



Model 707W Service Manual

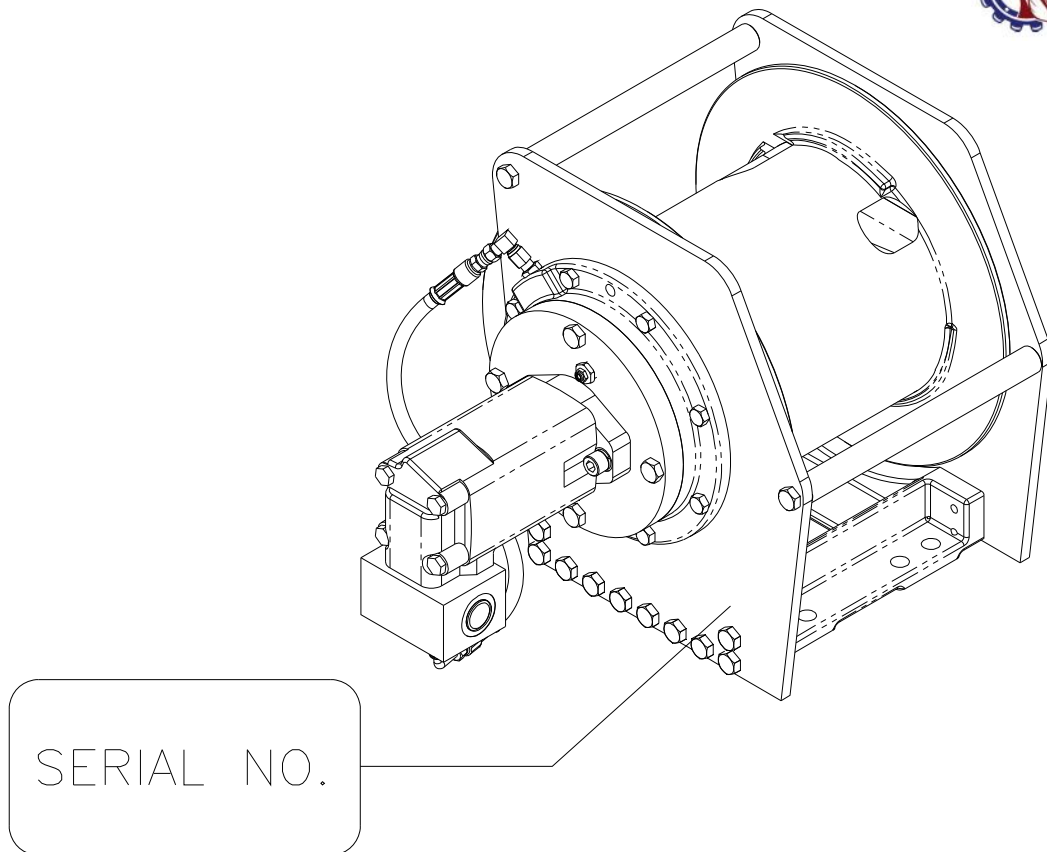


Authorized Distributor:
Pacific Marine & Industrial
www.pacificmarine.net
info@pacificmarine.net

DESIGN SERIES 001

TABLE OF CONTENTS

SAFETY NOTES	2
INTRODUCTION AND THEORY OF OPERATION	3
HYDRAULIC SCHEMATIC	4
MAINTENANCE AND SERVICE	5
WIRE ROPE	7
DISASSEMBLY	8
ASSEMBLY	9
SERVICING THE MOTOR	10
SERVICING THE BRAKE	11
SERVICING THE PLANETARY SET	13
TROUBLESHOOTING	14
TORQUE SPECIFICATIONS CHART	15
BILL OF MATERIAL	16
EXPLODED ISOMETRIC ASSEMBLY DRAWING	18

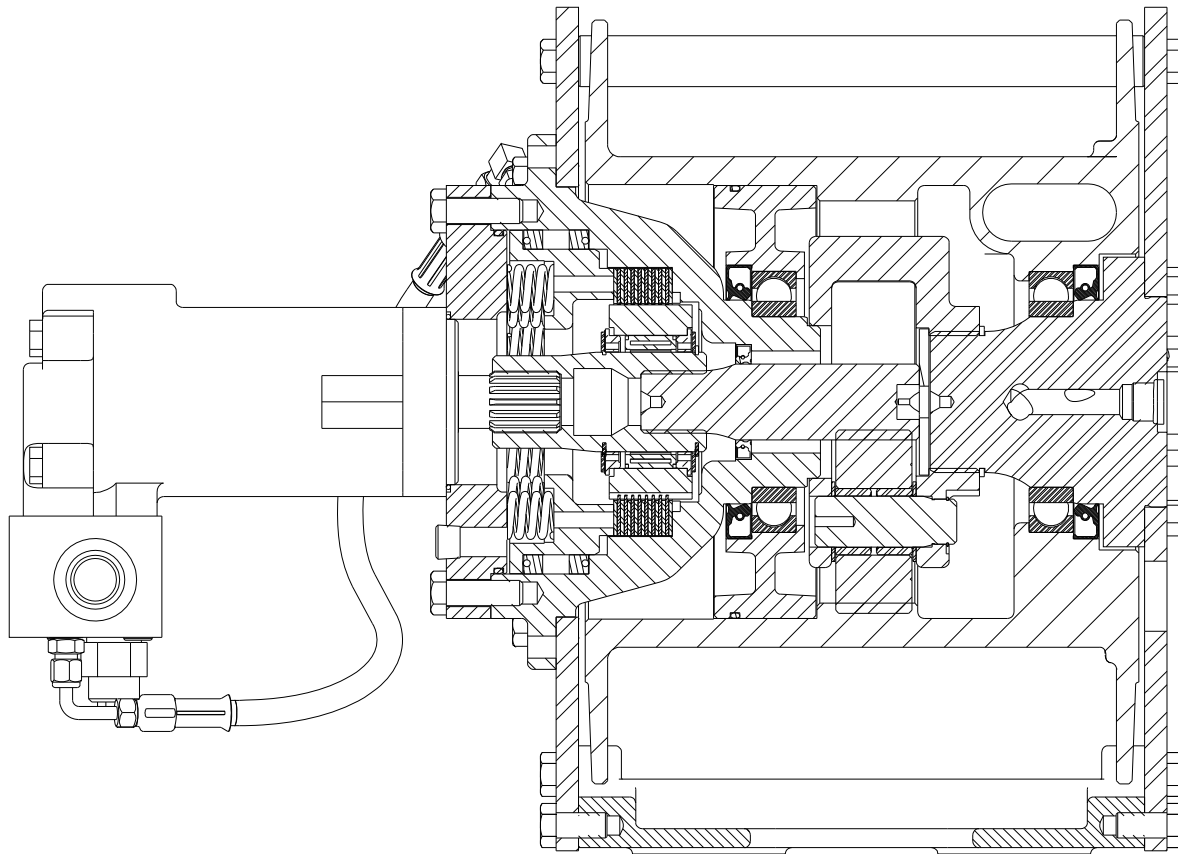


! WARNING
FAILURE TO HEED THE FOLLOWING WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH!

- Operators must be trained in the proper, safe operation of the hoist.
- Hoists are **not** to be used to lift, raise, or move people. If your task involves lifting or moving people, you **must** use the proper equipment, not this hoist.
- Cable anchors on hoists are not designed to hold the rated load of the hoist. You must keep at least five (5) wraps of cable on the drum to ensure that the cable doesn't come loose.
- Stay clear of suspended loads and of cable under tension. A broken cable or dropped load can cause serious injury or death.
- Avoid shock loads. This type of load imposes a strain on the hoist many times the actual weight of the load and can cause failure of the cable or the hoist.
- Make sure that all equipment, including the hoist and cable, are maintained properly.



INTRODUCTION AND THEORY OF OPERATION

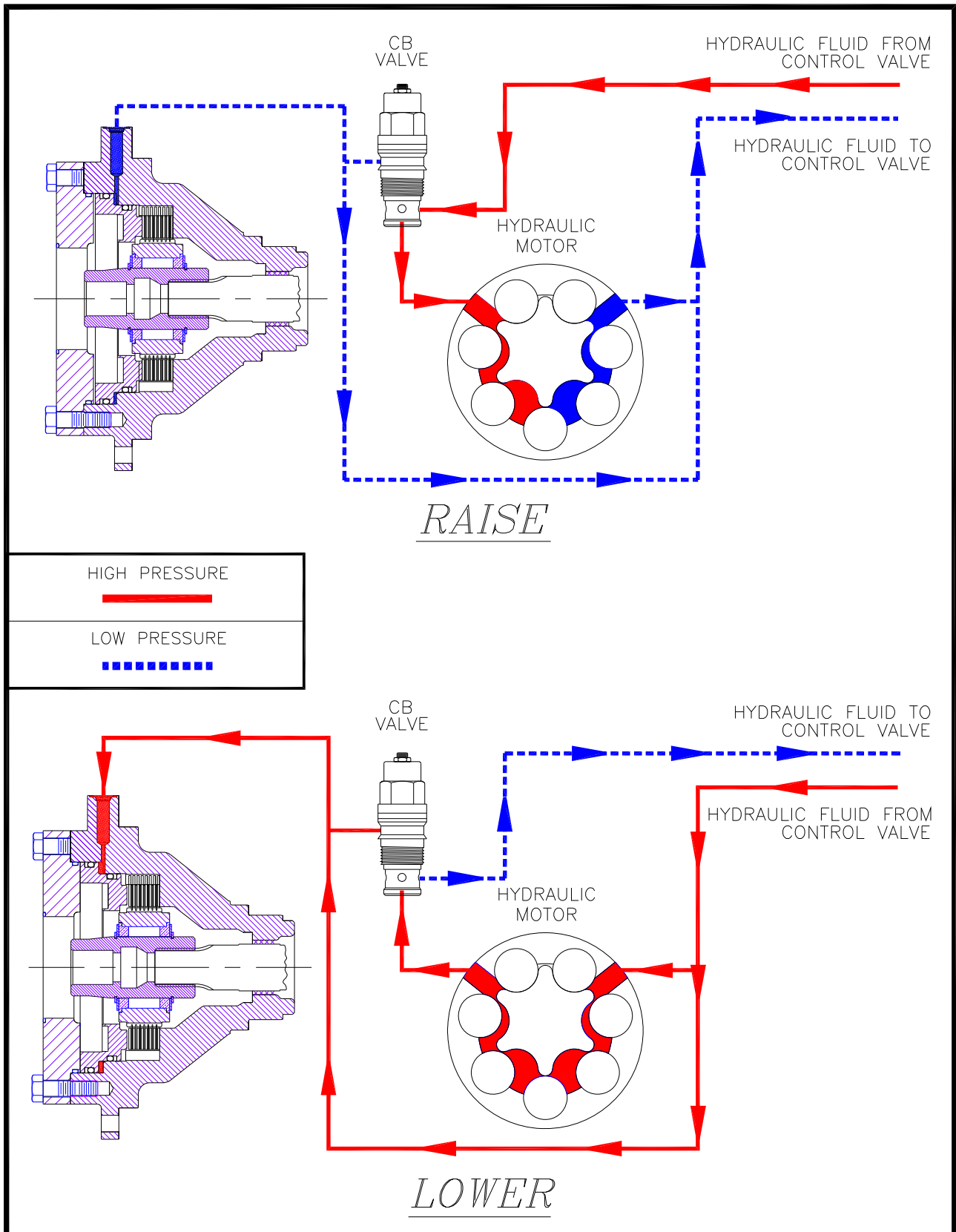


The planetary hoist is designed to utilize a geroler, gear, or piston motor, driving through a multiple-disc oil brake, through a planetary gearset to the cable drum.

The multiple-disc oil brake is spring applied and hydraulically released through a port in the brake housing. During inhaul, the brake is not released, since the load is driven through a one-way cam clutch, bypassing the brake. When the load comes to a stop, the cam clutch locks up and the brake prevents the load from moving.

During payout, a brake valve is used to prevent the load from moving faster than desired. This brake valve partially blocks the main line from the motor back to the directional control valve, allowing only a limited amount of hydraulic fluid through the motor. The brake valve is then modulated by sensing pressure on the other main line, the line from the directional control valve to the motor. Additionally, any time there is sufficient pressure (330 PSI \pm 10%) to modulate the brake valve; this same pressure releases the brake.

HYDRAULIC SCHEMATIC



MAINTENANCE AND SERVICE

For safe and consistent operation of TULSA WINCH hoists, swing drives, and winches, a regular program of preventive maintenance is strongly recommended. Regular oil changes with the correct oil for the ambient temperature conditions and an annual inspection of the wear components will help ensure a long life for your planetary geared products.

Maintenance Scheduling

The owner is to ensure proper inspection intervals, in compliance with the API RP 2D Section 4 requirements or the ANSI B30.5, 5-2.3, and will review hoist usage categories on a periodic basis. A Qualified Inspector should perform all maintenance and inspections.

- For hoists in occasional use, less than 10 hours per month, API RP 2D recommends a pre-use inspection and an annual 12-month inspection based on average use over a quarter.
- For hoists in moderate use, more than 10 but less than 50 hours per month, API RP 2D recommends a pre-use inspection, quarterly inspection, and an annual 12-month inspection based on average use over a quarter.
- For hoists in heavy use, more than 50 hours per month, API RP 2D recommends a pre-use inspection, monthly inspection, quarterly inspection, and an annual 12-month inspection.

Oil Level Maintenance

Tulsa Winch recommends that the oil level in the gearbox and brake housing be checked and adjusted as part of the pre-use inspection. If the oil level drops frequently or oil leakage is detected during an inspection, maintenance should be performed to correct any problems.

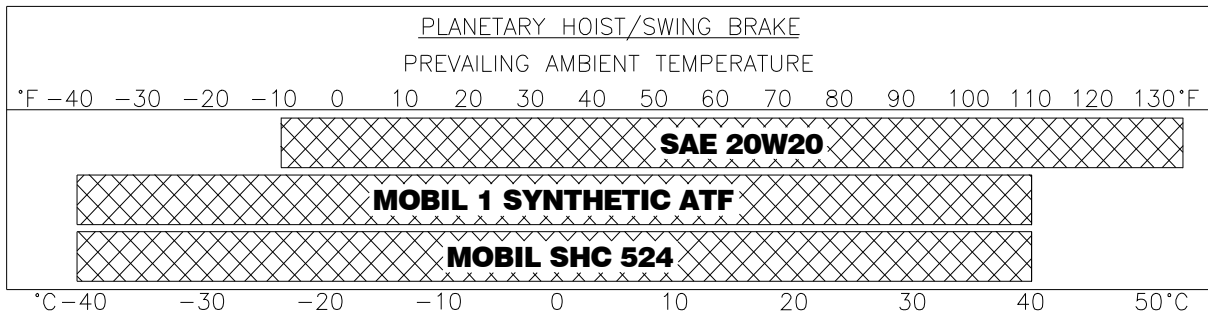
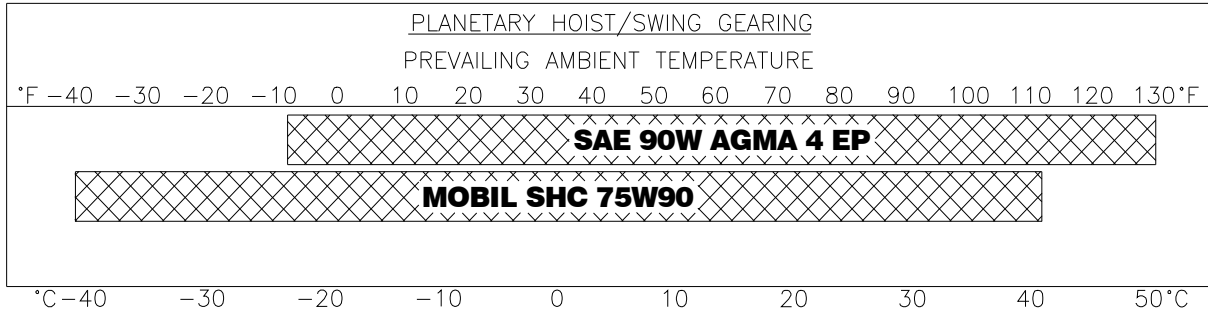
Oil Change Interval

The oil in the gearbox and brake sections should be changed every **1000 hrs** or **6 months** of usage.



Authorized Distributor:
Pacific Marine & Industrial
www.pacificmarine.net
info@pacificmarine.net

RECOMMENDED OIL



All oils must meet MIL-PRF2105E. Substitution from a reputable manufacturer is allowed as long as type and grade are maintained.

OIL CAPACITY	
GEARBOX	1.00 QUART
BRAKE	.25 QUART

WARNING

Do not use EP type gear lubes in the brake section of this winch. EP lubes may prevent the clutch from locking up, which, in turn causes the load to fall, resulting in property damage, personal injury, or death.

The hydraulic system should use only high quality hydraulic fluid from reputable suppliers. These oils should contain additives to prevent foaming and oxidation in the system. All hoist hydraulic systems should be equipped with a return line filter capable of filtering 10 micron particles from the system.

Hoists are shipped from the factory with SAE 90 Extreme Pressure (EP) gear lube in the gearbox and lightweight non-EP oil in the brake section. This oil and gear lube should be satisfactory for operation in ambient temperatures from -10° F (-23° C) to +130° F (+55° C).

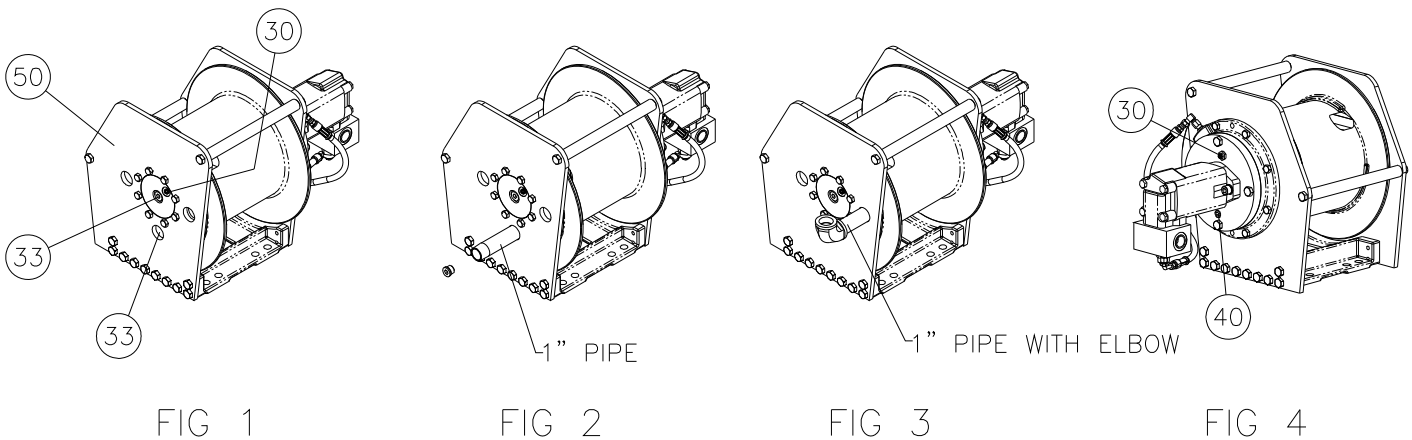


OIL CHANGE

Gearbox oil is drained by rotating the drum so that the drain plug (*Item 33*) is visible through the lower hole in the side plate (*Item 50*) (*See Fig 1*). Screw in a piece of 1" pipe to allow the oil to drain, and then with a hex wrench remove the drain plug located inside of the 1" pipe (*See Fig. 2*). Examine the used oil for signs of significant metal deposits and then dispose of it in a proper manner. Remove the 1" pipe.

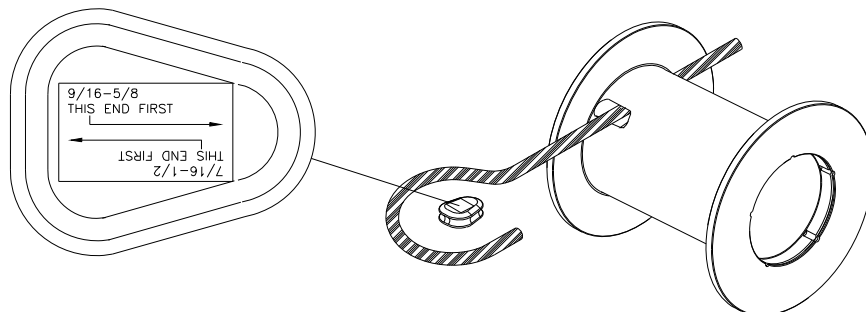
Rotate the drum so that the port is visible through the upper hole in the side plate. Install a 1" pipe with elbow into the upper hole in the side plate (*See Fig. 3*). Remove the plug (*Item 33*) located in the center of the shaft. Fill the gearbox with 1.00 quart of EP-90 oil. Remove the pipe and elbow then replace the plugs (*Item 33*). *See the Oil Chart on page 6 of this manual for the recommended oil type and grade for your application.*

Drain the brake section by removing the drain plug (*Item 40*) under the motor along with the vent (*Item 30*) above the motor (*See Fig. 4*). Inspect the oil for signs of metallic particles and/or burning and reinstall the drain plug. Fill with .25 quart of non-EP oil and reinstall the vent (*Item 30*). *See Oil Chart Pg. 6 this manual for recommended oil type and grade for your application.*



WIRE ROPE

Wire rope should be installed as shown in the drawing below. Note that the wedge will satisfy cable diameters from 7/16" to 5/8", depending on how it is installed in the cable drum.



DISASSEMBLY

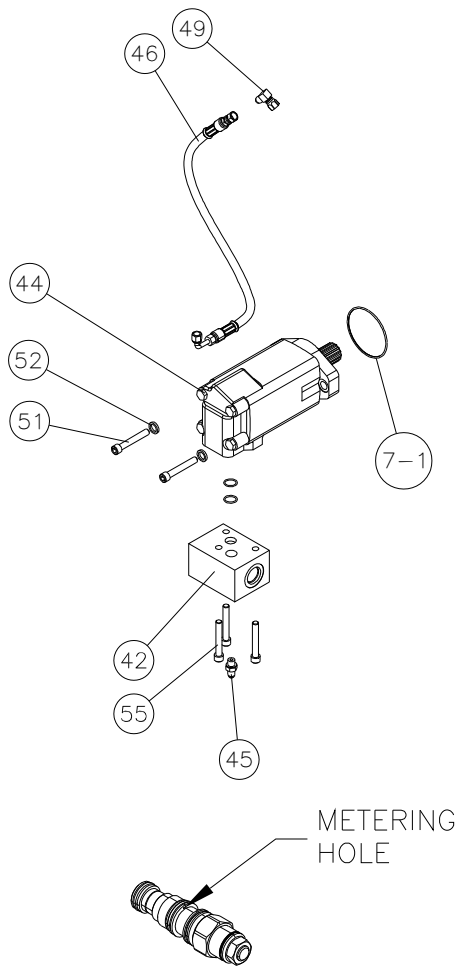
1. Drain the oil from the gearbox and brake sections using the instructions on page 7.
2. Stand the hoist on its end with the motor pointing up.
3. Disconnect the hose (*Item 46*) connected to the brake housing (*Item 21*). Remove the motor and counterbalance valve assembly from the hoist by removing two capscrews (*Item 51*) and washers (*Item 52*). See *Servicing The Motor* section on page 10 for motor and counterbalance valve disassembly.
4. Remove the brake subassembly from the hoist by removing eight capscrews (*Item 9*) holding the brake housing to the side plate (*Item 1*). See *Servicing The Brake* section on page 11 for brake repair.
5. Remove the side plate (*Item 1*) by removing twelve capscrews (*Items 2 & 60*).
6. Lift the bearing carrier (*Item 26*) out of the drum (*Item 5*). Inspect the bearing (*Item 28*) for signs of pitting or spalling and if necessary, replace the bearing and seal (*Item 7-3*).
7. Remove the sun gear (*Item 8*) from the planet gearset (*Item 4*). Inspect for damage and replace if needed.
8. Remove the planet gearset (*Item 4*) from the drum. Inspect the gearset for wear and repair as needed. See *Servicing The Planetary Set* section on page 13 for disassembly and repair.
9. Remove the drum (*Item 5*) by lifting straight up and off of the output shaft (*Item 32*). Inspect the gear teeth for excessive wear and replace if necessary. Inspect the bearing (*Item 28*) for signs of spalling or pitting and, if necessary, replace the bearing and seal (*Item 7-3*).
10. Inspect the retaining ring (*Item 3*) on the output shaft to ensure that it is still in the groove and is not bent, and replace if necessary.
11. Inspect the shaft (*Item 32*) for wear or damage and, if necessary, remove it from the side plate (*Item 50*) by removing six capscrews (*Item 62*).

ASSEMBLY

1. Thoroughly clean all parts. Replace those that show wear or damage.
2. Inspect the drum (*Item 5*) for structural integrity and the gear teeth for excessive wear, then replace if necessary.
3. Attach the output shaft (*Item 32*) to the side plate (*Item 50*) with six capscrews (*Item 62*), making sure the vent (*Item 30*) is oriented properly, then torque them to specification (*see Torque Specifications Chart on page 15 of this manual*).
4. Install the retaining ring (*Item 3*) onto the output shaft (*Item 32*).
5. Attach the rods (*Item 43*) and base (*Item 12*) to the side plate (*Item 50*) with twelve capscrews (*Items 2 & 60*). Torque to specification (*see Torque Specifications Chart on page 15 of this manual*).
6. If necessary, install a new bearing (*Item 28*) and oil seal (*Item 7-3*) into the drum.
7. Lay the unit down so that the rods (*Item 43*) and base (*Item 12*) are pointing up. Set the drum (*Item 5*) onto the output shaft (*Item 32*) being careful not to damage the seal (*Item 7-3*).
8. Install the planet gearset (*Item 4*) into the drum (*Item 5*), making sure it's installed correctly onto the shaft (*Item 32*).
9. Insert the sun gear (*Item 8*) into the planet gearset (*Item 4*). The slot in the sun gear must be installed down, facing the output shaft.
10. Install a new o-ring (*Item 7-6*) and, if necessary, a new bearing (*Item 28*) and seal (*Item 7-3*) into the bearing carrier (*Item 26*). Grease the o-ring and seal and install the bearing carrier into the drum.
11. Position the side plate (*Item 1*) on top of the rods (*Item 43*) and base (*Item 12*). Attach the side plate with twelve capscrews (*Items 2 & 60*). Torque to specification (*see Torque Specifications Chart on page 15 of this manual*).
12. Install the brake subassembly into the side plate (*Item 1*), making sure that the pilot of the brake housing (*Item 21*) aligns with the bearing (*Item 28*) and seal (*Item 7-3*) in the bearing carrier (*Item 26*) and that the holes for the motor are in the correct orientation. Also, make sure that the level and vent plugs in the cover are properly oriented. Install eight capscrews (*Item 9*) and torque them to specification (*see Torque Specifications Chart on page 15 of this manual*).
13. Install a new o-ring (*Item 7-1*) on the face of the motor and re-install the motor/counterbalance valve assembly. Install two capscrews (*Item 51*) and washers (*Item 52*) and torque them to specification (*see Torque Specifications Chart on page 15 of this manual*).
14. Reconnect the hose (*Item 46*) to the brake housing (*Item 21*).
15. Fill both the gearbox and the brake section with the proper amount and type of lubricants as instructed in the *Recommended Oil* section on page 6 of this manual.

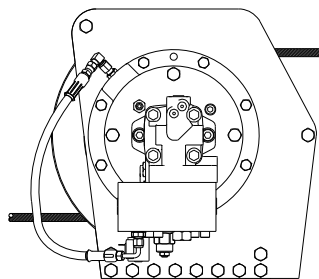
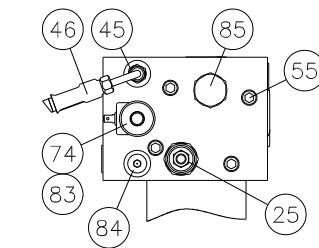
SERVICING THE MOTOR

1. Remove the hose (Item 46) and counterbalance block (Item 42) from the motor assembly.
2. Remove the counterbalance valve from the block (Item 42) and inspect the small metering hole located on the side of the valve to make sure it is not obstructed. Also, inspect the o-rings for damage and replace if necessary.
3. Motors and counterbalance components are not serviceable in the field. Return them to an authorized dealer for service.

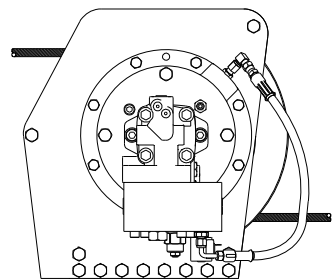
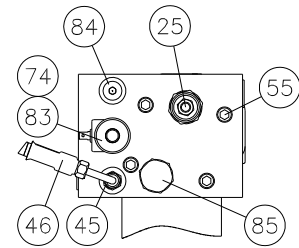


VIEW FOR 2 SPEED

CONFIGURATION
A



CONFIGURATION
B



SERVICING THE BRAKE

1. Evenly remove four capscrews (*Item 11*) holding the brake cover (*Item 20*) in place. Spring pressure will raise the cover as the capscrews are loosened. Remove the cover from the brake housing.
2. Remove the springs (*Item 24*) from the piston (*Item 10*) and check the free height. Each spring should measure at least 1.200 inches with no force on them.
3. Remove the brake piston (*Item 10*) by installing two pieces of 3/8"-16NC all-thread in the bottom of two spring pockets. Using jam nuts, screw the all-thread pieces in evenly until the piston is clear of the housing. An alternate way of removing the piston is to use a portable power unit or shop air to slowly pressurize the brake cavity until the piston is out of the bore.
4. Remove the brake driver/clutch assembly (*Items 13, 14, 15, 17, 34, and 38*) from the brake housing (*Item 21*).
5. Remove the stator plates (*Item 19*) and friction discs (*Item 18*) from the brake housing and check them for excessive wear, then replace if necessary. Additionally, check the top stator plate for scoring caused by the removal tools and polish if necessary. Friction discs should measure no less than 0.055 inches thick and stator plates should measure no less than 0.064 inches thick.
6. If necessary, remove the seal (*Item 7-5*) from the brake housing.
7. If the brake housing (*Item 21*) is removed from the hoist, examine the journal on the brake housing where the seal (*Item 7-3*) runs for wear. If severely worn, replace the brake housing.
8. Carefully disassemble the brake driver/clutch and note the side in which the markings on the clutch (*Item 34*) are facing. The clutch assembly must be re-assembled with the markings facing the proper direction in order for the hoist to function properly. Inspect the surface on the input and brake drivers (*Items 13 & 38*) where the clutch (*Item 34*) runs. If there is any pitting or spalling on the drivers then both it and the clutch must be replaced.
9. Re-assemble the driver/clutch assembly, making sure that the clutch is installed properly.
10. Install a new seal (*Item 7-5*) into the brake housing. If the brake housing is removed from the hoist, temporarily install the input sun gear (*Item 8*) into the brake housing and slide the driver/clutch assembly onto the sun gear spline.
11. Install the stator plates (*Item 19*) and friction discs (*Item 18*) into the brake housing starting with a stator and alternating friction discs and stator plates. There is one more stator plate than friction disc so you will finish with a stator plate.
12. Coat the new oil seals (*Item 7-4*) with light oil and install onto the piston (*Item 10*). *See Fig. 5 for proper installation.*
13. Carefully install the piston (*Item 10*) into the brake housing (*Item 21*) and gently tap it down until it is seated.
14. Install the springs (*Item 24*) into the spring pockets of the piston. If working in a horizontal position, coat the bottom of each spring with chassis lube to keep it in position.

15. Coat the new o-ring (*Item 7-2*) with light oil and install it into the groove on the brake cover (*Item 20*).
16. Install the cover (*Item 20*) onto the brake housing (*Item 21*) and draw it down evenly, alternating between opposite capscrews (*Item 9*). Make sure that the cover is aligned properly with the brake housing in order to correctly orient the motor and vent/drain plugs.
17. Check the brake release with a portable hydraulic pump. Full release should be obtained at 330 PSI \pm 10%.

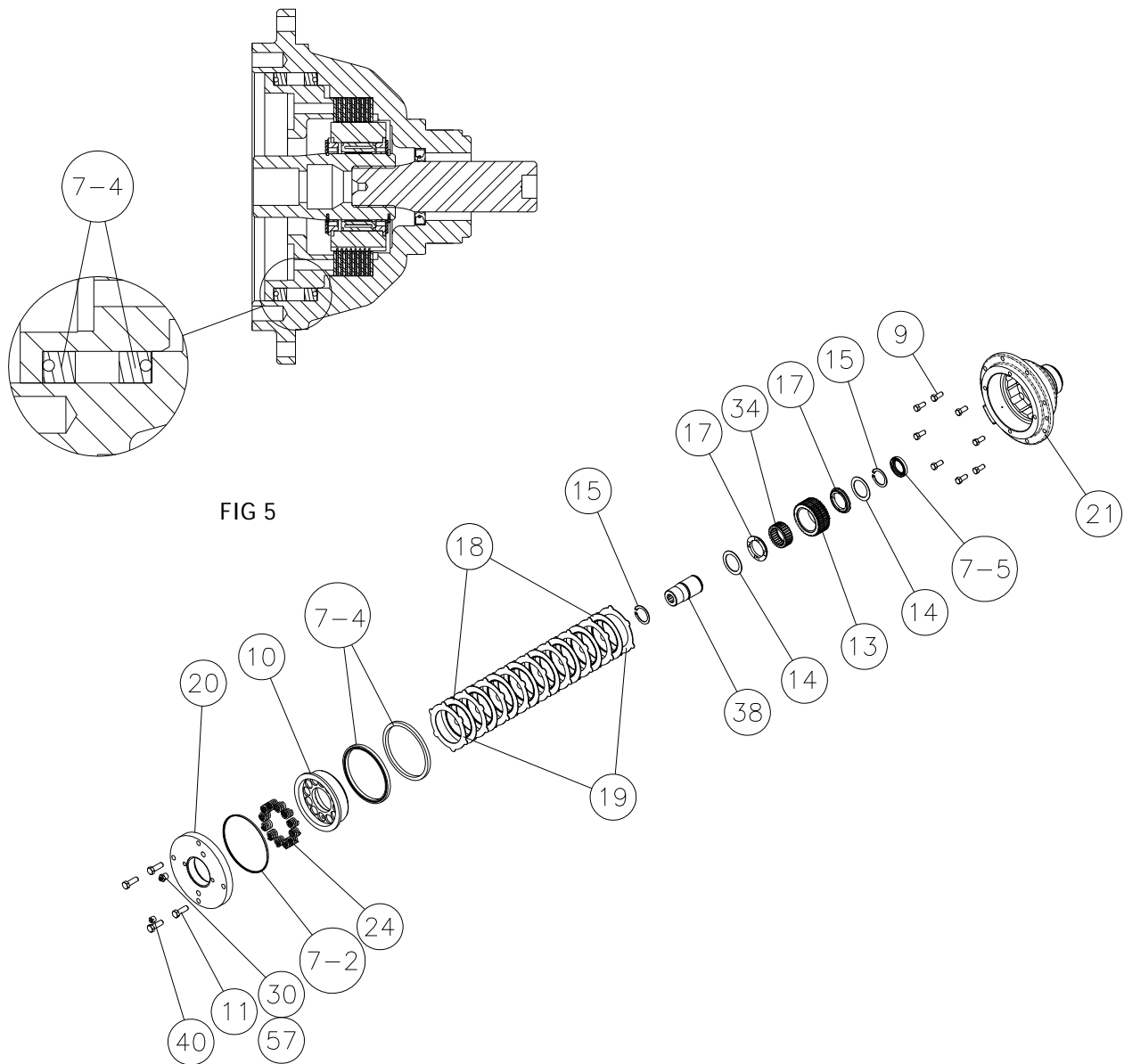
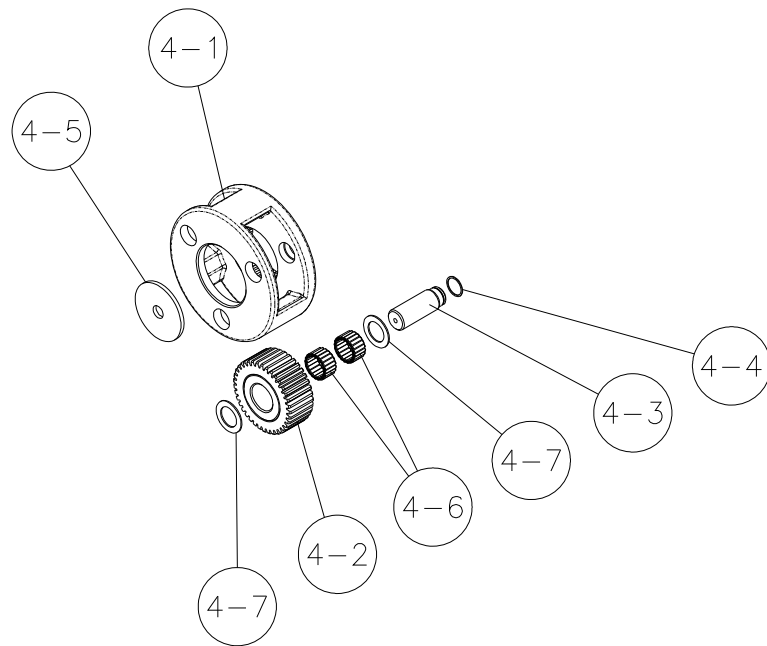


FIG 5

SERVICING THE PLANETARY SET

1. Remove the retaining rings from the planet pins.
2. Remove the pins from the carrier by carefully tapping them out.
3. Remove the planet gears, washers and bearings from the carrier.
4. Inspect the pins, bearings, and gear bores for evidence of wear and replace if necessary.
5. Before reassembly, be sure to insert the thrust plate into the carrier.
6. To reassemble, be careful to line up the planet pins with the washers and bearings then press the knurled part of the pin into the carrier. If the pins are not lined up properly, the washers can be shattered during the pressing operation.
7. Replace the retaining rings onto the planet pins.



TROUBLESHOOTING

Hoist won't hold load

Possible Solutions:

1. There is excessive back pressure in the hydraulic system. Check the system for line restrictions and reduce the back pressure.
2. The brake discs are worn. Replace the brake discs. Friction discs should measure no less than 0.055 inches thick and the stator plates should measure at least 0.064 inches thick.
3. The brake clutch is slipping due to wear of either driver and/or clutch. Inspect the driver components for wear and replace if necessary.

Hoist unable to lift load

Possible Solutions:

1. The relief valve setting may be too low to allow proper lifting. Increase the relief pressure setting.
2. The load being lifted may be more than the hoists rating. Verify weight and reduce the load or re-rig it to increase mechanical advantage.

Hoist unable to lower load

Possible Solutions:

1. The counterbalance valve cartridge may have a plugged metering hole (*see page 10 for location of metering hole*). Remove the cartridge and clean it.

Oil leaks from motor-side vent

Possible Solutions:

1. The motor shaft seal may have failed. Have the seal replaced and reduce the back pressure if that was a cause of the seal failure.
2. The brake pistons o-ring seals may have failed. Service the brake section and replace any worn parts found.

TORQUE SPECIFICATIONS CHART

Nominal	Size	Dry	Plated	Lubricated	Dry	Plated	Lubricated
		SAE Grade 5 Torque *(Ft-Lbs)	SAE Grade 5 Torque *(Ft-Lbs)	SAE Grade 5 Torque *(Ft-Lbs)	SAE Grade 8 Torque *(Ft-Lbs)	SAE Grade 8 Torque *(Ft-Lbs)	SAE Grade 8 Torque *(Ft-Lbs)
1/4	20	8	6	5	12	9	7
1/4	28	10	7	6	14	10	8
5/16	18	17	13	10	25	18	15
5/16	24	19	14	11	27	20	16
3/8	16	31	23	19	44	33	26
3/8	24	35	26	21	49	37	30
7/16	14	49	37	30	70	53	42
7/16	20	55	41	33	78	58	47
1/2	13	76	57	45	106	80	64
1/2	20	85	64	51	120	90	72
9/16	12	109	82	65	153	115	92
9/16	18	122	91	73	172	129	103
5/8	11	150	113	90	212	159	127
5/8	18	170	128	102	240	180	144
3/4	10	266	200	160	376	282	226
3/4	16	297	223	178	420	315	252
7/8	9	430	322	258	606	454	364
7/8	14	474	355	284	668	501	401
1	8	644	483	386	909	682	545
1	14	721	541	433	1019	764	611
1-1/8	7	794	596	475	1288	966	772
1-1/8	12	890	668	534	1444	1083	866
1-1/4	7	1120	840	672	1817	1363	1090
1-1/4	12	1241	930	745	2012	1509	1207

T = BOLT TORQUE (LB. FT.)

K = TORQUE COEFFICIENT (K = 0.20 DRY

W = PRELOAD TENSION

D = NOMINAL BOLT SIZE (IN.)

T = (KWD) / 12

K = 0.15 PLATED K = 0.12 LUBRICATED)

* ALL TORQUE VALUE TOLERANCES ARE ± 5%

BILL OF MATERIAL

SEQ	QTY	P/N	DESCRIPTION	NOTES
1a	1	42432	SIDE PLATE	BRAKE SIDE (SEE PICTORAL FOR DESCRIPTION)
1b	1	42440	SIDE PLATE	
2	20	44581	CAPSCREW	
3	1	29973	RETAINING RING	
4	1	4412	PLANET GEARSET	
4-1	1	42176	CARRIER	
4-2	6	30484	BEARING	
4-3	3	42185	PLANET GEAR	
4-4	6	28771	WASHER	
4-5	3	41715	RETAINING RING	
4-6	3	42184	PLANET PIN	
4-7	1	44067	THRUST PLATE	
5a	1	42179	DRUM	Ø15.00 FLANGE
5b	1	42443	DRUM	Ø14.25 FLANGE
7a	1	4314	SEAL KIT	
7b	1	4335	SEAL KIT	FOR CHARLYNN 4K SERIES MOTOR
8	1	44516	SUN GEAR	
9	8	40410	CAPSCREW	
10	1	41738	BRAKE PISTON	
11a	4	31456	CAPSCREW	1.50" LENGTH
11b	4	20525	CAPSCREW	2.00" LENGTH
12a	1	42347	BASE	FOUR MOUNTING HOLES
12b	1	42442	BASE	EIGHT MOUNTING HOLES
13	1	41740	BRAKE DRIVER	
14	2	41723	RACE	
15	2	26980	RETAINING RING	
17	2	41743	BUSHING	
18	5	32765	FRICTION DISC	
19	6	42148	STATOR PLATE	
20a	1	42172	BRAKE COVER	(SEE PICTORAL FOR DESCRIPTION)
20b	1	42401	BRAKE COVER	
20c	1	42552	BRAKE COVER	
21	1	42171	BRAKE HOUSING	
24	12	41718	BRAKE SPRING	
25a	1	42286	COUNTERBALANCE VALVE	FOR CHARLYNN 2 SPD. MOTOR
25b	1	42554	COUNTERBALANCE BLK W/ VALVE	FOR CHARLYNN 4K SERIES MOTOR
26	1	41752	BEARING CARRIER	
28	2	34550	BEARING	
29	1	41756	CABLE WEDGE	
30	2	13050	BREATHER	
32	1	42177	SHAFT	
33	2	41719	O-RING PLUG	
34	1	41759	CLUTCH	
38	1	44584	INPUT DRIVER	
40	1	32220	PIPE PLUG	
42a	1	40637	COUNTERBALANCE BLOCK	CHARLYNN 2K SERIES, 3 MOUNT HOLES
42b	1	42967	COUNTERBALANCE BLOCK	CHARLYNN 2K SERIES-2 SP, 4 MOUNT HOLES
42c	1	43883	COUNTERBALANCE BLOCK	CHARLYNN 2K SERIES, 3 MOUNT HOLES
43	2	42188	SUPPORT ROD	
44a	1	42189	HYDRAULIC MOTOR	CHARLYNN 2K SERIES, 14.9 CU-IN
44b	1	42968	HYDRAULIC MOTOR	CHARLYNN 2K SERIES, 18.7 CU-IN
44c	1	44513	HYDRAULIC MOTOR	CHARLYNN 2K SERIES-2 SP, 24.0/12.0 CU-IN
44d	1	42549	HYDRAULIC MOTOR	CHARLYNN 4K SERIES, 24.0 CU-IN

SEQ	QTY	P/N	DESCRIPTION	NOTES
45	2	41838	STRAIGHT ADAPTER	QUANTITY VARIES PER ASSEMBLY
46a	1	42031	HOSE ASSEMBLY	18.00" LENGTH
46b	1	42496	HOSE ASSEMBLY	19.50" LENGTH
46c	1	42494	HOSE ASSEMBLY	10.50" LENGTH
46d	1	42551	TUBING	FOR CHARLYNN 4K SERIES MOTORS
49	1	41873	SWIVEL ADAPTER	
50a	1	42433	SIDE PLATE	OUTPUT SIDE (SEE PICTORAL FOR DESCRIPTION)
50b	1	42441	SIDE PLATE	
50c	1	42477	SIDE PLATE	
51a	2	43857	CAPSCREW	MATCH QTY WITH PROPER MOUNT
52	2	43856	LOCKWASHER	
55a	3	43858	CAPSCREW	
55b	8	31558	CAPSCREW	
55c	4	43111	CAPSCREW	
57	1	12208	BUSHING	
60	4	44579	CAPSCREW	
62	8	44580	CAPSCREW	
64	1	41879	STRAIGHT ADAPTER	
70	1	4190	CABLE PACKER ASSEMBLY	
70-1	2	42515	BEARING	
70-2	1	42584	ARM	
70-3	2	42585	ROLLER	
70-4	1	42586	ROLLER	
70-5	2	42587	CAPSCREW	
70-6	2	42516	BEARING	
70-7	1	42425	LEFT SPRING	
70-8	1	42533	RIGHT SPRING	
74	1	43446	COIL	
83	1	43445	SPOOL VALVE	
84	1	42392	O-RING PLUG	
85	1	42287	CAVITY PLUG	

EXPLODED ISOMETRIC ASSEMBLY DRAWING

