

Model: PF56103-3P
2 gal (7.6 l) Fluid Dispenser

02/2024 – Rev. 05

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



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 Model PF56103-3P is a 2 gal (7.6 l) fluid dispenser used to service all variants of the JSF F-35 aircraft. The hand pump dispenser consists of a reservoir, pump assembly, relief valve, check valve, filter assembly, desiccant dryer, pressure gauge and a fluid delivery hose with a coupling.

1.2 MODEL & SERIAL NUMBER

Reference nameplate on unit

1.3 MANUFACTURER

Tronair / 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

Fluid	MIL-PRF-87252
Reservoir capacity	2 gal (7.6 l)
Pump outlet pressure	40 psig (276 kPa)
Volume per stroke	1.4 cubic in (23 cc)
Relief valve setting	40 psig (276 kPa)
Overall hose length	84 in (2134 mm)
Return hose length	84 in (2134 mm)
Net weight (empty)	25 lbs (11.3 kg)
Filter rating	3 micron absolute
Fluid tank color	blue

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.

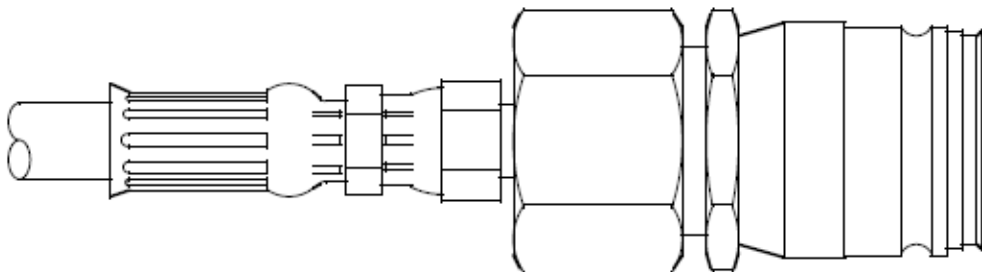
2.2 PERSONAL PROTECTION EQUIPMENT

- Safety glasses must be worn when operating the fluid dispenser
- Additional equipment recommended by the fluid manufacturer (gloves, etc.). Reference Appendix Safety Data Sheet pertaining to fluid(s)

3.0 PREPARATION PRIOR TO FIRST USE

The Flush/Fill procedure outlined below is intended to flush any residual impurities and purge as much air as possible for the PAO Servicing Unit and to ensure that fluid pumped from the Servicing Unit meets JSF Propulsion requirements for purity.

1. Remove fillport cap (figure 1B, item 16) and fill Servicing Unit with two gallons of new MIL-PRF-87252 fluid. Replace fillport cap.
2. The fill hose quick disconnect (QD) fitting shown below should be in storage position, attach to its mate (figure 1C, item 13) on the Service Unit. While viewing the sight glass (figure 1C, item 9) on the manifold block, actuate the pump handle until air bubbles are purged from the Service Unit system.



3. Leave QD couplings mated together until ready to service the aircraft.

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

1. Remove fill hose quick disconnect (QD) fitting from its mate on the Service Unit and connect the fill hose quick disconnect (QD) fitting to the aircraft service point.
2. Use full steady pumping strokes when operating pump assembly during replenishing.
3. Disconnect the fill hose quick disconnect (QD) fitting from the aircraft service point, insert into its mate on the Service Unit and store the unit in a dry, dust free location.

5.1 FLUSH AND FILL THE RESERVOIR

This fluid dispenser is intended for a single fluid type only. In case of fluid contamination, expiration, or incorrect fluid type, follow these steps to flush and re-fill the fluid dispenser.

1. Drain and remove all fluid from reservoir, as much as possible. This may be achieved by emptying through the fillport under the fill cap (Figure 1B, Item 16) as well as pumping out through the QD nipple (Figure 1C, Item 3). Dispose of all fluid according to local requirements.
2. Remove and replace the filter element per separate procedure in section 6.2.2 Filter Element and O-Ring Replacement.
3. Fill tank with 1 gallon of desired fluid. Cap fillport. Plug the QD nipple (Figure 1C, Item 3) to the QD coupler (Figure 1C, Item 13) on the manifold and operate the pump. Check for leaks and tighten connections as necessary. Check for fluid flow using the sight glass (Figure 1C, Items 9). Circulate approximately 2 gallons of fluid (approximately 330 strokes) while checking functionality.
4. Drain and remove all fluid from reservoir, as much as possible. Follow similar procedures as step 1.
5. Remove and replace the filter element again per separate procedure in section 6.2.2 Filter Element and O-Ring Replacement.
6. Fill tank with desired amount of correct fluid. Cap fillport. Plug the QD nipple (Figure 1C, Item 3) to the QD coupler (Figure 1C, Item 13) on the manifold and operate the pump. Check for leaks and tighten connections as necessary. Check for fluid flow using the sight glass (Figure 1C, Items 9). Circulate approximately ¼ gallon of fluid (approximately 40-45 strokes) while checking functionality.
7. Clean up any fluid spills on and around the fluid dispenser.
8. Perform additional fluid analysis on a fluid sample from the tank, if desired, to verify fluid purity and quality.

6.0 MAINTENANCE**6.1 SERVICING**

1. The frequency of filter change depends on operating conditions. Generally, changes should be made every 3-4 months or sooner if more than normal resistance is felt on the pumping stroke at low pressure. Refer to item 6 in figure 1A to change element. Proper element (item 6) must be installed, otherwise unit will not pump fluid.

NOTE: The relief valve should not be removed. The relief valve is set to by-pass oil back to the reservoir at 40 PSIG.

2. The desiccant contained in the clear cartridge located near the fill port cap is blue when the cartridge is new, but should be replaced when the desiccant has turned pink or red.

6.2 REPAIR AND REPLACEMENT

No definite time schedule can be established for the overhaul of the pump assembly for the replacement of the various moving parts. The number of times the pump assembly is operated materially affect the life of the working parts. The moving piston seal (O-ring Figure 2, item 4) and rod seal (O-ring item 14) are normally the first to wear (see figure 2). This is usually indicated by leakage of fluid past the piston or rod. It is advisable to change piston seal (O-ring item 4), rod seal (O-ring item 14) and gasket (O-ring item 13) immediately if leakage is discovered. A repair parts kit (P/N PF2-70PK) is available and recommended to keep on hand at your facility. Refer to Repair Parts Kit for the complete list of parts contained in the kit.

NOTE: If the relief valve (item 10, figure 1B) is replaced or repaired, care must be taken to reset it to the correct pressure setting (40 psig). This can be accomplished by first disconnecting the QD coupler (item 13, figure 1C) from the manifold block, unsetting the relief valve locknut and turning the relief valve screw counter clockwise completely. Next apply pressure to the hose with the pump assembly (item 2, figure 1B) while reading the pressure at the gauge (item 13, figure 1A). The adjusting screw on the relief valve should be turned clockwise gradually (increased setting) until the gauge reads 40 psig while operating the pump assembly. Set relief valve locknut

6.2.1 Pump Assembly Replacement

The pump assembly (Figure 1B, Item 2) may be repaired according to information in section 6.2; or, replaced altogether. To replace the pump assembly and gasket, proceed as follows:

1. Drain and remove all fluid from reservoir, as much as possible. Dispose of all fluid according to local requirements.
2. Slightly loosen but do not remove the lower tube nut on the tube assembly (Figure 1B, item 9) from the adjacent elbow (Figure 1C, Item 8) at the manifold (Figure 1C, Item 6). Use wrenches on both the elbow and on the nut for stability.
3. Disconnect the upper tube nut on the tube assembly (Figure 1B, Item 9) from the elbow (Figure 1C, Item 2) at the upper end of the filter assembly (Figure 1A, Item 5). Use wrenches on both the elbow and on the nut for stability. Pivot the tube assembly away from the filter body/elbow.
4. Note the location of the shorter socket head cap screw (SHCS). Loosen and remove all SHCS (Figure 1B, Items 4 & 5) from the pump housing.
5. Slowly remove the pump assembly (Figure 1B, Item 2) from the fluid tank (Figure 1C, Item 1). The filter assembly and connecting adapters (Figure 1A, Items 1, 2, 5) will be attached to the pump assembly at this point. Some fluid will drip and drain from the pump assembly during removal.
6. Remove the gasket (Figure 1B, Item 3) from the fluid tank.
7. Separate the filter assembly (Figure 1A, Item 5) and street elbow and nipple (adapters) (Figure 1A, Items 1 & 2) from the pump assembly. Do not disconnect the filter assembly from these adapters. Clean and inspect threads on the long nipple (Figure 1A, Item 2). Replace as needed if threads are damaged.
8. Fasten the filter assembly with its adapters to the replacement pump assembly. Apply liquid threadlocker (Loctite 592 or equivalent) to the threads of the long nipple (Figure 1A, Item 2), before fastening to the new pump assembly. Tighten until the filter assembly is in the orientation as illustrated in Figure 1A.
9. Align the replacement gasket over the pump port and assemble the replacement pump (with filter assembly attached) to the pump port on the tank. Fasten using the same SHCS from step 4. Note position of the shorter SHCS (Figure 1B, Item 5) in combination to the other SHCS (Figure 1B, Items 4).
10. Align and fasten upper the tube nut and sleeve to the elbow (Figure 1C, item 2) on the filter cap. Carefully align the flare and the sleeve on the elbow adapter before tightening the nut. The sleeve should protrude from the end of the nut when the nut is completely tightened.
11. Tighten the lower tube assembly nut to the elbow (Figure 1C, item 8) at the manifold. The sleeve should protrude from the end of the nut when the nut is completely tightened.
12. Connect the QD nipple (Figure 1C, Item 3) to the QD coupler (Figure 1C, Item 13) on the manifold and operate the pump. Check for leaks and tighten connections as necessary. Check for fluid flow using the sight glass (Figure 1C, Items 9). Circulate approximately ¼ gallon of fluid (approximately 40-45 strokes) while checking functionality.
13. Clean up any fluid spills on and around the fluid dispenser.

6.2.2 Filter Element and O-Ring Replacement

Filter element (Figure 1A, Item 6) and O-ring (Figure 1A, Item 7), should be replaced according to the guidelines in section 6.1. To replace the filter element and o-ring, proceed as follows:

1. Slightly loosen but do not remove the lower tube nut on the tube assembly (Figure 1B, item 9) from the adjacent elbow (Figure 1C, Item 8) at the manifold (Figure 1C, Item 6). Use wrenches on both the elbow and on the nut for stability.
2. Disconnect the upper tube nut on the tube assembly (Figure 1B, Item 9) from the elbow (Figure 1C, Item 2) at the upper end of the filter body (Figure 1A, Item 5). Use wrenches on both the elbow and on the nut for stability. Pivot the tube assembly away from the filter body/elbow.
3. Separate/unscrew the upper cap of the filter body (Figure 1A, Item 5) from the main filter body. The cap is located above the cylindrical relief. Use wrenches on both the body and on the hex flats of the cap.
4. Remove existing o-ring (Figure 1A, Item 7) from the cap and then replace with new o-ring. Check replacement o-ring for cracks, pitting or other damage before and after assembly to the filter cap.
5. Remove existing filter element (Figure 1A, item 6), taking note of orientation and alignment of filter element inside the filter body.
6. Insert new filter element in to the filter body in the same orientation and alignment as the old filter element.
7. Re-assemble upper cap to the filter body, using wrenches on both the body and on the hex flats of the cap. When fully tightened, the elbow on the cap should align to the same orientation as shown in Figure 1B, so that the tube assembly is easily aligned to the elbow.
8. Align and fasten upper tube nut and sleeve to the elbow on the filter cap. Carefully align the flare and the sleeve on the elbow adapter before tightening the upper tube nut. The sleeve should protrude from the end of the nut when the nut is completely tightened.
9. Tighten the lower tube nut to the elbow (Figure 1C, item 8) at the manifold (Figure 1C, item 6). The sleeve should protrude from the end of the nut when the nut is completely tightened.
10. Connect the QD nipple (Figure 1C, item 3) to the QD coupler (Figure 1C, Item 13) on the manifold and circulate approximately ¼ gallon of fluid through the filter (approximately 40-45 strokes). Check for leaks and tighten connections as necessary. Check for fluid flow using the sight glass (Figure 1C, Items 9).
11. Clean up any fluid spills on and around the fluid dispenser.

6.2.3 Desiccant Dryer Replacement

The desiccant dryer (Figure 1A, Item 11) attaches to the fillport by way of an elbow. Replacement is required when the desiccant media changes color per manufacturer's specifications, indicating media is saturated with moisture. See section 6.1 for more information. Follow these steps to replace as needed.

1. Remove the inlet check valve (Figure 1B, item 19) using two wrenches to turn it counter clockwise from the upper street elbow (Figure 1B, Item 6).
2. Remove the desiccant dryer (Figure 1A, item 11) using two wrenches to turn it counter clockwise from the lower adjacent street elbow that connects to the fillport (Figure 1A, Item 1).
3. Remove the upper adjacent street elbow (Figure 1B, Item 6) from the desiccant dryer using two wrenches to turn it counter clockwise. Save used desiccant dryer.
4. Thoroughly clean and inspect all threads on street elbows and inlet check valve. Replace if necessary.
5. Inspect replacement desiccant dryer to assure color matches dry condition, per manufacturer's specifications.
6. Install replacement desiccant dryer on to the lower elbow by turning clockwise. Fasten finger tight but do not fully tighten with a wrench yet.
7. Install upper elbow on to the replacement desiccant dryer by turning clockwise. Turn upper elbow and dryer body until tight and the upper elbow is pointing approximately the same direction as illustrated in Figure 1B.
8. Apply liquid threadlocker (Loctite 592 or equivalent) to the downstream threads of the check valve. Note check valve direction in Figure 1B, item 19 and compare to arrow on part. Install and tighten check valve to upper street elbow (Figure 1B, item 6), using wrenches on both the elbow and on the check valve for stability.
9. Clean up any fluid spills on and around the fluid dispenser.

6.2.4 Hose Replacement

In case of wear or failure of the hose assembly (Figure 1B, Item 8), replacement may be completed by doing the following:

1. Disconnect the QD nipple (Figure 1C, item 3) from the QD coupler (Figure 1C, item 13).
2. Untangle the hose and allow the hose to hang in one continuous loop while holding the QD nipple at the same elevation or a little above the elbow (Figure 1B, item 20). The hose should hang below the elevation of the QD nipple (Figure 1C, item 3) and elbow (Figure 1B, item 20), at this point.
3. Then, disconnect the reducer (Figure 1C, Item 4) from the hose end. Use wrenches on the hose fitting and on the reducer. A small amount of fluid will bleed out of the hose and reducer, but most will be retained in the hose.
4. Continue to hold the open hose end at the same elevation as the elbow and disconnect the other end of the hose from the elbow (Figure 1B, item 20). Again, some fluid will bleed from the ends of the connections, but continue to hold the open ends of the hose at the same elevation, with the hose ends facing upward and the length of hose hanging beneath. This will help prevent fluid from leaking from the hose. Dispose of fluid in the hose as appropriate and when ready.
5. Clean up any fluid spills on and around the fluid dispenser.
6. Clean and inspect threads on the reducer (Figure 1C, item 4) and on the elbow (Figure 1B, item 20).
7. Tighten one end of the replacement hose to the elbow (Figure 1B, item 20) on the manifold.
8. Tighten the other end of the hose to the reducer (Figure 1C, item 4) and QD nipple (Figure 1C, item 3).
9. Plug the QD nipple (Figure 1C, item 3) to the QD coupler (Figure 1C, item 13) on the manifold and operate the pump. Check for leaks and tighten connections as necessary. Check for fluid flow using the sight glass (Figure 1C, items 9). Circulate approximately ½ gallon of fluid (approximately 80-85 strokes) while checking functionality.
10. Clean up any fluid spills on and around the fluid dispenser.

6.2.5 Pressure Gauge Replacement

The pressure gauge (Figure 1A, Item 13) may require replacement if determined to be reading in error or broken. Removal and replacement may be done by the following:

1. Disconnect the Instrument Hose (Figure 1C, Item 5) from the Elbow (Figure 1C, Item 10) at the manifold (Figure 1C, Item 6).
2. Disconnect the straps (Figure 1A, Items 16) from the gauge mount plate (Figure 1A, Item 14) by removing BHCS, flat washer, split lockwasher and hex nut hardware (Figure 1A, items 18, 20, 22 and 24). The gauge on the mount plate will now be free of the handle, take care to support the gauge and pull the instrument hose through the space provided.
3. Disconnect the pressure gauge (Figure 1A, Item 13) from the gauge mount plate (Figure 1A, Item 14) by removing FHMS, flat washer, split lockwasher and hex nut hardware (Figure 1A, items 17, 19, 21 and 23).
4. Disconnect the elbow (Figure 1A, Item 12), with the Instrument Hose attached, from the gauge.
5. Clean and inspect threads on the elbow. Replace as necessary.
6. Apply liquid threadlocker (Loctite 592 or equivalent) to the threads of the replacement pressure gauge (Figure 1A, Item 13) and then fasten the elbow (Figure 1A, Item 12), with Instrument hose attached, to the pressure gauge. Note the orientation of the elbow to the pressure gauge as illustrated in Figure 1A.
7. Fasten the pressure gauge with elbow to the gauge mount plate (Figure 1A, Item 14) using the same fasteners FHMS, flat washer, split lockwasher and hex nut hardware (Figure 1A, items 17, 19, 21 and 23).
8. Fasten the pressure gauge with mount plate to the same location on the reservoir handle as previously mounted, using the same fasteners BHCS, flat washer, split lockwasher and hex nut hardware (Figure 1A, items 18, 20, 22 and 24). Take care to route the Instrument hose (Figure 1C, item 5) for good alignment to the elbow (Figure 1C, item 10) on the manifold (Figure 1C, item 6).
9. Fasten the Instrument Hose to the Elbow at the manifold.
10. Connect the QD nipple (Figure 1C, Item 3) to the QD coupler (Figure 1C, Item 13) on the manifold and operate the pump. Check for leaks and tighten connections as necessary. Check for fluid flow using the sight glass (Figure 1C, Items 9). Circulate approximately ¼ gallon of fluid (approximately 40-45 strokes) while checking functionality. Check for operation of the pressure gauge. With the relief valve properly set, the pressure gauge should read 125±10 psi.
11. Clean up any fluid spills on and around the fluid dispenser.

6.2.6 Manifold Repair

If the manifold (Figure 1C, item 6) or any component in the manifold is in need of repair or replacement, please contact Malabar for technical service. See section 1.3 – Manufacturer.

7.0 TROUBLE SHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
Does not dispense fluid	Fluid level in tank too low	Refill tank
	Filter element full/clogged	Change filter element
Pump handle offers zero resistance to movement	Pump seals worn or missing	Replace pump assembly per procedure
Pump handle difficult to move/operate	Filter element full/clogged	Change filter element
Pressure gauge not indicating/needle not moving	Broken pressure gauge	Replace pressure gauge

8.0 PROVISION OF SPARES

8.1 SOURCE OF SPARE PARTS

Spare parts may be obtained from the manufacturer:

Tronair / 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

For Spare Parts, Operations & Service Manuals or Service Needs:

Scan the QR code or visit Tronair.com/aftermarket



8.2 RECOMMENDED SPARE PARTS LISTS

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

Refer to figure 1A, 1B & 1C for unit assembly, figure 2 for pump assembly or figure 3 for filter assembly.

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 APPENDICIES

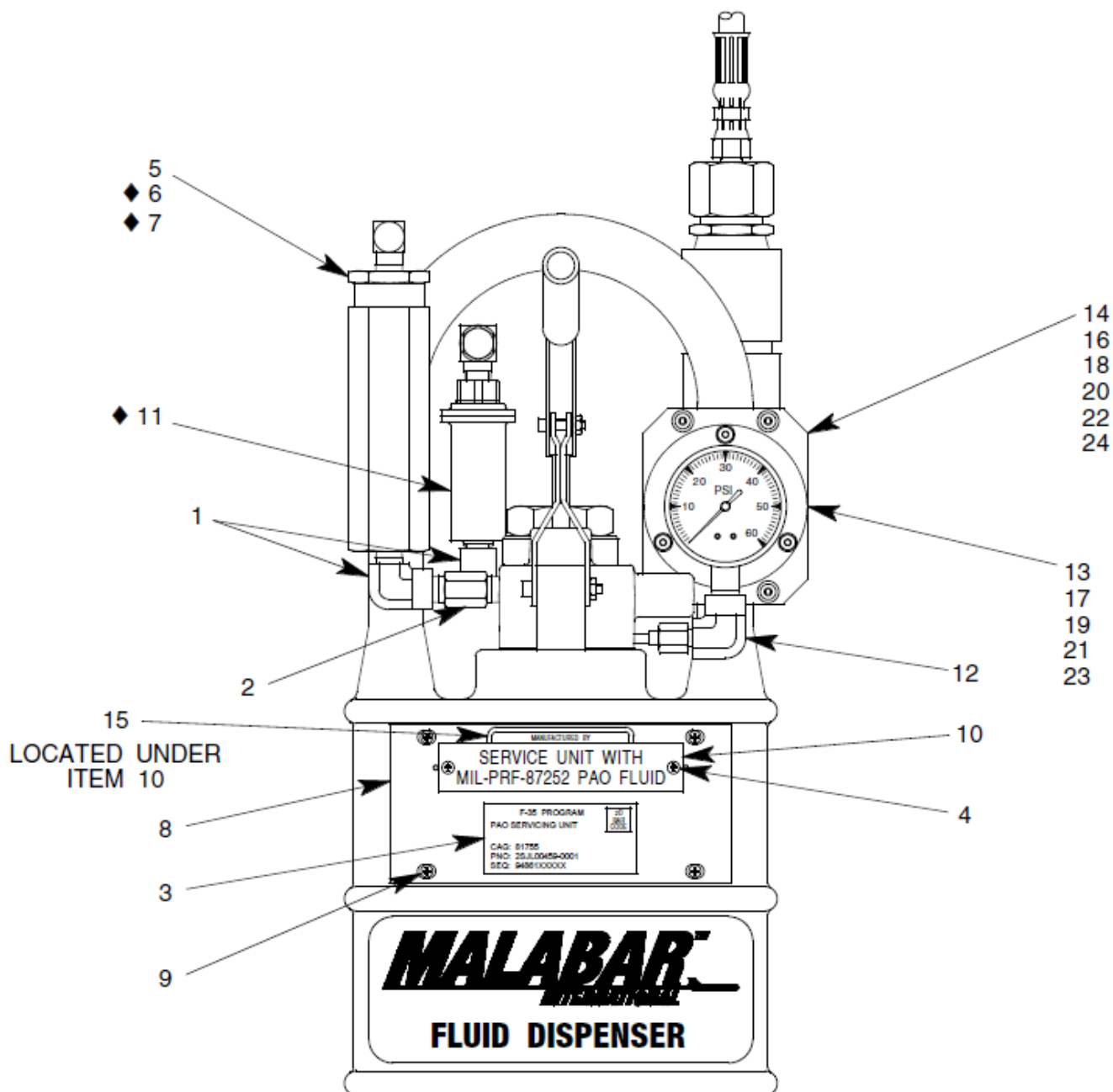
APPENDIX I SDS Lubricating Fluid

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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

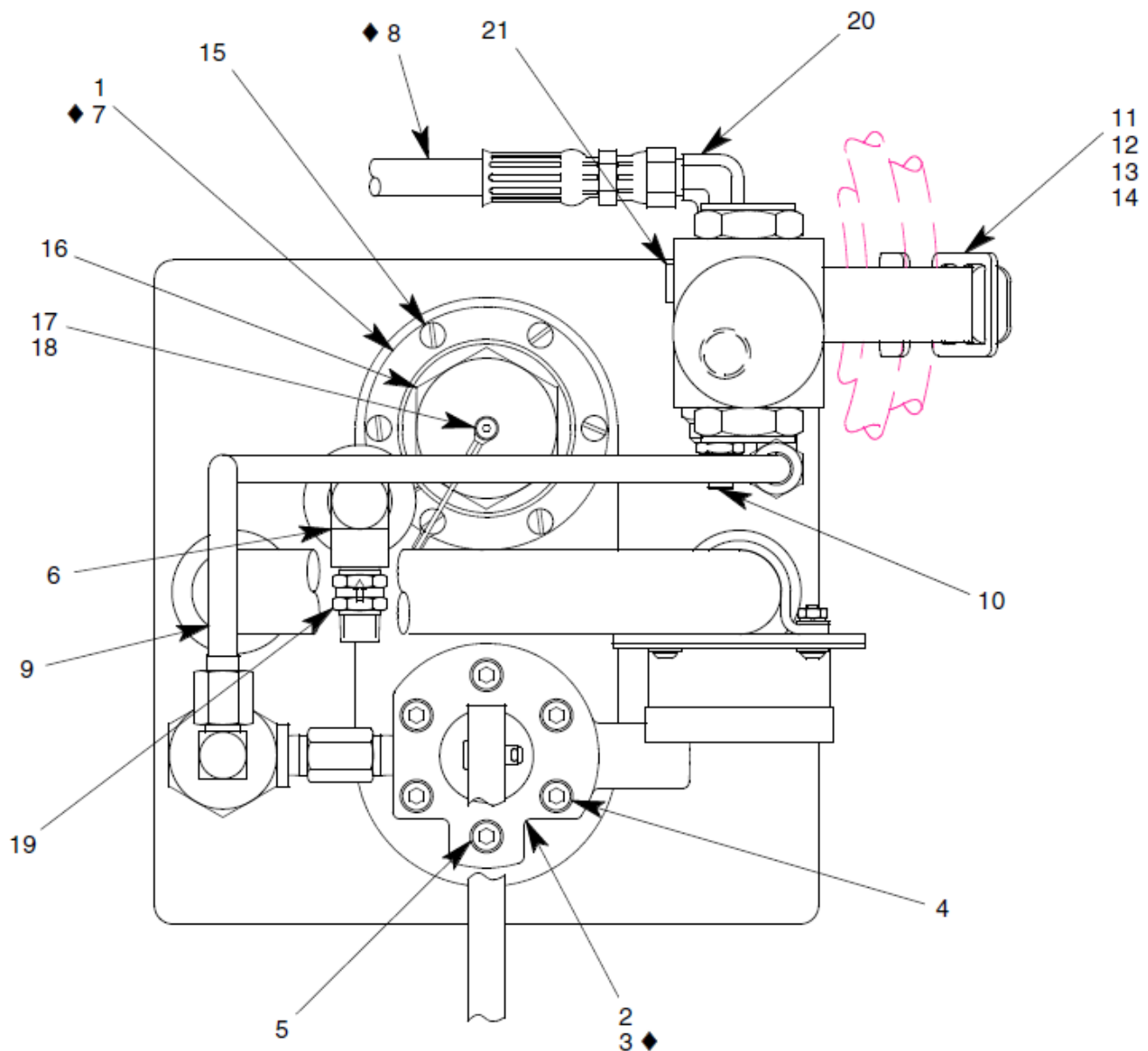
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	712-008	ELBOW, STREET, 1/4 NPT	2
2	711-120	NIPPLE, HEX LONG, 1/4 NPT	1
3	PF56252	IUID PLACARD	1
4	397-010	SELF TAPPING SCREW, 6-32	2
5	PF101160	FILTER ASSEMBLY	1
6	481-038	FILTER ELEMENT	1
7	55925-025	O-RING	1
8	TF-1039-38-84.0	PLACARD PLATE	1
9	344-011	FHCS, 6-32 x 7/16 LG	4
10	PF56166	PLACARD, MIL-PRF-87252	1
11	483-013	DESICCANT DRYER	1
12	722-058	ELBOW, 1/4 37° x 1/4 FPT	1
13	482-090	GAUGE, 0-60 PSIG	1
14	PF56165	GAUGE MOUNT PLATE	1
15	PF56172	STICKER, MALABAR P/N	1
16	394-082	STRAP	2
17	344-013	FHMS, 6-32 x 3/8 LG	3
18	324-066	BHCS, 8-32 x 5/8 LG	4
19	362-052	FLAT WASHER, #6 SAE	3
20	362-053	FLAT WASHER, #8 SAE	8
21	363-011	SPLIT LOCKWASHER, #6	3
22	363-016	SPLIT LOCKWASHER, #8	4
23	351-018	HEX NUT, 6-32	3
24	351-010	HEX NUT, 8-32	4

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

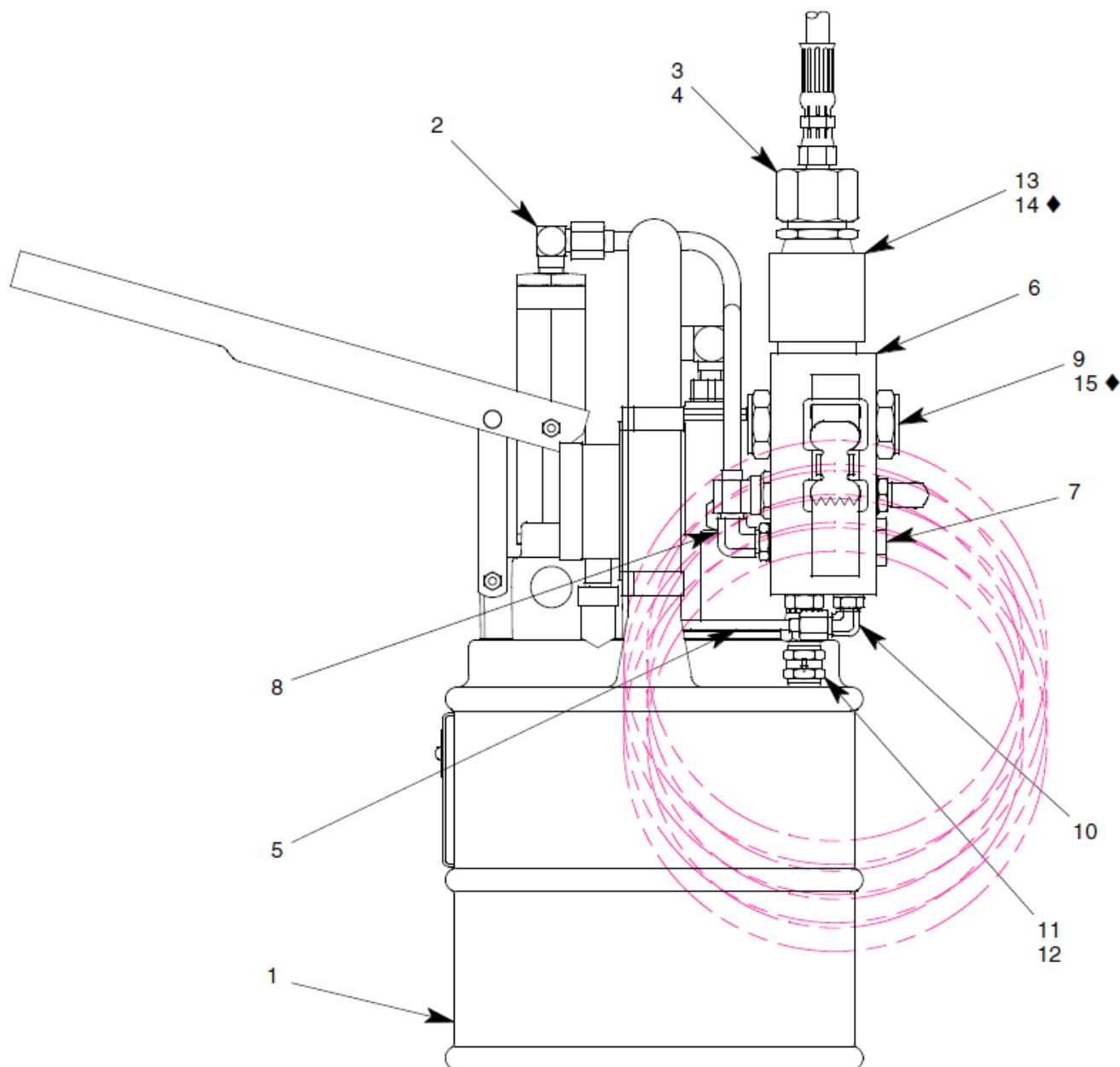
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	PF56136	RISER	1
2	PF55525	PUMP ASSEMBLY	1
3	PF55672	GASKET	1
4	323-038	SHCS, 1/4-28 x 1 3/4 LG	5
5	323-063	SHCS, 1/4-28 x 1" LG	1
6	712-008	ELBOW, STREET, 1/4 NPT	1
7	483-016	GASKET	1
8	PF55470-1	HOSE ASSEMBLY	1
9	PF56174	TUBE ASSEMBLY	1
10	423-065	RELIEF VALVE	1
11	363-001	SPLIT LOCKWASHER, 1/4	1
12	341-010	RHCS, 1/4-20 x 3/4 LG	1
13	362-001	FLAT WASHER, 1/4 SAE	1
14	837724	HOSE STRAP	1
15	341-009	RHCS, 10-32 x 1/2 LG	6
16	PF56073	FILL CAP	1
17	370-049	LANYARD, 6" LG	1
18	330-016	SHSS, 3/16 DIA x 1/4 LG, 8-32	1
19	422-036	CHECK VALVE	1
20	722-003	ELBOW, 1/4 37° x 1/4 SAE	1
21	717-087	PLUG, SOC HD, 3/16 SAE	1

Parts List – Figure 1C

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

◆ PART OF REPAIR PARTS KIT



Parts List – Figure 1C

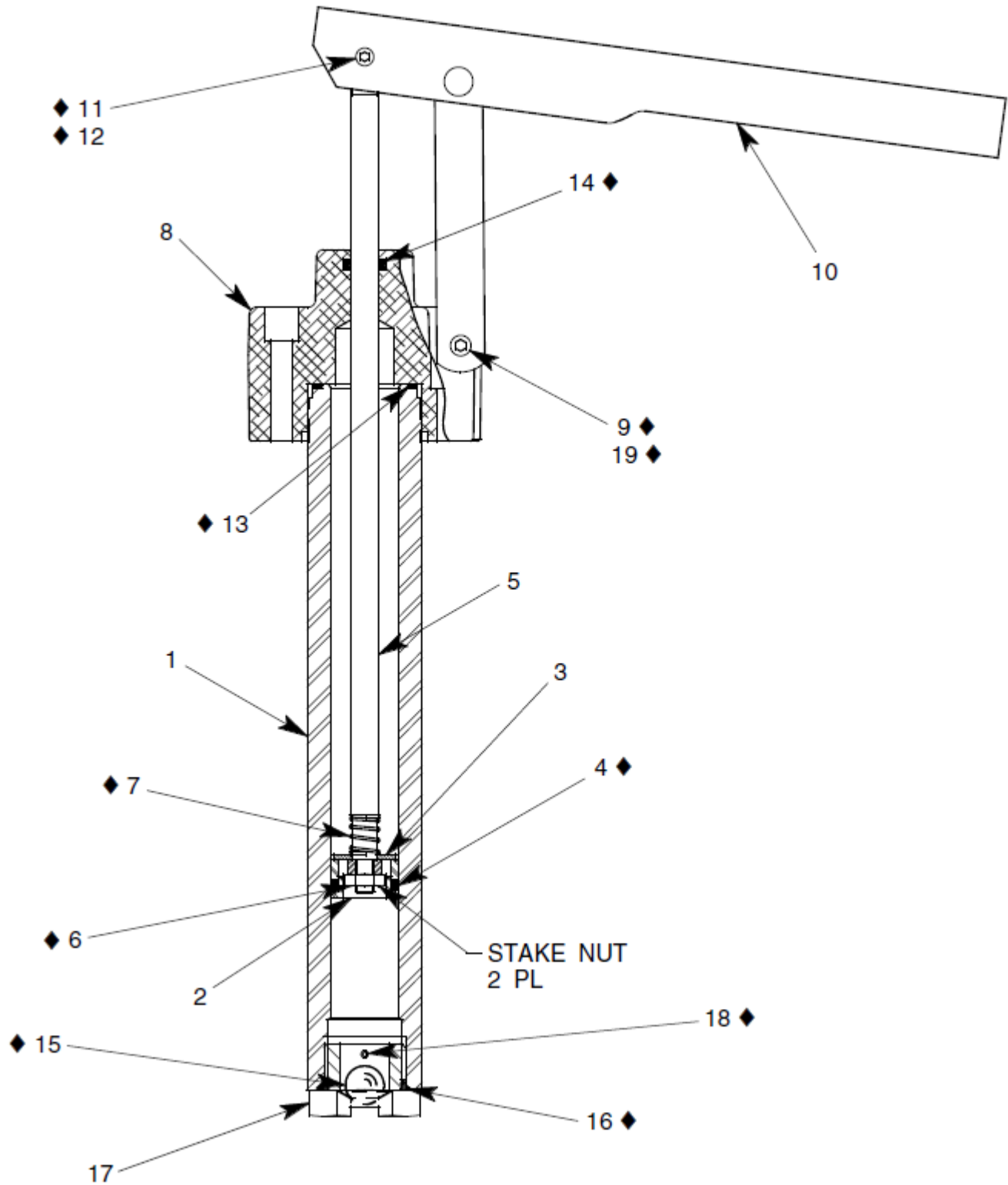
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	HC-2892-05	FLUID TANK	1
2	722-005	ELBOW, 3/8 37° x 1/4 MPT	1
3	736-128	QD NIPPLE (AE74537M)	1
4	729-114	REDUCER, 1" 37° x 3/8 37°	1
5	PF56175	INSTRUMENT HOSE	1
6	PF56164	MANIFOLD	1
7	422-082	CHECK VALVE	1
8	722-003	ELBOW, 3/8 37° x 3/8 SAE 4	1
9	484-034	SIGHT GLASS	2
10	722-124	ELBOW, 1/4 37° x 1/4 SAE	1
11	719-030	CONN., 3/8 FPT x 3/8 SAE	1
12	HC-2890	CHECK VALVE	1
13	47D02591-1	QD COUPLER (AE74538M)	1
14	55925-916	O-RING	1
15	55925-912	O-RING	2

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
	PF55525	PUMP ASSEMBLY ; <i>consists of:</i>	
1	PF55441	PUMP TUBE	1
2	PF55452	PUMP PISTON	1
3	PF55453	PUMP PISTON DISC	1
4	55925-115	O-RING	1
5	PF53378	PUMP PISTON ROD	1
6	352-011	HEX JAM NUT, 1/4-28	1
7	PF53406	SPRING	1
8	PF55685	PUMP OUTLET	1
9	341-029	SHSS, 1/4 DIA x 1-1/4 LG, 10-32	1
10	494-017	HANDLE ASSEMBLY	1
11	341-028	SHSS, 3/16 DIA x 1/2 LG, 8-32	1
12	355-034	LOCKNUT, 8-32	1
13	55925-024	O-RING	1
14	55925-110	O-RING	1
15	412-006	STEEL BALL, 1/2 DIA	1
16	55925-912	O-RING	1
17	PF55442	VALVE BODY	1
18	371-017	ROLL PIN, 3/32 DIA x 7/8 LG	1
19	355-035	LOCKNUT, 10-32	1

Parts List – PF2-70PK Repair Parts Kit

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

Part Number	Description	Qty
TF-1039-38-84.0	HOSE ASSEMBLY	1
481-038	FILTER ELEMENT	1
55925-115	O-RING	1
55925-024	O-RING	1
55925-110	O-RING	1
PF53406	SPRING	1
341-028	SOCKET HEAD SHOULDER SCREW, 3/16 DIA x 1/2 LG, 8-32	1
341-029	SOCKET HEAD SHOULDER SCREW, 1/4 DIA x 1 1/4 LG, 10-32	1
355-034	LOCKNUT, 8-32	1
355-035	LOCKNUT, 10-32	1
352-011	HEX JAM NUT, 1/4-28	1
412-006	STEEL BALL, 1/2 DIA	1
371-017	ROLL PIN, 3/32 DIA x 7/8 LG	1
483-013	DESICCANT DRYER	1
483-016	GASKET	1
PF55672	GASKET	1
55925-025	O-RING	1
55925-912	O-RING	3
55925-916	O-RING	1



APPENDIX I

Safety Data Sheet (SDS)

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Version: 1.5

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Hazard pictograms



Hazard statements

: H304 May be fatal if swallowed and enters airways.
H332 Harmful if inhaled.

Other hazards

None

Precautionary statements

: **Prevention:**
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P271 Use only outdoors or in a well-ventilated area.
Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P331 Do NOT induce vomiting.
Storage:
P405 Store locked up.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Carcinogenicity:

IARC

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous components

Chemical name	CAS-No.	Concentration (%)
Dec-1-ene, dimers, hydrogenated	68649-11-6	>= 90 - <= 100 %
2,2',6,6'-tetra-tert-butyl-4,4'-methylenediphenol	118-82-1	>= 1 - < 5 %



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SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name: ROYCO 602 MIL-PRF-87252C
HYDROLYTICALLY STABLE COOLANT & DIELECTRIC LUBRICATING FLUID

Product Use Description: Lubricant

Company: Manufacturer
Anderol Specialty Lubricants, a division of Lanxess Solutions US Inc.
215 Merry Lane
East Hanover, NJ
07936
United States of America (USA)
Telephone: +1 203-573-4596, Toll Free: +1 888-263-3765

Emergency telephone number: CHEMTREC: (24 hours) 800-424-9300
:
For additional emergency telephone numbers see section 16 of the Safety Data Sheet.

Prepared by Product Safety Department
(US) +1 866-430-2775
MSDSRequest@chemtura.com

Recommended use of the chemical and restrictions on use

Recommended use : Lubricant

SECTION 2. HAZARDS IDENTIFICATION

Form	liquid
Colour	clear to white
Odour	odourless

GHS Classification

Acute toxicity (Inhalation) : Category 4
Aspiration hazard : Category 1

GHS label elements

Signal word : **Danger**



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SECTION 4. FIRST AID MEASURES

- | | |
|---|---|
| If inhaled | : If inhaled
Move to fresh air.
If not breathing, give artificial respiration.
If breathing is difficult, give oxygen.
In case of bluish discoloration (lips, ear lobes, fingernails),
give oxygen as quickly as possible.
If symptoms persist, call a physician. |
| In case of skin contact | : In case of skin contact
Wash off with soap and water.
Remove contaminated clothing and shoes.
Wash contaminated clothing before re-use.
Get medical attention if irritation develops and persists. |
| In case of eye contact | : In case of eye contact
Rinse thoroughly with plenty of water, also under the eyelids.
If eye irritation persists, consult a specialist. |
| If swallowed | : If swallowed, DO NOT induce vomiting.
Consult a physician if necessary. |
| Most important symptoms
and effects, both acute and
delayed | : Aspiration may cause pulmonary oedema and pneumonitis. |
| Notes to physician | : For specialist advice physicians should contact the Poisons
Information Service. |

SECTION 5. FIREFIGHTING MEASURES

- | | |
|---|--|
| Suitable extinguishing media | : Carbon dioxide (CO2)
Dry powder
Dry sand
Alcohol-resistant foam
Water mist |
| Unsuitable extinguishing
media | : High volume water jet |
| Specific hazards during
firefighting | : Burning produces noxious and toxic fumes. |
| Specific extinguishing
methods | : In the event of fire, cool tanks with water spray. |
| Special protective equipment | : In the event of fire, wear self-contained breathing apparatus. |



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for firefighters

Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions,
protective equipment and
emergency procedures

: Use personal protective equipment.
Ensure adequate ventilation.

Environmental precautions

: Should not be released into the environment.
Do not contaminate water.
Do not flush into surface water or sanitary sewer system.

Methods and materials for
containment and cleaning up

: Contain spillage, soak up with non-combustible absorbent
material, (e.g. sand, earth, diatomaceous earth, vermiculite)
and transfer to a container for disposal according to local /
national regulations (see section 13).

SECTION 7. HANDLING AND STORAGE

Advice on safe handling

: Keep container closed when not in use.
Do not use pressure to empty drums.
Ensure all equipment is electrically grounded before beginning
transfer operations.

Conditions for safe storage

: Keep container tightly closed in a dry and well-ventilated
place.

Materials to avoid

: Strong acids and strong bases, Strong oxidizing agents

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Engineering measures

: Effective exhaust ventilation system
Ensure that eyewash stations and safety showers are close to
the workstation location.

Personal protective equipment

Respiratory protection

: Breathing apparatus needed only when aerosol or mist is
formed.
In the case of vapour formation use a respirator with an
approved filter.

Hand protection



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Remarks	: Neoprene gloves
Eye protection	: Safety glasses with side-shields Tightly fitting safety goggles
Skin and body protection	: Impervious clothing
Hygiene measures	: Avoid contact with skin, eyes and clothing. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Color	: clear to white
Odor	: odourless
Odour Threshold	: No data available
pH	: No data available
Melting point/range	: Not applicable
Boiling point/boiling range	: No data available
Evaporation rate	: No data available
Flash point	: 158 °C Method: open cup
Upper explosion limit	: No data available
Lower explosion limit	: No data available
Vapour pressure	: No data available
Relative vapour density	: No data available
Relative density	: 0.8
<u>Solubility(ies)</u>	
Water solubility	: slightly soluble
Solubility in other solvents	: No data available
Partition coefficient: n-octanol/water	: No data available
Auto-ignition temperature	: No data available
Viscosity	



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Viscosity, kinematic : 5.18 mm²/s (40 °C)

SECTION 10. STABILITY AND REACTIVITY

Reactivity : No dangerous reaction known under conditions of normal use.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : Hazardous polymerisation does not occur.

Conditions to avoid : Contamination
Heat, flames and sparks.

Incompatible materials : Strong acids and strong bases
Strong oxidizing agents

Hazardous decomposition products : Carbon oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute inhalation toxicity : Remarks: No data available

Acute toxicity estimate: 11.11 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: Calculation method

Components:

Dec-1-ene, dimers, hydrogenated:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): 3.8 mg/l
Test atmosphere: vapour

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg

2,2',6,6'-tetra-tert-butyl-4,4'-methylenediphenol:

Acute oral toxicity : LD50 (Rat, male and female): > 5,000 mg/kg
Method: OECD Test Guideline 401



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GLP: yes

Acute dermal toxicity : LD50 (Rabbit, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
GLP: yes

Skin corrosion/irritation

Components:

Dec-1-ene, dimers, hydrogenated:

Species: Rabbit

Result: No skin irritation

Serious eye damage/eye irritation

Components:

Dec-1-ene, dimers, hydrogenated:

Species: Rabbit

Result: No eye irritation

Carcinogenicity

IARC

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Aspiration toxicity

Product:

May be fatal if swallowed and enters airways.

Components:

Dec-1-ene, dimers, hydrogenated:

May be harmful if swallowed and enters airways.

Further information

Product:

Remarks: There is no data available for this product.



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SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Toxicity to fish (Product) : Remarks:
No data available

Toxicity to daphnia and other aquatic invertebrates (Product) : Remarks:
No data available

Toxicity to algae (Product) : Remarks:
No data available

Elimination information (persistence and degradability)

Bioaccumulation (Product) : Remarks:
No data available

Mobility (Product) : Remarks:
No data available

Biodegradability (Product) : Remarks:
No data available

Ecotoxicology Assessment

Results of PBT assessment (Product)

This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

Additional ecological information (Product) : There is no data available for this product.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : In accordance with local and national regulations.

Contaminated packaging : Do not burn, or use a cutting torch on, the empty drum.

SECTION 14. TRANSPORT INFORMATION



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International Regulations

UNRTDG

Not regulated as a dangerous good

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

49 CFR

Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA304 Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Acute Health Hazard

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.



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Please note that Section 3 of this document lists only the hazardous components required by the specific country or region hazard communication regulations. The chemical identifiers listed in Section 3 are used globally for hazard communication purposes and may not reflect those used for chemical inventory coverage in a particular country or region. The chemical inventory information given in Section 15 of this document applies to the product as a whole and should be used when evaluating inventory compliance.

The components of this product are reported in the following inventories:

DSL	All components of this product are on the Canadian DSL
AICS	On the inventory, or in compliance with the inventory
NZIoC	On the inventory, or in compliance with the inventory
ENCS	On the inventory, or in compliance with the inventory
KECI	On the inventory, or in compliance with the inventory
PICCS	On the inventory, or in compliance with the inventory
IECSC	On the inventory, or in compliance with the inventory
TCSI	On the inventory, or in compliance with the inventory
US.TSCA	On TSCA Inventory

SECTION 16. OTHER INFORMATION

Further information

Other Emergency Phone Number

<u>Latin America:</u>	Brazil	+55 113 711 9144
	All other countries	+44 (0) 1235 239 670
<u>Mexico:</u>		+52 555 004 8763

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.