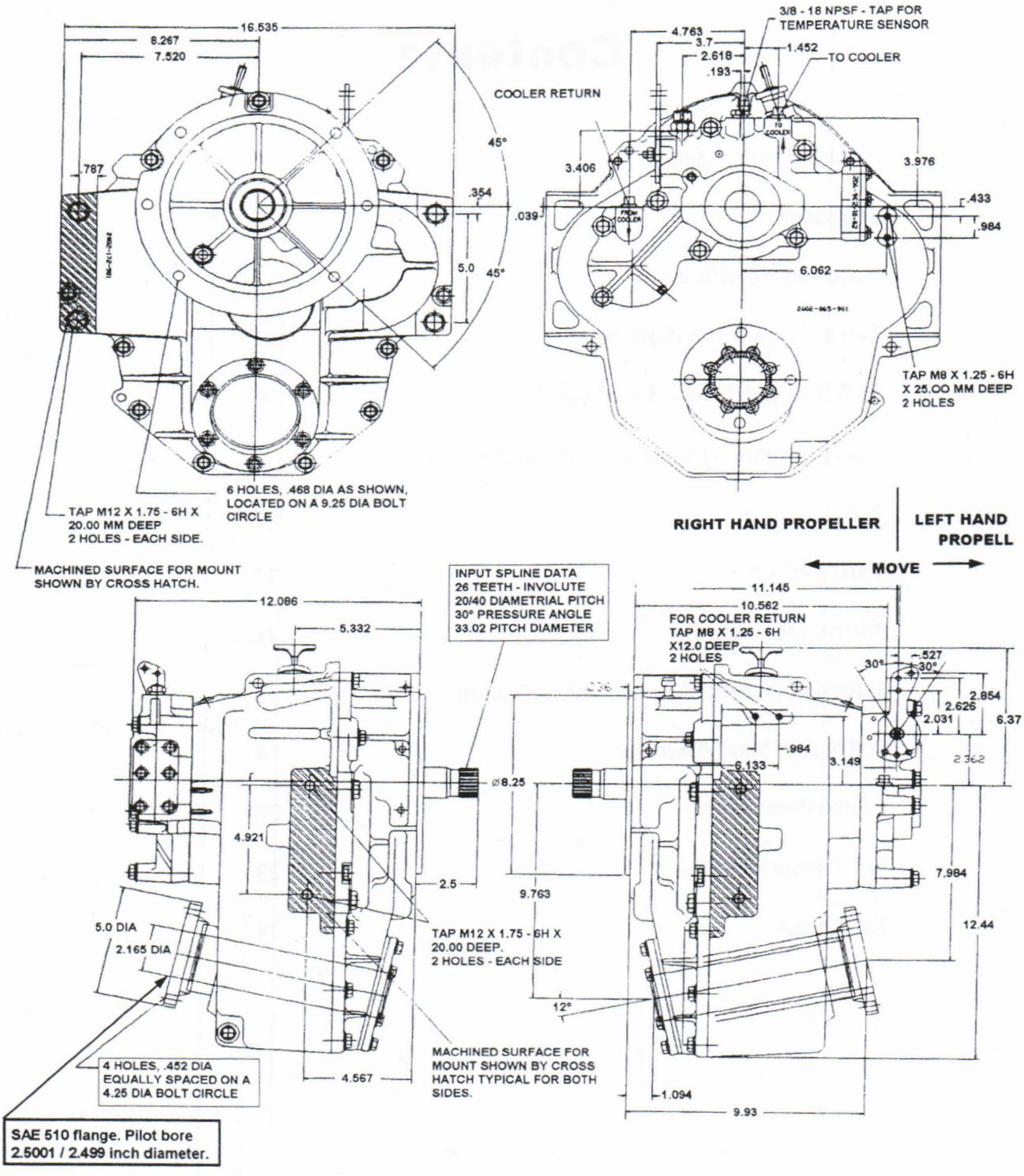
Contents



INSTALLATION DRAWING

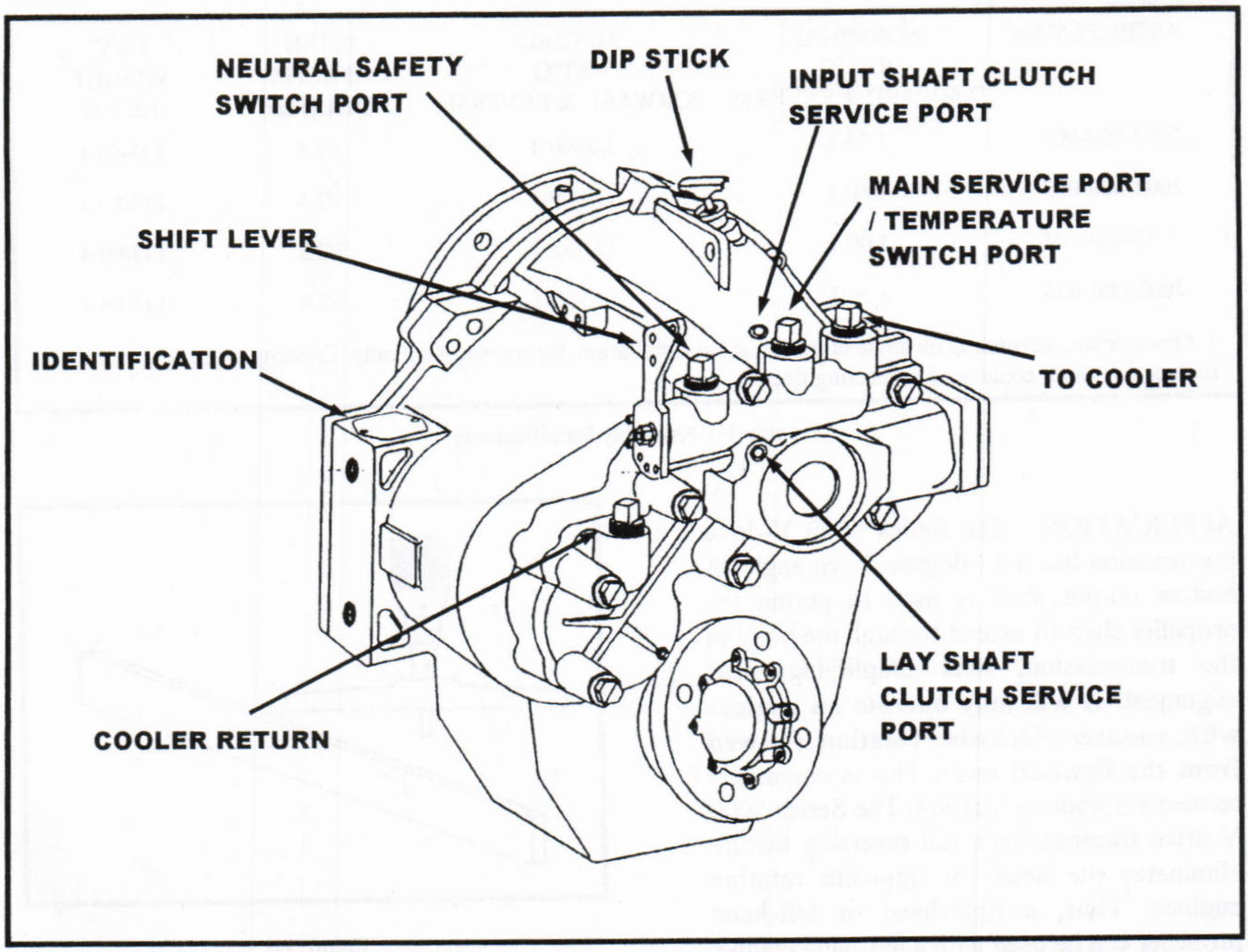


Figure 1-1. Series 5000 V-drive Marine Transmission

INTRODUCTION

PURPOSE AND SCOPE. This manual contains preliminary information to help the technician service the Velvet-Drive ® S5000 V-drive transmission (see figure 1-1) and is designed to be used in conjunction with the **Series 5000 Marine Transmission Service Manual (Form 1351/4-95). Service procedures for clutch and valve and pump assembly are located in Form 1351/4-95.**

Service parts for the S5000 V-drive are included in the "P" section of this supplement. Parts for the S5000 down angle model are included in Service Manual 1351.

GENERAL DESCRIPTION. The Velvet Drive ® Series 5000 V-Drive is a single-speed, forward/reverse, hydraulic-shift transmission. The gear ratio varies from model to model and is listed in Table 1-1.

The input (131), lay (132), intermediate (140), and output (153) shafts are supported by tapered roller bearings. Needle bearings (708) are used between the shafts and clutch gears on the input and lay shaft assemblies. Helical gearing is used throughout. The transmission has separate, multi-disc clutches for each direction of output shaft rotation.

ASSEMBLY No	NORMINAL RATIO FORWARD & REVERSE	ACTUAL RATIO FORWARD & REVERSE	FLUID CAPACITY* QT/LITER	DRY WEIGHT LB/KG
2002-000-002	1.25:1	1.2800:1	3/2.8	133/60.4
2002-000-003	1.50:1	1.5030:1	3/2.8	133/60.4
2002-000-004	2.00:1	1.9862:1	3/2.8	133/60.4
2002-000-005	2.50:1	2.4960:1	3/2.8	133/60.4

* Approximate, depending on angle of transmission installation, for transmission only. Capacity given does not include oil (fluid) cooler and connecting lines.

Table 1-1 Assembly Specifications

APPLICATION. The Series 5000 V-drive transmission has a 12 degree down angle. A hollow output shaft is used to permit the propeller shaft to extend through the body of the transmission, thus simplifying shaft alignment. **It will only operate on engines with counter clockwise rotation (viewed from the flywheel end).** This is commonly termed automotive rotation. The Series 5000 V-drive transmission's full reversing feature eliminates the need for opposite rotation engines. Thus, a right-hand or left-hand propeller can be used with a left-hand engine.

BEARING PRELOAD

Clutch service, and input and lay shaft preload procedures are similar to those used in the S5000 down angle and are described in detail in Service Manual Form 1351/4-95. Output shaft (153) and intermediate shaft (140) bearing pre-load procedures are different than those used in previous models.

INTERMEDIATE SHAFT BEARING PRELOAD If the intermediate bearings have an acceptable wear pattern and are otherwise in good condition, it is recommended this procedure be passed over, and the shaft and bearing cone assembly be reinstalled as removed. **However, if any bearing cone or cup has been removed, a re-calibration of the intermediate pre-load must be performed.**

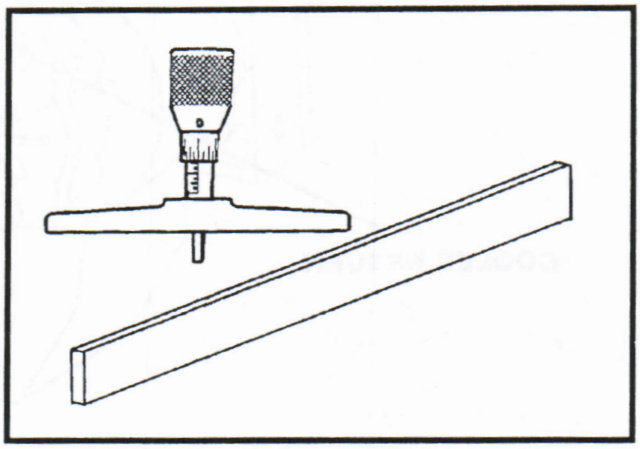


Figure 1-2
Depth micrometer and straight edge.

PROCEDURE A depth micrometer with extensions to reach six (6) inches, and a straight edge bar (figure 1-2) are required. **It is extremely important the straight edge is true and has no bends.**

1. Remove both bearing cups (137 & 142) and shims (138) from the casing (160) and cover (129). A heat lamp or suitable substitute will be required. Usually ten minutes with a 600 watt lamp will do the trick.
2. Measure the distance from the gasket surface to the bearing cup seat in the case as shown in figure 1-3.

a. Place a cover gasket (130) on case surface. Use petroleum jelly to hold in place.

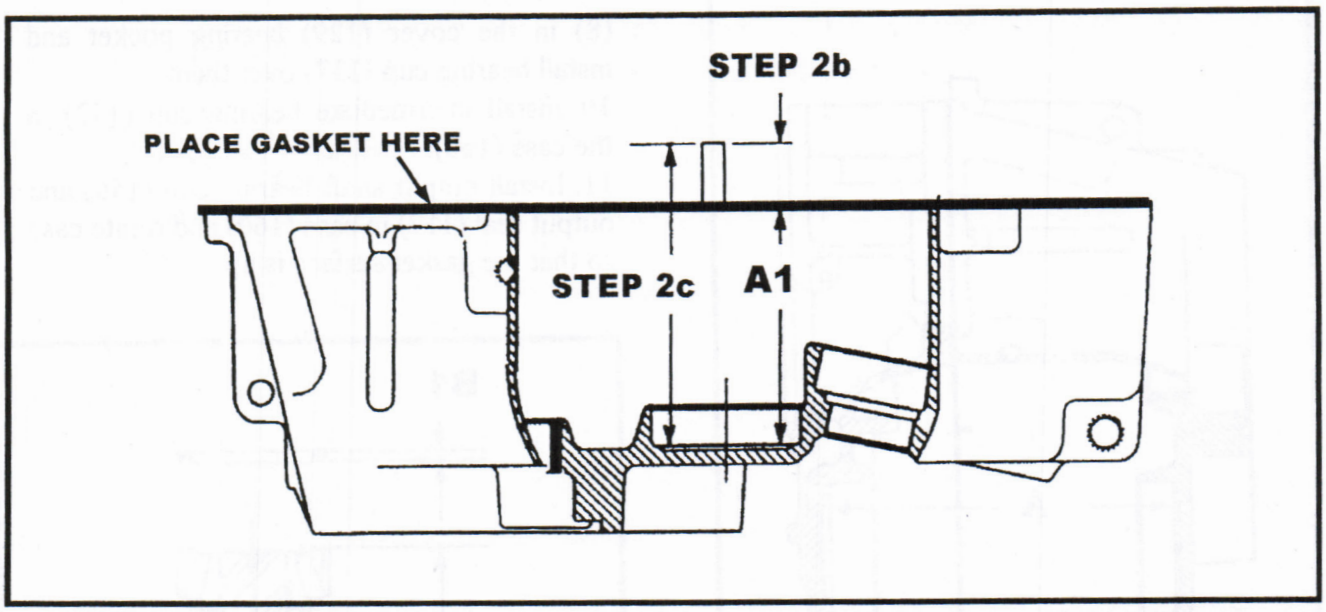


Figure 1-3 Case cut away

b. Place the straight edge across the gasket surface (Step 2b).
c. Measure from the straight edge to the bearing seat (Step 2c).
d. Subtract the straight edge thickness from the measurement determined in "Step 2c". This will become measurement "A1".
3. Measure the distance from the cover gasket surface **(do not use a gasket to make this measurement)** to the bearing cup seat in the cover as shown in figure 1-4.
e. Place the straight edge across the cover surface (Step 3e).
f. Measure from the straight edge to the bearing seat (Step 3f).
g. Subtract the straight edge thickness from the measurement determined in Step 3f. This will be measurement "A2".
4. **Add** measurements **A1 and A2** determined in 2d and 3g above. **This will be the total distance between the intermediate shaft bearing seats in an assembled case and cover (figure 1-5) This is measurement "A".**
5. Press the two bearing cones (139 & 141) on the intermediate shaft (140), place cups

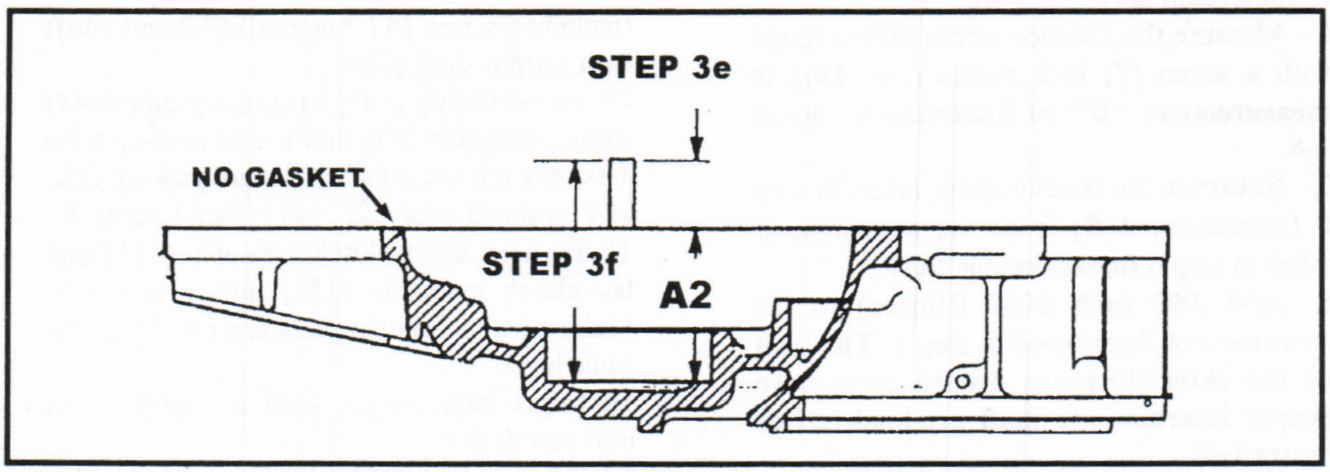


Figure 1-4 Cover cut away

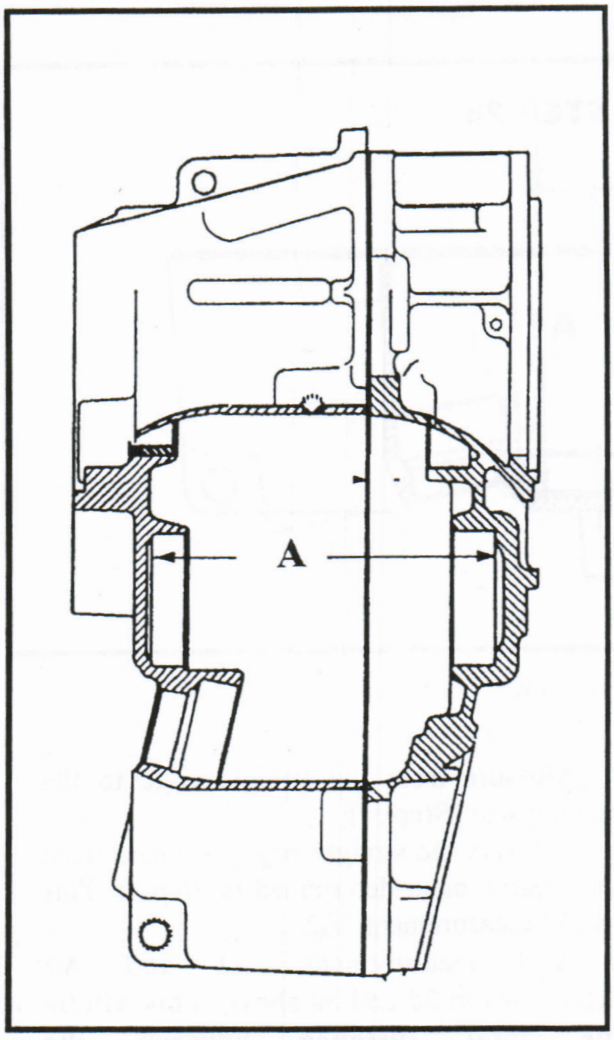


Figure 1-5. Assembled case and cover cutaway.

(137 & 142) on the cones and clamp with moderate pressure to assure proper bearing to roller seating (figure 1-6).

6. Measure the distance across the two cups with a seven (7) inch micrometer. **This is measurement "B"** as illustrated in figure 1-6.

7. **Subtract** the measurement taken in step 6 (measurement **B**) **from** the measurement taken in step 4 (measurement "**A**").

8. **Add .009 inch** (.007-.010inch) to the measurement determined in step 7. **This will be the shim thickness needed to achieve proper intermediate shaft pre-load (B1 in figure 1-6)**.

9. Place the shims (138) determined in step (8) in the cover (129) bearing pocket and install bearing cup (137) over them.

10. Install intermediate bearing cup (142) in the case (160).

11. Install output shaft bearing cup (156) and output seal (117) in case (160) and rotate case so that the gasket surface is up.

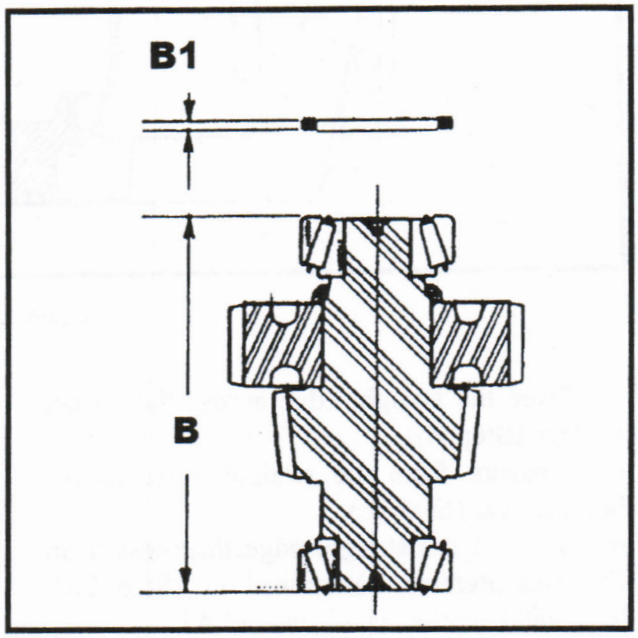


Figure 1-6. Intermediate shaft with bearing

12. Press bearing cones (152 & 155) on output shaft (153) and insert into case (160). **Be careful not to upset the garter string behind the seal's lip.**

13. Position oil shield assembly (146 (including screw 147, magnet 148 & nut 149)) over output shaft gear.

14. Install O-ring (145) on pick-up tube (144) using petroleum jelly and install pick-up tube assembly into case (160). Secure pick-up tube and oil shield with bolt (143) using Loctite ®.

15. Position input clutch assembly (131) and lay clutch assembly (132) into case (160). Make sure the clutch gears are resting at the same level

16. Insert intermediate shaft assembly (140) into case (160).

17. Position gasket (130) on case (160). Use

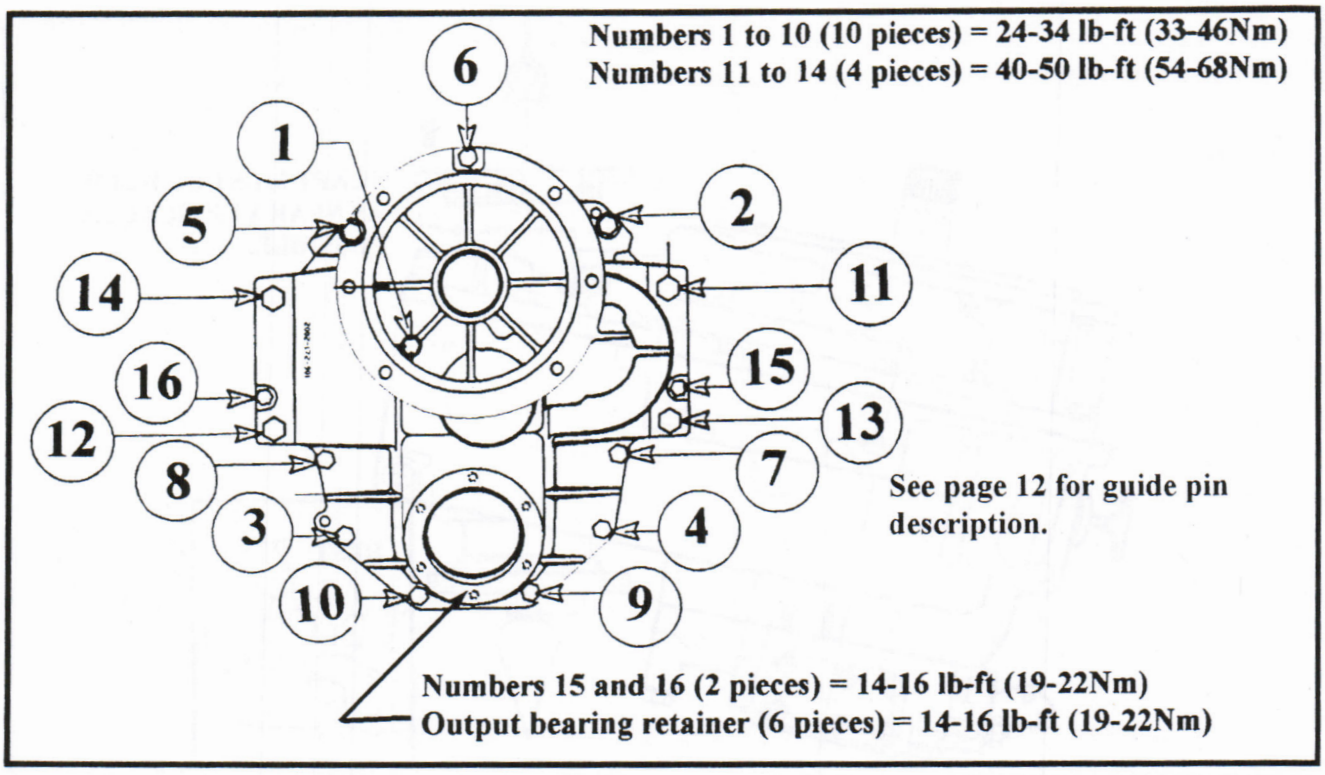


Figure 1-7. Torque sequence and specifications

petroleum jelly to hold gasket. Do not use sealer of any kind.

18. Place cover (129) on gasket and install guide pins into the two (2) roll pin (123) locations. See figure 1-7.

19. Install bolts (124, 125, 127 & 128) and washers (126) finger tight only. Use RTV sealer on bolt (127).

20. Remove guide pins and install roll pins (123) through cover (129) and case (160).

21. Tighten bolts as described in figure 1-7.

OUTPUT SHAFT BEARING PRELOAD

1. Arrange the transmission assembly in a position that assures the output shaft is in a vertical position (figure 1-9.

2. Install seal (120) and O-ring (121) in bearing retainer (119).

3. Install the output bearing cup (151) insuring the bearing cup is properly seated.

4. **Measure the distance from the bearing cup (151) to the cover surface and record (figure 1-8).**

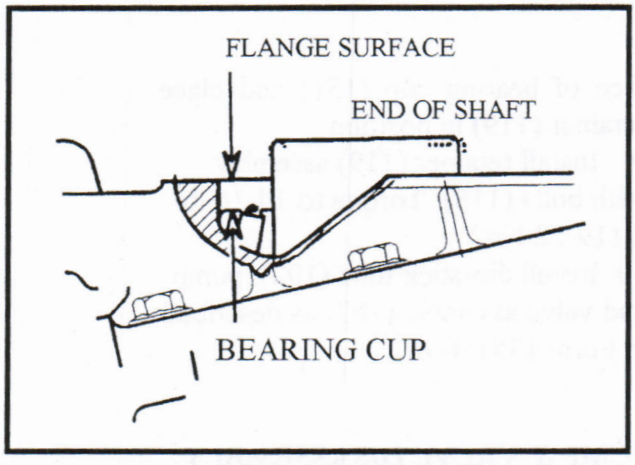


Figure 1-8. Measure to cup.

5. **Measure the distance between the two bearing retainer (119) surfaces as shown in figure 1-10 and record.**

6. **Subtract the measurement found in step 4 from that found in step 5.**

7. **Add .009 inch (.007-.010inch) to the measurement determined in step 6. This is the total thickness of the shim pack (122) to be placed on the output bearing cup.**

8. Place the shims determined in step 7 on

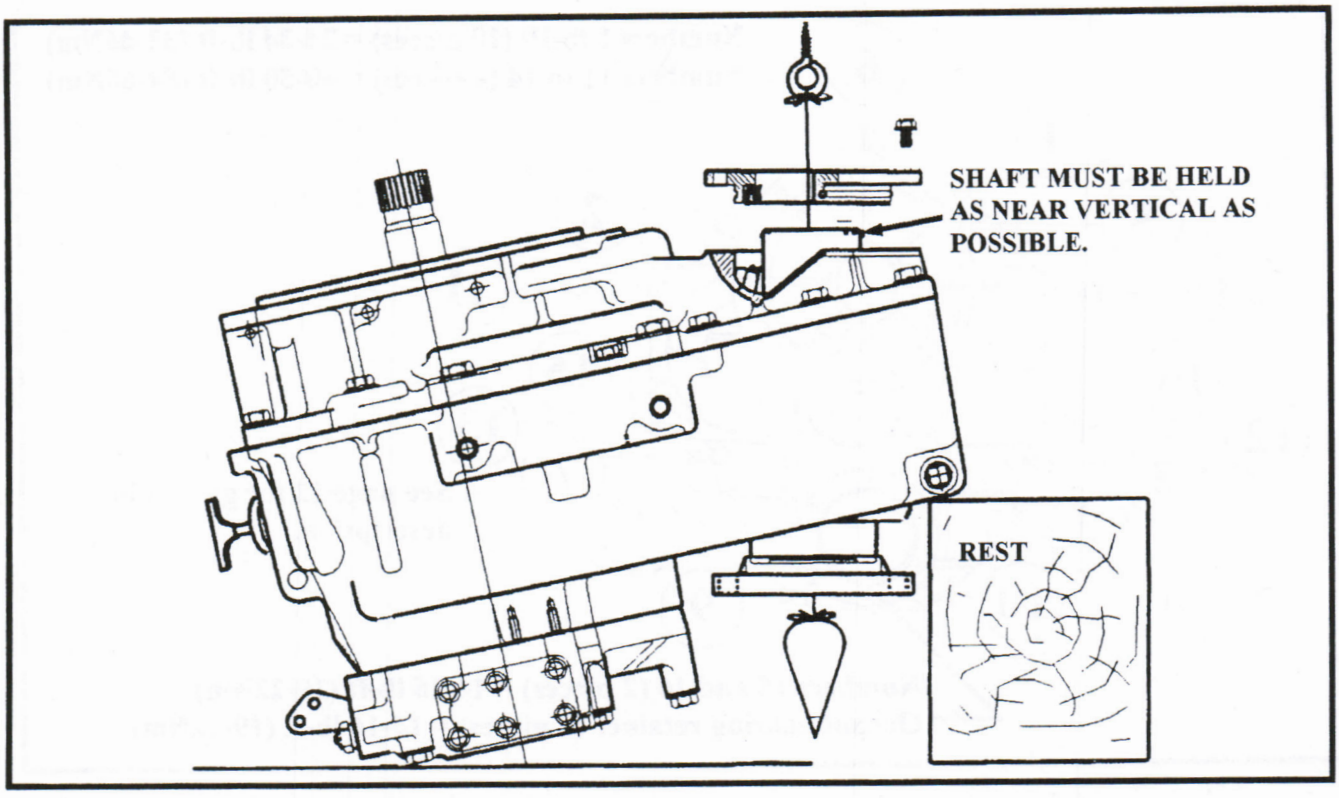


Figure 1-9. Case positioning for output bearing preload adjustment

face of bearing cup (151) and place retainer (119) in position

9. Install retainer (119) assembly with bolts (118). Torque to 14-16 lb-ft (19-22 Nm).

10. Install dip-stick tube (102), pump and valve assembly (107) as described in Form 1351/4-95

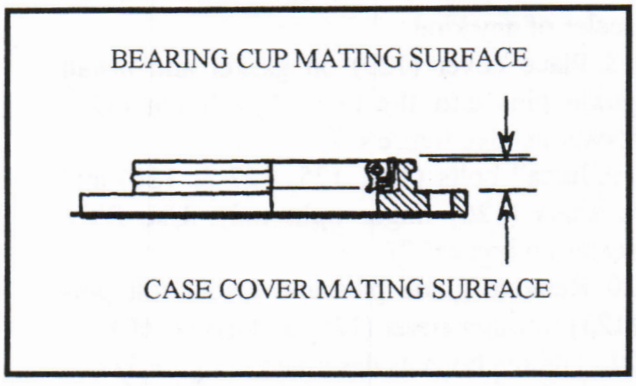


Figure 1-10. Measure taken from bearing retainer.

PUMP & VALVE DISASSEMBLY

GENERAL INFORMATION

There are two distinctly different pump and control valve assemblies used on the S5000 V-drive transmission. The two designs are interchangeable as complete assemblies, but for the most part their internal parts are different. **The manual control valve (212), spring (217) and screen (222) are the only common internal parts**.

1. The GEROTOR type is the latest design and quickly discernible by placing a magnet against the steel cover plate (215) see Figure 1-11.

2. The CRESCENT type is the earlier design and has an aluminum cover plate (215) which will not attract a magnet.

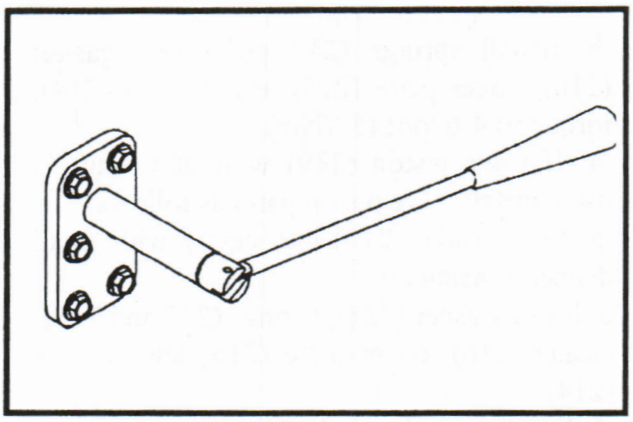


Figure 1-11
Identification of pump type.

DISASSEMBLY OF VALVE AND PUMP HOUSING ASSEMBLY

REMOVAL OF PUMP, CONTROL VALVE, SWITCH AND TRANSMISSION SHIFT LEVER. Proceed as follows (see figure 1-12):

1. Remove the neoprene o-ring (201) see Figure 1-12, three bolts (202) and pump assembly (203). The pump contains matched parts and must be replaced as an assembly.
2. Remove switch assembly (204) and temperature sensor (if used).
3. Holding transmission shift lever (208) to prevent control valve (212) from turning and ball (209) and spring (210) from dropping out, remove nut (205). Remove lock washer (206), flat washer (207), shift lever (208), ball (209) and spring (210).
4. Remove lock ring (211) and slide valve (212) from housing (107). Temporarily reinstal lever (208) for better leverage.
5. Remove pins (223) only if pin replacement is required.

REMOVAL OF PRESSURE CONTROL VALVE AND SCREEN. Proceed as follows (see figure 1-12);

1. Remove six bolts (214), cover plate (215), gasket (216), spring(s) (217 and/or 218).

INDEX	NO	APPLICATION	PART NO	DESCRIPTION	LB-FT	NM	REM.
128	9	COVER TO MAIN CASE	1300-183-018	M10 x 1.50 x 31.0 mm	32 - 36	43 - 49	
125	4	COVER TO MAIN CASE	1000-183-092	M12 x 1.75 x 35.0mm	40 - 50	54 - 68	
124, 118	8	COVER / FLANGE	11502693	M8 x 1.25 x 20.0mm	14 - 16	19 - 22	# 271
127	1	COVER TO MAIN CASE	1300-183-007	M10 x 1.50 x 110.0mm	32 - 36	43 - 49	# 242
114	8	FLANGE TO SHAFT	1000-183-093	M8 x 1.25 x 20.0mm	32 - 36	43 - 49	
104	7	VALVE BODY TO CASE	1000-183-088	M10 x 1.50 x 70.0mm	34 - 38	47 - 53	
105	1	VALVE BODY TO CASE	2000-183-001	M5 x 0.8 x 30.0mm	4 - 6	5 - 7	
143	2	OIL BAFFLE TO CASE	1000-183-090	M6 x 1.0 x 16.0mm	4 - 6	5 - 7	
202	3	OIL PUMP TO HOUSING	1000-183-087	M6 x 1.0 x 25.4mm	6 - 8	8 - 11	
204	1	NEUTRAL SWITCH	1000-640-004	9/16 x 18 UNF	20 - 25	27 - 34	
205	1	NUT, CONTROL VALVE	11505919	M8 x 1.25 mm	14 - 16	19 - 22	
214	6	END COVER, VALVE	1000-183-090	M6 x 1.0 x 16.0mm	4 - 6	5 - 7	
714	24	CLUTCH CYLINDER	2000-183-002	M6 x 1.0 x 20.0mm	16 - 18	22 - 25	##
103	1	DRAIN PLUG	444583	3/8 x 18 DRYSEAL NPSF	20 - 25	27 - 34	

LOCTITE (R) NUMBER, ## PREAPPLIED LOCTITE

Table 1-2 Torque specifications

2. Remove washer (221) (if used) and valve (219) (see figure 1-12).
3. Remove two o-rings (220) from valve (219).

ASSEMBLY

ASSEMBLE SCREEN, PISTON AND CONTROL VALVE as follows (see figure 1-12):

1. If removed, press in pins (223).
2. Install screen (222), chamfered end first, into valve and pump housing (107).
3. If valve piston (219) with double o-rings are used, install valve piston as follows:
a. Carefully place two o-rings (213) on piston (219), coat with petroleum jelly and insert into cavity, with o-rings first.
b. Install springs (217 and 218), gasket (216), cover plate (215) and 6 bolts (214), torque to 4-6 lb/ft (5-7Nm).
4. If valve piston (219) without o-rings is used, install valve piston parts as follows:
a. Insert valve (219) into cavity with small diameter facing out.
b. Insert washer (221), springs (217 and 218), gasket (216), cover plate (215) and 6 bolts (214).
5. Install neutral switch (204).
6. Install o-ring (213) in groove on control valve (212) using petroleum jelly and install control valve in housing (107) with (neutral switch) detent socket toward top. Install snap ring (211).
7. Fill detent spring hole with petroleum jelly, install spring (210), detent ball (209),

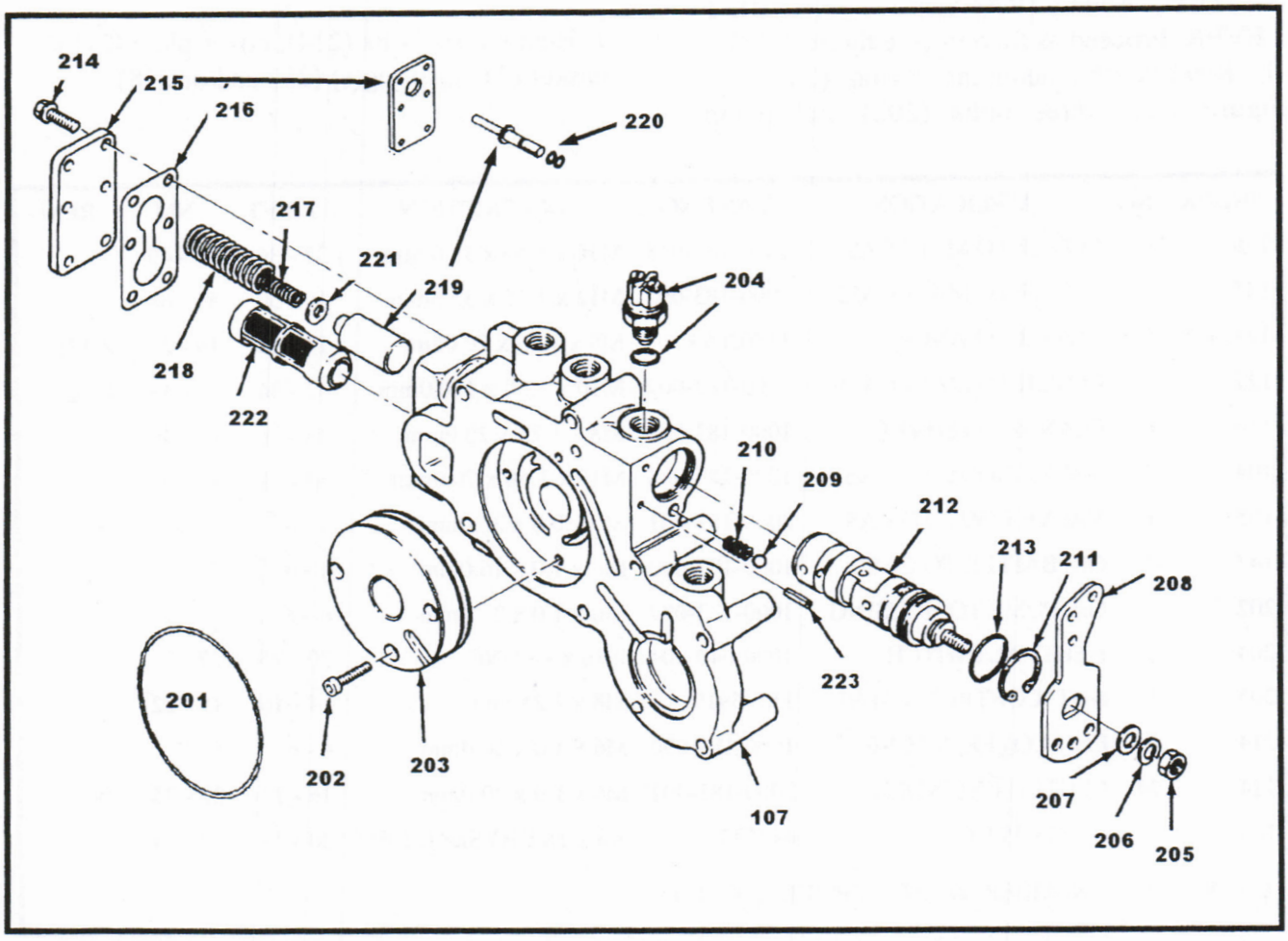


Figure 1-12 Valve & Pump Assembly

shift lever (208), flat washer (207), lock washer (206) and nut (205). Torque nut to 14-16 lb-ft (19-22 Nm).

8. Position pump assembly (203) in valve and pump housing assembly (107) with counter bored holes for bolt heads facing out. Align all three bolt holes and install bolts (202). Torque bolts to 6-8 lb-ft (8-11 Nm).

INSTALLATION OF VALVE AND PUMP ASSEMBLY

Determine input and lay shaft bearing preload as described in section 5-21, page 5-13 of the S5000 Down-Angle Service Manual (Form 1351/4-95)

Attach the valve and pump assembly (107) as follows.

1. Align the male flats on input shaft (733) with the female flats in the pump (203) by placing pump housing assembly over shaft with an oscillating motion until the mating surfaces come together.

2. Install two guide pins (figure 1-13) in case (160) on opposite sides of the pump mounting surface. Remove the pump assembly from the transmission case.

3. Position gasket (108) on mounting surface.

4. Install o-ring (201) in groove around pump (203) **(o-ring not required with crescent pump)**.

5. **Position shim packs (109) determined in section 5-21, page 5-13 of S5000 Down-Angle Service Manual (Form 1351/4-95) on bearing cups (110 & 111).**

6. **Carefully slide the pump assembly over the guide pins and finger tight five bolts (104), remove the guide pins and finger tight the two remaining bolts (104).**

TIGHTENING VALVE AND PUMP ASSEMBLY. Use the following steps to tighten the valve and pump assembly.

1. First, tighten bolts (104) to 15 lb/ft using

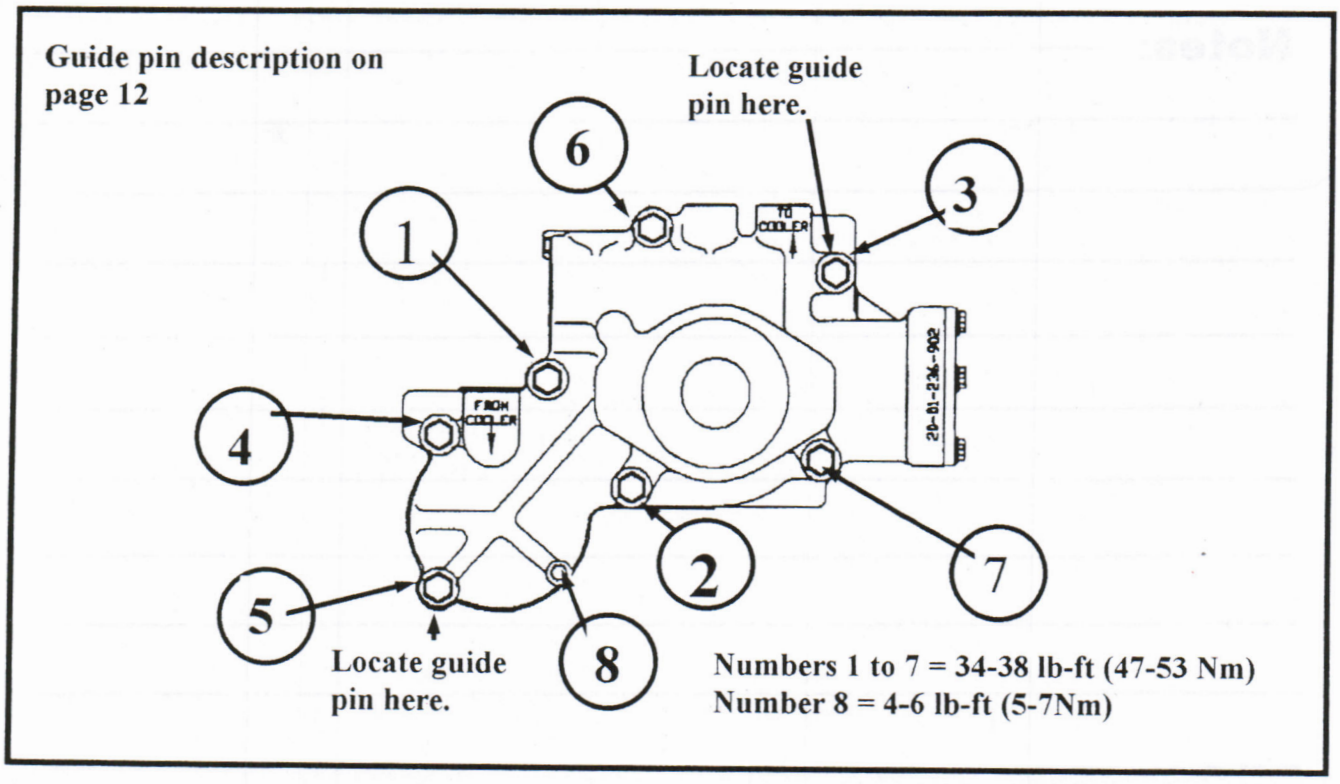
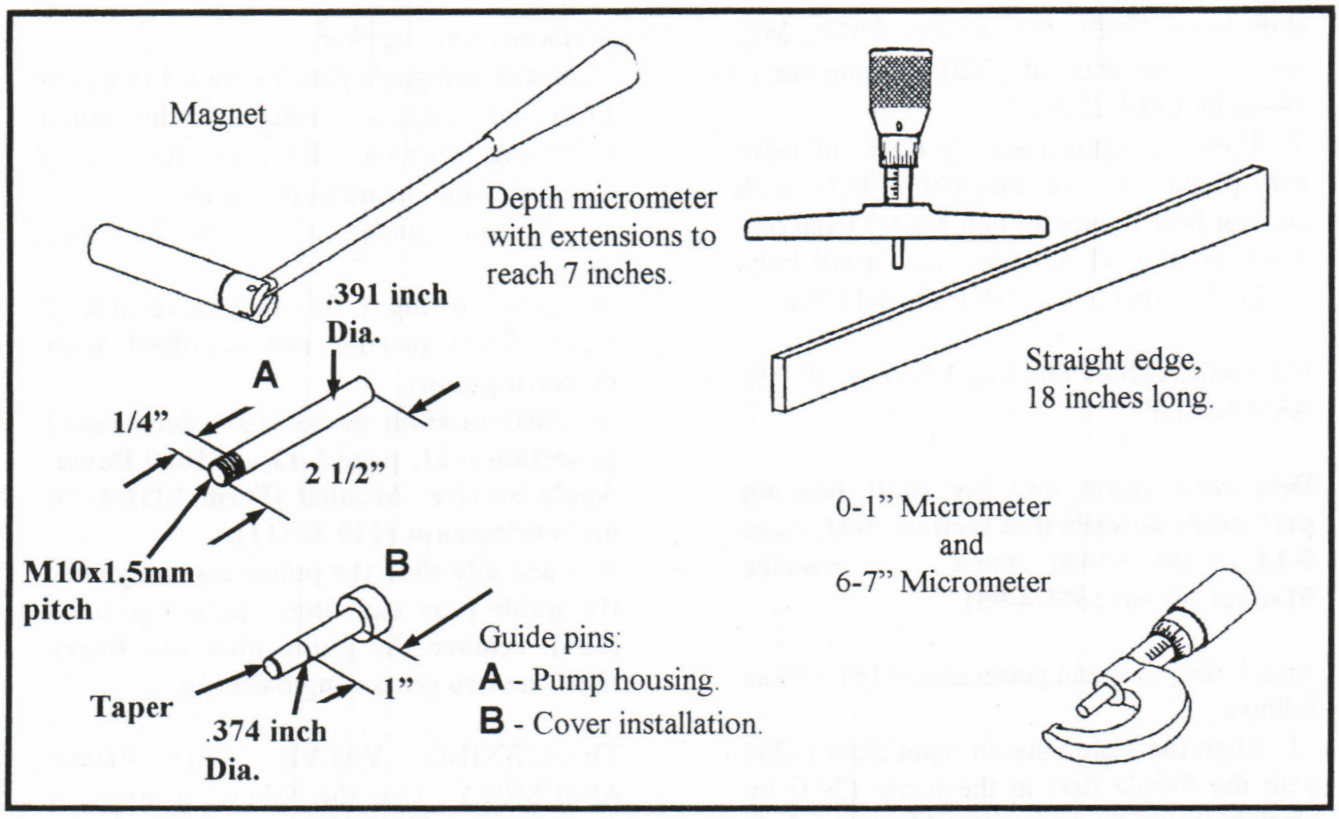


Figure 1-13 Pump housing bolt tightening sequence.



T-1, Special Tools

Notes:

Section P
Parts
Transmission Applications 2002-000-002 thru -005
Contents

P-1. INTRODUCTION

P-2 This section lists, describes and illustrates replacement parts for the Series 5000 V-Drive, Velvet Drive ® Marine Transmission. The exploded view illustration has a corresponding parts list. Index numbers are used to key each part in the exploded views to the parts list and service instructions in the preceding sections of this supplement.

P-3 The PART NUMBER column in the parts list gives the part number which can be used to order replacement parts. More than one part number is listed for some index numbers. For shims, select as required to meet the assembly requirements specified in the appropriate service section. For other parts, read the description column to determine part applicability.

P-4 The DESCRIPTION column gives the part nomenclature used, not only in the list but also in the service instructions. Part applicability is given in parenthesis if the parts used only on a specific model or models.

P-5 The QTY column designates the number of parts used at each location defined by the index number. Letter symbols may be used in this column to designate specific information as follows.

AR - As Required. This is used for selective fit parts, determined as specified in the assembly instructions.

Ref - Reference. This is used for subassemblies where the quantity required is listed on the main assembly parts list, figure P-1

NSS No Sold/Serviced Separately. Parts which are available only as an assembly.

LH - Left Hand Gear

RH - Right Hand Gear

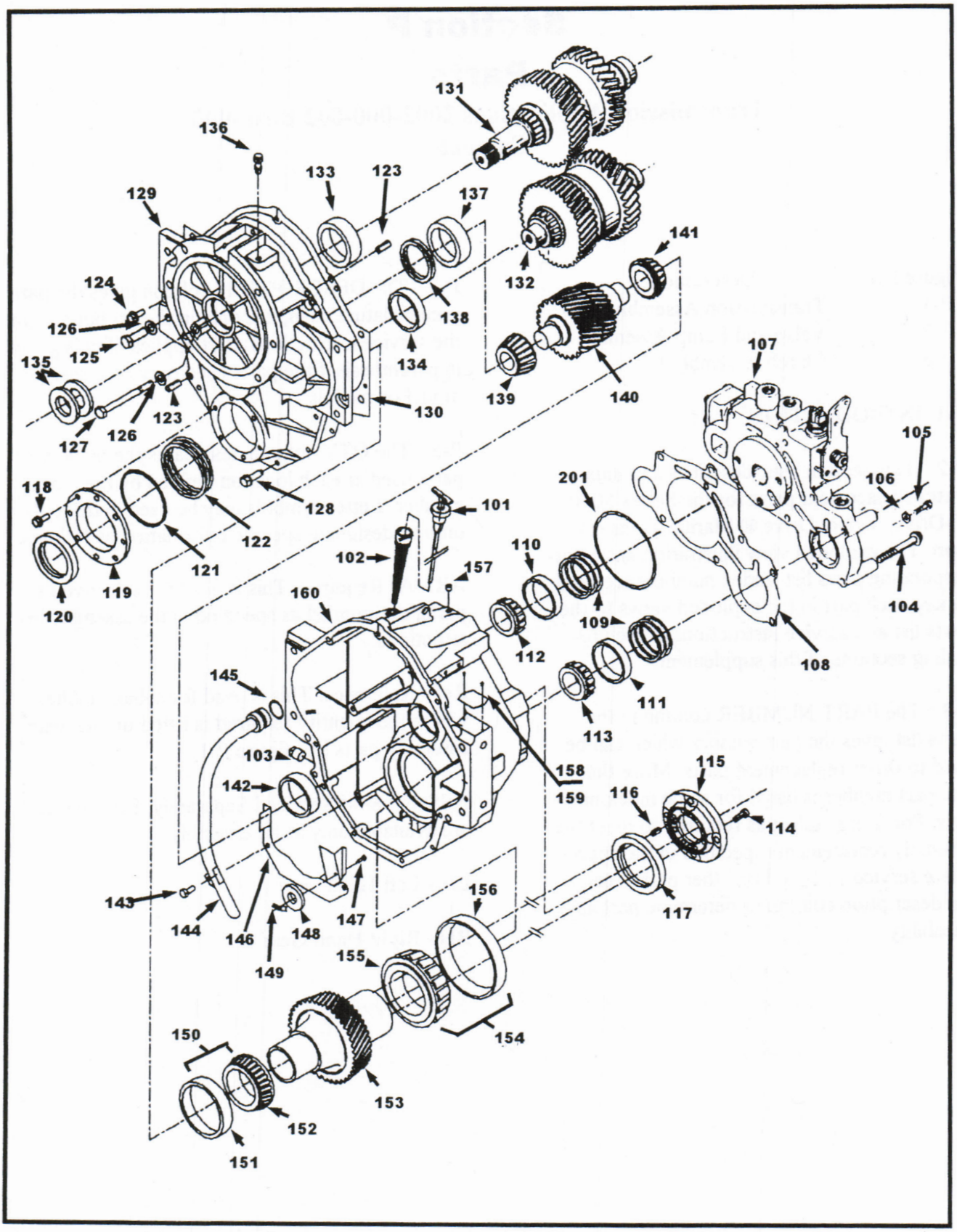


Figure P-1. V-drive Transmission Assembly

PARTS LIST FOR FIGURE P-1			
INDEX NO	PART NUMBER	DESCRIPTION	QTY
	1000-037-059	SHIM, 0.0050 in. (0.127 mm) thick	AR
101	2002-559-003	DIP STICK	1
102	2001-535-001	DIP STICK TUBE	1
103	444583	DRAIN PLUG	1
104	1000-183-088	BOLT, Hex head, M10 x 1.5 x 70	7
105	2000-183-001	BOLT, Hex head, M5 x 0.8 x 001	1
106	2000-047-001	WASHER	1
107	2001-736-002	VALVE & PUMP ASSY (See figure P-2)	1
108	2001-045-002	GASKET, Pump	1
109	SHIMS, INPUT AND LAY SHAFT PRELOAD		
	1000-037-058	SHIM, 0.0030 in. (0.076 mm) thick	AR
	1000-037-060	SHIM, 0.0070 in. (0.178 mm) thick	AR
	1000-037-061	SHIM, 0.0090 in. (0.229 mm) thick	AR
	1000-037-062	SHIM, 0.0200 in. (0.508 mm) thick	AR
	1000-037-063	SHIM, 0.0300 in. (0.760 mm) thick	AR
	1000-037-064	SHIM, 0.0400 in. (1.106 mm) thick	AR
	1000-037-065	SHIM, 0.0500 in. (1.270 mm) thick	AR
	1000-037-066	SHIM, 0.0600 in. (1.524 mm) thick	AR
	1000-037-067	SHIM, 0.0700 in. (1.778 mm) thick	AR
110	1000-133-009	BEARING CUP, Input shaft, pump side	1
111	1000-133-009	BEARING CUP, Lay shaft, pump side	1
112	1000-133-010	BEARING CONE, Input shaft, cover side	1
113	1000-133-010	BEARING CONE, Lay shaft, cover side	1
114	1000-183-093	BOLT, Flange	8
115	2002-031-001	FLANGE	1
116	2002-043-001	PIN	4
117	2000-044-004	SEAL, Output flange side.	1
118	11502693	BOLT, Bearing retainer, output.	6
119	2002-039-001	BEARING RETAINER, Output	1
120	2000-044-003	SEAL, Output retainer.	1
121	2000-141-500	O-RING, Output bearing retainer.	1
122	SHIMS, OUTPUT SHAFT PRELOAD		
	2002-037-001	SHIM, 0.0098 in. (0.250 mm) thick	AR
	2002-037-002	SHIM, 0.0198 in. (0.500 mm) thick	AR
	2002-037-003	SHIM, 0.0295 in. (0.750 mm) thick	AR
	2002-037-004	SHIM, 0.0393 in. (1.000 mm) thick	AR
	2002-037-005	SHIM, 0.0040 in. (0.102 mm) thick	AR
	2002-037-006	SHIM, 0.0070 in. (0.178 mm) thick	AR
123	2002-043-002	PIN, Roll	2

PARTS LIST FOR FIGURE P-1

INDEX NO	PART NUMBER	DESCRIPTION	QTY
124	11502693	BOLT, Hex head, M8 x 1.25 x 20	2
125	1000-183-092	BOLT, Hex head, M12 x 1.75 x 35	4
126	120395	WASHER	5
127	1300-183-007	BOLT, Hex head, M10 x 1.5 x 110.0 mm	1
128	1300-183-018	BOLT, Hex head, M10 x 1.5 x 30 mm	9
129	2002-172-001	COVER, Case	1
130	2002-045-002	GASKET, Cover	1
131	2002-689-001	INPUT SHAFT & CLUTCH ASSM.*** (35T*, 1.2800:1 Ratio transmission.)	1
	2002-689-002	INPUT SHAFT & CLUTCH ASSM.*** (33T*, 1.5030:1 Ratio transmission.)	1
	2002-689-003	INPUT SHAFT & CLUTCH ASSM.*** (29T*, 1.9862:1 Ratio transmission.)	1
	2002-689-004	INPUT SHAFT & CLUTCH ASSM.*** (25T*, 2.4960:1 Ratio transmission.)	1
132	2002-567-001	LAY SHAFT & CLUTCH ASSM.*** (35T*, 1.2800:1 Ratio transmission.)	1
	2002-567-002	LAY SHAFT & CLUTCH ASSM.*** (33T*, 1.5030:1 Ratio transmission.)	1
	2002-567-003	LAY SHAFT & CLUTCH ASSM.*** (29T*, 1.9862:1 Ratio transmission.)	1
	2002-567-004	LAY SHAFT & CLUTCH ASSM.*** (25T*, 2.4960:1 Ratio transmission.)	1
133	1000-133-053	BEARING CUP, Input shaft, cover side	1
134	1000-133-051	BEARING CUP, Lay shaft, cover side	1
135	1000-044-065	SEAL, Input shaft.	2
136	A4740G	VENT	1
137	1000-133-053	BEARING CUP, Intermediate, cover	1
138	SHIMS, INTERMEDIATE SHAFT PRELOAD		
	2002-037-011	SHIM, 0.003 in. +/- (0.076 mm +/-) thick	AR
	2002-037-012	SHIM, 0.005 in. +/- (0.126 mm +/-) thick	AR
	2002-037-013	SHIM, 0.007 in. +/- (0.172 mm +/-) thick	AR
	2002-037-014	SHIM, 0.009 in. +/- (0.228 mm +/-) thick	AR
	2002-037-015	SHIM, 0.020 in. +/- (0.505 mm +/-) thick	AR
	2002-037-016	SHIM, 0.030 in. +/- (0.752 mm +/-) thick	AR
	2002-037-017	SHIM, 0.040 in. +/- (1.016 mm +/-) thick	AR
	2002-037-018	SHIM, 0.050 in. +/- (1.270 mm +/-) thick	AR
	2002-037-019	SHIM, 0.060 in. +/- (1.526 mm +/-) thick	AR
	2002-037-020	SHIM, 0.070 in. +/- (1.777 mm +/-) thick	AR

PARTS LIST FOR FIGURE P-1

INDEX NO	PART NUMBER	DESCRIPTION	QTY
139	2000-133-075	BEARING CONE, Intermediate, cover	1
140	2002-584-001	INTERMIT. SHAFT, 28T**. 1.2800:1 ratio	1
	2002-584-002	INTERMIT. SHAFT, 31T**. 1.5030:1 ratio	1
	2002-584-003	INTERMIT. SHAFT, 36T**. 1.9862:1 ratio	1
	2002-584-004	INTERMIT. SHAFT, 39T**. 2.4960:1 ratio	1
141	2000-133-071	BEARING CONE, Intermediate, case	1
142	2000-133-070	BEARING CUP, Intermediate, case	1
143	1000-183-090	BOLT, oil shield and pick-up tube.	1
144	2002-534-001	PICK-UP TUBE, oil.	1
145	1000-141-214	O-RING, pick-up tube.	1
146	2002-036-001	SHIELD, oil.	1
147	2000-183-009	SCREW, magnet attach.	1
148	4915	MAGNET	1
149	1332-149-003	SPRING NUT, flat.	1
150	2000-633-002	BEARING, output cover side cone & cup.	1
151	2000-133-072	BEARING CUP, output cover side.	1
152	2000-133-073	BEARING CONE, output cover side.	1
153	2002-070-001	GEAR, output.	1
154	2000-633-001	BEARING, output case side cone & cup.	1
155	2000-133-069	BEARING CONE, output case side.	1
156	2000-133-068	BEARING CUP, output case side.	1
157	444685	PIPE PLUG, input clutch service port.	1
158	1000-183-077	RIVET, name plate.	2
159		NAME PLATE	NSS
160	2002-065-001	CASE	

* Driven gear.
** Driving gear.
*** See table on Page 18.

TRANS. MODEL/RATIO ***	INPUT-GEAR ***	INPUT-ASSY ***	LAY-GEAR ***	LAY-ASSY ***	INTER. GEAR # OF TEETH ***	INTER. ASSY NUMBER ***
2002-002 / 1.2800:1	2002-085-001 (35 TEETH)	2002-689-001	2002-085-001 (35 TEETH)	2002-567-001	28 TEETH	2002-584-001
2002-003 / 1.5030:1	2002-085-002 (33 TEETH)	2002-689-002	2002-085-002 (33 TEETH)	2002-567-002	31TEETH	2002-584-002
2002-004 / 1.9862:1	2002-085-003 (29 TEETH)	2002-689-003	2002-085-003 (29 TEETH)	2002-567-003	36 TEETH	2002-584-003
2002-005 / 2.4960:1	2002-085-004 (25 TEETH)	2002-689-004	2002-085-004 (25 TEETH)	2002-567-004	39TEETH	2002-584-004

Table P-1. INPUT, LAY AND INTERMIATE GEAR IDENTIFICATION.

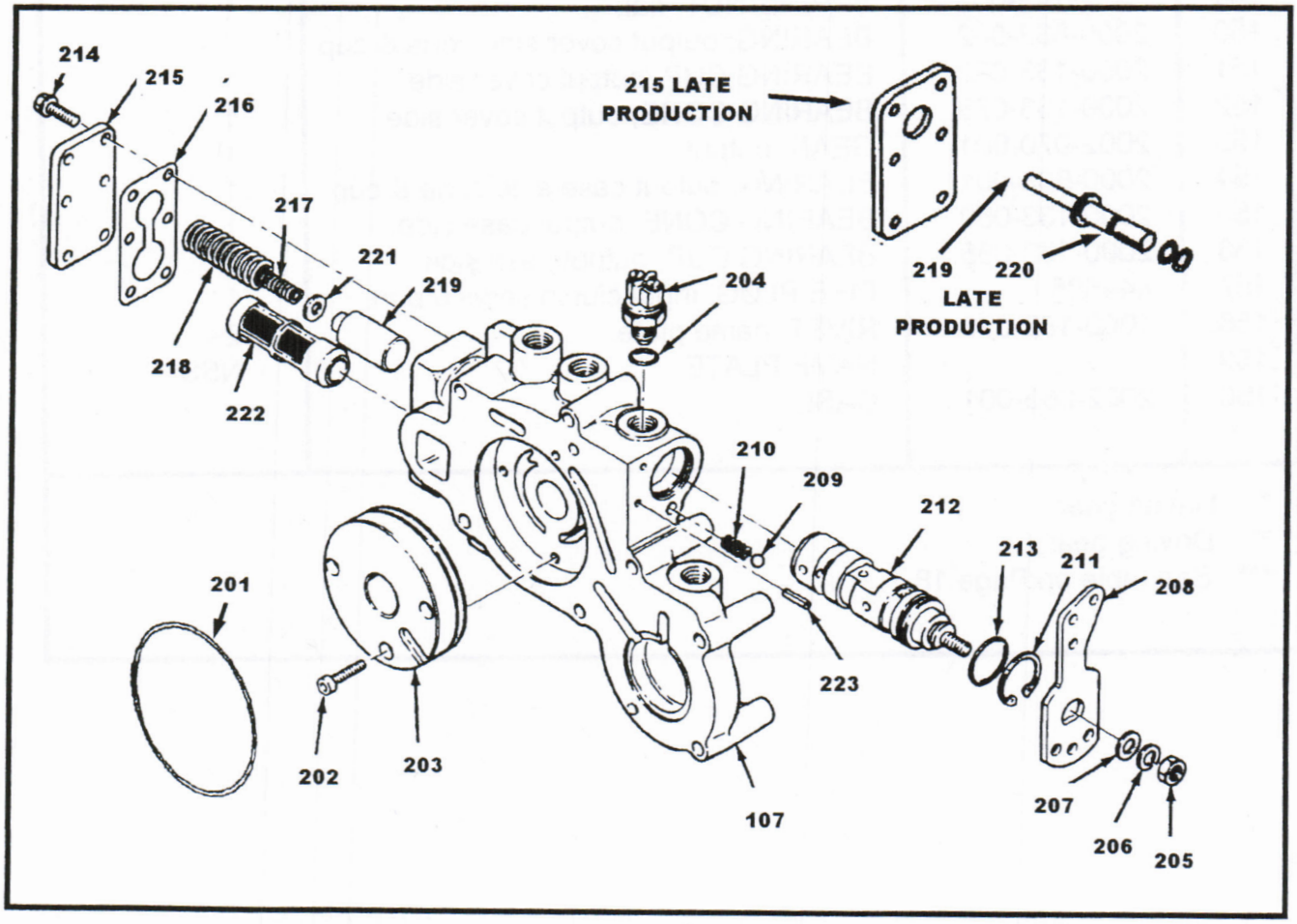


Figure P-2. Valve and Pump Assembly

PARTS LIST FOR FIGURE P-3				
INDEX NO	PART NUMBER	DESCRIPTION	QTY	
			INPUT	LAY
701	1000-133-052	BEARING CONE	1	
702	1000-133-050	BEARING CONE		1
703	2001-053-001	SPACER	1	
704	1000-193-022	THRUST WASHER	1	
705-706	2002-085-001	GEAR 35T (Used in 1.2800:1 ratio)	1	1
	2002-085-002	GEAR 33T (Used in 1.5030:1 ratio)	1	1
	2002-085-003	GEAR 29T (Used in 1.9862:1 ratio)	1	1
	2002-085-004	GEAR 25T (Used in 2.4960:1 ratio)	1	1
707	1000-139-068	SNAP RING	4	2
708	1000-132-055	BEARING	3	3
709	1000-139-069	SNAP RING	1	1
710	2001-062-003	PRESSURE PLATE, REACTION	1	1
711	2001-666-001	CLUTCH PLATE, BRONZE	8	8
712	2001-166-002	CLUTCH PLATE, STEEL	7	7
713	2001-062-002	SPACER PLATE, STEEL BACKING	1	1
714	2000-183-002	BOLT ()	12	12
715	2001-125-001	CYLINDER / CLUTCH GEAR (R)	1	
716	2001-125-002	CYLINDER / CLUTCH GEAR (LH)		1
717	1000-193-019	THRUST WASHER		1
718	2001-040-003	SPRING RETAINER (Flat)		1
719	2001-040-001	SPRING RETAINER (Grooves)	1	
720	1000-516-020	SEAL ASSM (Includes 721 & 722)	1	1
721	1000-016-020	SEAL (Inner, teflon)	1	1
722	1000-141-130	O-RING (Inner seal)	1	1
423	1000-516-019	SEAL ASSM (Includes 724 & 725)	1	1
724	1000-141-241	O-RING (Outer seal)	1	1
725	1000-016-019	SEAL (Outer, teflon)	1	1
726	2001-156-001	SPRING (Short heavy wire.)	4	4
727	1016-156-003	SPRING (Longer light wire.)	12	12
728	2001-624-001	PISTON, CLUTCH	1	1
729	1000-141-045	O-RING (Shaft to ring gear.)	1	1
730	2000-016-050	RINGS, SEALING	2	2
731	1000-016-021	RING, SEALING	1	
732	2001-067-001	SHAFT, LAY		1
733	2001-189-001	SHAFT, INPUT	1	
734	453595	BALL (Pressure relief)		1
735	72P-273	SPRING (Pressure relief)		1
736	2000-053-001	WASHER (Pressure relief)		1
737	2000-139-001	SNAP RING (Pressure relief)		1

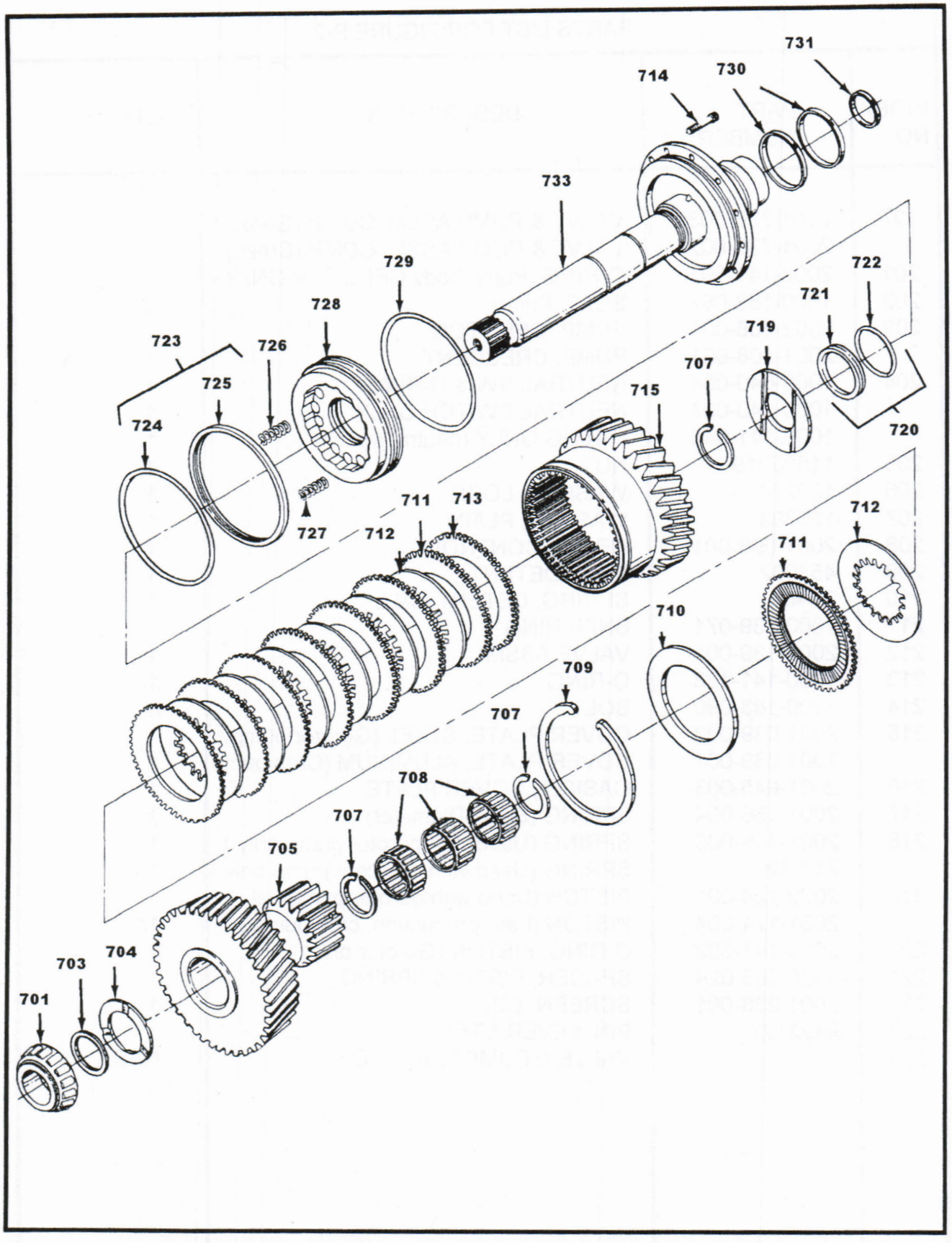


Figure P-3. Input Shaft Assembly

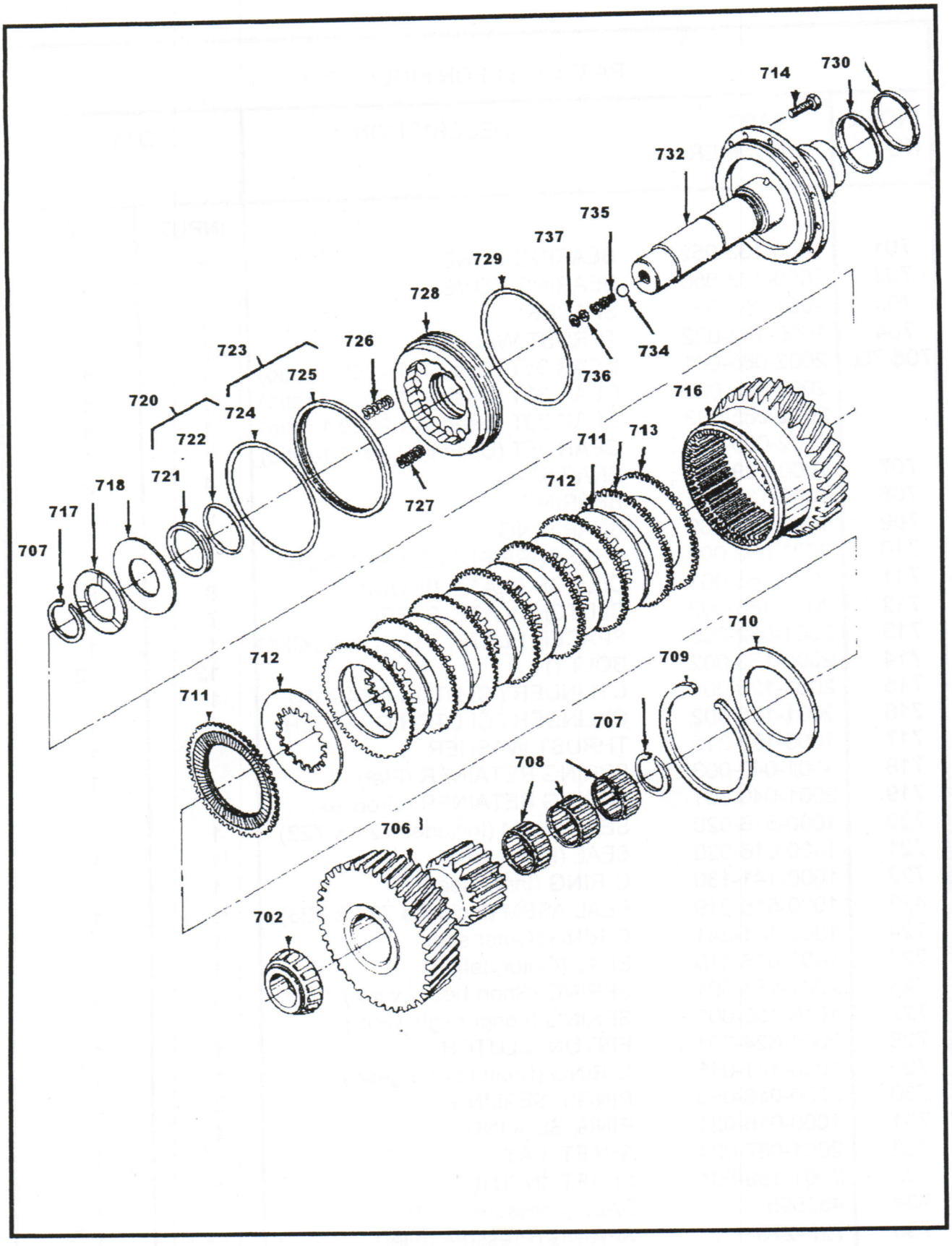


Figure P-4. Lay Shaft Asembly

PARTS LIST FOR FIGURE P-2			
INDEX NO	PART NUMBER	DESCRIPTION	QTY
107	2001-736-003	VALVE & PUMP ASSM. COMP.(Gerotor)	1
	2001-736-002	VALVE & PUMP ASSM. COMP.(Crest.)	1
201	2000-141-501	O-RING (Pump body GEROTOR ONLY)	1
202	1000-183-087	BOLT, Pump	3
203	2002-508-001	PUMP, GEROTOR	1
	2001-508-001	PUMP, CRESCENT	1
204	1000-640-004	NEUTRAL SW & O-RING	1
	1000-140-007	NEUTRAL SWITCH ONLY	1
	1000-141-046	O-RING ONLY (neutral switch)	1
205	11505919	NUT	1
206	120214	WASHER, LOCK	1
207	120393	WASHER, PLAIN	1
208	2001-098-001	LEVER, CONTROL	1
209	453632	BALL, DETENT	1
210	71-42	SPRING, DETENT BALL	1
211	1000-139-071	SNAP RING	1
212	2001-139-001	VALVE ASSM	1
213	1000-141-123	O-RING	1
214	1000-183-090	BOLT	6
215	2001-039-002	COVER PLATE, STEEL (Gerotor pump)	1
	2001-039-001	COVER PLATE, ALUMINUM (Cres pump)	1
216	2001-045-003	GASKET, COVER PLATE	1
217	2001-156-004	SPRING (Small Diameter)	1
218	2001-156-005	SPRING (Used with gerotor pump only.)	1
	71-242	SPRING (Used with crescent pump only.)	1
219	2002-124-001	PISTON (Used with geroter pump only.)	1
	2001-124-004	PISTON (Late production, cres pump.)	1
220	2000-141-502	O-RING, PISTON (Gerotor only)	2
221	1000-053-024	SPACER, PISTON SPRING	1
222	2001-238-001	SCREEN, OIL	1
223	9422127	PIN, LEVER STOP	1
224		VALVE & PUMP HOUSING	NSS

GASKET AND SEAL KIT 2002-410-001

The index numbers have been arrainged so that the parts used in each area of the transmission are shown together.

INDEX NO.	PART NUMBER	DESCRIPTION	QTY
108	2001-045-002	Gasket, punp	1
117	2000-044-004	Output seal, (flange)	1
120	2000-044-003	Output seal, (retainer)	1
130	2002-045-002	Gasket, case cover.	1
135	1000-044-065	Seal, input shaft	2
145	1000-141-214	O-ring	1
201	2000-141-501	O-ring	1
211	1000-139-071	Snap ring	1
213	1000-141-123	O-ring, control valve.	1
216	2001-045-003	Gasket, screen cover plate.	1
707	1000-139-068	Snap ring	6
709	1000-139-069	Snap ring	2
721	1000-016-020	Seal, piston small Tef.	2
722	1000-141-130	O-ring	2
724	1000-144-241	O-ring	2
725	1000-016-019	Seal, piston large Tef.	2
729	1000-141-045	O-ring, shaft to ring gear.	2
730	2000-016-050	Sealing ring, steel	2
731	1000-016-021	Sealing ring, piston	2
737	2000-139-001	Snap ring	1

CLUTCH KIT 2001-410-002

The parts in this kit will service one (1) clutch. Two (2) kits are required if both clutches are to be serviced.

INDEX NO.	PART NUMBER	DESCRIPTION	QTY
708	1000-132-055	Needle bearing	3
707	1000-139-068	Snap ring	3
709	1000-139-069	Snap ring	1
727	1016-156-003	Spring	12
717	1000-193-019	Thrust washer	1
704	1000-193-022	Thrust washer	1
730	2000-016-050	Sealing ring	2
714	2000-183-002	Bolt	12
719	2001-040-001	Spring retainer	1
718	2001-040-003	Spring retainer	1
703	2001-053-001	Spacer	1
710	2001-062-003	Backing plate	1
726	2001-156-001	Spring	16**
712	2001-166-002	Clutch disk (steel)	7
711	2001-666-001	Clutch disk (bronze)	8

** Only four (4) 2001-156-001 clutch springs are used in the S5000 V-drive models.