


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 emanating from its top point, creating a sunburst effect. The background of the entire cover is a gradient of blue and yellow, with a large blue arrow shape pointing to the right.

FabriSteel

A large, light-colored arrow-shaped graphic pointing to the right, which serves as a background for the title. The interior of this arrow is filled with a dense, repeating pattern of various types of metal fasteners, including bolts, nuts, and washers, in a light yellow or tan color.

**CP/CS PierceForm Stud
Bench Manual**

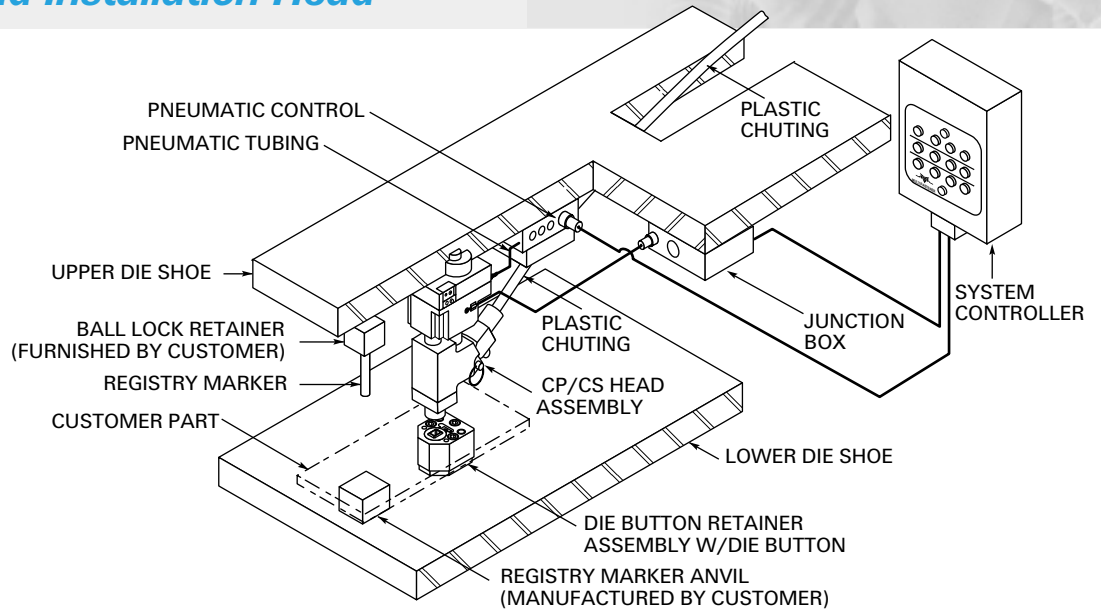


*THE TOTAL-SERVICE
FASTENING SYSTEMS
COMPANY*



PierceForm® Stud Installation Head

The PierceForm Studs (CP and CS) are property class 9.8 fasteners. They are system fed to automatic installation tools. The CP style stud pierces its own hole in a sheet metal panel (.75-3.00mm thickness) and retains the resulting slug. The CS style stud requires a pre-pierced hole and is used in heavier thickness panels (2.00-6.00mm). The installation tool requires a regulated, clean air supply for operation. A proximity sensor is positioned in the tool to identify that a stud is positioned for installation. The system controller regulates the various functions required for normal operation.



How the PierceForm Stud Installation System Works:

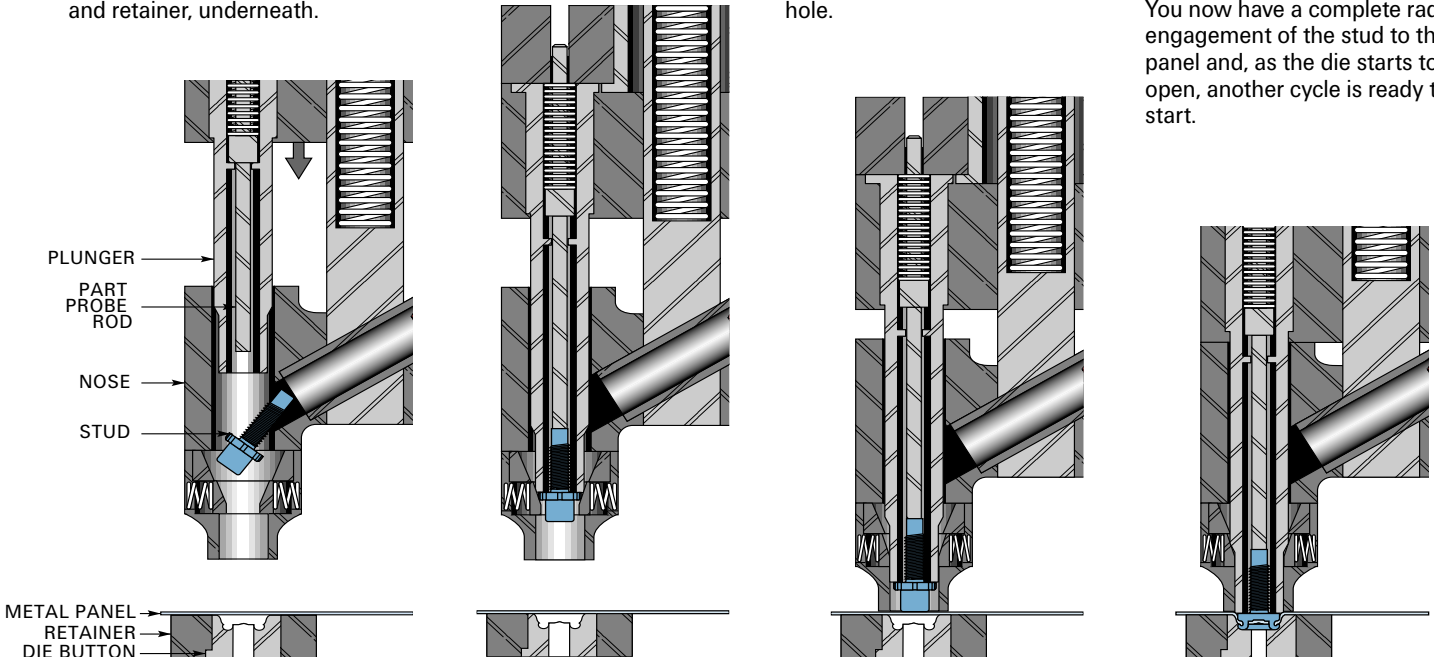
After aligning the PierceForm Stud installation head in the die it is necessary to establish the proper shut height with respect to the thickness of the panel being used. Use visual inspection of the stud installation as well as the Multifastener "registry marker" for establishing the proper shut height and as a continuous means of control installation integrity.

1 A PierceForm Stud is sent into the head via an air feeder. The stud is held in position by the PierceForm Stud installation head until the customer part is in place, supported by the die button and retainer, underneath.

2 The head is partially closed with the use of a valve. Stud displaces part probe rod which activates sensor and signals system controller that stud is in position for installation.

3 As the die closes, the nose of the installation head contacts the metal panel and the plunger inside the head begins to push the PierceForm Stud through the panel, piercing its own hole.

4 When the PierceForm Stud has penetrated the panel it contacts the die button which forms the stud barrel into a 360 mechanical attachment onto the back of the metal panel. You now have a complete radial engagement of the stud to the panel and, as the die starts to open, another cycle is ready to start.



Note: The pierce slug is retained in the barrel of the stud to simplify die designs and eliminate scrap handling, with the exception of a CS Stud, which has no slug.

Tooling Requirements

PierceForm HEAD ASSEMBLY

CPA/CSA-XXX-XXY-XXX

IDENTIFICATION SUFFIX

Indicates amount of extension in mm
(15 mm or 30 mm if required)
3 letter suffix indicates alteration

COMPONENT NUMBER

00 indicates standard Head Assembly

STUD LENGTH

B1 = 12 - 19 mm long studs
C = 28 - 35 mm long studs
D = 36 - 50 mm long studs
NO LETTER = 20 - 27 mm long studs

STUD DIAMETER NUMBER

Number indicates the assembly used:
05 = M5 stud size
06 = M6 stud size
08 = M8 stud size
10 = M10 stud size

HEAD TYPE

CPA = PierceForm CP Stud
CSA = PierceForm CS Stud

DIE BUTTONS

CPB/CSB-XX-XXX-XX

IDENTIFICATION SUFFIX (if required)

Indicates special or altered unit

NOMINAL PANEL METAL THICKNESS

STUD NUMBER

DIE BUTTON RETAINER

HRAM-32

STUD FEEDER

FP-2X-XXXXX-X

VALVE PACKAGE DESIGNATION

MULTIFASTER STUD NUMBER

TRACKS

2 = 2 track w/o aux. bin
2A = 2 track w/ aux. bin

FEEDER TYPE

FP = PierceForm Stud Feeder

REGISTRY MARKER

MSM-26-30 Use for all Stud sizes

ELECTRICAL PROXIMITY PROBE REQUIREMENTS

PFD-531A-4PNP Electrical Panel
MSE-85 Die Wiring Kit

PLASTIC CHUTING

PSC/SBK-XX-12 X 20'

STUD NUMBER

PNEUMATIC CONTROL VALVE

PFD-76-PX-120VAC (120VAC Valve)

NUMBER OF HEADS IN DIE

PFD-76-PX-24VDC (24VDC Valve)

NUMBER OF HEADS IN DIE

* No letter indicates standard length.

NOTE: Order all PierceForm Stud Equipment from Multifaster.

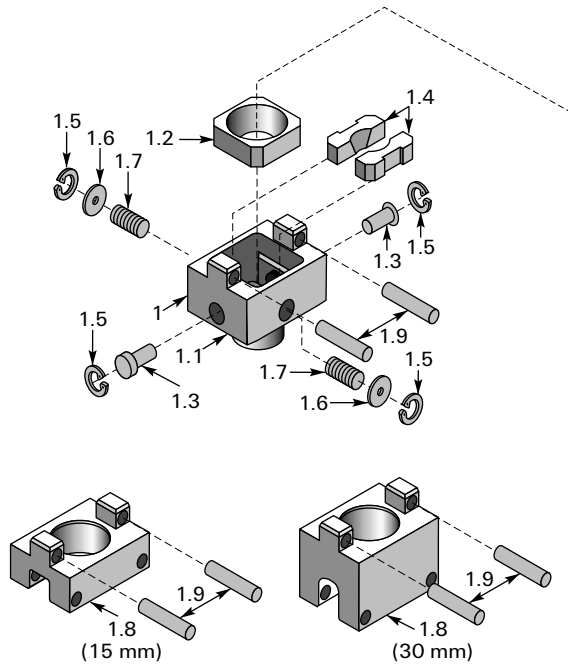
PierceForm Head Assembly

XX = Stud Size (Specify 05, 06, 08, 10, 12)

XX (bold) = Extension length in mm (15 or 30) – leave blank for no extension

CS part numbers in blue

COMPONENT GUIDE



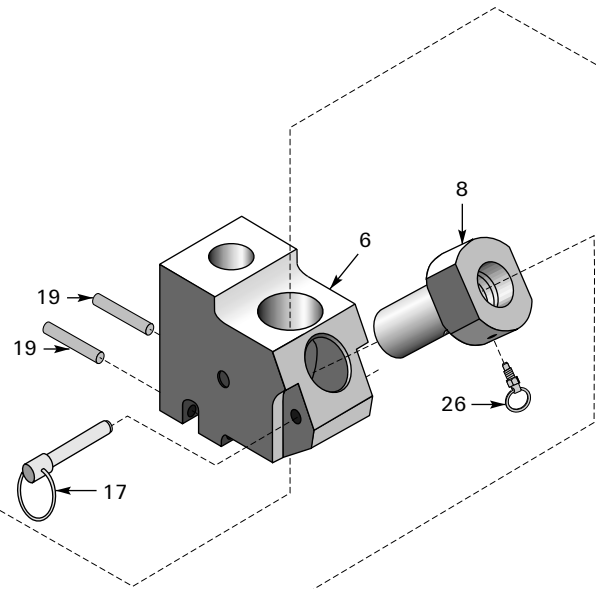
“Y” NOSE SUB-ASSEMBLY (STANDARD)

DETAIL NO.	DESCRIPTION	PART NO.	NO. REQ'D
1	Nose Assy. - "Y" Style	CP-XX-01Y- XX CS-XX-01Y- XX CP-XXB1-01Y- XX † CS-XXB1-01Y- XX †	1
1.1	Nose—"Y" Style	CP/CS-XX-01NY CP/CS-XXB1-01NY†	1
1.2	Protection Sleeve	PFD-XX-01S SBKD-XX-01S	1
1.3	Stop Pin	PFD-COM-01P1	2
1.4	Nose Fingers	PFD-XX-06 SBKD-XX-06	1 Set
1.5	Internal Retaining Ring	MS-174	2†
1.6	Washer	MS-175	2†
1.7	Compression Spring	MS-176	2†
1.8*	Nose Extension	PFD-XX-01E- XX	1
1.9*	Roll Pin	MS-164	2

* For 15 & 30 mm Nose Extensions only

† 4 req'd for M10 noses only

‡ For stud lengths 12-19mm long



CHUTE ATTACHING BLOCK SUB-ASSEMBLY

DETAIL NO.	DESCRIPTION	PART NO.	NO. REQ'D
9	Chute Adaptor Assy.	CP-XX-N23 or CS-XX-N23	1
9.1	Chute Coupler	CP-XX-44 or CS-XX-45	1
9.2	Coupler Cap	CP-XX-45 or CS-XX-46	1
12	PierceForm Stud Chuting	PSC-XX-12 or SBK-XX-12	1

Ordering Information:

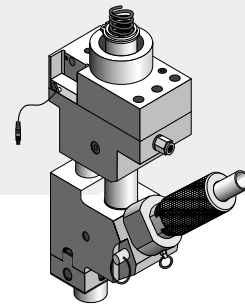
When ordering, specify:

- Stud Size and Length
- Length of Head extension (if any)
- Alteration (if any)

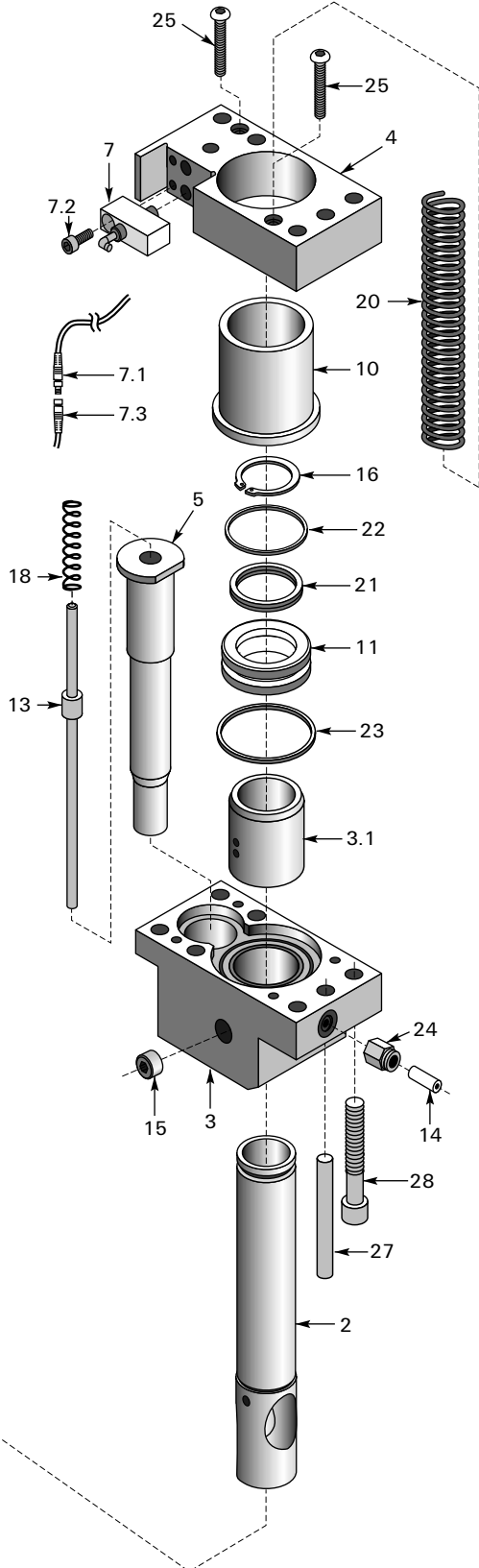
XX = Stud Size (Specify 05, 06, 08, 10, 12)

XX (bold) = Extension length in mm (15 or 30) – leave blank for no extension

CS part numbers in blue



PierceForm HEAD
CP and CS



PART PROBE ROD CHART

STUD LENGTH	EXT.	HEAD ASSEMBLY PART NO.*	PART PROBE PART NO.
12-19 mm	STD.	CPA-XXB 1-00Y CSA-XXB 1-00Y	PFD-XX-13AY
12-19 mm	15 mm	CPA-XXB 1-00Y-15 CSA-XXB 1-00Y-15	PFD-XX-13AY-15
12-19 mm	30 mm	CPA-XXB 1-00Y-30 CSA-XXB 1-00Y-30	PFD-XX-13AY-30
20-27 mm	STD.	CPA-XX-00Y CSA-XX-00Y	PFD-XX-13Y
20-27 mm	15 mm	CPA-XX-00Y-15 CSA-XX-00Y-15	PFD-XX-13Y-15
20-27 mm	30 mm	CPA-XX-00Y-30 CSA-XX-00Y-30	PFD-XX-13Y-30
28-35 mm	15 mm	CPA-XXC-00Y-15 CSA-XXC-00Y-15	PFD-XX-13AY
28-35 mm	30 mm	CPA-XXC-00Y-30 CSA-XXC-00Y-30	PFD-XX-13AY-15
36-50 mm	30 mm	CPA-XXD-00Y-30 CSA-XXD-00Y-30	PFD-XX-13Y-15

BASE/SHANK SUB-ASSEMBLY

DETAIL NO.	DESCRIPTION	PART NO.	NO. REQ'D
2	Shank	CP/CS-XX-02Y-XX or PFD-10-02-XX†	1
3	Base Assembly Sleeve Bearing PFD-XX-09	PFDS-XX-03	1
4	Back-Up Plate	CP/CS-COM-04	1
5	Plunger	PFD-XX-05Y-XX SBKD-XX-05Y-XX	1
6	Feed Housing	CP/CS-XX-36Y or CP/CS-XXB1-36Y‡	1
7	Proximity Probe Assembly	PFD-COM-7PNP-CA	1
7.1	Proximity Probe with Male Quick Disconnect	PFD-COM-7PNP-C	1
7.2	Socket Head Cap Screw	501311	1
7.3	Female Quick Disconnect with Cable	502353	1
8	Bushing - Feed Housing	CP-XX-08 or CS-XX-08	1
10	Cylinder Cap	PFD-XX-26-XX	1
11	Piston	PFD-COM-27	1
13	Part Probe Rod	See Rod Chart	1
14	Plastic Tubing	MSE-05	1
15	Plug	MS-20	1
16	Retaining Ring	MS-161	1
17	Detent Pin	MS-162	1
18	Compression Spring	MS-163	1
19	Roll Pin	MS-164	2
20	Spring	MS-168Y-XX	1
21	O-Ring	MS-169	1
22	O-Ring	MS-170	1
23	O-Ring	MS-171	1
24	Hose Fitting	MS-183	1
25	Button Head Screw	500240	2
26	Spring Plunger	503297	1
27	Dowel Pin	N/A	2
28	Socket Head Cap Screw	N/A	3

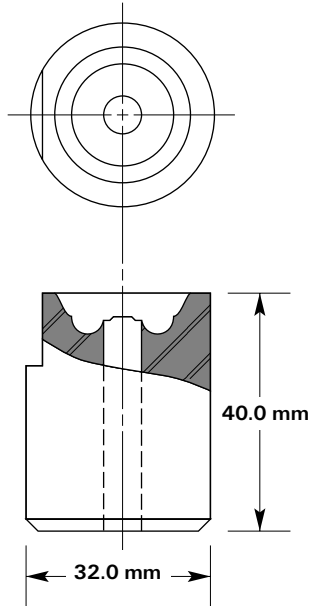
† Shank for M10 studs only

‡ For stud lengths 12-19mm long

Die Button and Retainer

The die button, held firmly in the die by the retainer, supports the metal panel and forms the barrel of the fastener to lock it in place against the bottom surface of the stamping with a complete radial engagement.

DIE BUTTON



NOTE:
Refer to
CP and CS tooling matrix

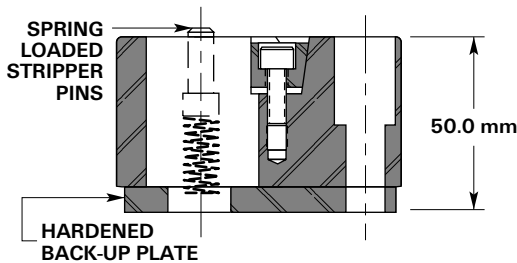
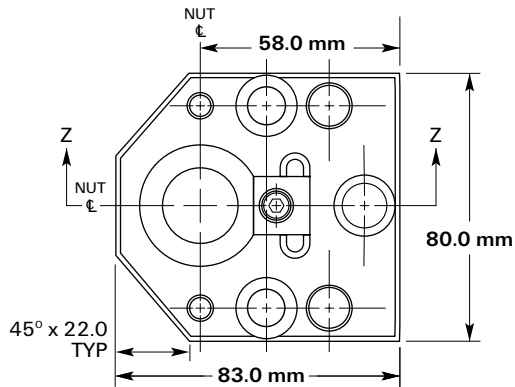
CP STUDS

STUD SIZE	METAL THICKNESS (MM)	DIE BUTTON NUMBER
5mm	0.75 - 1.24	CPB-06-100
	1.25 - 1.74	CPB-06-150
	1.75 - 2.00	CPB-06-200
6mm	0.75 - 1.24	CPB-06-100
	1.25 - 1.74	CPB-06-150
	1.75 - 2.00	CPB-06-200
8mm	0.75 - 1.24	CPB-08-100
	1.25 - 1.74	CPB-08-150
	1.75 - 2.25	CPB-08-200
10mm	0.75 - 1.24	CPB-10-100
	1.25 - 1.74	CPB-10-150
	1.75 - 1.99	CPB-10-190
	2.00 - 2.50	CPB-10-230
12mm	1.50-2.00	CPB-12-175

CS STUDS

STUD SIZE	METAL THICKNESS (MM)	DIE BUTTON NUMBER
5mm	2.00-2.74	CSB-06-230
	2.75-3.50	CSB-06-310
	3.51-4.27	CSB-06-380
	4.28-5.00	CSB-06-460
6mm	2.00-2.74	CSB-06-230
	2.75-3.50	CSB-06-310
	3.51-4.27	CSB-06-380
	4.28-5.00	CSB-06-460
8mm	2.25-3.00	CSB-08-260
	3.01-3.75	CSB-08-340
	3.76-4.50	CSB-08-410
	4.51-5.25	CSB-08-490
	5.26-6.00	CSB-08-565
10mm	2.50-3.18	CSB-10-300
	3.19-3.84	CSB-10-370
	3.85-4.50	CSB-10-430
	4.51-5.16	CSB-10-500
	5.17-6.00	CSB-10-570

DIE BUTTON RETAINER HRAM-32



Metric dimensions shown

STUD SIZE	MINIMUM INSTALLATION TONNAGE
5mm	12
6mm	12
8mm	15
10mm	25
12mm	TBD

"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

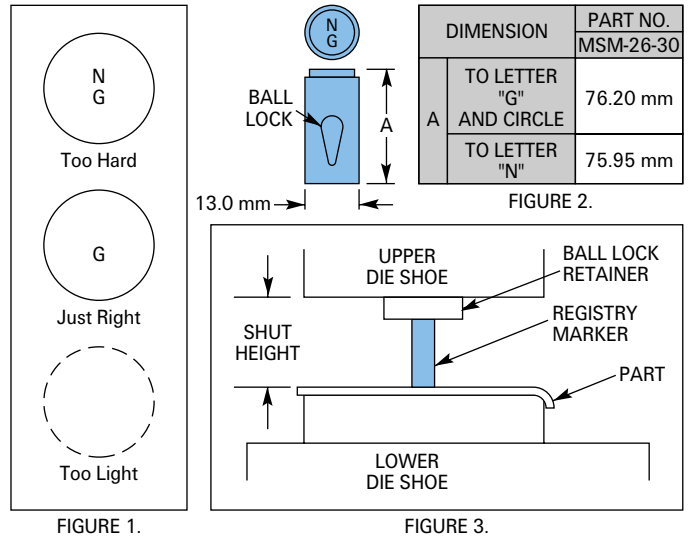
The registry marker is mounted in the same die shoe as the installation head and is positioned over the part panel that is to receive the PierceForm Stud (see Fig. 3). The registry marker should be located as close to the head as possible.

SETTING

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

MOUNTING IN THE DIE

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



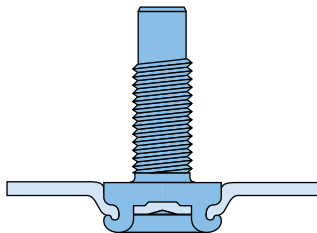
Visual Inspection of the Stud Installation

Proper ram setting can be achieved and continuously checked by visually inspecting the PierceForm Stud flange as installed, using the following guide.

CP STUD

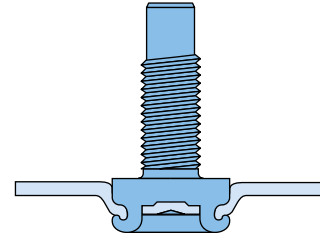
CASE 1: PROPER RAM SETTING

The flange of the stud is 0.13 mm to 0.35 mm below flush with the panel.



CASE 2: TOO LIGHT

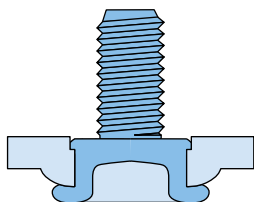
The flange of the stud is above flush with the panel.



CS STUD

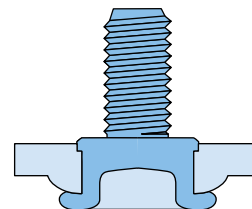
CASE 1: PROPER RAM SETTING

The post side of the stud barrel is flush to 0.20 mm below the panel.



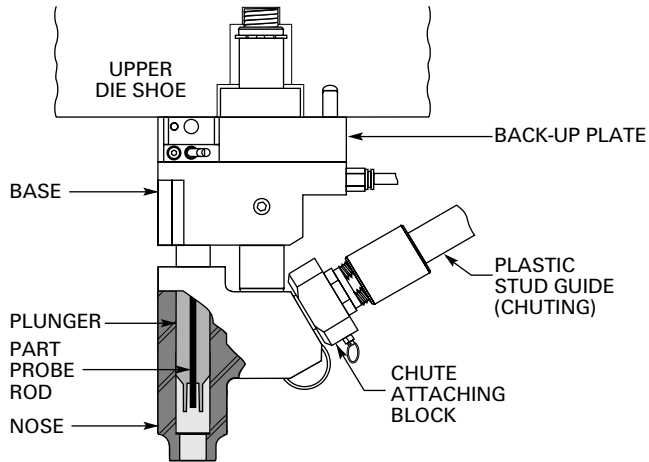
CASE 2: TOO LIGHT

The post side of the stud barrel is above flush with the panel.



PierceForm Stud Head Set-Up Adjustments

During die tryout of the PierceForm Stud installation head (and during normal operation) certain conditions may occur which may be easily corrected.



NO STUD IS DEPOSITED IN PANEL (CAUSES)

- No studs in head (check stud supply for obstruction in feed system, chuting).
- Head improperly assembled (check for proper assembly).
- Head failing to open fully.
- Improper shut-height setting (check ram setting - nose contacts base).
- Obstruction in chuting or chute attaching block (shut off stud flow and clear blockage at feeder).
- Stud jammed in head (remove chute attaching block and clear jammed stud from head - refer to page 9).

HEAD FAILS TO OPEN FULLY (CAUSES)

- Check main compression spring.
- Check for obstruction in air port.

AIR PRESSURE

- A constant air supply of 40-60 PSIG is required at air port. This air supply will insure that the head is in the proper position before stud installation.

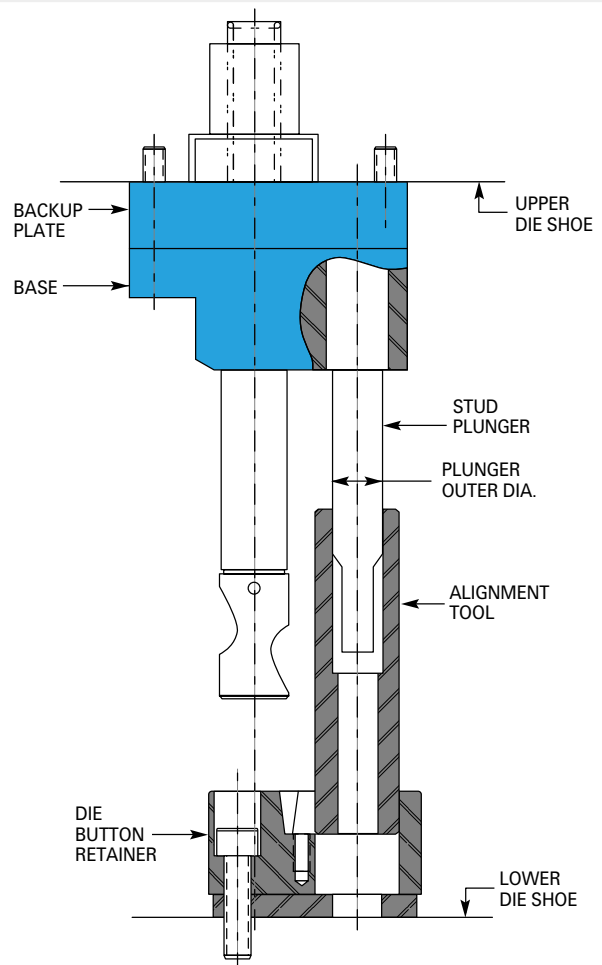
STUD IN HEAD - PRESS WILL NOT CYCLE

- Probe not sensing stud.

Alignment Procedures

RECOMMENDED ALIGNMENT METHOD

- Install die button retainer, screws, and dowels by math data or direct layout.
- Refer to installation drawings to machine mounting screws and spring pockets in upper die shoe. Do not machine dowel holes at this time.
- Loosely mount head assembly to upper die shoe with screws only.
- Place alignment tool into retainer and lower upper die shoe so that plunger outer diameter is approximately 10mm above alignment tool.
- Align installation head by sliding alignment tool up so that plunger enters into it freely.
- Tighten head mounting screws, open die and transfer dowel holes using base as a drill guide.
- Repeat for all heads in die, then double check that alignment tool slides freely onto plunger after doweling.



Assembly/Disassembly

The PierceForm Stud 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 ADAPTOR/CHUTING

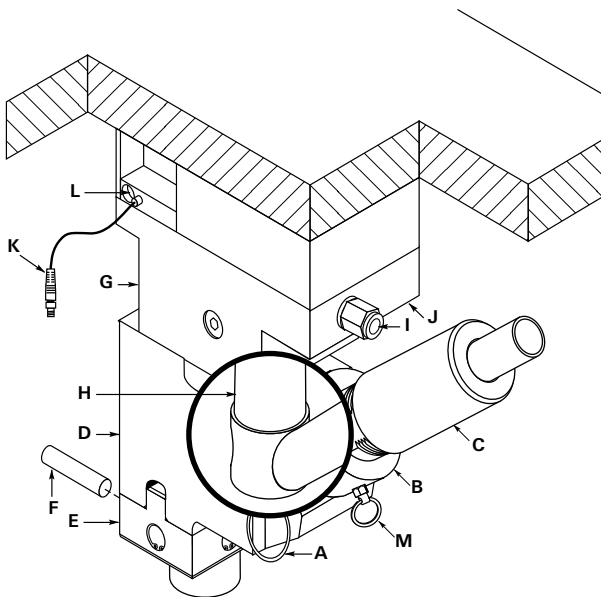
Removing or Installing Chute Adaptor/Chuting

REMOVAL:

- Shut off air/deactivate hopper feed before disconnect of chuting.
- Disconnect chute adaptor (C) and chuting from feed housing bushing (B) by releasing spring plunger (M).

INSTALLATION:

- Reconnect chute adaptor (C) and chuting into feed housing bushing (B).
- Engage spring plunger (M) to ensure that chute adaptor is retained.



NOSE ASSEMBLY

Removing or Installing Nose Body Assembly

REMOVAL (turn off air):

- Support nose/assembly (E) and push roll pins (F) out of feed housing (D) and nose body.
- Pull nose/assembly down off of feed housing.

INSTALLATION:

- Position nose/assembly (E) up against bottom surface of feed housing (D).
- Insert roll pins (F) into nose/assembly and through feed housing. Turn on air.

FEED HOUSING AND NOSE BODY ASSEMBLIES

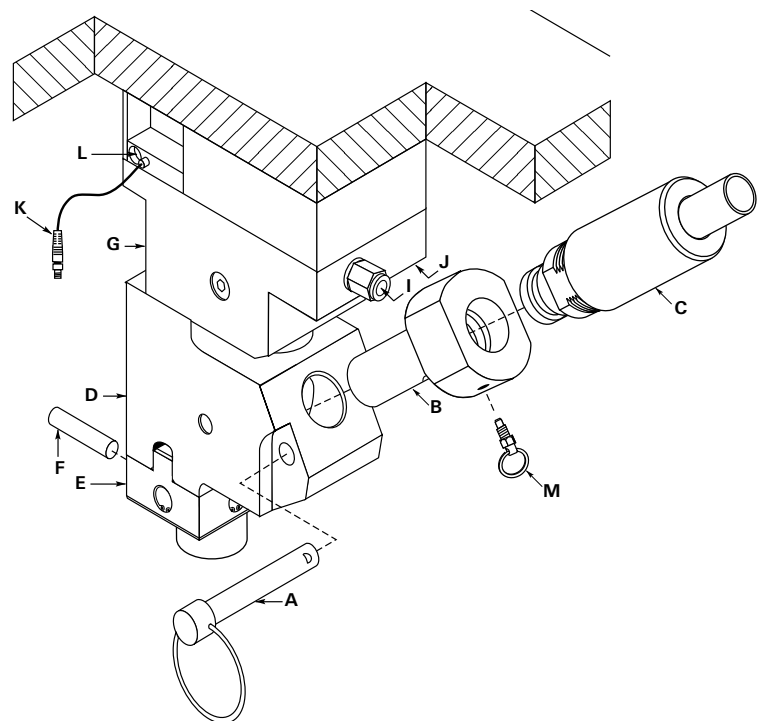
Removing or Installing Feed Housing and Nose Body Assemblies

REMOVAL (turn off air):

- Remove chute adaptor (C) and chuting as described previously.
- Remove detent pin (A).
- Support feed housing (D) and pull feed housing bushing (B) out of feed housing.
- Slide feed housing and nose body/assembly (E) off of shank (H) and plunger (not shown).

INSTALLATION:

- Position feed housing (D) and nose body (E) under base (G).
- Slide feed housing bushing (B) through feed housing and shank (H).
- Insert detent pin (A) through feed housing (D) and notch in feed housing bushing (B).
- Attach chute adaptor (C) and chuting as described previously. Turn on air.



HEAD ASSEMBLY

Removing or Installing Head Assembly

REMOVAL (turn off air):

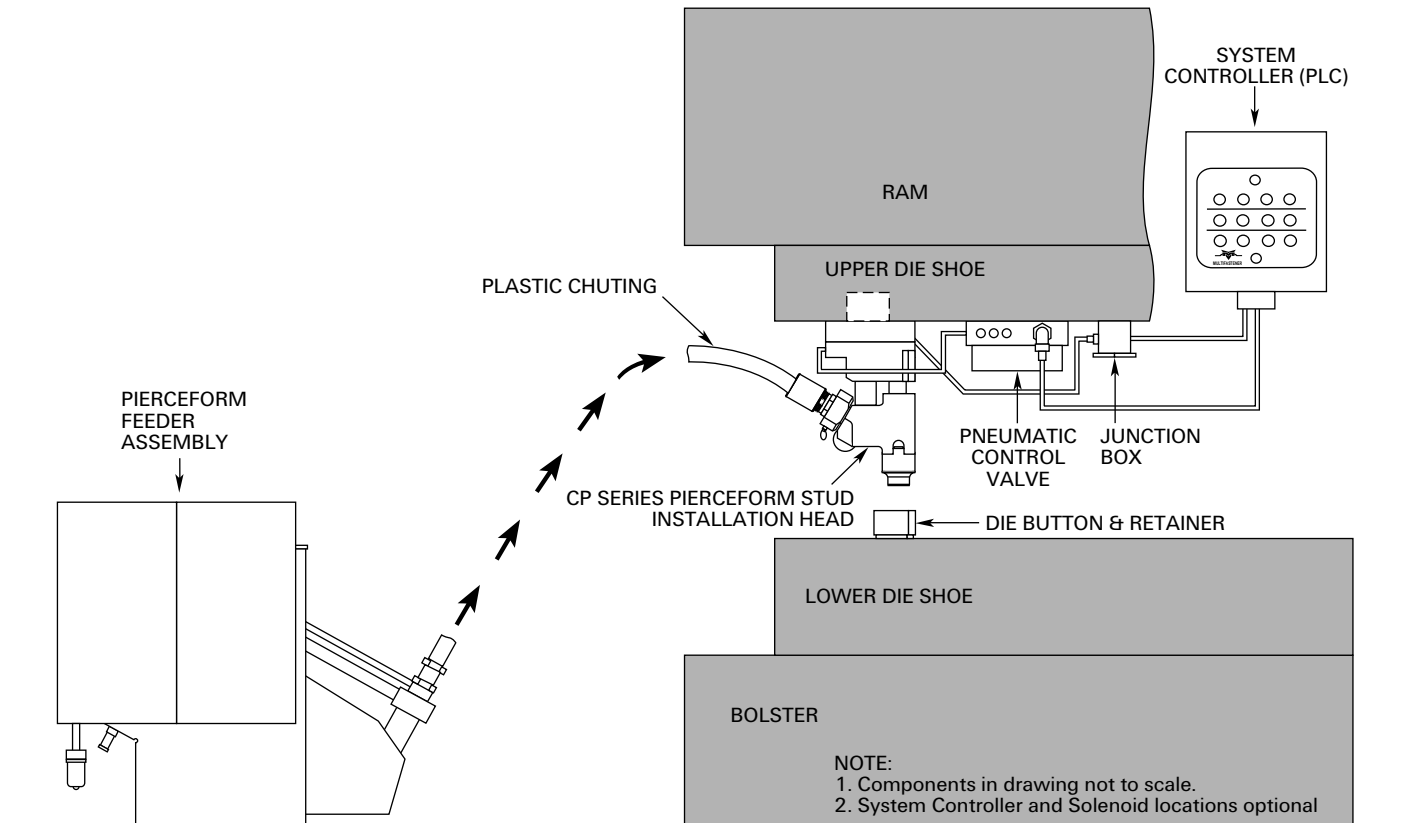
- Disconnect plastic tubing (I).
- Disconnect proximity probe (K) by loosening socket head cap screw (L).
- Remove head assembly by removing socket head cap screws (J).
- Tap base with soft hammer and pry from the die shoe dowel pins.

INSTALLATION:

- Position base assembly on dowel pins in die shoe and install socket head cap screws (J).
- Attach proximity probe (K) with socket head cap screw (L).
- Attach plastic tubing (I). Turn on air.

Operation

The PierceForm Stud feed system operates in unison with your press equipment to produce stud to panel attachments that are consistent time after time. For details concerning each component's setup and operation, plus maintenance and troubleshooting procedures, contact your sales representative.



Components

SYSTEM CONTROLLER - PLC

This unit controls all functions of the system. The timing of all solenoid valves, the release of a stud to the installation head, and the sensing of a stud within the head are all sequenced through this controller. All functions are timed to take place within single or continuous cycles. Note: If the speed of the press is changed from original setting, the controller must be reprogrammed.

FEEDER

Because PierceForm Studs are blown by air pressure from the feeder to the installation head in the feed system, the feeder can be mounted at any level you choose. The feeder has internal solenoids that control the blowing of studs to the head assembly.

STUD GUIDE

The plastic stud 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 PierceForm Stud installation head is mounted in the upper die shoe of the press. It is air-controlled and designed to accurately install PierceForm Studs 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 PierceForm Stud through the metal panel supported by the die button. The die button forms the barrel of the stud around its circumference to securely lock it in place and coins the slug into the barrel, thereby eliminating scrap disposal.

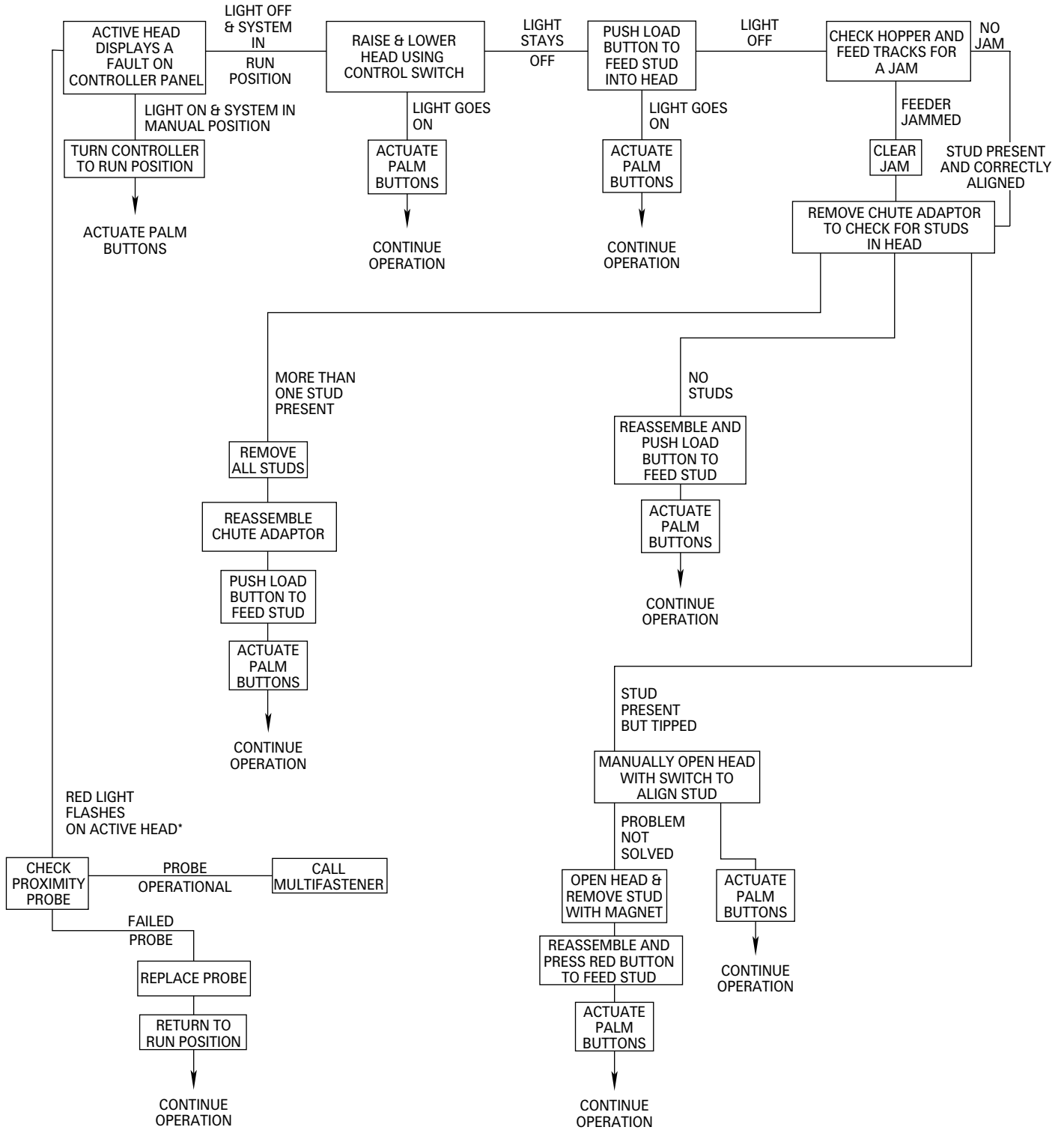
PNEUMATIC CONTROL VALVE

This system consists of a solenoid, which controls the movement of the installation head. The solenoid is initiated through the system controller. This timing shall be pre-set and adjusted to the stroke and speed of your press.

PROBING

The PierceForm installation system includes a probe in the installation head which, when properly connected through the system controller with the press, will prevent cycling the next stroke unless a stud is correctly positioned in the nose. Note: The customer must monitor removal of the stamping prior to the next cycle of the press.

Troubleshooting Chart



* NOTE: System controller is a fail-safe make break system. If the system stops and a red light is flashing the make break signal has not been received by the system controller. Check proximity probe for proper function.

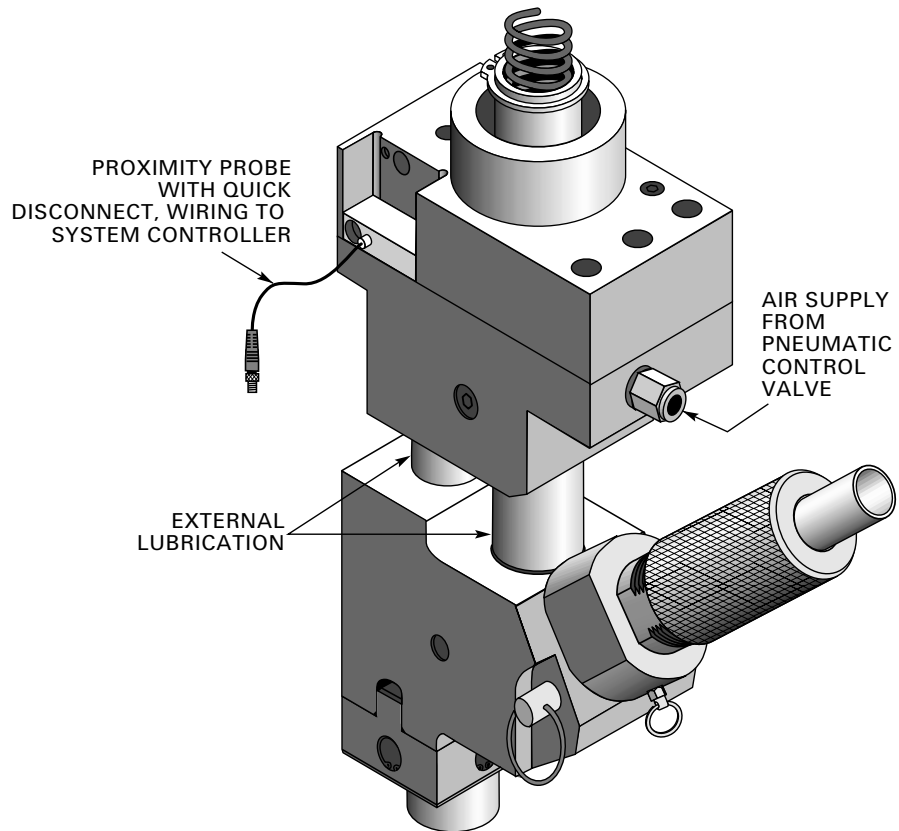
PIERCEFORM INSTALLATION HEAD

Head Assemblies do not require continuous lubrication. However, careful maintenance means longer product life and hours of trouble-free operation. Internal lubrication must be an integral part of air supply system. 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

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



FabriSteel Formed Products
A Whitesell Company



22 100 TROLLEY INDUSTRIAL DRIVE TAYLOR, MI 48180-1872
PHONE: (313) 299-8500 FAX: (313) 299-7966
WEBSITE: www.fabristeel.com



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