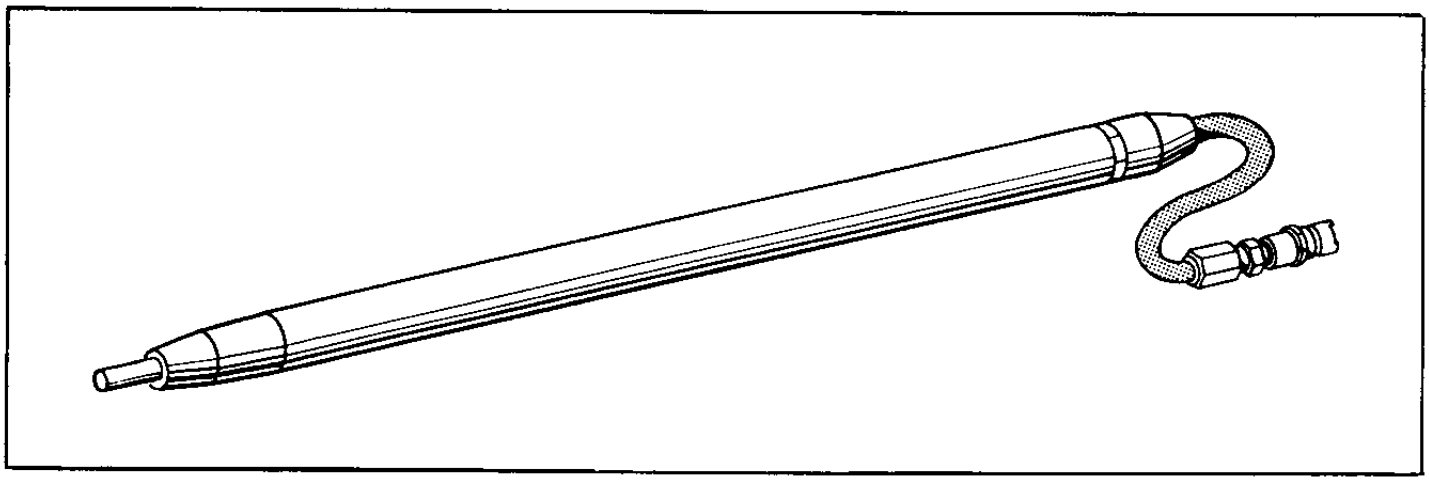
# MODEL 502 HOLE-HOG®

## Quick Reversing Underground Piercing Tool

## OPERATING AND MAINTENANCE INSTRUCTIONS PARTS LIST AND WARRANTY



1.0 GENERAL

The Allied 502 Hole-Hog pneumatic reversible underground piercing tool is designed to pierce continuous and blind horizontal, inclined and vertical holes in compressible subsoils. Such holes are used for trenchless installation of underground utility lines, gas lines, water lines, sewers, etc., without the necessity of breaking or disturbing asphalt and concrete paving, or landscaping such as lawns, shrubs, trees and flowerbeds. Backfilling operations are eliminated and traffic is maintained.

THE STANDARD PROCEDURES THAT ARE EXPECTED AND/OR REQUIRED OF THOSE WORKING UNDERGROUND SHOULD BE FOLLOWED INCLUDING THE DETERMINATION AND LOCATION OF EXISTING UNDERGROUND SERVICE LINES, CABLES, CONDUIT AND THE LIKE. SEE SECTION 6 FOR FURTHER SAFETY GUIDELINES.

CAUTION

Instructions given with this symbol are for personal safety and full service life of the Hole-Hog. Follow them carefully.

Operation or service other than in accordance with these instructions may subject the Hole-Hog to conditions beyond the design capability. Improper operation or servicing may result in Hole-Hog failure or personal injury. Read this manual thoroughly before operating or maintaining the unit.

## 2.0 DESCRIPTION

The Allied Hole-Hog is a self propelled pneumatic reversible piercing tool of percussion action. The body of the tool is the operating member which forms the hole. An internal ram (striker) performs reciprocating motion, delivering blows against the inner front face of the body. Under action of these blows, the body is driven through the ground.

A reversing mechanism allows for changing the direction of blows and thus the direction of the tool, allowing the tool to exit from the hole that it has made. The 502 Hole-Hog reversing mechanism is actuated easily by turning the whip hose 180° counterclockwise with the air supply off.

The 502 Hole-Hog consists of the following major parts:

### 2.1 BODY ASSEMBLY

The body assembly consists of an anvil and a body. The body's tail end has an internal thread intended for fastening the slide valve assembly.

The body's front section has an external conical surface. The anvil has an external conical surface which is pressed into a matching internal surface of the body forming an integral assembly.

### 2.2 STRIKER

The striker has two precision, externally ground bearing surfaces, one at the front and the other at the rear of the striker. These bearing surfaces guide and support the striker during its movement within the body assembly. The front bearing surface has machined flats to allow passage of the striker's cylindrical surface to control the motion of the striker.

### 2.3 SLIDE VALVE

The slide valve provides faultless starting of the unit in any position. It also controls forward and reverse directions of unit.

## 3.0 SPECIFICATIONS

| | U.S./Metric |
|---|---|
| Outside Diameter | 2 in./51 mm. |
| Overall Length | 40 in./1016 mm. |
| Weight | 24 lbs./10.9 kg. |
| Working Air Pressure* | 90 p.s.i./6.3 kg./cm.$^2$ |
| Air Consumption Per Minute | 20 c.f.m./83 c.m.m. |
| Air Hose (Inside Diameter) | .5 in./12.7 mm. |
| Percussion Rate Per Minute | 535 |
| Single Percussion Energy | 90 ft. lbs./102 n.m. |
| Maximum Working Pressure For All Models | 95 p.s.i./6.7 kg./cm.$^2$ |
| Average Ground Piercing Speed** | Up to 4 ft./min./1.3 m. |
| Reversing Speed | Up to 5 ft./min./1.5 m. |

*The longer the hole to be pierced, the higher the pressure required to compensate for line pressure drop. Allow 5 p.s.i./.4 kg./cm.$^2$ difference for each 100 ft./30 m. of hose. Pressure above 95 p.s.i./6.7 kg./cm.$^2$ at the tool could decrease the life of the Hole-Hog.

**Based on standard diameters. The rate, which depends upon soil conditions, will decrease when expanders are used for larger diameter holes.

OPERATING DEPTHS*:

| | | | |
|---|---|---|---|
| Hard Glacial Clay | 18 in. | Clay/Sand Mix | 18 in. |
| Sand - Dry | 24 in. | Cultivated Soil | 24 in. |
| Sand - Moist | 24 in. | Clay/Loam Mix | 20 in. |

*Hole-Hog operates best in soils that compact well. The minimum depth for operating the Hole-Hog varies with soil conditions and the length of the hole to be made. The chart above is meant as a guide only.

## 4.0 PREPARING FOR OPERATION

The Hole-Hog as delivered by the manufacturer has been assembled, lubricated, factory tested and placed in its shipping container. Remove the Hole-Hog from its container and inspect for possible damage. Pay particular attention to the hose. Check the end cap to ascertain its tightness. If loose, retorque as follows:

| TORQUE: 250-300 FT. LBS./1355 N.M. | WRENCH: 830540 |
|---|---|

It is suggested that the air hose be connected to an air compressor of sufficient capacity and the Hole-Hog operated above ground momentarily.

Daily, check the tightness of the end cap using the proper tool and torque. An end cap that is not tight could blow out and could cause injury to the operator.

## 5.0 GENERAL CONSTRUCTION SAFETY

Comply with the recommendations of the occupational safety and health standards of the U.S. Department of Labor. For OSHA construction guidelines contact your local federal government office, bookstore or write:

U.S. Government Printing Office
Superintendent of Documents
Washington, D.C. 20402

Ask for Construction Industry
OSHA Safety and Health Standards
29 CFR 1926/1910.

## 6.0 HOLE-HOG SAFETY PRECAUTIONS

- √ Observe all safety precautions stated in the supply air compressor manual.
- √ The owner/operator/contractor must accept responsibility for locating underground utilities.
- √ Trenches should be excavated or shored to meet federal, state and local guidelines.
- √ Entrance and exit pits dug in or near previously excavated soil may be unstable and dangerous.
- √ Be aware of the distance of Hole-Hog travel by marking air supply hose.
- √ If indications are the Hole-Hog is off its intended path, stop!

## 6.0 HOLE-HOG SAFETY PRECAUTIONS (cont'd.)

- √ If the Hole-Hog runs but makes no progress, stop!
- √ Check air supply hose periodically for fitting tear out and damage.
- √ Serious injury from flying debris may result if the operator's face is placed in line with the Hole-Hog's exhaust.
- √ Operator should keep body positioned in the pit so as not to interfere with the moving Hole-Hog.

## 7.0 SUGGESTED OPERATIONAL PROCEDURES

The following set of procedures should be followed when attempting to drive a hole with the Allied underground piercing tool.

1. Determine presence of obstructions such as: water lines, gas lines, sewers and utility lines in the area to be penetrated.

2. Open entrance pit to depth, width and length required to properly align piercing tool.

3. Open exit pit. Width and depth of exit pit should exceed entrance pit dimensions by 6 in. to 10 in./152 mm. to 245 mm.

4. Note type of soil.

5. Level entrance pit to achieve ground cover required, preferably at least the minimum recommended critical depth for the soil type.

(Continued on next page)

6. Determine length of hole to be penetrated and mark hose for that length. (This gives operator indication when the piercing tool should reach its terminal point, and would indicate if the tool had been deflected off course).

7. Check slope of ground using level.

8. Set piercing tool in pit and align on target level piercing tool.

9. Connect hose to compressed air supply and blow out air hose.

10. Pour small amount of All-Col into air line and connect to piercing tool (See Section 8.0 Lubrication).

11. If the Hole-Hog is not in the forward mode, turn supply hose 180° clockwise. Reduce air pressure to approximately 60 p.s.i./4.2 kg./cm.$^2$ and start piercing tool penetration into the ground of its motion. Stop after approximately 1/3 body length has penetrated, and recheck alignment on target and grade level using suitable spirit level.

12. Restart air supply to piercing tool. Continually check alignment and grade level until the tool's body has fully penetrated.

13. Increase air pressure to 90 p.s.i./6.3 kg./cm.2 and complete hole penetration.

THE TOOL SHOULD NEVER BE OPERATED ABOVE 95 P.S.I./6.7 KG./CM.2. PRESSURES ABOVE 95 P.S.I./6.7 KG./CM.2 WILL DECREASE TOOL LIFE AND PARTS WILL NOT BE COVERED UNDER WARRANTY.

After the tool has reached the exit pit, proceed as follows:

14. Stop compressed air delivery by shutting off the compressor air valve.

15. Disconnect the hose and remove the hose from the hole.

16. Withdraw the tool from the pit.



17. IF AT ANY TIME THE END CAP SHOULD LOOSEN UP, DO NOT RETIGHTEN IT. REMOVE END CAP, CLEAN THOROUGHLY (GIVE SPECIAL ATTENTION TO CLEANING THE THREADS OF END CAP AND BODY) AND LUBRICATE THREADS AS STATED IN MAINTENANCE SECTION, THEN REASSEMBLE. If the piercing tool has met an unsurpassable obstacle or has deviated from the given direction more than permissible, the tool should be stopped and returned out of the hole. The tool may also be stopped and returned when a blind hole is required.

7.1 TO REVERSE THE TOOL, PROCEED AS FOLLOWS:

1. Stop compressed air delivery by shutting off the valve at the compressor.

2. Turn air hose counterclockwise approximately 180°. Turn air on.

3. When tool has backed out of hole, turnoff air.

IMPORTANT!
If either or both of the items listed below occur, Allied is relieved of all warranty responsibilities on that Hole-Hog:

1. Heat applied by a torch or by any other method to any part or parts of the Allied Hole-Hog. This includes the body when attempting to remove the end cap. Applying heat may destroy the main body, valve body, striker and other parts beyond use.

2. USING A PIPE WRENCH ON THE BODY OF AN ALLIED HOLE-HOG. When a pipe wrench is used on the body while attempting to remove the end cap, it will usually hinder, not help, in the removing of the end cap.

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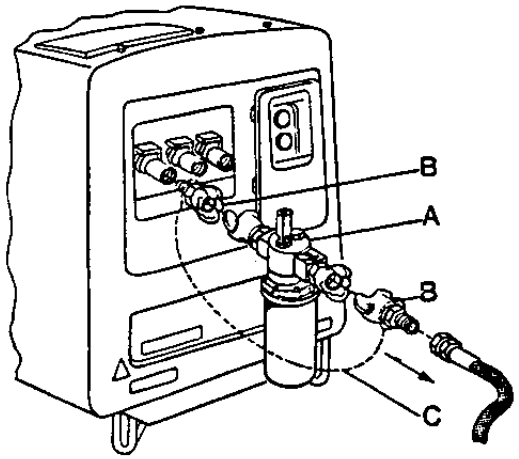
# SUGGESTED LUBRICATION INSTALLATION




FOR IMPROVED PERFORMANCE USE ALLIED ALL-COL LUBRICANT ACCORDING TO INSTRUCTIONS.

No. 832237 1 QUART BOTTLE
No. 832238 4 QUART CASE

A - No. 832208 LUBRICATOR

B - No. 865444 AIR HOSE COUPLING

C - RECOMMENDED SAFETY CHAIN

8.0 LUBRICATION

Before using the Hole-Hog it should be lubricated by pouring All-Col into the air supply hose. This should be repeated at approximately 100 ft./30 m. intervals. For more consistent operation, it is recommended an air line lubricator be installed and set to 4 drops/minute. All-Col Hole-Hog lubricant or equivalent is recommended. Dispense All-Col into the air supply hose using the Allied lubricator part number 832208.

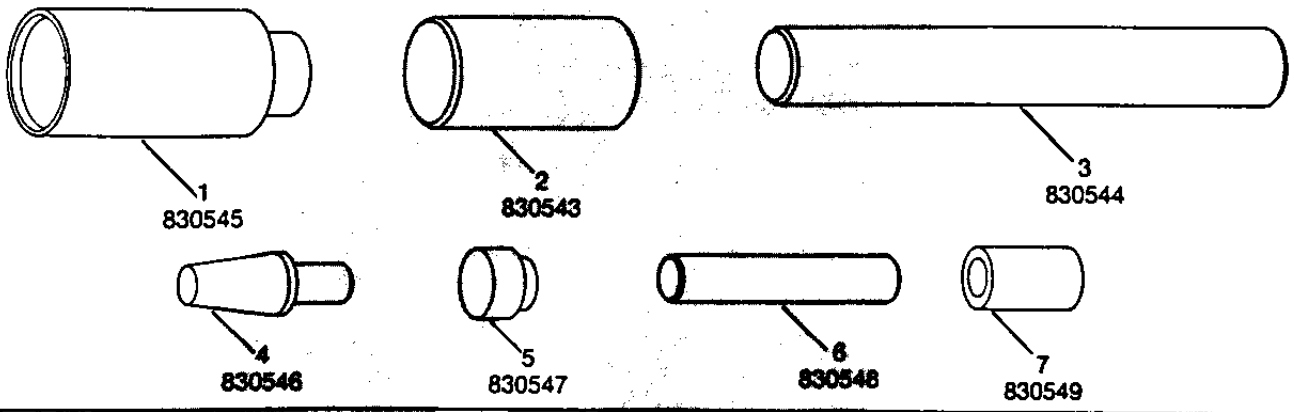
**Use the following consumption rate after reading instructions and safety notations thoroughly.**

| Below 40° F. | Above 40° F. |
|---|---|
| 4-6 drops/minute | 1-3 drops/minute |

**DANGER!**

**All-Col lubricant contains methanol. Harmful if inhaled. May be fatal or cause blindness if swallowed, inhaled or absorbed through the skin. Cannot be made nonpoisonous. Consult Material Safety Data Sheet for further information.**

## MODEL 502 HOLE-HOG ASSEMBLY TOOL KIT
## PART NO. 830542




| ITEM NO. | QTY. | PART NO. | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 830545 | Shock Absorber Installation Tool |
| 2 | 1 | 830543 | Push Bar for Shock Absorber (Step #1) |
| 3 | 1 | 830544 | Push Bar for Shock Absorber (Step #2) |
| 4 | 1 | 830546 | Valve Guide Installation Tool |
| 5 | 1 | 830547 | Valve Guide Pushing Tool |
| 6 | 1 | 830548 | Push Bar for Bushing |
| 7 | 1 | 830549 | Valve Spool Installation Tool |

## 9.0 POSSIBLE TROUBLES AND REMEDIES

**TROUBLE: WILL NOT RUN OR START**

| PROBABLE CAUSE | CORRECTION |
|---|---|
| a. Restriction in inlet hose. | a. Disconnect and blow out hose. |
| b. In cold weather, condensation may have frozen inside unit. | b. Pour small amount of anti-freeze or de-icing fluid into hose. See Section 8.0 for use of All-Col. |
| c. Bent valve stem. | c. Replace valve stem. |
| d. Foreign material in unit through valve seal or air line. | d. Disassemble unit and clean. |
| e. Striker broken. | e. Replace striker. |
| f. Rusting of friction surfaces. | f. Disassemble, clean and polish. |

**TROUBLE: RUNS ERRATICALLY (FORWARD) OR STOPS IN GROUND**

| PROBABLE CAUSE | CORRECTION |
|---|---|
| a. Bent valve stem. | a. Replace valve stem. |
| b. Hose restricted. | b. Disconnect and blow out hose. |
| c. Immovable obstacle. | c. Reverse. |
| d. Excessive clearance body to striker. | d. Replace worn parts. |
| e. Excessive clearance striker to valve sleeve. | e. Replace worn parts. |
| f. Moisture in air. | f. Flush with methanol. |

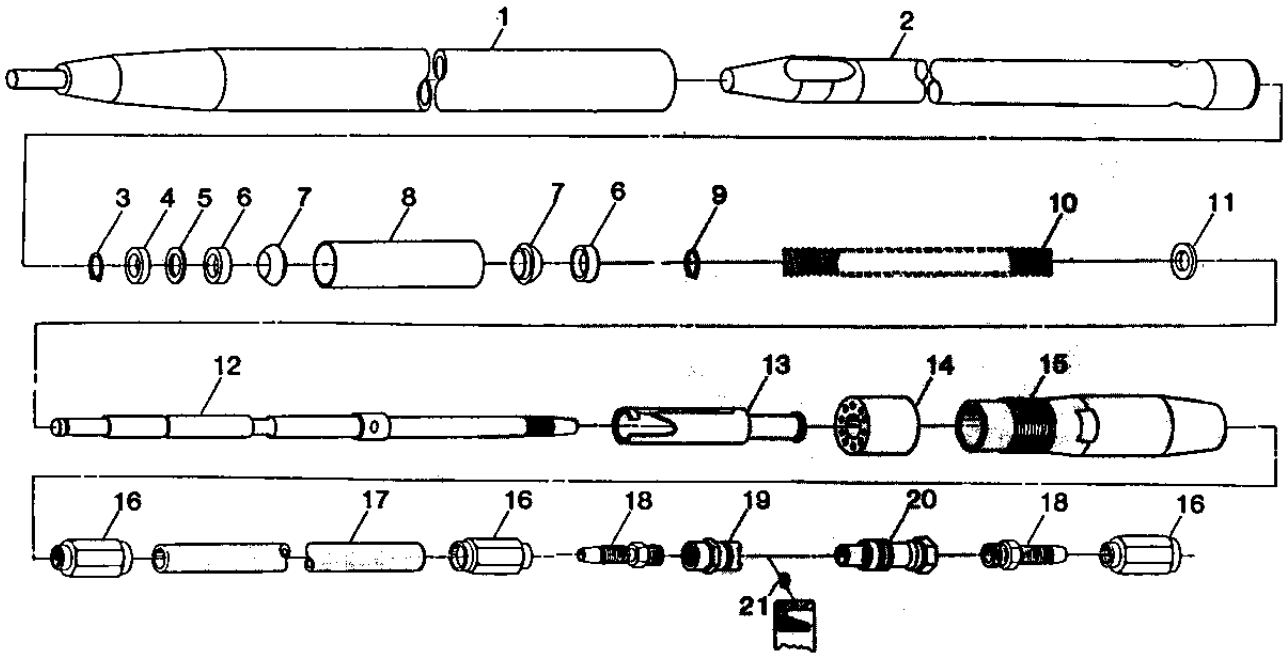
**TROUBLE: RUNS ERRATICALLY (REVERSE)**

| PROBABLE CAUSE | CORRECTION |
|---|---|
| a. Air pressure too high (90 p.s.i. recommended). | a. Check air pressure and flow. |
| b. Improper lubrication. | b. See recommended lube procedure. |
| c. Bent valve stem. | c. Replace valve stem. |
| d. Worn or deteriorated shock absorber. | d. Replace shock absorber. |

**TROUBLE: LOW ON POWER OR SLOW RATE OF PENETRATION**

| PROBABLE CAUSE | CORRECTION |
|---|---|
| a. Restriction in air hose. | a. Disconnect and blow out hose. |
| b. Air pressure too high (90 p.s.i. recommended). | b. Check air pressure. |
| c. Air pressure too low. | c. Check air pressure. |
| d. Worn or deteriorated shock absorber. | d. Replace shock absorber. |
| e. Oscillation due to ground condition (i.e., water and clay). | e. Prevent water from entering hole if possible. |
| f. Very hard ground condition. | f. Examine application. |
| g. Misalignment of internal parts. | g. Check alignment in shop. |
| h. Tight clearances due to distortion of parts. | h. Check for tight clearances in shop. |
| i. Ice buildup inside unit. | i. See Section 8.0 of this manual. |

# MODEL 502 HOLE-HOG
## BASIC COMPONENTS
## PART NUMBER 830500
## ALL UNITS S/N 2190 AND UP




## PARTS LIST

| ITEM NO. | QTY. | PART NO. | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 830520 | BODY & ANVIL ASSEMBLY |
| 2 | 1 | 830501 | STRIKER |
| 3 | 1 | 830536 | RETAINING RING |
| 4 | 1 | 830551 | SPACER |
| 5 | 1 | 830556 | WAVE WASHER |
| 6 | 2 | 830554 | SWIVEL SEAT |
| 7 | 2 | 830552 | BALL SWIVEL |
| 8 | 1 | 830553 | VALVE SLEEVE |
| 9 | 1 | 830535 | RETAINING RING |
| 10 | 1 | 830532 | BIAS SPRING |
| 11 | 1 | 830530 | SPRING SEAT |
| 12 | 1 | 830533 | VALVE STEM ASSEMBLY |
| 13 | 1 | 830505 | VALVE GUIDE |
| 14 | 1 | 830512 | SHOCK ABSORBER |
| 15 | 1 | 830507 | END CAP |
| 16 | 3 | 830538 | HOSE SOCKET FITTING |
| 17 | 1 | 830534 | WHIP HOSE SECTION |
| 18 | 2 | 830539 | HOSE NIPPLE FITTING |
| 19 | 1 | 831027 | Q.D. FEMALE COUPLING |
| 20 | 1 | 831042 | Q.D. MALE COUPLING |
| 21 | 1 | 831030 | GASKET (FOR REPLACEMENT ONLY) |

10.0 MAINTENANCE

The Allied tool is nearly a maintenance-free tool. However, at the end of each 100 operational hours (other than if operated in very sloppy soil; then, at the end of that working day), it is recommended that the tool be dismantled and all surfaces be checked for evidence of abrasion, and the exhaust ports in the shock absorber be inspected for obstructions.

11.0 DISASSEMBLE*

1. With body positioned horizontal in holding device, use wrench P/N 830540 to loosen the end cap. Screw end cap tail section out of the body.

2. Remove the striker (2) by using a long hook to pull striker out 6" or 8" and then pull striker completely out of body.

3. Do not disassemble the valve and the shock absorber assembly unless it is necessary to replace internal parts of the assembly.

4. a.) Position the end cap (15) vertically against top of vise jaws, allowing the whip hose (17) to clear the jaws of the vise. Push valve sleeve (8) until the flats of the hose socket fitting (16) are exposed between the jaws of the vise. Clamp the vise on the flats. With open end wrench placed across the flats of the valve stem (12), remove the valve body from the fitting (16) and hose (17). By holding the end cap with one hand, pull valve assembly out of the valve guide (13).

b.) Press shock absorber (14) and valve guide (13) out of end cap (15) using 830544 pusher tool.

c.) Using sharp instrument, cut through shock (14) and remove from valve guide (13).

11.0 DISASSEMBLE* (cont'd.)

5. DISASSEMBLE OF SWIVEL VALVE ASSEMBLY

Disassemble the swivel valve assembly to replace bias spring only when necessary.

a.) With the valve assembly lying horizontally on a work bench, hold with one hand and remove valve sleeve retaining ring (3).

b.) Remove spacer (4), wave washer (5), swivel seat (6) and ball swivel (7).

c.) Remove valve sleeve (8), ball swivel (7) and swivel seat (6).

d.) Depress bias spring (10) and remove retaining ring (9).

6. REASSEMBLE OF SWIVEL VALVE ASSEMBLY

Reassemble in reverse order lubricating swivel valve components during the assembly process.

a.) Install bias spring (10) depressing as necessary to install retaining ring (9). Be certain that spring seat (11) is in place.

b.) Place the bottom swivel seat (6) on the valve stem (12).

c.) Add one half of the swivel ball (7) on top of the swivel seat.

d.) Place valve sleeve (8) over the bottom half of the swivel ball (7).

e.) Install the top half of the swivel ball (7) inside the valve sleeve.

f.) Install the top swivel seat (6).

g.) Set the wave washer (5) on the upper half of the swivel ball seat (6).

h.) Set the spacer (4) on top of the wave washer.

i.) Insert the retaining ring (3) into the groove provided on the valve stem (12).

## 12.0 REASSEMBLE*

*1. Position end cap (15) in press with threaded end up. Insert shock absorber installation tool P/N 830545 into threaded end. Place shock (14) in tool and press into place with push bars P/N's 830543 and 830544. Insert valve guide installation tool 830546 into valve guide (13) and using push bar P/N 830548 push the valve guide into the shock absorber.

2. Press valve guide (13) into shock absorber (14).

3. Position end cap (15) horizontally in vise and clamp.

4. Insert valve assembly into the valve guide (13) until valve body threads are exposed on opposite end of end cap (15). Screw hose socket fitting (16) with whip hose (17) preassembled on valve body threads.

5. Reposition end cap vertically against vise, allowing whip hose to clear jaws of the vise. Push valve sleeve (8) until the flats of the hose socket fitting (16) are exposed between jaws of the vise and clamp the vise on the flats. With open-end wrench placed across the flats of the valve body (12), tighten the valve body into the hose socket fitting and hose until the undercut on the valve body reaches the fitting.

**6. Install the striker into the body so that the back-end of the striker is inside the body about 6" to 8".

7. Coat the valve assembly with hydraulic fluid. Apply anti-seize thread lubricant sparingly to the threads on the end cap and to the body threads and taper.

8. Install the end cap tail assembly by inserting the valve sleeve into the striker and screwing the end cap in the body.

9. Using wrench P/N 830540 tighten the end cap and torque to 250-300 ft. lbs.

*Contact your Allied distributor for information on appropriate tools required (see page 5).

**LUBRICATION NOTES:**

* **LUBRICATE ALL RUBBER PARTS WITH A SUITABLE LUBRICANT BEFORE ATTEMPTING TO INSTALL.**

** **COAT STRIKER WITH HYDRAULIC OIL BEFORE INSTALLING STRIKER INTO BODY.**

**NOTES:**

## HOLE-HOG PRODUCT WARRANTY

### BASE WARRANTY

**ALLIED** warrants its products to be well-made, durable and of good material and if within one hundred eighty (180) days from the date of delivery of such new product to the actual and original purchaser or renter, but no more than twelve (12) months from the date of shipment from **ALLIED'S** factory, any part except the rubber shock absorber, rubber valve seal, hose assemblies, rubber gasket/bushing or Hole-Hog accessories, such as launchers, extractors, expanders, pipe pushers, lengtheners which are covered by the **LIMITED WARRANTY**, shall fail by reason of defective material or poor workmanship, **ALLIED** will at its option, repair or furnish such part free of charge under the conditions listed in **WARRANTY LIMITATIONS. ALLIED'S WARRANTY LABOR ALLOWANCE POLICY IS WITH THE DEALER.** All inquiries on the **WARRANTY LABOR ALLOWANCE** should be directed to the Allied Authorized Sales and Service Dealer.

### LIMITED WARRANTY

The rubber shock absorber, rubber valve seal, hose assemblies, rubber gasket/bushing or Hole-Hog accessories, such as launchers, extractors, expanders, pipe pushers, lengtheners are covered by the **LIMITED WARRANTY** for a period of thirty (30) days. **ALLIED** reserves the full right to determine if and to what extent warranty adjustments may be made for damage or breakage of these items. **ALLIED IS NOT RESPONSIBLE FOR LABOR OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL ITEM REQUIRED TO MAKE THE REPAIR.**

### EXTENDED WARRANTY

The **EXTENDED WARRANTY** covers the failure of the main anvil/body assembly and the striker, which results under normal use and service, from defects in workmanship or material in the part. The coverage begins with the expiration of the **BASE WARRANTY** and ends one (1) year or five hundred (500) hours, whichever comes first, from the date of delivery. New or **ALLIED** approved rebuilt (main anvil/body assemblies or strikers) may be used in making the repair. **ALLIED IS NOT RESPONSIBLE FOR LABOR OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL ITEM REQUIRED TO MAKE THE REPAIR. ALLIED** is not responsible for the replacement of parts damaged due to the main anvil/body assembly or striker failure or repair.

### WARRANTY LIMITATIONS

For warrantable failures, **ALLIED** will, at its option, repair or furnish such part free of charge, F.O.B. factory where manufactured (or other place designated by **ALLIED**); provided, however, that the defective part or sufficient evidence of such defect in the part be delivered to its factory in the United States where manufactured (or other place designated by **ALLIED**), transportation prepaid. Such parts or such evidence must clearly show that the failure was due to poor workmanship of defective material and not due to the negligence or improper use by such purchaser, renter or operator.

No claim under this warranty will be accepted by **ALLIED** unless the proper filled out claim form is submitted and received by **ALLIED** within thirty (30) days of the date of discovery of the defect or within fifteen (15) days of the date of repair.

Breakage or damage resulting from installation or operation or use not in accordance with **ALLIED'S** published installation and operating instructions are not covered by any warranty.

Operation or use beyond published capacities, substitution or interchanging of parts or any alterations not approved by **ALLIED** shall void this warranty.

**ALLIED'S** responsibility and warranty applies only when this equipment is operated and used in accordance with (1) its published instructions and (2) pursuant to the terms, conditions and restrictions of any local, state, dominion, or federal laws, ordinances and regulations. The purchaser, user or renter assumes the responsibility to familiarize himself with such published capacities, instructions, terms and conditions as set forth above. **ALLIED'S** warranty is voided if the serial number is removed or altered in any way.

The original purchaser, user or renter is responsible for "downtime" expenses and all business costs and losses resulting from a warrantable failure.

### DISCLAIMER

**THESE WARRANTIES AND THE COMPANY'S OBLIGATIONS THEREUNDER ARE IN LIEU OF ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ALL OTHER REPRESENTATIONS TO THE ORIGINAL PURCHASER, USER OR RENTER AND ALL OTHER OBLIGATIONS OR LIABILITIES, INCLUDING LIABILITY FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES ON THE PART OF THE COMPANY OR THE SELLER WITH RESPECT TO THE SALE OR USE OF THE MACHINE.**

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