



INSTALLATION INSTRUCTIONS

**P/N 22500 - ROTOR & SCROLL DRY SUMP OIL PUMP
3-STAGE OVAL TRACK/ROAD RACE
SMALL OR BIG BLOCK CHEVROLET
90° V-6 WITH 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

	90° V-6	SBC	BBC
OIL PAN	21586	21510, 21520, 21550, 21560	21540
DRIVE KIT	23620, 23630	23620, 23630	
DRY SUMP TANK	22660, 22663	22660, 22663	22660, 22663
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
FILTER FITTING	23960	23950, 23960	23950, 23960
INLET FITTING FOR TANK	22700	22700	22700

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 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 two bushings with the 3/8" I.D. into both mounting brackets #8 and #13. When installing the pump on big block Chevrolets, use the 7/16" I.D. bushings. The bushings are marked #35 on the exploded view.

The pump mounts on the driver's side of the engine into the two tapped holes next to the side of the timing chain cover.

To attach the pump to the small block Chevrolet or 90° V-6, use a 3/8-16 x 1 1/2" bolt and washer in the slotted adjustment hole. Use a 3/8-16 x 2 1/2" bolt through the top hole in both bracket #8 and #13, and through the supplied .80 long spacer #30. **NOTE:** the bolt goes through both mounting brackets and the spacer. This prevents flexing of the mounting brackets.

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 -10AN fitting. For -12AN oil lines, use a -10AN to -12AN fitting.

Starting at the front (pulley end) of the pump, the first upper and lower holes are for the front scavenge stage. 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 second set of holes (going front to rear) are for the rear scavenge stage. Again, the bottom hole, which is the inlet, should attach to a line coming from the rear pickup in the oil pan. It is a common practice to plug the outlet in an Oval track/road Race pump as both front and rear scavenge stages are internally connected.

You may need to add a second inlet to the dry sump tank. If so, use Moroso part # 22700 inlet fitting and weld it according to the instructions under the existing inlet on the dry sump tank. **NOTE:** This additional inlet is required only if two lines are run from the pump to the tank.

Now attach a line from the rear scavenge stage outlet to the (newly added) inlet on the dry sump tank.

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 motor. It 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 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). Do the opposite to decrease oil pressure. Remember to tighten the locknut after adjusting the pressure.

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 ball from the pump body. Inspect for metal chips, burrs or wear. The ball 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 parts for complete rebuilding.

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 #20, which will prevent possible damage to the front seal. Extreme care should be taken not to scratch the shaft.
4. Next loosen and remove the three long bolts #19 which hold the pump together.
5. Gently lift off the front scavenge stage #3 and then the first Rotor & Scroll housing #6. Note the O-rings #17 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 #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 set screws #22 and should not be separated from the shaft. If this Rotor is removed from the shaft, special care must be taken to properly align the set screws with the hole in the shaft. 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 off the pressure adjustment screw #27 and remove it. Then remove the pressure spring #26 and valve ball #25.
9. Bearings #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 & Scroll and remove with a fine toothed file. If not removed they will cause circular grooves on the face of the stages.

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 the 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 of the 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 mounting bracket #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 next rotor in place over the woodruff key. Now place the next Rotor & Scroll housing 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 as before and slide mounting bracket #8 into place. Lubricate both faces 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 ball #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 rotors have to seat themselves 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 reinstallation.

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

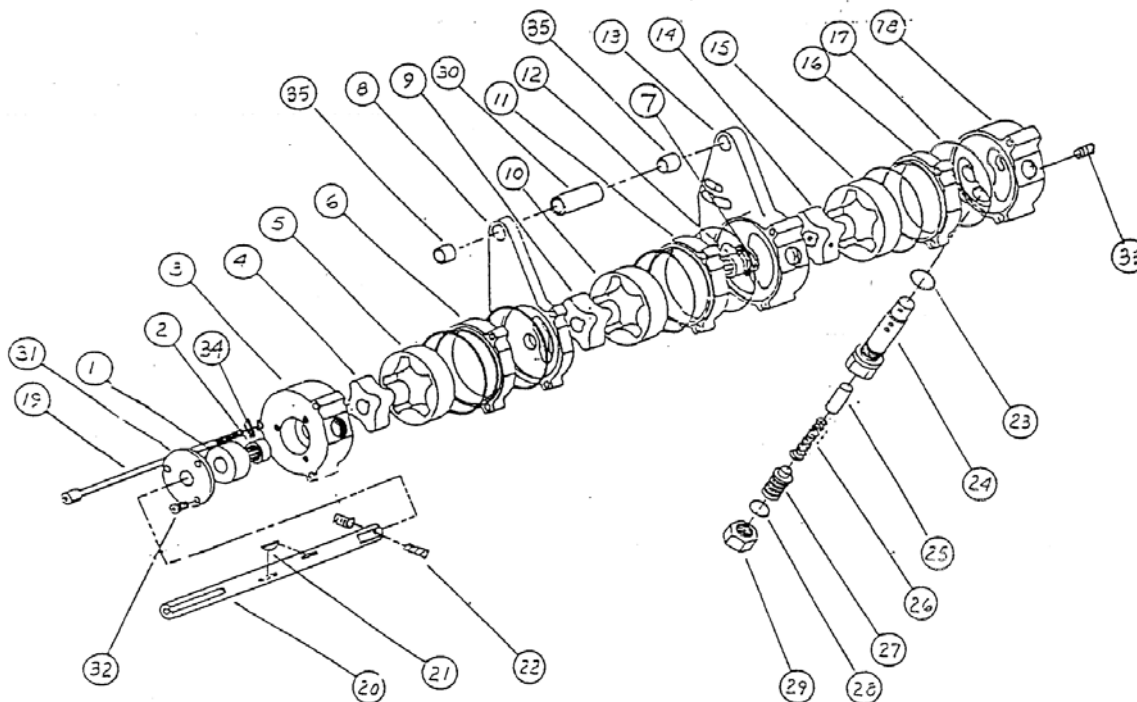
1. Use Moroso #23850 or #23860 inline filters between the pickups in the tank and the inlets of the pump. Use #23960 filter fittings in the pickup of the Dry Sump tank. These filters will remove metal chips from the oil before it can get to, and damage, the dry sump pump.

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 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 pump, use Moroso P/N 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	17	O-RING (6 REQUIRED)
2	BEARING	18	PRESSURE SECTION
3	FRONT SCAVENGE SECTION	19	BOLT 93 REQUIRED)
4	ROTOR 1.100	20	SHAFT
5	SCROLL 1.100	21	WOODRUFF KEY (2 REQUIRED)
6	ROTOR & SCROLL HOUSING 1.100	22	SET SCREW (2 REQUIRED)
7	SEAL	23	O-RING
8	MOUNTING BRACKET	24	BY-PASS VALVE BODY
9	ROTOR 1.100	25	STEEL PISTON
10	SCROLL 1.100	26	PRESSURE SPRING
11	ROTOR & SCROLL HOUSING 1.100	27	PRESSURE ADJUSTMENT SCREW
12	BEARING	28	O-RING
13	MID SCAVENGE SECTION	29	LOCKNUT
14	ROTOR .875	30	SPACER
15	SCROLL .875	31	SEAL CAP
16	ROTOR & SCROLL	32	BUTTON HEAD SCREW (3 REQUIRED)
		33	SET SCREW
		34	WASHER (3 REQUIRED)
		35	BUSHING (2 REQUIRED)

REPLACEMENT PARTS

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>CONTENTS INCLUDES #'S</u>
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)
22500210	REPLACEMENT ROTOR	14
97675	REPLACEMENT SCROLL .875	15



**For Technical Assistance, Call Moroso's Tech Line at
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