

Columbus**JACK**/Regent



**MODEL 6509-55**  
**65 TON ALLIGATOR AXLE JACK**  
**P/N: 128D1100-55**

Operation and Maintenance Manual  
with Illustrated Parts List

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9/26/2011

**MODEL 6509-55**  
**65 TON ALLIGATOR AXLE JACK**  
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**1.0 Introduction**

This manual is issued as a basic operation and maintenance manual covering the Model 6509-55, 65 Ton Alligator Axle Jack manufactured by Columbus**JACK**/Regent, 2222 S. Third St., Columbus, Ohio 43207, USA, phone number (614) 443-7492, FAX (614) 445-3981.

To derive maximum service, it is recommended that personnel have an understanding of the equipment before attempting to operate the jack. It is mandatory that the operating procedures herein be followed.

**2.0 Specifications**

Capacity	65 Tons
Minimum Height	9.32 Inches
Hydraulic Lift	8.69 Inches
Screw Extension	4.25 Inches
Maximum Height	22.25 Inches
Operating Pressure	8200 Psi
Relief Valve Pressure	9020 Psi
Reservoir Capacity	3 Gallon
Air Requirements	
Pressure	80 Psi Minimum
Flow	40 Scfm Minimum
Estimated Weight	213 Lbs

**3.0 Safety Information**

*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 65 tons (130,000 pounds). 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.

**4.0 Bleed Procedure**

4.1 Loosen hydraulic line at base of cylinder.

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**4.0 Bleed Procedure (continued)**

- 4.2 Raise cover assembly off cylinder.
- 4.3 Operate hand pump and air pump until oil comes out freely with no air bubbles. Tighten hydraulic line at base of cylinder.
- 4.4 Replace cover assembly on cylinder.

**5.0 Pre-Operation Procedure**

- 5.1 Perform visual inspection, by checking for oil leakage.
- 5.2 Check for loose, damaged or missing parts.
- 5.3 Check oil level.

**6.0 Lifting Procedure**

- 6.1 Verify jack is located per airplane jacking procedures.
- 6.2 Raise extension screw to mate with airplane axle jacking point.
- 6.3 Close release valve.
- 6.4 Connect air supply.
- 6.5 Activate the air pump.

**CAUTION:** WITH NO LOAD APPLIED TO THE JACK, IT IS NORMAL FOR EITHER STAGE TO EXTEND FIRST. ONCE A LOAD IS APPLIED TO THE JACK, ENSURE THAT THE FIRST STAGE RAM (LARGEST) IS FULLY EXTENDED BEFORE THE SECOND 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.

**7.0 Lowering Procedure**

- 7.1 Slowly open release valve to lower rams.

**NOTE:** Speed of lowering is controlled by how far release valve is open.

- 7.2 When airplane tires are on ground, open release valve completely.
- 7.3 Lower extension screw fully and disconnect the air supply.

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**7.0 Lowering Procedure (continued)**

- 7.4 Remove jack from under airplane.
- 7.5 Place cover assembly over cylinder.

**8.0 Relief Valve Setting (Figure 3)**

- 8.1 Position jack under a jack tester. Fully extend the first stage ram and partially extend the second stage ram.
- 8.2 Remove pin (Item 19).
- 8.3 Operate air pump and verify that relief valve is set at 68.25 – 71.5 tons. Increase pressure setting by using a screwdriver to adjust relief valve screw (Item 8) clockwise. To decrease pressure setting, adjust relief valve screw counterclockwise.

**CAUTION: USE CARE NOT TO SET VALVE MORE THAN 10% ABOVE RATED CAPACITY.**

**WARNING: DO NOT EXCEED 71.5 TONS.**

- 8.4 Reinstall pin (Item 19).

**9.0 Special Maintenance Instructions**

There are no special maintenance instructions for this jack

**10.0 Shop Aids Available**

Contact Columbus**JACK**/Regent Sales for any shop aids.

**11.0 Overhaul Kits Available**

Soft Kit           120A1629  
Repair Kit       120A1630

**12.0 How to Locate and Remedy Trouble**

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.

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**TROUBLE SHOOTING CHART**

<b>TROUBLE</b>	<b>PROBABLE CAUSE</b>	<b>REMEDY</b>
Rams fail to lift when operated, or jacks fails to lift rated load.	Incorrect setting of relief valve.	Adjust setscrew clockwise to increase system relief pressure.
	Low fluid level	Fill to correct fluid level.
	Defective outlet check valves.	Remove pump assemblies. Remove and inspect spring and steel ball and replace if necessary.
	Worn plunger o-ring or backup ring.	Remove cotter pin, pins and fulcrum. Remove and inspect o-rings and backup rings and replace if necessary.
	Defective inlet check valve.	Remove pump assembly. Remove cotter pin, pins, fulcrum, plug and cotter pin. Turn pump base upside-down and remove steel ball. Inspect cotter pin and steel ball and replace if necessary.
Pumps inoperative or difficult to operate.	Valve body partially open.	Using slotted pump handle, adjust valve body clockwise until tight.
	Vacuum created in reservoir due to clogged muffler. Obstructed pump passage.	Clean muffler. Remove pump assemblies. Completely disassemble pumps and blow compressed air into passages to free obstruction.
Pistons will not lower.	Obstructed pump passage.	Remove pump assemblies. Completely disassemble pumps and blow compressed air into passages to free obstruction.
Rams will not fully elevate.	Low fluid level.	Inspect and fill to correct level.
	Defective ram o-rings or backup rings.	Remove first, second and third stage rams. Remove and inspect o-rings and backup rings and replace if necessary.
	Valve body partially open.	Using slotted pump handle, adjust valve body clockwise until tight.

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**TROUBLE SHOOTING CHART**

TROUBLE	PROBABLE CAUSE	REMEDY
Rams will not support load.	Oil leaks at rams.	Remove first, second and third stage rams. Remove and inspect o-rings and backup rings and replace if necessary.
	Defective pump assembly o-rings.	Remove pump assemblies. Remove and inspect hand pump piston o-rings and replace if necessary.
	Defective outlet check valve.	Remove and inspect spring and steel ball. Replace if necessary.
	Loose pump assembly.	Tighten socket head screw.
Rams rise and fall with each stroke.	Valve body partially open.	Using slotted pump handle, adjust valve body clockwise until tight.
	Incorrect setting of relief valve.	Adjust setscrew clockwise to increase system relief pressure.
	Defective outlet check valve.	Remove pump assemblies. Remove and inspect spring and steel ball. Replace if necessary.

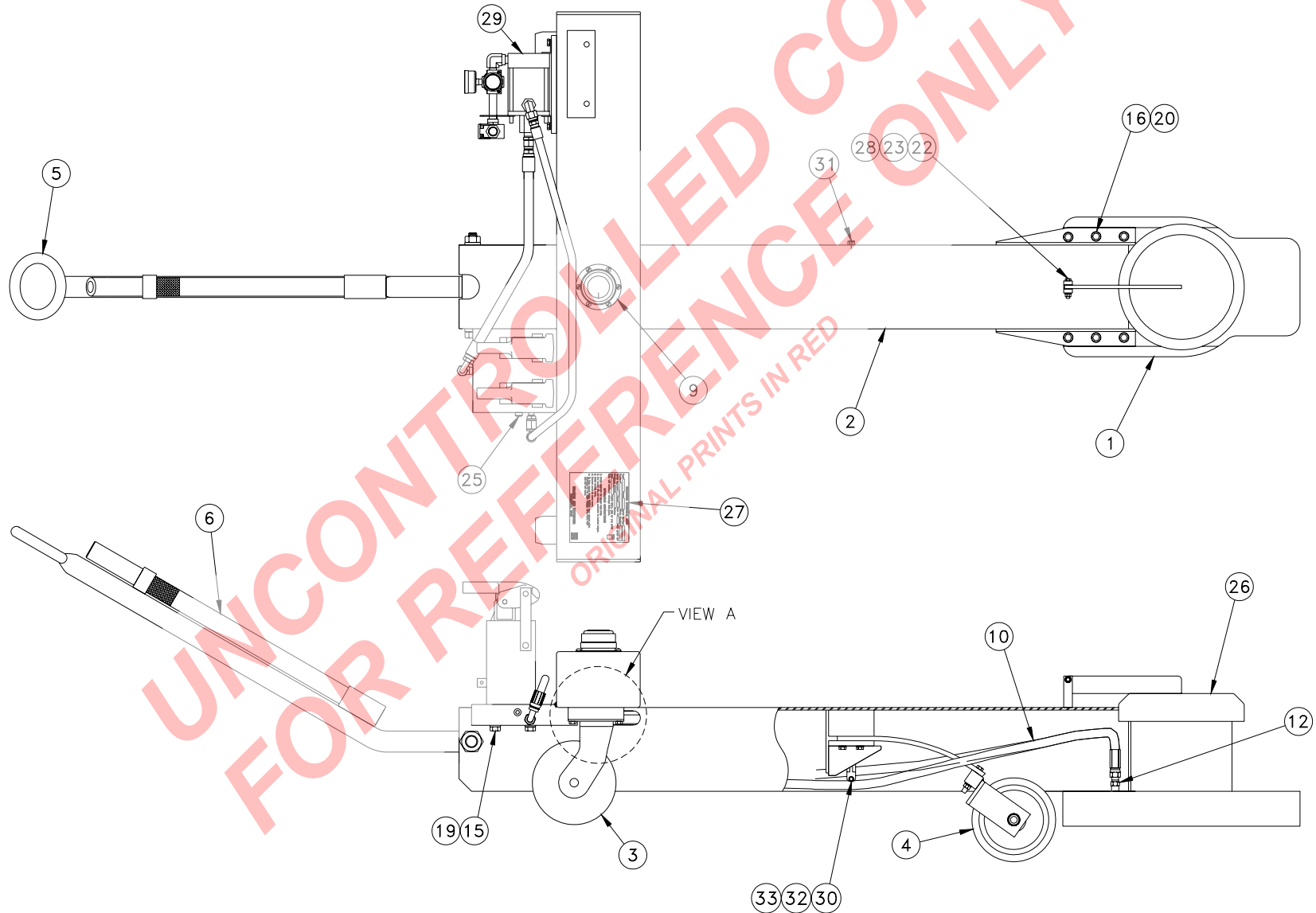
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 Figure 1

FIG. & ITEM NO.	PART NUMBER	DESCRIPTION	UNITS PER ASS'Y
<b>1-</b>	<b>6509-55</b>	<b>65 Ton Alligator Axle Jack .....</b>	<b>Ref</b>
-1	128D1200	Lift Assembly .....	1
-2	128D1400-1	Frame Weldment, Post .....	1
-3	450A7010	Caster .....	2
-4	349D1014	Spring Assembly .....	1
-5	128C1102	Towbar .....	1
-6	469B1211	Handle .....	1
-7	566-06	Pump Assembly .....	1
-8	566-02	Pump Assembly .....	1
-9	450A3300	Filler Assembly .....	1
-10	450A4400-49.5	Hose Assembly .....	1
-11	457-10602-A	Male Connector .....	1
-12	457-10604-A	Male Connector .....	1
-13	371-26560	Hex Head Cap Screw .....	1
-14	371-16070	Hex Head Cap Screw .....	8
-15	371-20180	Hex Head Cap Screw .....	4
-16	377-18100	Socket Head Cap Screw .....	6
-17	346-10048	Lockwasher .....	1
-18	346-10024	Lockwasher .....	8
-19	346-10032	Lockwasher .....	4
-20	346-10028	Lockwasher .....	6
-21	333-42600	Hex Nut .....	1
-22	371-12100	Hex Head Cap Screw .....	1
-23	333-41200	Hex Nut .....	1
-24	488-00002	Pipe Plug .....	1
-25	488-00004	Pipe Plug .....	1
-26	179C2002	Cover Assembly .....	1
-27	160B604	Plate, Operating Instructions .....	1
-28	346-10016	Lockwasher .....	1
-29	450C1832	Pump Kit .....	1
-30	450A7007	Clamp, Loop Type .....	1
-31	371-10060	Hex Head Cap Screw .....	1
-32	346-10010	Lockwasher .....	1
-33	333-41000	Hex Nut .....	1

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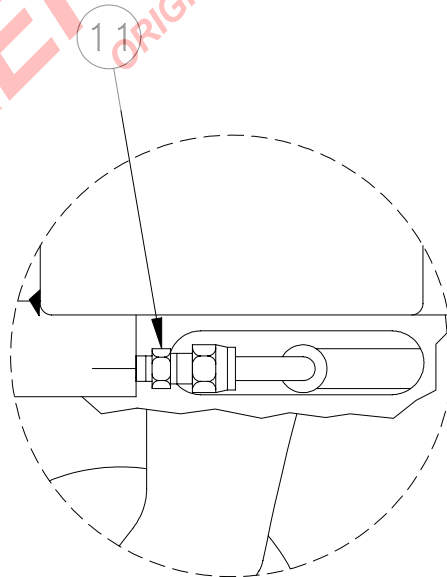
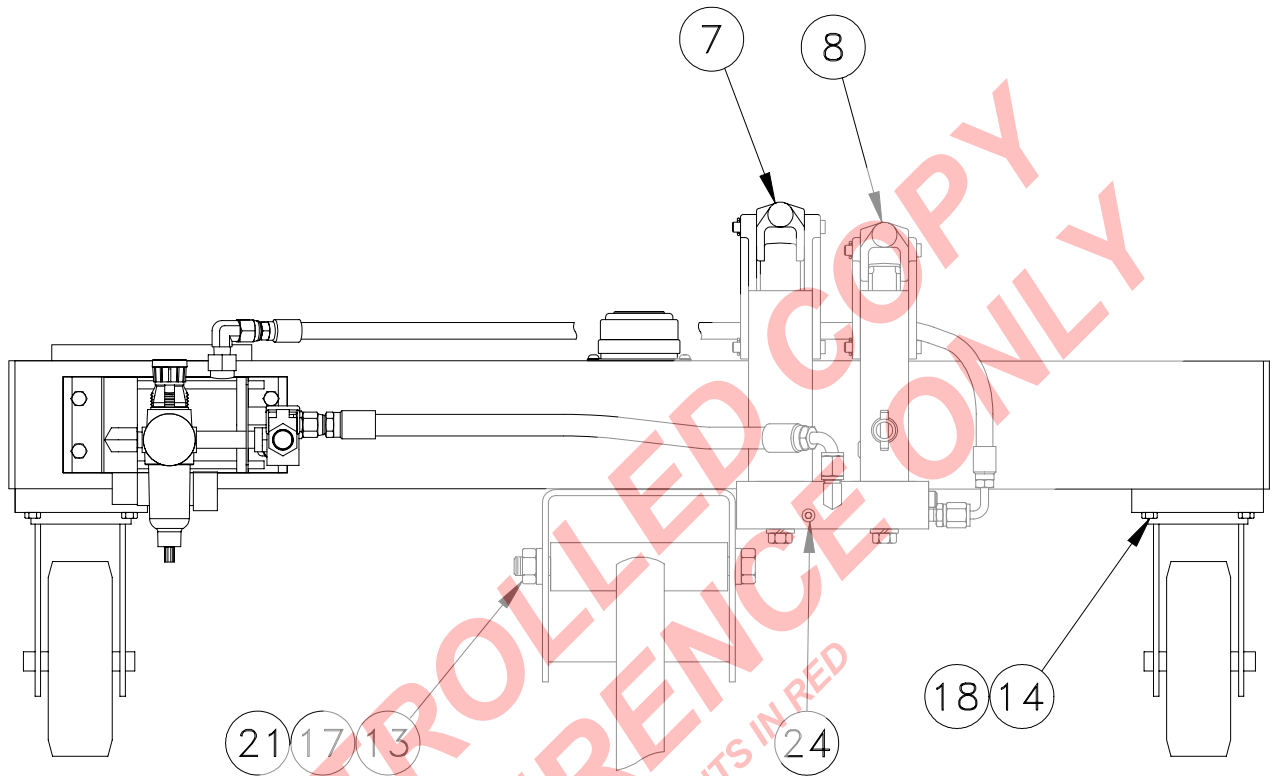
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Figure 1





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Figure 1



VIEW A  
SCALE 2/1

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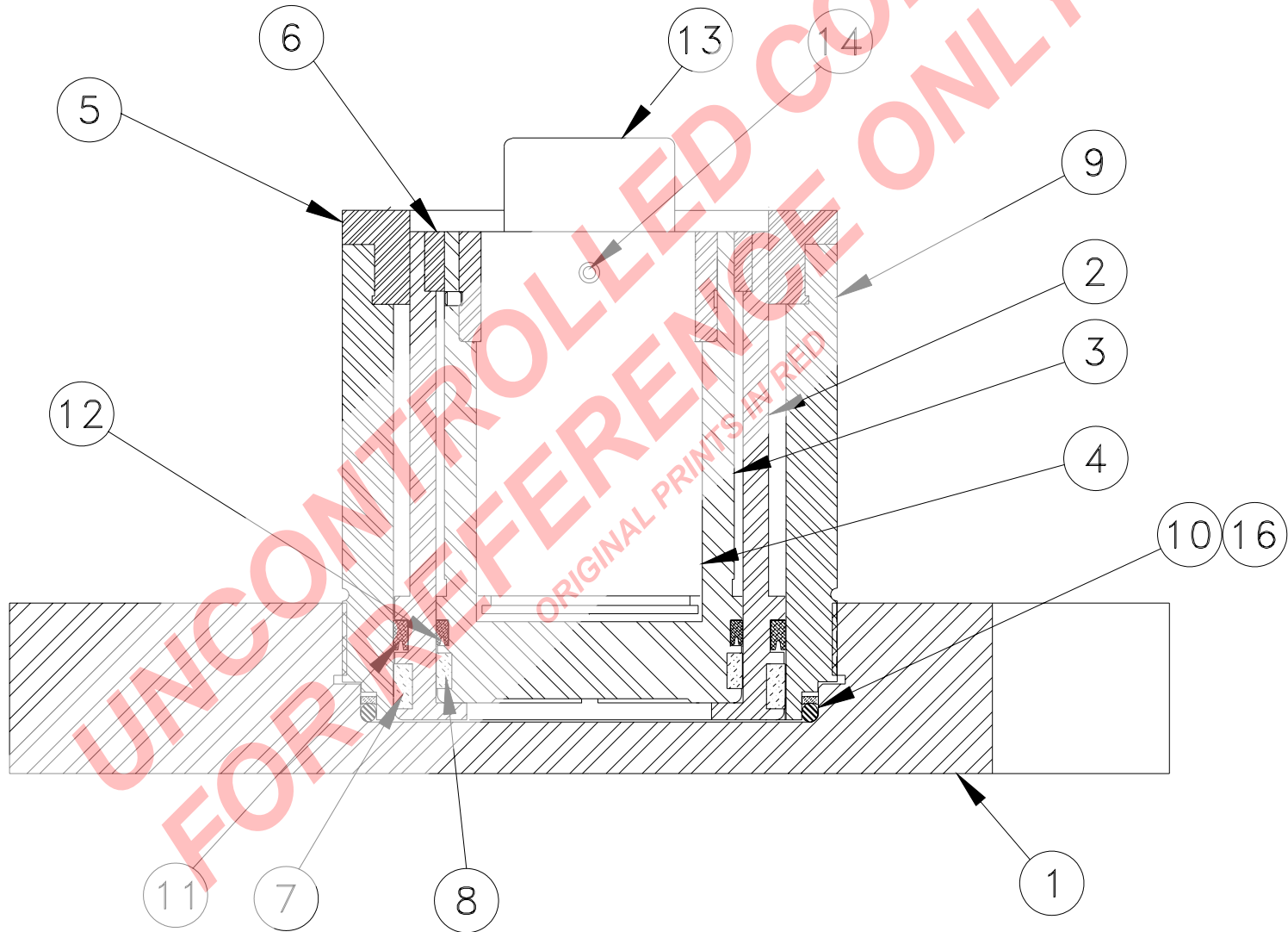
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 Figure 2

FIG. & ITEM NO.	PART NUMBER	DESCRIPTION	UNITS PER ASS'Y
2-	128D1200	Lift Assembly.....	Ref
-1	128D1010	Base.....	1
-2	128D2022	Ram, First Stage.....	1
-3	128D1021	Ram Assembly, Second Stage.....	1
	128D1021-1	Ram, Second Stage.....	1
	349B1080	Nut, Extension Screw.....	1
	311-12042	Set Screw.....	1
-4	349B1081	Extension Screw.....	1
-5	349C3018	Bearing.....	1
-6	349C2019	Bearing.....	1
-7	450A3455	Wear Band.....	1
-8	450A3456	Wear Band.....	1
-9	128C1202	Cylinder.....	1
-10	450A3446	O-Ring.....	1
-11	450A5883	Polypak.....	1
-12	450A5884	Polypak.....	1
-13	56B6129	Socket.....	1
-14	450A4213	Set Screw.....	1
-15	Not Used		
-16	450A3447	Backup Ring.....	1

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Figure 2



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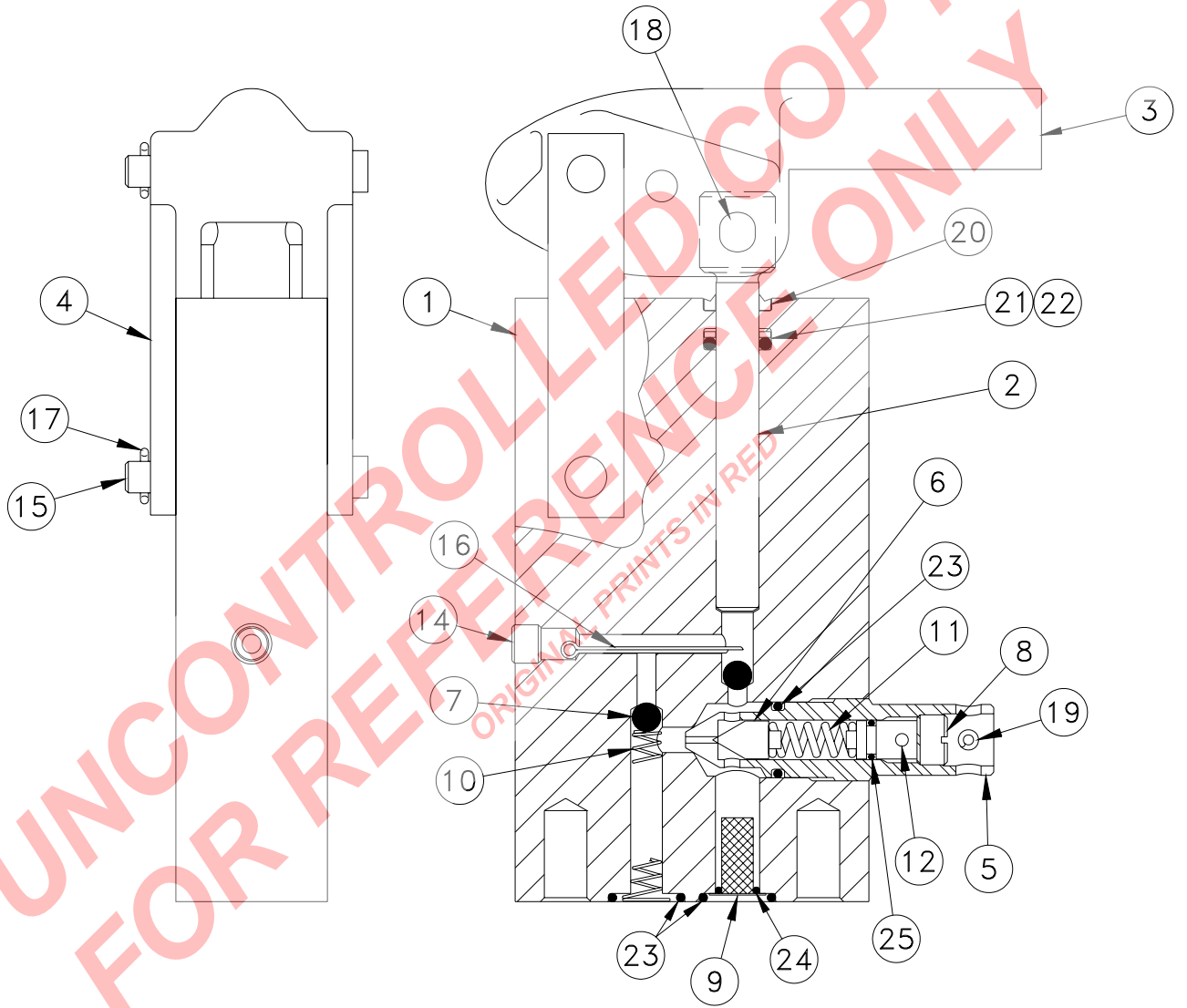
Model 6509-55  
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 Figure 3

FIG. & ITEM NO.	PART NUMBER	DESCRIPTION	UNITS PER ASS'Y
<b>3-</b>	<b>566-02</b>	<b>Pump Assembly .....</b>	<b>Ref.</b>
-1	30-182	Base, Pump .....	1
-2	70-88	Plunger .....	1
-3	230-23	Fulcrum .....	1
-4	220-19	Link .....	2
-5	20-118	Body, Valve .....	1
-6	20-2-23	Needle .....	1
-7	216-1-18	Ball.....	2
-8	20-2-51	Set Screw, Relief Valve.....	1
-9	250A024-1	Filter Screen .....	1
-10	240-14	Spring .....	1
-11	240-9-01	Spring .....	1
-12	566-01-19	Rubber Plug .....	1
-13	Not Used		
-14	488-00002	Pipe Plug .....	1
-15	321-14690	Clevis Pin .....	2
-16	322-03560	Cotter Pin .....	1
-17	322-03160	Cotter Pin .....	3
-18	321-14490	Clevis Pin .....	1
-19	325-12080	Spring Pin .....	1
-20	566-02-10	Wiper .....	1
-21	618-10091	Backup Ring .....	1
-22	611-11111	O-Ring.....	1
-23	611-11311	O-Ring .....	3
-24	611-01201	O-Ring .....	1
-25	611-01001	O-Ring .....	1

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Figure 3



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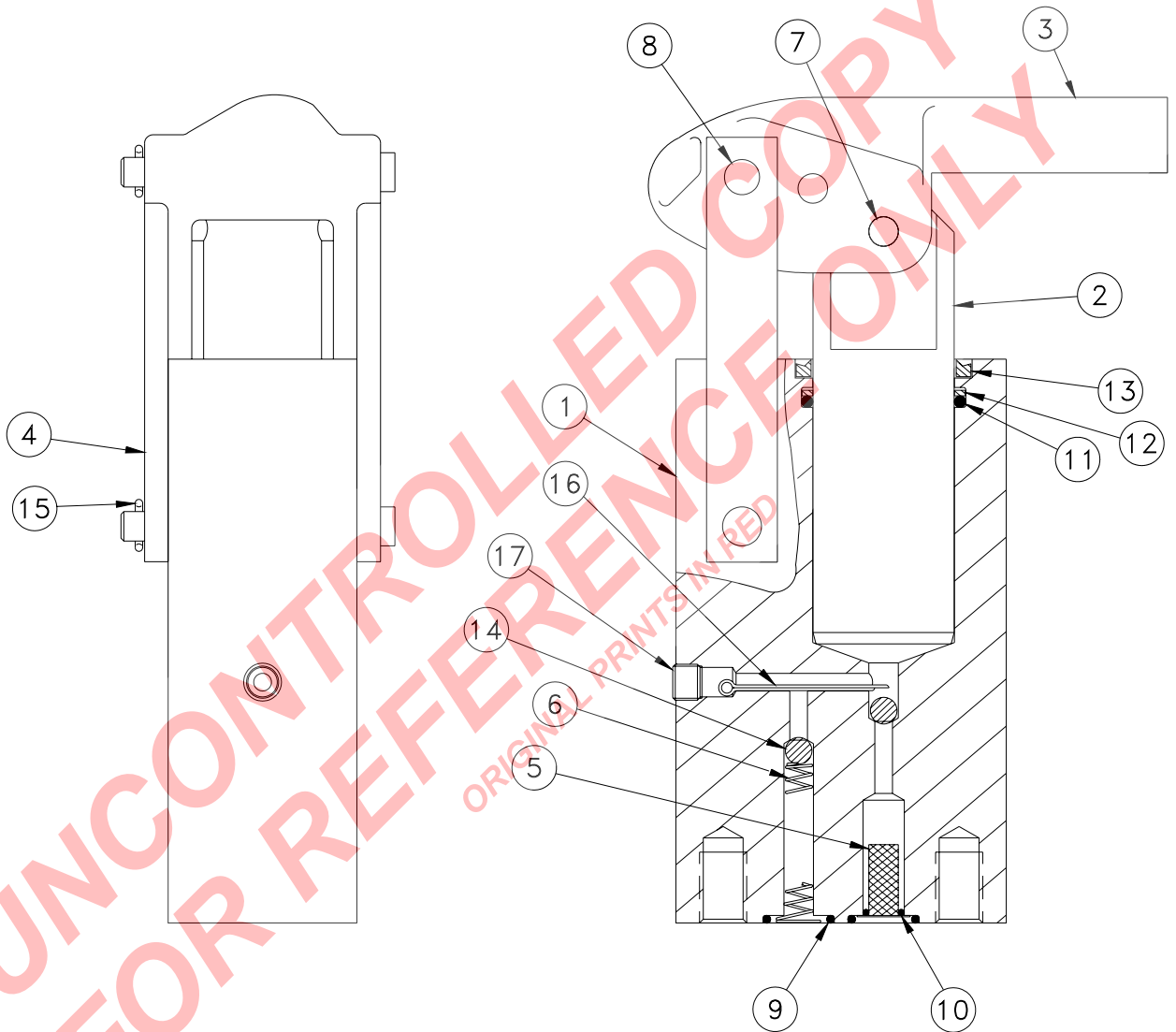
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 Figure 4

FIG. & ITEM NO.	PART NUMBER	DESCRIPTION	UNITS PER ASS'Y
<b>4-</b>	<b>566-06</b>	<b>Pump Assembly .....</b>	<b>Ref.</b>
-1	30C217	Base, Pump .....	1
-2	70A110	Plunger .....	1
-3	230-23	Fulcrum .....	1
-4	220A25	Link .....	2
-5	250A024-1	Filter Screen .....	1
-6	240-14	Spring .....	1
-7	321-14490	Clevis Pin .....	1
-8	321-14690	Clevis Pin .....	2
-9	611-11311	O-Ring .....	2
-10	611-01201	O-Ring .....	1
-11	611-22222	O-Ring .....	1
-12	618-10271	Backup Ring .....	1
-13	71X6223	Wiper .....	1
-14	216-1-18	Ball, Steel .....	2
-15	322-03160	Cotter Pin .....	3
-16	322-03560	Cotter Pin .....	1
-17	488-00002	Pipe Plug .....	1

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Figure 4



Columbus**JACK/Regent**

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 Figure 5

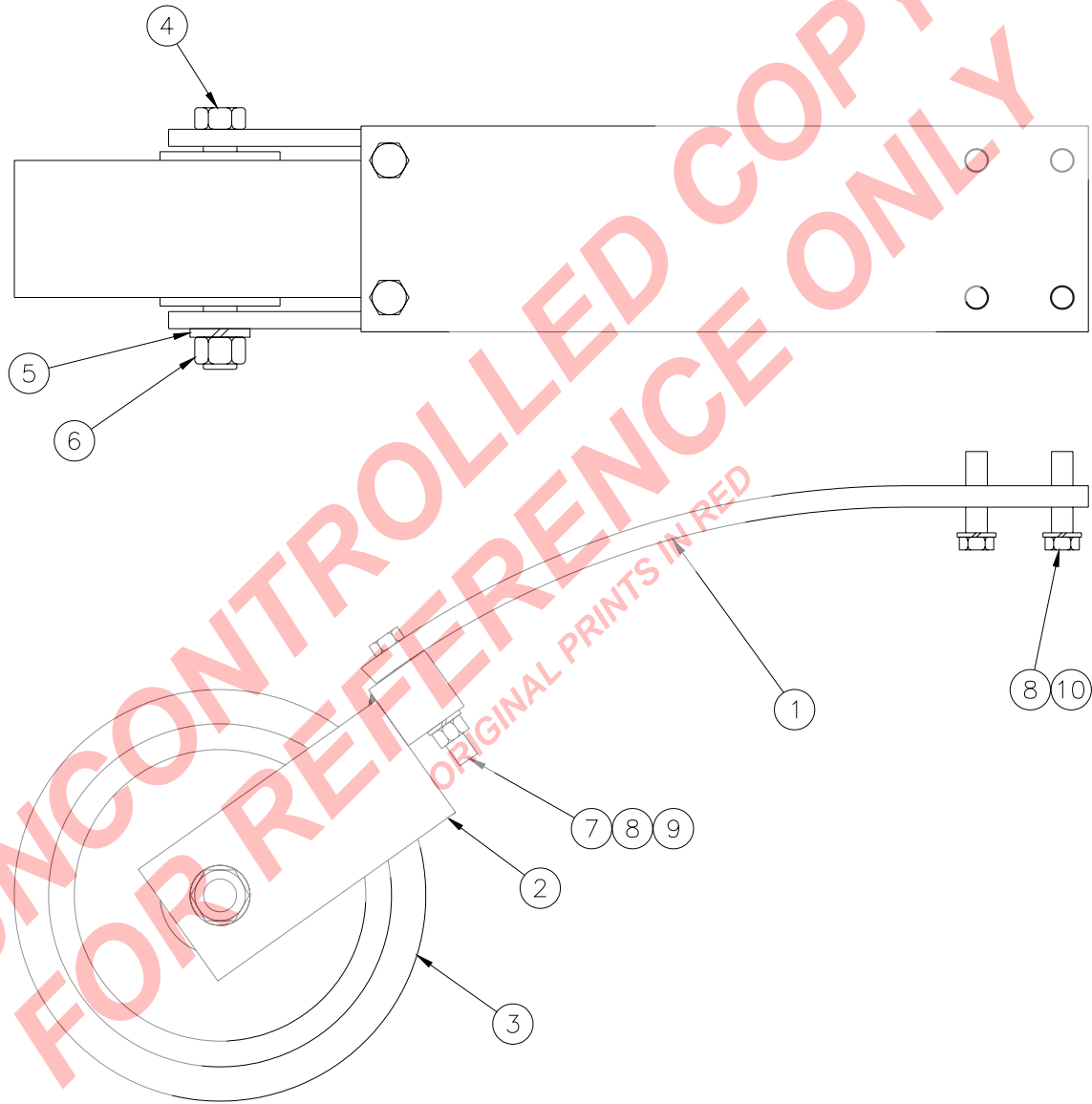
FIG. & ITEM NO.	PART NUMBER	DESCRIPTION	UNITS PER ASS'Y
<b>5-</b>	<b>349D1014</b>	<b>Spring Assembly .....</b>	<b>Ref.</b>
-1	349C1011	Spring .....	1
-2	349C1040	Bracket .....	1
-3	450A3803	Wheel-Rubber .....	1
-4	371-20280	Hex Head Cap Screw .....	1
-5	450A3966	Lockwasher .....	1
-6	333-42000	Hex Nut .....	1
-7	371-14160	Hex Head Cap Screw .....	2
-8	346-10020	Lockwasher .....	6
-9	333-41400	Hex Nut .....	2
-10	372-14100	Hex Head Cap Screw .....	4

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Figure 5



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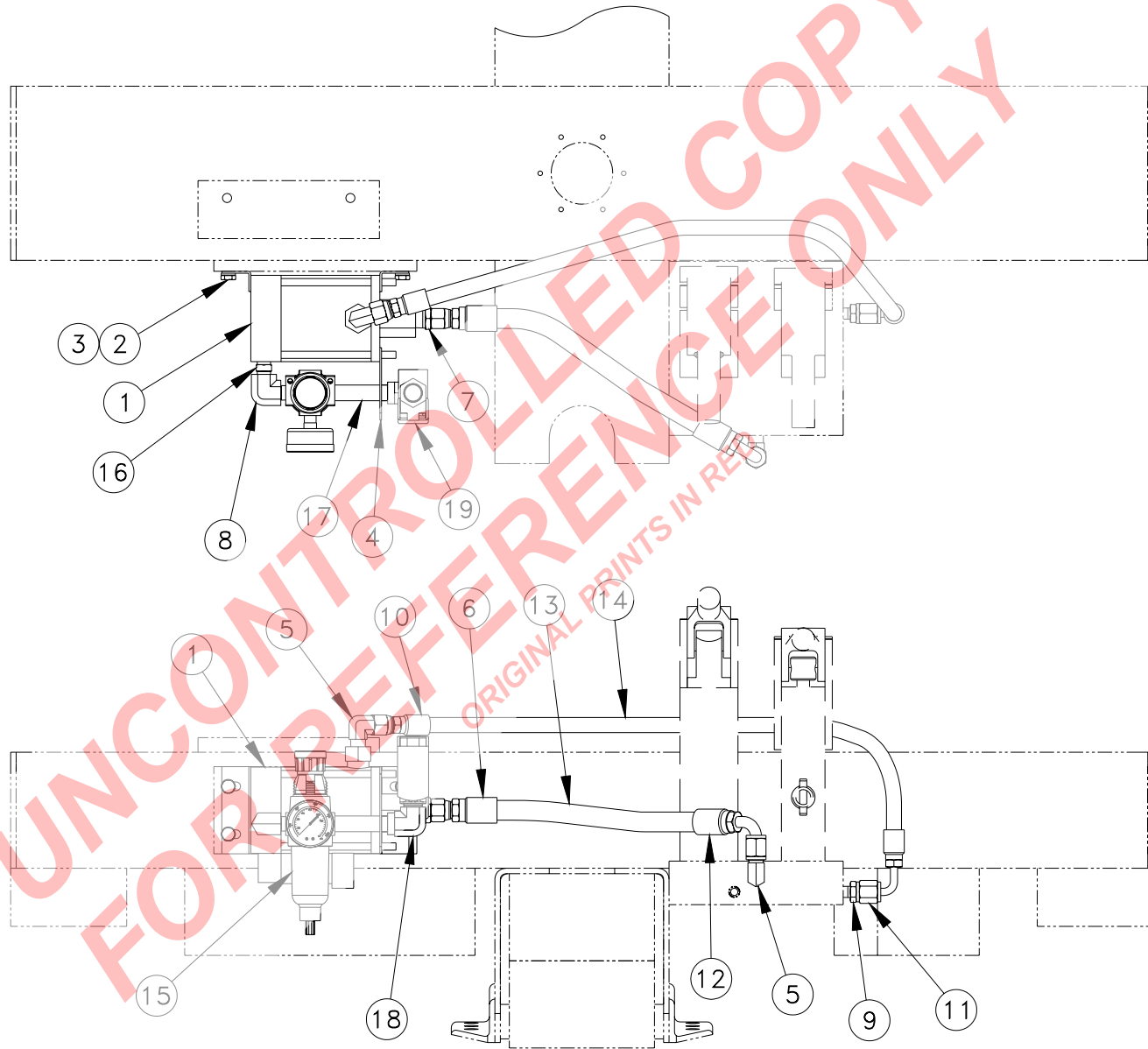
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 Figure 6

FIG. & ITEM NO.	PART NUMBER	DESCRIPTION	UNITS PER ASS'Y
<b>6-</b>	<b>450C1832</b>	<b>Pump Kit.....</b>	<b>Ref.</b>
-1	450A3344	Pneudraulic Pump.....	1
-2	371-12030	Hex Head Cap Screw.....	4
-3	346-10016	Lockwasher.....	4
-4	450A5474	Support Plate.....	1
-5	456-10604	Male Elbow.....	2
-6	486-50606	Hose End.....	1
-7	457-10606	Male Connector.....	1
-8	485-00404	Street Elbow.....	1
-9	457-10602	Male Connector.....	1
-10	486-50604	Hose End.....	1
-11	450A4224	Hose End.....	1
-12	450A4220	Hose End.....	1
-13	450A4300	Hose.....	AR
-14	450A5100	Hose.....	AR
-15	450A3381	Filter Regulator.....	1
-16	483-10404	Pipe Nipple.....	1
-17	483-40420	Pipe Nipple.....	1
-18	485-00604	Street Elbow.....	1
-19	450A3202	Valve.....	1

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Figure 6



# Appendix

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# **ROUTINE JACK MAINTENANCE BULLETIN**

RJM 102

1 OF 1

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

### **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-H-5606, or equal, with no further additive required.

- 2) At 0°F (-18°C) to -20°F (-29°C)

Use a mixture of 75% MIL-H-5606, or equal, and 25% kerosene.

- 3) Below -20°F (-29°C)

Use a mixture of 50% MIL-H-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-H-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.



# **ROUTINE JACK MAINTENANCE BULLETIN**

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

## **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 have 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.**

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# **ROUTINE JACK MAINTENANCE BULLETIN**

RJM 147

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

### **RECOMMENDED ANNUAL JACK CERTIFICATION PROCEDURE**

To ensure proper operation of all aircraft hydraulic jacks, it is important that at a minimum, each jack is certified on an annual basis. The following procedure is provided as an aid to the certification process.

- 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.
- 2) Open release valve and verify ram(s) retract fully.
- 3) Position jack under jack tester.
- 4) Close release valve, and extend ram(s):
  - a) Single Stage Cylinder - Extend ram at least 2 inches.
  - b) Multi-Stage Cylinder - Fully extend all but the last stage. Extend the last stage at least 2 inches.
- 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.



# ROUTINE JACK MAINTENANCE BULLETIN

RJM 149

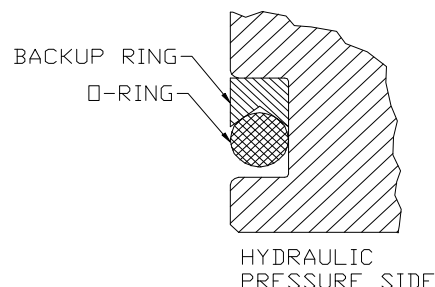
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## TO PROVIDE COMPLETE INFORMATION ON SERVICING ColumbusJACK/REGENT QUALITY GROUND HANDLING EQUIPMENT

### 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 or 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)







# **ROUTINE JACK MAINTENANCE BULLETIN**

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

## **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.
2. Perform "Recommended Annual Jack Certification Procedure" per RJM 147.



# **ROUTINE JACK MAINTENANCE BULLETIN**

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**TO PROVIDE COMPLETE INFORMATION ON SERVICING  
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## **RECOMMENDED HYDRAULIC OILS**

The following hydraulic oils are recommended for use in all ColumbusJACK/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-5606)  
Exxon/Mobil DTE-11, -15  
Phillips 66 X/C 5606  
Royco 783 (Anderol) (MIL-PRF-6083)  
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)

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RJM 207

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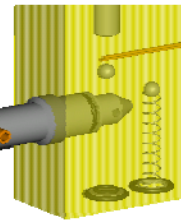
## TO PROVIDE COMPLETE INFORMATION ON SERVICING ColumbusJACK/REGENT QUALITY GROUND HANDLING EQUIPMENT

### PROCEDURE FOR ADJUSTING ColumbusJACK/REGENT CARTRIDGE 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 ColumbusJACK/Regent cartridge relief valves.

- 1) Position jack under tester.
- 2) Fully close release valve.
- 3) Extend cylinder ram(s):
  - 3.1 On single stage jacks, extend the ram approximately half way.
  - 3.2 On multiple stage jacks, extend all rams until the smallest ram is extended approximately half way.

- 4) Remove spring pin on release valve cartridge.

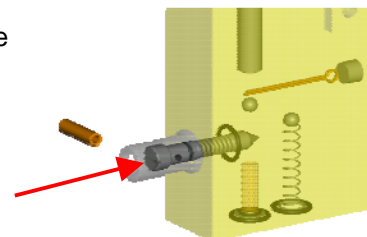


- 5) Using smooth, uniform pump handle strokes, manually pressurize the cylinder while monitoring either jack load gauge or load gauge on tester.

- 6) 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).

- 7) If safety relief valve is set too high, release pressure and rotate adjusting screw counterclockwise.

- 8) If safety relief valve is set too low, release pressure and rotate adjusting screw clockwise.



- 9) Repeat steps until valve is adjusted in range.
- 10) Open release valve and lower ram(s) completely.
- 11) Re-install spring pin. Jack is now ready for service.