



HB27

HYDRABREAKER

INSTRUCTIONS

REIMANN & GEORGER CORPORATION
CONSTRUCTION PRODUCTS
P/N 6122112

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1 SAFETY

1.1 INTRODUCTION

Your Reimann & Georger Corporation HB27 HydraBreaker has been engineered to provide breaking performance, long term economics and safety advantages that no other type can match. However, even a well-designed and well-built breaker can malfunction or become hazardous in the hands of an inexperienced and/or untrained user. Therefore, read this manual and related equipment manuals thoroughly before operating your breaker to provide maximum safety for all operating personnel, and to get the maximum benefit from your equipment.

1.2 SAFETY DEFINITIONS

A safety message alerts you to potential hazards that could injure you or others or cause property damage. The safety messages or signal words for product safety signs are **DANGER**, **WARNING**, and **CAUTION**. Each safety message is preceded by a safety alert symbol and is defined as follows:

DANGER: Indicates an imminently hazardous situation which, if not avoided, **will** cause death or serious injury. This safety message is limited to the most extreme situations.

WARNING: Indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.

CAUTION: Indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury. It may also be used to alert against unsafe practices that may result in property-damage-only accidents.

1.3 POWER SOURCE AND BREAKER SAFETY LABELS

These labels warn you of potential hazards, which could cause injury. Read them carefully. If a label comes off or becomes illegible, contact Reimann & Georger Corporation for a free replacement.

1.4 HB27 BREAKER SAFETY RULES

1. Only trained personnel shall operate the breaker or do repairs. A trained person is one who has read and thoroughly understands this instruction manual and related equipment manuals and, through training and experience, has shown knowledge regarding the safe operational procedures.
2. Construction area is to be kept clear of unauthorized personnel at all times. Place barricades or secure the area in such a manner that no personnel would be injured by flying debris.
3. Never use the breaker in an explosive atmosphere and/or near combustible material that could be ignited by a spark.
4. Provide adequate ventilation or approved NIOSH or MSHA respirators in closed areas to avoid breathing dust during breaking.
5. The outside surface of the breaker can be more than 30°C (86°F) warmer than the air temperature. Always wear protective clothing including gloves.
6. Keep clothing and all parts of the body away from moving parts of this breaker when connected to a hydraulic power source or when being used.
7. Safety goggles must be worn by operator and all bystanders to prevent injury to eyes.
8. Safety shoes, safety goggles, and hard hats **must** be worn to provide protection from falling material when breaking upwards or horizontally.
9. Safety shoes **must** provide good footing to prevent slipping or falling down.

10. Hearing protection must be worn to prevent permanent hearing damage.
11. Use only properly sized tool steels for which the breaker was designed.
12. **Avoid “free blows.”** Free blows result when the tool is operating, but is not contacting the material being broken.
13. Do not lean against the breaker to prevent losing foothold. The tool steel could accidentally break or suddenly penetrate the material being broken.
14. Never operate the breaker under the influence of drugs, alcohol, or medication.
15. Do not use the breaker when you are tired or fatigued.
16. Do not use a breaker that shows any signs of damage.
17. Keep the breaker handles dry, clean, and free of oil or fuel.
18. Always hold the breaker with both handles during operation.
19. Do NOT attempt to adjust the breaker during operation.
20. Always shut off the hydraulic power source before disconnecting the hoses, or servicing the breaker.
21. Always shut off the hydraulic power source when not using the equipment.

2 SPECIFICATIONS

2.1 INTRODUCTION

Your Reimann & Georger Corporation HB27 hydraulic breaker is a light duty breaker with a high performance to weight ratio. This breaker can be used for horizontal and vertical breaking of brickwork and light concrete. A vibration dampened D-handle and a front handle are provided for maximum safety and control. As with most hydraulic tools, the hydraulic system requirements detailed in the following section must be met but not exceeded to support tool performance and longevity of equipment.

2.2 TECHNICAL DATA

The following specifications apply to the HB27 HydraBreaker.

	ENGLISH	METRIC
Weight with hose whips and without tool steel	28 lbs.	(12.7 kg.)
Oil flow	5 gpm	(19 lpm)
Hydraulic Power Source Relief Valve Setting	2000 psi	(138 bar)
Maximum back pressure in return line	145 psi	(10 bar)
Steel size (hex)	7/8 X 3-1/4 in.	(22 X 82.5 mm)
Collar diameter	1-1/2 in.	(38 mm)
Required cooling capacity	5122 BTU/hr.	(1.5 kw/hr.)
Energy per impact	13 ft.-lb.	(18 joules)
Blow frequency (blows/minute)		2400
Sound level (decibels)		94
Couplings		1/2" HTMA flush face
Vibration level		a = 13.1 m/s ² (H/A) or L _A = 142.3 dB (H/A)

Note that the hydraulic power source flow and pressure requirement is 5 gpm (19 lpm) and 2000 psi (135 bar).

2.3 RECOMMENDED HYDRAULIC OIL

Viscosity	100-200 SUS at 100°F	(20-40 cSt at 40°C)
Viscosity index		Minimum 100

Many types of compatible hydraulic oil are available through your local dealer/distributor. As an original equipment manufacturer, RGC supplies a Grade ISO VG 32 hydraulic turbine oil.

Hydraulic oil types are too numerous to list in this manual. If you have any question concerning the type of oil suitable for breaker operation, please consult your local supplier or Reimann & Georger Corporation for details.

2.4 NAMEPLATE AND SERIAL NUMBER TAG

It is important to identify your breaker completely and accurately whenever ordering spare parts or requesting assistance in service. The breaker has a product nameplate which states the model and serial numbers. The breaker label should appear as the sample nameplate shown in Figure 2-1. Record the model and serial numbers for future reference.

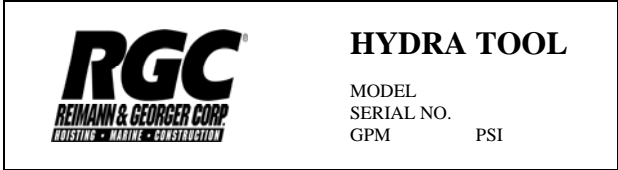


Figure 2-1.
Typical Breaker Product Nameplate

MODEL _____

SERIAL NUMBER _____

3 OPERATION

3.1 BEFORE OPERATING THE BREAKER

1. Read and fully understand the operating manual for the hydraulic power source being used.
2. Every tool has a maximum operating flow and pressure which, if exceeded, is a potential cause of damage to the tool or hydraulic power source. Check the power supply's flow and pressure output against the tool's requirements.
3. Use caution when refueling a gasoline driven hydraulic power source. Make sure the gas caps on the hydraulic power source and fuel can are properly tightened. Move the hydraulic power source at least 10 feet from the fueling point before starting the engine.
4. Do not start breaking without first checking for live electrical wiring near the breaking site, or imbedded in the breaking medium.
5. When breaking through a wall, check **both** sides of the wall for possible obstructions before starting. Insure that the breaking will not cause a wall collapse.

3.2 LOW AMBIENT AND OIL TEMPERATURE STARTUP (<32°F)

Oil temperatures can affect both power supply and tool performance. For ambient operating temperatures between 0-32°F, RGC recommends a warm-up period relative to outside temperatures to insure proper performance levels.

An oil becomes more viscous or thick as the ambient temperature lowers, which slows down the system. It is necessary to pre-heat the hydraulic oil in the power supply before use by proceeding as follows:

1. Leave the equipment inside a heated facility before use if practical, but this is not always possible.
2. At the job site, start the power supply and let the engine warm up for 5 minutes **WITHOUT** tool or hoses connected.
3. Adjust throttle speed to full engine rpm, then **SLOWLY** turn flow valve to ON position. Allow unit to run for 5-7 minutes, then turn flow valve to OFF position. Return engine RPM to slow idle, then turn off engine. Connect tool and hydraulic hoses as described in section 3.4. This procedure will labor the engine and generate the required heat in the power supply oil.
4. Taking the time to pre-heat the oil far exceeds the length of time it takes to get the system up to speed without pre-heating, but this will provide the level of designed performance.

3.3 HIGH AMBIENT AND OIL TEMPERATURE STARTUP (>100°F)

An oil become less viscous or thinner as ambient temperature increases which causes the hydraulic oil to operate at an elevated temperature. For ambient operating temperatures above 100°F (38°C), RGC recommends the following:

1. Insure that the hydraulic fluid level is up in the power supply reservoir.
2. Operate the tool at a reduced cycle time—10 minutes on, then 10 minutes off.

3.4 CONNECTION TO HYDRAULIC POWER SOURCE

1. Before making any hydraulic connections, inspect all hoses for leaks and risks of rupture as follows:
 - a. Inspect each hose for breaks, cracks, worn spots, bulges, chemical attack, kinks or any other damage. Never stop any detected leak with your hand or fingers. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of hydraulic oil.

- b. Replace a damaged hose immediately. Never repair the hose.
2. For connection, use a high pressure hose (inside diameter 1/2") which, as a minimum, is designed for a working pressure of 2500 psi. The breaker socket "P" is the oil inlet (pressure), and the socket "T" is the oil outlet (tank).
3. The HB27 uses flush-face quick-release couplings that are durable and very easy to clean. They are always fitted such that the male part gives oil and the female part receives oil.
4. An oil flow of 5 gpm at 2000 psi is required. Do NOT exceed this flow or pressure.
5. If the oil flow cannot be adjusted by lowering the rpm, a flow divider must be installed. This will insure the breaker receives the correct oil flow and return excess oil back to the tank.
6. To protect the breaker from excessively high pressure, the pressure relief valve of the power supply must be set at 2000 psi (138 bar). If this is not possible, connection can be made by installing a separate pressure relief valve set at 2000 psi (138 bar). If in doubt, contact your dealer.
7. The back pressure (return line pressure) of the breaker should be as low as possible and must not exceed 145 psi (10 bar) measured at the breaker. If this pressure is exceeded, the breaker will not reciprocate.
8. The hydraulic power source must be fitted with a return line oil filter with a filter rating of 10-25 microns.

3.5 BREAKING PROCEEDURE

1. Check that the tool steel is in good order and is pressed fully home in the nose part.
2. Check that the latch is locked so that the tool steel does not fall out.
3. Clean the quick-release couplings if needed and connect the hose whips to the extension hoses from the power source.
4. When lifting the breaker to start the procedure, observe the following precautions:
 - a. Be sure of your footing.
 - b. Keep hands off trigger to avoid accidental operation.
 - c. Bend your knees and lift with your legs.
 - d. Hold breaker close to your body when lifting.
5. Hold the breaker with both handles and place it at a right angle to the material to be broken. Make sure some feed force is being applied to the tool steel. Then release the trigger lockout and activate the trigger lever.
6. To insure breaking in 10-20 seconds, do not try to break too big a piece of material at once. Use just enough feed force to have the breaker run regularly.



CAUTION:

AVOID "FREE BLOWS" WHERE THE PISTON DOES NOT HIT THE TOOL STEEL. THIS WILL CAUSE UNNECESSARY HEATING OF THE OIL AND, IN TIME, DAMAGE BOTH THE SEALS AND THE BREAKER.

3.6 PREPARING BREAKER FOR SHUTDOWN

1. Stop the breaker by releasing the trigger lever.

2. Stop the hydraulic power source following the procedure in the respective instruction manual.
3. Disconnect the hoses from the breaker.



WARNING:

NEVER DISCONNECT ANY HYDRAULICALLY OPERATED PART OF THE BREAKER OR REMOVE HYDRAULIC COMPONENTS, LINES, OR FITTINGS WHILE THE POWER SOURCE IS RUNNING OR WHENEVER THE HYDRAULIC FLUID IS HOT.

LIQUID UNDER HIGH PRESSURE CAN PIERCE THE SKIN, CAUSING DEATH OR SERIOUS INJURY. HOT LIQUID CAN CAUSE SERIOUS PERSONAL BURNS. IF AN INJURY OCCURS, GET IMMEDIATE MEDICAL ATTENTION.

4. Secure the breaker and hydraulic power source to prevent unauthorized use.
5. Store the breaker away from excessive heat or moisture. Store in a clean, dry area away from exposure to high humidity, liquids, or freezing temperatures.

4 INSPECTION AND MAINTENANCE

4.1 GENERAL MAINTENANCE RULES

Hydraulic fluid can become contaminated after extended periods of use which can cause restrictions in the system. Check to see that the fluid is clean, and change at recommended intervals to extend tool's life. Refer to the respective manual for maintenance information on the hydraulic power source.

1. Proper maintenance of the breaker and related equipment requires timely adhering to all the guidelines given in this chapter. Proper maintenance is required to maintain the system in good condition and free of defects.
2. Review and follow all the safety rules given in Chapter 1 before attempting any maintenance.
3. Only authorized personnel should be allowed in the maintenance area. Authorized personnel are the trained people as defined below and their supervision.
4. Repairs must be made only by trained personnel. A trained person is one who has read and thoroughly understands this instruction manual and related equipment manuals and, through training and experience, has shown knowledge regarding the safe operational procedures.



CAUTION:

BEFORE STARTING ANY MAINTENANCE, DISCONNECT FROM HYDRAULIC POWER SOURCE TO PREVENT ACCIDENTAL STARTUP.



WARNING:

DURING ANY MAINTENANCE OR REPAIR PROCEDURES, DO NOT ATTEMPT ANY BREAKING. THIS CAN CAUSE SERIOUS PERSONAL INJURY AND/OR EQUIPMENT DAMAGE.

4.2 DAILY MAINTENANCE

1. Remove the tool steel. With a clean object, push the piston down, remove the object and put about 1 ounce of 10W oil into the nose assembly to lubricate.
2. Clean off any accumulation of particles from beneath the trigger area. Spray with a light oil and wipe off excess.
3. Disconnect hydraulic hoses and wipe couplings clean, especially before a connection is made. This is the single most common point of entry for foreign particles which can cause premature wear of hydraulic components in the system.
4. Check that all hardware on the breaker is tight.
5. Check the hoses before each use for damage. Replace a damaged hose immediately. Never repair the hose.
6. Before each use, insure that all broken, worn or defective parts are repaired or replaced.
7. Insure the tool steel is sharp to give maximum breaking power and operator comfort.

4.3 ANNUAL MAINTENANCE

1. Check that the chisel bushing, latch, and roll pins are in good working order. If the shaft of a new chisel can be turned more than 20° in the chisel bushing, or if the chisel collar is cracked, the chisel bushing must be replaced. A worn chisel bushing causes increased breaker noise and, in the long run, damage to the striking piston of the breaker.
2. Check the function and performance of the breaker.

3. It is recommended that the breaker be serviced at an authorized RGC service center where:
 - a. moving parts, chisel bushing, and bolts for example, are inspected and, if required, replaced.
 - b. all seals are replaced.

4.4 LONG-TERM STORAGE

During long-term storage, the striking piston must be protected against corrosion. Connect the quick-release couplings together and press the striking piston to its upper position with a chisel placed upside down through the chisel bushing.

5 TROUBLESHOOTING

The following chart is intended to assist with troubleshooting the HB27 HydraBreaker. While not all inclusive, the chart outlines the most common causes of a problem and the recommended course of action.

The troubleshooting guide for the associated power supply is in the instruction manual specifically for this unit.

SYMPTOM	CAUSE AND CORRECTIVE ACTION
Breaker does not strike—pressure does not build up when trigger is activated.	<p>No or incorrect flow or pressure—check flow and pressure as described in Section 3.4.</p> <p>“P” and “T” hoses interchanged—check connection. Standard connection has oil flowing from male quick release coupling into female quick release coupling. The tail-hose of the breaker P connection is fitted with female coupling.</p> <p>Insufficient activation of trigger valve—replace defective parts.</p>
Breaker does not strike—pressure is built up when trigger is activated.	<p>Back pressure too high—make direct tank connection. Maximum back pressure is 145 psi (10 bar) measured at the breaker. See Section 3.4.</p> <p>Quick release coupling in return line defect—locate and replace defective coupling.</p> <p>Striking piston sticks—push the breaker hard against the chisel.</p> <p>Striking piston sticks possibly due to thickening of cylinder:</p> <ol style="list-style-type: none"> 1. Chamfer/polish slightly the edge at the cylinder dashpot where the cylinder bore changes size. 2. Check oil viscosity. Thin oil increases the risk of cylinder thickening. <p>Spool/reversing spool or auxiliary spools stick—dismount and check that all parts move easily. Polish slightly if necessary.</p> <p>Seals defect—dismount, check, and replace.</p>
Breaker runs weakly or erratically.	<p>Insufficient flow—check flow and pressure.</p> <p>Seals defect—replace seals.</p> <p>Wear, internal leakage:</p> <ol style="list-style-type: none"> 1. Dismantle, check and replace defective or worn parts. 2. Check purity of oil and oil viscosity at working temperature. Thin oil can cause increased internal leakage. <p>Incorrect tool steel length—refer to Section 2.2.</p>
Oil leaking from breaker.	Defective seals—replace seals.
Chisel falls out.	<p>Worn latch—replace latch and roll pins.</p> <p>Worn chisel bushing or chisel—replace bushing or chisel.</p> <p>Incorrect tool steel in use (wrong hex size or collar diameter)—refer to Section 2.2.</p>

6 PARTS LIST

The following parts list applies to the HB27 HydraBreaker only. The parts list for the hydraulic power source is in the separate manual supplied for this item. Each item number on the following parts list can be matched with the item number shown on the corresponding assembly drawings.

6.1 BREAKER ASSEMBLY

Item Number	Part Number	Quantity	Description
3	1814121	1	NYLON GUIDE
4	1814132	1	BACKSTOP
5	1814163	1	SPRING F/TRIGGER VALVE
6	1814752	1	WASHER 016.8/8.5 X 1.5
7	1805503	1	SEAL 08/014 X 3.5/5
8	1814120	1	PACKING GLAND
9	1814700	1	O-RING 08.3 X 2.4
10	1814702	1	O-RING 016.3 X 2.4
11	1814701	1	BACK-UP RING
14	1820071	1	TRIGGER SPOOL W/ ROD
15	1814116	1	GUIDE SOCKET "T"
16	1814115	1	AUXILIARY SPOOL "T"
17	1814723	4	SCREW M10 X 35
18	5605714	2	SEAL RING 1/2"
20	5605711	2	ADAPTER 08-08
21	1814112	1	SPOOL
22	1814703	2	O-RING 024.2 X 3
23	1814113	1	AUXILIARY SPOOL "P"
24	1814710	2	O-RING 033 X 2
25	1814114	1	GUIDE SOCKET "P"
26	1814007	1	D-HANDLE
28	1814728	4	SCREW M10 X 20
29	1814134	2	WASHER M10
33	1814059	1	TOP PLATE
34	1815720	3	SCREW M10 X 50
35	1814108	1	VALVE HOUSING
36	1815738	1	LOCKING RING (USED ONLY IF THE CYLINDER IS PREPARED FOR LOCKING RING)
38	1814124	1	CYLINDER
39	1814733	4	FITTING 02 KRG
40	1814172	1	SEAL 028/036 X 5.7
41	1814707	1	SEAL 028/038 X 7/10
42	1815720	2	SCREW M10 X 50
43	1814125	1	STRIKING PISTON
44	1814180	1	NOSE PART 7/8 IN. HEX
45	1814140	1 U.S.A. STD.	BUSHING HEX 7/8 X 3-1/4 IN. HEX (22 X 82.5 MM HEX)
46	1802075	1	SPRING
47	1802073	1	LOCK PIN

Item Number	Part Number	Quantity	Description
48	1815122	1	LATCH
49	1815730	1	ROLL PIN 016 X 50
50	1815731	1	ROLL PIN 010 X 50
52	1814712	1	SEEGER SPRING RING
53	1814053	1	TRIGGER BOW
54	1815735	3	BACK-UP WASHER
55	1814169	1	BACK-UP WASHER 28.7 X 38 X 2
56	1814754	1	LOCKING RING 038 (USED ONLY IF THE CYLINDER IS PREPARED FOR LOCKING RING)
60	1814057	1	SEAL KIT WITH O-RING
62	1814008	1 U.S.A. STD.	NOSE ASSEMBLY COMPLETE 7/8 X 3-1/4 IN. HEX (22 X 82.5 MM HEX)
63	1814058	1	TRIGGER VALVE COMPLETE
70	1814748	1	O-RING 025 X 1.5
71	1414749	1	O-RING 013 X 1.5
72	1820706	2	O-RING 022 X 1.5
73	1814750	2	O-RING 012 X 1.5
74	1814751	1	O-RING 069 X 1.5
78	1814181	1	CHISEL BELLOWS 7/8 IN. HEX
79	1820736	1	LOCKING RING 57 X 2
80	1814149	1	PAWL
81	1814716	1	NUT M6
82	1814166	1	COMPRESSION RING
83	1814167	1	SCREW M5-6 X 40
84	1814717	1	NUT M5
85	1814715	1	SCREW M6 X 10

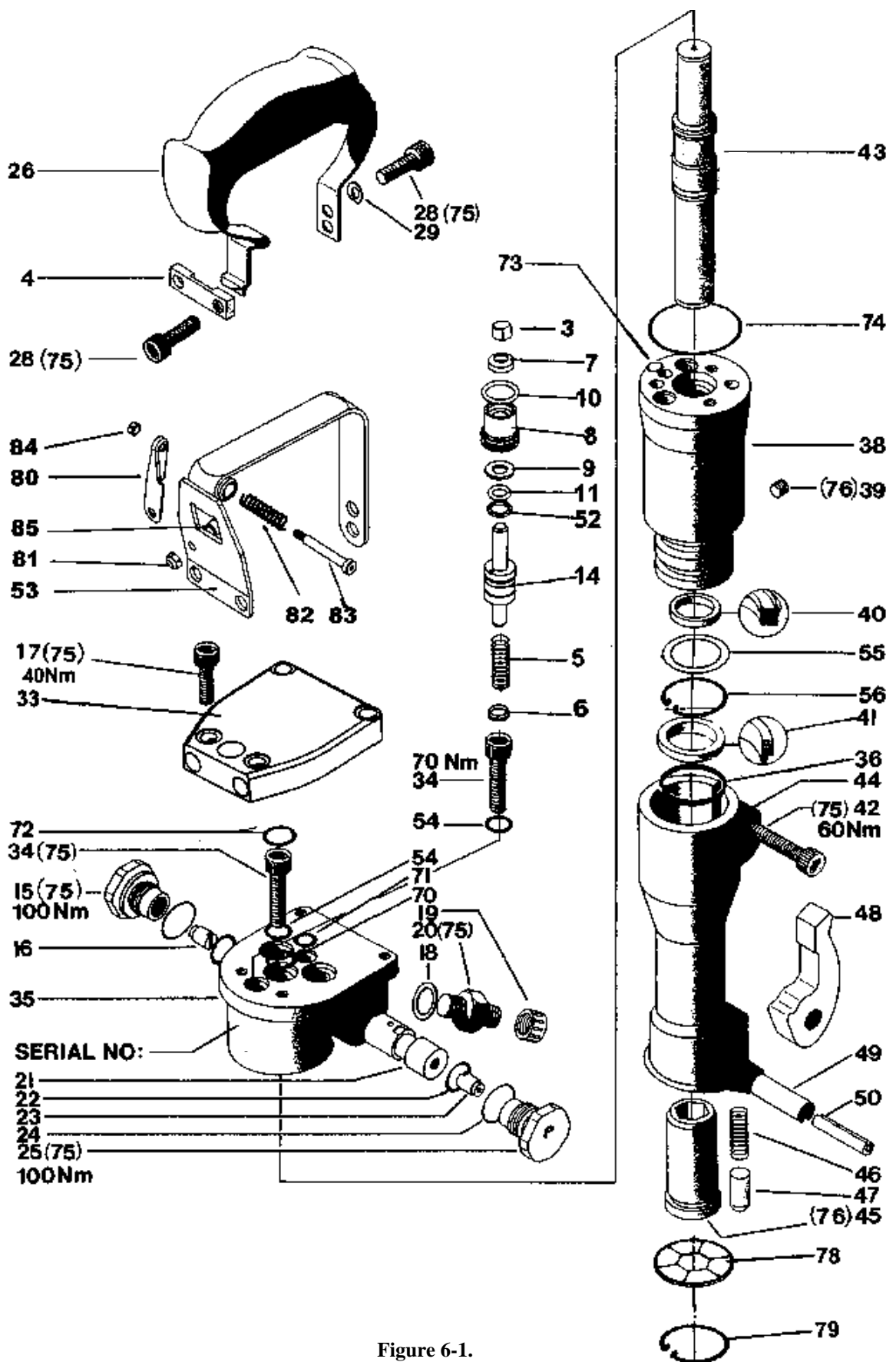


Figure 6-1.
Breaker Assembly

6.2 FRONT HANDLE ASSEMBLY

Item Number	Part Number	Quantity	Description
1	1814740	1	SCREW M10 X 130
2	1814741	1	SCREW M10 X 70
3	1814742	2	NUT M10
4	1814743	2	WASHER M10
5	1814174	1	TUBE 25 X 3 AFK. 109
6	1802043	1	RUBBER HANDLE
7	1814173	1	BOW
8	1814744	2	BUSHING

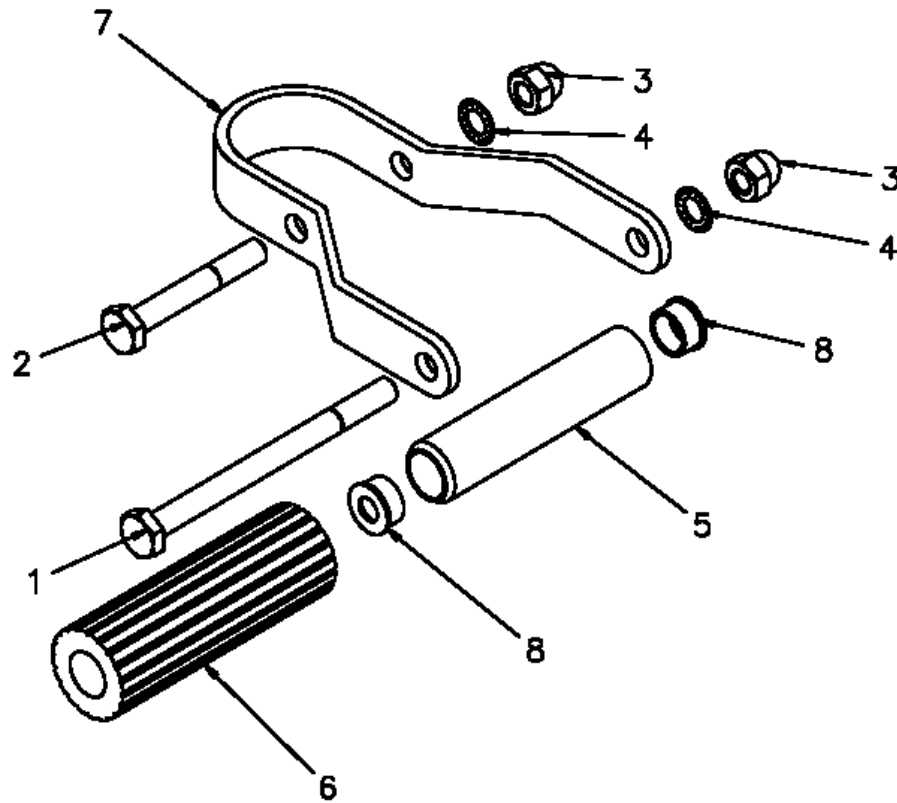


Figure 6-2.
Front Handle Assembly

6.3 HOSE ASSEMBLY

Refer to Figure 6-3.

Item Number	Part Number	Quantity	Description
95	1697502	2	HOSE WHIP 12"
96	6001886	1	COUPLING 1/2" FEMALE
97	6001885	1	COUPLING 1/2" MALE

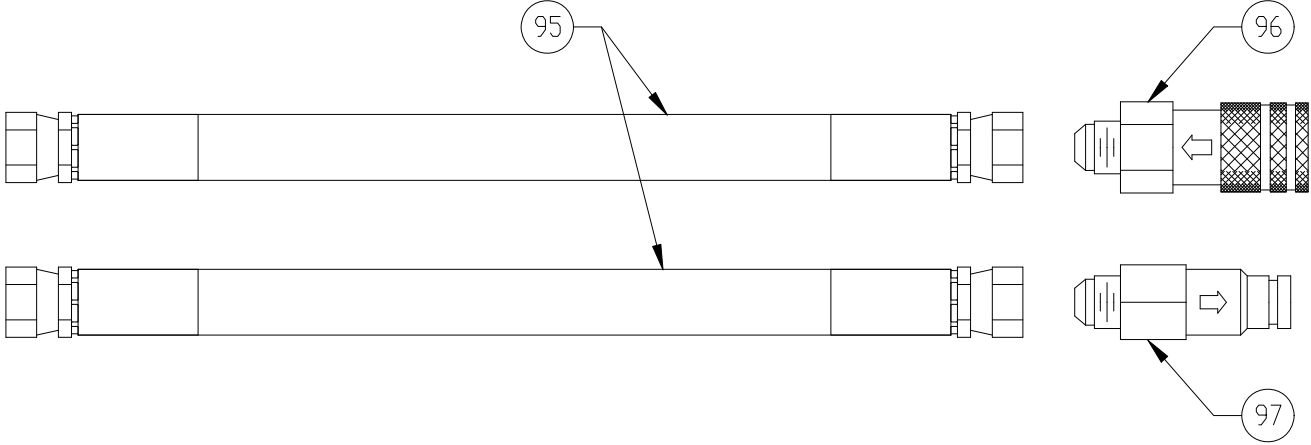


Figure 6-3.
Hose Assembly

LIMITED PRODUCT WARRANTY

**Reimann & Georger Corporation
Hoisting and Construction Products**

A. LIMITED WARRANTY

Reimann & Georger Corporation (the "Manufacturer") warrants to the original purchaser (the "Buyer") that all Reimann & Georger Hoisting and Construction products shall be free of defects in material and workmanship for a period of one (1) year from date of original purchase.

B. MANUFACTURER'S OBLIGATIONS

The Manufacturer's sole obligation under this Limited Warranty is the repair or, at the Manufacturer's discretion, the replacement of parts found to be defective. Parts and equipment must have authorization from the Manufacturer prior to return to the Manufacturer or repair by an authorized service person. Costs of transportation and other expenses connected with replacing or repairing parts are not covered under this Limited Warranty.

C. PARTS MANUFACTURED BY OTHERS

This Limited Warranty does not cover any parts manufactured by others. Such parts are subject to the warranty, if any, of their respective manufacturers, and are to be repaired only by a respective authorized service person for such parts. The Manufacturer shall have no obligation to undertake repairs of parts manufactured by others.

D. NO SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES

IN NO EVENT SHALL THE MANUFACTURER BE LIABLE TO THE BUYER OR ANY OTHER PERSON FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL LOSSES OR DAMAGES CONNECTED WITH THE USE OF THE PRODUCT UNDER THIS LIMITED WARRANTY. SUCH DAMAGES FOR WHICH THE MANUFACTURER SHALL NOT BE RESPONSIBLE INCLUDE, BUT ARE NOT LIMITED TO, LOST TIME AND CONVENIENCE, LOSS OF USE OF THE PRODUCT, THE COST OF A PRODUCT RENTAL, COSTS OF GASOLINE, TELEPHONE, TRAVEL, OR LODGING, THE LOSS OF PERSONAL OR COMMERCIAL PROPERTY, AND THE LOSS OF REVENUE.

E. NO LIABILITY IN EXCESS OF PURCHASE PRICE

IN NO EVENT SHALL THE MANUFACTURER'S OBLIGATIONS UNDER THIS LIMITED WARRANTY EXCEED THE PURCHASE PRICE OF THE PRODUCT.

F. NO EXTENSION OF STATUTE OF LIMITATIONS

ANY REPAIRS PERFORMED UNDER THIS WARRANTY SHALL NOT IN ANY WAY EXTEND THE STATUTES OF LIMITATIONS FOR CLAIMS UNDER THIS LIMITED WARRANTY.

G. WAIVER OF OTHER WARRANTIES

THE EXPRESS WARRANTIES SET FORTH IN THIS LIMITED WARRANTY ARE IN LIEU OF AND EXCLUDE ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

H. PROCEDURE FOR WARRANTY PERFORMANCE

If the product fails to perform to the Manufacturer's specifications, the Buyer must provide the Manufacturer with the applicable model and serial numbers, the date of purchase, and the nature of the problem.

I. ADDITIONAL EXCLUSIONS FROM THIS LIMITED WARRANTY. THIS LIMITED WARRANTY DOES NOT COVER ANY OF THE FOLLOWING:

1. Equipment which has been abused, damaged, used beyond rated capacity, or repaired by persons other than authorized service personnel.
2. Damage caused by acts of God which include, but are not limited to, hailstorms, windstorms, tornadoes, sandstorms, lightning, floods, and earthquakes.
3. Damage under conditions caused by fire or accident, by abuse or by negligence of the user or any other person other than the Manufacturer, by improper installation, by misuse, by incorrect operation, by "normal wear and tear", by improper adjustment or alteration, by alterations not completed by authorized service personnel, or by failure of product parts from such alterations.
4. Costs of repairing damage caused by poor or improper maintenance, costs of normally scheduled maintenance, or the cost of replacing any parts unless done as the result of an authorized repair covered by the one (1) year Limited Warranty.
5. Costs of modifying the product in any way once delivered to the Buyer, even if such modifications were added as a production change on other products made after the Buyer's product was built.

J. NO AUTHORITY TO ALTER THIS LIMITED WARRANTY

No agent, representative, or distributor of the Manufacturer has any authority to alter the terms of this Limited Warranty in any way.