

Disassembly and Assembly

1206E-E66TA Industrial Engine

BK (Engine)



Important Safety Information

Most accidents that involve product operation, maintenance and repair are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. A person must be alert to potential hazards. This person should also have the necessary training, skills and tools to perform these functions properly.

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product, until you have read and understood the operation, lubrication, maintenance and repair information.

Safety precautions and warnings are provided in this manual and on the product. If these hazard warnings are not heeded, bodily injury or death could occur to you or to other persons.

The hazards are identified by the "Safety Alert Symbol" and followed by a "Signal Word" such as "DANGER", "WARNING" or "CAUTION". The Safety Alert "WARNING" label is shown below.



The meaning of this safety alert symbol is as follows:

Attention! Become Alert! Your Safety is Involved.

The message that appears under the warning explains the hazard and can be either written or pictorially presented.

Operations that may cause product damage are identified by "NOTICE" labels on the product and in this publication.

Perkins cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are, therefore, not all inclusive. If a tool, procedure, work method or operating technique that is not specifically recommended by Perkins is used, you must satisfy yourself that it is safe for you and for others. You should also ensure that the product will not be damaged or be made unsafe by the operation, lubrication, maintenance or repair procedures that you choose.

The information, specifications, and illustrations in this publication are on the basis of information that was available at the time that the publication was written. The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service that is given to the product. Obtain the complete and most current information before you start any job. Perkins dealers or Perkins distributors have the most current information available.



When replacement parts are required for this product Perkins recommends using Perkins replacement parts.

Failure to heed this warning can lead to premature failures, product damage, personal injury or death.

Table of Contents

Disassembly and Assembly Section

Fuel Priming Pump - Remove and Install (Mechanical Priming Pump)	5	Flywheel Housing - Remove and Install (Standard Housing)	90
Flow Control Valve - Remove and Install	7	Vibration Damper and Pulley - Remove	93
Fuel Filter Base - Remove and Install (Twin Secondary Fuel Filter)	9	Vibration Damper and Pulley - Install	94
Water Separator and Fuel Filter (Primary) - Remove and Install	11	Crankshaft Front Seal - Remove and Install	95
Fuel Manifold (Rail) - Remove and Install	14	Crankshaft Front Seal - Remove and Install (Crankshaft Front Seal for Heavy Duty Front Cover)	96
Fuel Injection Lines - Remove	15	Front Cover - Remove and Install (Heavy Duty Front Cover)	97
Fuel Injection Lines - Install	17	Front Cover - Remove and Install	99
Exhaust Cooler (NRS) - Remove	20	Gear Group (Front) - Remove and Install	100
Exhaust Cooler (NRS) - Install	22	Gear Group (Front) - Remove and Install (Heavy Duty Gear Group (Front))	105
Inlet Air Control - Remove (NRS Inlet Air Mixer) ..	24	Idle Gear - Remove	112
Inlet Air Control - Install (NRS Inlet Air Mixer)	26	Idle Gear - Install	114
Fuel Injection Pump - Remove	29	Housing (Front) - Remove	117
Fuel Injection Pump - Install	31	Housing (Front) - Remove (Heavy Duty Housing (Front))	118
Fuel Injection Pump Gear - Remove	33	Housing (Front) - Install	119
Fuel Injection Pump Gear - Install	34	Housing (Front) - Install (Heavy Duty Housing (Front))	122
Electronic Unit Injector - Remove	35	Accessory Drive - Remove and Install (Accessory Drive SAE "B")	124
Electronic Unit Injector - Install	38	Accessory Drive - Remove and Install (Accessory Drive SAE "A")	127
Wastegate Solenoid - Remove and Install	41	Crankcase Breather - Remove	130
Exhaust Back Pressure Valve - Remove and Install	42	Crankcase Breather - Install	131
Flexible Exhaust Pipe - Remove and Install	44	Valve Mechanism Cover - Remove and Install ...	133
Exhaust Manifold and Turbocharger - Remove	48	Rocker Shaft and Pushrod - Remove	135
Exhaust Manifold and Turbocharger - Install	51	Rocker Shaft - Disassemble	137
Exhaust Elbow - Remove and Install	54	Rocker Shaft - Assemble	138
Diesel Particulate Filter - Remove	56	Rocker Shaft and Pushrod - Install	139
Diesel Particulate Filter - Install	57	Cylinder Head - Remove	142
Inlet and Exhaust Valve Springs - Remove and Install	59	Cylinder Head - Install	145
Inlet and Exhaust Valves - Remove and Install	63	Lifter Group - Remove and Install (Hydraulic Lifter Group)	148
Engine Oil Filter Base - Remove and Install	66	Camshaft - Remove and Install	149
Engine Oil Cooler - Remove (Engine Oil Cooler with a Low Mounted Filter Base)	67	Camshaft Gear - Remove and Install	151
Engine Oil Cooler - Remove (Engine Oil Cooler with a High Mounted Filter Base)	68	Camshaft Bearings - Remove and Install	156
Engine Oil Cooler - Install (Engine Oil Cooler with a Low Mounted Filter Base)	70	Engine Oil Pan - Remove (Aluminum Oil Pan) ...	157
Engine Oil Cooler - Install (Engine Oil Cooler with a High Mounted Filter Base)	72	Engine Oil Pan - Install (Aluminum Oil Pan)	158
Engine Oil Pump - Remove	74	Engine Oil Pan Plate - Remove and Install (Aluminum Oil Pan)	161
Engine Oil Pump - Install	75	Piston Cooling Jets - Remove and Install	163
Water Pump - Remove	76	Pistons and Connecting Rods - Remove	164
Water Pump - Install	77	Pistons and Connecting Rods - Disassemble	165
Water Temperature Regulator - Remove and Install	78	Pistons and Connecting Rods - Assemble	167
Flywheel - Remove	79	Pistons and Connecting Rods - Install	168
Flywheel - Remove (Equipped with Rear Power Take-Off)	80	Connecting Rod Bearings - Remove (Connecting Rods in Position)	170
Flywheel - Install	81	Connecting Rod Bearings - Install (Connecting Rods in Position)	171
Flywheel - Install (Equipped with Rear Power Take-Off)	82	Crankshaft Main Bearings - Remove and Install (Crankshaft in position)	172
Crankshaft Rear Seal - Remove	83	Crankshaft - Remove	176
Crankshaft Rear Seal - Install	84	Crankshaft - Install	178
Flywheel Housing - Remove and Install (Wet Back End Housing)	87	Crankshaft Timing Ring - Remove and Install	181
		Crankshaft Gear - Remove and Install	182
		Bearing Clearance - Check	184
		Refrigerant Compressor - Remove and Install ..	185
		Atmospheric Pressure Sensor - Remove and Install	188

Camshaft Position Sensor - Remove and Install ..	188
Crankshaft Position Sensor - Remove and Install	189
Coolant Temperature Sensor - Remove and Install	190
Engine Oil Pressure Sensor - Remove and Install	191
Soot Antenna - Remove and Install	193
Temperature Sensor (DPF) - Remove and Install	194
Pressure Sensor (DPF) - Remove and Install (Clean Emissions Module)	195
Temperature Sensor (Cooled Exhaust Gas) - Remove and Install	197
Pressure Sensor (Cooled Exhaust Gas) - Remove and Install (NRS Inlet and Outlet Pressure Sensors)	198
Boost Pressure Sensor - Remove and Install	201
Inlet Manifold Temperature Sensor - Remove and Install	201
Glow Plugs - Remove and Install	202
Alternator Belt - Remove and Install	204
Idler Pulley - Remove and Install (Grooved Idler Pulley)	205
Belt Tensioner - Remove and Install	206
Belt Tensioner - Remove and Install	208
Fan - Remove and Install	209
Fan Drive - Remove and Install	210
Electronic Control Module - Remove and Install (Electronic Control Module With Banjo Bolt Connections)	210
Electronic Control Module - Remove and Install (Electronic Control Module With Quick Coupler Connections)	214
ECM Mounting Bracket - Remove and Install	218
Alternator - Remove	220
Electric Starting Motor - Remove and Install	222
Alternator - Install	223
Air Compressor - Remove and Install (Twin Cylinder Compressor)	226

Index Section

Index	233
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Disassembly and Assembly Section

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Fuel Priming Pump - Remove and Install (Mechanical Priming Pump)

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	T410437	Cap Kit	1

NOTICE

Ensure that all adjustments and repairs that are carried out to the fuel system are performed by authorized personnel that have the correct training.

Before beginning ANY work on the fuel system, refer to Operation and Maintenance Manual, "General Hazard Information and High Pressure Fuel Lines" for safety information.

Refer to System Operation, Testing and Adjusting, "Cleanliness of Fuel System Components" for detailed information on the standards of cleanliness that must be observed during ALL work on the fuel system.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Dispose of all fluids according to local regulations and mandates.

1. Turn the fuel supply to the OFF position.
2. Turn the battery disconnect switch to the OFF position.

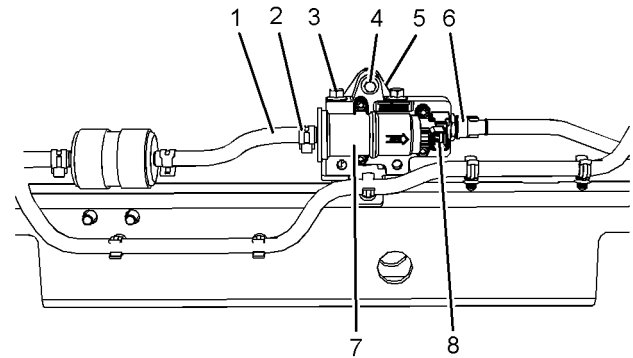


Illustration 1

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3. Make a temporary identification mark on plastic tube assembly and hose assembly in order to show the correct position of the tube assemblies.
4. Slide hose clamp (2) along hose assembly (1). Disconnect hose assembly (1) from the assembly of fuel priming pump (7). Plug the hose assembly with new plug. Cap all open connectors on the fuel priming pump with new caps.
5. Disconnect plastic tube assembly (6) from the assembly of fuel priming pump (7). Plug the tube assemblies with new plugs. Cap all open connectors on the fuel priming pump with new caps.
6. Disconnect the harness assembly from fuel priming pump connection (8).
7. Remove bolts (3) and bolt (4).
8. Remove the assembly of priming pump (7) from bracket (5).

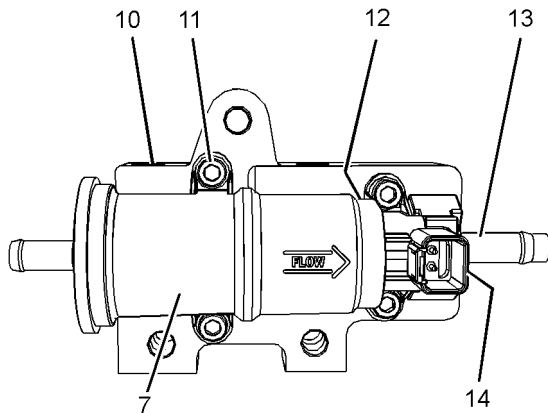


Illustration 2

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9. If necessary, follow Step 9.a through Step 9.d in order to disassemble the assembly of the fuel priming pump (7).
 - a. Remove Allen head screws (11) from fuel priming pump (7).
 - b. Remove fuel priming pump (7) from manifold (10).
 - c. Remove O-ring seal (12) (not shown).
 - d. If necessary, remove connection (13) from manifold (10). Remove O-ring seal (14) (not shown) from connection (13).

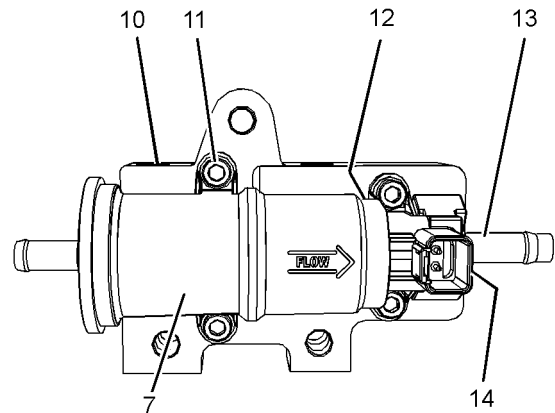


Illustration 3

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2. If necessary, follow Step 2.a through Step 2.c in order to assemble fuel priming pump (7).
 - a. If necessary, install a new O-ring seal (14) to connection (13). Install connection (13) to manifold (10). Tighten the connection to a torque of 20 N·m (177 lb in).
 - b. Install a new O-ring seal (12) to fuel priming pump (7).
 - c. Position fuel priming pump (7) onto manifold (10). Install Allen head screws (11). Tighten the Allen head screws to a torque of 9 N·m (80 lb in).

Installation Procedure

NOTICE

Ensure that all adjustments and repairs that are carried out to the fuel system are performed by authorized personnel that have the correct training.

Before beginning ANY work on the fuel system, refer to Operation and Maintenance Manual, “General Hazard Information and High Pressure Fuel Lines” for safety information.

Refer to System Operation, Testing and Adjusting, “Cleanliness of Fuel System Components” for detailed information on the standards of cleanliness that must be observed during ALL work on the fuel system.

1. Ensure that the fuel priming pump is clean and free from wear and damage. If necessary, replace the fuel priming pump.

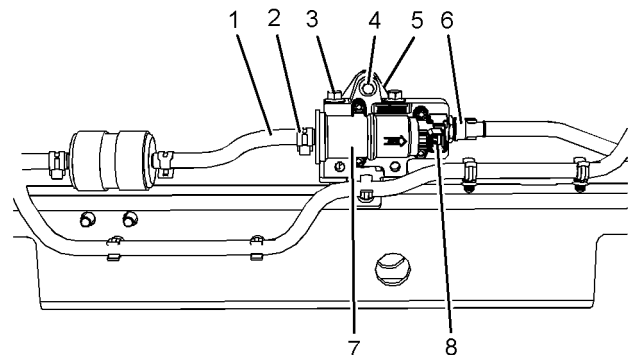


Illustration 4

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3. Position assembly of fuel priming pump (7) onto mounting bracket (5).
4. Install bolt (4) and bolts (3) to the fuel priming pump. Tighten bolt (4) and bolts (3) to a torque of 22 N·m (195 lb in).
5. Remove plug from hose assembly. Remove cap from connector on the fuel priming pump. Connect hose assembly (1) to fuel priming pump (7). Slide hose clamp (2) along hose assembly (1).

Note: Ensure that the hose clamp is correctly positioned.

6. Remove plug from plastic tube assembly. Remove cap from connector on the fuel priming pump. Connect plastic tube assembly (6) to fuel priming pump (7).
7. Connect the harness assembly to fuel priming pump connection (8).
8. Turn the fuel supply to the ON position.
9. Turn the battery disconnect switch to the ON position.
10. Prime the fuel system. Refer to Operation and Maintenance Manual, "Fuel System - Prime".

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Flow Control Valve - Remove and Install

Removal Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	T410437	Cap Kit	1

WARNING

Contact with high pressure fuel may cause fluid penetration and burn hazards. High pressure fuel spray may cause a fire hazard. Failure to follow these inspection, maintenance and service instructions may cause personal injury or death.

NOTICE

Ensure that all adjustments and repairs that are carried out to the fuel system are performed by authorized personnel that have the correct training.

Before beginning ANY work on the fuel system, refer to Operation and Maintenance Manual, "General Hazard Information and High Pressure Fuel Lines" for safety information.

Refer to System Operation, Testing and Adjusting, "Cleanliness of Fuel System Components" for detailed information on the standards of cleanliness that must be observed during ALL work on the fuel system.

1. Turn the fuel supply to the OFF position.
2. Turn the battery disconnect switch to the OFF position.

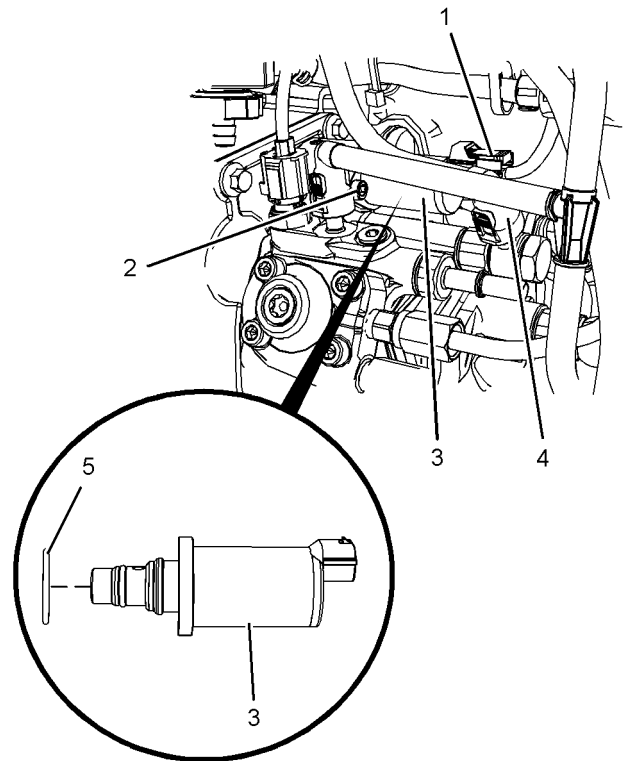


Illustration 5

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3. Clean the area around flow control valve (3) and fuel injection pump. Ensure that the area is free from contamination before beginning disassembly.
4. Disconnect harness assembly (1) from flow control valve (3).

5. Disconnect plastic tube assembly (4). Use Tooling (A) in order to plug and cap the open port on the fuel injection pump and the plastic tube assembly. Use a new plug and new cap.
6. Make temporary marks on flow control valve (3) and the fuel injection pump for installation purpose.
7. Remove Allen heads screws (2) from flow control valve (3).
8. Remove flow control valve (3) from the fuel injection pump.
9. Remove O-ring seal (5) from fuel injection pump.

Installation Procedure

1. Ensure that all component at free from wear and damage. If any part of the flow control valve is worn or damaged, the flow control valve must be replaced as an assembly. The flow control valve kit contains the guide pins in order to install the flow control valve assembly.

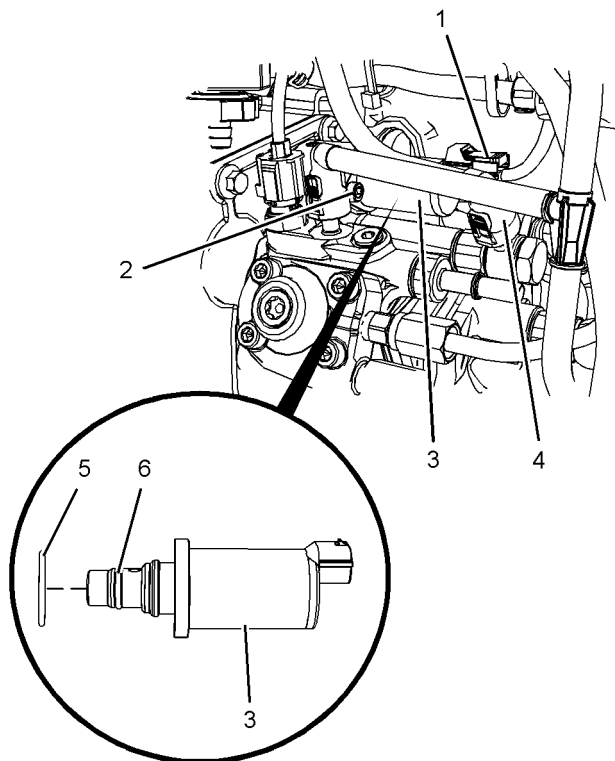


Illustration 6

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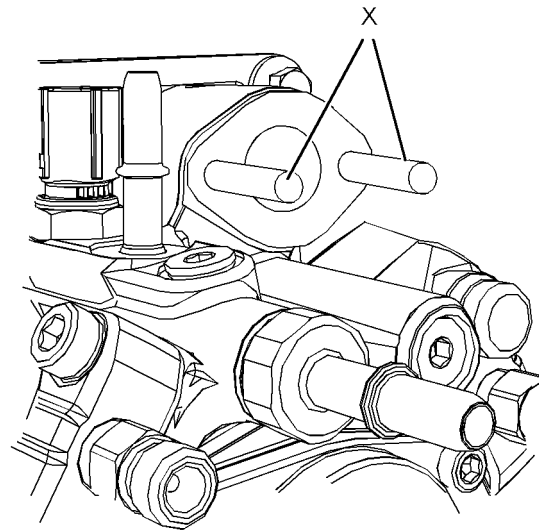


Illustration 7

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Flow control valve guide pins

2. Position a new O-ring seal (5) onto the flow control valve assembly.

3. Check O-ring seal (6) is correctly positioned. Ensure that O-ring seal (6) is not damaged.

Note: If O-ring seal (6) is damaged, a new flow control valve assembly must be installed.

4. Install guide pins into Position (X) on the fuel injection pump.

Note: Note the guide pins are part of the flow control valve repair kit.

5. Lubricate O-ring seal (6) with clean fuel.

Note: Ensure that the O-ring seal is not damaged or misaligned.

6. Align flow control valve (3) onto guide pins.

7. Install flow control valve (3) to the fuel injection pump.

8. Remove guide pins from the fuel injection pump.

9. Install Allen head screws (2) from the flow control valve repair kit.

10. Tighten Allen head screws (2) equally until the flow control valve is seated correctly onto the fuel injection pump.

Note: Ensure that the Allen screws are tightened equally. Failure to ensure that the Allen screws are tightened equally will result in damage to the fuel injection pump.

11. Tighten the Allen head screws to a torque of 9 N·m (80 lb in).
12. Connect harness assembly (1) to flow control valve (3).
13. Remove plug and cap from ports from the fuel injection pump and the plastic tube assembly.
14. Connect plastic tube assembly (4).
15. Replace the filters for primary fuel system. Refer to Operation and Maintenance Manual, "Fuel System Primary (Water Separator) Element - Replace" for the correct procedure.
16. Replace the filters for secondary fuel system. Refer to Operation and Maintenance Manual, "Fuel System Secondary Filter - Replace" for the correct procedure.
17. Turn the fuel supply to the ON position.
18. Turn the battery disconnect switch to the ON position.
19. Remove the air from the fuel system. Refer to Operation and Maintenance Manual, "Fuel System - Prime" for more information.

End By:

- a. Remove the air from the fuel system. Refer to Operation and Maintenance Manual, "Fuel System - Prime".
- b. After replacement of the flow control valve, the fuel injection pump requires a high-pressure fuel pump calibration procedure to be performed. Refer to Troubleshooting, "Fuel Rail Pressure Problem" for the correct procedure.

i04397706

Fuel Filter Base - Remove and Install (Twin Secondary Fuel Filter)

Removal Procedure

Table 3

Required Tools			
Tool	Part Number	Part Description	Qty
A	T410437	Cap Kit	1

NOTICE

Ensure that all adjustments and repairs that are carried out to the fuel system are performed by authorized personnel that have the correct training.

Before beginning ANY work on the fuel system, refer to Operation and Maintenance Manual, "General Hazard Information and High Pressure Fuel Lines" for safety information.

Refer to System Operation, Testing and Adjusting, "Cleanliness of Fuel System Components" for detailed information on the standards of cleanliness that must be observed during ALL work on the fuel system.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Dispose of all fluids according to local regulations and mandates.

1. Turn the fuel supply to the OFF position.
2. Turn the battery disconnect switch to the OFF position.
3. Drain the secondary filters. Refer to Operation and Maintenance Manual, "Fuel System Secondary Filter - Replace" for the correct procedure.

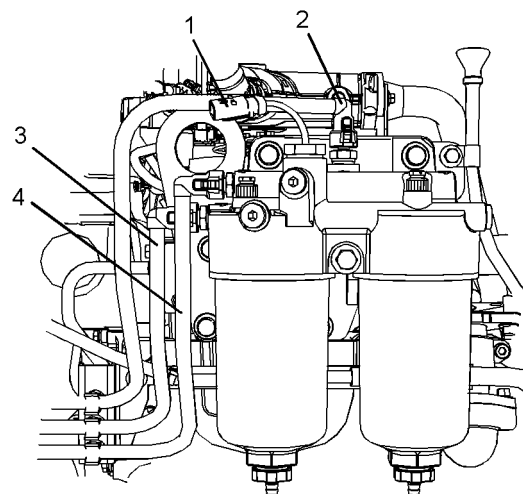


Illustration 8

4. Make temporary identification marks on all the plastic tube assemblies in order to show the correct position of the tube assemblies.
5. Place a suitable container below the fuel filter base in order to catch any fuel that might be spilled.
6. Disconnect plastic tube assembly (2), plastic tube assembly (3), and plastic tube assembly (4) from the fuel filter base.
7. Use Tooling (A) in order to plug the plastic tube assemblies with new plugs. Use Tooling (A) in order to cap the ports in the fuel filter base with new caps.
8. Disconnect the Original Equipment Manufactures (OEM) harness assembly from harness assembly (1) for the differential pressure switch.

- a. Remove differential pressure switch (9) from fuel filter base (6).
- b. Remove O-ring seal (10) (not shown) from the differential pressure switch.

Installation Procedure

NOTICE

Ensure that all adjustments and repairs that are carried out to the fuel system are performed by authorized personnel that have the correct training.

Before beginning ANY work on the fuel system, refer to Operation and Maintenance Manual, "General Hazard Information and High Pressure Fuel Lines" for safety information.

Refer to System Operation, Testing and Adjusting, "Cleanliness of Fuel System Components" for detailed information on the standards of cleanliness that must be observed during ALL work on the fuel system.

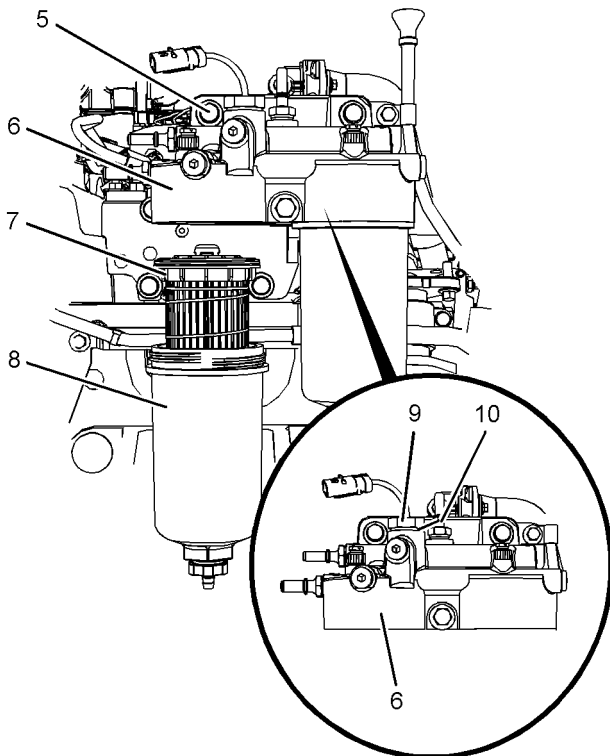


Illustration 9

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9. Remove secondary filters (7) from canisters (8). Refer to Operation and Maintenance Manual, "Fuel System Secondary Filter - Replace" for the correct procedure.
10. Remove bolts (5) from fuel filter base (6). Remove the fuel filter base from the mounting bracket.

Note: Do not disassemble the fuel filter base.

11. If necessary, follow Step 11.a through Step 11.b in order to remove differential pressure switch (9) from fuel filter base (6).

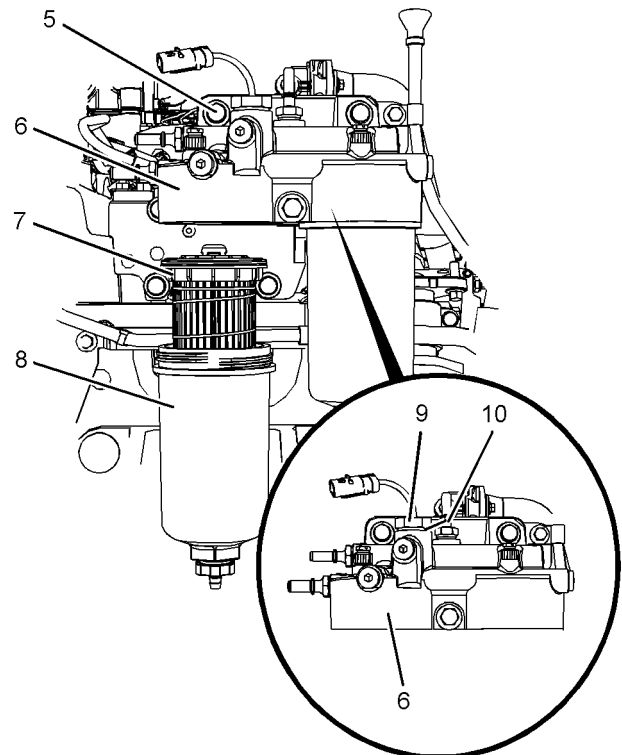


Illustration 10

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1. Ensure that fuel filter base (6) is clean and free from damage. If necessary, replace the complete fuel filter base and filter assembly.
2. If necessary, follow Step 2.a through Step 2.c in order to install differential pressure switch (9) to fuel filter base (6).

- a. Install a new O-ring seal (10) (not shown) to the differential pressure switch.
 - b. Install differential pressure switch (9) to fuel filter base (6).
 - c. Tighten differential pressure pressure switch (9) to a torque of 20 N·m (177 lb in).
3. Position fuel filter base (6) on the mounting bracket. Install bolts (5). Tighten the bolts to a torque of 44 N·m (32 lb ft).
 4. If necessary, install new fuel filters (7) to canisters (8). Refer to Operation and Maintenance Manual, "Fuel System Secondary Filter - Replace" for the correct procedure.

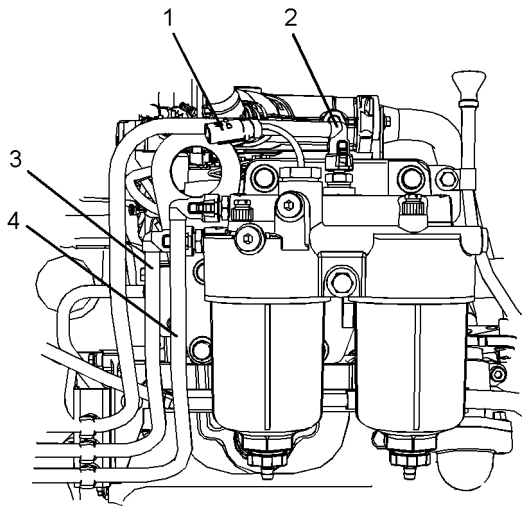


Illustration 11

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5. Remove the plugs from the plastic tube assemblies. Remove the caps from the ports in the fuel filter base.

NOTICE

Ensure that the plastic tube assemblies are installed in the original positions. Failure to connect the plastic tube assemblies to the correct ports will allow contamination to enter the fuel system. Serious damage to the engine will result if contaminated fuel enters the fuel system.

6. Connect plastic tube assembly (2), plastic tube assembly (3), and plastic tube assembly (4) to fuel filter base (6).
7. Connect the OEM harness assembly to harness assembly (1) for the differential pressure switch.
8. Turn the fuel supply to the ON position.

9. Turn the battery disconnect switch to the ON position.

End By:

- a. Remove the air from the fuel system. Refer to Operation and Maintenance Manual, "Fuel System - Prime" for the correct procedure.

i04397707

Water Separator and Fuel Filter (Primary) - Remove and Install

Removal Procedure

Table 4

Required Tools			
Tool	Part Number	Part Description	Qty
A	T410437	Cap Kit	1

NOTICE

Ensure that all adjustments and repairs that are carried out to the fuel system are performed by authorized personnel that have the correct training.

Before beginning ANY work on the fuel system, refer to Operation and Maintenance Manual, "General Hazard Information and High Pressure Fuel Lines" for safety information.

Refer to System Operation, Testing and Adjusting, "Cleanliness of Fuel System Components" for detailed information on the standards of cleanliness that must be observed during ALL work on the fuel system.

1. Turn the battery disconnect switch to the OFF position.
2. Turn the fuel supply to the OFF position.

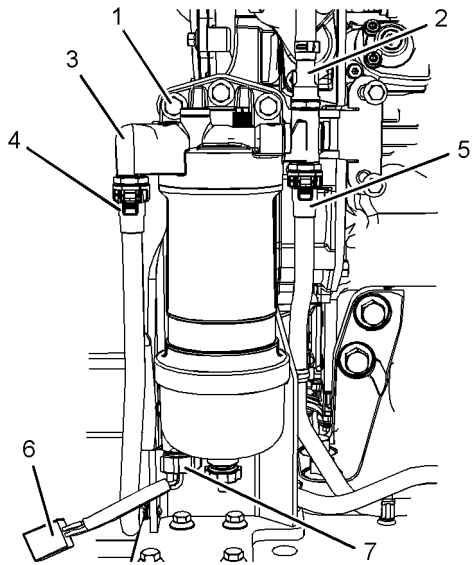


Illustration 12

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3. Make temporary identification marks on the plastic tube assemblies in order to show the correct position of the plastic tube assemblies.
4. Place a suitable container below the fuel filter base in order to catch any fuel that might be spilled.
5. Disconnect plastic tube assembly (2), plastic tube assembly (4), and plastic tube assembly (5) from the assembly of primary fuel filter (3).
6. Use Tooling (A) in order to plug the plastic tube assemblies with new plugs. Use Tooling (A) in order to cap the ports in the primary fuel filter with new caps.
7. Disconnect the Original Equipment Manufacturers (OEM) harness assembly from the connection on harness assembly (6) for water in fuel switch (7).
8. Remove bolts (1) and remove the assembly of primary fuel filter (3) from the mounting bracket.

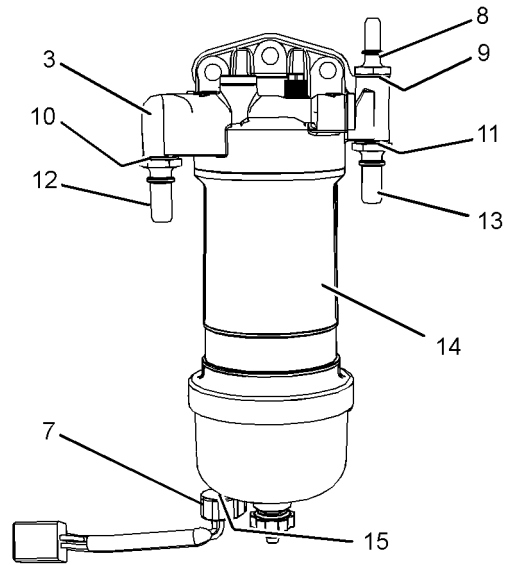


Illustration 13

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9. If necessary, follow Step 9.a through Step 9.e in order to disassembly the assembly of primary fuel filter (3).
 - a. Remove connection (8) and remove O-ring seal (9) (not shown).
 - b. Remove connection (12) and remove O-ring seal (10) (not shown).
 - c. Remove connection (13) and remove O-ring seal (11) (not shown).
 - d. Remove water in fuel switch (7) and remove O-ring seal (15) (not shown).
 - e. Remove the filter element from fuel filter canister (14). Refer to Operation and Maintenance Manual, "Fuel System Primary Filter (Water Separator) Element - Replace" for the correct procedure.

Installation Procedure

NOTICE

Ensure that all adjustments and repairs that are carried out to the fuel system are performed by authorized personnel that have the correct training.

Before beginning ANY work on the fuel system, refer to Operation and Maintenance Manual, "General Hazard Information and High Pressure Fuel Lines" for safety information.

Refer to System Operation, Testing and Adjusting, "Cleanliness of Fuel System Components" for detailed information on the standards of cleanliness that must be observed during ALL work on the fuel system.

1. Ensure that the fuel filter base is clean and free from damage. If necessary, replace the complete fuel filter base and filter assembly.

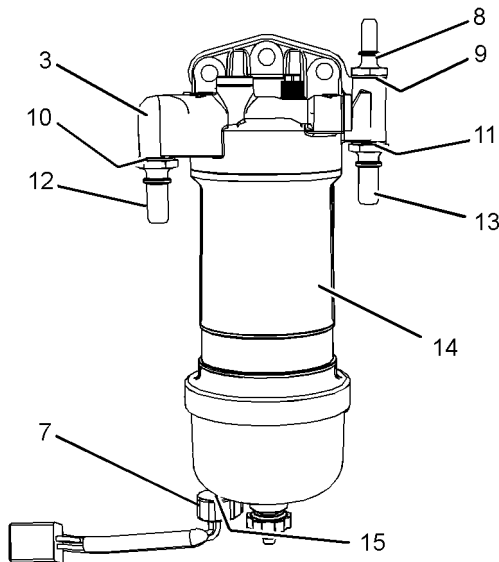


Illustration 14

g02524478

2. If necessary, follow Step 2.a through Step 2.e in order to assembly primary fuel filter (3).
 - a. Install a new O-ring seal (9) (not shown) to connection (8). Install connection (8) to primary fuel filter (3). Tighten the connection to a torque of 20 N·m (177 lb in).
 - b. Install a new O-ring seal (10) (not shown) to connection (12). Install connection (12) to primary fuel filter (3). Tighten the connection to a torque of 20 N·m (177 lb in).
 - c. Install a new O-ring seal (11) (not shown) to connection (13). Install connection (13) to primary fuel filter (3). Tighten the connection to a torque of 20 N·m (177 lb in).

- d. Install a new O-ring seal (15) (not shown) to water in fuel switch (7). Install water in fuel switch (7) to canister fuel filter (14). Tighten water in fuel sensor (7) securely.
- e. Install a new filter element to fuel filter canister (14). Refer to Operation and Maintenance Manual, "Fuel System Primary Filter (Water Separator) Element - Replace".

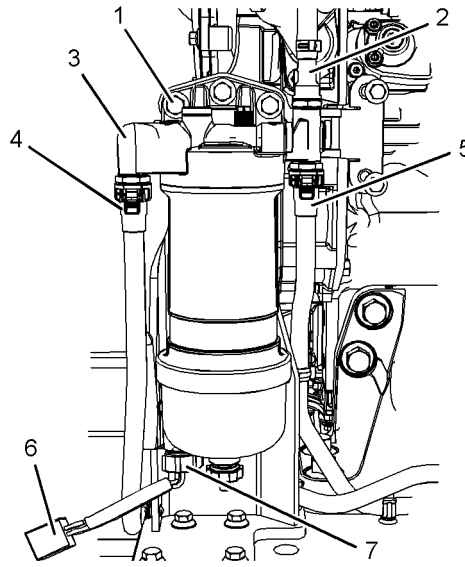


Illustration 15

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3. Position the assembly of primary fuel filter (3) onto the mounting bracket.
4. Install bolts (1) to the assembly of primary fuel filter (3). Tighten the bolts to a torque of 44 N·m (32 lb ft).
5. Remove the plugs from the plastic tube assemblies. Remove the caps from the ports in the fuel filter base.

NOTICE

Ensure that the plastic tube assemblies are installed in the original positions. Failure to connect the plastic tube assemblies to the correct ports will allow contamination to enter the fuel system. Serious damage to the engine will result if contaminated fuel enters the fuel system.

6. Connect plastic tube assembly (2), plastic tube assembly (4), and plastic tube assembly (5) to primary fuel filter (3).
7. Connect the OEM harness assembly to the connection on harness assembly (6) for water in fuel sensor (7).
8. Turn the fuel supply to the ON position.

9. Turn the battery disconnect switch to the ON position.

End By:

- a. Remove the air from the fuel system. Refer to Operation and Maintenance Manual, "Fuel System - Prime".

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Fuel Manifold (Rail) - Remove and Install

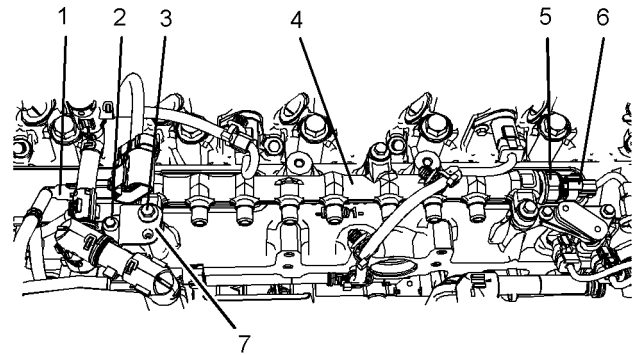


Illustration 16

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Removal Procedure

Table 5

Required Tools			
Tool	Part Number	Part Description	Qty
A	T410437	Cap Kit	1

Start By:

- a. Remove the inlet air control (NRS Induction Mixer) and mounting bracket. Refer to Disassembly and Assembly, "Inlet Air Control (NRS Induction Mixer) - Remove" for the correct procedure.
- b. Remove the fuel injection lines. Refer to Disassembly and Assembly, "Fuel Injection Lines - Remove" for the correct procedure.

WARNING

Contact with high pressure fuel may cause fluid penetration and burn hazards. High pressure fuel spray may cause a fire hazard. Failure to follow these inspection, maintenance and service instructions may cause personal injury or death.

NOTICE

Ensure that all adjustments and repairs that are carried out to the fuel system are performed by authorized personnel that have the correct training.

Before beginning ANY work on the fuel system, refer to Operation and Maintenance Manual, "General Hazard Information and High Pressure Fuel Lines" for safety information.

Refer to System Operation, Testing and Adjusting, "Cleanliness of Fuel System Components" for detailed information on the standards of cleanliness that must be observed during ALL work on the fuel system.

1. Thoroughly clean the area around fuel manifold (4).
2. Disconnect harness assembly (6) from fuel pressure sensor (5).
3. Disconnect plastic tube assembly (1) from the fuel pressure relief valve on fuel manifold (4). Immediately cap the open port in fuel manifold (4) with a new cap. Immediately plug the open end of plastic tube assembly (1) with a new plug.
4. Remove bolts (2) and bolts (3). Remove fuel injection line support bracket (7).
5. Remove fuel manifold (4) from cylinder head.

Installation Procedure

NOTICE

Ensure that all adjustments and repairs that are carried out to the fuel system are performed by authorized personnel that have the correct training.

Before beginning ANY work on the fuel system, refer to Operation and Maintenance Manual, "General Hazard Information and High Pressure Fuel Lines" for safety information.

Refer to System Operation, Testing and Adjusting, "Cleanliness of Fuel System Components" for detailed information on the standards of cleanliness that must be observed during ALL work on the fuel system.

1. Ensure that all ports on the fuel manifold are capped. Ensure that the fuel manifold is externally clean and free from damage.

Note: Do not install a fuel manifold that has not been capped. All caps must be left in place until the fuel injection lines or the fuel pressure relief valve are installed.

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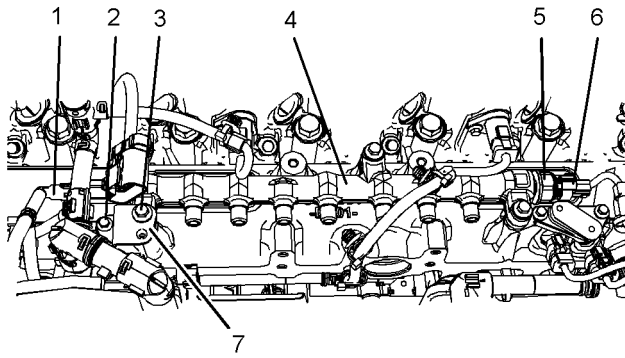


Illustration 17

g02178677

2. Position fuel manifold (4) onto the cylinder head. Install bolts (3) to fuel manifold (4) finger tight.
3. Position fuel injection line support bracket (7) onto the fuel rail. Install remaining bolt (3). Install bolt (2) for injection line support bracket (7) finger tight.
4. Install a new set of seals and a new set of fuel injection lines. Refer to Disassembly and Assembly, "Fuel Injection Lines - Install" for the correct procedure.
5. Tighten bolts (3) to a torque of 22 N·m (195 lb in).
6. Tighten bolts (2) to a torque of 9 N·m (80 lb in).
7. Remove the plug from plastic tube assembly (1). Connect plastic tube assembly (1) to the fuel pressure relief valve.
8. Connect harness assembly (6) to fuel pressure sensor (5).
9. Replace the filters for primary fuel system. Refer to Operation and Maintenance Manual, "Fuel System Primary (Water Separator) Element - Replace" for the correct procedure.
10. Replace the filters for secondary fuel system. Refer to Operation and Maintenance Manual, "Fuel System Secondary Filter - Replace" for the correct procedure.
11. Remove the air from the fuel system. Refer to Operation and Maintenance Manual, "Fuel System - Prime" for more information.

End By:

- a. Install the mounting bracket and the inlet air control (NRS Induction Mixer). Refer to Disassembly and Assembly, "Inlet Air Control (NRS Induction Mixer) - Install" for the correct procedure.

Fuel Injection Lines - Remove

Removal Procedure

Table 6

Required Tools			
Tool	Part Number	Part Description	Qty
A	T410437	Cap Kit	1

⚠ WARNING

Contact with high pressure fuel may cause fluid penetration and burn hazards. High pressure fuel spray may cause a fire hazard. Failure to follow these inspection, maintenance and service instructions may cause personal injury or death.

NOTICE

Ensure that all adjustments and repairs that are carried out to the fuel system are performed by authorized personnel that have the correct training.

Before beginning ANY work on the fuel system, refer to Operation and Maintenance Manual, "General Hazard Information and High Pressure Fuel Lines" for safety information.

Refer to System Operation, Testing and Adjusting, "Cleanliness of Fuel System Components" for detailed information on the standards of cleanliness that must be observed during ALL work on the fuel system.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Dispose of all fluids according to local regulations and mandates.

Note: Put identification marks on all hoses on all hose assemblies and on wires and all tube assemblies for installation purposes. Plug all hose assemblies and tube assemblies. Plugging all hose assemblies and tube assemblies will help to prevent fluid loss and helps to keep contaminants from entering the system.

1. Turn the fuel supply to the OFF position.

2. Turn the battery disconnect switch to the OFF position.
3. Remove the inlet air control (NRS Induction Mixer) and mounting bracket. Refer to Disassembly and Assembly, "Inlet Air Control (NRS Induction Mixer) - Remove" for the correct procedure.
4. Remove the crankcase breather canister and tube assemblies. Refer to Disassembly and Assembly, "Crankcase Breather - Remove" for the correct procedure.

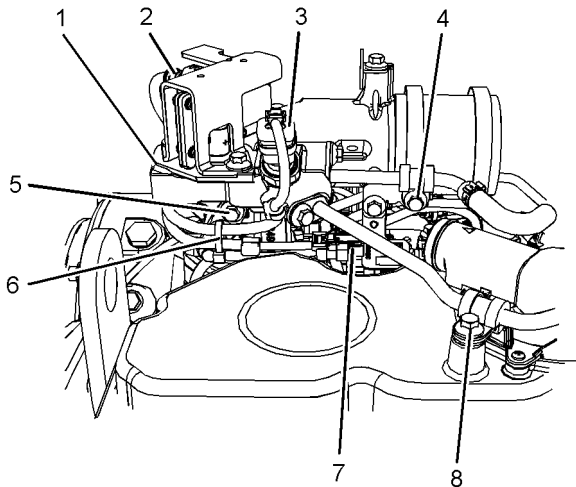


Illustration 18

g02177626

5. Cut cable straps (6) from the wiring harness assemblies.
6. Slide the locking tab for wiring harness connection (2) into the unlocked position. Remove wiring harness connection (2) from the pressure sensor.
7. Slide the locking tab for wiring harness connection (3) into the unlocked position. Remove wiring harness connection (3) from the pressure sensor.
8. Slide wiring harness connection (7) from the mounting bracket and position harness away from the inlet elbow.
9. Remove bolt (4) and bolt (8) from clips for tube assemblies.
10. Remove bolts (5) and remove manifold (1) from the inlet elbow.

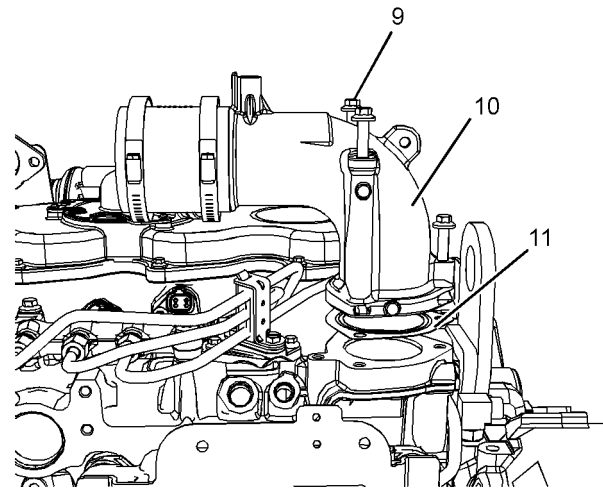


Illustration 19

g02177627

11. Remove bolts (9) and remove inlet elbow (10) from the cylinder head.
12. Remove gasket (11).

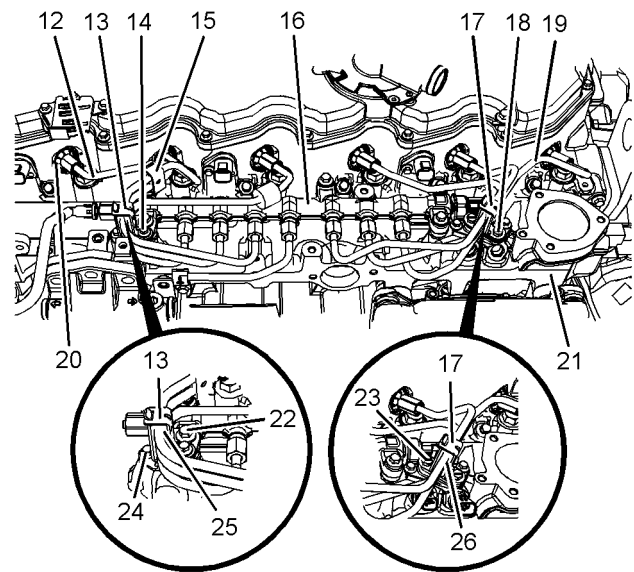


Illustration 20

g02177628

13. Loosen bolt (22) and bolt (24) for tube clamp (13) support bracket.
14. Remove bolt (14) from tube clamp (13). Remove the tube clamp from fuel injection lines (12). Remove rubber separator (25).
15. Use a suitable tool in order to remove tube clamp (15) from fuel injection lines (12).
16. Loosen bolt (23) for tube clamp (17).

17. Remove bolt (18) from tube clamp (17). Remove tube clamp (17) from fuel injection lines (19). Remove rubber separator (26).
18. Clean the area around the nuts for fuel injection lines (12) and fuel injection lines (12). Ensure that the area is free from contamination before beginning disassembly.
19. Disconnect fuel injection line (12) from the electronic unit injector.
20. Disconnect fuel injection line (12) from fuel manifold (16).
21. Use Tooling (A) in order to plug the open port in the electronic unit injector immediately.
22. Remove fuel injection line (12). **Discard the fuel injection lines.**
23. Use Tooling (A) in order to plug the open port in fuel manifold (16) immediately.
24. Remove seal (20) from the electronic unit injector and cylinder head (21).
25. Repeat Step 19 through Step 25 in order to remove the remaining fuel injection lines from the fuel manifold to the electronic unit injectors.

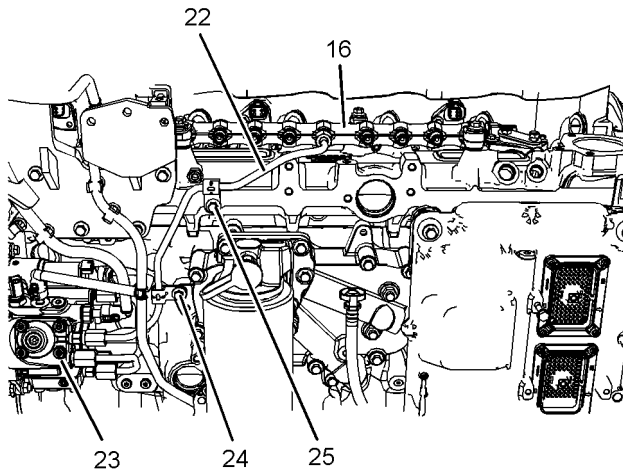


Illustration 21

g02177629

26. Remove bolt (24) and bolt (25) from tube clip for fuel injection line (22).
27. Disconnect fuel injection line (22) from fuel injection pump (23).
28. Disconnect fuel injection line (22) at fuel manifold (16).

29. Remove fuel injection line (22). **Discard the fuel injection lines.**
30. Use Tooling (A) in order to plug all open ports immediately in fuel manifold (16) and in fuel injection pump (23).

i04398409

Fuel Injection Lines - Install

Installation Procedure

Table 7

Required Tools			
Tool	Part Number	Part Description	Qty
B	T400030	Injector Pipe Nut Tool	1
C	-	Degree Wheel	1

NOTICE

Ensure that all adjustments and repairs that are carried out to the fuel system are performed by authorized personnel that have the correct training.

Before beginning ANY work on the fuel system, refer to Operation and Maintenance Manual, "General Hazard Information and High Pressure Fuel Lines" for safety information.

Refer to System Operation, Testing and Adjusting, "Cleanliness of Fuel System Components" for detailed information on the standards of cleanliness that must be observed during ALL work on the fuel system.

Note: The following procedure should be adopted in order to install the fuel injection lines when the electronic unit injectors or the fuel manifold have not been removed. If the electronic unit injectors or the fuel manifold have been removed, refer to Disassembly and Assembly, "Electronic Unit Injector - Install" and Disassembly and Assembly, "Fuel Manifold - Install" for more information.

NOTICE

Ensure that the wiring harness is correctly routed and the cable straps are not over tightened. Over tightening of the cable straps will damage the wiring harness convoluting.

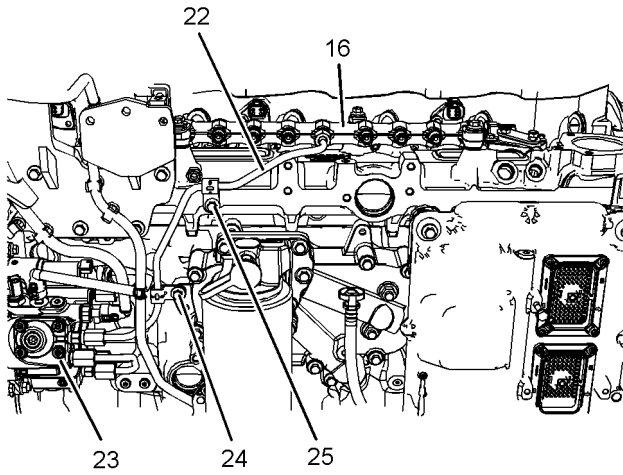


Illustration 22

g02177629

1. Remove plugs from fuel manifold (16) and fuel injection pump (23).
2. Remove the caps from new fuel injection line (22).
3. Position fuel injection line (22) onto fuel injection pump (23) and fuel manifold (16). Loosely install nuts for the fuel injection line onto the fuel manifold and the fuel injection pump.
4. Install bolt (24) and bolt (25) to the tube clip finger tight.
5. Use Tooling (B) to tighten the nuts on fuel injection line (22) to a torque of 20 N·m (177 lb in).
6. Use Tooling (C) and Tooling (B) in order to turn the nuts for the fuel injection line through an additional 74 degrees.
7. Tighten bolt (24) and bolt (25) to a torque of 10 N·m (88 lb in).

Note: Ensure that fuel injection lines do not contact any other engine component.

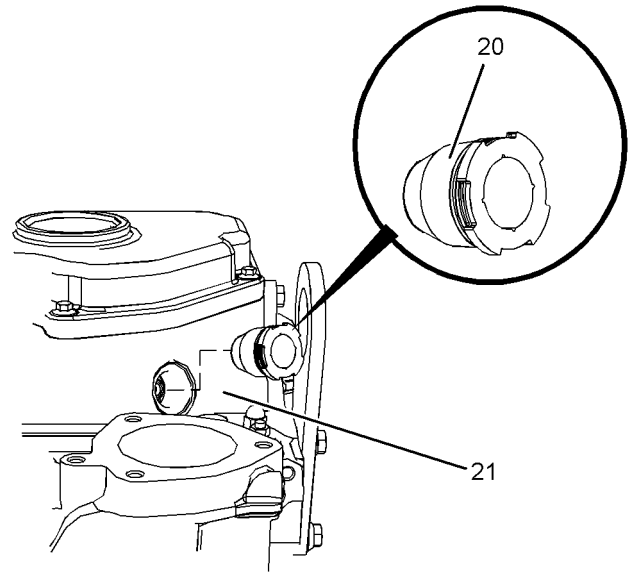


Illustration 23

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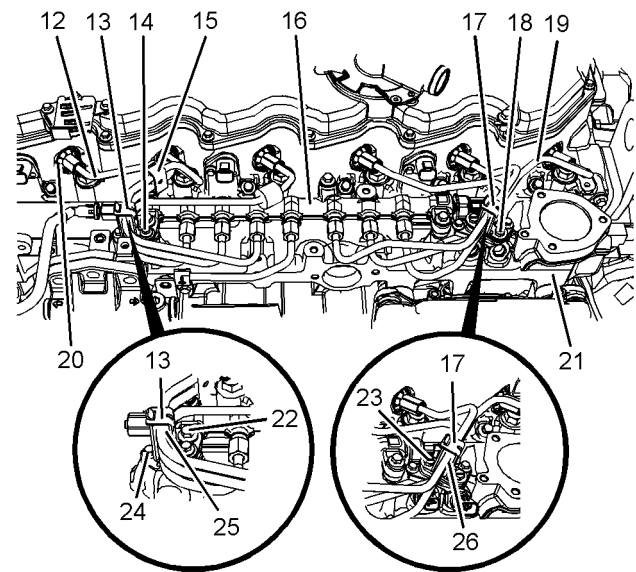


Illustration 24

g02177628

8. Follow Step 8 through Step 17 in order to install fuel injection lines for number one cylinder to number three cylinder.
9. Install new seal (20) to the electronic unit injector and cylinder head (21). Ensure that the flange on the seal is flush with the cylinder head.
10. Remove the caps from the port of the electronic unit injector and from the appropriate port in fuel manifold (16).

11. Loosely connect the nuts at both ends of fuel injection line (12) to the electronic unit injector and to the appropriate port in fuel manifold (16). Ensure that the ends of the fuel injection line are correctly seated in the electronic unit injector and in the fuel manifold.
12. If no further fuel injection lines are to be installed, follow Step 12.a through Step 12.e in order to assemble clamp (13) and clamp (15) for the fuel injection lines.
 - a. Position rubber separator (25) onto the fuel injection lines.
 - b. Position clamp (13) and install bolt (14) finger tight.
 - c. Tighten bolt (24) and bolt (22) finger tight.

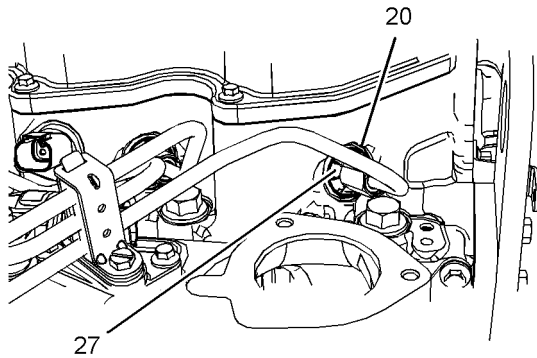


Illustration 25

g02178062

- d. Ensure that dust seal (27) is seated correctly against seal (20).
- e. Use a suitable tool in order to install tube clamp (15) to fuel injection lines (12).

Note: Ensure that the rubber separator is correctly installed to the fuel injection lines. Ensure that fuel injection lines do not contact any other engine component.

13. Use Tooling (B) in order to tighten the nuts on fuel injection line (12) to a torque of 20 N·m (177 lb in).
14. Use Tooling (C) and Tooling (B) in order to turn the nuts for the fuel injection line through an additional 74 degrees.
15. Follow Step 9 through Step 14 in order to install the remaining fuel injection lines.
16. Tighten bolt (14) and bolt (24) for tube clamp (13) to a torque of 10 N·m (88 lb in).
17. Tighten bolt (22) to a torque of 22 N·m (195 lb in).

18. Follow Step 19 through Step 26 in order to install fuel injection lines for number four cylinder to number six cylinder.
 19. Install new seal (20) to the electronic unit injector and cylinder head (21). Ensure that the flange on the seal is flush with the cylinder head.
 20. Remove the caps from the port of the electronic unit injector and from the appropriate port in fuel manifold (16).
 21. Loosely connect the nuts at both ends of fuel injection line (19) to the electronic unit injector and to the appropriate port in fuel manifold (16). Ensure that the ends of the fuel injection line are correctly seated in the electronic unit injector and in the fuel manifold.
 22. If no further fuel injection lines are to be installed, follow Step 22.a through Step 22.d in order to assemble clamp (17) for the fuel injection lines.
 - a. Position rubber separator (26) onto the fuel injection lines.
 - b. Position clamp (17) and install bolt (18) finger tight.
 - c. Tighten bolt (23) finger tight.
- Note:** Ensure that the rubber separator is correctly installed to the fuel injection lines. Ensure that fuel injection lines do not contact any other engine component.

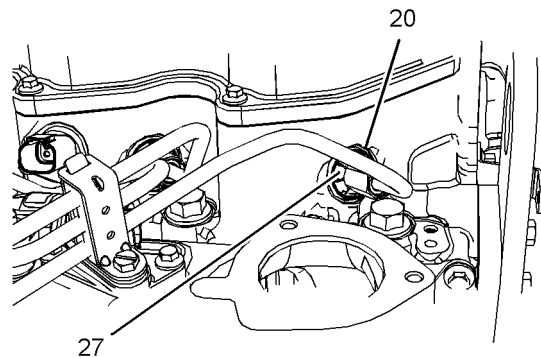


Illustration 26

g02178062

- d. Ensure that dust seal (27) is seated correctly against seal (20).
23. Use Tooling (B) to tighten the nuts on fuel injection line (12) to a torque of 20 N·m (177 lb in).
24. Use Tooling (C) and Tooling (B) in order to turn the nuts for the fuel injection line through an additional 74 degrees.



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