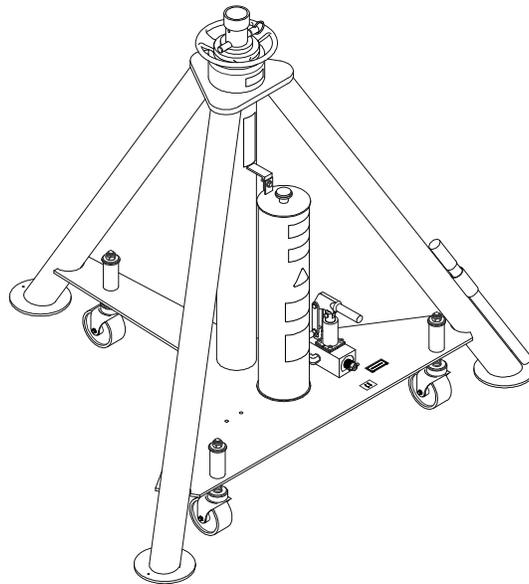




## Operation & Service Manual



**Model: 02-1248-0112**  
**12 Ton Single Stage Jack**

11/2004 – Rev. 02

**Includes Illustrated Parts Lists**

REVISION

01

02

DATE

08/2001

11/2004

TEXT AFFECTED

Major Revision

5.1 Jack Instructions - added Warning and illustrations

**TABLE OF CONTENTS**

	<b><u>PAGE</u></b>
<b>1.0 DESCRIPTION .....</b>	<b>1</b>
<b>2.0 USAGE .....</b>	<b>1</b>
<b>3.0 SPECIFICATIONS .....</b>	<b>1</b>
<b>4.0 ASSEMBLY INSTRUCTIONS .....</b>	<b>1</b>
4.1 GENERAL INSTRUCTION.....	1
4.2 PRE-USE CHECKS .....	1
<b>5.0 OPERATING INSTRUCTIONS.....</b>	<b>1</b>
5.1 JACK INSTRUCTIONS .....	2
<b>6.0 MAINTENANCE .....</b>	<b>4</b>
6.1 GENERAL .....	4
6.2 SERVICING JACK .....	4
6.3 JACK FUNCTION LOAD TEST.....	5
6.4 REMOVING AND SERVICING PUMP .....	5
<b>7.0 TROUBLE SHOOTING.....</b>	<b>5</b>
<b>8.0 PROVISION OF SPARES .....</b>	<b>5</b>
8.1 SPARE PARTS .....	5
8.2 PARTS LISTS & ILLUSTRATIONS .....	5
<b>9.0 IN-SERVICE SUPPORT .....</b>	<b>5</b>
<b>10.0 GUARANTEES/LIMITATION OF LIABILITY .....</b>	<b>6</b>

APPENDIX I HC-1751 Hand Pump (3250 Psi) Parts List

APPENDIX II MSDS Hydraulic Fluid

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 DESCRIPTION

The Tronair 02-1248-0112 Single Stage jack incorporates the following quality features:

- Steel Construction
- Mechanical ram lock nut that prevents lowering of jack under load
- Quick action mechanical extension
- Single speed, manually operated pump with pressure relief
- Uses standard MIL-PRF-5606 hydraulic fluid

## 2.0 USAGE

The purpose of the jack is to lift the aircraft for maintenance. See specifications for capacity of the jack.

## 3.0 SPECIFICATIONS

- Rated Capacity: 24,000 lbs
- Minimum Closed Height: 46 inches
- Mechanical Extension: 14 inches
- Hydraulic Extension: 30 inches
- Maximum Height Obtainable: 92 inches
- Weight: 305 lbs
- Pressure Relief Setting: 3250+300/-0 PSIG
- BUNA 'N' Seals

## 4.0 ASSEMBLY INSTRUCTIONS

### 4.1 GENERAL INSTRUCTION

This product should be assembled and/or repaired using good workmanship practices and proper tools. Bolts and elastic stopnuts should be tightened to a torque not to exceed industry standards for Grade '5' bolts.

All replacement parts must be the same as or equal to the original parts supplied.

### 4.2 PRE-USE CHECKS

Refer to the Parts Lists and Illustrations to identify and assure that all parts are present.

- Generally check over unit to assure the tightness of all nuts, bolts and fittings.
- With rams completely collapsed, check hydraulic fluid level; 1.5 inches below vent. Replenish with MIL-PRF-5606 fluid as required.

## 5.0 OPERATING INSTRUCTIONS

The user should be familiar with the following statements prior to using the jack(s):



### CAUTION!

1. **Never put hands between the aircraft and the jack pad; as after aircraft has been lowered, struts may have hung up.**
2. **Never align jack under aircraft by pounding on jack legs. Dented legs may lead to jack collapse.**
3. **Always lower ram locking nut(s) after jack is under load. Be sure ram nut(s) is seated fully after jacking.**
4. **Always raise and lower jacks simultaneously so that aircraft remains level.**
5. **Always use a tail or nose stand, as applicable, for additional stability.**

## 5.0 OPERATING INSTRUCTIONS *(continued)*

### 5.1 JACK INSTRUCTIONS

#### To Raise Aircraft:

1. Place jack on a hard, level surface.
2. Raise mechanical extension as close to aircraft jack pad as possible.

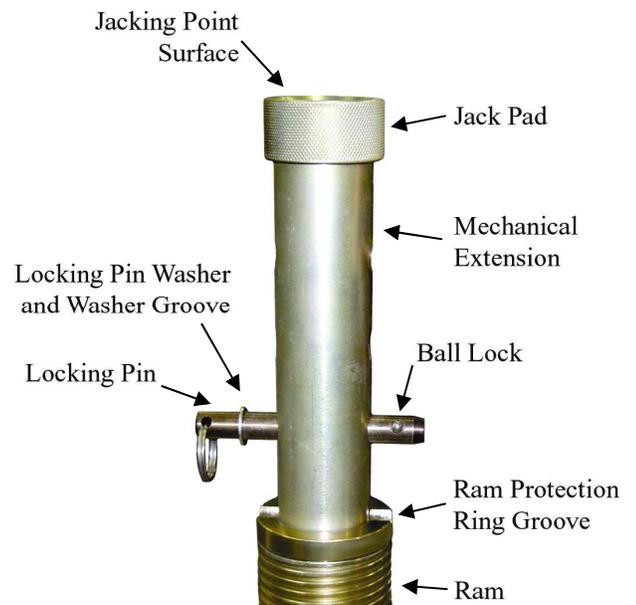
#### **WARNING!**



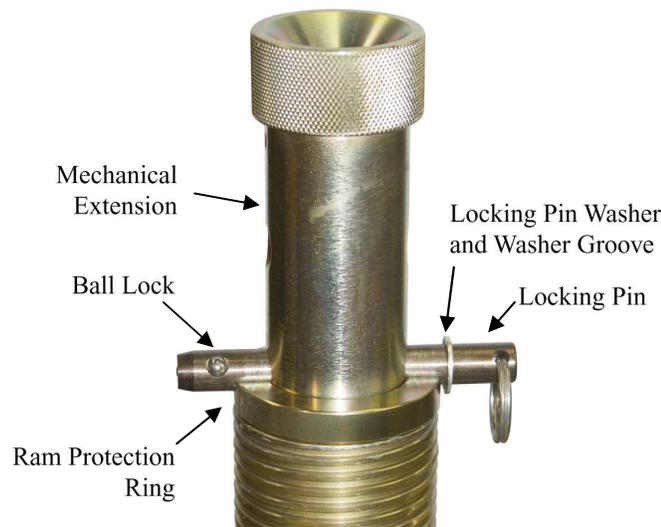
The locking pin **MUST** be placed in the ram protection ring groove and fully through the mechanical extension.

The locking pin washer and ball lock **MUST** be placed outside the ram protection ring.

- Visually inspect the jack prior to every use.
- Do not place extra locking pins in any other hole on the mechanical extension.
- Insure mating surfaces to jack point are free of debris and damage.
- Under no conditions should the locking pin washer or washer groove be inside the ram protection ring groove.
- Under no conditions should the locking pin's ball lock be inside the ram protection ring groove.
- Never use the jack if the ram protection ring is not installed.
- Never use the locking pin without a locking pin washer.
- Never use a locking pin that has been damaged.
- Never use a ram protection ring that has been damaged or deformed.
- Replace ram protection ring if it does not have a radius groove for the locking pin.
- Load test jacks annually
- Only order replacement parts from Tronair.
- Failure to comply could result in premature failure below certified weight and could cause serious injury including death.



### Correct Pin Placement



5.1 Jack instructions continued on following page.

5.1 JACK INSTRUCTIONS (continued)

### Incorrect Pin Placements



Washer In  
Ram Protection Ring



Ball Lock In  
Ram Protection Ring

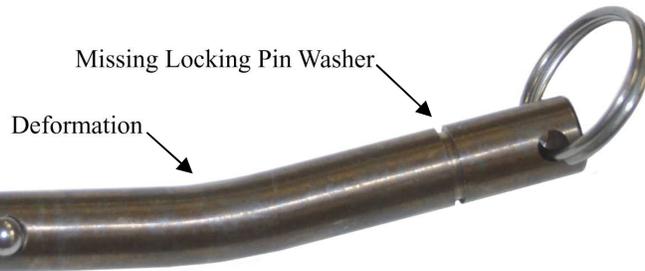


Washer On Top Of  
Ram Protection Ring

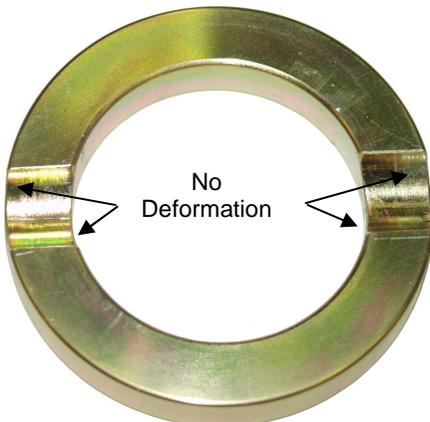


Locking Pin Not In  
Ram Protection Ring  
and top Locking Pin  
in Mechanical Extension  
(use only one pin)

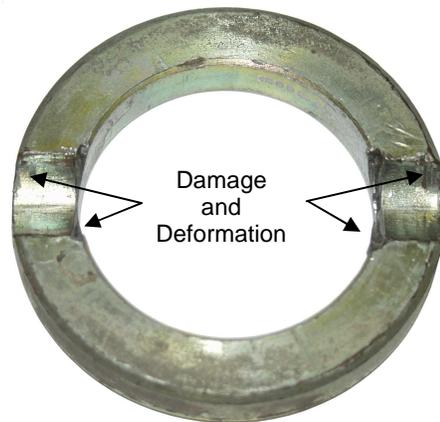
### Results Of Locking Pin In Incorrect Location



### Ram Protection Ring



Acceptable Condition



Unacceptable Condition

## 5.1 JACK INSTRUCTIONS *(continued)*

3. Close pump release valve and operate pump.

**NOTE:** *Turning the pump relief valve counter-clockwise lowers the jack. Turning the pump release valve clockwise stops the jack's descent and allows it to be raised.*

4. Lower ram locknuts as aircraft is raised.

### WARNING!



The ram locknuts are user operated safety devices. Failure to utilize these locknuts may result in personal injury or death.

#### To Lower Aircraft:

5. Lower all jacks simultaneously.
6. If ram locking nut(s) is tight, raise jack slightly to release nut(s).
7. Loosen pump release valve slightly to slowly lower aircraft. Raise locking nut(s) as jack ram(s) lower.

**NOTE:** *When using the jack during a washing or cleaning operation, the jack should be completely covered to protect it from cleaning solution, dirt and/or foreign matter which might get on or between the ram and cylinder causing damage to the seals and O-rings.*

### CAUTION!



Do not place hands on top of jack near ram locknuts while lowering jack. Pinch points exist between top of jack and threads on ram.

Always wear safety glasses while operating this equipment.

## 6.0 MAINTENANCE

### 6.1 GENERAL

- All maintenance and/or repair work should be done using good workmanship practices and proper tools.
- The work area should be clean and free of dirt.
- When O-rings and backup rings are removed, every effort should be made to avoid the contact of tools with the critical surfaces of parts. Surface deformities could cause degradation of seals and failure.
- It is good practice to replace both O-rings and backup rings once removed. Cut and damaged O-rings normally result in fluid leakage.
- If cylinder bore is found to be rusty, it may be honed to a maximum diameter of 3.257 inches and a surface finish of 16 micro inches. If pitting in the bore cannot be removed by this process, the jack cylinder must be replaced before the jack can be returned to service.
- At this time, flush old hydraulic fluid and dirt from overall system and replenish with new, clean hydraulic fluid.

### 90-Day Routine Maintenance

If jack is not being used on a regular basis, every 90 days the jack should be fully extended and retracted to exercise the seals and to prevent rust build up on the cylinder I.D. While ram is extended, clean the threads and spray with DoALL RPM, LPS, or equivalent that is water repellent and will not harm BUNA "N" O-rings.

### 6.2 SERVICING JACK

#### To Disassemble Jack:

1. Remove mounting plate (Item 29) by unscrewing four (4) socket head cap screws (Item 28).
2. Raise ram assembly (Item 31) to the point where it can be lifted from the jack cylinder.

#### To Reassemble Jack:

1. Re-assemble in reverse order of above.

**NOTE:** *Torque four (4) socket head cap screws (Item 28) to 44 ft-lbs.*

2. Spray inside diameter of cylinder and outside diameter of ram (Items 1 & 31) with DoALL RPM, LPS, or equivalent that is water repellent and will not harm BUNA "N" O-rings to protect surfaces from rusting when not in use.

**NOTE:** *To minimize air entrapment under the ram, raise the oil level in the cylinder to chamfer of the cylinder prior to ram insertion.*

## 6.0 MAINTENANCE *(continued)*

### 6.3 JACK FUNCTION LOAD TEST

**NOTE: If function load testing is required:**

3. Take all necessary precautions to prevent injury.
4. Always jack against a load and **never** against the jack itself.
5. Do not exceed a test load equal to the jack rated capacity plus 10%.

### 6.4 REMOVING AND SERVICING PUMP

**NOTE: If pump is found faulty, call the factory for replacement or replace seals as follows:**

1. Review Appendix I: HC-1751 Hand Pump Parts List during the following procedure.
2. Clamp suction (push on) hose and remove hose from pump.
3. Uncouple fitting of hydraulic hose from pump.
4. Remove pump from jack.
5. Remove cotter pin (Item 18) from clevis pin.
6. Remove four (4) socket head cap screws.
7. Remove flanges.
8. Remove tube assembly (Item 16).
9. Replace O-rings and backup ring. (See Appendix I: HC-1751 for available kits.)
10. Re-assemble in reverse order.

## 7.0 TROUBLE SHOOTING

TROUBLE	PROBABLE CAUSE	ACTION
Fluid leakage at pump piston or pump body	Damaged backup ring, o-ring, piston or pump body	Remove piston and pump body. Inspect for damage. Replace defective part(s). Replace removed o-ring and backup ring
External fluid leakage at ram(s)	Damaged o-ring, backup ring or inner cylinder wall	Remove ram(s) as a unit from cylinder. Inspect parts. Replace o-ring and defective part(s)
Jack fails to lift rated load	Release valve not closed properly	Fully tighten release valve
	Low fluid level	Fill to correct fluid level
	Pressure relief valve improperly adjusted	Adjust or replace release valve
	Leakage at inlet or outlet check ball	Inspect valve body for wear or replace valve body and check balls
	Vent screw closed	Open vent screw
Ram(s) will not support load after manual or pneumatic pump up	Leaking ram o-ring seals	Check for external leakage, if present replace defective seal and back up ring
	Leaking pressure check valve	Inspect valve body for wear or replace valve body and check balls
	Leaking pressure relief valve	Remove release valve, inspect ball and ball seat in pump block. Replace effective part(s)
Ram(s) raise and fall with each manual pump stroke	Release valve open	Fully tighten release valve
	Inlet check valve not seated or sticking	Pump rapidly to dislodge or replace valve body
	Pressure check valve not seated or sticking	Pump rapidly to dislodge or replace valve body
Jack fails to lower	Ram locknut not loosened	Raise jack ¼ inch and release locknut
	Vent screw closed	Open vent screw
	O-Ring (pinched or rolled)	Replace o-ring and back-up ring, clean up cylinder wall of debris

## 8.0 PROVISION OF SPARES

### 8.1 SPARE PARTS

Spare parts may be obtained from the manufacturer:

**TRONAIR, Inc.**  
1740 Eber Road  
Holland, Ohio 43528-9794 USA

Telephone: (419) 866-6301 or 800-426-6301  
Fax: (419) 867-0634  
E-mail: sales@tronair.com  
Website: www.tronair.com

### 8.2 PARTS LISTS & ILLUSTRATIONS

Reference the following page for Replacement Parts and Kits available.

## 9.0 IN-SERVICE SUPPORT

Contact Tronair for technical services and information.

**10.0 GUARANTEES/LIMITATION OF LIABILITY**

Tronair products are warranted to be free of manufacturing or material defects for a period of one year after shipment to the original customer. This is solely limited to the repair or replacement of defective components. This warranty does not cover the following items:

- a) Parts required for normal maintenance
- b) Parts covered by a component manufacturers warranty
- c) Replacement parts have a 90-day warranty from date of shipment

If you have a problem that may require service, contact Tronair immediately. Do not attempt to repair or disassemble a product without first contacting Tronair, any action may affect warranty coverage. When you contact Tronair be prepared to provide the following information:

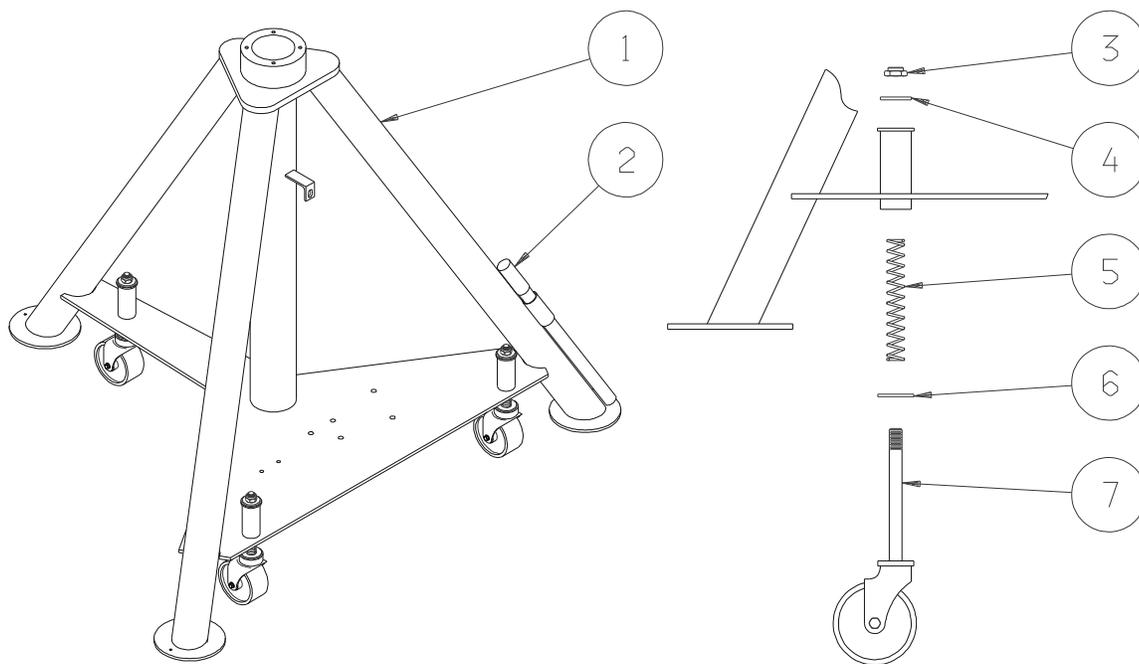
- a) Product Model Number
- b) Product Serial Number
- c) Description of the problem

If warranty coverage is approved, either replacement parts will be sent or the product will have to be returned to Tronair for repairs. If the product is to be returned, a Return Material Authorization (RMA) number will be issued for reference purposes on any shipping documents. Failure to obtain a RMA in advance of returning an item will result in a service fee. A decision on the extent of warranty coverage on returned products is reserved pending inspection at Tronair. Any shipments to Tronair must be shipped freight prepaid. Freight costs on shipments to customers will be paid by Tronair on any warranty claims only. Any unauthorized modification of the Tronair products or use of the Tronair products in violation of cautions and warnings in any manual (including updates) or safety bulletins published or delivered by Tronair will immediately void any warranty, express or implied.

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

## Parts List

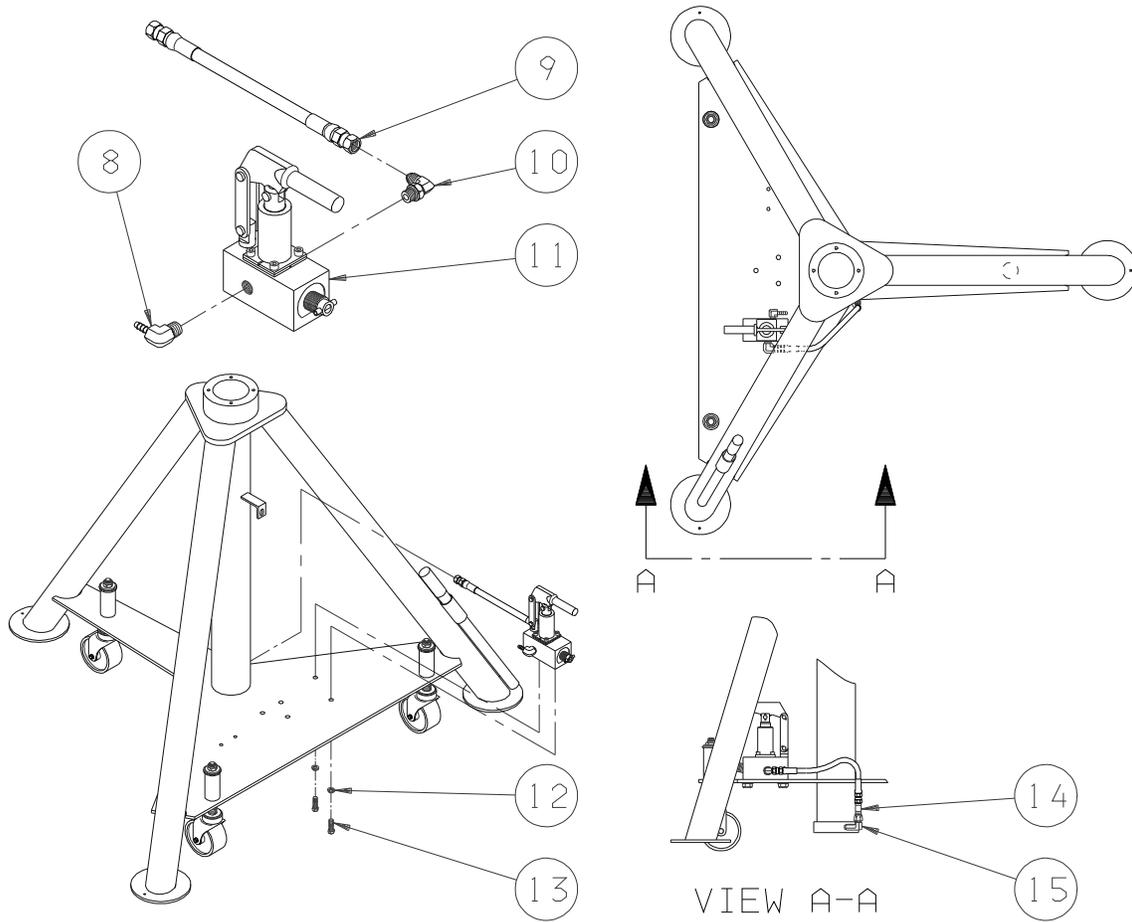
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
2	H-1009-01	Handle, Hydraulic Pump	1
5	H-1252	Spring	3
	<b>K-3469</b>	<b>Kit, Jack Weldment Replacement; consists of:</b>	
1	Z-5115-01	Weldment, Jack (with Labels)	1
	<b>K-2800</b>	<b>Kit, Caster Replacement; consists of:</b>	
3	G-1203-1105	Jamnut, 5/8-18 Elastic	1
4	G-1250-1100N	Flatwasher, 5/8 Narrow	1
6	G-1250-1110W	Flatwasher, 3/4 Wide	1
7	U-1053	Caster, Swivel	1

## Parts List

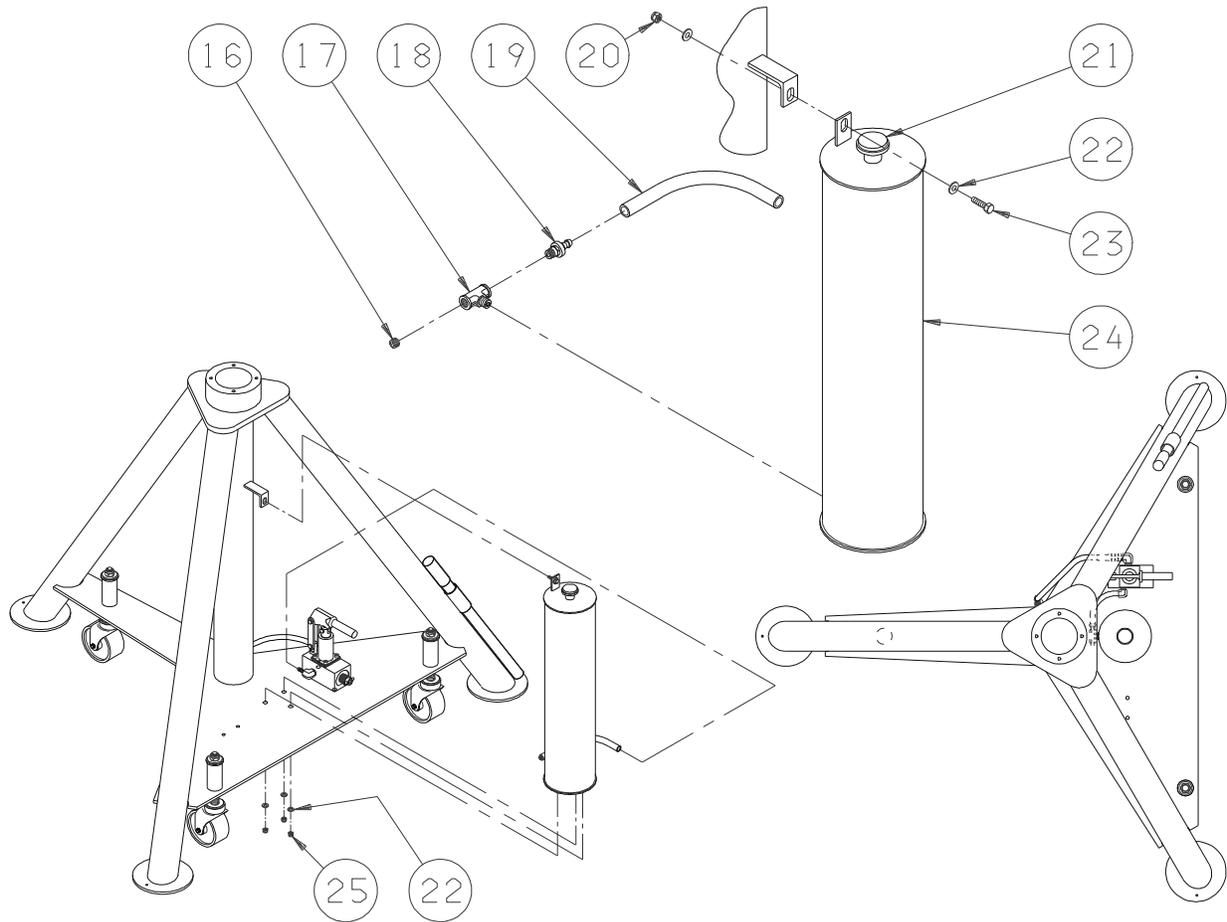
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
9	TF-1043-06*18.0	Assembly, Hose	1
14	N-2016-05-S	Tee, Swivel Nut Run	1
15	N-2004-15-S	Elbow, Extra Long 90° Male	1
	<b>K-1901-02</b>	<b>Kit, Pump Replacement; consists of:</b>	
8	N-2410-11	Elbow, 90° Male	1
10	N-2001-08-S-B	Elbow, 90° Male	1
11	HC-1751	Pump, Hydraulic Hand	1
12	G-1251-1070R	Lockwasher, 3/8 Regular	2
13	G-1100-107010	Bolt, Hex Head, Grade 5, 3/8-16 x 1" long	2
Not Shown	TF-1047-01*12.0	Hose, Push-on	1

## Parts List

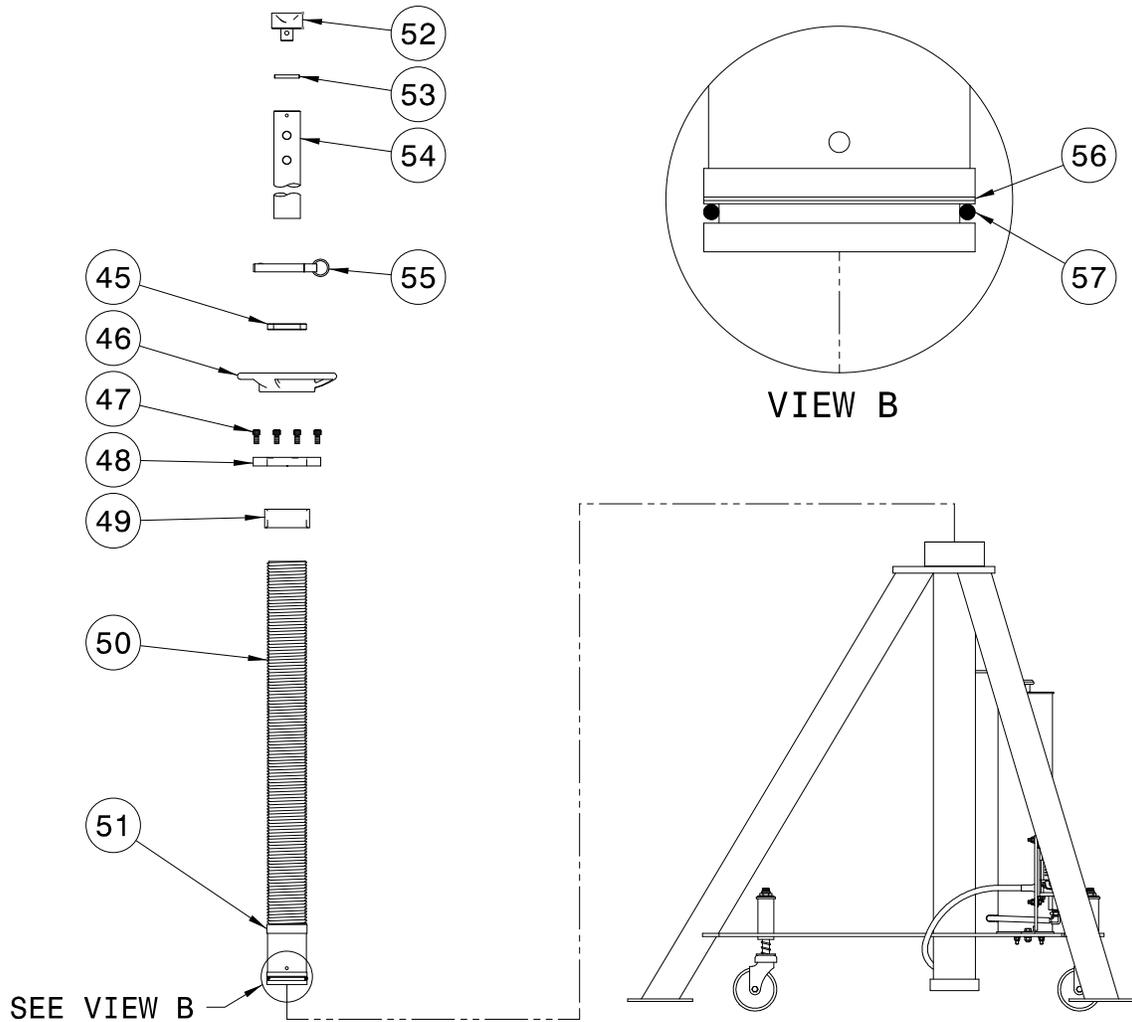
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
	<b>K-3220</b>	<b>Kit, Reservoir Replacement; consists of:</b>	
16	N-2205-02-S	Plug, Hollow Hex, 1/8 NPT	1
17	N-2208-01-S	Tee, Male Branch	1
18	N-2412-04	Connector, Barbed Hose	1
19	TF-1047-01*09.0	Hose, Push-on	1
20	G-1202-1055	Stopnut, 1/4-28 Elastic	1
21	H-1045	Breather	1
22	G-1250-1050N	Flatwasher, 1/4 Narrow	5
23	G-1100-105510	Bolt, Hex Head, Grade 5, 1/4-28 x 1" long	1
24	HJ-580-07-01	Assembly, Reservoir with Labels	1
25	G-1202-1050	Stopnut, 1/4-20 Elastic	3

## Parts List

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



Item	Part Number	Description	Qty
45	HJ-553	Ring, Ram Protection	1
46	H-2331	Stopnut	1
47	G-1151-107206	Screw, Socket Head Cap, 3/8-16 x 3/4" long	4
48	TR-1756	Plate, Mounting	1
51	TR-1505	Stop, Jack	1
52	HJ-557	Pad, Jack	1
53	G-1300-25200	Pin, Roll, 1/4" diameter x 2" long	1
54	HJ-225-04	Shaft, Extension	1
55	G-1318-1033	Pin, Model "D" 5/8" diameter x 3.3" long	1
	<b>K-1050</b>	<b>Kit, Ram Seal Replacement; consists of:</b>	
49	HJ-554	Ring, Guide	1
56	HC-2020-336	Ring, Backup	1
57	HC-2000-336	O-ring	1
	<b>K-2592-05</b>	<b>Kit, Ram and Jack Stop Replacement; consists of:</b>	
50	HJ-586-05	Assembly, Ram	1
51	TR-1505	Stop, Jack	1





**APPENDIX I**

**HC-1751  
Hand Pump  
Parts List**





**Model: HC-1751  
3250 PSI  
Hand Pump**

**\*\*\***

**Parts List  
With  
Illustrations**

08/2001 – Rev. OR

**When ordering Replacement Parts/Kits, please specify Model, Color and Serial Number of your Unit.**



### Parts List

This pump is compatible with MIL-PRF-5606/MIL-PRF-83282 Hydraulic Fluids only.

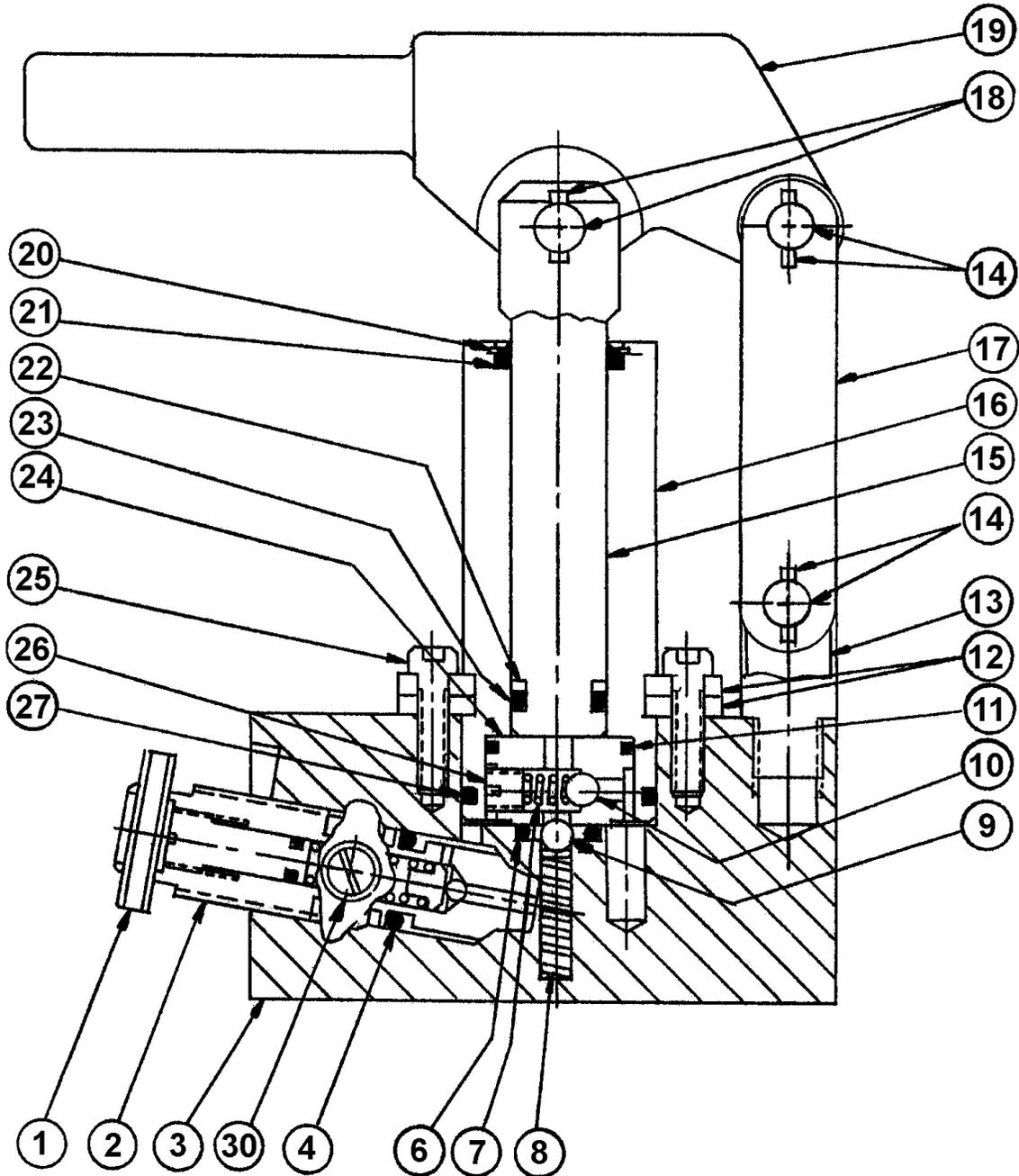
Item	Part Number	Description	Qty
3	5M1-000-001	Body, Pump	1
12	506-000	Half, Flange	4
25	18-000	Screw, Socket Head Cap	4
Not Shown	H-1009-01	Handle	1
	<b>K-1001</b>	<b>Kit, Seal Replacement; consists of:</b>	
4		O-ring, Release Screw	1
6		O-ring, Outlet Check	1
11		O-ring, Valve Body	1
21		Wiper, Rod	1
22		Ring, Backup	1
23		O-ring, Piston	1
27		O-ring, Tube Seal	1
◆ Not Shown		O-ring, Inlet Check	1
◆ Not Shown		O-ring, Guide Shoe	2
◆ Not Shown		Shoe, Piston Guide	1
	<b>K-1068</b>	<b>Kit, Linkage Replacement; consists of:</b>	
13		Pivot	1
14		Assembly, Linkage Pin	2
17		Strap	2
18		Assembly, Clevis Pin	1
19		Bracket, Pump Handle	1
	<b>K-1069</b>	<b>Kit, Internal Parts Replacement; consists of:</b>	
7		Spring, Inlet Check	1
8		Spring, Outlet Check	1
9		Ball, Outlet Check	1
10		Ball, Inlet Check	1
Not Shown		Ball, Release	1
	<b>K-1778</b>	<b>Kit, Piston/Cylinder Replacement; consists of:</b>	
15		Piston	1
16		Tube	1
20		Retainer, Wiper	1
24		Assembly, Valve Body (Includes Items 7, 10, 24, 26)	1
	<b>K-1906</b>	<b>Kit, Piston/Seal Replacement; consists of:</b>	
15		Piston	1
22		Ring, Backup	1
23		O-ring, Piston	1
	<b>K-2782</b>	<b>Kit, Release Screw Replacement; consists of:</b>	
2		Screw, Release	1
30		Retainer, Screw	1

◆ Although this item is listed in its particular kit, it is not used on HC-1751-01 pump. These items may be discarded.

**NOTE:** Entire pump assembly can be purchased as a kit. See Hydraulic Jack Parts list.

## Parts List Illustration

This pump is compatible with MIL-PRF-5606/MIL-PRF-83282 Hydraulic Fluids only.



### WARNING



Item 2 is a preset relief valve. Do Not disassemble this valve.  
Replacement parts are available as a preset relief valve assembly.



**APPENDIX II**

**Material Safety  
Data Sheet**

**MIL-PRF-5606  
Hydraulic Fluid**



## MATERIAL SAFETY DATA SHEET

### SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

#### PRODUCT

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

#### COMPANY IDENTIFICATION

**Supplier:** EXXON MOBIL CORPORATION  
3225 GALLOWS RD.  
FAIRFAX, VA. 22037 USA

**24 Hour Health Emergency** 609-737-4411  
**Transportation Emergency Phone** 800-424-9300  
**ExxonMobil Transportation No.** 281-834-3296  
**MSDS Requests** 713-613-3661  
**Product Technical Information** 800-662-4525, 800-947-9147  
**MSDS Internet Address** <http://www.exxon.com>, <http://www.mobil.com>

### SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

#### Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT	64742-47-8	10 - 30%
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	64742-53-6	30 - 60%
HYDROTREATED LIGHT PARAFFINIC DISTILLATES, PETROLEUM	64742-55-8	10 - 30%

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

### SECTION 3 HAZARDS IDENTIFICATION

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

#### POTENTIAL PHYSICAL / CHEMICAL EFFECTS

Combustible. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited.

#### POTENTIAL HEALTH EFFECTS

If swallowed, may be aspirated and cause lung damage. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. May be irritating to the eyes, nose, throat, and lungs. High-pressure injection under skin may cause serious damage.

**Target Organs:** Skin |

**NFPA Hazard ID:** Health: 0 Flammability: 2 Reactivity: 0  
**HMIS Hazard ID:** Health: 0\* 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 4 FIRST AID MEASURES

### INHALATION

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. 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:** Smoke, Fume, Sulfur oxides, Aldehydes, Incomplete combustion products, Oxides of carbon, Phosphorus oxides

### FLAMMABILITY PROPERTIES

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

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

**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. U.S. regulations require reporting releases of this material to the environment which exceed the 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 Section 3 for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

### 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. Use proper bonding and/or grounding procedures. Prevent small spills and leakage to avoid slip hazard.

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

### STORAGE

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. Drums must be grounded and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters.

**SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION**

**EXPOSURE LIMIT VALUES**

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

Source	Form	Limit / Standard			Note	Source
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)		TWA	2000 mg/m <sup>3</sup>	500 ppm	N/A	OSHA Z1
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	Mist.	STEL	10 mg/m <sup>3</sup>		N/A	ACGIH
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	Mist.	TWA	5 mg/m <sup>3</sup>		N/A	ACGIH
HYDROTREATED LIGHT PARAFFINIC DISTILLATES, PETROLEUM	Mist.	STEL	10 mg/m <sup>3</sup>		N/A	ACGIH
HYDROTREATED LIGHT PARAFFINIC DISTILLATES, PETROLEUM	Mist.	TWA	5 mg/m <sup>3</sup>		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, 10 mg/m<sup>3</sup> - ACGIH STEL, 5 mg/m<sup>3</sup> - OSHA PEL.

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

**ENGINEERING CONTROLS**

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. 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. Work conditions can greatly effect glove durability; 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

See Sections 6, 7, 12, 13.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

### GENERAL INFORMATION

**Physical State:** Liquid

**Color:** Red

**Odor:** Characteristic

**Odor Threshold:** N/D

### IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

**Relative Density (at 15 C):** 0.88

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

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

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

**Boiling Point / Range:** 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 mm<sup>2</sup>/sec) at 40 C | 5.1 cSt (5.1 mm<sup>2</sup>/sec) at 100C

**Oxidizing Properties:** See Sections 3, 15, 16.

### OTHER INFORMATION

**Freezing Point:** N/D

**Melting Point:** N/A

**Pour Point:** -60°C (-76°F)

**DMSO Extract (mineral oil only), IP-346:** < 3 %wt



**SECTION 10 STABILITY AND REACTIVITY**

**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.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**SECTION 11 TOXICOLOGICAL INFORMATION**

**ACUTE TOXICITY**

<b>Route of Exposure</b>	<b>Conclusion / Remarks</b>
<b>Inhalation</b>	
Toxicity (Rat): LC50 > 5000 mg/m3	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data.	Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components.
<b>Ingestion</b>	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
<b>Skin</b>	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
<b>Eye</b>	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

**CHRONIC/OTHER EFFECTS**

**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.

Additional information is available by request.

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

- REGULATORY LISTS SEARCHED--
- |              |             |               |
|--------------|-------------|---------------|
| 1 = NTP CARC | 3 = IARC 1  | 5 = IARC 2B   |
| 2 = NTP SUS  | 4 = IARC 2A | 6 = OSHA CARC |

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Material -- Expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

#### **MOBILITY**

Base oil 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:**

Base oil component -- Expected to be inherently biodegradable

#### **BIOACCUMULATION POTENTIAL**

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

<b>SECTION 13</b>	<b>DISPOSAL CONSIDERATIONS</b>
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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.

#### **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 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.

<b>SECTION 14</b>	<b>TRANSPORT INFORMATION</b>
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**LAND (DOT) :** Not Regulated for Land Transport

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

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



**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

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

**SECTION 15 REGULATORY INFORMATION**

**OSHA HAZARD COMMUNICATION STANDARD:** When used for its intended purpose, this material is classified as hazardous in accordance with OSHA 29CFR 1910.1200.

**NATIONAL CHEMICAL INVENTORY LISTING:** AICS, IECSC, DSL, EINECS, ENCS, KECI, PICCS, TSCA

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

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

**The Following Ingredients are Cited on the Lists Below:**

Chemical Name	CAS Number	List Citations
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT	64742-47-8	17, 18, 19
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	64742-53-6	1, 4, 13, 17, 18
HYDROTREATED LIGHT PARAFFINIC DISTILLATES, PETROLEUM	64742-55-8	1, 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

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

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

Revision Changes:

Section 05: Fire Fighting Measures - Unusual Fire Hazards was modified.  
Section 10: Conditions to Avoid was modified.  
Section 07: Handling and Storage - Handling was modified.  
Section 07: Handling and Storage - Storage Phrases was modified.  
Section 03: HIMS Flammability was modified.  
Section 03: NFPA Flammability was modified.  
Section 06: Accidental Release - Spill Management - Land was modified.  
Section 09: Flash Point C(F) was modified.  
Section 08: Exposure Control was modified.  
Section 15: SARA (311/312) REPORTABLE HAZARD CATEGORIES was modified.  
Section 16: Land Spill was modified.  
Section 14: DOT Technical Name - All was added.  
Section 03: Physical/Chemical Hazard was added.  
Section 14: Proper Shipping Name - Header was added.  
Section 14: Proper Shipping Name was added.  
Section 14: Hazard Class & Division - Header was added.  
Section 14: Hazard Class was added.  
Section 14: UN Number - Header was added.  
Section 14: UN Number was added.  
Section 14: Packing Group - Header was added.  
Section 14: Packing Group was added.  
Section 14: Label(s) - Header was added.  
Section 14: Label(s) was added.  
Section 14: ERG Number - Header was added.  
Section 14: ERG Number was added.  
Section 14: Transport Document Name - Header was added.  
Section 14: Transport Document Name was added.  
Section 14: DOT Technical Name - Open parenthesis was added.  
Section 14: DOT Technical Name - Close parenthesis was added.  
Section 03: Physical/Chemical Hazard was added.  
Section 03: Physical/Chemical Hazards - Header was added.  
Section 14: DOT Footnote was added.  
Section 16: Physical Hazards was added.  
Section 16: Physical Hazards - Header was added.  
Section 16: Precautions was added.  
Section 16: Precautions - Header was added.  
Section 10: Conditions to Avoid was deleted.  
Section 14: LAND (DOT) - Default was deleted.

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**PRECAUTIONARY LABEL TEXT:**

**Contains:** DISTILLATES (PETROLEUM), HYDROTREATED LIGHT  
CAUTION!

**HEALTH HAZARDS**

Repeated exposure may cause skin dryness or cracking. If swallowed, may be aspirated and cause lung damage.

**Target Organs:** Skin |

**PHYSICAL HAZARDS**

Combustible.

## PRECAUTIONS

Use proper bonding and/or grounding procedures.

### FIRST AID

**Inhalation:** 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.

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

**Oral:** Seek immediate medical attention. Do not induce vomiting. If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

**Skin:** Wash contact areas with soap and water. 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.

### FIRE FIGHTING MEDIA

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

### SPILL/LEAK

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. 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.

### Use

Not intended or suitable for use in or around a household or dwelling.

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