

NOTICE:

If the injector unit pump doesn't come out easily, do not try to pry up on the body of the pump. This will damage it.

10. If the injector unit pump is locked up, or frozen, in its seat, release it using the blade of a small screwdriver on the flange where the mounting bolt attaches. See arrow in Figure 2-5.

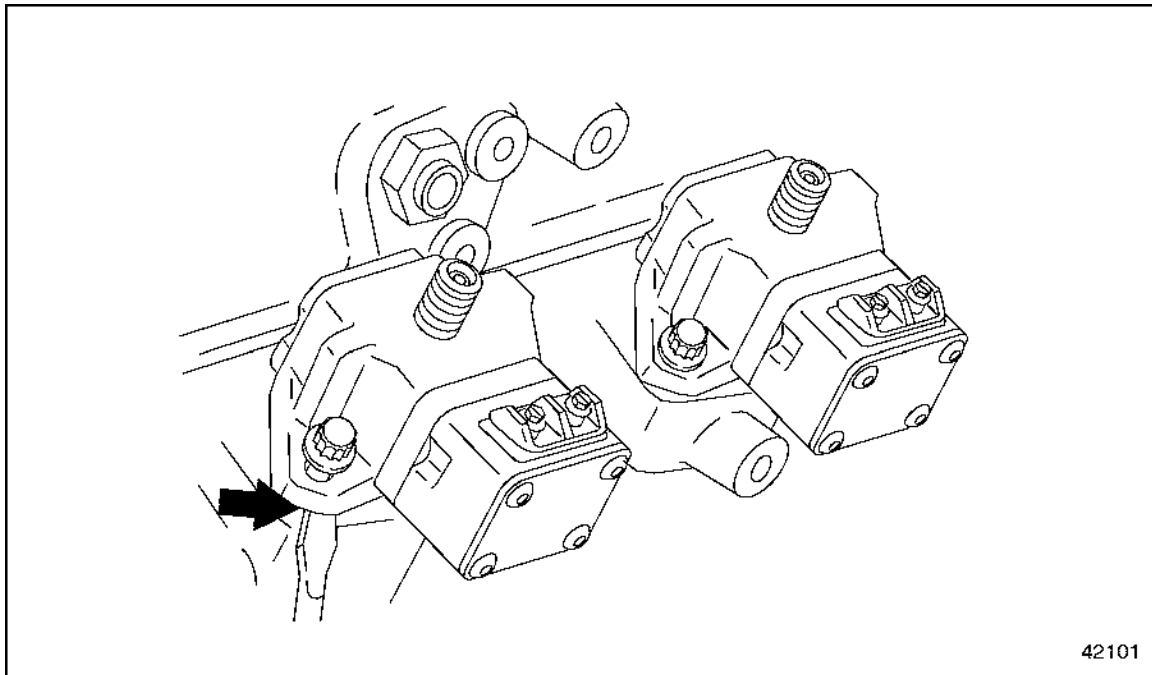
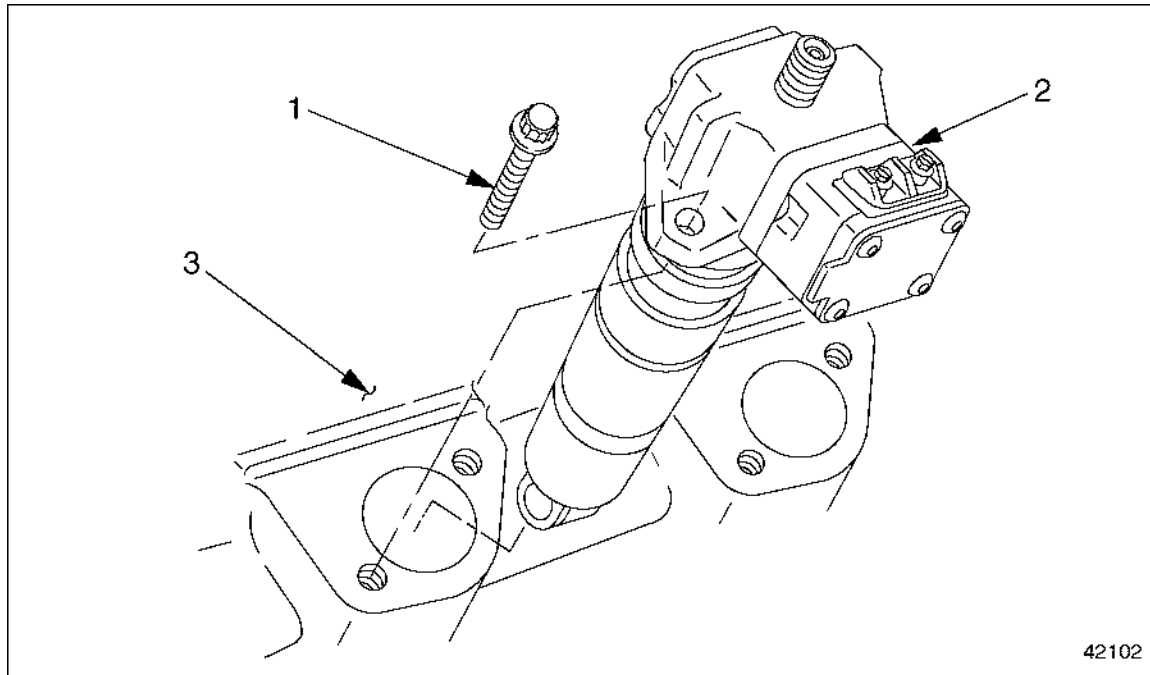


Figure 2-5 Releasing a Locked-up Pump

11. Remove both mounting bolts completely. Carefully pull the unit pump out of the cylinder block. See Figure 2-6.



1. Mounting Bolt

3. Cylinder Block

2. Unit Pump

Figure 2-6 Removing the Unit Pump

12. Check the injector unit pump for wear or damage. If any is found, refer to section 2.1.1.1.
13. Remove and discard the two O-rings on the unit pump shaft.

2.1.1.1 Repairing the Unit Pump Solenoid

A Unit Pump Solenoid repair kit (P/N: 0120740001) is now available for repair of the unit pump. This service kit is used to repair fuel leakage at the solenoid. For this type of complaint, total replacement of the unit pump is no longer necessary. Perform the following steps to install the unit pump repair kit.

 **WARNING:**

PERSONAL INJURY

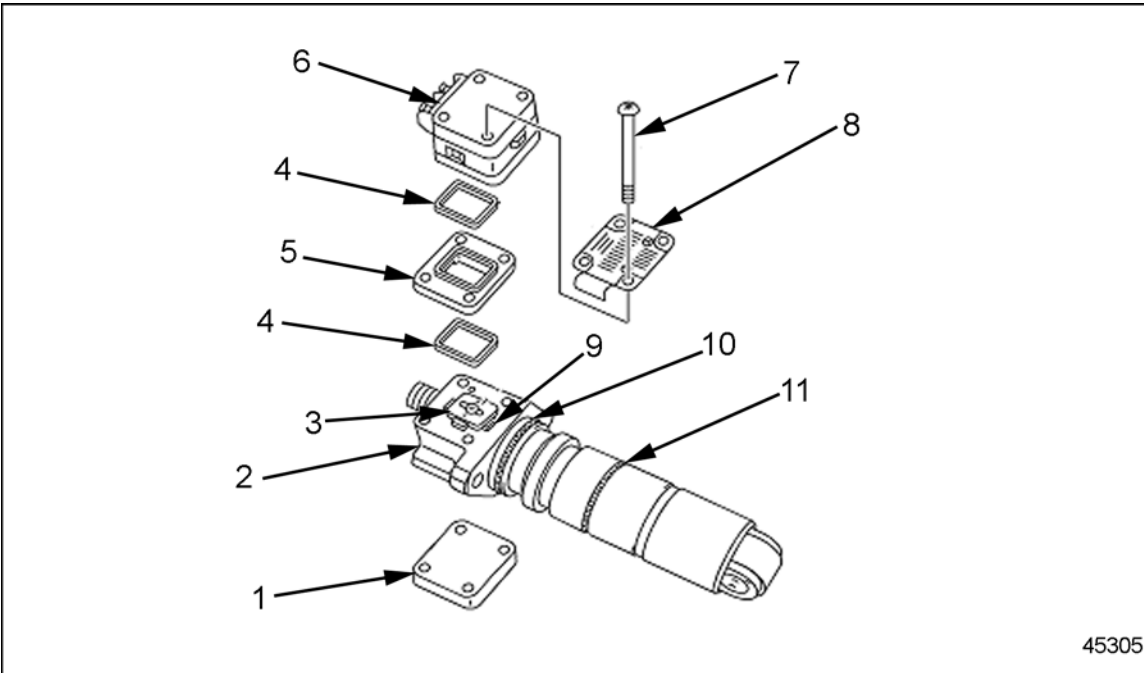
To avoid injury from penetrating fluids, do not put your hands in front of fluid under pressure. Fluids under pressure can penetrate skin and clothing.

 **WARNING:**

FIRE

To avoid injury from fire, keep all potential ignition sources away from diesel fuel, including open flames, sparks, and electrical resistance heating elements. Do not smoke when refueling.

1. Identify the failed unit pump and failure mode (fuel leak at the solenoid). Remove the failed unit pump. Refer to section 2.1.1 for unit pump removal procedure. See Figure 2-6a.

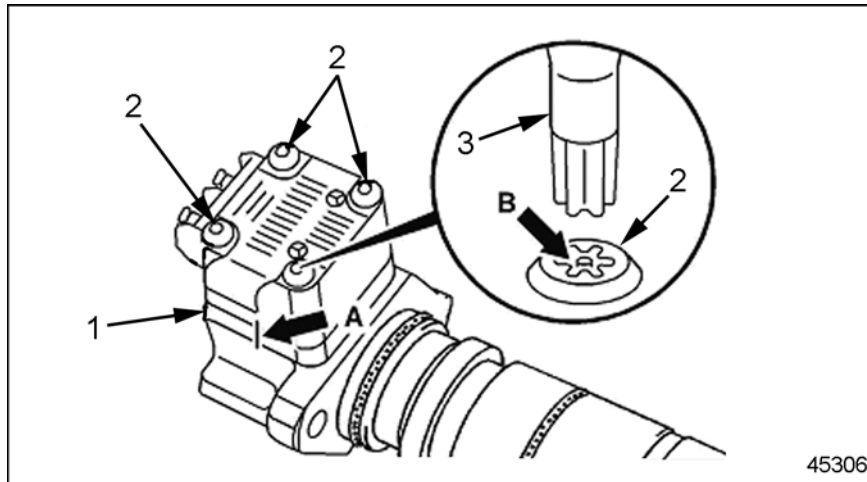


- | | |
|-----------------------|----------------|
| 1. Stop Plate | 7. Screw |
| 2. Unit Pump | 8. Model Plate |
| 3. Anchor Plate | 9. Cross Piece |
| 4. Seal | 10. O-ring |
| 5. Intermediate Plate | 11. O-ring |
| 6. Magnet | |

Figure 2-6a Unit Pump Components

2. Wipe the pump clean, removing excess fuel.
3. Remove the O-rings from the unit pump. Push the unit pump O-ring installer (J-45373) onto the unit pump. This will prevent dirt from entering the unit pump holes.

4. Mark the position of the intermediate plate in relation to the unit pump body (See arrow A of Figure 2-6b) and rest the unit pump on the stop plate. Use a pencil or scribe for marking. Do not use any stamping tools.



1. Intermediate Plate

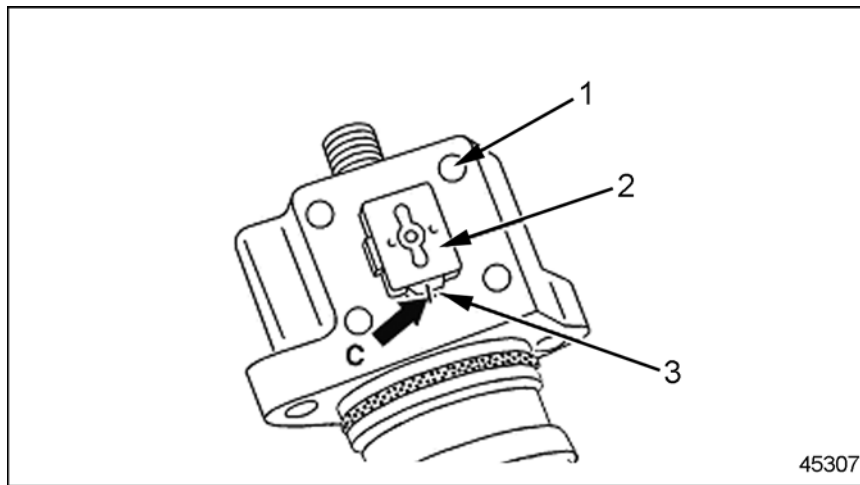
3. Torx Bit

2. Screw

Figure 2-6b Removing the Magnet and Intermediate Plate

5. Remove all traces of paint from screw heads. Remove screws using the torx bit (P/N: 9045890210/00) and lift off the magnet together with the intermediate plate and model plate. (See arrow B of Figure 2-6b).
6. Remove the intermediate plate and the model plate from the magnet. Wipe clean the sealing surface on the magnet, removing any excess fuel. Clean the model plate and remove paint from the screw heads contact area.
7. Remove the two spacer seals and clean the intermediate plate. Do not damage sealing surfaces.

8. Mark the cross piece and anchor plate in relation to the unit pump. (See arrow C of Figure 2-6c). Use a marker; do not use a scribe or stamping tool. The cross piece should not be moved or twisted.



1. Unit Pump

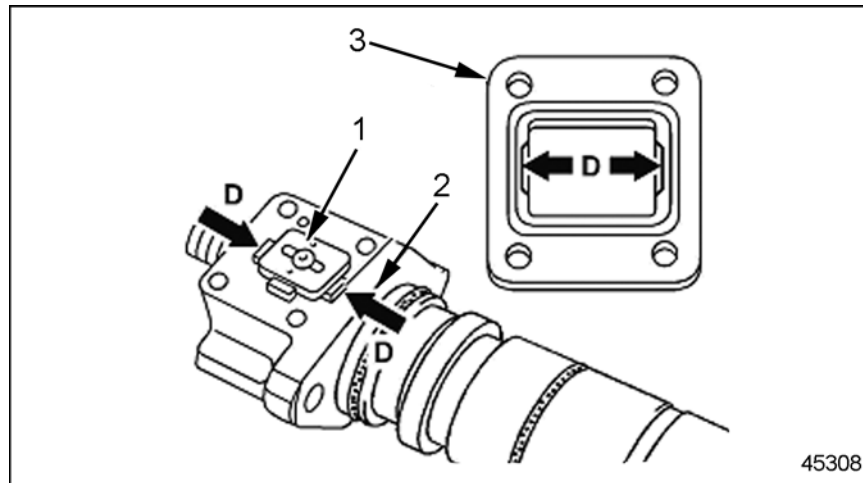
2. Anchor Plate

3. Cross Piece

Figure 2-6c **Marking the Cross Piece and Anchor Plate**

9. Wipe clean the sealing surfaces on the unit pump, cross piece, and anchor plate, removing any excess fuel. Clean the parts thoroughly. Do not remove the paint on the unit pump; it is used as a reference point for the intermediate plate assembly.
10. Remove the stop plate.
11. Place a new stop plate under the unit pump body.
12. Install the new seals in the intermediate plate. Protect the seals with a thin layer of high-temperature grease.
13. Place the intermediate plate on the unit pump body. Observe the identification mark on the cross piece and anchor plate for the unit pump body. The cutouts (see arrows D of

Figure 2-6d) at the opening in the intermediate plate must face towards the cross piece. The painted surface is a reference mark to the intermediate plate assembly on the unit pump.



1. Anchor Plate
2. Cross Piece

3. Intermediate Plate

Figure 2-6d Installing the Intermediate Plate

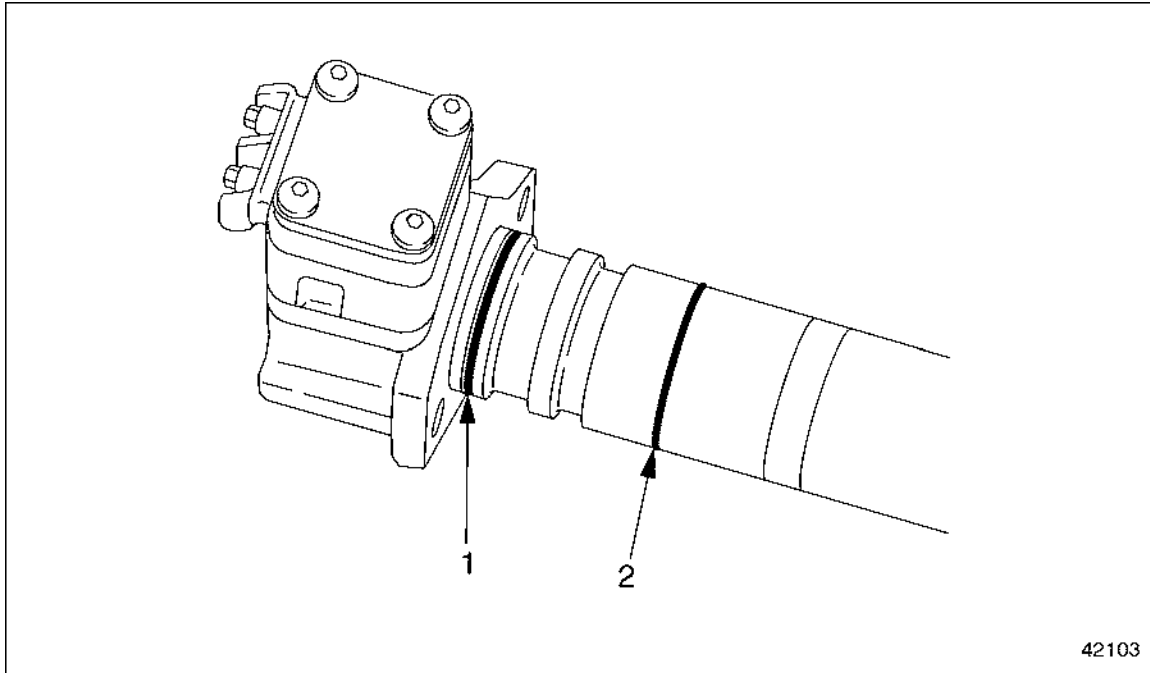
14. Place the magnet on the intermediate plate and place the model plate on the magnet.
15. Secure the model plate, magnet, intermediate plate, unit pump and stop plate together using new screws. Hand tighten.
16. Tighten the screws in a crosswise pattern to 5 N·m (4 lb·ft), using torx bit (P/N: 9045890210/00).
17. Push the unit pump O-ring installer (J-45373) onto the unit pump.
18. Install new O-rings on the unit pump and install the unit pump in the engine. Refer to section 2.1.2 for installation procedures.

2.1.2 Injector Unit Pump Installation

Install the injector unit pump as follows:

1. Lubricate two new O-rings with a light coating of engine oil.

2. Install the two new O-rings on the unit pump shaft using the Unit Pump O-ring installer (J-45373). See Figure 2-7.



1. Inner (larger) O-ring

2. Outer (smaller) O-ring

Figure 2-7 O-ring Installation

3. Install the injector unit pump into the cylinder block.
 - [a] Insert the injector unit pump into the mounting hole in the cylinder block.
 - [b] Use light hand pressure to push in the unit pump until it seats, about 4 mm (0.16 inch). If it won't seat easily, rotate the crankshaft until the unit pump seats.

NOTE:

Use the bolt mounting holes on the engine as a guide for positioning the injector pump.

4. Install the mounting bolts, and tighten to 65 N·m (48 lb·ft).
5. Connect the engine wiring harness to the injector unit pump.
6. Remove the engine cranking tool and replace the inspection cover on the flywheel housing. Tighten the inspection cover mounting bolts to 25 N·m (18 lb·ft).

**WARNING:****PERSONAL INJURY**

To avoid injury from the sudden release of a high-pressure hose connection, wear a face shield or goggles.

7. Connect the fuel line at the fuel gallery inlet. Tighten the fitting to 50 N·m (37 lb·ft).
8. Install the fuel lines and pressure limiting valve on the fuel gallery outlet. Tighten all fasteners to 50 N·m (37 lb·ft).
 - [a] Install the inner banjo fitting, and two new seal rings, on the pressure limiting valve, as marked on removal.
 - [b] Install the threaded end of the pressure limiting valve in the fuel gallery outlet. When the valve is firmly seated, tighten it to 50 N·m (37 lb·ft).
 - [c] Install the outer banjo fitting, again with two new seal rings, on the banjo bolt, as marked on removal.
 - [d] Install the banjo bolt on the pressure limiting valve and tighten to 40-50 N·m (30-37 lb·ft).
9. Install the fuel filter cap. Inspect the O-ring in the fuel filter and replace it if worn. Tighten the cap nut to 25 N·m (18 lb·ft).
10. Install the high-pressure fuel injector line. Refer to section 2.3.2.

**WARNING:****PERSONAL INJURY**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

- Always start and operate an engine in a well ventilated area.**
- If operating an engine in an enclosed area, vent the exhaust to the outside.**
- Do not modify or tamper with the exhaust system or emission control system.**

11. Start the engine and check for leaks. Tighten connections as needed.
12. Install the engine trim cover.

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