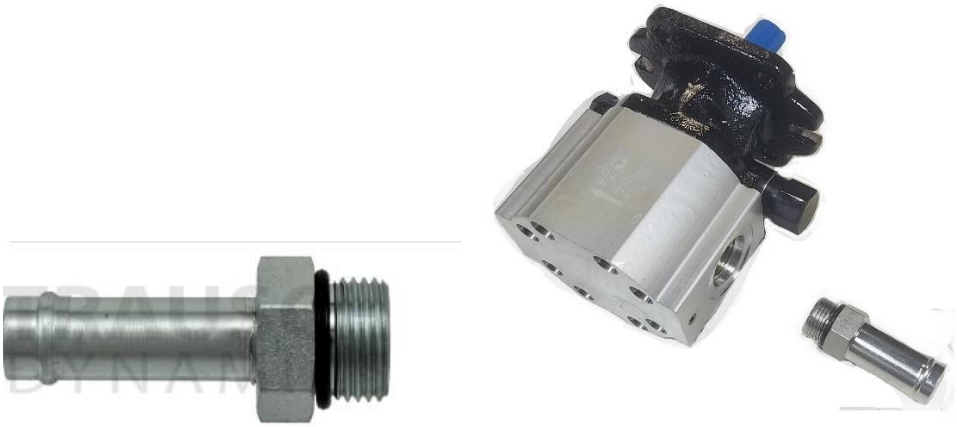
PHP ASSEMBLY

The general process is to mount the hydraulic equipment (pump, valve, filter, fittings) onto the engine, then mount the engine onto the tank and connect the hoses from the tank to the hydraulic components.

Tools you will need

- ½" wrench
- ½" socket – 3/8" drive
- 3/8" drive socket extension
- ½" socket – ¼" drive
- 13mm socket
- Large adjustable crescent wrench
- Flat head screw driver
- 1/8" Allen key
- Pipe tape
- Rubber mallet

1. **Pump**
   a. Attach the ¾" barbed pipe fitting to the pump using an adjustable wrench. In some version an adapter may be required between the hose barb fitting and pump. This fitting will be supplied if required.



ADJUSTABLE WRENCH

   b. Place the ½" pump coupler on the pump shaft and *loosely* tighten the coupler's set screw with an 1/8" Allen key. The end of the coupler should be flush to the end of the pump shaft. Verify there is a shaft key properly in place.

1/8" ALLEN KEY

2. **Engine**
   a. Place the ¾" engine coupler on the engine shaft and *firmly* tighten the coupler's set screw with the 1/8" Allen key. The end of the coupler should be flush to the end of the engine shaft. Verify there is a shaft key properly in place.

b. Place the spider on the engine coupler.

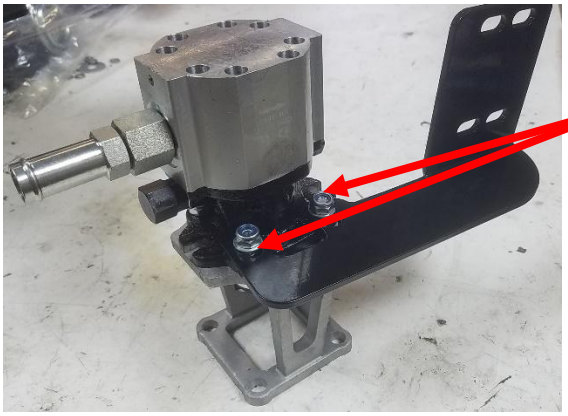
3. Mounting the Pump Mount to the Pump

a. The correct orientation is with the pump mount opening facing down, the same direction as the pump mount hose barb. Place and tighten the screws on the left side of the pump to the pump mount using 5/16”-18 x 1.25” qty 2 with locknuts. Use a ½” socket with extension on the bolt head and ½” wrench on the locknut.

BOLT: 5/16”-18 X 1.25” (QTY 2)
LOCKNUT: 5/16 (QTY 2)

½” WRENCH & SOCKET

b. On the right side of the pump, loosely attach the valve bracket on the outside of the pump flange using 5/16”-18 x 1.25” qty 2 with washers and locknuts. DO NOT fully tighten as these will come off at a later stage for ease of assembly. Use a ½” socket with extension on the bolt head and ½” wrench on the locknut.

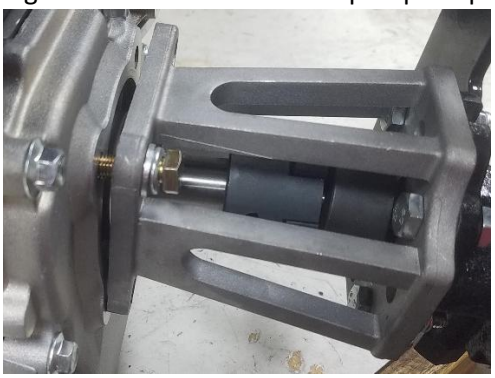


BOLT: 5/16”-18 X 1.25” (QTY 2)
LOCKNUT: 5/16 (QTY 2)
WASHER: 5/16 (QTY 2)

½” WRENCH & SOCKET

4. Mounting the Pump to the Engine

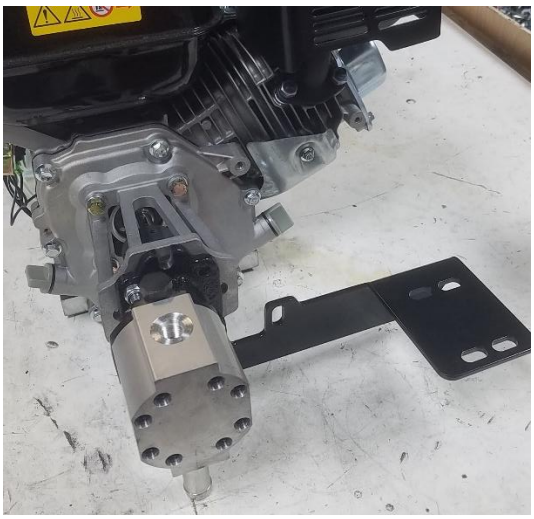
a. Align the pump coupler with the spider on the engine.
b. Rotate the pump such that the barbed pipe fitting is face down.
c. Use qty 4 of 5/16” - 24 x 1” Bolts, 5/16” lock washers, and flat washer to mount the pump mount to the engine with a ½” socket with extension.
d. There will initially be a slight gap between the pump mount and engine. The gap will close while the pump coupler slides to the correct location.
e. Tighten the set screw on the pump coupler with an 1/8” Allen key.



WASHER: 5/16 (QTY 4)
LOCK WASHER: 5/16 (QTY 4)
BOLT: 5/16”-24 X 1” (QTY 4)

½” SOCKET W/EXTENSION

f. To attach the valve in the follow steps the valve bracket must pivot out of the way. Remove the upper bolt that attaches the valve bracket to the pump mount and swing the bracket out of the way.

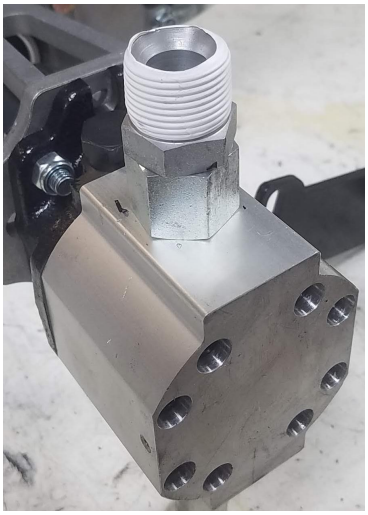


5. **Finish the Pump Assembly**
    a. Install using an adjustable wrench the *SAE-05 male to SAE-08 female fitting* to the outlet of the pump. Lube up the o-ring on the fitting prior to installing.

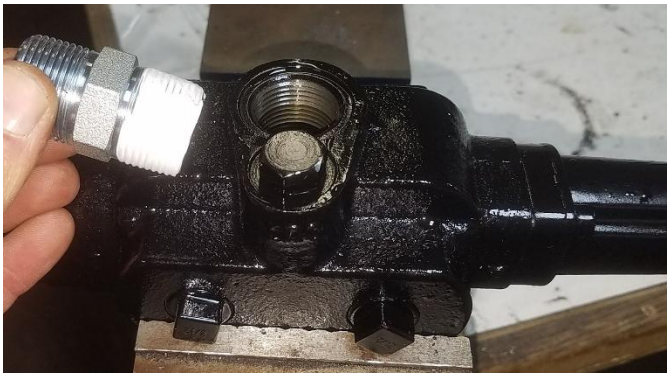


    b. Install using an adjustable wrench the *SAE-08 male to ¾" NPT male* to the previous fitting. Lube up the o-ring on the fitting prior to installing. Place pipe tape on the ¾" NPT end after installing.





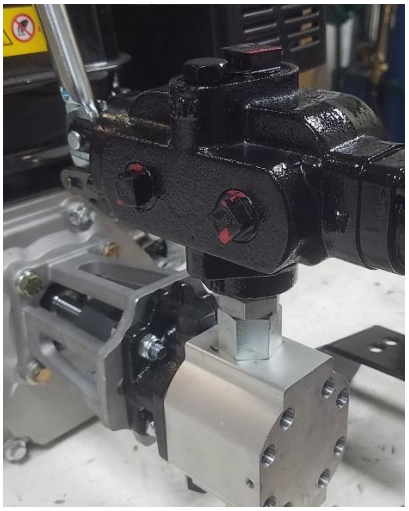
6. **Valve**
    a. Apply pipe tape to a ¾" NPT male to male fitting and install the fitting to the outlet of the valve. The valve has markings showing the outlet



7. Valve Assembly

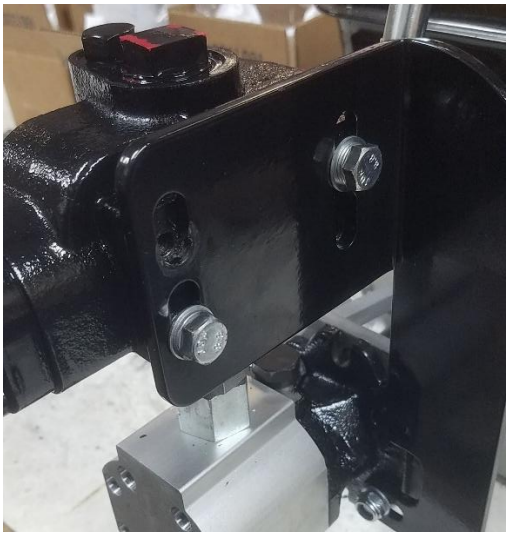
a. Secure the valve handle to the valve by removing the cotter pin and clevis pin and reinserting it thru the valve handle.


b. Attach the pump inlet port to the ¾" NPT fitting on the pump by rotating the valve. The final position of the valve is such that the threaded standoffs are positioned so the valve mounting bracket will attach to the valve. (Finial position is shown below)



c. Rotate the valve mounting bracket and reinsert the 5/16" bolt, washer and locknut to secure the bracket to the pump, do not tighten.

d. Using qty 2 M8-1.25 x 20mm screws, lock washers and washers, loosely attach the valve bracket to the valve. Any of the 4 threaded holes on the valve are acceptable. Use an M13 socket to tighten.



WASHER: 5/16 (QTY 2)
LOCK WASHER: 5/16 (QTY 2)
BOLT: M8-1.25 X 20 (QTY 2)

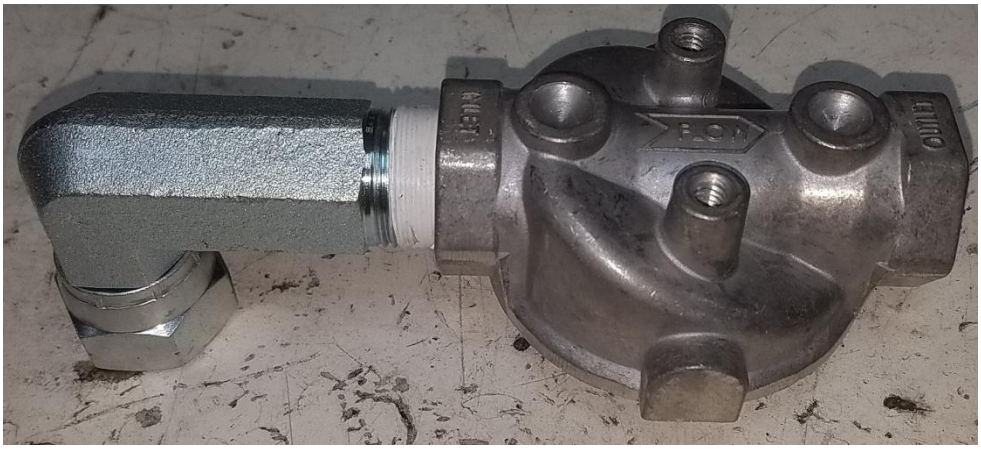
M13 SOCKET

e. Fully tighten the hardware for the valve mounting bracket to the pump mount using an ½" socket and wrench.

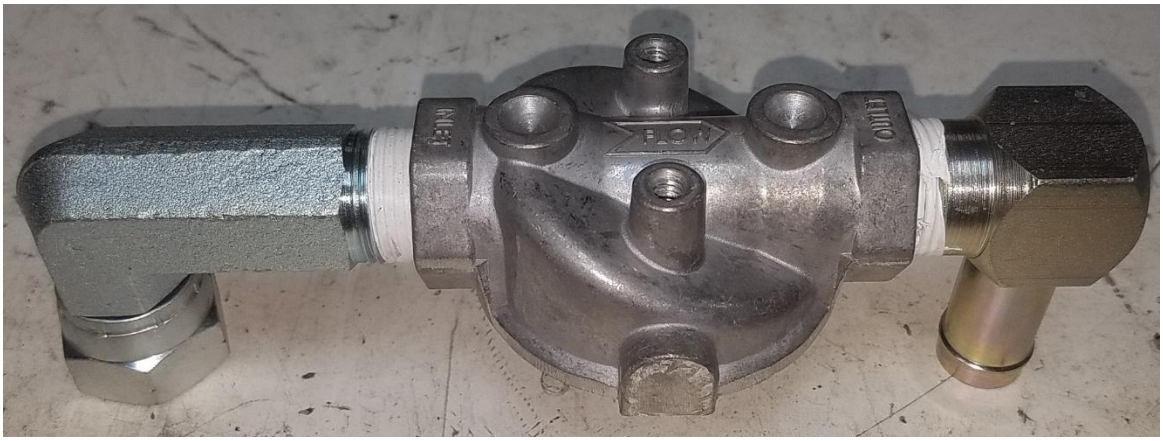
½" SOCKET
½" WRENCH

8. Filter Assembly

a. Apply pipe tape to the ¾" NPT to ¾" JIC 90 Deg fitting and thread it into the **inlet** of the filter base. The filter base can be on or removed at this point. The fitting should be facing down along the filter.



b. Apply pipe tape to the ¾" NPT to ¾" hose barbed 90 Deg fitting and thread it into the **outlet** of the filter base. The filter base can be on or removed at this point. The fitting should be facing down along the filter.



c. Apply a light coat of oil to the filter seal and thread the filter to the filter base assembly.

9. Filter Assembly Installation

a. Install the filter assembly to the valve.

10. Hoses (applies to hoses in bulk length)

a. Cut the ¾" suction hose to 3-3.25"
b. Cut the ¾" return hose to 15.25-15.5"

11. Engine Assembly Installation

a. Apply oil to the suction nipple and suction hose.
b. Using a rubber mallet, push the suction hose onto the suction nipple of the tank.

c. Slide 2 hose clamps over the suction hose.

d. Slide the pump onto the suction hose

e. Align the engine with the holes on the tank and fasten the tank down using 5/16”-18 x 1-1/2” bolts, washers and locknut.

BOLT: 5/16”-18 X 1.5” (QTY 4)
WASHER: 5/16 (QTY 8)
LOCKNUT: 5/16 (QTY 4)

½” WRENCH & ½” SOCKET (¼” DRIVE)

f. Apply a light coat of oil to the inside of the return hose and attach it to the barbed fitting on the filter and to the tank. Use hose clamps to secure.

12. End User Assembly

a. Attach the rubber feet using the supplied hardware.

b. Attach the quick disconnect couplers to the valve.