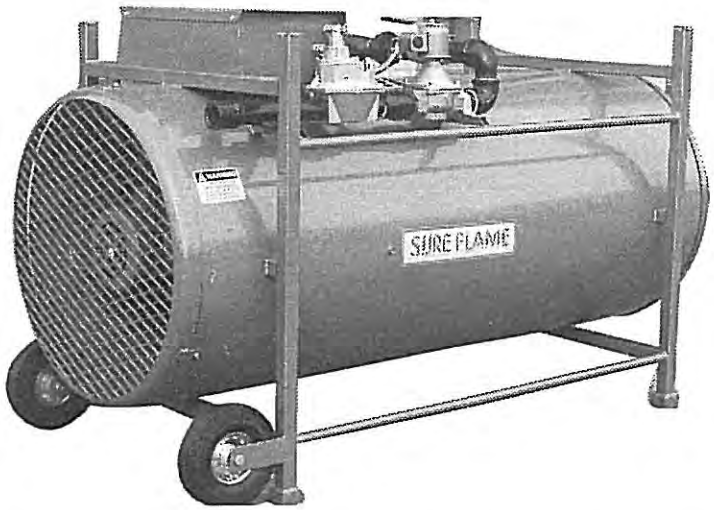
MODEL S1505

W/ Firaye

heat wagon

342 N. Co. Rd. 400 East • Valparaiso, IN 46383
219-464-8818 • 888-432-8924 • Fax 800-255-7985
www.heatwagon.com



Installation and Maintenance Manual

Sure Flame
Model S1505
Construction Heater

Please retain this manual for future reference.

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

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SPECIFICATIONS

Model No. S1505

Designed to ANSI Z83.7-1991	Construction Heater
Gases:	Natural or Propane
Capacity:	1,500,000 Btu/h maximum 850,000 Btu/h minimum
Orifice Size:	41 DMS (x46)
Blower:	7,000 CFM
Electrical Rating:	115V, 60Hz, 20 amps, single phase

Gas Supply:	Inlet Pressure		Manifold Pressure	
	Max W.C.	Min W.C.	Max W.C.	Min W.C.
Propane	14″	9″	2.7″	.75″
Natural Gas	14″	9″	7.2″	2.0″

(Minimum inlet pressure is for purpose of input adjustment)

heat wagon

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. Another regulator must be installed on the heater to reduce the pressure from this regulator down to a maximum inlet pressure of 1/2 psi.

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.

5. Push **START** button and release.

6. Set thermostat to desired temperature.

7. To stop, 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.

5. **Dirty Gas Supply** - Dirty gas can cause strainers to plug or form a buildup in the burner orifice.

6. **Lack of Preventative Maintenance** - Heaters must be cleaned as required, especially when used in a dirty environment.

7. **Improper Supply of Fresh Air** - It is normally recommended that the intake air of the heater be taken from outside the enclosed area. This provides a slight pressurization and prevents any problems associated with recirculation.

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 Fireye Control should 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**

The electric motor on the S1505 Heater is fitted with sealed bearings and no oiling is required. Keep the motor clean by blowing or wiping off dust or dirt in order to prevent it from overheating.

E. **Fan**

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

TROUBLE SHOOTING

Note: In order to make these checks a voltmeter is required. The motor and the control circuit is 120 volt. Use extreme caution when checking voltage.

I) Problem: Relay does not close

1) Sequence:

Press START switch and hold power relay closed indicated by "Click" sound

2) Possible Causes:

A) No power at supply plug
B) Faulty start switch
C) Faulty high temperature limit switch
D) Faulty relay coil

3) Check:

A) If no power between L1 and L2 of relay
B) If no power at high temperature limit switch
C) If no power at relay coil
D) If power at relay coil

II) Problem: Motor does not start

1) Sequence:

Fan motor starts

2) Possible Causes:

A) Faulty relay contacts
B) Faulty motor or motor overload tripped

3) Check:

A) If no power between T1 and T2 of relay
B) If power at motor

III) Problem: Light off

1) Sequence:

Short delay until fan reaches full rpm. Then air switch closes indicated by light "ON"

2)Possible Causes:

A) Insufficient air pressure differential to close air switch or blockage in tubing or faulty air switch

3) Check:

A) If no power at light

IV) **Problem: Valves do not open, no gas**

1) **Sequence:**
5 second delay for pre-purge Then automatic gas valve opens.

2) **Possible Causes:**
A) Faulty Fireye control
B) Insufficient gas inlet pressure on faulty pressure switch
C) Faulty valve/regulator combination control or improper gas inlet pressure

3) **Check:**
A) If no power at Fireye terminal #3
B) If no power at low flame side of valve/regulator
C) If power at low flame side of valve/regulator

V) **Problem: No Spark**

1) **Sequence:**
Ignition transformer produces spark. Indicator light goes "OFF"

2) **Possible Causes:**
A) Faulty Fireye control
B) Faulty ignition transformer or spark plug or ignition wire shorting to ground

3) **Check:**
A) If no power at Fireye terminal #4
B) If power at Fireye terminal #4

VI) **Problem: No Flame. Flame goes out after 5 seconds.**

1) **Sequence:**
Short delay until gas ignites (max. 5 sec.). Gas ignites, flame is proven, indicator light comes "ON"

2) **Possible Causes:**
A) Gas inlet pressure too high or too low
B) Check gas supply
C) Faulty flame rod or poor ground connection to burner
D) Faulty Fireye control

3) **Check:**
A) Gas inlet pressure
B) If no power (14 VDC) at test jacks on Fireye
C) If no power (14 VDC) at test jacks on Fireye

VII) Problem: Flame Goes Out

1) Sequence:
Release start switch

2) Possible Causes:
A) Faulty Fireye control
B) Faulty stop switch

3) Check:
A) If no power at Fireye terminal #5
B) If power at Fireye terminal #5

VIII) Problem: Poor Flame

1) Sequence:
Normal Operation

2) Possible Causes:
A) Improper gas inlet pressure or valve/regulator setting out of adjustment
B) Improper burner or insufficient air supply

3) Check:
A) If manifold gas pressure outside of specified range
B) If manifold gas pressure within specified range

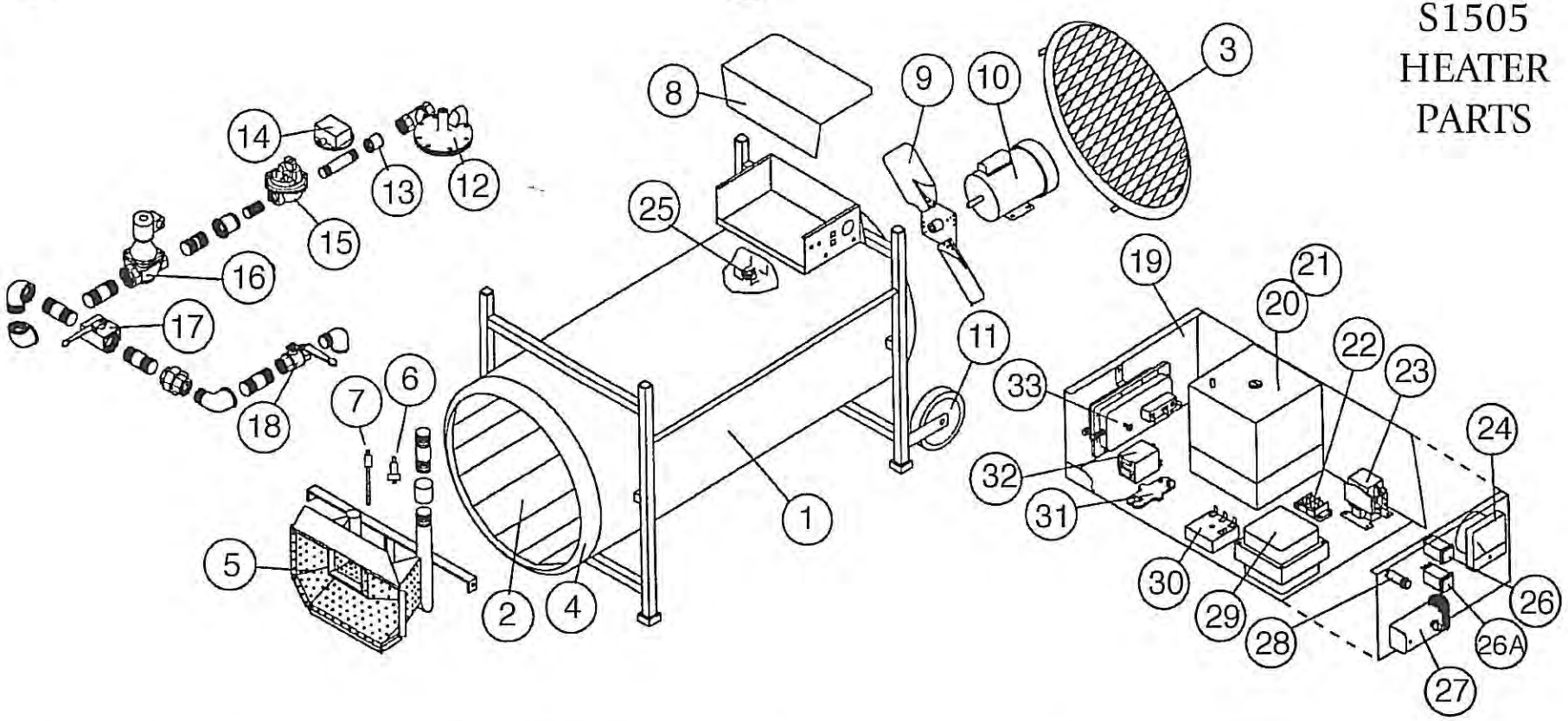
IX) Problem: Poor Flame

1) Sequence:
Normal Operation

2) Possible Causes:
A) Faulty start switch
B) Faulty thermostat or setting too low
C) Faulty valve/regulator combination control

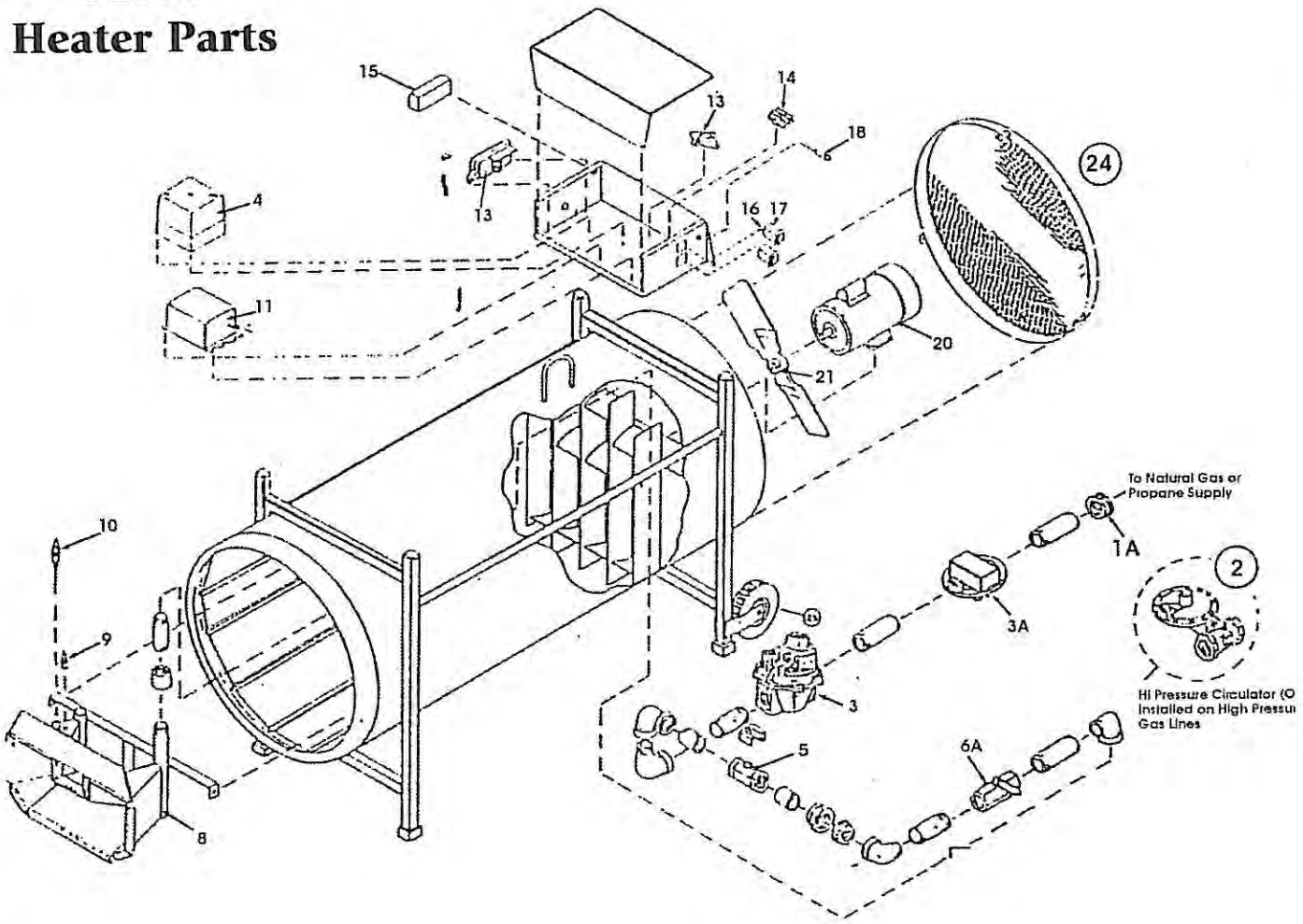
3) Checks:
A) If no power at thermostat
B) If no power at high flame side of valve/regulator
C) If power at high flame side of valve/regulator

S1505 HEATER PARTS



1	SL11B-55	HEATER BODY INCLUDES: 2, 4, 5
	SL11B-62	HEATER BODY INCLUDES: 2, 4
2	SL11B-2	HEAT SHIELD
3	SL11B53	SCREEN
4	SL11B-13	NOSE CONE
5	BV85-50	BURNER
6	2143	SPARK PLUG
7	SL11B86	FLAME ROD
8	SL11B-35	CONTROL BOX COVER
9	2423	24" FAN BLADE
10	HM1166	1 HP ELECTRIC MOTOR
11	HW1164	8" SEMI PNEMATIC WHEEL
12	11SV08	REGULATOR (OPTIONAL)
13	S1500-03	1.25" STRAINER
14	4509	GAS PRESSURE SWITCH
15	4490	1.25" 2 STAGE REGULATING VALVE
16	2537	1.5" SOLENOID VALVE
17	11SV06	1.5" GAS SELECTOR VAVLE
18	2539	1.5" MANUAL SHUT OFF VALVE
19	SL11B-58	CONTROL BOX
20	2438	FIREYE CONTROL
21	2439	5 SECOND CONTROL CARD (INSIDE 19)
22	5768	TERMINAL BLOCK
23	2436	MOTOR STARTING RELAY
24	5989	VOLTMETER
25	2446	HI LIMIT THERMOSWITCH
26	3337G	ON SWITCH (GREEN)
26A	3337R	OFF SWITCH (RED)
27	2453	THERMOSTAT
28	2505	WHITE LIGHT
29	2501	IGNITION TRANSFORMER
30	5988	10 SECOND DELAY ON BREAK TIMER
31	6440	RELAY CLIP
32	4512	CONTROL RELAY WITH CLIP
33	5124	AIRSWITCH (.5" W.C.)

S1505
Heater Parts



Valve Train

1A	S1500-83	1.25" STRAINER
2	11SV08	HI PRESSURE REGULATOR (OPT.)
3	4490	2-RATE REGULATOR/VALVE
3A	4509	PRESSURE SWITCH
5	11SV06	GAS SELECTOR VALVE
6A	2539	MANUAL SHUT-OFF VALVE

Burner

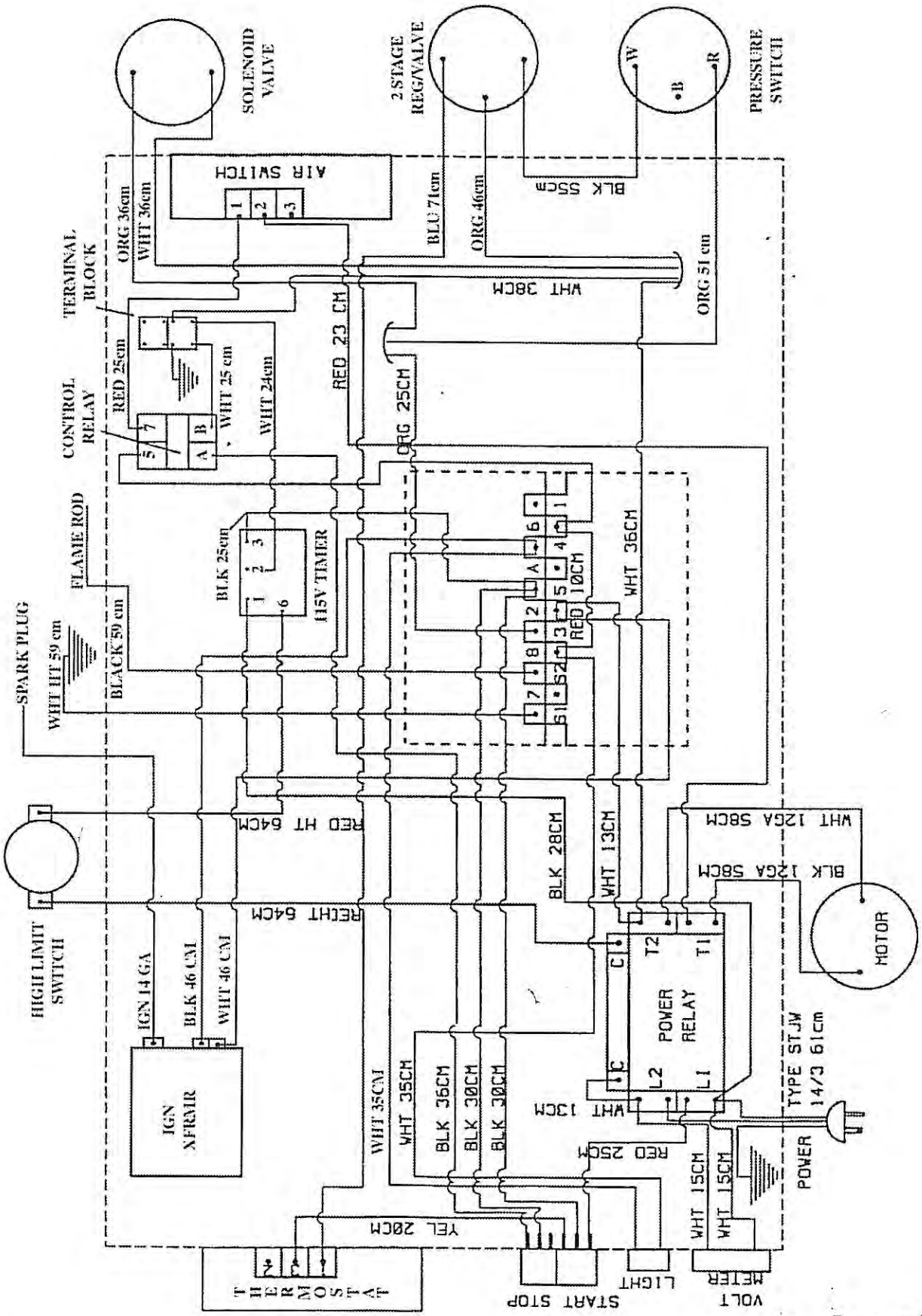
8	BV85-50	BURNER
9	2143	IGNITOR PLUG
10	SL11B86	FLAME ROD

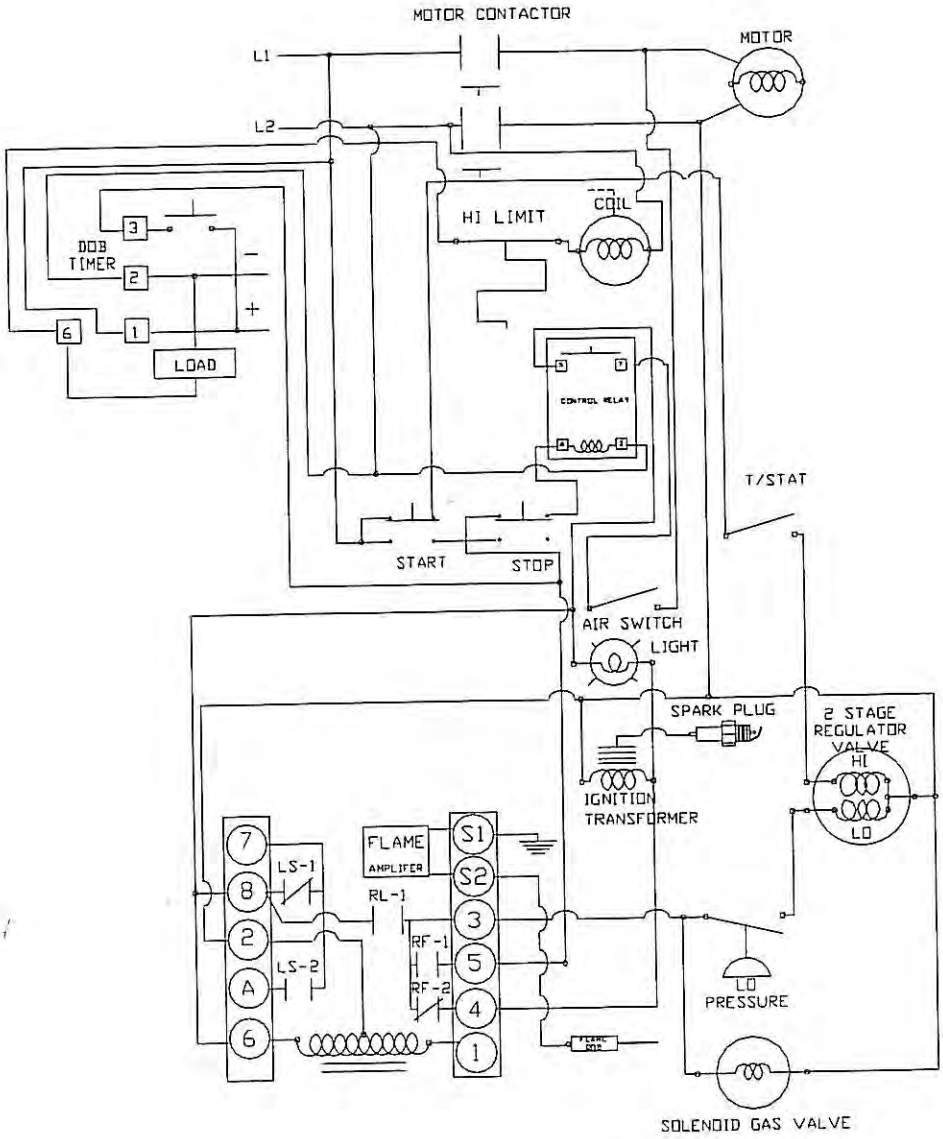
Control Box

11	2501	IGNITION TRANSFORMER
12	2438	FLAME SAFEGUARD CONTROL
13	5124	AIR SWITCH
14	2436	MOTOR RELAY
15	2446	HI LIMIT THERMOSWITCH
16	3337G	START SWITCH (GREEN)
17	3337R	STOP SWITCH (RED)
18	2505	INDICATOR LIGHT
19	2453	THERMOSTAT

Blower

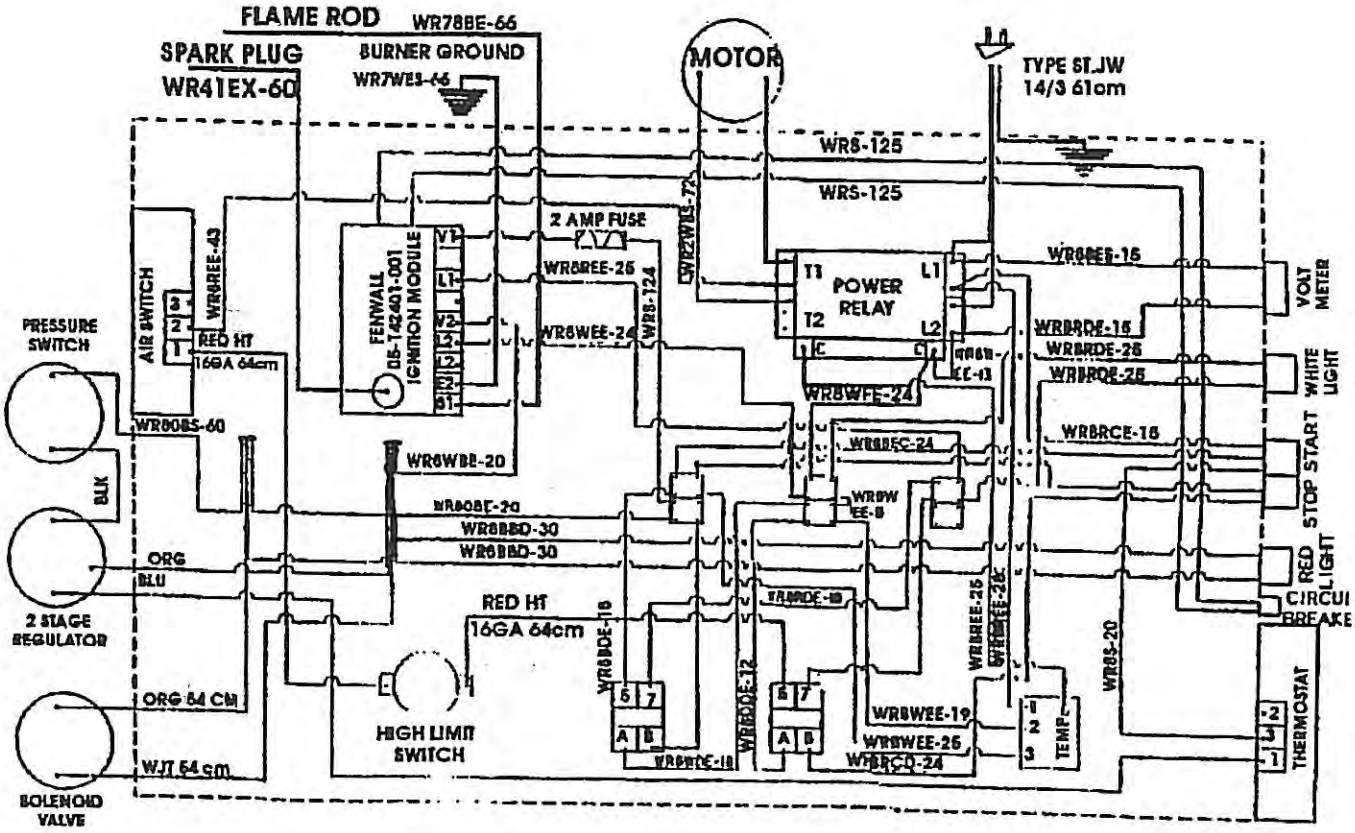
20	81SM22	1 HP ELECTRIC MOTOR
21	2423	FAN BLADE
22	HW1164	WHEEL
23	SL11B53	FAN GUARD SCREEN
24	SC7462	BOARD FOR ALL 1505's


SOLENOID VALVE
2 STAGE REG/VALVE
PRESSURE SWITCH
AIR SWITCH
TERMINAL BLOCK
CONTROL RELAY
FLAME ROD
SPARK PLUG
115V TIMER
HIGH LIMIT SWITCH
IGN XFRMR
POWER RELAY
MOTOR
THERMOSTAT
START STOP
LIGHT
VOLT METER
POWER
TYPE STJW 14/3 61cm
ORG 36cm
WHT 36cm
BLU 71cm
ORG 46cm
BLK 55CM
WHT 38CM
ORG 51 cm
RED 23 CM
ORG 25CM
RED 25cm
WHT 25 cm
WHT 24cm
WHT HT 59 cm
BLACK 59 cm
BLK 25cm
WHT 36CM
RED 10CM
RED HT 64CM
BLK 28CM
WHT 13CM
BLK 12GA 58CM
WHT 12GA 58CM
IGN 14 GA
BLK 46 CM
WHT 46 CM
WHT 35CM
BLK 36CM
BLK 30CM
WHT 13CM
RED 25CM
WHT 15CM
YEL 20CM


MOTOR CONTACTOR
MOTOR
L1
L2
HI LIMIT
COIL
DOB TIMER
3
2
6
1
LOAD
CONTROL RELAY
T/STAT
START
STOP
AIR SWITCH
LIGHT
SPARK PLUG
2 STAGE REGULATOR VALVE
HI
LO
IGNITION TRANSFORMER
FLAME AMPLIFER
7
8
2
A
6
LS-1
LS-2
RL-1
RF-1
RF-2
S1
S2
3
5
4
1
LO PRESSURE
SOLENOID GAS VALVE

S1505 WIRING DIAGRAM

April 9/97



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