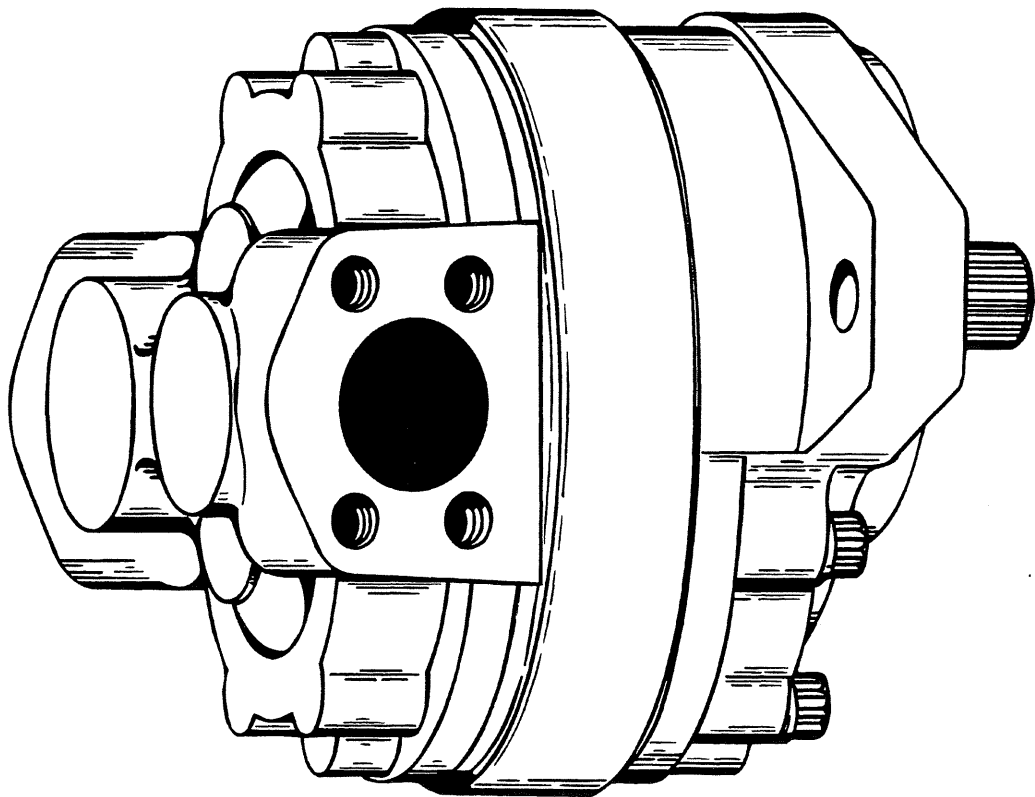


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**Hydraulics**

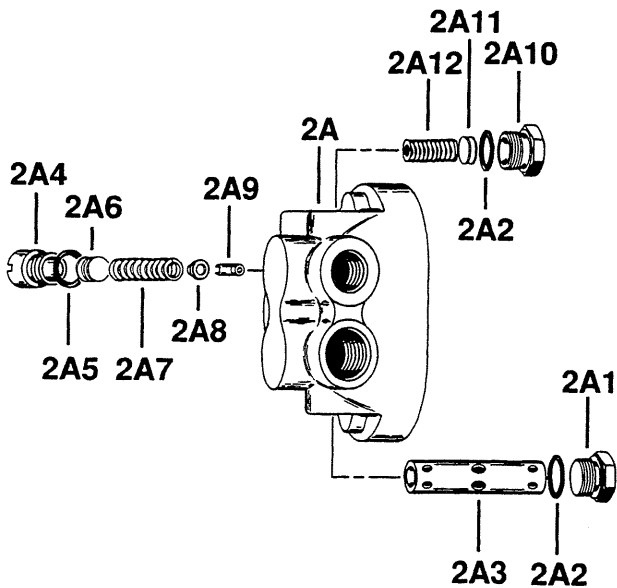
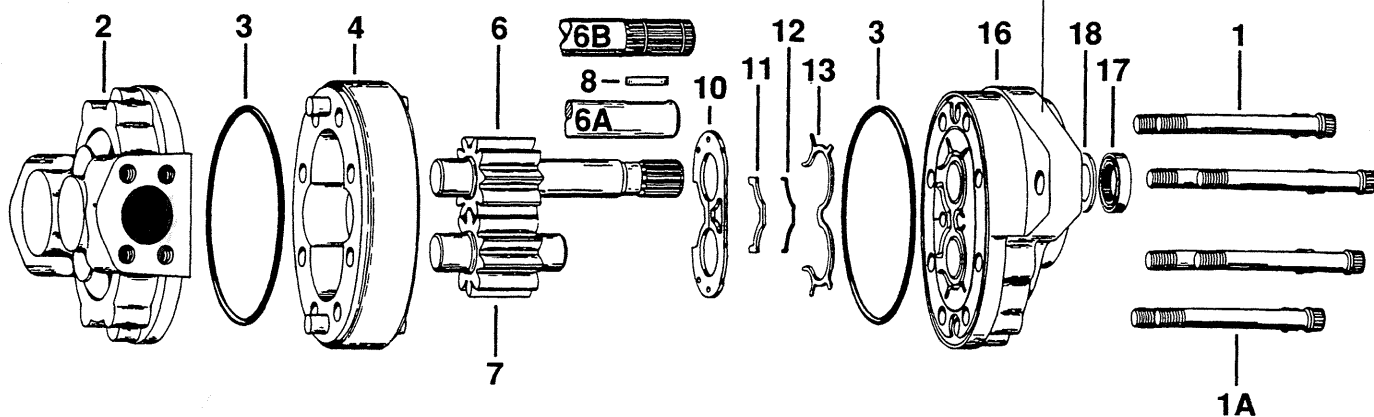
## Repair Information

**Model 25500 Gear Pump - L2 Series**



# Parts Drawing-Model 25500 & 25530 Gear Pumps

Serial Code and Assembly Number



Left-hand Rotation Shown

# Parts List Plain and Flow Divider

## Tools Required for Disassembly and Reassembly

- 7/16 in., 12 Point Socket
- Ratchet Wrench
- Torque Wrench (100 lb-ft)
- Screwdriver
- Soft Face Hammer
- Seal Driver or Simular Tool
- Light Petroleum Jelly

Item No.	Description	Qty
1	Cap screws	4
1A	Cap screws	4
2	Backplate Assembly, Plain	1
2A	Backplate Assembly, Flow Divider	1
+ 3	O-ring, 3/32 in. x 5 in. I.D. [2,38mm x 127mm I.D.]	2
4	Body	1
6	Drive Gear Assembly	1
7	Idler Gear Assembly	1
8	Key, for straight shaft	1
+ 10	Wear Plate	1
+ 11	Bearing Seal	1
+ 12	Molded O-ring	1
+ 13	Back-up Gasket	1
16	Front Plate	1
+ 17	Shaft Seal	1
+ 18	Washer	1
SP	Seal Repair Kit, (25500-901) Plain Pump only	1

Item No.	Description	Qty
2A	Backplate Assembly, Flow Divider	1
2A1	Hex Plug	1
++ 2A2	O-ring, 3/32 in. x 3/4 in. I.D. [2,38mm x 19,05mm I.D.]	2
2A3	Flow Divider Spool	1
2A4	Slotted	1
++ 2A5	O-ring, 3/32 in. x 5/8 in. I.D. [2,38mm x 15,88mm I.D.]	1
2A6	Shims	As Req'd
2A7	Spring	1
2A8	Plug Seat	1
2A9	Seat	1
2A10	Hex Plug	1
2A11	Disc	As Req'd
2A12	Spring, Flow Divider	1
SF	Seal Repair Kit (25500-905) Flow Divider only	1

- + Included in both seal repair kits  
 ++ Included in 25500-905 kit only.

## Repair Information - Model 25500

Work in a clean area, cleanliness is extremely important when repairing hydraulic pumps. Before disconnecting the lines, clean port area of pump. Disconnect hydraulic lines, removing pump assembly from vehicle and plug ports. Thoroughly clean the outside of pump. After cleaning, remove port plugs and drain oil.

### Disassembly

- 1 Remove key from drive shaft if keyed drive gear assembly(6A) is used.
- 2 Put a location mark across front plate, body and backplate. This will assure proper reassembly.
- 3 Clamp pump in vise, shaft end up.
- 4 Remove cap screws(1) and (1A) four each.
- 5 Remove pump from vise, hold pump in hands and bump shaft against wooden block to separate front plate(16) from backplate. Body (4) will remain with either front plate or backplate.
- 6 If the front plate separated first, remove wear plate (10) from body(4) gear pockets.
- 7 Remove drive gear assembly(6) and idler gear assembly(7) from body(4).
- 8 To separate body(4) from the plate it remained with, place drive gear assembly (6) in bushing and tap protruding end with plastic hammer or rawhide mallet.
- 9 Remove o-ring(3) from front plate (16) and backplate(2).
- 10 Remove back-up gasket(13) from front plate (16) by prying with a sharp tool.
- 11 Remove bearing seal(11) from front plate(16) by prying with a sharp tool.
- 12 Remove molded o-ring(12) from front plate(16).
- 13 Remove shaft seal(17)and washer(18) from front plate(16) by prying with a screw driver.
- 14 To disassemble the flow divider backplate use a slotted socket and remove relief valve plug(2A4), shims(2A6), plug seat(2A8), and seat(2A9) from backplate(2A13).Note: Do not remove internal relief valve cartridge assembly. Cartridge assembly is Loctited to a predetermined depth. Remove plug(2A1), spool(2A3), plug(2A10), shims(2A11), and spring(2A12) from backplate(2A13).

### Inspect Parts for Wear

#### General

- 1 Clean and dry all parts.
- 2 Remove all nicks and burrs from all parts with emery cloth.
- 3 Replace gear assembly if shaft measures less than .873 in. [22,17mm] in bushing area. (one gear assembly may be replaced separately; shafts and gears are available as assemblies only.)

#### Gear Assembly Inspection

- 1 Check spline drive shaft for twisted or broken teeth or check keyed drive shaft for broken or chipped keyway.
- 2 Inspect both the drive gear and idler gear shafts at bushing points and seal area for rough surfaces and excessive wear.
- 4 Inspect gear face for scoring and excessive wear.
- 5 Replace gear assembly if gear width is below the following dimensions. Refer to chart on this page.
- 6 Assure that snap rings are in grooves on either side of drive and idler gears.
- 7 If edge of gear teeth are sharp, break edge with emery cloth.

	Model Number								
	25500	25501	25502	25503	25504	25505	25506	25507	25508
Pump Disp. cu. in./rev. [mL/rev.]	1.30 [21,3]	1.55 [25,4]	1.78 [29,2]	2.05 [33,6]	2.33 [38,2]	2.61 [42,8]	2.85 [46,7]	3.12 [51,1]	3.37 [55,2]
Gear Width inches [millimeters]	.637 [16,18]	.773 [19,63]	.909 [23,09]	1.045 [26,50]	1.181 [30,00]	1.317 [33,45]	1.453 [36,90]	1.589 [40,36]	1.725 [43,81]

## Front plate and Backplate Inspection

- 1 Oil groove in bushings in both front plate and backplate should be in line with dowel pin holes and 180 degrees apart. This positions the oil grooves closest to respective dowel pin holes.
- 2 Replace the backplate or front plate if I.D. of bushings exceed .879 in. [22,33mm] (Bushings are not available as separate items).
- 3 Bushings in front plate should be flush with face of front plate.
- 4 Check for scoring on face of backplate. Replace if wear exceeds .0015 in. [.038mm].

## General Information

It is important that the relationship of the backplate, body, wear plate and front plate is correct. You will note two half moon cavities in the body which must face away from the front plate. Note: The smaller half moon port cavity must be on the pressure side of the pump. Side of wear plate with mid section cut out must be on suction side of pump. Suction side of backplate is always side with larger port boss.

## Reassembly

- 1 Replace the wear plate, bearing seal, molded o-ring, back-up gasket, shaft seal and o-rings as new parts.
- 2 Install o-ring (3) in groove of front plate (16).
- 3 Tuck back-up gasket (13) into groove in front plate (16) with open part of "V" section down of gasket.
- 4 Place molded o-ring (12) in groove in front plate. Place bearing seal (11) over molded o-ring with groove side down.
- 5 Apply a thin coat of petroleum jelly to both milled gear pockets of body. Slip body onto front plate with half moon port cavities in body facing away from front plate.

**Note:** The small half moon port cavity must be on the pressure side of pump.

- 6 Place wear plate (10) on top of back-up gasket with bronze face up. The side with the mid section cut away must be on the suction side of pump.

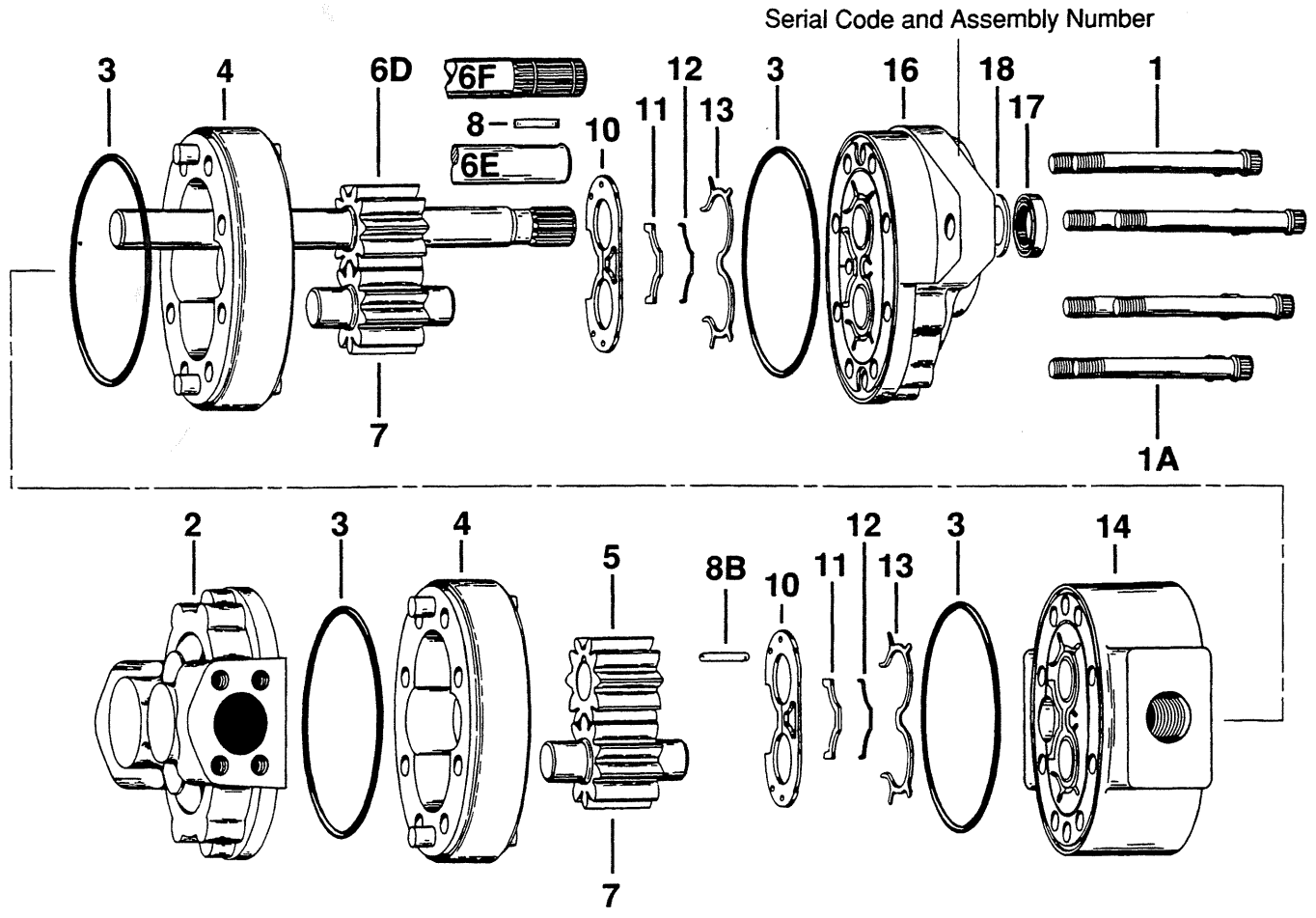
## Body Inspection

- 1 Check body inside gear pockets for excessive scoring or wear.
- 2 Replace body if I.D. of gear pockets exceeds 2.108 in. [53,54mm].

- 7 Dip gear assemblies into oil and slip into front plate bushings.
- 8 Install o-ring (3) in groove of backplate (2).
- 9 Slide backplate (2) over gear shafts until dowel pins are engaged.
- 10 Secure with cap screws (1) and (1A). Tighten cap screws evenly in a crisscross pattern to 40 to 50 lbs. ft. [54,24 to 67,8 N m] torque.
- 11 Place washer (18) over drive shaft into housing. Liberally oil shaft seal (17) and install over drive shaft, carefully so that rubber sealing lips are not cut.
- 12 Place 1-3/8" O.D. sleeve over shaft and press in shaft seal (17) .20 in. (5.08mm) below front surface of front plate.
- 13 Install key on keyed shaft.

Note: Refer to Trouble Shooting and Start-up Procedure .

# Parts Drawing-Model 25580 Double Gear



Left-hand Rotation Shown

## Parts List Model 25580 Double Gear Pump

### Tools Required for Disassembly and Reassembly

- 7/16 in., 12 Point Socket
- Ratchet Wrench
- Torque Wrench (100 lb-ft)
- Screwdriver
- Soft Face Hammer
- Seal Driver or Simular Tool
- Light Petroleum Jelly

Item No.	Description	Qty
1	Cap screws	4
1A	Cap screws	4
2	Backplate Assembly, Plain or Flow Divider	1
+	3	+
	O-ring, 3/32 in. x 5 in. I.D. [2,38mm x 127mm I.D.]	4
4	Body	2
5	Slip Fit Gear	1
6	Drive Gear Assembly either 6D, 6E, or 6F	1
7	Idler Gear Assembly	2
8	Key	1
8B	Rear Key	1
+	10	+
	Wear Plate	2
+	11	+
	Bearing Seal	2
+	12	+
	Molded O-ring	2
+	13	+
	Back-up Gasket	2
+	14	+
	Adapter Plate	1
+	16	+
	Front Plate	1
+	17	+
	Shaft Seal	1
+	18	+
	Washer	1
SD	Seal Repair Kit (25580-903) with or without Flow Divider	1

+ Included in seal repair kit

## Repair Information - Model 25580

Work in a clean area, cleanliness is extremely important when repairing hydraulic pumps. Before disconnecting the lines, clean port area of pump. Disconnect hydraulic lines, removing pump assembly from vehicle and plug ports. Thoroughly clean the outside of pump. After cleaning then remove port plugs and drain oil.

### Disassembly

- 1 Remove key from drive shaft if keyed drive- gear assembly(6E) is used.
- 2 Put a location mark across front plate, bodies, adapter plate and backplate. This will assure proper reassembly.
- 3 Clamp pump in vise, shaft end up.
- 4 Remove cap screws (1) and (1A) four each.
- 5 Remove pump from vise, hold pump in hands and bump shaft against wooden block to separate front pump sections. Front body (4) will remain with either front plate(16) or adapter plate(14).
- 6 Place front idler gear (7) into gear pocket and tap with soft face hammer till the front body separates. Now remove idler gear from front plate or adapter plate.
- 7 Remove backplate (7) from body (4) by tapping on backplate with plastic hammer or rawhide mallet.
- 8 Remove rear idler gear (7), slip fit gear (5) and key (8B).
- 9 Remove drive gear assembly from adapter plate.
- 10 Place rear idler gear assembly back into gear pocket and tap protruding end with soft face hammer to remove rear body (4) from plate it remained with.
- 11 Remove front wear plate (10) from front plate (16) and remove rear wear plate (10) from adapter plate (14).
- 12 Remove o-rings (3) from front plate (16), adapter plate (14), and backplate (2).
- 13 Remove back-up gasket (13), bearing seal (11) and molded o-ring (12) from front plate (16) and adapter plate (14) by prying out with a sharp tool.
- 14 Remove shaft seal(17) and washer(18) from front plate(16) by prying with a screw driver.

### Inspect Parts for Wear

#### General

- 1 Clean and dry all parts.
- 2 Remove nicks and burrs from all parts with emery cloth.

#### Gear Assembly Inspection

- 1 Check spline drive shaft for twisted or broken teeth or check keyed drive shaft for broken or chipped keyway. Also check for broken keyway, on drive shaft, that drives the slip fit gear of the rear pump.
- 2 Inspect both the drive gear and idler gear shafts at bushing points and seal area for rough surfaces and excessive wear.
- 3 Replace gear assembly if shaft measures less than .873 in. [22,17mm] in bushing area. (one gear assembly may be replaced separately; shafts and gears are available as assemblies only. The slip fit gear is available separately).
- 4 Inspect gear face for scoring and excessive wear.
- 5 Replace gear assembly if gear width is below the following dimensions. Refer to chart on this page.
- 6 Assure that snap rings are in grooves on either side of drive and idler gears.
- 7 If edge of gear teeth are sharp, break edge with emery cloth.

	Model Number								
	25500	25501	25502	25503	25504	25505	25506	25507	25508
Pump Disp. cu. in./rev. [mL/rev.]	1.30 [21,3]	1.55 [25,4]	1.78 [29,2]	2.05 [33,6]	2.33 [38,2]	2.61 [42,8]	2.85 [46,7]	3.12 [51,1]	3.37 [55,2]
Gear Width inches [millimeters]	.637 [16,18]	.773 [19,63]	.909 [23,09]	1.045 [26,50]	1.181 [30,00]	1.317 [33,45]	1.453 [36,90]	1.589 [40,36]	1.725 [43,81]



## Front Plate, Backplate and Adapter Plate Inspection

- 1 Oil groove in bushings in front plate, backplate and adapter plate should be in line with dowel pin holes and 180 degrees apart. This positions the oil grooves closest to respective dowel pin holes.
- 2 Replace the backplate, front plate or adapter plate if I.D. of bushings exceed .879in. [22,33mm] (Bushings are not available as separate items).
- 3 Bushings in front plate and back-up gasket side of adapter plate should be flush with face of plate.
- 4 Check for scoring on face of backplate or adapter plate. Replace if wear exceeds .0015 in. [,038mm].

## General Information

It is important that the relationship of the backplate, adapter plate, body, wear plate and front plate is correct. You will note two half moon cavities in the body which must face away from the front plate or adapter plate. Note: The smaller half moon port cavity must be on the pressure side of the pump. The side of wear plate with mid section cut out must be on suction side of pump. Suction side of backplate or adapter plate is always the side with larger port boss.

## Reassembly

- 1 Replace the wear plates, bearing seals, molded o-rings, back-up gaskets, shaft seal and o-rings as new parts.
  - 2 Install o-rings (3) in groove of front plate (16), adapter plate (14), and backplate (2) with a small amount of petroleum jelly to hold in place.
  - 3 Tuck back-up gasket (13) in front plate (16) and adapter plate (14) with open part of "V" section down.
  - 4 Place molded o-ring (12) in groove in front plate and adapter plate. Place bearing seal (11) over molded o-ring, groove side down.
  - 5 Apply a thin coat of petroleum jelly to both milled gear pockets of body. Slip body onto front plate with half moon port cavities in body facing away from front plate.
- Note:** The small half moon port cavity must be on the pressure side of pump.
- 6 Place wear plate (10) on top of back-up gasket with bronze face up. The side with the mid section cut away must be on suction side of pump.
  - 7 Dip drive gear assembly and idler gear assembly into oil. Slip both gear assemblies into gear pocket of body and into front plate bushings.

## Body Inspection

- 1 Check body inside gear pockets for excessive scoring or wear.
- 2 Replace body if I.D. of gear pockets exceeds 2.108 in. [53,54mm].

- 8 Install adapter plate (14) in place on front body (4). Check positioning mark on all sections of pump.
  - 9 Install rear body (4) onto adapter plate (14) and install wear plate (10).
  - 10 Install key (8B) in slot of drive gear shaft assembly. Dip slip fit gear (5) in oil and slip on shaft and into gear pocket of rear body. Check key for proper location.
  - 11 Dip rear idler gear (7) in oil and install in gear pocket of rear body (4).
  - 12 Position backplate (2) over shafts until dowel pins in body are engaged.
  - 13 Secure with cap screws (1) and (1A). Tighten cap screws evenly in a crisscross pattern to 40 to 50 lbs. ft. [54,24 to 67,8 N·m] torque.
- 11 Place washer (18) over drive shaft into housing. Liberally oil shaft seal(17) and install over drive shaft, carefully so that rubber sealing lips are not cut.
  - 12 Place 1-3/8" O.D. sleeve over shaft and press in shaft seal (17) .20 in. (5.08mm) below front surface of front plate.
  - 13 Install key on keyed shaft.

**Note:** Refer to Trouble Shooting and Start-up Procedure.

## Placing Pump Back Into Service

**1** If shop test stand is available, the following procedure for testing rebuilt pumps is recommended:

- A** Mount pump on test stand making sure that the proper level of clean oil is available in the reservoir. Check suction line for leaks and obstructions.
- B** Start pump and run for three minutes at zero pressure.
- C** Intermittently load pump to 500 P.S. I. for three minutes.
- D** Intermittently load pump to 1000 P.S. I. for three minutes.
- E** Intermittently load pump to 2000 P.S. I. for three minutes.
- F** Remove pump from test stand and check for freeness of drive shaft. Check for leaks.

**2** If shop test stand is not available, the following procedure for testing rebuilt pumps is recommended:

- A** Mount pump on equipment and run pump at 1 /2 engine speed at zero pressure.
- B** By operating control valve build pressure intermittently for three minutes.
- C** Increase engine speed to full throttle and build pressure intermittently for three minutes.
- D** Idle engine and check for leaks.

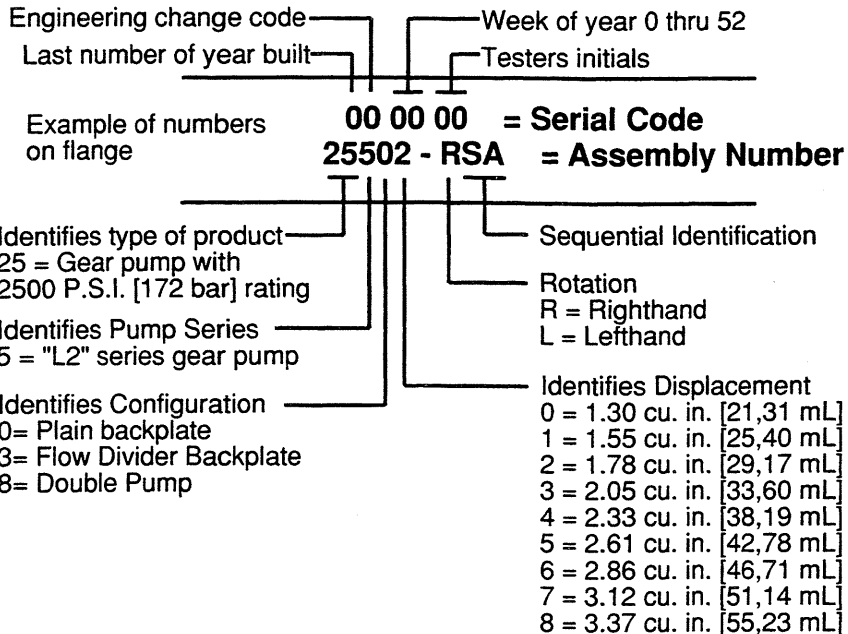
### Single or Double Pump Trouble Shooting

Problem	Possible Cause	Correction
1. Noisy pump caused by cavitation.	a. Oil too heavy. b. Oil filter plugged. c. Suction line plugged or too small.	a. Change to proper viscosity. b. Clean filters. c. Clean line and check for size.
2. Oil heating	a. Oil supply low. b. Contaminated oil.  c. Setting of relief valve too high or too low d. Oil in system too light.	a. Fill reservoir. b. Drain reservoir and refill with clean oil.  c. Set to correct pressure. d. Drain reservoir and refill with proper viscosity oil.
3. Shaft seal leakage	a. Worn shaft seal.  b. Broken bearing seal or back-up gasket c. Bushings out of position. d. Excessive internal wear.	a. Replace shaft seal. (If replacing shaft seal does not stop seal leakage, the pump should be disassembled and checked for causes b, c, & d. b. Replace back-up gasket, molded o-ring, bearing seal, & wear plate c. Replace front plate. d. Inspect parts and replace as needed.
4. Foaming oil	a. Low oil level b. Air leaking into suction line c. Wrong kind of oil.	a. Fill reservoir. b. Tighten fittings. c. Drain and fill reservoir with non-foaming oil.

### Flow Divider or Flow Control Trouble Shooting

Problem	Possible Cause	Correction
1. External leakage	a. O-ring damaged.	a. Install new seals.
2. Low priority pressure.	a. Low relief valve setting.	a. Replace weak or broken spring. b. Shim as required. c. Replace backplate assy.
3. Low priority flow.	a. Relief valve open or leaking. b. Scratched machined sealing surface in relief valve. (Either in seat or poppet within cartridge) c. Contaminant lodged in relief valve. d. Missing spring shims. e. Weak spool spring.	a. Replace weak or broken spring. b. Replace parts as required.  c. Clean relief valve cavity. d. Add shims as required. e. Replace spool spring.
4. No priority flow.	a. Broken spool spring. b. Orifice inside spool plugged.	a. Replace spool spring. b. Check for contaminant lodged in orifice.
5. No secondary flow.	a. Spool sticking.	a. Remove and clean spool bore.
6. Low secondary flow.	a. Pump flow degradation due to wear.	a. Check pump for worn parts and replace.

## Identification Numbers



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