



Operation and Maintenance Manual

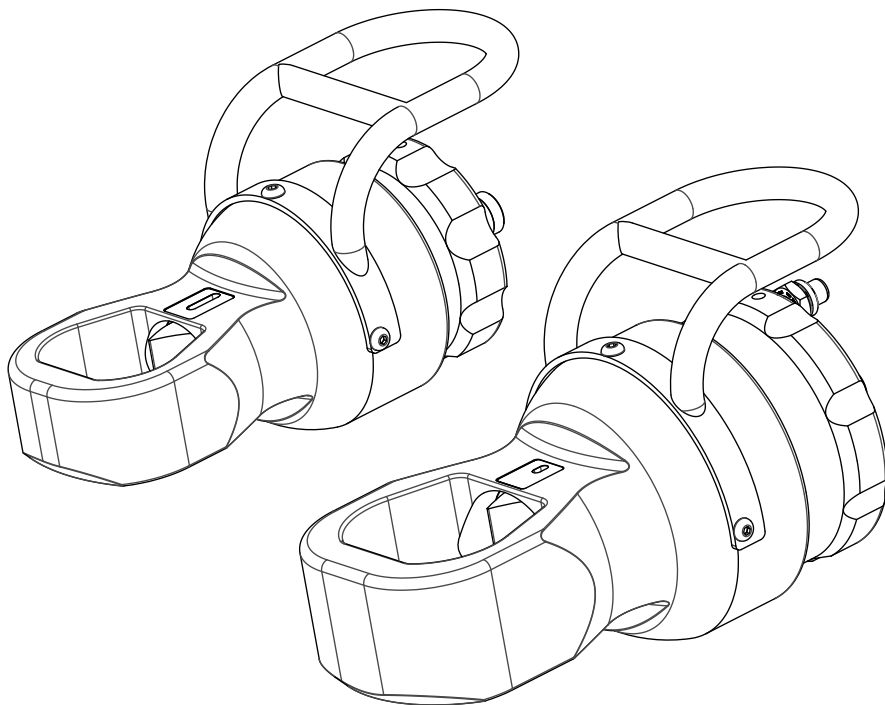
Enerpac NSH-Series NSH Cutting Head & NSPH Power Head

Document Number: L4489

Document Revision: D

Document Revision Date: 06-FEB-2025

Document Language: English EN



To reduce the risk of injury, users must read and understand this document before use.

ABOUT US

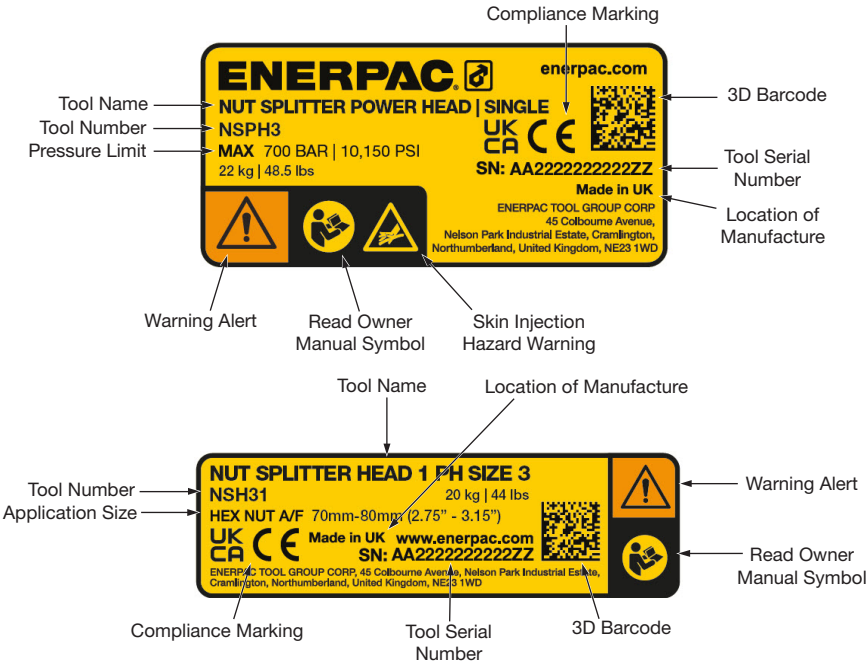
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WARRANTY

Refer to the Enerpac Global Warranty document for terms and conditions of the product warranty. Such warranty information can be found at www.enerpac.com.

NAMEPLATE



AVAILABLE LANGUAGES

L4489 is available in the following languages, visit www.enerpac.com for a copy.

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Contents

1. SAFETY	4
1.1 SAFETY PRECAUTIONS	4
2. COMPLIANCE STATEMENT(S)	8
2.1 CONFORMANCE TO NATIONAL AND INTERNATIONAL STANDARDS	8
3. FEATURES & COMPONENTS	9
3.1 NSPH FEATURES DIAGRAM	9
3.2 NSPH FEATURE DESCRIPTION	10
4. TECHNICAL PRODUCT DATA	11
4.1 NSPH DIMENSIONAL CALLOUT ART	11
4.2 NSPH DIMENSIONAL TABLE	11
4.3 NUT AND BOLT RANGES	12
5. OPERATION	13
5.1 ASSEMBLING CUTTING HEAD AND CYLINDER	13
5.2 HYDRAULIC PUMP	13
5.3 HOSE CONNECTIONS	14
5.4 ADJUSTING BLADE CUTTING DEPTH (IF BOLT DIAMETER IS SHOWN ON THE SCALE)	15
5.5 ADJUSTING BLADE CUTTING DEPTH (IF BOLT DIAMETER IS NOT SHOWN ON THE SCALE)	15
5.6 NUT SPLITTING PROCEDURE	16
5.7 IF NUT DOES NOT SPLIT AT FULL HYDRAULIC PRESSURE	18
5.8 AFTER USING THE NUT SPLITTER	19
6. STORAGE	19
7. MAINTENANCE	20
7.1 INSPECTION	20
7.2 CLEANING	20
7.3 MAINTENANCE	20
7.4 CUTTING BLADE REPLACEMENT	21
8. PARTS LIST	22
9. TROUBLESHOOTING	32

1. Safety

Read all instructions carefully. Follow all recommended safety precautions to avoid personal injury as well as damage to the product and / or damage to other property. Enerpac cannot be responsible for any damage or injury from unsafe use, lack of maintenance, or incorrect operation. Do not remove warning labels, tags, or decals. In the event that any questions or concerns arise, contact Enerpac or a local Enerpac distributor for clarification.

Save these instructions for future use.

If you have never been trained on high-pressure hydraulic safety, consult your distributor or service center for information about Enerpac Hydraulic Safety Courses.

This manual follows a system of safety alert symbols, signals, words, and safety messages to warn the user of specific hazards. Failure to comply with these warnings could result in death or serious personal injury, as well as damage to the equipment or other property.

The Safety Alert Symbol appears throughout this manual. It is used to alert you to potential physical injury hazards. Pay close attention to Safety Alert Symbols and obey all safety messages that follow this symbol to avoid the possibility of death or serious injury.



Safety Alert Symbols are used in conjunction with certain Signal Words that call attention to safety messages or property damage messages and designate a degree or level of hazard seriousness. The Signal Words used in this manual are DANGER, WARNING, CAUTION, and NOTICE.

⚠ DANGER Indicates a hazardous situation that, if not avoided, will result in death or serious personal injury.

⚠ WARNING Indicates a hazardous situation that, if not avoided, could result in death or serious personal injury.

⚠ CAUTION Indicates a hazardous situation that, if not avoided, could result in minor or moderate personal injury.

NOTICE Indicates information considered important, but not hazard related (e.g. messages related to property damage). Please note that the Safety Alert Symbol will not be used with the signal word.

1.1 Safety Precautions

⚠ WARNING

Failure to observe and comply with the following precautions could result in death or serious personal injury. Property damage could also occur.

- Read and completely understand the safety precautions and instructions in this manual before operating the NSPH tools or preparing them for use. Always follow all safety precautions and instructions, including those that are contained within the procedures of this manual.
- Be sure the operator has completed safety induction training, specific to the work surroundings. The operator should be thoroughly familiar with the controls and the proper use of the tool.

- Wear personal protective gear when operating hydraulic equipment. Always wear eye protection. Safety equipment such as dust mask, non-skid safety shoes, hard hats, gloves, or hearing protection (used as appropriate) will reduce personal injuries. The protective clothing must not interfere with safe operation of the tool or restrict the ability to communicate with co-workers.
- Operating procedures will vary, depending on the system arrangement. Always read, follow, and completely understand all manufacturers' instructions when operating pumps, valves and all other devices used with the NSPH tools. Follow all safety precautions contained in the manufacturer's manuals. Use only for intended purpose.
- To minimize risk of personal injury, keep hands and feet away from the tool and workpiece during operation.
- Do not overload equipment.
- Never apply pressure to a damaged hose, doing so may cause it to rupture.
- Immediately replace worn or damaged parts. Use only genuine Enerpac parts from approved distributors or service centers. Enerpac parts have been engineered and manufactured to be fit-for-purpose.
- Do not handle pressurized hoses or couplings; escaping oil under pressure can penetrate the skin, causing serious injury. Seek medical attention immediately if oil penetration is suspected.
- Only pressurize complete and fully connected hydraulic systems. Do not pressurize systems that contain unconnected couplers.
- Hydraulic circuit must be at zero pressure before couplings are disconnected.
- Never leave the system unattended when under pressure. When the system is under pressure DO NOT STAND IN LINE with the direction of force of the NSPH tools. This is a danger area. Always keep this area clear of personnel when the system is under pressure.
- Site pump on a secure, flat, level surface. Rope off working area and place warning signs.
- Do not tamper with air pressure relief safety valve on pump.
- Do not remove gauge covers when fitted.
- Check the date of the calibration certification. If the recalibration date has passed, the gauge must be recalibrated.
- If air supply is interrupted, turn off air stop valve on pump.
- The system operating pressure must not exceed the pressure rating of the lowest rated component in the system.
- Maximum allowable pressure for the **NSPH** Tool-Series is 10,000 psi [700 bar]. Do not exceed this pressure setting.
- Use only a high-quality non-flammable solvent for cleaning and degreasing parts during wrench repair procedures. To reduce the risk of fire or explosion, do not use flammable solvents.
- It is advised that a pressure gauge(s) is installed in the system when using the **NSPH** tools to monitor operating pressure, to allow the operator to monitor what is happening in the system.
- Care should be taken when using the lanyard to avoid entanglement with body parts.

- Do not strike the nut splitter (or any of its components) with a hammer or other objects in an attempt to shock or impact the nut.
- Do not attempt to move or reposition the nut splitter while it is in operation.
- Do not apply heat to the nut while the nut splitter is positioned on the nut.
- Always allow the nut splitter cylinder to fully retract before disconnecting hydraulic hose(s). High-pressure fluid may be ejected from an unretracted cylinder if a coupler has been damaged during handling.
- Fully release hydraulic pressure and disconnect hydraulic hose(s) from nut splitter cylinder before applying lubricant to blade or performing any other work inside the cutting zone.
- Sparks can be emitted at the blade tip when the nut fractures. To minimize the risk of sparks or hot metal fragments, a water spray can be directed over the entire nut and blade area. However if there is any doubt as to whether sparks can be effectively arrested, then the nut splitter should not be used.
- Never attempt to disconnect or retighten any part of the hydraulic system while under pressure. Be sure pressure gauge indicates zero (0) psi/bar before attempting to connect, disconnect or tighten hydraulic fittings.

CAUTION

Failure to observe and comply with the following precautions could result in minor or moderate personal injury. Property damage could also occur.

- Ensure components are protected from external sources of damage, such as excessive heat, flame, moving machine parts, sharp edges, and corrosive chemicals.
- Take care to avoid sharp bends and kinks in hydraulic hoses. Bends and kinks can cause severe back-up pressure and cause hose failure. Protect hoses from dropped objects; a sharp impact may cause internal damage to hose wire strands. Protect hoses from crush risks, such as heavy objects or vehicles; crush damage can cause hose failure.
- Do not lift hydraulic equipment by the body of the tool, hoses, or couplers. Use only the designated carrying handle.
- Keep hydraulic equipment away from flames and heat. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings.
- Lubricate NSPH tools as directed in this manual prior to operation. Use only approved lubricants of high quality, following the lubricant manufacturer's instructions.
- Only use the designated anchor point for fixing the lanyard. Do not attach the lanyard to the plastic handle.

- Be careful when handling severed nuts. Sharp edges can cause lacerations.
- Do not cut the nut into small pieces. Use a maximum of two cuts. The second cut must always be at 180° (opposite) to the first.
- Always use the correct size cutting head for the nut to be cut.
- Do not insert packing pieces or shims behind the nut or blade in an attempt to split a nut that is not within the specified size range for the cutting head.
- Use the nut splitter to cut hexagonal nuts only. Do not attempt to cut square, round, bi-hex or 12-point nuts.
- Do not use the nut splitter to cut chains or bolts.
- Do not use the nut splitter to rotate nuts.
- Do not use the nut splitter's hydraulic cylinder for jacking, lifting, pushing or any other purpose than that for which it is intended.

NOTICE

Failure to observe and comply with the following precautions could result in property damage and/or void the product warranty.

- Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Enerpac Authorized Service Centre in your area.
- It is strongly recommended that operators always use Enerpac pumps and hoses.
- Always use Enerpac replacement parts.
- Always follow the inspection and maintenance instructions contained in this manual. Perform inspection and maintenance after use, and at regular intervals.
- Rope off working area and place warning signs.
- To help ensure proper operation and best performance, use of Enerpac oil is strongly recommended

2. Compliance Statement(s)

2.1 Conformance to National and International Standards

•NSPH3 •NSPH4 •NSPH3D •NSPH4D

C

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UK

CA

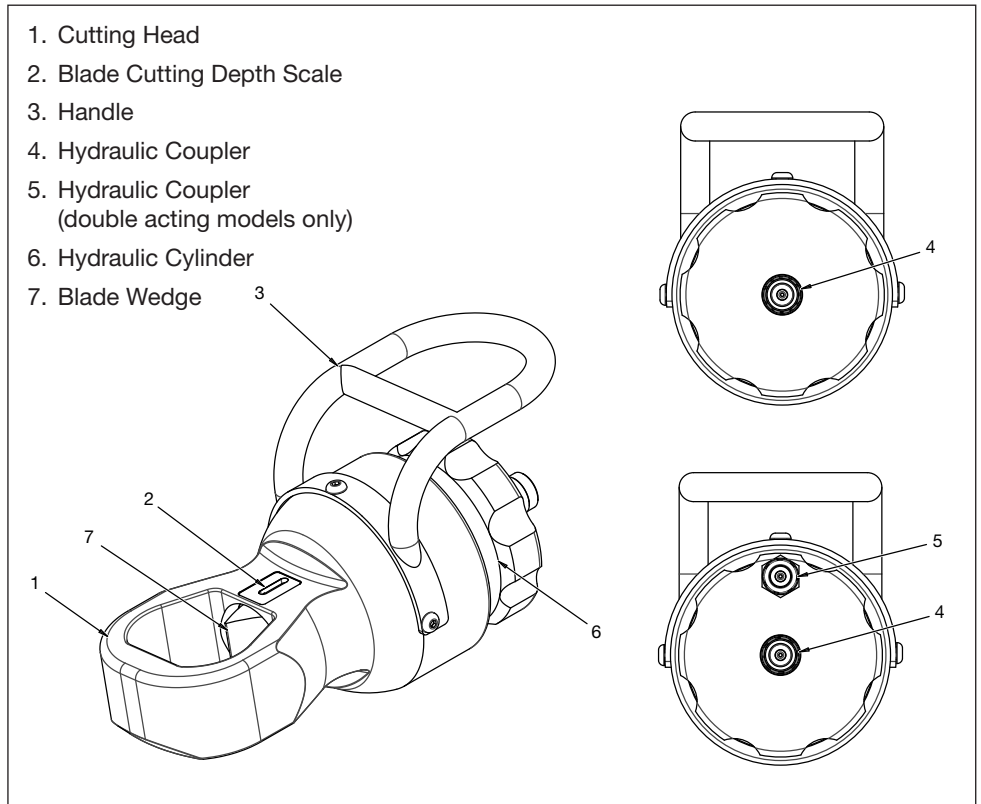
These tools conform with the requirements for CE and UKCA.

Enerpac declares that the product(s) have been tested and conforms to applicable standards and the product(s) are compatible to all EU and UK Requirements.

Copies of the EU Declaration as well as the UK Self-Declaration are enclosed with each shipment.

3. Features & Components

3.1 NSPH Features Diagram



3.2 NSPH Feature Description

The NSPH Series nut splitter is a hydraulically operated industrial power tool, designed to quickly remove seized or heavily corroded nuts from threaded studs.

See section 3.1 for an illustration of the NSPH nut splitter major features and components.

A complete nut splitter consists of two separate sub-assemblies: 1) a single or double acting hydraulic cylinder and 2) a matching cutting head designed for use with a specified nut size range. The replaceable cutting blade is installed in a blade carrier mounted on the shaft of the cylinder sub-assembly. See Figure 1.

One cutting head is provided with each nut splitter. If desired, additional cutting heads for different nut size ranges can be purchased separately from Enerpac.

Refer to sections 4.1 and 4.2 for nut splitter specifications and additional information.

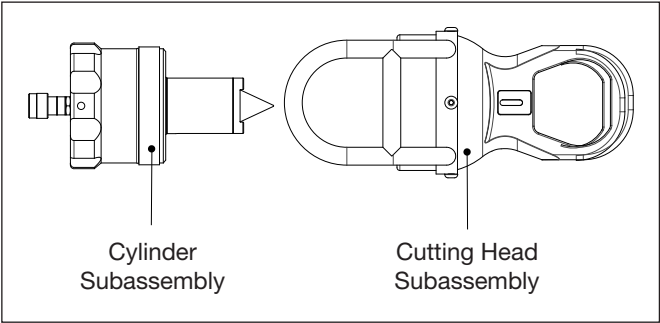
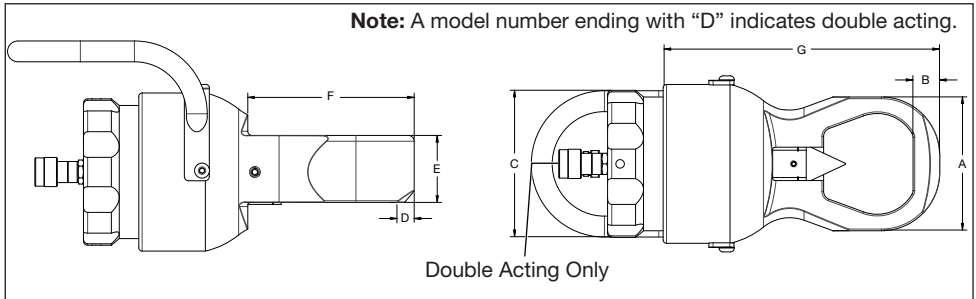


Figure 1: Nut Splitter Sub-assembly

4. Technical Product Data

4.1 NSPH Dimensional Callout Art



Notes:

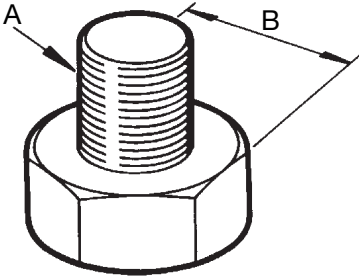
- The NSPH Series is available in both single and double acting models. Single acting models use spring force to retract the blade. Double acting models use hydraulic force to retract the blade.
- Both single and double acting models use the same NSPH series cutting heads.
- A model number containing “D” (e.g. ND3) indicates that the nut splitter (or cylinder sub-assembly) is double acting.

4.2 NSPH Dimensional Table

Cylinder Model Number	Cutting Head Model Number	Capacity tons [kN]	Dimensions inch [mm]							Minimum Pump Oil Capacity in³ [cm³]
			A	B	C	D	E	F	G	
NSPH3 NSPH3D	NSH31	105 [1025]	5.2 [132]	1.1 [28]	7.5 [190]	0.3 [7.0]	3.1 [81]	7.4 [189]	15.9 [404]	33.5 [550.0]
	NSH32	105 [1025]	5.7 [145]	1.2 [30]	7.5 [190]	0.6 [15]	3.1 [81]	7.9 [200]	16.5 [419]	33.5 [550.0]
	NSH33	105 [1025]	6.3 [160]	1.3 [32]	7.5 [190]	0.4 [11]	3.1 [81]	7.9 [200]	16.8 [427]	33.5 [550.0]
	NSH34	105 [1025]	6.8 [174]	1.4 [35]	7.5 [190]	0.4 [11]	3.2 [81]	8.0 [204]	17.2 [438]	33.5 [550.0]
NSPH4 NSPH4D	NSH41	178 [1733]	7.5 [190]	1.4 [36]	9.3 [235]	0.2 [4.5]	4.4 [111]	9.1 [230]	18.5 [470]	67.0 [1100.0]
	NSH42	178 [1733]	8.6 [220]	1.4 [36]	9.3 [235]	0.1 [3]	4.4 [111]	9.7 [246]	19.6 [499]	67.0 [1100.0]

Cylinder Model Number	Cutting Head Model Number	Cylinder Weight lb [kg]	Head Weight lb [kg]	Combined Weight lb [kg]	Additional Model Numbers
					Cutting Tip Service Kit
NSPH3 NSPH3D	NSH31	48.5 [22.0]	44.1 [20.0]	92.6 [42.0]	NSPH3CTK
	NSH32	48.5 [22.0]	46.3 [21.0]	94.8 [43.0]	
	NSH33	48.5 [22.0]	48.5 [22.0]	97.0 [44.0]	
	NSH34	48.5 [22.0]	48.5 [22.0]	97.0 [44.0]	
NSPH4 NSPH4D	NSH41	83.8 [38.0]	69.9 [31.7]	153.7 [69.7]	NSPH4CTK
	NSH42	83.8 [38.0]	95.9 [43.5]	179.7 [81.5]	

4.3 Nut and Bolt Ranges

Cutting Head Model Number	A Bolt Range inch [mm]	B Hexagon Nut Range inch [mm]	
NSH31	1.75 - 2.00 [M45 - M52]	2.75 - 3.13 [70 - 80]	
NSH32	1.75 - 2.25 [M45 - M56]	2.75 - 3.50 [70 - 85]	
NSH33	1.75 - 2.50 [M45 - M64]	2.75 - 3.88 [70 - 95]	
NSH34	1.75 - 2.75 [M45 - M72]	2.75 - 4.25 [70 - 100]	
NSH41	2.75 - 3.00 [M76 - M80]	4.25 - 4.63 [110 - 115]	
NSH42	2.75 - 3.50 [M76 - M90]	4.25 - 5.38 [110 - 130]	

NOTE: Maximum allowable hardness to split is ASTM A194 Gr 2H. Not to be used on square nuts or stainless steel.

5. Operation

5.1 Assembling Cutting Head and Cylinder

The cutting head is shipped disassembled from the cylinder. Assemble as described in the following steps:

1. Be sure that cylinder is fully retracted and disconnected from the hydraulic pump.
2. Loosen the set screw (Figure 2, item A) located on the cutting head body.
3. Insert the cylinder into the head, aligning the axial slot in the blade carrier (Figure 2, item B) with the set screw (Figure 2, item A) in the cutting head bore. Once aligned, rotate the cylinder in the direction shown in order to engage the screw threads.
4. Continue rotating the cylinder until NO threads are visible on the outside of the cylinder body (threads fully engaged).

⚠ WARNING Never use the nut splitter if any of the cylinder threads are visible.

5. Install the cutting blade. Refer to Section 5.5 for installation instructions.

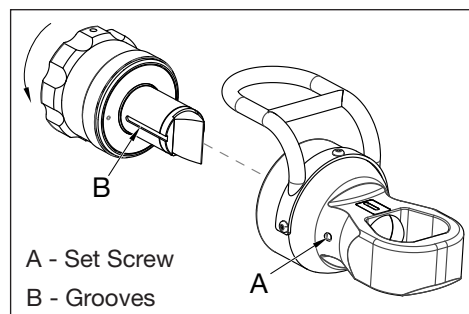


Figure 2: Assembling the Cylinder and Cutting Head

5.2 Hydraulic Pump

A 10,000 psi [700 bar] hydraulic pump is required to operate the nut splitter.

If a single acting nut splitter is used, the pump must be equipped with a pressure release valve. If a double acting nut splitter is used, the pump must be equipped with a suitable 4-way 3-position directional control valve.

Always check the pump hydraulic relief valve setting before connecting the nut splitter. Maximum pressure must not exceed 10,000 psi [700 bar].

If an air-powered hydraulic pump is used, an air regulator must be installed in the air supply line, limiting the air pressure to the recommended range for the pump being used.

If the pump is not equipped with a hydraulic pressure gauge, install a 0-10,000 psi [0-700 bar] gauge between the pump outlet and the hydraulic hose.

5.3 Hose Connections

The nut splitter is equipped with an Enerpac CR-400 3/8" female coupler. Be sure to use only high pressure hoses and fittings designed for 10,000 psi [700 bar] operation. See Figure 3 for typical pump and hose arrangements.

Single acting nut splitters are equipped with one Enerpac CR-400 3/8" Female coupler and one CH604 3/8" Male coupler.

Connect the hydraulic hose(s) between the pump and the nut splitter cylinder. Check that couplers on both ends of hose(s) are fully screwed together. Firmly tighten couplers by hand to prevent restricted oil flow.

IMPORTANT: Be sure that all couplers are fully connected. Loose or partially connected couplers will block the flow of oil between the pump and the nut splitter.

To remove any air trapped in the system, advance and retract the cylinder several times.

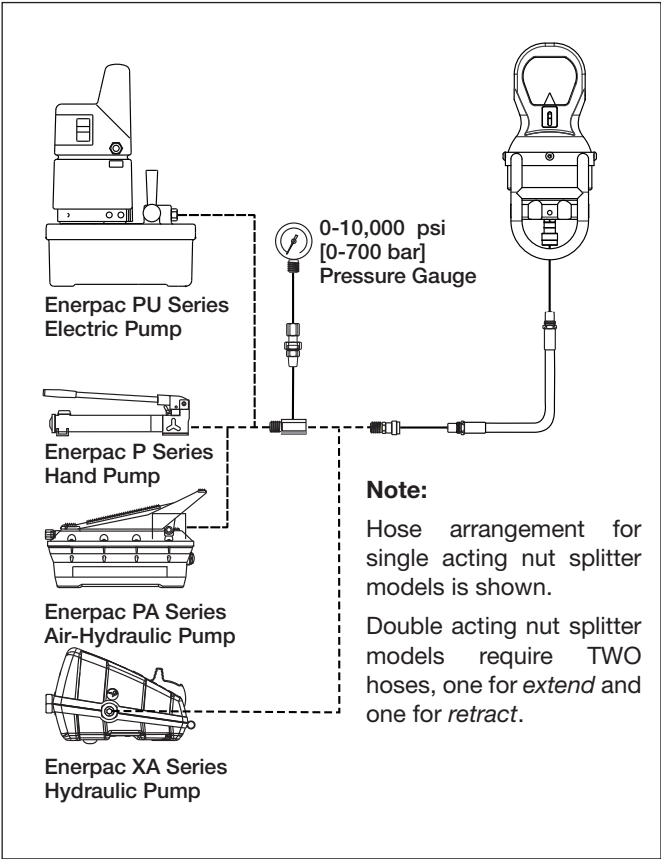


Figure 3: Hydraulic Connections (typical pumps shown)

5.4 Adjusting Blade Cutting Depth (If bolt diameter is shown on the scale)

The blade cutting depth scale allows the user to set the nut splitter's maximum stroke, and the corresponding depth of the cutting blade. This feature helps prevent bolt damage from occurring due to excessive blade penetration.

Adjust the cutting depth as described in the following steps:

1. Ensure that the nut splitter cylinder is fully retracted.
2. Check that the bolt diameter is within the range of the cutting head to be used (bolt diameter range is indicated on the scale). See Section 4.2 for additional information.

Note: The cutting depth scale is calibrated only for the following thread, bolt and nut types:

Imperial threads-Unified (UN) bolt threads with heavy series nuts.

Metric threads-Metric (M) bolt threads with standard series nuts.

If any other thread, bolt or nut type is present, skip the following steps in this section and refer to Section 5.5 for additional instructions.

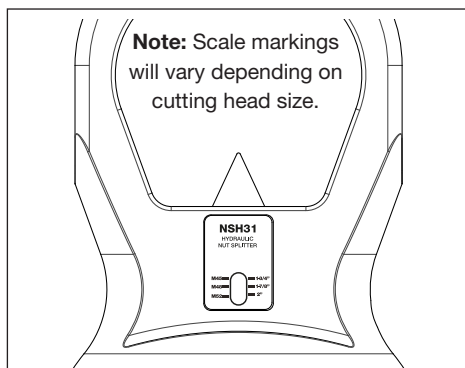


Figure 4: Blade Cutting Depth Scale

3. If tight, loosen the set screw located on the cutting head barrel. See Figure 2, item A.
4. Rotate cutting head until the top of the blade carrier is aligned with the required bolt size marker line on the scale. See Figure 4.
5. Retighten the set screw.

5.5 Adjusting Blade Cutting Depth (If bolt diameter is NOT shown on the scale)

1. Measure the distance from the flat of the nut to the furthest side of the bolt. See Figure 5.
2. Advance and hold the nut splitter cylinder at full stroke.
3. If tight, loosen the set screw located in the barrel portion of the cutting head. See Figure 2, item A.

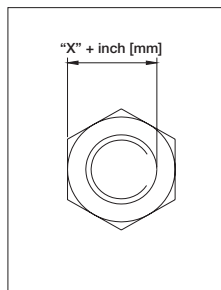


Figure 5

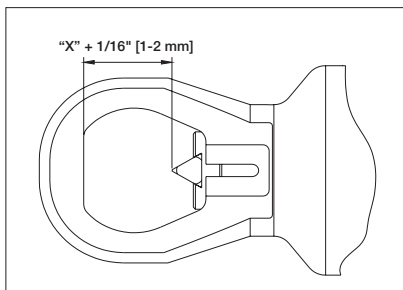


Figure 6

4. Rotate the cutting head until the distance from the head flat to the tip of the blade is the same as the nut to bolt distance previously measured in Step 1 PLUS an additional 1 to 2 mm (1/16"). See Figure 6.

IMPORTANT: Ensure that the cylinder threads are not exposed. If the threads are visible, a larger cutting head and possibly a larger cylinder is required. Refer to Section 4 for additional information.

5. Retighten the set screw.
6. Retract the nut splitter cylinder.

5.6 Nut Splitting Procedure

1. Verify that the nut splitter cutting head is the correct size (bolt range) for the nut to be cut. See Section 4.2.
2. Ensure that the nut splitter blade is in good condition and that the cutting edge is not worn, chipped or damaged. Rotate or replace blade as required.
3. Adjust the blade cutting depth to prevent damage to the bolt threads. Refer to sections 5.4 and 5.5 for adjustment instructions.
4. Connect hydraulic hose(s) as described in Section 5.3. Check that hydraulic pump reservoir is filled to the correct level.

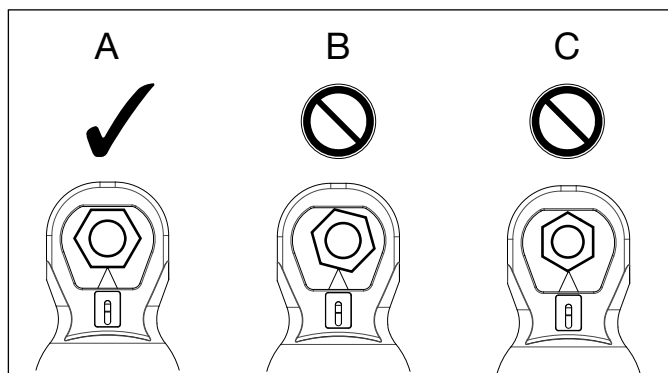


Figure 7: Positioning the Cutting Head

5. To help prolong blade life, lubricate the blade cutting edge and flanks with a molybdenum disulphide based lubricant or other high quality lubricant.

CAUTION Wear gloves when applying lubricants to prevent contact with skin.

6. Position the cutting head over the nut, ensuring that the flat surface of the blade rests against one of the nut flats. Centrally position the nut within the head so that the blade will cut in the center of the nut flat. See Figure 7, view "A".

7. Ensure that the underside of the cutting head is seated against the flange, as the blade must cut as close to the bottom of the nut as possible. However, if a washer is present under the nut, position the nut splitter so that the cutting blade will not contact the washer. See Figure 8.

IMPORTANT: Improper positioning of the nut splitter may cause damage to the cutting blade, blade carrier and piston.

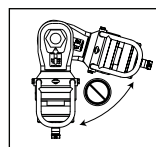
- 8. Vented pumps only:** open the vent/fill plug or loosen the vent screw to provide venting.

- 9. Air or electric powered pumps only:** Set the pump to deliver a nominal pressure of 1000 psi [69 bar].

WARNING To prevent personal injury, do not place hands or fingers in the cutting area.



WARNING Do not move or reposition nut splitter during operation.



10. Operate the pump to slowly advance the nut splitter blade until it makes contact with the nut. Check that the blade is resting squarely on the nut flat.

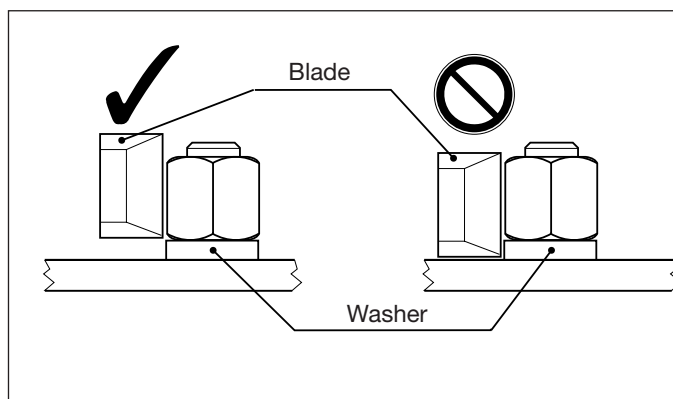


Figure 8: Blade Position

Notes:

- **Air or electric powered pumps only:** Once the blade has stopped cutting at 1000 psi [69 bar], the pressure should be gradually increased using the pressure regulator on the pump. Allow adequate time for the blade to cut before increasing pressure.
 - If pressure is increased too quickly, blade damage may result. Excessive pressure may also cause the nut splitter's internal relief valve to open, resulting in oil leakage from the oil bleed hole located on the underside of the blade carrier.
 - On larger nuts, it may be helpful to periodically retract and re-lubricate the blade. This will reduce friction and increase blade efficiency.
11. Continue to apply hydraulic pressure until the nut is completely severed. As the nut splits, a loud "crack" will be heard, indicating that the nut has been severed.
 12. If necessary, a second cut may be applied, at 180° to the first, completely severing the nut in half. See Figure 9.

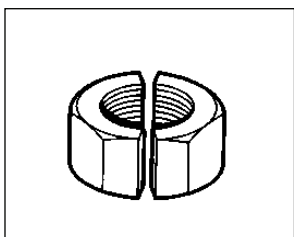


Figure 9: Making Two Cuts

IMPORTANT: Do not cut the nut into small pieces. Use a maximum of two cuts and always at 180° (opposite) to the first. Otherwise, nut metal fragments may be released.

13. After the cut is completed:

- **Single acting models:** Release the pressure to retract the nut splitter blade.
 - **Double acting models:** Move the control valve to the *retract* position to retract the nut splitter blade.
14. Stop the pump. Check that pressure gauge indicates zero (0) psi/bar.
 15. Remove nut splitter from the nut.
 16. Remove the severed nut from the stud.

5.7 If Nut Does Not Split at Full Hydraulic Pressure

If the nut splitter is at full pressure, 10,000 psi [700 bar], and the nut does not split:

⚠ WARNING Fully release hydraulic pressure and disconnect hydraulic hose(s) from nut splitter cylinder before applying lubricant to blade or performing any other work inside the cutting zone.

1. Ensure that the blade cutting depth setting is correct. Also, check that the cylinder is not at full stroke.
2. **If the blade cutting depth setting is correct and cylinder is not at full stroke:** Release hydraulic pressure and rotate the cutting head clockwise one full turn. This will allow the blade to advance 1 to 2 mm further. Then, re-apply hydraulic pressure and try again to split the nut.
3. **If step 2 did not work:** Release hydraulic pressure. Re-lubricate the blade and the groove in the nut where the blade has penetrated. Then, re-apply pressure, ensuring that the blade is positioned back in the same nut groove.

4. **If step 3 did not work:** Re-lubricate the blade and the nut groove again. Lift and position the nut splitter above the flange surface so that the blade will penetrate the nut approximately $\frac{2}{3}$ the height of the nut, and in the same groove. Then, re-apply pressure.
5. **If step 4 did not work:** Install a larger cutting head (if available) or use a larger nut splitter model. Be certain that the nut size is within the larger equipment's operating range.
2. Using a clean cloth, wipe away any debris from the nut splitter components. Pay particular attention to the cutting head and blade area. Remove all traces of lubricant from the blade.
3. Reinstall dust caps and/or plugs on all hydraulic couplers.
4. If nut splitter is to be stored in damp conditions or will not be used for a long period of time, coat exterior surfaces with a water-repellent spray or similar removable protective coating.

5.8 After Using the Nut Splitter

1. Ensure that the nut splitter cylinder is fully retracted. If it is fully or partially advanced, reconnect the cylinder to the pump and allow time for full retraction to occur. After ensuring that there is no pressure present in the system, disconnect the hydraulic hose(s) from the cylinder.

6. Storage

Enerpac tools should be stored in a cool dry place. Tools should always be cleaned, serviced and lubricated prior to storage.

7. Maintenance

⚠ WARNING Fully release hydraulic pressure and disconnect hydraulic hose(s) from nut splitter cylinder before performing any adjustments, repairs or maintenance.

⚠ CAUTION Piston retract spring and other internal parts may eject from cylinder suddenly during disassembly. To avoid personal injury, use caution if cylinder disassembly is necessary. Cylinder disassembly and repairs should be performed only by qualified personnel.

7.1 Inspection

A thorough inspection should be carried out prior to usage, storage or transportation to ensure the completeness and condition of the tool.

Inspection should include:

- Visual inspection of the outer parts of the tool, checking for obvious damage, degradation or missing parts,
- Visual inspection of the Cutting-Tip (this may require tool actuation).

Cleaning and servicing should be undertaken as required prior to the tool being used, stored or transported.

7.2 Cleaning

To lightly clean the tool, wipe gently with a damp cloth.

If more thorough cleaning is required (for example following immersion in water) carry out the following cleaning procedure:

- Strip the tool down, observing the exploded diagrams shown in the Section 8. Parts List,

- Clean the components using detergent, following the manufacturer's guidelines,
- Rinse the components to remove traces of detergent,
- Dry the components thoroughly.

Inspect, service and lubricate the tool immediately after the cleaning process.

7.3 Maintenance

Replace missing, worn or damaged parts. Use only genuine Enerpac parts from approved distributors or service centres. Enerpac parts have been engineered and manufactured to be fit-for-purpose.

Do not apply excessive force when inserting the blade wedges into the tool. Always replace the tip retention screw and alignment screw when replacing the blade wedge.

The alignment screw in the side of the cutting head sits in the slot of the piston and keeps the blade wedge aligned. This screw should not be fully tightened; back off the alignment screw by 1/4 turn after insertion

If topping up or replacing hydraulic oil as part of a service, use only premium quality hydraulic oil of the grade 15 cSt.

A thick grease should be applied to the blade wedge **before every cut**. This will ease the splitting operation, prolong the life of the blade wedge and limit the risk of sparking and debris projectiles.

7.4 Cutting Blade Replacement

Ensure the correct blade wedge is fitted to the tool and has been checked for damage. Some minor blunting is acceptable, but cracked or chipped blade wedges should be replaced.

The blade wedge is retained in the piston by the tip retention screw. Unscrew the tip retention screw with a hex-key and pull the blade wedge out to replace. Do not apply excessive force when inserting the blade wedge into the tool. If the blade wedge does not come out easily, slightly extend the piston to gain better access. When replacing the blade wedge, the tip retention screw and alignment screw should also be replaced every time.

Be sure that nut splitter cylinder is fully retracted and that pressure gauge indicates zero (0) psi/ bar. Disconnect hydraulic hose(s) from cylinder coupler(s).

CAUTION Be careful when handling blades. Fractured edges can be sharp. Wear appropriate hand protection when removing and installing blades.

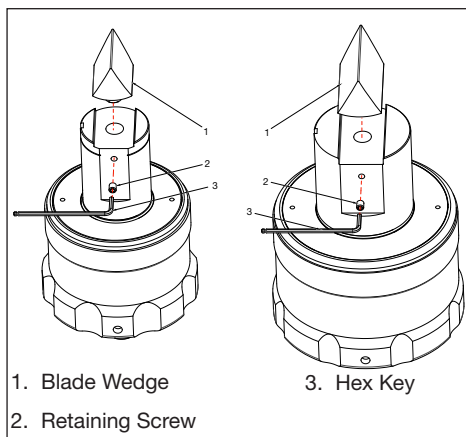


Figure 9: Blade Wedge Replacement

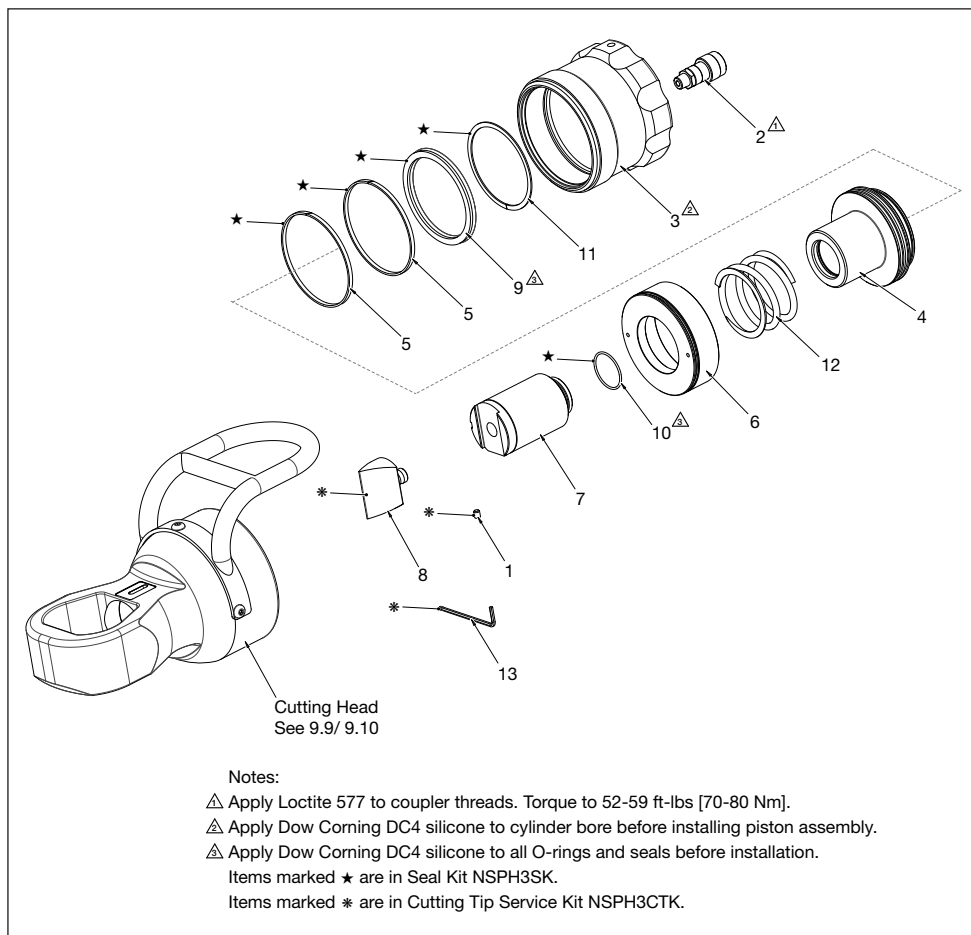
CAUTION Ensure the tip retention screw is screwed tightly into the piston and the hex key removed before actuating the tool.

A thick grease should be applied to the blade wedge before every cut. This will ease the splitting operation, prolong the life of the blade wedge and limit the risk of sparking and debris projectiles.

8. Parts List

Enerpac recommends that all kit components be installed to assure optimum performance of the repaired product.

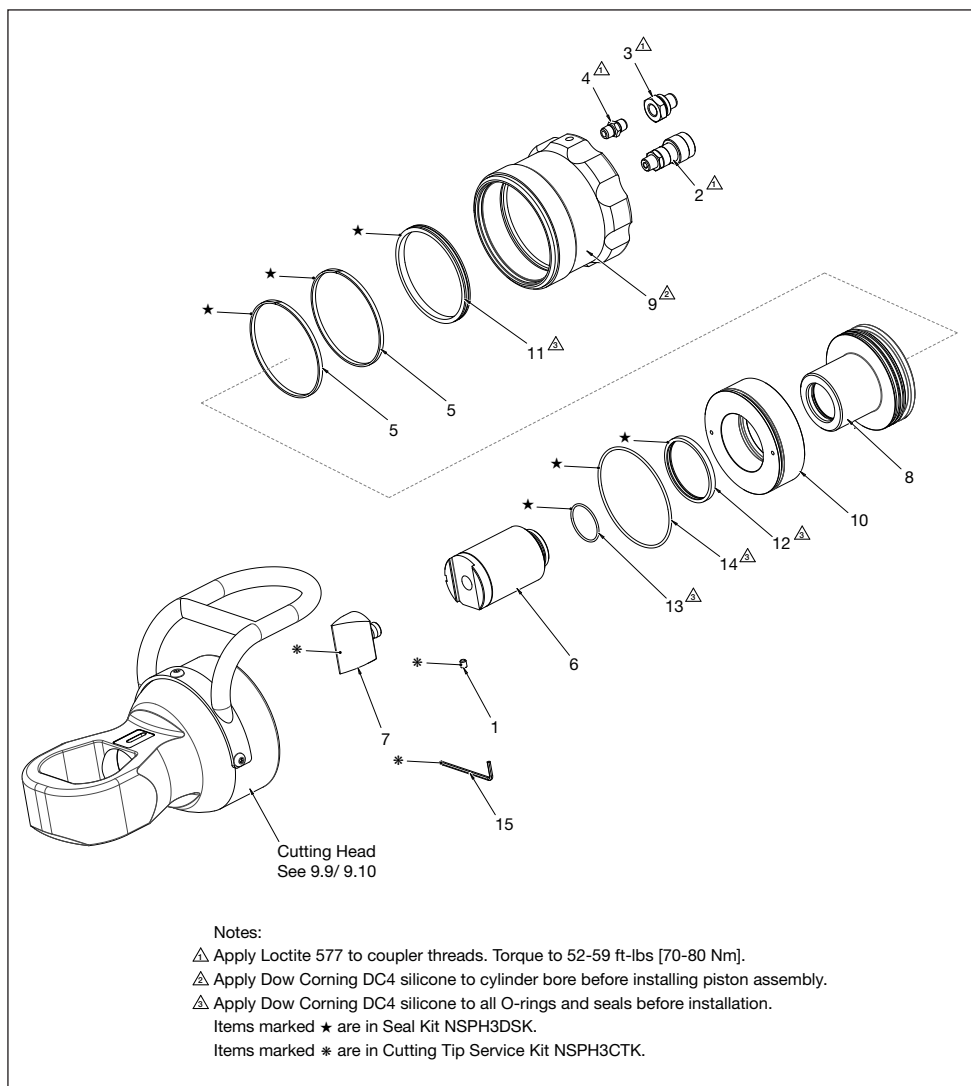
8.1 NSPH3 Nut Splitter Cylinder Assembly Exploded Views



8.2 NSPH3 Nut Splitter Cylinder Assembly Table of Parts

Item	Description	Qty	Part Numbers
1	Flat Set Screw	1	*
2	Female Coupler	1	CR400
3	Cylinder Body	1	DM1166190
4	Cylinder Piston	1	DM1167051
5	Bushing Strip	2	★
6	End Cap	1	DM1169020
7	Blade Carrier	1	DM1170151
8	Blade Wedge	1	*
9	Oil Seal Cup	1	★
10	Oil Seal O-Ring	1	★
11	Retaining Ring	1	★
12	Spring	1	E3089
13	Hex Key	1	*
★ Indicates items included and available only as part of Seal Kit NSPH3SK.			
* Indicates items included and available only as part of Cutting Tip Service Kit NSPH3CTK.			

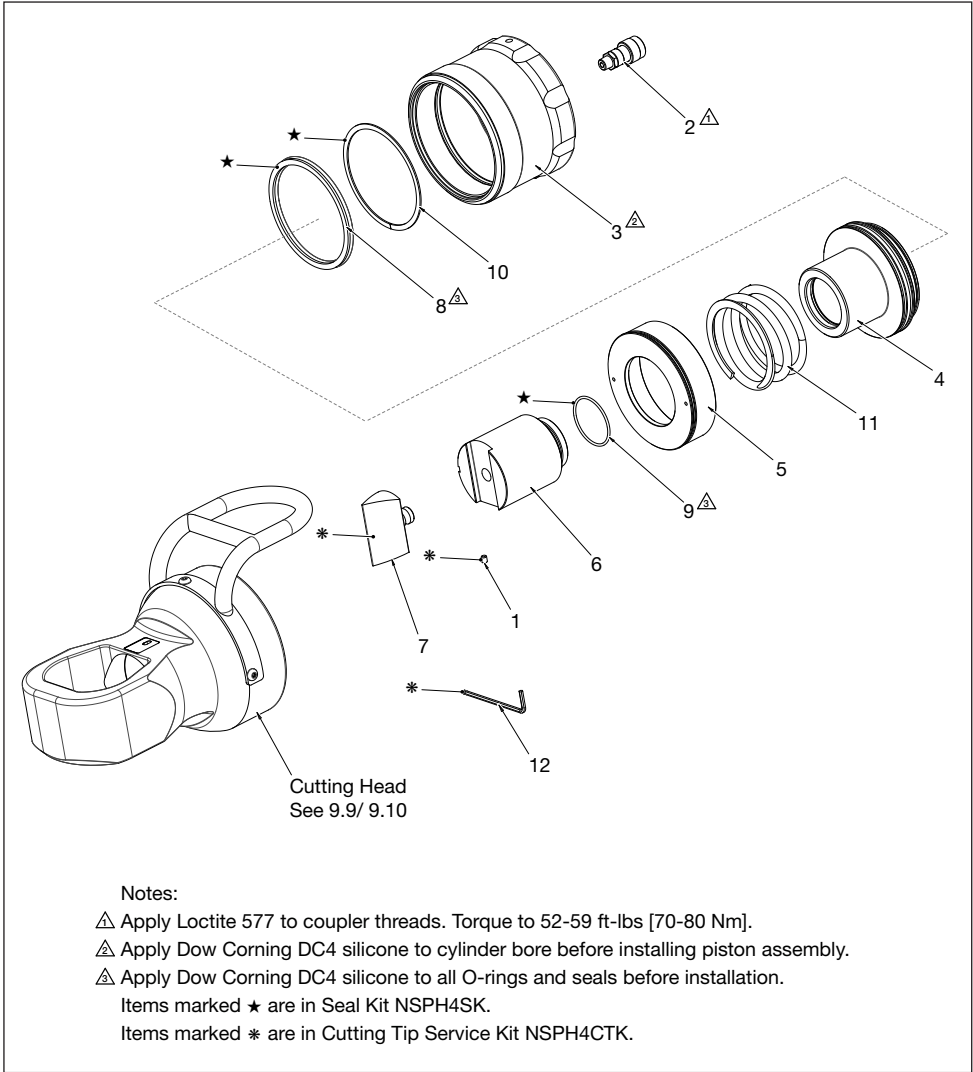
8.3 NSPH3D Double Acting Nut Splitter Cylinder Assembly Exploded Views



8.4 NSPH3D Double Acting Nut Splitter Cylinder Assembly Table of Parts

Item	Description	Qty	Part Numbers
1	Flat Set Screw	1	*
2	Female Coupler	1	CR400
3	Male Coupler	1	CH604
4	3/8" NPT Nipple	1	FZ1617
5	Bushing Strip	2	★
6	Blade Carrier	1	DM1170151
7	Blade Wedge	1	*
8	Cylinder Piston	1	DM1261051
9	Cylinder Body	1	DM1166190
10	End Cap	1	DM1267020
11	Oil Seal-T (124mm ID)	1	★
12	Oil Seal-T (82.5mm ID)	1	★
13	Oil Seal O-Ring (BS135, 48.9mm ID)	1	★
14	Oil Seal O-Ring (BS253, 136.12mm ID)	1	★
15	Hex Key	1	*
★ Indicates items included and available only as part of Seal Kit NSPH3DSK.			
* Indicates items included and available only as part of Cutting Tip Service Kit NSPH3CTK.			

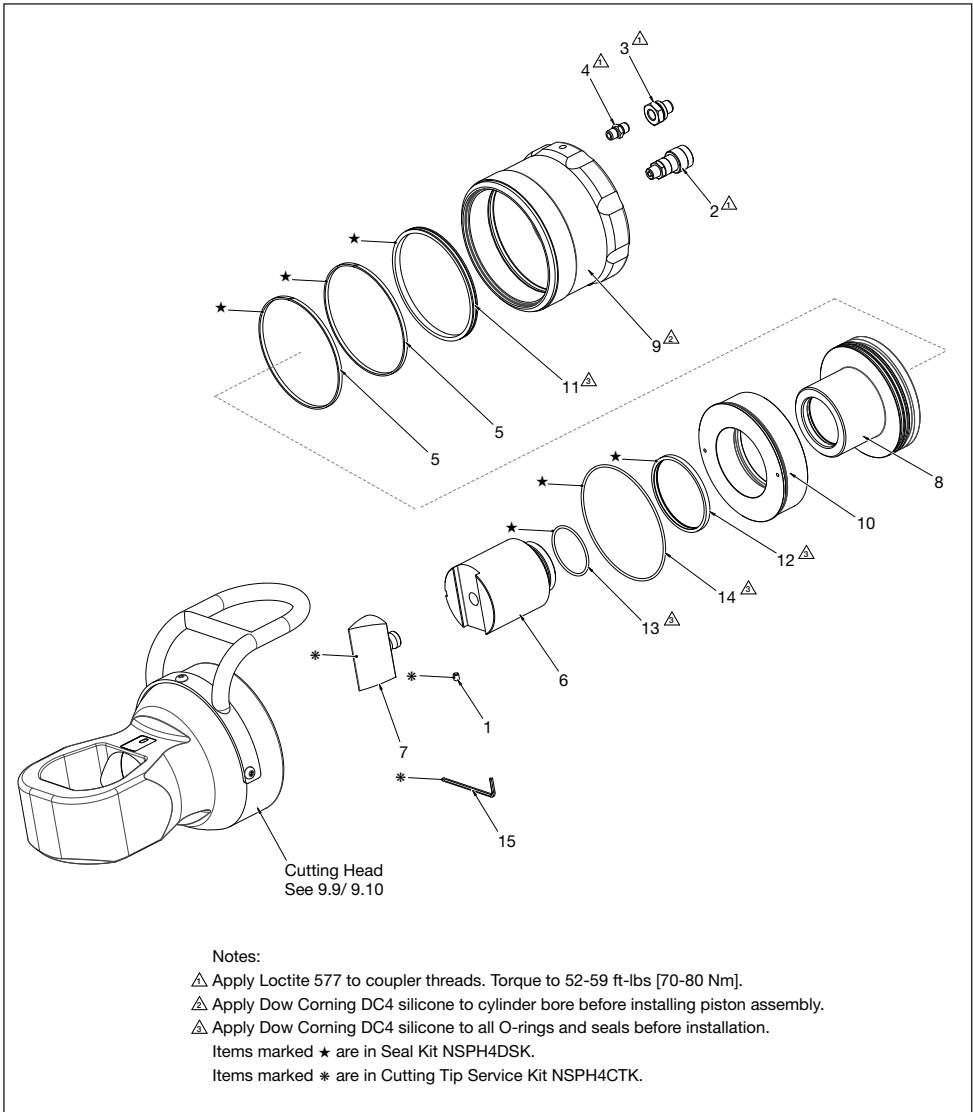
8.5 NSPH4 Nut Splitter Cylinder Assembly Exploded Views



8.6 NSPH4 Nut Splitter Cylinder Assembly Table of Parts

Item	Description	Qty	Part Numbers
1	Flat Set Screw	1	*
2	Female Coupler	1	CR400
3	Cylinder Body	1	DM1180190
4	Cylinder Piston	1	DM1181051
5	End Cap	1	DM1183020
6	Blade Carrier	1	DM1184151
7	Blade Wedge	1	*
8	Oil Seal Cup	1	★
9	Oil Seal O-Ring	1	★
10	Retaining Ring	1	★
11	Spring	1	E3067
12	Hex Key	1	*
★ Indicates items included and available only as part of Seal Kit NSPH4SK.			
* Indicates items included and available only as part of Cutting Tip Service Kit NSPH4CTK.			

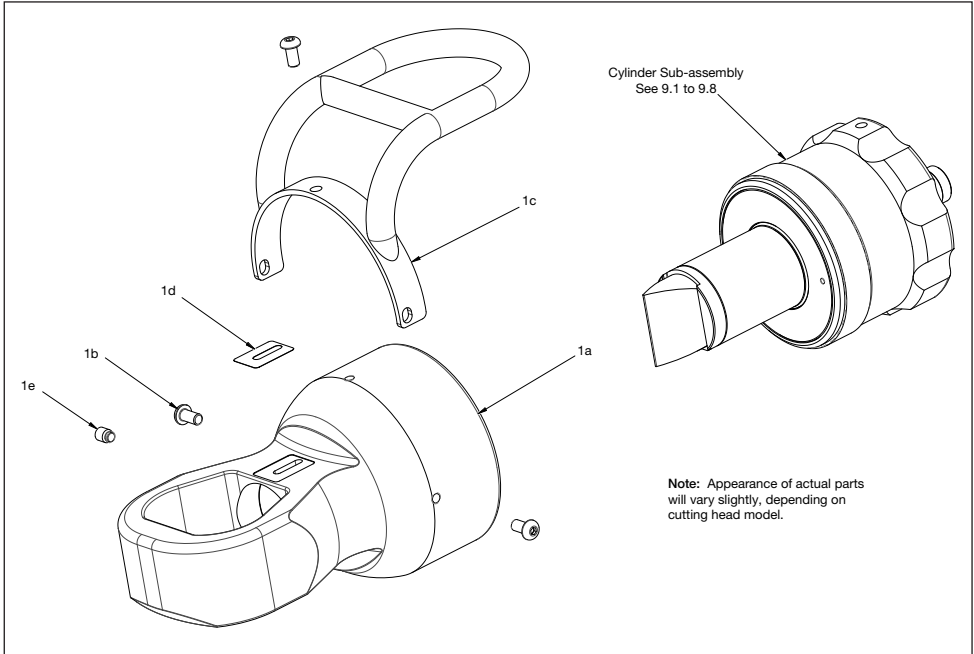
8.7 NSPH4D Double Acting Nut Splitter Cylinder Assembly Exploded Views



8.8 NSPH4D Double Acting Nut Splitter Cylinder Assembly Table of Parts

Item	Description	Qty	Part Numbers
1	Flat Set Screw	1	*
2	Female Coupler	1	CR400
3	Male Coupler (half)	1	CH604
4	3/8" NPT Nipple	1	FZ1617
5	Bushing Strip	2	★
6	Blade Carrier	1	DM1184151
7	Cutting Tip	1	*
8	Cylinder Piston	1	DM1261051
9	Cylinder Body	1	DM1268190
10	End Cap	1	DM1269020
11	Oil Seal-T (165mm ID)	1	★
12	Oil Seal-T (111mm ID)	1	★
13	Oil Seal O-Ring (BS233, 72.62mm ID)	1	★
14	Oil Seal O-Ring (BS262, 177.4mm ID)	1	★
15	Hex Key	1	*
★ Indicates items included and available only as part of Seal Kit NSPH4DSK.			
* Indicates items included and available only as part of Cutting Tip Service Kit NSPH4CTK.			

8.9 NSH Cutting Head Assembly Exploded Views



8.10 NSH Cutting Head Assembly Table of Parts

Item	Description	Qty	Part Numbers			
			Model NSH31	Model NSH32	Model NSH33	Model NSH34
1	Head Splitter Assembly	-	NSH31A	NSH32A	NSH33A	NSH34A
1a	Head	1	*	*	*	*
1b	Grub Screw	3	*	*	*	*
1c	Handle	1	*	*	*	*
1d	Nut Splitter Head Decal	1	*	*	*	*
1e	Dog Point Set Screw	1	*	*	*	*
* Indicates items included and available only as part of NSPH Cutting Head Assembly (NSH31-NSH34).						

Notes:

The above cutting head models must be used only with cylinder sub-assemblies NSPH3 and NSPH3D. See 8.1 and 8.3.

Item	Description	Qty	Part Numbers	
			Model NSH41	Model NSH42
1	Head Splitter Assembly	-	NSH41A	NSH42A
1a	Head	1	*	*
1b	Grub Screw	3	*	*
1c	Handle	1	*	*
1d	Nut Splitter Head Decal	1	*	*
1e	Dog Point Set Screw	1	*	*
* Indicates items included and available only as part of NSPH Cutting Head Assembly (NSH41-NSH42).				

Notes:

The above cutting head models must be used only with cylinder sub-assemblies NSPH4 and NSPH4D. See 8.5 and 8.7.

9. Troubleshooting

Fault	Possible Cause	Corrective Action
Nut splitter cylinder will not hold pressure.	Piston seal leaking.	Replace seal.
	Coupler leaking.	Replace coupler.
	Hydraulic pump malfunction.	Check hydraulic pump for proper operation. Repair or replace pump as required.
Nut splitter cylinder builds pressure, but piston and blade do not move or move only a partial amount.	Pump reservoir not vented.	If using a vented pump, loosen vent/fill cap or vent screw as required to provide venting.
	Coupler not fully assembled.	Check couplers.
	Both hoses not connected. (double acting models only)	Be sure that both hoses are connected.
	Piston at full stroke.	Allow piston to retract.
	Blocked hose.	Replace hose.
Nut splitter cylinder will not build pressure.	Pump release valve open.	Close pump release valve.
	Piston seal leaking.	Replace seal.
	Insufficient oil in pump.	Add oil to pump reservoir as required.
	Coupler leaking.	Replace coupler.
Frequent blade replacement.	Lubricant not used.	Use lubricant.
Hose is difficult to assemble.	Damaged coupler.	Replace coupler.
	Internal pressure within hose.	Vent hose.
Nut splitter builds full pressure, but will not split nut.	(See Section 5.7 of instructions.)	(See Section 5.7 of instructions.)

Fault	Possible Cause	Corrective Action
Nut splitter cylinder will not retract or retracts very slowly.	Loose coupler.	Check coupler and tighten if loose.
	Restricted or blocked hose.	Replace hose.
	Incorrect coupler being used.	Install correct coupler.
	Incorrect hose being used.	Install correct hose.
	Pump release valve closed.	Open pump release valve.
	Broken or weak piston return spring. (single acting models only)	Replace return spring.
	Hydraulic oil too thick.	Use correct (Enerpac) oil.

