Perkins®

THE HEART OF EVERY GREAT MACHINE

KENR9145
March 2013

Disassembly and Assembly

403F-15T, 404F-22 and 404F-22T Industrial Engines

EL (Engine)
EN (Engine)
EP (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.

⚠ WARNING

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.

⚠ WARNING

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.

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Fuel Priming Pump - Remove and Install
(Electrical Fuel Priming Pump for 404F-22 and 404F-22T Engines)

Removal Procedure

NOTICE
Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

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 battery disconnect switch to the OFF position.

2. Turn the fuel supply to the OFF position.

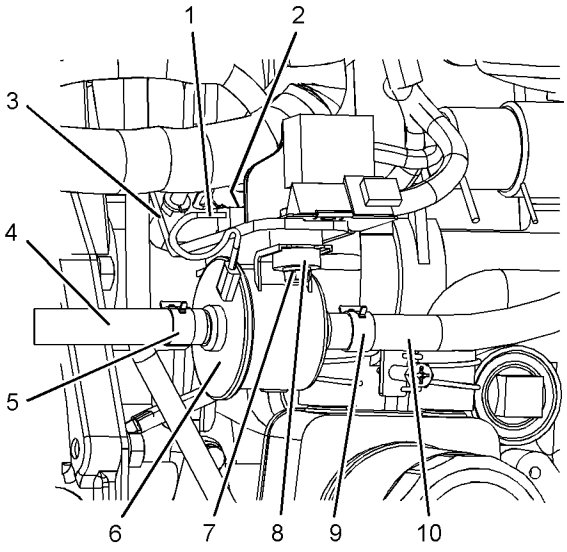

Illustration 1 g03342128

3. Compress hose clamp (5) and slide the hose clamp away from fuel priming pump (6).

4. Disconnect hose (4) from fuel priming pump (6).

5. Plug hose (4) and cap fuel priming pump (6) immediately.

6. Compress hose clamp (9) and slide the hose clamp away from fuel priming pump (6).

7. Disconnect hose (10) from fuel priming pump (6).

8. Plug hose (10) and cap fuel priming pump (6) immediately.

9. Disconnect harness assembly (1) from engine harness assembly (2) (not shown).

10. Remove the nuts and bolts (7) from fuel priming pump (6). Support the fuel priming pump as the nuts and bolts are removed

11. Remove fuel priming pump (6) from bracket (3).

12. If necessary, remove isolators (8) from fuel priming pump (6).

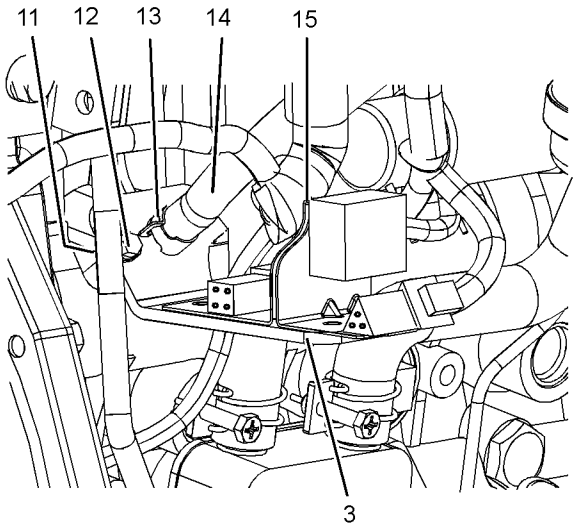

Illustration 2 g03342129

13. If necessary, follow Step 13.a. through Step 3.g. in order to remove bracket (3).

a. Position bracket (15) for the engine wiring harness assemblies away from bracket (3).

b. Compress hose clamp (13) and slide along hose (14).

c. Disconnect hose (14) from the connection on bracket (3).

d. Remove bolts (12) from bracket (3).

e. Remove bracket (3) from the cylinder block.

f. Remove gasket (11) (not shown).

Installation Procedure

NOTICE
Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

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. Ensure that the fuel priming pump and bracket are free from wear or damage. Replace any components that are worn or damaged.

2. Clean the gasket surfaces of the cylinder block and the bracket.

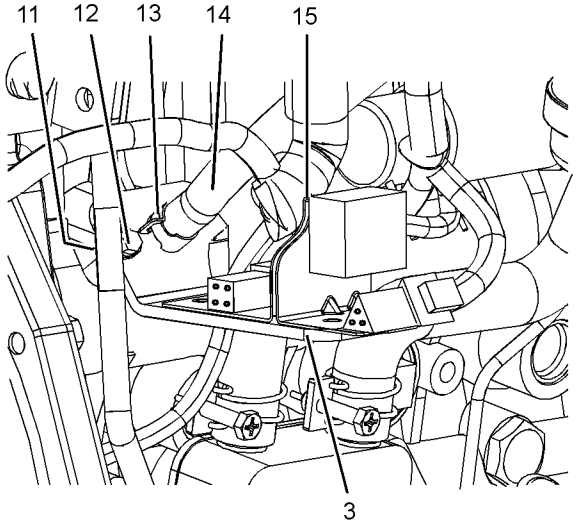

Illustration 3 g03342129

3. If necessary, follow Step 3.a. through Step 3.g. in order to install bracket (3).

a. Position a new gasket (11) (not shown) onto the cylinder block.

b. Position bracket (3) to the cylinder block.

c. Install bolts (12) to bracket (3) hand tight.

d. Tighten bolts (12) to a torque of 10 N·m (89 lb in).

e. Connect hose (14) to the connection on bracket (3).

f. Compress hose clamp (13) and slide along hose (14) toward the bracket. Ensure that the hose clamp is correctly positioned.

g. Position bracket (15) for the engine wiring harness assemblies away onto bracket (3). Ensure that the bracket for the engine wiring harness assemblies is correctly orientated.

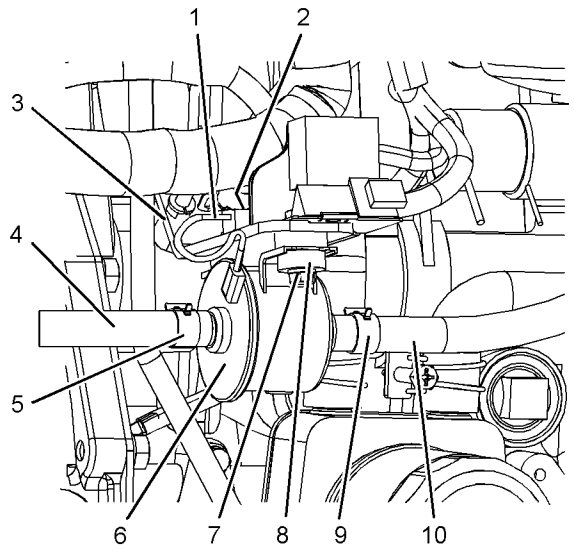

Illustration 4 g03342128

4. If necessary, install isolators (8) to fuel priming pump (6).

5. Position fuel priming pump (6) onto bracket (3).

6. Install the nuts and bolts (7) to fuel priming pump (6). Support the fuel priming pump as the nuts and bolts are installed

7. Tighten the nuts and bolts (7) to a torque of 10 N·m (89 lb in).

8. Remove the plug from hose (10) and cap from fuel priming pump (6).

9. Connect hose (10) to fuel priming pump (6).

10. Compress hose clamp (9) and slide the hose clamp along hose (10). Ensure that the hose clamp is correctly positioned.

11. Remove the plug from hose (4) and the cap from fuel priming pump (6).

12. Connect hose (4) to fuel priming pump (6).

13. Compress hose clamp (5) and slide the hose clamp along hose (4). Ensure that the hose clamp is correctly positioned.

14. Connect harness assembly (1) to engine harness assembly (2) (not shown).

15. Turn the fuel supply to the ON position.

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

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

i05240936

Fuel Priming Pump - Remove and Install
(Electrical Fuel Priming Pump for 403F-15T Engines)

Removal Procedure

NOTICE
Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

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 battery disconnect switch to the OFF position.

2. Turn the fuel supply to the OFF position.

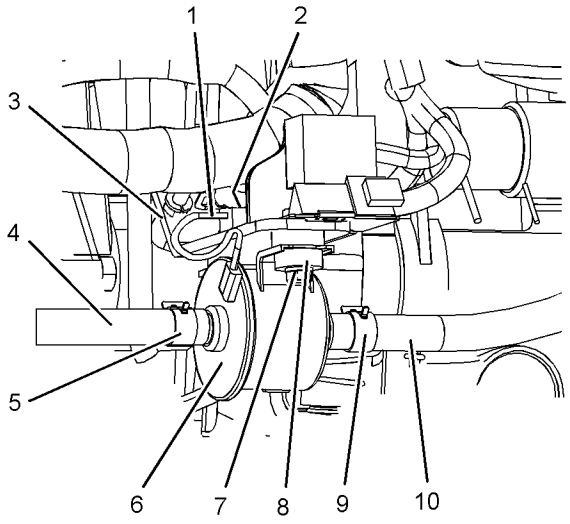

Illustration 5 g03342666

Typical example

3. Compress hose clamp (5) and slide the hose clamp away from fuel priming pump (6).

4. Disconnect hose (4) from fuel priming pump (6).

5. Plug hose (4) and cap fuel priming pump (6) immediately.

6. Compress hose clamp (9) and slide the hose clamp away from fuel priming pump (6).

7. Disconnect hose (10) from fuel priming pump (6).

8. Plug hose (10) and cap fuel priming pump (6) immediately.

9. Disconnect harness assembly (1) from engine harness assembly (2) (not shown).

10. Remove the nuts and bolts (7) from fuel priming pump (6). Support the fuel priming pump as the nuts and bolts are removed

11. Remove fuel priming pump (6) from bracket (3).

12. If necessary, remove isolators (8) from fuel priming pump (6).

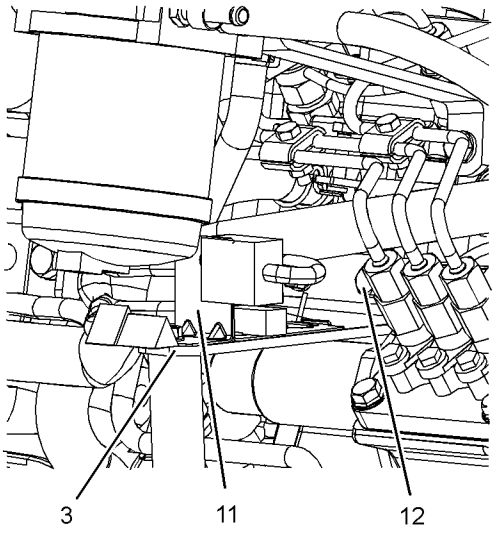

Illustration 6 g03342667

13. If necessary, follow Step 13.a. through Step 13.c. in order to remove bracket (3).

a. Position bracket (11) for the engine wiring harness assemblies away from bracket (3).

b. Remove bolts (12) from bracket (3).

c. Remove bracket (3) from the cylinder block.

Installation Procedure

NOTICE
Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

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. Ensure that the fuel priming pump and bracket are free from wear or damage. Replace any components that are worn or damaged.

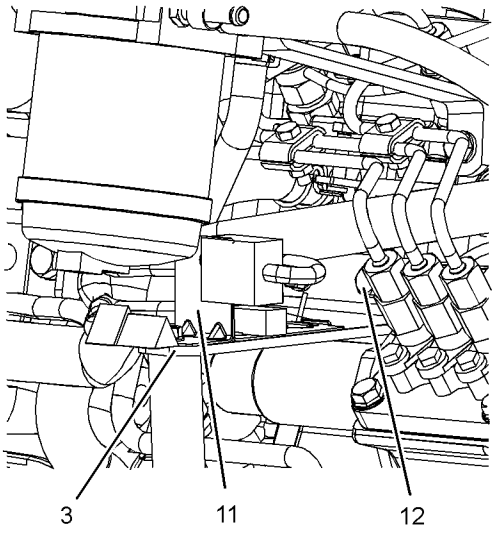

Illustration 7 g03342667

2. If necessary, follow Step 2.a. through Step 2.d. in order to install bracket (3).

a. Position bracket (3) onto the cylinder block.

b. Install bolts (12) to bracket (3) hand tight.

c. Tighten bolts (12) to a torque of 25 N·m (221 lb in).

d. Position bracket (11) for the engine wiring harness assemblies away onto bracket (3). Ensure that the bracket for the engine wiring harness assemblies is correctly orientated.

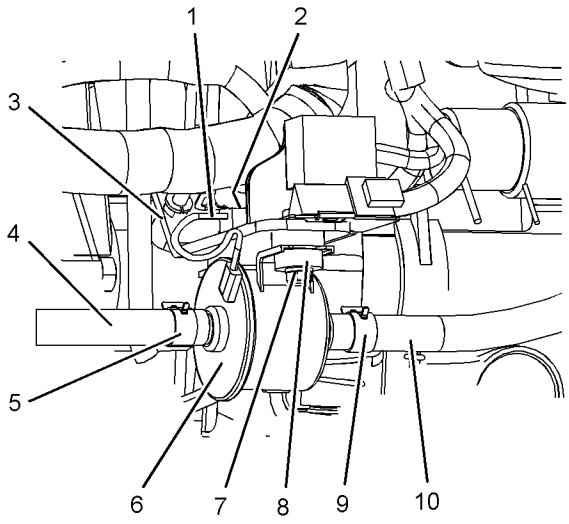

Illustration 8 g03342666

Typical example

3. If necessary, install isolators (8) to fuel priming pump (6).

4. Position fuel priming pump (6) onto bracket (3).

5. Install the nuts and bolts (7) to fuel priming pump (6). Support the fuel priming pump as the nuts and bolts are installed

6. Tighten the nuts and bolts (7) to a torque of 10 N·m (89 lb in).

7. Remove the plug from hose (10) and cap from fuel priming pump (6).

8. Connect hose (10) to fuel priming pump (6).

9. Compress hose clamp (9) and slide the hose clamp along hose (10). Ensure that the hose clamp is correctly positioned.

10. Remove the plug from hose (4) and the cap from fuel priming pump (6).

11. Connect hose (4) to fuel priming pump (6).

12. Compress hose clamp (5) and slide the hose clamp along hose (4). Ensure that the hose clamp is correctly positioned.

13. Connect harness assembly (1) to engine harness assembly (2) (not shown).

14. Turn the fuel supply to the ON position.

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

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

i05177851

Fuel Filter Base - Remove and Install

(Fuel Filter Base for 403F-15T, 404F-22, and 404F-22T Engines)

Removal Procedure

NOTICE
Do not allow dirt to enter the fuel system. Thoroughly clean the area around a fuel system component that will be disconnected. Fit a suitable cover over disconnected fuel system component.

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.

NOTICE
Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: Place identification marks on all hoses for installation purposes. Plug all hoses and all the ports in the fuel filter base. Plugging hoses and ports helps prevent fluid loss, and plugging hoses and ports helps to keep contaminants from entering the fuel system.

1. Turn the fuel supply to the OFF position.

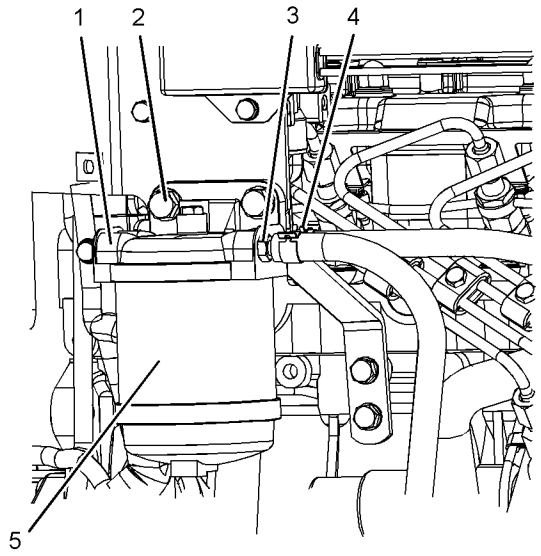

Illustration 9 g03343998

2. Disconnect tube connection (3) from fuel filter base (1).

3. Install plug to fuel filter base (1) and cap to tube connection (3).

4. Disconnect tube connection (4) from fuel filter base (1).

5. Install plug to fuel filter base (1) and cap to tube connection (4).

6. If necessary, remove fuel filter element (5). Refer to Operations and Maintenance Manual, “Fuel System Filter - Replace” for the correct procedure.

7. Remove bolts (2) and remove fuel filter base (1) from the bracket.

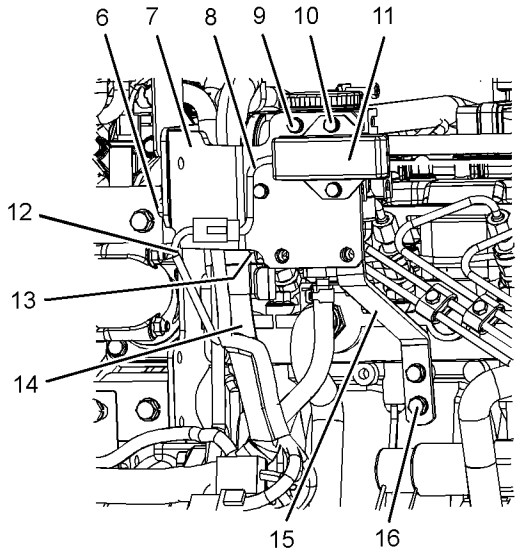

Illustration 10 g03343999

8. If necessary, follow Step 8.a. through Step 8.g. in order to remove mounting bracket (7) for the fuel filter base.

a. Disconnect harness assembly (8) from harness assembly (12).

b. Remove harness assembly (12) from bracket (7).

c. Remove bolts (9) for the crankcase breather canister.

d. Remove bolt (13) (not shown) for harness assembly (14).

e. Remove bolts (6) from bracket (7). Support the weight of the bracket as the bolts are removed.

f. If necessary, remove bolts (16) from bracket (15). Remove the bracket from the cylinder block.

g. If necessary, remove bolts (10) and remove voltage dropper (11) from bracket (7).

Installation Procedure

NOTICE
Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Ensure that the fuel filter base and the brackets are clean and free from damage. If necessary, replace any component that is worn or damaged.

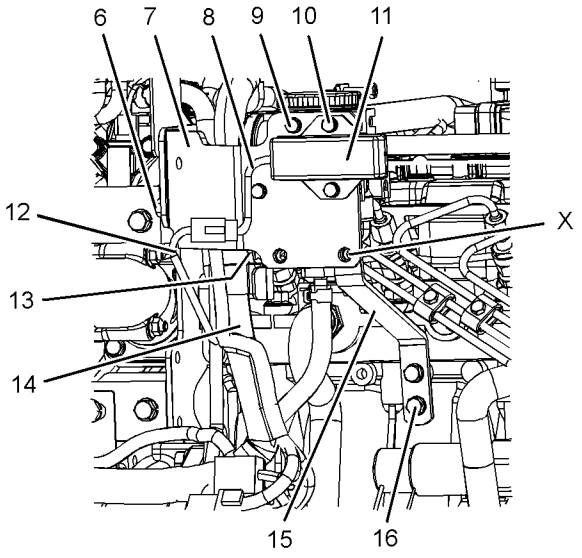

Illustration 11 g03344074

2. If necessary, follow Step 2.a. through Step 2.k. in order to install mounting bracket (7) for the fuel filter base.

a. If necessary, position bracket (15) onto the cylinder block. Loosely install bolts (16) to the bracket.

b. Install bracket (7) and install bolts (6) hand tight. Support the weight of the bracket as the bolts are installed.

c. Temporally install a bolt in Position (X) hand tight. Installation of a bolt in this position will align the bracket (15) with bracket (7).

d. Tighten the bolts (16) and bolts (6) to a torque of 25 N·m (221 lb in).

e. Remove the temporary bolt from Position (X).

f. Install bolts (9) for the crankcase breather canister. Tighten the bolts to a torque of 10 N·m (89 lb in).

g. Install bolt (13) (not shown) to harness assembly (14). Tighten the bolts to a torque of 10 N·m (89 lb in).

h. If necessary, position voltage dropper (11) onto bracket (7). Ensure that the voltage dropper is correctly orientated.

i. Install bolts (10). Tighten the bolts to a torque of 10 N·m (89 lb in).

j. Install harness assembly (12) to bracket (7).

k. Connect harness assembly (8) to harness assembly (12).

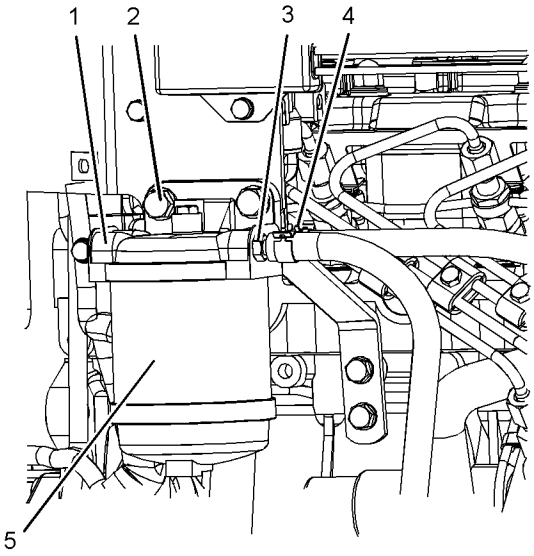

Illustration 12 g03343998

3. Position fuel filter base (1) onto the mounting bracket.

4. Install bolts (2) to fuel filter base (1).

5. Tighten bolt (2) to a torque of 25 N·m (221 lb in).

6. If necessary, install a new fuel filter element (5). Refer to Operations and Maintenance Manual, “Fuel System Filter - Replace” for the correct procedure.

7. Remove plug from fuel filter base (1) and remove cap from tube connection (3).

8. Connect tube connection (3) to fuel filter base (1). Tighten the tube connection to a torque of 32 N·m (283 lb in).

Note: Ensure that the hose does not come into contact any other engine components.

9. Remove plug from fuel filter base (1) and remove cap from tube connection (4).

10. Connect tube connection (4) to fuel filter base (1). Tighten the tube connection to a torque of 32 N·m (283 lb in).

Note: Ensure that the hose does not come into contact any other engine components.

11. Turn the fuel supply to the ON position.

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

i05177852

Fuel Injection Lines - Remove and Install

(Fuel Injection Lines and Leak Off Rail for 403F-15T, 404T-22, and 404F-22T Engines)

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	27610294	Injector Pipe Nut Tool	1

NOTICE
Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

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.

NOTICE
Do not let the tops of fuel injectors turn when the fuel line nuts are loosened or tightened.

The fuel injectors will be damaged if the top of the injector turns in the body.

The engine will be damaged if a defective fuel injector is used because the shape of fuel (spray pattern) that comes out of the nozzle will not be correct.

Note: Place identification marks on all tube assemblies for installation. Plug all lines and tube assemblies in order to prevent contamination.

1. Turn the fuel supply to the OFF position.

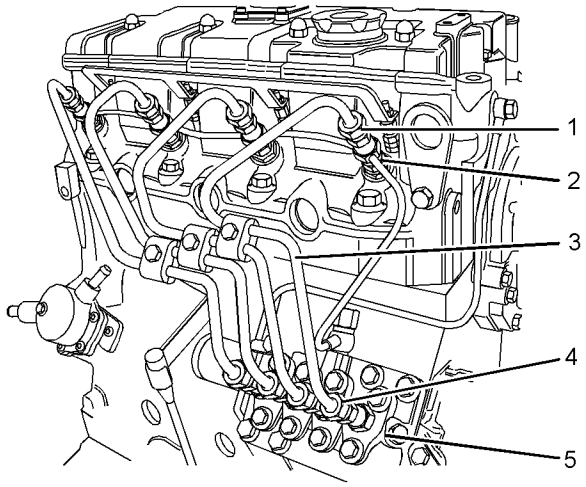

Illustration 13 g03341354

2. Use Tooling (A) to disconnect nuts (1) for fuel injection lines (3) from fuel injectors (2).

3. Use Tooling (A) to disconnect nuts (4) for fuel injection lines (3) from fuel injection pump (5).

4. Remove fuel injection lines (3) from the engine as an assembly.

5. Use suitable caps in order to plug the open ports of fuel injection pump (5) immediately.

6. Use suitable caps in order to plug the open ports of fuel injectors (2) immediately.

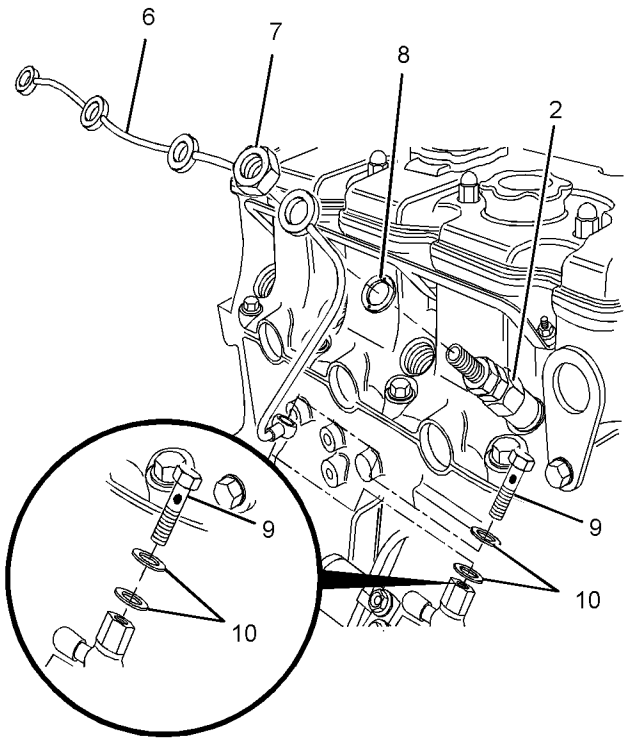

Illustration 14 g03341356

7. If fuel injectors (2) have been previously capped, the caps will need removing from fuel injectors (2) before removing nuts (7).

8. Use a deep socket in order to remove nuts (7) from fuel injectors (2).

Note: For engines with a fuel return line, ensure that the fuel return line is not distorted when the nuts are loosened.

9. Remove banjo bolt (9) from fuel return line (6).

10. Remove sealing washers (10).

11. Remove fuel return line (6) from fuel injectors (2).

12. Remove sealing washers (8) from fuel injectors (2).

13. Use suitable caps in order to plug fuel injectors (2) immediately.

Installation Procedure

Table 2

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	27610294	Injector Pipe Nut Tool	1

NOTICE
Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE
Do not let the tops of fuel injectors turn when the fuel line nuts are loosened or tightened.

The fuel injectors will be damaged if the top of the injector turns in the body.

The engine will be damaged if a defective fuel injector is used because the shape of fuel (spray pattern) that comes out of the nozzle will not be correct.

Note: The installation procedure is similar for the three cylinder and the four cylinder engines.

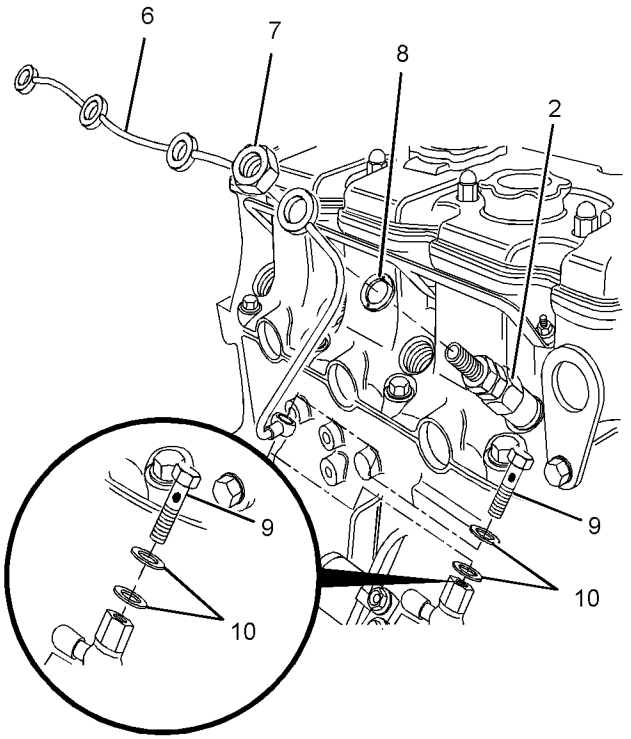

Illustration 15 g03341356

1. Remove the caps from fuel injectors (2).

2. Install new sealing washers (8) to fuel injectors (2).

Note: The sealing washers have two small holes.

3. Install fuel return line (3) onto fuel injectors (2).

4. Use a deep socket in order to install nuts (7) loosely to fuel injectors (2).

5. Install a new sealing washer (10) onto banjo bolt (9).

6. install banjo bolt (9) to rigid fuel return line (6).

7. Install remaining new sealing washer (10) between rigid fuel return line (6) and the connection on the fuel injection pump.

8. Tighten banjo bolt (9) hand tight.

9. Use a deep socket in order to tighten nuts (7) to a torque of 27 N·m (239 lb in).

10. Tighten banjo bolt (9) to a torque of 10 N·m (89 lb in).

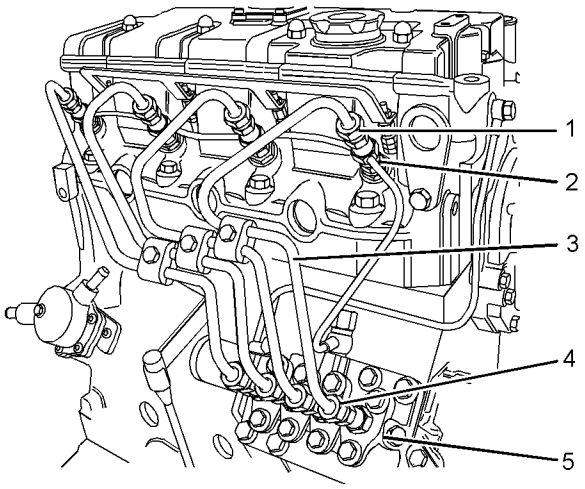

Illustration 16 g03341354

11. Remove the caps from fuel injection pump (5).

12. If necessary, the caps from fuel injectors (2).

13. Position fuel injection lines (3) onto the engine as an assembly.

14. Install fuel injection lines (3) to fuel injectors (2) and fuel injection pump (5).

15. Tighten nuts (1) and nuts (4) for fuel injection lines (3) hand tight. Ensure that the ends of the fuel injection line are correctly seated in the fuel injectors and in the fuel injection pump.

16. Use Tooling (A) in order to tighten nuts (4) for fuel injection lines (3) to a torque of 23 N·m (204 lb in).

17. Use Tooling (A) in order to tighten nuts (1) for fuel injection lines (3) to a torque of 23 N·m (204 lb in).

18. Turn the fuel supply to the ON position.

19. Prime the fuel system. Refer to Operation and Maintenance Manual, “Fuel System - Prime” for more information.

i05177791

Exhaust Cooler (NRS) - Remove and Install

Removal Procedure

Start By:

Drain the coolant from the cooling system into a suitable container for storage or disposal. Refer to Operation and Maintenance Manual, “Cooling System Coolant - Change” for the correct procedure.

⚠ WARNING

Sulfuric Acid Burn Hazard may cause serious personal injury or death.

The exhaust gas cooler may contain a small amount of sulfuric acid. The use of fuel with sulfur levels greater than 15 ppm may increase the amount of sulfuric acid formed. The sulfuric acid may spill from the cooler during service of the engine. The sulfuric acid will burn the eyes, skin and clothing on contact. Always wear the appropriate personal protective equipment (PPE) that is noted on a material safety data sheet (MSDS) for sulfuric acid. Always follow the directions for first aid that are noted on a material safety data sheet (MSDS) for sulfuric acid.

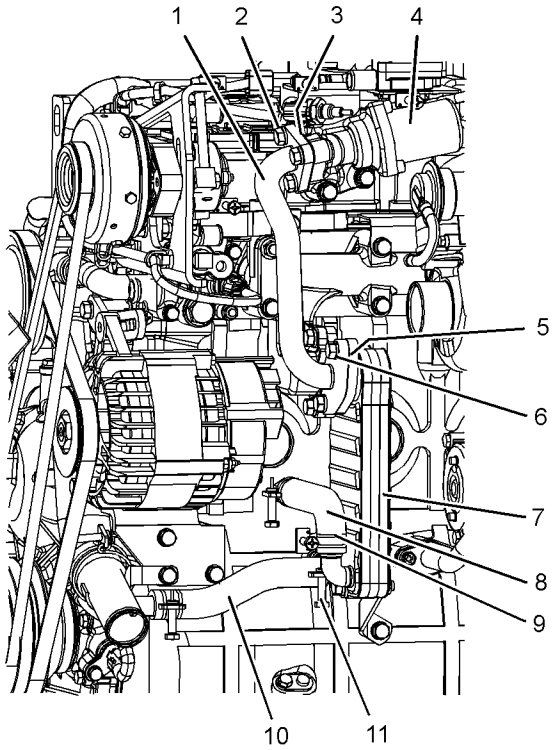

Illustration 17 g03329695

1. Loosen hose clamp (11) on hose assembly (10). Disconnect hose assembly (10) from exhaust cooler (NRS) (7).

2. Loosen hose clamp (9) on hose assembly (8). Disconnect hose assembly (8) from exhaust cooler NRS) (7).

3. Remove bolts (2) and bolts (6) from tube assembly (1).

4. Remove tube assembly (1) from exhaust cooler (NRS) (7) and exhaust gas recirculation (EGR) valve assembly (4).

5. Remove gasket (3) (not shown) and gasket (5) (not shown).

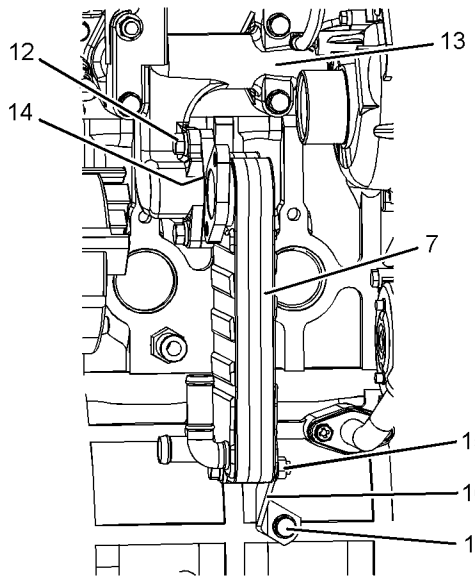

Illustration 18 g03329706

6. Remove bolts (12) from exhaust cooler (NRS) assembly (7).

7. Remove gasket (14) (not shown) from between exhaust manifold (13) and exhaust cooler (NRS) assembly (7).

8. Remove bolt (17) from bracket (16). Support exhaust cooler (NRS) assembly (7) as the bolt (17) is removed.

9. Remove exhaust cooler (NRS) assembly (7).

10. Plug and cap all open ports on exhaust cooler (NRS) assembly (7).

11. If necessary, remove nut (15) and remove bracket (16).

Installation Procedure

Table 3

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	-	Anti-Seize Compound	1

1. Check all components for wear and damage. If necessary, replace any components that are worn or damaged.

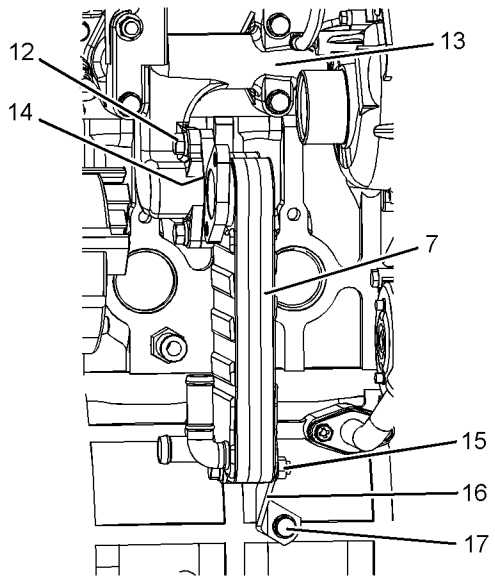

Illustration 19 g03329706

2. Ensure that the exhaust cooler (NRS) assembly is free from restriction and external damage. Ensure that the exhaust cooler (NRS) assembly and tube assemblies are free from wear and damage. Refer to Systems Operation Testing and Adjusting, “Exhaust Cooler (NRS) - Test” for the correct inspection procedure.

Note: Cleaning of the internal core of the exhaust cooler (NRS) should not be carried out.

3. Clean the gasket surfaces of exhaust cooler (NRS) assembly (7) and exhaust manifold (13).

4. If necessary, position bracket (16) onto exhaust cooler (NRS) assembly (7). Ensure that the bracket is correctly orientated.

5. Loosely install nut (15).

6. Remove plug and cap from all open ports of exhaust cooler (NRS) assembly (7)

7. Position exhaust cooler (NRS) assembly (7) onto the cylinder block.

8. Install bolt (17) to bracket (16). Support exhaust cooler (NRS) assembly (7) as bolt (17) is installed.

9. Position a new gasket (14) (not shown) between exhaust manifold (13) and exhaust cooler (NRS) assembly (7).

10. Apply Tooling (A) to the threads of bolts (12). Install bolts (12) to exhaust cooler (NRS) assembly (7) hand tight.

11. Tighten bolts (12) to a torque of 25 N·m (221 lb in).

12. Tighten bolt (17) to a torque of 25 N·m (221 lb in).

13. Tighten locking nut (15) to a torque of 25 N·m (221 lb in). Ensure that bracket (16) is not stranded as the nut is tightened.

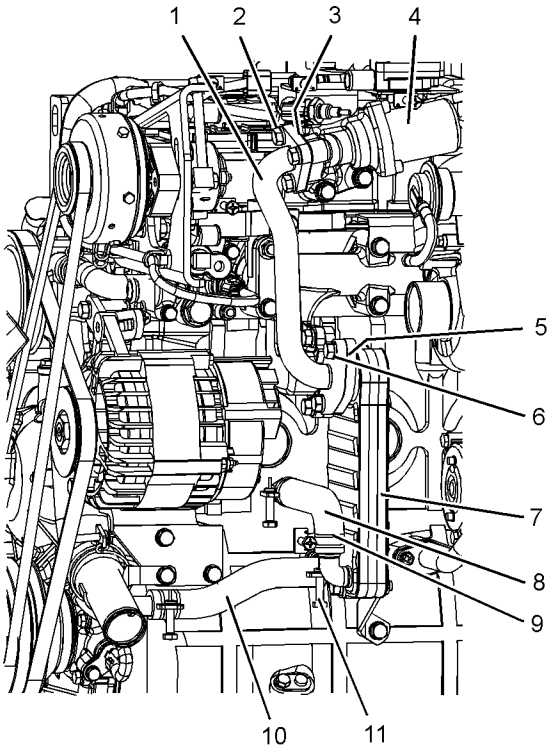

Illustration 20 g03329695

14. Connect hose assembly (10) to exhaust cooler (NRS) (7). Tighten hose clamp (11) securely.

15. Connect hose assembly (8) to exhaust cooler (NRS) (7). Tighten hose clamp (9) securely.

16. Clean the gasket surfaces of tube assembly (1) and exhaust gas recirculation (EGR) valve assembly (4).

17. Apply Tooling (A) to the threads of bolts (2) and bolts (6).

18. Position a new gasket (3) (not shown) and a new gasket (5) (not shown) onto tube assembly (1).

19. Position tube assembly (1) onto exhaust cooler (NRS) (7) and exhaust gas recirculation (EGR) valve assembly (4).

20. Install bolts (2) and bolts (6) to tube assembly (1). Hand tighten the bolts.

21. Tighten bolts (2) and bolts (6) to a torque of 25 N·m (221 lb in). Ensure that tube assembly (1) is not stranded as the bolts are tightened.

End By:

Fill the cooling system with coolant. Refer to Operation and Maintenance Manual, "Cooling System Coolant - Change" for the correct procedure.

i05183197

Position Sensor (Governor Control) - Remove and Install
(Fuel Rack Solenoid)

Removal Procedure

NOTICE
Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

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.

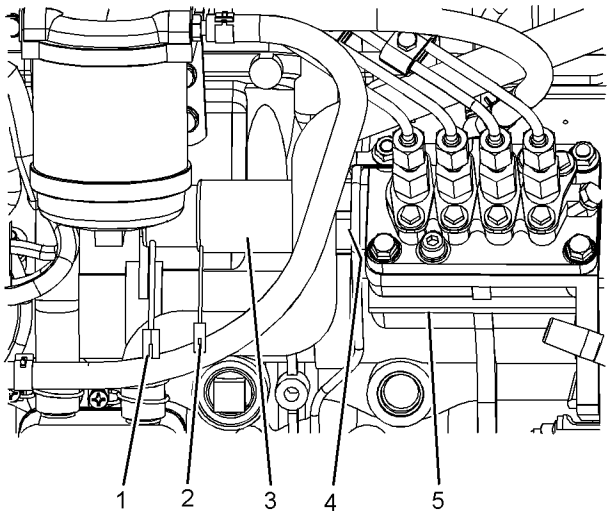

Illustration 21 g03340806

1. Disconnect harness assembly (1) and harness assembly (2) from the engine wiring harness assemblies.

2. Remove harness assembly (1) and harness assembly (2) from the fuel priming pump bracket.

3. Use a suitable tool in order to remove governor control (3) from cylinder block (5).

4. Remove sealing washer (4) (not shown).

Installation procedure

NOTICE
Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

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. Ensure that all components are clean and free from wear or damage. If necessary, replace any components that are worn or damaged.

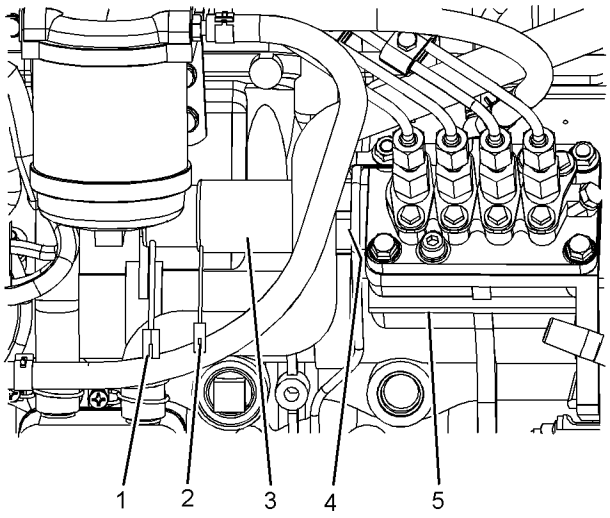

Illustration 22 g03340806

2. Install a new sealing washer (4) (not shown) onto governor control (3).

3. Install governor control (3) to cylinder block (5) hand tight. Ensure that the governor control is installed squarely into the cylinder block.

4. Use a suitable tool in order to tighten governor control (3) to a torque of 22 N·m (195 lb in).

5. Connect harness assembly (1) and harness assembly (2) to the engine wiring harness assemblies.

6. Install harness assembly (1) and harness assembly (2) to the fuel priming pump bracket.

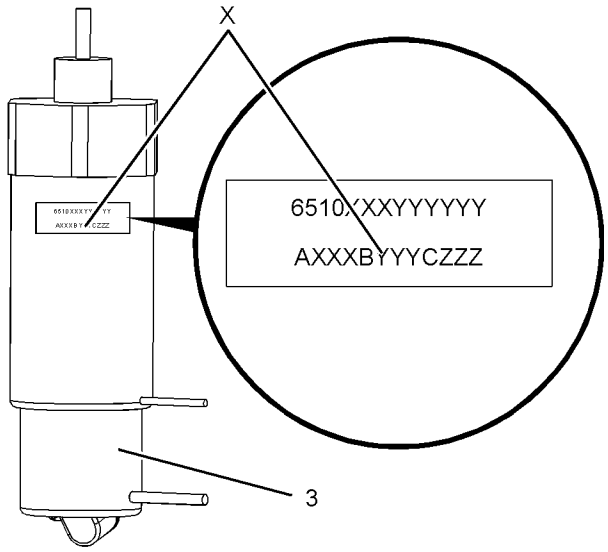

Illustration 23 g03340809

Trim code position

7. If a new governor control (3) has been installed, record the trim code from Position (X) on the new governor control, the trim code should be programmed into the Electronic Control Module (ECM). Use the electronic service tool to input the trim code for the governor control. The trim code is printed on the solenoid in the following format: "AXXX BXXX CXXX".

i05172845

Fuel Injection Pump - Remove

Removal Procedure

Start By:

Remove the position sensor (Governor Control). Refer to Disassembly and Assembly, "Position Sensor (Governor Control) - Remove and Install" for the correct procedure.

Remove the fuel injection lines. Refer to Disassembly and Assembly, "Fuel Injection Lines - Remove and Install" for the correct procedure.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.