1/2” REVERSIBLE HYDRAULIC DRILL INSTRUCTIONS

REIMANN & GEORGER CORPORATION
CONSTRUCTION PRODUCTS **BUFFALO, NY**
LE 09/10 F

Specifications

Reversible Drill

Application	Refer to "Accessories"
Type of Hydraulic System	Open-center or closed-center
Hydraulic Ports	
Pressure	9/16–18 SAE O-ring boss
Tank	3/4–16 SAE O-ring boss
Chuck Size (maximum shank diameter)	12 mm (1/2")
Revolutions per Minute @	
15.1 l/min (4 gpm)	866
22.7 l/min (6 gpm)	1300
30 l/min (8 gpm)	1733
Noise Levels	
Sound Power Level (unloaded)	85 L_{WA}
Vibration Level	16.3 m/s^2
Mass/Weight	2.7 kg (6 lb)
Length	191 mm (7.5")
Height	229 mm (9")
Width	76.2 mm (3")

Hydraulic Power Source

⚠WARNING

Do not exceed the following hydraulic power source maximums:

- Hydraulic flow: 30.3 l/min (8 gpm)
- Pressure relief: 138 bar (2000 psi)
- Back pressure: 13.8 bar (200 psi)

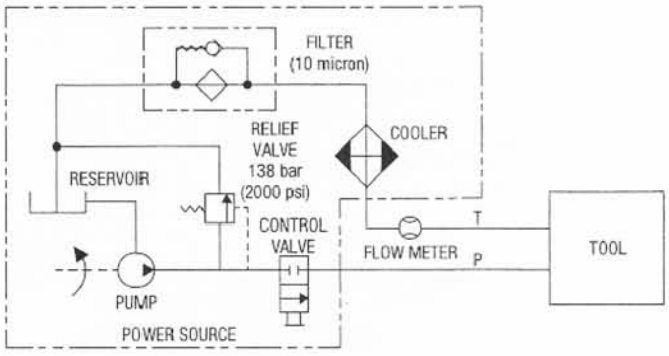
Failure to observe this warning could result in severe injury or death.

Type of Hydraulic System	Open-center or closed-center
Flow	
Minimum	15.1 l/min (4 gpm)
Recommended	22.7 l/min (6 gpm)
Maximum	30.3 l/min (8 gpm)
Filtration	10 micron (nominal)
Pressure Relief Setting	138 bar (2000 psi)
Back Pressure (maximum)*	13.8 bar (200 psi)

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

1. Maximum hydraulic fluid temperature must not exceed 60 °C (140 °F). A sufficient oil cooling capacity is needed to limit the hydraulic fluid temperature.
2. Hydraulic flow must not exceed recommended amount (see above). Install a flow meter in the return line to measure the rate of hydraulic flow before using the tool.
3. Pressure relief valve setting must not exceed 138 bar (2000 psi) at the tool's maximum flow. Locate the pressure relief valve in the supply circuit to limit excessive hydraulic pressure to the tool.

Hydraulic Schematic



Recommended Hydraulic Fluids

Use any non-detergent, petroleum-based hydraulic fluid which meets the following specifications or HTMA specifications.

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

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Safety

Safety is essential in the use and maintenance of **RGC hydraulic** tools and equipment. This instruction manual and any markings on the tool provide information for avoiding hazards and unsafe practices related to the use of this tool. Observe all of the safety information provided.

Purpose of this Manual

This manual is intended to familiarize all personnel with the safe operation and maintenance procedures for the **RGC 1/2" Reversible Hydraulic Drill.**

Keep this manual available to all personnel.

Replacement manuals are available upon request at no charge at **www.rgcproducts.com.**

IMPORTANT SAFETY INFORMATION

SAFETY ALERT SYMBOL

This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The signal word, defined below, indicates the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.

⚠DANGER

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

⚠WARNING

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

⚠CAUTION

Hazards or unsafe practices which, if not avoided, MAY result in injury or property damage.

⚠WARNING

Read and understand all of the instructions and safety information in this manual before operating or servicing this tool.

Failure to observe this warning could result in severe 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.
- 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.

⚠WARNING

Skin injection hazard:

- Do not use hands to check for leaks.
- Do not hold hose or couplers while the hydraulic system is pressurized.
- Depressurize the hydraulic system before servicing.

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

⚠WARNING

Wear eye protection when operating or servicing this tool.

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

⚠WARNING

Wear hearing protection when using this tool.

Long-term exposure to high noise levels could result in hearing damage.

IMPORTANT SAFETY INFORMATION

⚠WARNING

- Remove the chuck key from the chuck before drilling. Operation with the key in the chuck can result in severe injury.
- Inspect accessories before use. Discard accessories that have cracks, chips or gouges.
- 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 the operator does not control the tool.
- Do not lock the trigger in the power-ON position. The operator cannot stop the tool when the trigger is locked.

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

⚠WARNING

Tool and accessory may be hot during and after operation. Allow to cool before handling, or handle with heat-resistant gloves.

Failure to observe this warning could result in severe injury.

⚠WARNING

Do not exceed the maximum hydraulic flow, pressure relief or back pressure listed in the Specifications and Parts manual.

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

⚠WARNING

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

⚠WARNING

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

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

⚠WARNING

- Wear protective gloves when handling, removing and installing drill bits. Drill bits can cut even when stationary.
- Inspect tool before use. Replace any worn, damaged or missing parts with Greenlee Utility replacement parts. An improperly assembled tool can malfunction, injuring nearby personnel.
- Inspect the 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 the manufacturer's intended purpose only. Use other than that which is described in this manual can result in injury or property damage.
- Ensure that all bystanders are clear of the work area when handling, starting, and operating the tool. Nearby personnel can be injured by flying debris or by flying parts in the event of a tool malfunction.

IMPORTANT SAFETY INFORMATION

⚠CAUTION

Hydraulic oil can cause skin irritation.

- Handle the tool and hoses with care to prevent skin contact with hydraulic oil.
- In case of accidental skin contact with hydraulic oil, wash the affected area immediately to remove the oil.

Failure to observe these precautions may result in injury.

IMPORTANT

Emergency stop procedure:

1. Release the trigger.
2. Shut off the hydraulic power source.

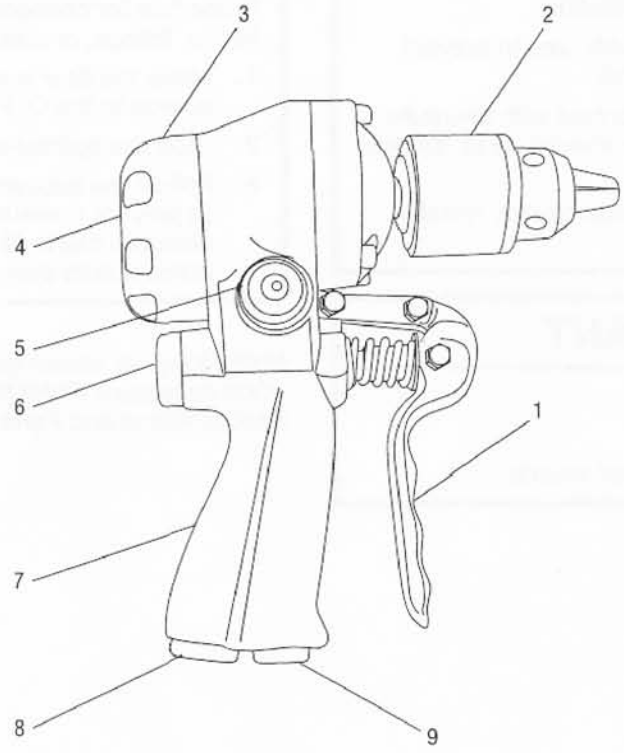
IMPORTANT

Procedure for connecting or disconnecting hydraulic hoses, fittings, or components:

1. Move the flow lever on the hydraulic power source to the OFF position.
2. Stop the hydraulic power source.
3. Follow the sequence under "Hose Connections" to prevent pressure buildup. In case some pressure has built up, loosen hoses, fittings, or components slowly.

Note: Keep all decals clean and legible, and replace when necessary. Refer to the decals listed in the Specifications and Parts manual.

Identification



1. Trigger
2. Chuck
3. Motor Cap
4. Serial Number
5. Directional Spool
6. Super Spool™
7. Handle
8. Tank Port
9. Pressure Port

Setting the Super Spool™

The Super Spool™ allows the tool to be used with either Open-Center or Closed-Center hydraulic systems.

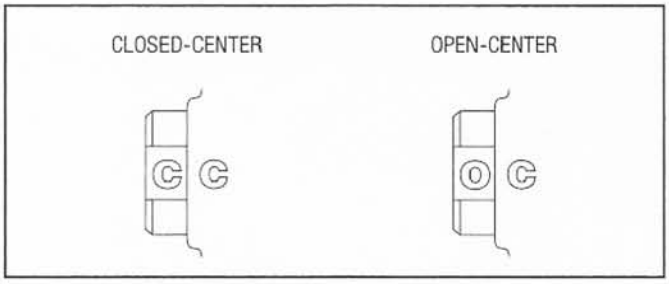
Open-Center Hydraulic System

Use a wrench to turn the Super Spool™ until the letter "O" on the spool is aligned with the letter "C" on the tool handle.

Closed-Center Hydraulic System

Use a wrench to turn the Super Spool™ until the letter "C" on the spool is aligned with the letter "C" on the tool handle.

Setting the Super Spool™ Position



Installing and Removing Accessories

⚠WARNING

Inspect accessories before use. Discard accessories that have cracks, chips or gouges.

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

1. Inspect the chuck. Remove any dirt or other contamination.
2. Insert the drill bit far enough to allow full contact with the chuck jaws, but not so far that the jaws contact the flute of the bit. Hand-tighten by turning the outer barrel of the chuck.
3. Insert the chuck key into one of the holes in the chuck and twist clockwise to tighten. Repeat for the other two holes.
4. To remove the drill bit, insert the chuck key into one of the holes in the chuck and twist counterclockwise to loosen.

Hoses and Fittings

Installation and Maintenance

See last pages of this manual.

Setup

1. Stop the hydraulic power source.
2. Install a drill bit according to the instructions under "Installing and Removing Accessories."
3. Connect the hydraulic hoses according to the instructions under "Hose Connections."

Hose Connections

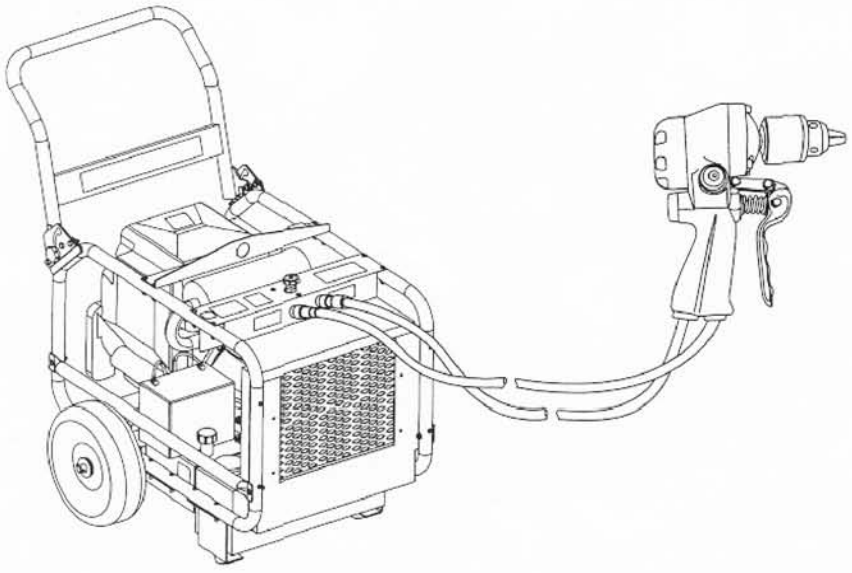
Connecting Hoses

1. Move the flow lever on the power source to the OFF position.
2. Stop the hydraulic power source.
3. Connect the tank hose to the tank (or return) port on the power source, and then to the tank port on the tool.
4. Connect the pressure hose to the pressure port on the tool, and then to the pressure (or supply) port on the power source.

Disconnecting Hoses

1. Move the flow lever on the power source to the OFF position.
2. Stop the hydraulic power source.
3. Disconnect the pressure hose from the power source, and then from the tool.
4. Disconnect the tank hose from the tool, and then from the power source.
5. Install dust caps over the ports to prevent contamination.

Typical Setup



Operation

⚠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.
- 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.

⚠WARNING

Skin injection hazard:

- Do not use hands to check for leaks.
- Do not hold hose or couplers while the hydraulic system is pressurized.
- Depressurize the hydraulic system before servicing.

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

⚠WARNING

Wear eye protection when operating or servicing this tool.

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

⚠WARNING

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.

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

1. Start the power source.

   Note: Allow the power source to run for a few minutes to warm the hydraulic fluid.
2. Set the directional control spool to the appropriate position (forward or reverse).

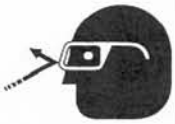
⚠CAUTION

Do not change the position of the directional control spool while the tool is operating. Allow the tool to stop before changing direction.

Failure to observe this precaution may result in damage to the tool.

3. Grasp the handle. Place your other hand on the top of the tool. This will allow you to apply leverage while operating the tool.
4. To start the tool, squeeze the trigger.
5. To stop the tool, release the trigger.
6. When the tool is not in use, stop the power source to reduce heat and wear on tool components.

Maintenance



⚠WARNING

Wear eye protection when operating or servicing this tool.

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

⚠WARNING

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.

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

Use this maintenance schedule to maximize the tool's service life.

Note: Keep all decals clean and legible. Replace decals when necessary. Refer to the Specifications and Parts manual for decal part numbers.

When disposing of any components (hydraulic hoses, hydraulic fluid, worn parts, etc.), do so in accordance with federal, state and local laws or ordinances.

Daily

1. Wipe all tool surfaces clean.
2. Inspect the bit for signs of cracks, wear or damage. Replace if necessary.
3. Inspect the hydraulic hoses and fittings for signs of leaks, cracks, wear or damage. Replace if necessary.
4. Install dust caps over the hydraulic ports when the tool is disconnected.

Monthly

Perform a thorough inspection of the hydraulic hoses and fittings

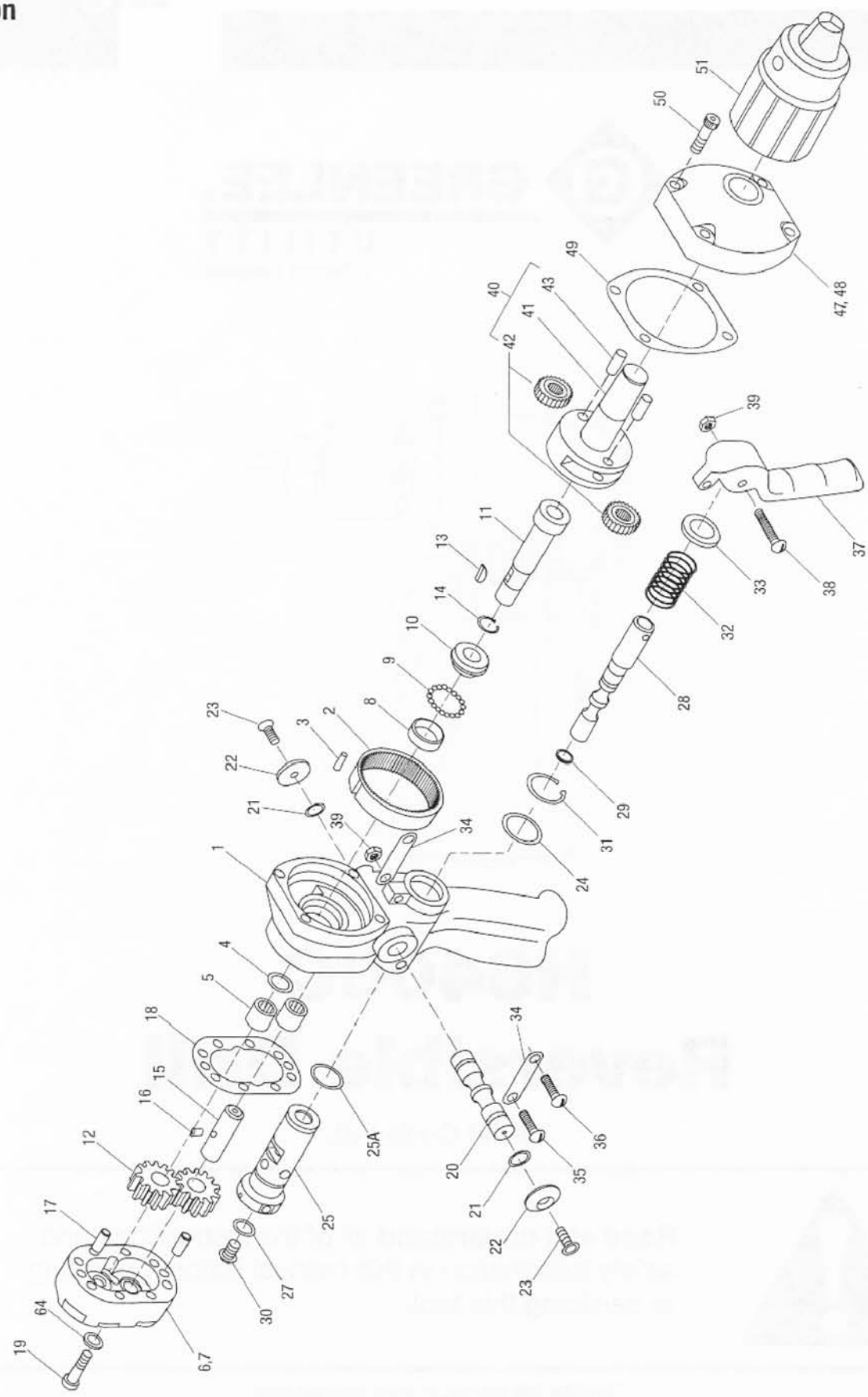
Troubleshooting

Before troubleshooting, determine whether the problem is in the tool, the hoses, or the power source. Substitute a tool, hoses, or power source known to be in good working order to eliminate the item that is not operating.

If the problem is in the tool, see the troubleshooting table in this manual. If the problem is in the power source, see the troubleshooting section of the power source instruction manual.

Problem	Probable Cause	Probable Remedy
Tool does not operate.	Improper power source.	Verify that the power source meets the specifications. Refer to the Specifications and Parts manual.
	Hydraulic fluid level low.	Check the fluid level. Check system for leaks.
	Incorrect hydraulic fluid viscosity.	Use hydraulic fluid with the correct viscosity. Refer to the Specifications and Parts manual.
Tool operates slowly or erratically.	Hydraulic fluid cold.	Allow fluid to warm to the operating temperature. Actuate the tool intermittently to reduce the warming time.
	Adjustable torque output screw incorrectly set, limiting hydraulic fluid flow.	Turn torque output screw counterclockwise to increase flow until desired output is obtained.
	Power source not adjusted correctly.	Refer to the power source operator's manual. Set the flow and pressure to correspond with the tool.
	Hydraulic fluid level low.	Check the fluid level. Check system for leaks.
	Flow control cartridge not operating properly.	Remove and clean cartridge. **Do not disassemble cartridge.** Install a new, factory-preset cartridge.
	Air in the hydraulic system.	Refer to the power source manufacturer's instructions for removing air from the system.
	Incorrect hydraulic fluid viscosity.	Use hydraulic fluid with the correct viscosity. Refer to the Specifications and Parts manual.
Tool feels hot.	Hydraulic fluid level low.	Check the fluid level. Check for leaks.
	Incorrect hydraulic fluid viscosity.	Use hydraulic fluid with the correct viscosity. Refer to the Specifications and Parts manual.
	Hydraulic fluid dirty.	Refer to the power source owner's manual for procedure to replace hydraulic oil and filter.
Tool operates too fast.	Flow control cartridge not operating properly.	Remove and clean cartridge. **Do not disassemble cartridge.** Install a new, factory-preset cartridge.

Illustration



Parts List

Key	Description	Qty
1	Handle, Insulated (includes items 2–5)	1
2	Gear	1
3	Dowel Pin, .125 x .500	1
4*	O-ring, .500 x .687 x .093–80	1
5	Needle Bearing, .439 x .625 x .500	2
6	Motor Cap (includes item 7)	1
7	Needle Bearing, .439 x .625 x .500	2
8	Outer Race	1
9	Ball, .125 Diameter, Steel	18
10	Inner Race	1
11	Drive Shaft with Gear	1
12	Gear, 11-Tooth	2
13	Woodruff Key, #213	1
14	Retaining Ring, .437, External	1
15	Shaft, Idler	1
16	Drive Pin, .123 x .209 with Square Head	1
17	Dowel Pin, .250 x .625	2
18*	Gasket, 2.09 x 3.09 x .0015	1
19	Screw, Cap, 1/4–20 x 1.25, Socket Head	8
20	Spool, Directional	1
21*	O-ring, .437 x .562 x .062–68	2
22	Button	2
23	Screw, Cap, #10–24 x .500, Flat Head	2
24*	O-ring, .875 x 1.000 x .062–70	1
25	Sleeve, Super Spool (for serial numbers after 99273)	1
25A*	O-ring, .787 x .889 x .051–70 (for serial numbers after 99273)	1
26*	O-ring, .750 x .875 x .062–90	1
27*	O-ring, .437 x .625 x .093–90	1
28	Super Spool	1

Key	Description	Qty
29*	O-ring, .312 x .437 x .062–70	1
30	Screw, Cap, 5/16–18 x .375, Button Head Socket	1
31	Retaining Ring, .875, External	1
32	Spring, Compression, .635 x .845 x 1.25	1
33	Washer, Flat, .580 x .937 x .050, Stainless Steel	1
34	Link	2
35	Screw, Machine, #10–24 x .875, Round Head	1
36	Screw, Machine, #10–24 x .750, Round Head	1
37	Trigger	1
38	Screw, Machine, #10–24 x 1.25, Round Head	1
39	Nut, Hex, #10–24 x .187, Lock	3
40	Spindle Assembly (includes 41–43)	1
41	Frame, Planet Gear	1
42	Gear, 21-Tooth (with Needle Bearing)	2
43	Dowel Pin, .250 x .625	2
47	Case Assembly, H6400C (includes item 48)	1
48	Bearing, Bronze	1
49*	Gasket	1
50	Screw. Cap, 1/4–20 x 1.00, Socket Head	4
51	Chuck	1
55*	O-ring, .644 x .818 x .087–90	1
60*	O-ring, .468 x .624 x .078–90	1
64	Washer, Hardened Flat, 6 mm	8
*	Packing Kit (includes all items marked with an asterisk)	

HOSE AND HOSE ASSEMBLIES

SELECTION, INSTALLATION AND MAINTENANCE OF HOSE AND HOSE ASSEMBLIES

SAE Recommended Practice

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.

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.