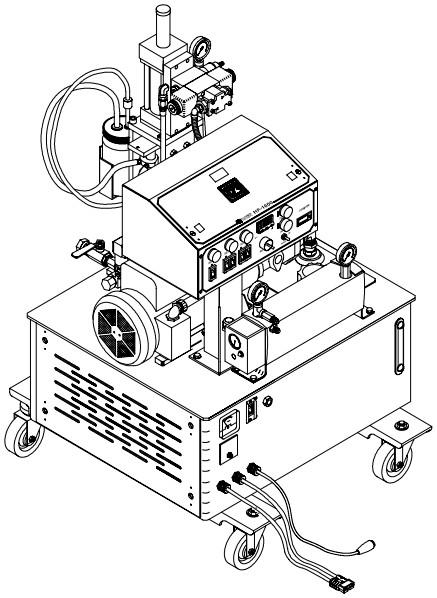
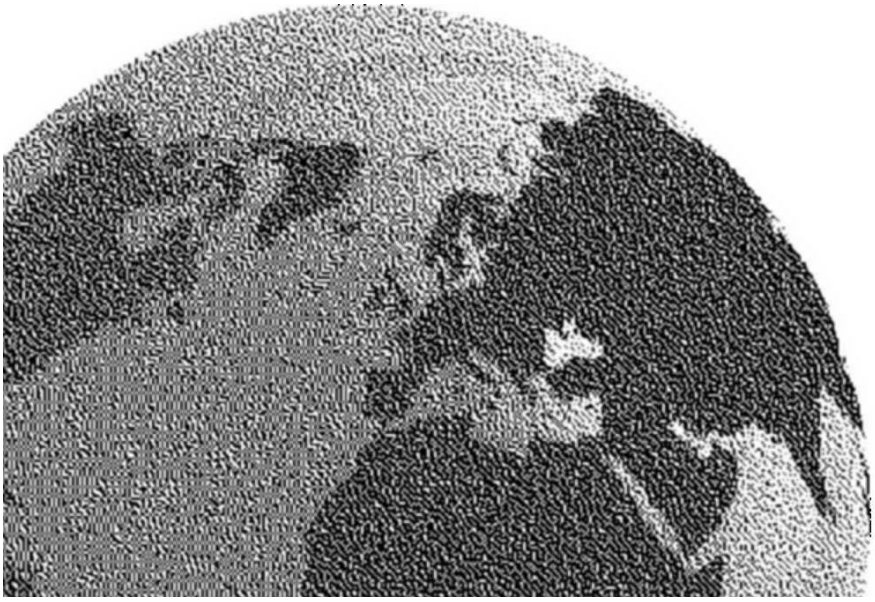
GUSMER® CORPORATION

"Success through Unity"



HF-1600/2500 Proportioning Unit

Operating Manual 18942-1



November 18, 2002

Issue 5

GUSMER CORPORATION ®

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NOTICE: *This manual contains important information about your GUSMER equipment. Read and retain for future reference.*

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WARRANTY

Gusmer Corporation (Gusmer) provides a limited warranty to the original purchaser (Customer) of Gusmer manufactured parts and equipment (Product) against any defects in material or workmanship for a period of one year from the date of shipment from Gusmer facilities.

In the event Product is suspected to be defective in material or workmanship, it must be returned to Gusmer, freight prepaid. If Product is found to be defective in material or workmanship, as determined solely by Gusmer, Gusmer will issue full credit to Customer for the freight charges incurred in returning the defective Product, and either credit will be issued for the replacement cost of the Product or a replacement part will be forwarded no-charge, freight prepaid to Customer.

This warranty shall not apply to Product Gusmer finds to be defective resulting from: installation, use, maintenance, or procedures not accomplished in accordance with our instructions; normal wear; accident; negligence; alterations not authorized in writing by Gusmer; use of "look alike" parts not manufactured or supplied by Gusmer; or Product used in conjunction with any other manufacturer's pumping or proportioning equipment. Further, the terms and conditions of this warranty shall not apply to services or repairs made to Product by any third party not authorized in writing by Gusmer. For such Product, a written estimate will be submitted to Customer at a nominal service charge, itemizing the cost for repair. Disposition of Product will be done in accordance with the terms stated on the written estimate.

The warranty provisions applied to product that are not manufactured by Gusmer will be solely in accordance with the warranty provided by the original manufacturer of the product.

GUSMER MAKES NO WARRANTY WHATSOEVER AS TO THE MERCHANTABILITY OF, OR SUITABILITY FOR, ITS PRODUCT TO PERFORM ANY PARTICULAR PURPOSE. CREDIT FOR, OR REPLACEMENT OF, PRODUCT DEFECTIVE IN MATERIAL OR WORKMANSHIP SHALL CONSTITUTE COMPLETE FULFILLMENT OF GUSMER OBLIGATIONS TO CUSTOMER. NO OTHER WARRANTY, EXPRESS OR IMPLIED ON ANY PRODUCT IT MANUFACTURES AND/OR SELLS, WILL BE RECOGNIZED BY GUSMER UNLESS SAID WARRANTY IS IN WRITING AND APPROVED BY AN OFFICER OF GUSMER.

Under no circumstances shall Gusmer be liable for loss of prospective or speculative profits, or special, indirect, incidental or consequential damages. Further, Gusmer shall have no liability for any expenses including, but not limited to personal injury or property damage resulting from failure of performance of the product, use of the product, or application of the material dispensed through the product. Any information provided by Gusmer that is based on data received from a third source, or that pertains to product not manufactured by Gusmer, while believed to be accurate and reliable, is presented without guarantee, warranty, or responsibility of any kind, express or implied.

Gusmer through the sale, lease, or rental of Product in no way expresses or implies a license for the use of, nor encourages the infringement of any patents or licenses.

To insure proper validation of your warranty, please complete the warranty card and return it to Gusmer within two weeks of receipt of equipment.

Revised 11/12/98

GENERAL SAFETY INFORMATION

It is necessary to understand and follow the instructions in this manual to ensure proper and safe operation of the equipment.

As with most mechanical equipment, certain safety precautions must be taken when the equipment discussed in this manual is operated or serviced. Severe bodily injury or damage to equipment and property may result if the instructions and precautions listed throughout this manual are not followed.

Needless to say, sufficient guidelines cannot be developed to eliminate the need for good common sense in the use and servicing of this equipment, and in the use and application of the products this equipment has been designed to process. Users of this equipment must therefore make their own determination as to the suitability of the information contained in this manual to their specific operation and requirements. There should be no assumption made that the safety measures and instructions contained herein are all-inclusive, and that other safety measures may not be required for specific use or application.

The following safety guidelines are generally applicable to the safe and efficient use of the equipment.

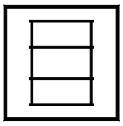
Acceptable Equipment Uses

The equipment is designed for the dispensing of polyurethane foams, two-component coating systems, and some two-component epoxy systems, specifically polyureas. Under no circumstances should any acid or corrosive chemicals be used in the unit. Consult GUSMER if there is any doubt about the compatibility of the chemical system to be used in this equipment.

Any use of this equipment other than as indicated above constitutes misuse unless express written approval is obtained from GUSMER.

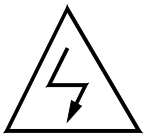
Operational Safety Procedures

This safety information will not be repeated in the text of this manual. The symbols pertaining to this information will appear where appropriate to alert the operator to potential hazards.



Solvents and Chemicals

WARNING: *THE SOLVENTS AND CHEMICALS USED WITH THIS EQUIPMENT EXPOSE THE OPERATOR TO CERTAIN HAZARDS. ADEQUATE PERSONAL PROTECTIVE MEASURES MUST BE TAKEN SO AS TO AVOID EXCEEDING THE THRESHOLD LIMIT VALUE (TLV) OF THE PRODUCTS BEING USED, AS ESTABLISHED BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) OR OTHER QUALIFIED AGENCY. OBTAIN INFORMATION CONCERNING PERSONAL PROTECTION AND PROPER HANDLING FROM THE SUPPLIER OF SUCH CHEMICALS.*

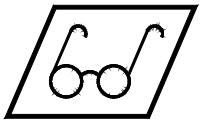


High Voltage

WARNING: *TO PREVENT SERIOUS BODILY INJURY FROM ELECTRICAL SHOCK, NEVER OPEN THE ELECTRIC CONSOLES OR OTHERWISE SERVICE THIS EQUIPMENT AND/OR EQUIPMENT USED WITH IT BEFORE SWITCHING OFF THE MAIN POWER DISCONNECT AND INTERRUPTING SUPPLY VOLTAGE AT THE SOURCE. THE ELECTRICAL SERVICE MUST BE INSTALLED AND MAINTAINED BY A QUALIFIED ELECTRICIAN.*

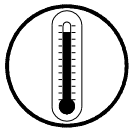
High Pressure

WARNING: *THIS EQUIPMENT HAS OR IS USED WITH EQUIPMENT THAT HAS HYDRAULIC COMPONENTS CAPABLE OF PRODUCING UP TO 1600 PSI. TO AVOID SERIOUS BODILY INJURY FROM HYDRAULIC EJECTION OF FLUID, NEVER OPEN ANY HYDRAULIC CONNECTIONS OR SERVICE HYDRAULIC COMPONENTS WITHOUT BLEEDING ALL PRESSURES TO ZERO.*



Personal Protective Equipment

WARNING: *TO AVOID SERIOUS BODILY INJURY, PROPER PROTECTIVE GEAR MUST BE WORN WHEN OPERATING, SERVICING, OR BEING PRESENT IN THE OPERATIONAL ZONE OF THIS EQUIPMENT. THIS INCLUDES, BUT IS NOT LIMITED TO, EYE AND FACE PROTECTION, GLOVES, SAFETY SHOES, AND RESPIRATORY EQUIPMENT AS REQUIRED.*



High Temperature

WARNING: *THIS EQUIPMENT HAS OR IS USED WITH EQUIPMENT THAT HAS HIGH TEMPERATURE COMPONENTS SUCH AS PRIMARY HEATERS AND HEATED HOSES. TO PREVENT SERIOUS BODILY INJURY FROM HOT FLUID OR HOT METAL, NEVER ATTEMPT TO SERVICE THE EQUIPMENT BEFORE ALLOWING IT TO COOL.*

Warning

WARNING: *FAILURE TO READ AND FOLLOW THIS SAFETY INFORMATION MAY RESULT IN PERSONAL INJURY AND/OR DAMAGE TO THE EQUIPMENT FROM ONE OR MORE OF THE ABOVE LISTED HAZARDS.*

GENERAL DESCRIPTION

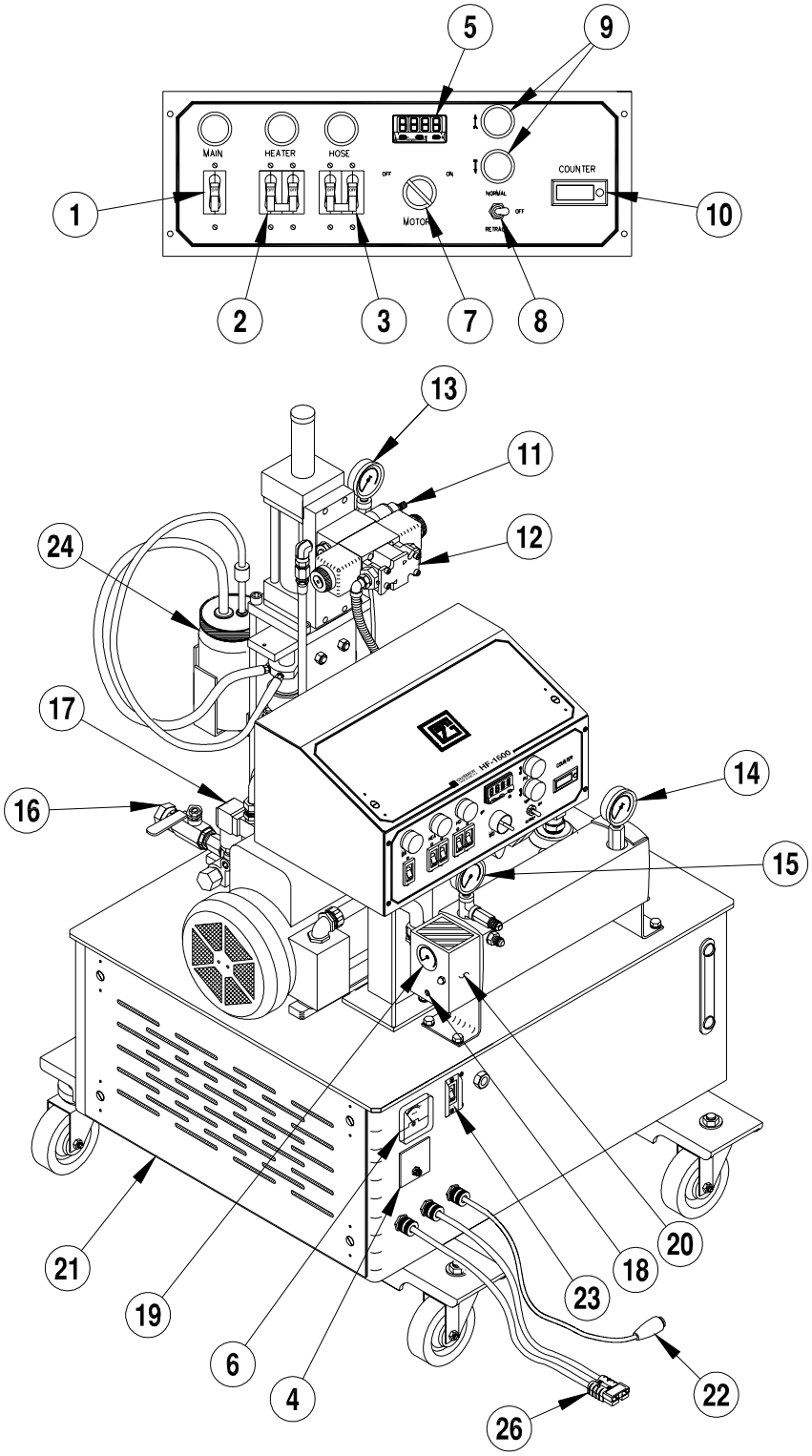


Figure 1. Model HF-1600/2500 Proportioning Unit

(Digital Hose Heat version shown)

1. **MAIN SWITCH-** Controls power to all circuits.
   - Pilot light (White) indicates that the Main Switch is ON.
2. **PRIMARY HEATER CIRCUIT BREAKER-** Controls and protects the Primary Heater.
   - Pilot light (Green) indicates that the Primary Heater is in a heating cycle.
3. **HOSE HEATER CIRCUIT BREAKER-** Controls and protects the Low Voltage Power Pack.
   - Pilot light (Green) indicates that the Hose Heater Circuit is on.
4. **HOSE HEAT POWER SET-** Controls the amount of amperage delivered to the hose heater. Adjust the power as required to maintain the desired hose temperature.
5. **HOSE HEATER TEMPERATURE CONTROLLER (DIGITAL HOSE HEAT ONLY)**- Controls the temperature maintained by the hose heater; set the Controller to the desired temperature. From this point, the temperature control is completely automatic.
6. **HOSE HEATER AMMETER-** Indicates the amount of amperage delivered to the hose heater.
7. **MOTOR CONTROL SWITCH-** Turns the Electric Motor on.
8. **PUMP CONTROL-** Controls operation of the Hydraulic Cylinder drive system.
   - **OFF-** Hydraulic drive system is off. Hydraulic pressure cannot be generated in this position.
   - **NORMAL-** Hydraulic drive system is on. Proportioning Pumps operate in this position.
   - **RETRACT**- Position for Shutting down the Proportioning Pumps. Stops the Proportioning Pumps in the retracted position.
9. **PUMP DIRECTIONAL INDICATOR LIGHTS (Amber)**- Indicate the direction the Proportioning Pump is traveling. Both lights will be off when the pump switch is OFF or when either Proportioning Pump exceeds its designed operating pressure limit.
10. **COUNTER**- Records the cycle count of the Proportioning Pumps. One cycle count equals two (2) strokes (one in each direction).
11. **PRESSURE REDUCING VALVE-** Controls the hydraulic pressure available to the hydraulic cylinder on the up stroke to compensate for the increased effect of transfer pump pressure.
12. **DIRECTIONAL VALVE-** Controls the direction of Hydraulic flow.
13. **HYDRAULIC PRESSURE GAUGE-** Displays the pressure in the hydraulic drive system during the up, down, and retract strokes.
14. **RESIN PRESSURE GAUGE-** Displays the pressure in the Resin proportioning system.
15. **ISO PRESSURE GAUGE-** Displays the pressure in the Isocyanate proportioning system.
16. **A-(ISO) INLET SUPPLY VALVE** *[R-(Resin) on other side]*

17. **CHEMICAL PRESSURE LIMIT SWITCH-** Factory set to turn off the hydraulic drive system when the Proportioning Pump exceeds the designed operating pressure limit.

18. **PRIMARY HEATER THERMOSTAT-** Controls the temperature of the Primary Heater. Turn clockwise to increase temperature; turn counter clockwise to decrease temperature.

19. **PRIMARY HEATER DIAL THERMOMETER-** Displays the temperature of the Primary Heater.

20. **THERMAL LIMIT SWITCH** *(not shown; located under heater cover)*- Interrupts power to the Primary Heater when the surface temperature approaches the designed operating temperature limit.

21. **HOSE HEAT TRANSFORMER** *(not shown; located behind compartment cover)* **-** Provides selectable low voltage outputs for heating various chemical hose lengths.

22. **TSU HARNESS** (*Digital Hose Heat only*)- Carries the electrical signal from the TSU sensor in the Iso hose to the Hose Temperature Controller.

23. **HOSE HEAT CIRCUIT BREAKER-** Controls and protects the Heated Hose Assemblies.

24. **LUBE SYSTEM** *(Iso Side Only)***-** Lubricates the pump shaft to prevent hardening of the Isocyanate.

25. **HYDRAULIC PRESSURE COMPENSATOR**- Controls the hydraulic pressure available to the hydraulic drive system.

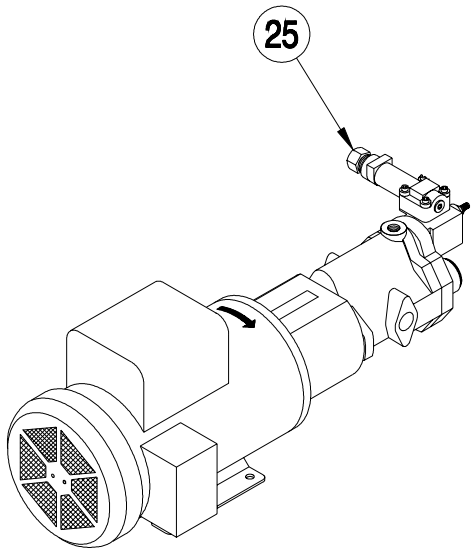


Figure 2. Hydraulic Pressure Compensator

26. **POWER-LOCK™ HOSE HEAT CONNECTION**- Connects power from the Transformer to the Heated Hoses.

SPECIFICATIONS

Hydraulic	250-1500 psi 15 gallon (max) 140° F Max.
Electric	
HF-1600 Manual Hose Heat:	42 amps @ 1x230 volts, 50/60 Hertz, AC 39 amps @ 3x230 volts, 50/60 Hertz, AC 43 amps @ 3x200 volts, 50/60 Hertz, AC (Asia only)
HF-1600 Digital Hose Heat:	42 amps @ 1x230 volts, 50/60 Hertz, AC 42 amps @ 3x230 volts, 50/60 Hertz, AC
HF-2500 Digital Hose Heat:	45 amps @ 1x230 volts, 50/60 Hertz, AC 32 amps @ 3x380 volts, 50/60 Hertz, AC
Output	
HF-1600:	16 lbs./min. (7 kg/min)
HF-2500:	10 lbs./min. (4.5 kg/min)
Maximum Operating Chemical Pressure	
HF-1600:	1600 psi (110 bars)
HF-2500:	2500 psi (172 bars)
Viscosity	25-3000 cps
Maximum Hose Length	310 feet (95 meters)
Weight	397 pounds serviced (180 kg)
Dimensions	44 inches high (118 cm high) 28 inches wide (71 cm wide) 28.5 inches deep (72 cm long)
Primary Heater	
HF-1600:	5000 Watts: Δt = 40° F (22° C) @10 lbs./min. *
HF-2500:	6000 Watts: Δt = 40° F (22° C) @10 lbs./min. *

***Theoretical:** your actual output may vary.

INITIAL MACHINE SET-UP

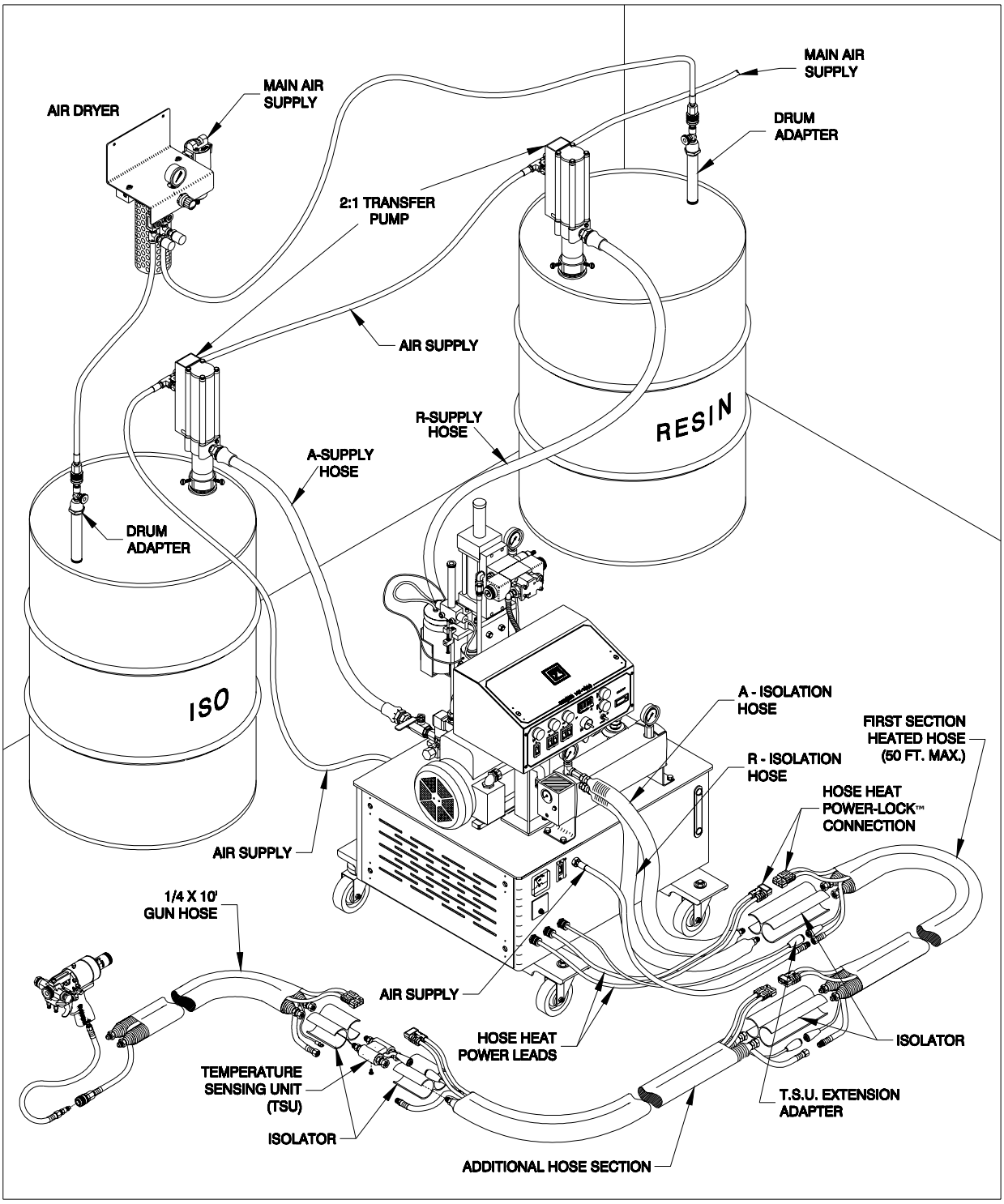
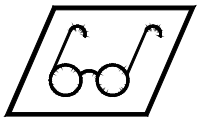


Figure 3. Typical HF-1600/2500 Installation

(Digital Unit shown with optional parts)



WARNING: *WEAR PROPER PROTECTIVE GEAR AS SPECIFIED BY THE CHEMICAL AND SOLVENT SUPPLIER WHEN USING OR SERVICING THIS EQUIPMENT. THIS INCLUDES BUT IS NOT LIMITED TO GLOVES, EYE PROTECTION, AND RESPIRATORY PROTECTION. REFER TO THE GENERAL SAFETY INFORMATION SECTION OF THIS MANUAL.*

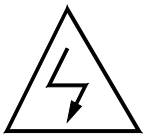
The Accessory Package included with the unit contains the following parts required for set-up:

- **Tape Roll**
- **Binder**
- **Lube Reservoir Bracket**
- **Isolator**
- **2.5' Air Hose**
- **(2) Swivel Unions**
- **Lube Reservoir**
- **Operating Manual**
- **Parts Identification Manual**
- **Isolation Hoses**
  Blue – Resin
  Red – Isocyanate
- **Warranty Card**
- **Hose Jumper Plug**
- **Temperature Sensing Unit (TSU) ∗**

∗ Supplied only with Digital Hose Heating System

Refer to Figure 3 for additional parts required for set-up.

IMPORTANT: *Complete and return the Warranty Validation Card within 2 weeks of receipt of equipment.*



WARNING: *THE PROPORTIONING UNIT ELECTRIC SERVICE MUST BE INSTALLED BY A QUALIFIED ELECTRICIAN ACCORDING TO THE NATIONAL ELECTRICAL CODE AND ALL APPLICABLE STATE AND LOCAL CODES.*

IMPORTANT: *Make sure the Main Power Supply is disconnected before proceeding.*

1. Connect the main power cord to the electrical console as follows:

   a) Feed the power cord through the strain relief in the rear of the console.

   b) **230V Units Only:**
   For Single-Phase Units connect the power leads to L1 and L2.
   For Three-Phase Units, connect the power leads to L1, L2, and L3 (see Figure 4).

NOTE:
The dashed lines in Figure 4 indicate the additional wire found on three-phase units.

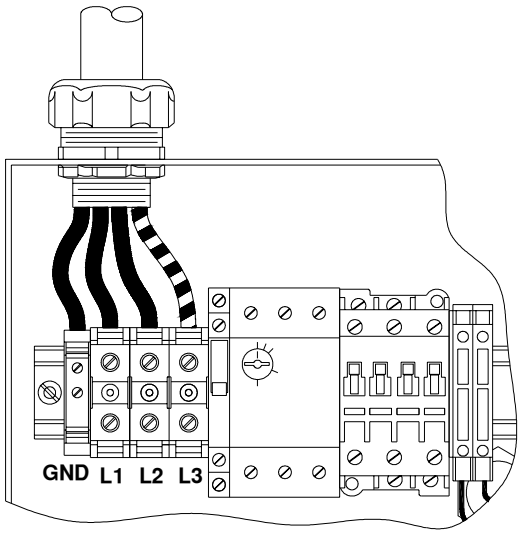


Figure 4. Main Power Connection, 230V

c) **380V Three-Phase Units Only:** Connect the power leads to L1, L2, and L3. Connect the neutral (N) wire to the blue neutral terminal block on the circuit breaker rail (see Figure 5).

d) **All Units:** Connect the ground wire to the ground (GND) position.

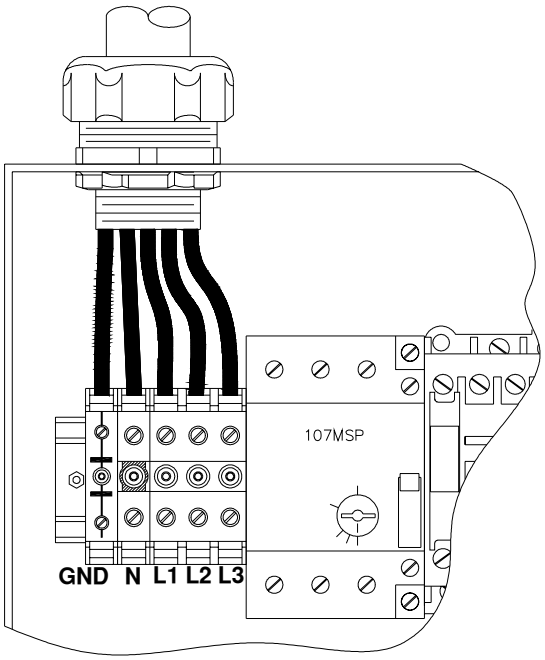


Figure 5. Main Power Connection, 380V

2. Set up the main air supply and moisture control systems as required. Refer to the individual instruction manuals for the proper procedures.

3. Fill the hydraulic reservoir through the vented filler with approximately 15 gallons of hydraulic fluid. (See APPENDIX for the recommended types of fluid.)

IMPORTANT: *DO NOT overfill. Check that the sight glass is approximately 3/4 filled with liquid.*

4. Check the hydraulic pump to ensure that the case is full. Remove the 90°-elbow fitting from the top of the pump and determine that the fluid level is to the top of the threaded hole. Add fluid as required and reattach fitting (see Figure 6).

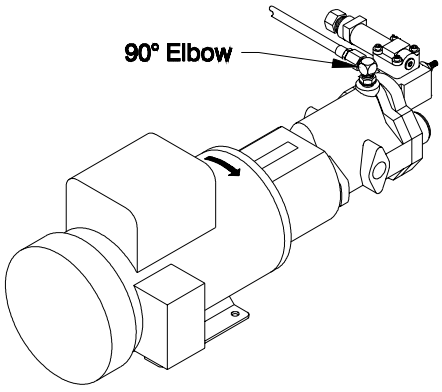


Figure 6. Hydraulic Fluid Level

5. Set up the Isocyanate Pump Lube System as follows (see Figure 7):

   a) Install the Lube Reservoir Bracket.

   b) Push the loose end of the ¼-inch urethane tube onto the ¼-inch Hose Barb on the Lube Pump Assembly.

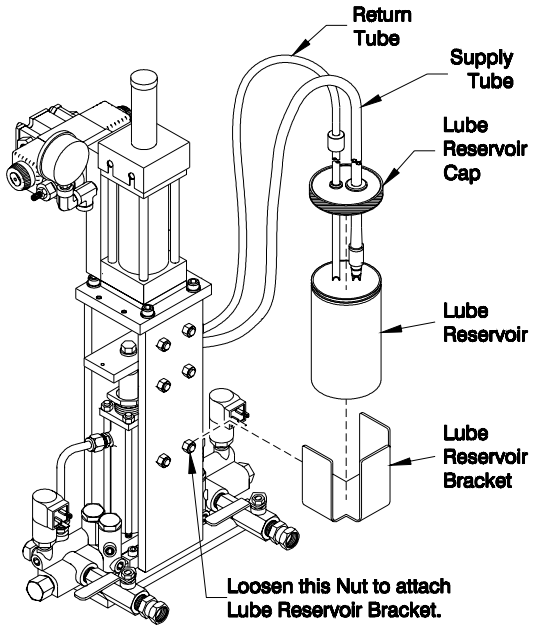


Figure 7. Lube Reservoir Installation

   c) Push the loose end of the 3/8-inch urethane tube onto the 3/8-inch Hose Barb on the Lube Pump Assembly.

   d) Fill the Lube Reservoir and thread it onto the Lube Reservoir Cap.

IMPORTANT: *Use only Gusmer Pump Lube (P/N 0960-1-GAL).*

   e) Place the Lube Reservoir into the Bracket. The Lube System is now ready for operation. No priming of the system is required.

6. Connect the Isolation Hoses to their respective Primary Heater outlets. Iso to the top fitting and Resin to the bottom fitting.

   IMPORTANT: *The Resin hoses are color-coded blue and the Isocyanate hoses are color-coded red for easy identification. In addition, the Resin and Isocyanate hose fittings are different sizes, making it virtually impossible to improperly connect the hoses.*

7. Connect the Heated Hose Assemblies to the Isolation Hoses as follows:

NOTE:
The hoses are Connected end to end during shipment to protect them from moisture intrusion. Do not separate the hoses until they are ready to couple to the proportioning unit.

IMPORTANT: *Be sure to make proper hose connections. The connection points are a potential source of chemical and air leaks and are susceptible to damage from scuffing and snagging on abrasive surfaces. A liberal amount of duct tape can be used in this area to make the bundle as compact as possible. Gusmer strongly recommends installing the optional scuff jacket to protect the hose insulation and TSU extension from damage.*

a) Lay out the heated hose assemblies as shown *(see Figure 8).*

- A- (Isocyanate) hoses are color-coded RED.
- R- (Resin) hoses are color-coded BLUE.

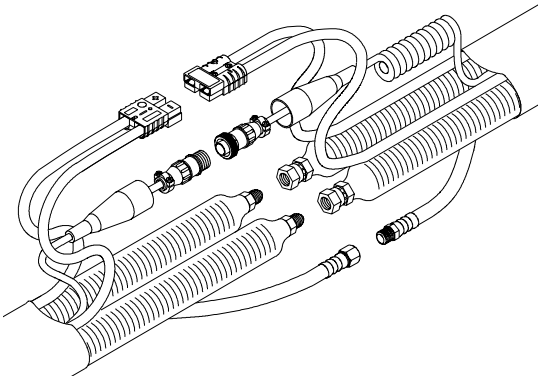


Figure 8. Hose Connection Step (a)

See Figure 9 for Steps b) and c).

b) Connect the Heated Hoses to the Isolation Hoses. Take care not to cross-thread or over-tighten the fittings, ensuring a leak-proof chemical connection.

c) Connect the Air Hoses and tighten the fittings with open-end wrenches.

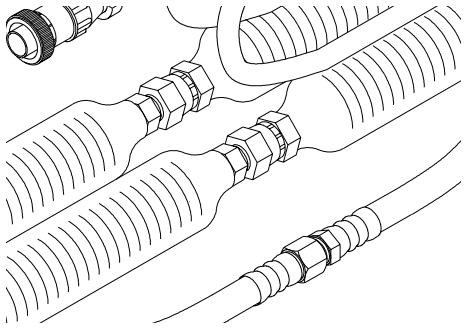


Figure 9. Hose Connection Step (b & c)

d) Tape the Isolator securely in place between the hydraulic fittings *(see Figure 10).*

IMPORTANT: *Always install the Isolator to prevent damage to the fittings.*

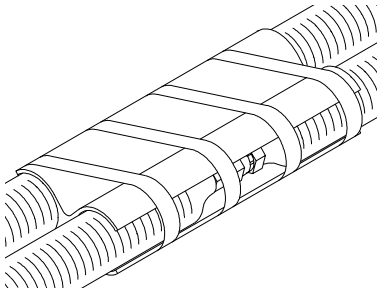


Figure 10. Hose Connection Step (d)

See Figure 11 for Steps e) and f).

e) Digital Hose Heat Machines Only: Connect the TSU Harness Plugs together. To ensure a secure electrical connection, place the protective electrical isolator boot over each plug and tape together.

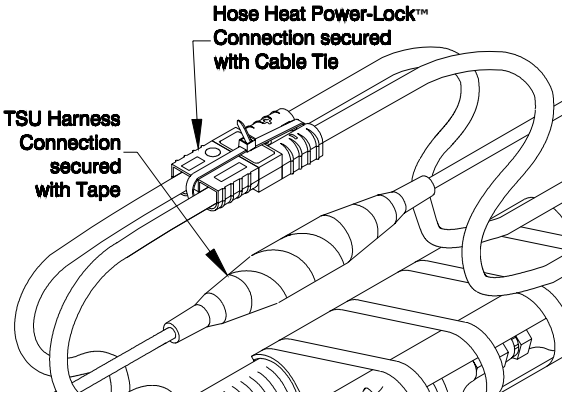


Figure 11. Hose Connection Step (e & f)

f) Plug the Hose Heat Power-Lock™ Connectors together. Secure the connection in place with the Cable Tie provided; failure to do so could cause a disruption in the Hose Heat System.

***** Repeat Step 7 for adding additional hoses.*****

8. On Manual Hose Heat units, connect the Gun Whip in the same way additional hoses are added and then go to Step 10.

9. On Digital Hose Heat units, install the Temperature Sensing Unit (TSU) on the Gun Whip as follows (see Figure 12).

   a) Pull out and carefully straighten the loose end of the temperature probe from the TSU.

   b) Insert the temperature probe into the Isocyanate hose and connect the Hose Whip, taking care not to cross-thread or over-tighten the fittings, ensuring a leak-proof chemical connection.

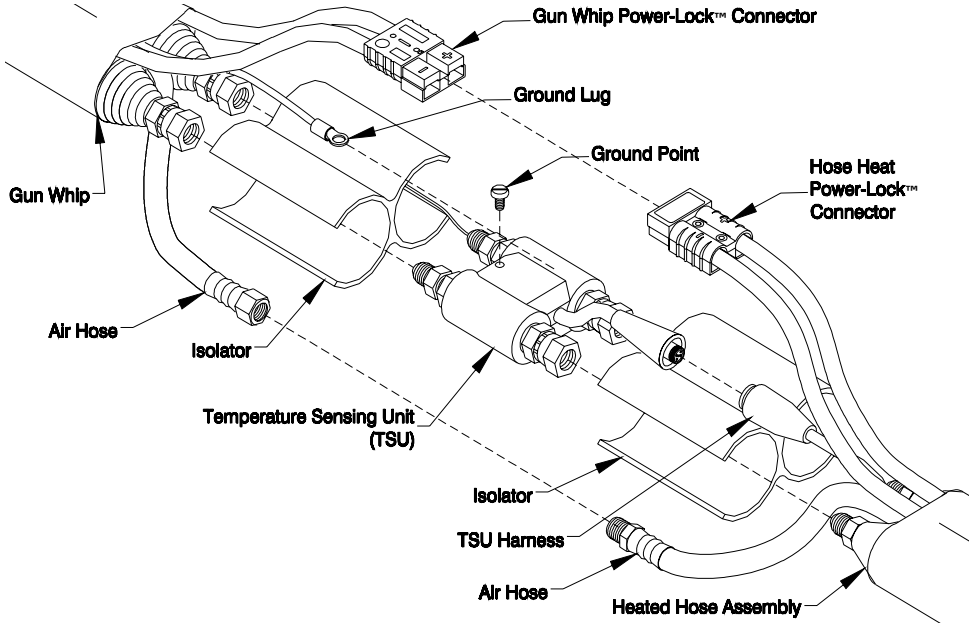


Figure 12. Temperature Sensing Unit (TSU) Connection

WARNING: *THE TEMPERATURE SENSOR EXTENDS APPROXIMATELY 8 INCHES INTO THE ISOCYANATE HOSE, AND ALTHOUGH IT IS A RUGGEDLY BUILT ASSEMBLY, IT WILL NOT WITHSTAND REPEATED ABUSE. BE CAREFUL NOT TO CRUSH THE HOSE OR SUBJECT IT TO SEVERE BENDING IN THE AREA WHERE THE SENSOR IS LOCATED. DO NOT TO COIL THE HOSE TIGHTER THAN THE RECOMMENDED 3 FT. MINIMUM BEND RADIUS.*

   c) Connect the ground wire on the gun hose to the ground point on the TSU.

   d) Connect the Heated Hose Assemblies to the TSU, taking care not to cross-thread or over-tighten the fittings, ensuring a leak-proof chemical connection.

   e) Connect the TSU Harness to the TSU. To ensure a secure electrical connection, place the protective electrical isolator boot over each plug and tape together.

f) Cut the Isolator in two and secure the two pieces in place between the hydraulic fittings.

g) Plug the Hose Heat Power-Lock™ Connectors together. Secure the connection in place with the Cable Tie provided; failure to do so could cause a disruption in the Hose Heat System.

h) Connect the TSU Harness to the Proportioning Unit.

10. Install the optional Scuff Jacket, if provided.

11. Connect the Main Air Source to the end of the Air Hose included with the Heated Hose Assemblies.

    IMPORTANT: *The Main Air Supply must be clean and free of contaminants. A minimum of 3/8- inch inside diameter air line (not supplied) should be used to deliver the air supply to the gun.*

12. Connect the coupling block to the gun hose and make sure that the manual valves are closed. (See the Spray Gun Operating Manual.)

13. On Manual Hose Heat units, install the Hose Thermometer. Insert the thermometer through the sponge so that the stem follows the twist of the hoses and lies between the butyl inner hose and the outer sponge insulation. This gives the most accurate temperature indication. Locate the thermometer in a position where the operator can clearly read the dial while spraying.

14. Properly ground all equipment. The high-velocity flow of fluid can create static sparking, which may cause fire or explosion. Certain solvents that are commonly in use with this equipment are flammable and may present a flash danger to the operator.

    a) The 2:1 Transfer Pump has a ground lug. Ground the pump in accordance with the instructions provided with the pump.

    b) Ground the Proportioning Unit at the main electrical source in accordance with the National Electrical Code. If a generator is powering the unit, consult with your electrician about additional grounding measures that may be required.

15. Connect the material supply system to the inlets of the proportioning unit. Use caution when connecting the chemical hoses to the appropriate Proportioning Pump.

Air Purge

Before the equipment is ready for use, the entire system must be purged of air and mineral oil left over from factory testing of the equipment.

To purge the machine proceed as follows:

1. Turn on the main air supply to the transfer pump.

NOTE:
It is a good practice at this point to check for material leaks.

2. Pressurize the Transfer Pumps and open the A- and R-Inlet Supply Valves.

3. Determine that the Hydraulic Pressure Compensator is fully decreased. (Counter clockwise) (See Figure 2 on Page 9.)

WARNING: *DO NOT DECREASE TO THE POINT WHERE THE HYDRAULIC PRESSURE COMPENSATOR IS DISENGAGED FROM THE PUMP, OR A HYDRAULIC SPILL MAY RESULT.*

4. With the Pump Switch OFF, switch ON the Main Switch and turn on the electric motor.
5. Switch the Pump Switch to NORMAL and jog pumps to top of stroke.
6. Remove the gun from the Coupling Block.
7. Turn ON the Pump Switch.

NOTE:
Materials must be properly discarded in accordance with applicable environmental regulations.

8. Open both manual valves while holding the coupling block over separate containers. Allow both materials to flow out of the coupling block simultaneously until all spitting of air stops and all traces of residual material have disappeared and a solid flow of each material is seen.
9. Switch the Pump Switch to OFF.
10. Close both manual valves and wipe clean any residual material from the coupling block.
11. Mount the gun to the coupling block.

Digital Hose Heater Temperature Controller (Optional)

The Gusmer 3200 controller automatically controls the temperature selected for the Digital Hose Heat System (See Figure 13).

WARNING: *DO NOT TURN THE TEMPERATURE CONTROLLER ON UNTIL ALL PURGING PROCEDURES ARE COMPLETED AND THE HOSE(S) COMPLETELY FILLED WITH CHEMICAL. DO NOT CHANGE ANY OF THE PREPROGRAMMED PARAMETERS.*

NOTE:
Digits normally show process temperature.

- * Press to view set point.
- * ▼ Press together to decrease set point.
- * ▲ Press together to increase set point.

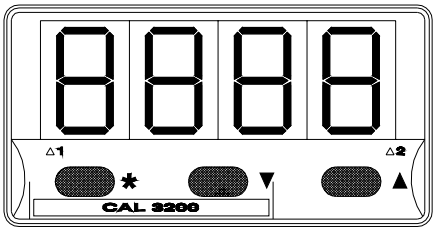


Figure 13. Gusmer 3200 Controller

WARNING: *THE TEMPERATURE CONTROLLERS ARE FACTORY-PROGRAMMED AND ARE NOT FIELD-PROGRAMMABLE. IF YOU ENCOUNTER ANY PROBLEMS WITH EITHER CONTROLLER, CONTACT GUSMER FOR A REPLACEMENT. DO NOT SUBSTITUTE A CONTROLLER FROM AN ALTERNATE SUPPLIER, AS ITS USE MAY RESULT IN DAMAGE TO THE EQUIPMENT AND/OR BODILY INJURY.*

Hose Heat Transformer

NOTE:
With the Hose Heat Power Set turned clockwise to maximum, the secondary amperage should not exceed 50 amps.

1. Set the tap on the Hose Heat Transformer in accordance with Figure 14.

IMPORTANT: *The transformer voltage must be set to match the hose length used. Too much power will cause the circuit fuse to open and too little power will result in insufficient hose heating. (See Figure 14)*

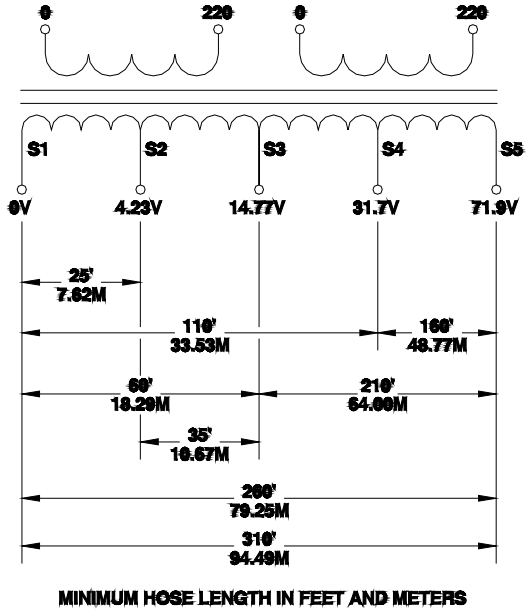


Figure 14. Transformer Tap Settings

NORMAL OPERATING PROCEDURES

Daily Start-up Procedure

WARNING: *DURING THE INITIAL START-UP, SLOWLY INCREASE THE HYDRAULIC PRESSURE AND CHECK ALL FITTINGS FOR SIGNS OF LEAKAGE. TIGHTEN AS REQUIRED.*

NOTE:
The daily start-up procedures will describe normal operation and will assume that all calibrations have been properly executed and that the heating system is NOT up to required temperatures.

1. Check the condition of the hydraulic system and Isocyanate Lube System and service as required.
2. Determine that the supply system is at the proper temperature as recommended by the system supplier, that the individual chemicals are properly mixed within their drums, and that the moisture protection system is properly set for operation.
3. Adjust the Packing(s). The packing nuts on the Iso and Resin Pumps are adjustable and will require periodic tightening to prevent leakage.
4. Check the inlet screens and service as required.
5. Turn on the Main Air Supply to the Transfer Pump.
6. Pressurize the Transfer Pumps and open both A- and R-Inlet Supply Valves.
7. Turn ON the Main Switch. The white pilot light should be on.
8. Switch ON the Hose Heat Circuit Breaker. The green pilot light should be on. (On Digital Hose Heat Units, adjust the Digital Temperature Controller to the desired temperature.)
9. Adjust the Hose Heat Power Set to 45-50 Amps for quick warm-up. Check the hose thermometer for proper spray temperature and readjust the Hose Heat Power Set as necessary to maintain temperature. **(Do not exceed 50 Amps.)**
10. Turn ON the Primary Heater Circuit Breaker.
11. Set the desired Primary Heater temperature by adjusting the Thermostat (clockwise to increase, counterclockwise to decrease). Make small adjustments and allow the heater to stabilize in between (See Figure 15).

    IMPORTANT: *To prevent excessive pressure build-up in the heated hoses, always bring the Hose Heater and Primary Heater up to the temperature before turning ON the Pump Switch.*

12. Turn on the Motor Control Switch.
13. Set the pump switch to NORMAL. One of the amber Directional Indicator Lights should be ON and the proportioning pumps should move a short distance and pressurize.
14. Set hydraulic pressure as required.

15. Connect air to the gun.

16. Open the manual valves and test spray while observing the Iso and Resin Pressure Gauges on both the up and down strokes.

17. To equalize the up stroke pressure, turn the Pressure Reducing Valve counter clockwise until it equals the chemical pressure read on the down stroke. (See Figure 1 on page 7)

Your Proportioning Unit is now ready for operation.

Daily Shut-Down Procedure

1. Set the Pump Switch to the RETRACT position.

2. Trigger the gun off target until the Proportioning Pumps stop in the retracted position and the Proportioning Pumps pressures bleed off to approximately 500 psi.

   IMPORTANT: *DO NOT bleed the pump pressure to zero. Some pressure is required to keep the packings operating normally and prevent weepage during shutdown.*

3. Turn OFF the Pump Switch.

4. Adjust the Hose Heat Power Set counterclockwise until the Ammeter reads zero.

5. Turn OFF the Hose Heater and Primary Heater Circuit Breakers.

6. Turn OFF the Hydraulic Pump Motor.

7. Turn OFF the Main Switch.

8. Close both Inlet Ball Valves.

9. Coil or secure the Heated Hose in a manner that prevents damage. (On Manual Hose Heat units, remove the Hose Thermometer.)

10. Shutdown the chemical supply system as required.

11. Close both manual valves on the Gun. Shutdown and service the gun as needed.

12. Turn OFF air to the gun and transfer pumps.

TROUBLESHOOTING PROCEDURES

General Information

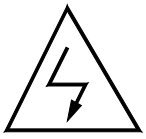
When properly maintained and operated, GUSMER equipment will provide long and faithful service. However, occasional problems will arise which must be resolved before operation can continue. The purpose of this section is to give an explanation of what problems may arise, how to detect them, and how to resolve them.

This manual is written to give the operator a general overview of the operation of the equipment, therefore it is imperative that before any troubleshooting process begins, the operators have read and understood the applicable portions of this manual.

Training schools held on a regular basis further develop the necessary knowledge for proper operation, maintenance and troubleshooting of GUSMER equipment. These schools give concentrated training on the equipment and help to develop an operator into a competent Certified Gusmer Technician. Obtain information on these schools from our sales office.

GUSMER maintains a competent staff of Technical Representatives and authorized Distributors who can resolve almost any problem you may encounter with GUSMER equipment. Feel free to call on these people for assistance when you need it.

WARNING: *THE TROUBLESHOOTING SECTION OF THIS MANUAL ASSUMES THAT THE INDIVIDUAL PERFORMING THE WORK ON THE EQUIPMENT IS QUALIFIED TO DO SO. THIS INDIVIDUAL MUST HAVE A WORKING KNOWLEDGE OF BASIC HYDRAULICS AND PNEUMATICS; MUST FOLLOW ALL GENERALLY ACCEPTED SAFETY PRECAUTIONS USED WHEN WORKING WITH HYDRAULICS, PNEUMATIC AND ELECTRICAL EQUIPMENT; MUST HAVE READ AND UNDERSTOOD THE APPLICABLE SECTIONS OF THIS MANUAL; AND MUST WEAR PERSONAL PROTECTION APPROPRIATE TO THE TASK BEING UNDERTAKEN.*



WARNING: *ALL ELECTRICAL TROUBLESHOOTING DESCRIBED IN THIS MANUAL MUST BE DONE WITH POWER OFF TO AVOID SEVERE BODILY INJURY FROM ELECTRICAL SHOCK. THIS MEANS, THAT IN ADDITION TO ALL CIRCUIT BREAKERS "OFF," DISCONNECT THE MAIN POWER AT THE SOURCE. ANY ELECTRICAL TROUBLESHOOTING REQUIRED BEYOND THE SCOPE OF THIS MANUAL MUST BE DONE BY A QUALIFIED ELECTRICIAN, THOROUGHLY FAMILIAR WITH THE OPERATION OF GUSMER EQUIPMENT.*

Primary Heating System

NOTE:
For clarity, this view shows the cover removed for troubleshooting ONLY. Otherwise, never remove it from the machine during normal use.

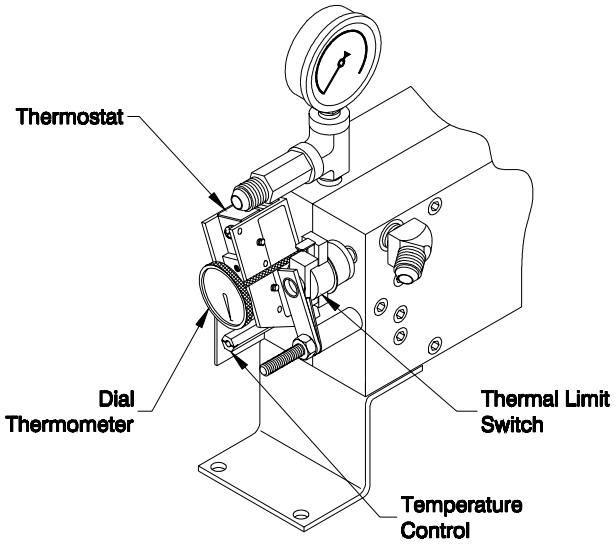
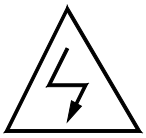
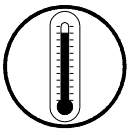


Figure 15. Primary Heater Features





WARNING: *BEFORE PERFORMING THESE TROUBLESHOOTING PROCEDURES, DETERMINE THAT ALL CIRCUIT BREAKERS ARE OFF AND MAIN POWER IS DISCONNECTED AT THE SOURCE TO AVOID BODILY INJURY FROM ELECTRICAL SHOCK. DO NOT ENTER THE ELECTRICAL CONSOLE WITH POWER ON.*
THERE IS HIGH VOLTAGE INSIDE THE PRIMARY HEATER COVER BOX. DO NOT REMOVE THE COVER BOX WITH POWER ON.
THERE IS HIGH TEMPERATURE INSIDE THE COVER BOX. NEVER OPERATE THE HEATER WITH COVER BOX REMOVED.
COOL THE FLUID IN THE HEATER BY PUMPING UNHEATED FLUID THROUGH THE HEATER TO AVOID BODILY INJURY FROM HOT FLUID AND HOT METAL.

To avoid unnecessary repairs, try the recommended solutions in the order given for each problem. Before assuming there is a problem, determine that all circuit breakers, switches, and controls are properly set.

Problems	**Solutions**
No heat- green pilot light does not cycle on.	1
Partial heat- green pilot light on continuously.	2

SOLUTIONS

1. The Thermostat or Thermal Limit Switch is not functioning properly.

   a) THERMOSTAT CHECK- the green pilot light will only be lit when the temperature of the Primary Heater is below the temperature setting of the thermostat. Turn the thermostat up (clockwise) to check the operation of the heater and then reset to the desired setting.
   If this does not solve the problem, continue to step (b).

b) THERMAL LIMIT SWITCH - When moving the Proportioning Unit, it is probable that the Thermal Limit Switch will trip in transit. Nevertheless, if the heater functions properly after the limit switch has been reset it is imperative that the operation of the heater be closely monitored to ensure the switch has not tripped as a result of a heater malfunction.

To reset the Limit Switch, proceed as follows:

1) Switch off the Main Switch and Primary Heater Circuit Breaker.

2) Remove the cover box by removing the acorn nut and sliding the cover box away from the heater.

3) Recheck to ensure all electrical power is OFF.

4) Reset the Thermal Limit Switch by pushing in the red button on the switch.

5) If the Thermal Limit Switch does not feel as though it reset, then disconnect one lead from the Thermal Limit Switch and read continuity across the switch. If no continuity, the switch is defective and must be replaced.

6) If this does not solve the problem, replace the thermostat.

7) Slide the cover box back into place and tighten the acorn nut.

8) Switch on the electrical power and monitor the operation of the primary heater to ensure it is functioning properly.

2. HEATING RODS - The Primary Heater contains four 1250-watt, 38.7 ohm (1500-watt, 32.3 ohm for HF-2500) Heating Rods wired in parallel. To check that all elements are operational, proceed as follows:

a) With power OFF and the Primary Heater Circuit Breaker OFF, read the resistance across the four Heating Rods. The resistance should be 9.6 ohms (8.1 ohms for HF-2500). A higher resistance indicates that one or more rods are not working. If this is the case, proceed to step (b).

b) Disconnect the Heating Rods and measure the resistance of each rod. Each rod should measure 38.7 ohms (32.3 ohms for HF-2500). If not replace the damaged rod or rods.

Proportioning System

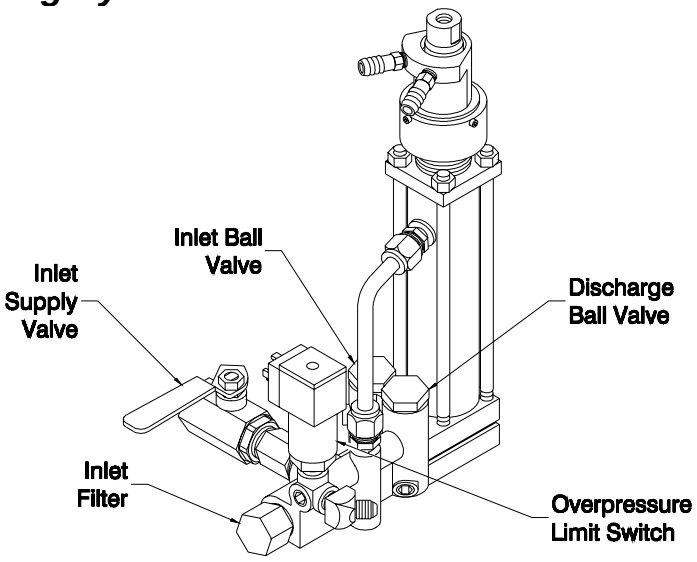


Figure 16. Proportioning Pump Features

To avoid unnecessary repairs, try the recommended solutions in the order given for each problem. Before assuming there is a problem, determine that all circuit breakers, switches, and controls are properly set.

Problems	**Solutions**
Proportioning pump does not hold pressure when stalled.	1
Pressure imbalance between pumps.	2,3,4
Cavitation in the Proportioning Pump.	2,3,4
Failure of the pump to reverse.	7,8
Pumps do not move and the directional indicator lights are out.	5,6,7
Pump movement is erratic.	8
Unequal pressure or speed on the upstroke verses the down stroke.	9

SOLUTIONS

1. LEAKING DISCHARGE VALVE - Determine which inlet or discharge valve is leaking. If the pump (A or R) is losing pressure on the upstroke, check the discharge valve of the respective pump. If the pump is losing pressure on the down stroke, check the inlet valve of the respective pump.

    a) Close the Inlet Supply Valve and de-pressurize the Transfer Pump.

    b) De-pressurize the Proportioning Pump.

    c) Remove the appropriate valve cover and use a magnet remove the valve ball.

    d) Flush and wipe clean the valve ball and ball seat of all residual material. Inspect these parts for damage.

e) In most cases, the cause of the leaking valve is a particle of foreign material preventing the ball from seating properly. If cleaning the ball and seat does not resolve the problem, replace the valve ball and or pump base.

NOTE: ***Higher supply temperatures will be necessary with systems containing substitute-blowing agents such as CFC-141b. Contact the system supplier for specifications.***

2. Troubleshooting this problem requires that two points be determined:

   First- Which chemical did not reach the gun?

   Second- Why did that chemical fail to reach the gun?

   Determine the first point by checking the color of the material exiting the gun. Foam systems are usually a combination of light and dark material. Therefore, by observing the color of the liquid exiting the gun, one can determine which material is missing.

   The second point either is due to a restriction in the gun or because the Proportioning Pump did not perform properly in pumping its designed volume.

   This is determined by checking the Iso and Resin Pressure Gauges on the Proportioning Unit. Focus on the Pressure Gauge corresponding to the missing chemical.

   Assume that the R-component is not reaching the gun. If the Resin Pressure Gauge is considerably lower than normal, the problem is the pump. If the Resin Pressure Gauge is considerably higher than normal, the problem is usually in the gun and must be resolved by referring to the gun manual.

3. CAVITATION is the formation of a partial vacuum or void within the pump cylinder during the fill/upstroke stroke.

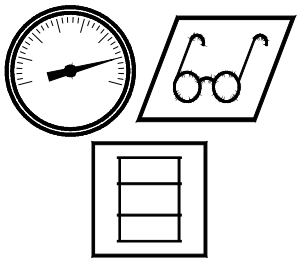
   It is actually a “short fill” since the fill chamber does not fill completely with liquid when the pump reverses to start the discharge/down stroke. This “short fill” occurs when the Proportioning Pump demands a greater volume of material during its fill stroke than can be supplied.

   The most common causes of cavitation are as follows:

   a) The Transfer Pump cannot handle the supply requirement. A Gusmer 2:1 Transfer Pump is recommended for use with the HF-1600/2500. Also recommended is a minimum of 3/4” diameter supply hose, as short as practical.

   b) The chemical is too viscous (thick) to pump properly. The recommended supply temperature is 65° F, to 75° F. Temperatures below 65° F, cause the material to thicken and become increasingly harder to pump.

   c) The Inlet Filter Screen is restricted. Service as required.



WARNING: *THIS PROPORTIONING UNIT OPERATES AT PRESSURES OF 1600-2500 PSI. EXERCISE EXTREME CAUTION BEFORE OPENING ANY HYDRAULIC CONNECTIONS OR SERVICING THE PUMP OR PUMP BASE. BLEED OFF THE PRESSURE IN BOTH THE SUPPLY AND DELIVERY SIDES OF THE PUMP TO ZERO TO AVOID SERIOUS BODILY INJURY FROM FLUID EJECTION. NEVER SERVICE COMPONENTS CONTAINING CHEMICALS WITHOUT WEARING APPROVED SAFETY GLASSES AND PROTECTIVE GLOVES TO PREVENT PROLONGED SKIN CONTACT.*

4. LEAKING INLET CHECK VALVE - An inlet check valve and/or leaking seat that does not properly seal will permit some of the proportioned material to flow back towards the supply drum. When this happens the proper volume of material will not pump during the discharge stroke and an off-ratio condition will result.

5. OVER-PRESSURE SHUTDOWN- A 2000-psi pressure limit switch (2800-psi pressure limit switch for HF-2500 unit) protects each Proportioning Pump. Upon reaching this pressure, the switch automatically removes power from both directional coils causing the pump to stall. When the power is removed, both Directional Indicator Lights will go out. This indicates there has been an Over-Pressure Shutdown.

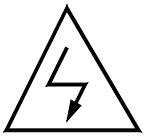
   As this is not a lockout type of system, the Proportioning Pumps will be restored to normal operation when the pressure bleeds off to approximately 200 psi. However, the cause of the over-pressure condition should first be determined and corrected.

   The most likely causes of over-pressure shutdown are:

   a) Restriction in the gun

   b) Pump cavitation

   c) Hydraulic pressure is set too high



WARNING: *BEFORE PERFORMING THESE TROUBLESHOOTING PROCEDURES, DETERMINE THAT ALL CIRCUIT BREAKERS ARE OFF AND MAIN POWER IS DISCONNECTED AT THE SOURCE TO AVOID SEVERE BODILY INJURY FROM ELECTRICAL SHOCK. DO NOT ENTER THE ELECTRICAL CONSOLE WITH THE POWER ON*

6. CONTROL TRANSFORMER FUSES- With the power OFF, open the electric console, and check the (3) three control transformer fuses for continuity or simply replace them. (See *Figure 17*)

WARNING: *REPLACE FUSES WITH ONES OF THE SAME RATING. A SUBSTITUTE MAY DAMAGE THE EQUIPMENT AND CREATE A POTENTIAL SOURCE OF INJURY TO THE OPERATOR.*

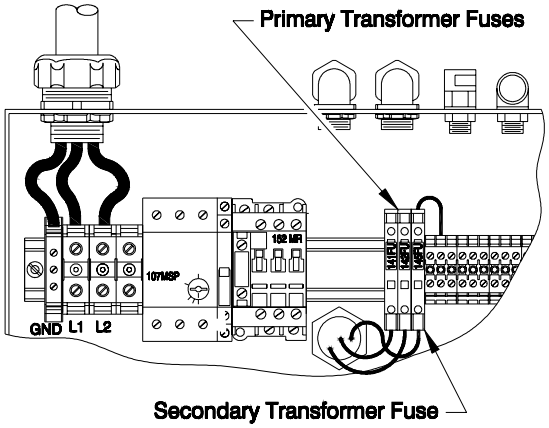


Figure 17. Transformer Fuse Location

7. REVERSING SWITCH - In order for the Proportioning Unit to reverse direction, the ends of a slot machined in the rear leg of the pump yoke must contact the arm of the switch lever. This contact causes the switch lever to activate on the Reversing Switch, which energizes one hydraulic valve coil and de-energizes the other. A problem arises when the yoke fails to contact the switch lever or when the spool in the hydraulic valve fails to shift after its coil activates.

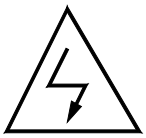
   Typically, something physically prevents the yoke from traveling its full stroke. In this case physically check and correct it. It may also be the result of the hydraulic pressure set to a point where the total resistance downstream of the hydraulic cylinder is such that the cylinder cannot pump against it. Correct this by increasing the hydraulic pressure.

   Failure of the hydraulic valve coils to energize and de-energize may be caused by several things. This failure is readily seen because the yoke will have physically switched the Reversing Switch, but the pump direction will not have reversed. If this occurs, the problem is either in the Reversing Switch circuitry of the malfunctioning valve, or a mechanical or electrical problem within the valve.

8. ROLLER BEARINGS- Occasional replacement of the roller bearings is necessary if they become clogged with dirt or Isocyanate and seize.

9. UPSTROKE PRESSURE REDUCING VALVE - During the upstroke, both proportioning pumps will be on the fill stroke and will be boosted by the supply pump pressure. Adjust the down stroke pressure using the Hydraulic Pump Regulator. The up stroke pressure can be adjusted using the Pressure Reducing Valve mounted under the Directional Valve.

Hose Heat System



WARNING: *BEFORE PERFORMING THESE TROUBLESHOOTING PROCEDURES, DETERMINE THAT ALL CIRCUIT BREAKERS ARE OFF AND THE MAIN POWER IS DISCONNECTED AT THE SOURCE TO AVOID SEVERE BODILY INJURY FROM ELECTRICAL SHOCK. DO NOT ENTER THE ELECTRICAL CONSOLE WITH POWER ON.*

To avoid unnecessary repairs, try the recommended solutions in the order given for each problem. Before assuming there is a problem, determine that all Circuit Breakers, switches, and controls are properly set.

Problems	**Solutions**
Hose warm but does not reach temperature or takes too long to reach temperature.	1, 2, 7
Hose does not heat; lights on.	2, 4, 3, 8
EE1 shows on digital display.	5
Hose Heat Circuit Breaker trips.	2
Hose temperature not maintained during flow; lights on.	2, 6, 7
Hose or hoses adjacent to the unit are warm - hoses downstream are cold.	4

SOLUTIONS

1. HOSE LENGTH- The design of the HF-1600/2500 Hose Heater allows it to operate with up to 310 feet of hose. Hose lengths greater than this reduce the ability of the hose heat to reach temperature. (See Initial Machine Set up) In addition, if chemical or ambient temperature is too cold, the hose circuit may not have enough power to bring the chemical up to temperature.

2. HOSE HEAT TRANSFORMER - The low voltage Transformer is adjustable to accommodate 35 ft. to 310 ft. of hose. If the Hose Heat Adjust is set too low the hose will not heat or take too long to heat. If set too high Hose Heat Circuit Breaker will trip. Set the power to 45 - 50 amperes in the hose circuit.

3. DIGITAL HOSE HEAT SOLID STATE RELAY (SSR)- It is not possible to check for normal operation of the SSR without electric power. Therefore, if all other testing fails to determine the source of problem, assume the SSR is inoperative and replace it.

4. HOSE HEATING ELEMENT- With power OFF, check to see that the Power-Lock™ Connectors on the hoses and all electrical connections between the hoses and Proportioning Unit are tight. If these connections are secure and hose heat is not present, then make a systematic search for the electrical fault as follows:

   a) Starting at the Gun Whip, unplug the Power-Lock™ Connectors and plug the Hose Jumper Plug (P/N 0684-3) into the last "upstream" segment of hose.

   b) Turn ON power to the Hose Heat System and adjust the Hose Heat Power Set (clockwise) to between 45 and 50 Amps **(Do Not exceed 50 Amps)**.
   If hose heat is restored, then the fault is within the Gun Whip.

      If hose heat is not restored, adjust the Hose Heat Power Set counterclockwise until the Ammeter reads zero, then turn OFF power to the Hose Heat System and proceed with the Steps below.

IMPORTANT: READ FIRST BEFORE PROCEEDING

ALWAYS reduce the Hose Heat Transformer voltage by adjusting the tap setting LOWER to match the shorter hose length each time an additional hose segment is unplugged. (See Figure 18.)

   c) Adjust the tap settings of the Hose Heat Transformer to match the next shortest length of heated hose (see Figure 18).

   d) Unplug the next set of Power-Lock™ Connectors and plug the Hose Jumper Plug into the last "upstream" segment of hose.

   e) Turn ON power to the Hose Heat System and adjust the Hose Heat Power Set to between 45 and 50 Amps.
   If hose heat is restored, then the fault is within the last unplugged segment of hose.

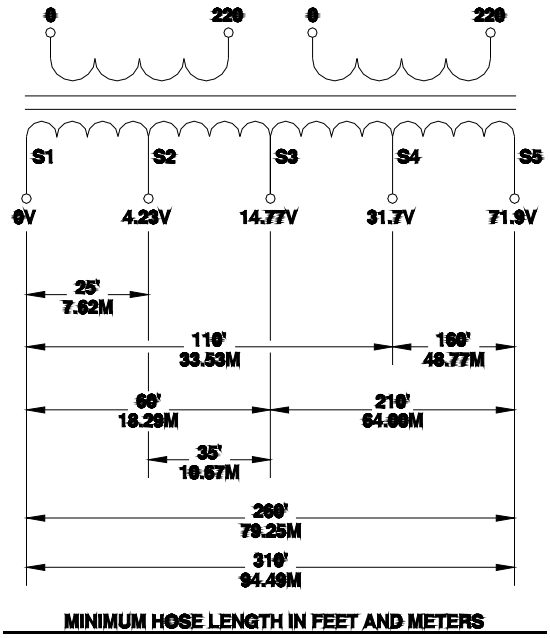


Figure 18. Transformer Tap Settings

If hose heat is not restored, adjust the Hose Heat Power Set counterclockwise until the Ammeter reads zero, then turn OFF power to the Hose Heat System and repeat Steps c) through e) until the fault is located.

5. TEMPERATURE SENSING UNIT (TSU)- Two conditions must be satisfied for proper operation:

   - The sensor must be functional.

   - The signal must travel uninterrupted from the sensor to the control unit.

Unplug the TSU from its extension. Without undoing any chemical connections, move the hose section with the TSU to the Proportioning Unit and plug the TSU directly into the TSU Extension Harness. Change the TSU, if control is not restored. If control is restored, systematically check each section of the TSU Wire Harness out to the gun.

6. PRIMARY HEAT AND HOSE HEAT SETTINGS- The purpose of the hose heater is not to add heat but rather to maintain the temperature developed by the Primary Heater. If indications are that the hose heater is not maintaining temperature during flow, check that the primary heat and hose heat are set for the same temperature or reduce the output.

7. LOW LINE VOLTAGE- Low line voltage may significantly reduce power available and the heater will not perform to its full capability at maximum hose length. Determine the secondary amperage of the Hose Heat circuit and adjust the tap setting as required to achieve 45-50 Amps.

8. MANUAL HOSE HEAT CONTROL- It is possible to bypass the Hose Heat System and operate the Hose Heat System manually. This feature allows for continued operation of the Hose Heat System in case of signal or SSR failure. To convert to manual control, proceed as follows:

   a) TURN OFF THE MAIN DISCONNECT. Open the transformer cover plate. Remove the terminal jumper strip located near the SSR. Install it across terminals #1 and #2 on the Hose Heat SSR (See Figure 19).

   b) Manual Hose Heat control requires the installation of a Hose Thermometer. Insert the thermometer through the sponge so that the stem follows the twist of the hoses and lies between the butyl inner hose and the outer sponge insulation. This gives the most accurate temperature indication. The thermometer should be located on the end of the hose nearest the gun in a position where the operator can see it while spraying.

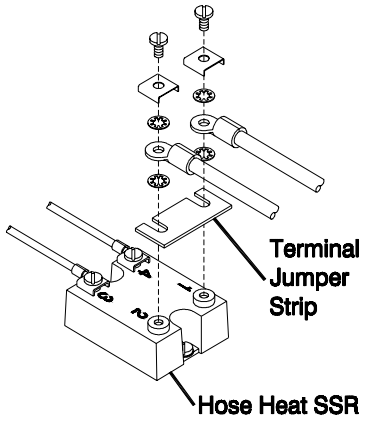
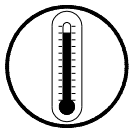


Figure 19. Terminal Jumper Strip Installation

   c) Maintaining hose temperature now requires manual adjustment of the Hose Heat Power Set. Adjust the control clockwise to a maximum of 50 Amps for initial warm up and then adjust as required to maintain the hose temperature.



WARNING: *DO* ***NOT ALLOW HOSE TO OVERHEAT*** *DURING MANUAL CONTROL OF THE HOSE HEAT SYSTEM.* ***HOSE TEMPERATURE, AS INDICATED BY A PROPERLY*** *INSTALLED HOSE* ***THERMOMETER, CANNOT EXCEED 170°F (76°C).*** *CLOSELY MONITOR HOSE TEMPERATURE TO AVOID POSSIBLE INJURYAND/OR DAMAGE TO PROPERTY.*

Hydraulic Drive System

WARNING: *BEFORE PERFORMING THESE TROUBLESHOOTING PROCEDURES, DETERMINE THAT ALL CIRCUIT BREAKERS ARE OFF AND THE MAIN POWER IS DISCONNECTED AT THE SOURCE TO AVOID SEVERE BODILY INJURY FROM ELECTRICAL SHOCK. DO NOT ENTER THE ELECTRICAL CONSOLE WITH POWER ON.*

To avoid unnecessary repairs, try the recommended solutions in the order given for each problem. Before assuming there is a problem, determine that all Circuit Breakers, switches, and controls are properly set.

Problems	**Solutions**
Electric motor will not start or stops during operation.	1
Hydraulic pump does not develop pressure.	1, 2
Low or zero pressure with screeching noises.	3

SOLUTIONS

1. MOTOR STARTER- The electric motor is protected by a Motor Starter factory set to trip when the motor draws too much current. To restore the motor to operation, with power OFF, switch the Motor Starter to the ON position.

   However, it is also important to determine the cause of the trip.

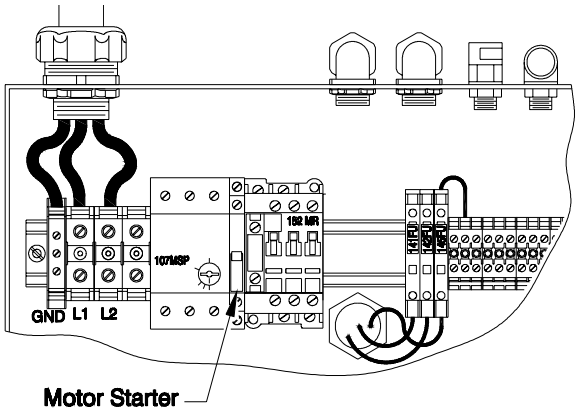


Figure 20. Motor Starter Location

2. ZERO OR LOW PRESSURE- Remember hydraulic pressure cannot be generated with the pump switch in the off position.

   Assuming the pump is in proper working order, and the pump switch is properly set, the one major factor that can cause it not to produce pressure is that the pump is either not priming or losing its prime. To assure a positive prime, check the following:

   a) Hydraulic reservoir serviced to the proper level including a check that the cartridge strainer and hydraulic fluid are clean.

   b) Pump case filled with fluid.

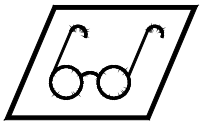
   c) Ensure Inlet fitting is tight. Air leaking into the pump case can cause the pump to lose its prime.

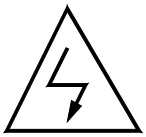
3. SCREECHING- The screeching noise is characteristic of cavitation and is normal at initial start-up for a maximum of 30 seconds. If the screeching continues for more than 30 seconds, check that the inlet fittings are tight and that the pump has not lost its prime.

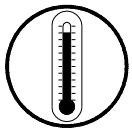
   A second cause of screeching can be high hydraulic temperature. Determine if the reservoir requires servicing and if necessary provide better ventilation to permit the reservoir to dissipate heat more efficiently.

MAINTENANCE

To realize the full productivity of the HF-1600/2500, it is necessary to perform maintenance on a daily or periodic basis.







WARNING: *WHENEVER WORKING ON THE EQUIPMENT, WEAR EYE AND SKIN PROTECTION TO GUARD AGAINST EXPOSURE TO THE CHEMICALS AND SOLVENTS IN USE. ALWAYS WORK IN A WELL VENTILATED AREA TO PREVENT EXPOSURE TO HARMFUL FUMES AND VAPORS. OBTAIN INFORMATION CONCERNING THE TOXICITY AND PROPER HANDLING PROCEDURES OF YOUR CHEMICALS AND SOLVENTS FROM YOUR SUPPLIER.*

UNLESS OTHERWISE SPECIFIED, SWITCH OFF ALL CIRCUIT BREAKERS AND DISCONNECT THE MAIN POWER AT THE SOURCE TO AVOID SEVERE BODILY INJURY FROM ELECTRICAL SHOCK. DO NOT ENTER THE ELECTRICAL CONSOLE WITH POWER ON.

THE PRIMARY HEATER CAN BE VERY HOT. BEFORE PERFORMING MAINTENANCE, ALLOW THE HEATER TO COOL TO AVOID BODILY INJURY FROM HOT FLUID OR HOT METAL.

PRESSURES OF 1600-2500 PSI EXIST IN THE HYDRAULIC COMPONENTS. BEFORE OPENING ANY HYDRAULIC CONNECTIONS OR SERVICING HYDRAULIC COMPONENTS, USE EXTREME CAUTION TO ENSURE THAT ALL PRESSURES HAVE BEEN BLED TO ZERO TO AVOID SERIOUS BODILY INJURY FROM FLUID EJECTION.

Pump Lube System

The HF-1600/2500 is equipped with Gusmer's Continuous Flushing Lube Pump System, which extends the life of the Isocyanate pump shaft seals. Isocyanate Crystals that form on the pump shaft are flushed away by a continuous flow of Pump Lube supplied to the Lube Cup. The Pump Lube then flows to the Lube Reservoir where the crystals sink to the bottom and do not reenter the system, preventing premature seal damage.

When properly maintained, this System will reduce down time due to Isocyanate pump seal maintenance. Take time to familiarize yourself with the Pump Lube System.

PUMP LUBE REPLACEMENT

To ensure trouble-free operation of the Continuous Flushing Lube Pump, replace the Pump Lube in the reservoir every two weeks as follows:

1. Unscrew the Lube Reservoir from the plastic cap attached to the hose assembly.

2. Dispose of the used Pump Lube in an appropriate manner.

3. Refill the reservoir with Gusmer Pump Lube (P/N 0960-1-GAL).

4. Replace the cap, making sure the outlet hose (the hose that supplies Pump Lube to the Lube Cup) is at the upper level of the reservoir and the inlet hose is at the lower level of the reservoir. This will ensure that any Isocyanate Crystals will settle to the bottom of the reservoir and not return to the Lube Cup.

Inlet Filter Screen

A filter screen in each Proportioning Pump filters out solid matter that could adversely effect the operation of the valve balls in the pump base.

For the first week or so of operation, you should clean both pump screens on a daily basis, as indicated in the Daily Start-up Procedure. However, you will probably find that the Resin pump screen remains clean and that weekly checking of this part will be sufficient.

The Isocyanate pump screen is another matter. The Isocyanate component can crystallize from either moisture contamination or from freezing. If you follow proper storage, transfer, and operating procedures, and if the chemicals you receive are clean, you should have little problem with the Isocyanate screen. In practice though, findings suggest that daily cleaning of the Isocyanate screen is sound preventative maintenance. It is important not to clean the Isocyanate pump screen during the shutdown operation. This is because the cleaning of the screen exposes it and its related parts to moisture and solvent, which can cause the Isocyanate to crystallize. By accomplishing the cleaning operation during the Start-up Procedure, contamination problems will flush out immediately when dispensing commences.

Remove and clean the filter screen as follows:

1. Turn OFF the pump switch and power to the hydraulic pump. Close the material supply valve at the inlet of the appropriate Proportioning Pump. This prevents the pumping of material with the screen screw removed. Bleed off chemical and hydraulic pressure by opening the corresponding manual valves on the coupling block while pointing it into appropriate separate containers.

2. Place a cup in the space provided beneath the filter base to catch the chemical that will drain off upon removing the screen screw.

3. Loosen the screen screw sufficiently to allow the material in the screen screw cavity to drain out into the cup.

4. Remove the screen screw from the pump base by continuing to unthread it until it comes loose.

5. Remove the retainer ring at the end of the screen screw and slide the screen from the screen screw. Thoroughly flush the screen screw, the retainer ring, and the screen with the gun cleaner, and shake them dry. Inspect the screen to ensure the mesh is not restricted. Replace as required.

6. Slide the screen on the screen screw and replace the retainer ring.

7. Flush the cavity in the pump base with gun cleaner and wipe the cavity clean using caution not to push foreign matter into the ball seat.

8. Install the screen screw assembly into the pump base by inserting the screen screw with the threaded portion sliding along the top cavity. This prevents pushing foreign matter into the ball seats.

9. Open the material supply valve. Ensure there are no leaks and wipe the equipment clean.

Hydraulic System

The hydraulic system should be checked annually for cleanliness as follows:

1. Disconnect Power.

2. Thoroughly clean the tank top and the components in the area of the tank. This prevents foreign matter from entering the hydraulic reservoir when the cover plate is removed.

3. Remove the six (6) cover plate mounting screws. Separate the hydraulic suction pipe from the fitting connecting the pipe to the hydraulic pump.

4. Remove the cover and pipe from the hydraulic reservoir.

5. Inspect the bottom of the reservoir for sediment. If present, drain the hydraulic fluid, clean the tank thoroughly, and refill the reservoir with new fluid. Replace the strainer on the suction pipe to ensure a free flow of hydraulic fluid to the pump.

NOTE:
Upon starting the motor, the hydraulic pump may make a screeching noise for a short time. Should this noise continue for more than 30 seconds, switch off the motor control and refer to the troubleshooting section of this manual.

6. Replace the cover and the suction pipe; connect and tighten the suction pipe to the fitting on the hydraulic pump; and secure the cover in place with the mounting screws.

7. Check to ensure the hydraulic pump is filled with hydraulic fluid.

8. Proceed with normal operation.

Proportioning Pumps

WARNING: *THE CHEMICAL COMPONENTS ARE PRESSURIZED TO 1600-2500 PSI. BEFORE OPENING ANY CHEMICAL CONNECTIONS OR SERVICING CHEMICAL COMPONENTS, USE EXTREME CAUTUION TO ENSURE THAT ALL PRESSURES HAVE BEEN BLED TO ZERO TO AVOID SERIOUS BODILY INJURY.*

Both proportioning pumps should be disassembled and cleaned annually. The pistons and cylinder should be inspected for mars or scratches, which may cause leakage or damage to packings. It is also recommended that the piston and cylinder packings, expanders, and packing springs be replaced on an annual basis as a preventative maintenance precaution. *(Refer to the Proportioning Pump Assembly section of the Parts I.D. for reference.)*

Pump Bases

1. Completely depressurize the system.

2. Remove the valve cover using an adjustable wrench.

   Inspect the valve cover o-ring and replace as required. Liberally coat the o-ring with grease before inserting the valve cover back into the pump base. Also, check the chamfer around the cavity to ensure that there are no sharp edges, which could damage the o-ring and prevent proper seal.

3. Remove the valve ball and inspect it for nicks and scratches. Also, remove the ball seat with the special tool provided and inspect it for nicks and scratches. Replace either as required.

4. Inspect the face of the gasket for damage and replace as required. Reassemble the pump base.

APPENDIX

The following hydraulic fluids are recommended for use with the HF-1600/2500:

- Mobil DTE 24
- Mobil DTE 25
- Cooks Albavis 10

The HF-1600/2500 is designed to interface with the following Equipment:

- GX-8 Low Output Spray Gun
- GX-7 High Pressure Spray Guns
- GX-7 Auto High Pressure Spray Gun
- TX-50 Automatic Shot Timer/Counter
- GX-10 Pour Head
- GX-14 Pour Head
- AR-C/D High Pressure Pour Gun
- Model D High Pressure Spray Gun

NOTES

INSTRUCTION MANUAL DISCREPANCY REPORT

Field Number	Field Title	Description
1	Date	
2	Name	
3	IM Number	
4	Issue Number	
5	Date of Issue	
6	Page Number	
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