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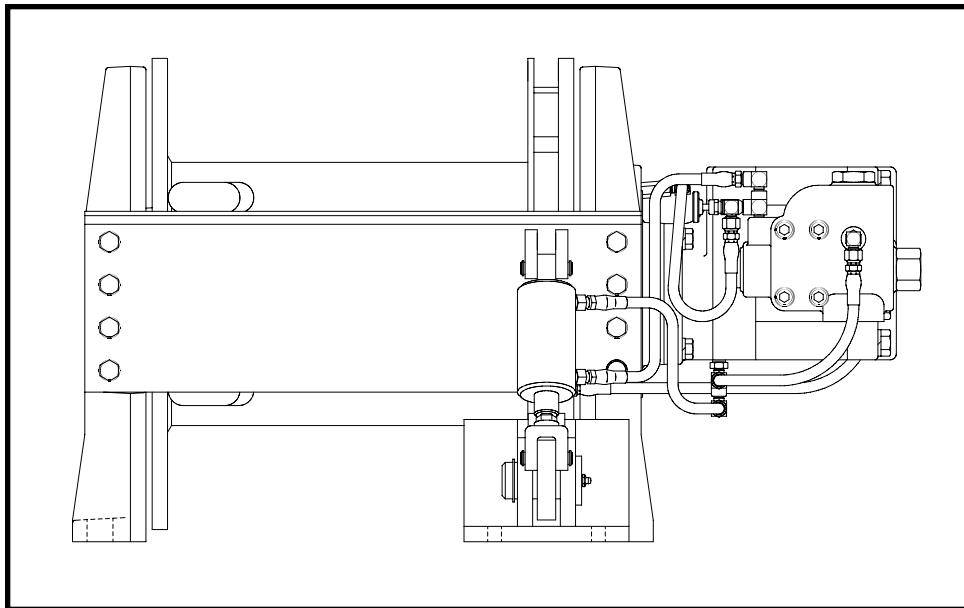
# BRADEN

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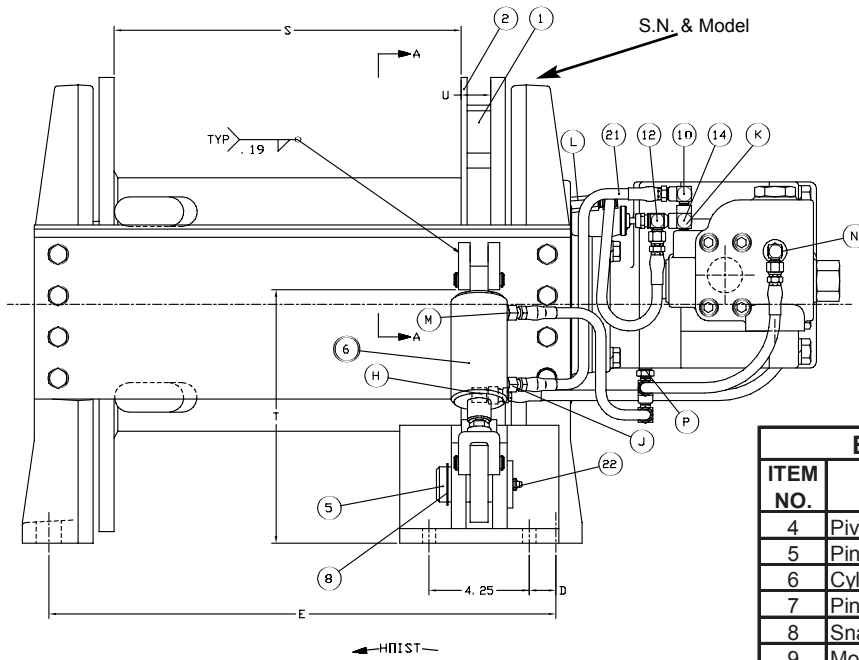
## MATERIAL LIST AND INSTALLATION INSTRUCTIONS RATCHET AND PAWL

For Use With The Following Braden Hoists:

CH150A, CH150B  
CH175A, CH185A  
CH210A (-02 drum only)  
CH230A, CH230B  
CH240A  
CH330A, CH400A



**FIG 1**

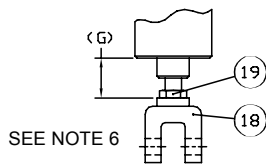
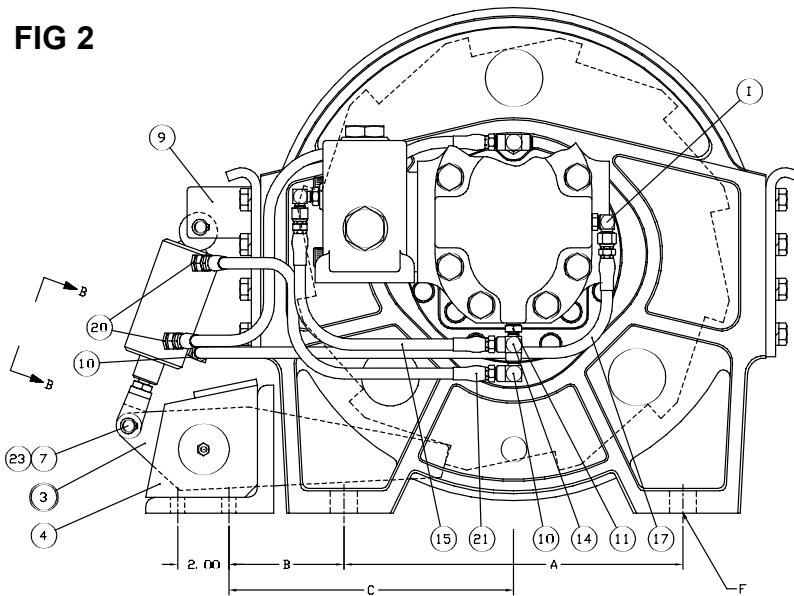


BASIC MATERIAL LIST			
ITEM NO.	DESCRIPTION	PART NO.	QTY
4	Pivot Base	24871	1
5	Pin	24876	1
6	Cylinder Assembly	81663	1
7	Pin Pivot	104153	2
8	Snap Ring	12035	1
9	Mounting Plate	52495	2
10	90° Elbow	13708	3
11*	Reducer Bushing	23508	1
12*	90° Elbow	21163	1
18	Clevis	24882	1
19	Jam Nut	18004	1
20	Elbow	21165	2
22	Grease Fitting	18047	1
23	Snap Ring	101082	4

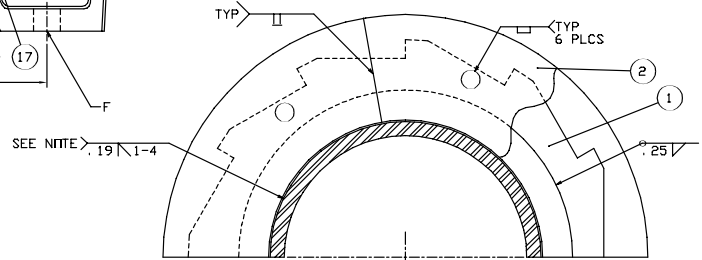
\* NOT used on CH330 winches

Always refer to the Serial Number and Model Number when requesting informaton or service parts. Serial Numbers and Model Numbers are stamped into the top of the motor end, support bracket.

**FIG 2**



VIEW B-B



WELD THE RATCHET WHEEL HALF TO THE DRUM FLANGE USING AN INTERMITTENT WELD. EXCESSIVE HEAT COULD DAMAGE AN O-RING INSIDE THE BARREL.

**SECTION A-A**

MATERIAL LIST VARIABLES													
ITEM NO.	DESCRIPTION	CH175		CH150/230		CH185		CH240-01		CH330-01 & 02		CH330-03	
		C2H175		C2H150/230		C2H185		CH240-02		CH400-01 & 02		CH400-03	
		PART NO.	QTY	PART NO.	QTY	PART NO.	QTY	PART NO.	QTY	PART NO.	QTY	PART NO.	QTY
1	Ratchet Half	24867	2	24868	2	24869	2	29216	2	29216	2	29216	2
2	Ratchet Cover Half	24877	2	24879	2	24878	2	40136	2	24521	2	28913	2
3	Pawl Assembly	81650	1	81652	1	81651	1	40155	1	40155	1	40155	1
	Bearing	24921	1	24921	1	24921	1	24921	1	24921	1	24921	1
14	Tee	23769	2	23769	2	23769	2	21166	1	22934	1	21166	1
15	Hose Assembly	13707	1	13707	1	13707	1	25749	1	25749	1	25749	1
17	Hose Assembly	24948	1	24948	1	24948	1	34197	1	34197	1	34197	1
21	Hose Assembly	13731	1	13731	1	13731	1	40242	1	24948	1	40242	1

KIT NO.	WINCH	A	B	C	D	E	F	S	T	U
61607	CH175, C2H175	13.25	4.50	11.13	1.125	21.50	1.06 D	14.75	10.75	1.25
61608	CH150, C2H150 CH230, C2H230	14.75	5.375	12.75	1.62	23.50	1.31 D	15.75	10.75	1.25
61609	CH185, C2H185 CH210-02	21.00	4.81	15.31	1.55	26.37	1.06 D	18.75	10.75	1.25
62708	CH240A-01 CH240A-02	20.00	4.88	14.88	3.35	<u>34.29</u> 48.54	1.38 D	<u>23.11</u> 37.36	11.31	1.25
62309	CH330-01 CH400-01	20.00	4.88	14.88	3.58	34.29	1.38 D	22.63	11.31	1.25
	CH330-02 CH400-02	20.00	4.88	14.88	3.58	48.54	1.38 D	36.88	11.31	1.25
	CH330-03 CH400-03	20.00	4.88	14.88	3.58	34.29	1.38 D	22.50	11.31	1.37

## INSTALLATION PROCEDURE FOR ASSEMBLY OF RATCHET AND PAWL KITS ON BRADEN CH HOISTS

- Remove wire rope from the hoist (if applicable) and move hoist assembly to an area convenient for welding.
- Position ratchet wheel halves, item 1, against the motor side drum flange. Center the ratchet wheel halves by making its O.D. concentric with the existing flange O.D. The distance between the O.D. of the flange and the O.D. of the ratchet wheel half is approximately 1 in. (25 mm) (See section A-A). Clamp ratchet wheel halves tight against flange.  
**NOTE:** Be sure ratchet wheel halves (item 1) are facing the correct way. The flat surface on the ratchet wheel half should allow engagement of pawl while lowering only. (See Figure 2, over-wound condition shown.)
- Tack weld the I.D. of each ratchet wheel half to the drum flange (see section A-A). CAUTION: Inside the drum, beneath the drum flange, there is an O-ring which seals the drum cavity. This O-ring can withstand temperatures up to 300°F. for short periods of time. Weld the ratchet wheel halves (item 1) to the drum flange using an intermittent weld about one inch long to limit the heat input into the flange. If this procedure is strictly followed, O-ring damage will be avoided. Butt-weld the ratchet wheel halves together and grind flush. Ratchet wheel material is T-1, drum flange is A36.
- Place the ratchet cover halves, (item 2) against the ratchet wheel and rotate them so that the holes in the cover are completely blocked off by the ratchet wheel. The O.D. of the flange should be concentric with the ratchet cover halves. Plug weld the ratchet cover halves to the ratchet wheel and butt weld the two halves together. Also, weld the I.D. of the ratchet cover halves to the drum barrel with an intermittent weld (this is to limit the heat input into the barrel – see caution in note 3). Any weld that will interfere with proper rope spooling should be ground flush.
- Assemble pawl, (item 3) pivot base, (item 4) and pin, (item 5) and secure with snap ring, (item 8). Attach mounting plates (item 9) to cylinder (item 6) and cylinder to pawl (item 3) using pins (item 7). Secure with snap rings.
- Position pawl and base (items 3 and 4) in place per dimensions B, C and D. Slowly rotate the drum by hand (in the raise direction) so that the pawl fully engages the ratchet wheel (See Fig. 2). When using cylinder assembly 81645, adjust the thread engagement on cylinder clevis

until dimension "G" is .56 in. (14 mm) (See view B-B, Fig. 2). When using cylinder assembly 81663, adjust the clevis until dimension "G" is 1.25 in. (31.7 mm).

- Rotate the cylinder assembly (item 6) and mounting plates (item 9) into position, per dimension "T", and weld to hoist tieplate while everything is pinned together.  
**NOTE:** Be sure pawl is still fully engaged in ratchet wheel before welding.
- Connect all hose assemblies.
- Hoist assembly is now ready to be mounted on structure. Use ½" diameter (Grade 8) bolts to secure ratchet and pawl base to structure.
- Check operation of hoist and ratchet & pawl assembly to insure that pawl will always fully disengage ratchet wheel (when control lever is in lowering mode) and that pawl engages fully (when control lever is in neutral or the raise position.)

## TROUBLESHOOTING

### THE PAWL WILL NOT ENGAGE OR NOT ENGAGE FULLY:

- Check dimension "G" and adjust if necessary. (Note 6)
- Spring item #12 in 81645, item #7 in 81663 may be weak or broken. Disassemble the cylinder and inspect the spring. If it is not broken, check spring free height. It should be  $2.50 \pm .09$  in. ( $63.5 \pm 2.3$  mm).
- Check the Orifice (located in the Piston) to be certain it is clear. The Orifice hole is approximately .020 in. (.51 mm) in diameter. (81663 only) (81645 Orifice = .040 in. [1 mm])

### THE PAWL WILL NOT DISENGAGE:

- If the ratchet is too tight against the pawl it may not disengage. Raise the load slightly and disengage normally.
- Check dimension "G" and adjust if necessary. (Note 6)

### CYLINDER ASSEMBLY LEAKS HYDRAULIC FLUID:

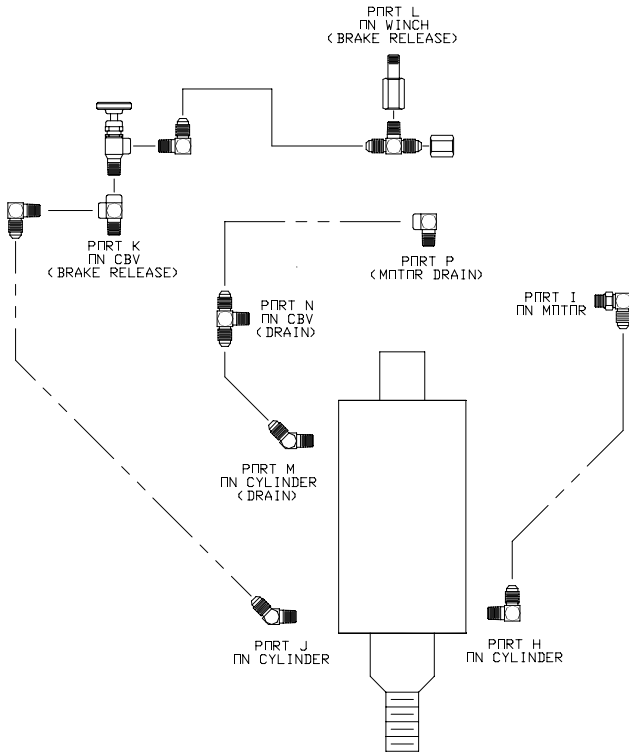
- Disassemble, remove and replace *all* O-rings. (Seal kit 61614)

### ADJUSTMENT - CARTRIDGE RELIEF VALVE (CYLINDER 81645)

Turn adjusting nut counterclockwise until it is free, then turn adjusting nut clockwise by hand until a slight resistance is felt. Lock in place with lock nut. This will set relief valve at approximately 1250 psi.

**NOTE:** Cylinder 81663 has an internal relief valve that is factory pre-set. No further adjustment is necessary.

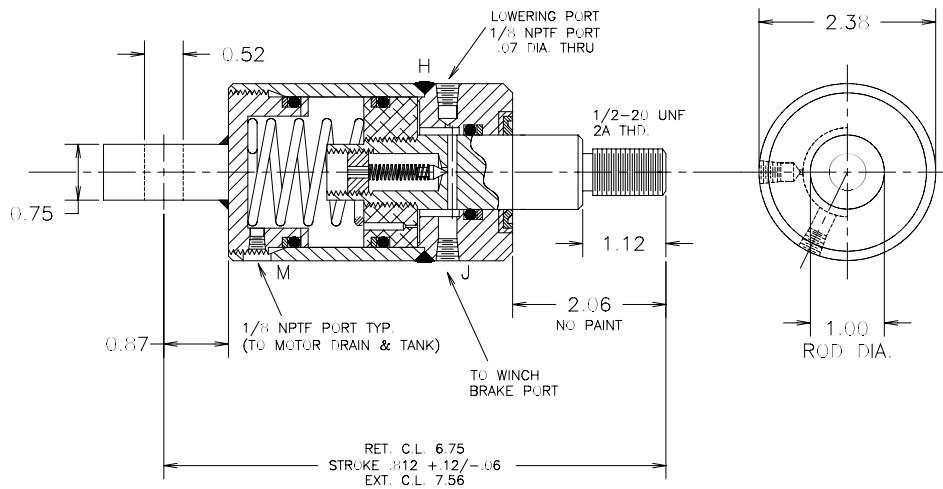
# HYDRAULIC SCHEMATIC (FITTINGS SHOWN MAY NOT MATCH ALL HOISTS)



**NOTE:**

**CONNECT PORT (H) ON CYLINDER TO PORT (I) ON MOTOR (LOWERING).**  
**CONNECT PORT (J) ON CYLINDER TO PORT (L) ON HOIST AND PORT (K) ON BRAKE VALVE.**  
**CONNECT PORT (M) ON CYLINDER TO PORT (P) ON MOTOR AND PORT (N) ON BRAKE VALVE.**

## RATCHET AND PAWL CYLINDER PART NUMBER 81663 (SINCE 1984)



**NOTE:**

**RATCHET AND PAWL CYLINDER 81645 HAS BEEN REPLACED WITH CYLINDER 81663 (SINCE 1984).**  
**CYLINDERS 81663 AND 81645 FUNCTION IDENTICALLY AND ARE INTERCHANGEABLE.**  
**WHEN REPLACING 81645 WITH 81663, HOSE ASSEMBLIES 13731 AND 13706 WILL BE REQUIRED TO ASSURE ASSEMBLY WITH ALL EXISTING MOTOR ASSEMBLIES.**  
**SEAL KIT FOR CYLINDER 81645 AND 81663 IS PART NUMBER 61614.**