



**Model: 1128AS100-5**  
**(Lockheed Martin: 2SJL00202-0003)**  
**20 Ton (18 Metric Ton)**  
**Axle Jack**



07/2021 – Rev. 05

REVISION	DATE	TEXT AFFECTED
01	01/2018	Original release
02	08/2020	Modified Parts List
03	10/2020	Modified Parts List
04	06/2021	Modified Parts List
05	07/2021	Modified Parts List

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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., its 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

20 Ton (18 Metric Ton) Axle Jack

### 1.2 MODEL & SERIAL NUMBER

Reference nameplate on unit

### 1.3 MANUFACTURER

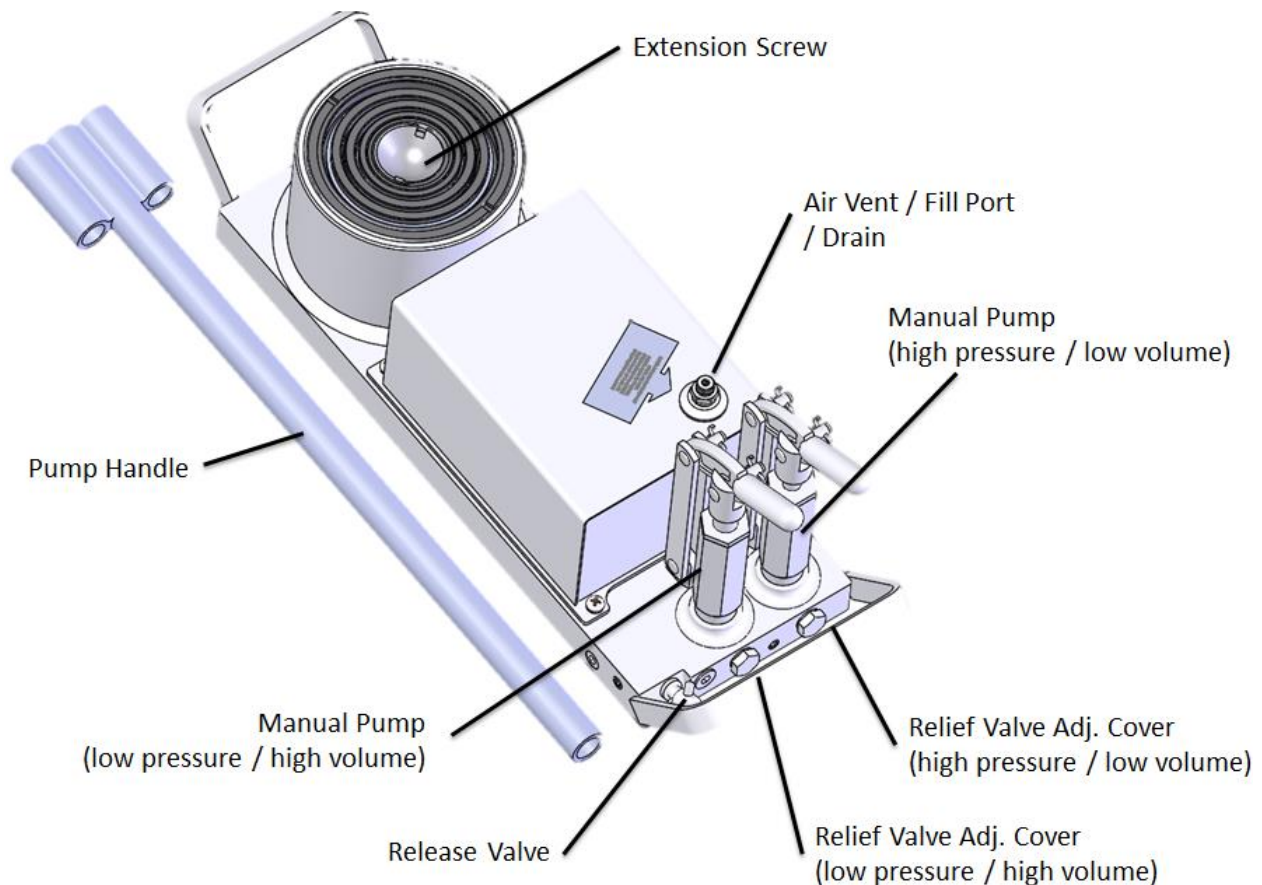
Columbus**Jack**/Regent  
1 Air Cargo Pkwy East  
Swanton, Ohio 43558 USA

Telephone: 614.443.7492  
Fax: 614.444.9337  
E-mail: [sales@columbusjack.com](mailto:sales@columbusjack.com)  
Website: [www.columbusjack.com](http://www.columbusjack.com)

### 1.4 FUNCTION

Portable self-contained manually operated hydraulic jack. Jack has two carry handles based on weight and heavy square base to provide stability during operation. Jack design has two manually operated hand pumps (low pressure/ high volume and high pressure/ low volume), relief valves for each pump (same setting), #50 mesh screen filter (297 micron), reservoir air vent, multi-stage rams and adjustable extension screw. The rams and extension screw are mounted inside a cylinder. The cylinder and all other components are attached to the steel base.

### 1.5 FEATURES



## 1.6 SPECIFICATIONS

Capacity .....	20 Ton (18 Metric Ton)
Minimum Height .....	5.5 in (13.97 cm)
Hydraulic Lift .....	11.32 in (28.75 cm)
Screw Extension .....	3.25 in (8.56 cm)
Maximum Height .....	20.7 in (52.58 cm)
Operating Pressure .....	5660 psi (39.0 MPa)
Relief Valve Pressure.....	6200 psi (42.7 MPa)
Reservoir Capacity .....	.95 gal (3.60 l)
Recommended Oil Volume .....	.75 gal (2.84 l)
Recommended Oil Type.....	MIL-PRF-5606H *
Operating Temperature.....	-20° to +130° F (-28°C to +54°C) **
Storage Temperature .....	-60° to +160° F (-50°C to +70°C)
Estimated Weight .....	100 lbs (45.35 kg)

\*Additional approved oil types listed in RJM 171 (see Appendix)

\*\*See RJM 102 for jack operation in temperatures below 0° F (-18° C) (see Appendix)

## 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 18 tonne (20 tons). 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.**

### 2.3 ENVIRONMENTAL SAFETY

#### The Work Area

Always keep the station clean to avoid and/or discover emissions.

#### Waste And Emissions Regulations

- Observe these safety regulations regarding waste and emissions:
- Appropriately dispose of all waste.
- Handle and dispose of the processed liquid in compliance with applicable environmental regulations.
- Clean up all spills in accordance with safety and environmental procedures.
- Report all environmental emissions to the appropriate authorities.

#### Recycling Guidelines

Always follow local laws and regulations regarding recycling.

## 2.4 USER SAFETY

### General Safety

Use safety equipment according to the company regulations. Wear appropriate safety equipment when operating and maintaining the equipment.

### Safety Equipment

- Safety goggles
- Protective gloves
- Breathing mask to prevent inhalation of oil mist

### Safety In Explosive Environment

Only trained personnel familiar with explosive environment work requirements should use this equipment. Appropriate grounding is the responsibility of the installer or operator.

### Potential Hazards To Avoid

- Nonmetallic parts should not be rubbed (e.g. cleaning) while in a known hazardous area.
- Removable jack handle, when not in use should be safely stowed and carefully positioned to avoid creating hazard.
- Do not drop or strike ground or other objects when handling portable jack.

## 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 CHECKING FLUID LEVEL, PUMP ASSEMBLY

Ensure that rams are fully collapsed prior to checking and adding fluid to reservoir. Wipe air vent and top of reservoir with a clean lint-free cloth to remove any dust or debris. Oil level should be 1/2 in (12.7 mm) below top of reservoir. To drain the fluid, remove the fill/drain port plug, drain. Add hydraulic fluid as required. Fill port does not have strainer basket and care should be taken to prevent contaminants from entering reservoir during the fill process.

**NOTE: Fluid is drained and filled through the same port.**



#### CAUTION!

**Use of contaminated fluid may cause damage to internal components. Filter oil as needed to maintain the cleanliness of system.**

### 3.3 SYSTEM BLEED PROCEDURE

Open air vent two full turns. Open release valve one full turn. Operate jack pump handle 10 to 20 complete strokes to expel any air in system.

Close Release Valve and raise rams at-least 6 in (152 mm). Open Release Valve and fully collapse rams to remove any air in the system. Repeat until all air is removed. Air Vent remains open during usage.



#### WARNING!

**DO NOT tamper with or modify relief valve setting.**



#### WARNING!

**Damaged, defective, or suspected parts shall be repaired or replaced before attempting to operate the jack. Defective parts or weak structural points may cause sudden jack failure and/or loss of lift load with attendant danger or injury to personnel.**

## 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 and verify Air Vent is in open position.



#### WARNING!

**Jack assembly weighs 100 lbs (45 kg) do not attempt to lift with less than 3 persons.**

### 5.2 LIFTING PROCEDURE

1. Verify jack is located and load rated per airplane jacking procedures.



#### WARNING!

**When positioning/removing jack, care should be taken not to drop or strike the ground and/or other objects that may create accidental sparking.**

2. Raise extension screw to mate with airplane axle jacking point.
3. Close release valve.
4. Operate hand pump to raise aircraft as required.

**Note: This jack is fitted with dual pressure pumps – position pump handle to actuate both pumps simultaneously. Operate pump handle until load starts to move or handle is difficult to actuate. To continue raising load, position pump handle onto the high pressure (low volume) pump only and continue raising load to the proper height.**



#### 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 (largest ram) is fully extended first, before the second stage ram begins to extend. Ensure that the second stage ram is fully extended before the third stage ram begins to extend. Ensure that the third stage ram is fully extended before the fourth 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. Verify air vent is open, slowly open release valve to lower rams.

**Note: Speed of lowering is controlled by how far release valve is open. Do not open release valve more than two complete turns when lowering.**

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



#### WARNING!

**When positioning/removing jack, care should be taken not to drop or strike the ground and/or other objects that may create accidental sparking.**



#### WARNING!

**Removable pump handle, when not in use, should be safely stowed.**

## **6.0 PACKAGING AND STORAGE**

### **6.1 PREPARATION FOR STORAGE**

1. Remove any dirt or hydraulic fluid from the outer surfaces of jack with lint-free cloth. Clean with lint-free cloth and apply light film of lubricating oil to outer bearing surfaces of rams.
2. Fully collapse rams, and with release valve in open position, close air vent.
3. Inspect hydraulic fluid level and fill as required.
4. Secure Pump Handle to pump assembly base and store jack in upright position on its base.
5. Stow jack in sheltered area. Use water resistant cover to prolong useful life.
6. If jack is prepared for shipment, drain and remove hydraulic fluid from jack.



## 7.0 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 pump piston or pump body	Damaged o-ring, backup ring, piston or pump body	Remove affected piston. In-spect piston and pump body for damage. Replace defective parts. Replace removed o-ring and backup ring
External fluid leakage at rams	Damaged backup ring, o-ring 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
Jack fails to lift rated load with operation of manual pump	Incomplete closure of release valve	Fully tighten release valve
	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
	Low fluid level	Fill to correct fluid level
	By-pass valve improperly adjusted	Test and adjust by-pass valve as per RJM 117 (See Appendix.)
	Broken compression spring	Remove pump rocker and link details. Unscrew pump body; remove and replace defective valve assembly; test and adjust per RJM 117 (See Appendix.)
	Air lock or vacuum in reservoir due to clogged breather pas-sage in air vent; clogged intake oil screen	Remove air vent assembly and/or oil screen and clear the obstruction
Rams will not fully elevate when manual pump is operated	Low fluid level	Fill to correct fluid level
	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 per RJM 117 (See Appendix.)
Rams will not support load after manual pump-up	Internal pressure leakage at ram static or dynamic seals	Check for external leakage. If present, replace defective seal. If no external leakage is observed, 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 on the side of the housing
	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
Rams elevate and fall with each manual pump stroke	Incomplete closure of release valve	Fully tighten release valve
	Check valve next to cylinder and in hand pump. Both are defective	Remove and replace defective check valve
	Pressure leakage past release valve ball	Remove release valve, inspect ball and ball seat in pump block. Replace defective parts
Manual pump inoperative or 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 the obstruction
Pump-up satisfactory but pump pressure fails to by-pass at maximum ram extension or with overload applied	By-pass valve improperly adjusted	Test and adjust by-pass valve per RJM 117 (See Appendix.)
	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 per RJM 11. (See Appendix.)

## 8.0 MAINTENANCE

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

- Inspect for damaged or missing components.
- Inspect for oil leakage and proper fluid level.
- Inspect screw extension for mechanical stop.
- Inspect all snap rings for engagement into grooves.
- Inspect jack adapter for damage.
- Inspect hydraulic hose and end adapters for damage.

### Every 6 Months

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

### Every 12 Months

Perform "Annual Jack Certification" to verify proper operation of aircraft hydraulic jack as described in RJM 147. If valve setting is required, refer to RJM 117 and Specialized Maintenance section below. RJM documents are located in Appendix.

### Every 36 Months

Based on local operating conditions and frequency of use, hydraulic fluids should be replaced to prevent contamination and premature wear of hydraulic components.

#### 8.1 SPECIAL MAINTENANCE INSTRUCTIONS (RELIEF VALVE SETTING)



#### **WARNING!**

**DO NOT tamper with or modify relief valve setting.**

**The following procedure should only be used if relief valve has been tampered with.**

1. Position jack under a jack tester. Fully extend the first, second and third stage rams and partially extend the fourth stage ram.
2. Remove the plug (Item 23) from under pump piston (Item 14).
3. Set the relief valve at 19.1 – 21 - 22 ton (20.0 metric ton) as described in RJM 117. (See Appendix).



#### **CAUTION!**

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



#### **WARNING!**

**DO NOT EXCEED 22 ton (20 metric ton)**

4. Reinstall plug (Item 23).
5. Remove the plug (Item 23) from under pump piston (Item 18).
6. Set the relief valve at 19.1 – 20.0 tonne (21 - 22 ton) as described in RJM 117. (See Appendix).



#### **CAUTION!**

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



#### **WARNING!**

**DO NOT EXCEED 22 ton (20 metric ton)**

7. Reinstall plug (Item 23).

#### 8.2 SHOP AIDS AVAILABLE

915-EB Adjuster Assembly

#### 8.3 OVERHAUL KITS AVAILABLE

Soft Kit 120A1533

Repair Kit 120A1534

## **9.0 PROVISION OF SPARES**

### **9.1 SOURCE OF SPARE PARTS**

Spare parts may be obtained from the manufacturer:

ColumbusJack/Regent

1 Air Cargo Pkwy East

Swanton, Ohio 43558 USA

Telephone: 614.443.7492

Fax: 614.444.9337

E-mail: sales@columbusjack.com

Website: www.columbusjack.com

### **9.2 RECOMMENDED SPARE PARTS LISTS**

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

## **10.0 IN SERVICE SUPPORT**

Contact Tronair, Inc. for technical services and information. See Section 1.3 – Manufacturer.

## **11.0 GUARANTEES/LIMITATION OF LIABILITY**

1. 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 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
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## **12.0 APPENDICES**

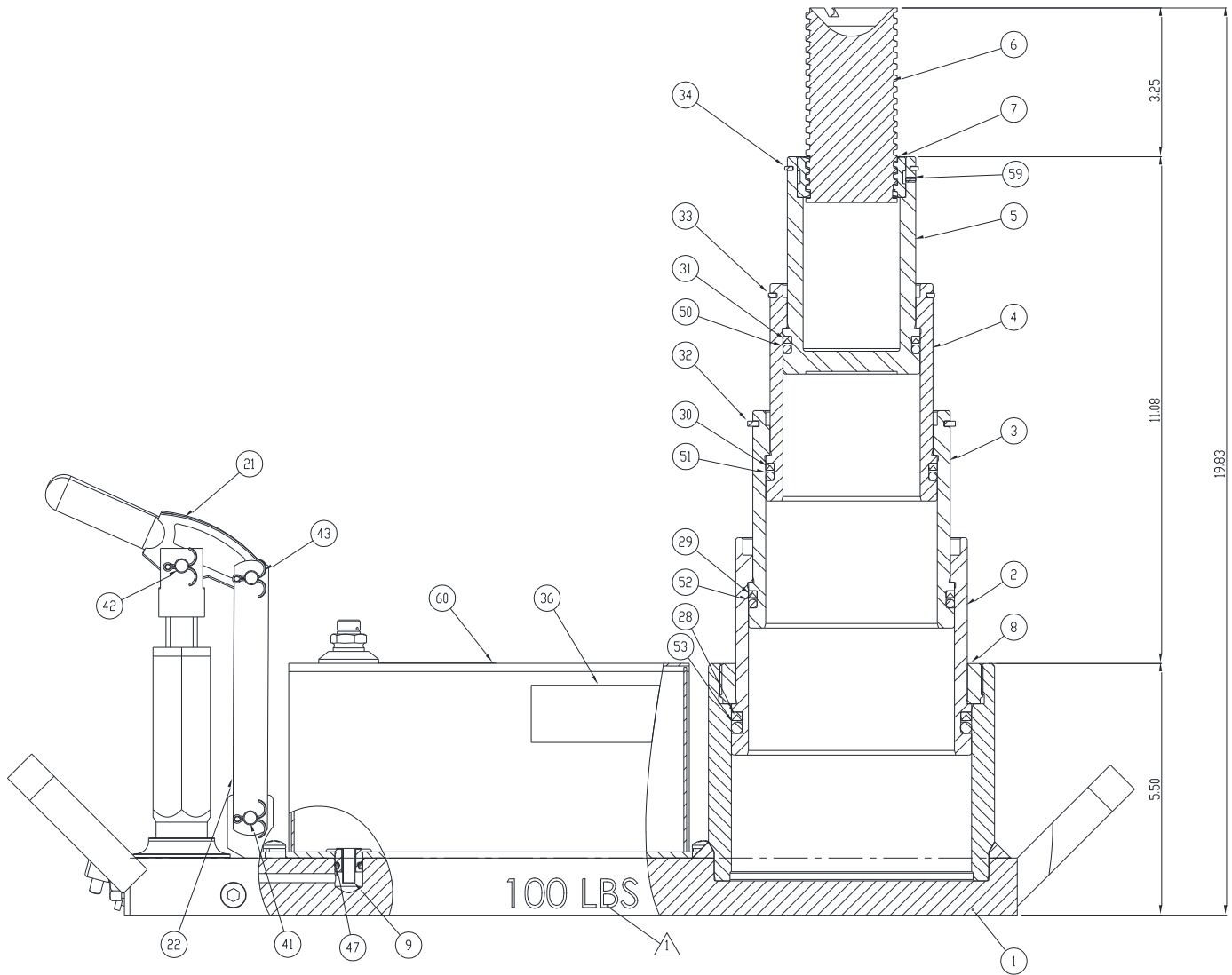
APPENDIX I Hydraulic Schematic

APPENDIX II Routine Jack Maintenance Bulletins

APPENDIX III Safety Data Sheet

## Parts List

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



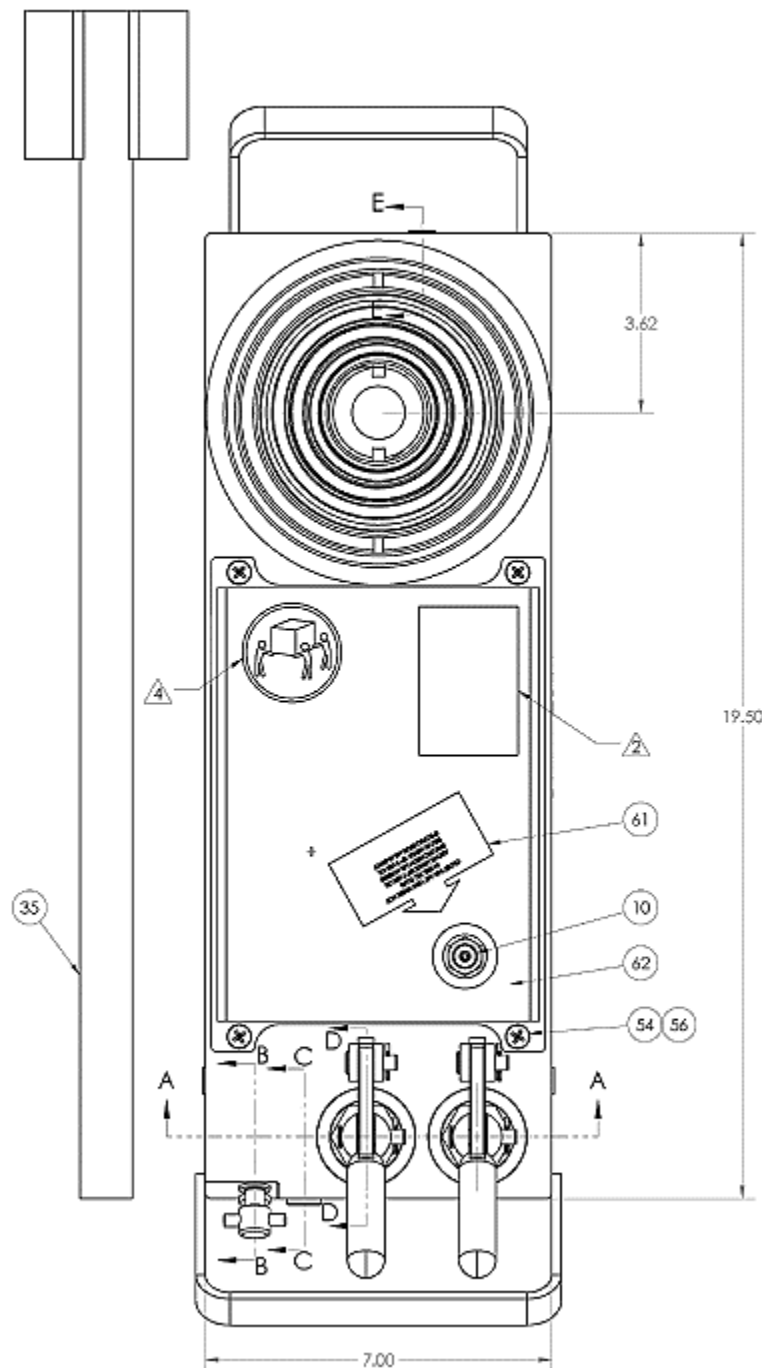
## Parts List

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

Item	Part Number	Description	Qty
1	1128AS101	Cylinder Base	1
2	1128AS107-5	Ram, First Stage	1
3	1128AS108-5	Ram, Second Stage	1
4	1128AS109-5	Ram, Third Stage	1
5	1128AS110-5	Ram, Fourth Stage	1
6	1128AS111	Extension Screw	1
7	1128AS112	Nut, Extension Screw	1
8	1128AS113-5	Bushing, Cylinder	1
9	47D02120-1	Screen, Pump	1
21	1128AS141	Rocker Arm	2
22	1128AS142	Link, Pump	4
28	1128AS152-5-1	Backup Ring	1
29	1128AS152-5-2	Backup Ring	1
30	1128AS152-5-3	Backup Ring	1
31	1128AS152-5-4	Backup Ring	1
32	1128AS154-1	Retaining Ring	1
33	1128AS154-2	Retaining Ring	1
34	1128AS154-3	Retaining Ring	1
36	160-701	CE Serial Label	1
41	MS20392-4C25	Pin, Flat Head	4
42	MS20392-4C35	Pin, Flat Head	2
43	MS24665-283	Cotter Pin	6
47	MS28775-111	O-Ring	1
50	MS28775-334	O-Ring	1
51	MS28775-340	O-Ring	1
52	MS28775-346	O-Ring	1
53	MS28775-427	O-Ring	1
59	MS51966-49	Set Screw	1
60	1128AS114	Reservoir	1
N/S	1128AS143	Adjusting Screw, Valve Plug	2
	MS35333-40	Lockwasher	4

## Parts List

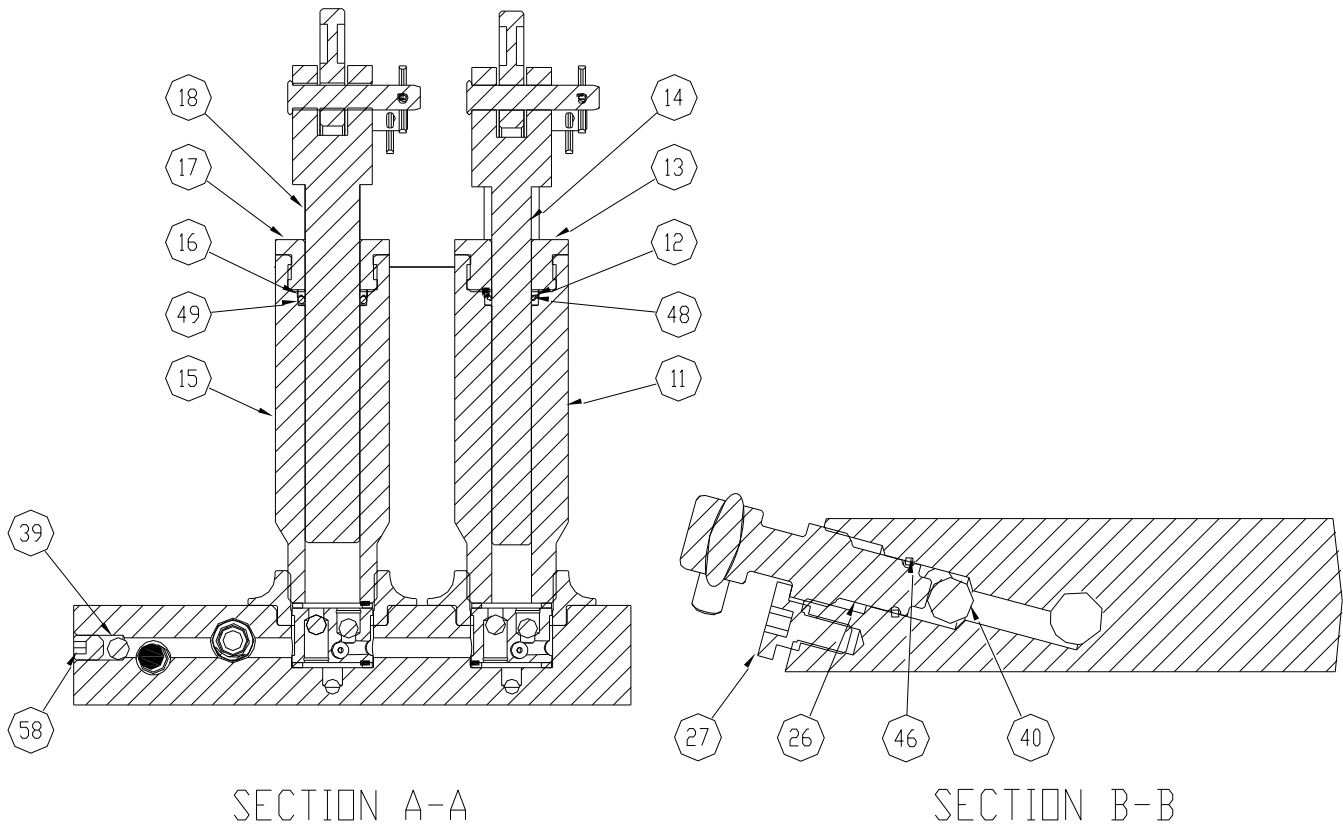
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
10	1128AS121	Air Vent Assembly	1
35	1128AS155	Pump Handle	1
54	MS35206-279	Screw, Pan Head	4
56	MS51965-65	Set Screw	1
61	1128AS151	Decal, Air Vent	1
62	V-2725	Label, Drain Plug	1

## Parts List

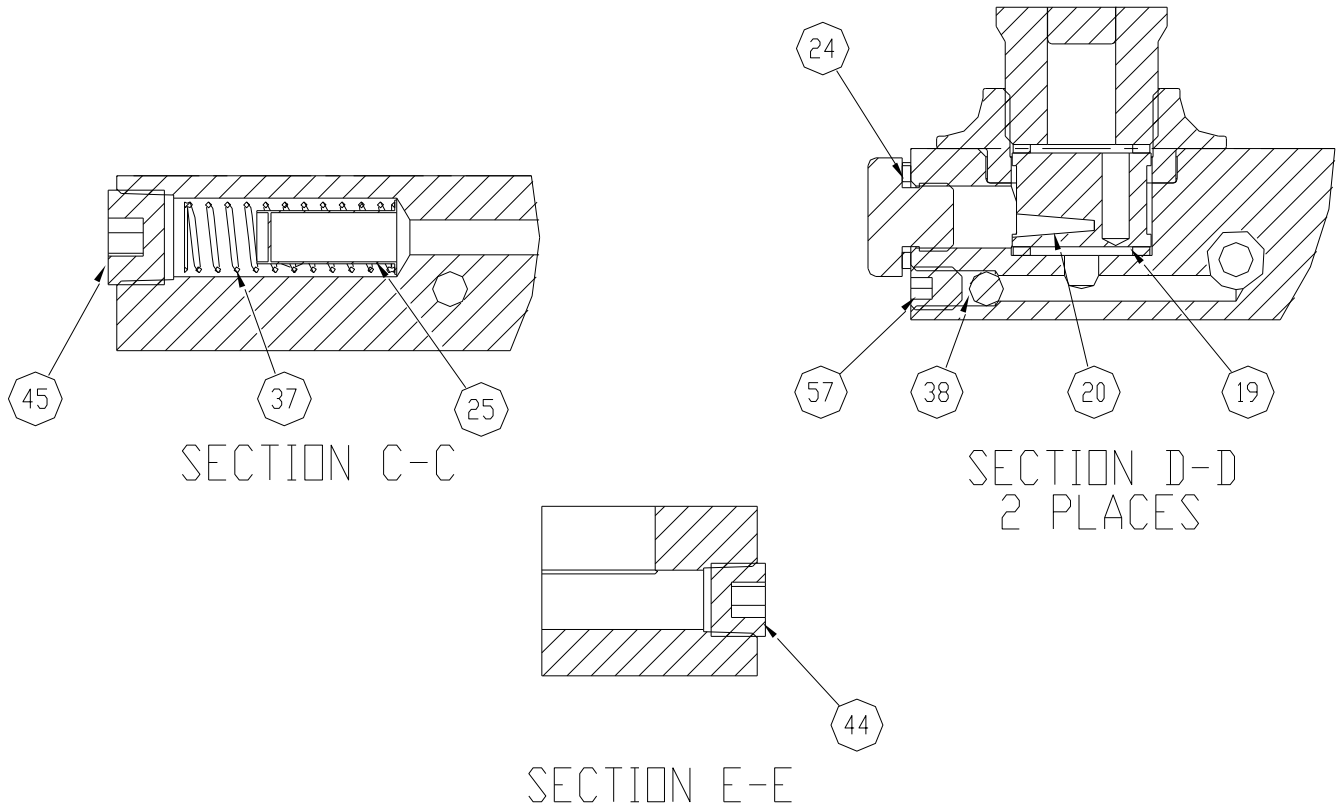
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
11	1128AS127	Pump Body, Small	1
12	1128AS128	Backup Ring	1
13	1128AS129	Nut-Packing, Small	1
14	1128AS130	Pump Piston, Small	1
15	1128AS131	Pump Body	1
16	1128AS132	Backup Ring	1
17	1128AS133	Nut-Packing, Large	1
18	1128AS134	Pump Piston, Large	1
26	1128AS147	Release Valve	1
27	1128AS150	Screw-Lock Release Valve	1
39	MS19059-2415	Ball, Steel	1
40	MS19059-2418	Ball, Steel	1
46	MS28775-011	O-Ring	1
48	MS28775-112	O-Ring	1
49	MS28775-115	O-Ring	1
58	MS51965-78	Set Screw	1

## Parts List

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



Item	Part Number	Description	Qty
19	1128AS135	Gasket, Valve	4
20	1128AS136	Valve Assembly	2
24	1128AS144	Gasket, Plug	2
25	47D02120-1	Screen, Pump	1
37	CJ69B1225	Spring, Screen	1
38	MS19059-2414	Ball, Steel	3
44	488-00004	Pipe Plug	3
45	488-00006	Pipe Plug	1
57	MS51965-66	Set Screw	2



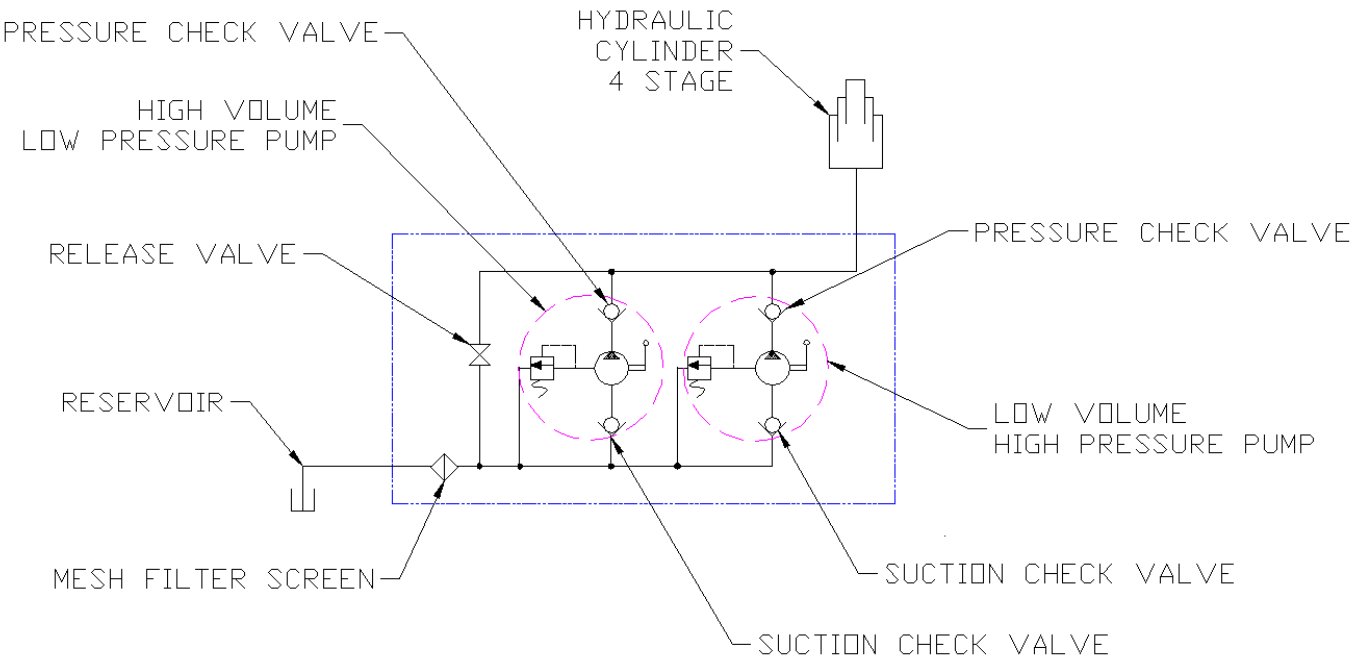


## **APPENDIX I**

### **Hydraulic Schematic**



# Hydraulic Schematic







## **APPENDIX II**

### **Routine Jack Maintenance Bulletins**





# Routine Jack Maintenance Bulletin

## **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.



# Routine Jack Maintenance Bulletin

## **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 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.**



## 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.

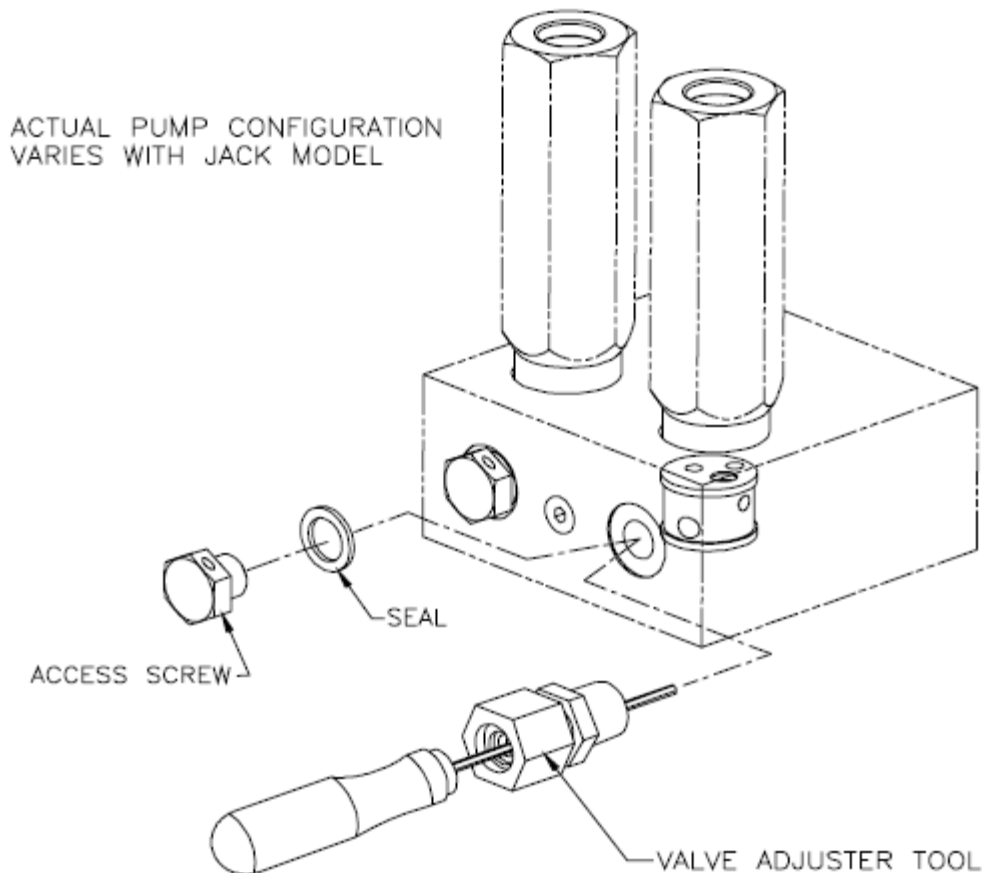
1. Position jack under jack tester.
2. Fully close release valve.
3. Remove access screw and seal. Install valve adjusting tool, Part No. 915-EB. (See illustration)

**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.
5. To set valves:
  - a. 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 or electric pump if applicable.



## **BULLETIN RJM 147 – RECOMMENDED ANNUAL JACK CERTIFICATION 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.

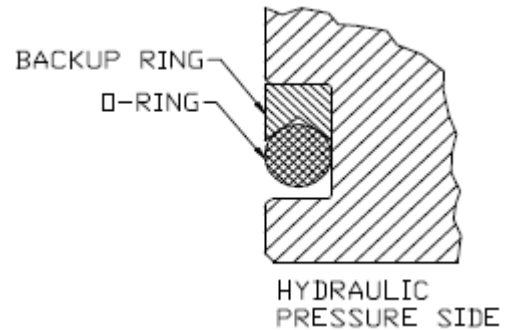
## BULLETIN RJM 149 – TEFLON BACKUP RING INSTALLATION PROCEDURE

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 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

## **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.



# Routine Jack Maintenance Bulletin

## **BULLETIN RJM171 - RECOMMENDED HYDRAULIC OILS**

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.

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 (Aderol) (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)





## **APPENDIX III**

### **SAFETY DATA SHEET**





Product Name: MOBIL AERO HFA  
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## SAFETY DATA SHEET

### SECTION 1

### PRODUCT AND COMPANY IDENTIFICATION

#### PRODUCT

**Product Name:** MOBIL AERO HFA  
**Product Description:** Base Oil and Additives  
**Product Code:** 201550401020, 490110-00, 970584  
**Intended Use:** Aviation hydraulic oil

#### COMPANY IDENTIFICATION

**Supplier:** EXXON MOBIL CORPORATION  
22777 Springwoods Village Parkway  
Spring, TX. 77253 USA  
**24 Hour Health Emergency** 609-737-4411  
**Transportation Emergency Phone** 800-424-9300 or 703-527-3887 CHEMTREC  
**Product Technical Information** 800-662-4525  
**MSDS Internet Address** <http://www.exxon.com>, <http://www.mobil.com>

### SECTION 2

### HAZARDS IDENTIFICATION

This material is hazardous according to regulatory guidelines (see (M)SDS Section 15).

#### CLASSIFICATION:

Flammable liquid: Category 4.  
Aspiration toxicant: Category 1.

#### LABEL:

##### Pictogram:



**Signal Word:** Danger

#### Hazard Statements:

H227: Combustible liquid. H304: May be fatal if swallowed and enters airways.

#### Precautionary Statements:

P210: Keep away from flames and hot surfaces. -- No smoking. P273: Avoid release to the environment. P280: Wear protective gloves and eye / face protection. P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P331: Do NOT induce vomiting. P370 + P378: In case of fire: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish. P403 + P235: Store in a well-ventilated place. Keep cool. P405: Store locked up. P501: Dispose of contents and container in accordance with local regulations.

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## Other hazard information:

**HAZARD NOT OTHERWISE CLASSIFIED (HNOC):** None as defined under 29 CFR 1910.1200.

## PHYSICAL / CHEMICAL HAZARDS

Material can accumulate static charges which may cause an ignition. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited. Combustible.

## HEALTH HAZARDS

High-pressure injection under skin may cause serious damage. Excessive exposure may result in eye, skin, or respiratory irritation.

## ENVIRONMENTAL HAZARDS

No significant hazards.

<b>NFPA Hazard ID:</b>	Health: 1	Flammability: 2	Reactivity: 0
<b>HMIS Hazard ID:</b>	Health: 1*	Flammability: 2	Reactivity: 0

**NOTE:** This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

## SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

### Hazardous Substance(s) or Complex Substance(s) required for disclosure

Name	CAS#	Concentration*	GHS Hazard Codes
2,6-DI-TERT-BUTYL-P-CRESOL	128-37-0	0.1 - < 1%	H400(M factor 1), H410(M factor 1)
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT	64742-47-8	5 - < 10%	H304
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	64742-53-6	50 - < 70%	H227, H304
HYDROTREATED MIDDLE DISTILLATE (PETROLEUM)	64742-46-7	20 - < 30%	H304
TRIPHENYL PHOSPHATE	115-86-6	0.1 - < 0.25%	H400(M factor 1), H410(M factor 1)

\* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

As per paragraph (i) of 29 CFR 1910.1200, formulation is considered a trade secret and specific chemical identity and exact percentage (concentration) of composition may have been withheld. Specific chemical identity and exact percentage composition will be provided to health professionals, employees, or designated representatives in accordance with applicable provisions of paragraph (i).

## SECTION 4 FIRST AID MEASURES

### INHALATION

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Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

## SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

## EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

## INGESTION

Seek immediate medical attention. Do not induce vomiting.

## NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

## SECTION 5 FIRE FIGHTING MEASURES

### EXTINGUISHING MEDIA

**Appropriate Extinguishing Media:** Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

**Inappropriate Extinguishing Media:** Straight Streams of Water

### FIRE FIGHTING

**Fire Fighting Instructions:** Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

**Unusual Fire Hazards:** Combustible. Pressurized mists may form a flammable mixture.

**Hazardous Combustion Products:** Aldehydes, Incomplete combustion products, Oxides of carbon, Phosphorus oxides, Smoke, Fume, Sulfur oxides

### FLAMMABILITY PROPERTIES

**Flash Point [Method]:** >82°C (180°F) [ASTM D-93]

**Flammable Limits (Approximate volume % in air):** LEL: 0.7 UEL: 7.0 [Estimated]

**Autoignition Temperature:** >225°C (437°F)

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable

regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

#### PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders: Respiratory protection: respiratory protection will be necessary only in special cases, e.g., formation of mists. Half-face or full-face respirator with filter(s) for dust/organic vapor or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to hydrocarbons are recommended. Gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

#### SPILL MANAGEMENT

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapor; but may not prevent ignition in closed spaces. Recover by pumping or with suitable absorbent.

**Water Spill:** Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

#### ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

### SECTION 7

### HANDLING AND STORAGE

#### HANDLING

Avoid contact with skin. Avoid prolonged breathing of mists and heated vapor. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static

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accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

**Static Accumulator:** This material is a static accumulator.

## STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be grounded and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit / Standard			NOTE	Source
2,6-DI-TERT-BUTYL-P-CRESOL	Inhalable fraction and vapor	TWA	2 mg/m3		N/A	ACGIH
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT [total hydrocarbon vapor]	Non-Aerosol	TWA	200 mg/m3		Skin	ACGIH
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	Mist.	TWA	5 mg/m3		N/A	OSHA Z1
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	Inhalable fraction.	TWA	5 mg/m3		N/A	ACGIH
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	Mist.	TWA	5 mg/m3		N/A	ACGIH
HYDROTREATED MIDDLE DISTILLATE (PETROLEUM)	Mist.	TWA	5 mg/m3		N/A	OSHA Z1
HYDROTREATED MIDDLE DISTILLATE (PETROLEUM)	Inhalable fraction.	TWA	5 mg/m3		N/A	ACGIH
TRIPHENYL PHOSPHATE		TWA	3 mg/m3		N/A	OSHA Z1
TRIPHENYL PHOSPHATE		TWA	3 mg/m3		N/A	ACGIH

**Exposure limits/standards for materials that can be formed when handling this product:** When mists/aerosols can occur the following are recommended: 5 mg/m<sup>3</sup> - ACGIH TLV (inhalable fraction), 5 mg/m<sup>3</sup> - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

No biological limits allocated.

### ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions.

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Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

## PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

**Respiratory Protection:** If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

**Hand Protection:** Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

If prolonged or repeated contact is likely, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet style gloves.

**Eye Protection:** If contact is likely, safety glasses with side shields are recommended.

**Skin and Body Protection:** Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

**Specific Hygiene Measures:** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

## ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

## SECTION 9

## PHYSICAL AND CHEMICAL PROPERTIES

**Note:** Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

## GENERAL INFORMATION

**Physical State:** Liquid

**Color:** Red

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Odor: Characteristic  
 Odor Threshold: N/D

## IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.88  
 Flammability (Solid, Gas): N/A  
 Flash Point [Method]: >82°C (180°F) [ASTM D-93]  
 Flammable Limits (Approximate volume % in air): LEL: 0.7 UEL: 7.0 [Estimated]  
 Autoignition Temperature: >225°C (437°F)  
 Boiling Point / Range: N/D  
 Decomposition Temperature: N/D  
 Vapor Density (Air = 1): N/D  
 Vapor Pressure: [N/D at 20 °C]  
 Evaporation Rate (n-butyl acetate = 1): N/D  
 pH: N/A  
 Log Pow (n-Octanol/Water Partition Coefficient): N/D  
 Solubility in Water: Negligible  
 Viscosity: 13.8 cSt (13.8 mm2/sec) at 40 °C | 5.1 cSt (5.1 mm2/sec) at 100°C [ASTM D 445]  
 Oxidizing Properties: See Hazards Identification Section.

## OTHER INFORMATION

Freezing Point: N/D  
 Melting Point: N/A  
 Pour Point: -60°C (-76°F) [ASTM D97]  
 DMSO Extract (mineral oil only), IP-346: < 3 %wt

## SECTION 10

## STABILITY AND REACTIVITY

**REACTIVITY:** See sub-sections below.

**STABILITY:** Material is stable under normal conditions.

**CONDITIONS TO AVOID:** Open flames and high energy ignition sources.

**MATERIALS TO AVOID:** Strong oxidizers

**HAZARDOUS DECOMPOSITION PRODUCTS:** Material does not decompose at ambient temperatures.

**POSSIBILITY OF HAZARDOUS REACTIONS:** Hazardous polymerization will not occur.

## SECTION 11

## TOXICOLOGICAL INFORMATION

### INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
<b>Inhalation</b>	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.

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<b>Ingestion</b>	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
<b>Skin</b>	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin Corrosion/Irritation: No end point data for material.	May dry the skin leading to discomfort and dermatitis. Based on assessment of the components.
<b>Eye</b>	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
<b>Sensitization</b>	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.
<b>Aspiration:</b> Data available.	May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material.
<b>Germ Cell Mutagenicity:</b> No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
<b>Carcinogenicity:</b> No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
<b>Reproductive Toxicity:</b> No end point data for material.	Not expected to be a reproductive toxicant. Based on assessment of the components.
<b>Lactation:</b> No end point data for material.	Not expected to cause harm to breast-fed children.
<b>Specific Target Organ Toxicity (STOT)</b>	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: No end point data for material.	Not expected to cause organ damage from prolonged or repeated exposure. Based on assessment of the components.

## TOXICITY FOR SUBSTANCES

NAME	ACUTE TOXICITY
2,6-DI-TERT-BUTYL-P-CRESOL	Oral Lethality: LD50 0.89 g/kg (Rat)

## OTHER INFORMATION

### For the product itself:

Repeated and/or prolonged exposure may cause irritation to the skin, eyes, or respiratory tract. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

### Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--



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1 = NTP CARC  
2 = NTP SUS

3 = IARC 1  
4 = IARC 2A

5 = IARC 2B  
6 = OSHA CARC

## SECTION 12

## ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

### ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

### MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

Less volatile component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

### PERSISTENCE AND DEGRADABILITY

#### Biodegradation:

Components -- Expected to be inherently biodegradable

### BIOACCUMULATION POTENTIAL

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

## SECTION 13

## DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

### DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

### REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

**Empty Container Warning** Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be

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completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

## SECTION 14 TRANSPORT INFORMATION

### LAND (DOT)

**Proper Shipping Name:** COMBUSTIBLE LIQUID, N.O.S. (Distillates (Petroleum), Hydrotreated Light)  
**Hazard Class & Division:** COMBUSTIBLE LIQUID  
**ID Number:** NA1993  
**Packing Group:** III  
**ERG Number:** 128  
**Label(s):** NONE  
**Transport Document Name:** NA1993, COMBUSTIBLE LIQUID, N.O.S. (Distillates (Petroleum), Hydrotreated Light), COMBUSTIBLE LIQUID, PG III

Footnote: This material is not regulated under 49 CFR in a container of 119 gallon capacity or less when transported solely by land, as long as the material is not a hazardous waste, a marine pollutant, or specifically listed as a hazardous substance.

**LAND (TDG):** Not Regulated for Land Transport

**SEA (IMDG):** Not Regulated for Sea Transport according to IMDG-Code

**Marine Pollutant:** No

**AIR (IATA):** Not Regulated for Air Transport

## SECTION 15 REGULATORY INFORMATION

**OSHA HAZARD COMMUNICATION STANDARD:** This material is considered hazardous in accordance with OSHA HazCom 2012, 29 CFR 1910.1200.

**Listed or exempt from listing/notification on the following chemical inventories:** AICS, DSL, ENCS, IECSC, KECI, PICCS, TCSI, TSCA

**EPCRA SECTION 302:** This material contains no extremely hazardous substances.

**SARA (311/312) REPORTABLE HAZARD CATEGORIES:** Fire. Immediate Health. Delayed Health.

**SARA (313) TOXIC RELEASE INVENTORY:** This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

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The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT	64742-47-8	1, 17, 18
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	64742-53-6	1, 4, 13, 17, 18
HYDROTREATED MIDDLE DISTILLATE (PETROLEUM)	64742-46-7	1, 4, 17, 18

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16	OTHER INFORMATION
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N/D = Not determined, N/A = Not applicable

**KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):**

H227: Combustible liquid; Flammable Liquid, Cat 4  
 H304: May be fatal if swallowed and enters airways; Aspiration, Cat 1  
 H400: Very toxic to aquatic life; Acute Env Tox, Cat 1  
 H410: Very toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 1

**THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:**

Revision Changes:  
 Section 01: Company Mailing Address information was modified.  
 Section 05: Hazardous Combustion Products information was modified.  
 Section 15: List Citations Table information was modified.  
 Section 15: National Chemical Inventory Listing information was modified.  
 Section 14: Marine Pollutant information was modified.  
 Composition: Component Table information was modified.  
 Section 08: Exposure Limits Table information was modified.  
 Section 16: Revision Information - Implementation of GHS requirements phrase. information was deleted.

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