

# **OPERATION & SERVICE MANUAL**



Model: 8704-010 35 Ton (31.8 Metric Ton) Portable Jacking System

04/2018 - Rev. 01

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This product can not be modified without the written approval of Tronair, Inc. Any modifications done without written approval voids all warranties and releases Tronair, Inc., it suppliers, distributors, employees, or financial institutions from any liability from consequences that may occur. Only Tronair OEM replacement parts shall be used.

#### 1.0 PRODUCT INFORMATION

#### 1.1 DESCRIPTION

35 Ton (31.8 Metric Ton) Portable Jacking System

#### 1.2 MODEL & SERIAL NUMBER

Reference nameplate on unit

## 1.3 MANUFACTURER

Columbus **Jack**/Regent Telephone: 614.443.7492 1 Air Cargo Pkwy East Fax: 614.444.9337

Swanton, Ohio 43558 USA E-mail: sales@columbusjack.com Website: www. columbusjack.com

## 1.4 SPECIFICATIONS

 Capacity
 35 Ton (31.8 Metric Ton)

 Minimum Height
 10 in (25.4 cm)

 Hydraulic Lift
 18 in (45.72 cm)

 Extension Screw
 4 in (10.16 cm)

 Maximum Height
 32 in (81.28 cm)

 Estimated Weight
 250 lbs (113.4 kg)

 Operating Pressure
 7350 psi (506.8 bar)

 Relief Valve Pressure
 8085 psi (557.4 bar)

 Reservoir Capacity
 1.75 gal (6.6 l)

## 2.0 SAFETY INFORMATION

### 2.1 USAGE AND SAFETY INFORMATION

To insure safe operations please read the following statements and understand their meaning. Also refer to your equipment manufacturer's manual for other important safety information. This manual contains safety precautions which are explained below. Please read carefully.



**WARNING!** — Warning is used to indicate the presence of a hazard that *can cause severe personal injury, death, or substantial property damage* if the warning notice is ignored.

**CAUTION!** — Caution is used to indicate the presence of a hazard that *will or can cause minor personal injury or property damage* if the caution notice is ignored.

## 2.2 PRODUCT SAFETY

Make sure all personnel involved with this jack read and understand these instructions before using.



## **WARNING!**

The jack is designed to lift only vertical loads with a maximum weight of 35 ton (31.8 metric ton). DO NOT use jack for lifts exceeding the weight or design limits. Failure to comply can result in injury or death to personnel and/or severe damage to the jack and aircraft.

## 3.0 PREPARATION PRIOR TO FIRST USE

## 3.1 GENERAL INSPECTION

If the jack is crated, uncrate and remove shipping straps or packing material. Inspect for physical damage and missing parts.

## 3.2 SYSTEM BLEED PROCEDURE

Using hand pump cycle cylinder rams several times.





### 4.0 TRAINING

## 4.1 TRAINING REQUIREMENTS

The employer of the operator is responsible for providing a training program sufficient for the safe operation of the unit.

## 4.2 TRAINING PROGRAM

The employer provided operator training program should cover safety procedures concerning use of the unit in and around the intended aircraft at the intended aircraft servicing location.

## 4.3 OPERATOR TRAINING

The operator training should provide the required training for safe operation of the unit.

NOTE: Maintenance and Trouble Shooting are to be performed by a skilled and trained technician.

## 5.0 OPERATION

#### 5.1 PRE-OPERATION PROCEDURE

- 1. Perform visual inspection, by checking for oil leakage.
- 2. Check for loose, damaged or missing parts.
- 3. Check oil level.

## 5.2 LIFTING PROCEDURE

- 1. Verify jack is located per airplane jacking procedures.
- 2. Connect the hand pump to the cylinder assembly.
- 3. Raise extension screw to mate with airplane axle jacking point.
- 4. Close release valve.
- 5. Operate hand pump to raise aircraft as required.



#### **CAUTION!**

With no load applied to the jack, it is normal for any stage to extend first. Once a load is applied to the jack, ensure that the first stage ram (larger) is fully extended first, before the second stage ram (smaller) begins to extend. Ensure that the second stage ram (smaller) is fully extended before the third stage ram (smallest) begins to extend. If the jack does not extend in this sequence, the jack should be disassembled to determine the cause of the excessive friction in the ram stages.

## 5.3 LOWERING PROCEDURE

1. Slowly open release valve to lower rams.

NOTE: Speed of lowering is controlled by how fast release valve is opened.

2. Lower extension screw fully after rams are completely collapsed.

## 5.4 RELIEF VALVE SETTING

- 1. Position jack under a jack tester. Fully extend the first and second stage rams and partially extend the third stage.
- 2. Remove the plug from under the hand pump piston (Item 6 on Double Pump Assembly).
- 3. Using hand pump set relief valve at 12 13.50 tons as described in RJM 117. (See Appendix).
- Reinstall plug
- 5. Remove plug from under the hand pump piston (Item 5 on Double Pump Assembly).
- 6. Using hand pump set relief valve at 36.75 18.50 tons as described in RJM 117. (See Appendix).



## **CAUTION!**

Use care not to set valve more than 10% above rated capacity.

DO NOT exceed 38 ton (34.5 metric ton).

Reinstall plug.



## 6.0 TROUBLE SHOOTING

If operational troubles are encountered, refer to the Trouble Shooting Chart which lists the most commonly occurring problems and gives information which will facilitate location of trouble source and determination of remedial action.

TROUBLE	PROBABLE CAUSE	REMEDY
External fluid leakage at manual pump piston or pump body.	Damaged backup rings, packing, piston or pump body.	Remove affected piston and inspect piston and pump body for damage. Replace defective parts. Replace removed packing and backup ring.
External fluid leakage at rams	Damaged backup ring, packing or inner cylinder wall	Withdraw rams as a unit from cylinder. Inspect defective parts. Replace "O" Ring.  Withdraw screw extension and ram components as a unit from cylinder. Inspect defective parts. Replace "O" Ring
	Incomplete closure of release valve	Fully tighten release valve
Jack fails to lift rated load	Obstructed fluid suction passages	Remove pump rocker and link details. Unscrew pump body; remove assembled valve assembly. Blow passage clear with compressed air; flush with clean fluid, reassemble and fill with hydraulic fluid
with operation of manual or pneudraulic pump	Low fluid level	Fill to correct fluid level
Freezensians Familia	By-pass valve improperly adjusted	Test and adjust by-pass valve as instructed in RJM 117
	Broken compression spring	Remove pump rocker and link details, unscrew pump body. Remove and replace defective valve assembly; test and adjust by-pass valve as instructed in RJM 117
	Low fluid level	Fill to correct fluid level
Rams will not fully elevate when manual pump is	Leaking pump discharge valve or leaking pump suction valve	Remove pump rocker and link details, unscrew pump body. Remove and replace defective valve assembly; test and adjust by-pass valve as instructed in RJM 117
operated	Air lock or vacuum in reservoir due to clogged breather passage in air vent; clogged intake oil screen	Remove air vent assembly and/or oil screen and clear the obstruction
Rams will not support load after manual or pneudraulic	Internal pressure leakage at ram static or dynamic seals	Check for external leakage, if present, replace defective seal. If no external leakage is observed then remove screw extension and check for oil inside of chamber. Oil here can be from a weld leak or leakage by the 1/8" pipe plug or the side of the housing
pump up	Leaking pump discharge valve	Remove the check valve and verify holding capacity on test stand. If leakage occurs, replace.
	Pressure leakage past release valve ball	Remove release valve, inspect ball and ball seat in pump block. Replace defective parts.
	Incomplete closure of release valve	Fully tighten release valve
Rams elevate and fall with each manual pump stroke	Check valve next to cylinder and in hand pump, both are defective	Remove and replace defective check valve
Cacif mandar pump shoke	Pressure leakage past release valve ball	Remove release valve. Inspect ball and ball seat in pump block. Replace defective parts
Manual pump inoperative of difficult to operate	Air lock or vacuum in reservoir due to clogged breather passage in air vent assembly, clogged intake oil screen	Remove air vent assembly, and/or oil screen and clear obstruction
Pump-up satisfactory, but	By-pass valve improperly adjusted	Test and adjust by-pass valve as instructed in RJM 117
pump pressure fails to by- pass at maximum ram extension or with overload applied	Defective or jammed by-pass valve spring, rivet or ball	Remove pump rocker and link details, unscrew pump body. Remove and replace defective valve assembly; test and adjust by-pass valve as instructed in RJM 117





7.0 MAINTENANCE

7.1 SHOP AIDS AVAILABLE Adjuster Assembly 915-EB

7.2 OVERHAUL KITS AVAILABLE

Seal Kit KC8704 Repair Kit KD87043

### 8.0 PROVISION OF SPARES

#### 8.1 SOURCE OF SPARE PARTS

Spare parts may be obtained from the manufacturer:

Columbus **Jack**/Regent Telephone: 614.443.7492 1 Air Cargo Pkwy East Fax: 614.444.9337

Swanton, Ohio 43558 USA E-mail: sales@columbusjack.com Website: www. columbusjack.com

### 8.2 RECOMMENDED SPARE PARTS LISTS

Reference the following page(s) for Replacement Parts and Kits available.

#### 9.0 IN SERVICE SUPPORT

Contact Columbus Jack. for technical services and information. See Section 1.3 - Manufacturer.

## 10.0 GUARANTEES/LIMITATION OF LIABILITY

- ColumbusJACK Corporation, (Seller) warrants each new product of its manufacture to be free from defects in material
  or workmanship, under proper, reasonable and normal use and service, and for a period of twelve (12) months after
  date of shipment from Seller's Swanton, OH. USA facility.
- 2. Where Buyer claims an alleged defect in material or workmanship and so advises Seller in writing within ten (10) days after discovery thereof, then and in such event, Buyer shall return said equipment, transportation prepaid, to the Seller, provided such return is timely and within twelve (12) months form date of original shipment. This warranty and liability of the Seller is expressly limited solely to replacement of repair of defective parts or goods, and return at Buyer's expense to Seller after find by Seller the product was defective prior to original shipment or, at the option of Seller, to making refund to Buyer of the purchase price for said product.
- 3. It is further expressly understood and agreed that:
  - a. THERE IS NO WARRANTY, representation of condition OF ANY KIND, express or implied, (INCLUDING NO WARRANTY OF MERCHANT-ABILITY OR OF FITNESS) EXCEPT THAT THE MATERIAL SHALL BE OF THE QUALITY SPECIFIED HEREIN, and none shall be implied by law. Except as otherwise provided herein, quality shall be in accordance with seller's specifications. Final determination of the material for the use contemplated by Buyer is the sole responsibility of Buyer and Seller shall have no responsibility in connection with such suitability, and
  - b. The Buyer's sole and exclusive remedy shall be repair or replacement of defective parts by the Seller. Should the goods, in the judgment of Seller, preclude the remedying of the warranted defects by repair or replacement, the buyer's sole and exclusive remedy shall the be the refund of the purchase price, and
  - c. Seller shall not be liable for prospective profits or special, indirect or consequential damages, nor shall any recovery of any kind against Seller be greater in amount than the purchase price of the specific material sold and causing the alleged loss, damage or injury. Buyer assumes all risk and liability for loss, damage or injury to persons or property of Buyer or others arising out of use or possession of any product or part sold hereunder, and
  - d. The Seller shall in no way be deemed or held to be obligated, liable or accountable upon or for any guarantees or warranties, express or implied, or created by statute or by operation of law or otherwise, in any manner of form beyond its express agreement above set forth, and
  - e. No warranty herein shall apply to any product which shall have been repaired or altered, unless such alteration or repair has been made by Seller or where, after return to and inspection by Seller, the product is found by Seller to have been subject to misuse, negligence or accident, and
  - f. No warranty of any nature is made by Seller as to any component forming a part of the product sold and Buyer shall receive only such warranties offered by such other manufacturer pertinent to such component, and
  - Seller does not assume nor does Seller authorize any other person to assume for it any other liability or make any warranty in connection with the sale of its products.

The obligations of ColumbusJACK expressly stated herein are in lieu of all other warranties or conditions expressed or implied. Any unauthorized modification of the ColumbusJACK products or use of the ColumbusJACK products in violations of cautions and warnings in any manual (including updates) or safety bulletins published or delivered by ColumbusJACK will immediately void any warranty, express or implied and ColumbusJACK disclaims any and all liability for injury (WITHOUT LIMITATION and including DEATH), loss or damage arising from or relating to such misuse.





## 11.0 APPENDICES

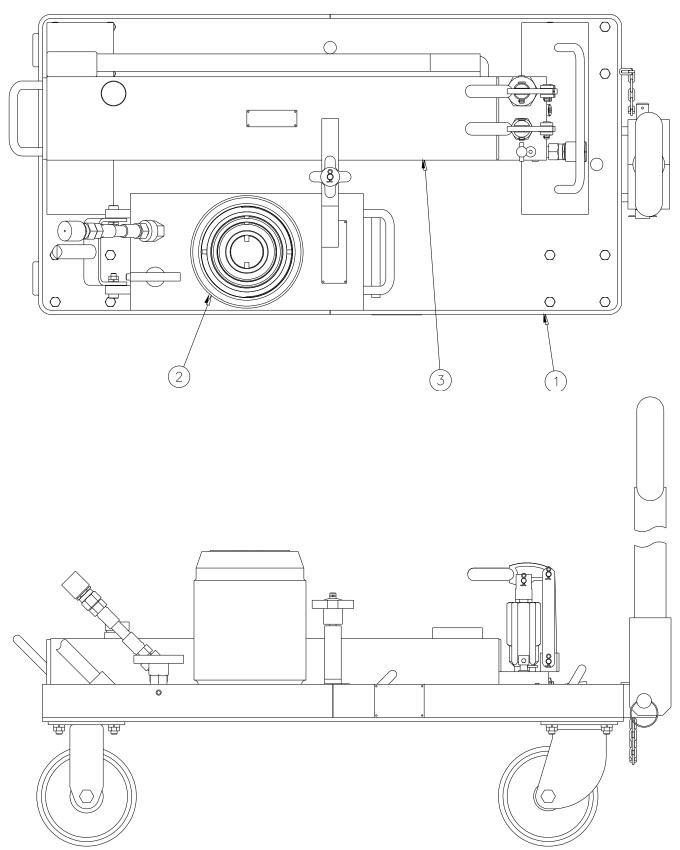
APPENDIX I Routine Jack Maintenance Bulletins



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Parts List
When ordering replacement parts/kits, please specify model, serial number and color of your unit.





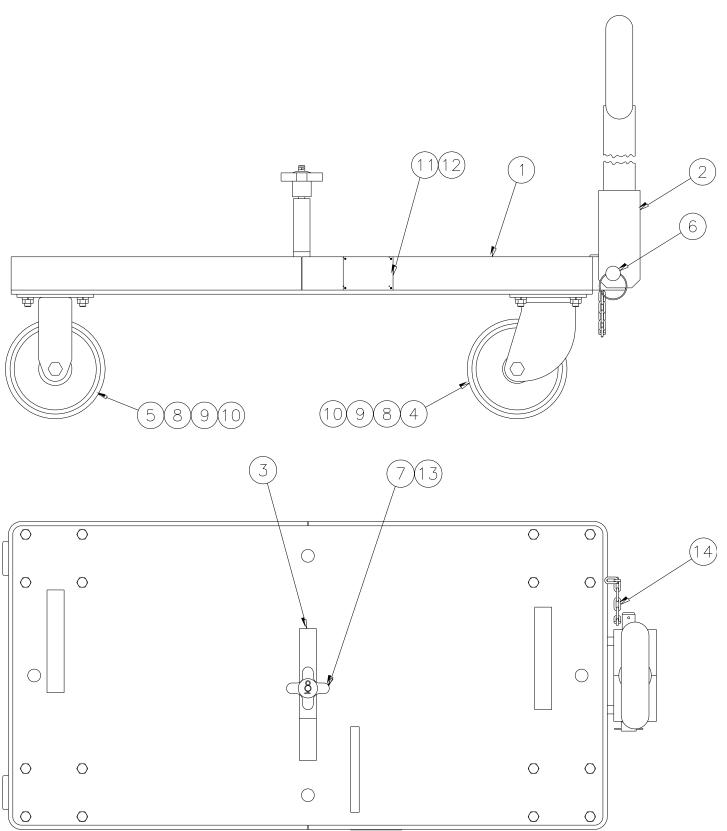
## **Parts List**

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	8704-D	Dolly Assembly	1
2	8704-C	Jack Assembly	1
3	7933-C	Pump Assembly	1



Parts List
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



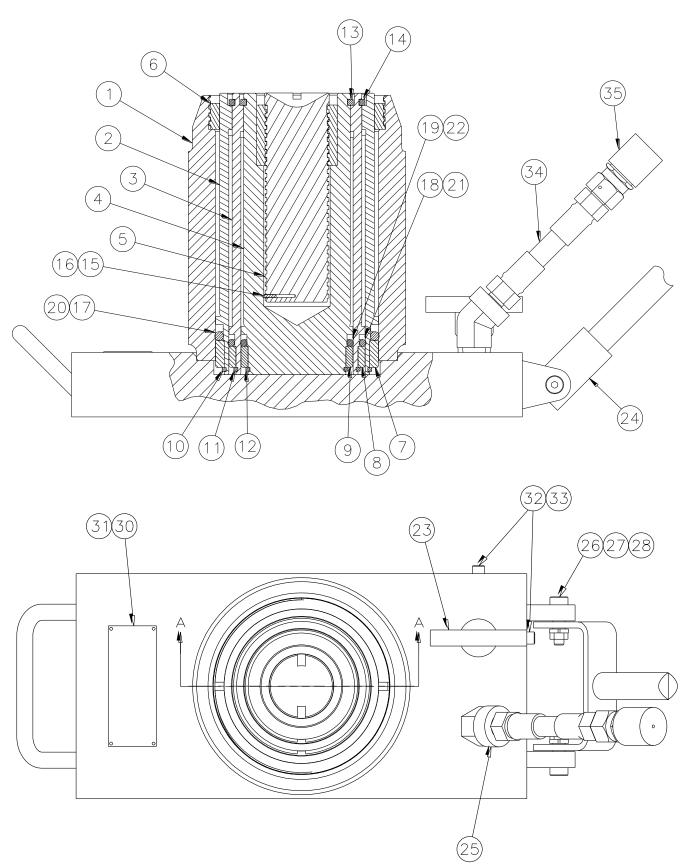


# Parts List When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
	8704-D	Dolly Assembly; consists of:	
1	8704-12	Frame	1
2	8404-3	Towbar	1
3	8704-10	Clamp	1
4	450A6145	Swivel Caster	2
5	450A6146	Rigid Caster	2
6	450A6086	Faspin	1
7	450A6147	Hand Knob	1
8	371-16080	Hex Head Cap Screw	16
9	333-41600	Hex Nut	16
10	346-10024	Lockwasher	16
11	916-47	Nameplate	1
12	450A6984	Drive Screw	4
13	322-04240	Cotter Pin	1
14	8704-14	Link Chain	1



Parts List
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



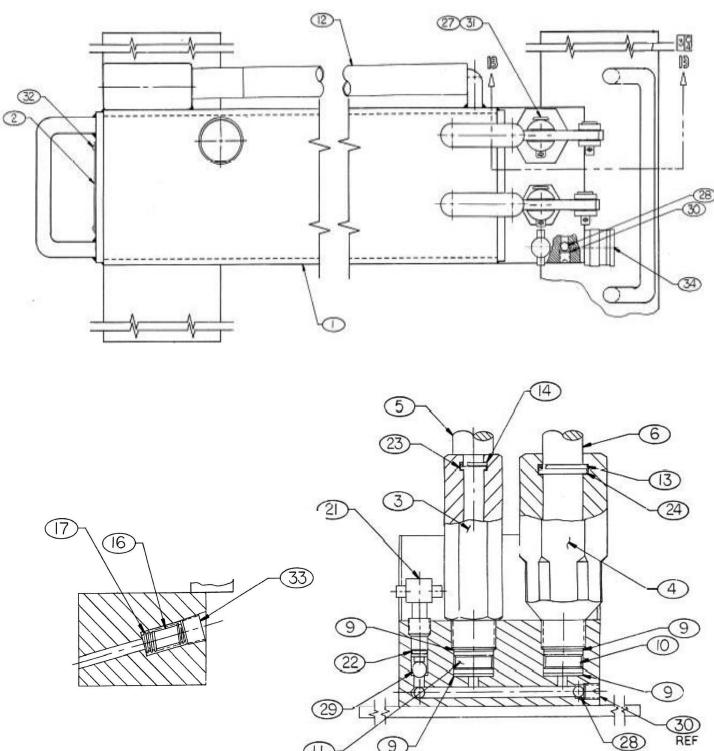


Parts List
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

8704-C         Jack Assembly; consists of:           1         8704-1         Base and Cylinder         1           2         8704-2         Ram, First Stage         1           3         8704-3         Ram, Second Stage         1           4         8704-4         Ram, Third Stage         1           5         8704-7         Screw Extension         1           6         1905-6         Bushing, Cylinder         1           7         1905-7         Piston, First Stage         1           8         1905-8         Piston, Second Stage         1           9         1905-9         Piston, Third Stage         1           10         915-140.12-4.380         Snap Ring         1           11         915-140.12-3.63         Snap Ring         1           12         915-140.18-3.81         Snap Ring         1           13         915-140.18-3.81         Snap Ring         1           14         915-140.18-3.81         Snap Ring         1           15         915-118         Plunger         1           16         915-149         Spring         1           17         611-42542         O-Ring         1	Item	Part Number	Description	Qty
2       8704-2       Ram, First Stage       1         3       8704-3       Ram, Second Stage       1         4       8704-4       Ram, Third Stage       1         5       8704-7       Screw Extension       1         6       1905-6       Bushing, Cylinder       1         7       1905-7       Piston, First Stage       1         8       1905-8       Piston, Second Stage       1         9       1905-9       Piston, Third Stage       1         10       915-140.12-4.380       Snap Ring       1         11       915-140.12-3.63       Snap Ring       1         12       915-140.12-3.83       Snap Ring       1         13       915-140.12-3.83       Snap Ring       1         14       915-140.13-3.81       Snap Ring       1         15       915-118       Plunger       1         16       915-119       Spring       1         17       611-42542       O-Ring       1         18       611-343434       O-Ring       1         20       916-44-4.583       Backup Ring       1         21       916-45-3.107       Backup Ring       1 </th <th></th> <th>8704-C</th> <th>Jack Assembly; consists of:</th> <th></th>		8704-C	Jack Assembly; consists of:	
3       8704-3       Ram, Second Stage       1         4       8704-4       Ram, Third Stage       1         5       8704-7       Screw Extension       1         6       1905-6       Bushing, Cylinder       1         7       1905-7       Piston, First Stage       1         8       1905-8       Piston, Second Stage       1         9       1905-9       Piston, Third Stage       1         10       915-140.12-4.380       Snap Ring       1         11       915-140.12-3.63       Snap Ring       1         12       915-140.12-3.63       Snap Ring       1         13       915-140.12-3.63       Snap Ring       1         14       915-140.12-3.63       Snap Ring       1         15       915-140.13-3.81       Snap Ring       1         16       915-119       Spring       1         17       611-343-3.095       Snap Ring       1         17       611-343-3.33       O-Ring       1         18       611-343-33       O-Ring       1         20       916-45-3.857       Backup Ring       1         21       916-45-3.867       Backup Ring <td< td=""><td>1</td><td>8704-1</td><td>Base and Cylinder</td><td>1</td></td<>	1	8704-1	Base and Cylinder	1
4       8704-4       Ram, Third Stage       1         5       8704-7       Screw Extension         6       1905-6       Bushing, Cylinder         7       1905-7       Piston, First Stage         8       1905-8       Piston, Second Stage         9       1905-9       Piston, Third Stage         10       915-140.12-4.380       Snap Ring         11       915-140.12-3.63       Snap Ring         12       915-140.12-2.88       Snap Ring         13       915-140.18-3.81       Snap Ring         14       915-140.18-3.81       Snap Ring         15       915-118       Plunger         16       915-119       Spring         17       611-42542       O-Ring         18       611-34434       O-Ring         19       611-33833       O-Ring         20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         21       916-45-3.107       Backup Ring         22       916-45-3.107       Backup Ring         23       450A6148       Needle Valve         24       485-10606       Street Elbow         25	2	8704-2	Ram, First Stage	1
5         8704-7         Screw Extension           6         1905-6         Bushing, Cylinder           7         1905-7         Piston, First Stage           8         1905-8         Piston, Second Stage           9         1905-9         Piston, Third Stage           10         915-140.12-4.380         Snap Ring           11         915-140.12-3.63         Snap Ring           12         915-140.12-2.88         Snap Ring           13         915-140.12-2.88         Snap Ring           14         915-140.18-3.81         Snap Ring           15         915-140.18-3.81         Snap Ring           16         915-118         Plunger           17         611-42542         O-Ring           18         611-34434         O-Ring           19         611-33833         O-Ring           20         916-44-4.583         Backup Ring           21         916-45-3.107         Backup Ring           21         916-45-3.107         Backup Ring           22         916-450-418         Needle Valve           23         450A6148         Needle Valve           24         7933-5         Handle         1 <tr< td=""><td>3</td><td>8704-3</td><td>Ram, Second Stage</td><td>1</td></tr<>	3	8704-3	Ram, Second Stage	1
6         1905-6         Bushing, Cylinder           7         1905-7         Piston, First Stage           8         1905-8         Piston, Second Stage           9         1905-9         Piston, Third Stage           10         915-140.12-4.380         Snap Ring           11         915-140.12-3.63         Snap Ring           12         915-140.12-3.63         Snap Ring           13         915-140.18-3.81         Snap Ring           14         915-140.18-3.81         Snap Ring           15         915-140.18-3.095         Snap Ring           15         915-118         Plunger           16         915-119         Spring           17         611-42542         O-Ring           18         611-34343         O-Ring           19         611-33833         O-Ring           20         916-44-3.583         Backup Ring           21         916-45-3.107         Backup Ring           22         916-45-3.107         Backup Ring           23         450A6148         Needle Valve           24         7933-5         Handle         1           25         485-10606         Street Elbow         1 </td <td>4</td> <td>8704-4</td> <td colspan="2">am, Third Stage</td>	4	8704-4	am, Third Stage	
7         1905-7         Piston, First Stage           8         1905-8         Piston, Second Stage           9         1905-9         Piston, Third Stage           10         915-140.12-4.380         Snap Ring           11         915-140.12-3.63         Snap Ring           12         915-140.12-2.88         Snap Ring           13         915-140.18-3.81         Snap Ring           14         915-140.18-3.81         Snap Ring           15         915-118         Plunger           16         915-119         Spring           17         611-42542         O-Ring           18         611-33434         O-Ring           20         916-44-4.583         Backup Ring           21         916-45-3.857         Backup Ring           21         916-45-3.107         Backup Ring           22         916-45-3.107         Backup Ring           23         450A6148         Needle Valve           24         7933-5         Handle         1           25         485-10606         Street Elbow         1           26         450A6149         Socket Head Shoulder Bolt         2           27         333-41400	5	8704-7	Screw Extension	
8       1905-8       Piston, Second Stage         9       1905-9       Piston, Third Stage         10       915-140.12-4.380       Snap Ring         11       915-140.12-3.63       Snap Ring         12       915-140.12-2.88       Snap Ring         13       915-140.18-3.81       Snap Ring         14       915-140.18-3.095       Snap Ring         15       915-118       Plunger         16       915-119       Spring         17       611-42542       O-Ring         18       611-34333       O-Ring         20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         21       916-45-3.857       Backup Ring         22       916-45-3.107       Backup Ring         21       946-45-3.107       Backup Ring         22       946-45-3.307       Backup Ring         24       7933-5       Handle       1         25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwas	6	1905-6	Bushing, Cylinder	
9 1905-9 Piston, Third Stage 10 915-140.12-4.380 Snap Ring 11 915-140.12-3.63 Snap Ring 12 915-140.12-2.88 Snap Ring 13 915-140.18-3.81 Snap Ring 14 915-140.18-3.095 Snap Ring 15 915-118 Plunger 16 915-119 Spring 17 611-42542 O-Ring 18 611-34434 O-Ring 20 916-44-4.583 Backup Ring 21 916-45-3.857 Backup Ring 22 916-45-3.107 Backup Ring 23 450A6148 Needle Valve 1 24 7933-5 Handle 1 25 485-10606 Street Elbow 1 26 450A6149 Socket Head Shoulder Bolt 2 27 333-41400 Hex Nut 2 28 346-10020 Lockwasher 2 30 915-543 Nameplate 1 31 450A6984 Drive Screw 2 31 216-1-20 Ball 2 3 48704-24 Hose Assembly 1	7	1905-7	Piston, First Stage	
10       915-140.12-4.380       Snap Ring         11       915-140.12-3.63       Snap Ring         12       915-140.12-2.88       Snap Ring         13       915-140.18-3.81       Snap Ring         14       915-140.18-3.095       Snap Ring         15       915-118       Plunger         16       915-119       Spring         17       611-42542       O-Ring         18       611-34434       O-Ring         19       611-33833       O-Ring         20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         22       916-45-3.107       Backup Ring         23       450A6148       Needle Valve       1         24       7933-5       Handle       1         25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32	8	1905-8	Piston, Second Stage	
11       915-140.12-3.63       Snap Ring         12       915-140.12-2.88       Snap Ring         13       915-140.18-3.81       Snap Ring         14       915-140.18-3.095       Snap Ring         15       915-118       Plunger         16       915-119       Spring         17       611-42542       O-Ring         18       611-34434       O-Ring         19       611-33833       O-Ring         20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         22       916-45-3.107       Backup Ring         23       450A6148       Needle Valve       1         24       7933-5       Handle       1         25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2 <td< td=""><td>9</td><td>1905-9</td><td>Piston, Third Stage</td><td></td></td<>	9	1905-9	Piston, Third Stage	
12       915-140.12-2.88       Snap Ring         13       915-140.18-3.81       Snap Ring         14       915-140.18-3.095       Snap Ring         15       915-118       Plunger         16       915-119       Spring         17       611-42542       O-Ring         18       611-34434       O-Ring         19       611-33833       O-Ring         20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         22       916-45-3.107       Backup Ring         22       916-45-3.107       Backup Ring         23       450A6148       Needle Valve         24       7933-5       Handle         25       485-10606       Street Elbow         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball	10	915-140.12-4.380	Snap Ring	
13       915-140.18-3.81       Snap Ring         14       915-140.18-3.095       Snap Ring         15       915-118       Plunger         16       915-119       Spring         17       611-42542       O-Ring         18       611-34434       O-Ring         19       611-33833       O-Ring         20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         22       916-45-3.107       Backup Ring         22       916-45-3.107       Backup Ring         23       450A6148       Needle Valve         24       7933-5       Handle         24       7933-5       Handle         25       485-10606       Street Elbow         1       26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball	11	915-140.12-3.63	Snap Ring	
14       915-140.18-3.095       Snap Ring         15       915-118       Plunger         16       915-119       Spring         17       611-42542       O-Ring         18       611-34434       O-Ring         19       611-33833       O-Ring         20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         22       916-45-3.107       Backup Ring         23       450A6148       Needle Valve         1       24       7933-5       Handle         24       7933-5       Handle       1         25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1   <	12	915-140.12-2.88	Snap Ring	
15       915-118       Plunger         16       915-119       Spring         17       611-42542       O-Ring         18       611-34434       O-Ring         19       611-33833       O-Ring         20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         22       916-45-3.107       Backup Ring         23       450A6148       Needle Valve         1       24       7933-5       Handle         24       7933-5       Handle       1         25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         20       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	13	915-140.18-3.81	Snap Ring	
16       915-119       Spring         17       611-42542       O-Ring         18       611-34434       O-Ring         19       611-33833       O-Ring         20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         22       916-45-3.107       Backup Ring         23       450A6148       Needle Valve         24       7933-5       Handle         25       485-10606       Street Elbow         1       26       450A6149       Socket Head Shoulder Bolt         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	14	915-140.18-3.095	Snap Ring	
17       611-42542       O-Ring         18       611-34434       O-Ring         19       611-33833       O-Ring         20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         22       916-45-3.107       Backup Ring       1         23       450A6148       Needle Valve       1         24       7933-5       Handle       1         25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	15	915-118	Plunger	
18       611-34434       O-Ring         19       611-33833       O-Ring         20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         22       916-45-3.107       Backup Ring       1         23       450A6148       Needle Valve       1         24       7933-5       Handle       1         25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	16	915-119	Spring	
19       611-33833       O-Ring         20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         22       916-45-3.107       Backup Ring         23       450A6148       Needle Valve         24       7933-5       Handle         25       485-10606       Street Elbow         26       450A6149       Socket Head Shoulder Bolt         27       333-41400       Hex Nut         28       346-10020       Lockwasher         30       915-543       Nameplate         31       450A6984       Drive Screw         32       312-16031-S       Set Screw         33       216-1-20       Ball         34       8704-24       Hose Assembly	17	611-42542	O-Ring	
20       916-44-4.583       Backup Ring         21       916-45-3.857       Backup Ring         22       916-45-3.107       Backup Ring       1         23       450A6148       Needle Valve       1         24       7933-5       Handle       1         25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	18	611-34434	-	
21       916-45-3.857       Backup Ring       1         22       916-45-3.107       Backup Ring       1         23       450A6148       Needle Valve       1         24       7933-5       Handle       1         25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	19	611-33833	O-Ring	
22       916-45-3.107       Backup Ring       1         23       450A6148       Needle Valve       1         24       7933-5       Handle       1         25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	20	916-44-4.583	Backup Ring	
23       450A6148       Needle Valve       1         24       7933-5       Handle       1         25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	21	916-45-3.857	Backup Ring	
24       7933-5       Handle       1         25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	22	916-45-3.107	Backup Ring	1
25       485-10606       Street Elbow       1         26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	23	450A6148	Needle Valve	1
26       450A6149       Socket Head Shoulder Bolt       2         27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	24	7933-5	Handle	1
27       333-41400       Hex Nut       2         28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	25	485-10606	Street Elbow	1
28       346-10020       Lockwasher       2         30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	26	450A6149	Socket Head Shoulder Bolt	2
30       915-543       Nameplate       1         31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	27	333-41400	Hex Nut	2
31       450A6984       Drive Screw       4         32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	28	346-10020	Lockwasher	2
32       312-16031-S       Set Screw       2         33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	30	915-543	Nameplate	1
33       216-1-20       Ball       2         34       8704-24       Hose Assembly       1	31	450A6984	Drive Screw	
34 8704-24 Hose Assembly 1	32	312-16031-S	Set Screw	2
·	33	216-1-20	Ball	2
35 43A13906 Connector Assembly, Male 1	34	8704-24	Hose Assembly	1
	35	43A13906	Connector Assembly, Male	1



Parts List
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



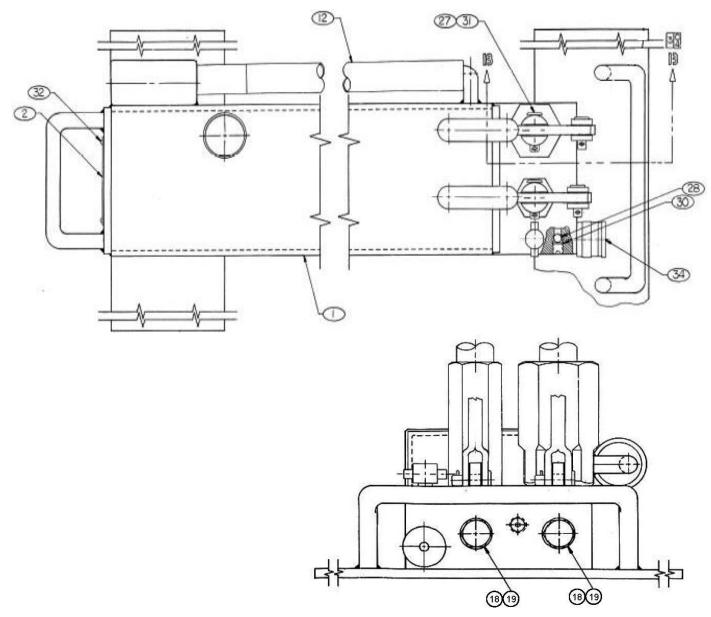


Parts List
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
	7933-C	Double Hand Pump Assembly; consists of:	
1	7933-1	Reservoir Assembly	1
2	916-192	Nameplate	
3	915-244	Pump Body	
4	915-246	Pump Body	1
5	915-138C	Piston, Pump	1
6	915-247C	Piston, Pump	1
9	915-17	Gasket	4
10	915-16A-3	Valve Assembly	1
11	915-16A-6	Valve Assembly	1
12	915-143U	Double Pump Handle	1
13	915-127.19	Backup Ring	1
14	915-127.10	Backup Ring	1
16	916-7	Oil Screen	1
17	916-10	Spring	
21	916-37	Release Valve Assembly	
22	611-01101	O-Ring	
23	611-11211	O-Ring	
24	611-21421	O-Ring	1
27	321-14330	Clevis Pin	2
28	216-1-20	Steel Ball	
29	216-1-24	Steel Ball	
30	312-16031	Socket Head Set Screw	
31	322-03240	Cotter Pin	
32	450A6984	Drive Screw	4
33	488-00006	Pipe Plug	
34	915-DZ	Female Coupler	1



Parts List
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
	7933-C	Double Hand Pump Assembly; consists of:	
7	915-151.42	Link, Pump	2
8	915-75	Rocker Arm	2
15	915-124	Filler Plug	1
18	916-21	Plug, Valve Adjusting	2
19	916-22	Gasket	2
20	916-35	Lock Screw, Release Valve	1
26	321-14250	Clevis Pin	4
31	322-03240	Cotter Pin	6
34	915-DZ	Female Coupler	1
35	611-21521	O-Ring	1



# **APPENDIX I**

**Routine Jack Maintenance Bulletins** 



TO PROVIDE COMPLETE INFORMATION ON SERVICING ColumbusJACK/REGENT QUALITY GROUND HANDLING EQUIPMENT

## BULLETIN RJM 102 - PROCEDURE FOR WINTERIZATION OF HYDRAULIC AIRCRAFT JACKS

The following procedures should be utilized for optimum operational characteristics when using jacks at various temperature extremes:

- 1. Above 0°F (-18°C) Use MIL-PRF-5606, or equal, with no further additive required.
- 2. At 0° to -20°F (-18°C to 29°C) Use a mixture of 75% MIL-PRF-5606, or equal, and 25% kerosene.
- 3. Below -20°F (-29°C) Use a mixture of 50% MIL-PRF-5606, or equal, and 50% kerosene.

Due to most company, safety, or union regulations which restrict employees from working out-of-doors below -30°F (-34°C), there is a lack of experience beyond this point. It is permissible, however, to increase the percentage of kerosene up to 100%. As the ambient temperature increases, MIL-PRF-5606, should be added back to the system in the appropriate mixture.

The air supply should be clean and dry. At -30°F (-34°C), the air pump will start to react sluggishly and continue to operate less efficiently as the temperature decreases when a normal air supply is used. The problem can be eliminated by using a dry nitrogen source of sufficient capacity.

To ease the operation of the locknut(s) and screw extension, use "Never Freeze" by Snap-On, or equal, and apply liberally to the thread surfaces.



TO PROVIDE COMPLETE INFORMATION ON SERVICING ColumbusJACK/REGENT QUALITY GROUND HANDLING EQUIPMENT

## **BULLETIN RJM 116 -SCREW EXTENSION USAGE**

When using a jack that has a screw extension, it is advisable that the screw extension be extended as far as possible, and still has the jack roll under the jacking point. If the screw extension is not properly extended, the aircraft may not be able to be raised to the desired height.

A periodic check should be made to the screw extension to ensure that the stop is operating properly to prevent over-extension. To do this, rotate the screw extension counterclockwise until it stops rotating. DO NOT FORCE THE SCREW EXTENSION BEYOND THIS POINT. If the screw extension does not stop rotating, remove it and repair the stop. DO NOT USE WITHOUT THE SCREW EXTENSION STOP WORKING PROPERLY, AS THE JACK COULD FAIL WITH AN OVER-EXTENDED SCREW EXTENSION.



TO PROVIDE COMPLETE INFORMATION ON SERVICING Columbus JACK/REGENT QUALITY GROUND HANDLING EQUIPMENT

## BULLETIN RJM 117 - PROCEDURE FOR ADJUSTING CARTRIDGE STYLE RELIEF VALVES

It is imperative that safety relief valves on all jacks always be set between rated capacity, and rated capacity plus 10% maximum. The following procedure describes how to adjust cartridge style relief valves.

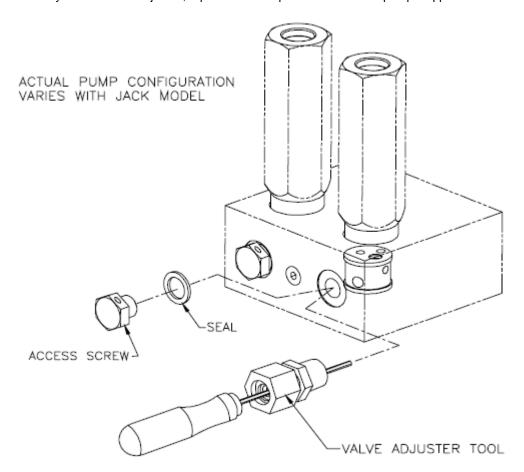
- 1. Position jack under jack tester.
- 2. Fully close release valve.
- 3. Remove access screw and seal. Install valve adjusting tool, Part No. 915-EB. (See illustration)

## NOTE: If tool is not available, disregard this step.

- 4. Extend cylinder ram(s):
  - a. On single stage jacks, extend the ram approximately half way.
  - b. On multiple stage jacks, extend all rams until the smallest ram is extended approximately half way.
- To set valves:
  - Using smooth, uniform pump handle strokes, manually pressurize the cylinder while monitoring either jack load gauge or load gauge on tester.
  - b. Pump handle shall "drop" or "go soft" at an indicated load between rated load and rated load plus 10% (ex: 50 ton jack should be between 50 and 55 tons).
  - c. If safety relief valve is set too high, release pressure and rotate adjusting screw counterclockwise. Repeat above steps until valve is adjusted in range.
  - d. If safety relief valve is set too low, release pressure and rotate adjusting screw clockwise. Repeat steps until valve is adjusted in range.

NOTE: If adjusting tool is not available, it is necessary to relieve pressure completely before removing valve access screw and seal. Then valve set screw can be adjusted using a 1/8 Inch Allen wrench. Valve access screw and seal must be Re-installed before jack can be re-pressurized.

6. After manual safety relief valve is adjusted, repeat above steps for air of electric pump if applicable.





TO PROVIDE COMPLETE INFORMATION ON SERVICING ColumbusJACK/REGENT QUALITY GROUND HANDLING EQUIPMENT

## BULLETIN RJM 147 - RECOMMENDED ANNUAL JACK CERTICIFATION PROCEDURE

The following Recommended Annual Jack Certification Procedure is provided as a guide to insure that hydraulic aircraft jacks are always certified for operation. An annual time interval is a general recommendation only. The actual interval used should include factors for the climatic conditions in which the equipment is stored and the frequency of equipment use. Recommendations for Suggested Preventative Maintenance can be found in RJM 170.

1. With no external load applied to the jack, fully close release valve and fully extend ram(s) to verify function and the absence of external hydraulic leakage.



## WARNING!

## DO NOT APPLY PRESSURE AGAINST INTERNAL RAM STOP(S).

- 2. Open release valve and verify ram(s) retract fully.
- 3. Position jack under jack tester.

## NOTE: For tripod jacks, all leg extensions should be installed on the jack.

- 4. Close release valve, and extend ram(s) until cup adapter contacts jack tester. Make sure that the ram of a single stage jack is partially extended and that the smaller ram of a multi-stage jack is partially extended.
- 5. Pressurize the jack against the jack tester. Using a calibrated pressure gauge on either the jack or the jack tester, monitor the pressure until the capacity (operating pressure) of the jack is reached.
- 6. With the jack pressurized against the jack tester, hold in this position for 3 minutes. Verify that the jack pressure has not decreased, indicating internal leakage.
- 7. Open the release valve to relieve jack pressure against the jack tester.
- 8. Set the safety relief valve per jack operation and maintenance manual.

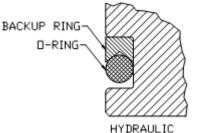


TO PROVIDE COMPLETE INFORMATION ON SERVICING ColumbusJACK/REGENT QUALITY GROUND HANDLING EQUIPMENT

## **BULLETIN RJM 149 - TEFLON BACKUP RING INSTALLATION PROCEDURE**

When installing new Teflon backup rings on a ram or piston of any jack model, the following procedure should be observed to ensure correct installation of the ring. When installing a new backup ring, the corresponding o-ring should always be replaced also.

- 1. Cut existing o-ring and Teflon backup ring.
- 2. Clean and visually inspect the groove in the ram or piston for any nicks, scratches of score marks, which could cut the o-ring and backup ring during installation.
- 3. Check to ensure backup ring is clean and not damaged.
- 4. Set backup ring on a flat metal surface.
- 5. Using a propane torch, heat backup ring in a circular motion until backup ring is equally softened and pliable or flexible.
- 6. Carefully pick-up the HOT Teflon backup ring off the HOT metal plate and stretch the ring enough to fit over the end of the ram (piston).
  - NOTE: Make sure the "V" cup portion of the backup ring will face the o-ring. (see figure)
- 7. If backup ring does not return to size after cooling, re-heat backup ring while on the part, and cool quickly with a cold, wet towel or rag.
- 8. Check to ensure o-ring is clean and not damaged.
- 9. Carefully stretch o-ring over the end of the ram (piston). Ensure that the o-ring and the "V" cup of the backup ring are facing each other. (See figure)



HYDRAULIC PRESSURE SIDE



TO PROVIDE COMPLETE INFORMATION ON SERVICING ColumbusJACK/REGENT QUALITY GROUND HANDLING EQUIPMENT

## **BULLETIN RJM 170 - SUGGESTED PREVENTATIVE MAINTENANCE FOR JACKS**

The following Preventative Maintenance Schedule is provided as a guide to insure that hydraulic aircraft jacks are always ready for operation. The time intervals listed are a general recommendation only. The actual interval used should include factors for the climatic conditions in which the equipment is stored and the frequency of equipment use.

## Prior to Operation

- 1. Inspect for damaged or missing components.
- 2. Inspect for oil leakage and proper fluid level.
- 3. Inspect screw extension for mechanical stop.
- 4. Inspect all snap rings for engagement into grooves.
- 5. Inspect jack adapter for damage.

## Every 6 Months

- 1. Inspect for worn snap ring grooves.
- 2. Change hydraulic filters if applicable.
- 3. If jack has not been used regularly, cycle jack without load.
- 4. Grease all lube fittings with a general purpose grease.
- 5. Wipe down ram(s) and screw extension with hydraulic oil.

## **Every 12 Months**

- 1. Calibrate pressure gauge if applicable per RJM 173.
- 1. Perform "Recommended Annual Jack Certification Procedure" per RJM 147.



TO PROVIDE COMPLETE INFORMATION ON SERVICING ColumbusJACK/REGENT QUALITY GROUND HANDLING EQUIPMENT

## **BULLETIN RJM 171 - RECOMMENDED HYDRAULIC OILS**

The following hydraulic oils are recommended for use in all Columbus JACK/Regent products, though any oil compatible with Buna-N seals may be used. Proper oil level should be .5 to 1 inch below the fill port when all rams are collapsed.

Exxon/Mobil Aero HF (MIL-PRF-5606)
Exxon/Mobil DTE-11, -15
NATO Code No. H-538 (MIL-PRF-87257)
Phillips 66 X/C 5606
Royco 783 (Anderol) (MIL-PRF-6083)
Royco 782 (Anderol) (MIL-PRF-83282)
Shell Tellus 10, 15
Shell Aerofluid 31 (MIL-PRF-83282)
Shell Aerofluid 41 (MIL-PRF-5606)
Texaco Regal Oil R & O (32, 46, 100, 150, 220, 320, 460)