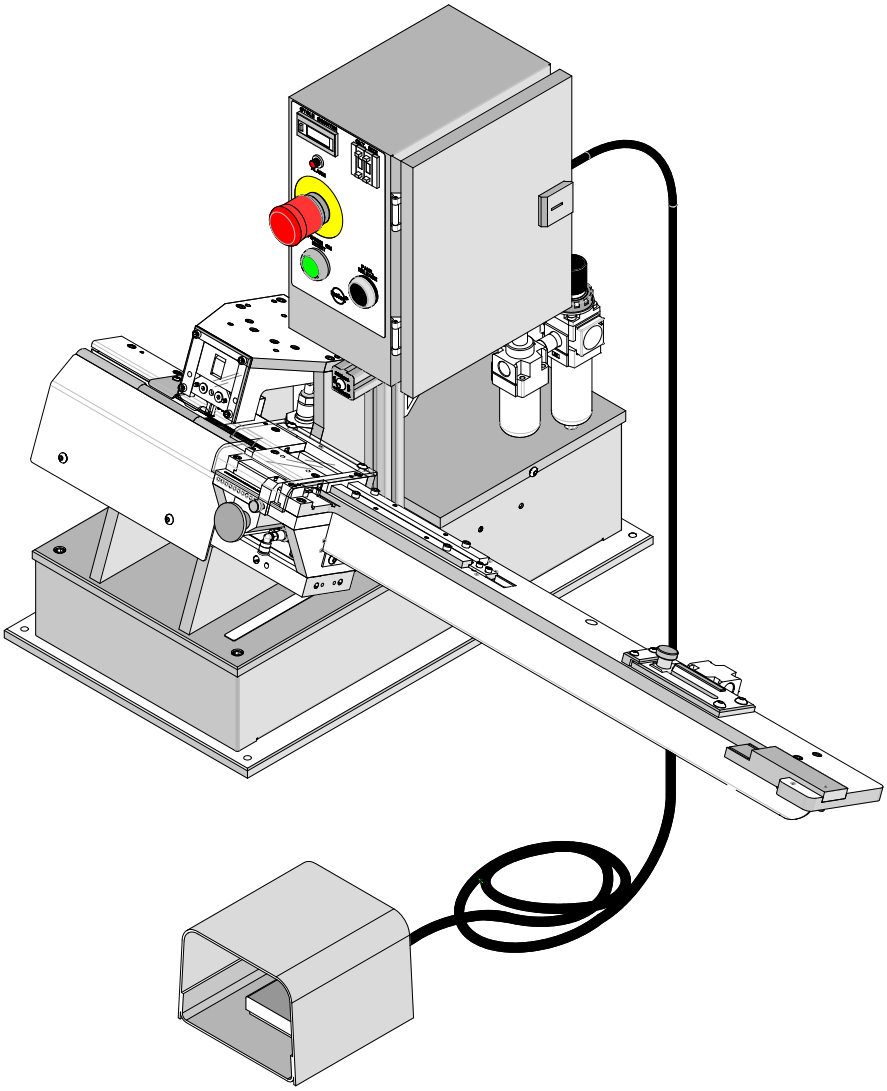


Hawk Discrete Wire Termination Machine

Operation Manual

Order No. 11-20-0949

Engineering No. AM-60520E

For C-Grid SL IDT Connector, 70400 Series

- Description
- Operation
- Maintenance

WARNING

NEVER USE THIS MACHINE WITHOUT THE GUARDS OR SAFETY DEVICES THAT ARE INTENDED TO PREVENT HANDS FROM REMAINING IN THE TERMINATION OR FEED AREAS. **RUNNING THIS MACHINE WITHOUT GUARDS, UNDER ANY CIRCUMSTANCES, CAN CAUSE SERIOUS INJURY.**

NEVER LIFT THIS MACHINE WITHOUT THE AID OF MECHANICAL LIFTING DEVICES. **SEVERE BACK OR OTHER INJURIES CAN RESULT.**

NEVER OPERATE, SERVICE, OR ADJUST THIS MACHINE, OR INSTALL TERMINATION TOOLING, WITHOUT PROPER INSTRUCTION AND WITHOUT FIRST READING AND UNDERSTANDING THE INSTRUCTIONS IN THIS MANUAL.

NEVER INSTALL TERMINATION TOOLING OR SERVICE THIS MACHINE WHILE IT IS CONNECTED TO ANY ELECTRICAL POWER SOURCE. DISCONNECT POWER BY UNPLUGGING THE MACHINE FROM ITS POWER SOURCE.

WORK SAFELY AT ALL TIMES

For Service, Contact Your Local Molex Sales Office

Molex Application Tooling Group
2200 Wellington Court
Lisle, Illinois 60532
Tel: 630-969-4550
Fax: 630-505-0049

Table of Contents

SECTION

Section 1

General Description

1.1. Description

1.2. Features

1.3. Technical Specifications

1.4. Delivery Check

1.5. Tools

1.6. Lifting

1.7. Installation

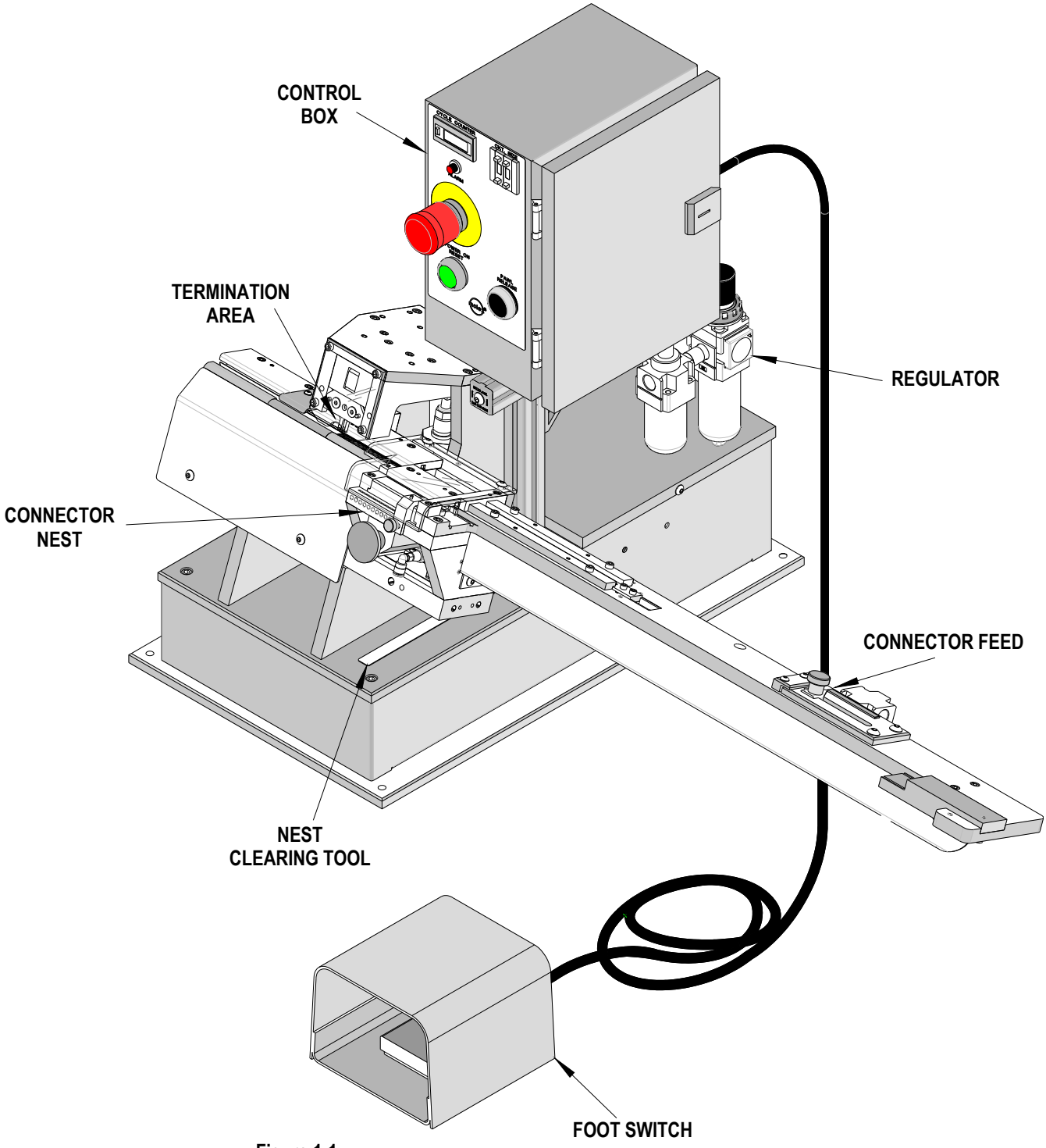

CONTROL BOX
TERMINATION AREA
REGULATOR
CONNECTOR NEST
CONNECTOR FEED
NEST CLEARING TOOL
FOOT SWITCH

Figure 1-1

General Description

1.1 Description

The Molex AM-60520E Hawk Discrete Wire Termination Machine was developed to assemble .100 S.L. IDT series (.100 in. centers Insulation Displacement Technology) discrete wire harnesses. An operator loads a cartridge containing preloaded connectors (70400 series) ranging from 2 to 25 circuits. As each connector assembly is completed, the machine automatically loads a new connector into the terminating nest, pushing the previously loaded connector into the next station. Then it inserts the terminals and breaks off the carrier strip. The operator then removes the completed harness, loads a wire (in its proper assembly order), then depresses the foot pedal. The machine then terminates that wire and indexes to the next position. This machine is ideally suited for mid- volume, semi-automatic applications.

1.2 Features

- Automatic loading and indexing of termination nest
- Automatic insertion of terminals
- Automatic break-off of carrier strip

1.3 Technical Specifications

Dimensions **Press with tooling**

Height	34.3cm (13.50")
Width	99.1cm (39.00")
Depth	50.8cm (20.00")
Unpacked weight	48.1kg (103.00 lbs.)

Power Requirements

Voltage:	110V AC or 220V AC 50/60 Hz
Current:	2A @ 110V 1A @ 220V

Pneumatics

Pressure:	5 BAR (80psig) minimum
Consumption:	14L/minimum (0.5 SCFM)

Rate

This machine terminates up to 1200 per hour, depending on operator skill and connector size.

1.4 Delivery Check

Remove the top and sides of the crate. Then remove the screws that mount the machine to the skid. Check to see that following items are included in this package:

Decription:		**Quantity**
11-20-0949 (AM-60520E) Discrete Wire Termination Machine		1
TM-011200949	Instruction Manual	1
63800-8394	Foot Switch Assembly	1
11-31-5302	Nest Cleaning Tool	1
11-31-1744	Carrier Tray	1

1.5 Tools

The following tools are recommended for setup and adjustments to the this tool.

- ✓ English Hex Wrench Set (inch)
- ✓ Large and small straight screwdriver
- ✓ Small Crescent Wrench
- ✓ Needle nose pliers
- ✓ Eye Loupe - 5X

1.6 Lifting

WARNING: The Molex Hawk Terminator weights 48kg (103 lbs.). It is **NOT** intended to be lifted by a single individual. The guarding or housing load assemblies are not attached to provide support for lifting purposes. Mechanical lifting devices should be used from below the unit. A person lifting this machine could sustain severe back or other injuries. Care should be taken at all times.

An electrical, hydraulic, or mechanical lift should be used to lift this termination machine

1.7 Installation

WARNING: When servicing this machine, disconnect this power cord to insure complete safety to service person.

Foot Pedal

Connect the 5-pin DIN plug on the foot pedal to the 5-pin socket in the right side of the terminator control assembly.
Note the locking action of the plug.

Power Connection

A power cord is supplied for standard 110VAC service. It is installed into the control box; plug the other end into a grounded outlet.

The Hawk Discrete Wire Termination Machine will operate on 110VAC or 220VAC, 50 or 60 Hz.

Air Connection

Because there are so many variations in air connections, Molex does not supply any type of fitting for air installation.
The user must supply a fitting of his choice to attach air of the correct pressure and volume to the 1/4 NPT port on the F-R-L unit. Use 1/4 inch line minimum. Once attached, adjust the regulator on the F-R-L to 80-85psig. Air will not flow into the machine proper until power is on and the "*RESET*" button is pressed.

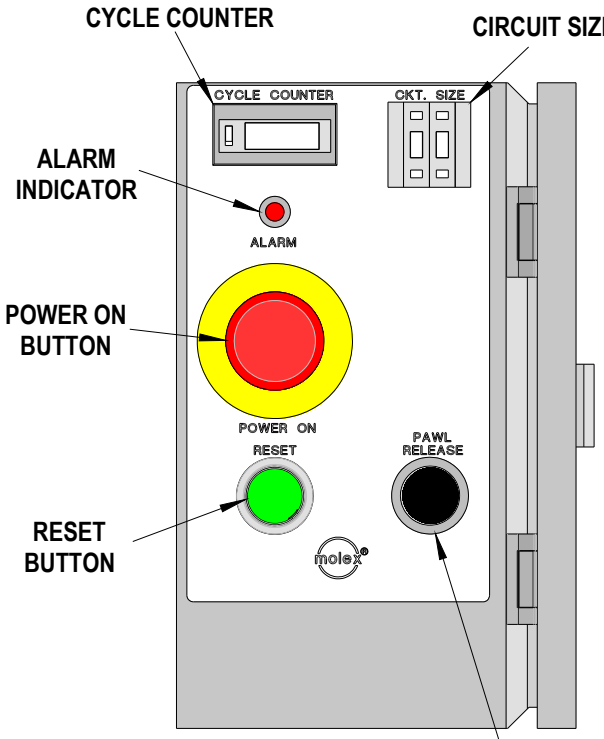


Figure 1-2

Section 2

Setting Up And Operation

2.1. Air Pressure

2.2. Connector Feed Adjustment

2.3. Shuttle Position Fine Adjustment

2.4. Termination Depth Adjustment

2.5. Termination Punch up Adjustment

2.6. Programming the Controller

2.7. Safety Precautions

2.8. Operation

Set Up

2.1 Air Pressure

Set the air pressure regulator on the air inlet to 5 - 6 BAR (80 - 90 PSI). This is done by pulling out the adjustment knob and setting to the proper pressure, then pushing in the knob. See Figure 2-1.

Figure 2-1

2.2 Connector Feed Adjustment

Shuttle Stop

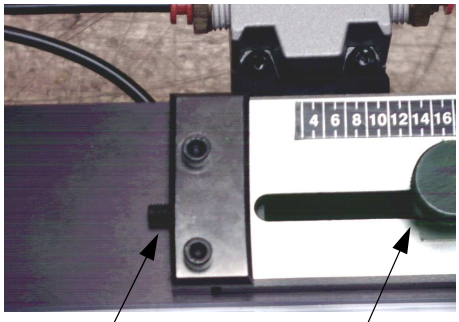


Figure 2-2

The shuttle stop is adjustable from 3 to 25 circuits.

1. To adjust the stop, loosen the thumb screw on top of the cartridge holder. This holds and locates the cylinder stop on the bottom side. Starting from "3" circuit to the left, each notch represents 1 circuit position on the shuttle. The left side of the connector must always go to the left end of the termination anvil when fed in.
2. Move the stop to the correct circuit size.
3. Tighten the thumb screw.

Note: 2 circuit connectors are loaded in pairs stop is set for 4 circuits.

Connector Feed Stop

This stop is also adjustable from 3 to 25 circuits. To adjust the stop:

1. Remove the nest guard.
2. Loosen the thumb screw on the connector feed stop located in front of the shift nest.
3. Starting from "3" circuits to the right, stop locates on every circuit position to 25 circuits. Adjust so that only 1 connector (except 2-2 circuits.) at a time can enter the shift nest from the cartridge feed.
4. When adjustment is set, tighten thumb screw.
5. Replace guard. See Figure 2-3.

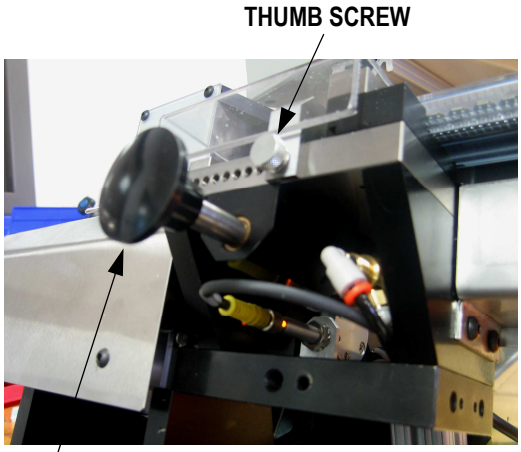


Figure 2-3

2.3 Shuttle Fine Adjustment

With a connector in the nest and the shuttle full forward against the stop, the first terminal should be centered on the terminal punch. Due to tolerance variations in connector lengths, it may be necessary to occasionally make a fine adjustment to the shuttle.

To adjust the shuttle:

1. Load a connector into the termination head in manual mode.
2. With the shuttle blade in the forward position, loosen the cap screws at the rear of the shuttle adjustment base.

3. Then adjust the location shuttle adjustment base by turning the set screw on the edge of the stop block located to the right. Hold the connector against the shuttle blade while making this adjustment. Turning the set screw "in" moves the connector to the right and "out" moves it to the left. See Figure 2-4.
4. Tighten the cap screws.

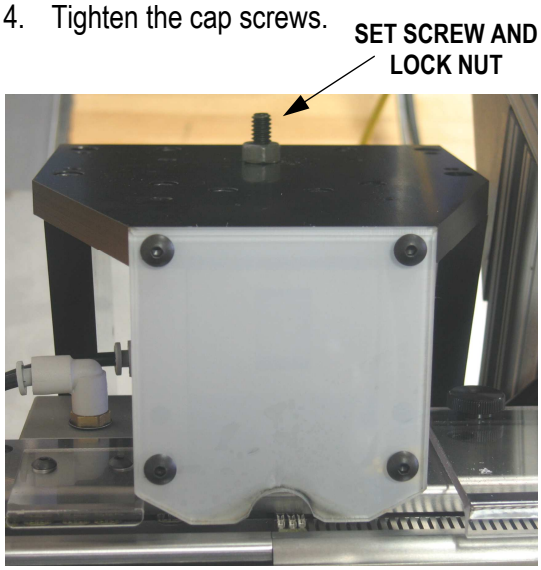


Figure 2-4

2.4 Termination Depth Adjustment

Termination depth is set by:

1. Loosening the lock nut located on top of the termination head.
2. To raise the punch depth, turn the screw clockwise. To lower, turn the screw counter-clockwise. The punch depth should be adjusted so that a terminated wire is touching the lower surface of the terminal, but is not crushed and the crimp tongs are securely gripping the wire without cutting into the insulation. See Appendix A for termination specifications.
3. Terminate a wire and check the settings.
4. Repeat steps 2 and 3 until the termination depth is correct.
5. Then tighten the lockout.

2.5 Punch Up Adjustment

Termination punches should be adjusted so that the bottom of the punch is about .015 - .020 inch above the top of the terminals.
To adjust the punch:

1. Loosen the jam nut on the clevis attached to the crimp and termination cylinder rod end.
2. Turning the rod end clockwise lowers the punches and counterclockwise raises them. The rod end can be turned with the jam nut by turning the jam nut down snug against the end of the threads on the rod. Then turn off the air supply and turn the jam nut to adjust. See Figure 2-5.
3. Turn the air back on to check punch height
4. Retighten the jam nut to clevis.

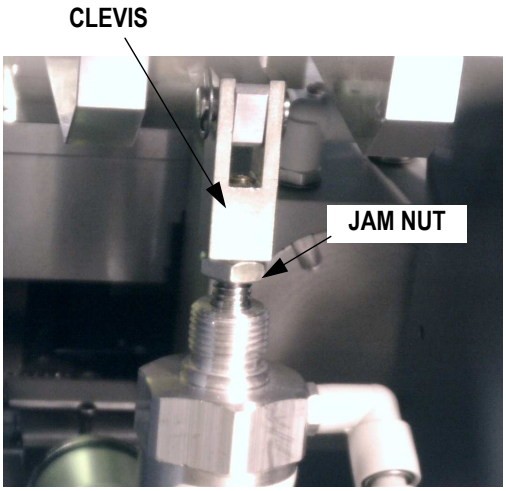


Figure 2-5

2.6 Programming The Controller

On the front of the base there is a pair of thumb wheels. These set the counter to the correct circuit size for the connector.

Example: a 3-circuit connector would be set at .03".

2.7 Safety Precautions

The following safety precautions should be taken before operating the terminator.

1. Check that the work area is well lighted. Adjust work light for best visibility.
2. Check that the area is clean and free of debris. Check that no tools have been left in the machine or work area.

NEVER operate in areas of excess moisture.

3. Be sure all guards are in place. Both the operator and bystanders must wear approved safety glasses when terminator is in operation.

NEVER operate this terminator without guards in place.

4. Make sure the unit is plugged into a grounded outlet. Check the connection at both ends of the power cord. Also check that the power cord is not damaged or in danger of being damaged.
5. Check that the terminator position is suitable for the operator's size. The foot pedal should be positioned for ease of use. A stool or chair with adjustable height and backrest should be provided for maximum comfort and back support to the operator.
   The machine should be located parallel and approximately 150mm (6 in) from the edge of the table. A chair or stool, with adjustable height and back rest, should be provided for maximum comfort and back support for the operator.
6. Be sure all setup procedures were followed and that terminations are within specifications. See Appendix A for termination specifications.

2.8 Operation

1. Set housing and shuttle stops and circuit counter as described in Sections 2.2 and 2.6.
2. Turn air "on" and push reset button to reset nest to the #1 position.
3. Load a tube of connectors with the terminals up and forward.
4. To start cycle, pull connector shift nest knob forward.
5. When the connector is in the shift nest, push the shift nest knob all the way "in". This will load the connector into the nest, ready for termination. If a connector is already in the nest it will automatically cycle through the insertion cycle and be ready for removal.
6. To load wires, insert appropriate wire under termination punches until it stops. The wire must be perpendicular to the face of the tooling and not angled up or down. See Figure 2-7 and 2-8 for correct position. When the wire is in the correct position, press the foot switch
7. Repeat operation until connector is complete. Machine will automatically reset and loaded connector is ready for removal.
8. Repeat Steps 4 and 5 then remove connector by pulling the wires briskly to the left.
9. Repeat steps 6 through 8 until tube is empty or the run is complete.

NOTE: The machine should be kept clean and free of carrier strips and other debris.

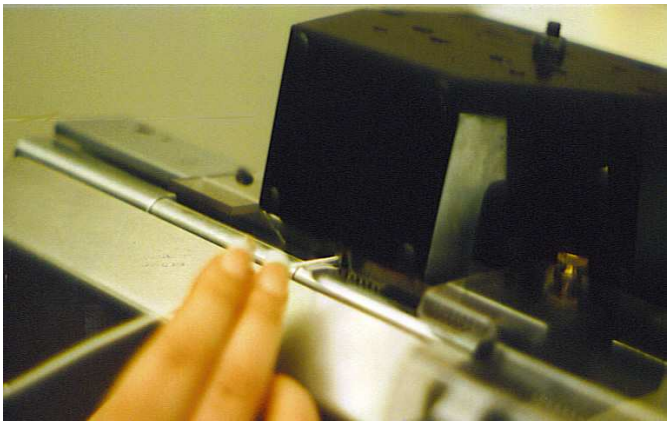


Figure 2-6

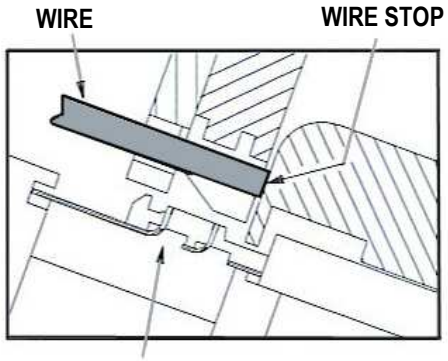


Figure 2-7

Section 3

Maintenance

3.1. Cleaning

3.2. Lubrication

3.3. Perishable Parts

3.4. Spare Parts

3.5. Troubleshooting

3.1 Cleaning

WARNING: Disconnect the compressed air line and the power cord from the power source during all maintenance operations.

For efficient operation, the Hawk Discrete Wire Termination Machine should be cleaned daily with a soft bristle brush to remove any carrier strip debris and terminal plating dust from the tooling area. For continuous operation this may have to be done several times throughout the day.

See Chart 3.1 for recommended Preventive Maintenance Schedule.

When it is necessary to change tooling, care should be taken to remove any debris from tapped holes or mounting surfaces. Debris can prevent tooling from being properly locked into position.

Keep the air filter clean. A visible coating of dirt in the bowl indicates that the unit needs cleaning. To clean, remove the bowl with the filter unit and wipe with denatured alcohol.

NOTE: Using compressed air to clean tooling is *not* recommended. Chips can wedge in the tooling and/or fly at an operator.

3.2 Lubrication

1. Check the oil level in the lubricator bowl periodically and fill as needed with SAE 10W motor oil.
2. Sparingly lubricate the sliding parts approximately every month with SAE 10W motor oil or equivalent.
3. Lubricate with multipurpose synthetic lubricant with Teflon or an equivalent. Molex ships its presses pre-greased with Permatex multi-purpose synthetic grease with Teflon No. 82329. SAE 10 non-detergent oil or light spindle oil or 3-in-1 oil should be used on pivot points.

WARNING: Never use penetrates such as WD40 for any lubrication on the Termination machine.

An example of a maintenance chart is shown below. Copy and use this chart to track the maintenance of your Press or use this as a template to create your own schedule or use your company's standard chart, if applicable.

Preventive Maintenance Chart

Daily: Clean. See Section 3.1.
Monthly: Check air filters and clean as necessary, See Section 3.1.

Lubricate sliding parts, See Section 3.2.

Check oil level in lubricator, See Section 3.2.

CHECK SHEET MONTH _____YEAR _____

Week	Monthly	Daily Clean	Days of the Week							Solution
			MON	TUE	WED	THU	FRI	SAT	SUN	
1										
2										
3										
4										
Air Filters	Yes									SAE 10W motor oil
Lubricate	Yes									SAE 10 non-detergent oil
Oil Level	Yes									SAE 10W motor oil
Cleaning Reapply greasing Reapply oil		Yes								Soft Brush Industrial Degreaser
Inspect all tooling for wear		Yes								Replace if signs of wear.

Schedule should be adjusted up or down depending on usage. Molex recommends that a log of preventive maintenance be kept with the press.

3.3 Perishable Parts

Customers are responsible for maintaining the Hawk Discrete Wire Termination Machine. Perishable parts are those parts that come in contact with the product and will wear out over time. Molex recommends that all customers keep at least one set of the perishable tool kit in stock at all times. This will reduce the amount of production down time. These parts are identified in the parts list in Section 4.

3.4. Spare Parts

Customers are responsible for maintaining the Hawk Discrete Wire Termination Machine. Spare parts are moving and functioning parts that can be damaged or wear out over time and will require replacement. Molex recommends that the customer keep some or all of them in stock to reduce production down time. These parts are identified in the parts list in Section 4.

3.5 Troubleshooting

Symptom	Cause	Solution
Switch does not turn on power	No current	Check power source.
	Fuse blown	Replace.
	Defective power switch	Replace.
Smashed terminals during termination	Improper shuttle fine adjustment	See Setting Up and Operation. Section 2.3.
	Damaged crimp or termination punches	Repair or replace.
	Nest Return cylinder rod end loose	Tighten.
	Carriers or other debris in lower slide area	Remove and clean. See *Maintenance* Section 3,.
	Damaged slide bearings	Replace
	Debris in anvil pockets	Remove and clean. See *Maintenance* Section 3,.
	Spring pressure on housing aligner bar too low	Replace spring.
	Nest return cylinder pressure regulator set too low	Adjust regulator.
	Improper adjustment of crimp and termination punch height	See *Setting Up and Operation* Section 2.4.
Improper crimp and termination depth	Improper adjustment of termination punch depth	See *Setting Up and Operation* Section 2.4
	Debris in anvil pockets	Remove and clean. See *Maintenance* Section 3,.
	Air pressure too low	Check air supply and regulator. See *Setting Up and Operation* Section 2.1.
	Termination cylinder flow control set improperly	Reset flow control.
Improper insertion depth (Terminals in Housing)	Carriers or other debris caught behind insertion slide mechanism	Carefully clean out area behind slide.
	Screws loose in insertion slide assembly	Tighten all insertion slide screws.
	Insertion cylinder loose or binding	Tighten the rod connections or replace the cylinder if binding.
Carriers not breaking off properly	Debris caught under carrier bend slide	Carefully clean area under bend slide. See *Maintenance* Section 3.
	Bend cylinder loose or binding	If binding, replace the cylinder and tighten all rod fittings.
	Improper coining on terminal carrier strip	Replace product.
	Loose carrier break-off cam block	Tighten all screws.
Tube feed not working	Shift nest not positioned properly	Adjust shift nest so connectors transition smoothly.
	Shift cylinder binding	Replace cylinder
	Tube bowed excessively or burred at ends	Replace tube
	Air feeder malfunctioning	Check air pressure and check for blockage of air passages.
Connector transfer Not working	Improper clearance in connector feed guide or carrier guide I nest	Contact Molex Application Tooling Group.
	Debris in anvil pocket	Remove debris and clean area.
	Debris behind shift nest slide	Remove debris and clean area.
	Shuttle cylinder binding	Replace or repair cylinder.
	Shuttle cylinder flow controls improperly adjusted	Readjust flows controls so cylinder extends and retracts but does not slam.
	Improper alignment in transition areas	Adjust alignments so that connector moves through smoothly.
	Terminal carrier thickness out of spec	Replace product.
Connector overshoots when transferred in	Shuttle cylinder flow control improperly set	Adjust flow control on front of cylinder to slow down cylinder extension.
	Spring pressure on housing aligner too loose	Replace spring.

Symptom	Cause	Solution
Nest Step not stepping to next circuit position	Nest return cylinder pressure set too high	Set separate regulator to a lower pressure, turn the knob counter clockwise.
	Debris caught in ratchet mechanism	Carefully clean ratchet mechanism. See Section 3.1.
	Nest step cylinder loose or binding	Repair joints or replace cylinder.
	Nest step cylinder flow controls set too far closed	Open flow control slightly.
	Damaged pawls on ratchet mechanism	Replace pawls.
	Valve malfunctioning or control problem	Contact Molex Application Tooling Group.
	Air pressure too low	See Section 2.1.
Nest step overshooting beyond next position	Nest return cylinder pressure set too low	Open separate regulator very slightly.
	Nest step cylinder flow controls too open	Close down flow controls a little bit at a time until proper flow is achieved.
Nest does not return	Control problems	Contact Molex Application Tooling Group.
	Pawl release cylinder loose or binding	Repair or replace cylinder.
	Nest return cylinder pressure set too high	Reduce pressure at separate regulator.
	Air pressure too low	Check pressure supply and pressure setting at main regulator. See Section 2.1.

Section 4

4.1 Parts List and Assembly Drawings

4.2 Schematisc Drawings

4.3 Pneumatic Drawing

4.1 Main Parts List and Assembly

11-20-0949 AM60520E Hawk Discrete Wire Termination Machine					
Item	**Order No**	**Engineering No.**	**Description**	**Quantity**	**Figure**
REF	11-20-0949	AM60520E	Main Assembly	1	4-1
1	N/A	N/A	Frame Assembly	1	4-2 and 4-3
2	N/A	N/A	Crimp Assembly	1	4-4
3	N/A	N/A	Feed Assembly	1	4-5 and 4-6
4	62300-6510	62300-6510	Control Assembly	1	4-7
5	62300-6520	62300-6520	Miscellaneous Electrical	1	4-8

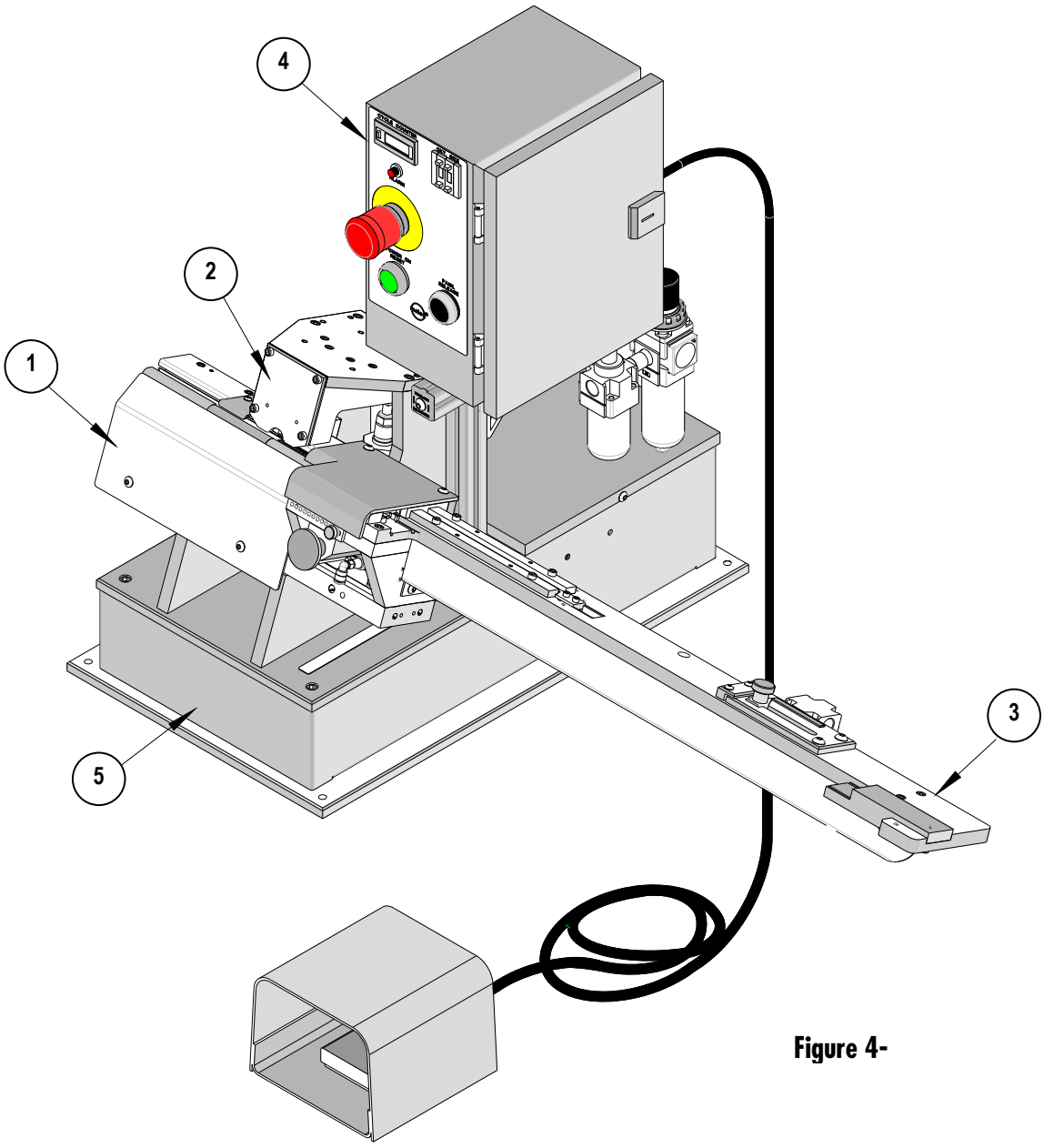


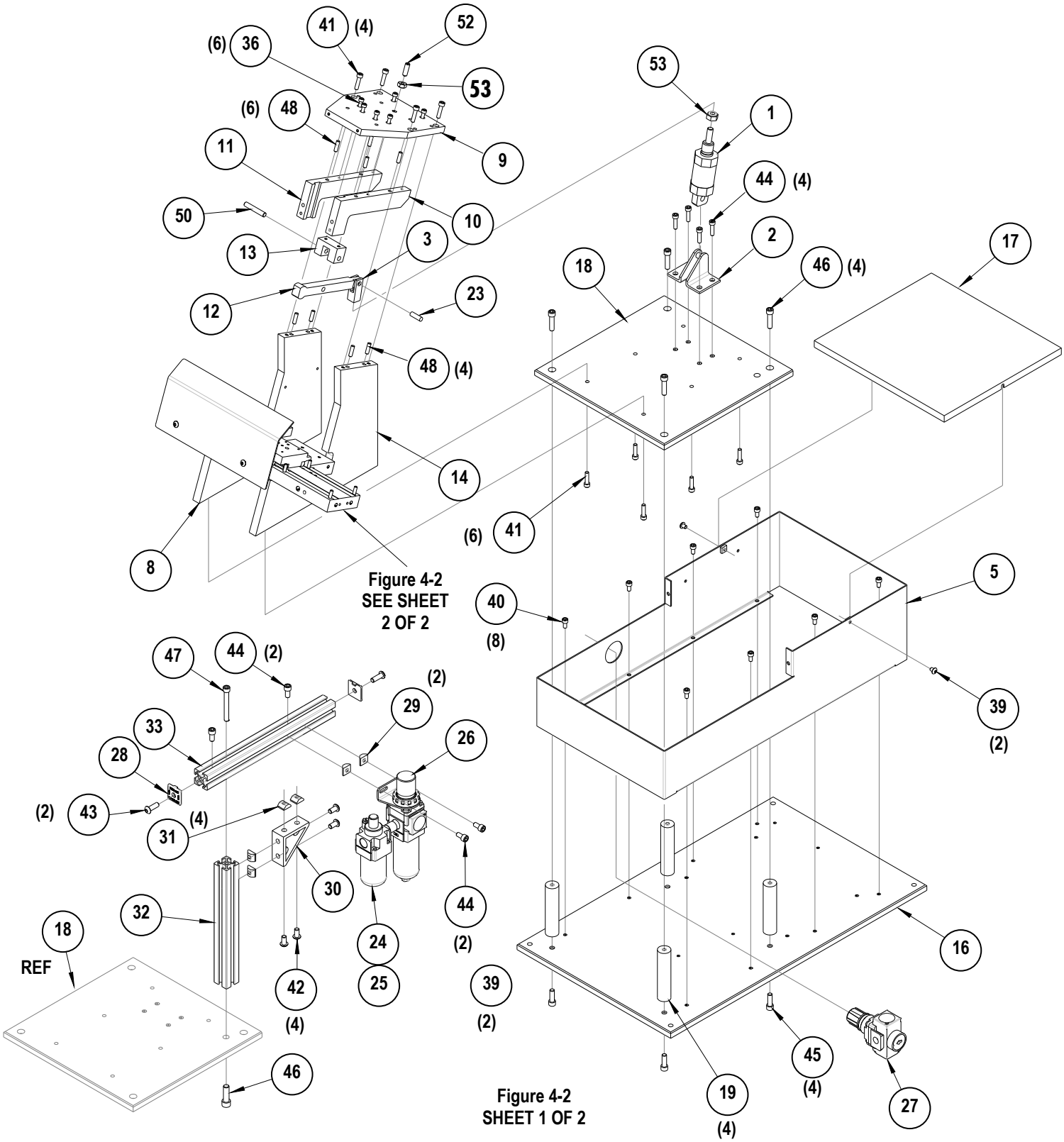
Figure 4-

Frame Parts List

Frame Assembly Figure 4-2 amd 4-3					
Item	**Order No**	**Engineering No.**	**Description**	**RSP / PP Parts and notes**	**Quantity**
1	11-31-0149	AM60510-5	Cylinder	**RSP**	1
2	11-31-0156	AM60510-12	Bracket, Clevis		1
3	11-31-0157	AM60510-13	Clevis, Rod		1
4	11-31-0173	AM60510-15	Bearing, Slide		2
5	11-31-1231	AM60520-14A	Enclosure		1
6	11-31-1730	AM60510-26	Front Slide Guide		1
7	11-31-1731	AM60510-27	Rear Slide Guide		1
8	11-31-1754	AM60510-50	Left Frame Upright		1
9	11-31-1755	AM60510-51	Termination Head Top Plate		1
10	11-31-1756	AM60510-52	Right Termination Guide		1
11	11-31-1757	AM60510-53	Left Termination Guide		1
12	11-31-1759	AM60510-55	Termination Lever		1
13	11-31-1760	AM60510-56	Termination Pivot		1
14	11-31-1784	AM60510-83	Frame Upright Right		1
15	11-31-1804	AM60510-115	Spacer		2
16	11-31-2017	AM60520-21A	Machine Base		1
17	11-31-3288	AM60520-15A	Enclosure Cover		1
18	11-31-3289	AM60520-22A	Machine Mount Plate		1
19	11-31-3290	AM60520-23A	Standoff, Mount Plate		4
20	11-31-4538	AM60570-21	Slide, Nest		1
21	11-31-4539	AM60570-22	Slide Base		1
22	11-31-4571	AM60570-97	Front Guard		1
23	11-31-5584	AM60510-70	Clevis Pin		1
24	62500-2056	62500-2056	Air Lubricator, 2000 Series		1
25	62500-2762	62500-2762	Pipe Nipple 1/4" BSPT 1 1/2" Long		1
26	62500-2820	62500-2820	Filter/Regulator Combo With Gauge And Bracket		1
27	62500-2861	62500-2861	Regulator 0-30psi W/Gauge		1
28	63600-2591	63600-2591	25 by 25 End Cap		2
29	63700-1242	63700-1242	#10-32 T-Nut		2
30	63700-1784	63700-1784	Corner Bracket		1
31	63700-2068	63700-2068	#1/4-20 T-Nut		4
32	63700-2370	63700-2370	1.0 by 1.0 Extrusion by 8.0” Long		1
33	66694-1662	66694-1662	1.0 by 1.0 Extrusion by 10.0” Long		1
Hardware					
34	N/A	N/A	#5-40 by 3/8“ Long SHCS		32**
35	N/A	N/A	#8-32 by 1/2“ Long BHCS		2**
36	N/A	N/A	#8-32 by 5/8“ Long SHCS		6**
37	N/A	N/A	#8-32 by 1.0“ Long SHCS		4**
38	N/A	N/A	#8-32 by 3/16“ Long SSS		8**
39	N/A	N/A	#10-32 by 1/4“ Long BHCS		2**
40	N/A	N/A	#10-32 by 1/2“ Long SHCS		7**
41	N/A	N/A	#10-32 by 3/4“ Long SHCS		14**
42	N/A	N/A	#1/4-20 by 1/2“ Long BHCS		4**
43	N/A	N/A	#1/4-20 by 3/4“ Long BHCS		2**
44	N/A	N/A	#1/4-20 by 1/2“ Long SHCS		8**
45	N/A	N/A	#1/4-20 by 3/4“ Long SHCS		4**
46	N/A	N/A	#1/4-20 by 1.0“ Long SHCS		5**
47	N/A	N/A	#1/4-20 by 2.0“ Long SHCS		1**
48	N/A	N/A	#3/16 by 5/8” Long Dowel Pin		12**
49	N/A	N/A	#1/8 by 3/8” Long Dowel Pin		2**
50	N/A	N/A	#1/4 by 1.5” Long Dowel Pin		1**

Frame Assembly Figure 4-2 amd 4-3					
Item	**Order No**	**Engineering No.**	**Description**	**RSP / PP Parts and notes**	**Quantity**
51	N/A	N/A	#1/4-20 by .226“ Thick Hex Nut		1**
52	N/A	N/A	#1/4-28 by 3/4“ Long Set Screw (Cup Point)		1**
53	N/A	N/A	#5/16-18 Lock Nut		1**
RSP - Part is a Molex Recommended Spare Part.					
PP - Part is a Perishable Part.					
** Available from an industrial supply company such as MSC (1-800-645-7270).					

Frame Assembly (Sheet 1)



Frame Assembly (Sheet 2)

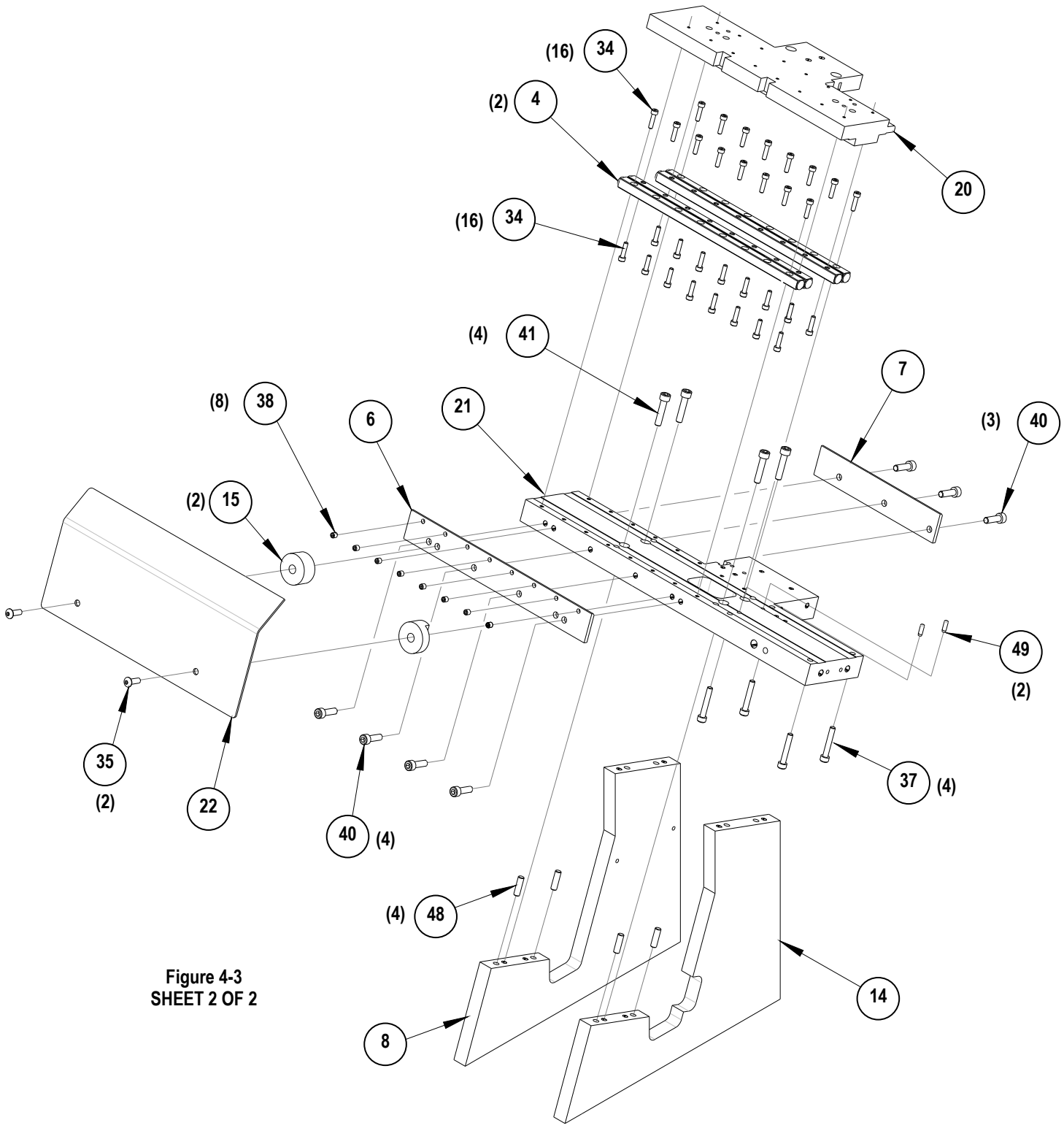


Figure 4-3
SHEET 2 OF 2

Crimp Parts List

Crimp Assembly Figure 4-4					
Item	**Order No**	**Engineering No.**	**Description**	**RSP / PP Parts and Notes**	**Quantity**
1	11-31-0147	AM60510-3	Insertion Cylinder	**RSP**	1
2	11-31-0150	AM60510-6	Nest Step Cylinder	**RSP**	1
3	11-31-0151	AM60510-7	Pawl Release Cylinder	**RSP**	1
4	11-31-0152	AM60510-8	Main Nest Return Cylinder	**RSP**	1
5	11-31-0154	AM60510-10	Cylinder Bracket		1
6	11-31-0155	AM60510-11	Cylinder Bracket		2
7	11-31-0418	AM60510-57	Termination Punch	**PP**	1
8	11-31-0419	AM60510-58	Crimp Punch	**PP**	1
9	11-31-1219	AM60520-1	Insertion Bar		1
10	11-31-1220	AM60520-2	Insertion Slide		1
11	11-31-1221	AM60520-3	End Cover		1
12	11-31-1439	AM60510-117	Pawl Release Guard		1
13	11-31-1728	AM60510-24	Nest Spacer		2
14	11-31-1729	AM60510-25	Insertion Guide		2
15	11-31-1735	AM60510-31	Compression Spring		2
16	11-31-1746	AM60510-42	Ratchet Pawl		2
17	11-31-1748	AM60510-44	Stationary Pawl Guide		1
18	11-31-1749	AM60510-45	Sliding Pawl Guide		1
19	11-31-1750	AM60510-46	Pawl Slide Cover		1
20	11-31-1751	AM60510-47	Pawl Slide Link		1
21	11-31-1752	AM60510-48	Pawl Retract		1
22	11-31-1753	AM60510-49	Ratchet Pawl Track		1
23	11-31-1758	AM60510-54	Termination Slide		1
24	11-31-1761	AM60510-59	Termination Head Cover		1
25	11-31-1783	AM60510-82	Insertion Guard		1
26	11-31-1917	R8432-40	Exhaust Muffler (1/8 NPT)		1
27	11-31-4548	AM60570-41	Ratchet		1
28	11-31-4537	AM60570-20	Nest		1
29	11-31-4540	AM60570-23	Nest Cover		1
30	11-31-4541	AM60570-30	Housing Aligner		1
31	11-31-4542	AM60570-32	Termination Anvil	**PP**	1
32	11-31-4543	AM60570-33	Carrier Guide		1
33	11-31-5302	AM60510-122	Nest Clearing Tool	Not Shown	1
34	11-31-7464	AM60510-28	Rod Aligner		1
Hardware					
35	N/A	N/A	#4-40 by 3/16“ Long SSS		1**
36	N/A	N/A	#6-32 by 1/4“ Long BHCS		2**
37	N/A	N/A	#8-32 by 1/4“ Long SHCS		4**
38	N/A	N/A	#8-32 by 3/8“ Long SHCS		10**
39	N/A	N/A	#8-32 by 5/8“ Long SHCS		8**
40	N/A	N/A	#8-32 by 1-1/4“ Long SHCS		2**
41	N/A	N/A	#8-32 by 1/2“ Long SSS		1**
42	N/A	N/A	#10-32 by 1/2“ Long SHCS		1**
43	N/A	N/A	#10-32 by 3/4“ Long FHCS		2**
44	N/A	N/A	#10-32 by 3/4“ Long SHCS		2**
45	N/A	N/A	#10-32 by 1-1/4“ Long SHCS		2**
46	N/A	N/A	#10-32 by 2“ Long SHCS		4**
47	N/A	N/A	#1/4-20 by 1“ Long SHCS		4**
48	N/A	N/A	#5/16-18 by 1“ Long SHCS		2**
49	N/A	N/A	#3/8-18 by 1“ Long SHCS		1**
50	N/A	N/A	#1/8 by 3/8” Long Dowel Pin		2**

Crimp Assembly Figure 4-4					
Item	**Order No**	**Engineering No.**	**Description**	**RSP / PP Parts and Notes**	**Quantity**
51	N/A	N/A	#1/8 by 5/8" Long Dowel Pin		8**
52	N/A	N/A	#1/8 by 1" Long Dowel Pin		2**
53	N/A	N/A	#1/8 by 1-1/2" Long Dowel Pin		4**
RSP - Part is a Molex Recommended Spare Part.					
PP - Part is a Perishable Part.					
** Available from an industrial supply company such as MSC (1-800-645-7270).					

Crimp Assembly

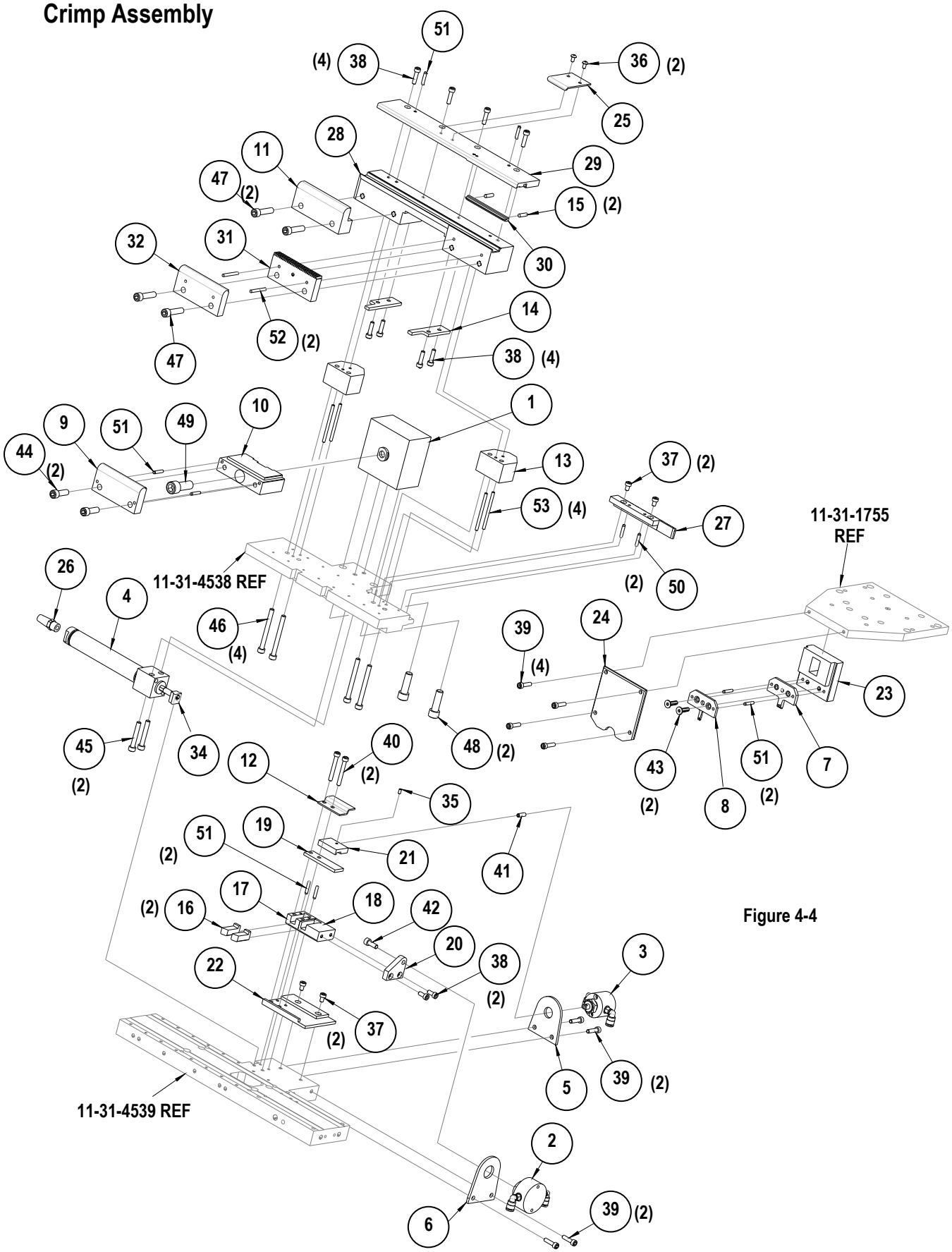


Figure 4-4

Feed Parts List

Feed Assembly Figure 4-5 and 4-6					
Item	**Order No**	**Engineering No.**	**Description**	**RSP / PP Parts and notes**	**Quantity**
1	11-21-5835	AM8230-29	Feeder Arm Bushing		1
2	11-31-0146	AM60510-2	Connector Shuttle Cylinder	**RSP**	1
3	11-31-0153	AM60510-9	Mounting Bracket		2
4	11-31-0256	AM60510-16	Knob		1
5	11-31-1222	AM60520-5	Knob-Shift Rod		1
6	11-31-1223	AM60520-6	Guide Block, Shift Rod		1
7	11-31-1224	AM60520-7	Bearing, Shift Rod		1
8	11-31-1226	AM60520-8	Valve Bracket		1
9	11-31-1229	AM60520-12	Push Button 2-Way Valve		1
10	11-31-1233	AM60520-4	Shift Rod		1
11	11-31-1743	AM60510-39	Shuttle Adjustment Indicator		1
12	11-31-1762	AM60510-61	Shift Base		1
13	11-31-1763	AM60510-62	Left Spacer		1
14	11-31-1764	AM60510-63	Right Spacer		1
15	11-31-1765	AM60510-64	Shift Nest		1
16	11-31-1766	AM60510-65	Shift Guide		1
17	11-31-1767	AM60510-66	Shift Guide Rt.		1
18	11-31-1768	AM60510-67	Shift Nest Cover		1
19	11-31-1769	AM60510-68	Stop Cart. Feed		1
20	11-31-1770	AM60510-69	Shift Nest Bracket		1
21	11-31-1771	AM60510-61	Shift Stop		1
22	11-31-1773	AM60510-73	Shuttle Cylinder Stop		1
23	11-31-1774	AM60510-75	Adjustable Shuttle Stop		1
24	11-31-1776	AM60510-76	Cartridge Holder		1
25	11-31-1777	AM60510-77	Shuttle Blade		1
26	11-31-1778	AM60510-78	Shuttle Arm		1
27	11-31-1779	AM60510-79	Shuttle Guide		2
28	11-31-1780	AM60510-81	End Shuttle Guard		1
29	11-31-1782	AM60510-73	Front Shuttle Guard		1
30	11-31-1785	AM60510-84	Rear Shuttle Guard		1
31	11-31-1786	AM60510-85	Sensor Bracket		2
32	11-31-1789	AM60510-88	Sensor Flag		1
33	11-31-1797	AM60510-96	Terminal Feed Guide		1
34	11-31-1799	AM60510-98	Housing Shift Guard		1
35	11-31-1800	AM60510-111	Guard Mount		1
36	11-31-1803	AM60510-114	Shuttle Adjustment Scale		1
37	11-31-3116	AM60510-119	Shuttle Adjustment Base		1
38	11-31-3117	AM60510-120	Fine Adjustment Pad		1
39	11-31-7475	AM60510-126	Bushing		1
40	11-31-7476	AM60510-127	Washer		1
41	11-31-7722	AM60510-128	Shuttle Cylinder Stop Guide		1
42	62300-3101	62300-3101	GPS Tube Rest		1
43	62500-0816	62500-0816	Filter Regulator		1
44	66801-5187	66801-5187	8mm Proximity Switch, 10-30vdc NPN, 1.5mm Sensing Range		3
Hardware					
45	N/A	N/A	#6-32 by 3/8“ Long SHCS		9**
46	N/A	N/A	#6-32 by 3/8“ Long SSS		1**
47	N/A	N/A	#8-32 by 1/4“ Long BHCS		2**
48	N/A	N/A	#8-32 by 1/2“ Long BHCS		2**
49	N/A	N/A	#8-32 by 3/8“ Long FHCS		2**
50	N/A	N/A	#8-32 by 1/2“ Long SHCS		6*

Feed Assembly Figure 4-5 and 4-6					
Item	**Order No**	**Engineering No.**	**Description**	**RSP / PP Parts and notes**	**Quantity**
51	N/A	N/A	#8-32 by 5/8“ Long SHCS		8**
52	N/A	N/A	#8-32 by 1.0“ Long SHCS		2**
53	N/A	N/A	#8-32 Thumb Screw		1**
54	N/A	N/A	#10-32 by 1/4“ Long BHCS		4**
55	N/A	N/A	#10-32 by 3/8“ Long BHCS		2**
56	N/A	N/A	#10-32 by 1/2“ Long BHCS		4**
57	N/A	N/A	#10-32 by 3/8“ Long SHCS		2**
58	N/A	N/A	#10-32 by 1/2“ Long SHCS		1**
59	N/A	N/A	#10-32 by 5/8“ Long SHCS		2**
60	N/A	N/A	#10-32 by 3/4“ Long SHCS		7**
61	N/A	N/A	#10-32 by 1/2“ Long SSS		3**
62	N/A	N/A	#10-32 by 1/8“ THK Hex Jam Nut		3**
63	N/A	N/A	#10-32 by 11/16“ THK Lock Nut		2**
64	N/A	N/A	#10-32 Flat Washer		1**
65	N/A	N/A	#1/4-20 by 3/4“ Long BHCS		2**
66	N/A	N/A	#3/32 by 1.0” Long Dowel Pin		1**
67	N/A	N/A	#1/8 by 1/4” Long Dowel Pin		11**
68	N/A	N/A	#1/8 by 3/4” Long Dowel Pin		8**
69	N/A	N/A	#1/8 by 1.0” Long Dowel Pin		4**
70	N/A	N/A	#3/16 by 3/8” Long Dowel Pin		1**
RSP - Part is a Molex Recommended Spare Part.					
PP - Part is a Perishable Part.					
** Available from an industrial supply company such as MSC (1-800-645-7270).					

Feed Assembly (Sheet 1 of 2)

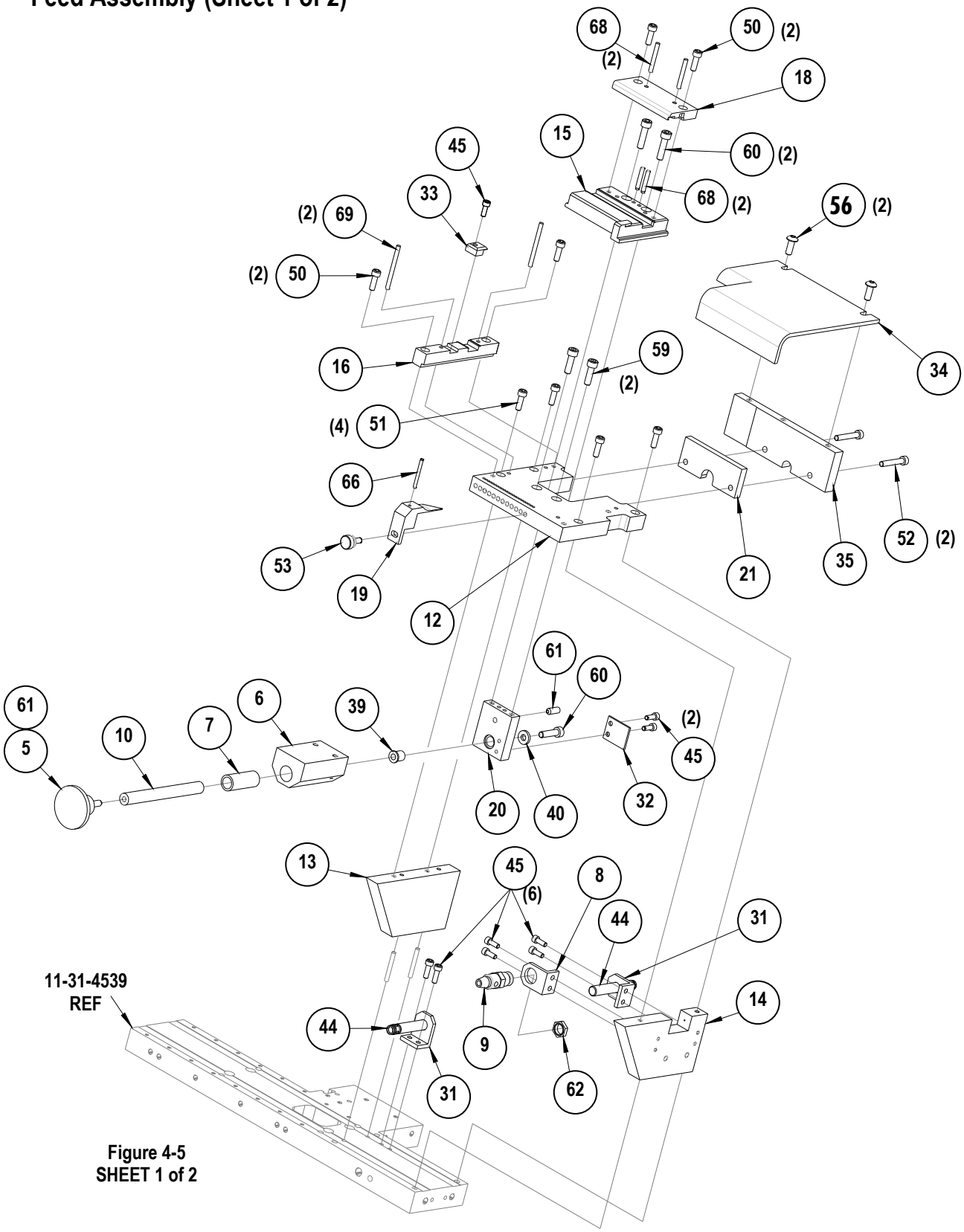


Figure 4-5
SHEET 1 of 2

Feed Assembly (Sheet 2 of 2)

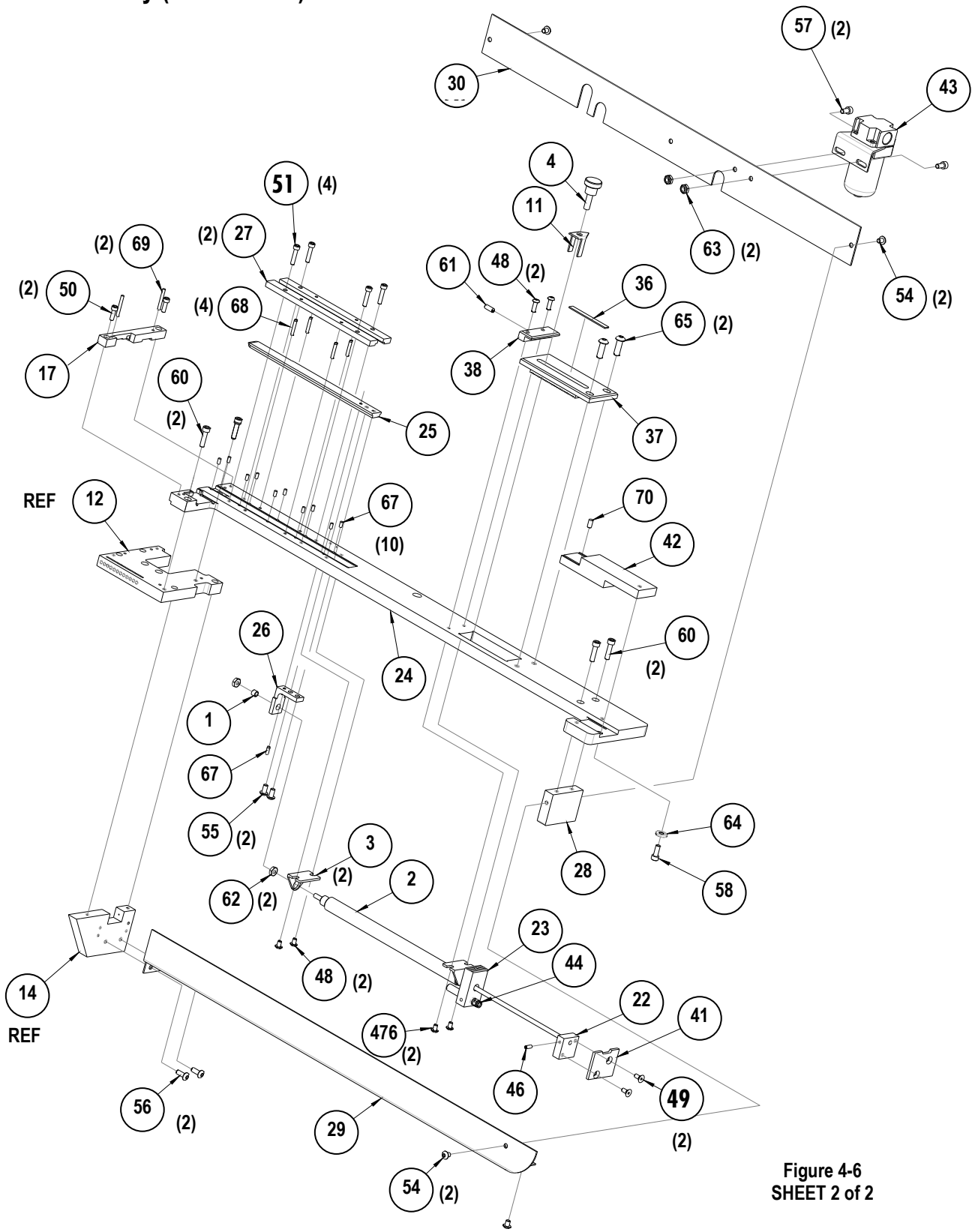


Figure 4-6
SHEET 2 of 2

4.1 Control Box Parts List

62300-6510 Control Box Assembly Figure 4-7				
Item	**Order No**	**Engineering No.**	**Description**	**Quantity**
1	11-31-8646	AM60585-E204	LED Red 28 VDC 3/8 OD, Cylindrical Cap	1
2	11-41-0264	KM241	Molex 3" diameter Logo (red on white)	1
3	62500-0667	62500-0667	Ring Ferrite	1
4	62500-0694	62500-0694	Terminal Block, Dbl Pos. Jumperable	10
5	62500-0721	62500-0721	Jumper For 4mm Wago Term Block	4
6	62500-0762	62500-0762	Resettable, Or Non-Resettable, 8 Digits Counter	1
7	62500-1023	62500-1023	Din Rail 6 inches	1
8	62500-1055	62500-1055	Micro-Dc Series 4 Pin Female,22awg W/12" Leads Receptacle	1
9	62500-1330	62500-1330	Cord Grip 0.20-0.47 by 1/2NPT Plastic	1
10	62500-1331	62500-1331	Cord Grip 0.35-0.71 by 3/4NPT Plastic	1
11	62500-1382	62500-1382	Homerun Straight Conn X 2m Long Black Conn/Cable	1
12	62500-1519	62500-1519	Terminal Ground Block, Top Wire, 3 Conductor, 24-12 Awg	1
13	62500-1620	62500-1620	Plate Separator For 279 Terminal Blocks, Orange Oversized	3
14	62500-2324	62500-2324	Cord Plug, 15 Amp	1
15	62500-2361	62500-2361	Cable W/Con M8 Straight Single Ended X 4m Long	3
16	62500-2362	62500-2362	Cable W/Con M8 Rt. Angle Single Ended by 4m Long Black Cable	1
17	62500-2366	62500-2366	Breaker 4 Amp Single Pole	1
18	62500-2523	62500-2523	10"H By 8"W By 6" Deep Hinge Cover Box Rla7035 Enclosure	1
19	62500-2527	62500-2527	Subpanel For Jb100806hc Enclosure	1
20	62500-2812	62500-2812	E-Stop, Illuminated (1) N.O. (2) N.C. Switch	1
21	62500-2813	62500-2813	M22-K10 Block N.0. Contact Block For M22 Series PB's	1
22	62500-2816	62500-2816	Illuminated PB Green Flush Type, 24vdc Led (1) N.O Switch	1
23	62500-2819	62500-2819	24vdc,30watt Supply	1
24	62500-2823	62500-2823	1.5mfd @400vdc Capacitor	1
25	62500-2826	62500-2826	Non-Illum. Flush Black Mom. (1) N.O. Switch	1
26	62500-2832	62500-2832	Relay DPDT 24vdc, (2) Form "C", 8amp Contacts	1
27	62500-2964	62500-2964	Overlay for am60520 hawk control	1
28	62500-2965	62500-2965	12 Dc In 8 Trans Out, 24vdc Input Supply, 13watts	1
29	63800-8394	63800-8394	Foot Switch Assembly	1
30	66801-5293	66801-5293	6mm End Stop	2
31	66801-5318	66801-5318	Omron TW Switch	2
32	66801-5319	66801-5319	Omron TW End Plate Switch	1

Control Box Assembly

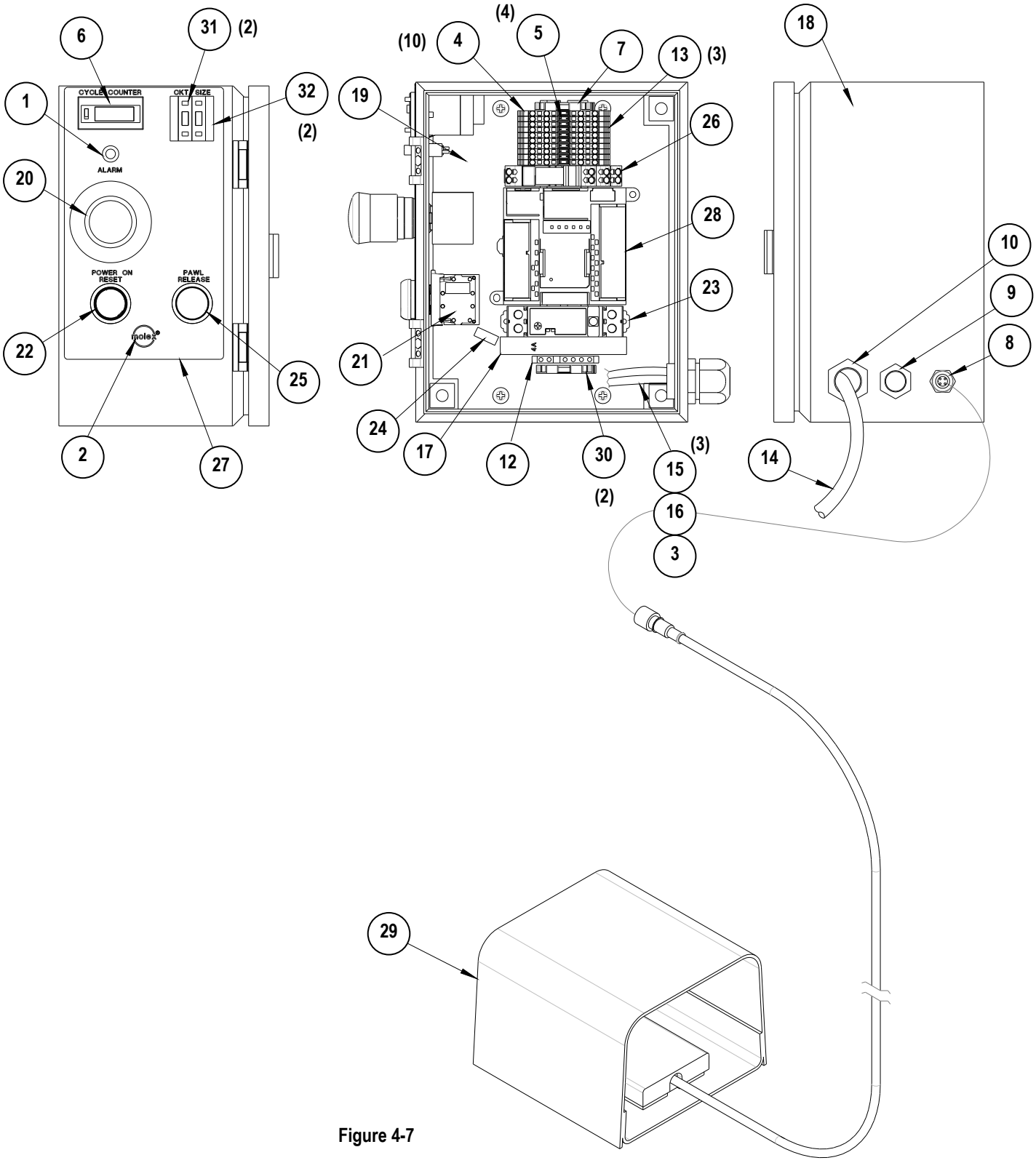


Figure 4-7

62300-6520 Miscellaneous Electrical Control Box Assembly Figure 4-8				
Item	**Order No**	**Engineering No.**	**Description**	**Quantity**
1	11-31-1229	AM60520-12	Valve 2-Way	See Figure 4-5
2	62500-0816	62500-0816	Micromist Seperator,1/4", .01 Micron Filtration	See Figure 4-6
3	62500-2025	62500-2025	J-Box 8 Port Picofast, 3-Pin Snap Lock, No LEDS	1
4	62500-2045	62500-2045	Blank Plate For SY5000 Series Valves On Bar Stock Manifold	1
5	62500-2056	62500-2056	SMC AI20-02b-2 Lubricator 2000 Series	See Figure 4-2
6	62500-2124	62500-2124	Spacer Individual Supply, For SS5Y Manifolds	2
7	62500-2192	62500-2192	Manifold Bar Stock, 6 Station For Sy5100 Valves	1
8	62500-2607	62500-2607	Valve Single Solenoid W/Integrated M8 Pico Connector	5
9	62500-2610	62500-2610	Valve Single Solenoid W/Integrated M8 Pico Connector	1
10	62500-2699	62500-2699	Cable M8 Pico Right Angle, For SMC SV Valves .5m Long	5
11	62500-2762	62500-2762	1/4" BSPT by 1 1/2" Long Pipe Nipple, Brass	(1)See also Figure 4-2
12	62500-2820	62500-2820	Filter/Regulator 2000 Series Combo With Built In Gauge	See Figure 4-2
13	62500-2861	62500-2861	Regulator 0-30ps1, 1/8 NPT Ports, Self Relieving	See Figure 4-2
14	66801-5187	66801-5187	8mm Proximity Switch, 10-30vdc NPN, 1.5mm Sensing Range	See Figure 4-5 and 4-6

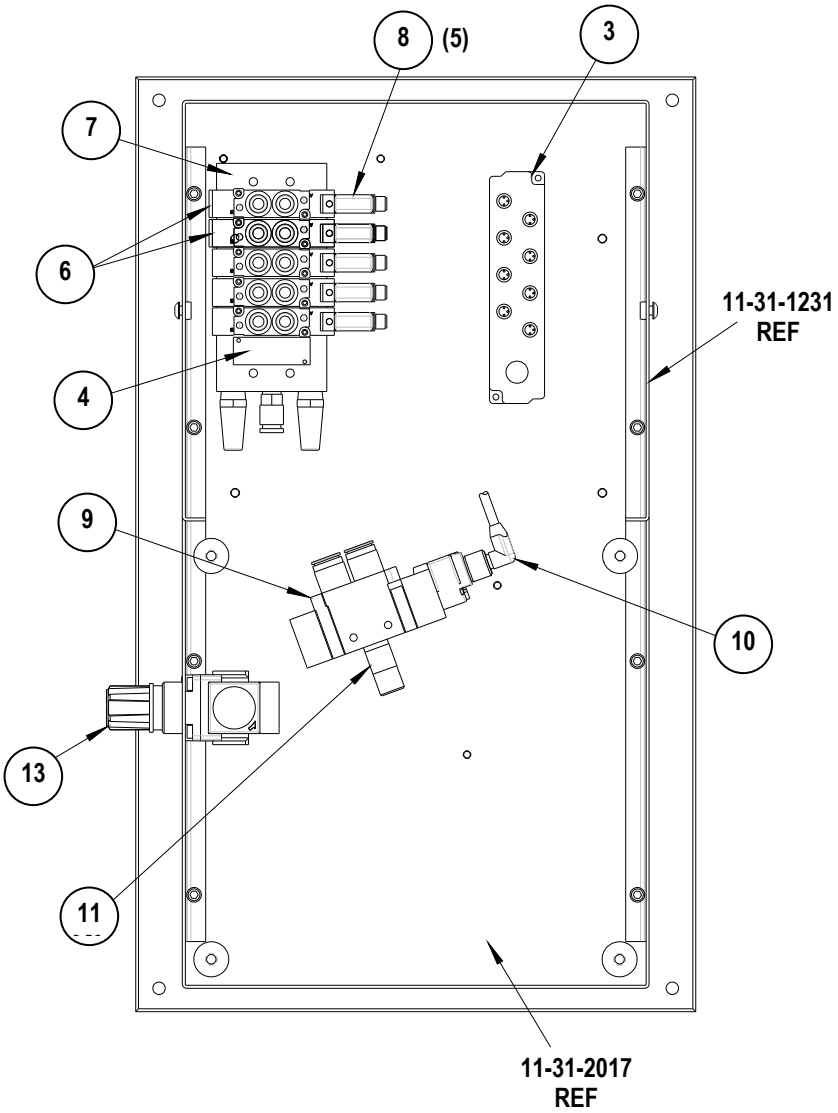
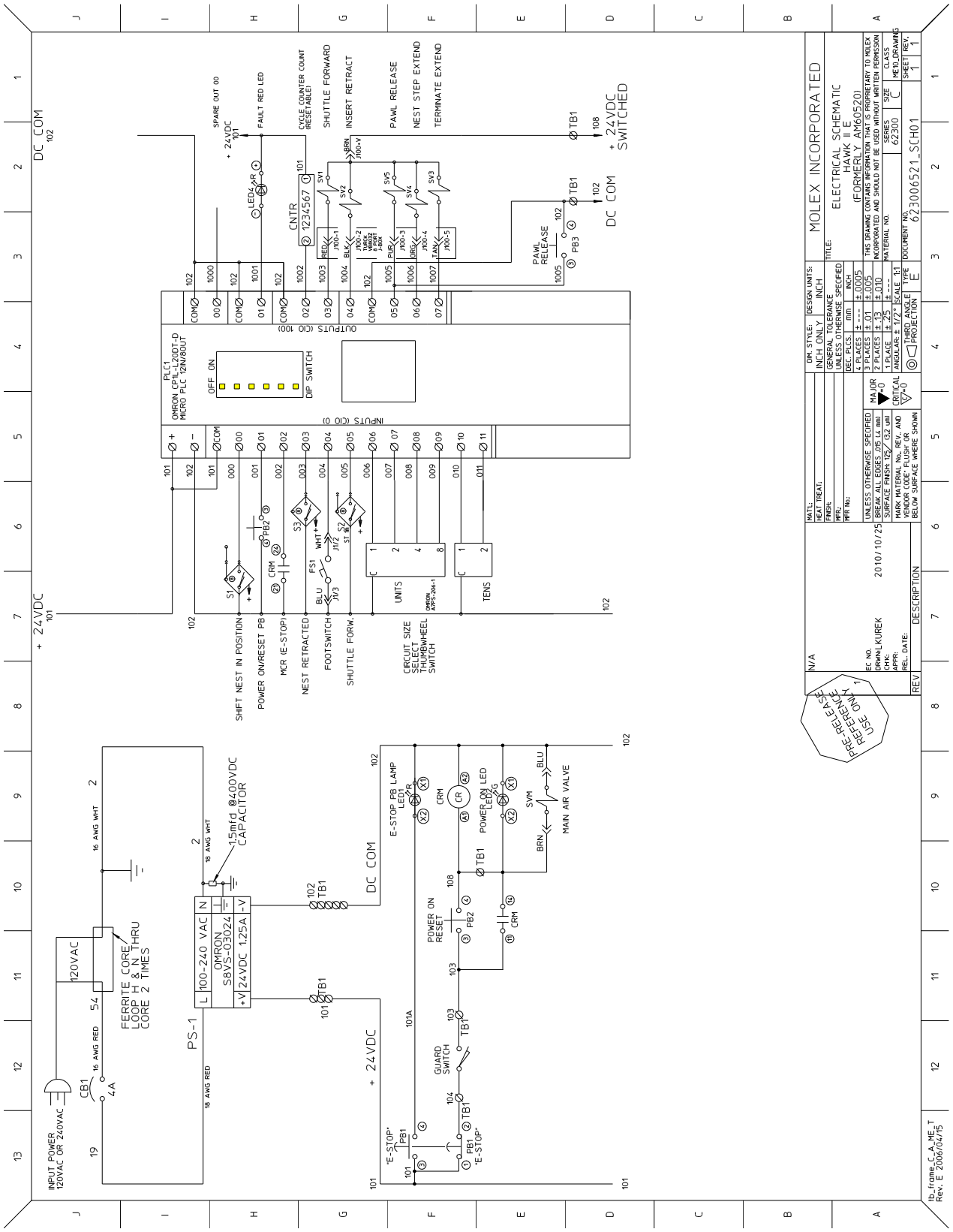
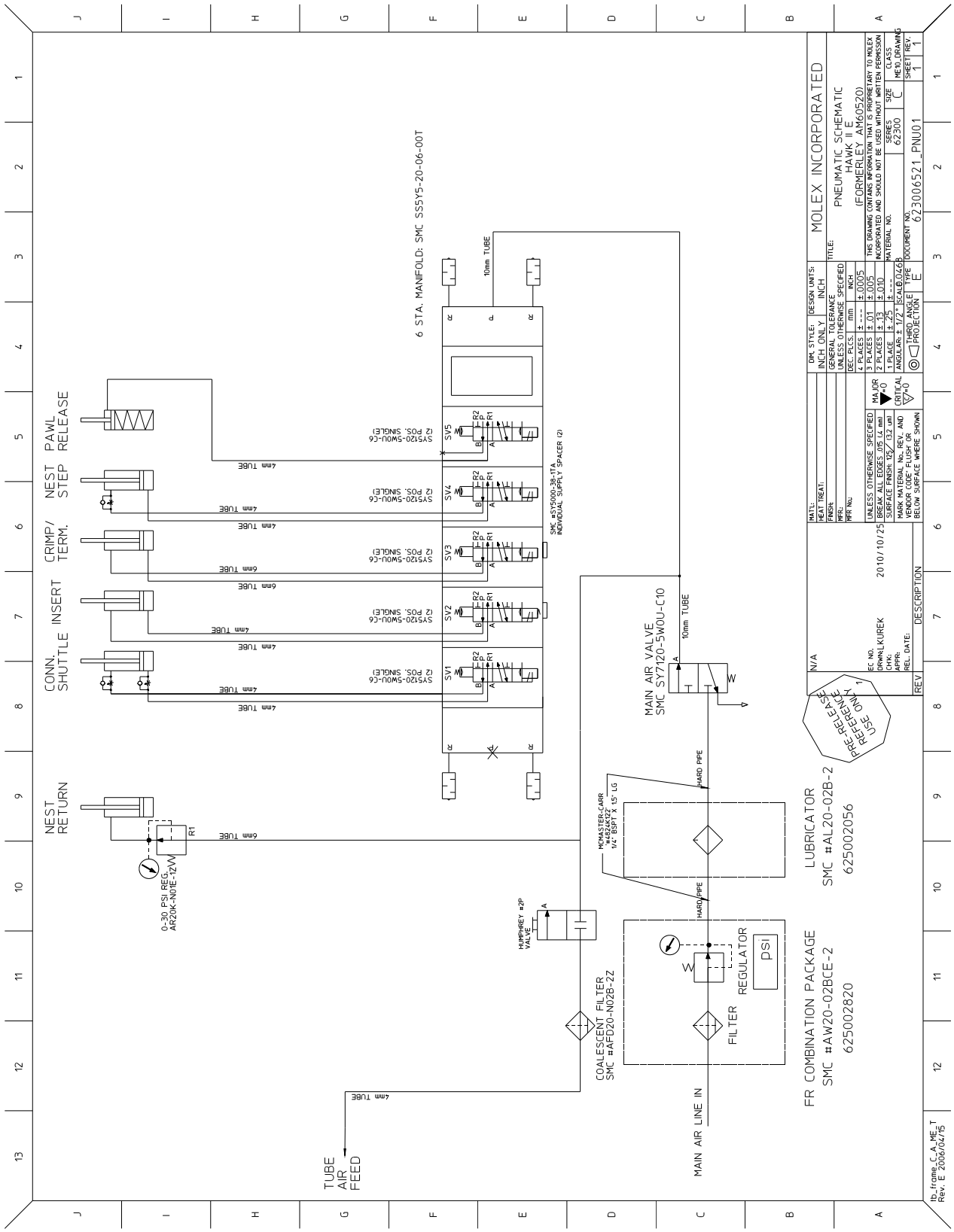


Figure 4-8

4.2 Electrical Schematic



4.3 Pneumatic Drawing



Section 5

GLOSSARY OF TERMS

Carrier A metal strip that temporarily holds the terminals together on a reel. It must be removed upon completion of an assembly.

Circuit Size The number of terminals/pins in the assembly which represents the number of electrical circuits the connector can transmit/carry

Crimp A controlled-dynamic process and method of mechanical bonding, i.e., a connector-to-conductor termination where one end of the connector (containing the conductor or wire positioned in a crimp barrel) is highly compressed and deformed (connector + conductor together) in order to create an interface that "bonds" the two dissimilar metals (usually different materials for the connector and conductor, respectively) intimately together.
On crimped terminal, a second crimp is often added to the insulation area for added strain relief.

Discrete Wire A single cable or wire. Contrast it to ribbon cable, which consists of multiple cables or wires.

Housing A device, usually plastic, used to contain and insulate electrical contacts. Also used for mating or locking with a specified mating connector. Housings are also called shells.

Insertion Pushing terminals into the housing.

IDT It means Insulation Displacement Technology. A termination method in which insulated wire is forced into a slot smaller in width than the diameter of the conductor. The sharp edges of the slot displace the insulation and make a permanent electrical interface between the wire conductor and the walls of the slot.

Nest Part of a crimping die set that provides the location and support for the terminal barrel as it is being deformed into the desired crimp configuration by the indentor.

Pawl A spring loaded device which moves and holds the nest during termination.

Punch The tooling piece that crimps or terminates wires to terminals.

Sensor An electrical non-contact switch that detects the presence of metal moving into its field and signals the machine control.

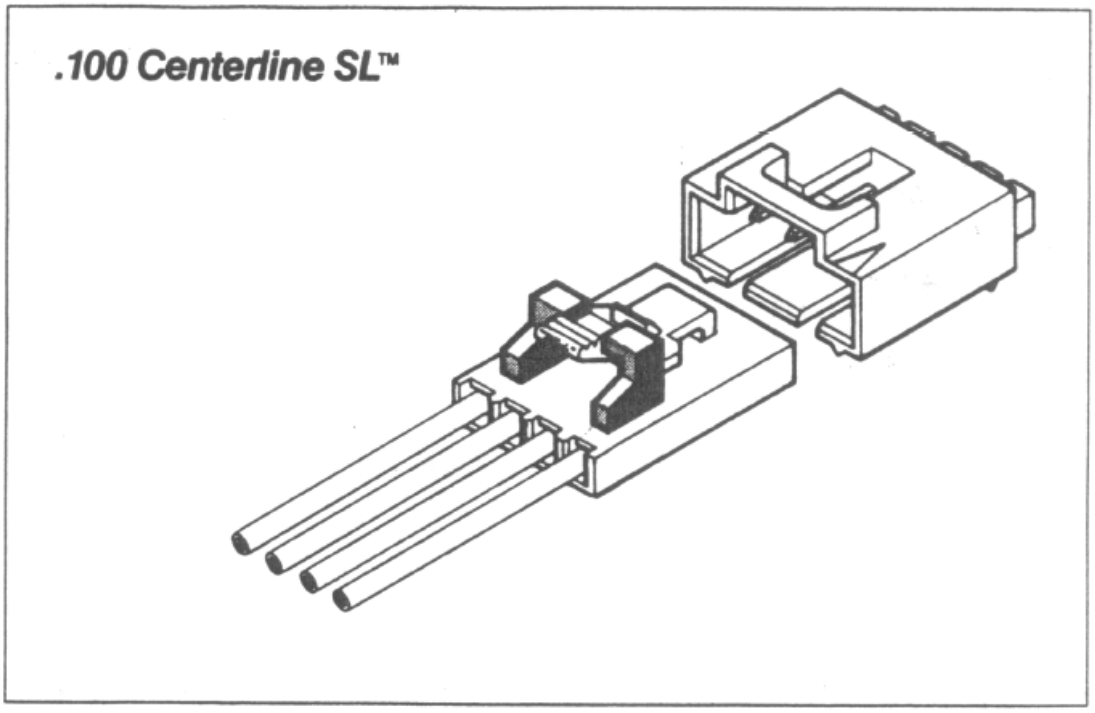
Terminal A device designed to terminate a conductor that is to be affixed to a post, stud, chassis, or other conductor, to establish an electrical connection. It is a synonym for contact.

Termination The process of attaching a wire(s) to a terminal(s).

Termination Head The part of the machine that holds the crimp and termination punches and terminates the wires.

Appendix A

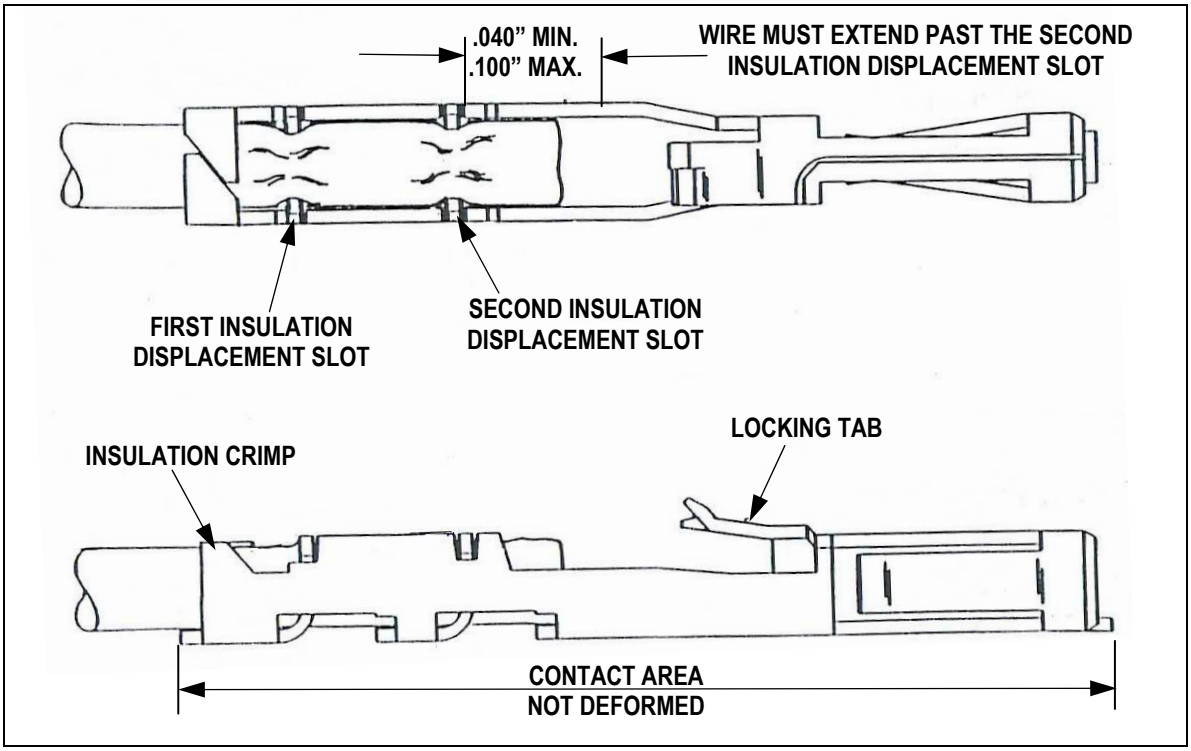
Termination Information

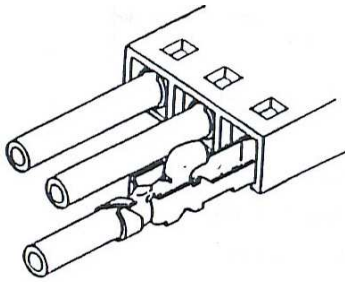
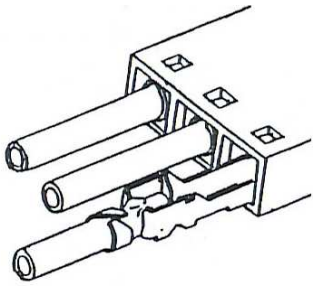
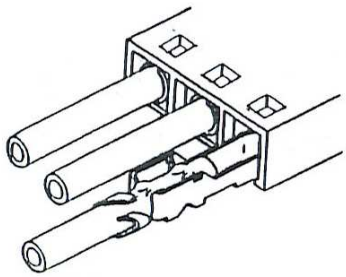
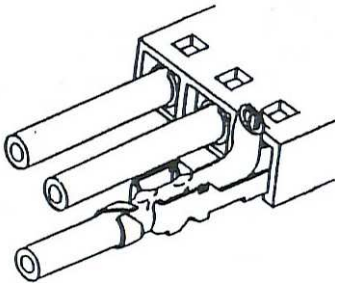


NOTE: The following document is uncontrolled and may not be the latest revision.
For the latest product specifications and product drawings (SDES-70400), contact Molex or visit our Web site at http://www.molex.com.

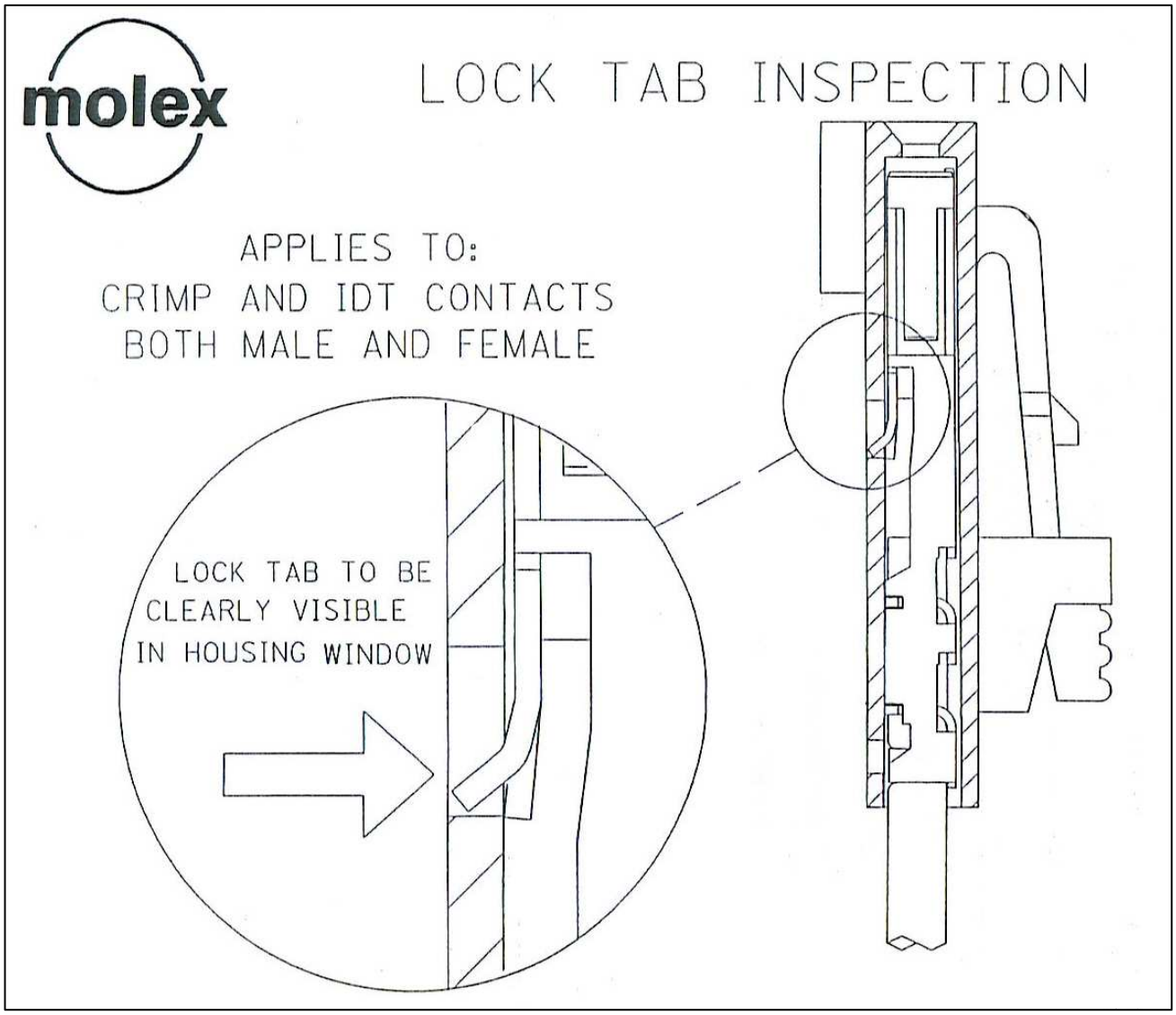
SL IDT CONTACT INSPECTION

(Applies to both male and female terminals



SL IDT INSPECTION BAD TERMINATIONS	
Wire Not Seated In Second Insulation Displacement Slot 	 **Wire Too Short**
One or Both Insulation Crimp Tabs are Not Folded Around the Wire Insulation 	 **Wire Too Long**

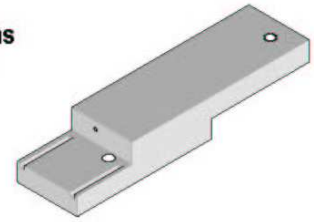
LOCKING TAB INSPECTION



Appendix B
Options

Instruction Sheet for Tube Rest Adaptor

SL / IDT Termination Machine Conversions
For Molex Global Packaging Standard
Instruction Sheet
Order No. 62300-3101



FEATURES

- An adapter to accommodate global standard tubes.

SCOPE

In 2000, the length of the SL / IDT connector packaging tube has change from 633.7mm (24.95") to 560.0 mm (22.05"). A conversion part no. 62300-3101 will be required and supplied at *no charge* upon request for the "Hawk" termination machines with the following order numbers:

Order No	Engineering No.	Order No	Engineering No.	Order No	Engineering No.
11-20-0781	AM-60510	11-20-1148	AM-60510US	11-20-1305	AM-60510E
11-20-0853	AM-60520	11-20-1185	AM-60520EC	11-20-1337	AM-60510EU
11-20-0908	AM-60560	11-20-1197	AM-60520EU	11-20-1356	AM-60560U
11-20-0949	AM-60520E	11-20-1223	AM-60510A	62300-3100	62300-3100
				62300-4900	62300-4900

Installation:

1. Remove the air line and the fitting from the air nozzle, order no. 11-31-1772 (AM60510-71).
2. Remove the #10-32 socket head screw that holds the air nozzle to the tube holder from below.
3. Remove the air nozzle. See Figure 1.
4. Install the tube support order no.62300-3101 where the air nozzle was located and fasten with the #10-32 screw and the nut provided with this kit.
5. Re install the air line in the tapped hole located on the lower surface of the tube support.

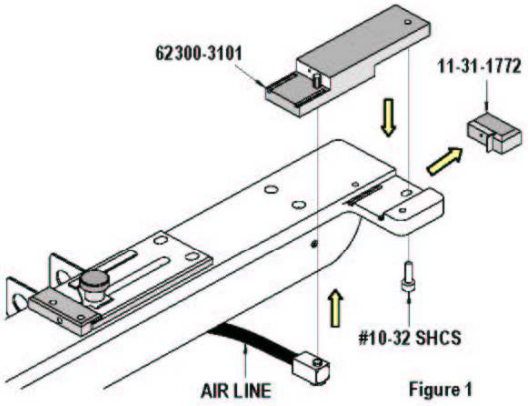


Figure 1

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