



INSTALLATION INSTRUCTIONS

**MOROSO PART NO. 22570 - ROTOR AND SCROLL DRY SUMP OIL PUMP - 4 STAGE
DRAG RACE - SMALL OR BIG BLOCK CHEVROLET 90° V-6 WITH DRIVER'S SIDE
MOUNTING PROVISIONS**

**MOROSO PART NO. 22580 - ROTOR AND SCROLL DRY SUMP OIL PUMP - 5 STAGE DRAG
RACE - SMALL OR BIG BLOCK CHEVROLET 90° V-6 W/DRIVER'S SIDE
MOUNTING PROVISIONS**

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

RELATED COMPONENTS

For the best in related Dry Sump components, see the latest Moroso Performance catalog. In it you will find the latest in oil pans, drive kits, dry sump tanks, oil filter block-off and adapters, internal oil pump block off plates, in-line and remote filters, oil pre-heaters, scavenge manifolds and many other quality components. Technical assistance is available by calling 203-453-6571.

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 Dry Sump Oil Pump is designed to fit either 90° V-6, small or big block Chevrolets, the only difference is the mounting holes. You can see that there are two sets of slotted holes on the mounting bracket which attaches the pump to the engine block.

Before installing the pump on a small block Chevrolet, install the bushing with the 3/8" I.D. into mounting bracket #8. When installing the pump on big block Chevrolets, use the 7/16" I.D. bushing. This bushing is marked #7 on the exploded view. The pump mounts on the driver's side of the engine from the two mounting holes near the side of the timing chain cover.

To attach the pump to the small block or 90° V-6 Chevrolet, use two 3/8-16 x 1-12" bolts and washer.

For installation on a big block Chevrolet, follow the above instruction substituting 7/16"-14 bolts for the 3/8"-16 bolts called for above.

OIL LINE ROUTING

Now that the pump is installed on the engine, you are ready to add fittings and lines. On Moroso rotor and scroll dry sump pumps, the inlets are on the bottom and the outlets are on top. Both inlet and outlet are tapped for -10 AN fitting. For -12 AN oil lines, use a -10 AN to -12 AN fitting.

On Drag Race Dry Sump systems, there are several choices for oil line routing. For inlet, one arrangement is to scavenge oil from three locations in the pan using an additional fitting installed in the pan. A second arrangement is to scavenge two lines from the oil pan and one from the cylinder head return galley or the lifter valley area. Either method is acceptable.

Outlet routing of the scavenge sections are variable also. One setup is to run the three outlet lines to the sump tank. This would require adding one additional inlet to the Dry Sump Tank. Use Moroso P/N 22700 inlet fitting and weld it according to the instructions under the existing inlets on the Dry Sump Tank. A second setup is to run any two of the three scavenge outlets to a scavenge manifold P/N 23695. This allows for two outlets to be run into one. Thus eliminating the need for an additional inlet on the tank. Methods are tailored to specific applications.

Starting at the front (pulley end) of the pump, the first upper and lower holes are for the front scavenge section. The lines are attached according to chosen arrangement.

The second set of holes (going front to rear) are for mid scavenge stage. Attach according to choice.

The third set of holes (going front to rear) are for the rear scavenge stage. Attach according to choice.

The last set of holes at the rear of the pump are for the pressure section. The bottom hole is connected to a line running from the dry sump tank bottom pickup tube. The top hole feeds oil to the engine. It should be attached by a line to a remote oil filter and then to the oil filter block-off plate. Be sure to use the appropriate oil pump block-off when removing the old internal oil pump. Refer to our list of matched components at the beginning of these instructions.

PRESSURE ADJUSTMENT

The Moroso rotor and scroll dry sump pumps have 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), counter-clockwise to decrease oil pressure. Remember to tighten the locknut after adjusting the pressure.

PUMP DISASSEMBLY

1. 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.
2. Provide yourself with a clean work area where parts may be inspected and cleaned.
3. First remove the drive pulley and use a very fine file or emery cloth to remove any set screw burrs from the shaft #31, which will prevent possible damage to the front seal. Extreme care should be taken not to scratch the shaft.
4. Then loosen and remove the three studs #36, which hold the pump together.
5. Gently lift off the front scavenge stage #3, and then the first rotor and scroll housing #6. Note the O-rings #22 on either side of the housing.

6. Then carefully remove the scroll #5 first and then the rotor #4. The rotor is located on the shaft with a woodruff key and may need a gentle tug to slide it off. Remove the woodruff key #32.
7. Repeat this process for each section until all sections have been disassembled. **NOTE:** The last rotor is attached to the shaft with a grooved pin #33 and should not be separated from the shaft unless the pin is to be replaced.
8. To disassemble the by-pass valve #25, simply unscrew it from the pressure section #23 then loosen the lock nut #30 and back it off the pressure adjustment screw #28 and remove it. Then remove the pressure spring #27 and piston #26.
9. Bearing #2, #12, #17, and seal #1 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 bearings to be sure that they turn freely. Look for high spots on rotors and scrolls and remove with a fine toothed file. If not removed, they will cause circular grooves on the face of the sections.

Examine each rotor and 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 or gears. Measure the I.D. of the housing in three places to check for an out of roundness condition.

Inspect the scavenge and pressure stages for wear marks on the rotor and 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

1. Providing yourself with a clean work area will ensure a professional assembly job.
2. Re-examine all parts and clean again if necessary.
3. We have found that petroleum jelly is an excellent assembly lubricant if used sparingly. Engine oil will do if petroleum jelly is not available.
4. The pump is assembled from back to front.
5. Begin by laying the pressure stage #23 on its back with the kidney shaped ports facing up.
6. Put a dab of petroleum jelly on six places around the O-ring step on the rotor and scroll housing #21. 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 that the rotor and scroll will touch sparingly with petroleum jelly

7. Carefully insert the scroll #20 and make sure it turns freely. Situate the next O-ring on the exposed side of the rotor and 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.
8. Lubricate the bearing in Rear Scavenge Stage #18 and gently slide the assembly over the shaft with the kidney shaped ports facing up. **Failure to install this component with the ports facing up will result in lack of oil pressure. Be sure it is installed correctly now.**
9. Properly seat it over the rotor and scroll housing making sure the O-ring is still in place.
10. Place a woodruff key #32 in the key slot in the shaft and slide the rotor in place over the woodruff key. Now place the next rotor and scroll in place with O-ring attached as before, again aligning the flats on the exterior of the housing with the flats on previously placed units. Coat the surfaces lightly with lubricant and install the scroll as before.
11. Install Mid-scavenge section #13 into place. Make sure rotor and scroll are aligned properly and O-rings are seated.
12. Position the next O-ring and slide mounting bracket #8 into place. Lubricate the face lightly and assemble the rotor and scroll as before. Don't forget the woodruff key.
13. Carefully slide the front scavenge section #3 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 hasn't moved out of position.
14. put a small amount of Loctite on the threads of the three long studs #36 and insert them in the bores. Tighten the studs into the pressure section. The locknuts #38 are installed next. These studs should be tightened evenly, gradually working your way up to 100 inch pounds of torque.
15. To assemble the by-pass valve #25, first drop the piston #26 into the bore followed by the pressure spring #27.
16. Slide O-ring #29 over pressure adjustment screw #28. 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.
17. Make sure that O-ring #24 is in place between the threads and the head of the by-pass valve and screw it into place in the pressure section.
18. 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. Pump should spin easily with less than 3 in/lbs. of torque.
19. The pump is now ready to put back on your engine.

Refer to the sections on mounting, oil line routing and pressure adjustment for re-installation.

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. 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 valve should be disassembled, cleaned, and inspected. This can be done without disassembling the rest of the pump. To remove the by-pass valve, 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 piston from the pump body. Inspect for metal chips, burrs or wear. The piston must be able to move freely inside the valve body.

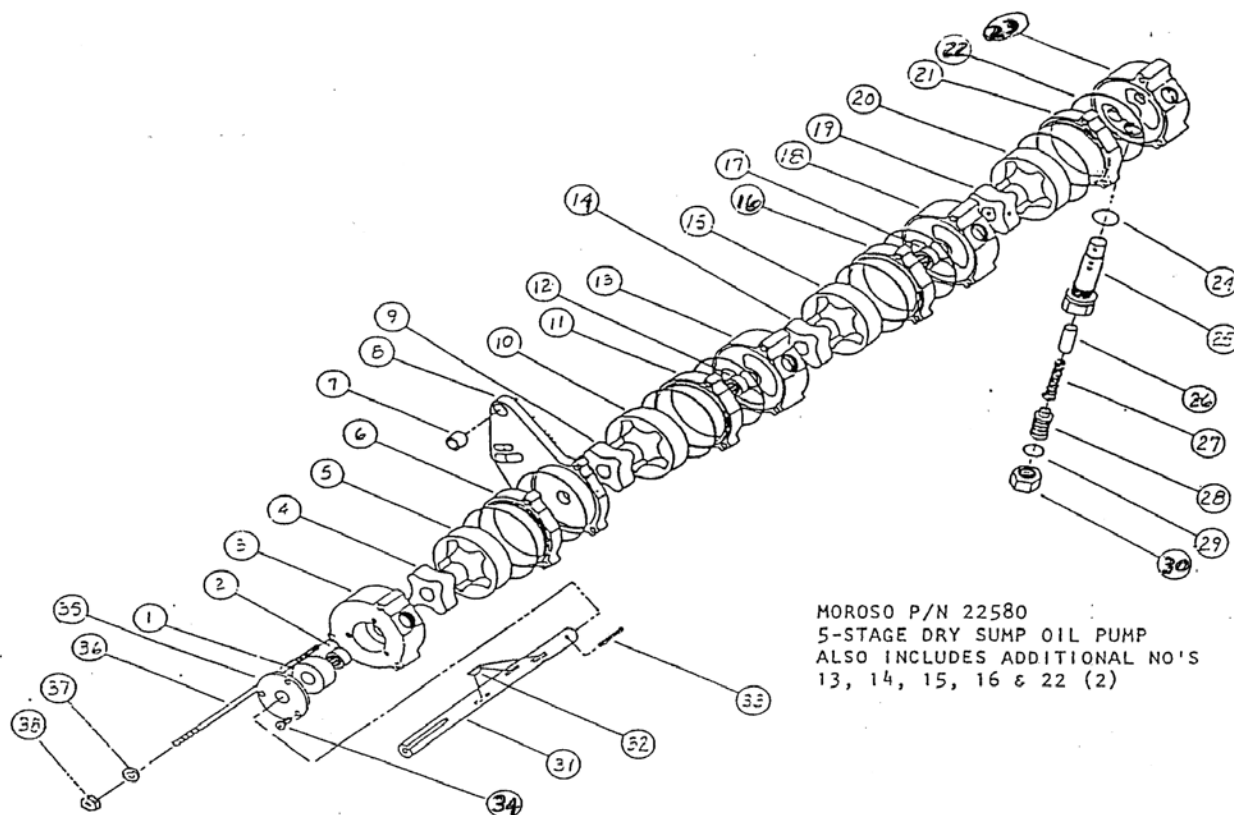
The pump itself will pump oil as long as the gears will turn, but an accident such as a blown engine is likely to put bits and pieces of metal into the oil lines, which, if allowed to get into the pump, will eventually damage some of the working parts. In the event of such an accident, the pump should 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 the parts for complete rebuilding.

Maintenance is an important aspect of any racing component. 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.

Treat it well and it will reward you with many trouble free racing miles.

HINTS FOR BETTER INSTALLATION

1. Use Moroso filter fittings #23950 or #23960, whenever possible to help remove metal chips from the oil. Install one before the pump (in the pickup of the oil tank) to help protect the pump from damage.
2. Before starting a new motor, 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 tank. 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 (1) minute.
3. Avoid 90° fittings if possible.
4. For additional chassis clearance around pump, use Moroso P/N23490 Mounting Bracket.
5. Two extra pressure relief springs are also supplied. One medium pressure spring measuring 1.875" long with a white stripe. One high pressure spring 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.



MOROSO P/N 22580
5-STAGE DRY SUMP OIL PUMP
ALSO INCLUDES ADDITIONAL NO'S
13, 14, 15, 16 & 22 (2)

- 1 FRONT SEAL
- 2 BEARING
- 3 FRONT SCAVENGE SECTION
- 4 ROTOR 1.100
- 5 SCROLL 1.100
- 6 ROTOR AND SCROLL HOUSING 1.100
- 7 STEEL BUSHING
- 8 MOUNTING BRACKET
- 9 ROTOR 1.100
- 10 SCROLL 1.100
- 11 ROTOR AND SCROLL HOUSING 1.100
- 12 BEARING
- 13 MID SCAVENGE SECTION
- 14 ROTOR 1.100
- 15 SCROLL 1.100
- 16 ROTOR AND SCROLL HOUSING 1.100
- 17 BEARING
- 18 REAR SCAVENGE SECTION
- 19 ROTOR .875

REPLACEMENT PARTS

- 20 SCROLL .875
- 21 ROTOR AND SCROLL HOUSING .875
- 22 O-RING 2.875 I.D. (8 REQUIRED)
- 23 PRESSURE SECTION
- 24 O-RING .75 I.D.
- 25 BY-PASS VALVE BODY
- 26 STEEL PISTON
- 27 PRESSURE SPRING
- 28 PRESSURE ADJUSTMENT SCREW
- 29 O-RING .50 I.D.
- 30 LOCK NUT
- 31 SHAFT
- 32 KEY (3 REQUIRED)
- 33 GROOVED PIN
- 34 BUTTON HEAD SCREW
- 35 SEAL CAP
- 36 STUD (3 REQUIRED)
- 37 WASHER (3 REQUIRED)
- 38 LOCKNUT (3 REQUIRED)

P/N	DESCRIPTION	CONTENTS INCLUDES #'S
97650	REPLACEMENT SMALL PARTS KIT	1,2,12,22,24,29,32,33
97660	REPLACEMENT ROTOR AND SCROLL HOUSING 1.100	6 or 11 or 16
97665	REPLACEMENT ROTOR AND SCROLL HOUSING .875	21
97670	REPLACEMENT ROTOR AND SCROLL 1.100	4&5 or 9&10 or 14&15
97675	REPLACEMENT ROTOR AND SCROLL .875	19&20
97680	BY PASS VALVE PARTS KIT	24,25,26,27,28,29,30

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

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