

NOTES

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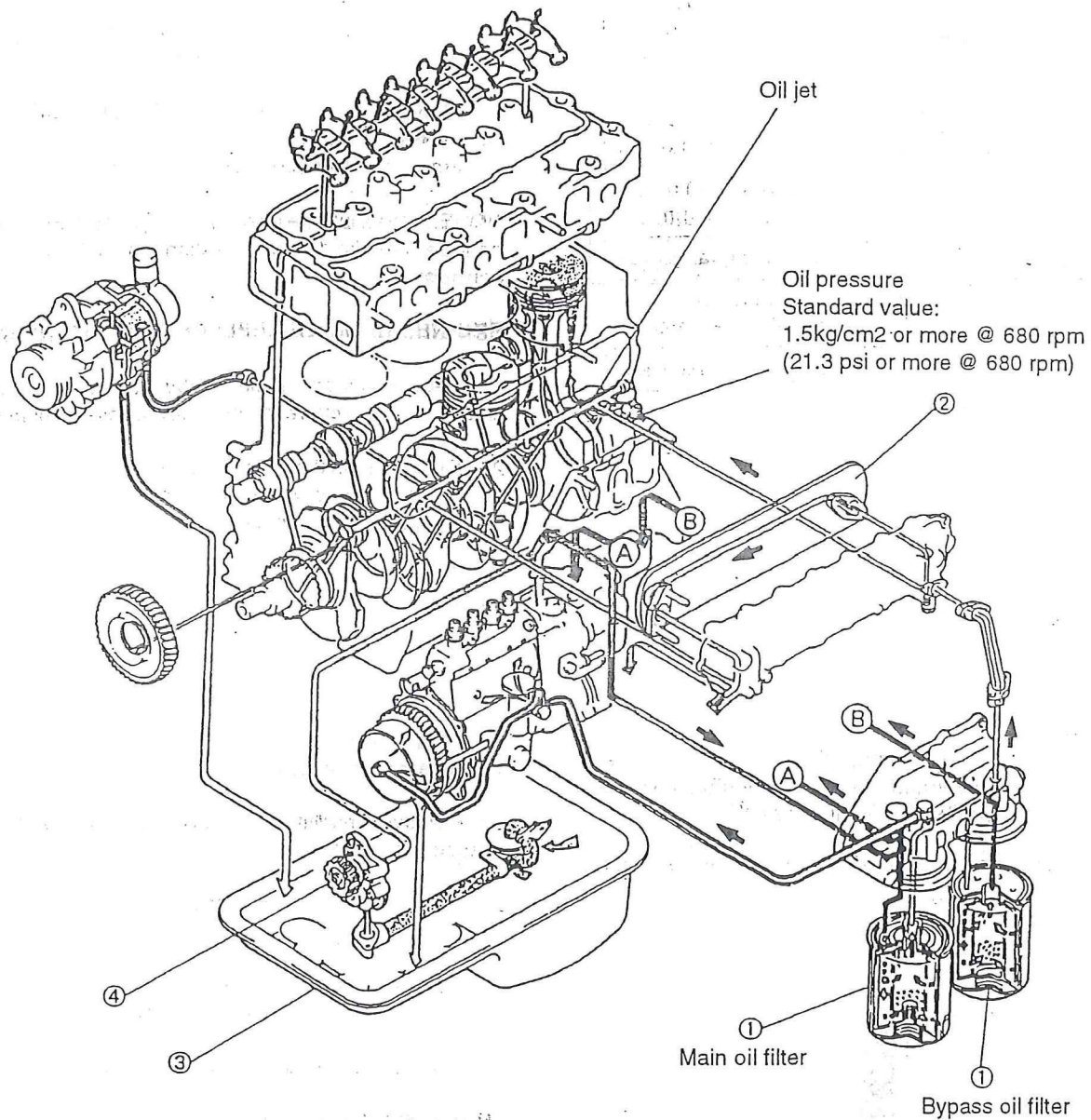
LUBRICATION SYSTEM

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LUBRICATION SYSTEM

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LUBRICATION SYSTEM DIAGRAM



1. Main oil filter and bypass oil filter
2. Oil cooler
3. Oil pan
4. Oil pump

LUBRICATION SYSTEM SPECIFICATIONS

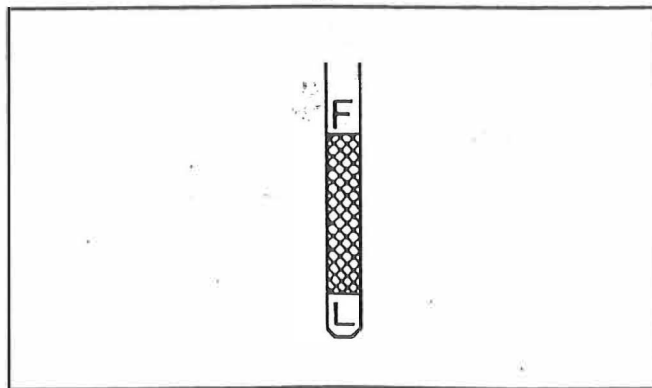
Lubricating oil capacity	9.3 litres / (9.83 qts)
Oil type (See Recommended Fluids Oils and Grease in the truck Maintenance Manual for complete specifications)	SAE 10W-30 SG / CD SAE 5W-30 SG / CD* *Not for use in tempera- tures above +60° F
Oil pan capacity	7.0 litres / (7.4 qts)
Delivery pressure (Minimum)	1.5 kg/cm ² @ 680 rpm 21.3 psi @ 680 rpm
Oil pump type	Pressure feed gear pump
Oil filter type	Full flow filter (paper filter element)
Oil cooler type	Water-cooled, built-in type

ENGINE OIL

ENGINE OIL INSPECTION

1. Park the lift truck on a flat surface. Place the gear selector in neutral and apply the parking brake.
2. Allow the engine to run until it reaches normal operating temperature.
3. Stop the engine, and wait five minutes.
4. Pull out the oil level gauge (dipstick), and verify that the oil level is between "F" (Full) and "L" (Low) on the gauge. Check the condition of the oil and service if necessary.

NOTE: Do not operate the engine if the oil level is below the "L" level.



5. If the oil level is below L, refill with the specified oil.

* The amount between F (Full) and L (Low) is approximately 2.0 liters / (2.1 qts)

ENGINE OIL REPLACEMENT INTERVAL

1. Replace the engine oil initially after the first 50 hours of operation on a new or overhauled engine.
2. Replace the engine oil every *200 hours or every *month, whichever comes first.
* Normal operating conditions.

NOTE: Use routine engine oil analysis to determine maintenance intervals during operation under other than normal conditions.

ENGINE OIL FILTER REPLACEMENT INTERVAL

1. Replace both the main and bypass filters initially after the first 50 hours of operation on a new or overhauled engine.
2. Replace both the main and bypass filters every *400 hours or every *2 months, whichever comes first.
* Normal operating conditions.

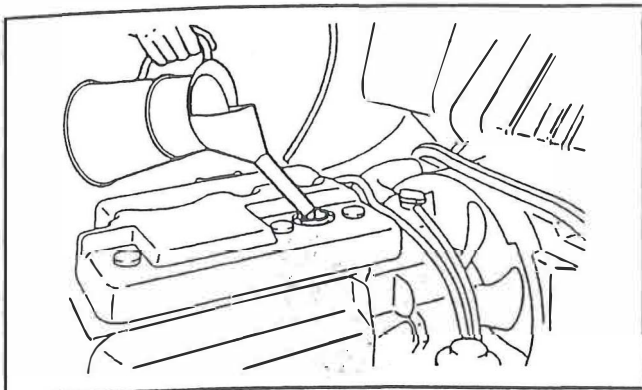
NOTE: Use routine engine oil analysis to determine maintenance intervals during operation under other than normal conditions.

ENGINE OIL REPLACEMENT

1. Park the lift truck on a flat surface. Place the gear selector in neutral and apply the parking brake.
2. Remove the oil filler cap and oil drain plug. Drain the oil into a suitable container.
3. Clean the oil drain plug and the mating surface on the oil pan.
4. Install the drain plug, using a new gasket.
Tightening torque: 3.0-4.2 kgm / (260-365 lbf in)
5. Install the correct amount of the recommended oil.

ENGINE OIL CAPACITY

Oil pan capacity (At full level)	7.0 litres 7.4 qts
Total engine oil capacity (Including filters, after engine overhaul)	9.3 litres 9.8 qts



6. Install the oil filler cap.
7. Start the engine, and verify that there are no oil leaks.
8. Check the oil level.

MAIN AND BYPASS OIL FILTER REPLACEMENT

1. Remove the main oil filter and bypass oil filter using an oil filter wrench.

For main oil filter: commercial wrench

For bypass oil filter: special tool 9224473-00

2. Apply a light coat of engine oil on the O-ring of the new filters.

3. Install the filters by hand until the O-ring contacts the filter housingbody. Then, tighten each filter an additional quarter of a turn with the oil filter wrench.

Reference tightening torque:

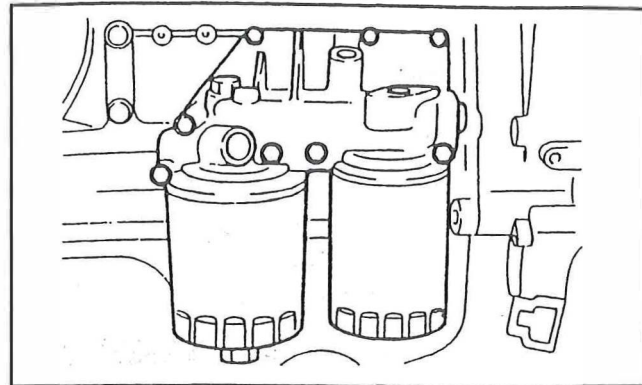
Main oil filter: 1.8-2.3 kgm
(156-200 lbf in)

Bypass oil filter: 2.0-2.5 kgm
(174-217 lbf in)

NOTE: Do not over tighten the filters.
(The filters can be damaged.)

OIL FILTER HOUSING REPLACEMENT

1. Install the oil filter housing, using a new gasket.
Tightening torque: 1.9-2.6 kgm / (165-226 lbf in)

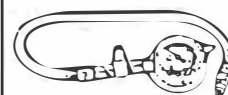


TESTING ENGINE OIL PRESSURE

SPECIAL TOOLS REQUIRED

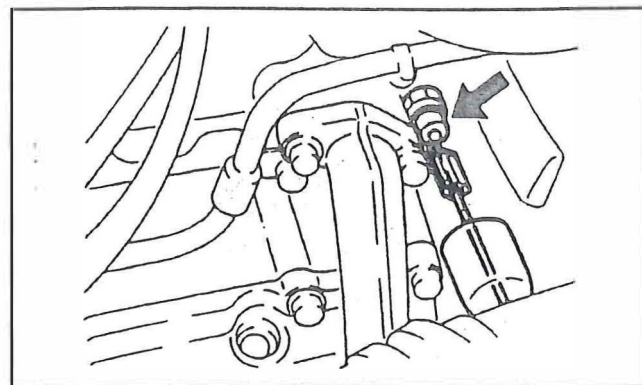
9125483-40

Oil pressure
gauge

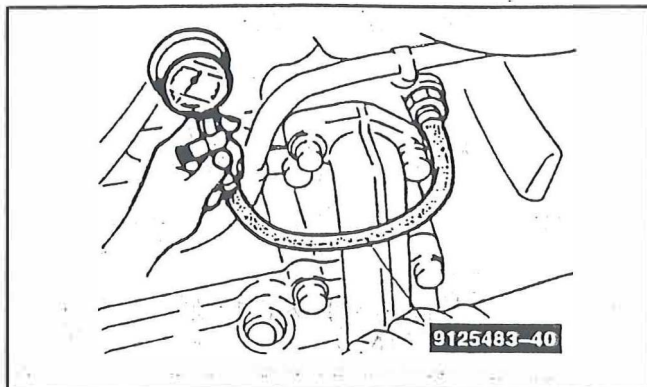


For oil pressure
inspection

1. Remove the oil pressure switch.



2. Install the oil pressure gauge (special tool 9125483-40).



3. Run the engine until it reaches normal operating temperature. Adjust the idle to 680 rpm, and read the value indicated on the oil pressure gauge.

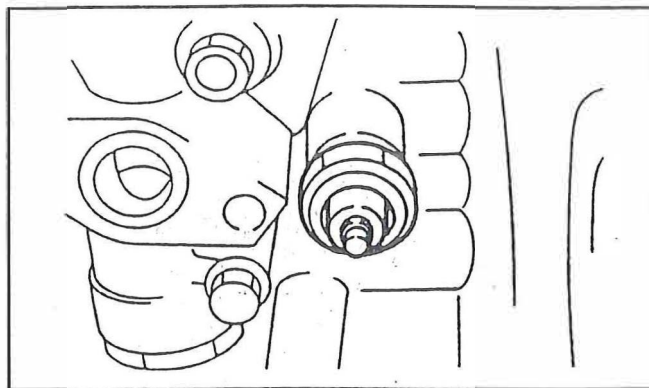
Delivery pressure:

1.5kg/cm² or more @ 680 rpm

(21.3 psi or more @ 680 rpm)

OIL PRESSURE SWITCH INSTALLATION

1. Install the oil pressure switch and reconnect the wire.
Tightening torque: 1.0-1.5 kgm / (87-130 lbf in)

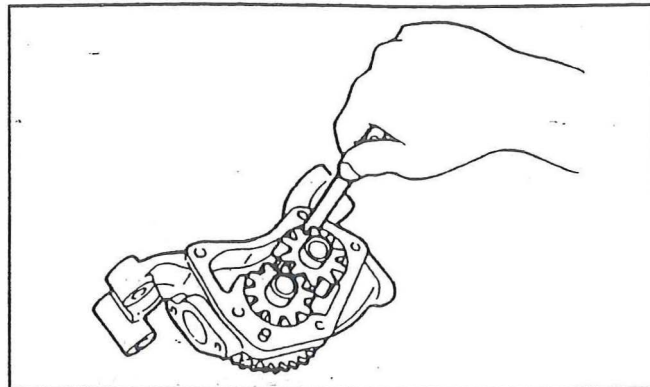


OIL PUMP

OIL PUMP INSPECTION

Check the following items, and replace the part if defective.

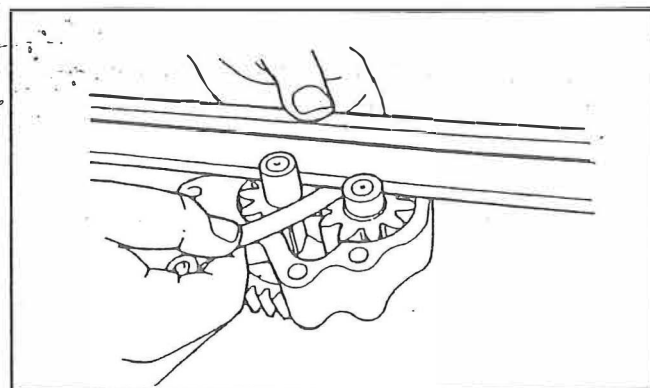
1. Visually check for damage on all oil pump components.
2. Measure the tip clearance using a thickness gauge.
Standard value: 0.10-0.19 mm / (.0039 in)
Limit value: 0.20 mm / (.0079 in)



3. Measure the side clearance using a thickness gauge.

Standard value: 0.04-0.09 mm / (.0016 in)

Limit value: 0.15 mm / (.0059 in)



OIL PUMP INSTALLATION

1. Apply engine oil to the bearing and rotor gear, and install the assembly into the cylinder block.

Tightening torque: 1.9-2.6 kgm / (165-226 lbf in)

