

4. Lubrication System

Service Information	4-1	Oil Pump Removal/Installation	4-4
Troubleshooting	4-1	Oil Pump Disassembly/Assembly	4-5
Lubrication System Diagram	4-2	Oil Cooler Removal/Installation	4-6
Oil Pan Removal/Installation	4-3	Oil Cooler Disassembly/Assembly	4-7

Service Information

▲ WARNING

- If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death.
- Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil. **KEEP OUT OF REACH OF CHILDREN.**

- The service procedures in this section can be performed with the engine in the frame.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks and that oil pressure is correct.
- Always lubricate the oil pump components with clean engine oil when assembling the oil pump.

Troubleshooting

Oil Level Low

- Oil consumption
- External Oil Leak
- Worn piston ring or incorrect piston ring installation
- Worn valve guide or seal
- Oil pump worn or damaged
- Oil leaks in the cooling system

Low Or No Oil Pressure

- Clogged oil orifice
- Clogged oil passage
- Incorrect oil being used

No Oil Pressure

- Oil level too low
- Oil pump drive chain or drive sprocket broken
- Oil pump damaged (pump shaft)
- Internal oil leaks

Low Oil Pressure

- Pressure relief valve stuck open
- Clogged oil filter
- Oil pump worn or damaged
- Internal oil leaks
- Incorrect oil being used
- Oil level too low

High Oil Pressure

- Pressure relief valve stuck closed and oil filter plugged
- Plugged oil filter, gallery, or metering orifice
- Incorrect oil being used