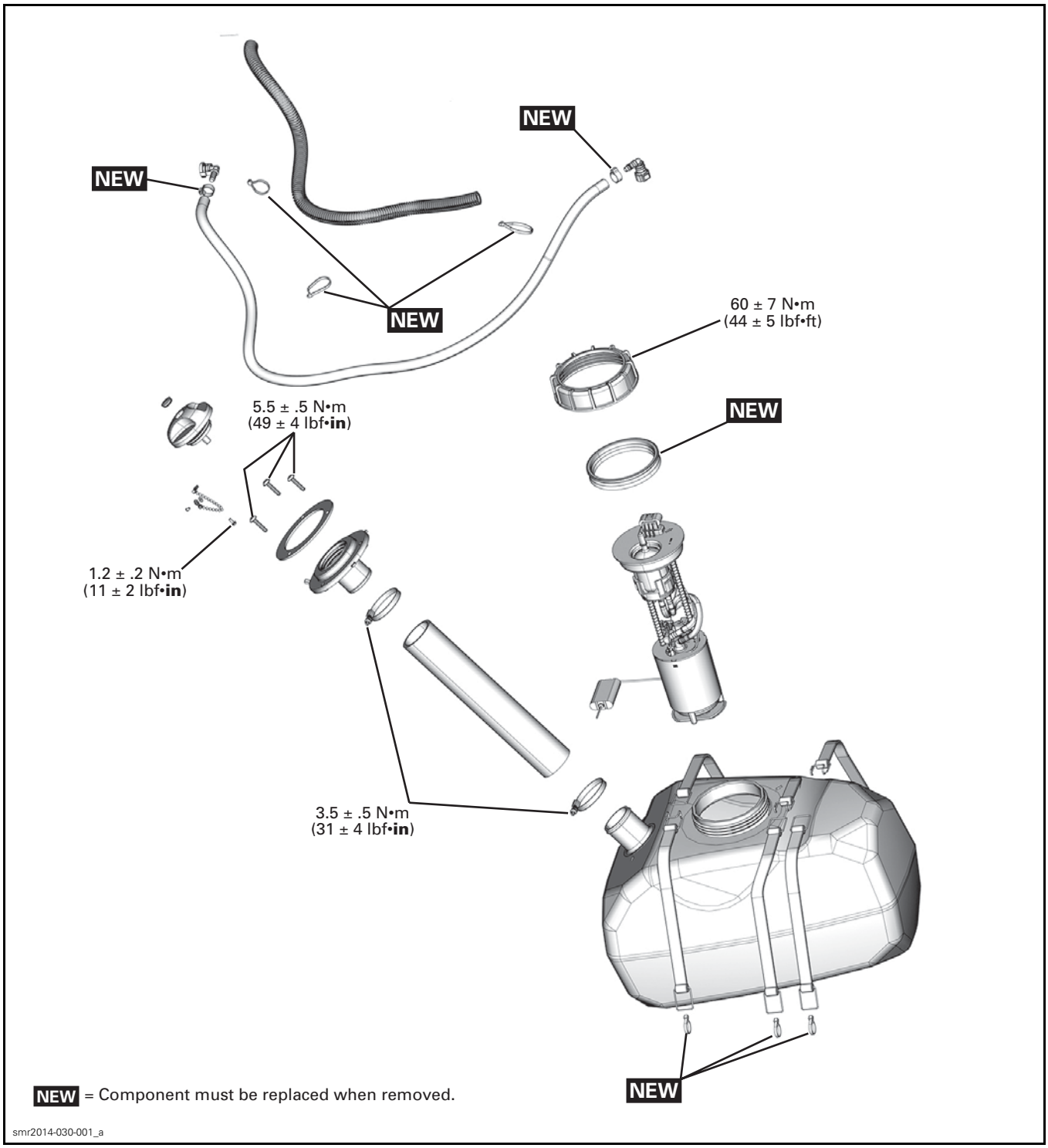
FUEL TANK AND FUEL PUMP

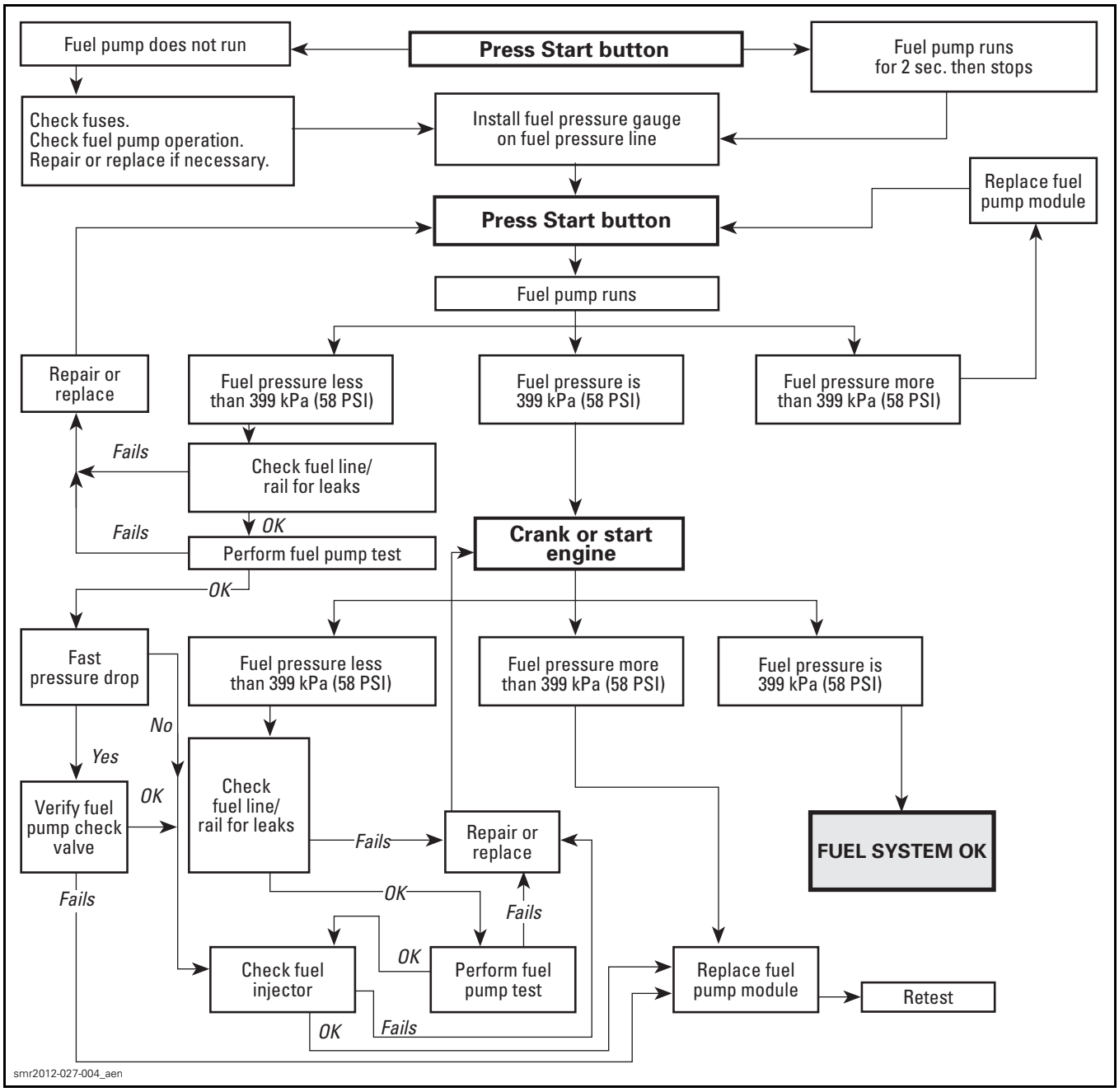
SERVICE TOOLS

Description	Part Number	Page
ECM ADAPTER TOOL	529 036 166	10
FLUKE 115 MULTIMETER	529 035 868	11, 14
FUEL HOSE ADAPTER	529 036 023	8
FUEL PUMP MODULE SOCKET	529 036 125	12
LEAK TEST KIT	529 033 100	5
OETIKER PLIERS	295 000 070	9
PRESSURE GAUGE	529 035 709	8
VACUUM/PRESSURE PUMP	529 021 800	5–6

FUEL TANK AND FUEL PUMP



FUEL SYSTEM DIAGNOSTIC FLOW CHART



GENERAL

⚠ WARNING

Fuel lines remain under pressure at all times. Always proceed with care and use appropriate safety equipment when working on a pressurized fuel system. Wear safety glasses.

⚠ WARNING

Always disconnect battery prior to working on the fuel system. Fuel vapors are flammable and explosive under certain conditions. Always work in a well ventilated area. Do not allow fuel to spill on hot engine parts and/or on electrical connectors. Proceed with care when removing/installing high pressure test equipment or disconnecting fuel line connections. Cover the fuel line connection with an absorbent shop rag. Wipe off any fuel spillage in the bilge.

⚠ WARNING

When the repair is completed, ensure that hoses and connections from fuel rail to the fuel pump are properly secured. Then, pressurize the fuel system. After carrying out a fuel pump pressure test, use the valve on the fuel pressure gauge to release the pressure (if so equipped).

⚠ WARNING

The fuel pump is energized for a few seconds each time the START button is depressed. It builds fuel system pressure very quickly. Prior to pressing the START button, ensure there are no disconnected or damaged fuel lines that may leak fuel. A high pressure leak test must be carried out whenever a fuel system component has been disconnected.

⚠ WARNING

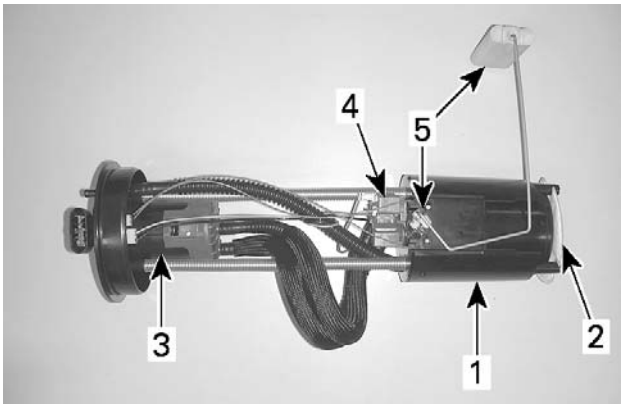
Ensure wires and hoses are routed and secured away from any vibrating, rotating, moving or hot components or sharp edges. Use appropriate shields and fastening devices as per factory standards.

NOTICE Whenever repairing the fuel system, always check for water infiltration in the fuel tank. Replace any damaged, leaking or deteriorated fuel line.

SYSTEM DESCRIPTION

The fuel system is comprised of:
- A fuel tank
- A vented fuel tank cap
- A fuel pump module mounted inside the fuel tank, and
- A variety of hoses.

The fuel pump module is basically comprised of:
- An electric fuel pump mounted inside a canister type pump reservoir
- A lower inlet filter
- An upper outlet filter
- A pressure regulator
- A float type fuel level sensor.



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FUEL PUMP MODULE
1. *Fuel pump reservoir*
2. *Lower inlet filter*
3. *Upper outlet filter*
4. *Fuel pressure regulator*
5. *Float type fuel level sensor*

Fuel Pump Operation

When the pump is in operation, it draws fuel into the canister through a lower inlet filter and a disk type valve.

The pressurized fuel is pushed through an upper outlet filter to the fuel rail.

Excess fuel pressure generated by the pump is routed from the upper filter back to the pump canister reservoir by a pressure regulator mounted on the pump reservoir cover.

When the START button is pressed, the electrical system is powered. The fuel pump will come on for approximately 2 seconds to pressurize the fuel rail in preparation for the engine start.

The ECM supplies the ground signal to turn on the fuel pump motor.

The pressure regulator will ensure appropriate fuel pressure is supplied to the injectors.

When the ECM receives a signal to shut down the engine (START/STOP switch or engine cut-off switch) it removes the fuel pump ground signal.

Fuel Level Indication

An electric float type fuel level sensor is mounted on the side of the fuel pump reservoir. As the float moves with changing fuel levels, it varies a resistance that changes the voltage signal coming from the multifunction gauge. This signal is representative of the fuel level.

The multifunction gauge interprets the fuel level voltage signal that comes back from the fuel level sensor. It then displays the proper fuel level in the multifunction gauge and a low fuel warning message when required.

The multifunction gauge will also trigger the beeper which produces the appropriate beep signal to warn the driver of a low fuel condition.

The fuel level sensor resistance is at its lowest value when the fuel tank is full, and at its highest value when the tank is empty.

Refer to the *FUEL LEVEL SENSOR* in this subsection for fuel level sensor testing procedures.

Fuel Tank Venting

The entire vent system is incorporated within the fuel tank cap.

⚠ WARNING

If the cap requires replacement, it must be replaced with an approved vented cap of the same type supplied by BRP. Use of any other cap, or use of a non-vented cap will not allow proper venting of the fuel tank. The result may be engine fuel starvation, fuel tank overpressure, or fuel leaks which could lead to a fire or an explosion.

NOTE: BRP is the only supplier of the vented fuel tank cap. There is no equivalent vented fuel tank cap available on the market today.

INSPECTION

FUEL TANK LEAK TEST

1. Remove central body. Refer to *BODY* subsection.

NOTE: To access all fuel system components for a thorough inspection, the central body must be removed.

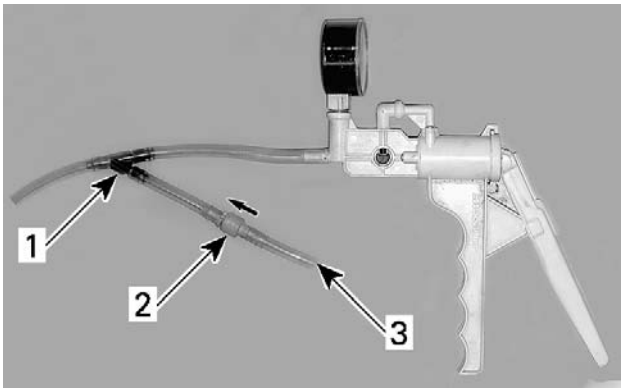
2. Visually inspect condition of hoses and clamps.
3. Remove fuel tank cap.
4. Fill up fuel tank.
5. Install test cap on the fuel tank filler neck.

REQUIRED TOOL	
TEST CAP (THREADED) (529 033 102)	
NOTE: Test cap is included in LEAK TEST KIT (P/N 529 033 100)	

6. Use the following tool to pressurize fuel tank.

REQUIRED TOOL	
VACUUM/PRESSURE PUMP (P/N 529 021 800)	

NOTE: A Y-fitting and a check valve can be installed to use compressed air for quick pressure build-up when the fuel tank is not full.



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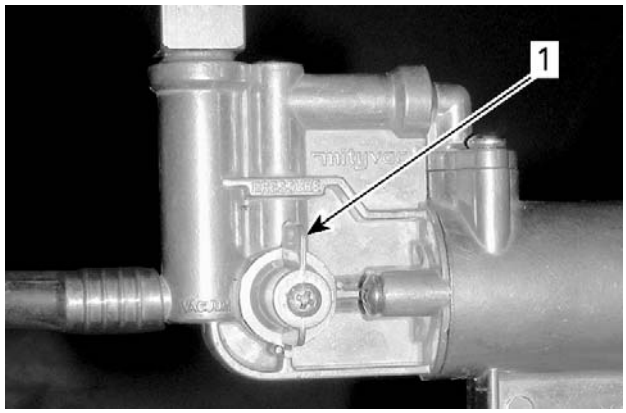
1. *Y-fitting (P/N 293 710 059)*
2. *Check valve (P/N 275 500 505)*
3. *Apply compressed air here*

7. Connect the vacuum/pressure pump to the nipple of fuel tank test cap.
8. Set vacuum/pressure pump to PRESSURE.



1. Pressure selected

9. Pressurize fuel tank to specification.

NOTICE **Do not exceed the specification when pressurizing the fuel tank.**

FUEL TANK LEAK TEST	
PRESSURE	TIME WITHOUT PRESSURE DROP
21 kPa (3 PSI)	10 minutes

If the pressure drops, locate fuel leak(s), repair/replace leaking component(s) and retest.

Possible leak areas are:
- Filler neck, hose and connections
- Fuel tank
- Fuel tank neck
- Fuel pump gasket
- Fuel pump check valve (unlikely).

To locate a leak, check for a fuel smell or leaking fuel.

If a leak is not visible, spray a soapy water solution on components to ease locating the leak(s); bubbles will indicate the leak location(s).

NOTE: If the pressure drops and no leak has been found, it could possibly be a fuel pump check valve problem.

NOTICE **When the fuel system leak test is completed, thoroughly rinse all components of the soapy water solution with clear water. A soapy water residue may cause premature deterioration and must be rinsed away.**

⚠ WARNING

If a leak is found, do not start the engine. Wipe off any fuel that leaked and ventilate the hull thoroughly to remove any accumulated fuel vapors. Do not use electric powered tools on watercraft unless system has passed the leak test.

10. Remove test cap.

FUEL TANK CAP LEAK TEST

To test the fuel tank cap, use the following tools.

REQUIRED TOOLS
VACUUM/PRESSURE PUMP (P/N 529 021 800)
VENTED CAP TEST ADAPTER (THREADED) (P/N 529 036 243)

VACUUM/PRESSURE PUMP

VENTED CAP TEST ADAPTER — TYPICAL THREADED TYPE SHOWN

Inlet Check Valve Function Test

Install the fuel tank cap onto the vented cap test adapter.

Set vacuum/pressure pump to the VACUUM function.

Connect vacuum/pressure pump to nipple of vented cap test adapter.

Squeeze the vacuum/pressure pump handle several times to draw air in through the check valve of fuel tank cap.

Air should be drawn in freely and vacuum indication on pump should remain at zero. If vacuum rises, replace the fuel tank cap.

Pressure Relief Valve Function Test

Set the vacuum/pressure pump to the PRESSURE function.

Squeeze the vacuum/pressure pump handle to apply pressure to the check valve of fuel tank cap and observe the pressure rise. It should be as per specification.

FUEL TANK CAP TEST	
PRESSURE	TEST RESULT
Up to 6.9 kPa (1 PSI)	Pressure must hold
Above 6.9 kPa (1 PSI) and below 13.8 kPa (2 PSI)	Pressure must release

If pressure holds above specification, replace the fuel tank cap.

Remove test adapter.

Reinstall/close fuel tank cap.

FUEL SYSTEM HIGH PRESSURE LEAK TEST

⚠ WARNING

A high pressure leak test must be carried out before starting the engine anytime a fuel system component has been disconnected for maintenance or replacement.

NOTE: To access all fuel system components for a thorough fuel leak check, the central body must be removed. Refer to *BODY* subsection.

1. Visually inspect fuel system to ensure all fuel system connections are properly made.
2. Lightly pull on hoses at each connection to ensure they are properly locked at the quick connect fittings.
3. Install the following tool on the disconnected steering connector. This will permit activation of the electrical system for testing using the vehicle controls.

REQUIRED TOOL
Diagnostic harness (P/N 529036276)

4. Remove tether cord from the engine cut-off switch to prevent engine starting.
5. Press the START button to turn on the fuel pump for a few seconds and pressurize the fuel system.

NOTE: As you press the START button, take a firm hold of the fuel pump outlet hose. You should feel the fuel pump operation.

6. Check for fuel odor and visually inspect hoses, fittings and components for leaking fuel.
7. If a leak is detected, repair or replace the leaking component and repeat leak test after the repair.
8. If no leak is found, engine can be started.

FUEL PUMP PRESSURE TEST

Preparation

The pressure test will show the available pressure at the fuel pump outlet. It validates the pressure regulator, the fuel pump and check valve and it tests for leaks in the system.

1. Remove central body, refer to *BODY* subsection.

NOTE: To access all fuel system components for a thorough fuel leak check, the central body must be removed.

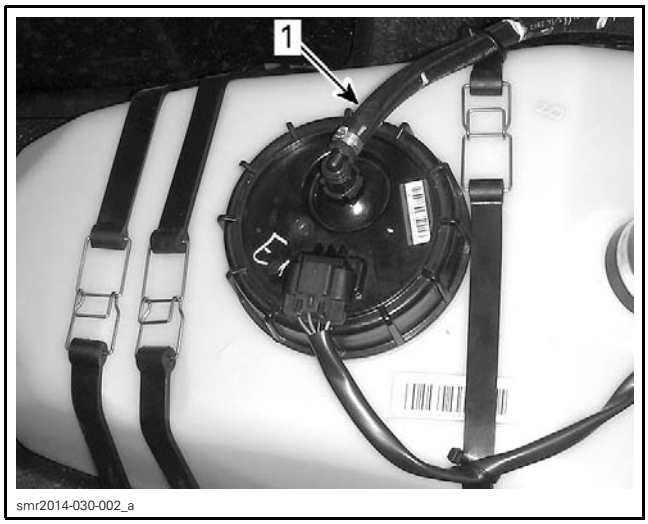
2. Ensure the battery is fully charged, refer to *CHARGING SYSTEM*.
3. Install the following tool on the disconnected steering connector. This will permit activation of the electrical system for testing using the vehicle controls.

REQUIRED TOOL
Diagnostic harness (P/N 529036276)

4. Ensure hoses and fittings are not leaking. Repair any leak.
5. Ensure there is enough gas in the fuel tank.
6. Disconnect the pressure outlet hose from the fuel pump.

⚠ WARNING

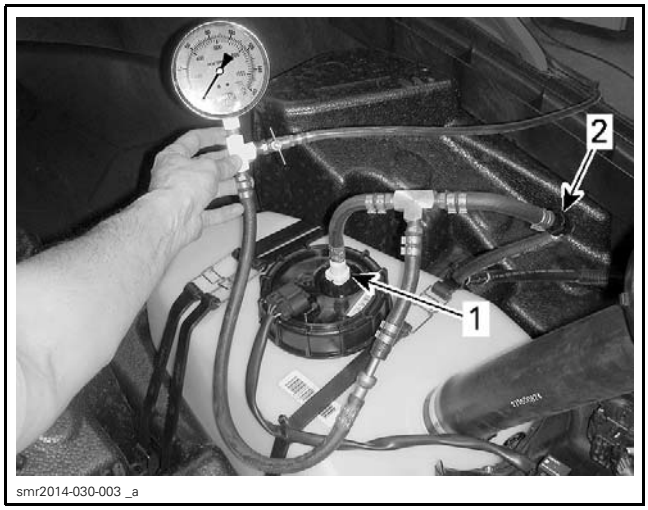
Cover the fuel line connection with an absorbent shop rag. Wipe off any fuel spillage inside the bilge.



1. Outlet hose

7. Install pressure test tools between disconnected hose and fuel pump fitting (in line installation).

REQUIRED TOOLS	
PRESSURE GAUGE (P/N 529 035 709)	
FUEL HOSE ADAPTER (P/N 529 036 023)	



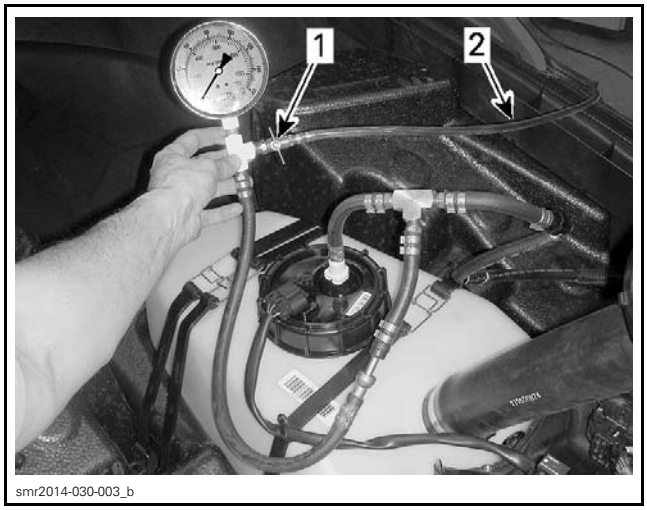
TYPICAL
1. Connect to fuel pump
2. Connect to outlet hose

Test when Engine Is Stopped

1. Remove tether cord from the engine cut-off switch to prevent engine starting.
2. Press the START button and observe fuel pressure.
3. Release pressure in system using the valve on the pressure gauge between each test so that the reading returns to zero (0).

NOTE: Be sure to drain the fuel pressure into an approved fuel container.

4. Repeat test twice and compare readings to specifications in following table.



FUEL PUMP PRESSURE TEST
1. Pressure relief valve on gauge
2. Hose to a fuel drain bottle

MODELS	FUEL PRESSURE (WHEN PRESSING THE START BUTTON)
All	386 kPa - 414 kPa (56 PSI - 60 PSI)

Test when Cranking or Starting Engine

NOTICE **The engine must not be run out of water without providing proper cooling to the exhaust system. Maximum engine run time out of water is 2 minutes. Failure to do so may result in damage to the exhaust system and engine. Refer to *EXHAUST SYSTEM* subsection.**

1. **Crank or start engine** and observe fuel pressure. The fuel pressure should be the same as in previous test.

If pressure is good, fuel pump and pressure regulator are functioning correctly.

2. Stop the engine.

A rapid pressure drop indicates leakage either from the fuel rail or from the fuel pump check valve. Check fuel rail for leaks.

If a pressure drop occurs when pressing the START button and the fuel rail is not leaking, then replace the fuel pump module.

A slow pressure drop indicates leakage either from a fuel injector or from the fuel pressure regulator in the fuel pump module. To check fuel injectors for leaks, refer to the *ELECTRONIC FUEL INJECTION (EFI)* subsection. If injectors are not leaking, then replace fuel pump.

3. Release fuel pressure in system using the valve on the pressure gauge.
4. Remove pressure gauge and reinstall fuel hose on fuel pump module.

⚠ WARNING

Wipe off any fuel spillage in the bilge. Fuel is flammable and explosive under certain conditions. Always work in a well ventilated area.

5. Reinstall all other removed parts, refer to applicable subsections.

PROCEDURES

FUEL HOSES AND OETIKER CLAMPS

NOTE: To access all fuel system components for a thorough inspection, the central body must be removed. Refer to *BODY* subsection.

Fuel Hose Inspection

1. Inspect all fuel hoses for wear, kinks, cracks or any other types of damages.
2. Inspect all clamps for tightness.

Fuel Hose Replacement

When replacing fuel hoses, be sure to use hoses and clamps as available from BRP parts department. This will ensure continued proper and safe operation.

⚠ WARNING

Use of fuel lines other than those recommended by BRP may compromise fuel system integrity.

⚠ WARNING

- **Never use a hose pincher on high pressure hoses.**
- **Never change the routing of a fuel hose.**
- **Always reinstall the corrugated protective tubing on fuel hoses.**
- **Secure fuel hoses using the appropriate locking tie or fastener to prevent contact with sharp edges or hot, rotating and moving parts.**
- **After connecting a hose or a quick connect fitting, pull on the hose near the fitting to make sure it is securely locked.**
- **Always validate fuel system tightness by performing a *FUEL PUMP PRESSURE TEST*.**

Oetiker Clamp Replacement

REQUIRED TOOL	
OETIKER PLIERS (P/N 295 000 070)	

⚠ WARNING

Whenever removing a hose in the fuel system, always use new Oetiker clamps at assembly.

FUEL PUMP

Fuel Pump Operation Test

1. Remove tether cord from the engine cut-off switch to prevent engine starting.
2. Press START button.
3. The fuel pump should run for 2 seconds to build up fuel system pressure.

NOTE: As you press the START button, take a firm hold of the fuel pump outlet hose. You should feel the fuel pump operation.

4. If fuel pump runs, carry out the *FUEL PUMP PRESSURE TEST* as described in *INSPECTION* of this subsection.
5. If the fuel pump does not run:
   - Check if multifunction gauge comes on when start button is pressed.

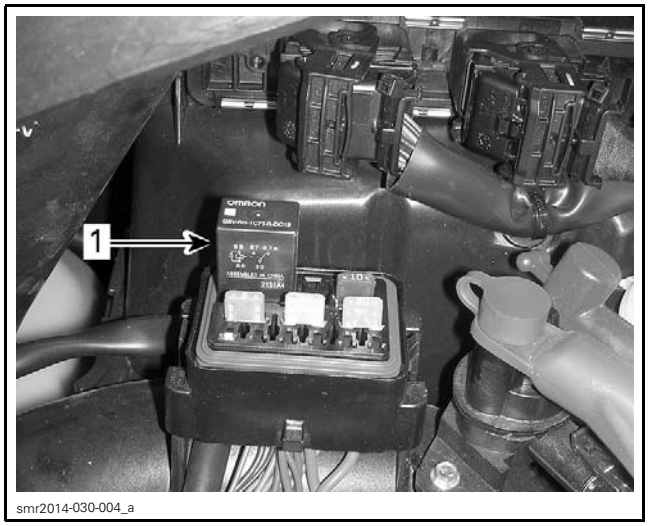
– If the gauge does not come on, check fuses F1, F2 and F3. If a fuse is faulty, replace it and repeat the test.
– If the gauge came on, connect the vehicle to B.U.D.S. and check for fault codes. Carry out service actions.

Fuel Pump Pressure Test

Refer to *INSPECTION* in this subsection.

Fuel Pump Circuit Test

1. Remove central body, refer to *BODY* subsection.
2. Remove fuse box cover.
3. Remove relay from fuse box.



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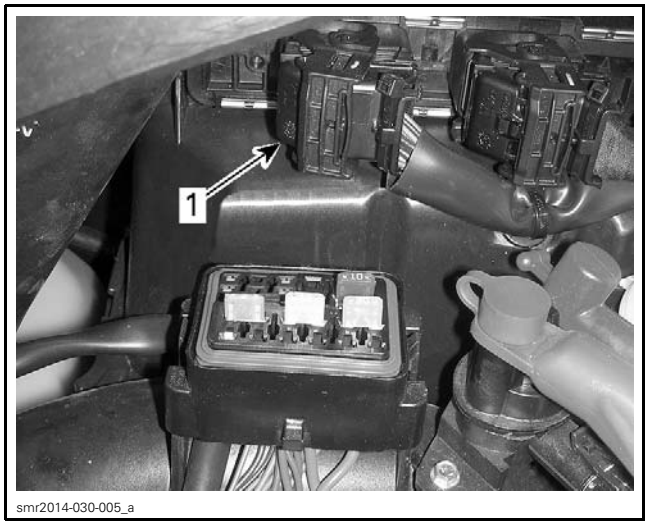
1. Relay to remove

4. Remove ECM-B connector and install it on the ECM adapter tool.



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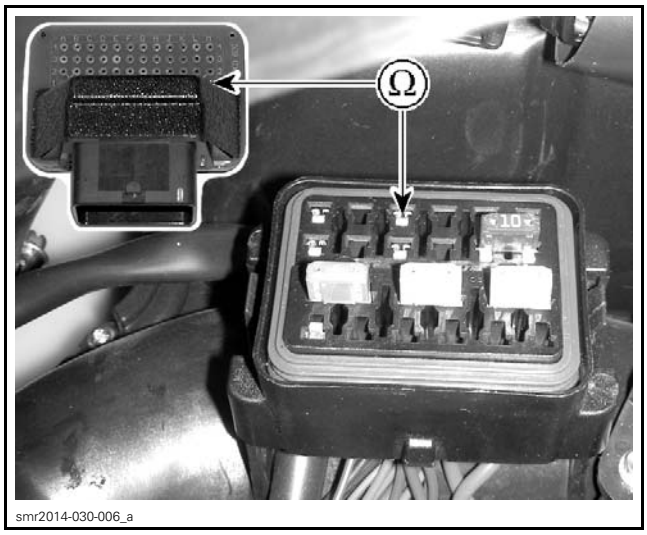
1. ECM-B connector to remove

REQUIRED TOOL
ECM ADAPTER TOOL (P/N 529 036 166)

529036166

5. Set multimeter to Ω and test pump circuit as per following table.

PUMP CIRCUIT TEST THROUGH FUEL PUMP		
TEST PROBES		RESISTANCE @ 20°C (68°F)
Fuse box terminal A4	ECM connector B pin B-M1	Approx. 12 Ω



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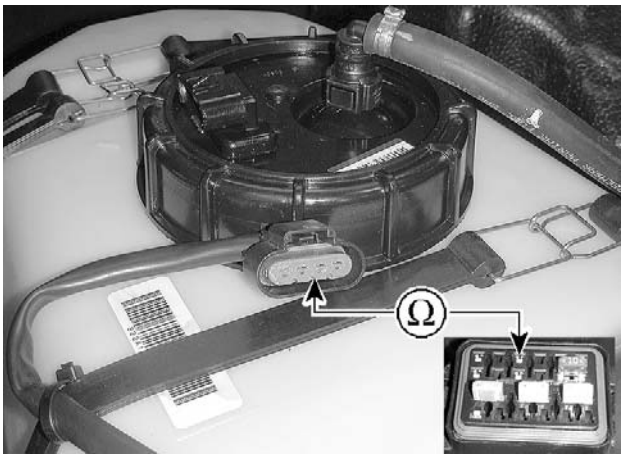
6. If test succeeded, the fuel pump and its wiring harness are electrically good. The problem may be a mechanical problem internal to the fuel pump, or an internal ECM problem that does not provide the control ground for the pump.
7. If test failed:
   – Remove central body, refer to *BODY* subsection.
   – Disconnect fuel pump connector.
   – Test wiring continuity as per following table.

FUEL PUMP HARNESS CONTINUITY TEST (WIRING ONLY)		
TEST PROBES		RESISTANCE @ 20°C (68°F)
Pump harness connector pin B	Fuse box terminal A4	Close to 0 Ω (continuity)
Pump harness connector pin A	ECM connector B pin B-M1	



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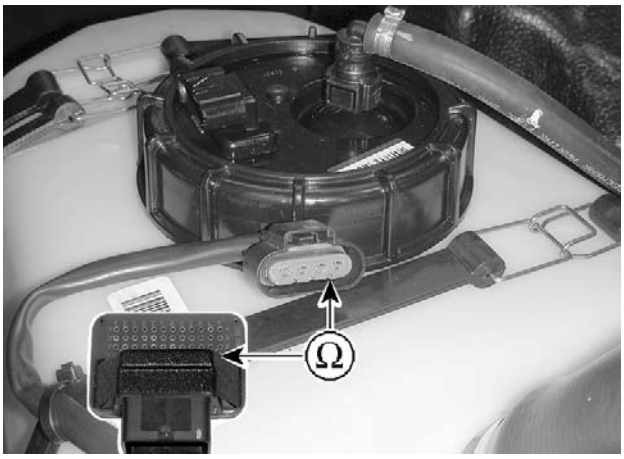

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If there is an open circuit to FB-A4, repair wiring/connector or JT VT between fuel pump and fuse box. Refer to wiring diagram.

If there is good there is an open circuit to the ECM, repair or replace wiring and connectors as required.

If the test succeeded, carry out the *FUEL PUMP INPUT VOLTAGE TEST*.

Fuel Pump Input Voltage Test

1. Remove central body, refer to *BODY* subsection.
2. Ensure the relay is installed in the fuse box and that fuses F1, F2 and F3 are in good condition.

NOTE: The fuel pump does not have a dedicated fuse. However, if any one of the listed fuses is open circuit, electrical power will not come on, or stay on.

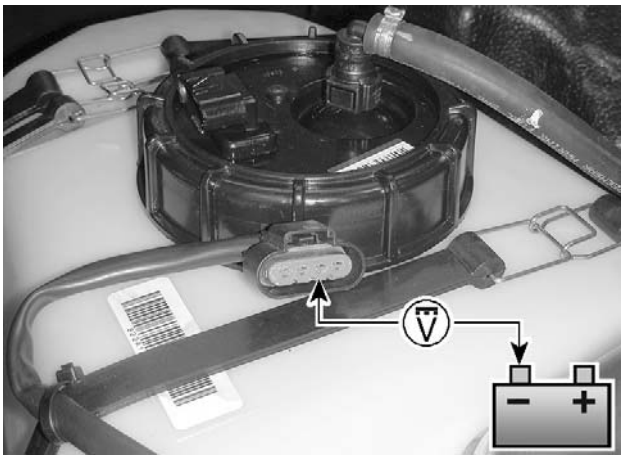
3. Install the following tool on the disconnected steering connector. This will permit activation of the electrical system for testing using the vehicle controls.

REQUIRED TOOL
Diagnostic harness (P/N 529036276)

4. Use the FLUKE 115 MULTIMETER (P/N 529 035 868).
5. Select Vdc.
6. Press the START button.
7. Read voltage at fuel pump harness connector as per following table.

NOTICE **Do not force a probe in the connector sockets. If so, the sockets may be permanently damaged causing poor pin contact with socket resulting in the requirement to replace the socket(s), or the connector.**

INPUT VOLTAGE TEST		
TEST PROBES		VOLTAGE
Pin B (+ probe)	Battery ground (- probe)	Battery voltage



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FUEL PUMP INPUT VOLTAGE TEST

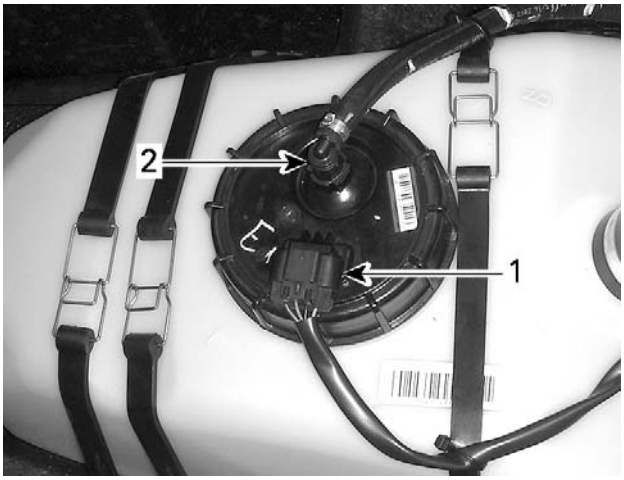
If battery voltage is read, power circuit is good. Test the fuel pump control circuit from ECM. Refer to *FUEL PUMP CIRCUIT TEST*.

If battery voltage is not read, power circuit is faulty. Test continuity of power circuit wiring between fuse box and fuel pump. Refer to *FUEL PUMP CIRCUIT TEST* in this subsection.

If every test succeeded and fuel pump still does not work, the problem may be a mechanical fuel pump problem, or the ECM that does not provide the ground control signal to the fuel pump. Refer to *ELECTRONIC FUEL INJECTION (EFI)* subsection.

Fuel Pump Removal

1. Remove central body. Refer to *BODY* subsection.
2. Disconnect the negative battery terminal, refer to *CHARGING SYSTEM* subsection.
3. Disconnect fuel pump electrical connector.
4. Wrap shop rags around the high pressure fuel hose fitting, then press on the release button of the quick connect fitting and disconnect the hose.



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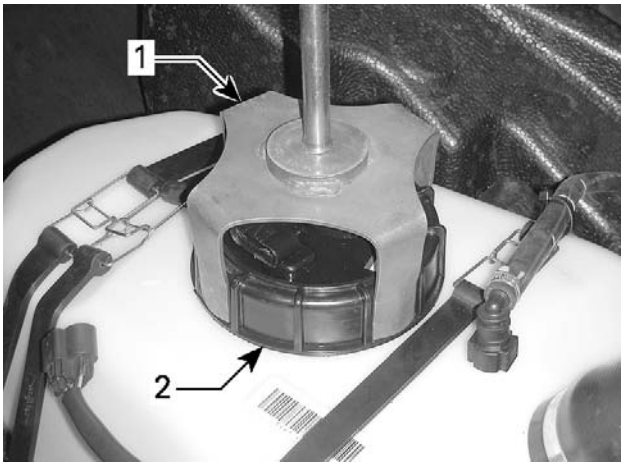
1. Fuel pump harness connector
2. Quick connect fitting (high pressure fuel hose)

5. Unscrew the fuel pump retaining nut.

REQUIRED TOOL	
FUEL PUMP MODULE SOCKET (P/N 529 036 125)	



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1. Fuel pump module socket
2. Fuel pump retaining nut

NOTICE **While pulling out the fuel pump module, pay attention to the corrugated tubes and fuel sensor float arm. Float arm can get caught up and bend which will reduce fuel sensor accuracy. If fuel pump module is dropped or damaged, it must be replaced.**

6. Slowly pull fuel pump module up through opening until corrugated tubes contact sides of opening. Tilt the fuel pump module as you slowly pull the pump upwards.

⚠ WARNING

The upper filter and fuel pump reservoir on the fuel pump module contain fuel which will drain out when fuel pump module is not in an upright position.

7. Carefully pull fuel pump module out.

⚠ WARNING

Always wipe off any fuel spillage from the watercraft. When working with fuel or fuel system and its components, always work in a well ventilated area.

Fuel Pump Installation

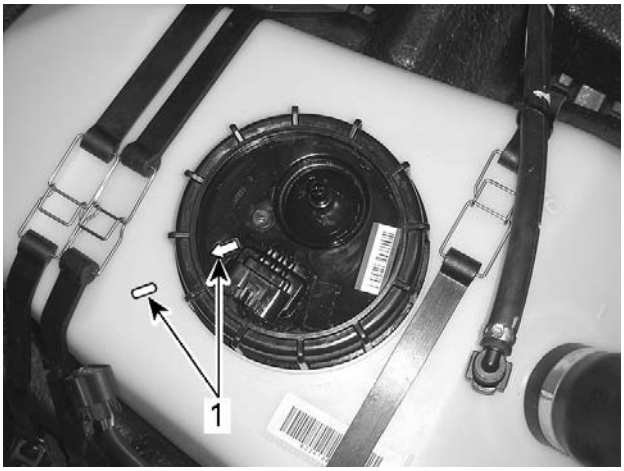
Reverse the removal procedure however, pay attention to the following.

1. Carefully insert fuel pump module in fuel tank so as not to bend float arm.
2. Install a NEW fuel pump module gasket each time the module is reinstalled.

NOTE: Wipe off parts to prevent fuel pump from turning while torquing fuel pump nut.

3. Align arrow on top of fuel pump module with index mark on top of fuel tank or fuel sensor accuracy will be affected.

NOTE: Index mark and arrow locations are highlighted for clarity in following illustration.



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FUEL PUMP MODULE INDEXING
1. Align marks

4. Tighten fuel pump nut to specification.

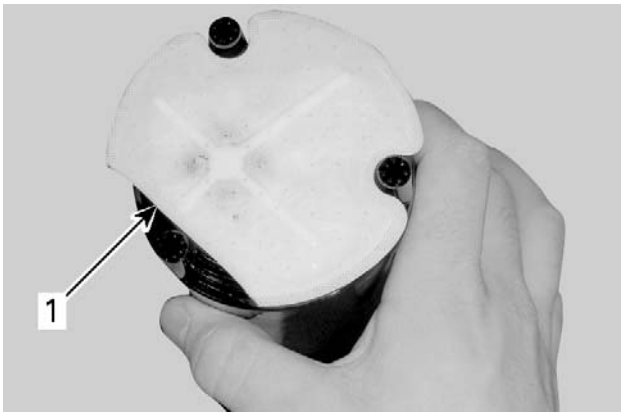
TORQUE	
Fuel pump nut	60 N•m ± 7 N•m (44 lbf•ft ± 5 lbf•ft)

5. Carry out a *FUEL TANK LEAK TEST* and a *FUEL SYSTEM HIGH PRESSURE LEAK TEST*. See procedures in this subsection.

FUEL FILTER

Fuel Filter Inspection

Inspect fuel filter. If dirty, partially clogged or damaged, replace it.



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1. Fuel filter

Fuel Filter Removal

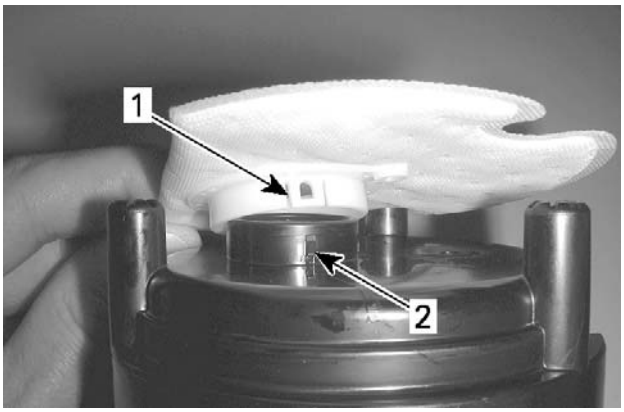
NOTE: The lower fuel filter on the fuel pump module does not require replacement under normal operating conditions. Replace only if permanently clogged or damaged.

1. Remove fuel pump. Refer to *FUEL PUMP* in this subsection.

⚠ WARNING

The upper filter and fuel pump reservoir on the fuel pump module contain fuel which will drain out when fuel pump module is not in an upright position.

2. Turn fuel pump upside down.
3. Using a small flat screwdriver, pry up the filter locking tabs.



smr2008-022-013_a

1. Fuel filter locking tab (x2)
2. Filter locking pin (x2)

4. Pull filter off fuel pump reservoir housing.

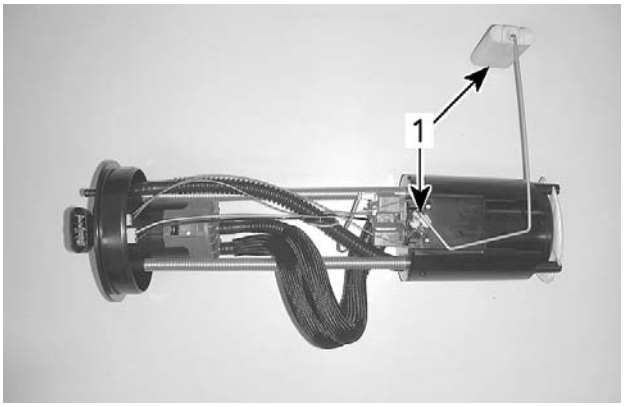
Fuel Filter Installation

1. Align new filter with pump reservoir housing.
2. Press new filter on by hand. Ensure it is fully seated and locked onto the pump reservoir housing.
3. Reinstall fuel pump as per procedure in this subsection.
4. Carry out a *FUEL SYSTEM HIGH PRESSURE LEAK TEST* as described in this subsection.
5. Install or other removed parts, refer to applicable subsection.

FUEL LEVEL SENSOR

Fuel Level System Overview

A float type fuel level sensor mounted on the fuel pump module sends a signal to the multifunction gauge.



smr2008-022-007_b

TYPICAL — FUEL PUMP MODULE
1. Fuel level sensor

The multifunction gauge interprets this signal and turns on the appropriate number of segments of a bar type fuel level indication in the lower RH side of the digital screen in the multifunction gauge.

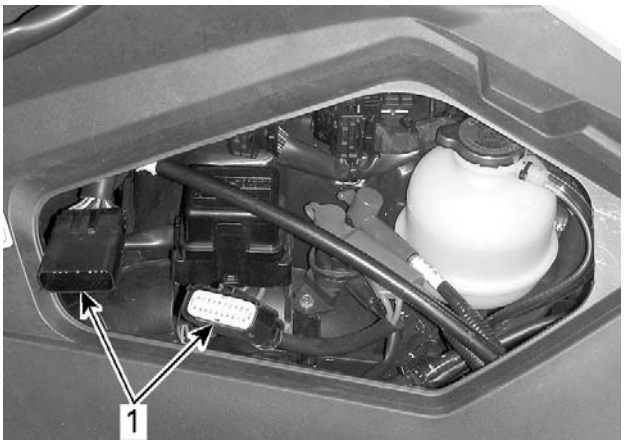
Fuel Level Troubleshooting

FUEL LEVEL TROUBLESHOOTING	
SYMPTOM	POSSIBLE CAUSE
Fuel gauge always display EMPTY	– Wiring/connectors – Fuel level sensor – Float stuck in low position
Fuel gauge always display FULL	– Water in fuel pump connector – Float stuck in full position
Fuel level sensor fault code	– Wiring/connectors – Fuel level sensor
Fuel gauge displays wrong level	– Low battery voltage – Fuel level sensor fault

Use B.U.D.S. to check for a fault code. Refer to *DIAGNOSTIC AND FAULT CODES*.

Fuel Level Sensor Resistance Test at Steering Connector

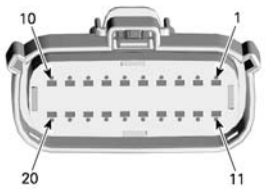
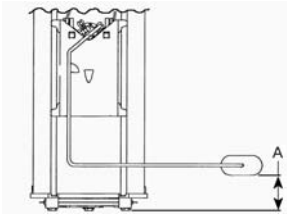
1. Remove LH access cover, refer to *BODY* subsection.
2. Disconnect steering connector.



smr2014-030-011_a

1. Steering connector disconnected

3. Use the FLUKE 115 MULTIMETER (P/N 529 035 868) and select Ω.
4. Alternately drain then fill fuel tank and measure the sensor resistance between pin 19 and battery ground.

RESISTANCE (Ω)	FLOAT HEIGHT (MM)
4.8 ± 2.2	260.2 ± 3.0 **(FULL)**
17.8 ± 2.2	220.9 ± 3.0
27.8 ± 2.2	198.1 ± 3.0
37.8 ± 2.2	173.2 ± 3.0
47.8 ± 2.2	147.6 ± 3.0 **(HALF)**
57.8 ± 2.2	117.6 ± 3.0
67.8 ± 2.2	84.6 ± 3.0
77.8 ± 2.2	59.3 ± 3.0
89.8 ± 2.2	27.3 ± 3.0 **(EMPTY)**
	 A. Float height

NOTE: If fuel tank is not full or empty, the resistance value will be proportional to the fuel level (somewhere in-between).

If readings are as per specifications, check continuity of wire from steering connector to multifunction gauge connector. Refer to *WIRING DIAGRAM*.

If continuity is good, the fuel level circuit and sensor are good. If fuel level does not work in multifunction gauge, try a new one.

If readings are out of specifications at the steering connector, perform the *FUEL LEVEL SENSOR RESISTANCE TEST AT FUEL PUMP*.

NOTE: For access to the fuel pump connector, remove the central body. Refer to *BODY* subsection.

If an open circuit is measured at the fuel pump, replace the fuel level sensor. Refer to *FUEL LEVEL SENSOR REMOVAL* in this subsection.

If readings are good at the fuel pump, carry out the following continuity tests. Refer to *WIRING DIAGRAM*.

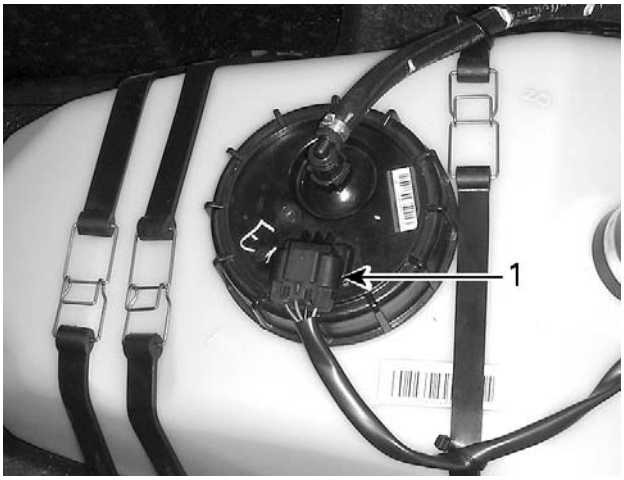
– Steering connector to fuel pump connector.
– Fuel pump connector to engine ground.

Repair or replace wiring and connectors as required.

5. Reconnect multifunction gauge connector.

Fuel Level Sensor Resistance Test at Fuel Pump

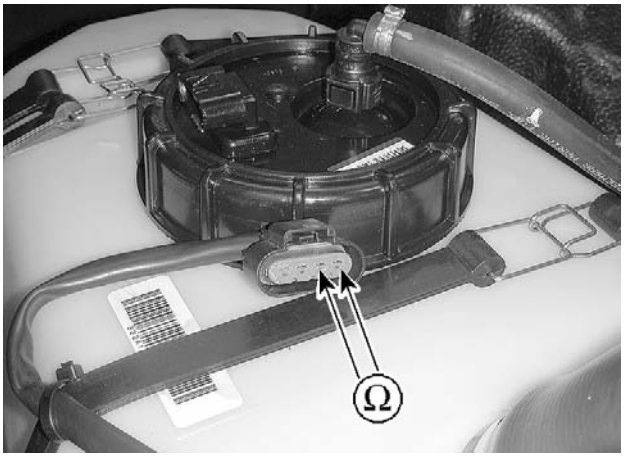
1. Remove central body, refer to *BODY* subsection.
2. Disconnect fuel pump module connector.



smr2014-030-002_c

FUEL PUMP MODULE
1. Fuel pump module connector

3. Alternately drain then fill fuel tank and measure the sensor resistance between pins "C" and "D" of the fuel pump connector. See table in *FUEL LEVEL SENSOR RESISTANCE TEST AT MULTIFUNCTION GAUGE*.



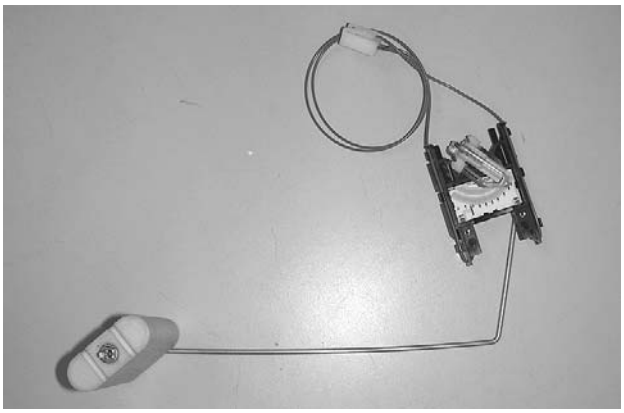
smr2014-030-007_d

FUEL LEVEL SENSOR RESISTANCE TEST

If readings are out of specifications, replace sensor.

When everything else has been tested and fuel level is still not working, try a new multifunction gauge.

Fuel Level Sensor Removal



smr2008-022-029

FUEL LEVEL SENSOR

1. Remove fuel pump module from fuel tank, see *FUEL PUMP REMOVAL* in this subsection.

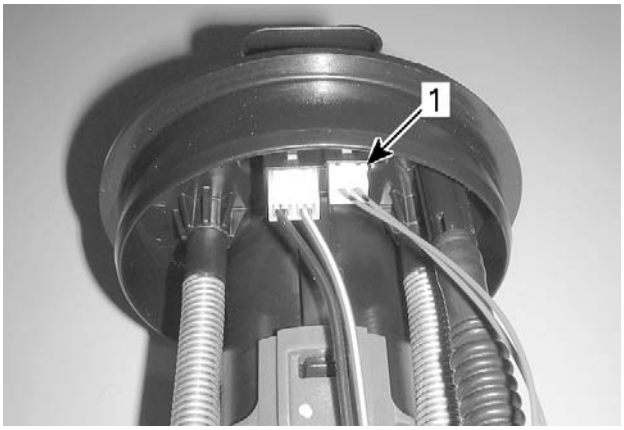
⚠ WARNING

The upper filter and fuel pump reservoir on the fuel pump module contain fuel which will drain out when fuel pump module is not in an upright position.

2. Drain all fuel from the upper fuel filter and fuel pump reservoir in an appropriate container.

NOTE: Note routing of fuel level sensor wires prior to disconnecting the sensor from the fuel pump module flange.

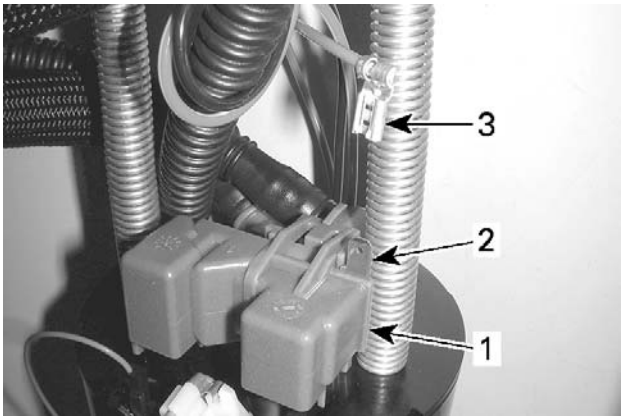
3. Disconnect the fuel level sensor connector from the fuel pump module upper flange.



smr2008-022-021_a

1. Fuel level sensor connector

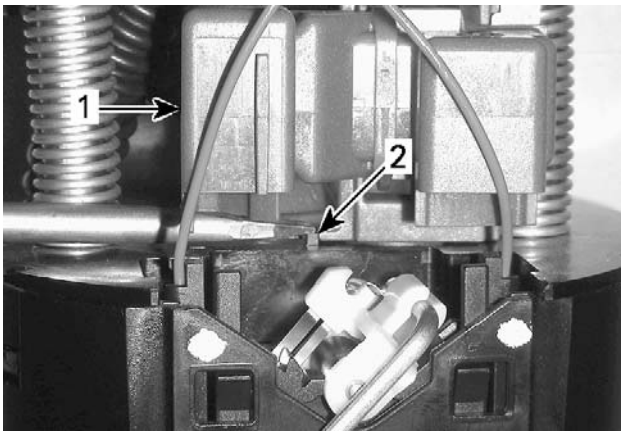
4. Disconnect the ground wire from the pressure regulator. Be careful not to bend the ground contact on the pressure regulator.



smr2008-022-022_a

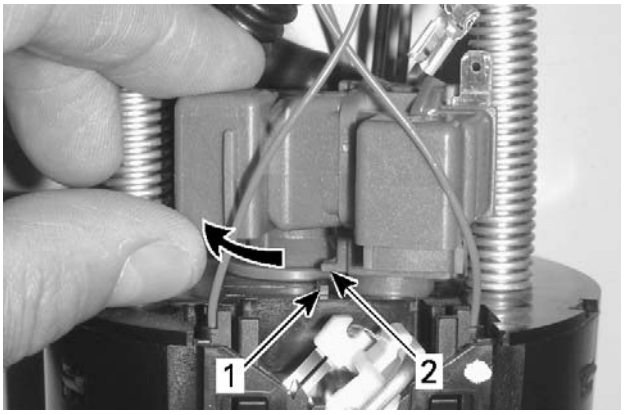
1. Pressure regulator
2. Ground wire contact on pressure regulator
3. Ground wire disconnected

5. Using a flat screwdriver, press down on the locking tab just below the pressure regulator to release it from the pump reservoir cover, and rotate it clockwise simultaneously so that it slips over the locking tab.



smr2008 022-023_a

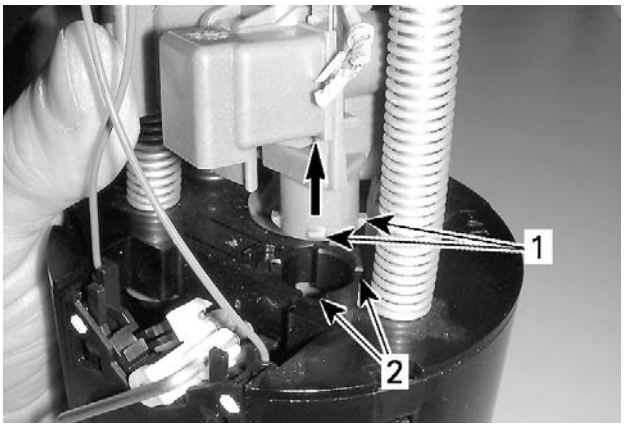
1. Pressure regulator
2. Pressure regulator locking tab



smr2008-022-024_a

1. Pressure regulator locking tab
2. Pressure regulator rotated clockwise over locking tab

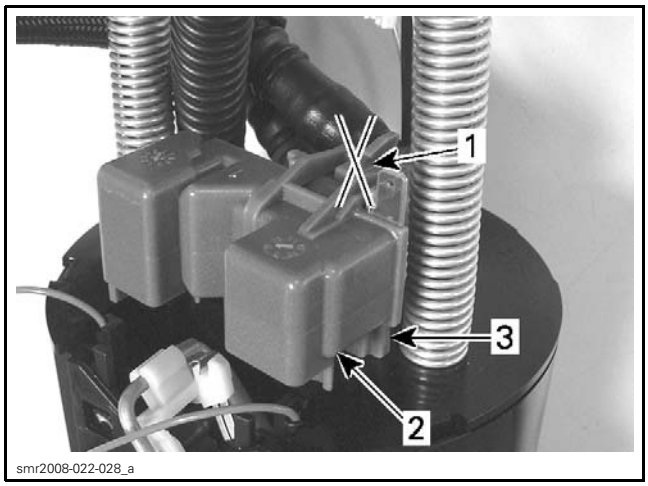
6. Once the pressure regulator is rotate over the locking tab, pull up on it to remove it from the pump reservoir cover.



smr2008-022-025_a

1. Pressure regulator alignment tabs
2. Fuel pump reservoir alignment tabs

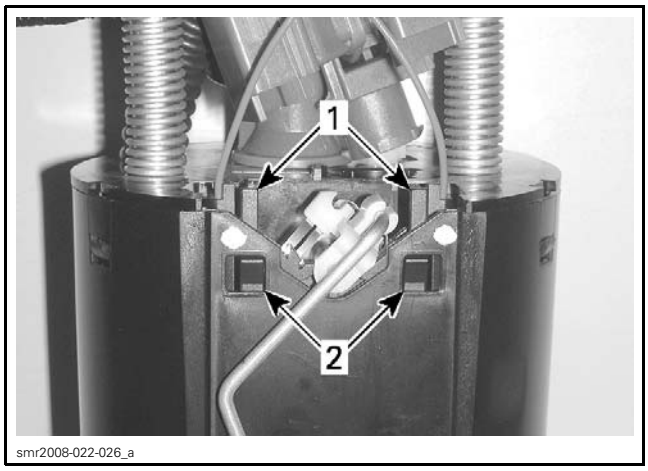
NOTE: The pressure regulator cover must not be removed from the pressure regulator housing assembly.



smr2008-022-028_a

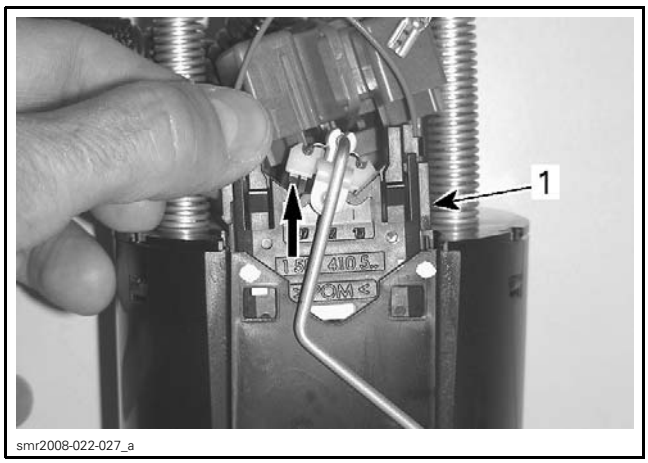
1. *Do not remove pressure regulator cover at locking tabs*
2. *Pressure regulator cover*
3. *Pressure regulator housing*

7. Push in on the release tabs at the top of the fuel level sensor to unlock it from the fuel pump reservoir housing, and simultaneously pull up on the fuel level sensor to remove it.



smr2008-022-026_a

1. *Fuel level sensor release tabs*
2. *Locking pins*



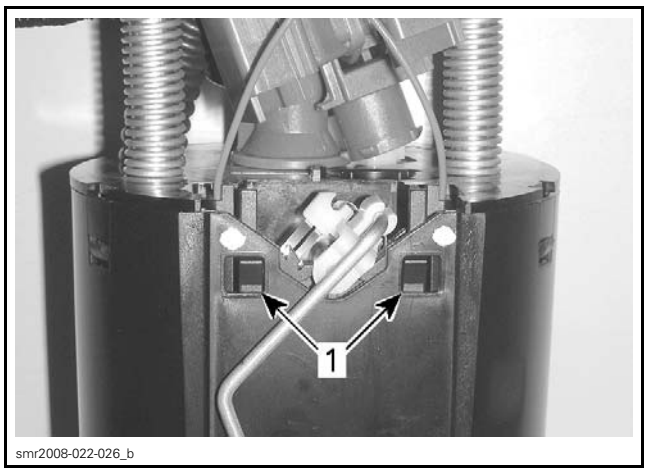
smr2008-022-027_a

1. *Pull up on fuel level sensor*

Fuel Level Sensor Installation

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

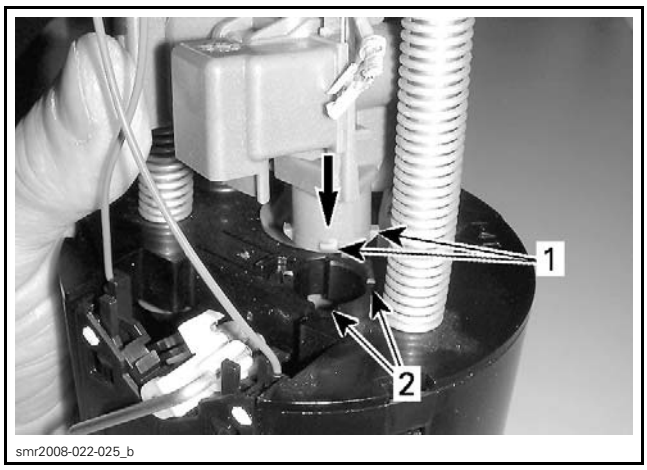
1. Ensure fuel level sensor locking pins are properly engaged into the fuel pump reservoir.



smr2008-022-026_b

1. *Ensure engagement of sensor locking pins*

2. Align the fuel pressure regulator tabs into the pump reservoir cover and turn it counterclockwise until it locks properly.



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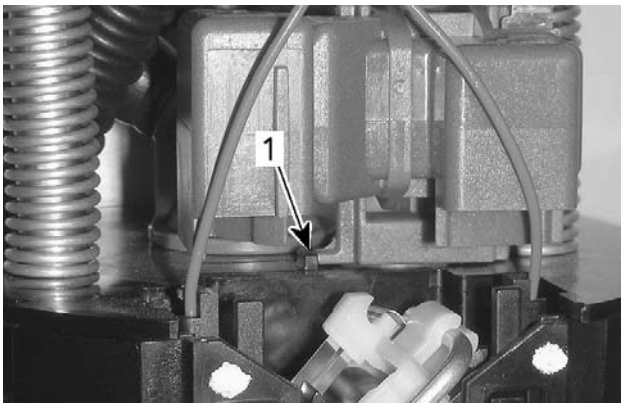
PRESSURE REGULATOR INSERTION INTO PUMP RESERVOIR COVER

1. *Pressure regulator alignment tabs*
2. *Fuel pump reservoir alignment tabs*



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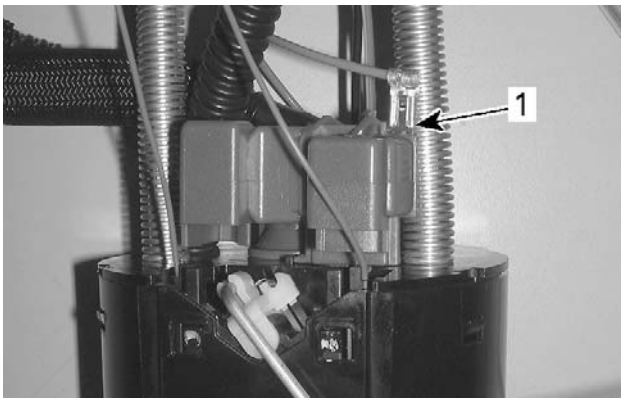
TAB UP WHEN PRESSURE REGULATOR PROPERLY LOCKED
1. Pressure regulator locking tab

3. Reconnect the ground wire onto the pressure regulator.



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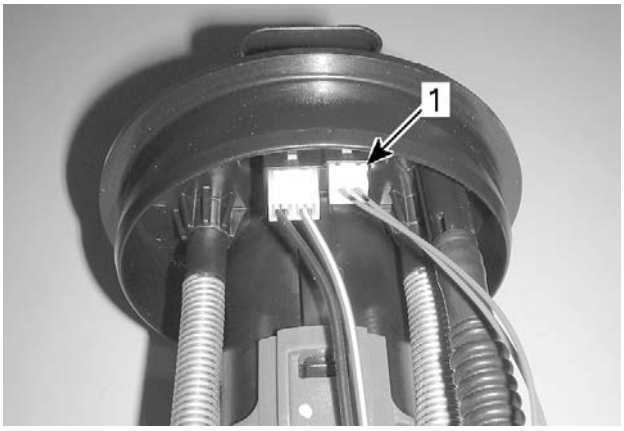
1. Pressure regulator ground wire installed

4. Ensure fuel level sensor connector is locked into the module flange connector.



smr2008-022-021_a

1. Fuel level sensor connector

5. Carry out a *FUEL LEVEL SENSOR RESISTANCE TEST* as described in this subsection.

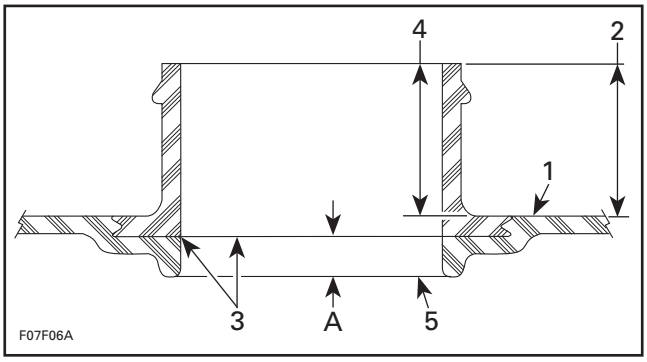
6. Reinstall the fuel pump module. Refer to *FUEL PUMP INSTALLATION* in this subsection.

FUEL TANK

Fuel Tank Inspection

1. Remove central body. Refer to *BODY* subsection.
2. Inspect fuel tank retaining straps for wear, cracks or any other damages. Inspect strap clip anchors and bolts.
3. Inspect fuel tank for wear caused by any abnormal contact or rubbing with other component(s).
4. Disconnect fuel filler hose from fuel tank.
5. Inspect fuel tank filler hose for wear, cracks or other damages.
6. Visually inspect the inside and outside of the fuel tank filler necks for crack(s). If crack(s) are found, replace fuel tank.
7. With your fingers, feel the inside and outside surfaces of fuel tank, especially near the filler neck.
8. Flex fuel tank neck to ensure there are no hidden cracks.

NOTE: A fuel tank is comprised of 2 components: the tank and the filler neck. The filler neck is injection molded and the tank is then blow molded over the neck. During the molding process, a small molding seam may appear on the inner side of the neck at approximately 4 mm (5/32 in) from the base of the neck. It is normal to have a molding seam and it should not be confused with a crack.



1. Tank upper surface area
2. Inspect outer upper surface at filler neck
3. Normal molding seam
4. Inspect upper surface area inside filler neck
5. Base of filler neck
A. Approx. 4 mm (5/32 in)

9. Install filler hose and tighten retaining clamps to specification.

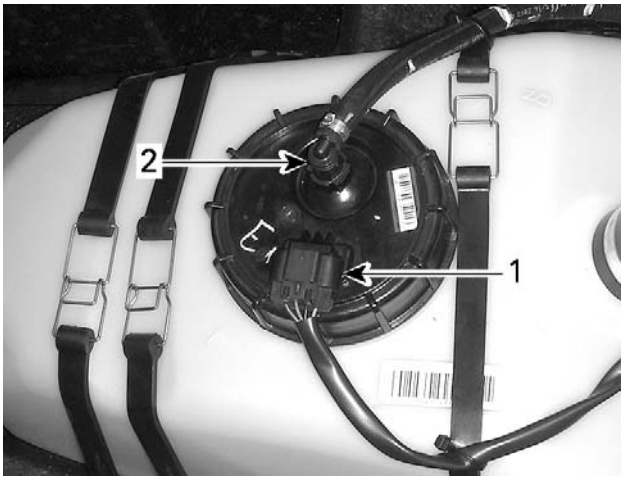
INDEXING WITH FUEL TANK
1. *Index mark on fuel tank*
2. *Index mark drawn on hose before removal*

TORQUE	
Filler hose retaining clamps	3.5 N•m (31 lbf•**in**)

10. Reinstall all other removed parts. Refer to appropriate subsection.

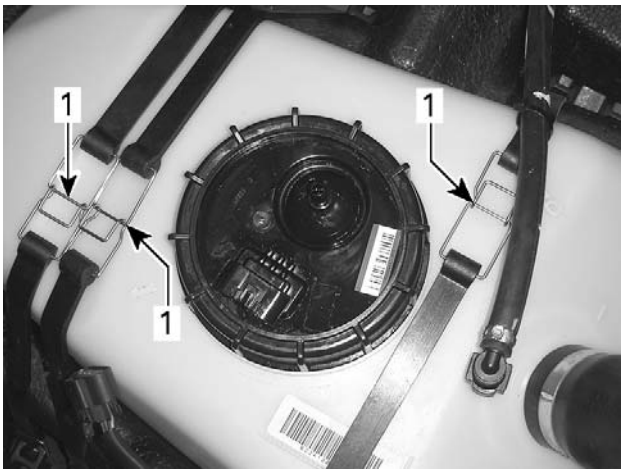
Fuel Tank Removal

1. Siphon fuel tank.
2. Remove the central body. Refer to *BODY* subsection.
3. Disconnect fuel pump connections. **Do not** cut any locking ties. It is not necessary for fuel tank removal.



1. *Fuel pump harness connector*
2. *Quick connect fitting (high pressure fuel hose)*

4. Detach fuel tank retaining straps.



1. *Detach fuel tank retaining straps here*

5. Remove fuel tank from the vehicle.
6. Remove fuel pump as necessary. Refer to *FUEL PUMP* in this subsection.
7. Inspect hull and flotation foams for wear.

NOTE: If replacing fuel tank with a new one, be sure to mark the fuel filler hose position with the hose index mark on the fuel tank before removing the hose from the old tank. This will ease alignment of the retaining screws of the filler neck adapter to the central body.

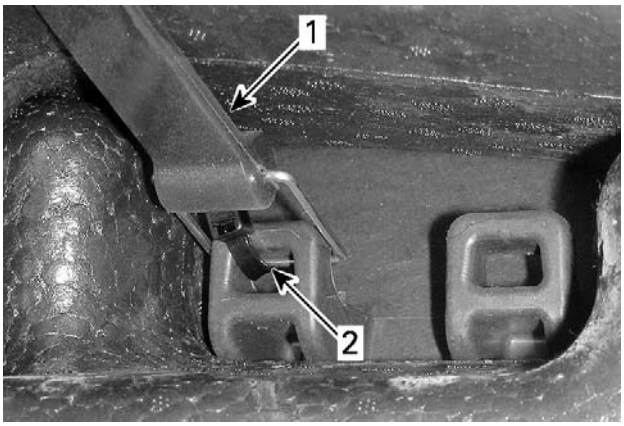
Fuel Tank Installation

NOTE: Apply torque values as specified in the exploded view.

1. Reinstall fuel pump if it was removed. Refer to *FUEL PUMP* in this subsection.
2. If replacing fuel tank with a new one, be sure to align mark on filler hose with index mark on fuel tank.

1. *Index mark on fuel tank*
2. *Index mark drawn on hose before removal*

3. Ensure flotation foam is properly positioned under fuel tank.
4. Ensure fuel tank retaining straps are properly secured to anchor points in hull using locking ties.



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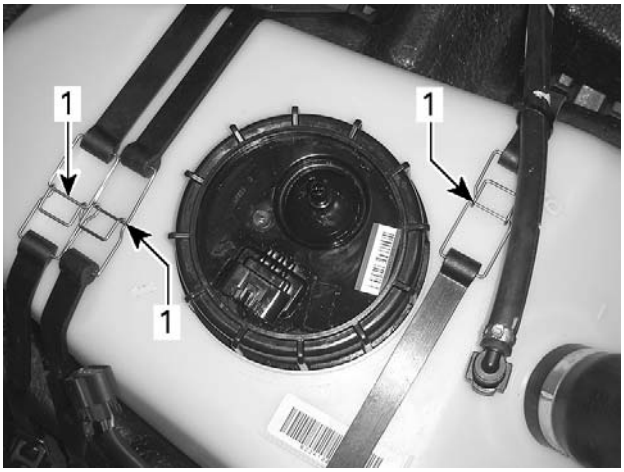
1. Fuel tank retaining strap
2. Strap clip secured with locking tie to anchor point in hull

5. Insert fuel tank in hull.
6. Secure retaining strap ends on top of fuel tank.



smr2014-030-009_b

1. Fuel tank retaining strap

7. Reinstall all other removed parts except for the central body. Refer to applicable subsections.
8. When vehicle reassembly is complete, carry out a *FUEL TANK LEAK TEST* and a *FUEL SYSTEM HIGH PRESSURE LEAK TEST* as described in this subsection.
9. Reinstall the central body. Refer to *BODY* subsection.

NOTE: If the retaining screws for the filler neck adapter do not align with the holes in the central body, loosen the filler hose clamp and slightly rotate the hose. Be sure to retighten hose clamp to specification.