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# IH: Oiling & Lubrication - Sub-01D

# Addressing Low Oil Pressure

The oil pressure light can fluctuate on and off for many reasons.
It doesn't necessarily mean you have low oil pressure (or flow) to the engine.
However, it does warrant immediate concern and diagnosis.
In fact, at idle, the oil pump check valve is barely opened past it's cracking pressure. Low revs at idle can cause the oil light to flicker off and on.
A flickering light could be a loose or grounding switch wire, bad switch, oil too thin (viscosity breakdown), clearances in the oil pump worn and others.
Don't assume the light or switch is bad. The job of the oil light and switch is to alert you of an oiling problem before it becomes a bigger problem.

**First, check for oil return in the tank**.
General rule of thumb is, if you have oil returning from the motor, then you also have oil feeding the motor.
But don't just take that for granted either.
With the motor running, remove the oil cap and look inside the tank for oil movement as coming from the return line.
If you're sure oil is not returning to the oil tank, immediately shut off the engine and diagnose why.
Don't automatically assume it's a bad pump. There are many things that can cause this. Hoses and connections could need attention instead.

**Check hoses and connections**:

- Check the return hose for kinks / cracks / damage and make sure the hose is tight with no leaks at all connections.
  The inner lining of old or rotten hoses has also been known to collapse and block oil flow.
- Check the feed hose from the tank to the pump.
  Visually inspect it for kinks / cracks / damage and make sure the hose is tight with no leaks at all connections.
  A loose connection may not leak oil but may induce air into the feed line lowering oil flow into the pump from the tank.
- Verify the feed hose from the tank to pump will voluntarily flow oil out the lower end of the hose (pump inlet side).
  Remove the hose at the pump only.
  If no oil flows from gravity alone (and the tank has enough oil), verify the tank vent line is not pinched or stopped up.

- Verify that the oil tank vent is free and clear from blockage (allowing pressure to equalize in the tank).
  Pull the vent line at the engine or cam chest respectively of year model.
  Induce air into the line and check that the air is coming into the tank.
  If no air goes through the vent to the tank or if pin holes in the line are found, replace the vent line.
  Pin holes can both leak air out and leak air into the hose compounding crankcase pressure in the bottom end.

**Check for oil flow from the pump both return and feed**:

- Check for flow out the return fitting at the pump.
  Pull the return line from the engine / pump respectively.
  Place a spare hose on the return fitting and to a catch can. Then roll the engine over by hand and verify that oil will come out of the fitting.
  If no oil at all comes out, then pull the pump and check for internal damage / blockage.
  There probably won't be lot of flow, just verify the gears/gerotors are turning and moving oil.
- Check for flow out the feed fitting at the pump.
  Pull the oil switch from the pump.
  Place a spare hose on the pump fitting and to a catch can. Then roll the engine over by hand and verify that oil will come out of the fitting.
  If no oil at all comes out, then pull the pump and check for internal damage / blockage.
  There probably won't be lot of flow, just verify the gears/gerotors are turning and moving oil.

**Verify that the oil pressure light is functioning properly**:

- Check for a loose or faulty connection at the oil pressure switch.
  The wire connection at the oil pressure switch has to be tight so vibration won't cause intermittent signal loss to the oil light.
- Inspect the signal wire between the light and the pressure switch for kinks, cuts or faults.
  - Make sure it's not grounding out on nearby metal parts (especially melted PVC jackets under wire ties).
  - Run a continuity test on the entire length of wire with a multi-meter.
  - Repair or replace the wire as needed.
- Verify that the light is not faulty or burnt out.
  - Disconnect the wire at the oil pressure switch.
  - Run a jumper wire off the (+) side of the battery to the end of the oil light wire.
  - Verify it lights up and then bump the light by hand to verify vibration doesn't affect it.

**Verify that the oil pressure switch is working properly**:

The oil pressure switch is a spring loaded diaphragm.
With insufficient pressure pushing against the spring mechanism, the switch is normally grounded.
The switch grounds the circuit to the engine to make the light come on.
With adequate oil pressure against the spring, the circuit contact is broken which turns off the oil light.
See below for the functions and testing of the oil pressure switch.

**Check the oil pressure against the specs in the service manual**

- Click Here to view the page in the REF section on expected oil pressure for 1957-up Sportsters.

For Ironheads, testing at the rocker boxes will give you lower pressure on the gauge and cannot be used for overall oiling system health.
Be sure to check pressure at the oil pump, not the rocker boxes.

- The pressure reading is directly tied to the flow rate. More flow = more gauge pressure, Less flow = less gauge pressure.
- If you have 6 PSI on cold start at the heads, you have more than that at the oil pump.
- Click Here to view “Installing a Pressure Gauge” in the REF section of the Sportsterpedia.

**A faulty oil pump check ball / valve spring in the pump may not turn off the oil light**:

- On 1957-1976 models, verify correct oil check ball spring pressure (1957-1976):
  - If the check valve spring pressure is changed with a stiffer spring or if the spring has been stretched (extended),
    The oil pump may not make sufficient oil pressure to overcome the spring pressure at warm idle.
    The oil light may stay on until higher RPM raises oil pressure enough to overcome the spring pressure.
- On 1977-1985 models, the restricted orifice in the check valve in the pump creates back pressure to actuate the oil pressure switch.
  - If the check valve is stuck in the open position;
    - The oil still has to travel through the restricted orifice in the check which creates backpressure to actuate the pressure switch → oil light.
  - If the check valve was stuck in the closed position;
    - Pressure would still build up inside the oil pump and actuate the oil pressure switch and then the oil light.
      This would seem like everything is fine with the engine running and the light off.
      However, with the check closed, no oil would enter the engine.
    - To check for a stuck closed check valve, remove oil the pump and cover, push a small screwdriver or suitable metal rod into check valve opening.
      The valve should be closed and the rod should push back on the internal spring with ease.
      If it is stiff, remove the check from the pump body and then remove it's O-ring seal.
      Soak it in solvent while pushing in and working the valve open and closed until it is easy to move with the rod.
      If it won't spring back, replace the check valve.
  - See more about the operation of the check valve below.

**Check for other possible causes of low oil pressure**:

- If the tank is empty, obviously oil pressure will be low. Do not check oil level with a cold engine (operating temp only)
- The oil filter (if applicable) could be restricted or plugged up.
- There has been occasions where silicon (placed on the oil pump gasket during installation) had made it's way into orifices inside the engine.
  You can blow compressed air thru oil inlet and outlets in the engine.
  You can also blow out the oil lines.
- No oil to the top end (1957-1976):
  - Make sure the rubber grommets on each end of the stock rocker feed lines are not partially

plugging the ends of the rocker feed lines.
Then remove the allen-hex rocker spindle plug from the front exhaust rocker spindle, at the right-hand side of the rocker box.
Oil should come out there if you have flow with the engine running. [1)]

- You can loosen or remove the 1/8“ NPT pipe plug from the right side, front corner of each rocker cover.
  With the engine at idle, you should get a small amount of oil plopping out (not shooting out like a fire hose). [2)]
- You can also use the same 1/8” plug hole to install a barb and clear hose to visually inspect for oil flow.

 [3)]

- Check the pinion shaft to bushing clearance to the specs in the FSM.
  If the fit is overly loose, this condition will not allow oil to be transferred up the lines at low speed.
  Oil will just be bled out into the cam chest until RPM sends and over-runs more oil than can be spilled at the bushing.
  - If the fit is out of spec, you'll need to replace the bushing. [4)]
  - Then line ream it using a special reamer through an old right-hand crankcase half to use to guide to get it in square.
- On 76< motors, it's best to eliminate that possibility before spending time and money yanking the engine out of the frame and inspecting the oil pump.
  (and before spending money getting a new pinion bushing reamed with the special tooling etc.) [5)]

- The oil pump could be weak or malfunctioning.
- 76< pumps:
  - If the pump shaft seal is blown, then the scavenge pump will continue to function because the pump pressure is higher than scavenge pressure. [6)]
    So oil will flow from your pump down the shaft into the scavenge pump and goes back to the tank from there.
    It's possible the pump got some trash in it and got scarred and now just doesn't pump very well.
    It's a nasty job getting the thing off, made doubly nasty if you don't find anything wrong.
    If you have an oil flow problem from the pump, you can either rebuild it or put a new one on just to make sure that this is not the problem.
    If it isn't the pump, then start looking for leaks.

**Remove and inspect the oil pump**.
The oil pump supplies pressurized oil into a hole in the cam cover.
That pressurized oil is forced up the lines (between the cylinders) to the rocker box by the oil pump.
That is the vertical end of responsibility (pressure wise) for the oil pump.
Before the oil reaches the rocker lines, it splits off to a hole through the pinion shaft (to get to the rod bearings).
This is the horizontal end of responsibility (pressure wise) for the oil pump.

With this pressure comes a certain amount of oil flow from the oil pump.
With a weak oil pump, there will be less pressure forced up the oil lines.
This will result in less oil reaching the rockers.
But, not necessarily less oil reaching the rod bearings (depending on degree of pump pressure reduction).
How much oil loss to the rockers is acceptable is yet to be determined.
However, the MoCo had to have accounted for a certain amount of pressure loss from the pump during the engineering phase.
But, the service limit for oil pressure was not detailed in the FSM.

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1)
Hopper of the XLFORUM
https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/98031-suggestions-on-lack-of-oil-to-top-end?t=831522
2)
IronMick of the XLFORUM
https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/150025-losing-oil-pressure-when-warm/page3?t=1625333&page=3
3)
photo by chevelle of the XLFORUM
https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/150025-losing-oil-pressure-when-warm/page2?t=1625333&page=2
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6)
XLFREAK of the XLFORUM

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