



## Service Information System

[Previous Screen](#)

Welcome: joegross

◀ Product: TRUCK ENGINE  
Model: C15 TRUCK ENGINE BXS  
Configuration: C15 On-highway Engine BXS00001-UP

### Testing and Adjusting

#### C15 On-Highway Engines

Media Number -SEN9692-14

Publication Date -01/04/2015

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i02177806

## Engine Oil Pressure - Test

SMCS - 1304-081

### Measuring Engine Oil Pressure



**Work carefully around an engine that is running. Engine parts that are hot, or parts that are moving, can cause personal injury.**

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#### NOTICE

**Keep all parts clean from contaminants.**

**Contaminants may cause rapid wear and shortened component life.**

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#### 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.**

**Refer to Special Publication, NENG2500, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat products.**

**Dispose of all fluids according to local regulations and mandates.**

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Table 1

Required Tools		
Part Number	Part Name	Quantity
1U-5470	Engine Pressure Group	1

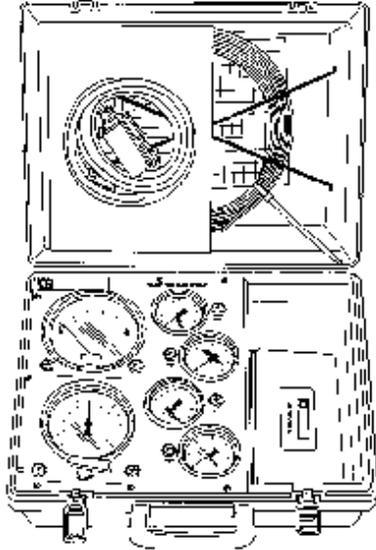


Illustration 1

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**1U-5470** Engine Pressure Group

The **1U-5470** Engine Pressure Group measures the oil pressure in the system. This engine tool group can read the oil pressure inside the oil manifold.

**Note:** Refer to Special Instruction, SEHS8907, "Using the **1U-5470** Engine Pressure Group" for more information on using the **1U-5470** Engine Pressure Group.

**Note:** The engine oil pressure can also be measured by using an electronic service tool. Refer to Troubleshooting for information on the use of the electronic technician.

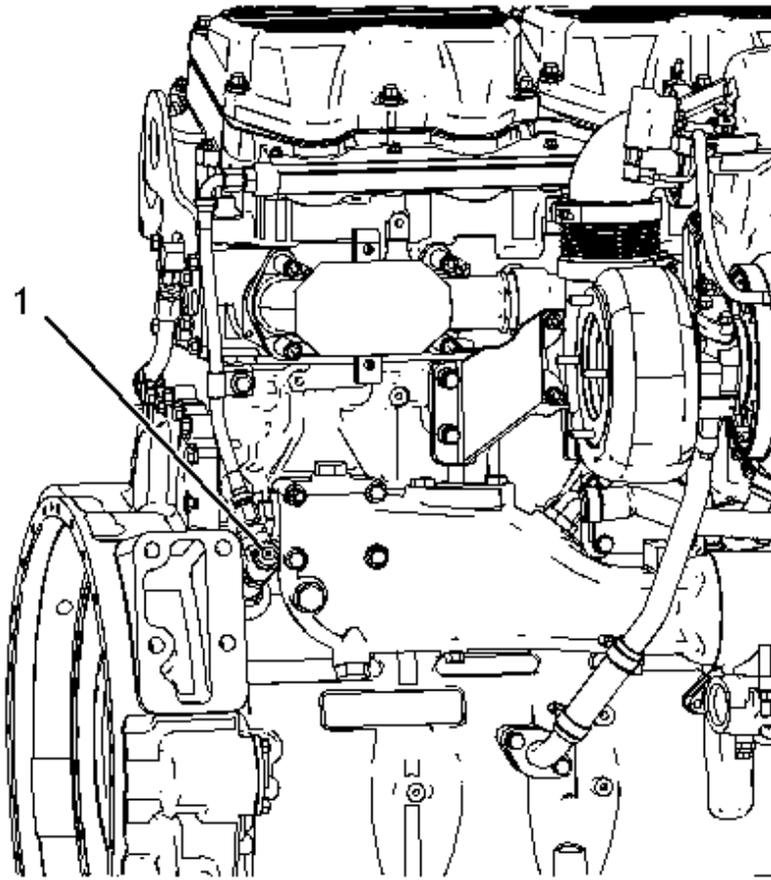


Illustration 2

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1. Install the **1U-5470** Engine Pressure Group into fitting (1).
2. Start the engine. Run the engine with SAE 10W30 or SAE 15W40 oil. The information in the engine oil pressure graph is invalid for other oil viscosities. Refer to Operation and Maintenance Manual, "Engine Oil" for the recommendations of engine oil.

**Note:** Allow the engine to reach operating temperature before you perform the pressure test.

**Note:** The engine oil temperature should not exceed 110 °C (230 °F).

3. Record the value of the engine oil pressure when the engine has reached operating temperature.
4. Locate the point that intersects the lines for the engine rpm and for the oil pressure on the engine oil pressure graph.

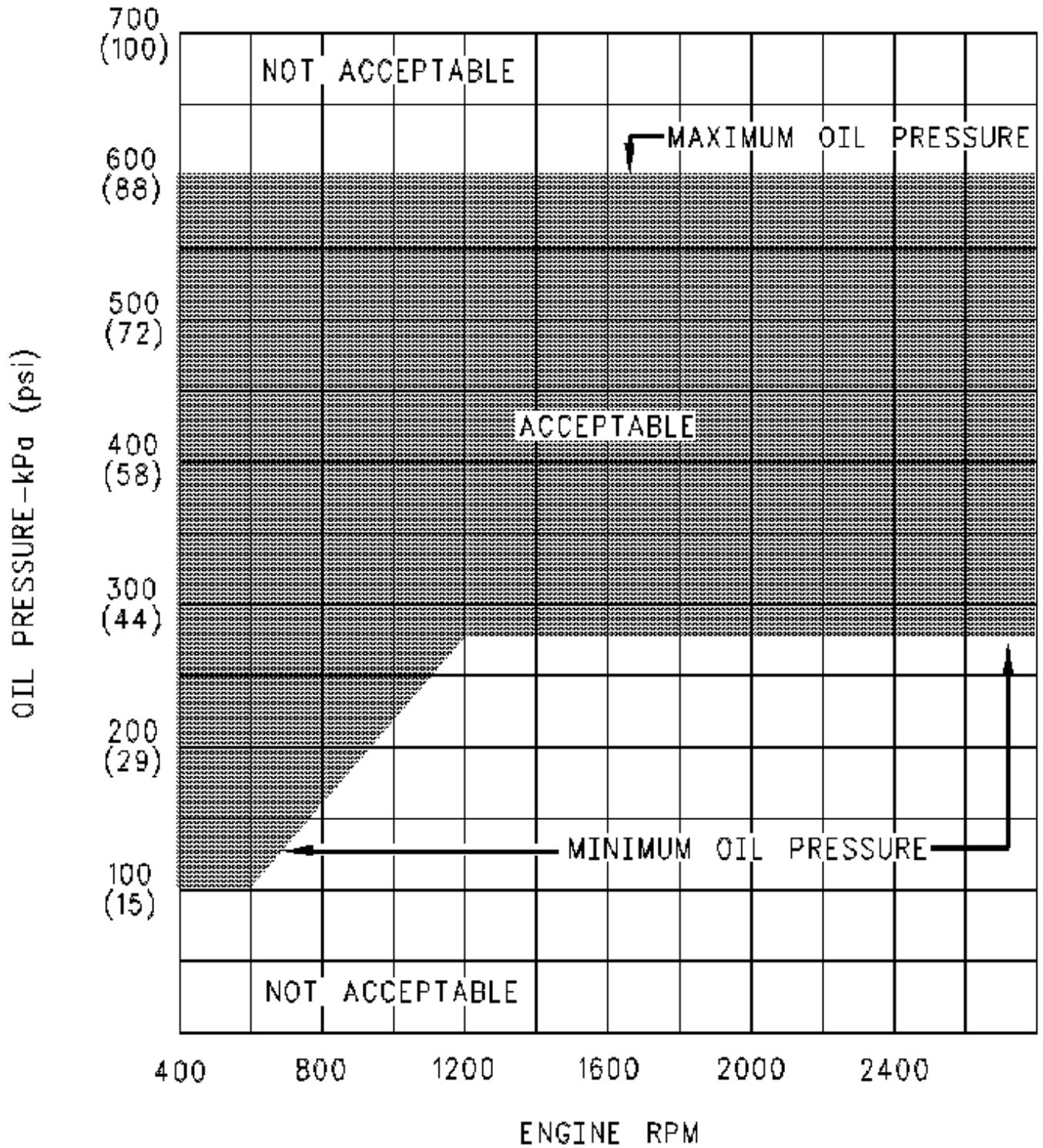


Illustration 3  
Engine oil pressure graph

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5. The results must fall within the "ACCEPTABLE" range on the chart. A problem exists when the results fall within the "NOT ACCEPTABLE" range on the chart. The problem needs to be corrected. Engine failure or a

reduction in engine life can be the result if engine operation is continued with oil manifold pressure outside this range.

**Note:** A record of engine oil pressure can be used as an indication of possible engine problems or damage. A possible problem could exist if the oil pressure suddenly increases or decreases 70 kPa (10 psi) and the oil pressure is in the "ACCEPTABLE" range. The engine should be inspected and the problem should be corrected.

6. Compare the recorded engine oil pressure with the oil pressure indicators on the instrument panel and the engine oil pressure that is displayed on Caterpillar Electronic Technician (ET).
7. An engine oil pressure indicator that has a defect or an engine oil pressure sensor that has a defect can give a false indication of a low oil pressure or a high oil pressure. If there is a notable difference between the engine oil pressure readings make necessary repairs.
8. If the engine oil pressure is low, refer to "Reasons for Low Engine Oil Pressure".
9. If the engine oil pressure is high, refer to "Reason for High Engine Oil Pressure".

## Reasons for Low Engine Oil Pressure

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- Engine oil level is low. Refer to Step 1.
- Engine oil is contaminated. Refer to Step 2.
- The engine oil bypass valves are open. Refer to Step 3.
- The engine lubrication system is open. Refer to Step 4.
- The oil suction tube has a leak or a restricted inlet screen. Refer to Step 5.
- The engine oil pump is faulty. Refer to Step 6.

- Engine Bearings have excessive clearance. Refer to Step 7.
1. Check the engine oil level in the crankcase. The oil level can possibly be too far below the oil pump supply tube. This will cause the oil pump not to have the ability to supply enough lubrication to the engine components. If the engine oil level is low add engine oil in order to obtain the correct engine oil level. Refer to Operation and Maintenance Manual, "Engine Oil" for the recommendations of engine oil.
  2. Engine oil that is contaminated with fuel or coolant will cause low engine oil pressure. High engine oil level in the crankcase can be an indication of contamination. Determine the reason for contamination of the engine oil and make the necessary repairs. Replace the engine oil with the approved grade of engine oil. Also replace the engine oil filter. Refer to Operation and Maintenance Manual, "Engine Oil" for the recommendations of engine oil.

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## NOTICE

**Caterpillar oil filters are built to Caterpillar specifications. Use of an oil filter not recommended by Caterpillar could result in severe engine damage to the engine bearings, crankshaft, etc., as a result of the larger waste particles from unfiltered oil entering the engine lubricating system. Only use oil filters recommended by Caterpillar.**

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3. If the engine oil bypass valves are held in the open position, a reduction in the oil pressure can be the result. This may be due to debris in the engine oil. If the engine oil bypass valves are stuck in the open position, remove each engine oil bypass valve and clean each bypass valve in order to correct this problem. You must also clean each bypass valve bore. Install new engine oil filters. For information on the repair of the engine oil bypass valves, refer to Disassembly and Assembly, "Engine Oil Filter Base - Disassemble".
4. An oil line or an oil passage that is open, broken, or disconnected will cause low engine oil pressure. An open lubrication system could be caused by a piston cooling jet that is missing or damaged.  
  
**Note:** The piston cooling jets direct engine oil toward the bottom of the piston in order to cool the piston. This also provides lubrication for the piston pin. Breakage, a restriction, or incorrect installation of the piston cooling jets will cause seizure of the piston.
5. The inlet screen of the oil suction tube for the engine oil pump can have a restriction. This restriction will cause cavitation and a loss of engine oil pressure. Check the inlet screen on the oil pickup tube and remove any material that may be restricting engine oil flow. Low engine oil pressure may also be the result of the oil pickup tube that is drawing in air. Check the joints of the oil pickup tube for cracks or a damaged O-ring seal. Remove the engine oil pan in order to gain access to the oil pickup tube and the oil screen. Refer to Disassembly and Assembly, "Engine Oil Pan - Remove and Install" for more information.
6. Check the following problems that may occur to the engine oil pump.
  - a. Air leakage in the supply side of the oil pump will also cause cavitation and loss of oil pressure. Check the supply side of the oil pump and make necessary repairs. For information on the repair of the engine oil pump, refer to Disassembly and Assembly, "Engine Oil Pump - Remove".
  - b. Oil pump gears that have too much wear will cause a reduction in oil pressure. Repair the engine oil pump. For information on the repair of the engine oil pump, refer to Disassembly and Assembly, "Engine Oil Pump - Remove".
7. Excessive clearance at engine bearings will cause low engine oil pressure. Check the engine components that have excessive bearing clearance and make the necessary repairs.

8. If the pressure at the oil feed to the oil rail is not much higher than the rest of the lubrication system during the operation of the variable valve actuators, the check valve in the oil feed is not functioning properly. Replace the check valve.

## Reason for High Engine Oil Pressure

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Engine oil pressure will be high if the engine oil bypass valves become stuck in the closed position and the engine oil flow is restricted. Foreign matter in the engine oil system could be the cause for the restriction of the oil flow and the movement of the engine oil bypass valves. If the engine oil bypass valves are stuck in the closed position, remove each bypass valve and clean each bypass valve in order to correct this problem. You must also clean each bypass valve bore. Install new engine oil filters. New engine oil filters will prevent more debris from causing this problem. For information on the repair of the engine oil filter bypass valve, refer to Disassembly and Assembly, "Engine Oil Filter Base - Disassemble".

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