

OPERATING MANUAL

MODEL NO. 934

ELECTRIC HOT AIR BLOWER

TRACK SWITCH SNOW MELTER

480 / 230 VAC 1 & 3 PHASE  
50KW AND 60 KW LOAD CAPACITY

MANUFACTURED

BY

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CAUTION

GENERAL HAZARD WARNING

FAILURE TO COMPLY WITH THE PRECAUTIONS AND INSTRUCTIONS PROVIDED WITH THIS HEATER, CAN RESULT IN DEATH, SERIOUS INJURY AND PROPERTY LOSS OR DAMAGE FROM HAZARDS OF FIRE, EXPLOSION, BURN, ASPHYXIATION, CARBON MONOXIDE POISONING, AND/OR ELECTRICAL SHOCK.

ONLY PERSONS WHO CAN UNDERSTAND AND FOLLOW THESE INSTRUCTIONS SHOULD USE OR SERVICE THIS HEATER.

IF YOU NEED ASSISTANCE OR HEATER INFORMATION, SUCH AS INSTRUCTION MANUALS, LABELS, ETC., CONTACT THE MANUFACTURER.



CAUTION

WARNING: FIRE, BURN, INHALATION, AND EXPLOSION HAZARD.

KEEP SOLID COMBUSTIBLES, SUCH AS BUILDING MATERIALS, PAPER OR CARDBOARD, A SAFE DISTANCE AWAY FROM THE HEATER AS RECOMMENDED BY THE INSTRUCTIONS. NEVER USE THE HEATER IN SPACES WHICH DO OR MAY CONTAIN VOLATILE OR AIRBORNE COMBUSTIBLES, OR PRODUCTS SUCH AS GASOLINE, SOLVENTS, PAINT THINNER, DUST PARTICLES OR UNKNOWN CHEMICALS.

**PLEASE READ THIS INSTRUCTION MANUAL ENTIRELY BEFORE HANDLING THIS MATERIAL OR ATTEMPTING TO INSTALL, OPERATE OR SERVICE THIS HOT AIR BLOWER SYSTEM.**

**PLEASE READ THE WARNINGS AND CAUTIONS LISTED BELOW.**



SHEET METAL EDGES MAY BE VERY SHARP AND CAN CAUSE SEVERE CUTS OR LACERATIONS. PROTECTIVE GLOVES AND CLOTHING SHOULD BE WORN. USE CAUTION WHEN HANDLING ALL SHEET METAL COMPONENTS.



THIS HOT AIR BLOWER TRACK SWITCH SNOW MELTER SYSTEM CAN BE OPERATED REMOTELY OR BY A SNOW DETECTOR SYSTEM. THEREFORE, OPERATION MAY BEGIN UNEXPECTEDLY. USE CAUTION WHEN IN THE AREA.



SYSTEM OPERATES WITH VARIOUS VOLTAGE LEVELS UP TO 600VAC. CONTACT WITH ELECTRICITY CAN BE HAZARDOUS OR LETHAL. MAKE SURE THAT THE MAIN CIRCUIT BREAKER IS TURNED OFF BEFORE ATTEMPTING TO SERVICE THIS SYSTEM. EVEN WITH CIRCUIT BREAKER OFF LINE VOLTAGE IS PRESENT AT THE TOP CIRCUIT BREAKER CONNECTIONS.



THIS SYSTEM CONTAINS A HIGH SPEED AIR FAN WHICH ROTATES AT UP TO 3600RPM AND CREATES FORCEFUL SUCTION WHEN OPERATING. DO NOT OPERATE THE BLOWER SYSTEM IF ANY OF THE DUCTWORK COMPONENTS HAVE BEEN REMOVED.

TWO (2) COMPLETE INSTRUCTION MANUALS HAVE BEEN INCLUDED WITH THIS SNOW MELTER SYSTEM. PLEASE KEEP ONE OF THE MANUALS WITH THE SYSTEM AFTER INSTALLATION. ANYONE OPERATING OR SERVICING THIS SNOW MELTER SYSTEM SHOULD READ THE MANUAL ENTIRELY BEFORE PROCEEDING.

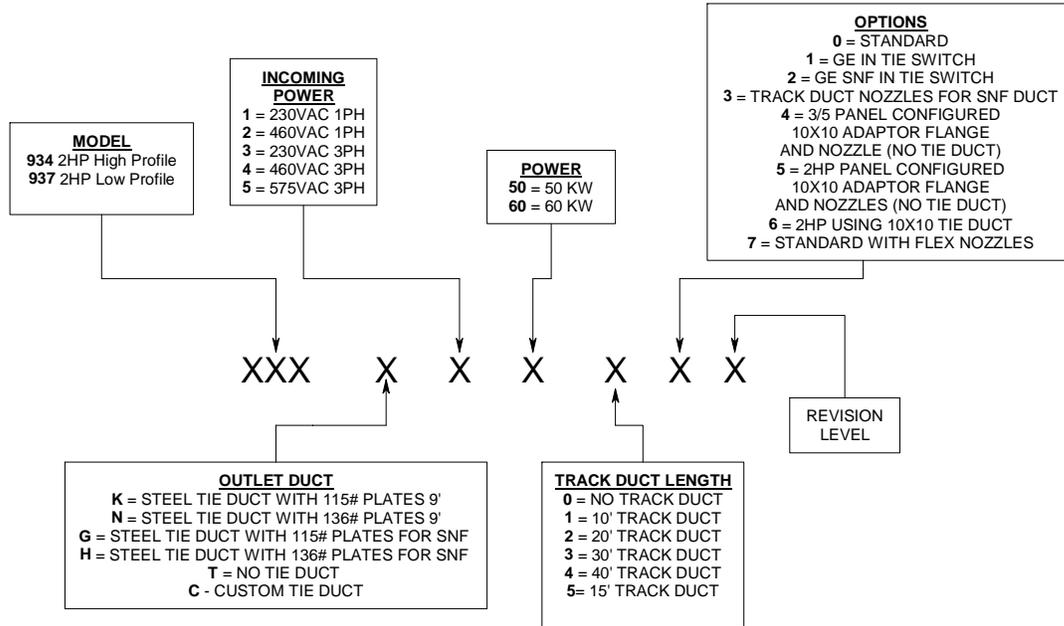
IF YOU HAVE ANY QUESTIONS CONCERNING THE MANUFACTURE, DESIGN, FUNCTION, INSTALLATION, OPERATION OR MAINTENANCE, CONTACT RAILWAY EQUIPMENT COMPANY BEFORE PROCEEDING.

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**I. GENERAL INFORMATION**  
**A. MODEL NUMBER DESCRIPTION**

**Electric Hot Air Blowers**



2.13.09 TM

## **B. STANDARD FEATURES OF TRACK SWITCH HOT AIR BLOWER**

1. Direct drive motor, totally enclosed fan cooled.
2. High efficiency, quiet operation blower.
3. Voltage sensor to prevent low or high voltage damage.
4. Current coils for open heater detection.
5. Remote operation via contact closure (low voltage, low current) with timed shut off.
6. Built-in snow detector system (requires Snow Detector assembly option).
7. Auto-Off-Local switch.
8. High temperature limit thermostat/shut off.
9. Adjustable air temperature control.
10. Adjustable rail temperature control.
11. Reply indication via EHAB contact closure.
12. Fail indication via EHAB contact closure.
13. Main circuit breaker.
14. Audible tone before blower startup
15. Weather tight gasketed control enclosure
16. Status indicating lights for all control functions
17. Start delay timer for sequential startup
18. Run timer for timed operation
19. Selectable "Transparent" snow detector operation
20. Snow detect timer
21. All ductwork and nozzles are thermally and electrically isolated from tracks
22. Quick-release track duct
23. Blower motor starter with overload protection
24. Elevated air intake
25. Adjustable delay for start up (1 Sec. -4.5 Min.)
26. All components mounted and wired within main unit – no external wiring required except for remote control, indications and optional snow detectors.
27. Galvanized case constructed of 14-gauge steel, high temperature powder coated finish.
28. Convenient panel access to fuses and heating elements.
29. Galvanized steel adjustable mounting foundations.
30. Standard ductwork: heat duct with straight insulated flexible duct and heavy duty insulated offset duct connects to main tie duct electrically insulated between rails, 24 inch (minimum) switch point nozzles.

## II. COMPONENT DESCRIPTION

### A. MAIN HOT AIR BLOWER (HAB) UNIT

1. **MAIN CIRCUIT BREAKER:** Provides main over-current protection and manual on-off control of electrical power.
2. **MOTOR CONTACTOR:** Provides automatic blower motor control, with high current contacts.
3. **MOTOR OVERLOAD RELAY:** Protects the blower motor from an over-current condition.
4. **CONTROL MODULE:** Provides complete control of operation. See separate description and details, section IV.
5. **AIRFLOW SWITCH:** Located in the heat duct, the sail switch indicates proper airflow before and during burner operation. The differential setting is determined by elevation.
6. **AIR TEMPERATURE SENSOR:** This is an analog type sensing circuit to monitor the ambient air temperature.
7. **BLOWER MOTOR:** The motor is totally enclosed and fan cooled.
8. **BLOWER:** The high efficiency blower wheel is dynamically balanced for smooth and quiet operation.
9. **BUZZER:** The buzzer will sound a 10-second tone immediately before the motor contactor is energized.

## **B. STANDARD DUCTWORK**

- 1. HEAT DUCT:** The first section of ductwork attached to the main HAB unit. This duct contains the heaters, fuses, air flow switch and overtemp.
- 2. FLEX DUCT:** Connects the heat duct to the offset duct. It is a section of flexible duct, enclosed in an insulated sheet metal wrapper.
- 3. HEAVY DUTY OFFSET DUCT:** Connects the flex duct to the tie outlet duct. This duct provides an 8" offset.
- 4. TIE OUTLET DUCT:** The outlet duct extends under the rails in place of a tie and directs the airflow to the point nozzles and track ducts. The rail attaches to the duct using tie plates and E clips. The tie plates are electrically insulated from the rail using an insulating kit. There are six openings in the top for point nozzles and track duct nozzles. Refer to the drawing page for the duct layout.
- 5. TRACK DUCTS:** These ducts rest on brackets on the ties and the outlet duct. They are installed over the track duct nozzles. The track ducts consist of a 5' point, a 5' mid, and 10' sections to complete the desired length.
- 6. TRACK DUCT NOZZLE:** Attaches to the inner two rectangular openings on the top of the outlet duct. Directs airflow down the length of the switch through the track ducts.
- 7. TRACK DUCT NOZZLE ISOLATING KIT:** This is an electrically insulating gasket with insulating washers and hardware to provide isolation between the nozzles and the outlet duct. Refer to drawing 9278-0027 for proper installation.
- 8. QUICK CHANGE NOZZLE PLATE:** This plate allows for quick removal or installation of nozzles to the tie duct, by simply loosening of four bolts the nozzle assembly can be removed or installed.
- 9. TRACK DUCT SUPPORT BRACKET:** These brackets are used to secure the track duct in position. Refer to drawing 92774.
- 10. SWITCH POINT NOZZLE:** These nozzles direct heated air down the switch point. They are mounted on the outlet duct. They can be adjusted for proper airflow direction. Nozzles may be shortened by up to 10" for proper fit.
- 11. POINT NOZZLE ISOLATING KIT:** This is an electrically insulating gasket with insulating washers and hardware to provide isolation between the nozzles and the outlet duct. Refer to drawing 9278-0021 for proper installation.

## C. OPTIONAL DUCTWORK

- 1. EXTENSION DUCTS:** Extension ducts of various lengths are available to meet specific requirements. These are insulated and enclosed in a metal wrapper. Make sure the duct is mounted in the correct orientation, as there is an access opening underneath the insulating wrapper cover. If additional duct extensions are required, this assembly can be added between the outlet duct and the offset duct.
- 2. 7' TRACK DUCT:** These track ducts are seven feet long. They are often mounted outside of the track near the switch machine. A kit is available (P/N 9278-0270) that includes a 7' track duct, a track duct nozzle and a track duct isolation kit.

OTHER DUCTWORK ASSEMBLIES ARE AVAILABLE. CONSULT THE FACTORY FOR SPECIAL DUCTWORK NEEDS.

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### **III. INSTALLATION**

INSTALLATION SHOULD BE DONE IN THIS ORDER:

- A. TIE DUCT OUTLET DUCT/OFFSET DUCT
- B. MAIN HAB UNIT/FLEX DUCT
- C. POINT NOZZLES AND TRACK DUCTS
- D. ELECTRICAL

**PLEASE READ THROUGH THE ENTIRE  
INSTRUCTIONS BEFORE BEGINNING INSTALLATION.**

#### **A. TIE DUCT**

1. Remove the appropriate tie. Choose the tie that will result in the point nozzles being as close to the switch point as possible without interfering with normal switch operation. The distance from the center of the tie duct to the end of the point nozzles is 33". If necessary, up to 10" may be cut off each point nozzle.
2. Remove sufficient ballast to provide at least 14" clearance from the bottom of the rails.
3. Carefully slip the tie duct under the rails and position it so that the rails are directly above the tie plates. Ensure that the tie duct is centered between the adjacent ties.
4. Place a rubber pad on the tie plate, then using a suitable lever, raise one end of the tie duct until the rail lies correctly on the pad on the tie plate. Place two e-clip insulators, one on each side of rail, in place and then fasten the rail to the tie plate using two of the four 927248 rail clips. Use a heavy hammer or maul to drive the clips securely into place.
5. While keeping the tie duct supported in place, firmly pack ballast under the tie duct from the rail out to the end.
6. Repeat steps 4 and 5 for the other end of the tie duct.
7.
  - a. Remove the end flange plate nearest the HAB by loosening the six retainer bolts.
  - b. Install the two-foot heavy duty offset duct (P/N 9278-3403) to the tie duct using hardware and gasket supplied with the offset duct.
8. Firmly repack ballast under the entire tie duct.

## **B. MAIN HAB UNIT**

1. The main HAB unit has four slotted mounting holes on 15-1/2" x 34-1/2" centers.
2. Refer to Foundation Assembly drawing for the assembly of the optional mounting foundation.
3. Use the provided EHAB positioning drawings to determine the approximate position and height of the mounting foundation. The top of the foundation should be placed 4"-6" below the height of the ties. This will allow final adjustment of the HAB unit. NOTE: The drawing shows a standard HAB unit, but can be used for the low profile series, also.
4. Excavate and place the foundation in its proper location.
5. Refer again to the drawing of the Foundation Assembly, detail A, showing the mounting bolt arrangement. Attach four 3/4-10 x 8" hex bolts in the slotted holes of the blower base, using a washer on each side of the blower base and a hex nut. Draw the hex nut hand-tight and then loosen one turn.
6. Thread a hex nut about halfway onto each bolt.
7. Place the blower unit on the foundation using a flat washer on the top and bottom of the foundation and another hex nut on the bottom. The slotted holes in the foundation will allow for side-to-side adjustment, and the slotted holes in the HAB base will allow front-to-back adjustment. However, do not tighten the mounting nuts yet.
8. Install the 24" flex duct onto the HAB flame duct.
9. Now adjust the HAB unit side to side, up or down, and forward or backward to obtain the proper alignment of the heat duct to the offset duct. It may be necessary to adjust the position of the offset/outlet duct assembly. The adjustments should be made so that there is no stress on any of the ductwork, also flex duct should measure 30". Again, leave the mounting nuts loose for now.
10. Connect the other end of the flex duct to the HD offset duct.
11. With all components in the proper position, the foundation nuts may now be tightened.
12. The fill can now be replaced around the mounting foundations.

13. Adjustable air intake screens. To start the GHAB in a new location, set the intake screens in the closed position. If there proves to be a moisture problem where frost builds up on the intake screens, the intake screens can be set in the open position to improve the airflow into the blower.
14. The airflow switch differential setting is factory set on “D” which is for elevations below 2000 ft. If your location is set at a higher elevation, This differential setting will need to be adjusted. Adjust per the following instructions:
  - a. Remove the galvanized cover over the airflow switch.
  - b. Remove the cover from the airflow switch.
  - c. Adjust the differential wheel on the base of the airflow switch as follows:

Below 2000 ft elevation, set Airflow Differential Wheel to “D”  
Below 4000 ft elevation, set Airflow Differential Wheel to “C”  
Below 6000 ft elevation, set Airflow Differential Wheel to “B”  
Above 6000 ft elevation, set Airflow Differential Wheel to “A”

## **C. POINT NOZZLES AND TRACK DUCTS**

REFER TO THE GHAB POSITIONING DRAWING FOR TRACK DUCT AND POINT NOZZLE POSITIONS.

### **LH AND RH POINT/TRACK NOZZLE ASSEMBLIES**

1. Attach point/track nozzle assembly RH (P/N 9508-4000) and point/track nozzle assy LH (P/N 9508-4001) to the openings in the tie duct. Position assemblies for proper airflow direction.
2. Assemble the individual track duct sections into two complete track duct sections. The mid and heel sections contain splices wrapped around the outside of the duct. Unhook the clips to remove the three cover pieces. The bottom can now be removed from the duct.

### **To assemble the splice:**

- a. Center the bottom splice piece on the seam between the two track ducts.
- b. Connect the center cover piece over the seam. (NOTE: The center cover piece has slots to contain the bolts on the track duct).
- c. Finally, connect the two end cover pieces.

4. Lay the track ducts on the rail ties alongside where they will be installed.
5. Refer to the drawing 92774. Place the track duct support brackets in position on the ties so that one is near the heel end and one near each joint. Use the lag bolts to fasten the brackets in place. Lay the track duct on the bracket bases. Place the hold-down straps over the track ducts. Attach the hold-down strap to the track duct support brackets by inserting the spring clip into the strap.
6. Push in the square knockouts in the track ducts where airflow is desired. The knockout should be pushed in and bent completely so that no portion of the knockout obstructs the airflow in the duct. Knockout tabs that are not bent back completely will obstruct the airflow as it moves through the track duct resulting in reduced air pressure and airflow further along the track duct.

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## F. ELECTRICAL CONNECTION

1. There are knockouts on the side and bottom of the control enclosure for incoming electrical wires.



CAUTION

**THE 480VAC SUPPLY LINES SHOULD BE SIZED TO ALLOW FOR THE AC MOTOR START-UP CURRENT. REFER TO THE SPECIFICATIONS PAGE FOR START-UP CURRENT. UNDERSIZED CONDUCTORS OR LONG WIRE RUNS COULD DAMAGE THE MOTOR.**

2. **INCOMING POWER:** The incoming power should be connected directly to the main circuit breaker. The neutral should be connected to the neutral lug TS1-N. The neutral should be grounded at the source.
3. **GROUND:** The chassis ground should be tied directly to earth ground.

SPECIAL NOTE: THE CONTROL CHASSIS AND THE REST OF THE MAIN HAB UNIT MUST BE CONNECTED TO GROUND/NEUTRAL. THE RUBBER PAD BETWEEN THE RAIL AND TIE PLATE ALONG WITH THE E-CLIP INSULATORS WILL INSULATE THE MAIN UNIT FROM THE TRACKS.

4. **CONTROL INPUT:** Remote operator control can be provided by a circuit closure applied between terminal posts TS1-1 and TS1-2.
5. **INDICATION:** Reply indication can be done two ways:
  - a. Dry contact closure: Terminal posts TS1-3 and TS1-4 will provide a dry contact closure for indication when the unit is operating under remote control.
  - b. +24 VDC: Place a jumper between terminal posts TS1-2 and TS1-4. +24 VDC indication is now present on post TS1-3 with common at terminal post TS1-6.
6. **FAIL:** Reply fail can be done two ways:
  - a. Dry contact closure: Terminal posts TS1-7 and TS1-8 will provide a dry contact closure for fail when the unit is in a fault mode.
  - b. +24 VDC: Place a jumper between terminal posts TS1-2 and TS1-7. +24 VDC fail is now present on post TS1-5 with common at terminal post TS1-6.

## IV. CONTROL MODULE

### A. DESCRIPTION

The hot air blower control module contains all of the elements and functions necessary for advanced snow melter operation. The unique single-chip microcomputer has been programmed with logic and timing sequences to provide complete heater control as well as operational control and system interface. Some of the many features included in the control module are:

- Auto-Off-Force selector switch
- Adjustable air temperature setting
- Built-in snow detector (Requires Optional Snow Detector Head)
- Adjustable start-up delay sequence
- Adjustable run timer for timed or continuous operation
- Adjustable snow detect timer for use with optional snow detector
- Operator control and indication
- Remote fault reset
- Audible tone before blower start-up
- Input/output status indication lights:
  - Inputs:
    - Air temperature
    - Remote Control
    - Moisture Detector One or two snow detector(s) (Optional)
    - Airflow switch
  - Outputs:
    - Blower motor
    - Heater contactor
    - Indication
    - Fail

### B. MODULE CONTROLS AND INDICATORS

#### CONTROLS

##### 1. AUTO/OFF/FORCE SWITCH (SS1)

- a) **AUTO:** This position will allow operation by placing a circuit closure across terminal posts 1 and 2. It will also allow operation by an optional snow detector.
- b) **OFF:** If off, GHAB cannot be run from remote or snow detector.

c) **FORCE:** Placing SS1 in the FORCE position enables the snow melter dependant on outside air temperature. The snow melter will remain on until FORCE is turned off. This is useful for on site testing. To use the FORCE position to operate the EHAB during warm weather, increase the TEMPERATURE SETPOINT on the SETPOINT menu until it is above ambient air temp.

2. **RESET – (PB1)** Pressing PB1 resets processor.

3. **MODE – (SS2)** Momentary switch used to navigate up or down through the display screens.

4. **SELECTOR DIAL – (RC1)** Rotary encoder used to change adjustable parameters on the displayed screen.

### **LED STATUS INDICATORS**

1 **AIR TEMP:**

This indicates the ambient air temperature is below set point.

2 **MOISTURE DETECTOR:**

This indicates that the optional snow detector sensing head(s) senses moisture.

3 **REMOTE CONTROL:**

On when there is a circuit closure across terminal posts 1 and 2.

4 **SAIL SWITCH:**

On when the sail switch in the air stream is sensing adequate airflow.

5. **INDICATION:**

On when there is a circuit closure across terminal posts 1 and 2 and the unit is operating, or the air temperature is above the set point. Also may be on when there is a fault condition under snow detector.

6. **FAIL:**

Is on when ever a fault is present.

### **THE DISPLAY**

The display works as follows: While the EHAB is not running, temperature setpoint and actual outside temperature will be displayed. When EHAB is running, the display will show outside temperature and the operation currently being performed. Following are all possible messages that can appear on display during operation. The display has a screen saver built in. After no user action, such as turning dial or changing mode switch has occurred for 10 minutes, the display will power down. To retrieve the display, rotate the selector dial.

**1. DELAY START**

Delay start displays the time remaining until the buzzer delay will start.

**2. BUZZER DELAY**

Buzzer delay displays the time remaining until the motor will start.

**3. START MOTOR**

Start motor displays the time remaining until the heat contactor will be started.

**4A. RUN TIMER**

Run timer displays the time remaining until the heat contactor will be disabled and the unit will start the cool down, if the unit was started locally or by dispatch.

**4B. SNOW TIMER**

Snow timer displays the time remaining until the heat contactor will be disabled and start the cool down, if the unit was started by moisture detection.

**4C. NET TIMER**

Net timer displays the time remaining until the heat contactor will be disabled and start the cool down, if the unit was started from the internet.

**5. COOL TIMER**

Cool timer displays the time remaining until the motor contactor will be disabled and the unit cycles down.

**6. CYCLE DONE TIMER**

Cycle done timer displays the time remaining until the motor stops turning.

## **C. FAULT CONDITIONS**

### **1. MAJOR VOLTAGE FAULT**

Major voltage fault is caused by a mismatch in control modules. If a module set up for 230 volts is used in a 460 volt EHAB, this fault is set. To correct this, change the unit type screen (found on the SET POINT menu) to match the voltage and phase of the EHAB unit.

### **2. OVERTEMP FAULT**

Overtemp fault is caused by high heat duct temperature. Possible cause of this fault is low air flow. The duct work should be checked for any obstructions. When an overtemp fault occurs the heat contactor will be disabled. After the overtemp sensor cools down, the overtemp will clear and the heat will resume.

### **3. SAIL SWITCH ON FAULT:**

Sail switch on fault occurs during startup when the processor checks the status of the airflow switch. If the airflow switch is closed or shorted the blower motor will turn on and the blower will run a 4-minute purge to try to clear the airflow switch. The motor will then shut off and sit idle for 1 minute. Upon completion of this 5-minute cycle, the blower will once again check the airflow switch for proper operation. If the airflow switch still shows that it is closed, the 5-minute loop will run again. This will repeat until fault is cleared or blower is no longer called for.

### **4. SAIL SWITCH OFF FAULT:**

Sail switch off fault is set when blower is running and air flow switch remains open. After the fault is set, the blower motor will run a 4-minute purge to try to clear the airflow switch. The motor will then shut off and sit idle for 1 minute. Upon completion of this 5-minute cycle, the blower will once again check the airflow switch for proper operation. If the airflow switch still shows that it is open it will run the 5-minute loop again. This will repeat until fault is cleared or blower is no longer called for. Things to check for are free movement of the sail switch and obstructions in the duct work.

### **5. MOTOR OVERLOAD, RESET OVERLOAD DEVICE:**

High motor current will trip the motor overload on the control panel. This device is connected to the bottom of the motor contactor on the control panel. Reset by pressing the red button on the device. Check unit for high motor current, bad bearings, or obstructions in the blower wheel.

**6. AC FREQUENCY FAULT:**

AC frequency fault is set when AC frequency is either above or below frequency setpoints. This fault is generally caused by a backup power source not being able to handle the load.

**7. CHECK FUSE # 2 5VDC:**

Fuse # 2 is tripped. Check the following circuits:

- a. Ambient temperature sensor.
- b. Rail temperature sensor.

After the problem is corrected and the unit cools down for 30 Seconds, the fuse will reset.

**8. CHECK FUSE # 6 115VAC:**

Fuse # 6 is tripped. Check the following circuits:

- a. T1 terminal 5 115VAC power.
- b. J15 wifi power.

After the problem is corrected and the unit cools down for 30 Seconds, the fuse will reset.

**9. CHECK FUSE # 1 24 VDC POWER:**

Fuse # 1 is tripped. Check the following circuits:

- a. Overtemp switch and wiring.
- b. Check TS1-2 +24 control on wiring.

After the problem is corrected and the unit cools down for 30 Seconds, the fuse will reset

**10. CHECK FUSE # 3 SNOW HEAD # 1:**

Fuse # 3 is tripped. Check the following circuits:

- a. Check snow detector head # 1 and wiring.

After the problem is corrected and the unit cools down for 30 Seconds, the fuse will reset.

**11. CHECK FUSE # 4 SNOW HEAD # 2:**

Fuse # 4 is tripped. Check the following circuits:

- a. Check snow detector head # 2 and wiring.

After the problem is corrected and the unit cools down for 30 Seconds, the fuse will reset.

**12. VOLTAGE FAULT PHASE 1:**

Voltage fault phase 1 is set when phase 1 line voltage is either above or below voltage setpoints.

**13. VOLTAGE FAULT PHASE 2:**

Voltage fault phase 2 is set when phase 2 line voltage is either above or below voltage setpoints.

**14. VOLTAGE FAULT PHASE 3:**

Voltage fault phase 3 is set when phase 3 line voltage is either above or below voltage setpoints.

**15. OPEN HEATER PHASE 1:**

This fault occurs when phase 1 current is below the current setpoint. Check for an open heater or heater fuse.

**16. OPEN HEATER PHASE 2:**

This fault occurs when phase 2 current is below the current setpoint. Check for an open heater or heater fuse.

**17. OPEN HEATER PHASE 3:**

This fault occurs when phase 3 current is below the current Setpoint. Check for an open heater or heater fuse.

**D. ADVANCED FEATURES:**

Advanced features allows access to extended menus. To access the extended menu structure rotate selector dial either direction until desired menu appears. Than move the mode switch either up or down until desired screen is found.

**1. MAIN MENU**

**A. 1. AIR TEMP \_\_ F**

Ambient air temperature is displayed.

**2. PRESET VALUE \_\_ F**

Air temperature below which unit will operate – this value can be changed on the SETPOINTS MENU.

**B. AC FREQUENCY \_\_ HZ**

Line voltage frequency is displayed.

**C. LINE VOLTAGE \_\_ V**

**D. LINE CURRENT \_\_ A**

**E. KWATTS TOTAL**

Real time kilowatt use is displayed.

**F. 1. KWH RESET**

Display of accumulated KWH use since this register was last

reset. To reset, turn knob.

**2. KWH TOTAL**

Display of accumulated KWH.

- G. **1. RAIL TEMP \_\_\_ F**  
Requires an optional rail temp sensor for display.
- 2. CABINET TEMP \_\_ F**
  
- H. **1. HOUR METER**
- 2. RESET HOUR**

**2. FAULT HISTORY:**

**The following FAULT COUNTERS will only be displayed if one or more of the FAULTS of the type have been recorded. If a FAULT COUNTER is cleared: it will no longer be displayed until another FAULT occurrence.**

- A. **PHASE 1 VOLTAGE FAULT COUNTER:**  
Phase 1 voltage low or high counter. To reset this fault, rotate selector dial.
  
- B. **PHASE 2 VOLTAGE FAULT COUNTER:**  
Phase 2 voltage low or high counter. To reset this fault, rotate selector dial. Note this fault only applies to 3 phase models.
  
- C. **PHASE 3 VOLTAGE FAULT COUNTER:**  
Phase 3 voltage low or high counter. To reset this fault, rotate selector dial. Note this fault only applies to 3 phase models.
  
- D. **DAY COUNTER:**  
Day counter is the total number of days the EHAB control module has been powered on.
  
- E. **POWER UP:**  
Power up counter is total count of power ups / processor resets. To reset this value, rotate selector dial.
  
- F. **OVERTEMP FAULT COUNTER:**  
Overtemp fault counter is total count of heat duct overtemps. To reset this value, rotate selector dial.

- G. MOTOR OVERLOAD FAULT COUNTER:**  
Overloads counter is total motor overloads faults.  
To reset above faults, rotate selector dial.
- H. SAIL ON FAULT COUNTER:**  
Sail on counter is total count of sail on faults.  
To reset above faults, rotate selector dial.
- I. SAIL OFF FAULT COUNTER:**  
Sail off counter is total count of sail off faults.  
To reset above faults, rotate selector dial.
- J. LINE 1 OPEN HEATER FAULT COUNTER:**  
Line 1 open heater fault counter is total count of open heater fault for line 1.  
To reset above faults, rotate selector dial.
- K. LINE 2 OPEN HEATER FAULT COUNTER:**  
Line 2 open heater fault counter is total count of open heater fault for line 2. Note this fault only applies to 3 phase models.  
To reset above faults, rotate selector dial.
- L. LINE 3 OPEN HEATER FAULT COUNTER:**  
Line 3 open heater fault counter is total count of open heater fault for line 3. Note this fault only applies to 3 phase models.  
To reset above faults, rotate selector dial.
- M. MAJOR VOLTAGE FAULT COUNTER:**  
Major voltage fault counter is total count of major voltage faults.  
To reset above faults, rotate selector dial.

### 3. SET POINT:

The **SET POINT** menu has two selectable levels: **BASIC** or **ADVANCED**. If the **ADVANCED** level is selected, the next screen is **PASSWORD**. To adjust items on the **ADVANCED** menu, enter **PASSWORD: 5** by rotating **RE1**. The **ADVANCED** menu includes the **BASIC** menu items as well as the **ADVANCED** items listed.

#### **BASIC**

##### **A. SELECT TEMPERATURE SETPOINT:**

Used to set temperature below which unit will start. Factory default is 38 degrees F (3.3 degrees C).

##### **B. SELECT RUN TIMER VALUE:**

The run timer can be set from 0 to 1000 minutes in 1 minute increments. If zero is selected, the unit will operate until the control on contact closure is removed. If any value other than zero is selected, a control on circuit closure will cause the unit to run for the amount of time set. When the count down timer reaches zero, the unit will shut down and drop indication. To restart the unit, the control on contact closure must be opened and closed again. Factory default is zero.

##### **C. SELECT SNOW TIMER**

The snow timer can be set from 1 to 1000 minutes in 1 minute increments. The EHAB unit will run as long as snow is detected. The value selected is the amount of time the unit will after snow is no longer detected. Factory default is 60 minutes.

##### **D. SELECT SNOW SENSOR SPEED**

Snow sensor speed can be set from 1 to 60 seconds. This sets the amount of time the EHAB must continuously sense snow before starting. Factory default is 1 second.

##### **E. SELECT START DELAY**

Starting the motor can be delayed using this parameter. This allows a staggered start for multiple units on the same power hook up. The parameter can be set from 0 to 240 seconds in 10 second increments.

#### **ADVANCED**

##### **A. PROG REV/DATE**

Displays the program revision level and the date of the last program revision.

**B. LINE VOLTAGE HIGH SETPOINT:**

The AC line voltage high setpoint can be set from 0 to 700. If the measured line voltage rises above the selected value, the high line voltage fault will be set.

**C. LINE VOLTAGE LOW SETPOINT:**

The AC line voltage low setpoint can be set from 0 to 700. If the measured line voltage falls below the selected value, the low line voltage fault will be set.

**D. LOCAL WITH/WITHOUT AIR TEMP:**

Sets the local feature to, or not to, be dependant on the air temperature. The factory default is with (you must have air temp to enable EHAB).

**E. UNIT TYPE**

Used to select unit voltage (230V or 460V) and phase (1PH or 3PH) of the unit the module will be installed in. The information is listed on the EHAB serial number tag.

**F. OPEN HEATER SETPOINT LINE 1**

The open heater can be set from 0 to 500 amps. If the measured current falls below the open heater setpoint the open heater fault will be set. (1PH or 3PH)

**G. OPEN HEATER SETPOINT LINE 2**

Same as F, but for line 2 (3 PH only)

**H. OPEN HEATER SETPOINT LINE 3**

Same as F, but for line 3 (3 PH only)

**I. SELECT SNOW INDICATION ON:**

The choices are OFF or ON, the factory default is off. With snow indication off indication will remain off during snow time if no faults are present. With snow indication on indication will remain on during snow time if no faults are present.

**J. SELECT RUN TIMER PULSE MODE:**

The choices are on or off, factory default is off. When on is selected a pulse will start run time sequence and continue until run timer has timed out. When off is selected run timer will time as long as remote is on, when remote on is removed blower will stop.

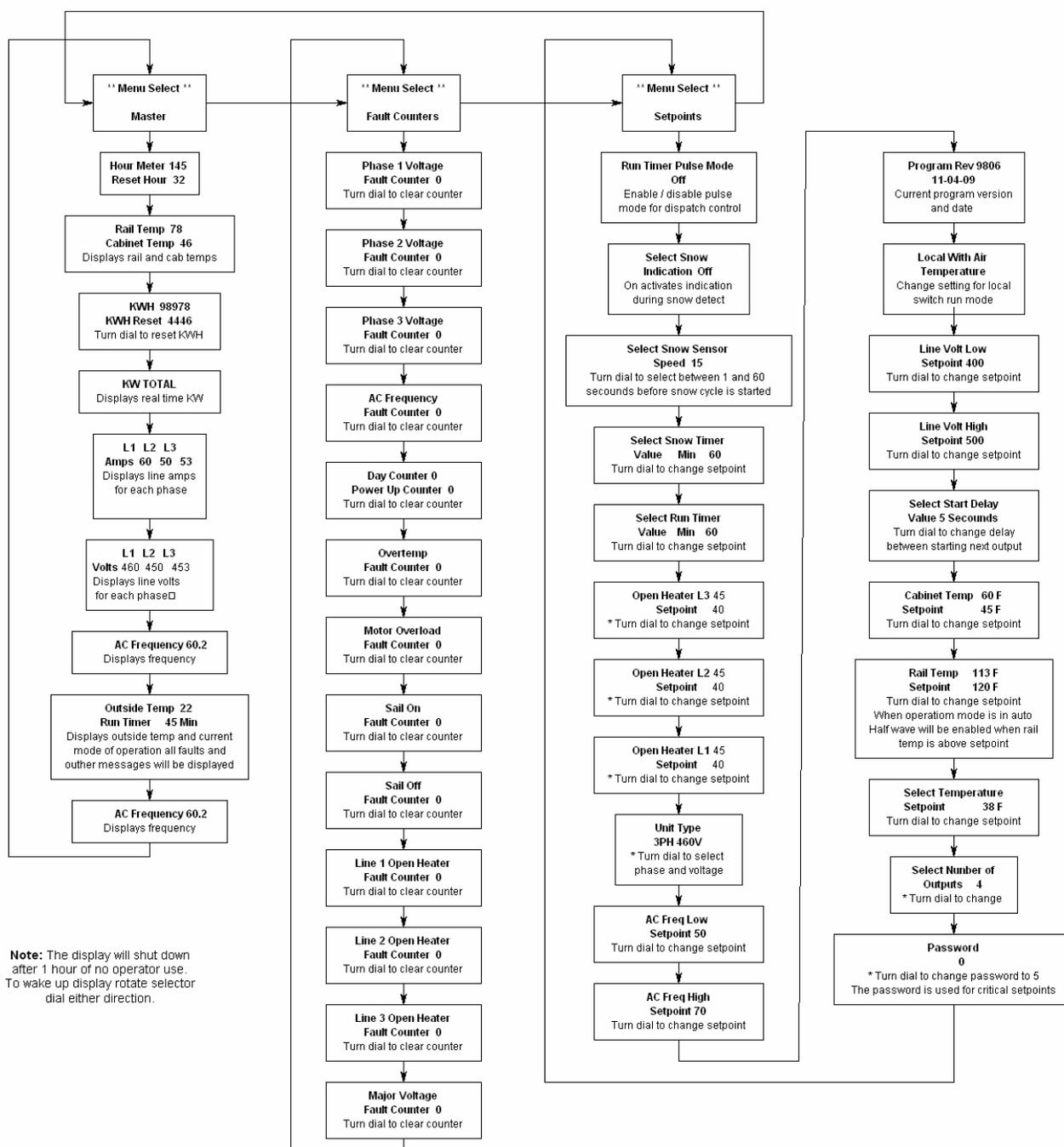
**K. SELECT F OR C**

This parameter allows selection of Fahrenheit or Celsius Temperature display.

**4. FACTORY DEFAULT:**

Factory default is used to place all parameters back to factory default settings. To enable factory default settings rotate selector dial while this menu item is displayed. All settings will return to factory default settings.

# 934 MENU



## **D. OPERATION**

With switch SS1 in the “auto” position, the unit can be activated by applying a circuit closure between terminals TS1-1 and 2. If the outside temperature is above set point, the unit will not start a snow melt sequence but will turn on the “indication” LED and provide a relay contact closure between TS1-3 and 4 to indicate to the remote station that the unit is operational.

If a circuit closure exists between TS1-1 and 2, and the air temperature is below set point, the unit will begin a snow melt sequence. The unit executes a 0 to 300 sec. time delay depending on the setting of the DELAY START TIMER. Then, a 10-sec. audible tone sounds as a warning that the blower motor is about to turn on.

The airflow switch is checked to see if it is closed. If it is, the blower will display: SAIL ON FAULT.

If the airflow switch is open the motor will turn on. After the blower motor is turned on, the airflow switch is monitored. It closes if airflow is normal. If it does not close within 10 sec. after blower turn-on the blower displays SAIL OFF FAULT. When the airflow switch closes a 30 second prepurge time will start. After the prepurge time is completed, The heater contactor is activated.

When the contactor is activated the “indication” switch closure is established between TS1-3 and 4. Heater current is checked at this time, and if an open heater is detected, a fault will be displayed and indication will drop out, but the unit will continue to run. The unit will run for a period of time determined by the setting of the RUN TIMER. If the run timer is set at “0” the unit will continue to run until the circuit closure between TS1-1 and 2 is removed.

SNOW DETECTOR OPERATION. If the unit is operating with one or two optional snow detector assemblies and moisture is detected by either (or both), a snow melt sequence will begin, provided that the air temperature is below the set point. The unit will start as described in Section IV Part B under (Select Snow Timer).

## **V. SEASONAL MAINTENANCE**

### **A. SPRING:**

1. Turn off electric power at source.
2. Disconnect and remove the control module. Store in a clean, dry place.

## **B. FALL**

1. Check all ductwork for clear airflow. Ensure that the point and track duct nozzle screens are not damaged and are completely covering the openings. Make sure that no debris or rodents have obstructed any area of the ductwork.
2. Inspect the track duct nozzles for proper operation.
3. Remove the heat duct cover. Check the fuses and heaters.  
Check the wiring to make sure rodents or vibration have not damaged the insulation.
4. Check the airflow sail switch to make sure it is operating properly.
5. Replace the heat duct cover.
6. Install the control module and connect the wires.
7. Turn on the electric power at source.
  - a) Set temp setpoint above ambient temperature.
  - b) Place switch SS1 in the FORCE position.
  - c) Unit should start and run. Check for proper operation.

## **VII. TROUBLESHOOTING**

### **A. UNIT DOES NOT START**

1. Check circuit breaker.
2. Check control fuses. The control module has both replaceable and auto resettable fuses. If the open fuse is an auto resettable type fuse, it will reset after it cools down. Correct the problem causing the fuse to open, turn the main circuit breaker off for one minute, then turn back on.
3. Check for 18VAC between the following points:  
TS1-9 and TS1-11  
TS1-9 and TS1-12  
Change T1 control transformer if either measurement is incorrect.
4. Check for air temperature below set point.
5. Is the control module programmed for a start-up delay?
6. Monitor the fault display on the control module.
7. Turn the circuit breaker off, then reset the motor overload relay. The motor overload relay is adjustable. It should be set for the motor name plate current.
8. Push the RESET Button (PB1).

### **B. LOW HEAT LEVEL**

1. Check heater fuses for an open fuse.
2. Check the heating elements for an open heater.

### C. LOW AIRFLOW

1. Check for obstructions in all ductwork and the air intake.
2. If there is frost buildup on the air intake screens, move the screens to the “open” position.
3. Check the voltage and current levels on the blower motor.
4. Make sure knockouts on the track duct are pushed all the way back in the track duct.
5. Check the spacing between the inlet cone and the blower wheel. The gap should be less than 1/16 of an inch.

## VIII. SNOW DETECTOR

### A. SNOW DETECTOR INSTALLATION

1. The snow detector sensing circuitry is contained within the control module. All that is required for snow detector operation is to connect the sensing head(s).
2. Either one or two sensing heads may be used.
3. Each sensing head has three lead wires; black, white, and green. Connect as follows:
  - a) green: one or both connected to TS1-9.
  - b) black #1: connected to TS1-11.
  - c) black #2: connected to TS1-12.
  - d) white: one or both connected to TS1-10.

NOTE: Refer to the diagrams when connecting wires for the sensing heads. It is important to properly connect the sensing head wires. Improper connection of the sensing head wires may result in damage to the control module and/or the sensing head.

4. To operate more than one HAB unit from a HAB unit that is controlled by a snow detector(s), connect terminal posts #9 together and terminal posts #10 together. (Do not connect terminal post #9 to terminal post #10.) When connecting snow detectors to more than one HAB unit, first connect one HAB. Then connect the snow detector to one more HAB. If the snow detector does not operate properly, exchange L1 and L2 on the newest HAB circuit breaker. NOTE: BE SURE L1 AND L2 ARE DE-ENERGIZED BEFORE EXCHANGING THEM. Continue to add HABs to the snow detector in the same manner until all the desired HABs are connected. DO NOT EXCEED 200' CABLE LENGTH (18 AWG WIRE).
5. The sensing heads should be mounted in a vertical position.
6. Experience has shown that positioning a snow detector sensing head in the switch area between the ties and between the switch point and the track duct is effective. A second sensing head is then placed away from the switch area, such as on a bungalow or pole.

## **B. SNOW DETECTOR OPERATION**

NOTE: A snow detector sensing head only detects moisture. With temperature sensing capability, the HAB unit assumes moisture is due to snow when the air temperature is below set point.

All operating functions are similar to remote operation with the following exceptions:

1. **INDICATION:** During normal operation under snow detector control, the indication contact across terminal posts 3 and 4 will not be closed. If indication during snow detect operation is desired, the SELECT SNOW INDICATION parameter on the SETPOINT menu should be set to ON.
2. **TIMED OPERATION:** The snow detector has several different time scenarios. Refer to SETPOINTS Parts C, D, and I for snow detector set up
3. **RUN TIMER:** During remote operation, if the snow detector senses moisture, the unit will operate according to the settings. The unit will then operate for the duration of the run timer setting.
4. **FAULT CONDITION:** A fault condition under snow detector control will cause the indication contact across terminal posts TS-3 and TS-4 to toggle.

## **C. SNOW DETECTOR MAINTENANCE**

The snow detector sensing head contains a small, self-regulating heater that will melt snow or ice into water. The sensing head relies on moisture to create a low resistance circuit path. The heater will also cause the moisture to evaporate within a short period. If the surface becomes non-conductive due to contamination by grease or oil, the sensing head will not operate. To ensure effective and dependable snow detector operation, it is important to inspect the sensing heads frequently and clean them thoroughly if necessary.. Use a solution of water and mild detergent or isopropyl alcohol to clean the sensing grid. Use a clean, dry cloth to wipe the grid. Make sure there is no residue left on the surface.

## **D. SNOW DETECTOR TROUBLESHOOTING**

NOTE: A newly-installed snow detector sensing head should operate 15-20 minutes to allow the internal heater to reach normal operating temperature.

### **1. NO HEAT ON THE SENSING HEAD**

- a. Check for voltage between terminal post 9 and 11, and between terminal post 9 and 12. It should be 18VAC (+2VAC). If not:
  - (1) Check the display on the control module.
  - (2) The control transformer may be defective.
  - (3) There may be a bad circuit connection.
- b. Remove the black and the green lead wires from the terminal posts. Check resistance between them. If resistance is greater than 10 ohms, the sensing head is defective and should be replaced.

### **2. DOES NOT DETECT MOISTURE**

- a. Clean the snow detector as described in Section VIII.C. SNOW DETECTOR MAINTENANCE
- b. If unit still does not detect moisture, check the wiring connections between detector head and terminal posts.
- c. If unit still does not detect moisture, replace the control module with a known good control module. If still not operating properly, replace the sensing head.

NOTE: If a snow detector head becomes saturated with moisture, it can sometimes be restored to normal operation by removing it and “baking” it in a conventional oven for several hours. Do not exceed 150 degrees F.

### **3. CONSTANT INDICATION OF MOISTURE DETECTION**

- a. Clean the snow detector heads as described in section C, Snow Detector Maintenance.
- b. Remove white lead(s) from terminal post 10. If moisture indication is still on, the control module is defective and should be replaced.

**IX.**

**SPECIFICATIONS: 480V SINGLE PHASE**

VOLTAGE: 480VAC, 1PH 60 HZ, 150 Amp

MOTOR: 2 HP, 3450RPM, TEFC  
39 Amp starting current  
6 Amp running current

AIRFLOW: 2000 CFM

KW OUTPUT: 50 – 60 KW

INDICATION CONTACTS: 30VDC 1A or 125VAC 300mA

**SPECIFICATIONS: 480V THREE PHASE**

VOLTAGE: 480VAC 3PH 60HZ 125 Amp

MOTOR: 2HP, 3450RPM TEFC  
39 Amp starting current  
6 Amp running current

AIRFLOW: 2000 CFM

KW OUTPUT: 50 – 60 KW

INDICATION CONTACTS: 30VDC 1A or 125VDC 300mA

**SPECIFICATIONS: 230V SINGLE PHASE**

VOLTAGE: 230VAC 1PH 60HZ 250/300 Amp

MOTOR: 2HP, 3450RPM TEFC  
60 Amp starting current  
9 Amp running current

AIRFLOW: 1500 CFM

KW OUTPUT: 50 – 60KW

INDICATION CONTACTS: 30VDC 1A or 125VAC 300mA

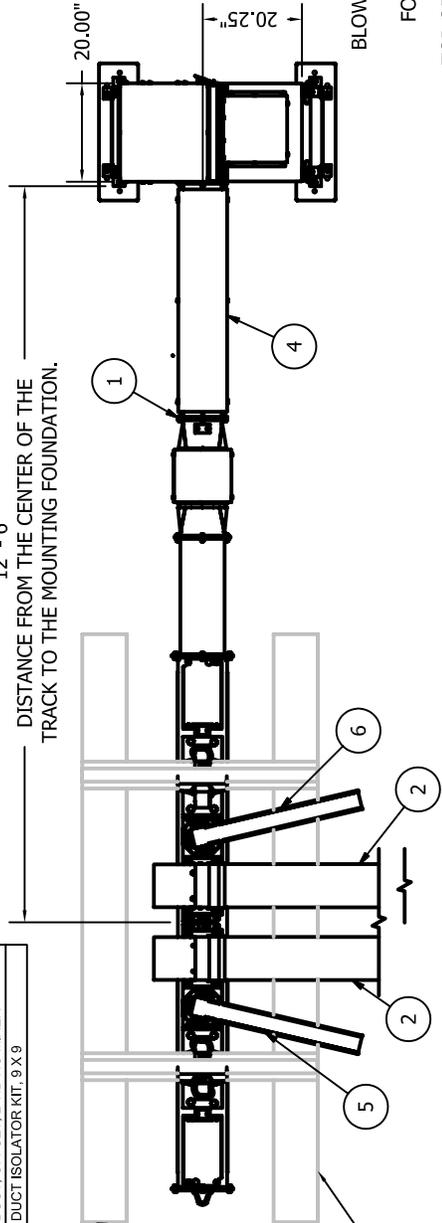
## **X. DRAWINGS**

EHAB 480V 60KW/3PH	934N4603
EHAB MAIN UNIT	9348-1360
MAIN EHAB LOW PROFILE	9378-1352
TIE DUCT ASSEMBLY 136LB E-CLIP	9278-4805
TIE DUCT ASSEMBLY 115LB E-CLIP	9278-4605
POINT / TRACK ASSEMBLY RH	9508-4000
POINT / TRACK ASSEMBLY LH	9508-4001
NOZZLE TRACK DUCT ASSEMBLY	927490
ISOLATION KIT, TIE DUCT POINT NOZZLE	9278-0021
ISOLATION KIT, TIE DUCT TRACK NOZZLE	9278-0027
GHAB FOUNDATION	9288-0202
HEAVY DUTY OFFSET DUCT W/O MIXER	9528-3404
2' INSULATED FLEX DUCT	9528-4223
TRACK DUCT, 5' POINT	9278-0226
TRACK DUCT, 5' MID	9278-0227
TRACK DUCT, 10', MID	9278-1201
TRACK DUCT, 10', HEEL	9278-1202
SWITCH ROD DUCT 7'	9278-0270
TRACK DUCT SUPPORT BRACKET ASSEMBLY	92774
EHAB CONTROL 480V/60KW/1PH	9348-2370
EHAB CONTROL 480V/60KW/3PH	9348-2380
EHAB 480VAC 1PH 60KW CONNECTION	9344-2370
EHAB 480VAC 3PH 60KW CONNECTION	9344-2380
MODULE MENU FLOWCHART	

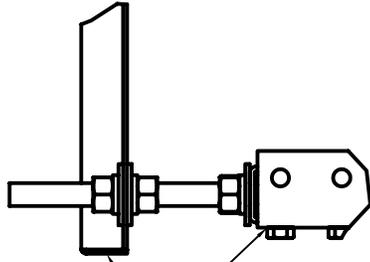
REVISION HISTORY			
REV	ECO #	DESCRIPTION	DATE
A	05-0006	NEW PART	02/03/05
B	05-0017	UPDATED PRINT	10/20/05
C		UPDATED EHAB MODULE	05/17/11

Parts List					
ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	9278-0026	B	EA	1	ASSY, 8X8 DUCT, BOLT KIT
2	9278-0223	D	EA	2	TRACK DUCT 30"
3	9288-0202	A	EA	1	FOUNDATION ASSY 2HP HAB BOLTED
4	9348-1380	H	EA	1	ASSY, MAIN EHAB, 480V/60KW/1PH
5	9508-4000	A	EA	1	POINT/TRACK NOZZLE ASSY RH
6	9508-4001	A	EA	1	POINT/TRACK NOZZLE ASSY LH
7	9528-4605	A	EA	1	TIE DUCT, 116# QUICK CHANGE
8	R8035-0807	B	EA	1	LABEL, ID
9	9528-4223	B	EA	1	FLEX DUCT 2ST INS NO MIXER
10	9528-3404	A	EA	1	DUCT, OFFSET, 2" HD NO MIXER
11	9368-0106	E	EA	1	DUCT ISOLATOR KIT, 9 X 9

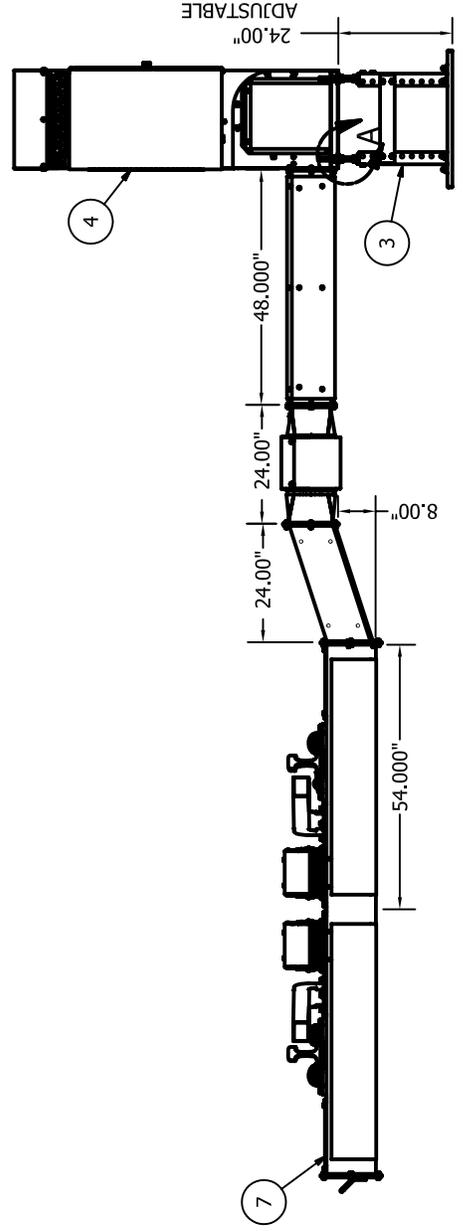
12' - 6"  
DISTANCE FROM THE CENTER OF THE TRACK TO THE MOUNTING FOUNDATION.



TIES AND TRACK SHOWN FOR DEPICTION PURPOSES ONLY.



DETAIL A  
SCALE 1 / 4



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.  
DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.  
DRAWN BY: J.A. JOHNSON  
CHECKED BY: J.A. JOHNSON  
DATE: 05/17/11  
DRAWING NO: 934N4603

RAILWAY EQUIPMENT CO. 2011  
RAILWAY EQUIPMENT CO.  
MAYNARD, MINNESOTA (763) 972-5200

TITLE: EHAB 480V/60KW/3PH  
ASSY/BOM

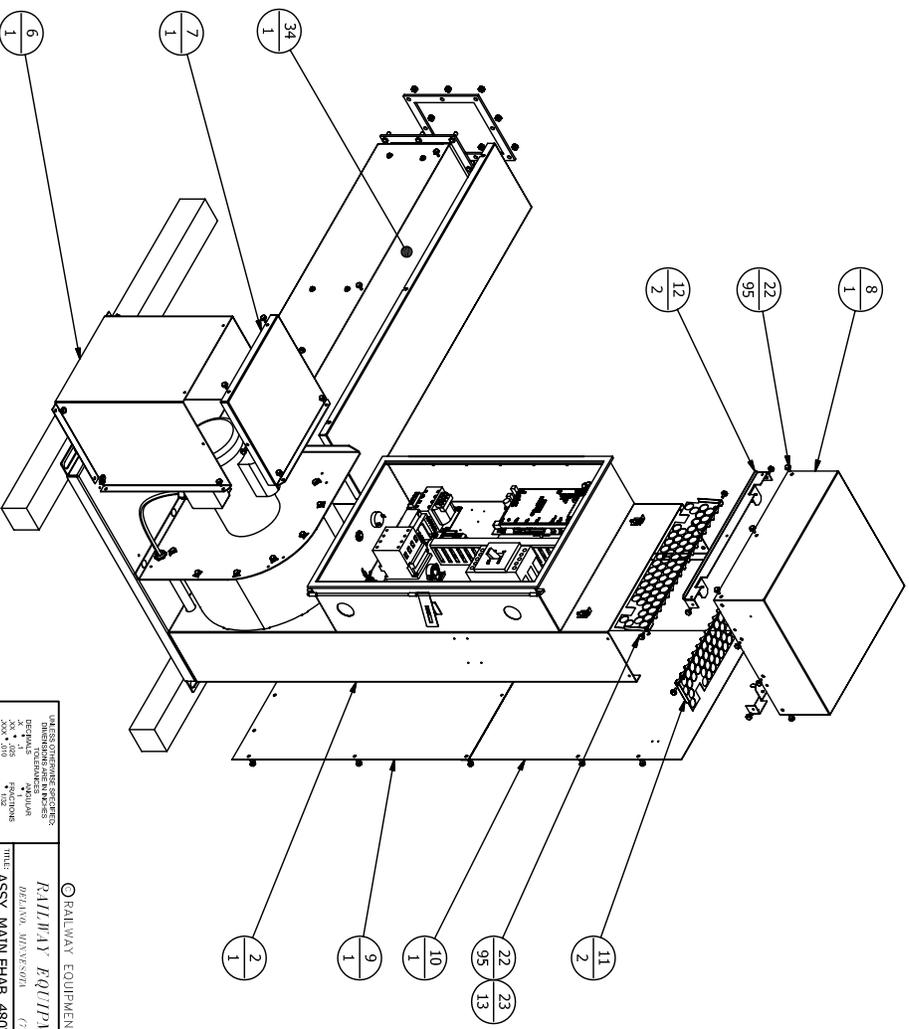
DATE: 5/17/11  
REV: NOTED  
SCALE: N/A  
SHEET: 1 OF 1

ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	95040	A	EA	1	BASE, HAB BOL-T TOGETHER
2	934417	A	EA	1	INTAKE BODY, ELEC BOL-T TOGETHER
3	933802	A	EA	1	MOTOR MOUNTING PLATE, HAB
4	933803	A	EA	1	BLOWER SHROUD
5	93430	G	EA	1	ENCLOSURE, ELEC HAB
6	95041	A	EA	1	COVER, HAB MOTOR BOL-T TOGETHER
7	95042	A	EA	1	COVER PLATE, HAB MOTOR BOL-T TO
8	93309	E	EA	1	INTAKE TOP, HAB
9	93915	B	EA	1	COVER, LOWER INTAKE, GALV
10	93316	D	EA	1	COVER, UPPER INTAKE, GALV
11	933254	B	EA	2	INTAKE SCREEN, FLIP DOWN 1"
12	933256	A	EA	2	DRIP RAIL, HAB WITH LATCHES
13	93484029	C	EA	1	ASSY, WIRED MOTOR 2HP, 240V, 1PH
14	61064	-	EA	1	CONDUIT, NIPPLE, 3/4 X 9
15	601003	-	EA	3	CONDUIT, LOCK NUT 3/4 IN
16	60030	-	EA	1	CONDUIT, CLAMP 1/2"
17	28035	-	EA	7	IMOUNT, RUBBER, MM, 1/4-20
18	933800	A	EA	1	BLOWER OUTLET FLANGE
19	26006	E	EA	1	ASSY, BLOWER WHEEL
20	26003	C	EA	1	INLET CONE, BLOWER
21	2833-5119	-	EA	4	WASHER, 1/4 X 1.5, FENDER
22	29051	-	EA	95	BOLT, 1/4-20 X 1/2, HW, X 1/2, HD
23	2832-5101	-	EA	13	NUT, 1/4-20, HEX
24	14185	-	EA	4	LATCH FOR SCREENS
26	29017	-	EA	8	BOLT, #6-32 X 3/8, WASHER HEAD
28	2833-5211	-	EA	13	WASHER, 1/4 SPLIT LOCK
27	2831861112	-	EA	8	BOLT, 3/8 X 3/4, CARRIAGE
28	2833-4310	-	EA	2	WASHER, #10, EXT, STAR
29	2833-4310	-	EA	2	SCREW, #10-32 X 3/4 PAN, SLT
30	2832-4101	-	EA	2	CONDUIT, FITTING 1 1/4, 90
31	21027	-	EA	1	POST, 4 X 4 X 8, TREATED
32	32007	-	EA	1	ASSY, BUZZER
33	9338-0026	A	EA	1	HEAT/DUCT, EHAB, 480V/60KW/1PH
34	9348-3380	F	EA	1	GASKET, 8 X 8, LIPT-OUT, DUCT
35	93358	-	EA	4	WASHER, 3/8 X 1-1/2, FENDER
36	2833-5119	-	EA	4	WASHER, 1/4 X 1.5, FENDER
37	28045	-	EA	4	3/8" X 2.5" HEX LAG
38	60165	A	FT	8	GASKET, 25X 75, ADHESIVE BACK
39	60165	-	IN	2	CONDUIT, 1.25 IN, LIQUID TIGHT
40	2833-5310	-	EA	4	WASHER, 3/8, EXT, STAR
41	2831851116	-	EA	14	BOLT, 3/8-16 X 1, HEX CAP
42	2833-9210	-	EA	8	WASHER, 3/8, SPLIT LOCK
43	2832-3101	-	EA	8	NUT, 3/8-16, HEX
44	2832-9904	-	EA	8	NUT, 3/8-16, CENTER LOCK
45	2833-4210	-	EA	1	WASHER, #10, SPLIT LOCK
46	9348-2370	A	EA	1	EHAB CONTROL, 480V/60KW/1PH
47	2831851108	-	EA	6	BOLT, 1/4-20 X 1/2, HEX HEAD
48	2833-5110	-	EA	7	WASHER, 1/4 FLAT
49	60169	-	EA	2	TX-RAP, 0.38 X 8
50	933400104	A	EA	2	MANUAL, EHAB WITH DISPLAY
51	2831851110	-	EA	10	BOLT, 5/16-18 X 3/4, CARRIAGE
52	2832-9901	-	EA	10	NUT, 5/16-18, CENTER LOCK
53	9348-4807	B	EA	1	LABEL, ID
54	9348-4807	B	EA	1	DIGITAL AIR TEMP SENSOR ASSY
55	9228-0558	A	EA	1	CONNECTOR, COORD 3, 4 IN STRAIGHT
56	601001	-	EA	1	ASSY, HARNESS AIR FLOW SWITCH EHAB
57	9348-0131	A	EA	1	ASSY, HARNESS AIR FLOW SWITCH EHAB

Parts List

REV	ECO #	DESCRIPTION	DATE	BY
H	09-0009	REDRAWN ON INVENTOR WITH CHANGES	5/6/2009	JB

REVISION HISTORY

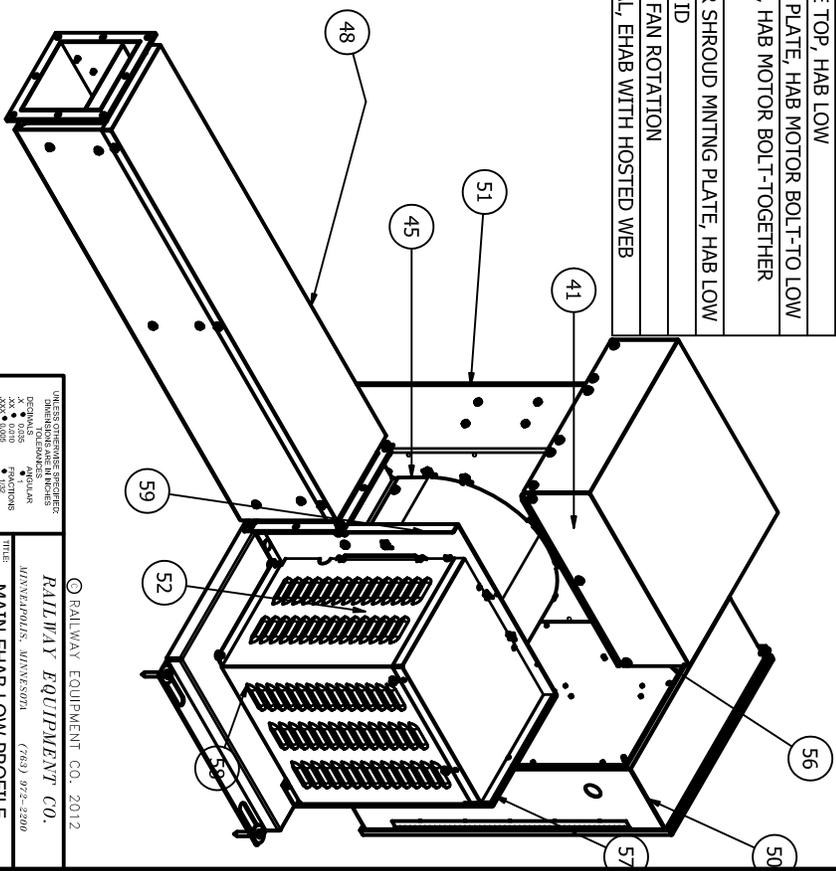


RAILWAY EQUIPMENT CO., 2009  
 RAILWAY EQUIPMENT CO.  
 DELAWARE, DELAWARE  
 (763) 922-2200  
 DATE: 5/6/09  
 DRAWN: JB  
 CHECKED: JB  
 APPROVED: JB  
 PARTS LIST: 300 PARTS  
 TITLE: ASSY, MAIN EHAB, 480V/60KW/1PH  
 QTY: 9348-1360  
 SCALE: NONE  
 SHEET: 1 OF 2



PARTS LIST					PARTS LIST						
ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION	ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	14165	-	EA	4	LATCH FOR SCREENS	46	9338-0026	A	EA	1	ASSY, BUZZER
2	16003	-	EA	0.33	RTV SILICONE CLEAR 10 OZ TUBE	47	9348-2370	C	EA	1	EHAB CONTROL 480V/60KW/1PH
3	1610004600	A	EA	1	CONDUIT FITTING 1.25" STRAIGHT	48	9348-3360	G	EA	1	HEATDUCT, EHAB 480V/60KW/1PH
4	21027	-	EA	1	CONDUIT, FITTING 1 1/4 90	49	93730	A	EA	1	COVER, LOWER INTAKE, GALV LOW EHAB
5	21207	-	EA	1	STRAIN RELIEF, 5 POS	50	93730	A	EA	1	ENCLOSURE, ELEC HAB LOW
6	21209	-	EA	1	CONNECTOR, HOUSING, 5 POS	51	937417	A	EA	1	INTAKE BODY, ELEC BOLT TOGETHER LOW
7	21221	-	EA	1	CONNECTOR, HOUSING, 4 POS	52	9378-0029	A	EA	1	ASSY, WIRED MOTOR 2HP 240V 1PH LOW
8	21222	-	EA	1	STRAIN RELIEF, 4 POS	53	9378-0131	A	EA	1	ASSY, HARNESS AIR FLOW SWITCH EHAB LOW
9	26003	C	EA	1	INLET CONE, BLOWER	54	95040	A	EA	1	BASE, HAB BOLT-TOGETHER
10	26006	E	EA	1	ASSY, BLOWER WHEEL	55	95046	A	EA	1	MOTOR MOUNTING PLATE, HAB
11	28035	-	EA	6	MOUNT, RUBBER, M/M 1/4-20	56	95108	B	EA	1	INTAKE TOP, HAB LOW
12	28045	-	EA	4	BOLT, 3/8 X 2 1/2 HEX LAG	57	95143	B	EA	1	COVER PLATE, HAB MOTOR BOLT-TO LOW
13	2831411112	-	EA	1	SCREW, #10-32 X 3/4 PAN SLT	58	95145	B	EA	1	COVER, HAB MOTOR BOLT-TOGETHER LOW
14	2831551108	-	EA	1	BOLT, 1/4-20 X 1/2 HEX HEAD	59	95149	A	EA	1	MOTOR SHROUD MNTNG PLATE, HAB LOW
15	2831851116	-	EA	8	BOLT, 3/8-16 X 1 HEX CAP	60	R8039-0807	B	EA	1	LABEL, ID
16	2831861112	-	EA	8	BOLT, 3/8-16 X 3/4 CARRIAGE	61	R8039-0816	A	EA	1	LABEL, FAN ROTATION
17	2832-4101	-	EA	2	NUT, #10-32 HEX	62	R9340-0104	A	EA	2	MANUAL, EHAB WITH HOSTED WEB
18	2832-5101	-	EA	13	NUT, 1/4-20 HEX						
19	2832-5901	-	EA	4	NUT, 1/4-20 CENTERLOCK						
20	2832-8101	-	EA	8	NUT, 3/8-16 HEX						
21	2832-8904	-	EA	8	NUT, 3/8-16 CENTERLOCK						
22	2833-4210	-	EA	1	WASHER, #10 SPLIT LOCK						
23	2833-4310	-	EA	2	WASHER, #10 EXT. STAR						
24	2833-5110	-	EA	6	WASHER, 1/4 FLAT						
25	2833-5119	-	EA	4	WASHER, 1/4 X 1.5 FENDER						
26	2833-5211	-	EA	14	WASHER, 1/4 SPLIT LOCK						
27	2833-8119	-	EA	4	WASHER, 3/8 X 1-1/2 FENDER						
28	2833-8210	-	EA	8	WASHER, 3/8 SPLIT LOCK						
29	2833-8310	-	EA	4	WASHER, 3/8 EXT. STAR						
30	29017	-	EA	8	BOLT, #8-32 X 3/8 WASHER HEAD						
31	29051	-	EA	100	BOLT, 1/4-20 X 1/2 WITH 1/2 HD						
32	32007	-	EA	2	POST, 4 X 4 X 8' TREATED						
33	60.001	-	EA	1	CONNECTOR, CORD 3/4IN STRAIGHT						
34	60.003	-	EA	3	CONDUIT, LOCK NUT 3/4 IN						
35	60069	-	EA	2	BUSHING, CONNECTOR 1 1/4"						
36	60165	-	IN	20	CONDUIT, 1.25 IN LIQUIDTIGHT						
37	60169	-	EA	2	TY-RAP, 0.30 X 8						
38	60185	A	FT	9	GASKET, .25X.75 ADHESIVE BACK						
39	680601	-	IN	180	WIRE, 6 GA BLACK						
40	9228-0526	A	EA	1	DIGITAL AIR TEMP SENSOR ASSY						
41	933254	B	EA	2	INTAKE SCREEN, FLIP DOWN 1"						
42	933256	A	EA	2	DRIP RAIL, HAB WITH LATCHES						
43	93358	A	EA	1	GASKET, 8 X 8 LIFT-OUT DUCT						
44	933600	A	EA	1	BLOWER OUTLET FLANGE						
45	933603	A	EA	1	BLOWER SHROUD						

PARTS LIST					PARTS LIST						
ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION	ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
46	9338-0026	A	EA	1	ASSY, BUZZER	46	9338-0026	A	EA	1	ASSY, BUZZER
47	9348-2370	C	EA	1	EHAB CONTROL 480V/60KW/1PH	47	9348-2370	C	EA	1	EHAB CONTROL 480V/60KW/1PH
48	9348-3360	G	EA	1	HEATDUCT, EHAB 480V/60KW/1PH	48	9348-3360	G	EA	1	HEATDUCT, EHAB 480V/60KW/1PH
49	93730	A	EA	1	COVER, LOWER INTAKE, GALV LOW EHAB	49	93730	A	EA	1	COVER, LOWER INTAKE, GALV LOW EHAB
50	93730	A	EA	1	ENCLOSURE, ELEC HAB LOW	50	93730	A	EA	1	ENCLOSURE, ELEC HAB LOW
51	937417	A	EA	1	INTAKE BODY, ELEC BOLT TOGETHER LOW	51	937417	A	EA	1	INTAKE BODY, ELEC BOLT TOGETHER LOW
52	9378-0029	A	EA	1	ASSY, WIRED MOTOR 2HP 240V 1PH LOW	52	9378-0029	A	EA	1	ASSY, WIRED MOTOR 2HP 240V 1PH LOW
53	9378-0131	A	EA	1	ASSY, HARNESS AIR FLOW SWITCH EHAB LOW	53	9378-0131	A	EA	1	ASSY, HARNESS AIR FLOW SWITCH EHAB LOW
54	95040	A	EA	1	BASE, HAB BOLT-TOGETHER	54	95040	A	EA	1	BASE, HAB BOLT-TOGETHER
55	95046	A	EA	1	MOTOR MOUNTING PLATE, HAB	55	95046	A	EA	1	MOTOR MOUNTING PLATE, HAB
56	95108	B	EA	1	INTAKE TOP, HAB LOW	56	95108	B	EA	1	INTAKE TOP, HAB LOW
57	95143	B	EA	1	COVER PLATE, HAB MOTOR BOLT-TO LOW	57	95143	B	EA	1	COVER PLATE, HAB MOTOR BOLT-TO LOW
58	95145	B	EA	1	COVER, HAB MOTOR BOLT-TOGETHER LOW	58	95145	B	EA	1	COVER, HAB MOTOR BOLT-TOGETHER LOW
59	95149	A	EA	1	MOTOR SHROUD MNTNG PLATE, HAB LOW	59	95149	A	EA	1	MOTOR SHROUD MNTNG PLATE, HAB LOW
60	R8039-0807	B	EA	1	LABEL, ID	60	R8039-0807	B	EA	1	LABEL, ID
61	R8039-0816	A	EA	1	LABEL, FAN ROTATION	61	R8039-0816	A	EA	1	LABEL, FAN ROTATION
62	R9340-0104	A	EA	2	MANUAL, EHAB WITH HOSTED WEB	62	R9340-0104	A	EA	2	MANUAL, EHAB WITH HOSTED WEB



REVISION HISTORY			
REV	ECO #	DESCRIPTION	DATE
A			6/11/2014

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DIMENSIONS ARE ANGULAR  
 XX.XX TO 0.010 FRACTIONS  
 XXXX TO 0.0005 DECIMALS  
 DRAWN: AEnglund

RAILWAY EQUIPMENT CO., 2012  
 RAILWAY EQUIPMENT CO.  
 MINNEAPOLIS, MINNESOTA (763) 972-2200

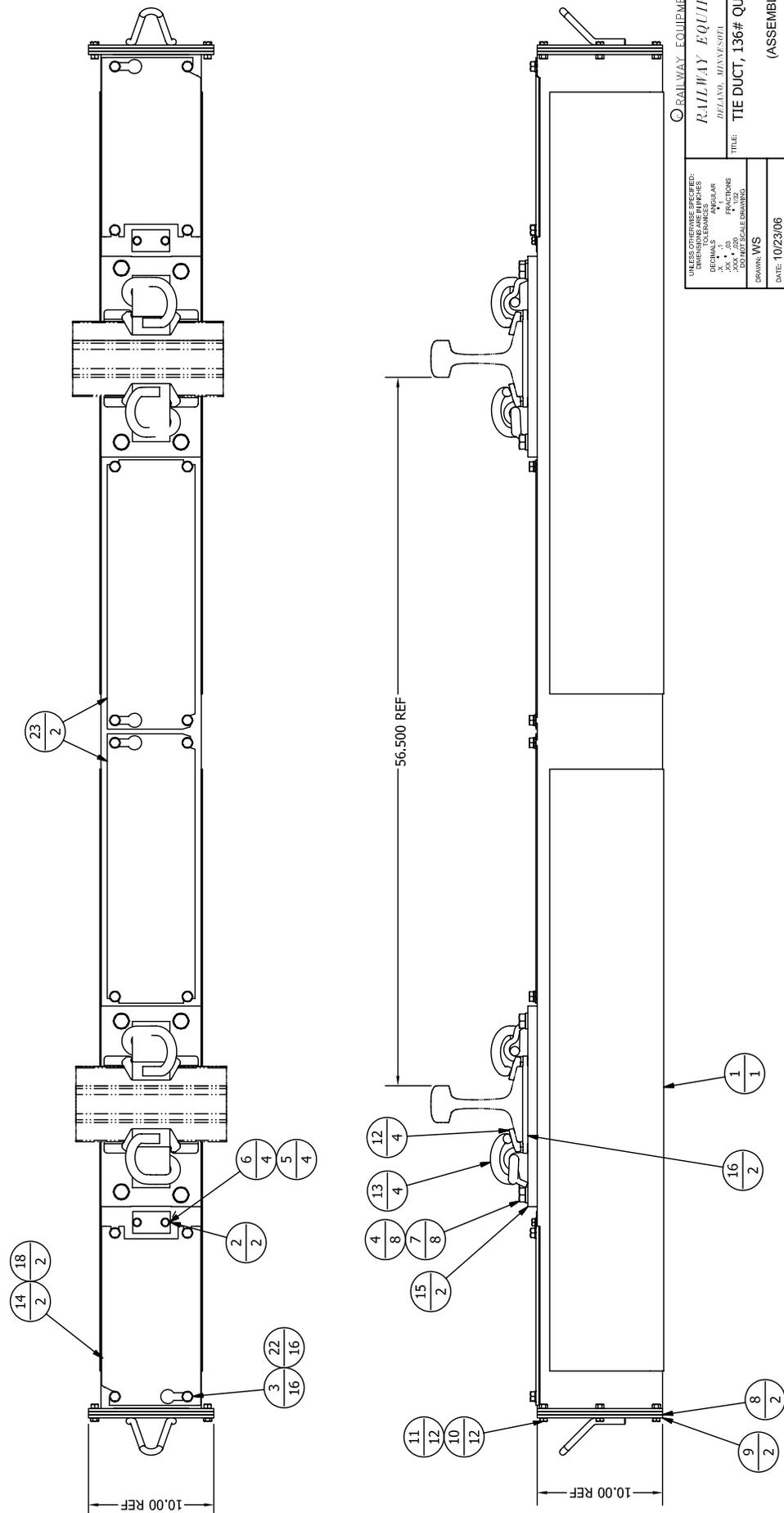
TITLE: MAIN EHAB LOW PROFILE  
 230V/1PH/60KW

DATE: 3/7/12  
 PART: N/A  
 REV: A  
 SCALE: 1/12  
 SHEET: 1 OF 2

REV	ECO	DESCRIPTION	DATE	BY
A	06-0024	NEW PART	10/23/2006	WS

REVISION HISTORY				
REV	ECO	DESCRIPTION	DATE	BY
A	06-0024	NEW PART	10/23/2006	WS

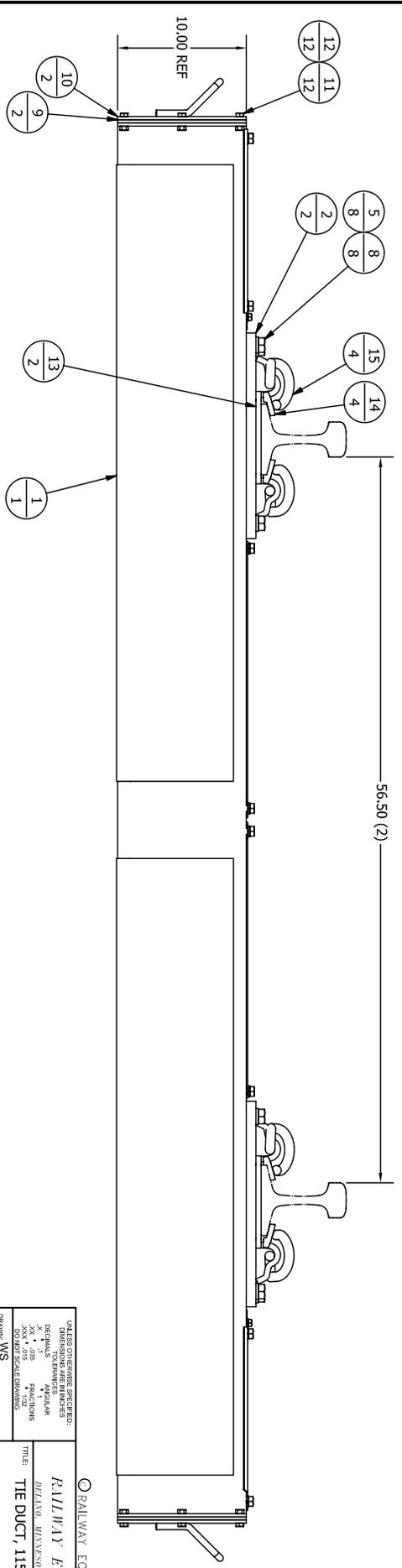
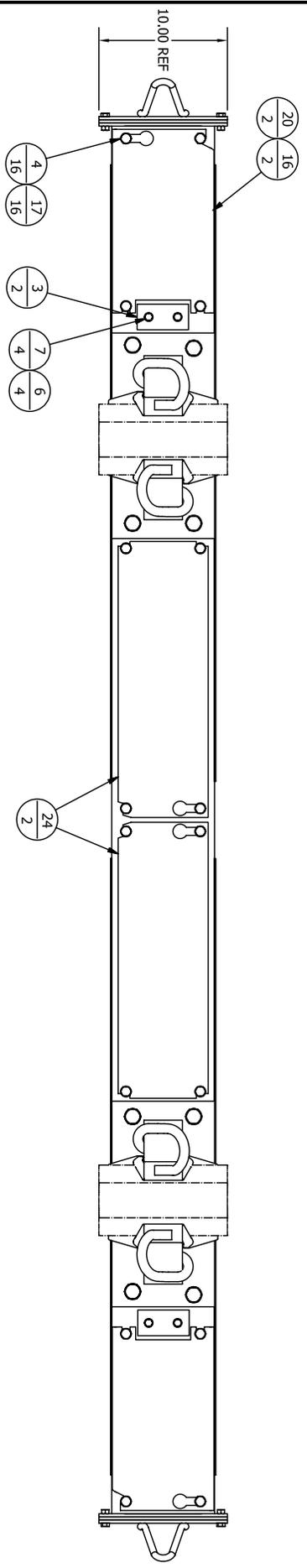
Parts List					Parts List						
ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION	ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	927279	A	EA	1	ASSY. TUBE TIE DUCT 8 X 10	13	927248	A	EA	4	RAIL CLIP, TIE DUCT
2	927237	A	EA	2	COVER PLATE, TEMP SENSOR	14	927603	A	EA	2	COVER, OUTSIDE TRACK NOZZLE
3	2631951121	-	EA	16	BOLT, 1/2-13 X 1.25, SS	15	927355	B	EA	2	TIE PLATE, 136# E-CLIP-PAD TYPE
4	2633-9009	-	EA	8	WASHER, 3/4 SPLIT LOCK	16	927367	B	EA	2	PAD FOR E-CLIP RUBBER 136# TIE
5	2633-8210	-	EA	4	WASHER, 3/8 SPLIT LOCK	17	14151	-	EA	1	WIRE BURLAPBAG CLOSING TIES 6"
6	2631851114	-	EA	4	BOLT, 3/8-16 X 1 HEX HEAD, SS	18	R8039-0901	D	EA	2	CAUTION LABEL, TIE DUCT 136#
7	26121	-	EA	8	BOLT, 3/4-10 X 1 1/2 HEX SS	19	R8039-0911	D	EA	1	TAG, ACCESS PARTS FOR TIE DUCT
8	93358	A	EA	2	GASKET, 8 X 8 LIFT-OUT DUCT	20	14150	-	EA	1	BAG, BURLAP 10" X 14" 100Z
9	927267	A	EA	2	COVER PLATE WITH LIFTING LUG	21	12425	-	IN	720	TAP ROLL, 2" WIDE HEAVY
10	2631851116	-	EA	12	BOLT, 3/8-16 X 1 HEX CAP	22	2633-9020	-	EA	16	WASHER, M12 SPLIT LOCK
11	2632-8904	-	EA	12	NUT, 3/8-16 CENTER LOCK	23	927602	A	EA	2	COVER, POINT/TRACK NOZZLE
12	927366	A	EA	4	E-CLIP INSULATOR						



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES		RAILWAY EQUIPMENT CO., 20016	
DECIMALS	ANGULAR	RAILWAY EQUIPMENT CO.	
1/16, 1/32	DIMENSIONS	DELLIWA, MISSISSAUGA (C/O) 972-3200	
1/32, 1/64	FRACTIONS	TITLE: TIE DUCT, 136# QUICK CHANGE	
1/32, 1/64	SCALE DRAWINGS	(ASSEMBLY)	
DRAWN: WS		DWG NO: 9278-4805	REV: A
DATE: 10/23/06		SCALE: 1/8" = 1'-0"	
MATERIAL: SEE B.O.M.		SHEET: 1 OF 1	
TOLERANCE: N/A		DRAWING: B	

Parts List				Parts List							
ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION	ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	927279	A	EA	1	ASSY. TUBE TIE DUCT 8 X 10	13	927368	A	EA	2	PAD FOR E-CUP RUBBER 115# TIE
2	927356	B	EA	2	TIE PLATE 115# E-CUP PAD TYPE	14	927366	A	EA	4	E-CUP INSULATOR
3	927237	A	EA	2	COVER PLATE, TEMP SENSOR	15	927248	A	EA	4	RAIL CLIP, TIE DUCT
4	2831951121	-	EA	16	BOLT, 1/2-13 X 1.25 SS	16	927603	A	EA	2	COVER, OUTSIDE TRACK NOZZLE
5	2833-9009	-	EA	4	WASHER, 3/4 SPLIT LOCK	17	2833-9020	-	EA	16	WASHER, M12 SPLIT LOCK
6	2833-8210	-	EA	4	WASHER, 3/8 SPLIT LOCK	18	927603	A	EA	2	COVER, OUTSIDE TRACK NOZZLE
7	2831651114	-	EA	4	BOLT, 3/8-16 X 1 HEX HEAD, SS	19	14151	-	EA	1	WIRE BURLAPBAG CLOSING TIES 6"
8	28121	-	EA	8	BOLT, 3/4-10 X 1 1/2 HEX SS	20	R8039-0900	D	EA	2	CAUTION LABEL, TIE DUCT 115#
9	93358	A	EA	2	GASKET, LIFTOUT DUCT	21	R8039-0910	D	EA	1	TAG, ACCESS PARTS FOR TIE DUCT
10	927267	A	EA	2	COVER PLATE WITH LIFTING LUG	22	14150	-	EA	1	BAG, BURLAP 10" X 14" 100Z
11	2831651116	-	EA	12	BOLT, 3/8-16 X 1 HEX CAP	23	12425	-	IN	720	TAPE ROLL 2" WIDE HEAVY
12	2832-8904	-	EA	12	NUT, 3/8-16 CENTERLOCK	24	927602	A	EA	2	COVER, POINT/TRACK NOZZLE

REVISION HISTORY				
REV	ECO	DESCRIPTION	DATE	BY
A	06-0024	NEW PART	10/17/2006	WS



RAILWAY EQUIPMENT CO., 2006

**RAILWAY EQUIPMENT CO.**  
DELAWARE, MARYLAND (703) 972-8200

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
DECIMALS ANGULAR  
XX .015 FRACTIONS  
3000 PSI SHEAR STRENGTH  
DRAWN: WS  
DATE: 10/17/06  
WRT: SEE B.O.M.  
N/A  
SCALE: 1/8" = 1" DRAW SHEET: B SHEET: 1 OF 1 REV: A

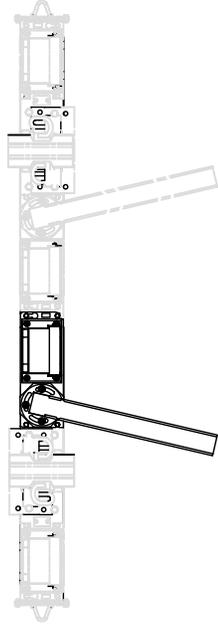
TIE DUCT, 115# QUICK CHANGE (ASSEMBLY)  
DWG NO: 9278-4605  
SCALE: 1/8" = 1" DRAW SHEET: B SHEET: 1 OF 1 REV: A

REV	ECO	DESCRIPTION	DATE	BY
A	06-0024	NEW PART	10/24/2006	WS

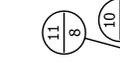
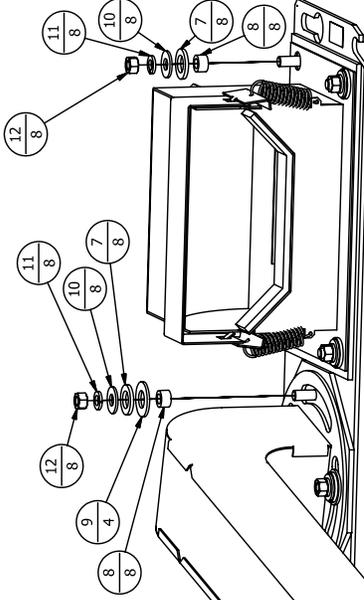
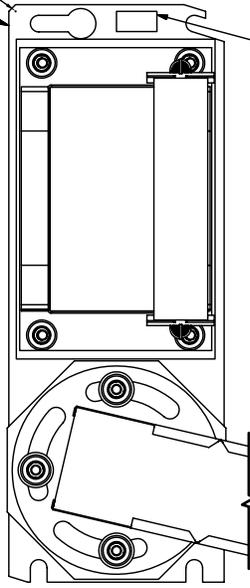
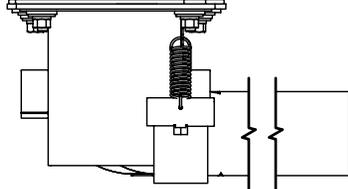
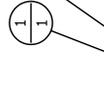
ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	927600	B	EA	1	POINT/ID NOZZLE MOUNT PLATE RH
2	927701	A	EA	1	SCREEN POINT NOZZLE
3	927702	A	EA	1	SCREEN TRACK DUCT NOZZLE LARGE
4	92757	D	EA	1	GASKET, ISO. PT NOZZLE RED
5	92759	B	EA	1	GASKET, ISO. TR NOZZLE RED
6	93617	D	EA	1	POINT NOZZLE, 4 X 4 GALV
7	2632-9015	B	EA	8	WASHER, ISOLATING NOZZLE
8	26106	-	EA	8	SPACER, .38X.62X.375 ROUND
9	2633-9014	-	EA	4	WASHER, 5/8 FLAT SAE
10	2633-8110	-	EA	8	WASHER, 3/8 FLAT
11	2632-8210	-	EA	8	WASHER, 3/8 SPLIT LOCK
12	2632-8101	-	EA	8	NUT, 3/8-16 HEX
14	R9508-4000	A	EA	1	LABEL, QUICK NOZZLE ASSY RH
15	927490	A	EA	1	NOZZLE, TRACK DUCT ASSY

REV	ECO	DESCRIPTION	DATE	BY
A	06-0024	NEW PART	10/24/2006	WS

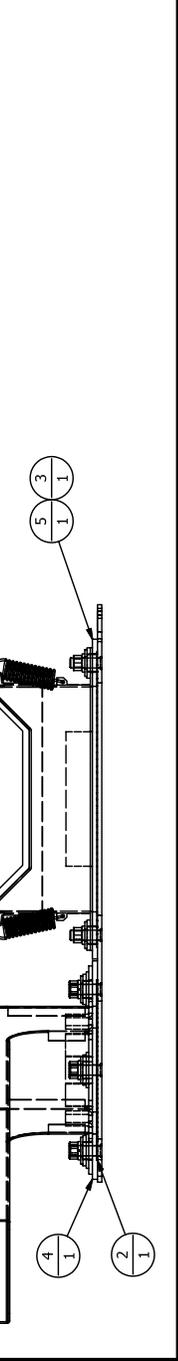
Parts List



CENTER POINT



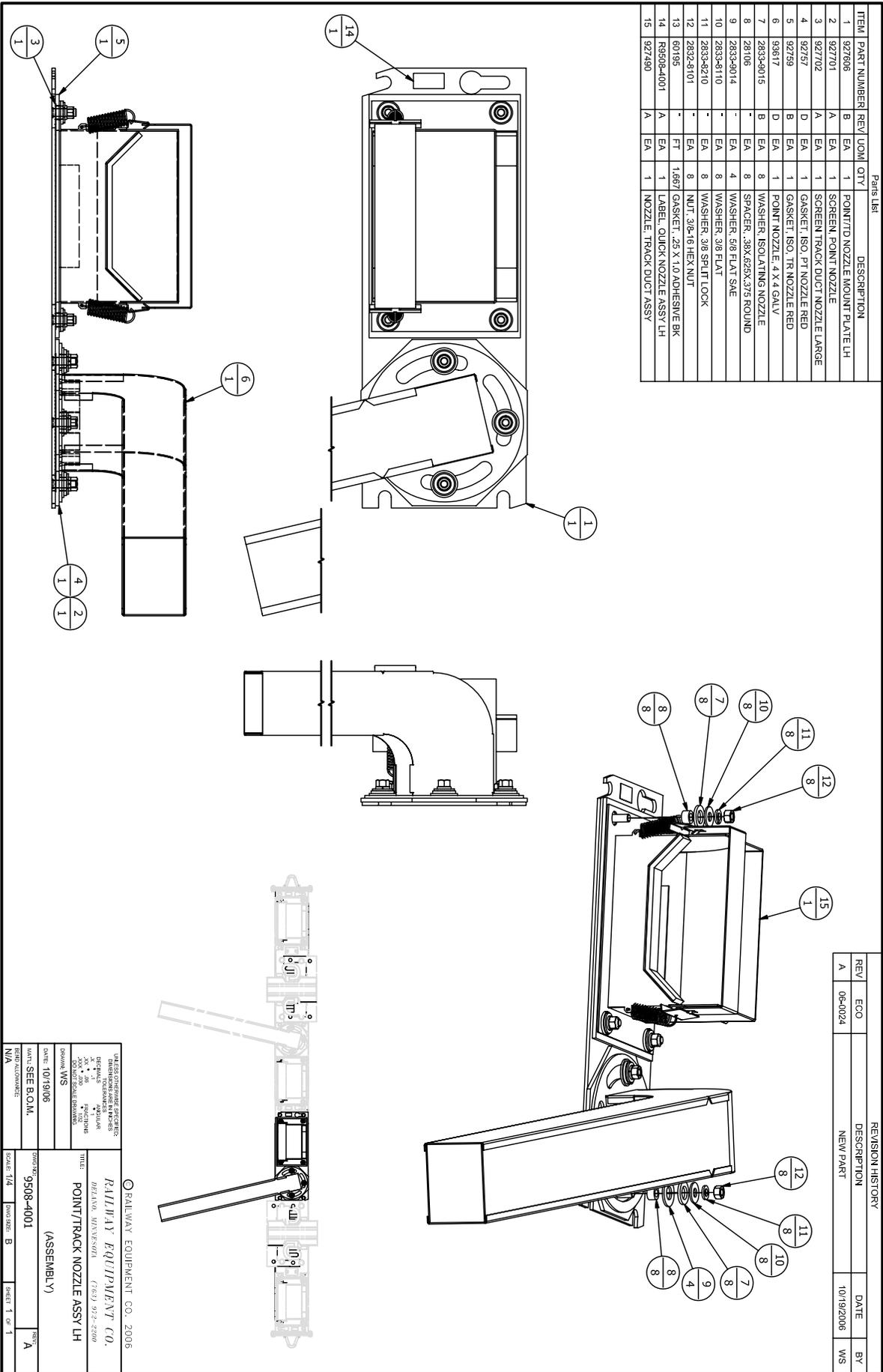
RAILWAY EQUIPMENT CO. - 2006	
RAILWAY EQUIPMENT CO.	RAILWAY EQUIPMENT CO.
DELAWARE, MASSACHUSETTS	DELAWARE, MASSACHUSETTS
TRAFFIC	TRAFFIC
POINT/TRACK NOZZLE ASSY RH	POINT/TRACK NOZZLE ASSY RH
(ASSEMBLY)	(ASSEMBLY)
DATE: 10/24/06	DATE: 10/24/06
BY: WS	BY: WS
NO. 9508-4000	NO. 9508-4000
SCALE: 1/4"	SCALE: 1/4"
SHEET 1 OF 1	SHEET 1 OF 1



ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	927706	B	EA	1	POINT/ID NOZZLE MOUNT PLATE LH
2	927701	A	EA	1	SCREEN, POINT NOZZLE
3	927702	A	EA	1	SCREEN TRACK DUCT NOZZLE LARGE
4	927757	D	EA	1	GASKET, ISO, PT NOZZLE RED
5	92759	B	EA	1	GASKET, ISO, TR NOZZLE RED
6	93817	D	EA	1	POINT NOZZLE, 4 X 4 GALV
7	2833-9015	B	EA	8	WASHER, INSULATING NOZZLE
8	28106	-	EA	8	SPACER, .38X.625X.375 ROUND
9	2833-9014	-	EA	4	WASHER, 5/16 FLAT SAE
10	2833-8110	-	EA	8	WASHER, 3/8 FLAT SAE
11	2833-8210	-	EA	8	WASHER, 3/8 SPLIT LOCK
12	2833-8101	-	EA	8	NUT, 3/8-16 HEX NUT
13	60195	-	FT	1.687	GASKET, .28 X 1.0 ADHESIVE BK
14	R9508-4001	A	EA	1	LABEL, QUICK NOZZLE ASSY LH
15	927490	A	EA	1	NOZZLE, TRACK DUCT ASSY

Parts List

REVISION HISTORY			
REV	ECO	DESCRIPTION	DATE
A	06-0024	NEW PART	10/19/2006
			WS



RAILWAY EQUIPMENT CO. - 2006

RAILWAY EQUIPMENT CO.  
 DELAWARE, DELAWARE  
 (763) 922-2200

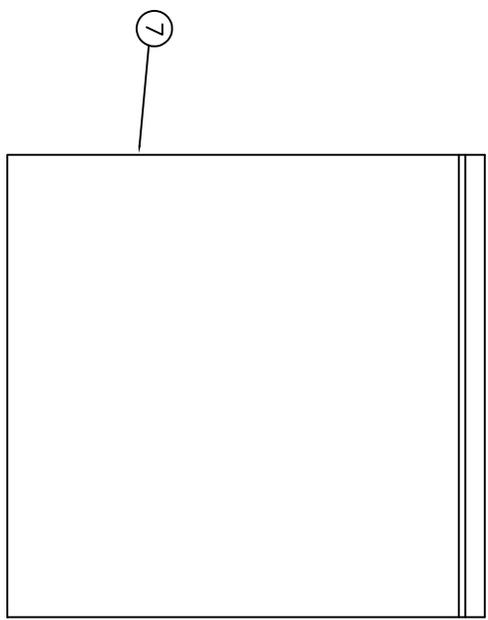
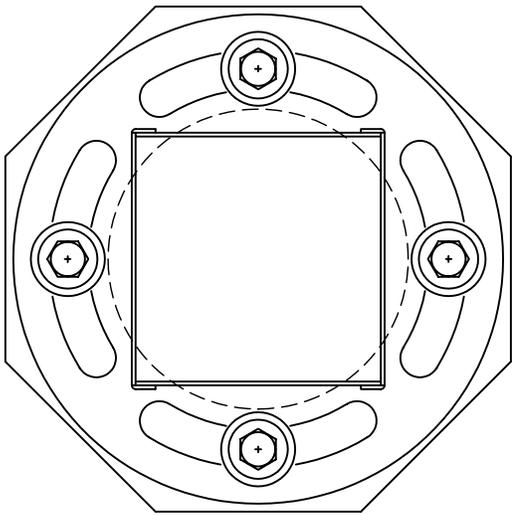
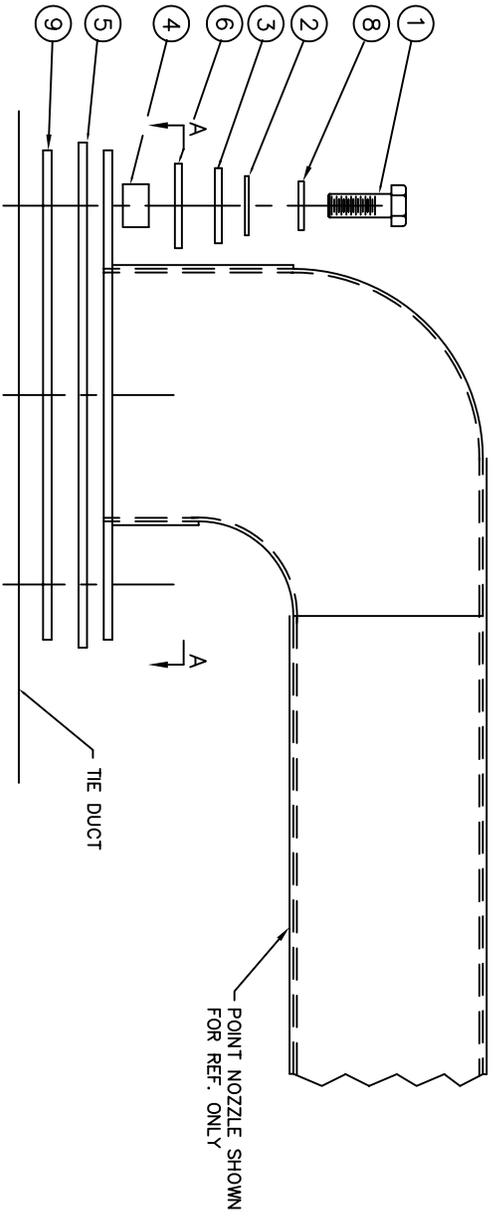
DATE: 10/19/06  
 TIME: 10:00 AM  
 DRAWN: WS  
 CHECKED: WS  
 PART: SEE B.O.M.  
 REV: N/A

9508-4001  
 (ASSEMBLY)

SCALE: 1/4" = 1" SHEET 1 OF 1



ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	2831891114	EA	4	BOLT, HEX HD 3/8-16 x 1" SS
2	2833-8110	EA	4	WASHER, FLAT 3/8"
3	2833-9015B	EA	4	WASHER, INSULATOR
4	28106	EA	4	SPACER, ROUND, .39 X .825 X .375
5	92757D	EA	1	GASKET, POINT NOZZLE
6	2833-9014	EA	4	WASHER, 5/8 FLAT PLATED
7	14046	EA	1	BAG, ZIPTOP 9x12 4mil
8	2833-8210	EA	4	WASHER, SPLIT LOCK 3/8"
9	927701A	EA	1	SCREEN, POINT NOZZLE



REV	EDA	REV	REVISION DESCRIPTION	DATE	APPROVED
B	---	TB	ADD 927701	10/19/00	---
C	06-0028	RJ	CORNERS CUT OFF ON DUCT	11/29/06	---

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**RAILWAY EQUIPMENT CO.**  
 DELANO, MINNESOTA (763) 978-2800

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMALS ARE TO TWO PLACES  
 FRACTIONS ARE TO 1/16"  
 DIMENSIONS IN PARENTHESES  
 ARE FOR SCALE DRAWINGS

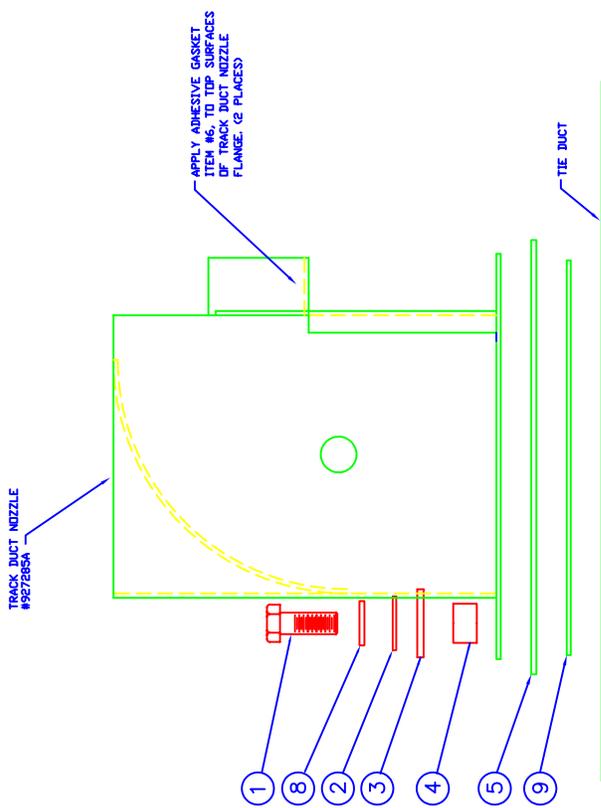
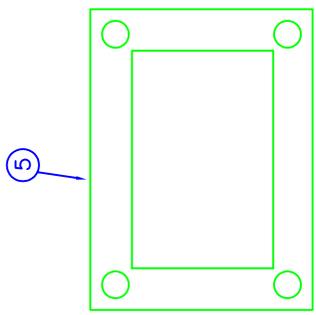
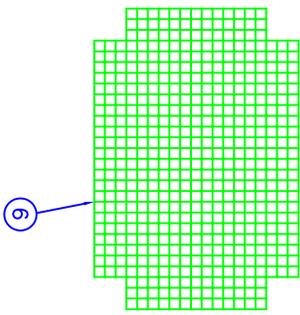
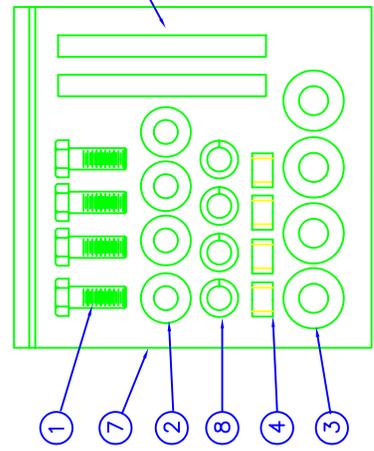
DRAWN: EFK  
 DATE: 04/11/97

TITLE: ISOLATION KIT ASSEMBLY  
 POINT NOZZLE  
 TIE DUCT

INT. NO.: N/A  
 REV. NO.: 9278-0021  
 SCALE: 1/4" DRAWING SIZE: B SHEET: 1 OF 1

Rev: A  
 Date: 08/06  
 By: TB  
 Part: NEW PART  
 Issue: 12/25/00

ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	283186114	EA	4	BOLT, HEX 3/8-16 x 1" SS
2	2833-8110	EA	4	WASHER, FLAIN 3/8"
3	2833-9015	EA	4	WASHER, INSULATOR
4	28106	EA	4	SPACER, ROUND .38 X .625 X .375
5	92759	EA	1	GASKET, TRACK DUCT NOZZLE
6	60195	FT	1.67	GASKET, ADHESIVE .25 X 1"
7	92759	EA	4	WASHER, SPLIT LOCK 3/8"
8	2833-8210	EA	4	WASHER, TRACK DUCT NOZZLE
9	927702	EA	1	SCREEN, TRACK DUCT NOZZLE



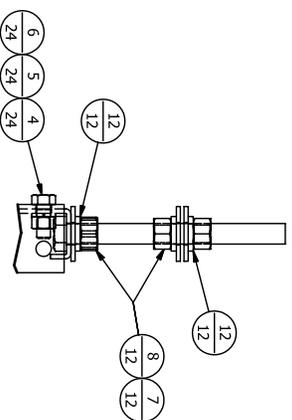
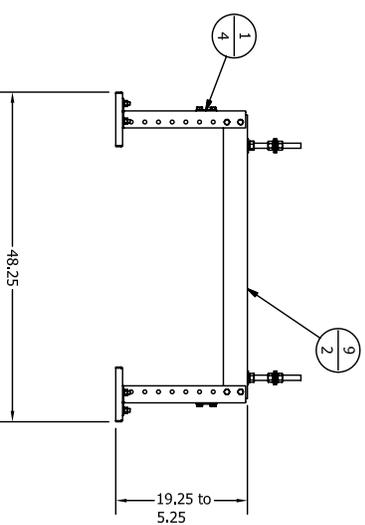
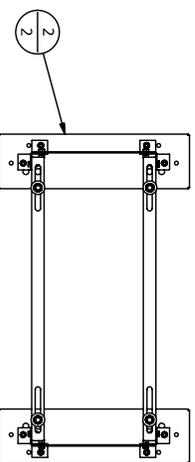
© RAILWAY EQUIPMENT CO. 2000  
 RAILWAY EQUIPMENT CO.  
 12.19.00  
 T. BURL  
 12.19.00  
 ASSY, ISO KIT  
 TRACK NOZZLE  
 TIE DUCT  
 9278-0027  
 Rev. A

ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	92852	A	EA	4	UPRIGHT LEG SHORT FOUNDATION
2	92855	A	EA	2	BASE FOUNDATION
3	92860	A	EA	2	FOUNDATION SUPPORT BRACE SMALL
4	2831951120	-	EA	24	BOLT, 1/2-13 X 1-1/4 HEX
5	2833-9002	-	EA	24	WASHER, 1/2 SPLIT-LOCK
6	2833-9002	-	EA	24	NUT, 1/2-13 HEX
7	2833-9010	-	EA	12	WASHER, 3/4-10 FLAT
8	2832-9102	A	EA	12	NUT, 3/4-10 HEX
9	92857	A	EA	2	TOP 2HP FOUNDATION
10	2831-9511	-	EA	4	BOLT, 3/4-10 X 8 HEX TAP
12	2833-9009	-	EA	12	WASHER, 3/4 SPLIT-LOCK
13	14150	-	EA	1	BAG, BURLAP 10' X 14' 100Z
14	14151	-	EA	2	WIRE BURLAP/BAG CLOSING TIES 6"
15	R9288-0200	A	EA	1	INSTRUCT SHEET 2 HP FOUNDATION
16	14153	-	EA	1	BAG, WOVEN YELLOW 23.5 X 48
17	14046	-	EA	1	BAG, 9 X 12 4MIL ZIPTOP

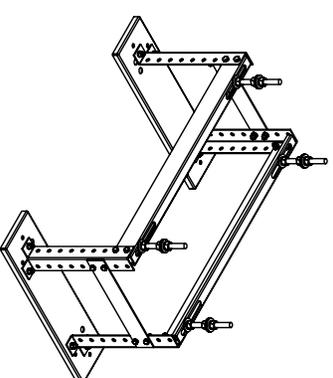
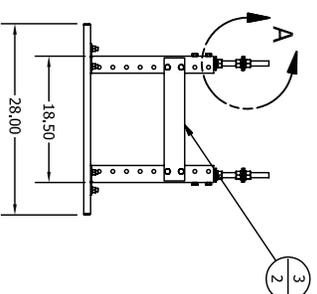
PARTS LIST

REV	ECO	DESCRIPTION	DATE	BY
A	06-0028	NEW PART	10/9/2006	WIS

REVISION HISTORY



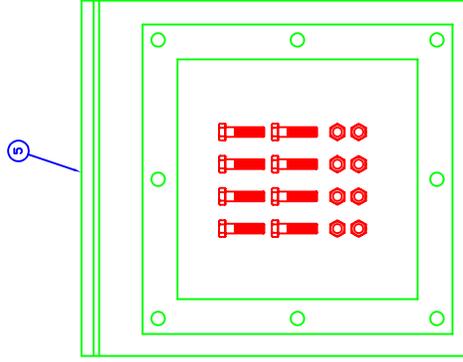
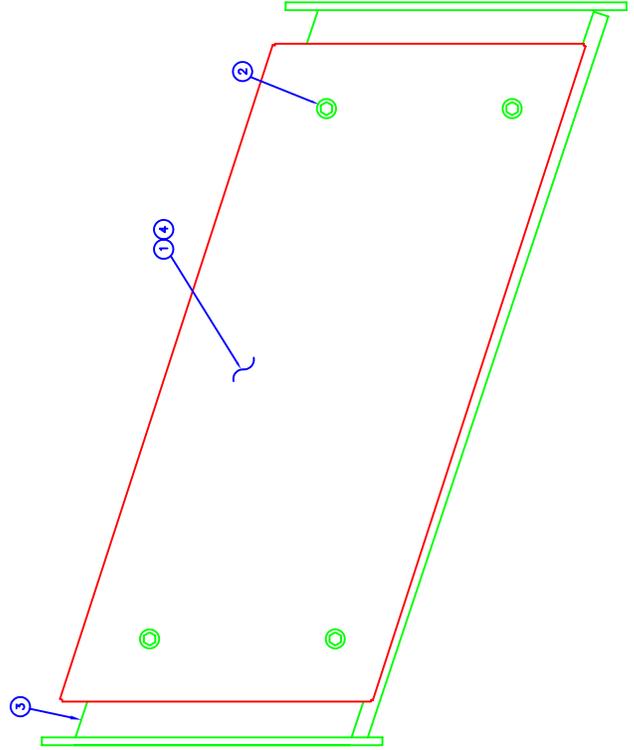
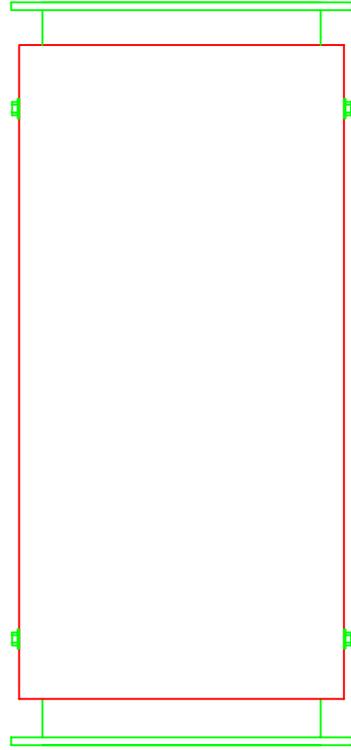
DETAIL A  
SCALE 1/4



RAILWAY EQUIPMENT CO. - 2006  
 RAILWAY EQUIPMENT CO.  
 BELLEVILLE, MISSOURI (636) 922-2200  
 TITLE: FOUNDATION ASSY, 2HP GHAB (ASSEMBLY)  
 DATE: 10/9/06  
 DRAWN: 9288-0202  
 CHECKED: SEE B.O.M.  
 SCALE: 1/16  
 SHEET 1 OF 1

ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	952226	EA	1	INSUL COVER, OFFSET DUCT
2	29019	EA	8	SHOULDER BOLT 1/4-20 X 1.3
3	952224	EA	1	DUCT, OFFSET, WITH HEAVY BASE
4	32002	SQ.FT.	6	INSULATION FIBERGLASS
5	9526-0074	EA	1	GASKET KIT, 6X9 SHP FLEX
6	6093-0102	EA	1	TY-RAP

REV	DATE	BY	DESCRIPTION	APP'D
A	08/07/05	RF	NEW PART	



UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS  
DIMENSIONS IN SQUARE INCHES ARE IN SQUARE MILLIMETERS  
DIMENSIONS IN CIRCLES ARE IN DIAMETERS  
DIMENSIONS IN SQUARE CIRCLES ARE IN SQUARE MILLIMETERS  
DO NOT SCALE DRAWING

DRAWN: RPF  
DATE: 09/07/05  
MATERIAL: N/A  
REV: N/A  
SCALE: 1/4" = 1'-0"  
SHEET: 1 OF 1

© RAILWAY EQUIPMENT CO. 2005  
RAILWAY EQUIPMENT CO.  
DELANO, MINNESOTA (763) 975-5800

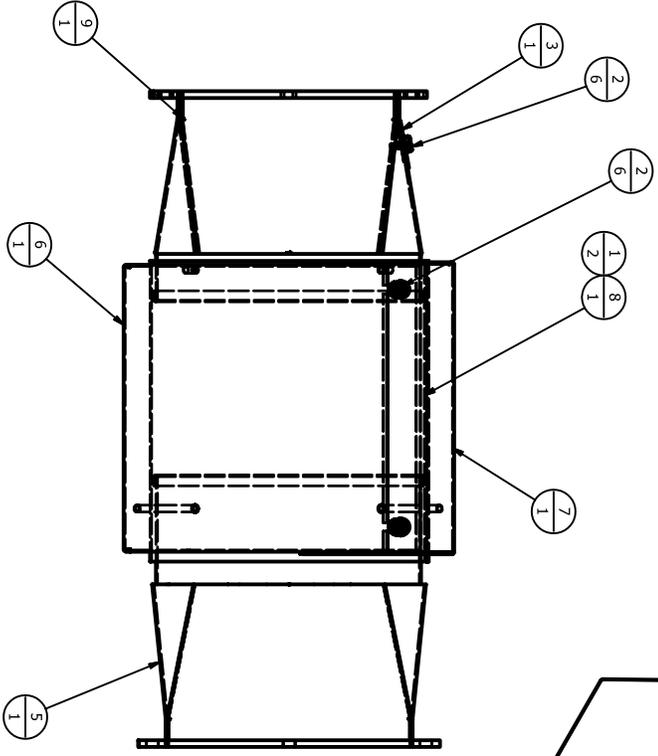
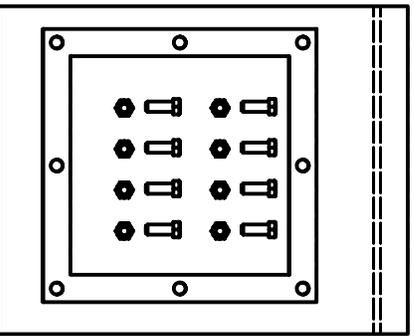
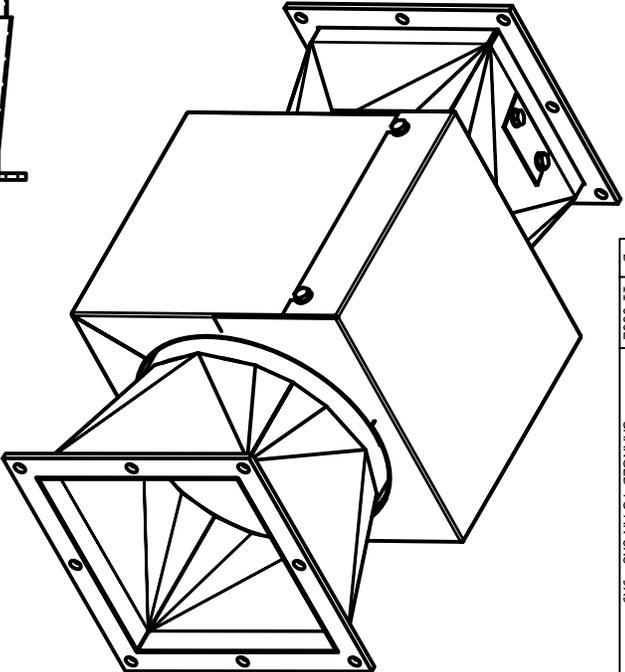
TITLE: OFFSET DUCT, 2' REINFORCED, LIFTOUT ASSEMBLY / B.O.M.  
DWG NO.: 9528-3404  
SCALE: 1/4" = 1'-0"  
SHEET: 1 OF 1

ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	28105	-	EA	2	CLAMP, HOSE SST 1.8 INCH
2	29051	-	EA	6	BOLT, 1/4-20 X 1/2 WITH 1/2 HD
3	927237	A	EA	1	COVER PLATE, TEMP SENSOR
4	9278-0026	B	EA	1	ASSY, 8X8 DUCT, BOLT KIT
5	952366	A	EA	1	FLEX DUCT, INPUT WELDMENT NO MIXER
6	952388	A	EA	1	FLEX WRAP, BOTTOM 2' 2HP HAB R
7	952389	A	EA	1	FLEX WRAP, TOP 2' 2HP HAB RUBB
8	952394	A	EA	1	RUBBER TUBE 10" ID 11" LONG
9	952400	A	EA	1	FLEX DUCT, 8X8 OUTPUT WELDMENT

PARTS LIST

REV	ECO #	DESCRIPTION	DATE	BY
A	08-0003	NEW PART	6/23/10	ES
B	11-0002	CHANGED TO AN 8X8 - 9X9	4/7/11	MF

REVISION HISTORY



RAILWAY EQUIPMENT CO. - 2009

RAILWAY EQUIPMENT CO.  
UNIVERSITY, MINNESOTA (612) 972-2200

DATE: 08/22/2010  
DRAWN: ELS  
CHECKED: SEE BOM

ITEM: FLEX DUCT 2ST INS NO MIXER  
8 X 8 - 9 X 9  
(ASSEMBLY / B.O.M.)

QUANTITY: 9528-4223

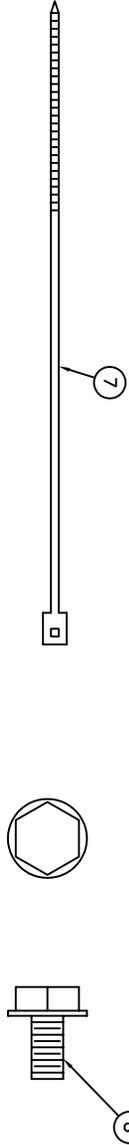
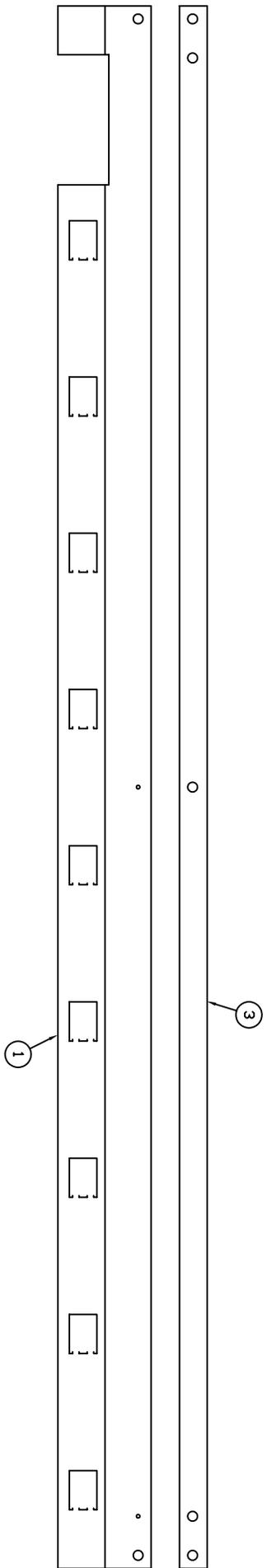
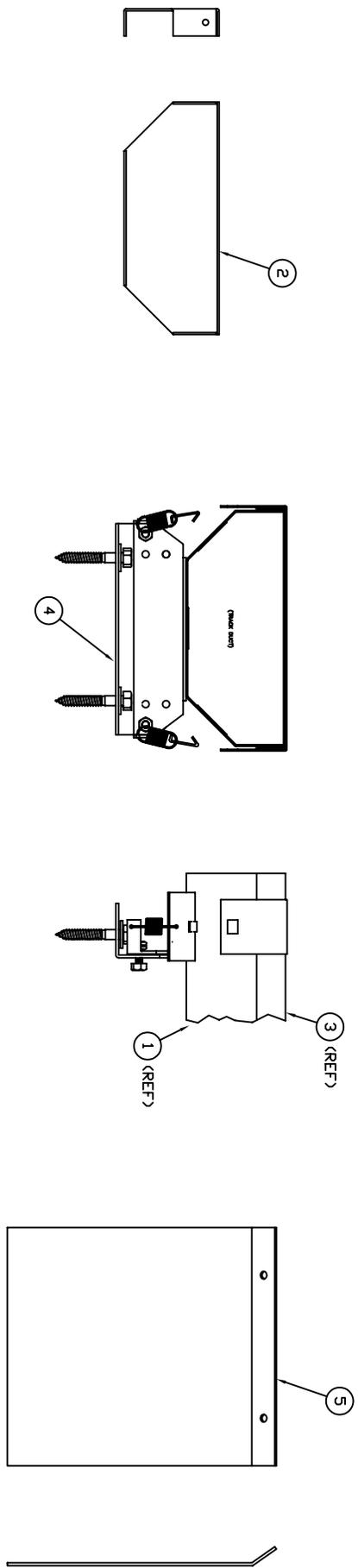
DATE: 7-4

REV: B

SHEET 1 OF 1

ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	92743	EA	1	TRACK DUCT BASE 5'
2	92740	EA	1	END FLANGE TRACK DUCT
3	92740	EA	1	TRACK DUCT COVER BARRACKET
4	92744	EA	1	TRACK DUCT SUPPORT BARRACKET
5	92745	EA	1	DEFLECTOR TRACK DUCT, SMALL
6	25031	EA	9	BOLT 1/4" X 20X 1/2" HEX HEAD
7	5931-0100	EA	1	WASHER 1/4" X 20X 1/2" HEX HEAD

REV	DATE	DESCRIPTION
A	05/24/05	NEW SPURCE SYSTEM
B	10/27/05	NEW SUPPORT ASSEM DESIGN



FULL SCALE

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
DIMENSIONS SHOWN ARE MINIMUMS

RAILWAY EQUIPMENT CO.  
DIZMO, MINNESOTA (763) 978-1800

DATE: 05/24/05  
DRAWN: RPF  
CHECKED: RPF  
SCALE: 1/4"

TITLE: TRACK DUCT  
5' POINT LTD  
ASSEMBLY / B.O.M.

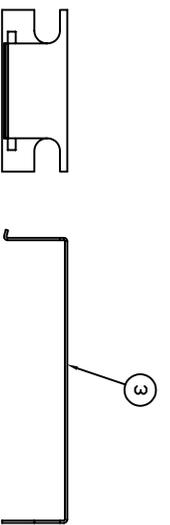
DATE: 05/24/05  
DWG NO.: 9278-0226  
SCALE: 1/4"

REV: B  
SHEET: 1 OF 1

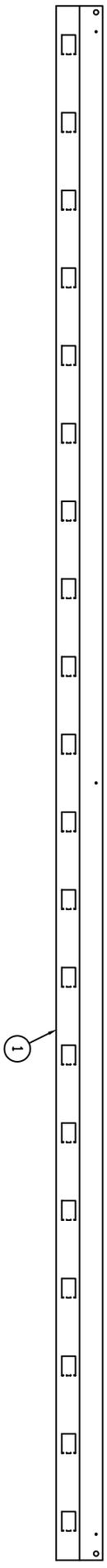
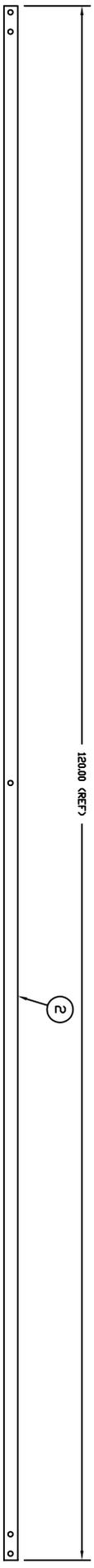
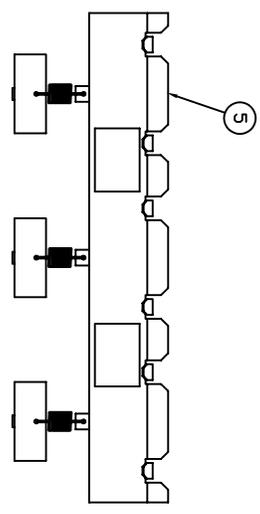
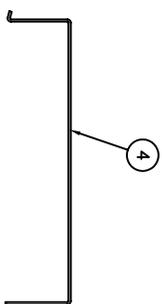
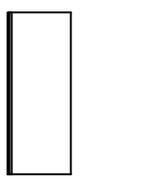
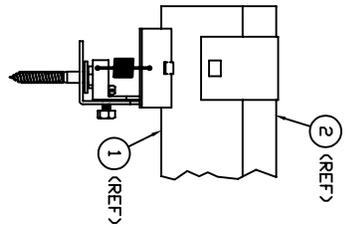
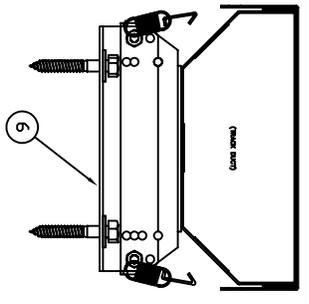
ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	92743	EA	1	TRACK DUCT BASE 5'
2	92740	EA	1	END FLANGE TRACK DUCT
3	92740	EA	1	TRACK DUCT COVER BARRACKET
4	92744	EA	1	TRACK DUCT SUPPORT BARRACKET
5	92745	EA	1	DEFLECTOR TRACK DUCT, SMALL
6	25031	EA	9	BOLT 1/4" X 20X 1/2" HEX HEAD
7	5931-0100	EA	1	WASHER 1/4" X 20X 1/2" HEX HEAD



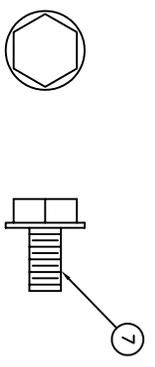
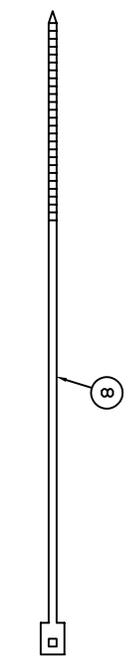
ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	927538	EA	1	TRACK DUCT BASE, 10'
2	92741	EA	1	TRACK DUCT COVER, 10'
3	927441	EA	1	CENTER COVER, E.Z. SPLICE
4	927442	EA	2	END COVER, E.Z. SPLICE
5	927450	EA	1	BASE, E.Z. SPLICE
6	92774	EA	1	TRACK DUCT SUPPORT BRACKET
7	28051	EA	6	BOLT, 1/4"-20X1/2" W/ 7/8" HEX HEAD
8	6093-0100	EA	1	TY-RAP, 4" .10 WIDTH



REV.	DATE	BY	REVISION DESCRIPTION
J	05/26/99	TB	REMOVE 92744, 28090, 28081
K	08/29/02	RF	REPLACE 29016 W/ 29051
L	05/18/05	RF	NEW SPLICE SYSTEM
M	10/27/05	RO	NEW SUPPORT ASSEM. DESIGN



1/8 SCALE



FULL SCALE

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**RAILWAY EQUIPMENT CO.**  
 DEBARKO, KENTON0794 (798) 972-8800

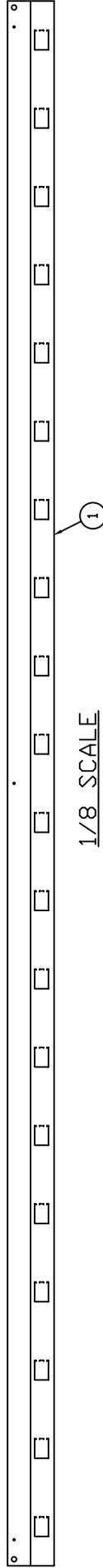
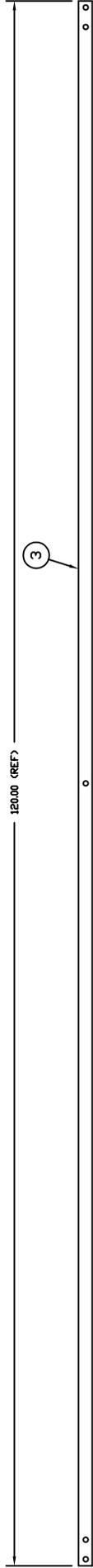
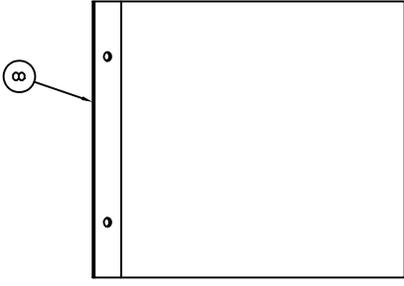
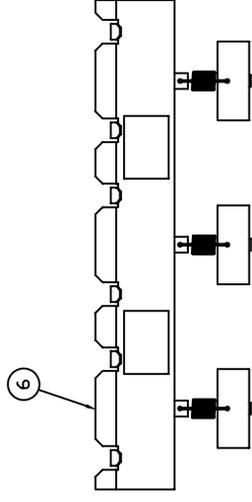
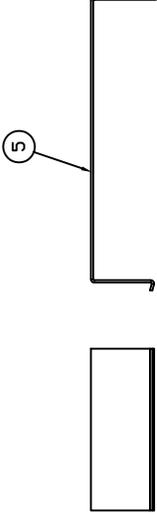
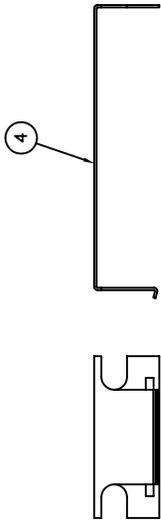
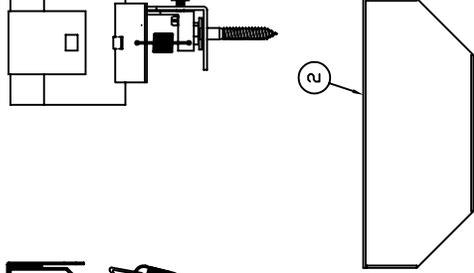
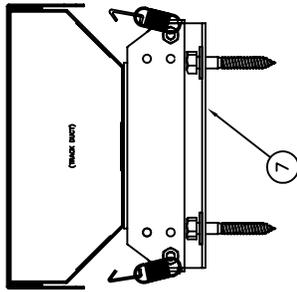
UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMAL DIMENSIONS SHALL BE TO 0.005 UNLESS OTHERWISE SPECIFIED  
 FRACTIONS SHALL BE TO 1/32 UNLESS OTHERWISE SPECIFIED  
 TOLERANCES UNLESS OTHERWISE SPECIFIED:  
 FRACTIONS 1/16 & OVER ± 0.005  
 DECIMALS 0.005 & OVER ± 0.005  
 DECIMALS 0.005 & UNDER ± 0.0025

TITLE: TRACK DUCT  
 TO MID ASSEMBLY / B.O.M.

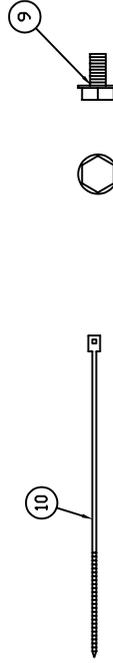
DATE: 02/15/93  
 DRAWN: RPF  
 CHECKED: SEE PRINT  
 APPROVED: SEE PRINT  
 SHEET: 1 OF 1

SCALE: 1/4 DRAWING SIZE B SHEET 1 OF 1

ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	927538	EA	1	TRACK DUCT BASE 10'
2	92740	EA	1	END PLATE, TRACK DUCT
3	92741	EA	1	TRACK DUCT COVER 10'
4	927441	EA	1	CENTER COVER, E.Z. SPLICE
5	927442	EA	2	END COVER, E.Z. SPLICE
6	927450	EA	1	BASE, E.Z. SPLICE
7	92774	EA	1	TRACK DUCT SUPPORT BRACKET
8	92785	EA	1	DEFLECTOR, TRACK DUCT, SMALL
9	29051	EA	9	BOLT, 1/4"-20X1 1/2" HEX HEAD
10	6093-0100	EA	1	TY-RAP, 4" .10 WIDTH



1/8 SCALE

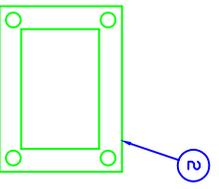
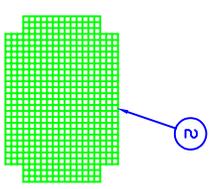
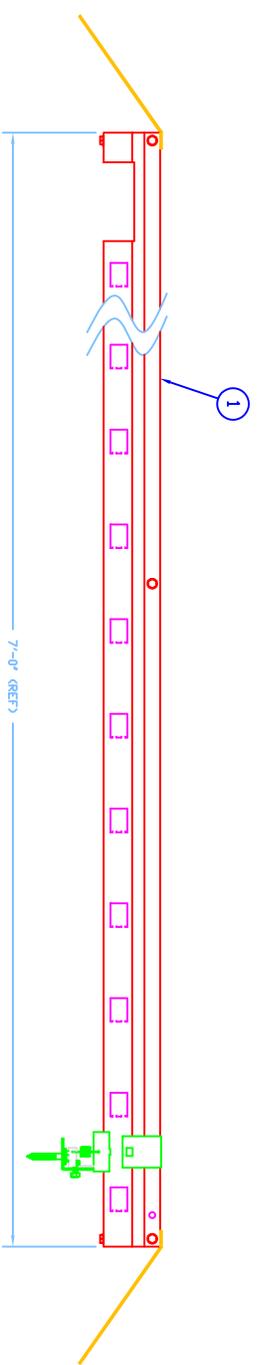
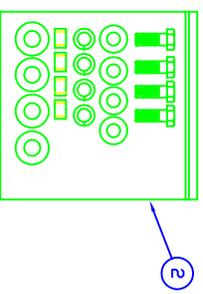
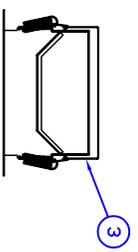


1/2 SCALE

REV.	DATE	BY	REVISION DESCRIPTION
J	05/26/99	TB	UPDATE TRACK DUCT SUPPORT
K	08/29/02	RF	REPLACE 29016 W/29051
L	05/18/05	RF	NEW SPLICE SYSTEM
M	10/27/05	RO	NEW SUPPORT ASSM DESIGN

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES DECIMALS TO THIRDS PLACE FRACTIONS TO 16THS HOLE DIMENSIONS TO 100THS DIMENSIONS TO 10THS DIMENSIONS TO 10THS DIMENSIONS TO 10THS		© RAILWAY EQUIPMENT CO. 1993-2005 <b>RAILWAY EQUIPMENT CO.</b> DRELENO, MINNESOTA (763) 972-8200	
DATE	02/15/93	TITLE	TRACK DUCT 10' HEEL
DRAWN	RPF	DWG NO.	9278-1202
DATE	02/15/93	ASSEMBLY / B.O.M.	
MATERIAL	SEE PRINT	SCALE	1/4" DRIVING SIZE
SEE P. FOR ALLOWANCE	N/A	REV	M
		SHEET	1 OF 1

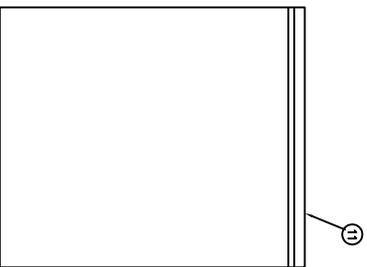
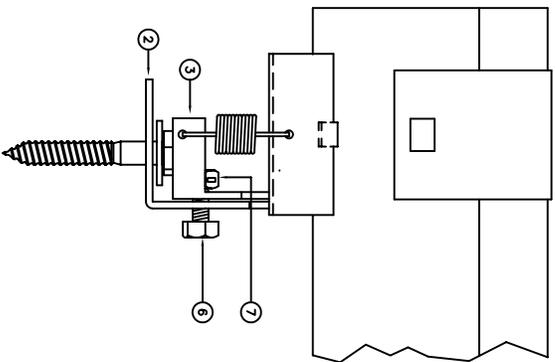
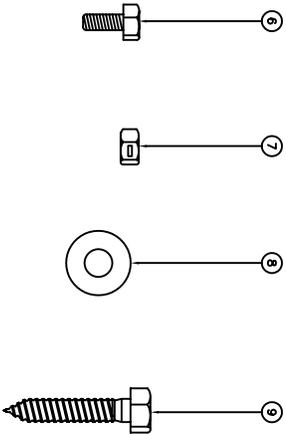
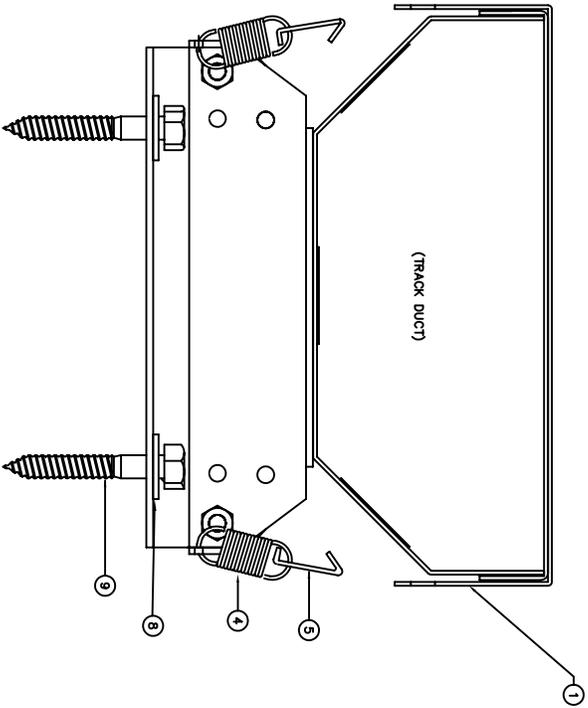
ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	9278-0207	EA	1	TRACK DUCT 7' HEEL
2	9278-0027	EA	1	ISO KIT TR NOZZLE LARGE
3	927480	EA	1	NOZZLE TRACK DUCT
4	41023	EA	1	BOX TRACK DUCT KIT



REV	DATE	DESCRIPTION
A	07/03/02	NEW PART
B	07/29/03	UPDATE NOZZLE
C	05/25/05	NEW SPUCE DESIGN
D	11/10/05	NEW TRACK DUCT NOZZLE
E	02/02/07	NEW TRACK DUCT NOZZLE

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES		RAILWAY EQUIPMENT CO. 2002-2005	
DECIMALS	FRACTIONS	RAILWAY EQUIPMENT CO. DEKANO, MINNESOTA (763) 978-5200	
1/16 & 1/32	1/16 & 1/32	TITLE	
3/16 & 1/8	3/16 & 1/8	TRACK DUCT KIT, 7'	
1/4 & 1/2	1/4 & 1/2	LARGE NOZZLE	
3/4 & 1	3/4 & 1	DRAWN	
BY	DATE	DATE	
RPF	07/03/02	SCALE N/A	
DATE	07/03/02	DRAWING SIZE B	
DATE	07/03/02	SHEET 1 OF 1	
DATE	07/03/02	REV E	
DATE	07/03/02	SCALE N/A	
DATE	07/03/02	DRAWING SIZE B	
DATE	07/03/02	SHEET 1 OF 1	
DATE	07/03/02	REV E	

ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	92745	EA	1	HOLDOWN STRAP, TRACK DUCT
2	92750	EA	1	TRACK DUCT SUPPORT BASE
3	92751	EA	1	TRACK DUCT SPRING BRKT
4	92742	EA	2	SPRING, TRACK DUCT SUPPORT BRKT
5	92743	EA	2	SPRING, TRACK DUCT SUPPORT BRKT
6	283151110	EA	2	1/4-20 X 5/8 HEX BOLT #5 HARD
7	2832-5901	EA	2	1/4-20 CENTERLOCK NUT
8	2833-8110	EA	2	3/8 FLAT WASHER
9	28049	EA	2	LAG BOLT 3/8 X 2.5
10	14042	EA	1	BAG, ZIPLOCK 4 X 6 X .002
11	14045	EA	1	BAG, ZIPLOCK 12 X 15 X .004



REV	DATE	BY	REVISION DESCRIPTION
D	6/21/91	EFK	REDESIGN FOR SPRING MOUNT.
E	9/25/92	EFK	CHG. P/N 927135 REV/B TO 927139 REV/C
F	7/8/94	EFK	CHG. P/N 92742 REV/A TO 92742 REV/B
G	5.26.99	TB	ADD ITEMS 10 THRU 15
H	4.11.01	TB	#92743B WAS 92743A
J	05/18/05	RF	NEW SPLICE SYSTEM
K	10/27/05	RO	SHORTENED 92750-551

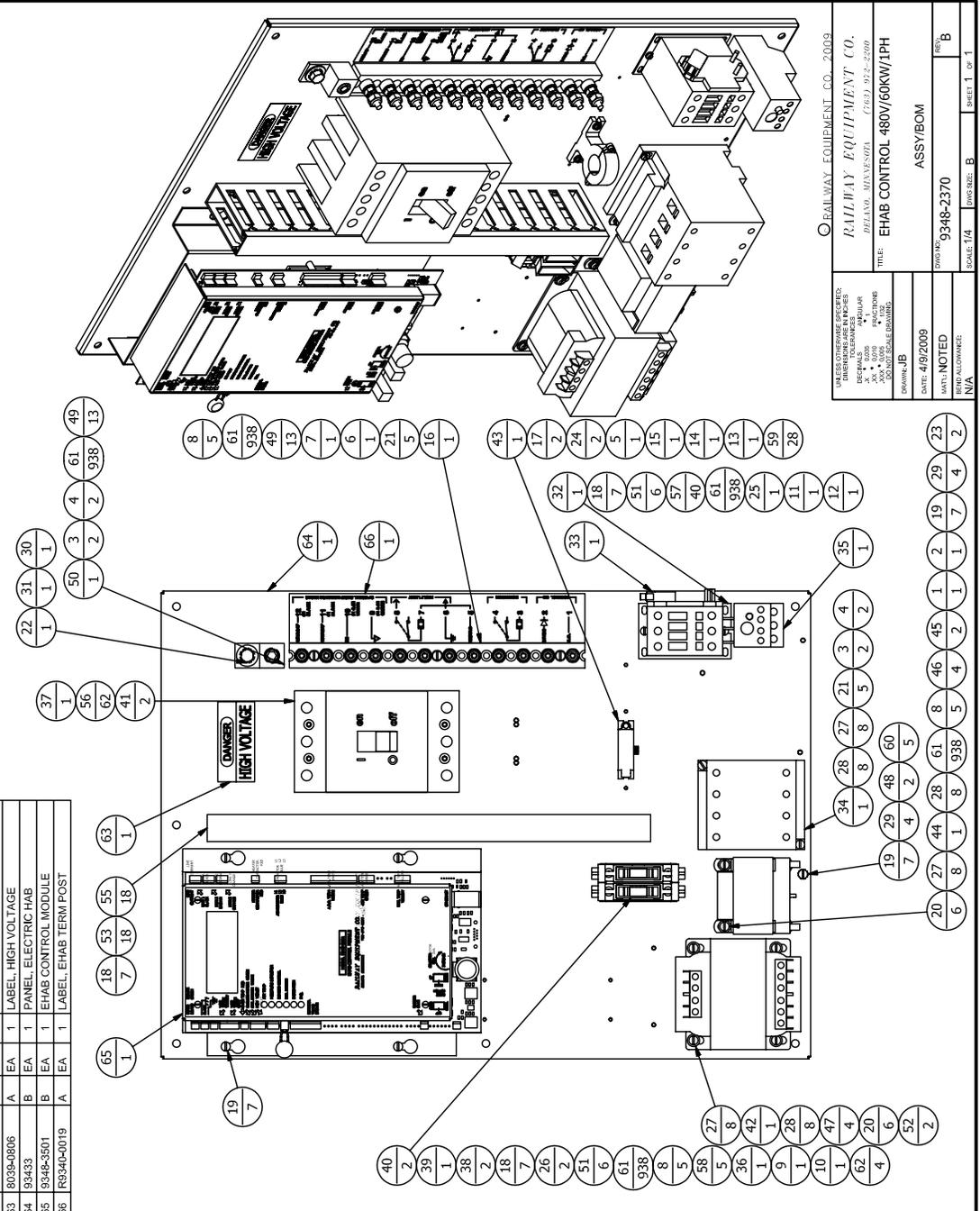
DATE	BY	REVISION DESCRIPTION
6/21/91	EFK	REDESIGN FOR SPRING MOUNT.
9/25/92	EFK	CHG. P/N 927135 REV/B TO 927139 REV/C
7/8/94	EFK	CHG. P/N 92742 REV/A TO 92742 REV/B
5.26.99	TB	ADD ITEMS 10 THRU 15
4.11.01	TB	#92743B WAS 92743A
05/18/05	RF	NEW SPLICE SYSTEM
10/27/05	RO	SHORTENED 92750-551

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**RAILWAY EQUIPMENT CO.**  
 RAILWAY APPURTENANCES (704) 978-8800  
 TRACK DUCT SUPPORT BRKT SUB-ASSEMBLY  
 92774

REV	ECO #	DESCRIPTION	DATE	BY
A	09-0009	NEW PART	4/9/2009	JB
B	10-0027	CHANGED LUG POSITION	11/4/10	MF

ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
60	681807	-	IN	5	WIRE, 18GA THINWALL BLACK, 600V
61	681812	-	IN	938	WIRE, 18GA THINWALL BLACK, 600V
62	681814	-	IN	4	TUBING, 20GA, TEFLON
63	8039-0806	A	EA	1	LABEL, HIGH VOLTAGE
64	93433	B	EA	1	PANEL, ELECTRIC HAB
65	9348-3501	B	EA	1	EHAB CONTROL MODULE
66	R9340-0019	A	EA	1	LABEL, EHAB TERM POST

ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	21018	-	EA	1	CONNECTOR, HOUSING, 8 POS
2	21019	-	EA	1	STRAIN RELIEF, 8 POS
3	21020	-	EA	2	CONNECTOR, HOUSING, 2 POS
4	21021	-	EA	2	STRAIN RELIEF, 2 POS
5	21023	-	EA	1	STRAIN RELIEF, 3 POS
6	21023	-	EA	1	CONNECTOR, HOUSING, 14 POS
7	21204	-	EA	1	STRAIN RELIEF, 14 POS
8	21205	-	EA	5	PLUG, KEVING
9	21207	-	EA	1	STRAIN RELIEF 5 POS
10	21209	-	EA	1	CONNECTOR, HOUSING, 5 POS
11	21221	-	EA	1	CONNECTOR, HOUSING, 4 POS
12	21222	-	EA	1	STRAIN RELIEF, 4 POS
13	21230	-	EA	1	CONNECTOR, HOUSING, 4 POS
14	21231	-	EA	1	STRAIN RELIEF, 4 POS
15	21232	-	EA	1	CONNECTOR, HOUSING, 3 POS 22GA
16	28029	-	EA	1	TERMINAL ASSY, 1 X 12 POS
17	2831211108	-	EA	2	SCREW, #6-32 X 1/2 PAN SLT
18	2831311106	-	EA	7	SCREW, #6-32 X 3/8 PAN SLT
19	2831411106	-	EA	7	SCREW, #10-32 X 3/8 PAN SLT
20	2831411108	-	EA	6	SCREW, #10-32 X 1/2 PAN SLT
21	2831411110	-	EA	5	SCREW, #10-32 X 5/8 PAN SLT
22	2831651112	-	EA	1	BOLT, 5/16-18 X 3/4 HEX HEAD
23	2832-4001	-	EA	2	NUT, #10-32 KEPS
24	2833-2110	-	EA	2	WASHER, #6 FLAT SAE
25	2833-3110	-	EA	1	WASHER, #6 FLAT SAE
26	2833-3200	-	EA	2	WASHER, #8 SPLIT LOCK
27	2833-4110	-	EA	8	WASHER, #10 FLAT SAE
28	2833-4210	-	EA	8	WASHER, #10 SPLIT LOCK
29	2833-4310	-	EA	4	WASHER, #10 EXT. STAR
31	2833-6110	-	EA	1	WASHER, 5/16 FLAT SAE
32	45124	-	EA	1	CONTACTOR, 3POLE, 115V COIL
33	45136	-	EA	1	AUXILIARY CONTACT NO/NC
34	45175	-	EA	1	CONTACTOR, 4 POLE 80AMP 120VAC
35	45182	-	EA	1	OVERLOAD RELAY, 4 + 6.3 AMPS
36	48803	-	EA	1	MOV, 600VAC 6500A
37	51041	-	EA	1	CR BRKR, 150A 600V 2 POLE
38	511-146011	-	EA	2	FUSE, 500V 1AMP SLO-BLO
39	5122-0400	-	EA	1	FUSEBLOCK, 600V 30A 2 POLE
40	5122-0401	-	EA	2	FUSEBLOCK COVER
41	51256	-	EA	2	CR BRKR LUG KIT 150A 2P S4
42	56058	-	EA	1	TRANS, 575 MAX P-115S 300VA
43	56061	-	EA	1	CURRENT SENSOR CYHCS-C2S
44	56063	-	EA	1	TRANSFORMER, 115220V PRIMARY
45	60122	-	IN	2	HEATSHRINK, TUBING 1/8 BLACK
46	60223	-	IN	4	HEATSHRINK, TUBING 3/16 BLACK
47	6031-0107	-	EA	4	LUG, FORK #8 22-18GA NYLON
48	6032-0109	-	EA	2	LUG, RING #10 22-18GA NYLON
49	6032-0110	-	EA	13	LUG, RING 1/4 22-18GA NYLON
50	6032-0201	-	EA	1	LUG, BOX SLOTTED SCREW
51	6034-0102	-	EA	6	LUG, PUSH-ON F, 250 22-18GA
52	6037-0301	-	EA	2	LUG, FORK #8 16-14GA VINYL
53	6093-0008	-	IN	18	WIRE DUCT, 1IN W, 3IN H
54	6093-0100	-	EA	32	TY-BAP, 4IN 0.10 WIDTH
55	6093-0302	-	EA	18	WIRE DUCT, COVER 1 IN
56	680601	-	IN	62	WIRE, 6GA BLACK 600V 105C
57	681001	-	IN	40	WIRE, 10GA BLACK 600V 105C
58	681401	-	FT	5	WIRE, 14GA BLACK 600V 105C
59	681602	-	IN	28	CABLE, 22GA 3 COND SHIELDED



ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
65	R9340-0019	A	EA	1	LABEL, EHAB TERM POST
66	93433	B	EA	1	PANEL, ELECTRIC HAB
67	9348-3501	B	EA	1	EHAB CONTROL MODULE
68	8039-0806	A	EA	1	LABEL, HIGH VOLTAGE
69	681814	-	IN	4	TUBING, 20GA, TEFLON
70	681812	-	IN	938	WIRE, 18GA THINWALL BLACK, 600V
71	681807	-	IN	5	WIRE, 18GA THINWALL BLACK, 600V

RAILWAY EQUIPMENT CO. 2009  
 RAILWAY EQUIPMENT CO.  
 2211 SW. MANASSAS BLVD. / GPO. 922-2200  
 TITLE: EHAB CONTROL 480V/60KW/1PH  
 DRAWN: JB  
 DATE: 4/9/2009  
 REV: NOTED  
 BY: N/A  
 SCALE: 1/4  
 DIMS: B  
 SHEET 1 OF 1

ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	21018	-	EA	1	CONNECTOR HOUSING 8 POS
2	21020	-	EA	2	CONNECTOR HOUSING 8 POS
3	21021	-	EA	2	CONNECTOR HOUSING 2 POS
4	21023	-	EA	2	STRAIN RELIEF 2 POS
5	21023	-	EA	1	STRAIN RELIEF 3 POS
6	21203	-	EA	1	CONNECTOR HOUSING 14 POS
7	21204	-	EA	1	STRAIN RELIEF 14 POS
8	21205	-	EA	5	PLUG W/KNING
9	21207	-	EA	1	STRAIN RELIEF 5 POS
10	21209	-	EA	1	CONNECTOR HOUSING 5 POS
11	21221	-	EA	3	CONNECTOR HOUSING 4 POS
12	21222	-	EA	3	STRAIN RELIEF 4 POS
13	21230	-	EA	1	CONNECTOR HOUSING 4 POS
14	21231	-	EA	1	STRAIN RELIEF 4 POS
15	21232	-	EA	1	CONNECTOR HOUSING 3 POS 22GA
16	28029	-	EA	1	TERMINAL ASSY 1 X 12 POS
17	28090	-	EA	1	CAP TERMINAL POST INSULATING
18	28091	-	EA	1	SHIELD TERMINAL POST INSULATE
19	2831211108	-	EA	6	SCREW #6-32 X 1/2 PAN SLT
20	2831311106	-	EA	7	SCREW #6-32 X 3/8 PAN SLT
21	2831411106	-	EA	7	SCREW #10-32 X 1/2 PAN SLT
22	2831411108	-	EA	6	SCREW #10-32 X 3/8 PAN SLT
23	2831411110	-	EA	5	SCREW #10-32 X 5/8 PAN SLT
24	2831651112	-	EA	1	BOLT 5/16-18 X 3/4 HEX HEAD
25	2832-4301	-	EA	2	NUT #0.32 KEPS
26	2833-2110	-	EA	6	WASHER #6 FLAT SAE
27	2833-3110	-	EA	1	WASHER #8 FLAT SAE
28	2833-3200	-	EA	2	WASHER #8 SPLIT LOCK
29	2833-4110	-	EA	8	WASHER #10 FLAT SAE
30	2833-4210	-	EA	1	WASHER #10 SPLIT LOCK
31	2833-4310	-	EA	4	WASHER #10 EXT STAR
32	2833-4310	-	EA	1	WASHER 5/16 FLAT SAE
33	2833-4310	-	EA	1	WASHER 5/16 EXT STAR
34	45124	-	EA	1	CONTRACTOR 3POLE 115V COIL
35	45136	-	EA	1	AUXILIARY CONTACT NOINC
36	45175	-	EA	1	CONTRACTOR 4 POLE 80AMP 120VAC
37	45182	-	EA	1	OVERLOAD RELAY 4-4.3 AMPS
38	48803	-	EA	1	MOV 600VAC 650VA
39	51096	-	EA	1	QIR BRKR 100A 600V 3POLE
40	51142061	-	EA	2	FUSE 800V 1AMP SLO-BLO
41	5122-4000	-	EA	1	FUSEBLOCK 600V 30A 2 POLE
42	5122-4001	-	EA	2	FUSEBLOCK COVER
43	56056	-	EA	1	TRANS 575 MAX P-155 300VA
44	56061	-	EA	3	CURRENT SENSOR CYHCS-225
45	56063	-	EA	1	TRANSFORMER 115/230V PRIMARY
46	60182	-	IN	2	HEAT SHRINK TUBING 1/8 BLACK
47	60223	-	IN	4	HEAT SHRINK TUBING 3/16 BLACK
48	6031-1107	-	EA	4	LUG FORK #8-22-18GA NYLON
49	6032-1109	-	EA	2	LUG RING #10 22-18GA NYLON
50	6032-1110	-	EA	13	LUG RING #14 22-18GA NYLON
51	6032-2021	-	EA	1	LUG BOX SLOTTED SCREW
52	6034-1012	-	EA	6	LUG PUSH-ON F 259 22-18GA
53	6037-3001	-	EA	2	LUG FORK #8-16-14GA VINYL
54	6092-0008	-	IN	16	WIRE DUCT 1IN W/3IN H
55	6093-0100	-	EA	32	TY-RAV 4IN 0.10 WIDTH
56	6093-0302	-	IN	16	WIRE DUCT COVER 1IN
57	680601	-	IN	62	WIRE 6GA BLACK 600V 105C
58	681001	-	IN	40	WIRE 10GA BLACK 600V 105C
59	681401	-	FT	5	WIRE 14GA BLACK 600V 105C

Parts List

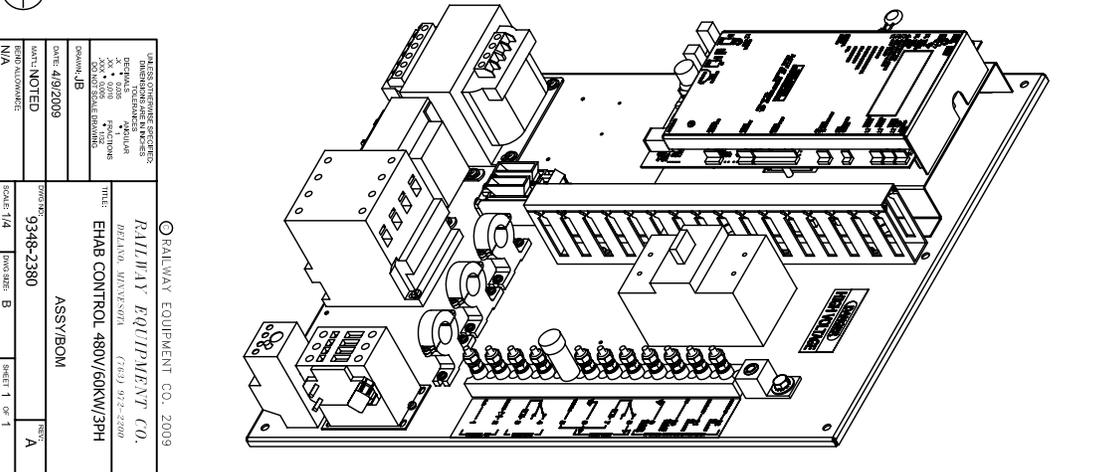
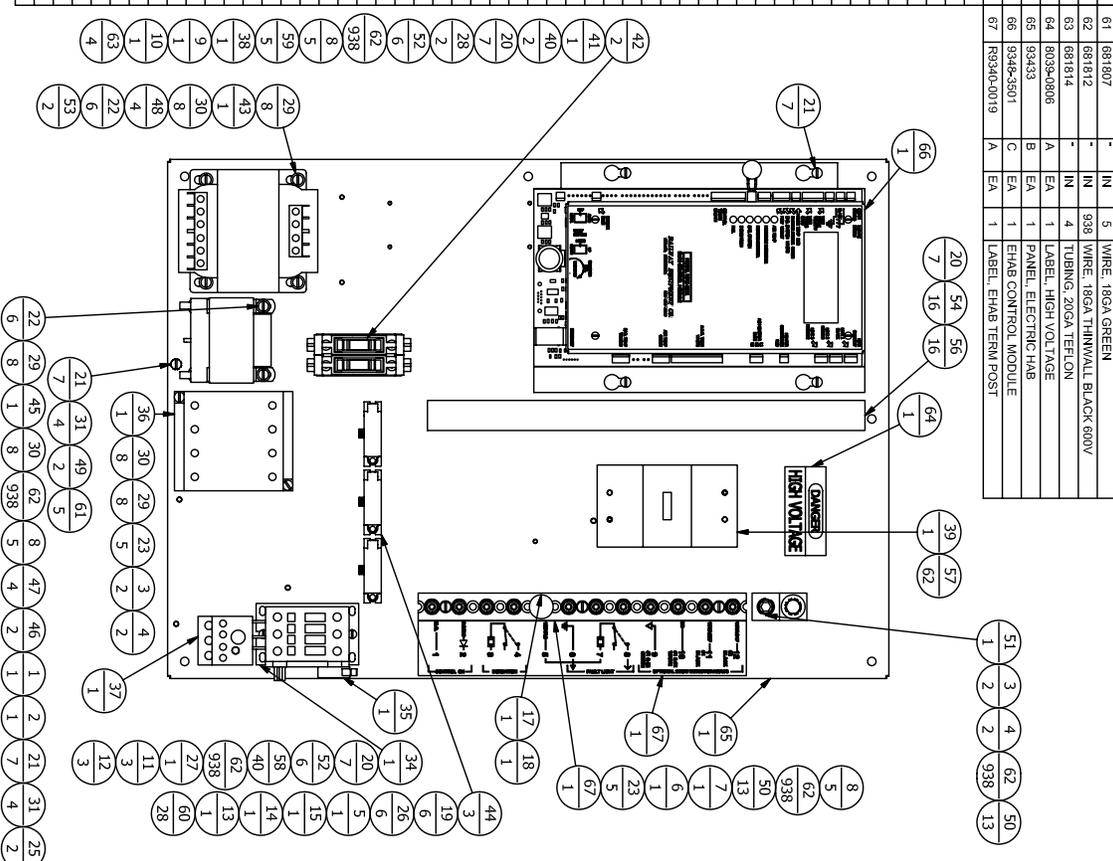
Parts List

ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
60	681602	-	IN	28	CABLE 22GA 3 CONN SHIELDED UL/CSA
61	681807	-	IN	5	WIRE 18GA GREEN
62	681812	-	IN	5	WIRE 18GA THINWALL BLACK 600V
63	681814	-	IN	4	TUBING 20GA TEF-LON
64	6039-0806	A	EA	1	LABEL HIGH VOLTAGE
65	93433	B	EA	1	PANEL ELECTRICAL HAB
66	9348-3501	C	EA	1	EHAB CONTROL MODULE
67	RS940019	A	EA	1	LABEL EHAB TERM POST

REV	ECO #	DESCRIPTION	DATE	BY
A		NEW DRAWING	05/19/11	GLJ

REVISION HISTORY

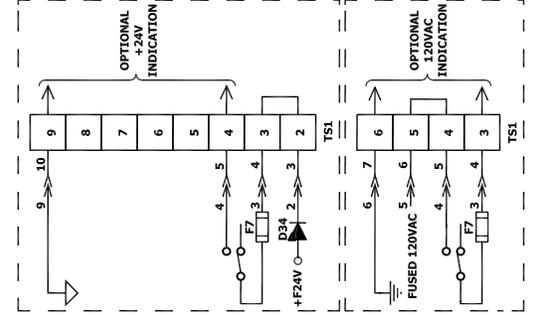
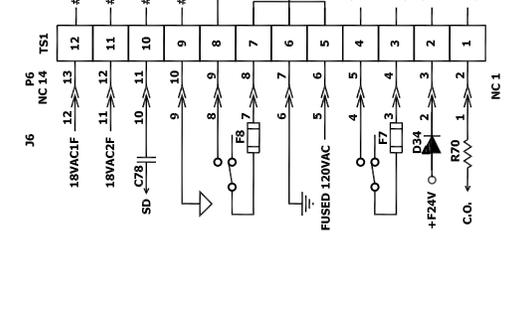
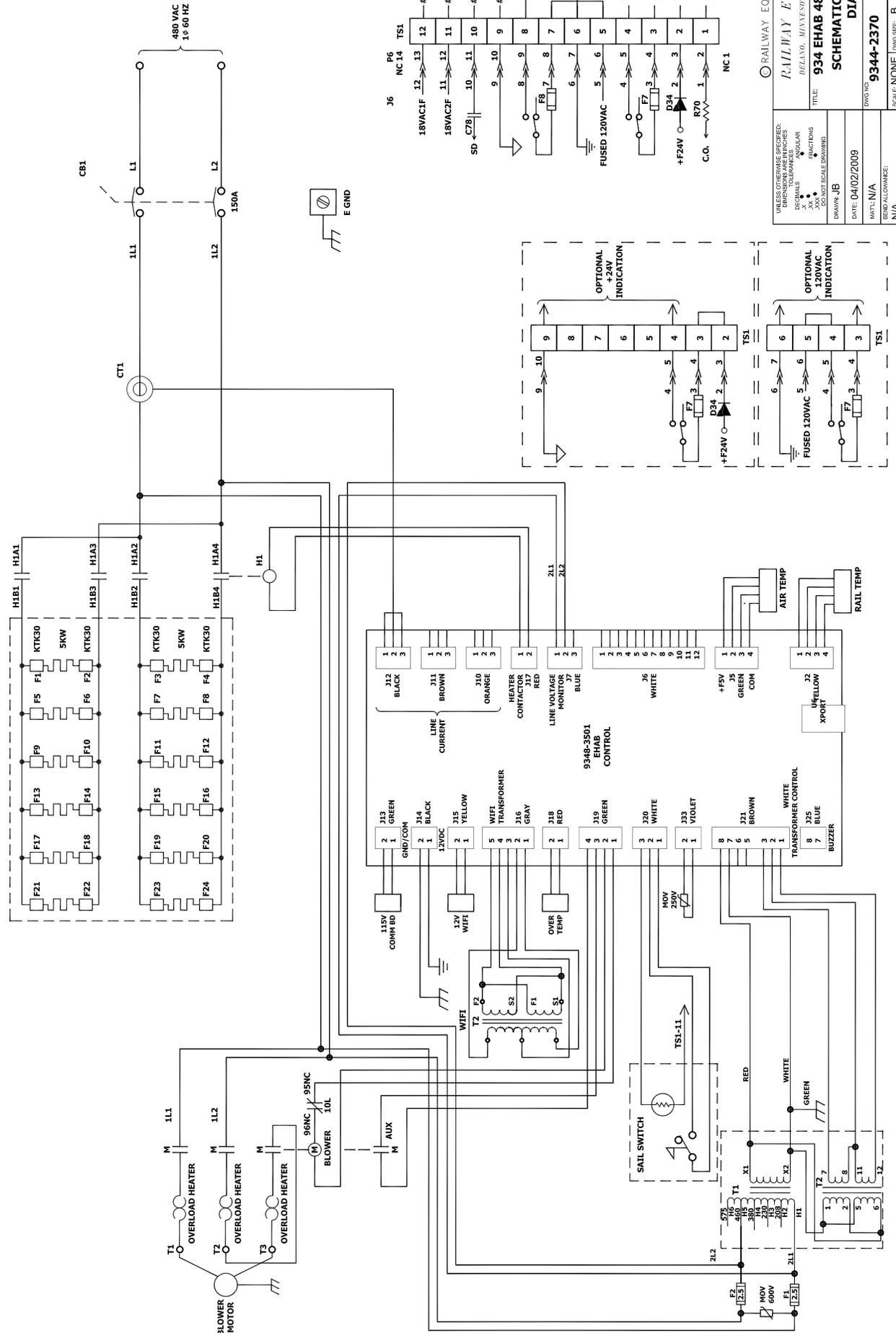
ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
42				2	
41				1	
40				1	
39				1	
38				1	
37				1	
36				1	
35				1	
34				1	
33				1	
32				1	
31				1	
30				1	
29				1	
28				1	
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16				1	
15				1	
14				1	
13				1	
12				1	
11				1	
10				1	
9				1	
8				1	
7				1	
6				1	
5				1	
4				1	
3				1	
2				1	



RAILWAY EQUIPMENT CO. 2009  
 RAILWAY EQUIPMENT CO.  
 DETROIT, MICHIGAN  
 (313) 922-2200  
 DATE: 05/19/2009  
 TIME: 09:00  
 DRAWN: JB  
 CHECKED: JB  
 TITLE: EHAB CONTROL 480V/60KW/3PH ASSY/BOM  
 COMPANY: 9348-2380  
 SCALE: 1/4  
 SHEET: 1 OF 1

REV	ECO #	DESCRIPTION	DATE	BY
A	09-0009	NEW PART	04/02/09	JB

REV	ECO #	DESCRIPTION	DATE	BY
A	09-0009	NEW PART	04/02/09	JB



UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMALS ARE IN THOUSANDS  
 FRACTIONS ARE IN SIXTEENTHS  
 DO NOT SCALE DRAWING

RAILWAY EQUIPMENT CO. 2009  
**RAILWAY EQUIPMENT CO.**  
 DELAWARE, MINNESOTA (763) 972-2200

TITLE: **934 EHAB 480VAC 1ϕ 60KW**  
**SCHEMATIC/CONNECTION**  
**DIAGRAM**

DATE: 04/02/2009  
 DRAWN: JB  
 PART: N/A  
 REV: A

SCALE: NONE  
 SHEET: 1 OF 1





**XI.****LIMITED WARRANTY**

Railway Equipment Co., Inc. ("Railway") warrants all of its products to be free from defects in material and workmanship when used under specified operating conditions and within specified limits. Railway's warranty shall extend for a period of two (2) years from the date of shipment to the original purchaser.

This warranty is expressly in lieu of and excludes all other expressed or implied warranties, including but not limited to warranties of merchantability and fitness for a particular purpose.

Railway, its agents, or representatives shall in no circumstance be liable for any direct, indirect, special, penal, or consequential loss or damage of any nature resulting from the malfunction of the product.

Remedies under this warranty are expressly limited to repair or replacement of the product at the sole discretion of Railway.

Before returning any defective product to Railway, contact the factory at the address or telephone number at the bottom of this article for a Return Merchandise Authorization number and instructions as to how and where the return is to be shipped. Materials received without this authorization will be returned at the customer's expense.

Products returned to Railway under warranty must be shipped freight prepaid, and return freight charges for repaired or replaced products, in or out of warranty, will be at customer's expense.

Railway reserves the right to reject any warranty claim on a product that has been altered by the user or damaged in shipping due to inadequate packaging or mishandling by freight carrier.

By returning a product to Railway the owner grants permission to Railway to open and disassemble the product as required for evaluation. Railway has the sole responsibility for determining the cause and nature of failure, and Railway's determination with regard thereto shall be final. Railway reserves the right to repair or replace any unit at its sole discretion.

A returned product that is found, upon inspection by Railway, to be operational within specification is subject to an inspection and testing fee, regardless of its warranty period.

Railway's liability on any claim of any kind (including negligence) for any loss or damage arising out of or resulting from this agreement, or from the performance of breach thereof, of from the products or services furnished hereunder, shall in no case exceed the price of the specific product or service which gives rise to the claim. All such liability shall terminate upon the expiration of the warranty period of two (2) years, as hereinabove stated.

The furnishing of advice or other assistance without separate compensation therefore will not subject Railway to any liability, either in contract, warranty, tort (including negligence) or otherwise.

Any alteration or modification of the product, or addition on non-Railway components to the product, unless expressly permitted by Railway in its documentation, will void warranty coverage.

This warranty is non-transferable, and warranty coverage is limited to initial user only.

Installation and/or use of the product shall demonstrate acceptance of the terms of this warranty.

Each of the foregoing paragraphs in this article will apply to the full extent permitted by law. The invalidity, in whole or part, of any paragraph will not affect the remainder of such paragraph or any other paragraph.

**RAILWAY EQUIPMENT CO.**  
P.O. Box 68 – Delano, Minnesota 55328 USA  
Tel. (763) 972-2200 Fax (763) 972-2900  
E-Mail - mail@rwy.com

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