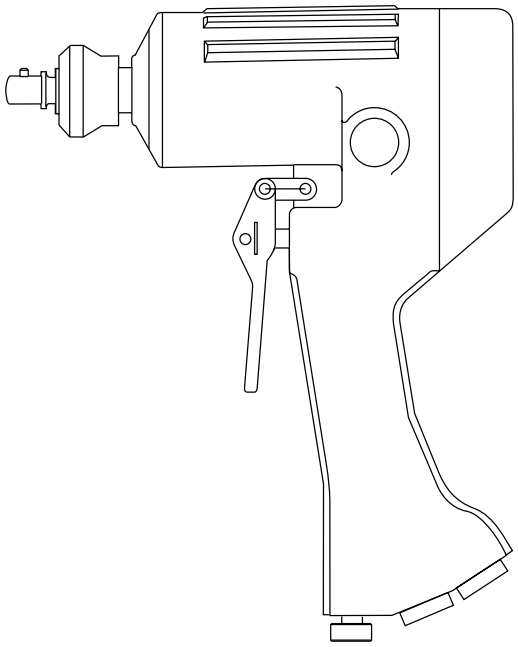
INSTRUCTION MANUAL

GREENLEE®
FAIRMONT®



H8508

HYDRAULIC IMPACT WRENCH

Models 48755/48760

Read and **understand** this material before operating or servicing this equipment. Failure to understand how to safely operate this tool could result in an accident causing serious injury or death.

Table of Contents

Description

The lightweight 48755 Impact Wrench/Drill/Screwdriver comes equipped with a standard 7/16-inch hex quick- change chuck for use with wood bits, screwdriver bits, or the provided 1/2-inch drive adaptor. The tool is used to tighten nuts, install or remove screws (lag, phillips, slotted, etc.) or used as a wood drill. The 48760 utilizes a standard 1/2-inch square drive. An adjustable torque output screw varies the torque output of the tool to match the job at hand. The trigger spool design contains a center spool which can be rotated to allow the impact wrench to be used with either an Open-Center or Closed-Center hydraulic system. The 48755 and 48760 also comes equipped with a reversing spool, allowing the wrench to be operated in forward or reverse. The handle is heat-insulated for operator comfort.

Purpose

This instruction manual is intended to familiarize operators and maintenance personnel with the safe operation and maintenance procedures for the H8508 Hydraulic Impact Wrench.

Additional or replacement manuals may be obtained from your Greenlee Fairmont dealer. When tool is received, complete the following record:

SERIAL NUMBER: _____

DATE OF PURCHASE:_____

WHERE PURCHASED: _____

IMPORTANT SAFETY INSTRUCTIONS

SAFETY ALERT SYMBOL

The symbol above is used to call your attention to instructions concerning your personal safety. Watch for this symbol. It points out important safety precautions. It means **"ATTENTION! Become alert! Your personal safety is involved!"** Read the message that follows and be alert to the possibility of personal injury or death.

⚠DANGER

Immediate hazards which, if not avoided, WILL result in severe personal injury or death.

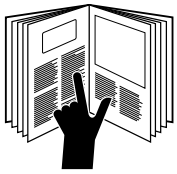
⚠WARNING

Hazards or unsafe practices which, if not avoided, COULD result in severe personal injury or death.

⚠CAUTION

Hazards or unsafe practices which, if not avoided, COULD result in minor personal injury or property damage.

Safety is a critical factor in the design of Greenlee equipment. The best program starts with a safety-conscious operator. The information highlighted in this bulletin describes operating practices for the benefit of the workers who will use our equipment in their daily jobs. Comments from users are appreciated.



⚠WARNING

A person who has not read and does not understand all operating instructions is not qualified to operate this tool.

Failure to read and understand safety instructions may result in injury or death.

⚠WARNING

Electric shock hazard:

This tool is not insulated. When using this unit near energized electrical lines, use only certified non-conductive hoses and proper personal protective equipment.

Failure to observe this warning could result in severe injury or death.

⚠WARNING

- Keep all parts of the body away from rotating parts when the tool is in operation. Contact with moving parts can result in severe injury.
- Do not change accessories, inspect, adjust or clean tool when it is connected to a power source. Accidental start-up can result in serious injury.
- Maintain a firm grip on tool, using both hands at all times. Serious injury can result if an operator does not control the tool.
- Do not lock trigger in the power-ON position. Operator can not stop tool when trigger is locked.

Failure to observe these warnings can result in severe injury or death.

SAVE THESE INSTRUCTIONS

Additional copies of this manual and decals are available upon request at no charge.

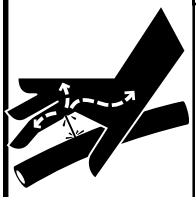
IMPORTANT SAFETY INSTRUCTIONS

⚠WARNING

- Use only impact style bits. Bits not designed for impact applications can break and cause severe injury.
- Use only sockets approved for impact use. Accessories not designed for impact applications can break and cause severe injury.
- Inspect drill bits and sockets before use. Discard damaged bits and sockets. Damaged accessories can break and cause severe injury.

⚠WARNING

Tool and drill bit may be hot during and after operation. Contact with hot surfaces can result in serious injury.



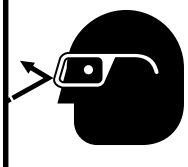
⚠WARNING

Skin injection hazard:

High pressure oil easily punctures skin causing serious injury, gangrene or death. If injured seek medical help immediately to remove oil.

Do not use fingers or hands to check for leaks.

Depressurize hydraulic system before servicing.



⚠WARNING

Wear eye protection when using this tool.

Failure to wear eye protection can result in serious eye injury from flying debris or hydraulic oil.

⚠WARNING

Do not disconnect tool, hoses or fittings while the power unit is running or if the hydraulic fluid is hot. Exposure to hot hydraulic fluid can cause serious burns.

⚠WARNING

Do not reverse hydraulic flow. Operation with hydraulic flow reversed can cause tool malfunction. Always connect supply (pressure) hose and return (tank) hose to proper tools ports.

Failure to observe this warning could result in severe injury or death.

⚠CAUTION

- Wear protective gloves when handling, removing and installing drill bits. Drill bits can cut even when stationary.
- Inspect hydraulic hoses and couplings every operating day. Repair or replace if leakage, cracking, wear or damage is evident. Damaged hoses or couplings can fail resulting in injury or property damage.
- Use this tool for manufacturer's intended purpose only. Use other than that which is described in this manual can result in injury or property damage.
- Make sure all bystanders are clear of the work area when handling, starting and operating the tool. Nearby personnel can be injured by flying or falling debris or by flying parts in the event of a tool malfunction.

IMPORTANT

Procedure for disconnecting tool, removing hydraulic lines, fittings or components:

1. Stop the power source.
2. Depressurize the hydraulic system.
3. Disconnect hydraulic hoses from tool. Remove lines, fittings or components slowly to release any trapped pressure.

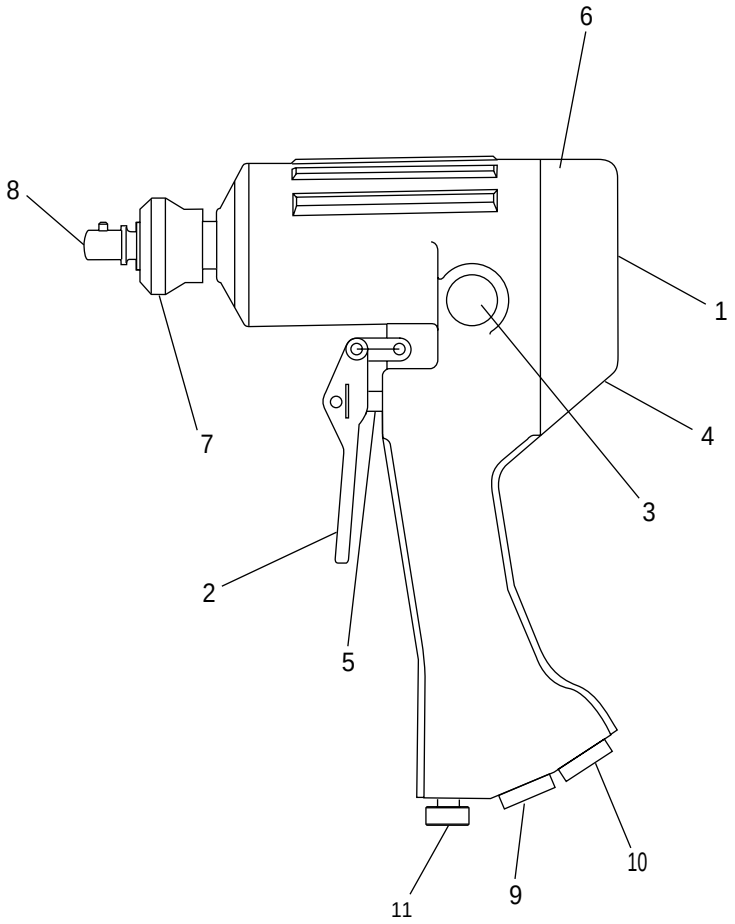
Note: Keep all decals clean and legible. Replace decals when necessary with new decals listed in the Parts List of this manual.

SAVE THESE INSTRUCTIONS

Additional copies of this manual are available upon request at no charge.

Identification

Figure 1
Model 48755 Shown



1. Serial Number
2. Trigger
3. Reversing Spool
4. Open-Center/Closed-Center Spool & Indicator
5. Trigger Spool
6. Hydraulic Gear Motor
7. Quick-Change Chuck
8. Adapter, 1/2"
9. Pressure Port “P”
10. Tank Port “T”
11. Variable Torque Output Screw

Specifications—Tool

Length ..... 8.19 in. (20.8 cm)
Width ..... 4.19 in. (10.6 cm)
Height 48755/48760 ..... 11.00 in. (27.9 cm)
Weight
- 48755 ..... 8 lbs (3.6 kg)
- 48760 ..... 7.80 lbs (3.5 kg)

RPM Range 48755/48760 ..... 4400 - 9700
Output Torque ..... 0 - 400 foot-pounds (0 - 188 Kglm)
Tool - Pressure Port ..... 3/4 16 UNF SAE O-ring
Tool - Return Port ..... 3/4 16 UNF SAE O-ring
Drive Size
- 48755 ..... 7/16" Hex quick-change chuck, 1/2" Square Drive
- 48760 ..... 1/2" Square Drive

Type of Hydraulic System ..... Open-Center or Closed-Center

Specifications—Hydraulic Power Source

⚠WARNING

- Power source flow must not exceed 12 gpm (45.41 lpm).
- Limit relief pressure to 2000 psi (137.9 bar).

Failure to observe these warnings could result in overpressurizing the system, resulting in severe injury to operator or bystanders.

Any hydraulic power source used with this tool must meet the following requirements:

Flow
- Minimum ..... 4 gpm (15.1 lpm)
- Recommended ..... 5 - 8 gpm (18.9 - 30.3 lpm)
- Maximum ..... 12 gpm (45.4 lpm)

Operating Pressure
- Minimum ..... 1000 psi (96.6 bar)
- Maximum ..... 2000 psi (137.9 bar)

Pressure Relief Setting ..... 2000 psi (137.9 bar)

Back Pressure
- Maximum* ..... 200 psi (13.8 bar)

Filtration ..... 10 Micron (Nominal)

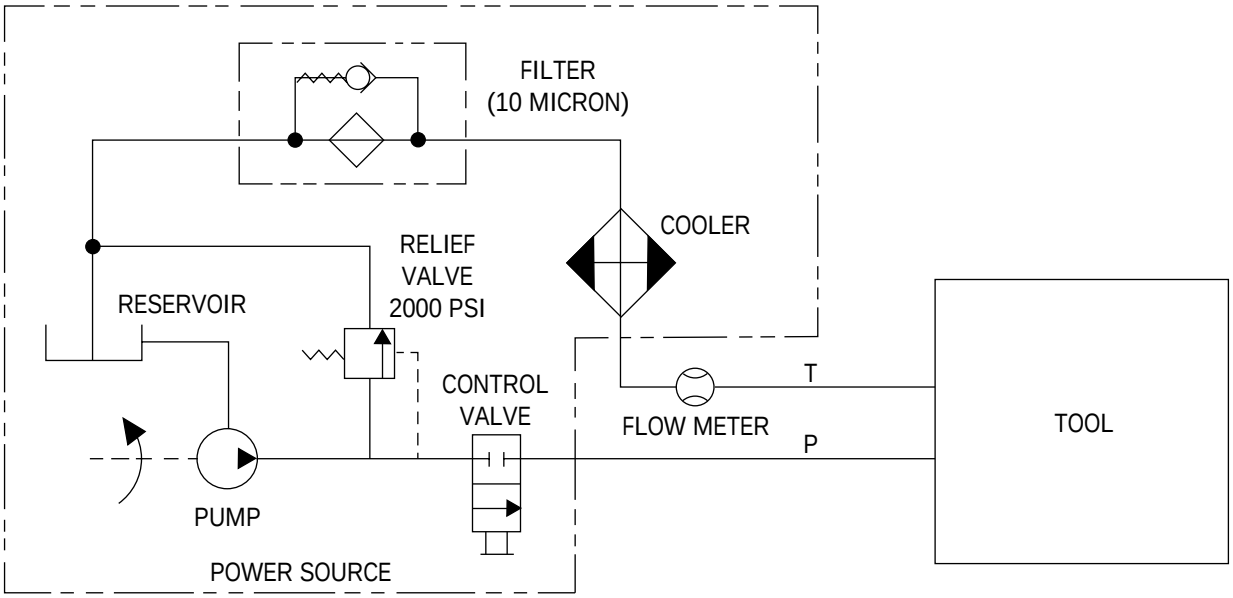
Type of Hydraulic System ..... Open-Center or Closed-Center

* 200 psi is the maximum agreed standard back pressure for the Hydraulic Tool Manufacturers Association (HTMA). Greenlee Fairmont tools will operate satisfactorily at this standard.

1. Maximum fluid temperature must not exceed 140°F (60°C) at the maximum expected ambient temperature. A sufficient oil cooling capacity is needed to limit the fluid temperature.
2. Maximum flow must not exceed 12 gpm (45.4 lpm). Install a flow meter in the return line to test the rate of flow in the system before working the tool.
3. Pressure relief valve must not exceed 2000 psi (137.9 bar) @ 10 gpm (37.8 lpm). The pressure relief valve must be located in the supply circuit between the pump and tool to limit pressure to the tool.

Figure 2 shows a typical hydraulic power source being used with the tool.

Figure 2
Hydraulic Schematic



Recommended Hydraulic Fluids

⚠WARNING

Electric shock hazard:

When using this unit near energized electrical lines, select and maintain the hydraulic fluid to meet the minimum dielectric standards required by your safety department.

Failure to observe this warning could result in severe injury or death.

Any non-detergent hydraulic fluid which meets the following specifications or HTMA specifications may be used.

S.U.S. @ 100°F (38°C) ..... 140 to 225
@ 210°F (99°C) ..... 40 minimum
Flash Point ..... 340°F (170°C) minimum
Pour Point ..... -30°F (-34°C) minimum

Hoses and Fittings

⚠WARNING

Hoses and fittings used with this tool must comply with SAE Standard J1273 (See Appendix A) recommended practice for “Selection, Installation and Maintenance of Hose and Hose Assemblies.”

Failure to observe this warning could result in severe injury.

Hose assemblies and quick-connect couplers are available from Greenlee Fairmont as accessories. SEE BULLETIN ON GREENLEE FAIRMONT NO-DRIP COUPLERS AND HOSES. CONTACT AUTHORIZED GREENLEE FAIRMONT DISTRIBUTOR.

Hose Connections

⚠WARNING

Always stop power source before connecting or disconnecting tool.

Failure to observe this warning can result in severe injury death.

Connecting Hoses (See Figures 1 and 2)

1. Stop the power source.
2. Connect the return (tank) hose from the power source (port T) to the tool (T port).

   Note: Return (tank) hose connection should always be connected before supply (pressure) hose connection to prevent pressure build-up inside the tool.
3. Connect the supply (pressure) hose from the power source (port P) to the tool (P port).

Disconnecting Hoses (See Figures 1 and 2)

1. Stop the power source.
2. Disconnect the supply (pressure) hose from the power source (port P) to the tool (P port).

   Note: Supply (pressure) hose connection should always be disconnected before return (tank) hose connection to prevent pressure build-up inside the tool.
3. Disconnect the return (tank) hose from the power source (port T) to the tool (T port).
4. To prevent contamination, always install dust caps over the hydraulic ports of the tool when disconnected.

Operation

Impact Bits

Greenlee recommends using Greenlee Impact Style Bits.

⚠WARNING

Some impact bits with a long spiral or wide flute spacing may not be acceptable to use with this tool. These bits can whip or bend under sideload. Do not use bits exhibiting these characteristics with the H8508 Impact Wrench.

Failure to observe this warning can result in severe injury or death.

UPC No.	Hole Dia.		Overall Length		Hex Shank		Weight	
78-3310-	Inch	mm	Inch	mm	Inch	mm	lbs.	g
37868	9/16	14.3	18	457	7/16	11.1	0.9	409
37869	11/16	17.5	18	457	7/16	11.1	1.1	499
37870	13/16	20.6	18	457	7/16	11.1	1.4	636
37871	15/16	23.8	18	457	7/16	11.1	1.5	681
37872	1-1/16	27.0	18	457	7/16	11.1	1.7	772
37873	9/16	14.3	22	559	7/16	11.1	1.2	545
37874	11/16	17.5	22	559	7/16	11.1	1.5	681
37875	13/16	20.6	22	559	7/16	11.1	1.8	817
37876	15/16	23.8	22	559	7/16	11.1	2.1	953
37877	1-1/16	27.0	22	559	7/16	11.1	2.2	998

1. Inspect the drill bit to be installed. Discard the bit if cracks, chips or gouges are evident.
2. Inspect the quick change chuck (7). Remove any dirt or other contamination that may have accumulated in the chuck (7).
3. Slide and hold quick-change chuck (7) away from tool and remove drive shank (8).
4. Insert desired bit into hex socket of tool and release chuck (7).
5. To remove drill bit, slide and hold quick-change chuck (7) away from tool and remove bit.

1/2 Inch Socket Drive Adapter and Sockets (See Figure 1)

1. Inspect quick-change chuck (7). Remove any dirt or other contamination that may have accumulated in the chuck.
2. To insert 1/2 inch socket drive adapter, slide and hold quick-change chuck (7) away from tool. Insert socket drive adapter into chuck and release chuck.
3. USE SOCKETS APPROVED FOR IMPACT WRENCH USE ONLY. Inspect 1/2 inch drive socket to be installed. DISCARD SOCKET IF CRACKS, CHIPS OR GOUGES ARE EVIDENT. Install socket on socket drive adapter.
4. To remove socket drive adapter, remove socket from adapter. Slide and hold quick-change chuck (7) away from tool. Remove socket drive adapter.

Screwdriver Bits—Model 48755 only (See Figure 1)

1. Inspect Screwdriver Bit to be installed. DISCARD SCREWDRIVER BIT IF CRACKS, CHIPS OR GOUGES ARE EVIDENT.
2. Inspect quick-change chuck (7). Remove any dirt or other contamination that may have accumulated in the chuck.
3. To insert screwdriver bit, slide and hold quick-change chuck (7) away from tool. Insert desired screwdriver bit into chuck and release chuck.
4. To remove screwdriver bit, slide and hold quick-change chuck (7) away from tool. Remove screwdriver bit.

Setting Tool for Open-Center or Closed-Center Operation

All H8508 models are equipped to allow the tool to be used with either an Open-Center or Closed-Center hydraulic power system.

Closed-Center Hydraulic System

Hold the tool as you would when operating, observe rear of trigger spool, turn center spool in trigger spool (Figure 1, Item 4) clockwise until spool stops. The tool is now ready for Closed-Center operation.

Open-Center Hydraulic System

Hold the tool as you would when operating, observe rear of trigger spool (Figure 1, Item 4), turn center spool in trigger spool counterclockwise until spool backs out to snap-ring. The tool is now ready for Open-Center operation.

Operation (cont'd)

⚠WARNING

Electric shock hazard:

This tool is not insulated. When using this unit near energized electrical lines, use only certified non-conductive hoses and proper personal protective equipment.

Failure to observe this warning could result in severe injury or death.

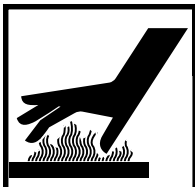
⚠WARNING

- Keep all parts of the body away from rotating parts when the tool is in operation. Contact with moving parts can result in severe injury.
- Do not change accessories, inspect, adjust or clean tool when it is connected to a power source. Accidental start-up can result in serious injury.
- Maintain a firm grip on tool, using both hands at all times. Serious injury can result if an operator does not control the tool.
- Do not lock trigger in the power-ON position. Operator can not stop tool when trigger is locked.

Failure to observe these warnings can result in severe injury or death.

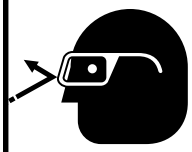
⚠WARNING

- Use only impact style bits. Bits not designed for impact applications can break and cause severe injury.
- Use only sockets approved for impact use. Accessories not designed for impact applications can break and cause severe injury.
- Inspect drill bits and sockets before use. Discard damaged bits and sockets. Damaged accessories can break and cause severe injury.



⚠WARNING

Tool and drill bit may be hot during and after operation. Contact with hot surfaces can result in serious injury.



⚠WARNING

Wear eye protection when using this tool.

Failure to wear eye protection can result in serious eye injury from flying debris or hydraulic oil.

⚠WARNING

Do not reverse hydraulic flow. Operation with hydraulic flow reversed can cause tool malfunction. Always connect supply (pressure) hose and return (tank) hose to proper tools ports.

Failure to observe this warning could result in severe injury or death.

⚠CAUTION

- Wear protective gloves when handling, removing and installing drill bits. Drill bits can cut even when stationary.
- Inspect hydraulic hoses and couplings every operating day. Repair or replace if leakage, cracking, wear or damage is evident. Damaged hoses or couplings can fail resulting in injury or property damage.
- Make sure all bystanders are clear of the work area when handling, starting and operating the tool. Nearby personnel can be injured by flying or falling debris or by flying parts in the event of a tool malfunction.

Operation (cont'd)

Pre-Operation (See Figure 1)

1. Stop the power source. Disconnect tool from power source.
2. Set Open-Center/Closed-Center spool (4) to correspond to the power source hydraulic system, that the tool will be connected to. See Operation - Setting Tool for Open-Center/Closed-Center Operation.
3. Slide desired 1/2" square drive socket onto 1/2" drive on tool (8) or insert desired bit in quick-change chuck. For model 48755, a screwdriver bit can also be inserted.
4. Connect the hydraulic hoses from the power source to the tool. Start the power source.
5. It is recommended that the power source be allowed to run (idle) for a few minutes to warm the hydraulic reservoir fluid. Actuating the tool intermittently will reduce the time required to warm the fluid to an efficient operating temperature.

Operation (See Figure 1)

1. Set reversing spool (3) to desired position (forward or reverse).

   Note: Never shift the reversing spool (3) while the tool is operating. Always allow the tool to come to a complete stop before changing drill direction. Shifting the spool while the tool is operating may cause internal tool damage.

2. Grasp the trigger handle. Place your opposite hand on the top of the tool. This will allow leverage to be applied while operating.
3. To start the wrench, squeeze the trigger (2).

   Note: Tool will not operate if variable torque output screw (11) is completely turned in (clockwise).

4. To adjust variable torque output to your desired setting, turn torque output screw (11) counterclockwise to increase torque output or clockwise to decrease torque output.
5. To stop the wrench, release the trigger (2).
6. After the tool has stopped rotating, lay the wrench on a flat surface.
7. When the tool is not in use, stop the power source flow to reduce heat and wear on the tool components.

Maintenance Schedule

⚠CAUTION

Inspect hydraulic hoses and couplings every operating day. Repair or replace if leakage, cracking, wear or damage is evident. Damaged hoses or couplings can fail resulting in injury or property damage.

Note: Keep all decals clean and legible. Replace decals when necessary with new decals listed in the Parts List of this manual.

The service life of the tool will be maximized by proper care and maintenance. The maintenance schedule below is recommended.

H8508 Impact Wrench

Daily:

1. Wipe all tool surfaces clean of grease, dirt and foreign material.
2. Inspect the hydraulic system hoses and fittings for signs of leaks, cracks, wear, or damage. Replace if necessary.
3. To prevent contamination, always install dust caps over the hydraulic ports when disconnected.

Monthly:

1. Perform a detailed inspection of the system hoses and fittings as stated in Appendix A - S.A.E. Standard J1273, May 1986. Replace the hoses and/or fittings if necessary.

Quarterly:

1. Remove the hammer case cap, anvil, impact mechanism assembly, spacer, washers and thrust bearing. Clean the grease from the inside of the handle cavity and all impact components. Apply a coat of grease (Mobile Grease HP) to thrust washers (48319), thrust bearing (48318), hammers (48345), hammer pins (48346) and anvil (48347) or (48397). Pack the hammer frame center space before pushing the anvil into the grease pocket. Reassemble components and tighten hammer case cap (48516) securely. If wrench is used under severe operating conditions or hard duty cycle, mechanism may need to be greased more often.

Semi-Annually:

1. Drain the hydraulic system fluid. Flush out the hydraulic system and fill with new, clean fluid. However, if the fluid turns dark or becomes milky colored, it should be changed as soon as possible.

Troubleshooting

Before You Begin

1. Tool must be connected to the correct power source system. See Tool Specification for type of hydraulic system required. Verify the power source hydraulic system.
2. Verify that the pressure and return hoses are connected properly to the tool and power source ports.
3. Power source reservoir must be filled to FULL level with hydraulic fluid.
4. Start the power source. All power source shut-off devices must be engaged or opened (clutch engaged, separate on/off valves open, etc.).
5. After verifying all of the above, check the tool to see if it operates.

   If the tool does not operate, it will be necessary to pinpoint the tool, hoses or power source as the problem area. The following steps will help to determine the problem area.

Determining the Problem Area

1. Stop the power source. Disconnect the existing tool from the hoses and power source.
2. Connect a known, properly operating tool to the hoses and power source. See the tool's operators manual for correct hook-up procedure. Start the power source.

   If the known, properly operating tool operates, the problem is in the disconnected tool. See the troubleshooting charts in this operator's manual.

   If the known, properly operating tool does not operate, the problem is likely to be in the hoses or the power source. Proceed to Step 3.
3. Stop the power source. Disconnect the existing hoses from the known, properly operating tool and power source.
4. Connect a different set of hoses to the known, properly operating tool and power source. Start the power source.

   If the known, properly operating tool operates with the different set of hoses, the problem is in the disconnected hoses.

   If the known, properly operating tool does not operate, the problem is in the power source. See your power source operator's manual for troubleshooting.

Troubleshooting (cont'd)

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Tool inoperative.	Tool connected to improper power source hydraulic system.	See Tool Specifications for type of hydraulic system required. Verify power source hydraulic system.
	No hydraulic fluid in system or fluid level low.	Check fluid level. Fill to FULL mark. Check system for leaks.
	Incorrect hydraulic fluid viscosity.	Use fluid viscosity recommended. See Recommended Hydraulic Fluids.
	Tool components loose.	Tighten component hardware.
	Dirt, contaminants, etc., in tool components.	Disassemble tool and clean components.
	Tool components worn or damaged.	Disassemble tool. Replace worn or damaged components.
	Hose connections to power source reversed.	Depressurize hydraulic system. Reverse hose connections.
Tool operates erratically.	Hydraulic fluid cold.	Viscosity of fluid may be too high at start of tool operation. Allow fluid to warm to operating temperature. Actuating tool intermittently will reduce time required to warm fluid to an efficient operating temperature.
	Air in system.	Check pump suction line for damage or loose clamps. Tighten clamps or replace components, if necessary. Fill reservoir.
	Tool components sticking or binding.	Check for dirt or gummy deposits. Clean components. Check for worn or damaged components. Replace components.
	Dirt, contaminants, etc., in tool components.	Disassemble tool and clean components.

Troubleshooting (cont'd)

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Tool impacts slowly.	Power source components not adjusted correctly.	Refer to power source operator's manual for recommended speed, flow, and pressure settings.
	Hydraulic fluid cold.	Viscosity of fluid may be too high at start of tool operation. Allow fluid to warm to operating temperature. Actuating tool intermittently will reduce time required to warm fluid to an efficient operating temperature.
	Adjustable torque output screw incorrectly set limiting hydraulic fluid-flow.	Turn torque output screw counter-clockwise to increase flow until desired output torque is obtained.
	Hydraulic fluid level low.	Check fluid level. Fill to FULL mark. Check system for leaks.
	Hydraulic fluid viscosity too heavy.	Use fluid viscosity recommended. See Recommended Hydraulic Fluids.
	Tool components loose.	Tighten component hardware.
	Dirt, contaminants, etc., in tool components.	Disassemble tool. Clean components.
	Tool components worn or damaged.	Disassemble tool. Replace worn or damaged components.
	Damaged hose couplings.	Inspect couplings. Replace if damaged.
	Flow control cartridge not operating properly.	Remove and clean cartridge. DO NOT DISASSEMBLE CARTRIDGE. Install a new, factory preset cartridge.
Tool operates too fast.	Power source components not adjusted correctly.	Refer to power source operator's manual for recommended speed, flow, and pressure settings.
	Tool components sticking or binding.	Check for dirt or gummy deposits. Clean components. Check for worn or damaged components. Replace components.
	Flow control cartridge not operating properly.	Remove and clean cartridge. DO NOT DISASSEMBLE CARTRIDGE. Install a new, factory preset cartridge.

Troubleshooting (cont'd)

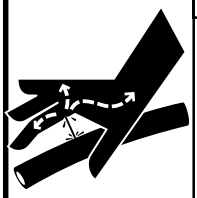
PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Tool feels hot.	Hydraulic fluid level low.	Check fluid level. Fill to FULL mark. Check system for leaks.
	Hydraulic fluid viscosity too light.	Use fluid viscosity recommended. See Recommended Hydraulic Fluids.
	Hydraulic fluid dirty.	Drain reservoir, flush and fill with clean fluid. Change filter.
	Tool control valve stuck in partial power-ON position.	Free valve so it returns to neutral position.
	Power source components not adjusted correctly.	Refer to power source operator's manual for recommended speed, flow, and pressure settings.
	Dirt, contaminants, etc., in tool components.	Disassemble tool. Clean components.
	Worn or damaged O-rings or gaskets.	Replace worn or damaged O-rings or gaskets.
	Tool components worn or damaged.	Disassemble tool. Replace worn or damaged components.

Troubleshooting (cont'd)

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Tool leaks hydraulic fluid.	Tool components loose.	Tighten component hardware.
	Worn or damaged O-rings or gaskets.	Replace worn or damaged O-rings or gaskets.
	Tool components worn or damaged.	Disassemble tool. Replace worn or damaged components.
Tool trigger plunger sticks or works hard.	Check for dirt or gummy deposits.	Clean components.
	Trigger binding (trigger bent, trigger pivot pin too tight, etc.).	Inspect, adjust trigger where binding occurs.
Power source works, but tool lacks power or does not operate.	Inappropriate hydraulic system.	Check type of hydraulic power source, Open-Center or Closed-Center.
Power source works, but tool lacks power and/or impacts slowly.	Relief valve setting in tool not correct.	Return tool to factory for service.
	Adjustable torque output screw incorrectly set limiting hydraulic fluid-flow.	Turn torque output screw counter-clockwise to increase flow until desired output torque is obtained.
	Flow control cartridge not operating properly.	Remove and clean cartridge. DO NOT DISASSEMBLE CARTRIDGE. Install a new, factory preset cartridge.
Tool appears to operate normally but lacks impact power or does not drill.	Impact mechanism dry. Grease has been thrown off.	Regrease impact mechanism. See the Maintenance Schedule section of this manual.
	Incorrect grease or overpacked.	Regrease impact mechanism. See the Maintenance Schedule section of this manual.
Grease leaks at anvil bushing, wrench warm.	Heavy duty cycle, heat caused grease to liquify.	Normal, mechanism may require grease more often, see the Maintenance Schedule section of this manual.

Disassembly

COMPLETE DISASSEMBLY OF THE TOOL IS NOT RECOMMENDED. RETURN THE TOOL TO YOUR NEAREST AUTHORIZED GREENLEE FAIRMONT DISTRIBUTOR OR TO THE FACTORY.



⚠WARNING

Skin injection hazard:

Oil under pressure easily punctures skin causing serious injury, gangrene or death. If injured, seek medical attention immediately.

Do not use fingers or hands to check for leaks.

Depressurize hydraulic system before servicing.

⚠WARNING

Do not disconnect tool, hoses or fittings while the power unit is running or if the hydraulic fluid is hot. Exposure to hot hydraulic fluid can cause serious burns.

IMPORTANT

Procedure for disconnecting tool, removing hydraulic lines, fittings or components:

1. Stop the power source.
2. Depressurize the hydraulic system.
3. Disconnect hydraulic hoses from tool. Remove lines, fittings or components slowly to release any trapped pressure.

The disassembly procedure is divided into sections of the tool. Complete disassembly of the tool is seldom necessary. Disassemble only the areas necessary to correct the problem. See Exploded View and Parts List for identification of parts as they are removed.

Disassembly should be done on a flat, clean surface. Some parts may fall free during disassembly. To prevent part loss or damage, keep the tool as close to the working surface as possible.

Inspect all parts as they are disassembled and mating parts in the tool that are not removed for signs of damage, wear, cracks, etc. Replace any parts which appear to be damaged.

When disassembling tool for service it is recommended that O-rings, back-up rings and gaskets be replaced.

Quick-Change Chuck (See Figure 7)

1. Remove adapter (61) from retaining sleeve (50).
2. Press on thrust ring (52) to expose thrust ring lock (51). Remove thrust ring lock (51) thrust ring (52) and spring (53). Slide retaining sleeve (50) off anvil (49) and remove the two steel balls (54).
3. Remove the second thrust ring lock (51) if anvil (49) needs to be removed from hammer case cap (55).

   Note: To prevent the loss of any steel balls, it is recommended to perform this step over a clean, empty container to catch any components that may fall free.

   Note: If either thrust ring (51) becomes sprung or out-of-round during disassembly, discard and replace with a new ring.

Hammer Case Components

1. Using flats provided on hammer case cap (55), unscrew cap and remove from tool.

   The remaining impact mechanism parts can now be removed from tool (items 46, 47 & 48).
2. Remove spacer (45), thrust bearing (43) and thrust washers (44) from hammer case cavity.

Motor (See Figures 6 and 7)

1. Remove socket head cap screws (16) and pull motor cap (6) from handle (1). Remove gasket (15). If necessary, remove dowel pins (14).
2. Pull idler shaft (13) with gear (10) from handle. Remove gear (10) from idler shaft (13). If necessary, remove drive pin (12) and retaining clip (11) from idler shaft (13).
3. Remove retaining clip (11) gear (10) and Woodruff key (9) from drive shaft (8). Push drive shaft (8) toward hammer case cavity and remove from handle (1).

Bearing Replacement

Note: If bearings in motor cap (6) or bearings in handle (1) are damaged or worn, Greenlee Fairmont recommends replacing the component as an assembly with the bearings already pressed in or return it to Greenlee Fairmont for repair.

Disassembly (cont'd)

Trigger and Control Spool—48696
(See Figures 5 and 7)

1. Remove spring pin (42) from trigger spool (29) by pressing or tapping with a hammer and punch.

   Note: Support trigger (41) so pressing or tapping does not bend trigger spool (29).

2. Remove washer (39), spring (38), snap ring (37), and washer (36). Trigger spool (29) may now be pushed out of handle (1). Push spool toward trigger side of tool.
3. Remove snap ring (33). Open-Center/Closed-Center spool (31) may now be removed to service O-ring (34).
4. Ball (32) is loose in this assembly. Take caution to catch ball when it falls free.

Reversing Spool (See Figure 4)

1. Remove reversing spool (19) by loosening and removing cap (24) on left side of tool and pulling spool (19) out right side of tool.

   Note: For tool orientation (left and right) grip tool as you would use it and view tool looking at motor cap (6). See Figure 6.

   Note: Attempting to push the reversing spool (19) the opposite way through the bore will cause damage to O-rings (25 & 26) and could allow particles of O-ring to get into the motor.

2. Remove plug (22), spring (21) and poppet (20).
3. Repeat procedure for right side of reversing spool (19).

   Note: If set screws (23 & 60) have not been disturbed and internal components are returned to the same side of spool (19), the relief valve setting may not have been affected and tool will perform properly when assembled.

   Note: Relief valve setting may require checking when tool is reassembled.

Flow Control Cartridge (See Figure 7)

Remove 11/16 internal retaining ring (66). Pull flow control cartridge (63) out of handle. Remove O-rings (64 & 65) from cartridge.

Note: Do not disassemble flow control cartridge. If necessary, replace with a new, factory preset cartridge.

Adjustable Torque Output Screw (See Figure 7)

Remove spring pin (70) from handle. Turn torque output screw (67) counterclockwise until threads are free. Pull screw out of handle. Remove O-ring (68) and back-up ring (69) from screw.

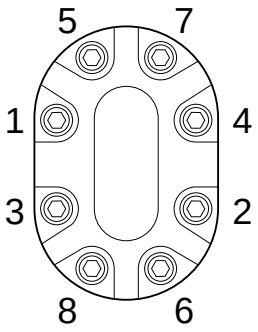
Assembly

Inspection

1. Motor Cap (6) and Handle (1). Mating surfaces, gear cavities, oil passageways, etc.; must be smooth and free of grooves or nicks. If either component has grooves or nicks, replace the component as an assembly with the bearings already pressed in.
2. Drive Shaft (8), Idler Shaft (13) and Gears (10). All surfaces, including gear teeth, must be smooth and free of grooves or nicks. If any component is damaged, replace the component.
3. Bearing (3 & 7). Hold motor cap or handle assembly in one hand or place on a flat surface. Insert drive shaft (8) or idler shaft (13) into bearing. Spin the shaft. The shaft should turn smoothly. If any roughness is noted, Greenlee Fairmont recommends replacing the component as an assembly with the bearings already pressed in.
4. Bearing (56) in hammer case cap (55). Slide anvil (49) into bearing (56). Turn anvil (49). The anvil should turn smoothly. If any roughness is noted, check anvil surface. If problem is the bearing surface, replace hammer case cap assembly as an assembly with the bearing already pressed in.
5. Thrust bearing (43) and thrust washers (44). Turn bearing on washer surfaces. Bearing should roll smoothly. If any roughness is felt, replace the components.
6. Trigger Spool (29). All surfaces must be free of grooves or nicks. If the component has grooves or nicks, replace the component.
7. Reversing Spool (19). All surfaces must be free of grooves or nicks. If the component has grooves or nicks, replace the component.
8. Flow Control Cartridge (63): All surfaces must be free of grooves, nicks or cracks. DO NOT DISASSEMBLE FLOW CONTROL CARTRIDGE. If necessary, replace with a new, factory preset cartridge.
9. Adjustable Torque Output Screw (67): All surfaces and threads must be free of grooves, nicks or cracks. If any component has grooves, nicks, or cracks, replace the component.
10. Hammer Frame (46), Anvil (49), Hammers (47) and Pins (48). All surfaces must be free of grooves, nicks, or cracks. If component has grooves, nicks or cracks, replace the component.
11. O-rings. Always replace O-rings in components that have been disassembled with new O-rings during assembly. A packing kit is available that includes all O-rings and gaskets.
12. Gasket (15). Always replace gaskets when motor cap or hammer case is removed from handle assembly.

Assembly (cont'd)

Figure 3
Torque Sequence



When assembling parts, refer to Exploded View and Parts List for correct orientation and placement of parts.

Clean grease and oil from all parts (take care to protect eyes), then dry thoroughly. Do not expose O-rings or other packing components to cleaning agent for long periods of time.

Inspect all parts as they are assembled for signs of damage, wear, cracks, etc. Do not install any parts which appear to be damaged.

Apply hydraulic fluid or O-ring lubricant to all O-rings and all metal surfaces which O-rings must slide over. When installing an O-ring over a sharp edge, use a rolling action to avoid damage to O-ring.

Wherever assembled parts cause metal-to-metal contact coat the surfaces with hydraulic fluid or O-ring lubricant.

Motor (See Figures 6 and 7)

1. Install new O-ring (4) and back-up ring (5) into drive shaft opening of handle (1) using an O-ring tool. Be careful, do not damage O-ring during installation.
2. Lubricate drive shaft (8) and slide into the opening in handle (1) through the O-rings and back-up ring from the impact mechanism side of the tool.
3. Install woodruff key (9) and one gear (10) onto drive shaft (8), guiding the keyway in gear (10) over the Woodruff key (9). Fasten gear to drive shaft with retaining clip (11).
4. Install drive pin (12) into idler shaft (13), if removed. Slide remaining gear (10) onto idler shaft (13), guiding the keyway in gear (10) over drive pin (12). Install idler shaft and gear into handle (1), meshing the two gears (10) together. Use retaining clip (11) to restrain lateral movement of idler shaft.
5. Install dowel pins (14) into handle (1) if removed. Install new gasket (15).
6. Install motor cap (6) onto handle (1).
7. Secure motor cap (6) to handle (1) with cap screws (16). Torque cap screws (16) to 80 inch-pounds. Follow torque sequence shown in Figure 3.

Reversing Spool (See Figure 4)

1. Install O-ring (25) onto reversing spool (19). Replace O-ring (26) in handle (1).
2. Install O-ring (30) on plug (22). At O-ring end of spool (19) install poppet (20), spring (21) and plug (22). Secure assembly with cap (24).
3. Slide reversing spool assembly into handle (1), as shown in Figure 4.
4. Install poppet (20), spring (21) and plug (22) into opposite end of spool (19). Secure with cap (24). Use two wrenches on cap (24) and tighten to 23 foot-pounds.

Trigger, Trigger Spool, and Open-Center/Closed-Center Spool
(See Figures 5 and 7)

1. Install O-ring (34) on Open-Center/Closed-Center spool (31). Install ball (32) in trigger spool (29) cavity. Install Open-Center/Closed-Center spool (31) into trigger spool (29). Secure with snap-ring (33).
2. Install O-ring (35) onto trigger spool assembly. Replace O-ring (27) and back-up ring (28) in handle (1).
3. Slide trigger spool assembly as shown in Figure 5 into handle (1) from trigger side of tool.
4. Slide washer (36) onto trigger spool (29) and secure with snap-ring (37).
5. Slide spring (38) and washer (39) onto trigger spool (29).
6. Secure trigger (41) to trigger spool (29) with spring pin (42).
7. Secure link (40) to handle (1) and trigger (41) with spring pins (42).

   Note: Support trigger (41) so pressing or tapping on spring pins (42) does not bend trigger spool (29).

Flow Control Cartridge (See Figure 7)

Install O-rings (64 & 65) on flow control cartridge (63). Install flow control cartridge in cavity of handle (1). Secure using 11/16 internal retaining ring (66).

Adjustable Torque Output Screw (See Figure 7**)**

Install O-ring (68) and back-up ring (69) on torque output screw (67). Install screw in cavity of handle (1). Turn screw clockwise until threads are engaged in threads of handle. Secure screw in handle using 5/64 x 7/8-inch spring pin (70).

Assembly (cont'd)

Hammer Case Components

Note: Grease required for assembly of impact mechanism = Mobil Grease HP.

1. Apply grease to thrust bearing (43) and work into needle rollers. Apply light film of grease to thrust washers (44), stack thrust washers and thrust bearing properly and place over drive shaft (8).
2. Place spacer (45) over drive shaft (8) with flange part of spacer up.

Impact Mechanism

1. Before assembly, grease surfaces of hammer frame (46), hammers (47), hammer pin (48) and anvil (49).
2. Install the two hammers (47) 180° from each other, into the hammer frame (46). Install the pins (48) into the hammer frame and through the hammers, then slide assembly onto spline of drive shaft (8).
3. Pack the hammer frame (46) center space with grease. Install the anvil (49) into the hammer frame (46) and through the hammers (47).
4. Install O-ring (62) over threads on hammer case cap (55).
5. Slide hammer case cap assembly (55 & 56) over anvil (49) and using flats on cap (55) screw into handle (1), tighten securely.

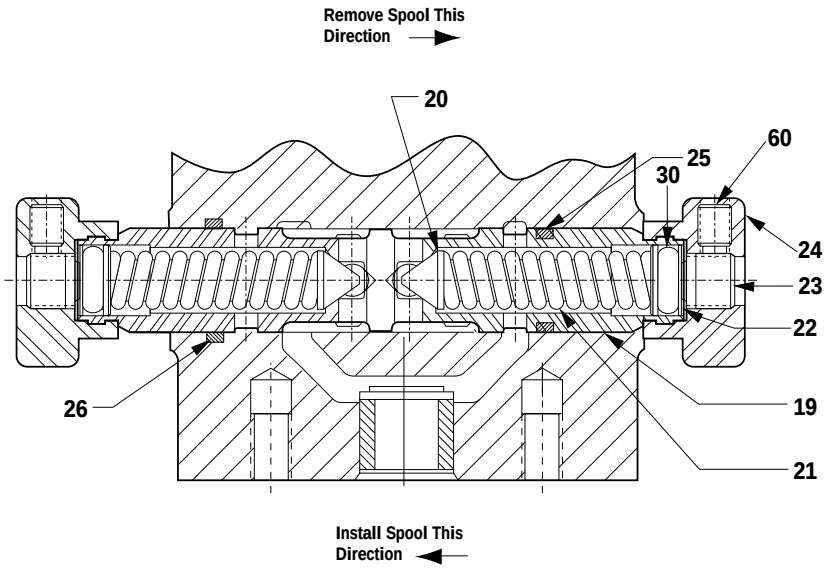
   Note: Apply lubrication to threads.

Quick-Change Chuck

1. Slide thrust ring lock (51) over anvil (49) to groove closest to hammer case cap (55).
2. Insert two balls (54) into holes in anvil (49). Slide retaining sleeve (50) onto anvil (49) "Open" side up. Insert spring (53) and thrust ring (52) into retaining sleeve (50). Depress thrust ring (52) and install thrust ring lock (51) on anvil (49). This will secure retaining sleeve (50) to anvil (49). Insert drive shank (61) into chuck.

   Note: If either thrust ring (51) becomes sprung or out-of-round during disassembly, discard and replace with a new ring.

Figure 4



Exploded View

Figure 5
Spool shown in Open-Center Position

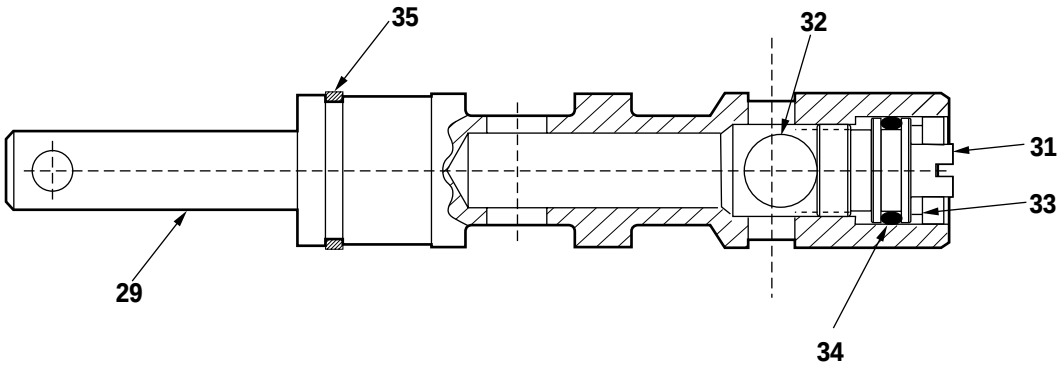
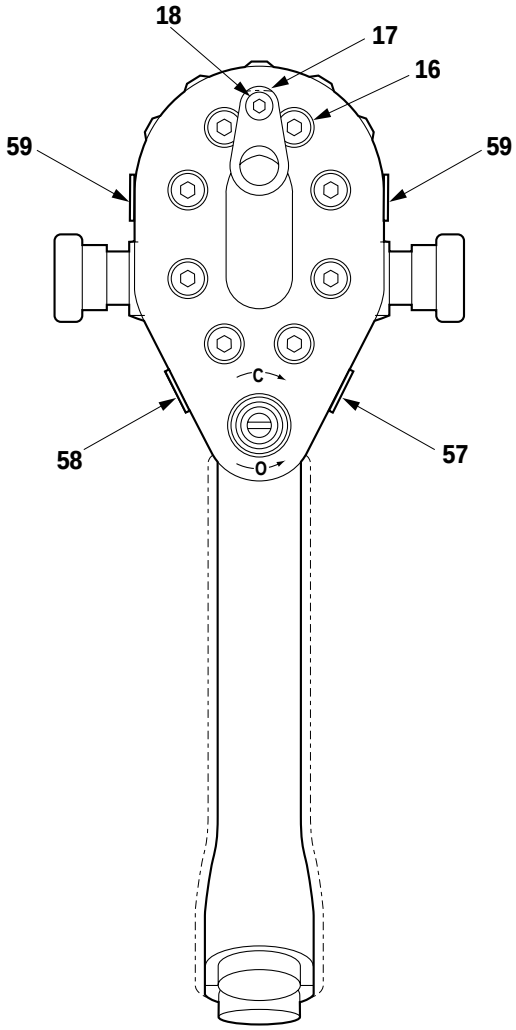
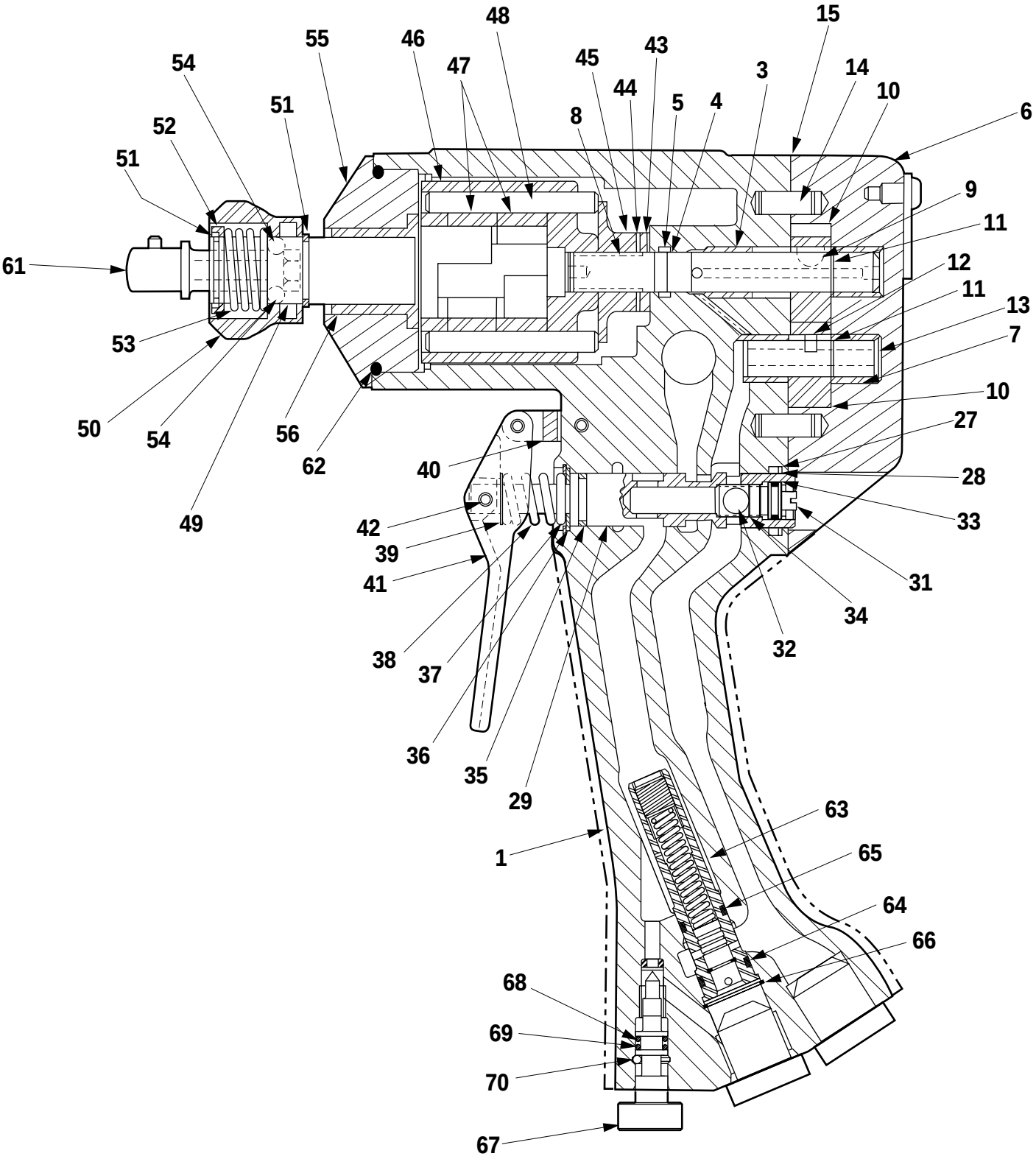


Figure 6



Exploded View (cont'd)

Figure 7



Parts List

KEY	UPC NO.	PART NO.	DESCRIPTION	QTY.
1		48752	HANDLE ASSY.	1
3	41591	F016728	Bearing	2
4*		48706	O-Ring	1
5*		48306	Back-up Ring	1
6		48307	MOTOR CAP	1
7	41591	F016728	Bearing	2
8		48279	Drive Shaft	1
9	41592	F016729	Key	1
10	41630	F017105	11-Tooth Gear	2
11	41621	F017010	Snap Ring	2
12	41593	F016730	Drive Pin	1
13	40168	104110K	Idler Shaft	1
14	41624	F017014	Dowel Pin	2
15*		48363	Gasket	1
16	41889	F021674	Socket Hd Cap Screw	8
17		48328	Eye	1
18	43701	F021676	Socket Hd Cap Screw	1
-		48382	REVERSING SPOOL ASSY.	1
19		48361	Reversing Spool	1
20		48515	Poppet	2
21		48543	Spring	2
22		48621	Plug	2
23		905 0765.7	Set Screw	2
24		48380	Cap	2
60		48622	Set Screw	2
25*	42050	F023449	O-Ring	1
26*	48889	48889	O-Ring	1
27*	48539	F011743	O-Ring	1
28*	43312	F021451	Back-up Ring	1
29		48696	Spool-Trigger	1
30*	42047	F023379	O-Ring	2
31		48697	OC/CC Spool	1
32	43829	F021411	Ball	1
33	48540	F021711	Snap Ring	1
34*	41331	F010777	O-Ring	1
35*	41491	F015261	O-Ring	1
36		48310	Washer	1
37	41648	F017595	Snap Ring	1
38		48311	Spring	1
39		48312	Washer	1
40		48313	Link	1
41		48360	Trigger	1
42	48542	F015810	Spring Pin	3
43		48318	Thrust Bearing	1
44		48319	Thrust Washer	2
45		48364	Spacer	1
-		48516	HAMMER CASE CAP ASSY.	
55		48320	Hammer Case Cap	1
56		48517	Bearing	1
57	43550	158055	Decal - Safety	1
58		48512	Decal - Pressure/Flow	1
59		48513	Decal - Greenlee Textron	2
62*	41803	F020780	O-Ring	1

Parts List (cont'd)

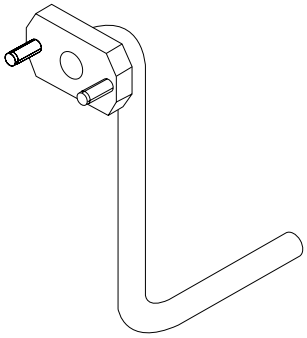
For Model 48755 Only

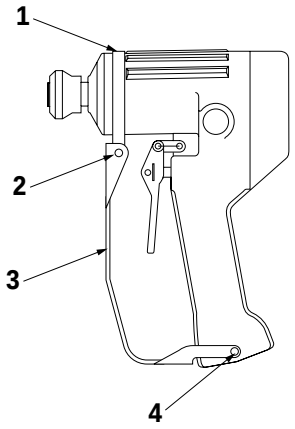
KEY	UPC NO.	PART NO.	DESCRIPTION	QTY.
-		48343	IMPACT MECHANISM	
46		48344	Hammer Frame	1
47		48345	Hammer	2
48		48346	Hammer Pin	2
49		48347	Anvil - Quick Change	1
50		48348	Retaining Sleeve	1
51		48349	Thrust Ring Lock	2
52		48350	Thrust Ring	1
53		48351	Sleeve Spring	1
54		48352	Ball	2
61	41515	F015321	Adaptor	1

For Model 48760 Only

KEY	UPC NO.	PART NO.	DESCRIPTION	QTY.
-		48398	IMPACT MECHANISM	
46		48344	Hammer Frame	1
47		48345	Hammer	2
48		48346	Hammer Pin	2
49		48397	Anvil - 1/2" Sq. Drive	1
63	43302	138338	FLOW CONTROL CARTRIDGE	1
64*	41491	F015261	O-Ring, 1/2 x 1/16 - 70	1
65*	41627	F017078	O-Ring, 7/16 x 1/16 - 70	1
66	41600	F016737	Retaining Ring, 11/16 Internal	1
67	41094	138311	Screw, Adjustable Torque Output	1
68*	42729	L080005	O-Ring, 1/4 x 1/16 - 70	1
69*	41843	F021471	Back-up ring	1
70	42053	F023467	Spring Pin, 5/64 x 7/8	1
*		48756	Seal Kit	

Accessories





Optional Accessories

PART NO.	DESCRIPTION	QTY.
49004	Kit—Relief Pressure Check	1

Trigger Guard 48518

KEY	UPC NO.	PART NO.	DESCRIPTION	QTY.
		48518	TRIGGER GUARD GROUP	1
1		48399	Bracket	1
2	43701	F021676	#10-32 x 3/8" Socket Button Head Cap Screw	2
3		48327	Trigger Guard	1
4	41875	F021610	#10-32 x 1/2" Button Head Hex Cap Screw	2

1/2" Square Drive Impact Socket Set (not shown)

KEY	UPC NO.	PART NO.	DESCRIPTION	QTY.
	41769	F020028	1/2 INCH SQUARE DRIVE IMPACT SOCKET SET	1
	41535	F015424	Impact Socket, 5/8	1
	41536	F015426	Impact Socket, 3/4	1
	41537	F015427	Impact Socket, 13/16	1
	41538	F015428	Impact Socket, 7/8	1
	41539	F015430	Impact Socket, 1	1
	41540	F015431	Impact Socket, 1-1/16	1
	41515	F015321	Adapter, Adapts Quick Change Chuck to 1/2" Square Drive	1

1/2" Square Socket x 5/8" Hex Socket Adapter (not shown)

KEY	UPC NO.	PART NO.	DESCRIPTION	QTY.
	41515	F020538	Adapter, 1/2 Square Socket x 5/8 Hex Socket.	1

Screwdriver Bits (not illustrated)

Note: For screwdriver applications, purchase Apex, or equivalent, 7/16 inch hex power drives for the following applicable screw head types.

Phillips, Slotted, Torex, Pozidriv, Sel-O-Fit, Frearson, Socket Head, Torq-Set

Appendix A

SELECTION, INSTALLATION AND MAINTENANCE OF HOSE AND HOSE ASSEMBLIES

- SAE J1273 MAY 1986*

SAE RECOMMENDED PRACTICE

The following recommendations on selection, installation and maintenance of hose and hose assemblies was established by the S.A.E. in 1979 and reaffirmed May 1986. Please read these general instructions carefully.

1. SCOPE

Hose (also includes hose assemblies) has a finite life and there are a number of factors which will reduce its life.

This recommended practice is intended as a guide to assist system designers and/or users in the selection, installation, and maintenance of hose. The designers and users must make a systematic review of each application and then select, install, and maintain the hose to fulfill the requirements of the application. The following are general guidelines and are not necessarily a complete list.

⚠WARNING

Improper selection, installation or maintenance may result in premature failures, bodily injury, or property damage.

2. SELECTION

The following is a list of factors which must be considered before final hose selection can be made.

2.1 Pressure - After determining the system pressure, hose selection must be made so that the recommended maximum operating pressure is equal to or greater than the system pressure. Surge pressures higher than the maximum operating pressure will shorten hose life and must be taken into account by the hydraulic designer.

2.2 Suction - Hoses used for suction applications must be selected to insure the hose will withstand the negative pressure of the system.

2.3 Temperature - Care must be taken to insure that fluid and ambient temperatures, both static and transient, do not exceed the limitations of the hose. Special care must be taken when routing near hot manifolds.

2.4 Fluid Compatibility - Hose selection must assure compatibility of the hose tube, cover, and fittings with fluid used. Additional caution must be observed in hose selection for gaseous applications.

2.5 Size - Transmission of power by means of pressurized fluid varies with pressure and rate of flow. The size of the components must be adequate to keep pressure losses to a minimum and avoid damage to the hose due to heat generation or excessive turbulence.

2.6 Routing - Attention must be given to optimum routing to minimize inherent problems.

2.7 Environment - Care must be taken to insure that the hose and fittings are either compatible with or protected from the environment to which they are exposed. Environmental conditions such as ultraviolet light, ozone, salt water, chemicals, and air pollutants can cause degradation and premature failure and, therefore, must be considered.

2.8 Mechanical Loads - External forces can significantly reduce hose life. Mechanical loads which must be considered include excessive flexing, twist, kinking, tensile or side loads, bend radius, and vibration. Use of swivel type fittings or adapters may be required to insure no twist is put in the hose. Unusual applications may require special testing prior to hose selection.

2.9 Abrasion - While a hose is designed with a reasonable level of abrasion resistance, care must be taken to protect the hose from excessive abrasion which can result in erosion, snagging and cutting of the hose cover. Exposure of the reinforcement will significantly accelerate hose failure.

2.10 Proper End Fitting - Care must be taken to insure proper compatibility exists between the hose and coupling selected based on the manufacturer's recommendations substantiated by testing to industry standards such as SAE J517d (November, 1976).

2.11 Length - When establishing proper hose length, motion absorption, hose length changes due to pressure, as well as hose and machine tolerances must be considered.

2.12 Specifications and Standards - When selecting hose, government, industry, and manufacturer's specifications and recommendations must be reviewed and applicable.

2.13 Hose Cleanliness - Hose components vary in cleanliness levels. Care must be taken to insure that the assemblies selected have an adequate level of cleanliness for the application.

2.14 Electrical Conductivity - Certain applications require that the hose be non-conductive to prevent electrical current flow. Other applications require the hose to be sufficiently conductive to drain off static electricity. Hose and fittings must be chosen with these needs in mind.

Appendix A (cont'd)

3. INSTALLATION

After selection of proper hose, the following factors must be considered by the installer.

3.1 Pre-Installation Inspection - Prior to installation, a careful examination of the hose must be performed. All components must be checked for correct style, size, and length. In addition, the hose must be examined for cleanliness, I.D. obstructions, blisters, loose cover, or any other visual defects.

3.2 Follow Manufacturers' Assembly Instructions.

3.3 Minimum Bend Radius - Installation at less than minimum bend radius may significantly reduce hose life. Particular attention must be given to preclude sharp bending at the hose/fitting juncture.

3.4 Twist Angle and Orientation - Hose installations must be such that relative motion of machine components produces bending of the hose rather than twisting.

3.5 Securement - In many applications, it may be necessary to restrain, protect, or guide the hose to protect it from damage by unnecessary flexing, pressure surges, and contact with other mechanical components. Care must be taken to insure such restraints do not produce additional stress or wear points.

3.6 Proper Condition of Ports - Proper physical installation of the hose requires a correctly installed port connection while insuring that no twist or torque is put into the hose.

3.7 Avoid External Damage - Proper installation is not complete without insuring tensile loads, side loads, kinking, flattening, potential abrasion, thread damage, or damage to sealing surfaces are corrected or eliminated.

3.8 System Check Out - After completing the installation, all air entrapment must be eliminated and the system pressurized to the maximum system pressure and checked for proper function and freedom from leaks.

Note: Avoid potential hazardous area while testing.

4. MAINTENANCE

Even with proper selection and installation, hose life may be significantly reduced without a continuing maintenance program. Frequency should be determined by the severity of the application and risk potential.

A maintenance program should include the following as a minimum.

4.1 Hose Storage - Hose products in storage can be affected adversely by temperature, humidity, ozone, sunlight, oils, solvents, corrosive liquids and fumes, insects, rodents and radioactive material. Storage areas should be relatively cool and dark, and free of dust, dirt, dampness and mildew.

4.2 Visual Inspection - Any of the following conditions requires replacement of the hose:

(a) Leaks at fitting or in hose. (Leaking fluid is a fire hazard).

(b) Damaged, cut or abraded cover. (Any reinforcement exposed).

(c) Kinked, crushed, flattened or twisted hose.

(d) Hard, stiff, heat cracked or charred hose.

(e) Blistered, soft degraded or loose cover.

(f) Cracked, damaged, or badly corroded fittings.

(g) Fitting Slippage on hose.

4.3 Visual Inspection - The following items must be tightened, repaired, or replaced as required:

(a) Leaking port conditions.

(b) Clamps, guards, shields.

(c) Remove excessive dirt buildup.

(d) System fluid level, fluid type, and any air entrapment.

4.4 Functional Test - Operate the system at maximum operating pressure and check for possible malfunctions and freedom from leaks.

Note: Avoid potential hazardous areas while testing.

4.5 Replacement Intervals - Specific replacement intervals must be considered based on previous service life, government or industry recommendations, or when failures could result in unacceptable down time, damage, or injury risk.

GREENLEE FAIRMONT TEXTRON

Greenlee Textron / Subsidiary of Textron Inc.
4455 Boeing Drive, Rockford, IL 61109-2988 USA
General Offices: 815/397-7070
Customer Center and Field Service: 800/435-0786
Fax (24 Hour) Customer Center: 800/451-2632 • 815/397-1865
Canada Fax (24 Hour) Customer Center: 800/524-2853

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