



# ELECTRONIC FUEL INJECTION

## Section 3C - Service Procedures

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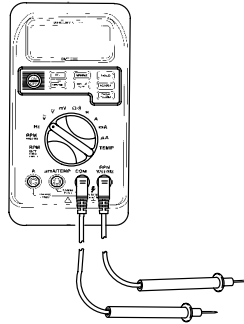
### Specifications

<b>FUEL SYSTEM</b>	<b>Fuel Pump Type</b>  <b>Fuel Pump:</b> <b>Pressure</b> <b>Fuel Tank Capacity</b>	Mechanical Water Cooled (Plunger/Diaphragm)  3-6 psi Accessory
<b>FUEL INJECTION</b>	<b>Fuel Injector System</b> <b>Idle rpm (Out Of Gear)</b> <b>Idle rpm (In Forward Gear)</b> <b>Wide Open Throttle rpm (WOT)</b> <b>Range</b> <b>Fuel Pump Pressure - Electric</b>	Batch (1 & 4) - (2 & 3) 725 ± 25 rpm 725 ± 25 rpm  5500-6000 42-44 psi (290-303 kPa)

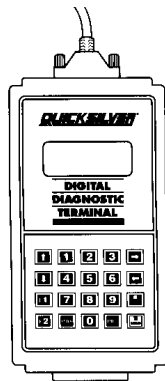


# Special Tools

1. DMT 2000 Digital Tachometer Multi-meter P/N 91-854009A1.



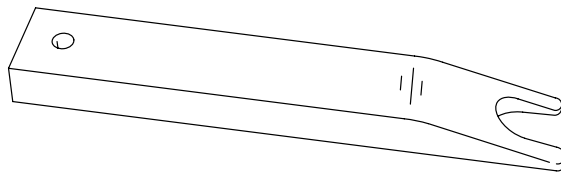
2. Digital Diagnostic Terminal P/N 91-823686A2



3. DDT Cartridge 91-822608-2



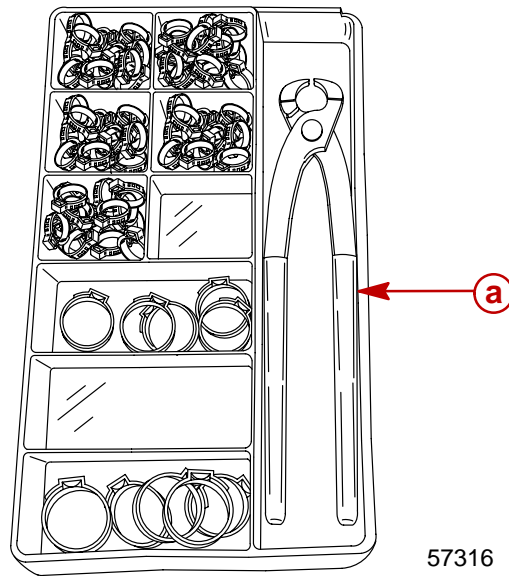
4. Fuel Injector Cap Tool 91-883877A1



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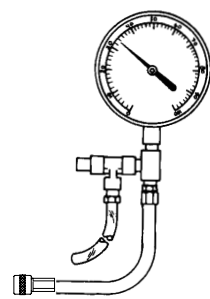


5. Clamp Tool Kit 91-803146A2

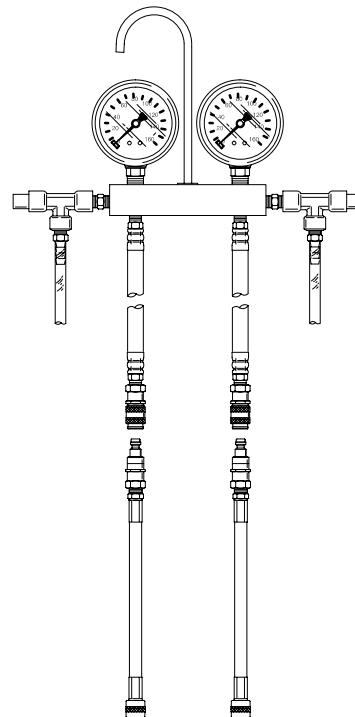


**a** - Clamp Tool 91-803146T

6. Fuel Pressure Gauge 91-16850A7 or Fuel Pressure Gauge 91-852087A3.



91-16850A7





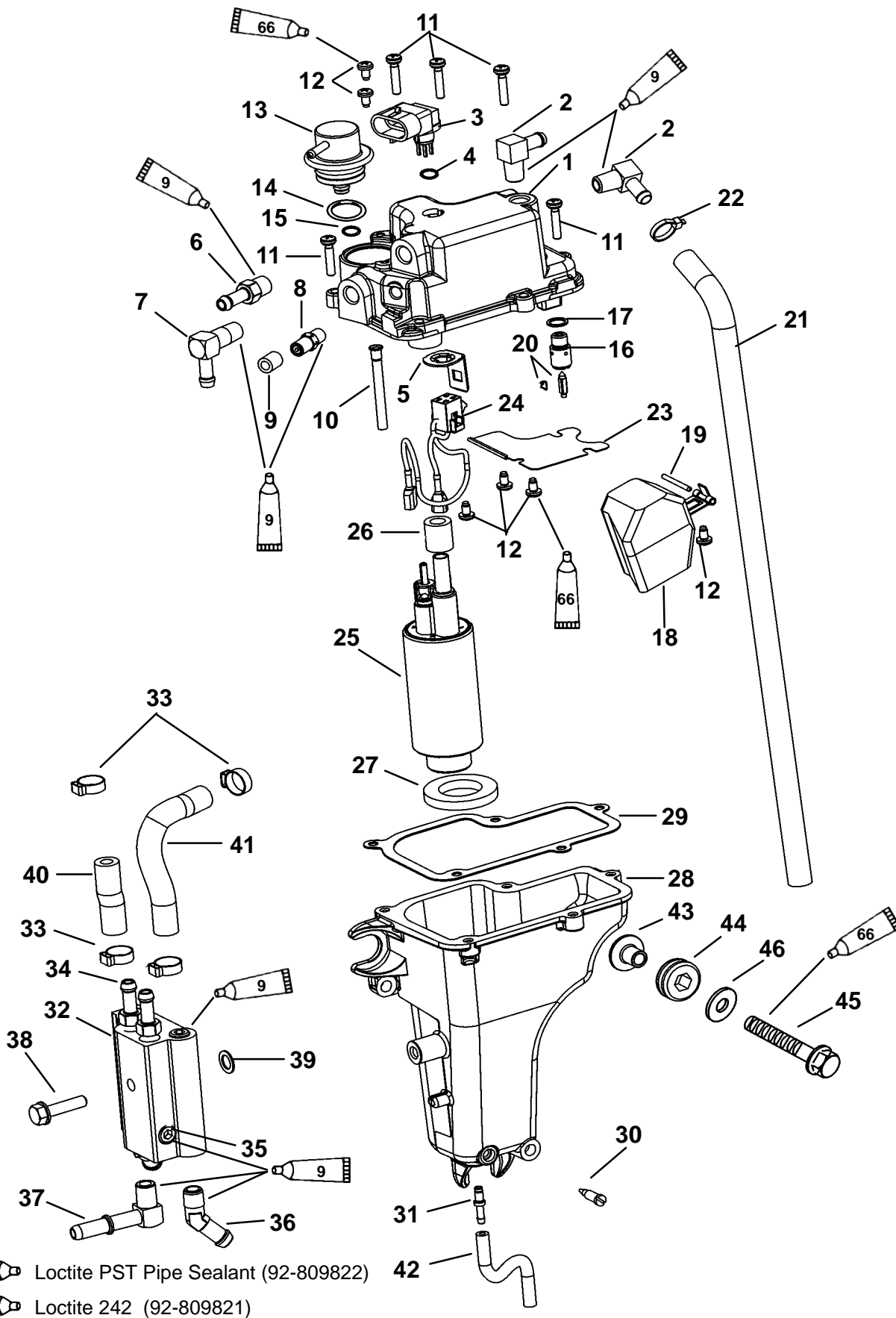


# INTAKE MANIFOLD

REF. NO.	QTY.	DESCRIPTION	TORQUE		
			lb-in	lb-ft	Nm.
1	1	INTAKE MANIFOLD			
2	4	GASKET			
3	1	SCREW	31		3.5
4	1	BRACKET			
5	1	NUT	75		8.5
6	1	IDLE AIR CONTROL (IAC)			
7	1	FUEL DISTRIBUTION MANIFOLD			
8	4	INJECTOR			
9	2	SCREW	31		3.5
10	4	SCREW	31		3.5
11	4	CLIP			
12	1	HOSE			
13	1	THROTTLE BODY			
14	1	GASKET			
15	2	SCREW	31		3.5
16	1	THROTTLE POSITION SENSOR (TPS)			
17	2	SCREW	18		2
18	1	MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR			
19	1	MANIFOLD AIR TEMPERATURE (MAT) SENSOR	12.5		1.4
20	1	O RING			
21	1	SOUND ATTENUATOR			
22	8	SCREW (M6 X 25)	75		8.5
23	1	RESTRICTOR (50)			
	1	RESTRICTOR (40)			
24	1	BREATHER HOSE			
25	1	SCREW (M6 X 30)	75		8.5
26	3	STA-STRAP			
27	1	SCREW (10-16 X .625)			Drive Tight
28	1	RETAINER			



# VAPOR SEPARATOR COMPONENTS



 Loctite PST Pipe Sealant (92-809822)

 Loctite 242 (92-809821)

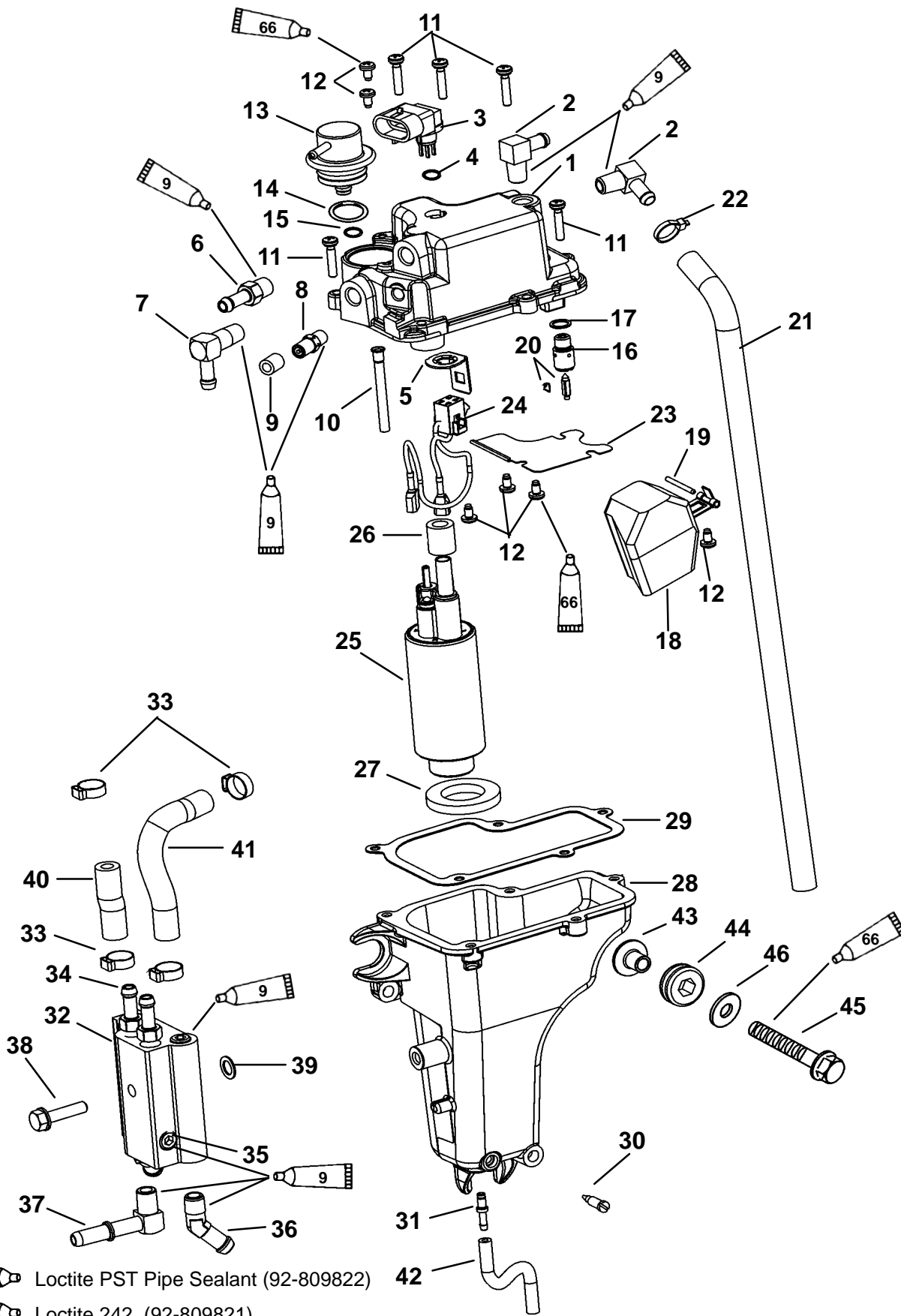


# VAPOR SEPARATOR COMPONENTS

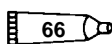
REF. NO.	QTY.	DESCRIPTION	TORQUE		
			lb-in	lb-ft	Nm.
1	1	COVER KIT			
2	2	FITTING			
3	1	ELECTRICAL PASS-THRU KIT	45-55		5.1-6.2
4	1	O RING			
5	1	RETAINER			
6	1	FITTING	45-55		5.1-6.2
7	1	FITTING	45-55		5.1-6.2
8	1	DIAGNOSTIC VALVE	40-50		4.5-5.7
9	1	CAP			
10	1	DRAIN TUBE			
11	5	SCREW	35-40		4-4.5
12	6	SCREW	20-24		2.3-2.7
13	1	REGULATOR			
14	1	O RING			
15	1	O RING			
16	1	SEAL KIT	30-35		3.4-4
17	1	GASKET			
18	1	FLOAT KIT			
19	1	FLOAT SHAFT			
20	1	INLET NEEDLE KIT			
21	1	VENT HOSE			
22	1	STA STRAP			
23	1	FUEL BAFFLE			
24	1	HARNESS			
25	1	PUMP KIT			
26	1	SLEEVE			
27	1	GROMMET			
28	1	FUEL BOWL KIT			
29	1	GASKET			
30	1	DRAIN SCREW	30-35		3.4-4
31	1	FITTING	Press to Shoulder		
32	1	FUEL COOLER BODY KIT			
33	4	CLAMP			
34	2	FITTING	45-55		5.1-6.2
35	5	PLUG			
36	2	ELBOW FITTING	Install 5 to 7 Turns		
37	1	ELBOW FITTING	45-55		5.1-6.2
38	1	SCREW		10.8-12.5	14.7-17
39	1	GASKET			
40	1	HOSE (1-5/8)			
41	1	HOSE (4-1/2)			
42	1	DRAIN HOSE			



# VAPOR SEPARATOR COMPONENTS



 Loctite PST Pipe Sealant (92-809822)

 Loctite 242 (92-809821)



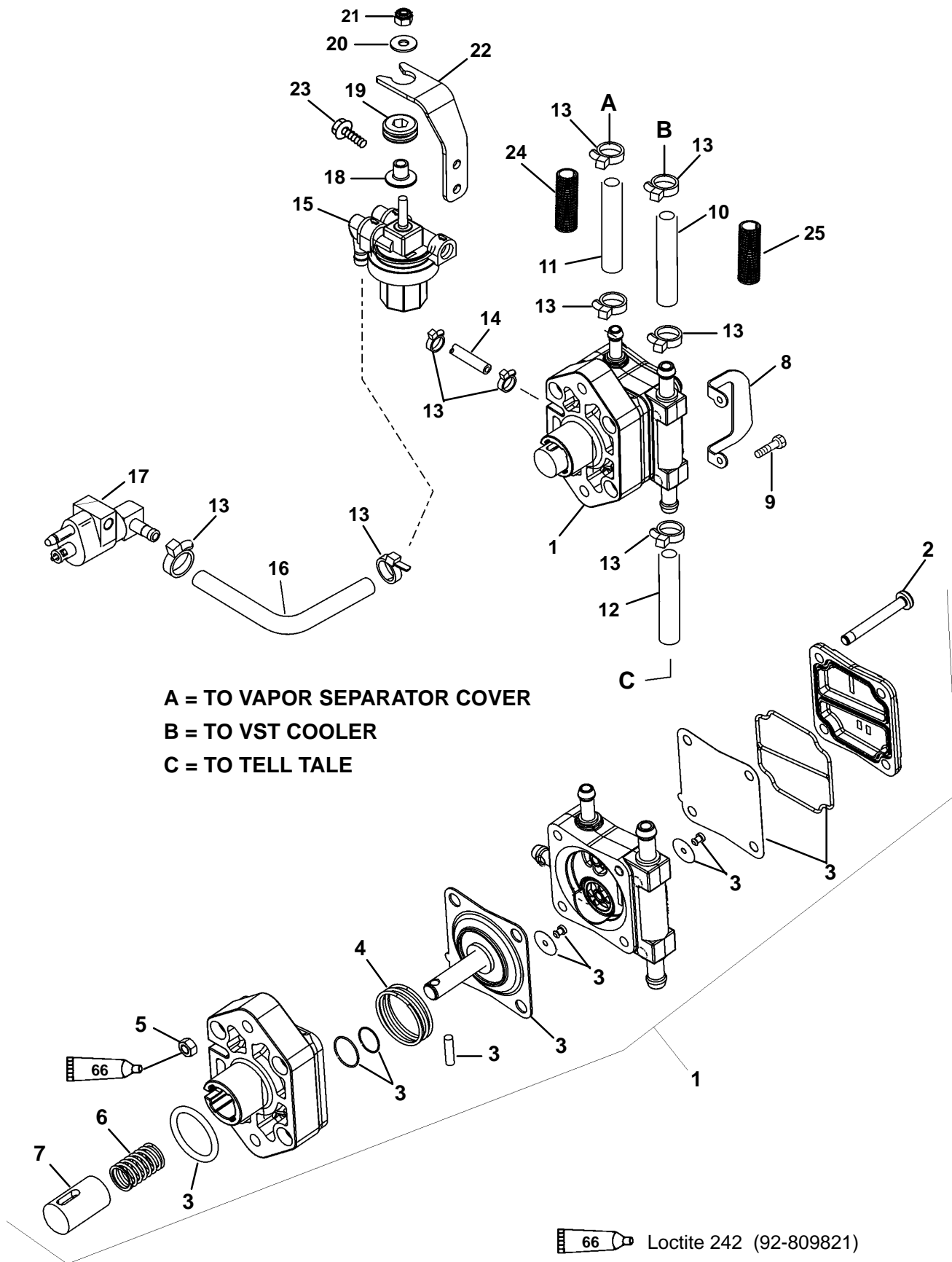


# VAPOR SEPARATOR COMPONENTS

REF. NO.	QTY.	DESCRIPTION	TORQUE		
			lb-in	lb-ft	Nm.
43	3	BUSHING			
44	3	GROMMET			
45	3	SCREW (M6 X 25)	45		5.1
46	3	WASHER			



# FUEL PUMP

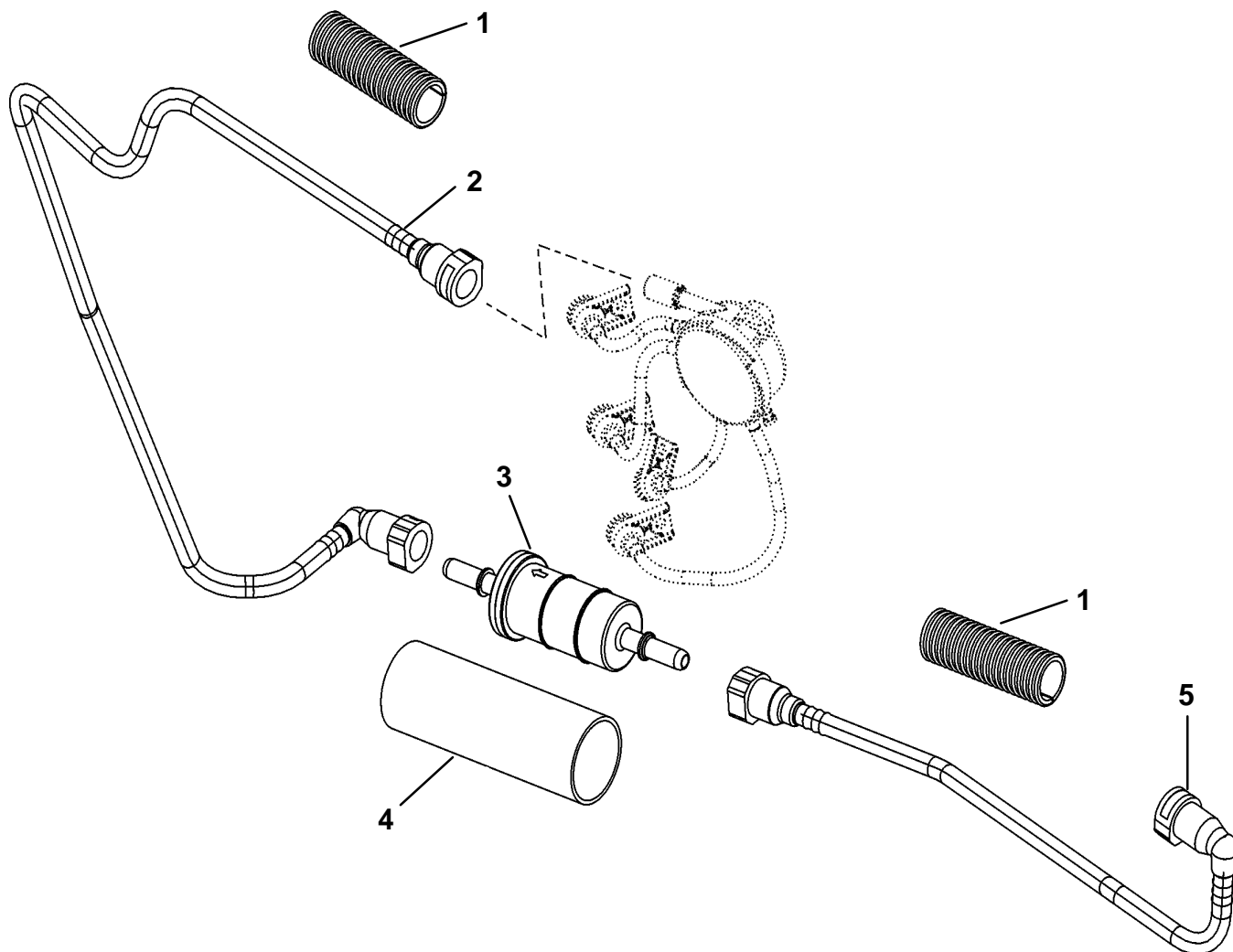


**FUEL PUMP**

REF. NO.	QTY.	DESCRIPTION	TORQUE		
			lb-in	lb-ft	Nm.
1	1	FUEL PUMP			
2	4	SCREW			
3	1	DIAPHRAGM/O-RING KIT			
4	1	SPRING			
5	4	NUT			
6	1	SPRING			
7	1	CAP			
8	1	COWL DEFLECTOR			
9	2	SCREW (M6 X 30)	75		8.5
10	1	TUBING (34 IN.)			
11	1	TUBING (19 IN.)			
12	1	TUBING (6 IN.)			
13	AR	STA STRAP			
14	1	TUBING (8 IN.)			
15	1	FUEL FILTER			
16	1	TUBING (38 IN.)			
17	1	FUEL CONNECTOR			
18	1	BUSHING			
19	1	GROMMET			
20	1	WASHER			
21	1	NUT (M6)	45		5.1
22	1	BRACKET			
23	2	SCREW (M6 X 13)	75		8.5
24	1	CONDUIT (13 IN.)			
25	1	CONDUIT (26 IN.)			



# FUEL LINES



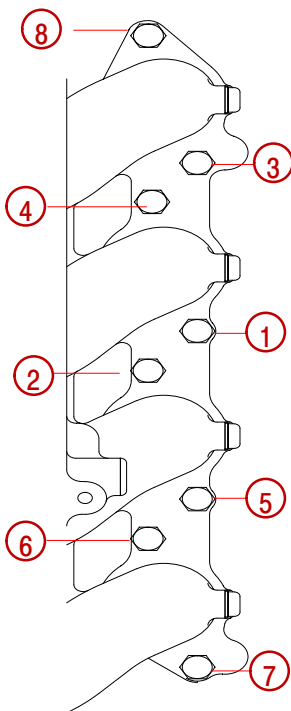
**FUEL LINES**

REF. NO.	QTY.	DESCRIPTION	TORQUE		
			lb-in	lb-ft	Nm.
1	1	CONDUIT (24 IN.)			
2	1	FUEL LINE			
3	1	FUEL FILTER			
4	1	PROTECTIVE SLEEVE			
5	1	FUEL LINE			



# Torque Sequence

## INTAKE MANIFOLD FLANGE





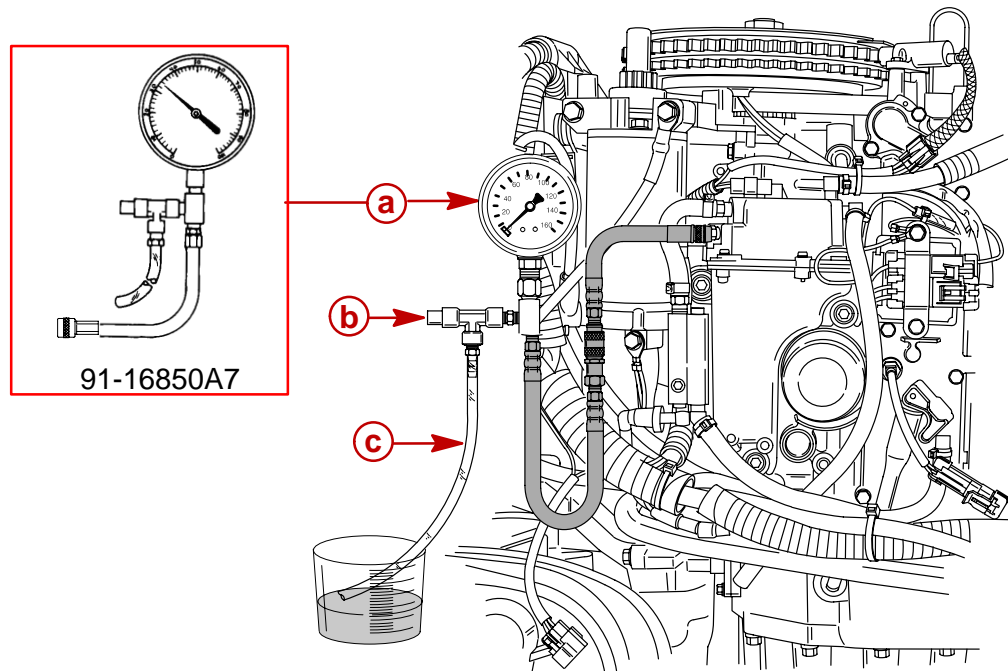
# Intake Manifold Assembly

## **⚠ WARNING**

Always release the fuel pressure in the high-pressure fuel line before servicing the line or the vapor separator. If the fuel pressure is not released, pressurized fuel may spray out.

### Releasing Fuel Pressure in the High-Pressure Fuel Line

1. Install the fuel pressure gauge onto the pressure check valve.
2. Place the drain hose into a container.
3. Push the relief button and release the pressure.



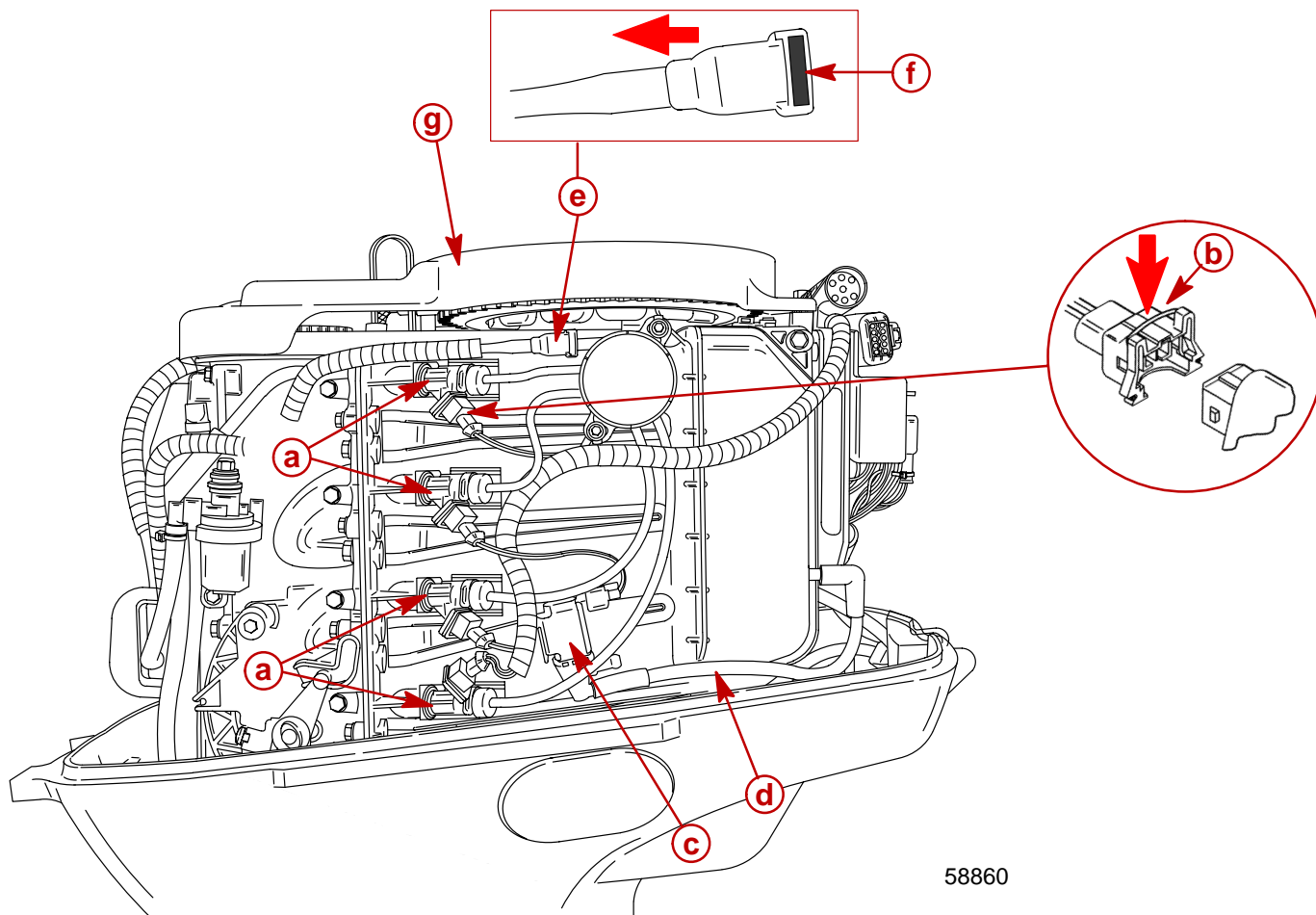
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- a** - Fuel Pressure Gauge
- b** - Pressure Relief Button
- c** - Drain Hose



## Removal

4. Push in on the fuel injector harness connector retaining clip and unplug the harness from each fuel injector. It is not necessary to remove the retaining clip from the connector.
5. Unplug the Idle Air Control (IAC) connector.
6. **AFTER RELIEVING PRESSURE** disconnect the high pressure fuel line from the fuel distribution manifold by depressing the locking tab and pulling back on the fuel line.
7. Remove the flywheel cover.



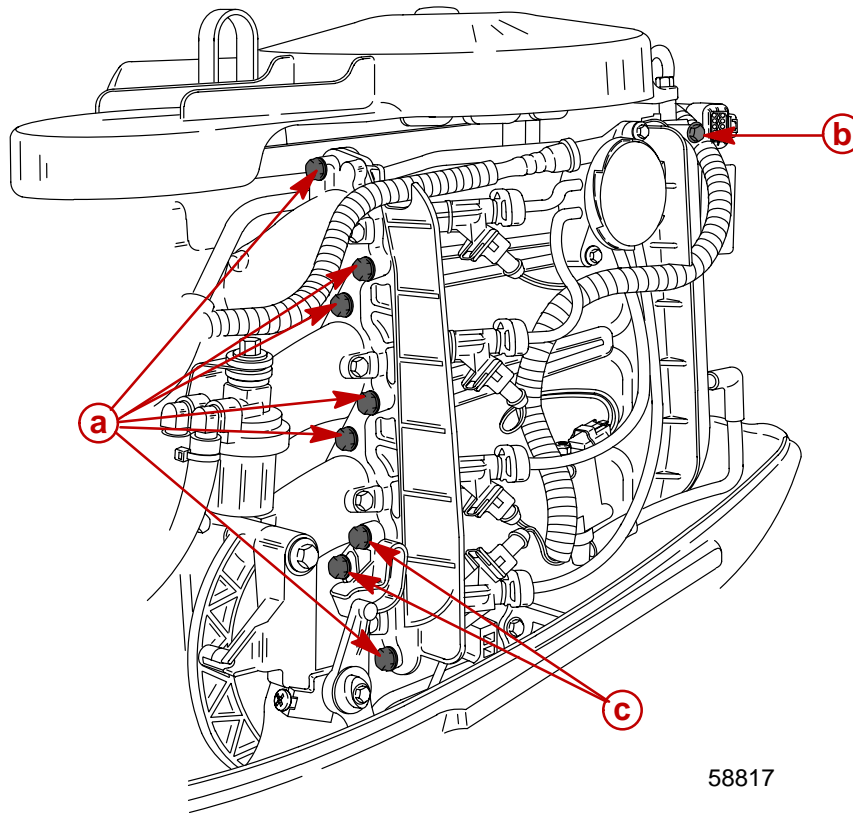
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- a** - Fuel Injector (4)
- b** - Harness Connector Retaining Clip
- c** - Idle Air Control (IAC) Connector
- d** - Throttle Air Bypass Hose
- e** - High Pressure Fuel Line
- f** - Locking Tab
- g** - Flywheel Cover





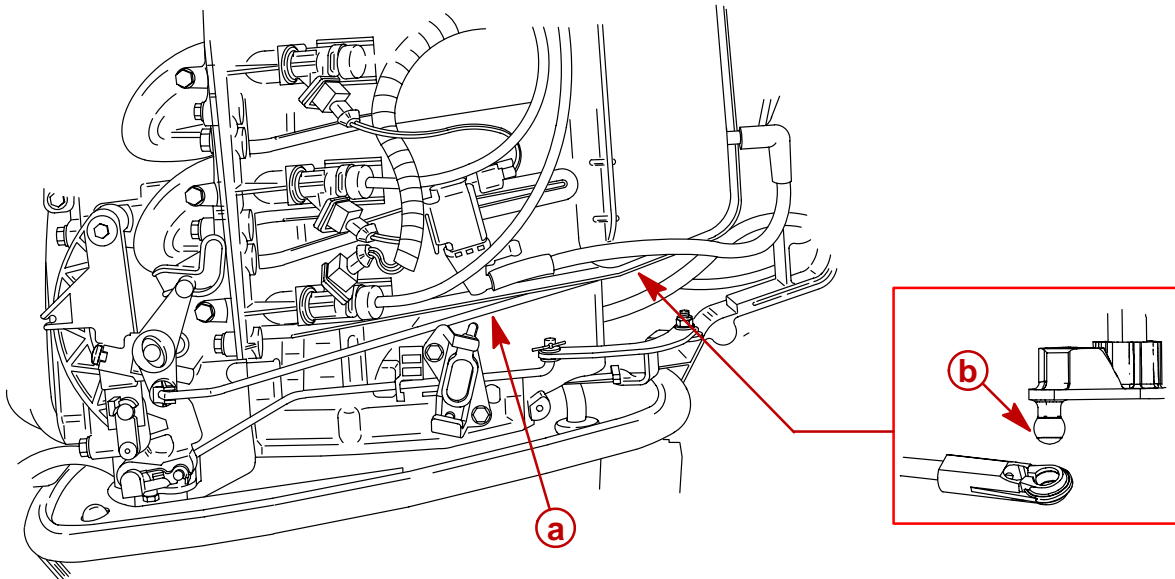
8. Remove intake assembly mounting screws and remove intake assembly.



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- a** - Intake Assembly Mounting Screw (6) M6 x 25
- b** - Intake Assembly Mounting Screw (1) M6 x 30
- c** - Intake Assembly Mounting Screw (2) M6 x 40

9. Disconnect throttle link rod from the throttle body ball socket.

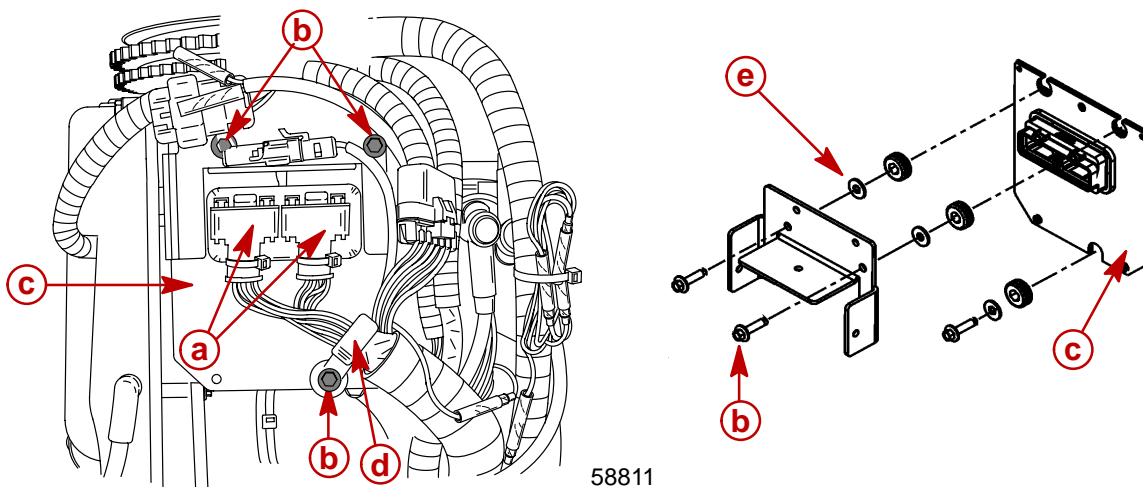


- a** - Throttle Link Rod
- b** - Throttle Body Ball Socket



10. Disconnect ECM harness connectors.

11. Remove the ECM mounting screws and washers. Remove the ECM from the mounting plate.

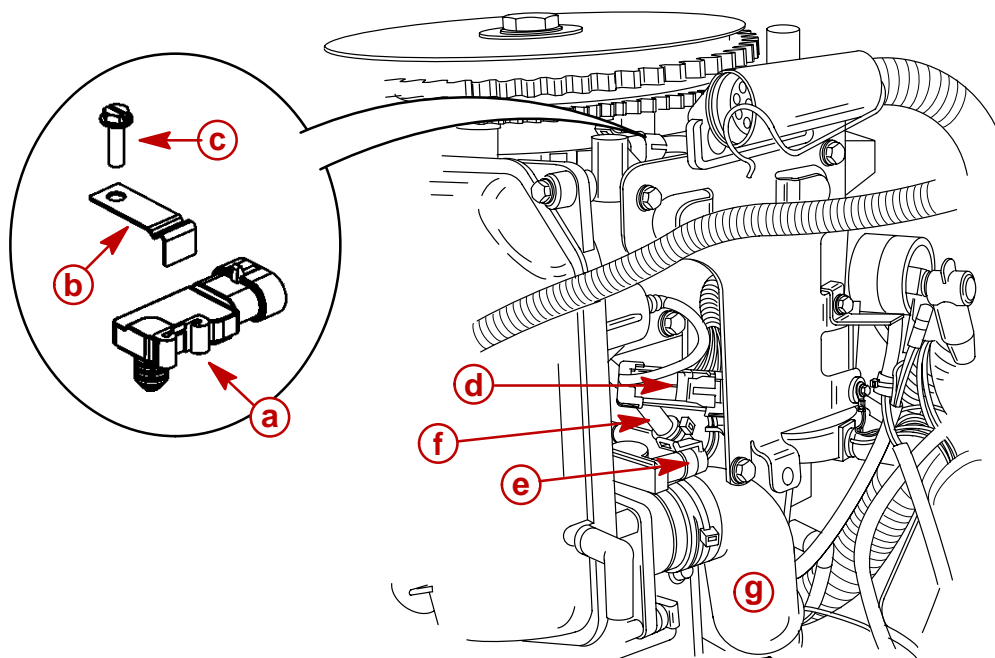


- a** - ECM Harness Connectors
- b** - ECM Mounting Screw (3) M6 x 25
- c** - ECM

- d** - J-Clip
- e** - Washers (3)

12. Disconnect the following sensors: Manifold Absolute Pressure (MAP), Manifold Air Temperature (MAT), and Throttle Position Sensor (TPS).

13. Cut sta-strap and remove crankcase breather hose from sound attenuator. Remove intake assembly from engine.

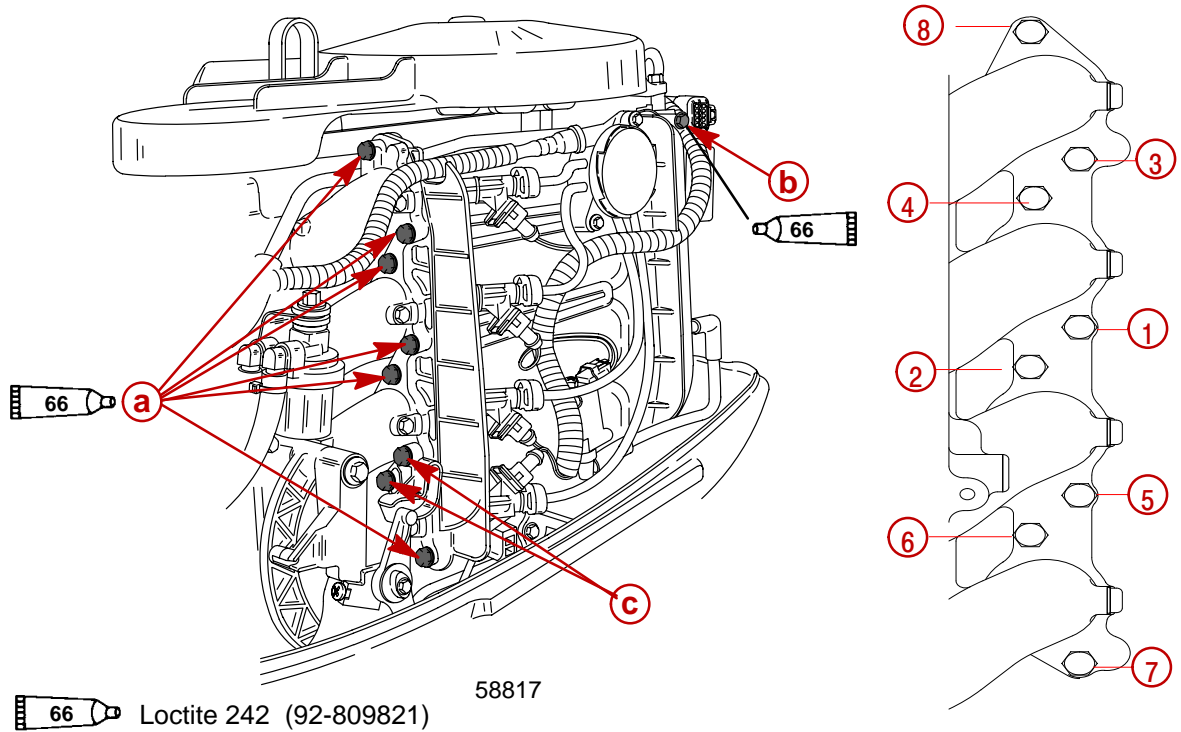


- a** - Manifold Absolute Pressure (MAP) Sensor
- b** - MAP Sensor Retaining Clip
- c** - Screw (10-16 x .625)
- d** - Manifold Air Temperature (MAT) Sensor Connector
- e** - Throttle Position Sensor (TPS) Connector
- f** - Crankcase Breather Hose
- g** - Sound Attenuator



## Installation

1. Install intake manifold assembly to engine. Make sure O-rings are in place. Tighten screws (in sequence shown) to specified torque.

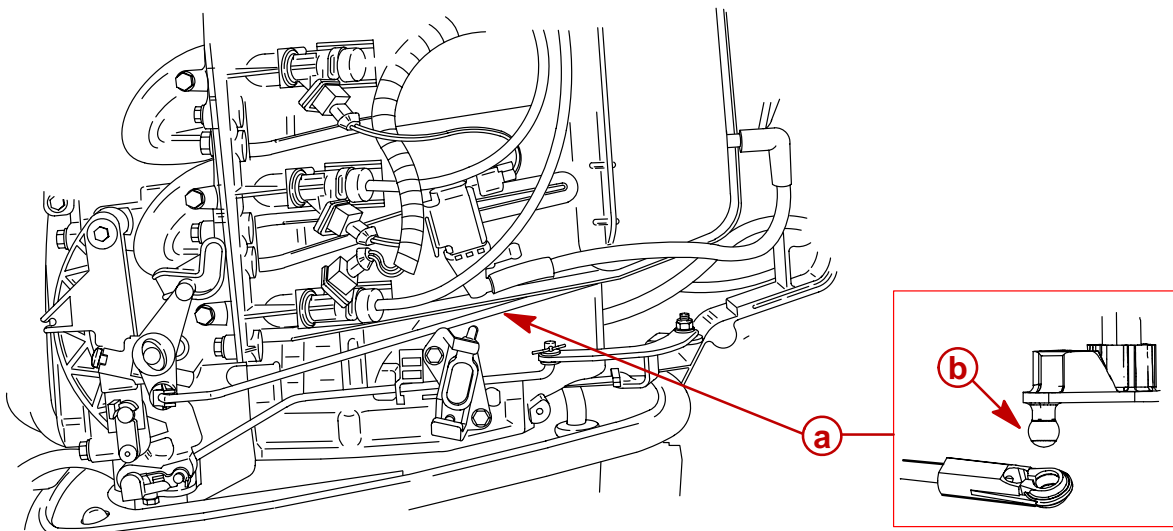


- a** - Intake Assembly Mounting Screw (6) M6 x 25
- b** - Intake Assembly Mounting Screw M6 x 30
- c** - Intake Assembly Mounting Screw M6 x 40

Intake Assembly Mounting Screw Torque
75 lb-in (8.5 Nm)

2. Connect throttle link rod to the throttle body ball socket.

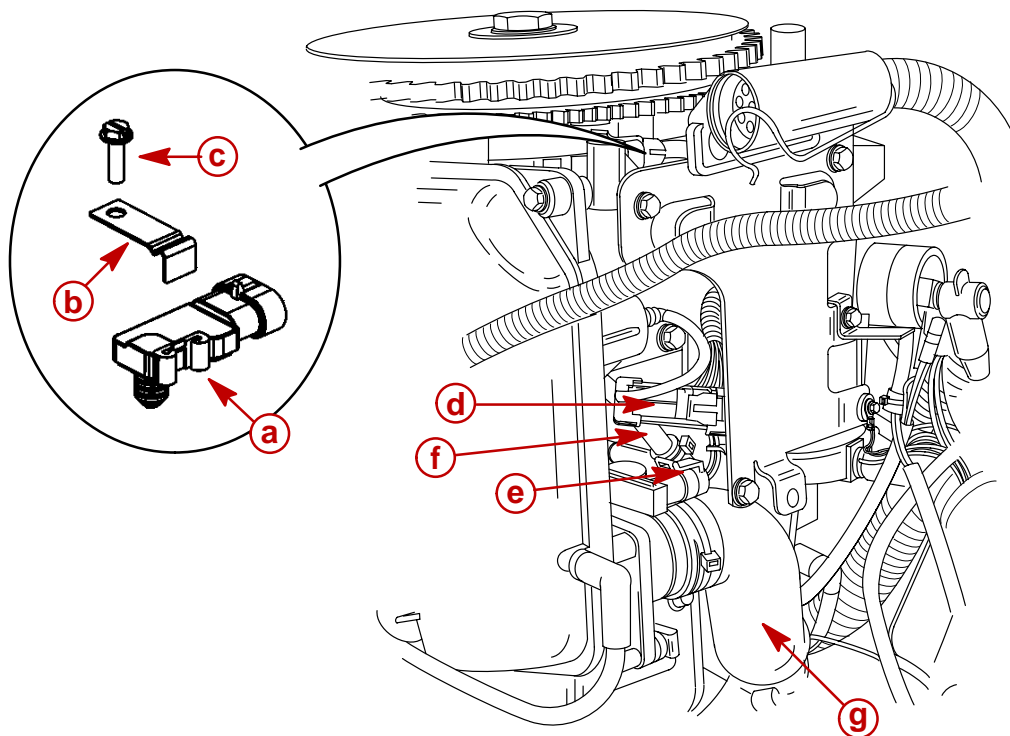
**IMPORTANT: Check for proper throttle link rod adjustment as outlined in section 7A.**



- a** - Throttle Link Rod
- b** - Throttle Body Ball Socket



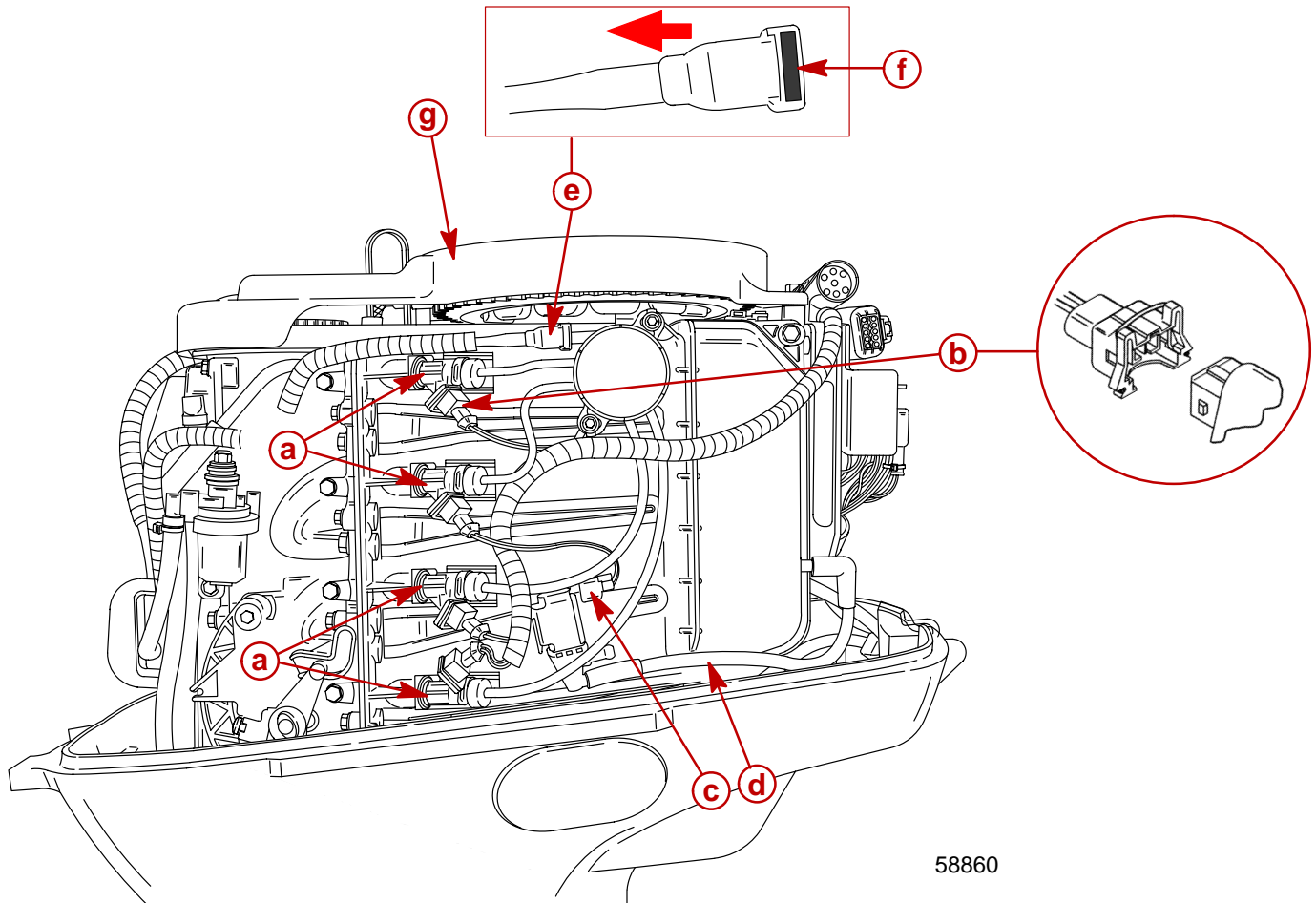
3. Connect the following sensors: Manifold Absolute Pressure (MAP), Manifold Air Temperature (MAT) Sensor, and Throttle Position Sensor (TPS).
4. Install MAP sensor retaining clip and tighten screw to specified torque.
5. Install crankcase breather hose into sound attenuator. Secure with sta-strap.



- a** - Manifold Absolute Pressure (MAP) Sensor
- b** - MAP Sensor Retaining Clip
- c** - Screw (10-16 x .625)
- d** - Manifold Air Temperature (MAT) Sensor
- e** - Throttle Position Sensor (TPS)
- f** - Crankcase Breather Hose
- g** - Sound Attenuator



6. Connect the fuel line to the fuel distribution manifold. Push on until locked into place.
7. Route injector harness as shown and plug-in the fuel injector and IAC connectors.
8. Install flywheel cover. Tighten screws to specified torque.



- a** - Fuel Injector (4)
- b** - Fuel Injector Connector (4)
- c** - Idle Air Control (IAC) Connector
- d** - Throttle Air Bypass Hose
- e** - Fuel Line
- f** - Locking Tab
- g** - Flywheel Cover

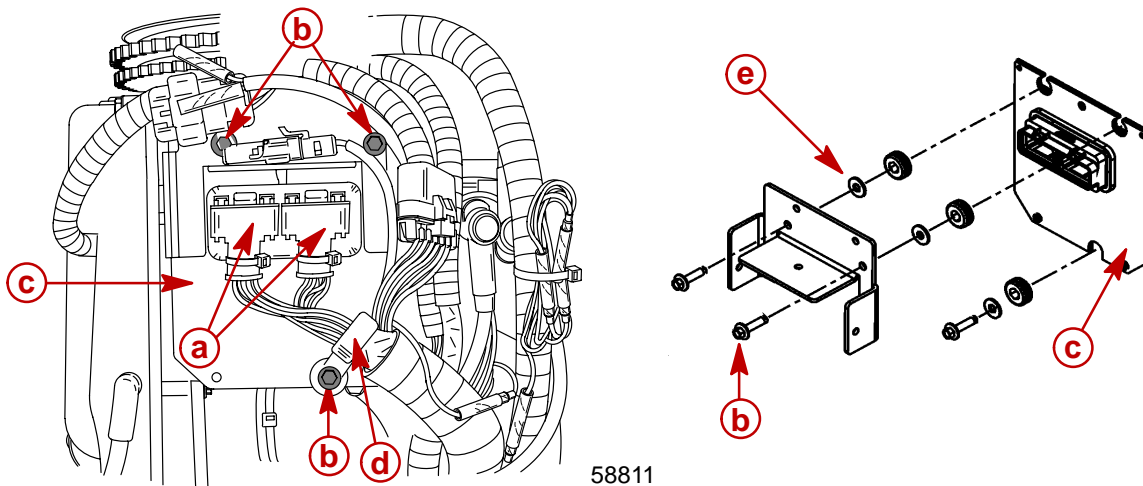
Flywheel Cover Screw Torque
-----------------------------

75 lb-in (8.5 Nm)
-------------------



9. Install ECM to mounting plate. Tighten mounting screws to specified torque.

10. Plug in ECM harness connectors.



- a** - ECM Harness Connectors
- b** - ECM Mounting Screw (3) M6 x 25
- c** - ECM
- d** - J-Clip
- e** - Washers (3)

ECM Mounting Screw Torque
45 lb-in (5.1 Nm)



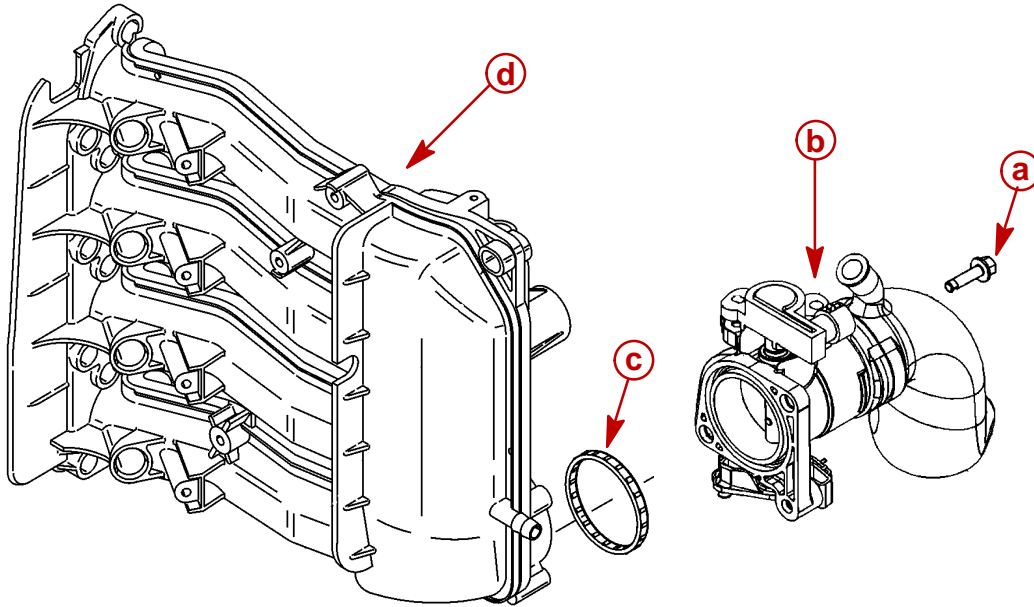
# Throttle Body Removal/Installation

## REMOVAL

1. Remove the intake manifold assembly. Refer to **Intake Manifold Assembly Removal**.
2. Remove throttle body mounting screws and remove throttle body assembly from the intake assembly.

## INSTALLATION

1. Lubricate O-ring and install throttle body to intake assembly. Tighten screws to specified torque.
2. Install the intake assembly. Refer to **Intake Assembly Installation**.



- a** - Throttle Body Mounting Screws (2) 25mm long
- b** - Throttle Body Assembly
- c** - Seal
- d** - Intake Assembly

Throttle Body Mounting Screw Torque
-------------------------------------

31 lb-in (3.5 Nm)
-------------------



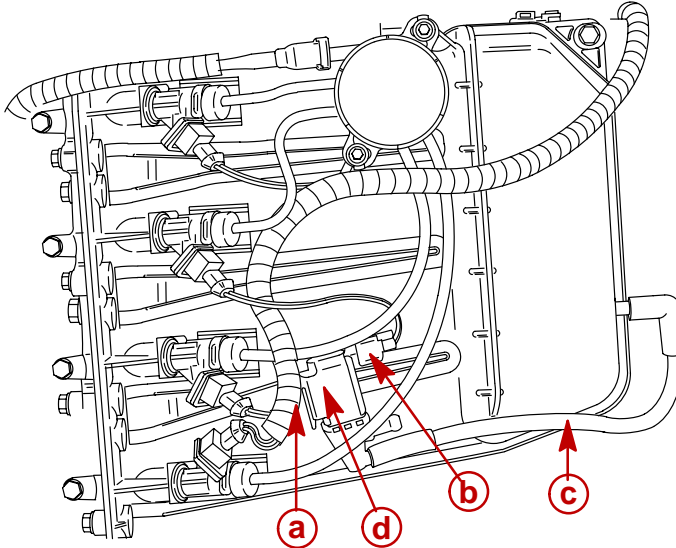
# Idle Air Control (IAC) Removal/Installation

## REMOVAL

1. Disconnect the IAC harness connector.
2. Remove IAC mounting screw.
3. Disconnect the throttle air bypass hose and remove the IAC valve.

## INSTALLATION

1. Install IAC and secure with mounting screw.
2. Connect IAC harness connector and bypass hose.



- a** - IAC Mounting Screw
- b** - IAC Harness Connector
- c** - Throttle Air Bypass Hose
- d** - Idle Air Control (IAC) Valve

IAC Mounting Screw Torque
31 lb-in (3.5 Nm)





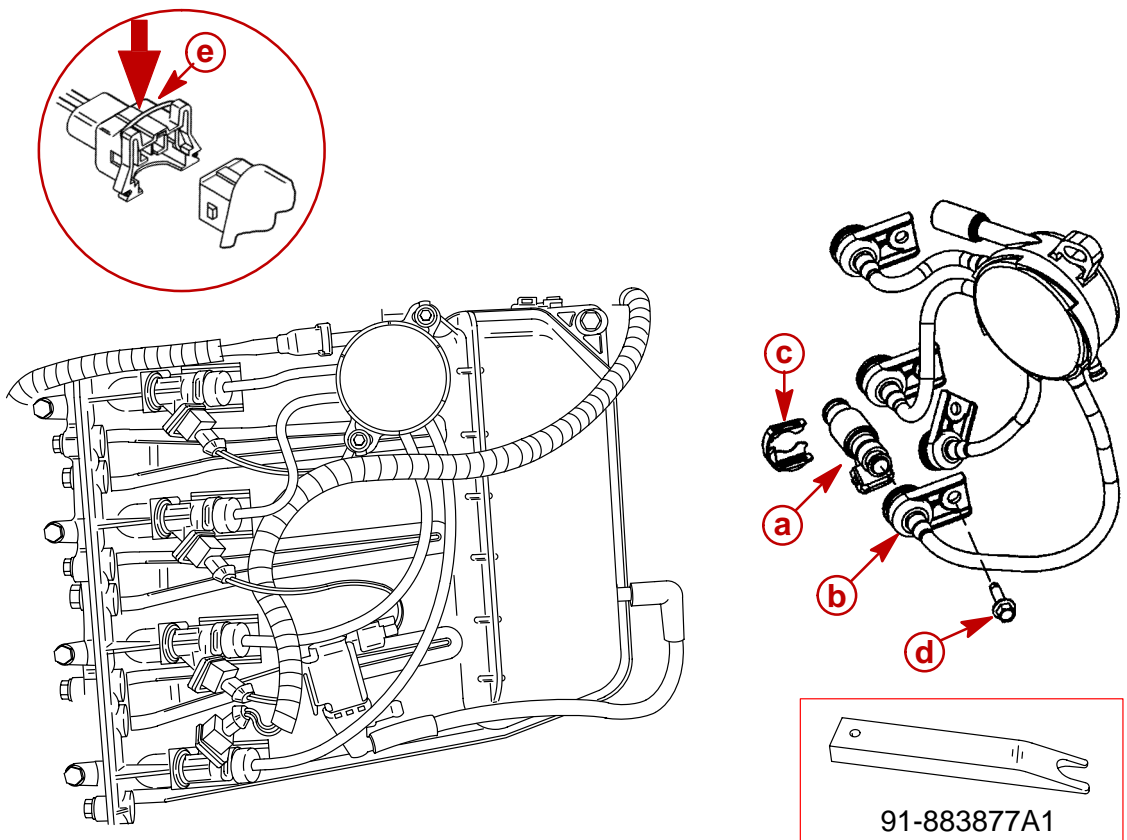
# Fuel Injectors

## ⚠ WARNING

Always release the fuel pressure in the high-pressure fuel line before servicing the line or the vapor separator. If the fuel pressure is not released, pressurized fuel may spray out.

## Removal

1. Remove fuel injector cap retaining clips and screws.
2. Push in on the harness connector retaining clip and unplug the harness from each fuel injector.
3. Using service tool 91-883877A1, pry injector cap from the injector.
4. Remove fuel injectors from intake manifold.

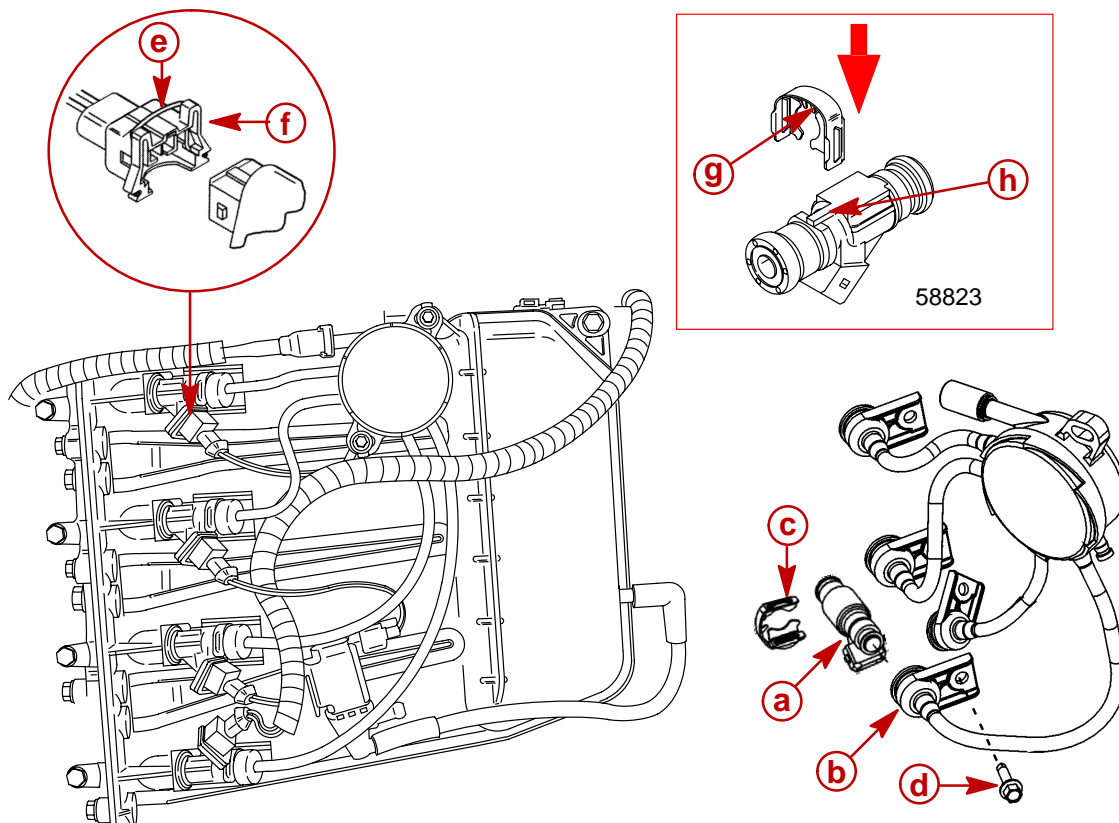


- a** - Fuel Injector (4)
- b** - Fuel Injector Cap (4)
- c** - Fuel Injector Cap Retaining Clip (4)
- d** - Screw (4)
- e** - Harness Connector Retaining Clip (4)



## Installation

1. Install fuel injector cap by pushing it on the fuel injector until it bottoms out.
2. Lubricate O-rings and install fuel injectors into intake manifold.
3. Install fuel injector cap retaining screws and tighten to specified torque. Install fuel injector cap retaining clips so that the locking teeth line up with the locking rib on the fuel injector (as shown).
4. Connect the harness connectors to each fuel injector. Push the connector on until the retaining clip locks in place.



- a** - Fuel Injector (4)
- b** - Fuel Injector Cap (4)
- c** - Fuel Injector Cap Retaining Clip (4)
- d** - Fuel Injector Cap Retaining Screw (4)
- e** - Fuel Injector Harness Retaining Clip (4)
- f** - Fuel Injector Harness Connector (4)
- g** - Locking Teeth
- h** - Locking Rib

Fuel Injector Cap Retaining Screw Torque
--

31 lb-in (3.5 Nm)
-------------------



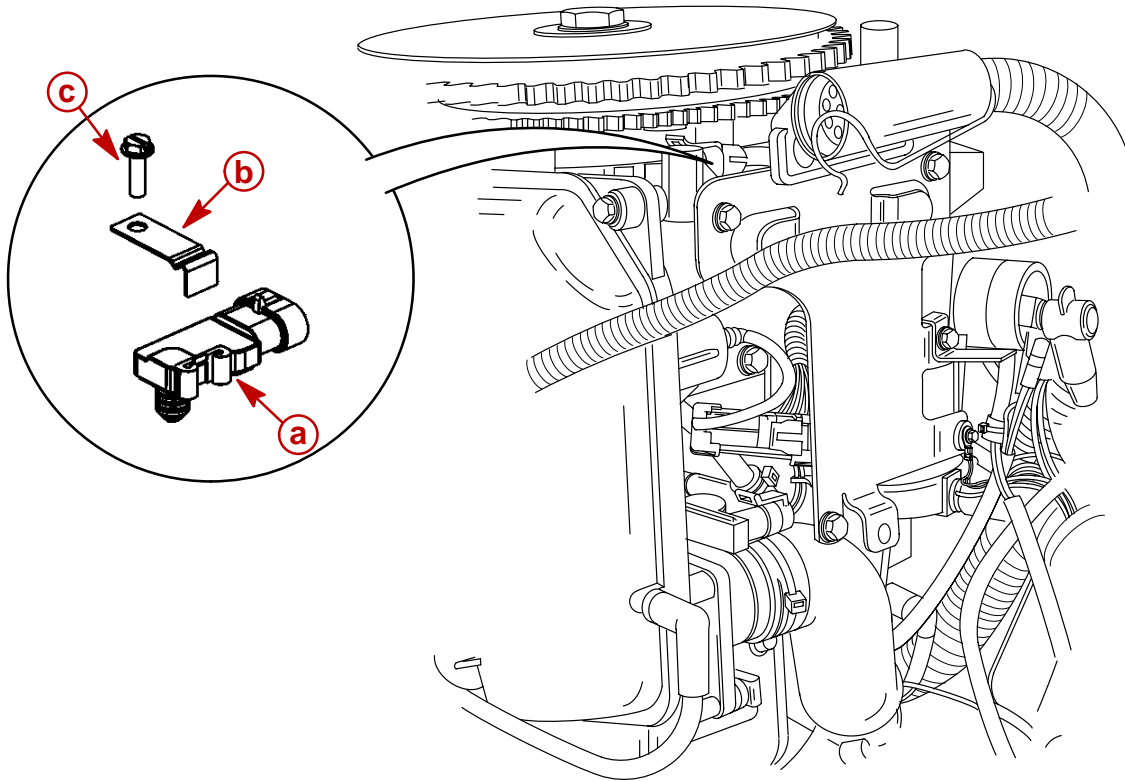
# Manifold Absolute Pressure (MAP) Sensor Removal/Installation

## REMOVAL

1. Remove the intake assembly. Refer to **Intake Assembly Removal**.
2. Remove the MAP sensor retaining screw and bracket. Remove the MAP from the intake by pulling and twisting simultaneously (pulls out hard).

## INSTALLATION

1. Lubricate seal and push MAP into intake assembly.
2. Install retaining clip and screw. Tighten screw securely.
3. Install intake assembly. Refer to **Intake Assembly Installation**.



- a - MAP Sensor
- b - Retaining Clip
- c - Screw



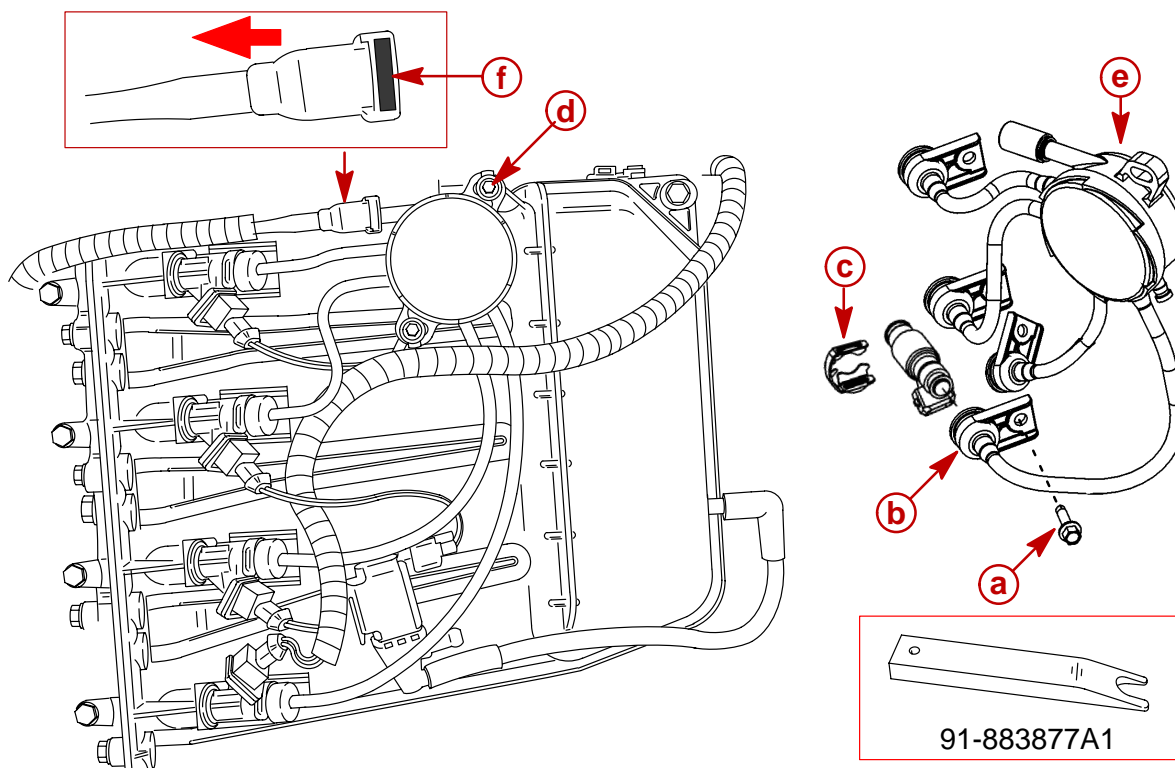
# Fuel Distribution Manifold

## ⚠ WARNING

Always release the fuel pressure in the high-pressure fuel line before servicing the line or the vapor separator. If the fuel pressure is not released, pressurized fuel may spray out.

## Removal

1. Remove fuel injector cap retaining screws.
2. Remove the fuel injector cap retaining clips.
3. Using service tool 91-883877A1, pry the fuel injector cap off of each fuel injector.
4. Remove fuel distribution manifold mounting screws.
5. **AFTER RELIEVING FUEL PRESSURE** disconnect the high pressure fuel line by depressing the locking tab and pulling back. Remove fuel distribution manifold.

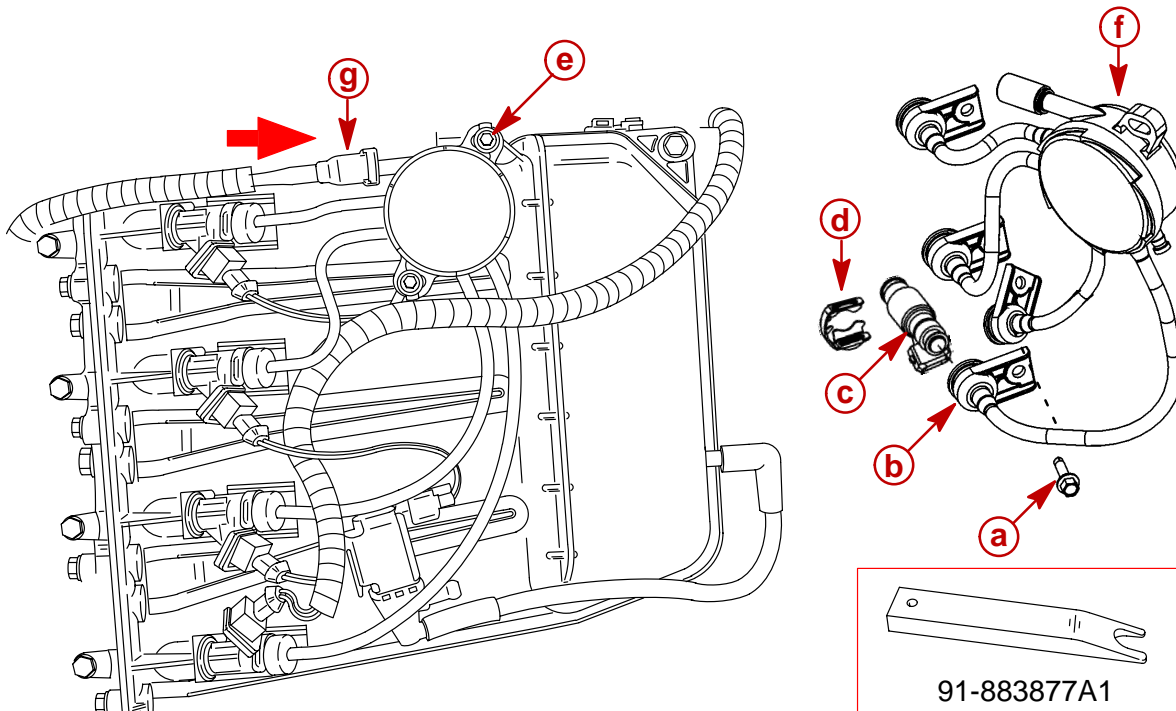


- a - Fuel Injector Cap Retaining Screw (4)
- b - Fuel Injector Cap (4)
- c - Fuel Injector Cap Retaining Clip (4)
- d - Fuel Distribution Manifold Mounting Screw (2)
- e - Fuel Distribution Manifold
- f - High Pressure Fuel Line Locking Tab



## Installation

1. Install fuel distribution manifold and tighten mounting screws to specified torque.
2. Push fuel injector cap onto the fuel injector until the cap bottoms out on the injector.
3. Install fuel injector cap retaining screws and tighten securely. Install fuel injector cap retaining clips so that the locking teeth line up with the locking rib on the fuel injector (as shown).
4. Connect high pressure fuel line. Push on until locking tab snaps in place.



- a - Fuel Injector Cap Retaining Screw (4)
- b - Fuel Injector Cap (4)
- c - Fuel Injector (4)
- d - Fuel Injector Cap Retaining Clip (4)
- e - Fuel Distribution Manifold Mounting Screw (2)
- f - Fuel Distribution Manifold
- g - High Pressure Fuel Line

Mounting Screw Torque
31 lb-in (3.5 Nm)



# Manifold Air Temperature (MAT) Sensor Removal/Installation

## REMOVAL

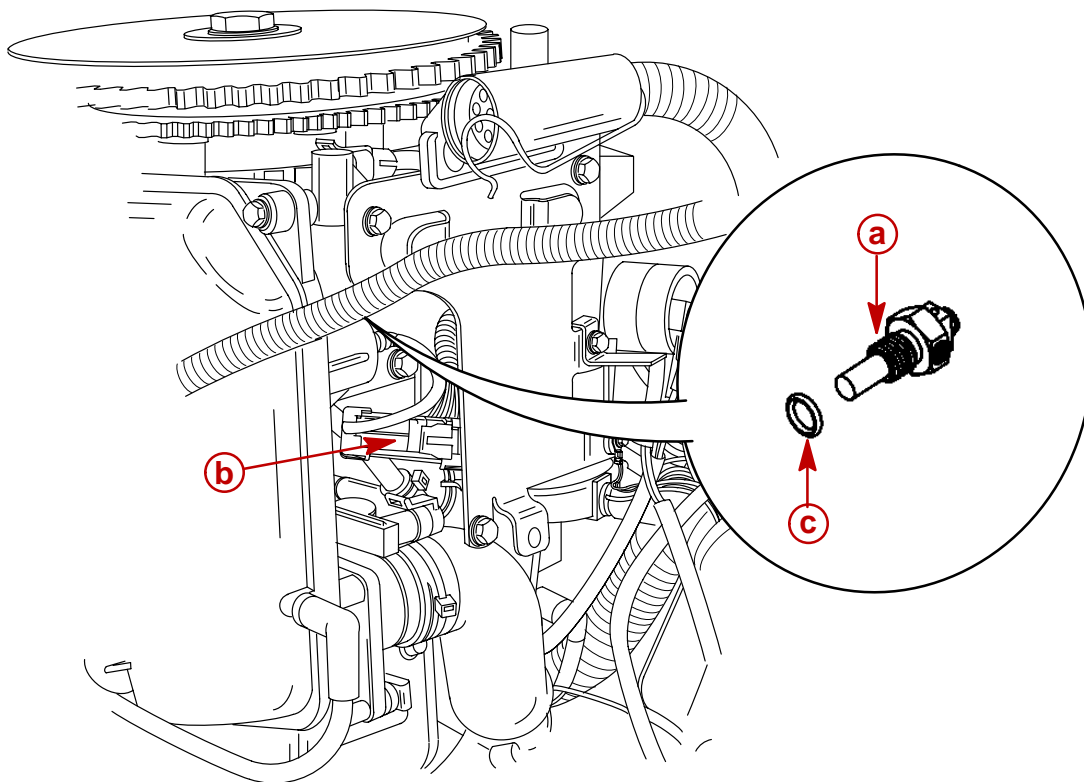
1. Remove the intake manifold assembly. Refer to **Intake Manifold Assembly Removal**.
2. Disconnect manifold air temperature (MAT) sensor connector.
3. Unscrew MAT sensor from the intake manifold assembly. Inspect o-ring and replace if necessary.

## INSTALLATION

### ⚠ CAUTION

Overtightening the manifold air temperature (MAT) sensor can lead to failing the plastic threads. Be sure to tighten to the specified torque.

1. Lubricate O-ring and screw in air temperature sensor. Tighten to specified torque.
2. Connect MAT sensor connector.
3. Install the intake manifold assembly. Refer to **Intake Manifold Assembly Installation**.



- a** - Manifold Air Temperature (MAT) Sensor
- b** - MAT Sensor Connector
- c** - O-ring

### Air Temperature Sensor Torque

12.5 lb-in. (1.4 Nm)



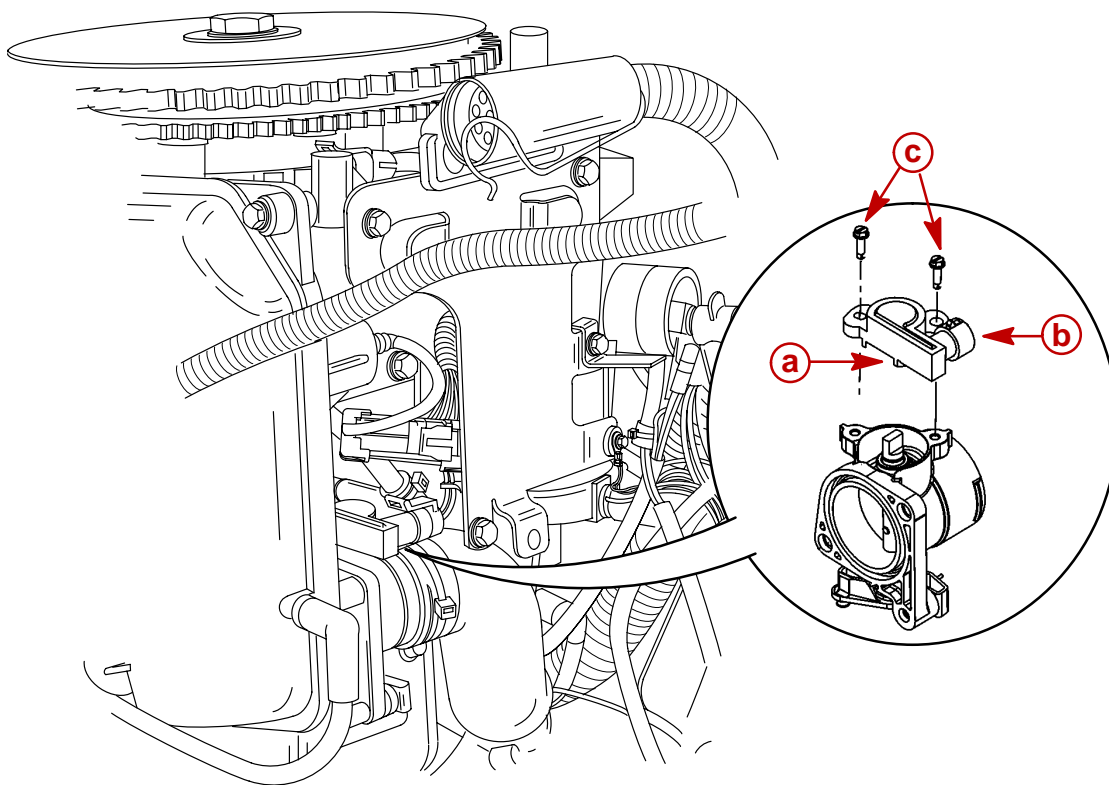
# Throttle Position Sensor (TPS) Removal/Installation

## REMOVAL

1. Remove the intake manifold assembly. Refer to **Intake Manifold Assembly Removal**.
2. Disconnect throttle position sensor (TPS) connector.
3. Remove mounting screws and remove throttle position sensor.

## INSTALLATION

1. Install throttle position sensor. Tighten screws to specified torque.
2. Connect throttle position sensor connector.
3. Install the intake manifold assembly. Refer to **Intake Manifold Assembly Installation**.



- a** - Throttle Position Sensor (TPS)
- b** - TPS Connector
- c** - TPS Mounting Screws(2) 15 mm long

Throttle Position Sensor Mounting Screw Torque
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18 lb-in (2 Nm)
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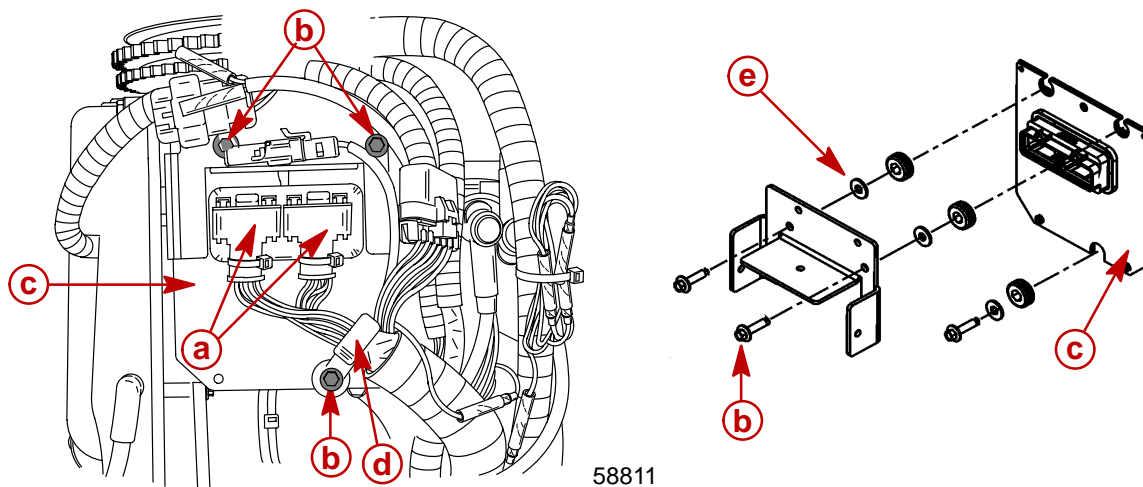
# ECM Removal/Installation

## Removal

1. Remove ECM harness connectors.
2. Remove the ECM mounting screws and washers. Remove the ECM from the mounting plate.

## Installation

1. Install ECM onto mounting bracket (position the j-clip as shown). Install screws and washers. Tighten screws to specified torque.
2. Connect ECM harness connectors.



- a** - ECM Harness Connectors
- b** - ECM Mounting Screw (3) M6 x 25
- c** - ECM
- d** - J-clip
- e** - Washers (3)

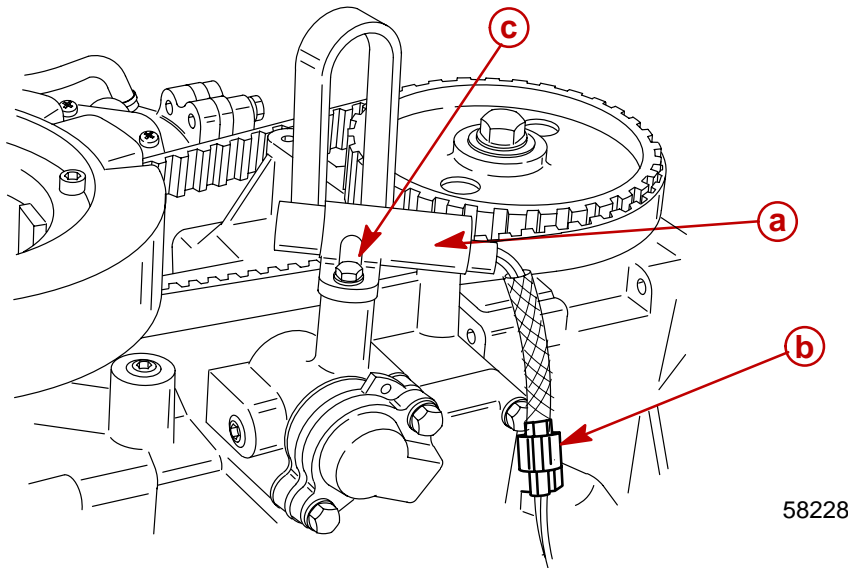
ECM Mounting Screw Torque
45 lb. in. (5.1 N·m)





## Crank Position Sensor Removal/Installation

1. Disconnect sensor from wiring harness.
2. Remove sensor mounting screws.
3. Reverse steps for installation. Tighten screws to specified torque.



- a** - Crank Position Sensor
- b** - Harness Connector
- c** - Screw (2) M5x16

Crank Position Sensor Mounting Screw Torque
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45 lb. in. (5.1 N·m)
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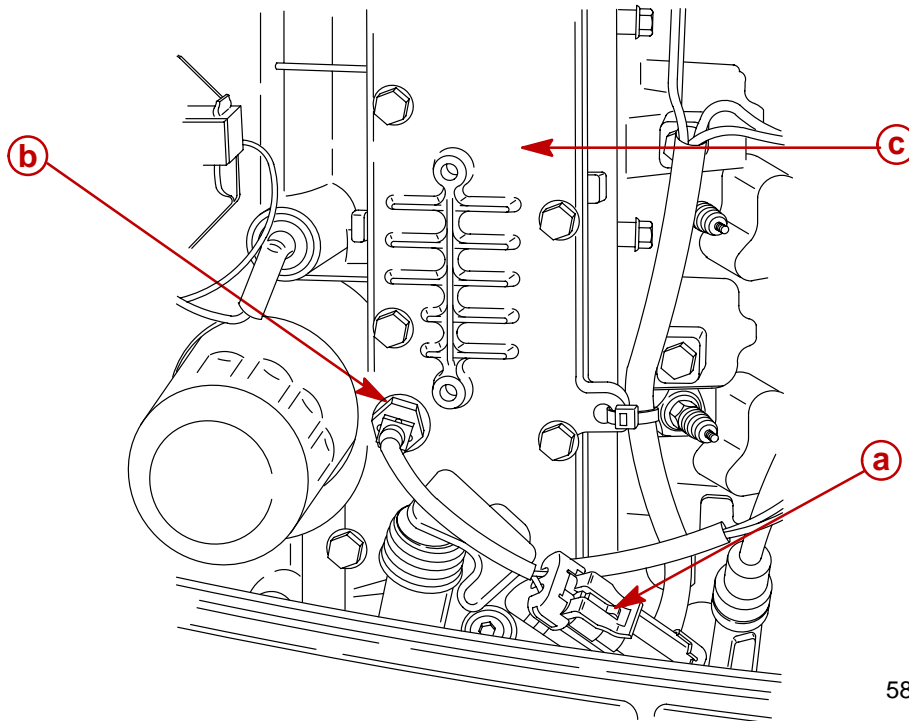


# Engine Coolant Temperature (ECT) Sensor Removal/Installation

1. Disconnect sensor from wiring harness.
2. Remove sensor from exhaust cover.
3. Reverse steps for installation. Tighten to specified torque.

## ⚠ CAUTION

Over-tightening the coolant temperature sensor can lead to failing the plastic threads. Be sure to tighten to the specified torque.



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- a - Harness Connector
- b - Temperature Sensor
- c - Exhaust Cover

### Temperature Sensor Mounting Torque

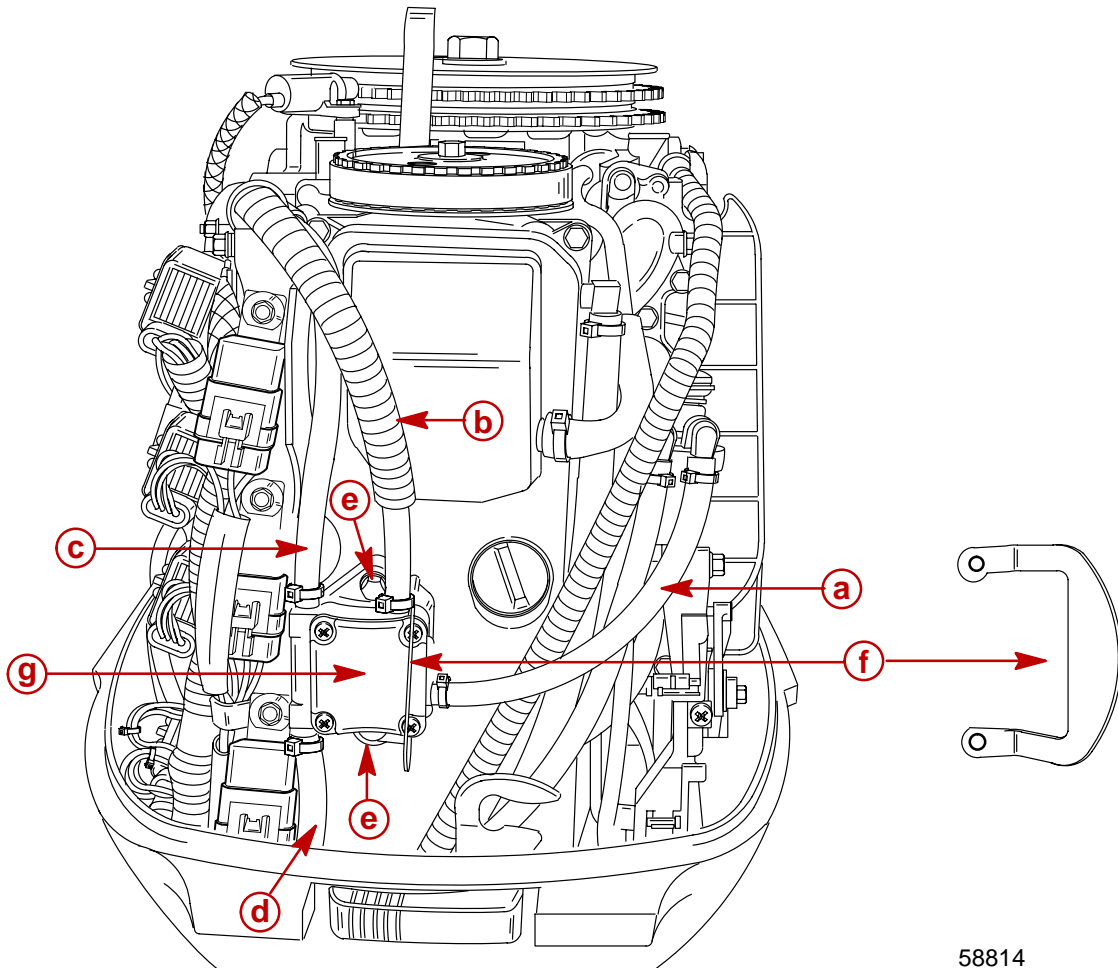
15 lb. in. (1.7 N·m)



# Low Pressure Fuel Line/Fuel Pump

## Removal

1. Cut sta-straps and remove fuel pump inlet/outlet hoses, and fuel cooler water inlet/outlet hoses.
2. Remove fuel pump mounting bolts and cowl deflector.
3. Separate fuel pump from cylinder head cover.



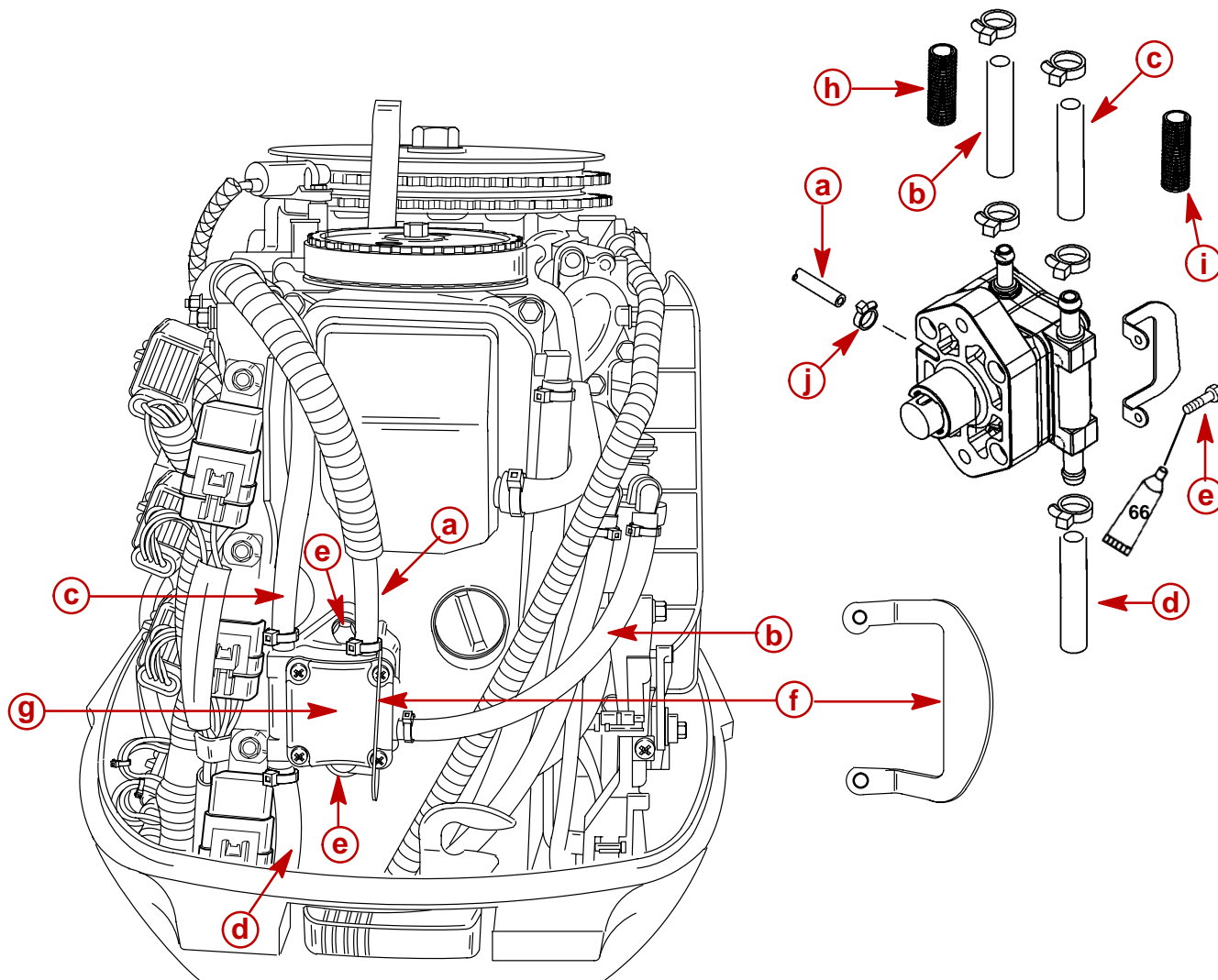
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- a** - Inlet Fuel Hose (from filter)
- b** - Outlet Fuel Hose (to VST)
- c** - Fuel Cooler Water Inlet Hose (from VST fuel cooler)
- d** - Fuel Cooler Water Outlet Hose (to tell-tale outlet)
- e** - Mounting Screw (2) M6 x 30
- f** - Cowl Deflector
- g** - Fuel Pump



## Installation

1. Secure fuel pump and cowl deflector to cylinder head cover with screws. Tighten to specified torque.
2. Connect fuel lines to pump and secure with new sta-straps.



Loctite 242 (92-809821)

58814

- a** - Inlet Fuel Hose (from fuel filter)
- b** - Outlet Fuel Hose (to VST)
- c** - Fuel Cooler Water Inlet Hose (from VST fuel cooler)
- d** - Fuel Cooler Water Outlet Hose (to tell-tale outlet)
- e** - Mounting Screw (2) M6 x 30
- f** - Cowl Deflector
- g** - Fuel Pump
- h** - Conduit (13 in.)
- i** - Conduit (21 in.)
- j** - Sta-strap

### Fuel Pump Mounting Screw Torque

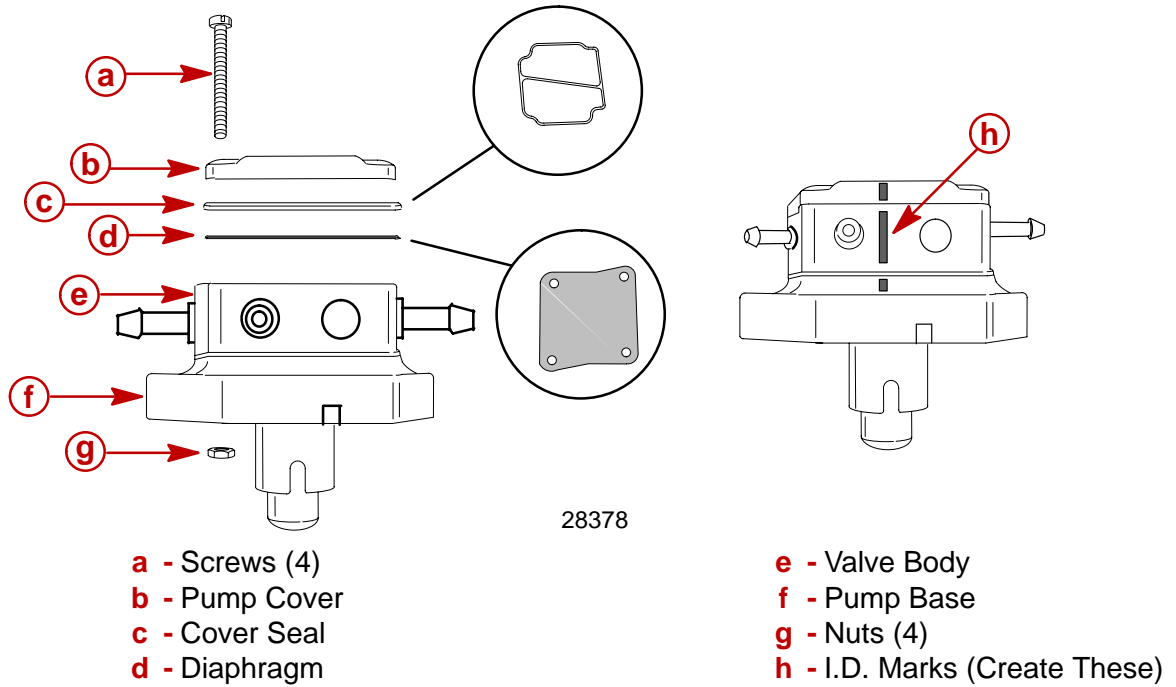
75 lb. in. (8.5 N·m)



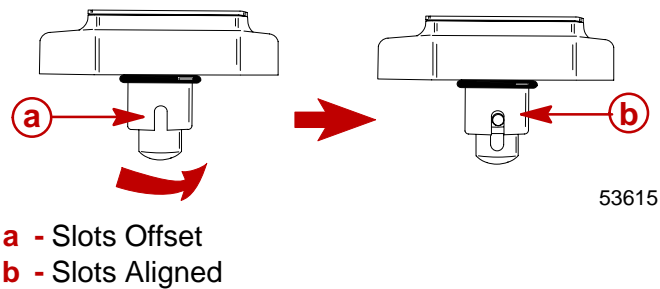
## Disassembly

**IMPORTANT:** Before separating fuel pump components mark each component with an awl or marker. This will ensure the components are oriented correctly during reassembly.

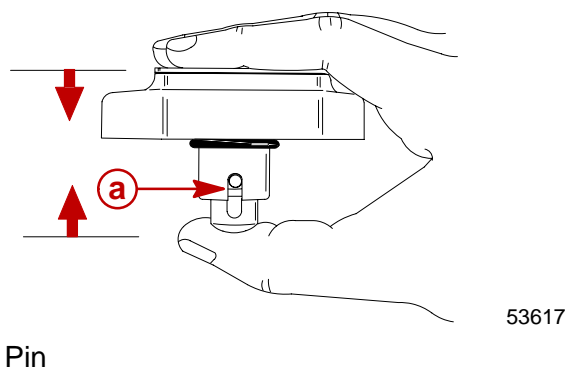
1. Remove screws to separate pump cover, cover seal, diaphragm and valve body from pump base.



2. Rotate plunger to line up slots.



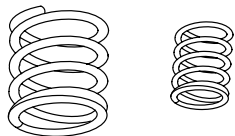
3. Compress pump assembly to free spring load on pin.
4. Tilt assembly to allow pin to slide out.



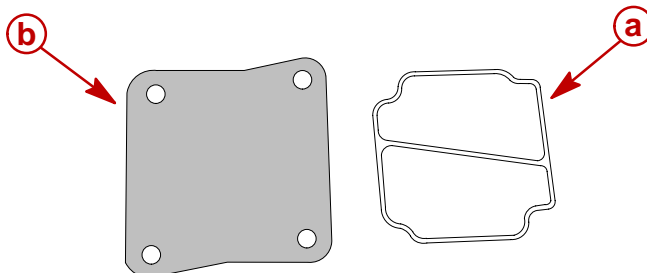


## Cleaning/Inspection/Repair

1. Inspect springs for damage, replace if necessary.



2. Inspect cover seal and diaphragm, replace if damaged.



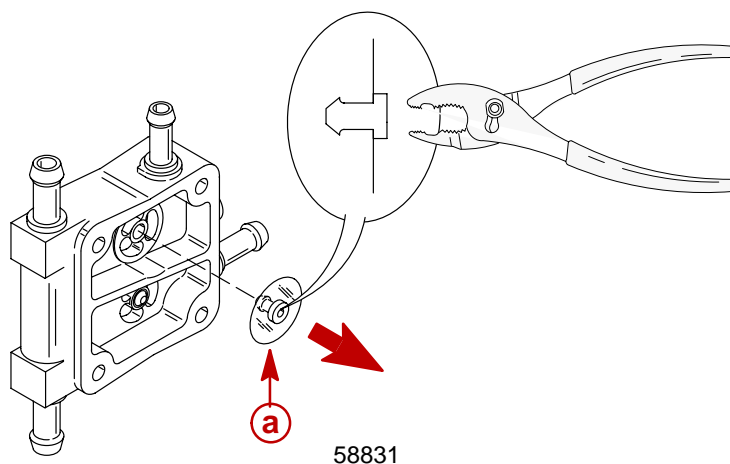
- a - Cover Seal
- b - Diaphragm

## Check Valve Inspection/Replacement

1. Inspect the check valves for damage, replace if necessary.

### REMOVAL

2. If replacement is needed remove old check valves by grabbing the seal and pulling.



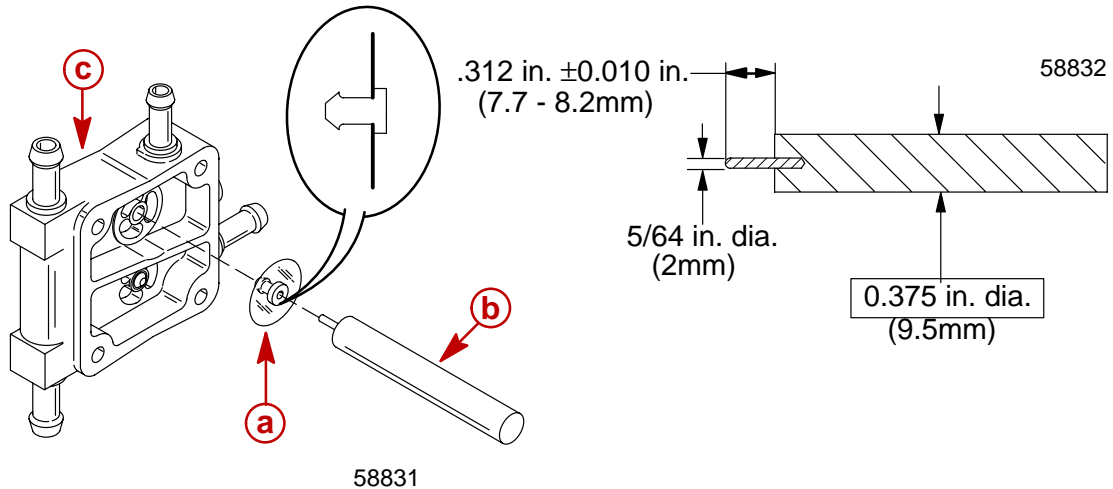
- a - Check Valve/Seal Assembly (2)



## INSTALLATION

1. Fabricate an installation tool to the dimensions specified.
2. Lubricate the end of the seal and push the assembly into the valve body.

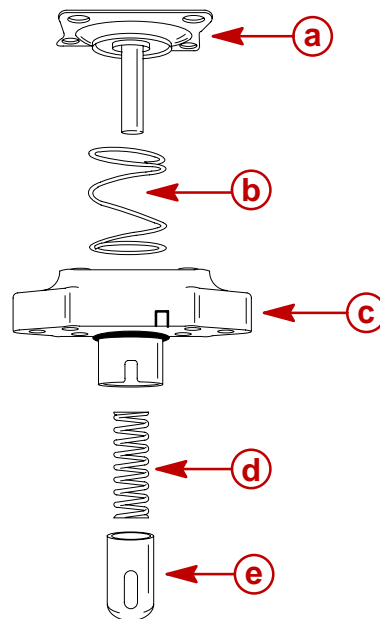
**NOTE:** Drill into the handle using a 5/64 in. (2mm) drill bit. Insert the peg into the drilled hole until 0.312 in. (8mm) remains exposed.



- a - Check Valve/Seal Assembly (2)
- b - Installation Tool (make yourself)
- c - Valve Body

## Assembly

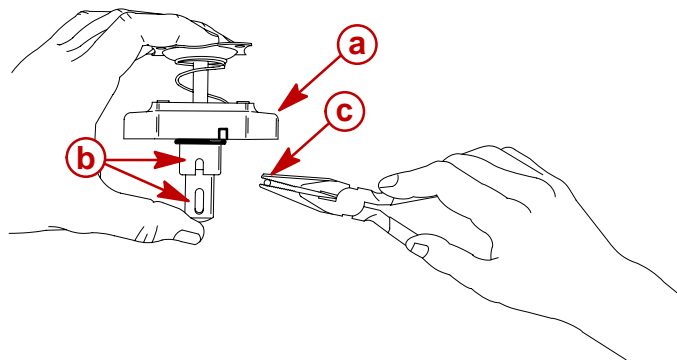
1. Assemble springs, diaphragm, and plunger onto pump base.



- a - Diaphragm
- b - Diaphragm Spring
- c - Pump Body
- d - Spring
- e - Plunger

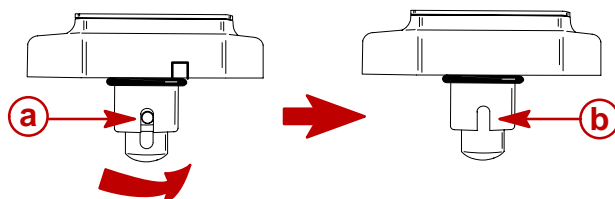


- Line up slots and compress assembly.
- Insert pin into hole.



- a - Pump Body
- b - Slots
- c - Pin

- Rotate plunger 90° to offset slots.

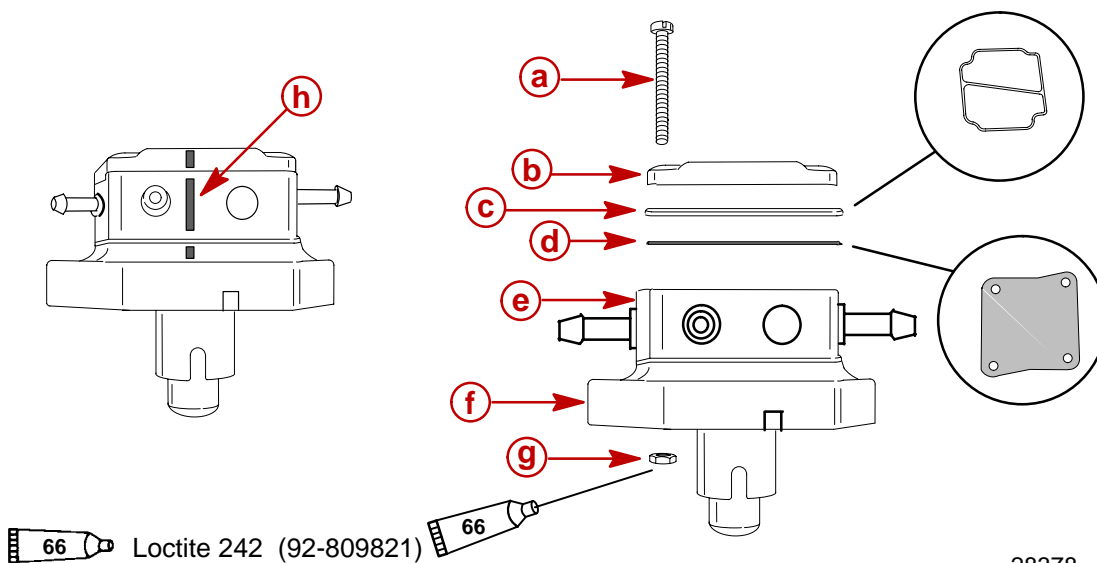


- a - Slots Aligned
- b - Slots Offset

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- Assemble valve body, diaphragm, seal, and cover to pump base. **Be sure to line up I.D. marks that were made before disassembly.** Apply Loctite 242 to screws and secure with nuts.

**NOTE:** Seal installs in one direction only.



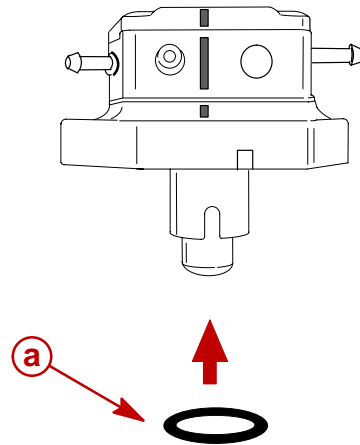
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- a - Screws (4)
- b - Pump Cover
- c - Cover Seal
- d - Diaphragm
- e - Valve Body
- f - Pump Base
- g - Nuts (4)
- h - I.D. Marks





6. Inspect O-ring and replace if necessary. Install onto fuel pump assembly.



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**a** - O-ring

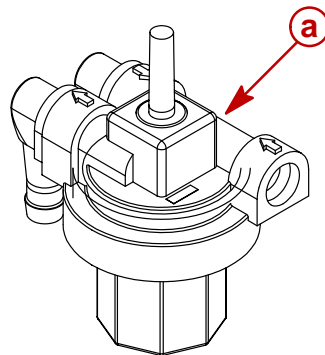
## Fuel Filter Disassembly/Assembly

### DISASSEMBLY

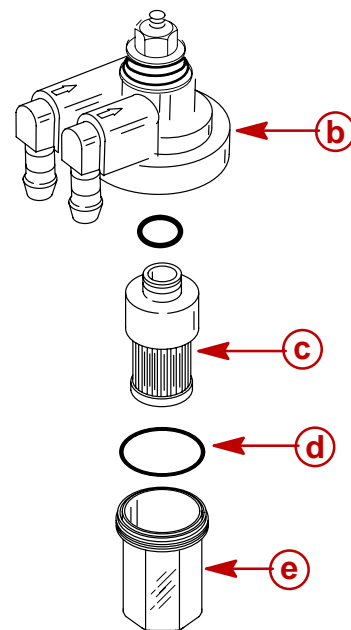
1. Unscrew fuel filter cup and remove fuel filter element and o-rings.
2. Inspect o-rings and replace if necessary.
3. Clean fuel filter cup and replace fuel filter element if needed.

### ASSEMBLY

1. Lubricate o-rings and install fuel filter element.
2. Install fuel filter cup and hand tighten.



**a** - Fuel Filter Assembly  
**b** - Fuel Filter Cap  
**c** - Fuel Filter Element



**d** - O-ring  
**e** - Fuel Filter Cup



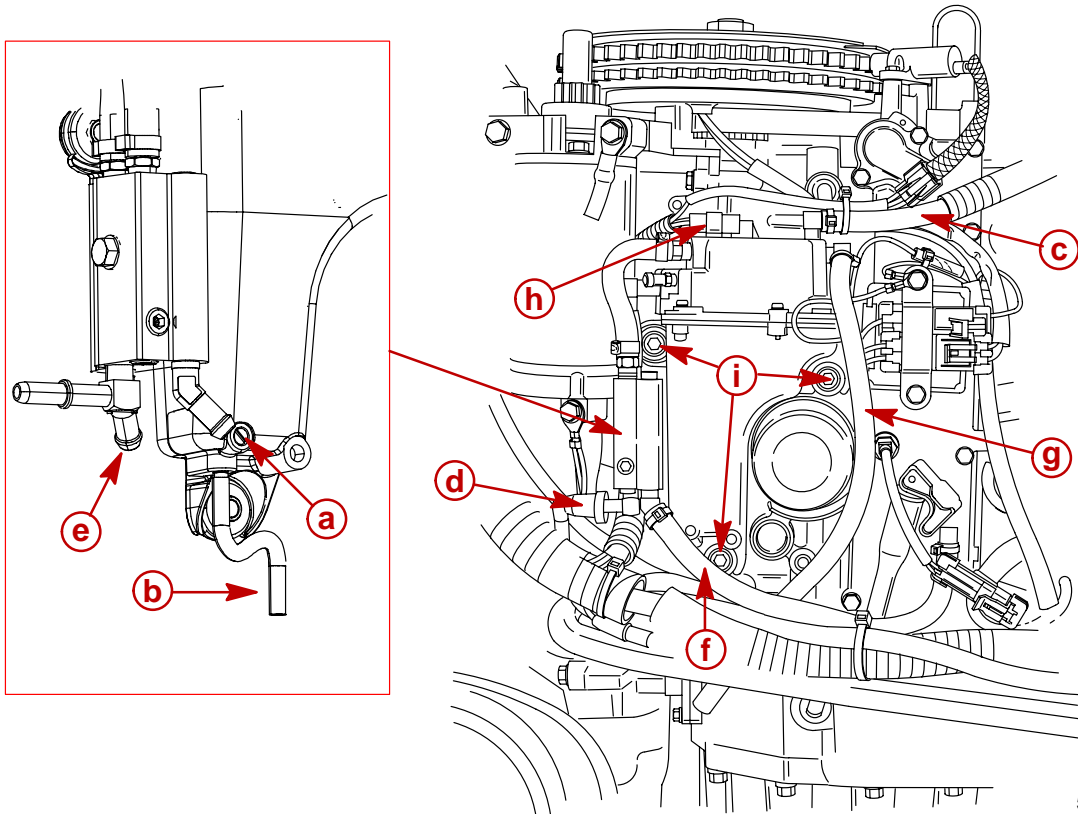
# Vapor Separator (VST)

## ⚠ WARNING

Always release the fuel pressure in the high-pressure fuel line before servicing the line or the vapor separator. If the fuel pressure is not released, pressurized fuel may spray out.

## Removal

1. Release fuel pressure. Refer to **Releasing Fuel Pressure in the High Pressure Fuel Line**.
2. Remove the lower cowl. Drain the fuel from the VST into a suitable container.
3. Disconnect fuel lines, water lines and high pressure fuel pump harness connector.
4. Remove vapor separator (VST) mounting screws and remove VST from engine.



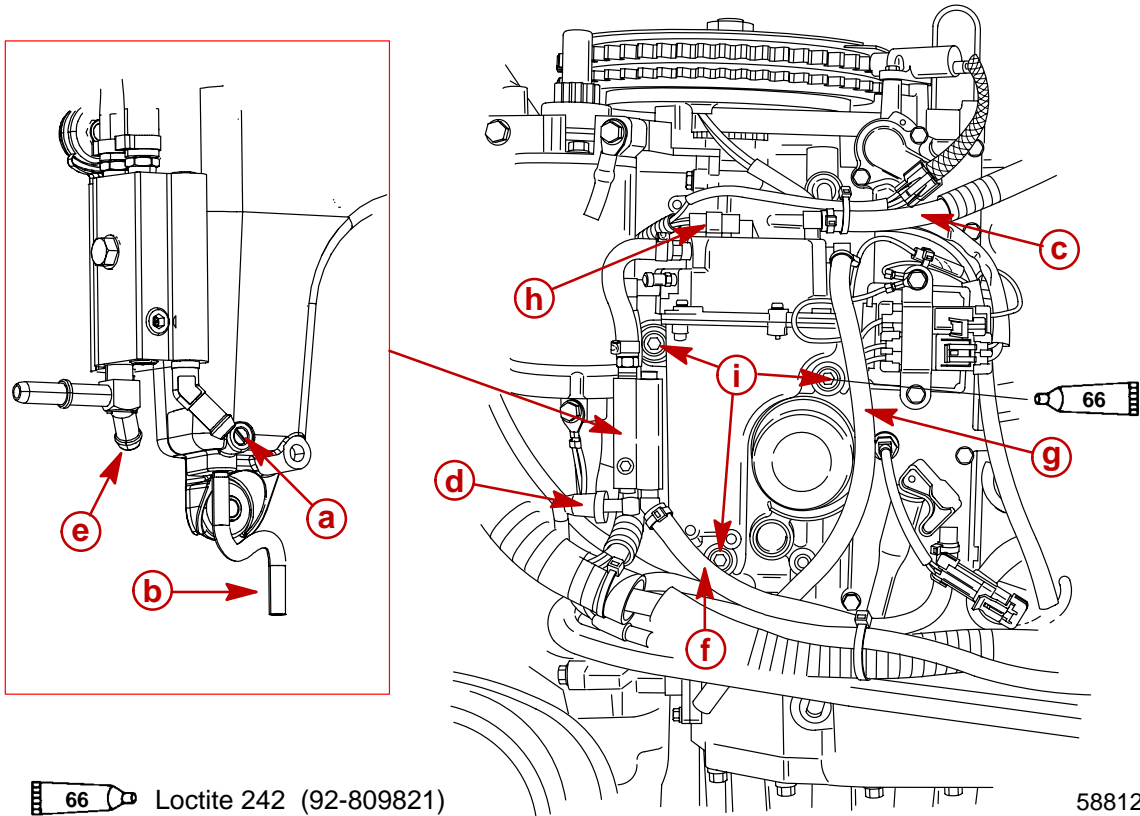
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- a** - VST Drain Valve
- b** - VST Drain Hose
- c** - Fuel Hose (Mechanical Fuel Pump to VST)
- d** - High Pressure Fuel Hose (Fuel Cooler to Fuel Distribution Manifold)
- e** - Water Hose (VST Fuel Cooler to Mechanical Fuel Pump Fuel Cooler)
- f** - Water Hose (Exhaust Cover to Fuel Cooler)
- g** - VST Vent Hose
- h** - High Pressure Fuel Pump Harness Connector
- i** - Vapor Separator Mounting Screws (3) M6 x 25



## Installation

1. Tighten drain valve and install VST to engine. Tighten mounting screws to specified torque.
2. Connect fuel and water hoses as shown below. Secure with sta-straps.
3. Plug in high pressure fuel pump harness connector.



- a** - VST Drain Valve
- b** - VST Drain Hose
- c** - Fuel Hose (Mechanical Fuel Pump to VST)
- d** - High Pressure Fuel Hose (Fuel Cooler to Fuel Distribution Manifold)
- e** - Water Hose (VST Fuel Cooler to Mechanical Fuel Pump Fuel Cooler)
- f** - Water Hose (Exhaust Cover to Fuel Cooler)
- g** - VST Vent Hose
- h** - High Pressure Fuel Pump Harness Connector
- i** - Vapor Separator Mounting Screws (3) M6 x 25

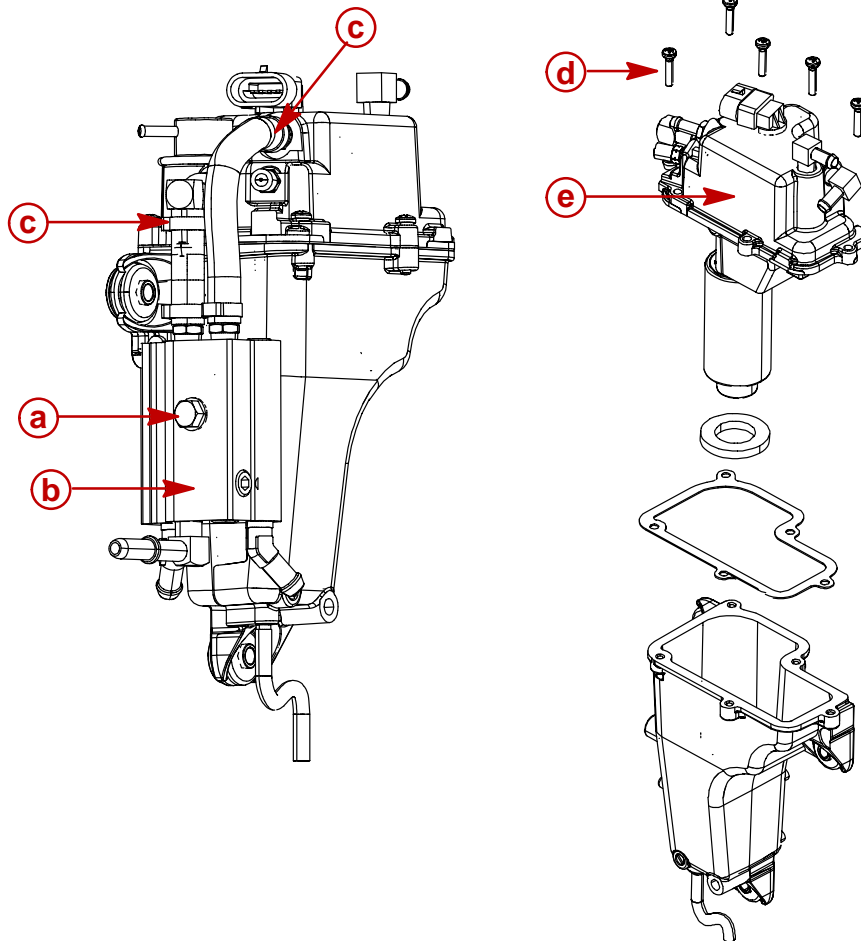
Vapor Separator Mounting Screw Torque
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45 lb. in. (5 N·m)
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## Disassembly

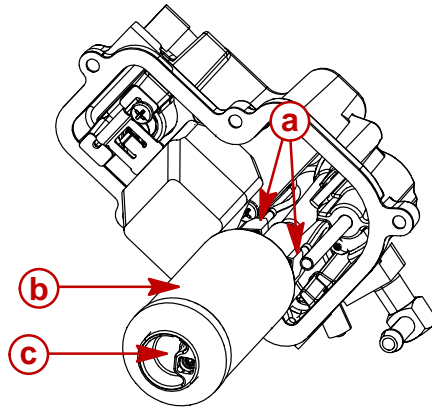
1. Remove fuel cooler mounting screw.
2. If removal of fuel cooler is required (because of damaged/plugged hoses or fuel cooler replacement), cut metal hose clamps and remove fuel hoses from VST cover. Remove fuel cooler.
3. Remove VST cover screws and remove cover assembly.



- a** - Fuel Cooler Mounting Screw (1) M6 x 25
- b** - Fuel Cooler
- c** - Metal Hose Clamp
- d** - VST Cover Screws (5)
- e** - VST Cover Assembly

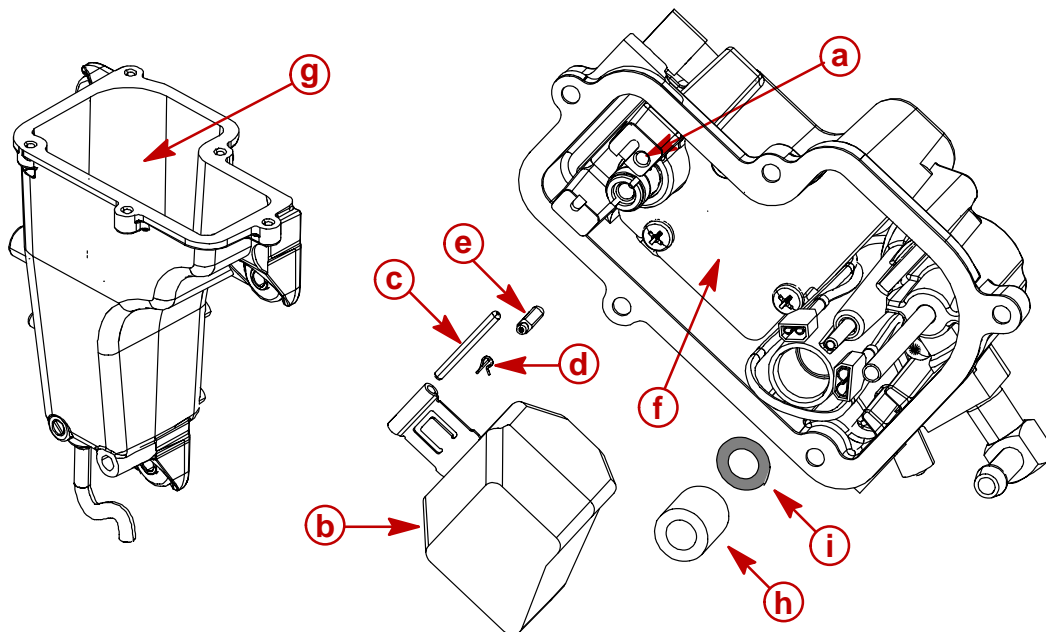


4. Disconnect high pressure fuel pump connectors and remove high pressure fuel pump.
5. Inspect and clean high pressure fuel pump screen.



- a** - Connectors
- b** - High Pressure Fuel Pump
- c** - Screen

6. Loosen float pin retaining screw and remove float assembly.
7. Remove baffle plate (if desired).
8. Remove and inspect seat.
9. Inspect and clean VST float chamber.

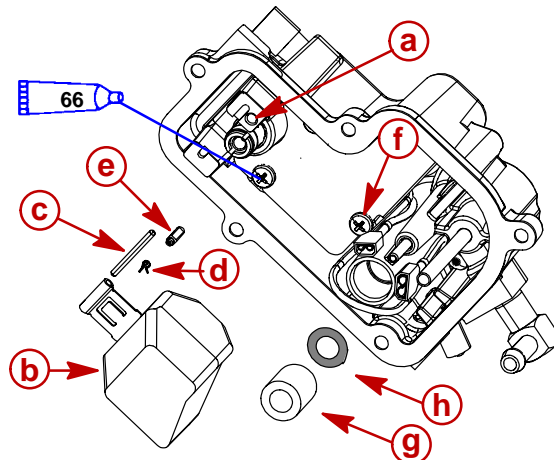


- a** - Float Pin Retaining Screw
- b** - Float
- c** - Float Shaft
- d** - Clip
- e** - Needle
- f** - Baffle Plate
- g** - VST Float Chamber
- h** - Seat
- i** - Gasket



## Assembly

1. Apply Loctite 242 to screws and install baffle plate (if removed). Tighten screws to specified torque.
2. Install seat (with new gasket) and tighten.
3. Install float assembly as shown. Install float pin and tighten retaining screw to specified torque.

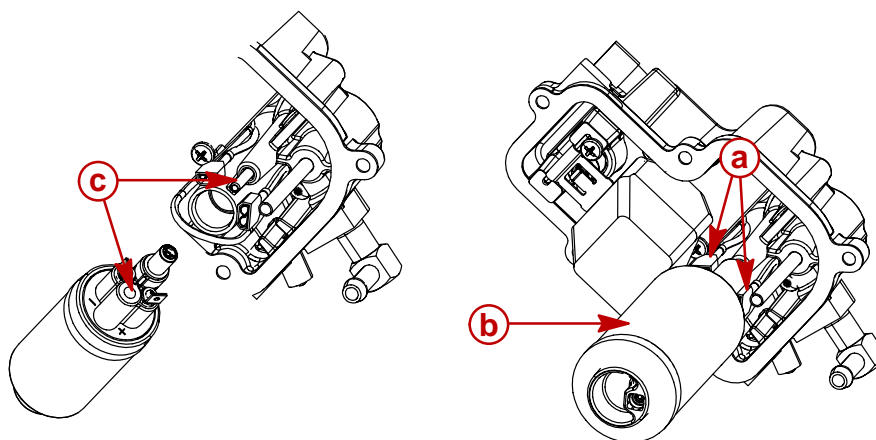


 Loctite 242 (92-809821)

- |                                      |                                   |
|--------------------------------------|-----------------------------------|
| <b>a</b> - Float Pin Retaining Screw | <b>e</b> - Needle                 |
| <b>b</b> - Float                     | <b>f</b> - Baffle Plate Screw (3) |
| <b>c</b> - Float Shaft               | <b>g</b> - Seat                   |
| <b>d</b> - Clip                      | <b>h</b> - Gasket                 |

<b>Screw Torque</b>
22 lb. in. (2.5 N·m)

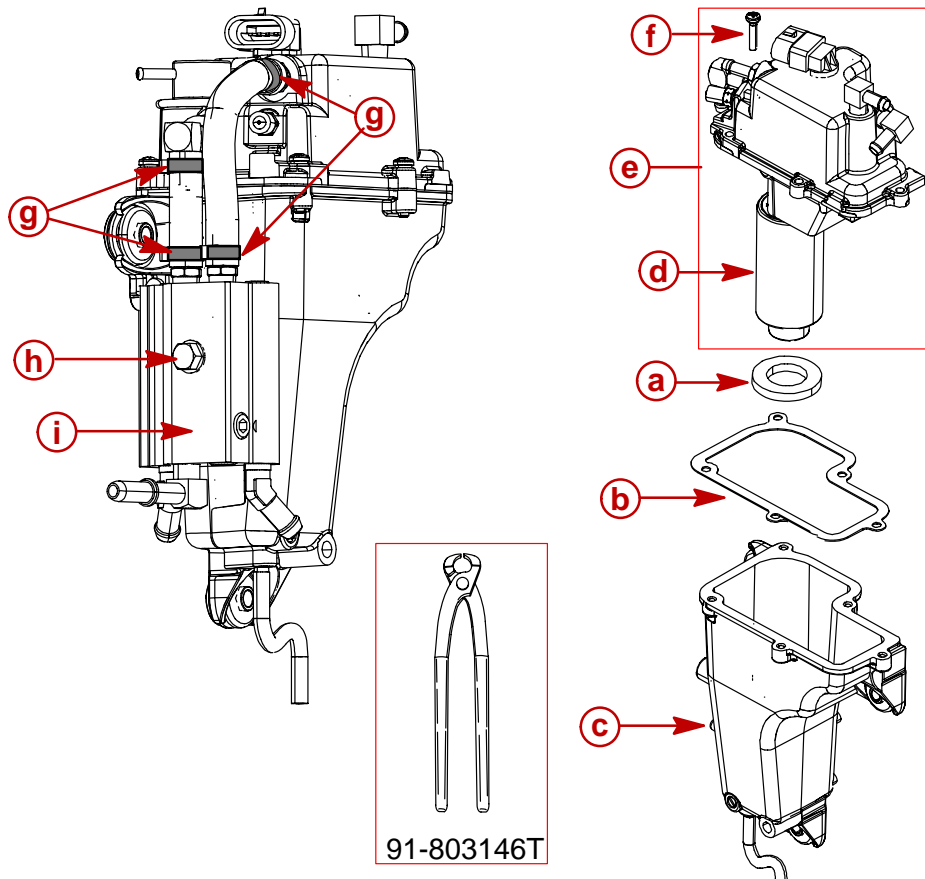
4. Connect the high pressure fuel pump connectors. Push the nozzle into the rubber grommet (lubricate with light oil if necessary). Make sure the alignment pin is positioned properly and lines up with hole in the high pressure fuel pump.



- |                                    |
|------------------------------------|
| <b>a</b> - Connectors              |
| <b>b</b> - High Pressure Fuel Pump |
| <b>c</b> - Alignment Pin           |



5. Install grommet to the bottom of the high pressure fuel pump.
6. Lightly clamp the VST float chamber in a vise. Position the VST cover assembly so the high pressure fuel pump is horizontal. This will prevent the grommet from falling off.
7. Install VST cover assembly and new gasket, into float chamber. Push the cover and float chamber together, this will compress the grommet and allow the screws to be threaded in.
8. Install VST cover screws and tighten to specified torque.



- a - Grommet
- b - Gasket
- c - VST Float Chamber
- d - High Pressure Fuel Pump
- e - VST Cover Assembly
- f - VST Cover Screws (5)
- g - Metal Hose Clamp (4)
- h - Fuel Cooler Mounting Screw(1) M4 x 20
- i - Fuel Cooler

**Screw Torque**

32 lb. in. (3.5 N·m)



# Pressure Regulator Removal/Installation

## ⚠ WARNING

Always release the fuel pressure in the high-pressure fuel line before servicing the line or the vapor separator. If the fuel pressure is not released, pressurized fuel may spray out.

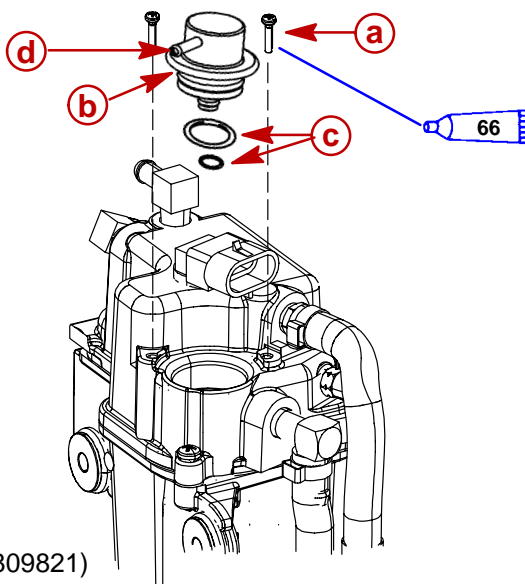
**NOTE:** The pressure regulator vent is an open fitting that does not require a hose to be attached.

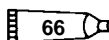
### Removal

1. Release fuel pressure. Refer to **Releasing Fuel Pressure in the High Pressure Fuel Line**.
2. Remove fuel pressure regulator mounting screws and remove regulator from VST cover.
3. Inspect o-rings. Replace if necessary. Inspect and clean screen.

### Installation

1. Lubricate o-rings with light lubricant and reassemble the pressure regulator to the VST cover (twist while pushing in).
2. Apply Loctite 242 to mounting screws and tighten to specified torque.



 Loctite 242 (92-809821)

- a** - Mounting Screw (2)
- b** - Fuel Pressure Regulator
- c** - O-rings
- d** - Vent (no hose)

### Pressure Regulator Mounting Screw Torque

22 lb. in. (2.5 N·m)





# High Pressure Fuel Line Removal/Installation

## ⚠ WARNING

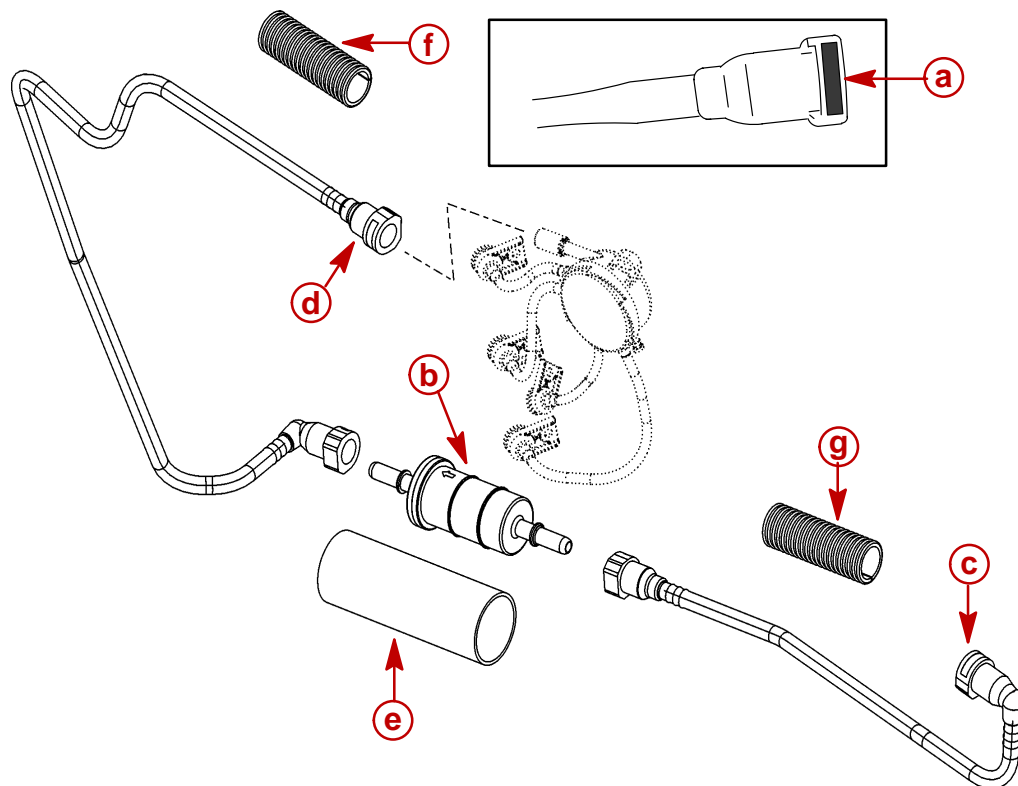
Always release the fuel pressure in the high-pressure fuel line before servicing the line or the vapor separator. If the fuel pressure is not released, pressurized fuel may spray out.

### REMOVAL

1. Disconnect the fuel line from the fuel distribution manifold by depressing the locking tab.
2. Disconnect the fuel line from the fuel cooler by depressing the locking tab.
3. Remove the high pressure fuel line assembly.
4. Inspect filter for cracks/debris. Replace if necessary.

### INSTALLATION

1. Connect fuel lines as shown.



- a - Locking Tab
- b - Fuel Filter
- c - Fuel Line (to VST fuel cooler)
- d - Fuel Line (to fuel distribution manifold)
- e - Protective Sleeve
- f - Conduit
- g - Conduit