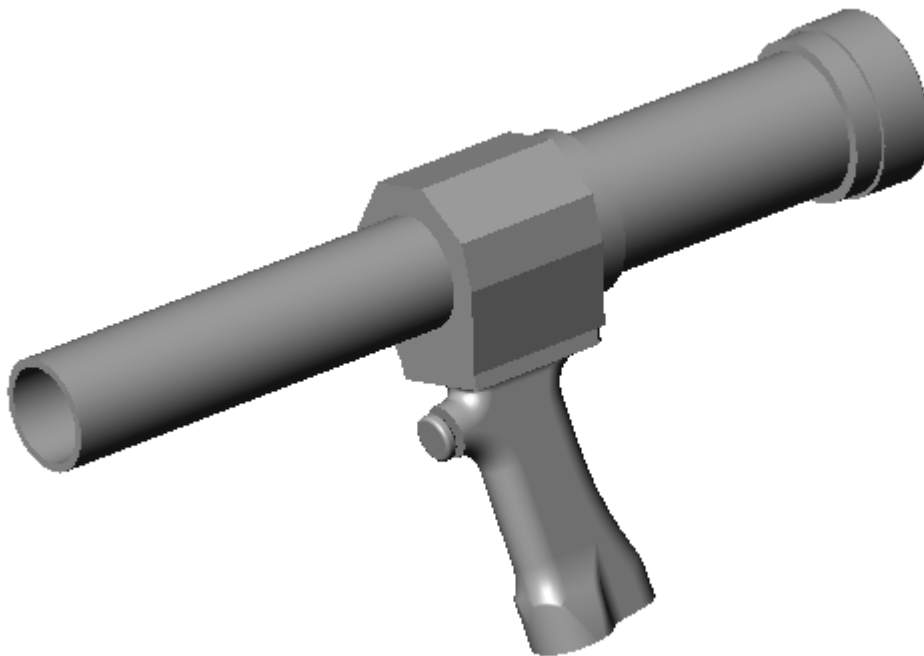

FTI OPERATIONS, MAINTENANCE AND REPAIR MANUAL

Medium Brute Puller Unit

FTI Part # 2720-007 ELN: 1204

Revised March 2007



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FTI's Cold ExpansionTM systems and processes are the subject matter of one or more of the following patents: 4,809,420; 4,885,829; 4,934,170; 5,083,363; 5,096,349; 5,103,548; 5,127,254; 5,129,253; 5,218,854; 5,245,743; 5,305,627; 5,341,559; 5,380,136; 5,405,228; 5,433,100; 5,468,104; 6,077,010; 6,183,180; 6,487,767; 6,792,657; 6,990,722; 7,024,908; 1,061,276; 513,898; 692015124; 581,385; 69310828; 468,598; 69105390; 643,231; 69414946; 696,686; 785,366; 1032769; and other patents pending. These systems and processes are tooling critical and must be performed in accordance with FTI's specifications or controlling documents. To ensure proper results from FTI's cold expansion systems and to be licensed to use FTI's patented processes, it is essential that FTI's complete integrated system of tooling be purchased and utilized. The use of tooling purchased from other than a licensed supplier could jeopardize fatigue life enhancement and may constitute patent infringement.

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ABOUT FATIGUE TECHNOLOGY INC.

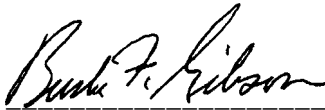
Fatigue Technology Inc. (FTI) has provided innovative solutions to fatigue problems in metal structures since 1969. Complete systems of tooling are used worldwide to enhance the fatigue life of holes in airframes, turbine engines, and other critical structures.

The FTI staff of professionals provides a full range of support services including:

- Application engineering
- Detailed project planning implementation and management
- On-site assistance, including training and tool room setup

Complete inventory allows FTI to respond quickly to customers' requirements.

Customer Technical Support is always available to assist with special fatigue life enhancement requirements. Please contact FTI with questions at any time.



Burke F. Gibson
CEO/Chairman of the Board

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SECTION 1: INTRODUCTION

This instruction manual contains information on the operation and maintenance of the Medium Brute (MB) Puller Unit. To obtain optimum performance and many years of trouble-free service, operate the puller unit properly, and carefully follow maintenance procedures.

Read this manual before operating the MB puller unit and retain the manual for future reference.

1.1 ABOUT THE MEDIUM BRUTE PULLER UNIT

The Medium Brute hydraulic puller unit is a powerful, moderately sized, lightweight tool specifically designed for use with FTI's patented Split Sleeve Cold Expansion process. The MB puller unit is designed to pull a mandrel through a hole with the pre-lubricated stainless steel split sleeves used in this process.

The MB pullers have a maximum pull force of 24,000 pounds ($1.1 \times 10^5 \text{N}$) at 10,000 psi (689.5 bar) pump pressure. The MB is available in sizes (models) capable of cold expanding holes up to 1 inch (25.4 mm) diameter and 7 inches (177.8 mm) deep in aluminum, and up to 7/8 inch (22.2 mm) diameter in steel and titanium. The Medium Brute is available in various models to accommodate multiple material stackups, including "-V" models with high-visibility hose markings.

The Medium Brute has a fail-safe air control system that causes the puller retraction cycle to be interrupted whenever the operator releases finger pressure on the trigger or in the event of air or hydraulic hose failure. All puller units operate in conjunction with either of FTI's PowerPak air-hydraulic power units, the standard FT-200 or portable FT-20 (and compatible with older units IW100MF and IW10MF). The MB has proven to be very reliable, and requires minimal maintenance.

1.2 GENERAL SPECIFICATIONS

Hydraulic Fluid Requirements	U.S. MIL-Spec #5606
Air Line Requirements	3/8 to 1/2 inch (9.5 to 12.7 mm) ID
Air Flow Requirements (via PowerPak)	45 cfm (1274.3 liter/minute)
Stackup Capacity (Grip)	Material up to 7 inches (177.8 mm)
Actuation	Pneumatic
Operation	Hydraulic
Compatible PowerPaks	FT-200 or FT-20
Fail-safe	Air logic safety circuit halts mandrel retraction when trigger is released
Replacement Seal Kit	Medium Brute Seal Kit (MB-SK)
Emission sound pressure level at the work station (according to EN ISO 11201:1995) on load	83.1 dB(A)
Weighted hand-arm vibration at the handle (according to EN 28662-1:1993) on load	<2.5 m.S ²

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1.3 GENERAL DESCRIPTION

- Air actuated, hydraulic puller is capable of cold expanding up to 15/16 inch (23.8 mm) diameter in aluminum and mild steel and up to 3/4 inch (19.1 mm) diameter in titanium and high-strength steel.
- Maximum pull force of 24,000 pounds (1.1×10^5 Newtons) at 10,000 psi (689.5 bar) of hydraulic pressure.
- Includes a 10-foot (3.0-m) hose assembly, spanner wrench, nosecap pin wrench and alternate 7/8-inch (22.2-mm) threaded adapter for larger mandrel sizes.
- Available in 16.7- to 24.0-inch (0.4- to 0.6-meter) overall lengths depending on model.
- Up to 7 inches (177.8 mm) material stack-up capacity.
- Hydraulic pressure provided by FT-200 or FT-20 PowerPak.

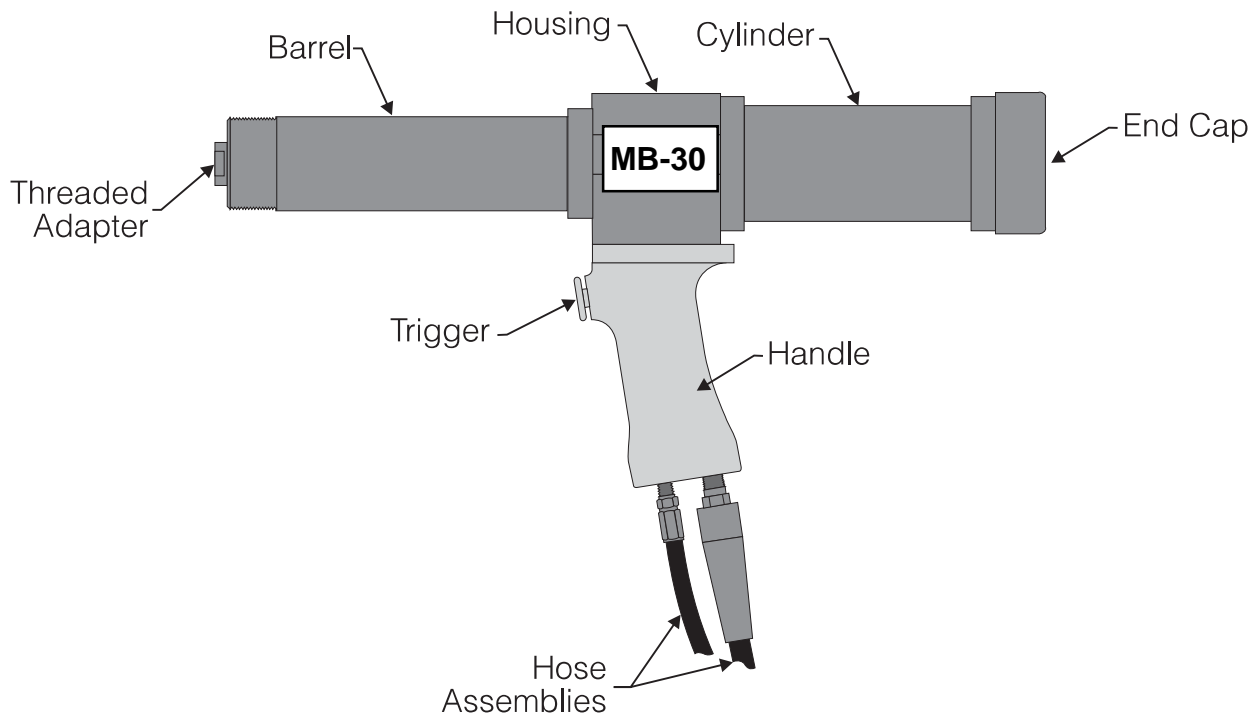


Figure 1.3-1
Medium Brute Parts

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**Table 1.3-1
Medium Brute Specifications**

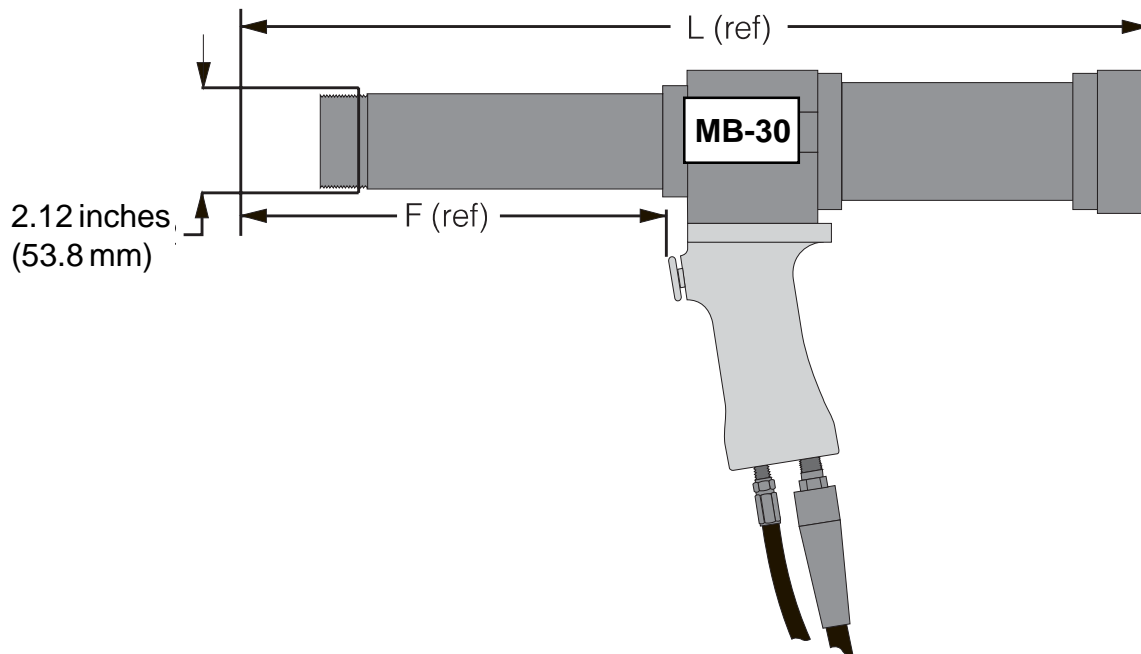
Model Number	Maximum Material Stackup	L (Ref Figure 2)	F (Ref Figure 2)	Weight	Stroke
MB-30	3.3 inches 83.8 mm	18.2 inches 462.3 mm	8.6 inches 218.4 mm	20 lb 9.1 kg	5.2 inches 132.1 mm
MB-70	7.0 inches 177.8 mm	25.5 inches 647.7 mm	11.6 inches 294.6 mm	24 lb 10.9 kg	8.9 inches 226.1 mm

Note: The **bold** model number is standard.

Nosecap Selection: The MB puller is compatible with both the standard nosecaps (Section 2, page 70*) or the extension nosecaps (Section 2, pages 65 to 66*).

Mandrel Selection: The MB puller is directly compatible with standard Type 2 or Type 5 threaded mandrels (Section 2, page 56*).

*Page numbers refer to FTI Tooling Catalog Revision #3.



**Figure 1.3-2
Medium Brute Specifications**

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SECTION 2: SAFETY

Consult the PowerPak manual for safety precautions before connecting the puller unit.

When used in accordance with these instructions, the puller unit is safe and easy to use. All general safety precautions associated with hydraulic and pneumatically operated power tools should be observed. Many of these are noted in this section.

Ultimately, the operator is responsible for his own safety; however, the following general safety precautions should be observed.

1. Wear eye and ear protection when operating the puller unit.
2. Disconnect the air supply when:
 - Maintenance is to be performed.
 - Hydraulic hose is disconnected.
 - PowerPak is not in use.
3. In the event of a ruptured or leaking hydraulic hose, **IMMEDIATELY RELEASE THE TRIGGER AND DISCONNECT THE AIR LINE**, at the air coupler, from the PowerPak (see Figure 2.0-1). Never use your hands to grasp a leaking hose under pressure. The force of escaping hydraulic fluid could cause serious injury.
4. **DO NOT** attempt to disconnect the hydraulic hose while it is under pressure.
5. **DO NOT** expose hoses to potential hazards such as extreme heat or cold, sharp surfaces, or heavy impact.
6. **DO NOT** allow hoses to kink, twist, curl or bend so tightly that the oil flow within the hose is blocked or reduced. Periodically inspect the hose for wear or damage that could cause premature failure of the hose and possibly result in injury.
7. **DO NOT** use the hose to move attached equipment.
8. Hose material and coupler seals must be compatible with hydraulic fluid that meets the requirements of U.S. MIL-SPEC #5606.
9. Hoses must not come in contact with toxic materials such as creosote imprinted objects and some paints. Keep clean and never paint couplers or hoses. Hose deterioration due to chemical degradation may cause the hose to fail under pressure.
10. Release puller unit trigger when mandrel clears the workpiece or becomes stuck.
11. Before operating pump, make sure all hose connections are tightened securely. **DO NOT** over tighten.
12. Keep hands away from nosecap assembly while holding nosecap against the workpiece.

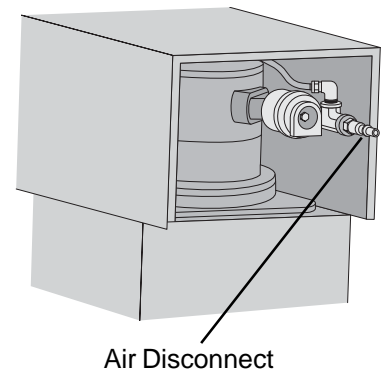


Figure 2.0-1
Air Disconnect Location

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13. Puller units are not generally insulated for coming into contact with electric power sources. Use caution when operating the puller units near electric power sources.
14. Unexpected tool movement or breakage of inserted tool may cause injuries to hands or feet.
15. Operating the puller units with unsuitable postures may not allow counteracting of normal or unexpected movement of the puller tool.
16. Periodically inspect hoses and fittings for wear or other types of damage. Repair or replace as necessary.

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SECTION 3: PULLER OPERATING INSTRUCTIONS

Become familiar with these instructions before operating the puller.

3.1 PULLER UNIT SET-UP PROCEDURE

Refer to Section 6 (Illustrated Parts Breakdown) for parts identification.

1. Inspect all threads and fittings of PowerPak for signs of wear or damage and replace them if necessary.
2. Uncoil the hose assembly of the puller unit, and inspect all threads, couplings, and hoses for damage and degradation.
3. Remove the thread protectors from the hydraulic fittings and thread the hydraulic hose fitting from puller unit (female) onto the hydraulic fitting of the FTI PowerPak (male). Wipe fittings clean prior to connecting. Make sure to thread couplers completely together. There should be positive contact between the PowerPak coupler and the hose fitting flange. Failure to completely tighten the coupler will prevent the puller from returning to the forward (start) position. See Section 5, Problem 5.2 for more information.
4. Connect the male/female AIR quick-disconnects from puller to FTI PowerPak.
5. Test shop air supply to ensure that it is clean, dry, and between 90 and 120 psi (6.2 and 8.3 bar) at 45 cfm (1274.3 liter/minute).
6. Connect the female quick disconnect of a 3/8-inch or 1/2-inch (9.5 mm or 12.7 mm) ID shop air line onto the male air inlet of the PowerPak.
7. Install appropriate mandrel into threaded adapter (hand tight).
8. Install appropriate nose cap assembly over mandrel and thread onto barrel (hand tight).

3.2 ACTUATION OF PULLER

1. The puller can be activated only when connected to a FTI PowerPak.
2. Activate the puller by depressing the trigger on the handle. Hydraulic pressure is transmitted through the hose to the cylinder of the puller which then retracts the hydraulic piston.
3. Releasing the trigger changes pressure at the pilot valve and stops the pull cycle, and returns puller to original position.
4. If the puller fails to operate as detailed above, refer to Section 5, (Troubleshooting).

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SECTION 4: MAINTENANCE

The puller requires routine checking and periodic preventative maintenance to ensure safe, trouble-free operation. No special maintenance is required. The following maintenance actions are suggested.

WARNING
Disconnect the PowerPak from the air supply before performing maintenance or repair procedures.

4.1 GENERAL CLEANING

1. Periodically clean the outer surfaces of the puller unit and PowerPak.
2. When not in use, ensure thread protectors are reinstalled.
3. Keep all hose connections free of dirt and grime.

4.2 LUBRICATION

1. There is no internal lubrication requirement for the puller unit.
2. Whenever the puller is to be stored for any length of time, maintain a thin coat of 10 weight oil on the outside of black oxidized surfaces.

4.3 INSPECTION

1. Periodically inspect the threaded fittings for cracks, leaks or other damage. Repair and replace as necessary.
2. Periodically inspect the hoses for wear or damage.

4.4 ASSEMBLY AND DISASSEMBLY

Normal replacement of seals (refer to the Illustrated Parts Breakdown, Section 6).

DISASSEMBLY:

1. Unthread and remove nose cap assembly.
2. Unthread and remove mandrel from threaded adapter.
3. Loosen lock ring (7) to remove tension from end cap (6) and cylinder (3).
4. Unthread and remove end cap (6).

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5. Unscrew and remove rear cylinder (3) and front cylinder (5) from housing (2).
6. Unthread and remove threaded adapter (8).
7. Unthread and remove the adapter (8) from the piston rod. Since it is necessary to hold the piston rod stationary to remove the lock nut (10), use a screwdriver in the slot (some old models have a hex wrench hole) in the back end of the piston, to keep the piston rod from turning.

DO NOT scratch the piston shaft during disassembly.

Note: Your MB was shipped with a 5/8-inch (15.9 mm) diameter threaded adapter installed and a 7/8-inch (22.2 mm) diameter threaded adapter.

8. Remove the piston rod assembly (4) by pushing on the threaded end (nosecap end) of the piston rod until threads engage the sleeve (2). Thread the piston rod through the sleeve and remove the piston rod assembly.
9. Remove the brass sleeve (2).
10. Remove the handle assembly (12) by removing four hex-head bolts.

REASSEMBLY:

Important: (1) Thoroughly clean all parts prior to reassembly,
(2) Install O-rings toward hydraulic flow, with teflon backup rings “behind.”

1. Replace O-rings and backup rings on the brass sleeve (2). Drop into front of housing (9).
2. Replace MB rear cylinder (3) and tighten until snug. Tighten the lock ring (7).
3. Replace O-rings and backup rings on air seal adapter on end of piston assembly (4).
4. Install threaded end of piston assembly (4) into housing (9). Thread piston through housing and push to full forward position.
5. Install handle assembly (12) onto housing using four hex-head bolts.
6. Install threaded adapter (10).
7. Install front barrel (5).
8. Install end cap (6) and tighten lock ring (7).
9. Select appropriate mandrel/nosecap combination and install.

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SECTION 5: TROUBLESHOOTING

This section provides solutions to some basic trouble spots. If you cannot solve your maintenance or operational problems with the information provided in this section, please contact your nearest FTI representative.

NOTE: Should difficulties originate in the PowerPak, consult the specific PowerPak Operations, Maintenance and Repair Manual.

PROBLEM

CAUSE

SOLUTION

5.1 POWERPAK WILL NOT BUILD FULL HYDRAULIC PRESSURE

- | | |
|---|---|
| <p>(a) One or more of the key air or hydraulic lines has not been securely connected.</p> | <p>(a) Check the following hose connections:</p> <ol style="list-style-type: none"> (1) Mail air line quick disconnect fitting from shop air system to PowerPak. (2) Hydraulic quick couplings connecting the hoses to the PowerPak manifold, and the puller to the hydraulic hoses. (3) Two male/female air line quick disconnect fittings connecting the puller to the PowerPak manifold. (4) Check the main air supply has not been interrupted. |
|---|---|

CAUTION

Hydraulic oil under extreme pressure may cause serious injuries if not handled carefully. For technical assistance, please contact FTI's Technical Sales Department.

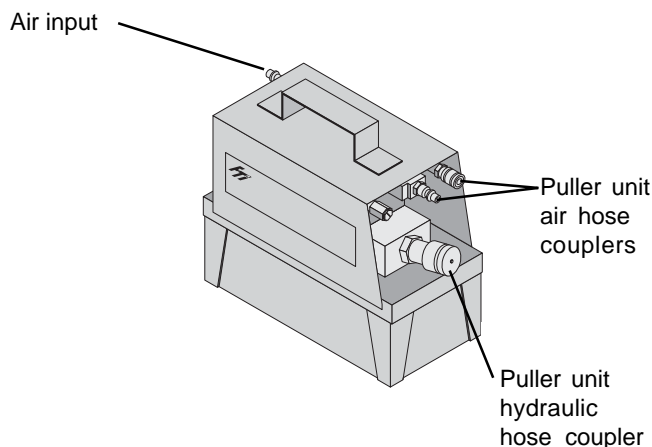


Figure 5.1-1
FT-20 PowerPak*

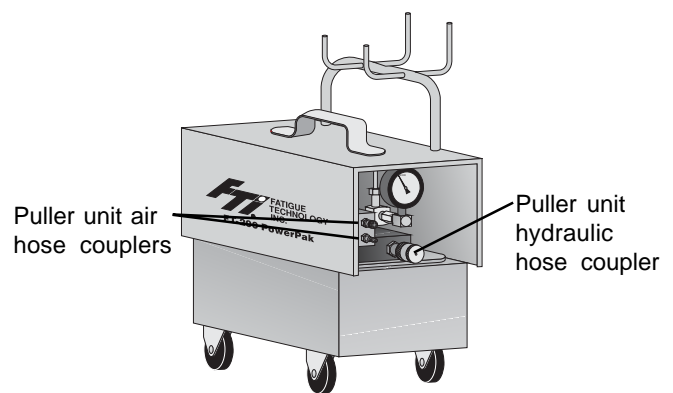


Figure 5.1-2
FT-200 PowerPak*

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*PowerPak drawings are not to scale.

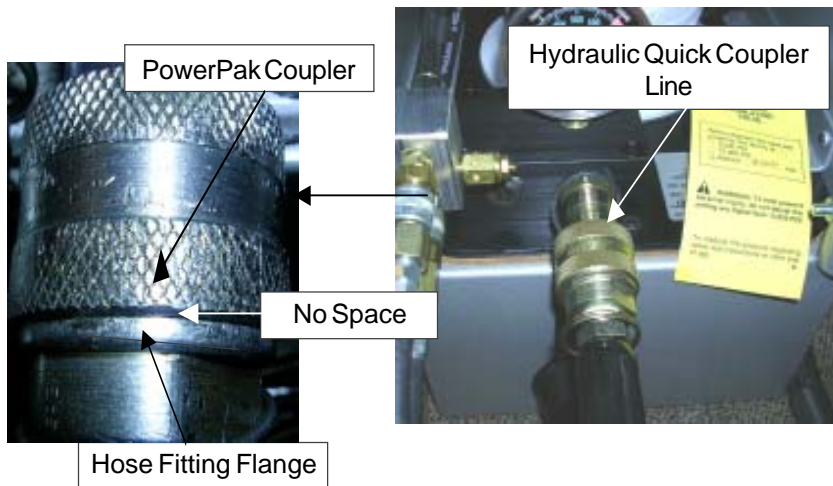
PROBLEM

CAUSE

SOLUTION

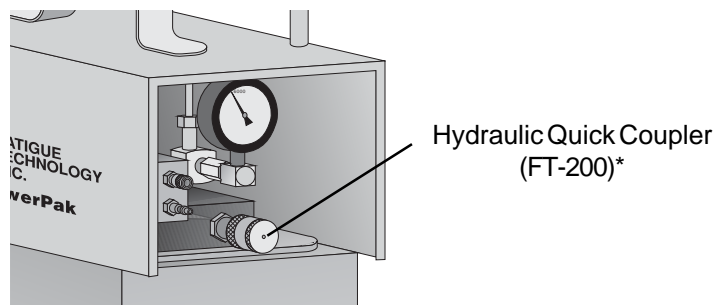
5.2 PULLER RETRACTS ON FIRST TRIGGER ACTUATION, BUT WILL NOT RETURN TO START POSITION

- (a) The new puller unit requires lubrication through the piston and cylinder.
- (a) Cycle trigger several times to introduce hydraulic fluid into the cylinder.
- (b) As above, AND the hydraulic hose is difficult to bend or coil (indicating unrelieved pressure built up in the hose).
- (b) The hydraulic quick coupler line has not been completely tightened at the PowerPak manifold (there should be no space between the PowerPak coupler and the hose fitting flange).
- (b) Once hydraulic pressure has been introduced to the hydraulic hose, the pressure must be relieved before the coupler can be sufficiently tightened.



Procedure for relieving hydraulic pressure:

- (1) Disconnect main air supply.
- (2) Disconnect coupler from PowerPak.
- (3) Wrap the fitting with a rag to absorb the squirting oil and slowly turn the coupler off the hydraulic hose to allow hydraulic oil to bleed out.
- (4) Once pressure is relieved, coupler may be tightened, and reinstalled onto PowerPak.
- (5) Re-attach air lines to get puller to return.



**Figure 5.2-1
Hydraulic Quick Coupler
(FT-200) Location**

*PowerPak drawings are not to scale.

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PROBLEM

CAUSE

SOLUTION

5.3 POWERPAK WILL NOT GENERATE CONSTANT PRESSURE (OR HICCUPS)

- (a) Trigger response valve requires adjustment.

- (a) Adjustment procedure:
- (1) Loosen locknut on trigger response valve.
 - (2) Using a screwdriver, open screw counterclockwise until PowerPak will not start when puller trigger is depressed.

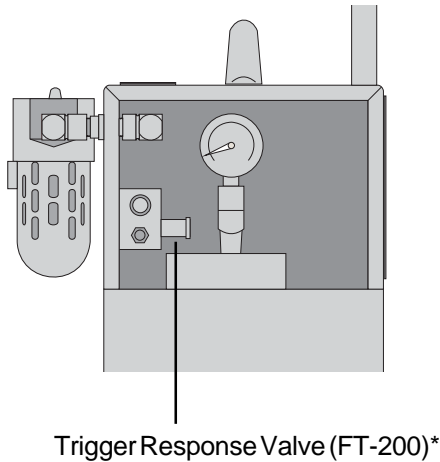


Figure 5.3-1
Trigger Response Valve
(FT-200) Location

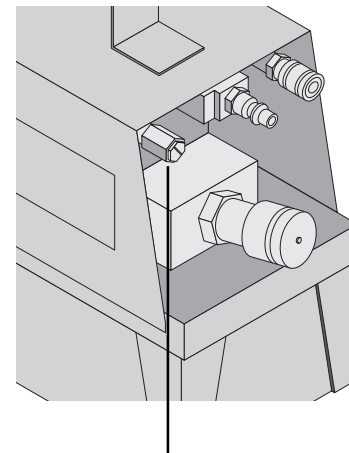


Figure 5.3-2
Trigger Response Valve
(FT-20) Location

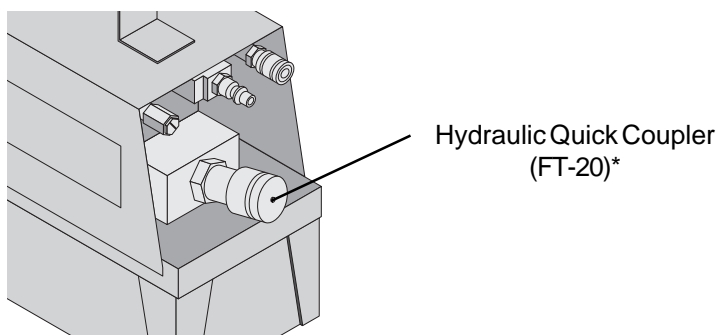


Figure 5.3-3
Hydraulic Quick Coupler
(FT-20) Location

- (3) Turn screw clockwise until:
 - PowerPak generates constant pressure when puller trigger is depressed, and
 - PowerPak starts instantly when puller trigger is depressed and stops instantly when released. When the puller trigger is depressed, the PowerPak should be run at the pre-set pressure until the trigger is released.
- (4) Hold set screw in position and tighten locknut.

*PowerPak drawings are not to scale.

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PROBLEM

CAUSE

SOLUTION

5.4 POWERPAK WILL NOT OPERATE OR MAINTAIN SUFFICIENT PRESSURE (6,000 PSI) (413.7 BAR)

(a) Hydraulic pressure requires adjusting (applicable to FT-200 PowerPak only).

- (a) Adjust PowerPak pressure valve:
- (1) Squeeze trigger on puller unit to activate PowerPak.
 - (2) If pressure does not reach 6,000 psi (413.7 bar), loosen wingnut and turn hydraulic pressure control clockwise until pressure reaches 6,000 psi (413.7 bar).
 - (3) Tighten locknut to secure available shop air.

(b) Inadequate air supply.

(b) Increase pressure or flow of available shop air.

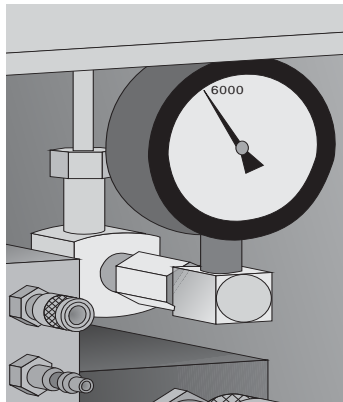
If the PowerPak will not generate or maintain sufficient pressure, the main air line pressure is too low or the PowerPak hydraulic pressure requires adjustment.

Air pressure requirements:

- 1/2-inch (12.7 mm) ID air line with 90 to 120 psi (6.2 to 8.3 bar) for the FT-200.
- 3/8-inch (9.5 mm) ID air line with 90 to 120 psi (6.2 to 8.3 bar) for the FT-20.

Flow requirements:

- 40 to 50 cfm (1274.3 to 1415.9 liter/minute) for the FT-200.
- 20 cfm (566.3 liter/minute) for the FT-20.



**Figure 5.4-1
Pressure Gauge
(FT-200) Location**

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PROBLEM

CAUSE

SOLUTION

5.5 THE MANDREL STICKS IN THE HOLE WHEN THE PULLER IS ACTIVATED

- | | |
|---|---|
| <p>(a) Not enough pressure used to generate pull forces. If Medium Brute is being used with an FT-20 PowerPak, proceed to solution (4).</p> | <p>(a) Use the following procedure to analyze the problem:</p> <ol style="list-style-type: none">(1) Actuate the puller and observe pressure reading on PowerPak pressure gage (FT-200 PowerPak only).(2) Pressure gage should read 6,000 psi (413.7 bar). (Note: FT-20 PowerPak is factory set at 10,000 psi or 689.5 bar). If an increase in pressure is required, refer to the solution for Problem 5-4 in this section for instructions.(3) Actuate puller again. If mandrel remains stuck, increase pressure to 10,000 psi (689.5 bar).(4) If mandrel remains stuck at 10,000 psi (689.5 bar) immediately disengage the mandrel from the puller. Push the mandrel out using an impact hammer. Contact FTI's Technical Sales Department for additional assistance. |
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SECTION 6: ILLUSTRATED PARTS BREAKDOWN

FTI has redesigned the puller unit trigger assembly, built with serial number 810 or higher, to a cartridge trigger assembly. The new design will reduce the occurrence of trigger air leaks, perform more reliably (better pump actuation), and be easier to maintain. The previous trigger design as detailed in Section 6.3 can be easily replaced with the Cartridge Trigger Assembly Kit (FTI-CT-RK) or the Medium Brute Rework Kit (MB-CT-RK) and the Puller Trigger Rework Tool Kit (FTI-CT-RKT). One FTI-CT-RK or MB-CT-RK is required for each puller converted. Only one FTI-CT-RKT is required regardless of the number of pullers converted. The FTI-CT-RKT kit also includes detailed instructions on how to perform the modification.

6.1 MEDIUM BRUTE REWORK KIT (MB-CT-RK)

This kit is used to repair or refurbish older pullers. Table 6.1-1 is a parts list for the Medium Brute Rework Kit and Figure 6.1-1 shows a diagram of the cartridge trigger assembly.

Table 6.1-1
Medium Brute Rework Kit (MB-CT-RK)

<u>Quantity</u>	<u>Piece Number</u>	<u>Description</u>	<u>FTI Part Number</u>
1		Screw, SHC (10-32 UNFX 3/4)	1029-005
1		MB-H-D16 Hydraulic Adapter	2039-002
1		Medium Brute Seal Kit (MB-SK) (See Section 6.2)	8000-485
1	2	Push Button, Brass	1187-623
1	3	Retaining Ring, Internal	1187-624
1	4	Sleeve, Puller Handle Trigger	3196-001

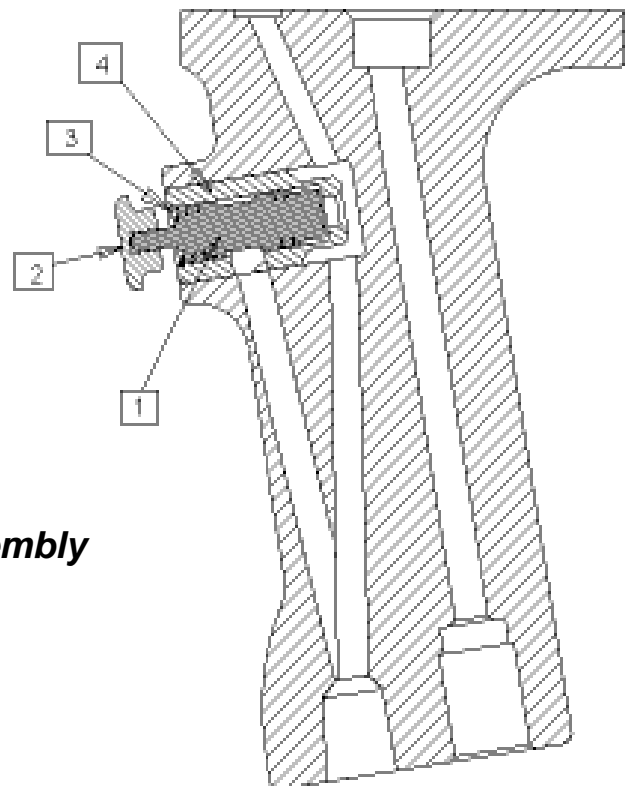


Figure 6.1-1
Diagram of Cartridge Trigger Assembly

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6.2 MEDIUM BRUTE SEAL KIT (MB-SK)

This kit is used to replace seals. It is included as part of the Medium Brute Rework Kit (see Section 6.1). Table 6.2-1 is a parts list for the Medium Brute Seal Kit.

Table 6.2-1
Medium Brute Seal Kit (MB-SK)

<u>Quantity</u>	<u>Description</u>	<u>FTI Part Number</u>
1	Valve, Cartridge Trigger (See Figure 6.1-1, Piece Number 1)	1187-622
1	Seal, LB Handle (See Table 6.3-1, Piece Item 6)	2040-001
2	Ring, Backup MS28782-7	1046-044
2	O-Ring, AN6227B-7	1046-045
1	O-Ring, AN6227B-3	1046-012
1	O-Ring, MS28775-224	1046-058
1	O-Ring, AN6227B-17	1046-002
2	MS2878217 Ring, Backup	1046-003
1	17149-122	1046-043
1	A-122-90-BUNA	1046-007
1	AN6227-28	1046-004
1	MS28782-28	1046-005
1	CP-325	1046-008

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6.3 PREVIOUS TRIGGER ASSEMBLY

The previous trigger design (serial numbers smaller than 810) detailed here can be easily replaced with the improved trigger assembly detailed in Section 6.1. Table 6.3-1 is a parts list for the old-style trigger assembly.

Table 6.3-1
Parts List for Previous Trigger Assembly

<u>Quantity</u>	<u>Line Item</u>	<u>Description</u>	<u>FTI Part Number</u>
1	1	Trigger, LB Handle	2042-001
1	2	Spring, LB Handle	1005-003
1	3	Retainer, LB Handle	2043-001
1	4	Ball, .250 Diameter stl.	1045-025
1	5	Pin, 1/8 x 3/4 stdl. Spring	1045-026
1	6	Seal, LB Handle	2040-001
1	7	Sleeve, LB Handle	2044-001

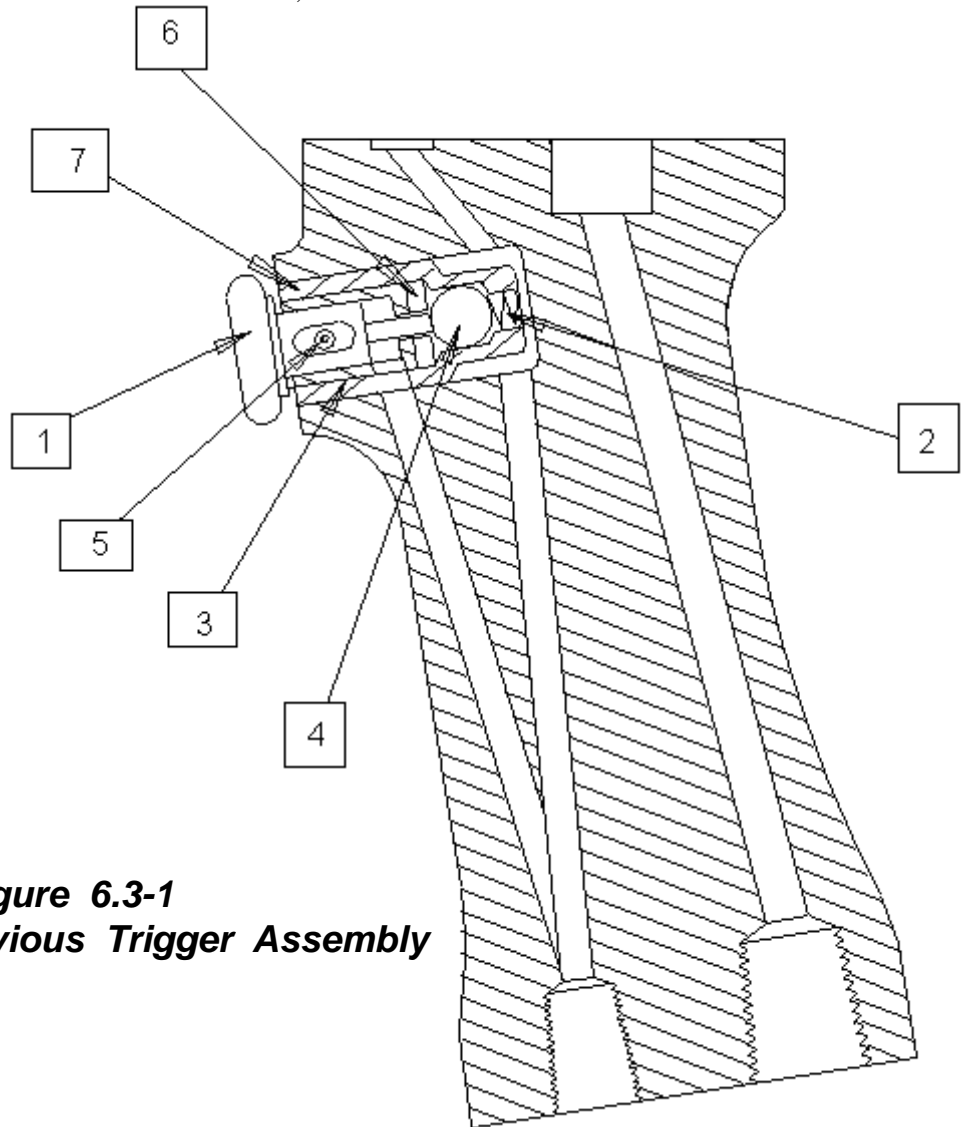


Figure 6.3-1
Diagram of Previous Trigger Assembly

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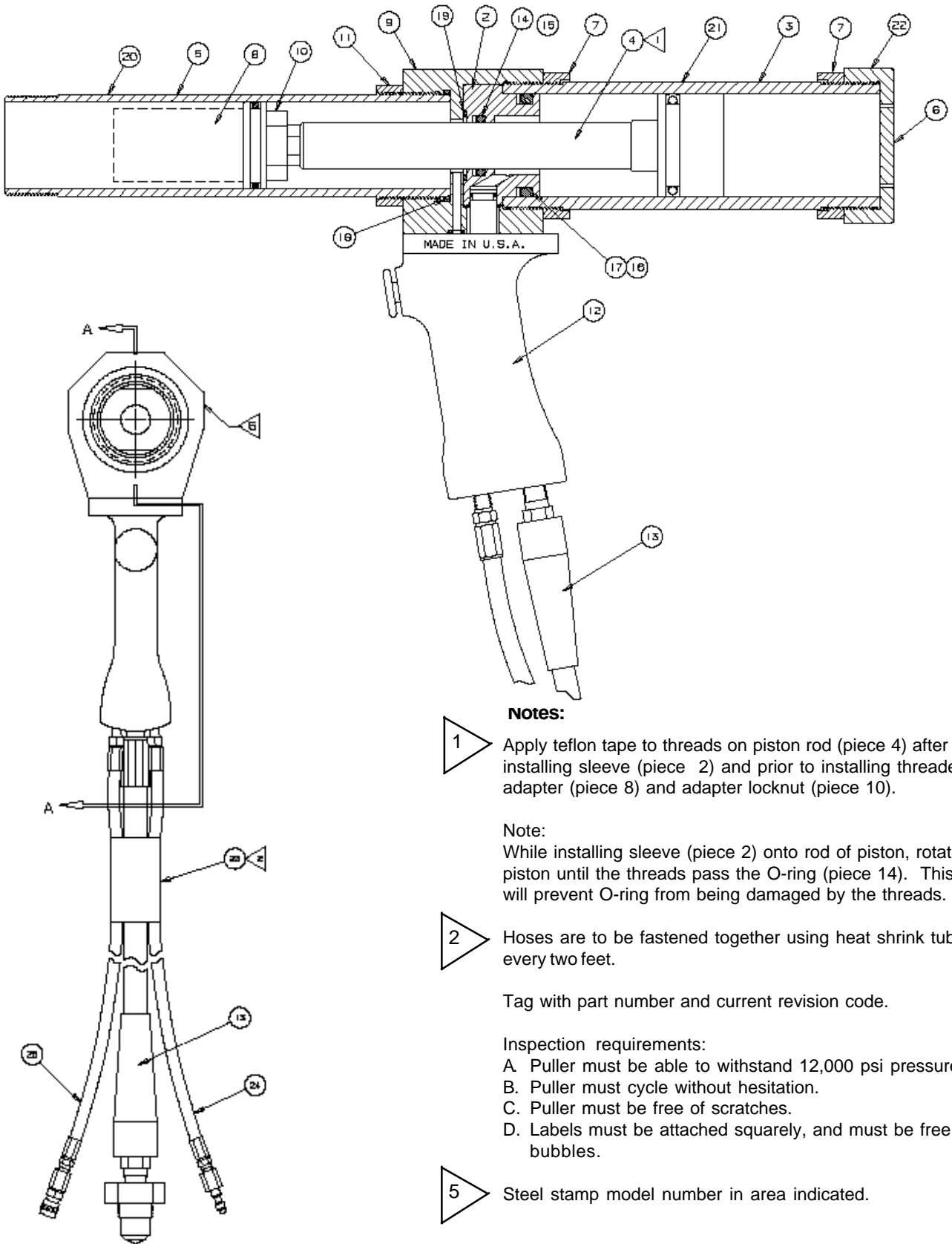
6.4 MEDIUM BRUTE PARTS LIST; ASSEMBLY DIAGRAM

Table 6.4-1
Medium Brute Parts List

Reference #	Description	Part #	Reference Information
2	Sleeve	2349-001	MB-D2
3	Cylinder	2184-00*	MB-**-D3
4	Piston Assembly	2405-00*	MB-**-D4
5	Barrel	2332-00*	MB-**-D5
6	End Cap	2136-002	MB-D6
7	Cylinder Lockring	2120-002	MB-D7
8	Chuck Assembly Adapter	2491-00*	MB-CA-**
		2425-001	MB-D17
9	Housing	2350-001	MB-D10
10	Locknut Adapter	2422-001	MB-D14
11	Barrel Lockring	2120-004	MB-D16
12	Handle Assembly	2049-002	MB-H-1
13	Hydraulic Hose Assembly	2107-001	IWHH-10
14	O'Ring	1046-002	AN6227-17
15	Backup Ring	1046-003	MS28782-17
16	O'Ring	1046-004	AN6227-28
17	Backup Ring	1046-005	MS28782-28
18	O'Ring	1046-058	MS28775-224
19	O'Ring	1046-007	A-122-90-BUNA
20	Warning Label	1009-185	--
21	FTI Label	1009-094	--
22	Do Not Strike Label	1009-184	--
23	Heat Shrink Tube	2638-001	3" Long
24	Air Hose Assembly (Male)	2106-001	IWAH-10
25	Air Hose Assembly (Female)	2106-002	IWAH-10
26	MB Puller Label	1009-187	--

* = Indicates part numbers dependent on Medium Brute Model No. (-30, or -70)
Contact FTI Technical Sales for assistance.
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NOTES:

1 Apply teflon tape to threads on piston rod (piece 4) after installing sleeve (piece 2) and prior to installing threaded adapter (piece 8) and adapter locknut (piece 10).

Note:

While installing sleeve (piece 2) onto rod of piston, rotate piston until the threads pass the O-ring (piece 14). This will prevent O-ring from being damaged by the threads.

2 Hoses are to be fastened together using heat shrink tube, every two feet.

Tag with part number and current revision code.

Inspection requirements:

- A. Puller must be able to withstand 12,000 psi pressure.
- B. Puller must cycle without hesitation.
- C. Puller must be free of scratches.
- D. Labels must be attached squarely, and must be free of bubbles.

5 Steel stamp model number in area indicated.

Figure 6.4-1
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Medium Brute Assembly Diagram

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