# ALLIED MODELS 1000 / 4605 / 4603

## HOLE-HOG® REVERSIBLE UNDERGROUND PIERCING TOOLS

# OPERATING AND MAINTENANCE INSTRUCTIONS PARTS LIST AND WARRANTY

P/N 100205

1.0 **GENERAL:** The Allied "Hole-Hog"pneumatic reversible underground piercing tools are 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, landscaping such as lawns, shrubs, trees, and flowerbeds. Backfilling operations are eliminated and traffic is maintained. The tools may also be used to drive and withdraw rigid pipe from the ground with the use of optional attachments.

**The standard procedures that are expected and/or required of those working underground should of course be followed including the determination and location of existing underground service lines, cable, conduit and the like.**

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. Hole-Hog's simple reversing mechanism is actuated easily by several clockwise turns of the hose assembly:

**Model 1000 – 18 turns counterclockwise**
**Model 4605 – 14 turns counterclockwise**
**Model 4603 – 9 turns counterclockwise**

The Hole-Hog consists of the following major parts and/or assemblies: (Refer to Illustrative Drawings).

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:** 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 compressed air. Ports are provided in the wall of the striker cylindrical surface to control the motion of the striker.

2.3 **SLIDE VALVE ASSEMBLY:** The slide valve assembly consists of End Cap, Valve Body Nut, Valve Body, Shock Absorber, Valve Seal, Two Hose Nuts, Hose, Connect and Disconnect. The Models 4605 and 4603 have a Stop Ring fixed on the valve body with dowel pins. The slide valve assembly provides reliable operation and faultless starting of the tool in any position.

Reversibility is accomplished by changing the axial displacement of the slide valve which can take two operating positions: front position for forward run of the tool, and rear position for reverse run. The slide valve is displaced from one position to another by turning the hose counter-clockwise.

MANUFACTURED BY:



ALLIED
STEEL & TRACTOR PRODUCTS, INC.
5800 HARPER ROAD, SOLON, OHIO 44139
(216) 248-2600 Cable ALTRAC Telex: 980192

## 3.0 SPECIFICATIONS

| Dimensions & Capacities | 1000 | 4605 | 4603 |
|---|---|---|---|
| Outer Diameter | 2-3/4" 70MM | 3-3/4" 95MM | 5-1/8" 130MM |
| Overall Length | 54" 137CM | 59" 150CM | 59" 150CM |
| Weight | 58 lbs. 26 Kg | 110 lbs. 50Kg | 190 lbs. 86Kg |
| Length of Diameter Ratio | 20 to 1 | 16 to 1 | 11.5 to 1 |
| Working Air Pressure* | 90 PSI 6.5Atu | 90 PSI 6.5Atu | 90 PSI 6.5Atu |
| Air Consumption Per Minute | 60 CFM 1.7M³ | 90 CFM 2.5M³ | 140CFM 4M³ |
| Air Hose (inside Diameter) | 3/4" 20MM | 1" 25MM | 1" 25MM |
| Percussion Rate Per Minute | 380-400 | 380-400 | 380-400 |
| Single Percussion Energy | 75 ft. lbs. 10KgM | 150 ft. lbs. 20KgM | 250 ft.lbs. 35KgM |
| Average Ground Piercing Speed** | Up to 4 ft. per minute (1.3 Meters) | | Up to 2 ft. per minute (.6+ Meters) |
| Maximum Working Pressure, All Models | 95 PSI (6.86Atu) | | |

*The longer the hole to be pierced, the higher the pressure required to compensate for line pressure drop. Allow 5 PSI (.4 Atu) difference for each 100 ft. (30 meters) of hose. Pressure above 95 PSIG (7 Atu) 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.

| OPTIONS | OPERATING DEPTHS* | | | |
|---|---|---|---|---|
| | TYPE OF SOIL | Model 1000 | Model 4605 | Model 4603 |
| Launching Stand (except 1000) | Hard Glacial Gravel | 18" 457MM | 25" 635MM | 36" 914MM |
| Pipe-Pusher (except 1000) | Sand—Dry | 24" 609MM | 33" 838MM | 48" 1219MM |
| Expanders (except 1000) | Sand—Moist | 24" 609MM | 33" 838MM | 48" 1219MM |
| Extractors | Clay/Sand Mix | 18" 457MM | 25" 635MM | 36" 914MM |
| Lengtheners | Cultivated Soil | 24" 609MM | 33" 838MM | 48" 1219MM |
| | Clay—Loam Mix | 20" 508MM | 28" 711MM | 42" 1066MM |

*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 OPERATION

**4.1 PREPARING FOR OPERATING:** The Hole-Hog as delivered by the manufacturer has been assembled, lubricated, factory tested, and placed in its shipping tube. Remove the Hole-Hog from its shipping tube 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 MINIMUM | | |
|---|---|---|---|
| MODEL NO. | FT.-LBS. | KgM | WRENCH |
| 1000 | 275 | 38 | 2-3/8" (60 mm) open end |
| 4605 | 300 | 41 | 832017 |
| 4603 | 550 | 76 | 833017 |

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

**SAFETY PRECAUTION:**

**DAILY, CAREFULLY CHECK THE TIGHTNESS OF THE END CAP USING THE PROPER TOOL & TORQUE. AN END CAP THAT IS NOT TIGHT COULD BLOW OUT AND COULD CAUSE INJURY TO THE OPERATOR.**

4.2 **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 to 10 inches, (152MM to 254MM).
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.
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. If starting device is used, align on target and level. If starting device is not used, level piercing tool.
9. Connect hose to compressed air supply and blow out air hose.
10. Pour small amount of Type A automatic transmission fluid into air line and connect to piercing tool. Make certain that valve assembly is in proper position for forward penetration.
11. Reduce air pressure to approximately 60 PSI (4 Atu) and start piercing tool penetration into the ground. It is necessary to apply force in the direction of its motion. If optional starting device is used, a down pressure on the handle is all that is required. 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. If tool fails to restart, simply kink the hose and release suddenly. Continually check alignment and grade level until the tool's body has fully penetrated.
13. Increase air pressure to 90 PSI (6.5Atu) and complete hole penetration. **Never exceed 95 PSIG (7Atu). Pressures above 95 PSIG (7Atu) could decrease tool life.**

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 GREASE THREADS AS STATED IN (MAINTENANCE), 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.

To reverse the tool, proceed as follows:

1. Stop compressed air delivery.
2. Disconnect the hose connector nearest the hole mouth.
3. Untwist the hose on its whole length and lay the hose connected to the tool along the hole axis.
4. Screw the slide valve mechanism to its extreme rear position by turning the hose counter-clockwise. When turning the hose in the hole, it is necessary to stretch it as it is being turned.
5. Pretwist the hose 3 to 4 turns so that it tends to turn the distributor counter-clockwise.
6. Connect the hose connector and open the air supply valve. If the tool fails to start, kink the hose and release suddenly.
7. When the tool is out of the hole, stop the compressed air delivery, disconnect the hose, and put the distributor valve assembly into the direct run position.

5.0 **TO PREVENT DAMAGE** to internal components, do not use the Hole-Hog's air hose as a handle, nor should you pull on the air hose.

5.1 **CAUTION:** 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.
   a. 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.

6.0 **LUBRICATION:** The tool should be lubricated after approximately 100 feet (30 meters) by pouring a small amount—2 oz. (60 grams)—**type "A" automatic transmission fluid mixed with ½ to 1 oz. (14-28 grams) of Marvel Mystery Oil or Wynn's friction proofing, or their equivalent** in the air hose. This also should be used to coat parts when reassembling the tool. Periodic lubrication, depending on usage, is accomplished in a similar manner. A noticeable slow-down in the tool's operating frequency indicates the need for lubrication. Avoid excess lubrication as it is only exhausted and will cause difficulties in reversing the tool from a pierced hole that has been coated with excessive lubricant.

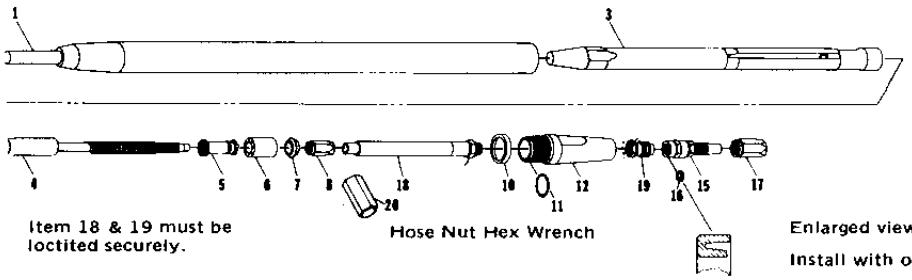
When operating in extremely low temperatures and/or high humidity, use lubricant containing molybdenum disulphide ($MoS_2$). NOTE: If icing or freezing takes place, we suggest pouring 2 oz. (60 grams) of alcohol or dry gas into the air line, as close to the tool as possible, followed immediately by lubricant.

The slide valve thread should be periodically lubricated with Lubriko M2 or equivalent.

7.0 **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.

8.0 **POSSIBLE TROUBLES AND REMEDIES**

| TROUBLE | PROBABLE CAUSE | CORRECTION |
|---|---|---|
| 1. Won't Run or Start | a. Restriction in inlet hose.<br>b. In cold weather, condensation may have frozen inside unit.<br>c. Bent valve stem<br>d. Valve not all the way in (forward) or out (for reverse)<br>e. Hose locknut pin broken or bent (1000 only)<br>f. Foreign material in unit thru valve seal, or air line<br>g. Striker broken<br>h. Rusting of friction surfaces | a. Disconnect and blow out hose (don't lose rubber seal)<br>b. Pour small amount of anti-freeze or de-icing fluid into hose<br>c. Replace valve stem<br>d. Be sure valve is against stop<br>e. Replace hose locknut assembly<br>f. Disassemble unit and clean<br>g. Replace striker<br>h. Disassemble, clean, and polish |
| 2. Runs Erratically (FORWARD) or stops in ground | a. Hose locknut pin broken or bent (1000 only)<br>b. Bent valve stem or damaged threads<br>c. Hose restricted<br>d. Immovable obstacle<br>e. Valve not all the way in (check for clogged or dirty threads causing binding)<br>f. Excessive clearance body to striker<br>g. Excessive clearance striker to valve sleeve | a. Replace hose locknut assembly<br>b. Replace valve stem<br>c. Disconnect and blow out hose (don't lose rubber seal)<br>d. Reverse<br>e. Clean threads<br>f. Replace worn parts<br>g. Replace worn parts |
| 3. Runs Erratically (REVERSE) | a. Valve not all the way out<br>b. Damaged threads on valve<br>c. Air pressure too high (recommended 90 psi)<br>d. Improper lubrication<br>e. Bent valve stem<br>f. Worn or deteriorated shock absorber | a. Check for correct number of turns<br>b. Replace valve stem<br>c. Check air pressure and flow<br>d. See recommended lube procedure<br>e. Replace valve stem<br>f. Replace shock absorber |
| 4. Low on Power or Slow Rate of Penetration | a. Restriction in air hose<br>b. Air pressure too high (90 psi recommended)<br>c. Air pressure too low<br>d. Shock absorber worn or deteriorated<br>e. Oscillation due to ground condition (i.e., water and clay)<br>f. Very hard ground conditions. | a. Disconnect and blow out hose (don't lose rubber seal)<br>b. Check air pressure<br>c. Check air pressure<br>d. Replace shock absorber<br>e. Prevent water from entering hole if possible<br>f. Examine application |




## HOLE-HOG MODEL 1000 – PART NO. 831000

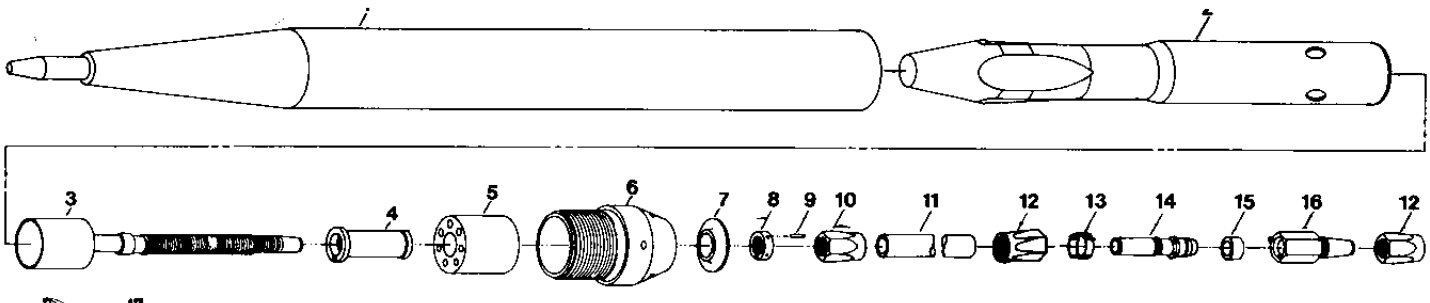
| Item No. | Qty. | Part No. | Description | Weight Lbs. | Weight Kg | Item No. | Qty. | Part No. | Description | Weight Lbs. | Weight Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 831020 | Anvil & Body Assy. | 37.5 | 17. | | | | Quick Disconnect | | |
| 3 | 1 | 831001 | Striker | 15.3 | 7. | 15 | 1 | 831018 | Coupling Assembly | .6 | .3 |
| 4 | 1 | 831024 | Valve Assembly | 1.5 | .7 | | | | includes: | | |
| 5 | 1 | 831006 | Valve Body Nut | .25 | .11 | 16 | 1 | 831030 | Gasket (Pt. No. for | | |
| 6 | 1 | 831012 | Shock Absorber | .12 | .05 | | | | replacement only) | | |
| 7 | 1 | 831013 | Valve Seal | .05 | .02 | 17 | 1 | 831029 | Hose Fitting Socket | .6 | .3 |
| 8 | 1 | 831023 | Hose Lock Nut Assy. | .3 | .14 | 18 | 1 | 831048 | Hose Assembly | 1.0 | .5 |
| 10 | 1 | 831008 | Lock Washer | | | 19 | 1 | 831042 | Quick Disconnect | .4 | .2 |
| 11 | 1 | 831011 | O-Ring | .2 | .09 | 20 | 1 | 831049 | Hose Nut Hex | .5 | .2 |
| 12 | 1 | 831007 | End Cap | 3.5 | 1.6 | | | | Wrench | | |

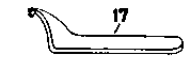
### 9.0 DISASSEMBLE

1. Using a 2-3/8" open end wrench and a hammer, strike the wrench handle several sharp raps until end cap is loosened. It may be necessary to hold the tool body with strap wrench or similar holding device.
2. Remove the striker (3) from the body by tilting the body.
3. Do NOT disassemble the valve and shock absorber assembly unless it is necessary to replace internal parts of the assembly.
4. If necessary to disassemble further, proceed according to the following instructions:
   a. Remove quick disconnect (19), clamp flats of valve stem assembly (4) in a vise. Using special hex socket wrench (20) 831049, remove hose assembly (18) and nut (8) from valve stem assembly (4).
   b. Remove valve stem assembly (4) from end cap and shock absorber assembly. Press shock absorber (6) and valve nut (5) out of end cap (12) using suitable press tools.
   c. To remove or replace shock absorbers (6) or valve seal (7) use sharp instrument to cut through rubber and remove.

### 10.0 REASSEMBLE

1. First make conical shaped adaptor (metal or wood) to insert into end of valve body nut (5) which will allow easier installation of shock absorber (6) over flanges of valve body nut.
2. Coat O.D. of valve body nut (5) with glue (Gallahers Super "100" Adhesive or equivalent). Press valve body nut (5) onto shock absorber (6) using suitable pressing tools. Then press valve seal (7) onto valve nut.
3. Coat I.D. of end cap (12) with glue. Apply a very small amount of grease on leading edge of shock absorber (6), 1/8" or less, for easier assembly. Press shock absorber (6), valve body nut (5) and valve seal (7) into end cap (12) until bottomed. Make sure valve seal is to the rear of end cap, and DOES NOT hang up on end cap lip. Distance from edge of end cap to shock absorber should be 3/16" (5MM). Wipe off excessive glue.
4. Install valve assembly (4) into valve body nut (5).
5. Insert hose locknut assembly (8) onto skived end of hose (18).
6. Clamp flats of valve assembly (4) into vise. Grease valve stem end—threaded area. Using hose nut hex wrench (20), screw hose assembly on until bottomed against valve assembly (4) shoulder, making sure end cap turns exactly 18 times from flats of valve assembly (4) to hose lock nut assembly (8). Look through valve stem to ascertain whether any rubber has extended into air passage. If so—remove as loose rubber parts may interfere with the operation of the unit.
7. Install quick disconnect (19) onto hose assembly (18). Make sure items 18 and 19 are loctited securely.
8. Install O-Ring (11) and lock washer (10) on end cap.
9. Thoroughly clean I.D. of body and anvil assembly (1). Pay special attention to threads in body.
10. Clean striker (3), then slide into body. Coat clean parts with light oil.
11. Coat threads of body and end cap assemblies with Never Seez (or equivalent) lubricant.
12. Install end cap assembly into body, by using a 2-3/8" open end wrench. Tighten end cap approximately 300 Ft. Lbs. (38 KgM). Rap handle of wrench if necessary to assure end cap is tight.
13. After assembly, test run in forward and reverse for 5 to 10 minutes to ascertain correct assembly.
14. The Hole Hog should be lubricated after approximately every 100 feet (330 meters) by pouring a small amount (2 oz. type "A" Automatic Transmission fluid mixed with ½ to 1 oz. (14-28 grams) of friction-proofing oil) in air hose. This should also be used to coat parts when assembling. (Avoid excessive lubrication.)




SPANNER WRENCH

# HOLE-HOG MODEL 4605 – PART NO. 834605

| ITEM NO. | QTY | PART NO. | DESCRIPTION | WEIGHT LBS. | WEIGHT Kg | ITEM NO. | QTY | PART NO. | DESCRIPTION | WEIGHT LBS. | WEIGHT Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 835020 | Anvil & Body Assy | 61.5 | 28 | 10 | 1 | 835046 | Valve Nut | .8 | 0.36 |
| 2 | 1 | 832001 | Striker | 40.0 | 18.2 | 11 | 30" | 832015 | Air Hose | 2.0 | .90 |
| 3 | 1 | 835045 | Valve | 3.2 | 1.45 | 12 | 2 | 832009 | Hose Nut | .8 | 0.36 |
| 4 | 1 | 832006 | Valve Body Nut | 1.5 | 0.7 | 13 | 1 | 832042 | Spring | | |
| 5 | 1 | 832012 | Shock Absorber | 0.6 | 0.26 | 14 | 1 | 832005 | Connector | .8 | 0.36 |
| 6 | 1 | 835056 | End Cap | 4.0 | 1.8 | 15 | 1 | 832011 | Rubber Bushing | .05 | 0.02 |
| 7 | 1 | 832013 | Valve Seal | .1 | 0.04 | 16 | 1 | 832008 | Hose Disconnect | 1.2 | 0.54 |
| 8 | 1 | 832010 | Stop Ring | .3 | 0.15 | 17 | 1 | 832017 | Spanner Wrench | 1.3 | 0.6 |
| 9 | 2 | 835014 | Dowel Pin | | | | | | | | |

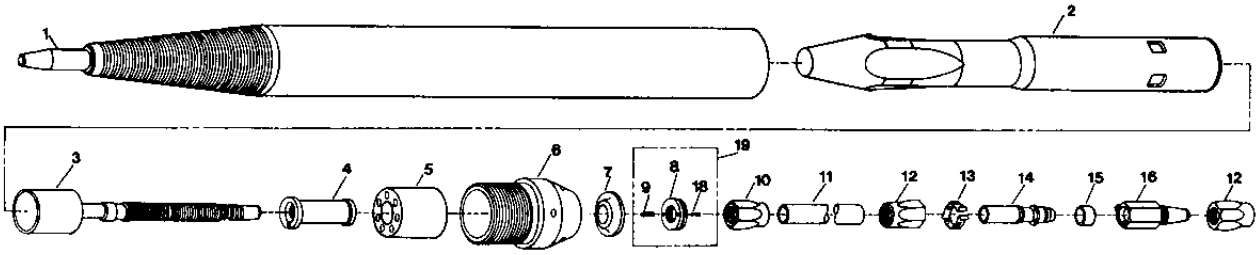
## 11.0 DISASSEMBLE

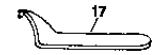
1. Using the spanner wrench provided, turn the slide valve assembly out of the body. Several sharp raps with a hammer on the wrench may be necessary to loosen the end cap.
2. Remove the striker from the body, hooking it by the exhaust ports with a wire, or by tilting the body slightly.
3. DO NOT disassemble the slide valve assembly unless it is necessary to replace the shock absorber.
4. After disassembly of the tool, rinse the parts and slide valve assembly in kerosene.
5. Wipe the rinsed parts and slide valve assembly with a clean cloth and coat parts with a film of lubricant. (See Lubrication.)

IMPORTANT: WHEN REASSEMBLING THE END CAP, A GOOD ANTI-SEIZE THREAD LUBRICANT (NEVER-SEEZ OR EQUIVALENT) SHOULD BE USED ON THE THREADS OF THE END CAP AND THE THREADS OF THE BODY. KEEP THE TAPER FREE OF DIRT OR LUBRICANT.

## 12.0 REASSEMBLE

1. First make conical shaped adaptor (metal or wood) to insert into end of valve body nut (4) which will allow easier installation of shock absorber (5) over flanges of valve body nut (4).
2. Coat O.D. of valve body nut (4) with glue (Gallahers Super "100" Adhesive or equivalent). Press valve body nut (4) into shock absorber (5), so that one end of shock absorber (5) is against the large flange of valve body nut (4).
3. Coat I.D. of end cap (6) with glue. Apply a very small amount of grease on the leading edge of the shock absorber (5) 1/8" or less for easier assembly. Press shock absorber (5) and valve body nut (4) into end cap (6) until bottomed and distance from edge of end cap to shock absorber is 1/4" (64 MM). Wipe off excessive glue.
4. Using conical shaped adaptor press valve seal (7) onto valve body nut (4). Make sure rubber valve seal is properly secured.
5. Install valve (3) into valve body nut (4).
6. Turn end cap until valve body nut (4) bottoms on flats of valve (3). Install stop rin (8) on first thread of valve body. Holding stop ring (8) and valve (3) stationary, drill two holes #22 (.1570" dia.)–3.9MM. Drill on both sides of ring. Insert both dowel pins (9) and fasten securely.
7. Assemble valve nut (10) and hose nut (12) on air hose (11). (Both ends of hose are the same.) Insert connector (14) on one end of hose. Grease connector (14) for easier installation.
8. Securely hold valve nut (10) (end without connector) into vise. Grease valve (3) (threaded end) and insert into hose nut. Use wrench on flats of valve (3) until valve nut (10) bottoms with stop ring (8). End cap should turn 14 times from stop on flats to stop ring.
9. Thoroughly clean I.D. of body and anvil assembly (1). (Pay special attention to threads in body.)
10. Clean striker (2) and slide into body (1). (Coat clean parts with light oil.)
11. Coat threads of body and end cap assembly with Never-Seez (or equivalent) lubricant.
12. Install end cap assembly into body, by using spanner wrench (17) (provided). Tighten end cap not less than 300 Ft. Lbs. (40 KgM). Rap handle of wrench if necessary to assure end cap is tight.
13. After assembly, test run in forward and reverse for 5 to 10 minutes on ground to ascertain correct assembly.
14. The Hole-Hog should be lubricated after approximately every 100 feet (330 meters) by pouring a small amount (2 oz. (60 grams) type "A" automatic transmission fluid mixed with ½ to 1 oz. (14-28 grams) of friction-proofing oil) in air hose. This should also be used to coat parts when assembling. (Avoid excessive lubrication.)





SPANNER WRENCH

# HOLE-HOG MODEL 4603 – PART NO. 834603

| ITEM NO. | QTY | PART NO. | DESCRIPTION | WEIGHT LBS. | WEIGHT Kg | ITEM NO. | QTY | PART NO. | DESCRIPTION | WEIGHT LBS. | WEIGHT Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 836020 | Anvil & Body Assy | 91. | 41. | 10 | 1 | 836046 | Valve Nut | .8 | 0.36 |
| 2 | 1 | 833001 | Striker | 84. | 38. | 11 | 36" | 833015 | Air Hose | 2.5 | 1.12 |
| 3 | 1 | 836004 | Valve | 5.5 | 2.5 | 12 | 2 | 832009 | Hose Nut | .8 | 0.36 |
| 4 | 1 | 833006 | Valve Body Nut | 2.0 | 0.9 | 13 | 1 | 832042 | Spring | | |
| 5 | 1 | 833012 | Shock Absorber | 1.6 | 0.7 | 14 | 1 | 832005 | Connector | .8 | 0.36 |
| 6 | 1 | 836007 | End Cap | 10.2 | 4.6 | 15 | 1 | 832001 | Rubber Bushing | .05 | 0.02 |
| 7 | 1 | 833013 | Valve Seal | .1 | 0.05 | 16 | 1 | 832008 | Hose Disconnect | 1.2 | 0.54 |
| 19 | 1 | 833010 | Stop Ring Assy | .37 | 0.17 | 17 | 1 | 833017 | Spanner Wrench | 1.5 | 0.67 |
| 8 | (1) | 833011 | Stop Ring | .35 | 0.16 | | | | | | |
| 9 | (1) | 833019 | Pin | – | – | | | | | | |
| 18 | (1) | 833018 | Lockscrew | – | – | | | | | | |

## 13.0 DISASSEMBLE

1. Using the spanner wrench provided, turn the slide valve assembly out of the body. Several sharp raps with a hammer on the wrench may be necessary to loosen the end cap.
2. Remove the striker from the body, hooking it by the exhaust ports with a wire, or by tilting the body slightly.
3. DO NOT disassemble the slide valve assembly unless it is necessary to replace the shock absorber.
4. After disassembly of the tool, rinse the parts and slide valve assembly in kerosene.
5. Wipe the rinsed parts and slide valve assembly with a clean cloth and coat parts with a film of lubricant. (See Lubrication.)

IMPORTANT: WHEN REASSEMBLING THE END CAP, A GOOD ANTI-SEIZE THREAD LUBRICANT (NEVER-SEEZ OR EQUIVALENT) SHOULD BE USED ON THE THREADS OF THE END CAP AND THE THREADS OF THE BODY. KEEP THE TAPER FREE OF DIRT OR LUBRICANT.

## 14.0 REASSEMBLE

1. First make conical shaped adaptor (metal or wood) to insert into end of valve body nut (4) which will allow easier installation of shock absorber (5) over flanges of valve body nut.
2. Coat the O.D. of valve body nut (4) with grease. Press valve body nut (4) into shock absorber (5) so that end of shock absorber (5) is against the large flange of valve body nut (4).
3. Coat the I.D. of end cap (6) with grease. Press valve body nut (4) and shock absorber (5) into end cap (6) until bottomed and distance from edge of end cap to shock absorber is 1/2" (127 mm).
4. Using conical shaped tool, press valve seal (7) onto valve body nut (4). Make sure valve seal is properly seated.
5. Install valve (3) into valve body nut (4).
6. Turn End Cap until Valve Body Nut (4) bottoms on flat of Valve (3). Install Stop Ring (8) on first thread of valve. Adjust to 14 59/64 ± 1/64 from end of Valve Body, to face of Dowel Pin. Tighten Lockscrew with 5/32 Allen wrench. Pin should be pressed into the Stop Ring to protrude 1/4 inch from face of ring.
7. Assemble valve nut (10) and hose nut (12) on air hose (11). Insert connector (14) on one end of hose. (Both ends of hose same.) Grease connector (14) for easier installation.
8. Securely hold valve nut (10) (end without connector) into vise. Grease valve (3) (threaded end) and insert into valve nut (10). Use wrench on flats of valve (3) until valve nut (10) bottoms with stop ring (8). End cap should turn 9 times from stop on flats to stop ring.
9. Thoroughly clean I.D. of body and anvil assembly (1). (Pay special attention to threads in body.)
10. Clean striker (2) and slide into body (1). (Coat clean parts with light oil.)
11. Coat threads on body and end cap assembly with Never-Seez (or equivalent) lubricant.
12. Install end cap assembly into body, by using spanner wrench (17) (provided). Tighten end cap not less than 550 Ft. Lbs. (75 KgM). Rap handle of wrench if necessary to assure end cap is tight. It may be necessary to hold the body (1) with strap wrench or other holding devices.
13. After assembly, test run in forward and reverse for 5 to 10 minutes on ground to ascertain correct assembly.
14. The Hole-Hog should be lubricated after approximately every 100 feet (330 meters) by pouring a small amount (2 oz. (60 grams) type "A" automatic transmission fluid mixed with ½ to 1 oz. (14-28 grams) of friction-proofing oil) in air hose. This should also be used to coat parts when assembling. (Avoid excessive lubrication.)

## HOLE-HOG WARRANTY

ALLIED warrants its Hole-Hog underground piercing tool products to be well made, durable, and of good material and if within six (6) months from the date of delivery of such new products to the actual user, (but in no case more than one (1) year from date of shipment from the factory), any part shall fail by reason of defective material or poor workmanship the Manufacturer will furnish a part free of charge F.O.B. factory where manufactured provided that the defective part or sufficient evidence of defect in the part be delivered to it at its factory in the United States where manufactured (or other place designated by ALLIED), transportation prepaid. Such parts or evidence must show clearly that the failure was due to poor workmanship or defective material and not to the negligence or improper use by the operator.

Breakage or damage resulting from installation or operation not in accordance with Manufacturer's published installation and operating instructions are not covered by warranty.

**This is ALLIED's sole warranty with respect to the Hole-Hog. ALLIED makes no other warranty of any kind whatever, express or implied; and all implied warranties of merchantability and fitness for any particular purpose, which exceed the aforesaid stated obligation, are hereby disclaimed by ALLIED and excluded from this agreement.**

**ALLIED specifically disclaims any responsibility for any damages of any kind or description, whether to property or person, in any way connected with, or arising out of the use of the Hole-Hog.**

Form No. CAN-HH Op 778-200 R480PP

Printed in U.S.A.

ALLIED

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