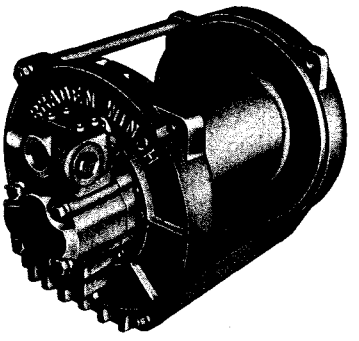
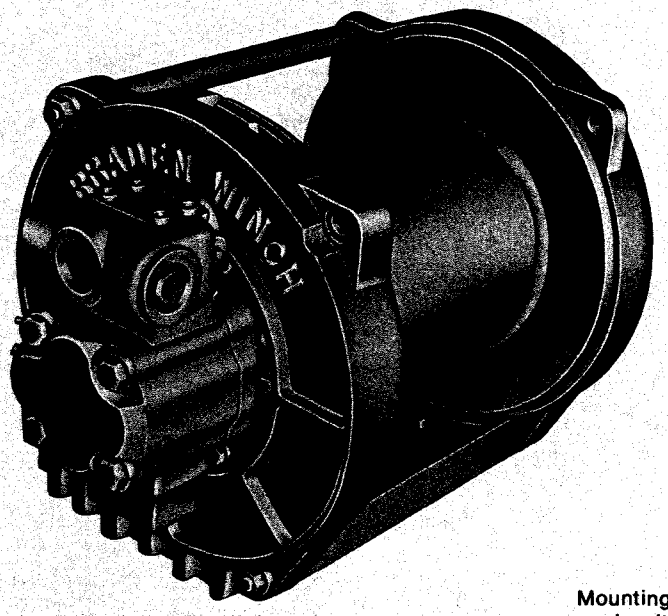
CONSTRUCTION
EQUIPMENT
DIVISION

BRADEN INDUSTRIES, INC., BROKEN ARROW, OKLAHOMA



BRADEN POWER DRUM
THE PD10 SERIES
INSTALLATION, MAINTENANCE AND SERVICE



BRADEN

Hydraulically Operated

SINGLE SPEED Series PD10 POWER DRUMS

Mounting is fast and easy. Winch can be rotated to any angle within plane of drum flanges.

Brake valve insures smooth operation of winch and braking system while raising or lowering load.

Balanced brake piston automatically compensates for back pressure up to 200 p.s.i.

Planetary gears inside drum barrel permit change of speed and load by gearing changes rather than motor changes.

Standard Commercial 25X Motor. Service available nationwide.

Seamless, heavy gauge steel barrel.

Fail-safe braking system. Brake is spring engaged, hydraulically released. If engine dies or hydraulic line breaks, load is held firmly until power is restored.

CROSS-SECTIONAL VIEW

DESCRIPTION OF WINCH

The Winch has three basic component parts:

1. Winch Base and Side Frames
2. Hydraulic Motor and Brake Valve
3. Cable Drum Assembly

The Cable Drum Assembly is made up of four basic assemblies:

1. Cable Drum
2. Brake Assembly
3. Primary Planetary Reducer
4. Final Planetary Reducer

The Hydraulic motor is bolted directly to the brake assembly housing. This housing is bolted and doweled to the side frame. The ring gear of both planetary reducers is splined to the brake housing. The cable drum is supported by this brake housing through a large bushing. A quad ring in the bushing prevents oil leakage.

The cable drum is supported on the other end by the final planet carrier to which it is splined. The carrier is supported by an anti-friction roller bearing on a ground and polished shaft projecting from the end frame.

HOW IT OPERATES

The hydraulic motor drives the sun gear of the primary planetary reducer. The output is transmitted, by the planet carrier, to the sun gear of the final planetary reducer.

This output is transmitted directly to the cable drum by a splined fitting between the planet carrier and the drum.

THE BRAKE SYSTEM

The automatic braking system has four operating component parts:

1. Brake Valve attached to Hydraulic Motor
2. Spring loaded Friction Brake
3. An over-riding Cam Clutch
4. A Hydraulic Piston and Cylinder

The brake valve is basically a counterbalance valve. It contains a check valve to allow free flow of oil to the motor in a hoisting direction of rotation, and a pilot operated check valve that prevents flow of oil out of the motor when the operating valve is placed in the reverse or lowering position until sufficient pressure is present for the pilot piston to open the check valve. It also contains a small pressure relief valve set to prevent excessive shocks on the motor when a lower operation is stopped.

The friction brake is a load holding brake only and has nothing to do with dynamic braking or stopping the descent of a load.

The over-riding clutch is splined to the drive shaft between the motor and primary sun gear. It will allow this driveshaft to turn freely in a rotation to raise a load and force the brake discs to turn with the shaft in rotation to lower a load.

The hydraulic cylinder when pressurized will release the spring pressure on the brake discs. This is a double acting cylinder and is balanced to back pressure when the winch is not being operated.

HOW IT OPERATES

When the winch is powered in a hoisting direction, the drive from the motor to the primary sun gear runs free. The over-riding clutch between the drive shaft and the brake discs allows complete freedom of rotation in this direction. The brake remains fully engaged as the brake release piston is balanced to any amount of back pressure that may exist.

When the lifting operation is stopped, the brake, being fully engaged prevents the load from lowering.

When the winch is powered to reverse, the motor cannot rotate until sufficient pressure is present to open the brake valve. The friction brake within the winch will completely release at a pressure lower than that required to open the brake valve. The extent to which this valve will open will determine the amount of oil that can flow through it and the speed at which the load will be lowered. Increasing the flow of oil to the winch motor will cause the pressure to rise and the opening in the brake valve to enlarge speeding up the descent of the load. Decreasing this flow causes the pressure to lower, the opening in the brake valve to decrease slowing down the descent of the load.

When the operating valve is shifted to neutral the pressure will drop, the brake valve will close stopping the load. The friction brake will engage after the valve has closed and hold the load.

When lowering a load very slowly for precise positioning, no oil flow actually occurs through the winch motor. The pressure will build up to a point where the brake will release sufficiently to allow the load to rotate the motor through its own leakage. This feature results in a very slow speed and extremely accurate positioning.

SUMMARY

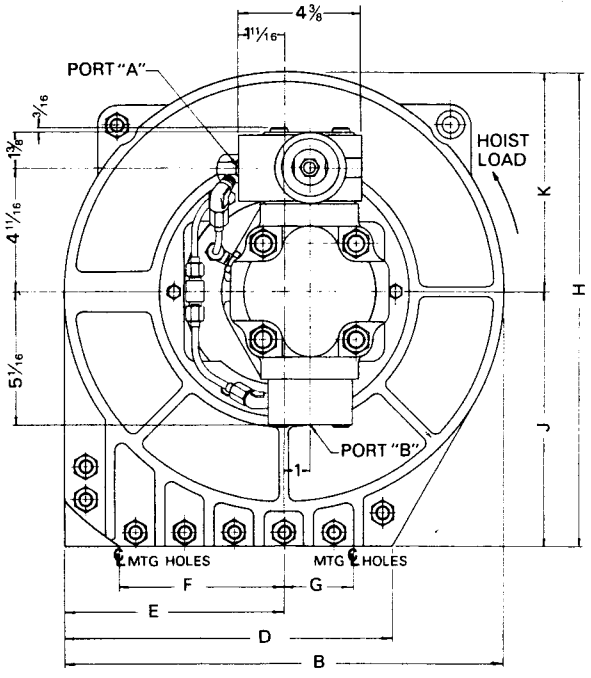
The winch in raising a load is not affected by any braking action. When lowering a load the brake valve has complete control of the speed at which it is lowered. When the winch is stopped by returning the control lever to neutral — the brake valve stops the load and the friction brake engages to hold the load.

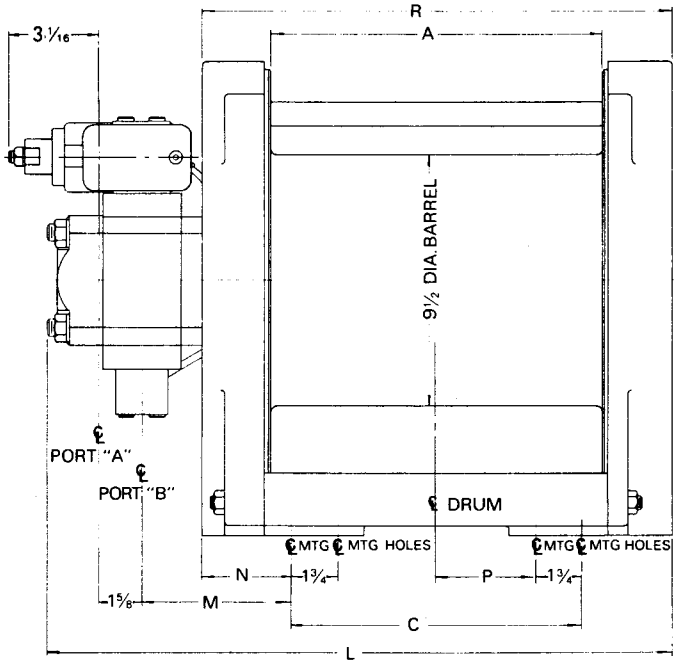
Thus the brake receives very little wear in lowering operations. All of the heat generated by the lowering and stopping of a load is absorbed by the hydraulic oil where it can be readily dissipated. The only heat absorbed by the winch in either hoisting or lowering is due to the efficiency losses within the winch itself.

DIMENSIONAL DATA

PD10 Power Drums

With Cast Type Side Plates





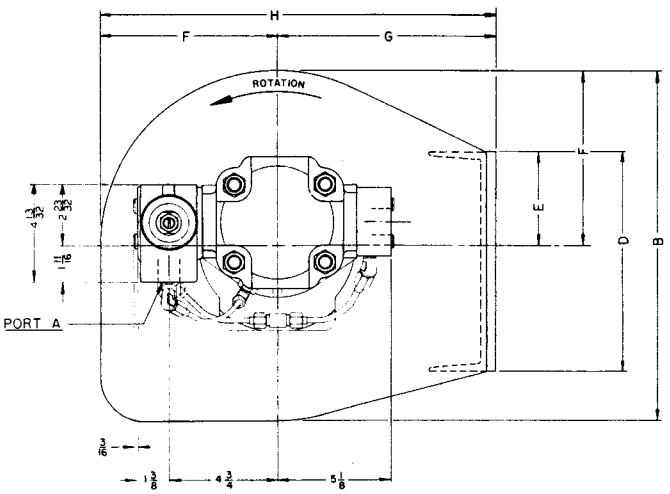
MODEL	MOTOR MOUNTING	LOAD CAPACITY 1ST LAYER	GEAR RATIO	CABLE CAPACITY WIRE ROPE ⅜"	WIRE ROPE 7/16"	WIRE ROPE ½"	ROPE ⅝"	ROPE ¾"	ROPE 1"	DIMENSIONAL DATA A	B	C	D	E	F	G	H	J	K	L	M	N	P	R
PD10-75	SHOWN	10,000	36:1	1350	850	630	425	340	158	16½	16⅝	14⅞	12⅜	8 5/16	6¼	2⅝	17 15/16	9⅝	8 5/16	27¾	6⅜	3⅜	5 11/16	21⅝
PD10-77	SHOWN	10,000	36:1	1030	640	490	325	245	118	12⅝	16⅝	11	12⅜	8 5/16	6¼	2⅝	17 15/16	9⅝	8 5/16	23⅞	6⅜	3⅜	3 11/16	17¾
PD10-77-1	SHOWN	10,000	36:1	1030	640	490	325	245	118	12⅝	16⅝	9 3/16	18	9¾	8⅞	7⅜	17 15/16	9⅝	8 5/16	23⅞	7 3/16	4 3/16	—	17¾
PD10-77-2	SHOWN*	8,800	36:1	700	527	410	269	189	105	12⅝	16⅝	11	12⅜	8 5/16	6¼	2⅝	17 15/16	9⅝	8 5/16	23⅞	6⅜	3⅜	3 11/16	17¾

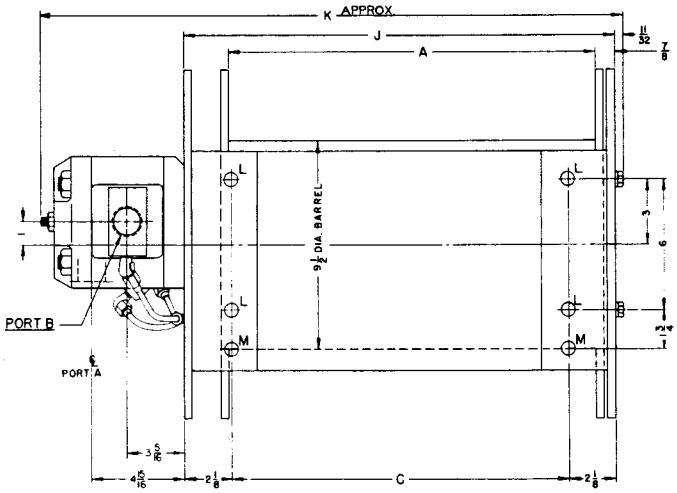
Ratings shown are on first layer of cable. *Barrel diameter 10¾".
Shipping weights: Model PD10-77 approximately 450 lbs. (winch only).

DIMENSIONAL DATA

PD10 Power Drums

With Fabricated Type Side Plates



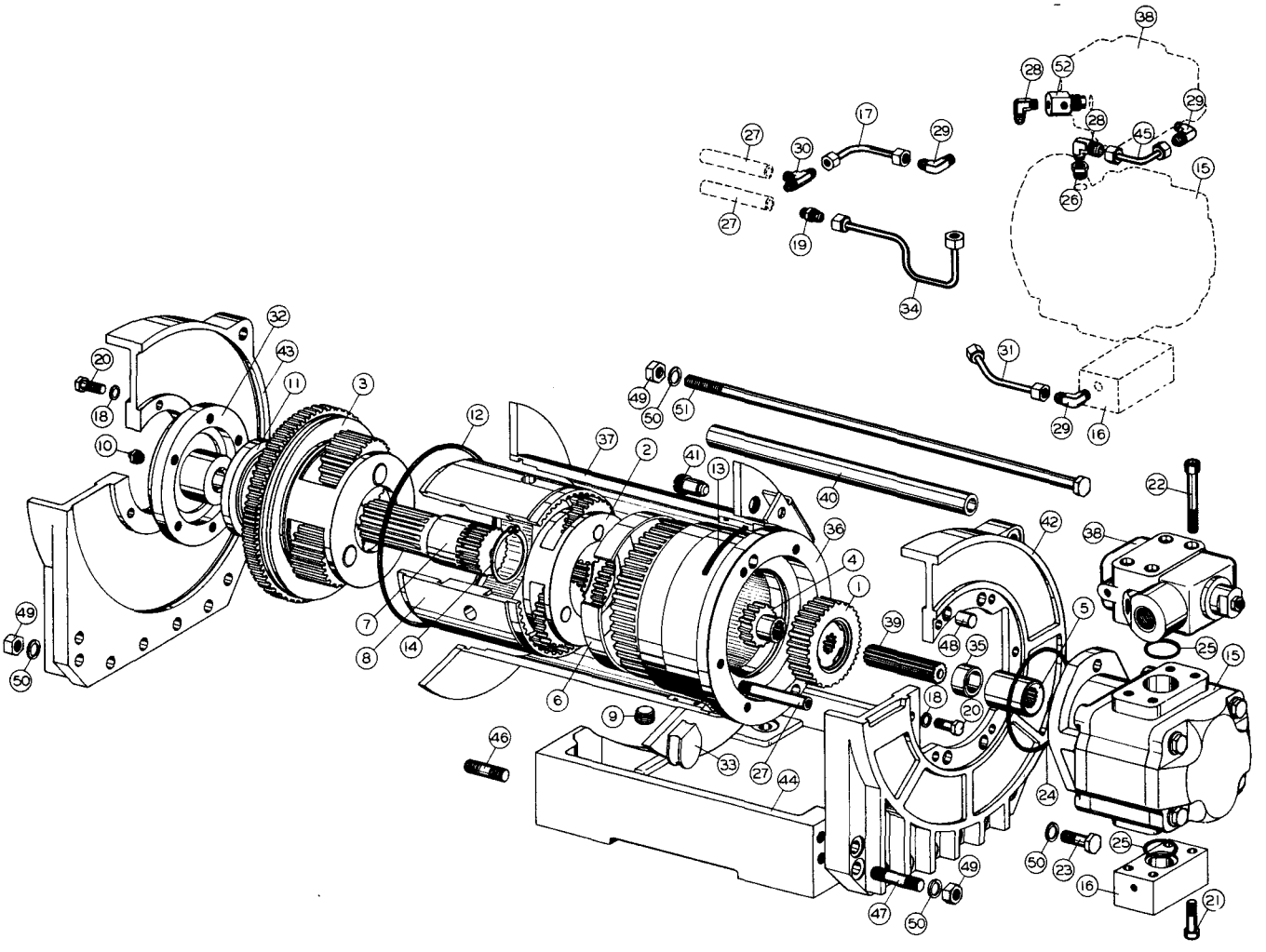


PORT "A" – RAISE LOAD 1 5/16-12 St.Thrd. 'O' RING
PORT "B" – LOWER LOAD 1 5/16-12 St.Thrd. 'O' RING
MOUNTING HOLES "L" & "M" – SEE TABLE

MODEL	MOTOR MOUNTING	LOAD CAPACITY 1ST LAYER	GEAR RATIO	CABLE CAPACITY WIRE ROPE			ROPE			DIMENSIONAL DATA										
				3/8"	7/16"	1/2"	5/8"	3/4"	1"	A	B	C	D	MOUNTING HOLES	E	F	G	H	J	K
PD10-1	SHOWN	10,000	36:1	410	250	225	115			13¼	13	11½	8	L 21/32 DIA.	4	6½	8	14½	15¾	24 3/32
PD10-2	MOTOR OPPOSITE END	10,000	36:1	410	250	225	115			13¼	13	11½	8	L 21/32 DIA.	4	6½	8	14½	15¾	24 3/32
PD10-5	SHOWN	10,000	36:1	1350	850	630	425	340	158	16½	16	15⅜	10	L&M 25/32 DIA.	4¼	8	9⅞	17⅞	19⅝	27 31/32
PD10-7	SHOWN	10,000	36:1	1030	640	490	325	245	118	12⅝	16	11½	10	L&M 25/32 DIA.	4¼	8	9⅞	17⅞	15¾	24 3/32
PD10-8	MOTOR OPPOSITE END	10,000	36:1	1030	640	490	325	245	118	12⅝	16	11½	10	L&M 25/32 DIA.	4¼	8	9⅞	17⅞	15¾	24 3/32

Ratings shown are on first layer of cable.
Shipping weights: Model PD10-1 approximately 310 lbs. (winch only).

COMPONENT LAYOUT – PDIO SERIES



MATERIAL LIST

ITEM NO.	QTY.	CATALOG NO.	DESCRIPTION	ITEM NO.	QTY.	CATALOG NO.	DESCRIPTION
1	1	850240	Brake/Clutch Assy.	20	12	S037-10P	Capscrew
2	1	850300	Prime Planet Carrier Assy.	21	4	S043-20A	Capscrew
3	1	850340	Second Planet Carrier Assy.	22	4	S043-30A	Capscrew
4	1	850420	Gear-Input Sun	23	2	S050-15P	Capscrew
5	1	850430	Coupling-Motor	24	1	1885004	O-ring (4" x 4" x ⅛")
6	1	850440	Spacer	25	1	1885009	O-ring (1⅜" x 1⅝" x ⅛")
7	1	850710	Gear-Output Sun	26	1	2385003	Reducer
8	1	850770	Gear-Ring	27	2	850511	Nipple-Brake Release
9	2	E050A	Plug	28	2	2685008	Elbow-Male 90°
10	1	28-FTD-Z	Valve Check	29	3	2685010	Elbow-Male 45°
11	1	1885001	Seal-Oil	30	1	2685011	Tee-Male Branch
12	1	1885002	O-ring (8½" x 8¾" x ⅛")	31	1	851011	Tube-Brake Release
13	1	22419	Quad Ring (8" I.D. x 8½" O.D. x ¼" W.)	32	1	850060	Support-Drum
14	1	1951001	Snap Ring	34	1	850991	Tube Assy.
15	1	850020	Motor-Hydraulic	38	1	850951	Brake Valve Assy.
16	1	850960	Manifold	48	2	2085001	Dowel Pin
17	1	851001	Tube-Valve Pilot	49	17	SH050P	Hex Nut-Heavy
18	12	A037	Lockwasher	50	19	A050	Lockwasher
19	1	2685014	Connector-Male	52	1	850940	Valve-Motor Drain Check

NOTE: REFER TO "MATERIAL LIST VARIABLES" FOR ITEMS NOT SHOWN IN BASIC MATERIAL LIST.

USE ONLY FACTORY CERTIFIED REPLACEMENT PARTS.

MATERIAL LIST VARIABLES

ITEM NUMBER	DESCRIPTION	QUANTITY AND CATALOG NUMBER																			
		QTY	PD10-1	QTY	PD10-2	QTY	PD10-5	QTY	PD10-7	QTY	PD10-8	QTY	PD10-75	QTY	PD10-77	QTY	PD10-77-1	QTY	PD10-77-2
33	Cable Clamp		—		—	1	850930	1	850930	1	850930	1	850930	1	850930	1	850930		22562
35	Spacer	1	850841	1	850841	1	850840	1	850841	1	850841	1	850840	1	850841	1	850841	1	850841
36	Brake Cylinder Assy.	1	850111	1	850111	1	851090	1	850111	1	850111	1	851090	1	850111	1	850111	1	850111
37	Cable Drum Assy.	1	850910	1	850910	1	850810	1	851030	1	851030	1	850811	1	851031	1	851033	1	850333
39	Input Shaft	1	850491	1	850491	1	850850	1	850491	1	850491	1	850850	1	850491	1	850491	1	850491
40	Spacer-pipe	1	850984	1	850984	1	850970	1	850984	1	850984	1	850983	1	850985	1	850985	1	850985
41	Anchor pin		—		—		—		—		—	1	851260	1	851260	1	851260		—
42	Side plate-motor	1	850580	1	850580	1	850660	1	850660	1	850660	1	850661	1	850661	1	850663	1	850661
43	Side plate-support	1	850590	1	850590	1	850680	1	850680	1	850680	1	850681	1	850681	1	850683	1	850681
44	Base	1	850640	1	850640	1	850700	1	850630	1	850630	1	850701	1	850641	1	850643	1	850641
45	Motor drain tube	1	850990	2	851130	1	850990	1	850990	2	851130	1	850990	1	850990	1	850990	1	850990
46	Stud		—		—		—		—		—	8	850380	8	850380	8	850380	8	850380
47	Stud		—		—		—		—		—	8	850381	8	850381	8	850381	8	850381
51	Capscrew	1	850390	1	850390		—	1	850390	1	850390	1	850391	1	850390	1	850390	1	850390
NOT SHOWN	Cable Clamp	1	850140	1	850140		—		—		—		—		—		—		—
NOT SHOWN	Capscrew for cable clamp	2	S031-10AF	2	S031-10AF		—		—		—		—		—		—		—
NOT SHOWN	Strap	2	851100	2	851100	2	851110	2	851110	2	851110		—		—		—		—

PD10 SERIES O-RING KIT NO. 61259*

ITEM NO.	QTY.	CATALOG NUMBER	DESCRIPTION
1	1	1855002	O-ring
2	1	22419	Quad ring
3	1	1885004	O-ring
4	1	1885009	O-ring

ITEM NO.	QTY.	CATALOG NUMBER	DESCRIPTION
5	2	1885003	O-ring
6	2	1858003	O-ring
7	1	21320	O-ring

*When O-ring replacements required, order complete O-ring Kit No. 61259.

PROCEDURE FOR DISASSEMBLY OF THE BRADEN POWER DRUM 10 SERIES WINCHES

For complete disassembly of the winch, drain oil with winch in a horizontal position.

Remove control tubing, Items 17, 34, 31 and 43.

Remove capscrews, Item 23, and remove motor, Item 15.

Remove motor coupling, Item 5, spacer, Item 35, input shaft, Item 39, and brake clutch assembly, Item 1.

Turn winch on end with motor side down.

Remove nuts and washers, Items 49 and 50.

Remove end plate, Item 43.

The planet carrier, Item 3, can now be removed with the aid of a small bar. Exercise care to prevent damage to the O-ring seal. Inspect planet carrier shafts, Item 3, for oil leaks. If oil is visible, check shaft O-rings, Item 5, for damage and replace.

Remove ring gear, Item 8.

Remove output sun gear, Item 7.

Remove primary planet carrier assembly, Item 2.

Remove input sun gear, Item 4.

Remove cable drum, Item 37.

Remove base, Item 44, from brake cylinder. (For disassembly of brake cylinder, refer to Page 10.)

If the brake cylinder only is to be removed for inspection or replacement, place winch in a vertical position with motor end up.

Remove control tubing, Items 17, 34, 31 and 45. The motor drain need not be removed. It is attached from the brake valve to the motor.

Remove capscrews, Item 23, from motor mounting to brake cylinder.

Remove Commercial hydraulic motor, Item 15.

Remove 6 capscrews, Item 20, from motor end plate. With plastic hammer, tap motor end plate, Item 42, to loosen from brake cylinder mounting and dowel pins, Item 48.

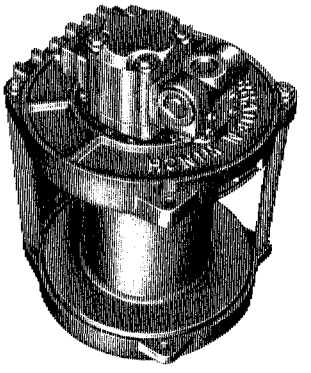
Remove motor coupling, Item 5.

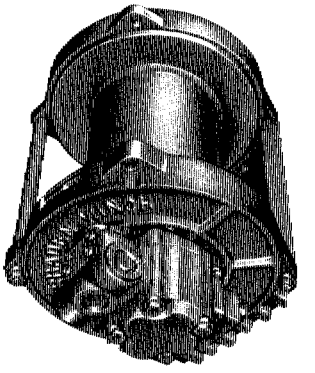
Remove spacer, Item 35.

Remove input shaft, Item 39.

Remove brake clutch assembly, Item 1.

Secure, with two capscrews, a short length of chain, or similar lifting device, to brake cylinder, Item 36. Lift brake cylinder assembly from drum. Be certain that cylinder is not cocked in removal as quad ring, Item 13, may be damaged. (For disassembly of brake cylinder, refer to Page 10.)





Remove from equipment mounting and place on either drum support or motor end to begin disassembly procedures.

PROCEDURE FOR REASSEMBLY OF THE BRADEN POWER DRUM 10 SERIES WINCHES

Assemble brake cylinder assembly per instructions on Page 10.

Install brake cylinder assembly, Item 36, to motor side plate, Item 42, with 6 capscrews, Item 20, and 2 dowel pins, Item 48.

Install spacer, Item 6.

Install primary planet carrier assembly, Item 2.

Install output sun gear, Item 7. Be certain that snap ring, Item 14, is in place.

Inspect quad ring, Item 13, for damage. Replace if necessary.

It is recommended that a light lubricating grease be used on O-rings and the surfaces to be sealed.

Install cable drum, Item 27, over this assembly, using care not to damage quad ring.

Install ring gear, Item 8. Be certain that primary gears and brake cylinder splines are in line.

Install secondary planet carrier assembly, Item 3. All splines and gears must be aligned for this step. Planet may require a few light taps with a plastic hammer to be seated properly in the drum. Care should be taken to prevent damage to the O-ring seal.

Install base, Item 44. Secure to motor side plate, Item 42, with studs, lockwashers and nuts, Items 47, 50 and 49.

Check seal, Item 11, for damage. Install to drum support, Item 32, and side plate, Item 43. Install side plate to base, Item 44, and secondary planet carrier assembly, Item 3. Secure with studs, lockwashers and nuts, Items 46, 50 and 49.

Be certain that check valve, Item 10, is in place.

Install spreader bar or spacer rod, Item 40, capscrews, Item 51, lockwasher, Item 50, and nut, Item 49. Tighten all nuts.

Turn winch over and place on support side plate end. Install sun gear, Item 4, in primary planet carrier, Item 2.

IMPORTANT: Check the rotation of the brake clutch assembly, Item 1.

For those PD10 winches which carry the motor on the right side when facing the spacer bar, i.e. Models PD10-1, PD10-5, PD10-7, PD10-75, PD10-77, PD10-77-1 and PD10-77-2 (uneven numbered units), insert the input shaft, Item 39, into the brake clutch assembly, Item 1. Place the brake clutch in the left hand and rotate the shaft in a counter-clockwise direction. If the rotor of the brake assembly turns in this direction, the brake clutch assembly is properly assembled and can be installed in the brake cylinder housing. If it will not turn in this direction, the installation of the parts should be reversed.

For those PD10 winches which carry the motor on the left side when facing the spacer bar, i.e., Models PD10-2 and PD10-8 (even numbered units), the procedure is the same as for the uneven numbered units except that the brake clutch is held in the left hand and the input shaft is rotated in a clockwise manner.

If the brake is installed opposite to the above procedure, the winch will be working against the brake and the brake will not release. There will be no forward rotation or raising action of the load.

Insert brake clutch assembly, Item 1, into the brake cylinder housing, Item 36.

Align all splines and install input shaft, Item 39, through brake assembly into input sun gear, Item 4.

Install spacer, Item 35.

Insert motor coupling, Item 5. (Some time may be saved at this point if the winch rotation is checked by inserting a device into the splines of the motor coupling to prevent wrong installation of the brake assembly.)

Check O-ring, Item 24, on motor pilot housing. If satisfactory, install Commercial hydraulic motor, Item 15, in place on the brake cylinder housing, Item 36. Secure with 2 capscrews, Item 23, and lockwashers, Item 50.

Insert O-ring, Item 25, in counter bore of the brake valve, Item 38. Secure this assembly to motor with 4 capscrews, Item 20.

Insert O-ring, Item 25, in counter bore of manifold, Item 16. Secure this assembly to motor by 4 capscrews, Item 21.

NOTE: If plumbing fittings were removed from brake cylinder housing, they should be installed before the motor is placed on the brake cylinder. Install input fittings, Item 27, tee, Item 30, and male connector, Item 19.

Install tube, Item 31, from manifold, Item 16, to tee, Item 30.

Tighten union nuts, brake release.

Install tube, Item 17, from tee to fitting, Item 29, pilot.

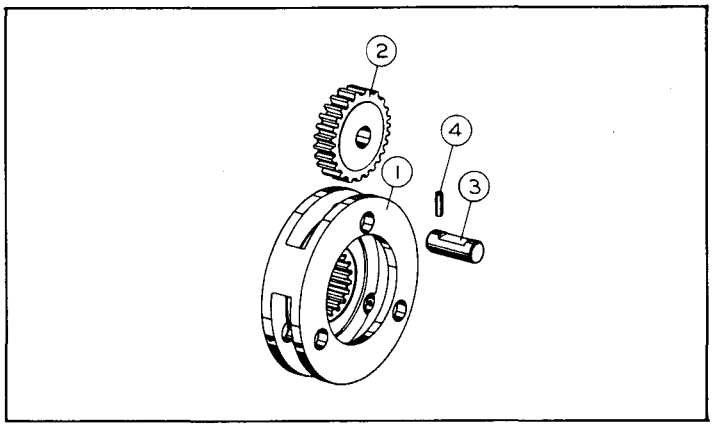
Install balancing tube, Item 34, from fitting, Item 19, to fitting in check valve, Item 52.

Install motor drain tube, Item 45, to check valve. It is recommended that a thread compound with a liquid teflon base, such as Rector Seal #2, be used on all hydraulic fitting threads.

If oil was drained from the winch, refill with a good grade of 90 All-purpose Gear Oil according to the chart shown on Page 12.

PRIMARY PLANET CARRIER, PART NO. 850300 — MATERIAL LIST AND ASSEMBLY INSTRUCTIONS

ITEM NUMBER	QTY.	CATALOG NUMBER	DESCRIPTION
1	1	850080	Carrier — Primary Planet
2	3	850310	Gear — Primary Planet
3	3	850360	Shaft — Prime Planet Gear
4	3	RI8-075	Roll pin (3/16 dia. x 3/4)



DISASSEMBLY PROCEDURE

Remove roll pin, Item 4, by inserting 3/16" punch into hole provided in planet housing, Item 1. A few taps on the punch will drive the roll pin into the planet shaft, thus allowing removal of the shaft for inspection.

Drive old roll pin completely from the shaft and use new roll pin, 3/16" x 3/4", for reassembly.

REASSEMBLY PROCEDURE

Locate planet carrier, Item 1.

Locate planet gear (24-teeth), Item 2.

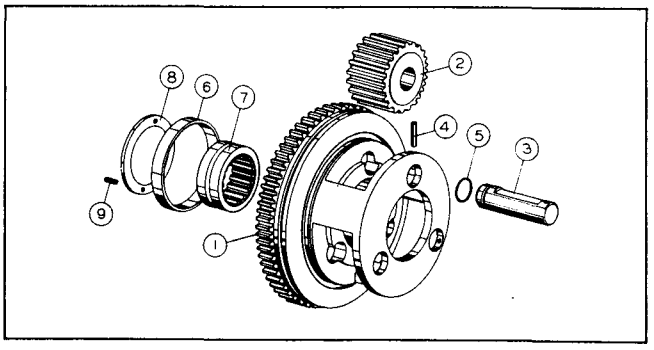
Install gear into carrier, aligning shaft holes.

Locate planet gear shaft, Item 3. Insert into carrier hole through gear into carrier. Be certain that roll pin hole aligns.

Install roll pin, Item 4. This pin should be countersunk to 3/16" below the surface of the carrier. A dimple installed by a center punch just at the edge of the roll pin hole will keep the pin from backing out.

Install remainder of gears, shafts and pins in the manner described.

SECONDARY PLANET CARRIER, PART NO. 850340 — MATERIAL LIST AND ASSEMBLY INSTRUCTIONS



ITEM NUMBER	QTY.	CATALOG NUMBER	DESCRIPTION
1	1	850040	Carrier — Secondary Planet
2	3	850350	Gear — Secondary Planet
3	3	850320	Shaft — Secondary Planet
4	3	RI8-100	Roll pin
5	3	1885010	O-ring (1 1/16 x 1 3/16 x 1/16)
6	1	2785001	Sleeve-wear
7	1	1385001	Bearing — Roller
8	1	850450	Washer — Thrust
9	2	850460	Pin-Thrust Washer

DISASSEMBLY PROCEDURE

Remove roll pin, Item 4, by inserting 3/16" punch into hole provided in planet housing, Item 1.

Tap roll pin into planet shaft, allowing for the removal of the shaft, Item 3, O-ring, Item 5, wear sleeve, Item 6, roller bearing, Item 7, thrust washer, Item 8, and thrust washer pin, Item 9.

For best performance, the O-ring seals and roll pins should be replaced by new parts prior to reassembly of the planet carrier.

SECONDARY PLANET CARRIER, PART NO. 850340 REASSEMBLY PROCEDURE

Locate planet carrier housing, Item 1.

Locate three planet gears (24-teeth), Item 2.

Insert gear into carrier.

Locate three planet shafts, Item 3.

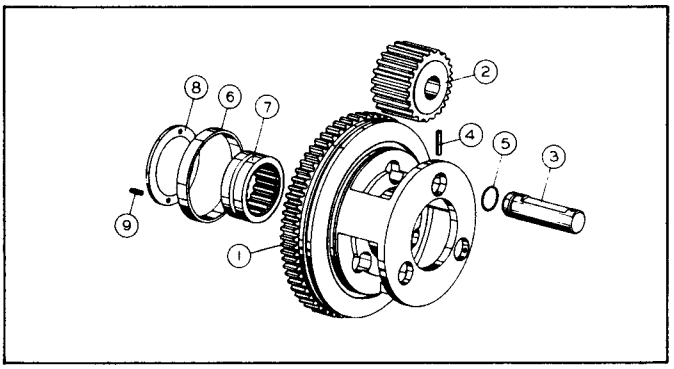
Install O-rings (1/16" dia., x 1 1/16" x 1 3/16"), Item 5, in the grooves machined into the planet shaft for this purpose. Planet shaft and O-ring should be given a light coating of all purpose grease.

Insert roll pin end of shaft into O-ring side of planet carrier. (This is also the bearing end.)

Press or tap lightly until pin end of shaft is through and aligned with roll pin hole in the carrier.

Install roll pin, Item 4, into position. This will lock shaft into place and prevent turning. Be certain that the roll pin is 3/16" below the surface of the carrier.

Dimple edge of hole with center punch to prevent pin from backing out.



Install remainder of gears, shafts, O-rings and pins in a similar manner.

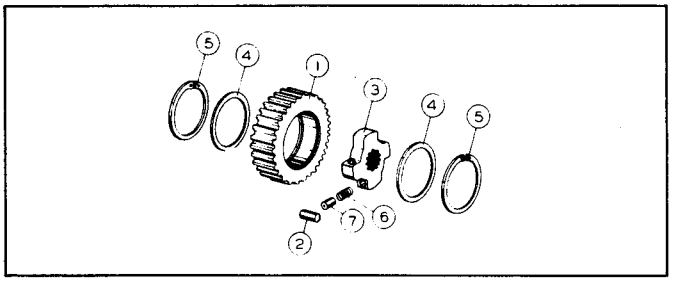
Insert bearing, Item 7, into hole provided.

Install wear sleeve, Item 6, by using a hand press to prevent damage to the part.

Install thrust washer, Item 8, secured by pins, Item 9.

Install O-ring, Item 12, shown on basic material list, Page 5.

BRAKE CLUTCH ASSEMBLY, PART NO. 850240 — MATERIAL LIST AND ASSEMBLY INSTRUCTIONS



ITEM NUMBER	QTY.	CATALOG NUMBER	DESCRIPTION
1	1	850250	Race-Brake
2	4	238-148-3	Rollers-Brake
3	1	850260	Cam-Brake
4	2	630300	Retainer-Cam
5	2	MU7-121	Ring-Snap
6	4	238-148-5	Spring
7	4	238-148-4	Plunger

DISASSEMBLY PROCEDURE

Remove snap rings, Item 5.

Remove cam retainers, Item 4.

This will release the brake cam, Item 3, brake rollers, Item 2, plunger, Item 7, and springs, Item 6.

REASSEMBLY PROCEDURE

Locate brake race, Item 1.

Locate brake cam, Item 3.

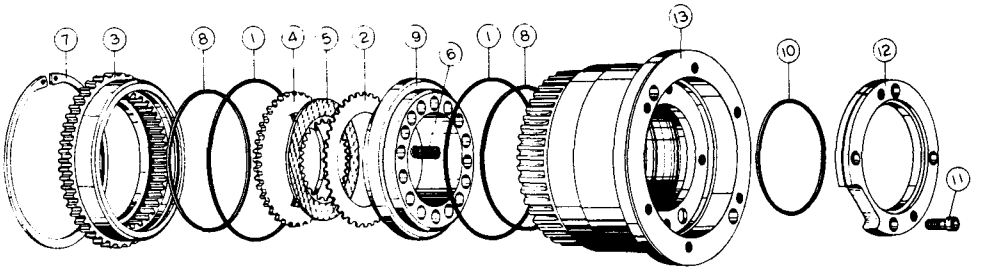
Insert cam into brake race just far enough to insert spring, Item 6, plunger, Item 7 and roller, Item 2.

By using the input shaft to hold the cam, the spring, plunger and roller can be inserted with a small screwdriver.

After the springs, plungers and rollers are installed and the cam is in place, install the cam retainers, Item 4 and secure with snap rings, Item 5.

After all parts have been installed, rotate the brake cam with the aid of the input shaft, Item 39. It should turn in one direction.

BRAKE CYLINDER ASSEMBLY, PART NO. 850111 — MATERIAL LIST AND ASSEMBLY INSTRUCTIONS



ITEM NUMBER	QTY.	CATALOG NUMBER	DESCRIPTION
1	2	1858003	O-ring
2	4	850200	Disc-Brake
3	1	850130	Ring-Brake
4	1	850150	Plate-Back up
5	4	850170	Disc-Friction
6	16	850190	Spring-Brake
7	1	1985001	Snap Ring

ITEM NUMBER	QTY.	CATALOG NUMBER	DESCRIPTION
8	2	1885003	O-ring
9	1	850161	Piston
10	1	21320	O-ring
11	4	S037-08-A	Bolt
12	1	850010	Motor Adapter Plate
13	1	850101	Cylinder Brake

DISASSEMBLY PROCEDURE

With the aid of a hand operated arbor press, insert cylinder in press and depress brake ring, Item 7. Remove retainer ring with snap ring pliers.

This will allow the brake assembly Items 3 (brake ring), 8 (O-ring), 1 (O-ring), 4 (back up plate), 5 (friction disc), 2 (brake disc), 9 (piston), and 6 (brake spring) to be removed.

The motor adapter plate, Item 12, and O-ring, Item 10, may be removed for inspection.

REASSEMBLY PROCEDURE

Locate brake ring, Item 3.

Insert back up plate, Item 4.

Install friction disc, Item 5, next to back up plate.

Install brake disc, Item 2, next to friction disc. Insert four (4) each in this manner.

Locate O-ring, Item 8. Give light coating of lubricating grease and insert in groove of brake ring.

Locate brake piston, Item 9. Lubricate O-ring surfaces with light grease and install, making certain that there are no foreign objects or dirt present.

Install pressure end of piston in brake ring. The holes for the pressure spring should be visible.

Insert 16 pressure brake springs in holes in piston, Item 6. Grease will hold these springs in place for installing piston assembly in brake cylinder.

Locate brake cylinder, Item 13. Make certain this part is clean by inserting air pressure to all grooves and oil passages.

Locate O-ring, Item 8. Lubricate with light grease and insert in O-ring groove at the bottom of the brake cylinder.

Locate O-ring, Item 1. Lubricate with light grease and insert in next groove.

Locate O-ring, Item 1. Lubricate with light grease and install in the top O-ring groove. This O-ring seals pressure at the brake ring part of the assembly.

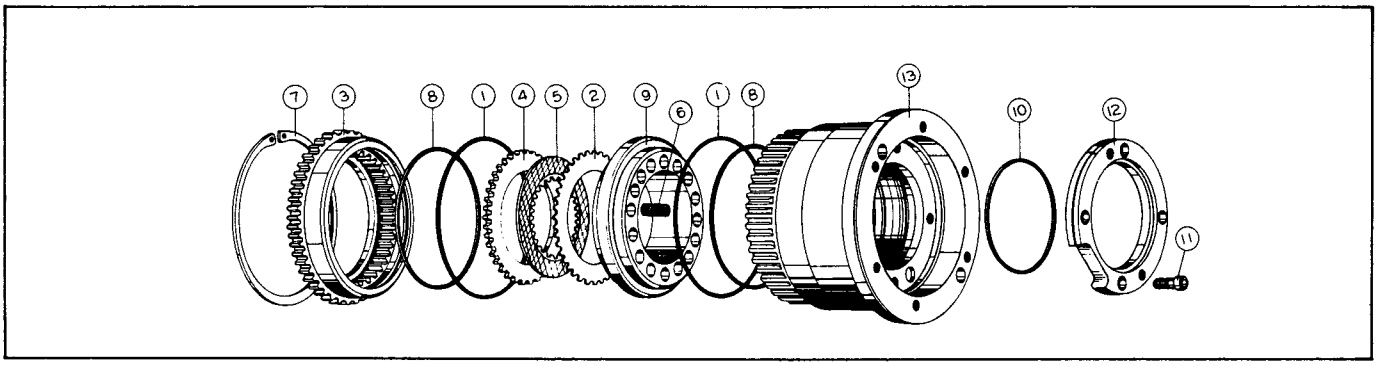
Lubricate the inside of the brake cylinder and piston assembly with a light coat of all-purpose grease.

Insert brake piston assembly into brake cylinder. With care, ease piston assembly through O-rings into position. This operation may require a few taps with a plastic hammer or hard wood. Damage to the O-rings will result in oil leaks.

Place brake cylinder assembly in a press. A hand operated arbor press is recommended (a power press may create too much pressure and damage the cylinder assembly). Apply enough pressure to compress the brake piston assembly to the extent that the retainer ring groove is visible.

Locate retainer ring, Item 7. Insert in groove to hold brake piston assembly in place.

BRAKE CYLINDER ASSEMBLY, PART NO. 850111 – REASSEMBLY PROCEDURES, CONT'D.



Remove cylinder from press. Turn motor side of the assembly in the upward position. Observe two holes with ¼" N.P.T. thread. These two holes are the pressure inputs into the brake cylinder whick operate the brake. When pressure is applied to one side, the brake is released and the winch can be operated in a reversing action for lowering the load. The second hole is for balancing the floating piston to back pressure.

Install ¼" tubing, fittings, Item 27, in brake release port. This port is located at 90° from motor bolt holes.

Connect a hydraulic hand pump which is equipped with a dial gauge that reads to 600 PSI or more.

Apply 600 lbs. pressure into brake cylinder and hold for about five minutes. If the pressure holds, the installation of the brake piston is proper. A slight drop in pressure may be evident; but, after the brake is operated a few times, the O-ring will seat and the pressure will hold.

If the piston assembly does not hold pressure and the gauge indicator returns to zero, check the hose and fittings from the pump to the brake cylinder for leaks. If no leaks are visible, the brake cylinder assembly must be disassembled and the O-rings and all parts checked for damage where leakage could occur.

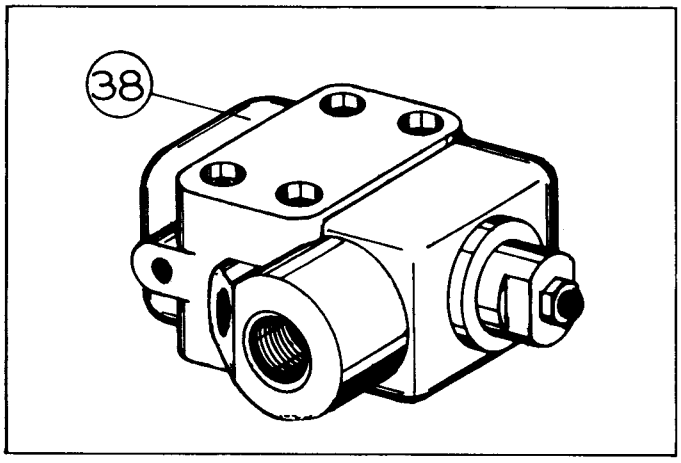
During the time that pressure is applied, check the brake friction discs. There should be no tension on the discs. Centering and aligning the discs with the brake clutch assembly is recommended and will be helpful in the final assembly to the motor end of the winch.

Use the same procedure for checking the other side of the piston by attaching the hand pump to the other port. Pressure here will not release the brake as only back pressure of the hydraulic system will be present when winch is operated.

If the brake cylinder holds pressure in both tests, the brake assembly is ready for installation.

BRAKE VALVE ASSEMBLY, PART NO. 850951

The brake valve assembly, Item 38, is a purchased component, manufactured to exacting Braden specifications. Should a failure occur, or repairs be needed in this assembly, it is suggested that the entire part be removed from the winch and forwarded to the Braden factory for inspection and replacement.



INSTALLATION SUGGESTIONS

1. The winch should be mounted with the center line of the cable drum in a horizontal position. The base can be mounted in any position around this horizontal center line.
2. It is important that the winch is mounted on a surface that will not flex when the winch is used, since this would bind working parts of the winch. Be sure that the winch is not mounted on an uneven surface. If necessary, use shim stocks to insure even mounting.
3. Hydraulic lines that operate the winch should be one inch (1") pipe or larger. Make lines as short as possible.
4. The winch directional valve should have both working parts open directly into the tank lines in neutral positions.

MAINTENANCE SUGGESTIONS

I. CHECKING OIL LEVEL

1. Remove cable from winch.
2. There are two pipe plug holes in the drum of the winch. Turn the winch drum until one plug is at the highest point on the drum. Oil should be level with the lowest plug. Add 90 weight (specified brands or equal) worm gear oil through top plug, if necessary.

II. OIL CHANGE INFORMATION

1. Oil should be drained after first two (2) months operating time.
2. Fill winch with clean kerosene and run for 15 minutes in each direction. Drain kerosene and add proper amount of approved 90 weight worm gear oil. Oil should then be changed every 6 months.

III. OIL CAPACITY RECOMMENDATIONS

POWER DRUM MODEL	OIL CAPACITY (PINTS)	POWER DRUM MODEL	OIL CAPACITY (PINTS)
PD10-1	4	PD10-75	5.5
PD10-2	4	PD10-77	4
PD10-5	5.5	PD10-77-1	4
PD10-7	4	PD10-77-2	4
PD10-8	4		

USE ONLY FACTORY CERTIFIED REPLACEMENT PARTS.

SUGGESTIONS FOR TROUBLE SHOOTING

A. Winch will not lower load.

1. This is an indication that either the orifice plug in the brake valve is stopped up or the brake is not being released. To check orifice plug, remove tube, Item 17, and elbow, Item 29. Remove the plug, using a screwdriver with a ⅛" wide blade. Check the hole in the plug with a wire of less than .020" in diameter. If the hole is open, the fault is probably not in the brake valve. Since the winch brake is not being released, the brake cylinder should then be removed and disassembled to determine the cause.

B. Winch leaks a large volume of oil through the vent plug. This is caused by the hydraulic oil leaking into the winch through the hydraulic motor seal or a damaged O-ring in the winch brake.

1. In order to determine the cause of the leak, remove the tubing from the motor manifold to the winch brake.
2. Attach a hydraulic jack to the brake connection and apply 500 PSI to the brake. The brake should be able to hold this pressure for ten minutes. Be certain that all connections are tight and that oil does not leak back into the jack.
3. If the brake holds the pressure, then the motor seal is leaking and should be replaced.
4. If the hydraulic seal must be replaced, it is necessary to remove the drain line check valve from the brake valve. Be certain that the check valve is clean and that it does not leak. Replace, if necessary.
5. If the brake will not hold pressure, the winch should be returned to the factory for repair.

C. Winch will not hoist rated load.

1. Be certain that the winch has not been mounted on an uneven surface. If necessary, shim shock should be used.
2. Be certain to check for proper hydraulic pressure to the winch brake valve. Check the pressure at the winch for accurate readings.
3. Be certain that the hydraulic system which operates the winch is not running more than 180°F.
4. Remember that the winch ratings are established on the first layer of cable.
5. Be certain that the cable sheaves, used with the winch, are operating efficiently.

D. Winch runs hot (over 200°F) or makes excessive noise.

1. Be certain that the winch has not been mounted on an uneven surface.
2. Be certain that the hydraulic system which operates the winch is not running more than 180°F.

E. Winch chatters while raising rated capacity load.

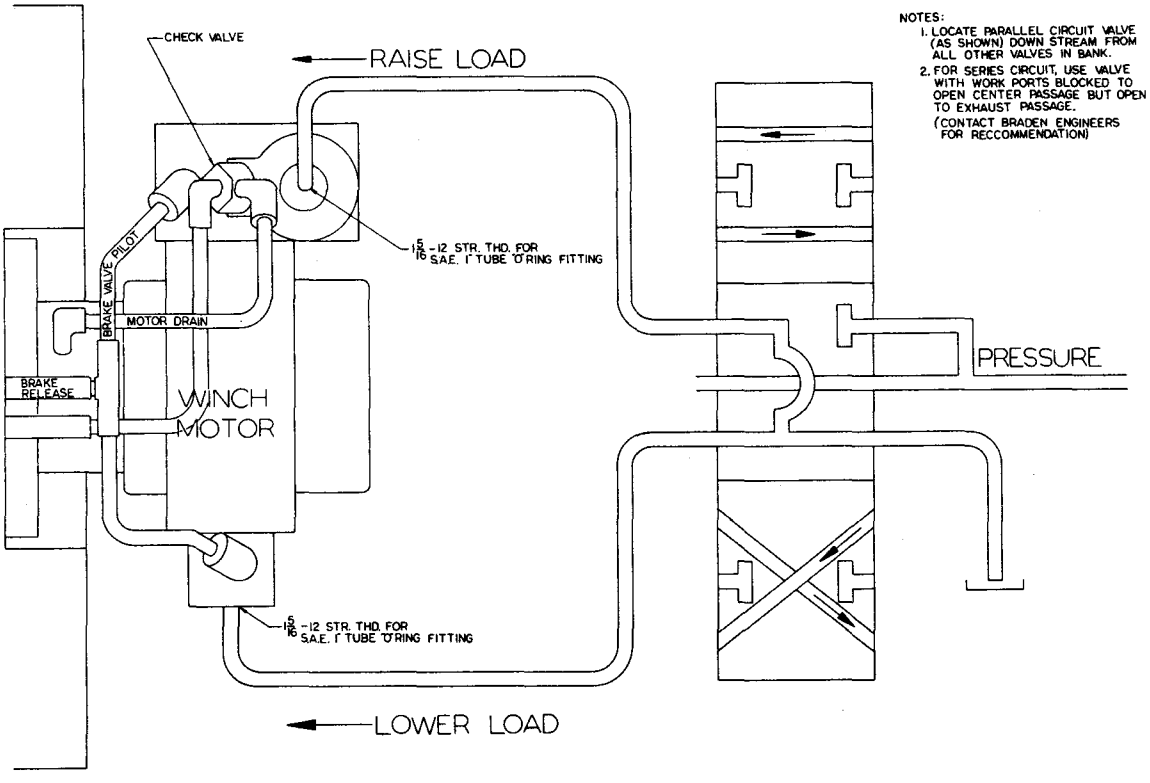
1. This is probably caused by the relief valve in the hydraulic system trying to by-pass.

A regular program of preventive maintenance will tend to eliminate the need for much emergency servicing and insure a long life and trouble-free service from your planetary winch.

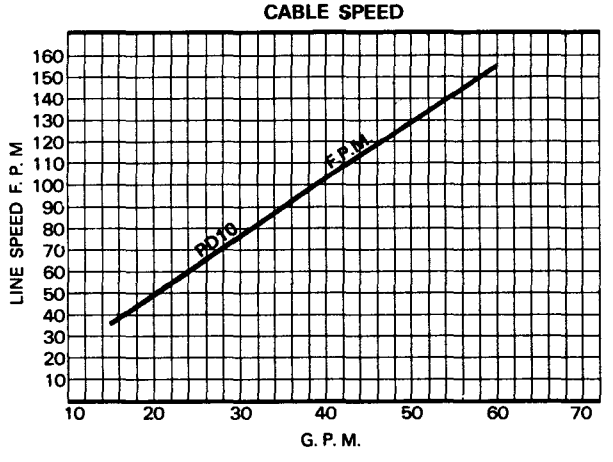
SOME THINGS TO REMEMBER IN YOUR SERVICING OPERATIONS:

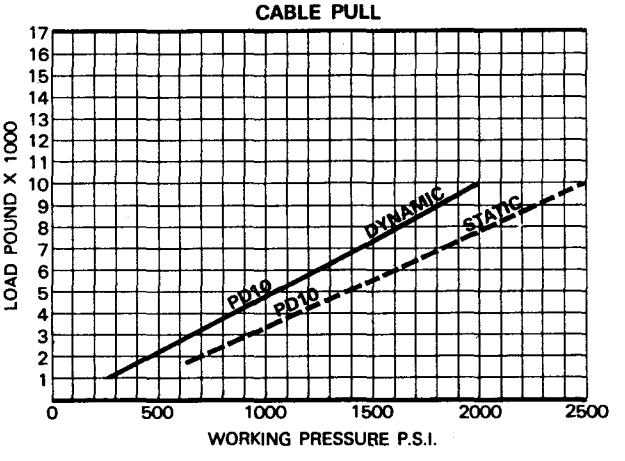
- Work in a clean, dust free area as cleanliness is of utmost importance when servicing any hydraulic equipment.
- Inspect all replacement parts, prior to installation, to detect any damage which might have occurred in shipment.
- Use only factory certified replacement parts for optimum results. Never re-use expendable parts such as oil seals, backup washers, O-rings and seals. Although they may appear to be in good condition, many times they are not.
- Clean all parts and inspect all machined surfaces for excessive wear or damage . . . before reassembly operations are begun.
- Lubricate all O-rings and oil seals with grease prior to installation.

WINCH CONTROL CIRCUITS

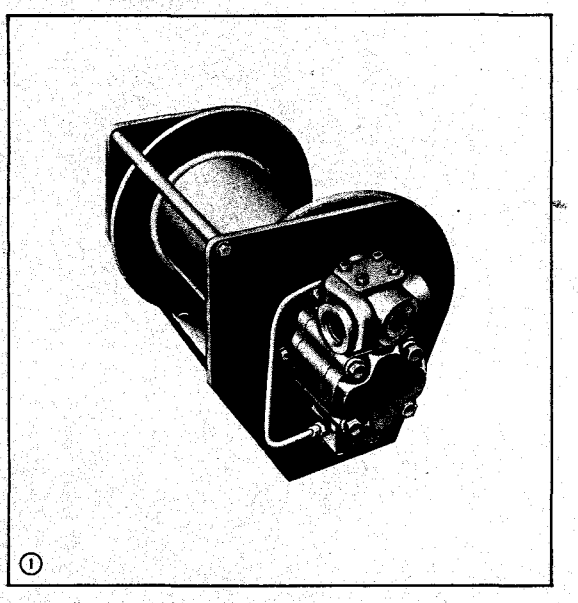


PERFORMANCE DATA





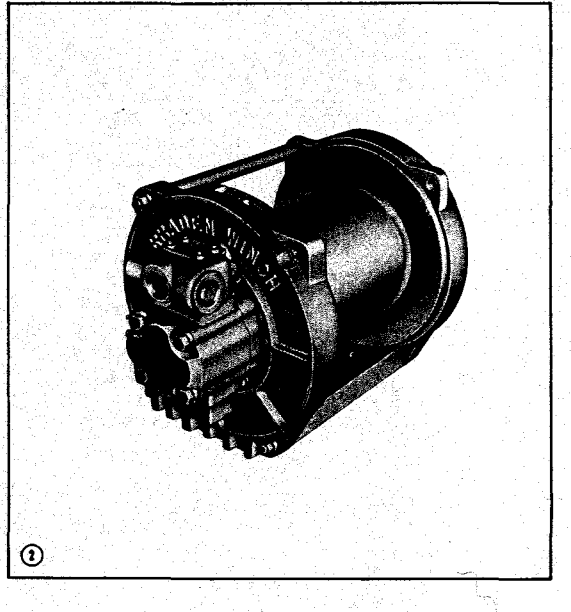
Ratings and speeds shown are on the first layer of cable.

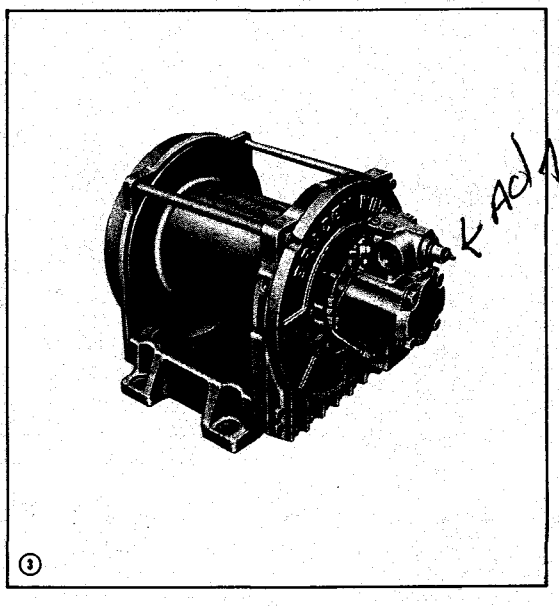


① PD10 Series Power Drum with fabricated side plates.

② PD10 Series Power Drum with cast side plates.

③ PD10 Series Power Drum with cast side plates and universal base.





K ADJUSTMENT