

**PARTS & OPERATORS  
MANUAL**

**dp WINCH**

*Pull Ahead!*

**61AAX2L1C  
HYDRAULIC WINCH**

**dp** MANUFACTURING, INC. 5647 S. 122nd E. Ave. Tulsa Oklahoma 74146 Tel. 918-250-2450 Fax 918-250-0690

Rev. 4/11/97

RELEASE DATE \_\_\_\_\_ SERIAL NUMBER \_\_\_\_\_

# TABLE OF CONTENTS

## WARNING AND CAUTION NOTICES - READ BEFORE OPERATING PRODUCT

DIMENSIONAL - 61AAX2L1C

WIRE ROPE INSTALLATION

HYDRAULIC SYSTEM

PLUMBING DIAGRAM

GENERAL INFORMATION AND DP SERVICING INSTRUCTIONS

INSTALLATION DRAWING - MOTOR END - EXPLODED VIEW

PARTS LIST - MOTOR END.....1.10350

INSTALLATION DRAWING - DRUM - EXPLODED VIEW

PARTS LIST - DRUM.....1.20156

INSTALLATION DRAWING - GEAR END - EXPLODED VIEW

PARTS LIST - GEAR END.....1.30122

INSTALLATION DRAWING - INPUT SHAFT - EXPLODED VIEW

PARTS LIST - INPUT SHAFT.....1.40183

INSTALLATION DRAWING - BASE MOUNT - EXPLODED VIEW

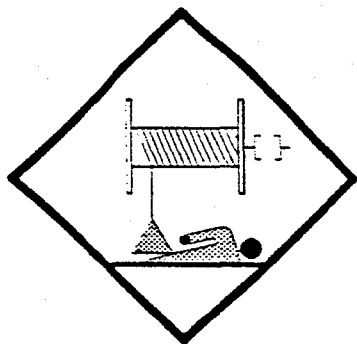
PARTS LIST - BASE MOUNT.....1.50295

INSTALLATION DRAWING - GEAR END COVER - EXPLODED VIEW

PARTS LIST - GEAR END COVER.....1.60024

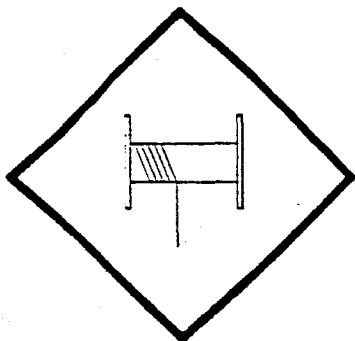
BOLT TORQUE CHART

WARRANTY, OIL SPECIFICATIONS AND HOW TO ORDER PARTS



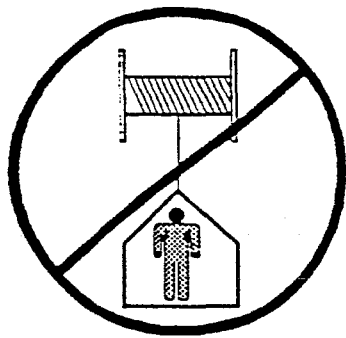
**DANGER**

**DO NOT**  
→ **DISENGAGE WINCH**  
**OR**  
→ **SHIFT 2 SPEED**  
**GEARBOX**  
**WHILE WINCH IS UNDER LOAD**  
**OR**  
**WHILE DRUM IS ROTATING**



**DANGER**

**THE LAST FIVE**  
**WRAPS OF WIRE ROPE**  
**MUST BE LEFT ON**  
**THE DRUM TO ASSIST**  
**THE WIRE ROPE CLAMP IN**  
**HOLDING THE LOAD**

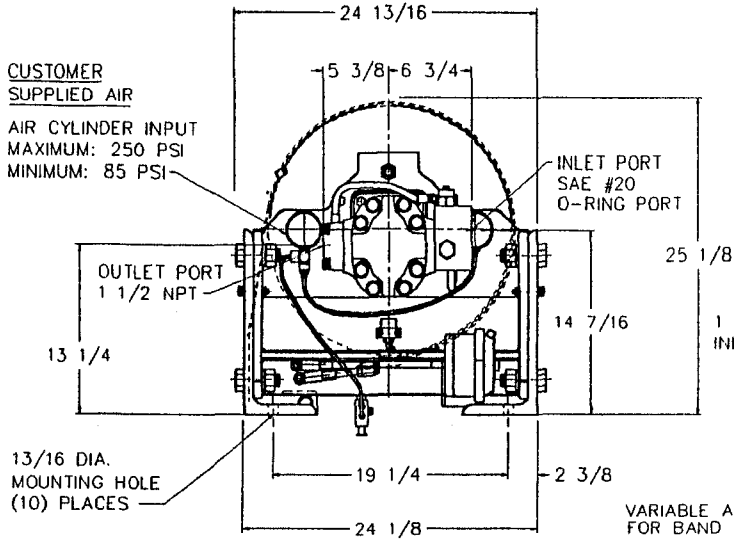


**WARNING**

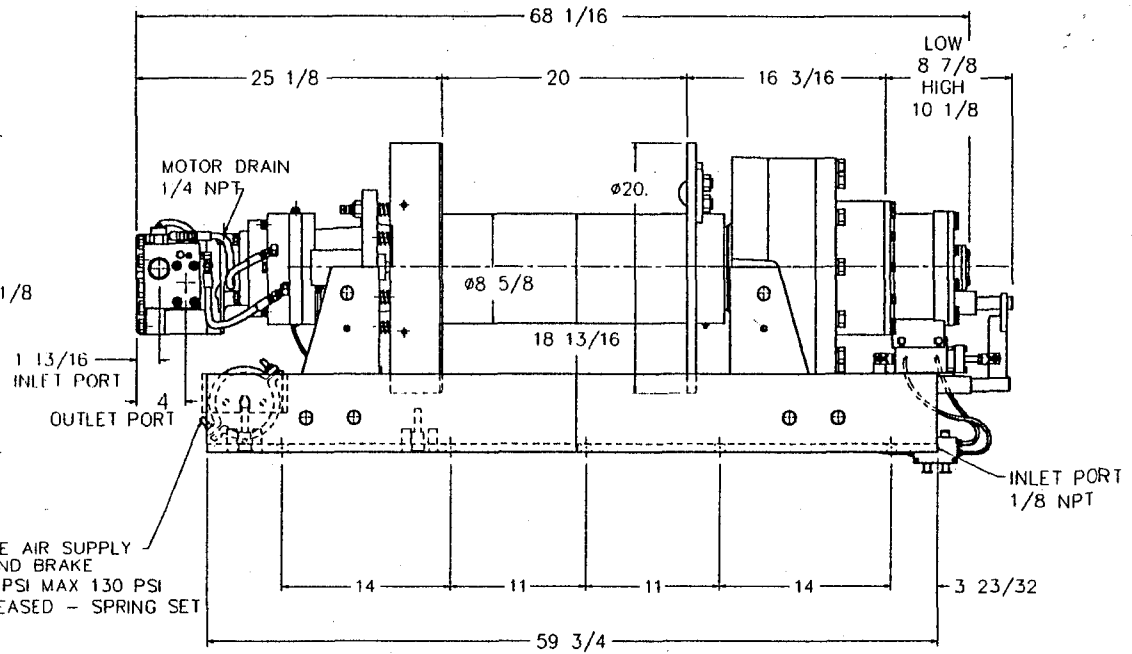
**WINCHES ARE NOT**  
**TO BE USED FOR**  
**THE LIFTING OR**  
**MOVING OF**  
**PERSONS**

CUSTOMER  
SUPPLIED AIR

AIR CYLINDER INPUT  
MAXIMUM: 250 PSI  
MINIMUM: 85 PSI



VARIABLE AIR SUPPLY  
FOR BAND BRAKE  
MIN 60 PSI MAX 130 PSI  
AIR RELEASED - SPRING SET



### PERFORMANCE DATA

LOW SPEED LINE PULL (LBS) & LINE SPEED (FPM)

CABLE SIZE	1ST LAYER		2ND LAYER		3RD LAYER		4TH LAYER		5TH LAYER		6TH LAYER	
	LINE PULL	FPM	LINE PULL	FPM	LINE PULL	FPM	LINE PULL	FPM	LINE PULL	FPM	LINE PULL	FPM
3/4	60,000	26	51,725	30	45,455	34	40,540	38	36,585	42	33,335	46
7/8	60,000	26	50,670	31	43,850	36	38,645	40	34,545	45		
1	60,000	26	49,680	32	42,385	37	36,960	43				

HIGH SPEED LINE PULL (LBS) & LINE SPEED (FPM)

CABLE SIZE	1ST LAYER		2ND LAYER		3RD LAYER		4TH LAYER		5TH LAYER		6TH LAYER	
	LINE PULL	FPM	LINE PULL	FPM	LINE PULL	FPM	LINE PULL	FPM	LINE PULL	FPM	LINE PULL	FPM
3/4	11,160	145	9,620	168	8,460	191	7,540	214	6,810	237	6,200	261
7/8	11,015	147	9,300	174	8,050	201	7,095	228	6,340	255		
1	10,870	149	9,000	180	7,680	210	6,700	241				

### CABLE CAPACITY

CABLE SIZE	1ST LAYER	2ND LAYER	3RD LAYER	4TH LAYER	5TH LAYER	6TH LAYER
3/4	59	127	205	292	389	495
7/8	51	112	182	261	350	
1	45	100	164	238		

CABLE CAPACITIES ARE IN ACCORDANCE WITH SAE J706 (ACTUAL CAPACITIES ARE USUALLY UP TO 10% GREATER THAN THOSE SHOWN)

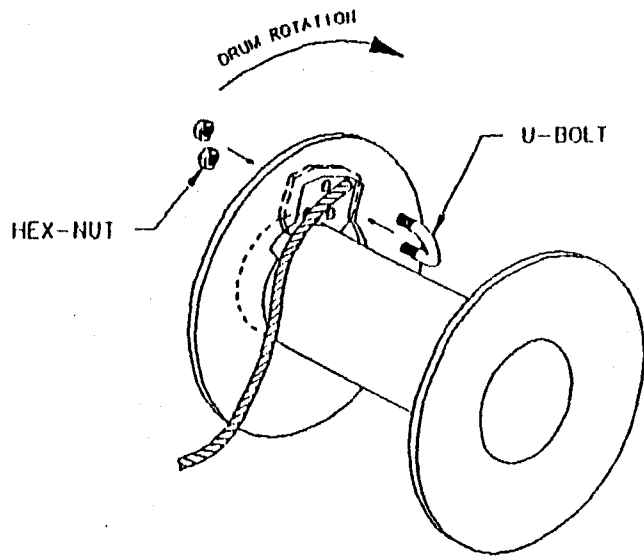
### RECOMMENDED BREAK-IN PROCEDURE

FULLY EXTEND CABLE AND MAKE (3) COMPLETE PULLS AT APPROXIMATELY HALF THE RATED CAPACITIES.  
THIS WILL EXTEND THE LIFE OF BOTH THE CABLE AND THE WINCH.

THE RATED LINE PULLS SHOWN ARE FOR THE WINCH ONLY. CONSULT THE WIRE ROPE MANUFACTURER FOR WIRE ROPE RATINGS.

LINE SPEED IS BASED ON 60 GPM (MAXIMUM ALLOWABLE INPUT IS 80 GPM).

LINE PULL IS BASED ON 2,500 PSI PRESSURE DIFFERENTIAL ACROSS THE MOTOR.

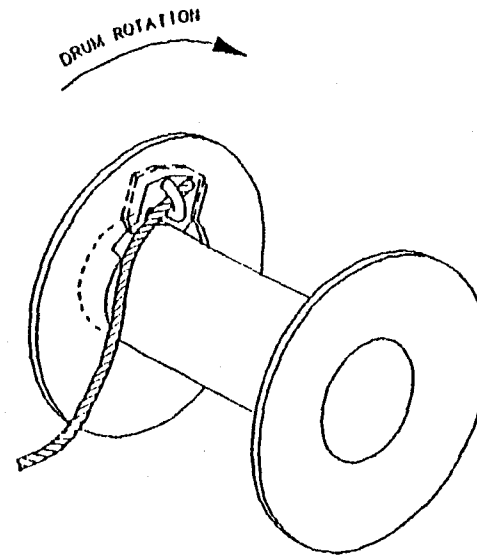


## STEP 1

ALIGN CABLE BETWEEN PROPER HOLES ACCORDING TO DRUM ROTATION. INSERT U-BOLT INTO HOLES AND THREAD ON NUTS FROM BACK OF FLANGE.

### CAUTION:

IF WINCH CABLE IS NOT INSTALLED FOR THE CORRECT DRUM ROTATION, THE WINCH BRAKE VALVE WILL NOT HOLD THE LOAD.



## STEP 2

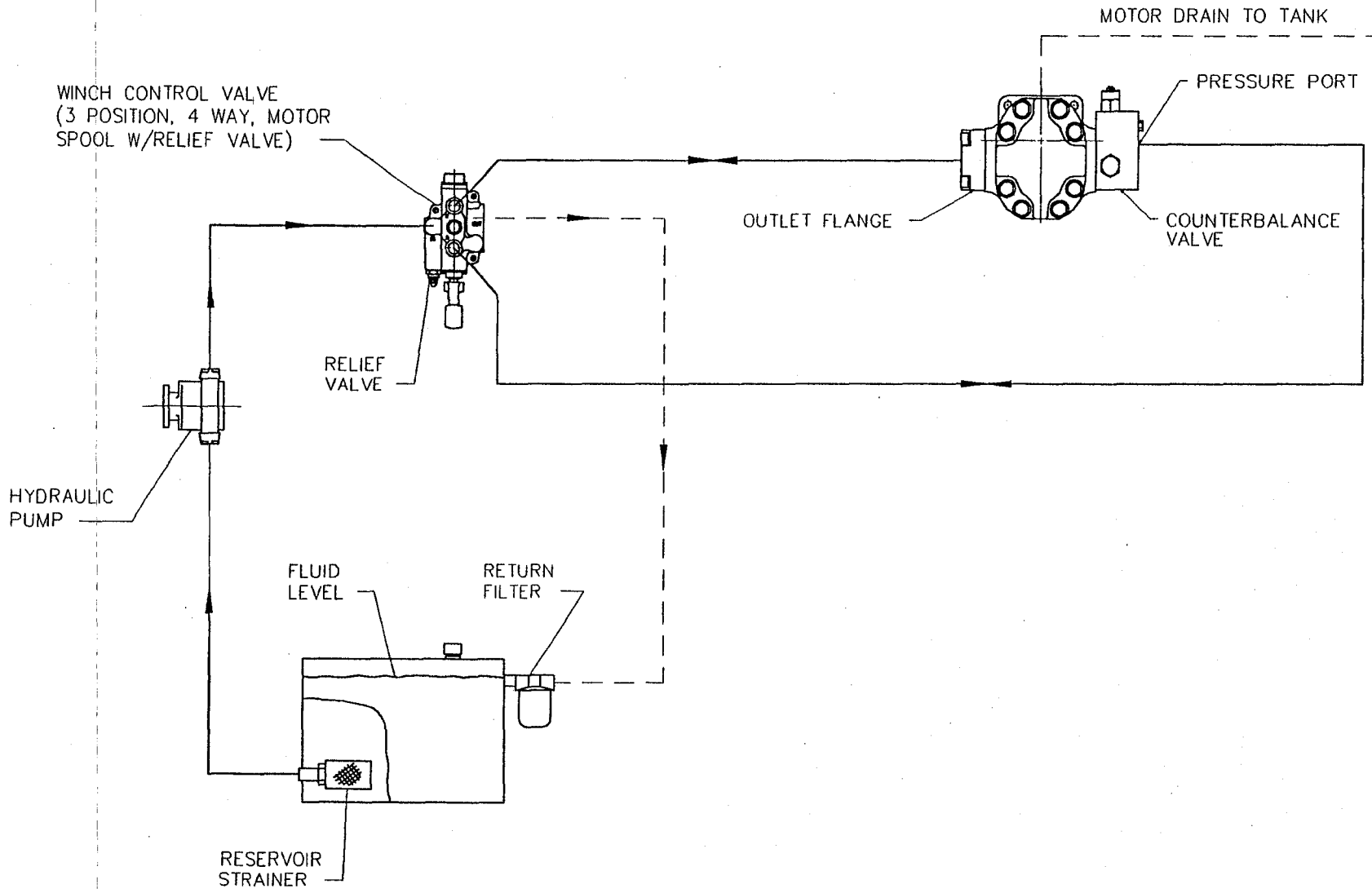
ONCE NUTS ARE TIGHTENED SECURE, THE CABLE IS PROPERLY INSTALLED.

### CAUTION:

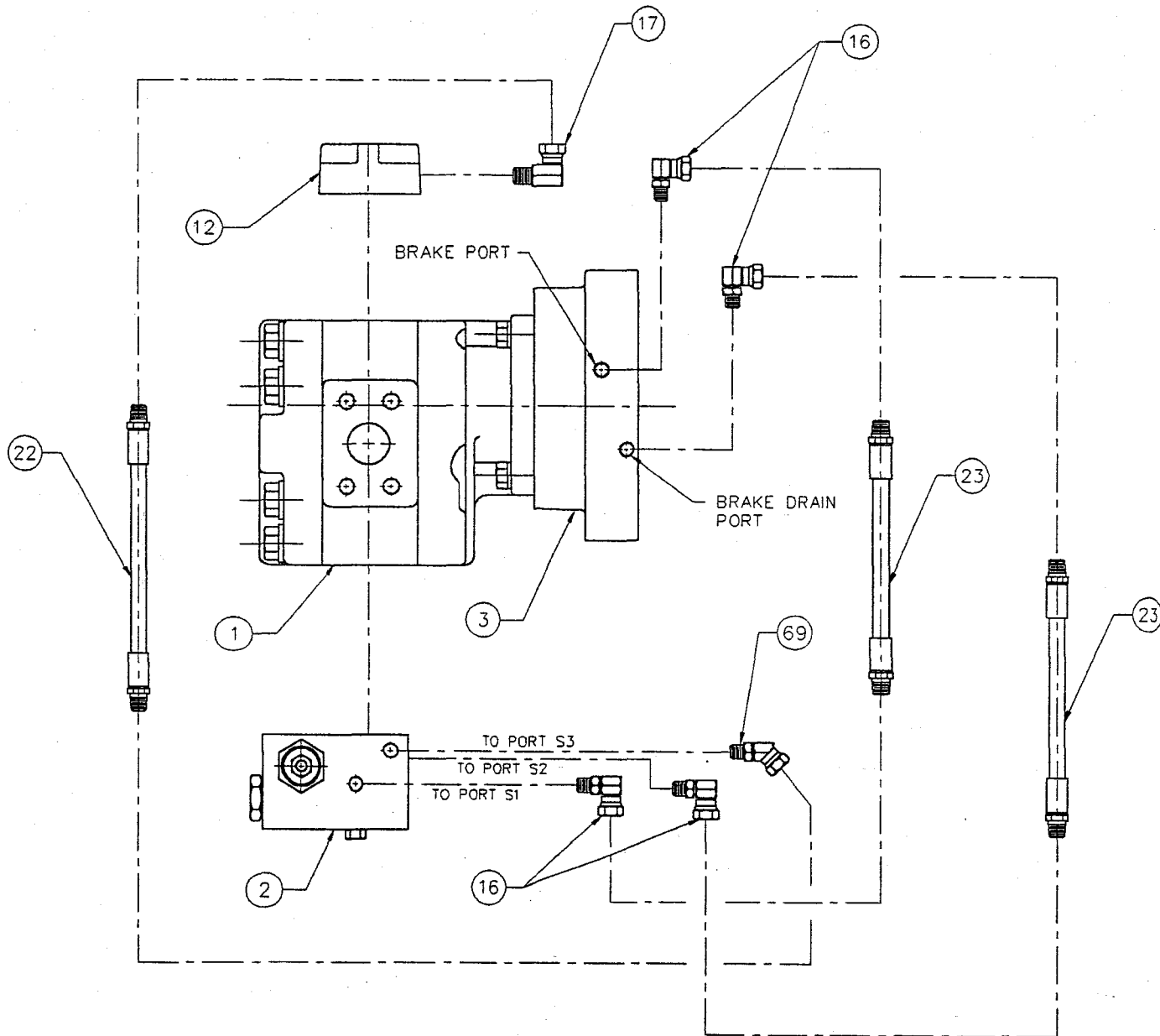
DO NOT OPERATE WINCH WITH LESS THAN 5 FULL CABLE WRAPS ON THE DRUM.

# CABLE INSTALLATION

# TYPICAL WINCH HYDRAULIC SYSTEM



# WINCH PLUMBING DIAGRAM



SEE MOTOR END INSTALLATION 1.10350

# SERVICE INSTRUCTIONS DP BRAKE

## GENERAL:

The winch is fully hydraulic with a multi disc wet brake. The brake is spring applied and hydraulically released, and will automatically set any time the winch control valve is in neutral or in case of power failure. When the hydraulic pressure is less than 270 psi, the brake will set. Hydraulic power must be restored before brake will release. Maximum brake torque is achieved at 0 psi. (These winches are not to be used for moving or lifting people.)

## DISASSEMBLY OF BRAKE

(REFER TO MOTOR END INSTALLATION DRAWING 1.10350)

1. Disconnect brake hoses (item 23) at connections (item 16) on brake housing (item 3). wrap hose ends to prevent dirt contamination.
2. Disconnect motor (item 1) from brake housing (item 3) by removing four capscrews (item 51), lock washers (item 10). Allow oil to drain.
3. Remove outer brake housing (item 3) by removing six capscrews (item 53) and lock washers (item 54).  
**CAUTION: Since housing is under spring loading of approximately 3,500 lbs., the capscrews should be loosened evenly until spring force has been relieved.**
4. In removing housing (item 3), the bearing (item 67) may come with it or remain on brake shaft (item 68), or the brake shaft may also slide out.
5. Remove o-ring (item 46) from mid-brake housing (item 8).
6. Remove friction plates (item 18), drive plates (item 19), and dowel pins (item 20), from piston (item 9).
7. Remove piston (item 9) from mid-brake housing (item 8) being careful not to damage o-rings on piston. Next, remove o-rings and back-up rings (item 47, 48, 49, & 50) from piston.
8. Finally, remove springs (item 21) and bearing (item 67) from mid-brake housing (item 8).

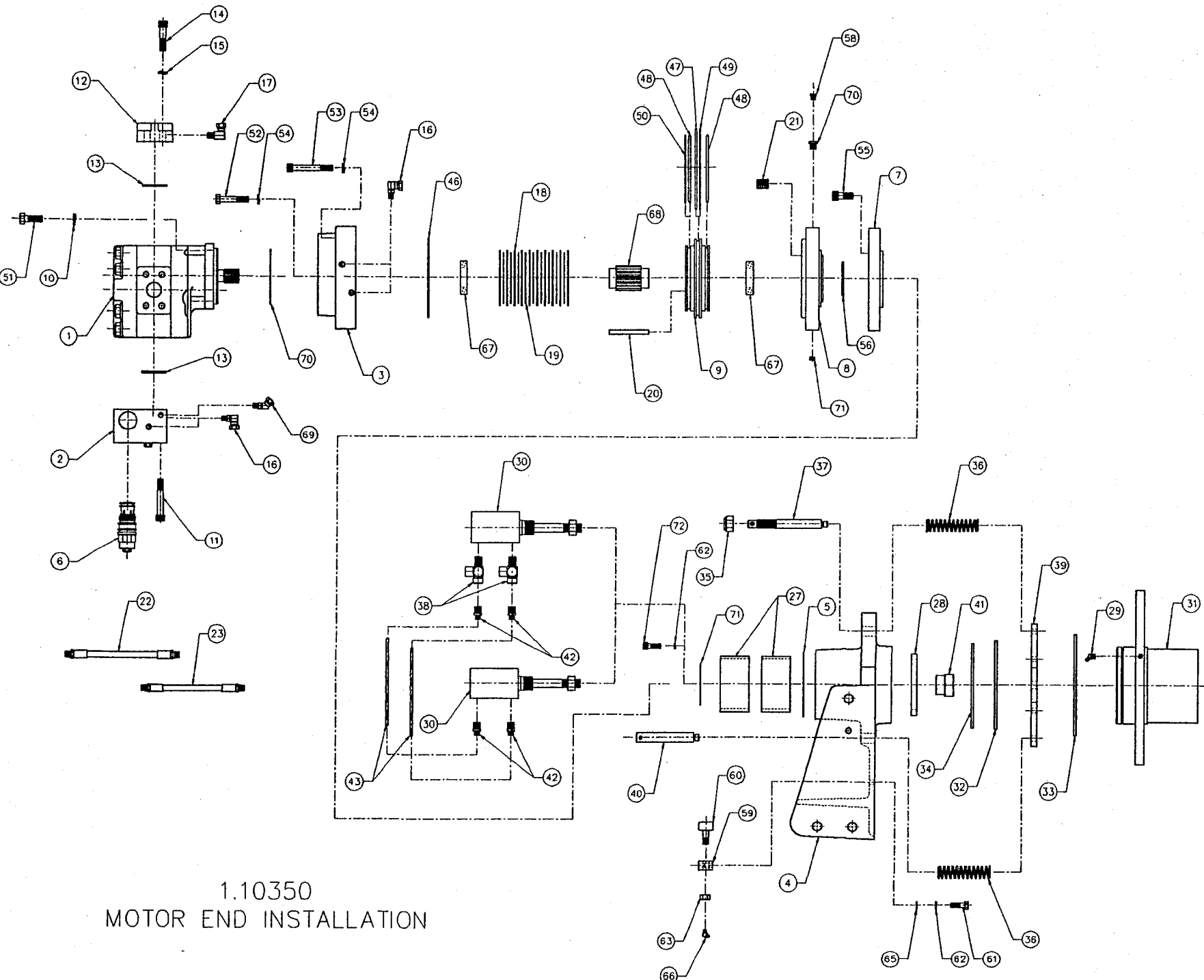
## ASSEMBLY OF BRAKE

1. Lubricate all o-rings and back-up rings with clean hydraulic oil used in the system.
2. Clean all parts thoroughly and visually examine for cuts, dents or other damage before assembly. Repair or replace parts with such defects.
3. Install bearing (item 67) into mid-brake housing (item 8), and insert twelve springs (item 21) into holes in housing. Next install shaft (item 68) into bearing (item 67).
4. Insert dowel pins (item 20) into respective holes in mid-brake housing (item 8).
5. Assemble o-rings and back up rings (item 47, 48, 49, & 50) on piston (item 9). Position back up rings as illustrated.
6. Insert piston (item 9) fitted with seals into mid-brake adapter (item 8) and over dowel pins (item 20) and tap down until piston face is resting against springs (item 21).
7. Insert a friction plate (item 18) alternating with a drive plate (item 19) into piston (item 9) and over shaft (item 68) until all plates are in place in sequence illustrated.
8. Next, place bearing (item 67) onto brake shaft (item 68).
9. Place o-ring (item 46) in position on mid-brake housing (item 8). Finally and with care not to pinch o-ring seals on piston, slide the housing (item 3) into place over the dowel pins (item 20) and tap down until firm. Install lock washers (item 54) and capscrews (item 53) in place until all six shoulder up. proceed to tighten evenly against spring pressure until housing face (item 3) is in full contact and capscrews are torqued to 50 ft. lbs.
10. The motor (item 1) can now be reinstalled on the housing (item 3). Place o-ring (item 70) on pilot dia. of motor. Then insert into brake housing (item 3) and secure with capscrews (item 51), lock washers (item 10). Reconnect brake hoses (item 23) as shown on winch plumbing diagram.
11. Refill winch with oil through gear end cover fill port (refer to gear end cover installation drawing). Allow time for oil to travel through brake end.
12. Before running winch, loosen adapter connections (item 16) at brake slightly to bleed air from brake release hoses (item 23) with hydraulic oil under pressure. Retighten connections and winch is ready to operate. (Note: pressure should not exceed 100 psi during bleeding.)

## BRAKE TROUBLE SHOOTING

1. Brake will not release:
  - (a) Insufficient system pressure to brake.
  - (b) Damaged o-rings or back up ring seals (item 47, 48, 49, or 50).
  - (c) Damaged piston (item 9).
  - (d) Damaged seal surfaces within housing (item 3) or mid-brake housing (item 3).
  - (e) Damaged bearing (item 67).
  - (f) Friction or drive plates (items 18 or 19) warped or heat damaged.
2. Brake will not apply or applies but torque low:
  - (a) Damaged springs (item 21), either broken or heat damaged and having taken a permanent set.
  - (b) Friction plates (item 18) worn out.
3. Oil leaks externally from brake:
  - (a) Damaged o-ring seal (item 46).





1.10350  
MOTOR END INSTALLATION

1.10350 PARTS LIST  
MOTOR END INSTALLATION

<u>LOC.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	73035	MOTOR - HYDRAULIC	1
2	11541	VALVE - COUNTERBALANCE	1
3	12489	HOUSING - BRAKE	1
4	14088	SUPPORT - END - MOTOR	1
5	1162	GASKET	1
6	70034	CARTRIDGE - VALVE	1
7	12280	ADAPTER - BRAKE	1
8	12279	HOUSING - BRAKE - MID	1
9	11443	PISTON - BRAKE	1
10	1495	WASHER - LOCK - 1/2	5
11	1457	CAP SCREW - SOCKET HEAD - 1/2 NC x 3	4
12	10506	FLANGE - 1-1/2 W/PORT	1
13	9962	O-RING - 1-7/8 I.D. x 1/8 SECTION	1
14	1459	CAP SCREW - SOCKET HEAD - 1/2 NC x 2	4
15	1144	WASHER - LOCK - HIGH COLLAR - 1/2	4
16	76511	ADAPTER - SWIVEL - 90° - #4 - 1/4	4
17	76503	ADAPTER - SWIVEL - 90° - 1/4 - 1/4	1
18	11603**	PLATE - DISC - FRICTION	10
19	3159**	PLATE - DRIVE - BRAKE	9
20	3263	PIN - DOWEL - 5/16 DIA. x 3-1/2 LG.	2
21	2319**	SPRING - COMPRESSION - BRAKE	12
22	75009	HOSE - 1/4 - 12 - R1	1
23	75005	HOSE - 1/4 - 9 - R1	2
24	1179*	CAPLUG - PLASTIC - 20 S.I.D.	1
25	1157*	PLUG - #4 RED - 1/4 NPT	3
27	11372	BEARING - BRONZE - 4-1/2 I.D.	2
28	9808	SEAL - SHAFT - 4-1/2 I.D. x 5-1/2 O.D.	1
29	1001	FITTING - GREASE - 45° - 1/8 NPT	2
30	72016	CYLINDER - AIR	2
31	11142	HUB - DRIVE	1
32	10957	BEARING - THRUST - 7-3/4 O.D. x 6-3/4 I.D. x 1/4 W.	1
33	10958	BEARING - THRUST - 8-3/4 O.D. x 6-3/4 I.D. x 1/4 W.	1
34	3099	RING - RETAINING - 6-5/16 I.D. x 5/32 W.	1
35	1693	NUT - LOCK - 3/4 NF	3
36	2316	SPRING	6
37	10964	PIN - GUIDE - SPRING	3
38	2088	TEE - SERVICE - 3/8 NPT	2
39	10954	PLATE - SHIFTER	1
40	10975	PIN - GUIDE - SPRING - SHORT	3
41	10991	NUT - SHOULDER - CYLINDER - AIR	2
42	3233	FITTING - STR. - 1/4 TUBE - 3/8 NPT	6
43	77800	TUBE - NYLON - 1/4 O.D.	5
44	10708*	TAG - WARNING	1
45	3112*	TIE - CABLE - LOCKING - SELF	2
46	9844<	O-RING - 6-3/4 I.D. x 1/8 SECTION	1
47	9853<	O-RING - 6-1/2 I.D. x 3/16 SECTION	1
48	9851<	O-RING - 5-3/8 I.D. x 3/16 SECTION	4

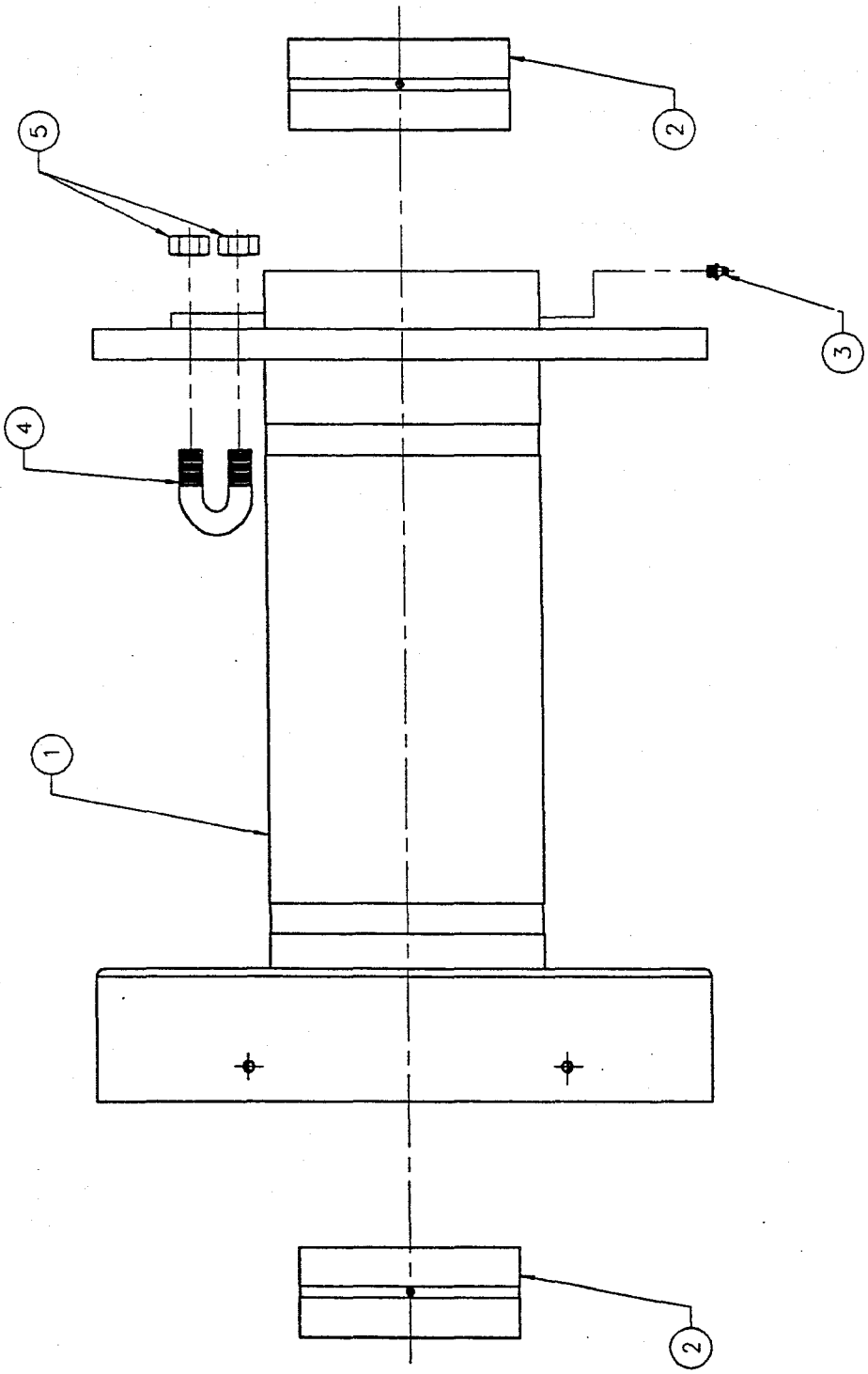
1.10350 PARTS LIST  
MOTOR END INSTALLATION CONTINUED

<u>LOC</u>	<u>PART NO</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
49	9854<	RING - BACK-UP - 6-1/2 I.D.	1
50	9852	RING - BACK-UP - 5.278 I.D.	1
51	1403	CAP SCREW - HEX HEAD - 1/2 NC x 1-1/2	4
52	1376	CAP SCREW - HEX HEAD - 7/16 NC x 2-1/2	6
53	1375	CAP SCREW - SOCKET HEAD - 7/16 NC x 3-1/2	4
54	1388	WASHER - LOCK - 7/16	6
55	1454	CAP SCREW - SOCKET HEAD - 1/2 NC x 1-1/4	4
56	9602	O-RING - 2-3/4 I.D. x 1/8 SECTION	1
58	3059	VENT - RELIEF	1
59	11600	SUPPORT - CAM - FOLLOWER - DRUM	1
60	81518	FOLLOWER - CAM	1
61	1303	CAP SCREW - HEX HEAD - 3/8 NC x 1-1/4	2
62	1395	WASHER - LOCK - 3/8	5
63	1491	NUT - HEX - 1/2 NF	1
65	1398	WASHER - FLAT - SAE - 3/8	3
66	3284	FITTING - GREASE - DRIVE	1
67	81434	BEARING - BALL - 1-3/4 I.D.	2
68	11688	SHAFT - BRAKE	1
69	76516	ADAPTER - SAE #4 - M x 1/4 F - 45	1
70	9620	O-RING - 5 I.D. x 3/32 SECTION	1
71	11577	PLATE - THRUST	1
72	1340	CAPSCREW - SOCKET HEAD - 3/8 16UNC x 1	1

\* NOT SHOWN ON EXPLODED DRAWING

\*\*ITEMS SOLD AS PART OF 9406 KIT ONLY

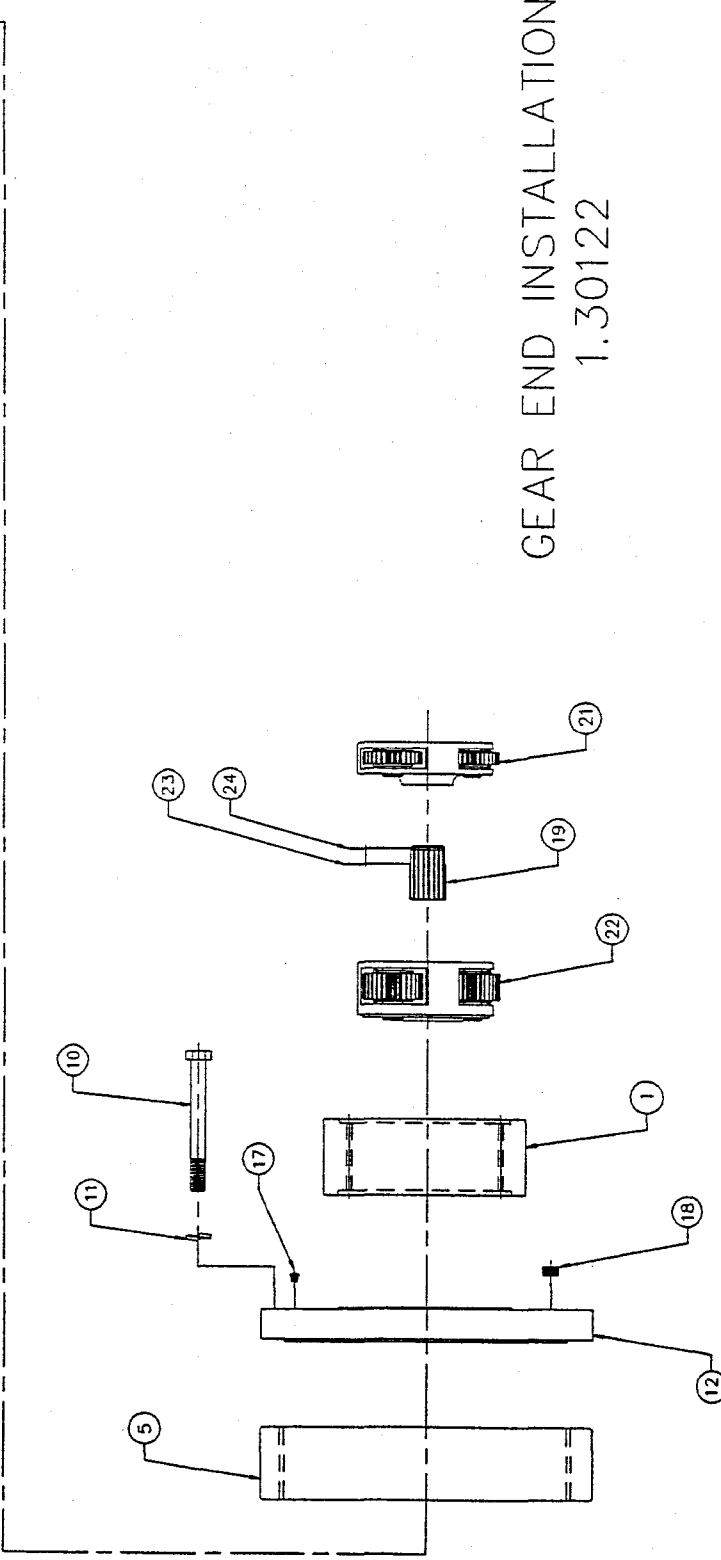
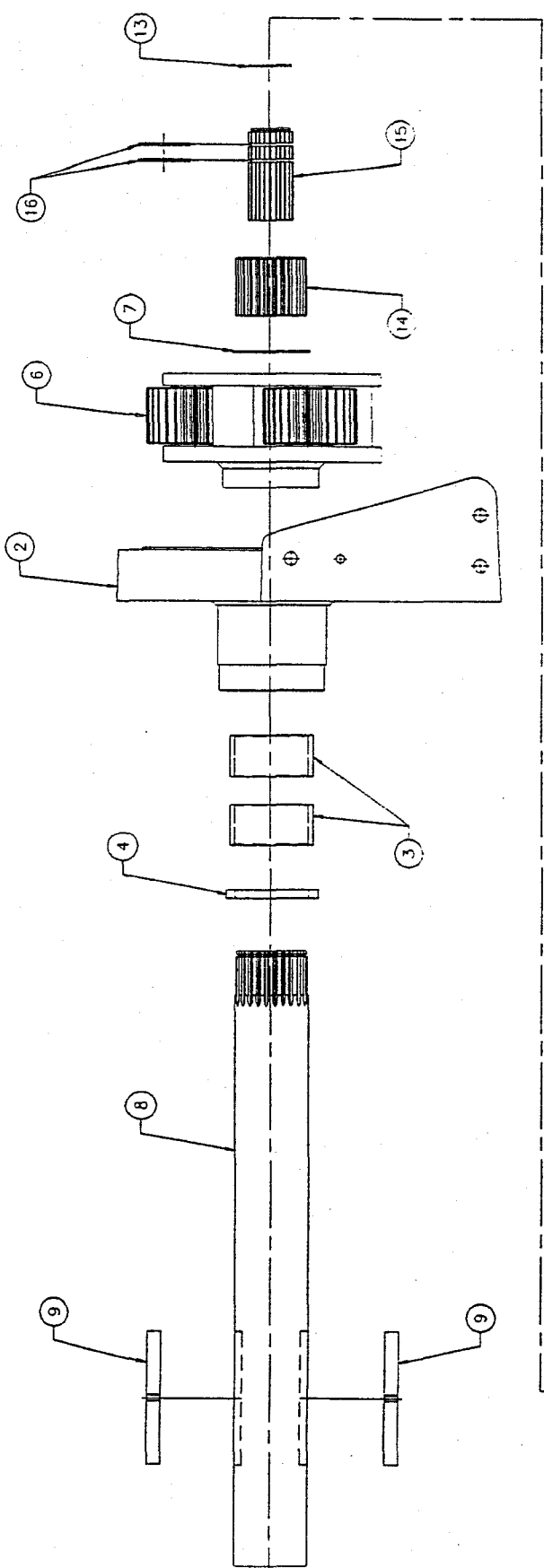
< ITEMS SOLD AS PART OF 9406 KIT ONLY



DRUM INSTALLATION  
1 20156

1.20156 PARTS LIST  
CABLE DRUM INSTALLATION

<u>LOC.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	14085	DRUM -	1
2	10977	BEARING - BRONZE	2
3	1000	FITTING - GREASE - STR - 1/8	1
4	10782	U BOLT - 1"	1
5	1690	NUT - HEX - 3/4 - 10NC	2

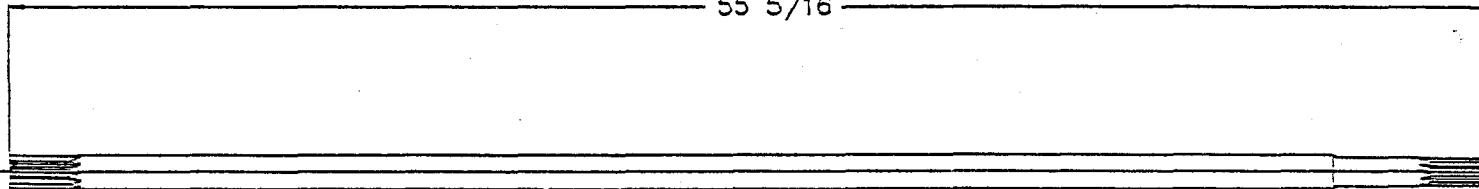


GEAR END INSTALLATION  
1.30122

1.30122 PARTS LIST  
GEAR END INSTALLATION

<u>LOC.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	81108	GEAR - RING	1
2	11654	SUPPORT - END - GEAR	1
3	11372	BEARING - BRONZE - 4-1/2 I.D.	2
4	9808	SEAL - SHAFT	1
5	10997	GEAR - RING - 4.5	1
6	11101	ASSEMBLY - CARRIER - 4.5 x 1	1
7	3060	RING - RETAINING - 4 I.D.	1
8	11144	SHAFT - OUTPUT	1
9	11369	KEY - TAPPED - DRUM	2
10	1618	CAP SCREW - HEX HEAD - 3/4 NC x 7	12
11	1695	WASHER - LOCK - 3/4	12
12	10774	COVER - ADAPTER	1
13	3041	RING - RETAINING - 2-5/16 x 1/16 W.	1
14	10998	GEAR - SUN - PLANETARY - 4.5 x 1	1
15	11585	SHAFT - OUTPUT PLANETARY	1
16	3148	RING - RETAINING - 2 SECTION	4
17	3059	VENT - RELIEF	1
18	3048	PLUG - MAGNETIC - 1/2 NPT	1
19	11139	GEAR - SUN - SECONDARY - 17 T.	1
20	10848*	LABEL - WARNING	1
21	13409	ASSEMBLY - CARRIER - PRIMARY	1
22	13093	ASSEMBLY - CARRIER - SECONDARY	1
23	3042	RING - RETAINING - 1-13/16 I.D.	1
24	3043	RING - RETAINING - 1-3/4 I.D.	1

\*NOT SHOWN ON EXPLODED DRAWING



55 5/16

A technical drawing of a shaft. The shaft is shown in a perspective view, extending horizontally. It has a diameter of 55 5/16. The shaft is shown with a central section that is slightly wider than the ends. The ends of the shaft are shown with a series of parallel lines, indicating a threaded or splined section. The drawing is a simple line drawing with no shading or texture.

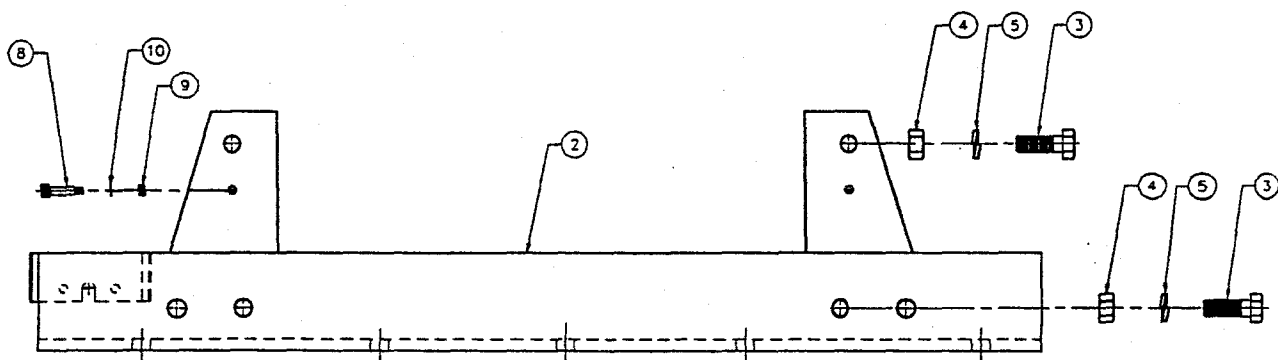
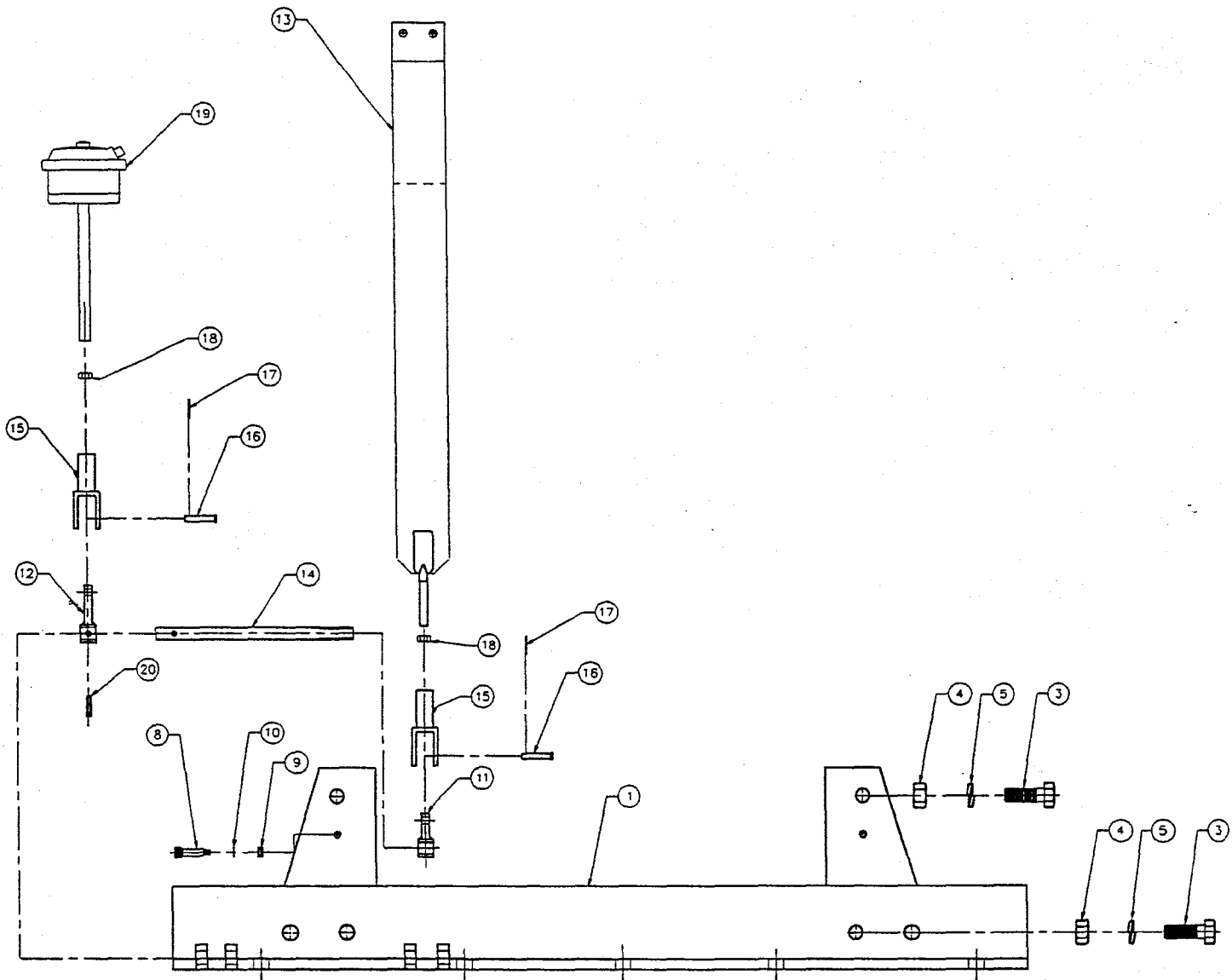
INPUT SHAFT INSTALLATION

1.40183



1.40183 PARTS LIST  
INPUT SHAFT INSTALLATION

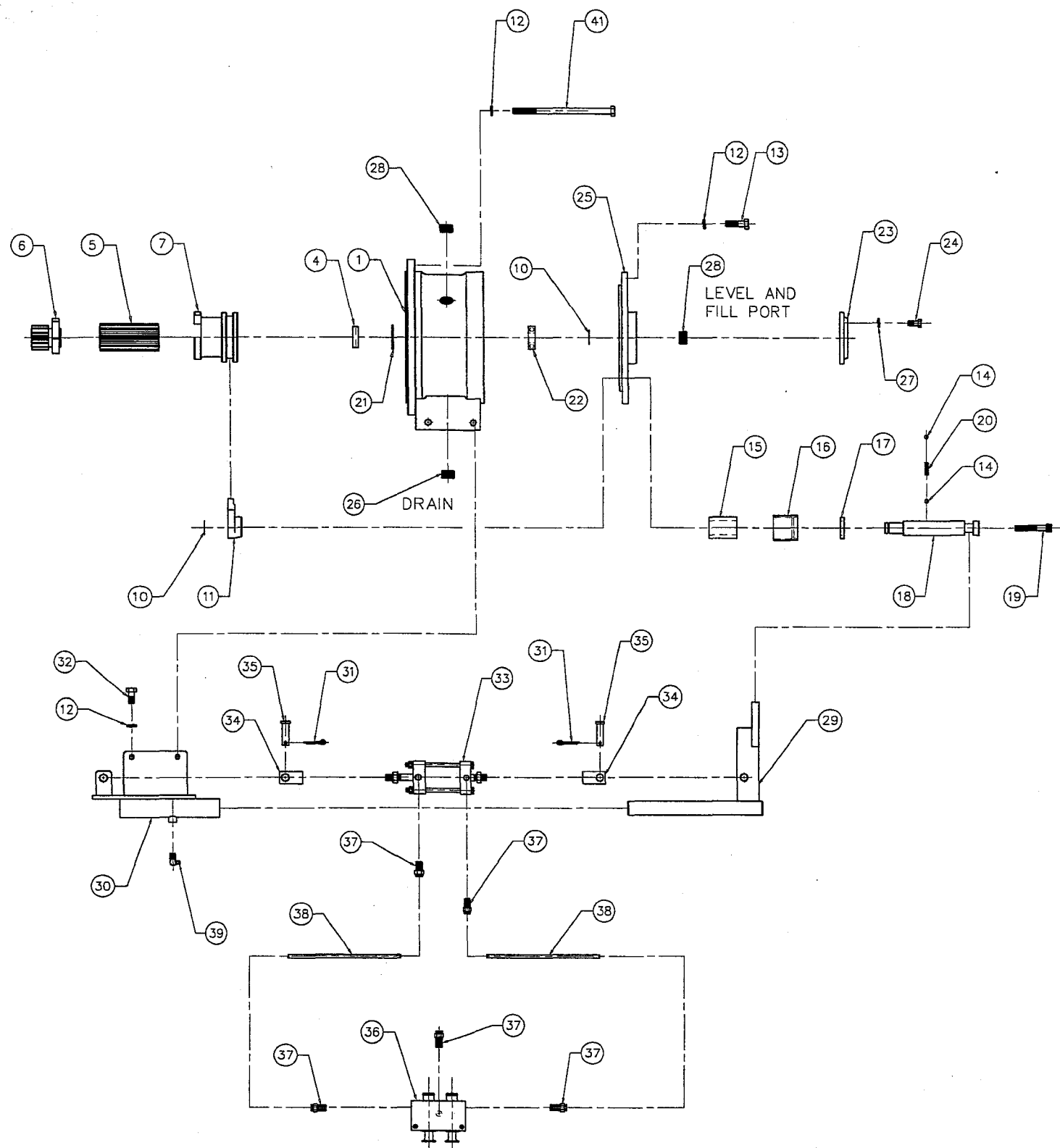
<u>LOC.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	13031	SHAFT - INPUT	1



BASE MOUNT INSTALLATION  
1.50295

**1.50295 PARTS LIST**  
**BASE MOUNT INSTALLATION**

<u>LOC.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	14081	BASE ANGLE - REAR	1
2	14082	BASE ANGLE - FRONT	1
3	1806	CAP SCREW - HEX HEAD - 1 8NC x 3	12
4	1890	NUT - HEX - 1 - 8NC	12
5	1895	WASHER - LOCK - 1	12
6	10466	PLATE - INFORMATION	1
7	1165	RIVET - DRIVE	4
8	1477	SHOULDER BOLT - SOCKET HEAD - 1/2 x 1 1/2	4
9	1390	NUT - HEX - 3/8 - 16NC GRADE 2	4
10	1394	WASHER - FLAT - 3/8	4
11	14086	LEVER - BRAKE - BAND - 2" x 7/8" SPLINED BORE	1
12	14078	LEVER - BRAKE - BAND - 3" x 1" BORE	1
13	14083	BAND ASSEMBLY - BRAKE	1
14	14077	SHAFT - BRAKE - BAND - 1"	1
15	1076	YOKE - CLEVIS - 1/2 NF	2
16	3133	PIN - CLEVIS - 1/2D x 1 1/2L	2
17	1013	PIN - COTTER - 1/8 x 1	2
18	1491	NUT - HEX - 1/2 - 20NF	2
19	3696	SPRING - PNEUMATIC - BRAKE - AIR - W/CLEVIS	1
20	3697	PIN - SPIROL - 3/8 x 1 1/2L - HEAVY DUTY	1



TWO SPEED AIR/HYDRAULIC KICKOUT  
 GEAR END COVER INSTALLATION  
 1.60024

**1.60024 PARTS LIST**  
**GEAR END COVER INSTALLATION**

<b><u>LOC.</u></b>	<b><u>PART NO.</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>QTY.</u></b>
1	11201	HOUSING - GEAR END	1
4	11340	SPACER - INPUT SHAFT	1
5	11204	COUPLING - SHAFT	1
6	11200	GEAR - LOW - 2 SPEED	1
7	11208	HUB - DRIVE	1
10	3115	RING - RETAINING - 25/32 x .078 THICKNESS	2
11	11158	SHIFTER - 2 SPEED	1
12	1395	WASHER - LOCK -3 /8	26
13	1303	CAP SCREW - HEX HEAD - 3/8 NC x 1-1/4	10
14	3116	BALL - BEARING - 1/4 DIA.	2
15	11248	BUSHING - DETENT - 2 SPEED	1
16	11159	HOUSING - SHIFTER - 2 SPEED	1
17	9809	SEAL - SHAFT	1
18	11155	SHAFT - SHIFTER	1
19	1343	CAP SCREW - SOCKET HEAD - 3/8 NC x 2	2
20	2318	SPRING	1
21	3109	RING - RETAINING - 2-1/32 O.D. x 1/16 THICKNESS	1
22	81428	BEARING - BALL - 21/32 I.D.	1
23	11105	COVER - SMALL	1
24	1190	CAP SCREW - HEX HEAD - 5/16 NC x 3/4	4
25	11202	COVER - GEAR END	1
26	3049	PLUG - MAGNETIC - 3/8 NPT	1
27	1168	WASHER - LOCK - 5/16	4
28	1988	PLUG - PIPE - 1/2	2
29	11221	YOKE - SHIFT	1
30	11220	BRACKET - CYLINDER	1
31	1013	PIN - COTTER - 1/8 DIA. x 1 LG.	2
32	1301	CAP SCREW - HEX HEAD - 3/8 NC x 3/4	4
33	72018	CYLINDER - AIR	1
34	3132	CLEVIS - 1/2	2
35	3133	PIN - CLEVIS - 1/2	2
36	71016	VALVE - AIR	1
37	3134	ADAPTER - STR. - PUSH-ON - 1/4 TUBE - 1/8 NPT	5
38	77800	HOSE - PLASTIC - 1/4 O.D. x .040 W.	25
39	1002	FITTING - GREASE - 90° - 1/8 NPT	1
41	1317	CAP SCREW - HEX HEAD - 3/8 NC x 5-1/2 - GRADE 8	12

# ***BOLT TORQUES***

<u>SIZE</u> THREADS / IN. ↓	<u>GRADE 5</u> <i>ft.lb.</i>	<u>GRADE 8</u> <i>ft.lb.</i>
1/4 - 20	6	9
5/16 - 18	13	18
3/8 - 16	23	35
7/16 - 14	35	55
1/2 - 13	55	80
9/16 - 12	80	110
5/8 - 11	110	170
3/4 - 10	200	280
7/8 - 9	320	460
1 - 8	480	680
1-1/8 - 7	600	960
1-1/4 - 7	840	1360
1-3/8 - 6	1100	1780

***NOTE: SUGGESTED TIGHTENING VALUES ONLY***

***UNLESS OTHERWISE NOTED.***