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MANUFACTURERS OF HYDRAULIC COMPONENTS AND SYSTEMS

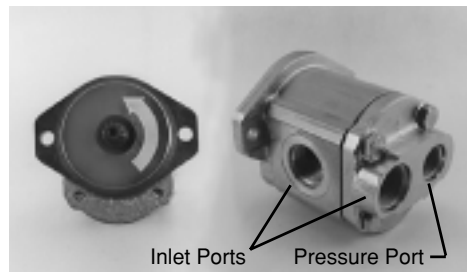


CAUTION

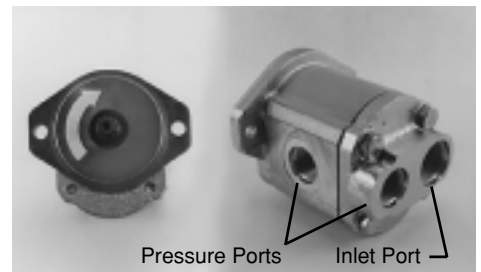
The gear pump you have purchased is a uni-rotational (single direction of rotation) pump. The installation of this pump into a system with an incorrect direction of rotation for the pump may result in personal injury and/or damage to the pump and/or system!

The direction of rotation for your pump can be verified by using the chart, photographs, and descriptions shown. (NOTE: CW = clockwise viewing drive shaft end; CCW = counter-clockwise viewing drive shaft end).

WILLIAMS p/n	Rotation
2536	CCW
2284	CCW
2282	CCW
2276	CCW
2272	CCW
2280	CCW
2296	CCW
2294	CCW
2288	CCW



Counter-Clockwise Rotation Shown



Clockwise Rotation Shown

Pump shaft rotation is determined by viewing pump from the shaft end. For pumps driven clockwise, the larger inlet port must be on the left hand side when looking at the pump from the shaft end and for counter-clockwise rotation, the larger inlet port must be on the right hand side.

Any combination of inlet and outlet ports may be used: i.e., large rear inlet port with small rear outlet port, OR large side inlet port with small side outlet port, OR large rear inlet port with small side outlet port. The remaining (unused) ports should be plugged according to the table below.

The following chart specifies torque requirements for the SAE port plugs installed in the side or rear ports of your Gear Pump.

PORT SIZE (SAE)	TORQUE (ft-lb)	TORQUE (N-m)
3/4 - 16	15 - 20	20 - 27
7/8 - 14	20 - 25	27 - 34
1-1/16 - 12	30 - 35	40 - 47
1-5/16 - 12	45 - 50	61 - 68
1-5/8 - 12	65 - 70	88 - 95

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Williams[®] MACHINE & TOOL

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Instruction Sheet Williams P/N 2412

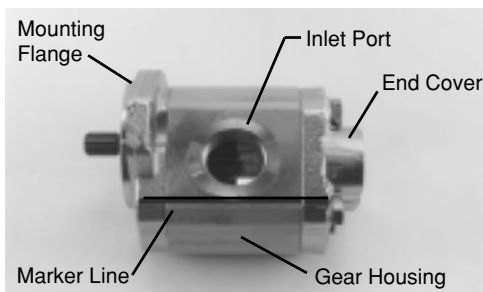
(Revised November 2006)

Reverse Shaft Rotation for GP900 and GP1500 Series Gear Pumps

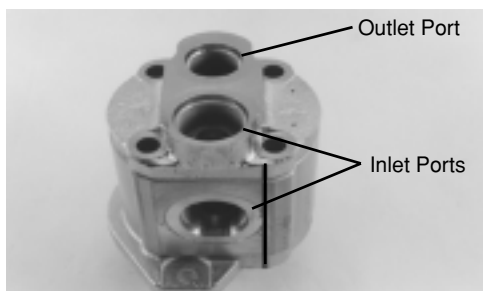
Note: If pump is new, it will not be necessary to replace the seals in the pump as long as care is taken to prevent damage to the seals while disassembling and reassembling the pump. If the pump has been used, it is recommended that all the seals be replaced as a kit. The seal kit number for a GP900 Series Gear Pump is 3116. The seal kit number for a GP1500 Series Gear Pump is 3117.

This instruction sheet demonstrates how to change from counterclockwise rotation to clockwise rotation.

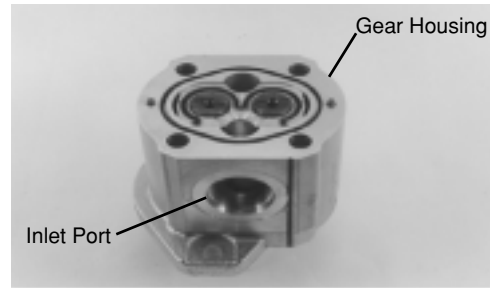
Step 1. Clean outside of pump thoroughly, make sure the work area is clean.



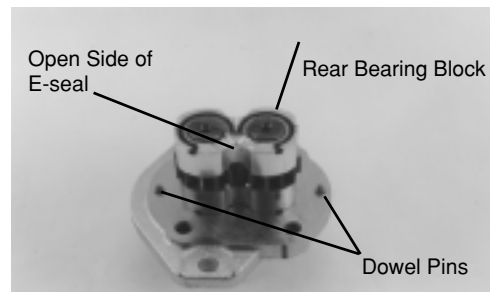
Step 2. Use a permanent marker pen to mark a line across the mounting flange, gear housing and end cover.



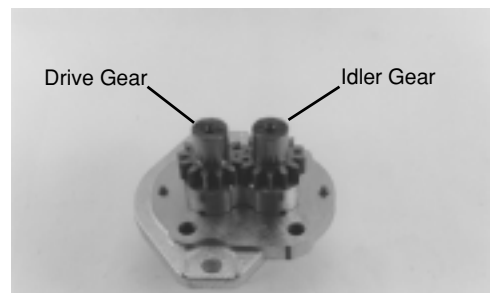
Step 3. Clamp the ears of the pump in a protected jaw vise, with pump shaft facing down, loosen and remove the four torx (T50) head bolts.



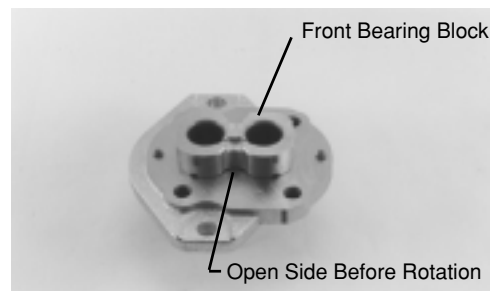
Step 4. Lift and remove the ported end cover.



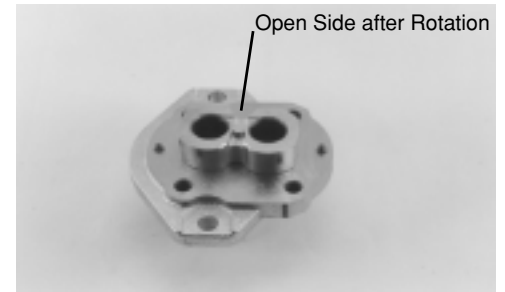
Step 5. Carefully remove the gear housing, make sure the rear bearing block remains on the drive and idler shafts. Be careful not to lose the dowel pins.



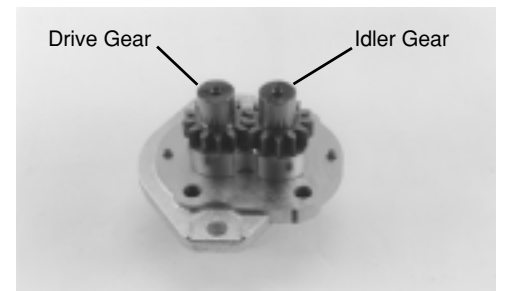
Step 6. Remove the rear bearing block from the drive and idler shafts. It is very important at this point to note the relative position of the bearing block to the front mounting flange.



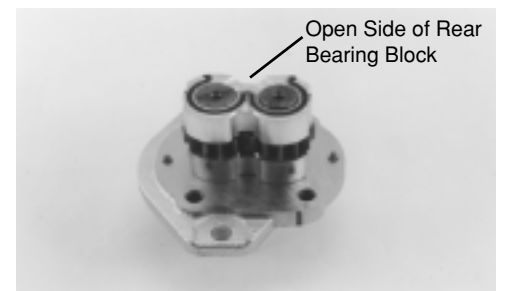
Step 7. Lift and remove the idler and drive gears from the bearing block and front mounting flange.



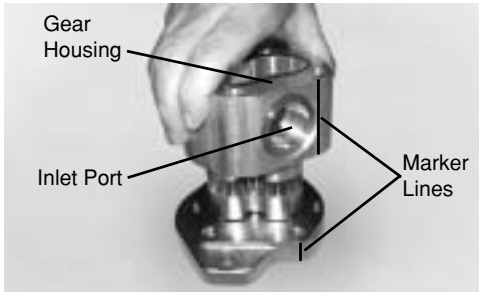
Step 8. Carefully, slightly lift the front bearing block and rotate the block 180° from its previous position. *(CAUTION: make sure E-seal and backup ring stay in position in the bearing block.)* This reorients the open side of the E-seal to point to the new intake side of the pump.



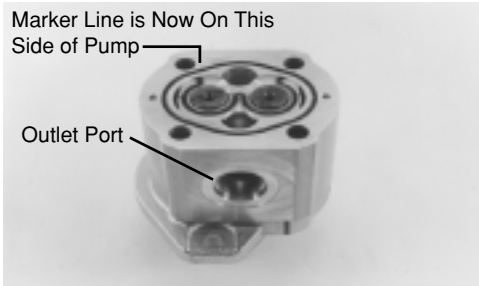
Step 9. Reinstall the drive shaft through the bearing block and mounting flange. It is recommended that a seal sleeve or duct tape be used over (around) the drive shaft to prevent damage to the shaft seal. Install the idler gear in the remaining position in the bearing block. Apply a light coat of clean oil to the face of the drive and idler gears.



Step 10. Pick up the rear bearing block, with seal side up and with the open side of the E-seal facing the reoriented intake side of the pump, place over the drive and idler gear shafts.

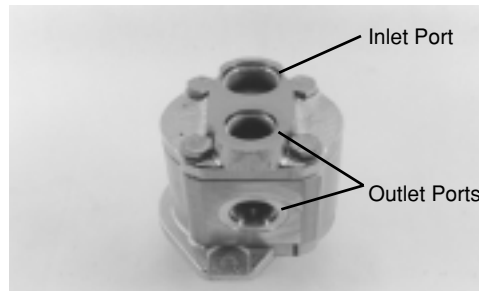


Step 11. Pick up the gear housing and rotate it 180 degrees so that the marked line is now on the opposite side of the pump from its original position. Take care to make sure the gear housing has been rotated, not flipped. In other words, the same face of the gear housing originally mating with the mounting flange should still mate to it. This will keep the drive gear and idler gear in the same respective gear pocket as they were before the rotation change. The large intake port should be on the same side as the open side of the E-seal.



Step 12. Carefully slide the housing over the rear bearing block assembly until the housing engages the dowel pins in the front mount flange. Make sure the dowel pins are still in place.

The surface of the rear bearing block should be slightly below the face of the gear housing. If the bearing block sits higher than the rear face of the gear housing then the E-seal or o-ring have shifted out of the groove. If this is the case, remove the gear housing and check for proper seal installation.



Step 13. Pick up the rear ported end cover and place over the gear housing. The large intake port should be on the same side as the large port in the gear housing.

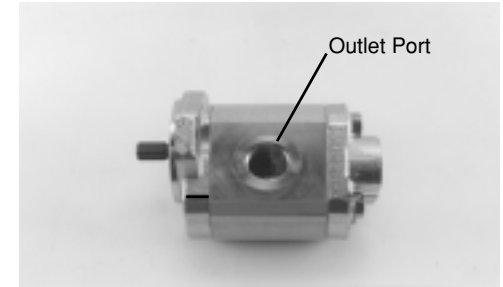
REAR COVER TORQUE SPECIFICATIONS

GP900 Series Pumps –
41-46 lb-ft (55-63 N-m)

GP1500 Series Pumps –
95-110 lb-ft (130-150 N-m)

Remove pump from vise. The drive shaft is now in position for opposite rotation. Place a small amount of clean oil in the inlet of the pump and rotate the drive shaft by hand.

Step 14. Pump is shown reassembled in the opposite clockwise rotation, the pressure port is now on this side of the pump. Notice the marked lines on the gear housing and rear cover plate are now on the opposite side of the pump. (Reference photo in step 2)



Step 15. This is a view of the opposite side of the pump (*inlet port side*) to show the new location of the marked lines.

