INSTALLATION INSTRUCTIONS

P/N 22560 – ROTOR & SCROLL DRY SUMP OIL PUMP
3-STAGE DRAG RACE – SMALL OR BIG BLOCK CHEVROLET
90° V-6 WITH DRIVER'S SIDE MOUTING 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.

	90° V-6	SBC	BBC
OIL PAN	21586	21240	21570, 21590
DRIVE KIT	23600, 23660	23600, 23660	23610, 23670
DRY SUMP TANK	22670	22670	22670
OIL FILTER BLOCK-OFF		23780	23780
OIL PUMP BLOCK-OFF	23790	23790	23790
INLINE FILTER	23850, 23860	23850, 23860	23850, 23860
OIL PREHEATER	23980, 23990	23980, 23990	23980, 23990

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, and 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 ½" bolts and washers.

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

OIL LINE ROUTING

Now that the pump is installed on the engine, you are ready to add fittings and lines. On Moroso Rotor & Scroll dry sump oil 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.

Starting at the front (pulley end) of the pump, the first upper and lower holes are for the front scavenges section. The bottom hole, which is the inlet, should be attached to a line coming from the front pickup in the oil pan. The top hole, which is the outlet, should be attached to a line going to an inlet on the dry sump tank.

The last set of holes at the rear of the pump is 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 block off plate. Be sure to use the appropriate oil pump block-off plate 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 & 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), counterclockwise 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. Remove the drive pulley and use a very fine file or emery cloth to remove any setscrew burrs from the shaft #20, which will prevent possible damage to the front seal. Extreme care should be taken not to scratch the shaft.

4. Loosen and remove the three long bolts #19, which hold the pump together.

5. Gently lift off the front scavenges stage #3 and then the first Rotor & Scroll housing #6. Note the O-rings #17 on either side of the housing.

6. 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 #21.

7. Repeat this process for each section until all sections have been disassembled. **NOTE**: The last Rotor is attached to the shaft with two setscrews and should not be separated from the shaft. If the Rotor is removed from the shaft, special attention must be paid to properly align the setscrews with the hole in the shaft when reassembling. Loctite these screws in place with **GREEN** Loctite.

8. To disassemble the by-pass valve #24, simply unscrew it from the pressure section #18 then loosen the locknut #29 and back it off the pressure adjustment screw #27 and remove it. Then remove the pressure spring #26 and piston #25.

9. Bearing #2 and #12 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 & 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 & 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 and scavenge and pressure stages 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

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 #18 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 & Scroll housing #16. 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 pressure section. Coat all surfaces that the Rotor & Scroll will touch sparingly with petroleum jelly.

7. Carefully insert the Scroll #15 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.

8. Lubricate the bearing in Mid Scavenge State #13 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 & Scroll housing; making sure the O-ring is still in place.

10. Place a woodruff Key #21 in the key slot in the shaft and slide the Rotor in place over the woodruff key. Now place the next Rotor & 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. Position the next O-ring and slide-mounting bracket #8 into place. Lubricate the face lightly and assemble the Rotor & Scroll as before. Don't forget the woodruff key.

12. 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.

13. Put a small amount of Loctite on the threads of the three long bolts #19 and insert them in the bores. These bolts should be tightened evenly, gradually working your way up to 80 inch pounds of torque.

14. To assemble the by-pass valve #24, first drop the piston #25 into the bore, followed by the pressure spring #26.

15. Slide O-ring #28 over pressure adjustment screw #27. 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.

16. Make sure that O-ring #23 is in place between the threads and the head of the by-pass valve and screw it into place in the pressure section.

17. 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.

18. 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 staring 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 minute.

3. Avoid 90° fittings if possible

4. For additional chassis clearance around the pump, use Moroso part #23490 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.

1. FRONT SEAL
2. BEARING
3. FRONT SCAVENGE SECTION
4. ROTOR 1.100
5. SCROLL 1.100
6. ROTOR & SCROLL HOUSING 1.100

7. STEEL BUSHING
8. MOUNTING BRACKET
9. ROTOR 1.100
10. SCROLL 1.100
11. ROTOR & SCROLL HOUSING 1.100
12. BEARING
13. MID SCAVENGE SECTION
14. ROTOR .875
15. SCROLL .875
16. ROTOR & SCROLL HOUSING .875
17. O-RING 2.875 I.D. (6 REQUIRED)
18. PRESSURE SECTION
19. BOLT (3 REQUIRED)
20. SHAFT
21. KEY (2 REQUIRED)
22. GROOVED PIN
23. O-RING .75 I.D.
24. BY-PASS VALVE BODY
25. STEEL PISTON
26. PRESSURE SPRING
27. PRESSURE ADJUSTMENT SCREW
28. O-RING, .50 I.D.
29. LOCKNUT
30. SEAL CAP
31. BUTTON HEAD SCREW (3 REQUIRED)

P/N	DESCRIPTION	CONTENTS INCLUDES #'S
97650	REPLACEMENT SMALL PARTS KIT	1, 2, 12, 17, 21, 22, 23, 28
97660	REPLACEMENT ROTOR & SCROLL HOUSING 1.100	6 OR 11
97665	REPLACEMENT ROTOR & SCROLL HOUSING .875	16
97670	REPLACEMENT ROTOR & SCROLL 1.100	(4 & 5) OR (9 & 10)
97675	REPLACEMENT ROTOR & SCROLL .875	14 & 15
97680	BY-PASS VALVE PARTS KIT	23, ,24, 25, 26, 27, 28, 29