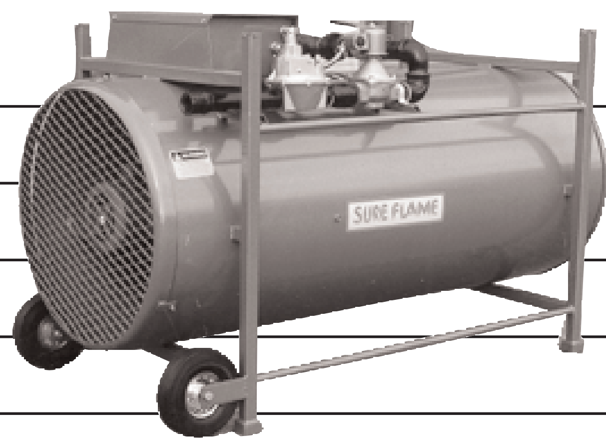
342 N. Co. Rd. 400 East
Valparaiso, IN 46383
219-464-8818 • Fax 219-462-7985
www.heatwagon.com

Installation and Maintenance Manual

Please retain this manual for future reference.

S1505A

Construction Heater



For your safety: Do not use this heater in a space where gasoline or other liquids having flammable vapors are stored.

Revision 9-13

Installation and Maintenance Manual
Model S1505A
Construction Heater

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Heater is not intended for use in pest remediation.

heat wagon

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Installation using a propane supply cylinder

1. When installing the heater for use with propane gas, set the gas selector valve to "Propane" and lock in position.

2. The supply container **must** be equipped with an LP Gas Regulator that complies with ANSI/UL 144 Standard for Pressure Regulating Valves for LP Gas. This is essential to reduce th gas pressure to a safe transmittable pressure that does not exceed the maximum input pressure of the heater.

3. Arrange the cylinder supply system to provide for vapor withdrawal from the operating cylinder. Supplying liquid propane to the heater is dangerous and will damage the components.

4. Ensure that for the surrounding temperature the size and capacity of the propane supply cylinder is adequate to provide the rated Btu/h input to the heater.

5. Turn off the propane supply cylinder when the heater is not in use.

6. The installation must conform with local codes, or in the absence of local codes, with the Standard for the Storage and Handling of Liquefied Petroleum Gases. ANSI/NFPA 58-1989.

7. When the heater is to be stored indoors the connection between the propane cylinder and the heater must be disconnected and the cylinder removed from the heater and stored in accordance with Chapter 5 of the above national standard.

Installation for Natural Gas Applications

1. When installing the heater for use with Natural Gas, set the selector valve to the "Natural" position.

2. Ensure that the supply is equipped with a suitable UL listed gas pressure regulator to limit the gas to a pressure that does not exceed the maximum inlet pressure of the heater.

Operating Instructions

1. Set the **GAS SELECTOR VALVE** to gas being used. The conversion shall be done by the owner or lessor of the equipment.

   NOTE: When using Propane Gas the Selector Valve **MUST** be locked in the "ON" position.

2. Ensure **MANUAL VALVE** (valve nearest the burner) is in the "ON" position.

3. Connect power - 115 volt supply

4. Open gas supply, set heat selector switch to HI-LO

5. Push **START** button and release. White light will come on during prepurge, both white and red lights will be on during firing sequence, red light will remain on while burner is lit. If red light fails to remain on, push **STOP** button and repeat sequence.

6. Set heat selector switch to desired heating mode:

   ON-OFF to cycle On (high flame) and Off.
   HI-LO to cycle form low flame to high flame.

7. Set thermostat to desired temperature.

8. To Stop, push **STOP** button and turn gas off.

The appliance area should be kept clear and free from combustible materials, gasoline, and other flammable vapors and liquids.

Ensure that the flow of supply air and combustion gases is not obstructed.

The installation and operation of the heater shall comply with the code requirements specified by the authorities having jurisdiction.

General criteria for the use of construction heaters may be found in the applicable sections of American National Standard A-10.10-1987, Safety Requirements for Temporary and Portable Space Heating Devises and Equipment Used in the Construction Industry.

Installation and maintenance of the heater must be accomplished by a qualified service person.

Common Installation & Operational Problems

1. **Low Voltage-** This is one of the most common problems and is usually the result of the supply cord having too small a wire gauge for its length. Low voltage results in the motor overheating, burnt relay contacts, or a relay that will not make contact.

2. **Supply line undersized.**

3. **Insufficient Vaporization at Supply-** Normally caused by undersized supply tank.

4. **Improper Gas Supply Pressure** - Usually a result of supply pressure being too high because of improper or no regulation.

   The Model S1505A uses a stainless steel burner for long life and consistent performance.

   In order to maintain the highly efficient combustion of the Sure Flame Heater, the combustion chamber must remain as manufactured. Any change or distortion could alter the fuel/air mixture and create unwanted gases.

On-Site Safety Problems

1. **Shorting out of defective components**
   This is a very common problem which saves short term expense at the risk of a large future cost. Any heaters found in this condition should be removed immediately.

2. **Improper enclosures**
   When heaters are installed partially to the outside for fresh air intake, strict adherence must be made to the minimum clearance to combustibles given on the instruction plate. Wood framing around a heater is a request for trouble.

3. **Supplying liquid propane to heater**
   This problem has occurred from time to time. To minimize the damage, shut off the gas supply and let the heater run until all of the liquid in the lines has been burnt.

Preventative Maintenance

Sure Flame construction heaters are built to withstand the rigors of operating on construction sites, for mining application, and multitude of other locations where heaters are used. To maintain reliable performance required it is necessary to do a certain amount of regular maintenance.

A. **Visual Checks**

The following items should be checked for excessive wear or damage:

1) Wheels
2) Cords and Connectors
3) Wiring and Conduit
4) Heater shell (including heat shield) and Control Box.

B. **Burner**

Flame rod and insulator -	Clean with soap and water or solvent on a routine basis. Any build up on burner should also be removed at this time.
Ground wire -	Ensure that the ground wire is secured to the burner. This is necessary for the flame detection system to operate.
Spark Plug-	Clean with solvent and check spark gap, approx. .070 to .085.

C. **Flame Safeguard Control**

The Fenwall Control can be cleaned using compressed air or alcohol. Do not use any other liquid or aerosol spray cleaners. In areas of high humidity, the control should be removed and placed in a dry atmosphere when the heater is expected to be out of service for an extended time.

It is recommended that units purchased as spares be rotated periodically, so that each unit will be placed in operation at least once every 90 days.

D. **Motor**

Motors equipped with oil cups should require only a few drops of clean, light machine oil every year. Motors not equipped with oil cups are fitted with sealed bearings and no oiling is required.

E. **Fan**

Check for build up on fan blades. Check the tightness of the set screw and run heater to check for fan vibration.

Troubleshooting S1505A

In order to make these checks an AC Voltmeter is required. Both the control circuit and the motor voltage is 115VAC. Use extreme caution when checking voltage.

1. Push Start button and release.

2. Motor starting, and black control relays close and fan starts
   A. If motor starting relay does not close then:
      1. Check for power at the coil of the motor starting relay, if there is power present then relay is faulty.
      2. Check for power between terminals 1 & 2 of the timer, if none present then trace black wire from terminal #1 back to the incoming power line.
      3. If there is power between #1 & #2 but no power between #2 & #6 then timer is faulty.
      4. Check for power at #3 on the timer, if no power is present check to see that terminals #2 & #7 are making contact when start button is depressed.

   B. If black control relay does not close then:
      1. Check for power on both terminals of the high limit switch, if power present on only one terminal then switch is defective.
      2. If there is power at the red wire (NO terminal) on the start switch and no power at the middle terminal (common terminal), then the start switch is faulty.
      3. If there is power at the black wire (common terminal) and no power at the red wire (NC terminal) of the start switch then the stop switch is defective.

   C. If fan does not start then:
      1. Check if there is power between the black and white wires inside the motor junction box (located on the side of the motor), if power is present then the motor may need manual resetting. Push the red button the side of the junction box. If this does not correct the problem then the motor is faulty. Also it may just be that the motor starting relay contacts may need cleaning, or replacing if burnt.

3. Transparent control relay closed, if not check:
   1. If there is power between terminals A & B of the small transparent relay, if so, relay is bad
   2. If there is power between terminals L1 & L2 of the Fenwall module, but no power at terminal NC of the Fenwall module 5 seconds after start-up, then the Fenwall module is defective.
   3. If above procedures do not correct problem, then the adjusting screw located on the side of the airswitch can be rotated counterclockwise, just enough so that the light stays lit.

4. Gas Valves are energized, and spark is initiated:
   A. If gas valves do not open then check gas valve individually.
      1. If there is power between the wires leading to the gas valve, then the gas valve is faulty.
      2. If there is no power at terminal V1 of the Fenwall module 5 seconds after start-up, but there is power at terminal L1 of the Fenwall, then the Fenwall module is faulty.
      3. If there is no power at terminal L1 of the Fenwall module then check the following components using the previously mentioned tests for the limit switch, the airswitch and transparent control relay.

Troubleshooting S1505A

B. If there is no spark then check:
   1. Check the spark plug, gap should be at least 1/8"
   2. Check if ignition wire is burnt or if it is grounding out to heater.
   3. If there is power at terminal L1, and no power at terminal V1 of the Fenwall the the Fenwall module is faulty.

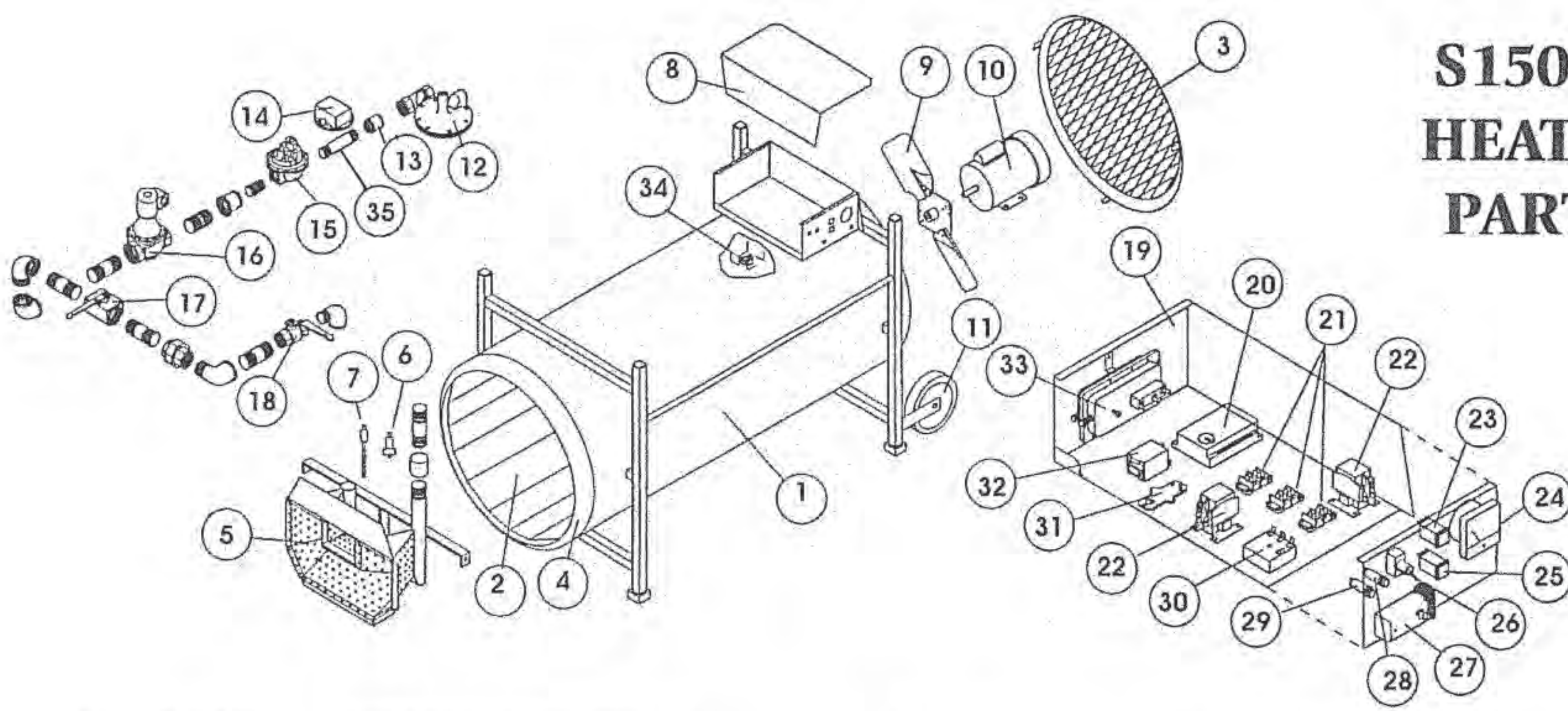
5. Flame rod senses, and maintains flame, if not check:
   1. If flame rod wire is connected to flame rod and not grounding out to the heater
   2. If flame rod wire is inserted into the correct location on the Fenwall module
   3. If the flame rod is screwed into the burner securely. The probe part should not be touching the burner in any way thus grounding out.

6. Should flame go out shortly after light-up then check:
   1. If flame rod is loose or not connected properly as mentioned above.
   2. If flame is too short and flame rod is not a bright orange color,then check if there is adequate manifold gas pressure.
   3. If above checks are all good then the Fenwall module could be faulty.

7. Heater does not cycle to hi and lo flame. Then set heat selector switch to HI-LO position, and turn thermostat to maximum setting then check.
   1. If there is no power at the thermostat then the start switch is faulty.
   2. If there is no power at the high flame side (blue wire) of the stage regulator then the valve is faulty.
   3. If there is power at the high flame side (blue wire) of the 2 stage regulator then the valve is faulty.

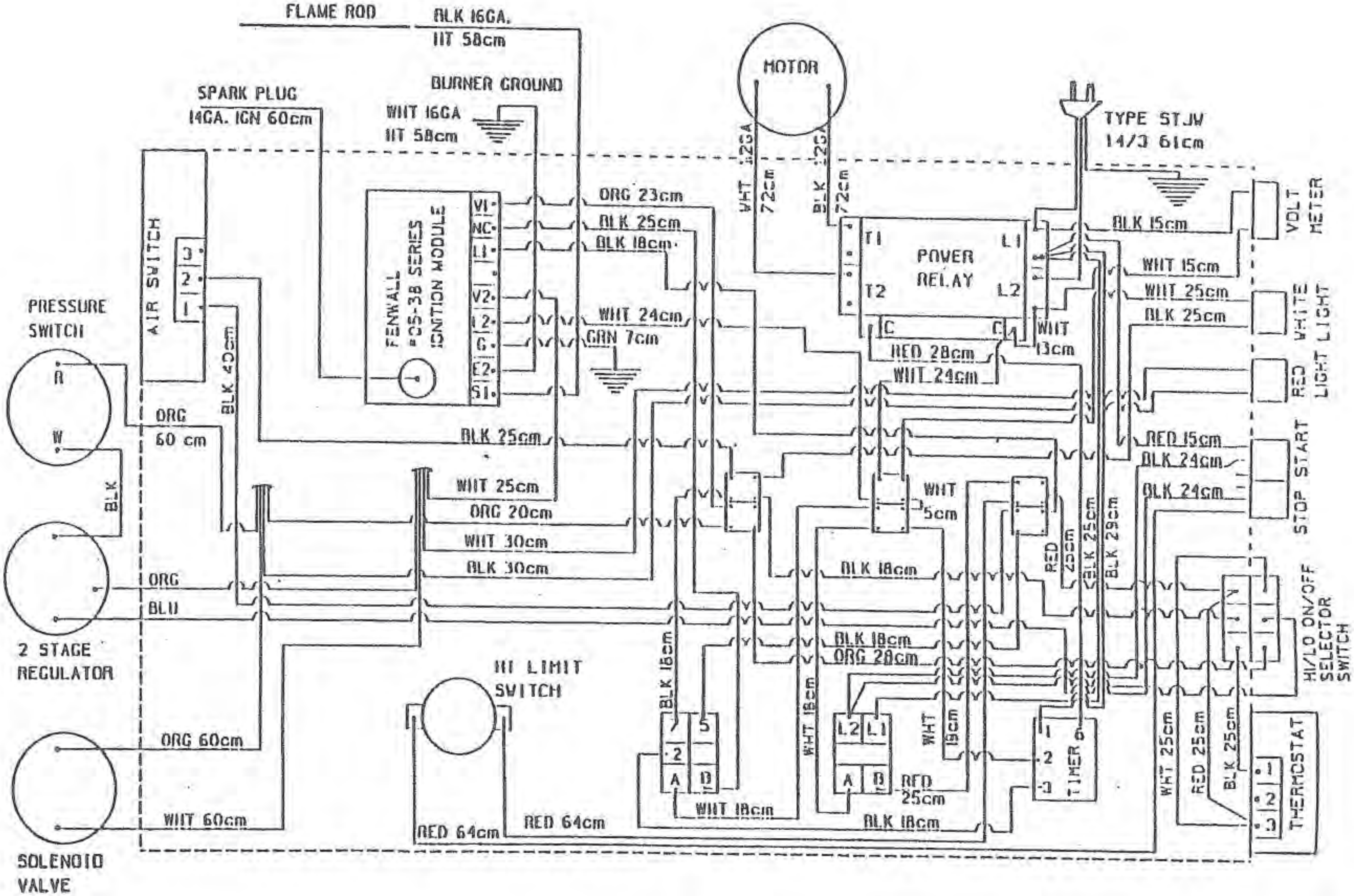
8. Heater does not cycle on and off. Then set the heat selector switch to ON-OFF position, and turn thermostat to maximum setting and check:
   1. If the heater does not restart, then check for power at terminal #3 of the thermostat, if power is present then the selector switch is faulty.
   2. If there is no power present at terminal #3 of the thermostat then the thermostat is faulty.

S1505A HEATER PARTS

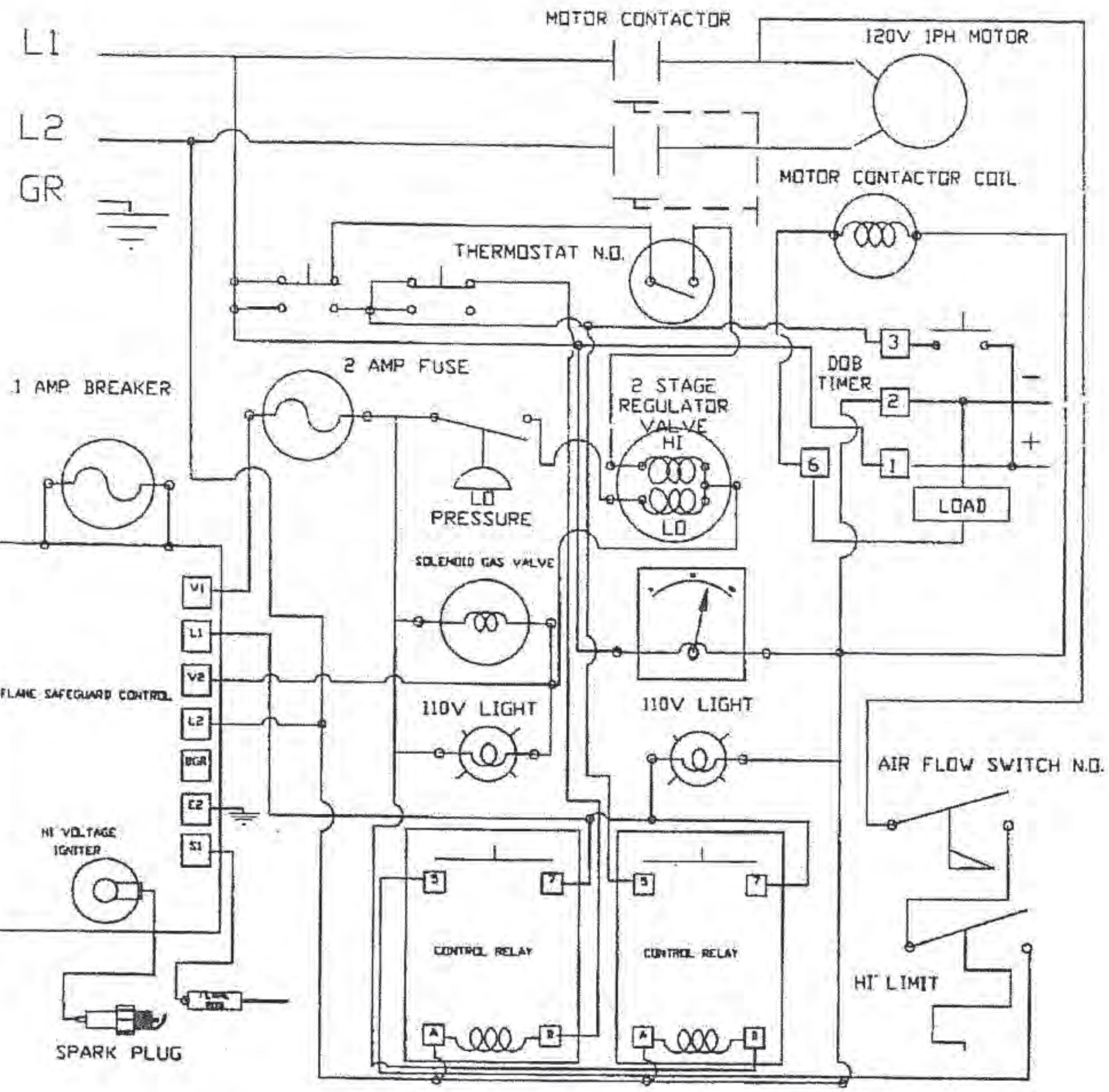


1	SL11B-55	HEATER BODY INCLUDES:2,4,5	18	2539	1.5" MANUAL SHUT OFF VALVE
	SL11B-62	HEATER BODY INCLUDES:2,4	19	SL11B-58	CONTROL BOX
2	SL11B-2	HEAT SHIELD	20	SC7462	DIRECT SPARK IGNITION MODULE
3	SL11B-53	SCREEN	21	5768	TERMINAL BLOCK (3)
4	SL11B-13	NOSE CONE	22	2436	MOTOR STARTING RELAY
5	BV85-50	BURNER	23	3337G	ON SWITCH (GREEN)
6	2143	SPARK PLUG	24	5989	VOLTMETER
7	SL11B-86	FLAME ROD	25	3337R	OFF SWITCH (RED)
8	SL11B-35	CONTROL BOX COVER	26	5545	TOGGLE SWITCH SELECTOR
9	2423	24" FAN BLADE	27	2453	THERMOSTAT
10	2432	1 HP ELECTRIC MOTOR	28	2506	RED LIGHT
11	6119	8" SEMI PNEUMATIC WHEEL	29	2505	WHITE LIGHT
12	11SV08	REGULATOR (OPTIONAL) 10psi max	30	5988	10 SECOND DELAY ON BREAK TIMER
13	S1500-83	1.25" STRAINER	31	6440	RELAY CLIP
14	4509	GAS PRESSURE SWITCH	32	4512	CONTROL RELAY WITH CLIP
15	4490	1.25" 2 STAGE REGULATING VALVE	33	5355	AIRSWITCH (.5 W.C.)
16	2537	1.5" SOLENOID VALVE	34	2446	HI LIMIT THERMOSWITCH
17	S1505-81	1.5" SELECTOR VALVE	35	SFP S1505-152	Inlet, 1-1/4 x 9" nipple

S1505A WIRING DIAGRAM



UPDATED FLAME SAFEGUARD CONTROL WIRING DIAGRAM 1997



SURE FLAME	MODEL S1505A
DATE OF DRAWING 1998	FROM TO
S1505A	1993-1997

heat wagon