

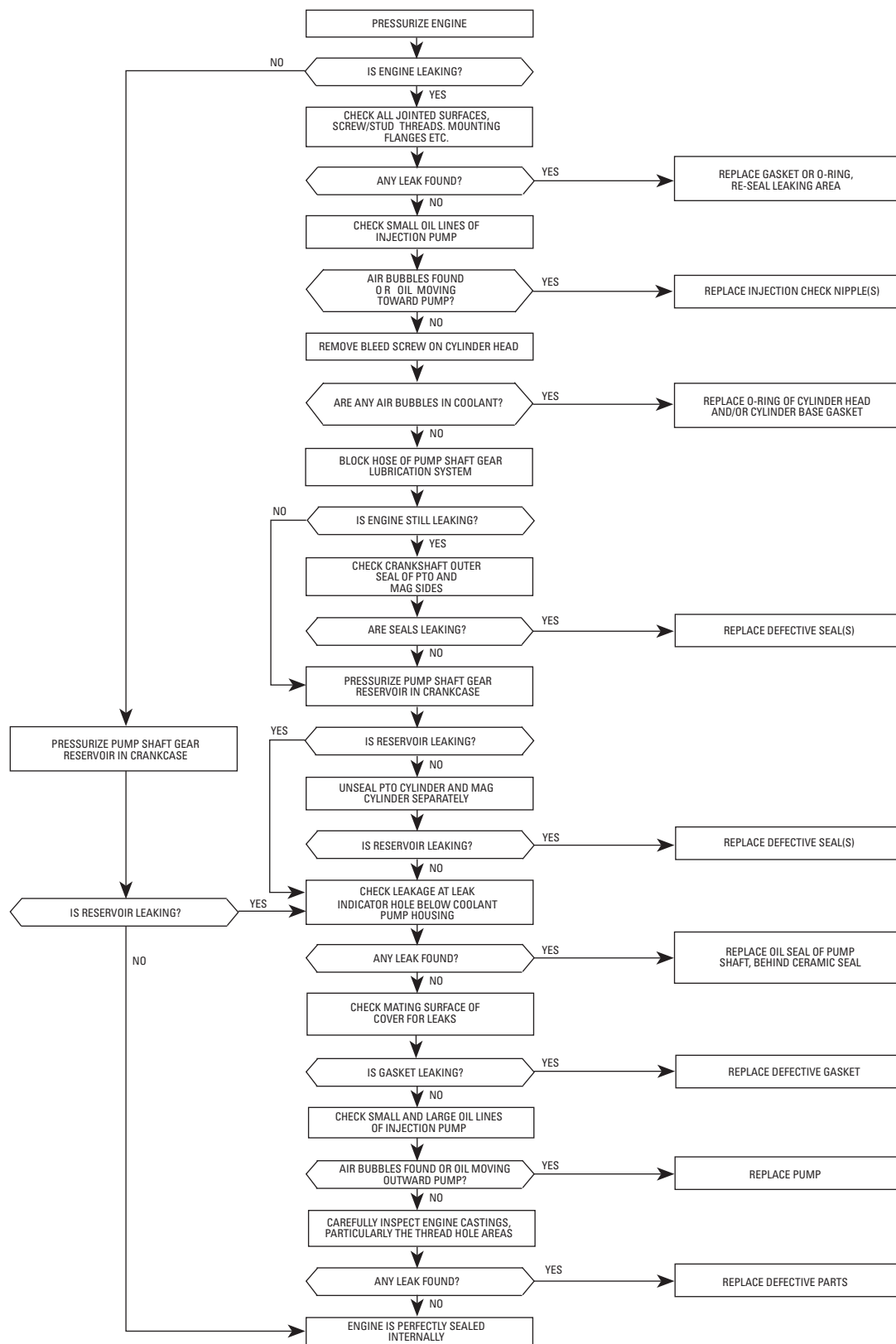
# ENGINE LEAK TEST

## SERVICE TOOLS

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MANIFOLD PLUG 63 MM (2-1/2") .....	529 035 961 .....	3
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## PROCEDURES


NOTE: This flow chart must be used as a visual reference during the engine leak test procedure.

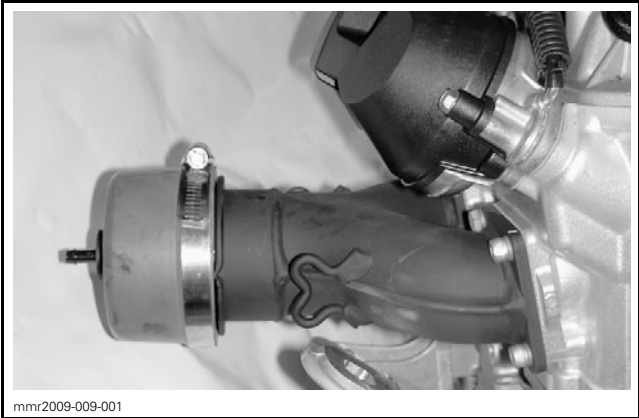


ENGINE LEAK TEST

Prior to take apart an engine, it is important to proceed with a leak test to diagnose engine problems. Whenever the engine is disassembled, a leak test should be performed after reassembly.


- 1. Remove engine. Do not remove the exhaust manifold. Refer to *ENGINE REMOVAL AND INSTALLATION* subsection.
- 2. Install appropriate plug over exhaust manifold and secure with a clamp.

REQUIRED TOOL	
MANIFOLD PLUG 63 MM (2-1/2") (P/N 529 035 961)	

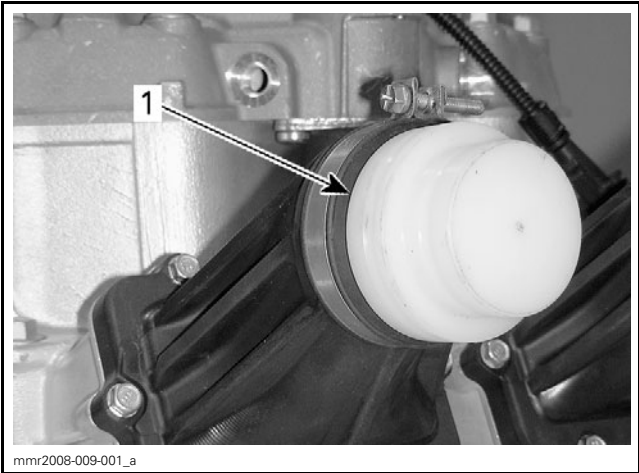


TYPICAL

- 3. Insert an intake plug in each intake adapters.

REQUIRED TOOL	
INTAKE PLUG (P/N 529 036 203)	


- 4. Tighten with existing clamps.

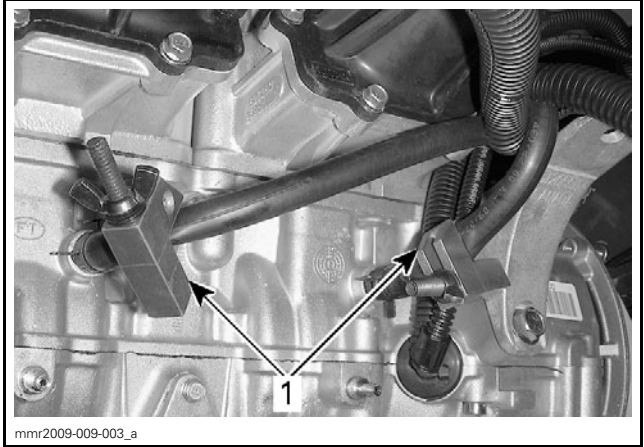


TYPICAL

1. Intake plug

- 5. Block each impulse hose as applicable.

REQUIRED TOOL	
SMALL HOSE PINCHER (P/N 295 000 076)	




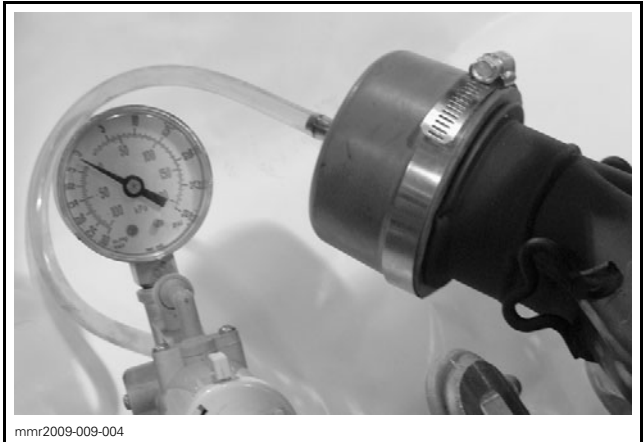
TYPICAL

1. Small hose pinchers

**NOTICE** Pay attention not to squeeze hose nipples.

- 6. Pressurize engine.

REQUIRED TOOL	
VACUUM/PRESSURE PUMP (P/N 529 021 800)	



TYPICAL

ENGINE LEAK TEST	
PRESSURE	TIME (without pressure drop)
34 kPa (5 PSI)	3 minutes

**NOTICE** Do not exceed the specified pressure.

Subsection XX (ENGINE LEAK TEST)

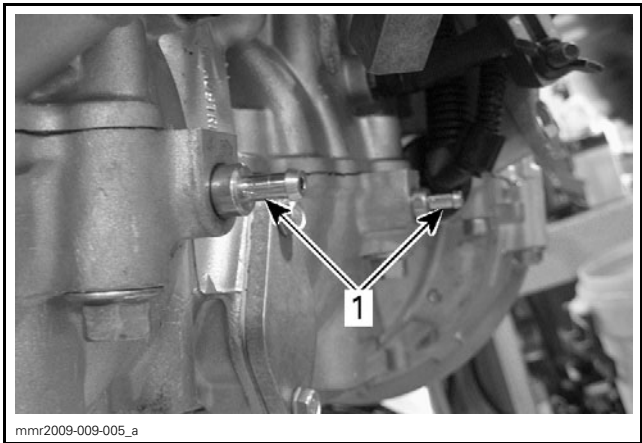
- 7. If pressure drops before 3 minutes, spray a soapy solution on tester kit (manifold and intake plugs, vacuum/pressure pump and its hose).
- 7.1 If tester kit (manifold and intake plugs, hoses and pump) is leaking, bubbles will indicate where leak comes from.
- 7.2 If tester kit is not leaking, check engine, see *ENGINE COMPONENTS TO BE VERIFIED*.

Engine Components to be Verified

- If air is escaping from engine check all jointed surfaces and screw or stud threads of engine:
- Spark plug base, insulator
  - Cylinder head
  - RAVE valve bellows, piston and housing
  - Cylinder
  - Crankcase halves (joint)
  - Crankshaft outer seals (PTO and MAG)
  - Water pump cover.
  - Coolant bleed nipples on cylinder head
  - Fuel injector gaskets.

Troubleshooting Tips

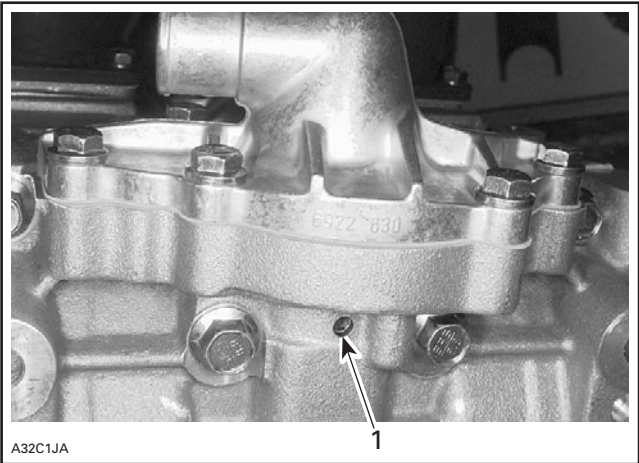
Air bubbles or oil column going toward pump may indicates a defective check valve in injection nozzle.



600 HO E-TEC ENGINE SHOWN  
1. Injection nipples

- Air bubbles in cooling system indicate a defective cylinder head O-ring or cylinder base gasket. Check leak indicator hole for oil or coolant. ,
- Leaking coolant indicates:
- A defective ceramic seal (on water pump side)
  - Defective O-ring on bearing carrier, see appropriate *BOTTOM END* subsection.

- Leaking oil indicates:
- A defective oil seal (behind ceramic seal).
  - Defective O-ring on bearing carrier, see appropriate *BOTTOM END* subsection.



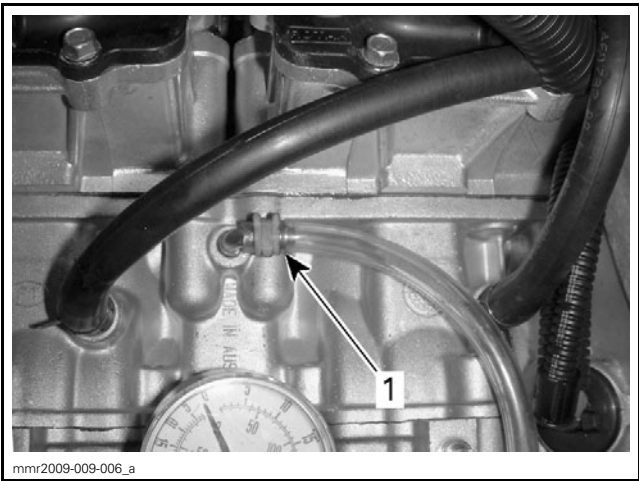
1. Leak indicator hole

PUMP SHAFT OIL GEAR RESERVOIR LEAK TEST

Install air pump on reservoir fitting and pressurize engine.

PUMP SHAFT OIL GEAR RESERVOIR LEAK TEST	
PRESSURE	TIME (without pressure drop)
34 kPa (5 PSI)	3 minutes

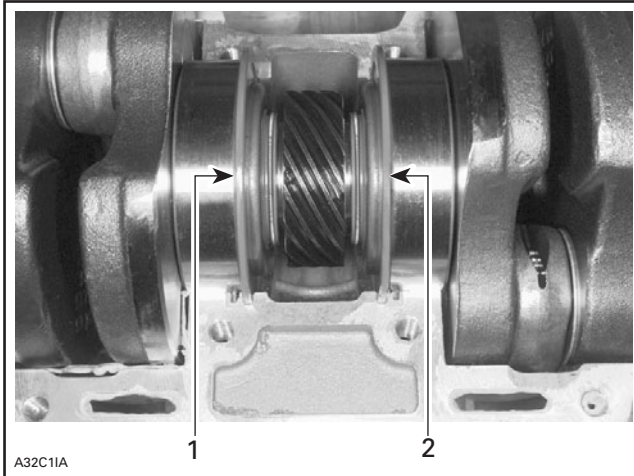
**NOTICE** Do not exceed the specified pressure.



TYPICAL  
1. Air pump hose on fitting

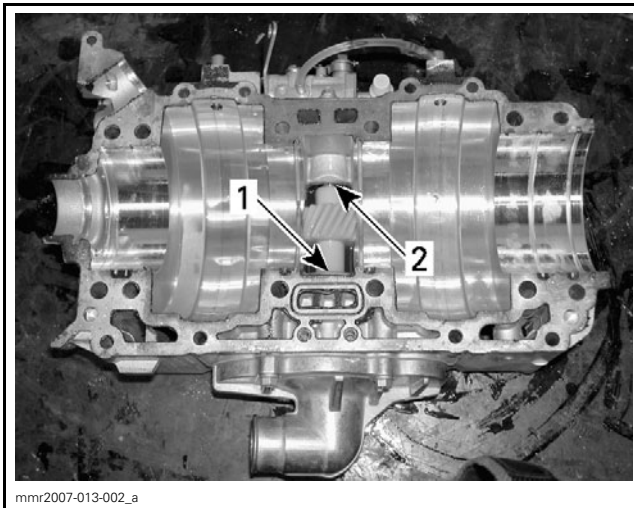
- If pressure drops check for:
- Leaking cover plate gasket

- Defective O-ring on bearing carrier (see appropriate *BOTTOM END* subsection)
- Defective oil seal on water pump side
- Defective crankshaft inner seal.



**TYPICAL — CRANKCASE INSIDE VIEW**

1. Leakage through inner seal on PTO side
2. Leakage through inner seal on MAG side



**TYPICAL — CRANKCASE INSIDE VIEW**

1. Leakage through water pump oil seal (reservoir side)
2. Leakage on cover plate side (gasket)