

VRO System Replacement Pump Installation Guide

Fig. 1



Fig. 2



How to tell if you have a 60° Johnson-Evinrude V4 or V6 Outboard

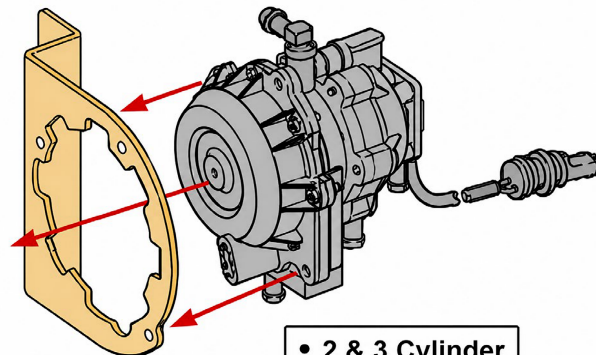
There are two ways to determine your engine type: **METHOD 1.** The 60° V4 & V6 outboards were introduced in the mid 1990's and All **60° models were equipped with a vapor tank system.** The 60° motors cowling will have vents at the top, the 90° typically will not. **METHOD 2.** Looking at the top of the outboard, the 90° motor will have a more triangular profile [see FIG 1], while the 60° has a more rounded **top-view motor covers and were roughly rectangular in shape and most had vents along the rear side** [see FIG 2].

Stand-alone bracket-mounted.

(Many V4 Crossflow motors mount to front air box instead).

Several designs were used for brackets but the general mounting scheme is the same.

ALL 90° VRO mount like this, on a separate bracket. There are different bracket designs for 90° Crossflow and Loopers but the VRO pump mounts to an external bracket for all of these. The Crossflow bracket is pictured here.

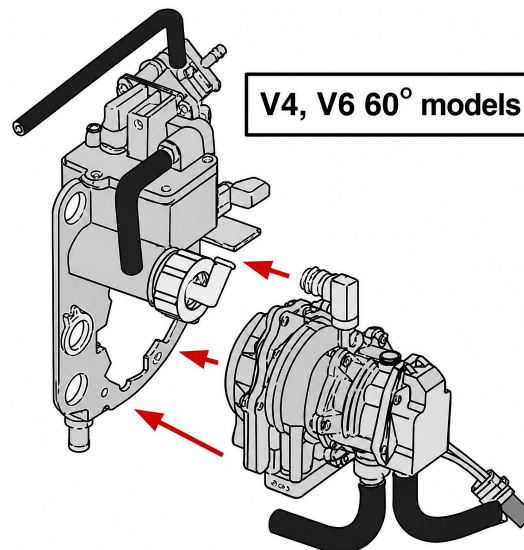
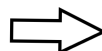


- 2 & 3 Cylinder
- 90° V4 & V6

Important Application Note:

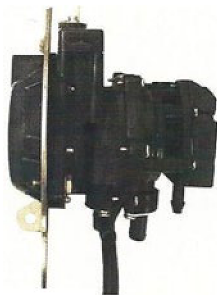
This EMP VRO Replacement Pump is designed for 90° Johnson/Evinrude applications only. Installation on a 60° engine may require modifications not covered by these instructions and is not recommended by EMP at this time.

ALL 60° VRO are Mounted to a vapor recovery tank as illustrated. The tank and bracket are one piece plastic.



V4, V6 60° models

VRO System Replacement Pump Installation Instructions

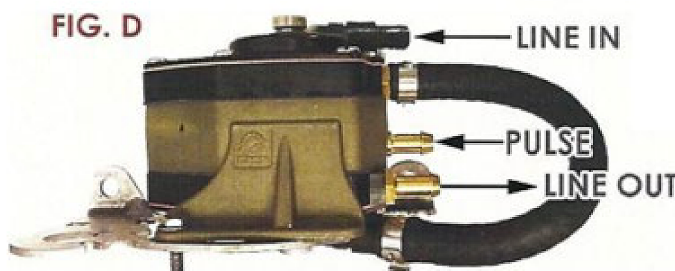


Original VRO pump.

Remove original VRO pump and bracket from engine. The pump is attached to the mounting bracket by 3 bolts [see FIG A]. Remove bracket and dispose of old pump, keeping mounting bracket and bolts.

Place bracket, flat-side down, on a surface and draw a line from the center of the semicircle to the end of the bracket

(just left of bottom mount) and a second line from the bottom of the first notch on the left to the end of the bracket [see FIG B1]. With a hacksaw or similar tool, cut along both lines modify bracket for use with pump [see FIG B2].



Typical pulse limiter valve
Must be removed from block and replaced with a 1/8" NPT hose barb. (not included in fuel pump kit.)

Place the VRO Replacement Pump on the bracket as shown in FIG C. Note that the replacement pump will only use two of the mounting bolts. The tubing on the new pump should fall into the area vacated by the bracket modification.

Install new pump back into boat engine. The fuel line should enter at the top of the pump and exit at the bottom. The vacuum pulse hose attaches to the center [see FIG D].

Important note:

The pulse limiter is not needed when you replace the VRO pump with this fuel pump and it should be removed and replaced with a 1/8" NPT hose barb nipple for the pump's pressure pulse to allow this fuel pump to function properly.

FAQ

Do I have to cut the mounting bracket?

The mounting bracket needs to be trimmed to make room for the replacement pump's fuel lines. This modification does not damage the integrity of the triangular bracket at all. If you decide later you won't to return to a VRO pump, it will still attach to the mounting bracket even after modification.

This is a "non-oiling" pump. What exactly does that mean?

Unlike the VRO Pump, this pump does not add oil into the fuel. The result of this is you have to pre-mix the fuel and oil prior to use. Simply mix your 2-cycle oil and gasoline in a 48:1 ratio (1 pint oil to 6 gallons fuel).