Congratulations! You're using a genuine Haeger Hardware Insertion Machine - the industry standard for dependable fastener insertion.

Haeger, Inc. is widely recognized as the industry leader in the development and implementation of innovative self-clinching fastener installation technologies. For over twenty years, Haeger engineers have been designing and building flexible systems for installing practically every kind of self-clinching fastener into practically every kind of work piece - creating new technologies to help Haeger owners get just about any job done productively and profitably.

Over the years, Haeger's innovative tooling and patented quick-change automatic fastener feeding systems have revolutionized the way the world's fabricators and manufacturers install hardware.

So whenever your operation faces an insertion challenge, turn to the manufacturer with the most experience in developing self-clinching fastener insertion solutions. Turn to Haeger.

Haeger

811 Wakefield Drive
Oakdale, California 95361
(209) 847-7057
FAX (209) 847-6553

Basic Data Sheet

Customer

Haeger Distributor

Telephone

Machine Model **618 Plus** Serial Number
Year Manufactured

Maximum Force	12,000 lb/54 kn
Throat Depth	18 in./458 mm
Stroke Length	0-8 in./0-203 mm
Voltage	
Amperes	
Phase	3
Hertz	50/60
Hydraulic Oil	Mobil AW-32*
Viscosity: SUS @ 100 F	315/355
ISO	68
Capacity	10 gallons/38 liters
Max. Operating Pressure	2,950 psi/203 bar
Height	84 in./2,134 mm
Width	33 in./838 mm
Depth	43 in./1,092 mm
Weight	1,200 lb./545 kg

Options:

* Equivalent hydraulic oils may be used. It is the machine owner's responsibility to determine which hydraulic oils in their area are equivalent to Mobil AW-32.

Warning and Safety Instructions

This symbol, appearing throughout this manual, means Attention! Be Alert! Your safety is involved.

NEVER: Operate this Haeger Hardware Insertion Machine without proper instructions. Read and thoroughly understand this manual before attempting to operate this machine.

NEVER: Tamper with any part of this machine's electrical system unless you are a trained electrician and thoroughly understand this machine's electrical schematic.

NEVER: Operate this machine while wearing any metal objects (i.e., rings, watches, bracelets, etc.) that may come into contact with the *Upper Tool, Lower Tool* or work piece.

NEVER: Attempt to test or demonstrate this machine's Safety System by placing any portion of your hand or body between the Upper and Lower tools. Always use the test procedure outlined in Section 4 of this manual.

NEVER: Exceed the maximum force of 9,000 pounds on the J- Frame and the Square *Tipped Tool Holder*. The maximum pressure for this force is indicated on the Pressure Gauge mounted in the Hydraulic Control Panel. **Do not exceed this pressure.**

NEVER: Attempt to run any irregular shaped sheet metal part that could contact the *Upper* and *Lower Tools* **before** these tools insert the fastener into the part. This applies to both the *Conductive* and *Non-Conductive Modes* of operation.

NEVER: Press the *Down Footswitch* a second time in the *Non-Conductive Mode* when your hands are in the area of the tooling.

NEVER: Operatethis Machine without wearing the proper eye protection.

Warning and Safety Instructions

This symbol, appearing throughout this manual, means: Attention! Be Alert! Your safety is involved.

CAUTION: The Safety System's heavy duty retractable electrical cord is very durable; however, caution should be taken when working close to the edge of deep boxes or cans. Operating with the Safety System's electrical cord too close to sharp metal edges may damage the cord.

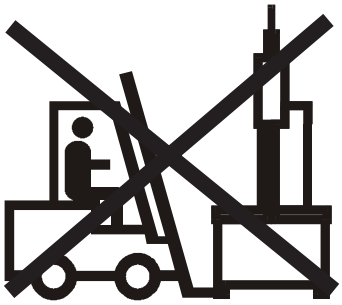
CAUTION: Lubricate the *Upper Tool Holder* with a small amount of lithium (white) grease. Any other lubricant may interfere with the Safety System's operation and will void your machine warranty.

Note: This message is on this page so that it would not be completely blank and give the reader the impression that some important information might be missing from this manual.

Handling

The Haeger Hardware Insertion Machine is designed to provide the operator with a comfortable working height and to allow freedom of movement when positioning workpieces in the tooling area. Because of these features, the machine is **top heavy**.

- Handle with **extreme caution**!
- **Never** attempt to move the machine with a forklift positioned in **front of or on either side** of the machine.
- **Always** position the forklift or pallet truck to the **rear** of the machine when moving the machine with a forklift or pallet truck.



Never lift with the forklift in front or on the side.

Always position the forklift to the rear of the machine.

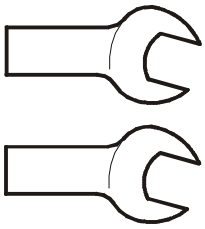
Skid Removal

Note:

The feet are already installed on the machine.

You will need to lift the machine to remove the skids.

9/16" socket wrench



You will need open three wrenches to adjust the feet.

Skid Bolt: 9/16 in. socket

Foot: 7/8 in./22 mm open end wrench

15/16 in./24 mm open end wrench

1. Uncrate the machine.
2. Remove the (8) lag screws that hold the machine base to the shipping skid (2 on each plate).

3. Use the strap on the top of the machine frame and an appropriate sling for the weight of this machine and lift it until it clears the skids.

The weight of the Haeger Hardware Insertion Machine and skids are as follows:

Machine	Pounds	Kilograms
618	1,300	580

4. Carefully move the machine away from the skids (or move the skids). Lower the machine onto the floor.
5. Lower the nut on the foot and remove the plate.
6. Tighten the 15/16” nut until it is flush with the bottom of the machine’s base.

Machine Setup

1. Carefully locate the machine in the shop. Level it front to back and left to right using the top surface of the Lower Tool Holder as a reference surface (see Figure 3.1) Using a 7/8 in./22 mm wrench to adjust the feet, level the machine left to right and front to back. Make sure that all of the machine's feet are securely resting on the shop floor.
2. Without changing the height adjustment of the feet, tighten the lock nut on each foot using a 15/16 in./24 mm wrench.
3. If the machine is not yet filled with oil, remove the sides of the machine (see Figure 3.2) Fill the machine with AW-32 or equivalent premium hydraulic oil. Replace the sides when finished.

Fill the reservoir of the machine with the amount of hydraulic oil listed below:

Machine	Gallons	Liters
618 Plus	**10**	**38**

If the machine is equipped with a Modular Autofeed System (MAS):

4. Air must be connected to the fitting on the black hose which extends down from the bottom of the MAS. Connect a line that is capable of delivering 3 ft^3/min - 85 l/min of clean, dry air at a pressure of 90 psi/620 kPa 2-3 CFM. For further instructions, see the Modular Auto Feeder Operation and Maintenance Manual Section of this manual.

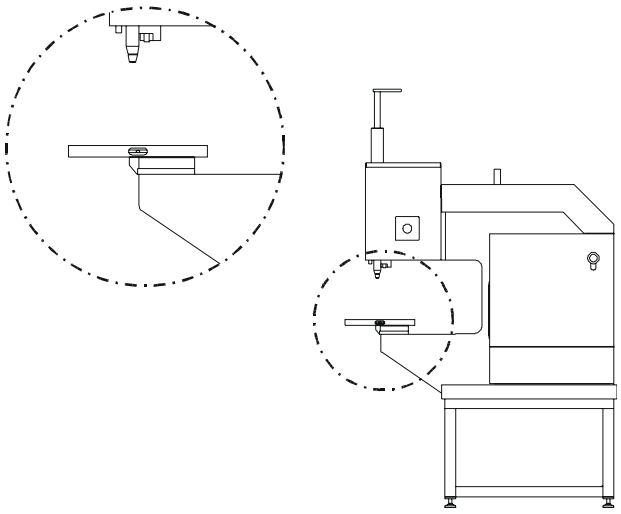


Figure 3.1: Level the machine by using the Lower Tool Holder as a reference surface

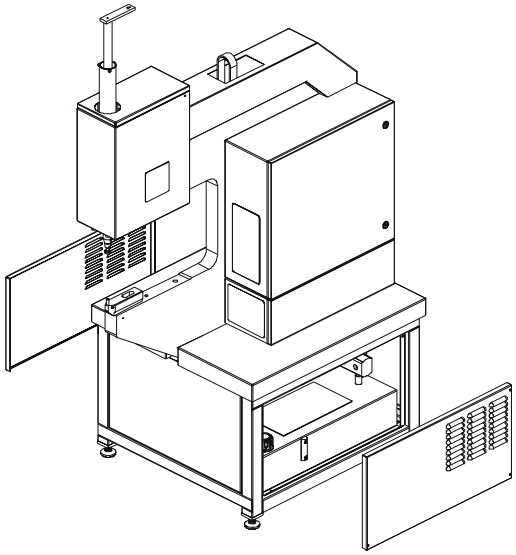


Figure 3.2: Remove the left and right Side Panels

Warning!

The electrical connections required in this section **must** be made by a qualified electrician.

Warning!

Check to make sure that the electrical power supply for this machine has been disconnected at the supply source before doing any work on the machine's electrical system.

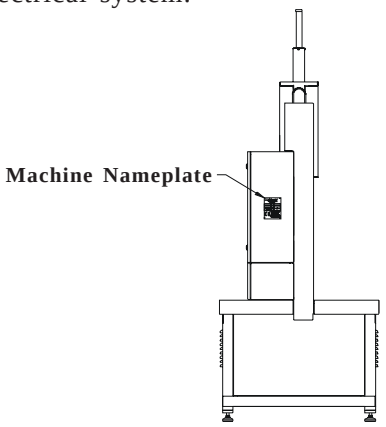


Figure 3.3: Check the voltage on the Machine Nameplate.

1. Turn off power.
2. Unlock door.
3. Open Cabinet.

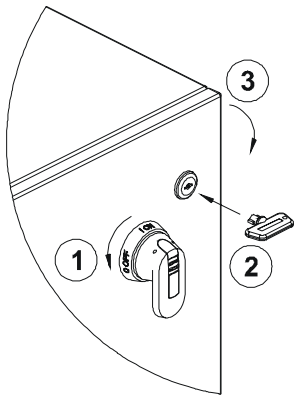


Figure 3.4: Open the door of the Main Electrical Control Cabinet.

Electrical Setup

1. Check the voltage on the Machine Nameplate, located on the rear of the machine's Main Electrical Cabinet (see Figure 3.3). **MAKE SURE** the machine's incoming shop voltage is the same as the voltage the machine has been wired for. If the voltages do not match, **STOP!** Call your Haeger Distributor for instructions on how to proceed. Their telephone number is listed on the machine's Basic Data Sheet in the Introduction Section of this manual.
2. Ensure that the machine's electrical power supply has been disconnected at the supply source. Turn the machine's Main Disconnect Switch to the Off position. Using the special key, open the door of the Main Electrical Control Cabinet (see Figure 3.4).
3. Wire the incoming three phase electrical power to the three connectors on the Main Disconnect Switch terminals labeled L1, L2 and L3 (see page 2.7 for Transformer Wiring details). Make sure the machine is properly grounded by connecting the incoming ground wire to the top terminal of the green and yellow terminal block on the right side of the Main Disconnect Switch.

See page 2.7 for additional information about the wiring of this machine.

4. After all electrical connections have been properly made, close and latch the Main Electrical Control Cabinet door using the special key.

Testing the Electrical Setup

Note:
The Machine Setup on page 2.3 must be completed before testing the electrical setup.

1. Turn the machine's Main Disconnect Switch to the On position (see Figure 3.5).
2. Turn the Run/Setup Switch to the Run position (see Figure 3.6).
3. Turn the Conductive/Non-Conductive Switch to the Conductive position (see Figure 3.6).
4. Have someone watch the motor in the base of the machine when you turn the machine on. The motor has an orange arrow indicating the correct direction. Press the On Button. The green light in the switch will turn on and the machine's motor will start. Immediately press the Off Button in until it latches.
5. If the motor turned the same direction as the arrow, install the Side Panels on the Machine Base. The machine is now ready for use.
6. If the motor **did not turn in the same direction as the arrow**, go on to the next series of steps.

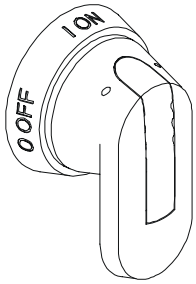
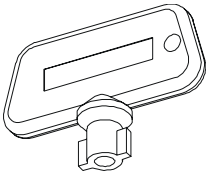


Figure 3.5: Turn the machine's Main Disconnect Switch to the On position.

Figure 3.6: Make sure the switches are set correctly before turning the machine on.



Special key used to open Main Electrical Control Cabinet

Warning!

Check to make sure that the electrical power supply for this machine has been disconnected at the supply source before doing any work on the machine's electrical system.

Warning!

NEVER tamper with any part of this machine's electrical system unless you are a trained electrician and thoroughly understand this machine's electrical schematic.

Adjusting the Wiring if the Previous Step Failed

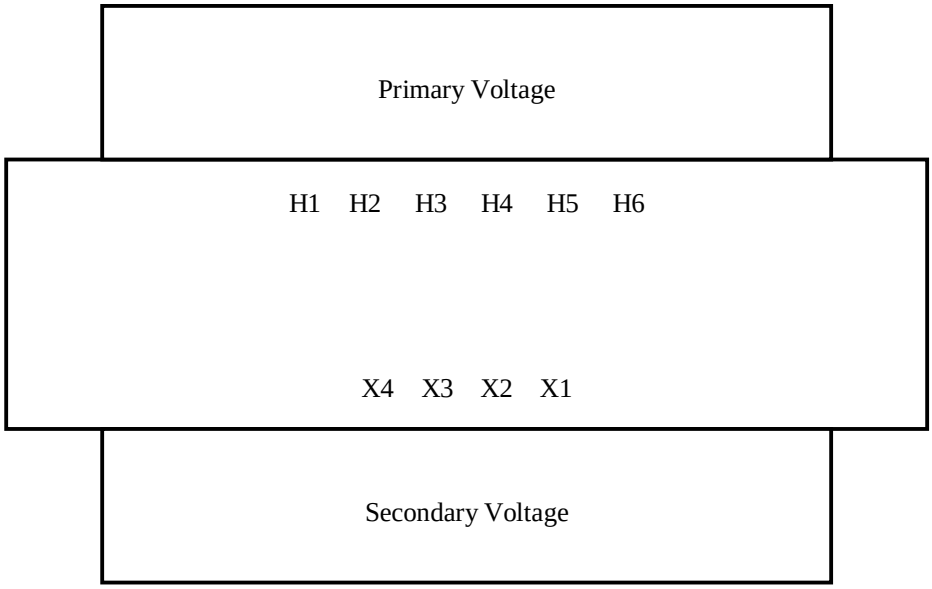
1. Disconnect the machine from its electrical power supply at the supply source.
2. After disconnecting the machine from its electrical power supply at the supply source, turn the machine's Main Disconnect Switch to the Off position.
3. Using the special key, open the door of the Main Electrical Control Cabinet.
4. Reverse the incoming electrical leads on terminals L2 and L3 of the Main Disconnect Switch (see page 2.7 for Transformer Wiring details).
5. Close and latch the door using the special key.

12. Turn the machine's Main Disconnect Switch to the On position.

10. Have someone watch the motor in the base of the machine when you turn the machine on. The motor has an orange arrow indicating the correct direction. Press the On Button. The green light in the switch will turn on and the machine's motor will start. Immediately press the Off Button in until it latches.

11. If the motor turned the same direction as the arrow, install the Side Panels on the Machine Base. The machine is now ready for use.

12. If the motor **did not turn in the same direction as the arrow** call your Haeger Distributor for instructions. Their telephone number is listed on the machine's Basic Data Sheet in the Introduction Section of this manual.



Primary Voltage		Secondary Voltage	
Volts		**115 Volts**	**120 Volts**
200	H1-H2	X1-X4	
208	H1-H2	X1-X3	
220	H1-H3	X1-X4	
230	H1-H3	X1-X3	
240	H1-H3		X1-X3
380	H1-H4	X1-X4	
400	H1-H4	X1-X3	
440	H1-H5	X1-X4	
460	H1-H5	X1-X3	
480	H1-H5		X1-X3
575	H1-H6	X1-X3	
600	H1-H6		X1-X3

Warning!

Do not operate the machine without both the Upper and Lower Tools properly locked in place with the correct set screws and/or Quick Change Lever.

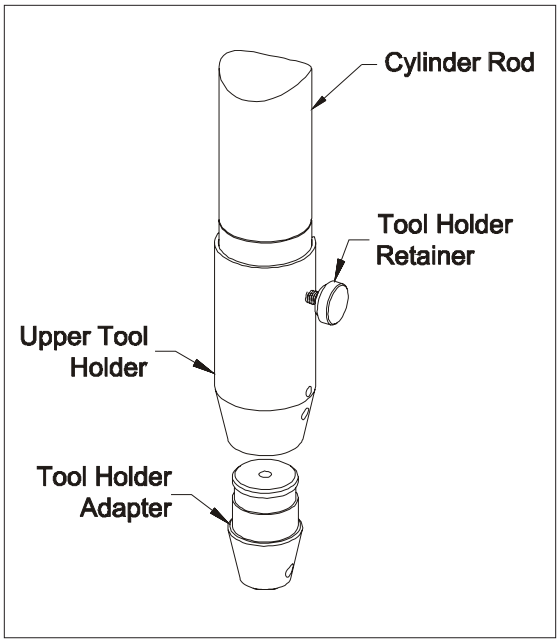


Figure 3.7: The Upper Tool Holder comes installed in your Hardware Insertion Machine.

The Upper Tool Holder

Note:

In this manual, the use of the terms left and right refers to the machine operator's left and right when they are standing in front of the machine, facing the work area between the Upper Tool Holder and Lower Tool Holder.

The *Upper Tool Holder* is secured to the machine's cylinder rod by the black serrated knob on its right side (see Figure 3.7). You can usually leave this Upper Tool Holder in the machine. If you do remove it, be very careful. There are continuity springs and guide pins inside the Upper Tool Holder. These items are **very important** part of the Haeger Safety System and **must not** be removed. If they are lost, do not operate the machine until they have been replaced.

Large tools, such as the Injector Tools, are secured in the Upper Tool Holder by a M6 x 6 SHSS (Socket Head Set Screw) located on the right side of the Upper Tool Holder.

For smaller tools, such as the standard Manual Tooling line, a Standard Tool Adapter may be installed in the Upper Tool Holder using the same M6 x 6 SHSS (see Figure 3.7). The smaller tools are held in the Standard Tool Adapter by another M6 x 6 SHSS also located on the right side of the Standard Tool Adapter.

When installing any tool or the Standard Tool Adapter, always make sure that it is pushed in as far as possible and is securely held by the M6 screw(s).

Steps to Install an Upper Tool

1. Loosen the M6 set screw in the Tool Holder or Adapter.
2. Insert the tool into the Tool Holder or Adapter.
3. Tighten the M6 set screw until the tool is locked securely in place.

The Lower Tool Holder

The *Lower Tool Holder* is secured to the lower arm of the machine's frame by a M16 X 50 SHCS (Socket Head Cap Screw) (see Figure 3.8). When this cap screw is loosened, the lower tool may be aligned to the upper tool.

All Standard Haeger Lower Tools fit in the *Lower Tool Holder* without the need for any adapters.

Warning!

Do not operate the machine without both the Upper and Lower Tools properly locked in place with the correct set screws and/or Quick Change Lever.

Steps to Install a Lower Tool

1. Loosen the Quick Change Tool Lever by turning it counter-clockwise when viewed from the right side of the machine.
2. Place the tool into the Lower Tool Holder.
3. Lock the tool into place in the Lower Tool Holder by turning the Quick Change Tool Lever clockwise until the tool is locked securely in place.

If the Quick Change Tool Lever comes in contact with any part of a workpiece during its production, it will **interfere** with the proper operation of the machine's Safety System and **must** be removed.

To remove the Quick Change Tool Lever:

1. Unscrew the Quick Change Lever (turn it counterclockwise when viewed from the right side of the machine) from the Lower Tool Holder.
2. Remove the M5 screw on the rear right side of the Lower Tool Holder.
3. Install the M5 screw in place of the Quick Change Tool Lever and tighten securely with an allen wrench.
4. The Quick Change Tool Lever may be stored by screwing it into the hole on the rear right side of the Lower Tool Holder where the M5 screw was stored. Make sure it does not come in contact with any part of the workpiece during its production.

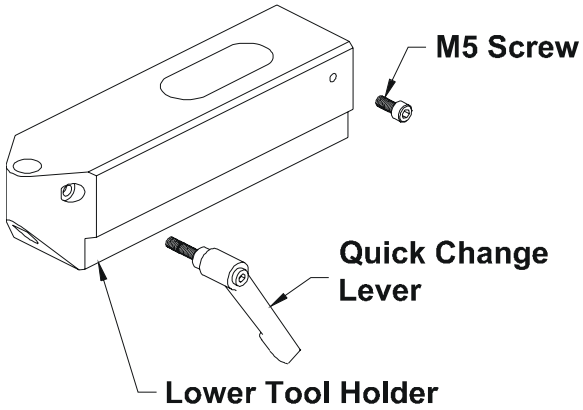


Figure 3.8: The Quick Change Lever makes it easy to change lower tools.

This page intentionally left blank.

Safety System Description

The Haeger Hardware Insertion Machine is equipped with a unique, reliable and patented *Safety System*.

Conductive Mode:

When the Safety System detects a non-conductive material between the Upper and Lower Tools, the Upper Tool's downward motion reverses immediately and returns to its Up position.

Non-Conductive Mode:

The Upper Tool's downward motion stops when **any** material is placed between the Upper and Lower Tools. If the Down Footswitch is depressed a second time after the Upper Tool has stopped, the machine continues the hardware insertion cycle. It applies the machine's set down force to the material. The Upper Tool then returns to its Up position.

How the Safety System Works

In both Conductive and Non-Conductive modes, the Safety System relies on the *Safety Switch* inside the *Cylinder Adapter* (see Figure 4.1). The *Upper Tool Holder Retainer Screw* secures the Upper Tool Holder to the *Cylinder Rod.* There is a black serrated knob on this Retainer Screw. It enables the Upper Tool Holder to move up on the Cylinder Adapter .25 in./6.4 mm. To move up, the Upper Tool Holder must overcome the light force of the *Continuity Springs*.

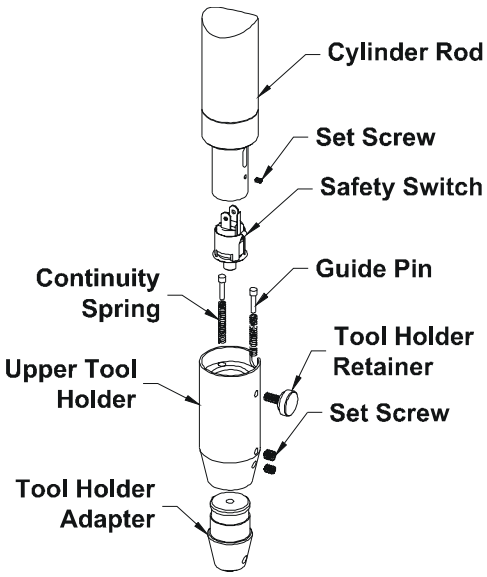


Figure 4.1: The Safety Switch is inside the Upper Tool Holder.

Warning!

Do not tamper with any part of the Safety System. The Haeger Hardware Insertion Machine will not operate properly if any part of the Safety System is removed or damaged.

Warning!

Never test or demonstrate the Safety System by placing any portion of your body between the Upper and Lower Tools.

Warning!

When operating the machine in the Non-Conductive Mode, be very careful. Do not press the Down Footswitch a second time with any portion of your body near the tooling.

Warning!

The heavy-duty, retractable Safety Electrical Cord is very durable, but caution should be taken when working close to the edges of deep cans. Operating with the Safety System Electrical cord too close to sharp metal edges may cut or shear the cord off.

Warning!

Test the Safety System every day **before** you use the machine. See the Safety System Test in this section of this manual.

Warning!

Always wear the proper eye protection when operating this Machine

When the *Upper Tool Holder* moves up .015 in/ .4 mm to .02 in./.5 mm, the *Safety Switch Actuation Screw* actuates the Safety Switch which is mounted in the end of the machine's Cylinder Adapter, opening its contacts. When the Safety Switch contacts are opened, the Upper Tool either returns to the Up position if the machine is in Conductive mode, or it stops if it is in Non-Conductive mode.

In operation, when the Safety Switch is actuated in *Conductive Mode* and a non-conductive material is between the Upper and Lower Tools, the Upper Tool Holder's downward motion is reversed immediately and returns to its Up position. If the Safety Switch is actuated and a conductive material is between the Upper and Lower Tools, the machine will continue the hardware insertion cycle. The machine will apply the set down force to the conductive material between the Upper and Lower Tools and then return to its Up position.

When the Safety Switch is actuated in the *Non-Conductive Mode* and **any** material is between the Upper and Lower Tools, the Upper Tool Holder stops. At this point, if the Down Footswitch is depressed a second time, the machine will continue the hardware insertion cycle by applying the set down force to the material between the Upper and Lower Tools and then return to its Up position.

For more information about the use of the machine in Conductive and Non-Conductive Modes, see Chapter 5: "Operating Instructions."

Safety System Tests

Note

In this manual, the use of the terms left and right refers to the machine operator's left and right when they are standing in front of the machine, facing the work area between the Upper Tool Holder and the Lower Tool Holder.

Step 1: Safety Switch Test Procedure

Note

Depending on the ambient shop temperature, you may need to warm up your Haeger Hardware Insertion Machine before beginning any operations. To do this, turn it on and let it run for about ten minutes.

1. Turn the *Main Disconnect Switch* to the On position. The Main Disconnect Switch is located on the upper right hand corner of the Main Electrical Cabinet door on the right side of the machine (see Figure 4.2).

Note

Except for the *Down Footswitch* and the *Off Switch*, all the other operating controls referred to in the rest of this procedure are on the Control Panel. The Control Panel is located on the front side of the Main Electrical Control Cabinet on the right side of the machine (see Figure 4.3).

2. Start the machine by pressing the On Switch on the Control Panel. The green light in the switch will be illuminated and the motor will start. If the machine doesn't turn on, twist the Off Switch clockwise until it pops out and try pressing the On Switch again.

Warning!

There are three (3) Steps in this testing procedure. **Do not skip or ignore any of them!**

Warning!

Experienced personnel must test the Safety System at the beginning of each work shift. See the Safety System Test in this section of this manual.

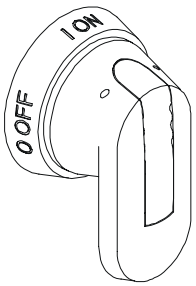


Figure 4.2: Turn the Main Disconnect Switch to the On Position.

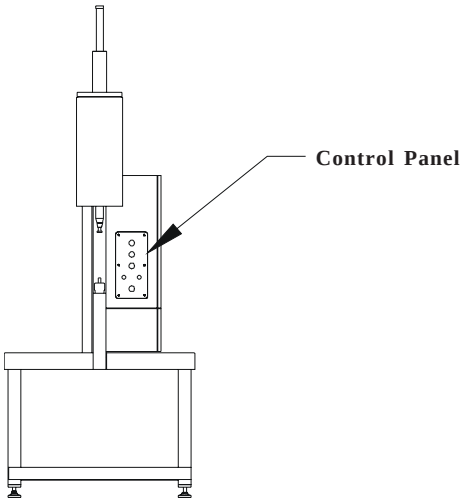


Figure 4.3: The Control Panel is on the front side of the Main Electrical Control Cabinet.

Safety System Test: Step 1

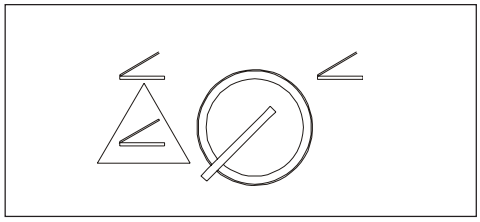


Figure 4.4: Turn the Conductive / Non-Conductive Switch to the Conductive position

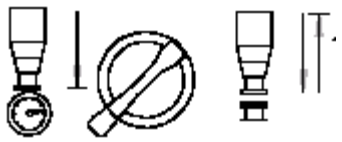


Figure 4.5: Turn the Run/Setup Switch to the Run position.

Figure 4.6: Turn the Up Travel Control Knob.

Warning!

There are three (3) Steps in this testing procedure. **Do not skip or ignore any of them!**

3. Turn the Conductive / Non-Conductive Switch to the Conductive position (see Figure 4.4).
4. Turn the Run/Setup Switch to the Run position (see Figure 4.5).
5. Turn the Up Travel Control Knob counterclockwise all the way to the stop. Then, rotate it clockwise until the pointer has moved about .25 in. / 6 mm on the white scale. The pointer should be pointing to the 10 o'clock position (see Figure 4.6).
6. Keep your hands away from the Tool Holder area. Use the Footswitches to lower or raise the Upper Tool Holder until it is about 4 in. / 100 mm above the Lower Tool Holder. Remove your foot from the Footswitches and keep your feet away from it.
7. Carefully grasp the sides of the Upper Tool Holder and push it upwards. This upward movement should actuate the Safety Switch and the Upper Tool Holder should move up. The movement will continue until the Up timer (set by the Up Travel Control Knob) has timed out. Remove your hand from the Upper Tool Holder as soon as the movement starts.
8. If the Upper Tool Holder moves Up, the Safety System Switch is operating. Go to **Step 2, "Conductive Mode Test Procedure."**
9. If the Upper Tool Holder does not move up, **the Safety System has failed!** Immediately turn the machine off by pressing the red Off Switch and turning the Main Disconnect Switch to the Off position. Call your Supervisor. The machine's Main Disconnect Switch must be locked in the Off position until repairs are begun. Do not operate this machine until qualified personnel have repaired the machine and the Safety System Switch has been properly tested.

Step 2: Conductive Mode Test Procedure

1. Following the Tool Installation instructions in Chapter 2: "Installation," install the 1 in. / 25 mm Flat Anvils in both the Upper Tool Holder and the Lower Tool Holder.
2. If you have just completed Step 1: "Safety Switch Test Procedure,"
   a. The machine is on and the green light in the On Switch is still illuminated. If not, return to Step 1 and restart the machine by following Instructions 1 and 2.
   b. The Conductive/Non-Conductive Switch is in the Conductive position. If not, turn it to the Conductive position.
3. Turn the Run/Setup Switch to the Setup position (see Figure 4.7).
4. Adjust the machine's Force Indicator on the Control Panel to 3,000 lb/13 kN by depressing the Down Footswitch and continuing to keep it depressed even when the Flat Anvil in the Upper Tool Holder contacts the lower Flat Anvil.

   Read the Force Indicator. Turn the Force Adjust knob on the Control Panel to increase or decrease the pressure to 3,000 lb/13 kN (clockwise increases, counterclockwise decreases the pressure). See Figure 4.8.
5. Raise the Upper Tool Holder about 4 in./100 mm by depressing the Up Footswitch.
6. Turn the Run/Setup Switch in the Run position (see Figure 4.9).
7. Keep your hands away from the tooling area. Depress the Down Footswitch. The Upper Tool Holder should move down, the Anvils will contact, the machine will apply the force to the Lower Anvil (as indicated by the rapid movement of the Force Indicator's pointer), and the Upper Tool Holder will return to the Up position.

   If this machine completes the above sequence correctly, go to Instruction 10.

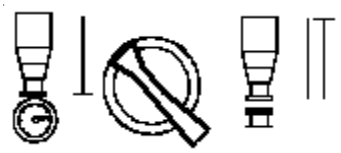


Figure 4.7: Turn the Run/Setup Switch to the Setup position.

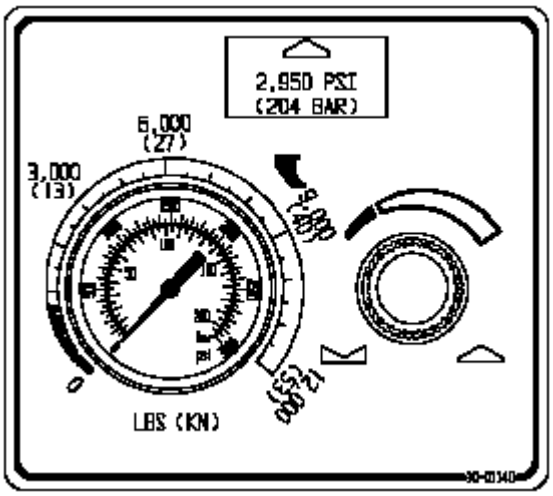


Figure 4.8: Turn the Force Adjust knob on the Control Panel to 3,000 lb/ 13 kN.

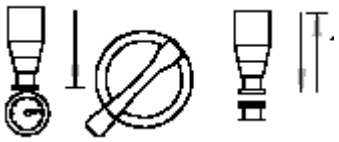


Figure 4.9: Turn the Run/Setup Switch in the Run position.

Warning!

Never attempt to test or demonstrate this machine's Safety System by placing any portion of your hand or body between the Upper and Lower tools. Always use the test procedure outlined in Section 3 of this manual.

NEVER Operate this Machine without the proper tooling installed. If no material and fastener is used, you must use two flat anvils.

8. If the machine does not complete the above sequence correctly, check the switch settings. If they are not correct, reset them and repeat the test. If the machine performs **correctly**, go to Instruction 10.
9. If the machine **does not** complete the above sequence correctly, there is a failure in the machine's control circuit. Trained personnel must correct it. Immediately turn the machine off by pressing the red Off Switch and turning the Main Disconnect Switch to the Off position. The machine's Main Disconnect Switch must be locked in the Off position until repairs are begun. Do not operate this machine until qualified personnel have repaired the machine and the Conductive Mode has been properly tested.
10. Place a small non-conductive object (e.g., plastic or paper) on top of the lower Anvil, making sure the object completely covers the top of the Anvil. Keep your hands away from the tooling area. Depress and hold the Down Footswitch.

    The Upper Tool Holder should move down, the Anvil would contact the non-conductive object and, **without applying any force**, return to the Up position.
11. Keep your hands away from the tooling area. Repeat Instruction 10. Observe the Force Indicator and make sure the machine did not generate anything more than a slight movement of the Force Indicator's pointer. If force was not applied to the non-conductive object, the Safety System is operating correctly in Conductive Mode.

    After confirming that **no force** was applied to the non-conductive object, go to **Step 3, "Non-Conductive Mode Test Procedure."**

11. If the force was applied to the non-conductive object, **the Safety System has failed!** Immediately turn the machine Off by pressing the red Off Switch and turning the Main Disconnect Switch to the Off position. The machine's Main Disconnect Switch must be locked in the Off position until repairs are begun. Do not operate this machine until qualified personnel have repaired the machine and the Conductive Mode has been properly tested.

Step 3: Non-Conductive Mode Test Procedure

1. If you have just completed Step 2:
   a. The machine is On and the green light in the On Switch is still illuminated. If not, return to Step 1 and restart the machine by following Instructions 1 and 2.
   b. The Conductive/Non-Conductive Switch in the Conductive position. If not, turn it to the Conductive position.
   c. The Run/Setup Switch is in the Run position.
   d. The machine's Force Indicator has been set to deliver 3,000 lb/13 kN. If this has been changed, repeat the instructions in Step 2, Instruction 4.
   e. The 1 in./25 mm Flat Anvils are installed in both the Upper and Lower Tool Holders.
2. Turn the Conductive/Non-Conductive Switch to the Non-Conductive position.
3. Keep your hands away from the tooling area. Depress the Down Footswitch. The Upper Tool Holder should move down, the flat Anvils will contact, and the Upper Tool Holder should **stop immediately**.

   If this machine completes the above sequence correctly, go to Instruction 5.

Warning!

There are three (3) Steps in this testing procedure. **Do not skip or ignore any of them!**

Warning!

When operating this Hardware Insertion Machine in the Non-Conductive Mode, be very careful! Do not depress the Down Footswitch a second time after the Upper Tool Holder has stopped on the down stroke with any part of your body near the tooling area.

4. If the machine **does not** complete the above sequence correctly, check the switch settings. If they are not correct, reset them and repeat the test. If the machine performs correctly, go to Instruction 5.

   If the machine **does not** complete the above sequence correctly, there is a **failure** in the machine's control circuit and it must be corrected by qualified personnel. Immediately turning the machine Off by pressing the red Off Switch and turn the Main Disconnect Switch to the Off position. The machine's Main Disconnect Switch must be locked in the Off position until repairs are begun. Do not operate this machine until qualified personnel have repaired the machine and the Non-Conductive Mode has been properly tested.

5. Remove your foot from the Footswitch.
6. Carefully grasp the sides of the Upper Tool Holder and raise it until a positive stop is reached. With a calibrated measuring instrument, measure the vertical distance between the upper and lower Anvils. If this measurement **is more than** .01 in./.25 mm, go to Instruction 7.

   If this dimension is **less** than .01 in./.25 mm, the **Safety System has failed!** Immediately turn the machine off by pressing the red Off Switch and turning the Main Disconnect Switch to the Off position. The machine's Main Disconnect Switch must be locked in the Off position until repairs are begun. Do not operate this machine until qualified personnel have repaired the machine and the Non-Conductive Mode has been properly tested.

7. Keep your hands away from the tooling area. Depress the Down Footswitch a second time. The machine should exert the 3,000 lb/ 13 kN force on the Anvils and then return to its Up position.

If this machine completes the above sequence correctly, the test of the Safety Switch and Safety System is complete.

NEVER Operate this Machine without the proper tooling installed. If no material and fastener is used, you must use two flat anvils.

Notes

Introduction

The Operating Controls Section of this Hardware Insertion Machine Manual is second in importance only to the Safety System Section (Section 3).

This section provides you, the operator, with all the information that you need to operate this Hardware Insertion Machine safely and productively.

Make sure that you read and understand all of the descriptions, instructions and notes contained in this section. Heed all of the Warnings and Cautions in this section and in Section 3.

Your safety and productivity depend on it.

This symbol, appearing throughout this manual, means: Attention! Be Alert! Your safety is involved.

NEVER wear anything that may come into contact with the Upper Tool, Lower Tool or workpiece (watches, rings, bracelets, etc.)

Warning!

Never leave your foot on or above the Down Footswitch after you have completed each cycle of the machine. Remove it from the Down Footswitch. Keep your feet away from the Down Footswitch until your hands are clear of the tooling area and you intend to lower or raise the Upper Tool Holder or insert hardware.

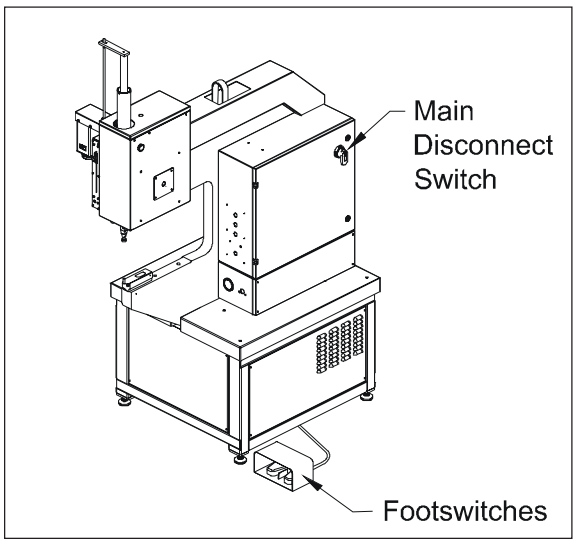


Figure 5.1: The Control Panels are on right side of the machine.

This vertical bar represents the On Switch on the Machine's Control Panel.

This circular symbol represents the Off Switch on the side of the Machine's Control Panel

Operating Controls

Note:

Except for the Down Footswitch and Stop Switch all operating controls referred to in this section are on the Control Panels located on the front side of the Main Electrical Control Cabinet on the right side of the machine (see Figure 5.1).

On Switch & Light

The On Switch is a momentary contact push button switch with a light in it (see Figure 5.2).

When the On Switch is pushed, the machine's controls are turned on and the motor starts. The green light in the switch will also turn on.

When the light is off, the machine's controls are off and the motor is stopped.

Off Switch

The Off Switch is used to shut the machine off in all situations (see Figure 5.2).

It is a two position switch with a red mushroom button. When it is pushed in, it latches, turns the machine's controls off and shuts down the machine's motor. **In the In position, the machine cannot be restarted.**

To restart the machine, twist the red mushroom button clockwise. There is an arrow showing the direction on the mushroom button. The mushroom button will snap out and the machine can be restarted.

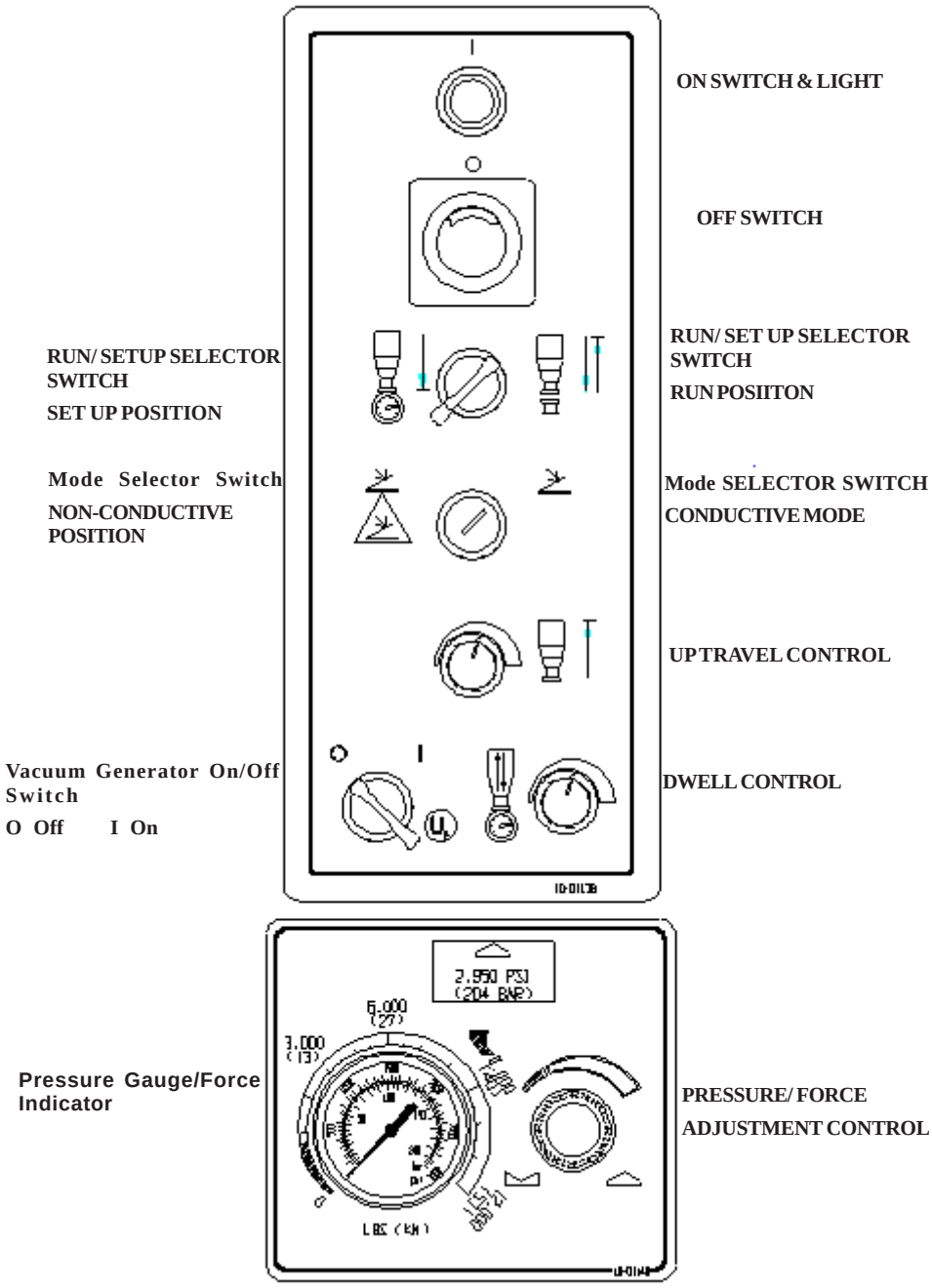
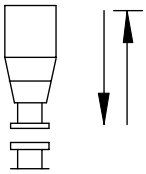
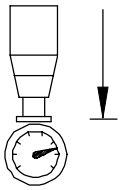


Figure 5.2: These Conrol Panels contain most of the controls needed to operation the machine.



The Run Mode position on the selector switch is on the right and it is represented by this symbol.

The arrows represent the directions the Upper Tool will travel when the Down Footswitch is depressed. The small horizontal line on the tip of the arrow on the right indicates that the Upper Tool will stop once it has completed the stroke and reached its set Up position (see **Up Travel Control** on page 5.7).



The Setup Mode position on the selector switch is on the left and is represented by this symbol.

The arrow represents the direction the Upper Tool will travel when the Down Footswitch is depressed. The small horizontal line on the tip of the arrow indicates that the Upper Tool will stop when it contacts the Lower Tool. The circular gauge represents the Pressure/ Force that may be set.

Run/Setup Selector Switch

The Run/Setup Switch is a two position selector switch (see Figure 5.2). You can choose either the Run Mode or the Setup Mode of operation.

Run Mode

The Run Mode is the normal operating mode for the Haeger Hardware Insertion Machine and will be used to insert all hardware. See the **Conductive/Non-Conductive Keyed Selector Switch** description on Page 5.5 for how the Hardware Insertion Machine operates in Run Mode.

Setup Mode

The Setup Mode is used to set the insertion force for the Haeger Hardware Insertion Machine.

See the **Conductive/Non-Conductive Keyed Selector Switch** description for how the Hardware Insertion Machine operates in Setup Mode.

Conductive/Non-Conductive Mode Keyed Selector Switch

The Conductive/Non-Conductive Keyed Selector Switch is a two-position selector switch (see Figure 5.2). It requires a key. This enables the supervisor to select either Conductive Mode or Non-Conductive Mode of operation.

Conductive Mode

Conductive Mode is used to insert hardware into conductive materials such as steel, stainless steel and aluminum.

Run Mode

When the Down Footswitch is depressed, the Upper Tool Holder will go down. When the Upper and Lower Tools make electrical contact, the Hardware Insertion Machine will exert the preset force, then reverse and go up to the position determined by the Up Travel Control (see **Up Travel Control** on page 4.7).

If the Upper and Lower Tools encounter any non-conductive material, such as fiberglass, plastic, or anodized aluminum, the tools will not make electrical contact. The Upper Tool will immediately reverse and go up to the Up position. Once the upward travel starts, release the Down Footswitch.

Setup Mode

When the Down Footswitch is depressed, the Upper Tool Holder will go down. When the Upper Tool contacts a conductive workpiece, the Hardware Insertion Machine will exert the preset force and hold it until the Down Footswitch is released. While the Down Footswitch is depressed, the Pressure/Force Control (see page 4.9) can be adjusted to either increase or decrease the force the Hardware Insertion Machine is exerting. After the force is set, release the Down Footswitch. Depress the Up Footswitch to raise the Upper Tool to the desired height above the workpiece.

Warning!

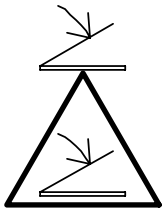
This is a keyed Selector Switch. It has been provided to permit strict supervisory control over the use of the Conductive and Non-Conductive Modes of operation.

It is the supervisor's responsibility to evaluate each operation to determine which mode should be used for each application. Once the supervisor selects the mode of operation, the supervisor must remove the key.

Do not leave the key in the switch!

The Conductive Mode position on the Keyed Selector Switch is on the right and is represented by this symbol.

The two straight lines form a V and represent the Footswitch. The arrow indicates that the machine's Upper Tool will start moving down when the Down Footswitch is depressed. In this mode, the Upper Tool will complete one full stroke, provided all operating conditions are met.



The Non-Conductive Mode position on the Selector Switch is on the left and is represented by this symbol.

The two straight lines form a V and represent the Footswitch. The arrow indicates that the machine's Upper Tool will start moving down when the Down Footswitch is depressed.

The upper Footswitch symbol indicates that the Upper Tool will only complete the down part of the stroke when the Down Footswitch is depressed. No force will be applied. When the Upper Tool stops, your foot must be removed from the Down Footswitch.

The lower Footswitch symbol indicates that the Down Footswitch must be depressed a second time to exert the preset force.

This Footswitch is shown on a yellow triangle to indicate Caution.

Remember, when the Down Footswitch is depressed a second time, it will exert the force the machine has been set for.

Caution!

Never press the Down Footswitch a second time in Non-Conductive Mode when your hands are in the area of the tooling.

Non-Conductive Mode

The Non-Conductive Mode is used to insert hardware into non-conductive materials such as fiberglass, plastics and some coated materials.

Run Mode

When Run Mode is selected with Non-Conductive Mode and the Down Footswitch is depressed, the Upper Tool Holder will go down until the Upper Tool contacts the workpiece and then stop. The Down Footswitch must then be released. When the Down Footswitch is **depressed a second time**, the Hardware Insertion Machine **will exert the force** for which it has been set and then return to the Up position. Release the Down Footswitch once the upper tool starts to move up.

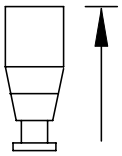
Setup Mode

When Setup Mode is selected with Non-Conductive Mode and the Down Footswitch is depressed, the Upper Tool Holder will go down. When the Upper Tool contacts a non-conductive workpiece, the Hardware Insertion Machine will stop. The preset force will not be applied. The Down Footswitch must then be released. When the Down Footswitch is **depressed a second time,** the hardware Insertion Machine **will exert the preset force** and hold it until the Down Footswitch is released. While the Down Footswitch is depressed, the Pressure/Force Control (see **Pressure/Force Adjust Control** on page 5.9) can be adjusted to either increase or decrease the force the Hardware Insertion Machine is exerting. After the force is set, release the Down Footswitch. Depress the Up Footswitch to raise the Upper Tool to the desired height above the workpiece.

Up Travel Control

The Up Travel Control determines how far the Upper Tool Holder will travel up, away from the Lower Tool, after the hardware has been inserted (see Figure 5.2).

To increase this distance, turn the indicator knob clockwise. To decrease the distance to be traveled, turn the indicator knob counterclockwise.



The Up Travel Control is represented by this symbol.

The arrow represents the direction the Upper Tool travels. The small horizontal line on the tip of the arrow indicates the Upper Tool will stop when it has reached the Up position.

Dwell Control

The Dwell is the length of time that the force is applied between the Upper and Lower Tools.

It can range from 0.0 seconds to 3.0 seconds.

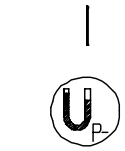
If you set the Dwell to 0.0 seconds, the Upper Tool will lower, apply the Force and return to the Up Position.

If you set the Dwell value greater than 0.0 seconds, the Upper Tool will lower and apply the Force. It will then continue applying the force for the length of time set by the Dwell value.

An increased Dwell setting should be used when inserting fasteners into materials such as stainless steel.

The Dwell Control is represented by this symbol.

Turning the control knob clockwise will increase the amount of time the machine will hold press.



The Vacuum Generator Selector Switch is represented by this symbol.

The circle with the manometer and small “p”, with a minus sign, represents the vacuum system.

With the switch in the right position, the vertical bar represents On.

With the switch in the left position, the circle represents Off.

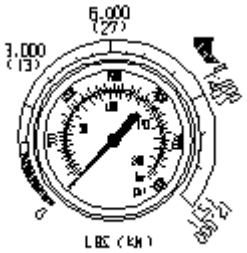


Figure 5.3: The Pressure Gauge/ Force Indicator displays the pressure/ force the system is exerting.

This symbol represents the Haeger J-Frame which is used in certain applications as a Lower Tool Holder. It is positioned by the 9,000 lb/ 40 kN mark, with the word MAXIMUM to indicate that this is the maximum load, in pounds & kilo-Newtons, which the J-Frame can support. Never exceed the load on the J-Frame! You could be injured and the machine, tooling, and workpiece could be damaged.

Vacuum Generator Selector Switch (Vac./Gen.)

The Vacuum Generator Selector Switch is an optional feature which can be installed in all Haeger Hardware Insertion Machines (see Figure 5.2). It is used to turn Haeger’s Vacuum Generator System On or Off. The vacuum system is used to hold hardware during the installation process with a wide variety of Haeger’s Automatic Tooling.

If this option was not ordered with the machine, the Selector Switch will still be installed but it will not be connected to anything.

If you find that you need the vacuum system after the machine is shipped from the factory, it can easily and economically be retrofitted to this machine.

Pressure Gauge/Force Indicator

The Pressure Gauge/Force Indicator (see Figure 5.3) displays the pressure/force the system is exerting during all phases of machine operation. The scale on the gauge is marked in Pounds Per Square Inch (psi) and Bar. The marks on the Control Panel indicate both pounds and kilo-Newtons of force. The outer scale represents Pounds and the inner scale, in parentheses, represents kilo-Newtons.

Warning!

Never exceed the maximum force of 9,000 lb/40 kN on the J-Frame and the Square Tipped Tool Holder. The maximum pressure for this force is indicated on the Pressure Gauge mounted on the Hydraulic Control Panel. **Do not exceed this pressure.**

Pressure/Force Adjust Control

The Pressure Force/Adjust Control is used to increase or decrease the pressure in the system which, in turn, will increase or decrease the force the machine exerts during the insertion process (see Figure 5.4).

This symbol is an IEC 417 graphic symbol which indicates the control by which a quantity is adjusted to its minimum value. In this case, the quantity is the Pressure/Force the machine can exert.

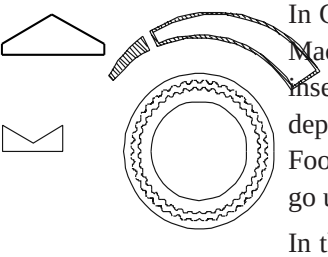
To decrease the pressure/ force exerted during the insertion cycle, turn the indicator knob counterclockwise.

This symbol is an IEC 417 graphic symbol which indicates the control by which a quantity is adjusted to its maximum value. In this case, the quantity is the Pressure/Force the machine can exert.

Down/Up Footswitch

The Down/Up Footswitch is shielded and connected to the Haeger Hardware Insertion Machine by a heavy duty cable. It contains both the Down and Up Footswitches.

When the Down Footswitch is depressed, the Upper Tool Holder moves down. If you remove your foot from the Down Footswitch, the Upper Tool Holder will stop. If you depress the Down Footswitch again, the downward motion will start again.



In Conductive Mode, the Hardware Insertion Machine will complete one normal cycle of the insertion process when the Down Footswitch is depressed and held down. Hold the Down Footswitch until the Upper Tool Holder starts to go up again.

In the Non-Conductive Mode, when the Down Footswitch is depressed, the Hardware Insertion Machine will lower the Upper Tool until it contacts the workpiece and then stop. The Down Footswitch must then be released. When the Down Footswitch is **depressed a second time**, the Hardware Insertion Machine **will exert the preset force** and then return to its Up position. Once the upward travel starts, release the Down Footswitch.

When the Up Footswitch is depressed, the Upper Tool Holder moves up. If you remove your foot from the Up Footswitch, the Upper Tool Holder will stop. If you depress the Up Footswitch again, the upward motion will start again.

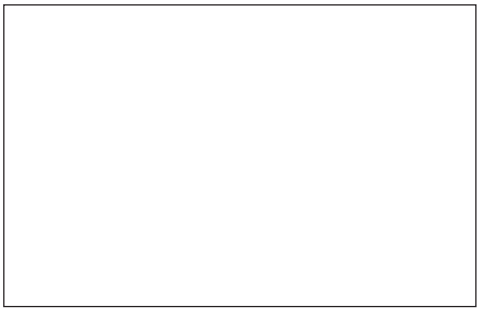


Figure 5.4: Turn clockwise to increase the pressure, counterclockwise to decrease.

Warning!

Make sure you read and understand the Warning and Safety Instructions in the Introduction section of this manual and follow the instructions for testing the Safety System in the Safety System section before attempting to operate this Hardware Insertion Machine.

Conductive Mode Setup Procedure

Note:

This procedure assumes that you are thoroughly familiar with this machine's controls as described in the first part of this section. If you are **not** familiar with these controls, **STOP.** Return to the beginning of this section and review any controls you are not thoroughly familiar with **before** continuing. If you have any questions, call your Haeger Distributor.

Depending on the ambient shop temperature, you may need to warm up your Haeger Hardware Insertion Machine before beginning any operations. To do this, turn it on and let it run for about ten minutes.

Getting Started - Before You Turn on the Machine

1. Determine the installation force required to properly install the hardware you are going to insert. Refer to the technical specifications provided by the hardware manufacturer for this insertion force.
2. Select the proper tools for this application and install them in the Upper and Lower Tool Holders.
3. Have your Supervisor use the key to set the Conductive/Non-Conductive Switch to the Conductive position.

Setting the Pressure

1. Turn the Main Disconnect Switch to the On position.
2. Start the machine by pressing the On Switch. The green On light in the switch will turn on and the motor will start.
3. Set the Run/Setup Switch to the Setup position.

4. Turn the Up Travel Control knob clockwise to about one half way up the scale (twelve o'clock).
5. Keep your hands away from the tooling area. Depress the Down Footswitch and hold it down until the Upper Tool Holder comes down, contacts the Lower Tool and stops.
6. Continue depressing the Down Footswitch and adjust the machine's Pressure/Force to the appropriate setting (see Page 4.9). Release the Down Footswitch.
7. Depress the Up Footswitch to raise the Upper Tool Holder to a position above the lower tool so the workpiece can be easily positioned to insert the hardware.
8. Set the Run/Setup Switch to the Run position.

Checking the Up Travel & Insertion

1. Keep your hands away from the tooling area. **Without** positioning the hardware or workpiece for insertion, depress the Down Footswitch and complete one stroke of the machine.
2. Check the position where the Upper Tool stopped.

   Is it adequate to permit the workpiece to be positioned easily while fasteners are installed? If not, adjust the Up Travel Control accordingly. If an adjustment is necessary, check the new setting by cycling the machine again.
3. Keep your hands away from the tooling area. Insert the first piece of hardware into the workpiece.
4. Examine the insertion.

   Is the hardware properly seated? Is the workpiece deformed? Adjust the insertion force accordingly and insert another fastener.
5. Once the hardware is properly inserted, start the production run.

Warning!

Never leave your foot on or above the Down Footswitch after you have completed acycle of the machine. Remove it from the Down Footswitch. Keep your feet away from the Down Footswitch until your hands are clear of the tooling area.

Warning!

Make sure you read and understand the Warning and Safety Instructions in the Introduction section of this manual and follow the instructions for testing the Safety System in the Safety System section before attempting to operate this Hardware Insertion Machine.

Non-Conductive Mode Setup Procedure

Note:

This procedure assumes that you are thoroughly familiar with this machine's controls as described in the first part of this section. If you are not familiar with these controls, STOP. Return to the beginning of this section and review any controls you are not thoroughly familiar with before continuing. If you have any questions, call your Haeger Distributor.

Depending on the ambient shop temperature, it may be necessary to warm up your Haeger Hardware Insertion Machine before beginning any operations. To do this, turn it on and let it run for about ten minutes.

Getting Started - Before You Turn on the Machine

1. **Determine the installation force that you will need to properly install the hardware you are going to insert. Refer to the technical specifications provided by the hardware manufacturer for this insertion force.**
2. **Select the proper tools for this application and install them in the Upper and Lower Tool Holders.**
3. **Have your Supervisor use their key to set the Conducive/Non-Conductive Switch to the Non-Conductive position.**

Setting the Pressure

1. Turn the Main Disconnect Switch to the On position.
2. Start the machine by pressing the On Switch. The green On light in the switch will turn on and the motor will start.
3. Set the Run/Setup Switch to the Setup position.
4. Turn the Up Travel Control knob clockwise to a position about one half way up the scale (12 o'clock).
5. Keep your hands away from the tooling area. Depress the Down Footswitch and hold it down until the Upper Tool Holder comes down, contacts the Lower Tool and stops.
6. Continue depressing the Down Footswitch and adjust the machine's Pressure/Force to the appropriate setting (see Page 4.9). Release the Down Footswitch.
7. Depress the Up Footswitch to raise the Upper Tool Holder to a position above the Lower Tool so the workpiece can be easily positioned to insert the hardware.
8. Set the Run/Setup Switch to the Run position.

Checking the Up Travel & Insertion

1. Keep your hands away from the tooling area. Without positioning the hardware or workpiece for insertion, depress the Down Footswitch and complete one stroke of the machine. [is this step necessary?]

Warning!

Never leave your foot on or above the Down Footswitch after you have completed acycle of the machine. Remove it from the Down Footswitch. Keep your feet away from the Down Footswitch until your hands are clear of the tooling area.

Warning!

NEVER press the Down Footswitch a second time in Non-Conductive Mode when your hands are in the tooling area.

2. Keep your hands away from the tooling area. Without positioning the hardware or workpiece for insertion, depress the Down Footswitch. The Upper Tool Holder will move down, the Upper and Lower Tools will contact and stop. Release the Down Footswitch. Depress the Down Footswitch a second time. The machine will immediately apply the force to the Lower Tool, and the Upper Tool will return to the Up position.

Description

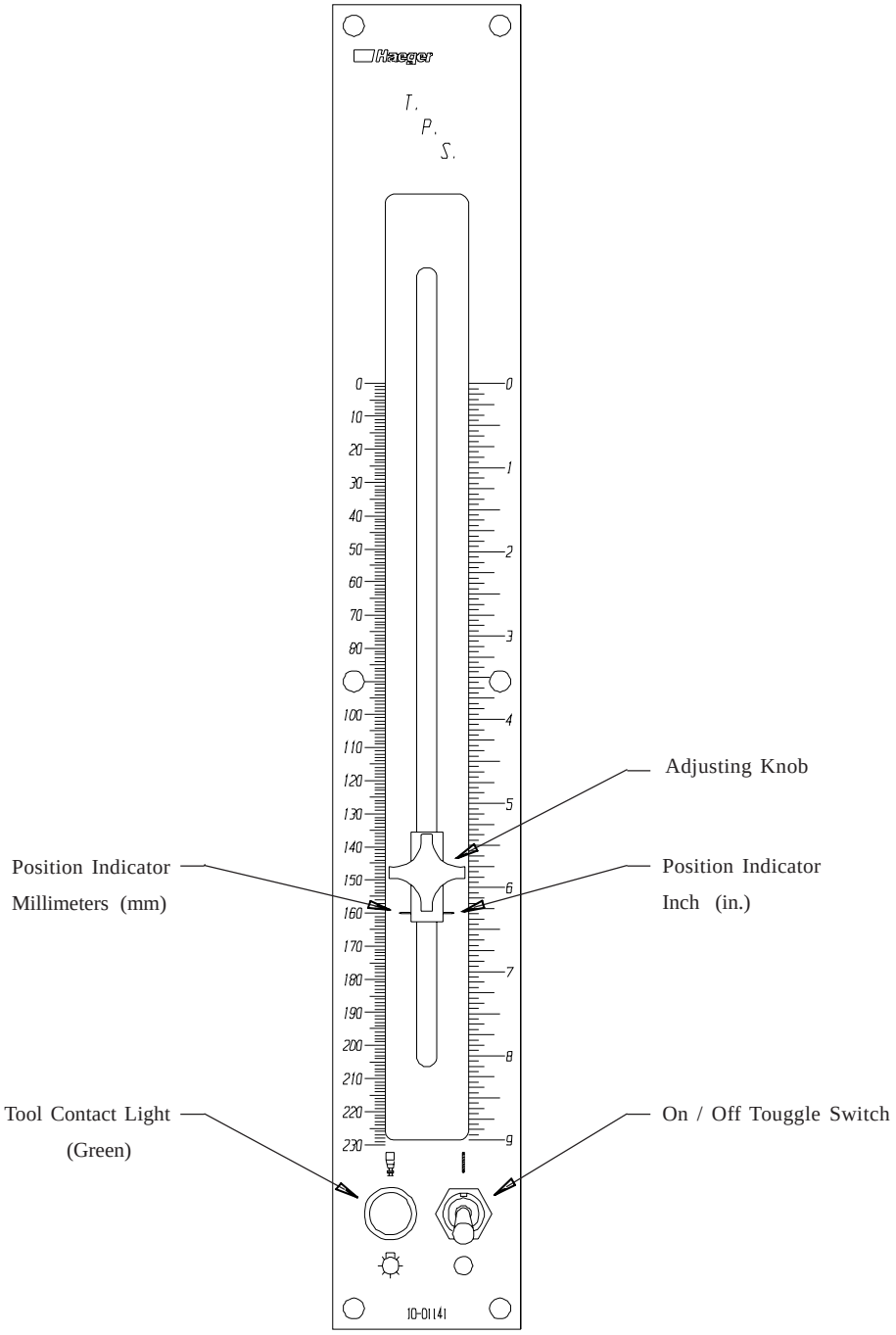
The *Tooling Protection System (TPS)* works in conjunction with Haeger's patented *Safety System* and is designed to protect both the tooling and the workpiece from damage. When properly set up, the *TPS* detects when the force is about to be applied to insert the hardware. If this position is not the correct position which the machine was set up for, the *Upper Tool* will retract without exerting the insertion force. The *TPS* can also be turned *Off* and Haeger's patented *Safety System* will remain fully operational. It is recommended, however, that the *TPS* by used for all hardware insertion operations.

The *TPS* is also fully adjustable for different length tooling and can be used with all Haeger tooling setups including the J-Frame. It is, however, particularly effective when *Automatic Tooling* is being used. In this case, you, the operator, may not realize or remember that the automated system has already positioned the hardware in the tooling and inadvertently cause a second piece of hardware to be installed in the tooling. If this occurs, and you attempt to insert the fastener, the *TPS* will prevent possible serious damage to the tooling and/or the workpiece.

It is strongly recommended, however, that if you are unsure if there is hardware already in the tooling, you must manually check the tooling to be sure. This is particularly true if you leave the machine, even for a brief period.

Warning!

NEVER: Place your hands or any part of your body between the *Upper* and *Lower Tool.*



f:\netmanual\618-1c\5\tpspan.prt

Warning!
Never operate this machine while wearing any metal objects such as a watch, bracelets, or rings.

Operating Controls

Note: All operating controls referred to in this section are on the Tooling Protection System Control Panel and the 618 Machine Control Panel. The Tooling Protection System Control Panel is located on the front left side of the 618's front cover. The 618's Control Panel is located on the front side of the Main Electrical Control Cabinet which is on the right side of the machine.

On/Off Toggle Switch

As the name implies, the *On/Off Toggle Switch* is a toggle switch which operates in the up and down direction.

This vertical bar represents the *On* position of the *On/Off Toggle Switch* on the TPS's Control Panel.

When the *On/Off Toggle Switch* is moved to the up position, near the *On* symbol, the TPS has been turned *On.*

This circular symbol represents the *Off* position of the *On/Off Toggle Switch* on the TPS's Control Panel.

When the *On/Off Toggle Switch* is moved to the down position, near the *Off* symbol, the TPS has been turned *Off.*

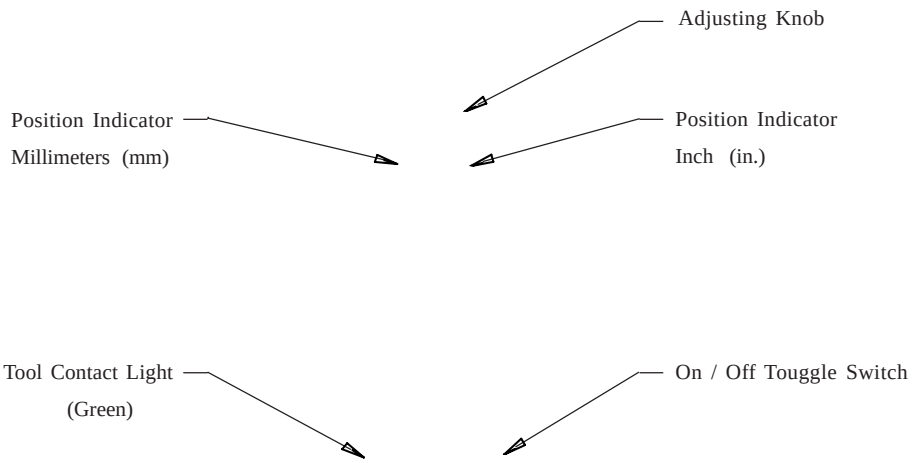
Tool Contact Light

The *Tool Contact Light* is green when it is illuminated.

This symbol shows an anvil tool in an Upper Tool Holder contacting a second anvil tool. It represents *Tool Contact.*

This is the symbol for lighting which represents the *Tool Contact Light.*

With the *On/Off Toggle Switch* in the *On* position, the green *Tool Contact Light* will turn *On* when the upper tool contacts the material or lower tool. If the *On/Off Toggle Switch* is in the *Off* position, the *Tool Contact Light* will not turn *On.*



f:\netmanual\618-1c\5\tpspan.prt

Warning!

Never operate this machine while wearing any metal objects such as a watch, bracelets, or rings.

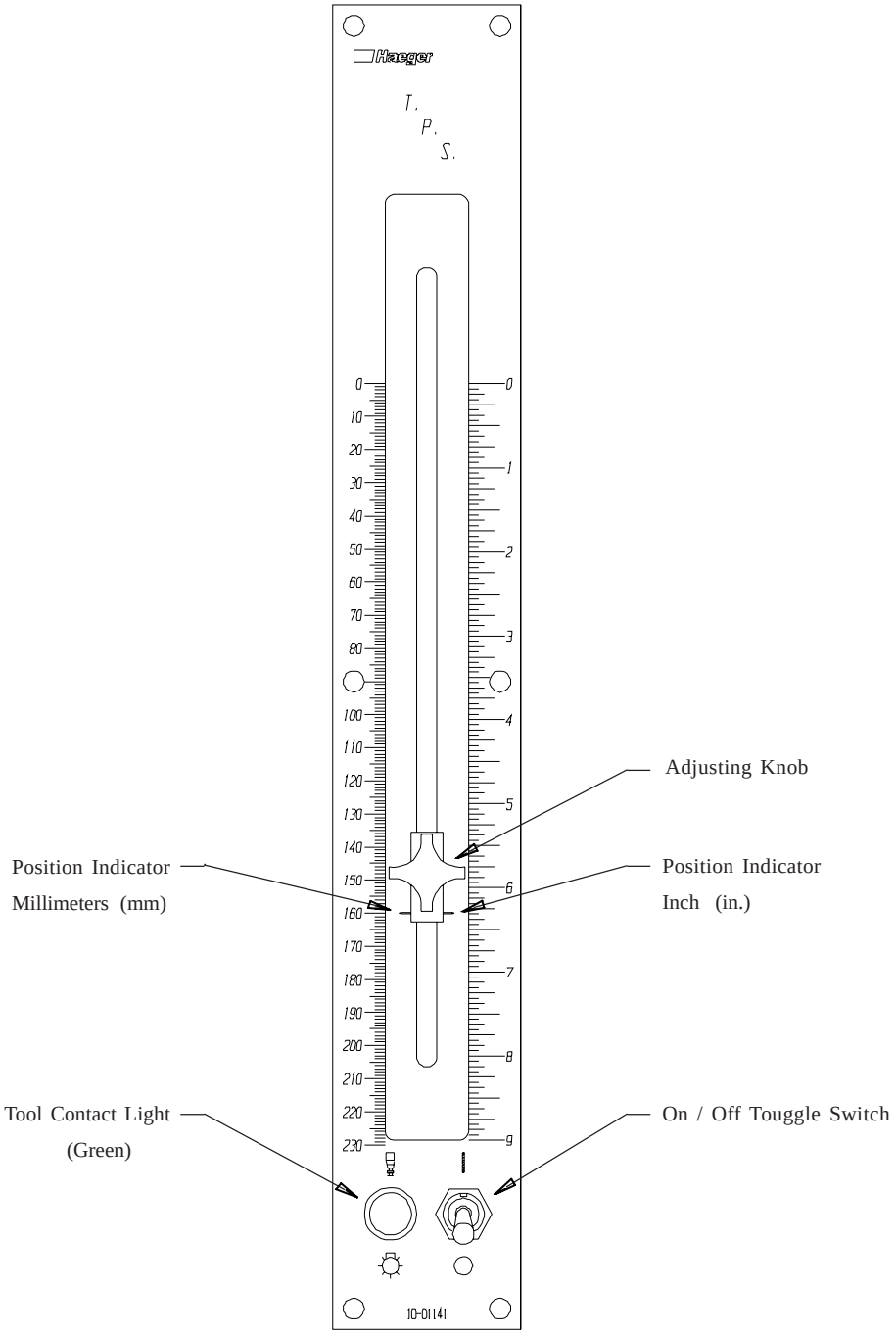
Setup Procedure

Note:

1. This procedure assumes that the trainee is thoroughly familiar and comfortable with this machine's controls as described in the first part of this section. If you are **not** familiar with these controls, **STOP.** Return to the beginning of this section and review any controls you are not thoroughly familiar and comfortable with **before** continuing. If you have any questions, call your Haeger Distributor to get the answer(s) to your question(s).
2. Depending on the ambient shop temperature, it may be necessary to warm up your Haeger Hardware Insertion Machine before beginning any operations. To do this, turn it on and let it run for about ten minutes.

1. Follow the *Setup Procedure* for the *Non-Conductive Modes* in this section of the manual. This includes having your supervisor use their key to select the *Non-Conductive Mode* of operation. You must also select and install the proper tooling, set the required insertion Force/Pressure, and set an adequate *Up Travel* position.
2. Start the machine by pressing the *On Switch*. The green *On* light in the switch will be illuminated and the motor will start.

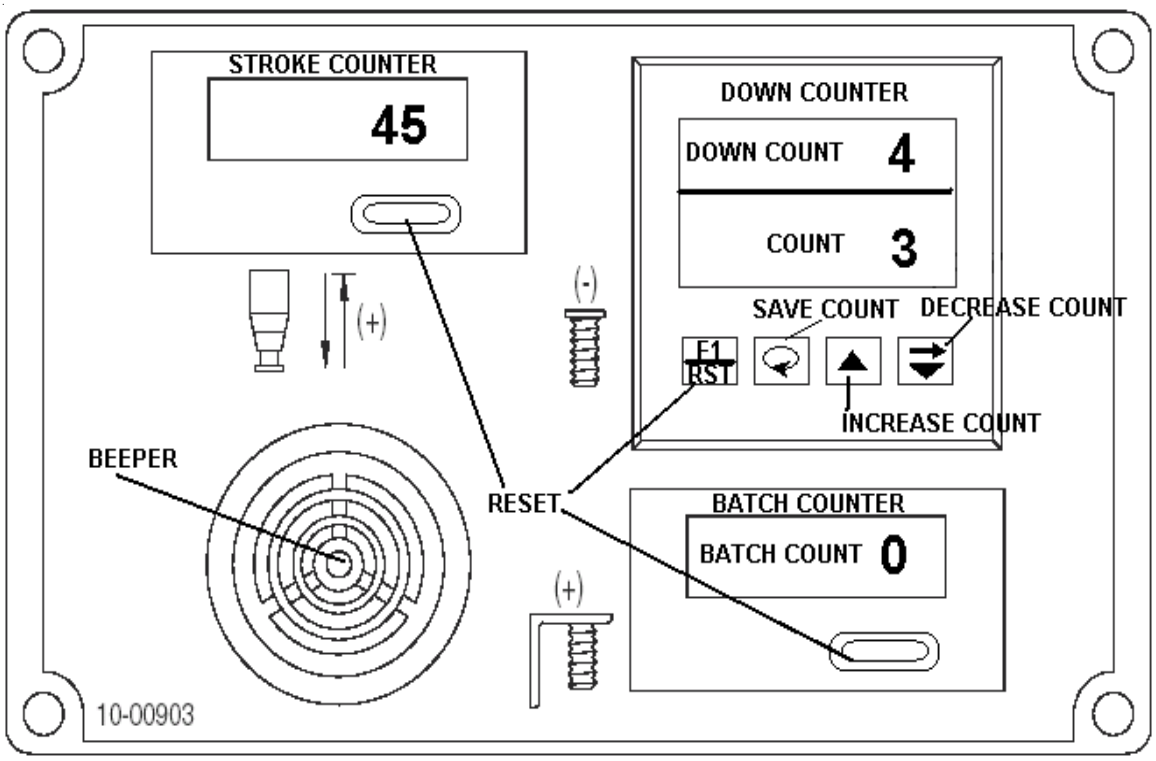
   If the machine does not start, check the *Off Switch* by twisting the red mushroom button clockwise, as indicated on the mushroom button. The mushroom button may snap out to the position where the machine can be started.
3. Set the *Run/Setup Switch* to the *Setup* position.
4. Turn the *TPS On* by moving the *On/Off Toggle Switch* to the *On* position.
5. Loosen the *Adjustment Knob* by turning it counterclockwise and move it down until the *Position Indicator* is aligned with the 210 millimeters/8 1/4 inch mark. The left scale on the *TPS* is the millimeters scale and the right scale is the inch scale. It is not necessary to tighten the *Adjustment Knob* at this position.



f:\netmanual\618-1c\5\tpspan.prt

6. Position one of the pieces of hardware to be inserted in the tooling.
7. Position the workpiece on the *Lower Tool*.
8. Keeping your hands away from the tooling area, lower the *Upper Tool* until it stops by depressing the *Down Footswitch*.
9. Insert the hardware by depressing the *Down Footswitch* a **second** time.
10. Leaving the *Upper Tool Holder* in this "down" position, slowly move the *Adjusting Knob* up until the green *Tool Contact* light is illuminated. On the metric scale, very carefully note the exact location of the *Position Indicator* when the *Tool Contact* light comes on. To obtain an accurate setting, lower the *Adjusting Knob* and repeat this step three or more times.
11. From the exact location where the *Position Indicator* was when the *Tool Contact* light came on, move the *Position Indicator* **up** 7 millimeters for 60 Hertz machines and 8 millimeters for 50 Hertz machines. (On the metric scale, one mark represents one millimeter and it is abbreviated 1 mm.) At this exact position, tighten the *Adjusting Knob* securely by rotating it clockwise.

    Note: If the hardware being inserted has an unusually long gripping length which will require the insertion force to be exerted over 1.5 mm/.06 in. of the stroke, the 7 mm or 8 mm setting may have to be increased by 1 or 1.5 mm.
12. Raise the *Upper Tool* to about the preset *Up Travel* position.
13. Set the *Run/Setup Switch* to the *Run* position.
14. Carefully insert another piece of hardware and check it. If the insertion is acceptable, proceed with production. If the insertion is not acceptable, review this *Setup Procedure*.
15. The *Setup Procedure* is now complete. If the production is going to be run in the *Non-Conductive Mode*, it may start now. If the production is going to be run in the *Conductive Mode*, have your supervisor use their key to select the *Conductive Mode* of operation.


STROKE COUNTER
45
DOWN COUNTER
DOWN COUNT 4
COUNT 3
SAVE COUNT
DECREASE COUNT
F1
RST
INCREASE COUNT
(-)
(+)
BEEPER
RESET
BATCH COUNTER
BATCH COUNT 0
(+)
10-00903

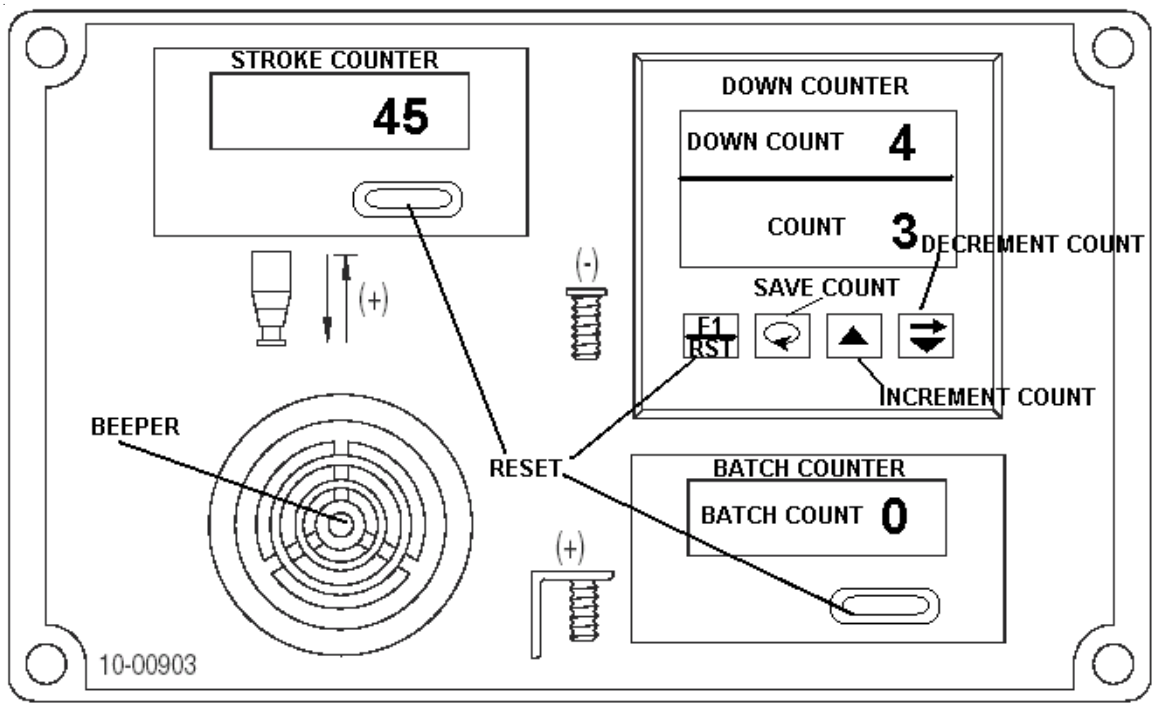
Description

The *Haeger Batch Counter Option*, which can be installed on any Haeger Hardware Insertion Machine, consists of three counters and an electronic beeper for audible signals. In use, the counters display the number of pieces of hardware to be inserted into the workpiece and the number remaining to be inserted in the workpieces, the number of workpieces which have been completed and the number of strokes the machine has taken. The electronic beeper sounds every time the last piece of hardware is inserted in the workpiece.

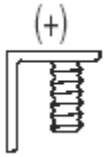
Each of the counters is identified by an international graphic symbol rather than having its name printed beside it in many different languages.

Down Counter Symbol Description

The *Down Counter* is the largest counter on the panel and is represented by this international graphic symbol. The graphic symbol represents a fastener and, in this case, it is a stud. The minus sign, just above the stud, indicates that this counter counts down. In operation, the counter subtracts (-) one from the display each time a fastener is inserted, decreasing the number displayed by one.


STROKE COUNTER
45
DOWN COUNTER
DOWN COUNT 4
COUNT 3
DECREMENT COUNT
SAVE COUNT
F1
RST
INCREMENT COUNT
(-)
(+)
BEEPER
RESET
BATCH COUNTER
BATCH COUNT 0
(+)
10-00903

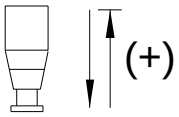
Batch Counter Symbol Description



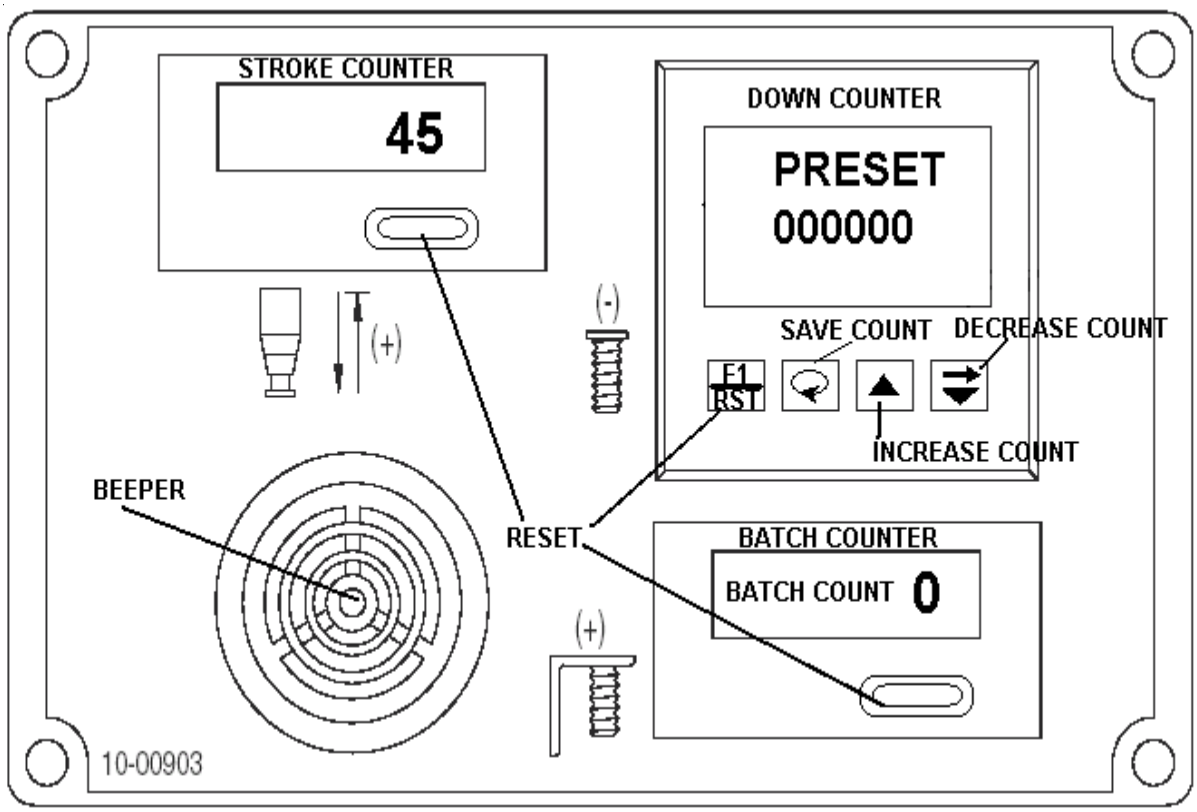
The *Batch Counter* is just below the *Down Counter* and is represented by this international graphic symbol. The graphic symbol represents a fastener (stud) which has been inserted into a workpiece formed into a right angle.

The plus sign, just above the stud and workpiece, indicates that this counter counts up. In operation, the counter adds (+) one to the display each time a workpiece is completed, increasing the number displayed by one.

Stroke Counter Symbol Description



The *Stroke Counter* is just to the left of the *Down Counter* and is represented by this international graphic symbol. The graphic symbol represents the *Upper Tool Holder*. The plus sign, just to the right of the *Upper Tool Holder*, indicates that this counter counts up. In operation, the counter adds (+) one to the display each time the *Upper Tool Holder* completes one stroke, increasing the number displayed by one. The two Arrows, one pointing down and one pointing up with a short bar at the arrow's point, indicate that the machine has to make one complete stroke. The *Upper Tool Holder* must go to the bottom of its stroke and then return to its up position where it stops. This sequence is counted as one stroke.

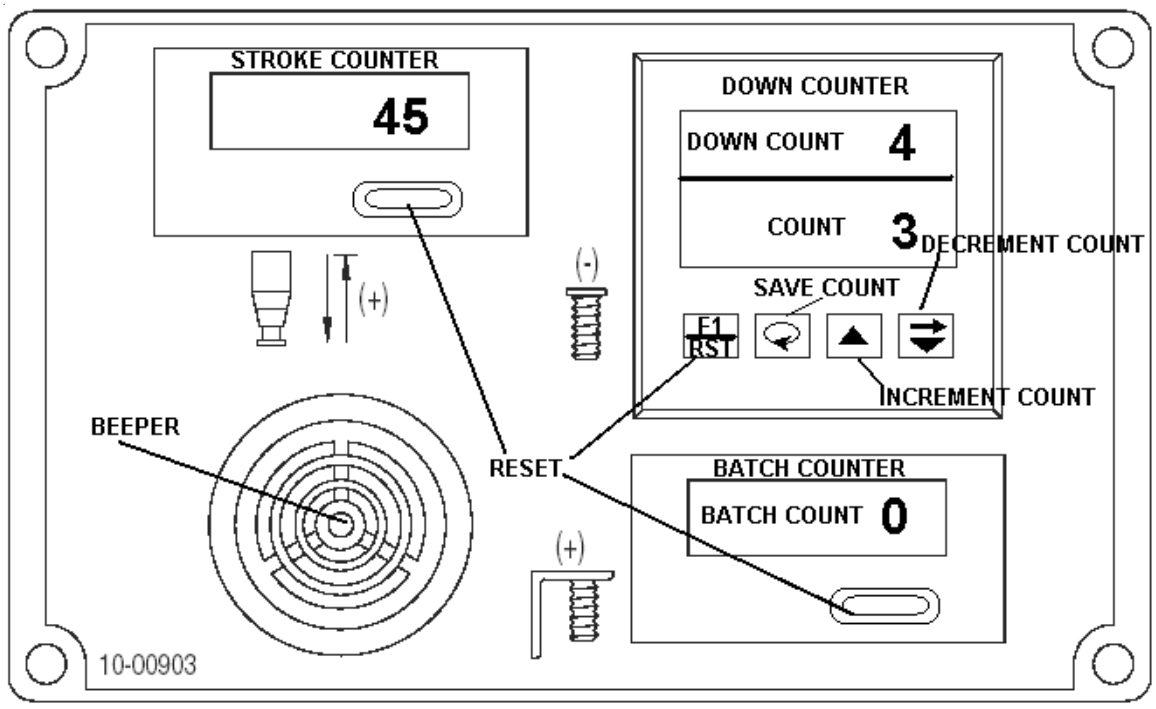

STROKE COUNTER
45
DOWN COUNTER
PRESET
000000
SAVE COUNT
DECREASE COUNT
F1
RST
INCREASE COUNT
(-)
(+)
BEEPER
RESET
BATCH COUNTER
BATCH COUNT 0
(+)
10-00903

Down Counter 

The *Down Counter* displays two numbers, the total number of pieces of hardware to be inserted in the workpiece and the number of pieces of hardware remaining to be inserted. The total number is represented by the smaller (lower) digits, and it must be set for each different production run. The number of pieces of hardware remaining to be inserted is represented by the larger (upper) number. As the hardware is inserted, this number will count down "1" each time the insertion force reverses the *Upper Tool.* When the last piece of hardware is inserted, the number will reset to the total number of pieces of hardware in the workpiece, the *Batch Counter* will count up "1," and the beeper will sound to confirm that the total number of pieces of hardware has been inserted and the workpiece is complete.

To set the total number of pieces of hardware in the workpiece, depress the Decrease Count or Increase Count buttons.  The Down Counter screen will now show the Preset screen. Using the Decrease Count or Increase Count buttons set the preset count value. Next you will press the Save Count button  to save the information and return to te run screen.

Using the Reset Button  on the Down counter will reset the count to the preset value.


STROKE COUNTER
45
DOWN COUNTER
DOWN COUNT 4
COUNT 3
DECREMENT COUNT
SAVE COUNT
F1
RST
INCREMENT COUNT
(-)
(+)
BEEPER
RESET
BATCH COUNTER
BATCH COUNT 0
(+)
10-00903

If during the production of a workpiece, one piece of hardware is **not** inserted but the machine exerts the insertion force and reverses, the number of fasteners remaining to be inserted will still count down "1." To correct the number of fasteners remaining to be inserted, increase the number by "1," by depressing the Increase Count button one time. This will also increase the total number of pieces of hardware in the workpiece by "1." When this workpiece is completed and the beeper sounds, reset the total number of pieces of hardware in the workpiece to the correct number.

If a defect is noticed in the workpiece when only a few of the pieces of hardware have been inserted and the workpiece is taken out of the production run, the hardware remaining to be inserted number can be reset to the total number by depressing the *Reset Button*. The *Batch Counter* will not "count" this rejected workpiece.

Batch Counter

The *Batch Counter* counts the number of completed workpieces by counting up "1" each time the *Down Counter* is reset to the number of pieces of hardware to be inserted into the workpiece and the *Beeper* sounds.

At the start of each production run, this counter must be reset to zero by pressing the single *Reset Button* on the counter.

Stroke Counter

The *Stroke Counter* counts up "1" each time the insertion force is exerted and the *Upper Tool* reverses and returns to its set *Up Travel* position. It may be used to count the total number of pieces of hardware inserted in a production run and during a work shift.

This counter may be reset to zero at any time by pressing the single *Reset Button* on the counter.

Batch Counter Beeper

The *Batch Counter Beeper* sounds each time the *Down Counter* counts down to zero to signal the operator that all the pieces of hardware have been inserted into the workpiece.

Positive Stop System

The optional Haeger 618 Positive Stop System provides an easily adjustable method of precisely maintaining the stopping point of the machine cylinder. The system is particularly well suited for improving uniformity on soft delicate workpieces. It is also effective when inserting small hardware.

In addition to aluminum, the system also provides excellent insertion results on a wide variety of softer materials such as fiberglass printed circuit boards and many plastic or composite materials.

When using this system, the machine is setup to exert a Force/Pressure which is about 20% above the normal insertion force specified by the manufacturer of the hardware. The accurate stopping point of the machine's stroke is controlled by a precision machined nut, in the Nut Tube (see Figure 5.9), and screwed on to a threaded rod extending up from the top of the machine's cylinder. When the nut contacts the Stop Tube, the machine exerts the insertion Force/Pressure on the Nut Tube, not the hardware or workpiece. The machine then reverses and returns to the set Up Travel position in the same manner as any other stroke.

Note:

For all instructions to turn the Tube Assembly, determine the direction when looking up from the operator's station.

Positive Stop System

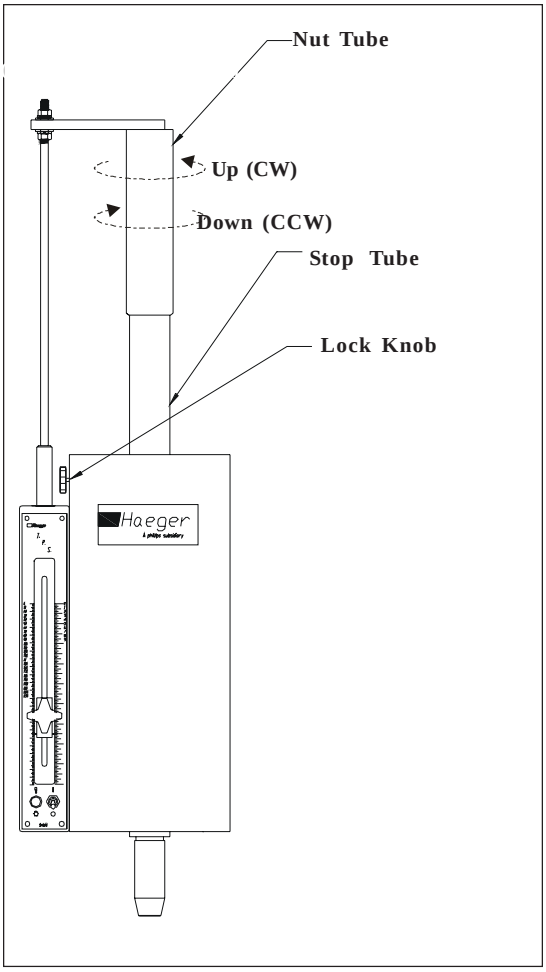


Figure 5.9: The Positive Stop System helps stop the machine cylinder at the same place every time.

Warning!

During the Setup Procedure, the machine's Pressure Gauge/Force Indicator on the Control Panel must be set to a force 500 pounds (2200 N) higher than the force the manufacturer recommends to insert the hardware. .

The Nut Tube is pinned to the Stop Tube so the stopping point can by adjusted by rotating the *Tube Assembly*, that is, either the Nut Tube or the Stop Tube. Turning the Tube Assembly counterclockwise (left), **when looking up** from the operator's station (moving the Nut Tube down), will shorten the machine's stroke. Turning the Tube Assembly clockwise (right), **when looking up** from the operator's station (moving the Nut Tube up), will lengthen the machine's stroke (see Figure 5.9).

The pitch of the thread on the threaded shaft extending up from the top of the cylinder is 14 threads per inch/25.4 mm. One complete revolution of the Tube Assembly counterclockwise (again, looking up from the operator's station,) will shorten the machine's stroke by .07 in./1.8 mm.

Turning the Tube Assembly clockwise (right) will lengthen the machine's stroke by the same amount, .07 in./1.8 mm.

The Lock Knob on the left side of the front cover is used to lock the Tube Assembly in position once they have been properly set.

Turning the Lock Knob clockwise will lock the Tube Assembly. Turning the Lock Knob counterclockwise will unlock the Tube Assembly.

Using the Positive Stop System, the stroke of the 618 Hardware Insertion machine can be adjusted from .375 in./10 mm to 8.5 in./216 mm. With this range, the Positive Stop System can be used with all Haeger tooling setups, including the J-Frame.

The 618 Hardware Insertion Machine can be operated in a conventional manner by adjusting the Nut Tube to its highest possibly position so that the nut never contacts the Stop Tube.

Warning!

Never operate this machine while wearing any metal objects such as a watch, bracelets, or rings.

Positive Stop System Setup Procedure

Note:

This setup procedure assumes that you are thoroughly familiar with this machine's Operating Controls, Safety System Testing Procedure, Conductive Mode Setup Procedure and the Non-Conductive Mode Setup Procedure. If you are not familiar with these sections of this manual, **STOP**! Return to these sections and become familiar with all of them **before** continuing.

This Setup Procedure can be used for production runs in both Conductive and Non-Conductive Modes of operation.

Getting Started

1. Turn the Lock Knob, located on the left side of the front cover, counterclockwise until the Tube Assembly are free to rotate.
2. Turn the Tube Assembly clockwise (right), when looking up from the operator's station. This will move the Nut Tube up. Move it to a position so that the Upper and Lower Tools will make contact when the Down Footswitch is depressed.
3. Follow the **Setup Procedure for the Non-Conductive Mode** on Page 4.12 in the Operating section of the manual. This includes having your supervisor use their key to select the Non-Conductive Mode of operation. You must also select and install the proper tooling, set the required insertion Force/Pressure, and set an adequate Up Travel position.

Note:

During the Setup Procedure, the machine's Pressure Gauge/Force Indicator on the Control Panel must be set to a force 500 pounds (2200 N) higher than the force the manufacturer recommends to insert the hardware.

4. Set the Conductive/Non-Conductive Switch to the Non-Conductive position.
5. Set the Run/Setup Switch to the Setup position.
6. Raise the Upper Tool to a position where the hardware and workpiece can be easily placed in the machine by depressing the Up Footswitch.

Adjusting for the Hardware and Workpiece

1. Place the hardware that will be inserted in the workpiece into the tooling.
2. Place the workpiece in the proper position to insert the hardware.
3. Keep your hands away from the tooling area. Depress the Down Footswitch. The Upper Tool will move down, contact the workpiece and stop.
4. Turn the Tube Assembly counterclockwise (left). This will move the Nut Tube down. Turn the Tube Assembly until it can't be turned any further. **Do not use any type of tools! Hand tighten only!**
5. Raise the Upper Tool to a position where the hardware and workpiece can be easily removed or placed on the Lower Tool by depressing the Up Footswitch.
6. Remove the workpiece and, if necessary, the hardware from the machine.
7. Turn the Tube Assembly clockwise (right) approximately two revolutions. This will move the Nut Tube up to lengthen the stroke.

Warning!

Never operate this machine while wearing any metal objects such as a watch, bracelets, or rings.

Checking the Settings

1. Replace the hardware to be inserted into the tooling.
2. Replace the workpiece in the proper position to insert the hardware.

3. Keep your hands away from the tooling area. Depress the Down Footswitch. The Upper Tool will move down, contact the workpiece and stop.
4. Keep your hands away from the tooling area. Depress the Down Footswitch a second time and the machine will insert the hardware.
5. Raise the Upper Tool to a position where the hardware and workpiece can be easily removed from the Lower Tool by depressing the Up Footswitch.
6. Examine the hardware to ensure it has been inserted properly.

   If the hardware has not been completely inserted, lengthen the stroke of the machine by turning the Tube Assembly clockwise (right). This will lengthen the stroke of the machine by moving the Nut Tube up.

   One eighth of a revolution of the Nut Tube clockwise (right) will lengthen the stroke by about .01 in./.25 mm.

   One quarter of a revolution of the Nut Tube clockwise (right) will lengthen the stroke by about .02 in./.5 mm.

   If the hardware has been overinserted (inserted too far or damaged), shorten the stroke of the machine by turning the Tube Assembly counterclockwise (left).This will shorten the stroke of the machine by moving the Nut Tube down.

   One eighth of a revolution of the Nut Tube counterclockwise (left) will shorten the stroke by about .01 in./.25 mm.

   One quarter of a revolution of the Nut Tube counterclockwise (left) will shorten the stroke by about 02 in./.5 mm.
7. Repeat these adjustments and check the settings by repeating Steps 1-6 until the hardware has been properly inserted.

Warning!

NEVER press the Down Footswitch a second time in Non-Conductive Mode when your hands are in the tooling area.

8. Lock the Tube Assembly in position by turning the Lock Knob clockwise until it is tight.

   Do not use any tools on the Lock Knob.

9. To start production, set the Run/Setup Switch to the Run position.
10. If you are not going to use the Non-Conductive Mode in this production run, have your supervisor use their key to select the Conductive Mode of operation.

Warning!

NEVER press the Down Footswitch a second time in Non-Conductive Mode when your hands are in the tooling area.

Digital Readout Option Setup Procedure (Inches)

Note:

This setup procedure assumes that you are thoroughly familiar with this machine's Operating Controls, Safety System Testing Procedure, Conductive Mode Setup Procedure and the Non-Conductive Mode Setup Procedure. If you are not familiar with these sections of this manual, **STOP**! Return to these sections and become familiar with all of them **before** continuing.

This Setup Procedure can be used for production runs in both Conductive and Non-Conductive Modes of operation.

Getting Started

1. Turn the Lock Knob counterclockwise until the Tube Assembly is free to rotate. The Lock Knob is located on the left side of the front cover.

Note:

For all instructions to turn the Tube Assembly, determine the direction when looking up from the operator's station.

2. Turn the Handwheel on the Digital Readout clockwise. This will move the Nut Tube up. Move it to a position where it will be possible for the Upper and Lower Tools to contact each other when the Down Footswitch is depressed.

Note:

The Inch Digital Readout has a five digit display with the decimal point three digits from the right, permitting the readout to be changed as little as one one thousandth of an inch (0.001 in.).

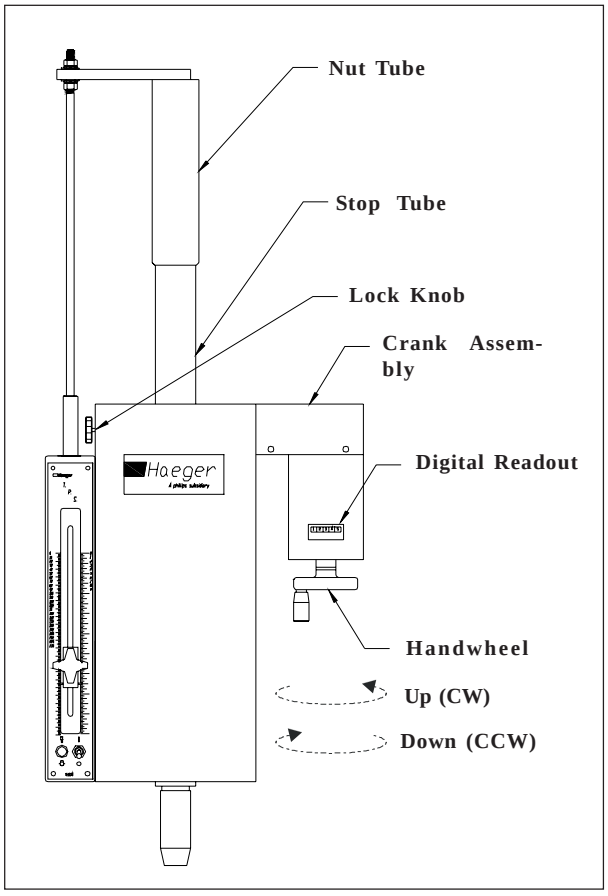


Figure 5.9: The Digital Readout Option for the Positive Stop System makes setup of the Positive Stop System easier.

3. Follow the Setup Procedure for the Non-Conductive Mode in this section of the manual (see page 5.12). This includes having your supervisor use their key to select the Non-Conductive Mode of operation. You must also select and install the proper tooling, set the required insertion Force/ Pressure, and set an adequate Up Travel position.

Note:

During the Setup Procedure, the machine's Pressure Gauge/Force Indicator on the Control Panel must be set to a force 500 pounds (2200 N) higher than the force the manufacturer recommends to insert the hardware.

4. Set the Conductive/Non-Conductive Switch to the Non-Conductive position.
5. Set the Run/Setup Switch to the Setup position.
6. Raise the Upper Tool to a position where the hardware and workpiece can be easily placed in the machine by depressing the Up Footswitch.

Adjusting for the Hardware and Workpiece

1. Place the hardware that will be inserted in the workpiece into the tooling.
2. Place the workpiece in the proper position to insert the hardware.
3. Keep your hands away from the tooling area. Depress the Down Footswitch. The Upper Tool will move down, contact the workpiece and stop.
4. Turn the Handwheel on the Digital Readout counterclockwise (when looking up at it), until it can't be turned any further. This will move the Nut Tube down. **Do not force the Handwheel!**

5. Raise the Upper Tool to a position where the hardware and workpiece can be easily removed or placed on the Lower Tool by depressing the Up Footswitch.
6. Remove the workpiece and if necessary, the hardware from the machine.
7. Turn the Handwheel on the Digital Readout clockwise to lengthen the stroke about 0.1 inches (100 on the Digital Readout). This will move the Nut Tube up.

Checking the Settings

1. Replace the hardware to be inserted into the tooling.
2. Replace the workpiece in the proper position to insert the hardware.
3. Keep your hands away from the tooling area. Depress the Down Footswitch. The Upper Tool will move down, contact the workpiece and stop.
4. Keep your hands away from the tooling area. Depress the Down Footswitch a **second** time. The machine will insert the hardware.
5. Raise the Upper Tool to a position where the hardware and workpiece can be easily removed from the Lower Tool by depressing the Up Footswitch.
6. Examine the hardware to ensure it has been inserted properly.

   If the hardware has not been completely inserted, lengthen the stroke of the machine by turning the Handwheel on the Digital Readout clockwise, (moving the Nut Tube up) to lengthen the stroke of the machine.

   Decrease the distance by .005 inches (5 units on the Digital Readout). A small change on the Digital Readout may make a significant difference in the quality of the hardware insertion.

Warning!

NEVER press the Down Footswitch a second time in Non-Conductive Mode when your hands are in the tooling area.

If the hardware has been overinserted (inserted too far or damaged), shorten the stroke of the machine by turning the Handwheel on the Digital Readout counterclockwise, (moving the Nut Tube down) to shorten the stroke of the machine.

Increase the distance by .005 inches (5 units on the Digital Readout). A small change on the Digital Readout may make a significant difference in the quality of the hardware insertion.

7. Repeat these adjustments and check the settings by repeating Steps 1-6 until the hardware has been properly inserted.
8. Lock the Tube Assembly in position by turning the Lock Knob clockwise until it is tight.

   Do not use any tools on the Lock Knob.
9. To start production, set the Run/Setup Switch to the Run position.
10. If you are not going to use the Non-Conductive Mode in this production run, have your supervisor use their key to select the Conductive Mode of operation.

Digital Readout Option Setup Procedure (Metric)

Note:

This setup procedure assumes that you are thoroughly familiar with this machine's Operating Controls, Safety System Testing Procedure, Conductive Mode Setup Procedure and the Non-Conductive Mode Setup Procedure. If you are not familiar with these sections of this manual, **STOP**! Return to these sections and become familiar with all of them **before** continuing.

This Setup Procedure can be used for production runs in both Conductive and Non-Conductive Modes of operation.

Getting Started

1. Turn the Lock Knob, located on the left side of the front cover, counterclockwise until the Tube Assembly is free to rotate.

Note:

For all instructions to turn the Tube Assembly, determine the direction when looking up from the operator's station.

2. Turn the Handwheel on the Digital Readout clockwise. This will move the Nut Tube up. Move it to a position where it will be possible for the Upper and Lower Tools to contact each other when the Down Footswitch is depressed.

Note:

The Metric Digital Readout has a five digit display with the decimal point two digits from the right, permitting the readout to be changed as little as one one hundredth of a millimeter (0.01 mm).

3. Follow the Setup Procedure for the Non-Conductive Mode in this section of the manual. This includes having your supervisor use their key to select the Non-Conductive Mode of operation. You must also select and install the proper tooling, set the required insertion Force/Pressure, and set an adequate Up Travel position.

Note:

During the Setup Procedure, the machine's Pressure Gauge/Force Indicator on the Control Panel must be set to a force 2200 N (500 pounds) higher than the force the manufacturer recommends to insert the hardware.

4. Set the Conductive/Non-Conductive Switch to the Non-Conductive position.
5. Set the Run/Setup Switch to the Setup position.
6. Raise the Upper Tool to a position where the hardware and workpiece can be easily placed in the machine by depressing the Up Footswitch.

Adjusting for the Hardware and Workpiece

1. Place the hardware to be inserted into the tooling.
2. Place the workpiece in the proper position to insert the hardware.
3. Keep your hands away from the tooling area. Depress the Down Footswitch. The Upper Tool will move down, contact the workpiece and stop.
4. Turn the Handwheel on the Digital Readout counterclockwise (when looking up at it), until it can't be turned any further. This will move the Nut Tube down. **Do not force the Handwheel!**
5. Raise the Upper Tool to a position where the hardware and workpiece can be easily removed or placed on the Lower Tool by depressing the Up Footswitch.

Warning!

NEVER press the Down Footswitch a second time in Non-Conductive Mode when your hands are in the tooling area.

6. Remove the workpiece and if necessary, the hardware from the machine.
7. Turn the Handwheel on the Digital Readout clockwise to lengthen the stroke about 3.8 millimeters. This will move the Nut Tube up.

Checking the Settings

1. Replace the hardware to be inserted into the tooling.
2. Replace the workpiece in the proper position to insert the hardware.
3. Keep your hands away from the tooling area. Depress the Down Footswitch. The Upper Tool will move down, contact the workpiece and stop.
4. Keep your hands away from the tooling area. Depress the Down Footswitch a **second** time. The machine will insert the hardware.
5. Raise the Upper Tool to a position where the hardware and workpiece can be easily removed from the Lower Tool by depressing the Up Footswitch.
6. Examine the hardware to ensure it has been inserted properly.

   If the hardware has not been completely inserted, lengthen the stroke of the machine by turning the Handwheel on the Digital Readout clockwise, (moving the Nut Tube up) to lengthen the stroke of the machine.

   Decrease the distance by .1 mm (10 units on the Digital Readout). A small change on the Digital Readout may make a significant difference in the quality of the hardware insertion.

   If the hardware has been overinserted (inserted too far or damaged), shorten the stroke of the machine by turning the Handwheel on the Digital Readout counterclockwise, (moving the Nut Tube down) to shorten the stroke of the machine.

   Increase the distance by .1 mm (10 units on the Digital Readout). A small change on the Digital Readout may make a significant difference in the quality of the hardware insertion.
7. Repeat these adjustments and check the settings by repeating Steps 1-6 until the hardware has been properly inserted.
8. Lock the Tube Assembly in position by turning the Lock Knob clockwise until it is tight.

   Do not use any tools on the Lock Knob.
9. To start production, set the Run/Setup Switch to the Run position.
10. If you are not going to use the Non-Conductive Mode in this production run, have your supervisor use their key to select the Conductive Mode of operation.

Maintenance Schedule

This maintenance schedule is applicable for standard machine shop operating conditions. When operating under severe conditions such as heavy dust and dirt, increase the schedule to reflect such conditions.

Warning!

DO NOT lubricate the Upper Tool Holder with any lubricant other than a small amount of lithium grease (white).** Other products may interfere with the Safety System.

Component	*Area*	*Maintenance*	*Schedule*
Safety System	Upper Ram	Perform safety system check procedures using "Testing the Safety System"	Daily
Upper Tool Holder (See **warning** above)	Upper Ram	Small amount of lithium grease (white)** between upper tool holder & cylinder rod	Once a month
Hydraulic System Filter	Lower Hardware Insertion Machine Motor Compartment	Remove and replace cartridge Haeger Part No. 15-00888	Once a year
Hydraulic Fluid	Lower Hardware Insertion Machine Motor Compartment	Change fluid. Use Mobil AW-32 or equivalent.* (See Capacity Chart below.)	Once every 2 years

Hydraulic Fluid Capacity Chart

Machine	Gallons	Liters
618 Plus	10	38

* Equivalent hydraulic oils may be used. It is the machine owner's responsibility to determine which hydraulic oils in their area are equivalent to Mobil AW-32.

** Each Haeger machine is shipped with a tube of Lubriplate 630-AA, produced by Fiske Brothers Refining Company. In Europe, Fiske Brothers is represented by Total Deutschland GmbH.

Problem	*Source*	*Solution*
Machine will not turn on.	1. Off Switch. 2. Disconnect Switch off. 3. No power to machine 4. Blown fuse. 5. Overload relay tripped. 6. Circuit breaker tripped.	1. Rotate Off Switch clockwise. 2. Turn Disconnect Switch "On." 3. Check for correct power supply. 4. Repair fault and replace fuse. 5. Reset overload relay. 6. Repair fault and reset.
When machine is turned on the F2 and or F3 fuse blows.	1. The light bulb in the start switch is shorted. 2. A diode or coil in one of the safety switch R6, R9, R10, or R11 shorted. 3. The timer relay is shorted. 4. FW1 24v bridge rectifier shorted. 5. Capacitor C1 is shorted. 6. The coil in the magnetic starter shorted.	1. Replace light bulb. 2. Locate and replace relay with a 24v DC relay with a diode. 3. Replace the 24v DC timer relay. 4. Replace. 5. Replace. 6. Replace.
When the machine is turned on the F1 and or F4 6v 2 amp fuse blows.	1. The FW2 bridge shorted. 2. The diode in R7 shorted. 3. The capacitor C2 shorted.	1. Replace. 2. Replace the relay with a 6v DC relay with a diode. 3. Replace
When the foot pedal is pressed to move the ram down the machine blows F2 and or F3 fuse.	1. The diode in R8 shorted. 2. The down solenoid valve is shorted.	1. Replace the relay with a 24v DC relay with a diode. 2. Replace the solenoid valve.
Machine starts but ram will not come down.	1. Pump direction of rotation is reversed. 2. Upper tool holder is sticking 3. Relays R6, R9, R10 & R11 are not energized when machine is turned on.	1. Check arrow on side of motorto verify correct rotation. Reverse L1 and L2 leads to change rotation if needed. 2. Remove and clean upper tool holder, lube with white grease. 3. Remove upper tool holder and insure safety switch is closed. Insure R6, R9, R10 & R11 are 24 volt DC.

Problem	*Source*	*Solution*
When in the Conductive mode the ram will not move down.	1. Relay R7 is energized when machine is turned on.	1. Cylinder is shorted to the frame. Check and repair as needed. Ensure R7 is 6v DC
When in the Conductive mode and Run mode the machine will not squeeze when the tool comes into contact with the material.	1. Lower tooling is not tight on the frame. 2. Upper tool holder is not making contact with the cylinder shaft. 3. Tooling is not clean. 4. Nonconductive material. 5. Dirty material.	1. Check tooling and tighten if necessary. 2. Remove and clean. Replace continuity springs and guide pins. 3. Clean tooling with fine sandpaper. 4. Use the correct mode for Non-conductive material. 5. Clean material.
When in the Conductive mode and Run mode, the machine will not squeeze when the tools come into contact with the material and autofeeder will send a fastener to the tooling.	1. The contacts in the pressure switch are closed.	1. The contacts may be able to be adjusted. If not, replace the pressure switch
When in the Conductive mode and Run mode the machine will build pressure but will not cycle up when pressure is reached.	1. The contacts in the pressure switch are not closing. 2. The Run/Setup switch is in the set up mode. 3. The contacts on the Run/ Setup switch are stuck.	1. The contacts may be adjusted. If not, then replace the switch. 2. Switch to the Run mode. 3. Replace the contact block on the switch.
In Conductive mode and Run mode the machine cycles and when the tools separate, the operator feels a slight tingle.	1. The diode in the 6v DC relay number R7 has opened up.	1. Replace R7 with a 6v DC relay including a diode.
In Conductive mode the machine blows the F1 and or F4 2amp fuses when the tools make contact.	1. The diode in R7 is shorted.	1. Replace R7 with a 6v DC relay including a diode.
In NON-Conductive mode the machine cycles as the same in Conductive mode. Pressure is built.	1. Relays R1 or R3 or R8 or R11 are not working correctly. 2. Run/ Setup switch not working correctly.	1. Replace each relay one by one to find which relay is damaged. 2. Check contactor bolck on back of switch for damage or sticking contacts.

Description

This Relay Table may be an important tool in troubleshooting your Haeger Hardware Insertion Machine.

A total of fourteen of the relays used on the printed circuit board in the Main Electrical Cabinet have lights on them. These lights are only illuminated when the relay's coil is energized. When the coil is energized, all of the normally "closed" contacts in the relay are "open." At the same time, all of the normally "open" contacts in the relay are "closed."

In this Relay Table, only the normal operating conditions are shown. The normal operating conditions are defined as when everything is operating correctly, there are no problems. For example, when the Hardware Insertion Machine has been turned "On," the Conductive/Non-Conductive Mode Selector Switch is in the Conductive position and the Run/Setup Selector Switch is in the Run position, the relay lights in the Idle row of the chart (first row) with "On" in the block, will be illuminated. If they are not illuminated, there is some type of problem. For instance, the coil in the relay may be defective (burned out) or possibly, the electrical power is not getting to the relay's coil.

When the Down Footswitch is depressed, all the lights in the Down row of the chart (second row) with "On" in the block, will be illuminated. If they are not, or if other lights without the "On" in their block are illuminated, start looking for the cause since this would not be a normal operating condition.

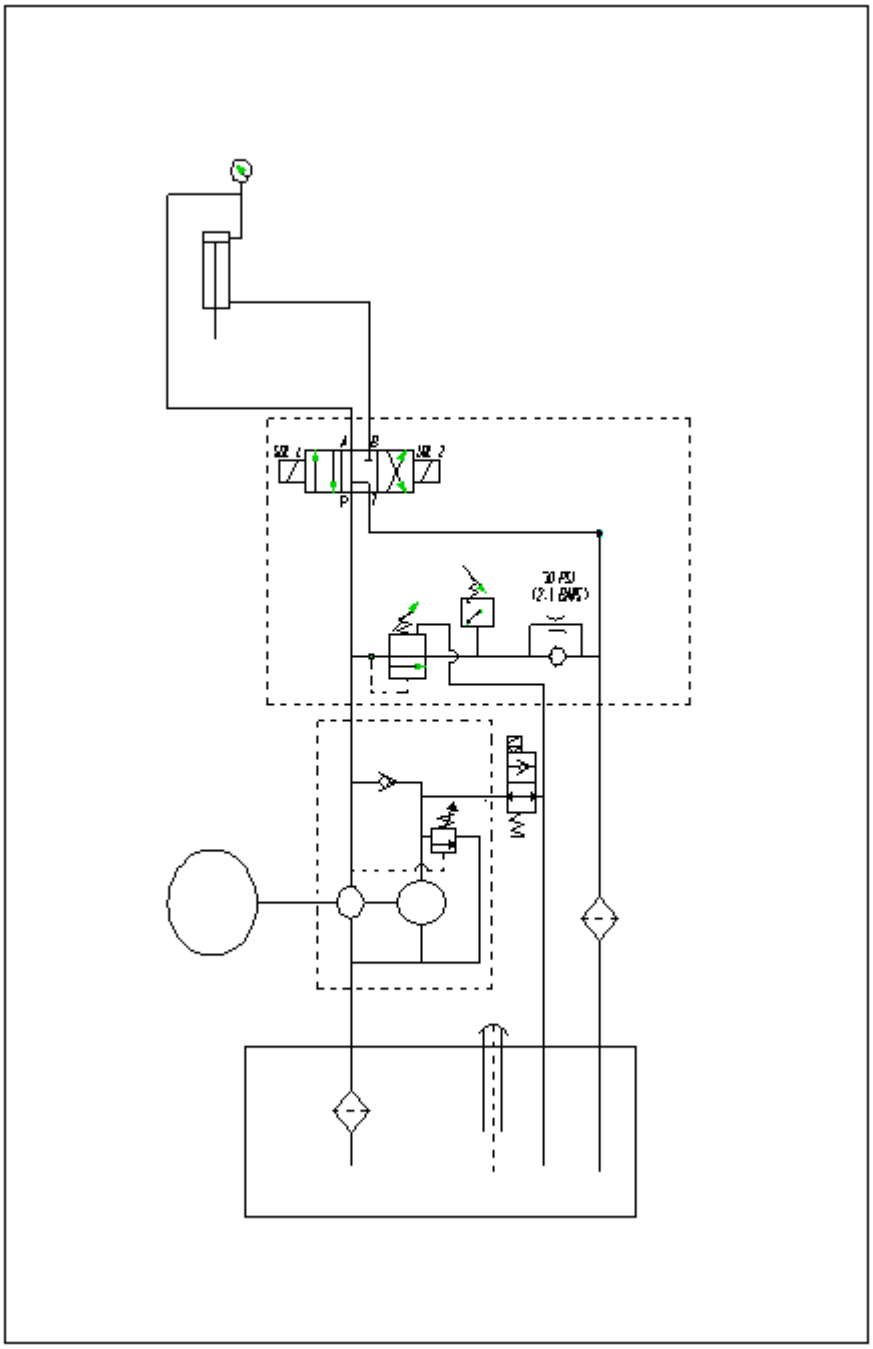
The same situations exist in the Tool Contact, Up and Idle Rows.

The lower half of the chart is similar but is for the Non-Conductive Mode.

The blocks where the "On" has an "F" subscript indicate that the light in this relay will only flash "On" momentarily and then quickly turn "Off".

Run Mode Conductive Mode Normal Operation	Single Stroke Relay #1	Tooling Protection Relay #2	Non-Conductive Mode Relay #3	Safety Monitor Relay #4	Pressure Sensing Relay #5	Safety Relay Relay #6	Tooling Contact Relay #7	Down Relay #8	Safety Monitor Relay #9	Safety Relay #10	Safety Monitor Relay #11	Vacuum Relay #12	Latch Relay #13	Pressure Relay #14
Idle		On				On			On	On	On			
Down		On		On		On		On	On	On	On		On	
Tool Contact		On		On			On						On_F	On_F
Up		On			On_F	On			On	On	On			
Idle		On				On			On	On	On			
Run Mode Non-Conductive Mode Normal Operation														
Idle		On				On			On	On	On			
Down		On		On		On		On	On	On	On		On	
Tool Contact Stop	On	On		On										
Release Footswitch		On	On	On										
Press Second Time	On	On	On	On	On_F	On		On	On	On	On		On	On
Starts Up		On				On		On	On	On	On			
Tool Contact Breaks	On	On	On	On		On		On	On	On	On			
Release		On				On		On	On	On	On			
Idle		On				On			On	On	On			

F= Momentary Flash



Problems?

- Have you worked your way through the Troubleshooting Section in this manual?
- Have you worked through the indepth Troubleshooting guide on the web site?

http://haeger.com/support/frameIndex.html

- You still haven't resolved the problem?

Call your Haeger Distributor!

Their telephone number is on the Basic Data Sheet in the Introduction Section of this manual.

or you can find them on our web site at

http://haeger.com/dist_locator/

To save time, please be prepared to give your area Haeger Distributor the following information:

1. Your **name.**
2. Your **company's name, location and telephone number.**
3. The **Model Number** of your Haeger machine.
4. The **Serial Number** of your Haeger machine.
5. A **very detailed description of the problem.**
6. What **steps you have already taken** to resolve your problem.
7. **How the machine responded** to each of the steps.

Notes

Instructions

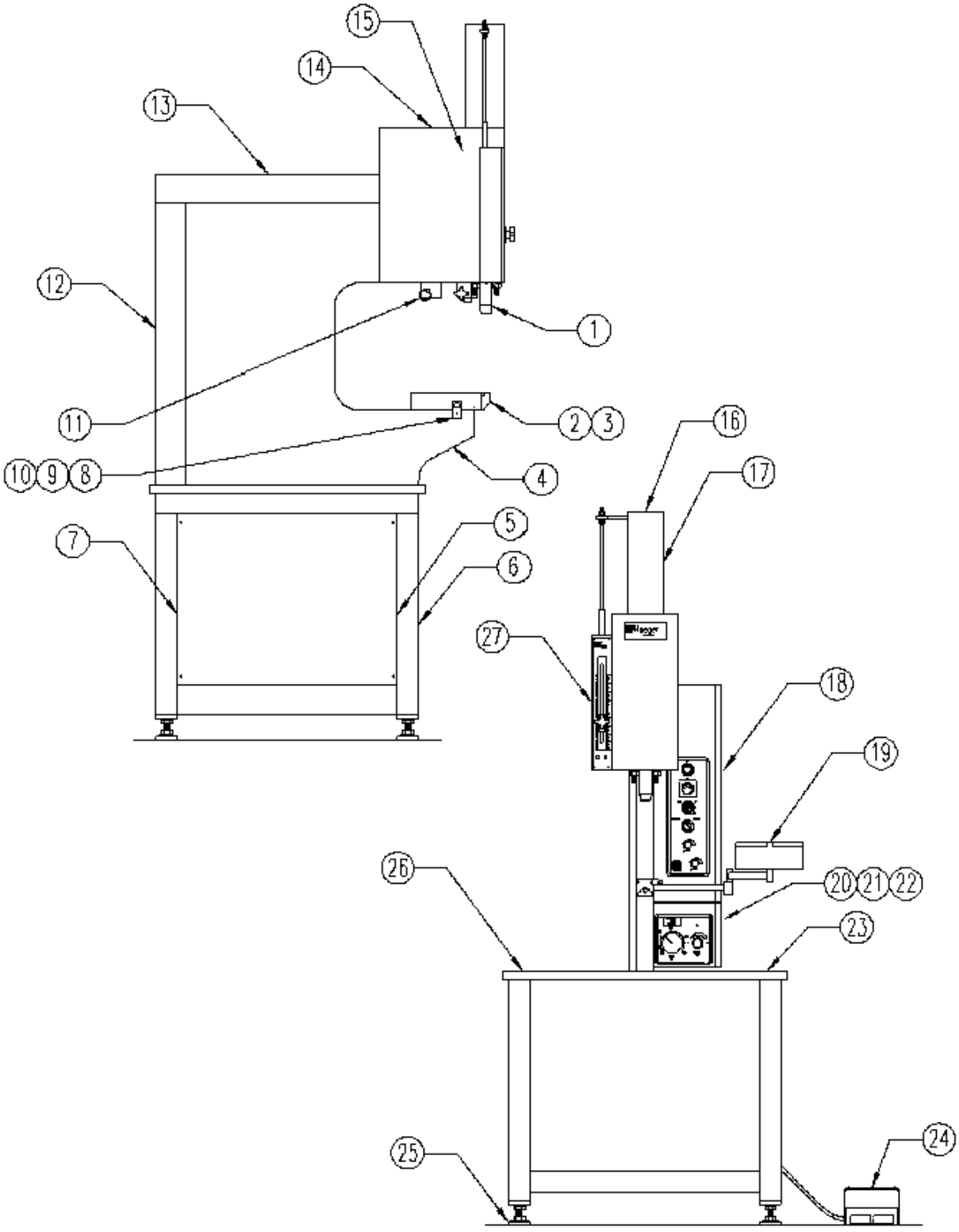
The *Parts* in this section of the manual are listed by *Item Number, Part Number, Description and Quantity*.

The *Item Numbers* are in a circle with an arrow pointing to the specific *Part*. These numbers are arranged sequentially in a clockwise direction. The number 1 is always in about the “1 o’clock” position. If there is more than one view in the Figure, the numbers will **start** at the “1 o’clock” position on the **right hand** or **top** view. When all the parts have been identified in the first view, the numbers will continue in the second view, again, starting at the “1 o’clock” position.

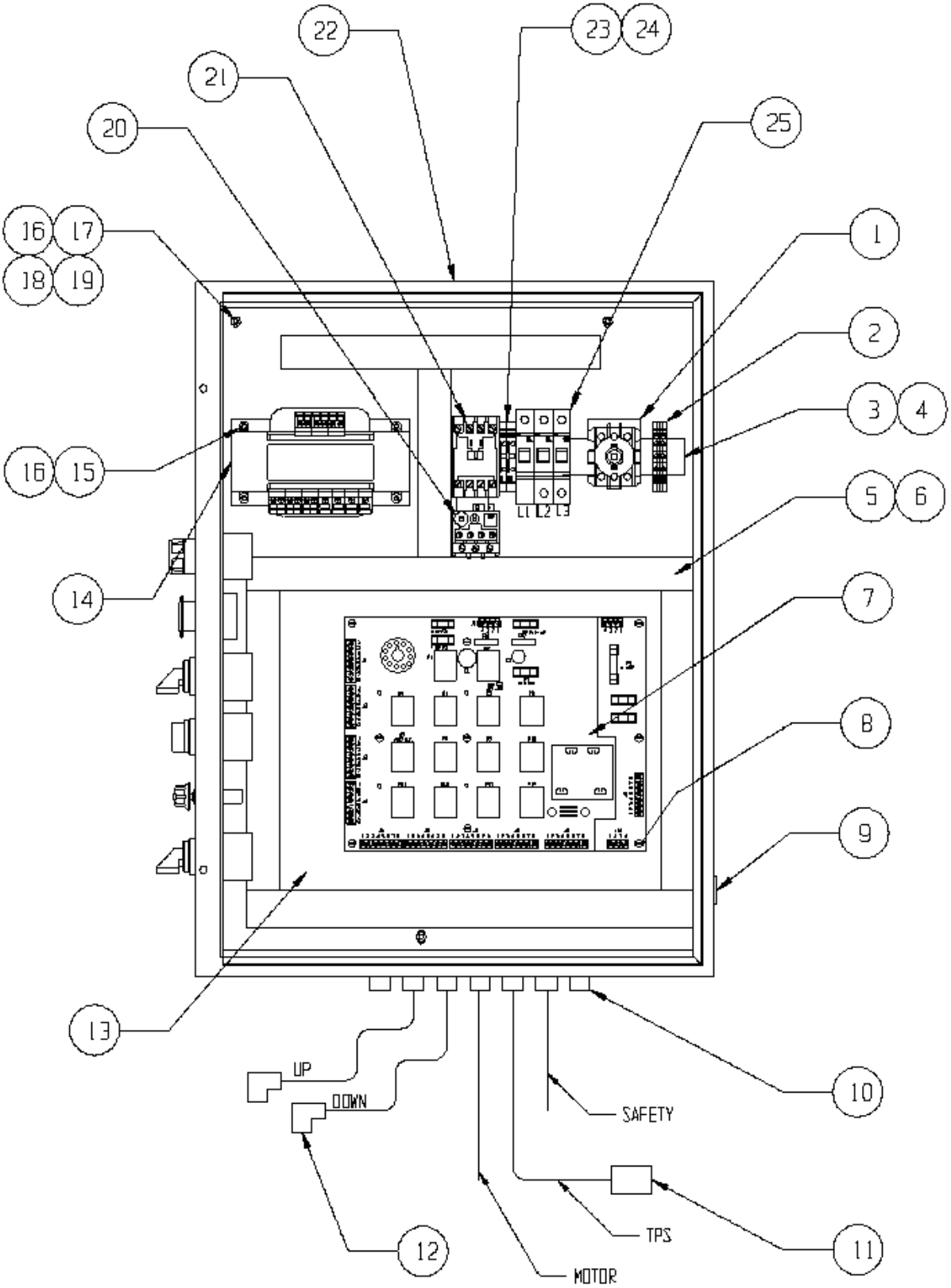
The *Part Number* is the most important number on the page. It identifies a specific item in Haeger’s inventory. To avoid delays when ordering parts, be very sure the *Part Number* and *Quantity* are stated correctly!

The *Description* is Haeger’s brief description of the part. For purchased parts, it may also include the manufacturer and their part number.

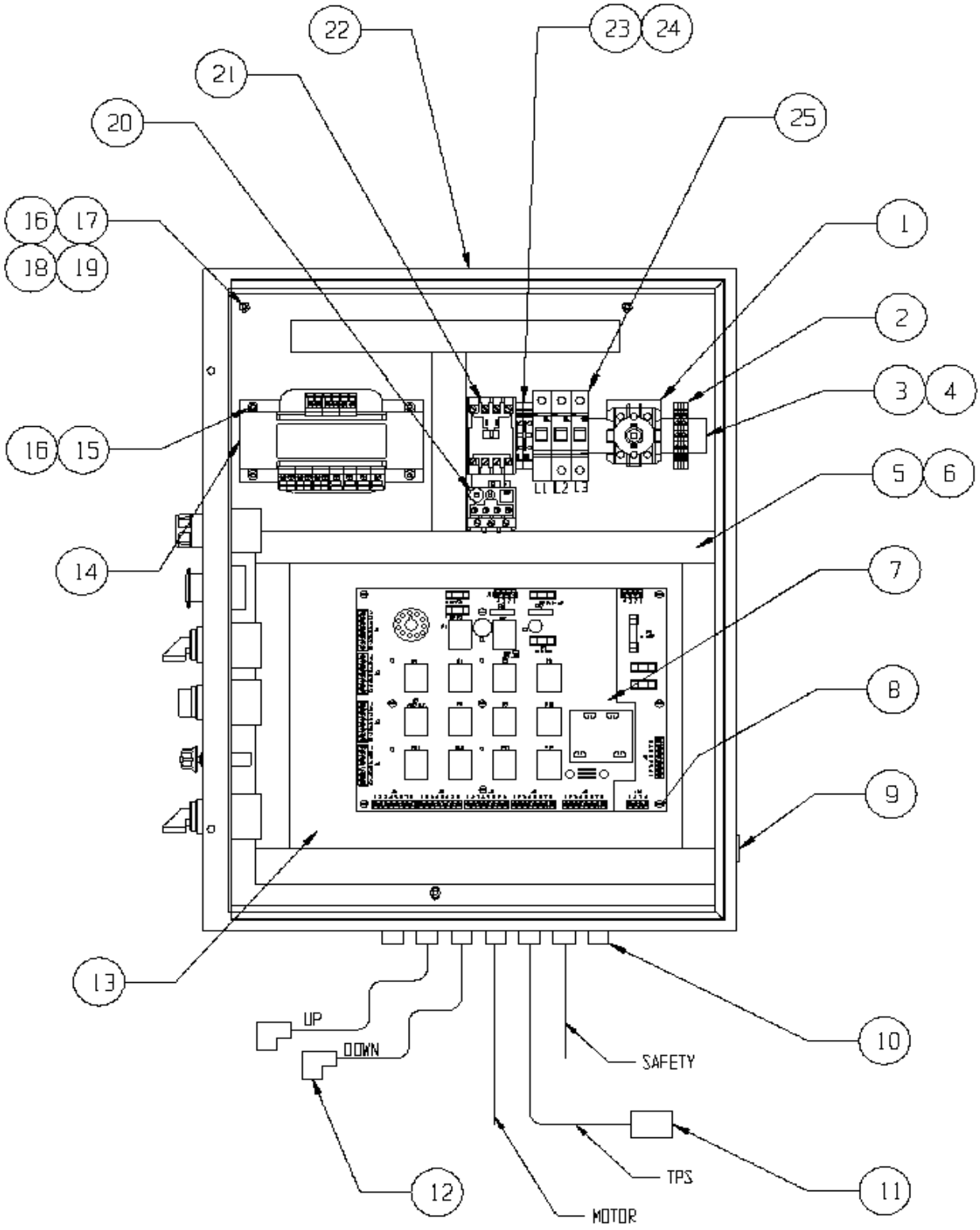
The *Quantity* represents the total quantity of the particular *Part* which is used in the complete assembly. When ordering *Parts*, it may not always be necessary to order the number of parts listed. Order only the quantity that is required to make the repairs.


15
14
13
12
1
11
2
3
16
17
10
9
8
4
5
7
6
27
18
19
26
20
21
22
23
25
24

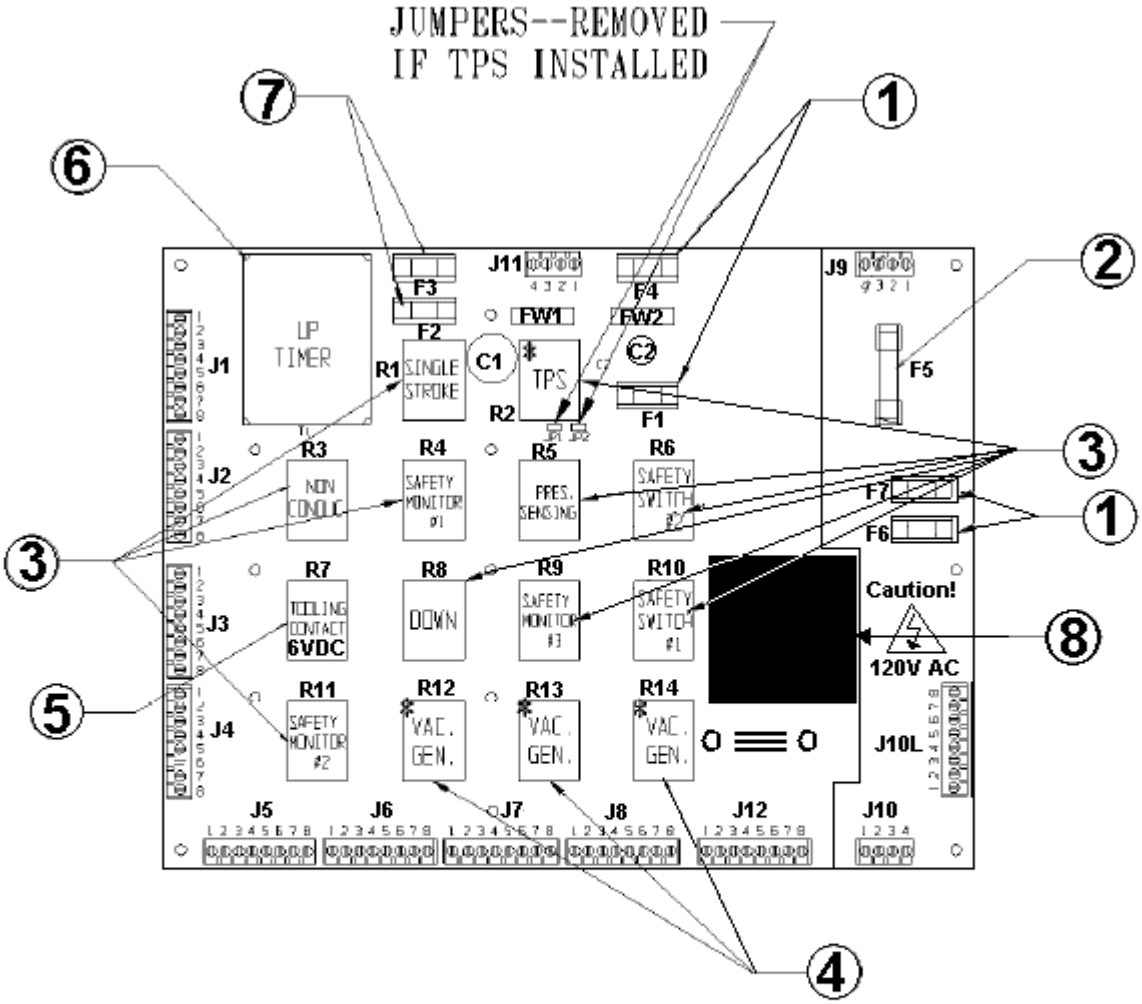
Item	Part No.	*Description*	Qty.
1	H-3501-4	*Upper Tool Holder*	1
2	H-166-7	*Lower Tool Holder*	1
3	11-00190	*M16 X 2.0*	1
4	10-00125	*Main Frame*	1
5	10-00124	*Left & Right Side Covers*	2
6	10-00113	*Base Frame Weldment*	1
7	10-00133	*Reservoir Assembly*	1
8	11-00582	*Lower Tool Bracket*	2
9	11-00319	*M6 x 20 shcs*	2
10	H-3882	*M6 X 1.0 BHCS*	2
11	10-00172	*J-Frame Assembly*	1
12	10-00032	*Back Cover*	1
13	10-00030	*Top Cover*	1
14	10-00034	*Cylinder Cover Cap Weldment*	1
15	10-00043	*Cylinder Cover*	1
16	10-00041	*Anti-Rotation Top Cover*	1
17	10-00040	*Anti-Rotation Cover*	1
18	10-00757	*Elecrical Cabinet, Low Voltage*	1
19	10-00152	*Service Tray Arm Weldment*	1
20	10-00036	*Hydraulic Cabinet*	1
21	10-00048	*Hydraulic Cabinet Door*	1
22	H-2011	*Pressure Gauge*	1
23	10-00025	*Table Top, Right*	1
24	H-1111	*Footswitch Assembly*	1
25	H-3940	*Leveling Feet*	4
26	10-00024	*Table Top, Left*	1
27	10-00190	*Tool Protection System Assembly*	1


22
23
24
21
20
25
16
17
18
19
1
2
3
4
16
15
5
6
14
7
8
9
13
UP
DOWN
SAFETY
10
TPS
12
11
MOTOR

Item	Part No.	*Description*	Qty.
1	11-00612	*Disconnect Switch*	1
2	11-00371	*Ground Terminal Block*	2
3	10-00771	*DIN Rail*	1
4	H-3552	*#10-32 X 3/8 BHCS*	2
5	10-00019	*Panduit Wiring Duct*	6
6	10-00127	*Panduit Nylon Rivets*	12
7	10-01237	*PC Board Assembly*	1
8	H-3534	*#6-32 X 3/8 BHCS*	8
9	H-1119	*4-Pin Female Receptacle*	1
10	10-00166	*Strain Relief*	7
11	H-1118	*4-Pin Male Plug*	1
12	11-00443	*Connector*	2
13	10-00026	*Electrical Panel*	1
14	10-00891	*High Voltage Transformer*	1
15	H-3911	*1/4-20 X 1/2 BHCS*	4
16	H-3765	*1/4 Lock Washer*	7
17	H-3596	*1/4 Flat Washer*	3
18	10-00434	*Spacer*	3
19	H-3595	*1/4-20 Hex Nut*	3
20	11-00325	*11 Amp Overload, Low Voltage*	1
21	10-00766	*Magnetic Starter*	1
22	10-00935	*Electrical Cabinet Weldment*	1
23	11-00368	*5 X 20 Fuse Block*	2
24	11-00375	*Fuse, 4A*	4
25	10-00668	*Circuit Breaker, Low Voltage*	1


22
23
24
21
20
25
16
17
18
19
1
2
3
4
16
15
5
6
14
7
8
9
13
UP
DOWN
10
SAFETY
TPS
11
12
MOTOR
L1 L2 L3

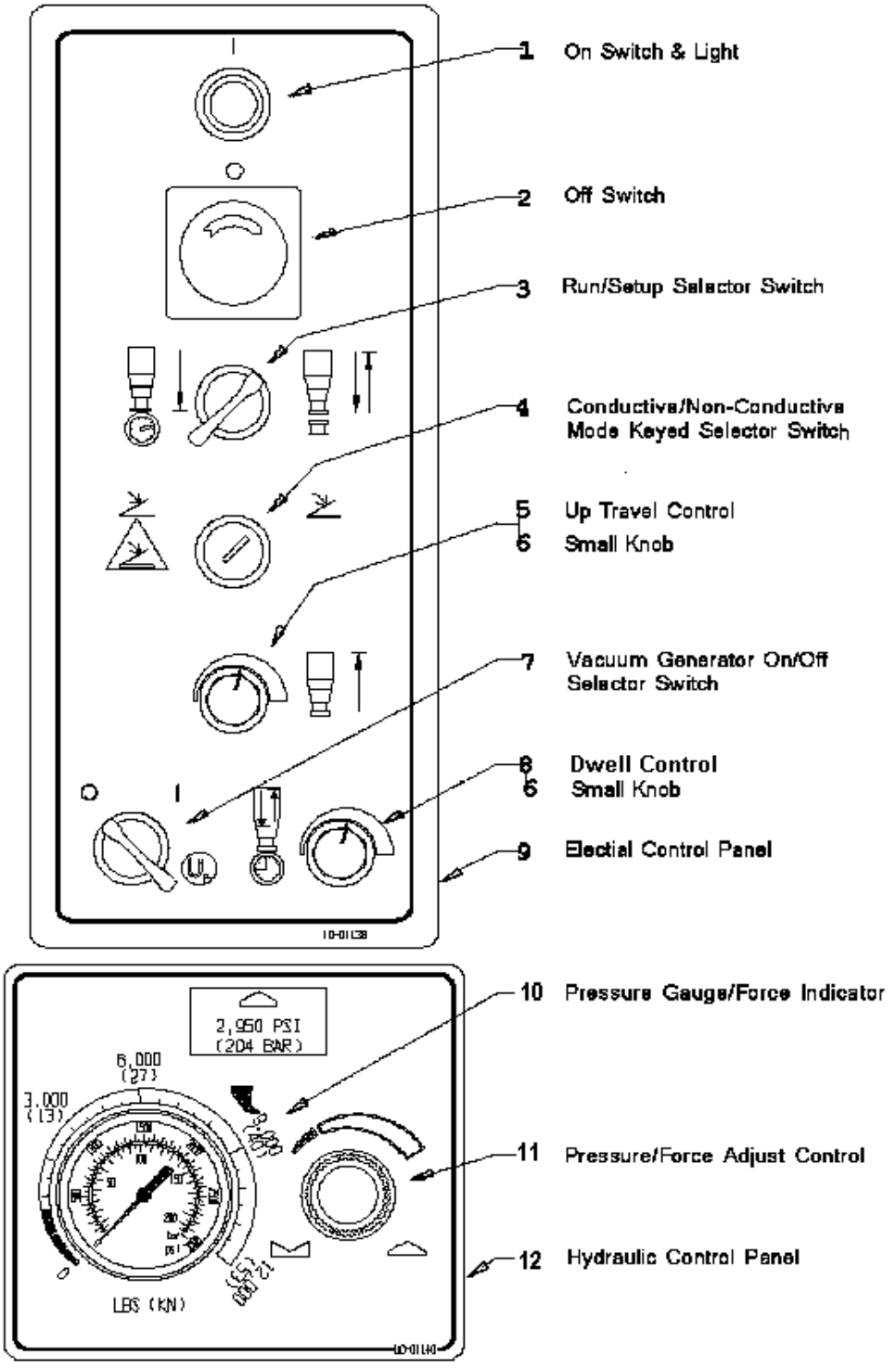
Item	Part No.	*Description*	Qty.
1	11-00612	*Disconnect Switch*	1
2	11-00371	*Ground Terminal Block*	2
3	10-00771	*DIN Rail*	1
4	H-3552	*#10-32 X 3/8 BHCS*	2
5	10-00019	*Panduit Wiring Duct*	6
6	10-00127	*Panduit Nylon Rivets*	12
7	10-01237	*PC Board Assembly*	1
8	H-3534	*#6-32 X 3/8 BHCS*	8
9	H-1119	*4-Pin Female Receptacle*	1
10	10-00166	*Strain Relief*	7
11	H-1118	*4-Pin Male Plug*	1
12	11-00443	*Connector*	2
13	10-00026	*Electrical Panel*	1
14	10-00891	*High Voltage Transformer*	1
15	H-3911	*1/4-20 X 1/2 BHCS*	4
16	H-3765	*1/4 Lock Washer*	7
17	H-3596	*1/4 Flat Washer*	3
18	10-00434	*Spacer*	3
19	H-3595	*1/4-20 Hex Nut*	3
20	10-00669	*5 Amp Overload, High Voltage*	1
21	10-00766	*Magnetic Starter*	1
22	10-00935	*Electrical Cabinet Weldment*	1
23	11-00368	*5 X 20 Fuse Block*	2
24	11-00375	*Fuse, 4A*	4
25	10-00667	*Circuit Breaker, High Voltage*	1



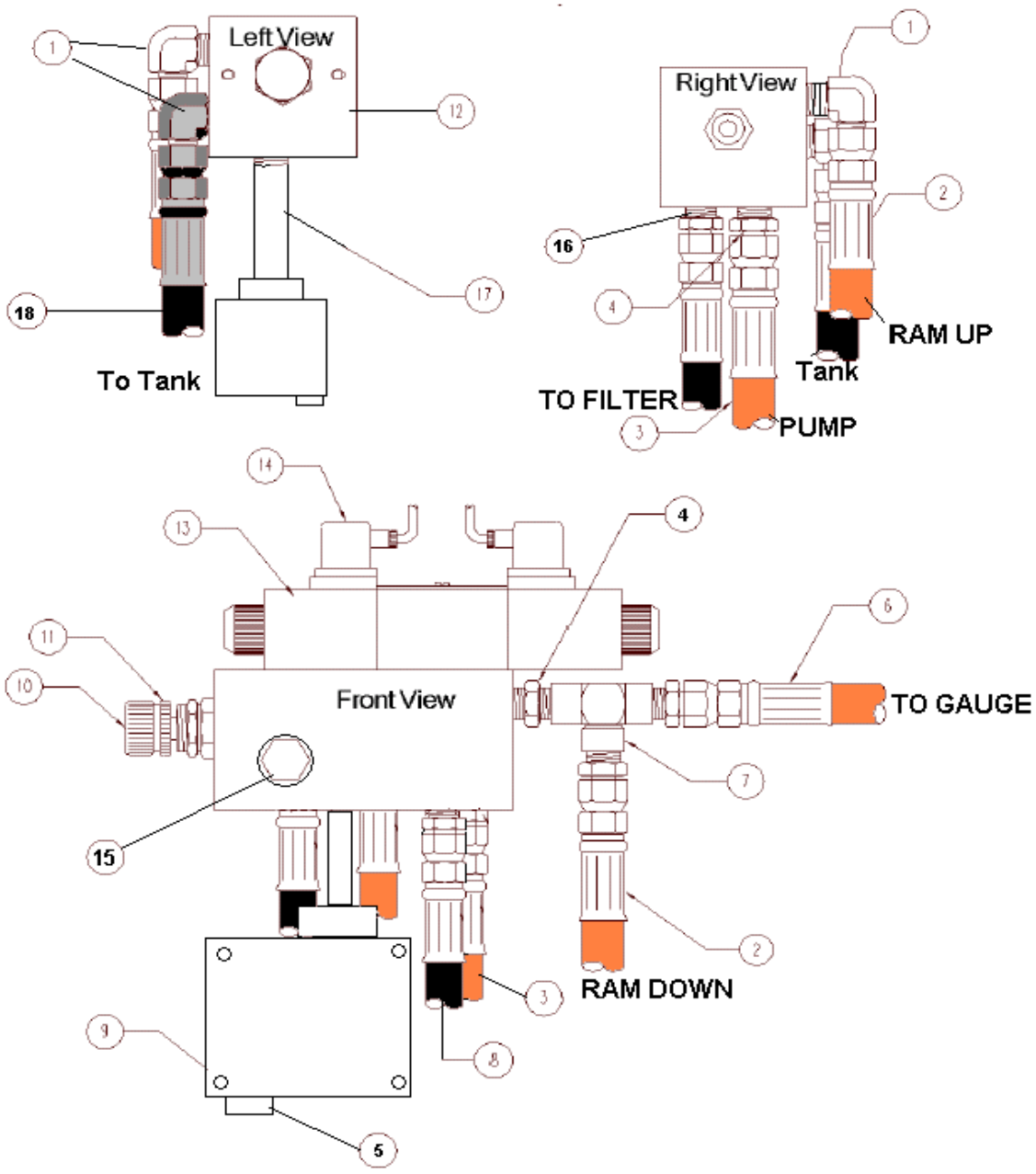
* These relays are only included on the PC Board Assembly when the Tool Protection System and/or the Vacuum Generator System options are installed on the machine.

Note: F7 and F6 Fuses are for optional work lights These Fuses are left out unless optional work lights are installed.

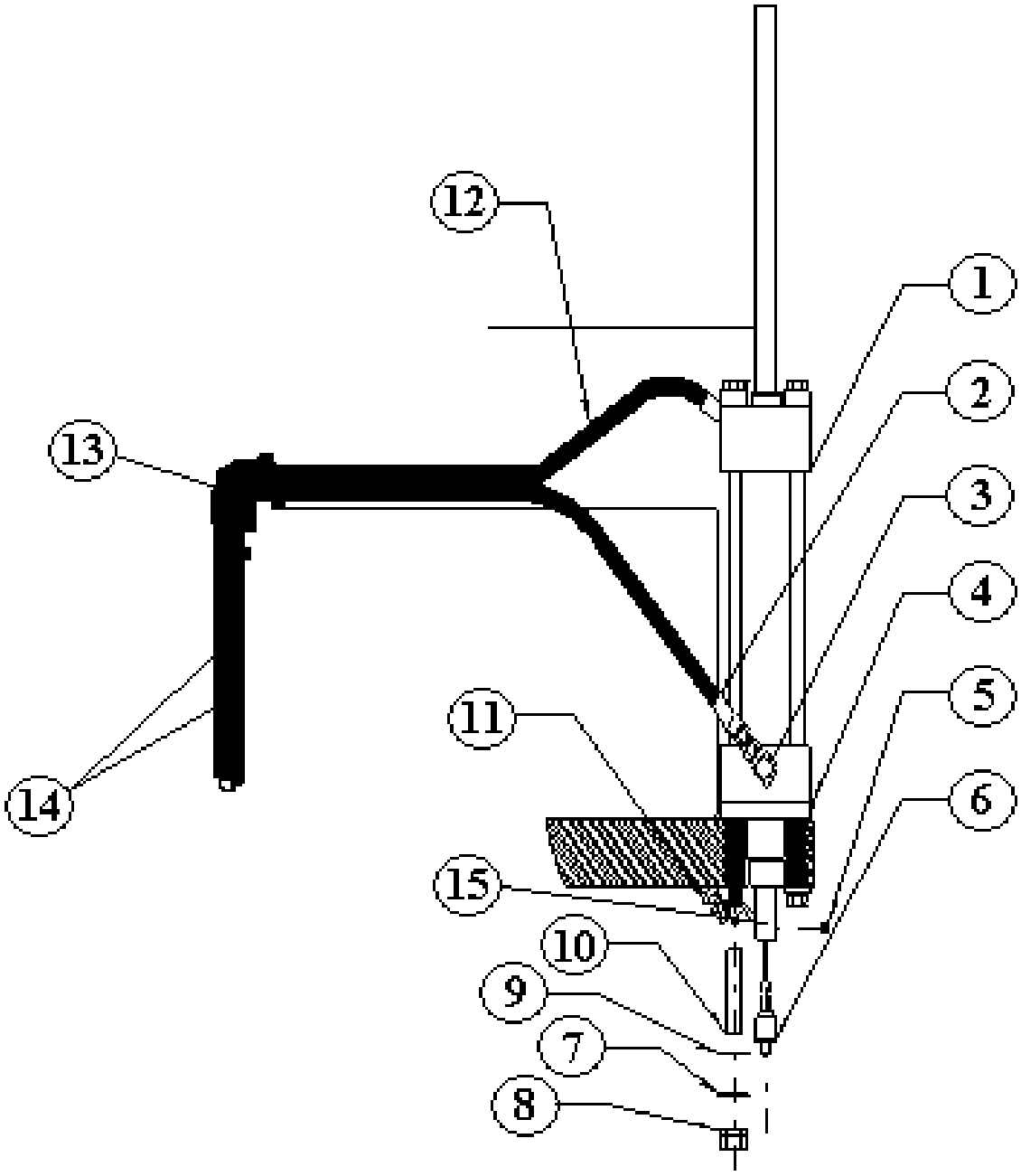
Item	Part No.	Description	Qty.
1	11-00376	Fuse, 2A	4
2	10-00617	Fuse, 4A, 120 V	1
3	10-00615	Relay, 24 V with diode	10
4	11-00592	Relay, 24 V without diode	3
5	10-00616	Relay, 6 V	1
6	10-01208	Timer Relay	1
7	11-00375	Fuse, 4A, 24 V	2
8	10-01130	Dwell Timer	1


1 On Switch & Light
2 Off Switch
3 Run/Setup Selector Switch
4 Conductive/Non-Conductive Mode Keyed Selector Switch
5 Up Travel Control
6 Small Knob
7 Vacuum Generator On/Off Selector Switch
8 Dwell Control
6 Small Knob
9 Electial Control Panel
10 Pressure Gauge/Force Indicator
11 Pressure/Force Adjust Control
12 Hydraulic Control Panel
2,950 PSI
(204 BAR)
6,000
(27)
3,000
(13)
LBS (KN)

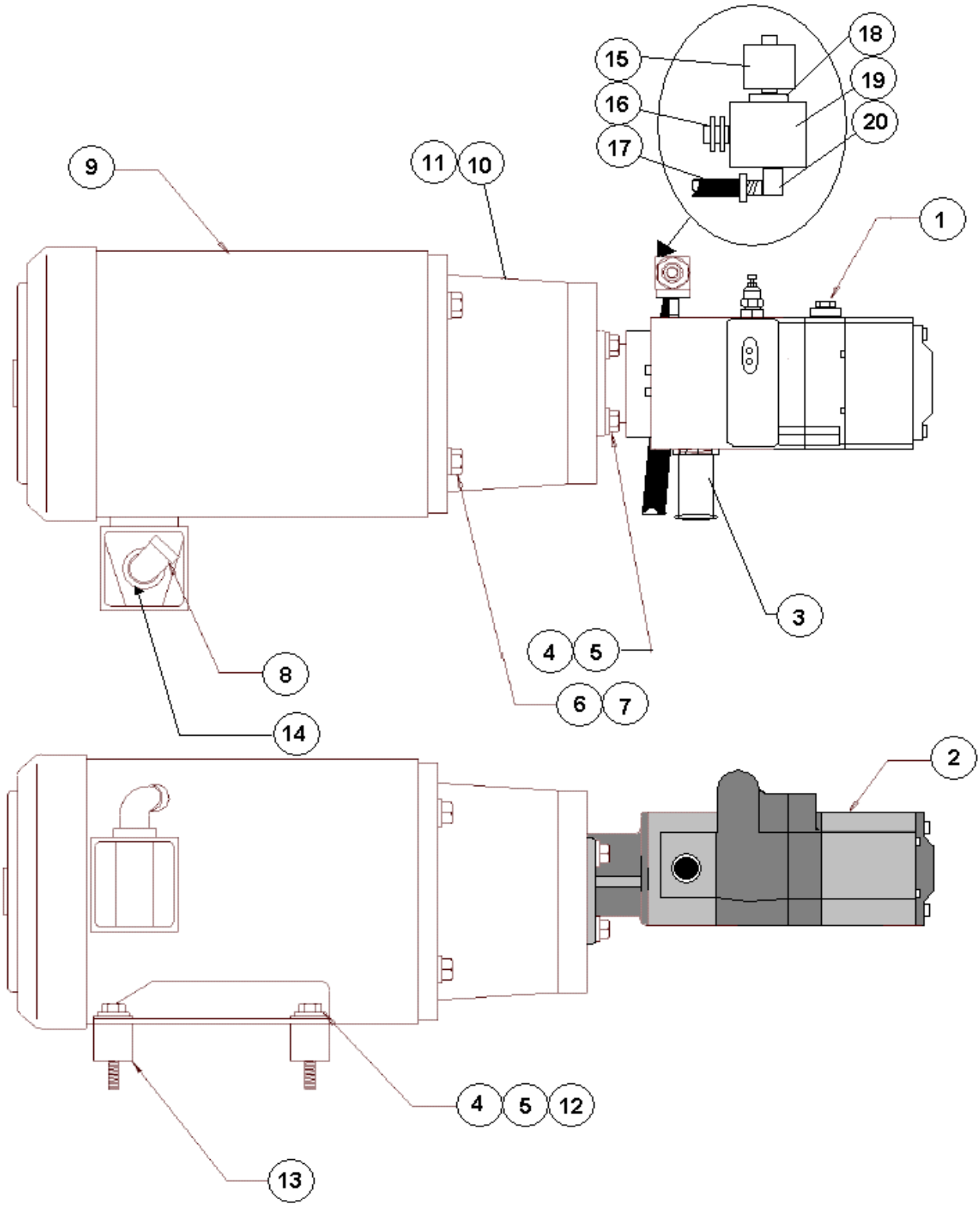
Item	Part No.	*Description*	Qty.
1	10-00618	*On Switch &* Light	1
2	10-00621	*Off Switch*	1
3	10-00620	*Setup/Run Selector Switch*	1
4	10-00619	*Cond./Non-Cond. Keyed Sel. Switch*	1
5	H-1017	*Up Travel Control (Rheostat)*	1
6	H-1044	*Small Knob*	1
7	10-00620	*Vacuum Generator On/Off Sel. Switch*	1
8	15-00209	*Dwell Control*	1
9	10-01138	*Electrical Control Panel Silkscreen*	1
10	H-2011	*Pressure Gauge/Force Indicator*	1
11	15-00071	*Pressure/Force Adjust Control*	1
12	10-01140	*Hydraulic Control Panel Silkscreen*	1


Left View
1
12
17
18
To Tank
Right View
1
2
16
4
RAM UP
Tank
TO FILTER
PUMP
3
14
13
4
6
11
10
Front View
TO GAUGE
7
15
2
RAM DOWN
3
9
8
5

Item	Part No.	*Description*	Qty.
1	15-00058	*Fitting MB-MJ90-6-6*	2
2	10-00146	*3/8 X 60" 100R8 Hose Assembly*	2
3	11-00175	*3/8 X 24" 100R8 Hose Assembly*	1
4	H-2568	*MB-MJ-6-6*	2
5	10-00166	1/2 NPT Strainrelief	1
6	11-00178	*1/4 X 14.5" 100R8 Hose Assembly*	1
7	15-00464	*Fitting 6MJ-6FJX-6MJ*	1
8	10-01261	*1/" x 13" Return Hose*	1
9	H-2010	*Pressure Switch*	1
10	15-00071	*Adjustable Relief Valve*	1
11	H-2016	*Adjustable Control Valve Spacer*	1
12	10-01227	*4 Way Relief Manifold*	1
13	16-00054	*4 Way Control Valve*	1
14	11-00443	*Connector*	2
15	10-01267	*Check Valve* 75psi, .079"	1
16	15-01133	*Coupling MB-MJ 8-8*	1
17	10-01275	*1/4 X 3" Pipe Nipple*	1
18	10-01263	3/8" X 15" Hose Return	1


12
1
2
13
3
4
11
5
6
14
15
10
9
7
8

Item	Part No.	*Description*	Qty.
1	10-00119	*Hydraulic Cylinder*	1
2	10-00150	*High Pressure Hose 3/8 X 39 1/4*	1
3	10-00138	*1/2 SAE Str. Thd. X 3/8 JIC Elbow*	2
4	10-00021	*Cylinder Insulation Gasket*	1
5	H-3850	*#4-40 X 3/16 SHSS*	1
6	11-00115	*Safety Switch*	1
7	H-3505	*Hardened Flatwasher*	4
8	H-3602	*Flange Nut*	4
9	H-3506	*Insulation Washer*	4
10	H-3509	*Bolt Insulation*	4
11	H-1036	*Retractable Cord*	1
12	11-00149	*High Pressure Hose 3/8 X 37*	1
13	10-00137	3/8 JIC x 3/8 JIC 90 deg	2
14	10-00146	3/8 100R8 Hose x 60”	2
15	10-00115	Ram Adapter	1

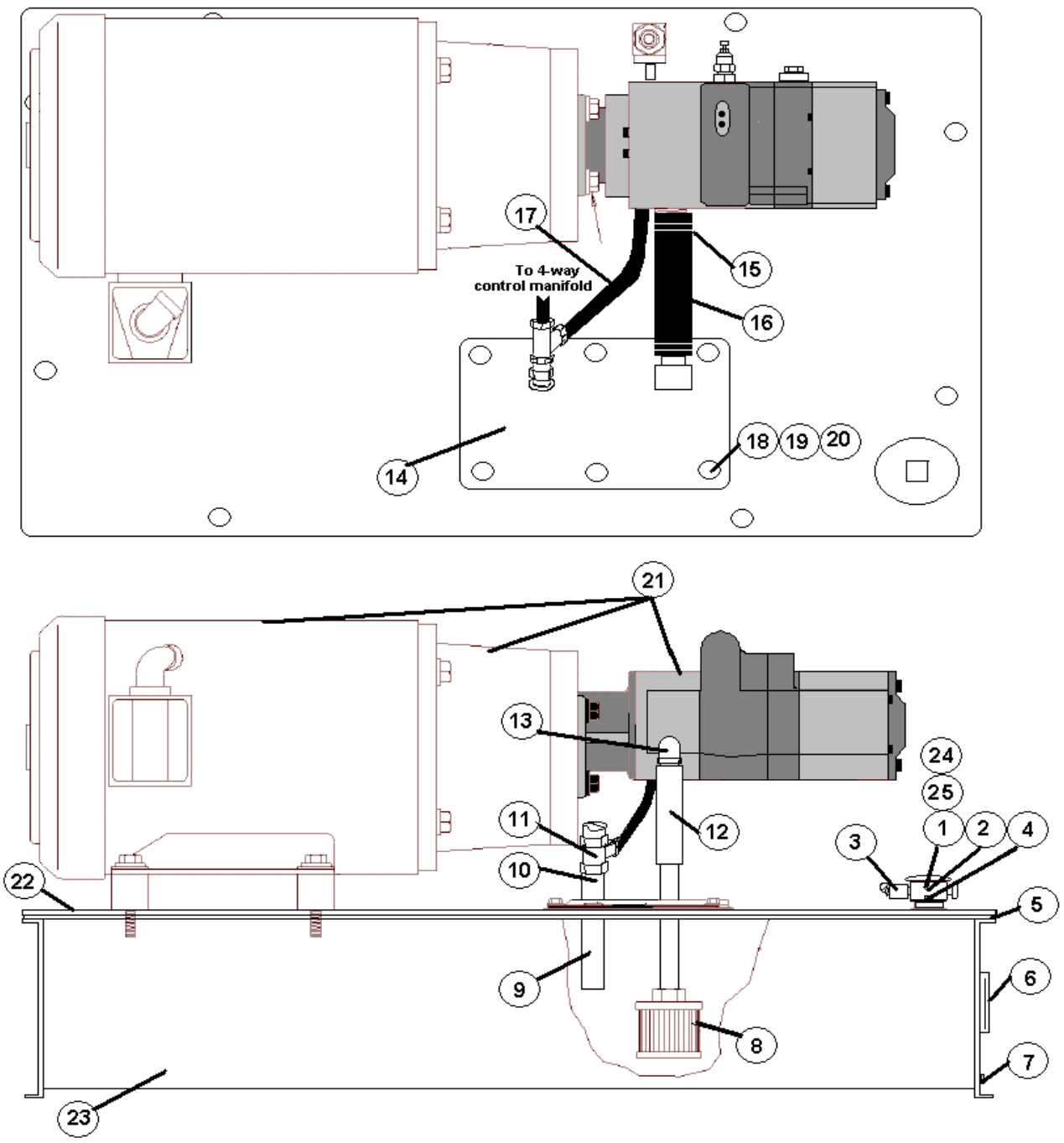

15
16
17
18
19
20
9
11
10
1
3
4
5
6
7
8
14
2
4
5
12
13

Item	Part No.	Description	Qty.
1	H-2507	*3/8 JIC 1/2 Pipe Elbow*	1
2	10-01229	*Hydraulic Pump (See below note)*	1
3	10-01247	*Fitting HB-MB-16-10*	1
4	11-00574	*M8 Lockwasher*	8
5	15-00080	*M8 x 16 Hex Bolt*	8
6	H-3564	*3/8 Lockwasher*	4
7	R830-1526	*3/8 - 16 X 1 SHCS*	4
8	H-1029	*3/8 LT 1/2 Pipe Elbow*	1
9	10-00492	*Electric Motor*	1
10	10-00023	*Coupling*	1
11	10-00022	*Motor/Pump Adapter*	1
12	11-00208	*M8 Flatwasher*	4
13	H-3820	*Motor Isolator*	4
14	H-1226	3/4-1/2 Reducer Washer	1
15	10-01250	Valve, Dump Coil	1
16	15-00436	Fitting MB-MB-6-6	1
17	10-01262	Hose, Return 3/8” x 10”	1
18	10-01248	Valve, Dump Cartridge	1
19	10-01249	Valve, Dump Body	1
20	15-00058	Fitting MB-MJ90-6-6	1

Note:

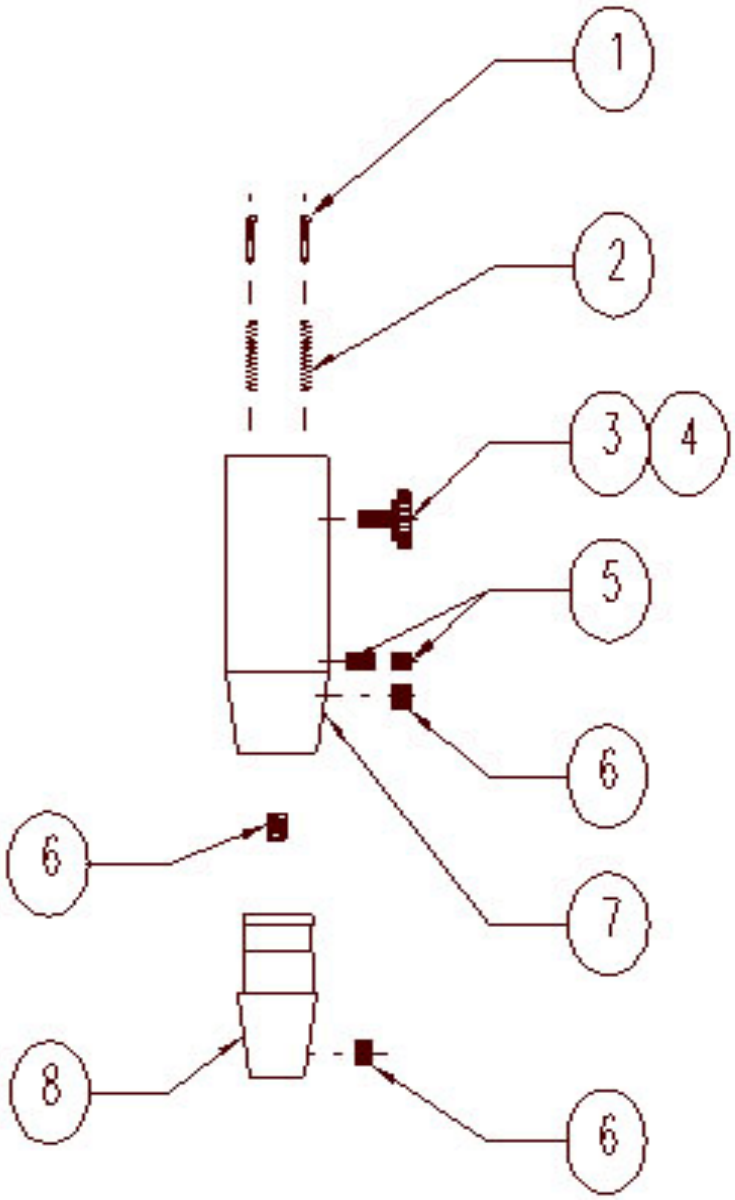
The hydraulic pump was changed to p/n 10-01229 for machines with serial number 21200 and above.

For older machines the upgrade kit p/n is 10-01332 for machines with serial number lower than 21200.

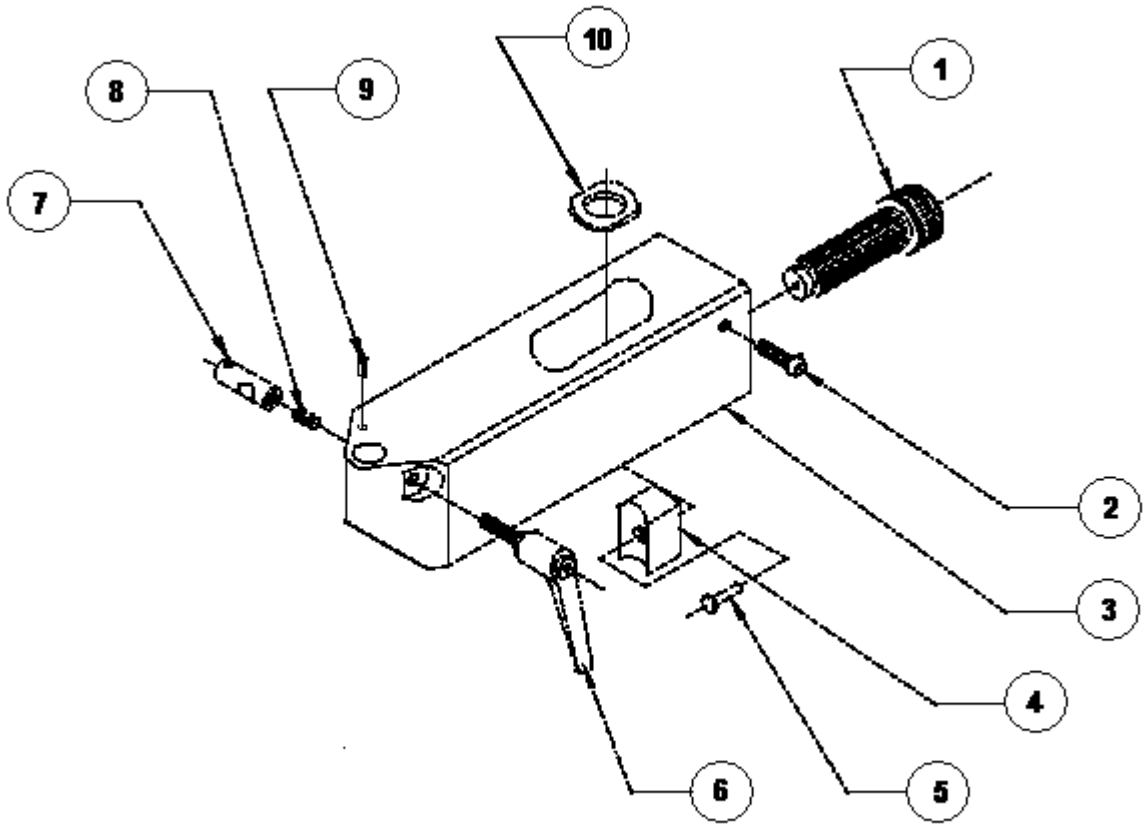

17
15
To 4-way
control manifold
16
14
18
19
20
21
13
24
25
11
12
1
2
4
3
22
10
5
9
6
8
7
23

Item	Part No.	Description	Qty.
1	15-00888	*Return Filter Cartridge*	1
2	15-00758	*Return Filter Assembly*	1
3	10-01255	*Fitting, MB-MJ90-16-8*	*1*
4	15-01165	*Nut, M-10 Hex Flange*	2
5	10-00087	*3/16 x 1 Rubber Seal* 6.7ft	1
6	15-00226	*Leval Gage W/O Thermometer*	1
7	R456-0081	*Reservoir Oil Pipe Plug*	1
8	15-01131	*Suction Strainer Fliter*	*1*
9	10-01256	*Return Flange* Pipe Nipple	1
10	10-01257	*Fitting, MP-MJ-8-6*	1
11	15-00464	*Fitting, 6MJ-6FJX-6MJ*	1
12	10-01245	*Fitting, 1" pipe coupling blk*	1
13	10-01244	*Fitting, HB-MP90-16-16*	1
14	10-01243	*Plate, Suction Access 618 plus*	1
15	H-2519	Hose Clamps 2"	2
16	15-00091	Suction Hose 1" ID 4.25" Long	1
17	10-01262	Hose, Return 3/8" x 10"	1
18	15-00080	M8 x 16 hex bolt	6
19	11-00574	M8 Lockwasher	6
20	11-00208	M 8 Flat Washer	6
21	10-01228	Motor Pump assembly	1
22	10-01235	Top Plate Reservoir	1
23	10-01260	Weldment, Reservoir	1
24	15-02714	Ring, Filter Assy Return Cap	1
25	15-02715	Cap, Filter Assy Return	1

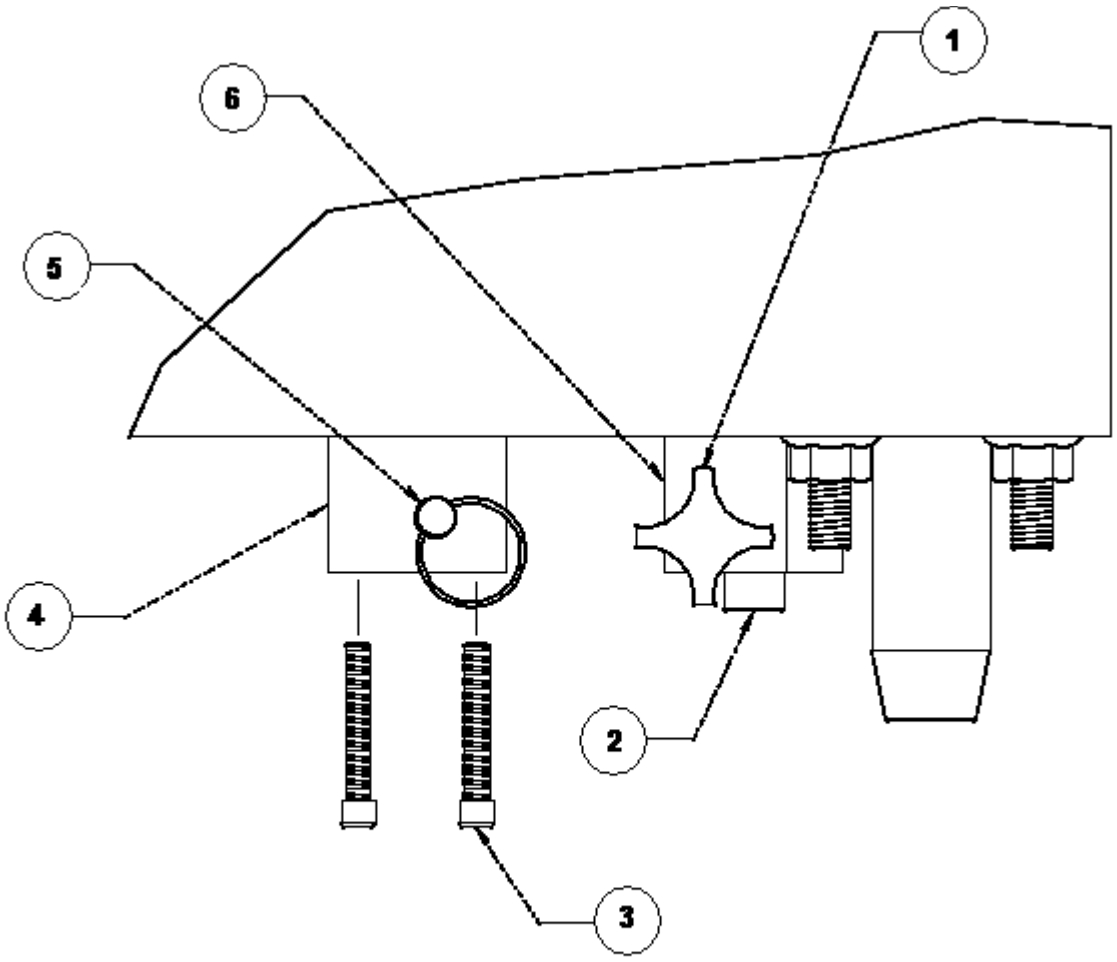
Note: Hydraulic pump has changed see page 7.17 for part number based on serial number of machine.


1
2
3
4
5
6
6
7
8
6

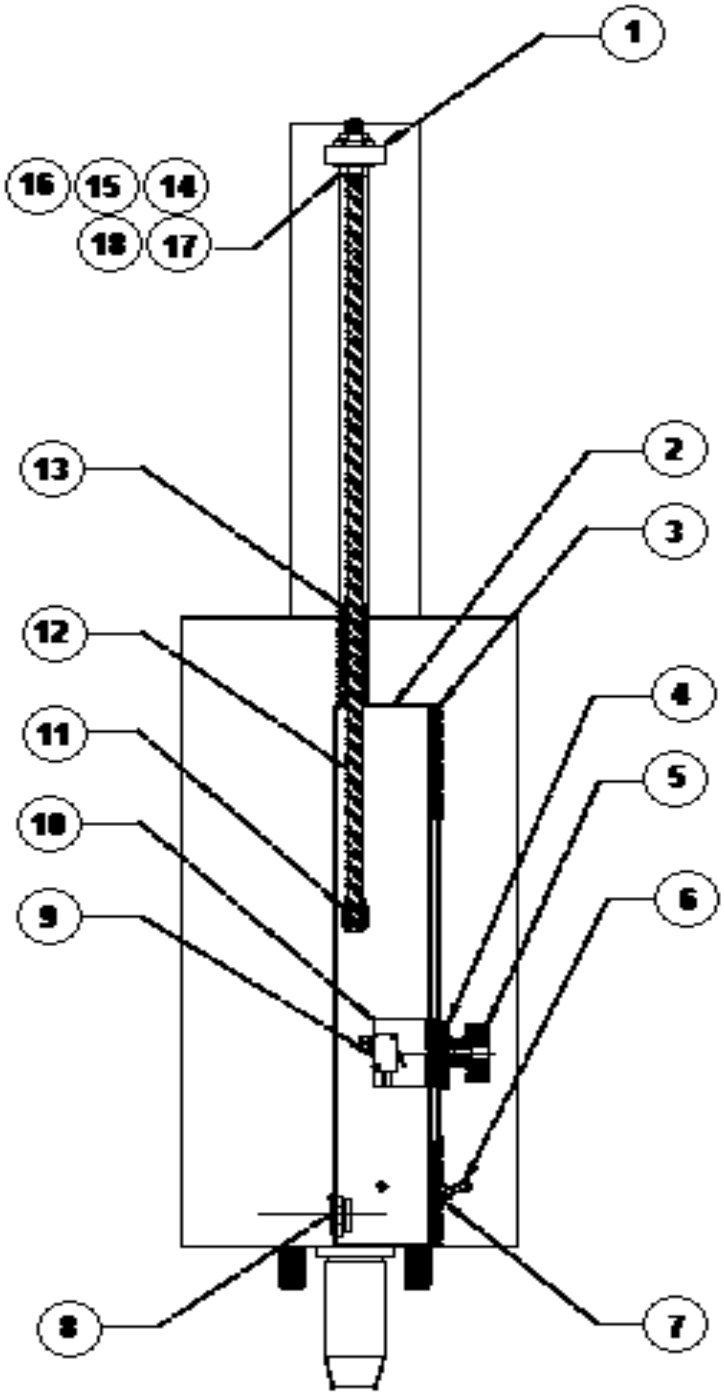
Item	Part No.	*Description*	Qty.
1	11-00016	*Continuity Guide Pin*	2
2	11-00114	*Continuity Spring*	2
3	11-00241	*M5 Knob*	1
4	11-00239	*M5 X 12 SHCS*	1
5	11-00238	*M5 X 6 SHSS*	2
6	11-00242	*M6 X 6 SHSS*	3
7	H-3501-3	*Upper Tool Holder Body*	1
8	11-00236	*Standard Tool Adapter*	1


10
1
8
9
7
2
3
4
6
5

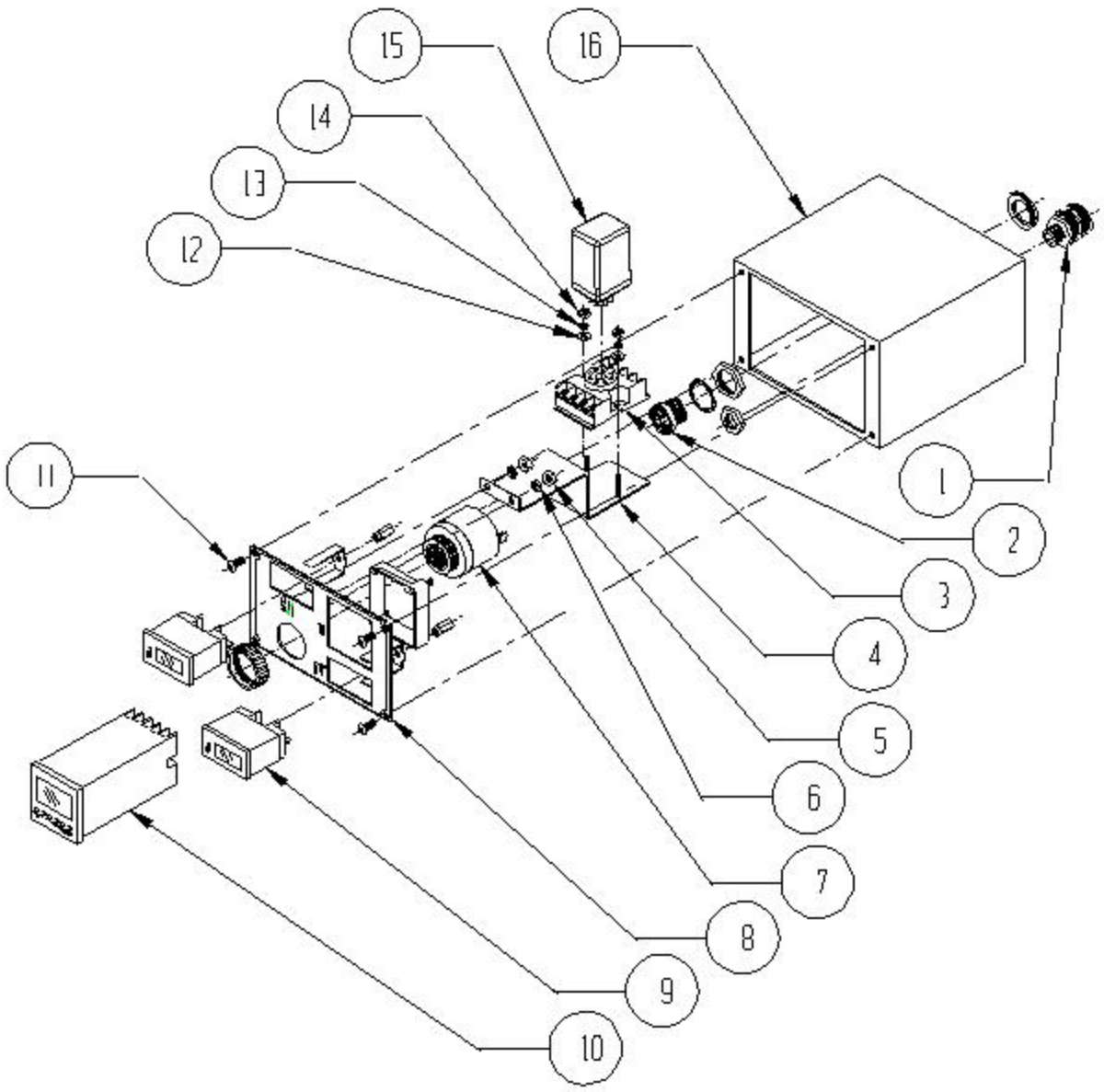
Item	Part No.	*Description*	Qty.
1	11-00191	*M16 X 2 SHCS Modified*	1
2	H-3568	*10-32 X 1 BHCS*	1
3	H-166-6	*Lower Tool Holder Body*	1
4	H-169-4	*Shoe*	1
5	H-169-5	*Pin*	1
6	11-00042	*Locking Lever*	1
7	11-00041	*Lock Cylinder*	1
8	11-00212	*Lock Cylinder Spring*	1
9	11-00199	*Spring Roll Pin, 1/8 X 1/4*	1
10	H-169-6	*Lower Tool Washer*	1


1
6
5
4
2
3

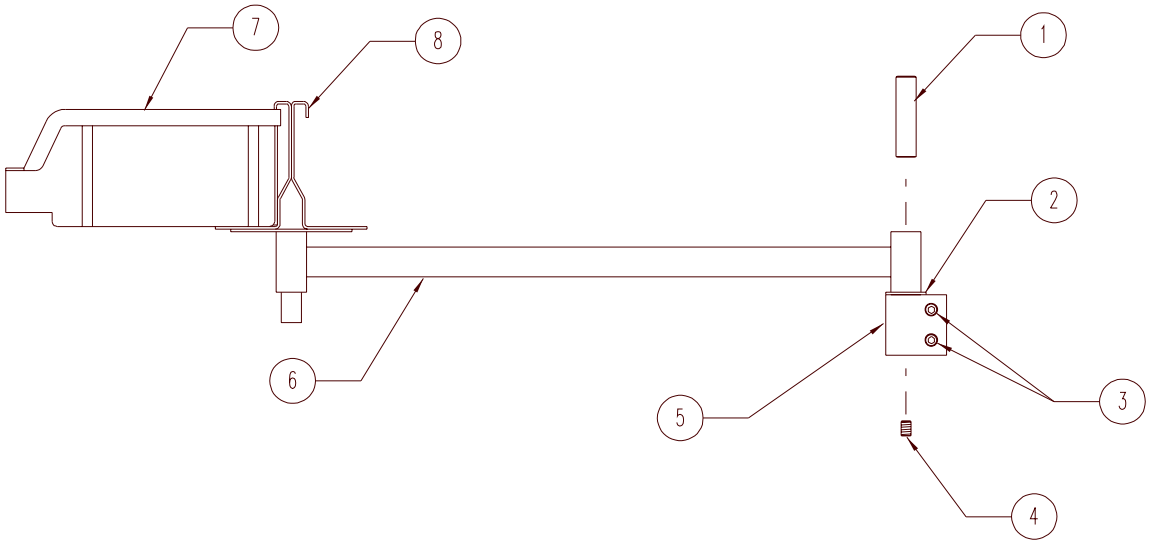
Item	Part No.	*Description*	Qty.
1	11-00580	*Star Knob*	1
2	10-01180	*M6 x 1 x 45*	2
3	10-01325	*M12 x 1.75 x 65 SHCS*	4
4	10-00002	*Back Mount Block*	2
5	11-00581	*Quick Release Pin*	1
6	10-00003	*Front Mount Block*	1


1
16
15
14
18
17
13
2
3
12
4
11
5
10
6
9
8
7

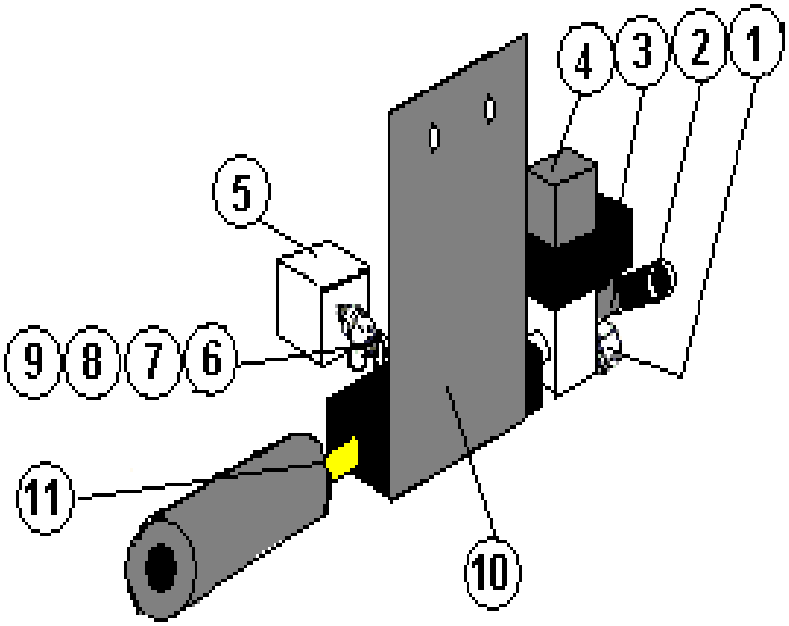
Item	Part No.	*Description*	Qty.
1	10-00054	*Top Connection Bar*	1
2	11-00172	*Limit Switch Enclosure Weldment*	1
3	10-01141	*Face Plate Silkscreen*	1
4	11-00118	*Pointer Plate Assembly*	1
5	11-00216	*Four Prong Knob 1/4-20*	1
6	H-1182	*Toggle Switch*	1
7	11-00149	*Green LED LIght*	1
8	H-1119	*4-Pin Female Receptacle*	1
9	H-1024	*Micro Switch*	1
10	11-00005	*Angle Bracket Assembly*	1
11	11-00004	*Cam*	1
12	11-00286	*Cam Shaft*	1
13	11-00214	*Flange Bearing*	2
14	11-00208	*M8 Flat Washer*	2
15	11-00209	*M8 Insulation Washer*	2
16	11-00210	*M8 Bolt Insulator*	1
17	11-00156	*M8 X 1.25 Hex Nut*	2
18	11-00574	*M8 Lockwasher*	1


15
16
14
13
12
11
1
2
3
4
5
6
7
8
9
10

Item	Part No.	*Description*	Qty.
1	H-2602	*Strain Relief*	1
2	H-1119	*4-Pin Female Receptacle*	1
3	H-1019	*Relay Socket, 8-Pin*	1
4	10-00901	*Bracket Relay*	1
5	H-3547	*10-32 Hex Nut*	2
6	H-3540	*10-32 Lockwasher*	2
7	H-1071	*Beeper*	1
8	10-00903	*Panel, Silkscreen*	1
9	15-00691	*Batch Counter (also used for Stroke Counter)*	2
10	15-00690	*Down Counter*	1
11	H-3551	*10-33 X 3/8 BHCS*	4
12	H-3640	*#6 Flatwasher*	2
13	H-3644	*#6 Lockwasher*	2
14	H-3638	*6 - 32 Hex Nut*	2
15	11-00497	*Relay, 24 V*	1
16	10-00886	*Enclosure*	1


7
8
1
2
6
5
3
4

Item	Part No.	*Description*	Qty.
1	10-00159	*Pin*	1
2	10-00160	*Bushing*	1
3	10-01331	*M 5 x 0.8 x 35 SHCS*	1
4	H-3865	*M 5 x 0.8 x 45 SHCS*	1
5	10-00153	*Service Tray Bracket*	1
6	10-00152	*Service Tray Arm Weldment*	1
7	H-3234	*Service Trays*	4
8	H-3211	*Parts Tray Holder*	1


4
3
2
1
5
9
8
7
6
11
10

Item	Part No.	Description	Qty.
1	10-00210	1/8” Brass Breather	1
2	10-00643	1/4” Push Lock Tee	1
3	11-00587	24v Solenoid Valve	1
4	11-00590	Solenoid Connector	1
5	15-01332	Vaccum Switch	1
6	14-00638	Push /Pull 1/4” Fitting	1
7	15-01325	Bushing Brass 1/4 NPT- 1/8 NPT	1
8	10-00211	1/8” Brass Tee	1
9	10-00209	1/8” Brass Cl Nipple	1
10	10-00173	Vacuum Gen Bracket	1
11	11-00589	Vacuum Generator W/Silencer	1

Note: This message is on this page so that it would not be completely blank and give the reader the impression that some important information might be missing from this manual.

SECTION 1 INTRODUCTION

SECTION 2 INSTALLATION

SECTION 3 HAEGER SAFETY SYSTEM

SECTION 4 OPERATING INSTRUCTIONS