



MOROSO P/N 22596 -ROTOR AND SCROLL EXTERNAL OIL PUMP SINGLE STAGE WITH PASSENGER SIDE MOUNTING PROVISION

Before installing your pump, be sure you have the proper Moroso components to go with it. Using our matched components will ensure a simple, professional installation.

DRIVE KITS
OIL PUMP BLOCK OFF
OIL FILTER BLOCK OFF
IN-LINE FILTERS
OIL PAN PICKUP
OIL PREHEATER
HEATING PADS

From time to time these instructions will refer to the exploded diagram, so at this time, it would be wise to study the diagram carefully.

MOUNTING

The Moroso External Oil Pump is designed to fit on the passenger side of an engine using an appropriate mounting bracket. There are two sets of slotted holes on the External Pump mounting bracket, which attaches the pump to the engine block.

Before installing the pump, install the supplied bushing that best suits your need, into the upper hole of mounting bracket #9.

The pump mounts on the passenger side of the engine from the two mounting holes on the side of the timing chain cover.

OIL LINE ROUTING

Now that the pump is installed on the engine, you are ready to add fittings and lines. On Moroso Rotor & Scroll External Oil Pumps, the inlet is on the bottom and the outlet is on the top. Both inlet and outlet are tapped for -10AN thread. For -12AN oil lines, use a -10AN to -12AN fitting.

The bottom hole or inlet is connected to a line running from the oil pan pick-up tube. The top hole feeds oil to the motor and should be attached by a line to a remote oil filter and then to the appropriate oil filter block-off plate. **BE SURE TO USE AN OIL PUMP BLOCK-OFF PLATE WHEN REMOVING THE OLD INTERNAL OIL PUMP.** Refer to our matched components listed in a Moroso Performance Catalog.

PRESSURE ADJUSTMENT

The Moroso Rotor & Scroll External Pump has an externally adjustable oil pressure relief valve at the bottom rear of the pump. This valve is pre-set at 50 psi. To increase the pressure, loosen the locknut and turn the Allen set screw clockwise (tighten). Do the opposite to decrease oil pressure. Remember to tighten the locknut after adjusting the pressure.

NOTE: Due to varying engines, types of oil restrictors, viscosity and temperature of oil, some adjustment in oil pressure will be required to suit your particular engine.

This pump is a precision engineered, ruggedly built integral part of the Moroso Dry Sump Oiling System. With minimal care it will give years of reliable service. Under certain circumstances it can be damaged. When oil pressure rises, the excess pressure opens the pressure by-pass valve (normally set at 50 psi) and the by-passed oil is re-circulated within the pump. Small particles of metal or dirt can cause the valve to stick open, resulting in erratic oil pressure. Should this condition present itself, the by-pass system should be disassembled, cleaned, and inspected. This can be done without disassembling the rest of the pump. To remove the by-pass system, loosen the locknut and back off the Allen screw all the way. Then unscrew the valve assembly from the pump housing. Next, remove the spring and ball from the pump body. Inspect for metal chips, burrs or wear. The ball must move freely in the valve body.

The pump itself will pump oil as long as the gears will turn, but an accident such as a blown engine is likely to put bits and pieces of metal into the oil lines, which, if allowed to get into the pump, will eventually damage some of the working parts. In the event of such an accident, the pump should immediately be disassembled and thoroughly cleaned and inspected to avoid any possible trouble. If parts are damaged, they can be replaced, but quick action will probably save the expense of replacement parts. If parts are damaged, Moroso can supply parts for complete rebuilding.

DISASSEMBLY

Pump disassembly and reassembly is not difficult but it is **very important to read all of the directions and study the exploded diagram very carefully before attempting to disassemble the pump.** Provide yourself with a clean work area where parts may be inspected and cleaned.

First, remove the drive pulley and use a very fine sand paper or emery cloth to remove the set screw burrs from the shaft #7, which will prevent possible damage to the front seal. Extreme care should be taken not to scratch the shaft. Next, loosen and remove the three long screws #1, which hold the pump together.

Remove the three small screws #2 holding the front seal cap #3. Lift off the front seal cap, mounting bracket #9 and scroll housing #10. Note the O-rings #8 on either side of the housing. Then carefully remove the scroll #12 first and then the rotor #11. The rotor

is attached to the shaft with a grooved pin and should not be separated from the shaft unless the pin is to be replaced.

To disassemble the by-pass valve #16 - #22, simply unscrew it from the pressure section #15 then loosen the locknut #22 and back off the pressure adjustment screw #21 and remove it. Next, remove the pressure spring #17 and steel piston #16.

Bearing #6 and #13 and seal #4 should not be removed unless they are damaged and need to be replaced.

INSPECTION

Clean all parts thoroughly and dry them well. Do not soak the O-rings in solvents, as this could tend to make them swell. Rather, simply wipe them with a clean cloth, being careful not to stretch them oversize. Inspect bearing to be sure that they turn freely.

Look for high spots on Rotor & Scroll and remove with a fine tooth file. If not removed, they will cause circular grooves on the face of the sections.

Examine the Rotor & Scroll housing for damage caused by the introduction of foreign matter into the pump. You will find that most soft foreign material that has worked its way into the pump has embedded itself into the housing rather than scratching or scoring the bore. Measure the I.D. of the housing in three places to check for an out of roundness condition.

Inspect the pressure stage for wear marks on the Rotor & Scroll mating surfaces. Grooves are evidence of foreign matter, but do not be concerned unless there are high spots on each side of the groove. If high spots exist, they must be removed with a small file or emery cloth.

PUMP ASSEMBLY

Providing yourself with a clean work area will ensure a professional assembly job. Re-examine all parts and clean again if necessary.

We have found that petroleum jelly is an excellent assembly lubricant if used **SPARINGLY**. Engine oil will do if petroleum jelly is not available.

The pump is assembled from back to front. Begin by laying the pressure section #15 on its back with the kidney shaped ports facing up. Put a dab of petroleum jelly on six places around the O-ring step on the bearing plate #14. Put the O-ring in place making sure it is completely seated in the groove. Carefully place the bearing plate into the step in the pressure section, being sure not to upset the O-ring. Make sure the flats on the exterior line up with the flats on the exterior of the pressure section. Also put a dab of petroleum jelly on six places around the O-ring step on the Rotor & Scroll housing #10. Put the O-rings in place making sure they are completely seated in their grooves.

Carefully place the housing into the step in the pressure section being sure not to upset the O-ring. Make sure the flats on the exterior line up with the flats on the exterior of the pressure section. Coat all surfaces **SPARINGLY** that the Rotor & Scroll will touch with petroleum jelly.

Carefully insert the scroll and make sure it turns freely. Situate the next O-ring on the exposed side of the Rotor & Scroll housing. Again, use petroleum jelly to hold it in place. Place the shaft with the Rotor attached in place and lubricate the face of the gears. Slide mounting bracket #9 into place over the shaft.

As before, install the last O-ring on the step in the front cap.

Carefully slide the front cap over the shaft as far as the seal will allow. Push the rubber lip of the seal outward with your thumbnail or a similar object and spin the section slowly. This will allow the seal to slide over the shaft without damaging it. Again position it properly making sure the O-ring has not moved out of position.

Put a small amount of thread locking solution on the threads of the three small screws and tighten the front seal cap, also the three long screws and insert them in the bores. **These bolts should be tightened evenly - gradually working your way to 80 inch pounds of torque.**

To assemble the by-pass valve, first drop the pressure relief piston #16 into the bore followed by the pressure spring #17.

Slide O-ring #20 over pressure adjustment screw #21. Thread the adjustment screw in the by-pass valve with the stepped end fitting in the I.D. of the pressure spring. Screw the adjustment screw in until only 3/4" remains showing. This will put you in the ballpark for oil pressure on initial startup. Screw on the locknut and tighten it. Make sure the O-ring #18 is in place between the threads and the head of the by-pass valve and screw it into place in the pressure section.

Turn the shaft using the drive pulley and key. Your pump should turn smoothly and evenly. If you notice a slight tight spot, do not worry, as the Rotor has to seat itself along the shaft and will do so when running. Also, uneven tightening of the bolts will most likely cause tight spots.

The pump is now ready to put back on your engine. Refer to the sections on mounting, oil line routing and pressure adjustment for reinstallation.

Maintenance is an important aspect of any racing components. Regular disassembly and inspection of this pump should become part of your regular maintenance schedule and will ensure its longevity, resulting in a trouble free component.

HINTS FOR BETTER INSTALLATION

1. Use Moroso inline filters between the pick-ups in the pan and the inlets of the pump. These filters will remove metal chips from the oil before it can get to and damage the pump.
2. Before starting a new engine, it is wise to prime the oiling system until oil pressure is shown on the gauge and oil has circulated the system and returned to the pan. Do this by adding two quarts of oil to the pan, removing the drive belt and inserting a 1/4-28 x 1" bolt in the threaded end of the shaft. Now spin the pump in a clockwise direction (with an electric drill) while watching an oil pressure gauge. Maintain pressure for one minute.
3. Avoid 90 fittings if possible.
4. For additional chassis clearance around pump, use an External Mounting Bracket.
5. Two extra pressure relief springs are also supplied. One is medium pressure measuring 1.875" long with a white stripe. One is high pressure measuring 2.125" long with a red stripe. A standard pressure spring is supplied in the pump measuring 1.75" long with no color identification. The engine builder can change springs to get the desired oil pressure vs. RPM curve. These springs are available separately.

PARTS LIST

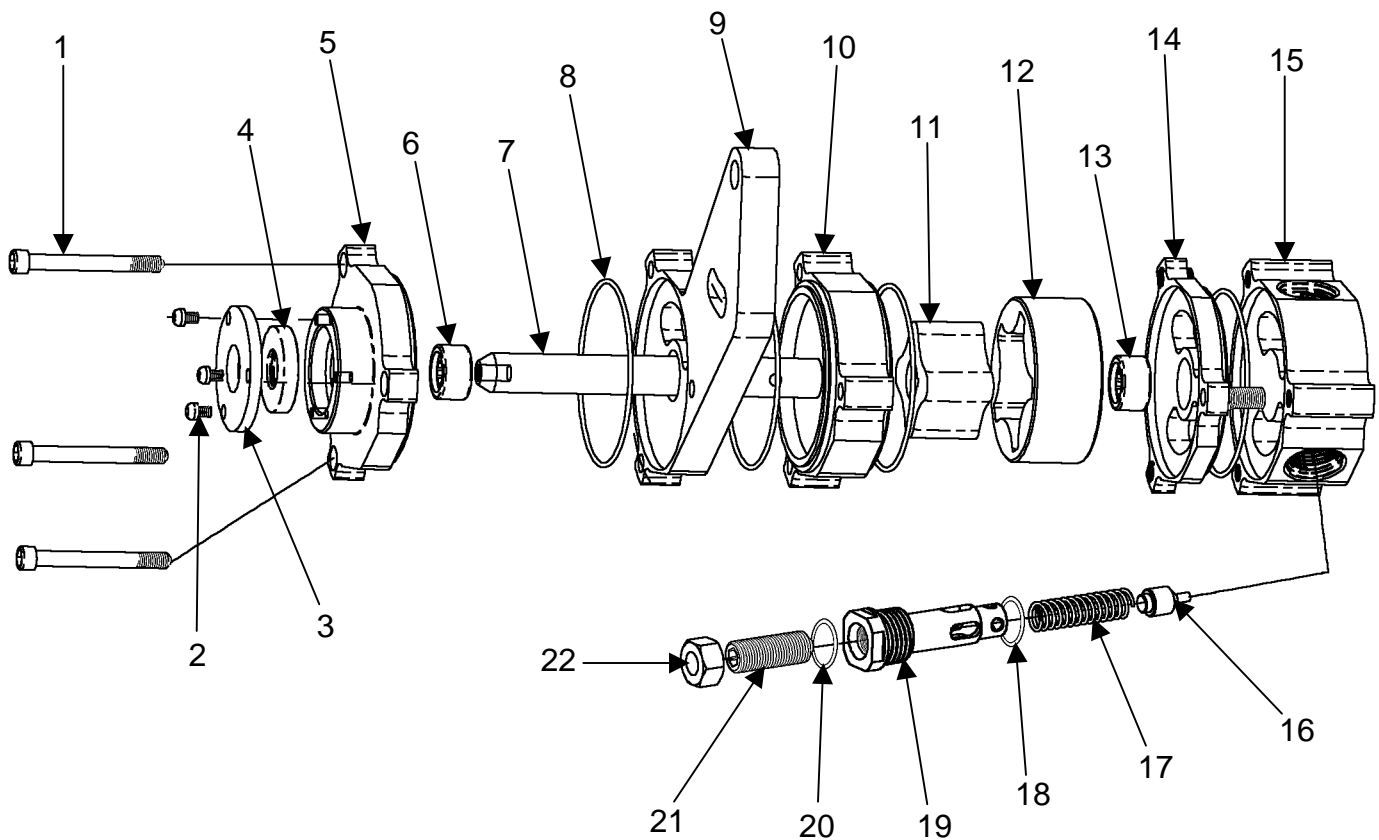
2	BUSHINGS - PLATED
1	RELIEF SPRING 1.875"
1	RELIEF SPRING 2.125"
1	EXT. OIL PUMP, 1 STAGE

REPLACEMENT PARTS

P/N	DESCRIPTION	CONTENTS INCLUDE #S
97660	Replacement Rotor & Scroll Housing 1.100	(10)
97670	Replacement Rotor & Scroll 1.100	(11 & 12)
97650	Replacement small parts kit	(4, 6, 8, 13,18,20)

22596 SINGLE STAGE EXTERNAL OIL PUMP

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|---------------------------------|-------------------------------|
| 1 – (3) 1/4 -28 x 2-1/4" SCREWS | 12 – SCROLL |
| 2 – (3) #8-32 SCREWS | 13 – BEARING .300 WIDE |
| 3 – FRONT SEAL CAP | 14 – BEARING PLATE |
| 4 – FRONT SEAL | 15 – PRESSURE SECTION |
| 5 – FRONT CAP | 16 – PRESSURE RELIEF PISTON |
| 6 – BEARING .500 WIDE | 17 – PRESSURE RELIEF SPRING |
| 7 – SHAFT | 18 – O-RING |
| 8 – (4) O-RINGS | 19 – PRESSURE VALVE BODY |
| 9 – MOUNTING BRACKET | 20 – O-RING |
| 10 – SCROLL HOUSING | 21 – PRESSURE ADJUSTING SCREW |
| 11 – ROTOR | 22 – LOCKNUT |



**For Technical Assistance, Call Moroso's Tech Line at
(203) 458-0542, 8:30am – 5:00pm Eastern Time**

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