



Manufacturers and Designers of
Performance Power Steering
Systems and Components

SHAFT DRIVE PUMP INSTRUCTIONS

IMPORTANT! PLEASE READ THESE SHEETS BEFORE INSTALLATION

You must first calculate pump rpm prior to installing this pump. Divide your crank pulley diameter by the power steering pump pulley diameter and multiply by maximum engine rpm. (Example: $4.5'' \text{ cp} \div 6'' \text{ psp} = 0.75 \times 7,200 = 5,400 \text{ rpm pump speed.}$) **Maximum recommended aluminum pump speed is 9,000 rpm.** The higher the pump rpm the more horsepower the steering pump will consume. The steering pump will give maximum assist by 1,500 rpms, so turning it faster will only consume more horsepower. You must keep in mind that the pit speed of the pump must be in the 1,000-1,500 rpm range. Torque on the pump pulley nut is 46 ft lbs.

Please fill out the enclosed Warranty Card. If you have problems once the pump has been installed, **do not return it to your dealer. All pumps must come back to the factory for replacement or repair.** Please call 770-422-5135 for a RGA number for all returns.

Installation Instructions:

KRC offers several models of shaft drive steering pumps. They are available with a 3/8" hex or 17-splined shafts. We have adapters to fit most dry sump applications, as well as engine plates for sprint cars. Our shafts and drive spuds are heat treated to Rockwell 56-58 hardness for long wear life. The drive shaft and spud are the weak link in a positive drive application. They take a beating on rough tracks. Inspecting them for wear every 200 to 300 laps is highly recommended. V-belt and serpentine pump pulleys do not have this problem because the belt can slip momentarily when the pump is put in a bind. Shaft drive, Gilmer and HTD pulley and belt combinations cannot slip, so the pump shaft and/or drive spud can twist or break if the steering is in a bind.

- 1)** Make sure that you have the proper adapter kit and attach it to your dry sump pump or engine plate according to the instructions included with the bracket.
- 2)** Bolt the pump to the adapter with fittings pointed in any direction that will suit your application. Make sure the pump engages the drive spud before tightening the pump bolts. **Use wheel bearing grease on pump shafts and drive spuds, not anti-seize. Anti-seize is abrasive and it will increase the wear on the shaft and spuds.** Condensation collects in this area and can cause them to rust very quickly if not kept lubricated.
- 3)** Mount the reservoir tank so the bottom of the fluid level, in the tank, will be at least two inches above the top of the pump. This will insure that you won't have a supply problem feeding the pump. All pumps require a gravity feed on the fluid to prime it. The suction will go up as the rpm's increase.

Continued on Page 2



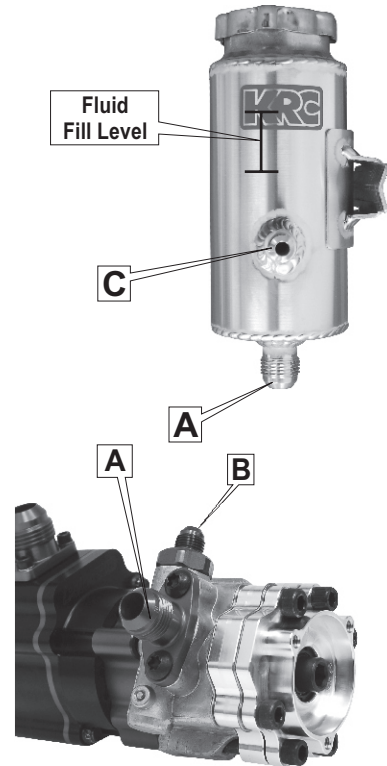
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SHAFT DRIVE PUMP INSTRUCTIONS

Continued from Page 1

4) Using only high pressure power steering hose (Aeroquip Blue P/S Hose or equivalent) connect (-10 hose) **A** on the tank to **A** on the pump. Then connect the (-6) pressure line **B** on the pump to the servo or the largest hole on the stock steering box. O-ring or inverted flare stock steering box to -6 adapters are sold separately. Connect the return line on the servo, or small hole on a stock steering box, to **C** on the tank. **Please read "Power Steering Hose Tech" on Page 3 for more information regarding the proper hose requirements for a power steering system.**

5) Fill the tank (KRC Power Steering Fluid is highly recommended) to a point halfway between the -6 return fitting and the top of the tank. Then rotate the pump several times to prime it before starting the engine. Raise the front wheels off of the ground, then start the engine and turn the steering wheel from lock to lock several times to bleed all of the air out of the system. Twist the cap off to allow the air to escape. Lower the car. While the engine is idling, check the fluid level. Make sure that you have 25% expansion space left inside the tank when the fluid warms up.



OPTIONAL FUEL DRIVE INSTRUCTIONS

KRC steering pumps that are equipped with a 3/8" female hex drive output, have a Hilborn 3-bolt pattern. Waterman, Barry Grant, DSR, Ron's and other fuel pumps have this pattern. Some Ron's fuel pumps have the mounting pattern cast into the pump body. On these pumps, make sure the hex does not bottom out in the drive spud before the registers meet on the two pumps. If it does, mill or grind the male hex on the fuel pump so the register will meet. It is best to use fuel pumps that have clamp type mounting brackets. This allows you to rotate the fuel pump 360 degrees and get full engagement on the drive spud. The 3/8" output drive spud on the power steering pump will back out if you rotate the pump backwards. When you are priming the engines oil pump, make sure that it is turning in the right direction. Use wheel bearing grease on the drive spud to reduce wear on the hex shaft and spud. **Do not use anti-seize it will promote wear on the spud and shaft.** A replacement 3/8" female hex to 1/4" x 28 male output drive spud on the rear of the power steering pump is available separately, order by part number KRC 19670000. The pump rear cover seal kit is available under part number KRC 19680000.





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KRC'S EXCLUSIVE CHANGEABLE FLOW VALVE TECHNOLOGY

KRC offers the only pump with changeable flow control fittings. KRC pumps are shipped with a standard flow control fitting that will give you excellent feel and assist in 90% of all applications. The standard -6 flow fitting has no identification mark on the hex. All optional flow fittings have an identifying mark stamped on the hex, and they will allow you to change the feel in your steering (see chart to right). The more flow your steering system receives the easier it will be to turn the wheels. If you increase the flow too much, the road feel in the steering will go away at higher speeds. Higher flow fittings are required when using steering quickeners or 3.4 inch per revolution, or faster, rack & pinions on short tracks with tight turns. Lower flow fittings are required to put feel and stability back in the steering on tracks with long straightaways. Cars on super speedways can use number 4 through 7 fittings, while a 1/4 mile track open wheel modifieds with 2-to-1 steering quickeners could try a B through E fitting. When selecting a flow control valve for a race track only car, the driver should use the valve that feels best at race speeds. On street driven race cars, you must consider finding a happy medium between the ease of parking and highway speed stability. Optional flow control valves are available individually or in sets of 4 from KRC or your local dealer. In high vibration applications you may want to use a steel flow fitting. To order a steel flow fitting change the 3 in the part number to a 4.

Aluminum Fitting Part Number	Aluminum Pump Flow	ID Mark
KRC 25300 407	SET OF 4	--
KRC 25300 912	SET OF 4	--
KRC 25304 000	1.05 GPM	4
KRC 25305 000	1.32 GPM	5
KRC 25306 000	1.58 GPM	6
KRC 25307 000	1.84 GPM	7
KRC 25308 000	2.11 GPM	NONE
KRC 25309 000	2.37 GPM	B
KRC 25310 000	2.64 GPM	C
KRC 25311 000	2.90 GPM	D
KRC 25312 000	3.17 GPM	E

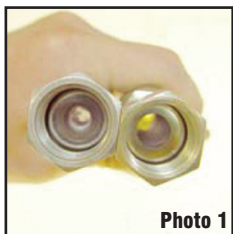


Photo 1

Power steering pumps require a hose with a vacuum rating of 28 INCHES/HG on the inlet side, and a minimum 1/2" inside diameter. This is required to keep the hose from collapsing at higher RPMs. As seen in Photo 1 to the left, common hydraulic hose may have a -10 fitting on them, but the inside diameter is smaller than -6 (.265"). This will damage the pump because there is no way for the pump to intake enough fluid to meet its requirement through such a small hole.



Photo 2

Push-lock hose may be the proper inside diameter, but the vacuum rating is only 18 INCHES/MG. As the fluid warms up, this rating actually goes down. Push-lock hose will suck shut anywhere there is a bend in it, starving the pump of fluid and can cause severe damage to the internals of the pump. See Photo 2.

The -6 pressure hose, leaving the pump, must have an operating pressure of 2,250 psi. and an inside diameter of .31". Common hydraulic hose may have the proper operating range, but their inside diameter is slightly smaller. See Photo 3. The smaller diameter can restrict the flow to the steering gear. This can cause problems in your steering, such as tight spots in the turns and increased driver effort.

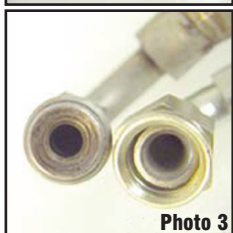


Photo 3

Also make sure the -10 feed line from the reservoir tank, remote tanks only, has a 1/2" inside diameter. Some companies have been importing tanks to the U.S. that have a 3/8" inside diameter. This will restrict flow to the pump and will damage the pump within a few races.

KRC only recommends Aeroquip AQP High Pressure power steering hose with steel AN fittings.

Power Steering Hose Tech

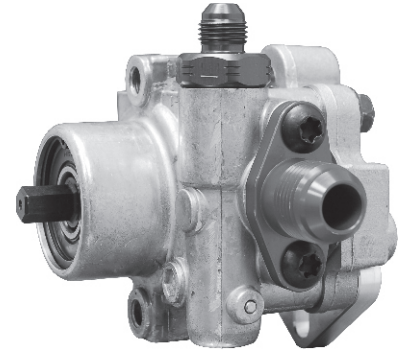


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Tips To Extend the Life of Your New Pump:

- 1) Never start your engine without fluid in the reservoir tank. One minute without fluid can permanently damage the pump.
- 2) Route all hoses away from headers to keep from adding heat to the system and burning the fluid.
- 3) We highly recommend a mineral based power steering fluid or equivalent. In our test, it runs cooler than synthetic based fluids. **For best results use KRC Power Steering fluid.**
- 4) When assembling new hoses, clean them with a rifle bore brush, then flush them out with hot water and air dry before use. Most problems with power steering systems are due to contamination from new hoses, or other steering components, which in turn damages the pump. Always place caps on pumps, steering gears and hoses when system is open to the air.
- 5) Install any filters or coolers on the return side if they are needed.



Common Questions and Answers:

- 1) **Steering feel is too heavy in the turns:** Change optional flow fitting to a higher letter.
- 2) **Steering feel is too light in the turns:** Change optional flow fitting to a lower number.
- 3) **Pump stopped working after only a few laps:** The most common problem on installation is forgetting to clean out the hoses and steering box when installing a new pump. The pump may have to be returned to the factory for cleaning to remove all trash.
- 4) **Assist fades the longer you race:** Overheating the fluid is the problem. Check the fluid temperature immediately after the race. The fluid should not be over 250 degrees. If it is over 250 degrees the heat is coming from an outside source or maximum rpm of pump has been exceeded. Use only high temperature, anti-foaming power steering fluid. Check for lines or tank that may be near headers. You can add a cooler in the return line if needed, that may cure the problem.

Checking for Suspension Bind:

It is critical to check for any suspension bind in the steering system. Place the car on jack stands and remove the springs from the front of the car. Move the suspension up one inch past the normal suspension travel, then move the steering wheel left and right (with the suspension up). Repeat the same process, but move the suspension down one inch past the normal suspension travel. Check for any binding in the suspension and steering. This will insure you have proper clearance of all steering components. Dirt cars may require the use of a limiting strap on the left front wheel. When the wheel lifts in the corner and is dangling, the steering system may be placed in a bind. Ball joints also have a limit to the travel they can move. If the ball joints extend past their travel limits, it will lock down the steering. Any bind in the suspension will increase the amount of pressure inside your steering system. It could cause the pump to go into pressure relief. The driver will feel a loss of power steering when this occurs.

Flow Valve and Pressure Relief Valve Installation:

Install spring first, then pressure relief valve, the last the flow valve. Torque flow valve to 46 ft lbs. This installation process is the same for both KRC aluminum and cast iron power steering pumps.

