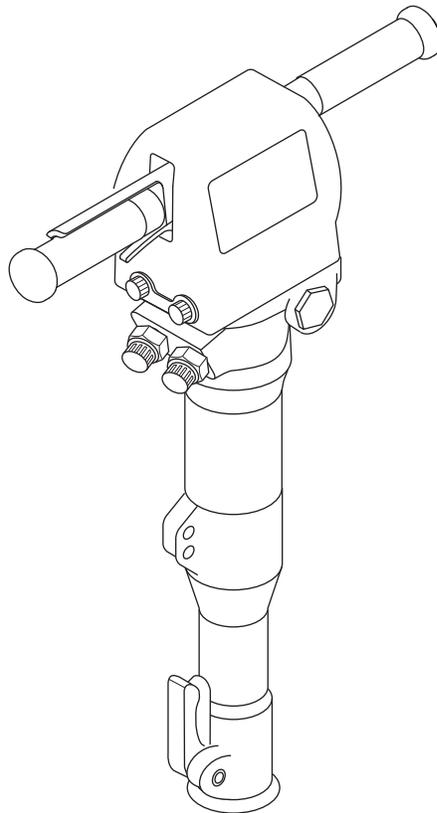


INSTRUCTION MANUAL



HPB45 Series **Hydraulic Paving Breaker**

Serial Codes GMN and GMP



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

Register this product at www.greenlee.com

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Description

The HPB45 Series Greenlee Utility Paving Breaker is intended to break up asphalt, concrete, and hard clay. Accessories available from Greenlee Utility allow the HPB45 to drive ground rods. The HPB45 breaker is provided with vibration-dampened handles.

Safety

Safety is essential in the use and maintenance of Greenlee Utility tools and equipment. This 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 personnel with the safe operation and maintenance procedures for the following Greenlee Utility Paving Breakers:

- HPB45-1AVS 1-1/8" x 6" shank with dampening handles
- HPB45-2AVS 1" x 4-1/4" shank with dampening handles

Keep this manual available to all personnel. Replacement manuals are available upon request at no charge at www.greenlee.com.

Other Publications

Tool Owners/Users

SAE Standard J1273 (Hose and Hose Assemblies):
 Publication 99930323

Authorized Greenlee Utility Service Centers

Service Manual: Publication 52042951

All specifications are nominal and may change as design improvements occur. Greenlee Textron Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

KEEP THIS MANUAL

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



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

Do not exceed the following hydraulic power source maximums:

- Hydraulic flow: 30 l/min (8 gpm)
- Pressure relief: 160 bar (2300 psi)
- Back pressure: 28 bar (405 psi)

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



⚠ 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.

Failure to observe this warning could result in serious injury.



⚠ WARNING

Wear foot protection when using this tool.

Failure to observe this warning could result in serious injury.

IMPORTANT SAFETY INFORMATION

	⚠ WARNING
	<p>Tool, bit, and other components may be hot during and after operation. Allow to cool before handling, or handle with heat-resistant gloves.</p> <p>Failure to observe this warning could result in severe injury.</p>

⚠ WARNING
<p>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.</p>

⚠ WARNING
<p>Do not reverse hydraulic flow. Operation with hydraulic flow reversed can cause tool malfunction. Connect the supply (pressure) hose and return (tank) hose to the proper ports.</p> <p>Failure to observe this warning could result in severe injury or death.</p>

⚠ WARNING
<p>Do not change accessories, inspect, adjust or clean tool when it is connected to a power source. Accidental startup can result in serious injury.</p> <p>Failure to observe these warnings could result in severe injury or death.</p>

⚠ WARNING
<p>Serious injury can result if the operator does not maintain control of the tool.</p> <ul style="list-style-type: none"> • Wear slip-proof gloves when operating this tool. • Maintain a firm grip on the tool, using both hands at all times. • Do not lock the trigger in the power-ON position. Operator cannot stop tool when the trigger is locked. <p>Failure to observe these warnings could result in severe injury or death.</p>

⚠ WARNING
<p>Accumulator is charged with nitrogen under high pressure. This pressure must be unloaded before dismounting.</p> <p>Failure to observe this warning could result in severe injury or death.</p>

⚠ CAUTION
<p>Vibration hazard:</p> <p>Apply just enough pressure to do the work. Applying excess pressure to the breaker can cause operator discomfort or temporary numbness.</p> <p>Failure to observe this precaution may result in injury.</p>

IMPORTANT SAFETY INFORMATION

⚠ CAUTION

- Do not operate the breaker unless the bit is properly installed and placed against the work surface. Damage to the breaker can result.
- 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 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.

⚠ 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.

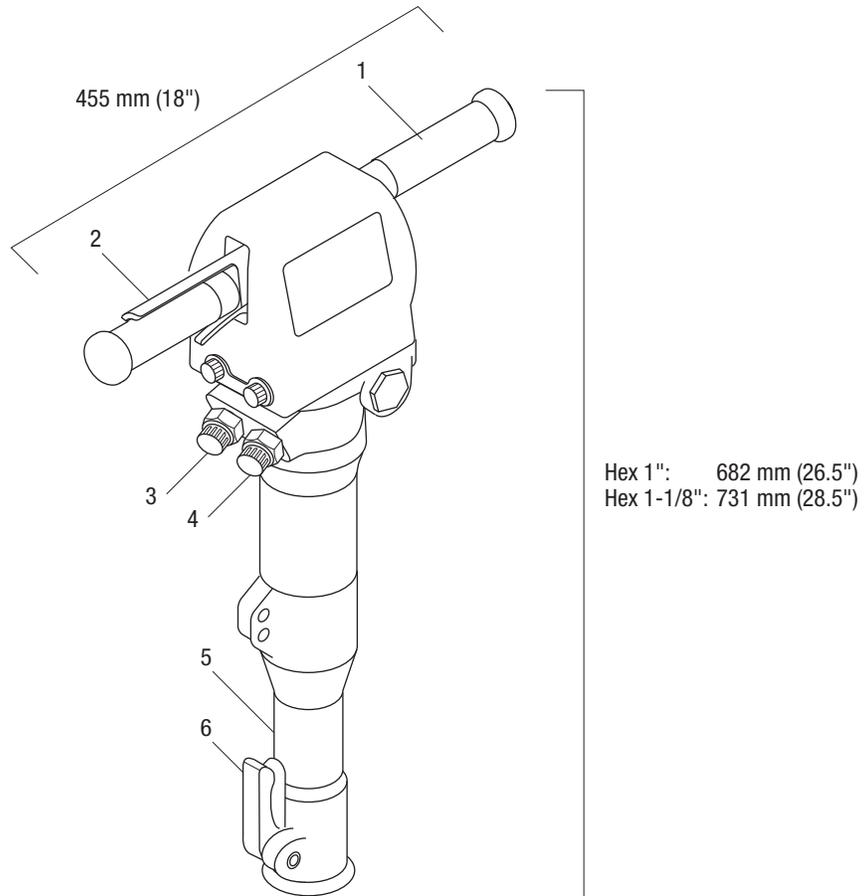
IMPORTANT

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

1. Move the flow lever on the 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 decals clean and legible. Replace decals when necessary.

Identification



HPB45 Series Hydraulic Paving Breaker

- | | |
|------------------|----------------|
| 1. Handle | 4. Return Port |
| 2. Trigger | 5. Front End |
| 3. Pressure Port | 6. Latch |

Specifications

HPB45 Series

Type of Hydraulic System.....	Open-center
Weight (without hoses and tool)	
Hex 1"	21.8 kg (48 lb)
Hex 1-1/8"	25.0 kg (55 lb)
Steel Size (standard).....	Hex 1" x 4-1/4", 1-1/8" x 6"
Working Pressure	105 to 125 bar (1500 to 1800 psi)
Hydraulic Oil	
Working Temperature	30 to 70 °C (86 to 158 °F)
Accumulator Charging	
Pressure (nitrogen)	50 bar (723 psi)
Blow Frequency.....	22 to 36 Hz (1320 to 2160/min)
Impact Energy	85 Joule
Hydraulic Port Connections	1/2" BSP
Vibration Level (3 axis).....	a = 4.8 m/s ²
Sound Power Level	
Guaranteed	
Hex 1"	LWA = 109 dB
Hex 1-1/8"	LWA = 110 dB
Measured	
Hex 1"	LWA = 107 dB
Hex 1-1/8"	LWA = 106 dB

Hydraulic Power Source

⚠ WARNING

Do not exceed the following hydraulic power source maximums:

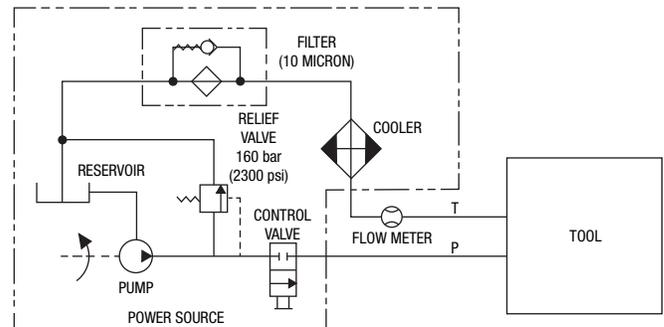
- Hydraulic flow: 30 l/min (8 gpm)
- Pressure relief: 160 bar (2300 psi)
- Back pressure: 28 bar (405 psi)

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

Type of Hydraulic System.....	Open-center
Flow	
Minimum	18 l/min (5 gpm)
Maximum	30 l/min (8 gpm)
Filtration.....	10 micron (nominal)
Pressure Relief Setting	160 bar (2300 psi)
Back Pressure (maximum).....	28 bar (405 psi)

- Optimal performance occurs at maximum flow.
- Maximum hydraulic fluid temperature must not exceed 70 °C (158 °F). A sufficient oil cooling capacity is needed to limit the hydraulic fluid temperature.
- Hydraulic flow must not exceed 30 l/min (8 gpm). Install a flow meter in the return line to measure the rate of hydraulic flow before using the tool.
- Pressure relief valve setting must not exceed 160 bar (2300 psi) at your tool's maximum flow. Locate the pressure relief valve in the supply circuit to limit excessive hydraulic pressure to the tool.

Hydraulic Schematic



Specifications (cont'd)

Recommended Hydraulic Fluid

Viscosity

Ideal20 to 40 cSt

Allowable.....15 to 1000 cSt

Viscosity Index Min. 100

Standard mineral or synthetic oil can be used.

When the tool works continuously, the oil temperature will steady at a certain level called the oil working temperature. Depending on the nature of the job and the cooling capacity of the system, the oil working temperature will be 20 °C to 40 °C (68 °F to 104 °F) above the air temperature. At working temperature, the oil viscosity must be within the ideal area. The tool may not be operated if the oil viscosity is not within the allowable area or if the temperature is not within -20 °C to 70 °C (-4 °F to 158 °F).

The viscosity index expresses the dependence of the viscosity on the temperature. Thus, a high viscosity index is preferable so that the oil can be used within a wide temperature interval.

Applicable Oil Types

TYPE OF OIL	(-4 F)	(14 F)	(32 F)	(50 F)	(68 F)	(86 F)	(104 F)	(122 F)	(140 F)	(158 F)	Viscosity at 40 C (104 F)
	-20 C	-10 C	0 C	10 C	20 C	30 C	40 C	50 C	60 C	70 C	
BP Biohyd 32	■		■		■		■		■		36.0 cSt
BP Biohyd 46	■		■		■		■		■		44.0 cSt
BP Biohyd SE 46	■		■		■		■		■		46.0 cSt
BP Biohyd SE 68	■	■		■		■		■		■	72.2 cSt
CASTROL Biotech HTG 32	■		■		■		■		■		36.8 cSt
MOBIL EAL 224 H	■	■		■		■		■		■	36.0 cSt
Q8 Holbein 46	■		■		■		■		■		48.4 cSt
SHELL Naturelle HF	■		■		■		■		■		35.0 cSt
STATOIL M 32-68	■		■		■		■		■		47.4 cSt
SHELL Tellus oil T46	■		■		■		■		■		46.0 cSt
ESSO Univis N46	■	■		■		■		■		■	45.7 cSt
TEXACO Rando oil HDZ46	■		■		■		■		■		51.0 cSt
MOBIL DTE 15	■		■		■		■		■		44.9 cSt

■ Permitted oil temperature

■ Recommended oil temperature

Hoses and Fittings

Installation and Maintenance

Refer to publication 99930323, SAE J1273 (Hose and Hose Assemblies).

Replacement

Adaptors: Breakers are installed with 1/2" BSP male–1/2" BSP male adaptors.

Hoses: Hoses are produced according to EN 853 with two layers of wire and have a maximum pressure of 275 bar (4000 psi). Hoses are approximately 300 mm (12") long.

Fittings: 1/2" BSP female for connecting to the breaker; 1/2" NPTF male for connecting to quick release couplings.

Hose Connections

▲ WARNING

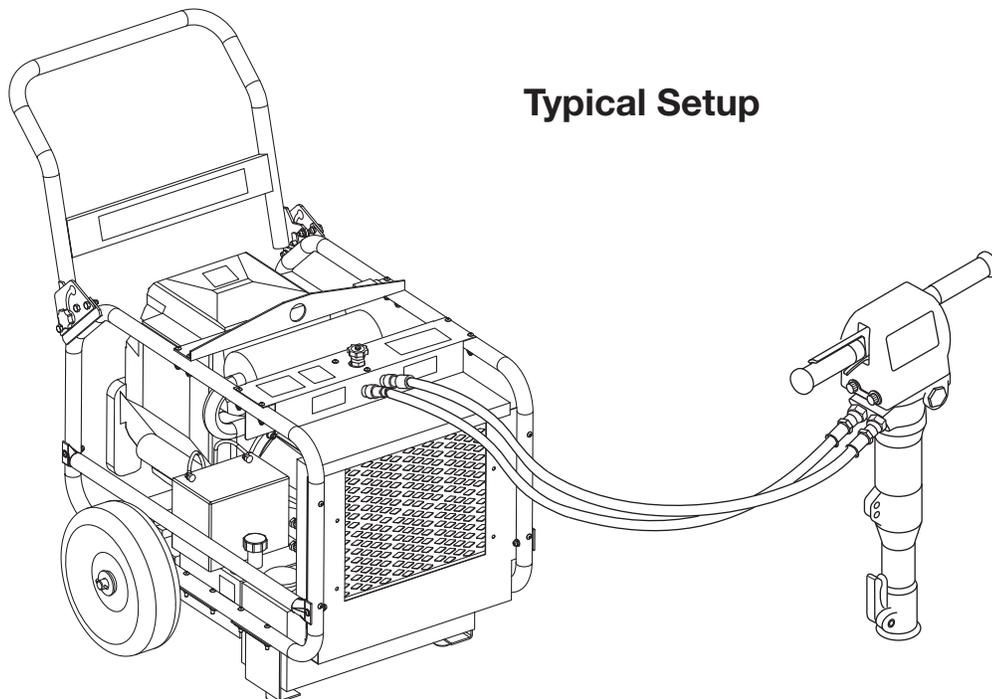
Do not disconnect tool, hoses or fittings while the power source is running or if the hydraulic fluid is hot. Hot hydraulic fluid could cause serious burns.

Connecting Hoses

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

Disconnecting Hoses

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



Typical Setup

Setup

⚠ WARNING

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

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

⚠ WARNING

Do not change accessories, inspect, adjust, or clean tool when it is connected to a power source. Accidental startup can result in serious injury.

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

1. Stop the hydraulic power source.
2. Unlock the latch with a downward motion.
3. Insert the accessory into the front head.
4. Lock the latch with an upward motion.
5. Connect the hydraulic hoses according to the instructions under “Hose Connections.”

Operation

1. Start the hydraulic power source.
Note: Allow the hydraulic power source to run for a few minutes to warm the hydraulic fluid.
2. Position the bit against the surface (material to be broken, ground rod to be driven, etc.).
3. Grasp both handles firmly.
4. To start the tool, activate the trigger.
5. To stop the tool, release the trigger.
6. When the tool is not in use, stop the hydraulic power source to reduce heat and wear on tool components.

Maintenance

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

Note: Keep all decals clean and legible. Replace decals when necessary.

Daily

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

Monthly

Perform a thorough inspection of the hydraulic hoses and fittings as described in publication 99930323, SAE J1273 (Hose and Hose Assemblies).

Annually

If required by your organization, have the tool inspected by an Greenlee Utility Authorized Service Center.

Maintenance (cont'd)

Accumulator Recharging Procedure

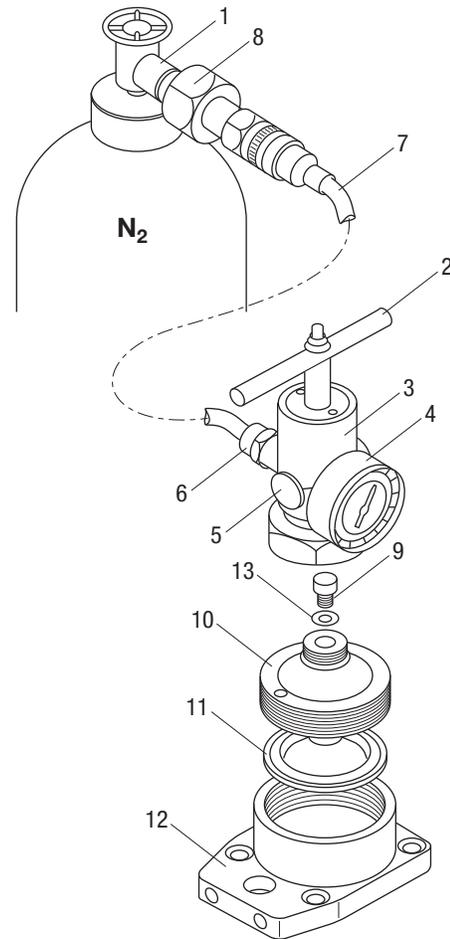
▲ WARNING

Accumulator is charged with nitrogen under high pressure. This pressure must be unloaded before dismounting.

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

1. Check that the oil inlet of the accumulator is depressurized.
 2. Remove the protective cap over the charging screw (9) of the accumulator. The socket head screw must be perfectly clean.
 3. Loosen the charging screw on top of the accumulator (maximum of two turns). Totally neutralize the pressure before dismounting the accumulator.
 4. Unscrew the accumulator cover (10), take out the diaphragm (11), and check for leakage and damage.
 5. Clean, check, and replace damaged or worn parts.
 6. Grease the seal faces of the accumulator body (12) and the accumulator cover (10) with silicone.
 7. Spray both sides of the diaphragm with silicone. Place the diaphragm with its bead pointing downward so that it fits in the groove of the accumulator body (12).
 8. Unscrew the charging screw and replace the seal ring (13).
 9. Grease the thread of the accumulator cover (10) with copper grease and tighten to approximately 300 Nm (221 ft-lb).
 10. Fasten the charging screw lightly, and loosen it two turns afterward.
 11. Mount the filling device on the filling socket of the accumulator cover and fasten it lightly while turning the handle (2) forward and backward, ensuring that the hexagon resiliently fits into the charging screw.
 12. Close the bleeder valve (5) by turning it clockwise.
 13. Connect the hose (7) to the check valve (6).
 14. Connect the free end of the hose directly to the nitrogen bottle by using the reducing nipple.
- Note: Use only pure nitrogen.*
15. Read the pressure on the gauge (4). Carefully open the valve of the nitrogen bottle (1) and charge with nitrogen until the pressure is approximately 20% higher than required charging pressure. Close the valve of the nitrogen bottle.
 16. If the gauge (4) shows too high a nitrogen pressure, loosen the bleeder valve (5) until the required pressure is achieved.

17. Close the charging screw (9) of the accumulator by turning the handle (2) clockwise.
18. Unload the nitrogen hose by opening the bleeder valve (5).
19. Dismount the filling device and check the charging screw (9) for leakage with drops of oil.
20. Fit the protective cap over the accumulator.



50027182 Accumulator filling device
(includes items 2–8)

50027174 Accumulator kit (fully charged)
(includes items 9–14)

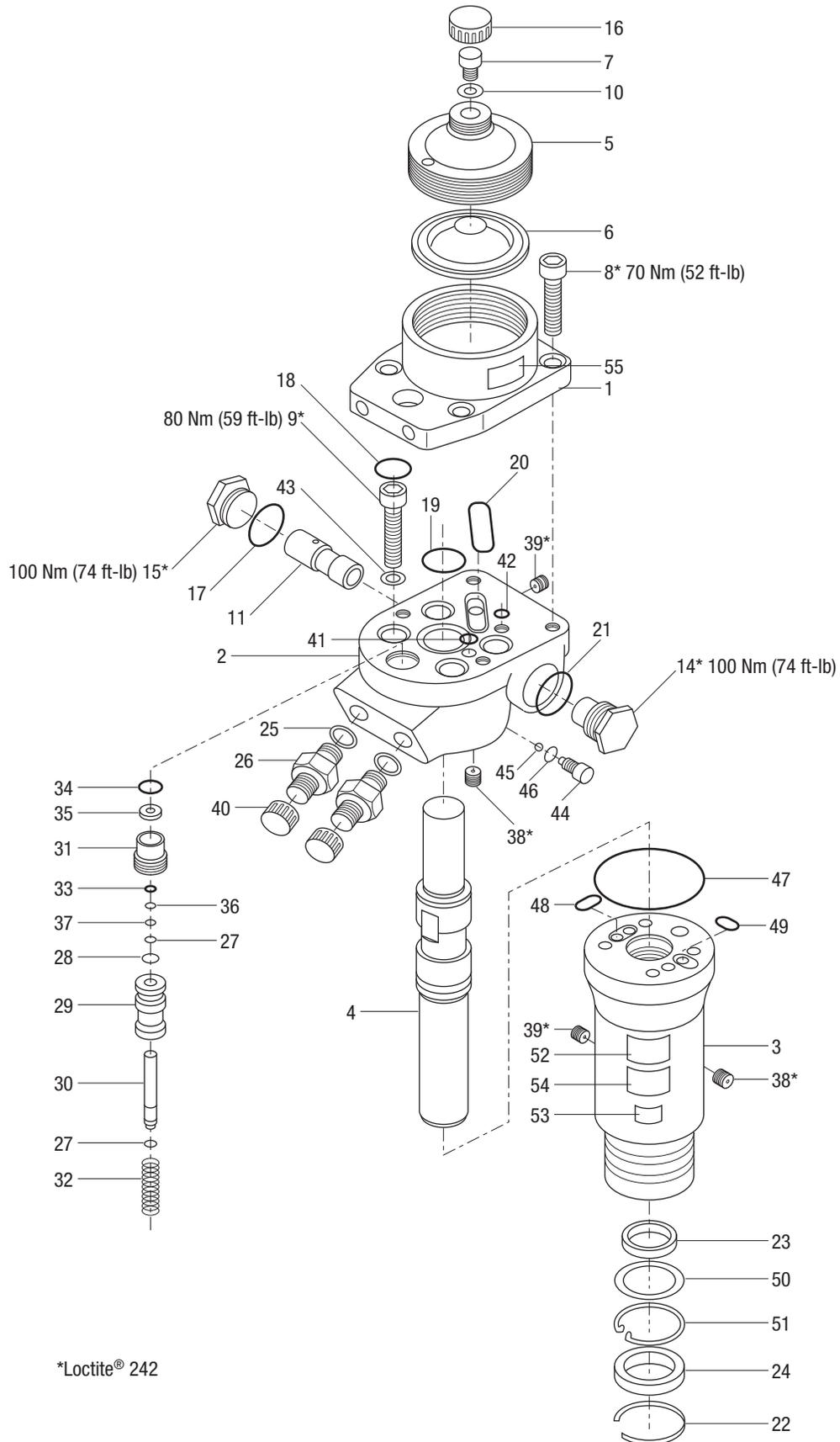
- | | |
|--|------------------------------------|
| (1) Valve of nitrogen bottle | (9) Charging screw |
| (2) Handle | (10) Accumulator cover |
| (3) Filling adaptor | (11) Diaphragm |
| (4) Gauge | (12) Accumulator body |
| (5) Bleeder valve | (13) Seal ring |
| (6) Check valve | (14) Protective cap
(not shown) |
| (7) Hose, approximately
3 m (10 ft) | |
| (8) Reducing nipple
(24.32-14WFG) | |

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. If the problem is in the tool, refer to the troubleshooting table in this manual. If the problem is in the power source, refer to 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.
	Hydraulic fluid level low.	Check the fluid level. Check system for leaks.
	Incorrect hydraulic fluid viscosity.	Use hydraulic fluid with the correct viscosity.
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.
	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.
	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.
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.
	Hydraulic fluid dirty.	Refer to the power source owner's manual for procedure to replace hydraulic oil and filter.
Strike rate is normal; blow energy is weak.	Low accumulator gas pressure.	Return tool to a Greenlee Utility Authorized Service Center.
	Broken accumulator diaphragm.	Return tool to a Greenlee Utility Authorized Service Center.

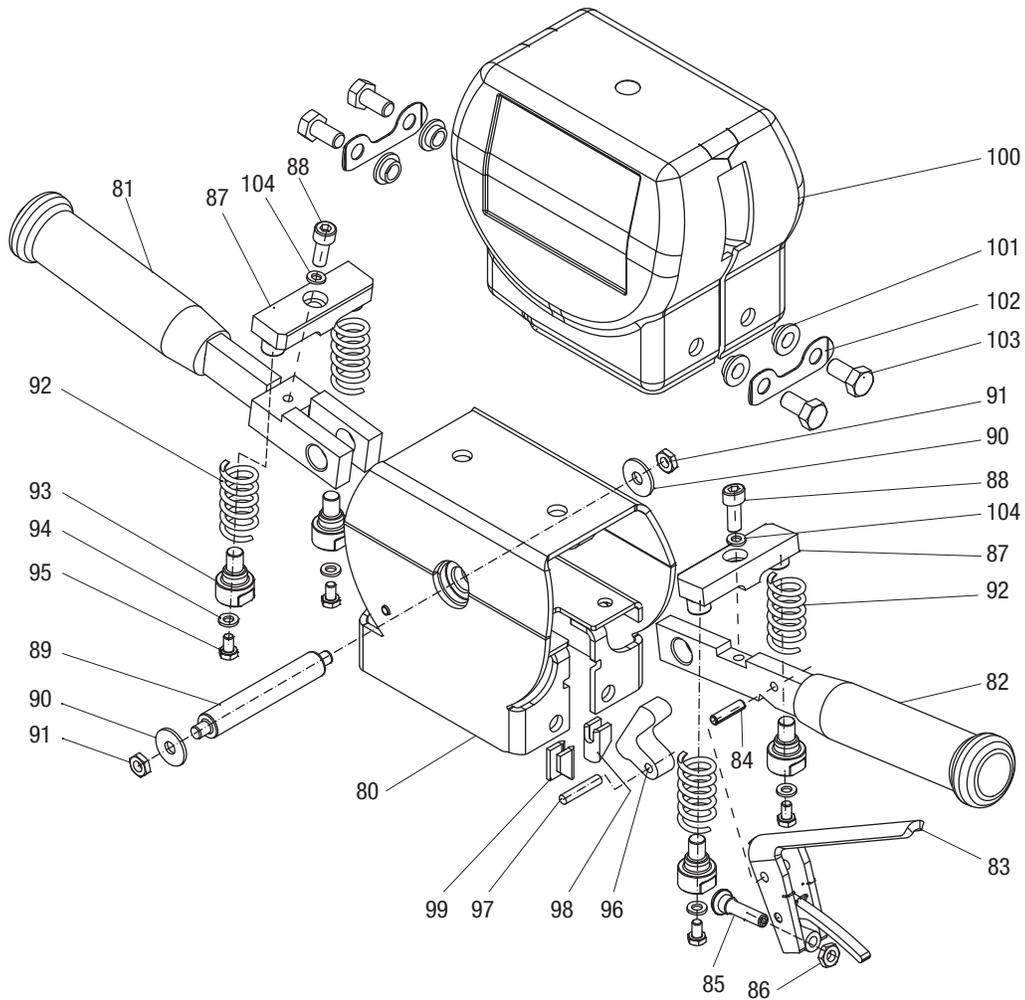
Illustration—Main



Parts List—Main

Key	Part No.	Description	Qty	Key	Part No.	Description	Qty
1	50022083	Accumulator body	1	33*		O-ring, Ø8.3x2.4	1
2	52033754	Valve housing.....	1	34*		O-ring, Ø16.3x2.4	1
3	52033755	Cylinder.....	1	35*		Seal, Ø8/Ø14x3.5/5	1
4	52033756	Striking piston.....	1	36*		Backup ring.....	1
5	50022164	Accumulator cover.....	1	37*		Seeger spring ring.....	1
6	50022172	Diaphragm	1	38	50022555	Fitting, 02 KRG	6
7	50022180	Charging screw	1	39	50022563	Fitting, 04 KRG	3
8	50022199	Screw, M10x30	4	40	50022741	Protective cap, 1/2" BSP	2
9	50022202	Screw, M10x35	4	41*		O-ring, Ø6x2	1
10*		Seal ring, Ø8.7/Ø13x1	1	42*		O-ring, Ø8x2	1
11	52033757	Spool.....	1	43	50022814	Backup washer	4
14	52033758	Guide socket.....	1	44	50022822	Screw	1
15	50022261	Spool socket.....	1	45	50022830	Check valve ball.....	1
16*		Protective cap, M24x1.5.....	1	46*		Seal ring, Ø9/Ø14x1	1
17*		O-ring, Ø24x1.5	1	47*		O-ring, Ø82x1.5	1
18*		O-ring, Ø18x2	4	48*		O-ring, Ø16x1.5	1
19*		O-ring, Ø30x2	1	49*		O-ring, Ø13x1.5	1
20*		O-ring, Ø32x2	1	50*		Backup washer, Ø32.7/45x2.5.....	1
21*		O-ring, Ø25x1.5	1	51*		Locking ring	1
22*		Locking ring	1	52	50109499	Plate, identification	1
23*		Seal, Ø32/Ø40x6	1	53	50109529	Decal, sound level 110 dB (HPB45-1AVS).....	1
24*		Seal, Ø32/Ø45x7/10	1		50027204	Decal, sound level 109 dB (HPB45-2AVS).....	1
25*		Seal ring, 1/2"	2	54	50110292	Decal, weight (HPB45-1AVS).....	1
26	50022377	Connector, 1/2" BSP	2		50110284	Decal, weight (HPB45-2AVS).....	1
27*		Seeger spring ring.....	2	55	50110764	Decal, accumulator.....	1
28*		Shim PS, 8x14x0.5	1				
29	50022415	Trigger spool	1	*	50023101	Seal kit (includes 10, 16–25, 27, 28, 33–37, 41, 42, 46–51, and 91)	
30	50022431	Trigger rod.....	1		50023152	Trigger valve kit (includes 27–37)	
31	50022458	Packing gland	1		52061099	Whip hose.....	2
32	50022474	Spring	1				

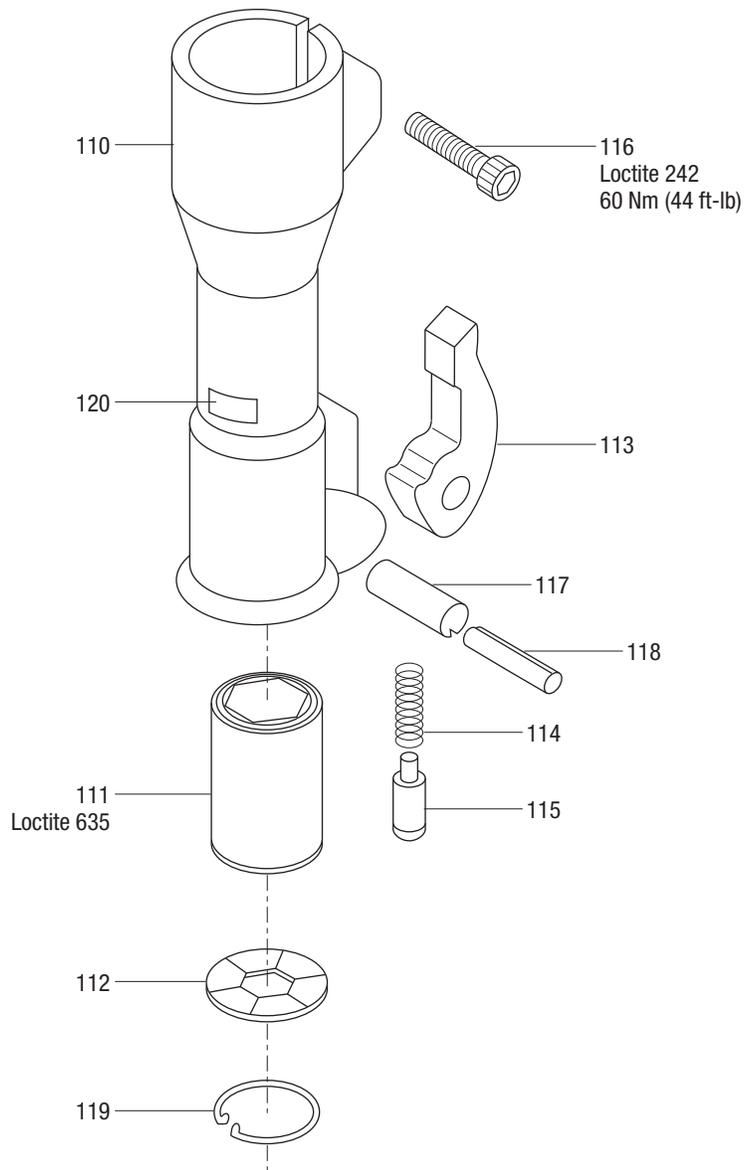
Illustration and Parts List—Ergo Handle with Cover



Key	Part No.	Description	Qty
	52061077	E-handle, complete.....	1
80		Frame	1
81		Handle.....	1
82		Handle.....	1
83		Trigger lever	1
84		Roll pin, Ø6x24	1
85		Thrust pad with M8 screw	1
86		Nut, M8	1
87		Stopper	2
88		Screw, M5x20	2
89		Pin.....	1
90		Washer, Ø8.....	2
91		Nut, M8	2
92		Spring	4
93		Spring guide.....	4
94		Washer, Ø6.....	4
95		Screw, M6x10	4
96		Trigger pawl	1

Key	Part No.	Description	Qty
97		Pin, Ø6x30	1
98		Pin latch, right.....	1
99		Pin latch, left	1
100		Top cover	1
101		Spacer.....	4
102		Nab	2
103		Screw, M10x25	4
104		Lock washer, M5.....	2
105	50463268	Decal, Greenlee Utility	2
106	50490095	Decal, warning	1
	52061094	Ergo handle mounting kit (includes 101–103)	
	52061095	Handle repair kit (includes 87, 88, 92–95, and 104)	
	52061096	Trigger pawl repair kit (includes 96–99)	
	52061097	Handle pivot repair kit (includes 89–91)	
	52061098	Trigger repair kit (includes 83–86)	

Illustration and Parts List—Nose



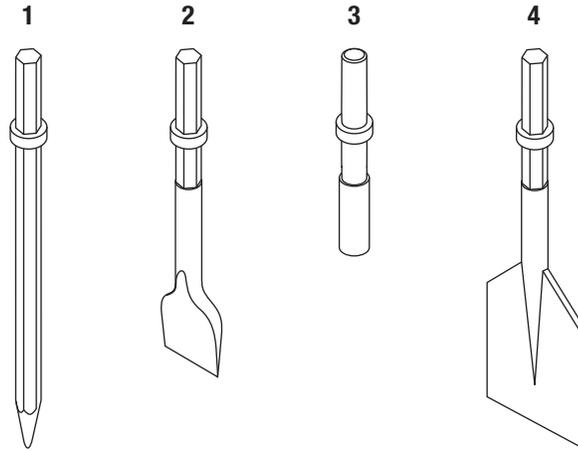
1" x 4-1/4" Hex Shank

Key	Part No.	Description	Qty
110	50023624	Nose part, hex 1"	1
111	50023632	Bushing, hex 1" x 4-1/4"	1
112	50023675	Chisel bellows, hex 1"	1
113	50023705	Latch	1
114	50023730	Spring	1
115	50023748	Lock pin	1
116	50023756	Screw, M10x55	2
117	50023764	Roll pin, Ø16x50	1
118	50023802	Roll pin, Ø10x50	1
119	50023829	Locking ring, 57x2	1
120	50109570	Decal, hex shank size 1 x 4-1/4.....	1

1-1/8" x 6" Hex Shank

Key	Part No.	Description	Qty
110	50023837	Nose part, hex 1-1/8", 1-1/4"	1
111	50023918	Bushing, hex 1-1/8" x 6"	1
112	50023926	Chisel bellows, hex 1-1/8"	1
113	50023705	Latch	1
114	50023730	Spring	1
115	50023748	Lock pin	1
116	50023756	Screw, M10x55	2
117	50023764	Roll pin, Ø16x50	1
118	50023802	Roll pin, Ø10x50	1
119	50023829	Locking ring, 57x2	1
120	50109561	Decal, hex shank size 1-1/8 x 6.....	1

Accessories



Accessories with 1" x 4-1/4" Hex Shank

	UPC No.	Part No.	Description	Qty
Key	78-3310-			
1	49138	50491385	Moil point, 14"	1
2	46219	50462199	Chisel bit, 3" x 14"	1
3	46222	50462229	Rod driver (for 5/8" maximum diameter ground rod)	1
	46223	50462237	Rod driver (for 1" maximum diameter ground rod)	1
4	46221	50462210	Asphalt cutter.....	1

Accessories with 1-1/8" x 6" Hex Shank

	UPC No.	Part No.	Description	Qty
Key	78-3310-			
1	41706	50417062	Moil point, 14".....	1
2	41707	50417071	Chisel bit, 3" x 14"	1
4	41708	52000031	Asphalt cutter, 5" x 11"	1



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