SP20B AND SP25A SERIES PUMP

PARTS MANUAL

PRINCE MFG. CORP.

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Date: July 2013
1) ALL HYDRAULIC PUMPS MUST BE PROPERLY INSTALLED INTO THE HYDRAULIC SYSTEM TO PREVENT PERSONAL INJURY AND/OR PROPERTY DAMAGE. FURTHER, THE IMPROPER SERVICING OF A PUMP MAY RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE. PLEASE READ AND UNDERSTAND ALL CATALOG AND SERVICE INFORMATION BEFORE STARTING. AS WITH ALL MECHANICAL WORK THE PROPER TOOLS, KNOWLEDGE, AND SAFETY EQUIPMENT ARE REQUIRED. ALWAYS WEAR SAFETY GLASSES.

2) MAKE SURE ALL PRESSURE HAS BEEN RELIEVED IN THE HYDRAULIC LINES BEFORE INSTALLING OR SERVICING A HYDRAULIC PUMP

WARNING: ESCAPING HYDRAULIC FLUID UNDER PRESSURE CAN HAVE SUFFICIENT FORCE TO PENETRATE SKIN, CAUSING SERIOUS PERSONAL INJURY. DO NOT USE YOUR HAND TO CHECK FOR HYDRAULIC LEAKS.

3) BEFORE INSTALLING OR SERVICING A HYDRAULIC COMPONENT MAKE SURE ALL WEIGHT HAS BEEN REMOVED FROM THE CYLINDERS OR MOTORS BEFORE DISCONNECTING HYDRAULIC LINES.

WARNING: DISCONNECTING THE HYDRAULIC LINES WHILE THE CYLINDER OR MOTOR IS UNDER LOAD MAY RESULT IN THE UNEXPECTED RAPID MOVEMENT OF MACHINE RESULTING IN SERIOUS PERSONAL INJURY.

4) DO NOT EXCEED THE OPERATING SPECIFICATIONS FOR PRESSURE, FLOW OR TEMPERATURE. ALL HYDRAULIC SYSTEMS REQUIRE A MEANS TO LIMIT THE MAXIMUM PRESSURE. THIS REQUIRES EITHER A PRESSURE RELIEF VALVE IN THE SYSTEM OR A PUMP THAT HAS PRESSURE COMPENSATION.

WARNING: OVERPRESSURE MAY CAUSE SUDDEN AND UNEXPECTED FAILURE OF A COMPONENT IN THE HYDRAULIC SYSTEM RESULTING IN SERIOUS PERSONAL INJURY. ALWAYS USE A GAUGE WHEN ADJUSTING A RELIEF VALVE.
NOTES:
1. ASSEMBLE WITH INLET SIDE OF BEARING CASE ADJACENT TO INLET SIDE OF BODY. THE INLET RECESS ON THE BEARING CASE AS SHOWN ABOVE MUST BE TOWARD THE SIDE OF THE GEAR.
2. ROTATION DIRECTION IS DETERMINED BY VIEWING THE PUMP FROM THE DRIVE SHAFT END. TO INSURE CORRECT PARTS/ORIENTATION OF PARTS, OBSERVE THE FOLLOWING WHEN ROTATING THE DRIVE GEAR IN THE DIRECTION OF ROTATION:
A) THE IDLER GEAR IS TURNED BY THE DRIVE GEAR THROUGH CONTACT ON THE DRIVE SIDE PROFILE OF THE TOOTH (SHALLOW SLOPE SIDE, NO UNDERCUT). LIKE PROFILES ARE TOUCHING AND GEARS ROTATE FREELY WHEN ASSEMBLED IN THE BEARING CASE.
B) THE GEARS TEETH ARE COMING OUT OF MESH ON THE INLET SIDE OF THE PUMP.
3. FRONT AND BACK PLATES MUST ALSO BE ORIENTATED SO THAT THE INLET SIDE IS ADJACENT TO THE INLET SIDE OF THE PUMP BODY.
4. BOLT TORQUE (LUBRICATED THREADS) 24 FT-LB ± 2 FT-LB.
5. THE GROOVE ON THE MOLDED SEAL IS TO BE TO THE OUTSIDE OF THE PUMP.
6. DRILL POINT MARK INDICATES FRONT SURFACE OF BODY.
7. BACKUP STRIP GOES TO INSIDE OF SEAL.
1. Assemble with inlet side of bearing case adjacent to inlet side of body.
2. Rotation direction is determined by viewing the pump from the drive shaft end. To insure correct part orientation of parts, observe the following when rotating the drive gear in the direction of rotation:
   A) The idler gear is turned by the drive gear through contact on the drive side profile of the tooth (shallow slope side with no undercut). Line profiles are touching and gear's rotate freely when assembled in the bearing case.
   B) The gear teeth are coming out of mesh on the inlet side of the pump.
3. Front and back plates must also be oriented so that the inlet side is adjacent to the pump body.
4. BOLT Torque (lubricated threads) 24FT-LB ± 2FT-LB.
5. The groove on the molded seal is to be to the outside of the pump.
6. Drill point mark indicates front surface of body.
7. Backup strip goes to inside of seal.

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SP20B PUMP-CLOCKWISE ROTATION-REAR PORTS (SP20B_D9H_-R)
NOTES:

1. ASSEMBLE WITH INLET SIDE OF BEARING CASE ADJACENT TO INLET SIDE OF BODY.
   THE INLET RECESS ON THE BEARING CASE AS SHOWN ABOVE MUST BE TOWARD THE SIDE OF THE GEAR.

2. ROTATION DIRECTION IS DETERMINED BY VIEWING THE PUMP FROM THE DRIVE SHAFT END. TO INSURE CORRECT PARTS/ORIENTATION OF PARTS, OBSERVE THE FOLLOWING WHEN ROTATING THE DRIVE GEAR IN THE DIRECTION OF ROTATION:
   A) THE IDLER GEAR IS Turned BY THE DRIVE GEAR THROUGH CONTACT ON THE DRIVE SIDE PROFILE OF THE TOOTH (SHALLOW SLOPE SIDE WITH NO UNDERCUT), LIKE PROFILES ARE TOUCHING AND GEARS ROTATE FREELY WHEN ASSEMBLED IN THE BEARING CASE.
   B) THE IDLER GEAR IS TURNED BY THE DRIVE GEAR THROUGH CONTACT ON THE DRIVE SIDE PROFILE OF THE TOOTH (SHALLOW SLOPE SIDE WITH NO UNDERCUT), LIKE PROFILES ARE TOUCHING AND GEARS ROTATE FREELY WHEN ASSEMBLED IN THE BEARING CASE.
   C) THE IDLER GEAR IS TURNED BY THE DRIVE GEAR THROUGH CONTACT ON THE DRIVE SIDE PROFILE OF THE TOOTH (SHALLOW SLOPE SIDE WITH NO UNDERCUT), LIKE PROFILES ARE TOUCHING AND GEARS ROTATE FREELY WHEN ASSEMBLED IN THE BEARING CASE.
   D) THE IDLER GEAR IS TURNED BY THE DRIVE GEAR THROUGH CONTACT ON THE DRIVE SIDE PROFILE OF THE TOOTH (SHALLOW SLOPE SIDE WITH NO UNDERCUT), LIKE PROFILES ARE TOUCHING AND GEARS ROTATE FREELY WHEN ASSEMBLED IN THE BEARING CASE.

3. FRONT AND BACK PLATES MUST ALSO BE ORIENTED AS THAT THE INLET SIDE IS ADJACENT TO THE INLET SIDE OF THE PUMP BODY.

4. BOLT TORQUE (LUBRICATED THREADS) 24 FT-LB ± 2 FT-LB.

5. THE GROOVE ON THE MOLDED SEAL IS TO BE TO THE OUTSIDE OF THE PUMP.

6. DRILL POINT MARK INDICATES FRONT SURFACE OF BODY.

7. BACK UP STRIP GOES TO INSIDE OF SEAL.

SP20B PUMP-COUNTER CLOCKWISE

ROTATION-SIDE PORTS (SP20B_A9H_-L)
NOTES:
1. ASSEMBLY WITH INLET SIDE OF BEARING CASE ADJACENT TO INLET SIDE OF BODY.
   THE INLET RECESS ON THE BEARING CASE AS SHOWN ABOVE MUST BE TOWARD THE
   SIDE OF THE GEARS.
2. ROTATION DIRECTION IS DETERMINED BY VIEWING THE PUMP FROM THE DRIVE SHAFT
   END. TO INSURE CORRECT PARTS_ORIENTATION OF PARTS OBSERVE THE
   FOLLOWING WHEN ROTATING THE DRIVE GEAR IN THE DIRECTION OF ROTATION:
   A) THE IDLER GEAR IS TURNED BY THE DRIVE GEAR THROUGH CONTACT ON THE DRIVE
   B) THE GEAR TEETH ARE COMING OUT OF MESH ON THE INLET SIDE OF THE PUMP.
   C) THE INLET SIDE IS ADJACENT TO THE INLET SIDE OF THE PUMP BODY.
3. FRONT AND BACK PLATES MUST ALSO BE ORIENTATED SO THAT THE INLET
   SIDE IS ADJACENT TO THE INLET SIDE OF THE PUMP BODY.
4. BOLT TORQUE (LUBRICATED THREADS) 24FT-LB ± 2FT-LB.
5. THE GROOVE ON THE MOLDED SEAL IS TO BE TO THE OUTSIDE OF THE PUMP.
6. DRILL POINT MARK INDICATES FRONT SURFACE OF BODY.
7. BACKUP STRIP GOES TO INSIDE OF SEAL.
8. THE IDLER GEAR IS TURNED BY THE DRIVE GEAR THROUGH CONTACT ON THE DRIVE
   GEAR TEETH ARE COMING OUT OF MESH ON THE INLET SIDE OF THE PUMP.
9. BACKUP STRIP GOES TO INSIDE OF SEAL.
10. THE INLET RECESS ON THE BEARING CASE AS SHOWN ABOVE MUST BE TOWARD THE
    SIDE OF THE GEARS.
11. FRONT AND BACK PLATES MUST ALSO BE ORIENTATED SO THAT THE INLET
    SIDE IS ADJACENT TO THE INLET SIDE OF THE PUMP BODY.
12. BOLT TORQUE (LUBRICATED THREADS) 24FT-LB ± 2FT-LB.
13. THE GROOVE ON THE MOLDED SEAL IS TO BE TO THE OUTSIDE OF THE PUMP.
14. BACKUP STRIP GOES TO INSIDE OF SEAL.
15. THE IDLER GEAR IS TURNED BY THE DRIVE GEAR THROUGH CONTACT ON THE DRIVE
    GEARS ROTATE FREELY WHEN ASSEMBLED IN THE BEARING CASE.

SP20B PUMP-COUNTER CLOCKWISE

ROTATION-REAR PORTS (SP20B__D9H_-L)
NOTES:
2. ROTATION DIRECTION IS DETERMINED BY VIEWING THE PUMP FROM THE DRIVEN END OF THE DRIVE SHAFT. TO ENSURE CORRECT PARTS/ORIENTATIONS OF PARTS, OBSERVE THE FOLLOWING WHEN ROTATING THE DRIVE GEAR IN THE CORRECT ROTATION:
   A) THE IDLER GEAR IS TURNED BY THE DRIVE GEAR THROUGH CONTACT ON THE DRIVE SIDE PROFILE OF THE TOOTH (SHALLOW SLOPE SIDE WITH NO UNDERCUT). LIKE PROFILES ARE TOUCHING AND GEARS ROTATE FREELY WHEN ASSEMBLED IN THE BEARING CASE.
   B) THE GEAR TEETH ARE COMING OUT OF MESH ON THE INLET SIDE OF THE PUMP.
3. FRONT AND BACK PLATES MUST ALSO BE ORIENTATED SO THAT THE INLET SIDE IS ADJACENT TO THE INLET SIDE OF THE PUMP BODY.
4. BOLT TORQUE TO BE 28-32 FT-LB.
5. THE FRONT OF THE BODY IS INDICATED BY NOTCHES ON THE SIDE.
6. WHITE BACK-UP STRIP GOES TO THE INSIDE OF THE SEALS.
7. FOR KEYED SHAFTS, PUT TAPE OVER KEY WAY TO PREVENT CUTTING SEAL DURING ASSEMBLY.

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SP25 PUMP-CLOCKWISE
ROTATION-SIDE PORTS
(SP25A_A9H_R)
NOTES:
2. ROTATION DIRECTION IS DETERMINED BY VIEWING THE PUMP FROM THE DRIVEN END OF THE DRIVESHAFT. TO ENSURE CORRECT PARTS/_ORIENTATION OF PARTS, OBSERVE THE FOLLOWING WHEN ROTATING THE DRIVE GEAR IN THE CORRECT ROTATION:
   A) THE IDLER GEAR IS TURNED BY THE DRIVE GEAR THROUGH CONTACT ON THE DRIVE SIDE PROFILE OF THE TOOTH (SHALLOW SLOPE SIDE WITH NO UNDERCUT). LIKE PROFILES ARE TOUCHING AND GEARS ROTATE FREELY WHEN ASSEMBLED IN THE BEARING CASE.
   B) THE GEAR TEETH ARE COMING OUT OF MESH ON THE INLET SIDE OF THE PUMP.
3. FRONT AND BACK PLATES MUST ALSO BE ORIENTATED SO THAT THE INLET SIDE IS ADJACENT TO THE INLET SIDE OF THE PUMP BODY.
4. BOLT TORQUE TO BE 28-32 FT-LB.
5. THE FRONT OF THE BODY IS INDICATED BY NOTCHES ON THE SIDE.
6. WHITE BACK-UP STRIP GOES TO THE INSIDE OF THE SEALS.
7. FOR KEYED SHAFTS, PUT TAPE OVER KEY WAY TO PREVENT CUTTING SEAL DURING ASSEMBLY.
8. BOLTS (ITEM 1)
9. WASHERS (ITEM 10)
10. BACK-UP STRIP
11. SEAL
12. WEAR PLATE
13. SNAP RING
14. FRONT PLATE
15. BACK PLATE
16. IDLER GEAR
17. BODY
18. DRIVE GEAR

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SP25 PUMP-CLOCKWISE ROTATION-REAR PORTS (SP25A__D9H__R)
NOTES:
1. ASSEMBLE WITH INLET SIDE OF BEARING CASE ADJACENT TO INLET SIDE OF BODY. THE INLET CAVITY ON THE BEARING CASE, AS SHOWN ABOVE, MUST BE TOWARD THE SIDE OF THE GEAR.
3. ROTATION DIRECTION IS DETERMINED BY VIEWING THE PUMP FROM THE DRIVEN END OF THE DRIVESHAFT. TO ENSURE CORRECT PARTS/ORIENTATION OF PARTS, OBSERVE THE FOLLOWING WHEN ROTATING THE DRIVE GEAR IN THE CORRECT ROTATION:
A) THE INLET GEAR IS TURNED BY THE DRIVE GEAR THROUGH CONTACT ON THE DRIVE SIDE PROFILE OF THE TOOTH (SHALLOW SLOPE SIDE WITH NO UNDERCUT). LIKE PROFILES ARE TOUCHING AND GEARS ROLL FREELY WHEN ASSEMBLED IN THE BEARING CASE.
B) THE GEAR TEETH ARE COMING OUT OF MESH ON THE INLET SIDE OF THE PUMP.
3. FRONT AND BACK PLATES MUST ALSO BE ORIENTED SO THAT THE INLET SIDE IS ADJACENT TO THE INLET SIDE OF THE PUMP BODY.
4. BOLT TORQUE TO BE 28-32 FT-LB.
5. THE FRONT OF THE BODY IS INDICATED BY NOTches ON THE SIDE.
6. WHITE BACK-UP STRIP GOES TO THE INSIDE OF THE SEALS.
7. FOR MEChanical SHAFTS, PUT TAPE OVER KEYWAY TO PREVENT CUTTING SEAL DURING ASSEMBLY.

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SP25 PUMP-COUNTERCLOCKWISE ROTATION SIDE PORTS
(SP25A__ASH.--L)
NOTES:
2. ROTATION DIRECTION IS DETERMINED BY VIEWING THE PUMP FROM THE DRIVEN END OF THE DRIVE SHAFT. TO ENSURE CORRECT PARTS ORIENTATION OF PARTS, OBSERVE THE FOLLOWING WHEN ROTATING THE DRIVE GEAR IN THE CORRECT ROTATION:
   A) THE IDLER GEAR IS TURNED BY THE DRIVE GEAR THROUGH CONTACT ON THE DRIVE SIDE PROFILE OF THE TOOTH (SHALLOW SLOPE SIDE WITH NO UNDERCUT). LIKE PROFILES ARE TOUCHING AND GEARS ROTATE FREELY WHEN ASSEMBLED IN THE BEARING CASE.
   B) THE GEAR TEETH ARE COMING OUT OF MESH ON THE INLET SIDE OF THE PUMP.
3. FRONT AND BACK PLATES MUST ALSO BE ORIENTED SO THAT THE INLET SIDE IS ADJACENT TO THE INLET SIDE OF THE PUMP BODY.
4. BOLT TORQUE TO BE 28-32 FT-LB.
5. WHITE BACK-UP STRIP GOES TO THE INSIDE OF THE SEALS.
6. FOR KEYED SHAFTS, PUT TAPE OVER KEY WAY TO PREVENT CUTTING SEAL DURING ASSEMBLY.

SP25 PUMP-COUNTER CLOCKWISE ROTATION -REAR PORTS
(SP25A__D9H_-L)
NOTE: Maintaining proper orientation of the pump and pump parts is critical when changing rotation. In order to maintain a reference, lay pump on its side and orient as shown in the exploded view, so that the drive shaft is farthest away from you and the drive end is on the left. For reference purposes, use drawing in conjunction with instructions.

PUMP DISASSEMBLY:
1. Remove the through bolts and washers holding the pump together.
2. Remove the rear cover. If the seal and backup strip come out of the seal groove, replace them with the white backup strip to the inside of the black seal and the groove on the molded seal to the bottom of the seal groove.
3. If the pump has a keyed shaft, remove the key and, to avoid cutting the seal, place tape over the shaft keyway slot (If the new shaft has a keyway, place tape over it also).
4. Remove the front cover, leaving the gear assembly inside the body.
5. Slide the complete gear assembly including: drive gear, idler gear and two bearing carriers, out of the body as one unit. You may have to slide the assembly back and forth a few times within the body to remove ridges formed when the pump was first broke in.
6. If dowel pins have remained in either of the covers, take them out and place them in the body.

CONVERTING THE ROTATION OF THE GEAR ASSEMBLY:
1. Orient the gear assembly that was just removed from the body on its side so that the drive shaft is farthest away from you and the drive end is on the left side.
2. Slide both bearing carriers off of the shafts without changing their orientation.
3. Replace the drive gear with the new drive gear of the opposite rotation (keeping drive end on the left).
4. Rotate the idler gear “end for end” so that the shaft area that was on the left side is now on the right side.
5. Bring the gears back together.
6. Rotate the bearing carriers so that the bearing that went over the drive shaft now goes over the idler shaft. Keep the same side closest to the gear during rotation. Insure that the inlet cavity (see drawing) will go towards the gear.
7. Slide both bearing carriers back onto the shafts. If the correct gears are in place and correctly orientated, the bearing carriers will slide on the shafts easily and the gears will rotate relatively freely within the bearing carriers. (See drawing for gear mesh detail.)

REASSEMBLY:
1. Remove molded seal and backup strip from the old front cover and insert them into the new (opposite rotation) front cover. The white backup strip goes to the inside of the black molded seal and the groove on the molded seal goes to the bottom of the seal groove. Note: Insure that the shaft seal and snap ring are also installed in the front cover.
2. Rotate the body about the pump axis (centerline), keeping the front surface mark on the body to the front of the pump. The lengthwise inlet and outlet grooves on the inside of the body will have will have moved to the opposite sides.
3. Rotate the rear cover about the axis (centerline) of the pump, the inlet area will have gone to the opposite side of pump.
4. Slide the gear assembly into the body. As per the standard orientation, the drive end of the drive shaft should be farthest away from you and on the left. You will need to carefully align the bearing carriers to be able to insert them into the body. As the assembly is inserted into the body, insure that the bearing carrier inlet cavity is towards the inlet (wide groove) side of the body (see drawing). Again at this point the gears should rotate relatively freely in the body.
5. Align the front and rear covers with the dowel pins and assemble them onto the body. As they are put in place, it should be noted that the inlet side of the body, the inlet side of the rear cover and the side of the front cover with "IN" embossed on the flange are all on the same side (see drawing). Care should also be taken to insure that the seals and backups are in place and not out of their grooves.
6. Insert the bolts and washers through the pump. Torque the bolts (lubricated threads) to 24FT-LB ± 2FT-LB.
7. For keyed shafts, the tape on the shaft should be removed and the key put back into place.
8. The pump should be tested for flow and pressure before being put into service.
RIGHT HAND CONFIGURATION

This is a right hand (clockwise rotation) drive gear and must be replaced to convert this pump to a left hand (counterclockwise rotation).

MARK INDICATES FRONT OF BODY
BACKUP STRIP GOES INSIDE OF MOLDED SEAL
ARROW ON BACKSIDE

OPTIONAL REAR OUTLET (SMALL) PORT
FOR CW ROTATION, PRINCE LOGO IS ON BOTTOM
OPTIONAL REAR INLET (LARGE) PORT
INLET SIDE (WIDE GROOVE)

LEFT HAND CONFIGURATION

SP20B ROTATION CONVERSION
RIGHT HAND (CW) TO LEFT HAND (CCW)
RIGHT HAND CONFIGURATION

THIS IS A LEFT HAND (COUNTERCLOCKWISE ROTATION) DRIVE GEAR AND MUST BE REPLACED TO CONVERT THIS PUMP TO A RIGHT HAND (CLOCKWISE ROTATION)

BEARING BLOCK

ARROW ON BACKSIDE

INLET SIDE

IDLER GEAR

MARK INDICATES FRONT OF BODY

FOR CW ROTATION, PRINCE LOGO IS ON BOTTOM

OPTIONAL REAR OUTLET (SMALL) PORT

SIDE OUTLET (SMALL) PORT

LEFT HAND CONFIGURATION

THIS IS A LEFT HAND (COUNTERCLOCKWISE ROTATION) FRONT PLATE AND MUST BE REPLACED TO CONVERT THIS PUMP TO A RIGHT HAND (CLOCKWISE ROTATION)

INLET SIDE

IDLER GEAR

MARK INDICATES FRONT OF BODY

FOR CW ROTATION, PRINCE LOGO IS ON BOTTOM

OPTIONAL REAR OUTLET (SMALL) PORT

SIDE OUTLET (SMALL) PORT

SP20B ROTATION CONVERSION
LEFT HAND (CCW) TO RIGHT HAND (CW)
SP25 ROTATION CHANGE INSTRUCTIONS

NOTE: Maintaining proper orientation of the pump and pump parts is critical when changing rotation. In order to maintain a reference, lay pump on its side and orient as shown in the exploded view, so that the drive shaft is farthest away from you and the drive end is on the left. For reference purposes, use drawing in conjunction with instructions.

PUMP DISASSEMBLY:
1. Remove the through bolts and washers holding the pump together.
2. Remove the rear cover. If the seals and backup strip come out of the seal grooves, replace them keeping the white figure “3” shaped backup strip to the inside of the thinner black seal and the thinner black seal to the inside of the thicker one.
3. If the pump has a keyed shaft, remove the key and, to avoid cutting the seal, place tape over the shaft keyway slot (if the new shaft has a keyway, place tape over it also).
4. Remove the front cover, leaving the gear assembly inside the body.
5. Slide the complete gear assembly including: drive gear, idler gear, two wear plates and two bearing blocks, out of the body as one unit. You may have to slide the assembly back and forth a few times within the body to remove ridges formed when the pump was first broke in.
6. If dowel pins have remained in either of the covers, take them out and place them in the body.

CONVERTING THE ROTATION OF THE GEAR ASSEMBLY:
1. Orient the gear assembly that was just removed from the body on its side so that the drive shaft is farthest away from you and the drive end is on the left side.
2. Rotate the body about the pump axis (centerline), keeping the front surface, indicated by notches on the side, to the front of the pump. The lengthwise inlet and outlet grooves on the inside of the body will have will have rotated to the opposite side.
3. Rotate the rear cover about the axis (centerline) of the pump, the inlet area will have gone to the opposite side of pump.
4. Rotate the idler gear “end for end” so that the shaft area that was on the left side is now on the right side.
5. Bring the gears back together.
6. Rotate the bearing blocks and the wear plates so that the bearing that went over the drive shaft now goes over the idler shaft. Keep the same side closest to the gear during rotation. Insure that the inlet cavity and larger cutout area of the wear plate are on the same side (see drawing) and next to gear. Also insure bronze side of wear plate is next to gear.
7. Slide both bearing blocks and wear plates back onto the shafts. If the correct gears are in place and correctly orientated, the bearing blocks will slide on the shafts easily and the gears will rotate relatively freely within the bearing blocks. (See drawing for gear mesh detail.)

REASSEMBLY:
1. Remove black seals and backup strip from the old front cover and insert them into the new (opposite rotation) front cover. The white figure “3” shaped backup strip goes to the inside of the thinner black seal and the thinner black seal goes inside the thicker black seal. Note: Insure that the shaft seal and snap ring are also installed in the front cover.
2. Rotate the body about the pump axis (centerline), keeping the front surface, indicated by notches on the side, to the front of the pump. The lengthwise inlet and outlet grooves on the inside of the body will have will have rotated to the opposite side.
3. Rotate the rear cover about the axis (centerline) of the pump, the inlet area will have gone to the opposite side of pump.
4. Slide the gear assembly into the body. As per the standard orientation, the drive end of the drive shaft should be farthest away from you and on the left. You will need to carefully align the bearing blocks to be able to insert them into the body. You may also have to adjust the wear plate slightly as it enters the body. As the assembly is inserted into the body, insure that the bearing block inlet cavity and larger cutout area of wear plate are towards the inlet (wide groove) side of the body (see drawing). Again at this point the gears should rotate relatively freely in the body.
5. Align the front and rear covers with the dowel pins and assemble them onto the body. As they are put in place, it should be noted that the inlet side of the body, the inlet side of the rear cover and the side of the front cover with “IN” embossed on the flange are all on the same side (see drawing). Care should also be taken to insure that the seals and backups are in place and not out of their grooves.
6. Insert the bolts and washers through the pump. Torque the bolts to 28-32 FT-LB.
7. For keyed shafts, the tape on the shaft should be removed and the key put back into place.
8. The pump should be tested for flow and pressure before being put into service.

LEFT HAND ROTATION (CCW)
(FACING DRIVE SHAFT)

RIGHT HAND ROTATION (CW)
(FACING DRIVE SHAFT)

The pump gears have non-symmetrical teeth, with different profiles on each side. The idler gear is turned by the drive gear through contact on the drive side profile of the tooth (shallow slope side with no undercut). Like profiles are touching and gears rotate freely when assembled in the bearing case. Rotating in the correct rotation, the teeth come out of mesh on the inlet side of the pump.
This is a right hand (clockwise rotation) drive gear and must be replaced to convert this pump to a left hand (counterclockwise rotation).

This is a right hand (clockwise rotation) front plate and must be replaced to convert this pump to a left hand (counterclockwise rotation).

Optional rear inlet (large) port for CW rotation.

Prince logo is on top.

Inlet side.

Backup strip goes inside of seals.

Inlet side.

For CW rotation, Prince logo is on top.

Desired rear outlet (small) port.

For CW rotation, Prince logo is on bottom.

Optional rear inlet (large) port.

Inlet side.

Cavity.

Inlet side.

Idler shaft arrow on backside.

Inlet side.

Inlet side.

For CW rotation, Prince logo is on bottom.

Optional rear outlet (small) port.

For CW rotation, Prince logo is on top.

Desired rear inlet (large) port.

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THIS IS A LEFT HAND (COUNTERCLOCKWISE ROTATION) DRIVE GEAR AND MUST BE REPLACED TO CONVERT THIS PUMP TO A RIGHT HAND (CLOCKWISE ROTATION)

WEAR PLATE

BEARING BLOCK

LARGER CUTOUT AREA

ARROW ON BACKSIDE

INLET SIDE

INLET (LARGE) PORT

OPTIONAL REAR INLET (LARGE PORT)

FOR CCW ROTATION PRINCE LOGO IS ON BOTTOM

FOR CW ROTATION PRINCE LOGO IS ON TOP

OPTIONAL REAR OUTLET (SMALL) PORT

BACKUP STRIP GOES TO INSIDE OF SEALS

ARROW ON BACKSIDE

IDLER SHAFT

INLET SIDE

INLET (WIDE GROOVE) SIDE

OUTLET (SMALL) PORT

FRONT OF BODY

LEFT HAND CONFIGURATION

SP25 ROTATION CONVERSION
LEFT HAND (CCW) TO RIGHT HAND (CW)
EXAMPLE HYDRAULIC CIRCUIT