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IH: Oiling & Lubrication - Sub-03H

77-85 Oil Pump Assembly

Build Kits / Parts

No build kit was ever assembled / sold from the factory according to the parts catalogs. So individual pieces were sold.
You can search individual part numbers on the net for seals and gaskets.
Or you can search for aftermarket parts / kits. MAKE SURE THE SEALS MATCH YOUR PUMP when using aftermarket parts. Current “kits” tend to have “current parts” in the them.
The “current” oil pump is the L83-85 pump (sold for 77-85 when the 77-E83 pump was discontinued).
If you have the older style pump, the L83-85 seal between the plates won't work on the earlier plate as it is pressed into it's matching plate.

Or James Gaskets makes a seal kit (JGI-77-XL).

- It appears to come with:
  - Pump to case gasket
  - Pump cover O-ring
  - (2) separator plate seals (77-E83 and L83-85)
  - Both check valve O-rings
  - Retainer ring
  - Pump housing pin

Outer Plates and Shaft Seals

Either of the 2 outer plates for 1977-1990 XL oil pumps will work for all 1977-1990 oil pumps as long as you use the correct seal that matches the plate.
NOTE: **Using the 83-90 metal cased rubber seal in the 77-82 outer plate can lock up the oil pump**.
Be sure to install the correct seal for the plate you are using.
If buying an aftermarket pump kit, you may have both shaft seals in the package. Only use the correct one for the plate you are using.

[1)]

Below are pics of the correct parts and part numbers.

The damage below was caused by using the wrong seal (83-90 seal with the metal shell) in the 77-82 outer plate with the counterbored seal hole. The plates (when installed) are very close together and the 83-90 seal doesn't sink down flush to the plate. This puts added resistance to the pump turning and as seen below, the seal will grind away at the counterbore and/or lock up the pump.

Pics by Billy1200 of the XLForum [2)]

Using the 1977-1982 outer separator plate (26493-75)

The seal (12036) for use with this plate is constructed of rubber and it simply slides down the driveshaft during installation resting against the inner plate. It also covers the retainer ring. The seal does not fit tight into the counterbore of the outer plate. The outer plate, once installed, simply sandwiches the seal between both plates with the outer plate's counterbore cupping the seal in the process.

Consider upgrading to the 82-90 outer plate AND it's corresponding seal. The plate is the same width and the seal is better.

Using the 1983-1990 plate (26493-75A)

The metal cased seal (12036A) for use with this plate is constructed of a rubber inner piece bonded to a steel outside metal casing.

Installation:
It is pressed into the outer plate hole (which has no counterbore) from the return side of the plate with the casing facing the return gerotors.
The seal isn't actually a press fit but more of an interferance fit so it doesn't take a lot of pressure to install it in the plate.
It has to go in either flush to the plate or sunk down below the plate a little so the inner plate or gerotors don't touch it.
If the seal sticks out of the plate, it could possibly lock up the pump.

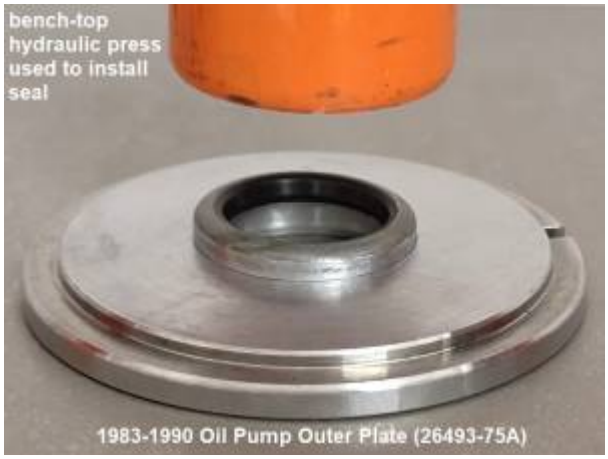
- Known Methods for Installation:
  - You can use a socket big enough to fit over the seal but small enough to fit thru the hole in the plate.
    Then gently tap the seal in straight with a hammer. Tap different sides of the socket to keep the seal going in straight if needed.
  - You can set the plate/seal/socket in a bench vice and pull the seal in straight.
  - You can use a shop press with the plate/seal/socket to pull the seal in.

Below, return side of plate up, seal's metal casing up and pressed in the plate bore. [3)]

Using a hydraulic press:
This method was submitted by XLForum member, Fizzle, as an upgrade to his 1977 oil pump.
His goal was to glue the seal squarely in place using a retaining compound so it could not come loose, stick out of the plate and jam up the pump.

I removed the protective blue paint from the seal with 91% iso alcohol, then scuffed the OD of the seal and the ID of the plate with 600 grit wet/dry sandpaper. I then thoroughly cleaned the two parts with 91% iso alcohol and applied a liberal amount of anaerobic retaining compound to each. I chose to use Eskonke brand from Amazon because it's way cheaper than Loctite, I could get it next day, and Eskonke provides a very useful application chart for their products.

I have a bench-top hydraulic press, so I positioned the seal in the hole and set the parts on a steel plate, covered them with a second plate (not shown), and pressed the seal in flush with the top of the outer plate. I found that the OD of a 5/16“ flange nut fits nicely on the seal and within the hole of the outer plate. I used that to press the seal a bit deeper into the hole so it would be recessed on both sides of the plate. I could only guess on how much more to press it and got lucky, ending up with 030” on one side and .040“ on the other. If I do this again for another pump, I could place something at the bottom of the hole to limit how deep I press the seal.
All done! It takes 24 hours to fully cure.



Installing the Oil Pump

Prior to installing the pump

It is assumed that before installing the oil pump, it has been opened up, inspected, measured for wear, lubed and reassembled.
This is normal maintenance for a gerotor type oil pump and should be done from time to time especially if you have no personal history with the oil pump.
If you just bought the bike or oil pump, never assume this has already been done by the P.O. or whoever you bought it from.
If the pump has been in service for “years without problems”, it's still a very good idea to pull the pump apart for inspection when you can.

- **Make sure the internals match the pump housing and cover before installing a gerotor oil pump on an Ironhead**.
  - There were basically 2 different style oil pumps from 1977 to 1985; (1977-E1983 style and L1983-1985 style).
    There were many part number changes for pump assemblies which mainly amounted to hose fitting changes although there were housing changes also.

But a big no-no is mixing internals of the two different styles of pumps without the knowledge of what the factory changes were.
    - The part numbers are not cast or stamped into the oil pump or it's internals so you cannot match parts catalog numbers to a used oil pump.
    - Rule of thumb (from the MoCo) on mixing gerotor oil pump internals:
    Any 1977-1985 oil pump can be mated to 1977-1985 cases as a unit. Mixing internal parts gets a little tricky though.
    77-E83 gerotors can be used in L83-up pumps. L83-up gerotors can only be used in L83-up style pumps.
    Click Here to read more specific information on the L83 oil pump changes.
    There are also pics of the chamfered and non chamfered gerotors on that page if you scroll the page.
- **Make sure the gearshaft seal is the correct one for the outer plate**.
    - There were 2 different outer separator plates (next to the feed gerotors) used from 77-85 with different IDs.
    Each has it's own type gearshaft seal that must be used with it.
    Each plate will fit any 77-85 oil pump as a set with it's specific seal (can't mix and match gearshaft seals).
- **Make sure the spring washer is installed in the correct orientation**.
    - If the spring is installed upside down, the fingers won't fit right inside the cupped area of the inner plate.
    That could affect spring tension and even pressure on the gerotors resulting in non-horizontal wear on the aluminum mating surfaces.
- **Make sure the outer separator plate is seated properly before installing the cover screws**.
    - One problem with assembling an IH gerotor pump is the roll pin in the oil pump housing.
    The lower (outer) spacer plate has a slot cut into it that goes around that pin in the housing. [4)]
    The uncompressed spring pushes this connection outward and with a loose cover, the outer plate will spin over the top of the pin.
    If the plate rides on the end of the pin when the cover is installed then tightened down, this will lock the pump to the point of damage with the motor running.
    Best to assemble the pump with duct tape until you get it mounted to keep the spacer from moving.
    Else the pump can lock up once the bolts are in due to the washer not being sunk into the housing properly.
    - What happens when the outer plate gets out of alignment (or turned even slightly) is the cover presses the plate onto the roll pin in the housing.
    Consequently, one side of the feed gerotors are pressed into the assembly more than the other side.
    Serious damage to the outer plate and possible seized gerotors is certain with this scenario and that damage will flow right to your crank. [5)]
    The gerotors depend on two main horizontal plains each. Each rotate on:
    A flat metal surface (plate) that is pressed against them by the spring washer and the flat aluminum surface in the body or the cover.
    With all things equal, the metal plate can wear down the thickness of the adjacent gerotors.
    And the gerotors can wear the aluminum mating surface as well.

Gearshaft resistance

Once the oil pump is installed and tightened up, the gears will be hard to turn by hand.
This is normal and because of the spring washer between the upper and lower separator plates.
The resistance felt at the driveshaft gear is only generated from pressure against the feed gerotors. [6)]
In fact, with the pump removed from the engine, assembled with all internals (a couple nuts and bolts to clamp the cover to the housing);
1977-1990 oil pumps have to be turned with 2 fingers… and some guff. It will be difficult (but doable) to turn.
1991-up oil pumps have no spring washer, only one separator plate and can be spun using 1 finger to roll the gearshaft around.
If you were to remove the spring between the plates on 77-90 pumps, the gearshaft would be easily turned with one finger.
But you can't run 77-90 oil pumps without the spring between the plates.
The pump housing and cover on these are both designed / machined to include that spring washer.

It is solely the spring that makes the resistance on 77-90 pumps.
The pump housing has two separate bores for feed and return gerotors with the return set being smaller in diameter.
With the return side on top, the divide between the two housing bores creates a “shelf” where the small bore stops and the larger feed side bore begins.
The inner separator plate sits against that “shelf” between the bores, then the spring washer and outer separator plate go on.
With this design, the return gerotors are shielded from spring pressure since they are above that divide between the bores.
During operation, the inner plate is nestled against the “shelf” (not touching the return gerotors).
The feed gerotors are placed into and protrude out from the cover and they end up taking the pressure from the spring washer.
The feed gerotors butt into the outer separator plate, pushing and compressing the spring washer against the inner separator plate / bore divide in the housing.

Smoke Testing the Oil Supply

This is not required but doesn't sound like a bad idea to test the oil pump and supply feed passages on a new engine or pump build.
It has more advantages for 57-76 motors since you have to pull the engine to replace the oil pump if something is wrong.
But it also isn't a bad idea for 77-up engines. As the article says, cheap insurance.
Plus it'll let you know if your feed and return lines are crossed before it's too late to do anything about it.

This is a excerpt of an article from Ironheacycle.com [7)]

> I hook up the oil pump supply line and fill it with engine oil, sometimes a funnel stuck in the end of a hose is all you need, in this case I hooked it right up to the oil tank. Then I grab the rods and spin the

> motor over until oil wells up in the holes that go to the rocker boxes. This makes sure that the pump is working and that all the oil passages are free and clear. Sometimes it is hard to make a new motor start pumping oil, in those cases I put an air hose on the oil tank and pressurize the tank with maybe three or four PSI out of my air hose to force oil into the supply line. I had to do that on this motor. It is not unusual. After oil wells up into those rocker box supply holes, I plug them. I usually just stick an old ball bearing in the fitting for the rocker supply line. Then keep spinning the motor, after just a little bit you should see oil coming out from around the connecting rods. If you don't you've got a problem. And as bad as it is to find that out now, it is a lot better to fine out now than after you've fired and fried the engine. All the oil you see around these rods is oil that got there by me spinning the engine over just by grabbing the ends of the connecting rods. I also dumped a little oil into the cam chest through the lifter block holes, after just a little spinning oil started being pumped out of the return to the tank fitting, so now I know the scavenge side of the pump is also working. I do this procedure on every engine I have the heads and barrels off on. It is cheap insurance to avoid costly problems down the road.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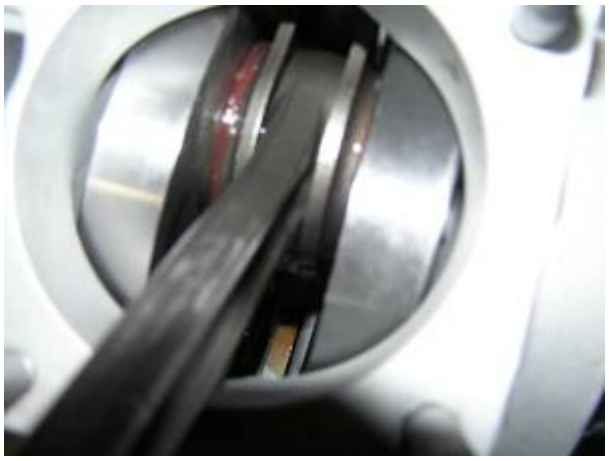
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photo by Fizzle of the XLFORUM

2)

https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-s

pecific/ironhead-sportster-motorcycle-talk-1957-1985/4960020-1980-oil-pump-outer-plate-oil-seal-q#post4960352
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https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/frame-mount-evo-sportster-talk-1986-2003-models/170489-oil-seal-in-plate#post3632330
4)

Hippysmack of the XLFORUM
https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/198728-oil-pump-gear-turning-resistance/page2#post4368150
5)

DirtyCory of the XLFORUM
https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/194881-let-s-study-the-77-85-oil-pump-parts-and-changes-and-when/page5#post4243482
6)

Hippysmack of the XLFORUM
https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/194881-let-s-study-the-77-85-oil-pump-parts-and-changes-and-when/page12?t=2071153&page=12
7)

https://ironheadcycle.com/pages/howto5.html
8), 9), 10)

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https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/58696-77-sportster-build/page5?t=315908&page=5