ALLIED
Construction Products, LLC

TECHNICAL MANUAL

Manual Part No. 002052

HOLE-HOG Models 4000 and 4001

Allied Hole-Hog, Model 4000 Series
Document Change Notice

Date	Page	Change
	Throughout	Update to CE Compliance and specifications
08/09/06	59 & 61	Coupling Revision
11/15/06	17 &18	Revise Section 6.2.8

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SECTION 1.0 INTRODUCTION

Hole-Hog Technical Manual: Part Number 002052

This Technical Manual is applicable to Hole-Hog:

Models: 4000 and 4001

Years of Manufacture: 1993 and beyond

Serial Number(s)_____

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 4000 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.

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.

2.1.1 Expanded Body

As shown in Figure 2-1, some Hole-Hogs have expanded bodies. These models pierce a larger diameter hole through the ground. The smaller portion of the body pierces a pilot hole and the larger portion of the body expands the hole.

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 and push the ridig pipe 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 Tail Assembly's End Cap secure the Tail Assembly to the Body/Anvil. The Whip Hose attaches to the other end of the Tail Assembly. Hole-Hog service and repair require removal of the tail assembly to access the serviceable parts.

2.4 Differences Among Models Covered

This manual covers two Allied Hole-Hog Models: 4000 and 4001.

All information in this manual applies to both models unless specifically noted otherwise. These two models are identical except for the Body/Anvil:

Model 4000 has a Standard Body.
Model 4001 has an Expanded Body.

SECTION 3.0 SPECIFICATIONS AND DECALS

3.1 Specifications

Outside Diameter:
4000 . . . . . 6 in. (98mm)
4001 . . . . . 8 in. (203mm)

Weight:
4000 . . . . . 282 lbs. (128kg)
4001 . . . . . 310 lbs. (141kg)

Overall Length: . . . 68 in. (1727mm)

Working Air PSI *: 90 psi (6.3 kg./cm^2)

Air Consumption/Min.: . . . 240 scfm (scmm)

Whip Hose
(inside diameter): . . 1-1/2 in. (38mm)

Recommend Delivery Hose
(inside diameter): . .1-1/2 in. (38 mm)

Percussion Rate Per Minute: . . . 400

* Pressure required at the tool. Allow 5 psi (0.4 kg/cm_2) pressure drop for each 100 ft. (30m) of hose. Pressure above 100 psi (7 kg./cm_2) at the tool decreases the life of the Hole-Hog.

3.2 Minimum Recommended Operating Depths

Hard Glacial Clay . . . . . 48 in.

Clay/Sand Mix. . . . . 48 in.

Wet/Dry Sand . . . . . 60 in.

Cultivated Soil . . . . . 60 in.

Clay/Loam Mix . . . . . 60 in.

The Hole-Hog operates best in compactable 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.

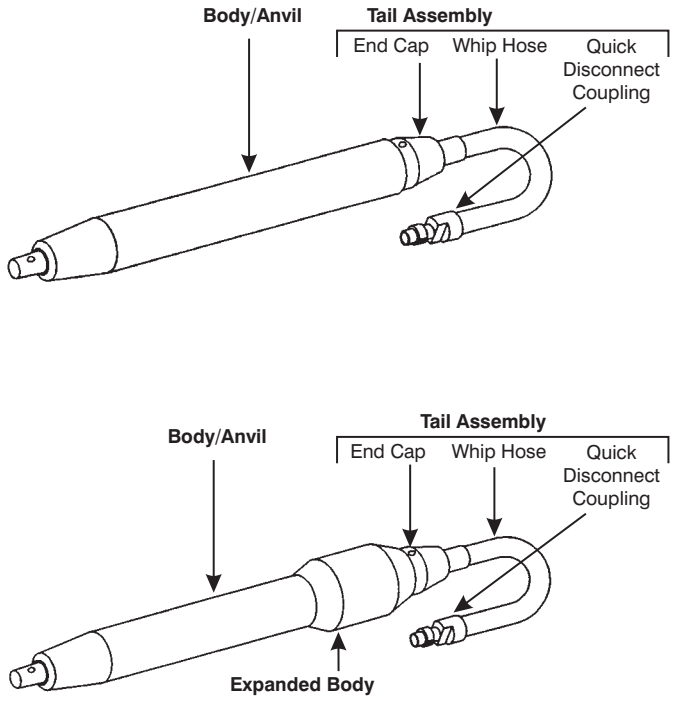
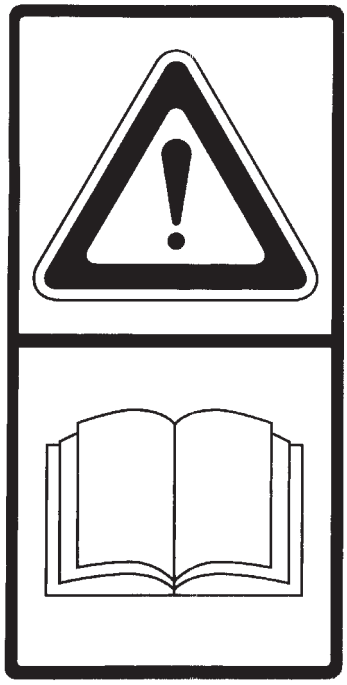


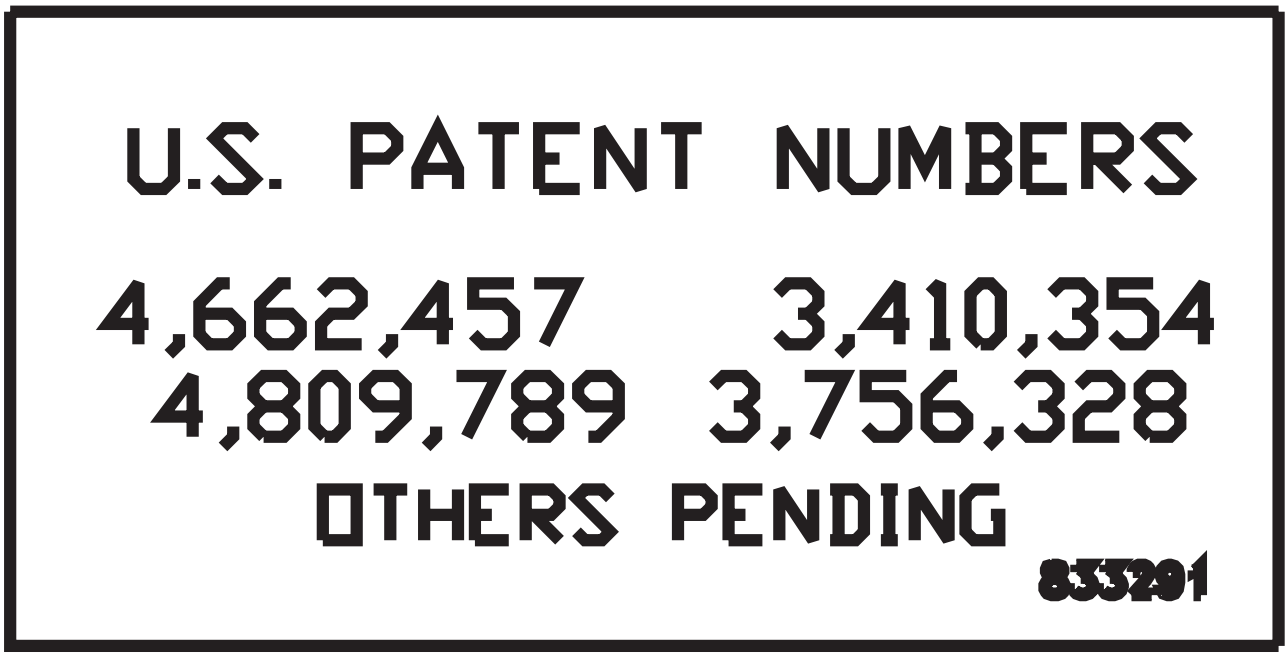
Figure 3-1. Major Components: Hole-Hog, Models 4000 and 4001

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:
Serial Number:
Year:
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 No. 833295			
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

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 the instructions and procedures. Even experienced service technicians are to review these CAUTIONS and WARNINGS prior to performing a procedure. These are highlighted by the symbol shown here.

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

Each of the Hole-Hog Models covered in this manual are heavy; refer to Section 3.0 Specifications. Even when disassembled, component parts like 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/or its components from rolling when they are placed on a horizontal surface.
- Always use suitable lifting equipment that will assure the safety of personnel and not damage 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 9.8, Step 9. A loose end cap could blow out with damaging force, injuring the operator or bystanders.

- 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 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

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 Section 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, Section 7.1 must performed at the beginning of piercing operations, Section 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. 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 Section 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.

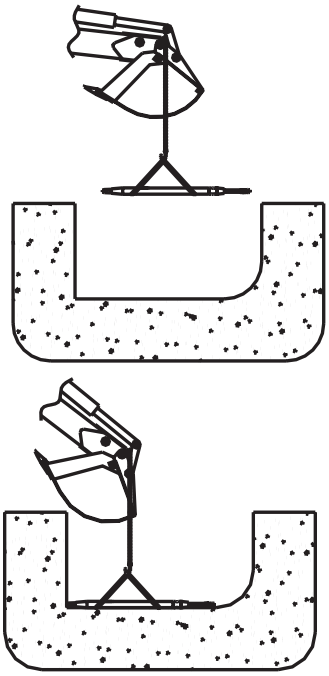


Figure 6-1. Lifting the Hole-Hog

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 a small amount 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. Refer to Section 6.2.6, step 4 for the proper pitch.
4. Restart air supply to piercing tool. If tool fails to start, simply 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 pit.
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.
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 Section 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 Section 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.
2. Disconnect the hose at the connector nearest the hole entry.
3. Untwist the hose attached to the tool along its entire length and position it in line with the hole.

NOTE

To reverse the tool, the valve must be located at the extreme rear position. To reposition the valve assembly, the hose must be turned counterclockwise.

4. Twist the hose 3 or 4 turns counterclockwise and pull the hose taut. The valve assembly should loosen and begin turn counterclockwise.
5. Continue to twist the hose until the valve assembly is seated in its rear position.
6. Reconnect the air hose and open the air supply valve.
7. If the tool fails to start, close and open the air supply valve rapidly to induce a sudden flow of air to start the tool.
8. 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.
9. When the tool has exited the hole, stop the air supply and disconnect the hose.
10. To avoid damage to the valve assembly, turn the hose or valve assembly clockwise to return the valve assembly to its fully seated, forward most position.

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.

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.

SECTION 8.0 DISASSEMBLY

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 Spanner Wrench 834017 must also be available. This wrench is supplied with the Hole-Hog. It is shown in Figure 8-1.

Figure 8-1. Spanner Wrench 834017.

In the following procedures, reference numbers in parentheses accompany most part names. These numbers refer to the part item numbers on the exploded views and parts lists in Section 13.0.

8.2 Extent of Disassembly

The procedures in this section explain how to completely disassemble every replaceable component in the Hole-Hog. Most repairs do not require such a complete disassembly. After removing the Tail As-

sembly and Striker from the Body/Anvil (paragraph 8.5), 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.

8.3 Whip Hose Replacement

- To Replace the Whip Hose (14) in the field, refer to paragraph 11.1.
- To Replace the Whip Hose (14) as part of shop disassembly, follow the procedures in this section, starting with 8.6.1.

8.4 Replacing The Body/Anvil

When replacing the Body/Anvil (1) only, it is not necessary to disassemble the Whip Hose (13) and tail assembly components.

1. Remove Striker (2) and the assembled Whip Hose (14) and tail assembly as described in paragraph 8.5.
2. Until the new Body/Anvil is installed, place the Striker (2), Whip Hose (13) and tail assembly where they will not be contaminated with dust and dirt. Cover or wrap them in cloth or plastic as required.

8.5 Removing Tail Assembly and Striker

1. Place the Hole-Hog on a level surface. Holding the Body/Anvil (1) with a strap wrench, use wrench P/N 834017 to loosen the End Cap (9). It may be necessary to strike the wrench handle several times with a hammer to loosen the End Cap. Refer to Figure 8-2.
2. Remove the tail assembly by unthreading the End Cap (9) and pulling the Tail Assembly from the Body/Anvil (1) as shown in Figure 8-3.

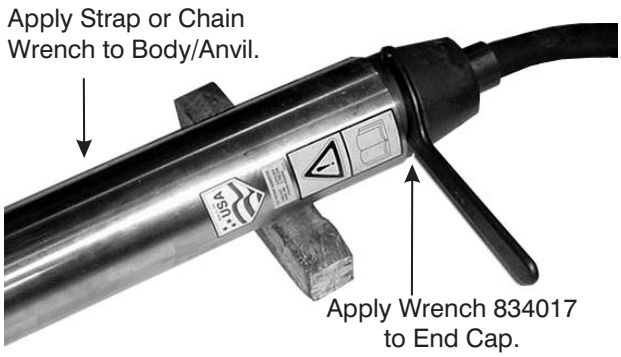


Figure 8-2. Loosening the End Cap.

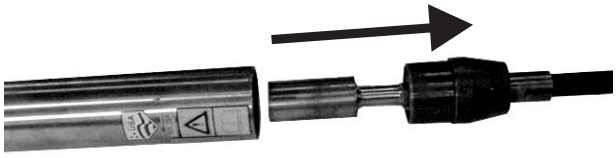


Figure 8-3. Removing Tail Assembly.

3. Place the Tail Assembly where it will not be contaminated with dust and dirt. Wrap in cloth or plastic if necessary.
4. Remove the Striker (2) from the Body/Anvil (1):
   a. If it is unsafe or impractical to lift the Body/Anvil and Striker, use a long hook to pull the Striker out of the Body/Anvil about six to eight inches as shown in Figure 8-4. Otherwise, perform step b.

Figure 8-4. Access the Striker with a Hook.

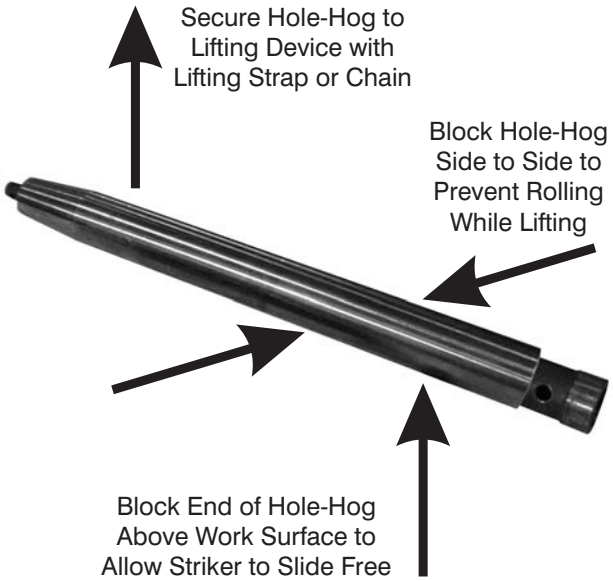


Figure 8-5. Tilting the body/anvil to Access the Striker.

b. Tip the Body/Anvil (1) so the end of the Striker (2) slides out of the Body/Anvil about six to eight inches. (Figure 8-5).

5. Once the Striker (2) is accessible, lower the Body/Anvil (1) to the level surface and block it to prevent rolling. Pull the Striker from the Body/Anvil by hand as shown in Figure 8-6.

Figure 8-6. Striker Removed from Body/Anvil.

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

7. 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.

8.6 Disassembling the Tail Assembly

NOTE

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

8.6.1 Remove Whip Hose and End Cap

1. Position the Tail Assembly in a vise so the End Cap (9) and Whip Hose (13) are above the vise jaws. The Valve (6) should be below the jaws, as shown in Figure 8-7.

2. Be sure the valve does not get caught in or interfere with vise components below the jaws.

3. Secure the Tail Assembly in the vise by clamping the jaws firmly across the flats of the Valve Stem (4) as shown in Figure 8-7.

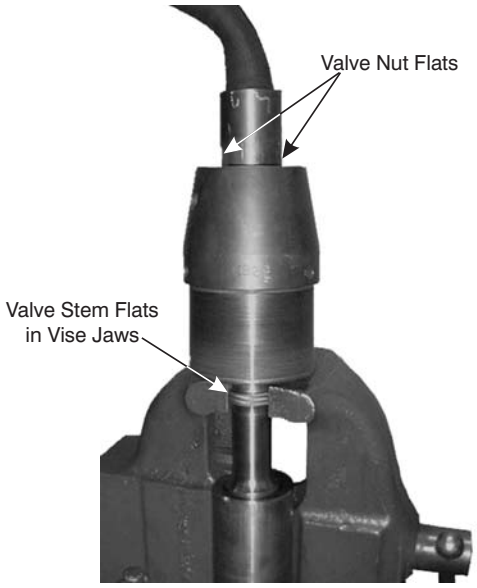


Figure 8-7. Place End Cap in Vise.

4. Fit a 2-3/8-inch open-end wrench across the Valve Nut flats. Loosen the Valve Nut.

5. Thread the Valve Nut and assembled Whip Hose from the Valve Stem as shown in Figure 8-8.

Figure 8-8. Thread the Valve Nut from the Valve Stem.

6. Place the assembled Whip Hose components where they will not be contaminated with dust and dirt. Wrap them in cloth or plastic if necessary.

7. Leave the Valve Stem (4) secured in the vice. Turning the End Cap (9) counterclockwise on the Valve Stem raises the End Cap up along the stem as shown in Figure 8-9.

Figure 8-9. Remove the Hose Socket and Whip Hose from the Valve Stem.

8. Thread the End Cap to the top of the Valve Stem and remove it from the stem.

9. Remove the Valve Stem (4) and its assembled components from the vice as shown in Figure 8-10.

Figure 8-10. Separate End Cap and Valve Stem Assemblies.

10. Place the End Cap and Valve Stem where they will not be contaminated with dust and dirt. Wrap them in cloth or plastic if necessary.

8.6.2 Disassemble Whip Hose and Quick Disconnect (Q.D.) Fittings

NOTE

DO NOT disassemble the Whip Hose components unless replacement is necessary.

1. Refer to Figure 8-11, and separate Q.D. Socket (17) from the Q.D. Plug (15).

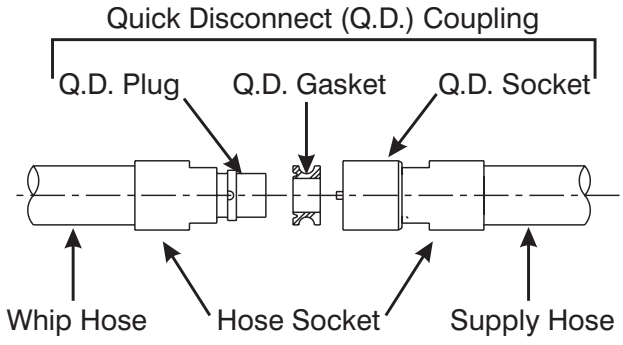


Figure 8-11. Quick Disconnect Components

2. Use a screw driver or needlenose plyers to pry the Gasket (16) from the Socket.

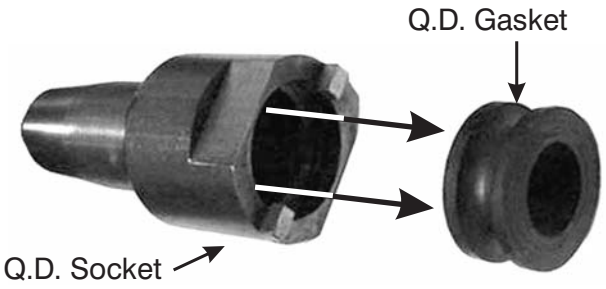


Figure 8-12. Remove Q.D. Gasket

Discard the gasket. Refer to Figure 8-12.

3. Separate the Q.D. Plug (15) from the Whip Hose (13) by threading the Q.D. Plug (15) out of Hose Socket (14). Refer

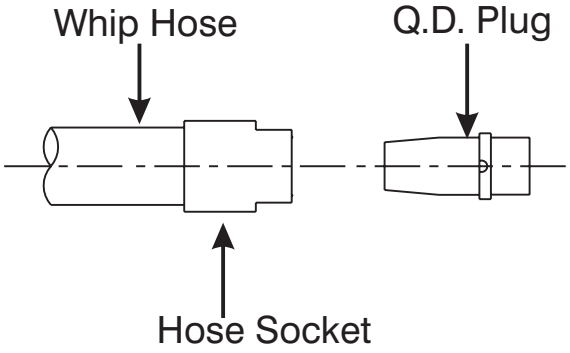


Figure 8-13. Whip Hose, Socket and Q.D. Plug.

to Figure 8-13.

a. Use a 2-inch open-end wrench to hold the Hose Socket (14).

b. Use a 2-inch open-end wrench to thread the Q.D. Plug (15) from the Hose Socket (14).

c. To remove the hose socket from the Whip Hose (13), refer to step 6, below.

4. Separate the Q.D. Socket (17) from its Hose by threading the Q.D. Socket (17) out of the Hose Socket (14). Refer to Figure 8-14.

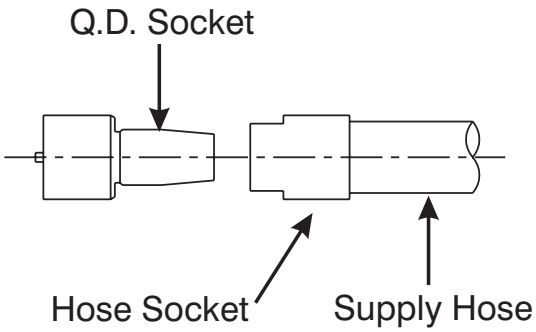


Figure 8-14. Q.D. Socket and Hose

a. Use a 2-inch open-end wrench to hold the Hose Socket (14).

b. Use a 2-inch open-end wrench to thread the Q.D. Socket (17) from the Hose Socket (14).

c. To remove the hose socket from its hose, refer to step 6, below.

5. Refer to Figure 8-15. Inspect the Roll Pin (11) for damage and correct height. The Roll Pin should extend 1/4-inch from the Valve Nut (12).

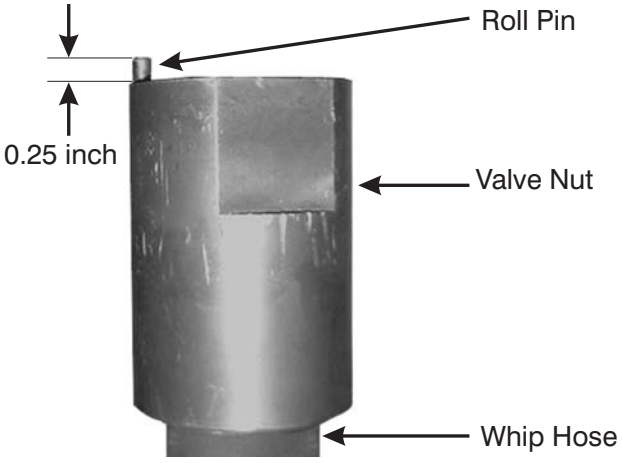


Figure 8-15. Valve Nut Assembly

If either the Roll Pin (11) or Valve Nut (12) must be replaced, replace both components.

If replacement is not required, DO NOT remove the Roll Pin (11) from the Valve Nut (12).

WARNING

Failure to use 100R2 hose could result in injury to personnel. Always use Allied's Whip Hose (see parts list in Section 13.0) or equivalent - 100R2 hose.

6. To remove the Valve Nut or either of the Hose Sockets from their hoses (shown in Figure 8-12), complete the following procedure:

   a. Clamp the hose in a vise with the attached Hose Socket or Valve Nut standing vertically above the jaws. Refer to Figure 8-16.

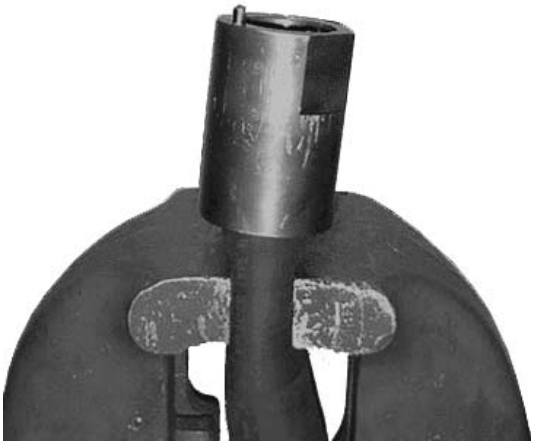


Figure 8-16. Valve Nut and Whip Hose in Vise

NOTE

The threads on the hose side of the Valve Nut and Hose Sockets are left hand threads; turn nut or socket:

Clockwise to loosen.
Counterclockwise to tighten.

   b. Grip the nut or socket with a large pliers. Turn it clockwise to remove it from the hose.

7. After removing the Valve Nut or Hose Socket (12 or 14) from Whip Hose (13), discard the Whip Hose.

8.6.3 Remove Valve and Bushing

NOTE

DO NOT remove the Valve and Valve Bushing from the Valve Stem unless replacement of one or more is necessary.

1. Refer to Figure 8-17-A, and block the Valve (6) and Valve Stem (4) in an arbor press:

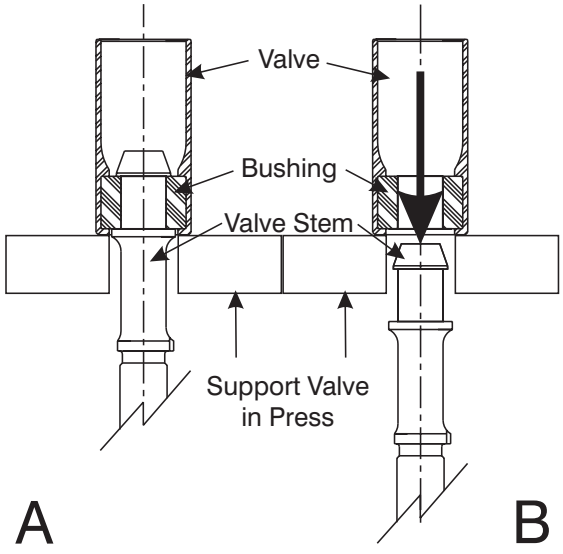


Figure 8-17. Valve and Components in Press.

Support the edges of the Valve (6) with standard blocking. Allow the Valve Stem (4) to hang freely below the blocking.
Allow enough space below the Valve Stem to permit Valve Stem Travel during pressing.

Place the arbor press plunger or an extension against the tip of the Valve Stem (4) protruding above the Valve Bushing (5).

NOTE

A plunger extension or pusher bar of 1-1/2-inch in diameter will pass through the bushing I.D. This enables removal of the Valve Stem in one operation.

2. Press the Valve Stem (4) from the Bushing (5) as shown in Figure 8-17-B.
3. If the press plunger or pusher bar extension is too wide to pass through the bushing, press the Valve Stem (4) until it is level with the Bushing (5) as shown in Figure 8-18-A.
4. Once unseated from the Bushing (5), the Valve Stem (4) can be pulled from the Bushing, as shown in Figure 8-18-B.

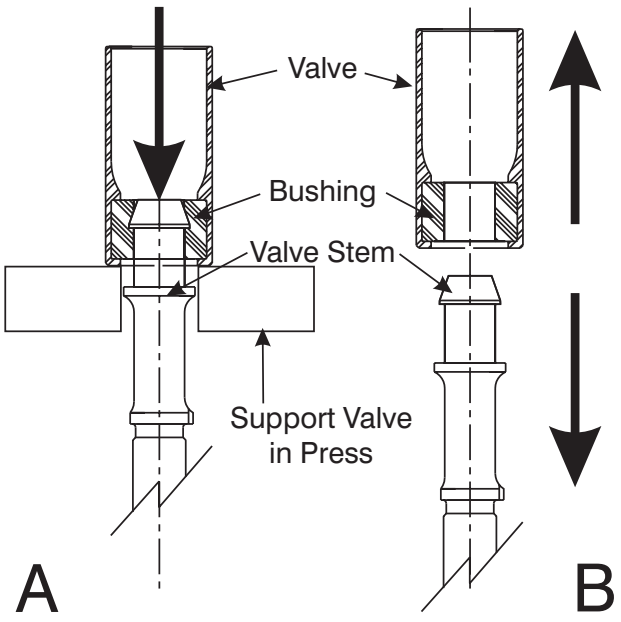


Figure 8-18. Press Valve Stem from Bushing.

5. Pull the Valve Stem (4) from the Valve Bushing (5), as shown in Figure 8-18-B.
6. Refer to Figure 8-19-A, and block the assembled Valve (6) and Bushing (5) in the arbor press:

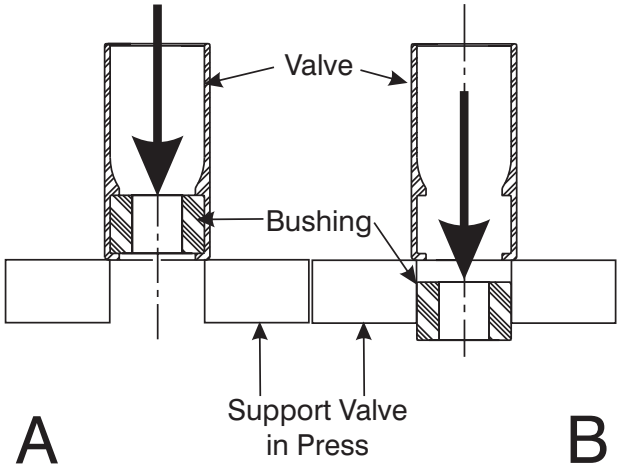


Figure 8-19. Press Bushing from Valve.

Support the edges of the Valve (6) with standard blocking. Leave space below the Valve to allow the Bushing to freely pass out of the Valve and between the blocking.

Use a pusher bar 1-1/2-inches in diameter. This size bar can pass between the internal shoulders of the Valve.

Center the pusher bar over the Bushing (5).

7. Press the Valve Bushing (5) from the Valve (6), as shown in Figure 8-19-B.

8.6.4 Disassemble End Cap Components

CAUTION

Removal destroys Shock Absorber. DO NOT remove Shock Absorber (8) and Valve Body Nut (7) from End Cap (9) unless replacement is necessary.

1. Use a sharp knife or hack saw to cut through the Valve Seal (10). Using a large screw driver or needlenose plyers, pry the Valve Seal from the End Cap. Discard the Seal. See Figure 8-20.

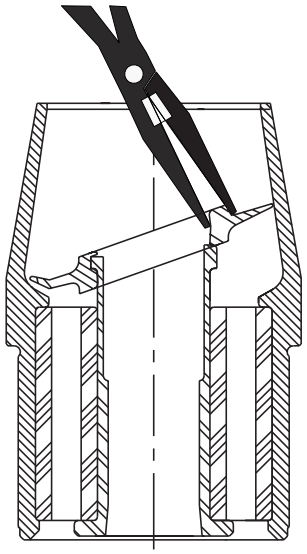


Figure 8-20. Removing the Valve Seal from the End Cap.

2. With threaded end down, place the End Cap in the arbor press as shown in Figure 8-21.

   Support the edges of the End Cap (9) with standard blocking.

   Provide additional space below the blocking to permit Valve Body Nut (7) travel during pressing.

3. If the plunger of the arbor press does not fit inside the End Cap, use a standard push bar of the required diameter, as shown in Figure 8-21.

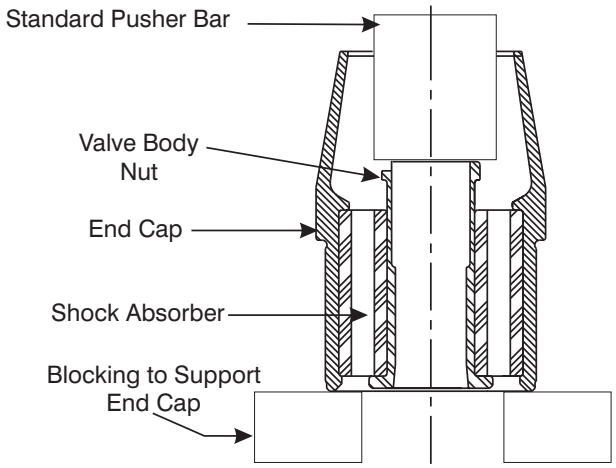


Figure 8-21. End Cap in Arbor Press.

4. Press the Valve Body Nut (7) from the Shock Absorber (8) as shown in Figure 8-22-A.

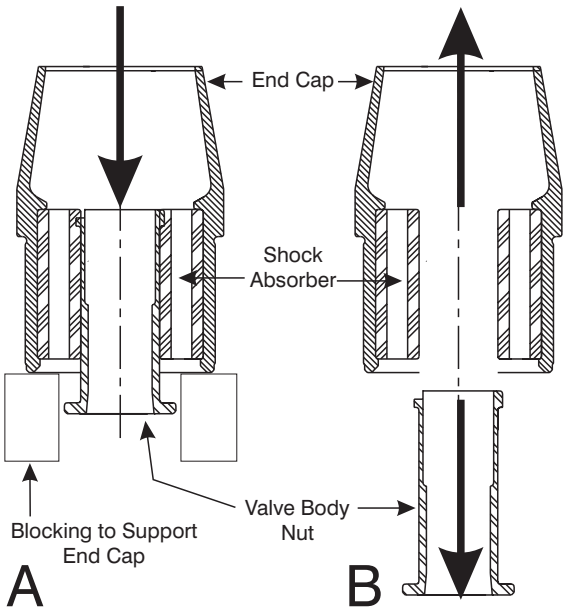


Figure 8-22. Remove Valve Body Nut from the End Cap.

5. Once started from the Shock Absorber, the Valve Body Nut (7) can be pulled free by hand. Refer to Figure 8-22-B.

6. Use a sharp knife or hack saw to cut through the Shock Absorber (8), and remove it from the End Cap. See Figure 8-23 for recommended cutting pattern.

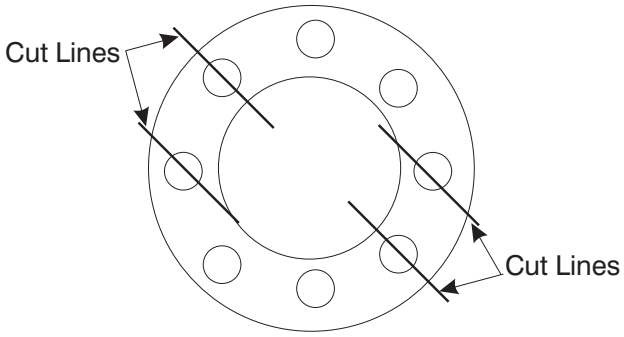


Figure 8-23. Cutting Pattern to Remove Shock Absorber from End Cap

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 Spanner Wrench 834017 must also be available. This wrench is supplied with the Hole-Hog. It is shown in Figure 8-1

In the following procedures, reference numbers in parentheses accompany most part names. These numbers refer to the part item numbers on the exploded views and parts lists in Section 13.0.

9.2 Whip Hose Replacement

To Replace the Whip Hose (13) in the field, refer to paragraph 11.1

To Replace the Whip Hose (13) as part of shop assembly, follow the procedures in this section, starting with section 9.7.

9.3 Replacing The Body/Anvil Only

When replacing the Body/Anvil (1) only, the Striker (2), the Whip Hose (18) and tail assembly components have all been removed from the Body/Anvil and stored with no further disassembly.

1. When the new Body/Anvil is available, bring the Striker (2), the Whip Hose

(13) 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.

9.4 Assemble End Cap Components

1. Lubricate the O.D. of the Shock Absorber (8) and the I.D. of End Cap (9). Position the End Cap (9) in an arbor press with the threaded end up as shown in Figure 9-1-A.

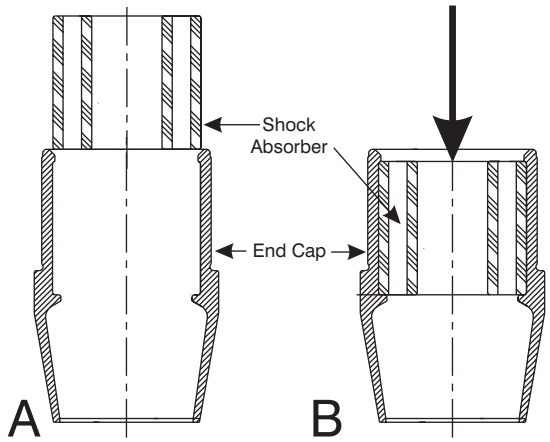


Figure 9-1. End Cap and Shock Absorber in Press

2. Center the Shock Absorber (8) over the threaded end of the End Cap (9) as shown in Figure 9-1-A.

3. Center the press plunger or a pusher bar over the Shock Absorber.

> **CAUTION**
> DO NOT press Shock Absorber past the seat at the non-threaded end of the End Cap.

4. Press the Shock Absorber into the End Cap until it seats against the shoulder at the non-threaded end of the cap as shown in Figure 9-1-B.

5. Before installing the Valve Body Nut (14), refer to Figure 9-2, and lubricate:

   the outer surface of the Valve Body Nut (7).
   the I.D. of the Shock Absorber (8).

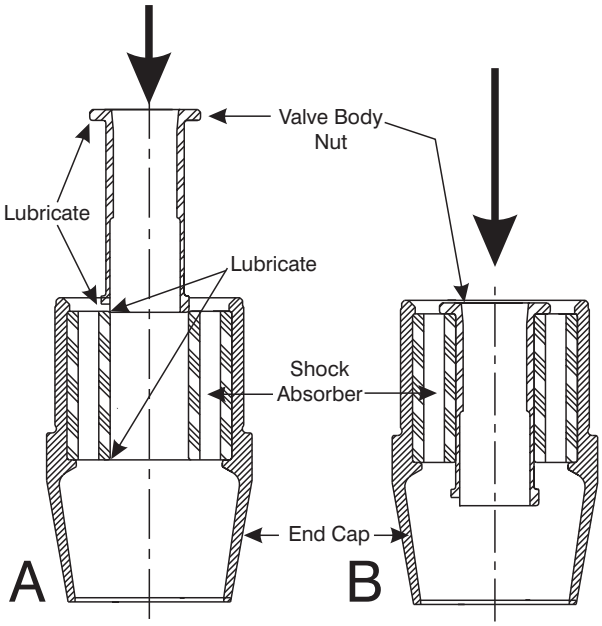


Figure 9-2. Press the Valve Body Nut into the Shock Absorber.

6. Center the Valve Body Nut (14) over the bore of the shock absorber as shown in Figure 9-2-A.

7. Center the press plunger or a pusher bar over the Valve Body Nut (7).

8. Press the Valve Body Nut (7) into the Shock Absorber (8) until the shoulder of the Valve Body Nut seats against the Shock Absorber, as shown in Figure 9-2-B.

9. Turn the End Cap (9) over in the arbor press so the threaded end is down as shown in Figure 9-3.

10. Look inside the non-threaded end of the End Cap and lubricate that part of the

Valve Body Nut that protrudes from the Shock Absorber. See Figure 9-3-A.

11. Lubricate the Valve Seal (10) and fit it over the end of the Valve Body Nut that protrudes from the Shock Absorber. See Figure 9-3-A.

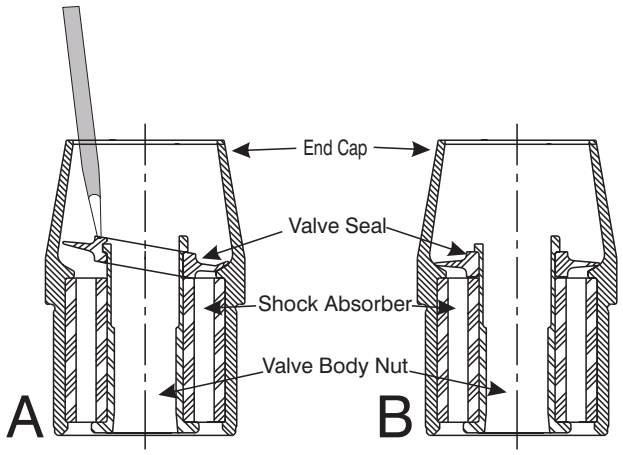


Figure 9-3. Press Valve Seal onto the Valve Body Nut .

12. With a large, flat screw driver, press the Valve Seal into the End Cap. Moving progressively around the seal, press each quarter of the seal deeper into the End Cap until the seal seats between the Shock Absorber and the shoulder at end of the Valve Body Nut (7) as shown in Figure 9-3-B.

9.5 Assemble Valve Stem Components

CAUTION

When securing the Valve Stem in position with a vise or clamp, pad the jaws to prevent damage to the finish surface.

1. Position the Valve (6) in an arbor press with the its larger bore up as shown in Figure 9-4-A.
2. Refer to Figure 9-4-A, and lubricate:

   The upper interior of the Valve (6)
   The exterior of Bushing. (5).

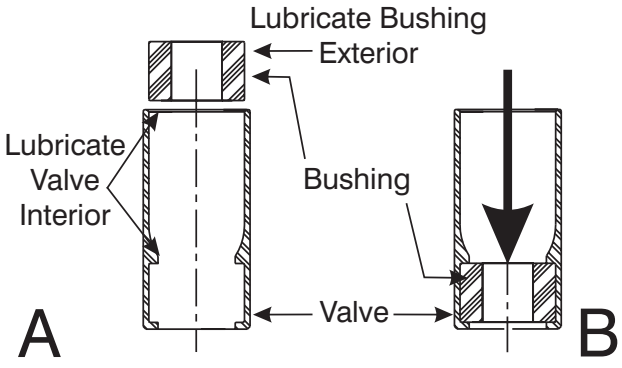


Figure 9-4. Press Bushing into Valve

3. Center the Bushing (5) over the bore of the Valve as shown in Figure 9-4-A.
4. Center the press plunger or a pusher bar over the Bushing (5).
5. Press the Valve Bushing (5) into the Valve (6) until the Bushing seats in the lower part of the Valve, as shown in Figure 9-4-B.
6. Refer to Figure 9-5, and lubricate:

   The inside of the Valve Bushing (5),
   The non-threaded end of the Valve Stem (4).

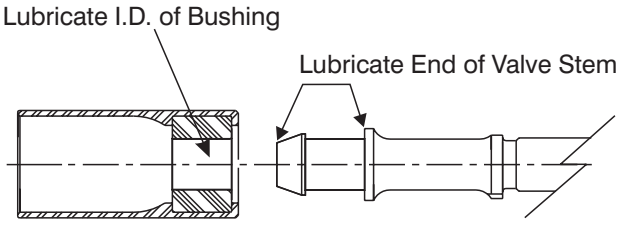


Figure 9-5. Lubricate Bushing and Valve Stem.

7. With the non-threaded end up, place the Valve Stem in an arbor press, as shown in Figure 9-6-A.

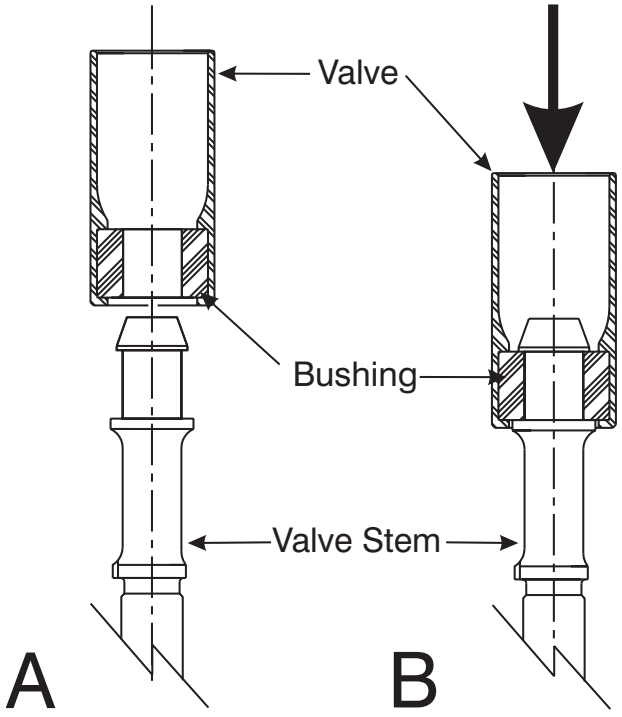


Figure 9-6. Press Valve and Bushing onto Valve Stem.

8. Center the assembled Valve and Bushing over the Valve Stem, as shown in Figure 9-6-A.
9. Center the press plunger over the Bushing (5).
10. Press the assembled Valve and Bushing onto the Valve Stem:

    Seat the Valve against the top of Bushing.
    Seat the bottom of the Bushing against the interior shoulder of the Valve.

9.6 Assemble Whip Hose and Fittings

WARNING
Always use Allied's Whip Hose Assembly (see parts list in Section 13.0) or equivalent: 100R2 hose. Failure to use 100R2 hose could result in injury to personnel.

1. Place the Whip Hose components and Q.D. fittings on the assembly bench. These items are listed below and illustrated in Figure 9-13.

    Whip Hose (13) - new 100R2 hose only
    Valve Nut (12) with Roll Pin (11
    Hose Socket (14) - quantity 2
    Q.D. Plug (15)
    Q.D. Gasket (16)
    Q.D. Socket (17)

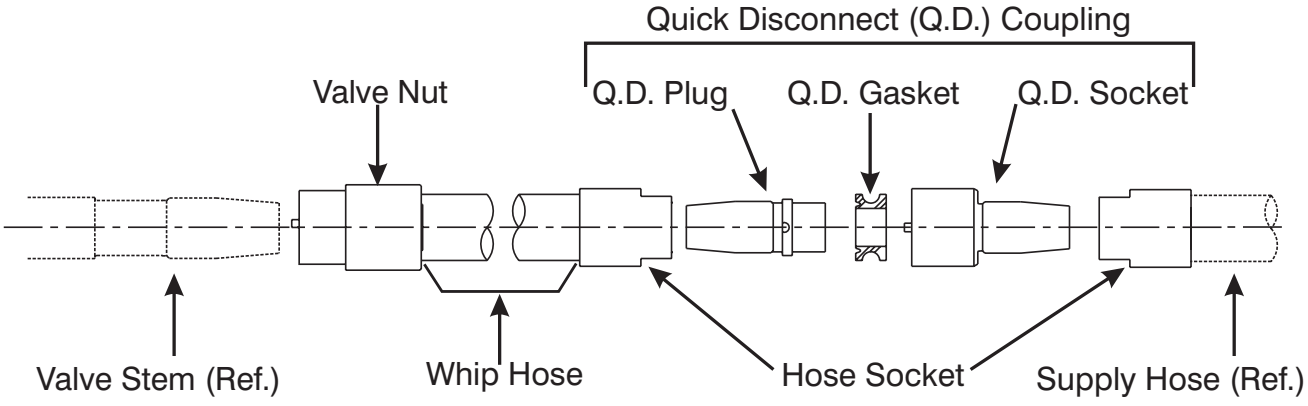


Figure 9-7. Whip Hose Components and Quick Disconnect Fittings.

Supply Hose (optional)

9.6.1. Assemble Q.D. Socket Fittings

1. Refer to Figure 9-8 and install a new

Figure 9-8. Install Gasket in Q.D. Socket.

Gasket (16) in the Quick Disconnect (Q.D.) Socket (17).

a. Hold the Gasket (16) with the grooved face toward the Quick Disconnect (Q.D.) Socket (17).

b. Squeeze the sides of the gasket and insert one end of the new Gasket into the Socket.

c. Press the Gasket into its seat with fingers or a blunt tool.

d. Check that the gasket seats securely in the socket.

NOTE

Allied does not provide the supply hose mentioned below. The connection instructions apply to typical 1.5-inch pneumatic supply hoses (equivalent to 100R2 hose).

2.

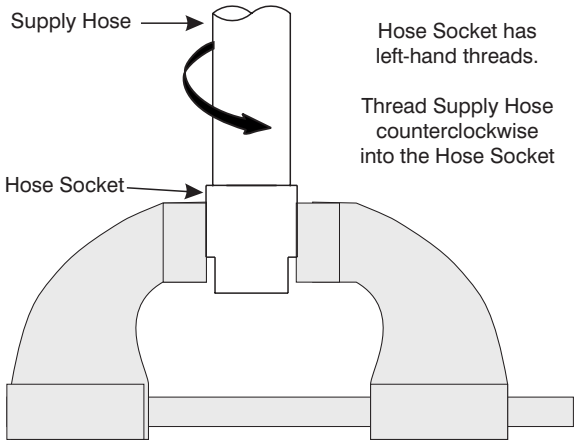


Figure 9-9.Hose Socket and Hose in Vise.

With its larger internal bore (hose end) facing up, clamp the Hose Socket (14) in a vise, as shown in Figure 9-9.

NOTE

The threads on the hose side of the Hose Socket are left hand threads. Turn the hose:

Clockwise to loosen.
Counterclockwise to tighten.

3. Thread the Supply Hose end into the Hose Socket, turning the hose counterclockwise until it bottoms in the Hose Socket.

4. Back the Supply Hose out of the Hose Socket ½ of a turn clockwise.

   This allows linear expansion of the hose when it is compressed by tightening the Q.D. Socket (17).

5. Remove the assembled Hose Socket and Supply Hose from the vise.

6. Apply a 2-inch open-end wrench across the flats of the Hose Socket (14) to hold the assembled hose and socket in place.

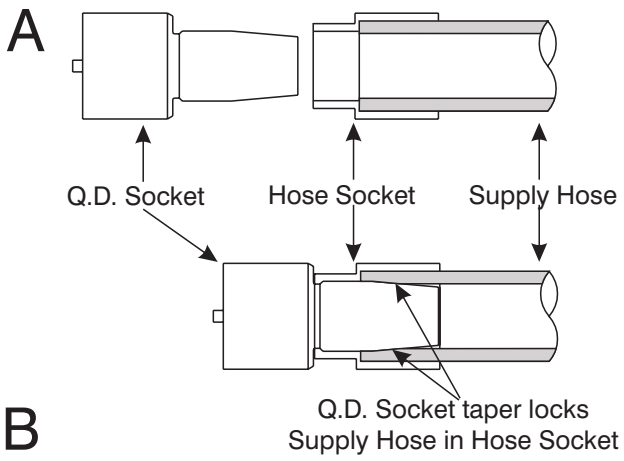


Figure 9-10. Thread Tapered End of Q.D. Socket into Hose Socket.

7. Start the tapered end of the Q.D. Socket (17) into the Hose Socket. See Figure 9-10-A.
8. Apply a 2-inch open-end wrench across the flats of the Q.D. Socket (17), and thread it into the Hose Socket (14). See Figure 9-10-B.

The taper of the Q.D. Socket moves into the Hose Socket and inside the Supply Hose. As the larger end of the taper expands the Supply Hose and presses it against the Hose Socket, the Supply Hose is locked in place between the Q.D. Socket and the Hose Socket.

9. Tighten the Q.D. Socket just enough to secure the two sockets together and secure the supply hose in the Hose Socket. Overtightening can damage the hose and it may pull apart under tension.

9.6.2. Assemble Q.D. Plug to Whip Hose

WARNING

Always use Allied's Whip Hose Assembly (see parts list in Section 13.0) or equivalent: 100R2 hose.

Failure to use 100R2 hose could result in injury to personnel.

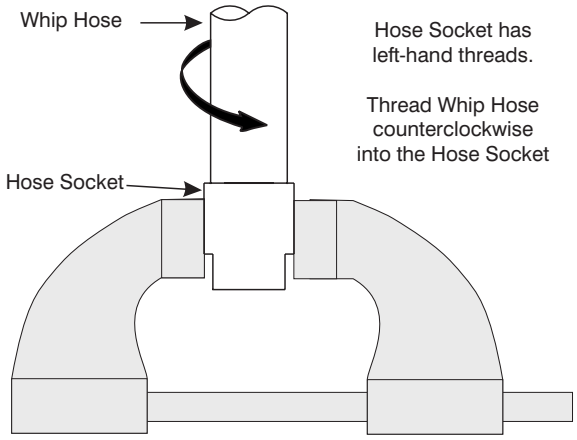


Figure 9-11. Hose Socket and Hose in Vise.

1. With its larger internal bore (hose end) facing up, clamp the Hose Socket (15) in a vise, as shown in Figure 9-11.

NOTE

The threads on the hose side of the Hose Socket are left hand threads. Turn the hose:

Clockwise to loosen.
Counterclockwise to tighten.

2. Thread one of the Whip Hose (13) ends into the Hose Socket, turning the hose counterclockwise until it bottoms in the Hose Socket.
3. Back the Whip Hose out of the Hose Socket ½ of a turn clockwise.

   This allows linear expansion of the hose when it is compressed by tightening the Q.D. Plug (15).
4. Remove the assembled Hose Socket and Whip Hose from the vise.
5. Apply a 2-inch open-end wrench across the flats of the Hose Socket (14) to hold the assembled hose and socket in place.

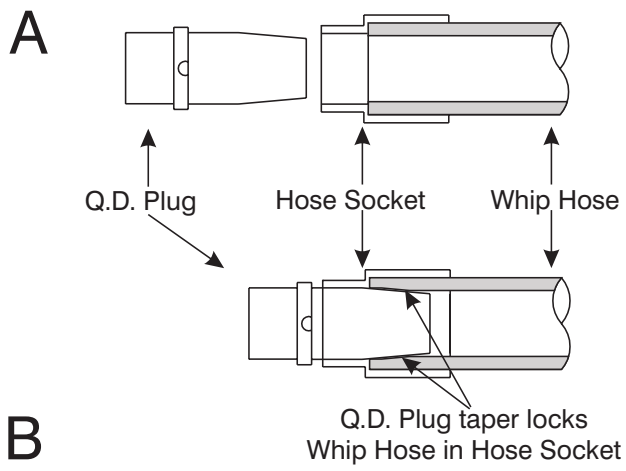


Figure 9-12. Thread Tapered End of Q.D. Plug into Hose Socket.

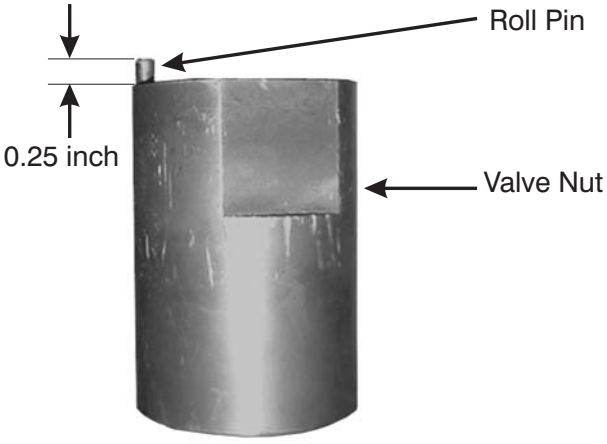


Figure 9-13. Valve Nut and Roll Pin

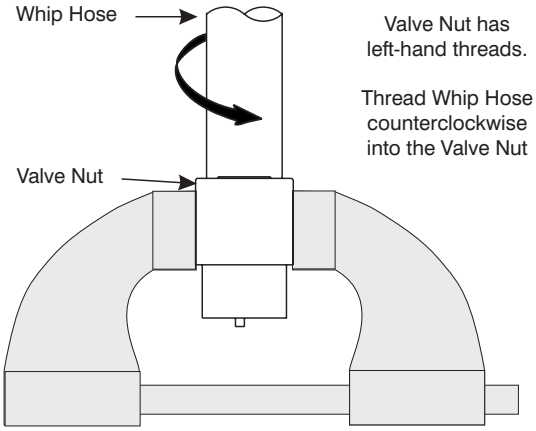


Figure 9-14. Valve Nut and Hose in Vise

6. Start the tapered end of the Q.D. Plug (15) into the Hose Socket. See Figure 9-12-A.

7. Use a 2-inch open-end wrench to tighten the Q.D. Plug (15) into the Hose Socket (14). See Figure 9-10-B.

   The taper of the Q.D. Plug moves into the Hose Socket and inside the Whip Hose. The larger end of the taper expands the Whip Hose and presses it against the Hose Socket. The Whip Hose is locked in place between the Q.D. Plug and the Hose Socket.

8. Tighten the Q.D. Plug just enough to secure the two fittings together and to secure the Whip Hose in the Hose Socket. Overtightening can damage the hose and it may pull apart under tension.

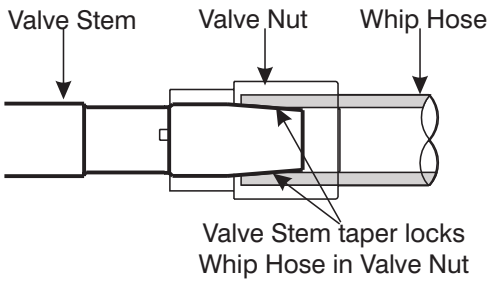


Figure 9-15. Valve Nut Secured to Valve Stem and Whip Hose.

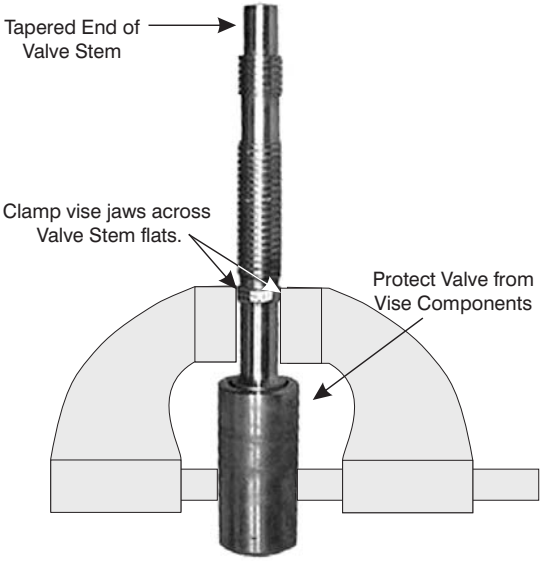


Figure 9-16. Valve Stem in Vise

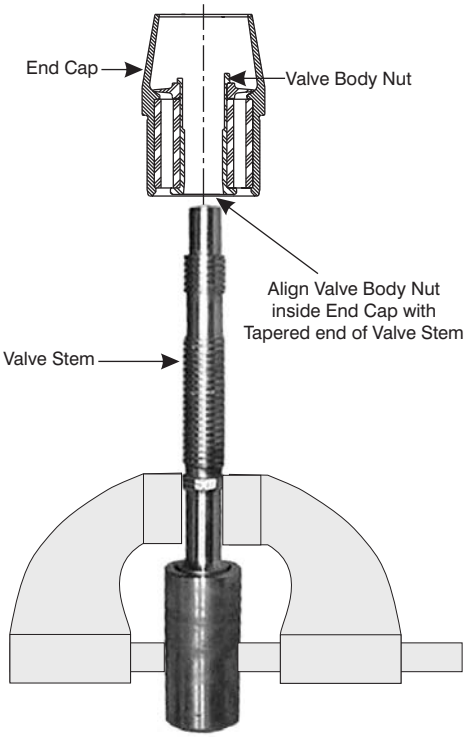


Figure 9-17. Align Valve Body Nut with the Tapered End of the Valve Stem.

9.6.3. Attach Valve Nut to Whip Hose

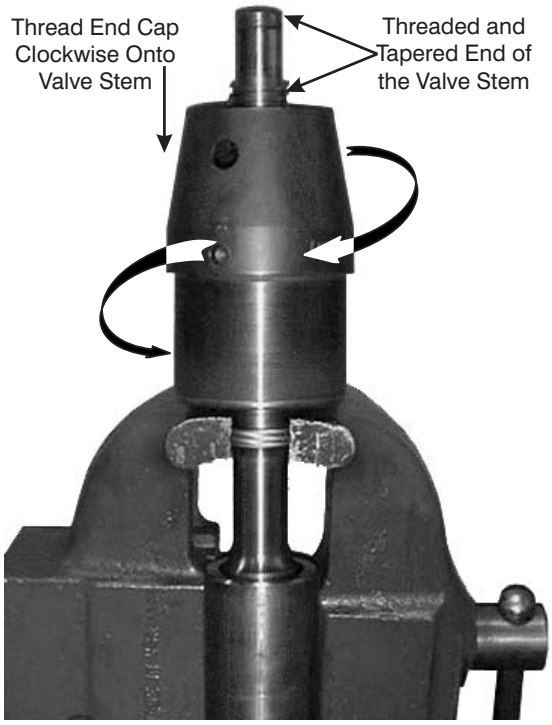


Figure 9-18. End Cap Threaded onto Valve Stem

WARNING

Always use Allied's Whip Hose Assembly (see parts list in Section 13.0) or equivalent: 100R2 hose. Failure to use 100R2 hose could result in injury to personnel.

Figure 9-19. Align Valve Nut on Valve Stem.

1. Inspect the Valve Nut (12) and Roll Pin (11). Verify that the Roll Pin extends 1/4-inch above the Valve Nut (12), as shown in Figure 9-13.

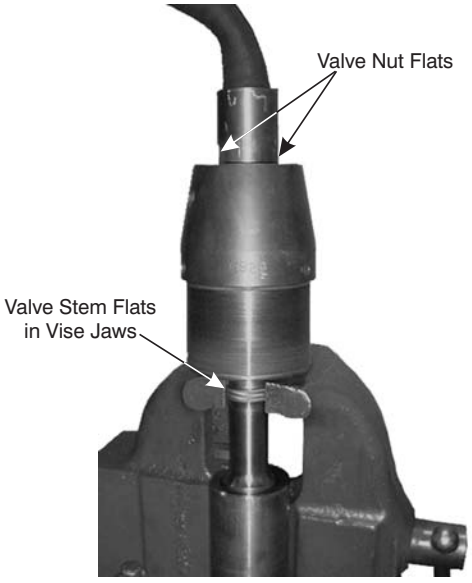


Figure 9-20. Tighten Valve Nut on Valve Stem.

The height of the Roll Pin controls the stroke timing. If the Roll Pin height is incorrect, replace both the Valve Nut and the Roll Pin.

2. With its larger internal bore (hose end) facing up, clamp the Valve Nut (12) in a vise, as shown in Figure 9-14.

NOTE

The threads on the hose side of the Valve Nut are left hand threads.

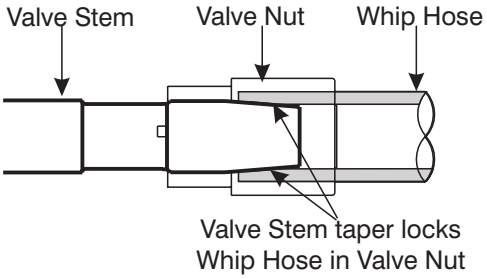


Figure 9-21. Valve Nut Secured to Valve Stem and Whip Hose.

Turn the hose:

Clockwise to loosen.
Counterclockwise to tighten.

3. Thread one of the Whip Hose (13) ends into the Valve Nut , turning the hose counterclockwise until it bottoms in the Valve Nut .

4. Back the Whip Hose out of the Valve Nut ½ of a turn clockwise.

This allows linear expansion of the hose when it is compressed by the tapered end of the Valve Stem during procedure 9.7, below.

NOTE

DO NOT put strain on the Valve Nut to Whip Hose connection before the Valve Stem is installed. The Valve Nut can be pulled from the Whip Hose until the tapered end of the Valve Stem locks the Whip Hose against the Valve Nut threads, as shown in Figure 9-15.

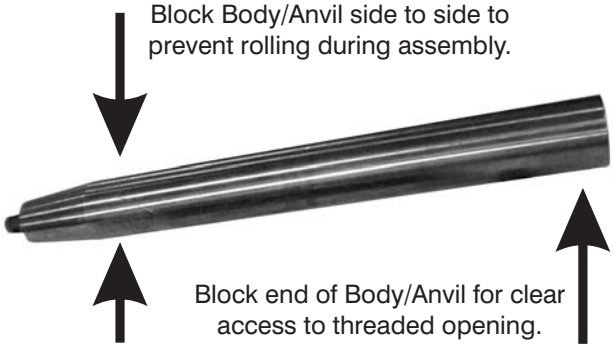


Figure 9-22. Blocking the Body/Anvil

9.7 Assemble Whip Hose & Tail Assembly

1. Position the assembled Valve Stem (4), Bushing (5) and Valve (4) in a vise with the threaded and tapered end of the Valve Stem (4) above the jaws and the Valve (6) below the jaws, as shown in Figure 9-16.

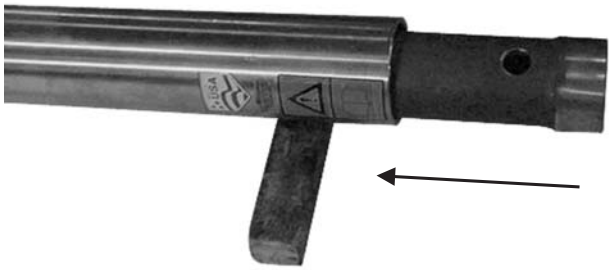


Figure 9-23. Install Striker into Body/Anvil.

2. Be sure the Valve (6) does not get caught in or interfere with vice components below the jaws.

3. Clamp the vise jaws firmly across the flats of the Valve Stem (4) as shown in Figure 9-16.

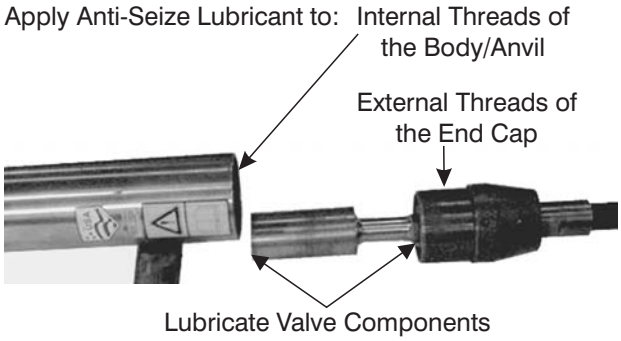


Figure 9-24. Prepare Tail Assembly and Body Anvil for Assembly.

4. Carefully lift the assembled End Cap (9) above the tapered end of the Valve Stem.

5. Align the Valve Body Nut (7), housed

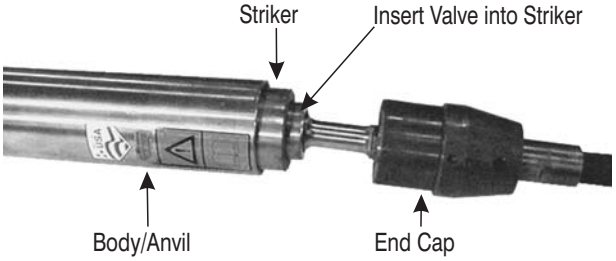


Figure 9-25. Insert Valve into Striker.

in the End Cap, with the Valve Stem as shown in Figure 9-17.

6. Slide the End Cap (9) down the Valve Stem (4) until the Valve Body Nut (7) engages the threads of the Valve Stem (4) . Thread the End Cap clockwise down the Valve stem until the tapered and threaded end is accessible as shown in Figure 9-18.

7. Obtain a Whip Hose (13) with the Valve Nut (12) attached as described in paragraph 9.6.3

8. Refer to Figure 9-19, and slide the open bore of the Valve Nut (12) over the tapered end of the Valve Stem (4). By hand, align and thread the Valve Nut onto the Valve Stem.

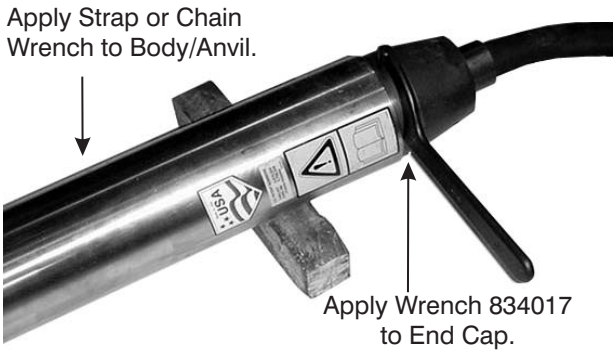


Figure 9-26. Secure End Cap to Body/Anvil.

9. Refer to Figure 9-20. Verify that the Valve Stem is securely held in the vise with the flats squarely between the jaws.

10. Apply a 2-3/8-inch open-end wrench across the flats of the Valve Nut (12),

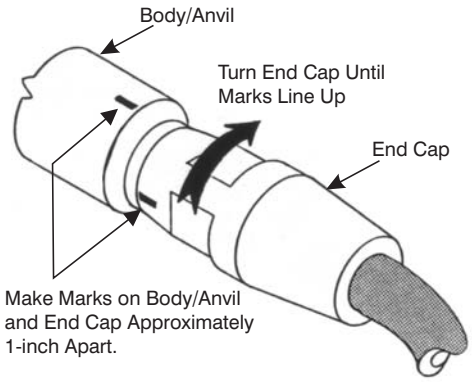


Figure 9-27. Tighten End Cap.

and secure it to the Valve Stem (4).

Refer to Figure 9-21. The taper of the Valve Stem moves into the Valve Nut and inside the Whip Hose. The larger end of the taper expands the Whip Hose and presses it against the Valve Nut. The Whip Hose is locked in place between the Valve Stem and the Valve Nut.

11.

Tighten the Valve Nut until it just reaches the end of upper threads on the Valve Stem.

9.8 Assemble Body/Anvil, Striker and Tail Assembly

NOTE

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

WARNING

The Body/Anvil and Striker are heavy. Bodily injury could result from improper handling of heavy components.

1. Place the Body/Anvil (1) on the work surface. Block so the open end is easily accessible and the Body/Anvil will not accidentally roll off the work surface. Refer to Figure 9-22.
2. Coat the Striker (2) with hydraulic fluid before installing it into Body/Anvil (1).
3. Refer to Figure 9-23 and slide the Striker (2) into the Body/Anvil (1). The back end of the Striker should be about 6 in. to 8 in. in (past the threads of the Body/Anvil).
4. Apply anti-seize thread lubricant sparingly to the threads of the End Cap (9) and the Body/Anvil (1). See Figure 9-24.
5. With the exception of the End Cap (9) and Whip Hose (13), coat the tail assembly components with hydraulic fluid.
6. Insert the Valve (6) into the Striker (2) and thread the End Cap (9) into the Body/Anvil (1), as shown in Figure 9-25.
7. Hand tighten the End Cap (9) to the Body/Anvil (1).
8. Place the Hole-Hog on a level surface. Holding the Body/Anvil (1) with a strap wrench, use wrench P/N 834017 to tighten the End Cap (9), as shown in Figure 9-26.
9. Tighten the End Cap to a torque of 550-ft.-lbs (745nm). If a torque wrench is not available, use the following procedure. See Figure 9-27.
   a. After tightening the End Cap hand tight, put a scribe mark on the End Cap next to the Body/Anvil.
   b. Measure from the scribe line 1-inch $\pm$1/8-inch and put another scribe mark on the Body/Anvil.
   c. Using P/N 834017 wrench, or equivalent, tighten the end cap until the mark on the end cap is in alignment with the mark on the body within the tolerance indicated.

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 9.8, Step 9.
- Clean and oil Hole-Hog.
- Lubricate Hole-Hog according to Section 7.0.

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.

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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

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 Replacement of the Whip Hose

CAUTION
Hole-Hog performance and operating life will be seriously reduced if the internal components are contaminated with dust or dirt.

The Whip Hose Assembly (13) may be changed as part of shop disassembly or changed in the field by the following procedure.

11.2 Repair Preparations

1. Obtain the required tools:
   a. Allied End-Cap wrench number 834017.
   b. Strap or chain wrench to hold the Body/Anvil: 4000: 6" dia; 4001: 8" dia.
   c. Open end wrench, 2-3/8".
   d. Open end wrench, 2".
2. 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 internal components.

3. To prevent contamination of the Striker, Body/Anvil and Tail Assembly, obtain a canvas or plastic sheet to cover the Tail Assembly and one to cover the open end of the Body/Anvil.
4. 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.

11.3 Remove Tail Assembly

1. Place the Hole-Hog on the work area tarp. Hold the Body/Anvil (1) with a strap wrench. Use wrench P/N 834017 to loosen the End Cap (9). It may be necessary to strike the wrench handle several times with a hammer to loosen the End Cap. Refer to Figure 11-1.
2. Remove the tail assembly by unthreading the End Cap (9) and pulling the tail assembly from the Body/Anvil (1) as shown in Figure 11-2.

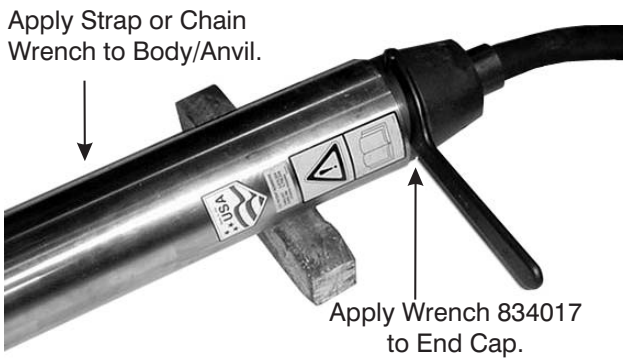

Figure 11-1. Loosening the End Cap

3. Place the tail assembly where it will not be contaminated with dust and dirt. If the repair area is very dusty, wrap it in a piece of cloth or plastic tarp until the Whip Hose is removed.

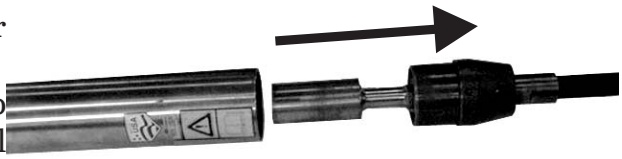

Figure 11-2. Removing Tail Assembly

4. Tip the Body/Anvil (1) so the Striker (2) slides to the anvil end.
5. Prevent dust and dirt from entering the Body/Anvil by wrapping its open end with a clean piece of plastic or canvas tarp. Secure this in place with an elastic cord or duct tape.
6. Place the Body/Anvil where it will not be contaminated with dust and dirt.

11.4 Remove Whip Hose Assembly

NOTE

DO NOT disassemble components of the tail assembly. Remove and disassemble only the Valve Nut and the Whip Hose Components that requirere placement.

1. Position the Tail Assembly in a vise so the End Cap (9) and Whip Hose (13) are above the vise jaws. The Valve (6) should

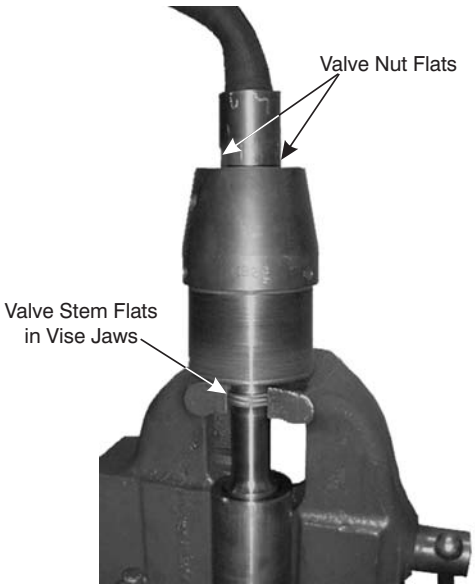

Figure 11-3. Place End Cap in Vise.

be below the jaws, as shown in Figure 11-3.

2. Be sure the valve does not get caught in or interfere with vise components below the jaws.

Figure 11-4. Thread the Valve Nut from the Valve Stem.

3. Secure the Tail Assembly in the vise by clamping the jaws firmly across the flats of the Valve Stem (4) as shown in Figure 11-3.

4. Fit a 2-3/8-inch open-end wrench across the Valve Nut flats. Loosen the Valve Nut.

5. Thread the Valve Nut and assembled Whip Hose from the Valve Stem as shown in Figure 11-4.

6. DO NOT remove the Valve Stem from the End Cap. Wrap these components

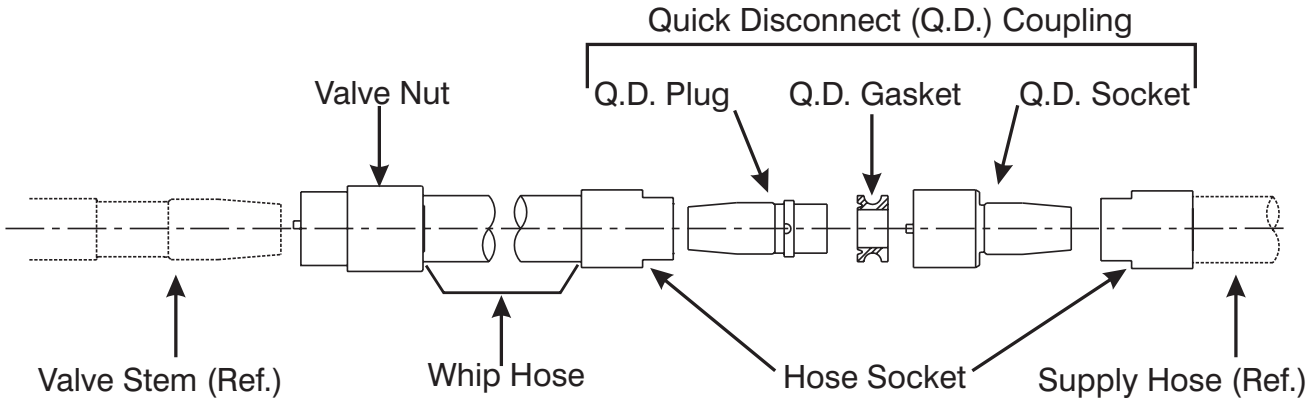

Figure 11-5. Whip Hose Components and Quick Disconnect Fittings.

in a protective piece of plastic or canvas tarp and set them aside with the Body/Anvil.

11.5 Disassemble Whip Hose and Quick Disconnect (Q.D.) Fittings

Refer to Figure 11-5 and determine which components must be replaced and/or disassembled. Disassemble the Whip Hose components only as far as required for repair or

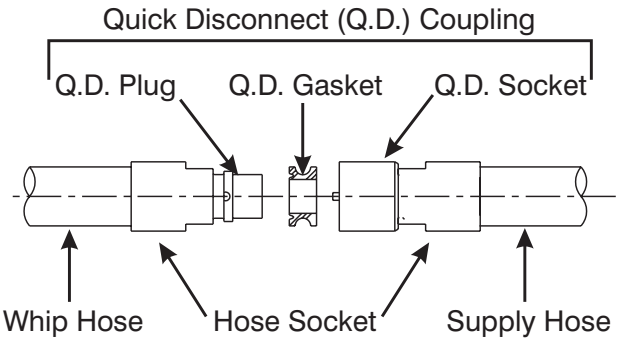

Figure 11-6. Quick Disconnect Components

replacement.

If the Whip Hose and all of the Quick Disconnect (Q.D.) components are to be replaced, disassembly of the old hose and coupling is not necessary.

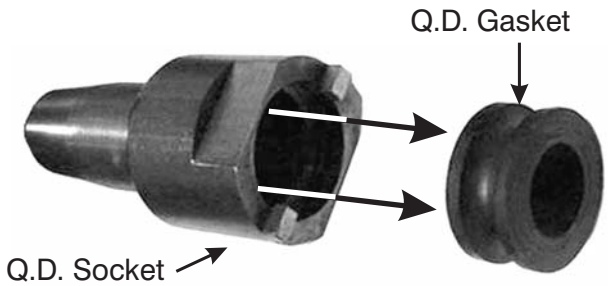

Figure 11-7. Remove Q.D. Gasket.

Discard the old assembly and proceed to the whip hose assembly instructions in paragraph 11.6.

If only a few of the Whip Hose and Q.D. components are to be replaced, perform the following disassembly procedure.

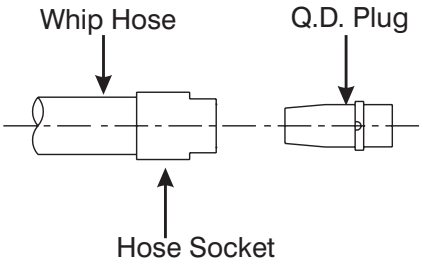

Figure 11-8. Remove Q.D. Plug.

1. Refer to Figure 11-6, and separate Q.D. Socket (17) from the Q.D. Plug (15).

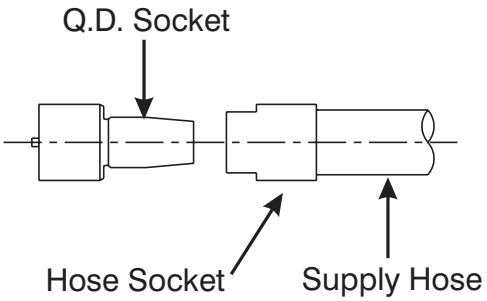

Figure 11-9. Q.D. Socket and Hose

2. Use a screw driver or needlenose pliers to pry the Gasket (16) from the Socket. Discard the gasket. Refer to Figure 11-7.
3. Separate the Q.D. Plug (15) from the Whip Hose (13) by threading the Q.D.

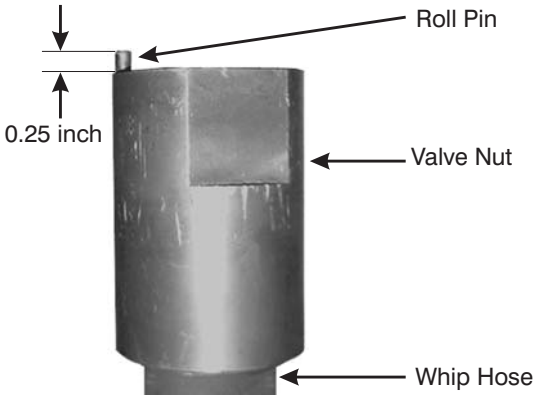

Figure 11-10. Valve Nut Assembly

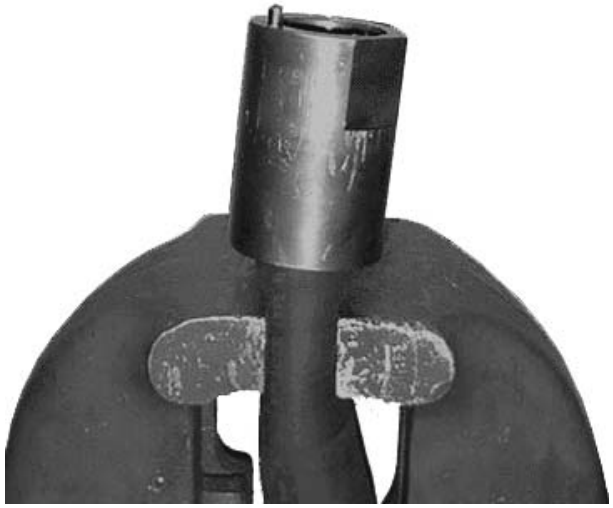

Figure 11-11. Valve Nut and Whip Hose in Vise

Plug (15) out of Hose Socket (14). Refer to Figure 11-8.

a. Use a 2-inch open-end wrench to hold the Hose Socket (14).

b. Use a 1-1/2-inch open-end wrench to thread the Q.D. Plug (15) from the Hose Socket (14).

c. To remove the hose socket from the Whip Hose (13), refer to step 6, below.

4. Separate the Q.D. Socket (17) from its Hose by threading the Q.D. Socket (17) out of the Hose Socket (14). Refer to Figure 11-9.

a. Use a 2-inch open end wrench to hold the Hose Socket (14).

b. Use a 2-inch open end wrench to thread the Q.D. Socket (17) from the Hose Socket (14).

c. To remove the hose socket from its hose, refer to step 6, below.

5. Refer to Figure 11-10. Inspect the Roll Pin (11) for damage and correct height. The Roll Pin should extend 1/4-inch from the Valve Nut (12).

If either the Roll Pin (11) or Valve Nut (12) must be replaced, replace both components.

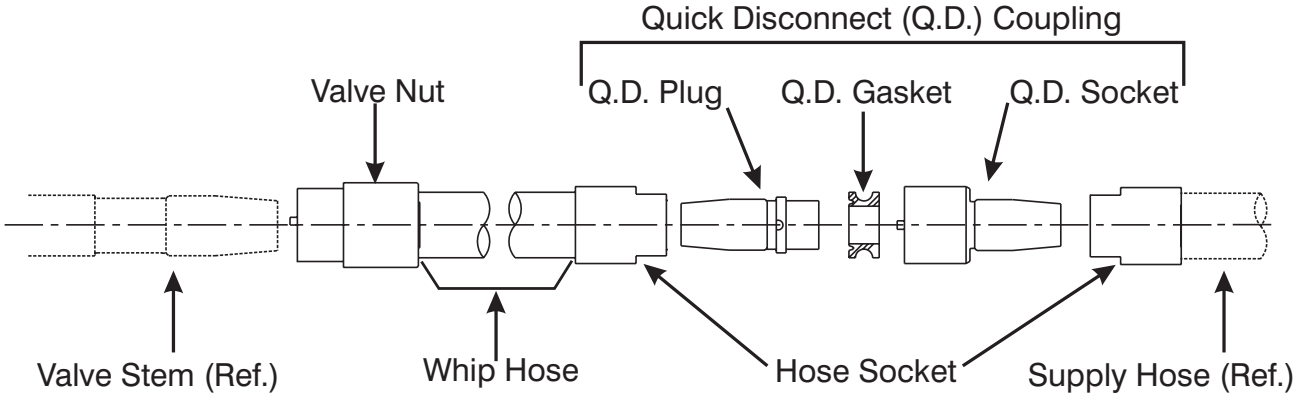

Figure 11-12. Whip Hose Components and Quick Disconnect Fittings.

If replacement is not required, DO NOT remove the Roll Pin (11) from the Valve Nut (12).

6. To remove the Valve Nut or either of the Hose Sockets from their hoses (shown in Figure 11-5), complete the following procedure:

   a. Clamp the hose in a vise with the attached Hose Socket or Valve Nut standing vertically above the jaws. Refer to Figure 11-11.

NOTE

The threads on the hose side of the Valve Nut and Hose Sockets are left hand threads; turn nut or socket:

Clockwise to loosen.
Counterclockwise to tighten.

   b. Grip the nut or socket with an open end wrench:

   Use a 2-3/8-inch open-end wrench across the flats of the Valve Nut (12). Use a 2-inch open-end wrench across the flats of a Hose Socket (14).

   c. Turn the Hose Socket or Valve Nut clockwise to remove it from the hose.

7. After removing the Valve Nut or Hose Socket (12 or 14) from Whip Hose (13), discard the Whip Hose.

11.6 Assemble Whip Hose and Fittings

WARNING
Always use Allied's Whip Hose Assembly (see parts list in Section 13.0) or equivalent: 100R2 hose. Failure to use 100R2 hose could result in injury to personnel.

Figure 11-13. Install Gasket in Q.D. Socket.

NOTE

Allied does not provide the supply hose mentioned below. The connection instructions apply to typical 1.5-inch pneumatic supply hoses (equivalent to 100R2 hose).

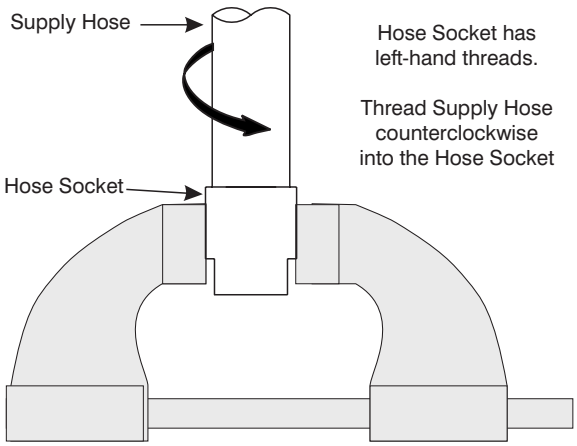

Figure 11-14. Hose Socket and Hose in Vise

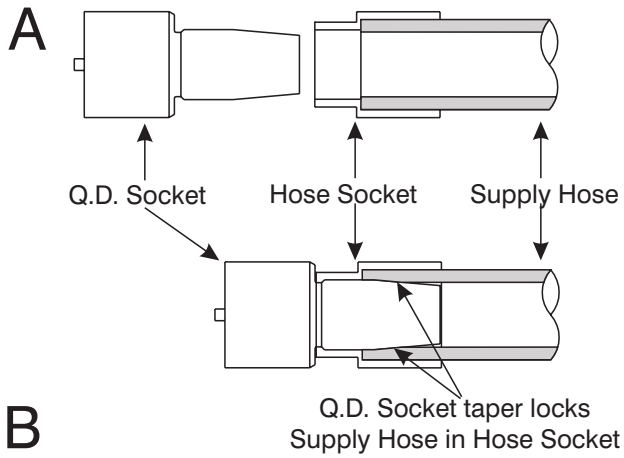

Figure 11-15. Thread Tapered End of Q.D. Socket into Hose Socket.

1. Place the Whip Hose components and Q.D. fittings on the assembly bench. These items are listed below and illustrated in Figure 11-12.

   Whip Hose (13) - new 100R2 hose only
   Valve Nut (12) with Roll Pin (11)
   Hose Socket (14) - quantity 2
   Q.D. Plug (15)
   Q.D. Gasket (16)
   Q.D. Socket (17)
   Supply Hose (optional)

11.6.1. Assemble Q.D. Socket Fittings

1. Refer to Figure 11-13 and install a new Gasket (16) in the Quick Disconnect (Q.D.) Socket (17).

   a. Hold the Gasket (16) with the grooved face toward the Quick Disconnect (Q.D.) Socket (17).

   b. Squeeze the sides of the gasket and insert one end of the new Gasket into the Socket.

   c. Press the Gasket into its seat with fingers or a blunt tool.

   d. Check that the gasket seats securely in the socket.

2. With its larger internal bore (hose end) facing up, clamp the Hose Socket (14) in a vise, as shown in Figure 11-14.

NOTE

The threads on the hose side of the Hose Socket are left hand threads. Turn the hose:

Clockwise to loosen.
Counterclockwise to tighten.

3. Thread the Supply Hose end into the Hose Socket, turning the hose counterclockwise until it bottoms in the Hose Socket.

4. Back the Supply Hose out of the Hose Socket ½ of a turn clockwise.

   This allows linear expansion of the hose when it is compressed by tighten-

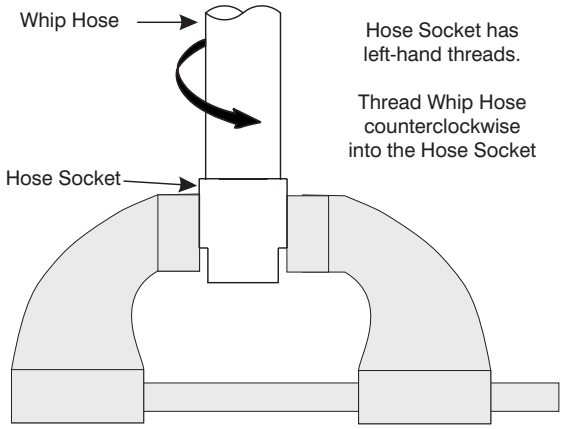

Figure 11-16. Hose Socket and Hose in Vise.

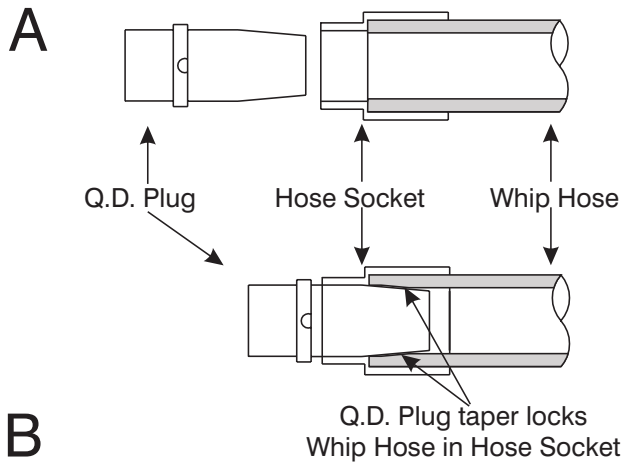

Figure 11-17. Thread Tapered End of Q.D. Plug into Hose Socket.

ing the Q.D. Socket (17).

5. Remove the assembled Hose Socket and Supply Hose from the vise.
6. Apply a 2-inch open-end wrench across the flats of the Hose Socket (14) to hold the assembled hose and socket in place.
7. Start the tapered end of the Q.D. Socket (17) into the Hose Socket. See Figure 11-15-A.
8. Apply a xxx-inch open-end wrench across the flats of the Q.D. Socket (17), and thread it into the Hose Socket (14). See Figure 11-15-B.

   The taper of the Q.D. Socket moves into the Hose Socket and inside the Supply Hose. As the larger end of the taper expands the Supply Hose and presses it against the Hose Socket, the Supply Hose is locked in place between the Q.D. Socket and the Hose Socket.
9. Tighten the Q.D. Socket just enough to secure the two sockets together and secure the supply hose in the Hose Socket.

   Overtightening can damage the hose and it may pull apart under tension.

11.6.2. Attach Q.D. Plug to Whip Hose

WARNING

Always use Allied's Whip Hose Assembly (see parts list in Section 13.0) or equivalent: 100R2 hose. Failure to use 100R2 hose could result in injury to personnel.

1. With its larger internal bore (hose end) facing up, clamp the Hose Socket (15) in a vise, as shown in Figure 11-16.

NOTE

The threads on the hose side of the Hose Socket are left hand threads. Turn the hose:

Clockwise to loosen.
Counterclockwise to tighten.

2. Thread one of the Whip Hose (13) ends into the Hose Socket, turning the hose

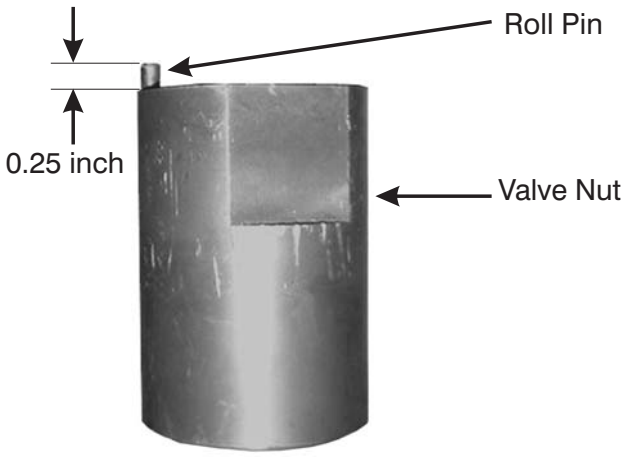

Figure 11-18. Valve Nut and Roll Pin

counterclockwise until it bottoms in the Hose Socket.

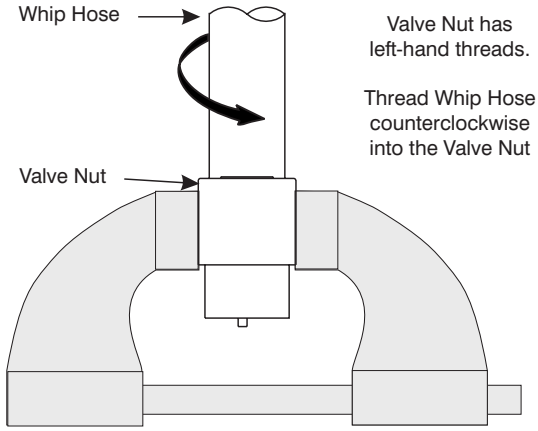

Figure 11-19. Valve Nut and Hose in Vise

3. Back the Whip Hose out of the Hose Socket ½ of a turn clockwise.

   This allows linear expansion of the hose when it is compressed by tightening the Q.D. Plug (15).

4. Remove the assembled Hose Socket and Whip Hose from the vise.

5. Apply a 2-inch open-end wrench across the flats of the Hose Socket (14) to hold the assembled hose and socket in place.

6. Start the tapered end of the Q.D. Plug (15) into the Hose Socket. See Figure 11-17-A.

7. Use a 1-1/2-inch open-end wrench to tighten the Q.D. Plug (15) into the Hose Socket (14). See Figure 11-17-B.

   The taper of the Q.D. Plug moves into the Hose Socket and inside the Whip Hose. The larger end of the taper expands the Whip Hose and presses it against the Hose Socket. The Whip Hose is locked in place between the Q.D. Plug and the Hose Socket.

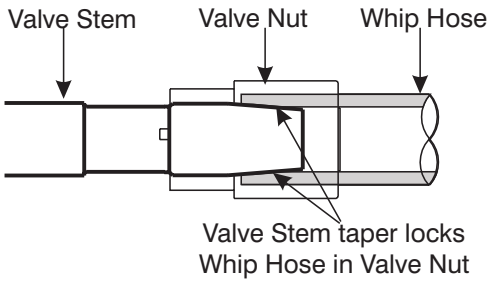

Figure 11-20. Valve Nut Secured to Valve Stem and Whip Hose

8. Tighten the Q.D. Plug just enough to secure the two fittings together and to secure the Whip Hose in the Hose Socket. Overtightening can damage the hose and it may pull apart under tension.

11.6.3. Attach Valve Nut to Whip Hose

WARNING
Always use Allied's Whip Hose Assembly (see parts list in Section 13.0) or equivalent: 100R2 hose. Failure to use 100R2 hose could result in injury to personnel.

1.

Figure 11-21. Align Valve Nut on Valve Stem.

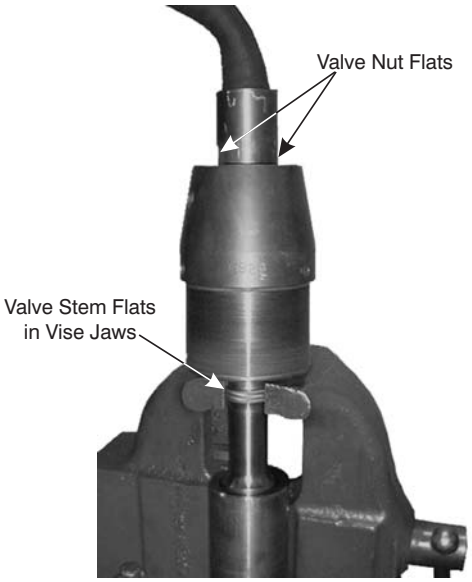

Figure 11-22. Tighten Valve Nut on Valve Stem.

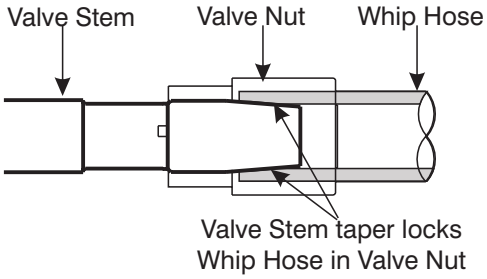

Figure 11-23. Valve Nut Secured to Valve Stem and Whip Hose

Inspect the Valve Nut (12) and Roll Pin (11). Verify that the Roll Pin extends 1/4-inch above the Valve Nut (12), as shown in Figure 11-18.

The height of the Roll Pin controls the stroke timing. If the Roll Pin height is incorrect, replace both the Valve Nut and the Roll Pin.

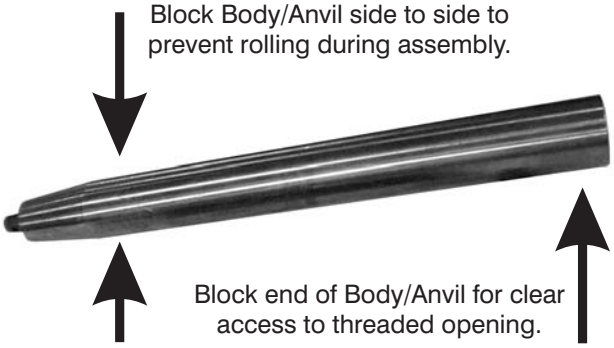

Figure 11-24. Blocking the Body/Anvil

2. With its larger internal bore (hose end) facing up, clamp the Valve Nut (12) in a vise, as shown in Figure 11-19.

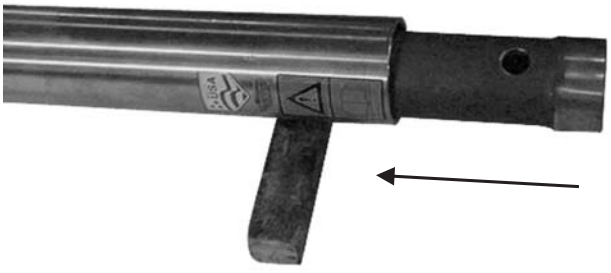

Figure 11-25. Install Striker into Body/Anvil.

NOTE

The threads on the hose side of the Valve Nut are left hand threads. Turn the hose:

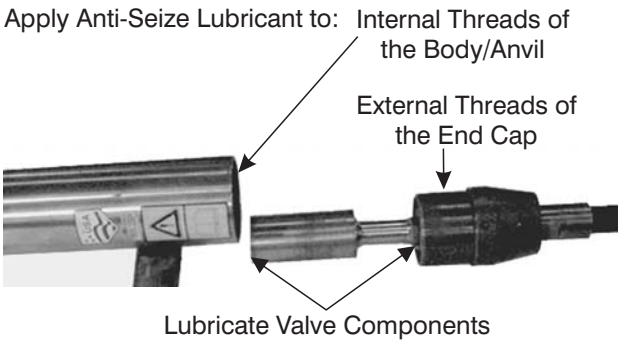

Figure 11-26. Prepare Tail Assembly and Body Anvil for Assembly.

Clockwise to loosen.
Counterclockwise to tighten.

3. Thread one of the Whip Hose (13) ends into the Valve Nut, turning the hose counterclockwise until it bottoms in the Valve Nut.

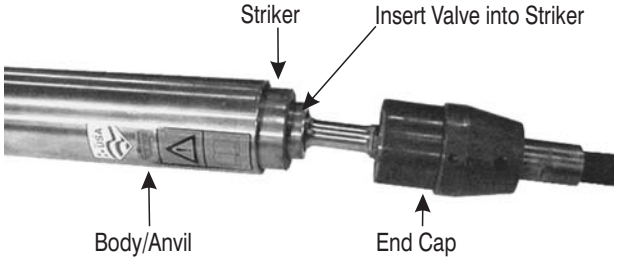

Figure 11-27. Insert Valve into Striker.

4. Back the Whip Hose out of the Valve Nut ½ of a turn clockwise.

This allows linear expansion of the hose when it is compressed by the tapered end of the Valve Stem during procedure11.7, below.

NOTE

DO NOT put strain on the Valve Nut to Whip Hose connection before the Valve Stem is installed. The Valve Nut can be pulled from the Whip Hose until the tapered end of the Valve Stem locks the

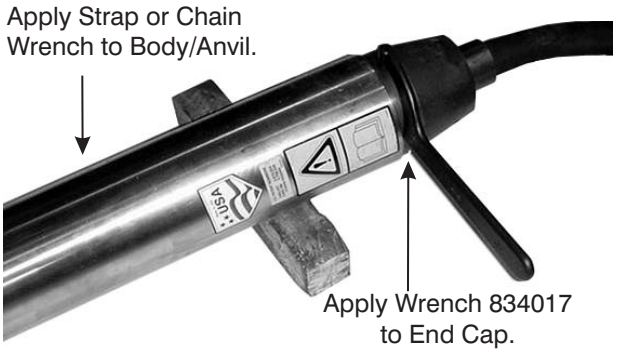

Figure11-28. Secure End Cap to Body/Anvil.

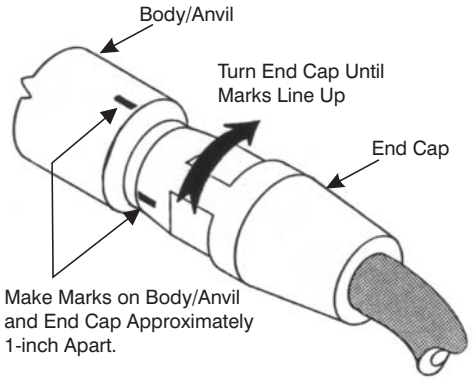

Figure 11-29. Tighten End Cap.

Whip Hose against the Valve Nut threads, as shown in Figure 11-20.

11.7 Attach The Assembled Whip Hose Components to The Tail Assembly

1. Place on the work bench:

   The assembled Whip Hose components and Q.D. Fittings

   The assembled Valve Stem and End Cap components.

2. Refer to Figure 11-21, and slide the open bore of the Valve Nut (12) over the tapered end of the Valve Stem (4). By hand, align and thread the Valve Nut onto the Valve Stem.

3. Refer to Figure 11-22. Verify that the Valve Stem is securely held in the vise with the flats squarely between the jaws.

4. Apply a 2-3/8-inch open-end wrench across the flats of the Valve Nut (12), and secure it to the Valve Stem (4).

   Refer to Figure 11-23. The taper of the Valve Stem moves into the Valve Nut and inside the Whip Hose. The larger end of the taper expands the Whip Hose and presses it against the Valve Nut. The Whip Hose is locked in place between the Valve Stem and the Valve Nut.

5. Tighten the Valve Nut until it just reaches the end of upper threads on the Valve Stem.

11.8 Clean Components

1. Place the Tail Assembly and Body/Anvil on the work area tarp and unwrap them.

2.

Inspect the internal operating parts (striker and valve stem components) for dirt or other contamination that will hinder proper operation.

3. Flush contaminated parts with clean hydraulic fluid. Use mineral spirits to remove persistent contamination.
4. Use clean cloths to wipe away excess cleaning fluids.
5. Repeat steps 2 through 4 until the parts are ready for assembly. Proceed to 11.9.

11.9 Body/Anvil and Tail Assembly

WARNING
The Body/Anvil and Striker are heavy. Bodily injury could result from improper handling of heavy components.

1. Place the Body/Anvil (1) on the work surface. Block so the open end is easily accessible and the Body/Anvil will not accidentally roll off the work surface. Refer to Figure 11-24.
2. If the Striker (2) has been removed from the Body/Anvil for cleaning:
   a. Lightly coat the Striker with hydraulic fluid before re-installing it into Body/Anvil (1).
   b. Refer to Figure 11-25, 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.
3. Apply anti-seize thread lubricant sparingly to the threads of the End Cap (9) and the Body/Anvil (1) as shown in Figure 11-26.
4. With the exception of the End Cap (9) and Whip Hose (14), lightly coat the tail assembly components with hydraulic fluid.
5. Insert the Valve (6) into the Striker (2) and thread the End Cap (9) into the Body/Anvil (1). See Figure 11-27.
6. Hand tighten the End Cap (9) to the Body/Anvil (1).
7. Place the Hole-Hog on a level surface. Holding the Body/Anvil (1) with a strap wrench, use wrench P/N 834017 to tighten the End Cap (9), as shown in Figure 11-28.
8. The End Cap should be tightened to a torque of 550 ft.-lbs (745 nm). If a torque wrench is not available, use the following procedure. See Figure 11-29.
   a. After tightening the End Cap hand tight, put a scribe mark on the End Cap next to the Body/Anvil.
   b. Measure from the scribe line 1-inch $\pm$1/8-inch and put another scribe mark on the Body/Anvil.
   c. Using P/N 834017 wrench, or equivalent, tighten the end cap until the mark on the end cap is in alignment with the mark second on the body within the tolerance indicated.

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.

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SECTION 14.0
PARTS & WARRANTY INFORMATION

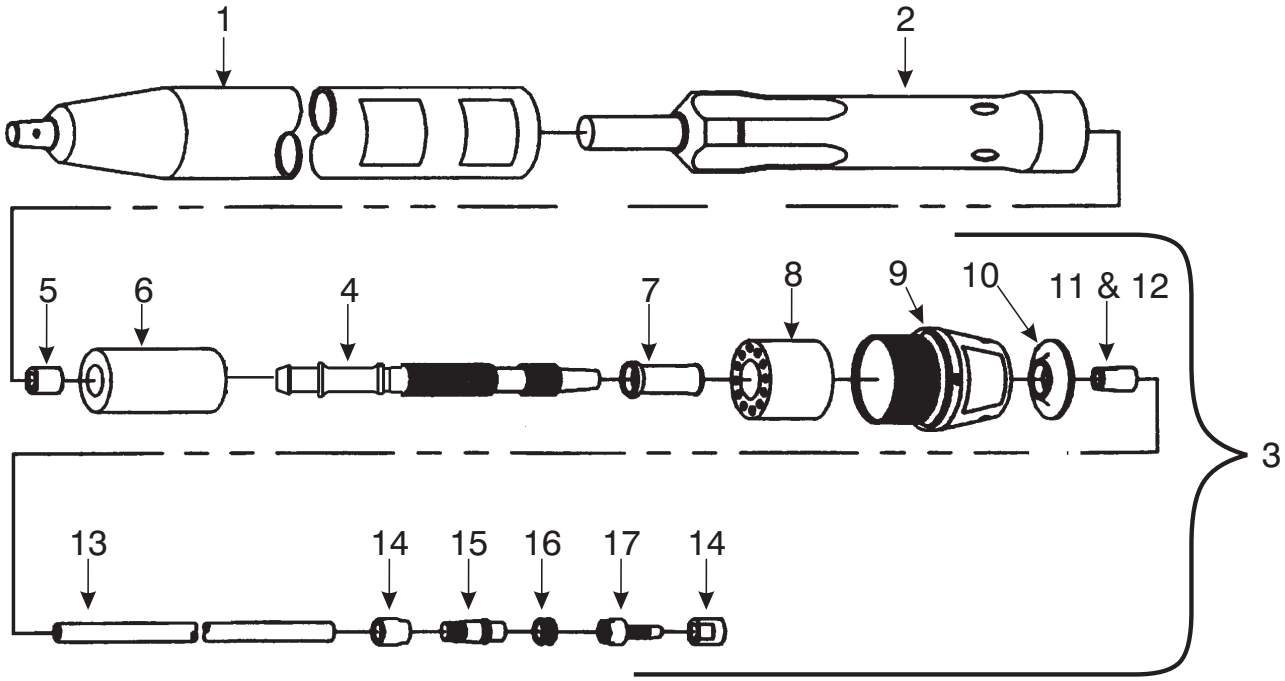

Figure 14-1. Model 4000 Hole-Hog Complete Assembly

Model 4000 Hole-Hog Complete Assembly Part No. 834000			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	834020	Body/Anvil/
2	1	834021	Striker
3		834048	Tail Assembly (Includes Items 4 thru 17)
4	1	834004	Valve Stem
5	1	834012	Valve Bushing
6	1	834014	Valve Sleeve
7	1	834006	Valve Body Nut
8	1	834057	Shock Absorber
9	1	834007	End Cap
10	1	834013	Valve Seal
11	1	833019	Roll Pin
12	1	834016	Valve Nut
*13	1	834041	Hose
*14	2	834009	Hose Socket
*15	1	834008	Plug, Quick Disconnect Coupling
*16	1	834011	Gasket, Q.D. Coupling
*17	1	834046	Socket, Quick Disconnect Coupling
18	1	834017	Spanner Wrench

* Effective serial number 02626: Item 13 replaced by P/N 572342 and items 14 through 17 replaced by 2x P/N 572341.

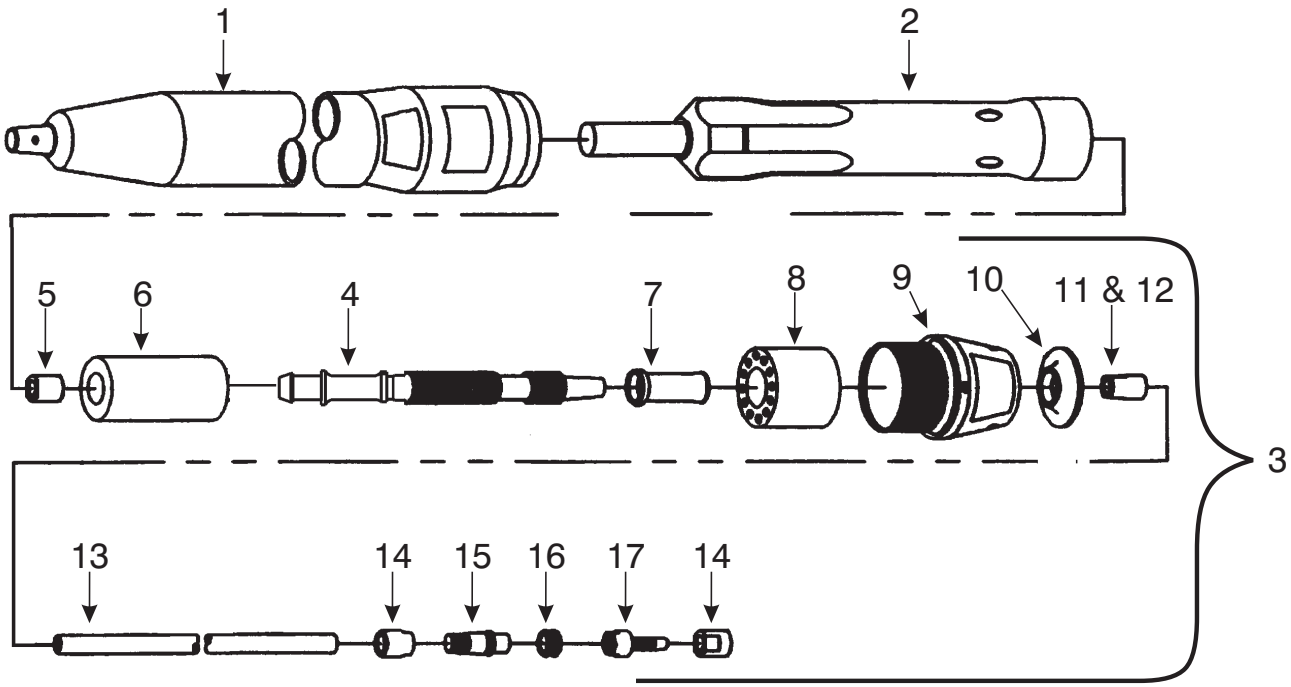

Figure 14-2. Model 4001 Hole-Hog Complete Assembly

Model 4001 Hole-Hog Complete Assembly Part No. 834402			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	834401	Body/Anvil/
2	1	834021	Striker
3		834048	Tail Assembly (Includes Items 4 thru 17)
4	1	834004	Valve Stem
5	1	834012	Valve Bushing
6	1	834014	Valve Sleeve
7	1	834006	Valve Body Nut
8	1	834057	Shock Absorber
9	1	834007	End Cap
10	1	834013	Valve Seal
11	1	833019	Roll Pin
12	1	834016	Valve Nut
*13	1	834041	Hose
*14	2	834009	Hose Socket
*15	1	834008	Plug, Quick Disconnect Coupling
*16	1	834011	Gasket, Q.D. Coupling
*17	1	834046	Socket, Quick Disconnect Coupling
18	1	834017	Spanner Wrench

* Effective serial number 02626: Item 13 replaced by P/N 572342 and items 14 through 17 replaced by 2x P/N 572341.

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