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Instruction Sheet HIGH PRESSURE OIL PUMP International T444E / Ford 7.3L 1994-2003

O-ring reference:

- O-Ring #1 O-ring for inside the HPOP hose fitting – Located in #8-029 packages
- O-Ring #2 O-ring for seal of HPOP hose fitting – Located in #8-029 packages
- O-Ring #3 O-ring for plug on rear of HPOP body – Located in packet HPOP #2
- O-Ring #4 O-ring for the Black Bypass valve(top front of the pump –Do not remove ANY internal parts) – Located in packet HPOP #2
- O-Ring #5 O-ring for the IPR sensor on rear of HPOP – Located in the packet #14-008
- O-Ring #6 O-ring for Pressure Port plug – Located in packet HPOP #3
- O-Ring #7 O-ring for HPOP reservoir fill plug – Located in packet HPOP #3

⚠ WARNING: To avoid serious personal injury, possible death, or damage to the engine or vehicle, read all safety instructions in the foreword of the corresponding model year service manual.

Identifying Parts

This high-pressure oil pump kit contains the following parts:

- Loctite® 680 Retaining Compound
- 3 o-ring seals for End Plug and Discharge fittings
- 2 o-rings seals for inside of the Discharge fittings
- 2 nylon spacers for the inside of the Discharge fittings
- 2 latch rings for the inside of the Discharge fittings.
- 1 o-ring seal for IPR to pump housing plug
- 1 o-ring for the HPOP reservoir plug

Description



Fig 1 End Plug and Discharge Fittings

1. End plug fitting

1. Prepare to collect engine oil from the back of the high pressure oil pump in the valley area of the engine.
2. Remove end plug from port and discard o-ring

NOTE: Oil will continue to flow out of the port. Use a rag or suitable container to collect the oil.

3. Remove both high pressure oil hoses from the pump. Using special tool, [#8-6595](#) quick release tool available from DieselOrings.com (see end of instructions on how to disconnect the quick release fittings).
4. Remove both discharge fittings from the pump.
5. Remove spring and check assemblies with needle nose pliers.
6. Remove fill plug from top of reservoir tank.

Cleaning

1. **Clean both fittings and end plug ports with a commercially available brake cleaning product.**

NOTE: Important! Be sure both ports in the pump housing are clean and dry.

Installation

- ⚠ CAUTION:** Before installing springs into both ports, make sure that the flat poppet end of the spring goes into the pump housing first. If this is not done it will cause damage to the pump.

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2. Discharge fittings (2)

The figure above shows (1) end plug and (2) discharge fittings with the first three threads with Loctite® 680 Retaining Compound.

NOTE: This kit is intended for on vehicle repair with the exception of the “non-serviceable” plug. It contains 7 o-rings and a capsule of Loctite® 680 to be added to only the first three threads.

Removal

- ⚠ WARNING:** To avoid serious personal injury, possible death, or damage to the engine or vehicle, make sure the transmission is in neutral, parking brake is set, and wheels are blocked before doing diagnostic or service procedures on engine or vehicle.

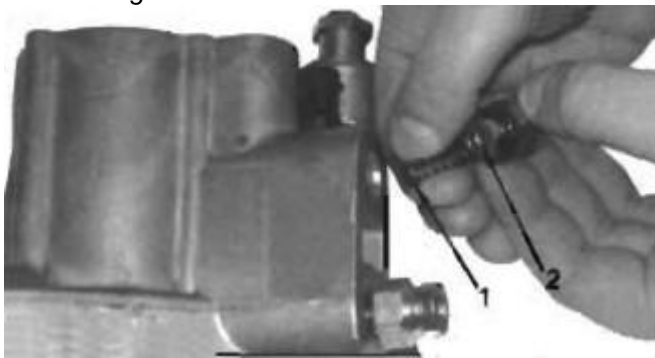


Fig 3 Installing spring and discharge fitting

1. Poppet end
2. Recess seat in fitting

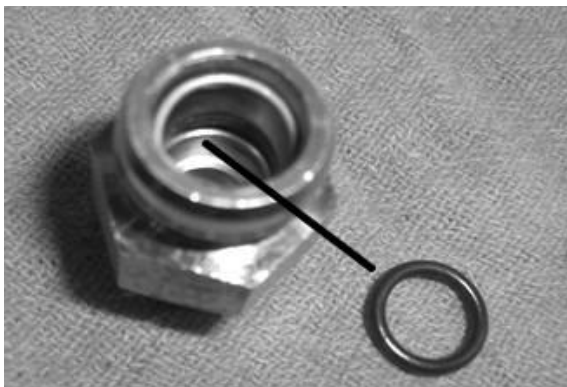


Fig 4 Internal o-ring on Discharge fitting

To rebuild the hose fittings, refer to the instructions on the next page.

Rear Plug repair:

NOTE: Make sure that all oil film has been removed

Rev 91719



Fig 2 Spring poppet orientation

IPR O-ring

This kit includes a new o-ring to re-seal the IPR valve to the HPOP.

1. Remove the old o-ring from the IPR threads and install the new o-rings.
2. Torque the IPR to the HPOP to 35 lb-ft and the IPR tin nut to 53 lb-in.

“Non-serviceable” Plug repair (optional)

- ⚠ WARNING:** The HPOP must be removed from the truck to perform this service as there is a small plastic ball behind the plug that will reposition itself or fall out if not performed properly.

If your “non-serviceable” plug is leaking, see our “Serviceable” plug kit [#8-007](#) instruction sheet for our “long threaded” plug. The instruction sheet available for download in PDF format includes instructions on how to remove the HPOP from the engine so it can be properly serviced on the bench. The kit contains a new “long threaded” serviceable plug, o-ring and packet of Loctite 680 Retaining Compound.





from the port prior to installation of the plug.

1. Install end plug and torque to 34 N-m (25 lb-ft).
2. Install new o-ring of reservoir plug and install.
3. Recommended cure time for the Loctite® 680 retaining compound is a **minimum of two to three hours** before starting the engine.
4. After allowing the Loctite to cure, start engine and check for oil leaks.
5. Check and correct the engine oil and reservoir levels as necessary. Reservoir level should be within ¾ inch from the top.

DieselOrings.com Kit #8-007 “Long Threaded” plug

The major cause that the HPOP “non-serviceable” plug begins to leak is due to an engineering defect that allows the short threaded plug to tear the soft aluminum threads from the HPOP body. The “long threaded plug” allows 85% more holding power in the HPOP threaded port.

1999-2003 Ford 7.3L Diesel HP Oil Hose fitting repair

(DieselOrings.com Kit # 8-028 and 8-029) DieselOrings offers two different kits to repair the quick-release hose fittings. One is for the fittings that attach to the High Pressure Oil Pump, the other for the fitting at the cylinder head. The thread sizes of the two fittings are different but the procedure to repair them are the same. The HPOP fitting requires the application on LocTite 680 to seal this fitting where the cylinder head does not require the LocTite.

Parts Included:

8-029 (HPOP):

- 1 – exterior thread O-ring
- 1 – Interior fitting O-ring
- 1 – Interior backup spacer
- 1 – Interior snap locking ring
- 1 - .5ml packet of LocTite 680

8-028 (Cylinder Head):

- 1 – exterior thread O-ring
- 1 – Interior fitting O-ring
- 1 – Interior backup spacer
- 1 – Interior snap locking ring

Before beginning the job, make sure that you have the proper kit and it contains all the necessary parts.



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Section I – Oil System Preparation

NOTE – If you are working on the Cylinder Head fittings, you can skip this section.



1. Prepare to collect engine oil from the back of the high pressure oil pump in the valley area of the engine by placing numerous towels in the valley.
2. Remove the reservoir fill plug from the top of the HPOP reservoir using a 5/16" Allen wrench.
3. With a vacuum pump and a thin vacuum tube, evacuate as much oil as you can from the HPOP reservoir.
4. Remove the tin nut and spacer from the IPR located on the back of the HPOP. Disconnect the electrical connector from the IPR coil and slip the coil off the IPR.
5. Slip a deep socket, 1 1/8" socket over the IPR. The rear threads of the IPR will protrude into the ratchet hole in the back of the socket but you should be able to have enough room to get the ratchet to grab the socket and break the IPR loose. The IPR has straight cut threads so once loose, you will be able to remove it with your hand.

NOTE: Oil will continue to flow out of the IPR port. Use a rag or suitable container to collect the oil. Allow all of the oil to drain from the High Pressure Oil Pump.

6. Remove both high pressure oil hoses from the pump. Using special tool, **#8-6595** quick release tool available from DieselOrings.com (see end of instructions on how to disconnect the quick release fittings).
7. Remove both discharge fittings from the pump. Be careful not to lose the spring and check assemblies that fit into the threaded end of the fittings. If the springs remain in the pump, remove them with needle nose pliers and set them aside for now.
8. Using a can of de-chlorinated break clean, clean the threads in the HPOP so they are oil-film free. **Oil residue left on the threads will not allow the Loctite 680 to adhere to the metal threads and will result in a short-term leak repair.**

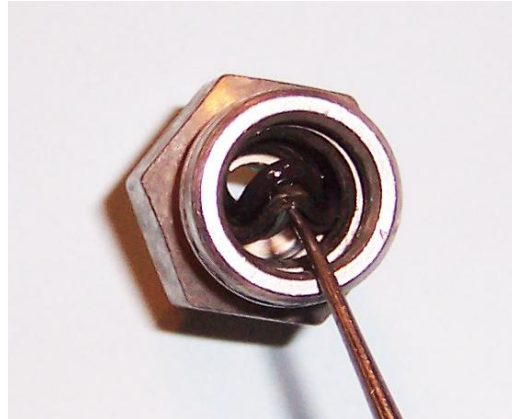
Section II – Fitting preparation and rebuild

1. Using your can of brake clean, clean the exterior thread and interior parts of the fitting.
2. With a Pick Tool, remove the top metal snap ring. The easiest way to do this is to attempt to pry one end of the ring that is close to the split. Once you remove one end, the remaining part of the ring will easily come out.



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3. With a Pick Tool, grab the O-ring and spacer that is about half-way down inside the fitting. Pull these parts out of the fitting and dispose.



4. Remove the old O-ring from the exterior threads and clean the fitting once again with brake clean to remove any oil trapped below the O-rings and spacer.

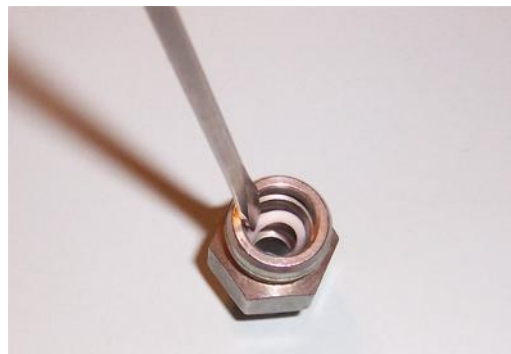
5. You should have 3 parts removed from the fitting at this time. The white spacer, O-ring and metal spring locking ring. Make sure you throw these parts away as so not to mix them with the new parts.



5. Begin installing the internal part using the new white O-ring spacer. Put the spacer in the fitting simply by shoving it into the opening vertical to the fitting. You will finish the installation of this spacer with a small flat-tipped screwdriver and pick tool.



6. Using a small flat-tipped screwdriver, push the bottom of the spacer all the way to the bottom of the fitting. Do not push too hard and damage this spacer.



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7. With the screwdriver, fold the outer most part of the spacer into the interior seating groove. At this point, the bottom of the spacer should be touching the bottom interior part of the fitting and the upper part should be in the interior seating groove.



8. With a curved, **dull** pick tool as to not damage the spacer, begin dragging the lower part of the spacer up, working one side that is out of the seating groove and then the other. Don't try to pull it up all at once, just a little on one side, then the other until it fully pops into its seat.



This procedure will most likely deform this spacer but do not worry about that. We will help it relax and straighten out after we get the O-ring into the fittings.

9. Install the O-ring in the same manner as we installed the spacer. Keep in mind that the O-ring needs to be seated **BELOW** the white spacer.

Push the O-ring to the bottom of the fitting with the flat-tipped screwdriver.



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10. With the screwdriver or pick tool, push the upper most part of the O-ring into its seating groove **BELOW** the white spacer ring.



11. With a curved, **dull** pick tool as to not damage the O-ring, begin dragging the lower part of the O-ring up, working one side that is out of the seating groove and then the other. Don't try to pull it up all at once, just a little on one side, then the other until it fully pops into its seat below the white spacer.



12. If the white spacer ring is deformed, Use the smooth end of your pick tool or use the side of a drift punch to smooth out the spacer and o-ring by using a circular motion with the tool inside of the fitting. The spacer will relax over time and take it's natural shape.



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13. Install the new Stainless Steel split locking ring. The easiest way to do this is to set the ring over the top of the fitting and place your thumb over the edge of the ring on the opposite side of the split. This will keep the ring from coming out of the fitting when you push one side of the ring at the split into its seat at the top of the fitting. Once one side pops in, work the remainder of the ring into the fitting using the small screwdriver.



14. When finished, your fitting should look like this one. Starting at the bottom of the fitting, the parts should be in the order of:

1. O-ring
2. White spacer ring
3. SS Locking split ring



Section III – Installation

1. Install the exterior thread O-ring on the fitting by “rolling” it over the threads. Do not attempt to “pull” the O-ring up to the base seating area.

HPOP FITTING INSTALLATION:

1. Clean both the HPOP threads and fitting threads with brake clean to remove all oil film from these parts.
2. Apply Loctite 680 Retaining Compound to only the first three threads of the discharge hose fitting.
3. Install the fitting into the pump housing and torque to 32 N-m (25 lb-ft)
4. Install the Quick Release hose on the fitting.
5. Allow the Loctite to cure for 3 to 4 hours before refilling the reservoir for a long term repair.

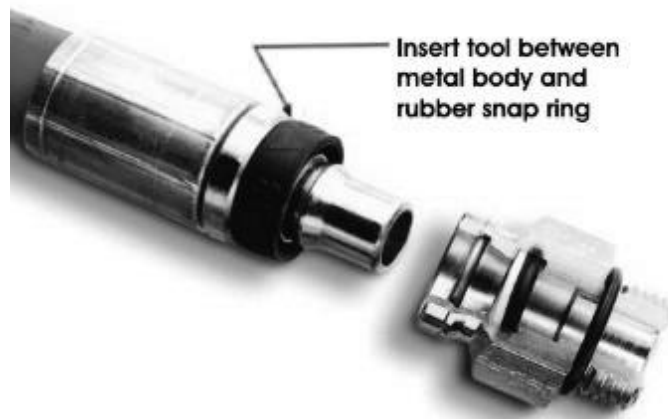
CAUTION: Before installing springs into both ports, make sure that the flat poppet end of the spring goes into the pump housing first. If this is not done it will cause damage to the pump.



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CYLINDER HEAD FITTING INSTALLATION:

1. The cylinder head fittings do not require use of the Loctite 680 since the rate of expansion of the metals of the fitting and head are similar and will not cause the fitting to leak like the aluminum HPOP does.
2. Install the fitting into the cylinder head and torque to 26 N-m (19 lb-ft)
3. Install the Quick Release hose on the fitting.



To release the line from the fitting:

While firmly pushing the line straight into the fitting with one hand, insert the tool behind the black release sleeve and gently pull on the line.

To connect the line to the fitting:

Push the line into the fitting until you hear/feel the snap ring “grab” the line.

Insure connection by pulling on the line. Note that some of the newer STC fittings have a small orange “indicator” o-ring on the outside of the fitting towards the opening. Once the weather boot of the hose covers up this indicator o-ring, the hose has been inserted into the fitting properly.

Note: Whenever the high pressure system is opened, air enters the system and the Vehicle needs to be driven to remove the air. It can take as much as 50 miles of hard driving to remove most of the trapped air in the system.



Internal Safety Bypass Nut O-ring

This O-ring seals the large black nut on the front of the pump to the bypass valve's body. It is recommended that the pump is placed in a vise with soft jaws so it does not move while replacing this o-ring. Simply remove the black cap nut,



remove the old o-ring and replace it with the new o-ring that is included in the kit. Tighten with just about 10 lb-ft of torque as the o-ring will seal the low pressure side of the valve easily.

There are parts under this black nut that can be dislodged that will cause a no start condition. The internal safety bypass pressure is factory set with a set of thin metal shims located in the top of the black nut. Do not loose these shims or the pressure of the pump will be compromised.

The most critical part of the safety bypass is the small check ball set located at the very bottom of the valve's body. Looking into the bypass cavity with all the parts removed, there is a small hole dead center of this cavity at the bottom. This is where the metal check ball has to be placed. It can easily roll off to one side or the other when moving the pump during repair if the top nut has been taken off and there is no spring pressure on the ball.



If you have mistakenly removed these parts I have laid out the sequence of the parts and how they are assembled in the safety bypass valve from the bottom up:

1. Steel valve ball seat
2. Triangular ball positioning piece with the spring positioning tab.
3. Spring
4. Multiple shims located inside the cap
5. Internal pressure relief cap O-ring
6. Internal pressure relief cap



Reservoir fill plug o-ring.

After all repairs have been completed, the truck has been started and the oil system has been checked for leaks this is when the o-ring for the fill plug should be replaced. Do not over tighten as with time it can become difficult to remove the plug and you may strip out the Allen head of the fill plug.

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