

LEAK TEST

GENERAL

A Sea-Doo Engine Leak Test Kit (P/N 295 500 352) and Supplementary Engine Leak Test Kit (P/N 295 500 780) are available to help diagnose engine problems such as engine seizure, poor performance, oil leakage, etc.

Before disassembling any components of the engine, it is important to perform a leakage test to determine which part is defective.

It is also very important after servicing the engine, even for a complete engine rebuilt, to perform another leakage test; at this stage, it may avoid further engine problems and minimizing the risk of having to remove and reinstall the engine again.

Static bench testing is the most effective way to conduct a leakage test. Inboard testing does not allow complete access to, and observation of all engine surfaces and should be avoided whenever possible.

On the 717 engine, cylinders can not be verified individually due to leakage from one cylinder to another through a common intake manifold.

When installing hoses of the Engine Leak Test Kit or Supplementary Engine Leak Test Kit, use the collars provided in the kit to ensure a proper sealing.

When pressurizing the engine, first confirm that the components of the Engine Leak Test Kit or Supplementary Engine Leak Test Kit are not leaking by spraying a solution of soapy water on all hoses, connections, fittings, plates, etc. If there is a leak, bubbles will indicate leak location.

Three areas of the engine will be tested in sequence as per the diagnostic flow chart (see the end of this subsection).

- 1) Engine Cooling System.
- 2) Bottom End and Top End.
- 3) Rotary Valve Shaft (except DI engine).

NOTE: If a leak is found, it is important to continue testing as there is the possibility of having more than one leak. Continue pumping to compensate for the air lost to find another leak.

PREPARATION

Verify fuel system for leaks.

WARNING

If any fuel leak is found, do not start the engine. Correct the leak and wipe off any fuel spillage. Do not use electric powered tools unless fuel system has passed pressure test.

Disconnect battery BLACK negative cable.

WARNING

Always disconnect battery cables in the specified order, BLACK negative cable first.

Disconnect battery RED positive cable.

TESTING PROCEDURE

Engine Cooling System

Remove the tuned pipe. Refer to EXHAUST SYSTEM.

Remove the exhaust manifold gasket and ensure the surface is clean.

Disconnect engine cooling hoses.

Install the appropriate exhaust manifold plate from the Engine Leak Test Kit (P/N 295 500 352) or Supplementary Engine Leak Test Kit (P/N 295 500 780). Tighten plate using fasteners provided in the kit.

NOTE: Do not torque plate excessively.

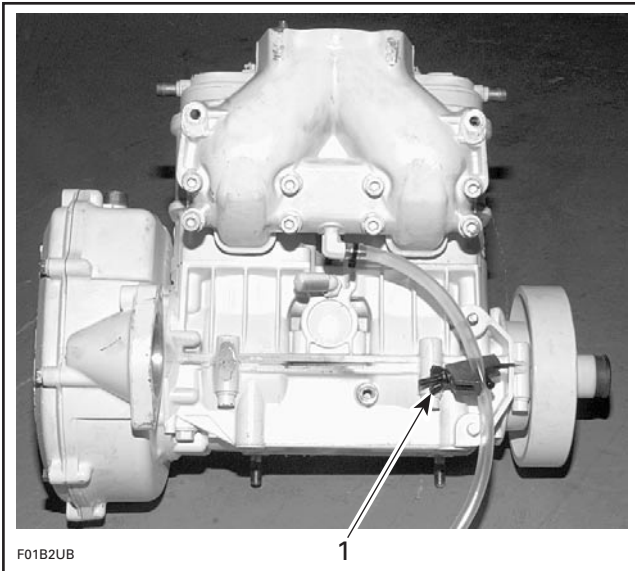
Install a hose pincher on engine drain hose.

Use hoses provided in the kit and install them on the engine.

Install pump using reducer and appropriate tube(s) as necessary.

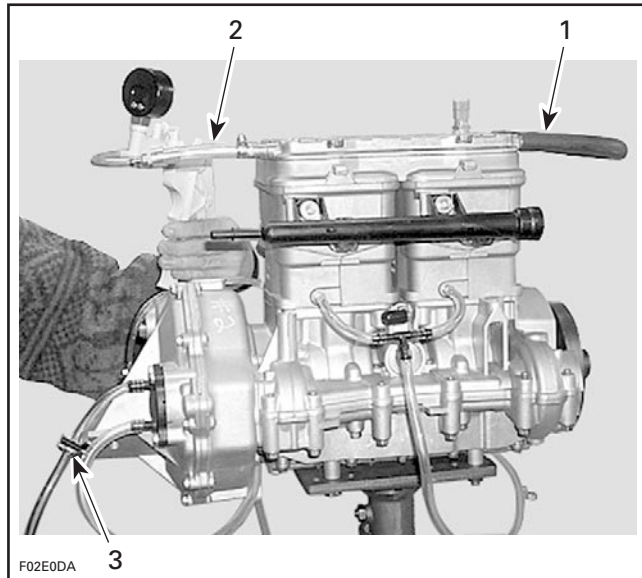
Section 04 ENGINE (2-STROKE)

Subsection 01 (LEAK TEST)



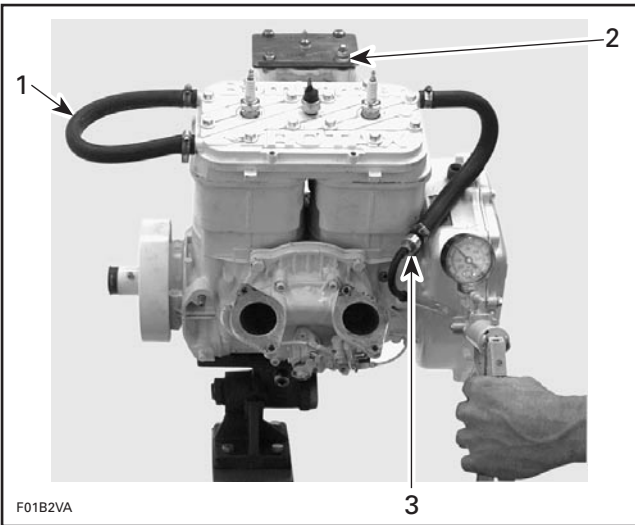
717 ENGINES — REAR VIEW

1. Engine drain hose blocked with a hose pincher



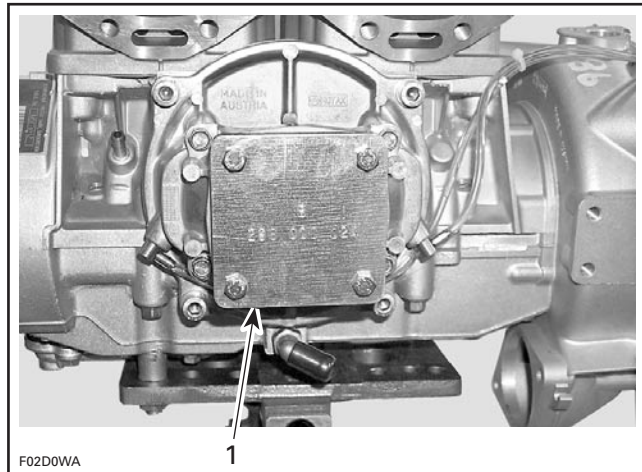
787 RFI ENGINES — REAR VIEW

1. Loop hose and use clamps
2. Hose with clamps. Install pump to the end
3. Block engine drain hose with a hose pincher



717 ENGINES — FRONT VIEW

1. Loop hose and use clamps
2. Use two washers with exhaust manifold stud
3. Hose with adapter and nipple

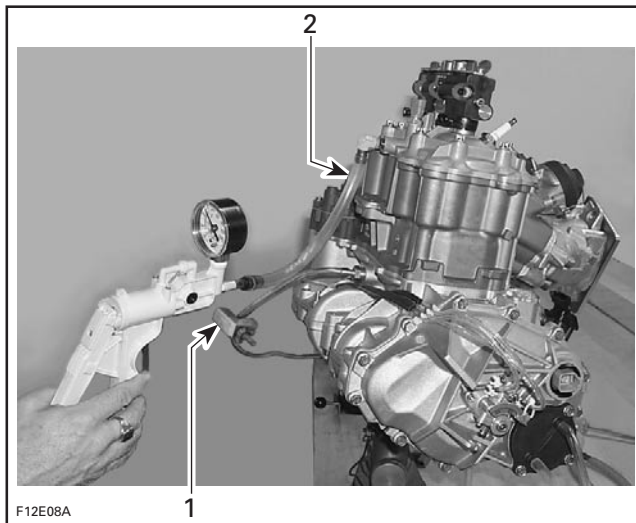


787 RFI ENGINES — FRONT VIEW

1. Exhaust manifold plate

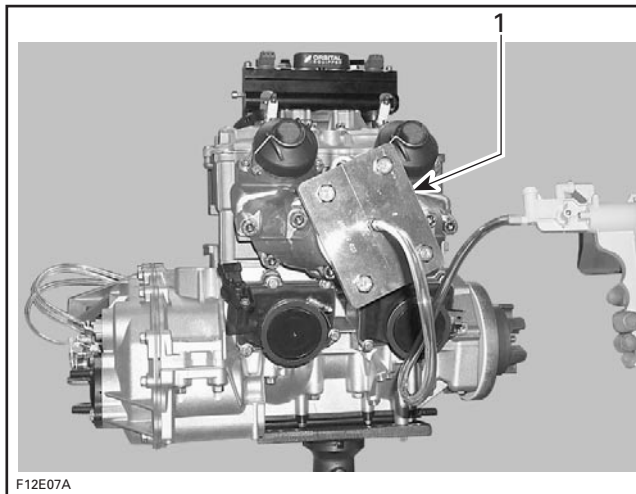
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947 DI ENGINES — SIDE VIEW

1. Block engine drain hose with a hose pincher
2. Install pump to water inlet hose



947 DI ENGINES — FRONT VIEW

1. Exhaust manifold plate

NOTE: Water is not required for testing.

DI models, it is not necessary to pressurize the bottom crankcase cover nor the magneto cover. There is no possible water leak path toward the internal components of the engine.

Activate pump and pressurize engine cooling system to 34 kPa (5 PSI).

Wait 3 minutes and check if pressure drops; if so, verify all testing components.

- If kit components are not leaking and pressure drops, verify all external jointed surfaces, temperature sensor and the O-ring between the spark plug area and the engine cylinder head cover. If none of these components are leaking, there is an internal leak and it can be detected with BOTTOM END AND TOP END testing.

Bottom End and Top End

Carburetor-Equipped Models

Remove the carburetor(s) and gasket(s). Make sure the surface of the intake manifold (717 engines) or rotary valve cover (787 RFI engines) are clean.

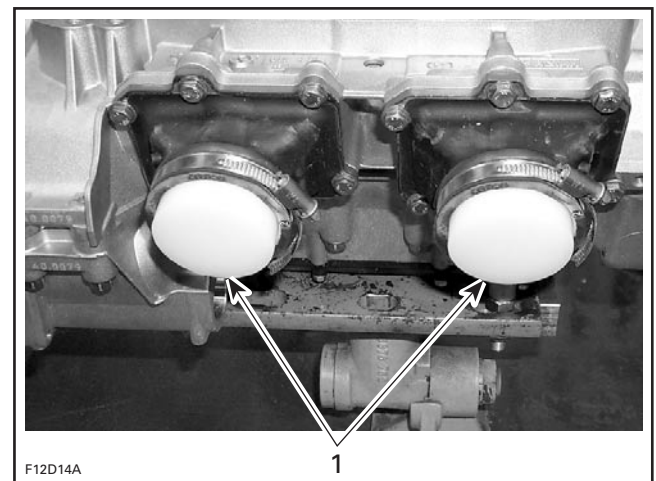
Install the intake plate(s) with fasteners from the kit and tighten adequately.

NOTE: For the 787 RFI engines, use the intake and exhaust plates included in the Supplementary Engine Leak Test Kit (P/N 295 500 780).

DI Models

Remove throttle bodies on DI models.

Install intake manifold plugs (P/N 529 035 708).



1. Intake manifold plugs

All Models

On engines with the RAVE system, remove the RAVE valves and gaskets.

Install the RAVE valve plates with fasteners from the kit and tighten adequately.

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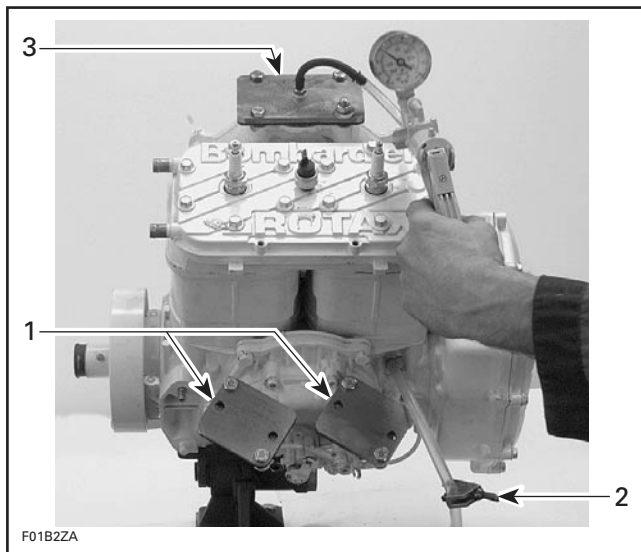
NOTE: Engines with the RAVE system, the boot (carburetor-equipped engines) and O-ring can be checked for leakage with the valve in place. Simply remove the cover to expose the parts.

Make sure the spark plugs (and the air/fuel rail on DI engine) are installed and tightened.

Block pulse hose (carburetor-equipped engines) using a hose pincher.

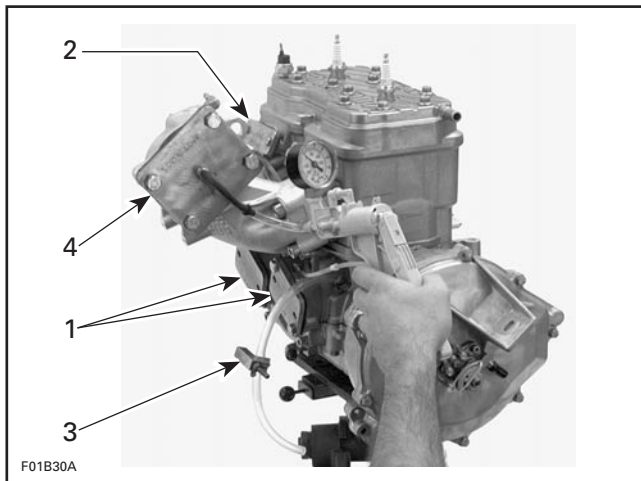
NOTE: Do not block the rotary valve shaft hoses (if so equipped).

Install pump to the exhaust plate fitting.



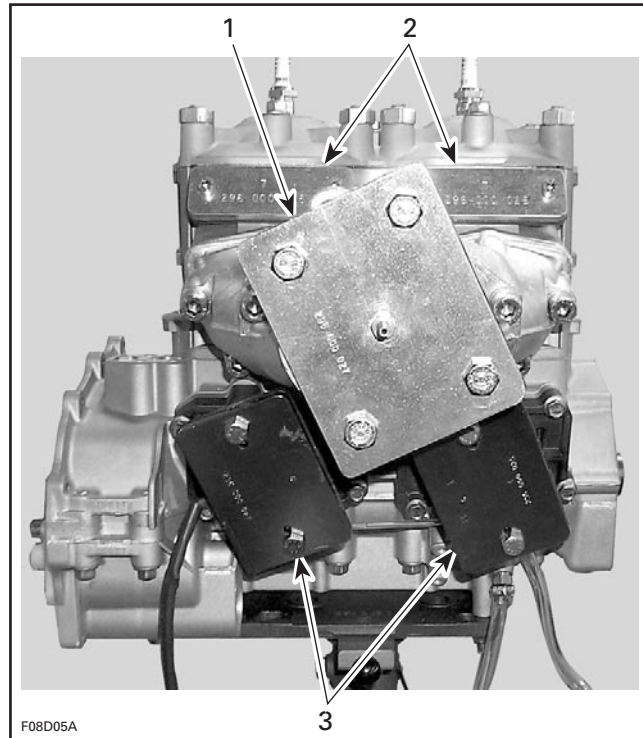
717 ENGINES

1. Intake plates
2. Pulse hose blocked with a hose pincher
3. Exhaust plate



787 RFI ENGINES

1. Intake plates
2. RAVE valve plates
3. Pulse hose blocked with a hose pincher
4. Exhaust plate



947 DI ENGINES

1. Exhaust plate
2. Rave valve plates
3. Intake plates

Activate pump and pressurize engine to 34 kPa (5 PSI).

CAUTION: Do not exceed this pressure.

Wait 3 minutes and check if pressure drops; if so, verify all testing components.

If kit components are not leaking, verify engine jointed surfaces as per following areas:

- spark plugs
- direct injector sealing (DI engines)
- cylinder head gasket
- cylinder base gasket
- crankcase halves
- rotary valve cover (except DI engines)
- engine plugs
- exhaust manifold
- intake manifold (717 engines)
- intake flanges (DI engines)
- oil injection pump (717 engines).

Check also small oil injection pump lines and fittings; check for air bubbles or oil column going toward pump, which indicate a defective check valve.

Section 04 ENGINE (2-STROKE)

Subsection 01 (LEAK TEST)

Check for leak through counterbalancing shaft seal toward air compressor (DI engines). Air bubbles in lowest fitting (oil return line) underneath compressor indicates a seal leakage.

If the above mentioned components are not leaking, block both oil hoses of the rotary valve shaft (if so equipped) using hose pinchers.

NOTE: If leakage stops at this point, proceed with ROTARY VALVE SHAFT testing (if so equipped).

If there is still some leakage, remove the PTO flywheel to verify outer seal.

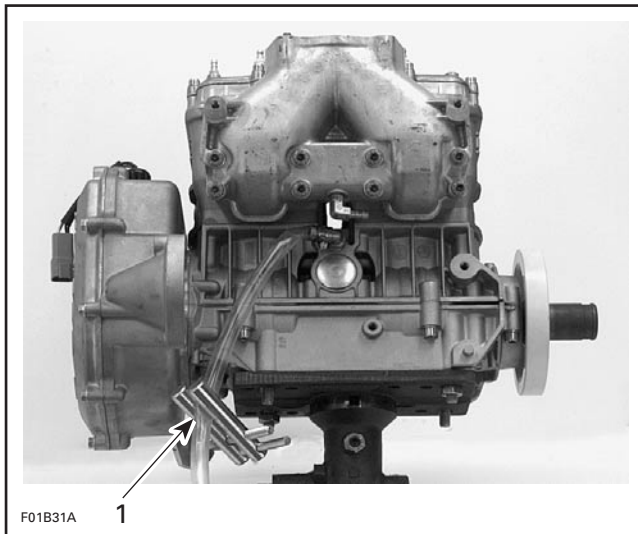
If no leak is found on the PTO side outer seal, remove magneto flywheel and verify crankshaft outer seals.

Proceed with the ROTARY VALVE SHAFT testing (if so equipped) if the crankshaft outer seals are not leaking.

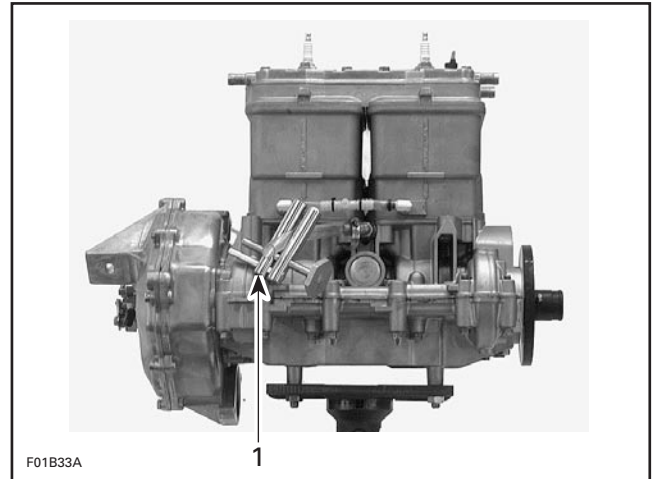
Rotary Valve Shaft (if so equipped)

NOTE: It is mandatory to drain the injection oil from the rotary valve shaft.

Block oil return hose of the rotary valve shaft with a hose pincher.

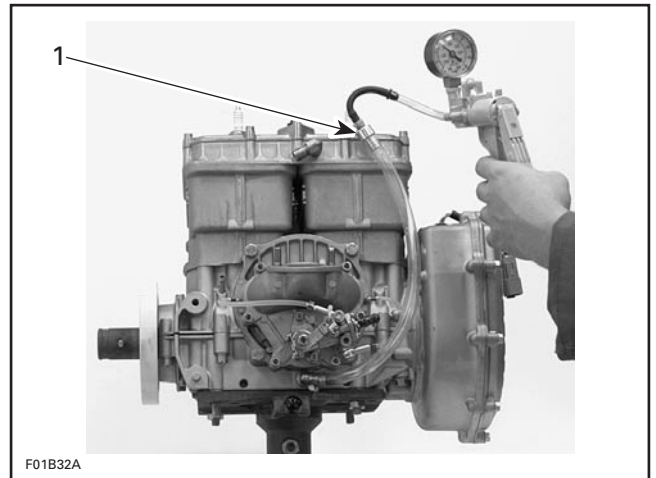


717 ENGINES
1. Oil return hose blocked with hose pincher



787 RFI ENGINES
1. Oil return hose blocked with hose pincher

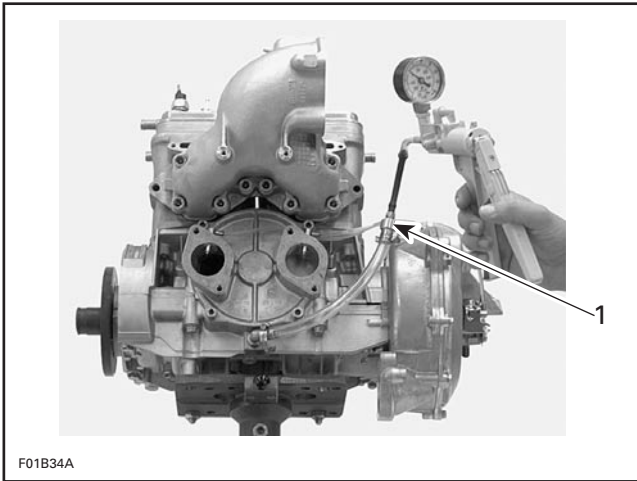
Install pump with reducer and nipple to the oil supply hose of the rotary valve shaft.



717 ENGINES
1. Pump with reducer and nipple

Section 04 ENGINE (2-STROKE)

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787 RFI ENGINES

1. Pump with reducer and nipple

Activate pump and pressurize to 34 kPa (5 PSI).

Check plug of the rotary valve shaft in crankcase.

Remove PTO side spark plug. If pressure drops, it indicates a defective PTO side crankshaft inner seal or crankcase is not sealed correctly.

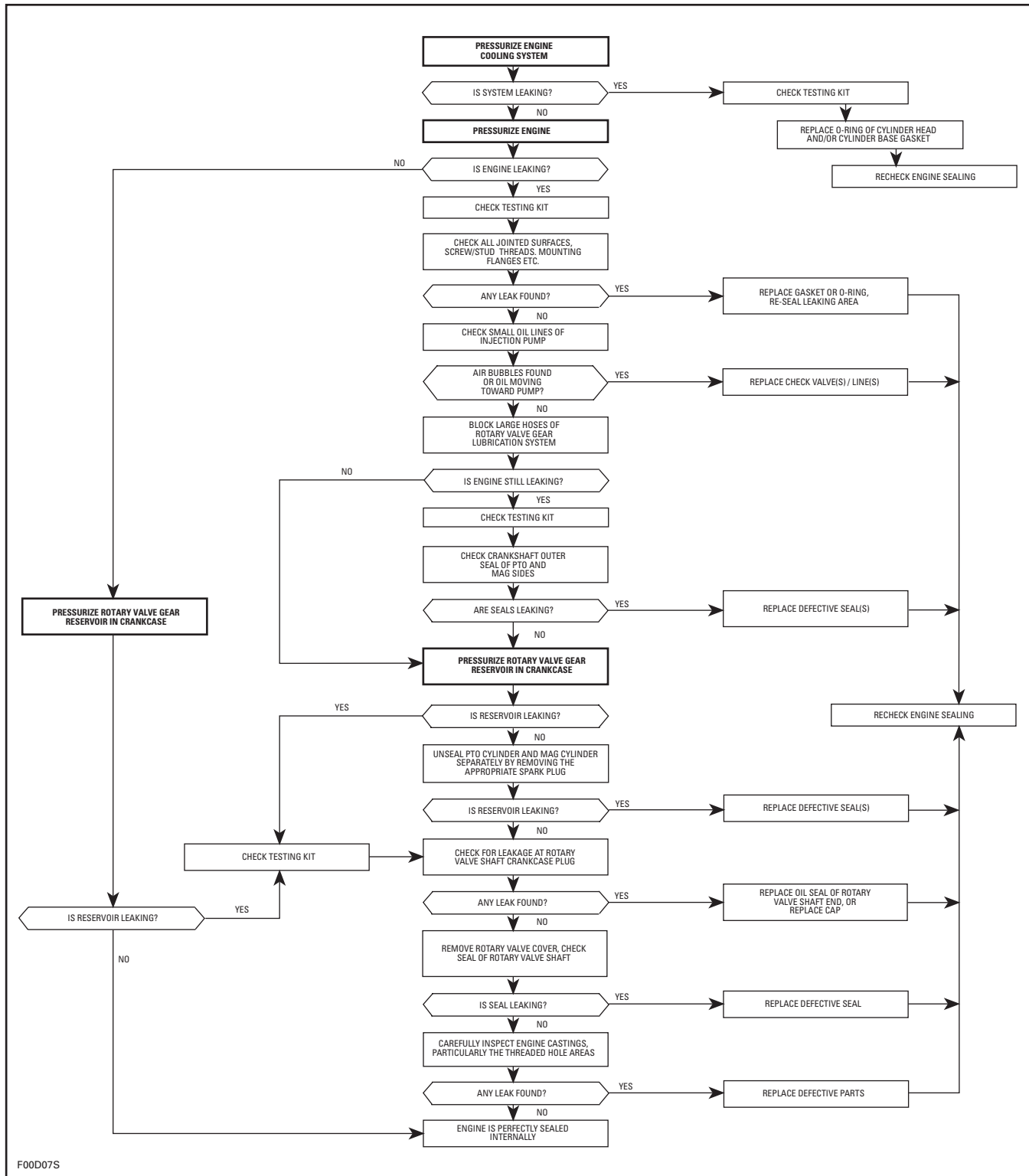
Remove MAG side spark plug. If pressure drops, it indicates a defective MAG side crankshaft inner seal or crankcase is not sealed correctly.

If the above mentioned components are not leaking and there is a pressure drops, remove the rotary valve cover. Check the seal of the rotary valve shaft.

If the rotary valve shaft is not leaking, it could indicate a defective engine casting. Disassemble engine and carefully check for defects in castings. Pay attention to tapped holes which may go through sealed areas of engine and thus lead to leakage.

ENGINE LEAKAGE DIAGNOSTIC FLOW CHART

717 and 787 RFI Engines



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947 DI Engines

