

SAFETY PRECAUTIONS

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SAFETY PRECAUTIONS AVOID INJURY

Safeguards are designed into this application equipment to protect operators and maintenance personnel from most hazards during equipment operation. However, certain safety precautions must be taken by the operator and repair personnel to avoid personal injury, as well as damage to the equipment. For best results, application equipment must be operated in a dry, dust-free environment. Do not operate equipment in a gaseous or hazardous environment.

- Carefully observe the following safety precautions before and during operation of the equipment:
- ALWAYS wear appropriate ear protection.
- ALWAYS wear approved eye protection when operating powered equipment.
- ALWAYS keep guard(s) in place during normal operation.
- ALWAYS insert power plug into a properly grounded receptacle to avoid electrical shock.
- ALWAYS turn off the main power switch and disconnect electrical cord from the power source when performing maintenance on the equipment.
- NEVER wear loose clothing or jewelry that may catch in moving parts of the application equipment.
- NEVER insert hands into installed application equipment.
- NEVER alter, modify, or misuse the application equipment.

TOOLING ASSISTANCE CENTER

CALL TOLL FREE 1-800-722-1111 (CONTINENTAL UNITED STATES AND PUERTO RICO ONLY)

The **Tooling Assistance Center** offers a means of providing technical assistance when required.

In addition, Field Service Specialists are available to provide assistance in the adjustment or repair of the application equipment when problems arise which your maintenance personnel are unable to correct.

INFORMATION REQUIRED WHEN CONTACTING THE TOOLING ASSISTANCE CENTER

When calling the Tooling Assistance Center regarding service to equipment, it is suggested that a person familiar with the device be present with a copy of the manual (and drawings) to receive instructions. Many difficulties can be avoided in this manner.

When calling the Tooling Assistance Center, be ready with the following information:

1. Customer name
2. Customer address
3. Person to contact (name, title, telephone number, and extension)
4. Person calling
5. Equipment number (and serial number if applicable)
6. Product part number (and serial number if applicable)
7. Urgency of request
8. Nature of problem
9. Description of inoperative component(s)
10. Additional information/comments that may be helpful

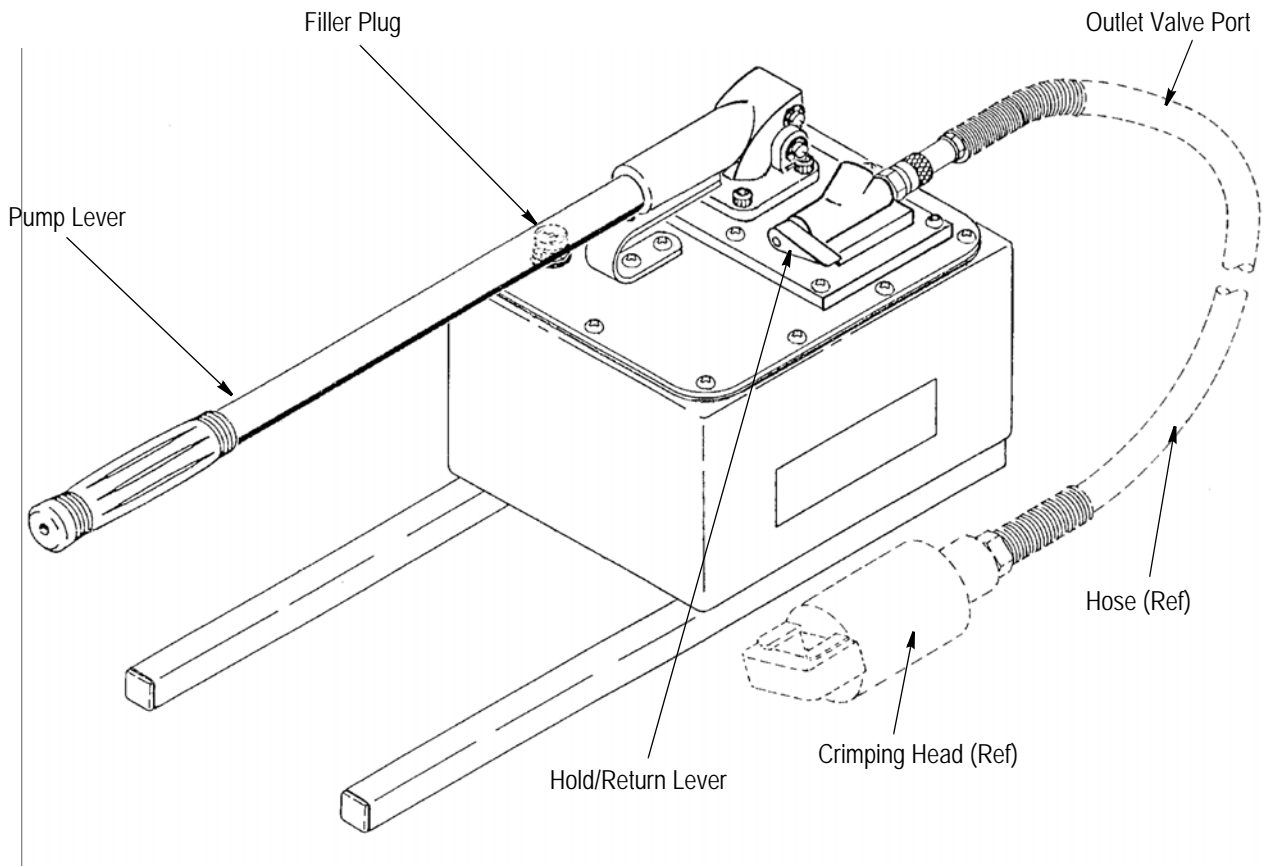


Figure 1

1. INTRODUCTION

Hydraulic Hand Pump 314979-1 combines the convenience of a hand tool with the power of a bench machine. It is used primarily for low-volume production or at locations where electrical power sources are not readily available. See Figure 1.

Heads and dies are available for use in this unit to crimp terminals and splices, in wire size ranges from No. 8 AWG to 1000 MCM. It should be noted that the crimping of terminals and splices in the 600 MCM to 1000 MCM range will require additional operator effort.

The hand pump can be used as a portable crimping unit. This type of operation provides a large working radius and accessibility to confined areas.

A complete line of precision-engineered heads and matched die sets is available from TE. Hose assemblies, in four different lengths, are also sold separately. See Figure 8 for accessory part numbers.

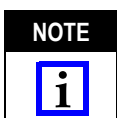
When reading this manual, pay particular attention to DANGER, CAUTION, NOTE statements.



Denotes an imminent hazard which may result in moderate or severe injury.



Denotes a condition which may result in product or equipment damage.



Highlights special or important information.



All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of ± 0.13 [.005] and angles have a tolerance of $\pm 2^\circ$. Figures and illustrations are for identification only and are not drawn to scale.

2. DESCRIPTION

2.1. Physical Description

The hydraulic hand pump features a two-speed hydraulic pumping unit. This unit will deliver 4.75 ml [.29 cu in.] per stroke at high pressure (up to 58608 kPa [8500 psi]), and 120.4 ml [7.35 cu in.] per stroke at 0 to 1379 kPa [200 psi] for fast ram advance and return. See Figure 2 for hand pump specifications.

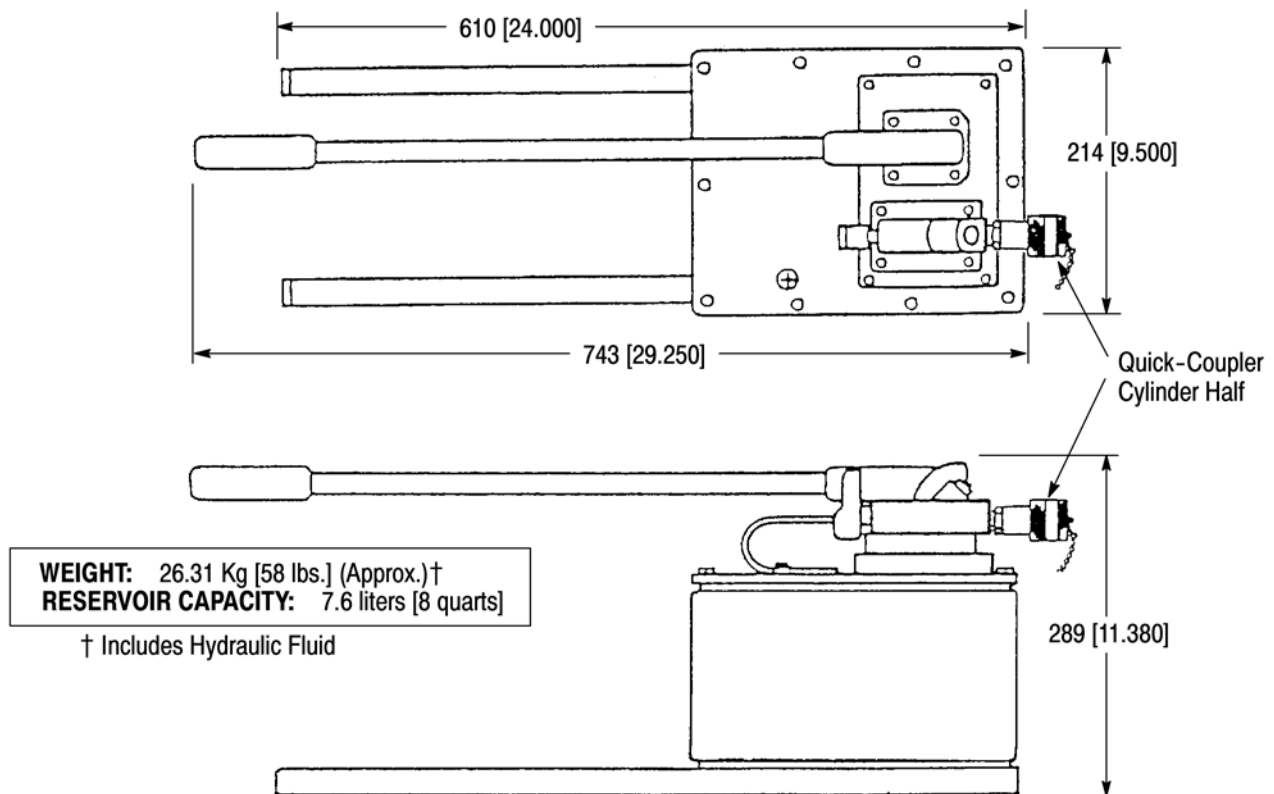


Figure 2

The pump is shipped with hydraulic fluid in the reservoir. Refer to Section 5, INSPECTION/ADJUSTMENTS AND MAINTENANCE, for refilling instructions. If additional fluid is required, it is essential that the proper grade of high-quality hydraulic fluid be used. Recommended hydraulic fluids and manufacturers of high-grade fluid for use in the hand pump are listed in Figure 3.



NEVER use brake fluid as a substitute for the recommended hydraulic fluid.

HYDRAULIC FLUID	MANUFACTURER
COSMOLUBRIC † No. 1500	E.F. Houghton & Co.
CLAVUS‡ 27	Shell Oil Co.
Duro 160	Sinclair Refining Co.
HAVOLINE▲ 10	Texaco Inc.
GARGOYLE ARCTIC C◆	Mobile Oil Co.

† COSMOLUBRIC is a trademark of E.F. Houghton & Co.

‡ CLAVUS is a trademark of Shell Oil Co.

▲ HAVOLINE is a trademark of Texaco Inc.

◆ GARGOYLE ARCTIC C is a trademark of Mobil Oil Co.

Figure 3

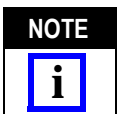
2.2. Functional Description (Figure 4)

On the intake stroke (up-stroke) of two-section piston (H and L), hydraulic fluid is drawn from the reservoir (K) and into intake line (A). See Detail A of Figure 4. The fluid flows past low-pressure intake poppet (B) into the low-pressure chamber, and it flows past high-pressure intake poppet (F) into the high-pressure chamber.

On the pressure stroke (down-stroke) of two-section piston (H and L), hydraulic fluid in the low-pressure chamber is directed through spool (C), past outlet poppet (D), and through outlet valve (J) to the crimping head. See Detail B of Figure 4. Simultaneously, the hydraulic fluid in the high-pressure chamber is directed through high-pressure outlet poppet (G), past outlet poppet (D), and through outlet valve (J) to the crimping head. This action causes the moving die to close, holding the terminal or splice in crimping position.

When approximately 1379 kPa [200 psi] is developed (see Detail C of Figure 5), hydraulic fluid from the high-pressure chamber will cause outlet poppet (D) to shift spool (C), allowing low-pressure hydraulic fluid to be discharged into reservoir (K). High-pressure hydraulic fluid continues to flow through high-pressure outlet poppet (G), past outlet poppet (D) and outlet valve (J), and into the crimping head, completing the crimp.

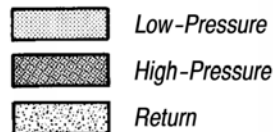
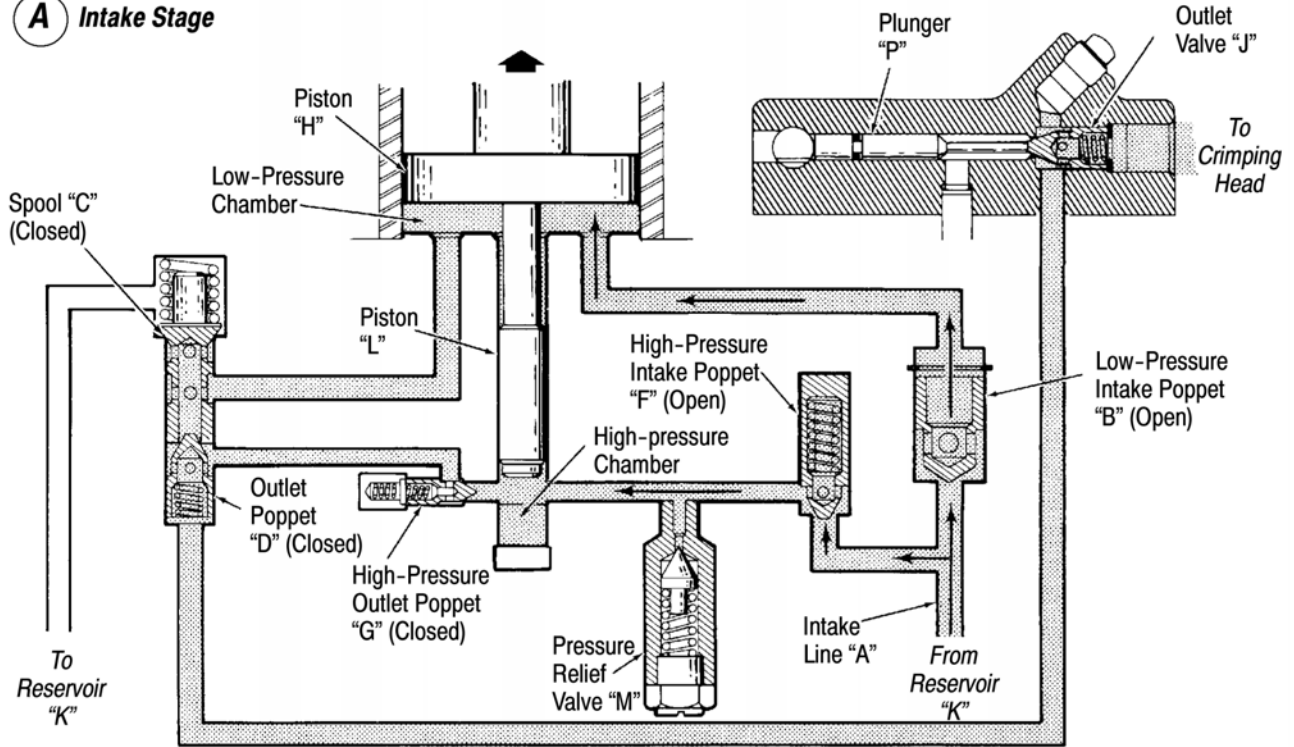
The high-pressure system has a pressure relief valve (M) which is set at the factory to release at between 55160 and 57918 kPa [8000 and 8400 psi]. If the pressure buildup in the high-pressure system exceeds this setting, pressure relief valve (M) will open, causing the hydraulic fluid to be discharged into reservoir (K).



DO NOT alter the setting of the pressure relief valve.

Turning the hold/return lever to the return position advances plunger (P) which opens poppet (X). See Detail D of Figure 5. When poppet (X) opens, hydraulic fluid returns from the crimping head to reservoir (K), for as long as the lever is in the return position.

A Intake Stage



B Low-Pressure Stage

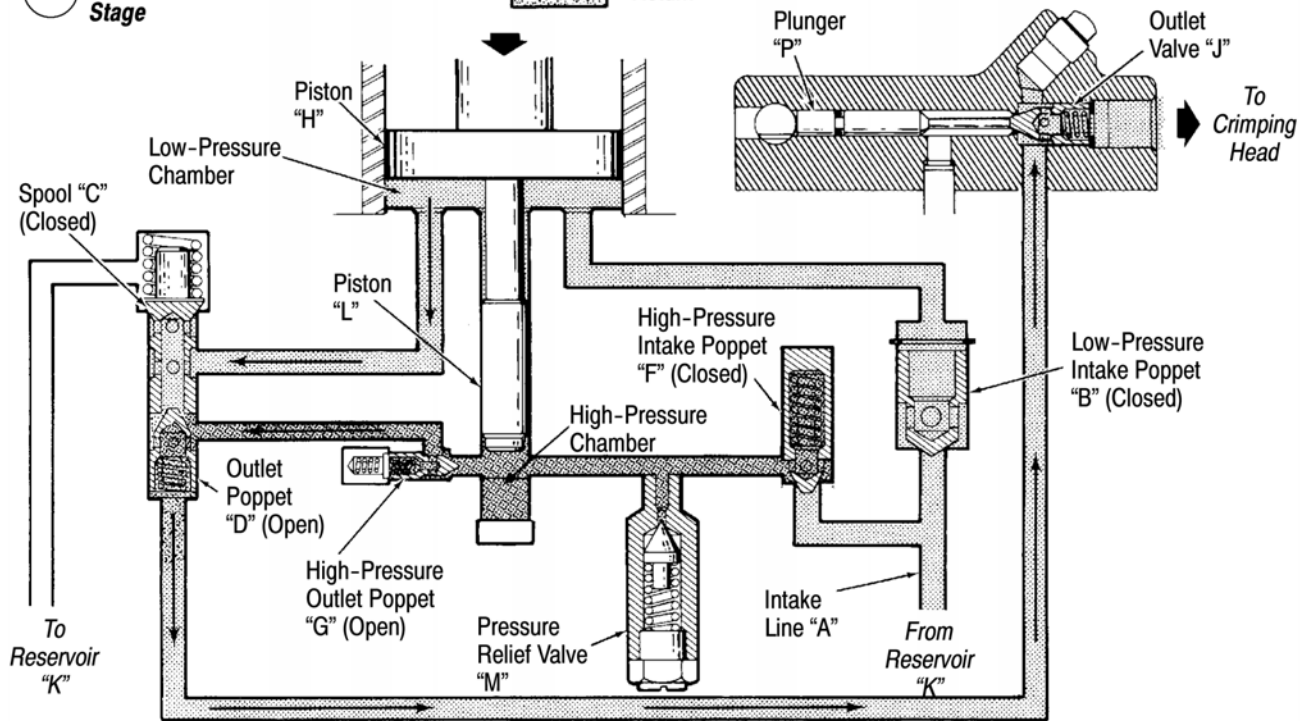
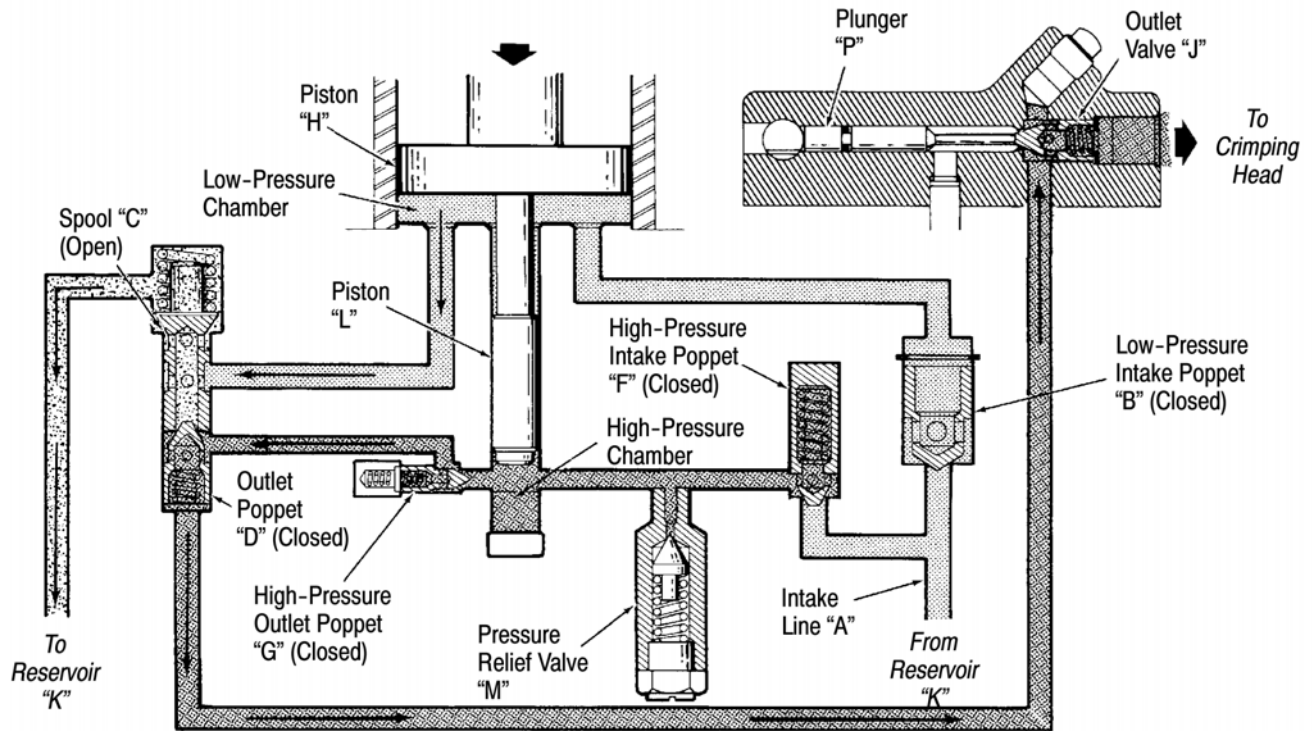


Figure 4

C High-Pressure Stage



D Pressure Release Stage

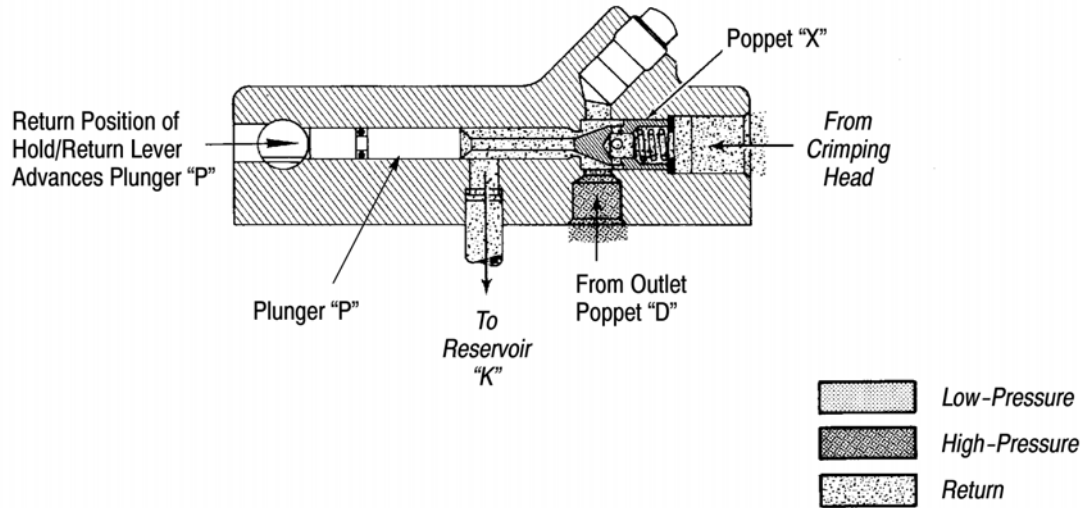


Figure 5

3. OPERATION



NEVER operate hand pump without having hose and crimping head attached. Refer to Figure 6.

3.1. Preparation

1. Check level of hydraulic fluid in reservoir, and add fluid if required. Refer to Paragraph 5.2.
2. Protective caps are put on crimping heads and hose fittings to prevent dirt from entering the hydraulic system. Ensure that caps are placed on head and hose fittings when they are disassembled.



Never store hand pump without having head or protective cap attached to the hose fittings.

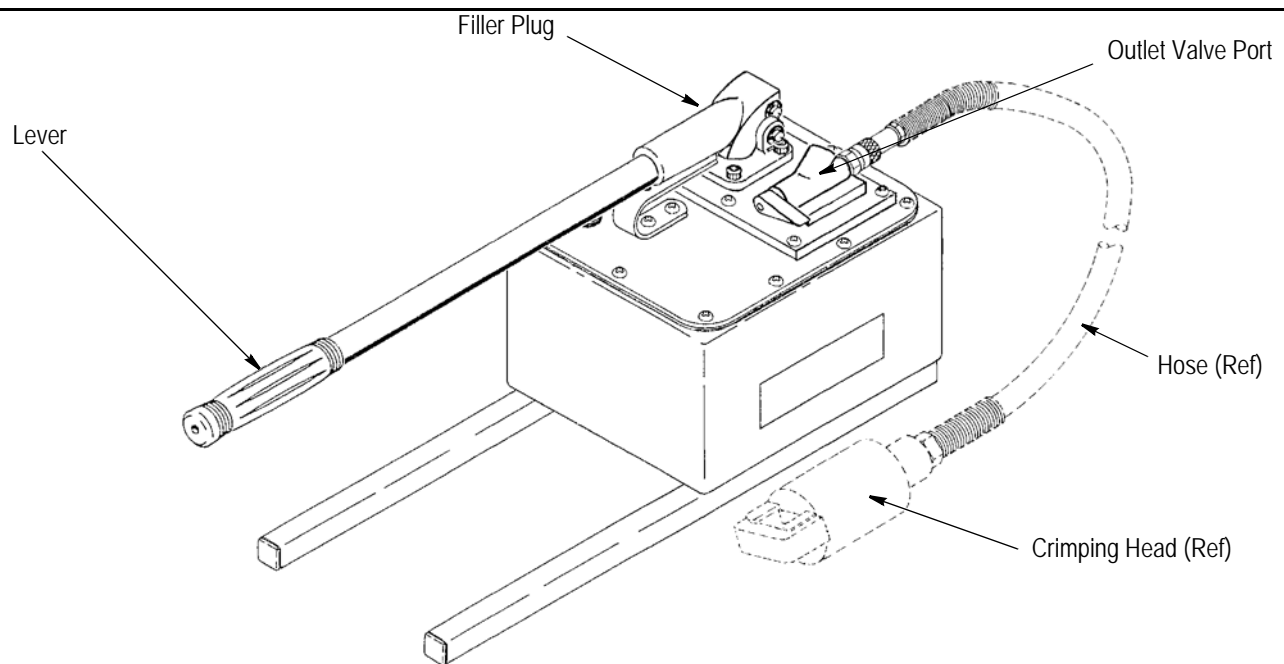


Figure 6

3.2. Attaching Crimping Head to Hose and Hose to Hand Pump



Always have lever in the return position when connecting or removing hose couplings or crimping heads.

A. To attach the crimping head, proceed as follows:

1. Thoroughly clean coupling area of hose assembly and crimping head.
2. Remove protective caps.
3. Mate coupling halves and tighten collar (refer to Figure 7).

B. To attach hand pump to hose, proceed as follows:



Make sure that the lever is in the return position while connecting coupling halves.

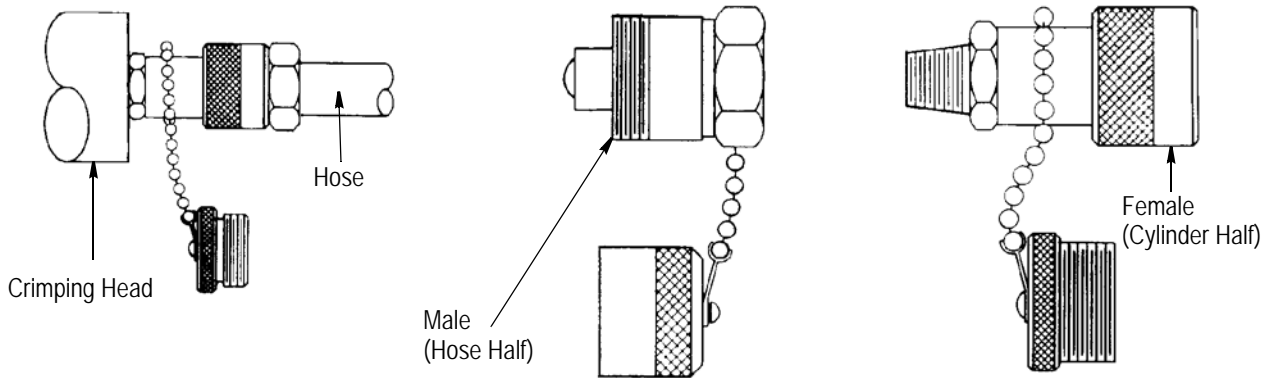
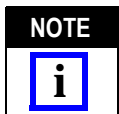


Figure 7

1. Thoroughly clean coupling area of hose assembly and hand pump.
2. Remove protective caps.
3. Mate coupling halves and tighten collar (refer to Figure 7).
4. After the hose has been attached to head and pump, bleed all air from the hydraulic system. Refer to Paragraph 5.3.

3.3. Insertion of Crimping Dies

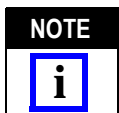
The instruction materials packaged with the dies give detailed instructions for die insertion, die adjustments, and die removal when the dies are used with crimping heads as listed. Insert required crimping dies as instructed.



All listed die numbers are for complete die sets except for those identified as nests or indenters for SOLISTRAND connectors. The interchangeability of nests and indenters for SOLISTRAND connectors requires that these dies be identified separately.*

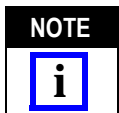
3.4. Operating Procedure

1. Be certain that crimping dies are properly installed in head. Refer to instruction material packaged with crimping dies for die insertion instructions.
2. Place terminal or splice in crimping dies. Refer to instruction material packaged with crimping dies for exact terminal or splice location in dies.



BE SURE latch pin has been fully inserted before operating pump.

3. Pump lever to activate unit. Continue pumping lever until ram moves up and holds terminal or splice firmly in place. A sudden decrease in effort required to push lever down will be observed during the initial buildup of pressure.
4. Insert stripped wire into terminal or splice.
5. Continue pumping until pressure relief valve is activated. A slight decrease in effort required to push lever down indicates that maximum required crimping pressure has been reached and that crimp is now complete.
6. Move the lever to the return position, and hold the lever in this position. Ram in crimping head will return to DOWN position, and crimped terminal or splice can be removed.
7. To make additional crimps, repeat Steps 2 through 6 as required.



Hold lever in the return position long enough to allow ram to move down just enough to remove crimped terminal or splice. Return the lever to the hold position for the next cycle.



DO NOT allow hand pump to remain under pressure for extended periods of time.

4. ACCESSORIES

4.1. Crimping Heads

The hand pump uses interchangeable crimping heads. Each crimping head uses interchangeable crimping dies (with the exception of crimping head 69069, which has integral dies designed for that particular head). The products to be crimped in each head are listed in the instructions covering the head.

4.2. Crimping Dies

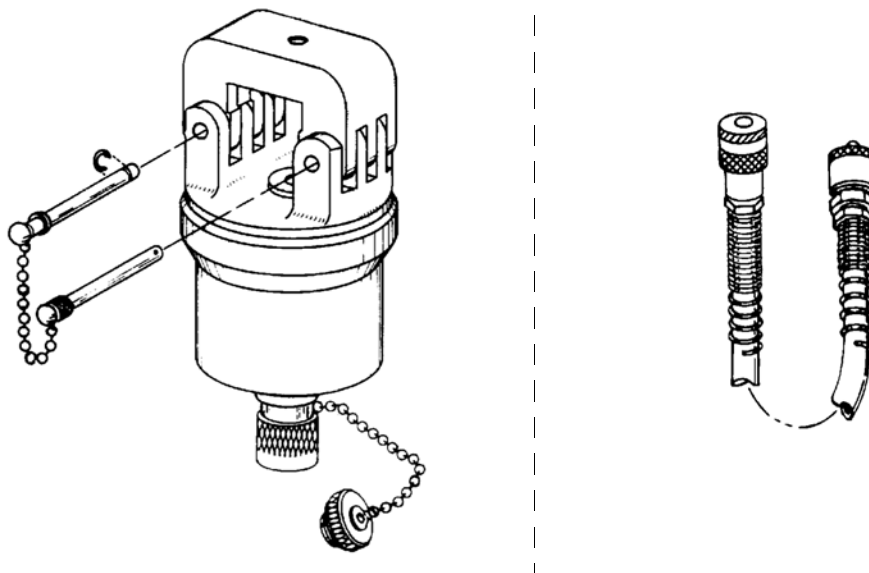
Each crimping head, except as noted in the preceding paragraph, uses interchangeable crimping dies designed for that particular head. The instructions packaged with the dies give complete information.

4.3. Latch Pin Kit

Latch pin kits are available as accessories for the crimping heads as listed and shown in Figure 8. This kit was designed to eliminate the possibility of misplacing the standard latch pin furnished with the head.

4.4. Hose Assemblies

Hoses are sold separately as accessories and are available in different lengths, which are listed with the part numbers in Figure 8.



HEAD NUMBER	LATCH PIN KIT NUMBER	HOSE aSEMBLY NUMBER	
		PART NUMBER	LENGTH m [Ft.]
69051	69709	59909-3	.914 [3]
69065	69709-2	59909-7	2.134 [7]
69066	69709-3	1-59909-5	14.572 [5]
69067	69709-4	2-59909-1	6.401 [21]

Figure 8

5. INSPECTION/ADJUSTMENTS AND MAINTENANCE



Before performing any maintenance, **MAKE SURE** that the hold/return lever is in the return position.

5.1. Troubleshooting

The hand pump is thoroughly tested before it leaves the factory, and it should be in excellent operating condition when it reaches the user. However, damage may occur during shipment. While unpacking the hand pump, carefully inspect it for damage. If damage is evident, file a claim against the carrier and notify Tyco Electronics, Harrisburg, PA.

If, at any time, the pump does not function properly, the troubleshooting chart (Figure 9) and the rest of the material in Section 5 should be used to locate and correct the trouble. (Refer to Figure 14 for parts identification.)

If the problem cannot be corrected with the aid of the troubleshooting chart, contact your local Field Service Specialist or Tyco Electronics, Harrisburg, PA 17105.

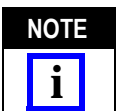
SYMPTOM	CAUSE	REMEDY
1.Hand pump does not develop pressure.	Low hydraulic fluid level.	Fill reservoir. Refer to Paragraph 5.2.
	Loose pump body fittings	Tighten pump body fittings. Refer to Paragraph 5.6.
	Improper seating of poppets.	Correct poppet seating. Refer to Paragraph 5.7.
2.Hand pump does not develop high pressure	High-pressure poppets or spool not seating properly.	Correct poppet seating. Refer to Paragraph 5.7.
3.Hand pump does not develop full crimping pressure.	Pressure relief valve not functioning properly.	Check pressure relief valve. Refer to Paragraph 5.4. Replace if necessary.
4.Slow die return.	Dirt or foreign matter in hydraulic system	Replace damaged filter. Refer to Paragraph 5.5.
	Dirt or foreign matter in spool or poppets.	Check poppets. Refer to Paragraph 5.7.
	Weak piston return spring in..	Remove crimping head and refer to separate instruction sheet for the crimping head.
5.Pump does not draw fluid from reservoir.	Low hydraulic fluid level.	Fill reservoir. Refer to Paragraph 5.2..
6.Handle feels "spongy" when pumped.	Air in hydraulic system.	Bleed air from hydraulic system. Refer to Paragraph 5.3.

Figure 9

5.2. Filling the Reservoir

To check fluid level:

1. Use a clean cloth to remove all dust and grit from area around filler plug. See Figure 6.
2. Remove filler plug, and check fluid level by measuring depth with a clean rod or screwdriver. Fluid level should be approximately 25.4 [1.000] to 38.1 [1.500] from top of filler hole.



Minimum fluid level to provide proper operation is approximately 38.1 [1.500] from bottom of reservoir.

3. If fluid level is satisfactory, replace filler cap. If fluid level is too low, add fluid.



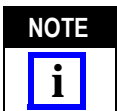
NEVER use brake fluid as a substitute for the recommended hydraulic fluid.

To add fluid:

1. Use a clean cloth to remove all dust and grit from area around filler plug. See Figure 6.
2. Remove filler plug, and insert a clean funnel, with filter, into filler hole.
3. Fill reservoir with recommended hydraulic fluid. See Figure 3.
4. Replace cap and be certain that breather hole in cap is open.

5.3. Bleeding Air from the Hydraulic System

If air gets into the hydraulic system (indicated by a "spongy" action of the handle when it is pumped), the air should be removed as follows:



Hand pump should always be elevated above crimping head when bleeding air from hydraulic system.

1. Make sure that the hold/return lever is in the return position.
2. Pump the lever several times to fill hydraulic pump.
3. Move the lever to the hold position.
4. Pump the lever until ram (moving die holder) advances.
5. Position the lever to remove air from the hydraulic system.
6. Repeat Steps 4 and 5 about three times to ensure that all air is removed from hydraulic system.
7. Check hydraulic fluid supply after bleeding the system. Fill if necessary, according to Paragraph 5.2. Hand pump is now ready for use.

5.4. Pressure Relief Valve Check



This procedure should be performed with crimping head and hose attached.

The pressure relief valve is preset at the factory to open at 55160 to 57918 kPa [8000 to 8400 psi]. This valve should be checked periodically, depending on use. Proceed as follows:

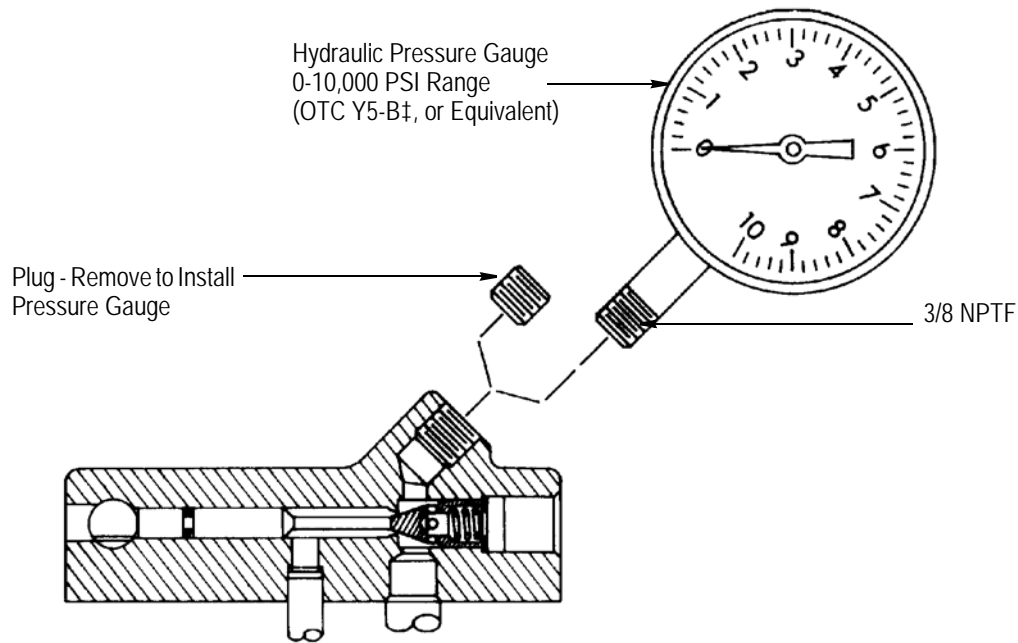


Make sure that the hold/return lever is in the return position.

1. Remove pipe plug and install gage. See Figure 10.
2. Pump lever until the bypass is activated. A slight decrease in effort required to move the lever indicates that maximum required crimping pressure has been reached.
3. Take pressure reading to ensure that pressure is within acceptable range.
4. Position lever to release all hydraulic pressure from pump.
5. Remove gage and replace pipe plug.



NEVER alter the setting of the pressure relief valve. If the valve does not open at the required pressure, it should be replaced.



† MANUFACTURED BY OWATONNA TOOL CO., OWATONNA, MINNESOTA 55060

Figure 10

5.5. Filter Screen Maintenance

All hydraulic fluid entering the hydraulic system must pass through the filter screen. The filter screen prevents dirt and any other foreign matter in the reservoir from entering the hydraulic system.

The hand pump should never be operated with a dirty filter screen, a damaged filter, or without a filter screen. The reservoir and filter screen should be cleaned periodically, and the hydraulic fluid replaced, to ensure operating efficiency. New filter screens can be obtained from TE. (Refer to Section 6, REPLACEMENT PARTS.)

If the hand pump does not operate at a consistent speed, the problem may be caused by a dirty or damaged filter screen.

A. Cleaning Filter Screen

To clean the filter screen:

- 1) Refer to Figure 11. Remove six pump assembly screws, holding reservoir cover to reservoir, and carefully lift pump assembly from reservoir.

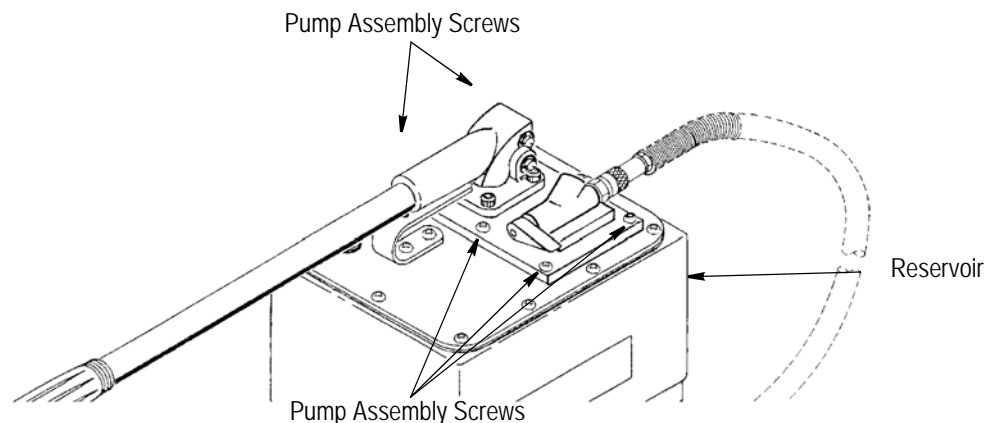


Figure 11

- 2) Refer to Figure 12, and remove the retaining ring, band, and filter screen.
- 3) Clean the filter screen in an appropriate solvent.
- 4) Replace the filter screen, band, and retaining ring.
- 5) Carefully lower the pump assembly into the reservoir.



Care MUST BE taken to prevent damage to the filter screen. DO NOT operate the hand pump with a damaged filter screen or without a filter screen.

- 6) Insert and tighten pump assembly holding screws.

B. Replacing Filter Screen

To replace the filter:

- 1) Remove pump assembly from reservoir as described in Steps 1 through 3 of Paragraph 5.5, A.
- 2) Refer to Figure 12, and remove the retaining ring, band, and filter screen.
- 3) Install a new filter screen and replace the band and retaining ring.
- 4) Re-assemble the pump assembly.

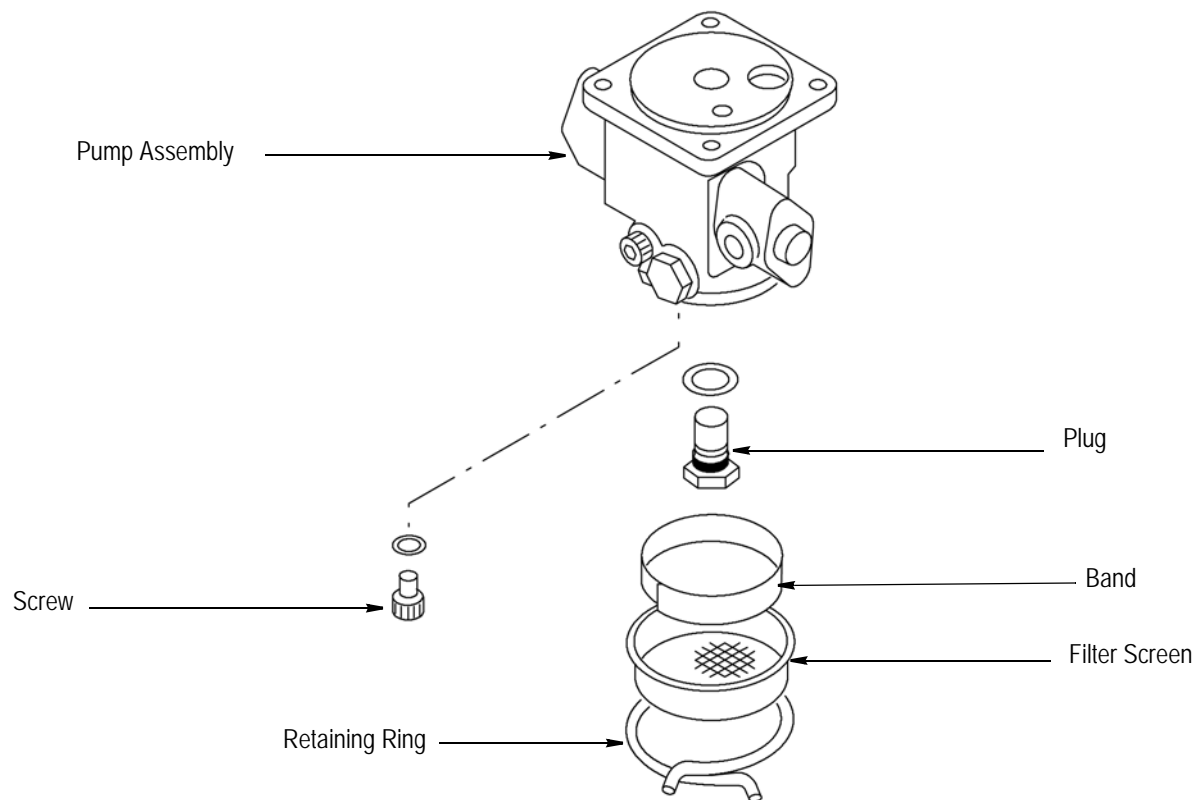


Figure 12

5.6. Pump Maintenance (Refer to Figure 14)

If the hand pump does not develop pressure, the trouble may be caused by loose pump body fittings. To tighten these fittings, proceed as follows:

1. Disconnect hydraulic hose from hand pump.

2. Refer to Figure 11. Remove the six pump assembly screws, holding the reservoir cover to the reservoir, and carefully lift the pump assembly from the reservoir.

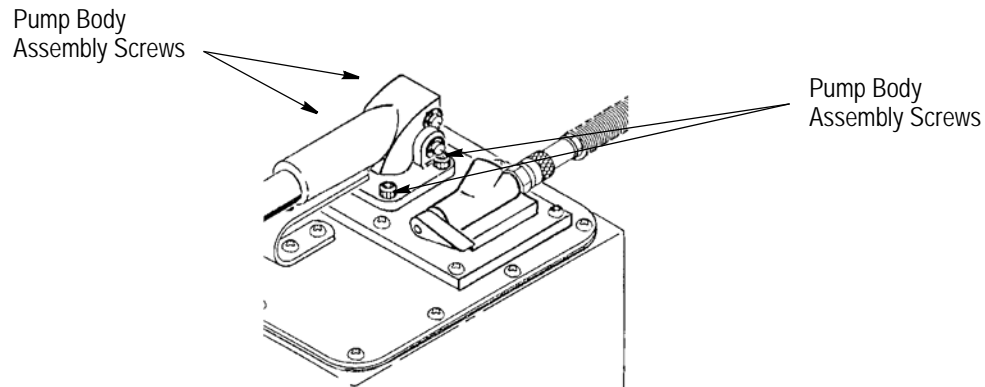


Figure 13

3. Tighten the four pump body assembly screws. Refer to Figure 13.
4. Refer to Figure 12. Remove the retaining ring, band, and filter screen, and then tighten screw and plug.
5. Replace the filter screen, band, and retaining ring.
6. Carefully insert the pump assembly into the reservoir; replace and tighten the six pump assembly screws.
7. Re-assemble return lever linkage (if lever was removed) and attach return spring.
8. Actuate hand pump to determine if pump will develop pressure. If hand pump does not function properly, return the pump to TE for repair. Contact your TE representative for assistance.

5.7. Poppet Maintenance (Refer to Figure 14)

If the hand pump does not develop pressure, and the hydraulic fluid level (Paragraph 5.2) is satisfactory, and all pump body fittings (Paragraph 5.6) are properly tightened, check the condition of poppets and poppet seats. Contact your TE representative for assistance.

6. REPLACEMENT PARTS

Figure 14 contains an exploded-view drawing of Hydraulic Hand Pump No. 314979-1, with references for items included in Repair Kit 314980-1. Refer to the parts list included with Repair Kit 314980-1 for part number and quantity information.

When ordering replaceable parts, be sure to specify the correct part number, description, and quantity required. Refer to Section 4 for accessory part numbers.

7. REVISION SUMMARY

Since the previous release of this manual:

- The logo was updated and the format was updated to the current corporate requirements; and
- A backup bushing in Figure 14 was referred to as a PTFE Backup Busing.

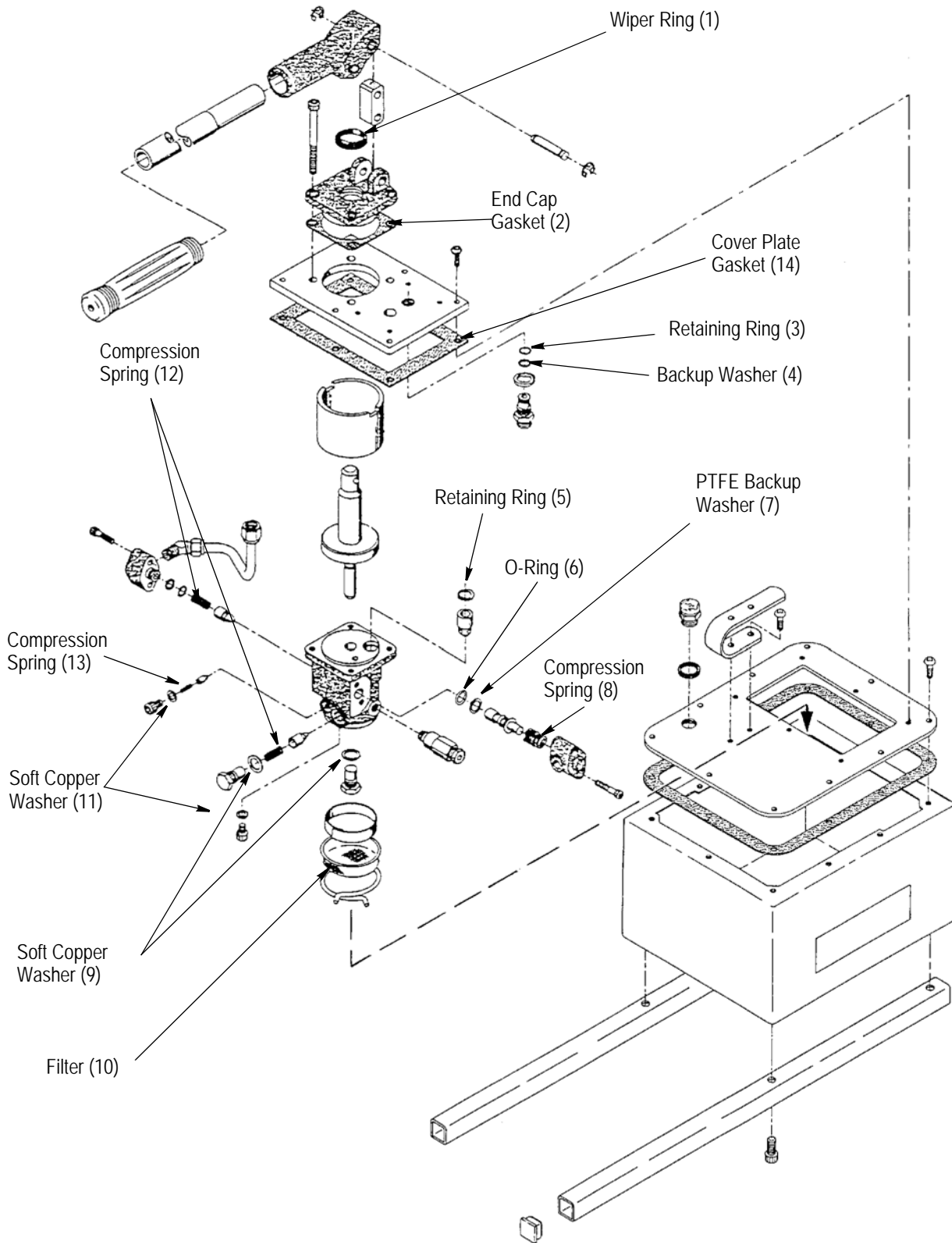


Figure 14