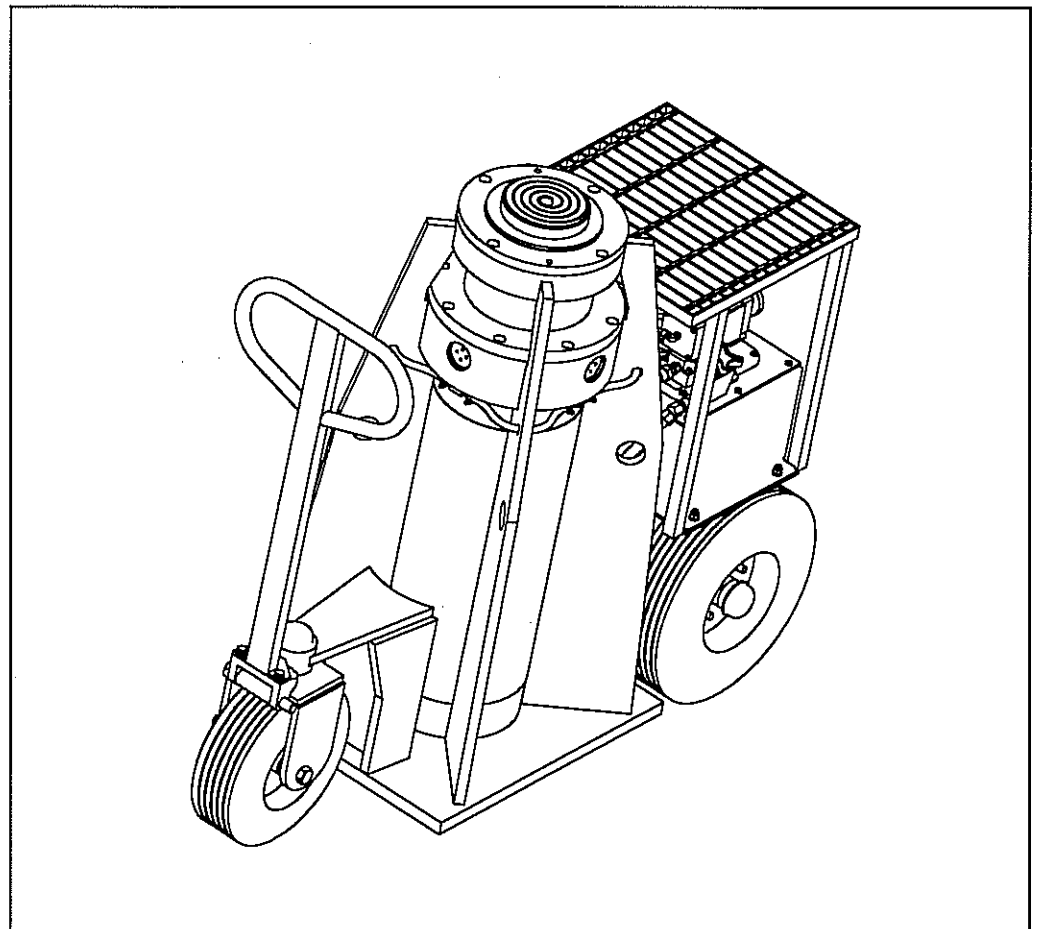




**Installation, Operating and Maintenance  
Instructions with Parts Lists  
For Model 15044 Bossman Jack**



**Publication Part No. BJ15044MM**

**BOSSMAN<sup>®</sup> Hydraulic Jack**



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## CAUTION

**This manual contains important information for the correct installation, operation and maintenance of the equipment described herein. All persons involved in such installation, operation and maintenance should be thoroughly familiar with the contents. To safeguard against the possibility of personal injury or property damage, follow the recommendations and instructions of this manual and keep it for further reference.**



## WARNING

**The equipment shown in this manual is intended for industrial use only and should not be used to lift, support, or otherwise transport people.**

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# Section I

## General Information

### 1-1. General

1. This manual provides instructions for operating, inspection, testing and maintenance and an illustrated parts list for Duff-Norton Model 15044 Bossman Jack.
2. This Duff-Norton Bossman Jack conforms with standards set forth in ASME B30.1 Safety Standard For Jacks. To ensure reliable and long satisfactory use of the Bossman Jack, the instructions in this publication should be closely followed. Safety precautions to protect against accidental injury and property damage should be observed at all times while the jack is in use. All personnel concerned with the installation, operation, inspection and maintenance are urged to read ASME B30.1. Copies of this standard may be obtained from:

The American Society Of Mechanical Engineers  
 22 Law Drive  
 P.O. Box 2900  
 Fairfield, NJ 07007-2900

### 1-2. Construction

The Duff-Norton Bossman Jack consists of a double acting high pressure hydraulic cylinder, an air motor powered hydraulic pump, an air actuated hydraulic control valve, a remote hand control, a manually adjustable load lowering valve, a hydraulic pressure gage and a patented cylinder locking mechanism. These components are integrated together into a rugged welded steel frame, which is equipped with three large pneumatic tired wheels, which flatten under load to allow the jack base to contact the floor and a swiveling transport handle. Optional extensions are available for increasing the jack's closed height.

For operation the jack must be connected to an air supply system which has the capability to deliver a minimum of 50 cfm (1,420 L/min) of air to the jack while maintaining 90 psi (6.2 bar) dynamic pressure. The jack has a 1/2 NPT female air supply inlet port and no inlet fitting is supplied. The dynamic air supply pressure at the jack should be no greater than 100 psi (6.9 bar). The air supply hose should be 3/4 in (20 mm) inside diameter minimum.

**Table 1-3. Table of Specifications**

Model number	15044
Capacity (tons)	150
Retracted Height - in (mm)	44 (1,118)
Lift - inches (mm)	30 (762)
Extended Height - in (mm)	74 (1,880)
Length - inches (mm)	54 (1,372)
Width - inches (mm)	20 (508)
Head Diameter without Cylinder Cap - in (mm)	6.23 (158)
Head Diameter with Cylinder Cap - in (mm)	8.25 (210)
Weight - lbs (kg)	1,550 (703)
Operating Air Pressure - psi (bar)	90 (6.2)
Lift Speed at No Load - in/min (mm/min)	14 (355)
Speed at Rated Load - in/min (mm/min)	1.8 (46)
Air Consumption at Rated Load - cfm (L/min)	150 (1,420)
Hydraulic Oil - 50° F (10° C) - 85° F (29° C) *	ISO-48 (215 SUS)
Below 50° F (10° C)	ISO-32 (150 SUS)
Above 85° F (29° C)	ISO-68 (315 SUS)
Reservoir Capacity - US Gal (L)	5 (19)
Max. Tire Pressure - psi (bar)	35 (2.4)

\* Shipped with this type oil.

## 1-4. Important Precautions

Read all instructions, warnings and cautions carefully. Follow all safety precautions to avoid personal injury or property damage during jack operation.

Failure to comply with the following warnings and cautions could cause equipment damage and personal injury.



Do not exceed rated jack capacity. Serious injury or death may result. Jack is rated at 150 tons. Do not tamper with the internal high pressure relief valve of pump.



To avoid personal injury keep hands and feet away from jack head and load during operation.



Wear proper personal protective gear when operating jack.



Support the jack base securely. The jack should be placed on a flat surface, which can support the load. Use flat base plates and shims when necessary.



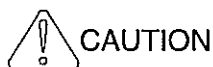
Do not operate damaged or malfunctioning jack.



Do not alter jack.



Use only recommended height extenders. Never use more than one extender.



Do not apply off center loads to jack. The head of the jack should be fully and properly engaged with the load before lifting it. Off-center loads

produce considerable strain on jacks. In addition, the load may slip or fall, causing potentially dangerous results. Distribute the load evenly across entire jack head surface.



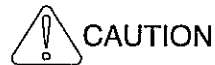
Keep the load lowering valve properly adjusted. If the valve is too far open the load will descend very rapidly when it is lowered. If the valve is fully closed the load can not be lowered. It is recommended that the valve be kept adjusted 1/8 turn from fully closed (clockwise stop position) unless a more desirable adjustment for the application has been found through experience.



Should a hydraulic circuit failure occur, stop jack immediately. Avoid contact with leaking hydraulic fluid spray. The force of escaping hydraulic fluid can cause serious injury.



Keep jack away from flames and heat. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials. For optimum performance do not expose jack to temperatures in excess of 150° F (65° C). Protect jack from weld splatter.



Before replenishing oil level, retract jack completely to prevent over filling the pump reservoir. An overfill may cause personal injury due to excess reservoir pressure created when the jack is retracted.



This is an industrial jack and is not designed to lift, support or transfer people. To avoid injury, do not lift or transfer people.



Do not remove or obscure warnings. Keep all capacity and warning labels clearly visible.



Insure all personnel are clear of load when lifting or lowering jack



Disconnect air supply when jack is not in use or when jack is being serviced. A shut-off valve for the supply air line is recommended.



Do not use hoses to move the jack. Stress may damage hoses and possibly cause personal injury.



The jack should not be dropped. Sudden, high impact can seriously damage the jack making it unsafe and unreliable for future use.

### 1-5. Warranty and Warranty Repair

Subject to the conditions stated herein, Duff-Norton will repair or replace, without charge, any parts proven to Duff-Norton's satisfaction to have been defective in material or workmanship. Claims must be made within one year after date of shipment. Duff-Norton will not repair or replace any

parts that become inoperative because of improper maintenance, eccentric loading, overloading, chemical or abrasive action excessive heat, or other abuse.

Equipment and accessories not of Duff-Norton's manufacture are warranted only to the extent that they are warranted by the manufacturer, and only if the claimed defect arose during normal use, applications and service. Equipment which has been altered or modified by anyone without Duff-Norton's authorization is not warranted by Duff-Norton. EXCEPT AS STATED HEREIN, DUFF-NORTON MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

If you have any questions concerning warranty repair, contact Duff-Norton.

Authorization for return must be received from Duff-Norton before returning any equipment for inspection or warranty repair.

## Section II

### Preparation

#### 2-1. Operational Requirements

1. The jack shall be visually examined for general conditions before each operation.
2. A determination of the load shall be made to assure that it is within the 150 ton load rating of the jack.
3. The base of the jack shall be securely supported. The jack should be placed on a flat surface, which can support the load. Use flat base plates and shims when necessary.
4. Operators shall be instructed in the proper use of the jack.

#### 2-2. Operational Procedures

1. Be familiar with the jack and these instructions on its operation, maintenance and inspection.
2. Take precautions to ensure that all personnel

- are clear of the load before lifting or lowering.
3. Properly engage the load. The jack head should be fully and properly engaged with the load before lifting it.
4. Center the load on the jack head. Off-center loading is dangerous and should be avoided.
5. Verify that the load lowering valve is properly adjusted. It is recommended that the valve be kept adjusted 1/8 turn from fully closed (clockwise stop position) unless a more desirable adjustment for the application has been found through experience.
6. Take measures to prevent personnel from working or passing under the load until it is secured by cribbing or blocking.
7. Follow the load with cribbing or blocking where practical.

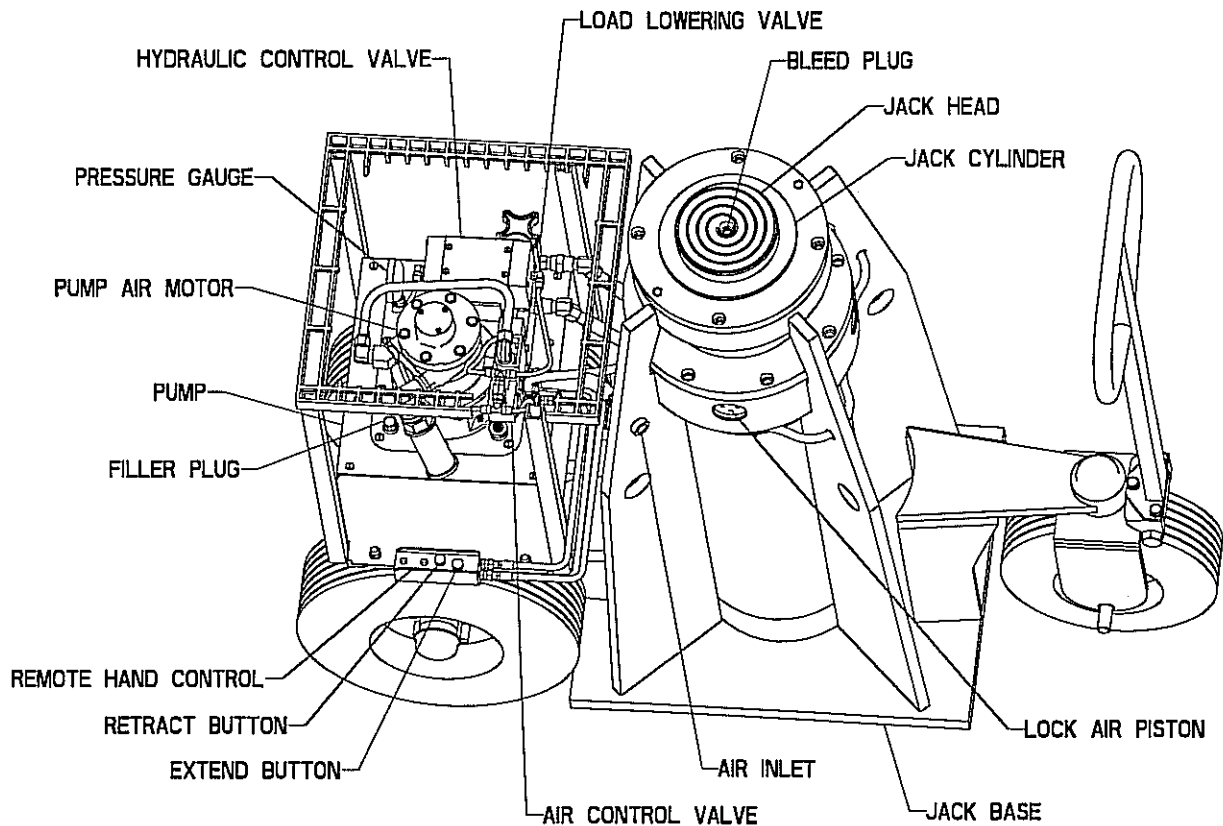


Figure 2-3. Operation Drawing for Bossman Jack

### Section III Operation

For operation the jack must be connected to an air supply system which has the capability to deliver a minimum of 50 cfm (1,420 L/min) of air to the jack while maintaining 90 psi (6.2 bar) dynamic pressure. The jack has a 1/2 NPT female air supply inlet port and no inlet fitting is supplied. The dynamic air supply pressure at the jack should be no greater than 100 psi (6.9 bar). The air supply hose should be 3/4 in (19 mm) inside diameter minimum.

#### 3-1. Raising the Jack

Press and hold the extend button (closest to the jack) of the remote hand control. The air control valve will direct air to the pump motor to cause it to run and to the hydraulic control valve which will direct pressurized oil through the load lowering valve to the extend port of the jack cylinder and allow oil from the retract port of the jack cylinder to return to the pump reservoir.

Spring pressure will hold the cylinder locking shoes against the cylinder body as it raises. The operator can visually verify proper locking mechanism function by watching the air pistons move in and out as the jack rises.

When the jack has raised to its maximum ex-

tended height the pumped hydraulic oil will be returned to the pump reservoir through a pressure relief valve and lifting will cease. The operator should release the control button to stop the pump when maximum extended height has been achieved as continued operation rapidly creates heat in the relief valve.

#### 3-2. Lowering the Jack

Raise the jack slightly to remove any load from the cylinder locking shoes and then press and hold the retract button (farthest from the jack) of the remote hand control. The air control valve will direct air to the air pistons of the locking mechanism to release the locking shoes, to the pump motor to cause it to run, and to the hydraulic control valve which will direct pressurized oil to the retract port of the jack cylinder and allow oil from the extend port of the jack cylinder to return through the load lowering valve to the pump reservoir.

Lowering will continue as long as the button in the hand control is held down or until closed height is achieved. The locking shoes can not engage with the cylinder body until the button is released.

When the jack has lowered to its closed height

the pumped hydraulic oil will be returned to the pump reservoir through a pressure relief valve and lowering will cease. The operator should release

the control button to stop the pump when closed height has been achieved as continued operation rapidly creates heat in the relief valve.

## Section IV

### Inspection

The inspection classification herein are minimum requirements and should be augmented when experience from operating conditions dictate.

#### 4-1. Inspection Classification

The jack inspection classification consists of initial inspection prior to use and general classifications designated as Frequent and Periodic Inspection. Inspection should be performed based on the degree of exposure to wear, deterioration or malfunction.

#### 4-2. Initial Inspection

Any new or repaired jack should be tested for its ability to lift its rated load prior to use. The jack is rated at 150 tons.

#### 4-3. Frequent Inspection

Visual inspection by the operator or other qualified, designated personnel.

- A. Normal service — one month
- B. Severe service — before each use or daily, whichever is less frequent.
- C. Infrequent Service — as recommended by a qualified person before and after each occurrence.



#### Caution

Any unsafe condition disclosed by the inspection shall be corrected before operation of the jack is resumed. Repairs should be performed only by designated qualified personnel.

The following items shall be visually inspected and the jack should be observed during operations for deficiencies which might appear between frequent inspection. Any deficiencies shall be carefully examined and determination made whether or not they constitute a hazard. If such a determination is made, the jack shall be removed from service.

- A. Check for cracked or broken cylinder body.
- B. Inspect for leaking hydraulic fluid.

- C. Check for scored or otherwise damaged cylinder plunger.
- D. Inspect for leaking, damaged or improperly assembled accessory equipment.
- E. Inspect for proper function of locking mechanism.

#### Note

A jack that has been idle for one year or more shall be inspected in accordance with Frequent Inspection.

#### 4-4. Periodic Inspection

Visual inspection by designated qualified personnel, making record of apparent external conditions, provide the basis for a continuing evaluation.

- A. Normal service — one year
- B. Severe service — before each use
- C. Infrequent Service — as recommended by a qualified person before the first such occurrence and as directed by the qualified person for any subsequent occurrences.

Perform inspection in the same manner as frequent inspections, except that records are kept. A dated inspection record shall be kept on a Periodic Inspections.

It is recommended that the Periodic Inspection be performed by an authorized service center or appropriate trained authorized individuals.

During Periodic Inspection if external appearance indicates possible internal difficulty, the ram shall be disassembled for cleaning and examined for internal wear or damage.

#### 4-5. Load Test

Any altered or repaired jack shall be tested for its ability to sustain its 150 ton rated load prior to regular use. The jack shall be operated to 100% of its 150 ton capacity.

## Section V

### Preventative Maintenance

#### IMPORTANT:

Any repair or servicing which requires dismantling the jack should be performed in a dirt-free environment by a qualified technician.

Disconnect the jack from the air supply before performing maintenance or repair procedures.

#### 5-1. Lubrication of the Air Driven Motor

An automatic air line oiler is recommended. Install the oiler in the air inlet line as close to the pumping unit as possible. Adjust the oiler to feed 1-3 drops of SAE #10 oil per minute (one drop for every 50-75 CFM of air) into the system.

#### 5-2. Bleeding Air from the System

After use, air may accumulate in the hydraulic system if the reservoir level has been permitted to get too low. This air will cause the cylinder to respond in an unstable or slow manner. To remove this air:

1. Loosen plug on top of cylinder and start pump.
2. When oil replaces the air escaping (bleeding) from loosened plug in cylinder, stop pump and retighten the plug.

#### 5-3. Draining and Flushing the Reservoir

The reservoir should be drained, flushed, and refilled with hydraulic oil approximately 300 hours after normal use. The following conditions would warrant more frequent changing of hydraulic oil:

- Very dusty environment and dust enters reservoir.
  - Hourly operations near 140° F - Evidence of oxidation and formation of gum, sludge, varnish.
  - Exposure to frequent extreme temperature change and high humidity resulting in excessive condensation in the reservoir while in storage.
1. Clean the pump exterior before the pump unit is removed from the reservoir.
  2. Remove the screws that hold the motor and pump assembly to the reservoir.

#### IMPORTANT

Do not damage the gasket or bump the filter or hydraulic pressure regulating valves when lifting the pump and motor off the reservoir.

3. After appropriately disposing of the used oil, clean the inside of the reservoir and fill with a

suitable flushing oil. Rinse the filter clean.

4. Place the pump and motor assembly back onto the reservoir and secure it with two machine screws assembled on opposite corners of the housing.
5. Connect a hose to the load lowering valve and place the other end of the hose into the oil filler plug hole.
6. Run the pump on "extend" several minutes.
7. Remove the motor and pump assembly from the reservoir. Drain and clean the inside of the reservoir.
8. Fill the reservoir with Hydraulic oil. Place the pump and motor assembly (with gasket) back on the reservoir and tighten the screws securely and evenly.

#### 5-4. Hydraulic fluid level

- Check the oil in the reservoir after each 10 hours of use.
- Proper oil level is within 1/2" of the filler plug when the cylinder is retracted.

#### 5-5. Adding oil to the reservoir

- Use only hydraulic oil
  - ISO -32 (150 SUS @ less than 50° F)
  - ISO -48 (215 SUS @ Normal Conditions)
  - ISO -68 (315 SUS @ Greater than 85° F)
- Clean the entire area around the filler plug before removing the filler plug.
- Use a clean funnel with filter when adding oil.
- Cylinder must be fully retracted and the power supply disconnected when adding oil to the reservoir.

#### 5-6. Maintenance cleaning

- Keep the outer surface of the pump, all hose connections and any equipment hooked up to the pump as free of dirt and oil as possible.
- The breather hole in the filter plug must be kept clean and unobstructed at all times.
- All unused couplers are to be sealed with thread protectors.
- Change oil as recommended.

## Section VI Accessory Equipment

### 6-1. Cylinder Extensions

Cylinder extensions are available as optional accessory equipment for increasing the closed height of the jack. Available extensions are as follows:

Part Number	Description
BJ150-70	6 in Extension
BJ150-71	9 in Extension
BJ150-72	12 in Extension
BJ150-692	6 in, 9 in & 12 in Extension Set

To apply a cylinder extension to the jack remove the cylinder cap and replace it with the cylinder extension.



**WARNING**

**Use only recommended height extenders.**

Never use more than one extender.

## Section VII Troubleshooting Guide

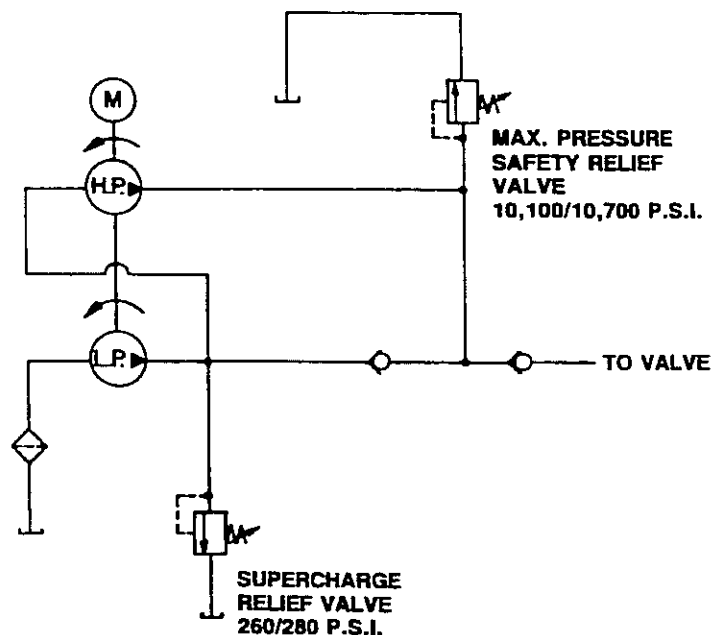


Figure 7-1. Hydraulic Schematic



### Warning

To prevent injuries, any repair work or troubleshooting must be done by qualified personnel familiar with this equipment.

#### Note:

- Use proper gauges and equipment when troubleshooting.
- Depending on the pump version, it is often best to check for leaks by using a hand pump and

applying pressure to the suspect area without the motor running. Watch for leaking oil and follow it back to its source.

- Plug the outlet ports of the pump when checking for leakage to determine if the leakage is in the pump or if it is in the cylinder.
- Refer to the Parts List and the hydraulic schematic when using this troubleshooting guide.

### Problem

Pump is not delivering oil or delivers only enough oil to extend cylinder partially or erratically

#### Cause

1. Oil level too low
2. Air in system
3. Cold oil or oil is too heavy (Hydraulic oil is of a higher viscosity than necessary)
4. Vacuum in reservoir

#### Solution

1. Fill reservoir to within  $\frac{1}{2}$ " of filler plug with the cylinder retracted. (See Section 5-4)
2. Bleed the system (See Section 5-2)
3. Change to lighter oil. (See Section 5-5)
4. Check for plugged vent in filler plug. (See Figure 2-3)

If the problem persists after the above causes are ruled out, the jack has serious internal problems and should be sent to a Duff-Norton Authorized Service Center for repair.

### Problem

Pump builds pressure but cannot maintain pressure.

#### Cause

1. Check to see if there are any external leaks. If no oil leakage is visible, the problem is internal. Remove jack cylinder from the system to insure that the leak is not in the cylinder.
2. To test for a leaking control valve, lift the pump from the reservoir but keep the filter in the oil. Remove the drain line to see if the oil is leaking from the valve. If the valve is not leaking, the internal check valve could be leaking. Refer to the "Note" concerning checking for oil leaks at the beginning of this troubleshooting guide.

#### Solution

1. Reseal leaking pipe fittings with pipe sealant.
2. Clean, reseal or replace control valve parts. If the internal check valve(s) are leaking, the pump must be dismantled and the seat areas repaired, poppets replaced, shear seals relapped, etc.

**Problem**

Pump will not build full pressure

Cause	Solution
1. Faulty pressure gauge.	1. Calibrate gauge
2. Check for external leakage	2. Seal any faulty pipe fitting with pipe sealant
3. Inadequate air pressure	3. Increase air pressure.

If the problem persists after the above causes are ruled out, the jack has serious internal problems and should be sent to a Duff-Norton Authorized Service Center for repair.

**Problem**

Jack cylinder will not retract

Cause	Solution
1. Inadequate air pressure	1. Increase air pressure
2. Locking Shoes Engaged	2. Raise cylinder approximately 1/4" or until locking shoe piston heads are flush with their holders.

If the problem persists after the above causes are ruled out, the jack has serious internal problems and should be sent to a Duff-Norton Authorized Service Center for repair.

Section VIII  
Parts Drawings and Lists

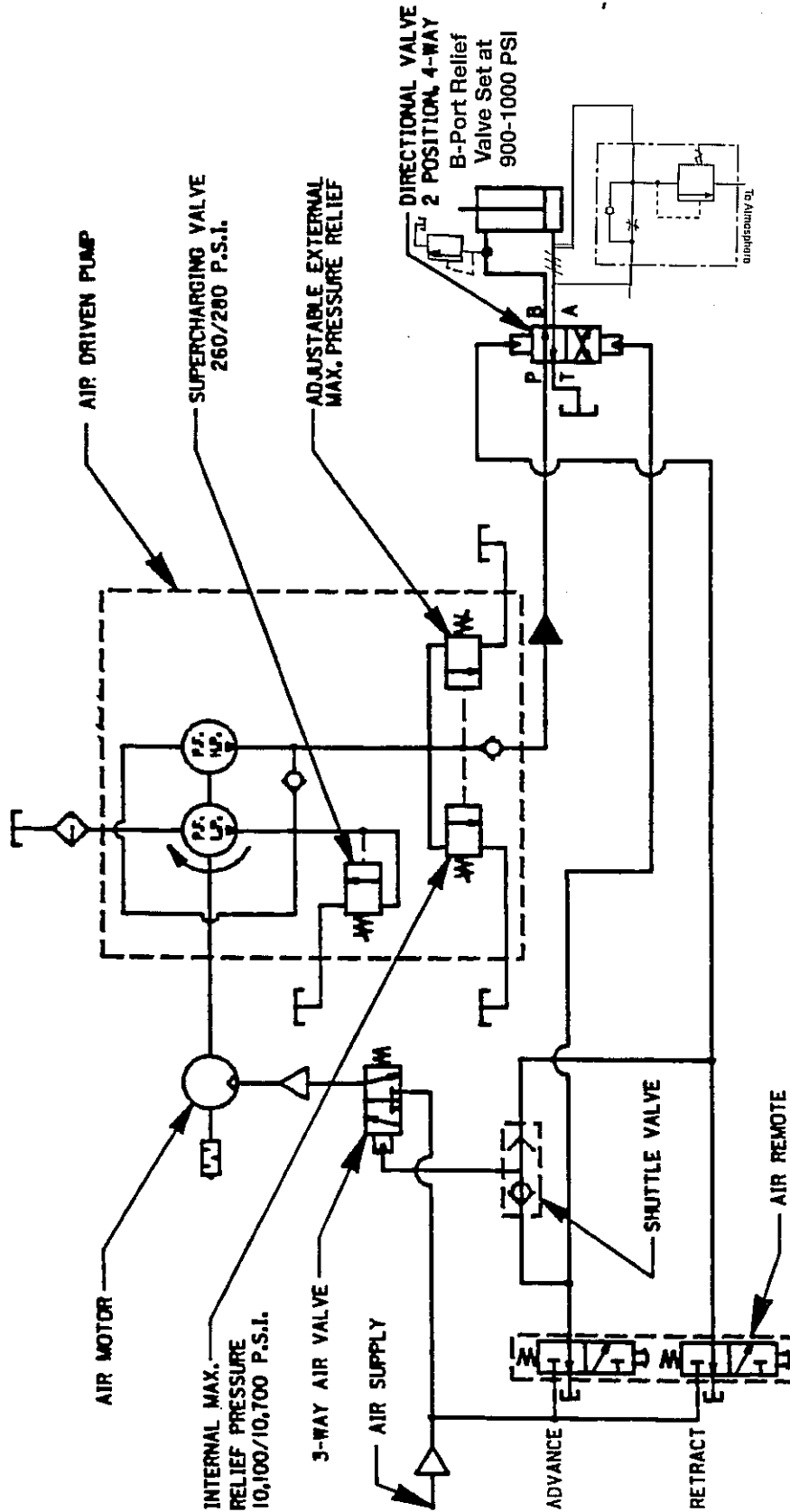
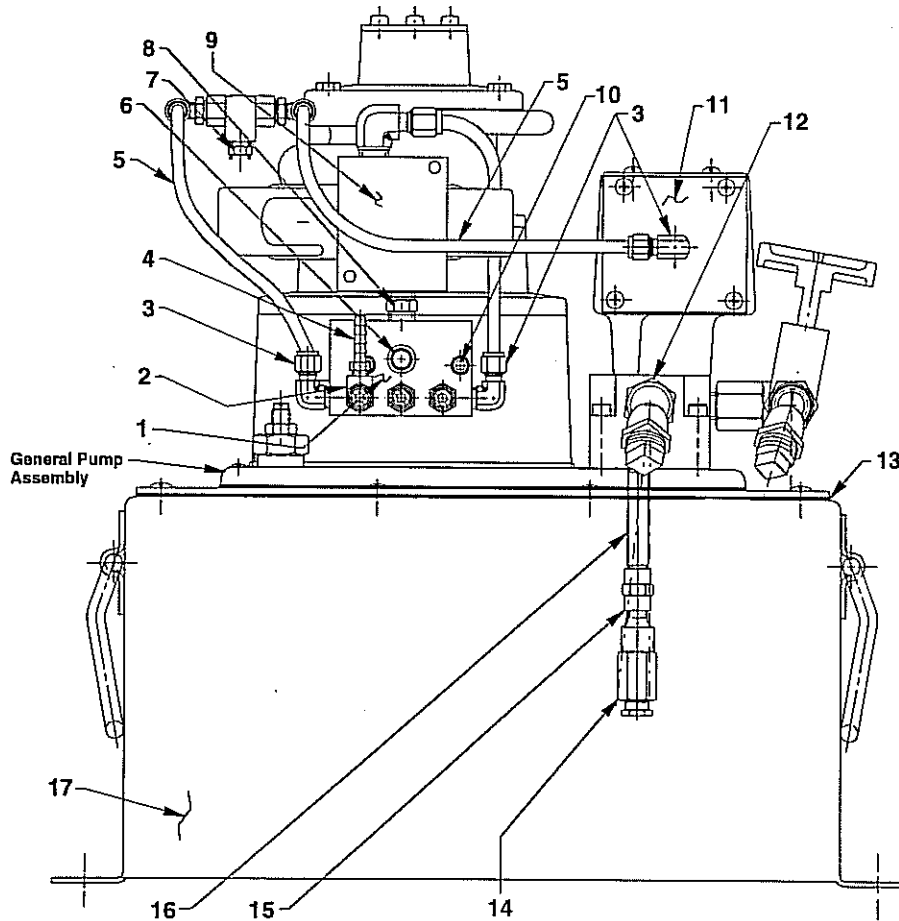


Figure 8-1. Hydraulic Schematic for Pump BJ1200C

Figure 8-2. General Pump Assembly

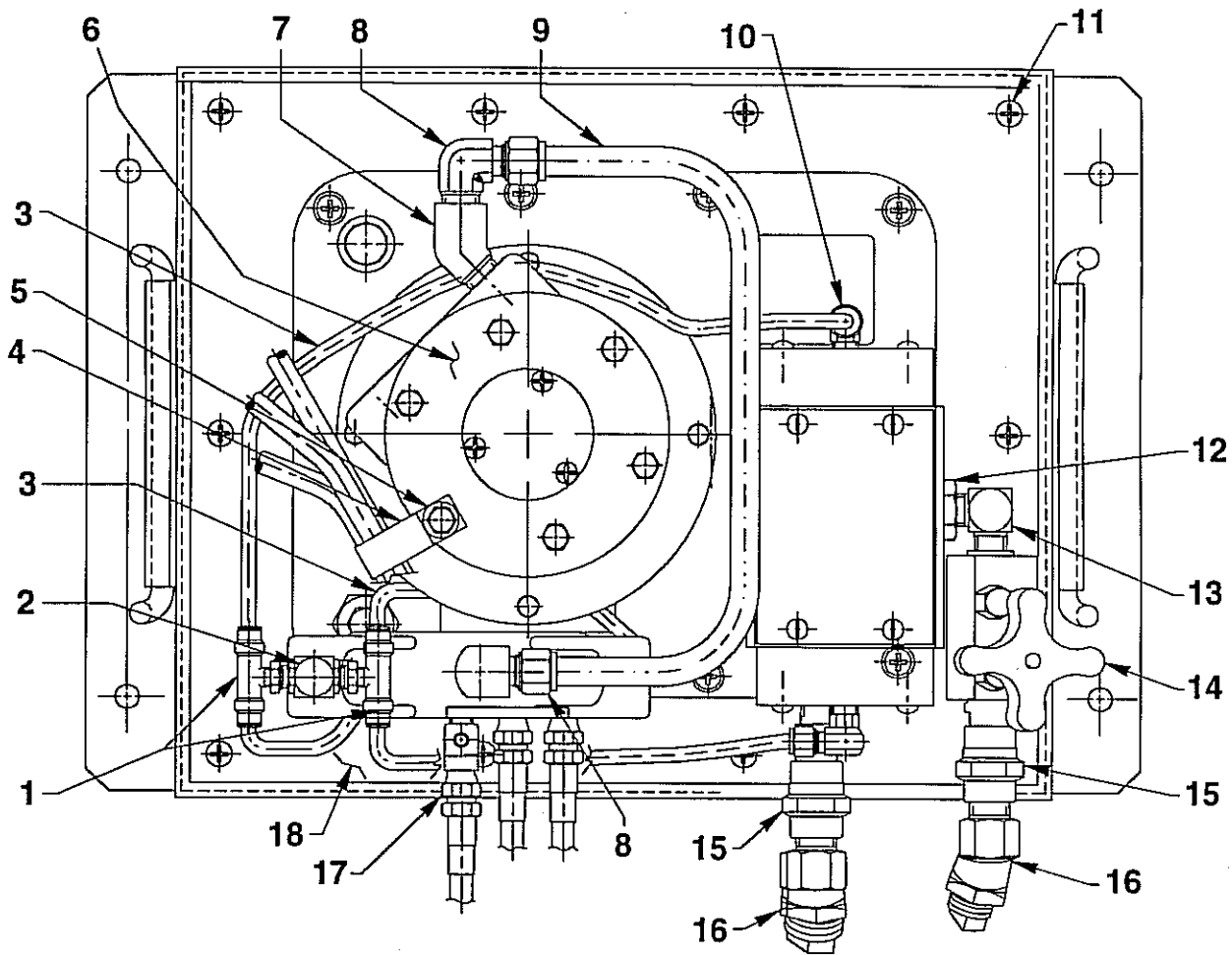


8-2. Parts List for General Pump Assembly

Item No.	Part No.	No. Req'd	Description
1	351443	1	Manifold
2	19463	1	Tee Fitting
3	250463	4	90° Elbow Fitting (1/8 NPTF)
4	15913	1	Hose Fitting
5	15883	18"	Polyethylene Tubing
6	12545	1	Plastic Cap
7	11421	1	Straight Fitting (1/8 NPTF)
8	14056	1	Straight Fitting (3/8 NPTF x 1/2 NPTF)
9	308608	1	Air Operated 2-Way Valve
10	10022	2	Machine Screw (1/4-20 x 1-1/2" Lg.)
11	66208	1	4-Way Pump Mount Air Valve (See Form No. 108068)
12	9674	1	Male Connector
13	40490	1	Reservoir Gasket
14	21278-10	1	Relief Valve (Set at 900/1,000 psi)
15	18841	1	Straight Fitting (1/8 NPTF)
16	15456	1	Straight Fitting (1/8 NPTF)
17	40137OR9	1	Reservoir

Figure 8-3. General Pump Assembly

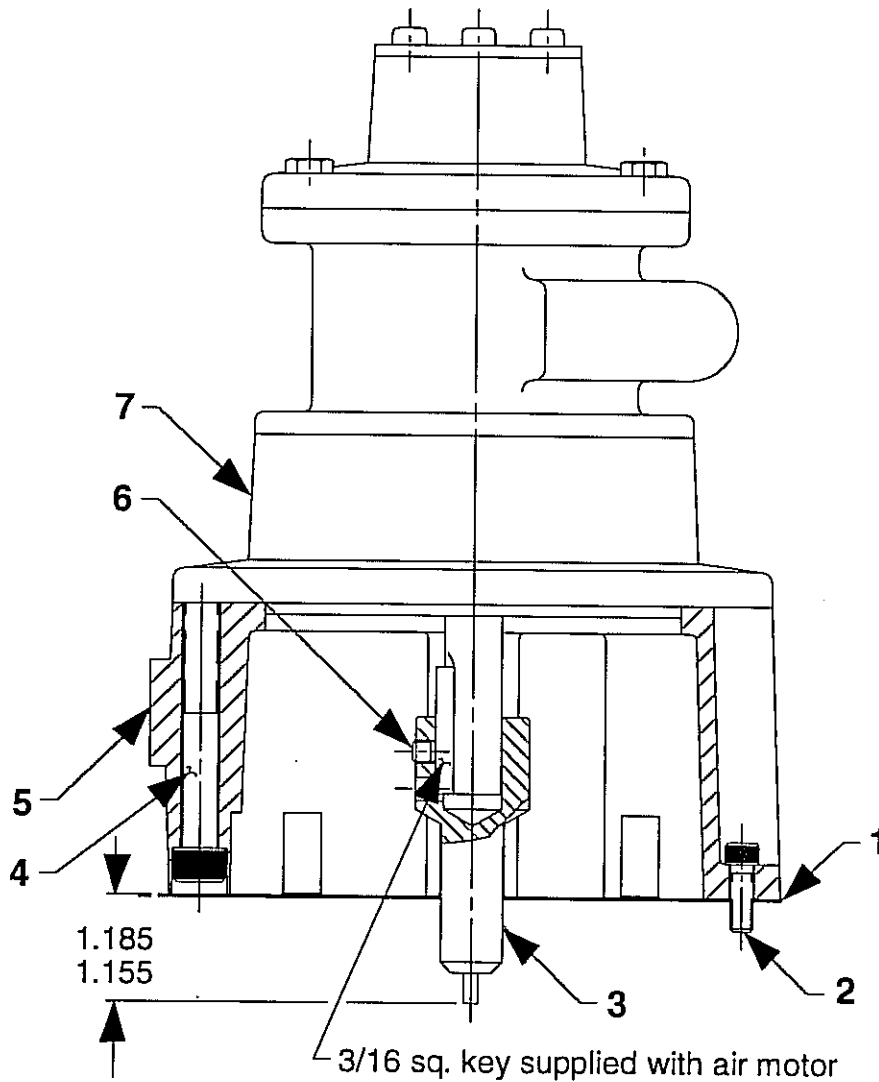
TOP VIEW



8-3 Parts List for General Pump Assembly

Item No.	Part No.	No. Req'd	Description
1	250741	2	Tee Fitting (1/4 Tube)
2	212405	1	Check Valve (1,000 psi)
3	15883	26.5"	Polyethylene Tubing
4	252291	1	Hose Clamp
5	12719	2	Plain Washer (For 1/4 Bolt)
6	59050	1	Air Motor
7	253079	1	45° Elbow Fitting
8	252520	2	90° Elbow Fitting
9	253080	1	Air Line Tube
10	250463	2	90° Elbow Fitting (1/8 NPTF)
11	10177	10	Rnd. Hd. Screw (1/4-20 x 3/4)
12	9689	1	Reducer Connector
13	16254	1	90° Elbow Fitting
14	46647	1	Manual Valve
15	9680	2	Coupling Fitting
16	9677	2	45° Swivel Connector
17	208218	6	Straight Fitting (1/8 NPTF)
18	40194BK2	1	Adapter Cover Plate

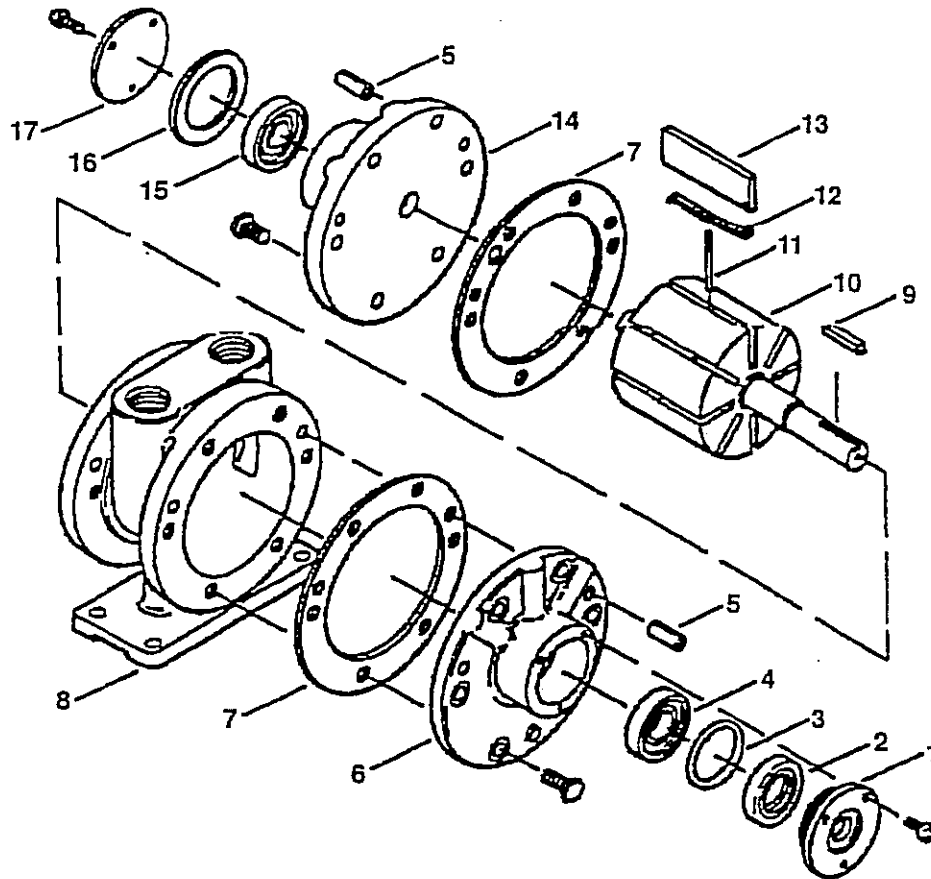
Figure 8-4. Air Motor for Pump



8-4. Parts List for Air Motor for Pump

Item No.	Part No.	No. Req'd.	Description
1	30650	1	Motor Base Gasket
2	10008	4	Screw (1/4-20 x 3/4 Lg.)
3	37842	1	Shaft Extension
4	17816	4	Screw (3/8-16 x 3" Lg.)
5	51158WH2	1	Motor Base
6	10556	1	Set Screw (1/4-20 x 1/3 Lg)
7	14717	1	Air Motor (See Page 17)

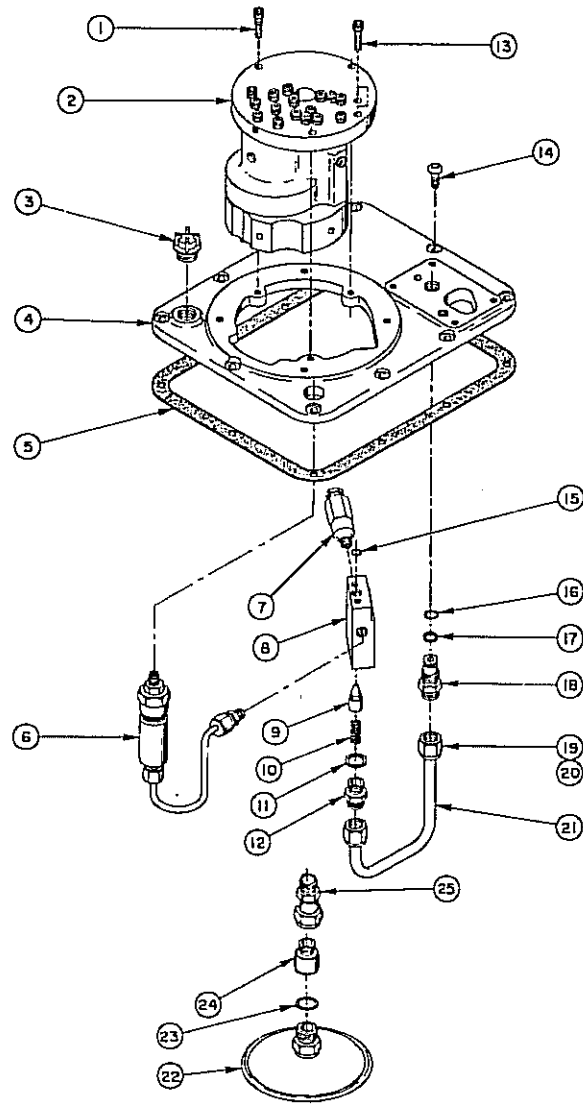
Figure 8-5. Air Motor For Pump



8-5. Parts List for Air Motor For Pump

Item No.	Part No.	No. Req'd.	Description
1	AD642A	1	End Cap Drive End
2	AD849A	1	Shaft Seal
3	AD649	1	O-Ring
4	AD638A	1	Bearing, Drive End
5	AB162	4	Dowel Pin
6	AD888	1	End Plate, Drive
7	AD641	2	Body Gasket
8	AD665	1	Body
9	AB136	1	Key
10	AD652	1	Rotor Assembly
11	AD655A	2	Push Pin
12	AD692	4	Vane Spring
16	AD961	4	Vane
14	AD651	1	End Plate, Dead
15	AB519	1	Bearing, Dead End
16	AD644	1	End Cap, Gasket
17	AD643	1	End Cap, Dead End
	K208	1	Service Kit

Figure 8-6. Basic Pump Assembly

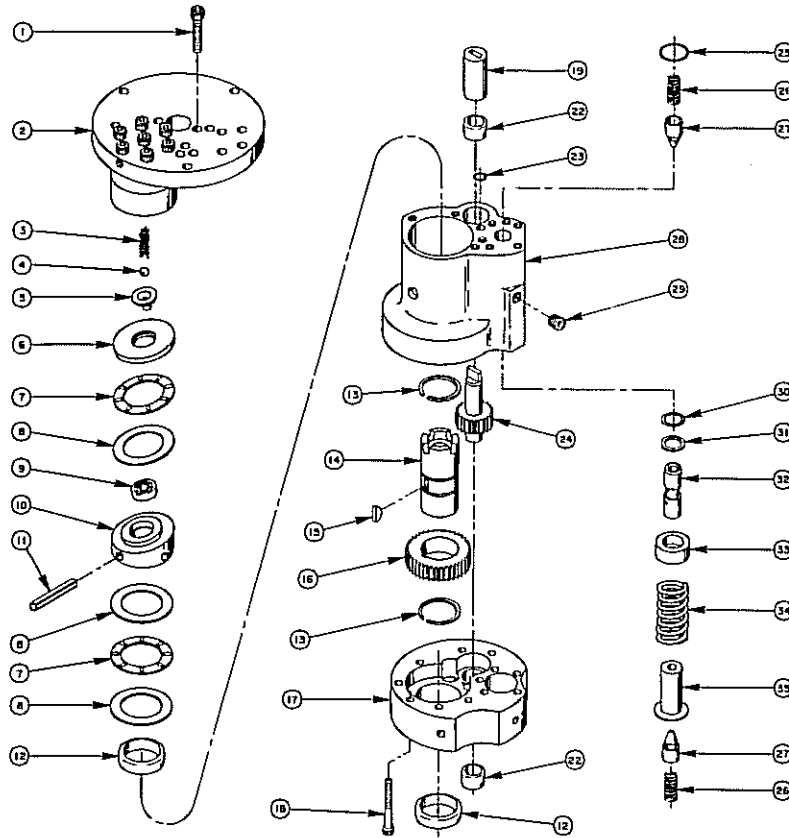


8-6. Parts List for Basic Pump Assembly

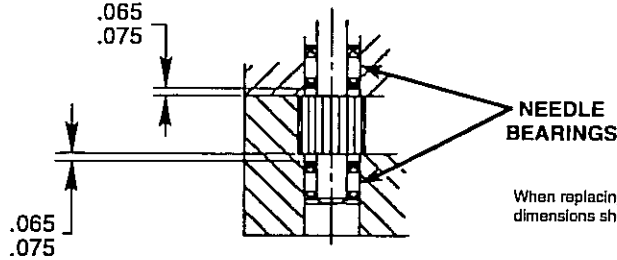
Item No.	Part No.	No. Req'd	Description
1	10016	3	Soc. Hd Cap Screw (1/4-20 UNC x 1" Lb.)
2	27206	1	Basic Pump Ass'y Replacement
3	20937	1	Filler Plug
4	40064WH2	1	Cover
5	40164	1	Gasket
6	22360	1	Pressure Regulator Ass'y
7	21278	1	Relief Valve (Set at 10,100/10,700 psi)
8	20776	1	Valve Body
9	20771	1	Poppet
10	10425	1	Compression Spring (3/8 O.D. x 3/4 Lg.)
11	10261	1	Copper Washer (3/4 x 19/32 x 1/32)
12	20770	1	Connector (Torque to 40/45 ft. lbs.)

No.	Part No.	Req'd	Description
13	10015	2	Soc. Hd. Cap Screw (1/4-28 UNF x 1" Lg; Torque to 180 in. lbs.)
14	10177	10	Mach. Screw (1/4-20 UNC x 3/4 Lg.)
15	10266	1	O-ring (3/8 x 1/4 x 1/16)
16	10268	1	O-ring (1/2 x 3/8 x 1/16)
17	11863	1	Teflon Backup Washer (1/2 x 3/8 x 1/16)
18	20787	1	Valve Connector
19	10430	2	Tube Sleeve
20	10431	2	Tube Nut
21	21045	1	Oil Line
22	21345	1	Filter Ass'y (Includes Item 23)
23	10527	1	O-ring (13/16 x .644 x .087)
24	22033	1	Suction Line
25	10528	1	Straight Fitting (1/2 NPSM)

**Figure 8-7. Basic Pump Assembly**



**Figure 8-7a. Needle Bearing Installation Specifications**



When replacing the needle bearings on the drive gear of the basic pump, the dimensions shown must be as specified.

**8-7. Parts List for Basic Pump Assembly**

Item No.	Part No.	No. Req'd.	Description
1	10020	9	Soc. Hd. Cap Screw (1/4-20 UNC x 1 1/4" Lg.; Torque to 170-180 in. lbs.)
2	33113	1	High Pressure Pump Assembly
3	10361	1	Compression Spring (1/4 O.D. x 1" Lg.)
4	10375	1	Steel Ball (1/4" Dia.)
5	23547	1	Bearing Top Plate
6	23548	1	Top Plate
7	11228	2	Thrust Bearing
8	11813	3	Bearing Race
9	11814	1	Ball Bearing
10	13549	1	Angle Plate
11	11955	1	Roll Pin
12	11064	2	Needle Bearing
13	11261	2	Retaining Ring
14	23556	1	Shaft
15	11821	1	Woodruff Key
16	23557	1	Gear

Item No.	Part No.	No. Req'd.	Description
17	30533	1	Pump End Plate
18	10001	12	Soc. Hd. Cap Screw (#10-32 UNF x 1-3/4 Lg.; Torque to 50 in. lbs.)
19	21091	1	Coupling
22	11199	2	Needle Thrust Bearing
23	10266	1	O-ring (3/8 x 1/4 x 1/16)
24	21272	1	Drive Gear
25	10303	1	O-ring (7/8 x 3/4 x 1/16)
26	10425	2	Compression Spring (3/8 O.D. x 3/4 Lg.)
27	20771	2	Poppet
28	10420	1	Pump Body
29	10427	1	Pipe Plug (1/8" NPTF)
30	10271	1	O-ring (1 1/16 x 1/2 x 3/32)
31	12389	1	Teflon Backup Washer (11/16 x 1/2 x 1/16)
32	20849	1	Spool
33	23255	1	Spring Guide
34	10426	1	Compression Spring (1" O.D. x 1-13/16 Lg.)
35	23256	1	Spring Guide

Figure 8-8. High Pressure Pump Assembly

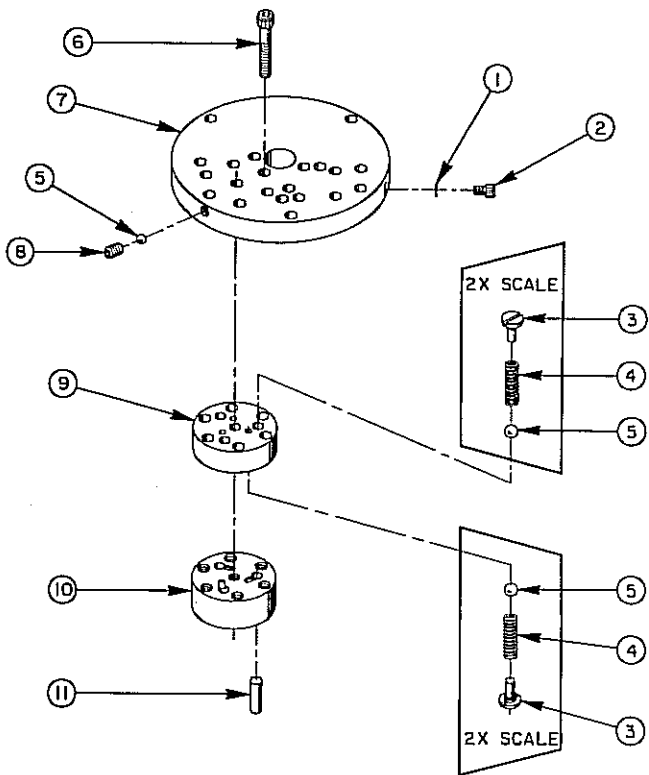
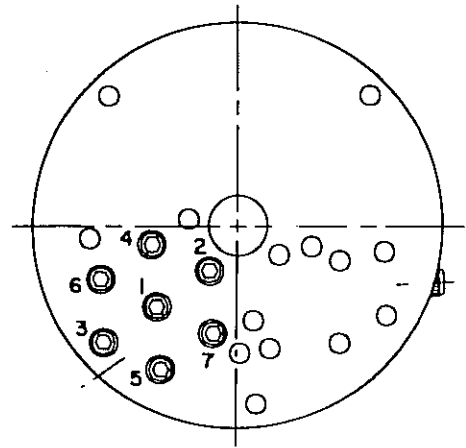


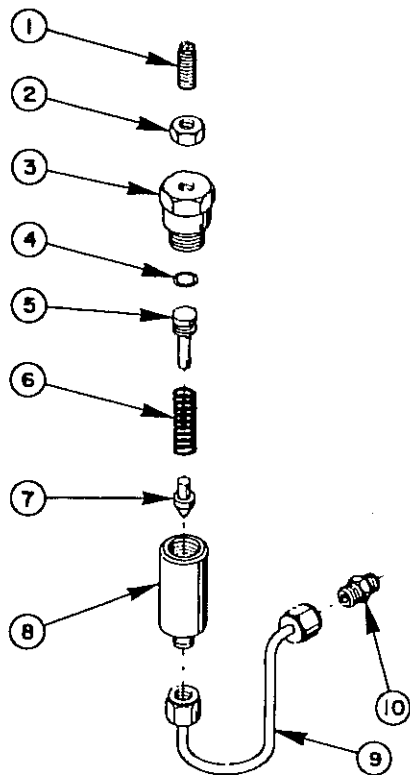
Figure 8-8a. Bolt Tightening Sequence For High Pressure Pump Assembly



Note: Assemble in sequence shown. Lubricate under head and on threads. Torque to 180 in. lbs.

8-8. Parts List for High Pressure Pump Assembly

Item No.	Part No.	No. Req'd.	Description
1	10442	1	Copper Washer (3/8 x 1/4 x 1/32)
2	10002	1	Soc. Hd. Cap Screw (1/4-20 UNC x 3/8" Lg.; Torque to 140/160 in. lbs)
3	24549	6	Valve Guide
4	10445	6	Compression Spring (5/32" O.D. x 3/4" Lg.)
5	12223	7	Steel Ball (3/16" Dia.)
6	10023	7	Soc. Hd. Cap Screw (1/4-28 UNF x 1-1/2 Lg.; Torque to 170/180 in. lbs.)
7	50411	1	Top Plate
8	10519	1	Soc. Set Screw (1/4-28 UNC x 3/8 Lg.; Torque to 65/70 in. lbs)
9	40630	1	Valve Head
10	14062	1	Pump Barrel
11	21628	3	Piston



### 8-9. Parts List For Pressure Regulator Assembly

Item No.	Part No.	No. Req'd	Description
1	22362	1	Adjusting Screw
2	10386	1	Hex Jam Nut
3	21305	1	Valve Cap
4	10268	1	O-ring (1/2 x 3/8 x 1/16)
5	21306	1	Spring Guide
6	10495	1	Compression Spring
7	21046	1	Valve Stem
8	22361	1	Body
9	29267	1	Oil Line Assembly (with nuts)
10	14844	1	Connector Fitting

Figure 8-9. Pressure Regulator Assembly

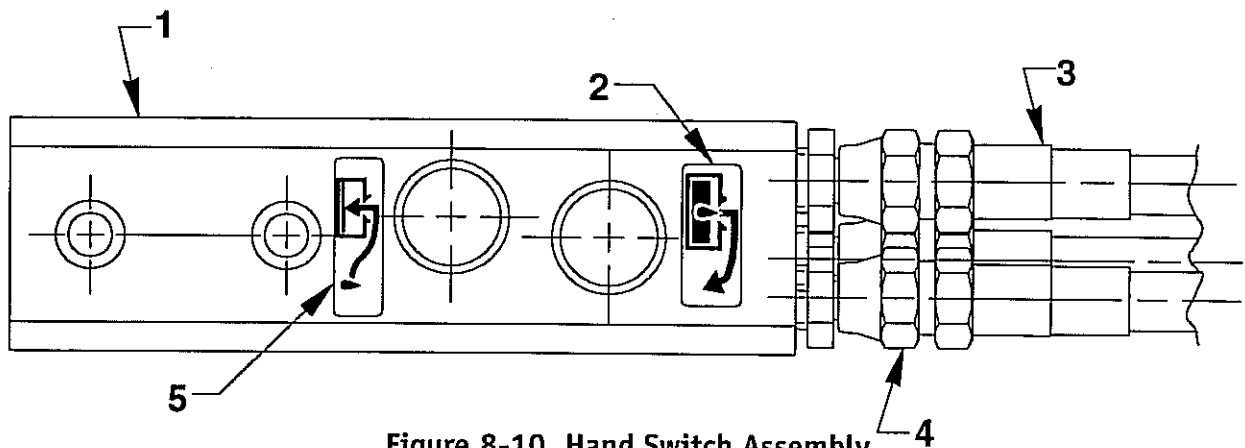


Figure 8-10. Hand Switch Assembly

### 8-10. Parts List For Hand Switch Assembly

Item No.	Part No.	No. Req'd	Description
1	421265	1	Air Operated Hand Control
2	251759	1	Instruction Decal (Pump)
3	45052	1	Three Strand Hose (12 ft. without spring guards; Note: connect hose assembly to remote control and pump as shown. Color coded or numbered ends must correspond to numbers on the remote control and pump unit.)
4	208218	3	Straight Fitting (1/8 NPTF)
5	251760	1	Instruction Decal (Release)

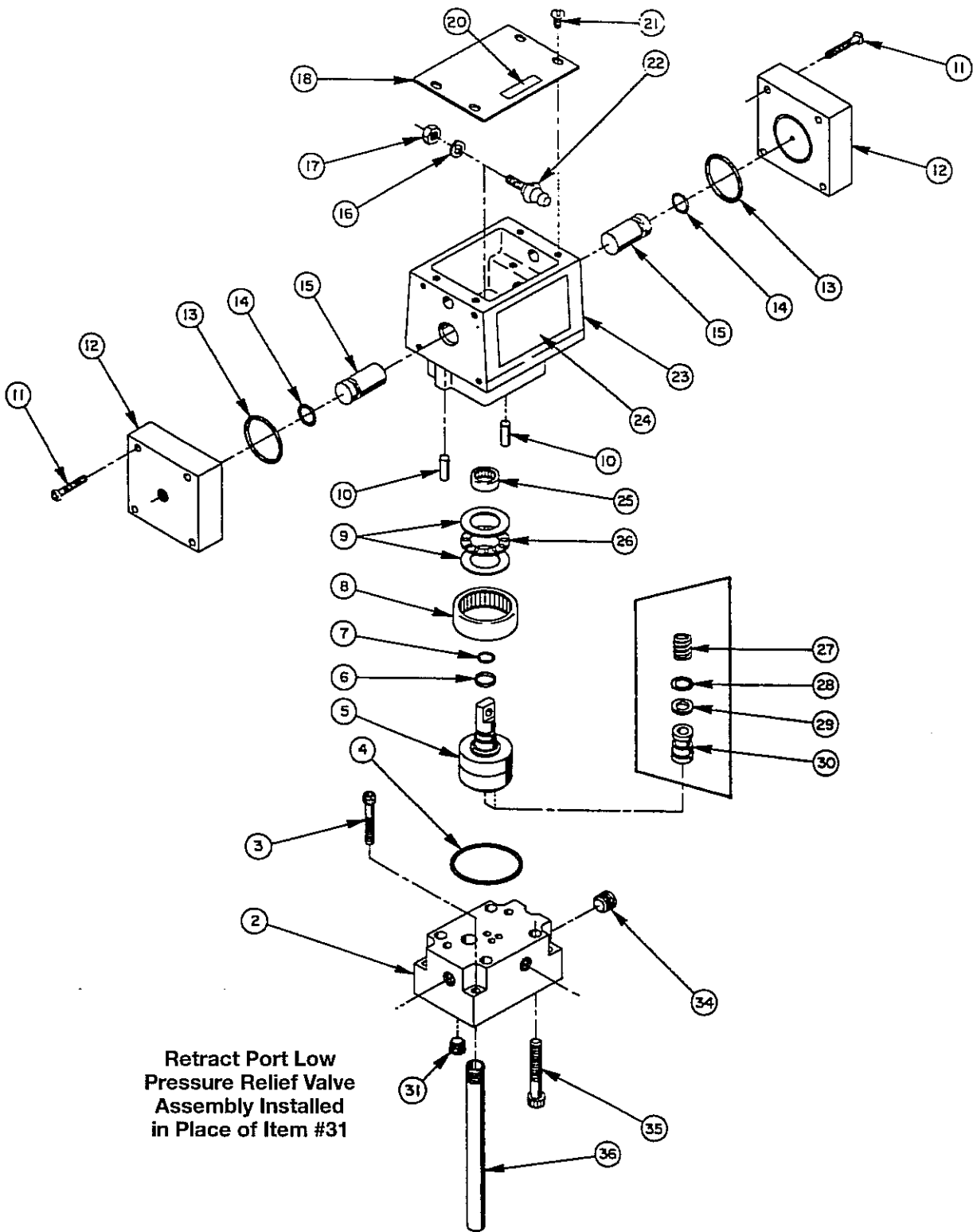


Figure 8-11. Valve Assembly

## 8-11. Parts List Valve Assembly

Item No.	Part No	No. Req'd	Description
2	61078	4	Subplate
3	10022	4	Soc Hd Mach Screw (1/4-20 UNC X 1 1/2 lg)
4	*214699	1	O-ring (2-3/16 X 2" X 3/32)
5	52064	1	Rotor
6	*208672	1	Glyd Ring
	*10268	1	O-ring (1/2 X 3/8" X 1/16, -012)
8	17505	1	Needle Roller Bearing
9	15935	2	Thrust Washer
10	17567	2	Spring Pin
11	13025	8	Mach Screw (#8 - 32 UNC X 1 1/4 lg) Torque to 10/15 in. lbs.
12	45209	2	Air Cap
13	*14852	2	O Ring (1 9/16 X 1 3/8 X 3/32, -126)
14	*210230	2	O Ring (11/16 X 1/2 X 3/32, -112)
15	208673	2	Cam Plunger
16	10245	1	Lockwasher
17	15504	1	Locknut
18	303976	1	Cover
20	209383	1	Patent Decal
21	10164	4	Machine Screw(#10-24 UNC x 3/8 Lg.)
22	304030	1	Lever
23	61077	1	Valve Body
24	208715	1	Part No. Decal
25	208671	1	Needle Roller Bearing
26	12188	1	Roller Bearing
27	15095	2	Compression Spring
28	*10265	2	O-ring (5/16 x 3/16 x 1/16, -008)
29	*15174	2	Backup Washer (5/16 x 3/16 x 3/64, -008)
30	303935	2	Shear Seal
31	15499	1	Pipe Plug (1/8 NPTF)
34	10479	1	Pipe Plug (1/4 NPFT)
35	18328	4	Soc. Hd. Cap Screw (5/16-18 x 2" Lg.)
36	200609	1	Drain Tube

### Parts Included But Not Shown

13999	1	Straight Fitting
16797	1	90° Elbow Fitting

Part numbers marked with an (\*) asterisk are contained in Repair Kit No. 300332.

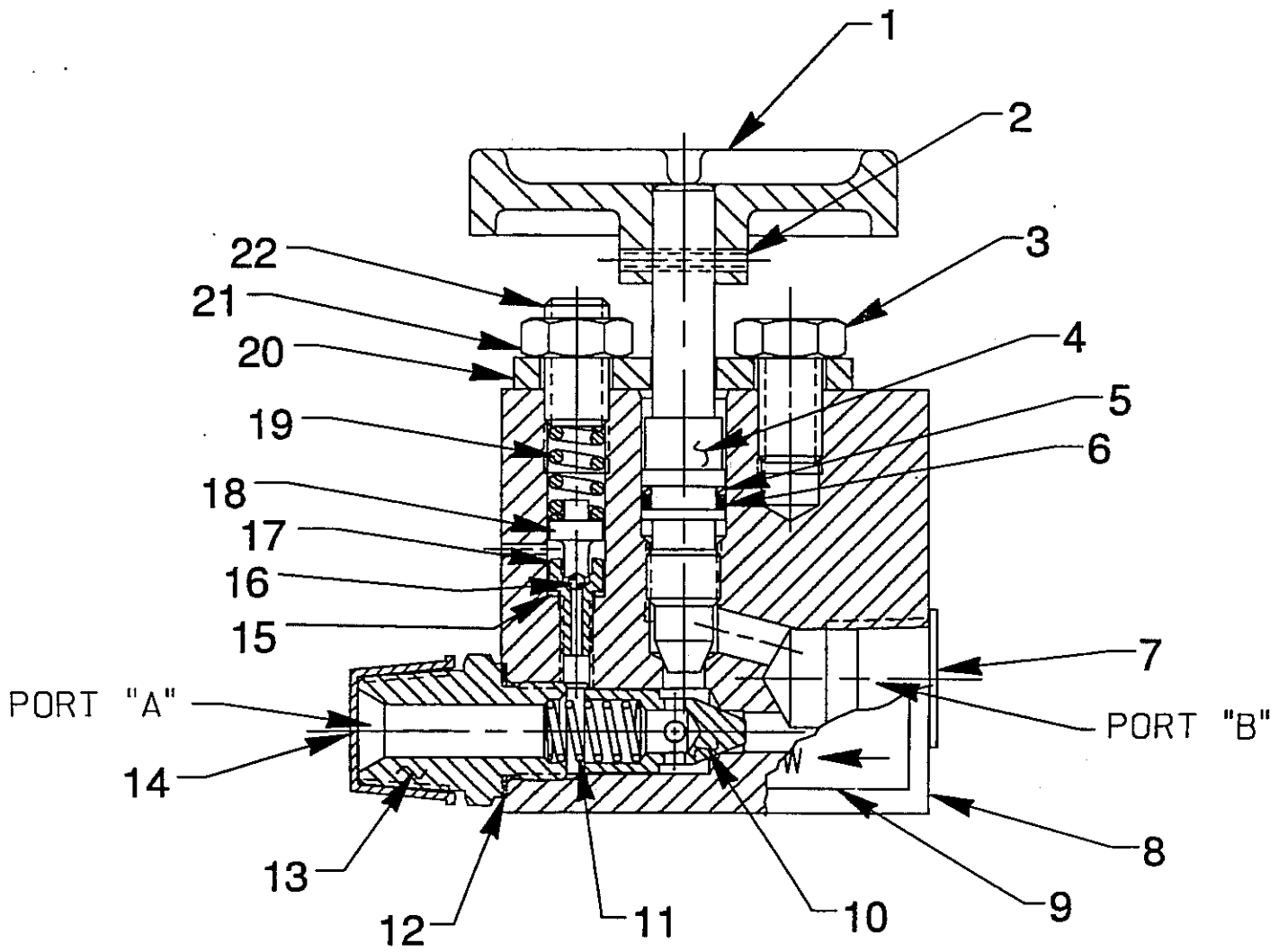


Figure 8-12. Load Lowering Valve

### 8-12. Parts List For Load Lowering Valve

Item No.	Part No.	Qty Req.	Description
1	23272	1	Knob
2	10895	1	Roll Pin
3	250951	1	Hex Hd Cap Screw
4	307022	1	Control Valve Stem
5	11863	1	Backup Washer (1/2 X 3/8 X 1/16, -0112)
6	10268	1	O-Ring (1/2 X 3/8 X 1/16 -012)
7	12545	1	Plug
8	52861	1	Valve body
9	212983	1	Trade name Decal
10	20771	1	Poppet
11	10425	1	Compression spring (3/8 OD x 3/4" lg.)
12	10261	1	Copper washer (3/4 X 19/32 X 1/32)
13	20879	1	Connector (Torque to 40/445 ft. lbs.)
14	12546	1	Cap
15	14319	1	Copper Washer (5/16 X 3/16 X 1/32)
16	17238	1	Ball (3/32 dia)
17	203364	1	Replaceable Seat (Torque to 40/50 in lbs.)
18	29785	1	Ball Retainer
19	14475	1	Compression spring (5/16 OD x 5/8" lg.)
20	202653	1	Stop Plate
21	10386	1	Jam Nut (3/8-24UNF)
22	16732	1	Set Screw

### 8-13. Specifications

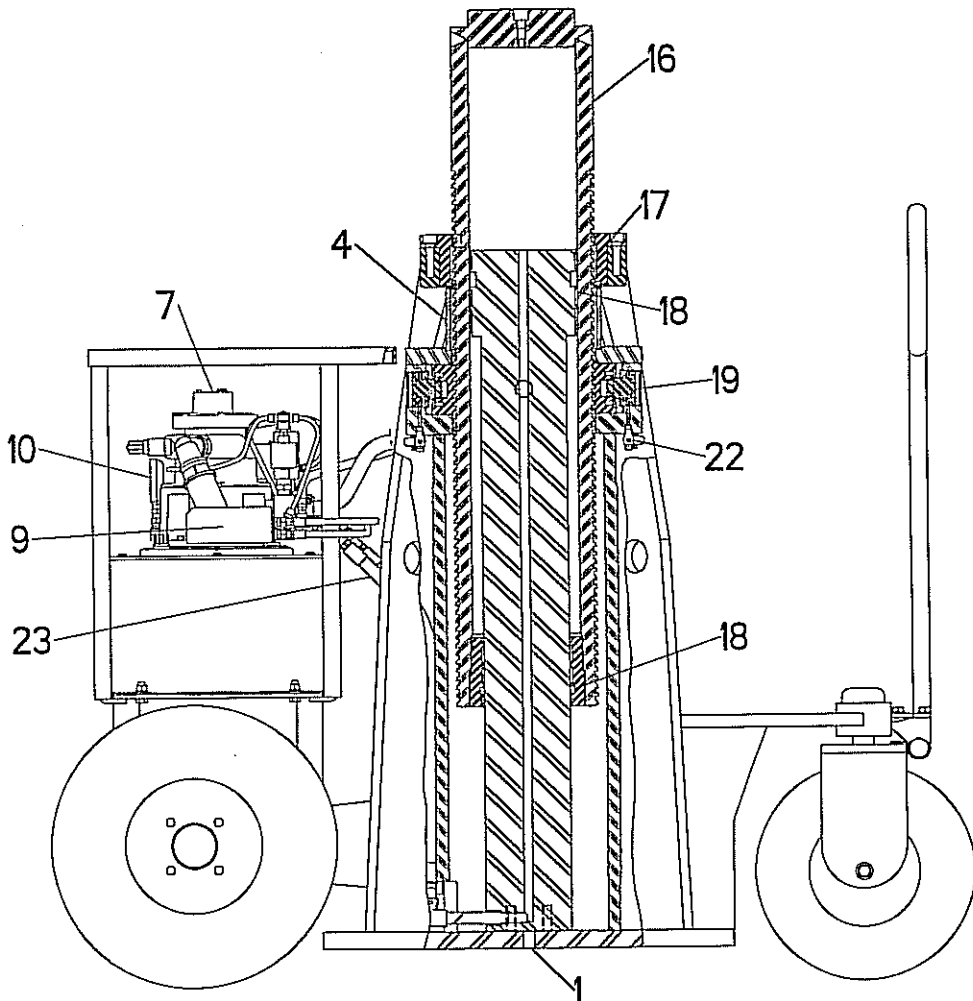
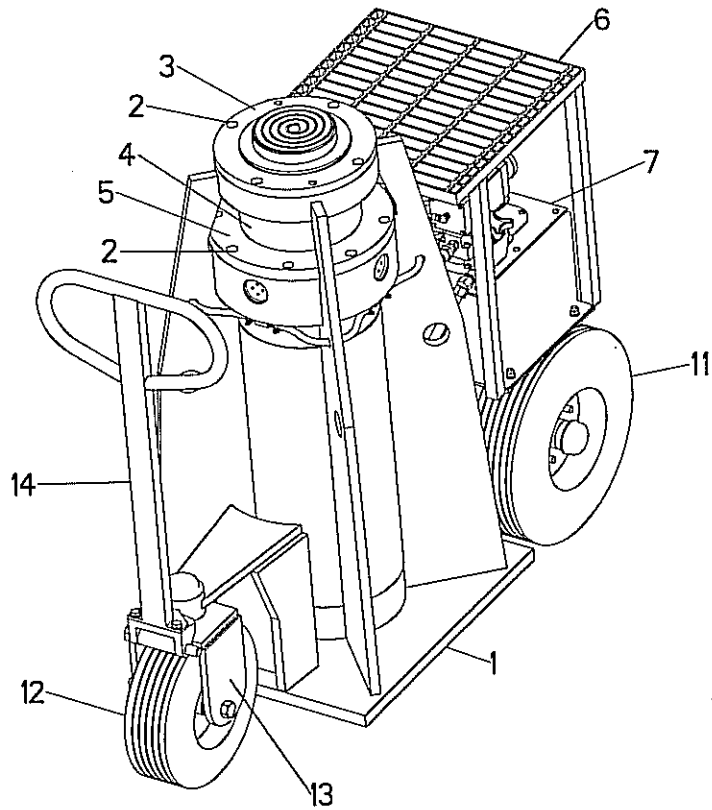
This is a valve that features precision metering for controlled cylinder return and built in pressure relief. The valve permits freeflow as the ram is extended. The built in check feature automatically locks and holds the load in the raised position until the operator opens the valve. The unit may be preset to provide consistent metered return of the load or the operator may select the rate of return with each actuation.

### 8-14. Operation

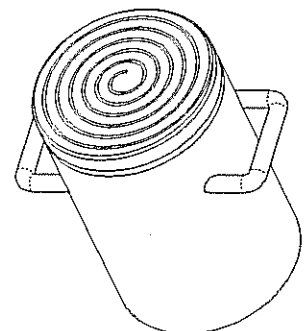
The direction of free flow is marked on one side of the valve body; note before installing valve. Connect port "A" to the extend side of the cylinder and port "B" to the control valve. On double acting cylinders the load lowering valve should not be completely closed when pressurizing the opposite port.

Note: This valve has a built in safety device that will vent system pressure to the atmosphere if accidentally pressurized beyond 12,500 PSI/ 875 Bar.

Pressure Relief Setting 12,500 PSI/ 875 Bar	Max. Flow Rate 5 Gal/Min	Max. Operating Pressure 10,000 PSI/700 Bar
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**Other  
Extensions  
Available**

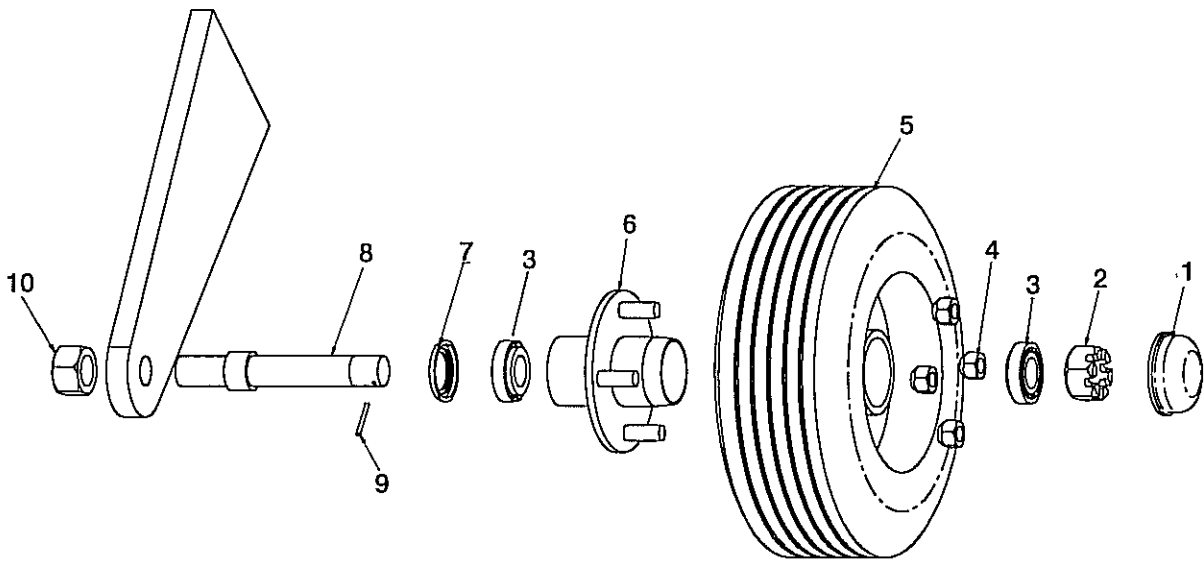


BJ150-70  
BJ150-71  
BJ150-72

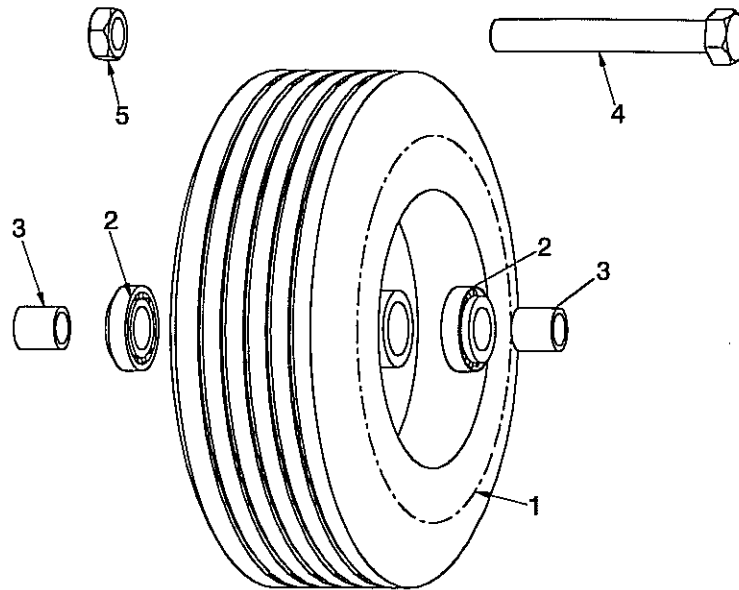
**Figure 8-16. BOSSMAN Jack Assembly**

## 8-16. Parts List BOSSMAN Jack Assembly

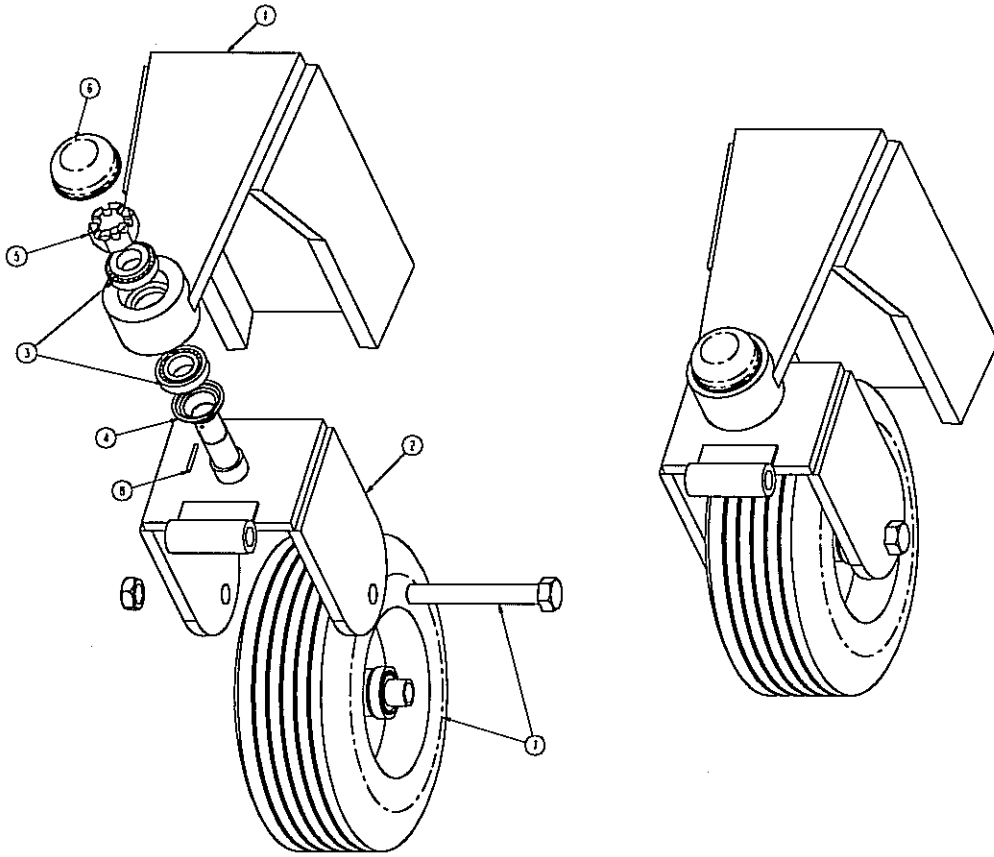
Index No.	Description	BJ15044		
		Part No.	Part No.	Qty. Req.
1	Main Base Parts/Assemblies	BJ100-6912		
	Cap Screw 1/2 -20 x 1 1/2		549-143C	3
	Cylinder Cap		BJ2200	1
	Cylinder Ext. Set (Optional)			1
	Cyl Ext. -6" Ht.		BJ150-70	1
	Cyl Ext. -9" Ht.		BJ150-71	1
	Cyl Ext. -12" Ht.	BJ150-72	1	
2	Cap Screw -1/2 - 20 X 1 1/4" Lg		549-140C	16
3	Top Cap		BJ1300	1
4	Safety Sleeve Clear Acrylic Tube		BJ2002	1
	Safety Sleeve Seal		BJ3005	2
5	Key Retainer Plate		BJ1760	1
6	Grate Assembly	BJ150-45		1
7	Power Unit	BJ150-05B		1
	Lowering Valve (included in 7)	BJ2050		1
9	Air Control & Hose Assembly (included in 7)	BJ150-20		1
10	Air Hose Protective Cover		BJ2400	1
	Guage		BJ1800	1
	Hex Bolt -3/8 -6 x 1" Lg		544-41C	1
	Flat Washer -3/8		H4095PC	4
	Muffler		X4859	4
	Pipe Nipple		BJ1215	1
	Reducing Elbow		BJ1216	1
	Pipe Nipple -1/4 x 3 Lg		BJ1801	1
	90° Swivel Fitting -1/4 FP x 1/4 Swivel Nut		BJ1803	1
11	Rear Wheel Assembly	BJ150-27		2
1	Dust Cap		BJ2305	1
2	Castle Nut -1" - 14		S56-33C	1
3	Tapered Bearing		SK2658-5	2
4	Lug Nut -1/2" - 20		S56 - 39C	4
5	Rear Tire & Rim		BJ2300	1
6	Idler Hub		BJ2301	1
7	Seal		BJ1004	1
8	Rear Axle		BJ2251	1
9	Cotter Pin		S2-24C	1
10	Hex Nut -1" - 14		S12 - 82C	1
12	Front Wheel Assembly	BJ150-01		1
1	Front Tire & Rim		BJ1000	1
2	Wheel Bearing		BJ1001	2
3	Wheel Spacer		BJ1058	2
4	Front Axle		S44 - 189C	1
5	Hex Nut -3/4" - 10		S12 - 43C	1
13	Front Wheel Support Assy (See Figure 8-19)	BJ150-02		1
2	Front Wheel Sub - Assy		BJ150 - 02B	1
3	Tapered Bearing		SK2658-5	2
4	Seal		BJ1004	1
5	Castle Nut -1" - 14		S56 - 33C	1
6	Dust Cap		BJ2305	1
7	Front Wheel Assembly		BJ150 - 01	1
8	Cotter Pin		S2 - 24C	1
14	Handle Assembly (See Figure 8-20)	BJ150-03		1
1	Handle		BJ1070	1
2	Handle Bracket		BJ1071	1
3	Bolt - 7/16-14 X 1" Lg		S44-97C	3
4	Washer -7/16 "		S42-23C	3
5	Bracket Bolt -3/4 - 10 X 5 1/2" Lg		S44-80C	1
6	Hex Nut Nyloc -3/4 - 10		S12-43C	1
	Bossman Nameplate	BJ3000		1
	Duff-Norton Nameplate	BJ3001		1
	Warning Decal	BJ3002		1
	Capacity Decal	BJ3004		1
16	Hydraulic Cylinder Assembly	BJ150-46		1
	Outer Tube		BJ150-48	1
	Inner Rod		BJ150-49	1
	Cylinder Head	BJ2150		1
17	Top Cap Wearguide		BJ1350	2
18	Cylinder Seal Kit	BJ150-10		1
	Piston Seal (Inner Rod)		BJ1450	1
	Wearguide (Inner Rod)		BJ1452	2
	O-Ring with back-up (Cylinder Head)		BJ1453	1
	Wearguide (Cylinder Head)		BJ1454	2
	Head Seal (Cylinder Head)		BJ1455	1
	Wiper (Cylinder Head)		BJ1456	1
	Cylinder Bleed Plug	H6267C		1
19	Locking Mechanism Parts			
	Lock Shoes (Set Of 4)		BJ1500	1
	Compression Spring		BJ1900	32
	Air Piston Kit	BJ150-12		1
	Piston		BJ1550	4
	O-Ring (Piston)		BJ1551	4
	Brass Liner Kit	BJ150-13		1
	Brass Liner		BJ1600	4
	O-Ring (Brass Liner)		BJ1601	4
22	Air Hose & Fiting Assembly	BJ100-18		1
	Fitting 90 Deg 1/8"MP x 1/8"FP		BJ1650	1
	"T" 1/8"MP x 1/8"FP x 1/8"FP		BJ1651	3
	Barb Fitting 1/8"MP x 1/4" Hose		BJ1652	7
	Hose Clamp (1/4" Hose)		BJ1654	8
	1/4" Hose x 12" Lg.		BJ1655-12	3
	1/4" Hose x 18" Lg.		BJ1655-10	1
	1/2" Hose x 12" Lg.		BJ1657-10	1
	Barb Fitting 1/2" MP x 1/2" Hose		BJ1658	1
	Barb Fitting 3/8" MP x 1/2" Hose		BJ1660	1
	Hose Clamp (1/2" Hose)		BJ1659	2
23	Hydraulic Hose Assembly	BJ150-19		1
	Pipe Nipple-3/8" x 6" Lg.		BJ1700	1
	Swivel Fitting-3/8"FP x 3/8" Swivel Nut		BJ1701	2
	Hydraulic Hose - 26" Lg		BJ1705	2
	Pipe Nipple-3/8" x 4" Lg.		BJ1704	1



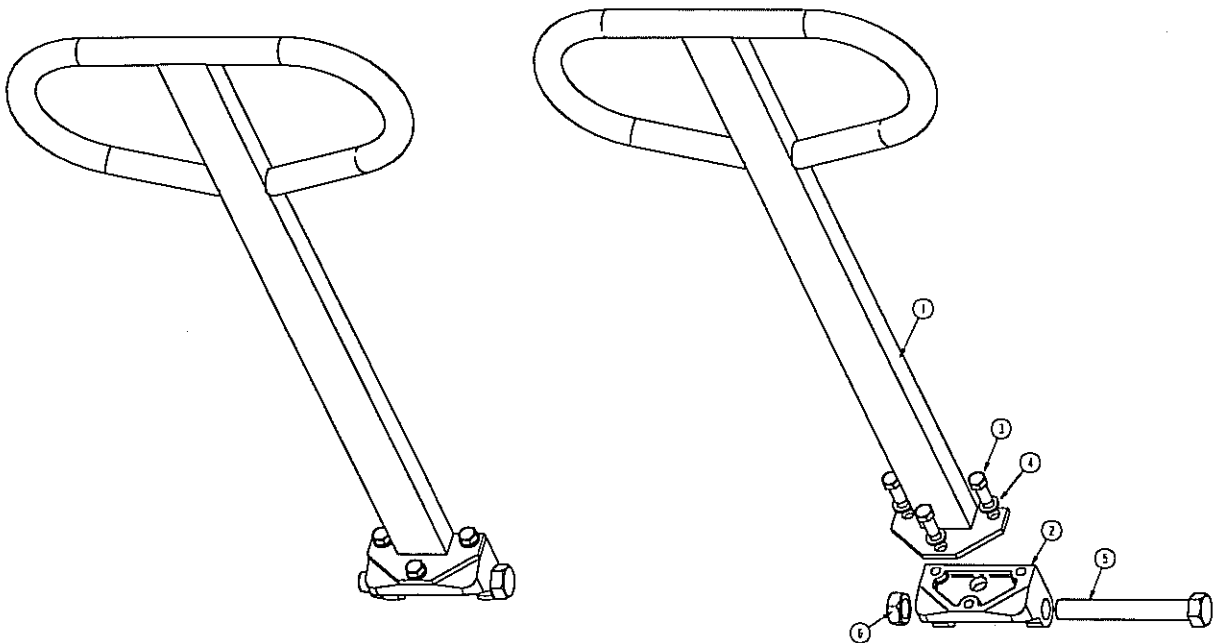
**Figure 8-17. Rear Wheel Assembly (Index No. 11)**



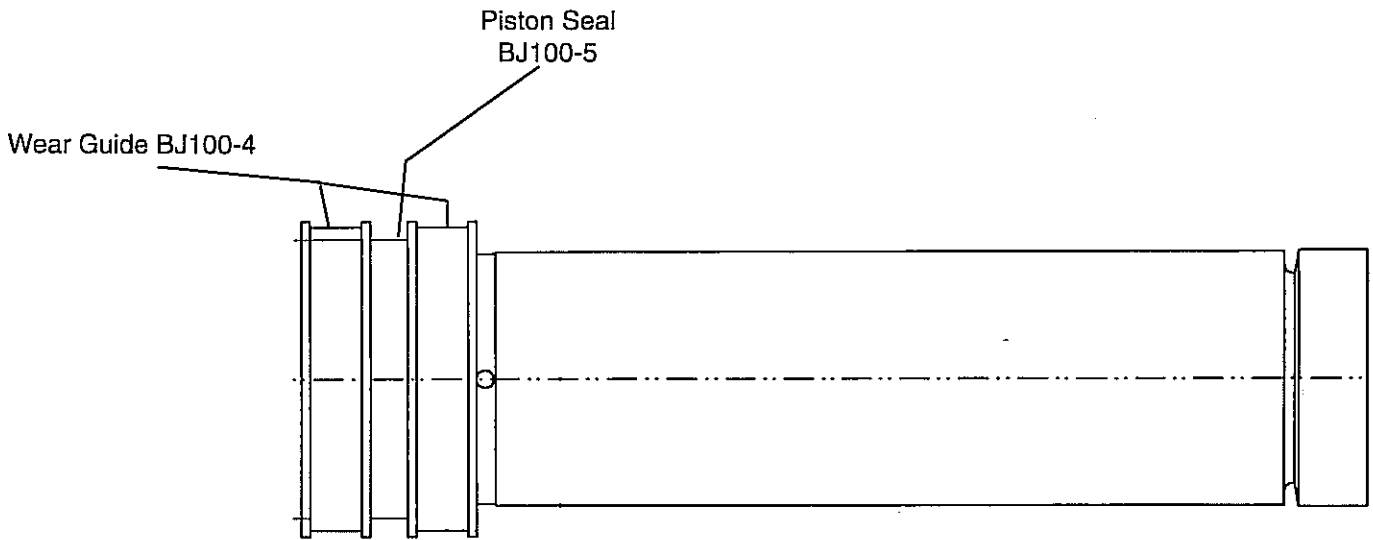
**Figure 8-18. Front Wheel Assembly (Index No. 12)**



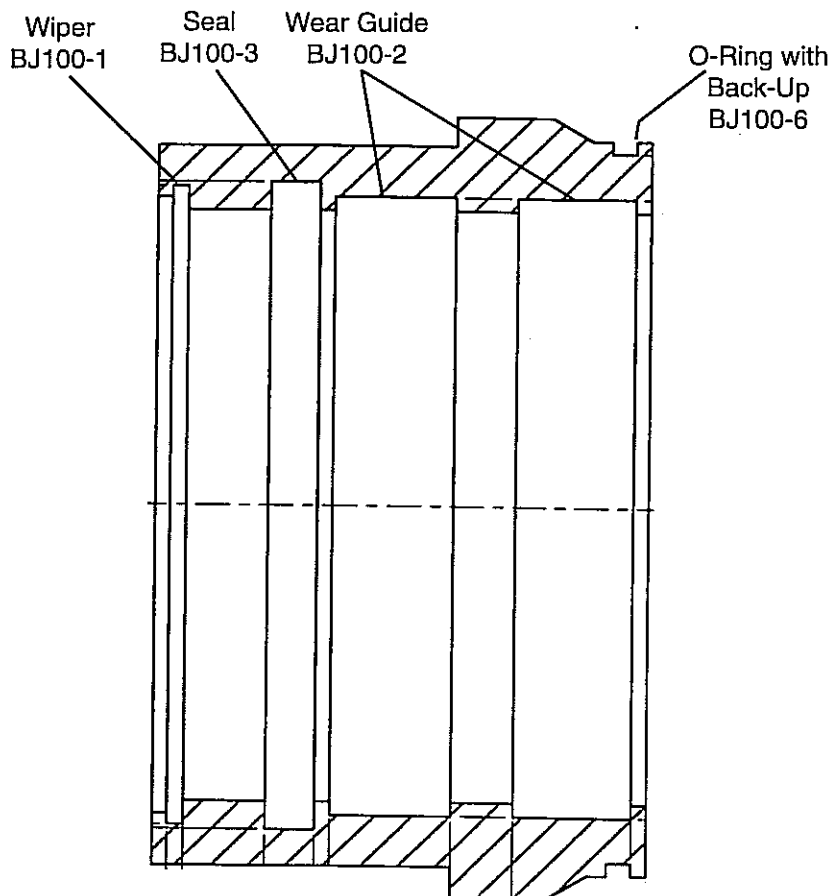
**Figure 8-19. Front Wheel Support Assembly (Index No. 13)**



**Figure 8-20. Handle Assembly (Index No. 14)**



**Figure 8-21. Inner Rod Assembly (Index No.18)**



**Figure 8-22. Cylinder Head (Index No. 18)**





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