

# Design-Rite Inc.

## Hi-Tech Compactor Control Panel



## Users Manual

## DR-150 with DR-X50

Rev. A boards with Serial Numbers starting at 20,000 and up beginning January 1, 1998

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## FOREWORD

THANK YOU for selecting Design-Rite's Hi-Tech compactor control as part of your waste disposal equipment. The Hi-Tech control system has been developed with customer convenience and ease of equipment maintenance in mind. This new system has many standard features including system diagnostics and is flexible to accept many other options.

This manual contains important information to help you operate, maintain, and service your Hi-Tech compactor. It is recommended that all operating and service personnel familiarize themselves thoroughly with its contents before placing the compactor in operation. With proper operating procedures, together with a sensible maintenance and service program, your Hi-Tech compactor will give maximum service.

If you need information not provided in this manual, please contact Design-Rite Inc. at:

(586) 726-8050 For Electrical Power and Control Systems

## WARRANTY

Design-Rite Inc. warrants each new control card to be free from defects in material and workmanship, under normal use and service, to the original purchaser only, for a period of (90) ninety days, subject to conditions outlined below. Design-Rite's sole obligation under this warranty is limited to repair or replacement (with a similar genuine part) of any part of the product of our manufacture which is returned to us within thirty (30) days after discovery of the defect, properly identified with transportation charges prepaid, and not more than (90) ninety days after purchase by the original user, provided that in our judgment the part is defective.

Design-Rite will furnish without charge, F.O.B. our plant, a similar genuine part to replace any part of a product of our manufacture which proves to be defective in normal use and service during this period.

Design-Rite's warranty or obligation in connection with the sale of this equipment:

1. Shall be expressly limited to the repair or replacement of defective parts, as stated above, and covers only those labor charges specifically authorized by the manufacturer, all other damages and claims, statutory or otherwise, being hereby expressly waived by the purchaser.
2. Shall not apply to any failure or damage incurred through neglect, lack of maintenance, misuse, accidents, improper installation, service call expenses, travel time and mileage, normal service items (hydraulic oil, filters, lubrication, hydraulic leaks, etc.), pressure settings and adjustments, equipment operated improperly (improper pressure settings, improper supply voltage, etc.), redesigning of assemblies or through any other cause natural or otherwise beyond the control of the manufacturer.
3. Shall not apply if the equipment has been operated beyond the factory recommended maximum capacity.
4. Does not cover products or accessories of other manufacturer beyond such warranty as is made by such manufacturer.

No claim under this warranty shall be valid unless such claim is submitted within (90) ninety days after date of sale or within fifteen (15) days after the discovery of the defect which is the basis for such claim whichever event shall occur first.

**THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES (EXCEPT THIS TITLE), EXPRESS OR IMPLIED, AND THERE IS NO IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL DESIGN-RITE ASSUME LIABILITY FOR LOSS OF PRODUCT, TIME OR ANY OTHER CONSEQUENTIAL DAMAGES.**

**FACTORY AUTHORIZATION MUST BE OBTAINED BEFORE MAKING WARRANTY REPAIRS OR REPLACEMENTS.**

## SAFETY INFORMATION

Only authorized personnel should be allowed to operate compactor.

Only qualified personnel should be allowed to service the compactor.

The key for the HAND-OFF-AUTO selector switch should be removed when compactor is not in use.

A disconnect box should be mounted near and within site of the electrical enclosure and should be locked in OFF position when performing maintenance and repairs on the compactor, hydraulic power unit, or electrical panel. Otherwise, Disconnect should be kept in the ON position so as to maintain power to the Hi-Tech control panel for proper operation of the compactor.

Electrical repairs should be done by qualified electricians only.

If compactor is located in a public place, accessible to children, an attendant should remain on duty while unit is in operation. When not in operation, all keys should be removed.

Roll-off Container must be secured to Packer before packing.

As an added safety factor, packer can be stopped at any time from the Remote Control Station (pendant) if available.

If the container is assumed to be full and shortened ram strokes commence - DO NOT continue loading the machine as this will adversely affect the "Pin-Off" operation and may make it impossible to detach the Roll-Off Container without discharging part of the load.

Complete enclosure of ram parts are recommended when children may be around compactor.

As a safety precaution, always inspect the charge box before loading anything into it. Don't load higher than the upper level of the charge box before starting packing cycle. Charge box should be cleared before reloading but not necessarily completely empty.

When the Receiving Container or "Roll-Off Container" is completely loaded, Discontinue loading but continue to cycle the machine. This softens the material going into the container. Do not load any further or use Hand cycle. Attempting to "round out" the load will make it difficult to "Pin-Off" the container.

Design-Rite Inc. will not be liable for injuries resulting from alterations made to electrical circuits or any of the above safety rules.

### IF JAMMING OCCURS:

Jamming of the material may occur in the Charge Box just before it is to be injected into the Roll-Off Container.

Do not load more of the same material in an effort to break the jam. The objective is to upset the condition of the material. The jammed material can (in most instances) be dislodged by breaking it loose at the bottom causing it to cave in.

This can be accomplished by laying one or two (one laid on the other) wood pallets on the floor of the Charge Box and cycling the packer. A 55 gallon drum can be substituted for the wood pallets. If automatic cycling will not deliver sufficient stroke, hand operation may then be used.

**FCC WARNING: (Compactor Control Card Model # DR-150)**

"This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference."

## HI-TECH COMPACTOR FEATURES AND OPTIONS

### STANDARD FEATURES

- **Equipped for Manual Bypass. Compactor can be operated in Hand Mode with DR-150 Removed**
- Eliminates Limit Switches and Pressure Switches
- Selection of Standard Compactor, or Standard Compactor with Electric Eye Operation
- Selection of Ram Forward or Ram Returned Machine Shut-Off
- Selection of up to 9 multi-cycles
- Unit Part Full Detection and Unit Part Full Light
- Unit Full Detection and Unit Full Light
- System Error Diagnostic Lights
- 1 Second Time Delay from Ram Forward to Ram Reverse
- 1 Second Time Delay from Ram Reverse to Ram Forward
- Eliminates Bottoming of Cylinder on Forward Stroke
- Automatic Shutdown if Maintained Output Contact Electric Eye is Continuously On for more than 15 Minutes. ( with multi-cycle switch set to zero )
- Automatic Shutdown if Ram Forward Stroke Time is Exceeded in Auto Mode
- Automatic Shutdown if Ram Return Stroke Time is Exceeded in Auto Mode
- No Machine Calibration required, Self Calibrates on 1<sup>st</sup> Auto Cycle
- FCC Class A Approved
- UL Recognized
- X50 Wiring Module provides all normally required wiring terminals

### HI-TECH COMPACTOR OPTIONS

- Manual Pendant (Remote Hand Operator)
- Auto Pendant (Remote Automatic Operator)
- Compactor Door Limit Switch
- Hydraulic Oil Heater
- Electric Eye
- Sonozaire(TM) Odor Neutralizer
- Zep(R) Automatic Deodorant Dispenser
- Other Options as needed Contact Manufacturer

## HI-TECH CONTROL SYSTEM TECHNICAL OVERVIEW

The Hi-Tech compactor control system consists of an approximately 7" x 6" microprocessor based control card (Model # DR150), a DRX50 wiring interface card, a motor starter and a control power transformer on a sub-plate in a NEMA 3R electrical enclosure. The DR150 control card replaces the standard relay panel and performs the necessary control of the hydraulic cylinder according to a factory programmed operation's logic.

The DR150 control card accepts input signals through the DRX50 wiring interface card from panel pushbuttons, selector switches and card mounted controls such as multi-cycle rotary selector switch (SW3), mode selection switches (SW1 & SW2), and motor current sensor. The card performs logic according to an internal program, and controls the necessary output signals such as motor starter, solenoid(s), and light(s) to control a commercial hydraulic trash compactor. The compactor sizes ranging from 3 HP unit to 20 HP unit, all having a single stage pump and a standard cylinder.

### CONNECTIONS TO DRX50 WIRING INTERFACE CARD

Input signals at 115 VAC consist of:

<u>Card Term. #</u>	<u>Input Signal Description</u>
6	Unit Reset
7	Emergency Stop
4	Door Limit (optional)
29	Remote Operator ON-OFF
9	Hand Forward Signal
10	Hand Reverse Signal
30	Remote Operator Hand Forward Signal
31	Remote Operator Hand Reverse Signal
12	Start Signal
13	Start Signal (Auto)
14	Start Signal (Hand)
15	Auto Signal
36	Ram Extend Limit (optional)
38	Ram Retract Limit (optional)
40	Electric Eye Contact (optional)
34	Remote Operator Start Signal (optional)

Output signals at 115 VAC consist of:

<u>Card Term. #</u>	<u>Output Signal Description</u>
16	Part Full Light
17	Unit Full Light
19	Extend Solenoid
20	Retract Solenoid
22	Motor Starter

Other Signals:

<u>Card Term. #</u>	<u>Signal Description</u>
1	Card Power (115VAC)
C	Status Lights Power (115VAC)
2	Card Return Power (neutral)
A,B	MOV surge protector
26,27	Start Signal Seal-in Contact
24,25	Remote Operator Start Signal Seal-in Contact
41,42	Electric Eye Power

Other Input Signals:

Card mounted mode switches for selection of ram forward or ram return machine shut off options  
 Card mounted, 10 position, rotary selector switch for the selection of multi-cycles  
 Current sensor to measure motor current

**HI-TECH CONTROL CARD TECHNICAL DATA**

**CONTROL CARD OPERATING ENVIRONMENT**

The card is mounted in a NEMA 3R electrical enclosure. The electrical enclosure may be outdoors and subject to extremes of temperature.

**TYPICAL MOTOR CURRENT AND RELATED TECHNICAL INFORMATION**

The card measures the current in one of the wires carrying power to a three phase motor. The supply voltage to the motor can be field connected for 208 volts, 230 volts or 460 volts 3 phase 60 Hz (575 volts system require a motor specifically rated at that voltage). Information on motor size, motor current and conductor size that may be connected are:

Rated Full Load Amperes & Minimum Wire Size

HP	208V	230V	460V	575V	Wire Size
3	10.6 A	9.6 A	4.8 A	3.9 A	12 (AWG)
5	16.7 A	15.2 A	7.6 A	6.1 A	10 (AWG)
10	30.1 A	28.0 A	14.0 A	11.0 A	8 (AWG)
15	46.2 A	42.0 A	21.0 A	17.0 A	6 (AWG)
20	59.4 A	54.0 A	27.0 A	22.0 A	4 (AWG)

NOTE: Above table based on 50 feet of wire.

Control Card Tested Operating Temp. (Celsius)..... -10 C to 60 C  
 Control Card Recommended Input Power ..... 115 VAC  
 Control Card Tested Input Supply Power Range.... 90 VAC - 127 VAC  
 Control Card Inputs From Panel Control Devices..... 5 ma - 30 ma

**DR-X50 Card Outputs:**

Terminal #22, 115 VAC Inductive Load..... 0.75 Amp - 1 Amp  
 Terminal #20, 115 VAC Inductive Load..... 0.75 Amp - 1 Amp  
 Terminal #19, 115 VAC Inductive Load..... 0.10 Amp - 1 Amp  
 Terminal #17, 115 VAC Resistive Load..... 10 ma - 1 Amp  
 Terminal #16, 115 VAC Resistive Load..... 10 ma - 1 Amp

## INSTALLATION INSTRUCTIONS

1. To check proper motor rotation, momentarily start the machine just enough to turn the motor and then press the STOP button and observe the rotation of the motor-pump coupling as motor is coasting down. Rotation of coupling should be as specified by the hydraulic pump manufacturer. Only run in momentary jog until the rotation is determined.

If the motor rotation is incorrect, interchange any two of the three lead-in wires at the motor, or if changing at the motor starter, change the two wires which do **not** pass through the current sensor.

2. Verify the solenoid leads are connected properly. Start the compactor in hand mode and turn the selector switch to the extend position and observe the ram extending. Release the selector switch. The spring return switch will return to the off position and the ram will stop. Turn the selector switch to the retract position and observe the ram retracting. Release the selector switch. The spring return switch will return to the off position and the ram will stop.

If the direction of motion is incorrect, interchange the extend and retract wires **at the valve**.

3. For proper operation of the compactor, it is very important to set the hydraulic relief valve at any point between 1600 PSI and 2000 PSI, but no higher than 2000 PSI, and check at regular intervals to confirm the setting. (For relief valve adjustments, please refer to the Maintenance Instruction section of this manual).

4. If the unit is to be operated in an environment where temperatures fall below freezing, then an oil heater is strongly recommended for proper operation of the compactor.

### **Equipped for Manual Bypass. Compactor can be operated in Hand Mode with DR-150 Removed**

The above four items can be checked with or without the DR-150 installed and do not depend on the operation of the DR-150. If difficulties are encountered unplug the DRX50 wiring interface card from the DR150 to remove it from consideration. ( Caution: do not allow connector pins from DR150 card to short across the back of the DRX50 wiring interface card. )

## SETTING THE HI-TECH COMPACTOR CONTROL SYSTEM OPTIONS

### **IMPORTANT:**

When compactor maintenance, repair, or changes to the Hi-Tech compactor control card's rotary switch and mode switch settings are required, make sure the compactor disconnect switch is in the off position. After all the necessary compactor maintenance is completed and the disconnect switch is turned on, check to see if the trash charging box is empty. If it is not empty, start the compactor in hand mode and jog the ram as necessary to sweep the trash into the receiving container. When the charging box is empty, the compactor is ready to be started in automatic mode.

### CONTROL CARD SETTINGS FOR STANDARD COMPACTOR

(Refer to figure 2: Hi-Tech control card picture, upper right corner)

Place the card mode switches SW1 and SW2 both outward from the center of the card ( to the left ) for ram forward machine shut off or both inward toward the center of the card ( to the right ) for ram return machine shut off. (Refer to mode switch selection chart at top of control card)

Set the card mounted 10 position rotary multi-cycle selector switch to the desired number of compactor cycles (1 to 9). If dial is set on any number from 1 to 9, the compactor will cycle that number of times.

### CONTROL CARD SETTINGS FOR STANDARD COMPACTOR WITH ELECTRIC EYE

(Refer to figure 2: Hi-Tech control card picture, upper right corner)

Place the card mode switches SW1 and SW2 both outward from the center of the card ( to the left ) for ram forward machine shut off or both inward toward the center of the card ( to the right ) for ram return machine shut off. (Refer to mode switch select chart at top of control card)

Set the card mounted 10 position rotary multi-cycle selector switch to zero (0) for standard (LM5) electric eye with maintained contact output operation. If a pulsing (LM8) electric eye is used the selector switch may be set to any position.

## SEQUENCE OF OPERATION-STANDARD COMPACTOR

### **IMPORTANT: COMPACTOR SYSTEM RESET**

If power is applied to the compactor control card, either by turning the compactor's power disconnect on or, if the power disconnect is on, pressing and holding the Unit Full light for one second or longer then releasing it, the Unit Part Full and Unit Full lights will turn on for one second and then turn off to confirm proper system reset. To insure proper compactor operation in automatic mode after the system reset the trash charging box must be empty. If it is not empty, start the compactor in hand mode and jog the ram as necessary to sweep the trash into the receiving container. When the charging box is empty, the compactor is ready to be started in automatic mode.

### **NOTE:**

If this is the first auto-cycle after disconnect is turned on, or UNIT FULL RESET button was pressed, the control card will automatically attempt to acquire important data (such as motor draw current and the length of cylinder) from the specific compactor it is connected to in order to provide proper operation on all subsequent auto cycles.

Therefore, on this first auto cycle, the ram will first extend for two seconds, stop, then return until fully retracted, hold pressure for two seconds, extend until ram bottoms out, and depending on the preset number of multi-cycles and ram stop machine shut off option selected, the ram will either cycle (retract and extend) again or stops and motor shuts off or retracts and motor shuts off. On all subsequent auto cycles the ram will only extend to 96% of full forward stroke so as to avoid unnecessary hammering on the forward end of the cylinder.

### **OFF MODE (KEY SELECTOR SWITCH IN OFF)**

If the main panel is in OFF mode the compactor will not respond to the panel controls (buttons, switches, etc.) and no motion starts. However, the compactor can be operated by the pendant controls if one is installed and vice-versa.

### **HAND MODE (KEY SELECTOR SWITCH IN HAND)**

NOTE: Hand operation should be used only when it is known that there is a jam-up of material within the Charge Box, or when making adjustments to the hydraulic relief valve.

- 1- Insert key and select HAND.
- 2- Press START to start the motor.
- 3- Turn FWD-REV selector switch to jog the ram.
- 4- To stop, Turn key to OFF and remove key. (In an emergency, press STOP pushbutton to stop the motor)

### **AUTOMATIC MODE (KEY SELECTOR SWITCH IN AUTO)**

- 1- Insert key and select AUTO.
- 2- Press START to start the auto-cycle.
- 3- When motor stops, turn key to OFF and remove key. (In an emergency, press STOP pushbutton to stop the motor)

## SEQUENCE OF OPERATION-STANDARD COMPACTOR W/ELECTRIC EYE

### **IMPORTANT: COMPACTOR SYSTEM RESET**

If power is applied to the compactor control card, either by turning the compactor's power disconnect on or, if the power disconnect is on, pressing and holding the Unit Full light for one second or longer then releasing it, the Unit Part Full and Unit Full lights will turn on for one second and then turn off to confirm proper system reset. To insure proper compactor operation in automatic mode after the system reset the trash charging box must be empty. If it is not empty, start the compactor in hand mode and jog the ram as necessary to sweep the trash into the receiving container. When the charging box is empty, the compactor is ready to be started in automatic mode.

### **NOTE:**

If this is the first auto-cycle after disconnect is turned on, or UNIT FULL RESET button was pressed, the control card will automatically attempt to acquire important data (such as motor draw current and the length of cylinder) from the specific compactor it is connected to in order to provide proper operation on all subsequent auto cycles.

Therefore, on this first auto cycle, the ram will first extend for two seconds, stop, then return until fully retracted, hold pressure for two seconds, extend until ram bottoms out, and depending on the presence of more trash and ram stop machine shut off option selected, the ram will either cycle (retract and extend) again or stops and motor shuts off or retracts and motor shuts off. On all subsequent auto cycles the ram will only extend to 96% of full forward stroke so as to avoid unnecessary hammering on the forward end of the cylinder.

### **OFF MODE (KEY SELECTOR SWITCH IN OFF)**

If the main panel is in OFF mode the compactor will not respond to the panel controls (buttons, switches, etc.) and no motion starts. However, the compactor can be operated by the pendant controls if one is installed and vice-versa.

### **HAND MODE (KEY SELECTOR SWITCH IN HAND)**

NOTE: Hand operation should be used only when it is known that there is a jam-up of material within the Charge Box, or when making adjustments to the hydraulic relief valve.

- 1- Insert key and select HAND.
- 2- Press START to start the motor.
- 3- Turn FWD-REV selector switch to jog the ram.
- 4- To stop, Turn key to OFF and remove key. (In an emergency, press STOP pushbutton. Pull to reset the button)

### **AUTOMATIC MODE (KEY SELECTOR SWITCH IN AUTO)**

- 1- Insert key and select AUTO.
- 2- Machine will start the cycle when trash is in front of the electric eye for at least 5 seconds.
- 3- To by-pass the electric eye and start auto cycle, press START.
- 4- Motor stops after each cycle. If more trash is present in front of the electric eye, the machine starts another auto cycle. (In an emergency, press STOP pushbutton. Pull to reset the button)

## SEQUENCE OF OPERATION-MANUAL PENDANT

1. Turn the keyed selector switch to the ON position. **NOTE:** When the remote operator is ON the main panel controls are LOCKED OUT and cannot be used to operate the compactor. But as an added safety factor, the compactor can be stopped at any time from the main panel.
2. Depress the START button. IMS is energized and the hydraulic pump motor will run. The motor will continue to run until the STOP button is depressed or the keyed selector is set to the OFF position.
3. The compactor ram can now be moved forward by turning the FORWARD-REVERSE selector switch to the FORWARD position. Release the switch and the ram will stop.
4. To return the compactor ram, turn the FORWARD-REVERSE selector to the REVERSE position. Release the switch and the ram will stop.
5. Depress the STOP button and the hydraulic pump motor will stop.
6. Turn the keyed selector switch to the OFF position.

(In an emergency, press STOP pushbutton to stop the motor)

## PANEL DIAGNOSTIC LIGHTS FUNCTION

### UNIT FULL AND PART FULL DETECTION BY CURRENT SENSING (General)

Due to the direct relationship between system pressure and motor current load in hydraulic power units with single stage pump, the current sensor is able to detect motor current levels corresponding to unit part full and unit full. These levels are calculated with respect to the setting of the machine's hydraulic relief valve at the time the card does the compactor calibrations. If the unit part full current level is detected, the Unit Part Full light output is turned on. If the unit full current level is detected, the Unit Full light output is turned on and the Unit Part Full light output is turned off. The Unit Part Full light output or the Unit Full light output remain on once turned on. To reset the diagnostic lights, please refer to diagnostic lights reset procedure in this section.

Diagnostics Lights Functions		
Part Full Green Light	Full Red Light	Description
ON	OFF	Warning Container is Part Full
OFF	ON	System Shut-Down, Container is Full or Jammed
FLASH	FLASH	<i>Lights flash together</i> System Error Due to: - Small Current Signal to Control Card or -Motor Not Running or -Overload Tripped or - Motor Lead Not Through Current Sensor - Improper system reset. Reset system again.
FLASH	FLASH	<i>Alternating flash of lights</i> -A problem exists on the circuit board and it should be returned for repair
FLASH	ON	System Error Due to: - Ram Did Not Return in Max. Time or - Incorrect Motor Rotation or -Failed Solenoid / Hydraulic Leak -Blown Solenoid Fuse
ON	FLASH	System Error Due to: - Ram Did Not Extend in Max. Time - Incorrect Motor Rotation or -Failed Solenoid / Hydraulic Leak -Blown Solenoid Fuse
FLASH	OFF	System Error Due to: - Unbalanced 3 Phase Power Affecting Motor Draw Current in Motor Leads.
OFF	FLASH	System Error Due to: - Electric Eye was continuously ON for more than 15 minutes. Check eye and correct any problems then reset the System.

For Further Troubleshooting Refer To The Troubleshooting Section

### DIAGNOSTIC LIGHTS RESET

To reset the diagnostic indicating lights:

1. Press and hold the UNIT FULL light for one second or longer and then release it. UNIT FULL and UNIT PART FULL lights will turn on for one second and then turn off to confirm proper system reset.

2. To insure proper operation, if the trash charging box is not empty, start the compactor in hand mode and jog the ram as necessary to sweep the trash into the receiving container. When the charging box is empty, the compactor is ready to be started in automatic mode.

## TROUBLESHOOTING

### NOTE:

LOADING DOOR MUST BE "CLOSED" AT ALL TIMES FOR MACHINE TO RUN IF EQUIPPED WITH DOOR SAFETY LIMIT SWITCH

#### A. Motor fails to run.

1. Check motor heaters for "reset".
2. Check electrical power source.
3. Check high voltage fuses in disconnect panel.
4. Check low voltage control fuse in machine control panel.
5. Check voltage at transformer output (secondary). Should be 110-120 volts AC.
6. Check motor starter coil to see if power is being applied to it when START button is pressed. If it will not "pull-in", check for continuity through stop switches and selector switch, operator stop and selector switch.
7. If motor starter coil will not remain "locked in" check selector switch contacts and "MS" contacts for continuity.
8. Check wiring to motor.
9. Check motor and control panel for loose wire connections.
10. If in HAND mode and START button is pressed, motor still does not run and 115VAC is present on terminals 3 & 7 but not on 14, then replace control card.
11. If motor starts and shuts off and both Unit Full and Part Full lights are flashing then make sure one motor lead passes through the current sensor and the current sensor is not damaged.

#### B. Motor runs, ram fails to move.

1. Check hydraulic oil level with cylinders fully retracted.
2. Check for damaged motor-pump coupler.
3. Check rotation of pump. Pump must rotate in a counter clockwise direction when viewed standing at the rear of the motor looking toward the pump.
4. Pump motor rotation can be changed by reversing any two high voltage leads at the main disconnect switch or at the motor starter.
5. Check for hand extend (FORWARD) and retract (REVERSE) of the ram by pushing manual push pins located at either end of the solenoids on the directional valve.
6. If ram cannot be operated in step #5, problem is probably hydraulic.
7. Check spool in control valve for dirt or restricted movement.
8. If ram can be operated in step #5, problem is probably electrical.
9. Check extend and retract solenoids of directional valve for power, loose wires, or burned out coils.
10. Check pump for proper output, gallons per minute and PSI.
11. If ram extends but will not retract check main relief valve for dirt or restriction. Relief valve is factory set at 2000 PSI. maximum.

#### C. Unit fails to pack a full load.

1. Check main relief. Factory set at 2000 PSI. maximum.
2. Check cylinder for internal bypass of oil.
3. Check charge box and ram movement for mechanical restriction.
4. Check pump for proper output.
5. Check for low voltage to high voltage motor circuit.

#### D. Small current signal to control card.

1. Check to see that one of the motor leads go through the current sensor.
  2. Check the incoming power for proper voltage.
  3. Check for broken or damaged current sensor coil.
- E. Unit Full light comes on in auto mode without full condition.
1. Start in hand mode and check the direction of ram motion as you jog the ram with the FORWARD - REVERSE selector switch.
  2. If ram is moving in opposite direction as selected by the switch, then disconnect power from the machine and check the hydraulic ports and hoses for proper connections.
  3. If the hydraulic hoses are connected properly, then check the solenoid wiring and correct if it is wired backward.
  4. Check for hydraulic relief valve setting too low.
- F. If light(s) are ON or FLASHING, please refer to DIAGNOSTIC LIGHTS FUNCTION.

**NOTE:**

To correctly identify the right diagnostic error, follow the Diagnostic Lights Reset procedure to insure that both lights are functional. The control card will re-calibrate on the first auto cycle, (refer to the Important Note in the Sequence Of Operation section). For Further Troubleshooting Refer To The Troubleshooting Section.

## MAINTENANCE INSTRUCTIONS

### RELIEF VALVE ADJUSTMENT

**CAUTION :**

All repairs and/or adjustments must be performed by qualified maintenance personnel only.

1. Locate relief valve on the hydraulic power unit.
2. Install a 3000 PSI pressure gauge at the gauge port provided, at the directional valve.
3. Set electrical panel control to "hand" mode and fully retract the ram.
4. With compactor ram fully retracted, the hydraulic system will develop full pressure.

**CAUTION:**

Relief valve adjustment screw should be loosened to initially lower system pressure to prevent any damage to system due to pressure overload.

5. Relief pressure can now be set at any point between 1600 PSI and 2000 PSI, depending on the desired container part full and container full trip points, by turning the adjusting screw on the relief valve as necessary. Lock in setting by tightening jam nut on valve.

For reference: Setting the relief pressure at 2000 PSI will give a container part full and a container full indications at around 1500 PSI and 1750 PSI respectively.

## ADAPTING THE DR150 TO A PANEL WIRED FOR DR100

### DR150 ADAPTER CARD

For older Hi-Tech panels wired for DR100 control cards, the DR150 ADAPTER CARD (Figure 7) must be used in place of the DRX50 wiring interface card. The DR150 adapter card has an 18 pin Phoenix type connector that mates with the 18 pin plug found on older Hi-Tech panels and routes power and signals to the DR150 card through the 12 pin Molex connector. The DR150 adapter card also includes an MOV surge protector as well as a control card fuse.

### INSTALLING THE DR150 ADAPTER CARD

The DR150 adapter card is easily installed by plugging the adapter card on top of the DR150 control card using the 12 pin Molex connector making sure to line up the mounting holes of the metal spacers.

### INSTALLING THE DR150 AND ADAPTER CARD TO A PANEL WIRED FOR DR100

Panels built in 1997 or later should already have drilled and tapped mounting holes for the DR150 and adapter card. If your panel has the mounting holes skip step # 4.

1. **REMOVE ALL POWER TO THE CONTROL PANEL !**
2. Unplug the 18 pin Phoenix connector from the bottom of the DR100 control card.
3. Remove the DR100 control card from the panel.
4. Drill 5 holes (using a #35 drill bit) and tap for # 6-32 screws. A full scale drill template is provided in the back of this manual which can be taped to the base plate. The mounting holes should begin about 2" from the left side of the back plate and should be located vertically to allow the 18 pin Phoenix plug to reach the adapter card.
5. Mount the DR150 with the adapter card to the back plate using the provided screws.
6. Plug the 18 pin Phoenix connector to the adapter card.
7. Insert one of the motor power wires through the current sensor (red donut-like device) and reconnect to motor starter contact.
8. Connect the wires from the current sensor to J5 pins 1 and 2 on the DR150. (The wires can be connected in any order)

The installation of the DR150 with adapter card is now complete.

FIGURE 1 : HI-TECH DR-150 CONTROL CARD DIAGRAM

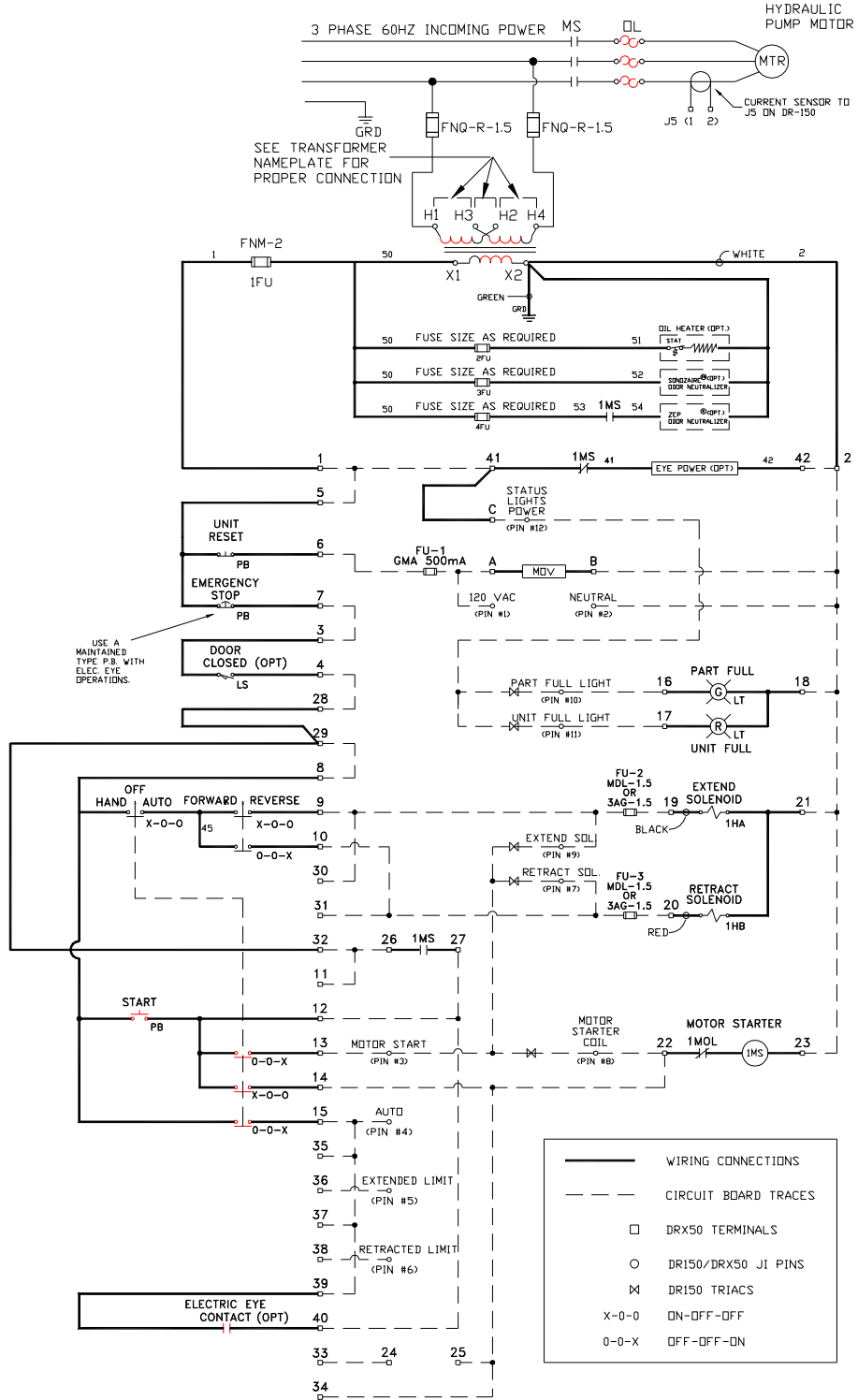


FIGURE 2 : DR-150 CONTROL CARD PICTURE



FIGURE 3 : HI-TECH CONTROLLER WITH DR-X50

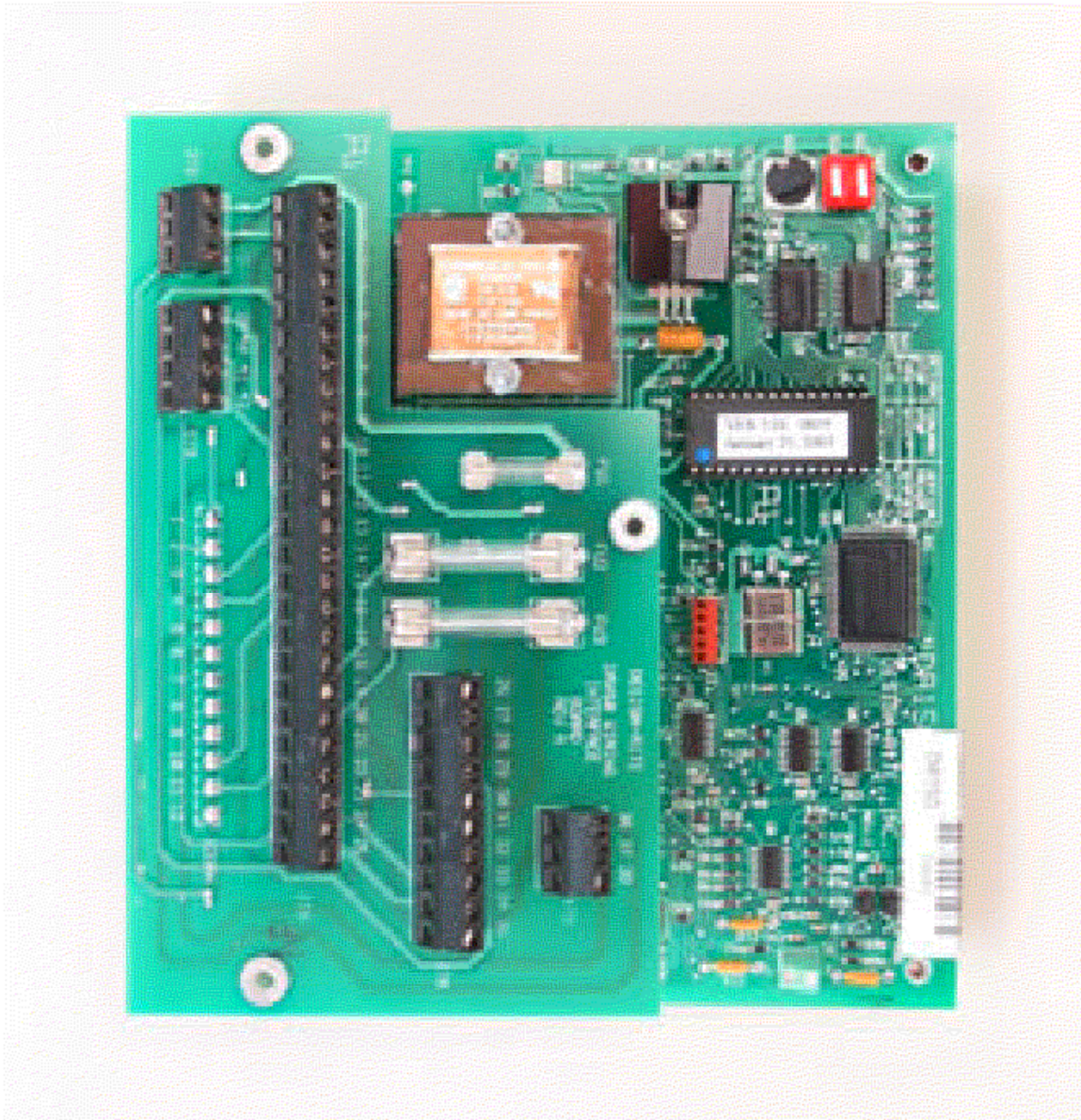


FIGURE 4 : HI-TECH CONTROL PANEL PICTURE



FIGURE 5 : DR-X50 WIRING INTERFACE CARD PICTURE

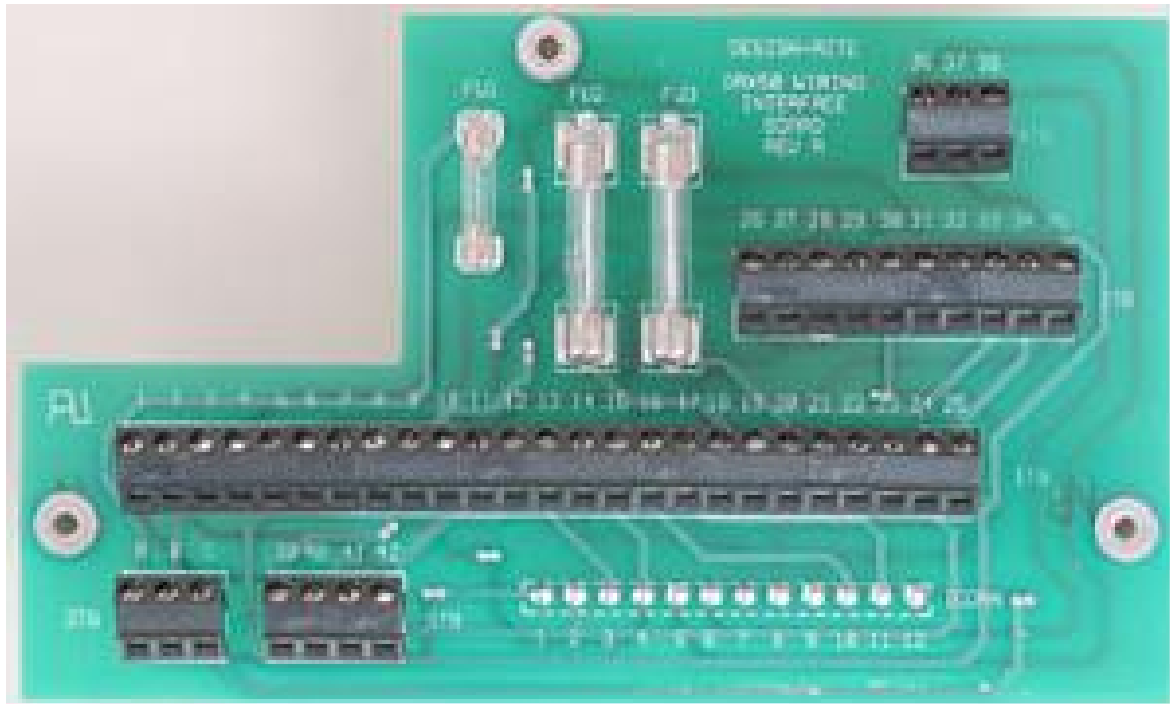


FIGURE 6 : DR-150 ADAPTER CARD PICTURE

