

**HY-JAX**

# HY-JAX HYDRAULIC SUPPORT

## Operating and Service Manual

Dependable Hydraulic Support for the Mining and Construction Industries

**“The HY-JAX remains unique among other support options as a self contained, yieldable, hydraulic roof support.”**

**Swanson Industries** has a proud history of providing products and services to the mining and construction industries. The HY-JAX products are exemplary of that devotion to industry. The HY-JAX support remains unique in its fit for purpose as a re-usable; rebuildable; self-contained; yieldable; hydraulic roof support. Some of the many uses of the HY-JAX products are described within this brochure and many mining and construction operations consider it a required part of their operation for safety needs or as part of their production cycle. Both the 10 and 20 ton versions of the HY-JAX have a long history of performance and proven track record in hundreds of operations. The ability to custom assemble to meet your needs from our large inventories means that your needs for temporary roof support and a safer work environment can be met quickly via use of the HY-JAX line of products.

**Model 10 (10 ton) and  
Model 20 (22.5 ton)**

## HYDRAULIC YIELDABLE JACKS THAT ARE IDEAL FOR TEMPORARY ROOF SUPPORT

For years, Commercial Intertech HY-JAX Hydraulic Supports have been acclaimed for their dependable, quality performance in both the mining and construction industries.

### HYDRAULIC SUPPORTS

Swanson is the exclusive manufacturer and distributor for HY-JAX Hydraulic Supports. We offer the widely proven HY-JAX design and carry an extensive inventory to quickly meet your needs.

### WHERE HY-JAX PAYS OFF

Safety jacks | Temporary roof supports | Cable hangers | Pre-loading steel tunnel ribs | Utility jack | Moving heavy cargo laterally | Replacing cribs | Auxiliary jacks for longwall mining and shortwall mining | Emergency jacks for wrecks | Lifting fallen debris | Replacing breaker posts | Supporting heavy top during advance | Straightening distorted frames | Moving buildings | Supporting trench walls | Supporting roof in small diameter tunnels in soft ground



## HY-JAX

### WHAT HY-JAX MEANS TO YOU

- Safer and more economical than other types of supports
- Rugged and strong, yet light enough for easy handling
- Fast installation—less than 30 seconds
- Minimum exposure of men and equipment to unsupported roof
- Rapid preloading to five or more tons to support load
- High capacity when yielding—10 or 22.5 tons, depending on HY-JAX model used
- Yieldable—roof is fully supported should bottom heave or roof sag
- Quick recovery—less than 10 seconds to recover from a remote, safe location
- Maximum flexibility—various extensions to the basic unit are available

## Operating the HY-JAX

### POSITIONING

HY-JAX operate in vertical or inclined positions without losing hydraulic fluid. Inclined or vertical, the oil reservoir must be on top (see FIG 1 below). To extend, stand the jack vertically and raise the release handle. Place both feet on the foot plate, grasp the top section with both hands, and lift slowly to the desired height. Then position for work.

### OPERATING

With the HY-JAX extended and in position, move the release lever down. Slide the bracket from the pump handle. Pump. When a force of 50 pounds is applied to the handle, the jack is pre-loaded to approximately 5 tons. When pumping is completed, lock the handle with sliding bracket.

### FOOTING

Footing must be solid. If working on a soft bottom, set the footer on a wide wooden block or header. For maximum safety, the HY-JAX should be perpendicular to both the floor and roof.

### RELEASING AND RECOVERING

The HY-JAX will maintain stable support until released. To release, raise the lever and push the pump body down. If the work area is dangerous or not supported by other approved means, the HyJax can be released from a safe, remote location by a rope or line. First thread the line through the ring at the top and fasten it to the release lever. From a safe distance, tug to release. Recover the jack by reeling in the line and your HY-JAX is ready for more work.

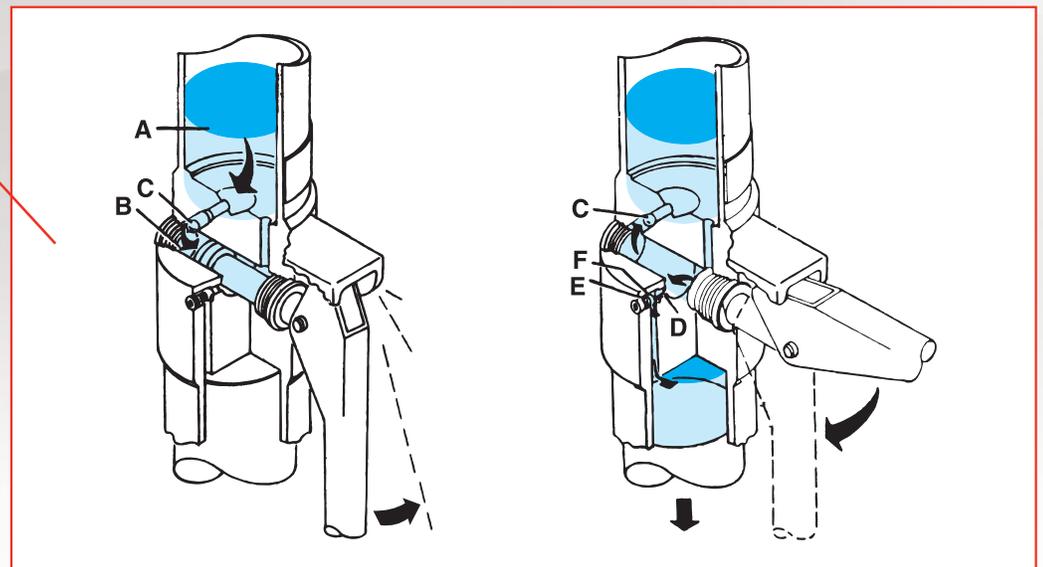
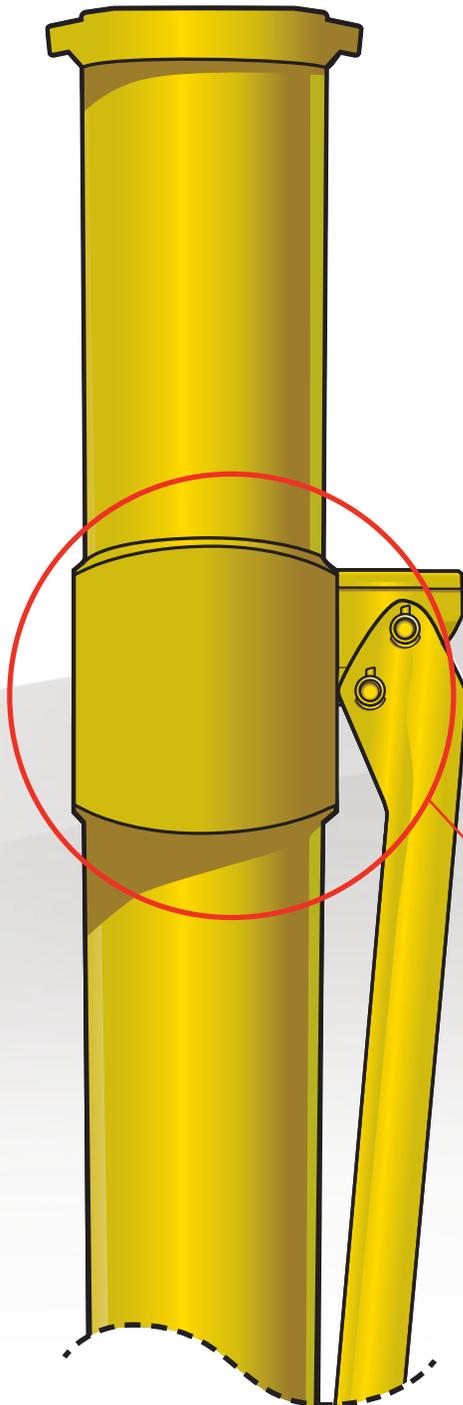


FIG. 1. PUMP OPERATION, STEP 1 When pump handle is pulled out, oil is sucked from the reservoir (A) into plunger chamber (B). Check ball (C) is lowered to permit oil to enter. STEP 2 When pump handle is pushed in, the pressure closes check ball (C). Oil is now forced through port (D) compressing spring (E) and pushing check ball (F) back to permit oil to enter cylinder. On the next outward pull of pump handle the operation reverts back to step one. Since pressure is relaxed, spring (E) pushes check ball (F) into place and prevents oil escaping from cylinder.

## Maintaining the HY-JAX

### GENERAL SERVICE INSTRUCTIONS

Maintenance of the HY-JAX is simple. Wipe dirt from plunger and keep proper oil level. To test for sufficient oil place HY-JAX in vertical position, raise release lever (26) and extend. If sudden release of plunger is experienced before HY-JAX is fully extended, oil level is low.

### TO ADD OIL

Collapse HY-JAX completely in vertical position. Wipe top cap and remove pipe plug (24). Fill with clean oil to approximately 3" below top of plug.

Use hydraulic oils of S.A.E. 5W or lower viscosity. We specify Atlantic Richfield S-150-AW oil.

### DISASSEMBLY & OVERHAUL

Dirt is the enemy of any hydraulic system. The HY-JAX must be overhauled in a clean work area.

Refer to exploded view on page 6 for item numbers in parenthesis.

1. Remove cap screw (1), hex nut (2), and extension.
2. Place HY-JAX horizontally in a vise, gripping oil reservoir tube. Caution: Do not squeeze tube out-of-round.
3. Remove pipe plug (24) in top cap, air breather (35). Tip and drain oil.
4. Unscrew wiper ring nut (38) and discard wiper ring (36).
5. Pull plunger assembly out of cylinder. Drain and discard all remaining oil.
6. Wash plunger assembly in Industrial Naptha or similar agent and wipe dry. Inspect packing for nicks, scratches, and excessive wear. Replace all seals and packing which appear damaged or scratched.
7. Remove lock nuts (11), washers (10), socket screws (9) and (25), and handle (39 or 40, 41).
8. Unscrew pump handle cap (3) and pump block cap (6). Remove check ball (13) and discard "O" rings (4) and (5).

9. Pull out pump plunger (7) and discard "U" cup packing (8). Plunger rod and "U" cup must be sub-assembled and installed from the back (opposite the pump handle).

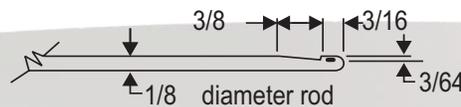
10. Remove release socket screw (9), release lever (26), and release plunger (28). Discard "O" ring (27).

11. Loosen spring retainer (30) rotate HY-JAX until retainer is facing down. Remove spring retainer (30), spring (29), and poppet (32). Discard O-ring.

12. Remove poppet seat (33) and discard "O" ring (34). Note: It may be helpful to make a hook as shown below for removing poppet seat.

13. Remove plug (16), spring (14), and ball (13).

14. Unscrew plug (24), remove spring (23), and ball (22).



### CLEANING

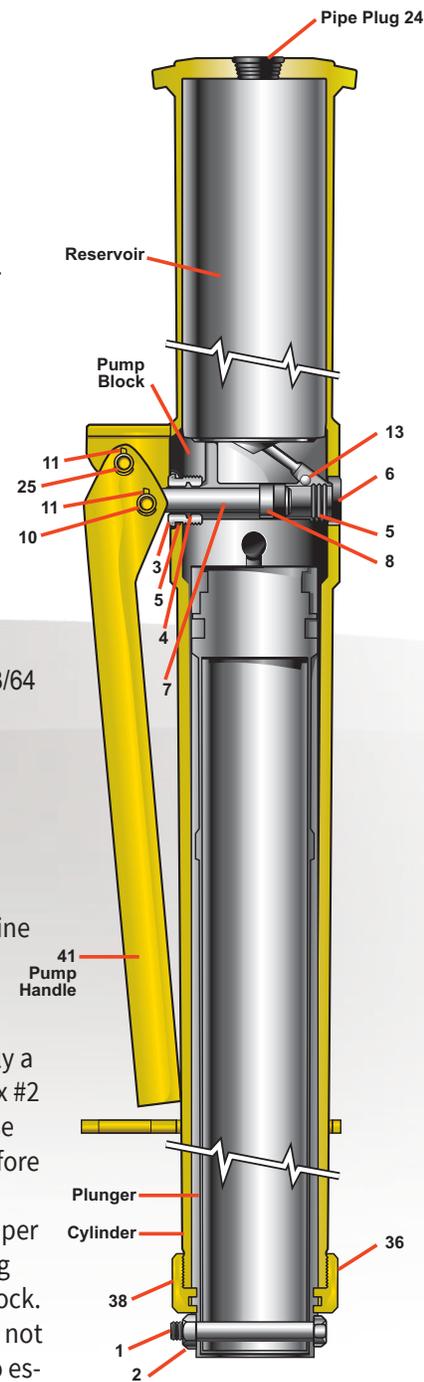
Clean all parts with solvent. Rinse with clean hydraulic oil. Wipe parts dry with lint-free cloth.

### INSPECTION

Examine all parts carefully. Any sign of wear or distortion is cause for replacement. Use only genuine HY-JAX parts.

### RE-ASSEMBLY

Lubricate all internal parts with hydraulic oil. Apply a good non-hardening sealing compound (Permatex #2 or equivalent) to all pipe plug threads. Coat release plunger (28) with heavy water-repelling grease before reassembly. Use the disassembly instructions in reverse order for reassembly. Grease threads of wiper ring nut (38) before assembly. When re-assembling pump block cap (6), screw cap tightly on pump block. Leave release lever (26) open (up position) and do not install pipe plug (24) in top cap. This permits air to escape. Reseat or coin all check valve balls. One or two light hammer blows with a brass punch is sufficient. Do not reseat poppet (32) or relief valve.



SECTION A-A

## Maintaining the HY-JAX

### TO RE-INSERT AIR BREATHER

1. If air breather (35) looks excessively dirty or is damaged, replace by new assembly.
2. Inspect 3/4" diameter air intake hole for damage or sharp edges. Smooth off edges of hole.
3. Put a little oil on outside of air breather (35) and press into air intake hole with two holes vertically in line.

Fill HY-JAX with Atlantic Richfield S-150-AW oil or S.A.E. 5W and replace pipe plug (24). Oil level should be approximately 3" below top of HY-JAX.

### TESTING

Raise release lever (26). Raise and lower HY-JAX a few times as mentioned by operating instructions on page 3 to purge out air in system. Pump HY-JAX against a rigid frame and let stand 15 minutes. Check for leaks around plugs, pump block cap, and plunger. Pump again to check if pressure has remained the same. Lift release lever and collapse HY-JAX. Plunger should slide smoothly.

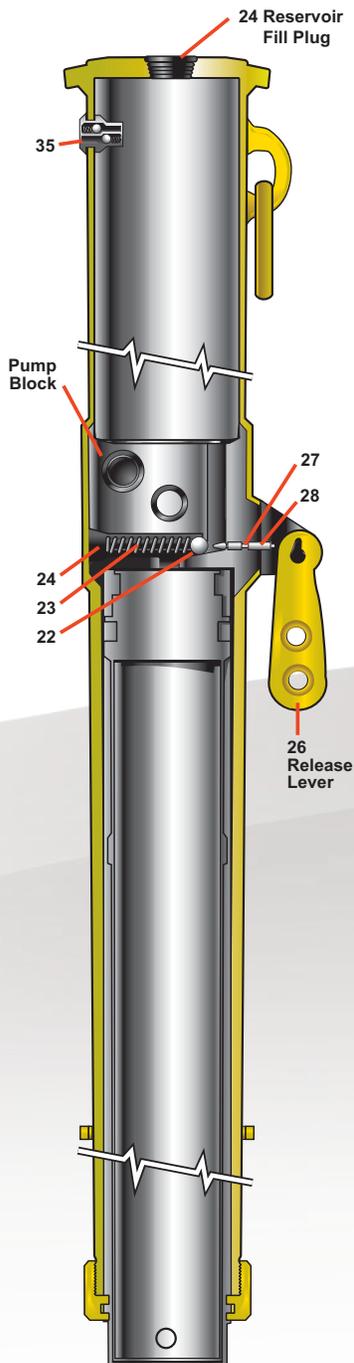
### TROUBLESHOOTING

Should a malfunction occur, the problem is most likely one of the following:

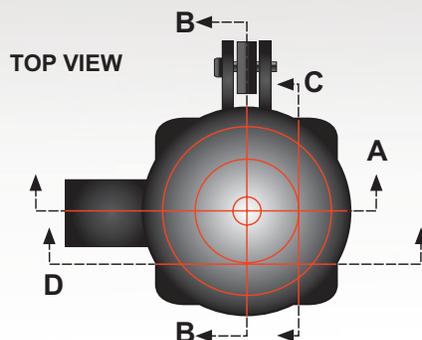
1. A check valve has not closed tightly.
2. Improper reassembly.
3. A seal is worn or damaged.
4. Oil level is too low.

If HY-JAX does not pump up, the probable cause is dirt lodged in a check valve. Remove the pump block cap (6) and ball (13). Then remove plug (16) and ball. Inspect and clean the check valves. When reassembling these valves, reseal the balls by coining them into their seats with brass punch as mentioned under re-assembly. If the unit is then still not fully operative, disassemble and clean thoroughly as described under General Service Instructions. If HY-JAX does not pump up when partially extended, the oil level in the reservoir may be too low. To check, collapse the jack to its minimum height, remove the plug (24), and inspect. Oil should reach to within 3" of the plug. If lower, bring to the proper level with recommended oil.

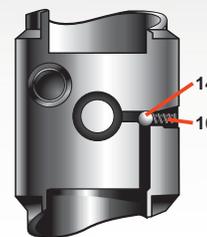
If oil runs out of air vent (35) flush this assembly with cleaning fluid or replace.



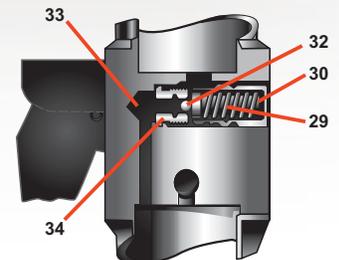
SECTION B-B



SECTIONAL VIEWS

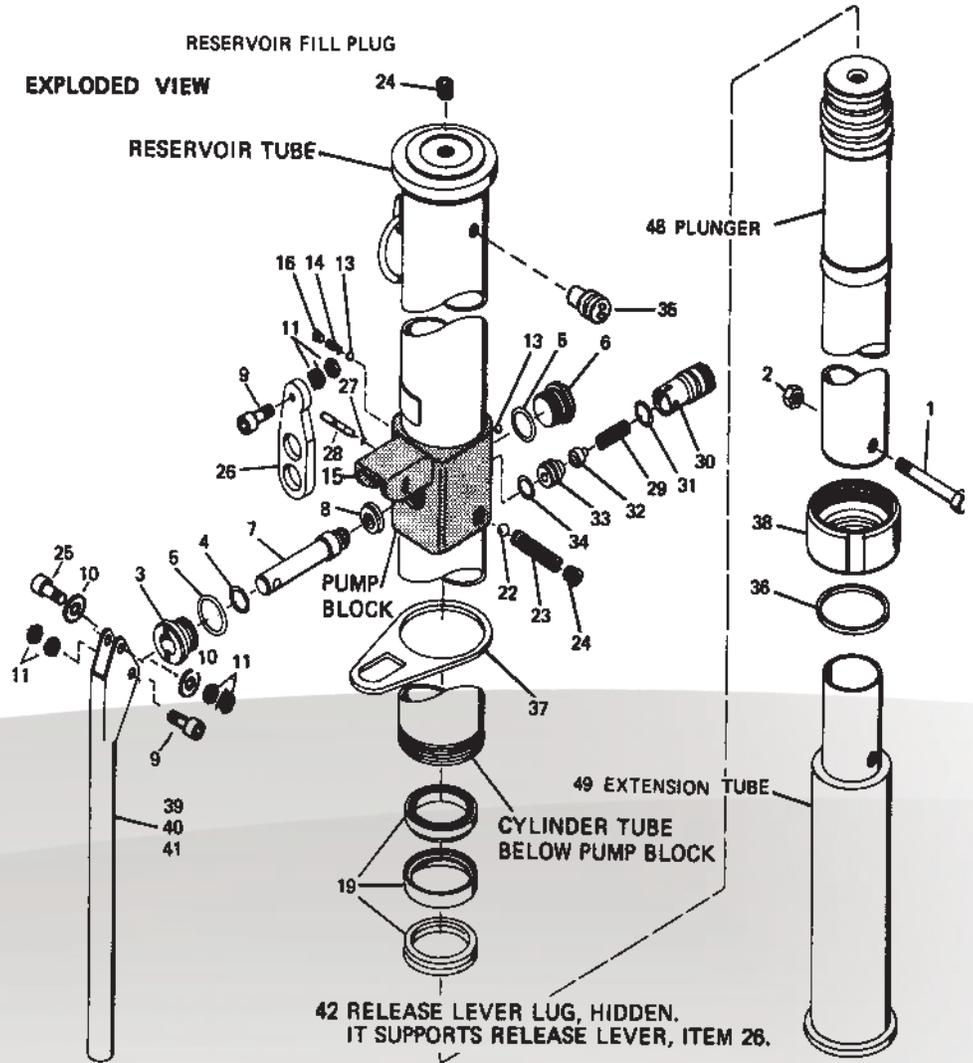


SECTION C-C



SECTION D-D

## HY-JAX Service / Parts



## HY-JAX Technical Data

### MODEL 10 HY-JAX—CAPACITY 10 TONS

Minimum Height Inches	Maximum Height Inches	Weight lbs.	Assembly Numbers Jacks	Extensions
36	48	39	D310-12	E310-1
42	54	42	D310-12	E310-6
48	60	44	D310-12	E310-12
54	66	47	D310-12	E310-18
49	64	47	D310-15	E310-1
55	70	49	D310-15	E310-6
61	76	52	D310-15	E310-12
67	82	55	D310-15	E310-18

73	88	57	D310-15	E310-24
63	87	55	D310-24	E310-1
69	93	57	D310-24	E310-6
75	99	60	D310-24	E310-12
81	105	62	D310-24	E310-18

### EXTRA TALL MODEL 10 HY-JAX --- CAPACITY 7 TONS

[Special Order]				
87	111	63	D307-3-24	E310-6
108	132	65	D307-1-24	E310-12

\*Applied to Model 20 HY-JAX only. All other parts are interchangeable.

## Technical Data Continued

ITEM NO.	PART NO.	COMPUTER NO.	DESCRIPTION	Weight (Oz.)
1.	X2-28	391 1401 028	Cap Screw 3/8—16UNC x 3" long	1.6
2.	X202-2	391 1463 013	3/8"—16 UNC—2 Locknut	.02
3.	TC 1021	391 0589 001	Pump Block Handle Cap	1.6
4.	L3006-44	391 2881 138	"O" Ring 3/4" O.D. x 9/16" I.D.	.015
5.	L3006-122	391 2881 216	"O" Ring 1" O.D. x 13/16" I.D.	.02
6.	SC 1021	391 0589 002	Pump Block Cap	2.4
7.	RC 1530	391 2381 012	Pump Plunger Rod	4.3
8.	C1307-1	391 1983 072	U-Cup Packing	.018
9.	X201-1	391 1402 118	5/16" x 1" Long Socket Head Shoulder Screw	.04
10.	X21-15	391 3786 017	1/4" Flat Washer	.007
11.	X202-1	391 1463 012	1/4"—20 UNC—2 Locknut	.01
13.	X53-9	391 0282 009	Ball 5/16" Dia.	.074
14.	N1327	391 3581 230	Spring	.001
15.	SF 2004	391 1844 004	Protector & Handle Lug (welded to pump block)	.4
16.	X1-20	391 2282 129	Plug 1/8" N.P.T.	.12
19.	SB 3006	391 2881 388	U-Cup Packing	.36
			Piston Seal Backup Ring	.32
			Piston Seal	.55
22.	X53-5	391 0282 005	Ball 7/16" Dia.	.2
23.	M1327-1	391 3581 225	Spring	.36
24.	X1-25	391 2282 131	Plug 3/8" N.P.T.	.42
25.	X201-2	391 1402 119	3/8" x 11/2" Long Socket Head Shoulder Screw	.05
26.	AM 1530	391 1861 007	Release Lever	8.17
27.	L3006-117	391 2881 211	"O" Ring 1/4" O.D. x 1/8" I.D.	.001
28.	BC1530	391 2381 013	Release Plunger	.29
29.	M1327-2	391 3581 226	Spring	.48
29.	M1327-4	391 3581 351	Spring for Extra Tall HY-JAX Assembly D310-24-2, to reduce yield to 7 ton	.476
30.	RC1021	391 2586 091	Spring Retainer	2.66
31.	L3006-24	391 2881 118	"O" Ring 7/8" O.D. x 11/16" I.D.	.016
32.	EB1044	391 2984 011	Poppet	.26
33.	DB1044	391 2483 107	Poppet Seat .188" I.D. (for Model 10)	.82
33.*	DB1044-1	391 2483 137	Poppet Seat .125" I.D. (for Model 20)	.83
34.	L3006-11	391 2881 105	"O" Ring 13/16" O.D. x 5/8" I.D.	.015
35.	H1307K	376 1307 001	Breather Assembly	.40
36.	GA3026-25	391 3881 055	Wiper Ring	.11
37.	AC1530	391 2187 001	Handle Bracket (for Model 10)	6.5
37.*	AC1530-1	391 2187 002	Handle Bracket (for Model 20)	5.3
38.	KA3011	391 1470 025	Wiper Ring Nut (for Model 10)	15.7
38.*	KA3011-1	391 1470 026	Wiper Ring Nut (for Model 20)	25.3
39.	BA1526-1	376 1526 001	Handle 143/4" Lg.	19.5
40.	BA1526-4	376 1526 003	Handle 61/4" Lg.	10.0
41.	BA1526-3	376 1526 002	Handle 93/4" Lg.	14.0
42.	TF2004	391 1844 003	Release Lever Lug (welded to pump block)	4.0

\*Applied to Model 20 HY-JAX only. All other parts are interchangeable.

### MODEL 20 HY-JAX—CAPACITY 15.75 TONS

Minimum Height Inches	Maximum Height Inches	Weight lbs.	Assembly Numbers Jacks	Extensions
36	48	58	D320-12	E320-1
42	54	64	D320-12	E320-6
48	60	69	D320-12	E320-12
54	66	74	D320-12	E320-18
63	87	92	D320-24	E320-1
69	93	97	D320-24	E320-6
75	99	103	D320-24	E320-12
81	105	108	D320-24	E320-18

### EXTRA TALL MODEL 20 HY-JAX CAPACITY 15.75 TONS

[Special Order]				
105	129	129	D320-1-24	E320-1
120	144	135	D320-2-24	E320-1

\*Applied to Model 20 HY-JAX only. All other parts are interchangeable.