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CONTROLLER INSTALLATION MANUAL

HMC-1000 HYDRAULIC CONTROLLER

Compliant with ASME A17.1 - 2000 / CSA B44-00 and later codes

This manual is for HMC-1000 Controllers with Release 4 software

Part # 42-02-1021 Rev. A.9 December 2008

Hook Up Schedule

For Temporary Operation of ASME A17.1 -2000 Hydro Controllers

! EXERCISE EXTREME CAUTION WHEN OPERATING THE ELEVATOR IN THIS MODE

Critical Safety Precautions:

1. ALWAYS connect an individual jumper for each device, so when the device is installed that jumper is removed. Note: NEVER jump out more circuits than necessary when preparing the car to operate or conduct a test.

2. ALWAYS connect the temporary run buttons in the CAR TOP INSPECTION circuits so they have top priority.

3. ALWAYS insert the temporary run button's EMERGENCY STOP SWITCH in the safety circuit between terminals 17 and 18. NOT in series with the ENABLE button.

4. ALWAYS get the GOVERNOR/GOVERNOR SWITCH and SAFETIES/SAFETY OPERATOR SWITCH (plank) operational as soon as possible.

If the door operator, fire service and emergency power are not yet wired:

Wire removed from panel mount terminal **DCL**
Jumper between panel mount terminal **DPM and 2 bus**
Wire removed from terminal **47** on the SC-SB2K-H board
Jumper from **2 bus to terminal 36** on the SC-SB2K-H board
Jumper from **2 bus to terminal 38** on the SC-SB2K-H board
Jumper from **2 bus to panel mount terminal EPI** (if present)

Safeties, door locks and temporary run buttons, jump terminals as follows:
2 bus to 16   2 bus to INCTI   9 to 10   9 to 10X   9 to 11   9 to 12   9 to 12X   9 to 13

16 to 17   18 to 20   2CT to CD   2CT to HD   4 to UNL   4 to DNL

remove wires from ACCEN and INICN

If rear doors are present also jump:
2CT to CDR   2CT to HDR   2 bus to DPMR

remove wires from 36R and 37R   jump 2 bus to 36R

Install Temporary Run Buttons as follows:
Connect EMERGENCY STOP SWITCH between terminals 17 and 18
Connect ENABLE button to terminal INCTI
Connect UP button to terminal INCTU and ENABLE button
Connect DOWN button to INCTD and ENABLE button

Refer to Section 5.3.2 for ASME A17.1 - 2000 bypass function.

TABLE OF CONTENTS

SECTION 3
START-UP

SECTION 4
FINAL ADJUSTMENT

SECTION 5
ONBOARD DIAGNOSTICS

SECTION 6
TROUBLESHOOTING

APPENDIX

IMPORTANT PRECAUTIONS & NOTES

We strongly recommend that you read this manual carefully before proceeding with installation. Throughout this manual you will see icons followed by a WARNING, CAUTION or NOTE. These icons denote the following:

WARNING: Operating procedures and practices which, if not done correctly, may result in personal injury or substantial damage to equipment.

CAUTION: Operating procedures and practices which, if not observed, may result in some damage to equipment.

NOTE: Procedures, practices or information which are intended to be immediately helpful and informative.

The following general rules and safety precautions must be observed for safe and reliable operation of your system.

NOTE

This controller may be shipped without the final running program. However, you may install the unit, hookup and run your elevator on Inspection operation. Call MCE about a week before you are ready to turn the elevator over to full automatic operation so the running program can be shipped to you.

If you need to change a program chip on a computer board, make sure that you read the instructions and know exactly how to install the new chip. Plugging these devices in backwards may damage your chip.

WARNING

Elevator control products must be installed by experienced field personnel. This manual does not address code requirements. The field personnel must know all the rules and regulations pertaining to the safe installation and running of elevators.

This equipment is an O.E.M. product designed and built to comply with ASME A17.1, National Electrical Code, CAN/CSA-B44.1/ASME-A17.5 and must be installed by a qualified contractor. It is the responsibility of the contractor to make sure that the final installation complies with any local codes and is installed safely.

The 3-phase AC power supply to this equipment must come from a fused disconnect switch or a circuit breaker that is sized in conformance with all applicable national, state and local electrical codes, to provide the necessary overload protection for the drive unit and motor. Incorrect motor branch circuit protection will void the warranty and may create a hazardous condition.

Proper grounding is vitally important to the safe and successful operation of your system. Bring your ground wire to the system subplate. You must choose the proper conductor size and minimize the resistance to ground by using shortest possible routing. See National Electrical Code Article 250-95, or the related local applicable code.

WARNING

Before applying power to the controller, physically check all components inside the controller cabinet. Components loosened during shipment may cause damage. Please make sure that all the safety relays on the SC-SB2K board are properly seated in their sockets by pushing each relay gently into its socket.

CAUTION

You must *not* connect the output triacs *directly* to a hot bus (2, 3 or 4 bus). This can damage the triacs. PIs, direction arrows and terminals 40 & 42 are examples of outputs that can be damaged this way. Note: miswiring terminal 39 into 40 can damage the fire warning indicator triac.

NOTE

Your HC-PI/O and HC-CI/O boards are equipped with quick disconnect terminals. During the original installation, you may want to remove the terminal connector, hook up your field wires to it, test it for no shorts to ground (1 bus) and to terminals 2, 3 and 4 before plugging these terminals back into the PC boards.

ENVIRONMENTAL CONSIDERATIONS:

Keep the machine room clean. Controllers are generally in NEMA 1 enclosures. Do not install the controller in a dusty area. Do not install the controller in a carpeted area. Keep room temperature between 32° F and 104° F (0° C and 40° C). Avoid condensation on the equipment. Do not install the controller in a hazardous location and where excessive amounts of vapors or chemical fumes may be present. Make sure power line fluctuations are within ± 10%.

CONTROLLER OR GROUP ENCLOSURES WITH AIR CONDITIONING

If your controller or group enclosure is equipped with an air conditioning unit, observe the following precautions (failure to do so can result in water condensation inside the enclosure):

- Ensure the integrity of the NEMA 12 or 4 enclosure is maintained by using sealed knockouts and by sealing any holes created during installation.
- Do not run the air conditioner unit when the doors are open.
- To avoid damaging the compressor, if the air conditioner is turned off while it is running, wait at least five minutes before turning power on again.
- Observe the manufacture’s recommended maintenance and optimum thermostat setting of 75° F (see Operator’s Manual).
- Ensure the air conditioner unit’s drain hose remains open.

LIMITED WARRANTY

Motion Control Engineering (manufacturer) warrants its products for a period of 15 months from the date of shipment from its factory to be free from defects in workmanship and materials. Any defect appearing more than 15 months from the date of shipment from the factory shall be deemed to be due to ordinary wear and tear. Manufacturer, however, assumes no risk or liability for results of the use of the products purchased from it, including, but without limiting the generality of the forgoing: (1) The use in combination with any electrical or electronic components, circuits, systems, assemblies or any other material or equipment (2) Unsuitability of this product for use in any circuit, assembly or environment. Purchasers' rights under this warranty shall consist solely of requiring the manufacturer to repair, or in manufacturer's sole discretion, replace free of charge, F.O.B. factory, any defective items received at said factory within the said 15 months and determined by manufacturer to be defective. The giving of or failure to give any advice or recommendation by manufacturer shall not constitute any warranty by or impose any liability upon the manufacturer. This warranty constitutes the sole and exclusive remedy of the purchaser and the exclusive liability of the manufacturer, AND IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY AS TO MERCHANTABILITY, FITNESS, FOR PURPOSE SOLD, DESCRIPTION, QUALITY PRODUCTIVENESS OR ANY OTHER MATTER. In no event will the manufacturer be liable for special or consequential damages or for delay in performance of this warranty.

Products that are not manufactured by MCE (such as drives, CRT's, modems, printers, etc.) are not covered under the above warranty terms. MCE, however, extends the same warranty terms that the original manufacturer of such equipment provide with their product (refer to the warranty terms for such products in their respective manual).

SECTION 1
PRODUCT DESCRIPTION

1.0 GENERAL INFORMATION

MCE's HMC-1000-HS Controller is designed to exhibit the characteristics listed below in a hydraulic elevator installation. The controller has been designed to save time in installation and troubleshooting, but it is still very important that the field personnel who work with this equipment familiarize themselves with this manual before attempting to install the equipment.

	PRINCIPAL CHARACTERISTICS
Number of Stops	16
Number of Cars in Group	12
Environment	32° to 104° F (0° to 40° C) ambient 12,000 ft altitude 95% humidity

EQUIPMENT CATEGORIES - The HMC-1000 Controller consists of the following pieces of equipment:

- Controller Unit
- Car Top Selector (Landing system)
- Peripherals
- Group Dispatcher (2 or more cars only)

1.1 CAR CONTROLLER DESCRIPTION

Figure 1.1 shows a typical layout of the Car Controller in a standard MCE cabinet. A brief description of each block follows:

① **COMPUTER SWING PANEL** - The Computer Swing Panel (Figure 1.2) houses the following:

- MC-MP2-2K Main Processor Board
- MC-CGP-4(8) Communication Processor Board (optional)
- MC-RS Communication Interface Board (optional)

MC-MP2-2K Main Processor board - (see Figure 1.3) The Main Processor board is located within the Computer Swing Panel and is responsible for Car Operation Control. This board is also responsible for the On-Board Diagnostics that provide interactive communication with the elevator mechanic. The board contains the alphanumeric display and all the LEDs, switches, and buttons found on the front of the Computer Swing Panel.

FIGURE 1.1 Typical Physical Layout

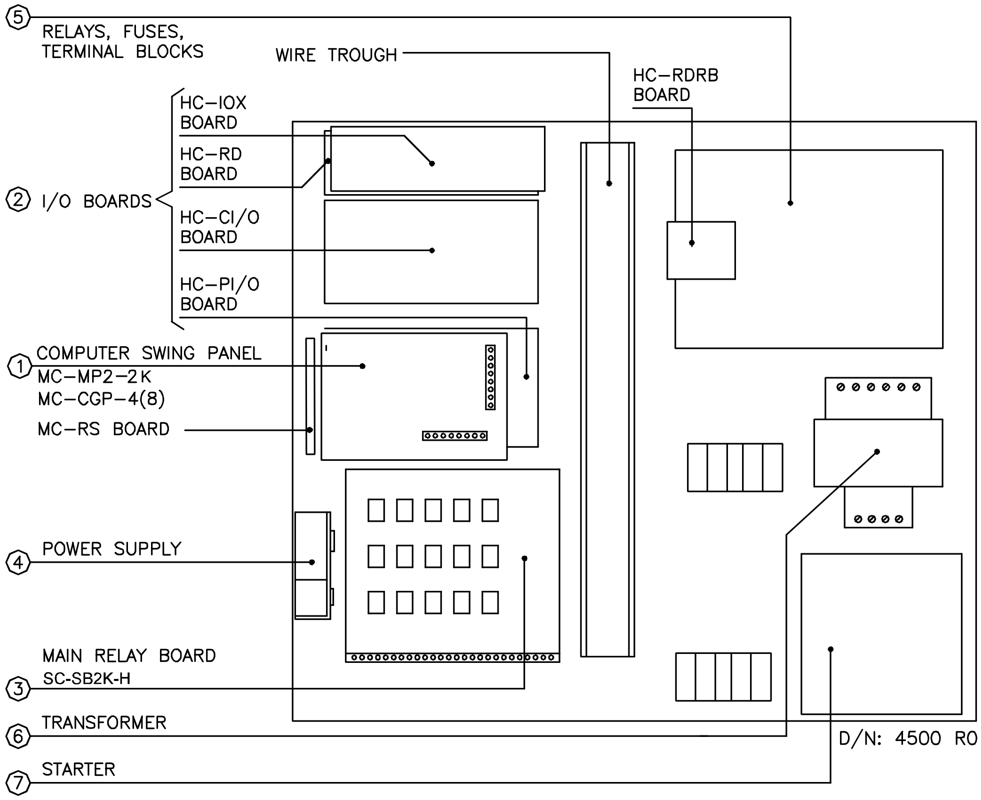


FIGURE 1.2 Computer Swing Panel

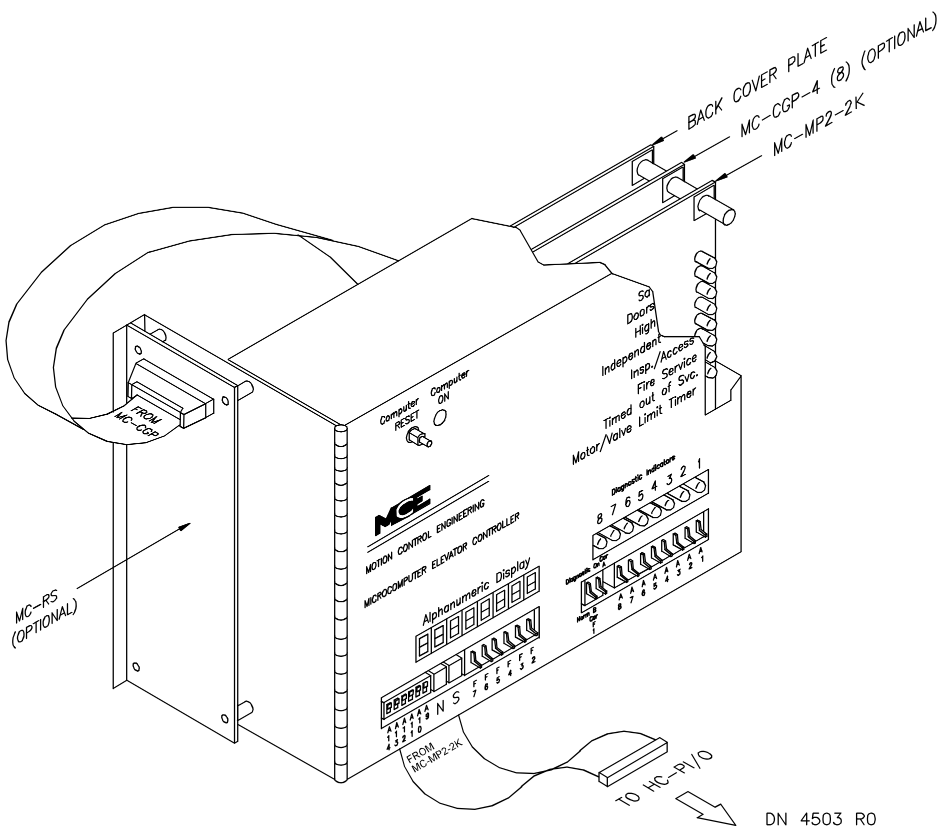


FIGURE 1.3 MC-MP2-2K Main Processor Board

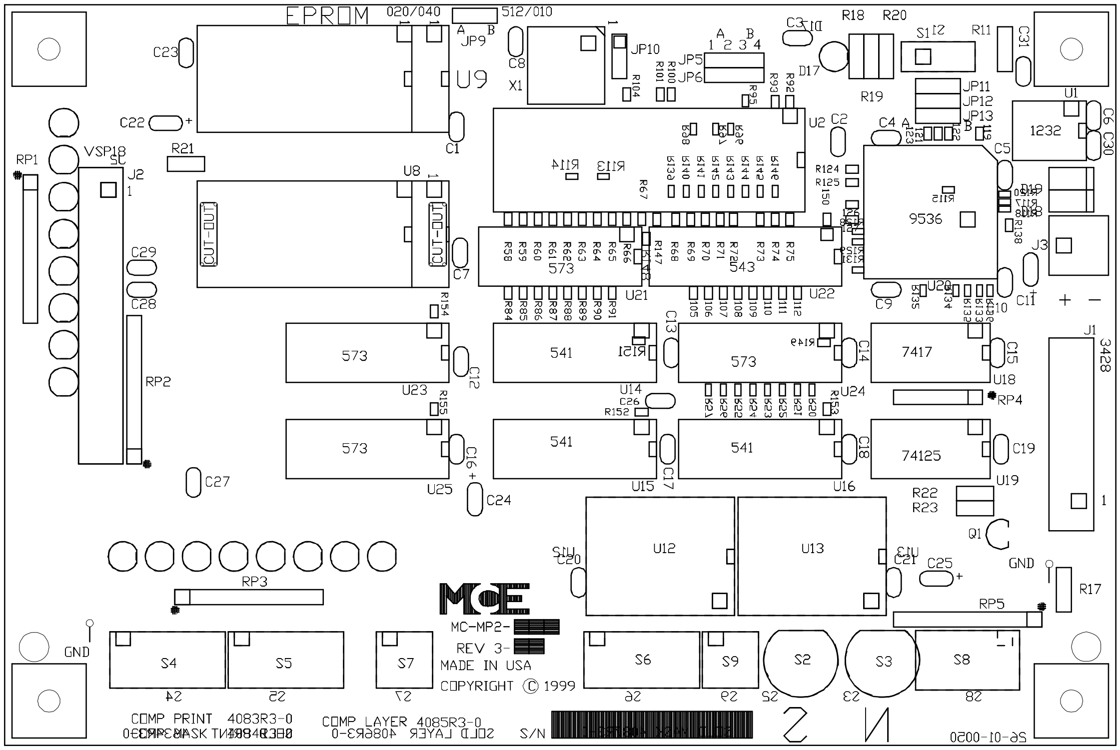
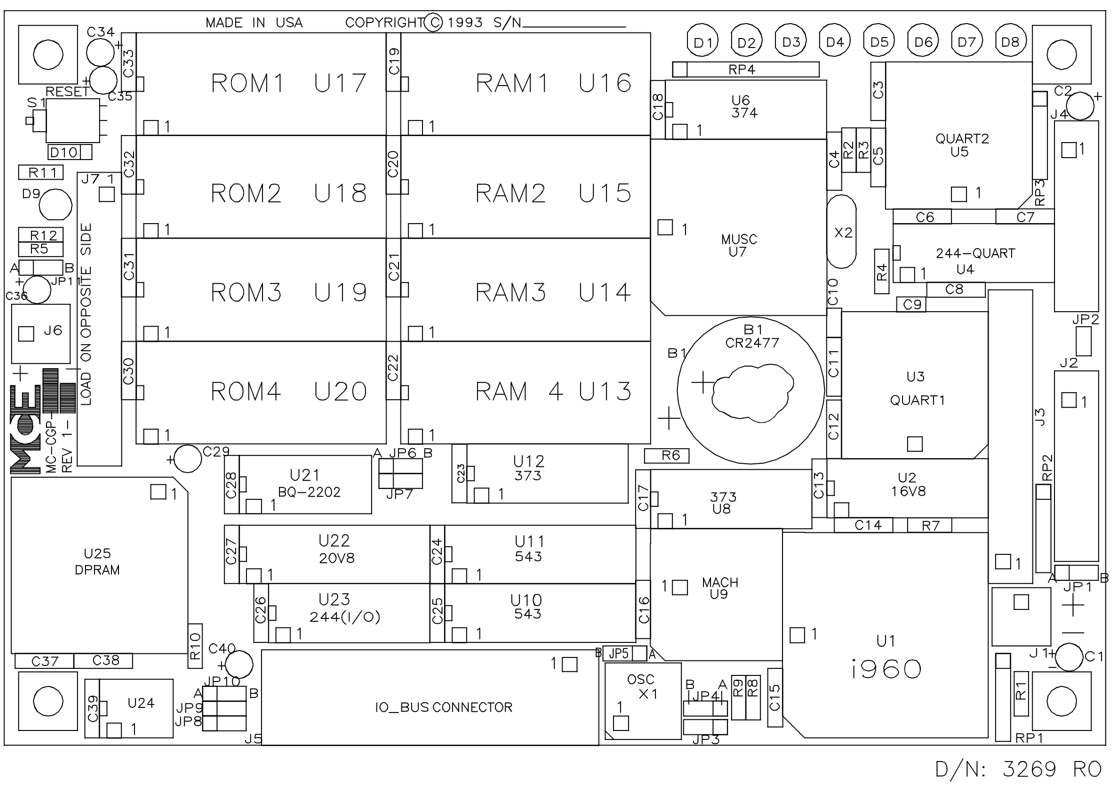
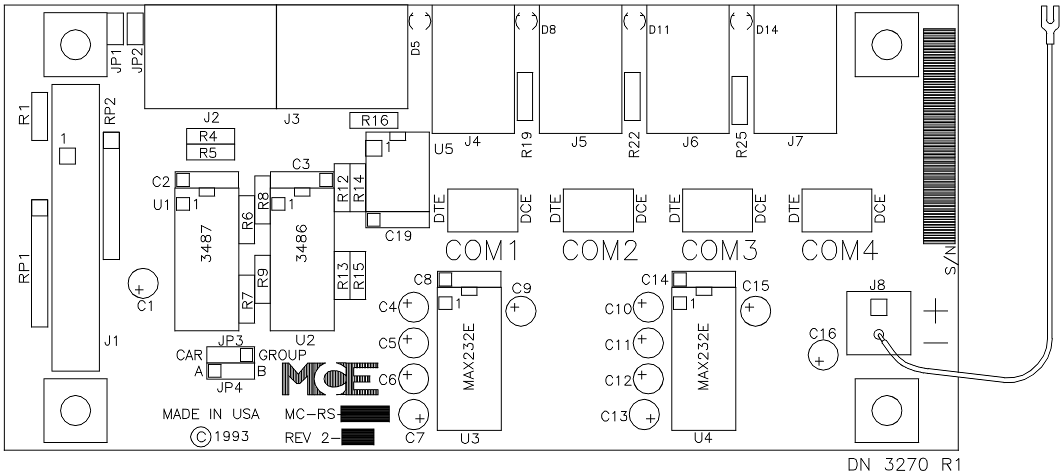


FIGURE 1.4 MC-CGP-4 Communication Processor Board



MC-CGP-4 Communication Processor Board - This board contains a very powerful 32-bit embedded RISC microcontroller, and is located along side the MC-MP2-2K Main Processor Board. The primary function of this board is to co-ordinate the flow of information between the car controller and other equipment and peripherals.

FIGURE 1.5 MC-RS Communication Interface Board



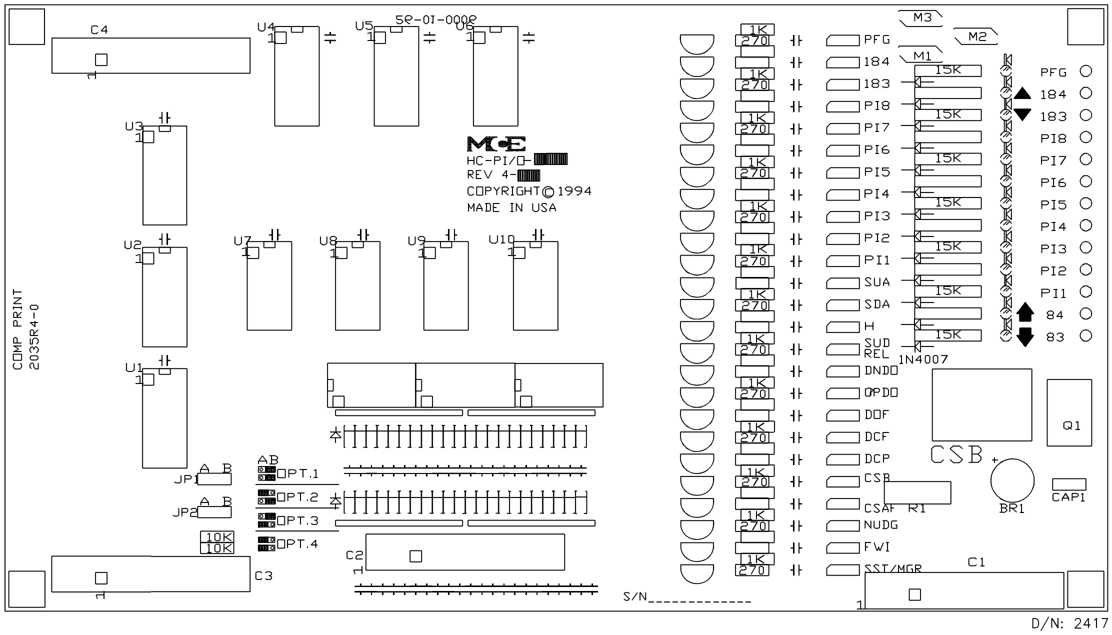
MC-RS Communication Interface Board - This board provides a high-speed RS-422 serial link between the individual car controller and the M3 Group Supervisor. It also provides four industry standard RS-232C serial ports to interface the car controller with a standard computer or data terminal, such as a printer, modem or CRT terminal.

② **INPUT/OUTPUT BOARDS** - This block consists of a number of different Input/Output boards. The following is a list of boards that could be used in this block:

- SC-SB2K-H Main Safety Relay Board for A17.1-2000
- SC-HDIO High Density I/O board for A17.1-2000
- SC-BAH Lock Bypass, Access board
- SC-BAHR SC-BAH with Rear Doors
- HC-PI/O Power and Call Input/Output board
- HC-PIX Position Indicator Expander Board (optional)
- HC-CI/O Call Input/Output board (optional)
- HC-IOX Input/Output Expander board (optional)
- HC-I4O Input/Output Expander board (optional)
- HC-RD Rear Door Logic board (optional)

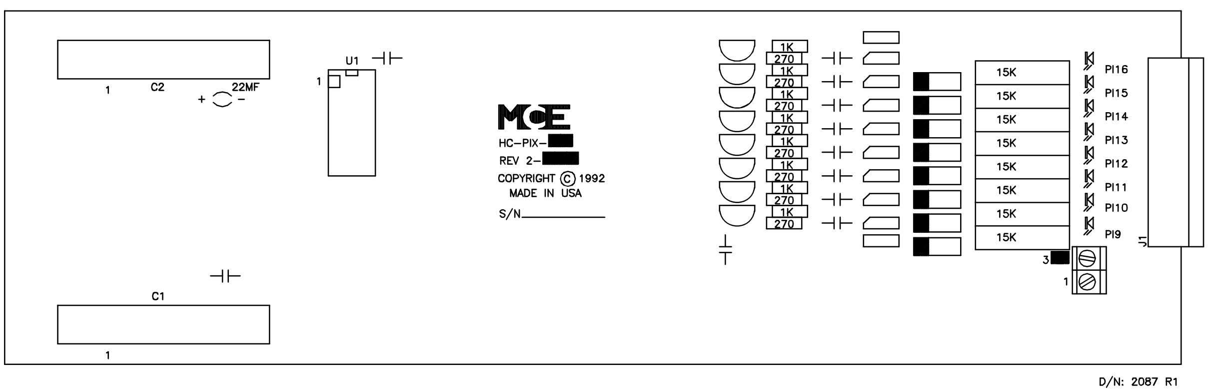
Note that more than one HC-CI/O, HC-IOX and/or HC-I4O boards may be required depending on system requirements (e.g., number of landings served).

FIGURE 1.6 HC-PI/O Power Input/Output Board



HC-PI/O Power Input/Output board - This board is typically located behind the Computer Swing Panel. The main function of this board is to receive inputs and provide outputs for individual car functions such as door operation, limit switches, direction sensing, position indicators, direction arrows and arrival gongs.

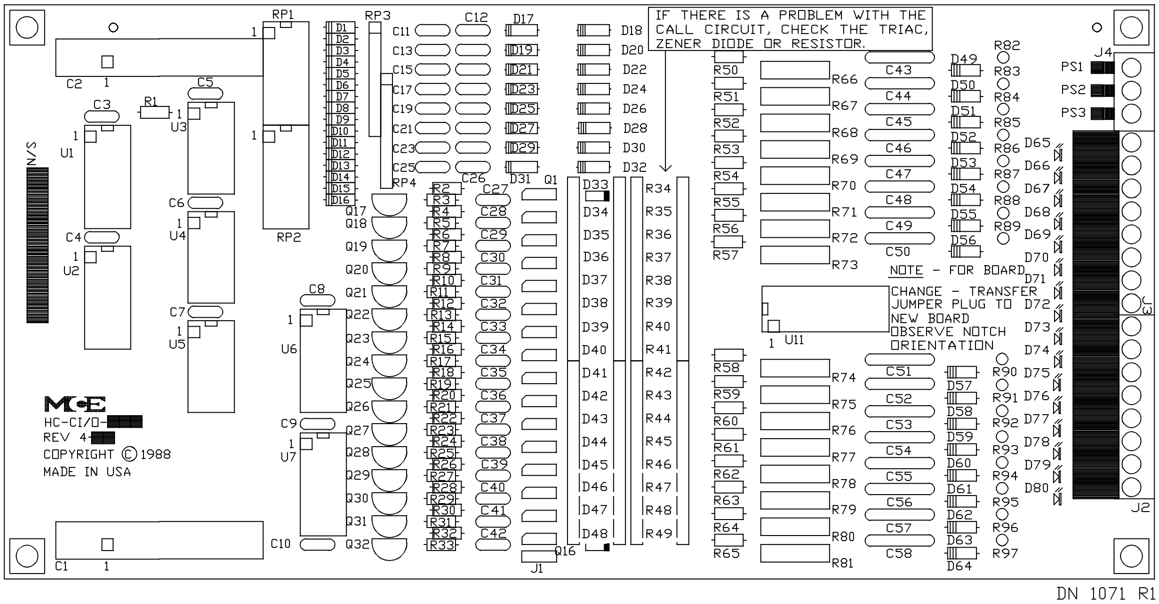
FIGURE 1.7 HC-PIX Position Indicator Expander Board



HC-PIX Position Indicator Expander board - This board provides additional PI outputs which are needed if there are more than eight floors in the building.

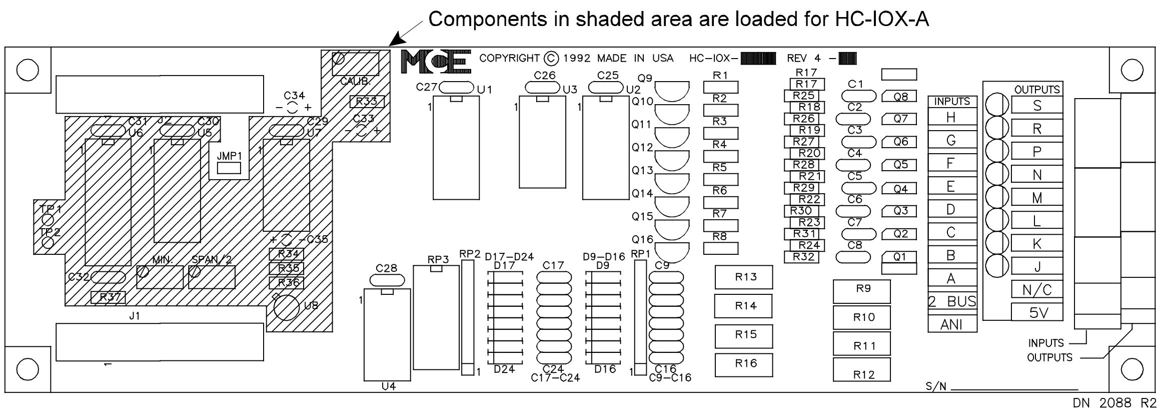
HC-RD Rear Door board - This board provides the necessary logic required when an additional independent rear door is present (board not pictured).

FIGURE 1.8 HC-CI/O Call Input/Output Board



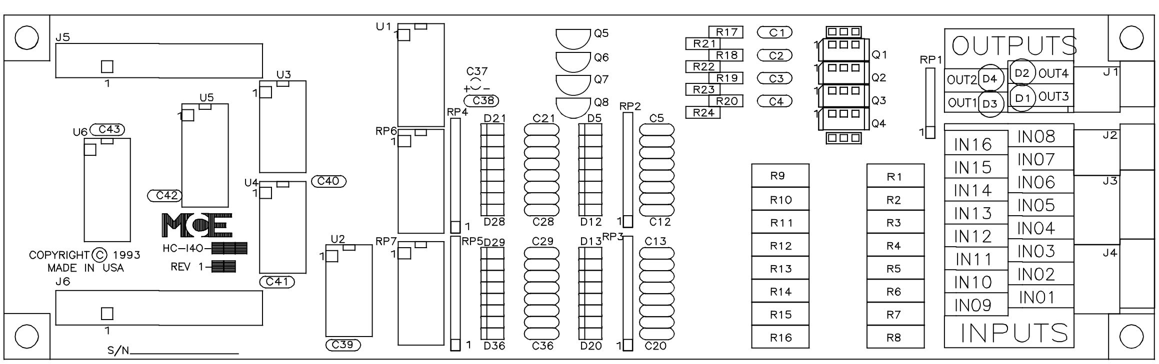
HC-CI/O Call Input/Output board - This board processes hall call and car call inputs, call acknowledgment outputs, and displays the status of each call.

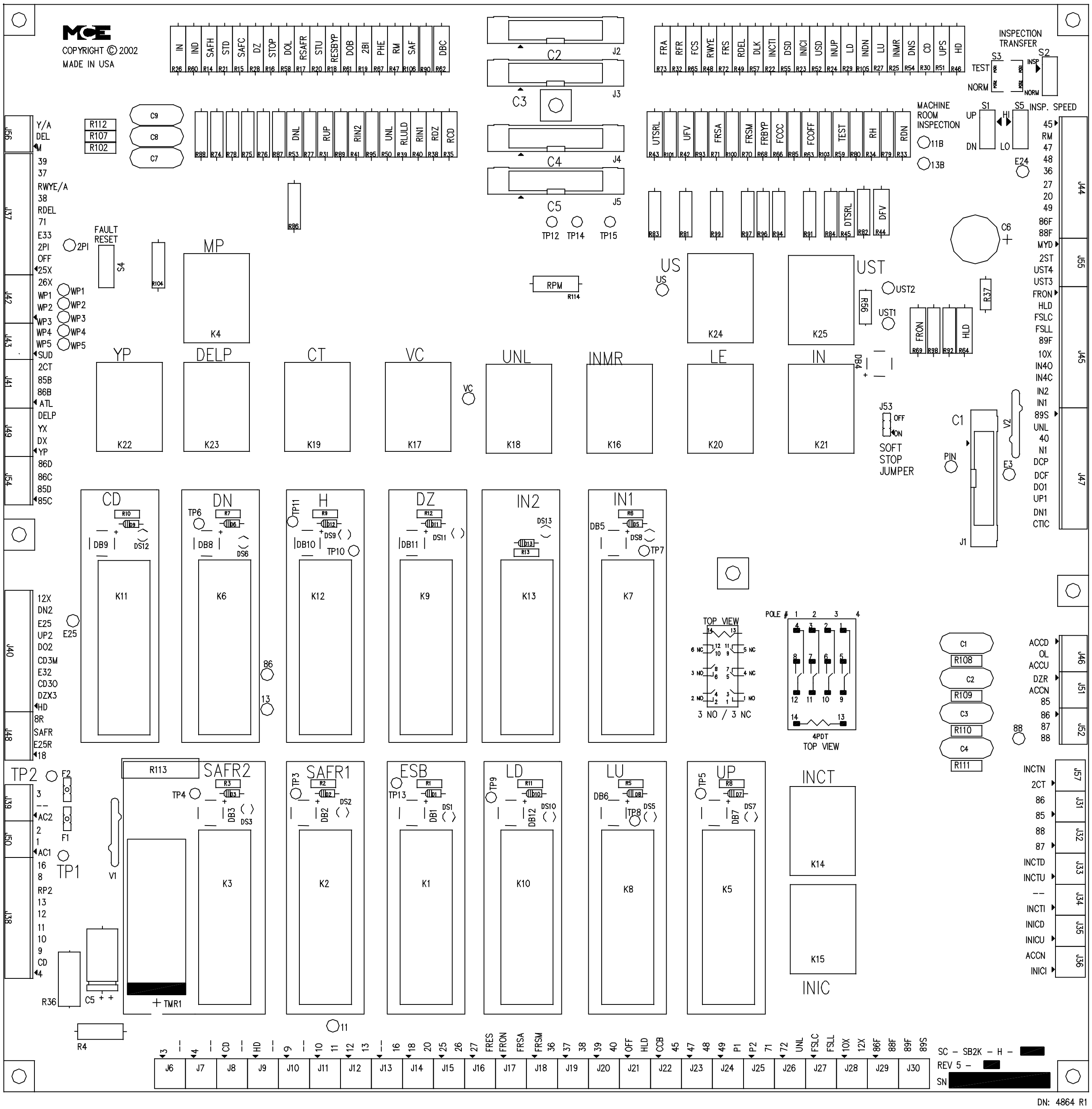
FIGURE 1.9 HC-IOX Input/Output Expander Board



HC-IOX / HC-I4O Input/Output Expander board - This is a multipurpose input/output board (Figure 1.9). Some installations have the HC-I4O board instead (Figure 1.10). Its functions are similar to the HC-IOX and HC-IOX-A.

FIGURE 1.10 HC-I4O Input/Output Expander Board

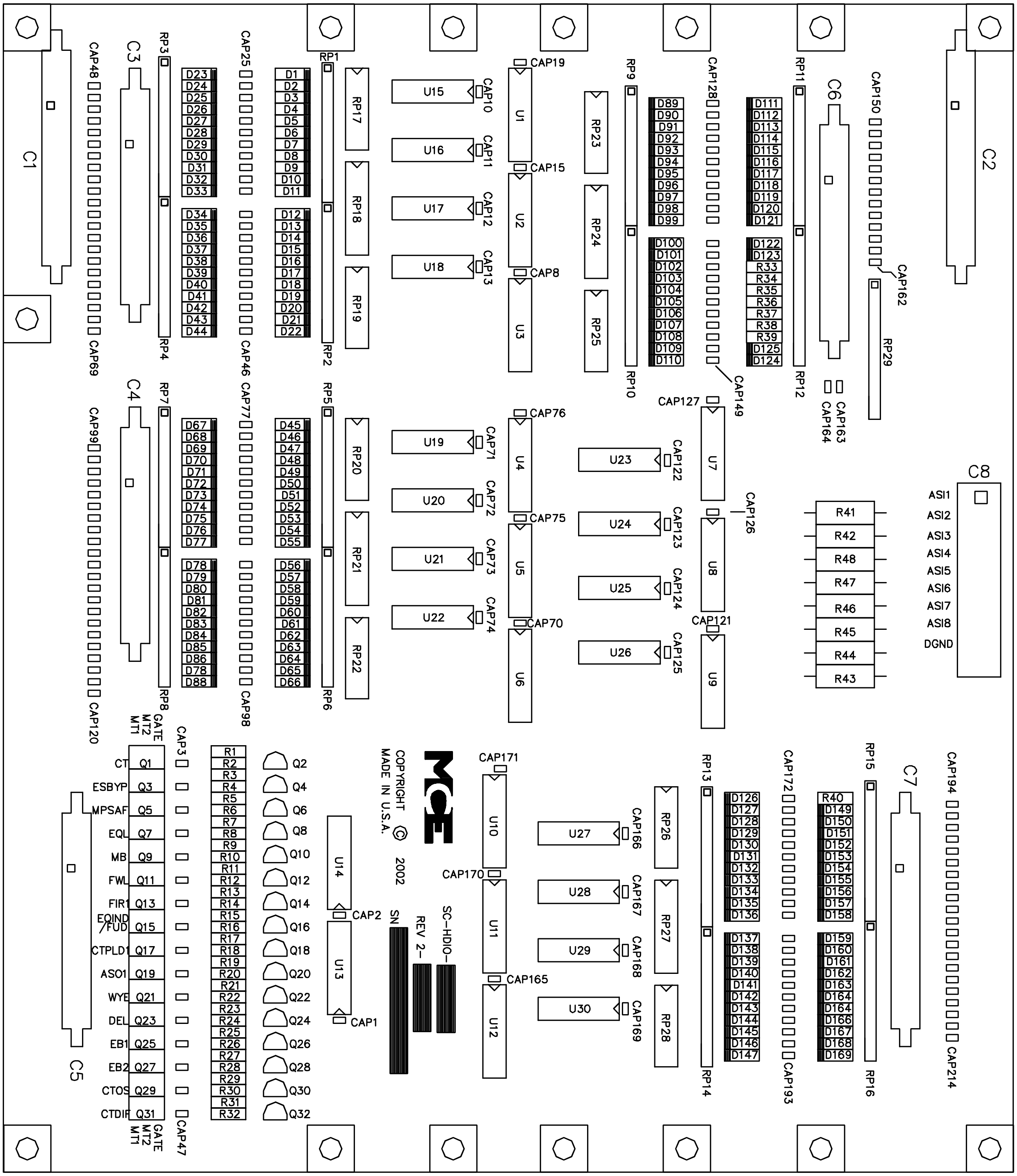




SC-SB2K-H Main Safety Relay Board - This board satisfies many of the ASME A17.1 - 2000 code requirements for “safety” relay contact redundancy and the requirements for normal terminal stopping devices. It also provides the necessary circuitry for running the car on Machine Room Inspection operation. This board, in conjunction with the HC-PI/O and SC-HDIO boards, comprises the high voltage interface between the MC-MP2-2K and the individual car logic functions such as door operation, direction outputs, direction sensing, main safety circuits, leveling circuitry, redundancy checking, etc.

A TEST/NORMAL switch, MACHINE ROOM INSPECTION UP/DN switch and a MACHINE ROOM INSPECTION TRANSFER INSP/NORM switch are provided on this board. Test pins on the board are available for inspection and testing of the redundancy checking logic for the force-guided (safety) relays. Refer to Chapter 4 for testing procedures.

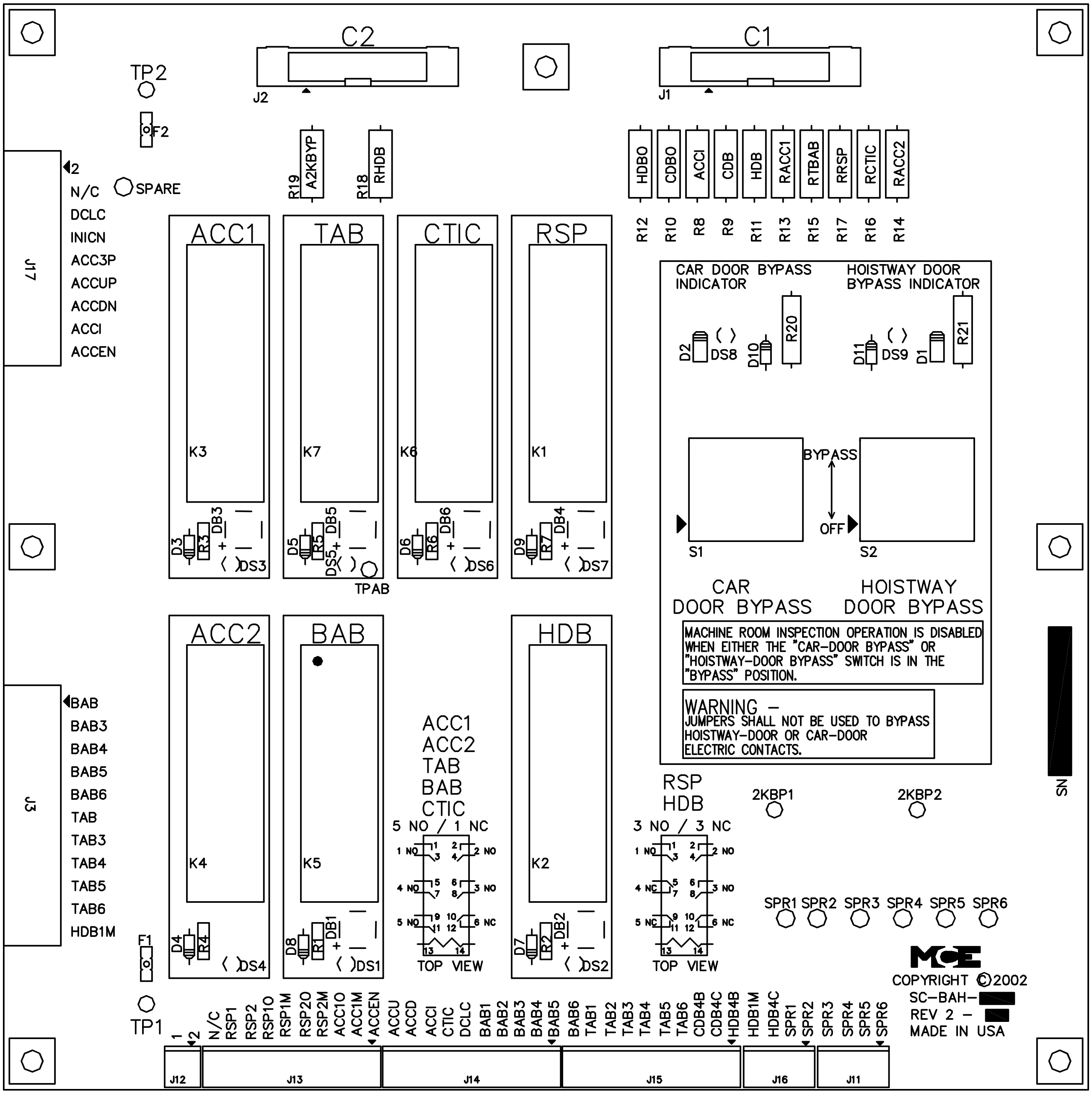
FIGURE 1.12 SC-HDIO Board



DN4868 R0

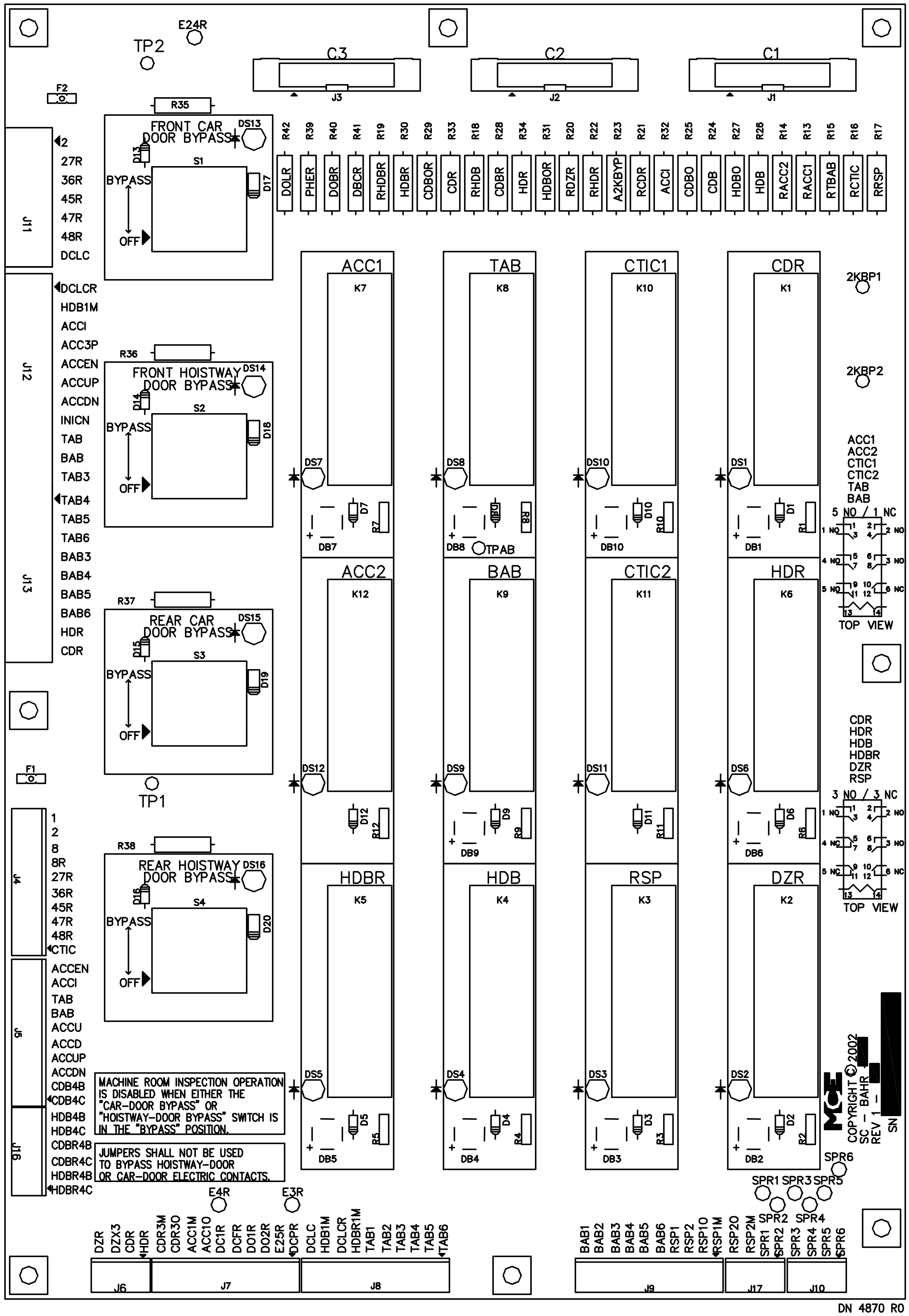
SC-HDIO High Density Input Output Board - This board handles the inputs and outputs that are associated with ASME A17.1 -2000 code compliance. This board processes many of the code required redundancy inputs and outputs. There are no adjustments. As there are no customer connections or adjustments on this board, it has been mounted behind the logic boards in the upper left-hand corner of the controller enclosure.

FIGURE 1.13 SC-BAH Board



DN 4869 R0

SC-BAH Lock Bypass, Access - This board contains inputs, logic and outputs that perform the lock bypass function, inspection access operation. The Car Door and Hoistway Door bypass switches are located on this board. Five test pins on the board (TP1, TP2 and TPAB) are available for inspection and testing of the redundancy checking logic for the force-guided (safety) relays. Refer to Chapter 4 for testing procedures.



SC-BAHR Lock Bypass, Access - This board is the same as the SC-BAH with additional logic and relays for rear doors.

③ **POWER SUPPLY** - The power supply (single output linear) provides +5VDC power to the computer and its peripheral boards.

④ **RELAYS, FUSES AND TERMINAL BLOCKS** - This block contains door operator circuitry, terminal blocks (for customer wiring), fuse holders, fuses, or any other circuitry needed for a specific job.

⑤ **TRANSFORMERS** - Transformers are provided, as necessary, according to the requirements of each individual car load and the available AC line voltage.

⑥ **STARTER** - The starter is usually located in the lower right-hand corner of the controller cabinet along with the associated terminal blocks for motor connections. An across-the-line or Wye Delta starter is usually provided to operate the AC pump motor. AC overloads are also provided

1.2 CAR CONTROLLER FUNCTIONAL LAYOUT

Functionally, the Control Unit is divided into two primary sections. Each section consists of the following functional blocks, as shown in Figure 1.15:

Computer Section
- Car Operation Control
- Car Communication Control
- Duplexing
- Programming and Diagnostics Tools
- Safety Checks and Redundancy Cycle Testing

Power Section
- Door Circuits
- Pump Motor Control

1.2.1 CAR OPERATION CONTROL (COC)

Normal Operation - Normal car operation consists of responding to hall and car call demands, and operating the doors, as required.

Special Operations - The following are special operations controlled by the COC:

- Inspection/Access
- Independent Service
- Fire Service
- Emergency Power
- Safety Checks and Redundancy Cycle Testing

For details of each operation, see MCE Specifications for Elevator Products. The special features and options are discussed in Section 5 of this manual.

Discussion of Car Operation Control (COC) - The Car Operation Control (COC) performs the elevator logic operations for the individual car. These functions are performed by the following circuit boards:

•	SC-SB2K-H	Main Safety Relay board
•	MC-MP2-2K	Main Processor board
•	HC-PCI/O	Power Input/Output board
•	HC-CI/O-E	Call Input/Output board (optional)
•	HC-RD	Rear Door board (optional)
•	HC-IOX	Input/Output Expander board (optional)
•	HC-I4O	Input/Output Expander board (optional)
•	SC-BAH(R)	Lock Bypass, Access
•	SC-HDIO	High Density I/O board

Car Operation Control involves the logical car operation such as door operation, response to hall and car calls, and special operations such as Inspection/Access and Fire Service. Additional special operations are provided as required per specifications.

COC INPUTS - This section describes the main signals received by the MC-MP2-2K Main Processor board.

The COC module is responsible for the “logical operation” of the elevator control system. For example, the COC may decide that the car should travel from one floor to another in response to a car call. The fundamental inputs that are required for the logical control of the elevator come to the Main Processor board through two boards: the HC-PI/O board (power input/output board) and the HC-CI/O board (call input/output board). Each HMC-1000 control system has one HC-PI/O board, and as many HC-CI/O boards as are required to accommodate the number of calls in the particular installation. Additional “miscellaneous” inputs come to the Main Processor board through the HC-IOX and/or HC-I4O board (I/O expansion board, also as many as needed).

Primary Power inputs - HC-PI/O board

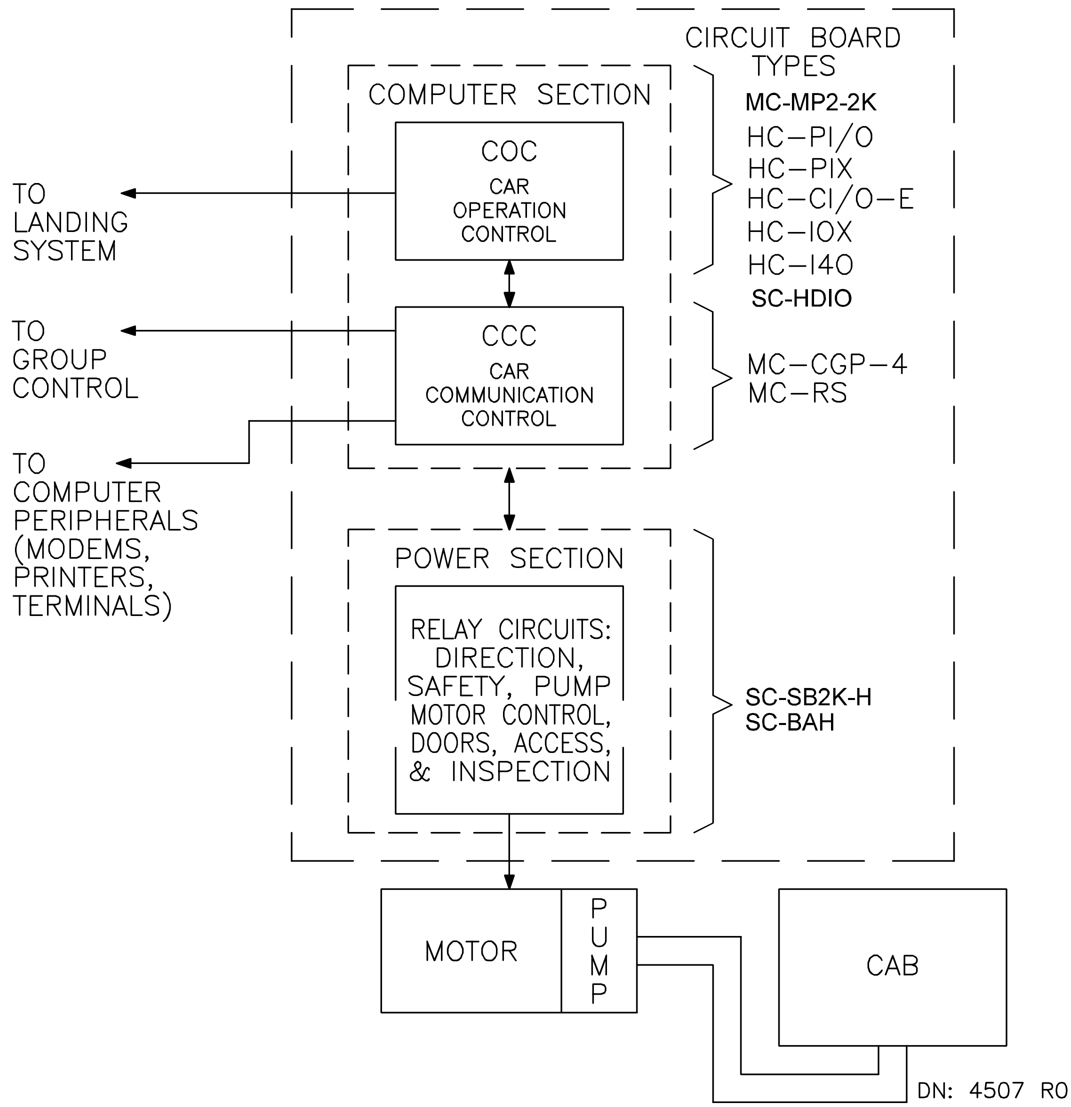
- **Door signals** - The HC-PI/O board receives the door-related signals through the Main Safety Relay board (SC-SB2K-H). The door related signals include the door reopening devices (photo eye, safe edge), car operating panel buttons (door open button, door close button), and the door position contacts (door open limit, door lock).

- **Landing system signals** - The HC-PI/O board receives some of the signals generated by the landing system through the Main Relay board (SC-SB2K-H). The landing system signals read by the COC module are the door zone, level up and level down signals.

- **Operational mode signals** - The HC-PI/O board receives a few of the operational and safety mode signals through the Main Relay board (SC-SB2K-H). These signals include the safety string status, the inspection operation status, and the independent service status. Additionally, some of the fire service signals are also received by the HC-PI/O board through the relay board (fire sensors, in-car fire service switch).

- **Direction sensing inputs** - Two direction sensing inputs (up sense and down sense) are read by the COC processor, again through the HC-PI/O and SC-SB2K-H, and are used to process the car position indicator logic and motor protection timing logic.

FIGURE 1.15 Car Controller Functional Layout



Call inputs (car call and hall call) - HC-CI/O board

The call buttons and call indicators are wired to the control system and read by the COC processor through the call board(s) (HC-CI/O). The connection to the HC-CI/O board is a single wire connection for both the button and the indicator (the terminal acts as both an input and output terminal). In multi-car group arrangements, “system” hall calls are wired to the Group Supervisor (also to HC-CI/O boards), but “swing car” hall calls are wired to the call board of the individual car controller, along with the car calls.

COC OUTPUTS - This section describes the main signals generated by the MC-MP2-2K Main Processor board.

The fundamental outputs that are required for the logical control of the elevator emerge from the Main Processor board through the same two boards described above: the HC-PI/O board (power input/output board) and the HC-CI/O board (call input/output board). Additional “miscellaneous” outputs emerge from the Main Processor board through the HC-IOX or HC-I4O I/O Expansion boards, as many as are needed, and some “specialty” output boards which may be used to drive specific devices.

Primary Power Outputs - HC-PI/O board

- **Position indicators, direction arrows, and arrival fixture signals** - Eight position indicator outputs are provided on the HC-PI/O board. Should the particular installation have more than eight landings, additional position indicator outputs are provided through the use of HC-PIX boards (position indicator expansion boards). The up and down direction arrow indicators and the up and down arrival lantern outputs are also provided on the HC-PI/O board. The output terminals for these indicator outputs are located on the HC-PI/O board.

- **Fire service operation signals** - Two outputs associated with fire service operation are generated on the HC-PI/O board, and are routed through the Main Relay board. The fire warning indicator output generates the visual/audible signal in the elevator during fire phase I recall, and the in-car stop switch bypass output is used for rendering the in-car stop switch inoperative, also during fire phase I recall.

- **Door control signals** - Four signals are generated by the COC module to control the operation of the doors. These outputs are generated on the HC-PI/O board, but are routed through the Main Relay board for connection to external relays. These signals are the door open function, door close function, door close power, and nudging outputs. Should the installation have a floor with both front and rear openings, a rear door logic board (HC-RD) is used to generate the corresponding outputs for the rear door.

- **Car movement signals** - Four signals are generated by the COC module to perform the *logical control* of car movement. In hydraulic applications these signals directly control the valve solenoids to cause the car to move up and down at high and low speeds.

Call outputs (car call and hall call) - HC-CI/O board

The call button indicators are wired to the control system and generated by the COC module through the HC-CI/O call board(s) The connection to the HC-CI/O call board is a single wire connection for both the indicator and the call button (the terminal acts as both an input and output terminal). In multi-car group arrangements, “system” hall calls are wired to the Group Supervisor, but “swing car” hall calls are wired to the call board of the individual car controller, along with the car calls.

1.2.2 CAR COMMUNICATIONS CONTROL (CCC)

This functional block coordinates the flow of information between the car controller and other equipment such as terminals, modems, printers and the Group Supervisor in an M3 Group System.

1.2.3 CAR POWER CONTROL (CPC)

This functional block is comprised of the relay circuits which control direction, safety, access, inspection and pump motor control.

1.3 LANDING SYSTEM CONTROL BOX

The Landing System is designed to be mounted on the car top. There are two types of landing systems that can be used with HMC-1000 controllers: LS-STAN-2K and LS-QUTE-2K.

LS-STAN-2K - The LS-STAN-2K is the standard landing system. The car top control box uses VS-1A infrared proximity switches to sense vanes that are mounted in the hoistway.

FIGURE 1.16 LS-STAN5-2K Cartop Control Box

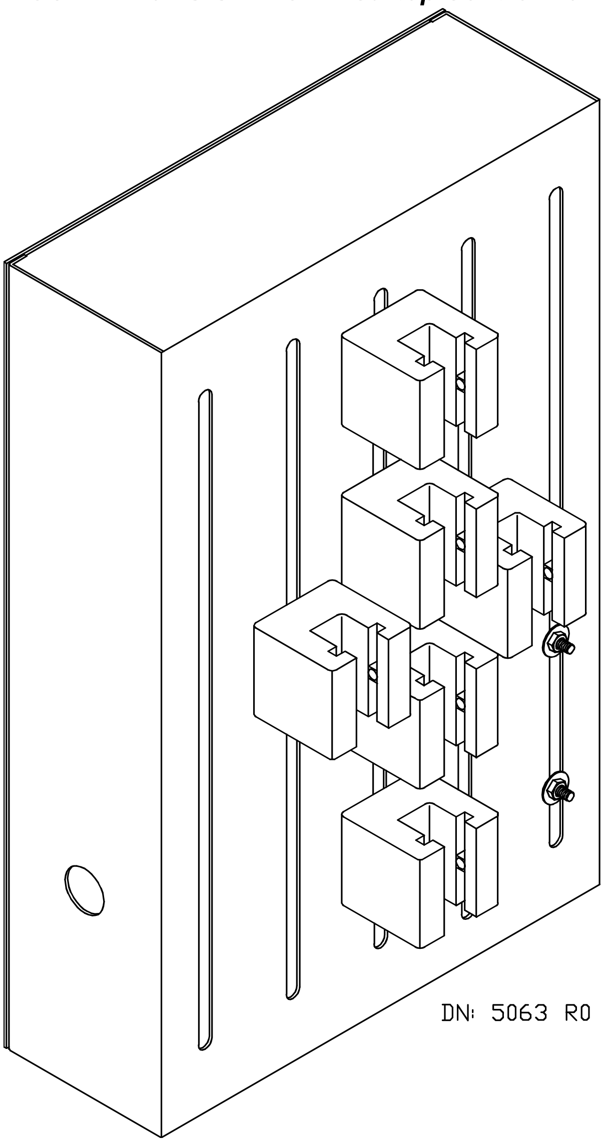
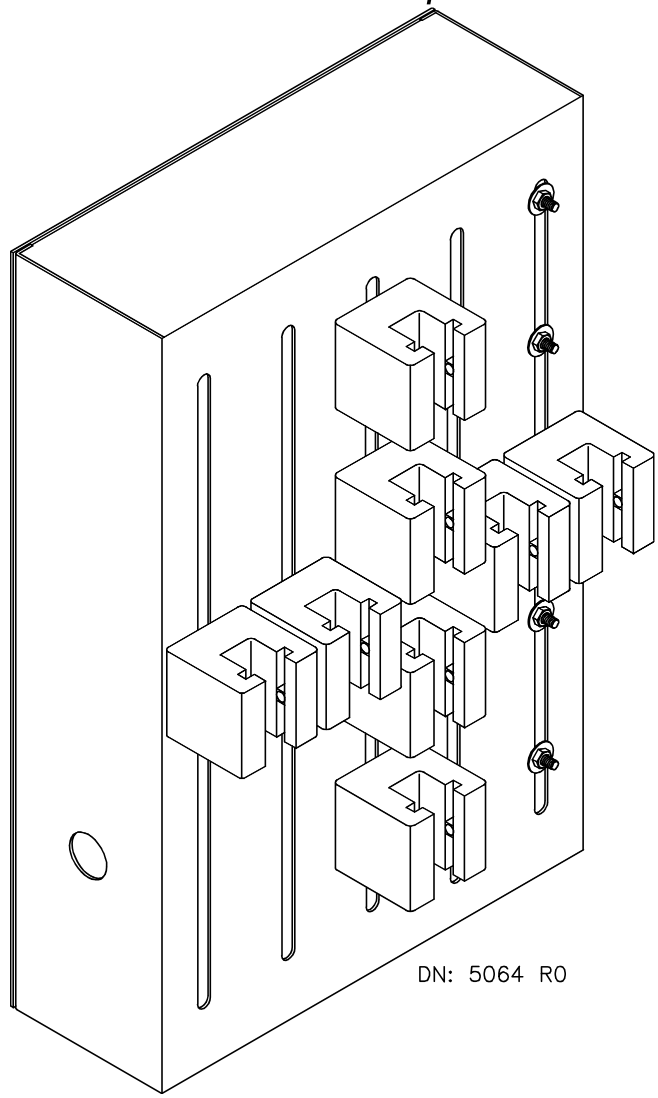
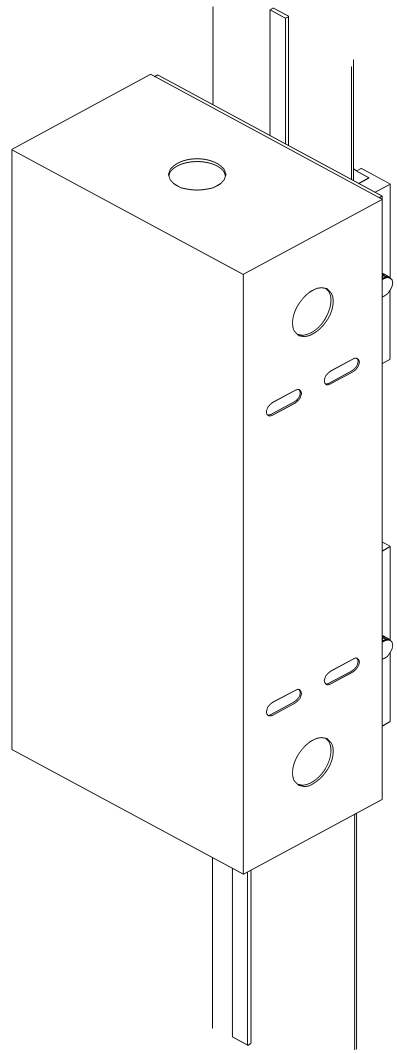


FIGURE 1.17 LS-STAN7-2K Cartop Control Box



LS-QUTE-2K - The LS-QUTE-2K is a tape-and-magnet-operated landing system, with a three inch wide steel tape mounted in the hoistway. The car top control box has a floating head that slides on the steel tape, and magnetic sensors for slow down, STU, STD, ISTU, ISTD, LU, LD and DZ. Optional absolute floor encoding is available. Refer to Appendix H, LS-QUTE-2K Landing System Assembly Drawings, for more information.

FIGURE 1.18 LS-QUTE-2K Car Top Control Box



1.4 DIAGNOSTIC TOOLS AND PERIPHERALS

Refer to Section 5, Onboard Diagnostics, for more information about the diagnostic tools available using the controller's Computer Swing Panel. Refer to the Computer Peripherals Manual, MCE part number 42-02-CP00, for more information about the diagnostic tools available using a CRT or PC.

1.5 GROUP SUPERVISOR (2 OR MORE CARS)

If this controller is part of an M3 Group System, refer to the M3 Group Supervisor Manual, MCE part number 42-02-G004, for more information about group operation.

SECTION 2
INSTALLATION

2.0 GENERAL INFORMATION

This section contains important recommendations and instructions for site selection, environmental considerations, installation guidelines and other factors that will help ensure a successful installation.

2.0.1 SITE SELECTION

In choosing a proper location for the control equipment, the following factors should be considered:

- Provide adequate working space for comfort and efficiency.
- Mount the controller in a logical location, taking into consideration the location of other equipment in the machine room and proper routing of electrical power and control wiring. Note that MCE controllers do not require rear access.
- Do not install equipment in a hazardous location.
- Provide adequate space for future expansion, if possible.
- If any areas in the machine room are subject to vibration, they should be avoided or reinforced to prevent equipment from being adversely affected.
- Provide adequate lighting for the control cabinets and machines in the machine room. A good working space such as a workbench or table is recommended.

2.0.2 ENVIRONMENTAL CONSIDERATIONS

The following are some important environmental considerations which will help to increase the longevity of the elevator equipment and reduce maintenance requirements:

- Provide an ambient temperature that will not exceed 32° to 104° F (0° to 40° C). Operation at higher temperatures is possible, but not recommended, because it will shorten the life of the equipment. Adequate ventilation and possibly air conditioning may be required.
- The air in the machine room should be free of excessive dust, corrosive elements or excessive moisture to avoid condensation. A NEMA 4 or NEMA 12 enclosure would help meet these requirements. If open windows exist in the machine room, locate the controller away from the windows so that severe weather does not damage the equipment.
- High levels of radio frequency (RF) radiation from nearby sources may cause interference to the computers and other parts of the control system. Using hand-held communication devices in close proximity to the computers may also cause interference. The controller is designed to EN12016 RFI standards.
- Power line fluctuation should not be greater than +/-10%.

2.0.3 RECOMMENDED TOOLS AND TEST EQUIPMENT

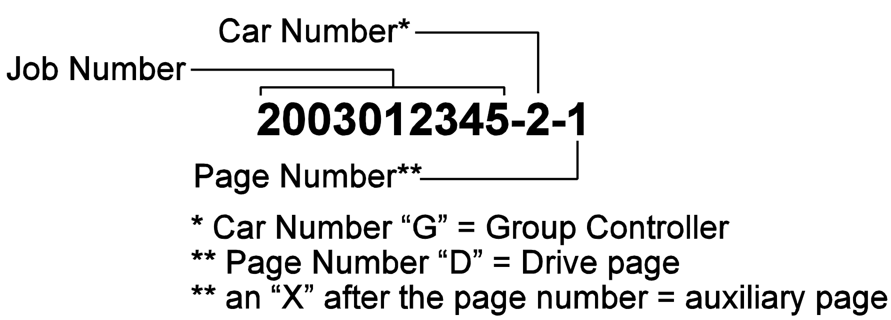
For proper installation, use the following tools and test equipment:

- A digital multimeter, Fluke series 75, 76, 77 or equivalent
- A hand-held tachometer
- A clamp-on AC ammeter
- Hand-held radios
- A telephone
- Test weights
- Pressure gauge
- Soldering tools, a flashlight and an MCE screwdriver (provided with controller).

2.0.4 THE WIRING PRINTS

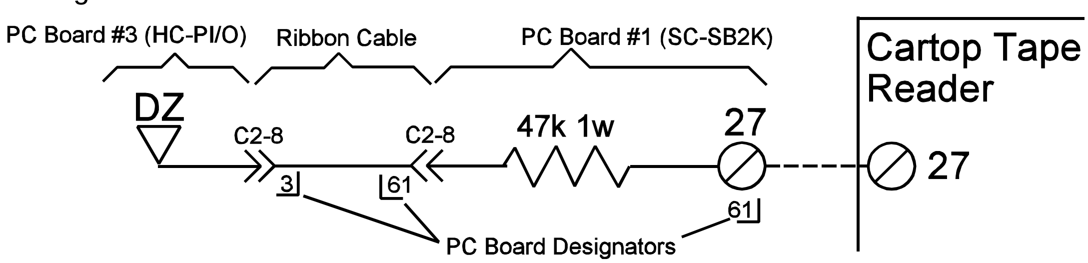
Become familiar with the following information as well as the wiring prints provided with this control system.

DRAWING NUMBER FORMAT - Each print has a drawing number indicated in the title block. The drawing number is comprised of the job number, car number and page number (see example). In this manual the drawings will often be referred to by the last digit of the drawing number (page number). The following is the drawing number format currently in use.



> **NOTE:** DRAWING NAME - Some drawings have a drawing name directly above the title block or at the top of the drawing. The drawing name may be used to refer to a particular drawing.

NOMENCLATURE - The following is an example of the schematic symbols use to indicate that a signal either enters or exits a PC board.



A listing of PC boards and their designator numbers plus other schematic symbols used in the wiring prints can be found at the beginning of the Job Prints and in Appendix C of this manual.

- Become familiar with the "Elevator Car Wiring Print" drawing number -1.
- Become familiar with the "Elevator Hoistway Wiring Print" drawing number -2.
- Group interconnects to individual car cabinets (two or more cars) are shown on the drawing titled “Group Interconnects to Individual Car Cabinets.”
- The power connections and power supplies are shown in drawing number -3.
- Review any additional wiring diagrams and details.
- The remainder of the job prints are detailed drawings of the HMC-1000-HC hydraulic control system.
- A specific part of a schematic may be referenced by the Area Number, which is found at the left-hand margin of the schematic.

2.1 CONTROLLER INSTALLATION

Mount the controller securely to the machine room wall or other appropriate location and cut holes to install a raceway or conduit to permit the routing of wires into the cabinet. Note that the standard MCE control cabinet does not require rear access.

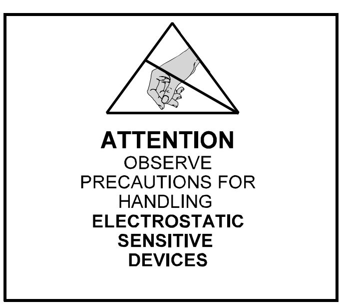
CAUTION: Do not allow any metal chips or drill shavings to fall into the electronics.

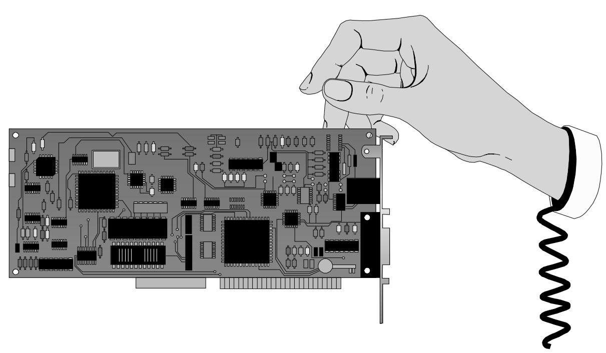
2.1.1 CONTROLLER WIRING GUIDELINES

NOTE: Pay very close attention to the hierarchy of the inspection inputs. In order to maintain safe operation of the lift while on access, car top or in car inspection, the inspection circuits must be wired as shown in the prints.

a. PC boards can be easily damaged by Electrostatic Discharge (ESD). Use a properly grounded wrist strap when touching the PC boards.

Do not touch PC Boards unless you are properly grounded.





b. Bring wires in from a location that allows the use of the wiring duct inside the controller to route the wires. The terminals are found conveniently near wiring ducts.

c. When routing field and/or power wiring, avoid the *left* side of the HC-PI/O and HC-CI/O boards As well as simply staying clear of the upper left area of the enclosure.

d. Connect the wires to the controller according to the hoistway and car wiring diagrams.

e. If the car is part of a group system, there are a number of details relating to the wiring of the interconnects between the individual cars. They are as follows:

1. If a group controller cabinet is provided, refer to the drawing titled “Group Supervisor Field Wiring Print” in the job prints. Power for the M3 Group Supervisor cabinet comes from the local Car Controllers as shown in drawing (-2). The main AC power supply wiring size must be determined by the electrical contractor.

> **WARNING:** Connecting the Group Supervisor directly to the building AC supply may cause damage to PC boards. Also, **connecting out-of-phase power *will* cause damage**. Check the “phasing” of the individual car 2-bus lines before connecting them to the Group Supervisor. With a voltmeter set to AC Volts, measure between adjacent car 2-bus terminals. The meter must read less than 10 VAC. If the reading is higher, reverse the power leads going to the car's T1 transformer at L1 and L2, and measure again.

2. A separate conduit or wiring trough must be provided for the high speed serial link from each car controller to the Group Supervisor cabinet. The wiring for the high speed communication link is fully detailed in the print titled "Instructions for Connection of High Speed Communication Cables." The wiring details should be followed exactly. Again, note the requirement for routing the high speed interconnect cables through a separate conduit or wiring trough.

3. If applicable, also wire according to the print titled "Group Interconnects to Individual Car Cabinets." Be sure to ground all cabinets according to Section 2.2.1.

4. The field wiring to the Group Supervisor cabinet is found in the print titled “Group Supervisor Field Wiring Print”.

2.2 GENERAL WIRING GUIDELINES

Basic wiring practices and grounding requirements are discussed in this section.

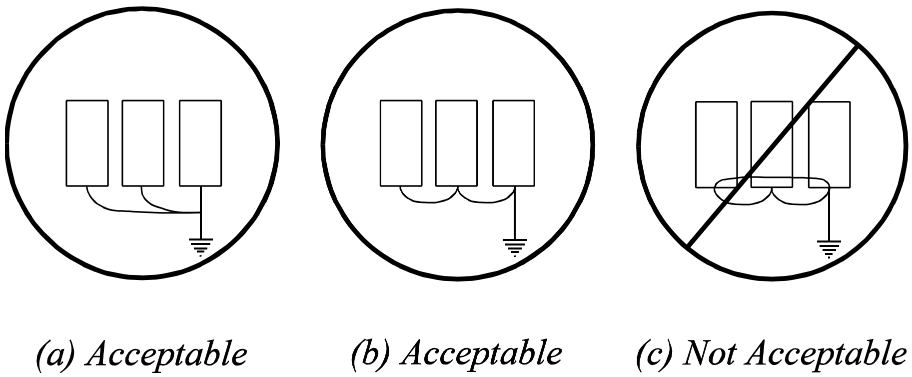
2.2.1 GROUND WIRING

To obtain proper grounding, quality wiring materials and methods should be used.

All grounding in the elevator system must conform to all applicable codes. Proper grounding is essential for system safety and helps to reduce noise-induced problems. The following are some grounding guidelines:

- The grounding wire to the equipment cabinet should be as large as, or larger than, the primary AC power feeders for the controller and should be as short as possible.
- The grounding between equipment cabinets may be branching or a daisy chain, but the wire must terminate at the last controller and NOT loop back (see Figure 2.1).

FIGURE 2.1 Ground Wiring to Controller Cabinets



- Direct solid grounding must be provided in the machine room to properly ground the controller and the motor. Indirect grounding, such as the building structure or a water pipe, may not provide proper grounding and could act as an antenna radiating RFI noise, thus, disturbing sensitive equipment in the building. Improper grounding may also render an RFI filter ineffective.
- The conduit containing the AC power feeders must not be used for grounding.

2.2.2 MAIN AC POWER

Main AC power supply wiring size must be determined by the electrical contractor. Proper motor branch circuit protection must be provided according to applicable electrical codes in the form of a fused disconnect or circuit breaker. Each disconnect or breaker must be clearly labeled with the elevator number.

2.2.3 PUMP MOTOR WIRING

Connect the pump motor for the proper configuration shown on the wiring diagrams. Connect the pump motor leads to the proper terminals on the controller.

2.3 HOISTWAY CONTROL EQUIPMENT INSTALLATION

This section covers the recommended procedures for installing the landing system, terminal slowdown switches, directional limit switches, hoistway access switches (if required), the hoistway access limit switch, and the emergency terminal slowdown switch.

2.3.1 INSTALLING THE LANDING SYSTEM - Refer to the installation drawings for the type of landing system provided.

2.3.2 INSTALLING THE HOISTWAY LIMIT SWITCHES

a. The terminal landing slowdown switches should be installed and adjusted to open approximately one inch beyond the point where a normal slowdown is initiated.

b. The direction limit switches should be installed and adjusted to open approximately one inch beyond the terminal landings.

c. The emergency terminal slowdown switch (if required) should open after the direction limit is open, but before striking the stop ring. Install and adjust the switch where it will not interfere with Inspection or Automatic operation while leveling or releveling. It must also be adjusted to achieve the required operation according to the applicable elevator code.

d. Ensure that the cam that operates the slowdown and limit switches maintains the terminal slowdown switch open until the direction limit switch and emergency terminal slowdown switches (if required) are open.

e. Ensure that the terminal slowdown, direction limit and emergency terminal slowdown switches are held open for the entire runby or overtravel of the elevator.

f. The hoistway access limit switch (if required) should be installed and adjusted to open and stop the elevator (in the down direction), when the top of the elevator is approximately level with the top landing (when the top hoistway access switch is activated while on Access or Inspection operation).

2.3.3 INSTALLING THE LANDING SYSTEM CONTROL BOX (LS-QUTE-2K) - Refer to the drawings in the job prints.

- The location for the landing system box should have already been selected.

- Holes are available on both sides and on the bottom of the landing system box for mounting to any support brackets or structural channels. The mounting of the box should be very firm and solid so that knocking it out of alignment should be difficult. Use 1/4-20 hardware.

- To install the tape into the tape guides on the LS-QUTE-2K landing system box, remove the 2 thumbscrews on the 2 guide assemblies, insert the tape and reinstall the guides with the thumbscrews (tighten firmly). If the installation has the LS-QUTE-2K car top selector with the additional sensor bracket on the rear of the tape, first remove the three 8-32 screws holding the protective 1" wide channel. This channel covers the back of the Door Zone sensors on the upper tape guide bracket. Remove the single standoff that is in the way of the thumbscrew holding the tape guide. Remove the thumbscrews holding the upper and lower tape guides, insert the tape, and reinstall the guides with the thumbscrews (tighten firmly). Reinstall the standoff (do not over-tighten) and the protective channel.

- After inserting the steel tape into the tape guides, check the location of the landing system box. The car should be at the top of the hoistway to make it easier to see if the alignment is causing any stress or binding on the tape guides. Make sure that the box is *vertical* and plumb with the tape. This allows for easy tape movement and avoids excessive wear on the tape guides (using a level is helpful). *Be careful* so as to avoid premature failure of the tape guides.

- Move the elevator to the top and bottom of the hoistway to check for smooth tape movement and to make sure that there is no excessive pressure on the tape guides. Correct any problems immediately.

2.3.4 INSTALLING THE MAGNETIC STRIPS ON THE STEEL TAPE

a. Carefully, read and follow the Magnet Installation instructions in the job prints, but read the rest of these instructions before proceeding.

b. Before installing the magnets, clean the steel tape thoroughly with an appropriate solvent. No oil should be left on the tape as it will interfere with the adhesive backing on the magnets.

c. There are normally five lanes of magnets installed on the side of the tape facing the car. One lane consists of only the LU/DZ/DZX/LD and requires that a 6-inch magnet be installed at each floor. The other lanes have magnets which initiate slow downs or act as AFE set points (remember Absolute Floor Encoding?).

d. If the installation has rear doors, it may have an LS-QUTE-2K landing system which has additional Door Zone sensors on the rear of the upper tape guide assembly. Follow the Magnet Installation instructions in the job prints and install the front and rear Door Zone magnets on the steel tape as shown.

2.3.5 DOOR POSITION MONITOR SWITCH (IF USED)

If you are in a jurisdiction where ASME A17.1 - 1996 or later is being enforced, Door Position Monitor switch(s) connected to the DPM and/or DPMR inputs, must be added to monitor the position of the closed doors. This must be a separate physical limit switch that makes up approximately 1 to 2 inches before the doors lock.

SECTION 3
START-UP

3.0 GENERAL INFORMATION

This section discusses preparing the car to run on Inspection operation and covers the sequence of applying power to the controller and its associated components and verifying proper phase sequence and motor rotation. It also covers completing the initial adjustment of the system to get basic car movement on Inspection operation.

3.1 GROUND CHECK

Perform a ground test before powering up the system. Set the multimeter on the RX1 range (100 to 200 ohm range). Take all measurements with respect to the 1-bus, which is also referred to as the *system common* elsewhere in this manual.

> **NOTE:** A short to ground is defined as a resistance of less than 20 ohms between the 1-bus (common) and the terminal being tested.

a. Remove fuse F4 in the individual car controller cabinet. If the system is a duplex and/or fire recall system, consult the schematics and remove the fuse that powers terminals 2H (Hall Call Power) and/or 2F (Fire Recall System). Check for shorts to ground on the 2H and 2F terminals.

b. Check for shorts to ground on all terminals on the bottom of the SC-SB2K-H Main Relay board. Terminals 89S and 89F are the only terminals that *should be* grounded.

c. Check for shorts to ground on all terminals on the HC-PI/O (and HC-CI/O-E boards, if present).

d. Check for shorts to ground on door operator terminals. Consult the job prints to determine which fuses to remove and check the appropriate terminals for shorts to ground.

3.2 BEFORE APPLYING POWER

> **NOTE:** These instructions also assume adequate electrical troubleshooting experience. Follow the procedure carefully. If the elevator does not respond correctly, check the circuits according to your ability. Proceed cautiously. Read these instructions all the way through to become familiar with the procedure before starting the work.

a. Unplug the screw terminal blocks from the HC-PI/O and any HC-IOX or HC-CI/O-E boards by moving the blocks toward the right. This is done to avoid damaging the boards by accidentally shorting one of the output devices to one of the power buses (terminals 2, 3, or 4) during the initial power-up of the system.

b. With all power OFF, remove one side of the ribbon cable connecting the Main Processor board to the HC-PI/O board at connector C3, by pushing the two latches on C3 open and removing the ribbon cable.

c. In the following instructions, it is assumed that all hoistway doors are closed, but not necessarily locked, and all hoistway and machine room wiring is complete. The hoistway limit switches *must* be adjusted to the manufacturer's specifications. Correct any malfunction before continuing further.

3.3 APPLYING POWER

3.3.1 INITIAL ADJUSTMENTS AND POWER PHASING

We must bypass the ASME A17.1 - 2000 faults as these have yet to be adjusted. Place a jumper between the single pin terminals labeled 2KBP1 and 2KBP2 on the SC-BAH(R) board. Also, invoke the software bypass by entering System mode. Once in System mode place the F6 function switch in the UP position (ON) and set software option ABYP = ON (see section 5.3.2). Now we have two hours to run the car without worrying about nuisance shutdown due to the as yet unadjusted fault monitors. Once two hours have expired simply toggle the MACHINE ROOM INSPECTION TRANSFER switch from NORM to INSP and back to NORM to get two more hours of run time. Note that when the system is on Inspection operation, with the switches set as described above, there is no time limit to running the car with the LTAB Long Term ANSI Bypass option invoked. Please exercise extreme caution when the fault monitors are bypassed.

CAUTION: **Please exercise extreme caution when the fault monitors are bypassed and the jumper is in place between terminal 2 and 9.**

a. Install a jumper wire between terminal 2 and 9 on the SC-SB2K-H board to **override the gate switch, door locks and entire safety string**. Exercise extreme caution.

b. On the SC-SB2K-H board, turn the TEST/NORM switch to TEST. For jobs with a two pole IN-CAR inspection switch, temporarily remove and insulate any wire in terminal ACCN and label it so that it may be reinstalled later. Install a temporary jumper from terminal 18 to terminal ACCN **to bypass the Inspection Switch (COP Access Enable)**. For jobs with a three pole IN-CAR inspection switch, temporarily remove and insulate any wire in terminal INICN and label it so that it may be reinstalled later. Install a temporary jumper from terminal 2 to terminal INICN **to bypass the Inspection Switch (COP Access Enable)**.

WARNING: If the wire to terminal ACCN (or INICN) is **not** removed (step 'b' above) and the jumper is installed between terminals 18 and ACCN (or INICN), **this will bypass the complete safety string.**

c. Verify that fuse F4 is removed to disable the primary controller relay voltage.

d. Check the line side of the main power disconnect switch to make sure that all three legs are at the correct voltage.

e. If a field wire is connected to terminal ACCN on the SC-SB2K-H board, temporarily remove the wire, label and insulate it. This will disable the Car Top Inspection switch. Now place a jumper between 18 and ACCN on SC-SB2K-H.

f. Turn ON power to the controller by closing the machine room disconnect switch.

g. Check pump motor rotation by placing a jumper between 2-bus and terminal P1 on the SC-SB2K-H board. Replace relay YP with a push button type and briefly push in relay YP and note motor rotation. If the rotation is not correct, reverse any two of the three leads at the main disconnect switch. If an RP (Reverse Phase) sensor is provided and the sensor contact does not close when power is applied to the controller (indicated by a light on the sensor that comes on when phase rotation is correct), then 2 of the 3 AC wires that connect to the RP sensor may have to be reversed. Remove jumper between 2-bus and P1.

h. Since the **C1 connector** between the SC-SB2K-H and the HC-PCI/O boards has already been disconnected, the LCD display should show that the **SAFETY STRING** is open by flashing in the upper right-hand corner of the controller. The SAFETY ON light will also be off.

NOTE: Pin 1 on both the ribbon cable connector and the header on the HC-PCI/O board must match. These are designated with arrows on the connector and header. Press the connector in until the latches snap, securing the connector in place.

i. Reinsert the C1 ribbon cable.

j. To provide for an immediate stop once direction is released, place the “Soft Stop” Jumper (JP53 on the SC-SB2K-H board) in the OFF position.

NOTE: The HMC-1000 Controller is equipped with an INSP. SPEED HI-LO switch to allow the car to be run at either high or low speed on car top Inspection or hoistway Access operation. For these operations the car should NOT be run at high speed if the contract speed is greater than 150 fpm.

3.3.2 MOVING THE ELEVATOR ON INSPECTION

NOTE: MCE's HMC-1000 HC controller is designed to operate on Inspection and Access without the computers hooked up during start-up.

a. Turn OFF power at the main disconnect and reinstall fuses F4, F7 and F8 (and any other fuses that may have been removed during the ground check).

b. Turn ON the power at the main disconnect. Place the Relay Panel MACHINE ROOM INSPECTION TRANSFER INSP/NORM switch in the INSP position (this switch is found on the left-hand side of the SC-SB2K-H Relay board).

c. Install a temporary jumper between terminals 18 and ACCN on the SC-SB2K-H board. Turn the power ON and verify that the IN relay is picked, thereby placing the car on Inspection operation. If the IN relay is not picked check the connections in the Safety String.

NOTE: If the car is not completely wired (temporary), check the following:

- wire removed from panel mount terminal DCL
- wire removed from terminal 47 on the SC-SB2K-H board
- jumper from 2 bus to terminal 36 on the SC-SB2K-H board
- jumper from 2 bus to terminal 38 on the SC-SB2K-H board
- jumper from 2 bus to panel mount terminal EPI (if present)

d. Move the car up and down with the Relay Panel MACHINE ROOM INSPECTION UP/DN switch. The following relays must pick in the *up* direction: SAFR1, SAFR2 CHDT, and for UP direction these must pick: MX, M, AA, Y, BB and DELTA. If AA and BB are not picked, check to see that relays IN1 and IN2 have dropped out (de-energized). If no relays are picked, check the F4 fuse and check to see that there is 120VAC between terminals 1 and 2. If SAFR1 and SAFR2 are picked and AA is not, check the starter overload contacts. If SAFR1 and SAFR2 are not picked, briefly jumper 2 to 20 (***bypass the Safety String***). If SAFR1 picks with the jumper in place, the trouble is in the safety string. If SAFR1 still does not pick, check the RP sensor again.

e. Adjust the **Wye-Delta Transfer** timer (see Table 5.1 in Section 5.2.3) on the SC-SB2K-H board to transfer from WYE to DELTA just as the pump motor reaches maximum rpm from a dead stop. For ATL (across the line) motors adjust TRANSFER to delay pick of valves until after pump motor is running at speed.

f. On the SC-SB2K-H board, place the INSP SPEED HI-LO switch in the LO position and adjust the valves for proper Inspection operation.

3.3.3 PREPARING THE CAR TO RUN ON AUTOMATIC OPERATION

a. Turn OFF the power at the main disconnect.

b. Complete and finalize installation and all wiring. Connect the field wires for the car calls, hall calls and PIs into their respective terminals (remember that the plug-in terminals have yet to be inserted into the boards). Connect one probe of the meter to the 1-bus and with the other probe, check all of the call and PI terminals for shorts to ground. Connect the common probe of the meter to the 2, 3 and 4 buses sequentially while checking for shorts to the call, PI, direction arrow and terminals 40 183 and 184.

c. Turn ON power at the main disconnect and probe (DVM set for 120VAC) on the call and PI terminals again. This time, check to make sure that there is no voltage present on any of the PI terminals with respect to the 1-bus. Jumper each of the call terminals one-by-one to ground or terminal 1. Verify that no fuses blow, especially F4. Turn OFF the power at the main disconnect.

d. Plug the call and PI terminal blocks back into the appropriate boards.

e. Remove the jumper from terminal 18 to ACCN and put the field wire back into terminal ACCN on the SC-SB2K-H board. With the power ON, verify that no AC voltage exists on terminal ACCN with respect to the 1-bus. Note that Car Top Inspection prevents Relay Panel Inspection operation by simply removing power from terminal ACCN.

3.4 PREPARATION FOR FINAL ADJUSTMENT

a. Verify that the door operator is operating properly with all door equipment (clutches, rollers, etc.) properly adjusted with the correct running clearances.

b. Verify that the car doors are closed and that all hoistway doors have been closed and locked. Run the car on Inspection through the hoistway to make sure that the hoistway is completely clear. Check to see that the landing system has been installed according to the installation instructions. Place the car at the bottom of the hoistway.

c. Place the TEST/NORM switch on the SC-SB2K-H Relay board in the TEST position.

SECTION 4
FINAL ADJUSTMENT

4.0 GENERAL INFORMATION

At this point all of the steps in Section 3 should have been completed. Please read Section 5 before proceeding: it explains the adjustment and troubleshooting tools available with the computer. This section contains important recommendations and instructions for operating the elevator on Automatic operation.

4.1 RUNNING ON AUTOMATIC OPERATION

Move the car to the bottom landing on Inspection operation and turn the power OFF. Reinsert connector C2 into receptacle C2 on the HC-PI/O board (if previously removed).

> **NOTE:** Pin 1 on both the ribbon cable connector and the header on the HC-PI/O board must match. These are designated with arrows on the connector and header. Press the connector in until the latches snap, securing the connector in place.

a. If the door operator is not working, pull the door fuses and close the doors so that the door clutch will not hit any of the door lock rollers. Take whatever steps are necessary to keep the installation safe, but make sure that the car top is still accessible after closing all of the doors. Turn ON the AC power to the elevator.

b. Temporarily take the car off of Inspection operation. If the Diagnostic Indicators do not show Test Mode, see what message is being displayed and correct the problem. For example, if the indicators show that the car is on Fire Service Phase 1, a jumper must be connected between terminal 2 on the back plate and terminal 38 on the SC-SB2K-H board in order to run the car on Normal operation. Remove the jumper once the Fire Service input is brought into the controller. Place the car on Inspection.

> **NOTE:** If the car is not completely wired (temporary), check the following:
> - wire removed from panel mount terminal DCL
> - wire removed from terminal 47 on the SC-SB2K-H board
> - jumper from 2 bus to terminal 36 on the SC-SB2K-H board
> - jumper from 2 bus to terminal 38 on the SC-SB2K-H board
> - jumper from 2 bus to panel mount terminal EPI (if present)

4.1.1 STATUS AND DIAGNOSTIC INDICATORS

Section 5 of this manual describes the onboard diagnostic tools that are available through the Computer Swing Panel. These diagnostic tools simplify the adjustment and troubleshooting of the system. It is important that Section 5 be read and understood before proceeding.

When the *Diagnostics On/Norm* switch is in the Norm position, the Diagnostic Indicators indicate when the system is ready for Normal operation. The Diagnostic Indicators must be scanning from right to left one light at a time. If the Diagnostic Indicators are flashing any other way, an abnormal or special condition exists. Table 5.1 (MC-MP Status and Error Messages) provides a list of abnormal or special conditions. Note that some conditions take priority over others. For example, if the safety string is open and the system is in Fire Service mode, the computer will show that the safety string is open and will expect the mechanic to correct this problem first since it is a higher priority condition.

Once the safety string has been made up and the computer recognizes this, then the computer will show that the car is on Fire Service mode. After successfully bringing in the Fire Service input, the computer will then start its normal scan. Once scanning normally, it is then possible to place calls and run the elevator automatically.

The controller has indicators for car position and direction. All calls are also displayed on the controller. A special feature is provided on the HC-CI/O Call Input/Output boards to show when an incandescent call light bulb is burned out. If a call bulb is burned out, the associated call LED on the HC-CI/O board will be lit dimly when a call is not registered and will be lit normally when a call is registered. If this job has non-incandescent indicators for calls, such as neon, check with MCE to make sure the Call boards are arranged appropriately.

4.1.2 ABSOLUTE FLOOR ENCODING

NOTE: To avoid conflicts between the A17.1 fault monitors and the next several tests, place a jumper between 2KBP1 and 2KBP2 on SC-BAH(R). Enter system mode on swing panel and set ABYP = ON (See Section 5.3.2).

All controllers are shipped with AFE as standard. If the car is not at a landing when power is turned ON, the controller will generate a down direction command and the car will move toward the closest landing, provided that all abnormal conditions have been corrected. When the car reaches a landing and is within the Door Zone (relay DZ picked) with leveling completed (relays LU and LD not picked) the controller reads the floor code vanes or magnets and corrects the Position Indicator. If the car is on Automatic Operation, and if a home floor has been designated, the car will move to the home landing at this time.

If the car is at a landing, within the Door Zone (relay DZ picked) with leveling completed (relays LU and LD not picked) when AC power is turned ON, the controller will read the floor code vanes or magnets at the landing and correct the Position Indicator. Again, if a home floor has been designated the car will move to this landing to park.

4.1.3 REGISTERING CAR CALLS

In the process of making final adjustments to the controller, periodically you will be asked to register car calls. A call or series of calls can be registered at the controller by momentarily placing a jumper between terminal 1 (system common) and the desired car call terminal or terminals on the HC-PI/O or HC-CI/O-E board, and then between terminal 2 and terminal 45 to allow the car to travel to each call. The car may move immediately after the first call is put in, or it may wait several seconds before moving.

CAUTION: The call terminals on the HC-PI/O and HC-CI/O-E board should *never* be connected to any of the power terminals (such as 2, 3, 4, etc.). If this happens and the call is turned on, it will blow the resistor-fuse or triac which plugs into the Call board. Later versions of these boards may have plug-in zener diodes. These parts are designed to be field replaceable and spares are provided in unused positions on the Call board, or are available from MCE. DO NOT JUMPER THESE PLUG-IN COMPONENTS AS IT MAY DESTROY THE BOARD OR OTHER CONTROLLER COMPONENTS. If any of these components should blow, FIND OUT WHY instead of constantly replacing them, as the constant faults can eventually damage the board.

4.1.4 TEST MODE OPERATION

The purpose of Test mode is to allow easy and convenient operation of the car so that the final adjustments can be made without cycling the doors. When the elevator is operated in the TEST mode, the elevator doors do not open. The door open relays are disconnected automatically during Test mode operation.

Put the car into TEST mode by placing the TEST/NORMAL switch on the SC-SB2K-H (Main Relay board) in the TEST position. Note that when the TEST/NORMAL switch is in the TEST position, it puts the car on Independent Service, provided that the Car Top Inspection and Relay Panel MACHINE ROOM INSPECTION TRANSFER switches are in the OFF or NORMAL positions. In that case, the Status Indicators (vertical LEDs) should show *Independent Svc*., however, the scrolling text on the Alphanumeric Display will show *Test Mode*. If the expected indication is not displayed, check to see what message is being displayed and correct the problem (see Section 5.1.1).

During the final adjustments, calls will be placed at various floors with the TEST/NORM switch on TEST. To get the car to move, a jumper must be connected between terminal 1 (or ground) and the desired car call terminal, until the car actually starts. If a CRT is available, calls can be entered using the CRT terminal's F3 screen.

Operation while in Test mode should be easy to understand by knowing the following:

a. Every time the car stops, a non-interference timer *must* elapse before the car can move again (the car will not move unless there is another car call). Note that after the timer has elapsed, the car will move immediately as soon as the next car call is placed (the car will not move if the system is a single button collective system and there is no jumper from terminal 2 to terminal 45). Placing a car call right after the car stops will require the non-interference timer to elapse before the car can move again.

b. Simply having one or more car calls registered will not necessarily cause the car to move. It will be necessary to jumper terminal 2 to terminal 45 to create a Door Close Button input to get the car to move. If the car is not a single button collective but is a selective-collective, the jumper from terminal 2 to 45 will not be necessary. Leave a jumper connected from terminal 1 to the last car call in the line of calls that have been placed. This will create a constant pressure signal on the car call which is an alternate means of creating a Door Close Button signal to get a car that is on Independent Service to leave the landing. However, the jumper from terminal 2 to terminal 45 may be more convenient.

c. If a jumper from terminal 1 is touched to the car call input for the floor where the car is located, it will reestablish the non-interference timer and it must elapse before the car can move again.

d. If the elevator is trying to level, it will not pick high speed and leave the landing until it has completed the leveling process. Drive Unit speed adjustments and direction limits at terminal landings may cause this problem.

e. If any of the inputs that open the door are active (Safety Edge On, Photo Eye On, Car Call input grounded to 1 for the floor matching the Position Indicator, etc.) the car will not leave the landing.

f. Both slowdown switch inputs (terminals 11 and 13) should *never* be open simultaneously. One or both should have power if the safety circuit is complete and the doors are closed and locked.

4.1.5 SWITCHING TO AUTOMATIC OPERATION

a. Place the car on Inspection operation.

b. Move the car to the bottom terminal landing. Check to see if the DZ relay is picked. If not, move the car on Inspection to place it in the Door Zone.

c. Place the Relay Panel MACHINE ROOM INSPECTION TRANSFER switch in the NORM position. If the car is not at a landing, it will move to a landing. If the car is at a landing but not in the door zone, either the LU or LD relays should pick and the car should perform a relevel. If the relevel in not successful, check the following:

- If the LD relay is picked, but the brake and other relays are not, the down direction limit switch may be preventing the leveling down operation.

- If the car is trying to level, it will not leave the landing for a call until the leveling is complete. Move the limit switch if necessary.

The Status Indicator lights should now display the indication for Independent Service operation. At this time the Position Indicator should match the actual car location. Note that all of the Position Indicators and direction arrows are conveniently displayed on the controller. All the calls are also displayed on the controller.

4.2 FINAL ADJUSTMENTS

4.2.1 DOOR OPERATOR ADJUSTMENTS

Install the fuses for the door operator(s) and complete the final adjustments. Doors can be opened at 3" before the floor or at the floor (non-pre-opening option). Hydraulic elevators are usually set up to open the doors only after the car stops, but pre-opening is available. Contact MCE Customer Service.

4.2.2 HYDRAULIC VALVES

Adjust hydraulic valves for proper speed, acceleration, deceleration, etc. and check contract speed. A hardware timer on the SC-SB2K-H board automatically provides pump motor overrun for Soft Stop operation. The Soft Stop jumper must be in the ON position for Soft Stop operation to be enabled or in the OFF position for it to be disabled.

4.2.3 SLOWDOWN AND LIMIT SWITCHES

Disconnect the stepping switch inputs for 3 or more landings and verify proper operation of all slowdown and limit switches for slowing and stopping the car at both terminal landings.

4.2.4 HALL CALLS

Place hall calls for all of the landings and make sure all hall calls function properly.

4.2.5 OPTIONS

Verify the operation of the following options: Independent Service, Fire Return Phase 1 (Main Floor and Alternate Floor operation, if provided), Fire Phase II In-Car operation, and any other options provided.

4.2.6 DOOR OPEN/CLOSE PROTECTION

The elevator controller is provided with door open protection and door close protection. If the doors do not open after several seconds, the car will give up and continue to the next call. After the car starts to close the doors and the doors do not lock, it will recycle the doors open and attempt to close the doors three times before a DLK fail error.

4.2.7 MOTOR LIMIT TIMER

A motor limit timer is provided to take the car to the bottom landing and open the doors if the motor is operating for too long.

4.2.8 VALVE LIMIT TIMER

The same is true for the valves with the down valves being turned off and the doors reenabled if the car is at a floor.

4.2.9 STUCK BUTTON PROTECTION

Stuck button protection is also provided for both car calls and hall calls.

4.2.10 RELEVEL OPERATION

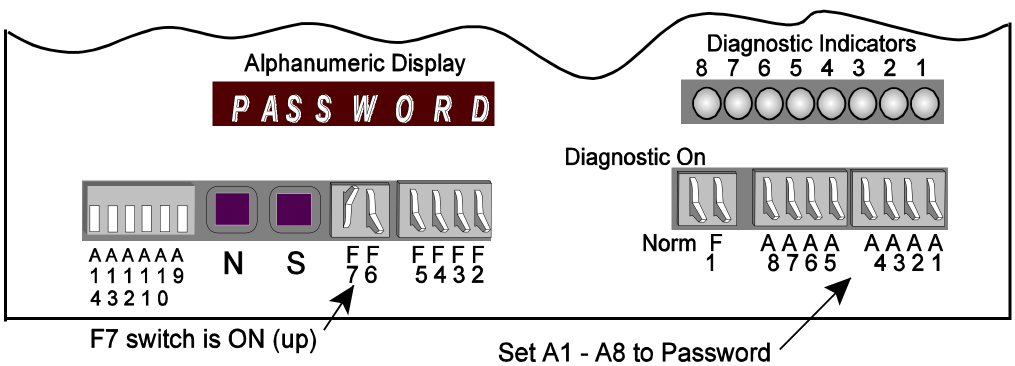
If the car relevels *up* after stopping at the floor, it will respond normally (instantly) the *first* time it relevels up. Any additional up leveling operations after the first one will be *delayed* by a computer-controlled timer (usually 3 seconds). This process will repeat itself every time the car runs to another floor (the first up relevel is always normal, not delayed). Down leveling is always normal and not involved with this timer.

4.3 SETTING THE CAR NETWORK ID

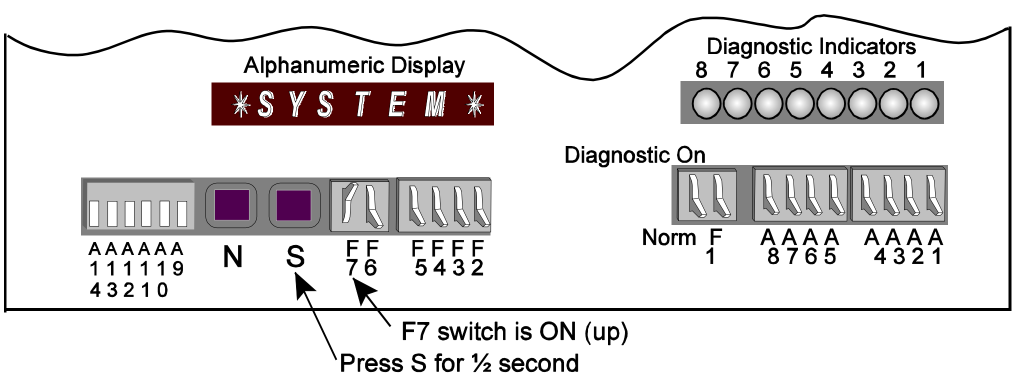
The Car Network ID identifies each local car controller to the Group Supervisor for communication purposes. With Release 4 Communication software this parameter is programmable and must be set for each local car in the Group System.

Using the optional CRT terminal - The optional CRT terminal connected to the local car controller may be used to set CNID Car Network ID. For instructions on using the CRT terminal, refer to the section in the Computer Peripherals Manual, MCE part #42-02-CP00 titled *Using the CRT Terminal*.

Using the Computer Swing Panel - The Car Network ID may be set using the Computer Swing Panel EOD in System Mode. To enter the System Mode, set the switches as follows:

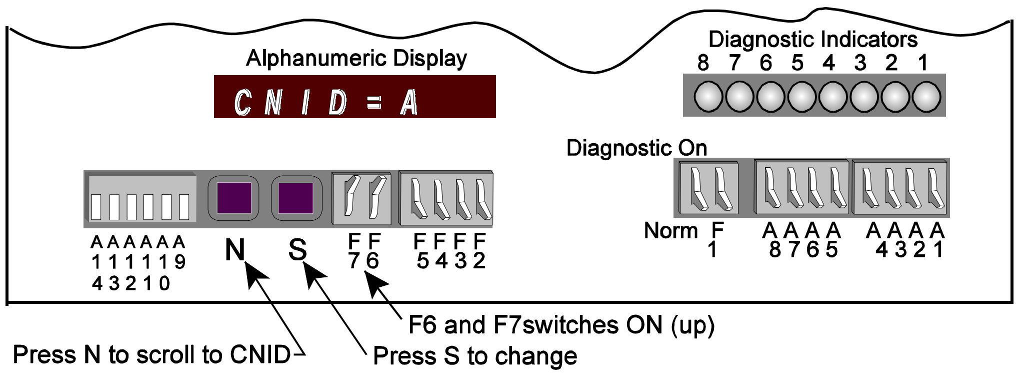


With the F7 switch in the ON position, the alphanumeric display shows **PASSWORD**. Set the A1 - A8 switches to the password value. If no password has been programmed for this job (which is normally the case), set A1 - A8 to OFF (down).



Press the **S** pushbutton for ½ second. The alphanumeric display changes to **SYSTEM**. While in System Mode, the group of eight vertical status LEDs scan from bottom to top indicating that System Mode is active.

SETTING THE CNID SOFTWARE OPTION - Once in System Mode, place the F6 switch in the ON (up) position. The first software option will be shown on the display. Press **N** to scroll to the CNID Car Network ID option. Then press **S** to change the setting.



Once the desired CNID setting is displayed, exit System Mode by placing switches F6 and F7 in the OFF (down) position.

WARNING: Before the Elevator can be turned over to normal use, it is very important to verify that no safety circuit is bypassed. The items to be checked, include, but are not limited to:

* Check that the hierarchy of the inspection inputs is correct. Car top inspection must take priority over in car, hoistway access and machine room inspection modes. In car must take precedence over hoistway access and machine room inspection. Hoistway access must take priority over machine room inspection.
* No jumper between 2KBP1 and 2KBP2 on SC-BAH(R)
* No jumper between terminals 2 and 15 (SC-SB2K).
* No jumper between terminals 4 and 9 (SC-SB2K).
* No jumper between terminals 9 and 10 or 12 (SC-SB2K).
* No jumper between terminals 10 and 11 (SC-SB2K).
* No jumper between terminals 12 and 13 (SC-SB2K).
* No jumper between terminals 16 and 17 (SC-SB2K).
* Options LTAB and ABYP are set to OFF and the the controller is in normal mode.

SECTION 5
ONBOARD DIAGNOSTICS

5.0 GENERAL INFORMATION

The HMC-1000 Hydraulic controller includes user-friendly diagnostic tools that help the mechanic install and service the equipment. The diagnostic tools available on the controller include an optional CRT terminal and the Enhanced Onboard Diagnostics (EOD). The CRT terminal provides the elevator mechanic with a set of easy-to-use menus for the purpose of servicing and troubleshooting the controller. More information about the CRT is available from the MCE Computer Peripherals manual. This section covers the Computer Swing Panel's Enhanced Onboard Diagnostics.

5.1 ENHANCED ONBOARD DIAGNOSTICS (EOD) OVERVIEW

The Computer Swing Panel provides the Enhanced Onboard Diagnostics (EOD). A quick look at the switches and LEDs provides an overview of the elevator and its functions. Once familiar with the equipment, an elevator mechanic can understand the current operating conditions of the elevator and diagnose a problem using the EOD. No external devices are required to view the status of the elevator and see what the elevator control system is actually trying to do. The Enhanced On-Board Diagnostics operate in three modes, Normal, System , and Diagnostic. All three modes are discussed in detail in this section.

5.1.1 DESCRIPTION OF EOD LIGHTS AND SWITCHES

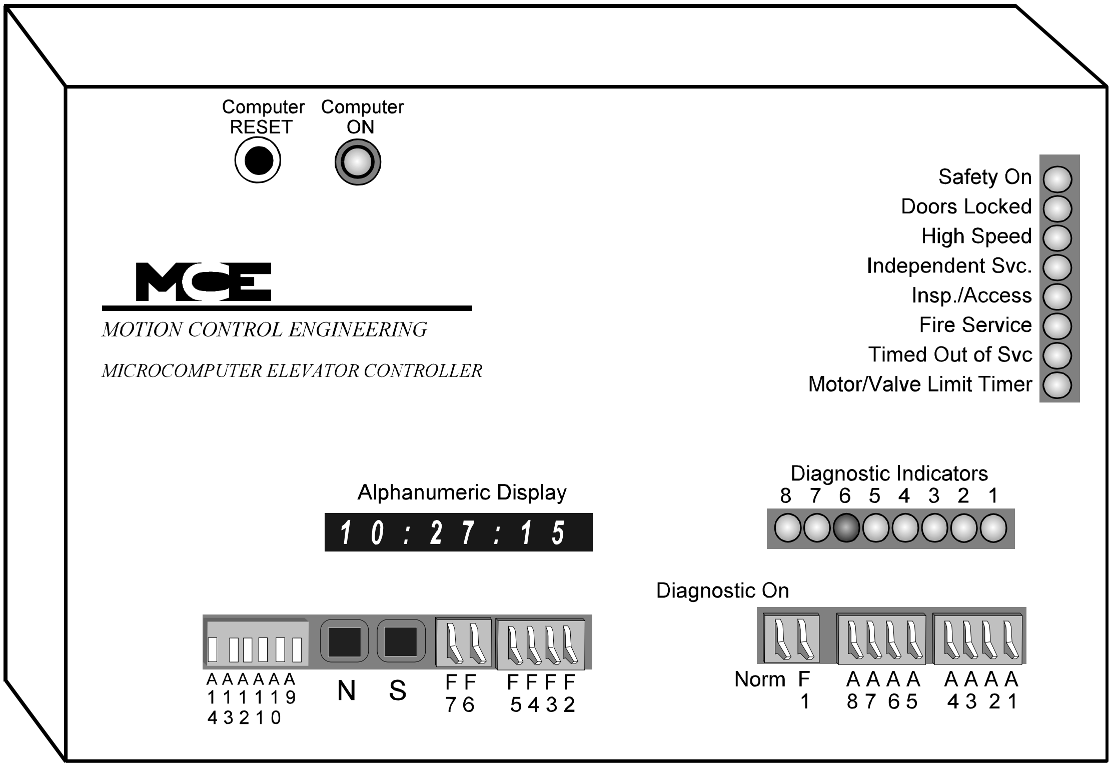
The following is a description of the EOD indicators and switches (see Figure 5.1)

COMPUTER ON LED - The Computer ON LED, when it is ON continuously, indicates that the MC-MP2-2K Main Processor board is functioning normally and is completing its program loop successfully. If the Computer ON LED flashes ON and OFF, it means that the program is not looping successfully and the Main Processor board is malfunctioning. When this happens the SAFR2 relay is dropped and all further operation is shut down. Check the EPROM chip to make sure it is installed properly. Refer to Appendix A, *Disassembling the Computer Swing Panel* and Appendix B, *Changing PC Boards or EPROMS*.

COMPUTER RESET BUTTON - Pressing the Computer RESET button on the front of the Swing Panel causes the MC-MP2-2K (Main Processor board) and the optional MC-CGP-4 (Communication Processor board) to reset. If the elevator is running, resetting drops the SAFR1 and SAFR2 safety relays and brings the elevator to an immediate stop. The elevator then goes to the closest floor to correct its position before responding to any calls. Existing call and PI information is lost when the microcomputer is reset.

Pressing the Computer RESET button on the Computer Swing Panel turns this light OFF and it will remain OFF while the RESET button is depressed. The Computer ON LED turns back ON when the RESET button is released. The Main Processor board is also equipped with a software system monitor that drops relay SAFR2 if for any reason the software system fails to execute its program.

FIGURE 5.1 Computer Swing Panel, Front View



STATUS INDICATORS - (vertical LEDs on the front of the Swing Panel) - These lights indicate the elevator's status. When these lights are ON, they mean the following:

Safety On	- the safety circuit is closed.
Doors Locked	- the door lock contacts are closed.
High Speed	- the elevator is running at high speed.
Independent Svc.	- the elevator is on Independent Service.
Insp./Access	- the elevator is on Hoistway Access, Car Top or Relay Panel Inspection operation.
Fire Service	- the elevator is on Fire Service operation.
Timed Out of Svc	- the TOS timer has elapsed.
Motor/Valve Limit Timer	- the Motor or Valve Limit Timer has elapsed.

DIAGNOSTIC INDICATORS - The eight horizontal diagnostic indicator lights (MP Diagnostic Indicators) have two functions. When in Normal mode, they indicate the current status or error condition (see Section 5.2.2) and when in Diagnostic mode, they indicate the contents of computer memory (see Section 5.4.1).

ALPHANUMERIC DISPLAY - The eight character alphanumeric display is used to provide user friendly interaction between the control equipment and the elevator mechanic by displaying alphanumeric messages (see Section 5.2.1).

ADDRESS SWITCHES (A1 - A8) - These switches enable the mechanic to look at the memory on the MC-MP2-2K Main Processor board (see Section 5.4.1). They are also used for entering calls into the system (see Section 5.4.2). These switches are ON in the up position and OFF in the down position.

ADDRESS SWITCHES (A9 - A14) - These address switches, on the left side, are primarily used by the factory.

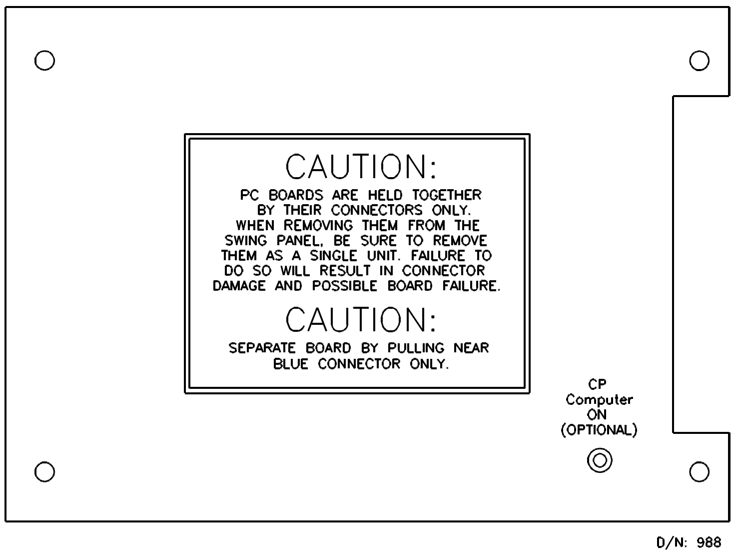
CAR A/CAR B (F1) SWITCH - In a duplex configuration, this switch selects which car's information is being displayed and can be accessed by the A1 - A8 switches. This switch is also used to access the COM Ports when in SYSTEM mode.

DIAGNOSTIC ON/NORMAL SWITCH - This switch puts the system in Diagnostic mode in the up position and in Normal mode in the down position (see Section 5.4).

FUNCTION SWITCHES (F2 - F7) - These switches are used to access diagnostic information for viewing and changing settings in the Normal and System modes of operation (see Sections 5.2 and 5.3).

PUSHBUTTONS N AND S - These pushbuttons are used in different diagnostic modes to help scan through the choices available and to make selections.

FIGURE 5.2 Computer Swing Panel (Back Plate)



CP COMPUTER ON INDICATOR LIGHT - The CP Computer ON LED on the optional MC-CGP-4 board indicates that the Communication Processor board is functioning normally and is completing its program loop successfully. The MC-CGP-4 board is equipped with an auto reset feature that will cause the elevator to go through a resetting process if, for any reason, the program loop cannot be completed.

5.2 NORMAL MODE (EOD)

The following is a description of the indicators and switches used in Normal mode, and the settings which can be viewed and changed. Begin with all switches in the OFF (down) position as shown in Figure 5.1. Specifically, the Diagnostic On/Norm and the F7 switches *must* be in the down position. In the Normal Mode, the F2, F4 and F5 switches are used to access and set the following:

F2 - Adjustment of Elevator Timers (see Section 5.2.3)
F4 - Setting the Real Time Clock (see Section 5.2.4)
F5 - Viewing the MP Internal Flags (see Section 5.2.5)
F2 thru F7 - Resetting the MC-CGP parameters (see Section 5.2.6)

5.2.1 ALPHANUMERIC DISPLAY (DEFAULT DISPLAYS)

The alphanumeric display, on the front of the Computer Swing Panel (see Figure 5.1), is used to communicate information in a user-friendly format. Upon power up, the message MP2 VERSION NUMBER X.XX.XX is scrolled. If the message PASSCODE REQUEST is then scrolled on the display, refer to Section 5.3.6 *Setting and Resetting the Passcode Option.*

The alphanumeric display is used in a number of special diagnostic functions that are available on the controller. Depending on the configuration of the control system, the available displays include the following:

- scrolling status and error messages
- temperature (Celsius)
- temperature (Fahrenheit)
- measured load
- trip counter
- software versions
- time of day

To scroll through the available displays (change what is currently being displayed on the alphanumeric display), press and hold the N push-button.

NORMAL OP

STATUS AND ERROR MESSAGES - Status and error messages are scrolled across the alphanumeric display. The message NORMAL OPERATION is scrolled when no other status or error condition(s) exist. Table 6.2 provides a list of scrolling messages. Table 6.3 provides descriptions and troubleshooting information for the Standard Status and Error Messages and Table 6.4 provides a list of ASME A17.1-2000 status and error messages, including descriptions and troubleshooting information.

Note that at any time, more than one status or error condition may exist. But the Alphanumeric Display can show only one message at a time. The message considered to be of highest priority will be displayed first. For example, if the car is on Independent Service *and* the safety circuit is open, the display will scroll SAFETY CIRCUIT IS OPEN. Once the problem with the safety circuit is corrected, the display will scroll the message INDEPENDENT SERVICE OPERATION. When Independent Service is turned OFF, NORMAL OPERATION will again be displayed.

TMP = 45C

TMP = -15C

TEMPERATURE (CELSIUS) - This mode displays the temperature in degrees Celsius. This mode is available only if the controller has been configured with the ability to connect a temperature sensor. In the examples, 45C represents 45° Celsius and -15C represents -15° Celsius.

TEMPERATURE (FAHRENHEIT) - This mode displays the temperature in degrees Fahrenheit. This mode is available only if the controller has been configured with the ability to connect a temperature sensor. In the examples, 104F represents 104° Fahrenheit and -27F represents -27° Fahrenheit.

`T M P = 1 0 4 F`

`T M P = - 2 7 F`

TRIP COUNTER - This mode provides the ability to view and/or reset a six-figure trip counter. The trip counter records the number of high speed runs made by the elevator since the last time the counter was reset to zero. The example on the right indicates that the car has made two thousand runs since the counter was last reset.

`T = 0 0 2 0 0 0`

RESETTING THE TRIP COUNTER - A trip counter may be reset to zero by pressing and holding the S pushbutton while the trip counter is displayed. Once the S pushbutton is pressed, the alphanumeric display will display **CLEAR: 5**, indicating that the counter will be cleared in 5 seconds. If the button is held for 5 seconds, the timer will count down from 5 to 0 and the counter will be reset to zero. The 5-second delay is provided to prevent an accidental reset of the counter. Once cleared, the counter will display the value zero.

`T = 0 0 0 0 0 0`

MOTOR STARTER COUNTER - This mode provides the ability to view and/or reset a six-figure motor starter counter. The motor starter counter records the number of times that the motor starter contactor has been energized since the last time the counter was reset.

`S = 0 0 2 0 0 0`

RESETTING THE MOTOR STARTER COUNTER - The motor starter counter may be reset to zero by pressing and holding the S pushbutton while the counter is displayed. Once the S pushbutton is pressed, the alphanumeric display will display **CLEAR: 5**, indicating that the counter will be cleared in 5 seconds. If the button is held for 5 seconds, the timer will count down from 5 to 0 and the counter will be reset to zero. The 5-second delay is provided to prevent an accidental reset of the counter. Once cleared, the counter will display the value zero.

`S = 0 0 0 0 0 0`

SOFTWARE VERSIONS - On local car controllers the version number of the MP Main Processor and CGP Communication Processor software are displayed. The following messages are scrolled across the alphanumeric display:

MP VERSION NUMBER:	X.XX.XX	(X.XX.XX is the version number)
CGP VERSION NUMBER:	X.XX.XX	(X.XX.XX is the version number)
DDP VERSION NUMBER:	X.XX.XX	(X.XX.XX is the version number)

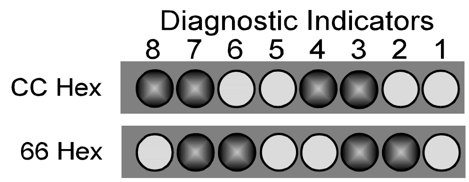
TIME OF DAY - This mode displays the time of day in a 24-hour military format (hours, minutes and seconds). Refer to Section 5.2.4 to change or adjust the time. The example shown on the right represents the time 1:30 p.m.

`1 3 : 3 0 : 0 0`

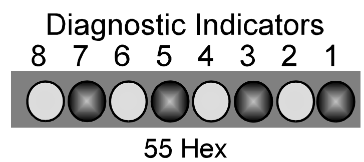
5.2.2 DIAGNOSTIC INDICATORS

MP2 DIAGNOSTIC INDICATORS - The MP2 Diagnostic Indicators are located on the front of the Computer Swing Panel. During normal operation these lights scan from right to left (indicating that the MP program is looping properly) or flash ON and OFF to indicate an error or status condition. If the car is connected to a Group Supervisor in a multi-car group system, the lights will scan from right to left, then left to right, indicating proper communication between the Car Controller and the Group Supervisor.

When a status or error condition exists, the Diagnostic Indicators flash one of several messages depending on the software version (MP2 version number scrolls on boot up):



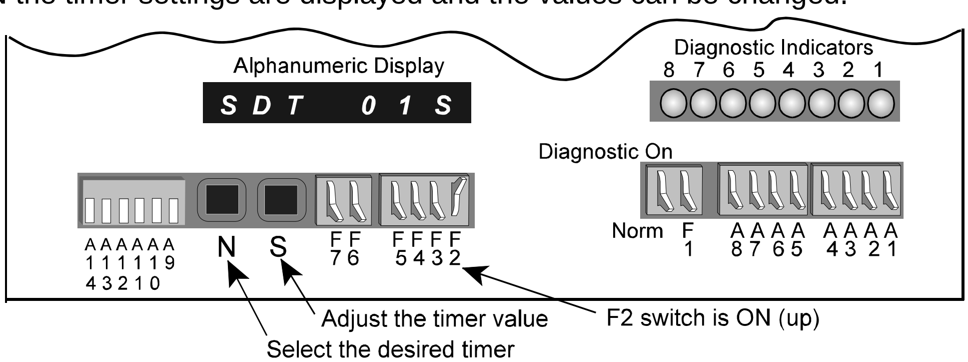
- Software versions 8.02.00 or earlier flash the MC-MP-1ES messages.
- Software version 8.03.00 flashes CC Hex.
- Software versions 8.04.00 or later flash 66 Hex. Set the alphanumeric display to scroll the status or error message. Refer to Table 6.1 *MC-MP2 Scrolling Messages Lookup* or find the message in the Index and then refer to Table 6.3 *Standard Status and Error Messages* for a description and troubleshooting information for the scrolling message.
- ASME A17.1 - 2000 status and error conditions are indicated by the diagnostic indicators flashing 55 Hex. Set the alphanumeric display to scroll the status or error message. Refer to Table 6.4 *ASME A17.1 - 2000 Status and Error Messages* for a description and troubleshooting information for the scrolling message.



If the scrolling status or error message is not immediately displayed, press the N pushbutton until the scrolling message appears (see Section 5.2.1 ALPHANUMERIC DISPLAY - STATUS AND ERROR MESSAGES).

5.2.3 ADJUSTMENT OF THE ELEVATOR TIMERS

To view or adjust the elevator timing functions, set the switches as shown. When the F2 switch is ON the timer settings are displayed and the values can be changed.



For example, when the F2 switch is turned ON, the display reads **SDT 01S**. SDT is the flag for Short Door Dwell Timer. The number (01S) means that the Short Door Dwell Timer has been set for 01 second. If the value had been in minutes, the last letter displayed would be M instead of S. Pressing the N pushbutton (for next) advances the display to the next available programmable timer. Constant pressure on the N pushbutton causes the display to scroll through all the available programmable timers. Table 5.1 provides a listing of the programmable timers and their ranges.

Once a programmable timer has been selected using the N pushbutton, the timer can be adjusted to a desired value by using the S (for select) pushbutton. The adjustment range for each timer is pre-set (see Table 5.1). Constant pressure on the S pushbutton increases the timer value by one (second or minute) and causes the display to flash until the value reaches the upper limit, at which point it automatically starts over from the lower limit. When the A1 switch is placed in the ON (Up) position, pressing the S pushbutton causes the timer value to decrease. Release the S pushbutton when the desired value is displayed. When the S pushbutton is released, the display flashes for three seconds. After the display stops flashing, the new timer value has replaced the old value.

NOTE: Timers listed in Table 5.1 are not included if the corresponding inputs/outputs/options are not available on your controller.

TABLE 5.1 Timers and their Ranges*

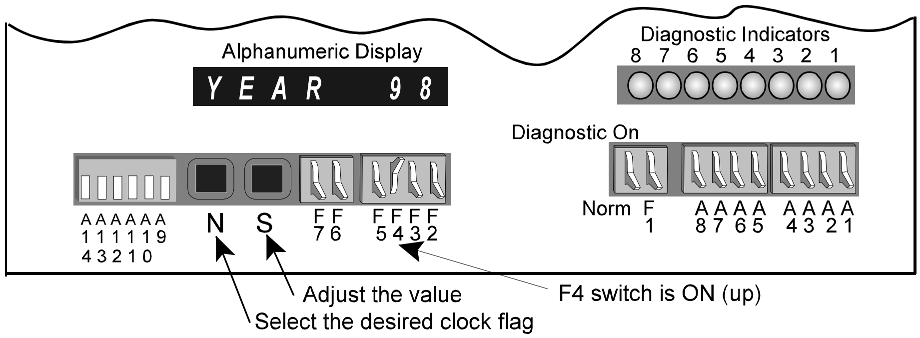
Timer	Description	Timer Range
ADAC	**ADA Car Call Door Dwell Timer.** This timer provides the minimum door dwell time when responding to a car call, as required by the ADA. This timer is not shortened by the activation of a button or door reopening device.	01-120 seconds
ADAH	**ADA Hall Call Door Dwell Timer.** This timer provides the minimum door dwell time when responding to a hall call, as required by the ADA. This timer is not shortened by the activation of a button or door reopening device.	01-120 seconds
ASTP	**Automatic Stop Door Dwell Timer.** This timer defines the amount of time the doors will stay open when the car has performed an “automatic stop”.	01-30 seconds
CCT	**Car Call Door Dwell Timer.** This timer provides the door dwell time when the car is responding to a car call.	01-120 seconds
DHLD	**Door Hold Timer.** This timer defines the amount of time the doors will stay open when the door hold button is pressed. This timer will only appear if the controller has been configured with a door hold button (DHLD input).	01-240 seconds
DRBZ	**Door Buzzer Timer.** This timer indicates the length of time that the door buzzer output should be active before door closing is initiated.	0-30 seconds
FLO	**Fan and Light Output Timer.** This timer defines the amount of time that the fan and light output (FLO) will keep the car fan and lights operative in the absence of demand on the car. This timer will only appear if the controller has been configured with a fan and light output (FLO output).	01-25 minutes
HCT	**Hall Call Door Dwell Timer.** This timer provides the door dwell time when the car is responding to a hall call.	01-120 seconds
HOS2	**In-car Hospital Service Timer.** This timer defines the amount of time that the car will remain at a floor in response to a hospital emergency call. If the timer elapses before the car is placed into “in-car hospital service”, the car will revert back to normal operation. This timer will only appear if the controller has been configured with hospital emergency service.	01-120 seconds
IDLE	**Idle Demand Timer.** This timer defines the amount of time that will pass before an idle car is automatically moved to the next floor. This feature is useful in applications in which it is desirable to lubricate the bearings and/or exercise the brake mechanism periodically to prevent friction at initial car movement. This timer may be turned OFF to disable this function.	01-60 minutes
LOT	**Lobby Call Door Dwell Timer.** This timer provides the door dwell time when the car is responding to either a car call or a hall call at the lobby landing (as specified by the adjustable control variable “LBBY”).	01-120 seconds
PHEB	**Photo Eye Bypass Timer.** This timer defines the amount of time that will pass before an active optical door reopening device is ignored and/or nudging is activated. The computer monitors the PHE input for continuous activation and, should the PHE input remain active for the amount of time defined by the PHEB timer, the PHE input is ignored and/or nudging operation invoked (depending on the controller configuration).	10-240 seconds

TABLE 5.1 Timers and their Ranges*

Timer	Description	Timer Range
PRIS	**In-car Priority Service Phase II Timer.** This timer defines the amount of time that the car will remain at a floor in response to a Priority Service call. If the timer elapses before the car is placed into "In-car Priority Service", the car will revert back to normal operation. This timer will only appear if the controller has been configured with In-car Priority Service.	01-120 seconds
PRKD	**Parking Delay Timer.** This timer represents the amount of time that will pass before an idle car will park at the specified parking floor (if applicable).	01-120 seconds
SDT	**Short Door Dwell Timer.** This timer defines the door dwell time that will be provided when a door reopening device has been activated.	01-120 seconds
SEPT	**Mechanical Safety Edge Protection Timer.** This timer defines the amount of time before an active mechanical safety edge is ignored and/or nudging is activated. If a mechanical safety edge is used (as specified by the adjustable control variable MSAF), the computer monitors the SE input for continuous activation and, should the SE input remain active for the amount of time defined by the SEPT timer, the SE input is ignored and/or nudging operation invoked (if applicable).	01-240 seconds
SFSP	**Soft Stop Timer.** Determines the amount of time the pump will continue to after the elevator has stopped, to allow the valves to fully close.	0.0-1.0 seconds
TOS	**Time Out of Service Timer.** This timer is used to determine that a car has been prevented from responding to a car or hall call demand. Once this timer elapses, the car's "in service" status is removed to allow hall calls assigned to the car to be reassigned to another car.	15-240 seconds
UTS1, UTS2, UTS3	**Up to Speed Timer.** These timers determine the amount of time required for the motor to accelerate to nominal speed. In a Wye-Delta configuration they determine how long the motor should run with the Wye contactor before switching to the Delta contactor.	1.0-8.0 seconds
YD01, YD02, YD03	**Wye-Delta Transfer Timer.** In a Wye-Delta configuration, these timers determine the delay before picking the Delta contactor after the Wye contactor is dropped.	150-500 milliseconds

**Some timers are not included if the corresponding inputs/outputs are not programmed.*

5.2.4 SETTING THE REAL TIME CLOCK



To adjust the real time clock, set the switches as shown. The F4 function switch is used to access the clock parameters located on the Main Processor board.
Placing the F4 switch in the ON (up) position causes the alphanumeric display to show the current year. The following table lists all the clock parameters and their adjustment ranges.

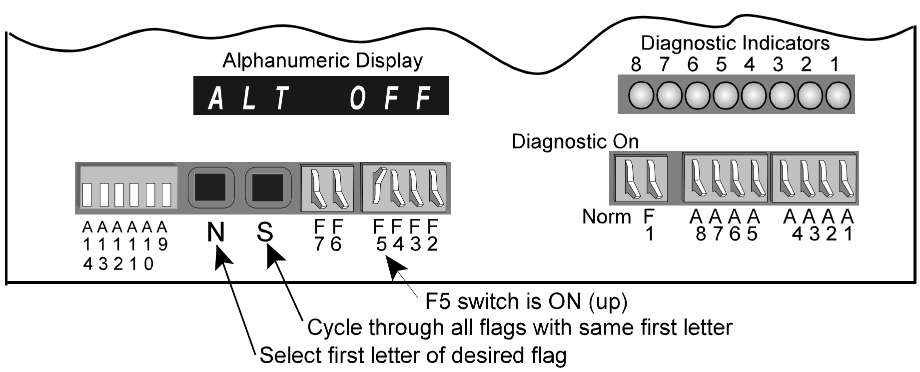
TABLE 5.2 Clock Parameters and their Ranges

Parameter	Range	Parameter	Range
YEAR	00 - 99	DATE	01 - 31
MONTH	01 - 12	HOUR	00 - 23
DAY	MON. - SUN.	MIN (MINUTE)	00 - 59

Press the N pushbutton to select the next parameter. Constant pressure on the N pushbutton causes the display to scroll through all of the real time clock parameters. Once a parameter has been selected, the value can be changed by pressing the S pushbutton. Constant pressure on the S pushbutton increases the value by one, until the value reaches the upper limit, at which point it automatically starts over from the lower limit. Release the S pushbutton when the desired value is displayed. The new value is saved immediately. Return the F4 switch to the OFF (down) position to exit the clock parameter adjustment menu.

5.2.5 ALPHANUMERIC DISPLAY - VIEWING THE MP COMPUTER VARIABLE FLAGS

This function is used to display the status of many of the input/output and internally generated flags related to the MC-MP2 computer. To access the MC-MP2 flags, set the switches as shown.



MC-MP2 Flags - With the MC-MP2 software, after moving the F5 switch to the ON position, the alphanumeric display scrolls the message ***FLAGS STATUS...*** and then displays abbreviation and status of the first available flag beginning with the letter A. Table 5.8 provides a listing of the available flags.

To select a flag, press the **N** pushbutton until the first letter of the flag displayed is the same as the first letter of the desired flag. Release the **N** pushbutton and press the **S** pushbutton until the desired flag is displayed. The flag's abbreviation and current status is displayed (0 = OFF, 1 = ON).

MC-MP2 Inputs - With the MC-MP2 software, the status of many system inputs may be viewed on the alphanumeric display. To view the inputs, the F5 switch plus various additional switches must be placed in the ON (up) position as follows:

- F5, A9 — HC-PIO board inputs
- F5, A10 — HC-RD board inputs
- F5, A9, A10 — HC-IOX / HC-I4O board inputs
- F5, A11 — HC-CIO board inputs
- F5, A9, A11 — MC-NC board inputs
- F5, A10, A11 — SC-SB2K-H board inputs
- F5, A9, A10, A11 — SC-BAH board inputs
- F5, A9, A10, A11, A12 — SC-HDIO board inputs

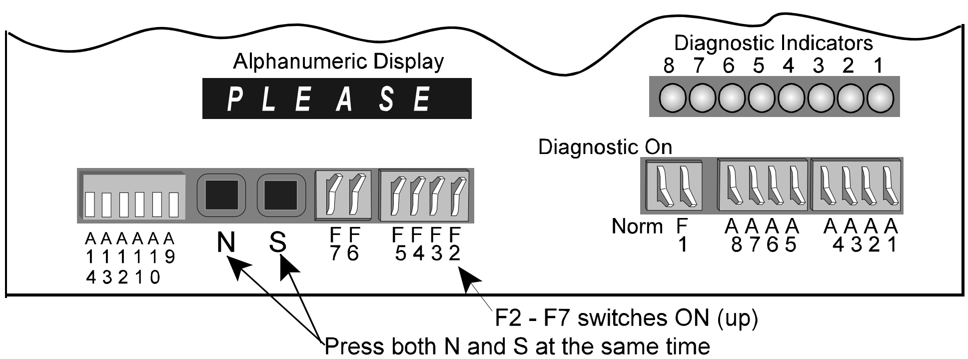
Press the **N** pushbutton to scroll through the inputs available for this job. They are displayed in the order they are arranged on the board. The abbreviation and status of each input is displayed (0 = OFF, 1 = ON).

5.2.6 RESETTING THE MC-CGP PARAMETERS

When an MC-CGP-4(8) Communication Processor Board or EPROM are changed it may be necessary to reset the CGP parameters to their default values. This can be done using the optional CRT terminal or via the Computer Swing Panel.

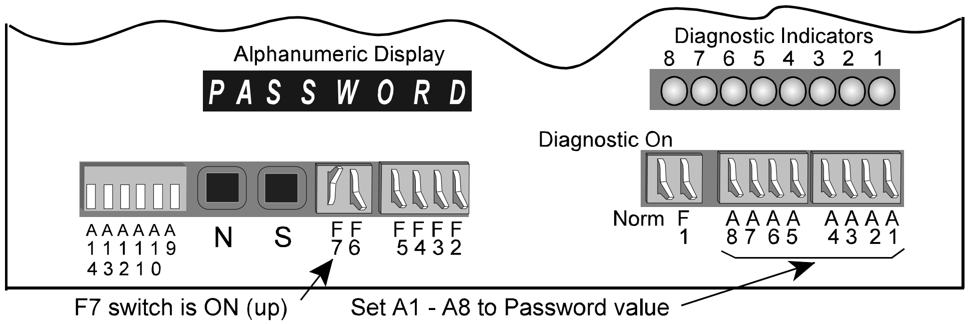
Using the optional CRT terminal - The optional CRT terminal connected to the local car controller may be used to reset the CGP parameters using ODPC Reset CGP Parameters on the General (Shift F1) screen. For instructions on using the CRT terminal, refer to the section in the Computer Peripherals Manual, MCE part # 42-02-CP00 titled *Using the CRT Terminal.*

Using the Computer Swing Panel - The CGP parameters can be reset to their default values using the Computer Swing Panel. Set the toggle switches as shown, then press and hold both the **N** and **S** pushbuttons in at the same time for about five seconds.

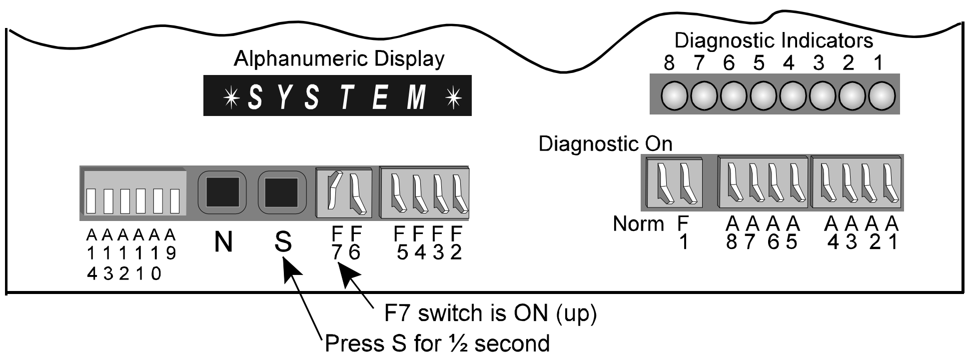


5.3 SYSTEM MODE (EOD)

System Mode provides a level of security (if programmed) so that an unauthorized person cannot modify or change the system parameters either intentionally or by mistake. To enter the System Mode, set the switches as shown.



With the F7 switch in the ON position, the alphanumeric display shows **PASSWORD**. Set the A1 - A8 switches to the password value. If no password has been programmed for this job (which is normally the case), set A1 - A8 to OFF (down).



Press the **S** pushbutton for ½ second. The alphanumeric display changes to **SYSTEM**. While in System Mode, the group of eight vertical status LEDs scan from bottom to top indicating that System Mode is active. If no function switch is moved or pushbutton is pressed for a period of two minutes, the computer will automatically exit from System Mode and go into the Normal Mode of operation. Placing the F7 switch in the OFF (down) position also causes the EOD to exit the System Mode.

In System Mode, the Function Keys are used to access and set the following system parameters:

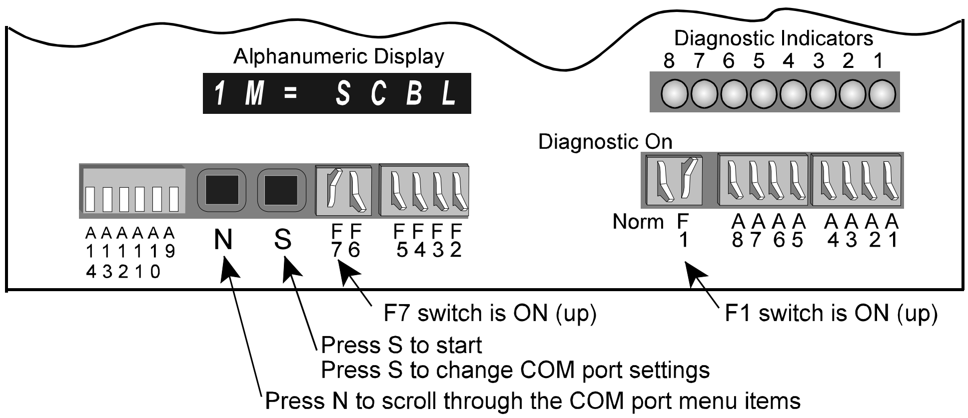
- F1 - Communication Port Settings (see Section 5.3.1)
- F3 - Security Codes (see Section 5.3.3)
- F4 - Not used
- F5 - MSK: Master Software Key (Simplex only) (see Section 5.3.4)
- F6 - Software Options - adjustable control variables (see Section 5.3.5)
- F7 - Turns System Mode ON and OFF
- A8 - Activate Passcode Requested Option - not on all controllers (see Section 5.3.6)

5.3.1 PROGRAMMING THE COMMUNICATION PORTS

The communication ports are field programmable through the Computer Swing Panel's Enhanced On-Board Diagnostics (EOD). MCE's Computer Peripherals Manual covers connecting a CRT terminal to a COM Port on the MC-RS Communication Interface board and set-up of the CRT terminal.

The communication ports were programmed (at the factory) for the original hardware, based on customer-provided information. It may be necessary to reprogram a communication port when changing from a monochrome to a color CRT, adding a lobby CRT or CRT with keyboard or adding a modem. The new hardware will not work correctly until the communication port is reprogrammed.

To reconfigure the communication port, enter the System Mode as described at the beginning of Section 5.3 and set the switches as shown.



When the F1 switch is placed in the ON (up) position, the alphanumeric display shows the following scrolling message: **COMPORT MENU PRESS S TO START**. Press the **S** pushbutton for ½ second and the display will show the current setting for the first item on the COM port menu, in this case **1M=SCBL**. The *1M* stands for *COM Port 1 Media* and *SCBL* stands for *Serial Cable* (see Tables 5.3 and 5.4) To change a communication port setting, press the **N** pushbutton to scroll through the Communication Port Menu until the desired item is shown on the alphanumeric display. Table 5.3 lists the items on the COM port menu.

CHANGING THE MEDIA SETTING - To change the *media* setting for COM Port #2, press the **N** pushbutton to scroll through the items on the Communications Port Menu (see Table 5.3) and release N when **2M** is displayed. Then press the **S** pushbutton to scroll through the Media Menu (see Table 5.4). Release S when the desired media is displayed. After selecting the desired media, press N to again scroll through the Communications Port Menu.

CHANGING THE DEVICE SETTING - To change the *device* setting for COM Port #2, press the **N** pushbutton to scroll through the Communications Port Menu and release N when **2D** is displayed. Then press the **S** pushbutton to scroll through the Device Menu (see Table 5.5). Release S when the desired device is displayed. After selecting the desired device, press N to again scroll through the Communications Port Menu.

SAVING THE CHANGES - When you have finished making changes, press the N pushbutton until, **SAVE?N/S** is displayed. Pressing **S** will save the changes and **SAVED...** will be displayed. If **N** is pressed the program will continue to scroll through the Communications Port Menu. To exit the Communications Port Menu, place the F1 switch in the OFF (down) position. If you exit the Communication Port Menu without choosing SAVE?N/S and pressing S, any changes made to settings will be ignored.

TABLE 5.3 Communication Port Menu

EOD Display	Description
NO COM	No COM port option has been enabled
1M	COM Port 1 Media
1D	COM Port 1 Device
2M	COM Port 2 Media
2D	COM Port 2 Device
3M	COM Port 3 Media
3D	COM Port 3 Device
4M	COM Port 4 Media
4D	COM Port 4 Device
SAVE?N/S	Save the changes? N for no or continue, S for save

TABLE 5.4 Media Menu

EOD Display	Description
NONE	NO MEDIA - Select when removing a computer terminal from a port.
SCBL	SERIAL CABLE - Select when setting up a CRT/terminal with a keyboard.
LDRV	LINE DRIVER - Used when setting up a CRT at a distance over 40 feet.
MODM	MODEM - Select when attaching a modem to a computer.

TABLE 5.5 Device Menu

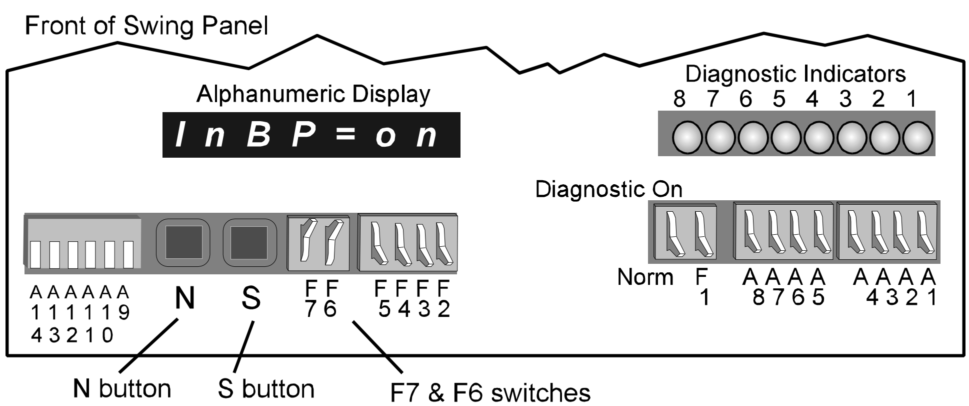
EOD Display	Description
NONE	No Device
CRTMK	Use for these terminals or emulators with keyboard (Link MC5, Wyse WY-325ES, Esprit 250C Emulator or ADDS 260LF Emulator)
CRTM	Use for these terminals or emulators without keyboard (Link MC5, Wyse WY-325ES, Esprit 250C Emulator or ADDS 260LF Emulator)
PC	Personal Computer with CMS / MSD
PCGD	Personal Computer Graphic Display (no longer used)
CRTCK	Use for these terminals with keyboard (Link MC-70, Wyse WY-370)
CRTC	Use for these terminals without keyboard (Link MC-70, Wyse WY-370)

5.3.2 ASME A17.1 - 2000 Fault Bypass Option

To allow the car to run during construction and adjustment of the controller, we need to bypass several of the code required functions. To bypass the 2000 code requirements, simply follow the instructions below.

For bypass with unlimited time in Inspection mode:

1. Place a jumper between 2KBP1 and 2KBP2 on the SC-BAH(R) board.
2. Place the MACHINE ROOM INSPECTION TRANSFER switch on the SC-SB2K board to the INSP position.
3. Enter system mode (**F7** switch up, press and hold **S** button for 1 second).
4. Access Software option LTAB (**F6** switch up, press **N** button to scroll to LTAB = OFF).
5. Change LTAB = ON (press **S** button)



For bypass for 2 hours in Automatic Operation:

1. Place a jumper between 2KBP1 and 2KBP2 on the SC-BAH(R) board.
2. Place the TEST/NORM switch on TEST on the SC-SB2K board.
3. Enter system mode (**F7** switch up, press and hold **S** button for 1 second).
4. Access Software option ABYP (**F6** switch up, press **N** button to scroll to ABYP = OFF).
5. Change ABYP = ON (press **S** button)

Please exercise extreme caution when the 2000 bypass function has been invoked. Note that, regardless of this bypass function, the emergency brake still functions.

NOTE: The SC-BAH(R) board's 2KBP1/2 jumper must also be activated (jumped) to bypass the A17.1 - 2000 faults.

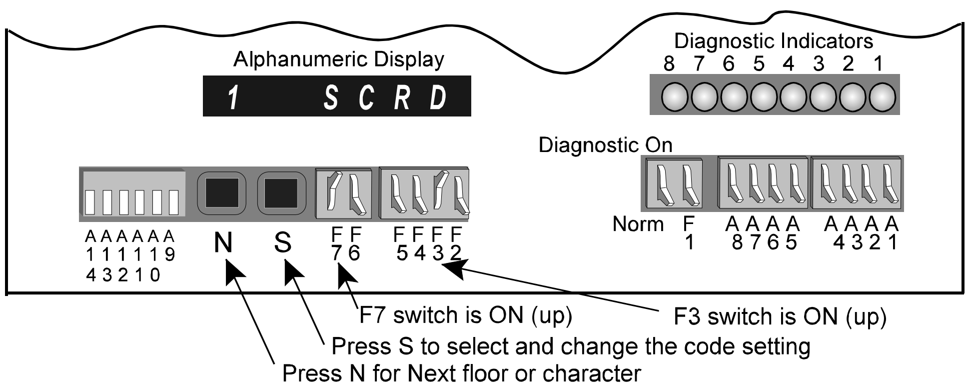
5.3.3 VIEWING AND CHANGING THE SECURITY CODES

For jobs with the MCE SECURITY, either Basic Security or Basic Security with CRT, this function allows the security codes to be viewed or changed. If the job does not have MCE SECURITY, the alphanumeric display will show **NOT USED**.

With MCE's Basic Security, the Building Security Input (BSI) is used to turn security ON and OFF. Refer to the job prints to find the BSI input. When *Security* is ON, all car calls are screened by the computer and become registered only if: (1) the call is to a floor that is not a secured floor, or (2) the floor is a secured floor and its Security Code is correctly entered within 10 seconds.

With MCE's Basic Security with CRT Option, additional programming options are available via the CRT terminal. Refer to MCE's Elevator Security User's Guide, part # 42-02-S024 for additional information and programming instructions. For both Basic Security and Basic Security with CRT Option, the security codes for each floor are programmed as described below.

The Security Codes are viewed and changed using the Computer Swing Panel. To view and change the security codes, place the F3 Switch in the *On* or up position while in "System" mode. Not all elevator systems are equipped with the SECURITY option. If the system does not have BASIC SECURITY, the Alphanumeric Display will show "NOT USED" when the F3 switch is turned On.



The security code for each floor may consist of from one to eight characters, where each character is one of the floor buttons found in the elevator car. Each floor may have a different length code. Table 5.6, *Changing Floor Security Status and Security Code*, describes the steps required to view and change a floor's security code. **A floor can not be *Secured* unless a *Security Code* has been programed.**

The Appendix, *Security Information and Operation* in the Elevator Security User's Guide, provides instructions for elevator passengers who will be using the elevator while Security is ON. Space has been provided for listing the security codes for each floor.

TABLE 5.6 Changing the Floor Security Status and Security Code

Switch	Explanation	Alphanumeric Display
Step 1 **F3 *On***	**To begin, display the 1st floor's status** While in the *System* mode, turn function switch F3 *On, "Up".*	**Example:** ***B NSCR*** B = basement NSCR = not secured
Step 2 **Press N**	**To display another floor's security status** Steps to the next floor's security status. Press N again for the next floor, etc.	**Example:** ***1 SCRD*** 1 = floor #1 SCRD = secured
Step 3 **Press S**	**To select a floor to view or change a code** With the floor's security status displayed, press S. The first character of the floor's security code is then displayed.	**Example:** ***2 1 = 3*** For floor 2, the first character in the code is 3.
Step 4 **Press S**	**To change a code character** Steps through the available code characters. When the desired character is displayed, go to Step 5.	**Example :** ***2 1 = 5*** For floor 2, the first security character is now 5.
Step 5 **Press N**	**To display the next code character** Steps to the next character in the code. To change more characters, repeat steps 4 and 5. The last character of a code must be the word END if the code is less than eight characters long.	**Example 1:** ***2 2 = 4*** For floor 2, the second character in the code is 4. **Example 2:** ***2 1 = END*** For floor 2, the first character in the security code is the word END. Floor 2 is unsecured.
Step 6 **Press N**	**To end and save** If END is chosen as a code character or if this is the eighth character, when N is pressed the computer saves the code and displays the current floor's security status. To view or change the code for another floor, return to step 2.	**Example :** ***2 NSCR*** If END was chosen for first character, this floor has no security code and is unsecured. Using END for any other character just ends that code, but the floor is still secured.
F3 and F7 switches *Off*, down position	**To exit System mode** Every security code must end with the word END or be 8 characters long. If not, the processor remains in System mode.	**Example:** ***11:04:27*** The time displayed

5.3.4 SETTING MSK: MASTER SOFTWARE KEY

On a simplex car, the Master Software Key is used in conjunction with the Basic Security with CRT Option. To view or change MSK, log into System Mode as described at the beginning of Section 5.3 and then place the F5 switch in the ON (Up) position. If this is not a simplex car or if this job does not have the Basic Security - CRT Option enabled, the alphanumeric display will show NOT USED. Additional information about the Master Software Key (MSK) can be found in MCE's Elevator Security User's Guide, Section 3, *Basic Security with CRT - Swing Panel*.

5.3.5 SETTING THE SOFTWARE OPTIONS - ADJUSTABLE CONTROL VARIABLES

Table 5.7 provides a listing of the software options - adjustable control variables. Not all of the options are available on all controllers. To view or set the adjustable control variables, log into System Mode as described at the beginning of Section 5.3 and place the F6 switch in the ON (Up) position.

The first available variable will be shown on the display. Press the S pushbutton to change the setting. Press the N pushbutton to scroll to the next available variable. Table 5.7 lists the variables in alphabetic order, not in the order in which they are displayed on the controller.

TABLE 5.7 Software Options

VARIABLE	NAME	DEFINITION
ABYP	*ASME A17.1 - 2000 Bypass option*	Allows the car to run without A17.1 - 2000 monitor (for 2 hours) Jumper must be in place between 2KBP1 and 2KBP2 on SC-BAH board (see Section 5.3.2).
AFR	*Alternate Fire Floor Recall*	Determine the designated recall floor for alternate Fire Service Operation.
AFR2	*Second Alternate Fire Floor Recall*	Determine the designated recall floor for the second alternate Fire Service operation (Detroit Fire code).
AGNG	*Alternate Gong Option*	Causes an arrival lantern to be illuminated whenever the car's doors are open at a non-lobby landing. In the absence of actual call demand, the direction selected is a reflection of the car's last direction of travel. If the car is located at a terminal landing, the appropriate lantern will be illuminated.
APP1	*Alternate Primary (lower) Parking Floor*	When on, the car will no longer park at the original parking floor (PPF). Instead the car will park at the first alternate parking floor specified by the landing stored in this variable.
APP2	*Alternate Primary (lower) Parking Floor #2*	When ON, the car will no longer park at the original parking floor (PPF). Instead the car will park at the second alternate parking floor specified by the landing stored in this variable.
ASP1	*Alternate Secondary (upper) Parking Floor*	When ON, the car will no longer park at the original secondary parking floor (SPF). Instead the car will park at the secondary parking floor specified by the landing stored in this variable. This variable is only available on a duplex system.
ASP2	*Alternate Secondary (upper) Parking Floor #2*	When ON, the car will no longer park at the original secondary parking floor (SPF). Instead the car will park at the secondary parking floor specified by the landing stored in this variable. This variable is only available on a duplex system.
CCBC	*Cancel Car Call Behind Car Option*	If ON, and if the car has a direction arrow (SUA/SDA), no car calls can be registered behind the car's current position. For example, if a car is at the fifth floor, moving down, then no car calls can be registered for any floors above the fifth floor.
CNID	*Car Network ID*	(A thru L) The Car Network ID identifies this controller to the Group Supervisor.
CPPB	*Constant/Momentary Pressure Photo Eye/Safety Edge Bypass*	This option, when turned “OFF”, will disable photo eye/safety edge bypass logic for cars that are on Independent Service, Attendant Service, Hospital Service Phase 2, and any other non-automatic door closing conditions (CPCLOSE, MPCLOSE, etc.).
CSAR	*CSA Redundancy Check Option*	When ON, CSA redundancy checking logic is invoked. When OFF, the LSR, CNP and UDF inputs are ignored, and CSA redundancy checking logic is not performed.
DCFL	*Door Close Front Latch*	Maintains the Door Close Function on the front doors continuously as long as a door open command is absent.
DCRL	*Door Close Rear Latch*	Maintains the Door Close Function on the rear doors continuously as long as a door open command is absent.

TABLE 5.7 Software Options

VARIABLE	NAME	DEFINITION
DDOP	*Double Ding on Down Option*	When ON, the gong output dings twice for down direction travel and once for up direction travel. If OFF, the gong output will only ding once for both up and down direction of travel.
DDPO	*Door Lock Direction Preference Option*	Causes the car to hold its direction preference until the doors are closed. When OFF, the car will be allowed to change direction preference with the doors open (when the hall call door time elapses).
DGNG	*Door Lock Gong Option*	Determines when the arrival gong outputs are activated. The arrival gong outputs are activated after the doors begin to open. When OFF, the arrival gong outputs are activated when the car steps into the floor. This option should be OFF when hall mounted arrival fixtures are used and turn ON when car-riding arrival fixtures are used.
DOFL	*Door Open Front Latch*	Maintains the Door Open Function on the front doors continuously as long as a door close command is absent.
DORL	*Door Open Rear Latch*	Maintains the Door Open Function on the rear doors continuously as long as a door close command is absent.
HREO	*Reopen doors with hall button*	If enabled, this option will allow the activation of a hall call button to cause a car's doors to reopen (if in the process of closing). If the option is turned OFF, the doors will not reopen if the doors are closing and a car call has been registered for that car.
KCE	*Keyboard Control of Elevators*	MCE's Elevator Central Monitoring System software, CMS for Windows, allows monitoring of elevators and control of certain elevator functions using a PC. The CMS option, KCE can be enabled or disabled at the local car or group level by turning the controller's Adjustable Control Variable, KCE, ON or OFF. Changing the KCE setting in the individual car's controller affects only that car. Changing the KCE setting in the Group controller affects all of the cars in that group. Consult the CMS for Windows manual for additional information.
LBBY	*Lobby Floor*	Determines the location of the lobby floor in the building.
LGNG	*Lobby Alternate Gong Option*	Causes an arrival lantern to be illuminated whenever the car's doors are open at the lobby landing. In the absence of actual call demand, the up direction lantern will be illuminated.
LLCC	*Light Load Call Cancel*	When the light load input (LLI) is ON, this variable sets the threshold above which an additional car call will cause all previous calls to be canceled with the exception of the last call entered in the system.
LTAB	*Long Term ASME A17.1 - 2000 Bypass option*	Allows the car to run on Inspection without A17.1 - 2000 monitor (indefinite time). Jumper must be between 2KBP1 and 2KBP2 on SC-BAH board (see Section 5.3.2).
MFR	*Main Fire Floor Recall*	Determine the designated recall floor for main Fire Service operation.
MSAF	*Mechanical Safety Edge*	Determine if the car has Mechanical Safety Edge. This option must be turned ON if the car has a Mechanical Safety Edge and OFF when an infrared detector is used.
NPRE	*No Pre-opening Option*	When ON, prevents pre-opening of the doors on an approach to any landing. When OFF, the doors will start to open as soon as the car is 3" (76 mm) from level at the target floor.
PECC	*Anti-nuisance Call Cancel*	Sets the threshold for the number of car call stops without an interruption of the photo eye. If no photo eye interruption is detected when the car answers the fourth car call, the controller will cancel any additional car calls registered in the system. This function is normally referred to as anti-nuisance.
PHEP	*Photo Eye Protection*	When this variable is set to ON, it prevents the photo eye from ever being bypassed except on Fire Service. When set to OFF, the stuck photo eye protection logic is enabled and the photo eye is bypassed after the car times out of service. This option must be turned ON for all jobs that use the PHE input for the door hold key switch.
PPF	*Primary (lower) Parking Floor*	Determines where the car will park in the absence of call demand. In a duplex system, this variable must be programmed as one of the landings in the building, and is set at the factory before shipment. In group systems, this variable only takes effect when the car is operating independently of the group supervisor or if there is a loss of communication with the group supervisor.
RCCD	*Reversal CCD Option*	When ON, all registered car calls are canceled when the car reverses direction.
SPED	*SPED > 150 FPM? ON/OFF*	Set to ON for ASME A17.1 - 2000 code compliant hydraulic elevators with speeds exceeding 150 FPM. When on Inspection operation, running on high speed is prevented by disabling the FUD output.
SPF	*Secondary (upper) Parking Floor*	Determines which landing is used as the second parking floor. This variable is only available on a duplex system.

5.3.6 LOAD WEIGHER LEARN OPERATION (CALIBRATION)

The load weigher (isolated platform or crosshead deflection) provides a signal that corresponds to the perceived load. This signal is brought to the control system where it is conditioned, sampled and digitized, and the value is used to calculate the actual load *inside* the elevator. This load value is then used for logical operations such as anti-nuisance and hall call bypass.

With the isolated platform load weigher (MCE), the system simply learns the reference values of the empty and fully loaded car weight, which are then used to calculate the current load (as a percentage of full load). However, with the crosshead deflection load weigher (K-Tech), the magnitude of the signal generated by the load sensor represents the perceived load *at the crosshead*, which includes the weight of the car itself, the load inside the car, the traveling cable, and any compensation cables that might be attached to the car. Therefore it is necessary for the controller to use the measured load value in a calculation to determine the load inside the elevator (the raw load value cannot be used as is).

Due to the dynamics of the elevator system, the load represented by the traveling cable and compensation cables will vary with the position of the car in the hoistway. The load weighing system accounts for these variances by performing a process which learns empty car and full car load values at each floor in the building. The load in the car can then be determined by reading the value at a given floor and, using the learned values for that floor, performing a linear interpolation to approximate the load inside the car (as a percentage of full load). The calculated load percentage is then used to initiate logical operations, i.e., hall call bypass at 80% of capacity.

Logical operations that use the load information include: light load weighing (anti-nuisance), advance car dispatch (reduction of door dwell time), heavy load weighing (hall call bypass), and overloaded car detection. Each threshold is user-programmable, and will determine when each of these logical operations should be performed.

The measurement of the load will only take place when the car is stopped at a landing with the doors open. This is the only time that we would anticipate a change in load upon which a logical operation should be initiated. The measurement is not taken when the car is running because the acceleration and deceleration of the car would be interpreted as a change in load.

Functional Description of Load Thresholds - The four load thresholds are:

- **LLW** (Light load weigher threshold): This threshold value is used to define the load at which a limited number of car calls is to be registered. If the programmed number of car calls is exceeded, all car calls will be canceled.

  Example: LLW=20%. If the measured load in the car is less than 20%, the computer will only allow a certain number of car calls to be registered (defined by a field-programmable value LLCC). If LLCC is programmed at a value of 3, the computer will only allow 3 calls to be registered if the load is less than 20%. If a fourth call is registered, all car calls will be canceled.

- **DLW** (Dispatch load weigher threshold): This threshold value is used to define the load at which the lobby landing door timer is reduced. This threshold should be set to a value (defined in many specifications as 60%) at which it is appropriate to initiate the process of moving the car out of the lobby.

- **HLW** (Heavy load weigher threshold): This threshold value is used to define the load value at which hall calls should be bypassed.

- **OLW** (Overloaded car threshold): This threshold value is used to define the load value at which it is considered unsafe to move the elevator. When this threshold is exceeded, the car will remain at the floor with doors open. Typically an application that requires OLW will use some type of visual and/or audible indicator to alert elevator passengers that the car is overloaded.

- **OLW2** (Overloaded car threshold 2): When on Fire Service, this threshold value is used instead of the OLW value (see OLW above).

Learn Modes - With the isolated platform load weigher (MCE), the system simply learns the reference values of the empty and fully loaded car weight. However, with the crosshead deflection load weigher (K-Tech), the system must learn the reference values of empty and fully loaded car weight at each floor. This is necessary because the perceived load at the crosshead varies with the position of the car in the hoistway due to the changing proportion of the traveling cable hanging beneath the car and the position of the compensation cables. Examples of the causes fo load variance include:

- The position of the traveling cable will present a varying load (a changing proportion of the traveling cable hanging directly beneath the car).

- The position of the compensation cables will present a varying load (a changing proportion of the compensation cable hanging directly beneath the car). Note that the compensation cables are intended to equalize the load at the motor sheave, not at the crosshead.

- Variances in the alignment of the hoistway guide rails will present varying amounts of resistance to elevator movement. An added amount of resistance or friction may result in an increased perceived load at the crosshead.

The values learned for the empty car and full car at a particular floor are used to calculate the load when the car is positioned at that floor.

The Learn Process - The learn process consists of three functions:

- Learning the measured load value for an empty car at each landing.

- Learning the measured load value for a fully loaded car at each landing.

- Establishing the load thresholds which will initiate the logical operations.

Each of these functions can be performed separately. All three functions must be performed before the load weigher system will perform properly. **To enter the learn function, the car must be placed on Independent Service.** If an independent service switch is available in the car, use it. If not, the car can be placed on Independent Service by connecting a jumper between terminals 2 and 49 on the controller main relay board. A further option is to use the TEST/NORM switch on the SC-SB2K relay board, but this will electrically disconnect the door open relays, and is therefore **not recommended**.

5.3.6.1 GETTING INTO LOAD WEIGHER LEARN MODE

a. Enter the SYSTEM mode of operation on the Computer Swing Panel by following the steps described at the beginning of Section 5.3.

b. Once in SYSTEM mode, access the load weigher learn function by turning the Diagnostic On switch ON (the F7 switch should remain in the ON position). The computer will respond with one of three scrolling messages:

- *NOT USED* - The software has not been configured to provide the "analog load weighing function". Contact MCE if you believe this to be in error.

- *CAR NOT READY TO LEARN* - Verify that the car has been placed on Independent Service.

- *PRESS N FOR K-TECH CROSSHEAD OR S FOR MCE PLATFORM...* - Select the type of load weigher by pressing N for K-Tech crosshead deflection or S for MCE isolated platform load weigher.

The following message is then displayed:

- *ANALOG LOAD WEIGHER LEARN FUNCTION...PRESS N TO CONTINUE* - The system is ready to learn, you have successfully placed the elevator in "load weigher learn mode".

c. Once the elevator has successfully been placed in "load weigher learn mode" one or all three of the learn functions can be performed as described in sections to follow. The system will display one of three main prompts:

- READY TO LEARN EMPTY CAR VALUES? PRESS S TO CONFIRM - Press the S push-button to begin this process. The car must be empty before beginning.

- READY TO LEARN FULL CAR VALUES? PRESS S TO CONFIRM - Press the S push-button to begin this process. Place the full load weights in the car before beginning.

- ADJUST THE LOAD THRESHOLDS? PRESS S TO CONFIRM - Press the S push-button to adjust the load threshold values.

Press the N push-button to cycle through these three different prompts. To exit the load weigher learn mode, turn the Diagnostic On function switch on the computer Swing Panel to OFF.

5.3.6.2 LEARNING THE EMPTY AND FULLY LOADED CAR VALUES

Learning the empty and loaded car values is an automated process that requires only that the appropriate load be present in the car before beginning each process. **It is best to have two persons available, one in the machine room at the elevator controller and one positioned at a floor with test weights available.** The test weights must represent the full load value.

If the K-Tech crosshead deflection load weigher was selected, the learn process will automatically run the car from floor to floor, stopping at each landing. The car will first travel to the bottom landing, stop and pause there for a period of time. The car will then move in the UP direction, stopping at each floor on the way to the car's highest landing served. Each time the car stops at a landing a value is learned for that landing (either the empty or full load value). Once all floors have been learned, the car will automatically return to its point of origin and open its doors. The learn process must be performed twice, once for empty car load and once for full car load.

Learning the Empty Car Load Values:

a. With the system in “load weigher learn mode”, press the N push-button until the following prompt is displayed: “READY TO LEARN EMPTY CAR VALUES? PRESS S TO CONFIRM...”.

b. Verify that the car is empty.

c. Press the S push-button to begin the learn process.

1. When the S push-button is pressed, the car will automatically close its doors and commence the learn operation. During this process, the doors will remain closed and the car will not respond to car or hall call demand. If the K-Tech crosshead deflection load weigher was selected, the car will move to the bottom floor, record the empty car value and then move up, stopping at each floor to record the empty car value. When the top floor has been reached, the car will move back to the floor at which the Load Weigher Learn procedure was begun.

2. During the learn process the computer will display the scrolling message: *LEARNING EMPTY CAR VALUES...PRESS N TO ABORT....* The learn process may be aborted by pressing the N push-button any time during the process.

3. Once the learn process is completed for the empty car, the computer will briefly display the message: “EMPTY CAR LEARN PROCESS COMPLETED...”. At that time, the car should be positioned at the floor where the learn process was begun, with the doors fully open.

4. The computer will then display the message: “READY TO LEARN FULL CAR VALUES? PRESS S TO CONFIRM...”. Refer to the next section if you wish to learn the fully loaded car values. **[Do not press the S push-button at this time!]**

Learning the Fully Loaded Car Load Values:

a. With the system in “load weigher learn mode”, press the N push-button until the following prompt is displayed: “READY TO LEARN FULL CAR VALUES? PRESS S TO CONFIRM...”.

b. Using a car call, call the car to the floor where the test weights are located. Load the test weights, that represent the full load value, into the car.

c. Once the test weights have been loaded, press the S push-button to begin this learn process. The process is identical to the empty car learn process described above. The computer will display the scrolling message: “LEARNING FULL CAR VALUES...PRESS N TO ABORT...”.

1. The learn process may be aborted by pressing the N push-button any time during the process.

2. Once the learn process is completed for the fully loaded car, the computer will briefly display the message: “FULL CAR LEARN PROCESS COMPLETED...”. At that time, the car should be positioned at the floor where the learn process began, with the doors fully open. The test weights may now be removed from the car.

3. The computer will then display the message: “ADJUST THE LOAD WEIGHER THRESHOLDS? PRESS S TO CONFIRM...”. Refer to the next section if you wish to adjust the load weigher threshold values.

5.3.6.3 ADJUSTING THE LOAD THRESHOLDS

The load thresholds are preset, at the MCE factory, to values based upon the job specification. However, these thresholds are user-adjustable and may be changed at any time. To adjust these thresholds, enter the SYSTEM mode of operation as described at the beginning of Section 5.3, and select the load weigher learn function. The car must be on Independent Service to enter the load weigher learn function.

a. With the system in the “load weigher learn mode”, press the N push-button until the computer responds with the scrolling message: “ADJUST THE LOAD WEIGHER THRESHOLDS? PRESS S TO CONFIRM...”.

b. Press the S push-button to adjust the thresholds.

c. Once the S push-button is pushed, the computer will respond by displaying mnemonics that represent the load values. The value shown next to the mnemonic is the current threshold value for that parameter expressed as a percentage of the full load value.

Dispatching Threshold	**Typical Value**	**Range**
• LLW = light load (anti-nuisance) threshold	20%	0 - 40%
• DLW = dispatch load threshold	50%	20 - 80%
• HLW = heavy load (hall call bypass) threshold	80%	50 - 100%
• OLW = overloaded car threshold	105%	80 - 125%
• OLW2 = overloaded car threshold 2	125%	100 - 140%

d. Choose the parameter to be adjusted by pressing the N push-button. The mnemonics and values will scroll as long as the N push-button is depressed.

e. The desired value may be adjusted by pressing the S push-button. The value will be incremented until the upper limit value is reached. The value will then roll over to the lower limit value. These limit values are predetermined at MCE, and must be modified with an EPROM change, if necessary.

f. After the last parameter is displayed, pressing the N push-button will cause the computer to display the prompt: DONE ADJUSTING THRESHOLDS? PRESS S TO CONFIRM... At this prompt, pressing the S push-button will exit the threshold adjustment function; pressing the N push-button will return the prompt to the first threshold parameter.

   The thresholds can be set to the desired values, as a percentage of full load. Setting the value to 00% will disable the corresponding function. Example: setting the HLW threshold to 00% will disable the hall call bypass function.

Exiting the Load Weigher Learn Mode

Exit the load weigher learn mode by placing the Diagnostic On/Normal switch in the Normal (down) position. Exit System Mode of diagnostics by turning the F7 switch OFF (down).

5.3.7 SETTING AND RESETTING THE PASSCODE OPTION (NOT ON ALL CONTROLLERS)

The Passcode Requested option can be used to require that a passcode be entered in order to run the car on any mode of operation other then Inspection. If a passcode has not been pre-programmed for the controller, the Passcode Requested option is not available and will not appear.

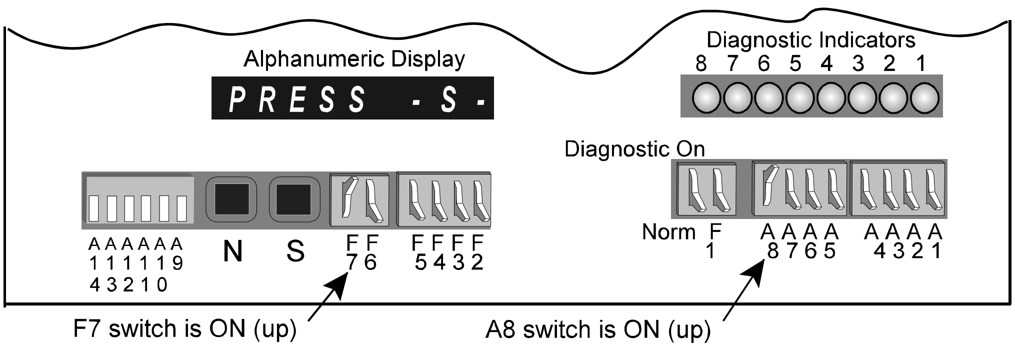
Upon power up, the message ***MP2 VERSION NUMBER: 8.xx.x*** will scroll across the alphanumeric display. If a passcode has been pre-programmed and the Passcode Requested option has been activated, the message ***PASSCODE REQUESTED...*** is then scrolled. This means a passcode is required in order to run the elevator on any mode other than Inspection.

In order to set the passcode (to run the car on Normal operation) or clear the passcode (to activate the Passcode Requested option), the controller must first be placed in System Mode as described at the beginning of Section 5.3.

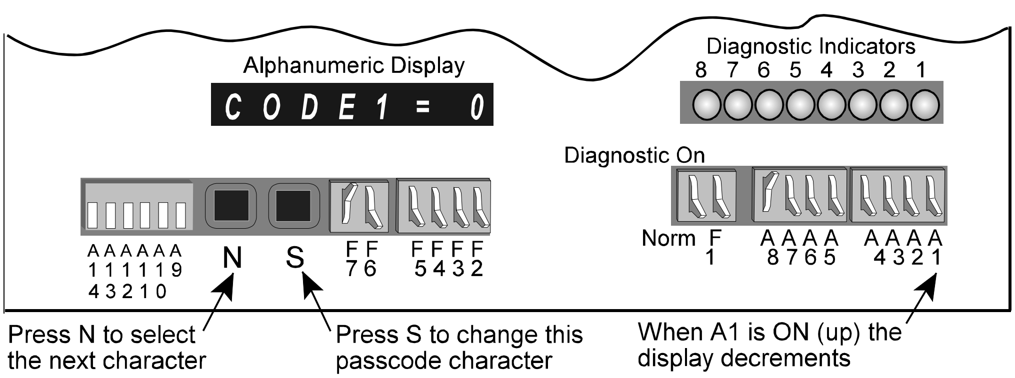
NOTE: PASSWORD is not the same as PASSCODE. The PASSWORD is used to limit access to System Mode. The PASSCODE, when activated, requires that a passcode be set in order to run on any mode other than Inspection.

SETTING THE PASSCODE

Once in System Mode, place the A8 switch in the ON (up) position as shown.



The message ***PRESS -S- TO SET PASSCODE OR -N- TO CLEAR PASSCODE...*** will scroll across the display. Press the **S** pushbutton. The message ***CODE 1 = 0*** is displayed.



The passcode consists of eight alphanumeric characters. The display indicates the value of code character #1. Press the **S** pushbutton to change the value. Press the **N** pushbutton to select the next passcode character. When the A1 switch is ON (up) the display will decrement when either **N** or **S** are pressed.

When the eighth passcode character is displayed, pressing the **N** pushbutton causes the display to change to ***SAVE? N/S***. Press **N** continue setting / changing the passcode. Press **S** to save the passcode. If the passcode is set correctly the display will show ***SAVED...***. If the passcode is not set correctly the message ***INVALID PASSCODE. PRESS N TO CONTINUE*** is scrolled across the display. Pressing **N** causes ***CODE1= (x)*** to be displayed so that the passcode can be corrected.

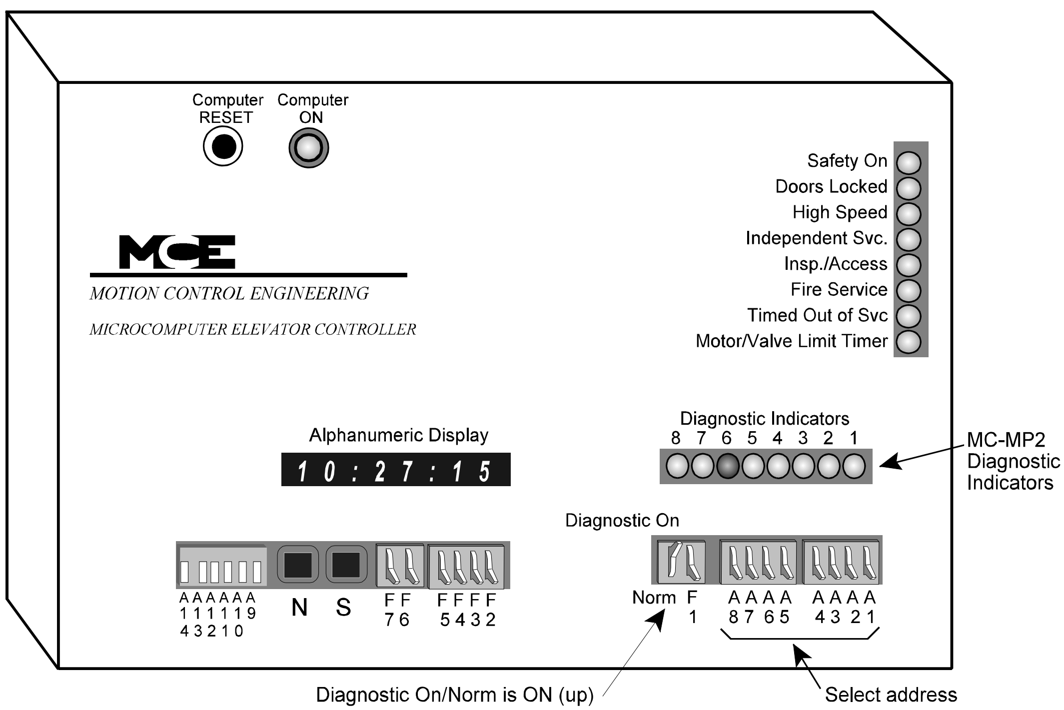
Once the passcode is set correctly and saved, exit System Mode by placing the F7 and A8 switches in the OFF (down) position. The car can then be run on Normal operation.

ACTIVATING THE PASSCODE REQUESTED OPTION

The Passcode Requested option can be re-activated by clearing the valid passcode setting. To clear the passcode, enter System Mode as described in Section 0.1 and place the A8 switch in the ON (up) position. Press the **N** pushbutton while the message ***PRESS -S- TO SET PASSCODE OR -N- TO CLEAR PASSCODE...*** is being scrolled. The display changes to ***CLEARED***. Exit System mode by placing the F7 and A8 switches in the OFF (down) position. The message ***PASSCODE REQUESTED...*** is scrolled across the display and the car is only allowed to run on Inspection operation.

5.4 DIAGNOSTIC MODE (EOD)

In the Diagnostic Mode, the A1 thru A8 switches allow the elevator mechanic to access the MC-MP2-2K computer memory locations. To access Diagnostic mode, set the switches as shown.

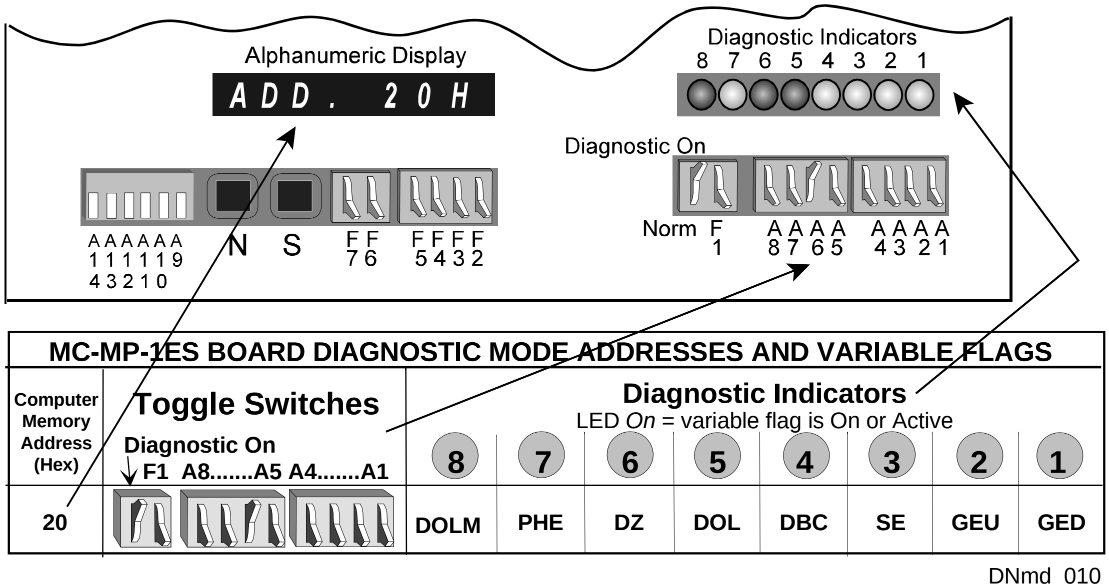


5.4.1 VIEWING THE MC-MP2-2K COMPUTER FLAGS

The A1-A8 switches enable an elevator mechanic to look at the MC-MP (MP2) flags when troubleshooting a problem. Figure 5.3 describes the procedure for viewing the computer flags, in this case at address 20H (selected from Table 5.9)

> **NOTE:** MC-MP2 flags are more easily viewed in Normal mode - see Section 5.2.5 Alphanumeric Display of MP2 flags.

FIGURE 5.3 Viewing the flags at Address 20H (from Table 5.9)



In this example, address 20 has been selected from Table 5.9 in the back of this section. The Diagnostic On/Norm switch and the A6 switch are UP; all other A switches are down. The display reads ADD.20H. The flags that can be viewed from this address are listed on the right. A complete list of these flags can be found in Table 5.8. Check the Diagnostic Indicators on the front of the Swing Panel. If an LED is ON, it means that flag is ON. For example, if Diagnostic Indicator #6 is ON, this means the Door Zone Input (DZ) is ON.

LED	Flag	Description
8	DOLM	Door open limit memory flag
7	PHE	Photo eye input
6	DZ	Door zone input
5	DOL	Door open limit input
4	DBC	Door close button input
3	SE	Safety edge input
2	GEU	Gong enable up output
1	GED	Gong enable down output

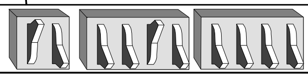
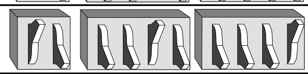
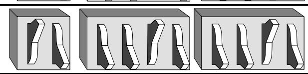
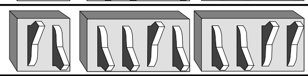
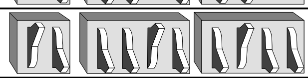
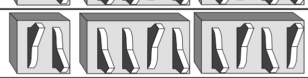
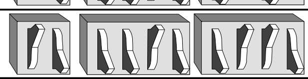
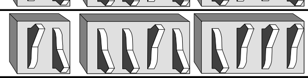
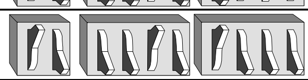
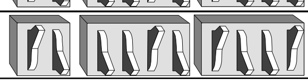
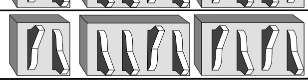
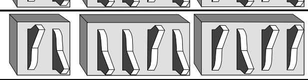
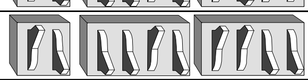
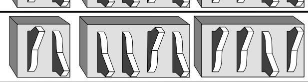
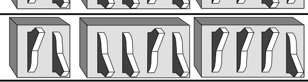
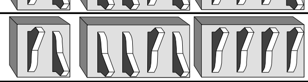
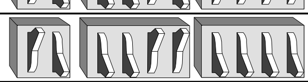
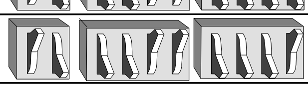
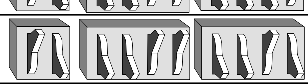
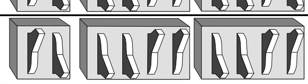
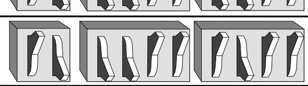
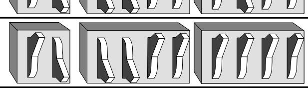
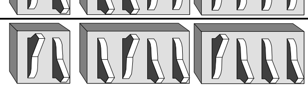
Tables 5.8 and 5.11 provide a listing of the MC-MP2-2K flags and the abbreviation assigned to each flag. Tables 5.9, 5.10, 5.12 and 5.13 show the memory address locations for the flags. Access a flag's address by setting the A1 - A8 switches as shown in Table 5.9, etc. Once an address has been selected, the diagnostic indicators, on the front of the Swing Panel, show the status of the flags at that computer memory address. Table 5.9 shows the abbreviations for the flags in the columns ❶ thru ❽ (corresponding to Diagnostic Indicators 1 thru 8) in each row.

ALTERNATE ADDRESS SELECTION METHOD - There is an alternate way of selecting the computer memory address, without using the A1-A8 switches. To do so, regardless of the position of A1-A8 switches, press the N pushbutton. The alphanumeric display automatically reads **ADD. 20H**, which is the first diagnostic address for the MC-MP2-2K flags. The Computer Swing Panel's Diagnostic Indicators show the contents of the address displayed. Constant pressure on the N pushbutton automatically increases the address shown on the alphanumeric display, and the state of the indicator lights changes respectively. Once the address reaches 33H, it automatically goes back to 20H. Releasing the N pushbutton holds the last address displayed on the alphanumeric display for an additional 3 seconds before changing the display to reflect the address selected by the A1-A8 switches.

TABLE 5.8 MC-MP2 Computer Variable Flags

ABREV	FULL NAME	ABREV	FULL NAME
ADAC	ADA Car Call Timer	GED	Gong Enable Down Output
ADACR	Rear ADA Car Call Timer	GEU	Gong Enable Up Output
ADAH	ADA Hall Call Timer	H	High Speed Output
ADAHR	Rear ADA Hall Call Timer	HCDX	Hall Call Disconnect
ALT	Alternate Service	HCR	Hall Call Reject
ATSF	Attendant Service Function	HCT	Hall Call Door Time
BFD	Bottom Floor Demand	HLD	Hold Input Fire Phase II
BSI	Building Security Input	HLI	Heavy Load Input
CC	Car Call	HLW	Heavy Load Weigher
CCA	Car Call Above	HML	Home Landing Select Input
CCB	Car Call Below	HSEL	Hospital Emergency Select
CCC	Car Call Cancel	HYD/TRC	1 = Hydro, 0 = Traction
CCD	Car Call Disconnect	IN	Inspection or Access Input
CCT	Car Call Door Time	IND	Independent Service Input
CD	Car Done	ISR	In Service and Ready
CD 3	Third Bit in Absolute PI Code	ISRT	In Service Truly
CD4	Fourth Bit in Absolute PI Code	ISV	In Service
CSB	Car Stop Switch Bypass Output	LD	Level Down Input
CTL	Car to Lobby Input	LFP	Lower Floor Parking
CTLF	Car to Lobby Function Flag	LLI	Light Load Input
DBC	Door Button Close Input	LLW	Light Load Weigher
DC	Down Call	LOT	Lobby Door Time
DCA	Down Call Above	LU	Level Up Input
DCB	Down Call Below	MLT	Motor Limit Timer
DCC	Door Close Complete	MLTDO	MLT Door Open Flag
DCF	Door Close Function Output	MLTP	MLT Pilot Flag (Internal)
DCL	Door Close Limit	NUDG	Nudging Output
DCLR	Rear Door Close Limit	PFG	Passing Floor Gong
DCLC	Door Closed Contact Input	PHE	Photo Eye Input
DCLCR	Rear Door Closed Contact Input	PK	Parking
DCP	Door Closed Power Output	PTI	Power Transfer Input
DDP	Down Direction Preference	RUN	Run
DHO	Door Hold Open	SAF	Safety String Input
DLK	Door Lock Input	SD	Supervisory Down
DMD	Demand Down	SDA	Down Direction Arrow Output
DMU	Demand Up	SDT	Short Door Time
DNDO	Down Direction Output	SE	Safety Edge Input
DNS	Down Direction Sense Input	SLV	Slaved
DOF	Door Open Function Output	SP1	Spare Input #1
DOI	Door Open Intent	SP2	Spare Input #2
DOL	Door Open Limit Input	SST	Soft Stop Timer Flag
DOLM	Door Open Limit Memory	STC	Stepping Complete
DPM	Door Position Monitor	STD	Step Down Input
DPMR	Rear Door Position Monitor	STU	Step Up Input
DSD	Down Slow Down Input	SU	Supervisory Up
DSH	Door Shortening (Car Call Button Pushed)	SUA	Up Direction Arrow Output
DSHT	Door Shortening (Final)	SUD	Up or Down Direction Input
DZ	Door Zone Input	TFD	Top Floor Demand
DZORDZ	Door Zone or Rear Door Zone	TOS	Timed Out of Service
ECRN	Emergency Power Running Car	UC	Up Call
EPI	Emergency Power Input	UCA	Up Call Above
EPR	Emergency Power Return Function	UCB	Up Call Below
ESSH	Elevator Shutdown Switch Flag	UDP	Up Direction Preference
ESSI	Elevator Shutdown Switch Input	UFP	Upper Floor Parking
EXMLT	Bottom Floor Recall Input	UPDO	Up Direction Output
FCS	Fire Phase II Input	UPS	Up Direction Sense Input
FRA	Alternate Fire Phase I Input	USD	Up Slow Down Input
FRC	Fire Phase II	VCA	Viscosity Control Active
FRM	Fire Service Phase I	VCI	Viscosity Control Input
FRS	Fire Phase I Input	VLT	Valve Limit Timer Flag
FWI	Fire Warning Indicator Output	WLD	Wildop Inhibit Input

TABLE 5.9 MC-MP2 Diagnostic Mode Addresses and Computer Variable Flags (Local)

MC-MP(2) BOARD DIAGNOSTIC MODE ADDRESSES AND VARIABLE FLAGS*									
Computer Memory Address (Hex)	Toggle Switches Diagnostic On F1 A8.......A5 A4.......A1	Diagnostic Indicators LED *On* = variable flag is On or Active 8	7	6	5	4	3	2	1
20		DOLM	PHE	DZ	DOL	DBC	SE	GEU	GED
21			DC	UC	CC			DHO	DOI
22		DCF	DCP	DOF	DSHT		HCT	CCT	SDT
23					CSB	DCC	NUDG		LOT
24		VCI	FRA	FCS	FRS	DNS	UPS	STD	STU
25			SP2	SP1	HLW	HLI		FWI	
26		LFP	UFP	VCA					
27				DCLC	IND	IN	EXMLT		
28		SUD	DLK		DZO RDZ			PK	
29		DNDO	LD		DDP	UPDO	LU		UDP
2A		DMD	DCB	UCB	CCB	DMU	DCA	UCA	CCA
2B		TOS	MLT	VLT	SST	H		DSH	RUN
2C			STC	SAF	HCR	HCDX	CCD	ISV	ISRT
2D						FRM	FRSS	FRAS	FRC
2E		SD	SDA	DSD	BFD	SU	SUA	USD	TFD
2F					SLV	ISR	HSEL		
30		WLD	BSI		HLI			HML	ALT
31				LLW	LLI	CTLF	CTL		PFG
32		PTI	CCC			ESSH	ESSI		
33		EPR	HLD	ECRN	CD3			EP1	EP1
3B**				DCLR				DCL	
3F**				ADAHR	ADACR			ADAH	ADAC
48**				DPMR	DCLCR			DPM	DCLC

* for Hydraulic Controllers that are part of a group ** MC-MP2 Ver. 8.0 or later software DNmd 035

TABLE 5.10 MC-MP2 Diagnostic Mode Addresses and Computer Variable Flags (Simplex)

MC-MP(2) DIAGNOSTIC MODE ADDRESSES AND COMPUTER VARIABLE FLAGS

Computer Memory Address (Hex)	Toggle Switches Diagnostic On F1 A8.......A5 A4.......A1	Diagnostic Indicators LED *On* = variable flag is On or Active 8	7	6	5	4	3	2	1
20		DOLM	PHE	DZ	DOL	DBC	SE	GEU	GED
21			DC	UC	CC			DHO	DOI
22		DCF	DCP	DOF	LOT		HCT	CCT	SDT
23				HSEL	CSB	DCC	NUDG		DSHT
24		INT/ DCLC	FRA	FCS	FRS	DNS	UPS	STD	STU
25				HLW	HLI			FWI	
26		LFP	UFP						
27				EQI	IND	IN		DEL SIM	YSIM
28		LLW	DLK		DZO RDZ			PK	LLI
29		DNDO	LD		DDP	UPDO	LU		UDP
2A		DMD	DCB	UCB	CCB	DMU	DCA	UCA	CCA
2B		TOS	MLT	PSTX	MGR	H	REL	DSH	RUN
2C			STC	SAF	HCR	HCDX	CCD	ISV	ISRT
2D						FRM			FRC
2E		SD	SDA	DSD	BFD	SU	SUA	USD	TFD
2F*		HLD		EQA	ATSF		ECRN	CD	EPR
2F		HLD	EPI	EPR	SLV	ISR	YRQ	PTR	PTS
30						EPS	EPI	HML	ALT
32*		CAC	CBC	CWI		EDS	ESTE	EQN	PUSD
32		CAC	CBC	CWI	EQA	EDS	ESTE	EQN	PUSD
33			CWIL						
3B**				DCLR				DCL	
3F**				ADAHR	ADACR			ADAH	ADAC
48**				DPMR	DCLCR			DPM	DCLC
4F**		VCI	VCA	SST	VLT	EXMLT	MLTP	MLTDO	HYD 1 TRC O

* Hydraulic Simpex Ver. 3.59 or earlier software ** MC-MP2 Ver. 8.0 or later software. DNmd 034

TABLE 5.11 ASME A17.1 - 2000 Variable and Flag Descriptions			
2BI	2 Bus Input	HDBR	Hoistway Car Door Rear Bypass Switch - Bypass Position
2KBP	ANSI 2000 Bypass Input	HDR	Hoistway Door Rear
ACCI	Inspection Access	ILO1	Overspeed - Inspection / Leveling, Pld #1
ASI	Assigned	ILO2	Overspeed - Inspection / Leveling, Pld #2
ASI1	Assigned	IMEM	Inspection Memory
ASI2	Assigned	INCTI	Inspection Car Top
ASI3	Assigned	INDN	Inspection Down Input
ASI4	Assigned	INICI	Inspection in Car
ASI5	Assigned	INMR	Inspection Machine Room
ASI6	Assigned	INUP	Inspection up Input
ASI7	Assigned	MB	Motor / Brake Output
ASI8	Assigned	MPSAF	Main Processor Safety Output
CD	Car Door Closed	ONE 2 TWO	Indicates Switching from Eb1 to Eb2
CDB	Car Door Bypass Switch - Bypass Position	RACC1	Redundancy Access Inspection Relay #1
CDBO	Car Door Bypass Switch - off Position	RACC2	Redundancy Access Inspection Relay #2
CDBR	Car Door Rear Bypass Switch - Bypass Position	RBK	Redundancy Brake Relay
CDR	Car Door Rear	RCD	Redundancy Car Door Closed Relay
COS1B	Overspeed - Contract, Pld #1	RCDR	Redundancy Car Door Rear
COS2	Overspeed - Contract, Pld #2	RCHDT	Redundancy Car / Hoistway Door Timed Relay
CT	Cycle Test Output	RCTIC	Redundancy Car Top/ in Car Inspection
CTDIF	Cycle Test - Dp Differential	RDN	Redundancy down Relay
CTOS	Cycle Test - Overspeed	RDZ	Redundancy Door Zone Relay
CWI	Counterweight Input	RDZR	Redundancy Door Zone Rear Auxiliary
DCBOR	Car Door Rear Bypass Switch - off Position	RDZX	Redundancy Door Zone Auxiliary
DETS	Down Emergency Terminal Switch	REB1	Emergency Brake Relay #1
DNDIR	Down Direction Detected	REB2	Emergency Brake Relay #2
DNL	Down Normal Limit	REI	Run Enable Input
DZRX	Door Zone Rear Auxiliary	RESBYP	Redundancy Emergency Stop Switch Bypass Relay
DZX	Door Zone Auxiliary	RFR	Redundancy Fault Reset
EB1	Redundancy Emergency Brake Relay #1	RFRM	Redundancy Fault Reset Memory
EB2	Redundancy Emergency Brake Relay #2	RGOV	Redundancy Governor Relay
EBR	Emergency Brake Reset	RH	Redundancy High Speed Relay
EBRM		RHD	Redundancy Hoistway Door Closed Relay
EDS	Earthquake Direction Switch	RHDB	Redundancy Hoistway Door Bypass
EQIND	Earthquake Indicator	RHDBR	Redundancy Hoistway Door Bypass Rear
EQL	Earthquake Latch	RHDR	Redundancy Hoistway Door Rear
EQLED	Earthquake Light	RIN1	Redundancy Inspection Relay #1
EQR	Earthquake Reset Switch	RIN2	Redundancy Inspection Relay #2
EQRM	Earthquake Memory Switch	RLULD	Redundancy Level up / Level Down Relays
ESBYP	Emergency Stop Switch Bypass	RMR	Redundancy Motor Relay
ETS1	Overspeed - Emergency Terminal Switch, Pld #1	RSAFR	Redundancy Safety Relay Input
ETS2	Overspeed - Emergency Terminal Switch, Pld #2	RTBAB	Redundancy Top / Bottom Access Buttons Relay
FCCC	Fire Phase 2 - Car Call Cancel	RUP	Redundancy up Relay
FCOFF	Fire Phase 2 Switch - off Position	RUPM	Redundancy up Relay Memory
FIR1	Fire Phase 1 Active - Main or Alternate	SAFC	Safety Circuit Car
FRBYP	Fire Phase 1 Switch - Bypass Position	SAFH	Safety Circuit Hoistway
FRSA	Fire Phase 1 - Mr / Htw Sensor - Alternate Recall	SSI	Seismic Switch Input
FRSM	Fire Phase 1 - Mr / Htw Sensor - Main Recall	STOP	Stop Switch Input

FWL	Fire Warning Light	TEST	Test Input
GOV	Governor Switch Input	TWO 2 ONE	Indicates Switching from Eb2 to Eb1
HD	Hoistway Door Closed	UETS	Up Emergency Terminal Switch
HDB	Hoistway Door Bypass Switch - Bypass Position	UNL	Up Normal Limit
HDBO	Hoistway Door Bypass Switch - Off Position	UPDIR	Up Direction Detected
HDBOR	Hoistway Car Door Rear Bypass Switch -Off Postion		

***TABLE 5.12 MC-MP2 ASME - 2000 Flags and Variables* [F2, A9, A10 and A11 must also be ON *(up)*]**

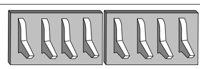
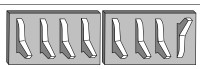
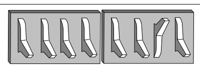
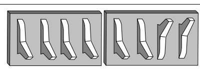
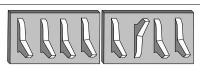
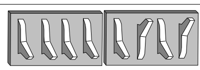
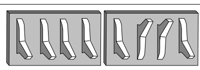
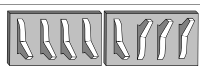
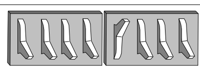
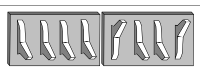
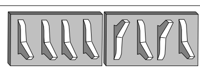
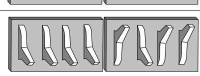
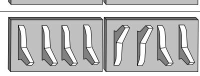
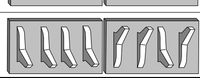
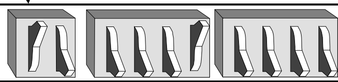
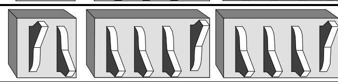
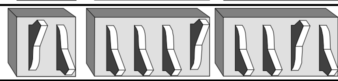
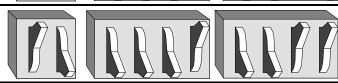
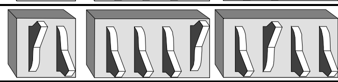
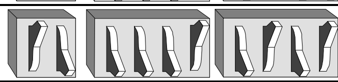
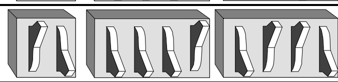
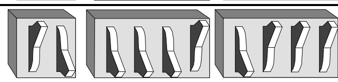
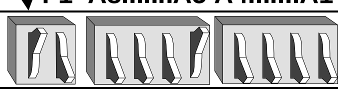
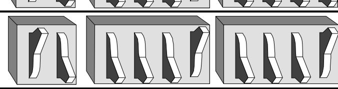
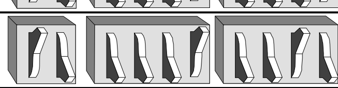
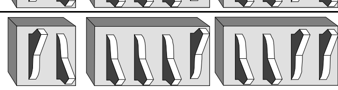
ADDR	Switch Setting A1 - A8	LED8	LED7	LED6	LED5	LED4	LED3	LED2	LED1
0700		2 BI M	MPSAF	STOP	SAFC	SAFH	GOV	RSAFR	2 BI
0701		TEST	INDN	INUP	RIN2	RIN1	INMR	INICI	INCTI
0702		IN M TRUE			RTBAB	RACC2	RACC1	ACCI	RCTIC
0703		EQL	EQRM	EQLED	EQIND	SSI	CWI	EQR	EDS
0704		HDBO	HDB	CDBO	CDB	RHD	RCD	HD	CD
0705			FIR1	FWL	FRSA	FRSM	FRBYP	FCCC	FCOFF
0706		CTDIF	CTOS	ILO2	ETS2	COS2	ILO1	ETS1	COS1
0707		RESBYP	ESBYP		RMR	RBK	RPT	REI	MB
0708		TWO 2 ONE	ONE 2 TWO	EB2	EB1	EBRM	EBR	REB2	REB1
0709		DNDIR	UPDIR	CTPLD1	RUPM	RDN	RUP	DNL	UNL
070A		RFR	RFRM	A2KBP	CT	RCT	RH	RLULD	RDZ
070B		HDBOR	HDBR	CDBOR	CDBR	RHDR	RCDR	HDR	CDR
070C		DETS1	UETS1	RHDBR	RHDB	RDZR	DZRX	RDZX	DZX
070D		ASI8	ASI7	RUDX2	FUDX1	ASI4	DETS2	UETS2	PFLT

TABLE 5.13   MC-MP2-2K Diagnostic Mode Rear Door Addresses and Computer Variable Flags

MC-MP-x DIAGNOSTIC MODE REAR DOOR ADDRESSES AND VARIABLE FLAGS*									
Computer Memory Address (Hex)	Toggle Switches Diagnostic On F1 A8.......A5 A4.......A1	Diagnostic Indicators LED *On* = variable flag is On or Active 8	7	6	5	4	3	2	1
10		DOLMR	PHER	DZR	DOLR	DBCR	SER	GEUR	GEDR
11			DCR	UCR	CCR			DHOR	DOIR
12		DCFR	DCPR	DOFR	DSHTR		HCTR	CCTR	SDTR
13				LOTR		DCCR	NUDGR		
14**		DOLMR	PHER	DZR	DOLR	DBCR	SER	GEUR	GEDR
15**			DCR	UCR	CCR			DHOR	DOIR
16**		DCFR	DCPR	DOFR	DSHTR		HCTR	CCTR	SDTR
17**				LOTR		DCCR	NUDGR		

* for Hydraulic Controllers, Simplex and Duplex
** Car B of a single computer Duplex

MC-MP-x DIAGNlOSTIC MODE REAR DOOR ADDRESSES AND VARIABLE FLAGS*									
Computer Memory Address (Hex)	Toggle Switches Diagnostic On F1 A8.......A5 A4.......A1	Diagnostic Indicators LED *On* = variable flag is On or Active 8	7	6	5	4	3	2	1
10		DOLMR	PHER	DZR	DOLR	DBCR	SER	GEUR	GEDR
11			DCR	UCR	CCR			DHOR	DOIR
12		DCFR	DCPR	DOFR	DSHTR		HCTR	CCTR	SDTR
13						DCCR	NUDGR		LOTR

* for Hydraulic Controllers that are part of a multi-car group   DNmd 008

5.4.2 VIEWING AND ENTERING CALLS

This function allows the user to view all the calls registered per floor, and to enter calls as desired. To view or enter calls, set the switches as shown.

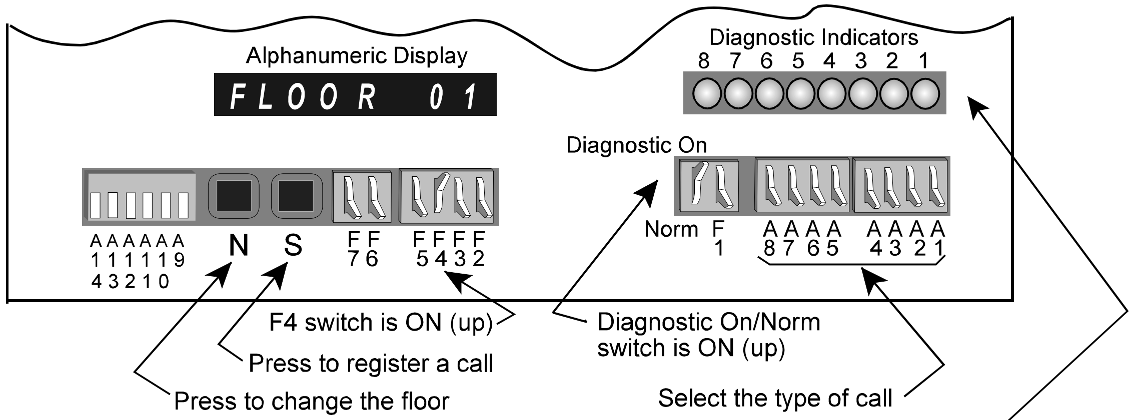


FIGURE 5.4 Viewing and Entering Hall & Car Calls via the EOD

Diagnostic Indicators show current calls	**Diagnostic Indicators**							
	❽	❼	❻	❺	❹	❸	❷	❶
Call type ➪	Hall Call UP Rear	Hall Call UP Front	Hall Call DOWN Rear	Hall Call DOWN Front			Car Call Rear	Car Call Front
To register calls, turn the address switch ON and press "S"	A8	A7	A6	A5	A4	A3	A2	A1
	Address Switches							

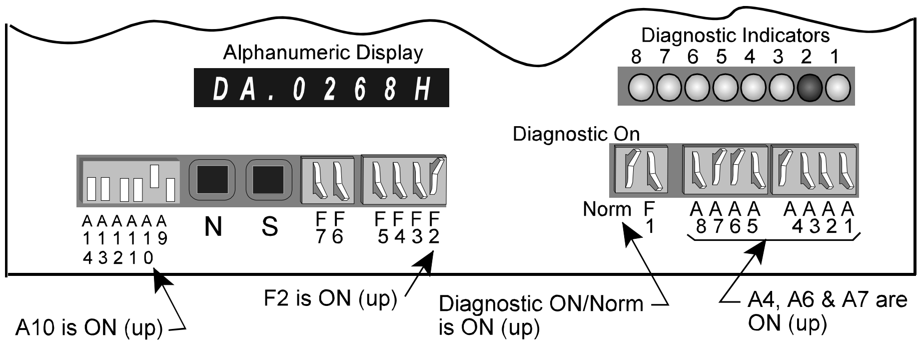
VIEWING CALLS - With the F4 switch in the ON position, the alphanumeric display shows **FLOOR 01** and the Diagnostic Indicators light up with the calls that have been registered. The format for the call indication is shown in Figure 5.4. To advance the floor number press the **N** pushbutton. The Diagnostic Indicator LEDs will show the calls registered for the floor shown in the alphanumeric display. When the top floor number is displayed, pressing N will cause the display to cycle to the bottom floor.

ENTERING CALLS - To enter calls, select the desired floor as described above. Use the A1-A8 switches to select the type of call to enter (see Figure 5.4). For example, set the A1 switch up to register a front car call. Then press and hold the ***S*** pushbutton until the call has been registered. Notes: (1) A call type which does not exist in the system cannot be entered, and (2) if this car is part of a group, only car calls can be entered.

5.4.3 VIEWING EXTERNAL MEMORY (EXAMPLE: DOOR CLOSED LIMIT (DCL) FLAG)

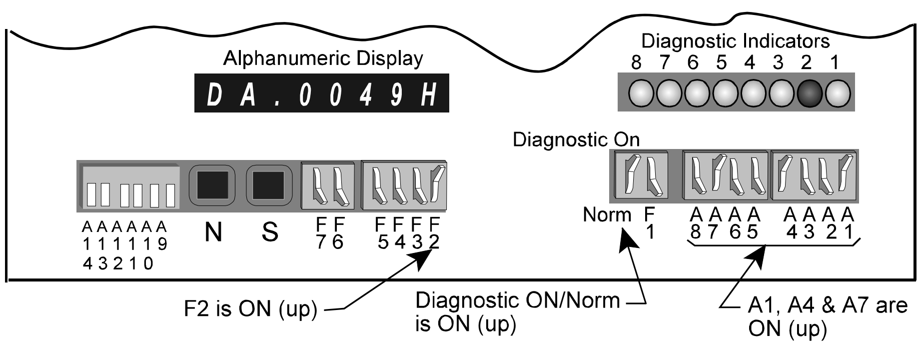
NOTE: With the MC-MP2 Main Processor board these flags may be viewed using the Alphanumeric Display as described in Section 5.2.5.

DCL INPUT - LOCAL TRACTION (MPOLTM software) - The memory flag for DCL is at external memory address 0268 Hex, Diagnostic Indicator #2. Set the switches as shown.



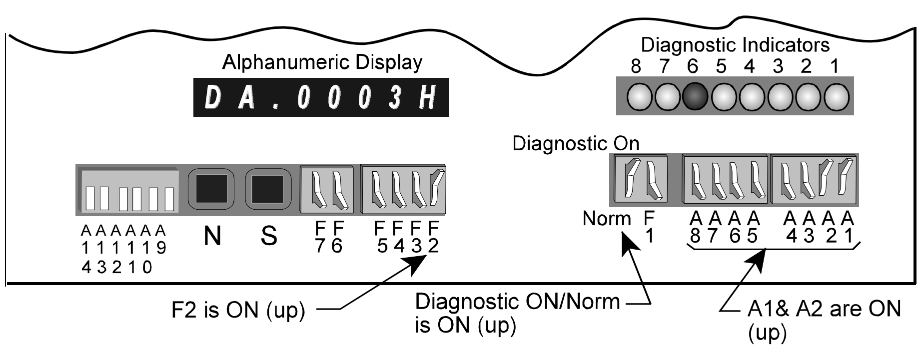
Switch F2 selects external memory. Switches A13 and A14 select the first digit (0), A9 thru A12 select the second digit (2), A5 thru A8 select the third digit (6) and A1 thru A4 select the last digit of the address (8). The Alphanumeric Display indicates that external memory address 0268 Hex is selected (DA.0268H). Diagnostic Indicator #2 shows the status of the DCL input (LED ON = high, LED OFF = low).

DCL INPUT - SIMPLEX TRACTION (MPODT software) - The memory flag for DCL is at external memory address 0049 Hex, Diagnostic Indicator #2. Set the switches as shown.



EXAMPLE: REAR DOOR CLOSED LIMIT (DCLR) FLAG

DCLR INPUT - (all software) - The memory flag for DCLR is at external memory address 0003 Hex, Diagnostic Indicator #6. Set the switches as shown.



SECTION 6
TROUBLESHOOTING

6.0 GENERAL INFORMATION

MCE's HMC-1000-HS controllers are equipped with certain features that can help field personnel speed up troubleshooting. Often the controller will indicate the nature of the problem in the form of a status or error message flashing on the Computer Swing Panel's Status and/or Diagnostic Indicators. The optional CRT terminal connected to either the car controller or the Group Supervisor can provide useful diagnostics in the form of View Hoistway (F3 screen) messages and/or Special Events Calendar Fault Log (F7, 1 screen) messages. Tables 6.3 *Standard Status and Error Messages* and 6.4, ASME A17.1 - 2000 *Status and Error Messages*, provide a complete listing of these messages, a description and recommended corrective actions to be taken.

Troubleshooting often involves determining the status of specific inputs, outputs or computer variable flags. This information is stored in the controller's memory and the status of these memory locations can be viewed using the Computer Swing Panel's Enhanced Onboard Diagnostics (EOD), described in Section 5. In addition, the system is designed so that tracing signals from the field wires onto various boards and into the computer can be achieved without the need for mechanical removal of any components or for rear access to the boards.

The troubleshooting section is arranged as follows:

Troubleshooting Topic:	**Go to:**
Status and Error Messages table and look-up table for the MC-MP2-2K scrolling and F3 screen messages.	Section 6.1
How to use the Special Events Calendar and setup for reporting emergency messages to a PC running CMS software.	Section 6.2
Using the Controller Diagnostics screens	Section 6.3
Troubleshooting Car Operation Control (COC), Door Logic, Call Logic, and Quick References for the HC-PI/O and HC-CI/O boards.	Section 6.4
PC Board Quick References	Section 6.5
Using the MLT / VLT Data Trap	Section 6.6
ASME A17.1 - 2000 Fault Troubleshooting Tables and Flowcharts	Section 6.7

6.1 STATUS AND ERROR MESSAGES

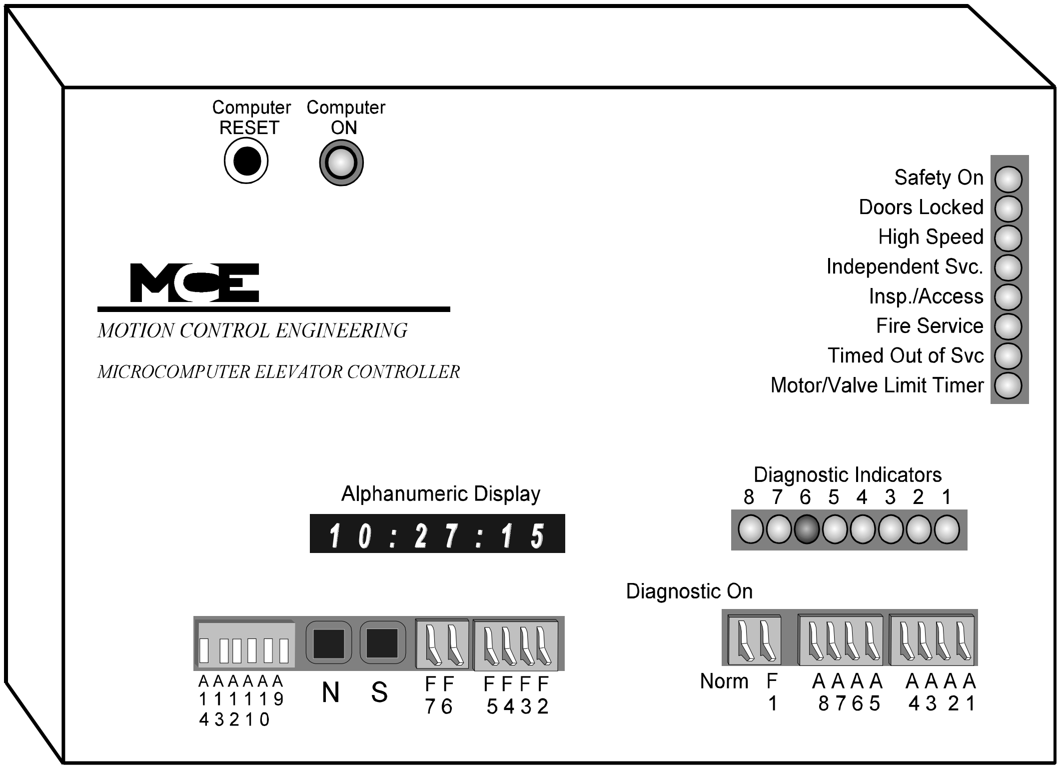
There are five locations where status and error messages are reported. They are:

- The Computer Swing Panel Status Indicators (Section 6.1.1)
- The Computer Swing Panel MP2 Diagnostic Indicators (Section 6.1.1)
- The Computer Swing Panel Alphanumeric Display Scrolling Messages (6.1.1)
- The Special Events Calendar Fault Log (Section 6.1.2)
- The View Hoistway (F3) screen (Section 6.1.3)

6.1.1 COMPUTER SWING PANEL STATUS AND DIAGNOSTIC INDICATORS

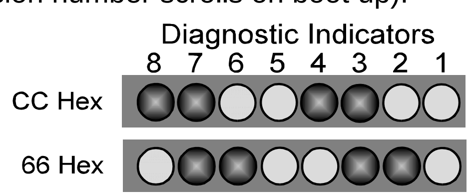
The Computer Swing Panel has two sets of eight indicators that can provide status and error information (Figure 6.1). The Status Indicators (vertical row of eight LEDs) provide information on the current status of the controller.

FIGURE 6.1 Computer Swing Panel, Front View

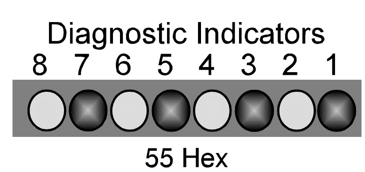


MC-MP2 DIAGNOSTIC INDICATORS - During normal operation these lights scan from right to left (indicating that the MP2 program is looping properly) or flash ON and OFF to indicate a status or error condition. If the car is connected to a Group Supervisor in a multi-car group system, the lights will scan from right to left, then left to right, indicating proper communication between the Car Controller and the Group Supervisor.

When a status or error condition exists, the Diagnostic Indicators flash one of several messages depending on the software version (MP2 version number scrolls on boot up):



- Software versions 8.02.00 or earlier flash the MC-MP-1ES messages.
- Software version 8.03.00 flashes CC Hex.
- Software versions 8.04.00 or later flash 66 Hex. Set the alphanumeric display to scroll the status or error message. Refer to Table 6.3 *Standard Status and Error Messages* for a description and troubleshooting information for the scrolling message.
- ASME A17.1 - 2000 status and error conditions are indicated by the diagnostic indicators flashing 55 Hex. Set the alphanumeric display to scroll the status or error message. Refer to Table 6.4 *ASME A17.1 - 2000 Status and Error Messages* for a description and troubleshooting information for the scrolling message.



MC-MP2 ALPHANUMERIC DISPLAY - If the scrolling status or error message is not displayed when the Diagnostic Indicators flash, press the N pushbutton until the scrolling message appears (see Section 5.2.1 ALPHANUMERIC DISPLAY - STATUS AND ERROR MESSAGES). You can lookup the scrolling message in the index and then refer to Table 6.3 *Standard Status and Error Messages* or Table 6.4 *ASME A17.1 - 2000 Status and Error Messages* for a description and troubleshooting information, or you can find the scrolling message in Table 6.1 *MC-MP2 Scrolling Messages Lookup* and then find the associated Message in Table 6.3 or 6.4.

TABLE 6.1 MC-MP2 Scrolling Messages Lookup

Scrolling Message	Event Message (see Table 6.3)
2ND LANDING AUX. ACCESS FAULT *(non ASME-2000 only)*	2nd Landing Aux. Access Fault
ATTENDANT SERVICE OPERATION	Attendant Service Operation
AUX. INSPECTION ACCESS FAULT *(non ASME-2000 only)*	Aux. Inspection Access Fault
BOTH LEVELING SWITCHES ARE ON (SETUP ERROR), LEARN MODE (*IMC only*)	Both Leveling Switches are ON (Learn Mode Setup Error)
BOTH USD AND DSD INPUTS ARE ACTIVE	Both USD and DSD are Open
BOTTOM FLOOR OR TOP FLOOR DEMAND	Bottom Floor Demand or Top Floor Demand
BOTTOM LANDING AUX. ACCESS FAULT *(non ASME-2000 only)*	Bottom Landing Aux. Access Fault
BRAKE PICK FAILURE *(Traction only)*	Brake Pick Failure
CAR CALL BUS IS DISCONNECTED	Car Call Bus Fuse Blown
CAR IN TEST MODE	Test Mode Operation
CAR NOT AT BOTTOM LANDING (SETUP ERROR), LEARN MODE *(IMC only)*	Car not at Bottom Landing (Learn Mode Setup Error)
CAR NOT BELOW DOOR ZONE (SETUP ERROR), LEARN MODE *(IMC only)*	Car Not Below Door Zone (Learn Mode Setup Error)
CAR NOT ON INSPECTION (SETUP ERROR), LEARN MODE *(IMC only)*	Car Not On Inspection (Learn Mode Setup Error)
CAR NOT ON LEVEL DOWN (SETUP ERROR), LEARN MODE (IMC only)	Level Down ON (Learn Mode Setup Error)
CAR NOT ON LEVEL UP (SETUP ERROR), LEARN MODE *(IMC only)*	Car Not On Level Up (Learn Mode Setup Error)
CAR SAFETY DEVICE OPEN	Car Safety Device Open
CAR TO LOBBY OPERATION	Car To Lobby
CONTACTOR PROOFING REDUNDANCY FAILURE	Contactor Proofing M Contactor Proofing Redundancy Failure MX and PT1 Redundancy Failure PT2 & PT3 Redundancy Failure
DIRECTION RELAY REDUNDANCY FAILURE	Direction Relay Redundancy Failure
DOL AND DLK BOTH ACTIVE	Doors Open and Locked
DOOR CLOSE FAILURE	Door Close Protection
DOOR LOCK FAILURE	Door Lock Failure
DOOR LOCK SWITCH FAILURE	Door Lock Contact Failure
DOOR OPEN LIMIT FAILURE	Door Open Limit Failure
DOOR ZONE SENSOR FAILURE	Door Zone Sensor Failure - On position
DOOR ZONE SENSOR FAILURE - OFF POSITION	Door Zone Sensor Failure - Off position
DPM REDUNDANCY FAULT	DPM Redundancy Fault
DPMR REDUNDANCY FAULT	DPMR Redundancy Fault
DRIVE FAILED TO RESPOND	Drive Failed to Respond
DRIVE FAULT 2 *(IMC only)*	Loss of Position Feedback Parity Sensor Failure (Floor Code) Pattern Door Zone Failure Position Error at DETS Position Error at DNTx Position Error at UETS Position Error at UNTx Read Sensor Failure (Floor Code)
DRIVE FORCED MOTOR LIMIT TIMER *(Traction only)*	Brake Failure Brake IGBT Failure MLT - Drive Forced MLT-Drive Forced (ALT) Pattern Detected Overspeed
DRIVE TEMPERATURE SENSOR FAULT *(IMC Traction only)*	Drive Temperature Sensor Fault
EARTHQUAKE OPERATION *(Traction only)*	Earthquake
EARTHQUAKE - REDUCED SPEED OPERATION *(Traction only)*	Earthquake Normal Operation
ELEVATOR SHUTDOWN SWITCH OR POWER TRANSFER INPUT ACTIVE	Elevator Shutdown or Power Transfer
EMERGENCY POWER OPERATION	Emergency Power
EMERGENCY POWER SHUTDOWN	Emergency Power Shutdown

TABLE 6.1 MC-MP2 Scrolling Messages Lookup

Scrolling Message	Event Message (see Table 6.3)
EMERGENCY STOP INPUT 1 ACTIVATED	Emergency Stop Input 1 Activated
EMERGENCY STOP INPUT 2 ACTIVATED	Emergency Stop Input 2 Activated
ENTER SECURITY CODE	Security
EXCESSIVE HEAT IN SMB UNIT *(IMC Performa only)*	Excessive Heat in SMB Unit
EXCESSIVE HEAT IN SYSTEM 12 *(IMC SCR only)*	Excessive Heat in System 12
FAILURE TO LEAVE THE FLOOR	MLT - Failed to Leave Floor
FIRE SERVICE PHASE 1 - ALTERNATE	Fire Service Alternate
FIRE SERVICE PHASE 1 - MAIN	Fire Service Main
FIRE SERVICE PHASE 2	Fire Service Phase 2
FLT RELAY DROPPED	FLT Relay Dropped
FRONT DOOR IS LOCKED BUT NOT FULLY CLOSED	Doors Locked but not fully Closed - Front
GATE SWITCH FAILURE *(non ASME-2000 only)*	Gate Switch Failure
GOVERNOR SWITCH OPEN *(Traction only)*	Governor Switch Open
HALL CALL BUS IS DISCONNECTED	Hall Call Bus Fuse Blown
HEAVY LOAD WEIGHER CONDITION	Heavy Load
HOISTWAY SAFETY DEVICE OPEN	Hoistway Safety Device Open
HOSPITAL PHASE 1 OPERATION	Hospital Service
HOSPITAL PHASE 2 OPERATION	Hospital Service Phase 2
IMC SUB-SYSTEM NOT READY *(IMC only)*	IMC Sub-System Error
IN CAR STOP SWITCH ACTIVATED	In-car Stop Switch
INDEPENDENT SERVICE OPERATION	Independent Service
INSPECTION / LEVELING OVERSPEED FAILURE *(IMC Traction only)*	Inspection/ Leveling Overspeed
INSPECTION OPERATION	Inspection
LANDING SYSTEM REDUNDANCY FAILURE *(non ASME-2000 only)*	Landing System Redundancy Failure
LEVELING DOWN	Level Down
LEVELING SENSOR FAILED - OFF POSITION	Leveling Sensor Failure (Inactive State)
LEVELING SENSOR FAILED - ON POSITION	Leveling Sensor Failure (Active State)
LEVELING SENSOR FAILURE	Leveling Sensor Redundancy Failure
LEVELING UP	Level Up
LIGHT LOAD WEIGHER CONDITION	Light Load
LOSS OF INSPECTION DURING LEARN MODE *(IMC only)*	Loss of IN During Learn (Learn Mode Setup Error)
MOTOR LIMIT TIMER (ANTI-STALL) ELAPSED	MLT - Excessive PI Correction (*Traction*) MLT - Excessive Releveling at Floor- MLT - Timer Expired Motor Limit Timer (*Traction*) Motor Limit Timer (INT) (*Traction*) Motor Limit Timer (LI) (*IMC Traction*) Motor Limit Timer (LI & INT) (IMC *Traction*) External Motor Limit Timer (*Hydro*) Low Oil Switch (*Hydro*)
NO RESPONSE FROM PATTERN GENERATOR (SETUP ERROR), LEARN MODE (*IMC only)*	No Response from Pattern Generator (Learn Mode Setup Error)
NORMAL OPERATION	
OVERLOAD CONDITION	Car is Overloaded
PASSCODE REQUEST	Passcode Requested
PG NOT READY *(IMC Traction only)*	Pattern Generator not Ready
PHOTO EYE FAILURE	Photo-Eye Failure (Front) or Photo-Eye Failure (Rear)
PRESSURE SWITCH ACTIVATED *(Hydro only)*	Pressure Switch Activated
PRE-TEST MODE	Pre-test Mode
PRIORITY / VIP SERVICE - PHASE 1	Priority/VIP Service Phase 1
PRIORITY / VIP SERVICE - PHASE 2	Priority/VIP Service Phase 2
REAR DOOR IS LOCKED BUT NOT FULLY CLOSED	Doors Locked but not fully Closed - Rear
REDUNDANCY DOOR LOCK RELAY FAILURE	Door Lock Relay Redundancy Failure
REDUNDANCY GATE SWITCH FAILURE *(non ASME-2000 only)*	Gate Switch Relay Redundancy Failure
SAFETY CIRCUIT IS OPEN	Safety Relay Circuit Open
SHUTDOWN OPERATION	MG Shutdown Operation/Shutdown Switch
TIME OUT OF SERVICE	Timed Out of Service
VALVE LIMIT TIMER ELAPSED *(Hydro only)*	Valve Limit Timer Elapsed
VISCOSITY CONTROL FUNCTION ACTIVE *(Hydro only)*	Viscosity Control Function

3-1-05

6.1.2 SPECIAL EVENTS CALENDAR FAULT LOG

The Special Events Calendar can document the most recent 250 important fault conditions or events and display them in chronological order. They can be viewed on the optional CRT terminal connected to either the car controller or the Group Supervisor. The data displayed includes the type of event or fault, the date and time the fault/event occurred, the date and time the fault/event was corrected, as well as other information about the status of the elevator when the fault or event occurred.

The Special Events Calendar is accessed from the Special Events Calendar Menu. Press the **F7** key while the Main Menu is displayed.

View Fault Log (F7, 1 or F7) - From the Special Events Calendar Menu (F7) screen press **1** or **F7** to display the events logged to the Special Events Calendar (Figure 6.2). This screen makes it possible to examine the documented faults and events. The latest 14 faults and events are displayed in the bottom half of the screen, including the date and time the event occurred.

FIGURE 6.2 Special Events Calendar (F7 - 1) screen

```
                         12/4/2000, 10:25:30 AM,   F4=Main Menu

                   Special Events Calendar (F7, F7)

STATUS                   SPEED (ft/min)     VOLTAGE (volts)    CURRENT (amps)
Direction   : N/A        Command  : N/A     Armature : N/A     Armature : N/A
High Speed  : N/A        Tach/Enc : N/A     Motor Fld: N/A     Command  : N/A
Start Floor : N/A        Terminal : N/A     Brake    : N/A
Stop Floor  : N/A        Safety   : N/A
Step Floor  : N/A        Pattern  : N/A     SENSOR (volts)     POSITION (ft)
Switch      : N/A                           Motor Fld: N/A     Absolute : N/A
PI          : 3                             Brake    : N/A
Event Code  : 0x03 ( Communication )

This fault indicates that the car was previously communicating with the Group
Supervisor but is now unable to communicate.

DATE              TIME              DESCRIPTION
12/4/2000         10:05:28 AM       Communication Loss
                  10:07:37 AM       Communication Loss [OFF]
                  2:36:18 PM        Sub-System(s) Reset

  ARROWS: Move Cursor, HOME: Oldest, END: Newest,  CTRL-T: Troubleshoot
                                                                  dnAI208c
```

When this screen is first displayed, the most recent event is displayed at the bottom of the screen. Use the **Up / Down Arrow** keys to scroll one event at a time, the **Page Up / Page Down** keys to scroll a page at a time, or the ***Home / End*** key to scroll to event 1 or 250.

As each event is selected (reverse video), the description of the event and any other logged data is displayed in the top half of the screen. Additional troubleshooting information for each event can be displayed by pressing **Ctrl + T**.

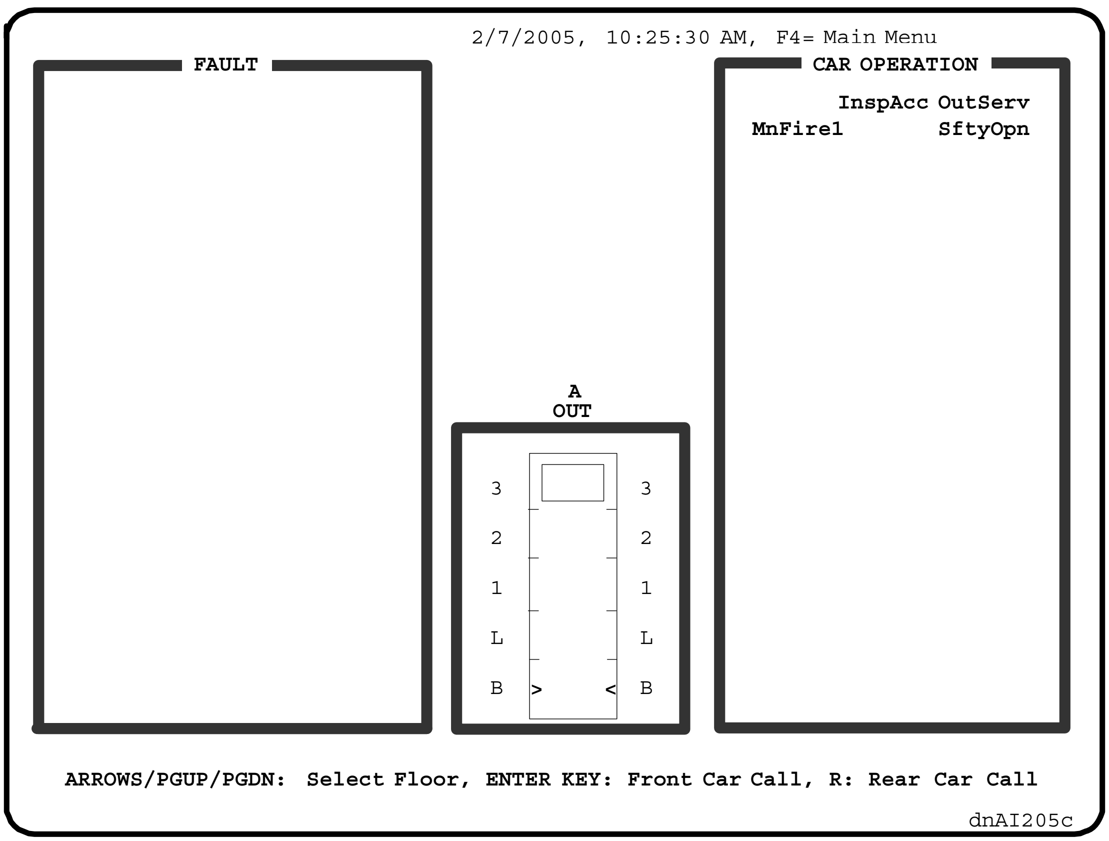
> **NOTE:** Table 6.3, *Standard Status and Error Messages*, and Table 6.4 *ASME A17.1 -2000 Status and Error Messages* list all of the events which can be recorded in the Special Events Calendar Fault Log, with a description of the event and the recommended troubleshooting actions to be taken.

Clear Fault Log (F7, 2) - While the Special Event Calendar Menu (F7) screen is displayed, if the **2** key is pressed, the message `Delete All Events? (Y/N)` is displayed. Press **Y** to clear the Special Events Calendar Fault Log of all events.

6.1.3 VIEW HOISTWAY (F3) SCREEN FAULT FLAGS

The View Hoistway (F3) screen provides information about the status of the controller. The messages in the CAR OPERATION section of the F3 screen are listed in Table 6.2. and a description and recommend troubleshooting actions can be found in Table 6.3, *Standard Status and Error Messages*.

FIGURE 6.3 View Hoistway (F3) Screen



> **NOTE:** Table 6.3, *Standard Status and Error Messages*, provides a description of the messages shown in the CAR OPERATION section of the View Hoistway (F3) screen, including recommended troubleshooting actions to be taken. Refer to Table 6.2, *View Hoistway (F3) Screen - CAR OPERATION* to find the desired flag, then look for the fault message by name in Table 6.3.

TABLE 6.2 View Hoistway (F3) Screen - CAR OPERATION

The flags appear only when the car condition exists.			
AlmNoDZ	Alarm - No Door Zone	**IndSrv**	Independent Service
AlmNoMv	Alarm - No Car Movement	**InServ**	In Service
AltFir1	Fire Service Alternate	**InspAcc**	Inspection
AntiNui	Anti-Nuisance Operation	**MLT**	MLT - Timer Expired
AttnSrv	Attendant Service Operation	**MnFire1**	Fire Service Main
AutoOps	Automatic Operation	**Nudging**	Nudging
BflrDem	Bottom Floor Demand	**OutServ**	Out of Service
Byp-HLW	Hall Call Bypass Operation	**SftyOpn**	Car Safety Device Open
EmrgPwr	Emergency Power	**SwngOpr**	Swing Car Operation
Eqactv	Earthquake	**TflrDem**	Top Floor Demand
FirePh2	Fire Service Phase 2	**TOS**	Timed Out of Service
HospEmr	Hospital Service		

6.1.4 STANDARD STATUS AND ERROR MESSAGES TABLE

Table 6.3, Standard Status and Error Messages provides a listing of the status and error messages from the following:

- Computer Swing Panel MP2 Scrolling Messages
- Special Events Calendar Fault Log
- View Hoistway (F3) Screen - CAR OPERATION section

FIGURE 6.4 Legend for Table 6.3, Standard Status and Error Messages

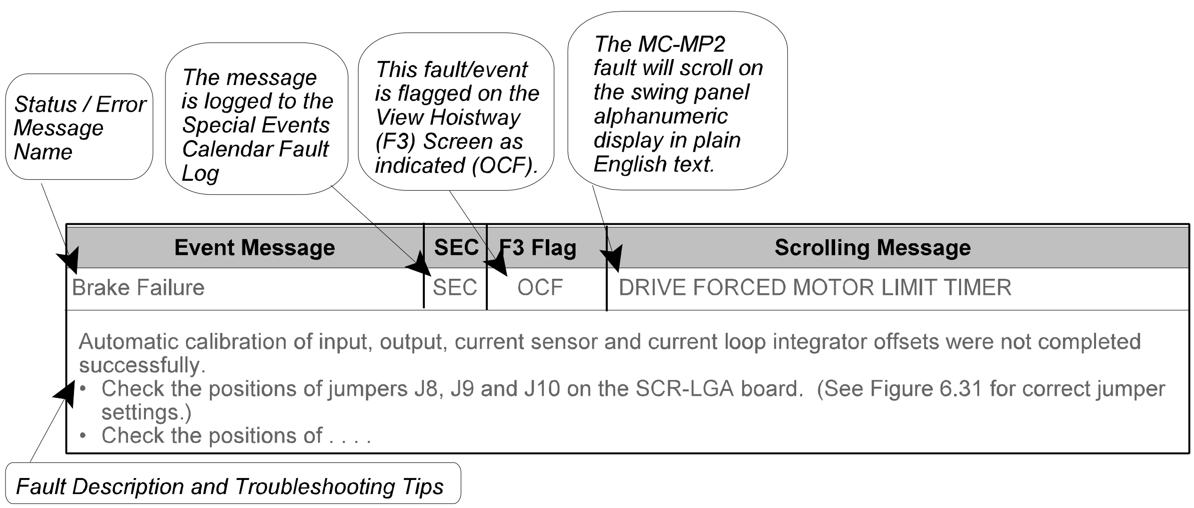


TABLE 6.3 Standard Status and Error Messages

Event Message	SEC	F3 Flag	Scrolling Message
Alarm - No Car Movement	SEC	AlmNoMv	
This status indicates that the alarm bell pushbutton was pressed when the car was not moving (ABI).			
Alarm - No Door Zone	SEC	AlmNoDz	
This status indicates that the alarm bell pushbutton was pressed when the car was not in door zone (ABIZ).			
Anti-Nuisance Operation		AntiNui	
This status indicates that the load weigher is detecting a minimal load in the car; therefore anti-nuisance logic is in effect allowing only a few car calls to be registered.			

TABLE 6.3 Standard Status and Error Messages

Event Message	SEC	F3 Flag	Scrolling Message
Attendant Service Operation		AttnSrv	**ATTENDANT SERVICE OPERATION**
This status indicates that the attendant service input (ATS) is activated. Attendant service is maintained as long as the ATS input is activated, and there are no “emergency service” (e.g., fire service) demands. • Check the status of the ATS input. When the car is in Attendant Service operation the input should be high.			
Automatic Operation		AutoOps	
This status indicates that the car is running on Automatic Operation.			
Both USD and DSD Are Open	SEC		**BOTH USD AND DSD INPUTS ARE ACTIVE**
This fault indicates that the Up Slow Limit Switch (USD input) and Down Slow Limit Switch (DSD input) are simultaneously open. This usually indicates a problem with one of the terminal landing limit switches. The MP detects this condition when USD=0, DSD=0, DLK=1. • Inspect both limit switches and associated wiring. • Measure voltages at relay board terminals 11 (USD) and 13 (DSD). Reference the job prints and verify measured voltages against the status of the limit switches. • If voltages are appropriate, possible causes may be a defective: 47Kohm resistors on top of the main relay board, SC-SB2K-H (for USD/DSD inputs). C2 ribbon cable between SC-SB2K-H and HC-PI/O boards. Input circuit on the HC-PI/O board.			
Bottom Floor Demand	SEC	BflrDem	**BOTTOM FLOOR OR TOP FLOOR DEMAND**
This status is generated either when the established PI value corresponds to the top terminal landing, but the Up Slow Limit Switch is closed or when a valid PI value can not be found. A Bottom Floor Demand is generated to move the car away from the landing and establish a car position. Possible causes are: • The COMPUTER RESET button was pressed. • Initial Power-up. • The state of the limit switch contacts do not correspond to the current PI value (example: the car is in door zone and the PI value corresponds to the bottom terminal landing, but the Down Slow Limit Switch is closed). • The car was placed on Inspection (the computer does not attempt to maintain the PI value while the car is being moved in a “manual” fashion; Bottom Floor Demand is declared when the car is placed back into automatic operation). Troubleshooting: If the floor encoding is invalid, the car should move to one of the terminal landings to establish car position. If the floor encoding is valid and the car is level at a landing, check the floor encoding magnets or vanes (perhaps a valid code cannot be read). If the floor encoding is invalid, check the terminal limit switches and associated wiring. Verify that the input circuits for USD and DSD are not failing by checking for defective: 1. 47Kohm resistors on top of the main relay board, SC-SB2K-H. 2. C2 ribbon cable between SC-SB2K-H and HC-PI/O boards. 3. HC-PI/O board. 4. Short circuit on SC-SB2K-H board.			
Car Call Bus Fuse Blown	SEC		**CAR CALL BUS IS DISCONNECTED**
This fault indicates that there is no power to the car call circuits on the HC-CI/O board(s). A problem may exist with the Car Call Bus fuse (F2CC) or the car call common wiring (bus 2CC). • Check the Car Call Bus fuse (F4) in the controller. • Check the wires that go to the Car Call Power inputs (labeled PS1/PS2/PS3) on the HC-CI/O board(s) in the controller. • Check for the proper installation of the call board “jumper plug” on the HC-CI/O board(s). Look at the notch on the chip and match it up according to the notch orientation label on the HC-CI/O board.			
Car is Overloaded			**OVERLOAD CONDITION**
This status indicates that the Overload input (OLW) is activated, or the perceived load in the car has exceeded the threshold value set for an overload condition. • For a discrete OLW input: check the status of the OLW input (wired to a load weigher contact), and determine if the status of the input is appropriate relative to the load in the car. • For an analog load weigher: check the perceived load percentage using the on-board diagnostic station. Determine if the value displayed (percentage) is appropriate relative to the load in the car.			
Car Out of Service with Doors Locked	SEC		
This fault indicates that the car was shut down because it was delayed from leaving the landing for a predetermined time (default 5 minutes) after it timed out of service. The doors were locked when the timer elapsed. • Correct the problem that caused the car to time out of service. Refer to the Special Event Calendar for the event name, then troubleshoot that event.			

TABLE 6.3   Standard Status and Error Messages

<table>
<tr><th>Event Message</th><th>SEC</th><th>F3 Flag</th><th>Scrolling Message</th></tr>
<tr><td>Car Out of Service without Doors Locked</td><td>SEC</td><td>SftyOpn</td><td></td></tr>
<tr><td colspan="4">This fault indicates that the car was shut down because it was delayed from leaving the landing for a predetermined time (default 5 minutes) after it timed out of service. Doors were not locked when the timer elapsed.
• Suspect an obstruction that has kept the doors from closing, thus preventing the car from leaving.
• Verify that controller terminal #9, on the SC-SB2K-H board, for zero voltage.
• Correct the problem that caused the car to time out of service. Refer to the Special Event Calendar for the event name, then troubleshoot that event.</td></tr>
<tr><td>Car Safety Device Open</td><td>SEC</td><td></td><td>CAR SAFETY DEVICE OPEN</td></tr>
<tr><td colspan="4">This fault indicates that one or more of the car safety circuit devices is open (e.g., emergency exit contact, safety clamp switch, car-top emergency stop switch). This error is generated when the safety string input (SAF) is low, and the safety circuit has been opened “upstream” of the SAFC input.
• Check the applicable car safety devices. Refer to controller wiring prints for applicable devices.</td></tr>
<tr><td>Car to Lobby</td><td></td><td></td><td>CAR TO LOBBY OPERATION</td></tr>
<tr><td colspan="4">This status indicates that the Car To Lobby input (CTL) has been activated.
• Check the status of the CTL input. It should be high.</td></tr>
<tr><td>Communication Loss</td><td>SEC</td><td></td><td></td></tr>
<tr><td colspan="4">This fault indicates that the car was previously communicating with the Group Supervisor but is now unable to communicate.
• Verify that the RS-422 communication cable is not removed from the Car’s MC-RS board.
• Verify the jumpers on all of the controllers’ MC-RS boards.
• Check for a defective MC-RS board on any of the controllers.</td></tr>
<tr><td>Door Close Protection</td><td>SEC</td><td></td><td>DOOR CLOSE FAILURE</td></tr>
<tr><td colspan="4">This fault indicates that the doors were unable to close in typically 60 seconds.
• Check door lock contacts for proper closure and conductivity.
• Check individual doors and door tracks for physical obstructions.
• Verify that the Door Close Limit contact functions properly.
• Check for a faulty hoistway or car door contact (HD or CD) or Door Close Limit input (DCL) or Door Position Monitor (DPM).</td></tr>
<tr><td>Door Lock Contact Failure</td><td>SEC</td><td></td><td>DOOR LOCK SWITCH FAILURE</td></tr>
<tr><td colspan="4">This fault indicates that a door lock contact appears to have failed in the closed state. The computer compares the state of the hoistway Door Lock contact input (HD or HDR) with the state of the Door Close Position Monitor (DPM). If HD, CD, HDR or CDR remain high after the doors have opened (DPM=1), this failure will be declared. (It appears that the door lock contact is shunted or has remained closed).
• Measure the voltage on the CD, HD, CDR or HDR input, with doors open.
• If voltage exists on any of these while the doors are open, trace the source of the voltage.
• If no voltage exists on any of these, suspect faulty DPM or DPMR input circuit. Check the HC-IOX and HC-I4O boards.</td></tr>
<tr><td>Door Lock Failure</td><td>SEC</td><td></td><td>DOOR LOCK FAILURE</td></tr>
<tr><td colspan="4">This fault indicates that the doors have closed, DPM = 1 (or DCLC = 1 if retiring cam), a demand exists for the car to move (DCP = 1), but the doors did not lock (DLK = 0) within 80 seconds with the door close power output (DCP) turned on.
• If no Retiring Cam is used, verify that the door lock contacts are closed to provide power to the door lock input (DLK = 1).
• If the Retiring Cam option is set:
1. Verify that the Retiring Cam relay is activated (DCP=1, DPM=1 or DCLC=1) and the doors are locked (DLK=1).
2. Momentarily place the car on Inspection to reset the Door Lock Failure.
3. Verify the proper operation of the Retiring Cam circuitry and mechanism.</td></tr>
<tr><td>Door Lock Relay Redundancy Failure</td><td>SEC</td><td></td><td>REDUNDANCY DOOR LOCK RELAY FAILURE</td></tr>
<tr><td colspan="4">This fault indicates that one of the door lock relays has failed to drop out.
• Verify that, with the hoistway doors open, there is no power on the Door Lock Sensor Relay input (RDLS or RDLSR, if the car has rear doors).
• If the RDLS or RDLSR input is high and the doors are open, then a door lock relay has failed to drop.
• Verify that the door lock relay(s) operates properly.
• If no voltage appears on the RDLS (or RDLSR) input, suspect a faulty RDLS (or RDLSR) input circuit. Replace the HC-IOX and/or HC-I4O boards.</td></tr>
</table>

TABLE 6.3 Standard Status and Error Messages

<table>
<tr><th>Event Message</th><th>SEC</th><th>F3 Flag</th><th>Scrolling Message</th></tr>
<tr><td>Door Open Limit Failure</td><td>SEC</td><td></td><td>DOOR OPEN LIMIT FAILURE</td></tr>
<tr><td colspan="4">This fault indicates that a door open limit contact appears to have failed in the open state. This means the Door Open Limit input (DOL or DOLR) is low--indicating an open door--while the car door (CD) or hoistway door (HD) inputs are high--indicating a closed and locked door.
• Verify that, with the doors closed, there is power on the Door Open Limit input (DOL or DOLR). DOL or DOLR must be high when HD and/or CD is high.
• Check the wire, in the controller, to terminal #36 on SC-SB2K-H to verify DOL.
• If there is a rear door, check terminal #36 on the rear door board to verify DOL.</td></tr>
<tr><td>Door Open Protection</td><td>SEC</td><td></td><td></td></tr>
<tr><td colspan="4">This fault indicates that the doors were unable to open in typically 12 seconds.
• Check door lock contacts for proper closure and conductivity.
• Check individual doors and door tracks for physical obstructions.
• Verify that the Door Open Limit contact functions properly.</td></tr>
<tr><td>Doors Locked but not fully Closed - Front</td><td></td><td></td><td>FRONT DOOR IS LOCKED BUT NOT FULLY CLOSED</td></tr>
<tr><td colspan="4">This fault indicates that the Door Lock input (DLK) was high (doors locked) and the Door Closed Limit input (DCL) was high (doors not fully closed). DCL should be low when doors are locked.
• Determine the state of the doors.
• If the doors are closed, check the voltage on the DCL input terminal. If the voltage is high, adjust the Door Closed Limit switch so the switch opens prior to DLK.
• Check for a faulty door close limit contact or associated wiring.</td></tr>
<tr><td>Doors Locked but not fully Closed - Rear</td><td></td><td></td><td>REAR DOOR IS LOCKED BUT NOT FULLY CLOSED</td></tr>
<tr><td colspan="4">This fault indicates the Door Lock input (DLK) was high (doors locked) and Door Closed Limit Rear input (DCLR) was high (doors not fully closed). DCLR must be low when doors are locked.
• Determine the state of the doors.
• If the doors are closed, check the voltage on the DCLR input terminal. If the voltage is high, adjust Rear Door Closed Limit switch so the switch opens prior to DLK.
• Check for a faulty door close limit contact or associated wiring.</td></tr>
<tr><td>Doors Open And Locked</td><td>SEC</td><td></td><td>DOL AND DLK BOTH ACTIVE</td></tr>
<tr><td colspan="4">This fault indicates that the Door Open Limit input (DOL) was low while the Door Lock input (DLK) was high. The leveling inputs (LU and LD) must also be low to log this fault.
• Determine the state of the doors.
• If the doors are open, check the voltage on terminal #9 (DLK), on the SC-SB2K-H board.
• If voltage exists, determine source of voltage (there should be no voltage on terminal 9 if doors are open and car is not leveling). If the doors are closed, check the voltage on terminal #36 (DOL), on the SC-SB2K-H board. The voltage should be high.
• If voltage does not exist, check for faulty door open limit contact (contact should be closed if doors are not fully open) or associated wiring.
• If voltages are appropriate, suspect faulty input circuit (either DLK or DOL input circuit). Check the 47Kohm resistors on the SC-SB2K-H and HC-PI/O boards.</td></tr>
<tr><td>Door Zone Sensor Failure
(active state)</td><td></td><td></td><td>DOOR ZONE SENSOR FAILURE</td></tr>
<tr><td colspan="4">This fault indicates that the Door Zone input (DZ) did not deactivate during the run. Probable causes are: shorted door zone sensor or associated circuitry (within the landing system assembly); faulty wiring from the landing system to the controller; or a faulty computer input circuit (main relay board or HC-PI/O board).
• Check the operation of the door zone sensors and associated wiring (place the car on inspection, move the car away from the floor, noting the transitions in the door zone signal(s) coming from the landing system).
• Verify that the computer diagnostic display of DZ (or DZ rear) matches the state of the sensor signals at the main relay board (or rear door relay board).</td></tr>
<tr><td>DPM Redundancy Fault</td><td>SEC</td><td></td><td>DPM REDUNDANCY FAULT</td></tr>
<tr><td colspan="4">A failure of a front door input, relay or associated circuitry has been detected. This logic detects failure of the input structure and hardware associated with the DPM (door position monitor) input that monitors the position of the doors in order to validate DLK. Valid when SAF=1. When DLK is ON (1) then input DPM must also be ON (1). When DOL=0, DPM=0. If this is not the case, then a DPM redundancy fault is recorded and the car is prevented from operating.
• Make sure that DPM makes (120VAC) 1" to 2" prior to door lock. If this is already the case then check associated input resistors, ribbon cable or boards associated with this input (refer to Job prints).</td></tr>
<tr><td>DPMR Redundancy Fault</td><td>SEC</td><td></td><td>DPMR REDUNDANCY FAULT</td></tr>
<tr><td colspan="4">A failure of a rear door input, relay or associated circuitry has been detected. This logic detects failure of the input structure and hardware associated with the DPMR (door position monitor rear) input that monitors the position of the doors in order to validate DLK.. Valid when SAF=1. When DLK is ON (1), input DPMR must also be ON (1). When DOLR=0, DPMR=0. If not, a DPMR redundancy fault is recorded and the car is prevented from operating.
• Make sure that DPMR makes (120VAC) 1" to 2" prior to door lock. If this is already the case then check associated input resistors, ribbon cable or boards associated with this input (refer to Job prints).</td></tr>
</table>

TABLE 6.3 Standard Status and Error Messages

Event Message	SEC	F3 Flag	Scrolling Message
Earthquake	SEC	Eqactv	**EARTHQUAKE OPERATION**
This fault indicates that one or both of the earthquake inputs (SSI, CWI) are low. The appropriate code-mandated earthquake operation is applied, for ANSI and California Earthquake Operation the car is brought to a floor and then shut down. • The elevator may be returned to normal service by means of momentary pressure on the Earthquake reset button on the SC-BAH(R) board. This should be done by authorized personnel, after it has been determined that it is safe to do so. • Should the system remain in this mode of operation after the reset button has been pressed, check the status of the earthquake sensing devices (seismic switch or counterweight derailment device).			
Earthquake Normal Operation			**EARTHQUAKE- REDUCED SPEED OPERATION**
This status allows the car to run after an Earthquake fault. To run at reduced speed on Earthquake Normal Operation the Earthquake fault timer must expire and the counterweight must **not** be derailed during the earthquake. (CWI or SSI is low; used for ANSI earthquake operation only.) Otherwise, the car remains shut down. • The elevator may be returned to normal service by pressing the EARTHQUAKE RESET button on the SC-BAH(R) board. This should be done by authorized personnel, after it has been determined that it is safe to do so. • Should the system remain in this mode of operation after the RESET button has been pressed, check the status of the CWI and SSI inputs.			
Elevator Shutdown or Power Transfer			**ELEVATOR SHUTDOWN SWITCH OR POWER TRANSFER INPUT ACTIVE**
This status indicates that either the Elevator Shutdown input (ESS) has been activated or the Power Transfer input (PTI) has been activated. The car is stopped at the next available floor and then shut down. • Verify that the status of the computer inputs (ESS) and (PTI) is appropriate relative to the status of the switch or contact that feeds the input.			
Emergency Power	SEC	EmrgPwr	**EMERGENCY POWER OPERATION**
This event indicates that the system is on Emergency Power operation. The Emergency Power input (EPI) is low, which indicates that the system is being powered by an emergency-power generator. • If system is not running on an emergency-power generator, check the voltage on the EPI terminal (this terminal is generally found in the group supervisor controller in multi-group applications). • If voltage does not exist on EPI, check contact and associated wires that feed the EPI input. • If voltage does exist on the EPI terminal, suspect faulty EPI input circuitry (HC-IOX or HC-I4O board). [Note: In some applications, the EPI input resides in the individual elevator controller. Refer to specific job prints for details.] • If this is a group system with emergency power, and the Group Supervisor has yet to be installed, place a jumper from the 2 bus to the EPI input on each local car's HC-IOX board. Remove the jumper when the Group Supervisor is installed.			
Emergency Power Shutdown	SEC		**EMERGENCY POWER SHUTDOWN**
This status indicates that the car is shutdown during Emergency Power Operation when the controller is unable to communicate with the Group Supervisor. When the Group Supervisor is unable to coordinate running the elevators on Emergency Power, this shutdown occurs in order to prevent the cars from running all at the same time and possibly overloading the generator.			
Emergency Stop Input 1 Activated			**EMERGENCY STOP INPUT 1 ACTIVATED**
This message is displayed when the Emergency Stop Input 1 (ESTP1) goes high.			
Emergency Stop Input 2 Activated			**EMERGENCY STOP INPUT 2 ACTIVATED**
This message is displayed when the Emergency Stop Input 2 (ESTP2) goes high.			
External Motor Limit Timer	SEC		**MOTOR LIMIT TIMER (ANTI-STALL) ELAPSED**
This fault indicates that the EXMLT input is active. This is an MLT shutdown wtih an External Motor Limit Timer (EXMLT).			
FLT Relay Dropped			**FLT RELAY DROPPED**
The FLT relay is dropped as a result of one or more of many possible fault conditions. • Check the Event Calendar to determine what has caused the FLT Relay Dropped message. Then look up that message or messages in this table to determine the appropriate troubleshooting and/or corrective action.			
Fire Service Alternate	SEC	AltFir1	**FIRE SERVICE PHASE 1 - ALTERNATE**
This event indicates that the system is on Fire Recall Operation (Fire Service Phase I), using the alternate fire recall floor. This recall is generally initiated by the activation of a smoke detector at the main fire recall floor. In some applications, an alternate fire recall switch may be specified (FRAON input). • Inspect the fire sensors (especially the main floor sensor) and the Fire Phase I switch wiring. For some fire codes including ANSI, the Fire Phase I switch must be turned to the BYPASS position and then back to OFF to clear the fire service status, if activated by a smoke sensor. • If this is a group installation and the group has yet to be installed, make sure the 2-bus is connected to terminal #38 on the SC-SB2K-H. Remove the jumper when Fire Service wiring is complete.			

TABLE 6.3 Standard Status and Error Messages

Event Message	SEC	F3 Flag	Scrolling Message
Fire Service Main	SEC	MnFire1	**FIRE SERVICE PHASE 1 - MAIN**
This event indicates that the system is on Fire Recall Operation (Fire Service Phase I), using the main fire recall floor. This recall is generally initiated by the activation of a smoke detector at a landing other than the main fire recall floor. Fire recall operation to the main floor can also be initiated by the activation of the fire recall switch (input FRON or FRON2). • Inspect the fire sensors and the Fire Phase I switch wiring. For some fire codes including ANSI, the Fire Phase I switch must be turned to the RESET position and then back to OFF to clear the fire service status if activated by a smoke sensor. • If this is a group installation and the group is not installed, make sure the 2-bus is connected to terminal #38 on the SC-SB2K-H. • If this installation must comply with the requirements of ASME A17.1-2000 or later code, and the machine room and hoistway sensors have not yet been installed, or if this is a group system and the Group Supervisor has yet to be installed, make sure the FRSM and FRSA inputs on the HC-IOX boards in each simplex or local car controller are connected to the 2/2F bus, as applicable.			
Fire Service Phase 2	SEC	FirePh2	**FIRE SERVICE PHASE 2**
This event indicates that the car is on In-car Fireman's Service (Fire Phase 2). The in-car fire service switch has been placed in the on (FCS) or hold (HLD) position. • Inspect the phase 2 switch and wiring. In most fire jurisdictions, the car must be returned to the fire floor at which Fire Phase 2 was activated, the doors must be full open, and the phase 2 switch must be turned OFF to remove the elevator from Fire Phase 2.			
Gate Switch Failure	SEC		**GATE SWITCH FAILURE**
This fault indicates that a car gate contact failed to open when the car doors opened. The computer checks the gate switch contact input (GS or GSR) against the door close limit input (DCL). If the gate switch contact remains closed (GS=1 or GSR=1) while the door is open (DCL=1) the fault is logged. Such a state would indicate that the gate switch contact has been shunted, or a contact or associated wiring is faulty. • Verify that, with the doors open, there is no power on the GS input (GS must be low when DCL is high). • If no voltage exists on the GS input, suspect a faulty GS input circuit (HC-IOX or HC-I4O board). • If there is a rear door perform the same tests for the GSR input.			
Gate Switch Relay Redundancy Failure	SEC		**REDUNDANCY GATE SWITCH FAILURE**
This fault indicates that a car gate switch relay failed to release when the doors opened. • Verify that, with the car gate open, there is no power on the RGS input (or RGSR, if rear doors). • If the RGS input is high, suspect a stuck or welded gate switch relay. • Verify that the gate switch relay(s) operates properly. • If no voltage appears on the RGS (or RGSR) input, suspect a faulty RGS (or RGSR) input circuit.			
Hall Call Bus Fuse Blown	SEC		**HALL CALL BUS IS DISCONNECTED**
This fault indicates that there is no power to the hall call circuits on the HC-CI/O board(s). A problem may exist with the Hall Call Bus fuse or the hall call common wiring. • Check the Hall Call Bus fuse in the controller. • Check the wires that go to the Hall Call Power inputs on the HC-CI/O board(s) in the controller. • Check for proper installation of the call board "jumper plug" on the HC-CI/O board(s).			
Hall Call Bypass Operation		Byp-HLW	
This status indicates that the load weigher is detecting a significant load in the car so hall calls will be bypassed.			
Heavy Load			**HEAVY LOAD WEIGHER CONDITION**
This status indicates that the Heavy Load (HLI) input has been high. • For a discrete HLI input (wired to a load weigher contact): Check the status of the HLI input, and determine if the status of the input is appropriate relative to the load in the car. • For an analog load weigher: Check the perceived load percentage using the on-board diagnostic station. Determine if the value displayed (percentage) is appropriate relative to the load in the car.			
Hoistway Safety Device Open	SEC	SftyOpn	**HOISTWAY SAFETY DEVICE OPEN**
This fault indicates that one or more of the Hoistway Safety Circuit Devices is open (e.g., pit stop switch, car and cwt buffers switches, up/down final limit switches). This error is generated when the safety string input (SAF) is low, and the safety circuit has been opened "upstream" of the SAFH input. • Check the applicable items (e.g., pit stop switch, car and cwt buffers switches, up/down final limit switches). Refer to the specific controller wiring prints for applicable devices.			
Hospital Service	SEC	HospEmr	**HOSPITAL PHASE 1 OPERATION**
This status indicates that the car was placed on Hospital Service. • Hospital Service can be initiated by the registration of a hospital call, or by the activation of the in-car Hospital Service switch (HOSP input). • Verify that the status of the in-car hospital switch computer input (HOSP) is appropriate relative to the status of the key-switch.			
Hospital Service Phase 2	SEC	HospEmr	**HOSPITAL PHASE 2 OPERATION**
This status indicates that the car has answered a hospital emergency call or the in car hospital emergency key switch has been activated (HOSP2 is high). • The car has been placed on in-car Hospital Emergency Service. The car will remain in this mode until the in-car Hospital Service key-switch is turned off. • Verify that the status of the in-car hospital switch computer input (HOSP2) is appropriate relative to the status of the key-switch.			
In-car Stop Switch	SEC	SftyOpn	**IN CAR STOP SWITCH ACTIVATED**
This fault indicates that the in-car stop switch has opened the safety circuit. • Check the status of the in-car emergency stop switch and associated wiring.			

TABLE 6.3 Standard Status and Error Messages

Event Message	SEC	F3 Flag	Scrolling Message
Inconspicuous Riser	SEC		
This event indicates that the System is on Swing operation or the Inconspicuous Riser is functional. • Check Swing Car Operation. • Inspect the SWG switch on the controller.			
Independent Service	SEC	IndSrv	**INDEPENDENT SERVICE OPERATION**
This event indicates that the Independent Service switch has been turned on, or the TEST/NORMAL switch on the Relay board is in the TEST position. • Check the Independent Service switch. • Inspect the TEST/NORMAL switch on the Relay board on the controller. • Check the wiring to the relay board (SC-SB2K-H) terminal #49.			
Inspection	SEC	InspAcc	**INSPECTION OPERATION**
This event indicates that the hoistway access, car top inspection or relay panel MACHINE ROOM INSPECTION TRANSFER switch is on INSP or the hoistway and/or car-door bypass switch is on bypass. The Inspection input (IN) is low. • Check all of the inspection switches and associated wiring. • Check the wiring to the relay board (SC-SB2K-H) terminals ACCN, INCTI, INICN and ACCI .			
Level Down			**LEVELING DOWN**
This status is normally on when the car is just above a floor. If the car is level with the floor and this message appears, it is usually the result of a switch or sensor problem. • Inspect the LD switch or sensor on the landing system and the placement of the landing system vane or magnet for that floor.			
Level Up			**LEVELING UP**
This status is normally on when the car is just below a floor. If the car is level with the floor and this message appears, it is usually the result of a switch or sensor problem. • Inspect the LU switch or sensor on the landing system and the placement of the landing system vane or magnet for that floor.			
Leveling Sensor Failure (Active State)			**LEVELING SENSOR FAILED - ON POSITION**
This fault indicates that the MP detected a LU or LD input that is stuck in the active state. Computer input circuit (main relay board or HC-PI/O board). • Check operation of the leveling sensors and associated wiring. • Move above and below a landing, noting the transitions in the leveling signal(s) coming from the landing system. • Verify that the computer diagnostic display (F3 screen or ADDR 29H bits 3 & 7) of LU and LD matches the state of the sensor signals at terminals 25 and 26 on the SC-SB2K-H board. • Check also the operation of any contacts that may be placed at the “low side” (the “1-bus” side) of the LU1/2 and LD1/2 relay coils (e.g., H, INT). Check that such contacts close properly when appropriate.			
Leveling Sensor Failure (Inactive State)			**LEVELING SENSOR FAILED - OFF POSITION**
This fault indicates that the MP detected a LU or LD input that is stuck in the inactive state. • Check operation of the leveling sensors and associated wiring. • Move above and below a landing, noting the transitions in the leveling signal(s) coming from the landing system. • Verify that the computer diagnostic display of LU and LD matches the state of the sensor signals at the main relay board SC-SB2K-H.			
Leveling Sensor Redundancy Failure	SEC		**LEVELING SENSOR FAILURE**
This fault indicates that one of the LU or LD sensors appears to have failed. The MP has observed one of the following faults: • One of the leveling inputs was active continuously throughout a floor-to-floor run • The appropriate leveling input was not seen prior to the arrival of the car at a door zone • Verify the proper operation of the leveling sensor signals when moving the car in the hoistway. • Check for a LU or LD input circuit failure by looking for defective: 47kohm resistor on top of the main relay board, SC-SB2K-H. C2 ribbon cable. HC-PI/O board input circuit. Inputs at terminals 25 and 26 on the SC-SB2K-H board.			
Light Load			**LIGHT LOAD WEIGHER CONDITION**
This status indicates that the Light Load Weighing (LLI) input is activated. The Light Load error message is generated whenever the load inside the car is less than the threshold specified to activate Anti-Nuisance operation, and car calls are registered. • Response is only required if the anti-nuisance function (cancellation of car calls) appears to activate even when the car is loaded to a value above the threshold load value. • For a discrete (LLI) input (wired to a load weigher contact): check the status of the (LLI) input and determine if the status is appropriate relative to the load in the car. • For an Analog Load Weigher: check the perceived load percentage using the on-board diagnostic station. Determine if the percentage displayed is appropriate relative to the load in the car.			

TABLE 6.3 Standard Status and Error Messages

Event Message	SEC	F3 Flag	Scrolling Message
Loss of IN During Learn (Learn Mode Setup Error)			**LOSS OF INSPECTION DURING LEARN MODE**
This status indicates that the car was taken off of Inspection operation during the learn process. • Place the car on relay panel Inspection and perform the learn process again.			
Lost Door Lock During Run	SEC		
This fault indicates that the Door Lock input was lost while the car was traveling through the hoistway. • Check door lock adjustment to prevent clipping of door lock mechanism when car passes a floor. • If logged with another fault, this event may be a side effect of the other fault.			
Low Oil Switch	SEC		**MOTOR LIMIT TIMER (ANTI-STALL) ELAPSED**
This fault indicates that the Low Oil Switch (LOS) input is active. This MLT shutdown gets latched until the car is momentarily on Inspection or reset.			
MLT - Excessive Releveling at Floor	SEC	MLT	**MOTOR LIMIT TIMER (ANTI-STALL) ELAPSED**
This fault indicates that the car has releveled 25 times at the same floor. • Check the brake releveling motor adjustment. • If the job is using a sleeve bearing motor, turn the Idle option ON. (See Timers and their Ranges, in Section 5 for details on the Idle option). • To clear the condition, the car can be placed momentarily on Inspection.			
MLT - Failed to Leave Floor	SEC	MLT	**FAILURE TO LEAVE THE FLOOR**
This fault is generated when the controller has picked high speed a number of times but failed to leave the floor. The number of tries allowed is a field-programmable value, programmed through the MC-MP2 enhanced on-board diagnostics (“System Mode”). • The field adjustable option FTLF in the MP2's EOD may be used to turn the option OFF or to change the number of times H picks before shutdown. • Check for an intermittent Door Lock. • To clear the condition, the car can be placed momentarily on Inspection.			
MLT - Timer Expired	SEC	MLT	**MOTOR LIMIT TIMER (ANTI-STALL) ELAPSED**
The motor limit timer has elapsed before the car has completed its movement. This condition can occur because the MC-MP2 computer receives a direction sensing (UPS or DNS) input for a sufficient amount of time to cause the MLT timer to elapse. This usually happens due to the system's failure to respond to a 120 VAC direction signal appearing on terminals 85(up) or 87 (down) on the SC-SB2K-H Relay board. • Check Up and Down Sense inputs. • To clear the condition, the car can be placed momentarily on Inspection.			
Nudging		Nudging	
This status indicates that the door nudging operation has commenced. Doors will be closed with reduced speed and torque as required by code.			
Photo-Eye Failure (Front)	SEC		**PHOTO EYE FAILURE**
This fault indicates that the front-door, photo-eye input (PHE) was activated during a run. • Check for abnormal blockage of the optical device. • Check for a failure of the device itself, or of the photo-eye input (PHE) circuit. • Ensure that the safety edge has power.			
Photo-Eye Failure (Rear)	SEC		**PHOTO EYE FAILURE**
This fault indicates that the rear-door, photo-eye input (PHER) was activated during a run. • Check for abnormal blockage of the optical device. • Check for a failure of the device itself, or of the photo-eye input (PHER) circuit. • Ensure that the safety edge has power.			
Pressure Switch Activated			**PRESSURE SWITCH ACTIVATED**
This message is displayed when the Pressure Switch Input (PSS) is programmed and activated (low). • Check the associated hardware device and take appropriate action.			
Pre-test Mode			**PRE-TEST MODE**
This status indicates that the car is bypassing hall calls and disabling the gongs. However, car calls may still be entered and will be answered. Once the last car call is answered, the car will park with doors closed. This function is normally used to capture a car.			
Power Down	SEC		
This event indicates that the entire controller lost power or was manually reset. This event is logged when the MC-CGP-x board loses power or is reset while running.			

TABLE 6.3 Standard Status and Error Messages

Event Message	SEC	F3 Flag	Scrolling Message
Priority/VIP Service Phase 1			**PRIORITY VIP SERVICE - PHASE I**
This status indicates that a Priority/VIP Service momentary call switch was activated at any floor. • The car has been assigned a Priority/VIP Service call. The car can be removed from Priority/VIP Service by toggling (On-Off) the in-car Priority/VIP Service key-switch. The car should automatically return to normal service after a pre-determined period of time (typically 60 seconds) if the in-car switch is not activated.			
Priority/VIP Service Phase 2			**PRIORITY VIP SERVICE - PHASE II**
This status indicates that the car has answered a Priority/VIP call or the in car Priority/VIP Service key switch has been activated (PRIS is high).			
Releveling	SEC		
This event indicates that the car has traveled through the Dead Zone on an approach to the floor, and has had to relevel. • The drive must be properly adjusted to track the velocity profile. • Widen the dead zone by moving the LU and LD sensors farther apart.			
RS-422 Network Down	SEC		
This fault indicates that the Group Supervisor was previously communicating with one or more local cars but is now unable to communicate with any cars. • Verify that the RS-422 communication cable is not removed from the Group's MC-RS board. • Verify the jumpers on all of the controllers' MC-RS boards. • Check for a defective MC-RS board on any of the controllers by replacing it.			
RS-422 Network OK	SEC		
This event indicates that the Group Supervisor has recovered from an RS-422 Network Down event.			
Safety Relay Circuit Open	SEC	SftyOpn	**SAFETY CIRCUIT IS OPEN**
This fault indicates that a contact in the safety relay circuit is open. This message is generated when the safety string input (SAFR1) is low and all safety devices through the in-car stop switch are closed (STOP=1). This indicates that a device “below” terminal #20 has opened. • Refer to the job prints to determine all components that make up the safety relay circuit (between terminal 20 and the CSAF output device). • Check each of these devices to determine the cause of the fault.			
Security	SEC		**ENTER SECURITY CODE**
This event indicates that the secured car call button has been pressed, and the controller is awaiting proper security code to be entered through the car call buttons. A 10-second period of time is allowed to enter the correct code. • Enter floor pass code with car call buttons on COP. • See Section 5.3.3 or the appropriate security appendix for instructions on how to program or change security pass codes.			
Swing Car Operation		SwngOpr	
This status indicates that the car is operating as a swing car, independently from the Group Supervisor. This car should be servicing a riser of hall calls dedicated to that car.			
Synch Function			**SYNCHRONIZATION OPERATION**
This event indicates that the SYNCI input has been momentarily activated and the car will be taken to the buffer in order to equalize the hydraulic pressure in systems that use more than one piston to move the car. The down normal limit switch is bypassed (by activation of a relay connected to the SYNC output) and the car is moved at slow speed in the down direction. The down slow valve circuits are energized for 30 seconds to ensure that the car has been lowered all the way to the buffer. Once this timer elapses, the car is moved back up to the bottom landing.			
System Power Up/Reset	SEC		
This event indicates that the Communication processor detected that all the individual system processors successfully powered up. If one or more processors fail to successfully power up, then this event will be replaced by one or more Sub-System Reset events detailing which individual processors successfully powered up.			
Test Mode Operation			**CAR IN TEST MODE**
This status indicates that the TEST/NORM switch on the SC-SB2K-H board is in the TEST position. • Check the TEST/NORM switch on the SC-SB2K-H board.			
Timed Out of Service	SEC	TOS	**TIME OUT OF SERVICE**
This fault indicates that the car delayed reaching its destination (direction arrow established - SUA/SDA). In most cases, the car is delayed at a floor because the doors are prevented from closing. When the timed out of service (TOS) status is generated, the car is removed from hall call service until it is allowed to leave the landing. • The timer is used to take the car out of service when the car is held excessively. Typically this occurs when the doors are held open by continuous activation of the photo-eye, a call button, or another reopening device. The TOS timer is a field-adjustable timer, which can be lengthened or shortened to suit the specific installation (via the MP diagnostics).			

TABLE 6.3 Standard Status and Error Messages

<table>
<tr><th>Event Message</th><th>SEC</th><th>F3 Flag</th><th>Scrolling Message</th></tr>
<tr><td>Timed Photo-Eye Failure</td><td>SEC</td><td></td><td></td></tr>
<tr><td colspan="4">The photo-eye was on longer than the predetermined time (default 60 seconds).
• Check for an abnormal blockage of the optical device.
• Check for a failure of the device itself, or of the photo-eye input (PHE or PHER) circuit.</td></tr>
<tr><td>Top Floor Demand</td><td>SEC</td><td>TflrDem</td><td>BOTTOM FLOOR OR TOP FLOOR DEMAND</td></tr>
<tr><td colspan="4">This status is generated either when the established PI value corresponds to the bottom terminal landing, but the Down Slow Limit Switch is closed or when a valid PI value can not be found. A top-floor demand is generated to move the car away from the landing to establish car position. Possible causes are:
• The COMPUTER RESET button was pressed.
• Initial Power-up.
• The state of the limit switch contacts do not correspond to the current PI value (example: the car is in door zone and the PI value corresponds to the bottom terminal landing, but the Down Slow Limit Switch is closed).
• The car was placed on Inspection (the computer does not attempt to maintain the PI value while the car is being moved in a “manual” fashion (Top Floor Demand is declared when the car is placed back into automatic operation).
1. If no floor encoding exists, car should move to one of the terminal landings to establish car position.
2. If floor encoding system exists and car is level at a landing, check the floor encoding magnets or vanes (perhaps a valid code cannot be read).
3. If floor encoding does not exist, check the terminal limit switches and associated wiring.
4. Verify the input circuits for USD and DSD by looking at:
47Kohm resistors on top of the SC-SB2K-H.
C2 ribbon cable on top of the SC-SB2K-H.
HC-PI/O board.
Short circuit on SC-SB2K-H relay board.</td></tr>
<tr><td>Valve Limit Timer Elapsed</td><td></td><td></td><td>MOTOR LIMIT TIMER (ANTI-STALL) ELAPSED</td></tr>
<tr><td colspan="4">The Valve Limit Timer starts whenever the controller attempts to move the car in the down direction. The timer is reset when the car reaches its destination floor. This message is generated if the timer expires before the car reaches its destination, and the controller will stop trying to move the car in order to protect the valves.
• Verify that the Down Sense Input (DNS) is high when the car moves in the down direction.
• Inspect the valves, valve solenoids and associated wiring.</td></tr>
<tr><td>Viscosity Control Function</td><td>SEC</td><td></td><td>VISCOSITY CONTROL FUNCTION ACTIVE</td></tr>
<tr><td colspan="4">This message indicates that the VCI input is activated and the car is executing the Viscosity Control Function. The car is moved to the bottom landing and the computer periodically runs the motor (not the valves) to warm the oil in the system. The pump is turned ON for three minutes, OFF for nine minutes, ON for three minutes, etc. until the VCI input is deactivated. Registration of any call will preempt the Viscosity Control Function, as will any special operation, e.g., fire service, independent service, etc.
• Check the device that is wired to the VCI input (usually an oil temperature sensor.</td></tr>
</table>

6.1.5 ASME A17.1 2000 STATUS AND ERROR MESSAGES TABLE

The following Note Boxes apply to the messages listed in Table 6.4 *ASME A17.1 - 2000 Status and Error Messages.*

NOTE: **GENERAL TROUBLESHOOTING TIPS** - Remember that 90% of the redundancy faults are the result of a relay failing to release. A normally closed (NC) contact of each critical relay is monitored, and after a run has been completed, is expected to drop out (release). The normally closed monitoring contact must make up. This means that the redundancy inputs should be ON (1) when the car has stopped at a landing. Relays that are normally picked (SAFH), are “cycle-tested,” forcing them to drop after every operating cycle.

For troubleshooting the redundancy faults, the first few letters of the fault name are the same as the input terminal or dropping resistor designation. Use the prints to locate the board. For example, if the RBK redundancy fault is displayed, measure the voltage at resistor RBK on the SC-SB2K-H (board #61) and expect, when stopped at a floor, at least 100 VAC on the input side and close to 5.0 volts on the output side of the resistor.

If the voltage at the associated terminal or resistor is as expected, try swapping the ribbon cable connectors. If the voltage is low at the 47K dropping resistor then replace the board (SC-SB2K-H or SC-BAH(R)). If the problem persists replace the SC-HDIO signal processing board.

For outputs, if the fault doesn’t clear, swap out associated output TRIACs and finally replace the offending board. Because the code required force-guided relays are soldered to the boards and cannot be replaced individually, the board must be replaced when the relay fails. Sockets for these code-required relays are as yet, unavailable.

The redundant “force-guided” relays are loaded on the two primary boards called the SC-SB2K-H and the SC-BAH(R). A third board, the SC-HDIO processes the input and output signals that go to and from the two primary boards and is located behind boards in the upper left of the control enclosure.

NOTE: **OPERATING CYCLE** - The term “operating cycle” is used to define a complete run. After a call is placed, the time between the picking of direction to dropping direction at the target floor, is defined as an operating cycle. This could be either a one-floor or multi-floor run.

CYCLE TESTING - Many of the inputs are checked via process called “Cycle Testing”. If any of the inputs tested fail the fault is termed a “cycle test” fault. Cycle testing is simply cycling a portion of the hardware to ensure that the input structure (solid state devices and software) are still operational. Cycle tests are performed at the end of an operating cycle when we turn OFF relays SAFR1, SAFR2 (the four bus is turned OFF) and output CT. Thus all of the devices associated with the four bus and Triac CT must go low (OFF). If any input fails to transition *OFF,* a cycle test fault is logged.

In Table 6.4, *ASME A17.1 - 2000 Status and Error Messages,* the faults are listed alphabetically as they would appear on the Swing Panel Alphanumeric Display. The Special Event Calendar event name (sometimes different) is in the right column. If the SEC name is different, then the fault is one of several that share that Special Event name as part of a logical group. The SEC event names are listed in the manual index for easy location in this table.

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
2BI REDUNDANCY FAULT	**2BI Redundancy Fault**
Description: If the F4 fuse blows, inputs GOV (0700 bit 3) and RSAFR (0707 bit 8) should be 0. If either of these two inputs fail to go low, this fault is generated. ASME 2000 event. **Troubleshooting Tips:** • Check fuse F4 if OK swap ribbon cable at C3 on SC-SB2K(-H). If problem persists, replace SC-SB2K(-H) and then SC-HDIO. • Also check input resistor 2BI at top left of the SC-SB2K(-H) board. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if 2BI resistor is defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
4 BUS CYCLE TEST FAULT	**End of Run Cycle Test Fault**
Description: A failure of the End of Run Cycle Test has been detected. At the end of an operating cycle, outputs MPSAF and CSAF are cycled OFF. This removes power from the four bus. ASME 2000 event. Troubleshooting: The following inputs must respond as listed or the 4 bus cycle test fault will be logged and further operation of the lift will be prohibited. Note that 0 = OFF and 1 = ON SAF = 0 RMR = 0 RBRK = 0 REI = 0 RIN1 = 1 RIN2 = 1 UPS = 0 USD = 0 DNS = 0 RPT = 1 DSD = 0 RH = 1 UNL = 0 DNL = 0 • Cycle testing is simply cycling a portion of the hardware to ensure that the input structure (solid state devices and software) are still operational. Cycle tests are performed at the end of an operating cycle when we turn OFF relays SAFR1, SAFR2 (the four bus is turned OFF) and output CT. Thus all of the devices associated with the four bus and Triac CT must go low (OFF). If any input fails to transition OFF, a cycle test fault is logged. • Also check input resistors ASI1/PFLT, SAF, STOP, REB1, REB2 or RSAFR on the associated board (refer to prints). Swap ribbon cables between SC-SB2K(-H), SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
ACCI REDUNDANCY FAULT	**Hoistway Access Input Fault**
Description: This verifies that all inspection inputs downstream of ACCI (hoistway access inspection is third highest priority) are OFF (0) when this input is ON (1). ASME 2000 event. **Troubleshooting:** If you have this fault logged use the controller prints to locate input resistors IN and INMR on the SC-SB2K(-H) board, voltage must be OFF when ACCI is ON otherwise the ACCI redundancy fault is logged and the system is shut down.	
CAR TOP INSPECTION	**Car Top Inspection**
Description: The Car Top Inspection switch has been activated. ASME 2000 event. **Troubleshooting:** • Confirm that INCTI = 1 (0701 bit 1). • Check input resistor INCTI on the associated board (refer to prints). Swap ribbon cables between SC-SB2K(-H), SC-HDIO. If swapping ribbons has no effect or if resistor are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
CD REDUNDANCY FAULT	**Front Door Input Fault**
Description: A failure of a front door lock input, relay or associated circuitry has been detected. The status of the car door lock input CD is constantly monitored. CD and DPM must be ON (1) when DLK is ON and the car is not in door zone. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Expect CD to be ON when hoistway access has been activated (input ACCI is ON) and either the top (TAB) or bottom (BAB) access switches are activated. If the Car Door Bypass switch is turned to the bypass position during car top or in car inspection, expect CD = ON also. If the above conditions are not true, the CD redundancy fault is logged. Check the voltage on the terminals used by the offending fault to determine the problem. If terminal voltages are correct, first swap the ribbon cables connected between the SC-SB2K(-H) board and the SC-HDIO board, then swap out the board; first try SC-SB2K(-H) followed by the SC-HDIO.	
CDB REDUNDANCY FAULT	**Front Door Input Fault**
Description: A failure of a front door input, relay or associated circuitry has been detected. Both the OFF and BYPASS positions of the Car Door Bypass switch are monitored. The OFF position feeds input CDBO and the BYPASS position feeds input CDB. If the CDB switch is OFF the CDBO input will be ON (1) and the CDB input will be OFF (0). In effect CDB = not CDBO. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. NOTE: This redundancy fault detects the failure of an input by comparing two inputs against each other. In every case the inputs have opposite polarity (when one is ON the other must be OFF). Check the voltage on the terminals used by the offending fault to determine the problem. If terminal voltages are correct, try swapping the ribbon cables connecting the SC-BASE(-D) to the SC-HDIO board. Finally replace SC-HDIO or SC-BASE(-D).	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
CDBR REDUNDANCY FAULT	**Rear Door Input Fault**
Description: A failure of a rear door lock input, relay or associated circuitry has been detected. Both the OFF and BYPASS positions of the Car Door Bypass switch are monitored. The OFF position feeds input CDBOR and the BYPASS position feeds input CDBR. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. If input CDBR switch is OFF then input CDBOR will be ON and the CDBR input will be OFF (0). If CDBOR does not reflect the opposite state of CDBR then the CDBR redundancy fault is logged and the car shut down. NOTE: This redundancy fault detects the failure of an input by comparing two inputs against each other. In every case the inputs have opposite polarity (when one is ON the other must be OFF). Check the voltage on the terminals used by the offending fault to determine the problem. If terminal voltages are correct, try swapping the ribbon cables connecting the SC-BASE(-D) to the SC-HDIO board. Finally replace SC-HDIO or SC-BASE(-D).	
CDR REDUNDANCY FAULT	**Rear Door Input Fault**
Description: A failure of a rear door lock input, relay or associated circuitry has been detected. The status of the car door lock input CDR is constantly monitored. CDR should be ON (1) when rear DLK is ON and the car is not in the rear door zone. Expect CDR to be ON when hoistway access has been activated (input ACCI is ON) and either the top (TAB) or bottom (BAB) access switches are activated. If the Car Door Bypass switch is turned to the bypass position during car top or in car inspection, expect CDR = ON also. If these conditions are not true, the CDR redundancy fault is logged. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Expect CD to be ON when hoistway access has been activated (input ACCI is ON) and either the top (TAB) or bottom (BAB) access switches are activated. If the Car Door Bypass switch is turned to the bypass position during car top or in car inspection, expect CD = ON also. If the above conditions are not true, the CD redundancy fault is logged. Check the voltage on the terminals used by the offending fault to determine the problem. If terminal voltages are correct, first swap the ribbon cables connected between the SC-BASE(-D) board and the SC-HDIO board, then the SC-BASE(-D) followed by the SC-HDIO.	
CONTACTOR FAILURE TO PICK *(Hydro only)*	**Contactor Failure to Pick**
Description: Indicates that one or more contactors have failed to energize when the car attempted to move in the UP direction. **Troubleshooting:** Reset this fault by pressing the Fault Reset button. Place the car on Inspection and move the car in the up direction. Watch the contactors to determine which one is failing to pick. Inputs RWYE, RDEL and RM are monitored and expected to go low when the contactors pick.	
COS1 FAULT (Future Use) *(Traction only)*	**Overspeed Fault**
Description: Contract overspeed 1 fault. The main processor monitors the COS1 signal coming from PLD1. ASME 2000 event. **Troubleshooting:** Run the car and observe if the car does indeed overspeed. If no overspeed condition is truly present we need to re-calibrate the overspeed function that is tripping (ILO, COS, ETS). For the SC-BASE(-D) simply check the 120 Hz reference test point with a scope. For the SC-BASE(-D), simply follow directions in section #4 of the adjustment manual. If neither of these attempts proves fruitful at eliminating the fault then first swap out the ribbon cable between the SC-BASE(-D) and SC-HDIO and finally replace the SC-BASE(-D). If the fault still occurs replace the SC-HDIO. On SC-BASE(-D) try turning COS trimpot fully clockwise.	
COS2 FAULT (Future Use) *(Traction only)*	**Overspeed Fault**
Description: Contract overspeed 2 fault. The main processor inspects the COS2 signal coming from PLD2. ASME 2000 event. **Troubleshooting:** Run the car and observe if the car does indeed overspeed. If no overspeed condition is truly present we need to re-calibrate the overspeed function that is tripping (ILO, COS, ETS). For the SC-BASE(-D) simply check the 120 Hz reference test point with a scope. For the SC-BASE(-D), simply follow directions in section #4 of the adjustment manual. If neither of these attempts proves fruitful at eliminating the fault then first swap out the ribbon cable between the SC-BASE(-D) and SC-HDIO and finally replace the SC-BASE(-D). If the fault still occurs replace the SC-HDIO. On SC-BASE(-D) try turning COS trimpot fully clockwise.	
CT CYCLE TEST FAULT	**End of Run Cycle Test Fault**
Description: A failure of the End of Run Cycle Test has been detected. This fault signifies that the functionality of the circuitry associated with the CT relay has failed to operate correctly. ASME 2000 event. **Troubleshooting:** At the end of an operating cycle, output CT is cycled OFF. Relay CT should drop out, this functionality is monitored via inputs CD/HD and DLK. When output CT is OFF, inputs CD, HD and DLK will be OFF. If not, the CT cycle test fault will be logged and further operation of the lift will be suspended. • Cycle testing is simply cycling a portion of the hardware to ensure that the input structure (solid state devices and software) are still operational. Cycle tests are performed at the end of an operating cycle when we turn OFF relays SAFR1, SAFR2 (the four bus is turned OFF) and output CT. Thus all of the devices associated with the four bus and Triac CT must go low (OFF). If any input fails to transition OFF, a cycle test fault is logged. • Also check input resistors PFLT, SAF, or RSAFR on the associated board (refer to prints). Swap ribbon cables between SC-SB2K(-H), SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

<table>
<tr><th>Scrolling Message</th><th>Special Event Message</th></tr>
<tr><td>CTDIF REDUNDANCY FAULT (Traction only)</td><td>CTDIF Redundancy Fault</td></tr>
<tr><td colspan="2">Description: An internal check performed by the software system to ensure that the differential cycle-testing (CTDIF) flag is only turned ON at the end of an operating cycle. ASME 2000 event.
Troubleshooting:
• If CTDIF (0706 bit 8) is turned ON any time other than at the end of an operating cycle, the system is shut down with the CTDIF redundancy fault.
• NOTE: This fault would indicate a failure of the software system or SC-BASE(-D) board. So first try swapping SC-BASE(-D) ribbon cables then replace SC-BASE(-D), SC-HDIO and finally the MC-MP2-2K or MC-PCA-OA-2K.</td></tr>
<tr><td>CTOS REDUNDANCY FAULT (Traction only)</td><td>CTOS Redundancy Fault</td></tr>
<tr><td colspan="2">Description: An internal check performed by the software system to ensure that the overspeed cycle-testing (CTOS) flag is only turned ON at the end of an operating cycle. ASME 2000 event.
Troubleshooting:
• If CTOS (0706 bit 7) is turned on any time other than at the end of an operating cycle, the system is shut down with the CTOS redundancy fault.
• This fault would indicate a failure of the SC-BASE(-D) board. First swap out ribbon cables and then try swapping SC-BASE(-D) and then SC-HDIO.</td></tr>
<tr><td>CYCLE TEST</td><td>Cycle Test</td></tr>
<tr><td colspan="2">Description: Indicates the car is performing the end of run cycle test.
Troubleshooting: Verify the car is in door zone and does not relevel during the cycle test.</td></tr>
<tr><td>DCL REDUNDANCY FAULT</td><td>Front Door Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of a front doorlock input, relay or associated circuitry has been detected. This logic detects failure of the input structure and hardware associated with the DCL (door close limit) input. ASME 2000 event.
Troubleshooting: See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. When DLK is ON (1) then input DCL must be OFF (0). When DOL=0, verify DCL=1. If not, then a DCL redundancy fault is recorded and the car is prevented from operating. Check voltages on associated dropping resistors, swap ribbon cables and swap SC-SB2K(-H) or SC-HDIO.</td></tr>
<tr><td>DCLR REDUNDANCY FAULT</td><td>Rear Door Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of a rear door lock input, relay or associated circuitry has been detected. Detects the failure of the input structure and hardware associated with the DCLR (door close limit rear) input. ASME 2000 event.
Troubleshooting: See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. When DLK is ON (1) then input DCLR must be OFF (0). When DOLR=0, verify DCLR=1. If this is not the case then a DCLR redundancy fault is recorded and the car is prevented from operating. Check voltages on associated dropping resistors, swap ribbon cables and swap SC-SB2K(-H) or SC-HDIO.</td></tr>
<tr><td>DETS REDUNDANCY FAULT</td><td>DETS Redundancy Fault</td></tr>
<tr><td colspan="2">Description: This fault is displayed when an inconsistency is detected between the Down Emergency Terminal Switches. ASME 2000 event.
Troubleshooting:
• Check the condition of the ETS switches. The DETS1/2 limit switches must operate simultaneously!!! .
• Check the wiring to the relay board (SC-SB2K) and IO board (SC-HDIO).
• Verify DETS1 (070C bit 8) equals DETS2 (070D bit 3) and the car is in door zone.
• Also check input resistors DETS1 and ASI3/DETS2 on the associated board (refer to prints). Swap ribbon cables between SC-BASE(-D) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-BASE(-D) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>DFV REDUNDANCY FAULT (Hydro only)</td><td></td></tr>
<tr><td colspan="2">Description: Input DFV checks the status of the down terminal speed reducing switches. We simply compare input DFV against input DTSRL. IF DFV not equal to DTSRL we assert this fault. Hence these switches must open up simultaneously. ASME 2000 event.
Troubleshooting: Check that the limit switches are opening within one second of each other as the car approaches the bottom terminal landing. If they are, then use diagnostics to determine the status of the inputs. Check voltage at top of associated input resistors on SC-SB2K-H. When the inputs are ON expect 5 VAC. When OFF expect 0 VAC. If this is not the case replace the SC-SB2K-H. If voltages are good, swap associated ribbon cable and finally swap the SC-HDIO</td></tr>
<tr><td>Direction Input Fault (not scrolled, Event Calendar only)</td><td>Direction Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of a direction related input, relay or associated circuitry has been detected. Look to the scrolling message to see which fault is active: RDN, DNS, UPDIR, UPS, RUP, DNDIR REDUNDANCY FAULT or UP / DOWN NORMAL LIMIT SWITCH OPEN. ASME 2000 event.
Troubleshooting: Once the scrolling message is identified, look up that message in this table.</td></tr>
</table>

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
DLK REDUNDANCY FAULT	**DLK Redundancy Fault**
Description: A failure of the DLK input or associated circuitry has been detected. ASME 2000 event. **Troubleshooting Tips:** • DLK should be high (28 bit 7) when we are leveling and in door zone [DZ is high (20 bit 6) or DZR is high (10 bit 6) and either LU (29 bit 3) or LD (29 bit 7)is high]. • DLK should also be high when all of the car and hoistway door lock inputs are made active [CD is high (0704 bit 1) and HD is high (0704 bit 2) and CDR is high (070B bit 1) and HDR is high (070B bit 2)]. If DLK is ON and any of these other relationships are not true, the DLK redundancy fault is set and disables further operation of the lift. Note that DLK is high when either or both of the car door or hoistway door lock bypass functions are active. • Also check input resistors DLK, DZR, CD, HD, CDR and HDR on the associated board (refer to prints). Swap ribbon cables between SC-SB2K(-H), SC-BASE(-D) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) or SC-BASER(-D) (for DZR) board. Otherwise replace SC-HDIO board.	
DNDIR REDUNDANCY FAULT	**Direction Input Fault**
Description: A failure of a direction related input, relay or associated circuitry has been detected. Valid when SAF=1. Input DNDIR is created by the SC-BASE(-D) board and represents resolved direction from the speed sensor. Input DNDIR must always be the opposite of RDN. If the main processor detects that the resolved direction (DNDIR from BASE board) does not agree with the intended direction (RDN from MP2 / PCA), the system is shut down with the DNDIR redundancy fault. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. • Verify that the UP LED on the SC-BASE(-D) is ON when car motion is up and OFF when car motion is down. If not, the speed sensor is reversed (rotate the sensor 180 degrees with respect to the magnet). • Swap Ribbons, check 95 and 96 signals (0 to 55VDC) swap SC-BASE(-D) or SC-HDIO.	
DNS REDUNDANCY FAULT	**Direction Input Fault**
Description: A failure of a direction related input, relay or associated circuitry has been detected. Valid when SAF=1. Verifies that the down sense input DNS is valid. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Once DLK is ON (1), if DNS is ON (1), then RDN must be OFF (0). Check associated input resistors, swap boards or ribbon cables to correct.	
Door Zone Input Fault (not scrolled, Event Calendar only)	**Door Zone Input Fault**
Description: A failure of a door zone related input, relay or associated circuitry has been detected. Look at the Swing Panel Alphanumeric Display to see which fault is active: DZX, DZRX, RDZ, RDZX, or RDZR REDUNDANCY FAULT. ASME 2000 event. **Troubleshooting:** Once the Swing Panel Alphanumeric Display fault is identified, find that particular fault in this table. See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table.	
DOWN NORMAL LIMIT SWITCH OPEN	**Direction Input Fault**
Description: A failure of a direction related input, relay or associated circuitry has been detected. A failure of a direction related input, relay or associated circuitry has been detected. If SAF=1 and DLK=1 and the car is below the Down Normal Limit Switch (DNL=0), then this status is displayed. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Verify SAF=1 and DLK=1 and move the car above the Down Normal Limit (DNL=1). Car should never automatically travel on to this limit switch. Possibility that switch is not far enough into terminal.. Please move limit switch.	
DP SENSOR / DIFFERENTIAL FAULT *(Traction only)*	**DP Sensor / Differential Fault**
Description: This fault indicates that one of the PLDs (on the SC-BASE/SC-BASER) has detected a count difference in the pulse signal generated from Speed Sensor and magnet mounted on the motor. **Troubleshooting:** Verify that for up direction travel, LEDS UP1 and UP2 turn ON, and for down direction, that LEDs DN1 and DN2 turn ON. If not: • Verify that the sensor is 1/16" away from the magnet on the motor shaft. Also verify that the magnet assembly is perpendicular to the sensor. • Check the shielded cable that connects sensor assembly to SC-BASE/R board. Swap the cable. • Replace the sensor, followed by the SC-BASE/R board. Otherwise replace SC-HDIO board.	
DPM REDUNDANCY FAULT	**Front Door Input Fault**
Description: A failure of a front door input, relay or associated circuitry has been detected. This logic detects failure of the input structure and hardware associated with the DPM (door position monitor) input. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Valid when SAF=1. When DLK is ON (1) then input DPM must also be ON (1). When DOL=0, DPM=0. Make sure that DPM makes (120 VAC) 1 to 2" prior to door lock. If this is already the case then check associated input resistors, ribbon cable or boards and replace as deemed necessary.	
DPMR REDUNDANCY FAULT	**Rear Door Input Fault**
Description: A failure of a rear door input, relay or associated circuitry has been detected. This logic detects failure of the input structure and hardware associated with the DPMR (door position monitor rear) input. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Valid when SAF=1. When DLK is ON (1), input DPMR must also be ON (1). When DOLR=0, DPMR=0. Make sure that DPMR makes (120 VAC) 1 to 2" prior to door lock. If this is already the case then check associated input resistors, ribbon cable or boards and replace as deemed necessary.	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
DRIVE FAULT / REI REDUNDANCY FAULT *(Traction only)*	**REI Redundancy Fault**
Description: A failure of the RE relay has been detected. ASME 2000 event. **Troubleshooting:** If FLT relay is picked, then check the following: • If SAF is low (2C bit 6), REI should be low (0707 bit 2), otherwise this fault is generated. • If UPS is high (24 bit 3) or DNS is high (24 bit 4), REI should be high (0707 bit 2), otherwise this fault is generated. • Verify REI = 0 (0707 bit 2), otherwise this fault is generated. • Also check input resistor REI at top left of the SC-SB2K board. Swap ribbon cables between SC-SB2K and SC-HDIO. If swapping ribbons has no effect or if REI resistor is defective, replace SC-SB2K board. Otherwise replace SC-HDIO board. • Confirm FLT relay is picked when a run is initiated. If not, then a DDP generated failure has occurred. Bypass ASME A17.1 faults and initiate a run. Check event calendar to determine which DDP fault has occurred and troubleshoot accordingly.	
DZRX REDUNDANCY FAULT *(Traction only)*	**Door Zone Input Fault**
Description: A failure of rear door zone input, relay or associated circuitry has been detected. This logic checks the integrity of the relay used for the auxiliary rear door zone function (DZX). ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Note that one DZX relay is used for both front and rear auxiliary door zone sensing. If DZR input is OFF, the DZX relay should be dropped out, which is checked by inspecting a NC contact of relay DZX with input RDZX. If input DZR is OFF and the “checking” input RDZX is ON, all is well. If this relationship is not true, the DZRX redundancy fault is logged and the car is shut down. Check associated input resistors, ribbon cable or boards and replace as deemed necessary.	
DZX REDUNDANCY FAULT *(Traction only)*	**Door Zone Input Fault**
Description: A failure of a door zone related input, relay or associated circuitry has been detected. Verifies that the “standard” door zone input DZ and the “auxiliary” door zone input DZX both agree. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. If DZX is ON, then DZ should be ON and RDZX should be OFF. When DZX = OFF, DZ will also be OFF and RDZX will be ON. Check associated input resistors, ribbon cable or boards and replace as deemed necessary.	
EBR Button Fault (not scrolled, Event Calendar only)	**EBR Button Fault**
Description: A failure of the Emergency Brake Reset Pushbutton or EBR input has been detected. Look at the Swing Panel Alphanumeric Display to see what fault is active, EBR STUCK or EBR FLICKERING FAULT. ASME 2000 event. **Troubleshooting:** Once the Swing Panel Alphanumeric Display fault is identified, look up that particular fault in this table.	
EBR FLICKERING FAULT *(Traction only)*	**EBR Button Fault**
Description: A failure of the Emergency Brake Pushbutton or EBR input has been detected. If the EBR input transitions from low (0) to high (1) six times or more per second, the EBR flickering fault will take the car out of service. ASME 2000 event. **Troubleshooting:** Check the EBR input (0708 bit 3) and confirm that it is changing state rapidly. If so, replace the SC-BASE(-D) board. If this doesn’ t correct the problem, replace the SC-HDIO board. Otherwise press the Redundancy Fault Reset pushbutton to clear the fault.	
EBR STUCK FAULT *(Traction only)*	**EBR Button Fault**
Description: A failure of the Emergency Brake Pushbutton or EBR input has been detected. If the EBR input remains high (1) continuously for 30 seconds the EBR stuck fault will take the car out of service. ASME 2000 event. **Troubleshooting:** Confirm that EBR = 1 (0708 bit 3). The EBR input must be continuously active for 30 seconds to generate this fault. To determine which board has failed, check the EBR resistor on the SC-BASE(-D) board for 0 VAC on the bottom end, if so then replace SC-HDIO board. If there is 120 VAC, then inspect the EBR reset pushbutton and determine if it is truly stuck. If stuck replace SC-BASE(-D), otherwise swap out associated ribbon cable.	
EMERGENCY BRAKE ACTIVATED *(Traction only)*	**Emergency Brake Activated**
Description: The Emergency Brake has been activated. ASME 2000 event. **Troubleshooting:** • Due to ascending car overspeed (GOV=0, RUP=0) or unintended motion (car out of floor zone with both doors open) this fault is logged and the car is shutdown. Note that there is separate hardware that can set the emergency brake by removing power from the emergency brake power supply. The software system can also set the Emergency Brake by monitoring the same logic (DZ, LU, CD, etc) by dropping the outputs labeled EB1 and EB2. This fault can only be reset by pushing the Emergency Brake Reset pushbutton on the SC-BASE(-D) board. • Also check input resistors GOV, REB1, REB2, RDZX, RDZ, RDZR, RLU, RLD, RCD, RHD, RCDR and RHDR on the associated board (refer to prints). If both relays EB1 and EB2 are dropped try replacing the EB1/EB2 triacs on the SC-HDIO board. Swap ribbon cables between SC-SB2K and SC-HDIO as well as the ribbons between SC-BASE(-D) and SC-HDIO. If swapping ribbons has no effect or if input resistors are defective, replace SC-SB2K board or SC-BASE(-D). Otherwise replace SC-HDIO board.	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

<table>
<tr><th>Scrolling Message</th><th>Special Event Message</th></tr>
<tr><td>EMERGENCY BRAKE CYCLE TEST FAULT (Traction only)</td><td>End of Run Cycle Test Fault</td></tr>
<tr><td colspan="2">Description: A failure of the End of Run Cycle Test has been detected. Indicates that either the input or output structure associated with the emergency brake has failed. At the end of an operating cycle, outputs EB1 and EB2 are sequentially cycled OFF (one at a time). During this process inputs REB1 and REB2 are checked. ASME 2000 event.
Troubleshooting: If EB1 output is OFF, then input REB1 will be ON. If not, the Emergency brake cycle test fault is generated and further operation of the lift is prevented. The same test is repeated for EB2 and REB2. Check input resistors ASI1/PFLT, SAF, STOP, REB1, REB2 or RSAFR on the associated board (refer to prints). Swap ribbon cables between SC-SB2K, SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K board. Otherwise replace SC-HDIO or SC-BASE(-D) board.</td></tr>
<tr><td>End of Run Cycle Test Fault (not scrolled, Event Calendar only)</td><td>End of Run Cycle Test Fault</td></tr>
<tr><td colspan="2">Description: A failure of the End of Run Cycle Test has been detected. Look at the Swing Panel Alphanumeric Display to see which faults is active (PLD, CT, ESBYP or EMERGENCY BRAKE CYCLE TEST FAULT or RSAFR CYCLE TEST FAULT or 4 BUS CYCLE TEST FAULT). ASME 2000 event.
Troubleshooting: Once the Swing Panel Alphanumeric Display fault is identified, look up that fault in this table.</td></tr>
<tr><td>EQR Button Fault (not scrolled, Event Calendar only)</td><td>EQR Button Fault</td></tr>
<tr><td colspan="2">Description: A failure of the Earthquake Reset Pushbutton or EQR input has been detected. Look at the Swing Panel Alphanumeric Display to see which fault is active: EQR STUCK or EQR FLICKERING FAULT. ASME 2000 event.
Troubleshooting: Once the Swing Panel Alphanumeric Display fault is identified, look up that fault in this table.</td></tr>
<tr><td>EQR FLICKERING FAULT</td><td>EQR Button Fault</td></tr>
<tr><td colspan="2">Description: A failure of the Earthquake Reset Pushbutton or EQR input has been detected. If the EQR input transitions from low (0) to high (1) six times or more per second, the EQR flickering fault will take the car out of service. ASME 2000 event.
Troubleshooting:
• Check the EQR input (0703 bit 2) and confirm that it is changing state rapidly. If so, replace the SC-HDIO board. If this does not correct the problem, then replace the SC-SB2K(-H) board. Otherwise press the Redundancy Fault Reset pushbutton to clear the fault.
• Also check input resistors CWI, EQR, SSI and EDS on the associated board (refer to prints). Swap ribbon cables between SC-SB2K(-H), SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>EQR STUCK FAULT</td><td>EQR Button Fault</td></tr>
<tr><td colspan="2">Description: A failure of the Earthquake Reset Pushbutton or EQR input has been detected. The Earthquake Reset pushbutton input is constantly monitored for correct functionality. If the EQR input remains high (1) continuously for 30 seconds the EQR stuck fault will take the car out of service. ASME 2000 event.
Troubleshooting:
• Confirm that EQR = 1 (0703 bit 2). The EQR input must be continuously active for 30 seconds to generate this fault.
• To determine which board has failed, check the EQR resistor for 0 VAC on the bottom end, if so then replace SC-HDIO board. If there is 120VAC, then inspect the EQR reset pushbutton and determine if it is truly stuck, otherwise replace the SC-SB2K(-H) board.
• Also check input resistors CWI, EQR, SSI and EDS on the associated board (refer to prints). Swap ribbon cables between SC-SB2K(-H), SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>ESBYP CYCLE TEST FAULT</td><td>End of Run Cycle Test Fault</td></tr>
<tr><td colspan="2">Description:. This fault indicates that either the output, relay or input associated with ESBYP has failed to function as required. At the end of an operating cycle, output ESBYP is cycled ON and then OFF. We expect that relay ESB will pick and drop and we monitor this functionality via input RESBYP. ASME 2000 event.
Troubleshooting: When ESB is OFF, expect that input RESBYP will be ON and visa versa. If not, the ESBYP cycle test fault will be logged and further operation of the lift will be prevented. Check input resistors ASI1/PFLT, SAF, STOP, REB1, REB2 or RSAFR on the associated board (refer to prints). Swap ribbon cables between SC-SB2K(-H), SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>ESBYP REDUNDANCY FAULT</td><td>ESBYP Redundancy Fault</td></tr>
<tr><td colspan="2">Description: A failure of emergency stop bypass (the ESB relay or ESBYP output) has been detected. ASME 2000 event. If both the ESBYP output (picks relay ESB) and the SAFC input are activated (both ON), the input STOP will be ON (1). If not, an ESBYP redundancy failure is logged. ASME 2000 event.
Troubleshooting:
• If ESBYP = 1 (0707 bit 7) and SAFC = 1 (0700 bit 5), STOP should be 1 (0700 bit 6), otherwise this fault is generated.
• Also check input resistors RESBYP and SAFC on the associated board (refer to prints).
• Swap ribbon cables between SC-SB2K(-H), SC-HDIO.
• If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.</td></tr>
</table>

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
ETS1 FAULT *(Traction only)*	**Overspeed Fault**
Description: Emergency terminal overspeed fault 1. The main processor monitors the ETS1 signal coming from PLD1. If this signal, which is normally high goes low, the MP2 / PCA looks at its ETS limit switch inputs to determine if a fault should be logged. If so, the carshuts down and logs the ETS1 fault. ASME 2000 event. **Troubleshooting:** Run the car and observe if the car does indeed overspeed. If no overspeed condition is truly present we need to re-calibrate the overspeed function that is tripping (ILO, COS, ETS). For the SC-BASE(-D) simply check the 120 Hz reference test point with a scope. For the SC-BASE(-D), simply follow directions in section #4 of the adjustment manual. If neither of these attempts proves fruitful at eliminating the fault then first swap out the ribbon cable between the SC-BASE(-D) and SC-HDIO and finally replace the SC-BASE(-D). If the fault still occurs replace the SC-HDIO. The UETS1/2, DETS1/2 limit switches must operate simultaneously!	
ETS2 FAULT *(Traction only)*	**Overspeed Fault**
Description: Emergency terminal overspeed fault 2. The main processor inspects the ETS2 signal coming from PLD2. If this signal, which is normally high goes low, the MP2 / PCA looks at its ETS limit switch inputs to determine if a fault should be logged. If so, the car shuts down and logs the ETS2 fault. ASME 2000 event. **Troubleshooting:** Run the car and observe if the car does indeed overspeed. If no overspeed condition is truly present we need to re-calibrate the overspeed function that is tripping (ILO, COS, ETS). For the SC-BASE(-D) simply check the 120 Hz reference test point with a scope. For the SC-BASE(-D), simply follow directions in section #4 of the adjustment manual. If neither of these attempts proves fruitful at eliminating the fault then first swap out the ribbon cable between the SC-BASE(-D) and SC-HDIO and finally replace the SC-BASE(-D). If the fault still occurs replace the SC-HDIO. The UETS1/2 , DETS1/2 limit switches must operate simultaneously!	
Front Door Input Fault (not scrolled, Event Calendar only)	**Front Door Input Fault**
Description: A failure of a front door input, relay or associated circuitry has been detected. Look at the Swing Panel Alphanumeric Display to see which fault is active: DCL, DPM, CD, RCD, CDB, HD, RHD, HDB or RHDB REDUNDANCY FAULT. ASME 2000 event. **Troubleshooting Tips:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table.	
GOV REDUNDANCY FAULT *(Traction only)*	**GOV Redundancy Fault**
Description: A failure of the safety string between input GOV and input SAFH has been detected. ASME 2000 event. **Troubleshooting Tips:** • If GOV = 0 (0700 bit 3), SAFH should be 0 (0700 bit 4), otherwise this fault is generated. • Check wiring connections to terminals 15, 15A, 15B and 16. • Check wiring connections to all safety devices between terminals 15, 15A, 15B and 16. • Also check input resistors GOV and SAFH. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
H REDUNDANCY FAULT	**H Redundancy Fault**
Description: Checks the status of the H (high speed) output against the RH input. ASME 2000 event. If relay H is OFF, then the back contact of the H relay, used for monitoring purposes, should close power into input RH (ON). **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Use diagnostics to determine which is the offending input. Look at the top of the input resistor and measure either 0 or 5 VAC. If voltage is wrong replace SC-SB2K(-H). If OK swap C1 or C4 ribbons, H triac on HC-PI/O or SC-HDIO.	
HD REDUNDANCY FAULT	**Front Door Input Fault**
Description: A failure of a front door lock input, relay or associated circuitry has been detected. HD should be ON (1) when DLK is ON and the car is not in door zone. And, if HD is ON (1), DPM must also be ON (1). ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Expect HD to be ON when hoistway access has been activated (input ACCI is ON) and either the top (TAB) or bottom (BAB) access switches are activated. If the Hoistway Door Bypass switch has been turned to the bypass position, expect HD = ON also. If the above conditions are not true, the HD redundancy fault is logged. First swap the ribbon cables connected between the SC-BASE(-D) board and the SC-HDIO board, then replace the boards SC-BASE(-D) followed by the SC-HDIO (if the problem persists).	
HDB REDUNDANCY FAULT	**Front Door Input Fault**
Description: A failure of a front door input, relay or associated circuitry has been detected. The OFF position feeds input HDBO and the BYPASS position feeds input HDB. So if the switch is OFF, the HDBO input will be ON (1) and the HDB input will be OFF (0).ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. First swap the ribbon cables connected between the SC-BASE(-D) board and the SC-HDIO board, then replace the boards SC-BASE(-D) followed by the SC-HDIO.	
HDBR REDUNDANCY FAULT	**Rear Door Input Fault**
Description: A failure of a rear door input, relay or associated circuitry has been detected. Both the OFF and BYPASS positions of the Rear Hoistway Door Bypass switch are monitored. The OFF position feeds input HDBOR and the BYPASS position feeds input HDBR. So if the switch is OFF, the HDBOR input will be ON (1) and the HDBR input will be OFF (0). ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. First swap the ribbon cables connected between the SC-BASE(-D) board and the SC-HDIO board, then replace the boards SC-BASE(-D) followed by the SC-HDIO.	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

<table>
<tr><th>Scrolling Message</th><th>Special Event Message</th></tr>
<tr><td>HDR REDUNDANCY FAULT</td><td>Rear Door Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of a rear door lock input, relay or associated circuitry has been detected. The status of the rear hoistway door lock input HDR is constantly verified. HDR should be ON (1) when DLK is ON and the car is not in door zone.Expect HDR to be ON when hoistway access has been activated (input ACCI is ON) and either the top (TAB) or bottom (BAB) access switches are activated. If the Hoistway Door Bypass switch has been turned to the bypass position, expect HDR = ON also. ASME 2000 event.
Troubleshooting: See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. First swap the ribbon cables connected between the SC-BASER(-D) board and the SC-HDIO board, then swap out the SC-BASER(-D) followed by the SC-HDIO.</td></tr>
<tr><td>HOISTWAY ACCESS</td><td>Hoistway Access</td></tr>
<tr><td colspan="2">Description: The hoistway access switch has been activated. ASME 2000 event.
Troubleshooting:
• Confirm that ACCI = 1 (0702 bit 2).
• Also check input resistor ACCI on the associated board (refer to prints). Swap ribbon cables between SC-SB2K(-H), SC-HDIO. If swapping ribbons has no effect or if resistor are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>Hoistway Access Input Fault (not scrolled, Event Calendar only)</td><td>Hoistway Access Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of the Hoistway Access input or an Inspection input has been detected. Two Inspection Inputs should never be active at the same time. ASME 2000 event.
Troubleshooting Tips:
• Confirm ACCI = 1 (0702 bit 2), INMR = 0 (0701 bit 3) and IN = 0 (27 bit 4), otherwise this fault is displayed.
• Also check input resistors ACCI, INMR and IN on the SC-SB2K(-H) board. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>ILO1 FAULT (Traction only)</td><td>Overspeed Fault</td></tr>
<tr><td colspan="2">Description: Inspection leveling overspeed 1 fault. The main processor monitors the ILO1 signal coming from PLD1. If ILO1 = OFF and IN or LEV are ON we log this fault. ILO stands for Inspection Leveling Overspeed. ASME 2000 event.
Troubleshooting: Run the car and observe if the car does indeed overspeed. If no overspeed condition is truly present we need to re-calibrate the overspeed function that is tripping (ILO, COS, ETS). For the SC-BASE(-D) simply check the 120 Hz reference test point with a scope. For the SC-BASE(-D), simply follow directions in section #4 of the adjustment manual. If neither of these attempts proves fruitful at eliminating the fault then first swap out the ribbon cable between the SC-BASE(-D) and SC-HDIO and finally replace the SC-BASE(-D). If the fault still occurs replace the SC-HDIO. Also check for noise on 95/96 (DP1/2) is shield grounded?</td></tr>
<tr><td>ILO2 FAULT (Traction only)</td><td>Overspeed Fault</td></tr>
<tr><td colspan="2">Description: Inspection leveling overspeed 2 fault. The main processor monitors the ILO2 signal coming from PLD2. ASME 2000 event.
Troubleshooting: Run the car and observe if the car does indeed overspeed. If no overspeed condition is truly present we need to re-calibrate the overspeed function that is tripping (ILO, COS, ETS). For the SC-BASE(-D) simply check the 120 Hz reference test point with a scope. For the SC-BASE(-D), simply follow directions in section #4 of the adjustment manual. If neither of these attempts proves fruitful at eliminating the fault then first swap out the ribbon cable between the SC-BASE(-D) and SC-HDIO and finally replace the SC-BASE(-D). If the fault still occurs replace the SC-HDIO. Also check for noise on 95/96 (DP1/2); is shield grounded at the controller?</td></tr>
<tr><td>IN CAR INSPECTION</td><td>In Car Inspection</td></tr>
<tr><td colspan="2">Description: The In Car Inspection switch has been activated. ASME 2000 event.
Troubleshooting:
• Confirm that INICI = 1 (0701 bit 2).
• Also check input resistor INICI on the associated board (refer to prints). Swap ribbon cables between SC-SB2K(-H), SC-HDIO. If swapping ribbons has no effect or if resistor are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>IN REDUNDANCY FAULT</td><td>Inspection Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of the Inspection Inputs has been detected. Two Inspection Inputs should never be active at the same time. ASME 2000 event.
Troubleshooting: If IN = 1 (27 bit 4) and SAF = 1 (2C bit 6), INUP should be 1 (0701 bit 6) and INDN should be 1 (0702 bit 7), otherwise this fault is generated. Locate dropping resistor INMR on the SC-SB2K(-H) board. INMR must be at zero volts when IN is ON. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>INCTI REDUNDANCY FAULT</td><td>Inspection Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of the Inspection Inputs has been detected. Two Inspection Inputs should never be active at the same time. ASME 2000 event.
Troubleshooting: Confirm INCTI = 1 (0701 bit 1), INICI = 0 (0701 bit 2), ACCI = 0 (0702 bit 2), INMR = 0 (0701 bit 3) and IN = 0 (27 bit 4), otherwise this fault is displayed. Use the controller prints to locate dropping resistors IN, INMR and INICI on the SC-SB2K(-H) board and ACCI resistor on the SC-BASE(-D) board, voltage must be OFF when INCTI is ON otherwise the INCTI redundancy fault is logged and the system is shut down. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.</td></tr>
</table>

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
INDN REDUNDANCY FAULT	**INDN Redundancy Fault**
Description: A failure of the INDN input has been detected. It may either be high when expected low or low when expected high. ASME 2000 event. **Troubleshooting Tips:** • If IN is high (27 bit 4) and SAF is low (2C bit 6), INDN should be low (0701 bit 7), otherwise this fault is generated. • If IN is high (27 bit 4) and SAF is high (2C bit 6), INDN should be high (0701 bit 7), otherwise this fault is generated. • If RDN is low (0709 bit 3), INDN should be high (0701 bit 6), otherwise this fault is generated. • If RDN is high (0709 bit 3), INDN should be low (0701 bit 6), otherwise this fault is generated. • Also check input resistors DLK, SAF, IN and INDN on the SC-SB2K(-H) board. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
INICI REDUNDANCY FAULT	**Inspection Input Fault**
Description: A failure of the Inspection Inputs has been detected. Two Inspection Inputs should never be active at the same time. ASME 2000 event. **Troubleshooting:** Confirm INICI = 1 (0701 bit 2), ACCI = 0 (0702 bit 2), INMR = 0 (0701 bit 3) and IN = 0 (27 bit 4), otherwise this fault is displayed. Use the controller prints to locate dropping resistors IN and INMR on the SC-SB2K(-H) board and ACCI input resistor on the SC-BASE(-D) board. Voltage must be OFF when INICI is ON, otherwise the INICI redundancy fault is logged and the system is shut down. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
INMR REDUNDANCY FAULT	**Inspection Input Fault**
Description: A failure of the Inspection Inputs has been detected. Two Inspection Inputs should never be active at the same time. ASME 2000 event. **Troubleshooting:** If IN = 1 (27 bit 4) and SAF = 1 (2C bit 6), INUP should be 1 (0701 bit 6) and INDN should be 1 (0702 bit 7), otherwise this fault is generated. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if associated 47 K dropping resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
Inspection Input Fault (not scrolled, Event Calendar only)	**Inspection Input Fault**
Description: A failure of the Inspection Inputs has been detected. Two Inspection Inputs should never be active at the same time. Look at the Swing Panel Alphanumeric Display to see which fault is active: INCTI, INICI, INMR or IN REDUNDANCY FAULT. ASME 2000 event. **Troubleshooting:** Once the Swing Panel Alphanumeric Display fault is identified, look up that fault in this table.	
INUP REDUNDANCY FAULT	**INUP Redundancy Fault**
Description: A failure of the INUP input has been detected. It may either be high when expected low or low when expected high. ASME 2000 event. **Troubleshooting:** • If IN = 1 (27 bit 4) and SAF = 0 (2C bit 6), INUP should be 0 (0701 bit 6), otherwise this fault is generated. • If IN = 1 (27 bit 4) and SAF = 1 (2C bit 6), INUP should be 1 (0701 bit 6), otherwise this fault is generated. • If RUP = 0 (0709 bit 3), INUP should be 1 (0701 bit 6), otherwise this fault is generated. • If RUP = 1 (0709 bit 3), INUP should be 0 (0701 bit 6), otherwise this fault is generated. • Also check input resistors IN, SAF, RUP and INUP on the SC-SB2K(-H) board. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
MOTOR UP TO SPEED FAILURE *(Hydro only)*	**Motor Up to Speed Failure**
Description: Indicates that the solid state starter failed to detect the motor was up to speed. ASME 2000 event. **Troubleshooting:** For Solid State Starters Only. Increase the Up to Speed Timer in the ASME A17.1 Options Menu. Verify UTS is programmed as a spare input and that it is connected to the proper terminal on the starter.	
MPSAF REDUNDANCY FAULT	**MPSAF Redundancy Fault**
Description: A failure of the SAFR1 relay has been detected. ASME 2000 event. This verifies that when output MPSAF has turned OFF, that relay SAFR1 and TRIAC MPSAF have both released as intended. **Troubleshooting:** If the relay and triac have released then input SAF will be OFF(0). If input SAF = ON, the car is shut down with the MPSAF redundancy fault. Verify MPSAF output = 0 (0700 bit 7) also verify SAFR1 relay is dropped und finally verify SAF input = 0 (2C bit 6). If swapping ribbons has no effect or if associated 47 K dropping resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
Overspeed Fault (not scrolled, Event Calendar only)	**Overspeed Fault**
Description: Look at the Swing Panel Alphanumeric Display to see which fault is active: IL01, IL02, ETS2, ETS1, COS1, or COS2 OVERSPEED FAULT. ASME 2000 event. **Troubleshooting:** Once the Swing Panel Alphanumeric Display fault is identified, look up that fault in this table.	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

<table>
<tr><th>Scrolling Message</th><th>Special Event Message</th></tr>
<tr><td>PFLT FAULT (Traction only)</td><td>PFLT Relay Dropped</td></tr>
<tr><td colspan="2">Description: Indicates that PLD1 has dropped the PFLT relay. ASME 2000 event.
Troubleshooting Tips:
• If STOP = 1 (0700 bit 6) and PFLT = 0 (070D bit 1), then this fault is generated and PLD1 has dropped the PFLT relay.
• Swap ribbon cables between SC-BASE-(D) and SC-HDIO. If swapping cables has no effect, replace SC-BASE(-D) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>PFLT RELAY DROPPED (Traction only)</td><td>PFLT Relay Dropped</td></tr>
<tr><td colspan="2">Description: Indicates that PLD1 has dropped the PFLT relay. ASME 2000 event.
Troubleshooting Tips:
• If STOP = 1 (0700 bit 6) and PFLT = 0 (070D bit 1), then this fault is generated and PLD1 has dropped the PFLT relay.
• Swap ribbon cables between SC-BASE-(D) and SC-HDIO. If swapping cables has no effect, replace SC-BASE(-D) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>PLD CYCLE TEST FAULT (Traction only)</td><td>End of Run Cycle Test Fault</td></tr>
<tr><td colspan="2">Description: A failure of the End of Run Cycle Test has been detected. At the end of an operating cycle outputs CTOS and CTDIF are activated in sequence. Inputs COS1, COS2, ETS1, ETS2, ILO1 and ILO2 must go low. ASME 2000 event.
Troubleshooting: If any of the listed inputs fail to transition to OFF, the PLD cycle test fault will be logged and further operation of the lift will be suspended. If the PFLT Bypass Jumper on the SC-BASE(-D) board is left in the ON position and the controller is switched to normal operation, then the controller will find the landing and then during the cycle test it will latch this fault to prevent the system from running. Make sure the PFLT Bypass Jumper is in the OFF position. Check input resistors ASI1/PFLT, SAF, STOP, REB1, REB2 or RSAFR on the associated board (refer to prints). Swap ribbon cables between SC-SB2K(-H), SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>RACC1 REDUNDANCY FAULT</td><td>Redundancy Access Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of a hoistway access related input, relay or associated circuitry has been detected. The RACC1 input monitors an NC contact of relay ACCI. If ACCI input is OFF (0) the input RACC1 should be ON (1). Hence RACC1 is not equal to ACCI. ASME 2000 event.
Troubleshooting:
• If ACCI = 1 (0702 bit 2), RACC1 should be 0 (0702 bit 3), otherwise this fault is generated.
• Or if ACCI = 0 (0702 bit 2), RACC1 should be 1 (0702 bit 3), otherwise this fault is generated.
• Check input resistors RTBAB, RACC1, RACC2, INUP, INDN, ACCI on associated board (refer to prints).
• Swap ribbon cables between SC-SB2K(-H), SC-BASE(-D) and SC-HDIO.
• If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) or SC-BASE(-D) (for RACC1, RACC2) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>RACC2 REDUNDANCY FAULT</td><td>Redundancy Access Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of a hoistway access related input, relay or associated circuitry has been detected. The RACC2 input monitors an NC contact of relay ACC2. If ACCI input is OFF (0) the input RACC2 should be ON (1). Hence this fault indicates that RACC2 is not equal to ACCI, not a good thing. ASME 2000 event.
Troubleshooting:
• If ACCI = 1 (0702 bit 2), RACC2 should be 0 (0702 bit 4), otherwise this fault is generated.
• If ACCI = 0 (0702 bit 2), RACC2 should be 1 (0702 bit 4), otherwise this fault is generated.
• Check input resistors RTBAB, RACC1, RACC2, INUP, INDN, ACCI on associated board (refer to prints).
• Swap ribbon cables between SC-SB2K(-H), SC-BASE(-D) and SC-HDIO.
• If swapping ribbons has no effect or if associated 47 K input resistors are defective, replace SC-SB2K-(H) or SC-BASE(-D) (for RACC1, RACC2) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>RBRK REDUNDANCY FAULT (Traction only)</td><td>RBRK Redundancy Fault</td></tr>
<tr><td colspan="2">Description: A failure of the BK relay or RBK input has been detected. This means a failure to activate when expected or a failure to drop when expected. ASME 2000 event.
Troubleshooting:
• If SAF = 0 (2C bit 6), RBK should be 1 (0708 bit 4), otherwise this fault is generated.
• If MB = 0 (0707 bit 1), RBK should be 1 (0708 bit 4), otherwise this fault is generated.
• If REI = 1 (0707 bit 2) and RPT = 0 (0707 bit 3) and RMR = 0 (0707 bit 5), RBK should be 0 (0708 bit 4), otherwise this fault is generated.
• Check the NC aux contact of relay BK. It must make up when the relay drops out.
• Also check input resistors RBK, REI and RPT on the SC-SB2K board. Swap ribbon cables between SC-SB2K and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>RCD REDUNDANCY FAULT</td><td>Front Door Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of a front door lock input, relay or associated circuitry has been detected. The RCD input monitors a normally closed contact of relay CD. If the CD input is OFF (0), then the NC contact of CD will be made up and input RCD will be ON. If CD is ON, RCD will be OFF. (CD = not RCD). CD should always be the opposite of RCD. If not, the RCD redundancy fault is logged and the controller is shut down. ASME 2000 event.
Troubleshooting: See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Check associated input resistors on the SC-SB2K(-H) board. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.</td></tr>
</table>

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
RCDR REDUNDANCY FAULT	**Rear Door Input Fault**
Description: A failure of a rear door lock input, relay or associated circuitry has been detected. The RCDR input monitors a normally closed contact of relay CDR. If the CDR input is OFF (0), then the NC contact of CDR will be made up and input RCDR will be ON. If CDR is ON, RCDR will be OFF. (CDR = not RCDR). ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Check associated input resistors on the SC-SB2K(-H) board. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
RCT REDUNDANCY FAULT *(Traction only)*	**RCT Redundancy Fault**
Description: A failure of the CT (Cycle Test) relay has been detected. ASME 2000 event. **Troubleshooting Tips:** • If CT = 1 (070A bit 5), RCT should be 0 (0704 bit 4), otherwise this fault is generated. • If CT = 0, RCT should be 1, otherwise this fault is generated. • Check the condition of the CT relay. Replace if defective. • Also check input resistor RCT. Swap ribbon cables between SC-SB2K and SC-HDIO. If swapping ribbons has no effect or if relay CT is defective replace SC-SB2K board. Otherwise replace SC-HDIO board.	
RCTIC REDUNDANCY FAULT	**Redundancy Inspection Input Fault**
Description: A failure of a redundancy inspection related input, relay or associated circuitry has been detected. ASME 2000 event. **Troubleshooting:** • If INCTI = 0 (0701 bit 1) and INICI = 0 (0700 bit 2), RCTIC should be 1 (0702 bit 1), otherwise this fault is generated. • Otherwise RCTIC should be 0 (0702 bit 1) if not this fault is generated. • Check input resistors RCTIC, RIN1, RIN2, IN, SAF, INCTI and INICI on the associated board (refer to prints). • Swap ribbon cables between SC-SB2K(-H),and SC-HDIO. • If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
RDEL1, RDEL2, RDEL3 REDUNDANCY FAULT *(Hydro only)*	**RDEL1, RDEL2, RDEL3 Redundancy Fault**
Description: Only for WYE-DELTA starters. This function checks the status of a normally closed auxiliary contact of relay DELTA. When the car is not running we expect input RDELX to be active (1). When we are running we expect input RDELX to be OFF (0). A few jobs may have more than one DELTA contactor (DELTA1, DELTA2, DELTAX, etc) in this case, when a failure occurs, we display the number of the problematic contactor, ie. RDEL3 Redundancy Fault. ASME 2000 Event. **Troubleshooting**: First check the contacts of the normally closed auxiliary that feed the associated input. The logic is written to check for input RDELX to be OFF (0, that is RDEL1 =0) when we have a valid run command as determined by checking that inputs RPM= UNL=SAF= RWYE= DEL1= 1 and RM1 = WYEX = RDELX =0. If no run command, then RDELX had better be = 1. Check voltage at top of associated input resistors on SC-SB2K-H. For those inputs that are ON expect 5 VAC. For those inputs that are OFF expect 0 VAC. If this is not the case replace the SC-SB2K-H. If voltages are good, swap associated ribbon cable and finally swap the SC-HDIO.	
RDFV REDUNDANCY FAULT *(Hydro only)*	**RDFV Redundancy Fault**
Description: Only for jobs with multiple valves. This logic checks input RDFV = 0 when DSD = VEU = FUD = 1 and RDN = RH = 0. It also checks that RDFV = 1 when there is no demand to run the car Down. ASME 2000 Event. **Troubleshooting:** Use diagnostics to check on status of above signals. Check voltage at top of associated input resistors on SC-SB2K-H. When the inputs are ON expect 5 VAC. When OFF expect 0 VAC. If this is not the case replace the SC-SB2K-H. If voltages are good, swap associated ribbon cable and finally swap the SC-HDIO	
RDN REDUNDANCY FAULT	**Direction Input Fault**
Description: A failure of a direction related input, relay or associated circuitry has been detected. Verifies the DN relay, DN relay activation circuits and RDN input are functioning as required. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. If a direction is not invoked on either automatic or inspection operation, then the NC contact of the DN relay, that feeds input RDN, should be closed. Check associated input resistors on the SC-SB2K(-H) board. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
RDSV REDUNDANCY FAULT *(Hydro only)*	**RDSV Redundancy Fault**
Description: Only for jobs with multiple valves. This logic checks input RDSV = 0 when SU, SD or RLULD = 1 and DNS = 1. It also checks that RDSV = 1 when there is no demand to run the car Down. ASME 2000 Event. **Troubleshooting.** Use diagnostics to check on status of above signals. Check voltage at top of associated input resistors on SC-SB2K-H. When the inputs are ON expect 5 VAC. When OFF expect 0 VAC. If this is not the case replace the SC-SB2K-H. If voltages are good, swap associated ribbon cable and finally swap the SC-HDIO	
RDZ REDUNDANCY FAULT	**Door Zone Input Fault**
Description: A failure of a door zone related input, relay or associated circuitry has been detected. The RDZ input monitors an NC contact of relay DZ. If the DZ input is OFF (0), the NC contact of DZ will be made up and input RDZ will be ON. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Check associated input resistors on the SC-SB2K(-H) board. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
RDZR REDUNDANCY FAULT	**Door Zone Input Fault**
Description: A failure of the rear door zone related input, relay or associated circuitry has been detected. This logic checks the integrity of the relay used for the rear door zone function (DZR). If DZR input is OFF, the DZR relay should be dropped out, which is checked by inspecting a NC contact of relay DZR with input RDZR. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Check associated input resistors on the SC-BASER(-D) board. Swap ribbon cables between SC-BASER(-D) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-BASER(-D) board. Otherwise replace SC-HDIO board.	
RDZX REDUNDANCY FAULT *(Traction only)*	**Door Zone Input Fault**
Description: A failure of a door zone related input, relay or associated circuitry has been detected. The RDZX input monitors a NC contact of relay DZX. If the car is not located in either a front or rear door zone (flag DZORDZ = OFF), the NC contact of DZX will be made up and input RDZX will be ON. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Check associated input resistors on the SC-BASE(-D) board. Swap ribbon cables between SC-BASE(-D) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-BASE(-D) board. Otherwise replace SC-HDIO board.	
Rear Door Input Fault (not scrolled, Event Calendar only)	**Rear Door Input Fault**
Description: A failure of a rear door input, relay or associated circuitry has been detected. Look at the Swing Panel Alphanumeric Display to see which fault is active: DCLR, DPMR, CDR, RCDR, CDBR, HDR, RHDR, HDBR or RHDBR REDUNDANCY FAULT. ASME 2000 event. **Troubleshooting:** Once the Swing Panel Alphanumeric Display fault is identified, look up that fault in this table.	
REB1 REDUNDANCY FAULT *(Traction only)*	**Redundancy Emergency Brake Fault**
Description: A failure of relay EB1 has been detected. REB1 Redundancy Fault is generated if EB1 = 0 (0708 bit 5) and REB1 is not 1 (0708 bit 1) OR if EB1 = 1 (0708 bit 5) and REB1 is not 0 (0708 bit 1). Also, if GOV = 0 (0700 bit 3), REB1 should be 1 (0708 bit 1) and REB2 should be 1 (0708 bit 2), indicating both relays are dropped. ASME 2000 event. **Troubleshooting Tip:** • Check input resistors REB1 and REB2 on the SC-BASE(-D) board. Swap ribbon cables between SC-BASE(-D) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-BASE(-D) board. Otherwise replace SC-HDIO board.	
REB2 REDUNDANCY FAULT *(Traction only)*	**Redundancy Emergency Brake Fault**
Description: A failure of relay EB2 has been detected. REB2 Redundancy Fault is generated if EB2 = 0 (0708 bit 6) and REB2 is not 1 (0708 bit 2) OR if EB2 = 1 (0708 bit 6) and REB2 is not 0 (0708 bit 2). Also, if GOV = 0 (0700 bit 3), REB1 should be 1 (0708 bit 1) and REB2 should be 1 (0708 bit 2), indicating both relays are dropped. ASME 2000 event. **Troubleshooting Tips** • Check input resistors REB1 and REB2 on the SC-BASE(-D) board. Swap ribbon cables between SC-BASE(-D) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-BASE(-D) board. Otherwise replace SC-HDIO board.	
Redundancy Access Input Fault (not scrolled, Event Calendar only)	**Redundancy Access Input Fault**
A failure of a hoistway access related input, relay or associated circuitry has been detected. Look to the Swing Panel Alphanumeric Display to see which fault is active: RACC1, RACC2 or RTBAB REDUNDANCY FAULT. ASME 2000 event. **Troubleshooting:** Once the Swing Panel Alphanumeric Display fault is identified, look up that fault in this table.	
Redundancy Emergency Brake Fault (not scrolled, Event Calendar only)	**Redundancy Emergency Brake Fault**
Description: A failure of EB1 relay or EB2 relay has been detected. Look at the Swing Panel Alphanumeric Display to see if REB1 or REB2 REDUNDANCY FAULT is active. ASME 2000 event. **Troubleshooting:** Once the Swing Panel Alphanumeric Display fault is identified, look up that fault in this table.	
Redundancy Inspection Input Fault (not scrolled, Event Calendar only)	**Redundancy Inspection Input Fault**
Description: A failure of a redundancy inspection related input, relay or associated circuitry has been detected. Look at the Swing Panel Alphanumeric Display to see which fault is active: RIN1, RIN2 OR RCTIC REDUNDANCY FAULT. ASME 2000 event. **Troubleshooting:** Once the Swing Panel Alphanumeric Display fault is identified, look up that fault in this table.	
REI REDUNDANCY FAULT *(Traction only)*	**REI Redundancy Fault**
Description: A failure of the RE relay has been detected. ASME 2000 event. **Troubleshooting:** If FLT relay is picked, then check the following: • If SAF is low (2C bit 6), REI should be low (0707 bit 2), otherwise this fault is generated. • If UPS is high (24 bit 3) or DNS is high (24 bit 4), REI should be high (0707 bit 2), otherwise this fault is generated. • Verify REI = 0 (0707 bit 2), otherwise this fault is generated. • Also check input resistor REI at top left of the SC-SB2K board. Swap ribbon cables between SC-SB2K and SC-HDIO. If swapping ribbons has no effect or if REI resistor is defective, replace SC-SB2K board. Otherwise replace SC-HDIO board. • Confirm FLT relay is picked when a run is initiated. If not, then a DDP generated failure has occurred. Bypass ASME A17.1 faults and initiate a run. Check event calendar to determine which DDP fault has occurred and troubleshoot accordingly.	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
RESBYP REDUNDANCY FAULT	**RESBYP Redundancy Fault**
Description: A failure of the ESB relay has been detected. The fault will be generated if SAFC = 0 (0700 bit 5) and RESBYP is not 1 (0707 bit 8), OR if ESBYP = 1 (0707 bit 7) and RESBYP is not 0 (0707 bit 8), OR if ESBYP = 0 (0707 bit 7) and RESBYP is not 1 (0707 bit 8). ASME 2000 event. **Troubleshooting:** Check input resistor RESBYP on SC-SB2K(-H). Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistor is defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
RFR Button Fault (not scrolled, Event Calendar only)	**RFR Button Fault**
Description: A failure of the Redundancy Fault Reset Pushbutton or RFR input has been detected. Look at the Swing Panel Alphanumeric Display to see which fault is active: RFR STUCK or RFR FLICKERING FAULT. ASME 2000 event. **Troubleshooting:** Once the Swing Panel Alphanumeric Display fault is identified, look up that fault in this table.	
RFR FLICKERING FAULT	**RFR Button Fault**
Description: A failure of the Redundancy Fault Reset Pushbutton or RFR input has been detected. If the RFR input transitions from low (0) to high (1) six times or more per second, the RFR flickering fault will take the car out of service. ASME 2000 event. **Troubleshooting:** Check the RFR input (070A bit 8) and confirm that it is changing state rapidly. If so, try swapping the ribbon cables between the SC-SB2K(-H) and SC-HDIO. If this does not correct the problem, then replace the SC-HDIO / SC-SB2K(-H) board. Otherwise reset the swing panel to clear the fault.	
RFR STUCK FAULT	**RFR Button Fault**
Description: A failure of the Redundancy Fault Reset Pushbutton or RFR input has been detected. If the RFR input remains high (1) continuously for 30 seconds the RFR stuck fault will take the car out of service. ASME 2000 event. **Troubleshooting:** Confirm that RFR = 1 (070A bit 8). To determine which board has failed, check the RFR resistor on board SC-SB2K(-H) for 0 VAC on the bottom end, if so then replace SC-HDIO board. If there is 120 VAC, then inspect the EBR reset pushbutton and determine if it is truly stuck, if so replace the SC-SB2K(-H). Try swapping the ribbon cables between the SC-SB2K(-H) and SC-HDIO. Otherwise replace the SC-SB2K(-H) board.	
RH REDUNDANCY FAULT	**Front Door Input Fault**
Description: A failure of the H relay or RH input has been detected.When output H is OFF (2B bit 4), input RH should be 1 (070A bit 3). If relay H's NO contacts weld closed, the monitoring contact will not make up when the H output is turned OFF at the end of a run. If this happens the RH redundancy fault will be logged and the system shut down.If SAF = 0 (2C bit 6) and DLK = 0 (28 bit 7), RH should be 1 (070A bit 3), otherwise this fault is generated.If H = 1 (2B bit 4) and RLULD = 1 (070A bit 2) and RIN2 = 0 (0701 bit 5)AND there is an intent to move up/down UP - if UNL = 1 (0709 bit 1) and RUP = 0 (0709 bit 3) and USD = 1 (2E bit 2)DOWN - if DNL = 1 (0709 bit 2) and RDN = 0 (0709 bit 4) and DSD = 1 (2E bit 6)RH should be 0 (070A bit 3), otherwise this fault is generated. If RH should be 1 (070A bit 3), otherwise this fault is generated. **Troubleshooting:** Check associated input resistors on the SC-SB2K(-H) board. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K(-H) board. Otherwise replace SC-HDIO board.	
RHD REDUNDANCY FAULT *(Traction only)*	**RHD Redundancy Fault**
Description: A failure of a front door lock input, relay or associated circuitry has been detected. The RHD input monitors an NC contact of relay HD. If the HD input is OFF (0), the NC contact of HD will be made up and input RHD will be ON. If HD is ON, RHD will be OFF (HD = not RHD). HD should always be the opposite of RHD. Otherwise, the RHD redundancy fault is logged and the controller is shut down. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Check associated input resistors on the SC-SB2K(-H) board. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K(-H) board. Otherwise replace SC-HDIO board.	
RHDB REDUNDANCY FAULT	**Front Door Input Fault**
Description: A failure of a front door bypass input, relay or associated circuitry has been detected. The RHDB input monitors an NC contact of relay HDB. If the HDB input is OFF (0), the NC contact of HDB will be made up and input RHDB will be ON. If HDB is ON, RHDB will be OFF (HDB = not RHDB). HDB should always be the opposite of input RHDB. Otherwise, the RHDB redundancy fault is logged and the controller is shut down. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Check associated input resistors on the SC-BASE(-D) board. Swap ribbon cables between SC-BASE(-D) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-BASE(-D) board. Otherwise replace SC-HDIO board.	
RHDBR REDUNDANCY FAULT	**Rear Door Input Fault**
Description: A failure of a rear door bypass input, relay or associated circuitry has been detected. The RHDBR input monitors an NC contact of relay HDBR. If the HDBR input is OFF (0), the NC contact of HDBR will be made up and input RHDBR will be ON. If HDBR is ON, RHDBR will be OFF (HDBR = not RHDBR). HDBR should always be the opposite of input RHDBR. Otherwise, the RHDBR redundancy fault is logged and the controller is shut down. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Check associated input resistors on the SC-BASER(-D) board. Swap ribbon cables between SC-BASER(-D) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-BASER(-D) board. Otherwise replace SC-HDIO board.	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
RHDR REDUNDANCY FAULT	**Rear Door Input Fault**
Description: A failure of a rear door lock input, relay or associated circuitry has been detected. The RHDR input monitors an NC contact of relay HDR. If the HDR input is OFF (0), the NC contact of HDR will be made up and input RHDR will be ON. If HDR is ON, RHDR will be OFF (HDR = not RHDR). HRD should always be the opposite of RHDR. Otherwise, the RHDR redundancy fault is logged and the controller is shut down. If HDR input is OFF the HDR relay should drop out. This is checked by inspecting a normally closed contact of relay HDR with input RHDR. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table.Check associated input resistors on the SC-BASER(-D) board. Swap ribbon cables between SC-BASER(-D) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-BASER(-D) board. Otherwise replace SC-HDIO board.	
RIN1 REDUNDANCY FAULT	**Redundancy Inspection Input Fault**
Description: A failure of a redundancy inspection related input, relay or associated circuitry has been detected. If SAF = 0 (2C bit 6), RIN1 should be 1 (0701 bit 4), otherwise this fault is generated. Or if IN = 1 (27 bit 4), RIN1 should be 0 (0701 bit 4), otherwise this fault is generated. Or if IN = 0 (27 bit 4), RIN1 should be 1 (0701 bit 4), otherwise this fault is generated. ASME 2000 event. **Troubleshooting:** • Check input resistors RCTIC, RIN1, RIN2, IN, SAF, INCTI and INICI on the associated board (refer to prints). • Swap ribbon cables between SC-SB2K(-H),and SC-HDIO. • If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
RIN2 REDUNDANCY FAULT	**Redundancy Inspection Input Fault**
Description: A failure of a redundancy inspection related input, relay or associated circuitry has been detected. If SAF = 0 (2C bit 6), RIN2 should be 1 (0701 bit 4), otherwise this fault is generated. Or if IN = 1 (27 bit 4), RIN2 should be 0 (0701 bit 4), otherwise this fault is generated. Or if IN = 0 (27 bit 4), RIN2 should be 1 (0701 bit 4), otherwise this fault is generated. ASME 2000 event. **Troubleshooting:** • Check input resistors RCTIC, RIN1, RIN2, IN, SAF, INCTI and INICI on the associated board (refer to prints). • Swap ribbon cables between SC-SB2K(-H),and SC-HDIO. • If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
RLULD REDUNDANCY FAULT	**RLULD Redundancy Fault**
Description: A failure of the LU1, LU2, LD1 or LD2 relays or associated circuitry has been detected. If both of the LU and LD inputs = 0, input RLULD should be 1 (070A bit 2). RLULD is also verified "OFF" when running at high (RH = 0, 070A bit 3) or intermediate speed (INT = 1, 02DC bit 1) or the car is on any form of inspection operation as all of these conditions prevent the LU/LD family of relays from picking. Basically, if the leveling inputs are OFF the NC monitoring contacts of these relays should be MADE or the RLULD redundancy fault is logged. ASME 2000 event. **Troubleshooting:** Check input resistors LU, LD and RLULD on the associated board (refer to prints). Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
RM1, RM2, RM3 REDUNDANCY FAULTS *(Hydro only)*	**RM1, RM2, RM3 Redundancy Faults**
Description: Only for jobs with M contactors. This function checks the status of a normally closed auxiliary contact of relay MX. When the car is not running we expect input RMX to be active (1). When we are running we expect input RMX to be OFF (0). A few jobs may have more than one M contactor (M1, M2, MX, etc) in this case, when a failure occurs, we would display the number of the problematic contactor, ie. RM2 Redundancy Fault. ASME 2000 Event. **Troubleshooting**: First, check the contacts of the normally closed auxiliary that feed the associated input. The logic is written to check for input RMX to be OFF (0, that is RM1=0) when we have a valid run command as determined by checking that inputs RPM=UNL=SAF= M1 = 1. If no run command, then RMX must = 1. Check voltage at top of associated input resistors on SC-SB2K-H. For those inputs that are ON expect 5 VAC. For those inputs that are OFF expect 0 VAC. If this is not the case replace the SC-SB2K-H. If voltages are good, swap associated ribbon cable and finally swap the SC-HDIO.	
RMR REDUNDANCY FAULT *(Hydro only)*	**RMR Redundancy Fault**
Description: A failure of the M1, M2 or M12 relays or RMR input has been detected. This means a failure to activate when expected or a failure to drop when expected. If SAF = 0 (2C bit 6), RMR should be 1 (0708 bit 5), otherwise this fault is generated. If MB = 0 (0707 bit 1), RMR should be 1 (0708 bit 5), otherwise this fault is generated. ASME 2000 event. **Troubleshooting:** • Check the NC aux contacts of relays M12, M1 and M2. They must make up when the contactor drops out. • Also check input resistor RMR on the SC-SB2K(-H) board. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K(-H) board. Otherwise replace SC-HDIO board.	
ROFRT REDUNDANCY FAULT *(Hydro only)*	
Description: Monitors the OFRT relay for proper operation. If the OFRT relay is ON , the ROFRT input will be OFF. ROFRT should always be the opposite of OFRT, otherwise the ROFRT Redundancy Fault is logged and the elevator shuts down. The elevator will attempt to recover from this fault up to four consecutive times after which this fault will latch and require a manual reset by pressing the fault reset button. **Troubleshooting Tips:** Check the OFRT relay for proper operation (Some times we relabel the spare relay on the SC-BAH or SC-BAHR and some times we use a small contactor mounted on backplate). Also check the prints to see where the input ROFRT comes in and check 47 K resistor, swap ribbon cable and finally try replacing the associated board (w/ relay) or SC-HDIO.	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
RPLT REDUNDANCY FAULT *(Hydro only)*	**RPLT Redundancy Fault**
Description: Only for jobs with multiple starters. This function checks the status of a normally closed contact of starter pilot relays PLT. When the car is not running, we expect input RPLT to be active (1). When we are running, we expect input RPLT to be OFF (0). ASME 2000 Event. **Troubleshooting**: First, check the normally closed contact of relay PLT that feeds the input RPLT. Check voltage at top of associated input resistors on SC-SB2K-H. For stopped condition (no demand), expect 5 VAC. For running, expect 0 VAC. If this is not the case, replace the SC-SB2K-H. If voltages are good, swap associated ribbon cable and finally swap the SC-HDIO.	
RPM REDUNDANCY FAULT *(Hydro only)*	**RPM Redundancy Fault**
Description: Verifies that input RPM is OFF when it should be by comparing RPM to inputs SAF=0= DLK= UNL=RPM. Also, if VC=1, RPM should also =1. Finally, we verify that RPM=1 when RUP=0 and either SU=1, RLULD=0 or VEU=0 or INUP=1 and IN=0. ASME 2000 Event. **Troubleshooting:** Use diagnostics to verify the status of the above mentioned inputs. For those inputs that should be OFF, check for 0 VAC at top of associated resistor on SC-SB2K-H and check for 5 VAC at top of resistors for active (ON) inputs. If not present, replace SC-SB2K-H. Otherwise swap associated ribbon cable or SC-HDIO.	
RPT REDUNDANCY FAULT	**RPT Redundancy Fault**
Description: A failure with the RPT input, PT relay or associated circuitry has been detected. If SAF = 0 or DLK = 0 or REI = 0 (0707 bit 2) then verify RPT = 1 (0707 bit 3). If RUP = 1 (0709 bit 3) and RDN = 1 (0709 bit 4) then verify RPT = 1. Else verify RPT = 0. ASME 2000 event. **Troubleshooting Tip:** • Check input resistors SAF, DLK, REI, RUP, RDN, and RPT on the associated board (refer to prints). Swap ribbon cables between SC-SB2K(-H), SC-BASE(-D) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
RSAFM REDUNDANCY FAULT *(Traction only)*	**RSAFM Redundancy Fault**
Description: Monitors the SAFM relay for proper operation. If the SAFM relay is ON , the RSAFM input will be OFF. RSAFM should always be the opposite of SAFM, otherwise the RSAFM Redundancy Fault is logged and the elevator shuts down. The elevator will attempt to recover from this fault up to four consecutive times after which this fault will latch and require a manual reset by pressing the fault reset button. **Troubleshooting Tips:** Check the SAFM relay for proper operation. Also check the prints to see where the input RSAFM comes in and check 47 K resistor, swap ribbon cable and finally try replacing the associated board (w/ relay) or HC-IOX.	
RSAFR CYCLE TEST FAULT	**RSAFR Cycle Test Fault**
Description: RSAFR Redundancy Fault; A failure of the either the RSAFR1 or RSAFR2 relays has been detected. ASME 2000 event. **Troubleshooting:** During cycle test check operation of RSAFR1/2 relays. Next check for 5 VAC at top of RSAFR resistor on the SC-SB2K(-H) board when both are dropped and 0 VAC when either picks. If not present replace SC-SB2K(-H). If present swap C3 ribbon cable or SC-HDIO.	
RSAFR REDUNDANCY FAULT	**End of Run Cycle Test Fault**
Description: A failure of the End of Run Cycle Test has been detected. A failure of the SAFR1 or SAFR2 relays, OR a failure of the CSAF or MPSAF outputs, OR a failure of the RSAFR input has been detected. ASME 2000 event. **Troubleshooting Tips:** • If MPSAF = 1 (0700 bit 7 and 0 VAC @ TP3) and 120 VAC is present at terminal 20, then verify relay SAFR2 is picked. If SAFR2 is not picked, then check devices between terminal 20 and right coil side of relay SAFR2 for continuity. • If CSAF output is active (0 VAC @ TP4) and 120 VAC is present at terminal 20, then verify relay SAFR1 is picked. If SAFR1 is not picked, then check devices between terminal 20 and right coil side of relay SAFR1 for continuity. • If relays SAFR1 and/or SAFR2 are picked, RSAFR should be 0 (0700 bit 2), otherwise this fault is generated. • Also check input resistor RSAFR. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect, swap triacs on SC-HDIO labeled MPSAF. Or, if RSAFR resistor is defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
RSTOP REDUNDANCY FAULT	**RSTOP Redundancy Fault**
Description: A failure of the In Car Stop Switch has been detected. If RSTOP = 0 (070D bit 4 for Tractions / 070D bit 1 for Hydros) and SAFC = 1 (0700 bit 5), STOP (0700 bit 6) should be 1, otherwise this fault is generated. If RSTOP = 1 (070D bit 4 for Tractions / 070D bit 1 for Hydros) and ESBYP = 0 (0707 bit 7), STOP (0700 bit 6) should be 0, otherwise this fault is generated. ASME 2000 event. **Troubleshooting Tips:**• If the In Car Stop Switch is in the RUN position, then the expected results are SAFC = 1, STOP = 1 and RSTOP = 0. • If this is not the case, then trace the signal from the source to determine the failed component. • Begin at the input terminal. If the voltage here is not correct (120VAC for high signals and 0VAC for low signals), then the problem lies outside of the controller equipment. • Next check the voltage at the similarly named input resistor. If the voltage here is not correct (5VAC for high signals and 0VAC for low signals), then the problem lies on this board. If the resistor is still good (typically 47kOhms), then the board should be replaced. • Check for a defective ribbon cable by swapping it. • Finally, replace the input board (HC-PIO, SC-HDIO, IOX, I4O depending on the input). • If the In Car Stop Switch is in the STOP position, then the expected results are ESBYP = 0, STOP = 0 and RSTOP = 1. • Follow the above checks with the additional step for validating ESBYP. ESBYP must be low for this event to occur so, confirm that relay ESBYP is dropped. If it isn't, then replace the ESBYP triac, ribbon cable, SC-HDIO board, or SC-SB2K(-H) board one at a time until the problem is corrected.	
RSYNC REDUNDANCY FAULT *(Hydro only)*	
Description: Monitors the SYNC relay for proper operation. If the SYNC relay is ON , the RSYNC input will be OFF. RSYNC should always be the opposite of SYNC, otherwise the RSYNC Redundancy Fault is logged and the elevator shuts down. **Troubleshooting Tips: :** Check the SYNC relay for proper operation (Some times we relabel the spare relay on the SC-BAH or SC-BAHR and some times we use a small contactor mounted on backplate). Also check the prints to see where the input RSYNC comes in and check 47 K resistor, swap ribbon cable and finally try replacing the associated board (w/ relay) or SC-HDIO.	
RTBAB REDUNDANCY FAULT	**Redundancy Access Input Fault**
Description: A failure of a hoistway access related input, relay or associated circuitry has been detected. The RTBAB input monitors NC contacts of relays TAB and BAB. If RACC1 input is ON (1) then input RACC2 should be ON (1). Hence RACC1 = RTAB. If RACC1 = 1 (0702 bit 3), RTBAB should be 1 (0702 bit 5), otherwise this fault is generated. If INUP = 0 (0701 bit 6) and INDN = 0 (0701 bit 7), RTBAB should be 1 (0702 bit 5), otherwise this fault is generated. Else RTBAB should be 0 (0702 bit 5), otherwise this fault is generated. ASME 2000 event. **Troubleshooting:** • Check input resistors RTBAB, RACC1, RACC2, INUP, INDN, ACCI on associated board (refer to prints). • Swap ribbon cables between SC-SB2K(-H), SC-BASE(-D) and SC-HDIO. • If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) or SC-BASE(-D) (for RACC1, RACC2) board. Otherwise replace SC-HDIO board.	
RUDX1 REDUNDANCY FAULT *(Traction only)*	**RUDX1 Redundancy Fault**
Description: Monitors the UP2 and DN2 relays. When the elevator is in motion either the UP2 or DN2 relays will be picked, depending on the direction of the car. Therefore the RUDX1 input must be active while the car is in motion and inactive when the car is stopped. **Troubleshooting Tips:** Check UP2 and DN2 relays. Also check RUDX1/ASI5 input resistor on the SC-HDIO board (refer to prints). If 47 K resistor is defective, replace SC-HDIO board. Otherwise replace UP2 or DN2 relays.	
RUDX2 REDUNDANCY FAULT *(Traction only)*	**RUDX2 Redundancy Fault**
Description: Monitors the UP2 and DN2 relays. When the elevator is in motion either the UP2 or DN2 relays will be picked, depending on the direction of the car. Therefore the RUDX2 input must be active while the car is in motion and inactive when the car is stopped. **Troubleshooting Tips:** Check UP2 and DN2 relays. Also check RUDX2/ASI6 input resistor on SC-HDIO board (refer to prints). If 47 K resistor is defective, replace SC-HDIO board. Otherwise replace UP2 or DN2 relays.	
RUDX3 REDUNDANCY FAULT *(Traction only)*	**RUDX3 Redundancy Fault**
Description: Monitors the UP2 and DN2 relays. When the elevator is in motion either the UP2 or DN2 relays will be picked, depending on the direction of the car. Therefore the RUDX3 input must be active while the car is in motion and inactive when the car is stopped. **Troubleshooting Tips:** Check UP2 and DN2 relays. Also check RUDX3/ASI7 input resistor on SC-HDIO board (refer to prints). If 47 K resistor is defective, replace SC-HDIO board. Otherwise replace UP2 or DN2 relays.	
RUDX4 REDUNDANCY FAULT *(Traction only)*	**RUDX4 Redundancy Fault**
Description: Monitors the UP2 and DN2 relays. When the elevator is in motion either the UP2 or DN2 relays will be picked, depending on the direction of the car. Therefore the RUDX4 input must be active while the car is in motion and inactive when the car is stopped. **Troubleshooting Tips:** Check UP2 and DN2 relays. Also check RUDX4/ASI8 input resistor on SC-HDIO board (refer to prints). If 47 K resistor is defective, replace SC-HDIO board. Otherwise replace UP2 or DN2 relays.	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

Scrolling Message	Special Event Message
RUFV REDUNDANCY FAULT *(Hydro only)*	**RUFV Redundancy Fault**
Description: Only for jobs with multiple valves. This logic checks input RUFV = 0 when USD = VEU = FUD = 1 and RUP= RH = 0. It also checks that RUFV = 1 when there is no demand to run the car Up. ASME 2000 Event. **Troubleshooting:** Use diagnostics to check on status of above signals. Check voltage at top of associated input resistors on SC-SB2K-H. When the inputs are ON, expect 5 VAC. When OFF, expect 0 VAC. If this is not the case, replace the SC-SB2K-H. If voltages are good, swap associated ribbon cable and finally swap the SC-HDIO	
RUP REDUNDANCY FAULT	**Direction Input Fault**
Description: A failure of a UP direction related input, relay or associated circuitry has been detected. Checks that the UP relay, UP relay activation circuits and RUP input are functioning as required. ASME 2000 event. **Troubleshooting:** See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. If a direction is not invoked on either automatic or inspection operation, then the NC contact of the UP relay, that feeds input RUP, should be closed. Thus RUP = ON. Check associated input resistors on the SC-SB2K(-H) board. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K(-H) board. Otherwise replace SC-HDIO board.	
RUSV REDUNDANCY FAULT *(Hydro only)*	**RUSV Redundancy Fault**
Description: Only for jobs with multiple valves. This logic checks input RUSV = 0 when SU, SD or RLULD = 1 and UPS = 1. It also checks that RUSV = 1 when there is no demand to run the car Up. ASME 2000 Event. **Troubleshooting.** Use diagnostics to check on status of above signals. Check voltage at top of associated input resistors on SC-SB2K-H. When the inputs are ON, expect 5 VAC. When OFF, expect 0 VAC. If this is not the case, replace the SC-SB2K-H. If voltages are good, swap associated ribbon cable and finally swap the SC-HDIO.	
RWYE1, RWYE2, RWYE3 REDUNDANCY FAULTS *(Hydro only)*	**RWYE1, RWYE2, RWYE3 Redundancy Faults**
Description: This function checks the status of a normally closed auxiliary contact of relay WYE (or A for Across the Line Starters). When the car is not running, we expect input RWYEX to be active (1). When we are running we expect input RWYEX to be OFF (0). A few jobs may have more than one WYE contactor (WYE1, WYE2, WYEX, etc). In this case, when a failure occurs, we display the number of the problematic contactor, ie. RWYE2 Redundancy Fault. ASME 2000 Event. **Troubleshooting**: First check the contacts of the normally closed auxiliary that feed the associated input. The logic is written to check for input RWYEX to be OFF (0, that is RWYE1=0) when we have a valid run command as determined by checking that inputs UNL=SAF= M1 = WYEX = RDELX (if wye-delta starter) = 1. If no run command, then RWYEX had better be = 1. Check voltage at top of associated input resistors on SC-SB2K-H. For those inputs that are ON, expect 5 VAC. For those inputs that are OFF, expect 0 VAC. If this is not the case, replace the SC-SB2K-H. If voltages are good, swap associated ribbon cable and finally swap the SC-HDIO.	
SAFC REDUNDANCY FAULT	**SAFC Redundancy Fault**
Description: A failure of the safety string between input SAFC and input STOP has been detected. If SAFC = 0 (0700 bit 5), STOP should be 0 (0700 bit 6), otherwise this fault is generated. ASME 2000 event. **Troubleshooting Tips:** • Check wiring connections to terminals 18 and 20. • Check wiring connections to the IN-CAR STOP SWITCH. • Also check input resistors STOP and SAFC. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
SAFH REDUNDANCY FAULT	**SAFH Redundancy Fault**
Description: A failure of the safety string between input SAFH and input SAFC has been detected. If SAFH = 0 (0700 bit 4), SAFC should be 0 (0700 bit 5), otherwise this fault is generated. ASME 2000 event. **Troubleshooting Tips:**• Check wiring connections to terminals 16, 17 and 18. • Check wiring connections to all safety devices between terminals 16, 17 and 18. • Also check input resistors SAFH and SAFC. Swap ribbon cables between SC-SB2K(-H) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	
STARTER FAULT RELAY DROPPED *(Hydro only)*	**Starter Fault Relay Dropped**
Description: Indicates that the solid state starter has dropped the fault relay. ASME 2000 Event. **Troubleshooting:** For Solid State Starters Only. Confirm that the Fault Relay has truly dropped. If not, then check the wiring. Otherwise refer to the Starter Manufacturers manual.	
TEST REDUNDANCY FAULT	**TEST Redundancy Fault**
Description: A failure of the TEST/NORMAL switch, input or associated circuitry has been detected. ASME 2000 event. **Troubleshooting:** The switch can't be in the NORMAL and TEST positions at the same time. • If TEST = 0 (02D9 bit 7), meaning the switch is in the TEST position, IND should be 1 (27 bit 5), otherwise this fault is generated. • Check input resistors TEST and IND on the associated board (refer to prints). • Swap ribbon cables between SC-SB2K(-H), SC-HDIO. • If swapping ribbons has no effect or if resistors are defective, replace SC-SB2K-(H) board. Otherwise replace SC-HDIO board.	

TABLE 6.4 ASME A17.1 - 2000 Status and Error Messages

<table>
<tr><th>Scrolling Message</th><th>Special Event Message</th></tr>
<tr><td>UETS REDUNDANCY FAULT (Traction only)</td><td>UETS Redundancy Fault</td></tr>
<tr><td colspan="2">Description: This fault is displayed when an inconsistency is detected between the Up Emergency Terminal Switches. ASME 2000 event.
Troubleshooting:
• Check the condition of the ETS switches. The UETS1/2 limit switches must operate simultaneously.
• Check the wiring to the relay board (SC-SB2K(-H)) and IO board (SC-HDIO).
• Verify UETS1 (070C bit 7) equals UETS2 (070D bit 2) and the car is in door zone.
• Also check input resistors UETS1 and ASI2/UETS2 on the associated board (refer to prints). Swap ribbon cables between SC-BASE(-D) and SC-HDIO. If swapping ribbons has no effect or if resistors are defective, replace SC-BASE(-D) board. Otherwise replace SC-HDIO board.</td></tr>
<tr><td>UFV REDUNDANCY FAULT (Hydro only)</td><td>UFV Redundancy Fault</td></tr>
<tr><td colspan="2">Description: Input UFV checks the status of the up terminal speed reducing switches. We simply compare input UFV against input UTSRL. If UFV is not equal to UTSRL, we assert this fault. Hence these switches must open up simultaneously. ASME 2000 event.
Troubleshooting: Check that the limit switches are opening within one second of each other as the car approaches the top terminal landing. If they are, then use diagnostics to determine the status of the inputs. Check voltage at top of associated input resistors on SC-SB2K-H. When the inputs are ON, expect 5 VAC. When OFF, expect 0 VAC. If this is not the case, replace the SC-SB2K-H. If voltages are good, swap associated ribbon cable and finally swap the SC-HDIO.</td></tr>
<tr><td>UNL REDUNDANCY FAULT (Hydro only)</td><td>Direction Input Fault</td></tr>
<tr><td colspan="2">Description: Input UNL checks the status of the UNL relay against the up normal limit switch when the doors are locked. We simply compare input UNL against input UNLS. If UNL is not equal to UNLSL, we assert this fault. Hence these switches must open up simultaneously. ASME 2000 Event.
Troubleshooting: Check that both the limit switch and relay are activating/deactivating within one second of each other as the car approaches the top terminal landing. If they are, then use diagnostics to determine the status of the inputs. Check voltage at top of associated input resistors on SC-SB2K-H. When the inputs are ON expect 5 VAC. When OFF expect 0 VAC. If this is not the case replace the SC-SB2K-H. If voltages are good, swap associated ribbon cable and finally swap the SC-HDIO</td></tr>
<tr><td>UP NORMAL LIMIT SWITCH OPEN</td><td>Direction Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of a direction related input, relay or associated circuitry has been detected. If SAF=1 and DLK=1 and the car is above the Up Normal Limit Switch (UNL=0), then this status is displayed. ASME 2000 event.
Troubleshooting: See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Verify SAF=1 and DLK=1 and move the car below the Up Normal Limit (UNL=1). In most cases we simply need to move the limit switch further into the terminal.</td></tr>
<tr><td>UPDIR REDUNDANCY FAULT (Traction only)</td><td>Direction Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of a direction related input, relay or associated circuitry has been detected. Valid when SAF=1. Input UPDIR is created by the SC-BASE(-D) board and represents resolved direction from the speed sensor. Input UPDIR must always be the opposite of RUP. If the main processor detects that the resolved direction (UPDIR form SC-BASE(-D)) does not agree with the intended direction (RUP from MP2 / PCA), the system is shut down with the UPDIR redundancy fault. ASME 2000 event.
Troubleshooting: See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table.
• Verify that the UP LED on the SC-BASE(-D) is ON when car motion is up and OFF when car motion is down. If not, the speed sensor is reversed (rotate the sensor 180 degrees with respect to the magnet).
• Swap associated Ribbons cables between SC-BASE(-D) and SC-HDIO, check 95 and 96 signals (0 to 55VDC), swap SC-BASE(-D) or SC-HDIO.</td></tr>
<tr><td>UPS REDUNDANCY FAULT</td><td>Direction Input Fault</td></tr>
<tr><td colspan="2">Description: A failure of a direction related input, relay or associated circuitry has been detected. Valid when SAF=1. Determines if the up sense input (UPS) agrees with the intended direction (RUP) once the doors are closed and locked (DLK). ASME 2000 event.
Troubleshooting: See the note, GENERAL TROUBLESHOOTING TIPS, just prior to this table. Once DLK is ON (1), if UPS is ON (1), then RUP must be OFF (0). If this is not the case, the system is shut down with the UPS redundancy fault. Check associated input resistors, swap boards or ribbon cables to correct.</td></tr>
<tr><td>UTS REDUNDANCY FAULT (Hydro only)</td><td>UTS Redundancy Fault</td></tr>
<tr><td colspan="2">Description: Only for solid state starters. This input validates that the “Up To Speed” (UTS) signal is low (OFF) when either WYE or DEL are OFF (0). If UTS is ON, we set this fault. For jobs with multiple starters, we have UTS1, UTS2, etc. ASME 2000 Event.
Troubleshooting. Use diagnostics to check on status of WYE, DEL and UTS as above. Check voltage at top of associated input resistors on SC-SB2K-H. When the inputs are ON, expect 5 VAC. When OFF, expect 0 VAC. If this is not the case, replace the SC-SB2K-H. If voltages are good, swap associated ribbon cable and finally swap the SC-HDIO</td></tr>
</table>

4-19-04

6.2 USING THE SPECIAL EVENTS CALENDAR

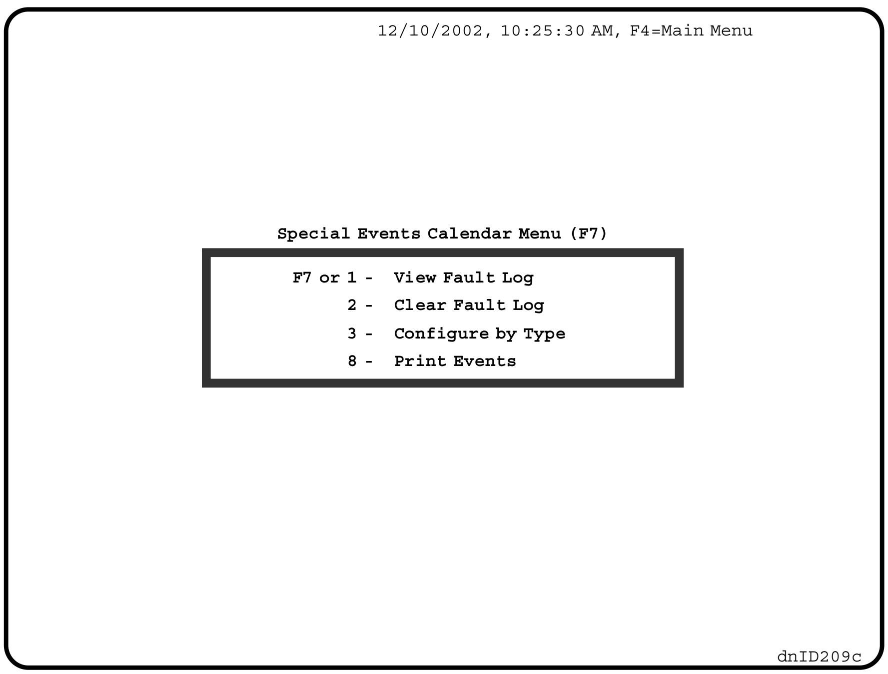
The Special Events Calendar documents the 250 most recent fault conditions or events and displays them in chronological order. They can be viewed on the optional CRT terminal connected to either the car controller or the Group Supervisor. The data displayed includes the type of event or fault, the date and time the fault/event occurred, the date and time the fault/event was corrected, as well as other information about the status of the elevator when the fault or event occurred.

The Special Events Calendar Fault Log is accessed from the Special Events Calendar Menu (Figure 6.5). Press the **F7** key while the Main Menu is displayed.

VIEW FAULT LOG

From the Special Events Calendar Menu (F7) screen press **1** or **F7** to display the events logged to the Special Events Calendar (Figure 6.6). This screen makes it possible to examine the documented faults and events. The latest 14 faults and events are displayed in the bottom half of the screen, including the date and time the event occurred.

FIGURE 6.5 Special Events Calendar Menu (F7) screen



When this screen is first displayed, the most recent event is displayed at the bottom of the screen. Use the **Up / Down Arrow** keys to scroll one event at a time, the **Page Up / Page Down** keys to scroll a page at a time, or the ***Home / End*** key to scroll to event 1 or 250. As each event is selected (reverse video), the description of the event and any other logged data is displayed in the top half of the screen. Additional troubleshooting information for each event can be displayed by pressing **Crtl + T** (see Figure 6.7). Table 6.3 Standard Status and Error Messages and Table 6.4, *ASME A17.1 - 2000 Status and Error Messages* list the faults or events which are recorded, including a description and recommended troubleshooting actions.

FIGURE 6.6 Special Events Calendar (F7 - 1) screen

```
                              12/4/2000,  10:25:30 AM,    F4=Main Menu

                     Special Events Calendar (F7, F7)
--------------------------------------------------------------------------
STATUS                 SPEED (ft/Mmin)  VOLTAGE (volts)   CURRENT (amps)
Direction   : N/A      Command  : N/A   Armature : N/A    Armature : N/A
High Speed  : N/A      Tach/Enc : N/A   Motor Fld: N/A    Command  : N/A
Start Floor : N/A      Terminal : N/A   Brake    : N/A
Stop Floor  : N/A      Safety   : N/A
Step Floor  : N/A      Pattern  : N/A   SENSOR (volts)    POSITION (ft)
Switch      : N/A                       Motor Fld: N/A    Absolute : N/A
PI          : 3                         Brake    : N/A
Event Code  : 0x03 ( Communication )
--------------------------------------------------------------------------
This fault indicates that the car was previously communicating with the Group
Supervisor but is now unable to communicate.

--------------------------------------------------------------------------
DATE           TIME            DESCRIPTION
--------------------------------------------------------------------------
12/4/2000      10:05:28 AM     Communication Loss
               10:07:37 AM     Communication Loss [OFF]
               2:36:18 PM      Sub-System(s) Reset

   ARROWS: Move Cursor, HOME: Oldest, END: Newest,  CTRL-T: Troubleshoot
                                                                 dnID208c
```

FIGURE 6.7 Special Events Calendar Troubleshooting (F7 - 1 - Crtl +T) screen

```
                              2/16/2000,  10:25:30 AM,  F4= Main Menu


          Special Events Calendar Troubleshooting Tips

          12/4/2000,  10:05:28 AM, Communication Loss

--Verify that the RS-422 communication cable is not removed from the Car's
MC-RS board.
--Verify the jumpers on all of the controllers' MC-RS boards.
--Check for a defective MC-RS board on any of the controllers.


               ESC or CTRL-T: Special Events Calendar
                                                                 dnID248b
```

CLEAR FAULT LOG

While in the Special Event Calendar Menu (F7) screen is displayed, if the **2** key is pressed, the message **`Delete All Events? (Y/N)`** is displayed. Press **Y** to clear the Special Events Calendar of all events.

SPECIAL EVENTS - CONFIGURE BY TYPE

In order to aid in troubleshooting, the list of events which are logged to the Special Events Calendar can be configured based on the event type.

While in the Special Event Calendar Menu (F7) screen is displayed, press the **3** key to access the Special Events - Configure by Type (F7, 3) screen (see Figure 6.8). The ***Log*** column controls which events are logged to the Special Events Calendar Fault Log. Place an 'X' in this column if you want the event type listed in the selected row to be logged to the Special Events Calendar. When the Event Description is highlighted, a description of the event type is displayed above the column headings (see Figure 6.9). Tables 6.3 & 6.4 provide a complete listing of events. The event messages that are logged to the Special Event Calendar are shown with SEC in the *Location* column.

FIGURE 6.8 Special Events - Configure by Type (F7, 3) screen

```
                              12/5/2000, 10:25:30, F4= Main Menu

                 Special Events - Configure by Type (F7, 3)
The Log column controls which events are logged to the Special Events
Calendar. Place an X in the Log column to have events of the type specified by
this row to be logged to the Special Events Calendar. Events with a "." in the
Log column will not be logged.

Log          Process          Event Description                  1 of 39
X            Communication    Alarm - No Car Movement
X            Communication    Alarm - No Door Zone
X            Communication    Both USD and DSD Are Open
X            Communication    Bottom Floor Demand
X            Communication    Car Call Bus Fuse Blown
X            Communication    Car Out of Service with Doors Locked
X            Communication    Car Out of Service without Doors Locked
X            Operation        Car Safefy Device Open
X            Communication    Communication Loss
X            Communication    Contactor Proofing Redundancy Failure
X            Communication    Direction Relay Redundancy Failure
X            Communication    Door Close Protection
X            Communication    Door Lock Contact Failure
X            Communication    Door Open Limit Failure
X            Communication    Doors Open and Locked
X            Operation        Earthquake
X            Communication    Fire Service Phase 2
X            Communication    Gate Switch Relay Redundancy Failure
X            Operation        Governor Switch Open
X            Operation        Hoistway Safety Devide Open

            ARROWS: Select,   ENTER KEY: Edit,   S: Saves
                                                              dnID239d
```

FIGURE 6.9 Special Events - Configure by Type - Event Description (F7, 3) screen

12/5/2000, 10:25:30, F4= Main Menu

Special Events - Configure by Type (F7, 3)

This event indicates that one or more of the car safety circuit devices is open (e.g., emergency exit contact, safety clamp switch, car-top emergency stop switch). This error is generated when the safety string input (SAF) is low, and the safety circuit has been opened "upstream" of the SAFC input.

Log	Process	Event Description	1 of 39
X	Communication	Alarm - No Car Movement	
X	Communication	Alarm - No Door Zone	
X	Communication	Both USD and DSD Are Open	
X	Communication	Bottom Floor Demand	
X	Communication	Car Call Bus Fuse Blown	
X	Communication	Car Out of Service with Doors Locked	
X	Communication	Car Out of Service without Doors Locked	
X	Operation	Car Safefy Device Open	
X	Communication	Communication Loss	
X	Communication	Contactor Proofing Redundancy Failure	
X	Communication	Direction Relay Redundancy Failure	
X	Communication	Door Close Protection	
X	Communication	Door Lock Contact Failure	
X	Communication	Door Open Limit Failure	
X	Communication	Doors Open and Locked	
X	Operation	Earthquake	
X	Communication	Fire Service Phase 2	
X	Communication	Gate Switch Relay Redundancy Failure	
X	Operation	Governor Switch Open	
X	Operation	Hoistway Safety Devide Open	

ARROWS: Select, ENTER KEY: Edit, S: Saves

dnID239e

FIGURE 6.10 Special Events - Print Events (F7, 8) screen

12/19/2002, 10:25:30, F4= Main Menu

Event Calendar Print Setup (F7, 8)

Print Range: **ALL EVENTS**

Start Date: **-- N/A --**
End Date: **-- N/A --**

Events Per Page: **8**

ARROWS: Select Item, +/- KEYS: Change Value, P: Print

dnID272

6.3 USING THE DIAGNOSTICS

System diagnostics are available using the optional CRT terminal with Release 4 Communication software. Diagnostics are accessed via the Diagnostics Menu (F11) screen.

FIGURE 6.11 Diagnostics Menu (F11) screen

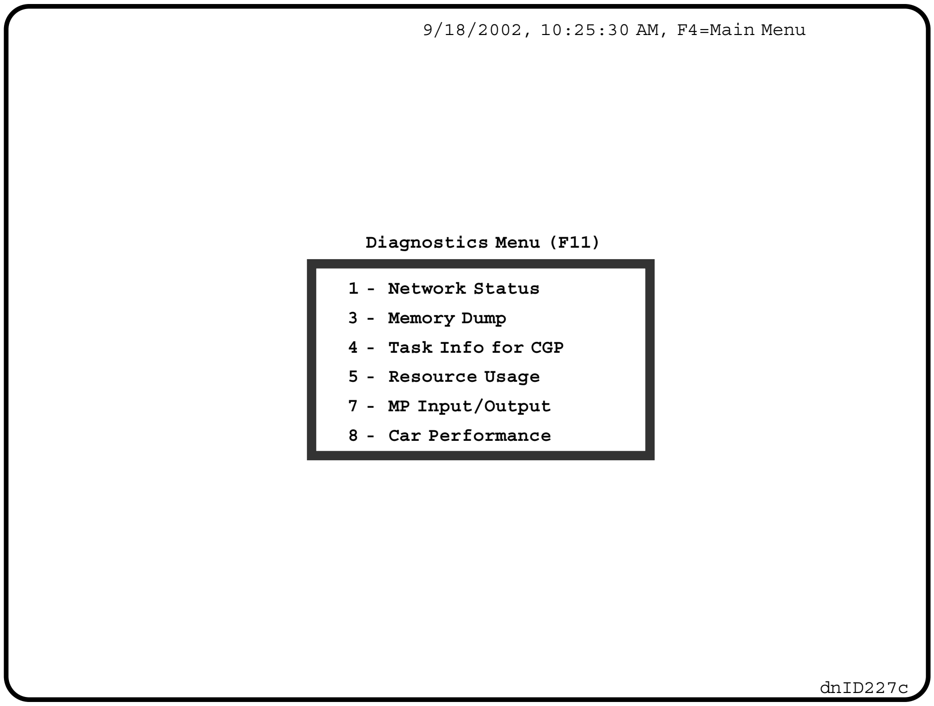
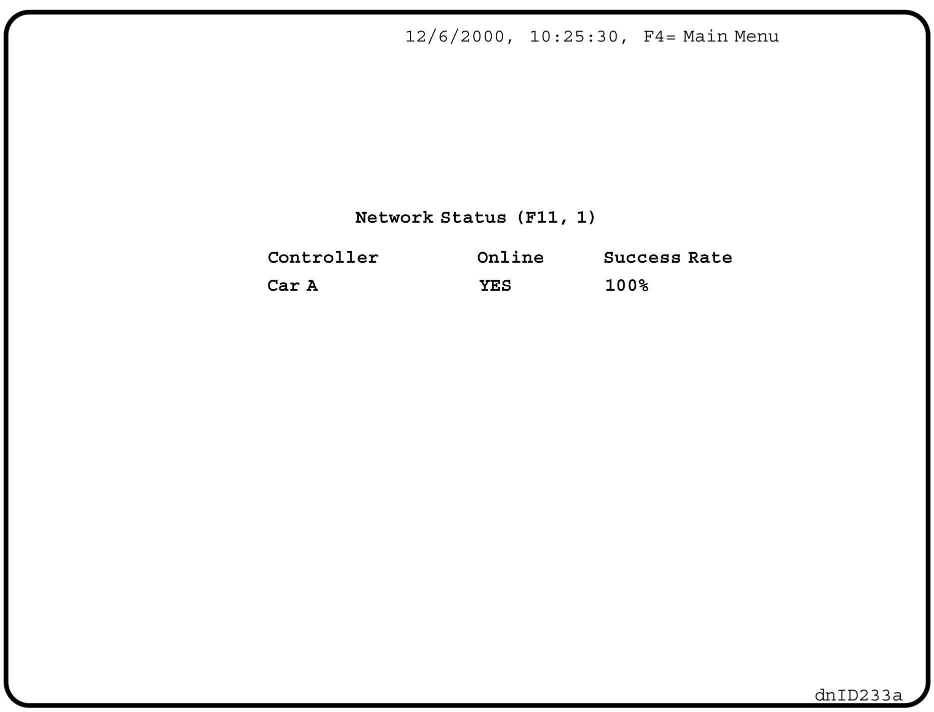


FIGURE 6.12 Network Status (F11, 1) screen



Network Status - The status of communication between the car controller and the Group Supervisor can be verified using the Network Status (F11, 1) screen. A Success Rate of less than 100% indicates possible improper termination of the High-Speed Serial Communication Link. Proper termination is achieved by installing or removing shunts on jumpers JP1 and JP2 on the MC-RS Communication Interface boards at the ends of the communication chain while observing the Success Rate percentage for each local Car. The goal is to achieve 100% Success Rate for each car, or the highest percentage possible. This diagnostic screen is also available on the M3 Group Supervisor (see Section 3.9.2 *Using the Network Status Diagnostics Screen* in the M3 Group Supervisor manual, part #42-02-G004)

Memory Dump - (screen not shown) This diagnostic screen shows the status of memory locations within the controller's computers. MCE Technical Support personnel may request information from this screen while troubleshooting a problem.

Task Info for CGP - (screen not shown) This diagnostic screen shows the status of various tasks performed by the MC-CGP-4(8) Communication Processor Board. MCE Technical Support personnel may request information from this screen while troubleshooting a problem.

Resource Usage - (screen not shown) This diagnostic screen shows resource usage in the MC-CGP-4 Communication Processor Board. MCE Technical Support personnel may request information from this screen while troubleshooting a problem.

MP Input / Output - Displays the status of the MP inputs and outputs (Figure 6.13).

FIGURE 6.13 MP2 Input/Output (F11,7) screen

7/19/2000, 10:25:30 AM, F4=Main Menu

MP Diagnostic Input/Output Flags

20	DOLM	PHE	DZ	DOL	DBC	SE	GEU	GED
21		DC	UC	CC			DHO	DOI
22	DCF	DCP	DOF	LOT		HTC	CCT	SDT
23			HSEL	CSB	DCC	NUDG		DSHT
24	INT	FRA	FCS	FRS	DNS	UPS	STD	STU
25			HLW	HLI			**FWI**	
26	LFP	UFP						
27			EQI	IND	IN		DEL	YSIM
28	LLW	DLK		DZORDZ			PK	LLI
29	DNDO	LD		DDP	UPDO	LU		UDP
2A	DMD	DCB	UCB	CCB	DMU	DCA	UCA	CCA
2B	TOS	MLT	PSTX	MGR	H	REL	DSH	RUN
2C		STC	SAF	**HCR**	**HCDX**	**CCD**	ISV	ISRT
2D					**FRM**			FRC
2E	SD	SDA	DSD	BFD	SU	SUA	USD	TFD
2F	HLD		EQA	ATSF		ECRN	CD	EPR

dnID265

FIGURE 6.14 Car Performance Graph (F11, 8) screen

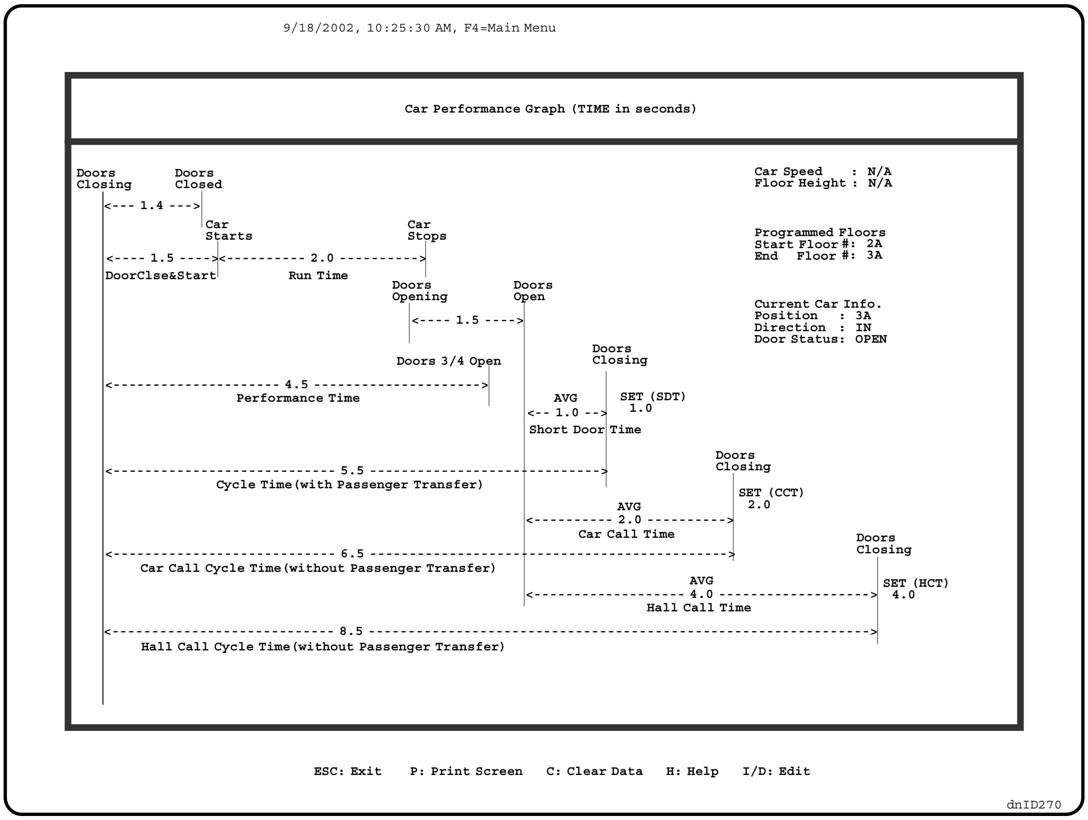
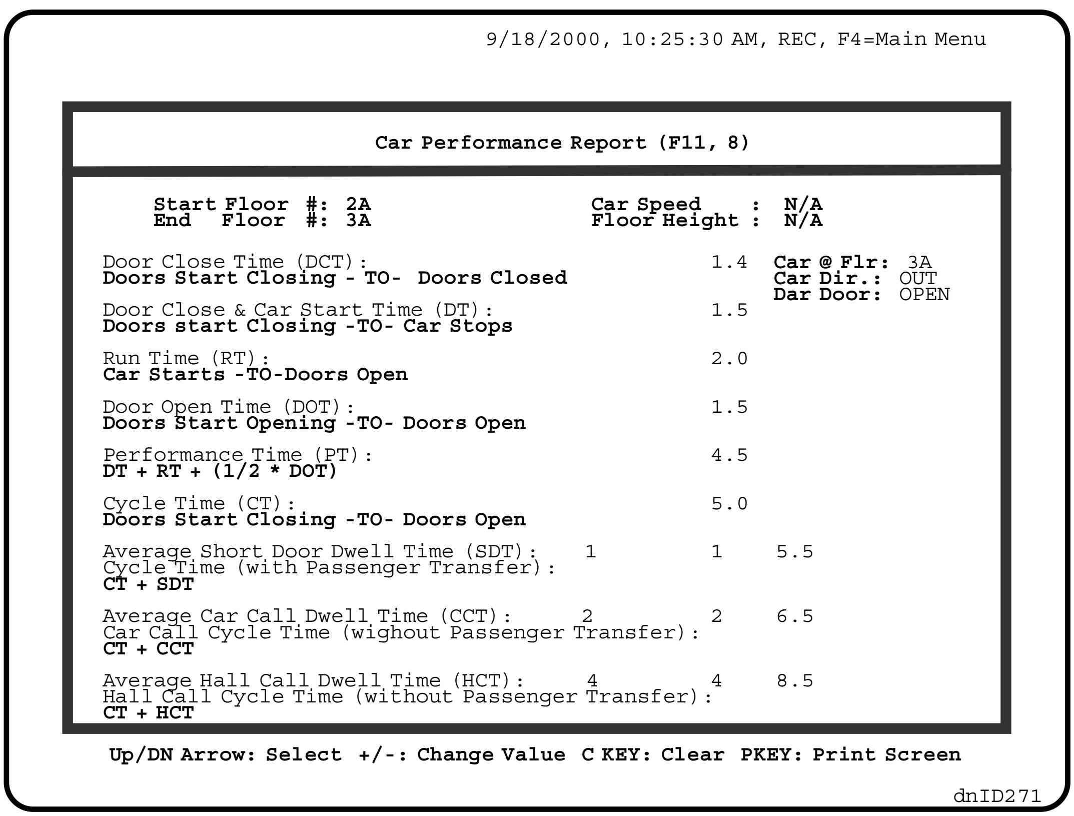


FIGURE 6.15 Car Performance Report (F11, 8, H) screen



Car Performance - The Car Performance Graph (F11, 8) screen and the Car Performance Report (F11, 8, H) screen provide car performance data including:

- Door Close Time (DCT)
- Door Close & Car Start Time (DT)
- Run Time (RT)
- Door Open Time (DOT)
- Performance Time (PT)
- Cycle Time (CT)
- Average Short Door Dwell Time (SDT)
- Average Car Call Dwell Time (CCT)
- Average Hall Call Dwell Time (HCT)

6.4 TROUBLESHOOTING CAR OPERATION CONTROL (COC)

Usually, a malfunction is due to a faulty input or output signal. Inputs are signals generated outside the controller cabinet that connect to terminals inside the cabinet, and are subsequently read by the computer during its input scan. Outputs are signals generated by the computer that energize relays or turn on indicators during the computer's normal output scan. Since an incorrect input or output can cause a system malfunction, tracing these signals to find the source of the problem is essential. Read the example problem under *Tracing Signals in the Controller* to become familiar with signals generated in the system.

6.4.1 DOOR LOGIC

As complex as it is, the door logic basically answers one simple question; should the doors be open? The computer looks at certain inputs and then calls upon specific logic to answer this question. All of the inputs and flags generated by the specific logic are available for viewing through the EOD. When troubleshooting a door problem, inspecting the action and sequence of these flags and inputs is important. The status of these logic flags will generally point toward the root of the problem. Once the computer has determined the answer to the door status question, the appropriate outputs are turned ON or OFF, so the doors are in the desired state.

The computer looks at the following inputs:

- DBC - Door Close Button input
- DCLC - Door Closed Contacts input (Retiring Cam only)
- DLK - Door Locks input
- SE - Safety Edge input
- DOL - Door Open Limit input
- DZ - Door Zone input
- PHE - Photo Eye input

The computer generates the following outputs:

- DCF - Door Close Function output
- DCP - Door Close Power output
- DOF - Door Open Function output
- NUDG - Nudging output

TRACING SIGNALS IN THE CONTROLLER

The following example shows how an input signal can be traced from its source (field wire) to its destination inside the computer (EOD). Monitor the Door Zone (DZ) flag. The DZ flag can be monitored using the Computer Swing Panel Diagnostic Indicators as described in Section 5.4.1, *Viewing the MC-MP2-2K Computer Variable Flags.* The door flags can also be viewed on the optional CRT terminal using the MP Input / Output (F11, 7) screen. Moving the car in the hoistway should cause this flag to turn ON and OFF whenever the car goes through a floor. If the flag (LED) does not turn ON and OFF, the following could be causing the problem.

1. Defective Door Zone sensor.
2. Incorrect hoistway wiring.
3. Faulty termination of hoistway wiring to the (DZ) terminal inside the controller.
4. Defect on the SC-SB2K-H or HC-PI/O board.

NOTE: If this installation has rear doors and at least one floor where both openings exist, look up the rear door zone flag (DZR). To do so, the Diagnostic On/Norm switch and the A5 switch must be up. All other switches are down. Diagnostic Indicator 6 shows the status of DZR.

First, determine whether the problem is inside or outside the controller. With a voltmeter, probe the Door Zone terminal (27). This terminal is in Area 3 of the job prints. Moving the car in the hoistway should cause the voltmeter to read 120VAC when the car is in the door zone. If when the car passes through the door zone the voltmeter does not read 120VAC the problem is external to the controller (see items 1, 2, and 3 above). If the voltmeter does read 120VAC when the car passes through the door zone the problem is internal to the controller (see item 4 above). The job prints show the DZ signal goes to the right hand side of the DZ relay to a 47K 1W resistor, to pin 8 of connector C2 on the SC-SB2K-H Relay board, and then to pin 8 of connector C2 on the HC-PI/O board.

Figures 6.19 and 6.20 show the HC-PI/O and SC-SB2K-H boards and the location of the DZ signal in the controller. Notice that if terminal 27 is powered, approximately 120VAC will be present at the bottom of the 47K 1W resistor corresponding to DZ. The top of the same resistor should read about 5VAC with respect to COM.

The SC-SB2K-H board has test pads on the front of the board which surround every relay and connector. Relays IN2 and SAFR1 each have a legend that indicates which pad corresponds to which contact or its coil on this board. To be sure that the input from terminal 27 is making its way to the relay coil, probe the test pad on the lower right hand side of the DZ relay.

It is not necessary to remove the relay or get to the back of the SC-SB2K-H board to trace signals on the board. Signals can be traced on the HC-PI/O board. If the signal gets to the HC-PI/O board but does not get to the computer, it is safe to assume that the problem is on the HC-PI/O board.

Important computer-generated logic flags:

- CCT - Car Call Time flag
- DOI - Door Open Intent flag
- DSH - Door Shortening (Intermediate) flag
- DSHT - Door Shortening (Final) flag
- HCT - Hall Call Time flag
- LOT - Lobby Time flag
- SDT - Short Door Time flag

Using the logic flags listed above, the computer makes a decision regarding the doors. The Door Open Intent flag's (DOI) status reflects the computer's decision. If the computer recognizes the necessity of either opening the doors or keeping the doors open, this flag will come ON. This flag can be found using the EOD. When viewing this flag, the corresponding Diagnostic Indicator will turn ON when the computer decides that the doors should be open.

FIGURE 6.16 Door Operation Timing Diagram

Door Operation Timing Diagram

Start with door fully open...

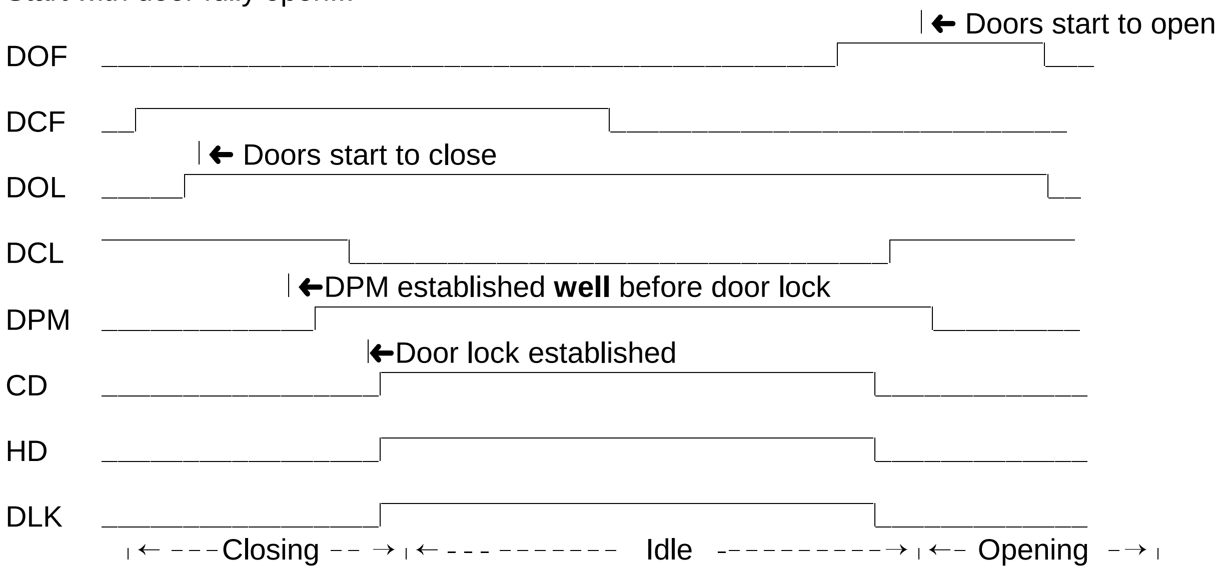
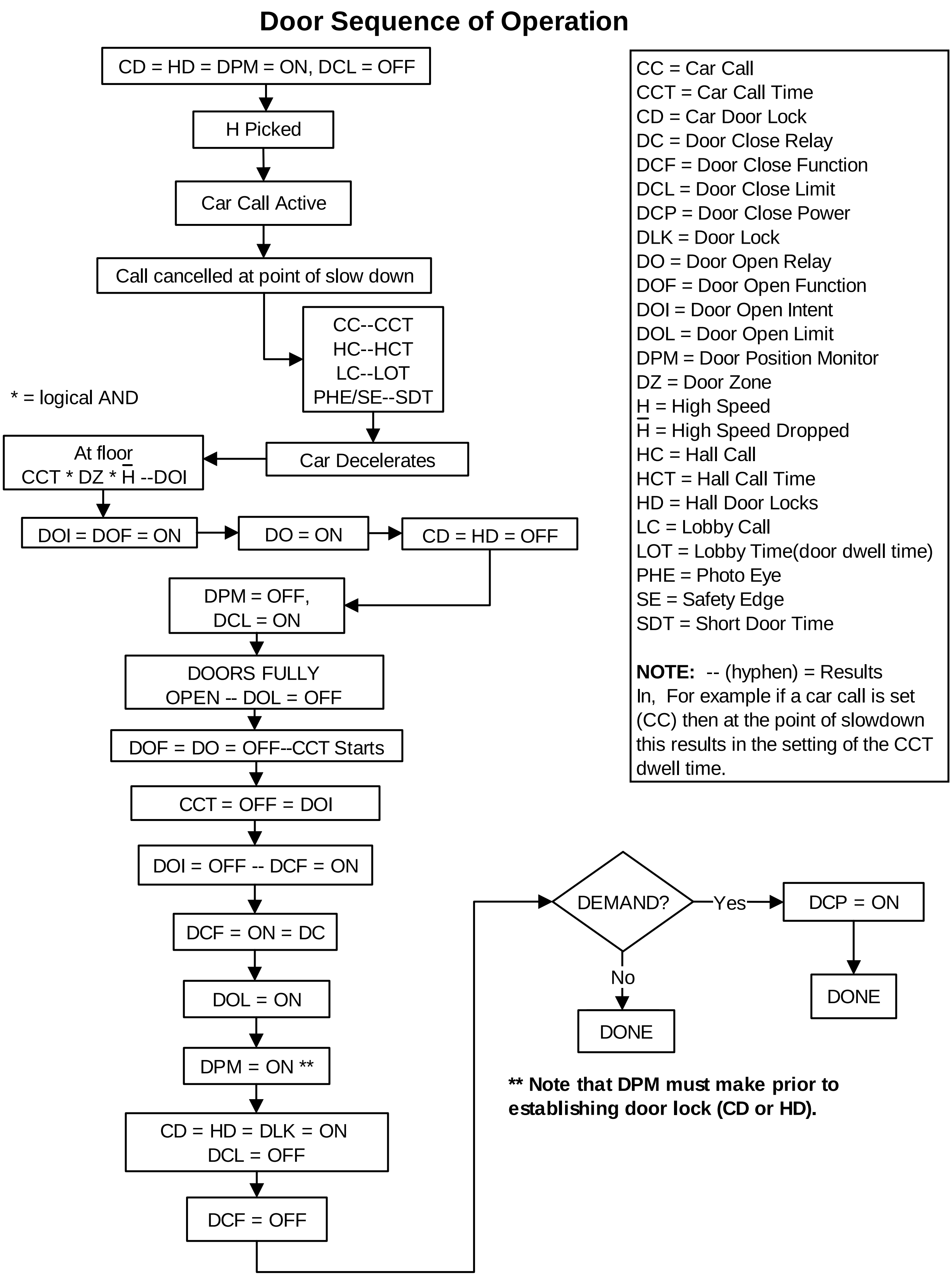


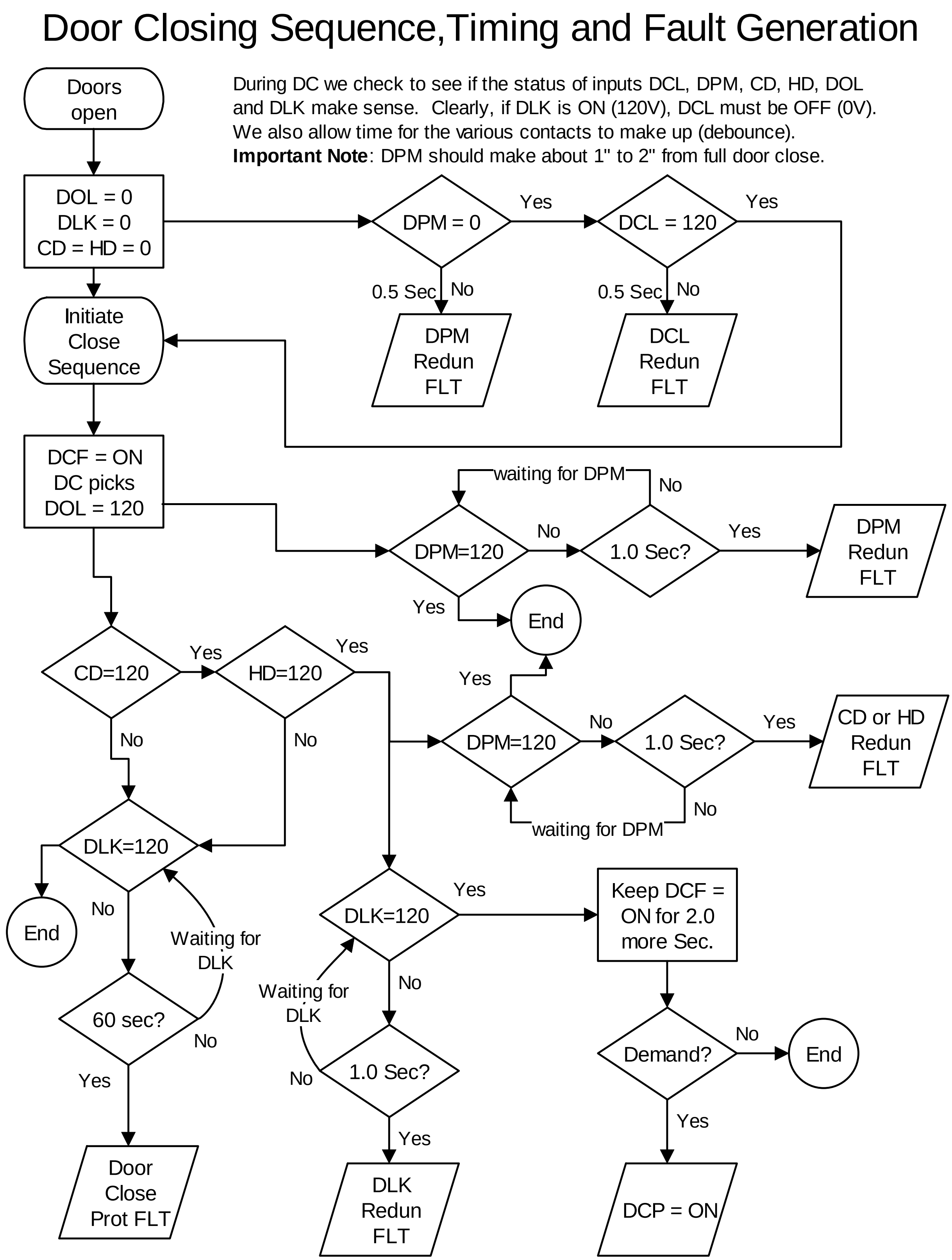
FIGURE 6.17 Door Sequence of Operation Flowchart



CC = Car Call
CCT = Car Call Time
CD = Car Door Lock
DC = Door Close Relay
DCF = Door Close Function
DCL = Door Close Limit
DCP = Door Close Power
DLK = Door Lock
DO = Door Open Relay
DOF = Door Open Function
DOI = Door Open Intent
DOL = Door Open Limit
DPM = Door Position Monitor
DZ = Door Zone
H = High Speed
$\overline{H}$ = High Speed Dropped
HC = Hall Call
HCT = Hall Call Time
HD = Hall Door Locks
LC = Lobby Call
LOT = Lobby Time(door dwell time)
PHE = Photo Eye
SE = Safety Edge
SDT = Short Door Time

NOTE: -- (hyphen) = Results
In, For example if a car call is set (CC) then at the point of slowdown this results in the setting of the CCT dwell time.

FIGURE 6.18 Door Closing Sequence, Timing and Fault Generation Flowchart



The DOI flag is a useful flag to inspect when troubleshooting door problems. Remember if DOI is ON, it will turn the DOF output ON which should pick the DO relay. The door should stay open until the DOL (Door Open Limit) turns OFF. The absence of DOL will turn the DOF output OFF. DOI will remain ON for the door dwell time (CCT, HCT, etc.). When DOI turns OFF, the DCF output turns ON and the DC relay will close the car doors. The signal that turns the DCF output OFF is DLK (Doors Locked) or possibly DCLC if the car has a retiring cam. After the doors are locked there is approximately a two-second delay before the DCF output turns OFF.

If there is a demand for the car (as is evidenced by the DMU or DMD flags being on) and if the DOI flag is *not* ON, then the DCP (Door Close Power) output will be turned ON regardless of the position of the door. The DCP output is used to provide door closing power while the car runs through the hoistway for those door operators requiring it, such as those made by the G.A.L. corporation.

If the doors get stuck because the door interlock keeper failed to lift high enough to clear the door interlock during the opening cycle, then the doors cannot complete opening, which could damage the door motor. The Door Open Protection Timer will eventually stop trying to open the doors and the car will then go on to the next call. Similarly, if the doors do not close all the way, the computer recycles the doors at a programmed interval in an attempt to clear the problem.

The computer basically looks for a reason to open the doors. If a valid reason to open the doors is *not* found, or if conditions are detected that prohibit the opening of the doors, the logic will close the doors (reset, or turn DOI OFF). To open the doors, the car must be in a door zone and not running at high or intermediate speed. Once the car has settled into a proper position to open the doors, a condition must exist that indicates that the doors should be open. Some of these conditions are listed below:

- Call demand at the current landing (or a call has just been canceled)
- Safety Edge/Door Open Button (DOB) input
- Emergency/Independent Service conditions
- Photo Eye input

When a call is canceled, one of the following door time flags should be turned ON: CCT, HCT, or LOT. When one of the reopening devices (SE or DOB) is active, the SDT flag is turned ON. When an Emergency or Independent Service condition exists, the presence of the particular condition will cause the DOI flag to be set. Some of these conditions include: Fire Service, Emergency Power operation, Independent Service, Attendant Service, etc.

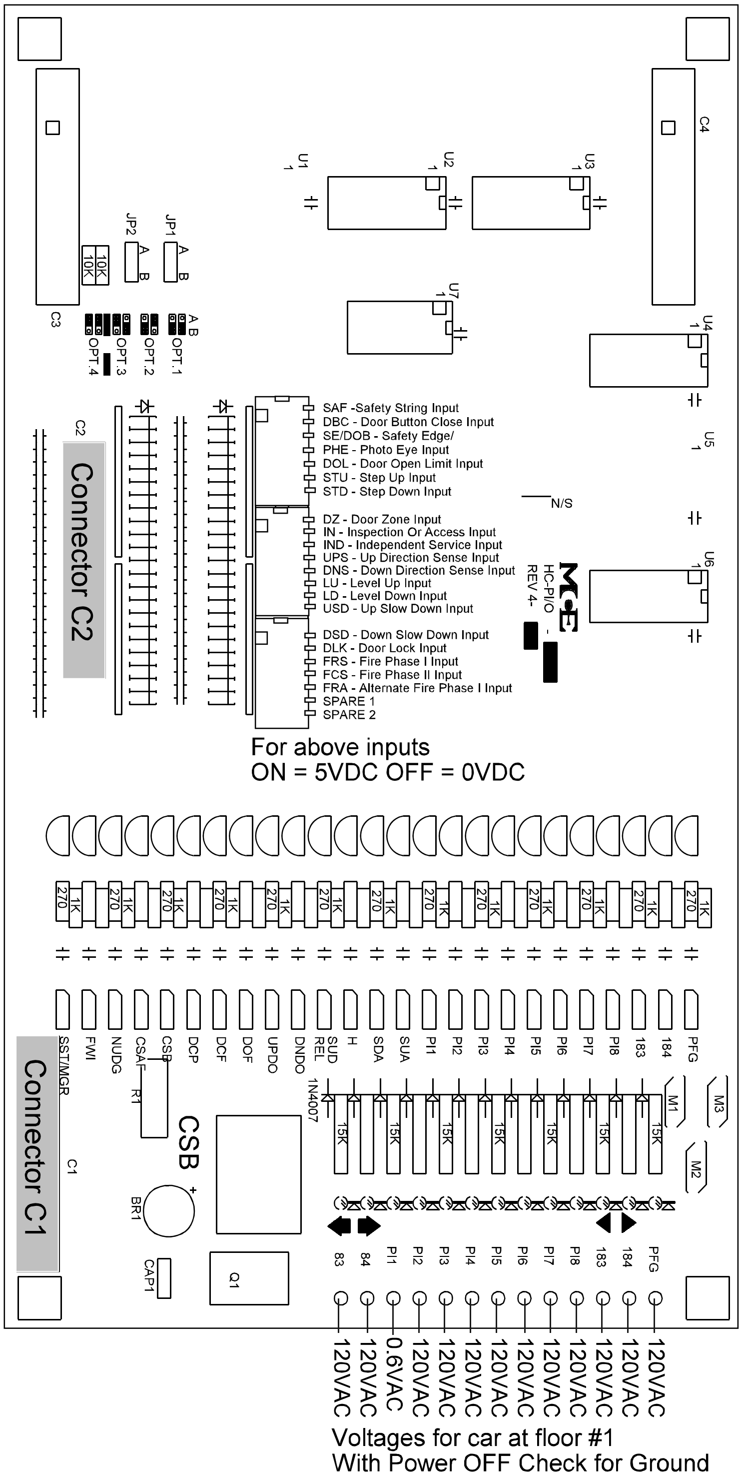
Once the state of the computer flags has been determined, inspect the high voltage hardware to see if the appropriate functions are being carried out. For example, if the doors are closed and the DOI flag is set, the doors should be opening (the DO relay picked). If the doors are open and the DOI flag is cleared (turned OFF), the doors should be closing (the DC relay picked).

It is vital to determine whether or not *the control system* is doing what *its* logic determines it should be doing. If the control system is doing what the logic intended it to do, then it is important to determine how the logic came to its conclusions. If the control system is *not* doing what the logic intended it to do, then it is important to determine what is preventing the desired function from being carried out. The diagnostics on the Computer Swing Panel and/or the CRT can help determine which situation is present. The output flags will show which outputs the computer is attempting to turn ON/OFF. Compare the flags with what is actually happening in the high voltage hardware.

FIGURE 6.19 HC-PI/O Power Input/Output Board Quick Reference

42-QR-HC-PCI/O Rev. 1

HC-PI/O QUICK REFERENCE CARD (Board 3)



Connector C2

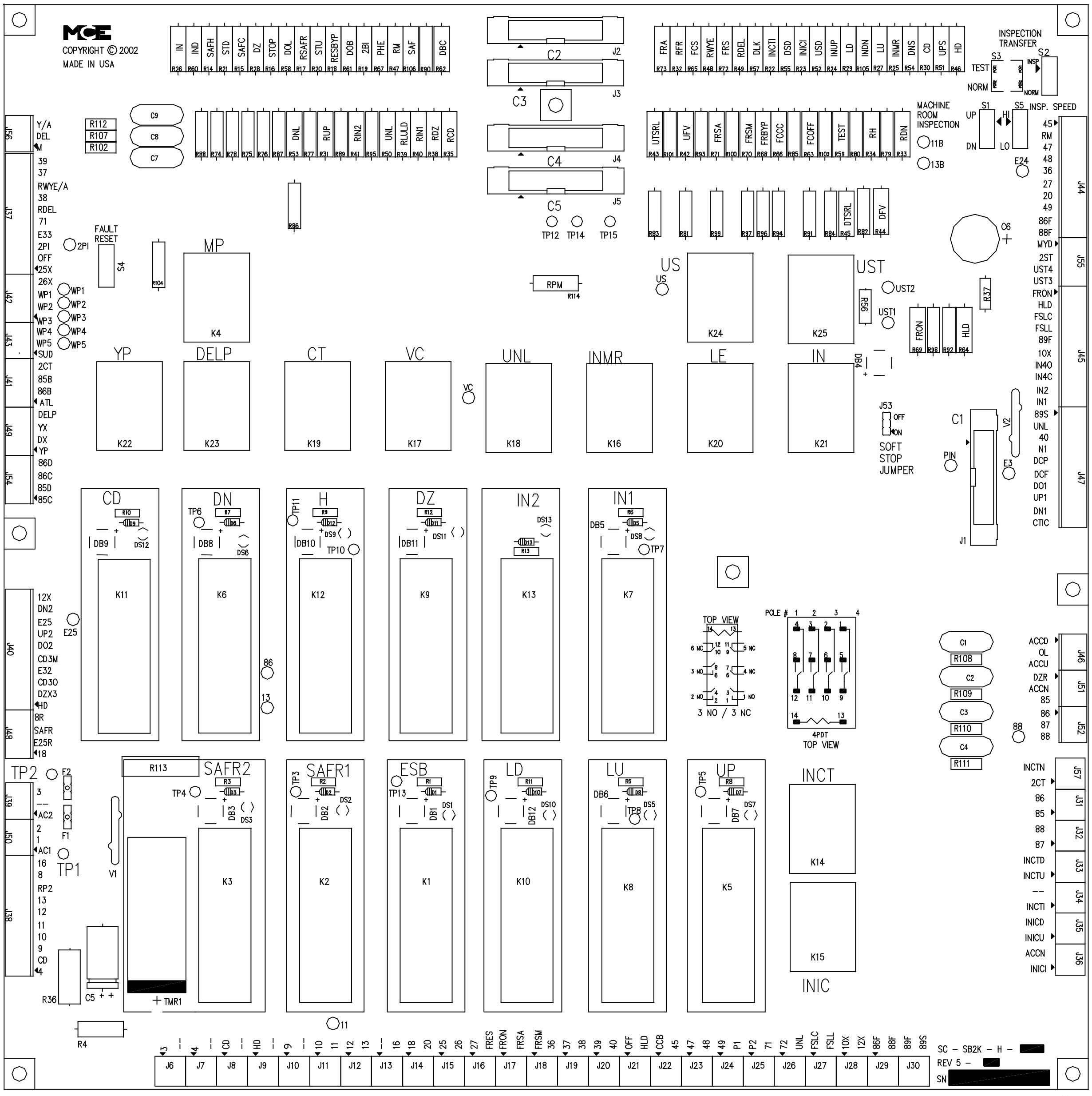
INPUT	PIN
SAF	1
DBC	2
SE/DOB	3
PHE	4
DOL	5
STU	6
STD	7
DZ	8
IN	9
IND	10
UPS	11
DNS	12
LU	13
LD	14
USD	15
DSD	16
DLK	17
FRS	18
FCS	19
FRA	20
SPARE 1	21
SPARE 2	22

Connector C1

OUTPUT	PIN
SST/MGR	1
FWI	2,4
SPARE 2 input	3
SPARE 1 input	5
NUDG	6
Lamp Common	7
CSAF	8
SUB/REL	9,11
DCP	10
DCF	12
Stop SW Out	13,15
DOF	14
UPDO	16
DNDO	18
Stop SW Source	17,19
H	20

FIGURE 6.20 SC-SB2K-H Main Safety Relay Board Quick Reference

42-QR-SC-SB2K-H **SC-SB2K-H QUICK REFERENCE**



INDICATORS	**Redundancy checking TEST POINTS** (See Section 4 of this manual on A17.1 - 2000 code functions and testing)	
Earthquake:		
SWITCHES	ESB: TP1 (fused 1-bus) and TP13	IN1, IN2: TP7 and TP2 (fused 2-bus, 120VAC)
Earthquake Reset Pushbutton:	SAFR1: TP1 (fused 1-bus) and TP3	LU: Terminal 26 and TP2 (fused 2-bus, 120VAC)
Fault Reset Pushbutton:	SAFR2: TP1 (fused 1-bus) and TP4	LD: Terminal 25 and TP2 (fused 2-bus, 120VAC)
Machine Room Inspection Transfer INSP/NORM:	UP: TP1 (fused 1-bus) and TP5	CD: TP2 (fused 2 bus) with screw terminal CD
Machine Room Inspection Up/Dn:	DN: TP1 (fused 1-bus) and TP6	H: TP1 (fused 1-bus) and TP11 and TP10 and TP2 (fused 2-bus, 120VAC)

6.4.2 CALL LOGIC - NORMAL OPERATION

Calls are input to the system by grounding the appropriate call input, as labeled on the Call Input/Output board (Figure 6.21, HC-CI/O Call Input/Output Board Quick Reference). The act of physically grounding the call input terminal turns on the corresponding LED on the Call board. Recognition and acceptance of the call by the computer will cause the indicator to remain lit on the board. Cancellation of the call turns the indicator off. The single input/output terminal on the Call board accepts call inputs from the call fixture pushbuttons, and also serves as the output terminal illuminating the call fixtures to indicate registration of a call. This means that the field wiring is identical to that used for a standard relay controller.

The computer may intentionally block call registration. When the computer prevents car call registration, it turns ON the Car Call Disconnect flag (CCD) for that car. Inspection of this flag in the diagnostics (ADDR 2C, Diagnostic Indicator #3) will tell if the computer is preventing the acceptance of calls. If the CCD flag is ON, the reason for this condition must be discovered. CCD condition is caused by: Fire Service, motor limit timer elapsed, bottom or top floor demand, etc.

A corresponding flag exists for hall call registration prevention. The computer may detect conditions that prevent hall calls from registering, and set the Hall Call Disconnect Flag (HCDX). This is a system flag (as opposed to a per car flag) but is available for viewing in the diagnostic display along with each car's operating flags. There are many reasons for the computer to reject hall call registration: Fire service, a hall call bus problem, no available cars in service to respond to hall calls, etc.

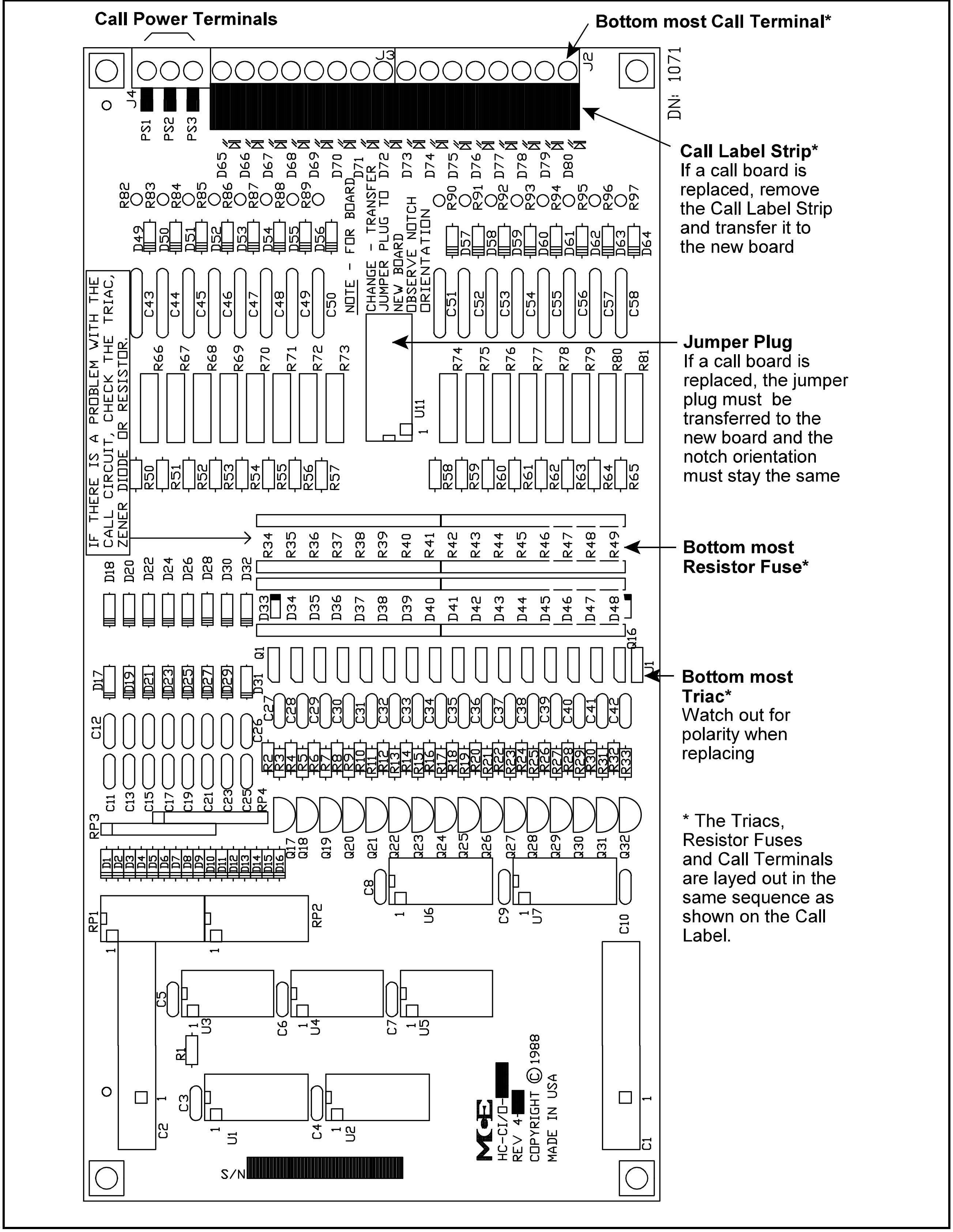
If a call circuit becomes damaged or simply stuck on as the result of a stuck push-button, the elevator will release itself from the stuck call automatically. If the pushbutton remains stuck, the car will stop at the floor each time it passes. Again, the computer will release itself automatically, thereby allowing continued service in the building.

FIGURE 6.21 HC-CI/O Call Input/Output Board Quick Reference

42-QR-HC-CI/O Rev. 2

HC-CI/O QUICK REFERENCE CARD

Board 2



6.4.3 TROUBLESHOOTING THE CALL CIRCUITS

If there is a problem with a call, first disconnect the field wire or wires from that call terminal to determine if the problem is on the board or in the hoistway wiring or fixtures. Disconnect the calls by unplugging the terminals, or removing individual wires. If the individual field wire is disconnected, lightly tighten the screw terminal since it may not make contact if an attempt is made to ground the terminal using a jumper when the screw on the terminal is loose.

> **NOTE:** Call terminal voltage must be ≥ 85% of call supply voltage.
> *Example:* If supply is 100VAC, terminal voltage may be 85VAC to 100VAC. 80VAC is insufficient.

TABLE 6.5 Call Board Troubleshooting

Problem	Recommended steps to resolve the problem
Call Terminal Voltage is insufficient	1. Turn OFF the power and remove the resistor fuse associated with that terminal. 2. Turn ON the power and check terminal voltage again. 3. If no voltage is present on the terminal: a. Check the jumper plug (header) on the HC-CI/O Call board. The jumper plug socket is located on the right hand side near the call indicators. If a Call board is replaced, this jumper plug must be transferred to the new board and stay in the same board position (more than one Call board on the controller). b. Verify that the correct incoming power is on terminals marked PS1, PS2 and PS3. NOTE: Power will exist on *at least one* and possibly more of these terminals.
Call LED is ON even though the field wire is removed	1. Reset the computer (Computer Reset pushbutton on Swing Panel). 2. Run the car to the nearest landing to reset PI. 3. It may be necessary to reset the computer in the Group Supervisor in order to reset a latched hall call. 4. If the call does not cancel under these conditions--replace the call board
Cannot register a hall call at the call board	To discover whether the problem is with the call board or the field wiring: 1. First remove the resistor fuse and disconnect the field wire(s). 2. Verify that the HCDD, Hall Call Disconnect Computer Variable Flag is OFF (Address 2C, LED 6). 3. Verify that there is proper voltage on the call terminal. 4. Register a call by shorting the call terminal to terminal 1 or GND and verify with EOD as described in Section 5.4.3, *Viewing and Entering Calls* (the call registered light on the call board may not work correctly). 5. If the call does not register under these conditions--replace the call board. 6. If the call circuit works with field wires removed, before connecting wires, jumper the wire(s) to ground or terminal 1 and press the call pushbutton. If a fuse blows, there is a field wiring problem. If connecting the call wires causes a problem, the call board may be damaged.
Call remains latched even though the car arrives at that landing	Remove the associated resistor fuse. If call cancels, replace the bad resistor fuse.

6.4.4 TROUBLESHOOTING THE CALL INDICATORS

When working correctly, a call indicator glows brightly when a call is registered and glows dimly or not at all when a call is not registered.

NOTE: Before troubleshooting the call indicators, ensure that the call circuit is working correctly, the field wires are connected and the resistor fuses are plugged in. If the board is arranged for neon (or LED) indicators (HC-CI/O-N), the board indicators are not affected by the fixture bulbs.

TABLE 6.6 Call Indicator Troubleshooting

Problem	**Recommended steps to resolve the problem**
With a call registered, the Call Indicator is dimly lit (Call Board is HC-CI/O)	Incandescent bulb in the fixture for the call is burned out or missing. Replace the bulb.
Indicator glows bright whether or not there is a call registered	Bad triac or triac driver transistor. Check triac with power OFF and field wire removed. Failed triac usually measures a short circuit from the metal back (collector) to terminal 1. If board is not in system, measure short between metal back and pad area around mounting hole. Be careful, the metal back of the triac is connected to AC when power is ON. NOTE: bottom triac corresponds to bottom terminal.

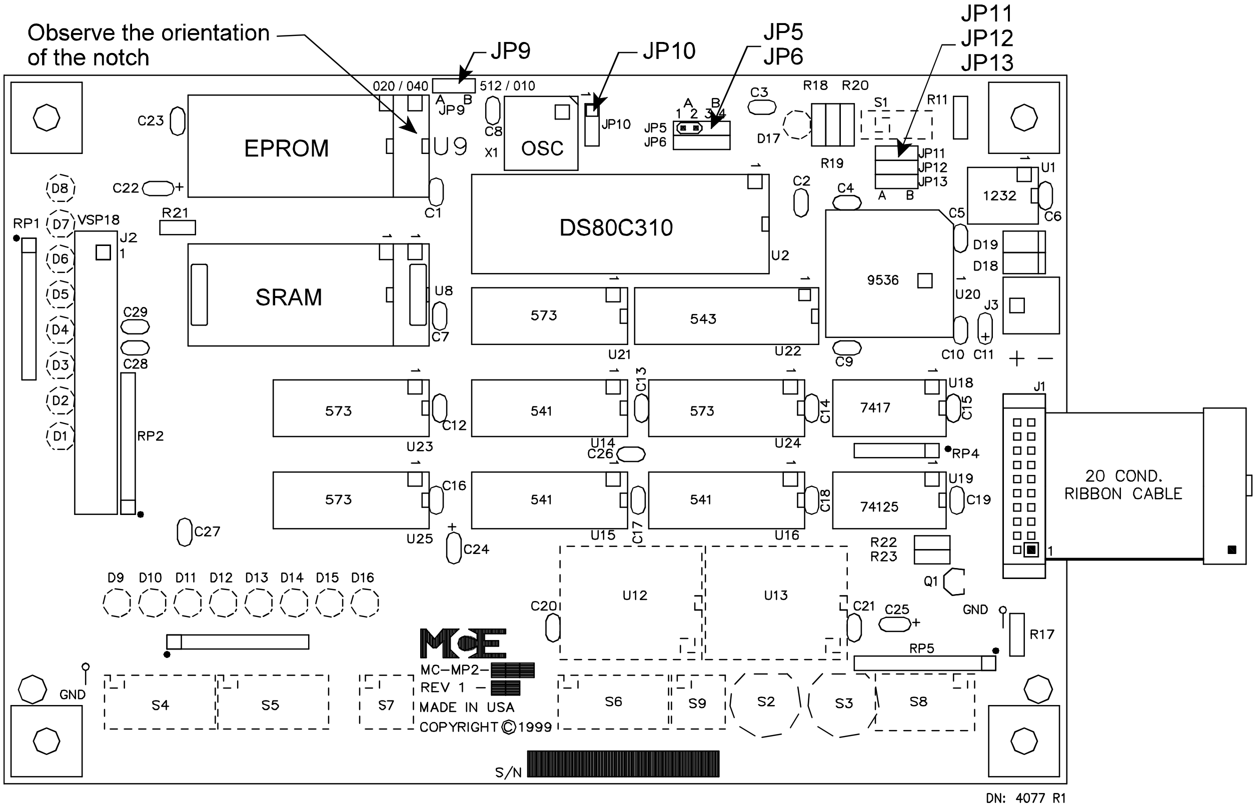
6.5 PC BOARD QUICK REFERENCES

This section contains a quick reference for the PC boards found in the typical HMC-1000-HS controller. They are as follows:

FIGURE 6.22 MC-MP2-2K Main Processor Board Quick Reference

42-02-MC-MP2-2K

MC-MP2-2K QUICK REFERENCE

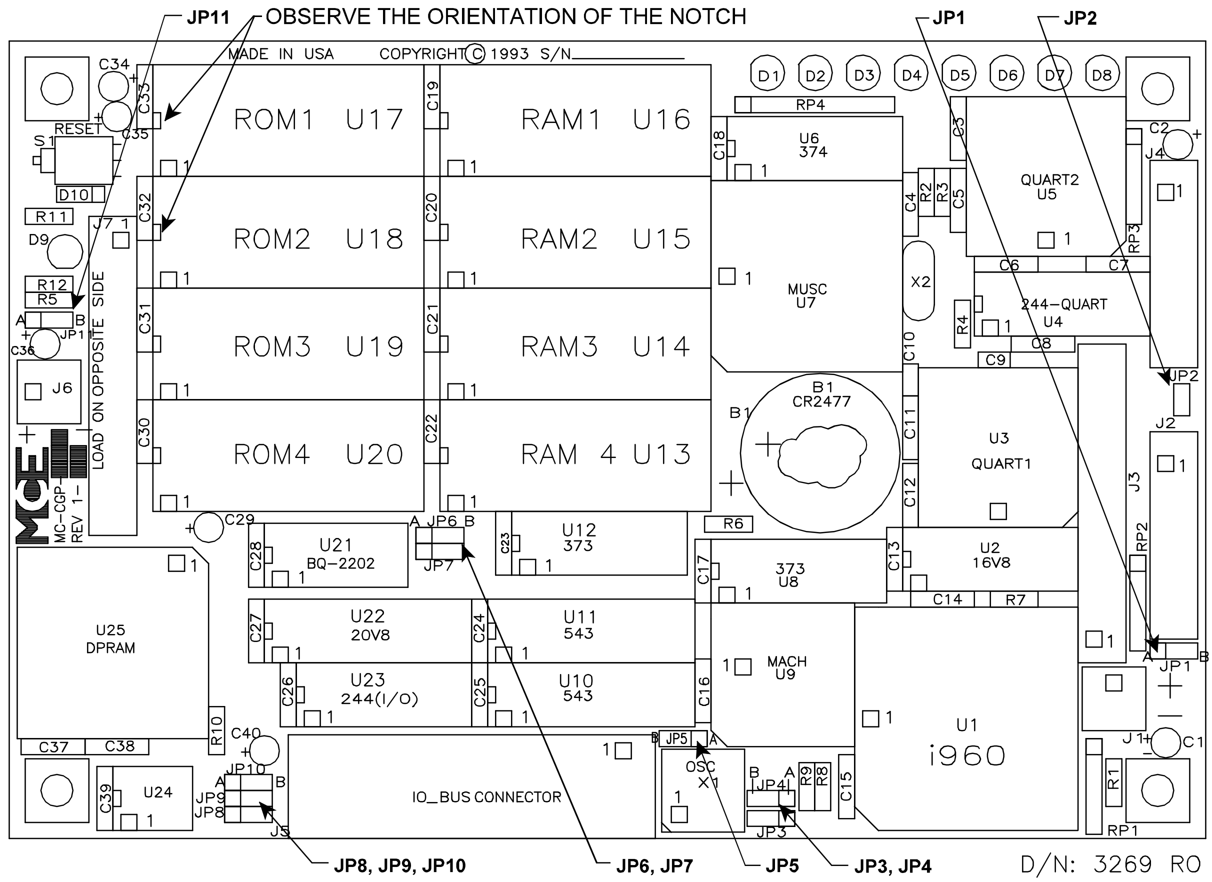


JUMPER	TYPICAL SETTING	DESCRIPTION
JP5	see Description	N/C = Car Controller A pins 1 & 2 = M3 Group Supervisor
JP6	N/C	Jumper not loaded
JP9	A	A = 27C020, 27C2001, 27C040 or 27C4001 EPROM B = 27C512, 27C010 or C27C1001EPROM
JP10	N/C	Jumper not loaded
JP11	A	A = SRAM A16 Bank select enabled, B = Bank select disabled
JP12	A	A = ROM A17 Bank select enabled, B = Bank select disabled
JP13	A	A = ROM A16 Bank select enabled, B = Bank select disabled

FIGURE 6.23 MC-CGP-4 Communication Processor Board Quick Reference

42-QR-MC-CGP Rev 3

MC-CGP-x QUICK REFERENCE CARD



JUMPER TABLE

JUMPER	CGP	CGP-4 CGP-8	DESCRIPTION
JP1	A	A	Communication Clock Rate: set to A if JP4 = B, set to B if JP3 = A or B or if JP4 = A.
JP2	ON	ON	Master Clock Rate: ON = Enabled, N/C = Disabled. Set to ON if JP4 = B. Set to N/C if JP3 = A or B or if JP4 = A.
JP3	N/C	N/C	Communication Clock: A = 16 Mhz, B = 4 Mhz (if JP3 = A or B, JP4 must = N/C).
JP4	B	B	Communication Clock: A = 8 Mhz, B = 2 Mhz (if JP4 = A or B, JP3 must = N/C).
JP5	B	B	This jumper relates to the I/O Bus Connector (J5), which is currently not used. I/O Connector J5 Pin 38 function: A = i960 Interrupt INT3# input, B = IO_CS1# output.
JP6	B	B	EPROM Size (27Cxxx): set to A for xxx = 512, set to B for xxx = 010, 020, 040 or 080.
JP7	A	A	Off Board Reset Signal: A = Enabled, B = Disabled.
JP8	A or hard wired	A or hard wired	EPROM Size (27Cxxx): set to A for xxx = 010, 020, 040 or 080, set to B for xxx = 512.
JP9	B	B	EPROM or Flash Memory: A = Flash, B = EPROM.
JP10	B	B	EPROM or Flash Memory: A = Flash, B = EPROM.
JP11	B or hard wired	B or hard wired	SRAM Size (68xxx): set to A for 1Mb SRAM, set to B for 4Mb SRAM.

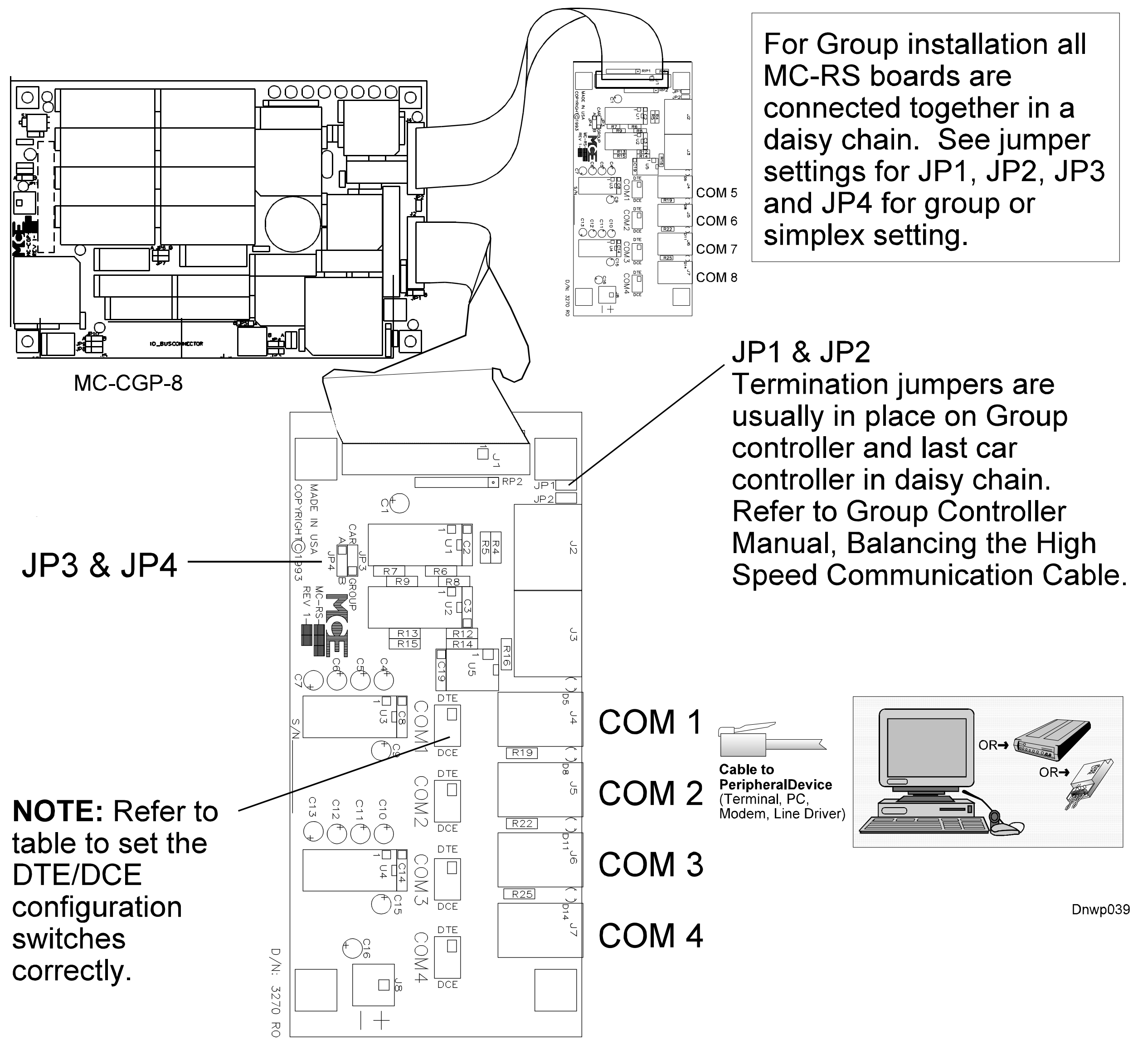
FIGURE 6.24 MC-RS Communication Interface Board Quick Reference

42-QR-MC-RS Rev.3

MC-RS QUICK REFERENCE CARD

MC-RS COM Port Toggle Switches

Port Switch Setting	Cable Connects to
DCE	CRT Terminal or PC
DTE	Line Driver or Modem



Jumper	Setting	Description
JP3	Car	Setting for car controllers (Simplex or Local).
	Group	Setting for Group controller. **Only the Group MC-RS board should be set to Group.**
JP4	B	Set to B on all car controller MC-RS boards.
	B	Set to B on all car controller MC-RS boards.

FIGURE 6.25 SC-BAH Lock Bypass, Access Board Quick Reference

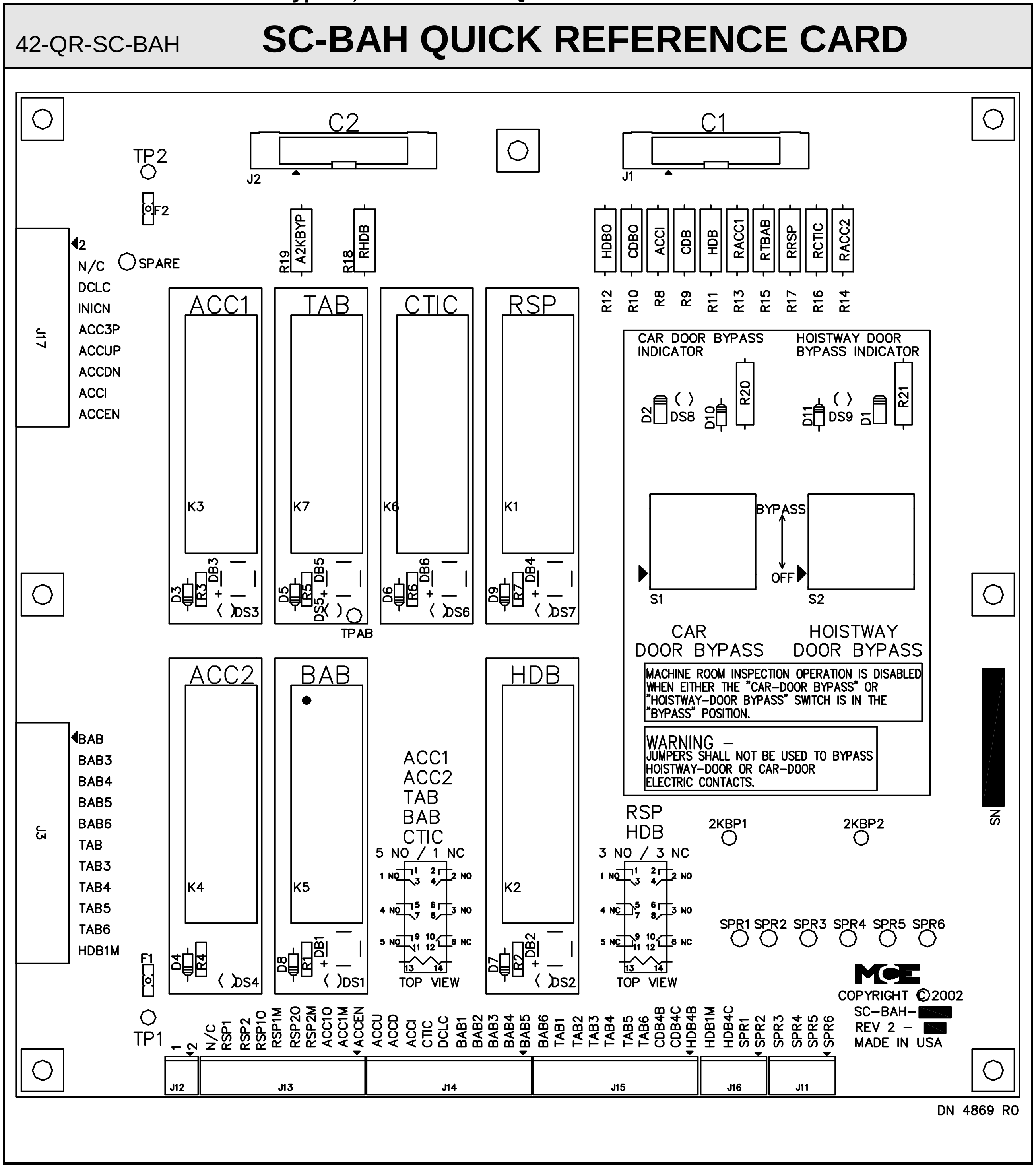


FIGURE 6.26 SC-BAHR Lock Bypass, Access Board with Rear Doors Quick Reference

42-QR-SC-BAHR **SC-BAHR QUICK REFERENCE CARD**

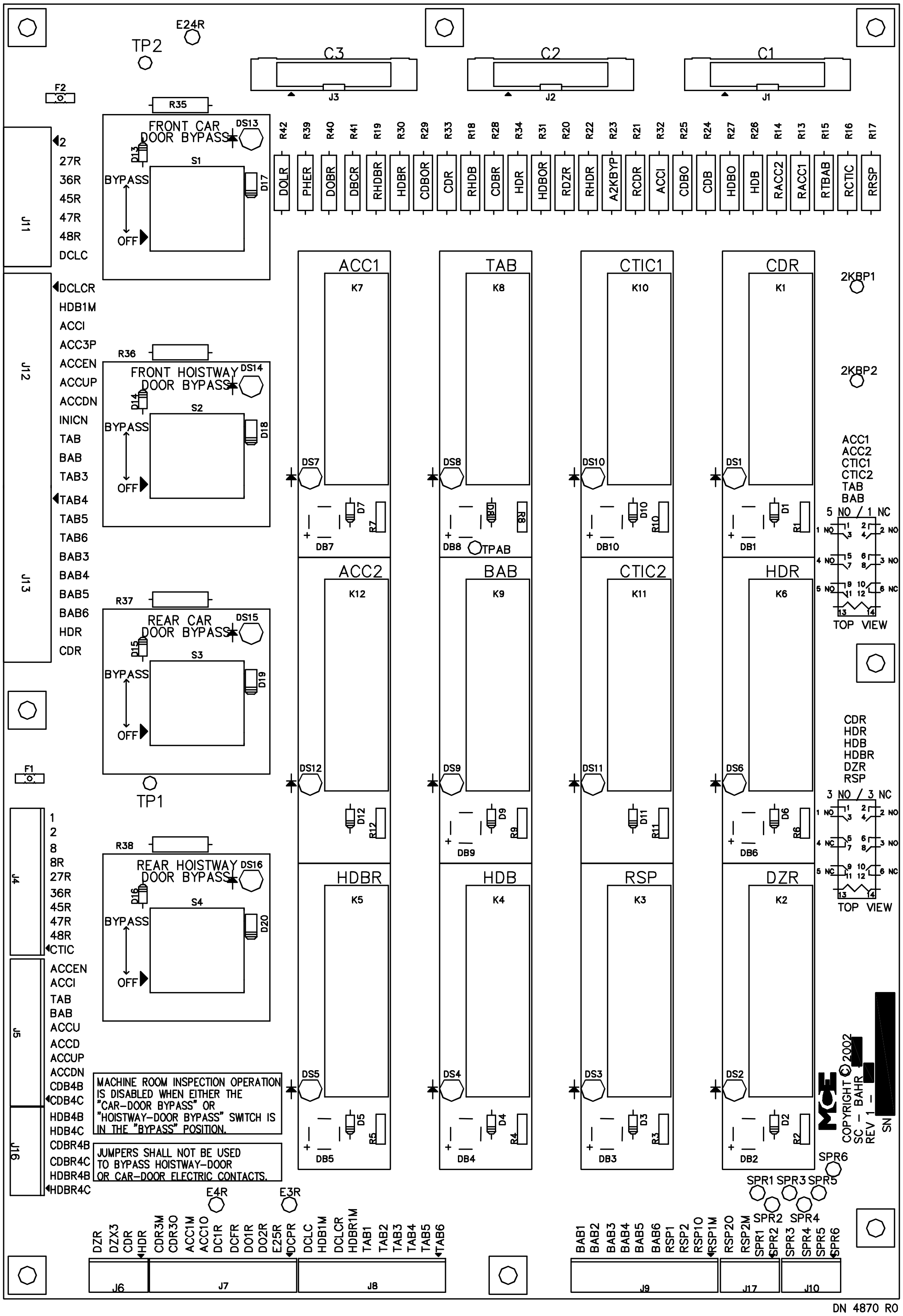
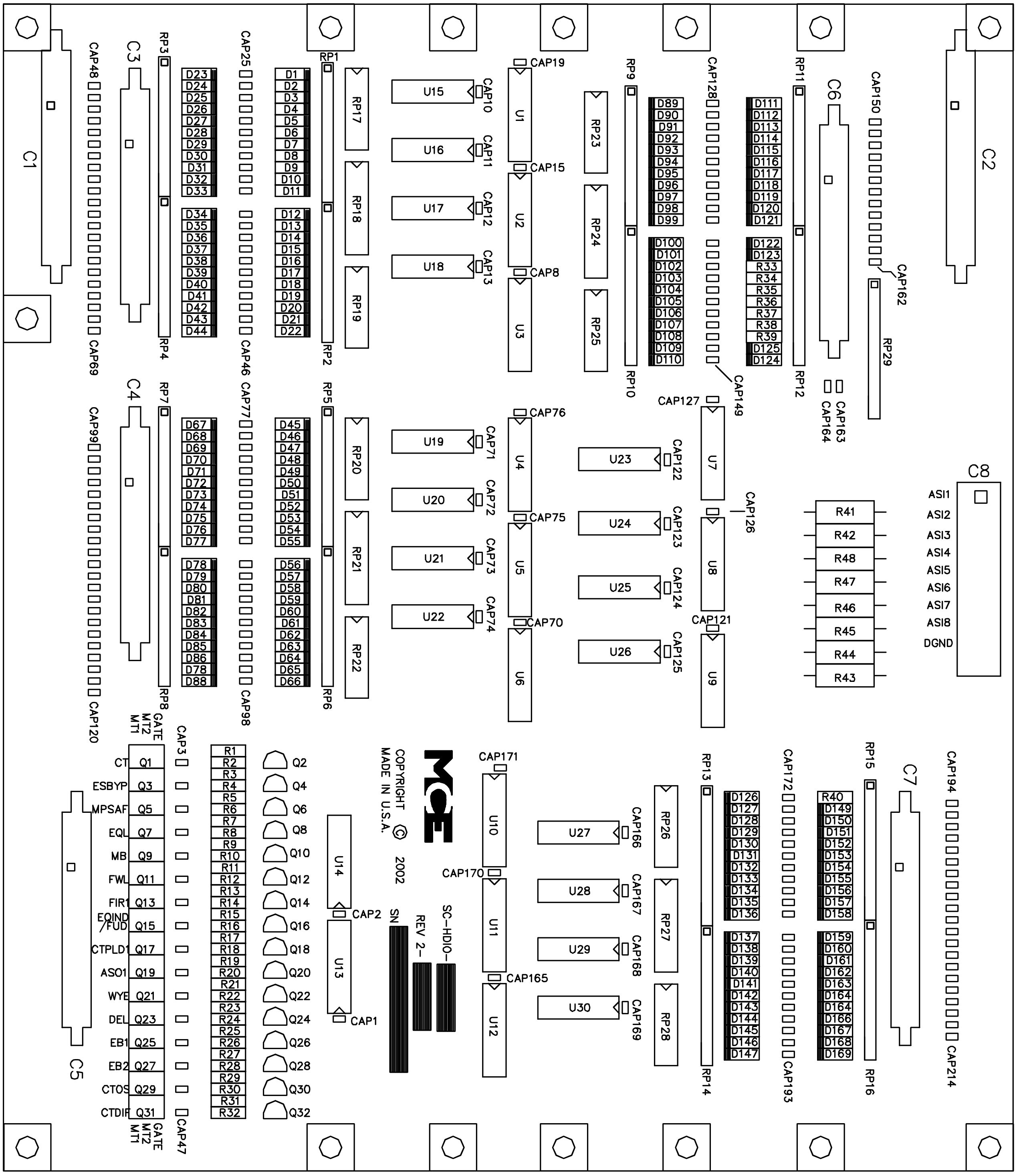


FIGURE 6.27 SC-HDIO High Density I/O Board Quick Reference

42-QR-SC-HDI/O

SC-HDI/O QUICK REFERENCE

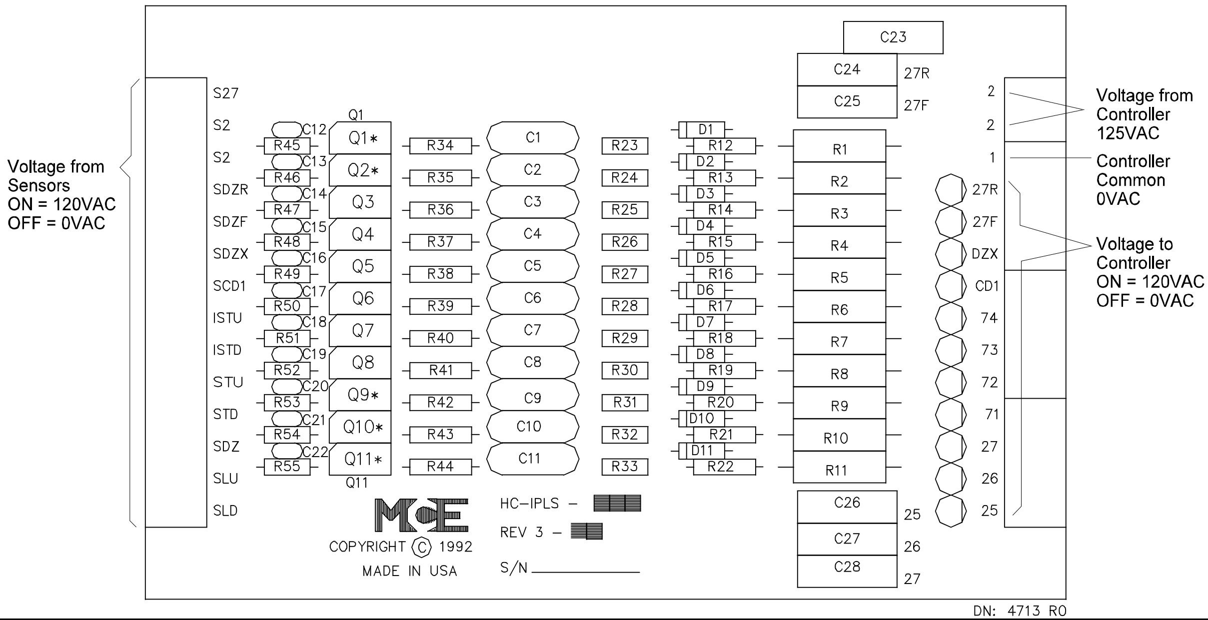


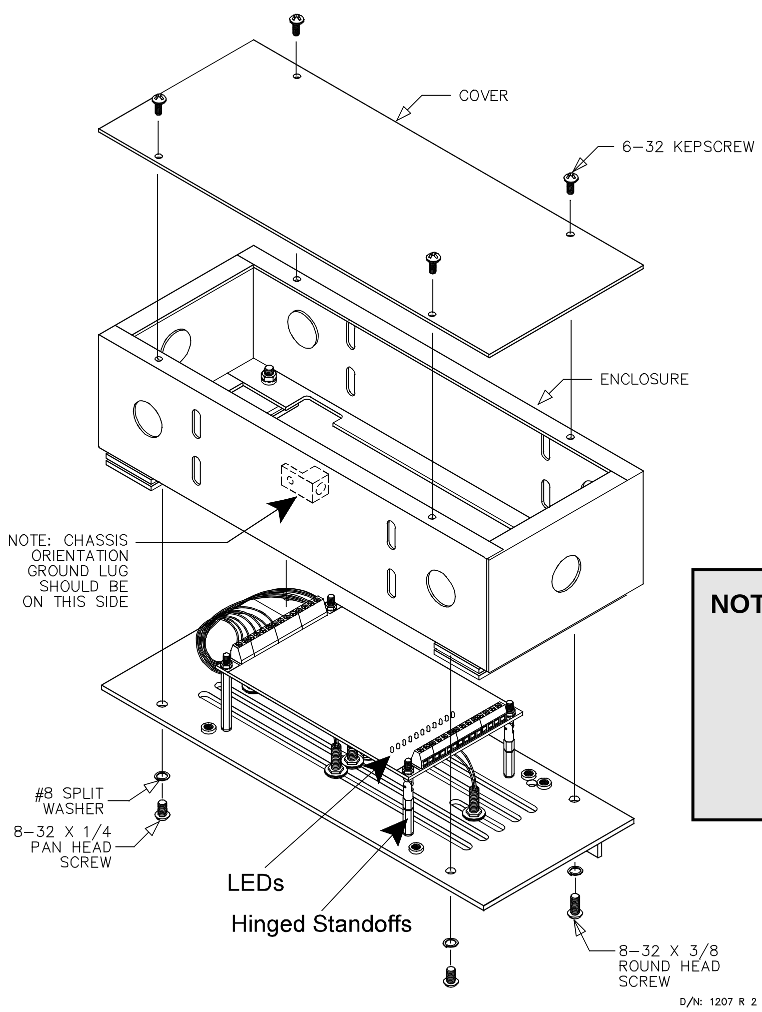
DN4868 R0

FIGURE 6.28 HC-IPLS IP Landing System Board Quick Reference

42-QR-HC-IPLS-TR

HC-IPLS-TR QUICK REFERENCE





NOTE: If a sensor or the HC-IPLS board is replaced, make sure the **orientation of the HC-IPLS** board is correct. Use the GROUND LUG and the LEDs shown in the Assembly drawing for an orientation reference.

FIGURE 6.29 Standard Board Layout

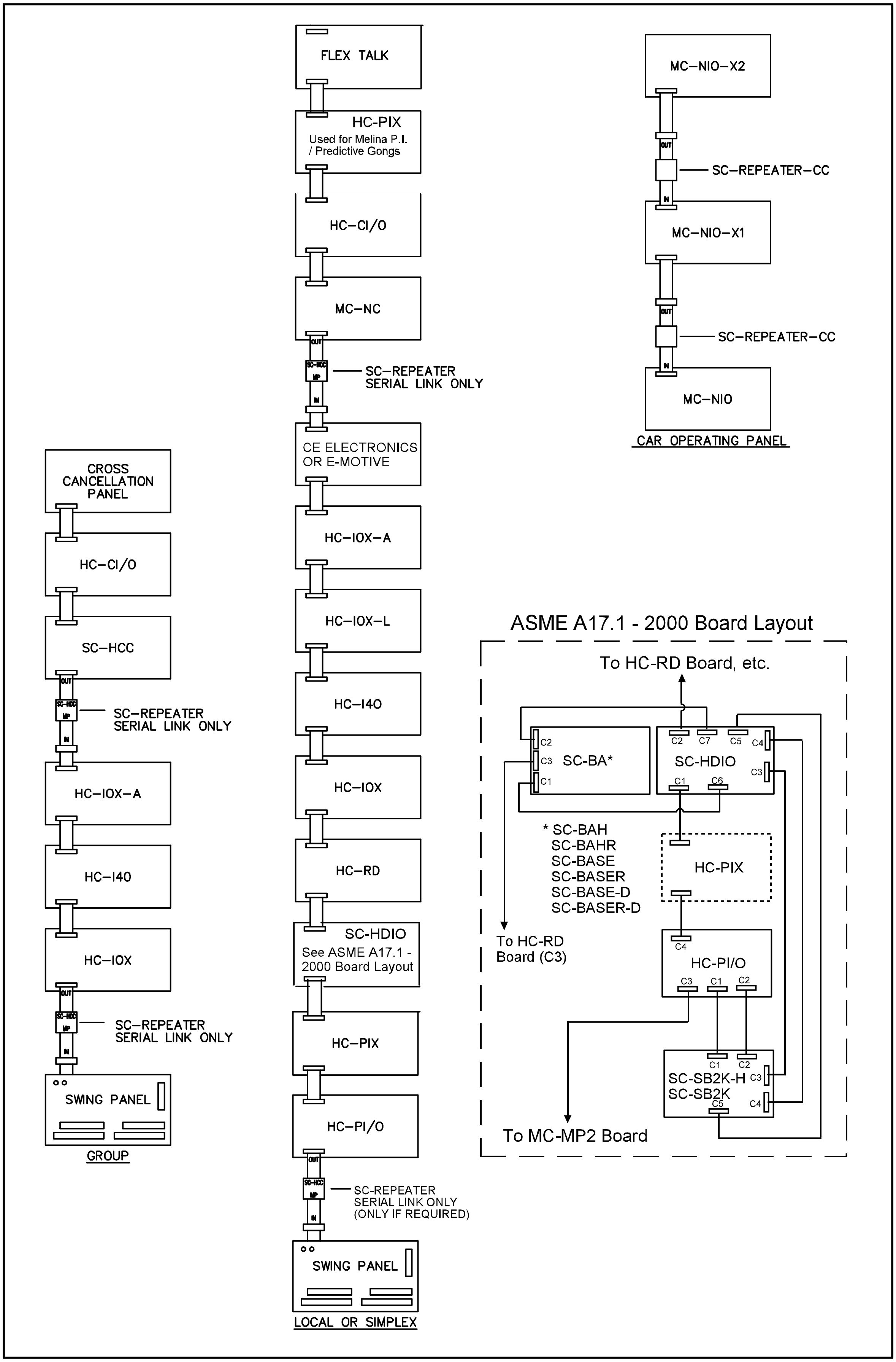
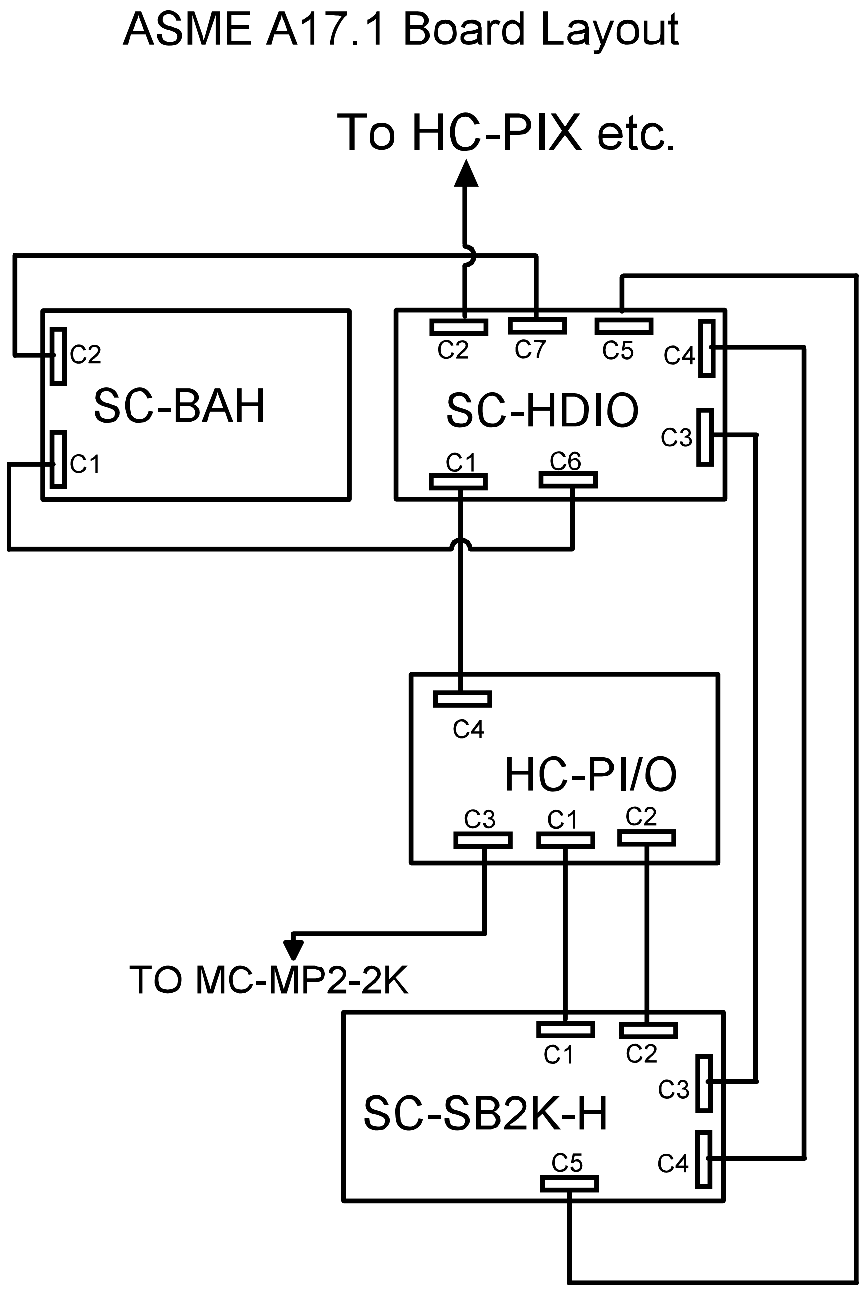


FIGURE 6.30 ASME A17.1 Board Layout



WARNING:	Please verify the connector labels before connecting the ribbon cables to the PCBs. The physical location of the connectors on the board may be different than shown here.

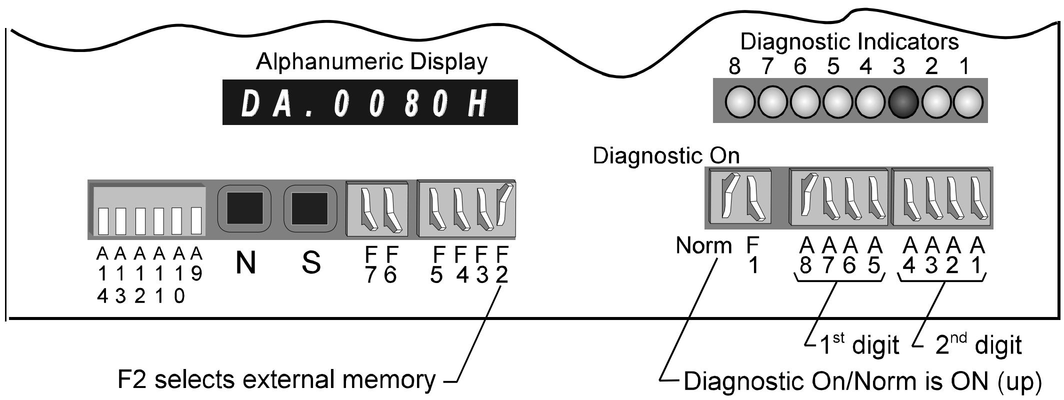
6.6 USING THE MLT / VLT DATA TRAP

The MLT / VLT "data trap" records many of the controller's operation “flags” at the moment the MLT or VLT occurs. This allows you to see what flags led up to the fault. Note: Direction must be on (inputs UPS or DNS) for three minutes before MLT / VLT will occur.

Once an MLT or VLT shuts down the car, use these steps to look at the stored flags.

1. Do not reset the computer, as this will clear the data trap on controllers with older software versions.* To return the car to service and not harm the data, simply toggle the relay panel inspection switch from OFF to ON and back to OFF.

2. On the Computer Swing Panel, place the Diagnostic On/Norm switch and the F2 switch up (ON) as shown.



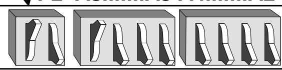
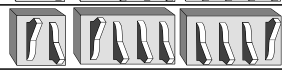
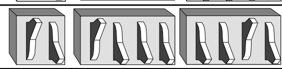
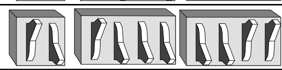
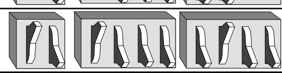
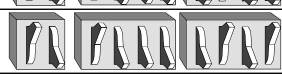
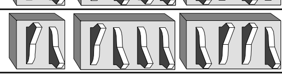
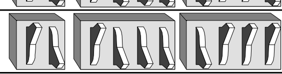
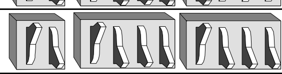
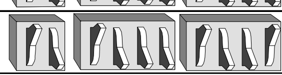
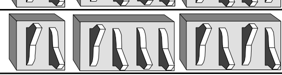
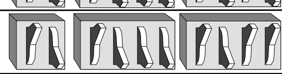
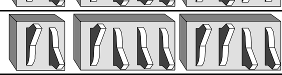
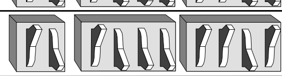
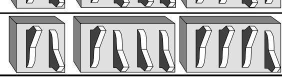
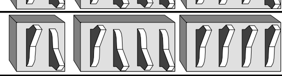
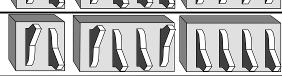
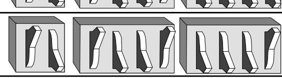
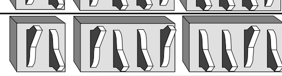
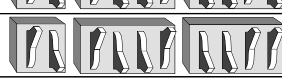
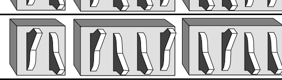
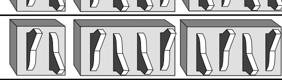
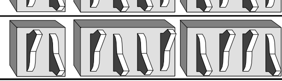
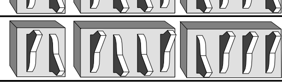
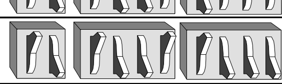
3. Use the DATA TRAP MEMORY CHART to look at the saved data. Set the address switches A1 thru A8 as shown in the Data Trap Memory Chart which is appropriate for your controller type. Switches A5 thru A8 select the first digit and switches A1 thru A4 select the second digit of the Hex address. The picture above shows the switches set for the first address in the local controller chart.

4. Record the data displayed on the Diagnostic Indicators for all rows (addresses) shown on the chart. It helps if you have a few photocopies of the chart. Simply mark the positions in the chart for the Diagnostic Indicators that are ON. The first 20 addresses contain car status flags. The last four addresses contain the car's position indicator value at the instant the MLT condition occurred, MLT counter, PG flags and MLT Code number. Only the labeled positions are important to mark.

5. Use the recorded values to help determine the root of the problem. Call MCE for assistance if any is needed.

   * Note: If the data trap has been cleared and/or no MLT / VLT has occurred, all of the flags in the data trap memory addresses will be set (LEDs will be ON). Each time a new MLT / VLT occurs, the new data overwrites the old data.

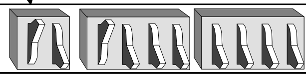
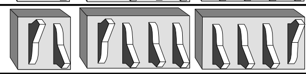
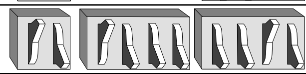
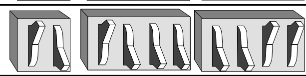
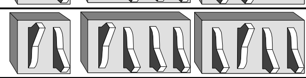
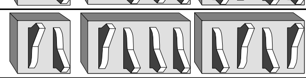
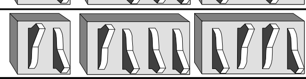
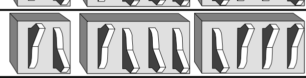
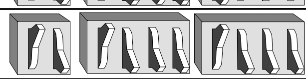
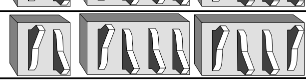
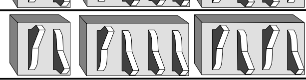
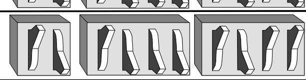
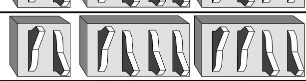
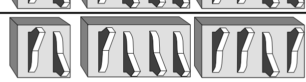
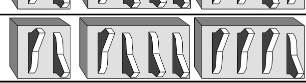
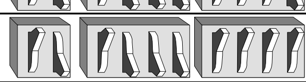
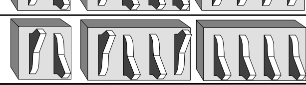
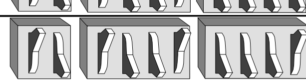
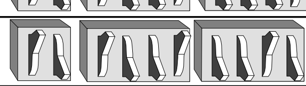
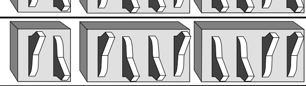
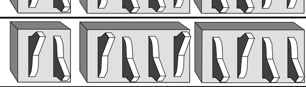
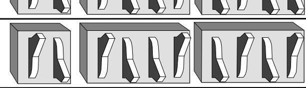
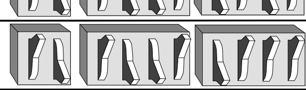
Use this chart for Hydro Local or Simplex with MC-MP2 (software Rev. 8.00 or greater)

HMC HYDRO MLT / VLT DATA TRAP MEMORY CHART									
Computer Memory Address (Hex)	Toggle Switches Diagnostic On F1 A8.......A5 A4.......A1	Diagnostic Indicators LED *On* = variable flag is On or Active 8	7	6	5	4	3	2	1
80		DOLM	PHE	DZ	DOL	DBC	SE	GEU	GED
81			DC	UC	CC			DHO	DOI
82		DCF	DCP	DOF	LOT		HCT	CCT	SDT
83				HSEL	CSB	DCC	NUDG		DSHT
84		INT/DCLC	FRA	FCS	FRS	DNS	UPS	STD	STU
85				HLW	HLI			FWI	
86		LFP	UFP						
87				EQI	IND	IN		DELSIM	YSIM
88		LLW	DLK		DZORDZ			PK	LLI
89		DNDO	LD		DDP	UPDO	LU		UDP
8A		DMD	DCB	UCB	CCB	DMU	DCA	UCA	CCA
8B		TOS	MLT	PSTX	MGR	H	REL	DSH	RUN
8C			STC	SAF	HCR	HCDX	CCD	ISV	ISRT
8D						FRM			FRC
8E		SD	SDA	DSD	BFD	SU	SUA	USD	TFD
8F		HLD	EPI	EPR	SLV	ISR	YRQ	PTR	PTS
90								HML	ALT
91		ATSF	NSI	DNI	UPI	ATS	CTLF	CTL	PFG
92		CAC	CAB	CWI	EQA	EDS	ESTE	EQN	PUSD
93			CWIL						
94		PI	PI	PI	PI	PI	PI	PI	PI
95		Counter	Counter	Counter	Counter	Counter	Counter	Counter	Counter
96		LEARN	IN	CORR	SHRTRUN	DANGER	PH2	PH1	PHS0
97		CODE #	CODE #	CODE #	CODE #	CODE #	CODE #	CODE #	CODE #
98		VCI	VCA	SST	VLT	EXMLT	MLTP	MLTDO	On=Hydro Off=Trctn

Hydro Local / Simplex with MC-MP2 Rev. 8.00 or greater software DNmd 036

Use this chart for Hydro Local with MC-MP-1ES (software less than Rev. 8.00)

HMC HYDRO (LOCAL) MLT /VLT DATA TRAP MEMORY CHART

Computer Memory Address (Hex)	Toggle Switches Diagnostic On F1 A8.......A5 A4.......A1	Diagnostic Indicators LED *On* = variable flag is On or Active 8	7	6	5	4	3	2	1
80		DOLM	PHE	DZ	DOL	DBC	SE	GEU	GED
81			DC	UC	CC			DHO	DOI
82		DCF	DCP	DOF	DSHT		HCT	CCT	SDT
83					CSB	DCC	NUDG		LOT
84		VCI	FRA	FCS	FRS	DNS	UPS	STD	STU
85			SP2	SP1	HLW	HLI		FWI	
86		LFP	UFP	VCA					
87				DCLC	IND	IN	EXMLT		
88		SUD	DLK		DZORDZ			PK	
89		DNDO	LD		DDP	UPDO	LU		UDP
8A		DMD	DCB	UCB	CCB	DMU	DCA	UCA	CCA
8B		TOS	MLT	VLT	SST	H		DSH	RUN
8C			STC	SAF	HCR	HCDX	CCD	ISV	ISRT
8D						FRM	FRSS	FRAS	FRC
8E		SD	SDA	DSD	BFD	SU	SUA	USD	TFD
8F					SLV	ISR	HSEL		
90									
91				LLW	LLI	CTLF	CTL		PFG
92		PTI	CCC			ESSH	ESSI		
93		EPR	HLD	ECRN	CD3			EP2	EP1
94		PI	PI	PI	PI	PI	PI	PI	PI
95		Counter	Counter	Counter	Counter	Counter	Counter	Counter	Counter
97		CODE #	CODE #	CODE #	CODE #	CODE #	CODE #	CODE #	CODE #

DNmd 028

Use this chart for Hydro Simplex with MC-MP-1ES (software less than Rev. 8.00)

HMC HYDRO (SIMPLEX CAR A) MLT / VLT DATA TRAP MEMORY CHART									
Computer Memory Address (Hex)	Toggle Switches Diagnostic On F1 A8.......A5 A4.......A1	Diagnostic Indicators LED *On* = variable flag is On or Active 8	7	6	5	4	3	2	1
C0		DOLM	PHE	DZ	DOL	DBC	SE	GEU	GED
C1			DC	UC	CC			DHO	DOI
C2		DCF	DCP	DOF	DSHT		HCT	CCT	SDT
C3			HEPART	LOT	CSB	DCC	NUDG		HSEL
C4		VCI	FRA	FCS	FRS	DNS	UPS	STD	STU
C5			SP2	SP1	HLW	HLI		FWI	
C6		LFP	UFP	VCA					
C7				DCLC	IND	IN	EXMLT		
C8		SUD	DLK		DZORDZ			PK	
C9		DNDO	LD		DDP	UPDO	LU		UDP
CA		DMD	DCB	UCB	CCB	DMU	DCA	UCA	CCA
CB		TOS	MLT	VLT	SST	H		DSH	RUN
CC			STC	SAF	HCR	HCDX	CCD	ISV	ISRT
CD						FRM	FRSS	FRAS	FRC
CE		SD	SDA	DSD	BFD	SU	SUA	USD	TFD
CF					ATSF	ECRN	CD	EPR	
D0									
D1				LLW	LLI	CTLF	CTL		PFG
D3			HLD		CD3	CD4			
D4		PI	PI	PI	PI	PI	PI	PI	PI
D5		Counter	Counter	Counter	Counter	Counter	Counter	Counter	Counter
D6									
D7		CODE #	CODE #	CODE #	CODE #	CODE #	CODE #	CODE #	CODE #

DNmd 029

6.7 ASME A17.1 - 2000 FAULT TROUBLESHOOTING TABLES

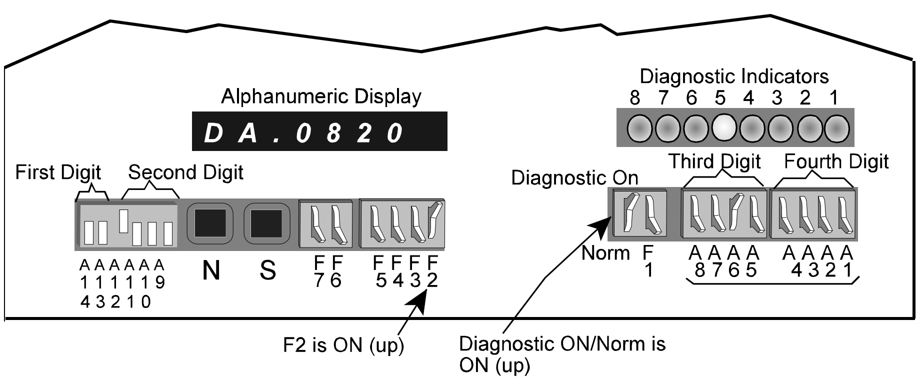
Refer to Section 5.4 *Diagnostic Mode* for detailed information. Diagnostic mode is initiated by placing the Diagnostic On switch up with all other switches in the down position.

TABLE 6.7 ASME A17.1 - 2000 Redundancy Fault Established Map

HEX ADDRESS	FAULT DATA SHOWN ON DIAGNOSTIC INDICATORS							
	8	7	6	5	4	3	2	1
0800	--	RESBYP	RSAFR	RSTOP	--	SAFH	SAFC	RCT
0801	RFR_FLKR	RFR_STK	--	--	--	--	--	2BI
0802	INUP	IN	INMR	ACCI	INICI	INCTI	--	--
0803	--	RCD	DLK	HDB	CDB	HD	CD	INDN
0804	RACC1	RIN2	RIN1	RLULD	DZX	RDZX	RDZ	--
0805	--	--	--	--	--	RCTIC	RTBAB	RACC2
0806	RUP	DNS	DNL	UNL	UPS	DNDIR	UPDIR	--
0807	--	MPSAF	ESBYP	TEST	DCL	DPM	RH	RDN
0808	--	--	--	RHDB	H	--	--	--
080A	DZRX	RDZR	RHDR	RCDR	HDBR	CDBR	HDR	CDR
080B	--	--	--	--	--	RHDBR	DCLR	DPMR
080C	RM3	RDEL2	RWYE2	RM2	RDEL1	RWYE1	RM1	RPM
080D	RUSV	UTS	UNLS	RPLT	DFV	UFV	RDEL3	RWYE3
080E						RDFV	RUFV	RDSV
080F	--	CT	ESBYP	--	4BUS	RSAFR	--	--

6.7.1 ASME A17.1 - 2000 REDUNDANCY FAULT DATA TRAP (F2 is UP)

This Data Trap records the state of the Redundancy Fault Established Map and the SC-HDIO Board Input Map when the MPSAF Output is turned OFF, indicated by the SAFR1 Relay.



Switch F2 selects external memory. Switches A13 and A14 select the first digit (0), A9 thru A12 select the second digit (8), A5 thru A8 select the third digit (2) and A1 thru A4 select the last digit of the address (0). The Alphanumeric Display shows the address 0820 and the diagnostic indicators show the state (on or off) of the data at that address. Looking at Table 6.8 below note that Diagnostic Indicator 5 (which is on in this example) shows the status of RSTOP.

TABLE 6.8 Redundancy Fault Established Data Trap

HEX ADDRESS	FAULT DATA SHOWN ON DIAGNOSTIC INDICATORS							
	8	7	6	5	4	3	2	1
0820	--	RESBYP	RSAFR	RSTOP	--	SAFH	SAFC	RCT
0821	RFR_FLKR	RFR_STK	--	--	--	--	--	2BI
0822	INUP	IN	INMR	ACCI	INICI	INCTI	--	RBK
0823	--	RCD	DLK	HDB	CDB	HD	CD	INDN
0824	RACC1	RIN2	RIN1	RLULD	DZX	RDZX	RDZ	RPT
0825	--	--	--	--	--	RCTIC	RTBAB	RACC2
0826	RUP	DNS	DNL	UNL	UPS	DNDIR	UPDIR	ILO2
0827	--	MPSAF	ESBYP	TEST	DCL	DPM	RH	RDN
0828	--	--	--	RHDB	H	--	--	--
0829	--	--	--	--	--	--	--	--
082A	DZRX	RDZR	RHDR	RCDR	HDBR	CDBR	HDR	CDR
082B	--	--	--	--	--	RHDBR	DCLR	DPMR
082C	RM3	RDEL2	RWYE2	RM2	RDEL1	RWYE1	RM1	RPM
082D	RUSV	UTS	UNLS	RPLT	DFV	UFV	RDEL3	RWYE3
082E						RDFV	RUFV	RDSV
082F		CT	ESBYP	--	4BUS	RSAFR	--	--

6.7.2 ASME A17.1 - 2000 SC-HDIO BOARD INPUT DATA TRAP

TABLE 6.9 ASME A17.1 - 2000 SC-HDIO Board Input Data Trap

HEX ADDRESS	FAULT DATA SHOWN ON DIAGNOSTIC INDICATORS							
	8	7	6	5	4	3	2	1
0830	2BI	RCT	RESBYP	RSAFR	STOP	SAFC	SAFH	--
0831	INUP	INICI	INCTI	RDEL1	RWYE1	RFR	DZX	RM1
0832	--	--	--	RCD	CD	INDN	INMR	HD
0833	RUP	DNL	UNL	RIN2	RIN1	RLULD	RDZ	--
0834	FRSA	FRSM	FRBYP	FCCC	FCOFF	TEST	RH	RDN
0835	--	--	C5.4	C5.3	DFV	UFV	UTSRL	DTSRL
0836	HDBO	HDB	CDBO	CDB	ACCI	--	--	--
0837	--	--	--	RDZX	RCTIC	RTBAB	RACC2	RACC1
0838	--	--	RUSV	RSTOP	--	--	--	UPDIR
0839	CDBOR	CDBR	CDR	DZRX	RHDB	--	--	DNDIR
083A	A2KBP	RHDR	RCDR	RDZR	RHDBR	HDBOR	HDBR	HDR
083B	--	--	RUFV	RDSV	UNLS	ASI8	ASI7	RDFV

6.7.3 RAW ASME A17.1 - 2000 SC-HDIO BOARD INPUT MAP

The *RAW* data for the ASME A17.1 - 2000 HDIO Board Input Map table that follows, is data that has not been modified by the controller. To see these inputs, select the address in Diagnostic mode as described in Section 6.7.1.

TABLE 6.10 RAW ASME A17.1 - 2000 SC-HDIO Board Input Map

HEX ADDRESS	INPUTS							
03E0	2BI	RCT	RESBYP	RSAFR	STOP	SAFC	SAFH	--
03E1	INUP	INICI	INCTI	RDEL1	RWYE1	RFR	DZX	RM1
03E2	--	--	--	RCD	CD	INDN	INMR	HD
03E3	RUP	DNL	UNL	RIN2	RIN1	RLULD	RDZ	--
03E4	FRSA	FRSM	FRBYP	FCCC	FCOFF	TEST	RH	RDN
03E5	--	--	--	--	DFV	UFV	UTSRL	DTSRL
03E6	HDBO	HDB	CDBO	CDB	ACCI	--	--	--
03E7	--	--	--	RDZX	RCTIC	RTBAB	RACC2	RACC1
03E8	--	--	RUSV	RSTOP	--	--	--	UPDIR
03E9	CDBOR	CDBR	CDR	DZRX	RHDB	--	--	DNDIR
03EA	A2KBP	RHDR	RCDR	RDZR	RHDBR	HDBOR	HDBR	HDR
03EB	--	--	RUFV	RDSV	UNLS	ASI8	ASI7	RDFV

6.7.4 ADDITIONAL FLAGS AND VARIABLES ADDED FOR ASME A17.1 - 2000

TABLE 6.11 Flags and Variables Added for ANSI 2000

HEX ADDRESS	INPUTS / OUTPUTS							
0730	XTN1	UTS1	RDEL1	DEL1	RWYE1	WYE1	RM1	M1
0731	XTN2	UTS2	RDEL2	DEL2	RWYE2	WYE2	RM2	M2
0732	XTN3	UTS3	RDEL3	DEL3	RWYE3	WYE3	RM3	M3
0733	ABORT_PUMP	SS_UTSF	SS_FAIL	SSFN	VEU	FUD	VC	RPM
0737								CUR_PUMP
0738			FS3	FS2	FS1	SS3	SS2	SS1
073aA					VC_T	VC_M	RPM_M	RPLT

TABLE 6.12 Definitions for Flags and Variables in Table 6.11

ABORT_PUMP	Failed to Activate. Abort Start-Up Sequence	RWYE1	WYE Redundancy, Pump #1
CUR_PUMP	Current Pump Selected for Start-up Sequence	RWYE2	WYE Redundancy, Pump #2
DEL1	DEL, Pump #1	RWYE3	WYE Redundancy, Pump #3
DEL2	DEL, Pump #2	SS_UTSF	Solid State Motor Up To Speed Failure
DEL3	DEL, Pump #3	SS1	Successful Start, Pump #1
FS1	Failed Start, Pump #1	SS2	Successful Start, Pump #2
FS2	Failed Start, Pump #2	SS3	Successful Start, Pump #3
FS3	Failed Start, Pump #3	SS_FAIL	Solid State Starter Failure
FUD	Fast Up Down Enable Output	SSFN	Soft Stop Function Active
M1	M Contactor, Pump #1	UTS1	Up to Speed for Starter 1
M2	M Contactor, Pump #2	UTS2	Up to Speed for Starter 1
M3	M Contactor, Pump #3	UTS3	Up to Speed for Starter 1
OXTN_CTR	Y - DEL Contactor Open Transition Counter	VC	Viscosity Output
RDEL1	DEL Redundancy, Pump #1	VC_T	Viscosity Timed
RDEL2	DEL Redundancy, Pump #2	VC_M	Viscosity Memory
RDEL3	DEL Redundancy, Pump #3	VEU	Valve Enable Up Output
RM1	M Contactor Redundancy, Pump #1	WYE1	WYE, Pump #1
RM2	M Contactor Redundancy, Pump #2	WYE2	WYE, Pump #2
RM3	M Contactor Redundancy, Pump #3	WYE3	WYE, Pump #3
RPLT	PLT Relay Redundancy	XTN1	Y-DEL Contactor Open Transition Flag, Pump #1
RPM	Run Pump / Motor Input	XTN2	Y-DEL Contactor Open Transition Flag, Pump #2
RPM_M	Run Pump Motor Memory	XTN3	Y-DEL Contactor Open Transition Flag, Pump #3

6.7.5 FORMATTED ASME A17.1 - 2000 SC-HDIO BOARD INPUT / OUTPUT MAP

Refer to Section 5.4 *Diagnostic Mode* for detailed information about Diagnostic mode. Diagnostic mode is initiated by placing the Diagnostic ON switch up.

TABLE 6.13 Formatted ASME A17.1 - 2000 HDIO Board Input / Output Map

HEX ADDRESS	INPUTS / OUTPUTS							
0700	2_BI_M	MPSAF	STOP	SAFC	SAFH		RSAFR	2_BI
0701	TEST	INDN	INUP	RIN2	RIN1	INMR	INICI	INCTI
0702	--	UPDO_M	INUP_M	RTBAB	RACC2	RACC1	ACCI	RCTIC
0703	--	--	--	--	DFV	UFV	UTSRL	DTSRL
0704	HDBO	HDB	CDBO	CDB	--	RCD	HD	CD
0705	--	FIR1	FWL	FRSA	FRSM	FRBYP	FCCC	FCOFF
0707	RESBYP	ESBYP	–	--	--	--	--	--
0709	DNDIR	UPDIR	--	RUP_M	RDN	RUP	DNL	UNL
070A	RFR	RFRM	A2KBP	CT	RCT	RH	RLULD	RDZ
070B	HDBOR	HDBR	CDBOR	CDBR	RHDR	RCDR	HDR	CDR
070C	--	--	RHDBR	RHDB	RDZR	DZRX	RDZX	DZX
070D	ASI8	ASI7	UNLS	RDFV	RDSV	RUFV	RUSV	ASI1

TABLE 6.14 MNEMONIC DEFINITIONS FOR INPUTS AND OUTPUTS IN TABLE 6.13

A2KBP	ANSI 2000 Bypass Input	RCDR	Redundancy Car Door Rear Relay
ACCI	Inspection Access	RCT	Redundancy CT Relay
ASI1		RCTIC	Redundancy Car Top / In Car Inspection Relay
ASI7		RDN	Redundancy Down Relay
ASI8		RDFV	Redundancy Down Fast Valve
CD	Car Door	RDSV	Redundancy Down Slow Valve
CDB	Car Door Bypass Switch - Bypass Position	RDZ	Redundancy Door Zone Relay
CDBO	Car Door Bypass Switch - Off Position	RDZR	Redundancy Door Zone Rear Auxiliary Relay
CDBOR	Car Door Rear Bypass Switch - Off Position	RDZX	Redundancy Door Zone Auxiliary Relay
CDBR	Car Door Rear Bypass Switch - Bypass Position	RESBYP	Redundancy Emergency Stop Switch Bypass Relay
CDR	Car Door Rear	RFR	Redundancy Fault Reset
CT	Cycle Test Output	RFRM	Redundancy Fault Reset Memory
DFV	Down Final Valve	RH	Redundancy High Speed Relay
DNDIR	Down Direction Detected	RHDB	Redundancy Hoistway Door Bypass Relay
DNL	Down Normal Limit	RHDBR	Redundancy Hoistway Door Bypass Rear Relay
DTSRL	Down Terminal Speed Reducing Limit	RHDR	Redundancy Hoistway Door Rear Relay
DZRX	Door Zone Rear Auxiliary	RIN1	Redundancy Inspection Relay #1
DZX	Door Zone Auxiliary	RIN2	Redundancy Inspection Relay #2
ESBYP	Emergency Stop Switch Bypass	RLULD	Redundancy Level Up / Level Down Relays
FCCC	Fire Phase 2 - Car Call Cancel	RMR	Redundancy Motor Relay
FCOFF	Fire Phase 2 Switch - Off position	RSAFR	Redundancy Safety Relay Input
FIR1	Fire Phase 1 Active - Main or Alternate	RSTOP	Redundancy Stop Switch Input
FRBYP	Fire Phase 1 Switch - Bypass Position	RTBAB	Redundancy Top / Bottom Access Buttons Relay
FRSA	Fire Phase 1 - MR / HTW Sensor - Alternate Recall	RUDX1	Redundancy Up/Down Auxiliary #1
FRSM	Fire Phase 1 - MR / HTW Sensor - Main Recall	RUDX2	Redundancy Up/Down Auxiliary #2
FWL	Fire Warning Light	RUP	Redundancy Up Relay
HD	Hoistway Door	RUP_M	Redundancy Up Relay Memory
HDB	Hoistway Door Bypass Switch - Bypass Position	RUFV	Redundancy Up Fast Valve
HDBO	Hoistway Door Bypass Switch - Off Position	RUSV	Redundancy Up Slow Valve
HDBOR	Hoistway Door Rear Bypass Switch - Off Position	SAFC	Safety Circuit - Car
HDBR	Hoistway Door Rear Bypass Switch - Bypass Position	SAFH	Safety Circuit - Hoistway
HDR	Hoistway Door Rear	SSI	Seismic Switch Input
INCTI	Inspection - Car Top Inspection	STOP	Stop Switch Input
INDN	Inspection - Down Input	TEST	Test Input
INICI	Inspection - In Car Inspection	TWO_BI	2 Bus Input
INMR	Inspection - Machine Room	TWO_BI_M	2 Bus Input Memory
INUP	Inspection - Up Input	UFV	Up Final Valve
INUP_M	Inspection Up Memory	UNL	Up Normal Limit
MPSAF	Main Processor - Safety Output	UNLS	Up Normal Limit Switch
RACC1	Redundancy Access Inspection Relay #1	UPDIR	Up Direction Detected
RACC2	Redundancy Access Inspection Relay #2	UPDO_M	Up Direction Output Memory
RCD	Redundancy Car Door Relay	UTSRL	Up Terminal Speed Reducing Limit

6.7.6 STARTERS: WYE - DELTA, ATL & SOLID STATE SEQUENCE OF OPERATION FLOWCHARTS

FIGURE 6.31 WYE - DELTA Starter Sequence of Operation

SEQUENCE OF OPERATION for WYE - DELTA HYDRAULIC STARTER

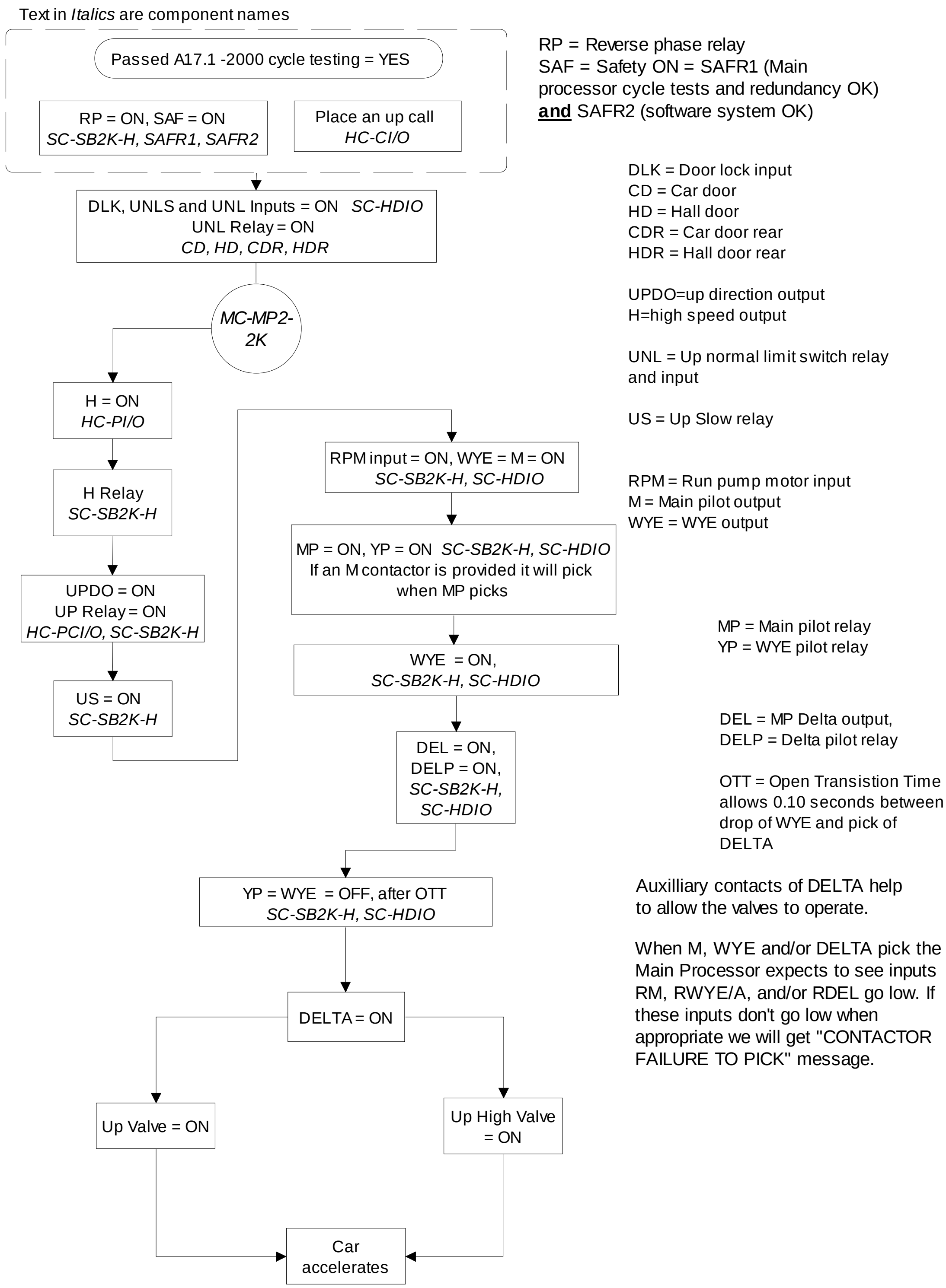


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FIGURE 6.32 ATL Starter Sequence of Operation

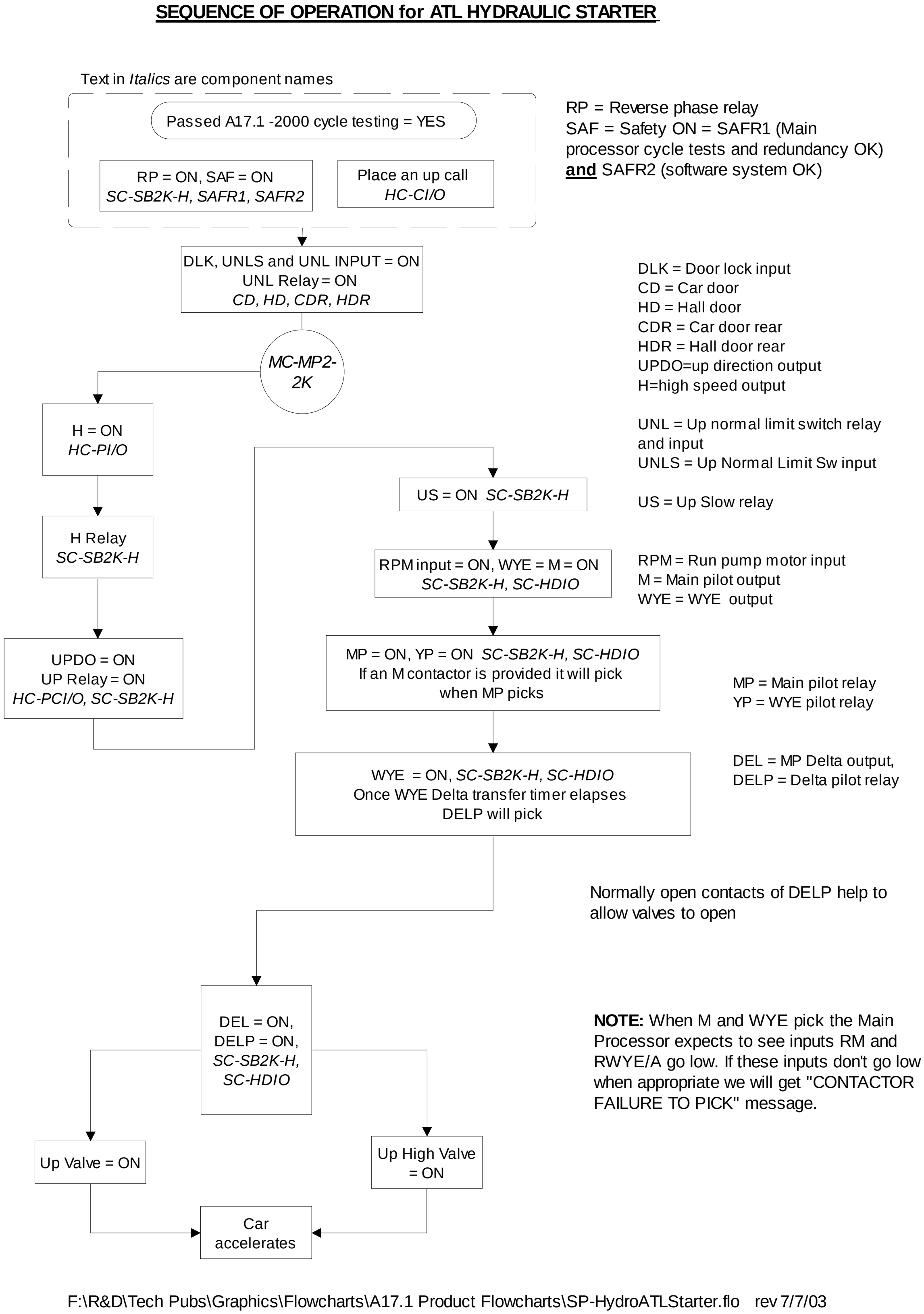
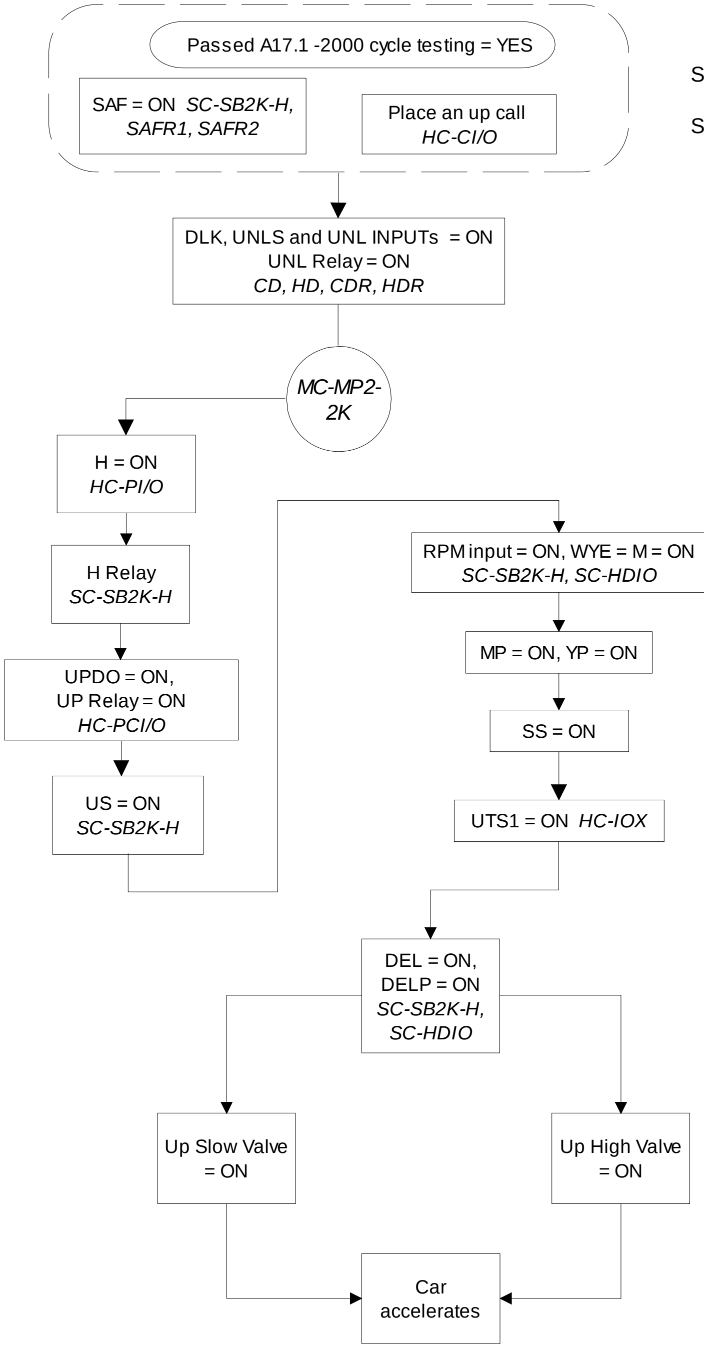


FIGURE 6.33   Solid State Starter Sequence of Operation

HYDRO WITH SOLID-STATE STARTER SEQUENCE OF OPERATION

Text in *Italics* are component names



SAFR1 = Main processor cycle tests and redundancy OK
SAFR2 = software system OK

DLK = Door lock input
CD = Car door
HD = Hall door
CDR = Car door rear
HDR = Hall door rear

UNLS = Up Normal Limit Input
UPDO=up direction output
H=high speed output
UNL = Up normal limit switch relay and input

US = Up slow relay

UP Relay = Up Pilot Relay
RPM = Run pump motor input
M = Main pilot output
WYE = WYE output

MP = Main pilot relay
YP = WYE pilot relay

SS = Solid-state starter applies voltage to motor

UTS1 = Up to speed input (OK to open valves - from SS)

DEL = MP Delta output,
DELP = Delta pilot relay

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APPENDIX

APPENDIX A
DISASSEMBLING THE COMPUTER SWING PANEL

MCE Technical Support may advise an installer to remove a circuit board for troubleshooting reasons. If so, remove the thumbscrew holding the Swing Panel to the bracket on the back plate. Open the Swing Panel , exposing the back cover plate.

Loosen and remove the four nuts securing the back cover plate. This may require the use of a 11/32 nut driver.

CAUTION:	Components on the PC boards can be damaged by ESD. Install a grounding strap on your wrist and connect it to ground before handling the PC boards.

Disconnect the 20 pin ribbon cables from the HC-PI/O and MC-RS boards.

Remove the circuit boards from the Swing Panel. Put the nuts back on the bolts for safekeeping.

Unsnap the boards from each other and replace/repair the boards as necessary.

FIGURE A.1 Computer Swing Panel Boards, Unsnapped

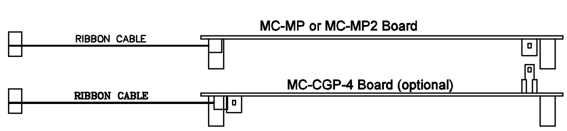


FIGURE A.2 Computer Swing Panel Boards, Snapped Together

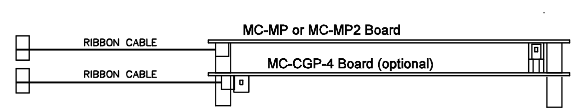
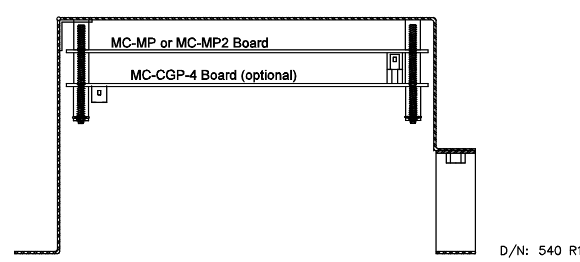


FIGURE A.3 Computer Swing Panel Without Boards (Top View)

FIGURE A.4 Computer Swing Panel With Boards (Top View)



APPENDIX B
CHANGING PC BOARDS, EPROMS OR MICROCONTROLLERS

With directions from MCE Technical Support, a PC board, EPROMs or Microcontroller may need to be reinstalled in the field. Great care should be taken when changing any of these items. The EPROM stores the computer program, the microcontroller both stores and executes the program and all three are subject to damage by ESD (see CAUTION). These instructions should be followed step-by-step.

CAUTION: Components on the PC boards can be damaged by ESD. Install a grounding strap on your wrist and connect it to ground before handling the PC boards.

B.1 REPLACING THE MAIN PROCESSOR BOARD OR EPROM

Normally the microprocessor on the Main Processor board (MC-MP2-2K) is not replaced in the field. Sometimes the EPROM is replaced to upgrade the program and occasionally the complete board must be replaced due to a component failure.

Replacing the EPROM - The EPROM for the MC-MP2-2K board is labeled S-MP2-xx-1. The “xx” represents the controller type. If the new EPROM has the same job number as the old EPROM, the user settings for timers and adjustable control variables, etc., are retained. Any new timers or variables added to the new EPROM will be set to their default values.

If the job number on the new EPROM is different from the job number on the old EPROM, all of the timers and variables will be set to their default values. The user settings should be documented before the old EPROM is removed so that they can be re-entered when the new EPROM is installed.

Replacing the Main Processor board - The user settings for timer and adjustable control variables are stored in battery backed RAM on the Main Processor board. If the new board was previously installed in another car controller, the user settings from that car will be retained. If the new board is a replacement from MCE, all of the user programmable values will be set to their default values. Therefore, the current user settings should be documented before the old board is removed so that they can be re-entered when the new board is installed. The following is a list of the user settings:

- Elevator Timers (see Section 5.2.3)
- Real Time Clock Flags (see Section 5.2.4)
- Communications Port Settings (see Section 5.3.1)
- Security Codes (see Section 5.3.2)
- Master Software Key (MSK) (see Section 5.3.3)
- Software Options - Adjustable Control Variables (see Section 5.3.4)

Replacement Procedure

1. Document the current settings for the items listed above.

2. Turn power OFF at the main disconnect and verify that no lights are operating on the microprocessor panel. Install a grounding strap on your wrist and connect it to ground before handling the PC boards.

3. Remove the Main Processor board (MC-MP2-2K) from the Swing Panel. Refer to Appendix A for instructions on unloading the boards from the Swing Panel. If you are replacing the PC board, proceed to step 6 below (refer to Figure 6.22 *MC-MP2-2K Main Processor Board Quick Reference* for proper jumper settings.

4. Using a small, thin-bladed screwdriver, place the tip between the EPROM chip and its socket, *not* between the socket and the board (see Figure 6.22). Gently pry the existing EPROM out from the socket. Do this very slowly, taking care not to bend the leads. If they become bent, straighten them carefully with needlenose pliers.

5. Place the new EPROM lightly (do not plug it in yet) into the socket and check to see that all pins are aligned with their corresponding holes in the socket. Also make sure that the notch on the end of the EPROM is correctly aligned with the notch on the socket (the orientation of the notch should also correspond to the notches on all of the other chips on the board). Now push the EPROM firmly into the socket and make sure that *none* of the pins are bent during the insertion. Inspect the EPROM to make sure that no pins are bent outward or under the EPROM.

6. Reassemble the Swing Panel assembly and close the Swing Panel. Refer to the instructions in Appendix A.

7. Turn power ON at the main disconnect. Verify the proper operation of all boards by inspecting the diagnostic indicators and Computer ON LEDs on the individual processor boards.

   - If the Computer ON LEDs are not illuminated on all boards, the EPROMs may not have been installed properly. Repeat the above steps 2 through 7.

8. Re-enter the user settings documented in step 1 above.

B.2 REPLACING THE MC-CGP-4 (8) BOARD OR EPROMS

Sometimes the EPROMs are replaced to upgrade the program to a new software version and occasionally the complete board must be replaced for a software upgrade or a component failure.

Replacing the EPROMs - The EPROMs for the MC-CGP-4 (8) board are labeled S-CGP-CC-1 and S-CGP-CC-2.

i) EPROMs with the same software version number will not cause the loss of user data. Follow steps **2 thru 7** in the Replacement Procedure below.

ii) EPROMs with a new software version number will result in loss of user data. Follow the **entire** Replacement Procedure below.

Replacing the MC-CGP-4 (8) board - The user settings for the items listed below are stored in battery backed RAM on the MC-CGP-4 (8) board. If the new board was previously installed in another car controller, the user settings from that car will be retained. Follow the **entire**

Replacement Procedure below when using a board from another car controller which has different settings from those of the car being replaced or when installing a board from MCE.

NOTE: The Fault Log and Performance Reports will all be lost and can not be recovered.

Replacement Procedure

1. Document the current settings for the items listed below.

   - M3 Group Parameters or Car ID parameter CNID on F1 -1 screen for local cars only
   - Security - timer tables, security configurations, passenger names and access codes (simplex car and group only)
   - Special Events Calendar Menu options Configure by Type, Configure by Controller, and CMS Com Port Setup (if available)
   - Job Configuration data used for display - job name, car label and landing labels

2. Turn power OFF at the main disconnect and verify that no lights are operating on the microprocessor panel. Install a grounding strap on your wrist and connect it to ground before handling the PC boards.

3. Remove the MC-CGP-4 (8) board from the Swing Panel. Refer to Appendix A for instructions on unloading the boards from the Swing Panel. If you are replacing the PC board, proceed to step 6 below (refer to Figure 6.23 *MC-CGP-4 Communication Processor Board Quick Reference* for proper jumper settings).

4. The two EPROMs on the MC-CGP-4 (8) board are labeled ROM1-U17 and ROM2-U18 (see Figure 6.23) Using a small, thin-bladed screwdriver, place the tip between the EPROM chip and its socket, *not* between the socket and the board. Gently pry the existing EPROMs out from the socket. Do this very slowly, taking care not to bend the leads. If they become bent, straighten them carefully with a needlenose pliers.

5. Place the new EPROMs lightly (do not plug it in yet) into the sockets and check to see that all pins are aligned with their corresponding holes in the socket. Also make sure that the notch on the end of the EPROM is correctly aligned with the notch on the socket (the orientation of the notch should also correspond to the notches on all of the other chips on the board). Now push the EPROMs firmly into the socket and make sure that *none* of the pins are bent during the insertion. Inspect the EPROMs to make sure that no pins are bent outward or under the EPROM.

6. Reassemble the Swing Panel assembly and close the Swing Panel. Refer to the instructions in Appendix A.

7. Turn power ON at the main disconnect. Verify the proper operation of all boards by inspecting the diagnostic indicators and Computer ON LEDs on the individual processor boards.

   - If the Computer ON LEDs are not illuminated on all boards, the EPROMs may not have been installed properly. Repeat the above steps 2 through 7.
   - Verify that the group controller is communicating with the cars by looking at the LEDs in the front of the group swing panel.

8. Set ODPC=ON, on the General F1-1 screen, and save the parameter, or reset the MC-CGP parameters as described in Section 5.2.6.

9. Re-enter the user settings documented in step 1 above.

APPENDIX C
NOMENCLATURE

Motion Control Engineering, Inc.	NOMENCLATURE
	Effective Date: 03/06/02 3 Pages

#	PC BOARD	DESCRIPTION
1	HC-RB4	Traction Controller Main Relay Board
1	HC-RBH	Hydraulic Controller Main Relay Board
2	HC-CI/O	Non Programmable Controller Call I/O Board
2	HC-CI/O-E	Programmable Controller Call I/O Expander Board
3	HC-PI/O	Non Programmable Controller Power I/O Board (Car A) ①
3	HC-PCI/O	Programmable Controller Power And Call I/O Board
4	HC-PI/O	Non Programmable Controller Power I/O Board (Car B) ①
6	HC-TAB	Traction Adapter Board
7	HC-RDRB	Rear Door Relay Board
8	HC-RD	Rear Door Logic Board (Car A) ①
9	HC-RD	Rear Door Logic Board (Car B)
10	HC-DB-MOD	Front G.A.L. MOD Door Interface Board
11	HC-DB-MOD-R	Rear G.A.L. MOD Door Interface Board
12	HC-DPS	Door Power Supply Board
13	HC-PIX	Position Indicator Expander Board (Car A) ①
14	HC-PIX	Position Indicator Expander Board (Car B)
15	HC-SRT	Suicide Relay Timing Board
16	HC-SCR	SCR Interface Board
17	HC-EQ	Earthquake Board
18	HC-IOX	I/O(8 Input / 8 Output) Expander Board (Car A) ①
19	HC-IOX	I/O(8 Input / 8 Output) Expander Board (Car B)
20	HC-IOX	Additional I/O(8 Input / 8 Output) Expander Board (Car A) ①
21	HC-IOX	Additional I/O(8 Input / 8 Output) Expander Board (Car B)
26	HC-DYNA	Dynalift Interface Board
27	MC-ACFR	AC Feedback Relay Board
28	IMC-GIO	General Turbo DF I/O Board
29	IMC-RB	Turbo DF Relay Board
30	HC-DB-MOM/H	Front G.A.L. MOM/MOH Door Interface Board
31	HC-DB-MOM/H-R	Rear G.A.L. MOM/MOH Door Interface Board
32	HC-OA	Output Adapter Board
33	IMC-RI	M/G Relay Interface Board
34	IMC-PRI	M/G Power Relay Interface Board
35	IMC-DIO	Digital I/O Board
36	IMC-DAS	Data Acquisition Board
37	HC-I4O	I/O(16 Input /4 Output) Expander Board (Car A) ①
38	HC-I4O	I/O(16 Input /4 Output) Expander Board (Car B)
39	HC-I4O	Additional I/O(16 Input / 4 Output) Expander Board (Car A) ①
40	HC-I4O	Additional I/O(16 Input /4 Output) Expander Board (Car B)
41	SCR-RI	SCR/AC Relay Interface Board

Motion Control Engineering, Inc.

NOMENCLATURE

Effective Date: 03/06/02 3 Pages

#	PC BOARD	DESCRIPTION
42	SCR-PRI	SCR/AC Power Relay Interface Board
43	HC-LB	Lock Bypass Board
44	HC-GB	Gong Board
45	HC-GB	Additional Gong Board
46	HC-SIB	Selectable Input Buffer Board (Car A) ①
47	HC-SIB	Selectable Input Buffer Board (Car B)
48	HC-RT	Relay Tester Board
49	IMC-ACIB	AC Baldor Interface Board
50	HC-DPS-MOM/H	Front G.A.L. MOM/MOH Door Interface and Power Supply Board
51	HC-ACI	AC Drive Interface Board
52	HC-ACIF	AC Flux Vector Interface Board
53	HC-DPS-MOM/H-R	Rear G.A.L. MOM/MOH Interface and Power Supply Board
54	IMC-MBX	IMC Enhanced Motherboard
55	SCR-RIX	SCR Relay Interface Extension Board
56	HC-HBF	A.S.M.E. Front Door Lock Bypass Board
57	HC-HBFR	A.S.M.E Front and Rear Door Lock Bypass Board
58	IMC-ACIM	AC MagneTek Interface Board
59	HC-TACH-MG	Tach Adjust Board for VVMC-MG Controller
60	HC-TACH-SCR	Tach Adjust Board for VVMC-SCR Controller
61	SC-SB2K	Main A17.1 - 2000 Compliant Relay Board
62	SC-HDIO	High Density I/O board for A17.1 - 2000
63	SC-BASE-D	Lock Bypass, Access, Overspeed and Emergency Brake Board used with DF controlers
64	SC-BASE	Lock Bypass, Access, Overspeed and Emergency Brake Board used with non-DF controllers
65	SC-BASER-D	Rear version of SC-BASE used with DF controllers
66	SC-BASER	Rear version of SC-BASE used with non-DF controllers
67	SC-SB2K-H	Hydraulic controller main relay board for A17.1 compliance
68	SC-BAH	Hydraulic controller Bypass/Access board
69	SC-BAHR	Hydraulic controller Bypass/Access/Rear Door board

① Individual group cars use board numbers for car A only

SCHEMATIC SYMBOLS

SYMBOL	DESCRIPTION
X / X	BUS LOCATED ON PC BOARD
X / X	BUS LOCATED OFF PC BOARD
	MICROCOMPUTER OUTPUT OR CALL CIRCUIT
	MICROCOMPUTER INPUT
MP	MICROCOMPUTER OUTPUT OR CALL CIRCUIT FOR ASME 17.1-2000 SERIES CONTROLLER
MP	MICROCOMPUTER INPUT FOR ASME 17.1-2000 SERIES CONTROLLER
P	PATTERN GENERATOR OUTPUT
P	PATTERN GENERATOR INPUT
S	PATTERN GENERATOR SAFETY INPUT
	POWER TERMINAL
	PANEL MOUNT TERMINAL
XI	EYELET ON PC BOARD
XI	SCREW TERMINAL ON PC BOARD
XI	IDC CONNECTOR ON PC BOARD
CX-X XI CX-X IX	RIBBON CABLE CONNECTOR
TPX	TEST POINT
OFF BOARD SIDE IX BOARD NUMBER	BOARD DESIGNATOR
	SOLDER CONNECTION ON REAR OF PC BOARD
	WIRING INSIDE CONTROL CABINET
	TRACE ON PC BOARD
	CUSTOMER WIRING INTO CONTROL CABINET
	ALL UNMARKED DIODES ARE 2.5 AMP 1000 VOLT
	VOLTAGE SPIKE SUPPRESSOR
	DOT BY RESISTOR INDICATES TOP OR LEFT SIDE AS MOUNTED
	BOX INDICATES UNUSED ITEM
	RELAY COIL
	FORCE GUIDED RELAY COIL
POLE NUMBER X SWING SIDE	NORMALLY OPEN (N.O.) RELAY CONTACT
POLE NUMBER X SWING SIDE	NORMALLY CLOSED (N.C.) RELAY CONTACT
N/C	NO CONNECTION

WIRE SYMBOLS

SYMBOL	DESCRIPTION
X	#X AWG THHN WIRE 90° C
X	#X AWG PVC WIRE 105° C
X	#X AWG PTL WIRE 125° C
X	#X AWG TEFLON WIRE 200° C

UNLESS NOTED, ALL WIRES ARE #18 AWG PVC, WITH EXCEPTION TO THE PC BOARD WIRING, WHICH IS DETERMINED BY ENGINEERING.

WIRE GAUGES

SYMBOL	SIZE
03	3/0 AWG
02	2/0 AWG
0	0 AWG
1	1 AWG
2	2 AWG
4	4 AWG
6	6 AWG
8	8 AWG
10	10 AWG
12	12 AWG
14	14 AWG
16	16 AWG
18	18 AWG

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APPENDIX D
FLEX-TALK OPTION

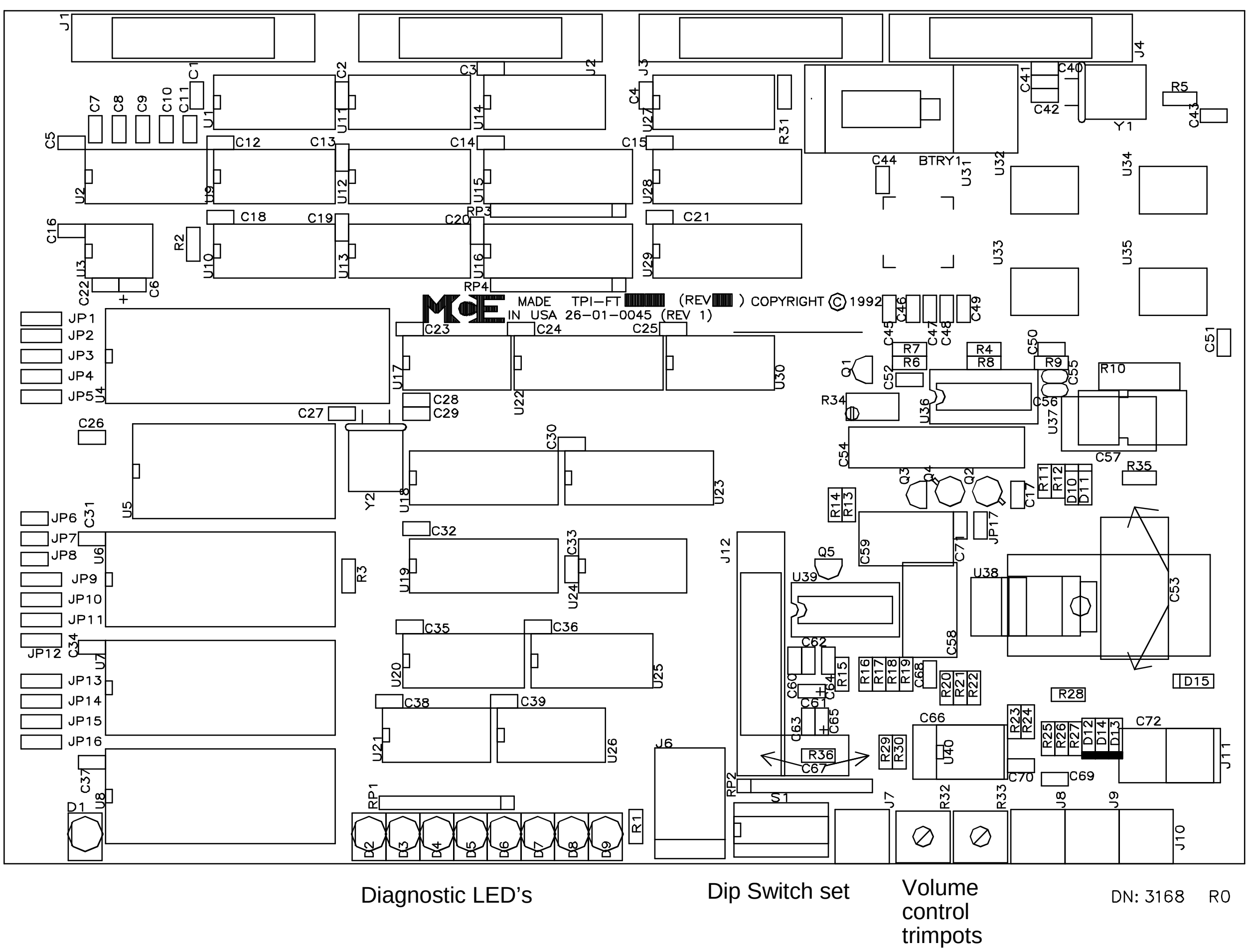
> **NOTE:** The following is a listing of diagnostic tools available on a controller if the Flex-Talk option is provided.

Use this appendix in conjunction with the manual. The appendix provides information regarding the diagnostics and volume adjustments for the TPI-FT option on the Flex-Talk unit.

D.1 INTRODUCTION AND THEORY OF OPERATION

The Flex-Talk board is designed for use on any MCE controller to provide flexibility in audio announcement. The TPI-FT board is installed inside the controller and hooked up to the last board of the daisy chain. The TPI-FT receives such needed information as door status, nudging, PI, etc. from the MCE bus. A +5V power supply runs the digital circuitry, and a -/+15V supply operates the analog circuitry of the speaker. There are eight LED's used for diagnostic purposes in conjunction with the dip switches. The input and output connectors (J1 and J2) are used for the MCE bus; however, it is unlikely that the output will be used, as the Flex-Talk board is typically the last in the daisy chain, the exception being a duplex where there are two Flex-Talk boards.

FIGURE D.1 TPI-FT Flex-Talk Board



D.2 DIAGNOSTICS

The six switches on the dip switch package are used for diagnostics purposes. There are eight LED's (D2 through D9) also, for displaying diagnostics information. These LED's are used in conjunction with the dip switch package (see below). For self-test, turn on switch S2 of the dip switch set. The unit will announce each of the floor messages, the direction, nudging, and the fire service messages (the special messages are not included in the self test). This test does not require the connection of the MCE bus.

FIGURE D.2 Diagnostic Table

DIP SWITCHES					DIAGNOSTIC LEDS								MNEM.
S2	S3	S4	S5	S6	D2	D3	D4	D5	D6	D7	D8	D9	
1	0	0	0	0	SELF TEST								
0	0	0	0	0	UP	DOWN	NUDG	DOOR	MAIN FIRE	SAF	ALT FIRE	HOSP	MODSW
0	1	0	0	0	PIs DISPLAYED IN BINARY (00 = BOTTOM)								PIN
0	0	1	0	0	X	EM3A	EM2A	EM1A	DORA	GDA	GUA	PIA	MAW
0	1	1	0	0	PIs DISPLAYED IN BINARY (00 = BOTTOM)								IPR_3
0	0	0	1	0	SEC. FLR	HLW	EMP	X	X	X	X	X	SMAW1
0	1	0	1	0	STOP SW	OVS	LOBM	X	X	X	X	X	SMAW2
0	0	1	1	0	X	X	EMP	X	X	X	X	X	EMPWI N
0	1	1	1	0	UP	DOWN	NUDG	DLK	FRS	SAF	FRA	HOSP	ITR-1
0	0	0	0	1	PI0	PI1	PI2	PI3	PI4	CSE	HLW	EPR	ITR-2
0	1	0	0	1	PI5	X	DOPLFR	X	X	H OR (NOT) STC	ATALT	ATMN	ITR-3

Dip switches:
- switches S2, S3, S4, S5, and S6 are used to select which flags on the TPI are to be displayed.
- switch S2 is used for the self test.
- switch S1 is currently not used.
- 0 = switch is "Off", 1 = switch is "On"

D2 thru D9: diagnostic LEDs located on the processor board. Lit LEDs indicate that one of the flags listed below D2 thru D9 on the above chart are read as active.

Example: if all switches are off, D4 & D6 are turned on, then nudging and main fire service flags are on.

D.3 VOLUME CONTROL

The trimpots R32 and R33 adjust the main and alternate volume. The main volume adjustment (R32) controls the floor announcements (such as "First Floor"). The alternate volume (R33) controls all other announcements (such as "going up"). Turning either trimpot fully counterclockwise gives maximum volume. The adjustments are easily made with diagnostics switch S2-ON. This will activate the messages and allow the time necessary to adjust volume. These two trimpots do not affect any music volume that may be connected on J8. Music volume is set external of this unit.

D.4 TROUBLESHOOTING

If there are no audio messages, then:

- The speaker may not be connected on J9.
- The +/-15V supply on connector J7 may not be present.
- Relay U39 may be defective.
- U38 (audio power op-amp) may be defective.
- U5 (program EPROM), U7 or U8 (digitized voice EPROM) may be defective.
- A volume control trimpot may be defective or turned fully clockwise.

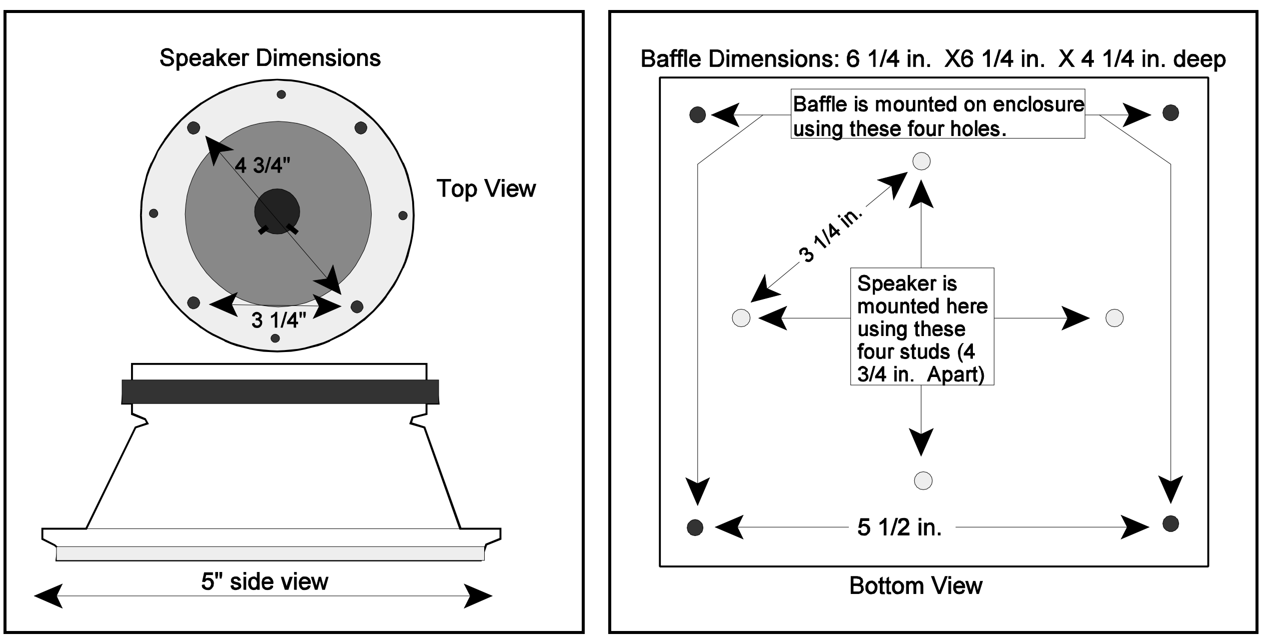
If the message, "Please allow the doors to close" is heard when nudging:

- The photo eye used to detect objects in the door path may be blocked.
- The photo eye may be dirty, or defective.

D.5 PERIPHERAL EQUIPMENT

Square recessed mount 6 1/4" by 6 1/4" by 4 1/4" deep (manufacturer Model # 198-4).
Square surface mount 7" by 7" by 4 1/4" deep (manufacturer Model # SE 198-4).
Circular recessed mount 6 1/8" by 4 1/4" deep without lip (manufacturer Model # 94-4).
7" round by 4 1/4" deep (including lip).
7 3/8" in diameter with circular grill.

FIGURE D.3 Speaker Dimensions



APPENDIX E
LS-QUTE LANDING SYSTEM ASSEMBLY DRAWINGS

NOTE: If a sensor or the HC-IPLS board is replaced, make sure that the **orientation of the HC-IPLS** board is correct. Use the chassis ground and the LEDs shown in the figure below for an orientation reference.

FIGURE E.1 LS QUTE Enclosure Assembly

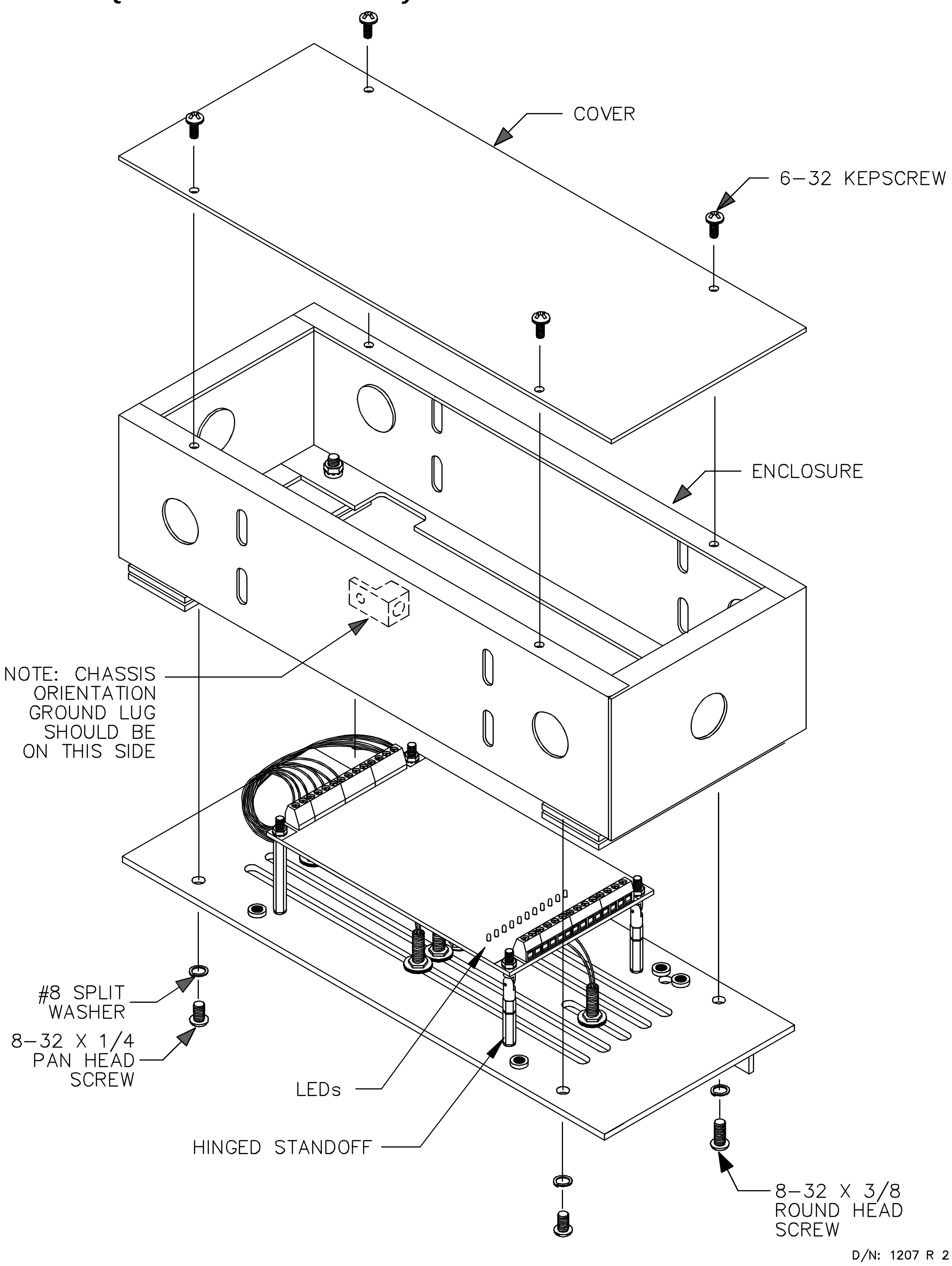
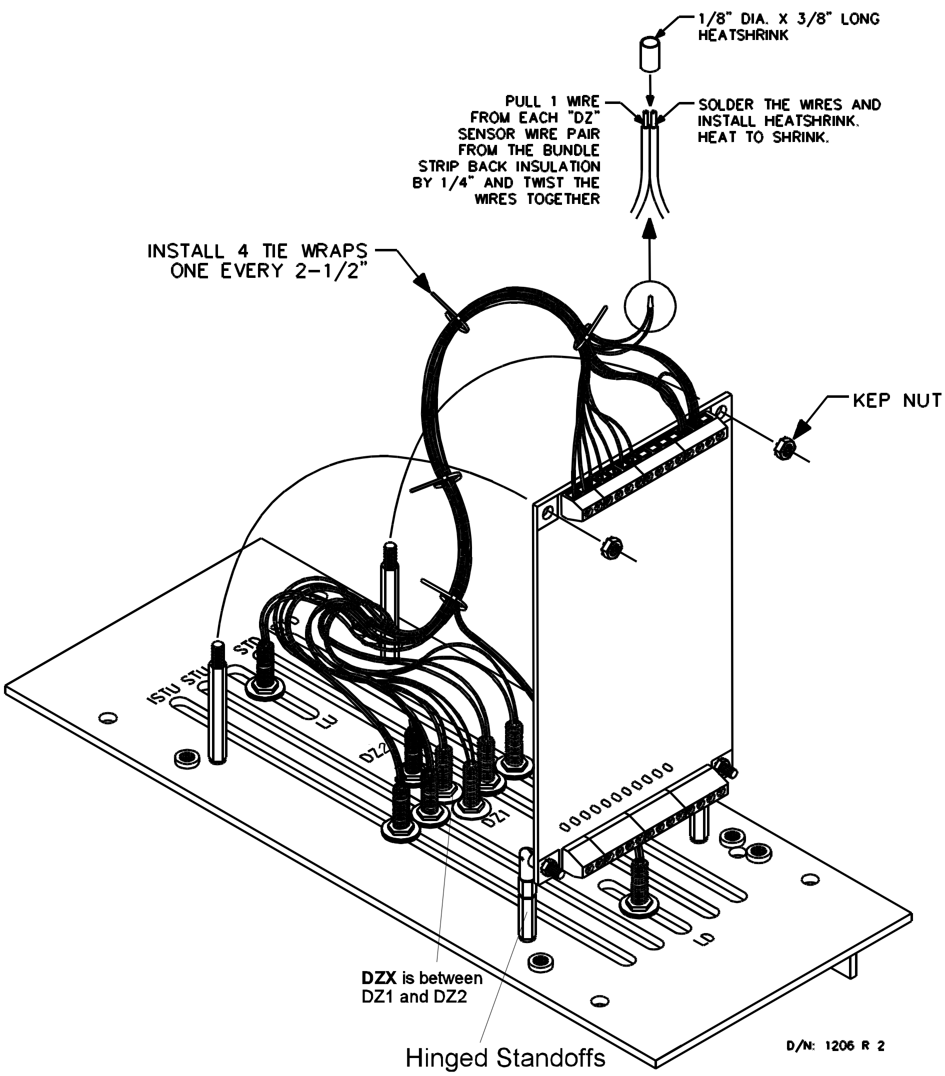


FIGURE E.2 LS QUTE Wiring Diagram



SENSOR	HC-IPLS BOARD TERMINALS	
DZ1	DZ2 SENSOR	S18
DZX	SDZX	S18
DZ2	DZ1 SENSOR	S27
DZF	SDZF	S18
DZR	SDZR	S18
LD	SLD	S18
LU	SLU	S18
STD	STD	S2
STU	STU	S2
ISTD	ISTD	S2
ISTU	ISTU	S2
One 2 inch jumper	S18	S2

INDEX

D

E

F

G

H

I

K

L

M

N

O

P

R

S

T

U

V

W

Y