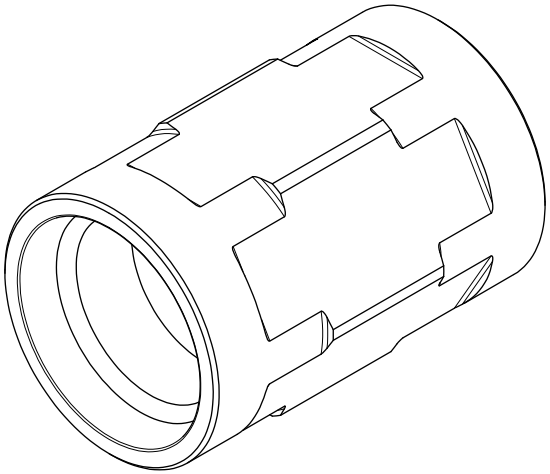
UNIVERSAL PCV RESTRICTOR

PART NO. FO-06R

MADE IN USA



Important: Read these instructions in their entirety prior to installation.

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APPLICATIONS

- Internal combsution engines with modified PCV systems.

PARTS LIST

Item	Qty	Part Number	Description
1	1	FO-06	-6 ORB Union Fitting
2	1	FO-06R-01	Restrictor Disc Screw
3	1	FO-06R-XXX	Restrictor Discs (Refer to Size Table)

DISC SIZES

Restrictor Size	Laser Marking
2.6 mm	2.6
3 mm	3.0
3.5 mm	3.5
4 mm	4.0
4.5 mm	4.5
D.I.Y.	None

TECHNICAL SPECIFICATIONS

Max. Operating Temp.	302°F (150°C)
Min. Operating Temp.	-22°F (-30°C)
Max. Operating Pressure	300 psi (20.68 bar)
Adapter Material	CNC-Machined 6061-T6 Billet Aluminum
Finish	Plain or MIL-A-8625 Type II Anodize, Black
Connections	-6 SAE ORB, $^{9}/_{16}$"-18 UNF - 2A

BEFORE YOU BEGIN

RETHINK PCV

The installer's understanding about a PCV system might be incorrect. For example, PCV has never meant pollution control valve. Positive crankcase ventilation (PCV) systems are necessary for internal combustion engines with wet sumps.

In the past, most PCV valves never functioned 100 percent correctly. When draft tubes retired, most PCV systems received a one size fit all for decades, meaning the same PCV valve appears on most engines until the mid-1990's. This led to their negative image, and quick removal in the aftermarket. When compared to antique draft tubes, PCV systems are better for the planet, but they still serve the same purpose: Removing crankcase pressure.

Modern engines use highly optimized PCV systems to separate oil and manage air-flow. However, modification to a modern engine could mean their highly optimized PCV systems also require retuning. Engine manufacturers manage PCV airflow in unique, but overall similar methods. Typically, these methods are passive or active. Passive systems use restrictor plates like FO-06R. Active methods utilize PCV valves and diaphragms.

Your favorite professional racing engines use dry sump oiling systems to remove crankcase pressure instead of PCV systems. Crankcase vacuum from a dry sump does create a better sealing piston ring (higher net horsepower). Changing pump pulleys lets engine builders adjust crankcase vacuum and flow. Engine mounted vents appear more rarely. Traditional dry sump systems vent on the oil reservoir.

Knowing this information helps the installer understand the benefit of a correctly tuned PCV system: More horsepower by creating a partial vacuum, and no oil leaks! After sampling intake manifold vacuum at idle, the installer will know which restrictor disc is best for the engine.

Now, a correctly tuned PCV system increases flow through the PCV circuit. Increased flow results in more oil vapor circulating between the crankcase and intake manifold. Therefore, installing an oil catch can is an important part of this installation.

Engines with forced induction must install check valve(s) during the installation of FO-06R. Check valves block boost pressure from entering the crankcase and blowing out seals.

UNDERSTANDING YOUR ENGINE AS A SYSTEM

Before installing the restrictor, verify that the engine components discussed below are functioning correctly. These components can affect proper engine idling.

- Verify all vacuum connections are in good condition:
  - Leaky vacuum hoses could cause improper idling.
  - Replace cracked / brittle hoses prior to installing this kit.
- Verify that the idle air control valve functions correctly:
  - A faulty idle air control valve could cause improper idling.
  - Note that not all engines have these valves.
- If equipped, the confirm the distributor is correctly adjusted:
  - Incorrect engine timing could cause improper idling.
  - Verify the timing is correct using a timing light.
- Confirm that custom ECU configurations account for the calculated air leak that the PCV system creates.
  - This is especially true for mass air flow (MAF) tunes if venting to atmosphere.
  - Manifold air pressure (MAP) tunes are more forgiving.

INSTALLATION INSTRUCTIONS

Engines with inconsistent idle, or performance camshafts should use a digital vacuum gauge capable of displaying an average value.

SAMPLE INTAKE MANIFOLD VACUUM

1. Connect the vacuum gauge to an intake manifold vacuum source.
   a. Any small vacuum line on the intake manifold may be used.
2. Start the engine.
3. Let the engine warm up.
4. Record the vacuum level at idle every ten seconds for one minute, then average the values.
5. Shut the engine off.
6. Remove the vacuum gauge and reconnect / re-cap the vacuum source.

CONFIGURE FO-06R & TEST

Engines with inconsistent idle, or performance camshafts should use a digital vacuum gauge capable of displaying an average value.

1. Refer to the table below, and Figure 1 to assemble FO-06R starting with the smaller disc listed in the table row.

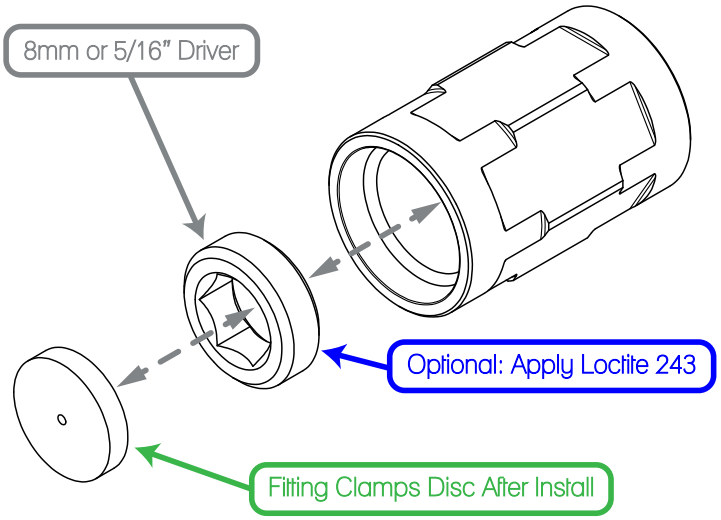


Figure 1 - FO-06R General Assembly

Measured Vacuum at Intake Manifold	Starting Disc Size
0 inHg to 7 inHg	4mm (or 4.5mm)
7 inHg to 10 inHg	3mm (or 3.5mm)
10 inHg to 14 inHg	2.6mm

2. Prepare the oil catch can for installation.
3. Create a test hose for the PCV circuit:
   a. Remove the original PCV hose.
   b. Measure the hose diameter.
   c. Purchase a vacuum hose and a tee fitting if necessary.
   d. Connect the oil catch can, FO-06R and the tee fitting to the vacuum hose, as shown in Figure 2.
   e. Do not forget to install check valve in forced induction applica-

tions.

f. Connect the vacuum gauge to the in-line tee fitting.

g. Install the test assembly onto the engine.

h. Review Figure 2 to confirm the test hose connections are correct.

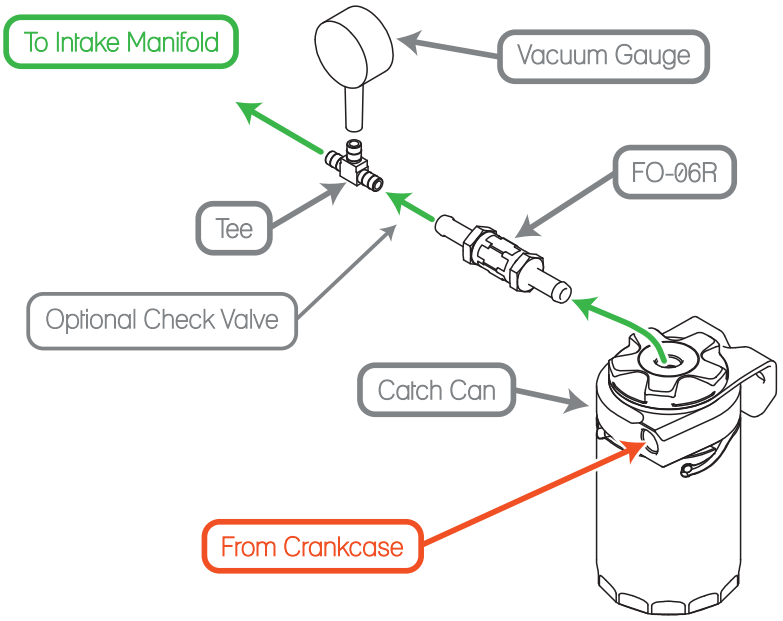


Figure 2 - Vacuum Gauge Test Setup

4. Start the engine and allow it to idle / confirm if the engine will idle.
5. If the idle is still not stable, repeat these steps with the alternate disc listed in the table row.
   a. It may be necessary to create a custom restrictor disc by drilling progressively larger holes into the unmarked restrictor disc provided in this kit.
6. Confirm the measured vacuum level is higher than intake manifold idle vacuum level.
7. Shut off the engine when the prior step is completed.

COMPLETE THE INSTALLATION

1. Remove the tee fitting from the PCV test hose.
2. Reattach the hose with the oil catch can and FO-06R installed only (plus

a check valve when applicable).

3. Reinstall the oil catch can when necessary.
4. Monitor oil collection in the catch can:
5. Miles driven vs. collected ounces is the simplest benchmark to know whether the suction through the PCV system is collecting oil too quickly.
6. While vacuum in the crankcase has advantages, a daily driver vehicle should not need to drain their catch can weekly, or monthly.
7. Install a larger restrictor disc and see if the maintenance interval increases.

 Installation is now complete. Thank you for purchasing an Improved Racing product!