

The logo for FabriSteel, featuring the company name in a bold, blue, sans-serif font. The text is centered within a red diamond shape that has a yellow-to-white gradient radiating from its center, creating a starburst effect. The background of the entire cover is a gradient of blue and grey, with a large blue arrow pointing from the top right towards the center.

**FabriSteel**

A large, semi-transparent yellow arrow pointing to the right, which serves as a background for the title. The arrow is filled with a dense, repeating pattern of various nuts and bolts in a light yellow color, creating a textured effect.

# MHN Round Pierce Nut Bench Manual

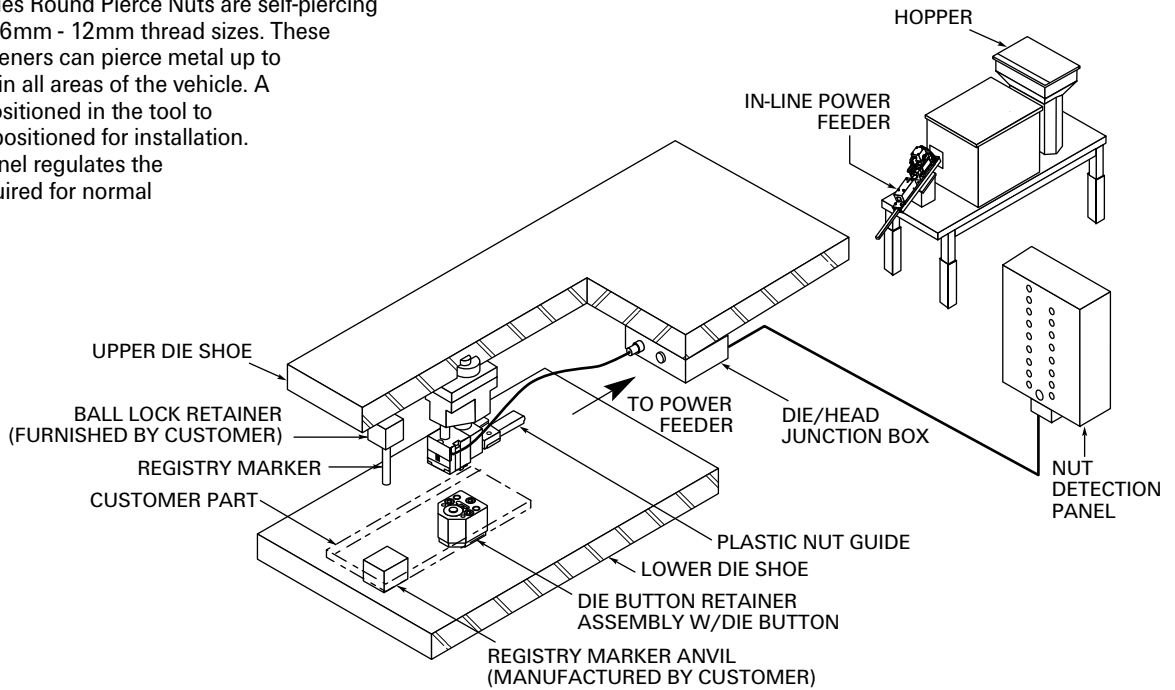


*THE TOTAL-SERVICE  
FASTENING SYSTEMS  
COMPANY*



# MHN Series Round Pierce Nut Installation Head

FabriSteel's MHN Series Round Pierce Nuts are self-piercing fasteners available in 6mm - 12mm thread sizes. These automatically fed fasteners can pierce metal up to 3.5mm and are used in all areas of the vehicle. A proximity sensor is positioned in the tool to identify that a Nut is positioned for installation. The Nut Detection Panel regulates the various functions required for normal operation.

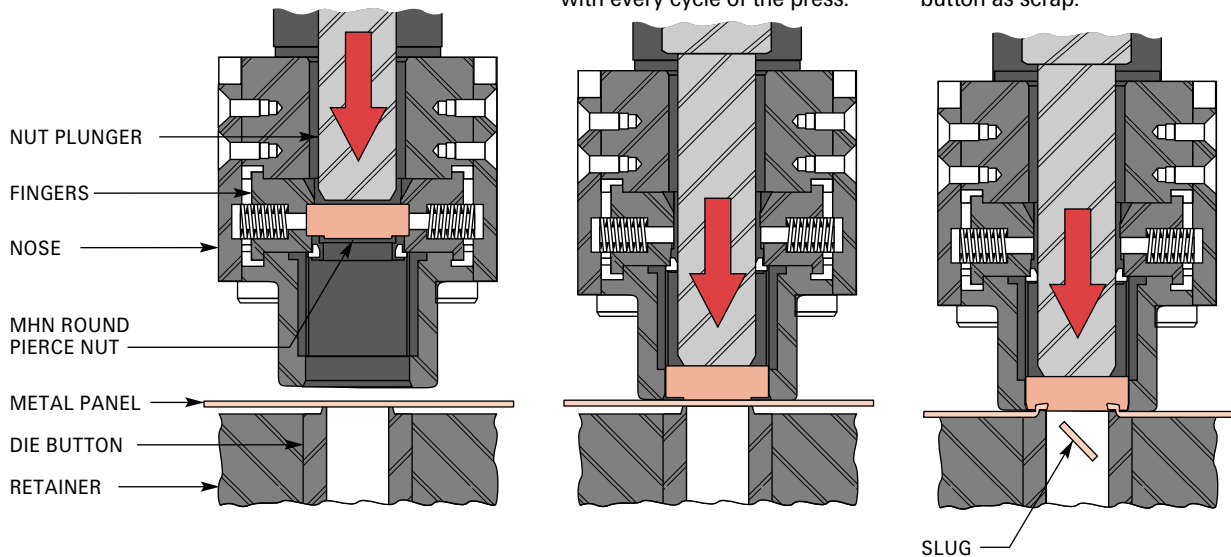


## MHN Series Round Pierce Nut Installation. As easy as...

**1** The Pierce Nut is automatically placed in position in the Installation Tool (Head) until the metal panel is in position with the die button underneath.

**2** As the die closes, the nut plunger pushes the nut through the metal panel. The pilot area of the nut serves as the punch - virtually a new punch with every cycle of the press.

**3** The die button forms the metal panel to lock the nut in place. The die-stamped blank (slug), cut by the pilot of the nut, drops through the die button as scrap.



# Tooling Requirements

## MHN HEAD ASSEMBLY

MHNXX-XX-XX-XX

### IDENTIFICATION SUFFIX

Blank = standard (no extension)  
25 = 25mm extension  
50 = 50mm extension  
75 = 75mm extension  
Larger number indicates amount of extension  
Letters indicate special or altered unit

### COMPONENT NUMBER

00 Indicates standard Head

### NUT NUMBER

06 indicates M6 MHN Nut  
08 indicates M8 MHN Nut  
10 indicates M10 MHN Nut  
12 indicates M12 MHN Nut

### HEAD TYPE IDENTIFICATION

MHNA indicates standard head  
MHNAE indicates head with error proofing

## DIE BUTTONS

MHNB-XX-XXX-XX

### IDENTIFICATION SUFFIX

Indicates special or altered unit

### NOMINAL PANEL METAL THICKNESS

### NUT NUMBER

06  
08  
10  
12

### INDICATES STANDARD MHN NUT BUTTON

## DIE BUTTON RETAINER

HRAM-32 (M6, M8, M10)  
HRAM-40 (M12)

## POWER FEEDER

MPF-XX-X

### 00 INDICATES ASSEMBLY

### NUT THD IN MILLIMETERS

MHN06  
MHN08  
MHN10  
MHN12

### PIERCE NUT FEEDER

## REGISTRY MARKER

MSM-26-30 Use for all Nut sizes

## ELECTRICAL PROX PROBE REQUIREMENTS

FCP-8D-PNP Nut Detection Panel  
MSE-84 Die Wiring Kit

## PLASTIC NUT GUIDE

MHN-XX-12 X 15'

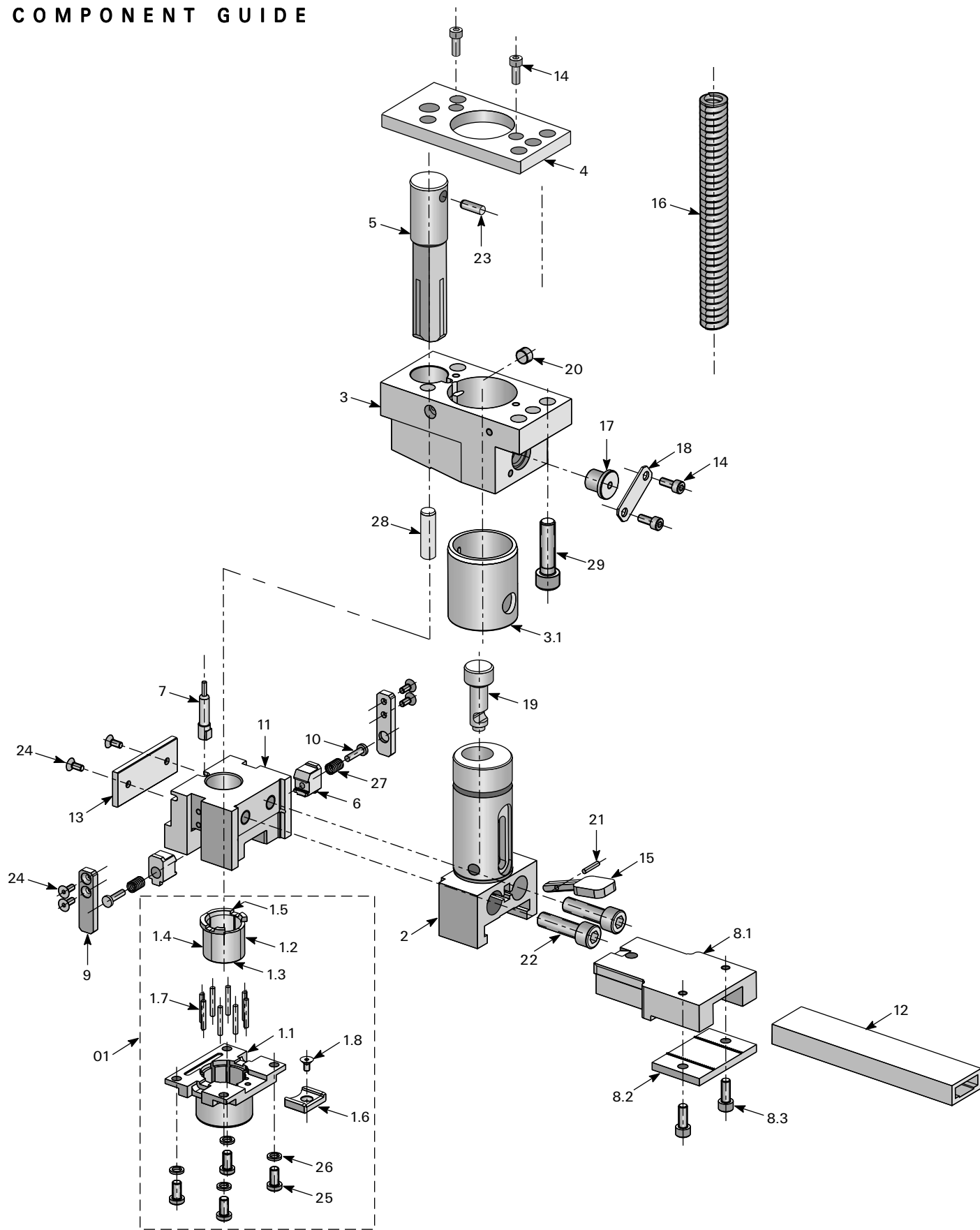
### NUT NUMBER

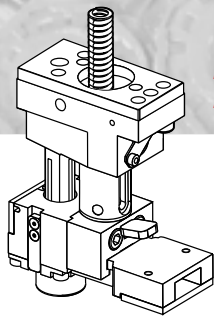
06 indicates M6 MHN Nut  
08 indicates M8 MHN Nut  
10 indicates M10 MHN Nut  
12 indicates M12 MHN Nut

NOTE: Order all MHN Series Round Pierce Nut Equipment from FabriSteel

# MHN Round Pierce Nut Head Assembly

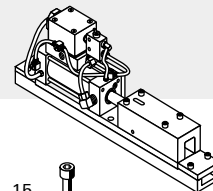
## COMPONENT GUIDE





**MHN Round Pierce Nut  
Installation Head**

**MHN Round Pierce Nut  
In-Line Power Feeder**



**NOSE SUB-ASSEMBLY**

DETAIL #	DESCRIPTION	PART #	# REQ'D
01	Nose Assy	MHN-XX-01-XX	1
1.1	Nose Body	MHN-XX-01N-XX	1
1.2	Segment 1	MHN-XX-01S1-XX	1
1.3	Segment 2	MHN-XX-01S2-XX	1
1.4	Segment 3	MHN-XX-01S3-XX	1
1.5	Segment 4	MHN-XX-01S4-XX	1
1.6	Guide Insert	MHN-XX-01G	1
1.7	Urethane Round Rod	130648	8
1.8	Flat Head Screw	502095	1

**BASE SUB-ASSEMBLY**

DETAIL #	DESCRIPTION	PART #	# REQ'D
2	Shank	MHN-XX-02-XX	1
3	Base	MHN-COM-03	1
3.1	Sleeve Bearing	MHN-MS-144	1
4	Backup Plate	MHN-COM-04	1
5	Plunger	MHN-XX-05-XX	1
6	Finger	MHN-XX-06	2
7	Proximity Probe	MSE-7APNP-CA	1
9	Cover	MHN-XX-09	1
10	Guide Pin	MHN-XX-10	2
11	Guide Plate	MHN-XX-11	1
12	Plastic Chuting	MHN-XX-12	1
13	Probe Retaining Plate	MHN-XX-13	1
14	M5 x 0.8P x 12 lg SHCS	500221	4
15	Lever Arm	MHN-COM-15	1
16	Shank Spring	MS-1-XXX	1
17	Shank Stop Pin	MHN-MS-3	1
18	Stop Pin Retaining Plate	MHN-MS-4	1
19	Retaining Bolt	MHN-MS-5	1
20	NPT Plug (1/8")	MS-20	1
21	3 mm OD x 16 mm lg Dowel	MS-109	1
22	M10 x 1.0P x 35 lg SHCS	500222	2
23	6 mm OD x 20 mm lg Dowel	501922	1
24	M4 x 0.7P x 10 lg FHS	502100	6
25	M6 x 1.0P x 12 SHCS-Low hd	502577	4
26	Spring Ring	502950	4
27	Finger Spring	503186	2
28	10 mm OD x 40 mm lg Dowel	Supplied by customer	2
29	M10 x 1.5P x 40 lg SHCS	Supplied by customer	3

**CHUTE ATTACHING BLOCK SUB-ASSEMBLY**

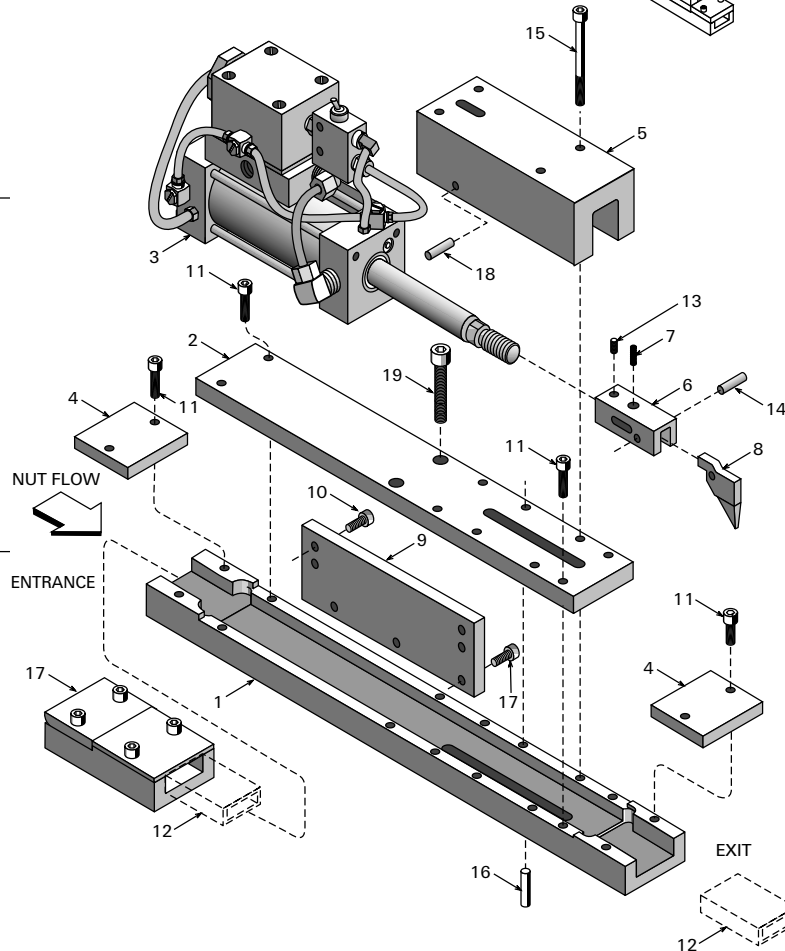
DETAIL #	DESCRIPTION	PART #	# REQ'D
8	Chute Attaching Block Assy.	MHN-XX-08	1
8.1	Chute Attaching Block	MHN-XX-08B	1
8.2	Cover Plate	MHN-XX-08C	1
8.3	M6 x 1.0P x 16 SHCS	500905	2

XX - denotes nut number & extension length

**Ordering Information:**

When ordering, specify:

- MHN Series Round Nut Number
- Length of Head extension (if any)
- Alteration (if any)



**IN-LINE POWER FEEDER**

DETAIL #	DESCRIPTION	PART #	# REQ'D
01	Feed Block	MPF-MHNXX-01-PP	1
02	Top Plate	MPF-250-02-PP	1
03	Air Cylinder (1-1/2 bore)	MPF-AIR-PP	1
04	Cover Plate	MPF-MHNXX-04-PP	2
05	Slide Track	MPF-250-B-05	1
06	Clevis	MPF-COM-06	1
07	Nut Pawl Spring	CS-3	1
08	Nut Pawl	MPF-COM-31	1
09	Side Mounting Plate	MPF-250-09	1
10	Cover Plate Screws (1/4-20 x 5/8" socket head cap screw)	MS-17	3
11	Cover Plate Screws (1/4-20 x 1/2" socket head cap screw; low head)	500021	8
12	Chuting	MHN-XX-12	2
13	Clevis Set Screw (# 10-32 x 3/16")	CS-10	1
14	Clevis Dowel (1/4 O.D. x 3/4" long)	CS-15	1
15	Slide Track Screws (1/4-20 x 2-3/4" socket head cap screw)	MS-156	4
16	Slide Track Dowel (1/4 O.D. x 1-3/8" long)	500300	2
17	Screw (1/4-20 x 7/8")	500209	4
18	Roll Pin (5/16 O.D. x 2" long)	MS-158	1
19	???? Screw (5/16-18 x 1.75" long)	???	???

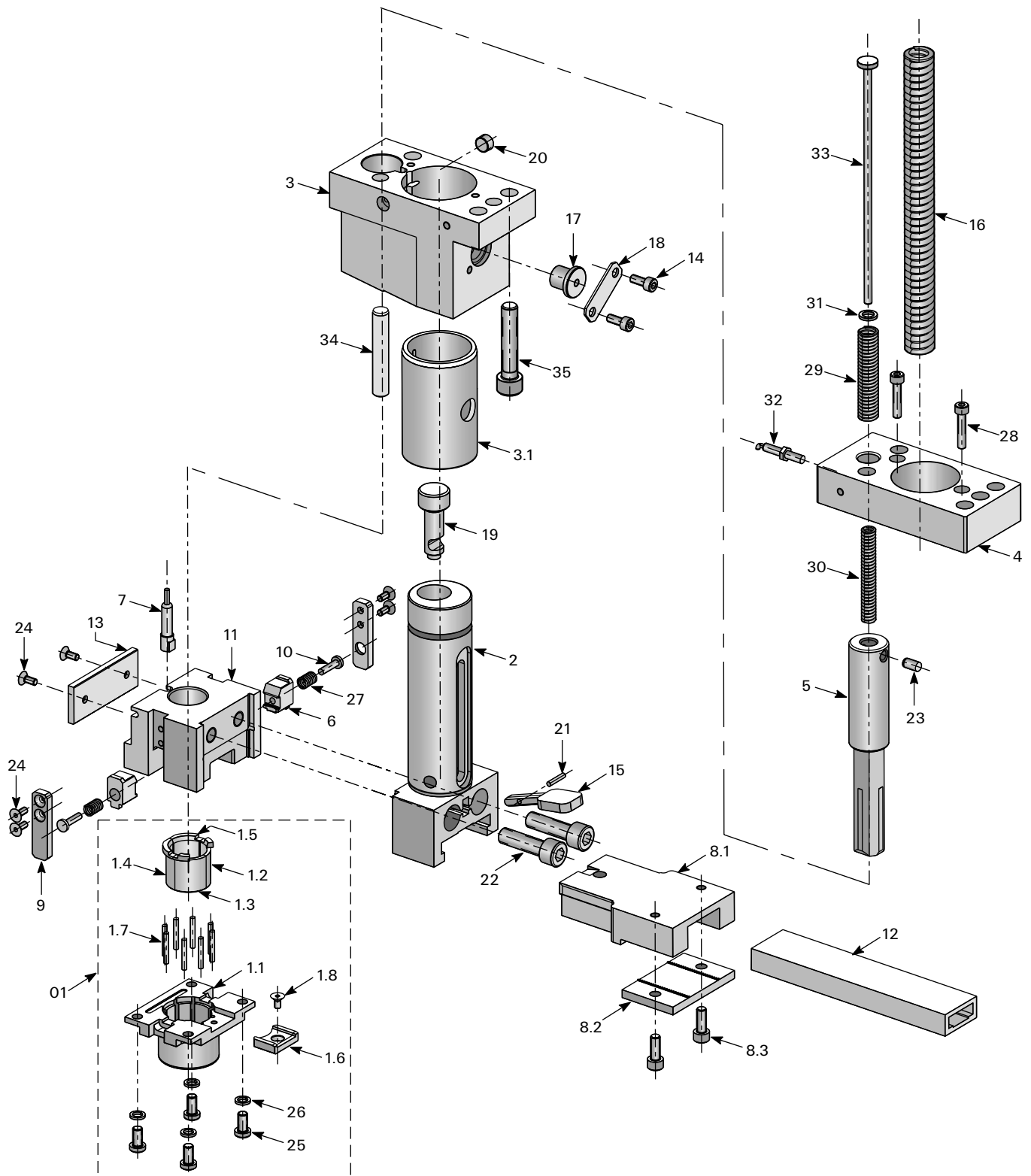
XX - denotes nut number

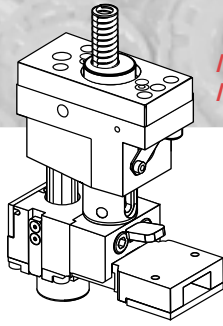
†† - denotes chuting option:

- B - Brass
- P - Plastic

# MHNE (Error-proofing) Round Pierce Nut Head Assembly

## COMPONENT GUIDE





**MHNE Round Pierce  
Nut Installation Head**

**NOSE SUB-ASSEMBLY**

DETAIL #	DESCRIPTION	PART #	# REQ'D
01	<b>Nose Assy</b>	<b>MHN-XX-01-XX</b>	<b>1</b>
1.1	Nose Body	MHN-XX-01N-XX	1
1.2	Segment 1	MHN-XX-01S1-XX	1
1.3	Segment 2	MHN-XX-01S2-XX	1
1.4	Segment 3	MHN-XX-01S3-XX	1
1.5	Segment 4	MHN-XX-01S4-XX	1
1.6	Guide Insert	MHN-XX-01G	1
1.7	Urethane Round Rod	130648	8
1.8	Flat Head Screw	502095	1

**BASE SUB-ASSEMBLY**

DETAIL #	DESCRIPTION	PART #	# REQ'D
2	Shank	MHNE-XX-02E-XX	1
3	Base	MHNE-COM-03	1
3.1	Sleeve Bearing	MHNE-MS-144	1
4	Backup Plate	MHNE-COM-04	1
5	Plunger	MHNE-XX-05-XX	1
6	Finger	MHN-XX-06	2
7	Proximity Probe	MSE-7APNP-CA	1
9	Cover	MHN-XX-09	2
10	Guide Pin	MHN-XX-10	2
11	Guide Plate	MHN-XX-11	1
12	Plastic Chuting	MHN-XX-12	1
13	Probe Retaining Plate	MHN-XX-13	1
14	M5 x 0.8P x 12 lg SHCS	500221	2
15	Lever Arm	MHN-COM-15	1
16	Shank Spring	MS-1-XXX	1
17	Shank Stop Pin	MHN-MS-3	1
18	Stop Pin Retaining Plate	MHN-MS-4	1
19	Retaining Bolt	MHN-MS-5	1
20	NPT Plug (1/8")	MS-20	1
21	3 mm OD x 16 mm lg Dowel	MS-109	1
22	M10 x 1.0P x 35 lg SHCS	500222	2
23	6 mm OD x 12 mm lg Dowel	500289	1
24	M4 x 0.7P x 10 lg FHS	502100	6
25	M6 x 1.0P x 12 SHCS-Low hd	502577	4
26	Spring Ring	502950	4
27	Finger Spring	503186	2
28	M5 x 0.8P x 25 lg SHCS	502580	2
29	Spring	503219	1
30	Spring	503221	1
31	Urethane Spring	129602	1
32	Proximity Probe	MSE-32PNP-CA	1
33	Slug Probe Rod	MHNE-XX-22-XX	1
34	10 mm OD x 60 mm lg Dowel	Supplied by customer	2
35	M10 x 1.5P x 50 lg SHCS	Supplied by customer	3

**CHUTE ATTACHING BLOCK SUB-ASSEMBLY**

DETAIL #	DESCRIPTION	PART #	# REQ'D
8	<b>Chute Attaching Block Assy.</b>	<b>MHN-XX-08</b>	<b>1</b>
8.1	Chute Attaching Block	MHN-XX-08B	1
8.2	Cover Plate	MHN-XX-08C	1
8.3	M6 x 1.0P x 16 SHCS	500905	2

XX - denotes nut number

**Ordering Information:**

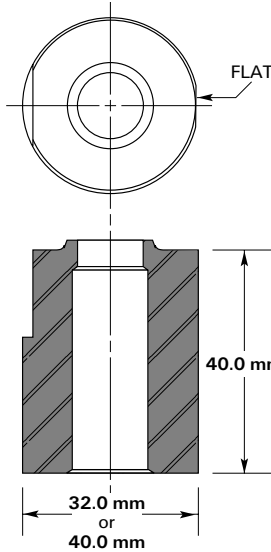
When ordering, specify:

- MHN Series Round Nut Number
- Length of Head extension (if any)
- Alteration (if any)

**Die Button and Retainer**

The die button, held firmly in the die with a retainer, supports the metal panel for piercing and forms the barrel of the fastener over its circumference to lock it in place against the bottom surface of the part in complete radial engagement.

**DIE BUTTON**



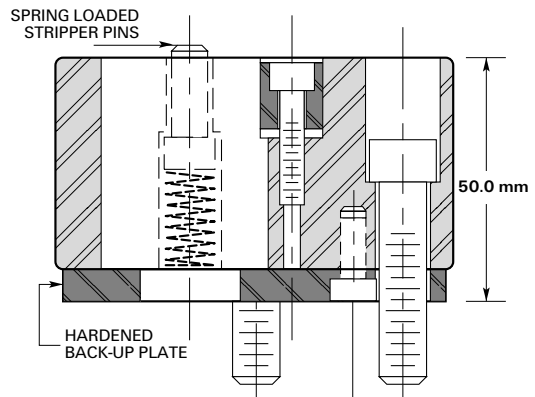
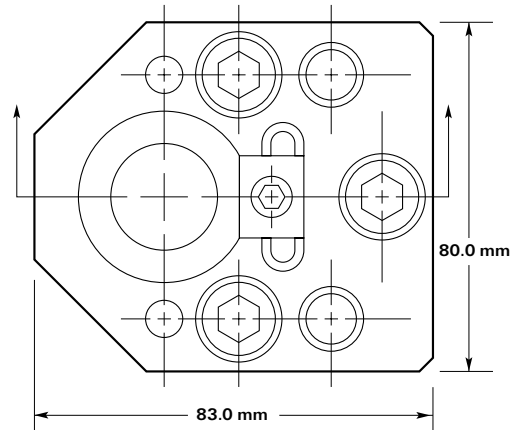
**DIE BUTTONS**

Dimensions in millimeters

NUT SIZE	PIERCE METAL RANGE	DIE BUTTON PART NO.	DIE BUTTON METAL RANGE
MHN-06	0.70-2.50	MHNB-06-100	0.70-1.30
		MHNB-06-160	1.31-1.90
		MHNB-06-220	1.91-2.50
MHN-08	0.70-2.50	MHNB-08-100	0.70-1.30
		MHNB-08-160	1.31-1.90
		MHNB-08-220	1.91-2.50
MHN-10	1.00-3.00	MHNB-10-130	1.00-1.67
		MHNB-10-200	1.68-2.33
		MHNB-10-270	2.34-3.00
MHN-12	1.50-3.50	MHNB-12-200	1.50-2.50
		MHNB-12-300	2.51-3.50

NUT SIZE	INSTALLATION TONNAGE
MHN-06	11
MHN-08	16
MHN-10	17.5
MHN-12	19

**DIE BUTTON RETAINERS  
PART # HRAM-32 (MHN 06, 08, 10)  
# HRAM-40 (MHN 12)**



NOTE: Diagrams not to scale

# "Good" and "Not Good" Registry Marker

The Multifastener Registry Marker is designed to provide immediate visual determination of proper or improper ram setting.

## FUNCTION

- The Registry Marker has a raised circle with the letters "N" and "G" located within, raised to different levels (see Fig. 2).
- At the bottom of the die stroke, if a circle and a "G" are stamped in your metal panel, the die is set properly (see Fig. 1).
- If a circle and "NG" appears, the hit is too hard (see Fig. 1).
- If no mark appears, the hit is too light (see Fig. 1).

## LOCATION IN THE DIE

The Registry Marker is mounted in the same die shoe as the Installation Head and is positioned over the part panel that is to receive the PierceForm Nut (see Fig. 3). The Registry Marker should be located as close to the Head as possible.

## SETTING

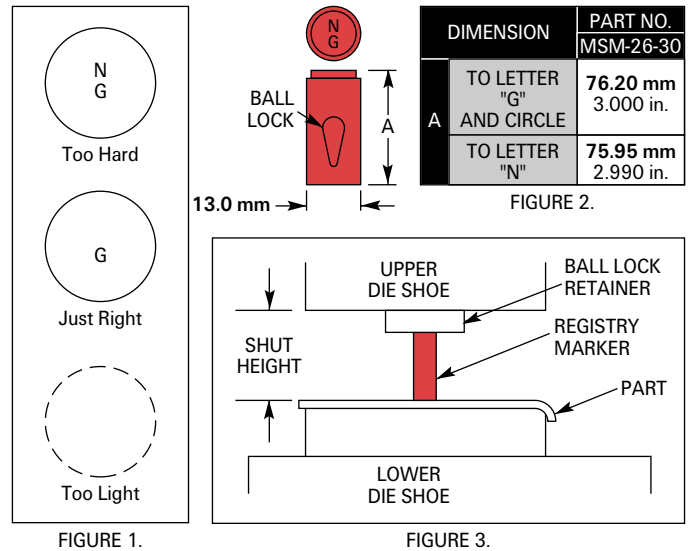
The proper shut height of the "Good" Registry Marker is 76.07mm (2.995") (see Fig 3). Shut height dimension does not include retainer plate thickness.

## MOUNTING IN THE DIE

The Registry Marker incorporates a heavy-duty ball lock feature to facilitate mounting in the die. (Ball lock retainer must be provided by customer.)

## ADDITIONAL INFORMATION

Inch Registry Markers are available. Heavy-duty ball lock Registry Markers also available: Inch MS-26-30-H, Metric MSM-26-30-HD

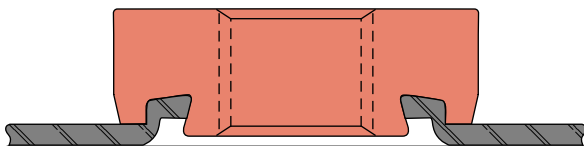


## Visual Inspection of the MHN Round Pierce Nut Installation

Proper ram setting can be achieved and continuously checked by visually inspecting the MHN Round Pierce Nut flange as installed, using the following guide.

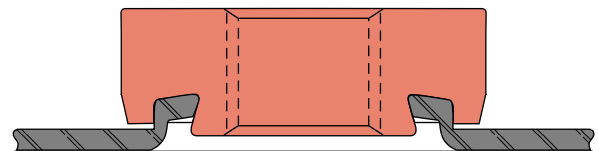
### CASE 1: PROPER RAM SETTING

The base of the Nut is flush with the panel.



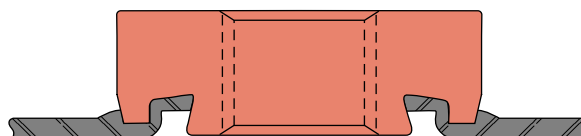
### CASE 2: TOO LIGHT

The base of the Nut is above flush with the panel.



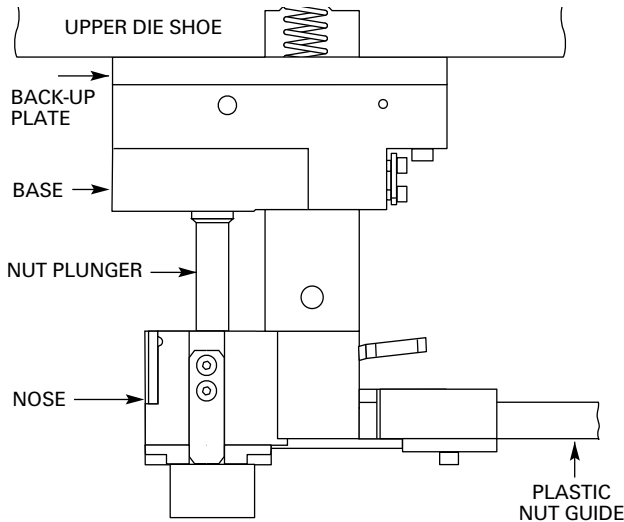
### CASE 3: TOO HEAVY

The base of the Nut is below flush with the panel.



# MHN Round Pierce Nut Head Set-Up Adjustments

During die tryout of the MHN Round Pierce Nut Installation Head (and during normal operation) certain conditions may occur which may be easily corrected.



## NO NUT IS DEPOSITED IN PANEL (CAUSES)

- No Nuts in Head (check Nut supply for obstruction in feed system, chuting).
- Head improperly assembled (check for proper assembly).
- Head failing to open fully (see condition/solution).
- Improper shut-height setting (check ram setting - nose contacts base).
- Obstruction in Plastic Nut Guide or chute attaching block (shut off Nut flow and clear blockage at Feeder).
- Nut jammed in Head (remove chute attaching block and clear jammed Nut from Head - refer to page 10).

## HEAD FAILS TO OPEN FULLY (CAUSES)

- Improper shut-height setting (check ram setting - nose contacts base).
- Check for obstruction in shank clearance hole in die shoe.
- Power feed pressure set too high.

## Alignment Procedures

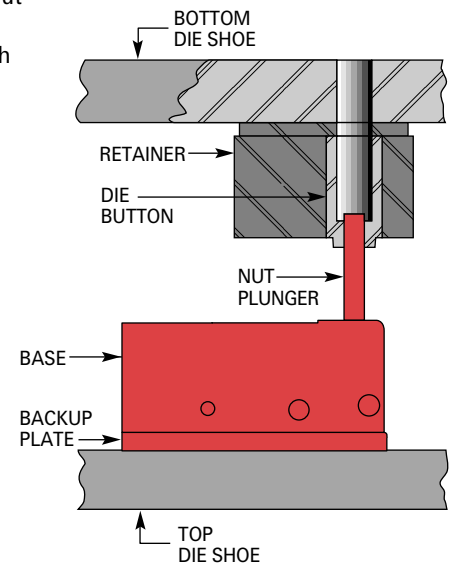
MHN Round Pierce Nut Installation Heads may be mounted in the die by either of two methods: Direct Layout or Die Layout.

### DIRECT LAYOUT METHOD

- Install die button retainer by direct layout or with template.
- Insert alignment die button in retainer.
- Invert die set (so die button retainer is on top).
- Set base, back-up plate, and plunger in head position.
- Lower die shoe (with retainer) so plunger enters die button.
- **Plunger and die button must be equivalent sizes.**
- Transfer base mounting holes to die (with punch).
- Repeat steps above for all Heads in die.
- Drill and tap mounting holes for screws.
- Loosely mount base and back-up plate in each Head location.
- Replace mating die shoe.
- Lower die shoe (with retainer) so plunger enters die button.
- Tighten base mounting screws.
- Repeat steps above for each Head in die.
- Remove mating die shoe; transfer dowel holes. Drill as required for reaming.
- Ream for press fit for dowel pins.
- Locate and machine clearance holes for shank and spring.
- Install Head in each Head location. Follow plant die tryout procedures; follow Multifastener ram setting procedures in this manual.

### DIE LAYOUT METHOD

- Install die button retainer by direct layout or with template. Insert alignment die button in retainer.
- Loosely mount base, back-up plate, and plunger in each Head location by the layout procedure.
- Lower die shoe with retainer so plunger properly enters die button.
- Tighten base mounting screws.
- Repeat steps above for each Head in die.
- Remove mating die shoe; transfer dowel holes. Drill as required for reaming.
- Ream for press fit for dowel pins.
- Locate and machine clearance holes for shank and spring.
- Install Head in each Head location. Follow plant die tryout procedures; follow ram setting procedures in this manual.



# Assembly/Disassembly

The MHN Round Pierce Nut Installation Heads may be easily repaired using the following procedures. Most repairs can be accomplished without removing the Head from the die or fixture, keeping 'downtime' to a minimum.

## CHUTE ATTACHING BLOCK

*Removing or Installing Chute Attaching Block*

### REMOVAL:

- Depress lever arm (J) to disengage lock pin. Pull Chute Attaching Block (A) from head.

### INSTALLATION:

- Insert Chute Attaching Block (A). Make certain lock pin engages when Chute Attaching Block is inserted.
- Remove device used to block Nut flow from hole (J) in Chute Attaching Block.

## NOSE ASSEMBLY

*Removing or Installing Nose Body Assembly*

### REMOVAL:

- Remove Chute Attaching block (A), as described previously.
- Support nose (Q) and remove two shank screws (P).
- Slide Nose/Assembly down off plunger (D).

### INSTALLATION:

- Position Nose/Assembly on plunger and install two shank screws (P).
- Install Chute Attaching Block (A), as described previously.

## NOSE AND SHANK ASSEMBLIES

*Removing or Installing Nose and Shank Assemblies*

### REMOVAL:

- Remove Chute Attaching Block (A), as described previously.
- Remove screws (C) and pin plate (F) from base.
- Use a pry bar and apply force on Shank to relieve spring pressure on Shank stop pin (E) and remove pin. Slowly release spring pressure.
- Remove Nose (Q) and Shank (K).

### INSTALLATION:

- Position Shank (K) and Nose (Q) in Head.
- Use a pry bar and apply force to Shank to compress Shank spring and install Shank stop pin (E) so that pin enters slot in Shank.
- Install stop pin plate and tighten plate screw (C).
- Install Chute Attaching Block (A), as previously described.

## HEAD ASSEMBLY

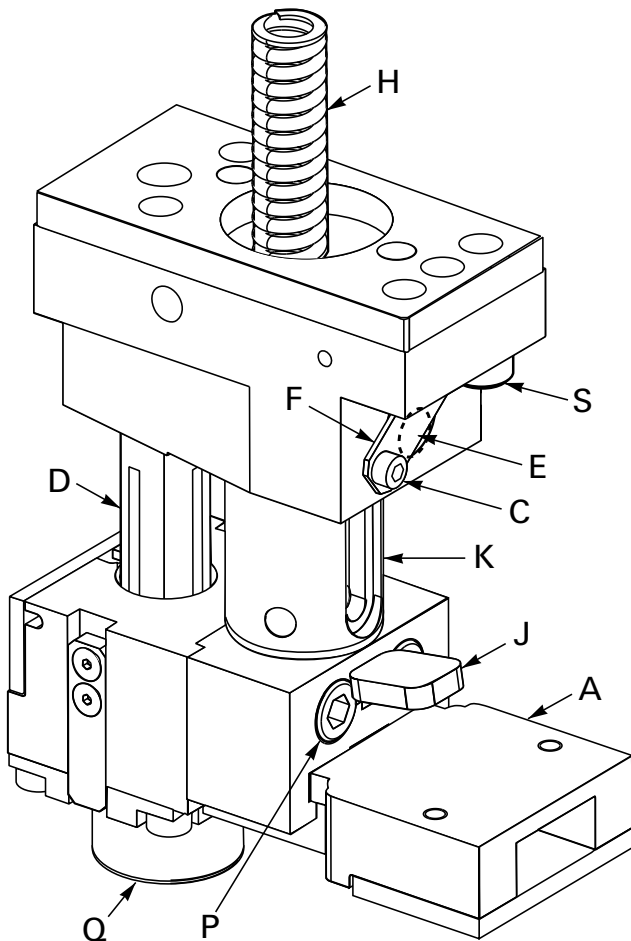
*Removing or Installing Head Assembly*

### REMOVAL:

- Remove Chute Attaching Block (A), as described previously.
- Remove screws (C) and pin plate (F) from base.
- Use a pry bar and apply force on Shank to relieve spring pressure on Shank stop pin (E) and remove pin. Slowly release spring pressure.
- Remove socket head screws (S). Tap base with a soft hammer and pry loose from the die shoe dowel pins.

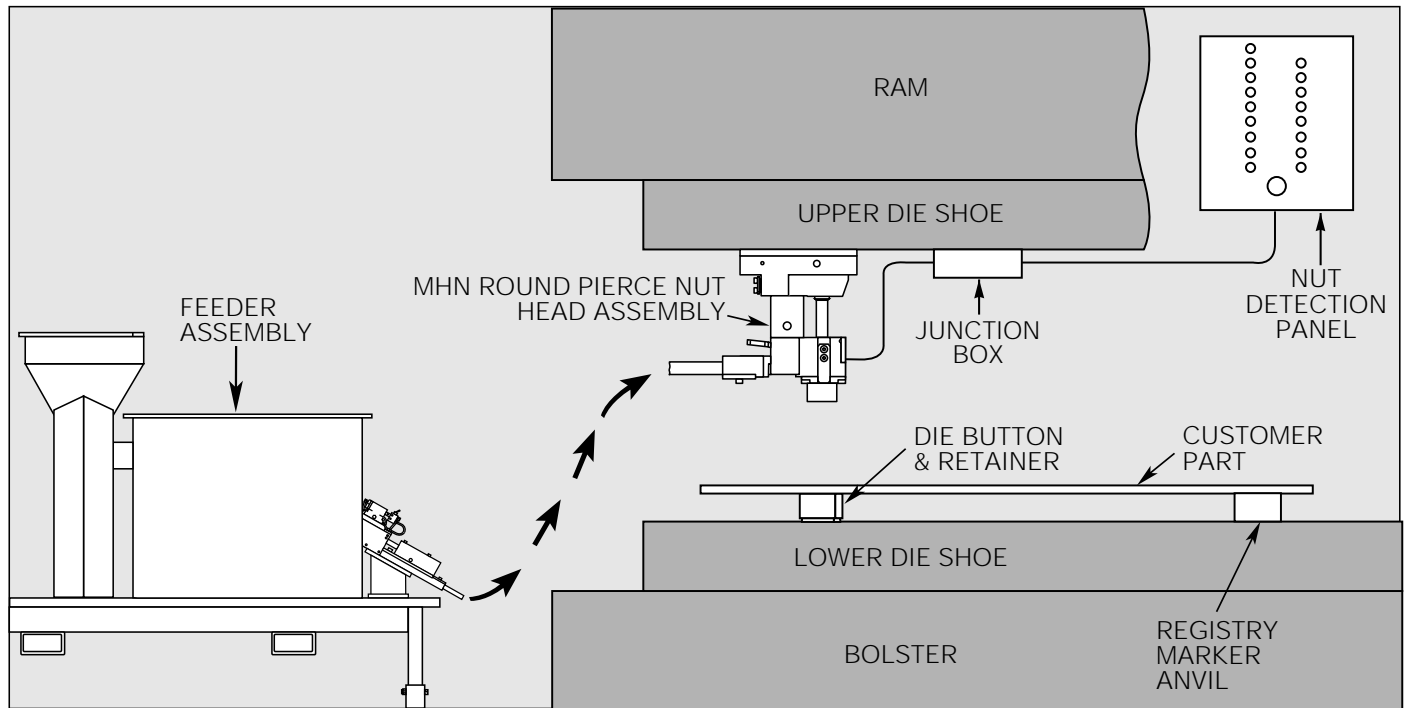
### INSTALLATION:

- Position Base Assembly on dowel pins in die shoe and install socket head screws (S).
- Use a pry bar and apply force to Shank to compress Shank spring and install Shank stop pin (E) so that pin enters slot in Shank.
- Install stop pin plate (F) and tighten plate screw (C).
- Install Chute Attaching Block (A), as described previously.



## Operation

The MHN Round Pierce Nut Feed System operates in unison with your press equipment to produce Nut to panel attachments that are consistent time after time. For details concerning each component's setup and operation, plus maintenance and troubleshooting procedures, see individual component sheets.



## Components

### FEEDER

Because MHN Round Pierce Nuts are pushed by air pressure from the feeder to the Installation Head in the Feed System, the Feeder can be mounted at any level you choose.

### NUT GUIDE

The plastic Nut Guide is connected between the Feeder and the Installation Head. When setting up the system, careful attention must be taken not to kink this component. Generally a three foot radius is used to ensure efficient operation.

### INSTALLATION HEAD

The MHN Nut Installation Head is mounted in the upper die shoe of the press. It is air-controlled and designed to accurately install MHN Round Pierce Nuts using the mechanical force of the press.

### DIE BUTTON & RETAINER

The Die Button is secured in a Retainer, which is mounted in the lower die shoe. When the press closes, the Installation Head punches the MHN Round Pierce Nut through the metal panel supported by the Die Button.

### PROBING

The MHN installation system includes a probe in the Installation Head which, when properly connected through the Nut Detection Panel with the press, will prevent cycling the next stroke unless a Nut is correctly positioned in the nose. Note: The customer must monitor removal of the stamping prior to the next cycle of the press.

# Maintenance Procedures

## MHN ROUND PIERCE NUT INSTALLATION HEAD

Head Assemblies do not require continuous lubrication. However, careful maintenance means longer product life and hours of trouble-free operation. It is recommended that a thorough internal cleaning and lubrication be completed between 80,000 and 90,000 cycles. External lubrication should occur every 25,000 cycles.

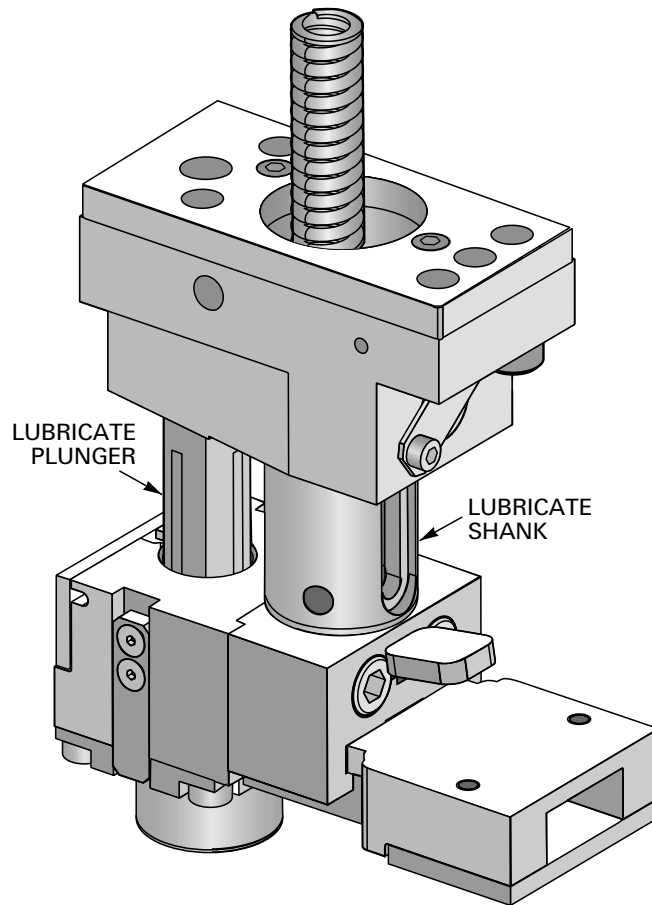
The head should be removed from the die and disassembled, as outlined in "Assembly/Disassembly." Clean all grease and metal particles from parts. Coat parts with a lithium soap base grease Molykote BRZ-5 or equivalent and reassemble the head. The lubricant is available from the following sources:

### FabriSteel

22100 Trolley Industrial Drive  
Taylor, Michigan 48180-1872

### Dow Corning Corporation

South Saginaw Road  
Midland, Michigan 48641  
Catalog #8500-26



**MULTIFASTENER®**

A BRAND OF  
**WHITESSELL INTERNATIONAL  
CORPORATION**

22100 TROLLEY INDUSTRIAL DRIVE TAYLOR, MI 48180-1872  
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