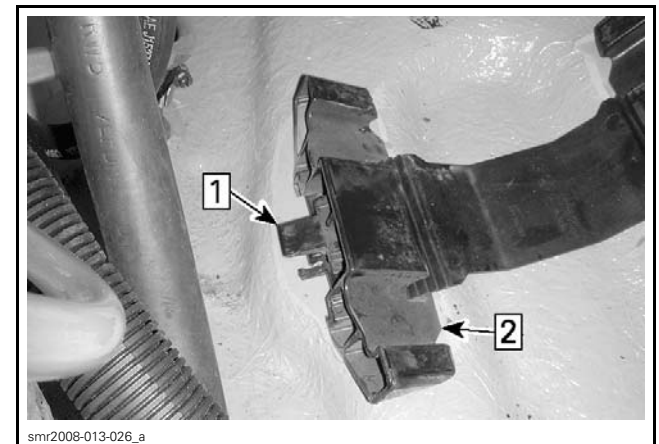
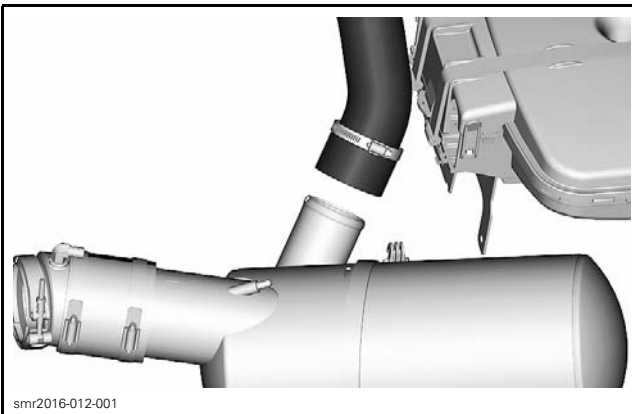
Replace any defective part.



Installing the Muffler

With a new muffler, install the EGTS sensor. Refer to *ELECTRONIC FUEL INJECTION (EFI)* subsection.

Open muffler adjusters by sliding adjuster blocks.



TYPICAL – RUBBER PAD REMOVED FOR CLARITY PURPOSE

Step 1: Lift adjuster tab

Step 2: Move adjuster outward

Insert the muffler in hull.

Align the exhaust pipe flange with the exhaust manifold. Rotate and move muffler so that the exhaust pipe flange makes perfect contact with exhaust manifold.

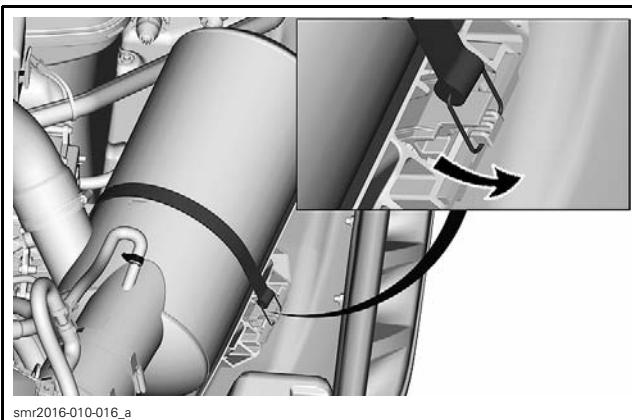
Slide both adjuster blocks against muffler to support it in position.

NOTE: Ensure muffler is in contact with both adjuster blocks. Readjust as required.

Install exhaust clamp with the nut upward.

Tighten clamp loosely.

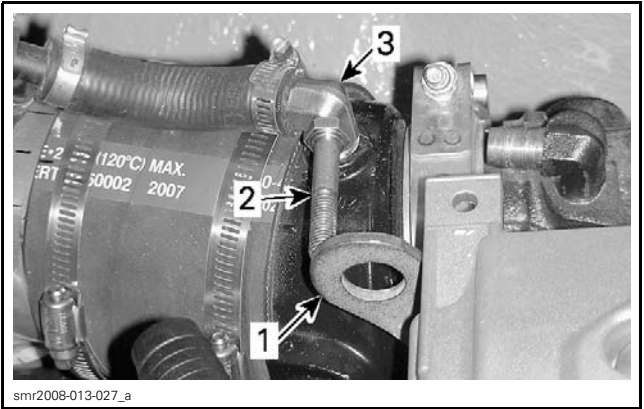
Using a spacer, position the exhaust pipe.



Remove the muffler.

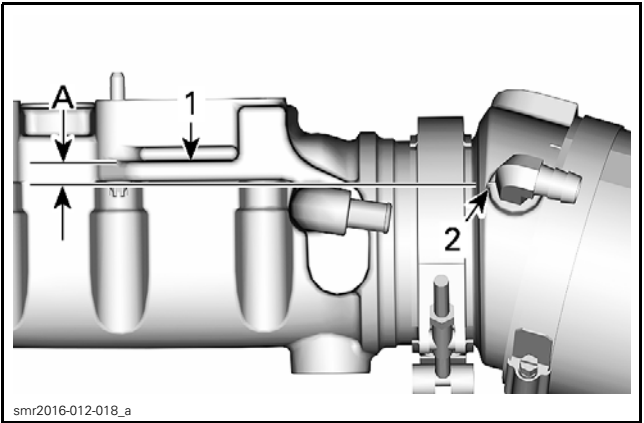
Subsection XX (EXHAUST SYSTEM)

REQUIRED SPACER	
All models	50 mm (2 in)



- TYPICAL**
- 1. Engine lifting ring
 - 2. Spacer (in this case a bolt)
 - 3. Exhaust pipe fitting

Confirm that the exhaust pipe mark is aligned with the mark on the exhaust manifold.



- 1. Exhaust manifold rib wall facing the engine
- 2. Exhaust pipe mark
- A. 35 mm (1-3/8 in)

Tighten exhaust clamp to specification.

TIGHTENING TORQUE	
Exhaust clamp	11 N•m (97 lbf•in)

NOTICE Do not use pneumatic or electric tools as seizure may occur.

Install the muffler strap.

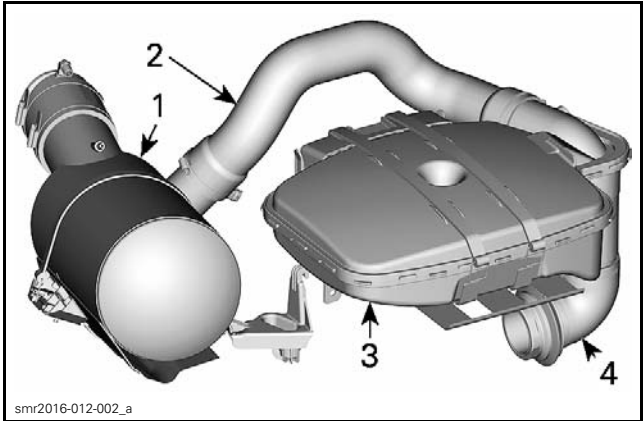
NOTICE Ensure not to rotate muffler during strap installation. The use of a soapy water solution on inner side of muffler strap is recommended.

Install all other removed parts.

After installation, ensure there is no water or exhaust gas leak when engine is running.
Test run the engine while supplying water to the exhaust system.

NOTICE Never run engine without supplying water to the exhaust system when watercraft is out of water.

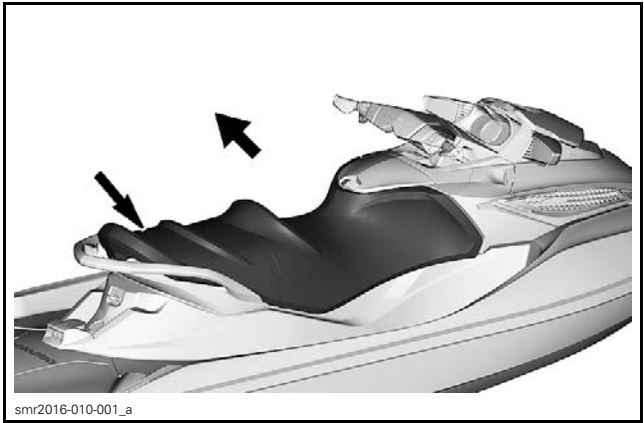
EXHAUST HOSES

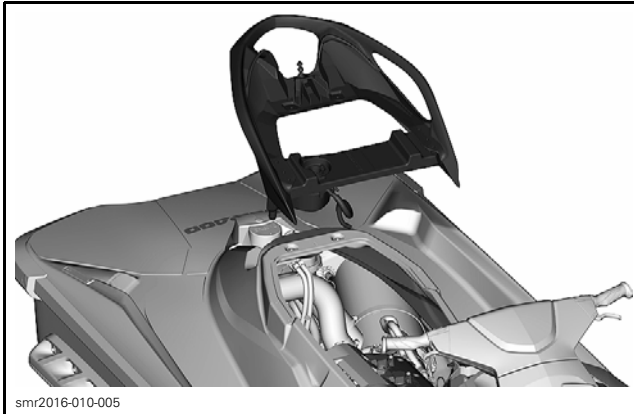


- 1. Muffler
- 2. Front exhaust hose
- 3. Resonator
- 4. Rear exhaust hose

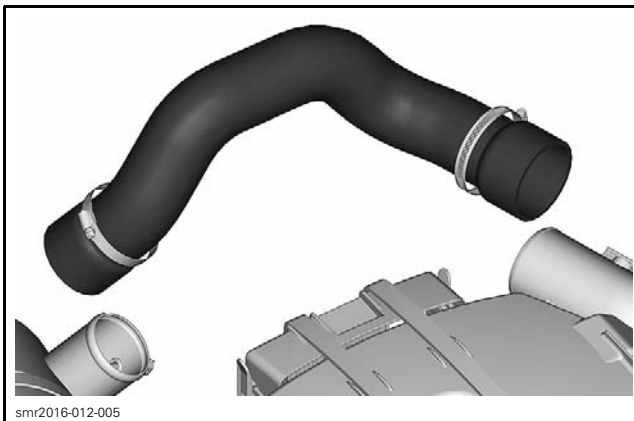
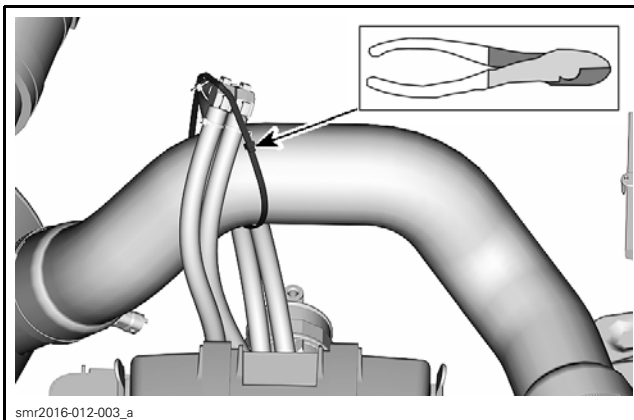
Front Exhaust Hose

Removing the Front Exhaust Hose



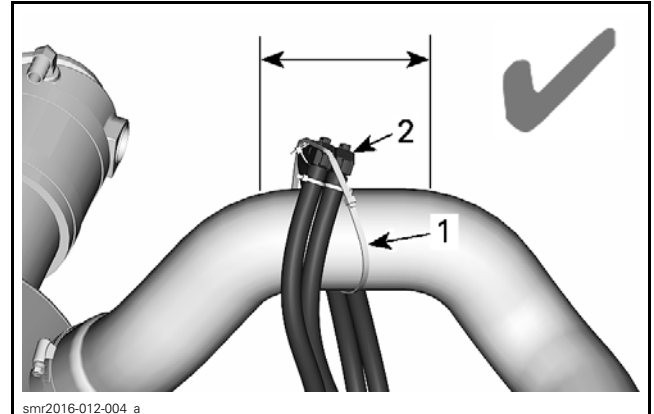


All Models



Installing the Front Exhaust Hose

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



1. New locking tie
2. Elbow fittings tied on highest part of hose

TIGHTENING TORQUE

Front exhaust hose clamp	4 N•m ± 1 N•m (35 lbf•in ± 9 lbf•in)
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After installation, ensure there is no water or exhaust gas leak when the engine is running. Test run the engine while supplying water to the exhaust system.

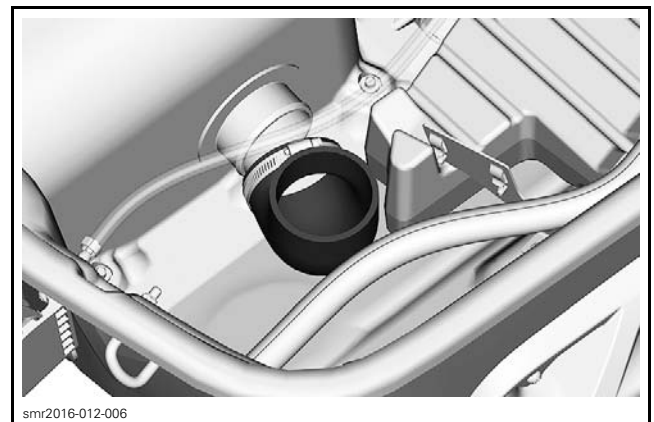
NOTICE Never run engine without supplying water to the exhaust system when watercraft is out of water.

Rear Exhaust Hose

Removing the Rear Exhaust Hose

Remove the resonator. See procedure in this subsection.

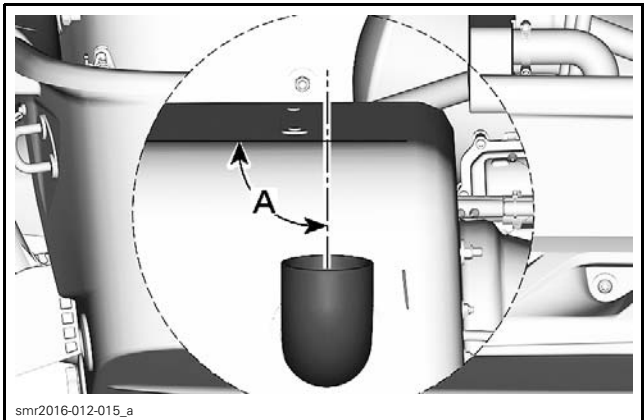
Loosen clamp securing the rear exhaust hose to RH fixing plate.



Installing the Rear Exhaust Hose

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

Subsection XX (EXHAUST SYSTEM)



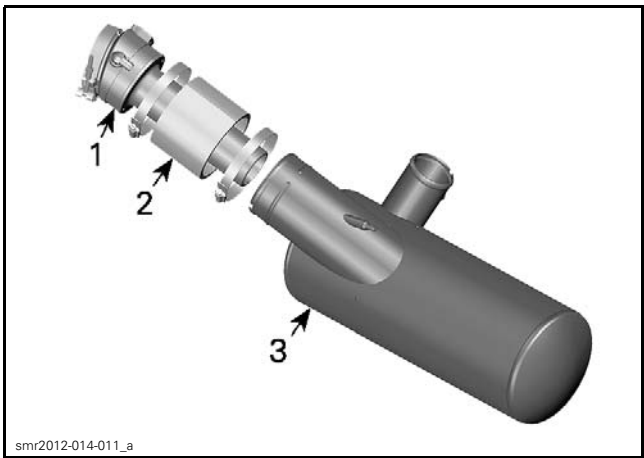
A. 90°

TIGHTENING TORQUE	
Rear exhaust hose clamp	4 N•m ± 1 N•m (35 lbf•in ± 9 lbf•in)

After installation, ensure there is no water or exhaust gas leak when the engine is running. Test run the engine while supplying water to the exhaust system.

NOTICE Never run engine without supplying water to the exhaust system when watercraft is out of water.

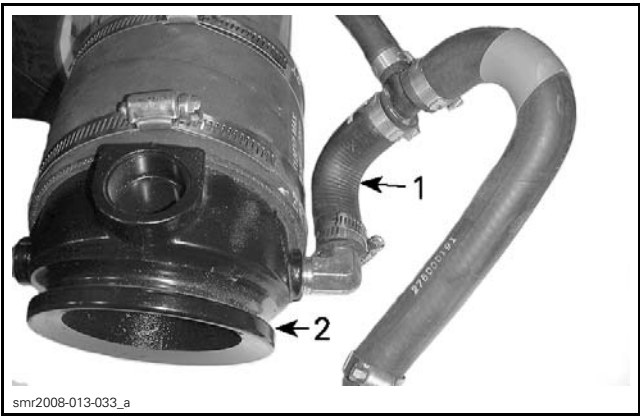
EXHAUST PIPE



1. Exhaust pipe
2. Rubber adapter
3. Muffler

Removing the Exhaust Pipe

Remove *MUFFLER*, see procedure in this subsection.
Loosen rubber adapter clamps.



1. Water inlet hose
2. Exhaust pipe

Remove exhaust pipe and the rubber adapter.

Inspecting the Exhaust Pipe

Inspect exhaust pipe for:

- Cracks
- Flange damages
- Other damages.

Replace exhaust pipe as required.

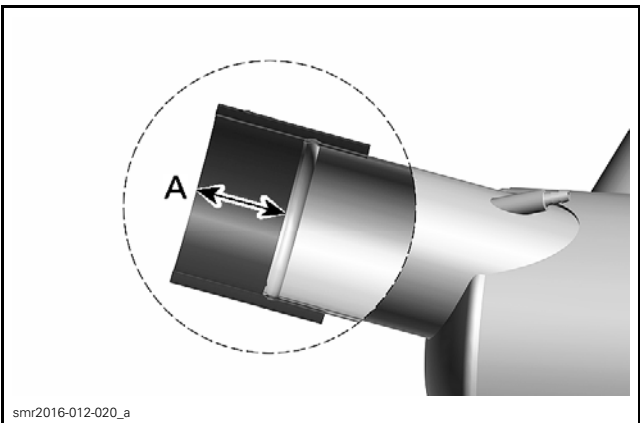
Check if the rubber adapter is:

- Brittle
- Hard
- Otherwise damaged.

Replace rubber adapter if necessary.

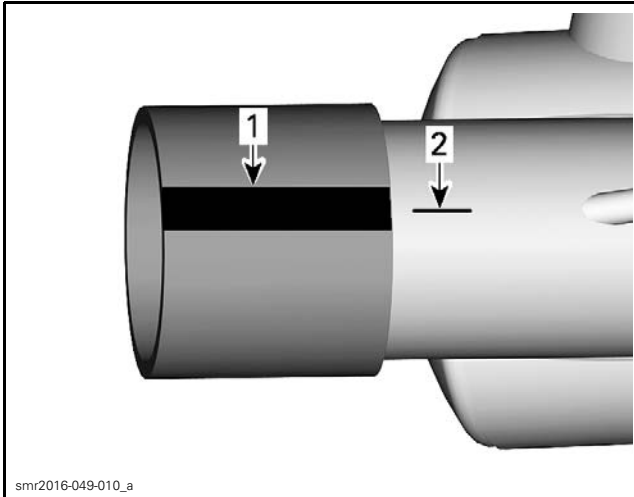
Installing the Exhaust Pipe

Install rubber adapter on muffler.



SECTION VIEW
A. 57 mm ± 2 mm (2-1/4 in ± 5/64 in)

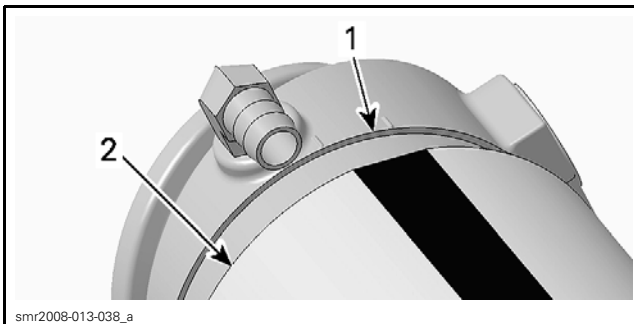
Center the muffler pre-mark with the BLUE strip on rubber adapter.



1. Muffler pre-mark
2. Blue strip on rubber adapter

Secure the rubber adapter to the muffler using retaining clamp.

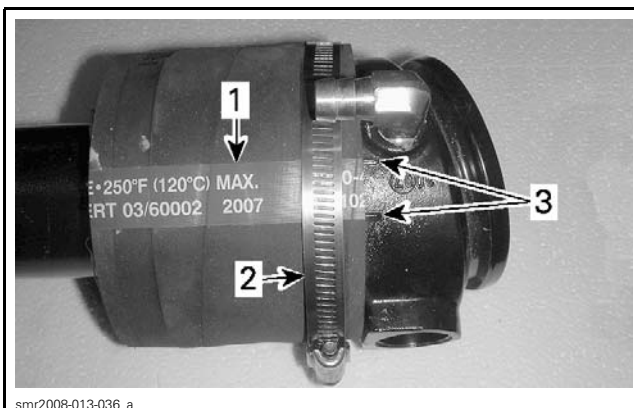
Install the exhaust pipe in the rubber adapter. Ensure rubber adapter is properly seats against exhaust pipe shoulder.



1. Exhaust pipe shoulder
2. Rubber adapter

Center the rubber adapter strip of the rubber adapter between both exhaust pipe marks.

Tighten retaining clamp.



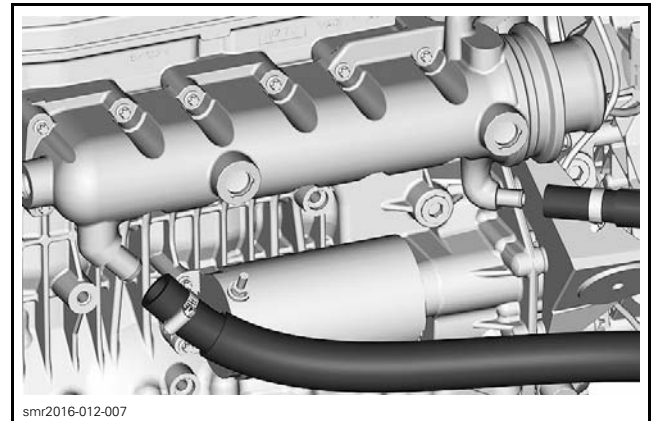
1. Rubber adapter strip
2. Retaining clamp
3. Exhaust pipe marks

Install muffler in vehicle. Refer to *INSTALLING THE MUFFLER* in this subsection for complete procedure.

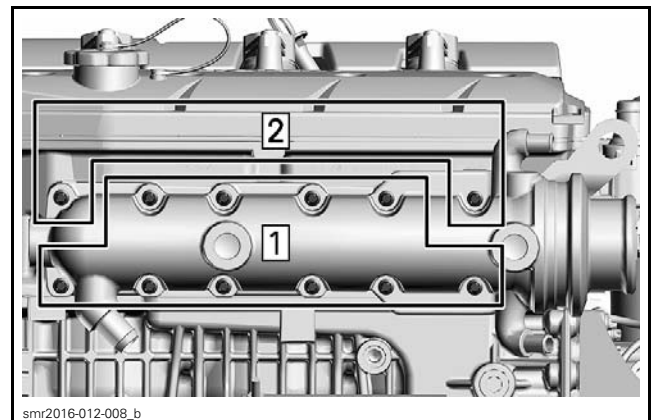
EXHAUST MANIFOLD

Removing the Exhaust Manifold

Move muffler rearwards to make room. Refer to *REMOVING THE MUFFLER* in this subsection.



Unscrew the exhaust manifold screws.



1. Remove first
2. Remove last

Inspecting the Exhaust Manifold

Inspect exhaust manifold condition paying attention for cracks or other damage. Check contact surfaces and hose. Replace any defective part.

Inspect plane surfaces for warpage. Small deformation can be corrected by grinding surface with a fine sand paper. Install sand paper on a flat surface and rub part against oiled sand paper.

Clean all metal components in a solvent.

Check if the injection holes (4x) are not clogged.

Subsection XX (EXHAUST SYSTEM)



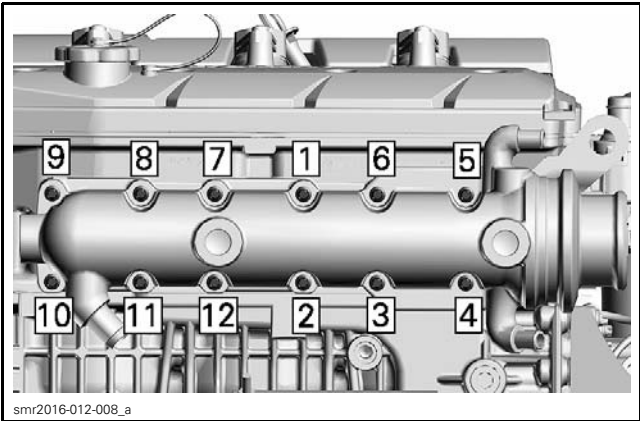
1. Injection holes

Installing the Exhaust Manifold

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

NOTE: There is no gasket between cylinder block and exhaust manifold.

Insert the exhaust manifold into the exhaust hose.



EXHAUST MANIFOLD TIGHTENING SEQUENCE

Tighten screws to specification as per following illustrated sequence. Repeat the procedure twice.

TIGHTENING TORQUE	
Exhaust manifold screw	9 N•m ± 1 N•m (80 lbf•in ± 9 lbf•in)

TIGHTENING TORQUE	
Exhaust manifold hose clamp	1.7 N•m ± 0.2 N•m (15 lbf•in ± 2 lbf•in)

After installation, ensure there is no water or exhaust gas leak when the engine is running. Test run the engine while supplying water to the flushing connector.

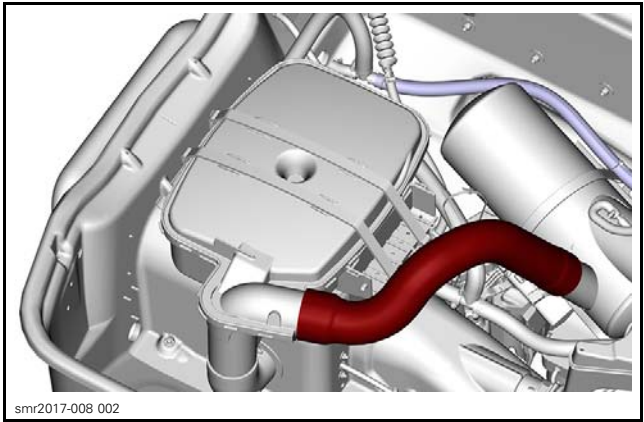
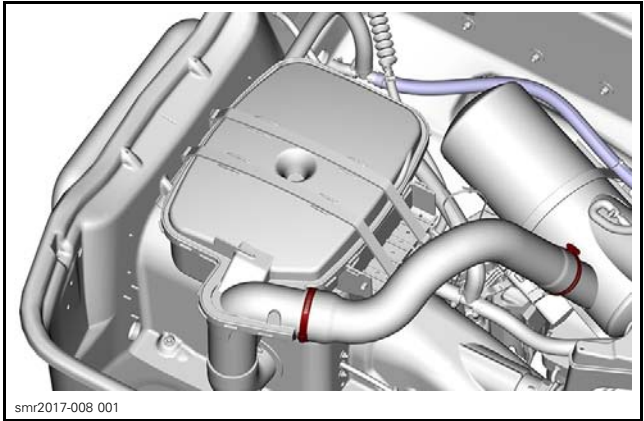
NOTICE Never run engine without supplying water to the exhaust system when watercraft is out of water.

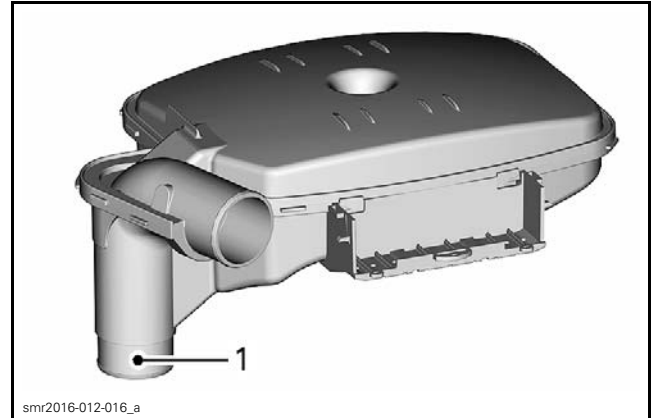
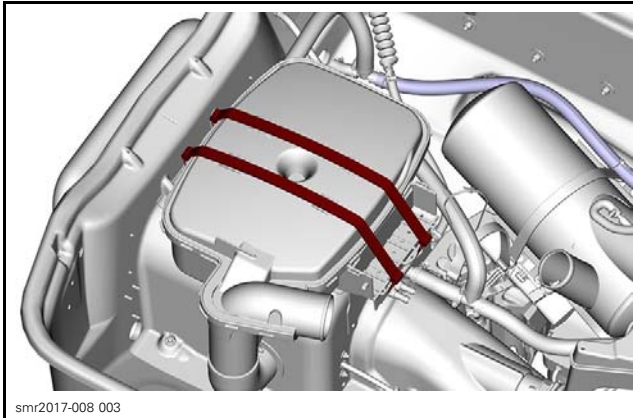
RESONATOR

Removing the Resonator

Remove the muffler. See the procedure in this subsection.

Remove the intercooler. Refer to *INTERCOOLER* subsection.

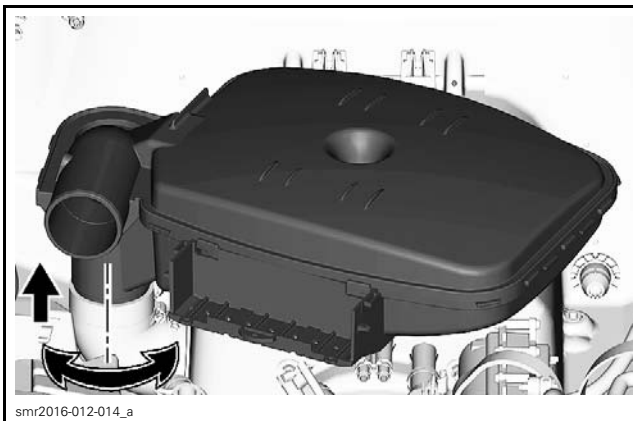
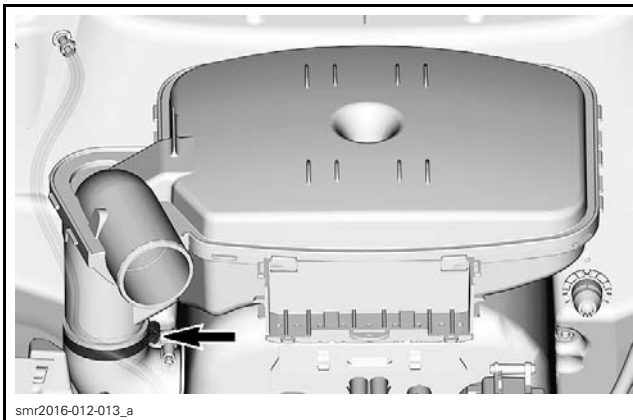




1. Spray P80 GRIP-IT (P/N 296 000 406)

After installation, ensure there is no water or exhaust gas leak when the engine is running. Test run the engine while supplying water to the exhaust system.

NOTICE Never run engine without supplying water to the exhaust system when watercraft is out of water.



Inspecting the Resonator

Inspect parts condition paying attention for deformation, cracks or other damage. Check hoses. Replace any defective part.

Installing the Resonator

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