



Model: 215B
Two Stage Hydraulic
Aviation Axle Jack

12/2018 – Rev. 01

REVISION
01

DATE
12/2018

TEXT AFFECTED
Original release

TABLE OF CONTENTS

PAGE

1.0	PRODUCT INFORMATION	4
1.1	DESCRIPTION.....	4
1.2	MODEL & SERIAL NUMBER.....	4
1.3	MANUFACTURER	4
1.4	SPECIFICATIONS	4
1.5	PROTECTIVE DEVICES	4
2.0	SAFETY INFORMATION.....	4
2.1	USAGE AND SAFETY INFORMATION	4
3.0	PREPARATION PRIOR TO FIRST USE	5
4.0	TRAINING	5
4.1	TRAINING REQUIREMENTS	5
4.2	TRAINING PROGRAM	5
4.3	OPERATOR TRAINING	5
5.0	OPERATION.....	5
5.1	PRE OPERATION INSPECTION.....	5
5.2	OPERATING PROCEDURES.....	5
6.0	TROUBLE SHOOTING	6
7.0	MAINTENANCE.....	7
7.1	SERVICING	7
7.2	DISASSEMBLY INSPECTION	7
7.3	OVERHAUL INSTRUCTIONS.....	7
7.4	TESTING:	9
8.0	PROVISION OF SPARES.....	9
8.1	SOURCE OF SPARE PARTS.....	9
8.2	RECOMMENDED SPARE PARTS LISTS	9
9.0	IN SERVICE SUPPORT.....	10
10.0	GUARANTEES/LIMITATION OF LIABILITY	10
11.0	APPENDICES	10

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.



CAUTION!

Aircraft manufacturer's specifications and instructions must be followed. In the event of contradiction between aircraft manufacturer's specifications and Malabar's, aircraft manufacturer's will prevail.

1.0 PRODUCT INFORMATION

1.1 DESCRIPTION

The Malabar Axle Jack Model 215B is a 20 ton capacity two stage telescoping hydraulic jack designed primarily for use in jacking main and/or nose landing gear of various aircraft. The jack consists of a two stage cylinder assembly, hydraulic reservoir and hand pump assembly. Lifting handle is also supplied for ease of lifting the jack.

1.2 MODEL & SERIAL NUMBER

Reference nameplate on unit

1.3 MANUFACTURER

Malabar International
1 Air Cargo Pkwy East
Swanton, Ohio 43558 USA

Telephone: (419) 866-6301 or 800-426-6301
E-mail: sales@malabar.com
Website: www.malabar.com

1.4 SPECIFICATIONS

Rated Capacity20 tons (18.1 m. tons)
Side Load15% of vertical load
Low Height.....8 in (203 mm)
Hydraulic Lift.....8.25 in (210 mm)
Extension Screw3 in (76 mm)
Total Extended Height.....19.5 in (495 mm)
Oil Pressure at Rated Capacity5760 psig (405 kg/sq cm)
Safety Pop-off Valve set at.....22 ton (20 m. tons)
Proof Load30 ton (27.2 m. tons)
Reservoir Capacity.....0.5 gal (1.9 l)
Hydraulic FluidMIL-PRF-5606 or equivalent
Approximate Jack Net Weight50 lbs (23 kg)

1.5 PROTECTIVE DEVICES

- A safety pop-off valve is incorporated in the jack (located in the base) to prevent lifting of loads in excess of 20 tons (18.1 m. tons).
- The extension screw has a positive stop to prevent it from being extended beyond its safe thread engagement.

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, and/or substantial property damage** if the Warning Notice is ignored.



CAUTION!

Caution is used to indicate the presence of a hazard, which will or can cause **minor personal injury or property damage** if the Caution Notice is ignored.

3.0 PREPARATION PRIOR TO FIRST USE

The jack is shipped fully assembled without hydraulic fluid. Before placing jack in operation, perform the following procedures:

1. Carefully remove jack from the shipping container.
2. Remove air vent and bushing from top of reservoir.
3. Fill jack reservoir to within 1/2 inch of reservoir top surface with MIL-PRF-5606 hydraulic fluid or approved equivalent (reservoir capacity is approximately 0.5 gallons/1.9 liters). Jack plungers must be fully retracted before filling reservoir.
4. Open release valve located next to hand pump and operate hand pump a few strokes to bleed all air trapped under hand pump.
5. Close release valve and operate hand pump to raise plungers approximately 1 inch.
6. Open release valve to retract plungers fully to bleed all air trapped under jack plungers. Close release valve.
7. Check reservoir fluid level. Replace air vent and bushing to top of reservoir.

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 INSPECTION

Each time the jack is to be used, inspect the following:

1. Check for hydraulic fluid leaks around the base, cylinder, reservoir and hand pump.
2. Check hand pump for proper operation.
3. Check reservoir fluid level with jack plungers fully retracted.

5.2 OPERATING PROCEDURES

1. Position jack on a level surface under the jacking pad of the aircraft axle.
2. Raise extension screw by turning counterclockwise until screw contacts the axle jacking pad or as far as screw will travel, 3 in (7.62 cm) maximum.
3. Close release valve.
4. Open air vent one turn. Air vent must always be open during any phase of raising or lowering the load.
4. Operate hand pump to raise plungers until extension screw contacts the jacking pad.
5. Insure extension screw and jacking pad are correctly mated.
6. To raise the load:
 - a. The load may now be raised by operating the hand pump.
 - b. Do not lift a load greater than the rated capacity of 15 tons.
 - c. Do not attempt to raise jack plungers beyond the rated hydraulic lift (8.25 inches maximum).
 - d. Avoid lifting with excessive side load on jack.
 - e. Keep release valve closed at all times.
7. To lower the load:
 - a. Slowly open release valve to lower the load. The speed of lowering is controlled by the amount at which the release valve is open.
 - b. Close release valve after plungers are fully retracted.
8. Lower the extension screw by turning clockwise.
9. Close air vent. Air vent must always be closed during jack transport.
10. Cover jack when not in use to prevent entrance of contaminants and water into the cylinder.

6.0 TROUBLE SHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
Jack will not raise	Release valve open (Oil passing back into reservoir)	Close valve firmly
	Intake valve open. (Oil passing back into reservoir)	Pump rapidly to flush dirt off
	Discharge valve open (Oil passing back into pump chamber)	Pump rapidly to flush dirt off
	Sticking intake valve	Remove pump from jack base. Unscrew valve block. Clean or replace valve
	Clogged screen	Remove and clean
	Lack of oil. Air under plunger	Refill. Check for leaks. Bleed air out by opening release valve. Pump rapidly a few times and close release valve
Jack will not raise to full height	Lack of oil	Refill, check for leaks
	Sticking intake valve	Remove pump from jack base. Unscrew valve block. Clean or replace ball valves. Re-tighten or repair
Jack will not raise capacity load	High pressure leaks (At pump or release valve)	Reseat valve
	Leaky release valve	Reseat valve and clean valve block
Jack raises and falls during each stroke	Leaky discharge valve	Tighten or replace ball valve or packing
Jack will not hold up load	Leaky release valve	Reseat valve
	Defective "O" ring and back up ring	Remove plunger and replace "O" ring and back up ring
Jack will not lower the load	Damaged release valve	Remove and replace parts as needed
	Bent plunger	Replace
Jack will not close completely	Air under plunger	Bleed air out. Open release valve and pump rapidly several times. Close valve
Handle stroke only partly effective	Air in pump chamber	Open release valve and pump rapidly several times. Close valve
	Sticking intake valve	Remove pump and clean valve block
	Clogged screen	Remove and clean
Handle raises without effort	Leaky intake valve	Remove pump and clean valve block
Handle snaps back	Sticking intake valve	Open release valve. Pump rapidly several times. Close valve
	Clogged screen	Remove and clean

7.0 MAINTENANCE

7.1 SERVICING

Servicing the jack consists primarily of the following:

1. When in use, the reservoir should be kept at the proper level with hydraulic fluid MIL-PRF-5606 or approved equivalent. Always check fluid level with jack plungers fully retracted.
2. Lubricate hand pump link pins.
3. If the jack has been put into storage or has not been used, the plungers must be fully extended and retracted every 90 days to exercise the seals.

7.2 DISASSEMBLY INSPECTION

Each time the jack is disassembled carefully inspect the following:

1. Inspect interior walls of jack cylinder, plungers and hand pump cylinder for smoothness and freedom from rust, nicks, scratches and excessive wear.
2. Inspect exterior walls of jack plungers for smoothness and freedom from rust, pits and excessive wear.
3. Check extension screw, cylinder, etc., for corrosion, wear and condition of threads.
4. Verify that the extension screw has a positive stop to prevent it from being extended beyond its safe thread engagement.
5. Inspect packings, seals, gaskets and wipers in the cylinder assembly and hand pumps for cuts, wear, dirt, scratches, deterioration and distortion.
6. Check oil screen located in the base for cleanliness.
7. Inspect valves and valve seats in the base for scratches, dents and proper seating of the balls.
8. Inspect all pivot pins for wear, cracks, pits or evidence of damage or pending damage.
9. Inspect all areas for excessive dirt, oil, dust and chips.

7.3 OVERHAUL INSTRUCTIONS

No definite time schedule can be established for the overhaul of the jack for replacement of the various moving parts. The number of times the jack is raised and lowered and the amount of load raised at each operation materially affect the life of the working parts. Do not overload the jack. Overloading is dangerous, will hasten the need for overhaul and may damage the jack. During overhaul, replace all parts that do not pass disassembly inspection requirements. Regardless of apparent condition, replace all parts marked with (♦) in the parts breakdown. A repair parts kit (P/N 215BPK) which contains all of the parts marked with (♦) is available and recommended to keep on hand at your facility. Coat all O-rings and backup rings with hydraulic fluid MIL-PRF-5606 prior to assembly. Clean all metal parts with clean solvent and dry with compressed air. Lubricate all threads. Use Teflon tape carefully on all pipe threads. Remove excess tape because it can clog valves and passages. If ball valves, located in the base, do not seat properly, they may need to be resealed by tapping the ball into the valve seat with a brass rod cupped at one end.

When necessary to disassemble/reassemble the jack, follow the instructions below for the selected components and drain all hydraulic fluid from the reservoir if necessary by removing plug (figure 1A, item 38) at end of base and turn jack on end until hydraulic fluid is completely drained.

1. Oil screen (figure 1A):
 - a. Turn jack on end opposite pump.
 - b. Remove plug (item 38) and oil screen (item 37) from base.
 - c. Check oil screen for cleanliness. Replace if necessary.
 - d. To reassemble, install oil screen and plug into base.
2. Release valve (figure 1A):
 - a. Turn jack on end opposite pump.
 - b. Remove release valve lock screw (item 36) from base.
 - c. Remove stem (item 33) and steel ball (item 28) from base. Remove and discard O-ring (item 34) from stem.
 - d. To reassemble, install O-ring on stem. Install ball, stem and release valve lock screw into base.
3. Safety pop-off valve (figure 1A):

CAUTION!



The safety pop-off valve, located in the base, should not be removed unless absolutely necessary. The valve is set to by-pass hydraulic fluid back to the reservoir at 5-10% above the rated capacity of 15 Tons (13.6 metric ton). If adjustment is required, see procedure under testing.

- a. Turn jack on its side.
 - b. Remove plug (item 32), set screw (item 31), spring (item 30), spring guide (item 29) and steel ball (item 28).
 - c. Remove any dirt from valve seat. Inspect seat for proper seating of ball. Reseat if necessary.
 - d. To reassemble, install ball, spring guide, spring, set screw and plug.
4. Cylinder assembly (figure 1B):
 - a. Unscrew cylinder (item 11) from base.

7.3 OVERHAUL INSTRUCTIONS (*continued*)



CAUTION!

Plungers are free to slide out of cylinder. Do not drop plungers and/or cylinder.

- b. Remove cylinder assembly from base.
- c. Push assembly out of cylinder.
- d. Remove snap ring (item 25) from center plunger (item 13).
- e. Push assembly out of outer plunger (item 12).
- f. Remove set screw (item 17) from inner plunger.
- g. Remove extension screw (item 14) and extension screw (item 15) from inner plunger.
- h. Remove roll pin (item 16) from extension screw. Unscrew extension screw nut off extension screw.
- i. Remove and discard all O-rings, back-up rings and wipers from cylinder and plungers.
- j. To reassemble, install O-rings, back-up rings and wipers onto cylinder and plungers. Lubricate all O-rings with MIL-PRF-5606 fluid or equivalent.
- k. Screw extension screw nut onto extension screw. Install roll pin to extension screw.
- l. Slide assembly into inner plunger and install set screw.
- m. Slide outer plunger over inner plunger. Install snap ring to inner plunger.
- n. Slide cylinder over outer plunger.
- o. Screw cylinder assembly into base.
5. Intake check valve (figure 2):
 - a. Turn jack on end opposite pump.
 - b. Remove plug (item 12), spring (item 14) and steel ball (item 16).
 - c. Remove and discard O-ring (item 19) from plug.
 - d. To reassembly, install O-ring to plug. Install ball, spring and plug. Verify the pin in the plug is not pressing against the ball for it can restrict the ball movement and prevent hydraulic fluid passage through the valve.
6. Discharge check valve (figure 2):
 - a. Drain all hydraulic fluid.
 - b. Unscrew reservoir screw (figure 1A, item 8).
 - c. Remove reservoir screw, screw gasket (figure 1A, item 9), reservoir (figure 1A, item 4) and reservoir gasket (figure 1A, item 5).
 - d. Discard screw gasket and reservoir gasket.
 - e. Remove plug (item 12), spring (item 13) and steel ball (item 16).
 - f. Remove and discard O-ring (item 19) from plug.
 - g. To reassemble, install O-ring to plug. Install ball, spring and plug. Verify the pin in the plug is not pressing against the ball for it can restrict the ball movement and prevent hydraulic fluid passage through the valve.
 - h. Install reservoir gasket, reservoir, screw gasket and reservoir screw. Verify reservoir sits flat on reservoir gasket.
7. Hand pump assembly (figure 2):
 - a. Drain all hydraulic fluid.
 - b. Remove fulcrum (item 3) from hand pump assembly by removing cotter pins (items 15) and pump link pins (items 4).
 - c. Remove pump plunger (item 2) from pump body (item 1).
 - d. Remove capscrew (item 11), split lockwasher (item 17), pump washer (item 9), O-ring (item 7) and back-up ring (item 8) from pump plunger.
 - e. Unscrew pump body from base. Remove gasket (item 10) and wiper (item 6).
 - f. Discard all cotter pins, O-ring, back-up ring, gasket and wiper.
 - g. To reassemble, install wiper into pump body.
 - h. Install gasket and pump body into base.
 - i. Install back-up ring, O-ring, pump washer, split lockwasher and capscrew onto pump plunger.
 - j. Install pump plunger into pump body.
 - k. Install fulcrum, pump link pins and cotter pins to pump plunger and the pump link.

7.0 MAINTENANCE *(continued)*

7.4 TESTING:

Place jack in a load indicating test fixture. Make sure the test adapter is 1/2 inch or 3/4 inch male spherical radius. Operate hand pump to extend outer plunger fully and inner plunger partially. Make sure the extension screw and the test adapter are correctly mated. Load test the jack at rated capacity of 20 tons. If jack fails to operate properly, check for trouble as indicated in 6.0 Trouble Shooting. With plungers extended and supporting the load, allow the jack to stand for 10 minutes. Any excess settling indicates leakage in the hand pumps, check valves or jack packing seals. Check for hydraulic fluid leaks and replace all defective parts.

If adjustment is required for the safety pop-off valve, perform the following procedure:

1. Remove plug (figure 1A, item 32). Close release valve (figure 1A, item 33).
2. Place jack in a load indicating test fixture. Make sure the test adapter is 3/4 inch male spherical radius. Operate hand pump to extend outer plunger fully and inner plunger partially. Make sure the extension screw and the test adapter are correctly mated.
3. While operating hand pump, adjust set screw (figure 1A, item 31) until safety pop-off valve bypasses hydraulic fluid back to the reservoir at 21 to 22 tons.
4. Install plug (figure 1A, item 32). Once more operate hand pump to verify correct setting.
5. Open release valve to relieve pressure.

8.0 PROVISION OF SPARES

8.1 SOURCE OF SPARE PARTS

Spare parts may be obtained from the manufacturer:

Malabar International

1 Air Cargo Pkwy East
Swanton, Ohio 43558 USA

Telephone: (419) 866-6301 or 800-426-6301

E-mail: sales@malabar.com

Website: www.malabar.com

8.2 RECOMMENDED SPARE PARTS LISTS

The following spare parts are recommended and available upon request. Reference the following page(s) for Replacement Parts and Kits available.

Part Number	Description	Qty
215PK	Repair Parts Kit	1
55360	Pump Assembly	1
55120	Air Vent	1
55997-2	Nameplate	1
55989-4	Placard, Tonnage, 20 Ton	1
55490	Placard, Air Vent	1
55998-1	Sticker, Malabar	1
55994	Sticker, Fluid	1
55155	Safety Pop-Off Valve Assembly	1
100	Release Valve Assembly	1

9.0 IN SERVICE SUPPORT

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

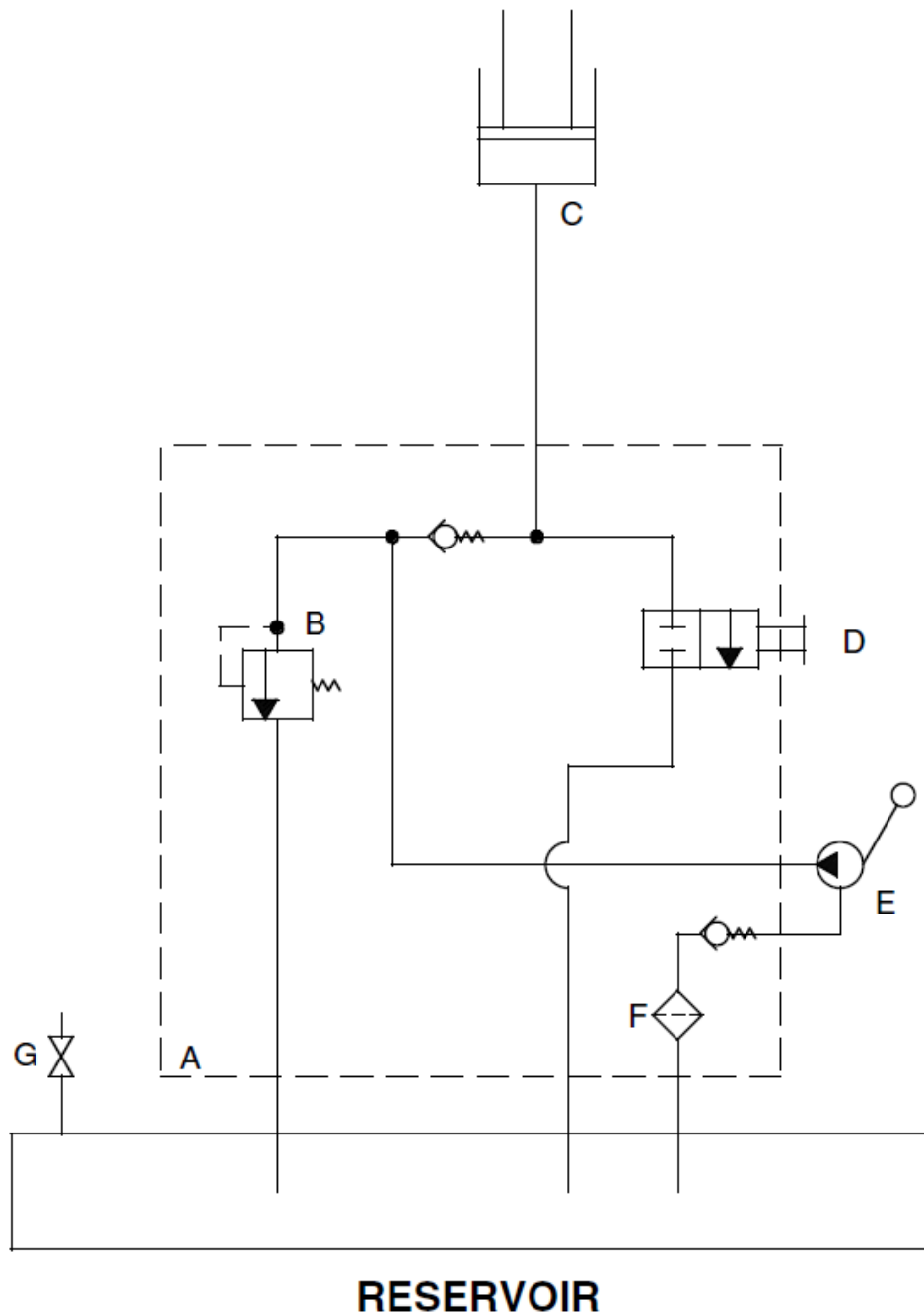
10.0 GUARANTEES/LIMITATION OF LIABILITY

- I. 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.
- II. The warranty period shall be as follows:
 - A. For Malabar equipment, with the exception of Tripod Jacks, the warranty period is one (1) year after date of shipment.
 - B. For Malabar Tripod Jacks, the warranty period is three (3) years after date of shipment.
- III. 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 the above-mentioned warranty period. This warranty and liability of the Seller is expressly limited solely to replacement or repair of defective parts or goods, and return at Buyer's expense to Buyer after finding by Seller the product was defective prior to original shipment or, at the option of Seller, to providing refund to Buyer of the purchase price for said product.
- IV. 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 MERCHANTABILITY OR OF FITNESS) EXCEPT THAT THE MATERIAL SHALL BE OF THE QUALITY SPECIFIED IN APPLICABLE SPECIFICATIONS, 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. Buyer's sole and exclusive remedy shall be repair or replacement of defective parts or goods 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. 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 if, 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 of such component, and
 - G. Seller does not assume nor does Seller authorize any other person to assume for it any other liability or make any warranty in connection with the sale of its products.

11.0 APPENDICES

APPENDIX I Safety Data Sheet – MIL-PRF-5606 Hydraulic Fluid

Hydraulic Diagram



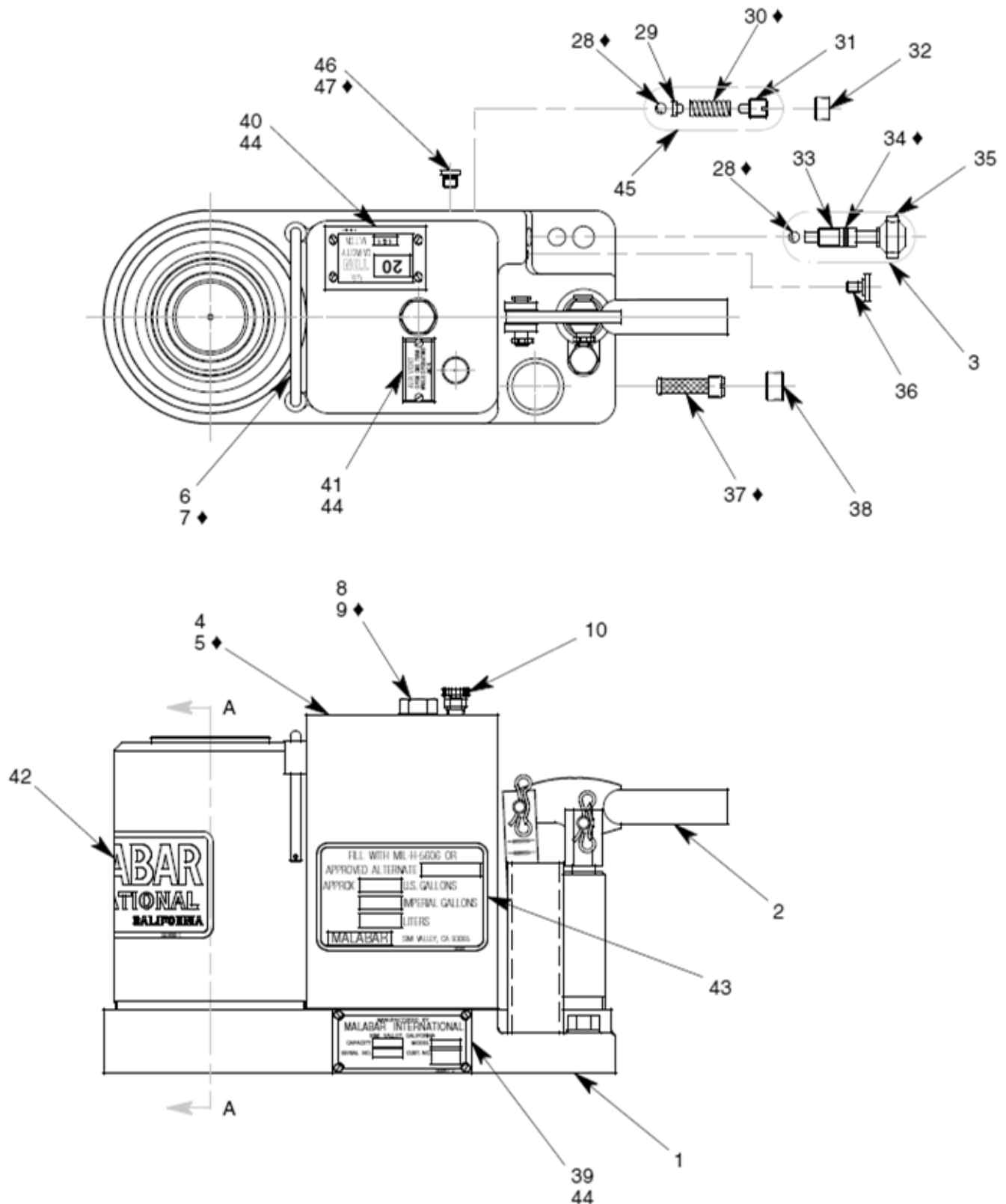
- A - BASE
- B - SAFETY POP-OFF VALVE
- C - CYLINDER ASSEMBLY
- D - RELEASE VALVE

- E - HAND PUMP
- F - OIL SCREEN
- G - AIR VENT

Parts List – Figure 1A

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

♦ PART OF REPAIR PARTS KIT



Parts List – Figure 1A

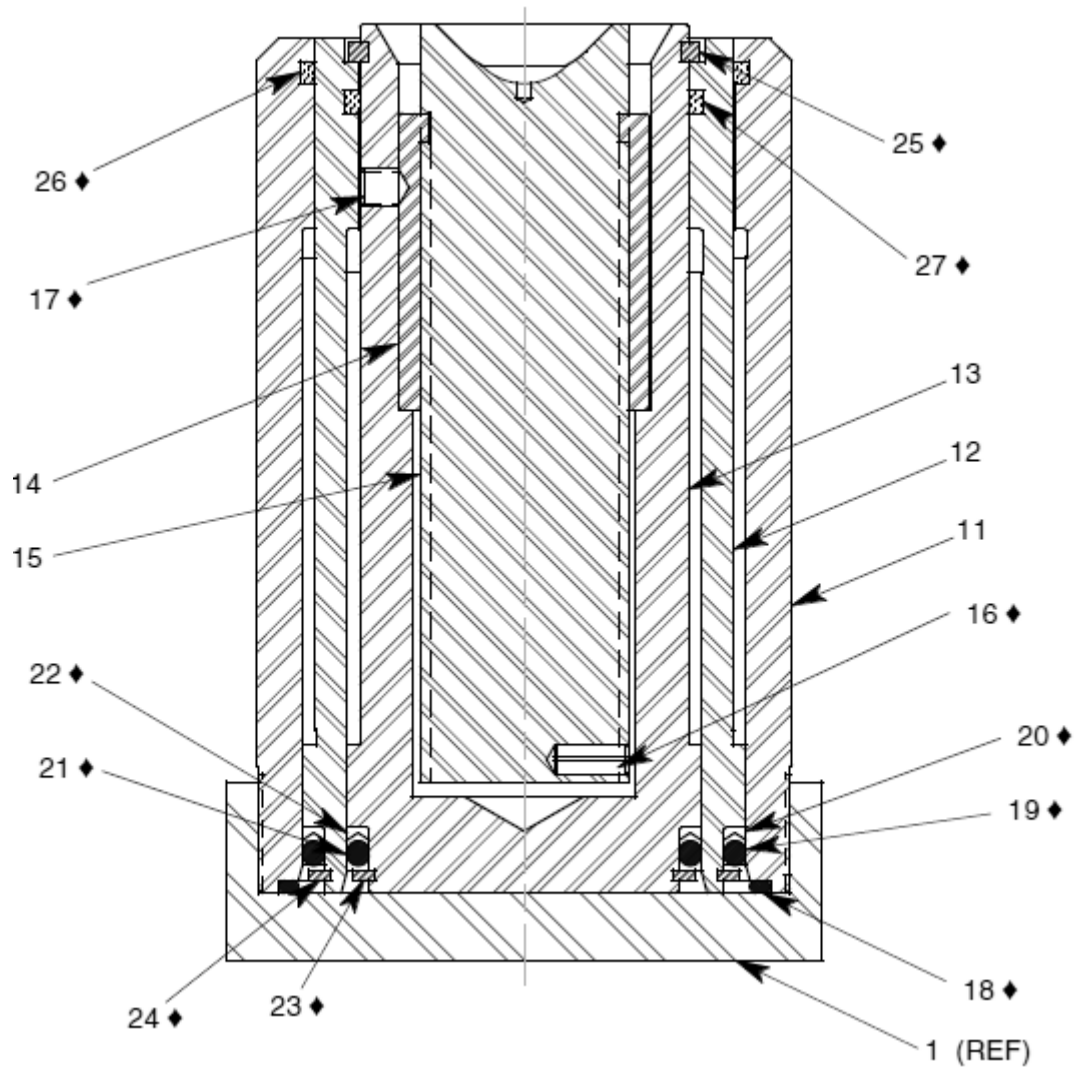
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	64207	BASE	1
2	55360	PUMP ASSEMBLY	1
3	100	RELEASE VALVE ASSEMBLY	1
4	64803	RESERVOIR	1
5	64205	RESERVOIR GASKET	1
6	64288	LIFTING HANDLE	1
7	MS16562-14	ROLL PIN, 5/64 x 7/16 LG	2
8	64882	RESERVOIR SCREW	1
9	61889	SCREW GASKET	1
10	55120	AIR VENT	1
28	412-004	STEEL BALL, 1/4 DIA	2
29	55153	SPRING GUIDE	1
30	55154H	SPRING	1
31	55148	SET SCREW	1
32	717-006	PLUG, 1/4 NPT	1
33	101	STEM	1
34	55925-011	O-RING	1
35	390-001	DOWEL PIN, 1/4 x 1" LG	1
36	870225	RELEASE VALVE LOCKSCREW	1
37	55567	OIL SCREEN	1
38	717-007	PLUG, 3/8 NPT	1
39	55997-2	NAMEPLATE	1
40	55989-4	PLACARD, TONNAGE, 20 TON	1
41	55490	PLACARD, AIR VENT	1
42	55998-1	STICKER, MALABAR	1
43	55994	STICKER, FLUID	1
44	397-005	SELF TAPPING SCREW, #4	10
45	55155	SAFETY POP-OFF VALVE	1
46	717-076	PLUG, 1/8 SAE SOCKET HEAD	1
47	MS28778-2	O-RING	1

Parts List – Figure 1B

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

◆ PART OF REPAIR PARTS KIT



Parts List – Figure 1B

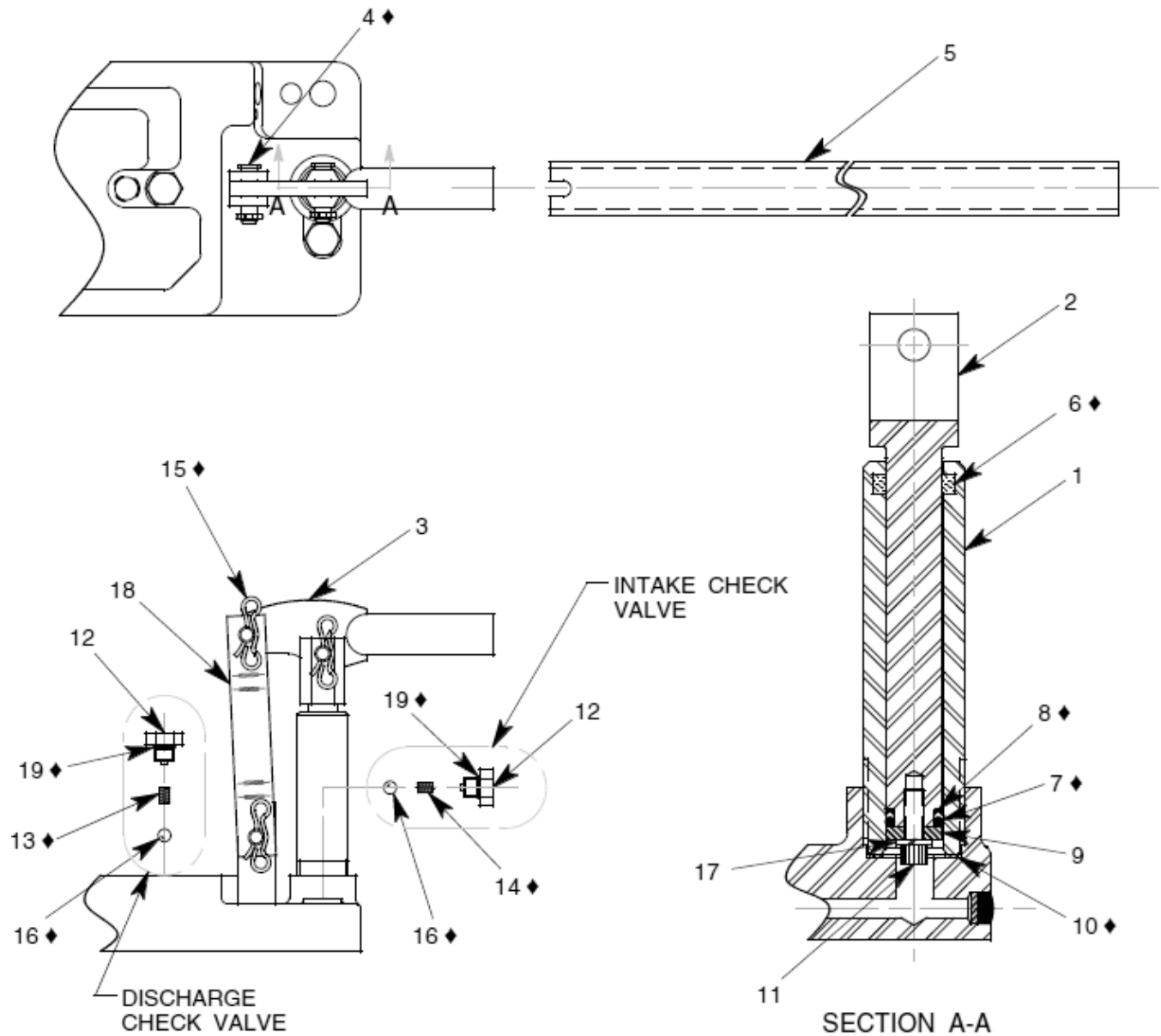
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	64207	BASE	ref
11	64806	CYLINDER	1
12	64810	OUTER PLUNGER	1
13	21550B	INNER PLUNGER	1
14	21909	EXTENSION SCREW NUT	1
15	21508B	EXTENSION SCREW	1
16	371-014	ROLL PIN, 1/4 x 5/8 LG	1
17	331-004	SHSS, 5/16-24 X 5/16 LG	1
18	55925-241	O-RING	1
19	55925-340	O-RING	1
20	55902-43	BACK-UP RING	1
21	55925-334	O-RING	1
22	55902-37	BACK-UP RING	1
23	55917-262	RETAINING RING	1
24	55924-337	RETAINING RING	1
25	64043	SNAP RING	1
26	64211	WIPER	1
27	64231	WIPER	1

Parts List – Figure 2

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

♦ PART OF REPAIR PARTS KIT



Parts List – Figure 2

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

Item	Part Number	Description	Qty
	55360	Pump Assembly; consists of:	
1	55362	PUMP BODY	1
2	55364	PUMP PLUNGER	1
3	55001	FULCRUM	1
4	55002	PUMP LINK PIN	3
5	61878	PUMP HANDLE	1
6	55363	WIPER	1
7	55925-110	O-RING	1
8	55900-8	BACK-UP RING	1
9	55367	PUMP WASHER	1
10	55361	GASKET	1
11	323-016	SHCS, #10-32UNF x 1/2 LG	1
12	64889	PLUG	2
13	64198	SPRING	1
14	64197	SPRING	1
15	372-028	BOWTIE COTTER PIN	3
16	412-004	STEEL BALL, 1/4 DIA	2
17	363-009	SPLIT LOCKWASHER, #10	1
18	55615	PUMP LINK	1
19	55908-3	O-RING (PART OF ITEM 12)	12



APPENDIX I

Safety Data Sheet MIL-PRF-5606 Hydraulic Fluid

Product Name: MOBIL AERO HFA
Revision Date: 01 Oct 2015
Page 1 of 12

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.

Product Name: MOBIL AERO HFA
Revision Date: 01 Oct 2015
Page 2 of 12

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.

NFPA Hazard ID:	Health: 1	Flammability: 2	Reactivity: 0
HMIS Hazard ID:	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

Product Name: MOBIL AERO HFA

Revision Date: 01 Oct 2015

Page 3 of 12

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 (CO₂) 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

Product Name: MOBIL AERO HFA
Revision Date: 01 Oct 2015
Page 5 of 12

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/m³ - ACGIH TLV (inhalable fraction), 5 mg/m³ - 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.

Product Name: MOBIL AERO HFA
Revision Date: 01 Oct 2015
Page 6 of 12

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

Product Name: MOBIL AERO HFA
Revision Date: 01 Oct 2015
Page 7 of 12

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
Inhalation	
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.

Product Name: MOBIL AERO HFA
 Revision Date: 01 Oct 2015
 Page 8 of 12

Ingestion	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
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.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
Sensitization	
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.
Aspiration: Data available.	May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
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--

Product Name: MOBIL AERO HFA
Revision Date: 01 Oct 2015
Page 9 of 12

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



Product Name: MOBIL AERO HFA
Revision Date: 01 Oct 2015
Page 10 of 12

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.

Product Name: MOBIL AERO HFA
 Revision Date: 01 Oct 2015
 Page 11 of 12

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
-------------------	--------------------------

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.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law,



Product Name: MOBIL AERO HFA
Revision Date: 01 Oct 2015
Page 12 of 12

re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

Internal Use Only

MHC: 2A, 0, 0, 0, 1, 1

PPEC: C

DGN: 2005454XUS (552975)

Copyright 2002 Exxon Mobil Corporation, All rights reserved