ALLIED

Construction Products, LLC

TECHNICAL MANUAL

Manual Part No. 002004
May 12, 2003

HOLE-HOG Models 310 and 310-TH

Allied Hole-Hog, Model 310 Series
Document Change Notice

Date	Page	Change
10/2/97	29	Part Numbers on Parts List and Art
10/2/97	35	Part Numbers in Text and Art
10/2/97	43	Parts List Items 5 and 7
10/2/97	44	Art - Added Washers
10/2/97	45	Parts List Item 8
5/08/98	All	Added S/N 500 and Above
1-18-99	All	Added 1-piece striker
1-26-99	All	Rewrite and Reorganize
3-15-01	All	Update to Current Product and Documentation Standards
4-01-03	5	corrected specifications
4-23-03	Throughout	Update to CE Compliance
5-7-03	87	Corrected S/N break
5-12-03	86	Corrected Tail Assy Figure

TABLE OF CONTENTS

Section Page

TABLE OF CONTENTS (continued)

Section Page

TABLE OF CONTENTS (continued)

Section **Page**

TABLE OF CONTENTS (continued)

Section Page

TABLE OF CONTENTS (continued)

Section Page

LIST OF FIGURES

Figure Page

LIST OF FIGURES

Figure Page

LIST OF FIGURES

Figure Page

LIST OF FIGURES

Figure Page

LIST OF FIGURES

Figure Page

SECTION 1.0 INTRODUCTION

Hole-Hog Technical Manual: Part Number 002004

This Technical Manual is applicable to Hole-Hog:
Models: 310 and 310-TH
Years of Manufacture: 1993 and beyond
Serial Number(s)_____

The model and serial numbers are located on the ID Plate mounted on the Hole-Hog as shown in Section 3.3 Decal Identifcation. The serial number is also stamped on the striker.

This manual contains important information for the safe use and maintenance of the Allied Hole-Hog. Read this manual thoroughly before installing, operating or servicing the Hole-Hog. This manual must be easily accessible to operators or service and transport personnel. Store this manual in a convenient location.

Pay careful attention to all instructions and follow all governing regulations. Operation or service other than in accordance with these instructions may subject the Hole-Hog to conditions beyond its design capability. Improper operation, service or the use of non-Allied parts may result in Hole-Hog failure or personnel injury.

1.1 Safety Information

When using the Hole-Hog, underground safety procedures such as the location of existing underground service lines, cables and conduit must be followed. See Sections 4.0 and 5.0 for further safety guidelines.

Pay particular attention to WARNINGS and CAUTIONS, identified with this symbol.

These instructions are important for personnel safety and full service life of the Hole-Hog. Follow them carefully.

1.2 Warranty Information

Warranty coverage of the Allied Hole-Hog, depends on proper maintenance and operation of the Hole-Hog as detailed in this manual. Improper maintenance or operation shall void Hole-Hog warranty coverage. Immediately upon receipt of the Hole-Hog, read all Allied warranty documents delivered with the unit for a thorough understanding of warranty coverage.

Record the Hole-Hog Serial Number in the space provided above.

1.3 Allied Product Policies

Allied reserves the right to make modifications to the design or changes to the specifications without prior notice.

In this manual, Allied recommends Hole-Hog applications, maintenance and service consistent with industry practices. Allied takes no responsibility for the results of actions not recommended in this manual and specifically the results of:

- Operation in non-recommended applications
- Incorrect operation
- Improper maintenance
- Use of service parts not approved or supplied by Allied.

These exclusions apply to damage to the Hole-Hog, associated equipment, and injury to personnel.

SECTION 2.0 OVERVIEW

The Allied 310 Series Hole-Hog is a pneumatically propelled, reversible, ground piercing tool designed to pierce continuous, blind horizontal, inclined and vertical holes in compressible soils. With optional attachments, the Hole-Hog can also be used to install or remove rigid pipe from the ground.

The tool consists of three primary sections: Body/Anvil, Striker and Tail Assembly. A simple reversing mechanism allows the operator to easily change the tool's direction from forward to reverse.

2.1 Body/Anvil

The body/anvil forms the majority of the Hole-Hog's exterior. It consists of the anvil and the body. Refer to Figure 2-1. The body/anvil is the ground contact surface. Wear of this component is expected and normal. The body is internally threaded at the rear for attaching the Tail Assembly.

2.1.1 Plain Anvil (310)

The anvil is the conical surface that forms the front of the body/anvil. The anvil is pressed into the body, and cannot be removed from the assembled body/anvil.

2.1.2 Threaded Anvil (310-TH)

The Model 310-TH anvil is threaded for mounting optional accessories that enhance operation of the Hole-Hog. Refer to Section 11.0 for more information on accessories and their functions. When an accessory is not installed, the anvil cap protects the anvil threads.

2.2 Striker

The striker is moved by air pressure back and forth within the body. Internally, the striker impacts either the anvil in the front or the tail assembly in the rear to propel the Hole-Hog through the ground.

2.3 Tail Assembly

Except for the Striker, the Tail Assembly contains all internal operating components, including the reversing mechanism. The external threads of the End Cap secure the Tail Assembly to the Body/Anvil. The Whip Hose attaches to the Tail Assembly at the other end of the End Cap. Hole-Hog service and repair require removal of the tail assembly to access the serviceable parts.

2.3.1 Tapered End Cap Adapter

The Tapered End Cap Adapter is a tapered cylinder that attaches to the hose end of the End Cap. The End Cap has internal threads at the hose end for mounting optional accessories that enhance operation of the Hole-Hog. Refer to Section 11.0 for more information on accessories and their functions. When an accessory is not installed, the Tapered End Cap Adapter protects the End Cap threads and the Whip Hose connection.

2.4 Differences Among Hole-Hogs

2.4.1 Variations by Model

This manual covers both Models of Allied's 310 Hole-Hog Series: the 310 and 310-TH. All information in this manual applies to both models unless specifically noted otherwise. These two models are identical except for the provisions for securing optional attachments to the anvil of the 310-TH.

- Model 310 has a plain anvil with no Anvil Cap.
- Model 310-TH has a threaded anvil with a protective Anvil Cap.

2.4.2 Variations by Serial Number

In addition to the difference between the 310 and 310-TH Models, there are three significant differences among 310-Series Hole-Hogs separated by Serial Number. There are two methods for mounting the Whip Hose, and some models have a nylon insert to lock the Anvil Cap threads. Three serial number groups track these differences:

499 and Below
- Whip Hose Mounting Method 1*

500 through 649
- Whip Hose Mounting Method 2*

650 and Above
- Whip Hose Mounting Method 2 and
- Nylon insert used to lock Anvil Cap

These differences affect only four sections of the manual:

- Disassembly, Section 8.0
- Assembly, Section 9.0
- Field Maintenance, Section 11.0
- Parts Information, Section 14.0

In these section notations indicate the information that applies to each serial number group. The information in the other sections applies to all Hole-Hogs regardless of unit serial number.

*For details on the different Whip Hose mountings and the use of the nylon insert, refer to Disassembly Section 8.3.

SECTION 3.0 SPECIFICATIONS AND DECALS

3.1 Specifications

Outside Diameter: . . . 3.10 in. (79 mm)

Overall Length: . . . . 59 in. (1499mm)

Weight:. . . . . 76 lbs. (34kg)

Recommended Operating Temperature Range*
0°F (-18°C) to 120°F (50°C)

Working Air PSI **: . 100 psi (7 kg./cm2)

Air Consumption/Min.: . 40 cfm (1.2m3)

Whip Hose
(inside diameter): . . . . 3/4 in. (19 mm)

Recommend Delivery Hose
(inside diameter): . . . . 3/4 in. (19 mm)

Percussion Rate Per Minute: 380

*Refer to Section 7.0 for lubrication and de-incing requirements.

**Pressure required at the tool. Allow 5 psi (0.4 kg/cm2) pressure drop for each 100 ft. (30m) of hose. Pressure above 100 psi (7 kg./cm2) at the tool decreases the life of the Hole-Hog.

3.2 Minimum Recommended Operating Depths

Hard Glacial Clay . . . . . 18 in.

Clay/Sand Mix . . . . . 18 in.

Wet/Dry Sand . . . . . 24 in.

Cultivated Soil . . . . . 24 in.

Clay/Loam Mix . . . . . 20 in.

The Hole-Hog operates best in compact able soils. The minimum depth of operation varies with soil conditions and the length of the hole. The chart above is intended as a guide only. Specifications subject to change without notice.

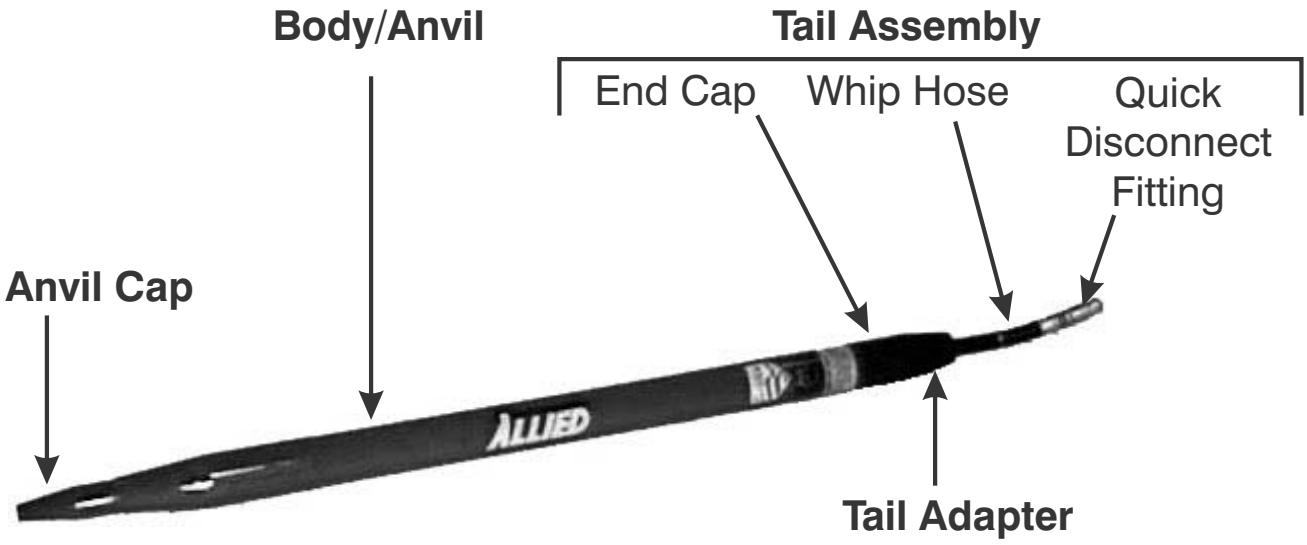
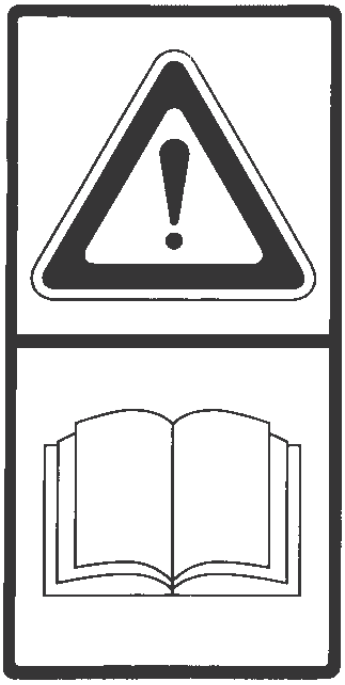


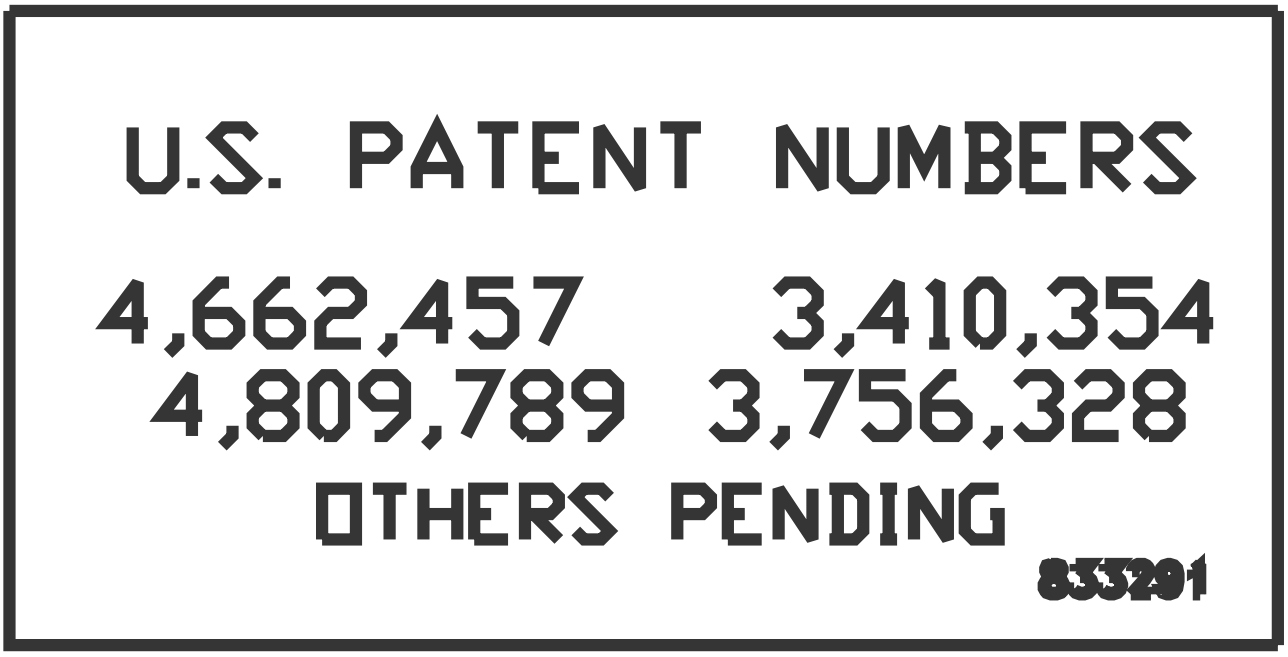
Figure 3-1. Major Components: Hole-Hog Models 310 and 310-TH

3.3 DECAL IDENTIFICATION



IMPORTANT! Read Technical Manual.
Follow Instructions, Cautions and Warnings.

Made in USA



Hole-Hog Patent Numbers.

The ALLIED LOGO decal is the Allied brand identifier and is a registered trademark of Allied Construction Products, LLC

Hole-Hog®

Model:
Year:

Serial Number:
Mass (kg):

ALLIED 3900 Kelley Avenue, Cleveland, Ohio 44114 USA

Hole-Hog CE Serial Number Plate

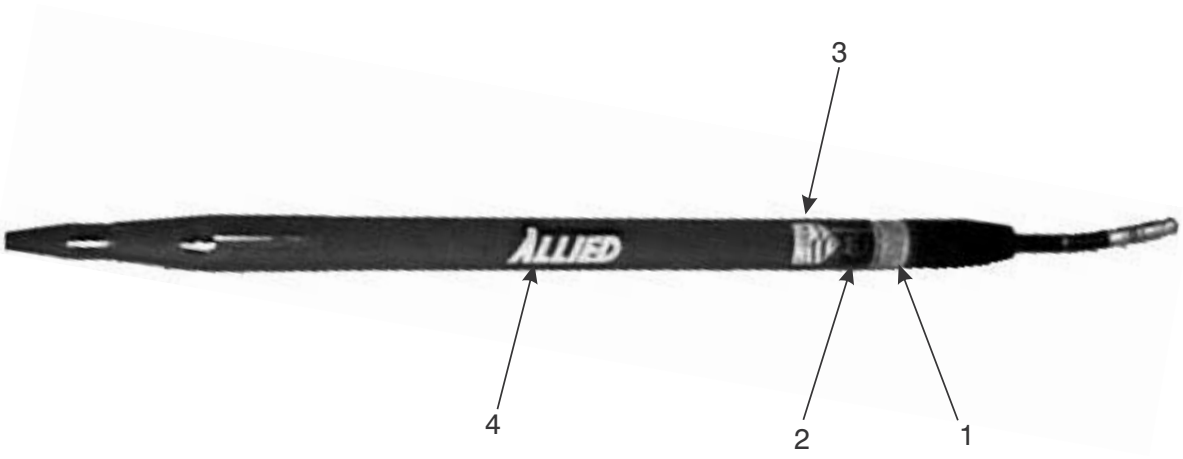


Figure 3-2. Hole-Hog Decal Location

Hole-Hog Decal Kit Part Number 101234			
ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	676984	Decal - Read Instructions
2	1	833291	Decal - Hole-Hog Patents
3	1	815696	Decal - Made in USA
4	1	676653	Decal - Allied Logo (not included in Decal Kit)
5	1	102398	Decal - Serial Number Plate

SECTION 4.0 GENERAL CONSTRUCTION SAFETY

4.1 Owner's Responsibilities

The equipment owner shall:

- Provide this technical manual to the Hole-Hog operators.
- Train all operating personnel and enforce the procedures explained in this manual, especially regarding safety to personnel and equipment.
- Adapt these general instructions to specific applications.

4.2 General Construction Safety

Follow standard safety precautions expected and required of those working in construction, including but not limited to: locating existing underground service and utility lines, establishing pedestrian barriers and using personnel protection equipment, etc.

4.3 Federal, State, Local and OSHA Construction Guidelines and Regulations

Use the Hole-Hog in accordance with all federal, state and local regulations regarding construction practices and public safety. Identification of, and compliance to, governing regulations are the responsibility of the owner and operator.

In the United States, comply with the recommendations of the Occupational Safety and Health Administration standards of the U.S. Department of Labor. For OSHA construction guidelines contact your local federal government office or write:

U.S. Government Printing Office
Superintendent of Documents
P.O. Box 371954
Pittsburgh, Pa. 15250

Ask for Construction Industry OSHA Standards Stock #869-034-00107-6.

4.4 General Safety Summary

The safe and effective use of any heavy construction equipment depends upon proper installation, operation, maintenance and repair. Operational safety must encompass all of these factors. Section 5.0 includes minimum safety policies the Hole-Hog owner shall establish for all Hole-Hog installations. The operational safety program must be tailored by the Hole-Hog owner to the specific site and application. Such a program will result in increased equipment life and performance and reduced downtime. Most importantly, it will reduce the risk of equipment damage and personnel injuries.

4.4.1 CAUTIONS and WARNINGS

Throughout this manual detailed CAUTIONS and WARNINGS are included with instructions and procedures. Even experienced service technicians are to review these CAUTIONS and WARNINGS prior to performing a procedure. CAUTIONS and WARNINGS are highlighted by the symbol shown here and explained as follows:

WARNING

Instructions preceeded by this symbol identify hazards to personnel. WARNING instructions must be followed to ensure safe handling and operation. These instructions shall be followed at all times. Improper operation or servicing can result in personal injury. Read this manual thoroughly before operating or maintaining the Hole-Hog.

CAUTION

Instructions identified with this symbol are important to prevent damage to equipoment and to maintain full service life of the Hole-Hog. Follow them carefully. Operation or service not in accordance with these instructions may subject the Hole-Hog to conditions beyond its design capability. Read this manual thoroughly before operating or maintaining the Hole-Hog.

4.4.2 Personnel Precautions

- Always wear safety glasses, and protective clothing when operating or handling the Hole-Hog.
- All personnel in the immediate area must wear ear protection.

SECTION 5.0 HOLE-HOG SAFETY PRECAUTIONS

5.1 Receiving A New Hole-Hog

The Hole-Hog is delivered assembled, lubricated, and factory tested. Inspect for possible shipping damage. Pay particular attention to the hose.

> **WARNING**
> Ensure that the End Cap is properly tightened. A loose End Cap could blow out with damaging force causing injury to the operator and bystanders. Before operation, check the tightness of the end cap using the proper tools and torque (Section 9.13, Steps 10, 11, and 12).

> **CAUTION**
> If the end cap becomes loose at any time, do not retighten. Remove end cap and clean thoroughly. Pay special attention to cleaning the threads of end cap and body. Lubricate threads as instructed in the maintenance section, then reassemble according to Section 9.8

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

5.2 Record The Serial Number

Upon receipt of the Hole-Hog, record the Serial Number, as listed on the shipping papers, in the space provided in Section 3.1.

5.3 Hole-Hog Use

The Allied Hole-Hog is an underground peircing tool used to pierce underground holes and to drive pipe. Do not use the Hole-Hog in any manner not described in this manual. Personal injury may result from improper use of the Hole-Hog.

5.4 Lifting and Blocking Precautions

The assembled Model 310 Hole-Hog covered in this manual is heavy; refer to Section 3.0 Specifications. Even when disassembled, components such as the Body/Anvil and Striker are heavy enough to cause serious bodily injury if not handled with caution.

When handling and lifting these Hole-Hogs, follow all precautions normal to the lifting and operating of heavy equipment with particular attention to the following.

- Always use sufficient blocking to prevent accidental or sudden movement of the Hole-Hog or its components.
- Always prevent the Hole-Hog and its components from rolling when they are placed on a horizontal surface.
- Always use suitable lifting equipment to insure the safety of personnel and avoid damage to the Hole-Hog or its components.
- Any unit over 88 pounds (40kg) cannot be lifted manually. Use slings on either end of the Hole-Hog as shown in Figure 6-1 to lift the Hole-Hog in and out of the trench.

- Never stand under Hole-Hog being lowered into trench.
- Always wear gloves and keep hands and feet away from pinch points.
- Hole-Hog surface may be extremely hot or cold. Always wear gloves or burns may result.
- Always wear a hard-hat when any part of the Hole-Hog will be lifted above waist level.
- When manually handling the Hole-Hog or its components, make sure enough personnel are used to safely distribute the strain among them. Make sure they are wearing the following safety items.
  - Steel-toed shoes suitable to protect the arch as well as the toes.
  - Kidney belt wide enough and tight enough to protect against herniating internal organs and lower back.

5.5 Operating Precautions

- Daily, before operation, check the tightness of the end cap using the proper tools and tightening method as described in Section 9.13, Steps 10, 11, 12. A loose end cap could blow out with damaging force, injuring the operator or bystanders.
- Daily, before operation, check the tightness of the anvil cap on models with a threaded anvil; refer to Section 9.9.
- Observe all safety precautions outlined in the air compressor operating manual.
- The owner/operator/contractor is responsible for locating underground utilities.
- Do not attempt to pierce a hole in frozen ground.
- Entrance and exit pits may be unstable and dangerous. These trenches must be shored to meet federal, state and local guidelines. Allied's TrenShore is recommended.
- The work site must be properly illuminated to provide enough light to work safely.
- There shall be a safety person at the compressor to shut the unit down in case of emergency. The operator and safety person shall have agreed upon hand signals to indicate the necessity of immediate shut down.
- Be aware of Hole-Hog travel distance by marking air supply hose. Place marking tape at two foot intervals on the hose to monitor travel.
- Check air supply hose periodically for fitting and hose damage.
- Serious injury from flying debris may result if personnel are in line with the Hole-Hog exhaust. Stand clear.
- Never stand directly over the Hole-Hog air supply hose. Retain hoses to protect against whipping in case of failure.
- Never pull on whip hose or air compressor hose to move or position Hole-Hog. Injury could result from broken or separated hoses.

SECTION 6.0 OPERATION

6.1 Operating Overview

There are 9 steps in piercing an underground hole with a Hole-Hog :

- Review all safety precautions.
- Select a safe path for the hole to be pierced.
- Dig an entrance pit at one end of the path.
- Dig an exit pit or set a target marker at the other end of the path.
- Prepare the Hole-Hog and air supply lines.
- Place the Hole-Hog in the entrance pit and align it with the target or exit hole.
- Operate the Hole-Hog until it completes the hole.
- Remove the Hole-Hog.
- Install material into the pierced hole.

6.2 Operating Guidelines

When performing each of the steps listed in 6.1, pay particular attention to the related guidelines below.

6.2.1 Safety Precautions

Review the safety sections, 4.0 and 5.0, of this manual. Perform all operations according to the precautions and recommendations described in these sections.

WARNING

Locate all utility lines before starting operation of the Hole-Hog. Use extreme caution working with electric and gas lines. Cutting a utility line could cause serious injury or death.

6.2.2 Select a Safe Piercing Path

Plan and mark the complete piercing path and the depth of the hole prior to starting Hole-Hog operation.

1. Locate all utility lines: water, electric, gas and sewer lines, in the area to be penetrated.
2. Select the shortest possible path under the obstacle (road, walk, driveway, etc.).
3. Determine the depth (elevation) of the hole to be pierced.
   a. Refer to 3.2 Minimum Recommended Operating Depths.
   b. Identify the type of soil to be pierced and the minimum depth of the hole.
   c. If possible, select a hole depth well below the minimum. In some soils, the Hole-Hog may raise while piercing a shallow hole.
   d. When the piercing path is very long through low density soil, the hole depth should be as deep as practical for the application.
   e. Do not attempt to pierce a hole through frozen ground. However, a hole can be peirced under the frost line.

6.2.3 Prepare Entrance Trench

WARNING
Entrance and exit trenches may be unstable and dangerous. These trenches must be shored to meet federal, state and local guidelines or injury to personnel could occur.

Excavate the entrance trench to the depth, width and length required to properly align the piercing tool and work comfortably. Shore entrance trench to meet safety guidelines. Allied's TrenShore is recommended.

Trench length should:

- Allow enough room for the operator to push the Hole-Hog into the wall to be pierced, approximately one foot beyond the end of the whip hose.
- Permit a soft bend in the Whip Hose. Do not crimp the air supply.

6.2.4 Prepare Exit Pit or Target

Excavate the exit pit. The length, width, and depth of the exit pit should exceed the entrance pit dimensions by 6 in. to 10 in./152mm to 254mm.

In cases where the exit pit length is limited and for blind holes, the unit is reversed and drives itself back out through the pierced hole.

6.2.5 Prepare The Hole-Hog and Air Hose

1. Refer to Section 10.0 Maintenance and perform Daily and Preventive Maintenance.
2. Review all of Section 7.0 Lubrication. Startup Lubrication, paragraph 7.1 must performed at the beginning of piercing operations, paragraph 6.2.7
3. To monitor Hole-Hog travel along the piercing path, mark the air hose in two ways.
   a. Place tape at two foot intervals along the hose.

      This provides an indication of how far the Hole-Hog has traveled along the path.

   b. Measure the total length of the piercing path. Measure that length from the piercing tip, back along the Hole-Hog and hose. Make a special tape mark at that point.

      This provides an indication of when the piercing tool should reach the exit point. It will also indicate if the tool has been deflected off course.
4. For the TH models only, verify that the Anvil Cap or other required tool is secured to the threaded anvil.
5. Connect air supply hose to compressed air supply and purge air hose.

6.2.6 Position and Aim The Hole-Hog

1. Verify that the bottom of the entrance pit is at the depth (elevation) determined in 6.2.2, step 3.

WARNING
Do not manually lift any unit over 88 pounds (40kg). Use slings on either end of the Hole-Hog to lift the Hole-Hog in and out of the trench.

WARNING
Do not stand under Hole-Hog being lowered into trench. The Hole-Hog could fall and cause serious injury or death.

2. Lower the Hole-Hog into the entrance trench with slings, as shown in Figure 6-1., with the piercing tip just touching the wall to be pierced.

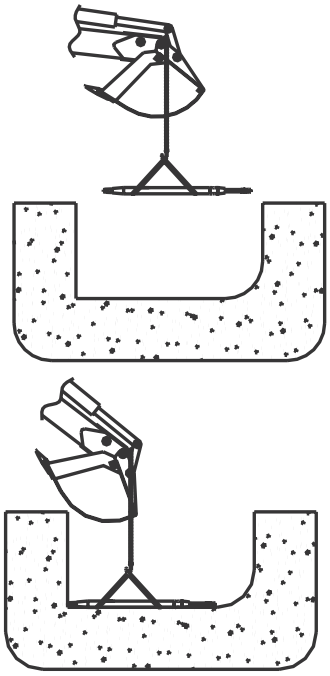


Figure 6-1. Lifting the Hole-Hog

3. Align the length of the Hole-Hog with the center of the exit pit or target at the other end of the piercing path.

4. The nose of the tool must be pitched down to compensate for a tendency of the tool to raise along the path.

   The amount of pitch depends on the length of travel and the soil type. Normally one half a bubble on a construction level is sufficient.

5. Block the Hole-Hog in this position.

WARNING
Always wear safety glasses, gloves and protective clothing when operating or handling the Hole-Hog to prevent injury from flying debris.

WARNING
All personnel in the immediate area must wear ear protection to protect the ears from the noise of the compressor and the Hole-Hog.

WARNING
Do not stand in the Hole-Hog exhaust. Serious injury from flying debris may result. Stand clear.

WARNING
Do not stand behind Hole-Hog. If an obstruction is hit, the unit could kick back and cause serious injury.

WARNING
Never pull on whip hose or air supply hose**.** Serious injury could result if hoses break or separate.

WARNING
Hole-Hog surface may be extremely hot or cold. Always wear gloves or burns may result.

6.2.7 Piercing The Underground Hole

1. To "wet" the air line, pour one or two ounces of Allied Hog Wash into air line at the compressor connection and connect it to piercing tool air line.(Refer to Section 7.0 Lubrication.)
2. Quickly turn on the air supply and immediately reduce air pressure to approximately 2/3 of full open and start piercing tool penetration into the ground. It is necessary to apply force in the direction of motion.
3. After approximately 1/3 of the body length has penetrated into the forward wall of the entrance pit, check alignment on target and pitch using suitable level. The nose of the tool must be pitched down; refer to paragraph 6.2.6, step 4.
4. Restart air supply to piercing tool. If tool fails to start, open and close the quick-acting valve to create pulses of air to start the tool.
5. Continue checking alignment and pitch (steps 3 and 4) until the Hole-Hog is completely enveloped by the forward wall of the entrance trench.
6. Increase air pressure to 100 psi (7.0kg/cm^2) and complete hole penetration. Never exceed 100 psi (7.0kg/cm^2). Pressures above 100 psi (7.0kg/cm^2) decrease tool life and void the warranty..
7. Monitor Hole-Hog progress along the piercing path. Use the 2-foot tape markers on the air hose to estimate the length of hose used and progress along the path.
8. The Hole-Hog can be stopped or deflected from its path by some underground obstacles.
   - If the Hole-Hog stops moving along the path, it has hit an obstacle.
   - If total path marker on the air hose is reached but the Hole-Hog has not reached the target or exit pit, the Hole-Hog has been deflected by an obstacle.

   In either case:

   a. Retrieve the Hole-Hog by reversing Hole-Hog direction as described in paragraph 6.2.8.

> **WARNING**
> Locate all utility lines before starting operation of the Hole-Hog. Use extreme caution working with electric and gas lines. Cutting a utility line could cause serious injury or death.
>
> Verify location of all utilities before starting a second hole.

   b. Pierce another hole that will bypass the object, repeating steps 6.2.6 and 6.2.7. In extreme circumstances it may be necessary to relocate the entrance or exit pit.

9. When the Hole-Hog reaches the exit pit or target, stop compressed air delivery by closing the air supply valve.

   DO NOT REMOVE THE HOLE-HOG from the exit pit or pierced hole.

10. Before removing the Hole-Hog from the exit pit or pierced hole, verify the means by which the pipe, tube, cable, etc. will be installed in the pierced hole.

    Refer to paragraph 6.2.9 Install Material in the Pierced Hole.

CAUTION

If the end cap becomes loose at any time, do not retighten. Remove end cap and clean thoroughly. Pay special attention to cleaning the threads of end cap and body. Lubricate threads as instructed in the maintenance section, then reassemble according to Section 9.8.

6.2.8 Reversing The Hole-Hog

If the Hole-Hog meets an obstacle or deviates from course, stop the tool and reverse it 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 by closing the air supply valve.

CAUTION

Do not pull on the air hose or use hose as a handle. This could damage internal components.

2. With the air supply off, rotate hose assembly 120 degrees counterclockwise. The hose may need to be turned several times to account for hose twist.
3. Open the air supply valve and verify that the tool is in reverse mode.
4. Increase air pressure to 100 psi (7.0kg/cm^2) and drive the tool out of the hole. Never exceed 100 psi (7.0kg/cm^2). Pressures above 100 psi (7.0kg/cm^2) decrease tool life and void the warranty.

6.2.9 Install Material in the Pierced Hole

Many attachments are available for the Hole-Hog. Some of these install materials in the pierced hole; for example: pipe drivers and cable /tube pullers.

If one of these attachments is used to install material in the pierced hole:

1. Refer to the manual provided with the attachment and proceed as instructed.
2. Once the material is installed in the pierced hole, remove and service the Hole-Hog as described in 6.2.10.

6.2.10 Remove and Service Hole-Hog

1. When the Hole-Hog is no longer required for piercing or material installation, proceed as follows:
   a. Stop compressed air delivery by closing the air supply valve.
   b. Disconnect the hose and remove the hose from the hole.

WARNING

Any unit over 88 pounds (40kg) shall not be lifted manually. Use slings on either end of the Hole-Hog as shown in Figure 6-1.
to lift the Hole-Hog out of the trench.

   c. Remove the tool from the pit.
2. Clean all mud and other debris from the Hole-Hog. Refer to Section 10.0 Maintenance and perform appropriate procedures.

SECTION 7.0 LUBRICATION

WARNING
Always read and follow lubricant safety precautions. Lubricant is harmful if breathed or swallowed and could cause illness or death. Use caution when applying lubricant.

WARNING
Never use flammable lubricants or in-line cleaners. Explosion and fire could result causing serious personal injury. Flammable lubricants can damage Hole-Hog parts.

To insure proper operation and tool life, the Hole-Hog must be lubricated during use. Allied recommends the use of Allied Hog Wash lubricant or equivalent and de-icing agent dispensed by the Allied Air Line Lubricator. At temperatures below 60°F (15°C), the use of a lubricator and de-icing agent is recommended.

7.1 Startup

Just prior to operation, purge the supply hose of any debris and water. Next, pour approximately 2 ounces (60cc) of Allied Hog Wash into the hose at the compressor and at every 100 ft. (30m) interval. This wets the hose and ensures that lubricant flows into the Hole-Hog. An initial heavy mist of lubricant in the exhaust air may be experienced upon tool startup.

7.2 Normal Operation

During normal Hole-Hog operation, dispense lubricant at the following rate:

- At temperatures below 40°F (5°C): 5 to 7 drops per minute.
- At temperatures above 40°F (5°C): 3 to 5 drops per minute.

After several minutes of operation at the proper lubricant rate, the whip hose should be lightly coated with lubricant. If a heavy mist of lubricant is continuously present in the exhaust air, the lubrication rate is too great. Adjust the lubrication rate accordingly.

7.3 De-Icing

Because the tool is powered by expanding compressed air, a normal cooling effect inside the tool is experienced. Under certain temperature and humidity conditions, the moisture in the compressed air can condense and freeze on internal components. The weather conditions of cool, damp days are ideal for icing problems to develop.

Icing problems can be minimized by conditioning (heating or drying) the compressed air prior to delivery to the Hole-Hog. Consult the air compressor manufacturer for the availability of these accessories.

An early indicator of internal icing is the presence of ice chips in the air exhaust. Excessive icing restricts striker movement which results in erratic or non-performance.

If internal ice buildup is suspected:

1. Stop the air delivery to the tool.
2. Wait several minutes to allow the tool to warm.

3. Prior to restarting the tool, follow the instructions in Section 7.1. This step may need to be repeated if icing is severe.
4. If icing persists, increase the amount of lubricant delivered to the Hole-Hog. The use of a lubricant with a de-icing agent is extremely important under these conditions. Allied Hog Wash is recommended.

SECTION 8.0 DISASSEMBLY

CAUTION

Do not remove the End Cap from the Body/Anvil under field operating conditions. This may expose the internal operating parts to contamination, and reduce the operating life of the Hole-Hog.

CAUTION

Using a pipe wrench on the Hole-Hog Body/Anvil relieves Allied of all warranty responsibilities.

WARNING

Applying heat with a torch or by any other method to any part of the Hole-Hog relieves Allied of all warranty responsibilities. Applying heat can destroy the main body, striker and other parts beyond use. Heating Hole-Hog components can cause altered component strength and result in premature failure, such as ruptures or a blown out end cap. This could cause personal injury or death.

CAUTION

Before starting any of the Disassembly procedures in this section, refer to Section 3.1 and verify the Serial Number of the unit to be disassembled. Refer to sections 8.2 and 8.3 for information about the differences among serial number groups.

8.1 General

The procedures in this section must be performed in a machine shop suitable for the disassembly, cleaning, inspection and repair of pneumatic construction equipment. In addition to the tools and fixtures normally stocked in such a shop, the Allied Tool Kit 831147 must also be available. This Tool Kit is described and illustrated in section 8.4.

In the following procedures, reference numbers in parentheses accompany most part names. These numbers refer to the part item numbers on the most recent parts drawings and parts lists in Section 14.0, specifically:

Figure 14-4. Complete Hole-Hog Assembly
Figure 14-7. Tail Assembly

8.2 Hole-Hog Serial Numbers

Each Hole-Hog's Serial Number is etched on the Striker. In addition, it is recorded upon receipt by the owner in section 3.1 of this manual. Refer to that section for the Serial Number.

Hole-Hog Serial Numbers are issued sequentially at the time of manufacture. For example: The Hole-Hog with S/N 499 is the four hundred and ninety-ninth unit built. The next unit built would be assigned S/N 500, and so forth.

8.3 Variations by Serial Number

In addition to model differences, there are a few significant differences among the 310-Series Hole-Hogs covered in this manual. There are two different methods for

mounting the Whip Hose, and some models have a nylon insert to lock the Anvil Cap threads. Three serial number groups track these differences:

499 and Below

- Whip Hose Mounting Method 1 (Refer to 8.3.1.)

500 through 649

- Whip Hose Mounting Method 2 (Refer to 8.3.2.)

650 and Above

- Whip Hose Mounting Method 2 and
- Nylon insert used to lock Anvil Cap (Refer to 8.3.3.)

8.3.1 Whip Hose Mounting Method 1

On Hole-Hogs numbered 499 and below, the Whip Hose connects directly to the Valve Stem. The Whip Hose hex fitting slides over the tapered and threaded end of the Valve Stem. The fitting threads securely onto the Valve Stem. Refer to Figure 8-1.

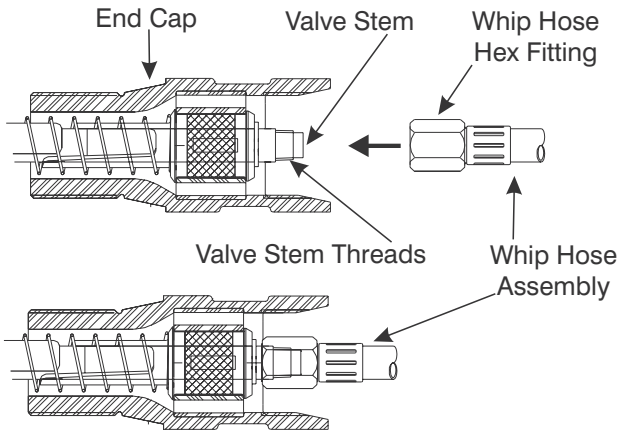


Figure 8-1. Whip Hose Mounting Method 1

8.3.2 Whip Hose Mounting Method 2

On Hole-Hogs numbered 500 and above the Whip Hose connects to a Thread Adapter secured to the Valve Stem. The Thread Adapter slides over the threaded end of the Valve Stem and threads securely onto the Valve Stem. The Whip Hose hex fitting slides onto and threads securely to the Thread Adapter. Refer to Figure 8-2.

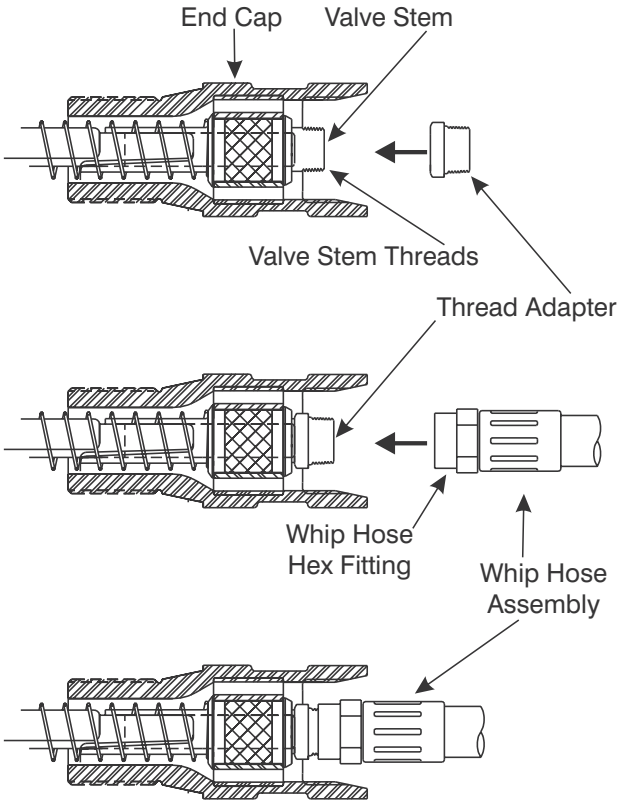


Figure 8-2. Whip Hose Mounting Method 2

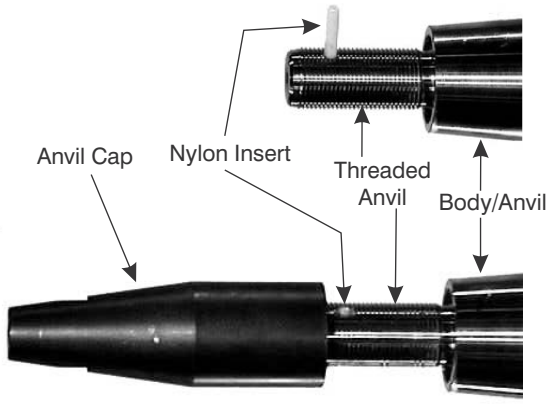


Figure 8-3. Anvil Cap and Nylon Insert

8.3.3 Nylon Insert for Anvil Cap

On Hole-Hogs numbered 650 and above, there is a hole in the Threaded Anvil for insertion of a Nylon Insert (3). When the Anvil Cap (2) threads onto the Anvil, the Nylon Insert presses against the threads of the Anvil Cap.

During operation of the Hole-Hog, the Nylon Insert (3) pressing against the threads prevents the Anvil Cap from vibrating off of the anvil. Refer to Figure 8-3

8.4 Disassembly and Assembly Tool Kit Part Number 831147

The tools contained in this kit are listed below and illustrated in Figure 8-4.

1. Shock Absorber Installation Tool, P/N 831144, quantity 1.
2. Valve Guide Installation Tool, P/N 831145, quantity 1.
3. Spherical Bearing Installation Tool, P/N 831146, quantity 1.
4. End Cap Wrench, P/N 831150, quantity 2.
5. Valve Sleeve Guide, P/N 831171, quantity 1.
6. Valve Guide Installation Pusher, P/N 831172, quantity 1.
7. Second Stage Shock Absorber Pusher; P/N 831797, quantity 1.
8. Bearing Removal Tool, P/N 101756, quantity 1.

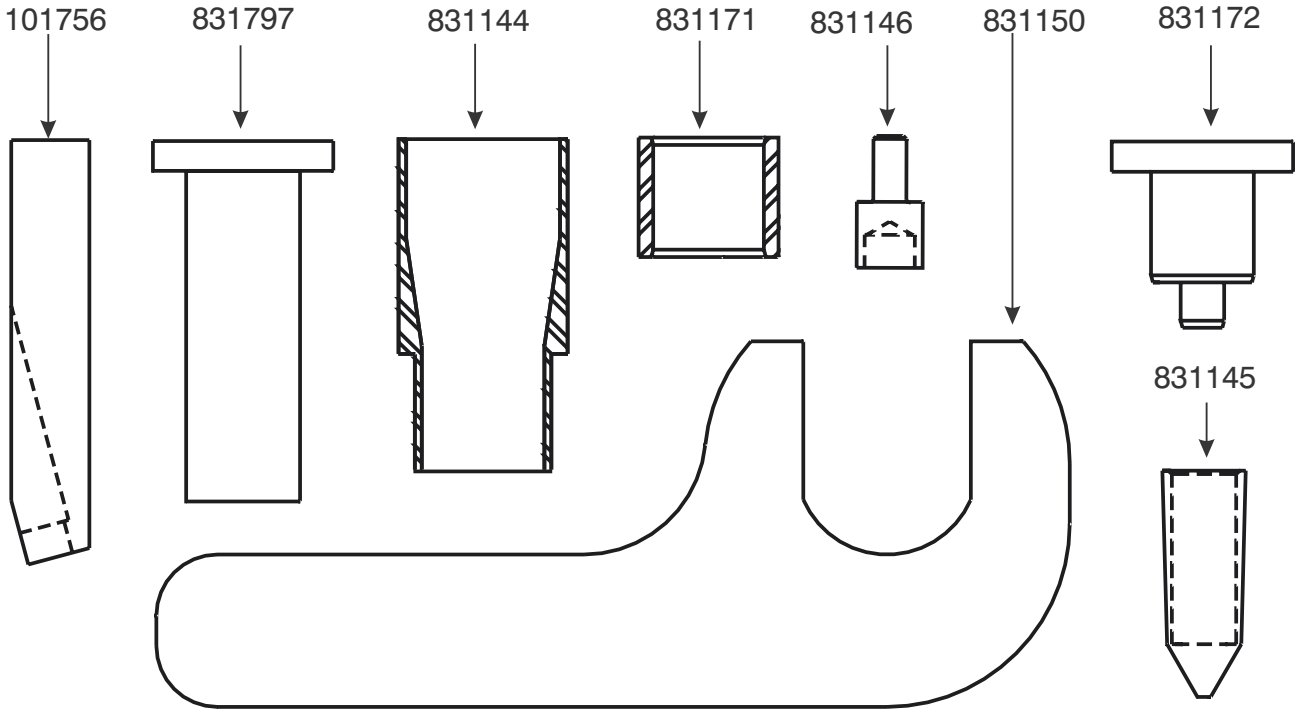


Figure 8-4. Hole-Hog Tool Kit

8.5 Extent of Disassembly

This section includes instructions for removal of every replaceable component in the Hole-Hog. Most repairs do not require such complete disassembly. After removing the Tail Assembly and Striker (4) from the Body/Anvil (1) as described in Section 8.8, clean and inspect the internal components while they are still assembled. After cleaning and inspection, perform only the minimum disassembly required to replace worn or broken parts.

8.6 Replacing Only The Whip Hose

The Whip Hose (10) and Quick Disconnect (11) can be removed and replaced without disassembling internal Hole-Hog components.

- To replace either of these components in the field, without disassembly of internal Hole-Hog components, refer to section 11.7 and 11.8 or 11.9.

- Remove these components as part of shop disassembly as described in the procedures 8.9.2.

8.7 Replacing Only the Body/Anvil and Anvil Cap

1. When replacing the Body/Anvil (1) only, it is not necessary to disassemble the Whip Hose (10) and tail assembly components.

   a. Remove Striker (4) and the assembled Whip Hose and tail assembly as described in section 8.8.

   b. Until the new Body/Anvil is installed, place the Striker (4), Whip Hose (10) and tail assembly where they will not be contaminated with dust and dirt. Cover or wrap them in cloth or plastic as required.

2. For 310-TH only.

   a. When replacing a worn Body/Anvil (1), also replace the Anvil Cap (2).

   b. To replace only the Anvil Cap, refer to Section 11.6.

8.8 Removing Tail Assembly and Striker

1. Place the Hole-Hog on a level surface and secure it with a strap wrench or saddle clamp. Block the Hole-Hog to prevent rolling during removal of the End Cap. Refer to Figure 8-5.

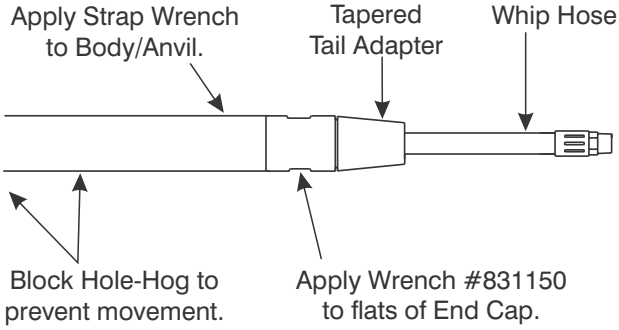


Figure 8-5. Loosening the End Cap

2. With the Body/Anvil (1) secured in place, use wrench P/N 831150 to loosen the End Cap (8). It may be necessary to strike the wrench handle several times with a hammer to loosen the End Cap.

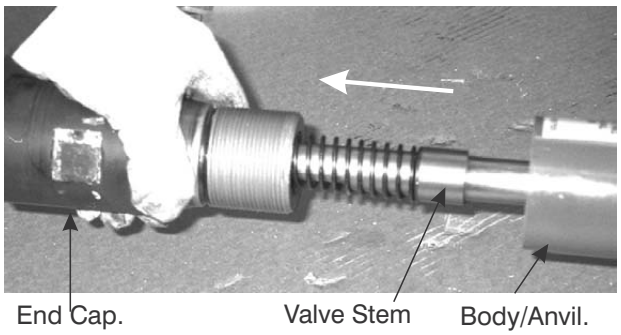


Figure 8-6. Removing the Tail Assembly.

3. Remove the tail assembly by unthreading the End Cap (8) and pulling the assembly from the Body/Anvil (1) as shown in Figure 8-6.

4. Place the tail assembly where it will not be contaminated with dust and dirt. Wrap it in cloth or plastic if necessary.

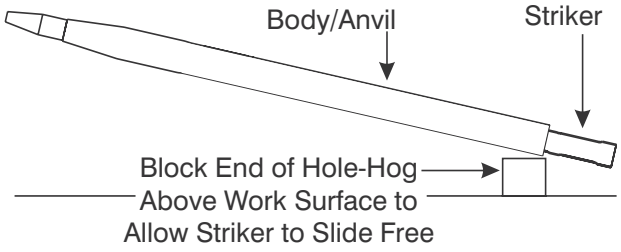


Figure 8-7. Tilting the Body/Anvil to Access the Striker.

5. Tip the Body/Anvil (1) so the end of the Striker (4) slides out of the Body/Anvil (1) about 6 to 8 inches. (Figure 8-7).

6. Once the Striker (4) is accessible, lower the Body/Anvil (1) to the level surface. Pull the striker from the body/anvil by hand as shown in Figure 8-8.

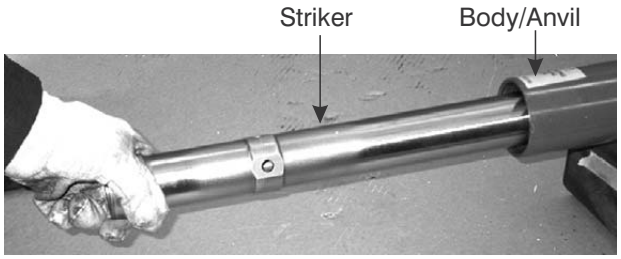


Figure 8-8. Removing Striker from Body/Anvil.

7. Clean the Striker with hydraulic fluid as required to locate the Serial Number. Verify that the Serial Number matches the one recorded in Section 3.1 of the Specifications.

   If the serial number has not been recorded, or if it has been recorded incorrectly; record the correct serial number in Section 3.1 now.

8. Place the striker where it will not be contaminated with dust and dirt. Wrap it in cloth or plastic if necessary.

9. Cover the open-end of the Body/Anvil to prevent contamination of the interior and threads. Coat threads with grease if long term storage is anticipated.

8.9 Disassembling the Tail Assembly

NOTE

DO NOT disassemble the components of the tail assembly unless replacement is necessary.

8.9.1 Remove Tapered Tail Adapter

CAUTION

DO NOT grip the End Cap (8) by its threads. Refer to Figure 8-9.

1. Place the Tail Assembly on a level surface and secure it with a strap wrench, saddle clamp, or with one of the two End Cap Wrenches (831150), supplied with the Tool Kit.

   a. When using the End Cap Wrench, grip the End Cap (8) across the flats as shown in Figure 8-9.

   b. When using a vise or saddle clamp, grip the End Cap (8) across the raised area on both sides of the wrench flats as shown in Figure 8-9.

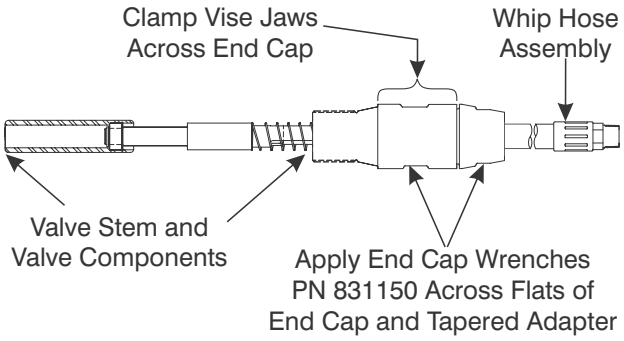


Figure 8-9. Secure End Cap for Disassembly.

2. With the End Cap secured as described above, fit one of the End Cap Wrenches (831150) across the flats of the Tapered Tail Adapter (13) as shown in Figure 8-9.
3. With the End Cap Wrench, loosen the Tapered Tail Adapter (13). It may be necessary to strike the wrench handle several times to loosen the adapter.
4. Thread the Tail Adapter (13) from the End Cap (8) and slide it off, over the Whip Hose as shown in Figure 8-10.

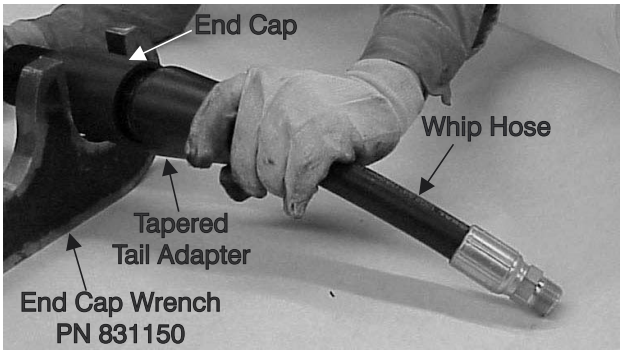


Figure 8-10. Slide Tail Adapter from End Cap, over Whip Hose.

8.9.2 Remove Whip Hose and Valve Components from the End Cap

There are two methods for mounting the Whip Hose and Valve Stem Components. Refer to Section 8.3 Variations by Serial number. Disassembly varies for each of these mounting methods. For Hole-Hogs with serial numbers:

- 499 or below, follow the disassembly procedures in Sections 8.9.2.1. and 8.9.2.2.
- 500 or above, follow the disassembly procedures in Sections 8.9.2.3. and 8.9.2.4.

8.9.2.1 Remove Whip Hose and Fittings (for Serial Numbers 499 and below)

The reference numbers in this section refer to the part item numbers on the following parts drawings and parts lists:

Figure 14-1. Complete Hole-Hog Assembly

Figure 14-6. Tail Assembly

1. Secure the End Cap (8) as described in step 1 of Section 8.9.1.
2. By hand, press the Valve end of the Valve Stem (5) toward the End Cap until the flats on the stem are accessible as shown in Figure 8-11.

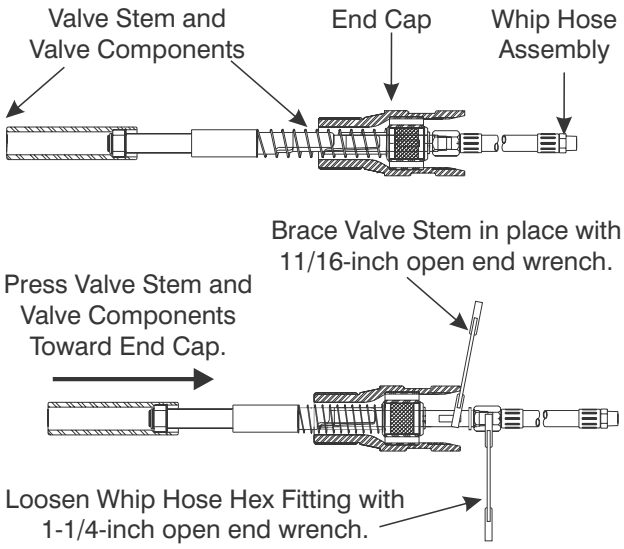


Figure 8-11. Press Valve Stem into Position

3. Fit an 11/16-inch open-end wrench across the exposed flats of the Valve Stem. Brace the wrench against the edge of the End Cap and pry the stem outward with enough force to prevent the Valve Stem from pulling back into the End Cap as shown in Figure 8-12.

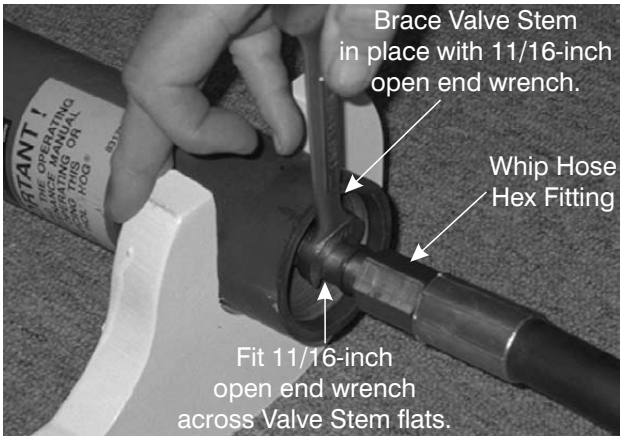


Figure 8-12. Hold Valve Stem in Position

4. While holding the Valve Stem in position with the 11/16-inch open-end wrench, fit a 1-1/4-inch open-end wrench across the flats of the Whip Hose Hex Fitting as shown in Figure 8-13.

5. Loosen and thread the Whip Hose Hex Fitting from the Valve Stem. Remove the Whip Hose from the Valve Stem and Tail Assembly.

6. Place the Whip Hose on the work surface. Fit a 1-1/8-inch open-end wrench across the flats of the Quick Disconnect Socket (11). Refer to Figure 8-14.

7. While holding the Quick Disconnect Socket (11) in place, use a 1-1/4-inch open-end wrench to loosen and thread the Whip Hose fitting from the Socket. Refer to Figure 8-14.

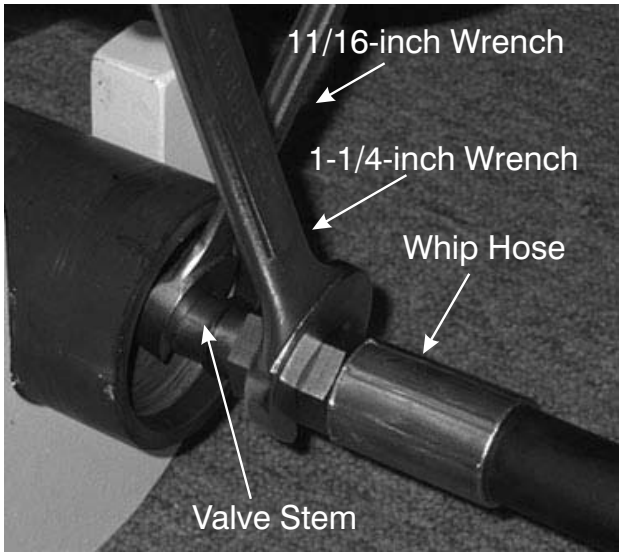


Figure 8-13. Loosen Hex Fitting and Remove Whip Hose

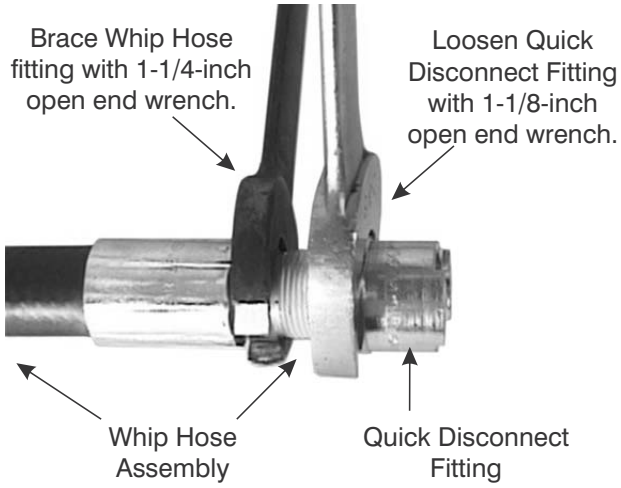


Figure 8-14. Remove Quick Disconnect From Whip Hose

8. If parts replacement is not required, leave the Quick Disconnect Socket (11) assembled. Otherwise, use a screw driver or needlenose plyers to pry the Gasket (12) from the Socket. Discard the gasket. Refer to Figure 8-15.

Figure 8-15. Remove Quick Disconnect Gasket

9. Proceed to Section 8.9.2.2

8.9.2.2 Remove Valve Stem from End Cap (for Serial Numbers 499 and below)

The reference numbers in this section refer to the part item numbers on the following parts drawings and parts lists:

Figure 14-1. Complete Hole-Hog Assembly

Figure 14-6. Tail Assembly

1. Secure the End Cap (8) as described in step 1 of Section 8.9.1.
2. By hand, press the Valve end of the Valve Stem (5) toward the End Cap until the Snap Ring (3) on the end of the Stem is accessible. See Figure 8-16.
3. Use needlenose or snap-ring pliers to expand the Snap Ring (3) and slide it from the Valve Stem (5). Refer to Figure 8-17.

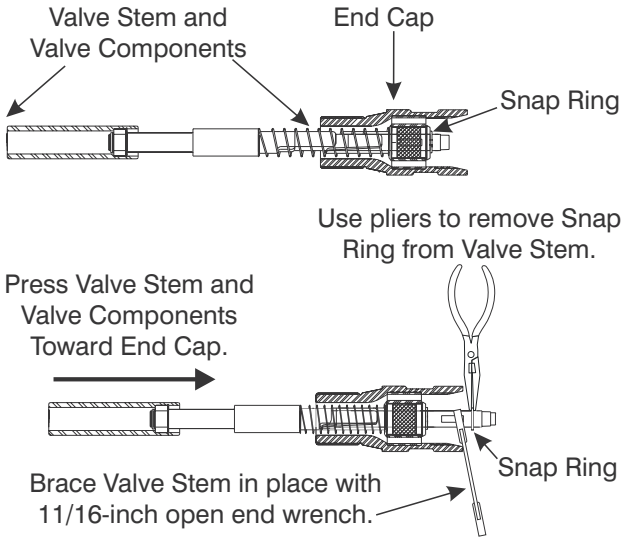


Figure 8-16. Press Valve Stem into Position

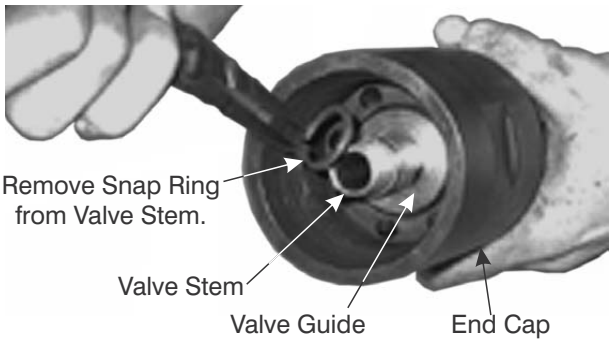


Figure 8-17. Remove Snap Ring from Valve Stem

4. Slide the assembled Valve Stem (5), Valve Spring (6) and Valve (1) from the End Cap (8) as shown in Figure 8-18.

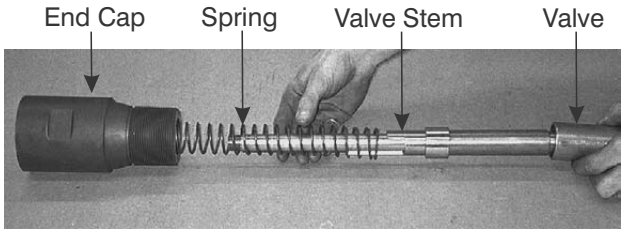


Figure 8-18. Remove Valve Components from End Cap

5. Proceed to Section 8.7.6

8.9.2.3 Remove Whip Hose and Fittings (for Serial Numbers 500 and above)

The reference numbers in this section refer to the part item numbers on the following parts drawings and parts lists:

Figure 14-4. Complete Hole-Hog Assembly

Figure 14-7. Tail Assembly

1. Secure the End Cap (8) as described in step 1 of Section 8.9.1.

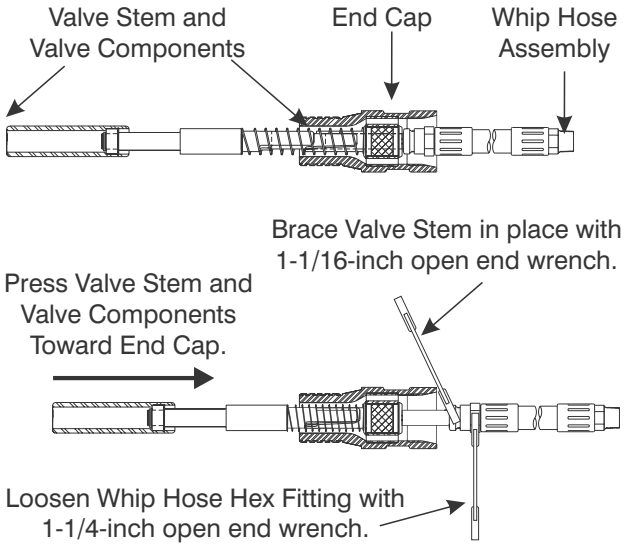


Figure 8-19. Press Valve Stem into Position

2. By hand, press the Valve end of the Valve Stem (5) toward the End Cap until the flats of the Thread Adapter (3) are accessible as shown in Figure 8-19.

3. Fit a 1-1/16-inch open-end wrench across the exposed flats of the Thread Adapter (3). Brace the wrench against the edge of the End Cap and pry the Adapter outward with enough force to prevent the Valve Stem from pulling back into the End Cap. See Figure 8-20.

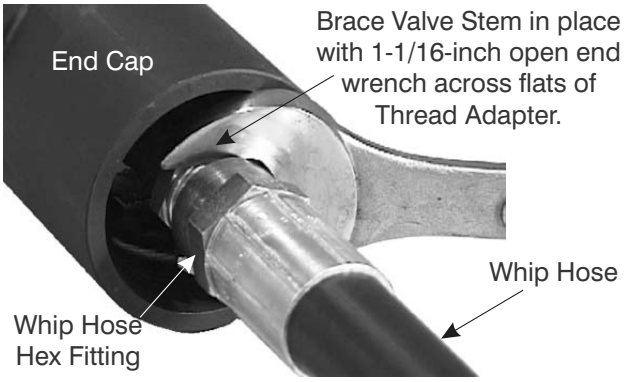


Figure 8-20. Hold Thread Adapter in Position

4. While holding the Thread Adapter in position with the 1-1/16-inch open-end wrench, fit a 1-1/4-inch open-end wrench across the flats of the Whip Hose Hex Fitting as shown in Figure 8-21.

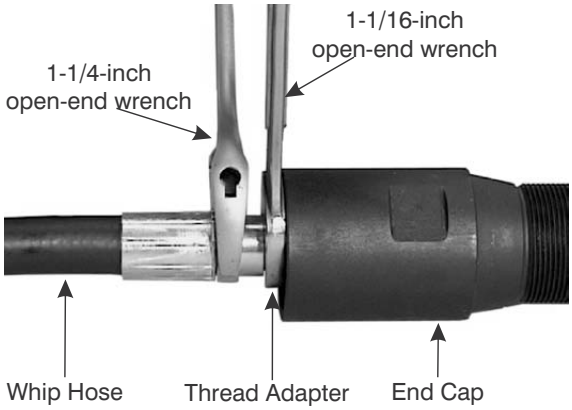


Figure 8-21. Loosen Hex Fitting and Remove Whip Hose

5. Loosen and thread the Whip Hose Hex Fitting from the Thread Adapter. Remove the Whip Hose from the Valve Stem and Tail Assembly.
6. Place the Whip Hose on the work surface. Fit a 1-3/8-inch open-end wrench across the flats of the Quick Disconnect Socket (11). Refer to Figure 8-22.

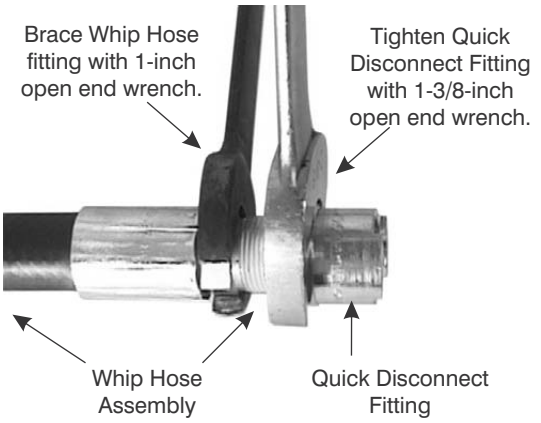


Figure 8-22. Remove Quick Disconnect From Whip Hose

7. While holding the Quick Disconnect Socket (11) in place, use a 1-inch open-end wrench to loosen and thread the Whip Hose fitting from the Socket. Refer to Figure 8-22.
8. If parts replacement is not required, leave the Quick Disconnect Socket (11) assembled. Otherwise, use a screw driver or needlenose plyers to pry the Gasket (12) from the Socket. Discard the gasket. Refer to Figure 8-23.

Figure 8-23. Remove Quick Disconnect Gasket

9. Proceed to Section 8.9.5

8.9.2.4 Remove Valve Stem from End Cap (for Serial Numbers 500 and above)

The reference numbers in this section refer to the part item numbers on the following parts drawings and parts lists:

Figure 14-4. Complete Hole-Hog Assembly

Figure 14-7. Tail Assembly

1. Secure the End Cap (8) as described in step 1 of Section 8.9.1.
2. By hand, press the Valve end of the Valve Stem (5) toward the End Cap until the Thread Adapter (3) on the end of the Stem is accessible. See Figure 8-24.

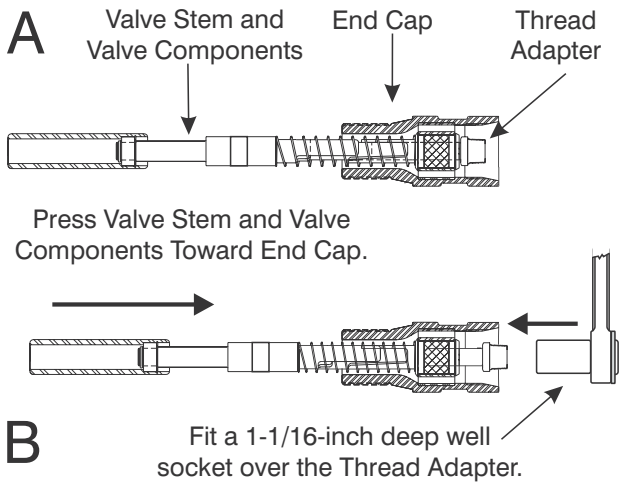


Figure 8-24. Press Valve Stem into Position

3. Fit a 1-1/16-inch deep well socket over the Thread Adapter (3) to hold the adapter in place. Refer to Figure 8-24.
4. With a 3/4-inch open-end wrench across the flats of the Valve Stem (5), thread the Valve Stem (5) from the Thread Adapter (3) as shown in Figure 8-25.

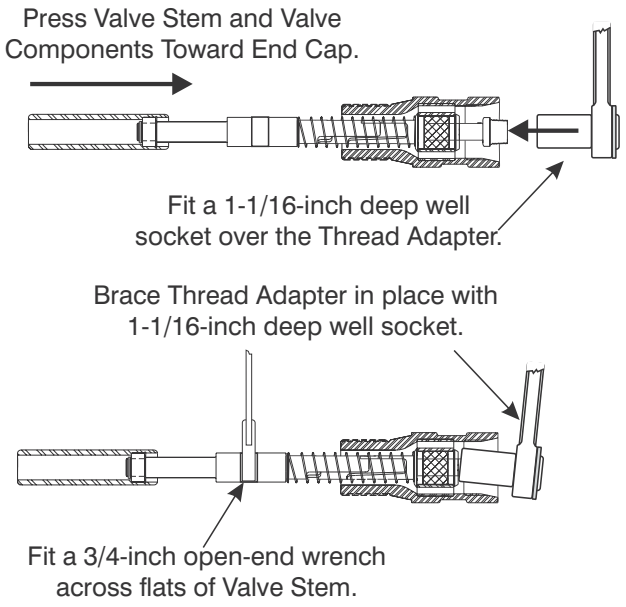


Figure 8-25.Hold Thread Adapter in place.

5. Slide the assembled Valve Stem (5), Valve Spring (6) and Valve (1) from the End Cap (8) as shown in Figure 8-26.
6. Proceed to Section 8.9.3

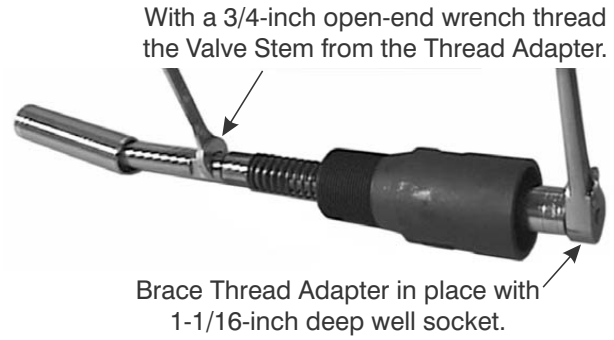


Figure 8-26. Remove Thread Adapter from the Valve Stem.

8.9.3 Remove Valve Stem Components

NOTE

DO NOT disassemble the Valve and Valve Stem components unless component replacement is required.

Snap Rings (4 & 14), and Spherical Bearing (2) are not re-usable. Discard them as they are removed.

1. After the assembled Valve Stem (5), Valve Spring (6) and Valve (1) are removed from the End Cap (8), slide the Spring (6) from around the Valve Guide inside the End Cap, and from the Valve Stem. Refer to Figure 8-27.

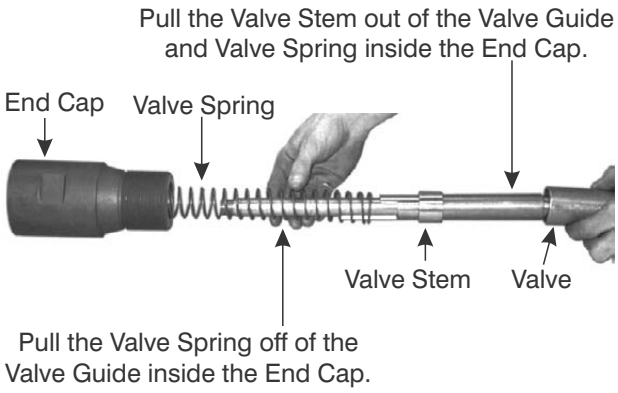


Figure 8-27. Remove the Valve Components from the End Cap.

2. As shown in Figure 8-28, Snap Ring (4) holds the Valve (1) on the Valve Stem (5). It is attached to the Valve (1) just inside the inner end.

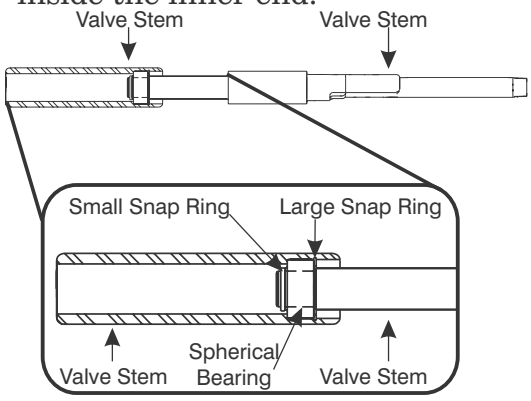


Figure 8-28. Snap Ring on Valve Stem

3. Use either a screwdriver or retaining ring pliers to expand and remove the Snap Ring (4) from the Valve (3) as shown in Figure 8-29.

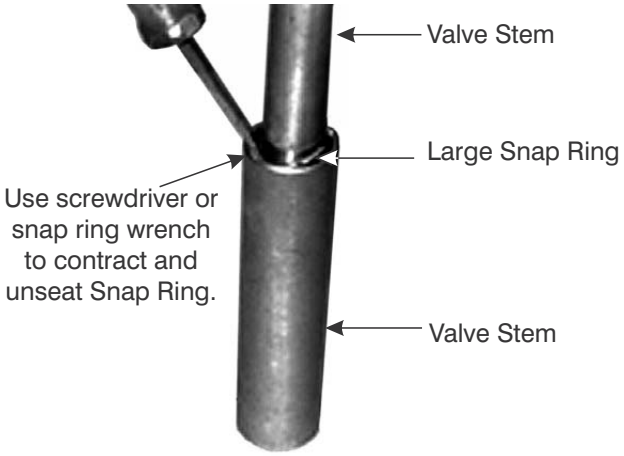


Figure 8-29. Remove Snap Ring from Valve

4. Slide the loosened Snap Ring along the Valve Stem away from the Valve.
5. Pull the Valve (1) from the Spherical Bearing (2) and Valve Stem (5). If necessary, use a hammer with a plastic head to drive the Valve off the Spherical Bearing. Refer to Figure 8-30.

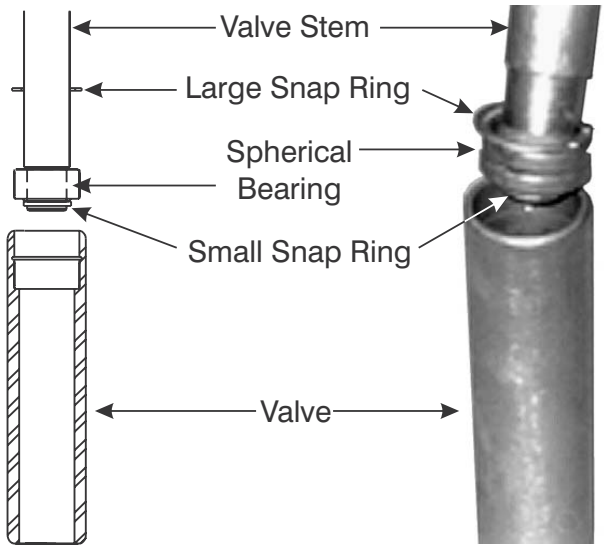


Figure 8-30. Remove the Valve from the Spherical Bearing.

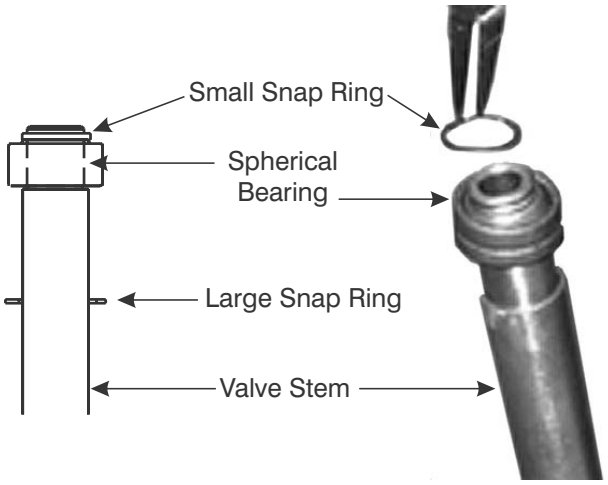


Figure 8-31. Snap Ring Secures Spherical Bearing

6. The Spherical Bearing is secured to the Valve Stem by the smaller Snap Ring, as shown in Figure 8-31.
7. Use needle-nose or retaining ring pliers to expand and remove Snap Ring (14) from the Valve Stem (5) as shown in Figure 8-31. Discard the Snap Ring.
8. Turn the Valve Stem (5) so the end with the Spherical Bearing (2) is down, and place the Stem in a vise as shown in Figure 8-32.
   a. Put the Valve Stem between the vise jaws with the Stem shoulder resting on top of the jaws.
   b. Slide the Valve Stem to one side of the jaws so the Stem hangs freely from the shoulder and does not touch the vise.

CAUTION

DO NOT scar the surface of the Valve Stem. Clamp the Stem lightly in the vise - only tight enough to prevent movement while removing the Spherical Bearing.

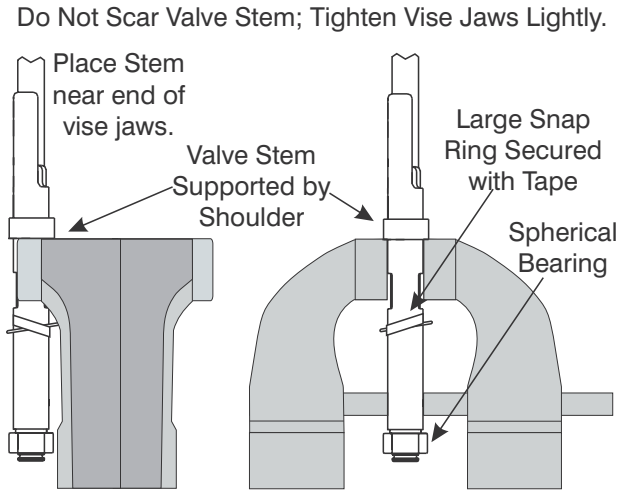


Figure 8-32. Secure Valve Stem in Vise

9. Verify that the Valve Stem is supported by the Stem shoulder resting on the top of the vise jaws. Lightly clamp the Valve Stem in the vise as shown in Figure 8-33.

10. Fit the Bearing Removal Tool, P/N 101756 to the assembled Spherical Bearing and Valve Stem as shown in Figure 8-33.

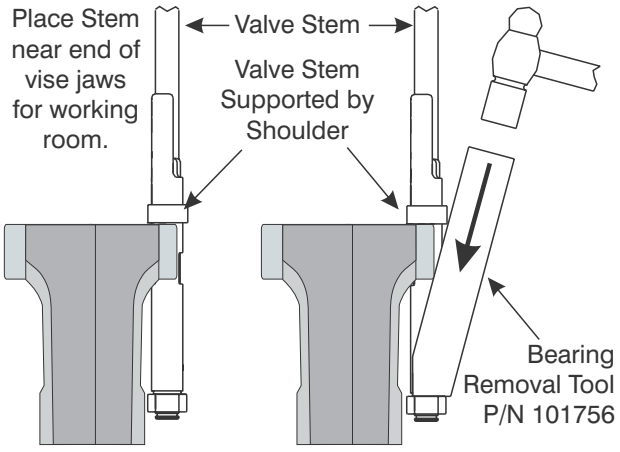


Figure 8-33. Drive the Spherical Bearing from the Valve Stem.

11. Use a hammer to drive the Spherical Bearing (2) from the Valve Stem (5).

12. Slide the loose Snap Ring (4) from the Valve Stem as shown in Figure 8-34.

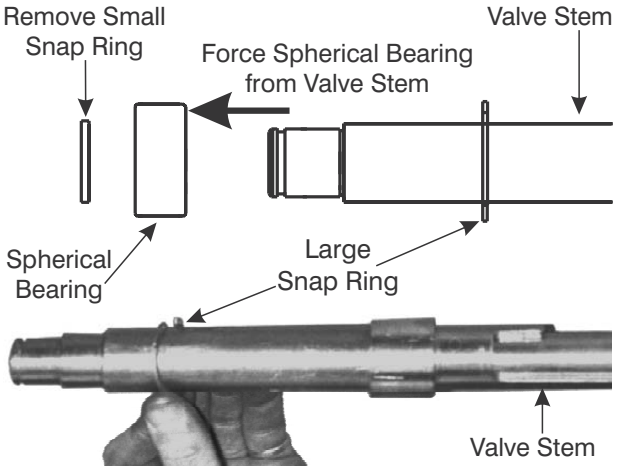


Figure 8-34. Remove Spherical Bearing and Snap Ring from Valve Stem

8.9.4 Remove End Cap Components

CAUTION

Disassembly destroys the Shock Absorber. DO NOT remove the Shock Absorber (9) and Valve Guide (7) from End Cap (8) unless replacement is necessary. Refer to Figures 8-35 and 8-36.

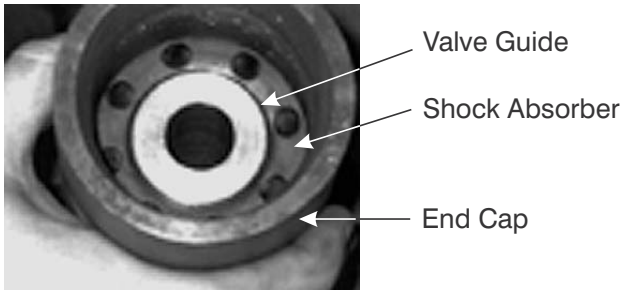


Figure 8-35. End Cap Components

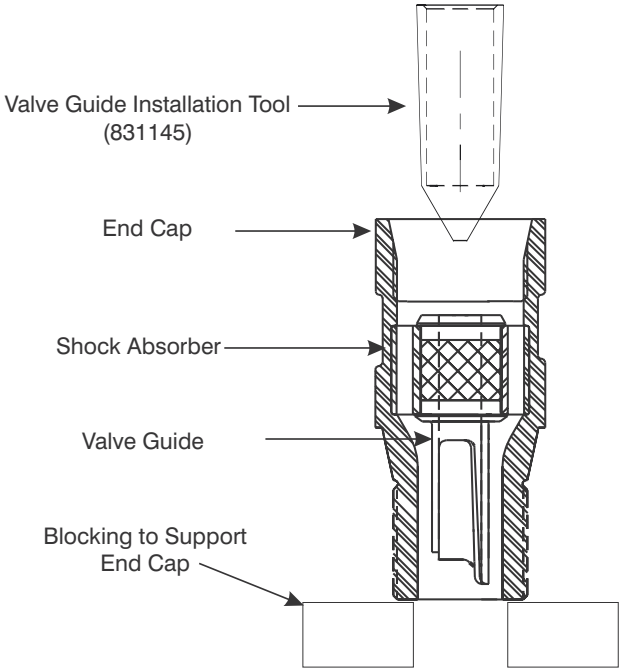


Figure 8-36. Place End Cap in Arbor Press

1. With threaded end down, place the End Cap in an arbor press as shown in Figure 8-36.
   - Support the edges of the End Cap (8) with standard blocking.
   - Provide additional space below the blocking to permit Valve Guide travel during pressing.
2. Insert the Valve Guide Installation Tool P/N 831145 in the Valve Guide as shown in Figure 8-37-A.

NOTE

If the plunger of the arbor press does not fit inside the End Cap as illustrated, use a standard push bar of the required diameter.

3. Press the Valve Guide from the Shock Absorber as shown in Figure 8-37-B.
4. Once started from the Shock Absorber, the Valve Guide can be pulled free by hand.

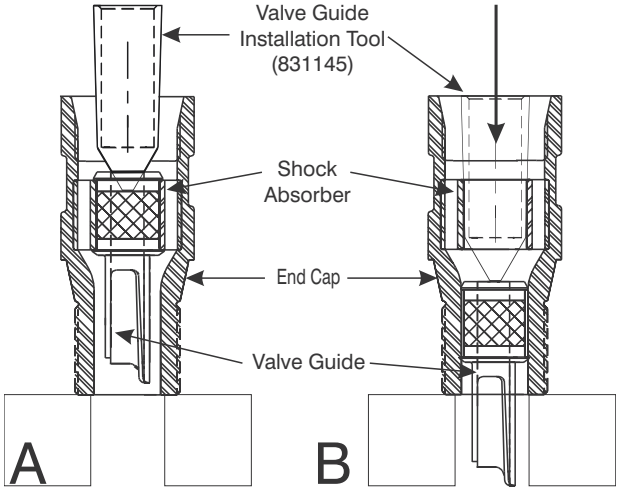


Figure 8-37. Press Valve Guide from the Shock Absorber.

5. Use a sharp knife or hack saw to cut through the Shock Absorber (9), and remove it from the Valve Guide (7). See Figures 8-38 and 8-39.

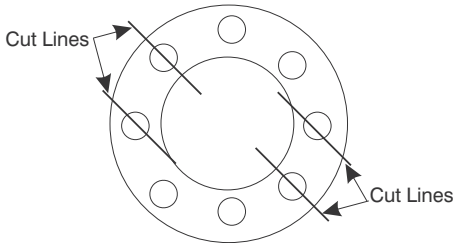


Figure 8-38. Cutting Pattern for Shock Absorber

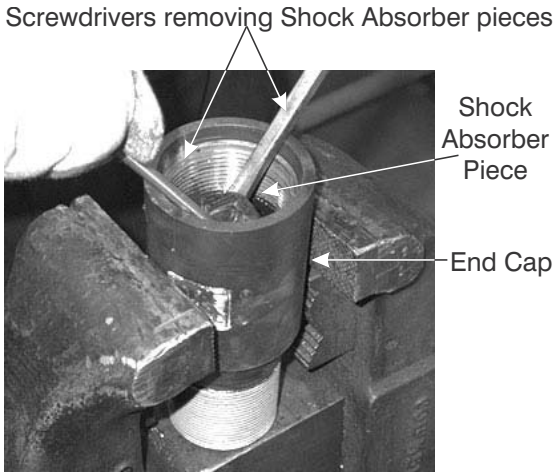


Figure 8-39. Removing Shock Absorber from End Cap.

SECTION 9.0 ASSEMBLY

WARNING

Applying heat with a torch or by any other method to any part of the Hole-Hog relieves Allied of all warranty responsibilities. Applying heat can destroy the main body, striker and other parts beyond use. Heating Hole-Hog components can cause altered component strength and result in premature failure, such as ruptures or a blown out end cap. This could cause personal injury or death.

CAUTION

Using a pipe wrench on the Hole-Hog Body/Anvil relieves Allied of all warranty responsibilities.

CAUTION

Lubricate all rubber parts & tools with lithium grease before pressing. The grease will protect the rubber parts and make installation easier.

CAUTION

Before starting any of the Assembly procedures in this section, refer to Section 3.1 and verify the Serial Number of the unit to be assembled. Refer to sections 9.2 and 9.3 for information about the differences among serial number groups.

9.1 General

The procedures in this section must be performed in a machine shop suitable for the cleaning, inspection, repair and assembly of pneumatic construction equipment. In addition to the tools and fixtures normally stocked in such a shop, the Allied Tool Kit 831147 must also be available.

In the following procedures, reference numbers in parentheses accompany most part names. These numbers refer to the part item numbers on the most recent parts drawings and parts lists in Section 14.0, specifically:

Figure 14-4. Complete Hole-Hog Assembly

Figure 14-7. Tail Assembly

9.2 Hole-Hog Serial Numbers

Each Hole-Hog Serial Number is etched on the Striker. In addition, it is recorded upon receipt by the owner in section 3.1 of this manual. Refer to that section for the Serial Number.

Hole-Hog Serial Numbers are issued sequentially at the time of manufacture. For example: The Hole-Hog with S/N 499 is the four hundred and ninety ninth unit built. The next unit built would be assigned S/N 500, and so forth.

9.3 Variations by Serial Number

In addition to model differences, there are a few significant differences among the 310-Series Hole-Hogs covered in this manual. There are two different methods for

mounting the Whip Hose, and some models have a nylon insert to lock the Anvil Cap threads. Three serial number groups track these differences:

499 and Below

- Whip Hose Mounting Method 1 (Refer to 9.3.1.)

500 through 649

- Whip Hose Mounting Method 2 (Refer to 9.3.2.)

650 and Above

- Whip Hose Mounting Method 2 and
- Nylon insert used to lock Anvil Cap (Refer to 9.3.3.)

9.3.1 Whip Hose Mounting Method 1

On Hole-Hogs numbered 499 and below the Whip Hose connects directly to the Valve Stem. The Whip Hose hex fitting slides over the tapered and threaded end of the Valve Stem. The fitting threads securely onto the Valve Stem. Refer to Figure 9-1.

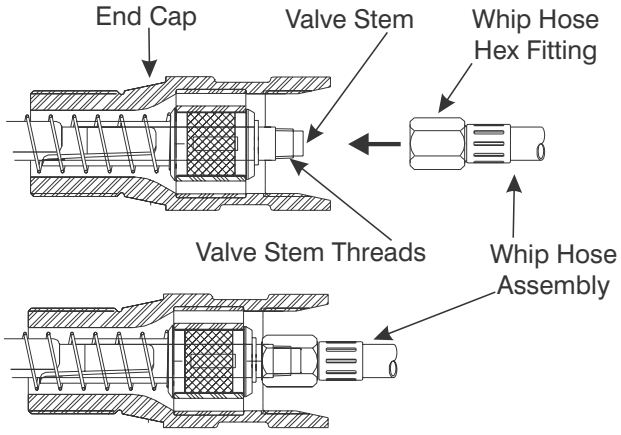


Figure 9-1. Whip Hose Mounting Method 1

9.3.2 Whip Hose Mounting Method 2

On Hole-Hogs numbered 500 and above the Whip Hose connects to a Thread Adapter secured to the Valve Stem. The Thread Adapter slides over the threaded end of the Valve Stem and threads securely onto the Valve Stem. The Whip Hose hex fitting slides onto and threads securely to the Thread Adapter. Refer to Figure 9-2.

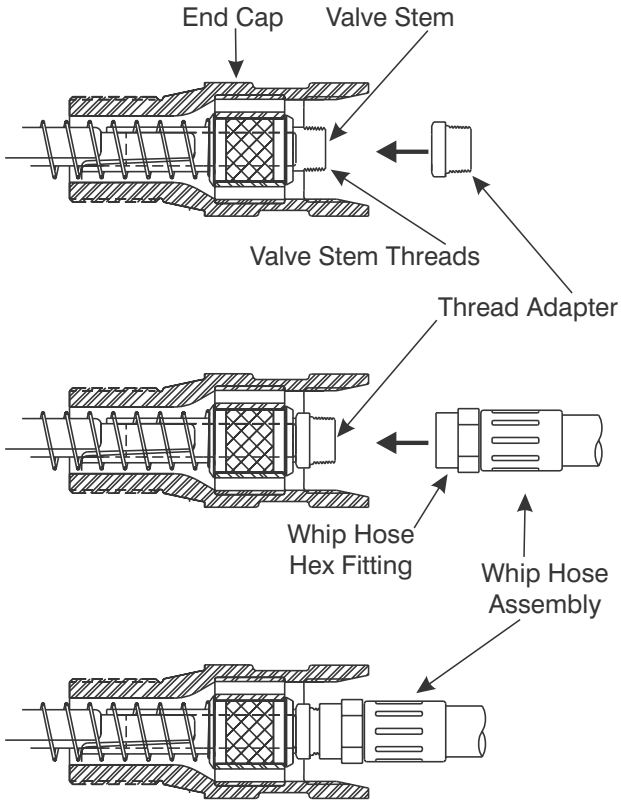


Figure 9-2. Whip Hose Mounting Method 2

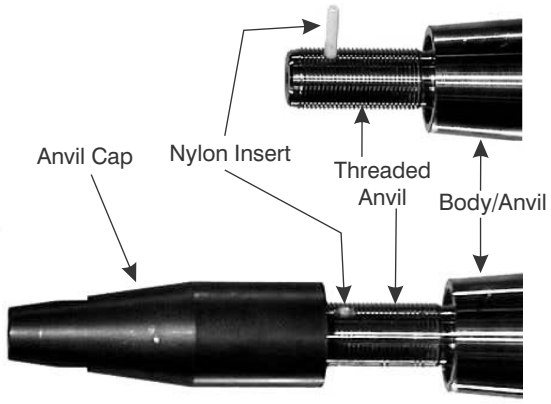


Figure 9-3. Anvil Cap and Nylon Insert

9.3.3 Nylon Insert for Anvil Cap

On Hole-Hogs numbered 650 and above, there is a hole in the Threaded Anvil for insertion of a Nylon Insert (3). When the Anvil Cap (2) threads onto the Anvil, the Nylon Insert presses against the threads of the Anvil Cap.

During operation of the Hole-Hog, the Nylon Insert (3) pressing against the threads prevents the Anvil Cap from vibrating off of the anvil. Refer to Figure 9-3.

9.4 Disassembly and Assembly Tool Kit Part Number 831147

The tools contained in this kit are listed below and illustrated in Figure 9-4.

1. Shock Absorber Installation Tool, P/N 831144, quantity 1.
2. Valve Guide Installation Tool, P/N 831145, quantity 1.
3. Spherical Bearing Installation Tool, P/N 831146, quantity 1.
4. End Cap Wrench, P/N 831150, quantity 2.
5. Valve Sleeve Guide, P/N 831171, quantity 1.
6. Valve Guide Installation Pusher, P/N 831172, quantity 1.
7. Second Stage Shock Absorber Pusher; P/N 831797, quantity 1.
8. Bearing Removal Tool, P/N 101756, quantity 1.

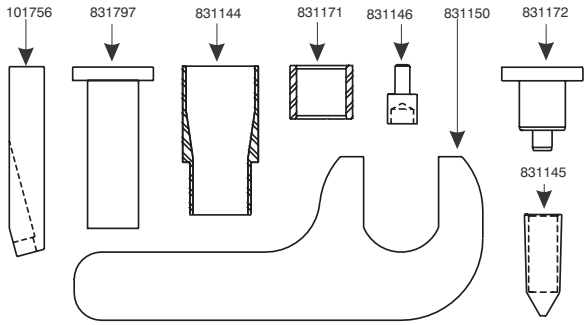


Figure 9-4. Hole-Hog Tool Kit

9.5 Extent of Re-assembly

This section includes instructions for re-assembling the replaceable Hole-Hog components. Most repairs do not require complete disassembly. Before starting the Assembly procedures, clean and inspect the disassembled components to determine which parts require replacement. Then read through the Assembly procedures and select the sections to be performed.

9.6 Replacing Only The Whip Hose and Quick Disconnect Fitting

The Whip Hose (10) and Quick Disconnect (11) can be removed and replaced without disassembling internal Hole-Hog components.

- To replace either of these components in the field, without disassembly of internal Hole-Hog components, refer to section 11.7 and 11.8 or 11.9.

- To re-assemble these components as part of shop Assembly, follow the procedures in this section, starting with 9.6.

9.7 Replacing The Body/Anvil Only

When replacing the Body/Anvil (1) only, the Striker (2) and tail assembly components are removed from the Body/Anvil and stored with no further disassembly as described in 8.7.

1. When the new Body/Anvil is available, bring the Striker (2), and tail assembly components to the work area for reassembly.
2. Install all of the assemblies in the Body/Anvil following the assembly procedures in this section, starting with section 9.8.

9.7.1 Threaded Anvil (TH) Units Only

1. A replacement Body/Anvil (1) includes a new Anvil Cap (24). Check that it is securely attached to the Body/Anvil as described below.
2. If the Anvil Cap alone is being replaced, install it hand tight on the Body/Anvil. Then, with the Body/Anvil held securely by a strap wrench, use a 1-1/4-inch open-end wrench to tighten the Anvil Cap another 1/8-inch. Refer to Section 9-14.

9.8 Assemble End Cap Components

1. Lubricate the internal surface of the Shock Absorber Installation Tool, P/N 831144. Lubricate the mating surfaces of the installation tool and End Cap (8) as shown in Figure 9-5-A.
2. Position the End Cap (8) in an arbor press with the threaded end down and insert the installation tool into the upper end of the End Cap, as shown in Figure 9-5-B.

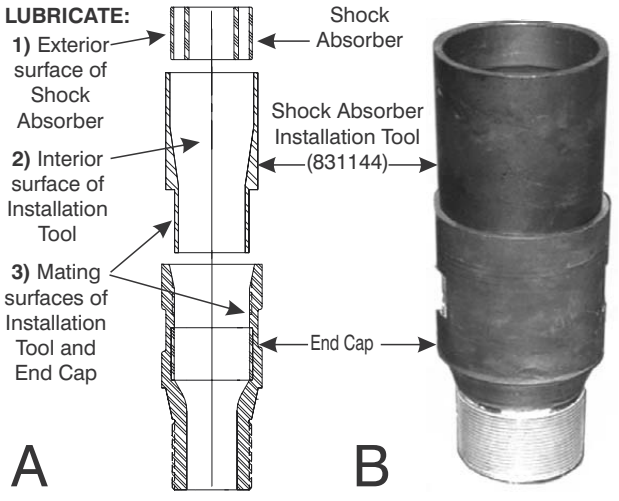


Figure 9-5. End Cap, Tool P/N 831144 and Shock Absorber

3. Lubricate the outer surface of the Shock Absorber (9). Place the Shock Absorber into the Installation Tool as shown in Figure 9-6-A.

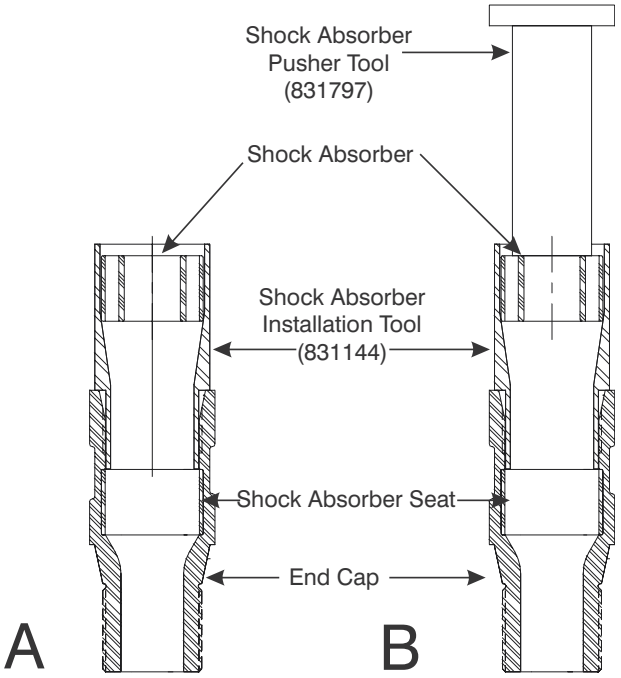


Figure 9-6. Compress Shock Absorber in Installation Tool 831144.

4. Center the Shock Absorber Pusher Tool P/N 831797 over the Shock Absorber as shown in Figure 9-6-A.

5. Slowly compress the Shock Absorber in Installation Tool 831144 as shown in Figure 9-7-A.

> **CAUTION**
> When using Tool 831797, DO NOT press Shock Absorber past the seat in the End Cap.

6. Continue pressing the Shock Absorber into the End Cap until it seats between the internal shoulders of the End Cap as shown in Figure 9-7-B.

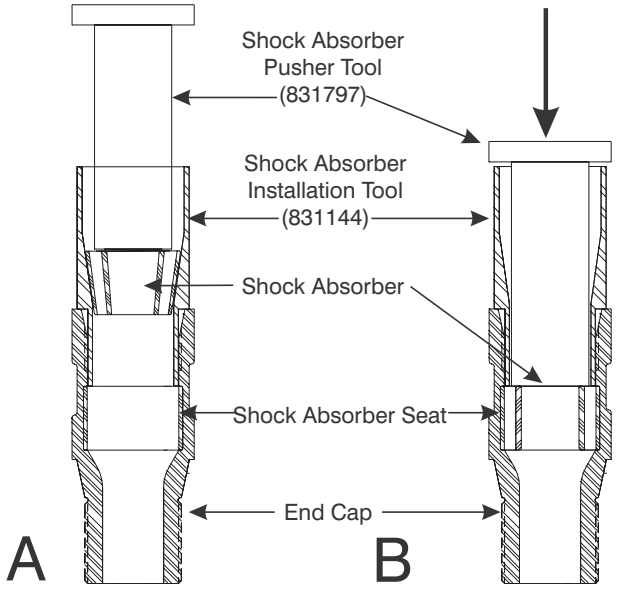


Figure 9-7. Press the Shock Absorber into the End Cap Shock Absorber Seat.

7. Remove the Shock Absorber Installation Tool 831144 from the End Cap.

8. Before installing the Valve Guide (7) , lubricate:

- the outer surface of the Valve Guide.
- the I.D. of the Shock Absorber (9).
- Installation Tool P/N 831145.
- Installation Tool P/N 831171.
- Installation Tool P/N 831172.

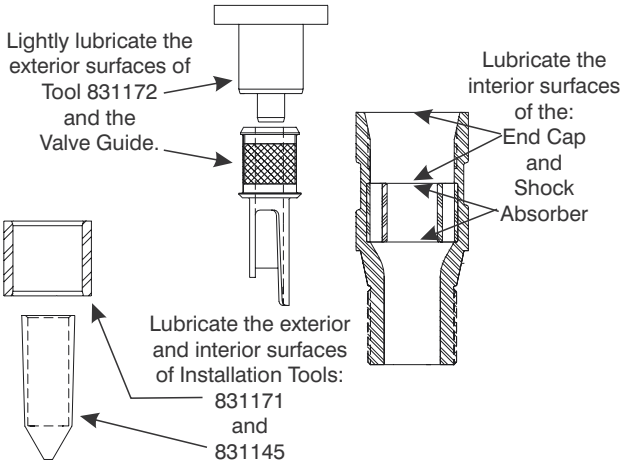


Figure 9-8. Lubricate Valve Guide, Shock Absorber and Installation Tools.

9. Position the End Cap (8) in an arbor press with the threaded end down. Insert the Valve Sleeve Guide 831171 into the upper end of the End Cap, as shown in Figure 9-9-A.

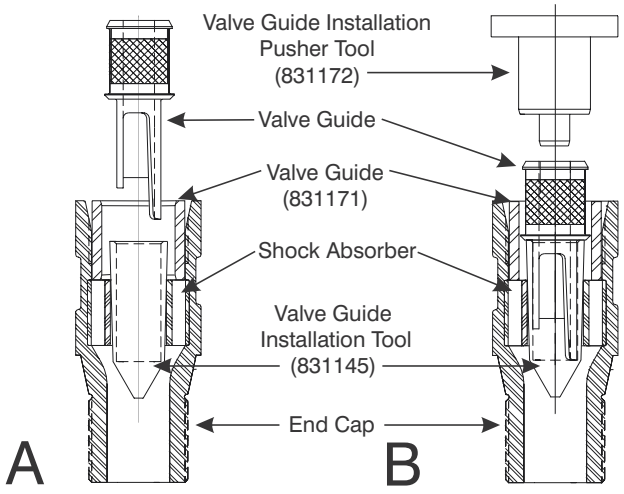


Figure 9-9. Place End Cap, Valve Guide and Installation Tools in the Arbor Press.

10. Place the Valve Guide Installation Tool 831145 in the center bore of the Shock Absorber (9), as shown in Figure 9-9-A.

11. Refer to Figure 9-9-A and slide the Valve Guide (7) into the Valve Guide Installation Tool P/N 831145.

12. By hand, push the Valve Guide and Tool 831145 into the Shock Absorber until it seats firmly. This centers the Valve Guide on the Shock Absorber and Valve Sleeve Guide P/N 831171, as shown in Figure 9-9-B.

13. Center the Valve Guide Installation Pusher 831172 on the upper end of the Valve Guide as shown in Figure 9-9-B.

14. Slide the alignment post of the Valve Guide Pusher into the upper end of the Valve Guide as shown in Figure 9-10-A.

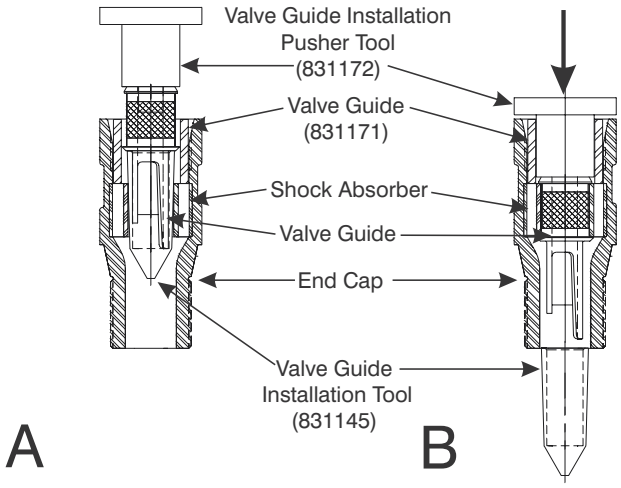


Figure 9-10. Press Valve Guide into End Cap and Shock Absorber.

CAUTION

Do not damage the upper shoulder of the Valve Guide while pressing it into the Shock Absorber. Maintain proper alignment of the Valve Guide Pusher and Valve Guide with the Valve Sleeve Guide.

15. Align the plunger of the arbor press with the Valve Guide Pusher and carefully press the Valve Guide (7) through the Guide Sleeve and into the Shock Absorber (9) as shown in Figure 9-10-B.

16. Continue pressing the Valve Guide into the Shock until the upper shoulder of the Valve Guide seats against the edge of the Shock Absorber as shown in Figure 9-10-B.

17. The Valve Guide Installation Tool P/N 831145 will fall free of the Valve Guide when the Valve Guide seats against the Shock Absorber.

18. Remove the End Cap from the arbor press and remove the Valve Guide Installation Tools 831172, 831171 and 831145.

19. Refer to Figures 9-10-B and 9-11 and verify that the Shock Absorber is securely seated between the shoulders of the Valve guide.

9.9 Fit Spherical Bearing to Valve Stem

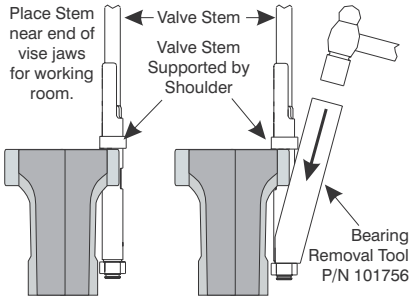


Figure 9-11. Valve Guide In Shock Absorber

1. Collect the Valve Stem (5) Spherical Bearing (2), Valve Snap Ring (4), Snap Ring (14), and Spherical Bearing Installation Tool 831146. Refer to Figure 9-12.

2. Lubricate the internal bore of the Spherical Bearing (2), and Valve Snap Ring (4). Lubricate the non-threaded end of the Valve Stem (5) and the exterior of the installation tool. Refer to Figure 9-12-A.

3. Slide the Valve Snap Ring (4) over the non-threaded end of the Valve Stem (5). Slide it as far as it will travel freely along the Stem. Tape it in place away from the non-threaded end of the Valve Stem so it will not be damaged during installation of the Spherical Bearing as shown in Figure 9-12-B.

4. Place the Valve Stem in an Arbor Press with the un-threaded end up.

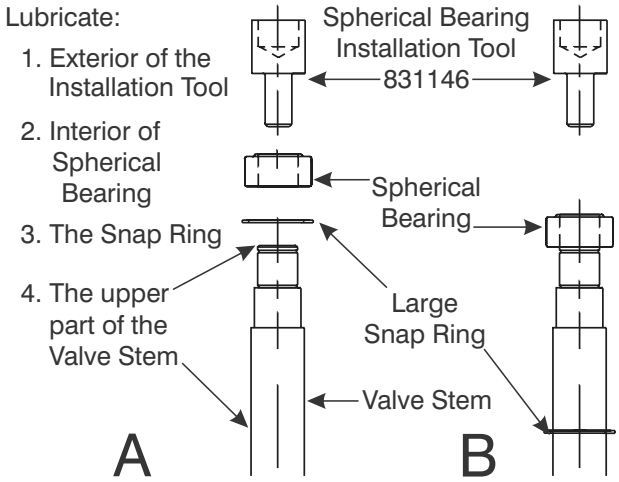


Figure 9-12. Lubricate Spherical Bearing Components.

5. Turn the spherical Bearing (2) so the central shoulder is at the top and the flat side is at the bottom as shown in Figure 9-13.

6. Center the bore of the bearing over the Valve Stem. Figure 9-12-A.

7. Start the Spherical Bearing over the un-threaded (grooved) end of the Valve Stem as shown in Figure 9-12-B.

8. Slide the stem of Installation Tool 831146 through the Spherical Bearing

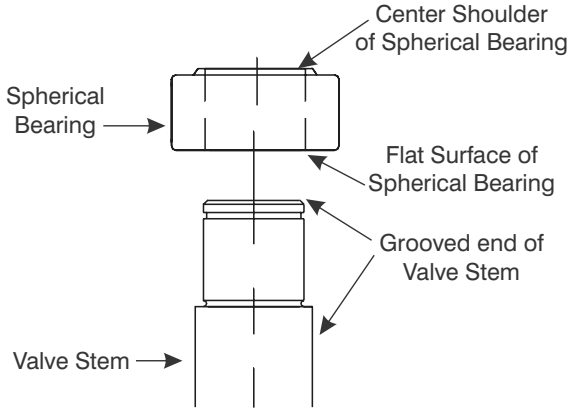


Figure 9-13. Orientation of Spherical Bearing

and into the center bore of the Valve Stem as shown in Figure 9-14-A.

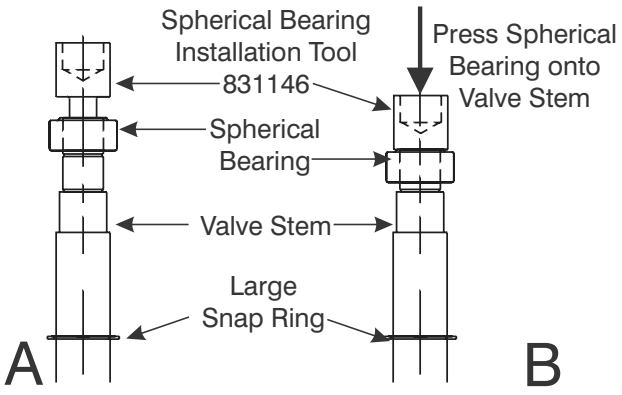


Figure 9-14. Start Spherical Bearing onto The Valve Stem.

9. Press the Spherical Bearing onto the Valve Stem until the shoulder of the tool presses against the upper end of the Valve Stem as shown in Figure 9-14-B.
10. Turn the Spherical Bearing Installation Tool 831146 so the stem of the tool is up. Center the tool over the Spherical Bearing as shown in Figure 9-15-A.

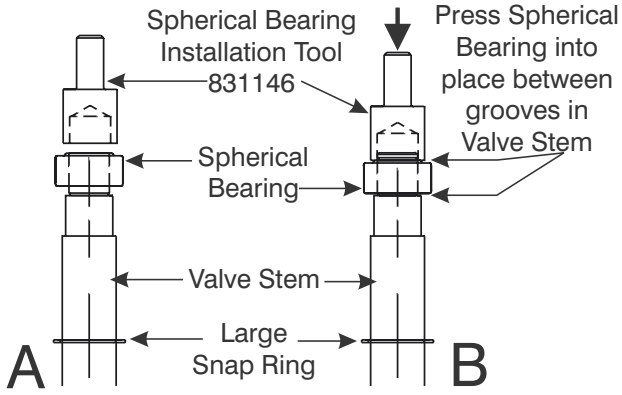


Figure 9-15. Press Spherical Bearing into place on the Valve Stem.

11. Using tool 831146, press the Spherical Bearing onto the Valve Stem as shown in figure 9-15-B.
12. The Spherical Bearing should fit between the two grooves in the Valve Stem as shown in Figure 9-16.

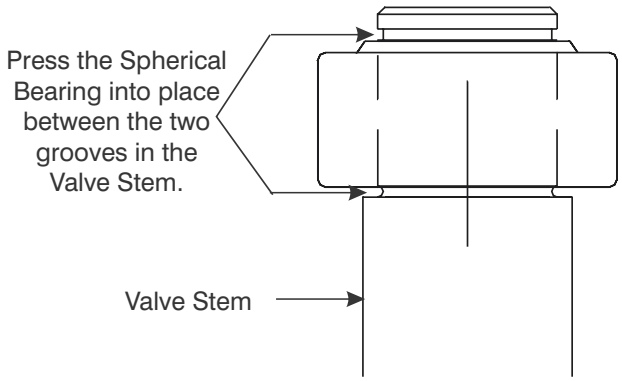


Figure 9-16. Placement of Spherical Bearing

13. The Spherical Bearing is secured to the Valve Stem by the smaller Snap Ring (14), as shown in Figure 9-17.
14. Use needle-nose or retaining ring pliers to expand and fit the Snap Ring (14) into the Valve Stem (5) groove as shown in Figure 9-17.

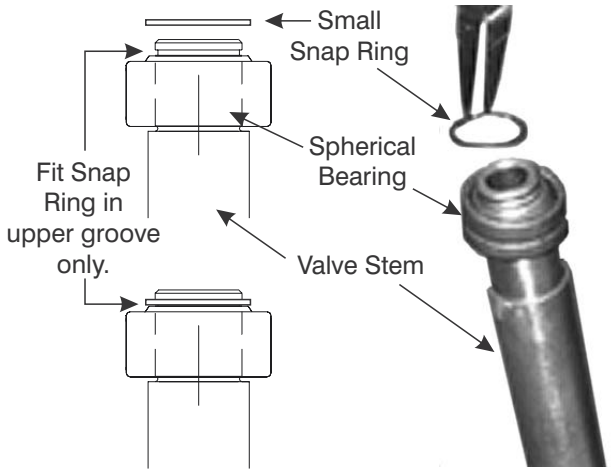


Figure 9-17. Snap Ring secures Spherical Bearing on Valve Stem.

9.10 Attach Valve to Valve Stem

1. Collect on a clean flat work bench: the Valve (1) and the Valve Stem with the Spherical Bearing attached per section 9.9.
2. Lubricate the external surface of the Spherical Bearing (2) and the larger internal bore of the Valve (1), as shown in Figure 9-18.

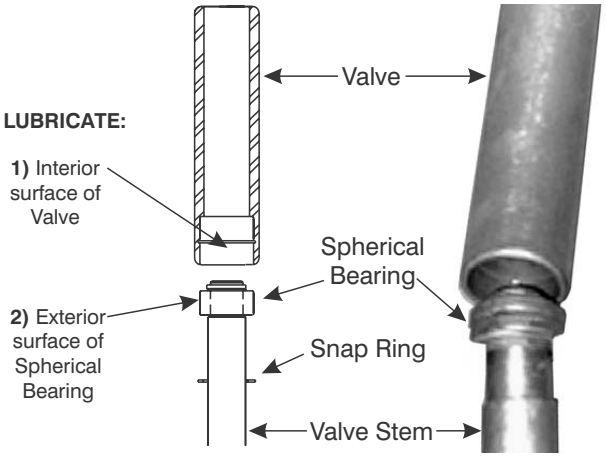


Figure 9-18. Fit Valve onto Spherical Bearing.

3. By hand, start the larger internal bore of the Valve (1) onto the Spherical Bearing as shown in Figure 9-18. Slide the Valve onto the Spherical Bearing as far as it will go by hand.

   - If manual pressure is enough to properly fit the Valve to the Spherical Bearing, as shown in Figure 9-19, proceed to step 6.
   - If mechanical force is required proceed to step 4.

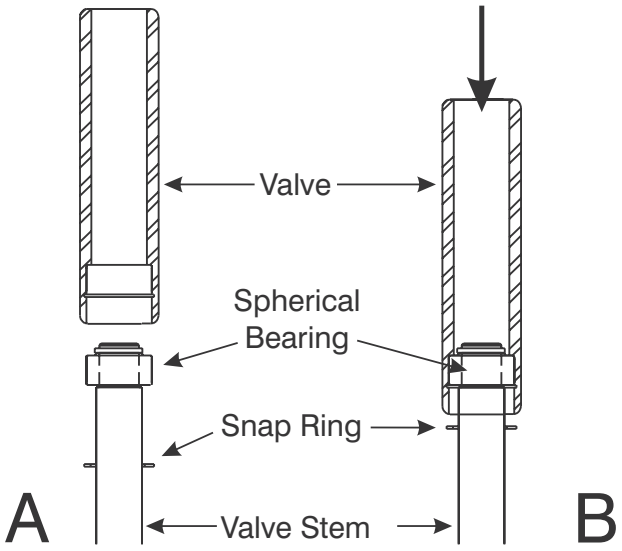


Figure 9-19. Seat Bearing Against Internal Shoulder of the Valve.

CAUTION

Do not damage or unseat the Spherical Bearing when pressing the Valve into place. Stop pressing the Valve as soon as the Spherical Bearing touches the bearing seat inside the Valve as shown in Figure 9-19.

4. Place the Valve Stem in an arbor press with the Spherical Bearing up.
5. With the Valve (1) centered on the bearing, slowly press the Valve onto the Spherical Bearing. (2).
6. Only press the valve onto the Spherical Bearing until the internal shoulder of the Valve touches the top of the Spherical Bearing, as shown in Figure 9-20.
7. The Valve (1) is secured to the Spherical Bearing and Valve Stem by the larger Snap Ring (14), as shown in Figure 9-21.

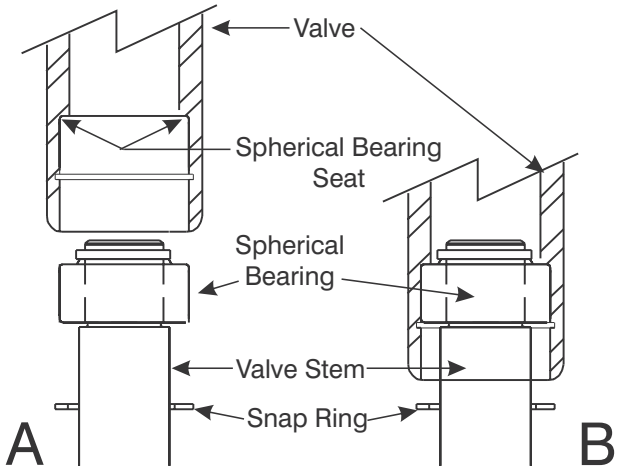


Figure 9-20. Proper Valve Seating

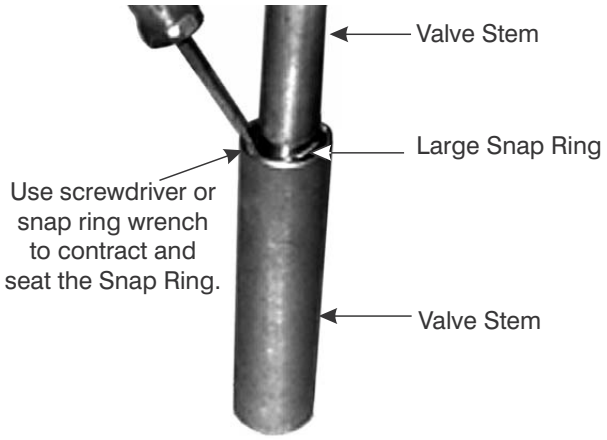


Figure 9-22. Install Snap Ring in Valve.

8. Remove the tape that was applied in paragraph 9.9, step 3, and slide the Snap Ring (14) to the edge of the Valve.
9. Use needle-nose or retaining ring pliers to compress and fit the Snap Ring (14) into the Valve's internal snap ring seat as shown in Figures 9-21 and 9-22.
10. After securing the Valve to one end of the Valve Stem, slide the Valve Spring (6) onto the other end of the Valve Stem. Refer to Figure 9-23.

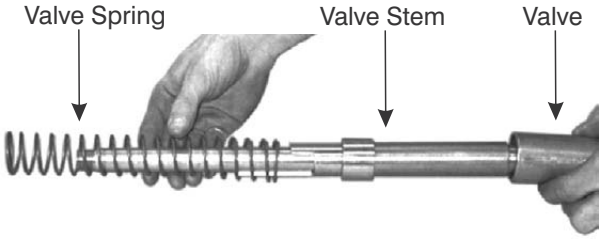


Figure 9-23. Slide Spring onto Valve Stem

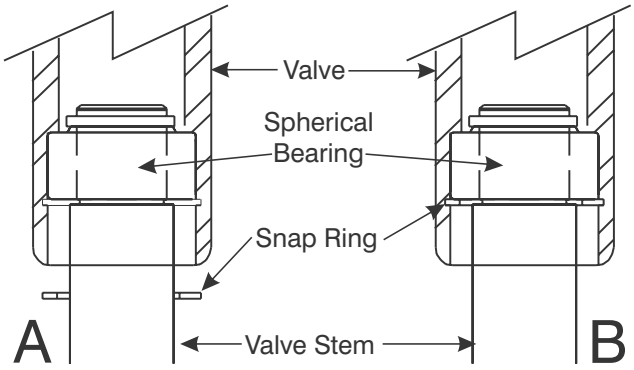


Figure 9-21. Valve Snap Ring Seat

9.11 Secure the Whip Hose and Valve Components to the End Cap

There are two methods for mounting the Whip Hose and Valve Stem Components. Refer to Section 8.3 Variations by Serial number. Assembly varies for each of these mounting methods. For Hole-Hogs with serial numbers:

- 499 or below, follow the assembly procedures in Sections 9.11.1 and 9.11.2.
- 500 or above, follow the assembly procedures in Sections 9.11.3 and 9.11.4.

9.11.1 Secure Valve Stem to End Cap (for Serial Numbers 499 and below)

The reference numbers in this section refer to the part item numbers on the following parts drawings and parts lists:

Figure 14-1. Complete Hole-Hog Assembly

Figure 14-6. Tail Assembly

1. Collect on a clean flat work bench: The End Cap (8) and the Valve Stem (5) with Valve (1) and Spring (6) attached per section 9.10.
2. Slide the Spring (6) into smaller end of the End Cap. As shown in Figure 9-24:
   - the Spring fits around the outside of the of the Valve Guide, and
   - the Valve Stem fits inside the Valve Guide.

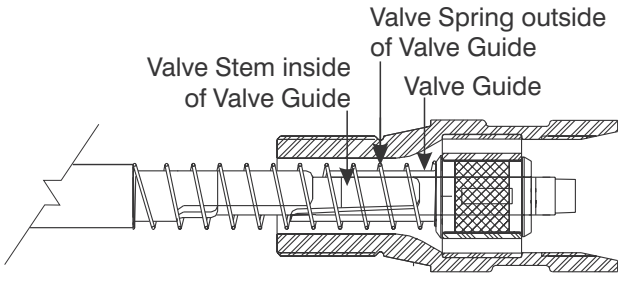


Figure 9-24. Valve Spring, Stem, and Guide

3. By hand, press the Valve end of the Valve Stem (5) toward the End Cap until the flats on the stem are accessible as shown in Figure 9-25.

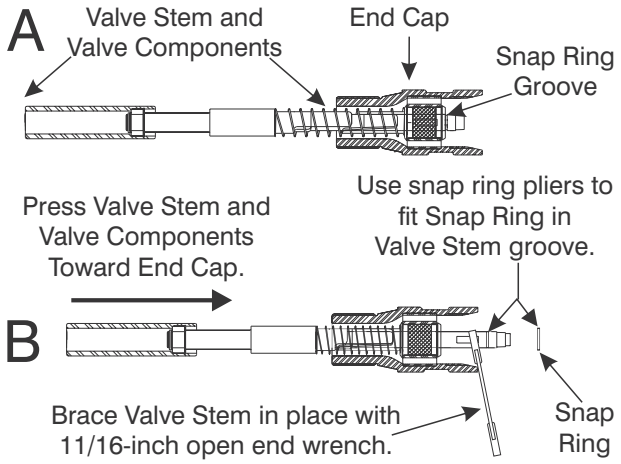


Figure 9-25. Install Snap Ring on Valve Stem.

4. Fit an 11/16-inch open-end wrench across the exposed flats of the Valve Stem. Brace the wrench against the edge of the End Cap and pry the stem outward with enough force to prevent the Valve Stem from pulling back into the End Cap as shown in Figure 9-25.
5. Use needlenose or snap-ring pliers to expand the Snap Ring (3) and slide it into the groove in the Valve Stem (5). Refer to Figures 9-25-B and 9-26.

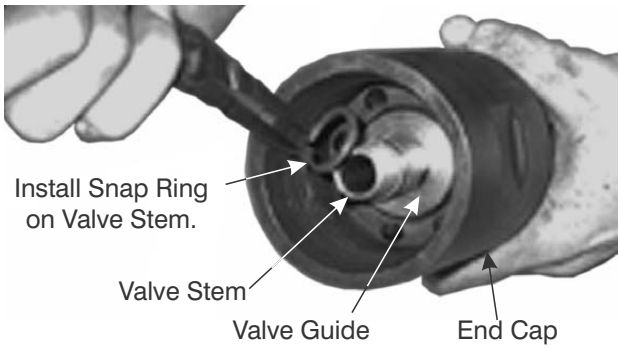


Figure 9-26. End Cap and Snap Ring

6. Carefully let the Spring push the Valve components away from the End Cap until the Snap Ring rests against the collar of the Valve Guide (7), as shown in Figure 9-27.

7. Proceed to 9.11.2.

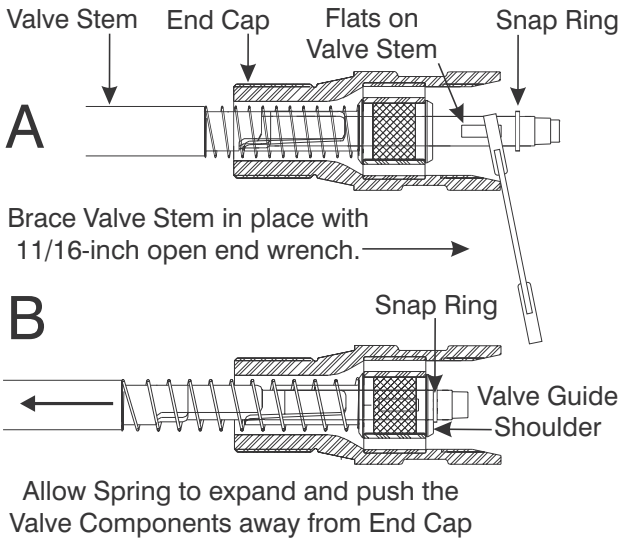


Figure 9-27. Valve Guide and Snap Ring

9.11.2 Install Whip Hose and Fittings (for Serial Numbers 499 and below)

> **WARNING**
> Always use Allied's Whip Hose Assembly (see parts lists in Section 14.0) or equivalent: 100R2 hose. Failure to use 100R2 hose could result in injury to personnel.

The reference numbers in this section refer to the part item numbers on the following parts drawings and parts lists:

Figure 14-1. Complete Hole-Hog Assembly

Figure 14-6. Tail Assembly

1. Collect on a clean flat work bench: the End Cap (8) with the Valve components assembled per section 9.11.1, the Whip Hose (10), and the Quick Disconnect Fitting (11) and Gasket.

2. By hand, press the Valve end of the Valve Stem (5) toward the End Cap until the flats on the stem are accessible as shown in Figure 9-28.

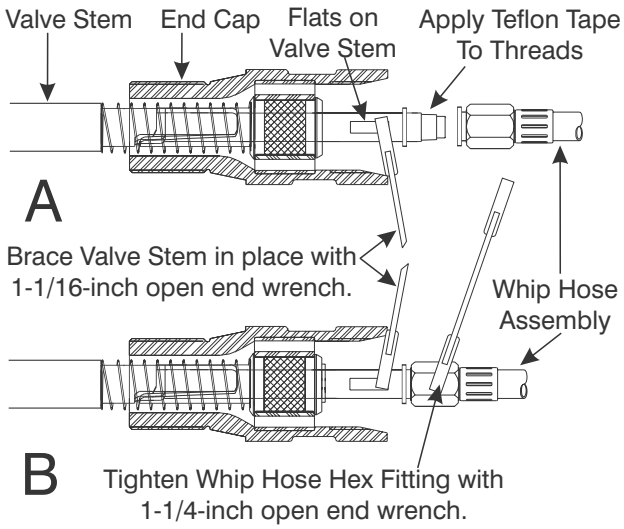


Figure 9-28. Hold Valve Stem in Place.

3. Fit an 11/16-inch open-end wrench across the exposed flats of the Valve Stem. Brace the wrench against the edge of the End Cap and pry the stem outward with enough force to prevent the Valve Stem from pulling back into the End Cap as shown in Figure 9-28.

4. While holding the Valve Stem in position with the 11/16-inch open-end wrench, apply Teflon tape to the threads at the end of the Valve Stem.

5. Thread the larger hex fitting of the Whip Hose (10) onto the threads of the Valve Stem. Tighten the fitting finger tight. Refer to Figure 9-28.

6. Continue holding the Valve Stem in position with the 11/16-inch open-end wrench, and fit a 1-1/4-inch open-end wrench across the flats of the Whip Hose Hex Fitting as shown in Figure 9-29.

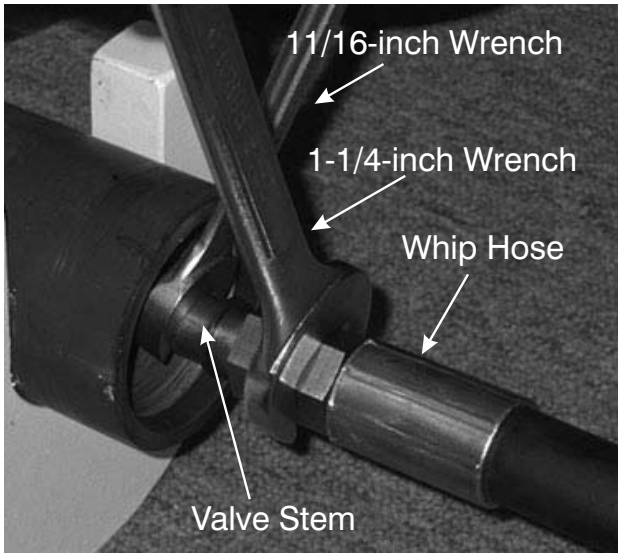


Figure 9-29. Secure the Whip Hose to the Valve Stem.

7. Tighten the Whip Hose Hex Fitting securely onto the Valve Stem as shown in Figure 9-29.

8. Install a new gasket in the Quick Disconnect (Q.D.) Fitting (11):

   - If a new Q.D. Fitting (11) is to be installed, it already contains a new gasket. Proceed to step 10.

   - If the old Q.D. Fitting (11) is to be installed, proceed to step 9, and install a new gasket.

9. With the grooved face of the new Gasket toward the Quick Disconnect Fitting (11), insert the new gasket into the fitting. Check that the gasket seats properly. Refer to Figure 9-30.

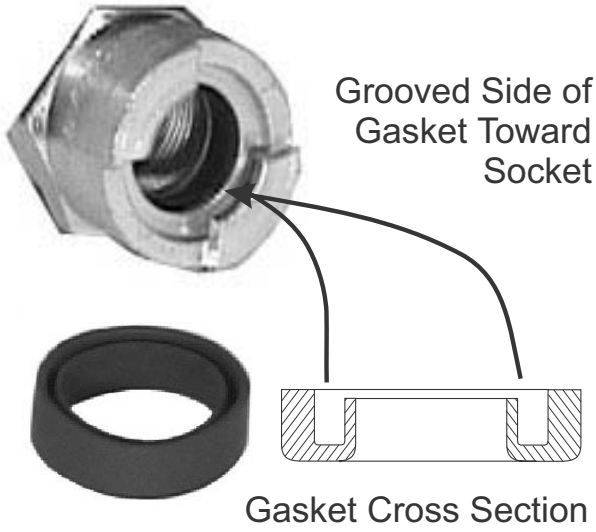


Figure 9-30. Install a new Quick Disconnect Gasket

10. Place the Whip Hose with the attached Tail Assembly, and the Q.D. fitting on the assembly bench.

11. At the free end of the Whip Hose, wrap the external threads of the hose fitting with tape as shown in Figure 9-31.

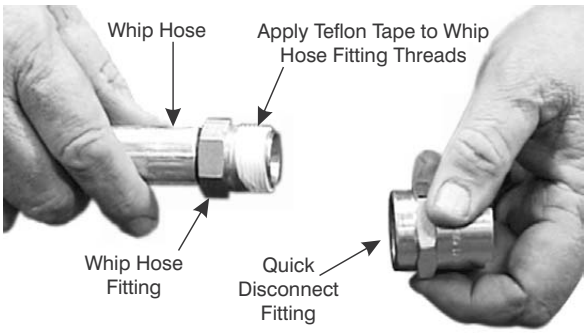


Figure 9-31. Apply Teflon Tape to Hose Fitting.

12. By hand, start the Quick Disconnect Fitting onto the Whip Hose fitting. Thread together and hand tighten.

13. Fit a 1-1/4-inch open-end wrench across the flats of the Whip Hose fitting, and a 1-1/8-inch open-end wrench across the flats of the Quick Disconnect Socket (11).

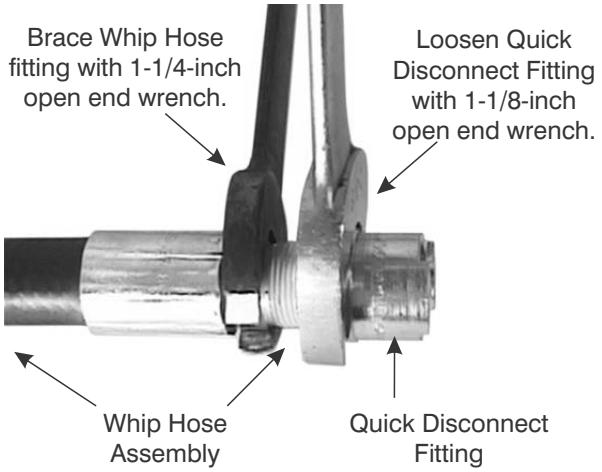


Figure 9-32. Secure the Q.D. Fitting to the Whip Hose fitting.

14. While holding the Whip Hose fitting in place with the 1-1/4-inch open-end wrench, use the 1-1/8- open-end wrench to tighten the two fittings so the Quick Disconnect is fastened securely to the Whip Hose. Refer to Figure 9-32.
15. Proceed to Section 9.12.

9.11.3 Secure Valve Stem to End Cap (for Serial Numbers 500 and above)

The reference numbers in this section refer to the part item numbers on the following parts drawings and parts lists:

Figure 14-4. Complete Hole-Hog Assembly

Figure 14-7. Tail Assembly

1. Collect on a clean flat work bench: The End Cap (8) and the Valve Stem (5) with Valve (1) and Spring (6) attached per section 9.10.
2. Slide the Spring (6) into smaller end of the End Cap. As shown in Figure 9-33:
   - the Spring fits around the outside of the Valve Guide, and
   - the Valve Stem fits inside the Valve Guide.

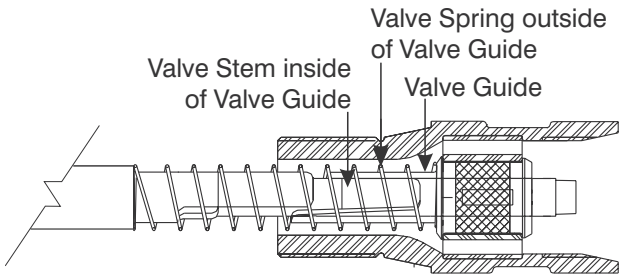


Figure 9-33. Valve Spring, Stem, and Guide

3. By hand, press the Valve end of the Valve Stem (5) toward the End Cap until the threads on the stem are accessible as shown in Figure 9-34.
4. While holding the Valve Stem in position, apply Teflon tape to the threads at the end of the Valve Stem.
5. Thread the Thread Adapter (3) onto the Valve Stem and tighten finger tight. Refer to Figure 9-34.

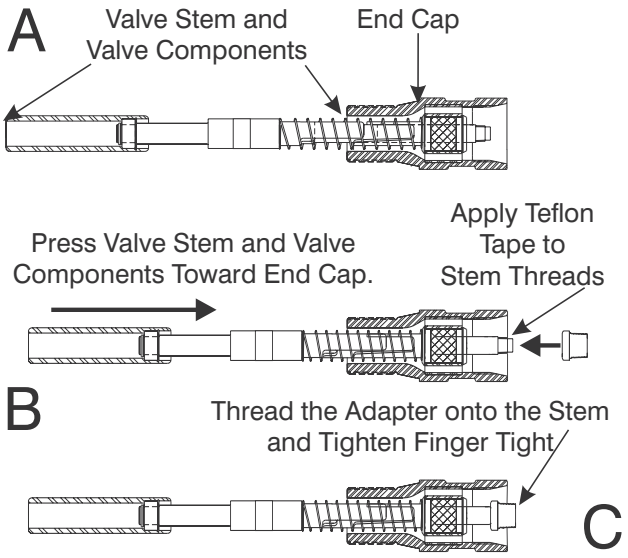


Figure 9-34. Install the Thread Adapter on the Valve Stem.

6. Fit a 1-1/16-inch deep well socket over the Thread Adapter (3) to hold the adapter in place. Refer to Figure 9-35.

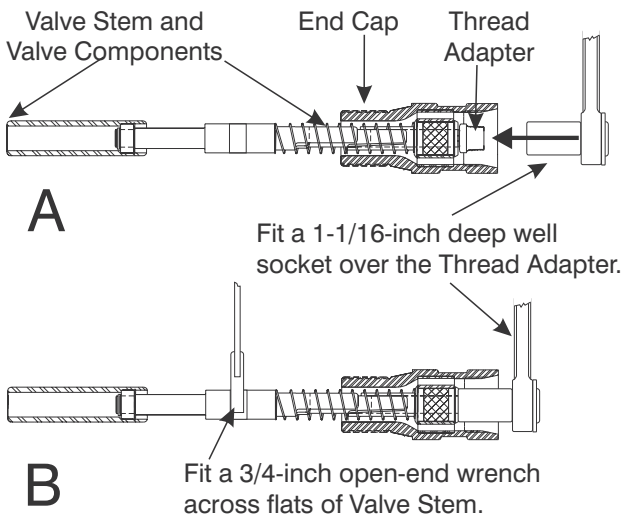


Figure 9-35. Position Wrenches on Thread Adapter and Valve Stem.

7. With a 3/4-inch open-end wrench across the flats of the Valve Stem (5), thread the Valve Stem (5) onto the Thread Adapter (3) as shown in Figure 9-36.
8. Tighten the Thread Adapter (3) securely to the Valve Stem (5).
9. Proceed to 9.11.4

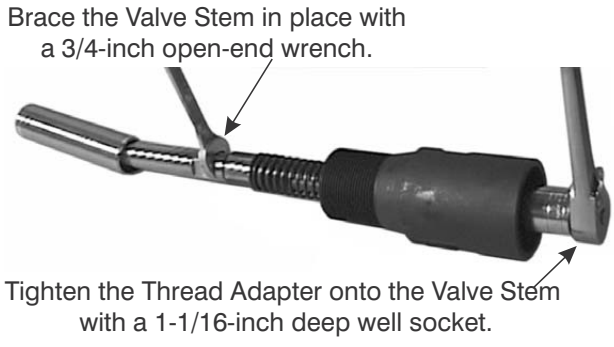


Figure 9-36. Secure the Thread Adapter on the Valve Stem.

9.11.4 Install Whip Hose and Fittings (for Serial Numbers 500 and above)

> **WARNING**
> Always use Allied's Whip Hose Assembly (see parts lists in Section 14.0) or equivalent: 100R2 hose. Failure to use 100R2 hose could result in injury to personnel.

The reference numbers in this section refer to the part item numbers on the following parts drawings and parts lists:

Figure 14-4. Complete Hole-Hog Assembly

Figure 14-7. Tail Assembly

1. Collect on a clean flat work bench: the End Cap (8) with the Valve components assembled per section 9.11.3, the Whip Hose (10), and the Quick Disconnect Fitting (11) and Gasket.
2. By hand, press the Valve end of the Valve Stem (5) toward the End Cap until the Thread Adapter (3) is accessible as shown in Figure 9-37.

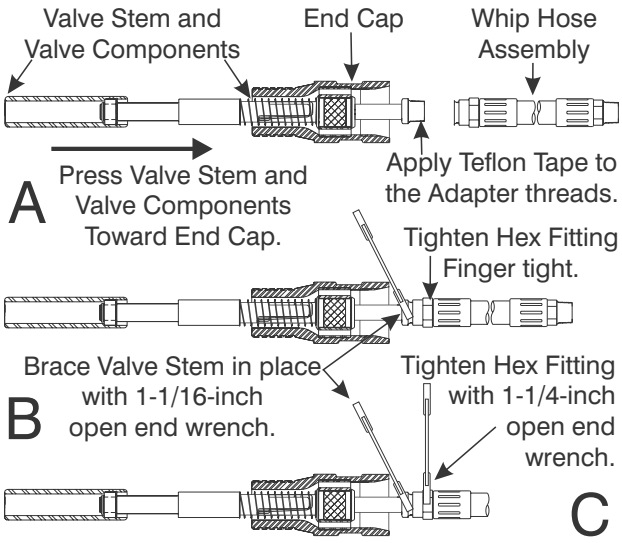


Figure 9-37. Hold Valve Stem in place.

3. Fit an 1-1/16-inch open-end wrench behind the exposed Thread Adapter. Brace the wrench against the edge of the End Cap and pry the stem outward with enough force to prevent the Valve Stem from pulling back into the End Cap as shown in Figures 9-37 and 9-38.

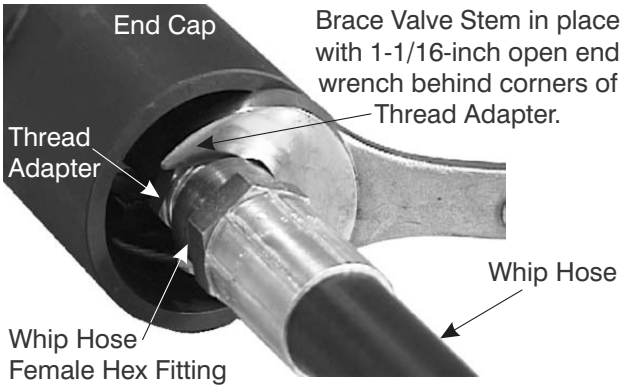


Figure 9-38. Hold Thread Adapter in Position

4. While holding the Valve Stem in position, apply Teflon tape to the threads at the end of the Valve Stem.
5. Thread the female hex fitting of the Whip Hose (10) onto the threads of the Adapter. Tighten the fitting finger tight. Refer to Figure 9-38.
6. Continue holding the Valve Stem in position. Fit the 1-1/16-inch open-end wrench across the flats of the Thread adapter, and a 1-1/4-inch open-end wrench across flats of the Whip Hose Hex Fitting as shown in Figure 9-39.
7. Tighten the Whip Hose Hex Fitting securely onto the Thread Adapter (3) as shown in Figure 9-39.

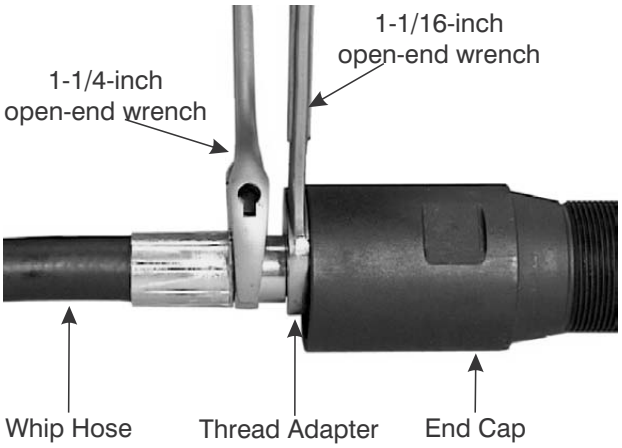


Figure 9-39. Loosen Hex Fitting and Remove Whip Hose

8. Install a new gasket in the Quick Disconnect (Q.D.) Fitting (11):
   - If a new Q.D. Fitting (11) is to be installed, it already contains a new gasket. Proceed to step 10.
   - If the old Q.D. Fitting (11) is to be installed, proceed to step 9, and install a new gasket.
9. With the grooved face of the new Gasket toward the Quick Disconnect Fitting (11), insert the new gasket into the fitting. Check that the gasket seats properly. Refer to Figure 9-40.

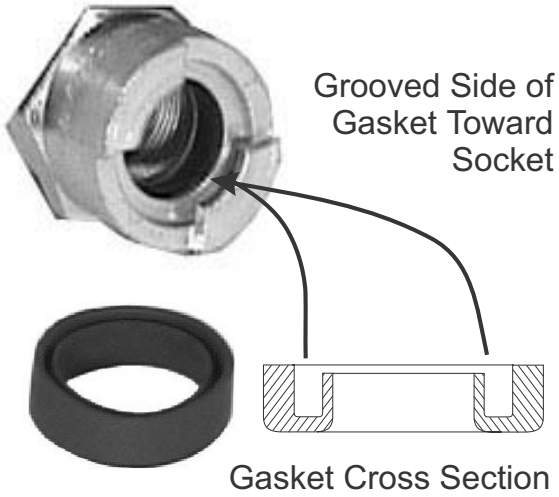


Figure 9-40. Install a new Quick Disconnect Gasket

10. Place the Whip Hose with the attached Tail Assembly, and the Q.D. fitting on the assembly bench.

11. At the free end of the Whip Hose, wrap the external threads of the hose fitting with tape as shown in Figure 9-41.

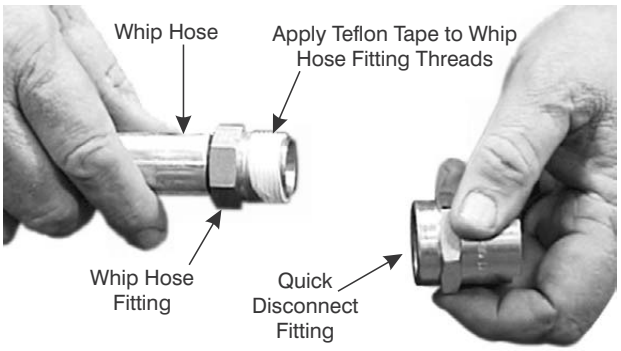


Figure 9-41. Apply Teflon Tape to Hose Fitting.

12. By hand, start the Quick Disconnect Fitting onto the Whip Hose fitting. Thread together and hand tighten

13. Fit a 1-inch open-end wrench across the flats of the Whip Hose fitting, and a 1-3/8-inch open-end wrench across the flats of the Quick Disconnect Socket (11).

14. While holding the Whip Hose fitting in place with the 1-inch open-end wrench, use the 1-3/8-inch open-end wrench to tighten the two fittings so the Quick Disconnect is fastened securely to the Whip Hose. Refer to Figure 9-42.

15. Proceed to Section 9.12

9.12 Install Tapered Tail Adapter

1. Collect on a clean flat work bench: the Tapered Tail Adapter (13) and the Valve and End Cap components as assembled in section 9.11.

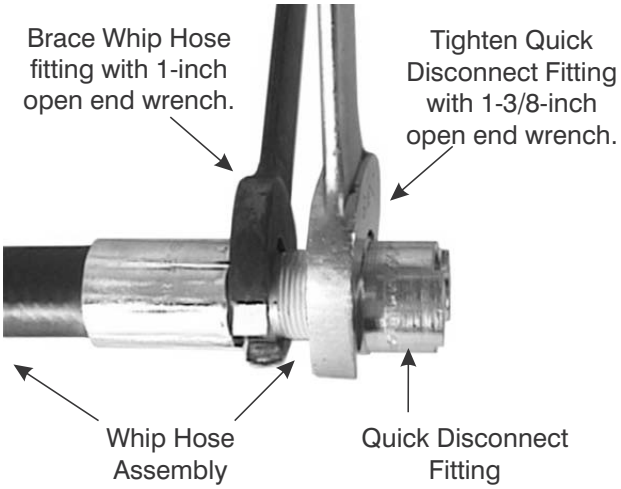


Figure 9-42. Secure the Q.D. Fitting to the Whip Hose fitting.

> **CAUTION**
> DO NOT grip the End Cap (8) by its threads. Refer to Figure 9-43.

2. Secure the Tail Assembly with a strap wrench, saddle clamp, or with one of the two End Cap Wrenches (831150), supplied with the Tool Kit.

   a. When using the End Cap Wrench, grip the End Cap (8) across the flats as shown in Figure 9-43.

   b. When using a vise or saddle clamp, grip the End Cap (8) across the raised area on both sides of the wrench flats as shown in Figure 9-43.

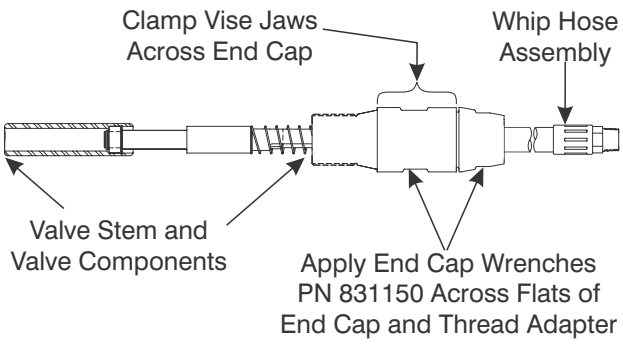


Figure 9-43. Secure End Cap for Assembly.

3. Apply a light coat of Anti-Seize lubricant to the external threads of the Tapered Tail adapter (13) and the internal threads of the End Cap (8), as shown in Figure 9-44.

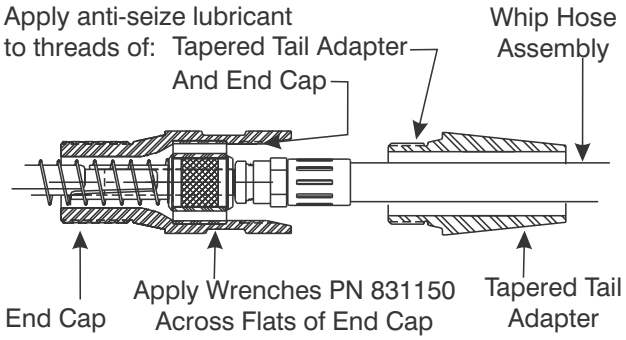


Figure 9-44. End Cap and Tail Adapter

4. With the threaded end toward the End Cap (8), slide the Tapered Tail Adapter (13) over the Whip Hose (10) to the internal threads of the End Cap as shown in Figure 9-45.

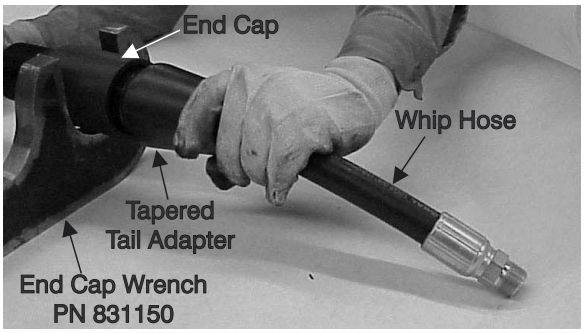


Figure 9-45. Slide Tail Adapter to End Cap

5. By hand, thread the Tapered Tail Adapter into the End cap and tighten finger tight.

6. With the End Cap secured as described step 2, above, fit one of the End Cap Wrenches (831150) across the flats of the Tapered Tail Adapter (13) as shown in Figure 9-46.

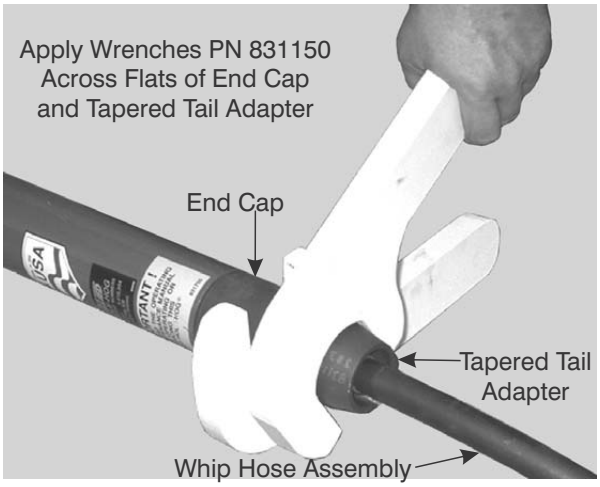


Figure 9-46. Secure Tail Adapter to End Cap.

WARNING

Fingers can be pinched. Always wear gloves and keep hands away from pinch points.

7. Tighten the Tapered Tail Adapter (13) until it is securely fastened to the End Cap.

9.13 Body/Anvil, Striker and Tail Assembly

1. Collect on a clean flat work bench: the Body/Anvil (1), the Striker (4), and the Tail Assembly as assembled in sections 9.11 and 9.12.

2. Remove the protective wrapping and coatings from any stored components.

NOTE

The Body/Anvil and Striker are not customer serviceable. If these components are worn or damaged, replace them with new components.

3. Refer to Section 3.1 and verify that the serial number of the Striker (2) is correct.

4. Block the Body/Anvil so it will not roll side to side. Raise and block the open-end of the Body/Anvil so the Striker (4) can be easily inserted. Refer to Figure 9-47.

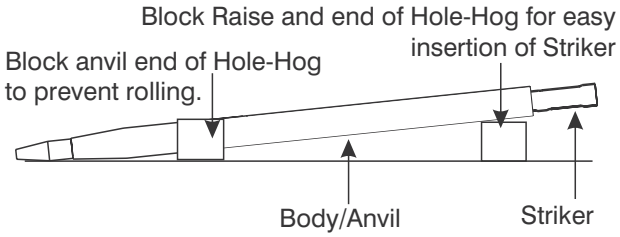


Figure 9-47. Block the Body/Anvil in place.

5. Before installing the Striker (2) into the Body/Anvil (1). Coat the external surface and internal bore of the Striker with hydraulic fluid.

6. Refer to Figure 9-48 and slide the Striker (2) into the Body/Anvil (1). The back end of the Striker should be about 6 in. to 8 in. past the threads of the Body/Anvil.

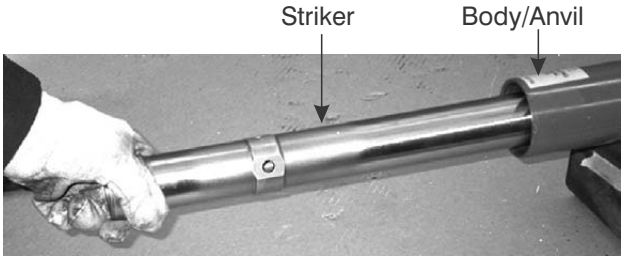


Figure 9-48. Insert Striker into Body/Anvil.

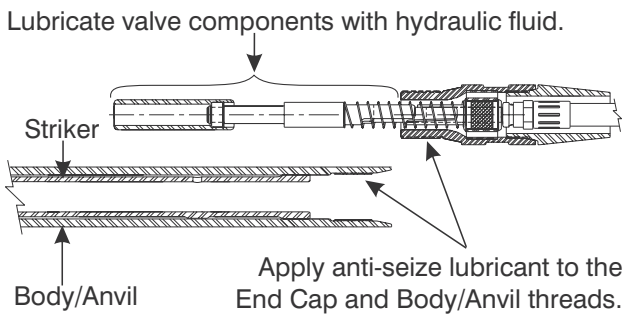


Figure 9-49. Prepare Body/Anvil and Tail Assembly for Assembly.

7. Apply anti-seize thread lubricant sparingly to the threads of the End Cap (8) and Body/Anvil (1). See Figure 9-49.

8. Coat the valve assembly components with hydraulic fluid, as shown in Figure 9-49.

9. Insert the Valve (1) into the internal bore of the Striker (4) and thread the End Cap (8) into the Body/Anvil (1). See Figure 9-50.

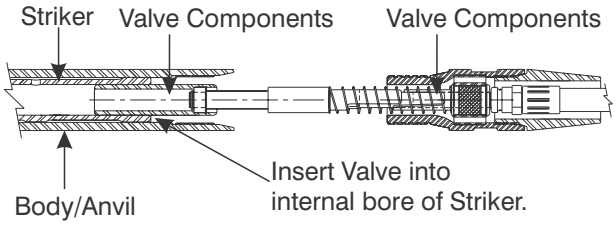


Figure 9-50. Insert Valve into Body/Anvil and Striker.

10. Hand tighten the End Cap (16) to the Body/Anvil (1).

11. Place the Hole-Hog on a level surface. Holding the Body/Anvil (1) with a strap wrench, use wrench P/N 831150 from the Tool Kit to tighten the End Cap (18, as shown in Figure 9-51.

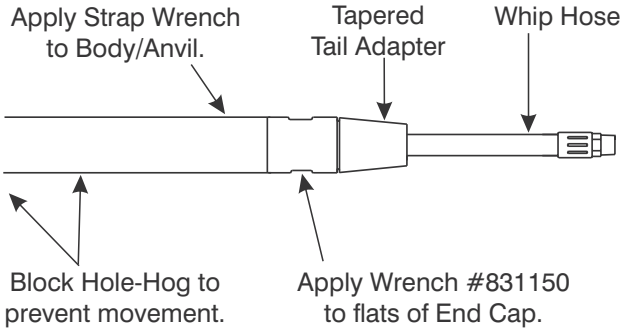


Figure 9-51. Secure End Cap to Body/Anvil.

12. Tighten the End Cap to a torque of 750-1000 ft.-lbs (1015-1355 n-m). If a torque wrench is not available, use the following procedure. See Figure 9-52.

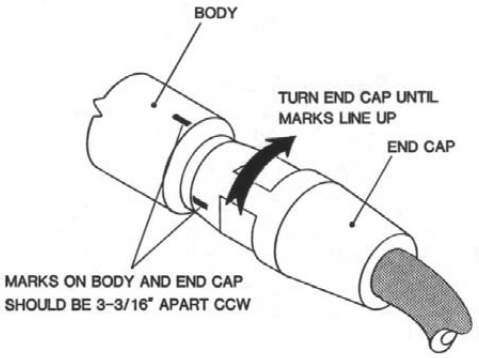


Figure 9-52. Tighten End Cap to Required Torque.

a. After tightening the End Cap hand tight, put a scribe mark on the Body/Anvil next to the End Cap.

b. On the End Cap, place a second scribe mark 3-3/16-inch counter-clockwise to the first mark.

c. Using P/N 831150 wrench, tighten the End Cap until the two scribe marks align.

9.14 Installing the Anvil Cap For Threaded Anvil (TH) Units Only

1. Place the Hole-Hog on a level surface and block it to prevent rolling during assembly.

2. On Hole-Hogs numbered 650 and above, there is a hole in the Threaded Anvil for insertion of a Nylon Insert (3) as shown in Figure 9-53. Refer to section 8.3.3 for details.

   Insert the Nylon Insert (3) as shown in Figure 9-53.

3. Thread the Anvil Cap (24) onto the Body/Anvil (1) hand tight.

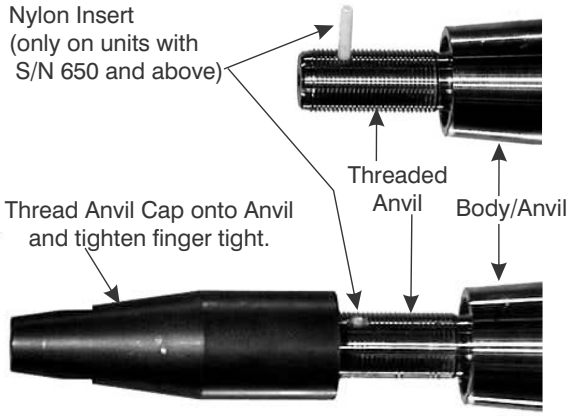


Figure 9-53. Secure Anvil/Cap to Body/Anvil

4. Hold the Body/Anvil (1) in place with a strap or chain wrench. See Figure 9-54.

5. With a 1-1/4-inch open-end wrench, tighten the anvil cap a minimum 1/8-inch past hand tight. See Figures 9-54 and 9-55.

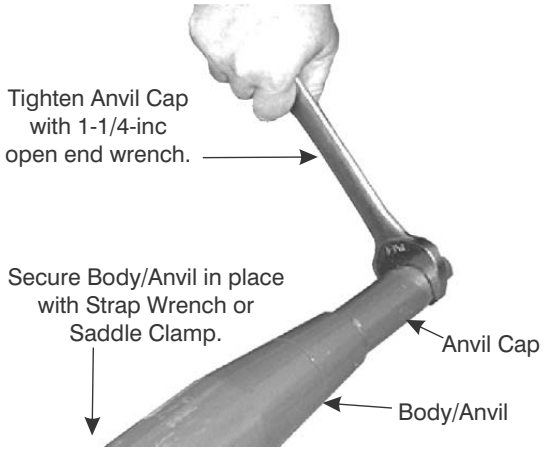


Figure 9-54. Tighten Anvil/Cap.

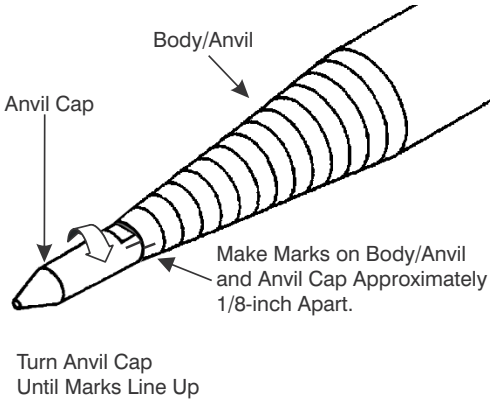


Figure 9-55. Align Marks to Torque.

SECTION 10.0 MAINTENANCE

10.1 Daily Maintenance

- Clean and lubricate end cap threads with an anti-seize lubricant. Tighten end cap according to procedure in Section 9.13, Steps 11 & 12.
- Clean and oil Hole-Hog.
- Lubricate Hole-Hog according to Section 7.0.
- 310-TH: Check anvil cap. If anvil cap is loose, remove cap and clean and lubricate threads with an anti-seize lubricant. Install cap hand tight on the anvil, then tighten another minimum 1/8-inch (refer to Section 9.14).
-

10.2 Inspection And Preventive Maintenance

After every 100 hours of operation, the Hole-Hog should be disassembled, cleaned and inspected.

- Check all components for abrasion and excessive wear. Repair or replace as required.
- Inspect the body and anvil for cracks or large chips. Replace if excessively worn. A smoothly worn body is acceptable.
- Check the exhaust ports in the shock absorber for obstructions. Clean and check for damage.
- Check hose for excessive wear or kinks. Replace a damaged hose.
- Check shock/valve guide for proper seating. Press into place or replace shock if necessary.

The frequency of maintenance depends upon the operating environments and conditions of operation. Refer to 10.3 for additional maintenance considerations.

When disassembling the Hole-Hog, refer to 8.5 Extent of Disassembly for guidelines in planning disassembly maintenance.

10.3 Conditional Maintenance

Disassemble, clean and lubricate all Hole-Hog working surfaces under the following conditions:

- The Hole-Hog is to be stored for more than one week.
- The Hole-Hog is operated in extremely humid weather conditions.
- The Hole-Hog is operated in muddy or extremely wet soils.
- If reduced performance is observed.

10.4 Warranty Protection

Maintain written records of Hole-Hog maintenance, service and repair. These records will be helpful if warranty coverage is ever in question. Each record shall include :

- The date of service, maintenance or repair.
- A description of the service, maintenance or repair performed. Include part numbers if applicable.

- Copies of purchase order(s) and invoice(s) for repair parts and service.
- The name and signature of the person performing the service, maintenance or repair.

SECTION 11.0 FIELD MAINTENANCE

WARNING

Do not remove the End Cap from the Body/Anvil under field operating conditions. This may expose the internal operating parts to contamination, and reduce the operating life of the Hole-Hog.

WARNING

Always use Allied's Whip Hose Assembly (see parts list in Section 14.0) or equivalent - 100R2 hose. Failure to use 100R2 hose could result in injury to personnel.

WARNING

Using a pipe wrench on the Hole-Hog Body/Anvil relieves Allied of all warranty responsibilities.

WARNING

Applying heat with a torch or by any other method to any part or parts of the Hole-Hog relieves Allied of all warranty responsibilities. Applying heat can destroy the main body, striker and other parts beyond use. Heating Hole-Hog components can cause altered component strength and result in premature failure or personal injury.

CAUTION

Before starting any of the maintenance procedures in this section, refer to Section 3.1 and verify the Serial Number of the unit to be assembled. Refer to sections 9.2 and 9.3 for information about the differences among serial number groups.

11.1 Field Replaceable Components

DO NOT REMOVE the End Cap from the Body/Anvil under field operating conditions. To avoid contamination of internal components, Allied recommends field replacement for only three of the Hole-Hog components:

- The Quick Disconnect Fitting (11)
- The Whip Hose (10).
- The Anvil Cap (2) - 310TH Only

Figure 11-1 shows the location of these field replaceable components.

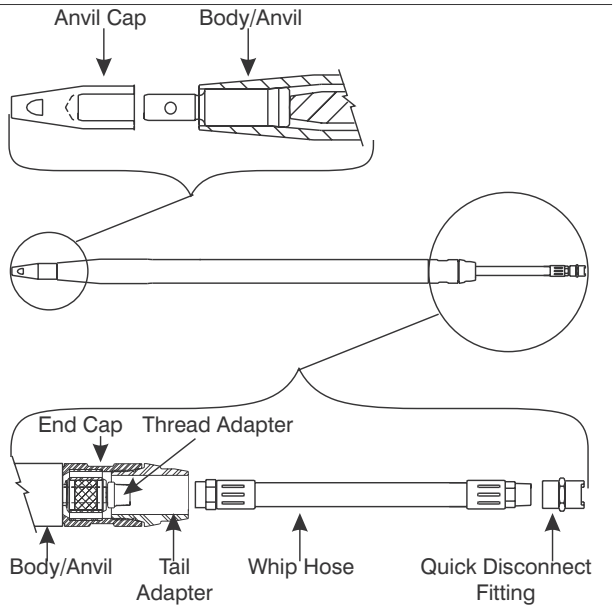


Figure 11-1. Field Replaceable Components.

11.2 Reference to Parts Drawings

In the following procedures, reference numbers in parentheses accompany most part names. These numbers refer to the part item numbers on the most recent parts drawings and parts lists in Section 14.0, specifically:

- Unless otherwise specified, all of the parts reference numbers in the following text refer to drawings:
  1. Figure 14-4. Complete Hole-Hog Assembly
  2. Figure 14-7. Tail Assembly
- When the parts reference numbers relate to other drawings, the drawings will be specified in the text.
- When in doubt, refer to the Drawing Applicability Chart in Section 13. Parts Information.

11.3 Hole-Hog Serial Numbers

Each Hole-Hog Serial Number is etched on the Striker. In addition, it is recorded upon receipt by the owner in section 3.1 of this manual. Refer to that section for the Serial Number.

Hole-Hog Serial Numbers are issued sequentially at the time of manufacture. For example: The Hole-Hog with S/N 499 is the four hundred and ninety-ninth unit built. The next unit built would be assigned S/N 500, and so forth.

If the serial number for the Hole-Hog to be repaired has not been recorded, refer to Section 11.4. Determine in which serial number group the Hole-Hog belongs by carefully inspecting and comparing it to the illustrations and descriptions.

11.4 Variations by Serial Number

In addition to model differences, there are a few significant differences among the 310-Series Hole-Hogs covered in this manual. There are two different methods for mounting the Whip Hose, and some models have a nylon insert to lock the Anvil Cap threads. Three serial number groups track these differences:

499 and Below
- Whip Hose Mounting Method 1 (Refer to 11.4.1.)

500 through 649
- Whip Hose Mounting Method 2 (Refer to 11.4.2.)

650 and Above
- Whip Hose Mounting Method 2 and
- Nylon insert used to lock Anvil Cap (Refer to 11.4.3.)

11.4.1 Whip Hose Mounting Method 1

On Hole-Hogs numbered 499 and below, the Whip Hose connects directly to the Valve Stem. The Whip Hose hex fitting slides over the tapered and threaded end of the Valve Stem. The fitting threads securely onto the Valve Stem. Refer to Figure 11-2.

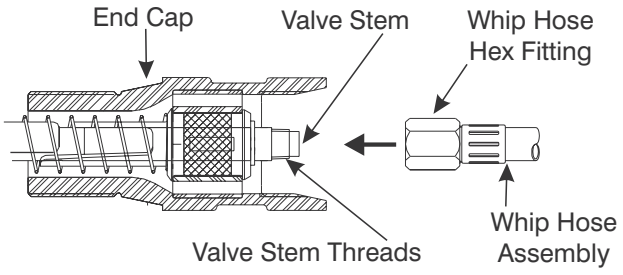


Figure 11-2. Whip Hose Mounting Method 1.

11.4.2 Whip Hose Mounting Method 2

On Hole-Hogs numbered 500 and above, the Whip Hose connects to a Thread Adapter secured to the Valve Stem. The Thread Adapter slides over the threaded end of the Valve Stem and threads securely onto the Valve Stem. The Whip Hose hex fitting slides onto and threads securely to the Thread Adapter. Refer to Figure 11-3.

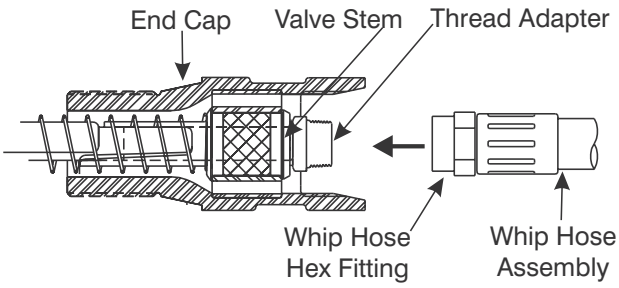


Figure 11-3. Whip Hose Mounting Method 2

11.4.3 Nylon Insert for Anvil Cap

On Hole-Hogs numbered 650 and above, there is a hole in the Threaded Anvil for insertion of a Nylon Insert (3). When the Anvil Cap (2) threads onto the Anvil, the Nylon Insert presses against the threads of the Anvil Cap.

During operation of the Hole-Hog, the Nylon Insert (3) pressing against the threads prevents the Anvil Cap from vibrating off of the anvil. Refer to Figure 11-4.

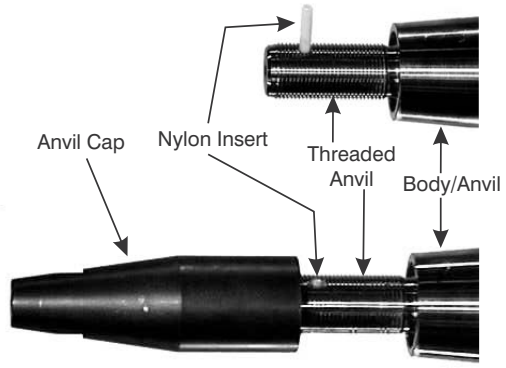


Figure 11-4. Anvil Cap and Nylon Insert

11.5 Replacement Preparations

1. For work on Hole-Hogs with Serial numbers 499 and below, obtain the following tools:
   a. open-end wrench, 11/16”.
   b. open-end wrench, 1-1/8”.
   c. open-end wrench, 1-1/4”.
   d. strap wrench.
   e. saddle-clamp or vise.
   f. End Cap. Wrench (831150) from Tool Kit, refer to Sections 8.4 and 9.4.
2. For work on Hole-Hogs with Serial numbers 500 and higher, obtain the following tools:
   a. open-end wrench, 1-1/16”.
   b. open-end wrench, 1-1/8”.
   c. open-end wrench, 1-1/4”.
   d. strap wrench.
   e. saddle-clamp or vise.
   f. End CAP. Wrench (831150) from Tool Kit, refer to Sections 8.4 and 9.4.
3. To prevent injury to personnel and damage to equipment, mount a vise or saddle clamp on the work surface. Otherwise, obtain blocking to hold the Hole-Hog in place during disassembly and reassembly.

4. For a clean work platform, obtain a clean, plastic or canvas tarp. Spread this clean tarp over the work bench or work area to prevent contamination of the Hole-Hog components.
5. To clean parts that are accidentally contaminated, obtain:
   a. Mineral spirits and clean hydraulic fluid.
   b. Clean cloth rags to wipe away dirt, mineral spirits and excess hydraulic fluid.

11.6 Anvil/Cap Replacement (Model 310TH Hole-Hogs only)

Place the Hole-Hog on a clean flat work table. To prevent rolling during maintenance, secure the Hole-Hog in a vise or saddle-clamp, or between adequate blocking.

11.6.1 Remove the Anvil/Cap

1. Secure the Hole-Hog on the work surface as described above.
2. Hold the Body/Anvil (1) in place with a strap or chain wrench. See Figure 11-5.

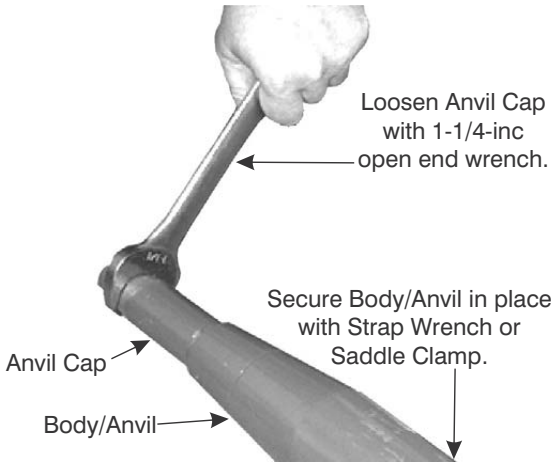


Figure 11-5. Loosen Anvil/Cap.

3. With a 1-1/4-inch open-end wrench, loosen the Anvil/Cap (2) from the Body/Anvil (1). It may be necessary to strike the wrench handle several times with a hammer to loosen the Anvil/Cap. See Figure 11-5.
4. Thread the Anvil/Cap (2) off of the Body/Anvil (1).
5. On Hole-Hogs numbered 650 and above, a Nylon Insert (3) prevents the Anvil Cap from vibrating off of the Anvil during operation. Refer to section 11.4.3 for details.
6. Refer to Figure 11-4 and remove Nylon Insert (3) from the hole in the threaded portion of the Body/Anvil. Discard the Nylon Insert.

11.6.2 Install the Anvil/Cap

1. Secure the Hole-Hog on the work surface as described in Section 11.6
2. On Hole-Hogs numbered 650 and above, there is a hole in the Threaded Anvil for insertion of a Nylon Insert (3) as shown in Figure 11-4. Refer to section 11.4.3 for details.
3. Insert the Nylon Insert (3) as shown in Figure 11-4.
4. Thread the Anvil Cap (2) onto the Body/Anvil (1) hand tight.
5. Hold the Body/Anvil (1) in place with a strap or chain wrench. See Figure 11-5.
6. With a 1-1/4-inch open-end wrench, tighten the anvil cap a minimum 1/8-inch past hand tight. See Figures 11-5 and 11-6.

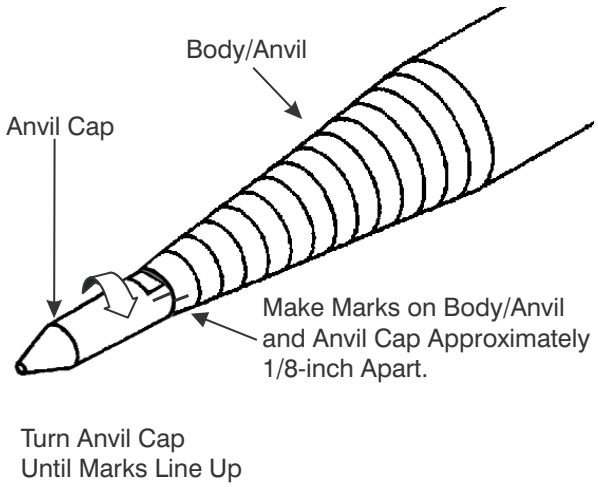


Figure 11-6. Align Marks to Torque.

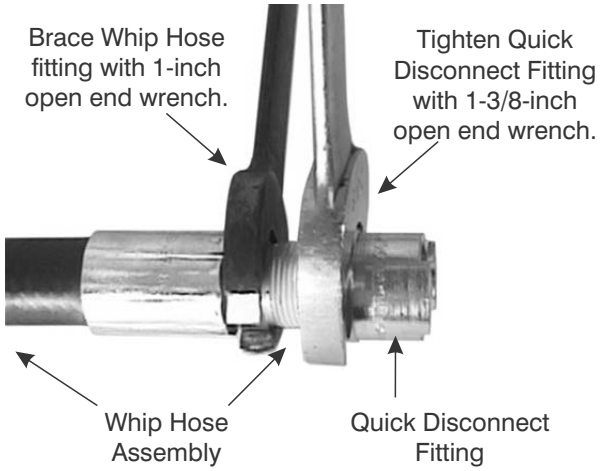


Figure 11-7. Remove Quick Disconnect From Whip Hose

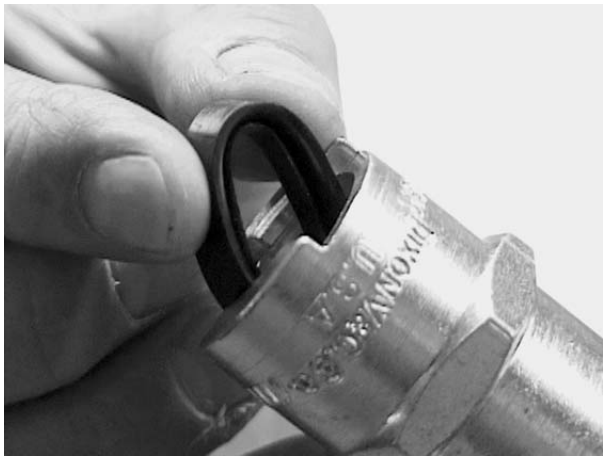


Figure 11-8. Remove Quick Disconnect Gasket

11.7 Quick Disconnect Fitting Replacement

Place the Hole-Hog on a clean flat work table. To prevent rolling during maintenance, secure the Hole-Hog in a vise or saddle-clamp, or between adequate blocking..

11.7.1 Remove the Q.D. Fitting

1. Secure the Hole-Hog on the work surface as described above.
2. Arrange the whip hose to access the Quick Disconnect Fitting. Fit a 1-3/8-inch open-end wrench across the flats of the Quick Disconnect Socket (11). Refer to Figure 11-7.
3. While holding the Quick Disconnect Socket (11) in place, use a 1--inch open-end wrench to loosen and thread the Whip Hose fitting from the Socket. Refer to Figure 11-7.
4. If parts replacement is not required, leave the Quick Disconnect Socket (11) assembled. Otherwise, use a screw driver or needlenose plyers to pry the Gasket (xx) from the Socket. Discard the gasket. Refer to Figure 11-8.

11.7.2 Install the Q.D. Fitting

1. Secure the Hole-Hog on the work surface as described under 11.7. Obtain the gasket and Q.D. fitting to be installed.
2. Install a new gasket in the Quick Disconnect (Q.D.) Fitting (11):
   - If a new Q.D. Fitting (11) is to be installed, it already contains a new gasket. Proceed to step 4.
   - If the old Q.D. Fitting (11) is to be installed, proceed to step 3, and install a new gasket.

3. With the grooved face of the new Gasket toward the Quick Disconnect Fitting (11), insert the new gasket into the fitting. Check that the gasket seats properly. Refer to Figure 11-9.

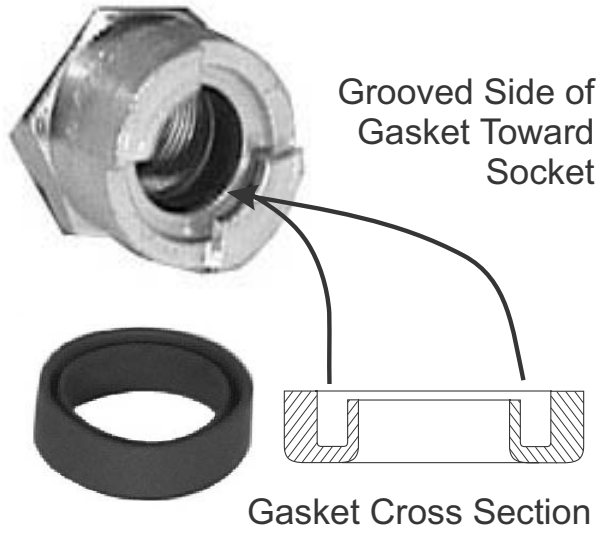


Figure 11-9. Install a new Quick Disconnect Gasket

4. Arrange the Whip Hose to access the free end.
5. At the free end of the Whip Hose, wrap the external threads of the hose fitting with tape as shown in Figure 11-10.

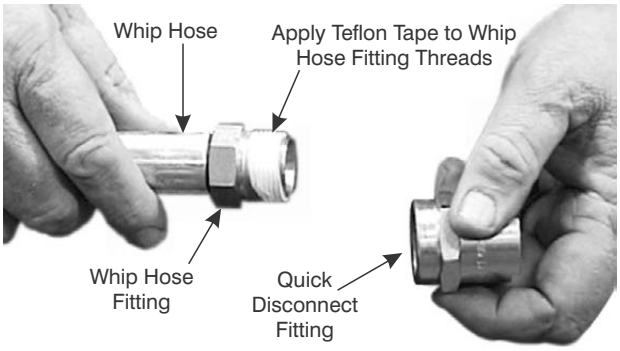


Figure 11-10. Apply Teflon Tape to Hose Fitting.

6. By hand, start the Quick Disconnect Fitting onto the Whip Hose fitting. Thread them together and hand tighten.
7. Fit a 1-inch open-end wrench across the flats of the Whip Hose fitting, and a 1-3/8-inch open-end wrench across the flats of the Quick Disconnect Socket (11).
8. While holding the Whip Hose fitting in place with the 1-inch open-end wrench, use the 1-3/8-open-end wrench to tighten the two fittings so the Quick Disconnect is fastened securely to the Whip Hose. Refer to Figure 11-11.

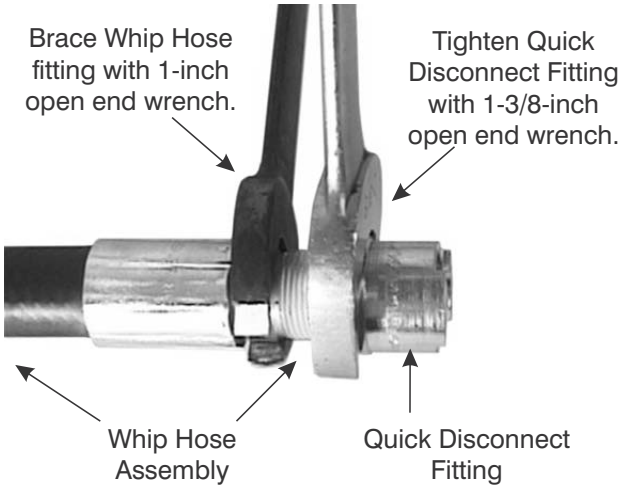


Figure 11-11. Secure the Q.D. Fitting to the Whip Hose fitting.

11.8 Whip Hose Replacement (For Serial Numbers 499 and lower)

This section details Whip Hose Replacement for Hole-Hogs employing Whip Hose Mounting Method 1, as described in Section 11.4.1. Refer to Figure 11-12.

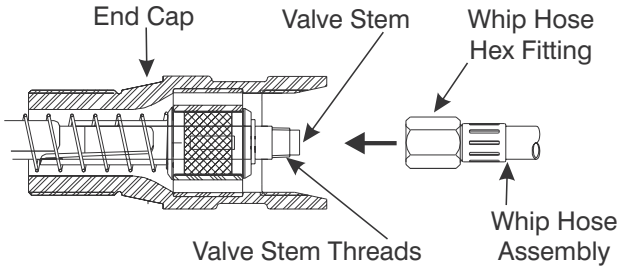


Figure 11-12. Whip Hose Mounting Method 1

The reference numbers in this section refer to the part item numbers on the following parts drawings and parts lists:

Figure 14-1. Complete Hole-Hog Assembly

Figure 14-6. Tail Assembly

11.8.1 Tail Adapter Removal

1. Place the Hole-Hog on a level surface and secure it with a strap wrench, saddle clamp, or with one of the two End Cap Wrenches (831150), supplied with the Tool Kit.
   a. When using the End Cap Wrench, grip the Hole-Hog across the wrench flats of the End Cap (8) as shown in Figure 11-13.
   b. When using a vise or saddle clamp, grip the Hole-Hog across the raised area of the End Cap (8) on either side of the wrench flats as shown in Figure 11-13.

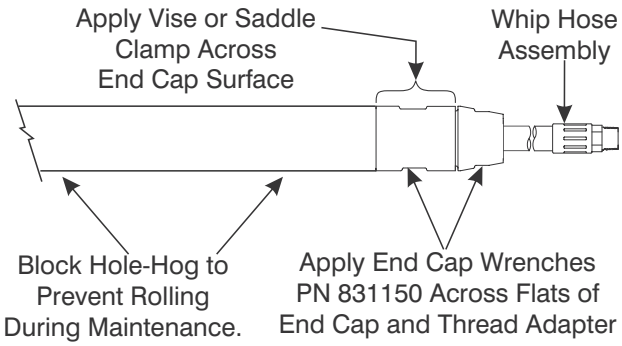


Figure 11-13. Secure Hole-Hog for Tail Adapter Removal

2. With the Hole-Hog secured as described above, fit one of the End Cap Wrenches (P/N 831150) across the flats of the Tapered Tail Adapter (13) as shown in Figure 11-13.
3. With the End Cap Wrench, loosen the Tapered Tail Adapter (13). It may be necessary to strike the wrench handle several times to loosen the adapter.
4. Thread the Tail Adapter (13) from the End Cap (8) and slide it off, over the Whip Hose as shown in Figure 11-14.

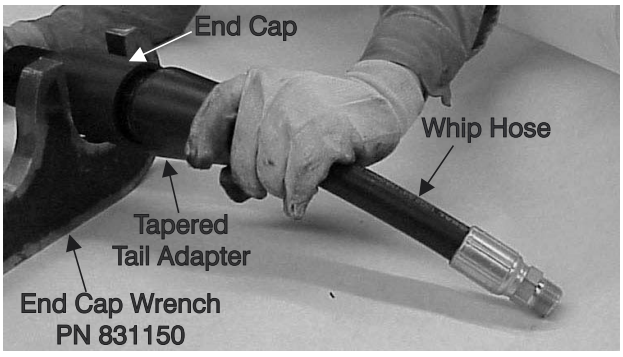


Figure 11-14. Slide Tail Adapter from End Cap, over Whip Hose.

11.8.2 Whip Hose Removal

1. Secure the Hole-Hog and remove the Tail Adapter as described in Section 11.8.1.
2. By hand, pull the Whip Hose away from the End Cap (8) until the flats of the Valve Stem (5) are accessible as shown in Figure 11-15.

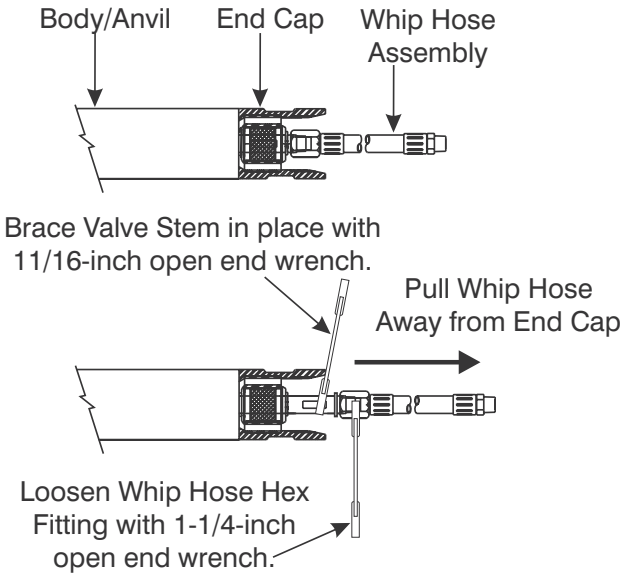


Figure 11-15. Access and Hold the Valve Stem flats in Position

3. Fit an 11/16-inch open-end wrench across the exposed flats of the Valve Stem as shown in Figure 11-16.

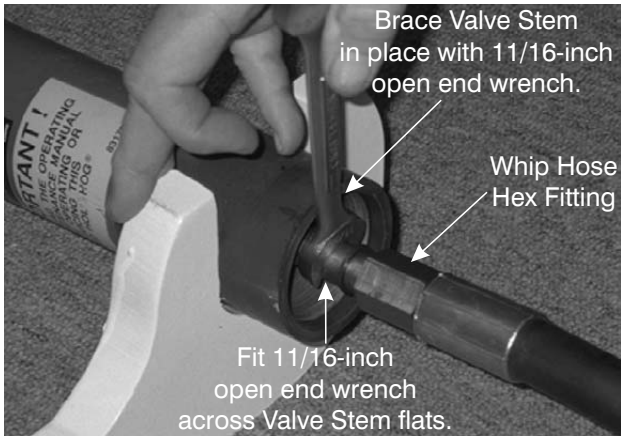


Figure 11-16. Hold Valve Stem in Position

4. Brace the wrench against the edge of the End Cap and pry the stem outward with enough force to prevent the Valve Stem from pulling back into the End Cap as shown in Figure 11-16.
5. While holding the Valve Stem in position with the 11/16-inch open-end wrench, fit a 1-1/4-inch open-end wrench across the flats of the Whip Hose hex fitting as shown in Figure 11-17.

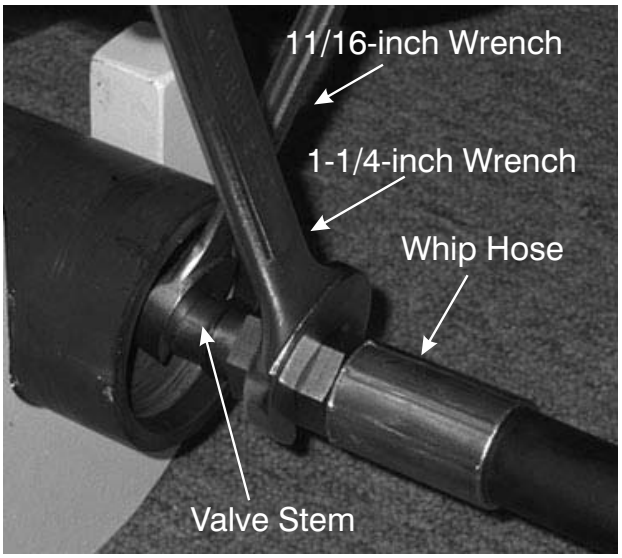


Figure 11-17. Loosen Hex Fitting and Remove Whip Hose

6. Loosen and thread the Whip Hose hex fitting from the Valve Stem. Remove the Whip Hose from the Valve Stem and End Cap.

> **CAUTION**
> DO NOT USE COMPRESSED AIR to clean dirt from the End Cap opening while the Whip Hose is removed. Compressed air could force dirt past the retracted Valve Stem and contaminate the internal components.

7. While the Whip Hose is removed, prevent contamination of internal parts, by covering the open-end of the End Cap with plastic or a clean cloth.

11.8.3 Whip Hose Installation

1. Place on a clean flat work bench: the Whip Hose (10), the Quick Disconnect Fitting (11) and Gasket, assembled as described in Section 11.7.2.
2. Place the Hole-Hog on the work bench and secure it with a strap wrench, saddle clamp, or with one of the two End Cap Wrenches (831150), supplied with the Tool Kit.
   a. When using the End Cap Wrench, grip the Hole-Hog across the wrench flats of the End Cap (8) as shown in Figure 11-18.
   b. When using a vise or saddle clamp, grip the Hole-Hog across the raised area of the End Cap (8) on either side of the wrench flats as shown in Figure 11-18.

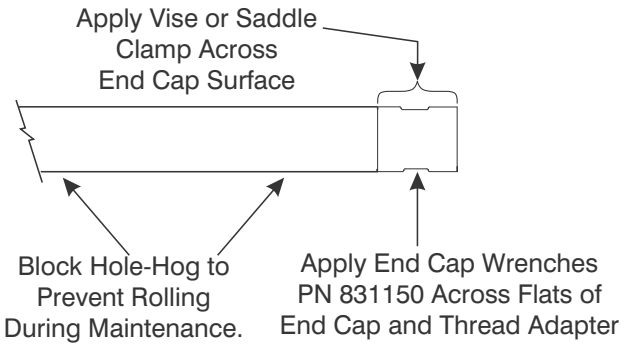


Figure 11-18. Secure Hole-Hog for Whip Hose Installation

3. Remove protective wrappings and coatings from new or stored components.
4. Apply Teflon tape to the threads at the end of the Valve Stem.
5. Thread the larger hex fitting of the Whip Hose (10) onto the threads of the Valve Stem. Tighten the fitting finger tight.
6. By hand, pull the Whip Hose away from the End Cap (8) until the flats of the Valve Stem (5) are accessible as shown in Figure 11-15.
7. Fit an 11/16-inch open-end wrench across the exposed flats of the Valve Stem. Brace the wrench against the edge of the End Cap and pry the stem outward with enough force to prevent the Valve Stem from pulling back into the End Cap as shown in Figures 11-18 and 11-16.
8. Continue holding the Valve Stem in position with the 11/16-inch open-end wrench, and fit a 1-1/4-inch open-end wrench across the flats of the Whip Hose hex fitting as shown in Figure 11-17.
9. Tighten the Whip Hose hex fitting securely onto the Valve Stem as shown in Figure 11-17.

11.8.4 Tail Adapter Installation

1. Secure the Hole-Hog and install the Whip Hose as described in Section 11.8.3.
2. Apply a light coat of Anti-Seize lubricant to the external threads of the Tapered Tail Adapter (13) and the internal threads of the End Cap (8), as shown in Figure 11-19.

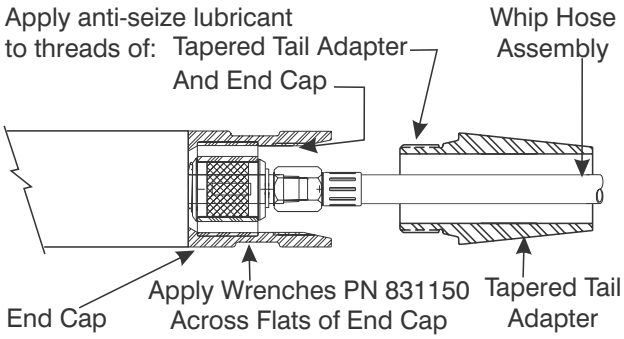


Figure 11-19. End Cap and Tail Adapter

3. With the threaded end toward the End Cap (8), slide the Tapered Tail Adapter (13) over the Whip Hose (10) to the internal threads of the End Cap as shown in Figure 11-20.

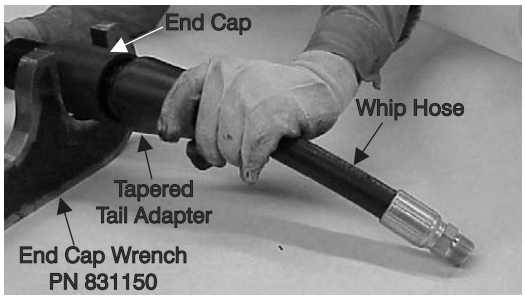


Figure 11-20. Slide Tail Adapter to End Cap

4. By hand, thread the Tapered Tail Adapter into the End cap and tighten finger tight.

5. With the End Cap secured as described in step 1 above, fit one of the End Cap Wrenches (831150) across the flats of the Tapered Tail Adapter (12) as shown in Figure 11-21.

WARNING
Fingers can be pinched. Always wear gloves and keep hands away from pinch points.

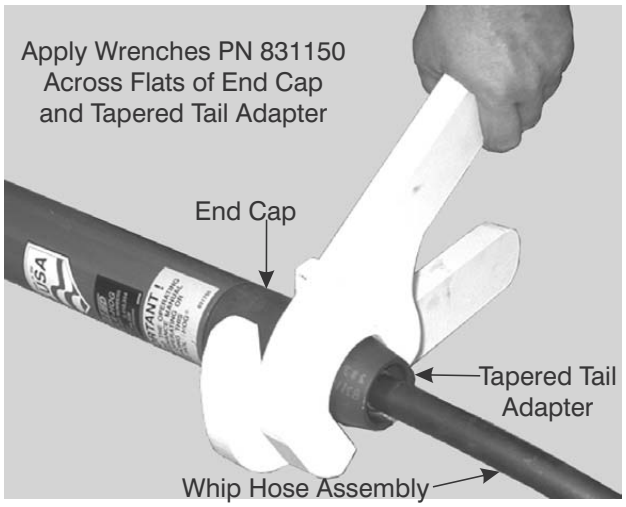


Figure 11-21. Secure Tail Adapter to End Cap.

6. Tighten the Tapered Tail Adapter (13) until it is securely fastened to the End Cap.

11.9 Whip Hose Replacement (For Serial Numbers 500 and higher)

This section details Whip Hose Replacement for Hole-Hogs employing Whip Hose Mounting Method 2, as described in Section 11.4.2. Refer to Figure 11-22.

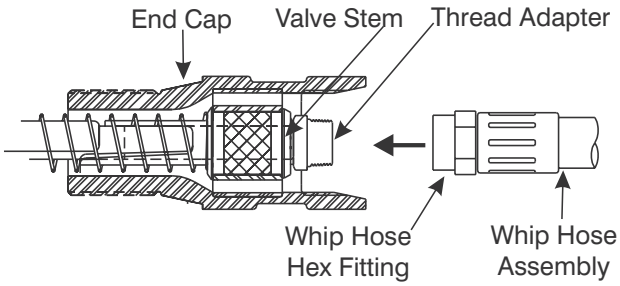


Figure 11-22. Whip Hose Mounting Method 2.

The reference numbers in this section refer to the part item numbers on the following parts drawings and parts lists:

Figure 14-4. Complete Hole-Hog Assembly

Figure 14-7. Tail Assembly

11.9.1 Tail Adapter Removal

1. Place the Hole-Hog on a level surface and secure it with a strap wrench, saddle clamp, or with one of the two End Cap Wrenches (831150), supplied with the Tool Kit.
   a. When using the End Cap Wrench, grip the Hole-Hog across the wrench flats of the End Cap (8) as shown in Figure 11-23.
   b. When using a vise or saddle clamp, grip the Hole-Hog across the raised area of the End Cap (8) on either side of the wrench flats as shown in Figure 11-23.
2. With the Hole-Hog secured as described above, fit one of the End Cap Wrenches (P/N 831150) across the flats of the Tapered Tail Adapter (13) as shown in Figure 11-23.
3. With the End Cap Wrench, loosen the Tapered Tail Adapter (13). It may be necessary to strike the wrench handle several times to loosen the adapter.
4. Thread the Tail Adapter (13) from the End Cap (8) and slide it off, over the Whip Hose as shown in Figure 11-24.

11.9.2 Whip Hose Removal

1. Secure the Hole-Hog and remove the Tail Adapter as described in Section 11.9.1.

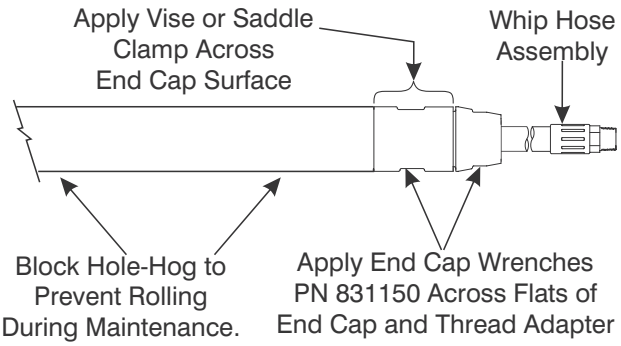


Figure 11-23. Secure Hole-Hog for Tail Adapter Removal

2. By hand, pull the Whip Hose away from the End Cap (8) until the flats of the Valve Stem (5) are accessible as shown in Figure 11-25.
3. Fit a 1-1/16-inch open-end wrench across the exposed flats of the Thread Adapter (3). See Figures 11-25 and 11-26.

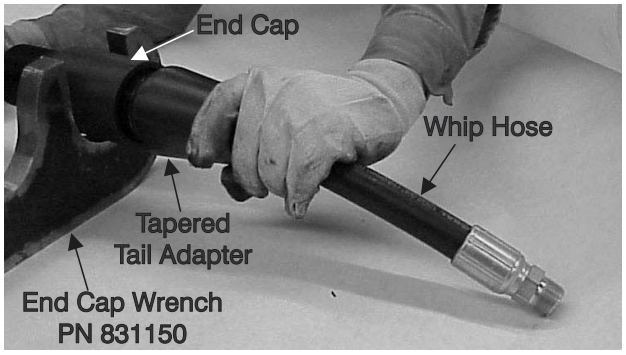


Figure 11-24. Slide Tail Adapter from End Cap, over Whip Hose.

4. Brace the wrench against the edge of the End Cap and pry the Adapter outward with enough force to prevent the Valve Stem from pulling back into the End Cap. See Figures 11-25 and 11-26.

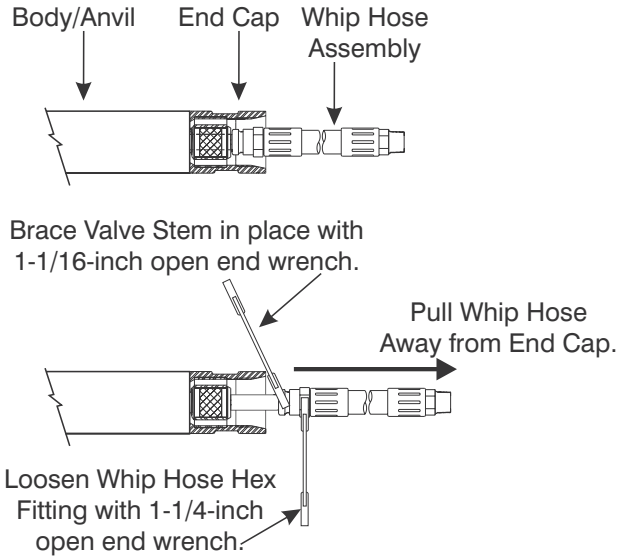


Figure 11-25. Access and Hold the Valve Stem in Position

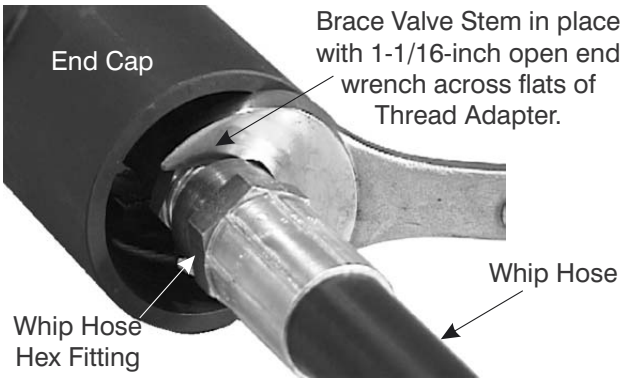


Figure 11-26. Hold Thread Adapter in Position

5. While holding the Thread Adapter in position with the 1-1/16-inch open-end wrench, fit a 1-1/4-inch open-end wrench across the flats of the Whip Hose hex fitting as shown in Figure 11-27.

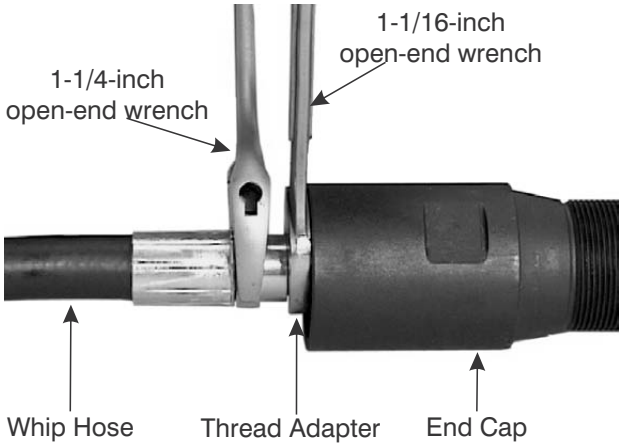


Figure 11-27. Loosen Hex Fitting and Remove Whip Hose

6. Loosen and thread the Whip Hose hex fitting from the Thread Adapter. Remove the Whip Hose from the Valve Stem and End Cap.

11.9.3 Whip Hose Installation

1. Place on a clean flat work bench: the Whip Hose (10), the Quick Disconnect Fitting (11) and Gasket, assembled as described in Section 11.7.2.
2. Place the Hole-Hog on the work bench and secure it with a strap wrench, saddle clamp, or with one of the two End Cap Wrenches (831150), supplied with the Tool Kit.
   a. When using the End Cap Wrench, grip the Hole-Hog across the wrench flats of the End Cap (8) as shown in Figure 11-28.
   b. When using a vise or saddle clamp, grip the Hole-Hog across the raised area of the End Cap (8) on either side of the wrench flats as shown in Figure 11-28.

3. Apply Teflon tape to the threads at the end of the Valve Stem.
4. Thread the female hex fitting of the Whip Hose (10) onto the threads of the Adapter. Tighten the fitting finger tight.

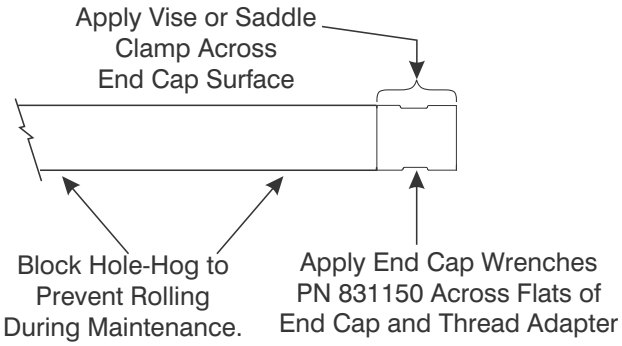


Figure 11-28. Secure Hole-Hog for Whip Hose Installation

5. By hand, pull the Whip Hose away from the End Cap (8) until the Thread Adapter (3) is accessible as shown in Figure 11-25.
6. Fit an 1-1/16-inch open-end wrench behind the exposed Thread Adapter. Brace the wrench against the edge of the End Cap and pry the stem outward with enough force to prevent the Valve Stem from pulling back into the End Cap as shown in Figures 11-28 and 11-26.
7. Continue holding the Valve Stem in position. Fit the 1-1/16-inch open-end wrench across the flats of the Thread adapter, and a 1-1/4-inch open-end wrench across flats of the Whip Hose Hex Fitting as shown in Figure 11-27.
8. Tighten the Whip Hose Hex Fitting securely onto the Thread Adapter (3) as shown in Figure 11-27.

11.9.4 Tail Adapter Installation

1. Secure the Hole-Hog and install the Whip Hose as described in Section 11.9.3.
2. Apply a light coat of Anti-Seize lubricant to the external threads of the Tapered Tail Adapter (13) and the internal threads of the End Cap (8), as shown in Figure 11-29.

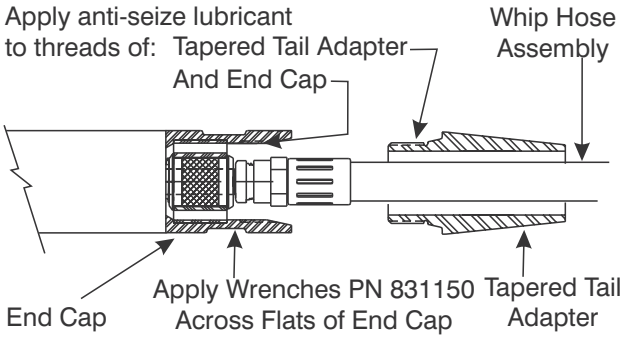


Figure 11-29. End Cap and Tail Adapter

3. With the threaded end toward the End Cap (8), slide the Tapered Tail Adapter (13) over the Whip Hose (10) to the internal threads of the End Cap as shown in Figure 11-30.
4. By hand, thread the Tapered Tail Adapter into the End Cap and tighten finger tight.
5. With the End Cap secured as described in step 1 above, fit one of the End Cap Wrenches (831150) across the flats of the Tapered Tail Adapter (13) as shown in Figure 11-31.
6. Tighten the Tapered Tail Adapter (13) until it is securely fastened to the End Cap.

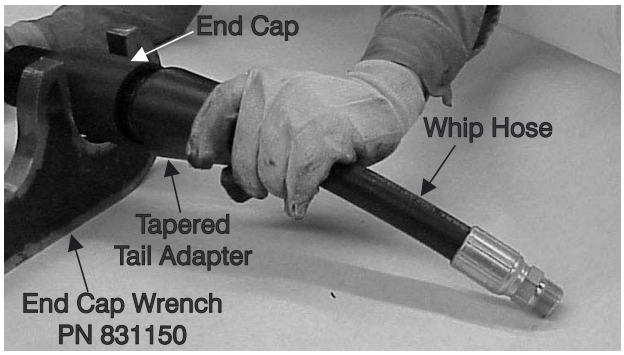


Figure 11-30. Slide Tail Adapter to End Cap

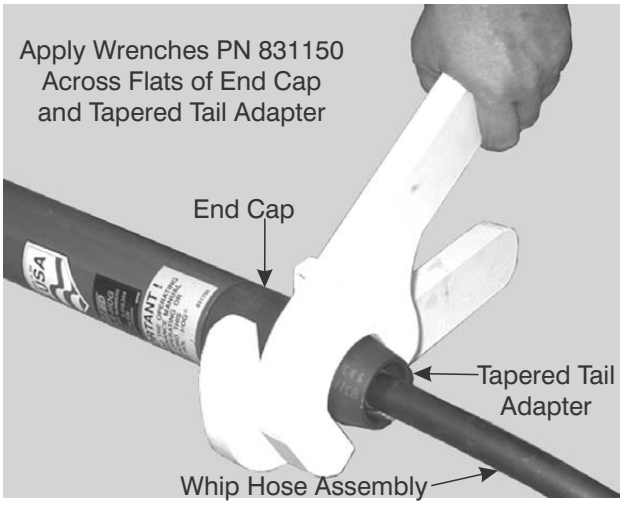


Figure 11-31. Secure Tail Adapter to End Cap.

SECTION 12.0 HOLE-HOG TROUBLESHOOTING CHART

The following chart outlines corrective actions for several commonly encountered conditions. For further information, contact the Allied Technical Service Department.

Hole-Hog Troubleshooting Chart

Will not run or start	Runs erratically in forward	Runs erratically in reverse	Stops in ground	Low impact power	Slow ground penetration	**Cause & Corrective Action**
X	X	X	X	X		Restriction in air supply hose. Disconnect & purge hose.
X	X	X				Bent valve stem. Replace valve stem.
	X	X			X	Air pressure too high. Check air pressure.
X				X		Air pressure too low. Check air pressure.
X	X	X	X	X		Ice buildup inside unit. Follow de-icing instructions.
			X		X	Ground too hard or too soft. Re-evaluate application.
		X		X		Deteriorated shock absorber Replace shock absorber.
X				X		Excessive internal clearances. Replace body, striker, or valve.
		X		X		Improper lubrication. Follow lubrication instructions
X						Foreign material inside unit. Disassemble & clean.
X				X		Broken/misaligned internal parts. Disassemble, then repair or replace.
X				X		Rusted or rough sliding surfaces. Disassemble, clean and polish.
	X		X		X	Hit obstacle. Reverse tool from hole and retry.

SECTION 13.0 HOLE-HOG STORAGE

13.1 Short Term Field Storage

1. Clean exterior.
2. Clean out whip hose connection to the valve stem.
3. Lubricate interior of unit.
4. Wipe surface of unit with an oily rag to leave a thin coating of oil over the whole unit.
5. Position or tie whip hose in a manner to prevent it from being crushed.
6. Secure unit in a dry storage area or cover with a waterproof tarp.

13.2 Long Term Storage

1. Refer to Section 8.0 and disassemble the body/anvil from the end cap. Remove the striker.
2. Clean and inspect these components for damage and excessive wear.
3. Schedule replacement and repairs so unit will be ready to use after storage
4. Thoroughly clean all disassembled parts.
5. Lubricate all parts and reassemble.
6. Store in a protected, dry area.
7. Avoid wet or damp conditions to minimize rust.

SECTION 14.0
PARTS INFORMATION

Model No. Serial No.	Figures						
	14-1 Complete Assembly	14-2 Complete Assembly	14-3 Complete Assembly	14-4 Complete Assembly	14-5 Complete Assembly	14-6 Tail Assembly	14-7 Tail Assembly
310-TH 1 to 499	X					X	
310-TH 500 to 649		X					X
310-TH 650 to 1099			X				X
310-TH 1100 and Above				X			
310					X		X

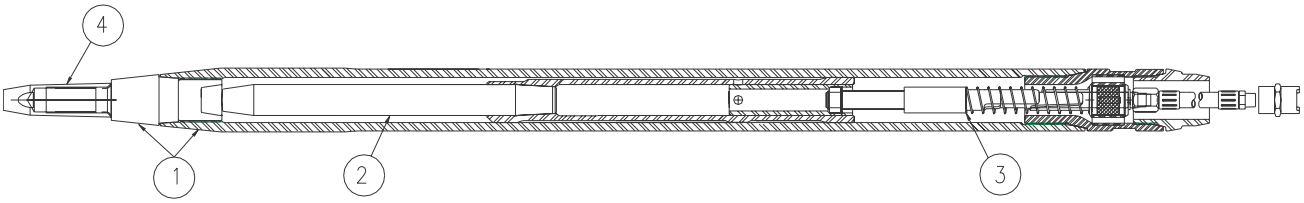


Figure 14-1. Model 310-TH Hole-Hog Complete Assembly
Serial Number 499 and Below

Model 310-TH Hole-Hog Complete Assembly Part No. 831500 Serial Number 499 and Below			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	831126	Body/Anvil/Cap. Assembly (Replaced by 831168)
2	1	831114	Striker (Replaced by 100746)
3	1	831159	Tail Assembly (Replaced by 831167)
4	1	831091	Tapered Anvil Cap (Use with 831126)
4	1	831162	Tapered Anvil Cap (Use with 831168)

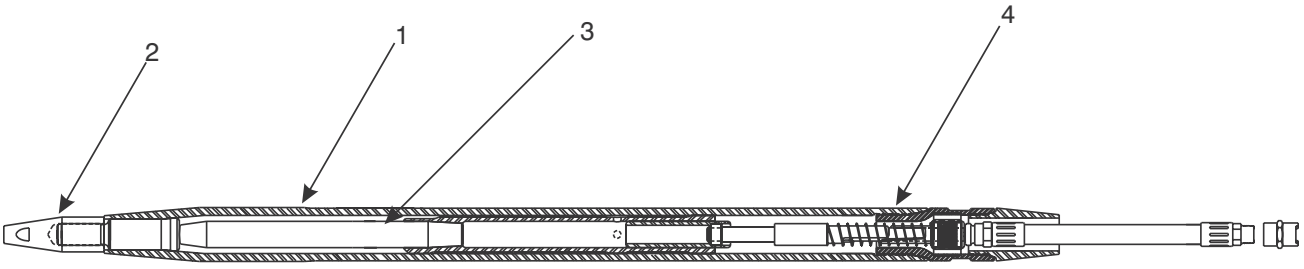


Figure 14-2. Model 310-TH Hole-Hog Complete Assembly
Serial Number 500 thru 649

Model 310-TH Hole-Hog Complete Assembly Part No. 831500 Serial Number 500 thru 649			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	831168	Body/Anvil/Cap. Assembly (Includes Item 2)
2	1	831162	Anvil Cap.
3	1	831114	Striker (Replaced by 100746)
4	1	831167	Tail Assembly

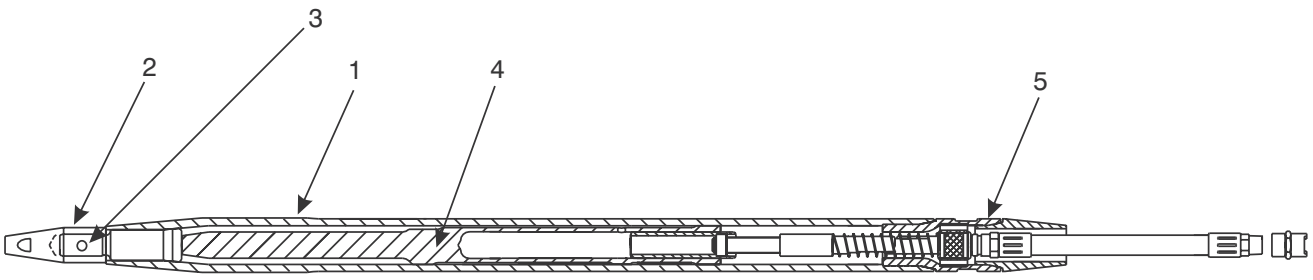


Figure 14-3. Model 310-TH Hole-Hog Complete Assembly
Serial Number 650 thru 1099

Model 310-TH Hole-Hog Complete Assembly Part No. 831500 Serial Number 650 thru 1099			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	831168	Body/Anvil//Cap. Assembly (Includes Items 2 and 3)
2	1	831162	Anvil Cap. (Included in Item #1)
3	1	818709	Nylon Insert
4	1	831170	Striker (Replaced by 100746)
5	1	831167	Tail Assembly

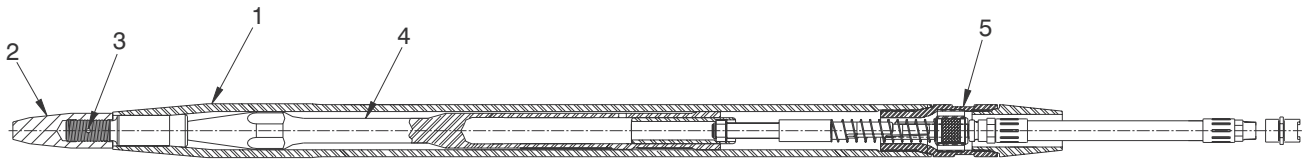


Figure 14-4. Model 310-TH Hole-Hog Complete Assembly
Serial Number 1100 and Above

Model 310-TH Hole-Hog Complete Assembly Part No. 831500 Serial Number 1100 and Above			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	831168	Body/Anvil//Cap. Assembly (Includes Items 2 and 3)
2	1	831162	Anvil Cap. (Included in Item #1)
3	1	818709	Nylon Insert
4	1	100746	Striker
5	1	831167	Tail Assembly

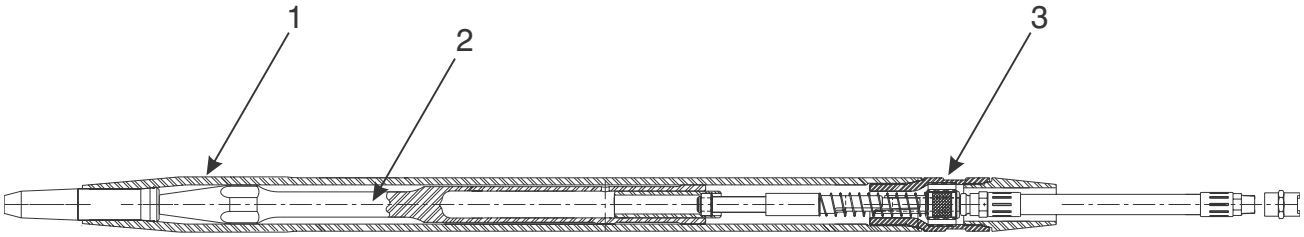


Figure 14-5. Model 310 Hole-Hog Complete Assembly

Model 310 Hole-Hog Complete Assembly Part No. 100747			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	100744	Body/Anvil
2	1	100746	Striker
3	1	831167	Tail Assembly

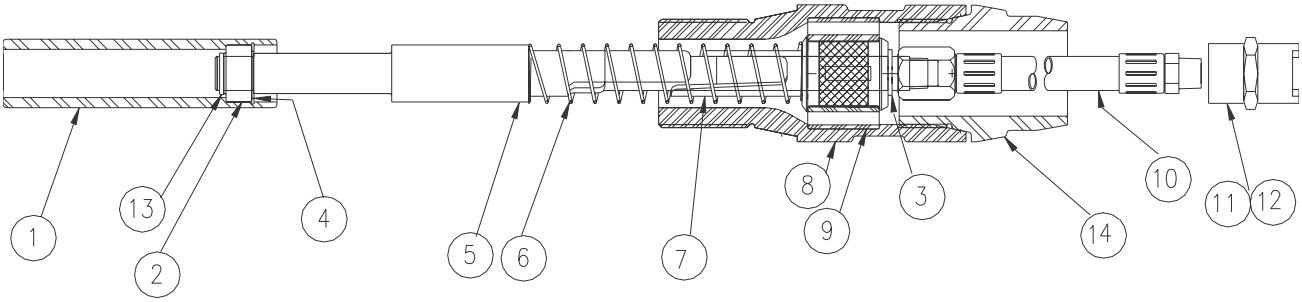
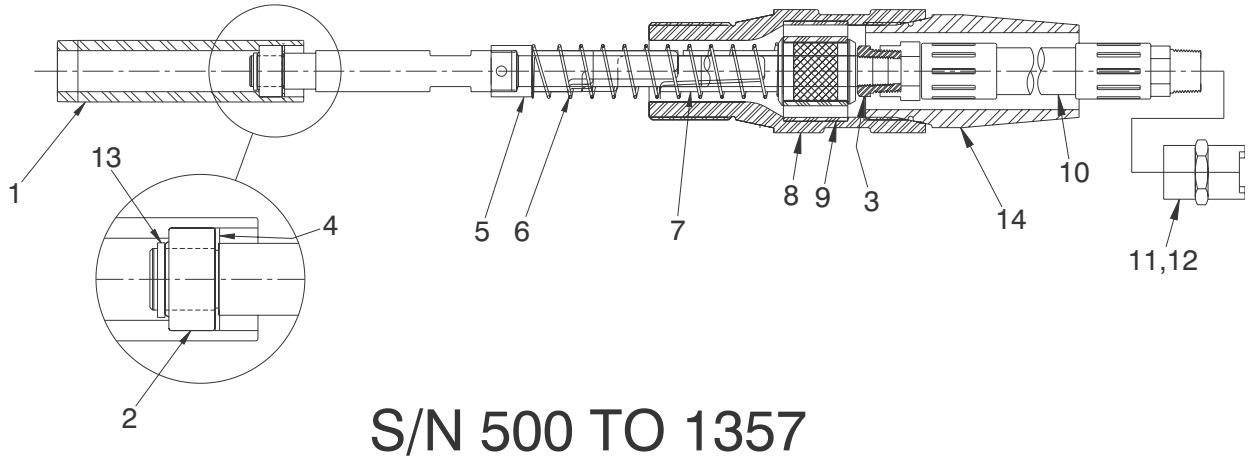


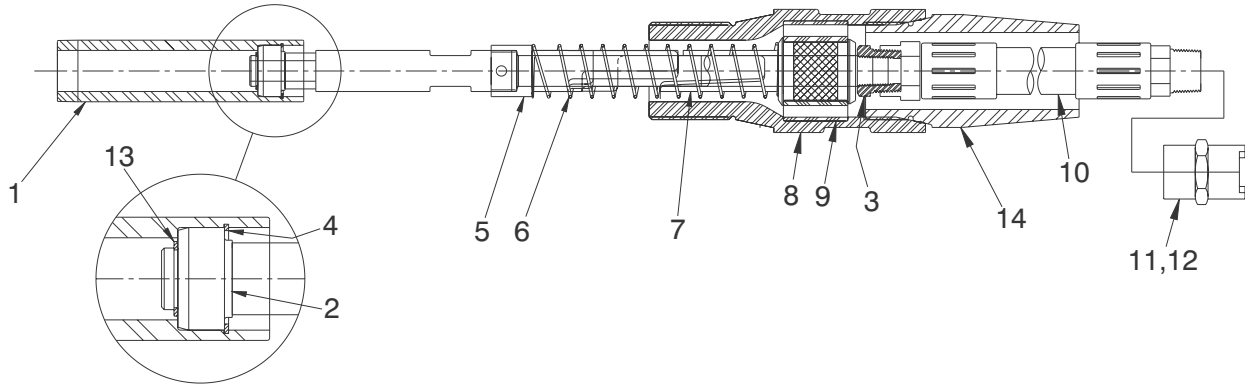
Figure 14-6. Tail Assembly, Model 310-TH
Serial Number 499 and Below

Model 310-TH Hole-Hog Tail Assembly, Part No. 831153 Serial Number 499 and Below			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	831115	Valve
2	1	831116	Spherical Bearing
3	1	831123	Snap Ring
4	1	831118	Snap Ring
*5	1	831119 831155 831157	Valve Stem (S/N 0134 and Below) Valve Stem (S/N 0140 to 0279) Valve Stem (S/N 0280 and Above)
6	1	831121	Valve Spring
*7	1	831120 831158	Valve Guide (S/N 0279 and Below) Valve Guide (S/N 0280 and Above)
8	1	831122	End Cap.
9	1	831812	Shock Absorber
10	1	831125 831154	Whip Hose Assembly (S/N 0134 and Below) Whip Hose Assembly (S/N 0140 and Above)
11	1	831027	Female Quick Disconnect (Includes Item 12)
12	1	831030	Gasket (Not Shown)
13	1	831117	Snap Ring
14	1	831124	Tapered Tail Adapter
15	1	831042	Male Quick Disconnect (Not Shown) or Male QD 102395 and Hex Pipe Coupling 798056 (Not Shown)

*Note: P/N 831157 and 831158 must be used as a set. They cannot be mixed with other valve stems and guides.



S/N 500 TO 1357



ENLARGED VIEW OF VALVE BUSHING
MUST BE INSTALLED AS SHOWN

S/N 1358 AND ABOVE

Figure 14-7.Tail Assembly
310TH: Serial Number 500 and Above
310: All Serial Numbers

Tail Assembly, Part No. 831167 310-TH: Serial Numbers 500 and Above 310: All Serial Numbers			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	831115	Valve
2	1	831116	Spherical Bearing (S/N 1357 & Below. Replaced by 103169)
2	1	103169	Valve Bushing (S/N 1358 & Above)
3	1	831165	Thread Adapter
4	1	831118	Snap Ring - Valve
5	1	831166	Valve Stem
6	1	831121	Valve Spring
7	1	831158	Valve Guide
8	1	831122	End Cap
9	1	831812	Shock Absorber
10	1	831164	Whip Hose Assembly (S/N 0500 and Above)
11	1	831027	Female Quick Disconnect (Includes Item 12)
12	1	831030	Gasket (Not Shown)
13	1	831117	Snap Ring
14	1	831124	Tapered Tail Adapter
15	1	102395	Male Quick Disconnect (Not Shown)
16	1	798056	Hex Pipe Coupling

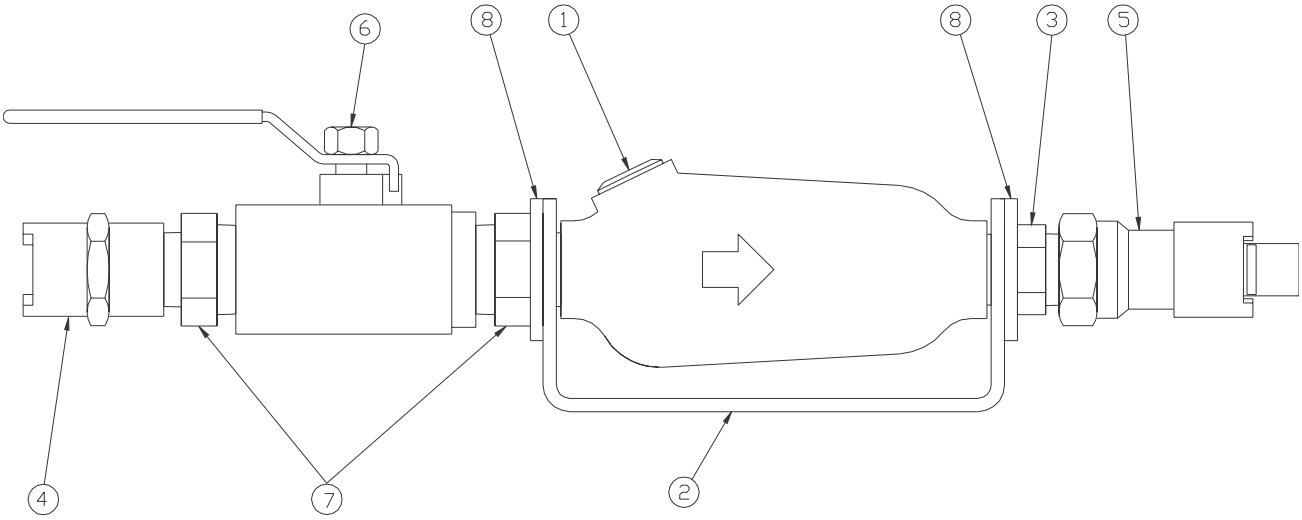


Figure 14-8. Air Line Lubricator Assembly

Model 310 and 310-TH Hole-Hog Air Line Lubricator Assembly (Accessory) Part No. 831035			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	831021	In-Line Air Lubricator 3/4"
2	1	831022	Support Bracket
3	1	798057	Pipe Nipple
4	1	831027	Quick Disconnect Coupling - Socket 3/4
5	1	831042	Quick Disconnect Coupling - Plug 3/4
6	1	837099	Ball Valve
7	2	798092	Pipe Nipple
8	2	677346	Washers
			FOR USE WITH AIR LINE LUBRICATOR
		832240	Hog Wash, 1 quart
		832219	Hog Wash, 4 quart case
		832220	Hog Wash, 5 gallons

Construction Products, LLC

3900 Kelley Avenue, Cleveland, Ohio 44114
Tel: 216-431-2600 Fax: 216-431-2601
e-mail: Sales@AlliedCP.com
website: http://www.AlliedCP.com