

Fuel System

Section 5C - Gen III Cool Fuel System

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Precautions

WARNING

Avoid fire or explosion hazard. Electrical, ignition, and fuel system components on Mercury Marine products comply with federal and international standards to minimize risk of fire or explosion. Do not use replacement electrical or fuel system components that do not comply with these standards. When servicing the electrical and fuel systems, properly install and tighten all components.

WARNING

Neglect or improper maintenance, repairs, or inspections of the power package can result in product damage or serious injury or death. Perform all procedures as described in this manual. If you are not familiar with proper maintenance or service procedures, consign the work to an authorized Mercury Marine dealer.

WARNING

Performing service or maintenance without first disconnecting the battery can cause product damage, personal injury, or death due to fire, explosion, electrical shock, or unexpected engine starting. Always disconnect the battery cables from the battery before maintaining, servicing, installing, or removing engine or drive components.

WARNING

Explosive fumes contained in the engine compartment can cause serious injury or death from fire or explosion. Before starting the engine, operate the bilge blower or vent the engine compartment for at least five minutes.

WARNING

Fuel is flammable and explosive. Ensure that the key switch is off and the lanyard is positioned so that the engine cannot start. Do not smoke or allow sources of spark or open flame in the area while servicing. Keep the work area well ventilated and avoid prolonged exposure to vapors. Always check for leaks before attempting to start the engine, and wipe up any spilled fuel immediately.

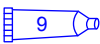


NOTICE

Without sufficient cooling water, the engine, the water pump, and other components will overheat and suffer damage. Provide a sufficient supply of water to the water inlets during operation.

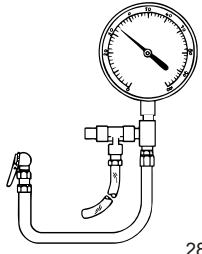
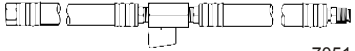
IMPORTANT: To avoid damaging the electrical system, follow these precautions:

- Do not tap accessories into the engine harness.
- Do not puncture wires for testing (probing).
- Do not reverse the battery leads.
- Do not splice wires into the harness.
- Do not attempt diagnostics without the proper, approved service tools.

Lubricants, Sealants, Adhesives

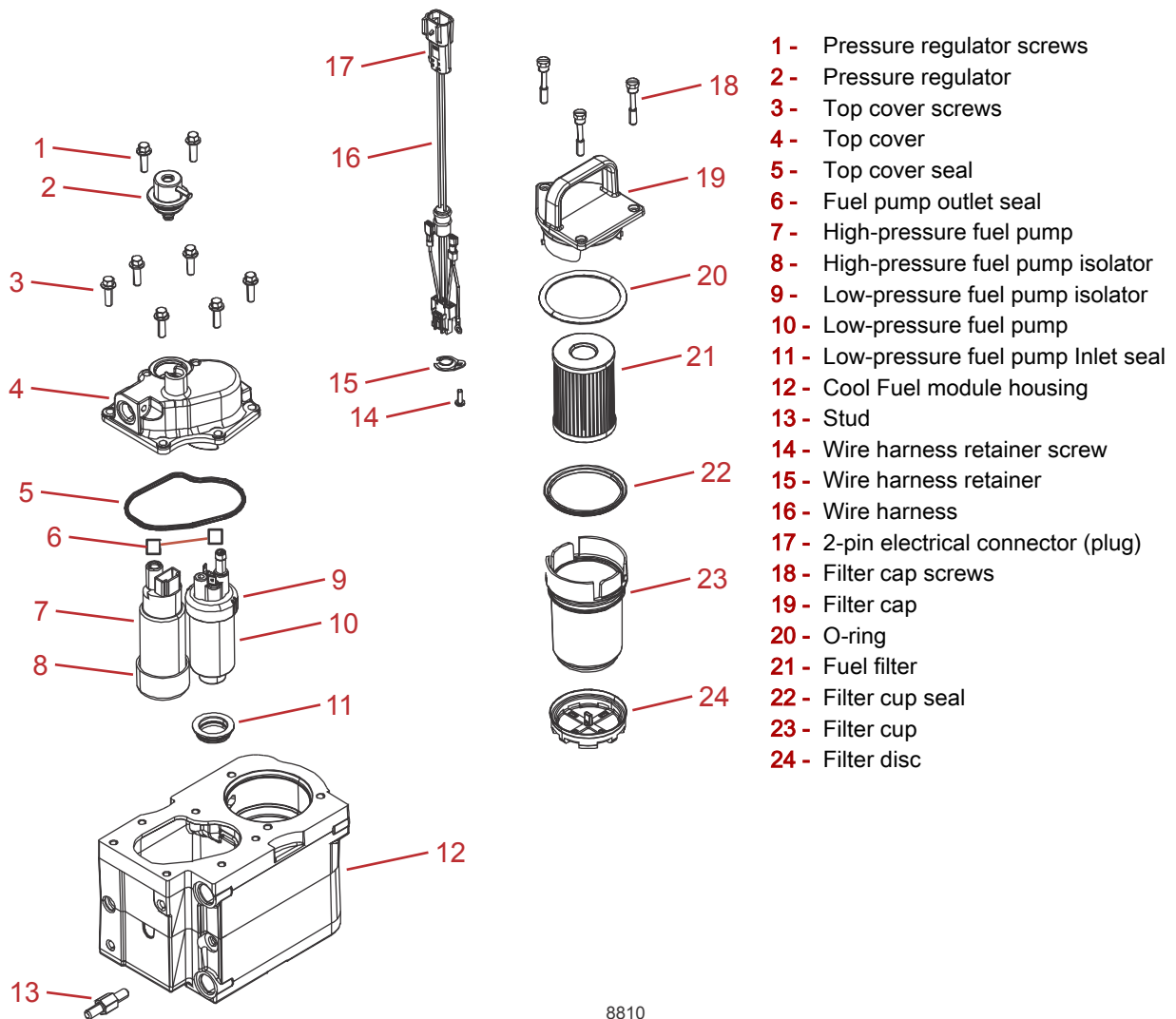
Tube Ref No.	Description	Where Used	Part No.
 9	Loctite 567 PST Pipe Sealant	Fuel inlet adapter fitting	92-809822
		Fuel line inlet connector to adapter	
 19	Perfect Seal	Cooling hose orifices and mating bore	92-34227Q02
 154	Mercury MerCruiser Full-Synthetic Engine Oil 20W-40, NMMA FC-W rated	Fuel outlet line O-ring	92-858087K01
		Fuel line O-ring	

Special Tools

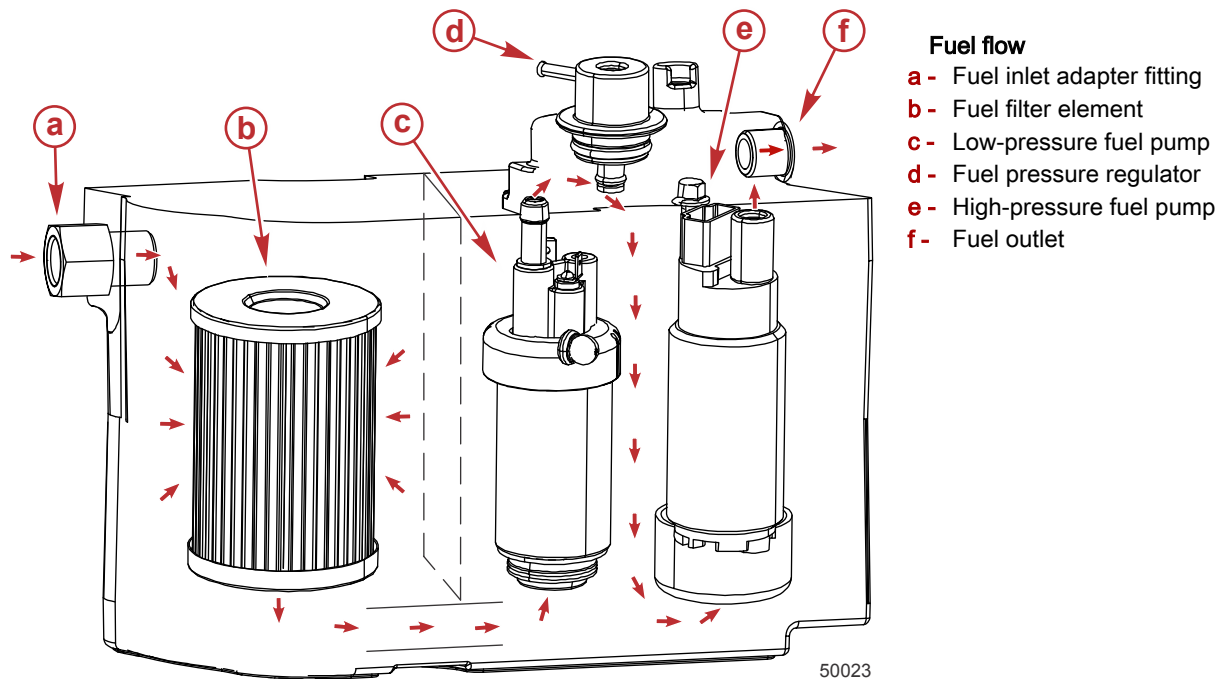
Fuel Pressure Gauge Kit	91-881833A03
 2807	Tests the fuel pump pressure; can be used to relieve fuel pressure.
Fuel Shutoff Tool	91-805918A1
 7051	Tests fuel system pressure/vacuum

Exploded Views and Diagrams

Gen III Cool Fuel Module Exploded View



Gen III Cool Fuel Module Fuel Flow Diagram



Changing the Water Separating Fuel Filter Element

⚠ WARNING

Fuel is flammable and explosive. Ensure that the key switch is off and the lanyard is positioned so that the engine cannot start. Do not smoke or allow sources of spark or open flame in the area while servicing. Keep the work area well ventilated and avoid prolonged exposure to vapors. Always check for leaks before attempting to start the engine, and wipe up any spilled fuel immediately.

⚠ CAUTION

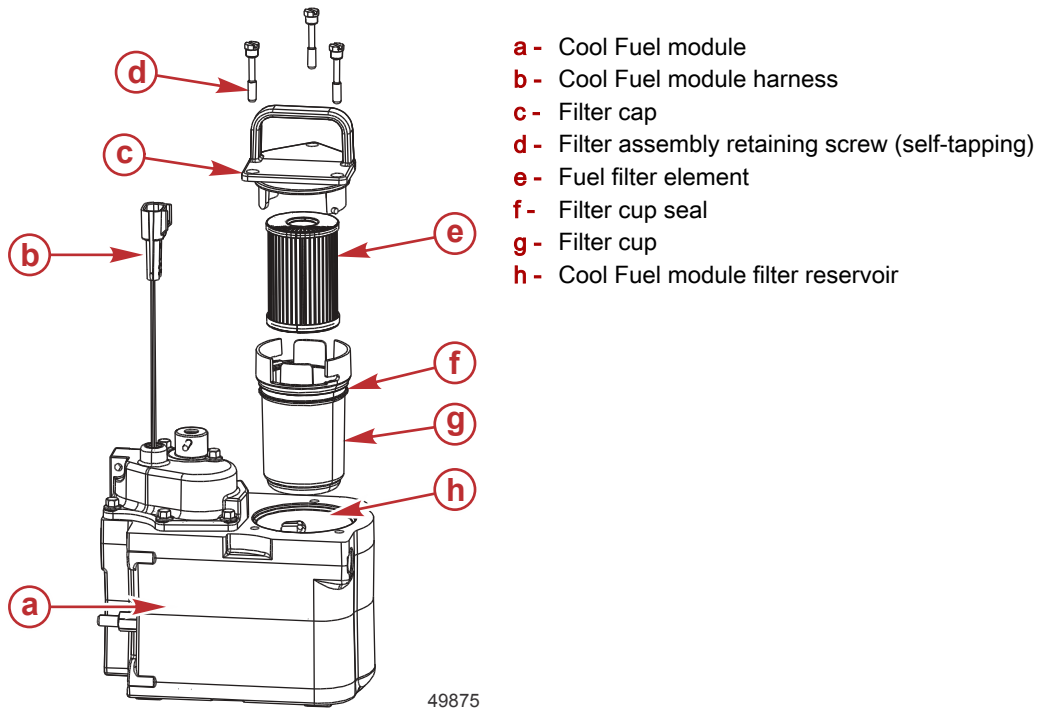
Failure to release pressure from the fuel system will result in fuel spraying out, which can cause a fire or explosion. Allow the engine to cool completely and release all fuel pressure before servicing any part of the fuel system. Always protect eyes and skin from pressurized fuel and vapors.

1. Allow the engine to cool down.
2. Close the fuel supply valve, if equipped.
3. Disconnect the Cool Fuel module harness from the engine wiring harness.
4. Turn the key switch to the start position and allow the starter to operate for five seconds to relieve fuel system pressure.
5. Turn the key switch to the off position.

6. Loosen each filter assembly retaining screw until the screw is disengaged from the Cool Fuel module. Do not remove the filter assembly retaining screws from the filter cap.

NOTE: The filter cap screw holes are not tapped in the housing. If replacing the lower assembly, use the self-tapping filter assembly retaining screws.

7. Unseat the filter assembly by grasping the filter assembly handle and pulling upward. Do not completely remove the filter assembly from the Cool Fuel module at this time.



8. Allow any fuel that may be in the filter assembly to drain out through the bottom of the filter assembly and into the Cool Fuel module filter reservoir.
9. Remove the filter cup from the filter cap by grasping the filter cap and rotating it clockwise while holding the filter cup stationary.
10. Remove the used water separating fuel filter element from the filter cup, and place it in a clean, approved container.
11. Dispose of any water or debris that may be in the filter cup.
12. Install a new water separating fuel filter element into the filter cup. Push the element into the cup until it is completely seated.
13. Install a new O-ring on the filter cup.
14. Attach the filter cap to the filter cup by grasping the filter cap and rotating it counterclockwise while holding the filter cup stationary. Continue turning until the filter cap locks securely into place.
15. Carefully install the fuel filter assembly into the Cool Fuel module to prevent spilling fuel, and align the screws in the filter cap with the screw holes in the Cool Fuel module. Tighten the filter assembly retaining screws until they are hand tight.
16. Ensure that the filter cap is firmly seated against the Cool Fuel module and tighten each filter assembly retaining screw to specification.

Description	Nm	lb-in.	lb-ft
Filter assembly retaining screw	6	53	

17. Open the fuel supply valve, if equipped.
18. Reconnect the Cool Fuel module harness to the engine wiring harness.
19. Supply cooling water to the engine.
20. Properly ventilate the engine compartment.

⚠ WARNING

Fuel vapors trapped in the engine compartment may be an irritant, cause difficulty breathing, or may ignite resulting in a fire or explosion. Always ventilate the engine compartment before servicing the power package.

21. Run the engine and check for any leaks. Stop the engine immediately if a leak exists, and correct it before continuing.

Gen III Cool Fuel Module Removal

⚠ WARNING

Performing service or maintenance without first disconnecting the battery can cause product damage, personal injury, or death due to fire, explosion, electrical shock, or unexpected engine starting. Always disconnect the battery cables from the battery before maintaining, servicing, installing, or removing engine or drive components.

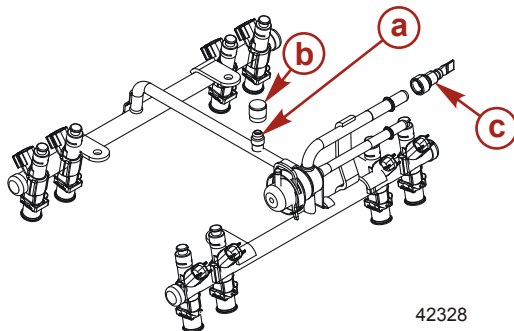
⚠ WARNING

Fuel vapors trapped in the engine compartment may be an irritant, cause difficulty breathing, or may ignite resulting in a fire or explosion. Always ventilate the engine compartment before servicing the power package.

⚠ CAUTION

Failure to release pressure from the fuel system will result in fuel spraying out, which can cause a fire or explosion. Allow the engine to cool completely and release all fuel pressure before servicing any part of the fuel system. Always protect eyes and skin from pressurized fuel and vapors.

1. Close the fuel supply valve, if equipped.
2. Close the seacock, if equipped.
3. Disconnect the negative (-) battery cable from the battery.
4. Disconnect the positive (+) battery cable from the battery.
5. Relieve the fuel system pressure as follows:
 - a. Connect the fuel pressure gauge kit to the Schrader valve on the fuel rail.

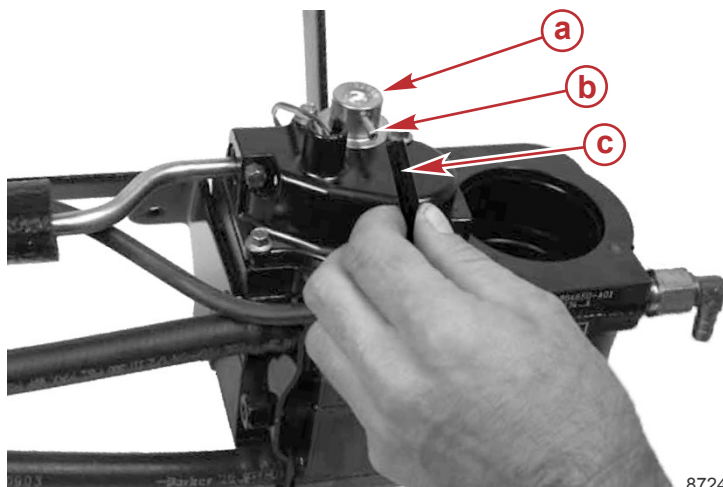


Typical MPI fuel rail, excluding Scorpion models

- a - Schrader valve
- b - Schrader valve cap
- c - Fuel rail block-off plug

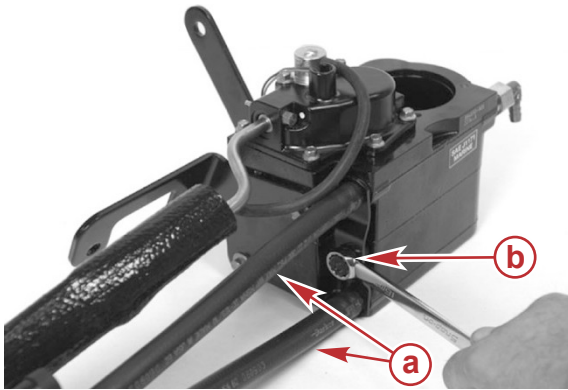
Fuel Pressure Gauge Kit	91-881833A03
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- b. Place the end of the fuel pressure gauge relief line into an approved container.
 - c. Open the fuel pressure gauge relief valve to relieve the pressure.
6. Disconnect the Cool Fuel module 2-pin harness connector.
7. Disconnect the fuel supply (inlet) hose and plug the hose.
8. Disconnect the fuel pressure regulator vacuum hose from the fuel pressure regulator on the Cool Fuel module.



- a - Fuel pressure regulator
- b - Fuel pressure regulator hose nipple
- c - Fuel pressure regulator vacuum hose

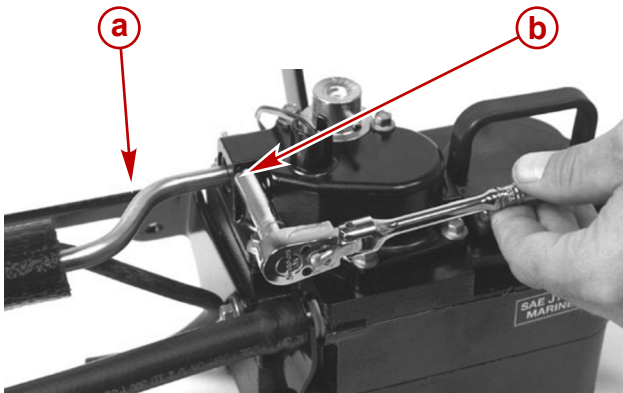
9. Loosen the nut on the cooling hose bracket and remove the cooling hoses from the Cool Fuel module.



- a** - Cooling hoses
- b** - Bracket nut

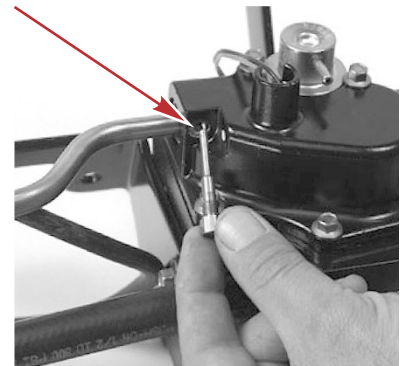
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10. Remove the fuel outlet line retainer screw.



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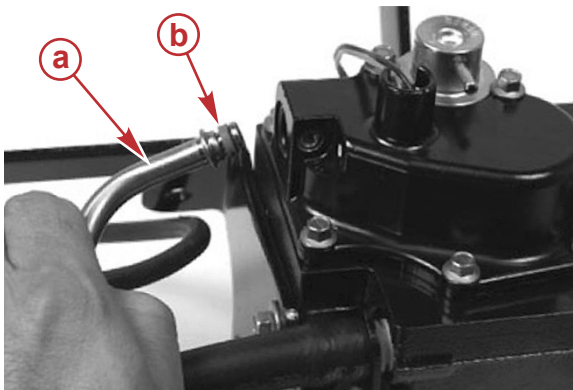
- a** - Fuel outlet line
- b** - Fuel outlet screw



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Fuel outlet line retainer screw

11. Carefully pull the fuel outlet line straight out from the module, and plug the line.



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- a** - Fuel outlet line
- b** - O-ring

12. Remove the Cool Fuel module mounting brackets from the engine.
13. Carefully remove the Cool Fuel module from the engine.

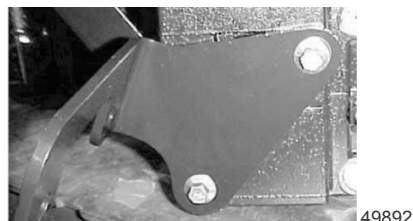
Gen III Cool Fuel Module Disassembly

NOTE: Retain all fasteners and hardware unless instructed otherwise.

IMPORTANT: Do not remove the fuel inlet adapter fitting.

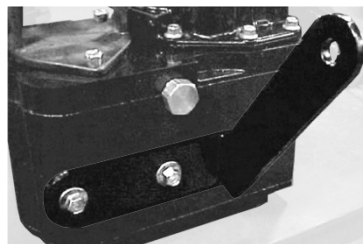


1. Remove the Cool Fuel module from the engine. Refer to **Gen III Cool Fuel Module Removal**.
2. Remove the primary mounting bracket from the Cool Fuel module.



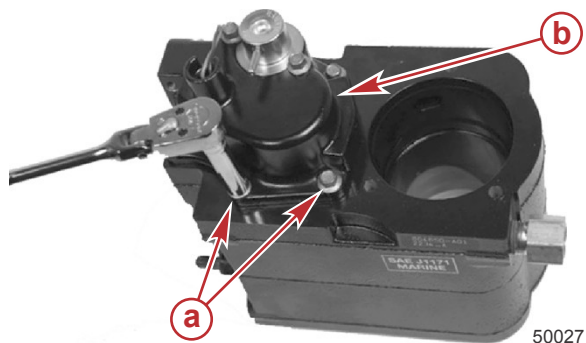
Primary mounting bracket

3. Remove the support bracket from the Cool Fuel module.



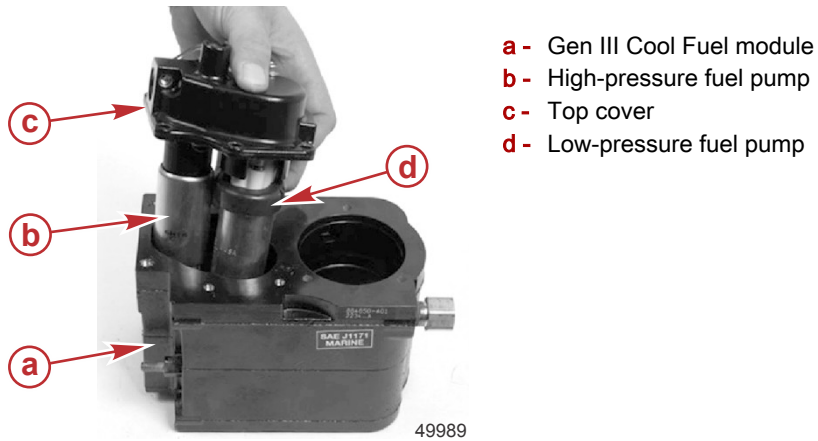
Support bracket

4. Remove the filter assembly. Refer to **Changing the Water Separating Fuel Filter Element**.
5. Remove the six screws holding the top cover.

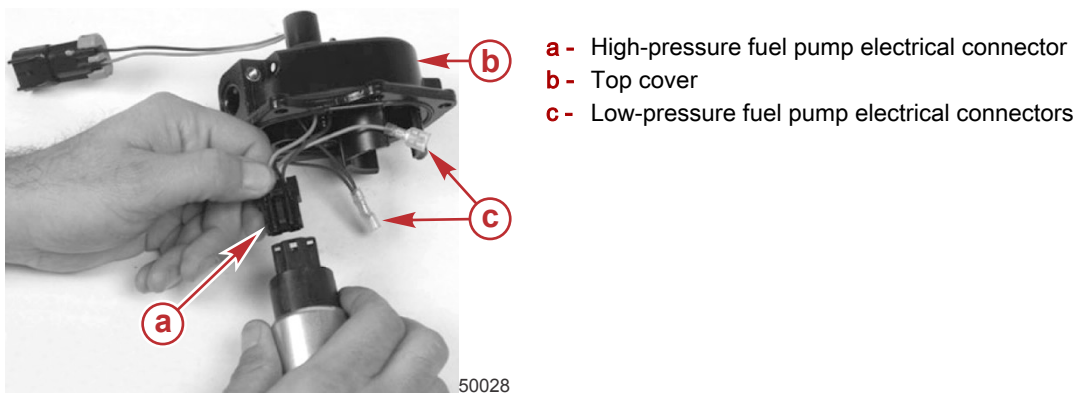


- a** - Top cover screws (not all are shown)
- b** - Top cover

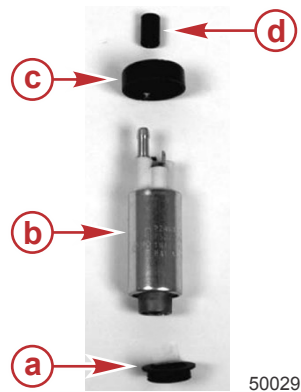
6. Pull the top cover straight up.



7. Disconnect the electrical connections from the low-pressure and high-pressure pumps and remove the pumps from the top cover.

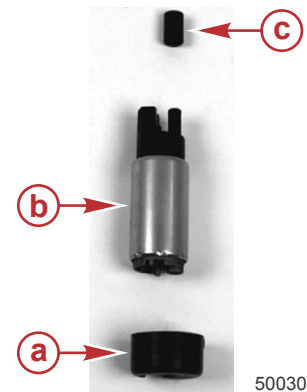


8. Remove the seals and isolators from the fuel pumps.



Low-pressure fuel pump

- a - Inlet seal
b - Low-pressure fuel pump
c - Isolator
d - Outlet seal



High-pressure fuel pump

- a - Isolator
b - High-pressure fuel pump
c - Outlet seal

NOTE: The fuel inlet seal for the low-pressure pump may not come out with the pump when the pump is removed from the Cool Fuel module housing. Be sure to remove the seal from the housing before low-pressure fuel pump installation.

9. Drain the fuel from the Gen III Cool Fuel module into an approved container.

Gen III Cool Fuel Module Assembly


Fuel Inlet Adapter Fitting

- 1. Install the fuel filter assembly. Refer to **Changing the Water Separating Fuel Filter Element**.

⚠ WARNING

Improper installation of brass fittings or plugs into the fuel pump or fuel filter base can crack the casting, causing a fuel leak and possible fire or explosion. Always install fittings and plugs correctly, and do not tighten with power tools.

- 2. Apply Loctite 567 to the threads of the fuel inlet adapter fitting.

Tube Ref No.	Description	Where Used	Part No.
 9	Loctite 567 PST Pipe Sealant	Fuel inlet adapter fitting	92-809822

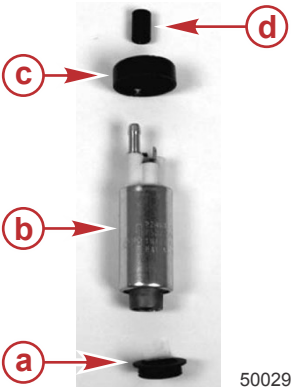
- 3. Hand thread the fuel inlet adapter fitting into the Cool Fuel module.
- 4. Tighten the fuel inlet adapter fitting to the specified torque.



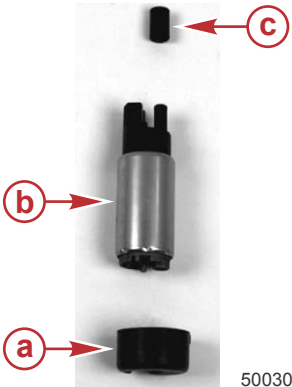
Description	Nm	lb-in.	lb-ft
Fuel inlet adapter fitting	22		16

Top Cover and Fuel Pumps

- 1. Place the fuel pump outlet seals and isolators onto both fuel pumps.
- 2. Place the inlet seal for the low-pressure pump into the Cool Fuel module housing.
IMPORTANT: The inlet (bottom) seal on the low-pressure pump must be placed in the Cool Fuel housing for installation. Do not place the inlet seal on the pump prior to pump installation. The seal may become dislodged during pump installation and cause the pump to not seal properly.

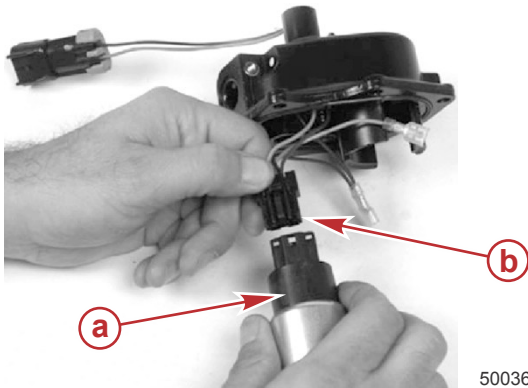


- Low-pressure fuel pump
- a - Inlet seal
 - b - Low-pressure fuel pump
 - c - Isolator
 - d - Outlet seal



- High-pressure fuel pump
- a - Isolator
 - b - High-pressure fuel pump
 - c - Outlet seal

3. Connect the electrical connector to the high-pressure fuel pump.



- a** - High-pressure fuel pump
b - Electrical connector

50036

4. Connect the electrical connectors to the low-pressure fuel pump:

- Red wire to the positive terminal
- Black wire to the negative terminal

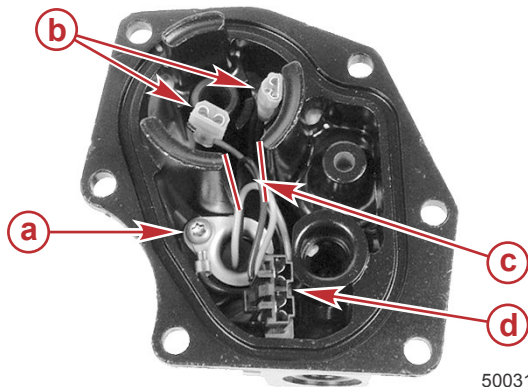
The fuel pump is marked positive (+) and negative (-) on the top of the pump. Spade connection sizes are matched to the appropriate connection.



- a** - Low-pressure fuel pump
b - Negative (-) electrical connection
c - Positive (+) electrical connection

49990

5. Route the wires as shown. Ensure that the ground wire terminal at the harness end is positioned against the outer wall of the casing. The low-pressure pump wiring must be routed through the slot and above the fuel pump. The high-pressure pump wiring must also be routed above the fuel pump. Ensure that the wiring is not bound or pinched.

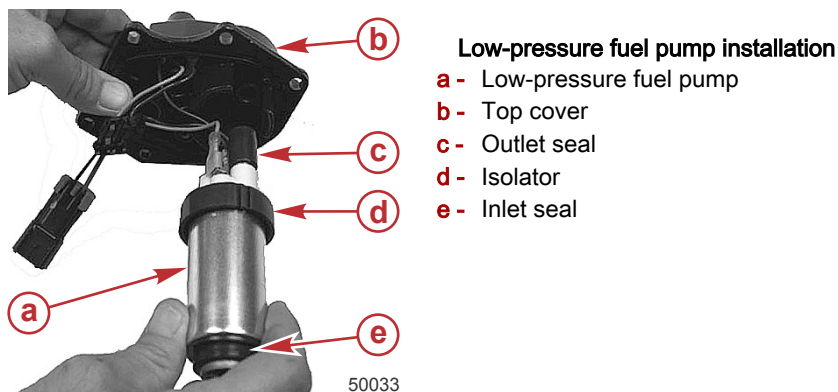


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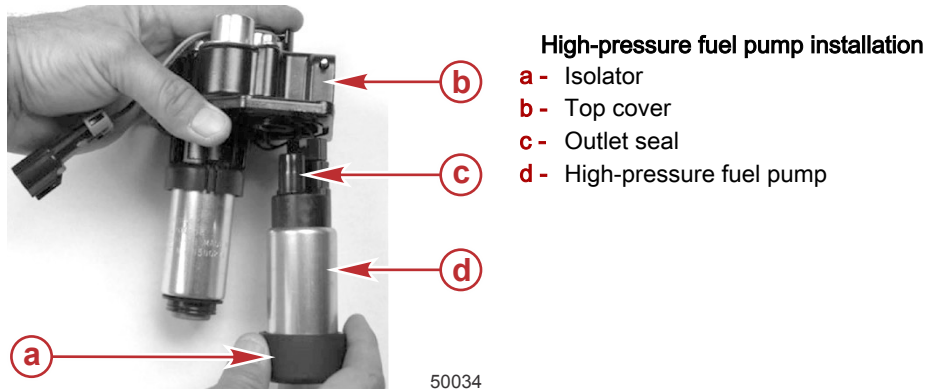
Fuel pumps not shown for clarity

- a** - Ground wire terminal
b - Low-pressure pump electrical connectors
c - Slot (low-pressure pump wire routing)
d - High-pressure pump electrical connector

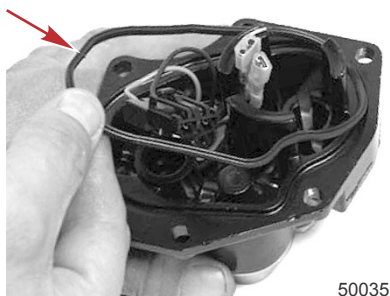
6. Insert the low-pressure pump into the top cover.



7. Insert the high-pressure pump into the top cover.



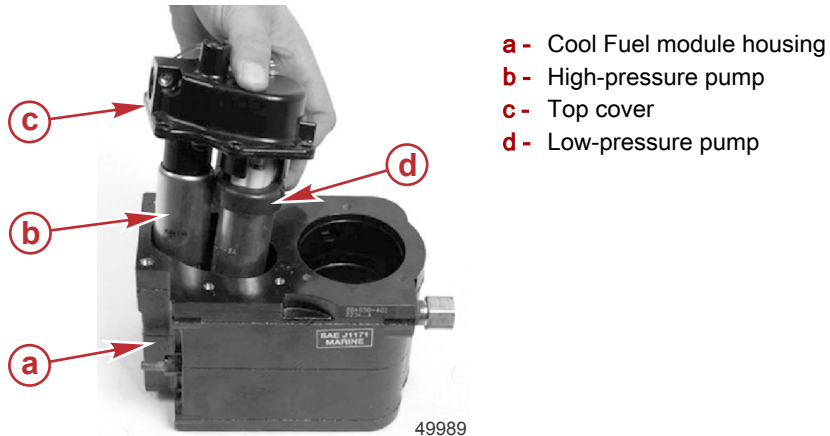
8. Verify that the top cover seal is not damaged. Replace it if necessary.
9. Place the top cover seal into the groove in the top cover.



Fuel pumps not shown for clarity

NOTE: Be sure that mating surfaces are clean and clear of any debris before installing the top cover.

10. Carefully lower the top cover with the fuel pumps into the Cool Fuel module housing.

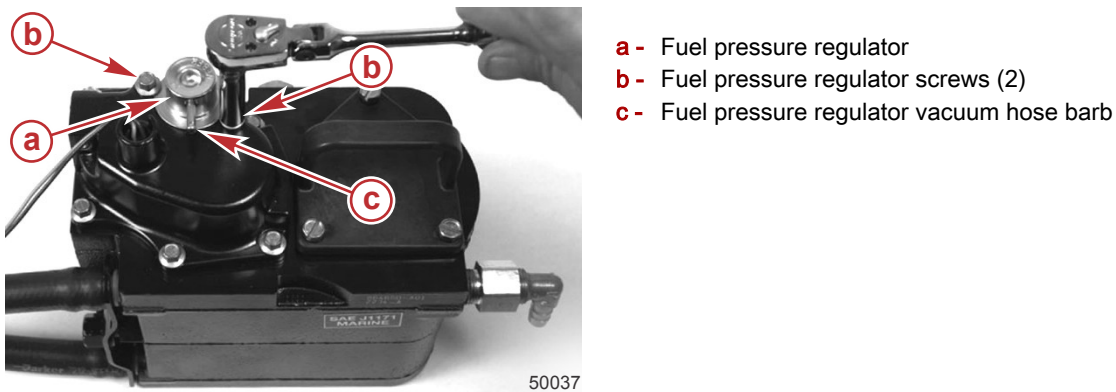


11. Install the top cover screws and hand-tighten them.
12. Pull the cover gently into place with the top cover screws.
IMPORTANT: Be sure to tighten the top cover screws evenly when pulling the top cover into place.
13. Tighten the top cover screws to the specified torque.

Description	Nm	lb-in.	lb-ft
Top cover screws	14	124	

Fuel Pressure Regulator

1. Insert the fuel pressure regulator into the top cover with the hose barb facing the outboard side of the Cool Fuel module.

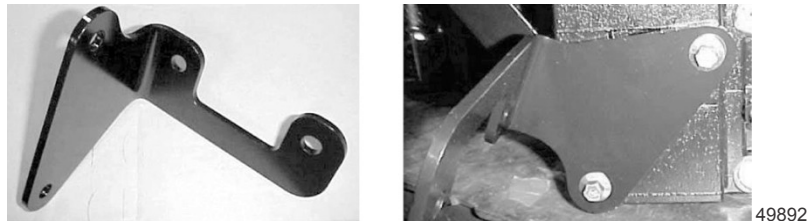


2. Install the two fuel pressure regulator screws and tighten them to the specified torque.

Description	Nm	lb-in.	lb-ft
Fuel pressure regulator screws	14	124	

Gen III Cool Fuel Module Installation

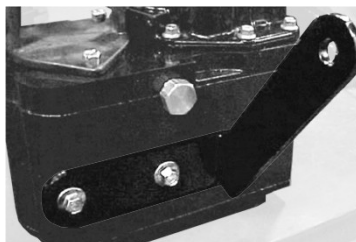
1. Connect the primary mounting bracket to the Cool Fuel module. Tighten to specification.



Primary bracket

Description	Nm	lb-in.	lb-ft
Primary bracket screws (Cool Fuel module)	23		17

- Connect the support bracket to the Cool Fuel module. Tighten to specification.



8796

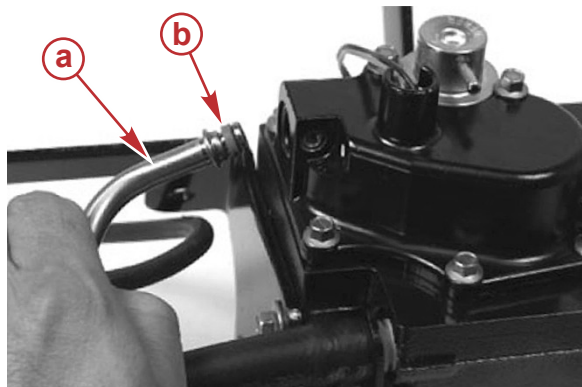
Support bracket

Description	Nm	lb-in.	lb-ft
Support bracket screws (Cool Fuel module)	23		17

- Install the Cool Fuel module onto the engine. Tighten the bracket fasteners to specification.


Description	Nm	lb-in.	lb-ft
Primary bracket screw (engine)	31		23
Primary bracket nuts (engine)	47		35
Support bracket nut (engine)	31		23

- Inspect the fuel outlet line O-ring. Replace if damaged.
- Apply a thin coat of oil to the O-ring.



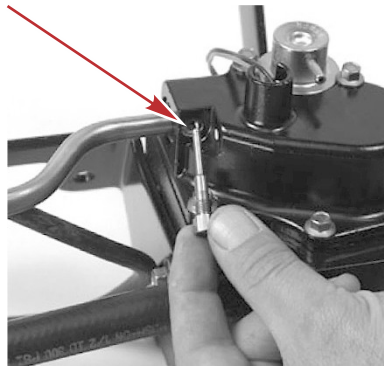
a - Fuel outlet line
b - O-ring

50038

Tube Ref No.	Description	Where Used	Part No.
	Mercury MerCruiser Full-Synthetic Engine Oil 20W-40, NMMA FC-W rated	Fuel outlet line O-ring	92-858087K01

- Carefully insert the fuel outlet line into the Cool Fuel module.

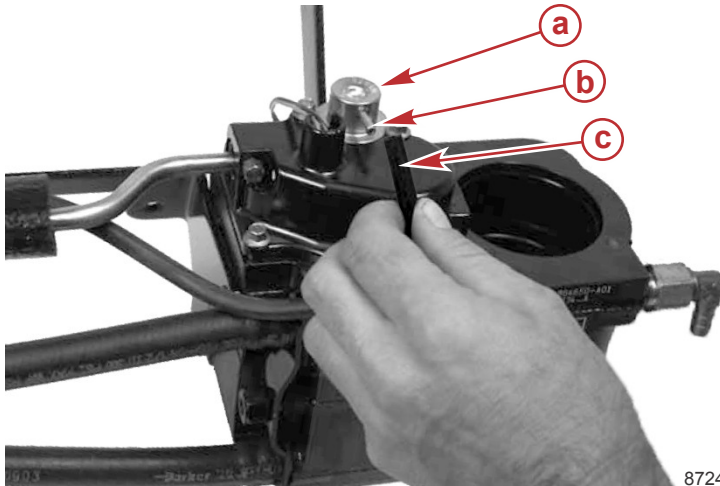
7. Install the fuel outlet line retainer screw. Tighten to specification.



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Description	Nm	lb-in.	lb-ft
Fuel outlet line retainer screw	9	80	

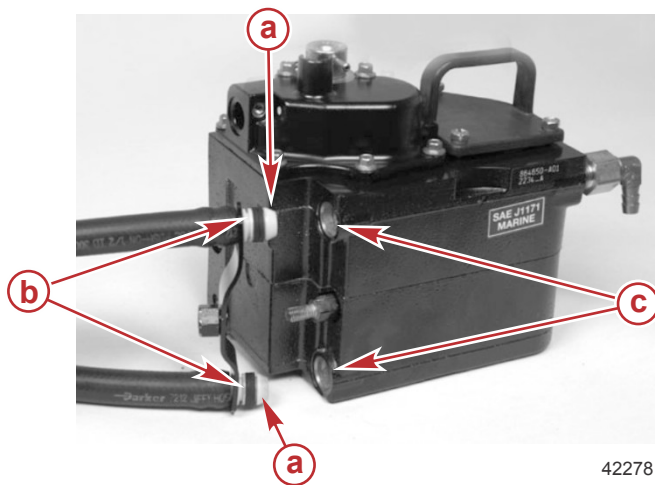
8. Install the vacuum hose onto the fuel pressure regulator.



- a** - Fuel pressure regulator
b - Fuel pressure regulator hose nipple
c - Fuel pressure regulator vacuum hose


8724

9. Inspect the quad rings on the cooling hose orifices. Replace if damaged.
 10. Coat the cooling hoses orifices and the bore of the fuel cooler assembly with Perfect Seal.

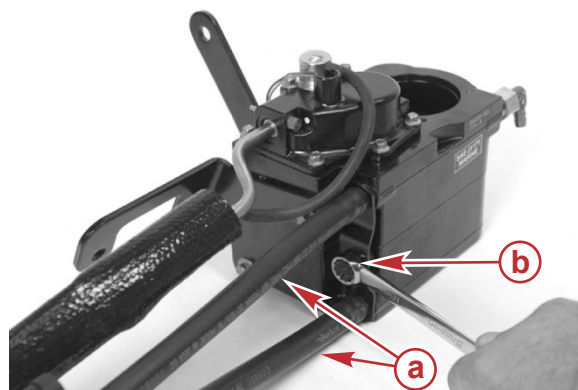


- a** - Cooling hose orifices
b - Quad rings
c - Cooling hose bore in the fuel cooler assembly

42278

Tube Ref No.	Description	Where Used	Part No.
 19	Perfect Seal	Cooling hose orifices and mating bore	92-34227Q02

- Align the cooling hoses and bracket to the Cool Fuel module and connect the bracket with the attached nut. Push the cooling hose ends into place on the Cool Fuel module.



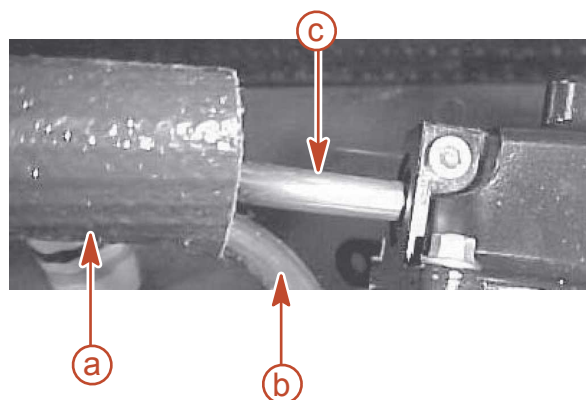
- a - Cooling hoses and bracket
- b - Cooling hose bracket nut

49891

- Tighten the cooling hose bracket nut to specification.

Description	Nm	lb-in.	lb-ft
Cooling hose bracket nut	20		15


- Pull the heat-resistant sleeve until the vacuum hose and the fuel outlet line are completely covered at the module.



- a - Heat-resistant sleeve
- b - Fuel pressure regulator vacuum hose
- c - Fuel outlet line

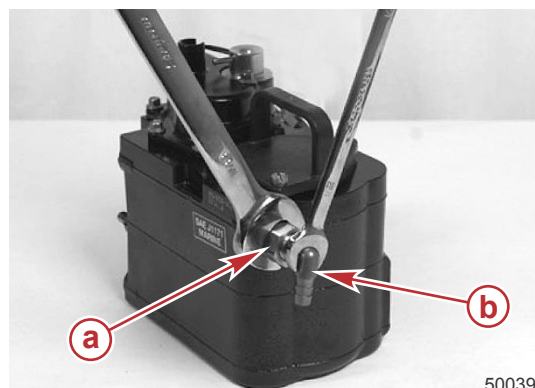
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- Apply Loctite 567 to the fuel supply line inlet connector.

Tube Ref No.	Description	Where Used	Part No.
 9	Loctite 567 PST Pipe Sealant	Fuel line inlet connector to adapter	92-809822

- Install the fuel line inlet connector by hand, finger-tight.
- While holding the fuel inlet adapter fitting securely, tighten the fuel line inlet connector an additional 1-3/4 to 2-1/2 turns with a wrench. Do not overtighten.

IMPORTANT: Hold the fuel inlet adapter fitting securely when installing the fuel line inlet connector.



Typical

- a - Fuel inlet adapter fitting
- b - Fuel line connector (typical 90° hose barb)

50039

- Connect the Cool Fuel module 2-pin harness connector.
- Connect the positive (+) battery cable to the battery.

19. Connect the negative (–) battery cable to the battery.
20. Open the seacock, if equipped.
21. Open the fuel supply valve, if equipped.
22. Run the engine and check for any leaks. Stop the engine immediately if a leak exists, and correct it before continuing.

Gen III Cool Fuel Module Diagnostics

Electrical

1. Disconnect the electrical connector at the Cool Fuel module.
2. Connect a digital volt/ohmmeter (DVOM) to the engine side of the electrical connector.
3. Turn the ignition switch to the run position.
4. Verify that there is 12 volt battery (+) power going to the Cool Fuel module. If voltage is less than 11.5 vdc, find and correct the cause of the voltage drop.

NOTE: The fuel pump relay will only remain active for 2–3 seconds while the key is in the run position.

Checking Fuel Pressure and Fuel Supply Vacuum

1. Connect a fuel pressure gauge to the Schrader valve on the fuel rail.
2. Cycle the key switch 2–3 times ("OFF" to "RUN" position) at three-second intervals to reach maximum fuel pressure.
3. Verify that the pressure is within specification.
4. If the fuel pressure exceeds 303 kPa (44 psi), replace the fuel pressure regulator.
5. If the fuel pressure is less than 276 kPa (40 psi), but greater than 90 kPa (13 psi):
 - a. Relieve the fuel pressure in the fuel rail. Refer to the **Fuel Pressure Relief** procedure in **Section 5A** (non-Scorpion models) or **Section 5B** (Scorpion models).
 - b. Use a T-fitting and connect a vacuum gauge to the fuel inlet side of the Cool Fuel module. Do not remove the fuel inlet fitting adapter.
 - c. Cycle the key switch 2–3 times ("OFF" to "RUN" position) at three-second intervals to reach maximum pressure.
 - d. Verify that the vacuum from the fuel source is within specification. If the vacuum exceeds 7 kPa (2 in. Hg), excessive fuel restriction exists. Correct the fuel restriction before proceeding.
 - e. With the vessel secured to the dock and the engine running in neutral, restrict the fuel supply with a fuel shutoff tool, and verify that the Cool Fuel module has the ability to cause an inlet vacuum reading of 37 kPa (11 in. Hg) or greater. If the vacuum reading is less than 37 kPa (11 in. Hg) with the fuel supply restricted, but fuel pressure is within specification, replace the low-pressure pump.

Fuel Shutoff Tool	91-805918A1
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6. If the fuel pressure is 90 kPa (13 psi) or less and the inlet vacuum is less than 51 kPa (15 in. Hg), replace the high-pressure pump and the fuel pressure regulator.

In the Water Test

1. With a vacuum gauge and a fuel pressure gauge in place, operate the boat throughout the RPM range and record the pressure and vacuum readings.
2. If the fuel supply vacuum reading is greater than 7 kPa (2 in. Hg), find and correct the fuel supply restriction.
3. If fuel pressure is less than 276 kPa (40 psi), but greater than 90 kPa (13 psi):
 - a. Verify that the vacuum from the fuel source is within specification. If the vacuum exceeds 7 kPa (2 in. Hg), excessive fuel restriction exists. Correct the fuel restriction before proceeding.
 - b. If no excessive fuel supply restriction exists, replace low-pressure fuel pump.
4. If fuel pressure is 90 kPa (13 psi) or less and no excessive fuel supply restriction exists, replace high-pressure pump and fuel pressure regulator.

IMPORTANT: It will be necessary to conduct a sea-trial of the boat following repairs to ensure that the pressure and the fuel system vacuum remain within specification throughout the RPM range.

Gen III Cool Fuel Line Replacement

Fuel Line Replacement Warnings

⚠ WARNING

Improper fuel line installation can cause fuel leaks, causing serious injury or death from fire or explosion. Install the fuel line so it is not restricted, pinched, or in contact with any sharp or rough surfaces. Ensure that the fuel line and required clips are installed according to the installation instructions.

⚠ WARNING

Fuel is flammable and explosive. Ensure that the key switch is off and the lanyard is positioned so that the engine cannot start. Do not smoke or allow sources of spark or open flame in the area while servicing. Keep the work area well ventilated and avoid prolonged exposure to vapors. Always check for leaks before attempting to start the engine, and wipe up any spilled fuel immediately.

Removing the Fuel Line

⚠ CAUTION

Failure to release pressure from the fuel system will result in fuel spraying out, which can cause a fire or explosion. Allow the engine to cool completely and release all fuel pressure before servicing any part of the fuel system. Always protect eyes and skin from pressurized fuel and vapors.

1. Remove and retain the engine cover.

1. Disconnect the negative (–) battery cable from the battery.

2. Disconnect the positive (+) battery cable from the battery.
- NOTE: Place a rag or other suitable material under the fuel line fittings and connections to catch any fuel.
3. Relieve fuel system pressure as follows:

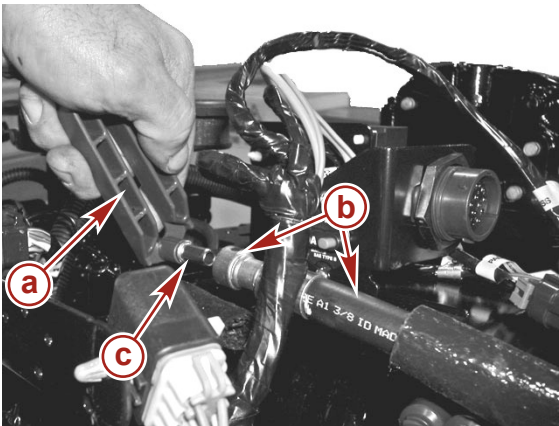
a. Connect a fuel pressure gauge kit to the Schrader valve.

Fuel Pressure Gauge Kit	91-881833A03
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IMPORTANT: Use a suitable container to collect fuel. Clean up any spills immediately and dispose of fuel in a safe manner in accordance with all local, federal, and international regulations.

- b. Place the end of the fuel pressure gauge relief line into a suitable container.

c. Open the fuel pressure gauge relief valve to relieve pressure.
4. Disconnect the fuel line from the fuel rail fitting:
- a. Using a 3/8-inch fuel line disconnect tool, disconnect the fuel line from the fuel rail.



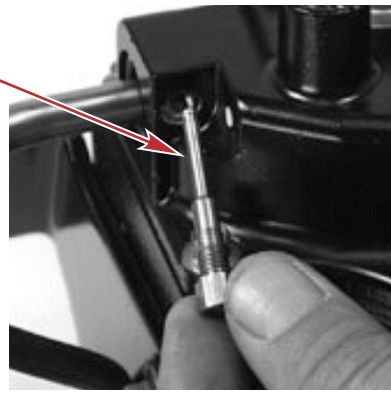
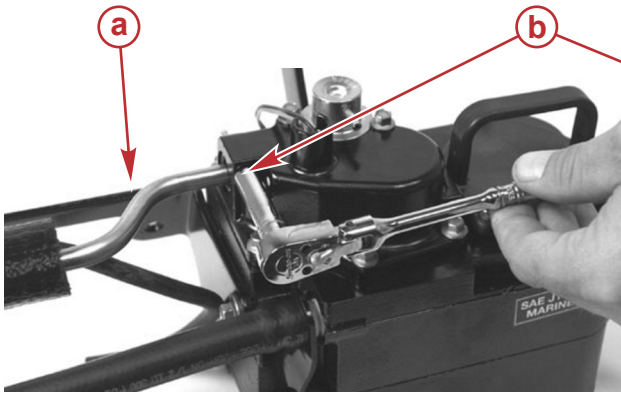
- a - Fuel line disconnect tool
- b - Fuel line
- c - Fuel rail

25370

Description	SPX Part Number
3/8-inch fuel line disconnect tool	J-41769-1

- b. Drain any fuel remaining in the fuel line into a suitable container.
5. Disconnect the fuel line from the Gen III Cool Fuel module:

- a. Remove the fuel line retainer screw. The fuel line retainer screw may differ from the screw pictured.



51271

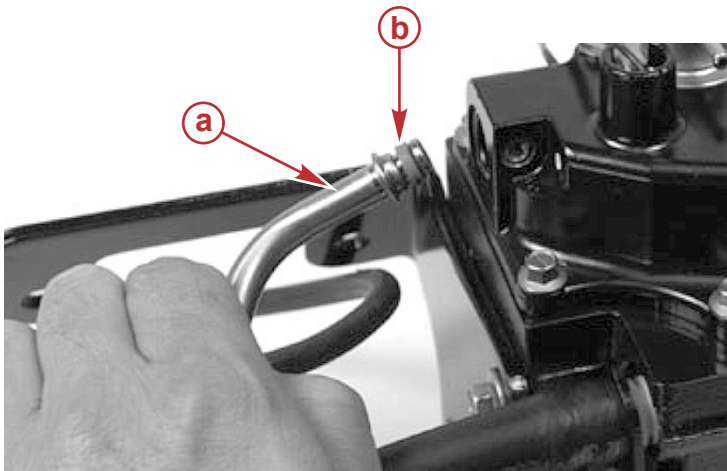
- a** - Fuel line (heat-resistant sleeve pulled back for clarity)
b - Typical fuel line retainer screw

- b. Carefully pull the fuel line straight out from the module and plug the line.
 6. Discard the fuel line and the heat-resistant sleeve.

Installing the Fuel Line

Connecting the Fuel Line to the Gen III Cool Fuel Module


1. Install the O-ring onto the fuel line connector as shown.



- a** - Fuel outlet line
b - O-ring

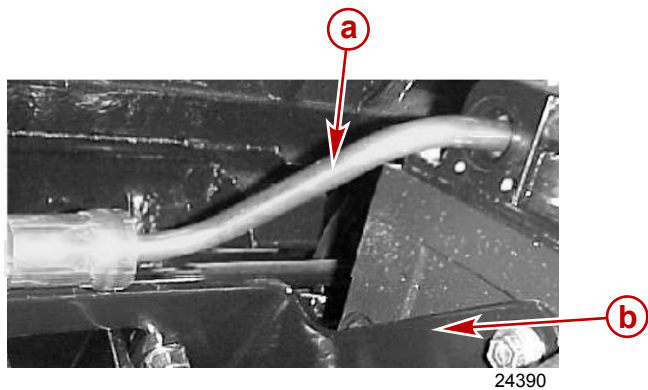
24580

2. Apply a thin layer of oil onto the O-ring.

Tube Ref No.	Description	Where Used	Part No.
 154	Mercury MerCruiser Full-Synthetic Engine Oil 20W-40, NMMA FC-W rated	Fuel line O-ring	92-858087K01

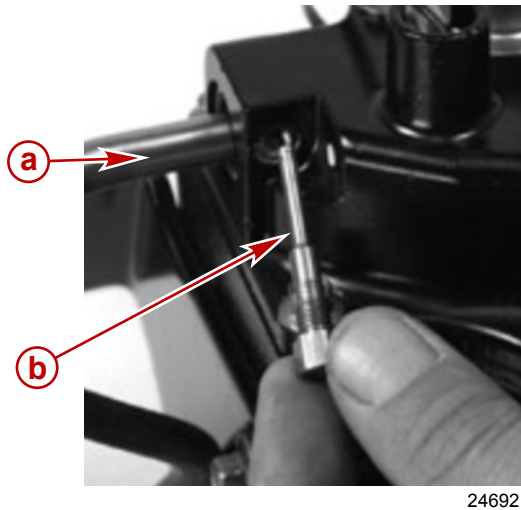
3. Carefully insert the fuel line into the Gen III Cool Fuel module.

4. Rotate the fuel line toward the engine block as shown in the following photograph.



Heat-resistant sleeve removed for visual clarity
a - Fuel line
b - Bracket

5. Install the fuel line retainer screw. Tighten it to specification. The fuel line retainer screw may differ from the screw pictured.



a - Fuel line
b - Typical fuel line retainer screw

Description	Nm	lb-in.	lb-ft
Fuel line retainer screw	9	80	

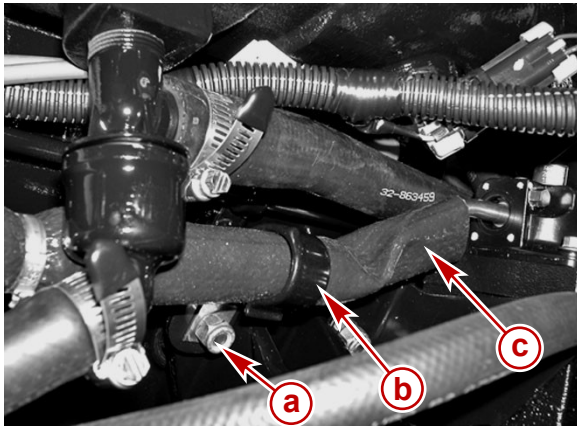
IMPORTANT: The replacement fuel line has a heat-resistant sleeve pre-installed. Do not remove the sleeve from the fuel line; ensure that the sleeve covers the fuel line to within 6 mm (1/4 in.) of the connection.

6. Pull the heat-resistant sleeve over the fuel line to within 6 mm (1/4 in.) of the Gen III Cool Fuel module.

Installing the Fuel Line J-Clip

1. Install the fuel line J-clip onto the Cool Fuel module mounting bracket stud.
- a. Remove and retain the nut (item a) as shown in the following photograph.
 - b. Slide the curved end of the J-clip over the top of fuel line and heat-resistant sleeve as shown.
 - For models that are not equipped with closed cooling, the open end of the clip faces away from the engine block.
 - For models equipped with closed cooling, the open end of the clip faces the engine block.
 - c. Install the J-clip over the stud.

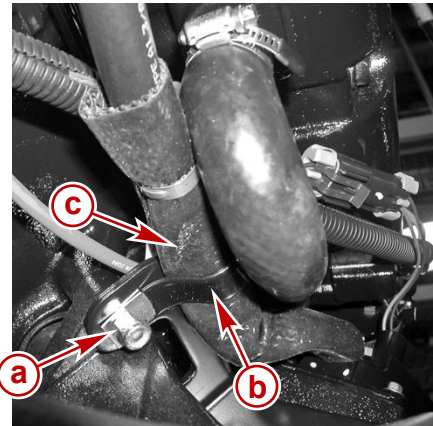
- d. Reinstall the J-clip nut. Tighten to specification.



25373

Model without closed cooling

- a** - Nut
b - J-clip
c - Fuel line



25372

Model with closed cooling

Description	Nm	lb-in.	lb-ft
J-clip nut	48		36

2. Ensure that the fuel line is routed in a manner such that it is not restricted, pinched, or in contact with any sharp or rough surfaces.
 - On models without closed cooling, the fuel line should be routed behind the drain valve assembly and drain hoses.
 - On models with closed cooling, the fuel line should be routed behind the cooling hose.

Connecting the Fuel Line to the Fuel Rail

1. Install the fuel line onto the fuel rail fitting. Listen for a snap.
2. Test that the fuel line is properly seated by tugging firmly on the line.
3. Position the heat resistant sleeve to within 6 mm (1/4 in.) of the fuel rail fitting.
4. Install the engine cover.
5. Connect the positive (+) battery cable to the battery.
6. Connect the negative (-) battery cable to the battery.
7. Ventilate the engine compartment.
8. Start the engine and test for fuel leaks. If leaks exist, stop the engine immediately. Wipe up any leaked fuel. Find and repair any fuel leaks before restarting the engine.

Notes: