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# **L4 Handgun Hose Assembly**

## **Product Manual**

Manual Number: 19600-110



**1-800-642-7876**

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Manual Number: 19600-110

Date: 7/30/09

230 VAC models are  
certified for use in countries  
requiring the CE mark.



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# 1 Safety Precautions for Hot Melt Applicator Equipment

This manual contains important safety information and instructions. Failure to comply with these instructions can result in death, injury or permanent damage to this equipment and will void the warranty.

## 1.1 Intended Use

This equipment is designed for use with standard adhesive and sealant materials with flash points above 232 °C (450 °F). Use of flammable material or material not compatible with the specifications of this equipment can cause injury to operator and damage to equipment.

The manufacturer has designed this equipment for safe operation. Specified models are in compliance with EN 60204-1:1997. However, heated thermoplastics and other hot melt materials are dangerous and care must be exercised to ensure operational safety. Handling must be in accordance with hot melt manufacturer specifications. Never exceed the maximum application temperature recommended by the adhesive manufacturer.

Dispose of hot melt properly. Refer to the Materials Safety Data Sheet (MSDS) of the hot melt for recommended disposal methods.

## 1.2 Personal Safety



**Wear Safety Goggles**



**Wear Heat-Resistant Safety Gloves**



**Wear Protective Clothing**

Wear the following protection when working on or around this equipment:

Always wear heat resistant gloves rated to 205 °C (400 °F) and allow all system temperatures to stabilize below 193 °C (380 °F) before servicing. Properly ventilate equipment according to MSDS of equipment.

Trained operators and service technicians should be aware of exposed surfaces of the unit that cannot be practically safeguarded. These exposed surfaces may be hot and take time to cool after the unit has been operating.

Keep parts of the body away from rotating parts. Do not wear loose articles of clothing when operating or servicing units with rotating parts. Remove wristwatches, rings, necklaces, or other jewelry and cover or pin up long hair before performing any work on or with the unit.

Trained operators may perform only external equipment adjustments. Trained service technicians must perform internal adjustments and service.

## 1.3 Electrical Safety

Determine voltage of this equipment before installation and confirm compatibility with available power. Equipment must be connected to a properly grounded circuit and installed in accordance with all applicable electrical codes. Ground fault protection must be provided in supply circuitry at site installation.

Models designed to EN60204-1: 1997 require power cords be approved to a harmonized (HAR) standard and rated for 70 °C (158 °F). A HAR approved Type B plug and strain relief for power cord are required to meet standard IEC 309. Power conducting wires must be nominal 5.3 mm<sup>2</sup> (10 AWG) maximum and nominal 2.1 mm<sup>2</sup> (14 AWG) minimum.

## 1.4 Emergency Power Disconnect

In the event of a malfunction, turn off power to the equipment at the power off switch and remove source power to the system at the nearest main disconnect.

## 1.5 Follow Directions

Read the product manual thoroughly before installation, operation or maintenance. Failure to do so can result in a serious accident or equipment malfunction. **The manufacturer will not be held liable for injuries or damage caused by misuse of this equipment.**

## 1.6 Safety Symbols and Signal Words

The following safety symbols and signal words are used throughout the manual and on the product to alert the reader and operator to personal safety hazards or to identify conditions that may result in equipment or property damage.

### General Safety Symbols



**DANGER:** Indicates a hazard, which, if not avoided, will result in serious injury, including death, or equipment and property damage.



**WARNING:** Indicates a hazard, which, if not avoided, can result in serious injury, or equipment and property damage.



**CAUTION:** Indicates a hazard, which, if not avoided, can result in minor injury, or equipment and property damage.

### Specific Symbols and Signal Words



**DANGER:** High Voltage. Can cause serious injury, including death. Disconnect electrical power at external source before servicing.



**WARNING:** Hot Surface. Can cause serious injury and burns. Wear heat resistant clothing, gloves and safety goggles.



**WARNING:** Disconnect electrical power at external source. Failure to do so can cause electrical shock.



**WARNING:** High Pressure. System contents under pressure. Can cause serious injury and burns or equipment and property damage. Relieve pressure before servicing.

### Other Product Symbols



On



Off



Ground



Protective Earth



Tank



Heated Hose



Applicator



Pump Motor



Set Temp



Standby Temp



Overtemp



Adhesive Flow



Tank Heater



Alarm



Actual Temp



Source Power



Valve Group



Manual Task



Input



Output

The manufacturer reserves the right to make design changes for product improvement. This manual may not reflect all details of these improvements.



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## 2 Introduction

### 2.1 Description

The L4 Handgun is a lightweight, manually operated extrusion applicator for hot melt adhesives and other thermoplastic materials. A flexible heated hose supplies hot melt adhesive from the melt unit to the handgun.

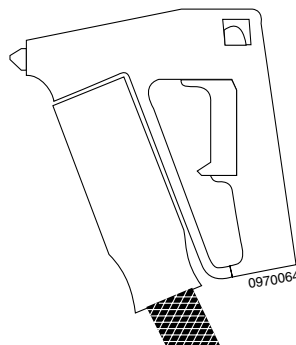
The L4 Handgun is a manually controlled valve that links the handgun trigger to a needle contained in the handgun body. A carbide ball tip seals against a matching seat at the end of the needle.

The L4 Handgun comes either “switched” or “unswitched”. The switched version has the pump motor control at the handgun trigger. The unswitched version has the pump motor control located on the melt unit control panel.

The L4 Handgun is also available in a high temperature model that comes equipped with o-rings rated for high continuous temperatures for more rigorous applications. This high temperature handgun is available in both the switched and unswitched versions of the L4 Handgun.

### 2.2 Features

- ☐ Continuous 360° rotation on unswitched version
- ☐ Up to 360° rotation for switched version
- ☐ Lightweight and maneuverable design
- ☐ Safety trigger lock
- ☐ Cool touch handle
- ☐ Thermostat or solid state temperature control models
- ☐ Various extrusion nozzles
- ☐ Available in 115 VAC and 230 VAC versions



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## 3 Specifications

### 3.1 Electrical

Input voltage -----	115 VAC
-----	230 VAC
Power requirements: Handgun --	80 W
Hose-----	2.4 m (8 ft), 200 W
-----	3.6 m (12 ft), 300 W
-----	4.9 m (16 ft), 400 W
Heater type: Handgun -----	Replaceable cartridge
Hose -----	Wire wound element
RTD type-----	100 ohm, platinum

### 3.2 Physical

Handgun weight-----	0.8 kg (1.75 lb)
Hose length and weight -----	2.4 m (8 ft)    2.25 kg (7.5 lb)
-----	3.6 m (12 ft)    3.40 kg (10.0 lb)
-----	4.9 m (16 ft)    4.50 kg (12.5 lb)

### 3.3 Performance

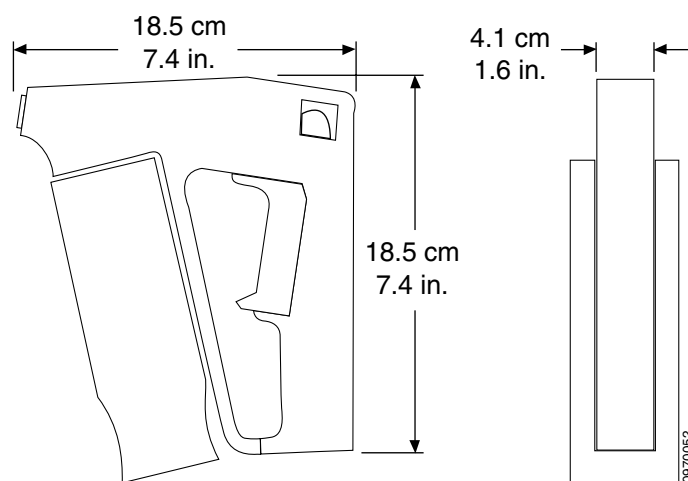
Operating pressure-----	10.34 kPa (500 psi) maximum
Warm-up time-----	30 – 45 minutes
Viscosity-----	Maximum 25,000 cps
Temperature control:	
Thermostat models:	
Handgun-----	Fixed bimetallic thermostat in gun. Values from 93-218 °C (200-425 °F)
Hose-----	Adjustable thermostat in melt unit with capillary bulb sensor in hose. Adjustable from 150-205 °C (300-400 °F)
Solid-state/RTD models:	
Handgun-----	RTD sensor in gun with controller in melt unit. Adjustable from 37-230 °C (100-450 °F)
Hose-----	RTD sensor in hose with controller in melt unit. Adjustable from 37-230 °C (100-450 °F)

### 3.4 Environmental

Operating temperature-----	37 – 230 °C (100 – 446 °F)
Storage temperature -----	-30 – 70 °C (-22 – 158 °F)

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### 3.5 Dimensions



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## 4 Installation

### 4.1 General

The L4 Handgun is shipped in one of three configurations:

#### ***Complete Hot Melt Applicator System***

The handgun is attached to the hose, and the hose is attached to the melt unit. No installation is required.

#### ***Spare Handgun Hose Assembly***

The handgun is attached to the hose. Installation requires attaching the input end of the hose to the melt unit, as indicated in melt unit product manual.

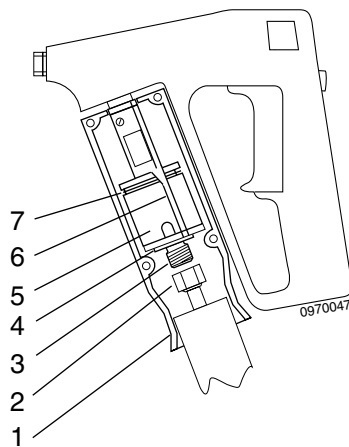
#### ***Spare Handgun without Hose***

Installation requires making fluid and electrical connections between the handgun and the hose.

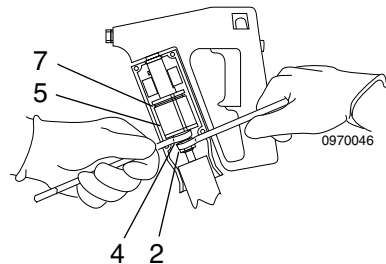
### 4.2 Inspection

1. Inspect the handgun and hose surfaces for possible shipping damage.
2. Retighten all electrical connections.
3. Remove all shipping materials and check for other loose material.

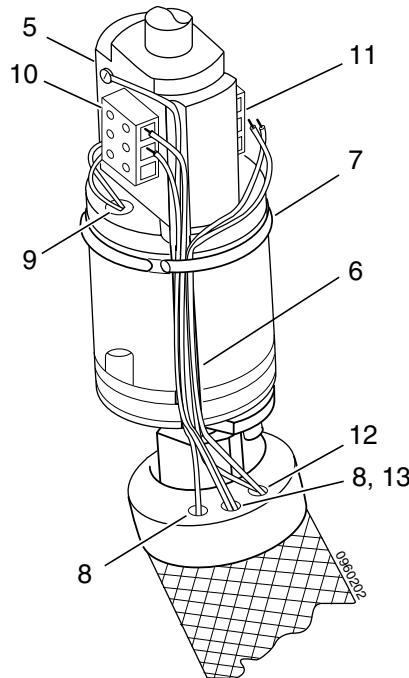
### 4.3 Fluid Connection – Hose to Handgun



1. Remove the pivot sleeve shell [1] by removing the 4 screws holding the shell halves together.
2. Rotate the pivot sleeve [5] so that the heater side faces up. The heater is larger in diameter than the RTD sensor.
3. Remove and discard the plastic cap on the swivel connector thread [3], and attach the hose fitting [2]. Tighten firmly.
4. Hold the wing [4] of the swivel connector with an open-end wrench across the flat portion, and tighten the hose fitting [2] with another open-end wrench.



## 4.4 Electrical Connection for RTD Version - Hose to Handgun



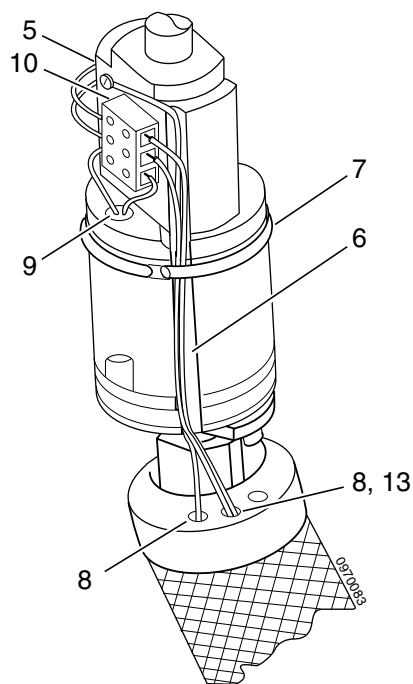
1. Thread the wire bundle from the hose under the wire retaining clip [7] on the pivot sleeve. Ensure wires lie flat in the wire channel [6].
2. Locate the 2 heater wires [8], (one is brown; one is either red, blue, or white), coming from the hose. Individually insert the heater wires into the vacant slots on the heater terminal block [10] opposite the wires going to the heater [9].
3. Secure the green/yellow ground wire [13] with the screw located on the pivot sleeve [5] above the heater terminal block [10]. The terminal lug must lie flat against the side of the pivot sleeve.
4. Locate the 2 RTD sensor wires [12], (black and white wires twisted together), from the hose. Individually insert the wires into the vacant slots in the terminal block [11] opposite the wires going to the RTD sensor.
5. Tuck the excess wire into the space between the hose cuff and the pivot sleeve as needed.



**WARNING:** Possible electric shock can occur if wires do not lie flat and side-by-side, not crossing each other within the channel. When replacing shells, exercise care to ensure wires are not pinched between the shells and pivot sleeve.

6. Place one pivot sleeve shell half [1] over the hose and pivot sleeve [5], and position the terminal blocks [10 and 11] into the shell.
7. Place the second pivot sleeve shell half [1] and secure it with the 4 screws.
8. On switched models, attach the cable assembly from the hose to the connector on the handgun handle.

#### ***4.5 Electrical Connection for Thermostat Version - Hose to Handgun***



1. Thread the wire bundle from the hose under the wire retaining clip [7] on the pivot sleeve. Ensure the wires lie flat in the wire channel [6]. See the previous page for additional illustrations.
2. Locate the 2 heater wires [8] (one is brown; one is either red, blue, or white), coming from the hose. Individually insert the heater wires into the vacant slots on the heater terminal block [10] opposite the wires going to the heater [9].
3. Secure the green/yellow ground wire [13] with the screw located on the pivot sleeve [5] above the heater terminal block [10]. The terminal lug must lie flat against the side of the pivot sleeve.
4. Tuck the excess wire into the space between the hose cuff and the pivot sleeve as needed.



**WARNING:** Possible electric shock can occur if wires do not lie flat and side-by-side, not crossing each other within the channel. When replacing shells, exercise care to ensure wires are not pinched between the shells and pivot sleeve.



5. Place one pivot sleeve shell half [1] over the hose and pivot sleeve [5] and position the terminal block [10] into the shell.
6. Place the second pivot sleeve shell half [1] and secure it with the 4 screws.
7. On switched models, attach the cable assembly from the hose to the connector on the handgun handle.

#### 4.6 Hose to Melt Unit Connection

To install the hose to the melt unit, see the appropriate melt unit manual.

- The fluid connection is made underneath the melt unit to the pump block or the manifold.
- The electrical connection is made by properly attaching the hose electrical connector to the melt unit electrical connector.

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## 5 Operation



**CAUTION:** To prevent inadvertent discharge during start-up, leave trigger safety in locked position until appropriate steps are performed in initial start-up procedure.



**CAUTION:** Do not operate hot melt system at pressures capable of causing the adhesive to extrude beyond 46 cm (18 in.) from the nozzle tip.



**CAUTION:** The system may retain pressure even when handgun trigger is released and pump motor is off.



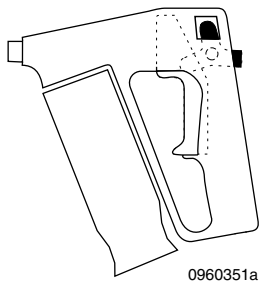
**DANGER:** Do not operate the handgun with its body shells removed or damaged. This gun contains voltages that can be fatal.

### 5.1 Setup and Initial Operation

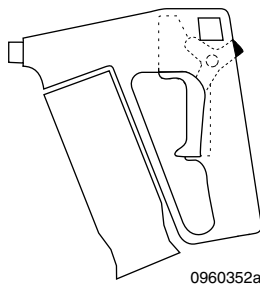
1. Start the system in accordance with the melt unit manual.
2. Unlock the trigger safety.
3. Quickly trigger the handgun to initiate adhesive flow.
4. Test adhesive pressure. Adhesive pressure should be as low as possible for the desired application. If exiting adhesive pressure is too great:
  - Decrease pump pressure at the melt unit flow control valve.
  - Change nozzle to a larger orifice size.
5. Begin operation.

## 5.2 Operation

Handgun Unlocked



Handgun Locked



### 5.2.1 Handgun Operation

1. Operate the melt unit according to the melt unit manual.
2. Warm the melt unit to operating temperature.
3. Turn the pump motor switch on before operating the handgun. On unswitched models, the pump is continuously on. On switched models, the pump is on and the system is pressurized only when the handgun trigger is pulled.
4. In the unlocked position, depress the handgun trigger to allow pressurized adhesive to flow out the nozzle.
5. Release the trigger to stop the adhesive flow.
6. Place the trigger safety in the locked position when the handgun is not in use to prevent inadvertent triggering.
7. Hang the handgun by the opening at the top of the gun handle. The trigger safety must be in the locked position.

### 5.2.2 Precautions to Prevent Equipment Damage

1. Do not trigger the handgun when it is cold. Damage to packing cartridge will result.
2. Never force a cold handgun to swivel before it is fully heated. This can destroy the swivel seal and cause the handgun to leak.
3. Use caution when rotating the handgun around the hose. On switched models, damage can result to the cord set between the hose and the handgun handle causing improper application.

## 5.3 System Shutdown

1. Shut down the system in accordance with the melt unit manual.
2. Place the handgun trigger safety in the locked position.
3. Hang the handgun by the hole in the handle.



**WARNING:** Never hang handgun by its trigger area. Hanging by its trigger area may cause accidental discharge resulting in burns.



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## 6 Maintenance



**DANGER:** Handgun contains electrical components with voltages that can be fatal. Disconnect electrical power from external source before performing maintenance.



**CAUTION:** Relieve system pressure before opening any fluid connection to prevent inadvertent contact with hot material.



**CAUTION:** Never heat any component of a hot melt system with a torch or other open flame. If necessary to heat a component for maintenance or repair, use an electric oven with forced air circulation or a flameless electric heat handgun. Do not heat plastic handgun shells above 230 °C (450 °F).



**WARNING:** Halogenated hydrocarbon solvents are dangerous when used to clean aluminum components in a pressurized fluid system. Halogenated hydrocarbon fluids include fluorocarbon solvents, chlorinated solvents, brominated solvents, and iodinated solvents. No available stabilizers prevent halogenated hydrocarbon solvents from reacting under all conditions with aluminum components in a pressurized fluid pumping system. Never clean any aluminum component or flush any pressurized system using halogenated hydrocarbon solvents. Use Type R Solvent or contact your solvent or adhesive supplier for a non-halogenated hydrocarbon solvent for cleaning and flushing (e.g., Strip-N-Clean®, P/N 11200-X).

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## 6.1 Preventive Maintenance

### 6.1.1 Daily Maintenance

1. Clean exposed surfaces to remove hot melt adhesive, which can char and cause erratic operation.

### 6.1.2 Semiannual Maintenance



**WARNING:** Vibration and heating/cooling cycles may loosen connections resulting in possible electric shock hazard or equipment damage.

#### *Handgun Inspection*

1. With handgun at operating temperature, disconnect electrical power from external source.
2. Turn off pump motor at melt unit.
3. Activate trigger to relieve trapped residual pressure.
4. Remove the pivot sleeve shell by removing the 4 screws.
5. Inspect wiring for signs of wear or damage to the insulation.
6. Check electrical and fluid connections for tightness.

#### *Nozzle Cleaning*



**CAUTION:** Do not heat Strip-N-Clean® solvent above 245 °C (475 °F) or with an open flame or in an uncontrolled heating device. Doing so creates a fire hazard. Use only a controlled heating device to heat the solvent above melting point of adhesive.



**CAUTION:** Failure to relieve system pressure can result in serious burns when nozzle is removed.



**SAFETY:** Solvents may present a toxic or fire hazard, even at room temperature. Use extreme care in selecting a cleaning solvent other than Type R solvent.

Nozzle clogging occurs when a filter screen is damaged or charred material is in hose or handgun. Char may occur if adhesive is heated above application temperature recommended by adhesive manufacturer. If this occurs, it may be necessary to clean or replace nozzle, hose, and/or handgun.

1. Raise handgun to operating temperature in accordance with melt unit manual.

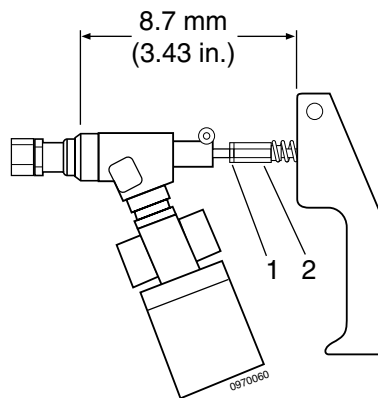
2. Turn off pump motor at melt unit.
3. Activate trigger to relieve any trapped residual pressure in system and place the handgun in the locked position.
4. Remove nozzle.
5. Place nozzle in a container of heated Strip-N-Clean<sup>®</sup> or other appropriate solvent.

**NOTE:** Some solvents may not be compatible with the adhesive. Sludge formation can further compound the problem. Test solvent with a small sample of adhesive for compatibility before using it in system.

6. Clean nozzle following one of the methods below:
  - Insert pin-type probe into nozzle in opposite direction of adhesive flow.
  - Place parts in an ultrasonic cleaner filled with heated Strip-N-Clean<sup>®</sup>.

**NOTE:** Do not use an open torch, drill, or broach to clean a nozzle. Brass brushes are effective in cleaning nozzle exterior – do not use steel brushes.

7. Reattach nozzle on handgun.
8. Allow handgun to reach operating temperature, and tighten nozzle.
9. Check for leaks.



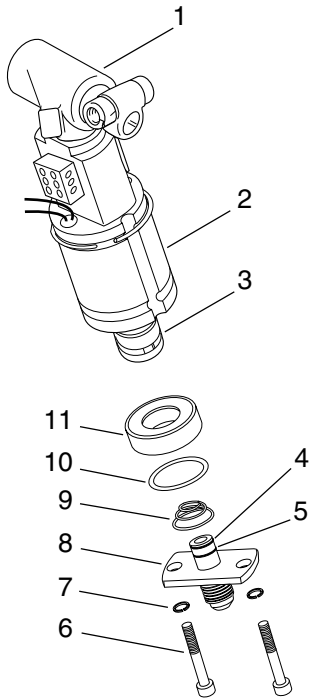
### **Trigger Adjustment**

1. Turn off main power.
2. Remove the handgun handle shell by removing the 5 screws.
3. Holding the lock nut [1] with a wrench, loosen the trigger linkage [2].
4. Thread the linkage in or out to achieve a distance, between the edge of the trigger and the front end of the handgun body, of 85 mm (3.43 in.). Make the measurement while the assembly is set in the shell half.
5. Lock the trigger linkage [2] in place with the lock nut [1].
6. Replace the shell halves and tighten the screws.

## Thrust Bearing Lubrication

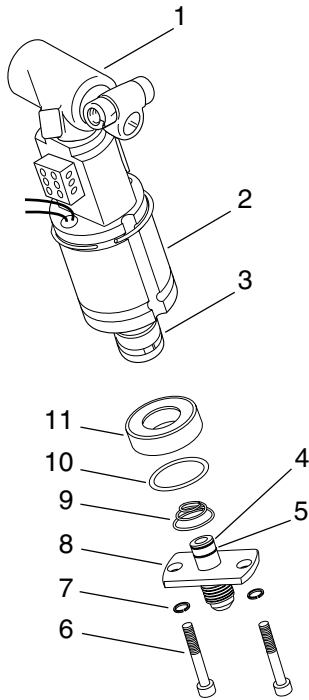


**WARNING:** Swivel connector and hose fitting must be heated to disconnect hose from the handgun. Do not heat these parts with a torch or open flame. Use a flameless electric heat gun for heating handgun components. Wear safety glasses, safety gloves and protective clothing to prevent injury from hot melt unit parts, splashed adhesive material and hot handgun surfaces.



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1. Disconnect and lock out electrical input power. It is not necessary to disconnect any electrical connections to service the thrust bearing.
2. Turn off the pump motor switch at the melt unit.
3. If the handgun is hot, activate the trigger to relieve pressure.
4. Remove the pivot sleeve shell by removing the 4 screws.
5. Remove the hose from the handgun at the hose connector.
6. Handle the handgun carefully to avoid undue strain on internal wiring or hose cord set.
7. Remove the 2 screws [6] and washers [7] securing the swivel connector [8] to the pivot sleeve [2].
8. Remove the swivel connector [8] and the conical spring [9] from the pivot sleeve [2].
9. Remove the retaining ring [3] from the end of the handgun body [1].
10. Remove the thrust bearing [11].
11. Clean and repack the thrust bearing [11] with a high temperature grease. High temperatures will carbonize standard greases causing the bearing to bind. Do not remove the pivot sleeve [2] from the handgun body [1].
12. Inspect the swivel connector [8] seal and the backup ring [10] located inside the handgun body [1]. Replace these parts if there is evidence of hardening, cracking, or other damage.
13. Lubricate the swivel connector [8] seal with bearing lubricant.
14. Reassemble the swivel connector [8] seal and backup ring [10].
15. Reinstall the thrust bearing [11] with the printed side of the bearing facing the handgun body [1].
16. Reinstall the retaining ring [3] in the retaining ring groove using snap-ring pliers.
17. Reinstall the conical spring [9], (smaller end first), and the swivel connector [8] into the handgun.



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18. Install the 2 screws [6] and washers [7] to retain the swivel connector [8]. Tighten finger tight.
19. Rotate the pivot sleeve [2] to allow the swivel connector [8] to self-center.
20. Tighten the screws [6] and check for free rotation. If binding occurs, loosen the screws [6] and rotate the pivot sleeve [2]. Retighten the screws [6] and check for free rotation. Repeat as necessary.
21. Connect the hose to the handgun at the hose connector and tighten.
22. Replace shells and secure with four screws.
23. Restore system to operating conditions in accordance with melt unit manual.

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## 7 Troubleshooting

### 7.1 Troubleshooting Table

Problem	Solutions
Handgun Does Not Heat	<ol style="list-style-type: none"><li>1. Fuse failure in melt unit: Check fuse in melt unit. Replace fuse, and check circuit for overload.</li><li>2. Control relay failure in melt unit: If plug-in type relay, switch relay with a good relay. Replace relay. If wired-in type relay, such as T150, move wiring to a good relay. Replace temperature controller board.</li><li>3. Handgun heater failure: Check heater resistance at L4 electrical connector: use ohmmeter, Resistance Chart in Appendix A, and Pin Location Diagrams in sections 7.2 and 7.3. If resistance is out of specification, replace heater.</li><li>4. Intermittent or broken connection in heater or sensor circuit: Check all wiring connections in the heater and sensor circuit. Refer to the melt unit schematic. Repair or reinstall any loose or broken connections. Remove left pivot sleeve shell to access RTD and heater terminal blocks. Check continuity of heater and sensor through-wires in hose using Pin Location Diagrams in sections 7.2 and 7.3. Replace hose if necessary.</li><li>5. Handgun sensor failure: Check sensor resistance at RTD terminal block on pivot sleeve: use Ohmmeter, Resistance Chart in Appendix A. If resistance is out of specification, replace sensor.</li><li>6. Thermostat fails open (thermostat models only): Check thermostat at terminal block on pivot sleeve for continuity while handgun is cold. If no continuity, replace thermostat.</li><li>7. Applicator zone not learned (microprocessor controllers only): See temperature controller manual.</li></ol>

Hose Does Not Heat	<ol style="list-style-type: none"> <li>1. Fuse failure in melt unit: Check hose fuse in melt unit if present. Replace fuse, and check circuit for overload or short circuit.</li> <li>2. Temperature control relay failure in melt unit: If plug-in type relay, switch relay with a good relay. Replace relay. If wired-in type relay such as T150, move wiring to a good relay. Replace temperature controller board.</li> <li>3. Hose heater failure: Check heater resistance at pins 2 and 6 of input electrical connector: use Ohmmeter, Resistance Chart in Appendix A, and Pin Location Diagrams in sections 7.2 and 7.3. If resistance is out of specification, replace hose.</li> <li>4. Broken connection in heater or sensor circuit: Check all wiring connections in the heater and sensor circuit. Refer to the melt unit schematic. Repair or reinstall any loose or broken connections.</li> <li>5. Hose sensor failure: Check sensor resistance at pins 8 and 9 of input connector: use Ohmmeter, Resistance Chart in Appendix A. If resistance is out of specification, replace hose.</li> <li>6. Applicator zone not learned (applies to microprocessor controllers only): See temperature controller manual.</li> <li>7. Hose controller failure: If capillary type thermostat, ensure capillary bulb is fully inserted in tube on input end of hose. Fully insert capillary bulb into tube as needed. Ensure tube is not crimped. If tube is crimped, replace hose controller. If RTD sensor controller, check possible causes listed above. Replace hose controller.</li> </ol>
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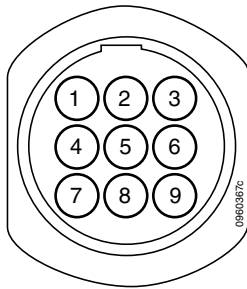
Handgun Does Not Reach Set Temperature	<ol style="list-style-type: none"> <li>1. Temperature setting too low, or controller set to incorrect scale (°F or °C): Verify Set temperature. Check temperature scale. Adjust temperature setting and/or scale. Refer to temperature controller or melt unit manual.</li> <li>2. Heater voltage does not match source voltage, or source voltage is too low for heater voltage rating.: Check heater voltage rating by measuring heater resistance at heater terminal block on the pivot sleeve: Use Ohmmeter, Pin Location Diagrams in sections 7.2 and 7.3, and Resistance Chart in Appendix A. Select a heater that matches the source voltage. Measure source voltage with volt meter. Ensure proper voltage is available.</li> <li>3. Intermittent or broken connection in sensor circuit wiring: Check all wiring connections in heater and sensor circuit. Refer to melt unit schematic. Repair or reinstall any loose or broken connections. Check continuity of heater and sensor through wires in hose using Ohmmeter and Pin Location Diagram. Replace hose if necessary.</li> </ol>
Handgun Overheats	<ol style="list-style-type: none"> <li>1. Temperature controller set too high or set to incorrect scale (°F or °C): Verify Set temperature. Check temperature scale. Adjust temperature setting and/or scale. Refer to temperature controller or melt unit manual.</li> <li>2. Wiring incorrectly connected: Verify electrical connections from temperature controller to hose and from hose to handgun are correct. Connect wiring according correct diagram. See melt unit schematic, and Pin Location Diagram in hose manual.</li> <li>3. Thermostat failed closed: Check thermostat at terminal block on pivot sleeve for continuity while handgun is at or above operating temperature. If continuity is present at or above operating temperature, replace thermostat.</li> </ol>
Handgun Does Not Swivel	<ol style="list-style-type: none"> <li>1. Handgun is not at operating temperature: Check Set and Actual L4 temperature. Adjust temperature setting and/or wait for L4 to reach Set temperature.</li> <li>2. Binding or wear on pivot sleeve bearing: Remove pivot sleeve shell and disassemble. See Section 8. Clean and lubricate bearing if possible. See Section 8.</li> <li>3. Binding or wear on thrust bearing: Remove pivot sleeve shell and disassemble. See Section 8. Replace bearing if required.</li> <li>4. Pump pressure too high: Reduce pressure at melt unit flow control valve. Keep pump pressure below 200 psi.</li> </ol>



Problem	Solutions
No Adhesive Flows From Handgun	<ol style="list-style-type: none"> <li>1. No input power: Verify correct power is connected to melt unit and handgun. Turn on all necessary circuit breakers.</li> <li>2. Low adhesive level: Check adhesive level. Add adhesive as needed.</li> <li>3. L4 temperature set too low: Verify handgun Set Temperature. Adjust temperature setting.</li> <li>4. Pump motor not operational: Check pump motor switch. Check tank temperature at base and compare to pump warmup thermostat rating. Ensure pump warmup switch has correct rating and is functional. Check pump run relay in melt unit. Check for motor overtemperature condition. Allow motor to cool and restart. Ensure switch is on. Replace if necessary. Allow warmup time. Replace switch if needed. Replace relay if necessary. Reduce load on motor by reducing pump pressure.</li> <li>5. Fuse failure: Check fuse in melt unit. Replace fuse.</li> <li>6. Hose failure: Check hose heater resistance: use ohmmeter, Resistance Chart in Appendix A, and Pin Location Diagram in hose manual. If resistance is out of specification, replace hose.</li> <li>7. Clogged pump filter: Inspect melt unit pump filter. Clean or replace filter. Refer to melt unit manual.</li> <li>8. Clogged hose: Remove L4 from hose. Check for restricted flow and appearance of exiting adhesive. Clean hose and verify good flow from hose. If unable to unclog, replace hose.</li> <li>9. Clogged nozzle: Check flow through handgun without nozzle. Clean or replace nozzle.</li> <li>10. Triggering device dirty or faulty: Check trigger and microswitch adjustment. Check microswitch continuity at electrical connector. Use ohmmeter, Pin Location Diagrams in sections 7.2 and 7.3, and Resistance Chart in Appendix A. Check all connections melt unit to handgun including hose through-wires for microswitch. Clean or adjust trigger and microswitch. Replace microswitch if faulty. Repair/reinstall any loose or broken connections. Replace hose if needed.</li> <li>11. Low voltage: Check handgun voltage. Match handgun voltage to motor rating.</li> </ol>

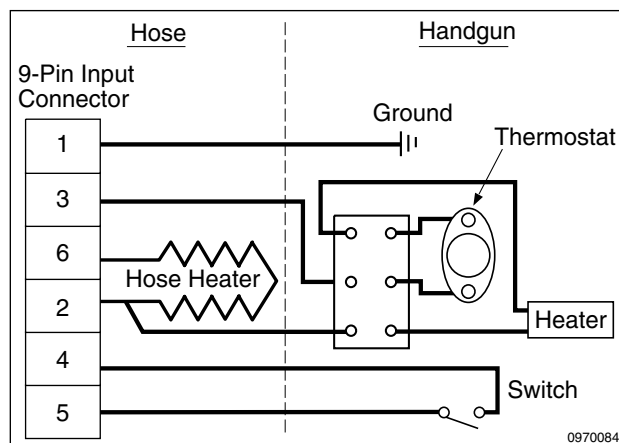
<b>Problem</b>	<b>Solutions</b>
Handgun Fails To Shut Off	<ol style="list-style-type: none"> <li>1. Triggering device dirty or faulty. Check trigger adjustment. Refer to section 8. Clean or replace if needed.</li> <li>2. Foreign material lodged between seat and packing cartridge ball tip: Check nozzle assembly. Clean or replace as needed.</li> <li>3. Packing cartridge failed: Check packing cartridge for damage. Replace packing cartridge as needed.</li> </ol>
Adhesive Leaks From Handgun Handle	<ol style="list-style-type: none"> <li>1. Improperly installed hose or loose hose-to-handgun connection: Inspect hose-to-handgun connection for leaks. Tighten any loose connections. Refer to section 4.</li> <li>2. Damaged seal ring: Check seal ring for damage. Replace seal ring if damaged. Refer to section 8.</li> </ol>
Adhesive Leaks From Pivot Sleeve Shells	<ol style="list-style-type: none"> <li>1. Cracked or damaged swivel connector seal: Check seal for damage. Replace swivel connector seal and backup ring. Refer to section 8.</li> <li>2. Worn or damaged packing cartridge: Check packing cartridge. Replace packing cartridge if damaged.</li> </ol>
Hose/Handgun Hydraulic Fitting Leaks	<ol style="list-style-type: none"> <li>1. Loose hydraulic fitting: Check hydraulic fitting connection. Tighten hydraulic fitting at operating temperature.</li> <li>2. Damaged fitting threads on hose hydraulic fitting: Check fitting threads. Replace hose.</li> <li>3. Damaged fitting threads on handgun swivel: Check fitting threads. Replace swivel.</li> </ol>

## 7.2 Thermostat Hose - Male Connector Pin Location and Function

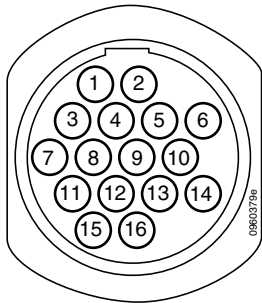


Input End of Hose

Handgun Hose	
Pin	Function
1	Ground
2	Heater circuit return
3	Handgun heater (with pin no. 2)
4	Handgun pump motor switch
5	Handgun pump motor switch
6	Hose heater
7	Blank
8	Blank
9	Blank

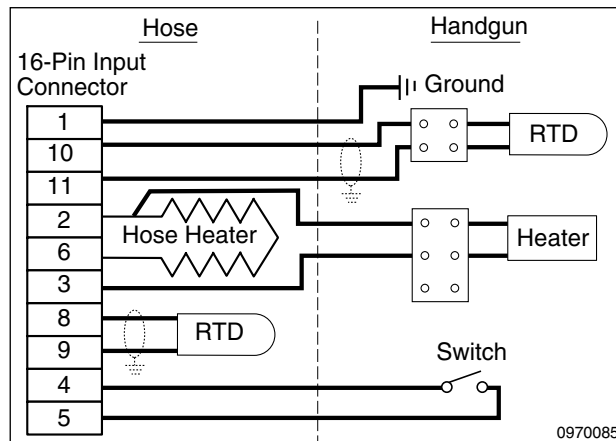


### 7.3 Solid State RTD Hose - Male Connector Pin Location and Function



Input End of Hose

Handgun Hose			
Pin	Function	Pin	Function
1	Ground	9	Hose RTD
2	Heater circuit return	10	Handgun RTD
3	Handgun heater (with pin no. 2)	11	Handgun RTD
4	Handgun pump motor switch	12	Blank
5	Handgun pump motor switch	13	Blank
6	Hose heater circuit (with pin no. 2)	14	Blank
7	Blank	15	Blank
8	Hose RTD	16	Blank



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## 8 Repair and Replacement

Refer to Section 9 Parts List for the part numbers of all replacement parts. Replacement kits come with instructions.



**DANGER:** Handgun contains electrical components with voltages that can be fatal. Disconnect electrical power from external source before performing maintenance.



**CAUTION:** Relieve system pressure before opening any fluid connection to prevent injury from sprayed hot melt adhesive.



**CAUTION:** Never heat any component of a hot melt system with a torch or other open flame. If necessary to heat a component for maintenance or repair, use an electric oven with forced air circulation or a flameless electric heat handgun. Do not heat plastic handgun shells above 230 °C (450 °F).

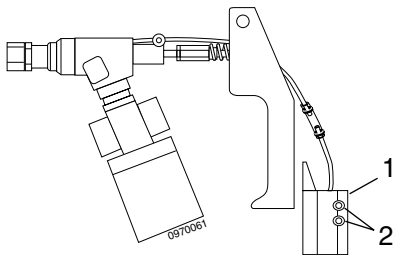


**Carefully read Safety Precautions before servicing the L4.**

## 8.1 Trigger Microswitch Adjustment (Switched Version Only)

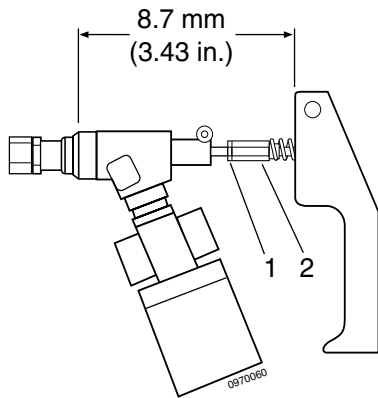


**CAUTION:** Adjust trigger microswitch with the handgun at application temperature for hot melt adhesive. Wear safety glasses, safety gloves and protective clothing to prevent injury from hot melt unit surfaces, splashed hot material and hot handgun parts.

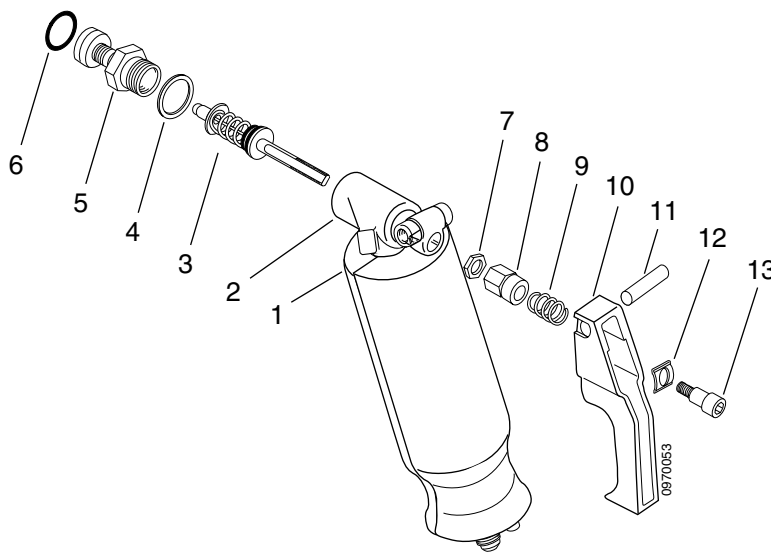


1. Bring handgun to operating temperature in accordance with melt unit manual. Depressurize melt unit system to prevent accidental contact with hot adhesive when the handgun is triggered.
  2. Disconnect switch plug from hose.
  3. Position handgun on its right side.
  4. Remove handgun handles by removing 5 screws.
  5. Remove left-side handle shell.
  6. Using an ohmmeter, set for continuity and attach leads to handgun pins 2 and 4.
  7. Slowly depress trigger and watch for indication of electrical continuity. Continuity should indicate just after packing cartridge shaft begins to move out of handgun body.
  8. Loosen microswitch mounting screws [2].
  9. Slide microswitch [1] toward or away from trigger until continuity is indicated, just after packing cartridge shaft starts to move.
- NOTE:** In some cases, microswitch actuation arm may need to be bent slightly to achieve proper adjustment.
10. When properly positioned, tighten microswitch mounting screws [2].
  11. Release trigger and ensure no continuity exists when handgun is not being triggered.
  12. Replace left-side shell and tighten screws.
  13. Reconnect switch plug to hose. Electrical connectors have orientation lugs to ensure proper alignment of the connectors before mating.
  14. System is ready for operation.

## 8.2 Packing Cartridge Replacement



1. Disconnect and lock out electrical power. Depressurize system.
2. Remove handgun handles by removing 5 screws.
3. Holding lock nut [7] with a wrench, loosen trigger linkage [8].
4. Remove shoulder screw [13], bearing plate [12], trigger [10] and trigger spring [9] from packing cartridge shaft [3] by unthreading linkage [8].
5. Unscrew and remove seat [5], seal ring [6] and nozzle from body [2].
6. Pull packing cartridge [3] out of body [2]. Replace if necessary.
7. Inspect seal ring [6] and replace if damaged or cracked.
8. Install packing cartridge [3] in body.
9. Install seal ring [6] and seat [5] in body [2].
10. Torque seat [5] to 34 N-m (25 ft-lb).
11. Reassemble lock nut [7], trigger linkage [8], trigger spring [9], trigger [10], bearing plate [12], and shoulder screw [13] onto packing cartridge shaft [3].
12. Thread trigger linkage [8] toward or away from body [2] until distance between edge of the trigger [10] and front end of body [2] is 85 mm (3.4 in.).
13. Lock linkage [8] in place with lock nut [7].
14. Install handle shells [1] and secure with 5 screws.
15. Restore system to normal operation.



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### 8.3 Swivel Disassembly, Sleeve, and Thrust Bearing Replacement

1. Disconnect and lock out electrical power.
2. Relieve system pressure by activating trigger.
3. Remove pivot sleeve shells [2] by removing 4 screws [13].
4. Disconnect handgun from hose.

Note: It is not necessary to disconnect any electrical connections to service the thrust bearing. However, avoid putting undue strain on internal wiring or hose cord set.

5. Remove 2 screws [6] and 2 washers [7] securing the swivel connector [8] to pivot sleeve [3].
6. Remove swivel connector [8] and conical spring [9] from pivot sleeve [3].
7. Using snap-ring pliers, remove retaining ring [12] from end of handgun body [1].
8. Remove thrust bearing [11].
9. Slide pivot sleeve [3] off handgun body [1].
10. Inspect sleeve bearing [14] for tears or worn spots and replace if necessary.
11. Wrap sleeve bearing [14] around body [1].
12. Slide body [1] and sleeve bearing [14] into pivot sleeve [3].
13. Inspect swivel connector seal [4] and backup ring [5] for evidence of pitting, hardening, or other damage.

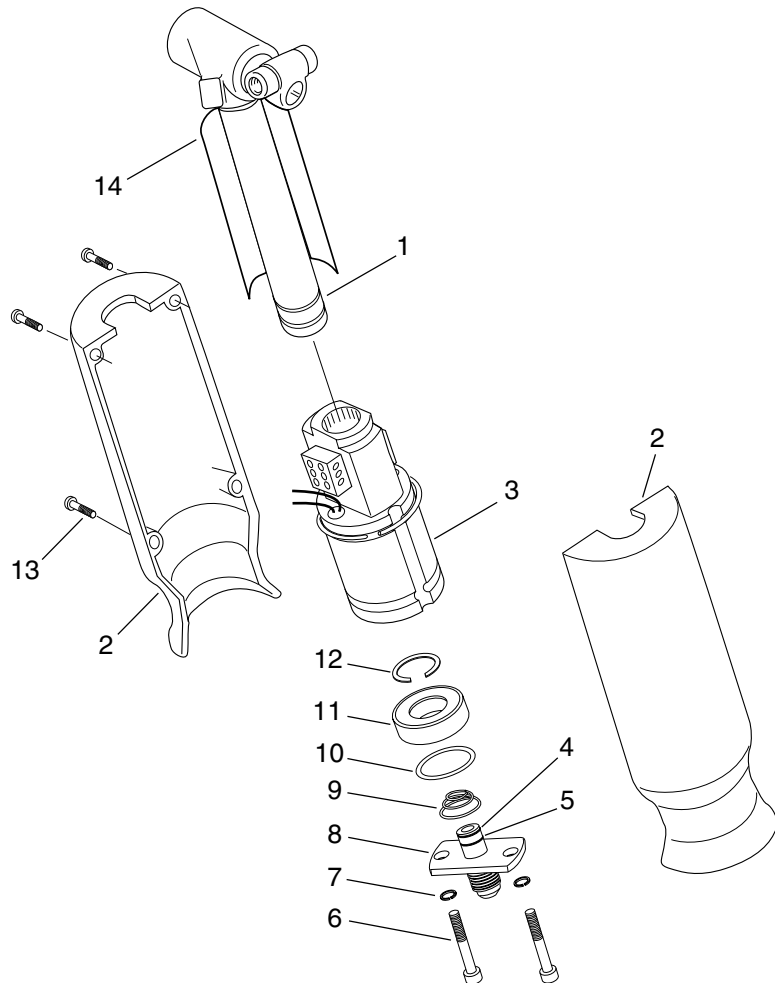


**CAUTION:** The swivel connector seal and thrust bearing require high temperature grease. High temperatures can carbonize a standard grease causing the bearing to bind.

14. Lubricate swivel connector seal with bearing lubricant.
15. Assemble swivel connector seal [4] and backup ring [5] in accordance with figure below.
16. Inspect thrust bearing [11] and replace it if binding. If not binding, thoroughly clean bearing to remove old grease.
17. Pack thrust bearing [11] with bearing lubricant.
18. Install thrust bearing [11] in pivot sleeve [3] with printed side of bearing facing body [1].
19. Using snap-ring pliers, reinstall retaining ring [12] into retaining ring groove on body [1].
20. Reinstall conical spring [9] (small end toward body) and swivel connector [8] into pivot sleeve [3].
21. Install 2 washers [7] and 2 screws [6] to secure swivel connector [8]. Tighten finger tight.



22. Rotate pivot sleeve [3] to allow swivel [8] to self-center.
23. Tighten screws [6] to check for binding and free rotation. If binding occurs, loosen screws [6] and rotate pivot sleeve [3]. Tighten screws [6] and check for free rotation. Repeat as necessary.
24. Connect hose to handgun at hose connector.
25. Replace pivot sleeve shells [2] and secure with 4 screws [13].
26. Restore system to operating conditions in accordance with melt unit manual

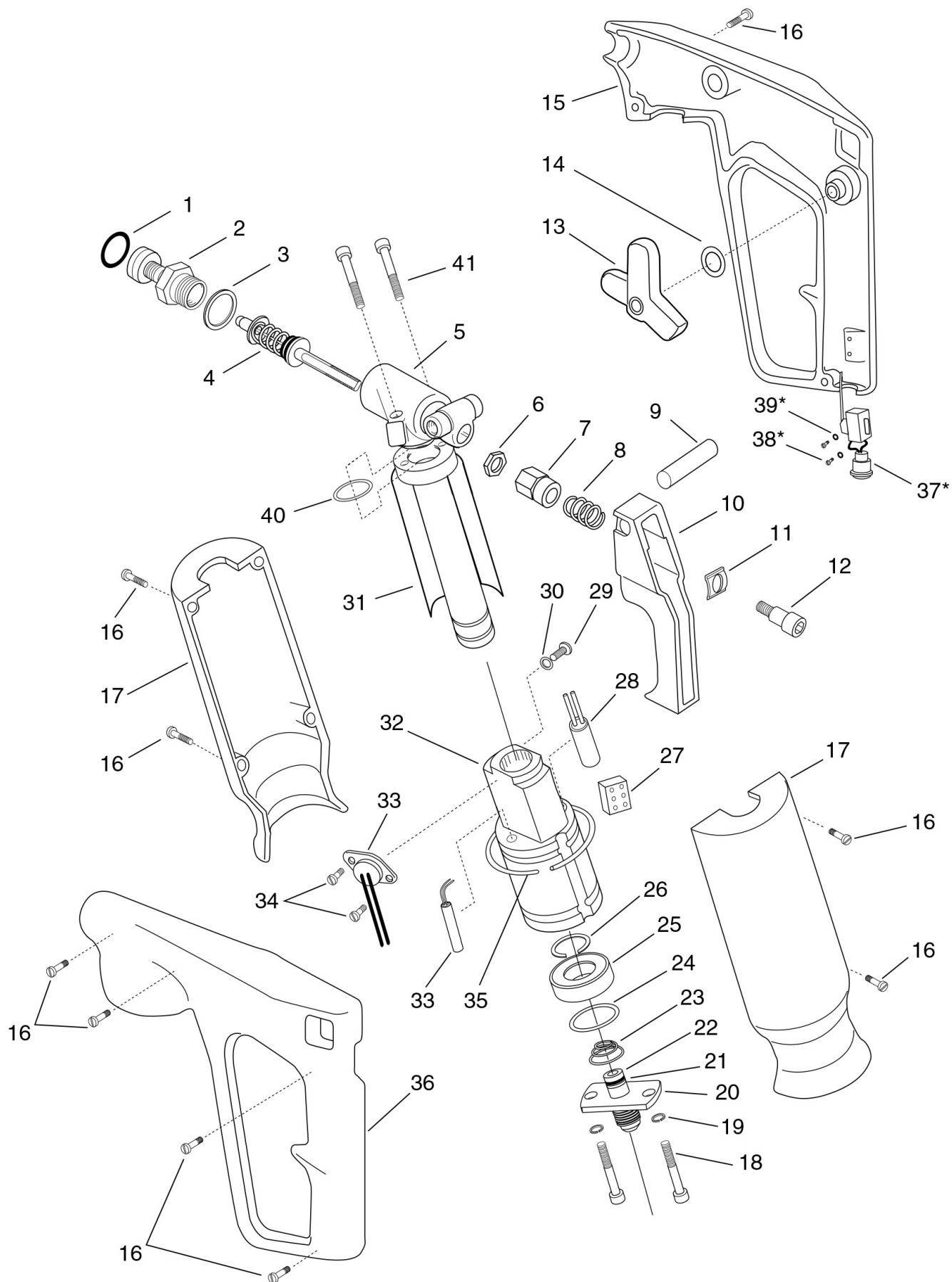


Swivel Bearing Assembly

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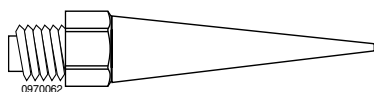
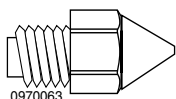
Item	Description	Part Number	Quantity
1†	O-ring,Viton, 0.070" x 0.426"ID	10413	1
1†	O-ring,Teflon, 0.070" x 0.426"ID	10493-013	1
2	Seat	70086-09	1
3	Ring, Seal	70086-11	1
4	Cartridge, Packing	73298-01	1
5	Body, Gun (Internal)	70087-03	1
6	Hex Nut,10-32	14441-FA	1
7*	Linkage, Trigger	70086-05	1
8*	Spring, Trigger	14487-02	1
9*	Pin, Dowel	14446-7	1
10*	Trigger, Handgun	70085-04	1
11*	Plate, Bearing	70086-06	1
12*	Screw, Shoulder, 10-24 x 0.375"	14400-001	1
13*	Safety, Handgun	70085-05	1
14*	Spring, Wave	14508-03	1
15*	Shell, Handgun, Right	70085-14	1
16*	Screw, 6-32 x 0.50"	14416-CAF	9
17	Sleeve, Pivot	79257-01	2
18	Screw 8-32 x 1.25"	14416-DAL	2
19	Lock Washer, NO.6	14451-CA	2
20	Connector, Swivel	70086-14	1
21	Back-up Ring, 0.35 x 0.38"	10476-01	1
22†	O-ring, Viton, 0.070 x 0.239"	10410	1
22†	O-ring, Teflon, 0.070 x 0.239"	10493-010	1
23	Spring, conical	14463-7	1
24	Snap ring, 0.625"ID	14502-22	1
25	Thrust Bearing	70086-08	1
26	Retaining ring, 0.625"ID	14502-21	1
27	Terminal Block, 3-Pole	70086-12	1-2
28†	Heater, 80w, 120V	12632-02	1
28†	Heater, 80w, 240V	12632-03	1
29	Screw, 6-32 x 0.250"	14416-DAD	1
30	Lock Washer, NO.8	14451-DA	1
31	Bearing, sleeve	70086-07	1
32	Pivot Sleeve	70086-16	1
33†	RTD Sensor, 100 Ω	79117-06	1
33†	Thermostat, 191°C (350°F) Kit	APNT350	1
34	Screw, 5-40 x 0.25"	14416-OAC	2
35	Clip, wire	14502-23	1
36*	Shells, Handgun, Left	70085-15	1
37	Switch Plug Assembly (switched guns only)	73299-01	1
38	Screw, 5-40 x 0.50"	14413-BAW	2
39	Lock Washer, NO. 4	14451-BC	2
40†	O-ring, Viton, 0.070 x 0.426"	10412	1
40†	O-ring, Teflon, 0.070 x0.426"	10493-012	1
41	Screw, 6-32 x0.875" SHCS	14431-CDJ	1

\* Part of 79257-2 Kit † Multiple options available



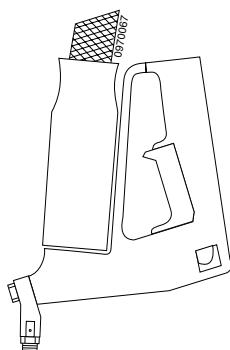
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## 9.2 Standard Nozzles



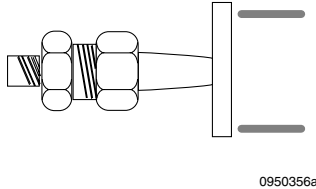
Extrusion Nozzles		
Description	Orifice Diameter	Part Number
Nozzle, standard	0.51 mm (0.020 in.)	73861-020
Nozzle, standard	0.76 mm (0.030 in.)	73861-030
Nozzle, standard	1.02 mm (0.040 in.)	73861-040
Nozzle, standard	1.52 mm (0.060 in.)	73861-060
Nozzle, standard	2.29 mm (0.090 in.)	73861-090
Nozzle, extended	1.07 mm (0.042 in.)	73862-042
Nozzle, extended	1.55 mm (0.062 in.)	73862-062
Nozzle, extended	2.29 mm (0.090 in.)	73862-090
Nozzle, extended	3.30 mm (0.130 in.)	73862-130

Standard Nozzle Adapters	
Description	Part Number
Adapter, L1 Nozzle to L4 Handgun (Use with nozzles: 73059-XX, 73059-XXX, 73060-XXX, 73060S-XXX, 73065-XX, 73118-XX)	70168-1
Adapter, L1 Nozzle to L4 Handgun (Use with nozzles: 73063-XXX, 73064-XX, 73061-XXX, 73062-XXX)	70188-1



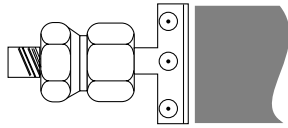
L4 Down Apply Nozzle Adapter	
Description	Part Number
L4 Down Apply Adapter kit (Use with nozzles: 73861-XXX, 73862-XXX)	79302-01

## 9.3 T Bar Nozzles

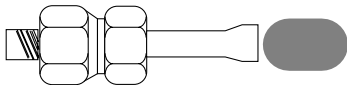


T Bar Nozzles	
73059-413	T Bar Nozzle, 2 Orifice, .020" @ 0.50" spacing
73059-402	T Bar Nozzle, 2 Orifice, .020" @ 3.125" spacing
73059-407	T Bar Nozzle, 2 Orifice, .060" @ 0.75" spacing
73059-419	T Bar Nozzle, 2 Orifice, .020" @ 1.25" spacing
73059-421	T Bar Nozzle, 2 Orifice, .030" @ 1.25" spacing
73059-422	T Bar Nozzle, 2 Orifice, .060" @ 1.25" spacing
73059-415	T Bar Nozzle, 2 Orifice, .060" @ 1.00" spacing
73059-417	T Bar Nozzle, 2 Orifice, .060" @ 1.50" spacing
73059-418	T Bar Nozzle, 2 Orifice, .060" @ 1.75" spacing
73059-420	T Bar Nozzle, 2 Orifice, .060" @ 2.00" spacing
73059-403	T Bar Nozzle, 3 Orifice, .050" @ 1.00" spacing
73059-404	T Bar Nozzle, 3 Orifice, .050" @ 0.50" spacing
73059-408	T Bar Nozzle, 3 Orifice, .060" @ 0.75" spacing
73059-410	T Bar Nozzle, 3 Orifice, .070" and .04" @ 0.75" spacing
73059-423	T Bar Nozzle, 3 Orifice, .060" @ 0.625" spacing
73059-411	T Bar Nozzle, 3 Orifice, .020" @ 1.75" spacing
73059-401	T Bar Nozzle, 4 Orifice, .030" @ 0.50" spacing
73059-406	T Bar Nozzle, 4 Orifice, .050" @ 0.50" spacing
73059-409	T Bar Nozzle, 4 Orifice, .060" @ 0.75" spacing
73059-412	T Bar Nozzle, 5 Orifice, .030" @ 0.75" spacing
73059-414	T Bar Nozzle, 5 Orifice, .030" @ 0.50" spacing

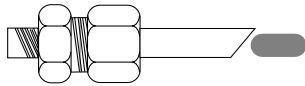
## 9.4 Slot Nozzles



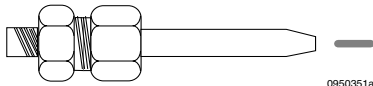
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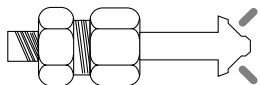
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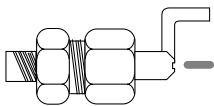
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Slot Nozzles	
73060-01	Slot Nozzle, .062" opening x 0.50" wide
73060-02	Slot Nozzle, .062" opening x 0.75" wide
73060-03	Slot Nozzle, .062" opening x 1.00" wide
73060-04	Slot Nozzle, .062" opening x 1.25" wide
73060-05	Slot Nozzle, .062" opening x 1.50" wide
73060-06	Slot Nozzle, .062" opening x 1.75" wide
73060-07	Slot Nozzle, .062" opening x 2.00" wide
73061-01	Spreader Nozzle, .25" wide x .50"
73061-02	Spreader Nozzle, .25" wide x 1.00" long
73061-03	Spreader Nozzle, .25" wide x 1.50" long
73062-01	Extension Nozzle, .125" Orifice x .50", brass
73062-02	Extension Nozzle, .125" Orifice x 1.00", brass
73062-03	Extension Nozzle, .125" Orifice x 1.50", brass
73062-04	Extension Nozzle, .125" Orifice x 1.50", stainless
73063-01	Needle Nozzle, .062" Orifice x 1.00" long
73063-02	Needle Nozzle, .062" Orifice x 1.50" long
73063-03	Needle Nozzle, .062" Orifice x 1.75" long
73063-04	Needle Nozzle, .025" Orifice x 1.00" long
73063-05	Needle Nozzle, .025" Orifice x 1.50" long
73063-06	Needle Nozzle, .025" Orifice x 1.75" long
73065-001	Mitre Nozzle, 2 Orifice, .030", 45° angle
73065-002	Mitre Nozzle, 2 Orifice, .050", 45° angle
73065-003	Mitre Nozzle, 2 Orifice, .060", 45° angle
73065-004	Mitre Nozzle, 2 Orifice, .070", 45° angle
73118-001	"L" Nozzle, 1 Orifice, .060", 1.12" from edge
73118-002	"L" Nozzle, 1 Orifice, .090", 1.12" from edge
Use these adapters to modify existing L1 nozzles to be compatible with L4, L5, and L7 Handguns.	
70168-1	Adapter, L1 Nozzle to L4 (Use with: 73059-XX, 73059-XXX, 73060-XXX, 73060S-XXX, 73065-XX, 73118-XX)
70188-1	Adapter, L1 Nozzle to L4 (Use with: 73063-XXX, 73064-XX, 73061-XXX, 73062-XXX)

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## 9.5 Hoses

Standard L4 Hoses	
Description	Part Number
Capillary, 100 VAC (for thermostat handguns)	21264-XX
Capillary, 115 VAC (for thermostat handguns)	21260-XX
Capillary, 200 VAC (for thermostat handguns)	21266-XX
Capillary, 230 VAC (for thermostat handguns)	21262-XX
RTD2, 100 VAC (for RTD handguns)	21265-XX
RTD2, 115 VAC (for RTD handguns)	21261-XX
RTD2, 200 VAC (for RTD handguns)	21267-XX
RTD2, 230 VAC (for RTD handguns)	21263-XX

Switched L4 Hoses	
Description	Part Number
Capillary, 100 VAC (for thermostat handguns)	21272-XX
Capillary, 115 VAC (for thermostat handguns)	21268-XX
Capillary, 200 VAC (for thermostat handguns)	21274-XX
Capillary, 230 VAC (for thermostat handguns)	21270-XX
RTD2, 100 VAC (for RTD handguns)	21273-XX
RTD2, 115 VAC (for RTD handguns)	21269-XX
RTD2, 200 VAC (for RTD handguns)	21275-XX
RTD2, 230 VAC (for RTD handguns)	21271-XX

Hoses are ordered in lengths as follows:	
Length	Part Number Add-on
2.44 m (8 ft)	XXXXX-08
3.66 m (12 ft)	XXXXX-12
4.88 m (16 ft)	XXXXX-16

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## 9.6 Optional Thermostat Kits

Optional Thermostat Kits	
Description	Part Number
94 °C (200 °F)	79229-200
107 °C (225 °F)	79229-225
121 °C (250 °F)	79229-250
135 °C (275 °F)	79229-275
149 °C (300 °F)	79229-300
163 °C (325 °F)	79229-325
177 °C (350 °F)	79229-350
191 °C (375 °F), standard	79229-375
204 °C (400 °F)	79229-400
218 °C (425 °F)	79229-425

## 9.7 Accessories and Tools

Accessories and Tools	
Description	Part Number
Heat release and heat transfer compound	11207
High temperature lubricant, clear, o-rings	11208
High temperature grease, black, bearings	11209-1
AMP pin extraction tool	11042-2
Kit, extended cuff, L4 Handgun	79412-01
Air line kit, 6.10 m (20 ft)	79350
Handgun hanger kit	79023
Safety gloves	11068-1
Strip-N-Clean ®	11200-X



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## Appendix A Resistance Tables

Minimum and maximum resistance (R) of common handguns and hoses

Unless otherwise specified, resistance values are measured at 20° + 5° C (68° + 10° F).

**Table 1. RTD Sensor Resistance**

Temperature	Ohms
0 °C (32 °F)	100
38 °C (100 °F)	115
66 °C (150 °F)	126
93 °C (200 °F)	136
121 °C (250 °F)	147
149 °C (300 °F)	158
177 °C (350 °F)	168
204 °C (400 °F)	178
Same RTD sensor is used in tank, hose, and applicator.	

**Table 2. Heater Resistance for L4 Handguns**

Model	Voltage	Heater Quantity	Heater Wattage	Ohms*
L4	230 VAC	1	80	664–720
L4	115 VAC	1	80	170–190
*For applicators with more than 1 heater, resistance shown is for heaters in parallel.				

**Table 3. Heater Resistance for L4 Handgun Hoses in Ohms**

Part No. (VAC)	2.44 m (8 ft)	3.66 m (12 ft)	4.88 m (16 ft)
L4 Hose, Capillary Sensor			
21260 (115 VAC)	71–74	48–50	36–38
21262 (230 VAC)	283–294	192–200	145–152
L4 Hose, RTD Sensor			
21285 (115VAC)	75–79	45–52	37–39
21287 (230VAC)	298–315	199–209	149–157

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# Warranty

- A. Astro Packaging warrants its products, when operated and maintained in accordance with Astro Packaging recommended procedures, are free of defects in material and workmanship during the periods indicated below commencing with the date the product is placed in service.

Product	Warranty Period
1. Tank heater (including entire tank when heater is cast into tank)	5 years or 10,000 hours of use, whichever occurs first
2. Melt unit (unless specified below); pattern controller; head driver	1 years or 4,000 hours of use, whichever occurs first
3. Stationary hose; automatic electric head; JR® Series Hot Melt System or melt unit; standard pail UN-loader; standard accessory purchased with a system	1 year or 2,000 hours of use, whichever occurs first
4. Manual hose; handgun; Mini Squirt III; any butyl system; any PUR system (including hose, gun or head used with PUR); any spare or replacement component; pneumatic head; industrial heated hose; T100 Temperature Controller; nozzle; nozzle bar	6 months or 1,000 hours of use, whichever occurs first
5. Rebuilt equipment	90 days or 500 hours of use, whichever occurs first

- B. The sole liability of Astro Packaging and exclusive remedy extended to any Astro Packaging customer shall be limited to replacing or repairing, at the option of Astro Packaging, any product returned under the terms of this warranty. Labor and related expenses incurred to install replacement or repaired parts are not covered by this warranty.
- C. Astro Packaging is not responsible for repair or replacement of any product that has been subject to abuse, misuse, alteration, accident, or negligent use, nor for repairs made by an unauthorized person or with parts other than those provided by Astro Packaging.
- D. Astro Packaging assumes no responsibility for the performance of adhesives or other materials used with its products.
- E. The warranty for a product repaired or replaced under this warranty shall continue in effect for the remainder of the original warranty period, or for ninety (90) days following the day of shipment by Astro Packaging the repaired or replaced product, whichever period is longer.
- F. No warranty is made with respect to custom products or products developed, designed and manufactured to customer specifications, except as specifically stated in writing by Astro Packaging.
- G. Astro Packaging is responsible only for payment of shipping charges for delivery of a repaired or replaced product, via the least expensive means of transport, to customer or an authorized Sales and Service Center in the Continental United States only. Payment for shipment to Astro Packaging or an authorized Sales and Service Center for evaluation, repair or replacement is the responsibility of the customer.
- H. For service under this warranty, contact the Factory Authorized Representative from which the product was purchased.

**THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE.**

Complete Reverse Side and Retain for Your Records

## Equipment Record

Record the information below on all equipment received and retain for your records.

(Systems, melt units, hoses, guns, heads, pattern controllers, drivers, etc)

Products were purchased from: \_\_\_\_\_

Astro Packaging

Product Model/Description \_\_\_\_\_ Serial No. \_\_\_\_\_

Product Part Number \_\_\_\_\_ Order No. \_\_\_\_\_

Date Received \_\_\_\_\_ Start-Up Date \_\_\_\_\_ Invoice No. \_\_\_\_\_

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Product Model/Description \_\_\_\_\_ Serial No. \_\_\_\_\_

Product Part Number \_\_\_\_\_ Order No. \_\_\_\_\_

Date Received \_\_\_\_\_ Start-Up Date \_\_\_\_\_ Invoice No. \_\_\_\_\_

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