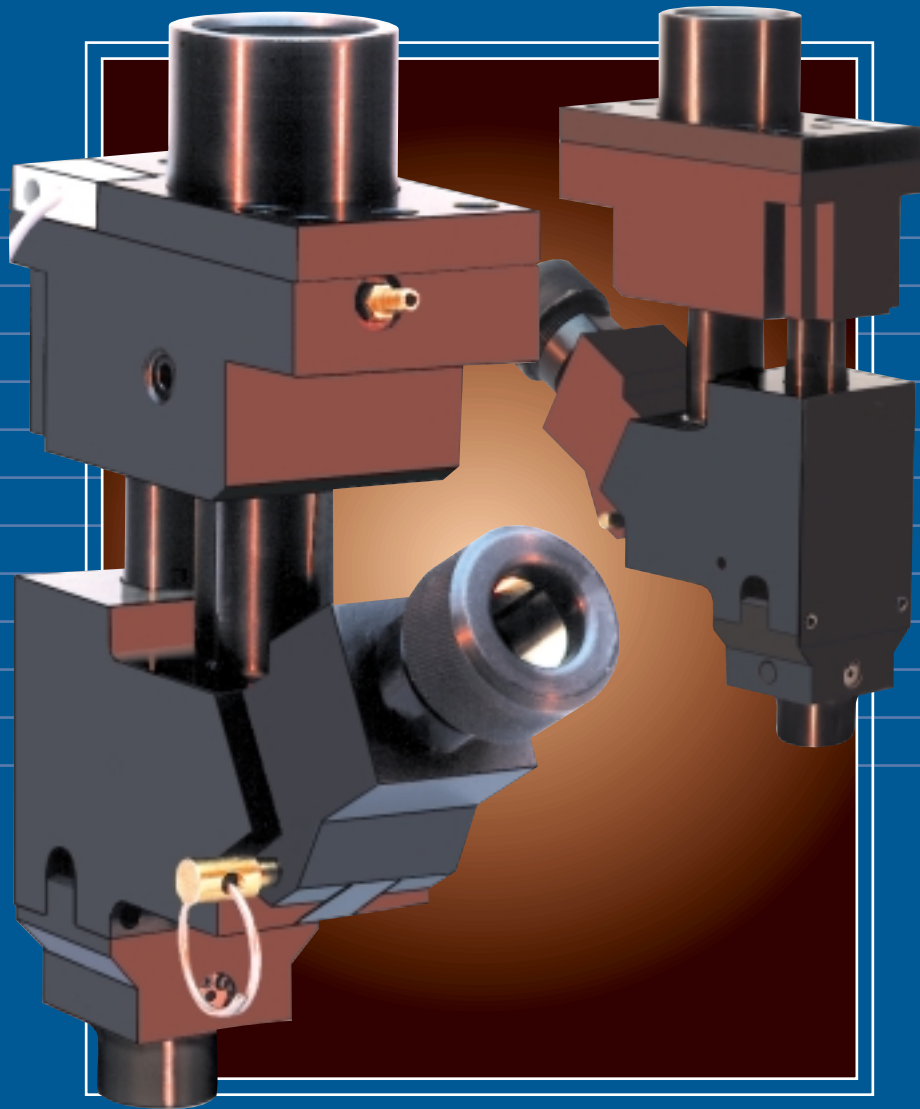


PIERCEFORM® STUD BENCH MANUAL

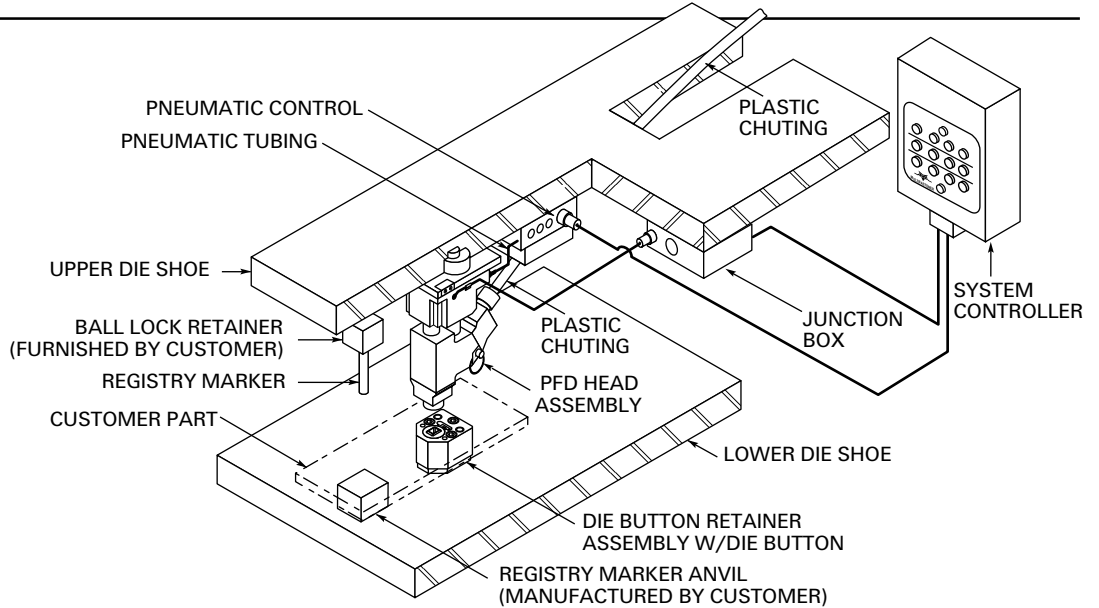


The total-service fastening
systems company.



PierceForm® Stud Installation Head

The PierceForm Studs (PFS and SBK) are property class 9.8 fasteners. They are system fed to automatic installation tools. The PFS style Stud pierces its own hole in a sheet metal panel (.75-2.50mm thickness) and retains the resulting slug. The SBK 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:

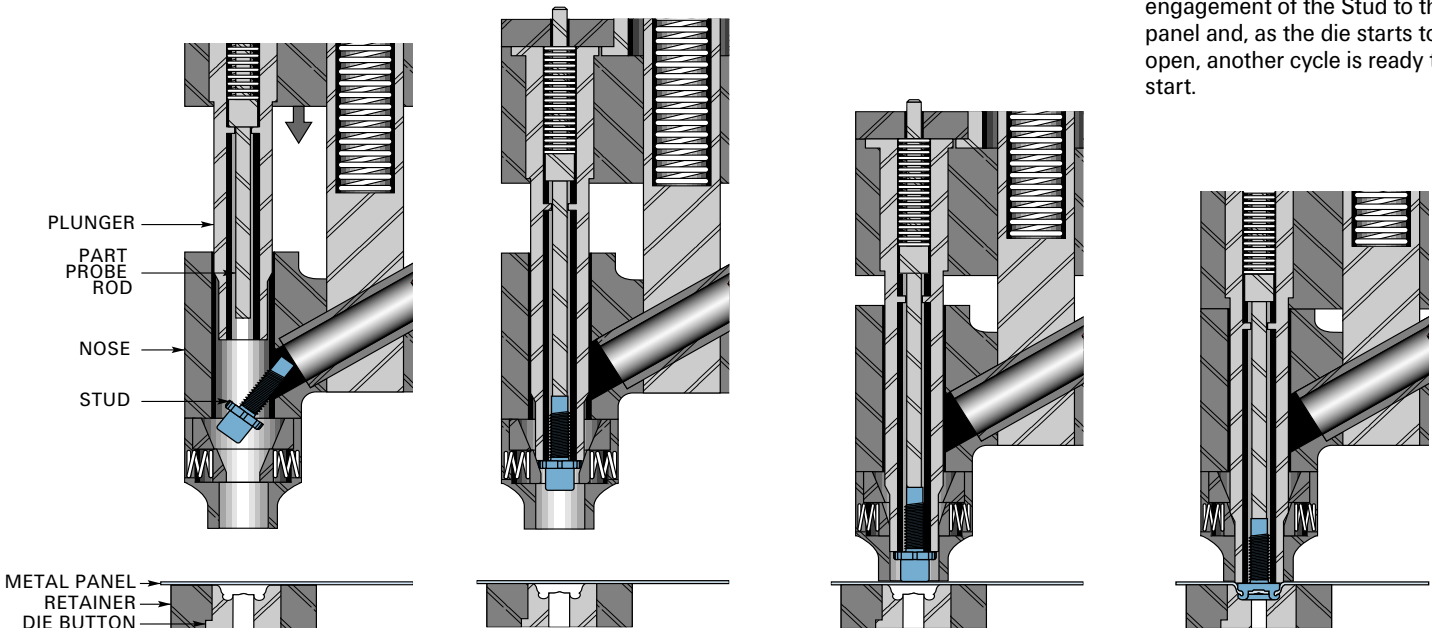
After aligning the PierceForm Stud Installation Head in the die it is necessary to establish the proper shut height with respect to the thickness of the panel being used. Use visual inspection of the Stud installation as well as the Multifastener "Registry Marker" for establishing the proper shut height 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 a probe rod which activates the 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.

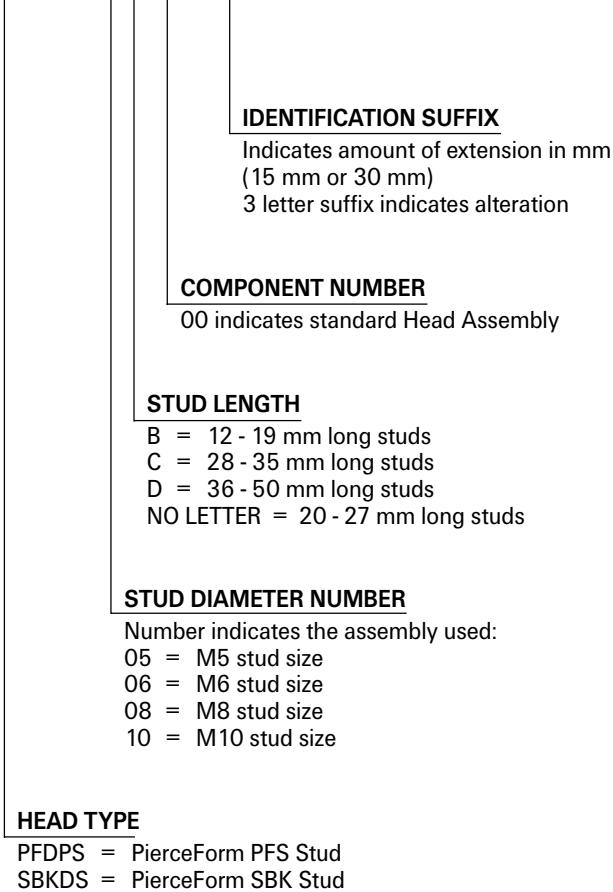


Note: The pierce slug is retained in the barrel of the Stud to simplify die designs and eliminate scrap handling, with the exception of an SBK Stud, which has no slug.

Tooling Requirements

PierceForm HEAD ASSEMBLY

PFDP/PS/SBKDS-XXX-XXY-XXX

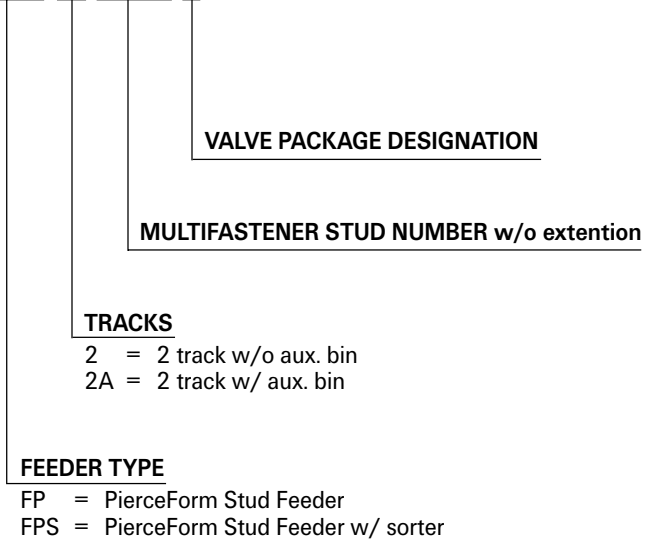


DIE BUTTON RETAINER

PFRAM-32

STUD FEEDER

FP/FPS-2X-XXXXX-X



REGISTRY MARKER

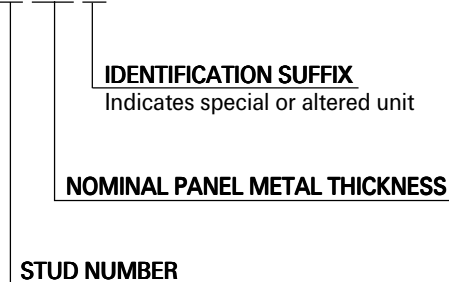
MSM-26-30 Use for all Stud sizes

ELECTRICAL PROXIMITY PROBE REQUIREMENTS

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

DIE BUTTONS

PSB/SBK-XX-XXX-XX



PLASTIC CHUTING

PSC/SBK-XX-12 X 20'

STUD NUMBER

PNEUMATIC CONTROL VALVE

PFD-76-PX

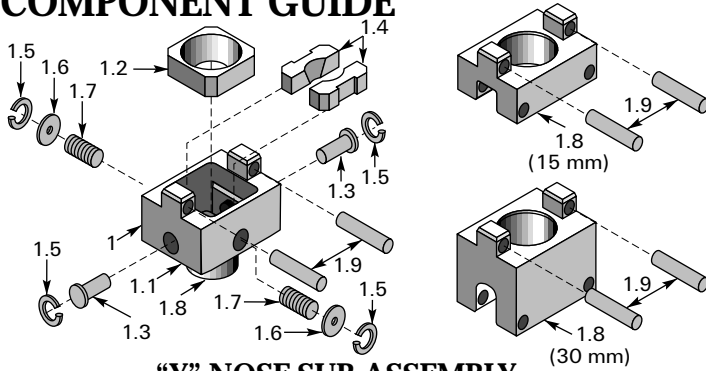
NUMBER OF HEADS IN DIE

* No letter indicates standard length.

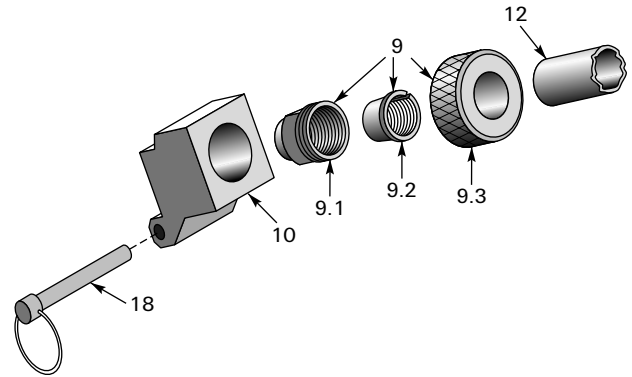
NOTE: Order all PierceForm Stud Equipment from Multifaster.

PierceForm Head Assembly

COMPONENT GUIDE



**"Y" NOSE SUB-ASSEMBLY
(STANDARD)**

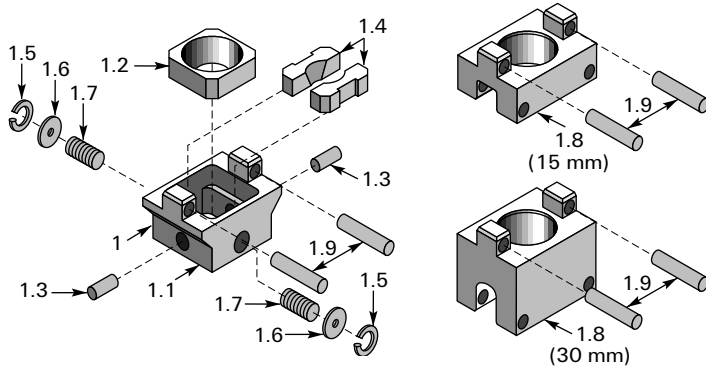


CHUTE ATTACHING BLOCK SUB-ASSEMBLY

DETAIL NO.	DESCRIPTION	PART NO.	NO. REQ'D
1	Nose Assy. - "Y" Style	PFD-XX-01Y-XX	1
1.1	Nose—"Y" Style	PFD-XX-01NY	1
1.2	Protection Sleeve	PFD-XX-01S or SBKD-XX-01S	1
1.3	Stop Pin	PFD-COM-01P1	2
1.4	Nose Fingers	PFD-XX-06 or SBKD-XX-06	1 Set
1.5	Internal Retaining Ring	MS-174	4†
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

DETAIL NO.	DESCRIPTION	PART NO.	NO. REQ'D
9	Chute Attaching Collet Assy.	PFD-XX-N23 or SBKD-XX-N23	1
9.1	Bushing	PFD-XX-44 or SBKD-XX-44	1
9.2	Collet	PFD-XX-45 or SBKD-XX-45	1
9.3	Nut	PFD-XX-46 or SBKD-XX-46	1
10	Chute Attaching Block	PFD-XX-N10	1
12	PierceForm Stud Chuting	PSC-XX-12 or SBK-XX-12	2
18	Detent Pin	MS-162	1

SBK Part Numbers indicated in blue.



**SQUARE NOSE SUB-ASSEMBLY
(NON-STANDARD; FOR SPARE PARTS ONLY)**

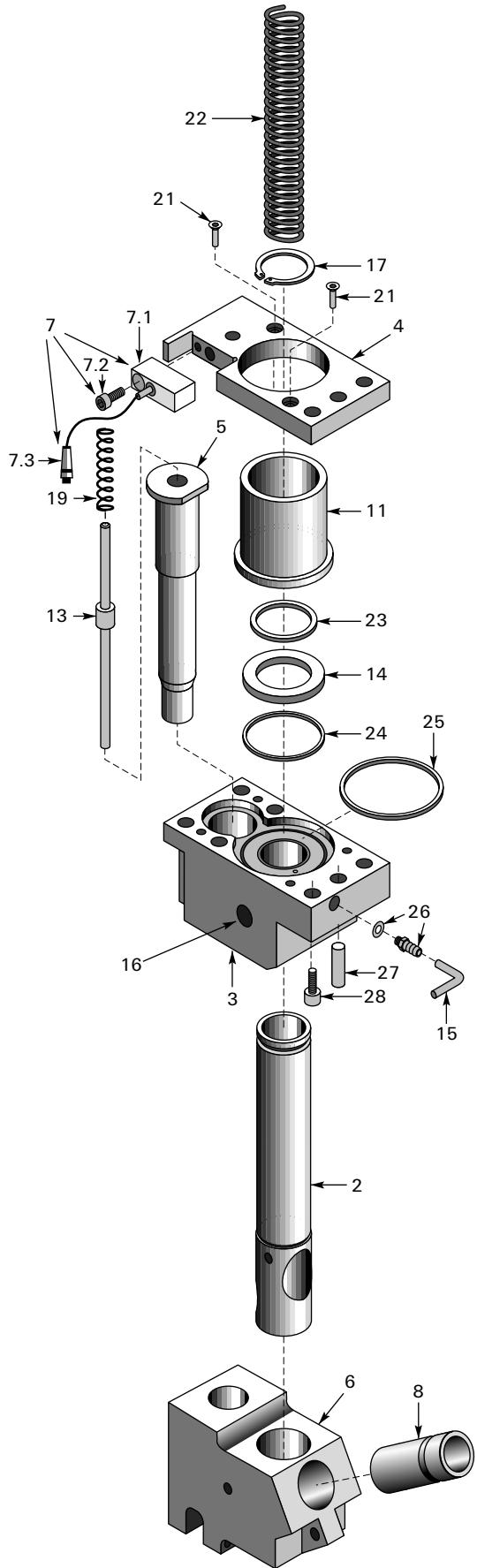
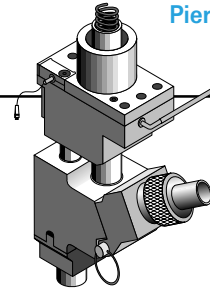
DETAIL NO.	DESCRIPTION	PART NO.	NO. REQ'D
1	Nose Assy.	PFD-XX-01-XX	1
1.1	Nose Body	PFD-XX-01N	1
1.2	Protection Sleeve	PFD-XX-01S or SBKD-XX-01S	1
1.3	Stop Pin	PFD-COM-01P	2
1.4	Nose Fingers	PFD-XX-06 or SBKD-XX-06	1 Set
1.5	Internal Retaining Ring	MS-174	2†
1.6	Washer	MS-175	2†
1.7	Compression Spring	MS-176	2†
1.8	*Nose Extension	PFD-XX-01E-XX	1
1.9	*Roll Pin	MS-164	2

Ordering Information:

When ordering, specify:

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

* For 15 & 30 mm Nose Extensions only † 6 req'd for M10 noses only



PART PROBE ROD CHART

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

* Chart applies to both PFDPS and SBKDS heads

BASE/SHANK SUB-ASSEMBLY

DETAIL NO.	DESCRIPTION	PART NO.	NO. REQ'D
2	Shank	*PFD-XX-02Y-XX or PFD-XX-02-XX	1
3	Base Assembly Sleeve Bearing PFD-XX-09	PFD-XX-03	1
4	Back-Up Plate	PFDS-COM-04	1
5	Plunger	*PFD-XX-05Y-XX *SBKD-XX-05Y-XX or PFD-XX-05-XX SBKD-XX-05-XX	1
6	Feed Housing	*PFD-XX-36Y or PFD-XX-36	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	PFD-XX-08	1
11	Cylinder Cap	PFD-XX-26-XX	1
13	Part Probe Rod	See Rod Chart	1
14	Piston	PFD-COM-27	1
15	Plastic Tubing	MSE-05	1
16	Plug	MS-20	1
17	Retaining Ring	MS-161	1
19	Compression Spring	MS-163	1
21	Button Head Screw	MS-167	2
22	Spring	*MS-168Y-XX or MS-168-XX	1
23	O-Ring	MS-169	1
24	O-Ring	MS-170	1
25	O-Ring	MS-171	1
26	Fitting	MS-172	1
27	Dowel	Customer Supplied	2
28	Socket Head Cap Screw	Customer Supplied	3

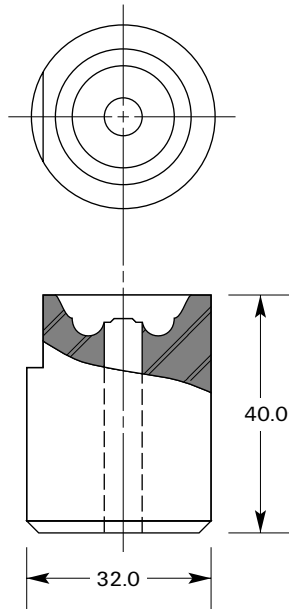
SBK Part Numbers indicated in blue.

*For "Y" style head assembly

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



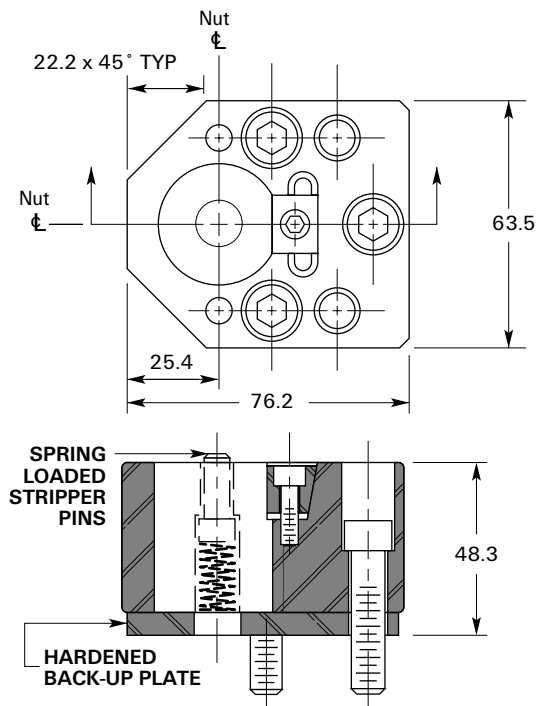
PFS STUDS

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

SBK STUDS

STUD SIZE	METAL THICKNESS (MM)	DIE BUTTON NUMBER
5mm	1.75 - 2.83	SBK-06-230
	2.84 - 3.92	SBK-06-340
	3.93 - 5.00	SBK-06-450
6mm	1.75 - 2.83	SBK-06-230
	2.84 - 3.92	SBK-06-340
	3.93 - 5.00	SBK-06-450
8mm	2.00 - 3.33	SBK-08-270
	3.34 - 4.67	SBK-08-400
	4.68 - 6.00	SBK-08-530
10mm	2.00 - 3.33	SBK-10-270
	3.34 - 4.67	SBK-10-400
	4.68 - 6.00	SBK-10-530

DIE BUTTON RETAINER PFRAM-32



STUD SIZE	MINIMUM INSTALLATION TONNAGE
5mm	12
6mm	12
8mm	15
10mm	17

NOTE: ALL DIMENSIONS ARE SHOWN IN MILLIMETERS

“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

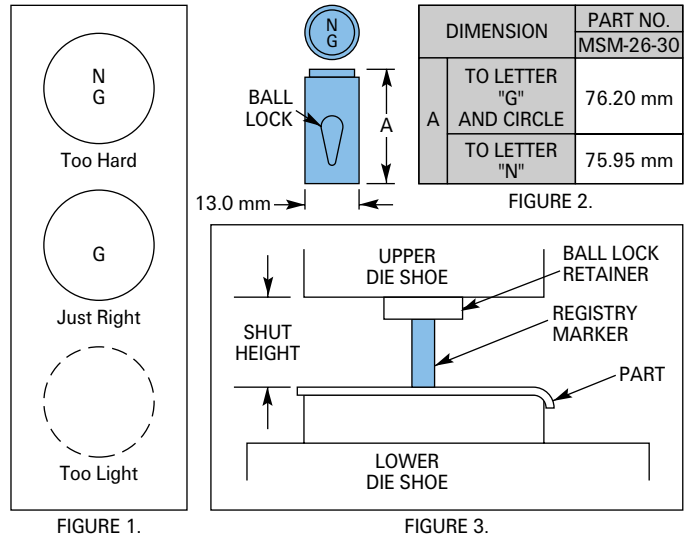
The Registry Marker is mounted in the same die shoe as the Installation Head and is positioned over the part panel that is to receive the PierceForm Stud (see Fig. 3). The Registry Marker should be located as close to the Head as possible.

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.)



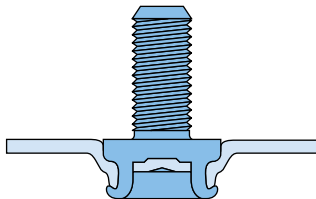
Visual Inspection of the Stud Installation

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

PFS STUD

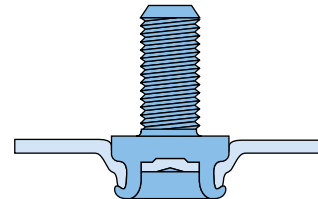
CASE 1: PROPER RAM SETTING

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



CASE 2: TOO LIGHT

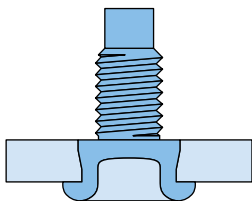
The flange of the Stud is above flush with the panel.



SBK STUD

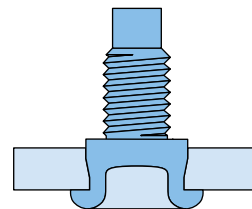
CASE 1: PROPER RAM SETTING

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



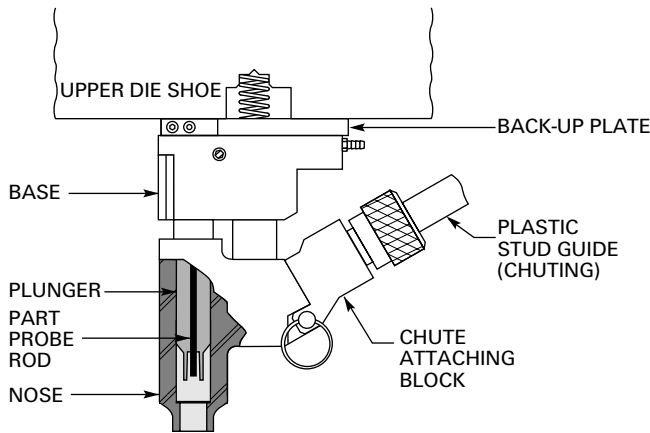
CASE 2: TOO LIGHT

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

PierceForm Stud Installation Heads may be mounted in the die by either of two methods: Direct Layout or Die Layout.

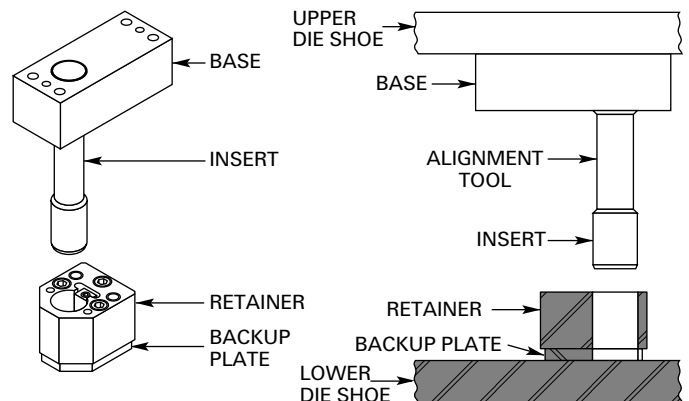
DIRECT LAYOUT METHOD

- Install die button retainer by direct layout or with template.
- Invert die set (so die button retainer is on top).
- Set assembled alignment tool in Head position.
- Lower die shoe (with retainer) so alignment insert enters retainer. **Alignment insert and retainer must be equivalent sizes.**
- Transfer alignment tool mounting holes to die (with punch).
- Repeat steps above for all Heads in die by transferring complete alignment tool to each Head location.
- Drill and tap mounting holes for screws.
- Loosely mount alignment plates in each Head location.
- Replace mating die shoe.
- Attach alignment plate in first Head position.
- Lower die shoe (with retainer) so alignment insert enters retainer.
- Tighten alignment plate screws through access holes, then remove insert.
- Repeat steps above for each Head in die.
- Remove mating die shoe; transfer dowel holes using alignment plates as drill fixtures. 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 plate die tryout procedures; follow Multifastener ram setting procedures in this manual.

DIE LAYOUT METHOD

- Install die button retainer by direct layout or with template.
- Loosely mount alignment plates in each Head location by die layout procedure.
- Attach alignment insert to alignment plate in first Head position.

- Lower die shoe (with retainer) and align tool so alignment insert properly enters retainer.
- Tighten alignment plate screws through access holes, then remove alignment insert.
- Remove mating die shoe; transfer dowel holes using alignment plates as drill fixtures. Drill as required for reaming.
- Ream for press fit for dowel pins.
- Repeat steps above for each Head in die.
- Locate and machine clearance holes for shank and spring.
- Install Head in each Head location. Follow plate die tryout procedures; follow Multifastener ram setting procedures in this manual.



Note: Alignment Tooling available for customer use upon request. Contact Multifastener.

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 ATTACHING BLOCK

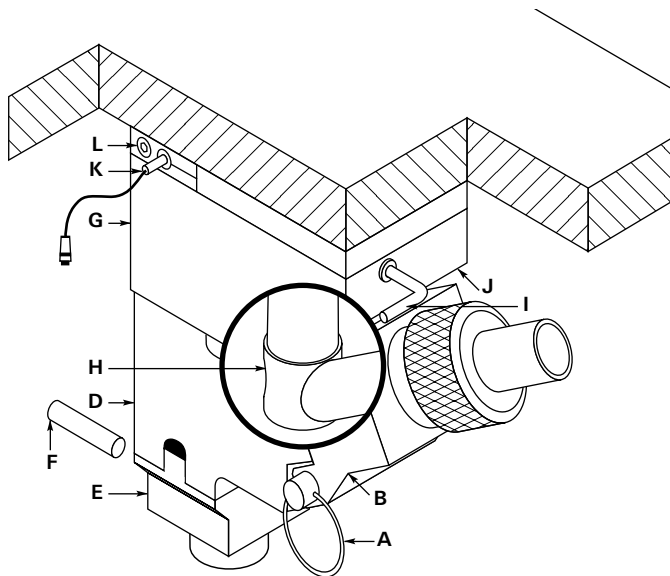
Removing or Installing Chute Attaching Block

REMOVAL:

- Shut off Air/Deactivate Hopper Feed before disconnect of Chuting.
- Remove Detent Pin (A).
- Slide Chute Attaching Block Sub-Assembly (B) off of Feed Housing Bearing (C).

INSTALLATION:

- Slide Chute Attaching Block (B) over Feed Housing Bearing (C).
- Insert Detent Pin (A) through Chute Attaching Block and Feed Housing (D).



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

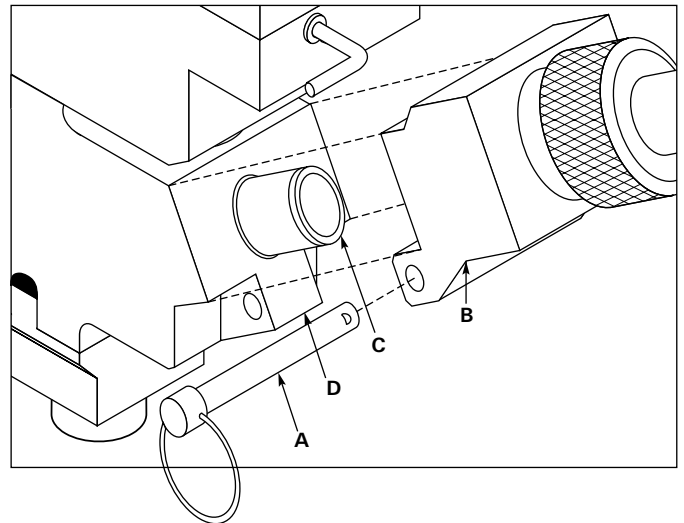
Removing or Installing Feed Housing and Nose Body Assemblies

REMOVAL (turn off air):

- Remove Chute Attaching Block (B), as described previously.
- Support Feed Housing (D) and pull Feed Housing Bearing (C) 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 Bearing (C) through Feed Housing and Shank (H).
- Attach Chute Attaching Block (B) as described above. Turn on air.



HEAD ASSEMBLY

Removing or Installing Head Assembly

REMOVAL (turn off air):

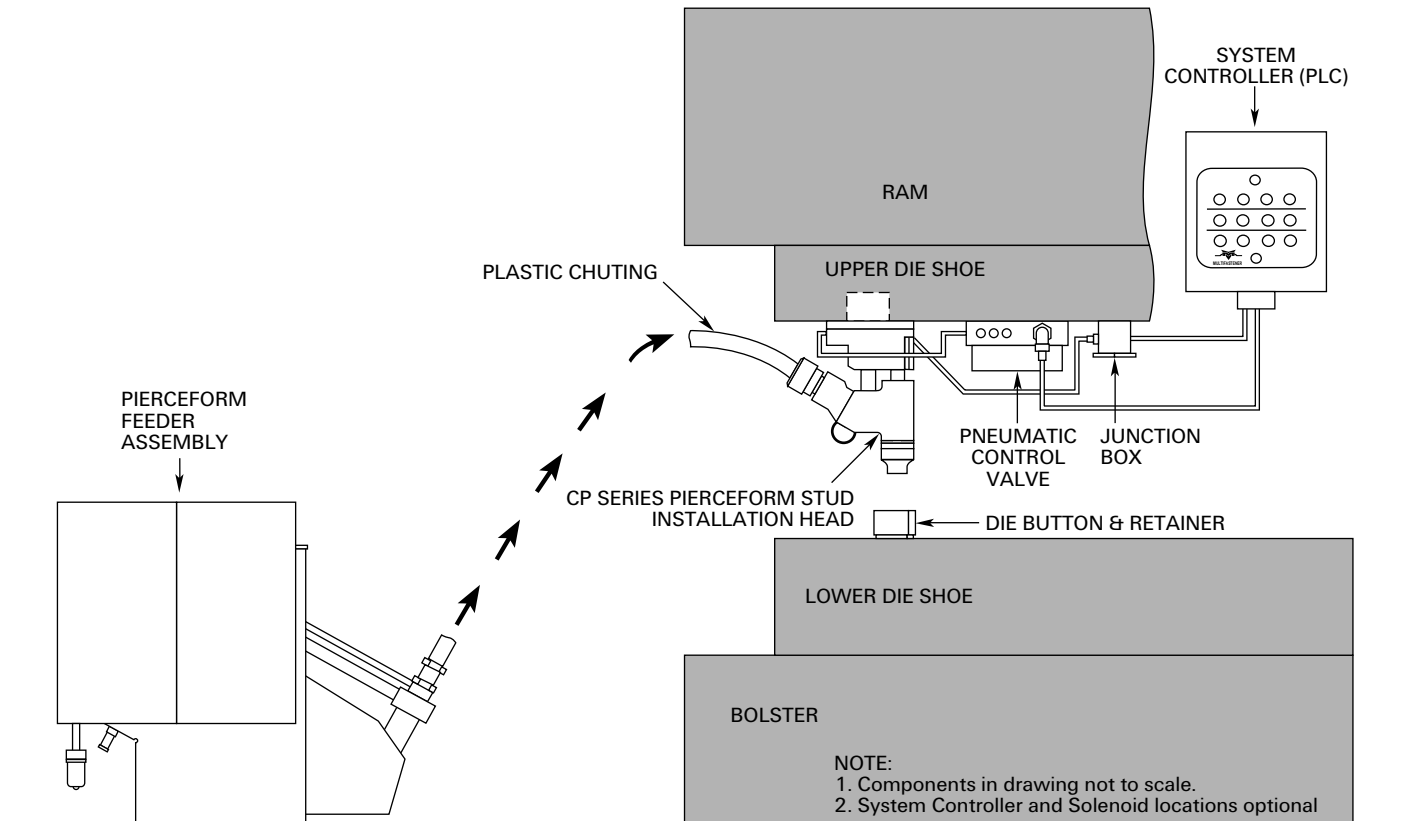
- Disconnect Plastic Tubing (I).
- Disconnect Proximity Probe (K) by loosening socket head cap screw (SHCS) (L).
- Remove Head Assy. by removing socket head cap screws (J).
- Tap base with soft hammer and pry from the die shoe dowel pins.

INSTALLATION:

- Position base assembly on dowel pins in die shoe and install SHCS (J).
- Attach Proximity Probe (K) with SHCS (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 Multifastener 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.

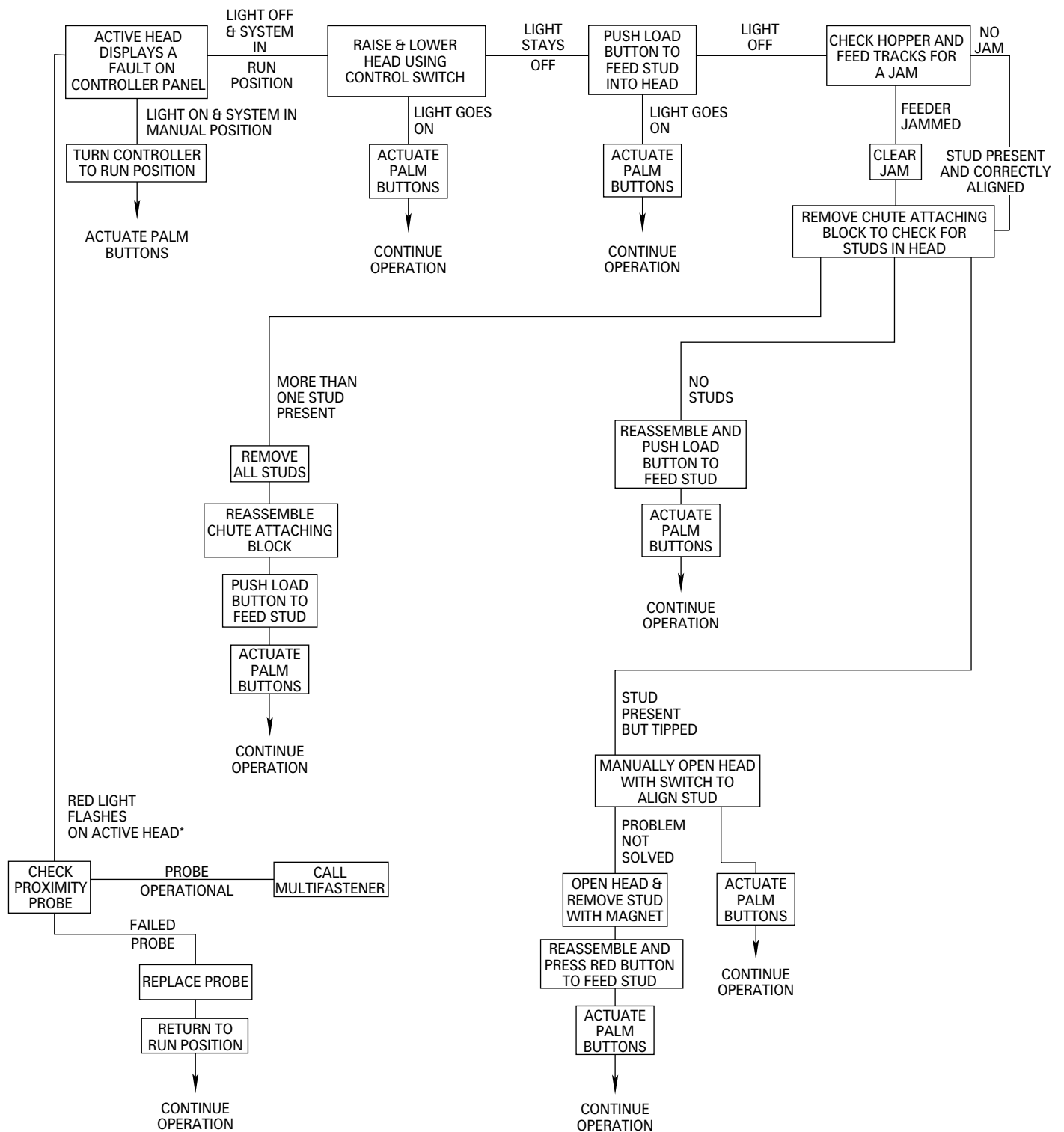
PNEUMATIC CONTROL VALVE

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.

Maintenance Procedures

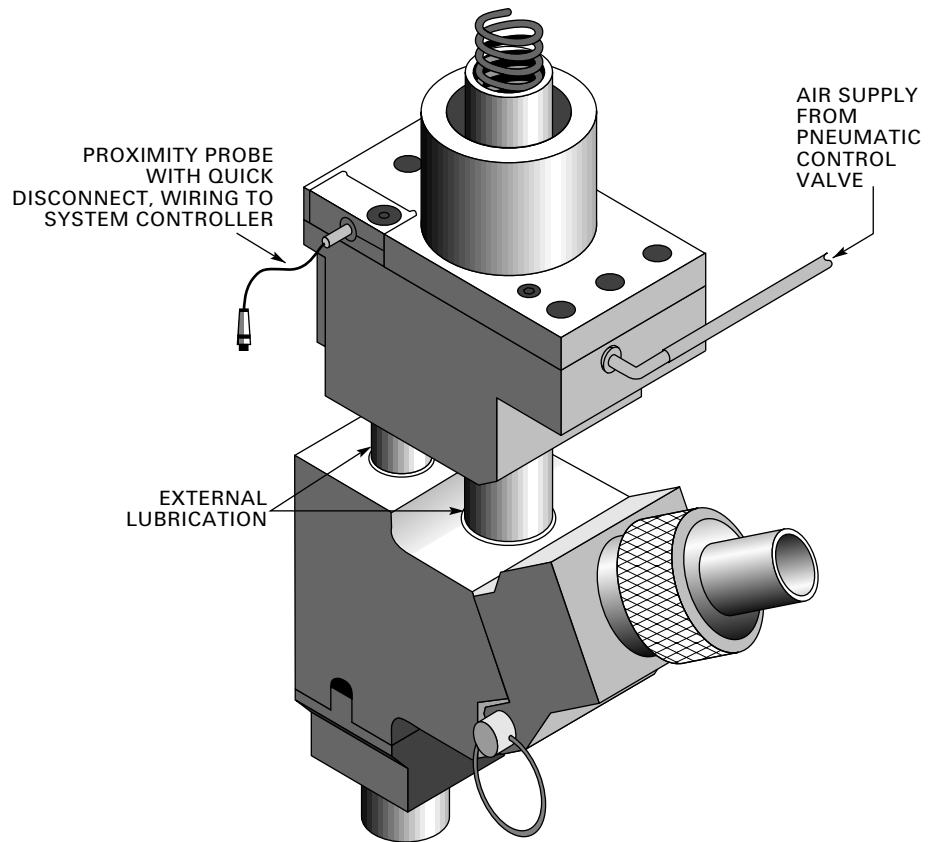
PIERCEFORM INSTALLATION HEAD

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 Products, Inc.
22100 Trolley Industrial Drive
Taylor, Michigan 48180

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
PHONE: (313) 299-8500 FAX: (313) 299-7966
WEBSITE: www.fabristeel.com