

SWIFT[®]
FUTURA[™]
The Highest Standard

Product Manual
Version 4.6



COMPUTERIZED ELEVATOR CONTROL CORP.
Moving People. Moving Business.



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FUTURA SAFETY PROCEDURES

WARNING

The following procedures are intended for the use of qualified and authorized personnel **ONLY**. In the interest of your personal safety and the safety of others, do **NOT** attempt **ANY** procedure that you are **NOT** qualified and authorized to perform.

These procedures should be performed in accordance with any governing local codes; and where practical, any rules of the latest edition of the National Electrical Code, Article 620; the latest edition of ASME A17.1, Safety Code for Elevators.

Every attempt has been made to ensure that this manual is as accurate and up-to-date as possible. However, Computerized Elevator Controls assumes no liability for consequences resulting from any error or omission. The material contained herein is subject to revision, and Computerized Elevator Controls makes every effort to inform its product users of these revisions as they occur. Please report any problems with this manual to the Technical Support Department.

SAFETY SUMMARY

This information should be read **BEFORE** any work is performed on the Futura.

Terms in this Manual

CAUTION statements identify conditions that could result in damage to the equipment or other property if improper procedures are followed.

WARNING statements identify conditions that could result in personal injury if improper procedures are followed.

Use the Proper Fuse

To avoid fire hazard, use only a fuse of the correct type, voltage rating and current rating as specified in the parts list for your product.

Other Electrical Safety Information

Electric shocks can cause personal injury or loss of life. Circuit breakers, switches and fuses may **NOT** disconnect all power to the equipment. Always refer to the wiring diagrams. Whether the AC supply is grounded or not, high voltage to ground will be present at many points.

Do **NOT** remove connections or printed circuit cards from the equipment while power is applied. This can damage equipment.

Always lock out the Mainline Disconnect when power has been removed from equipment.

Installation Wiring

All installation wiring must comply with all applicable national, state, or local codes, and should be in accordance with the U.S. National Electric Code (NEC) where practical.

When Servicing With Power On

Dangerous voltages exist at several points in this product. To avoid personal injury, do **NOT** touch exposed connections or components while power is **ON**.



STATIC PROTECTION GUIDELINES

IMPORTANT!

Read this page before working with electronic circuit boards.

Modern elevator systems use a number of electronic circuit boards to control various functions of the elevator. These boards house components that are extremely sensitive to electrostatic voltage, which can cause board damage or failure.

Proper handling and shipping of boards is important to ensure their reliability and long-term operation. Use the following guidelines when handling circuit boards.

SHIPPING

- All boards, whether they are “good” or “to be repaired,” MUST be packaged in a closed and sealed anti-static bag whenever they are being transported.
- Boards MUST also be packaged in sturdy protective cartons for shipping.
- Use only anti-static packing materials (ordinary Styrofoam is not acceptable).

HANDLING

- Store all boards in separate, sealed anti-static bags until time for installation.
- When handling all boards, always wear an anti-static wrist strap with ground wire. Acceptable straps should be available through any local electronics parts supplier.
- Handle boards only by their edges using proper anti-static techniques. Avoid touching components, traces and connectors.
- Always lay boards on a grounded electrostatic protection barrier (i.e., a dissipative mat or an anti-static bag).
- Extra care should be used when handling individual components such as integrated chips, metal oxide semi-conductors, and field-effect transistors, some of which can be destroyed with as little as 30 volts of electrostatic discharge.

Failure to adhere to these guidelines will VOID board warranty!

RECOMMENDED TOOLS AND TEST EQUIPMENT

The following tools and calibrated equipment are required for installing and adjusting:

- RS-232C compatible PC/Laptop or terminal capable of operating at 19,200 baud rate.
- TOOLS: Soldering iron, 60/40-rosin core solder, solder sucker, assorted screw drivers, electronic type long nose pliers, and side cutters.
- SWIFT Wizard program for WINDOWS.
- Digital VOM, Fluke 8024B or equivalent.
- *Oscilloscope, Tektronix T-912 or equivalent. (if necessary)*



SAFETY NOTICES

WARNING

This equipment contains voltages, which may be as high as 800 Volts and connects to rotating parts on motors and driven machines. High voltage and moving parts can cause serious or fatal injury. Only qualified personnel, familiar with elevator operation, should attempt to start-up or troubleshoot this equipment. Observe these precautions:

- Use extreme caution. Do not touch any circuit board, power device or electrical connection without ensuring that high voltage is not present.
- Electric shocks can cause personal injury or loss of life. Circuit breakers, switches and fuses may not disconnect all power to the equipment (more than one live circuit). Always refer to the wiring diagrams. Whether the AC supply is grounded or not, high voltage to ground will be present at many points.
- All equipment must be properly grounded. Do not apply AC power before following grounding instructions.
- On AC VVVF drive systems: Do not open cover for two (2) minutes after removing AC power to allow capacitors to discharge.
- Improper control operation may cause violent motion of motor shaft and driven equipment. Be certain that unexpected motor shaft movement will not cause injury to personnel or damage to equipment. Peak torques of several times rated motor torque can occur during a control failure.
- Motor circuits may have high voltage present whenever AC power is applied, even when the motor is not rotating.

CAUTION

- Do not remove connections or printed circuit boards from the equipment while power is applied. This can damage the equipment.
- Meggering or "buzzer" type continuity testers can damage electronic components. Damage resulting from their use will void all existing warranties.
- When instruments such as an oscilloscope (line voltage operation) are used to work on live equipment, great caution must be used. The oscilloscope's chassis should be grounded and a differential amplifier input probe should be used. Always refer to the manufacturer's instruction book for proper operation and adjustments of the test equipment.
- Connection of devices such as voltmeters on certain low-level analog circuits or tachometer may degrade performance of the regulator drive system. Always use a voltmeter having a minimum of 20K OHM/VOLT. A digital voltmeter is recommended.
- Always read the complete instructions prior to applying the power or troubleshooting the equipment. Follow the procedures step by step.
- The controller must be grounded at one point only. Refer to the "Site and Installation Planning Guide" section for further information.

For Additional Information or Assistance

If you require assistance or additional information, please contact Technical Support at:
Computerized Elevator Control, Corp.
24 Empire Blvd. (201) 508-2300
Moonachie, N.J. 07074



SECTION 1 - SITE PLANNING & INSTALLATION

Machine Room Layout

Controller: The standard *Futura* is a front and rear access designed controller. This controller is a RETMA enclosure 22.5" wide, 32.5" deep and 74.25" tall. The doors are hinged to swing open and they are also removable. The top has a removable section to permit punching or cutting of access holes for the installation of the wiring conduits. Both side panels are an integral part of the cabinet structure and have top and bottom ventilation louvers. [See Figure 1-1.]

Note: *Make sure to leave at least 2" of clearance when mounting cabinets next to each other.*

Caution



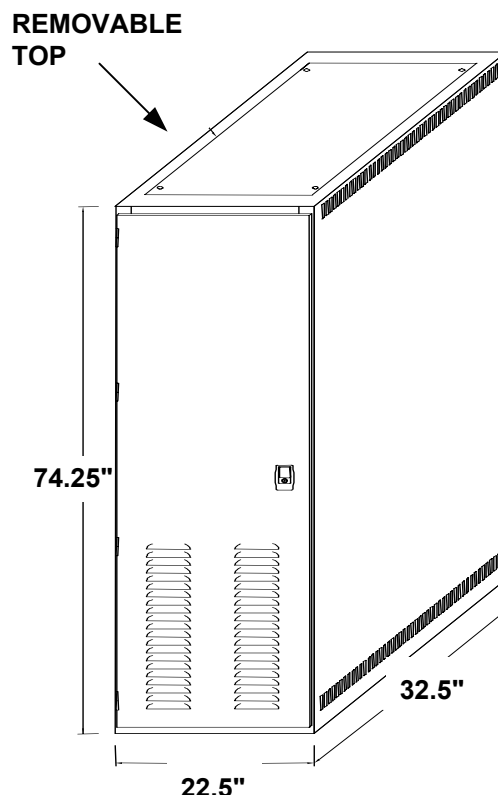
While cutting/punching holes or drilling in the top or side of the controller, take care to prevent metal shavings from entering the controller.

Mounting: The *Futura* is designed to be a floor mount controller. Place the controller in a location that will provide for proper ventilation and meet local codes for proper work clearances. Place a level on the side of the floor stand and level as needed with shims. Once controller is level, use proper anchors to secure the controller to the machine room floor. Front access controller cabinet is an available option.

Transformers and Chokes (if required): Place transformers and chokes as close to the controller as machine room conditions allow (leave a min. of 2" clearance on each side of the transformers for ventilation). Level the transformer and chokes and secure them properly to the machine room floor.

Encoder: Direct Coupling is required on all geared machines and is strongly recommended for Gearless machines. [See Figure 1-2.]

Futura Controller



The controllers should be installed in a well ventilated area with ambient temperature ranging from 0C-50C (32F-122F) and relative humidity up to 95 percent, non-condensing.

Figure 1-1

Encoder Mounting Types

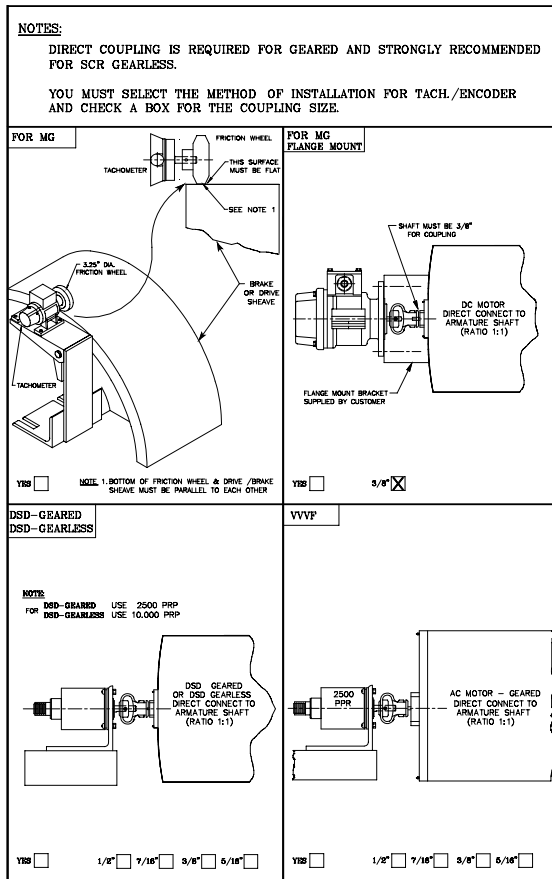


Figure 1-2

Machine Room Duct, Conduit and Wiring

Duct and Conduit

Warning! All electrical conduit and ductwork must be used, properly bonded and grounded according to Article 620, section J of the latest National Electrical Code.

Warning! Use caution when cutting or punching holes into the controller cabinet to prevent metal filings from entering cabinet.

- Always run the encoder wiring in a separate conduit to the controller.
- Always run the power wiring from the disconnect and the transformer (if required) into the controller separately.
- Use the flex conduit when connecting to machines, transformers and chokes to minimize mechanical and electrical vibrations.

Machine Room Wiring

Power wiring to the controller: The power wiring can be a 2, 3 or 4 circuit configuration dependent upon the drive system that is supplied.

- The first circuit common to all drive types is an independent single phase supply for the cab lighting circuit. Usually 120 VAC for North America. This circuit should be a 15 amp fused circuit. [See Figure 1-3.]

Cab Circuit Lighting

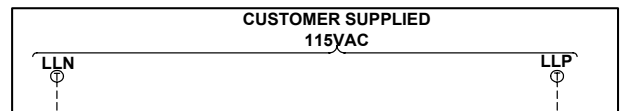


Figure 1-3

Note: The Futura controller transformer is not designed to support cab lighting and cab ventilation. Using the Futura 120 VAC control circuits in this manner may cause damage to the transformer and possibly void the warranty.

- The second circuit required common to all drive types (for the 1st controller of each group only) is a separate independent emergency backed single phase 120 VAC circuit for North America to supply power for the hall call circuitry. This circuit should also be a 15 AMP fused circuit. [See Figure 1-4.]

Group Power Circuit

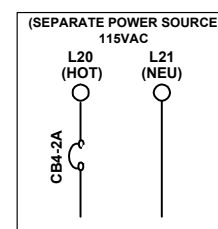


Figure 1-4

- The third circuit required common to all drive types is 3 phase Main Line power. This 3 phase power will either connect directly into a fuse block in the drive side of the controller or to the primary side of an Isolation, Step Up or Step Down power transformer. If a power transformer is used the secondary side will be wired to the fuse block in the drive side of the controller. [See Figure 1-5a and 1-5b.]

Three-Phase Power Circuit on an AC Drive

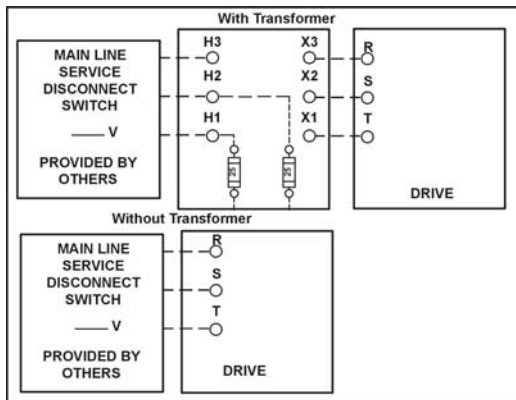


Figure 1-5a

Three-Phase Power Circuit on a DC Drive

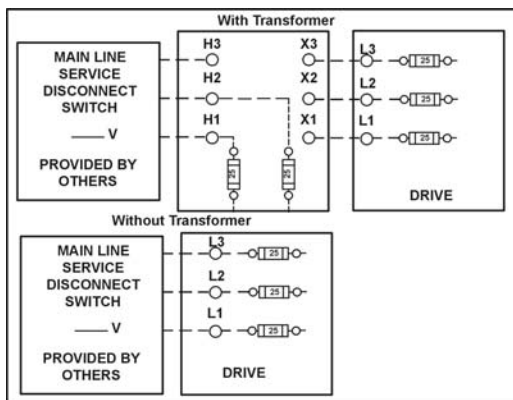


Figure 1-5b

- The fourth circuit will only be required if a power transformer is used. A separate fused circuit from the primary side of the power transformer terminals H1 and H2 to the FP1 fuse block on the drive side of the controller. [See Figure 1-6.]

Controller Power Circuit

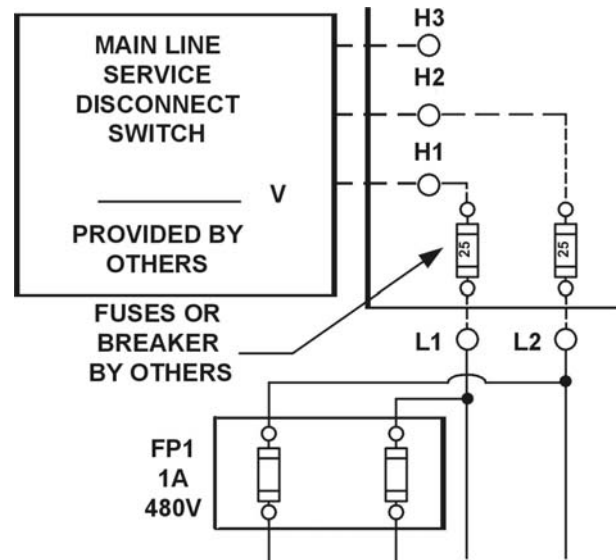


Figure 1-6

Warning! All wire sizes are to be in accordance to the National Electrical Code.

Warning! The main line power must supply a ground wire in accordance to National Electrical Code that is continuous to the source or to an earth ground connection.

Power wiring to the hoist machine: There will be 2 to 4 circuits required to the elevator hoist machine.

- The first is to the motor that consists of current conductors wired from the drive output through the choke (if required) to the motor and a ground wire to the grounding lug at the drive side of the controller. [See Figure 1-7.]

SITE PLANNING & INSTALLATION

Motor Wiring

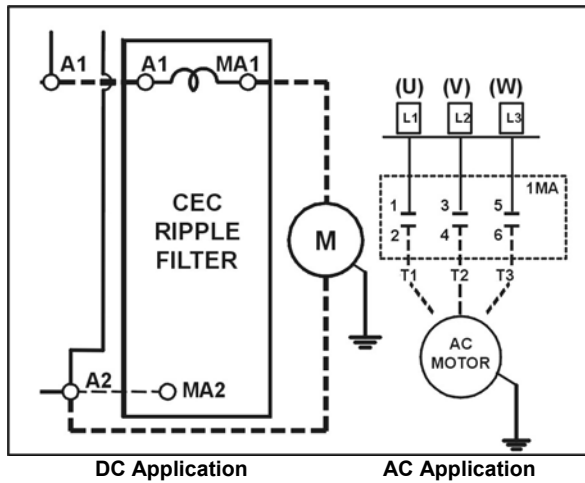


Figure 1-7

- The second circuit will be to provide power to the brake coil and wiring to the Brake Switch (if available see wiring diagrams for details). These 4 wires can be run with the motor wires. [See Figure 1-8.]

Brake Wiring



Figure 1-8

- The third circuit is to bring power to the Motor Fields (if a DC motor is used). These 2 wires can be run with the motor wires. [See Figure 1-9.]

Motor Field Wiring

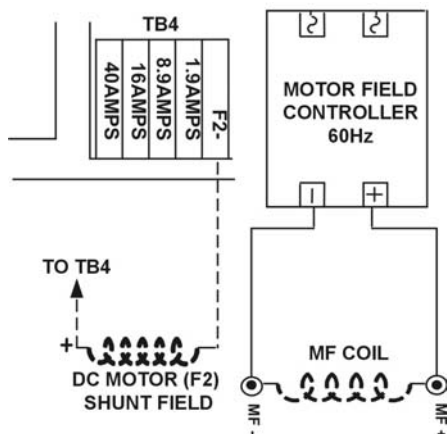


Figure 1-9

- The fourth circuit is for the brake switch (if required). These 2 wires can be run with the motor wires.

Power wiring to the generator: There will be 4 circuits required to the generator (if applicable).

- The first is for the generator A/C motor, that consists of current conductors wired from the controller starter relays to the A/C motor windings. [See Figure 1-10.]

M.G. Motor Wiring

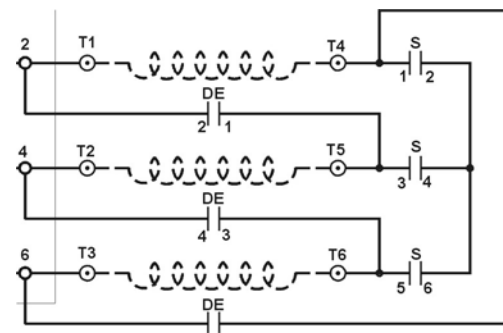


Figure 1-10

- The second is for the Motor Loop that consists of current conductors wired from the controller to the generator armature. [See Figure 1-11.]

M.G. Loop Circuit

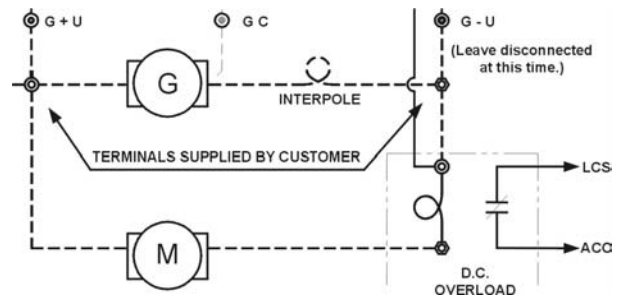


Figure 1-11

- The third is for the generator field that consists of current conductors that wire from the controller to the Field windings of the generator. [See Figure 1-12.]

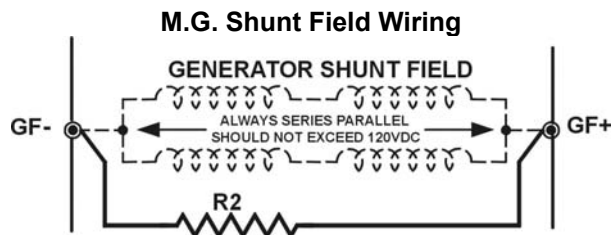


Figure 1-12

- The fourth is for the generator feedback circuits, that consists of two shielded pairs from the controller to the generator armature and the generator inner-poles. [See Figure 1-13.]

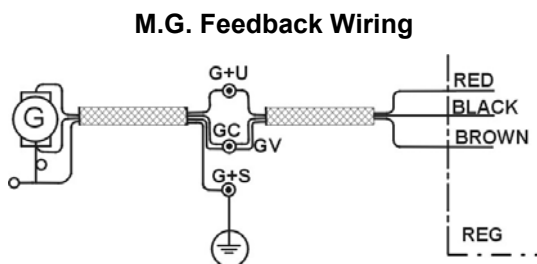


Figure 1-13

Tach Wiring: The tach uses 1 twisted shielded pair. This wiring must be run in separate conduit from the tach to the controller.

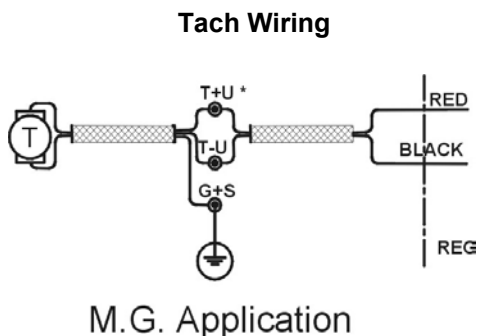
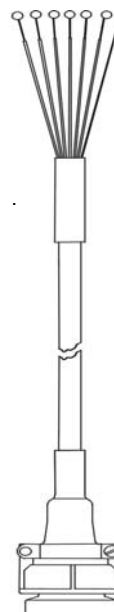


Figure 1-14

Motor Encoder wiring: The encoder wiring uses 3 twisted shielded pairs. This cable is provided from CEC on most applications. [See Figure 1-15.] This wiring must be run in a separate conduit from the encoder to the drive side of the encoder.

Motor Encoder

	ENCODER TYPE				TERMINAL		
	SOLID SHAFT ALL	HOLLOW SHAFT 1024			DSD 412	HPV 900	SWIFT 10K
	DYNAPAR 7 PIN	DYNAPAR 10 PIN	KUBLER 9 PIN	REULAND 9 PIN	TB1	TB1	CONN 2
5V	D	D	2	2	1	25	30
COM	F	F	7	1	43	19	31
A	A	A	1	3	2	21	26
\bar{A}	C	H	3	6	3	20	27
B	B	B	4	4	4	23	28
\bar{B}	E	I	5	7	5	22	29
SHLD					6	26	GND



SCR & VVVF APPLICATION

Figure 1-15



Governor wiring: Two 18 Ga. wires are required from the electrical safety switch on the governor to the controller. [See Figure 1-16.] (2000 code compliant also requires an OSD {100% Over Speed} input.

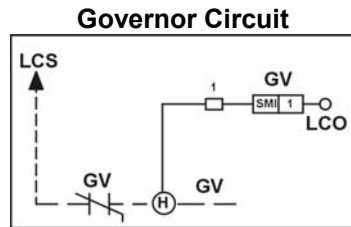


Figure 1-16

Hoistway Switches, Tape and Tapeless Installation, Conduit and Wiring

Hoistway Limit Switches

The Futura controller uses Final, Direction and Terminal Slowdown switches.

Final limits: Final limits are used at both the top and bottom of the hoistway. They are usually set to open for the bottom final 1" prior to the car hitting the car buffer. The top final is usually set to open 1" prior to the counterweight hitting the counterweight buffer. These switches are wired into Safety Circuit in series. See Wiring Diagrams.

Directional Limits (normal limits): Directional limits are also used at both the bottom and top of the hoistway. **During installation**, they are usually set so they open prior to floor level so that a car traveling at 50 FPM in either direction will strike its appropriate switch and stop approximately floor level. This distance should be approximately 2"

below top floor and 2" above bottom floor. [See Figure 1-17.] Each of these switches wire directly to the controller. Final installation +/- 2" floor level.

Normal Limits

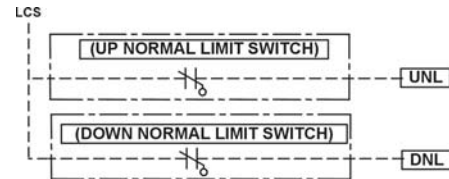


Figure 1-17

Terminal Slowdown Switches: These slowdown switches are also used at the bottom and top of the hoistway. The number of these switches is dependent upon the contract speed of the elevator. [See Figure 1-18.] These switches wire directly to the controller. See Wiring Diagrams.

Note: These switches may be moved during Terminal Slowdown Setup. Make sure enough slack in the wiring is available to move any switch up or down 12".

Slowdown Limit Switches

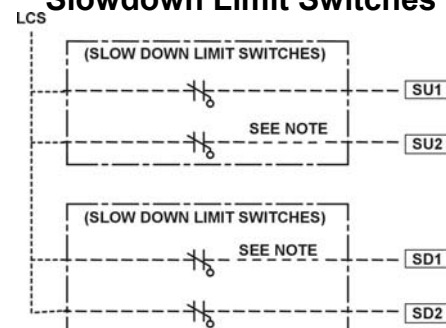


Figure 1-18

Slowdown Limit Switch Table

FPM	(m/s)	SLD1/TSV1	SLD2/TSV2	SLD3/TSV3	SLD4/TSV4
100	(0.51)	14" (36 cm)/80			
200	(1.02)	19" (49 cm)/160			
250	(1.27)	29" (74 cm)/210			
300	(1.52)	42" (107 cm)/260			
350	(1.78)	54" (137 cm)/310			
400	(2.03)	48" (122 cm)/310	90" (220cm)/360		
450	(2.29)	48" (122 cm)/310	90" (220cm)/410		
500	(2.54)	48" (122 cm)/320	102" (259cm)/460		
600	(3.05)	48" (122cm)/320	102" (259cm)/460	143" (363cm)/550	
700	(3.56)	48" (122 cm)/310	119" (302cm)/500	198" (503cm)/650	
800	(4.06)	48" (122 cm)/320	119" (302cm)/500	198" (503cm)/650	240" (610cm)/750
900	(4.57)	48" (122cm)/320	119" (302cm)/500	198" (503cm)/650	240" (610cm)/850
1000	(5.08)	48" (122 cm)/320	119" (302cm)/500	198" (503cm)/650	264" (670cm)/950
1200	(6.09)	48" (122cm)/320	119" (302cm)/500	198" (503cm)/650	264" (670cm)/950

Table 1

Emergency Terminal Slowdown Switch: These Emergency switches are also used at the bottom and top of the hoistway (not used on low speed cars). See wiring diagram for details. These switches open as the car comes into a terminal, **after one slowdown limit switch has been opened.**

Vane Installation for Tapeless Applications: The Futura is designed to run as a taped application but can also be run as a tapeless application. A vane is mounted at each floor that will signal the controller when it is at a floor. The vanes are mounted on the rail at a level off the hoistway sill that its center is at the same height as the center of the CPT when the car is exactly floor level. [See Figure 1-19 & section 1-15.]

Tapeless Car Position Transducer

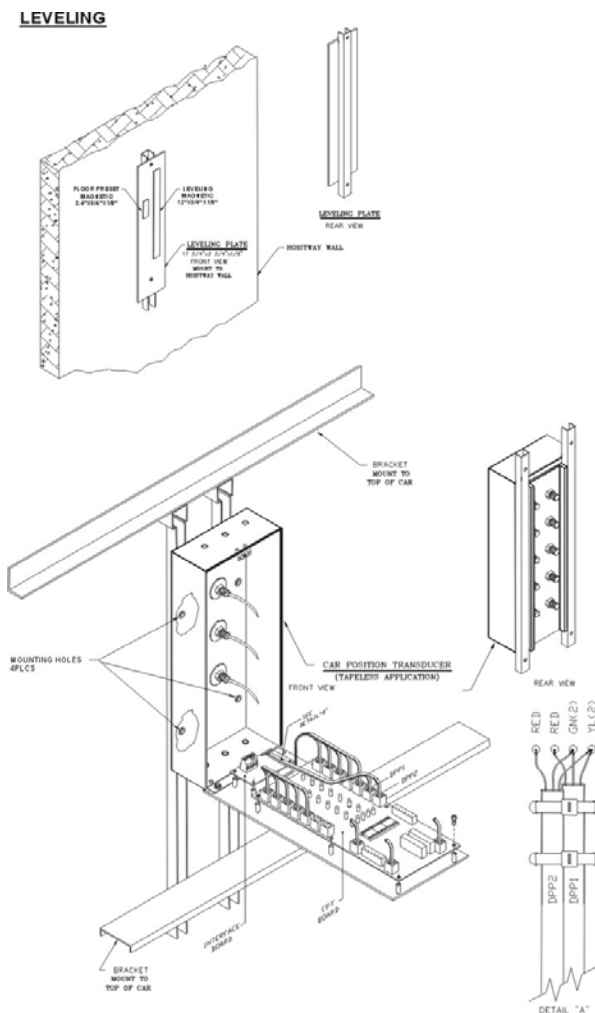


Figure 1-19

Installation for Tape Application:

Mounting the Tape:

- Locate the quadrant of the hoistway where the tape would not interfere with switches, governor, etc.
- Mount top tape support bracket on the main guide rail high enough so that the car, sitting on a compressed counterweight buffer, would not strike the bracket. [See Figure 1-20 & section 1-15.]

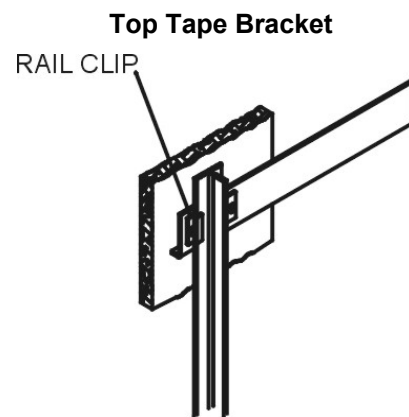


Figure 1-20

- Make sure the support bracket is square to the main guide rail and securely fastened.
- For most installations place the spool of tape on reel stands and pull the end of the tape up to the top support bracket and secure (snug but still allow to swing right to left).
- Once the tape is connected to the top support bracket and extends the length of the hoistway, allow the tape to hang freely for some period of time (overnight) to allow any twists to disperse.
- After the tape has been allowed to hang freely for a period of time, loosely mount the bottom support bracket. Position the bracket so it is low enough to not interfere with any over travel of the car and is in line with the top support bracket and the centerline of the tape.

SITE PLANNING & INSTALLATION

- With the tape hanging motionless secure it to the top bracket. [See Figure 1-21.]

Top Tape Bracket with Support

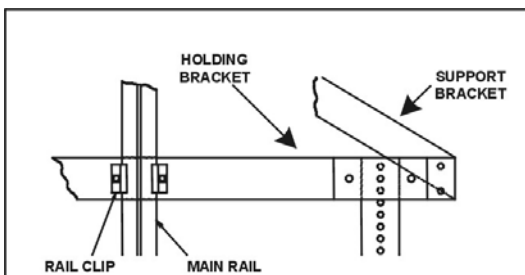


Figure 1-21

- Double over a short portion of the end of the tape and secure the bottom portion of the tape between plate #1 and plate #2. Cut off and discard remaining tape. [See Figure 1-22.]

Bottom Spring Tension Plates

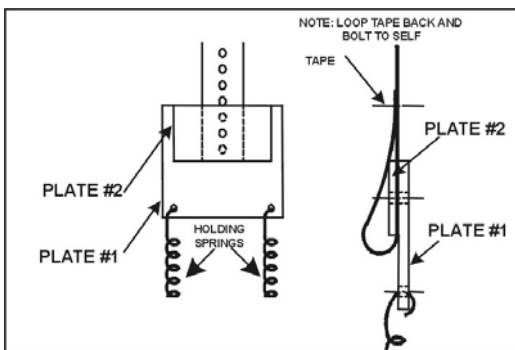


Figure 1-22

- Connect tension springs to plate #1 and to support bracket plate #1. [See Figure 1-23.]

Bottom Tape Tensioning Assembly

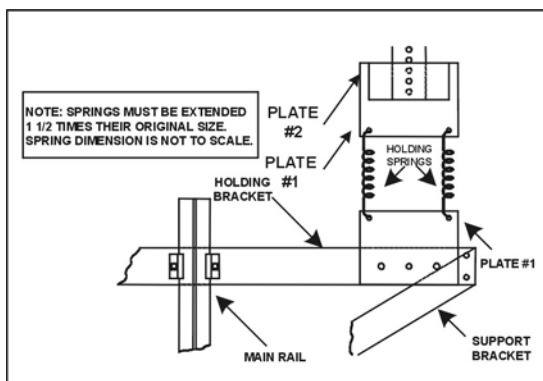


Figure 1-23

- Position the bottom support bracket to a position below the support bracket plate #1 that would allow the springs to become stretched to 1.5 times their original lengths. Verify the support bracket is in line with the top bracket and the centerline of the tape. Securely mount the bottom support bracket to the rail. [See Figure 1-24.]

Bottom Tape Bracket

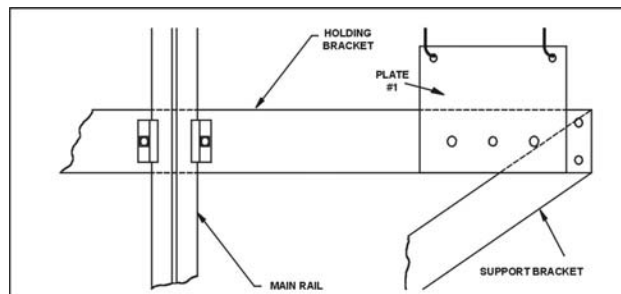


Figure 1-24

- Pull the bottom support bracket plate #1 down and secure it to the bottom support bracket. Verify the springs are approx. 1.5 times their original lengths, move the bottom support bracket if required [See Figure 1-25.]

Tape Tensioning

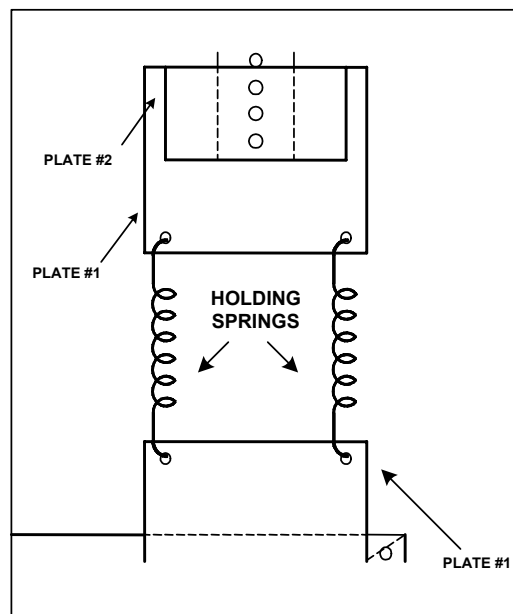


Figure 1-25

Note: For proper operation and longevity of the selector tape guides the tape must run true from top to bottom without any twists.

Hall Position Indicator, Push Button and Hall Lantern Wiring

Hall Lantern

The Futura can support 2 different configurations of wiring for Hall Lanterns: Discrete Circuit and Serial. Check the wiring diagrams for the configuration used for this job.

Discrete Circuit:

- From the controller, a Common wire is run the length of the hoistway of an individual elevator.
- A UHL and DHL wire per floor is run from the controller to the hall lantern.
- From the hall lantern, wires are connected to the applicable wires in the hoistway.
- This process is repeated for every floor where a hall lantern exists. See wiring diagrams for detail.

Serial:

- From controller terminals (VL+, VLC) and SPU (HLRT+, HLRT-), 2 power wires and 1 twisted pair all of 12 gauge wire are run the entire length of the hoistway.
- Connect to the bottom of these wires a HPU Termination board. [See Figure 1-26.]

HPU Termination Board

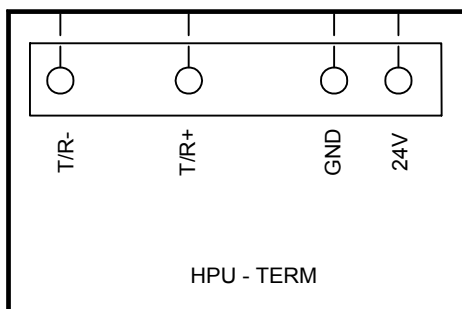


Figure 1-26

- Run the cable provided by CEC from the hall lantern box to the hoistway duct.

- Connect the cable to the wires using the provided fasteners. [See Figure 1-27.]

HPU Wiring Harness

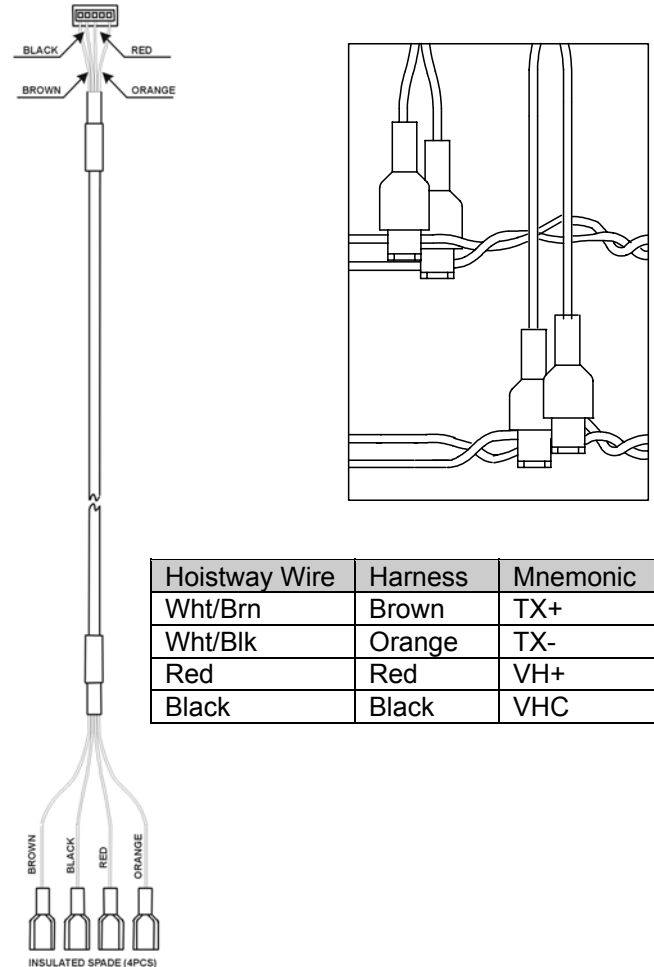


Figure 1-27

- Connect the other end of the cable to the Hall Lantern HPU board P1 (5 pin) connector (HPU is to remain in the Hall Lantern box). Verify that the connections correspond to their appropriate connections in the hoistway.
- Connect the Hall Lantern devices to the CEC supplied cable as shown in the wiring diagrams.
- Connect the Hall Lantern cable to the P5 (5 pin) connector on the HPU board. [See Figure 1-28.]

Hall Lantern Wiring

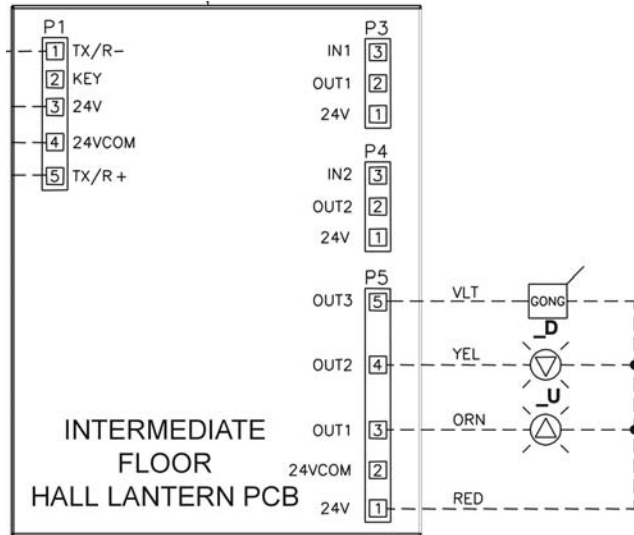


Figure 1-28

- Verify the HPU address jumpers are correct for that floor. [See Figure 1-29.]

H/L and P.B. HPU Card

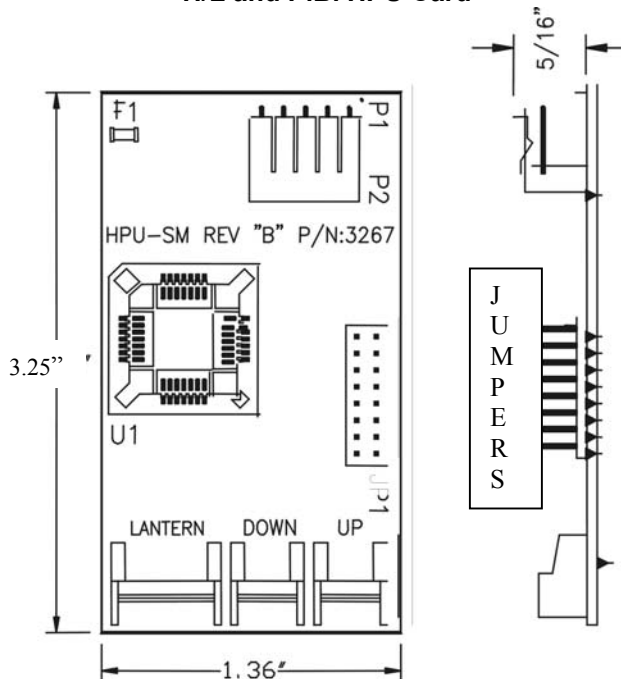


Figure 1-29

- Verify all connections are correct and that the plastic insulating sleeve is installed over the HPU.

Hall Push Buttons

The Futura can support 2 different configurations of wiring for Hall Push Buttons: Discrete Circuit and Serial. Check the wiring diagrams for the configuration used for this job.

Discrete Circuit:

- From the group controller, Power and Common wires are run the length of the hoistway of an individual elevator.
- From the hall push button, wires are connected to the applicable wires in the hoistway.
- The 3rd and 4th wires (usually from a multi-cable from the group controller) for that particular floor are also connected to the hall push button.
- This process is repeated for every floor where a hall push button exists. See wiring diagrams for detail.

Serial:

- From group controller terminals (VH+, VHC) and SPU Link terminals (HCRT+, HCRT-), 2 power wires and 1 twisted pair all of 12 gauge wire are run the entire length of the hoistway.
- Connect to the bottom of these wires a HPU Termination board. [See Figure 1-26.]
- Run the cable provided by CEC from the hall push button box to the hoistway duct.
- Connect the cable to the wires using the provided fasteners. [See Figure 1-27.]
- Connect the other end of the cable to the Hall Push Button HPU board P1 (5 pin) connector (HPU is to remain in the Hall Call box). Verify that the connections correspond to their appropriate connections in the hoistway.

Warning!

Failure to keep the connection correct will cause damage to the HPU board and possible void of board warranty.

- Connect the hall push buttons to the CEC supplied cable as shown in the wiring diagrams.
- Connect the Hall Push Button cable(s) to the P3 and/or P4 (3 pin) connector(s) on the HPU board. [See Figure 1-30.]
- Verify the HPU address jumpers (JP1) match the SMI sheet for that floor. [See Figure 1-29.]

Hall P.B. Wiring

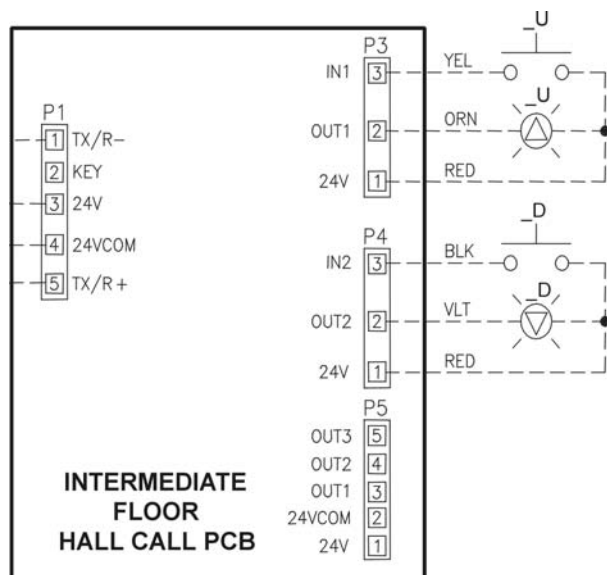


Figure 1-30

- Verify all connections are correct and that the plastic insulating sleeve is installed over the HPU.

Note: When routing the HPU wiring through the controller it is important to keep 6" or more clearance from any high voltage wiring.

Hall Position Indicators

The Futura can support 2 different configurations of wiring for Hall Position Indicators: Discrete Circuit and Serial. Check the wiring diagrams for the configuration used for this job.

Discrete Circuit:

- From the controller, Power and Common wires are run the length of the hoistway of an individual elevator.

- From the P.I., wires are connected to the applicable wires in the hoistway.
- A wire (usually from a multi-cable from the controller) for each particular floor is also connected to the P.I. or wires from a decoder board in the controller.
- This process is repeated for every floor where a hall position indicator exists. See wiring diagrams for detail.

Serial:

- From controller terminals (VL+, VLC) and SPU LINK (HLRT+, HLRT-), 2 power wires and 1 twisted pair all of 12 gauge wire are run the entire length of the hoistway.

Note: If serial hall lanterns are used, connection should be made to these wires.

- Run the cable provided by CEC from the P.I. box to the hoistway duct.
- Connect the cable to the wires using the provided fasteners. [See Figure 1-27.]
- Connect the other end of the cable to the Hall P.I. verifying that the connections correspond to their connections in the hoistway. [See Figure 1-31.]

Hall P.I. Wiring

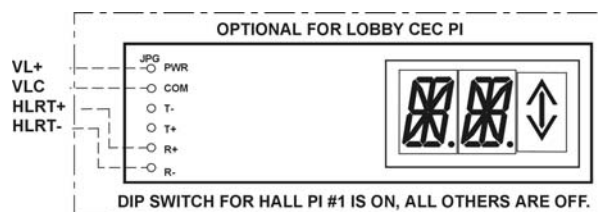



Figure 1-31

Warning! Failure to keep the connection correct will cause damage to the P.I. board and possible void of board warranty.



- Repeat this process wherever a hall position indicator is present.

Car Top Box and Encoder Installation

Car Top Box: The standard Futura Car Top box is 22.5" W X 15.5" D. It contains the terminals for the termination of the traveling cable wires as well as the CPT, COP, CC1, Door Board, Car top inspection station, Work light and Car position indicators. This box must be placed in a convenient location for piping and wiring as well as conforming to any and all codes governing car top clearances. (usually mounted on the front side of car top next to cross head). [See Figure 1-32.]

Car Top Box

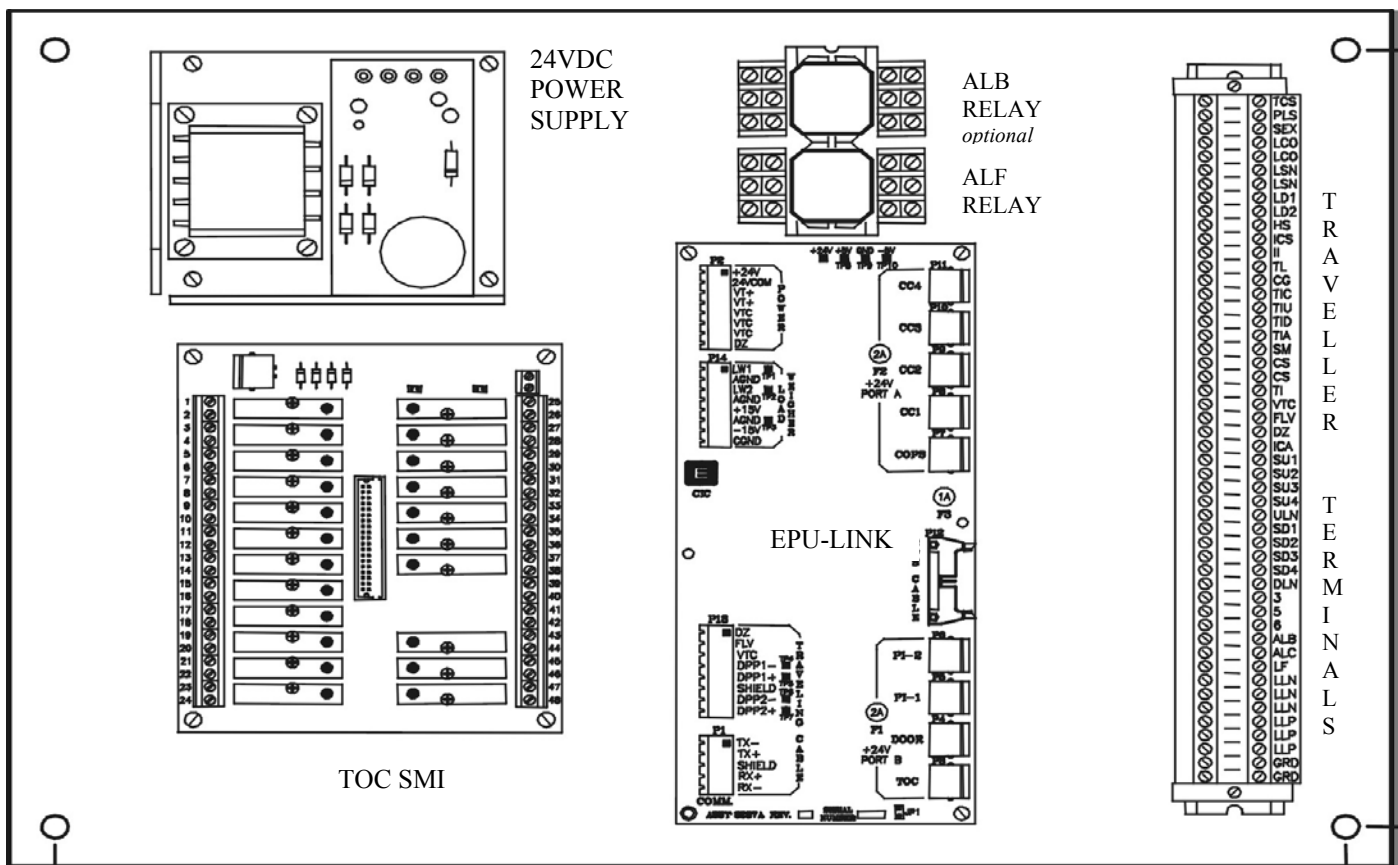


Figure 1-32



Car Position Encoder For Tapeless Installations: This encoder is mounted on the crosshead above the roller guides. [See Figure 1-33.]

Car Encoder Mounting

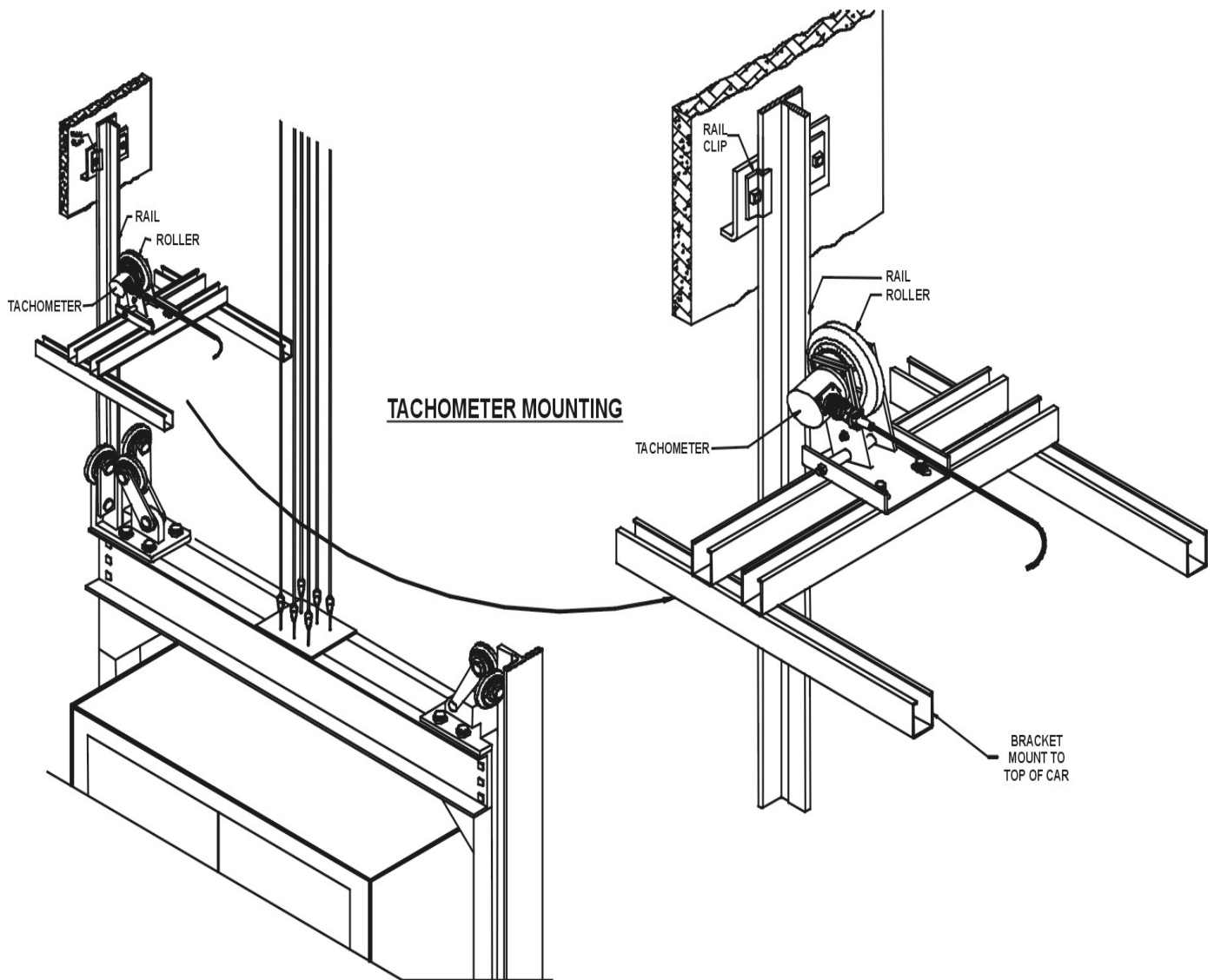


Figure 1-33



Taped CPT Installation

The bracket for the CPT is mounted plumb from top to bottom on the car top in the same quadrant where the Selector is to be located. [See Figure 1-34.]

Tapeless installation

See supplement at end of chapter (1-19)

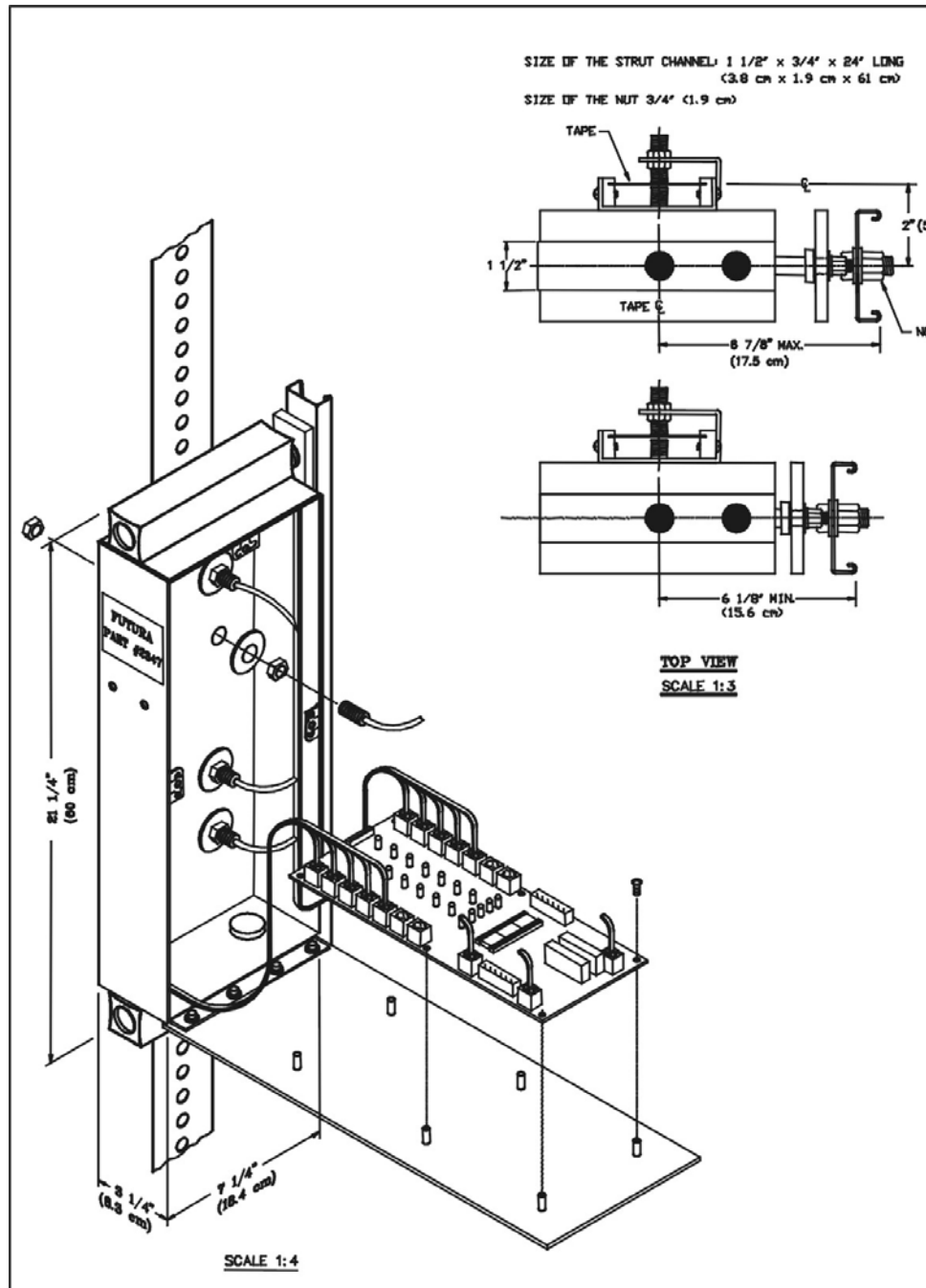


Figure 1-34

Magnet Placement

The Futura tape and tapeless systems incorporate a series of magnets for leveling and floor identification. The magnets consist of a 12" Leveling Magnet and 3" Parity Magnets. Place the car floor exactly floor level.

1. Scribe a mark across the tape that is even with the top of the CPT.
2. Using the template provided, place the template on the left side of the tape with the R1, R2, etc. facing outward. (modify template for tapeless application see 1-19)
3. Align the top of the template even with the scribed mark in step 2.
4. Place the 3" magnets in their proper location as shown in the table.
5. Turn the template over and place it against the right side of the tape.
6. Again aligning the top of the template to the scribed mark. Place the 12" magnet at the position shown on the template.
7. Repeat until all floors have magnets installed.
8. Secure magnets after final adjustments.

Magnetic Placement Table – Low Floors

Floor	R16	R8	R4	R2	R1	OP
1	-	-	-	-	M	-
2	-	-	-	M	-	-
3	-	-	-	M	M	M
4	-	-	M	-	-	-
5	-	-	M	-	M	M
6	-	-	M	M	-	M
7	-	-	M	M	M	-
8	-	M	-	-	-	-
9	-	M	-	-	M	M
10	-	M	-	M	-	M
11	-	M	-	M	M	-
12	-	M	M	-	-	M
13	-	M	M	-	M	-
14	-	M	M	M	-	-
15	-	M	M	M	M	M
16	M	-	-	-	-	-

Magnetic Placement Table – High Floors

Floor	R16	R8	R4	R2	R1	OP
17	M	-	-	-	M	M
18	M	-	-	M	-	M
19	M	-	-	M	M	-
20	M	-	M	-	-	M
21	M	-	M	-	M	-
22	M	-	M	M	-	-
23	M	-	M	M	M	M
24	M	M	-	-	-	M
25	M	M	-	-	M	-
26	M	M	-	M	-	-
27	M	M	-	M	M	M
28	M	M	M	-	-	-
29	M	M	M	-	M	M
30	M	M	M	M	-	M
31	M	M	M	M	M	

Table 2 (R32- reverse polarity on magnet)

COP and CC1 Board Installation

These boards are normally located in the Car Operating Panel. [See Figure 1-35.]

Call Car Wiring

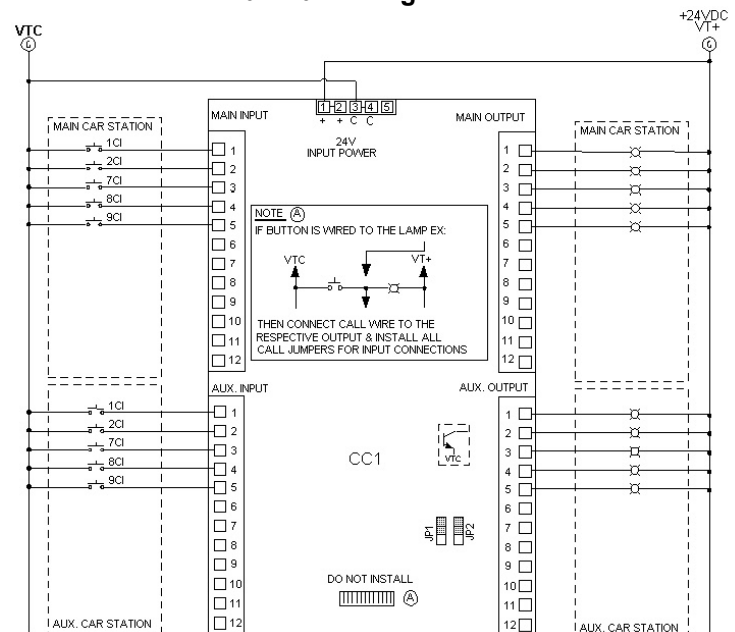


Figure 1-35

SITE PLANNING & INSTALLATION

These boards are connected to the EPULINK using the gray phone cable provided. Each device will have a port designated for installation of the communication cable.

Note: See wiring diagrams for job specific wiring of the COP and CC1 boards.

Door Board Installation

The door board is supplied in its own 12" wide controller box. [See Figure 1-36.]

Door Board Controller Drawing

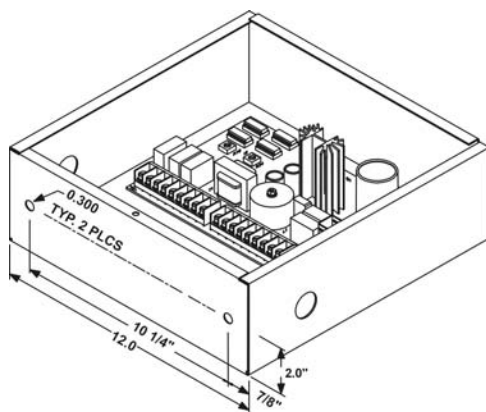


Figure 1-36

The door board requires the following inputs from the existing operator: DOL, DCL, DL6, ODS1, ODS2, CDS1, CDS2 limits. [See Figure 1-37.]

Note: These inputs must be dry inputs (no voltage other than supplied by door board) from the operator. Verify no other wiring exists on these switches other than what is required on wiring diagrams.

Door Operator Wiring

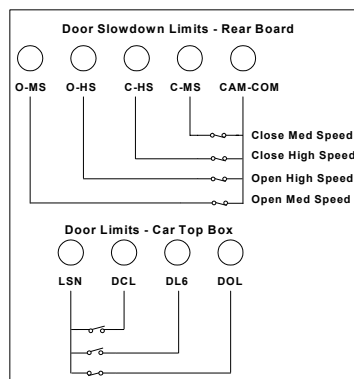


Figure 1-37

The door board also requires an armature connection to the door motor and a motor field connection (if required). Check existing door motor for details on motor field requirements. [See Figure 1-38.]

Motor Field Wiring

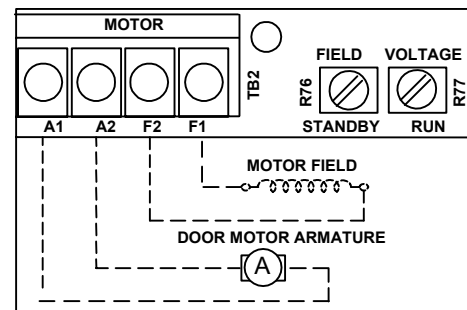


Figure 1-38

From the Top of CAR controller (TOC) there will be 3 inputs required to the door boards. They are DO, DC and Nudging (NR). [See Figure 1-39.]

Door Controller Wiring

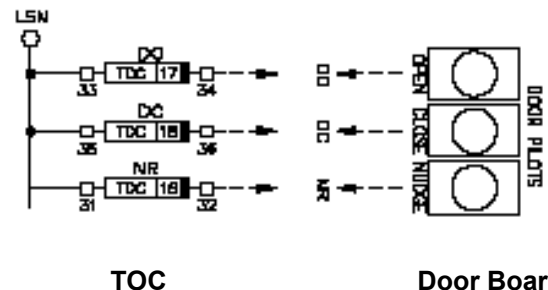


Figure 1-39

From the controller the Door Board will require these 2 power supplies: LSN/LCO and LD1/LD2. These supplies will be available on the terminal connectors in the TOC. [See Figure 1-40.]



Door Controller Power Wiring

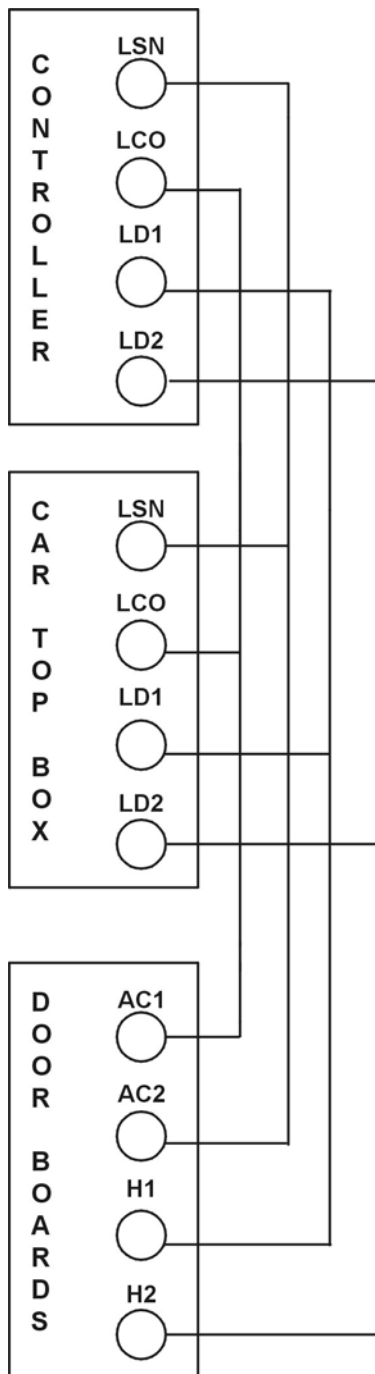


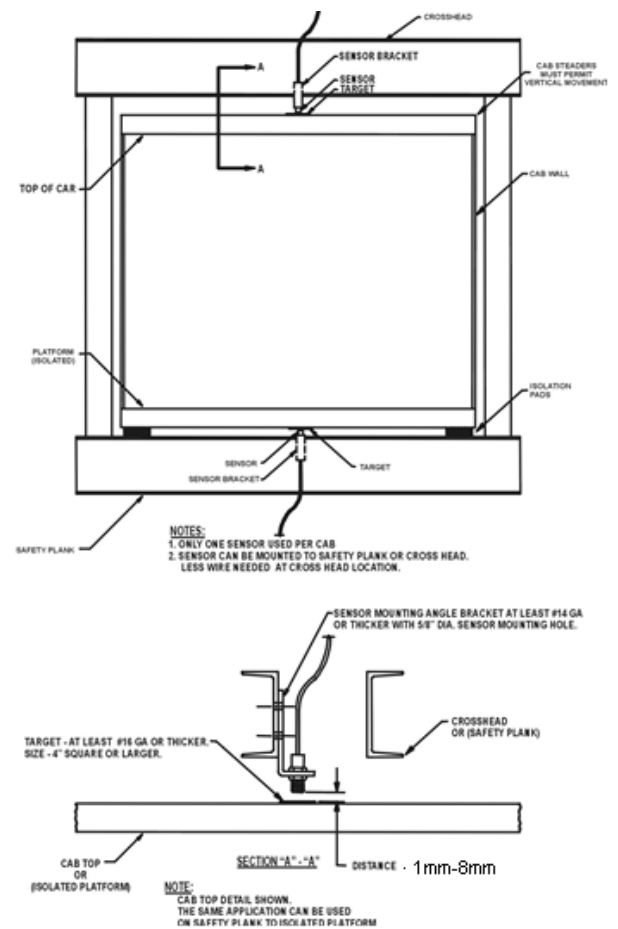
Figure 1-40

Load Weigher

The loadweiger can be mounted in 2 locations: Either on the car top or under the isolation platform. [See Figure 1-41.]

Load Weigher Mounting

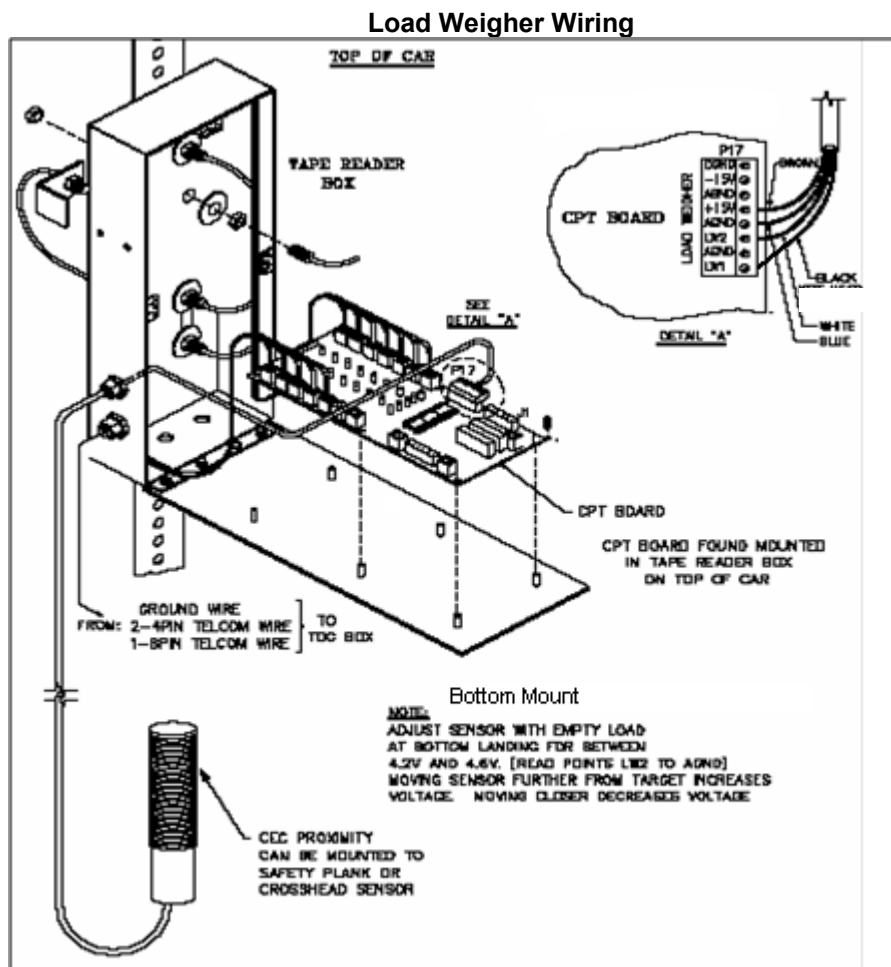
Figure 1-41





Once proper location has been determined and the load weigher mounted it will plug into the CPT unit. [See Figure 1-42.]

Figure 1-42



Car Safety Circuit Wiring.

The remaining safety devices located on the car are wired to the Car Top box. See wiring diagrams for specific details.

Hoistway and Car Door Locks

See the wiring diagrams for your particular job for specific wiring details.



Tape-less Car Position Transducer (CPT)

Installation

Note: This section is to be used as a reference guide only. Job conditions may vary and installation technique may need to be altered to fit the specific job requirements. When installing the CPT and hoistway magnet plates, consider the location and what will be best suited to properly align the CPT with the magnet plates before proceeding. It is also necessary to have properly adjusted crosshead rail guides so as to provide a minimal amount of lateral motion (side to side) in the car crosshead. Excess motion, greater than ½ inches, may cause erratic sensor activation and affect performance.

1-Material Identification

- 1- Tape-less CPT
- 2- Magnet Plates
- 3- Leveling and parity magnets
- 4- Magnet template
- 5- "Unistrut" and rail clamps to fabricate rail mounted brackets (not supplied by CEC)
- 6- See pictures 1, 2, 3, 4, 5

2-CPT and CEC Supplied Material Checklist

- 1- Examine CPT for any visible damage and report this to CEC.
- 2- Leveling and parity magnets are a different size than the normal magnets used in a taped application. The magnets used in the tape-less application are 1/8th inches thick, 3/4th inches wide and 12 inches long for the leveling magnets and 2 & 3/8th inches long for the parity magnets. One 12" long leveling magnet is required for each landing, and for the required number of parity magnets for each landing consult the table in the main manual. Each magnet has an adhesive backing for application. Peel off the white backing strip to expose the adhesive when installing magnets.
- 3- One magnet plate is required for each landing
- 4- Leveling sensors and parity sensors are a special manufacture and are identified by a "bar" or "line" across the face of the sensor. This "concentrator" must be specifically oriented when reading the magnets as illustrated in Drawing #1 below. The sensors should be factory set for correct orientation and depth, however, this should be verified before installation. See pictures 25, 26, 27, and 28.



3-Hoistway Magnet Plate Installation

- 1- Determine the best location for the magnet plates to be installed.
- 2- Drop a plumb line down the length of the hoistway as a guide for installing brackets for the magnet plates.
- 3- "Unistrut" or other type of bracket can be used to mount the magnet plates off of the main guide rails.
- 4- Verify that the brackets are plumb and level. Refer to picture 6, and 7.
- 5- Install magnet plate mounting strut and verify that it is plumb, level and set equally distant on the top and bottom from the guide rail. Make this strut long enough to adjust the plate up or down approximately 1-2 inches. Refer to pictures 8, 9,10, and 11.
- 6- Install the magnet mounting plate to the strut and again verify that the plate is plumb, level and set equally distant on the top and bottom from the guide rail. Refer to pictures 12,13 and 14.
- 7- Repeat steps 3 thru 6 for each landing.
- 8- Install CPT in a secure location, preferably off the crosshead steel. It is recommended that the mounting bracket be fabricated from "Unistrut" or some other type of slotted rigid steel to facilitate adjusting.
- 9- Align CPT to the center of the magnet plates, plumb and level and set distance from the magnet plates to provide approximately ½ inches of clearance from the edge of the CPT sensor guard to the magnet plate. See pictures 15, 16, 17, and 18.
- 10- After installation of the CPT, verify clearances and run by on all floors and adjust as necessary. It is important that clearance measurements be constant on all floors as variations will cause erratic sensor activation and affect performance.

4-Magnet Installation

- 1- Verify that the CPT and all magnet plates are level, plumb and clearances are set as outlined previously.
- 2- Set the level of the car so that the car doorsill is even with the hoistway doorsill. See Picture 19
- 3- Adjust the magnet plate so that the top of the plate is level with the top of the CPT. See picture 20.
- 4- Move the car away from the floor and verify that the magnet plate is plumb and level.
- 5- Using the template provided, align the top of the template with the top of the magnet plate, and on the right side of the plate install the 12-inch leveling magnet. See Picture 21.
- 6- Again using the template, align the top of the template with the top of the magnet plate, and on the left side of the plate install the required inch parity magnets. See Picture 22
- 7- Verify that the magnets are centered on the sensors and are straight on both sides of the magnet plate. See Pictures 27, 28 and 29
- 8- On Inspection, run the car past each floor magnet plate and verify that the sensors activate in the proper sequence.



5-Floor Level Adjustments

Note: The following procedure assumes that the controller and drive system have been adjusted for proper operation and speed, and that the AUTO SET-UP procedure to learn the floor positions has been successfully completed.

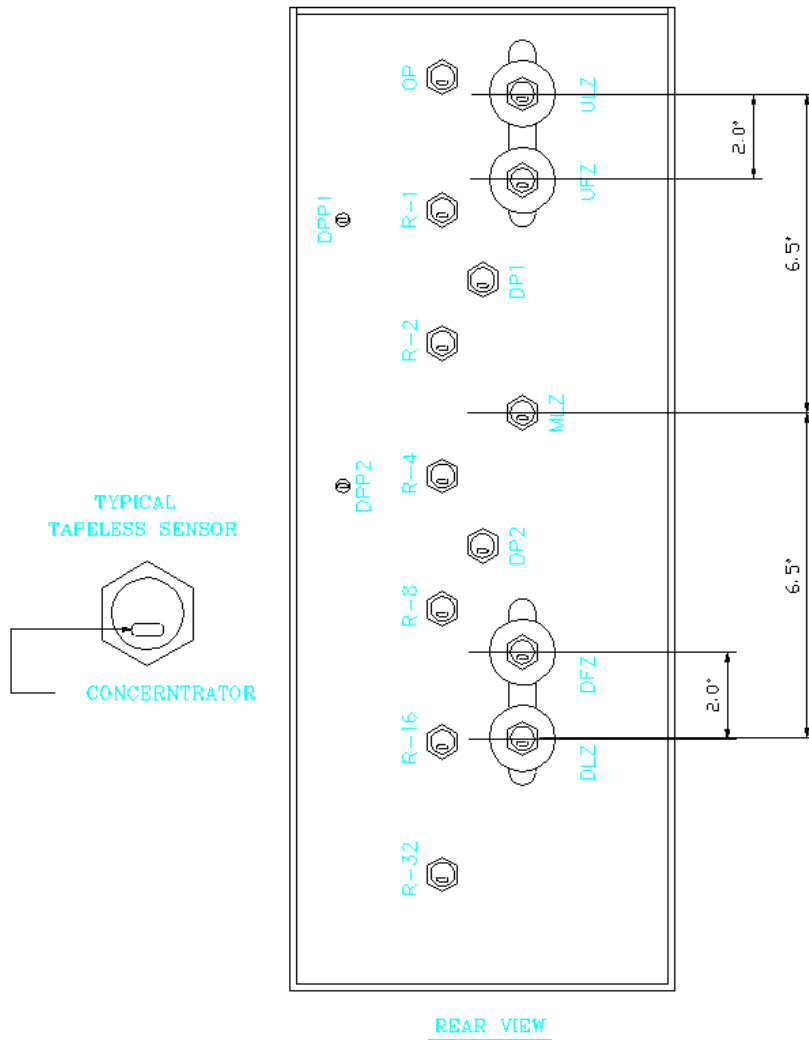
After the CPT, magnet plates and magnets have been installed and all clearances and plumb has been verified, you may begin to check and adjust floor stops.

- 1- Run the car floor-to-floor and record floor stops in both directions.
- 2- If the car stops above the floor in both directions or if the car stops below the floor in both directions by the same amount of distance, adjust the magnet plate up or down to correct.
- 3- If the car stops at the floor in one direction above and the other direction below the floor, verify that the magnet plate is set correctly, the leveling magnet is set correctly, clearances are the same on that floor as other floors and that all leveling sensors are activating correctly. Also verify the floor DPP count.
- 4- The "Dead Zone" has been pre-set in the previous steps, however you may need to decrease this distance. If it is necessary to do this, follow the procedures as outlined in FUTURA ADJUSTMENT PROCEDURES of this manual and decrease the distance to meet your specific needs.

FACTORY SETTINGS FOR TAPELESS SENSORS

Swift Futura

INSTALLATION



For tighter Dead Zone, use 6.25" from MLZ

- Notes
1. This diagram is to be used in-house for tapeless sensor set-up.
 2. Sensor adjustments measurements apply to both taped and tapeless applications.
 3. Sensors are shown in correct orientation for tapeless application.
 4. For taped application, sensor orientation is not necessary.
 5. Measurements shown are from center to center of sensors.

TAPELESS SENSOR SET-UP

DRAWING NO. 024

COMPUTERIZED ELEVATOR CONTROL CORP.
24 EMPIRE BLVD NODNACHIE, NEW JERSEY 07074 TEL. 201-508-2300

JOB NAME/LOC.:		
DATE:	CEC JOB NO.	CAR NO.
DRAWN BY:	DWG. NO.	REV.

15/11/05 14.3 R:\YOUNGS\MECH-DWG\DIAGRAMS\TAPELESS\024 TAPELESS.dwg



Picture #1



Picture #2



Picture #3



Picture #4



Picture #5



Picture #6



Picture #7



Picture #8



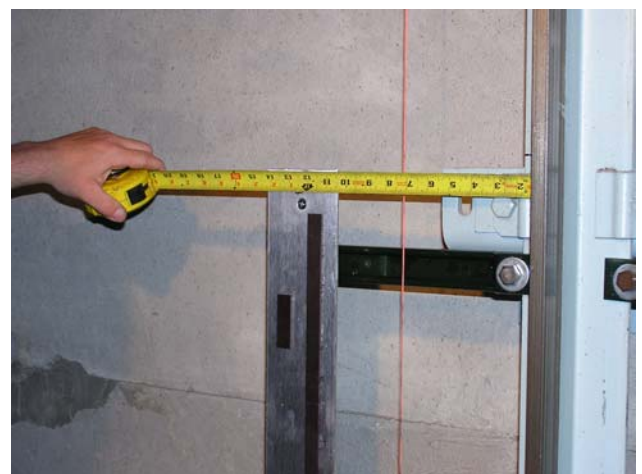
Picture #9



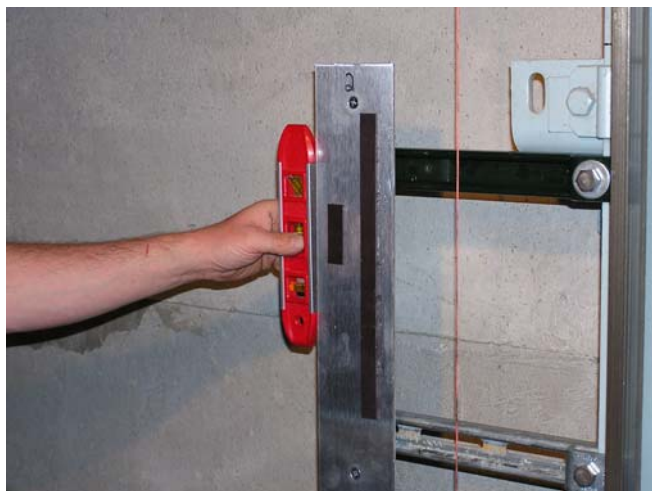
Picture #10



Picture #11



Picture #12



Picture #13



Picture #14



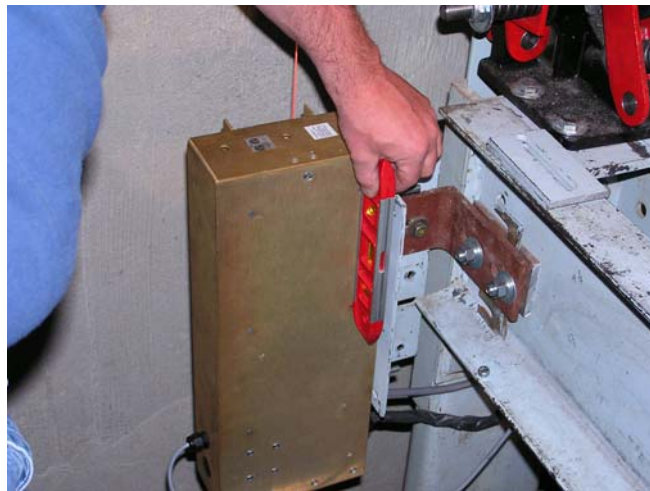
Picture #15



Picture #16



Picture #17



Picture #18



Picture #19



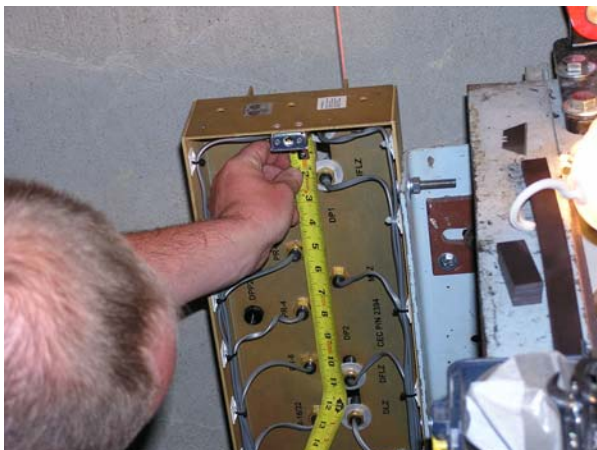
Picture #20



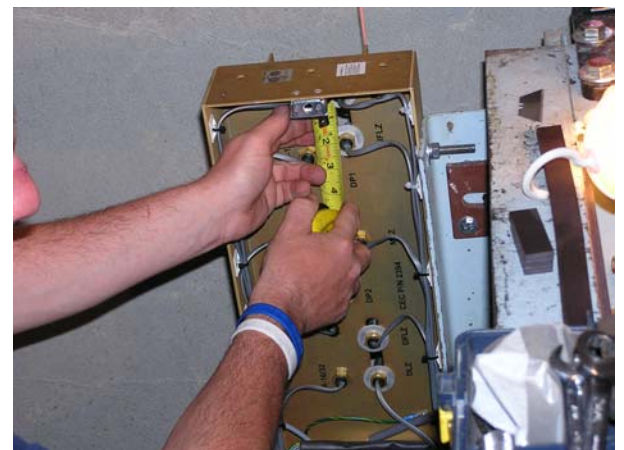
Picture #21



Picture #22



Picture #23



Picture #24



SECTION 2 - FUTURA STARTUP PROCEDURES HPV

MACHINE ROOM PREPARATIONS

Field Wiring Check

1. Verify Mainline disconnect is in the **OFF** position and properly locked out.
2. Verify all the circuit breakers on the front panel (located at the top of the controller) are in the **OFF** position. [See Figure 2-1.]

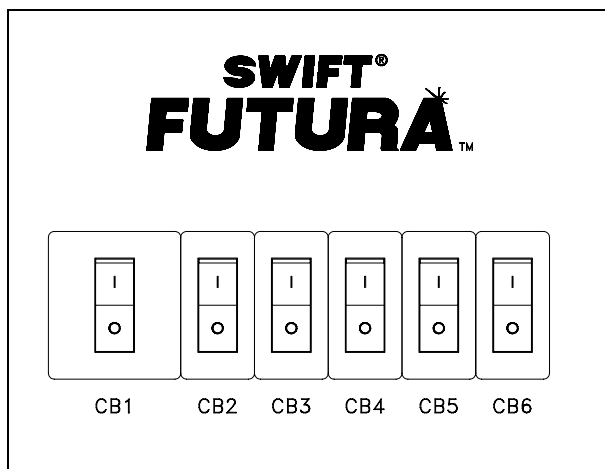


Figure 2-1

3. Turn the AUTO/TEST switch to the **TEST** position.
4. Verify that the following field wires are connected as described in the Installation portion of this manual.

Power wiring to the controller: The power wiring can be a 2, 3 or 4 circuit configuration dependent upon the drive system that is supplied.

- A. The first circuit common to all drive types is an independent single phase supply for the cab lighting circuit. Usually 120 VAC for North America and 230 VAC for the remainder of the world. This circuit should be a 15 amp fused circuit. [See Figure 2-2.]

Cab Circuit Lighting

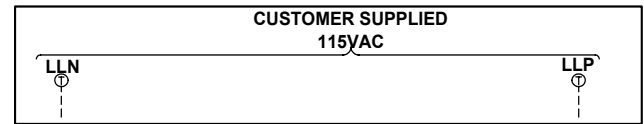


Figure 2-2

Note: The Futura controller transformer is not designed to support cab lighting and cab ventilation. Using the Futura 120 VAC control circuits in this manner may cause permanent damage to the main controller transformer.

- B. The second circuit required common to all drive types (**for the 1st controller of each group only**) is a separate independent emergency backed single phase 120 VAC circuit for North America and 230 VAC circuit for the remainder of the world to supply power for the hall call circuitry. This circuit should also be a 15 amp fused circuit. [See Figure 2-3.]

Group Power Circuit

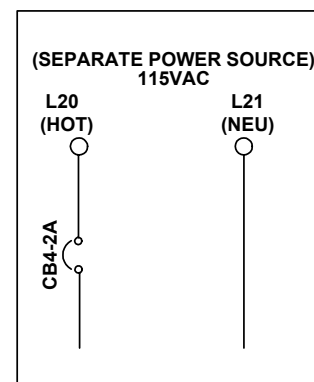


Figure 2-3

- C. The third circuit required common to all drive types is 3 phase Main Line power. This 3 phase power will either connect directly into a fuse block in the drive side of the controller or to the primary side of an Isolation, Step Up or Step Down power transformer. If a power transformer is used the secondary side will be wired to the fuse block in the drive side of the controller. [See Figure 2-4.]



Three-Phase Power Circuit

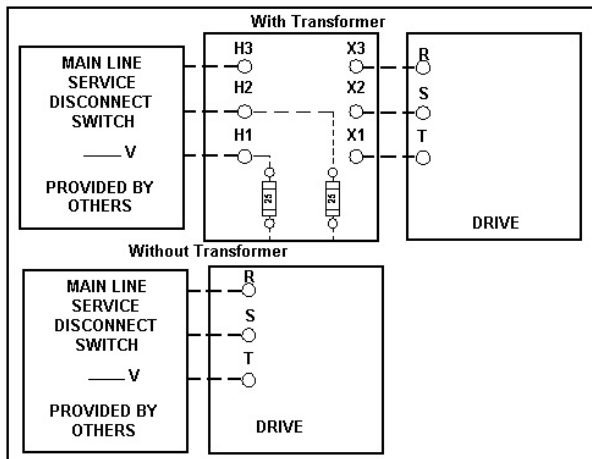
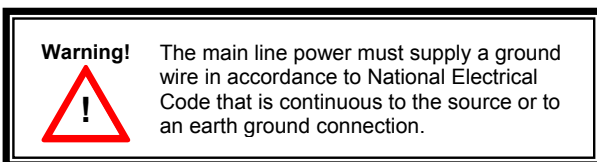
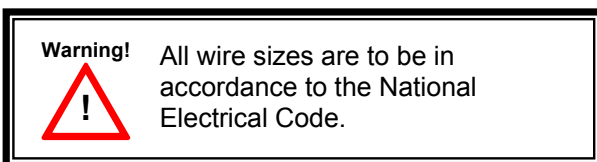


Figure 2-4

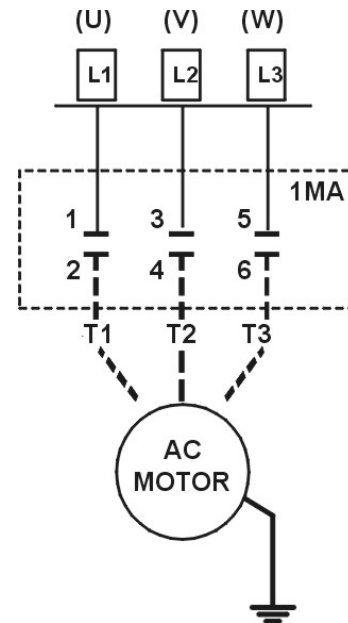


D. Power wiring to the hoist machine:

There will be 2 to 3 circuits required to the elevator hoist machine.

- 1) The first is to the motor that consists of current conductors wired from the drive output to the motor and a ground wire to the grounding lug at the drive side of the controller. [See Figure 2-5.]

Motor Wiring



AC Application

Figure 2-5

- 2) The second circuit will be to provide power to the brake coil. These 2 wires can be run with the motor wires. [See Figure 2-6.]

Brake Wiring

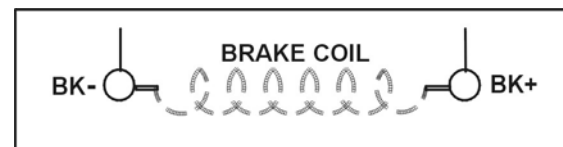


Figure 2-6

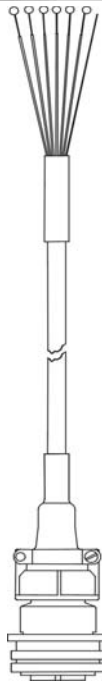
- 3) The third circuit is for the brake switch (if required). These 2 wires can be run with the motor wires

- E. Motor Encoder wiring: The encoder wiring uses 3 twisted shielded pairs. This cable is provided from CEC on most applications. It is imperative that this wiring be run separately from the encoder to the drive side of the encoder. [See Figure 2-7.]



Motor Encoder

	ENCODER TYPE				TERMINAL		
	SOLID SHAFT ALL	HOLLOW SHAFT 1024			DSD 412	HPV 900	SWIFT 10K
	DYNAPAR 7 PIN	DYNAPAR 10 PIN	KUBLER 9 PIN	REULAND 9 PIN	TB1	TB1	CONN 2
5V	D	D	2	2	1	25	30
COM	F	F	7	1	43	19	31
A	A	A	1	3	2	21	26
\bar{A}	C	H	3	6	3	20	27
B	B	B	4	4	4	23	28
\bar{B}	E	I	5	7	5	22	29
SHLD					6	26	GND



SCR & VVVF Application

Figure 2-7

F. Governor wiring: Two 18 Gauge wires are required from the electrical safety switch on the governor to the controller.

Brake and Motor Check

1. Check the brake coil:
 - A. Disconnect the brake coil leads (BK-&BK+).
 - B. With an ohmmeter, measure the coil resistance and verify it matches the value given on the straight-line diagram power distribution page.
 - C. Next measure the brake coil leads to ground and verify that neither brake lead is grounded.
2. With an ohmmeter measure the motor leads at the main contactor to ensure the motor is not grounded. This would be the at the 1MA contactor for VVVF job.

Transformer(s) Configuration

1. Verify all transformer taps are connected for proper voltage according to the Power Distribution page of the wiring diagrams.
2. Verify the mainline voltage:
 - A. Measure and record the input voltage at the mainline disconnect.
 - B. Ensure the voltage agrees with the job voltage +/- 10%. See the Power Distribution page of the wiring diagrams.
 - 1) If the job has an isolation transformer, verify the data nameplate meets the actual job requirements for input and output voltages. See Power Distribution page of the wiring diagrams.
 - 2) Turn on CB1 and verify there is 115 VAC between terminals LD1 and LD2.
 - 3) Turn off CB1 and turn on CB3 and verify there is 115 VAC present between LH and LCO terminals.
 - 4) Turn off CB3 and turn on CB5 and verify there is 115 VAC present between LSN and LCO.
 - 5) Turn off CB5. CB4 will be tested during group startup.



TEMPORARY Wiring Installation

1. Verify the mainline disconnect is in the **OFF** position.
2. Install the following **temporary** jumper. [See Table 1.]

Temporary Jumpers		
Circuit	From	To
Governor	LCS	GV&OSD*
Hoistway Safeties	GV	HS
Car Safeties	HS	ICS
Motor Room Insp. Switches <i>(NOT FOR TEMPORARY SWITCH)</i>	ICS TIC	II TIA
Group Power	V+	VG+
Normal Power	VG+	NP
Earth-quake	V+	EQA*
Drive Switch	V+	DRVS
Car Gate	DRV or GLT	RCG*& CG
Door Locks	DRV or GLT	RDL*& DL##
Secondary Locks	DRV or GLT	DI*&DI1*
Rope Gripper	RG5	RG7*
Landing By-Pass	LCS	LBP*
Car Door By-Pass	LCS	CDP*
Landing Door By-Pass	LCS	LDP*
Down Slowdown Limits	LCS	SDx
Up Slowdown Limits	LCS	SUX
Emergency Terminal Limits	LCS	ETSU&ETSD
Normal Limits	LCS	UNL&DNL

Table 1

* if applicable
Do not use Bypass Switch

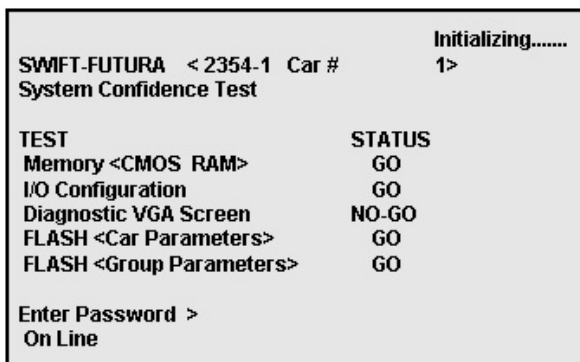


Figure 2-8

AC Voltage and Switch Test

1. Turn on the mainline disconnect.
2. Turn on CB2 and CB6 and verify the following:
 - The SPU front panel LED should flash red and then stay lit constant green.
 - 115 VAC voltage is present between LCS and LCO.
 - Verify that there is 24 VDC across V+ and VC on the SPU link board.
 - Verify the drive is operating and relay CEN is energized.

SPU Power-up, Initialization and Wizard Operation

SPU Power-Up and Wizard Connection

1. Verify the mainline disconnect switch and verify CB2 and CB6 are in the **ON** position.
 2. **Connect a PC or Lap-Top 9 pin Serial Port to the 9 pin port on the SPU Link using a 9 pin RS-232 cable.**
 3. Start the Wizard program.
 4. At opening screen click on the Terminal button.
 5. Cycle off CB2 then back on and check terminal for Confidence test. [See Figure 2-8.]
 6. Verify all tests are a "GO". Should there be a "NO-GO" in the Flash tests, go to System Initialization on page 2-5.
- Note:** *If the load weigher or VGA Card is not present at this time a "NO-GO" will appear at the Diagnostic Screen test. Disregard unless items are present.*
7. Enter the password – "INSTALL."
 8. Verify the prompt returned on the screen matches the car number. [i.e. C# 1=> is car 1 of this group.]
 9. Enter IVE=50. (Inspection Velocity)



STARTUP PROCEDURE HPV

10. Set the following Brake Parameters:

Initial Brake Parameters

Parameter	Description
BMV =	Max brake voltage shown on the wiring diagrams
BLV =	Brake lift voltage shown on the wiring diagrams.
BHV =	Brake hold voltage shown on the wiring diagrams.
BCL =	16
BLT =	1
BMA =	Max. Brake Amps. shown on the wiring diagrams.
BDD =	64 (when using BCD Parameter)

11. Enter WRT.
12. Click the close button and return to the Wizard start menu.
13. Click on the Run Wizard button to connect to the Wizard Main Menu.
14. Click on the car to monitor. This should be the car you are connected to. This will take you to the Car Menu.
15. Click the Diagnostics Button to display the diagnostics window.

System Initialization (For No-Go Tests)

Note: These procedures are to be used only if the confidence test shows a NO-GO in the FLASH TEST ONLY. [See Figure 2-9.]

1. At the password prompt enter the following password – **HUDSON.BAY**
2. Enter the following command – **EPI2374**, wait for “EPI ok”, than power down SPU at this point. (note: default parameters will be loaded. Call CEC if you do not wish to lose adjustments)
3. Power up SPU. Enter Password.
4. Enter the “GET” command and note the parameter that is returned. A value must be entered for this parameter in order for the test to be successful. See parameter listing for the proper default value. (i.e. DZD=2048 ENTER). Enter WRT after every change.

5. Repeat step 3 until an “OK” is received after the “GET” command. Enter WRT.
6. Enter the GRP command and repeat steps 2 and 3 for clearing a NO-GO Group Flash test.
7. Enter “CAR” command to return to the car prompt.
8. Return to step 6 of the SPU Power-Up and Wizard connection.

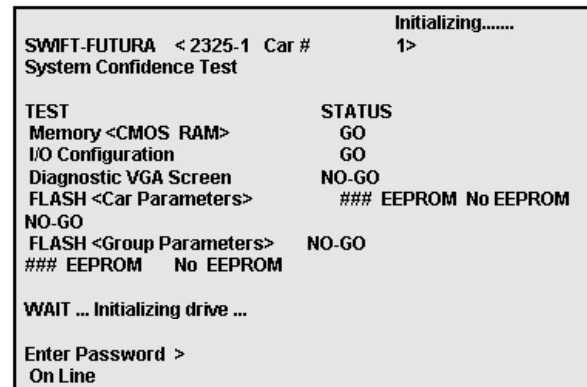


Figure 2-9

Establishing Correct Direction and Speed

Drive Setup

The drive is shipped pre-configured to suit the motor required for this application.

Note: In order to successfully configure the drive, the motor details must be provided to CEC upon placing the controller order.

Note: If any problems are suspected with the drive unit, refer to Table 1 for generic setting of the drive.

The HPV communicates with the control system via an RS232 serial link. This communication channel conveys all speed and torque information to the drive system and receives information regarding the drive status.

1. Verify Drive Parameters per Drive table.
2. Connect the encoder cable appropriately and ensure that the cable is routed through a separate metal conduit.



Note: *Failure to keep the encoder away from high voltage will result in erratic drive operation.*

3. Measure three-phase voltage and store in menu A4 (INPUT L-L Volts).
4. Use "STM" command if top of car is not wired.
5. Ensure that the cab is away from a terminal floor if possible. Use inspection switch to move the car UP.
6. If direction is correct but speed is excessive, reverse the encoder connections as follows:
 - Interchange the wires in terminals TB1-20 and TB1-22.
 - Interchange the wires in terminals TB1-21 and TB1-23.
7. If direction is incorrect and speed is stable, reverse the encoder connections as above but also interchange any two motor leads.
8. If direction is incorrect and speed is excessive, simply reverse any two motor leads.
9. If the car runs slowly and the motor current is high then interchange the A – A wires connected to TB1-20 and TB1-21.
10. Verify that the car speed is equal to the speed demand (IVE parameter in the control system). During initial setup it is unlikely that there will be a car top encoder for speed feedback, so a hand held tachometer may be needed. Adjust the drive parameter (CONTRACT MOTOR SPEED in the A1 menu).

HPV Drive Menus

Drive A1	
Contract Car speed	Contract speed in fpm
Contract Motor speed	Motor rpm required to achieve contract speed
Response	10
Inertia	2
Encoder Pulses	per encoder used
UP/DN Threshold	0.6%
S-Curves A2	
Accel Rate 0	7.9
Decel Rate 0	7.9
All Jerk Rates 0	0
All Lev Jerk Rates 0	0

Power Converter A4	
UV Alarm level	80
UV Fault level	70
External reactance	set only if external reactor is used
Input L-L volts	line voltage
User Switches C1	
Spd command Src	Serial
Run Command Src	External TB1
Hi/Lo gain Src	Internal
Speed Reg Type	elev spd reg
Motor Rotation	forward
Spd ref release	reg release
Pre-torque Src	EXT TB1
Pre-Torque latched	None
Pre-Torque latch src	None
Fault reset src	Serial

Logic Inputs C2	
Log In 1	RUN
Log In 2	DRIVE ENABLE
Log In 3	FAULT RESET
Log In 4	N/A
Log In 5	N/A
Log In 6	N/A
Log In 7	N/A
Log In 8	N/A
Log In 9	CONTACT CONFIRMED

Logic Outputs C3	
Log Out 1	RUN UP
Log Out 2	RUN DN
Log Out 3	N/A
Log Out 4	N/A
Relay Coil 1	READY
Relay Coil 2	RUN CONFIRMED

Motor A5	
Motor ID	(see note 1)
Rated motor power	Nameplate
Rated motor volts	Nameplate
Rated excit. Freq	Nameplate
Rated motor current	Nameplate
Motor poles	Nameplate
Rated motor speed	(see note 2)
% no load current	(see note 2)
Stator leakage X	9 (see note 3)
Rotor leakage X	9 (see note 3)
Stator resistance	1.5
Motor iron loss	0.5
Motor mech. Loss	1
Flux sat break	75
Flux sat slope 1	0
Flux sat slope 2	0



STARTUP PROCEDURE HPV

Note 1: The HPV has a library of motors commonly used and these are selected by ID number which presets the parameters.

Note 2: This is the nameplate **rotor** rpm of the motor which is used to calculate the vector currents and has no bearing on the contract speed. If nameplate indicates **field** RPM (900, 1200, 1800, ect.), lower value by 2%

Note 3: If motor is 1800 rpm/4 pole, then both STATOR and ROTOR LEAKAGE should be set to 11%. If motor is 1200 rpm/6 pole, then both STATOR and ROTOR LEAKAGE should remain at 9%.

Running the Car on Inspection

- 1. Place the controller in **setup mode** by doing the following steps.

Note: *This function can be activated using terminal window and entering "STM" (setup mode).*

Note: *This procedure will have to be done every time the power is cycled.*

Setup enables operation without the car top unit. If the car top unit is installed and operational this will not be required.

- A. Press and hold the SPU button on the circuit breaker panel at the top of the controller until the **DISPLAY** buttons lights (about 5 seconds).
- B. Release the SPU button and press the Display button once.
- C. The Display button will now flash red and green. This will indicate you are in the setup mode.

On the Diagnostics Screen in the wizard or the RVU screen, verify that the elevator is on inspection.

- 2. Verify the following inputs are activated for panel test (motor room) run.

SDx	LBP*	CG
SUx	(R) DL	(R) GL
ETSU	ETSD	GL1
DRV	DI&DI1*	GV
UNL	DNL	NP
DRVS	PT	EAQ *
HS #	CS#	ICS#

with Top of Car

* if available

- 3. For 2000 compliant controllers the following additional inputs must be activated

LDP	CPI	CDP
OSD	RPI	GTS

- 4. When there are rear doors on 2000 compliant controllers, the following inputs are needed

RCDP	RLDP	RCG
RDL		

- 5. Verify the following relays and modules are activated.

CG (RCG)	DL (RDL)	CEN
THC	CGL	FLT

CGDLA
(2Kcode)

- 6. Momentarily press the up button and verify the SM and the MC relay energize.

- 7. Press the up button and verify the direction of the drive sheave matches the direction pushed.

- 8. Run elevator up and down hoistway verifying the brake is clear from the brake drum.

Note: *If brake is rubbing the brake drum refer to manufacturer's manual for brake setup. Also refer to Brake section of the wizard program for proper brake voltage.*

- 9. Run the elevator in both directions verifying it runs without vibrations. See Drive information for eliminating vibrations.

- 10. Run the elevator both down and up verifying that when elevator is stopped, the brake holds the car from moving.

Note: *If the elevator keeps moving when stopped, refer to the manufacturer's manual on brake setup.*



Running From A Temporary Run Box

1. Remove jumper II to ICS.
2. Remove jumper TIC to TIA.
3. Wire temporary run box as per Figure 2-10.

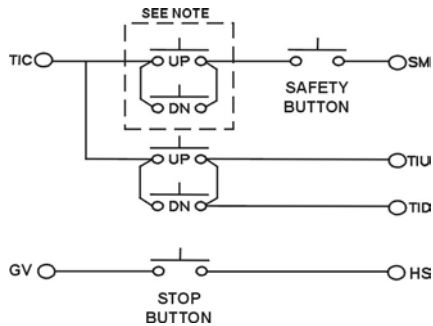


Figure 2-10

Note:

Make these connections only if two-pole buttons are used.

4. Verify the elevator runs in the proper direction from the temporary run box.
5. Verify that a stop switch is wired in the safety circuit and opens the safety circuit when activated.
6. Set IVE value for a safe working speed for the elevator.
7. Verify the car is on STM mode.

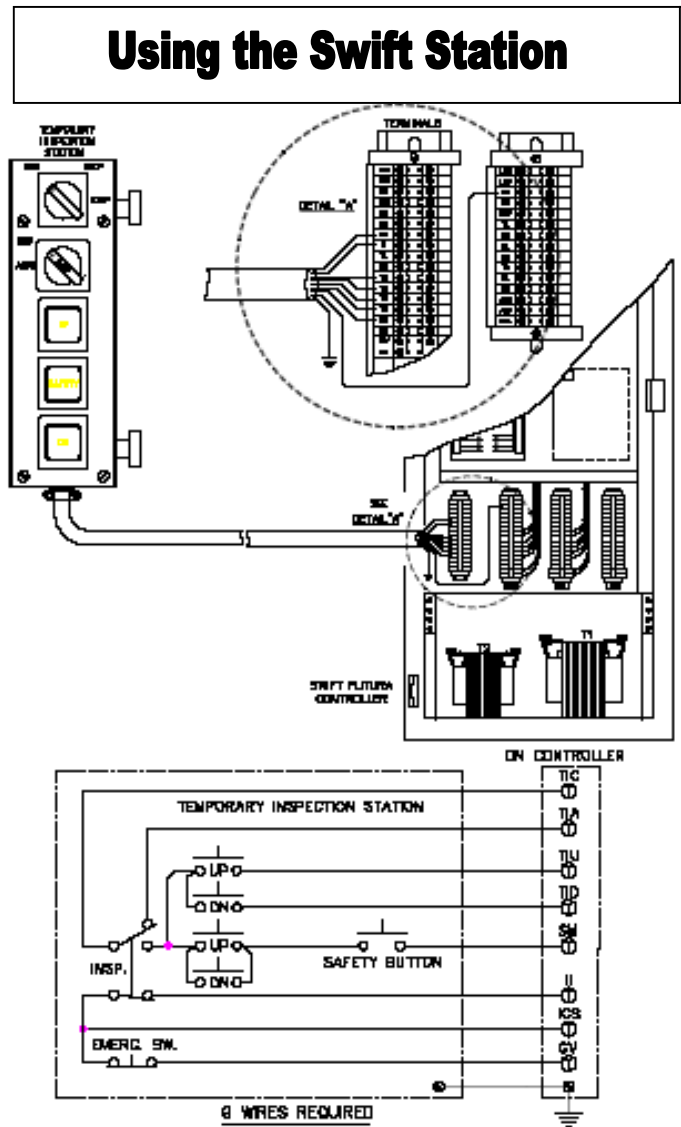


Figure 2-11



SECTION 3 – FUTURA STARTUP PROCEDURES DSD 412

MACHINE ROOM PREPARATIONS

Field Wiring Check

1. Verify Mainline disconnect is in the **OFF** position and properly locked out.
2. Verify all the circuit breakers on the front panel (located at the top of the controller) are in the off position. [See Figure 3-1.]

FUTURA Circuit Breakers

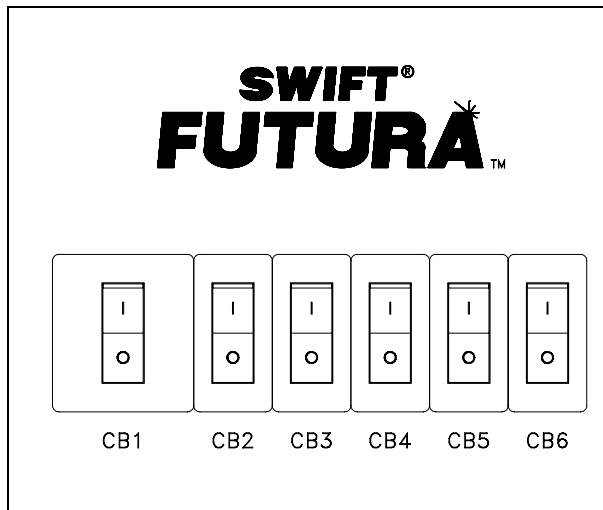


Figure 3-1

3. Turn the AUTO/TEST switch to the **TEST** position.
4. Verify that the following field wires are connected as described in the Installation portion of this manual.

Power wiring to the controller: The power wiring can be a 2, 3 or 4 circuit configuration dependent upon the drive system that is supplied.

- A. The first circuit common to all drive types is an independent single phase supply for the cab lighting circuit. Usually 120 VAC for North America and 230 VAC for the remainder of the world. This circuit should be a 15 amp fused circuit. [See Figure 3-2.]

Cab Circuit Lighting

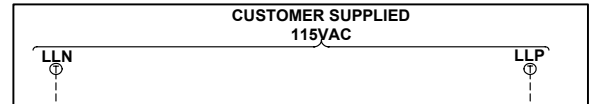


Figure 3-2

NOTE: The Futura controller transformer is not designed to support cab lighting and cab ventilation. Using the Futura 120 VAC control circuits in this manner may cause permanent damage to the main controller transformer.

- B. The second circuit required common to all drive types (**for the 1st controller of each group only**) is a separate independent emergency backed single phase 120 VAC circuit for North America and 230 VAC circuit for the remainder of the world to supply power for the hall call circuitry. This circuit should also be a 15 amp fused circuit. [See Figure 2-3.]

Group Power Circuit

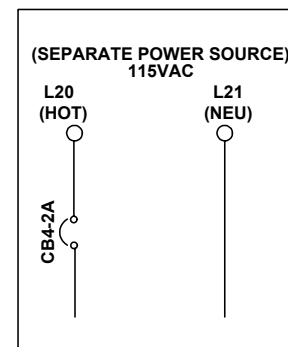


Figure 3-3

- C. The third circuit required common to all drive types is 3 phase Main Line power. This 3 phase power will either connect directly into a fuse block in the drive side of the controller or to the primary side of an Isolation, Step Up or Step Down power transformer. If a power transformer is used the secondary side will be wired to the fuse block in the drive side of the controller. [See Figure 3-4.]



Three-Phase Power Circuit

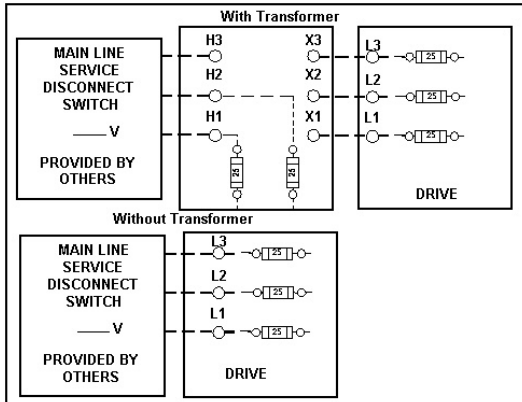


Figure 3-4

D. The fourth circuit will only be required if a power transformer is used. A separate fused circuit from the primary side of the power transformer terminals H1 and H2 to the FP1 fuse block on the drive side of the controller. [See Figure 3-5.]

Controller Power Circuit

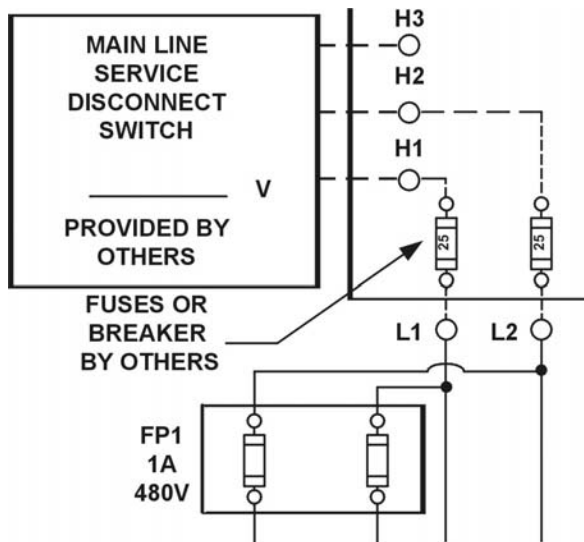


Figure 3-5

Warning! All wire sizes are to be in accordance to the National Electrical Code.

Warning! The main line power must supply a ground wire in accordance to National Electrical Code that is continuous to the source or to an earth ground connection.

E. **Power wiring to the hoist machine:**
There will be 2 to 4 circuits required to the elevator hoist machine.

- 1) The first is to the motor that consists of current conductors wired from the drive output through the choke (if req.) to the motor and a ground wire to the grounding lug at the drive side of the controller. [See Figure 3-6.]

Motor Wiring

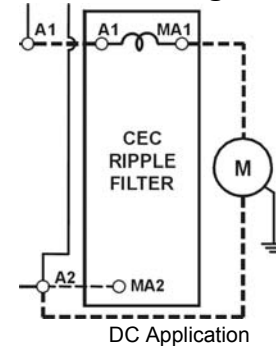


Figure 3-6

- 2) The second circuit will be to provide power to the brake coil. These 2 wires can be run with the motor wires. [See Figure 3-7.]

Brake Wiring



Figure 3-7

- 3) The third circuit is to bring power to the Motor Fields (if a DC motor is used). These 2 wires can be run with the motor wires. [See Figure 3-8.]

Motor Field Wiring

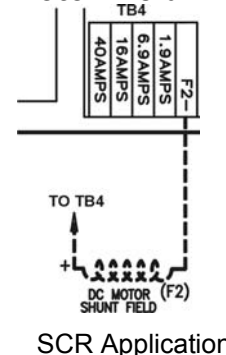


Figure 3-8

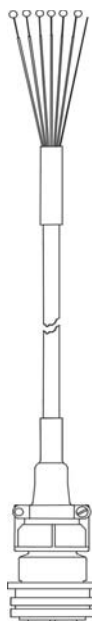


4) The fourth circuit is for the brake switch (if required). These 2 wires can be run with the motor wires.

F. Motor Encoder wiring: The encoder wiring uses 3 twisted shielded pairs. This cable is provided from CEC on most applications. It is imperative that this wiring be run separately for the encoder to the drive side of the encoder. [See Figure 3-9.]

Motor Encoder

	ENCODER TYPE				TERMINAL		
	SOLID SHAFT ALL	HOLLOW SHAFT 1024			DSD 412	HPV 900	SWIFT 10K
	DYNAPAR 7 PIN	DYNAPAR 10 PIN	KUBLER 9 PIN	REULAND 9 PIN	TB1	TB1	CONN 2
5V	D	D	2	2	1	25	30
COM	F	F	7	1	43	19	31
A	A	A	1	3	2	21	26
A̅	C	H	3	6	3	20	27
B	B	B	4	4	4	23	28
B̅	E	I	5	7	5	22	29
SHLD					6	26	GND



SCR & VVVF Application

Figure 3-9

G. Governor wiring: Two 18 Ga. wires are required from the electrical safety switch on the governor to the controller.

Brake and Motor Check

1. Check the brake coil:
 - A. Disconnect the brake coil leads (BK- & BK+).
 - B. With an ohmmeter, measure the coil resistance and verify it matches the value given on the straight-line diagram power distribution page.
 - C. Next measure the brake coil leads to ground and verify that neither brake lead is grounded.
2. With an ohmmeter measure the motor leads at the main contactor and motor fields to ensure the motor is not grounded. This would be across A1 & A2 and F1+ & F2.

Transformer(s) Configuration


1. Verify all transformer taps are connected for proper voltage according to the Power Distribution page of the wiring diagrams.
2. Verify the mainline voltage:
 - A. Measure and record the input voltage at the mainline disconnect.
 - B. Ensure the voltage agrees with the job voltage +/- 10%. See the Power Distribution page of the wiring diagrams.
 - 1) If the job has an isolation transformer, verify the data nameplate meets the actual job requirements for input and output voltages. See Power Distribution page of the wiring diagrams.
 - 2) Turn on CB1 and verify there is 115 VAC or 230 VAC (see wiring diagram) for proper voltage requirement) between terminals LD1 and LD2.
 - 3) Turn off CB1 and turn on CB3 and verify there is 115 VAC present between LH and LCO terminals.



- 4) Turn off CB3 and turn on CB5 and verify there is 115 VAC present between LSN and LCO.
- 5) Turn off CB5. CB4 will be tested during group startup.

Temporary Wiring Installation

1. Verify the mainline disconnect is in the OFF position.
2. Install the following temporary jumper. See Table 1.



Warning! These jumpers are only temporary and must be removed as the circuits are installed. Never operate a car at high speed with door and safety related circuit jumpers still installed.

Temporary Jumpers		
Circuit	From	To
Governor	LCS	GV&OSD*
Hoistway Safeties	GV	HS
Car Safeties	HS	ICS
Motor Room Insp. Switches <i>(NOT FOR TEMPORARY SWITCH)</i>	ICS TIC	II TIA
Group Power	V+	VG+
Normal Power	VG+	NP
Earth-quake	V+	EQA*
Drive Switch	V+	DRVS
Car Gate	DRV or GLT	RCG*& CG
Door Locks	DRV or GLT	RDL*& DL##
Secondary Locks	DRV or GLT	DI*&DI1*
Rope Gripper	RG5	RG7*
Landing By-Pass	LCS	LBP*
Car Door By-Pass	LCS	CDP*
Landing Door By-Pass	LCS	LDP*
Down Slowdown Limits	LCS	SDx
Up Slowdown Limits	LCS	SUx
Emergency Terminal Limits	LCS	ETSU&ETSD
Normal Limits	LCS	UNL&DNL

Table 1

* if applicable
Do not use Bypass Switch

AC Voltage and Switch Test

1. Turn on the mainline disconnect.
2. Turn on CB2 and CB6 and verify the following:
 - The SPU front panel LED should flash red and then stay lit constant green.
 - 115VAC voltage is present between LCS and LCO.
 - Verify that there is 24 VDC across V+ and VC on the SPU link board.
 - Verify the drive is operating and relay CEN is energized.

SPU Power-up, Initialization and Wizard Operation

SPU Power-Up and Wizard Connection

1. Verify the mainline disconnect switch and verify CB2 and CB6 are in the on position.
2. **Connect a PC or Lap-Top 9 pin Serial Port to the 9 pin port on the SPU Link using a 9 pin RS-232 cable.**
3. Start the Wizard program.
4. At opening screen click on the terminal button.
5. Cycle off CB2 then back on and check terminal for Confidence test. See Figure 3-10.

```

SWIFT-FUTURA < 2354-1 Car #           Initializing.....
System Confidence Test                 1>

TEST                                STATUS
Memory <CMOS RAM>                    GO
I/O Configuration                    GO
Diagnostic VGA Screen                NO-GO
FLASH <Car Parameters>               GO
FLASH <Group Parameters>             GO

Enter Password >
On Line
    
```

Figure 3-10



- Verify all tests are a "GO". Should there be a "NO-GO" in the Flash tests Go to System Initialization on page 3-5.

Note: *If the load weigher or VGA Card is not present at this time a "NO-GO" will appear at the Diagnostic Screen test. Disregard unless items are present.*

- Enter the password – "INSTALL."
- Verify the prompt returned on the screen matches the car number. C# 1=> is car 1 of this group.
- Enter IVE=50. (Inspection Velocity)
- Set the following Brake Parameters:

Initial Brake Parameters

Parameter	Description
BMV =	Max brake voltage shown on the wiring diagrams
BLV =	Brake lift voltage shown in wiring diagrams.
BHV =	Brake hold voltage shown in wiring diagrams.
BCL =	16
BLT =	1
BMA =	Max. Brake Amps. Shown on the wiring diagrams.
BDD =	64 (when using BCD Parameter)

- Enter WRT.
- Click the close button and return to the Wizard start menu.
- Click on the Run Wizard button to connect to the Wizard Main Menu.
- Click on the car to monitor. This will take you to the Car Menu.
- Click the Diagnostics Button to display the diagnostics window.

System Initialization (For No-Go Tests)

Note: *These procedures are to be used only if the confidence test shows a NO-GO in the FLASH TEST ONLY. See Figure 3-11.*

- At the password prompt enter the following password – **HUDSON.BAY**
- Enter the following command – **EPI2374**, wait for "EPI ok", than power down SPU at this point. (*note: default parameters will be loaded. Call CEC if you do not wish to lose adjustments*)
- Power up SPU. Enter Password.
- Enter the GET command and note the parameter that is returned. A value must be entered for this parameter in order for the test to be successful. See parameter listing for the proper default value. (i.e. DZD=2048 ENTER). Enter WRT after every change.
- Repeat step 3 until an "OK" is received after the GET command. Enter WRT.
- Enter the GRP command and repeat steps 2 and 3 for clearing a NO-GO group flash test.
- Enter CAR command to return to the car prompt.
- Return to step 6 of the SPU power-up and Wizard connection.

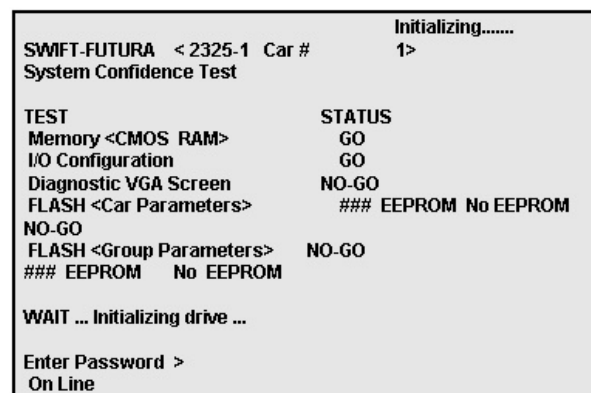


Figure 3-11



Drive Startup Procedures

Magnatek DSD 412

Parameter Setup and Check

1. With the controller mainline, and all CBs except CB4 on, look at the drive display (SCDU) and verify it is active.

Note: *On a normal power-up the SCDU will show "P-UP". If there is a number shown it is a fault number and should be disregarded at this time.*

2. Verify the parameters in the drive match actual job conditions. See Quick Reference.

- A. Use the UP or down arrow keys on the drive to select the parameter number required.

Note: *Both the DATA and the DATA PEND LEDs are off.*

- B. Press the DATA/FCTN key to display the setting of this parameter. *(press again to return)*

Note: *The DATA LED is now lit green.*

- C. Use the UP and DN arrow keys on the drive to change this data to the required value.

Note: *Once this setting is changed the DATA PEND LED is now lit red and the DATA LED is off.*

- D. Once you have changed the data to the required setting push the ENT key on the drive.

Note: *Once ENT is pushed the DATA LED is now green and the DATA PEND LED is now off. Press the DATA/FCTN key to return*

- E. To save any changed parameter(s), use the UP or DN arrow keys to function number 994.

- F. Turn the NV Ram Protection switch to the off position.

Note: *The unprotect LED will now be lit.*

- G. Press the DATA/FNCT key. This will show "REST" on the SCDU.

Note: *The DATA LED will now be lit green.*

- H. Press the UP arrow key and the SCDU will now display "SAVE".

Note: *The DATA PEND LED is now lit red.*

- I. Press the ENT key.

Note: *The DATA LED should now be lit green.*

- J. Place the NV Ram Protect switch back in the on position.

Self Test

1. Place the Auto/Test switch into the **TEST** position.
2. Press the up arrow on the drive to display the parameter 998.
3. Press the DATA/FCTN key.
4. From the front of the Controller, push and hold in the MC contactor until the test is complete.
5. Press ENTER on the Drive. The MA contactor will cycle twice.
6. After the test is complete, the SCDU should flash "PASS" or an Error. If an error occurs, refer to the Drive manual for definition. Then correct the problem and retest.

Self Tune

1. Place the Auto/Test switch into the **TEST** position.
2. Place the NVRAM protect switch in the **OFF** position.

Note: *The unprotect LED will now be lit.*



3. Press the UP arrow on the drive to display the parameter 997.
4. Press DATA/FCTN key.
Note: The SCDU will now display “TEST”.
5. From the front of the controller push in the MC contactor.
Note: *This will require the MC contactor to be held in for the entire SCR self tune test.*
6. Press the ENT key on the SCDU.
Note: *The Main Contactor will pull in and drop briefly then pull in again as it tests the motor.*
7. After the test is complete the SCDU should flash “Pass”.
8. Once the test is completed place the NVRAM switch back to the on position.
Note: *At that time the unprotect LED should be off.*
9. Record values in drive Parameters 613 (Arm. Resistance), 614 (Arm. Inductance) and 615 (Measured Field L/R).
10. Take the values recorded in step 9 and place them accordingly into drive parameters 4 (Arm. Resistance), 6 (Arm. Inductance) and 51 (Measured Field L/R).
11. Follow steps described in Parameter Setup and Save step 10 using the 994 save function.

Quick Reference for Geared DSD 412 Applications			
Function	Description	Units	Settings
1	Current Limit	%	250
2	Enable Self Tune Values	Off/On	Off
3	Rated Armature Amps	Amps	Motor Nameplate
4	Armature Ohms	Ohms	From Self Tune P613
6	Armature Inductance	Henrys	From Self Tune P614
7	Rated Armature Voltage	Volts	Motor Nameplate
8	Irreg Crossover	Rads	500
9	Nominal A/C input Voltage	Volts	Drive Input A/C
10	Encoder Pulses per Revolution	PPR	Encoder Nameplate
11	Motor Speed	RPM	Motor Nameplate
12	Motor Overspeed	%	110
14	Arm. Voltage Sensing	%	25
15	Tach (encoder) Sensing	%	5
16	Gearless Ratio	Ratio	1
17	Rated Velocity (speed)	FPM	Contract Speed
21	Rated Acceleration Rate	F/S/S	8.0
32	Full Field Sensing	%	45
40	Response	Rads	6
41	System Inertia	Sec	2
42	Stability		2
49	Weak Field Current	Amps	Job Prints
50	Full Field Current	Amps	Job Prints
51	Motor Field Time Constant	Sec	From Self Tune P615
52	Rated Field Voltage	Volts	Job Prints
53	Standing Field Current	Amps	Job Prints
54	Field Response	Rads	5



Quick Reference for Geared DSD 412 Applications			
Function	Description	Units	Settings
55	Nominal Field AC Voltage	Volts	Same As P9
56	Field Strength Speed	%	90
57	Field Weaken Speed	%	80
58	Field Strength Rate	Sec	2
59	Field Weaken Rate	Sec	2
63	Direction UP/DN Bit Pickup	%	0.01
80	Overspeed Test Enable	Off/On	Off
81	Overspeed Multiplier	X	1
82	Reference Multiplier	X	1
83	Motor Overload Time Out	Sec	90
84	Motor Overload Level		1
85	Current Delay Ramp	Sec	0.2
86	LPR Delay Time	Sec	0.3
95	Analog Output 0	PU	0 (speed ref.)
96	Analog Output 1	PU	0 (speed ref.)
104	I Serial Gain Switch	Off/On	Off
105	Gain Switch Speed	% Speed	100
107	Tach (encoder) Rate Gain		0
108	Gain Reduce	X	1.0
View Only Functions			
600	Car Speed	FPM	N/A
601	Motor RPM	RPM	N/A
602	Speed Reference	FPM	N/A
603	Pretorque Input	%	N/A
609	CEMF VDC	Volts (DC)	N/A
610	Motor Armature Voltage	Volts (DC)	N/A
611	Motor Armature Current	Amps. DC	N/A
612	Motor Field Current	Amps. DC	N/A
613	Measured Motor Resistance	OHMS	N/A
614	Measured Motor Inductance	HENRIES	N/A
615	Measured Field L/R Time Constant	Sec.	N/A
616	Speed Error	F/M	N/A
617	AC Line Frequency Parameter	Hz	N/A
618	Heatsink Temperature	C°	N/A
619	AC Line Voltage	Volts (AC)	N/A
Internal Command Controls			
994	Used to Save Parameters		
997	Self Tune Test		
998	Self Diagnostics		

For more Drive information, see SCR Drive Information in Troubleshooting section of this manual.

MOVING THE CAR ON INSPECTION FOR SERIAL DRIVES

1. Verify the Wizard is displaying the Diagnostic Screen. [See Figure 3-12.]

Car Diagnostic Display

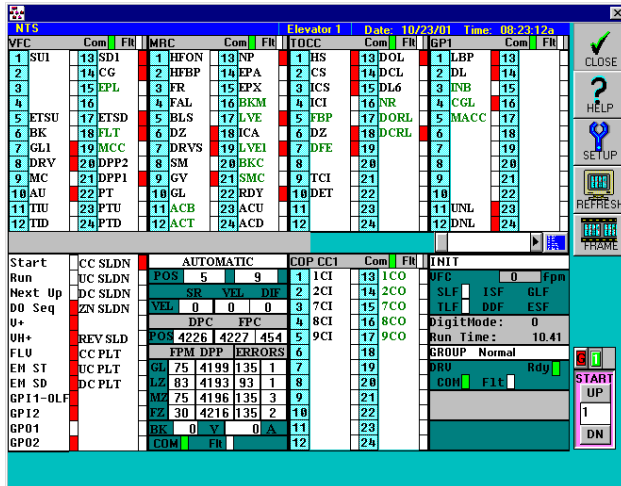


Figure 3-12

2. Uncouple motor encoder from the UP direction.
3. By hand rotate the encoder in the **UP** direction. Verify that P600 Car Speed on drive displays a positive direction. Do the same for the DOWN for a negative speed. To change the direction, swap the Encoder wiring to the DSD 412 as follows: A to A or B to B.
4. Recouple the encoder to Motor. Briefly press the UP button on the Panel Test Station while observing the drive sheave.

Note: Should the drive sheave turn in the UP direction at an uncontrolled speed, swap the A and B wires also the A and B wires at the drive from the encoder. [See Figure 3-13.]

Note: Should the drive sheave turn in the opposite direction at an uncontrolled speed, swap MF+ and MF- from the motor.

5. Verify that the car speed is equal to the speed demand (IVE parameter in the control system) during initial setup. It is unlikely that there will be a cartop encoder for speed feedback, so a handheld tachometer may be needed. Adjust the drive parameter 11, motor speed (RPM), to make the car velocity equal to the speed command. Use “STM” command if top of car is not wired. (See Section 3-10)

Note: To verify proper pairing of the encoder wiring place the positive lead of a voltmeter to the A terminal and the Negative to the A terminal. A positive voltage of about 2.85 vdc should be present when that phase is active. The car may need to be drifted to have the encoder pulse change from low to high. Repeat for B and B.

Motor Encoder Wiring

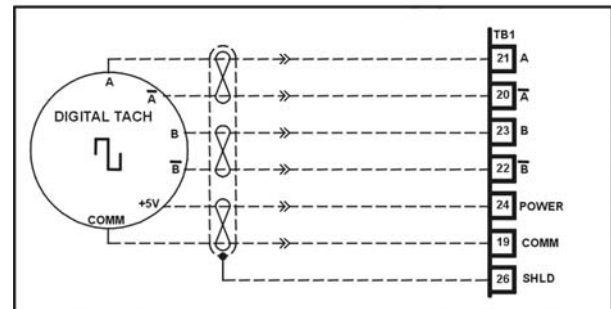


Figure 3-13

6. Verify the car now moves UP when the UP button is pressed and down when the down button is pressed.
7. Verify the SR & VEL are close to speed within +/- 2 fpm in both directions.
8. Rotate the SDCU screen to P600 Parameter. Press DATA/FNC key to display Car Speed.

SDCU Screen (P600)

UP Direction



↑
Note: This character not lit during the up direction.

DN Direction



Figure 3-14



Running the Car on Inspection

- Place the controller in **setup mode** by doing the following steps.

Note: *This function can be activated using terminal window and entering "STM" (setup mode).*

Note: *This procedure will have to be done every time the power is cycled.*

Setup enables operation without the car top unit. If the car top unit is installed and operational this will not be required.

- Press and hold the SPU button on the circuit breaker panel at the top of the controller until the **DISPLAY** buttons lights (about 5 seconds).
- Release the SPU button and press the Display button once.
- The Display button will now flash red and green. This will indicate you are in the setup mode.

On the Diagnostics Screen in the wizard or the RVU screen, verify that the elevator is on inspection.

- Verify the following inputs are activated for panel test (motor room) run.

SDx	LBP*	CG
SUx	(R) DL	(R) GL
ETSU	ETSD	GL1
DRV	DI&DI1*	GV
UNL	DNL	NP
DRVS	PT	EAQ *
HS #	CS #	ICS #

with Top of Car
* if available

- For 2000 compliant controllers the following additional inputs must be activated

LDP	CPI	CDP
OSD	RPI	GTS

- When there are rear doors on 2000 compliant controllers, the following inputs are needed

RCDP	RLDP	RCG
RDL		

- Verify the following relays and modules are activated.

CG (RCG)	DL (RDL)	CEN
CGDLA (2Kcode)	CGL	FLT

- Momentarily press the up button and verify the SM and the MC relay energize.
- Press the up button and verify the direction of the drive sheave matches the direction pushed.
- Run elevator up and down hoistway verifying the brake is clear from the brake drum.
- Note:** *If brake is rubbing the brake drum refer to manufacturer's manual for brake setup. Also refer to Brake section of the wizard program for proper brake voltage.*
- Run the elevator in both directions verifying it runs without vibrations. See Drive information for eliminating vibrations.
- Run the elevator both down and up verifying that when elevator is stopped, the brake holds the car from moving.

Note: *If the elevator keeps moving when stopped, refer to the manufacturer's manual on brake setup.*



Running From A Temporary Run Box

1. Remove jumper II to ICS.
2. Remove jumper TIC to TIA.
3. Wire temporary run box as per Figure 3-15.

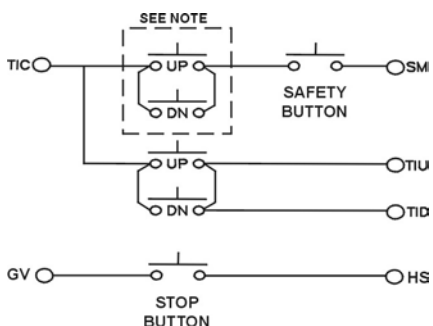
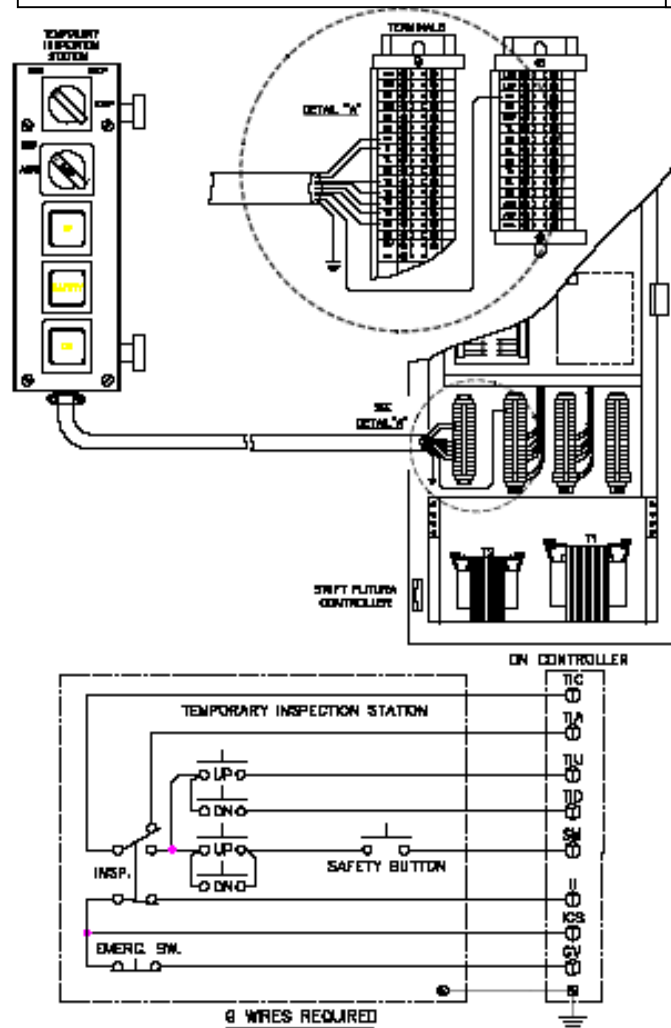


Figure 3-15

Note: Make these connections only if two-pole buttons are used.

4. Verify the elevator runs in the proper direction from the temporary run box.
5. Verify that a stop switch is wired in the safety circuit and opens the safety circuit when activated.
6. Set IVE value for a safe working speed for the elevator.
7. Verify the car is on STM mode.

Using the Swift Station





SECTION 4 - FUTURA STARTUP PROCEDURES Swift Drive

MACHINE ROOM PREPARATIONS

Field Wiring Check

1. Verify Mainline disconnect is in the **OFF** position and properly locked out.
2. Verify all the circuit breakers on the front panel (located at the top of the controller) are in the **OFF** position. [See Figure 4-1.]

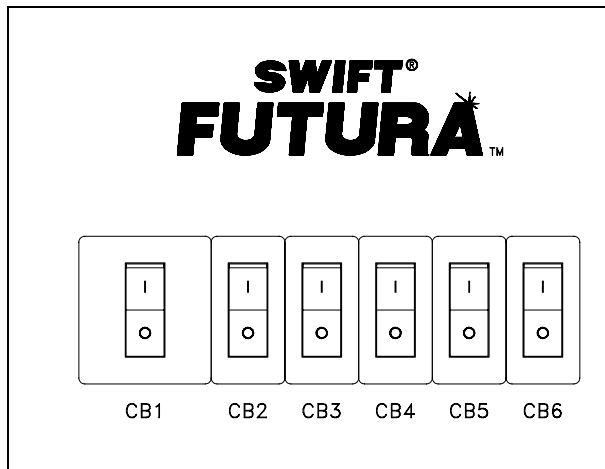


Figure 42-1

3. Turn the AUTO/TEST switch to the **TEST** position.
4. Verify that the following building wiring is connected as described in the Installation portion of this manual.
 - A. Cab Lighting Power: 120 VAC connects to LLP and LLN terminals located in the bottom of the controller.

Cab Lighting Circuit

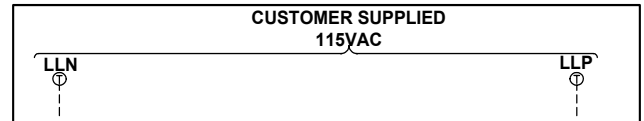


Figure 4-2

Note: The Futura controller transformer is not designed to support cab lighting and cab ventilation. Using the Futura 120 VAC control circuits in this manner may cause permanent damage to the main controller transformer.

- B. 3 Phase Power: Connects from main line disconnect to the AC contactor terminals 1 – 2 – 3 or the isolation transformer if provided. [See Figure 4-3]

3 Phase Power Circuit

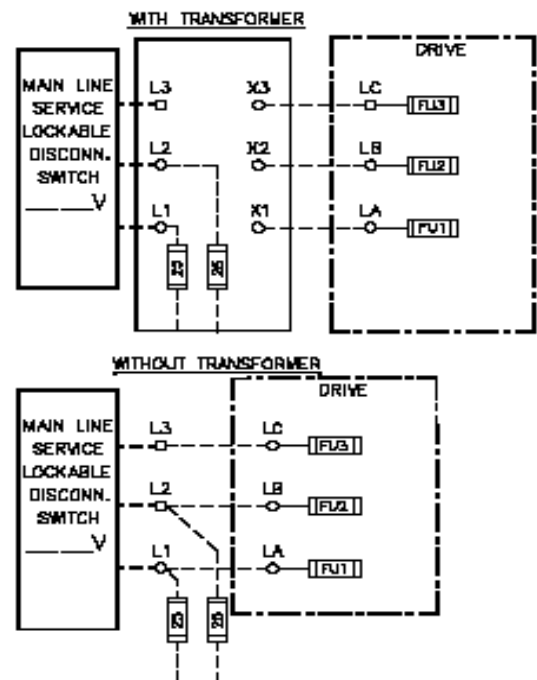
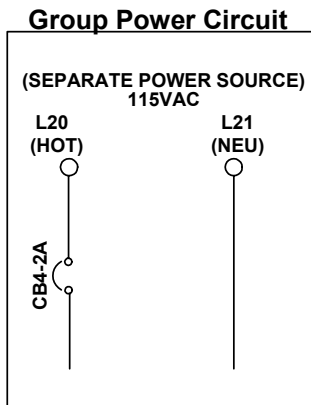


Figure 4-3



STARTUP PROCEDURE Swift Drive

- C. Group Power Source: 115 VAC connects to L20 and L21 terminals located in car 1.



Note: This power source should be emergency backed.

Figure 4-4

Warning! All wire sizes are to be in accordance to the National Electrical Code.

Warning! The main line power must supply a ground wire in accordance to National Electrical Code that is continuous to the source or to an earth ground connection.

- 5. Verify that the following field wiring is connected as described in the installation section of this manual.

- A. Motor wiring: connects from motor leads to 1MA contactor terminals 2 – 4 – 6.

Motor Wiring (AC Application)

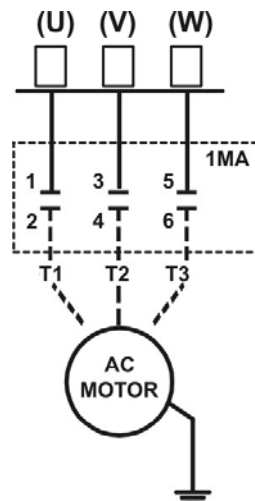


Figure 42-5

- B. Brake coil: connects from brake coil leads to BK+ and BK- on terminal strips located in bottom of controller. [See Figure 4-6.]

Brake Wiring

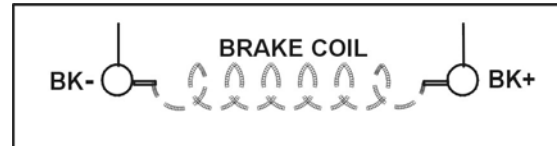


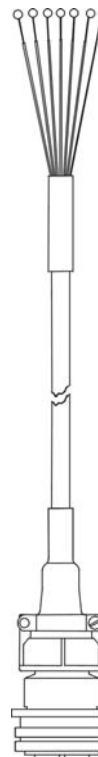
Figure 4-6

- C. Motor Encoder: connects from motor encoder to drive terminals. Use cable provided by CEC. [See Figure 4-7 and Table A.]

- D. Brake Switch: connects from brake switch to BDC board terminals and common supply see drawing 40 for details.

Note: Do Not run brake switch wiring with any high voltage wiring.

Motor Encoder



	ENCODER TYPE				TERMINAL		
	SOLID SHAFT ALL	HOLLOW SHAFT 1024			DSD 412	HPV 900	SWIFT 10K
	DYNAPAR 7 PIN	DYNAPAR 10 PIN	KUBLER 5 PIN	REILAND 9 PIN	TB1	TB1	CONN 2
5V	D	D	2	2	1	25	30
COM	F	F	7	1	43	19	31
A	A	A	1	3	2	21	26
A̅	C	H	3	6	3	20	27
B	B	B	4	4	4	23	28
B̅	E	I	5	7	5	22	29
SHLD					6	26	GND

Table A

Figure 4-7

- E. Governor Switch: connects from governor switch to terminals LCS and GV located in bottom of controller.



STARTUP PROCEDURE Swift Drive

Brake and Motor Check

1. Check the brake coil:
 - A. Disconnect the brake coil leads (BK-&BK+).
 - B. With an ohmmeter, measure the coil resistance and verify it matches the value given on the straight-line (wiring diagram) power distribution page (DWG 20).
 - C. Next measure the brake coil leads to ground and verify that neither brake lead is grounded.
2. With an ohmmeter measure the motor leads at the main contactor to ensure the motor is not grounded. This can be done at the 1MA contactor.

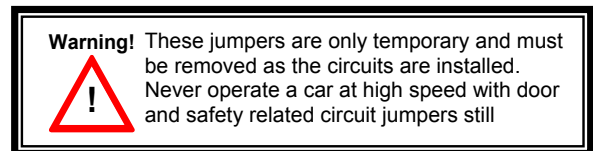
Transformer(s) Configuration

1. Verify all transformer taps are connected for proper voltage according to the Power Distribution page (DWG 20) of the wiring diagrams.
2. Verify the mainline voltage:
 - A. Measure and record the input voltage at the mainline disconnect.
 - B. Ensure the voltage agrees with the job voltage +/- 10%. See the Power Distribution page (DWG 20) of the wiring diagrams.
 - 1) If the job has an isolation transformer, verify the data nameplate meets the actual job requirements for input and output voltages. See Power Distribution page (DWG 20) of the wiring diagrams.
 - 2) Turn on CB1 and verify there is 115 VAC between terminals LD1 and LD2.
 - 3) Turn off CB1 and turn on CB3 and verify there is 115 VAC present between LH and LCO terminals.
 - 4) Turn off CB3 and turn on CB5 and verify there is 115 VAC present between LSN and LCO.

- 5) Turn off CB5. CB4 will be tested during group startup.

TEMPORARY Jumper Installation

- 1) Verify the mainline disconnect is in the **OFF** position.
- 2) Install the following **temporary** jumper. [See Table B.]



Temporary Jumpers		
Circuit	From	To
Governor	LCS	GV&OSD*
Hoistway Safeties	GV	HS
Car Safeties	HS	ICS
Motor Room Insp. Switches <i>(NOT FOR TEMPORARY SWITCH)</i>	ICS TIC	II TIA
Group Power	V+	VG+
Normal Power	VG+	NP
Earth-quake	V+	EQA*
Drive Switch	V+	DRVS
Car Gate	DRV or GLT	RCG*& CG
Door Locks	DRV or GLT	RDL*& DL##
Secondary Locks	DRV or GLT	DI*&DI1*
Rope Gripper	RG5	RG7*
Landing By-Pass	LCS	LBP*
Car Door By-Pass	LCS	CDP*
Landing Door By-Pass	LCS	LDP*
Down Slowdown Limits	LCS	SDx
Up Slowdown Limits	LCS	SUx
Emergency Terminal Limits	LCS	ETSU&ETSD
Normal Limits	LCS	UNL&DNL

Table B

* if applicable

Do not use Bypass Switch



STARTUP PROCEDURE Swift Drive

AC Voltage and Switch Test

- 1) Turn on the mainline disconnect.
- 2) Turn on CB2 and CB6 and verify the following:
 - The SPU front panel LED should flash red and then stay lit constant green.
 - 115 VAC voltage is present between LCS and LCO.
 - Verify that there is 24 VDC across V+ and VC on the SPU link board.
 - Verify the drive is operating and relay CEN is energized.

SPU Power-up, Initialization and Wizard Operation

SPU Power-Up and Wizard Connection

1. Verify the mainline disconnect switch and verify CB2 and CB6 are in the **ON** position.
2. **Connect a PC or Lap-Top 9 pin Serial Port to the 9 pin port on the SPU Link using a 9 pin RS-232 cable.** Start the Wizard program.
3. At the SPU Connection Screen, click on the Terminal button.
4. Cycle off CB2 then back on and check terminal for Confidence test. [See Figure 4-8.]

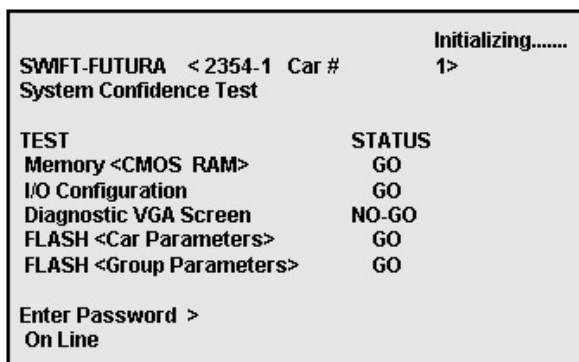


Figure 4-8

5. Verify all tests are a "GO". Should there be a "NO-GO" in the Flash tests; go to System Initialization in section 4-5.

Note: *If the load weigher or VGA Card is not present at this time a "NO-GO" will appear at the Diagnostic Screen test. Disregard unless items are present.*

6. Enter the password – "INSTALL."
7. Verify the prompt returned on the screen matches the car number. [i.e. C# 1=> is car 1 of this group.]
8. Enter IVE=50. (Inspection Velocity)
9. Set the following Brake Parameters:

Initial Brake Parameters

Parameter	Description
BMV =	Brake Max Voltage. Set to match AC incoming to Brake board. (Normally 145 or 290 VAC)
BLV =	Brake Lift Voltage. Set to desired Brake Pick voltage.
BHV =	Brake Hold Voltage. Set to desired Brake Hold voltage.
BCL =	Brake Control Lift timer. Set to 16.
BLT =	Brake Lift Time. Set at 1 for fast Brake Pick on Inspection.
BMA =	Brake Max Amps. Set at 1 for Non-serial Brake board. Match jumper configuration of brake board if using serial brake board.
BDD =	Set to 64 (when using BCD Parameter)

Table C

10. Enter WRT.
11. Click the close button and return to the SPU Connection Screen.
12. Click on the Run Wizard button to connect to the Wizard Main Menu.
13. Click on the car # to monitor. This should be the car you are connected to. This will take you to the Car Main Menu.
14. Click the Diagnostics Button to display the diagnostics window.



Setting Up the Drive

Note 1: Though the drive is shipped pre-configured to suit the motor required for this application, it is strongly suggested to verify the drive parameters and the jumper configuration of the drive

Note 2: Refer to the Swift Drive Manual for directions to navigate the drive using the User Interface Tool.

Drive Parameters

Parameter	Sub-menu	Adjustment Description	Value
MDC	Drive	Motor Drive Current	See Table E.
MFC	Drive	Motor Field Current	See Table F.
RSF	Drive	Motor Slip Frequency	See Table F.
MTP	Drive	Motor Poles	Motor Name Plate
MNC	Drive	Motor Current	Motor Name Plate
MNV	Drive	Motor Voltage	Motor Name Plate
MNF	Drive	Motor Frequency	Motor Name Plate
NRRM	Drive	Motor RPM	Motor Name Plate
UTL	Drive	Upper I _d Torque Limit	75
VEP	Drive	Motor Encoder Pulse	Encoder Name Plate
CTS	Speed Loop	Contract Top Speed	Job Specification
RPM	Speed Loop	Motor RPM @ Top speed	Job Specification
AFS	Speed Loop	Analog Full Scale	9.75
KVI	Speed Loop	Velocity Integral Gain	300 / 150 / 100 Geared / 2:1 / 1:1
KFP	Speed Loop	Feedback Proportional Gain	45 / 22.5 / 15 Geared / 2:1 / 1:1
DCN	System	Drive Configuration	See Table G.
MAL	System	Menu Access Level	2

TableD



6. Verify the drive parameters listed in table D are set correctly. Refer to tables E, F, and G as necessary.

Parameter	HP	Recommended/ Initial Setting	
		230VAC Input	460VAC Input
MDC	10	66.0	33.0
	15	99.0	50.0
	20	129.0	67.0
	30	198.0	99.0
	40	258.0	129.0
	60	400.0	198.0
	80	-	258.0
	120	-	400.0

Table E

Parameter Name	Method Used to Determine Setting
KFF	0
MFC	Set for the NO Load Data, (Balanced Load), on the motor nameplate: Or 35% of the Full Load Nameplate Rating. (Value entered in Amps.)
MTP	Set to the number of stator poles per phase in the machine motor.
RSF	Set per Formula below: $\frac{(\text{Synchronous Motor RPM} - \text{Rated Load RPM})}{\text{Rated Load RPM}} \times 60$

Table F

Parameter Name	Method Used to Determine Setting
DCN	Note: Add only the numbers that match your actual known job conditions to determine the number (nn) for the DCN parameter.
	DC Drive = +1
	AC Drive = +0
	230V Drive = +2
	460V Drive = +0
	Analog Speed Reference = +4
	Digital Speed Reference = +0
	Regenerative Drive = +8
	Non-Regenerative Drive = +0
	Motion Direction = +16
	No Motion Direction = +0
	Low Frequency (AC Gearless) = +32
High Frequency (AC Geared) = +0	
DCN*	Total = nn (DCN Setting)
	<p>Example: 460V DC drive with analog speed reference for a non-regenerative drive with motion direction Add: 1 + 0 + 4 + 0 + 16 = 21 DCN Parameter setting</p> <p>Example: 230V DC drive with analog speed reference for a regenerative drive with motion direction Add: 0 + 2 + 0 + 8 + 16 = 26 DCN Parameter setting</p>
MAL	1
FRS	0

Table G

*DCN definitions can vary with model



7. Verify the jumper configuration on the DCR board using the following chart.

HP	230V		460V	
	AC	DC	AC	DC
7.5	NA	NA	J1 & J2 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	NA
10	J5 & J6 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J5 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2	J1 & J2 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J1 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2
15	J7 & J8 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J7 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2	J3 & J4 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J3 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2
20	J9 & J10 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J9 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2	J5 & J6 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J5 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2
30	J7 & J18 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J7 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2	J7 & J8 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J7 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2
40	J9 & J10 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J9 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2	J9 & J10 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J9 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2
60	J11 & J12 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J11 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2	J7 & J8 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J7 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2
80	NA	NA	J9 & J10 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	NA
100	NA	NA	J11 & J12 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	NA

Table H

Note: When using the 6300LR3 Current Regulator Card with 460V drives with AC Geared Motor connect J19 Pin 1 & 2, J20 Pin 1 & 2.

Note: When using the 6300LR3 Current Regulator Card with 460V drives with AC Gearless Motor connect J19 Pin 2 & 3, J20 Pin 2 & 3. (Remember to add 32 to the DCN parameter for AC Gearless – Refer to table G.)



Establishing Correct Encoder Direction

1. Uncouple the Encoder so it can be spun by hand.
2. Set the drive to display feedback Velocity in the Speed Loop sub-menu.
3. Rotate the encoder in the up direction and verify that the feedback signal is positive. Rotate the encoder in the down direction and verify the signal is negative.
4. If the signals are reversed swap the B and B/ encoder inputs to the drive, and repeat step 3.
5. Re-couple the motor encoder.

Establishing Correct Motor Direction and Speed

1. Place the controller in **setup mode** by doing the following steps.
 - Note:** *This function can be activated using terminal window and entering "STM" (setup mode).*
 - Note:** *This procedure will have to be done every time the power is cycled.*
 - Setup enables operation without the car top unit. If the car top unit is installed and operational this will not be required.**
- A. Press and hold the SPU button on the circuit breaker panel at the top of the controller until the **DISPLAY** buttons lights (about 5 seconds).
- B. Release the SPU button and press the Display button once.
- C. The Display button will now flash red and green. This will indicate you are in the setup mode.

On the Diagnostics Screen in the wizard or the RVU screen, verify that the elevator is on inspection.

2. Verify the following inputs are activated for panel test (motor room) run.

SDx	LBP*	CG
SUX	(R) DL	(R) GL
ETSU	ETSD	GL1
DRV	DI&DI1*	GV
UNL	DNL	NP
DRVS	PT	EAQ *
HS #	CS #	ICS #

with Top of Car
* if available

3. For 2000 compliant controllers the following additional inputs must be activated

LDP	CPI	CDP
OSD	RPI	GTS

4. When there are rear doors on 2000 compliant controllers, the following inputs are needed

RCDP	RLDP	RCG
RDL		

5. Verify the following relays and modules are activated.

CG (RCG)	DL (RDL)	CEN
THC*	CGL	FLT
CGDLA (2Kcode)		*if applicable

6. Press the up or down button and verify the direction of the drive sheave matches the direction pushed.

Note: *Should drive sheave turn in the opposite direction, or the same for both buttons swap any two motor leads at the 1MA contactor*

7. With a handheld Tachometer, verify the car speed is +/- 2 FPM from SR. If not, increase or decrease the RPM in the Speed Loop sub-menu until proper speed is achieved.

8. Run elevator up and down hoistway verifying the brake is clear from the brake drum.

Note: *If brake is rubbing the brake drum refer to manufacturer's manual for brake setup.*



Running on Temporary from a Run Box

1. Remove jumper II to CS.
2. Remove jumper TIC to TIA.
3. Wire temporary run box as per Figure 4-10.

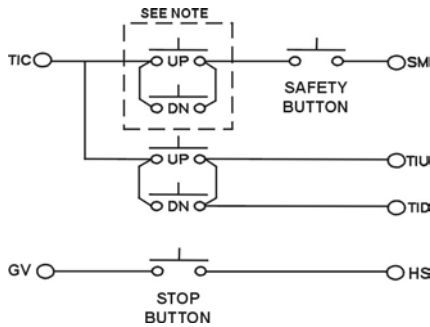


Figure 4-10

Note: Make these connections only if two-pole buttons are used.

4. Verify the elevator runs in the proper direction from the temporary run box.
5. Verify that a stop switch is wired in the safety circuit and opens the safety circuit when activated.
6. Set IVE value for a safe working speed for the elevator.
7. Verify the car is on STM mode.

Using the Swift Station

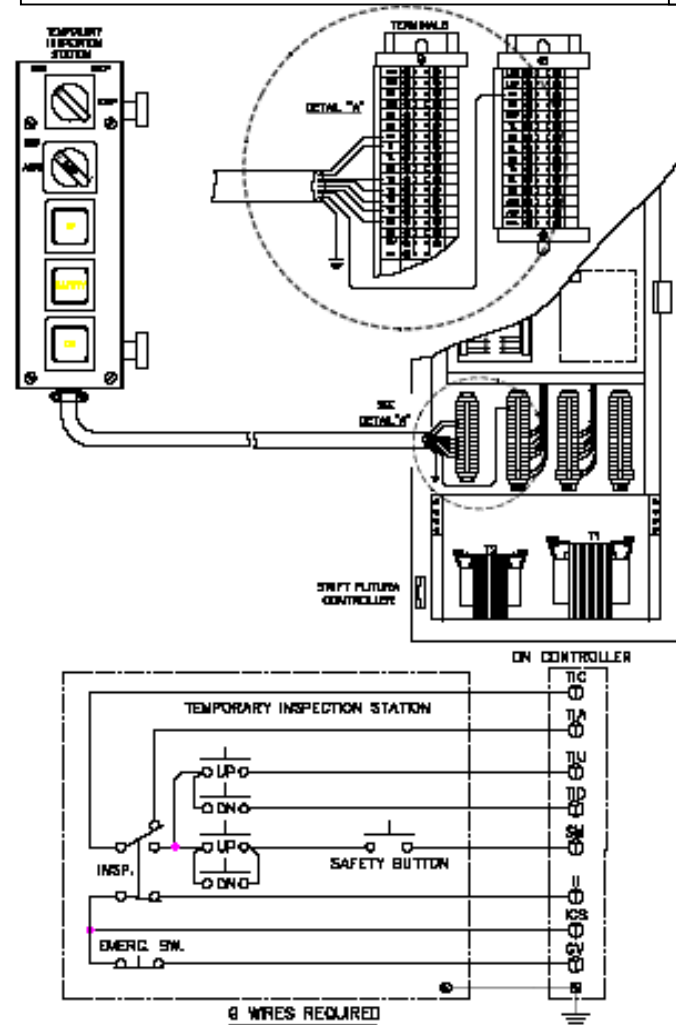


Figure 4-11



SECTION 7 - FUTURA ADJUSTMENT PROCEDURES WITH DSD 412

SPU Communication Verification

1. Verify all components are connected to the SPU Link.
2. Place the Wizard into Terminal Mode.
3. Turn off the mainline disconnect for 5 seconds then back on.
4. Verify the Wizard Terminal Screen confidence test does not list any errors. Verify the CPU LED is flashing along with the green LEDs on the SMIC boards.
5. At the Wizard Terminal, enter the password "INSTALL".
6. At the Wizard Terminal window, enter the CMC command. (See Car Commands, section 12, for details.)
7. Verify that all the devices are communicating with the SPU.

Note: *Depending on job configuration, there may be more CAR address location than shown. Check job folder for details.*

8. Access the Wizard Diagnostic screen.
9. Run the car in the Up direction and verify VEL is equal to SP (*if not, change motor RPM in drive*). Also verify both SR and VEL have green arrows. Run the car in the Down Direction and verify speed. Then verify the SR and VEL green arrows change to red.

Hoistway Completion and Verification

Counter-weighting

1. Place a balanced load on the elevator. This is usually 40 to 45% of capacity.
Note: *Check original layouts for proper percentages.*

2. Run the car on inspection about 20 feet above the counterweight.
3. Set the cars inspection speed to 20 fpm.
4. Set the drive to monitor current (parameter 611).
5. Run the elevator down to 20 feet past the counter-weights and note the current.
6. Run the elevator back up to 20 feet above the counter-weight and note the current.
7. Compare these two readings. They should be within 2 - 3 amps of each other.
8. If they are not, then weight will have to be added to or removed from the balanced load until proper current readings are established.
9. If weights are added to the balanced load, then the counter-weights are too heavy and the added amount of weight added will need to be removed from the counter-weights.
10. If weights are removed from the balance load, then the car is too heavy and weights will have to be added to the counter-weight frames.
11. Leave balanced load on the elevator.

Note: *Make sure the elevators are properly counter-balanced in order for the drive to operate correctly.*



Magnet and Switch Placement

Magnet Placement (when using Tape)

The Futura tape system incorporates a series of magnets for leveling. The magnets consist of a 12” Leveling Magnet.

1. Place the car floor exactly floor level.
2. Scribe a mark across the tape that is even with the top of the CPT.

Note: Do not mark across the slide bearing box.

3. Using the template provided, place the template on the right side of the tape.
4. Align the top of the template to the scribed mark. Place the 12” magnet at the position shown on the template with its white mark outward.
5. Using template provided, place the template on the left side of tape.
6. Align the top of template to the scribed mark. Place a 2.5 inch magnet where required according to chart. Magnet placement is a binary count with the Odd Parity (OP) to ensure all magnets are present.

Tapeless Magnet Placement

See Supplement at end of section 1.

Magnetic Placement Table

Floor	R16	R8	R4	R2	R1	OP
1	-	-	-	-	M	-
2	-	-	-	M	-	-
3	-	-	-	M	M	M
4	-	-	M	-	-	-
5	-	-	M	-	M	M
6	-	-	M	M	-	M
7	-	-	M	M	M	-
8	-	M	-	-	-	-
9	-	M	-	-	M	M
10	-	M	-	M	-	M
11	-	M	-	M	M	-
12	-	M	M	-	-	M
13	-	M	M	-	M	-
14	-	M	M	M	-	-
15	-	M	M	M	M	M
16	M	-	-	-	-	-
17	M	-	-	-	M	-
18	M	-	-	M	-	M
19	M	-	-	M	M	-
20	M	-	M	-	-	M
21	M	-	M	-	M	-
22	M	-	M	M	-	-
23	M	-	M	M	M	M
24	M	M	-	-	-	M
25	M	M	-	-	M	-
26	M	M	-	M	-	-
27	M	M	-	M	M	M
28	M	M	M	-	-	-
29	M	M	M	-	M	M
30	M	M	M	M	-	M
31	M	M	M	M	M	-

Table B (reverse magnet for R32)

7. Repeat steps 1 through 6 until all floors have a leveling magnet installed.
8. Adjust ULZ and DLZ sensors for 12.5 inch (from center to center) to allow for a + or - 1/4 “ dead zone.

Switch Placement

1. Verify **All Temporary Jumpers** have been removed and all circuits are operational.
2. Verify that the Terminal Slowdown Switches are at the required distance from the terminal

floors for the required contract speed and the TSV values are also correct for that speed. TSV values can be viewed and modified under the Wizard program sub-menu "Limits." See Table 1. ESV values are 5-10 ft/min greater than TSV.

Slowdown Limit Switch Table (approx. greater values permitted for high decelerations)

FPM (m/s)	SLD1/TSV1	SLD2/TSV2	SLD3/TSV3	SLD4/TSV4
100 (0.51)	14" (36 cm)/80			
200 (1.02)	19" (48 cm)/160			
250 (1.27)	29" (74 cm)/210			
300 (1.52)	42" (107 cm)/260			
350 (1.78)	54" (137 cm)/310			
400 (2.03)	48" (122 cm)/310	90" (220cm)/360		
450 (2.29)	48" (122 cm)/310	90" (220cm)/410		
500 (2.54)	48" (122 cm)/320	102" (259cm)/460		
600 (3.05)	48" (122cm)/320	102" (259cm)/460	143" (363cm)/550	
700 (3.56)	48" (122 cm)/320	119" (302cm)/500	198" (503cm)/650	
800 (4.06)	48" (122 cm)/330	119" (302cm)/500	198" (503cm)/650	240" (610cm)/750
900 (4.57)	48" (122cm)/330	119" (302cm)/500	198" (503cm)/650	240" (610cm)/850
1000 (5.08)	48" (122 cm)/330	119" (302cm)/500	198" (503cm)/650	264" (670cm)/950
1200 (6.09)	48" (122cm)/330	119" (302cm)/500	198" (503cm)/650	264" (670cm)/950

Table 1 >1200-call CEC **ESV values are 5-10 ft/min greater than TSV**

3. Note: If ETS switches are required, they are placed to open approximately 12" after the first slowdown switch opens. Then the remaining switches open. Estimate initial ETV parameter 5 ft/min less than highest TSV.
4. Verify that the Up and Down normal limits stop the car as close to floor level with the car running on access speed of 50 fpm.
5. Place the car on Panel Test and all other Inspection switches in the Automatic position.
6. Verify on the Wizard car diagnostics the PT input is activated.
7. Verify the type of service states Inspection.

DPP Setup

Note: Tape reader is adjusted at factory

AC Voltmeter Method

1. Connect a voltmeter between DPP1+ and DPP1- on the SPU LINK.
2. Run the car Up and Down on Inspection at 50fpm.
3. Adjust the meter settings to monitor the DC Pulsed voltage. Reading should be 2.7 VAC +/-0.5 VAC.
4. If not in tolerance, adjust the distance between the sensor and the magnet.
5. Repeat steps 2-4 until the reading is in tolerance.
6. Repeat for DPP2.



Oscilloscope Method

An alternate and more accurate method of verifying the DPP signals is using the Oscilloscope method. It is the preferred method but can be bypassed if an Oscilloscope is not available.

1. With an isolated dual channel oscilloscope, connect the one channel to DPP1+ and the other channel to DPP2+ [with ground on TP4 (GND) on the SPU LINK.
2. Run the car Up and Down on Inspection at 50fpm.
3. Verify the proper waveforms and amplitude of the square waves are correct.

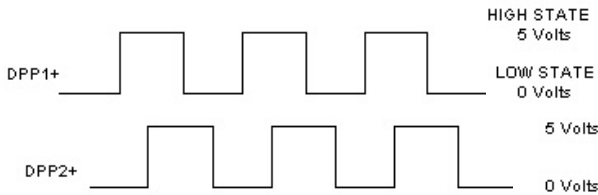


Figure 7-1

4. Verify the two signals are 90° out of phase with each other.

Verify the following conditions **do not** exist in the DPP signals on the display.

- Excessive Noise Spikes
- Ringing or Oscillations
- Distortion

(See figure 7-2 for examples of incorrect waveforms.)

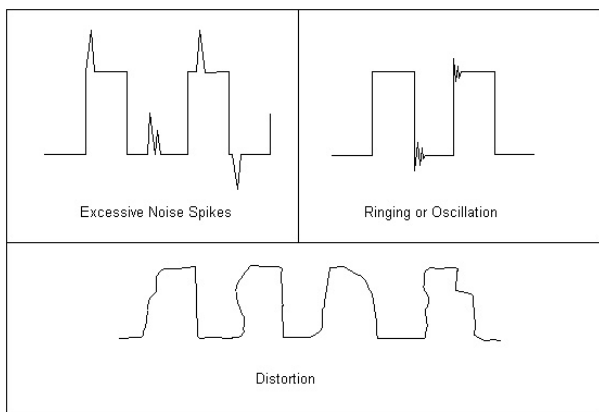


Figure 7-2

If any of these conditions exist, verify the following:

- The DPP signal is wired (continuous run) through the twisted shielded cable.

- The shielded cable is grounded on the controller ground terminal.
- The DPP wiring is not run in the same traveling cable with the high voltage signals.
- The minimum wire gauge for the DPP signal is 18 AWG.

Correct as necessary.

Auto-Setup

1. Place temporary jumpers from LCS to UNL and DNL. This will disable these direction limit switches.
2. Set IVE = 100
3. Place the elevator below the bottom floor with just the ULZ and UFLZ inputs activated.

4. Activate the Wizard Terminal window (black screen).

5. Set IVE=20 and press Enter.

6. Type **ASU** and press Enter.

7. Press and hold the up button on the controller.

Note: Should car stop before the top floor, setup will be invalid

8. While elevator is running up activate the Wizard Car Diagnostics window.

Note: *DPC value will change 100 to 1000 upon acceptance of the ASU command.*

9. Verify the DPP count is increasing in value and the DPP LEDs are flashing on the front of the SPU.

10. Once car has stopped above the top floor return to the Wizard Terminal window.

11. Type FCP command and press Enter. Verify default values have changed to the actual floor counts, i.e. 1000, 1420, 1881, etc

12. Verify that the EUR, EDR, and ETV parameters have acceptable values.

13. Once the FCPs are verified that the scan was successful, type **WRT** and press Enter.



14. Select **Door Disconnect** from the panel buttons. This will start the Door Disc. LED to flash.
15. Place the Panel Test switch to Auto and verify the car re-levels down to the top floor. Remove jumpers.

Running High Speed

Note: *The "S Curve" for the Futura has been pre-programmed by the factory for overall performance and ride quality. Leave these values at factory settings for the following procedures.*

1. Once the elevator has re-leveled to the top floor, enter **STD** and verify the cars runs on automatic to the next floor below.
2. Continue to enter **STD** and verify the car stops at every floor. Once the car reaches the bottom floor, type **STU** and press Enter. This will run the car to next floor in the up direction.
3. Continue to enter **STU** and verify the car stops at every floor.
4. Once the elevator reaches the top floor, type **SCC#** (# floor number so the car reaches high speed, usually 2 to 3 floor below top landing) and press Enter.
5. Verify the elevator will make high-speed multi floor runs up and down the hoistway.
6. Once you have verified the elevator will make high-speed runs, place a call so the car will run on high speed for almost the entire length of the hoistway.

Note: *Keep from running into Terminal Landings.*

DSD 412 Final Adjustments

Note: *The following procedure must be performed only after the Futura Adjustment Procedures "Running High Speed" has been performed.*

1. Verify the velocity and the speed reference equal +/- 3 fpm in the Car Diagnostics window.
2. If the car velocity is off, change the RPM (INP11 of Drive) value until the velocity is within 2 to 3 fpm.

Note: *If the speeds are different, verify Speed Reference on the car status is demanding contract speed and verify the RPM setting on the drive is correct. If speed reference is incorrect, check FLT for any faults. See Error Code Section 15, for more details.*

3. Verify the motor data and the parameters in the drive are in agreement.
4. Set IVE to 10 and press Enter.
5. Start with a parameter 40 on the SCR drive at a value of 7.
6. From the panel test buttons at the controller press the down direction button monitoring the drive sheave.
7. Note the amount of up roll back.
8. Increase the drive parameter 41 (System Inertia) until there is very little roll back.
9. Note: Some roll back is required but very little.
10. Set the IVE parameter to 50 and run the elevator up and down.
11. Observe the machine for any vibrations.
12. Should vibration exist lower the SCR drive parameter 40 (Response) until the vibration is eliminated.



13. Using the SDCU, scroll to parameter 994 and save the new settings. (See Section 3 “Drive Startup Procedures” Step 2e for details).

Note: *It may be necessary to reduce SCR parameter 41 should vibration occur at top speed.*

“S Curve” and Floor Accuracy Adjustments

1. Display the Car Diagnostics Window.

Note: *The “S Curve” for the Futura has been pre-programmed by the factory for overall performance and ride quality.*

2. Place a balanced load on the elevator.
3. Run the elevator on multi-door runs up and down into the same mid hatch floor.
4. Using the parameters listed in **Figure 7-4**, adjust the “S Curve” profile for the desired acceleration and deceleration ride profile.
5. Once the desired “S Curve” pattern is achieved, observe the elevator’s approach to the floor. Adjust parameter LVE (leveling velocity) for the best overall approach into the floor.

Brake Adjustment

Note: *The brake assembly MUST be in good working condition in order to achieve proper brake operation. Do not continue until any operational problems have been corrected.*

Note: *See Figure 7-3 on following page for acronyms.*

1. Verify brake can stop and hold 125% of the capacity of the elevator. See manufacturer’s information for details.
2. With capacity load on the elevator, adjust parameters BLV (Brake Lift Voltage), BLT (Brake Lift Time) and BSL (Brake Start Lift Voltage) so that the car does not drift down on a one floor run up from the bottom floor.

3. Adjust parameter BHV (Brake Hold Voltage) and BHD (Brake Hold Delay) so that the brake will pick fully then drop to economy value without rubbing.
4. Adjust the parameters BDD (Brake Drop Delay) (BCD on modulated brake) and BDT (Brake Drop Time) to allow the brake to start setting when the elevator reaches the 2” from the floor mark and be set once the elevator is stopped (electrically) by the drive.
5. Manually pick the brake slightly to allow the elevator to sag below the floor. Adjust the parameters BRT, BRV and RVE to allow the elevator to re-level into the floor without dropping further. See Figure 7-3 for full brake parameter details.
6. Set parameter MCT=25 and press Enter.
7. Type **WRT** and press Enter.



Brake Step Settings

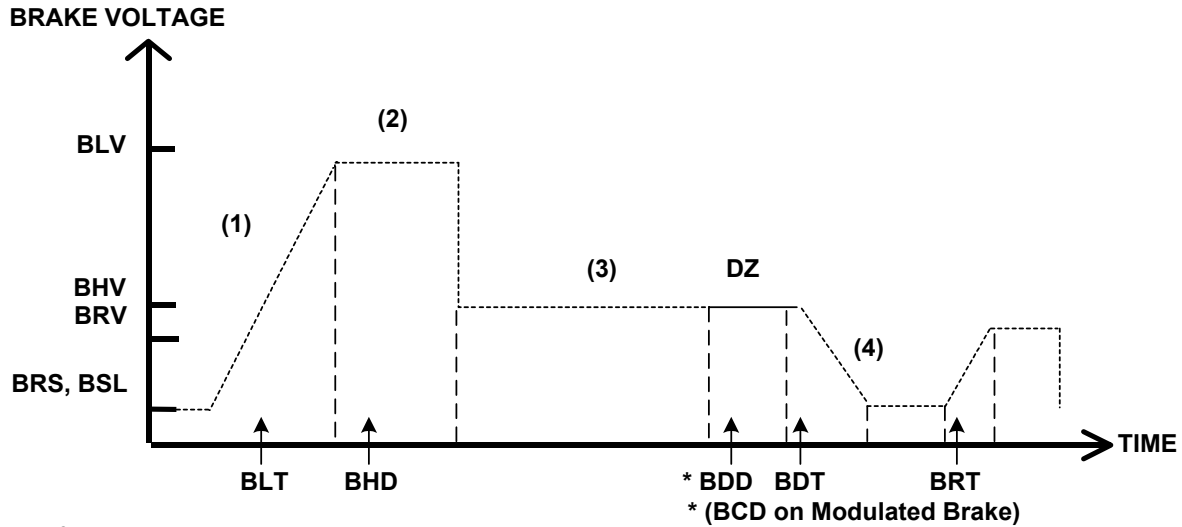


Figure 7-3

Adjustment Parameters			
Parameter	Range	Units	Description of Car Adjustment Parameters
BMV	20-500	VOLTS	Brake Maximum line Voltage. - AC line voltage applied to the Brake board.
BMA	1-20	AMPS	Brake Maximum Amps. - Maximum Amps used by the brake.
BLV	10-500	VOLTS	Brake Lift Voltage. - Initial Brake voltage. Maximum value is 90% of the Brake Maximum Voltage (BMV) parameter.
BHV	0-500	VOLTS	Brake Hold Voltage. - Brake voltage when the car is running.
BLT	0-320	1/64 SEC	Brake Lift Time. - Amount of time from Brake Start Lift (BSL) voltage to Brake Lift Voltage (BLV).
BHD	0-320	1/64 SEC	Brake Hold Delay. - Mount of time from when brake voltage reaches Brake Lift Voltage (BLV).
BSL	0-100	VOLTS	Brake Start Lift voltage. - The brake voltage output to the brake when a run is initiated.
BRV	1-500	VOLTS	Brake Re-level Voltage. - Lift voltage during a re-level.
BRT	0-320	1/64 SEC	Brake Re-level lift Time. - The amount of time from the Brake Re-level Start voltage (BRS) to the Brake Re-level Lift Voltage (BRV).
BRS	0-500	VOLTS	Brake Re-level Start lift Voltage. - The voltage output to the brake when a re-level is initiated.
BDD	0-320	1/64 SEC	Brake Drop Delay. - Time delay after the 2" (5 cm) door zone Brake voltage is reduced to zero volts.
BDT	0-320	1/64 SEC	Brake Drop Time. - The rate at which the brake voltage is reduced to zero volts.
BRR	0-65535	NUMERIC	Brake Resistance Ratio - Brake Board scaling factor <i>PWM (3 AMP) board only</i>

$$BRR=(100R_{coil} \times R_{Brake \text{ Resistor}})$$

Note: BDD and BDT will be set up after the car is H.S.

Table 2

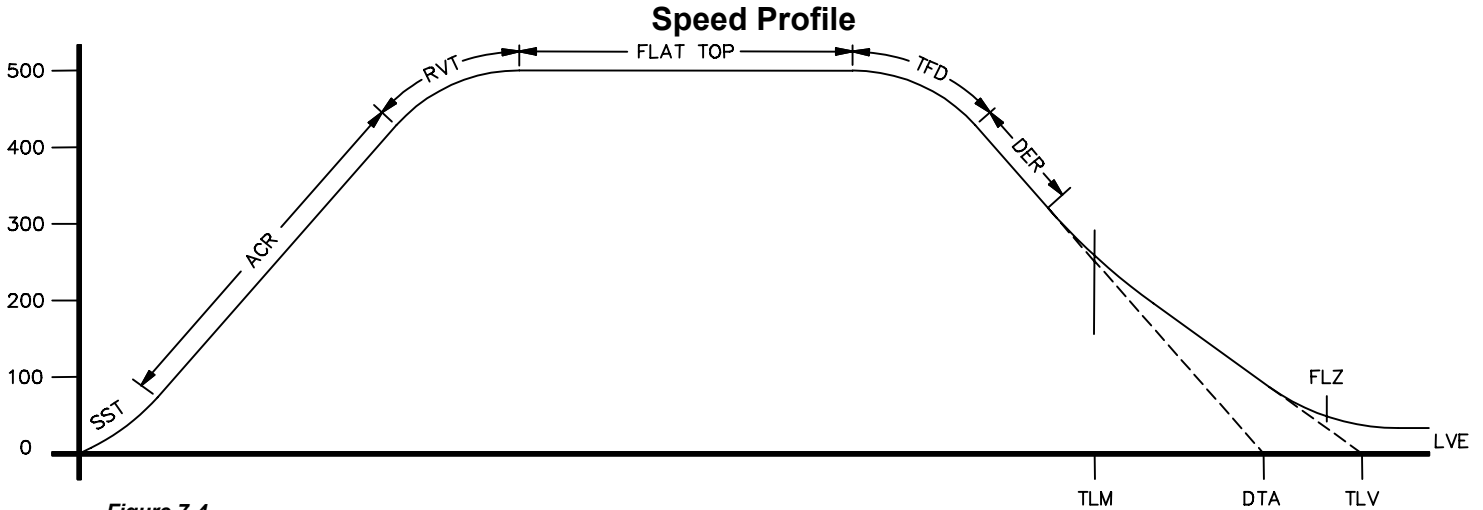


Figure 7-4

Parameter	Range	Default	Units	Description of Car Adjustment Parameters
LVE	1-20	8	fpm	Leveling VE locity (feet per minute).
TLV	0-10	5	DPP	Transfer to Leveling Vane (DPP): Distance from floor level at which the constant leveling velocity takes effect. NOTE: When car enters the 2 inch Leveling Zone (5 cm), a constant leveling velocity is introduced.
SST	0-96	16	1/64 sec	Start Start Time (1/64 of a second): Time period needed to attain rated acceleration from zero speed (ACR parameter).
ACR	75-300	150	Feet/ min/ sec	AC celeration R ate: The rate of constant acceleration for the car to top speed. Divide ACR parameter by 60 to convert value into feet-per-second. (multiply ACR by 0.00508 to convert to m/s ²)
RVT	8-60	20	FPM	Roll VE locity for T op speed (feet per minute): Velocity at which the transition from acceleration mode to flat top (top speed) begins, e.g. for RVT=25, the transition will start at 325 FPM for a rated 350 FPM car. (Where 200 FPM is about 1 m/s)
TFD	1-4	1	Number	Top speed Flat top travel D istance: Similar to FTK parameter but used only when Top speed is
DER	80-300	150	Feet/ min/ sec	DE celeration R ate: The rate of Constant Deceleration of the car to the transfer to leveling. Divide DER by 60 to convert to feet per second. (or multiply DER by 0.00508 to convert to m/s ²).
TLM	10-50	25	DPP	Transfer to Leveling M ode (DPP): Distance from floor level at which the computation changes from Deceleration to Leveling mode. The ratio between the TLM and DTA parameters determines the slope at which the car will level. NOTE: The leveling mode does not refer to the leveling operation. In this mode the velocity is directly proportional to the distance remaining from floor. TLM must be the larger value.
DTA	8-40	18	DPP	Deceleration T arget (DPP Count): This is the distance from the floor level that deceleration speed reference is calculated.

Table 3



Final Approach

Note: A well-adjusted "S Curve" will have the car stopping at the same DPP position in the hoistway up and down.

1. With the car stopping at the same position up and down, run the car to each landing recording the elevators leveling accuracy from the car.
2. Once all floor differences have been measured, return to the main menu and select Car Hoistway.
3. Type **FCP#** (# is the individual floor number) and press Enter.
4. Enter either an increased or decreased FCP number. An increased FCP# will bring an elevator higher when stopping at that floor. A decreases FCP# will bring an elevator lower when stopping at that floor.

Note: This can only be done once the elevator has been adjusted to stop in the same position in the hoistway as discussed in steps 3 and 4 above, and can change only $\pm 3/8$ inch.

5. Once all floors have been changed, recheck each floor for leveling accuracy. If further adjustment is needed, repeat steps 8 and 9 until you are satisfied with the floor accuracy.
6. Type **WRT** and press Enter to Save all above work to Flash memory.
7. Return to the Car Diagnostics Window.

Note: If floor levels are off more than $3/8$ inch, recheck magnet placement and move as necessary. If moved, perform a new auto setup.

Miscellaneous Safety Parameter Adjustments

1. Using the Terminal Window set the following parameters. See Table 4.

VEE	Highest difference between Speed Reference and Velocity during Acceleration plus 30.
MLV	160
MRV	60
CDL	DPP position count of the elevator when the platform is even with the top of the counter-weight. Only if CWT derailment is required.
CDH	DPP position count of the elevator when the crosshead is even with the bottom of the counter-weight. Only if CWT derailment is required.

Table 4

2. IF hoistway access is provided, run the car from both switches. Using parameter **ACB** for the bottom landing and **ACT** for the top landing, set the access travel limits.

Terminal and Emergency Slowdown Limit Adjustments

1. Perform multiple types of floor runs (1, 2, 3 and high speed) into the top terminal landing.
2. Type ULB and press Enter after each run into the terminal landing. Record the Up Limits Position lowest DPP count and speed.
3. Repeat for the bottom terminal landing using DLB and record the Down Limits positions highest DPP count.
4. Compare the ULB and the DLB limit positions recorded in step 2 and 3. They should be within 3 DPP counts of each other. If not adjust either ULR or DLR values for each switch, i.e. ULR1 for SU1, DLR1 for SD1, etc.
5. Set the corresponding TSV (TSV1 is for SU1 and SD1, etc.) value approximately 15 fpm higher than what was recorded in the previous steps.



6. Set parameter LPE to a value between 20 to 30.
7. Make multiple runs into the terminal landings and verify no fault 11 occurs. IF an 11 error occurs, the LPE value may have to be higher.
8. Set the ESV parameters to approximately 25 fpm higher than the corresponding TSV values, ESV1 higher than TSV1, etc.
9. Run the car at high speed into the top landing.
10. Enter the ELB command.

Note: *ETSU must be in position 5 and ETSD in position 17 on the VFC board. If not, contact CEC for changes.*

11. Note the Emergency Terminal Slowdown velocity and the ETS UP Limit position.
12. Set parameter EUR = ETS Up Limit position in step 11.
13. Run the car high speed into the bottom floor and enter the ELB Command.
14. Note the Emergency Terminal Slowdown velocity and the ETS DN Limit position.
15. Set parameter EDR = DN Limit position in step 14.
16. Compare the Emergency Terminal Slowdown velocities in step 11 and 14. Note the Higher value.
17. Set ETV = to the higher value recorded in step 16 + 20FPM.
18. Type WRT and press Enter.

Load Weigher Setup (see sec. 14)

1. Ensure the CSW bits are set. (CS7,6-9)
2. Place the elevator with no load at the bottom landing on car top inspection.
3. Using a voltmeter on the DC scale, connect the positive lead on **LW2** and the negative lead on **GND** in the CPT.

4. Adjust the sensor on cartop until the voltmeter measures **+1.0** to **+1.4** Volts DC (for Isolated platform mount (bottom mount) sensor the voltage will be between +4.2 and +4.6 VDC).
5. Lock the sensor in place with the lock nut.
6. Place the car on Independent Service.
7. Using the Wizard Terminal Window, perform the following setup:

Note: *Setup Load Weigher in terminal mode only.*

- A. Type **LWU** and press Enter.
- B. Select the Proximity Sensor Setup.
- C. Select the installation type (either cross head mount or Isolation frame mount) and press Enter.
- D. With the car empty at the bottom floor, type **LWU1**.
- E. Once the display shows LWU1 OK, press Enter.
- F. Place full load on the Elevator.
- G. Type **LWU2**.
- H. Once the display shows LWU2 OK, press Enter.
- I. From inside the elevator, run the fully loaded car on Independent to the top floor.
- J. Type **LWU3**.
- K. Once the display shows LWU3 OK, press Enter.
- L. Remove all weights from inside the elevator.
- M. Type **LWU4**.
- N. Once the display shows LWU4 OK, press Enter.
- O. Enter WRT command to save these readings.



**PRE-TORQUE SETUP
(TORQUE COMPENSTATION)**

1. Place an empty car at the top floor on door disconnect.
2. Set CSW8 bit 9 (bits 8,9).
3. Set SST parameter to 1.
4. Run the car down 1 floor at a time and note the roll back.
5. Increase parameter TRC until the roll back is just eliminated.
6. Increase PDT for the amount of delay Pre-Torque required before the "S" curve pattern is started.
7. Increase SST parameter until the desired start acceleration is achieved.
8. Enter the WRT command.
9. Verify the settings are correct by placing the full load at the bottom floor and running the car one floor at a time in the up direction.

Note: If roll back exists on a fully loaded car then further adjust TRC and PDT until it is just eliminated.

Miscellaneous Adjustments

Setting the Hoistway Access

1. Place the car at the top floor on Inspection (ICA)
2. Set parameter ACT to a value to stop the car to a preferred level.

Note: ACT and ACB values are not used until the car travels off of SD1 or SU1.

3. Access car down verifying car stops where desired.
4. Repeat at bottom floor setting ACB.

Note: If top access is located other than top floor, set ACF to the Top Access Floor

Setting Earthquake Collision (If required)

1. Run the car on inspection 1-2' below the point where the bottom of the counterweight would strike the car.
2. Record the DPC count.
3. Set CDL to the value recorded in step 2.
4. Run the car up 1-2' beyond the point where the bottom of the car would strike the counterweight.
5. Record the DPC count.
6. Set CDH to the value recorded in step 5.
7. Enter the WRT command.

Door Limit Check

Verify the following modules:

PARAMETER	OPEN	HALF OPEN	CLOSED
DOL	LOW	HIGH	HIGH
DLC	HIGH	HIGH	LOW
DL6	HIGH	HIGH	LOW



Various Door Parameter and Control Status Word Settings

DOORS			
CSn	Bit	DEFAULT	DESCRIPTION
0	13	R	When set and on independent service, the doors will close automatically when a car call is registered.
1	4	R	When set, pre-opening is disabled for the front doors.
1	5	R	When set, front door pre-opening will occur at the 2" leveling zone.
2	1	R	If set, pressing the door close button shortens the door open time. If reset, DCB has no affect on door open time.
2	8	R	Does not allow reopening of doors with the safety edge or the electric eye during nudging.
3	13	R	If set, door-nudging operation is disabled.
4	5	R	If set, front door pre-opening will occur when car reaches 6" from floor level.
5	3	R	If set, car will shutdown if car goes out of the level zone and doors are open.
6	3	R	Set to disable electronic detector edge time out.
6	4	R	Set to enable electronic detector edge operation Vs. mechanical safety edge.
6	5	R	Set to enable electronic proximity edge operation Vs. mechanical safety edge.
6	14	R	Set to enable drive fault GLR error. (both GLR input and DOL input active while at the floor)
7	10	R	Set to invert detector edge input.
9	5	R	Set to require DCL on (with GLI and GL) to start car.

DOORS			
PAR	RANGE	UNIT	DESCRIPTION
CDT	16-200	1/16s	Door Open Time: Time for doors after answering a car call.
DCC	2-20	Units	Door Cycle protection Counter: Normally adjusted for 6 cycles before removing power form doors.
DCP	5-20	Sec.	Door Close Protection time: The amount of time the doors are given to close before taken out of service on door protect.
DDT	0-80	Sec.	Door open Time after activation of DOB input.
DHT	0-64	1/16s	Door Hold Time: Delay time before high-speed door opening. Only used on Dover OHS door operator circuits.
DOH	0-360	Sec.	Extra Door Open button Hold time: Only used with door hold buttons.
DOP	5-20	Sec.	Door Open Protective time: Amount of time allowed to open the doors before taken out of service on door protects
DOT	0-60	Sec.	Door Open button Time-out: Maximum amount of time doors are allowed to remain open form the door open input.
LDT	32-200	1/16s	Long Door open Time: Time used when car answers a hall call.
NDT	5-120	Sec.	Nudging Door Time: Time doors are allowed to be held open before nudging goes into effect.
SDT	4-48	1/16s	Short Door Time: Door time after electric eye or safety edge has been activated.



FIRE			
PAR	RANGE	UNIT	DESCRIPTION
FAL	1-# FLs	Unit	Fire recall Alternate Floor: The alternate floor to which car recalls when main fire floor sensor is activated.
FBT	1-65535	1/64s	Fire Bypass Timer for GSA fire standard.
FIR	1-# FLs	Unit	Fire Recall Floor: The main fire floor for phase 1 recall mode.
IFT	0-300	Sec.	Independent Fire Time: Time system takes to override independent service during fire phase 1 operation.

FIRE			
CSn	Bit	DEFAULT	DESCRIPTION
1	8	R	When set, the fire buzzer is pulsed.
1	9	R	When set, the fire emergency light is pulsed.
1	10	R	When set, the stop switch is not bypassed. When reset, it is bypassed according to bit 11.
1	11	R	When set, stop switch is bypassed all the time. When reset, the stopswitch is bypassed according to ANSI code standard.
1	13	R	When set, the in-car fire service light also operates during phase II.
1	14	R	When set, the doors will close when a car call is registered. If reset, the door must be closed with the door close button.
3	3	R	If set, allows car to shut automatically after phase II key switch is set to "OFF" and phase I condition exists.
3	5	R	When set, the door open button is disabled during phase I fire service.
3	14	R	If set, door-nudging operation is activated during phase I fire service operation while the door is closing. This bit will override bit 13 (disable nudging).
4	0	R	If reset, car will open front door automatically when it reaches the fire floor during phase I.

CALL			
CSn	Bit	DEFAULT	DESCRIPTION
0	4	R	Dumps all calls after consecutive car calls answered per CCD parameter number order with no electric eye break.
4	10	R	If set, car calls will not be cancelled when the car has a reversal slowdown.
4	11	R	If set, cancel car calls for positions above the car when the car is moving down and cancel car calls below the car when the car is moving up.
7	15	R	Set to pulse car call output for low intensity lights.



BUFFER TEST

Following are the steps to follow in preparing the controller for buffer tests:

1. Place the controller on Door Disconnect.
2. Run the car to a position that will allow the car (or counter-weight) to reach constant contract speed or the reduced stroke buffer speed before striking the buffer. If a reduced stroke buffer is used, set CS7=20H and set the MMS parameter for the rated speed of the buffer.
3. Jumper all the UP or DOWN slowdown limits high, depending on a car (or counter-weight) buffer test. Example: LCS to SU1, SU2, etc.
4. Jumper the ETSU or ETSD (Emergency Terminal Slowdown limits) high, depending on a car or counter-weight buffer test. Example: LCS to ETSU or ETSD.
5. RESET bit 1 of CSW0 to prevent the DPP count from resetting at the start of a run.

Type **BITR0, 1** (Note: the 0 in BITR0 is a zero, not the letter 'O').

Type **WRT** to store the data in FLASH memory in case power is interrupted.

6. Remove the UNL or DNL module, depending upon direction of the car for the test. This will cause the position (POS) and FCP (Floor Count Position) to default to the top or bottom terminal.
7. Change the current DPP count of the car by typing DPC = 1000 (for the lowest landing default) or DPC = top floor FCP.
8. Type **SCC1** (or SRC1 if position 1 is a rear call) for the lowest landing, or SCCn, where n is the floor number of the top call (type **SRCn** if the position is a rear call). The car or counter-weight will start its run to the respective buffer. The status of the directional and final limits will be up to the local code authorities and/or the installation company.
9. After the test, remove all jumpers; replace the UNL or DNL modules. Set the CSW0, 1 bit by typing BITS0, 1; set CS7 = 0h, then type **WRT**.

OVERSPEED TEST

Following are steps to follow in preparing the controller for overspeed tests:

1. Place the controller on Door Disconnect.
2. Run the car to one floor below the top or one floor above the bottom terminal (depending on car or cwt. overspeed test).
3. Place a temporary jumper from LCS to GV.
4. Set Weak Field Current (F# 49) to the value needed to attain mechanical governor tripping speed.

Example: Contract car speed is 300 FPM (1.5meters/sec), motor RPM is set to 1150 and the overspeed must be 30% higher than contract speed. $1150 \text{ RPM} \times 130\% = 1495 \text{ RPM}$. Enter the calculated value into F# 11.

5. Set Weak Field Current (F# 11) to the value needed to attain mechanical governor tripping speed.
6. Set the Overspeed % (F# 12) to 150%.
7. Set VEE = 300.
8. Place a call that will permit the car to reach its overspeed condition.

After completing the overspeed test, remove all jumpers and restore all parameters to their original values.



ETS TEST

Following are steps to follow in preparing the controller for ETS tests:

1. Place the controller on Door Disconnect.
2. Run the car to a position that will allow the car to reach contract speed before actuating the ETS limit(s).
3. Set the ETV parameter to a value equal to or less than the speed rating of the buffer. The physical position of the limit (distance from limit to buffer) is critical to the proper operation of the ETS switch. This will ensure that when the car shuts down on an ETS (emergency stop), it (or the counter-weight) will be at a speed equal to or less than the speed rating of the buffer. (Setting ETV to a low number will drop brake)
4. RESET bit 1 of CSW0 to prevent the DPP count from resetting at the start of a run. Type **BITR0, 1** and press **enter** (Note: the 0 in BITR0 is a zero, not the letter O). Type **WRT** to store in FLASH memory in case power is interrupted.

5. Remove the UNL or DNL module, depending on direction of the car for the test. This will cause the position (POS) and FCP (Floor Count Position) to default to the top or bottom terminal.
6. Change the current DPP count of the car by typing DPC = 1000 (for the lowest landing default) or DPC = top floor FCP.
7. Type **SCC1** (or SRC1 if position 1 is a rear call) for the lowest landing, or SCCn where n is the floor number of the top call (or SRCn if the position is a rear call). The car will start its run to the respective ETS limit switch. The status of the directional and final limits will be up to the local code authorities and/or the installation company.

After the test, replace the UNL or DNL modules, set the CSW0, 1 bit by typing BITS0, 1, enter, then type WRT, enter.



SECTION 8 - FUTURA ADJUSTMENT PROCEDURES WITH SWIFT DRIVE

Hoistway Verification

Inspection Operation

1. Remove the car gate and door lock jumpers that were installed during Temporary Operation.
2. Remove any safety circuit jumpers that were installed during temporary operation.
3. Remove jumpers from the normal and the slowdown limits.
4. Remove temporary run cord and any wiring used to make temporary operation available.
5. Verify all Inspection switches are in the Inspection Mode and all safety circuit switches are in their correct positions.
6. Verify that the car is now ready for inspection operation via the top of car run station. [Refer to Table A.] All Inputs/Outputs are High.

I/Os required to run Car Top Inspection					
I/O	Description	Location	I/O	Description	Location
SU1	1st Slowdown	VFC	GV	Motor Room Safety Circuit	MRC
SD1	1st Slowdown	VFC	GL	Gate Lock Relay	MRC
UNL	Up Normal Limit	VFC	NP	Normal Power	MRC
DNL	Down Normal Limit	VFC	LBP	Landing / Car Bypass	GP1
ETSU	Emergency Terminal Limit	VFC	DL	Door Locks	GP1
ETSD	Emergency Terminal Limit	VFC	CGL	Gate Lock Output	GP1
DRV	Drive Ready	VFC	CG	Car Gate	GP1
FLT	Fault Control	VFC	HS	Hoistway Safety Circuit	TOC
GL1	Gate / Lock Relay	VFC	CS	Car Safety Circuit	TOC
THC	Thermistor Time Delay	MRC	ICS	In Car Stop	TOC
DRVS	Drive Switch	MRC	TCI	Top Car Inspection	TOC

Table A

Note: I/O Locations may vary on each job. Refer to SMI charts for Board and Slot location.

Note: More I/O's may be needed to be on if specific devices are required. (e.g. Rope Gripper, Earthquake, additional slowdowns, 2000 code compliance). See section 4-9

Door and Gate Check

While running from Car Top inspection switches, open each door and gate to verify the car stops.

Safety Switch Check

1. While running the car, verify that each safety circuit device stops the car.
2. Verify that all limit switches are activated mechanically. (Example: Top final limit is broken by cam on car.)

Note: You will have to jump normal limits to check finals. You may also have to eliminate TOC comm. to get past Top and Bottom Floor level.

Normal Limits Check

1. Verify that that top directional switch stops the car from running up and the bottom directional switch stops the car when running down.
2. Verify that the directional switches open when the car is within 2 inches of the floor level.



Magnet Placement (when using Tape)

The Futura tape system incorporates a series of magnets for leveling. The magnets consist of a 12” Leveling Magnet.

1. Place the car floor exactly floor level.
2. Scribe a mark across the tape that is even with the top of the CPT.

Note: Do not mark across the slide bearing box.

3. Using the template provided, place the template on the right side of the tape.
4. Align the top of the template to the scribed mark. Place the 12” magnet at the position shown on the template with its white mark outward.
5. Using template provided, place the template on the left side of tape.
6. Align the top of template to the scribed mark. Place a 2.5 inch magnet where required according to chart. Magnet placement is a binary count with the Odd Parity (OP) to ensure all magnets are present.

Tapeless Magnet Placement

See Supplement at end of section 1.

Magnetic Placement Table

Floor	R16	R8	R4	R2	R1	OP
1	-	-	-	-	M	-
2	-	-	-	M	-	-
3	-	-	-	M	M	M
4	-	-	M	-	-	-
5	-	-	M	-	M	M
6	-	-	M	M	-	M
7	-	-	M	M	M	-
8	-	M	-	-	-	-
9	-	M	-	-	M	M
10	-	M	-	M	-	M
11	-	M	-	M	M	-
12	-	M	M	-	-	M
13	-	M	M	-	M	-
14	-	M	M	M	-	-
15	-	M	M	M	M	M
16	M	-	-	-	-	-
17	M	-	-	-	M	-
18	M	-	-	M	-	M
19	M	-	-	M	M	-
20	M	-	M	-	-	M
21	M	-	M	-	M	-
22	M	-	M	M	-	-
23	M	-	M	M	M	M
24	M	M	-	-	-	M
25	M	M	-	-	M	-
26	M	M	-	M	-	-
27	M	M	-	M	M	M
28	M	M	M	-	-	-
29	M	M	M	-	M	M
30	M	M	M	M	-	M
31	M	M	M	M	M	-

Table B (reverse magnet polarity for R32)

7. Repeat steps 1 through 6 until all floors have a leveling magnet installed.
8. Adjust ULZ and DLZ sensors for 12.5 inch (from center to center) to allow for a + or - 1/4 “ dead zone.



DPP Setup

Note: Tape reader is adjusted at factory

Note: *This step may be required if a tape driven selector is used. Skip this step if using a rail or governor mounted encoder.*

AC Voltmeter Method

- Using a voltmeter on the **AC scale** to verify the DPP signals, connect it between DPP1+ (positive lead) and DPP1— (negative lead) on CPE or CTI boards.
- Run the car Up and Down on Inspection at 50 FPM.
- Adjust the meter settings to monitor the Pulsed voltage. The reading should be between 2.7 VAC to 3.0 VAC.
- If not within tolerance, adjust the distance between the sensor and the magnet.

Note: *Start with the sensor set for 1/16 to 1/8 inch between sensor face and tape. [See Figure 8-4]*

Note: *Verify that the sensor is in the center of the holes in the tape.*

- Rotate the magnet away or toward the sensor to adjust the voltage output.
- Repeat steps 2-4 until the reading is within tolerance.
- Repeat steps 1-5 for DPP2+ and DPP2—.

Oscilloscope Method

An alternate and more accurate method of verifying the DPP signals is using the Oscilloscope method. It is the preferred method but can be bypassed if an Oscilloscope is not available.

- With an isolated dual channel oscilloscope, connect the one channel to DPP1 + and — (plus and minus) and the other channel to DPP2 + and — .
- Run the car Up and Down on Inspection at 50 FPM.

- Verify the proper waveforms and amplitude of the square waves is correct. The Oscilloscope Time/div setting should be set at 0.5 seconds/div.

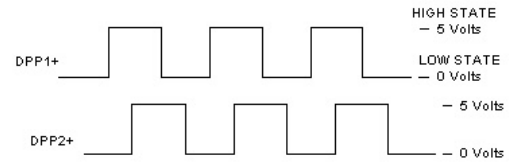


Figure 8-1

- Adjust the sensors and magnets to obtain a 50% duty cycle. Signal should be high for the same amount of time as it is low.
- Verify the two signals are 90° out of phase with each other.

Verify the following conditions **do not** exist in the DPP signals on the display.

- Excessive Noise Spikes
- Ringing or Oscillations
- Distortion

(See Figure 8-2 for examples of incorrect waveforms.)

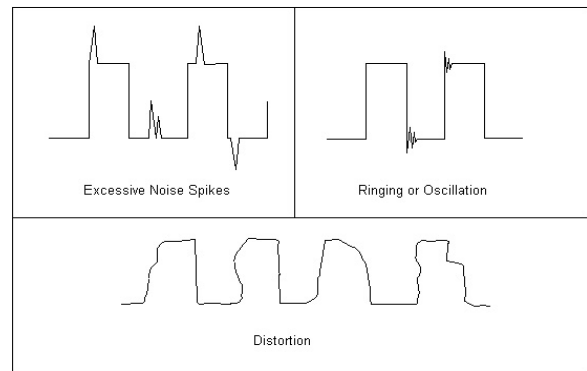


Figure 8-2

If any of these conditions exist, verify the following:

- The DPP signal is wired (continuous run) through the twisted shielded cable.
- The shielded cable is grounded on the controller ground terminal.
- The DPP wiring is not run in the same traveling cable with the high voltage signals (over 120 VAC).
- The minimum wire gauge for the DPP signal is 20 AWG.

Correct as necessary.



Slowdown and ETS Switch Check

1. Run car into Top and Bottom terminal floors. Verify the slowdown switches open at the required distance from the floor level.

2. Verify that if ETS switches are required, they are placed to open approximately 12" after the first slowdown switch opens. Then the remaining SLD switches open.

Slowdown Limit Switch Table (approx)

FPM (m/s)		SLD1		SLD2		SLD3		SLD4	
100	(0.51)	14"	(36 cm)						
200	(1.02)	19"	(48 cm)						
250	(1.27)	29"	(74 cm)						
300	(1.52)	42"	(107 cm)						
350	(1.78)	54"	(137 cm)						
400	(2.03)	48"	(122 cm)	90"	(220cm)				
450	(2.29)	48"	(122 cm)	90"	(220cm)				
500	(2.54)	48"	(122 cm)	102"	(259cm)				
600	(3.05)	48"	(122cm)	102"	(259cm)	143"	(363cm)		
700	(3.56)	48"	(122 cm)	119"	(302cm)	198"	(503cm)		
800	(4.06)	48"	(122 cm)	119"	(302cm)	198"	(503cm)	240"	(610cm)
900	(4.57)	48"	(122cm)	119"	(302cm)	198"	(503cm)	240"	(610cm)
1000	(5.08)	48"	(122 cm)	119"	(302cm)	198"	(503cm)	264"	(670cm)
1200	(6.09)	48"	(122cm)	119"	(302cm)	198"	(503cm)	264"	(670cm)

Table C >1200-call CEC

Position of switches are recommendations. Variations are permitted.



Machine Room Verification

Terminal Speed Setting (note: Factory initialization should be adequate)

1. Place all **Car** inspection switches in the automatic position.
2. Place the car on independent service if available.
3. Using the wizard terminal mode set the terminal slowdown speed per Table D below.

Temporary Terminal Speed Settings*									
Car Speed	Normal Slowdown				Emergency	VFC Slowdown			
	TSV1	TSV2	TSV3	TSV4	ETV	ESV1	ESV2	ESV3	ESV4
100	80				75	90			
200	160				155	170			
250	210				205	220			
300	260				255	270			
350	310				305	320			
400	310	360			355	320	370		
450	310	410			405	320	420		
500	320	460			455	330	470		
600	320	460	550		545	330	470	560	
700	320	500	650		645	330	510	660	
800	330	500	650	750	745	340	510	660	760
900	330	500	650	850	845	340	510	660	860
1000	330	500	650	950	945	340	510	660	960
1200	330	500	650	950	945	340	510	660	960

*greater values permitted for high decelerations

Table D

Note: All values listed in the table above are in FPM (feet per minute).

Note: For speeds greater than 1200 FPM consult factory or raise values so that there will not be any interference from terminal slowdowns while adjusting elevator.



Counter-weighting

Note: *Until the brake is fully adjusted in the next step, extreme care should be taken when loading and unloading weights in car and counterweight.*

1. Place the balanced load on elevator. This is normally between 40 to 45% of capacity. (Example: 3000 lbs. x 45% =1575 lbs.)
2. Set the car inspection speed to 20 FPM.
3. Set Drive to display motor current at ???
4. Run the car through the center of the hoistway in both directions. Note the current in both directions while running the car.

Note: ** If current is within 2-3 Amps of each other, the car is counter balanced sufficiently.*

** If the current is larger in the up direction, then weights must be added to the counterweight.*

** If the current is larger in the down direction, then weights must be removed from the counterweight.*

5. Remove or add counterweights as necessary until current readings are equal in both directions.

Note:

It is extremely important that the elevator is counter-balanced in order for the drive to operate correctly. You may wish to check the balance mechanically.

Brake Setup

1. Move the elevator to the lowest landing and verify the brake can hold 125% of capacity by adjusting the brake spring tension.
2. Once the brake spring has been adjusted, place the balanced load on the elevator.
3. Verify parameter BMV is per power distribution print and BMA is set to maximum amps used by brake.
4. Run the elevator up or down and adjust BRR so that the brake board has the output voltage equal to the BHV voltage setting.
5. Adjust brake per manufacturer specifications.

Note:

Use both Manufacturer's setup procedure and Table G for electrical and mechanical setting of the brake.



Brake Steps

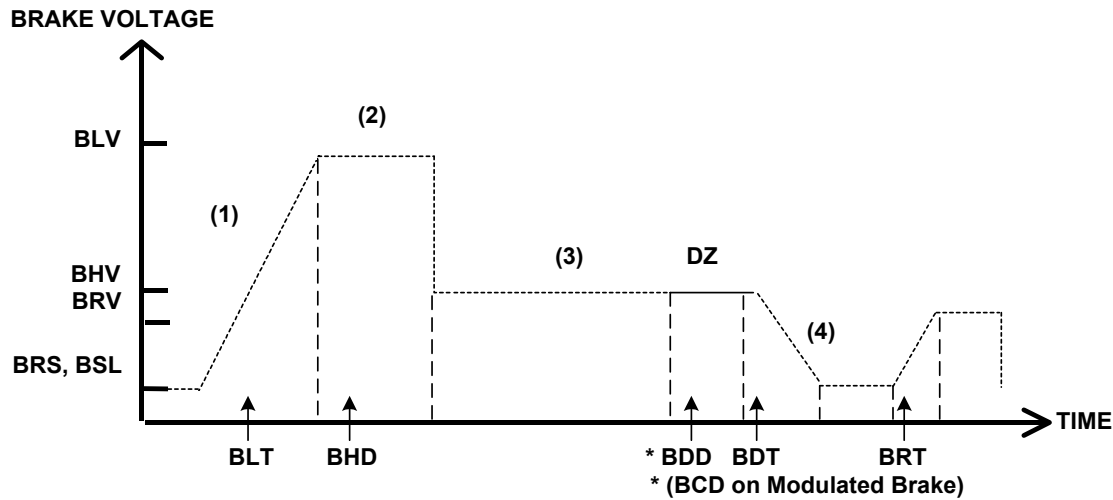


Figure 8-6

Adjustment Parameters			
Parameter	Range	Units	Description of Car Adjustment Parameters
BMV	20-500	VOLTS	Brake Maximum line Voltage. - AC line voltage applied to the Brake board.
BMA	1-20	AMPS	Brake Maximum Amps. - Maximum Amps used by the brake.
BLV	10-500	VOLTS	Brake Lift Voltage. - Initial Brake voltage. Maximum value is 90% of the Brake Maximum Voltage (BMV) parameter.
BHV	0-500	VOLTS	Brake Hold Voltage. - Brake voltage when the car is running.
BLT	0-320	1/64 SEC	Brake Lift Time. - Amount of time from Brake Start Lift (BSL) voltage to Brake Lift Voltage (BLV).
BHD	0-320	1/64 SEC	Brake Hold Delay. - Amount of time from when brake voltage reaches Brake Lift Voltage (BLV) to voltage being lowered to BHV value.
BCL	0-32	1/64 SEC	Brake Control Lift timer delay. -This parameter delays BKC output from energizing BK contactor. Note: Only used on VVVF drives.
BSL	0-100	VOLTS	Brake Start Lift voltage. - The brake voltage output to the brake when a run is initiated.
BRV	1-500	VOLTS	Brake Re-level Voltage. - Lift voltage during a re-level.
BRT	0-320	1/64 SEC	Brake Re-level lift Time. - The amount of time from the Brake Re-level Start voltage (BRS) to the Brake Re-level Lift Voltage (BRV).
BRS	0-500	VOLTS	Brake Re-level Start lift Voltage. - The voltage output to the brake when a re-level is initiated.
BDD	0-320	1/64 SEC	Brake Drop Delay. - Time delay after the 2" (5 cm) door zone Brake voltage is reduced to zero volts.
BDT	0-320	1/64 SEC	Brake Drop Time. - The rate at which the brake voltage is reduced to zero volts.
BRR	0-65535	NUMERIC	Brake Resistance Ratio - Brake Board scaling factor PWM (3 AMP) board only

Table E

$$BRR = (100R_{coil} \times R_{Brake Resistor})$$

Note: BDD and BDT will be set up after the car is H.S.



Board Communication Check

1. Using the wizard terminal mode, enter the **CMC** command.
2. Verify all local and car boards are communicating.
 - Every board with a processor, has a numerical address. (see 12-2)
 - Percent failure for a board must be less than 10%.
 - If greater, check voltage, communication lines, and noise immunity.

Hoistway Switch Check

1. Using the wizard diagnostic screen or the RVU screen, verify that Top and Bottom slow downs open when running into the terminal floors. Slowdowns should open from the highest to lowest. (e.g. SU3, SU2, SU1)
2. Verify that ETS switch opens after the first slowdown opens. (e.g. SU2, ETSU, SU1)
3. While running the car, verify that the selector switches are functioning.
Note: *The sequence of leveling sensors in the up direction: ULZ, ULFZ, MLZ, DFLZ, DFZ.*
4. Verify that DPP1 and DPP2 are toggling as the car runs up and down.
Note: *DPP1 should turn on before DPP2 when running in the up direction.*
5. Verify DPC count increases as the car runs up and decreases when the car runs down.
Note: *If count is backwards swap DPP2 + and DPP2 – at the SPU link board.*
6. Verify car speed is equal to Demand speed (**SR**) **using a handheld tachometer**. If it is not equal, change the RPM setting in the drive Speed Loop Sub-menu, to achieve correct speed.

Drive Parameters

1. Verify the drive parameters per table below. See table F and then refer to tables G, H, and I as necessary.

Drive Parameters			
Parameter	Sub-menu	Adjustment Description	Value
MDC	Drive	Motor Drive Current	See Table G.
MFC	Drive	Motor Field Current	See Table H.
RSF	Drive	Motor Slip Frequency	See Table H.
MTP	Drive	Motor Poles	Motor Name Plate
MNC	Drive	Motor Current	Motor Name Plate
MNV	Drive	Motor Voltage	Motor Name Plate
MNF	Drive	Motor Frequency	Motor Name Plate
NRRM	Drive	Motor RPM	Motor Name Plate
VEP	Drive	Motor Encoder Pulse	Encoder Name Plate
CTS	Speed Loop	Contract Top Speed	Job Specification
RPM	Speed Loop	Motor RPM @ Top speed	Job Specification
AFS	Speed Loop	Analog Full Scale	9.75
KVI	Speed Loop	Velocity Integral Gain	300
KFP	Speed Loop	Feedback Proportional Gain	45
DCN	System	Drive Configuration	See Table I.
MAL	System	Menu Access Level	2

Table F



Parameter	HP	Recommended/ Initial Setting	
		230VAC Input	460VAC Input
MDC	10	66.0	33.0
	15	99.0	50.0
	20	129.0	67.0
	30	198.0	99.0
	40	258.0	129.0
	60	400.0	198.0
	80	-	258.0
	120	-	400.0

Table G

Parameter Name	Method Used to Determine Setting
KFF	0
MFC	Set for the NO Load Data, (Balanced Load), on the motor nameplate: Or 35% of the Full Load Nameplate Rating. (Value entered in Amps.)
MTP	Set to the number of stator poles per phase in the machine motor.
RSF	Set per Formula below: $\frac{(\text{Synchronous Motor RPM} - \text{Rated Load RPM})}{\text{Rated Load RPM}} \times 60$

Table H

Parameter Name	Method Used to Determine Setting
DCN	Note: Add only the numbers that match your actual known job conditions to determine the number (nn) for the DCN parameter.
	DC Drive = +1 AC Drive = +0 230V Drive = +2 460V Drive = +0 Analog Speed Reference = +4 Digital Speed Reference = +0 Regenerative Drive = +8 Non-Regenerative Drive = +0 Motion Direction = +16 No Motion Direction = +0 Low Frequency (AC Gearless) = +32 High Frequency (AC Geared) = +0
DCN	Total = nn (DCN Setting)
	Example: 460V DC drive with analog speed reference for a non-regenerative drive with motion direction Add: 1 + 0 + 4 + 0 + 16 = 21 DCN Parameter setting Example: 230V DC drive with analog speed reference for a regenerative drive with motion direction Add: 0 + 2 + 0 + 8 + 16 = 26 DCN Parameter setting
MAL	1
FRS	0

Table I



2. Verify the jumper configuration on the DCR board using the following chart.

HP	230V		460V	
	AC	DC	AC	DC
7.5	NA	NA	J1 & J2 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	NA
10	J5 & J6 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J5 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2	J1 & J2 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J1 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2
15	J7 & J8 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J7 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2	J3 & J4 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J3 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2
20	J9 & J10 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J9 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2	J5 & J6 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J5 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2
30	J7 & J18 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J7 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2	J7 & J8 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J7 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2
40	J9 & J10 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J9 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2	J9 & J10 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J9 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2
60	J11 & J12 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J11 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2	J7 & J8 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	J7 & J2 – On J13 – On J15 - 1 & 2 J16 – 1 & 2
80	NA	NA	J9 & J10 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	NA
100	NA	NA	J11 & J12 – On J13 – Off J15 - 1 & 2 J16 – 1 & 2	NA

Table J

Note: When using the 6300LR3 Current Regulator Card with 460V drives with AC Geared Motor connect J19 Pin 1 & 2, J20 Pin 1 & 2.

Note: When using the 6300LR3 Current Regulator Card with 460V drives with AC Gearless Motor connect J19 Pin 2 & 3, J20 Pin 2 & 3. (Remember to add 32 to the DCN parameter for AC Gearless – Refer to table I.)

3. Using the drive Auto-Tune Command, run a self tune on the drive. **See 8-22.**

Note: Leave balanced load on car.



Auto Setup (Hatch Scan)

1. Place a temporary jumper from the UNL to the DNL on the VFC board. This will disable the direction limit switches.
2. Set IVE to 100 FPM.
3. Run elevator down to the first opening so DLZ and DLFZ inputs from the CPT selector are low.

Note: *If the Final limit is open, it will need to jumped TEMPORARILY until the car is above the first opening.*

4. From the wizard Terminal Mode, set IVE to 20 FPM.
5. Enter the ASU command. Terminal will show (Auto Set-up).
6. Run the elevator from the first opening to the Top floor.

Note: *Should the car stop before reaching the top floor, Set-up will be invalid and will need to be done again.*

7. Once the car has stopped on its own at or above the top floor, the wizard terminal should go to Normal.
8. Enter the FCP command and verify the Floor count positions have changed from the default settings of 1000, 1400, 1800, etc. First floor should be 1000 and the rest something higher than the previous floor.
9. Verify that the EUR, EDR, and ETV parameters have acceptable values.

Note: *If any of the above values are set to zero, insert a value that is approximately equal to where the ETS switch is located.*

10. Save all learned values by entering the WRT command.
11. Remove any jumpers that were used during the Hoistway Scan.

High Speed Operation

Relevel Test

1. Using inspection buttons, run the car down a few floors until DLZ is high.
2. Place the car on Door Disconnect by pressing the Disconnect button once. This will remove the doors from service. (Button should flash on and off).
3. Place the car in automatic by switching the Panel Test button to Auto. Verify the car levels into the floor.
4. Repeat for an up re-level condition.

One Floor Run Test

1. Once the elevator is able to re-level, run the car up one floor by entering the STU command.
2. Verify the car comes to a controlled stop at floor level.
3. Repeat step one for the down direction using the STD command.
4. Verify the car comes to a controlled stop.

Note: *If the car is not making controlled stops, some parameters that may need adjusting are mentioned in the table below.*

Parameter	Description of Car Adjustment Parameters
LVE	Leveling Velocity – Lower for less leveling speed. (Ideal setting 5 FPM)
TLV	Transfer to Leveling – Point where car goes into constant leveling speed prior to reaching the floor level. (Should not exceed 3)
TLM	Transfer to Leveling Mode –
DTA	Deceleration Target – Together TLM and DTA set the amount of rounding from constant deceleration to constant leveling Note: TLM is always larger than DTA
DER	Constant Deceleration Rate – Lowering the value brings the car to floor slower. Note: Do not set more than 1/2 High Speed.

Table K



Multi Floor Runs

1. Once the car is able to make controlled stops, make Multi-Floor runs by using the SCC command.
2. Verify the car can accelerate to high speeds and come to controlled stop.
3. Run the car from Top to Bottom avoiding the terminal floors. Verify the analog output from CPU to drive at drive terminals 21 and 22. This should be 9.75 VDC.
4. Adjust the DMU Parameter to set the output in the UP direction to 9.75 VDC.
5. Adjust the DMD Parameter to set the output in the Down direction to 9.75 VDC.

Note: *Voltage level should be equal but opposite polarity in each direction. If 9.75 VDC cannot be achieved, balance outputs and enter this value in Analog Full scale under the Speed Loop Adjustments.*

6. Verify the speed of the car, using a handheld tachometer, equals the SR value. Raise or lower the RPM setting in the drive Speed Loop Sub-menu to achieve Rated car speed.

Ride Quality Adjustments

1. With a balanced load on the elevator, run elevator into a floor midway in the hoistway, in both directions.
2. Adjust the S-Curve for the desired ride and approach to floor level. Refer to Table L.
3. Once the ride is acceptable, remove the balanced load and verify ride and approach.
4. Place full load on the car and verify ride and approach to floor.

Note: *Refer to drive manual for adjustments used to vary the response (Control) of drive.*

Note: *You can view the speed reference and feedback signals from the drive while adjusting the ride quality.*

Floor Level Adjustments

1. Once the car is running to the desired ride quality, place the balanced load on the car.
2. Run the car to a floor midway in the hoistway. Verify floor level and adjust ULZ and DLZ leveling sensors for the desired dead zone.

Note: *Care should be used when moving ULZ and DLZ so they are not rotated.*

3. Once the car is stopping floor level with selected floor, adjust the other floors by moving the 12 inch leveling magnets to bring car to floor level at each floor.

Note: *If the magnets need to be moved more than 1/4 inch, it is recommended to do new Hatch Setup.*

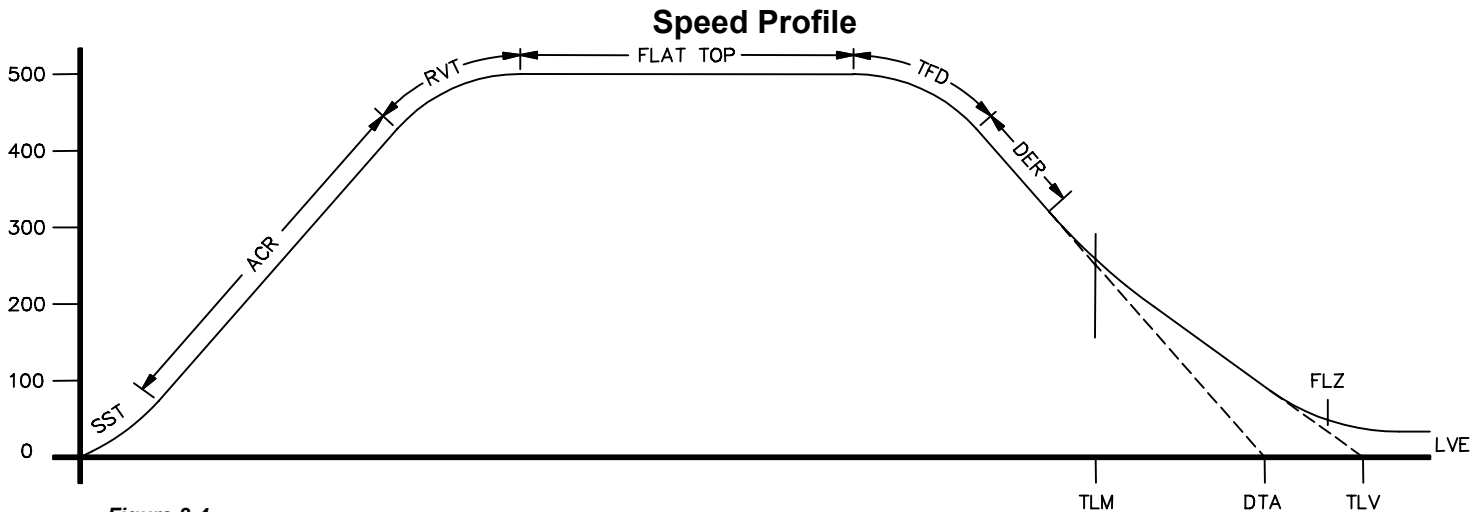


Figure 8-4

Parameter	Range	Default	Units	Description of Car Adjustment Parameters
LVE	1-20	8	fpm	Leveling VE locity (feet per minute).
TLV	0-10	5	DPP	Transfer to Leveling Vane (DPP): Distance from floor level at which the constant leveling velocity takes effect. NOTE: When car enters the 2 inch Leveling Zone (5 cm), a constant leveling velocity is introduced.
SST	0-96	16	1/64 sec	Start Start Time (1/64 of a second): Time period needed to attain rated acceleration from zero speed (ACR parameter).
ACR	75-300	150	Feet/ min/ sec	AC celeration R ate: The rate of constant acceleration for the car to top speed. Divide ACR parameter by 60 to convert value into feet-per-second. (multiply ACR by 0.00508 to convert to m/s ²)
RVT	8-60	20	FPM	Roll VE locity for T op speed (feet per minute): Velocity at which the transition from acceleration mode to flat top (top speed) begins, e.g. for RVT=25, the transition will start at 325 FPM for a rated 350 FPM car. (Where 200 FPM is about 1 m/s)
TFD	1-4	1	Number	Top speed Flat top travel D istance: Similar to FTK parameter but used only when Top speed is
DER	80-300	150	Feet/ min/ sec	DE celeration R ate: The rate of Constant Deceleration of the car to the transfer to leveling. Divide DER by 60 to convert to feet per second. (or multiply DER by 0.00508 to convert to m/s ²).
TLM	10-50	25	DPP	Transfer to Leveling M ode (DPP): Distance from floor level at which the computation changes from Deceleration to Leveling mode. The ratio between the TLM and DTA parameters determines the slope at which the car will level. NOTE: The leveling mode does not refer to the leveling operation. In this mode the velocity is directly proportional to the distance remaining from floor. TLM must be the larger value.
DTA	8-40	18	DPP	Deceleration T Arget (DPP Count): This is the distance from the floor level that deceleration speed reference is calculated.

Table L



Final Approach

Note: **A well-adjusted "S Curve" will have the car stopping at the same DPP position in the hoistway up and down.**

1. With the car stopping at the same position up and down, run the car to each landing recording the elevators leveling accuracy from the car.
2. Once all floor differences have been measured, return to the main menu and select Car Hoistway.
3. Type **FCP#** (# is the individual floor number) and press Enter.
4. Enter either an increased or decreased FCP number. An increased FCP# will bring an elevator higher when stopping at that floor. A decreases FCP# will bring an elevator lower when stopping at that floor.

Note: **This can only be done once the elevator has been adjusted to stop in the same position in the hoistway as discussed in steps 3 and 4 above, and can change only $\pm 3/8$ inch.**

5. Once all floors have been changed, recheck each floor for leveling accuracy. If further adjustment is needed, repeat steps 8 and 9 until you are satisfied with the floor accuracy.
6. Type **WRT** and press Enter to Save all above work to Flash memory.
7. Return to the Car Diagnostics Window.

Note: *If floor levels are off more than 3/8 inch, recheck magnet placement and move as necessary. If moved, perform a new auto setup.*

Miscellaneous Safety Parameter Adjustments

1. Using the Terminal Window set the following parameters. See Table M.
 - VEE- Highest difference between Speed Reference and Velocity during Acceleration plus 30.
 - MLV- 160
 - MRV- 60
 - CDL- DPP position count of the elevator when the platform is even with the top of the counter-weight. **Only if CWT derailment is required.**
 - CDH- DPP position count of the elevator when the crosshead is even with the bottom of the counter-weight. **Only if CWT derailment is required.**

Table M

2. IF hoistway access is provided, run the car from both switches. Using parameter **ACB** for the bottom landing and **ACT** for the top landing, set the access travel limits.

Terminal and Emergency Slowdown Limit Adjustments

1. Perform multiple types of floor runs (1, 2, 3 and high speed) into the top terminal landing.
2. Type ULB and press Enter after each run into the terminal landing. Record the Up Limits Position lowest DPP count and speed.
3. Repeat for the bottom terminal landing using DLB and record the Down Limits positions highest DPP count.
4. Compare the ULB and the DLB limit positions recorded in step 2 and 3. They should be within 3 DPP counts of each other. If not adjust either ULR or DLR values for each switch, i.e. ULR1 for SU1, DLR1 for SD1, etc.
5. Set the corresponding TSV (TSV1 is for SU1 and SD1, etc.) value approx. 15 fpm higher than what was recorded in the previous steps.



6. Set parameter LPE to a value between 20 to 30.
7. Make multiple runs into the terminal landings and verify no fault 11 occurs. IF an 11 error occurs, the LPE value may have to be higher.
8. Set the ESV parameters approximately 25 fpm higher than the corresponding TSV values, ESV1 higher than TSV1, etc.
9. Run the car at high speed into the top landing.
10. Enter the ELB command.

Note: *ETSU must be in position 5 and ETSD in position 17 on the VFC board. If not, contact CEC for changes.*

11. Note the Emergency Terminal Slowdown velocity and the ETS UP Limit position.
12. Set parameter EUR = ETS Up Limit position in step 11.
13. Run the car high speed into the bottom floor and enter the ELB Command.
14. Note the Emergency Terminal Slowdown velocity and the ETS DN Limit position.
15. Set parameter EDR = DN Limit position in step 14.
16. Compare the Emergency Terminal Slowdown velocities in step 11 and 14. Note the Higher value.
17. Set ETV = to the higher value recorded in step 16 + 20FPM.
18. Set IVE=75 and press Enter.
19. Type WRT and press Enter.

Load Weigher Setup (see sec.14)

1. Ensure the CSW bits are set. (CS7,6-9)
2. Place the elevator with no load at the bottom landing on car top inspection.
3. Using a voltmeter on the DC scale, connect the positive lead on **LW2** and the negative lead on **GND** in the CPT.
4. Adjust the sensor on cartop until the voltmeter measures **+1.0 to +1.4** Volts DC (for Isolated platform mount (bottom mount) sensor the voltage will be between +4.2 and +4.6 VDC).
5. Lock the sensor in place with the lock nut.
6. Place the car on Independent Service.
7. Using the Wizard Terminal Window, perform the following setup:

Note: *Setup Load Weigher in terminal mode only.*

- A. Type **LWU** and press Enter.
- B. Select the Proximity Sensor.
- C. Select the installation type (either cross head mount or Isolation frame mount).
- D. With the car empty at the bottom floor, type **LWU1**.
- E. Once the display shows LWU1 OK, press Enter.
- F. Place full load on the Elevator.
- G. Type **LWU2**.
- H. Once the display shows LWU2 OK, press Enter.
- I. From inside the elevator, run the fully loaded car on Independent to the top floor.
- J. Type **LWU3**.



- K. Once the display shows LWU3 OK, press Enter.
- L. Remove all weights from inside the elevator.
- M. Type **LWU4**.
- N. Once the display shows LWU4 OK, press Enter.

- O. Enter WRT command to save these readings.
- P. Type **LWU** and press Enter.
- Q. Select Activation Offset.
- R. Type **WRT** and press Enter.

Load Weigher Mounting

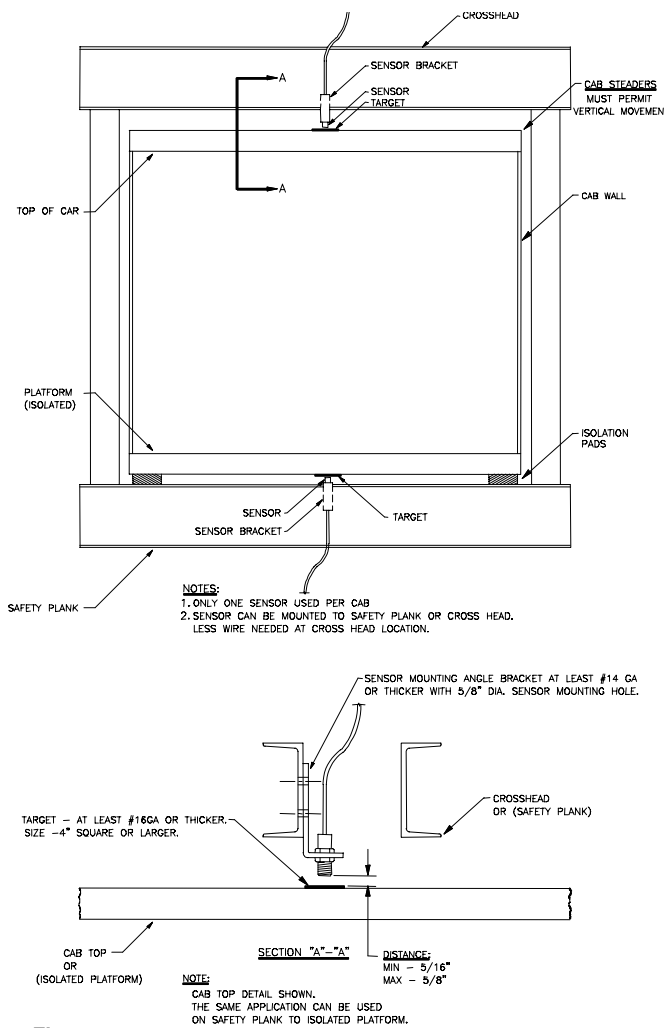


Figure 7-7

Load Weigher Wiring

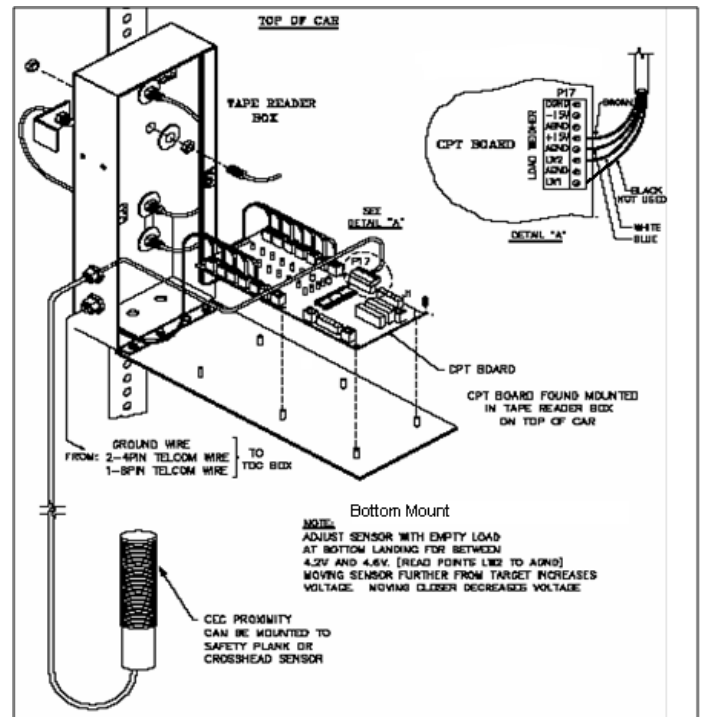


Figure 7-8

Note: Always refer to job specific drawings for connection details.



**PRE-TORQUE SETUP
(TORQUE COMPENSTATION)**

1. Place an empty car at the top floor on door disconnect.
2. Set CSW8 bit 9 (bits 8,9) & CSW6 bit 8 (bits 6,8)
3. Set SST parameter to 1.
4. Run the car down 1 floor at a time and note the roll back.
5. Increase parameter TRC until the roll back is just eliminated.
6. Increase PDT for the amount of delay Pre-Torque required before the "S" curve pattern is started.
7. Increase SST parameter until the desired start acceleration is achieved.
8. Enter the WRT command.
9. Verify the settings are correct by placing the full load at the bottom floor and running the car one floor at a time in the up direction.

Note: If roll back exists on a fully loaded car then further adjust TRC and PDT until it is just eliminated.

Miscellaneous Adjustments

Setting the Hoistway Access

1. Place the car at the top floor on Inspection (ICA)
2. Set parameter ACT to a value to stop the car to a preferred level.

Note: ACT and ACB values are not used until the car travels off of SD1 or SU1.

3. Access car down verifying car stops where desired.
4. Repeat at bottom floor setting ACB.

Note: If top access is located other that top floor, set ACF to the Top Access Floor

Setting Earthquake Collision (If required)

1. Run the car on inspection 1-2' below the point where the bottom of the counterweight would strike the car.
2. Record the DPC count.
3. Set CDL to the value recorded in step 2.
4. Run the car up 1-2' beyond the point where the bottom of the car would strike the counterweight.
5. Record the DPC count.
6. Set CDH to the value recorded in step 5.
7. Enter the WRT command.

Door Limit Check

Verify the following modules:

PARAMETER	OPEN	HALF OPEN	CLOSED
DOL	LOW	HIGH	HIGH
DLC	HIGH	HIGH	LOW
DL6	HIGH	HIGH	LOW



Various Door Parameter and Control Status Word Settings

DOORS			
CSn	Bit	DEFAULT	DESCRIPTION
0	13	R	When set and on independent service, the doors will close automatically when a car call is registered.
1	4	R	When set, pre-opening is disabled for the front doors.
1	5	R	When set, front door pre-opening will occur at the 2" leveling zone.
2	1	R	If set, pressing the door close button shortens the door open time. If reset, DCB has no affect on door open time.
2	8	R	Does not allow reopening of doors with the safety edge or the electric eye during nudging.
3	13	R	If set, door-nudging operation is disabled.
4	5	R	If set, front door pre-opening will occur when car reaches 6" from floor level.
5	3	R	If set, car will shutdown if car goes out of the level zone and doors are open.
6	3	R	Set to disable electronic detector edge time out.
6	4	R	Set to enable electronic detector edge operation Vs. mechanical safety edge.
6	5	R	Set to enable electronic proximity edge operation Vs. mechanical safety edge.
6	14	R	Set to enable drive fault GLR error. (both GLR input and DOL input active while at the floor)
7	10	R	Set to invert detector edge input.
9	5	R	Set to require DCL on (with GLI and GL) to start car.
DOORS			
PAR	RANGE	UNIT	DESCRIPTION
CDT	16-200	1/16s	Door Open Time: Time for doors after answering a car call.
DCC	2-20	Units	Door Cycle protection Counter: Normally adjusted for 6 cycles before removing power form doors.
DCP	5-20	Sec.	Door Close Protection time: The amount of time the doors are given to close before taken out of service on door protect.
DDT	0-80	Sec.	Door open Time after activation of DOB input.
DHT	0-64	1/16s	Door Hold Time: Delay time before high-speed door opening. Only used on Dover OHS door operator circuits.
DOH	0-360	Sec.	Extra Door Open button Hold time: Only used with door hold buttons.
DOP	5-20	Sec.	Door Open Protective time: Amount of time allowed to open the doors before taken out of service on door protects
DOT	0-60	Sec.	Door Open button Time-out: Maximum amount of time doors are allowed to remain open form the door open input.
LDT	32-200	1/16s	Long Door open Time: Time used when car answers a hall call.
NDT	5-120	Sec.	Nudging Door Time: Time doors are allowed to be held open before nudging goes into effect.
SDT	4-48	1/16s	Short Door Time: Door time after electric eye or safety edge has been activated.



FIRE			
PAR	RANGE	UNIT	DESCRIPTION
FAL	1-# FLs	Unit	Fire recall Alternate Floor: The alternate floor to which car recalls when main fire floor sensor is activated.
FBT	1-65535	1/64s	Fire Bypass Timer for GSA fire standard.
FIR	1-# FLs	Unit	Fire Recall Floor: The main fire floor for phase 1 recall mode.
IFT	0-300	Sec.	Independent Fire Time: Time system takes to override independent service during fire phase 1 operation.

FIRE			
CSn	Bit	DEFAULT	DESCRIPTION
1	8	R	When set, the fire buzzer is pulsed.
1	9	R	When set, the fire emergency light is pulsed.
1	10	R	When set, the stop switch is not bypassed. When reset, it is bypassed according to bit 11.
1	11	R	When set, stop switch is bypassed all the time. When reset, the stopswitch is bypassed according to ANSI code standard.
1	13	R	When set, the in-car fire service light also operates during phase II.
1	14	R	When set, the doors will close when a car call is registered. If reset, the door must be closed with the door close button.
3	3	R	If set, allows car to shut automatically after phase II key switch is set to "OFF" and phase I condition exists.
3	5	R	When set, the door open button is disabled during phase I fire service.
3	14	R	If set, door-nudging operation is activated during phase I fire service operation while the door is closing. This bit will override bit 13 (disable nudging).
4	0	R	If reset, car will open front door automatically when it reaches the fire floor during phase I.

CALL			
CSn	Bit	DEFAULT	DESCRIPTION
0	4	R	Dumps all calls after consecutive car calls answered per CCD parameter number order with no electric eye break.
4	10	R	If set, car calls will not be cancelled when the car has a reversal slowdown.
4	11	R	If set, cancel car calls for positions above the car when the car is moving down and cancel car calls below the car when the car is moving up.
7	15	R	Set to pulse car call output for low intensity lights.



BUFFER TEST

Following are the steps to follow in preparing the controller for buffer tests:

1. Place the controller on Door Disconnect.
2. Run the car to a position that will allow the car (or counter-weight) to reach constant contract speed or the reduced stroke buffer speed before striking the buffer. If a reduced stroke buffer is used, set Bit5 of Word 7 and equate the MMS parameter for the rated speed of the buffer.
3. Jumper all the UP or DOWN slowdown limits high, depending on a car (or counter-weight) buffer test. Example: LCS to SU1, SU2, etc.
4. Jumper the ETSU or ETSD (Emergency Terminal Slowdown limits) high, depending on a car or counter-weight buffer test. Example: LCS to ETSU or ETSD.
5. RESET bit 1 of CSW0 to prevent the DPP count from resetting at the start of a run.

Type **BITR0, 1** (Note: the 0 in BITR0 is a zero, not the letter 'O').

Type **WRT** to store the data in FLASH memory in case power is interrupted.

6. Remove the UNL or DNL module, depending upon direction of the car for the test. This will cause the position (POS) and FCP (Floor Count Position) to default to the top or bottom terminal.
7. Change the current DPP count of the car by typing DPC = 1000 (for the lowest landing default) or DPC = top floor FCP.
8. Type **SCC1** (or SRC1 if position 1 is a rear call) for the lowest landing, or SCCn, where n is the floor number of the top call (type **SRCn** if the position is a rear call). The car or counter-weight will start its run to the respective buffer. The status of the directional and final limits will be up to the local code authorities and/or the installation company.

9. After the test, remove all jumpers; replace the UNL or DNL modules. Set the CSW0, 1 bit by typing BITS0, 1; set CS7 = 0h, then type **WRT**.

OVERSPEED TEST

Following are steps to follow in preparing the controller for over-speed tests:

1. Place the controller on Door Disconnect.
2. Run the car to one floor below the top or one floor above the bottom terminal (depending on car or cwt. Over-speed test).
3. Place a temporary jumper from LCS to GV.
4. Raise motor RPM in the Speed Loop Menu.
Example: If top speed RPM is set to 1170, set RPM to 1521 for 30% over-speed [(1170 x .3) + 1170=1521]
5. Set VEE = 300.
6. Place a call that will permit the car to reach its over-speed condition.

After completing the over-speed test, remove all jumpers and restore all parameters to their original values.



ETS TEST

Following are steps to follow in preparing the controller for ETS tests:

1. Place the controller on Door Disconnect.
2. Run the car to a position that will allow the car to reach contract speed before actuating the ETS limit(s).
3. Set the ETV parameter to a value equal to or less than the speed rating of the buffer. The physical position of the limit (distance from limit to buffer) is critical to the proper operation of the ETS switch. This will ensure that when the car shuts down on an ETS (emergency stop), it (or the counter-weight) will be at a speed equal to or less than the speed rating of the buffer. *(Setting ETV to a low number will drop brake)*
4. RESET bit 1 of CSW0 to prevent the DPP count from resetting at the start of a run. Type **BITR0, 1** and press **enter** (Note: the 0 in BITR0 is a zero, not the letter O). Type **WRT** to store in FLASH memory in case power is interrupted.
5. Remove the UNL or DNL module, depending on direction of the car for the test. This will cause the position (POS) and FCP (Floor Count Position) to default to the top or bottom terminal.
6. Change the current DPP count of the car by typing DPC = 1000 (for the lowest landing default) or DPC = top floor FCP.
7. Type **SCC1** (or SRC1 if position 1 is a rear call) for the lowest landing, or SCCn where n is the floor number of the top call (or SRCn if the position is a rear call). The car will start its run to the respective ETS limit switch. The status of the directional and final limits will be up to the local code authorities and/or the installation company.

After the test, replace the UNL or DNL modules, set the CSW0, 1 bit by typing BITS0, 1, enter, then type WRT, enter,

Swift Drive Auto-Tune

1. Set inspection Speed to zero (IVE=0)
2. Use DZO (*DZU, DZD for drive with serial communication*), and if necessary, DMU, DMD to adjust zero speed.
3. Disconnect brake wire.
4. Under Drive Command Menu (SWIFT DRIVE) choose Auto-Tune.
5. Verify Nameplate Parameters.
6. Find unknown values with inspection button depressed.
7. When Auto-Tune requires IVE to be raised, replace the brake wire.
8. Find remaining unknown values with inspection button depressed.

Note: if Drive requires IVE greater than 100, call CEC.



SECTION 10 - FUTURA GROUP SETUP

NOTE: All GROUP Operations can only be done from the “Master” (*Dispatcher*) Car.
Any car can be the Master with the “RMA” *Request Master command*.
To go to Group Mode, enter the “GRP” command. Use the “CAR” command to return.
A “WRT” *write* command in Group Mode will write all group parameters to all cars.

HPU Hall Call Activation

1. Verify that all HPU for the hall push buttons have been installed and properly addressed. [See Section 1 page 10 for details.]

2. In terminal mode, go to Group and verify the following CSW bits are reset:

CS4, Bits 5, 13, 14 (**see sec.18**)

3. In Group Mode, set CS4 Bit 3 to disable Emergency dispatching. This will be reset after HPU are communicating.

4. Verify hoistway wiring for HPUs are connected to terminals, VH+, VHC, HCRT+ & HCRT- .

5. Verify this wiring is at least 6” away from any high voltage wiring. (mainline and motor).

Note: *If the HPU is not on, check the VH+ & VHC power connections to the card. If it is on solid, check the HCRT+ and HCRT- communication connections.*

6. In terminal mode, go to “CAR”, type **CMG** and press enter (this can only be done when connected to the group car). This will display the address of each hall HPU and the status of its communication. The primary HPU addresses are 11 through 42. (*Physical binary jumpers are 10 less than corresponding address, i.e.; jumpers corresponding to #3 will be represented by #13 under CMG command*)

Note: *If there are any with 100% failures, check the connection address of that HPU. If problem still exists, replace HPU.*

7. With all the HPUs showing good communications, place the car on Automatic and, using the hall push button stations, call

the car to each landing, using both the up and down push buttons.

Note: *If aux. risers are used, set CS4 bit 13 and repeat step 6.*

Note: *If discrete wiring is used from push buttons to I/O boards, Set Bit5 in Word 4 (BITS4,5), write, and recycle processor power. (Circuit Breaker 2)*

Setting Additional Group Parameters

Set the following parameters for the group under the Group Parameters Menu.

Note: *These parameters that set floors must also be set to the same floor in each car.*

LBY	Lobby Floor Designation
FIR	Main Fire Recall Landing
FAL	Fire Alternate Floor Landing
EPF	Emergency Power Floor
MEP	Maximum Cars on Emergency Power
LER	Elevator Lobby Request Set to 0

Group Dispatching

Note: *This procedure can be set up when 2 or more of the cars have been put into service. It is ideal to set the group up when all cars are in service.*

Note: *Prior to setting up the group, it is a good idea to monitor and note existing traffic patterns. For example, if the main lobby has continuous traffic all day, then an elevator might want to be returned to the lobby when free.*

The Futura is defaulted so that one elevator will stay at the lobby floor if there is no demand. If this is what is required, there is no further adjustment necessary.



Parking One or More Cars at the Lobby

1. Note which floor in the building is referred to as the main lobby.
2. Set Group parameter **LER** to the number of elevators wanted to be placed at the lobby. In most cases this will be 0 (no elevators required) or 1.
3. Place all the elevators on Automatic and observe, verifying that the number of cars returning to the lobby matches what was set for parameter **LER**.

Note: *If the lobby has floors below, an elevator going up from those lower floors will always stop at the lobby.*

4. Once the proper number of elevators have been assigned to stop at the lobby an extended door time can be programmed in for that floor. If this is desired set CSW 0 bit 1 and enter the time required to stay open at group parameter **NDH**.

Should the remainder of the elevators be required to space themselves out in the building once they are free for a period of time, then Zoning will be required.

Zoning Setup

1. Note the traffic in the building and determine the following:
 - A. Is one or more cars required in the lobby?
 - B. Are there certain floors where you would want to park an elevator?
 - C. What floor spacing would be required to accommodate one elevator per zone? (Having an elevator parked at the lobby will be a separate zone function).
2. Count the number of elevators you wish to zone, minus **LER** value and set Group Parameter **NZN** to that number.
3. Set **CSW 0 Bit 4** to activate Zoning.
4. Set **ZN1** (first zone) to the floor where an elevator should park.
5. Set **ZN2** (second zone) to the floor where an elevator should park.
6. Continue setting **ZN#** until there are no more elevators for zones. The **ZN#** should equal the **NZN** parameter.
7. Set the time the elevators have to set idle before zoning using **PFT** parameter.
8. Once these are set, use the **WRT** Car command to save to flash memory.

See sections 16-18 for full array of GROUP options



Up Peak and Down Peak

1. In order to trigger up peak automatically from the number of calls or load, set the following Group Parameter:

UCC – Number of trips from the lobby with more than 2 calls entered.

ULC – Number of trips from the lobby with load switch tripped.

2. In order for Down peak to be triggered by calls, ETA times and wait times, set the following parameters:

DCC – Number hall calls initiated at one time.

DTT – Average ETA time. The time that triggers down peak if the average ETA time exceeds this value.

DWT – Long down call waiting time. If a down call is not answered in this amount of time the system will swing to Down Peak.

Setting Elevator ETA Parameters in the Group (optional)

In order for the group to optimally dispatch the elevators to the call, it must know specific details of each elevator.

1. Using a stop watch, observe and note the following:

- **ACC** - Average acceleration time it takes the elevator to reach top speed.
- **ATT** - Average transfer time the doors are fully open when loading and unloading passengers.
- **BTT** - Blind travel time it takes the car to travel through a blind hoistway.
- **DCT** - Door closing time it takes the doors to close.
- **DEC** - Average deceleration time it take the elevator to slow from top speed to stopping at a floor.
- **DOT** - Door open time it takes to open the doors fully.
- **SPE** - Speed of elevator in timed units by using the formula:

Average floor height (h)/(Speed in FPM/60) X 16 = SPE value

or for metric

Average floor height in meters X 3.28/(Speed in meters per second/.3048) X 16. = SPE value

- **GPT** - If this is a generator application the time it takes for the generator to start completely.
2. Using the **Group Command REE**, enter the car number you are working on, then enter the previous values. [For example, REE = 1.]
 3. With the exception of **SPE**, all values recorded in the previous steps will be multiplied by 16 and entered into these related group parameters. **ACC, ATT, BTT, DCT, DEC, DOT, GPT, SPE.**



SECTION 11 – CONTROLLER COMMUNICATION INTRODUCTION

This section describes how to communicate, or “interface” with the **Futura™** controller via either a PC/Laptop or a VT100-terminal (Human Interface). This section is critical in setting up the controller and performing diagnostics. We recommend that you read it over carefully. If you have any questions about any part of this section, please call CEC Technical Support.

This manual uses several important terms repeatedly, which describe various ways information is transferred between the user and the system. They are called: **error codes, commands, input, output, parameters, bits, and devices**. In some cases, these terms are interchangeable, but most often, each refer to a specific type of communication between the system and you, or communication within the system.

ERROR CODE: A failure (also called fault or error) status indicator, which is returned by the system in order to locate the source/resolution of a problem occurrence. The manufacturer programs these codes into the system (i.e.: Error code 96 signifies that the SPU board tach was not in UP position while car was running UP).

COMMAND: A request entered (or “input”) by the user (via the computer keyboard) which orders the controller to perform a specific function (i.e.: <RFL> asks the system to **Reset** all the **Faults**). Commands must be recognizable to the system in order to trigger a response, and therefore are written exclusively in the language of the system by the manufacturer. Various tables of commands and their descriptions are presented in this section, and most commands in this manual are presented in a specific way for easy identification and input.

INPUT: Data entered by the user or from external mechanical devices (i.e.: switches, sensors, etc.) which is necessary for the system to process information and execute commands.

OUTPUT: Data (signals) sent from the CPU to the mechanical devices to (de)activate.

PARAMETER: A variable entered (or “input”) by the user and assigned a value, which refers to a specific function of the system. Parameters are used for setting limits, timers, etc. ----- (i.e.: <CDT = 5> is what is entered to set the Car Call Door Timer at 5 seconds)

BIT: A variable setting, which determines enabling, or disabling of specific features in the system. (Similar to a toggle switch)

DEVICE: Generic term usually referring to a physical, mechanical component (i.e.: board, switch, or other mechanical equipment) monitored by and used to execute or trigger input and output signals.

Note: *We recommend that a list of the parameter and bit settings be recorded and maintained for each individual controller as each initial controller setup is completed. This list will be helpful in the event the settings are accidentally changed or lost. We also recommend that any person placing a technical support call to CEC have this list available.*

TERMINAL MODE OPERATION

Terminal Mode operation allows the user to interface directly with all the parameters and commands of the controller. One does not need the **Futura™ WIZARD** interactive tool to operate exclusively on terminal mode. A PC with a 9-pin serial port and any regular VT-100 terminal emulating program can be used to interface with the controller. (the program “HyperTerminal” is standard with Windows)

Your computer or terminal must be connected to P11 (USER) RS-232 port located on the left side of the SPU Link board. The following communication parameter settings must be available:

Baud Rate	19200
Word Length	8
Parity	No Parity
Stop Bit	1
Flow Control	Xon / Xoff



WIZARD MODE OPERATION

The *Futura™ WIZARD* is a PC-based visual interface, which operates under the Microsoft Windows operating system. The information is grouped logically, permitting easy navigation through the menus with the tool's built-in mouse.

The *WIZARD* permits interfacing with most controller functions, including most commands parameters, diagnostics, and uploading of software (whereas the Terminal mode only permits manipulation of parameters and commands, which are accessible exclusively through Terminal mode). Door timing setup, speed curve setup, diagnostics, or downloading new software are a few functions accomplished by selecting, with the mouse, the appropriate *icon*. However, full Terminal operation is also available from within the *WIZARD*.

Menus within the *WIZARD* software program make adjustments easy for those not familiar with the *Futura™* parameters. The *WIZARD* software is provided for *Futura™* installations. This *Futura™* interactive tool is based on a regular PC or a notebook PC with integral mouse control (preferred) and requires a standard RS-232 serial communication port (usually COMM 1) to operate. The integral mouse control is preferred because notebooks without the integral port use the RS-232 serial communication port for the mouse. The *WIZARD* is an optional item, available in color or monochrome. The online HELP system for this visual interface is provided with the *WIZARD* software.

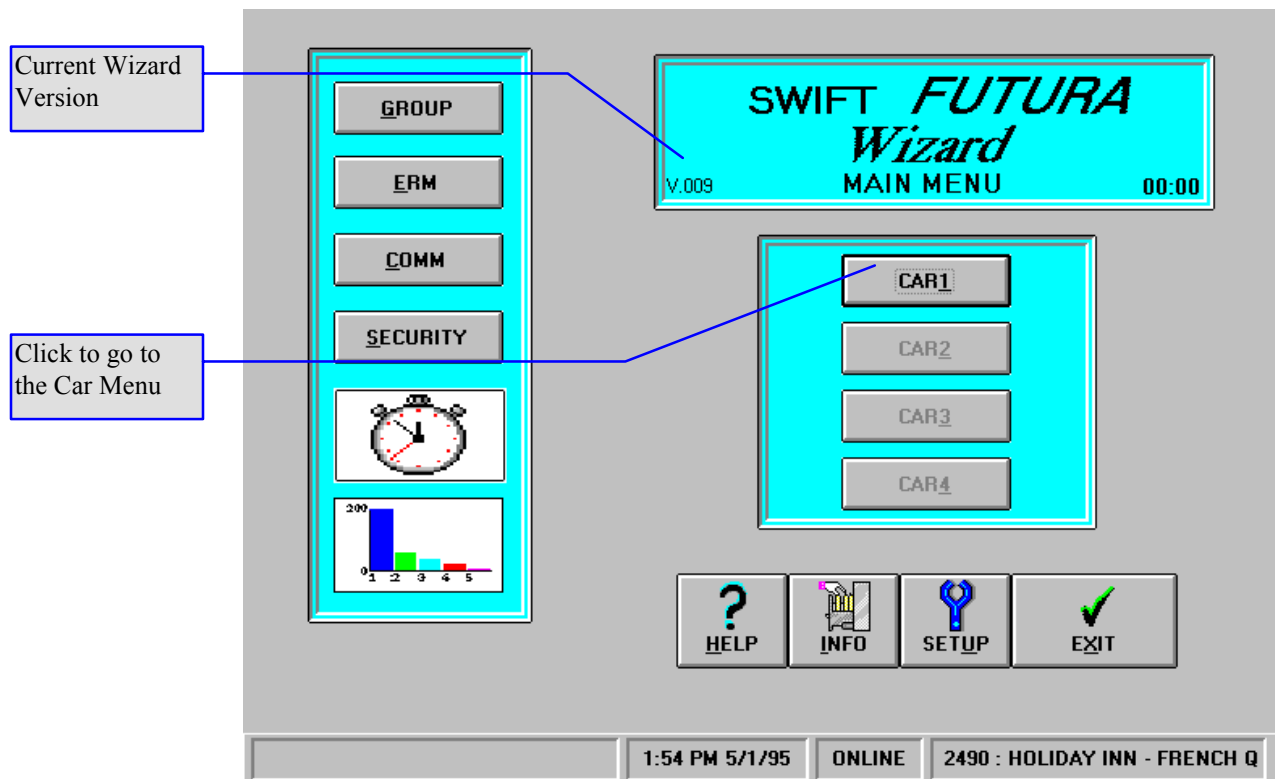


Figure 11-1



CONTROLLER COMMANDS & PARAMETERS

LINE EDITING AND CONTROL CHARACTERS

The examples shown in this chapter are based on the assumption that **no typing errors** occur. The *Futura*™ Operating System has line-editing controls to permit you to correct typing mistakes.

You can use specific characters to control and edit terminal input. Some of these characters correspond to single keys on your terminal.

Examples:

<enter ↵> = Carriage RETURN

<backspace ← > = DELETE).

Any time you need to delete a character, use the backspace key. The delete key **** is not used on the *Futura*™.

For control characters, you must hold down the **<ctrl>** key while also pressing an alphabetical key. The *Futura*™ Operating System recognizes these control/edit characters:

<enter ↵>

Terminates the current line and executes the command.

<backspace ← >

Deletes the previous character in the input line. Each execution of the Backspace key (←) removes a character from the screen and moves the cursor back to that position. Used in place of delete **** key.

OPTIONAL----->

<ctrl>+<R>

If the current line is not empty, this command reprints the line including any editing that's been performed. If the line is empty, it reprints the previous line and executes it.

<ctrl>+<X>

Discards the current line: echoes a pound sign (#) followed by a carriage return/line feed.

<ctrl>+<S>

Places the terminal in stopped mode (stops output). This feature can be used to pause or freeze the display when viewing scrolling data. You can resume output without loss of data by entering **<ctrl> +<Q>**.

<ctrl>+<Q>

Resumes output mode. (See **<ctrl>+<S>**)

<ctrl>+<Z>

Aborts output to the terminal. This feature can be used to stop scrolling data on the display and return to the terminal prompt.

POWER-UP OR RESET MESSAGE SEQUENCE

When power is applied to the SPU chassis, the CPU board boots up invoking a System Confidence Test (**SCT**). This confidence test will display its results on the terminal through the human interface port. The normal power-up or reset message sequence is shown in the example below. A GO or NO GO status indicates whether or not the test was successful. If any of these tests fail, the processor will not enter into the control mode.

The RAM Memory and FLASH Memory (EEPROM) tests are associated with devices on the CPU board. If the FLASH test fails, it probably indicates a **checksum** error or invalid job parameter(s).



FUTURA	5434-1	Car # 1)
Software Version 0.1		
System Confidence Test		
TEST		STATUS
Memory (CMOS RAM)		GO
Video Display		GO
Job Configuration		GO
I/O Configuration		GO
Analog Load Weigher		GO
EEPROM (Car Parameters)		GO
EEPROM (Group Parameters)		GO
WAIT...Initializing Drive		
Enter Password >		
On Line		

Figure 11-2 System Confidence Test Screen (No Failure)

When new software is installed in the car controller, it may be necessary to initialize the FLASH (EEPROM). To determine if the FLASH requires initialization, check the "Status" in the System Confidence Test (SCT) for "No EEPROM". (See System Confidence Screen Figure 11-3.) Check both the "FLASH (Car Parameters)" and "FLASH (Group Parameters)" lines. If status is "No EEPROM", then the FLASH must be initialized.

Note: the Video board installed on the main processor as well as an analog load-weighing sensor are options.

FUTURA	5434-1	Car # 1)
Software Version 0.1		
System Confidence Test		
TEST		STATUS
Memory (CMOS RAM)		GO
Video Display		GO
Job Configuration		GO
I/O Configuration		GO
Analog Load Weigher		GO
EEPROM (Car Parameters)		NO-GO
### EEPROM NO EEPROM		NO-GO
WAIT...Initializing Drive		
Enter Password >		
On Line		

Figure 11-3 System Confidence Test Screen (Flash Memory Failure)

Initialize Flash (Car Parameters)

Note: this procedure loses all previous adjustments

To initialize **FLASH (Car parameters)**, perform the following steps (Terminal Mode only):

1. Get Car Prompt: Logon as <HUDSON.BAY>
<enter ↵>
2. Enter <EPI2374> to initialize the RAM memory. (wait 10 seconds and recycle main processor [Circuit Breaker 2])
3. Additional parameter adjustments may be needed. Enter system with password "install", enter <GET> to update the RAM. If any parameters require adjustment, a message will be displayed naming the parameter. A value is entered for this parameter and steps 2 and 3 are repeated. If after entering <GET> your response is "OK", then you have successfully completed the initialization of **FLASH (Car Parameters)**.



4. If the car has previously been adjusted, parameters saved and the EEPROM data has failed, the car will power up as **car #0** and will show a prompt of C# 0>. To attempt to recover parameters, follow steps 5 through 7).
5. Logon as <HUDSON.BAY> <enter ↵>.
6. Enter <GET> <enter ↵> to read data into RAM. Any parameters with errors will be displayed. If parameters cannot be updated, call CEC.
7. Correct the individual parameter then enter <WRT> <enter ↵>. Repeat until you receive a response of "OK" indicating that all parameters are fine. If there were more than 5 parameters with errors, it would be better to re-initialize the EEPROM with the EPI2374 command and start over at step 1.

Initialize Flash (Group Parameters)

To initialize **FLASH (Group parameters)**, perform the following steps (Terminal Mode only):

1. Get Car Prompt: Logon as <HUDSON.BAY> <enter ↵>
2. Go to Group prompt: Enter <GRP>
3. Enter <EPI2374> to initialize the EEPROM memory. (wait 10 seconds and recycle main processor [Circuit Breaker 2])
4. To return to the Car prompt, enter <CAR>.

LOG-ON

When prompted for the password, type in the system password, then <enter ↵> (see Note). Each character you type will be displayed as an asterisk on the terminal screen for security. It is important that you enter the password carefully. If you enter the password incorrectly, the system will prompt you to reenter the password continually until the correct password is entered. When the system acknowledges a valid password, it will return the prompt "OK".

Note: <INSTALL> is the factory default system password. Each time you disconnect and

then reconnect the terminal, you must reenter the password.

EXAMPLE (How to Type in the Password)

```
Enter Password
On Line
***** <enter ↵>
(* represents each key entry of the password)
OK>
C # 1 =>

(ready to perform diagnostics or adjustments)
```

CHANGING PASSWORDS

The Change Password <CHP> command has been provided to allow the user to change the default passwords used to enter the human interface. The first two levels of password protection can be changed using this command (see below).

Caution: *Once the passwords are changed, CEC will not be able to help you in case you forget the new passwords. To provide extra security, the passwords cannot be read back from the terminal. It is critical that you write down any new passwords and store them in a safe place.*



	<u>FACTORY SET <PASSWORD></u>	<u>PROMPT</u>	<u>FIXED?</u>	<u>AVAILABLE FUNCTIONS</u>
Level #1	SNOW-FLAKE	C# 1=:	(Changeable)	Adjust, View, and Change Password
Level #2	INSTALL	C# 1=>	(Changeable)	Adjust and View
Level #3	INSTALL	C# 1=>	(Changeable)	Adjust and View
Level #4	HUDSON.BAY	C# 1=.	(Fixed)	View Only

Figure11-4

To change any of the passwords you must first log-on using the level #1 password, then type the <CHP> command. You will be prompted for the password ID level and the new password. You will be prompted to enter the password twice in order to ensure that the password is entered correctly. It is then necessary to execute the <WRT> command in order to save any changes made with the <CHP> command.

Note: The prompt " =: " indicates that you have logged-on using the 1st level password. <SNOW-FLAKE> (you must include the dash) is the default 1st level password.

To Change the Password:

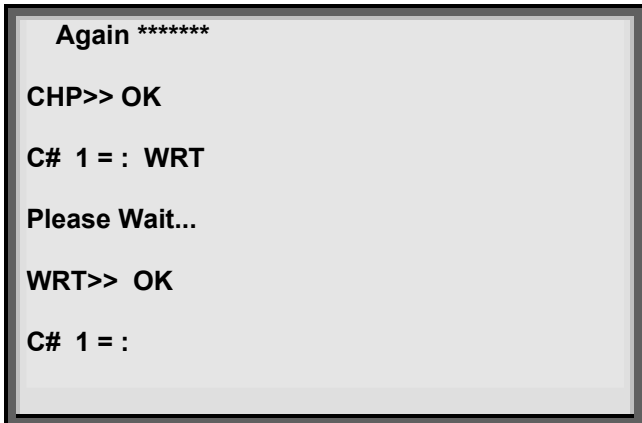
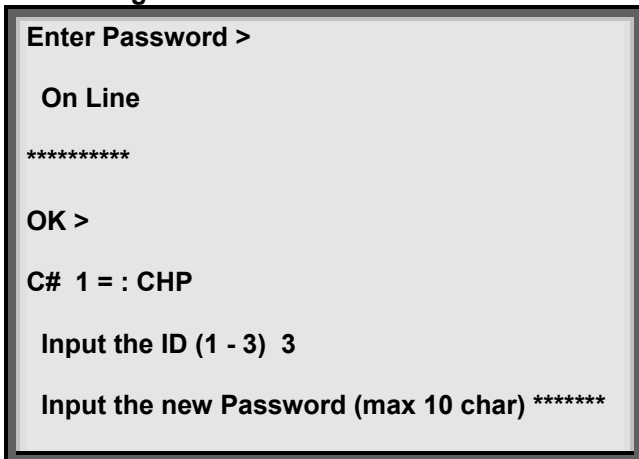


Figure 11-6 Change Password Screen

SAVING PARAMETERS

A Parameter Menu is available to save all Car and Group Parameters to a file on your computer or floppy disk. These Parameters can then be reinstalled on the controller at a future time. It is HIGHLY recommended that the Parameters be saved after any time significant changes are made to parameter settings.

TRIGGERING FOR ERRORS (Frame Capture)

The **WIZARD** contains a frame capture feature. When the icon is clicked, a new set of icons are available. Clicking the "setup" icon at the bottom of the screen, allows the user to arm the wizard to "capture frames" on a particular error. Once the user has chosen the error and clicks "activate", the **WIZARD** will wait for the error to occur. When the error has occurred, a "video" will be available which shows all the information concerning car operation for 45 seconds prior to the fault. This "video" may be played back and forth in 1/16 of a second frame intervals through easy to use icons. The captured frames can also be saved and played back when the PC / laptop is disconnected from the controller. The captured frames can also be emailed to CEC for further analysis.



Figure 11-5

To Change the Password:

- | | |
|-----------------------------------|--|
| 1. Log on as <SNOW-FLAKE> <enter> | 5. Type <WRT> <enter ↵> (Write to FLASH memory. Saves change.) |
| 2. Enter password level. | 6. Disconnect the connector from the P15 USER port and then reconnect it. You should now be able to log-on using the new password. |
| 3. Enter new password. | |
| 4. Repeat password entry. | |

Swift-Futura Remote Video Unit Operation (optional)

Introduction

This section will provide a complete understanding of the operation of the SWIFT **FUTURA™** Remote Video Unit (RVU). By using the four push buttons on the front panel of the RVU, a variety of functions can be performed. These functions include:

- setting hall calls and car calls
- error tracking
- error analysis.

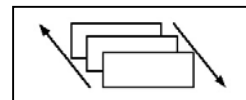
These features make the RVU an invaluable tool for troubleshooting and diagnostics.

The RVU communicates to the group controller (SPU) on the Car to Group bus (CTG). Since the Futura system is a distributed system, any of the cars in the bank can act as the group. Therefore, the RVU can be wired to any controller in the bank. The RVU will communicate with whichever controller is acting as the group. Once connected, it is possible to view information from all of the cars in that particular bank.

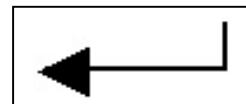
There are two main screens displayed by the RVU:

1. Group Screen, which shows all of the elevators in the bank, their position and movement.
2. Car Diagnostic Screen, which provides detailed information on the status of the car being viewed.

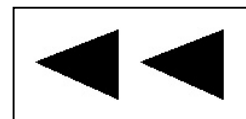
Depending on which screen is being viewed, the push buttons can be used to perform different tasks. Throughout the remainder of this document, the push buttons will be referred to as:



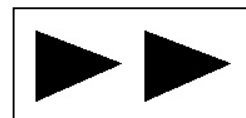
Rotate Screen



Enter



Scroll Left



Scroll Right

Figure 11-7

Become familiar with these buttons and their names. A full description on the use of the push buttons and the functions they perform will be provided in the following pages.



INITIALIZATION AND COMMUNICATION SETUP (Set at factory)

Before powering up the RVU, consult the wiring diagram. Remember, when wiring the RVU, the transmit and receive lines are swapped with the SPU. **Example:**

T_x- on the RVU is wired to R_x- on the SPU

Once proper wiring is confirmed, connect the VGA monitor to the RVU and power on the monitor and RVU.

After a few seconds, the following screen will appear:

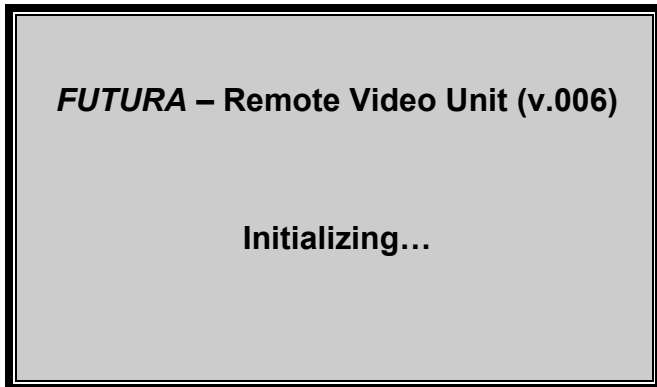


Figure 11-87

If the EMIS feature was purchased, the screen will display “Remote Video Unit & EMIS.”

When this screen appears, you have approximately three seconds to access the communication setup menu. To enter communication setup, press the rotate screen button as soon as the initialization screen appears. The following screen will appear:

Communication Setup			
PORT	BAUD RATE	SIGNAL TYPE	COMM ADDRESS
REMON/WIZARD	19200	RS-232	1
CTG/HC	38400	RS-485	212
[] DONE	<-CHANGE	<<>> UP/DOWN	<< LEFT >>RIGHT

The default settings are shown in the screen illustration.

The only time it will be necessary to change any settings is when a Remote Monitoring System is being used. If any changes need to be made and the message “Unable To Setup Comm” appears on the screen, disconnect the connector from the CTG/HC port on the back of the RVU.

If line drivers are used to communicate to a Remote Monitor PC, the comm setting for the Remon/Wizard port will need to be changed:

1. Press the scroll right button until the signal type for the Remon/Wizard port is highlighted.
2. Next, press the Enter button to change the value from RS-232 to RS-485.
3. Once this value has been changed, press the rotate screen button (DONE). The RVU will reset and the change will take place.
4. Reconnect the CTG/HC port after the RVU resets.



The menu can also be used to set up extended RVUs. In this configuration, more than one RVU can be connected to the same group on the same bus. One RVU, the master, will communicate to the SPU at address 212. Any other RVUs or extended RVUs connected to this group must use comm address 213. **To switch to the CTG/HC parameters:**

1. Press both the scroll left and right buttons simultaneously.

2. Highlight the comm address parameter.
3. Press the enter button to switch the address to 213.
4. Press the rotate screen button and the RVU will reset. Extended RVUs can only access the group screen, not diagnostic screens.

THE GROUP SCREEN

After the RVU initializes successfully, the group screen, or motor room screen, will be displayed. A sample group screen is shown below:

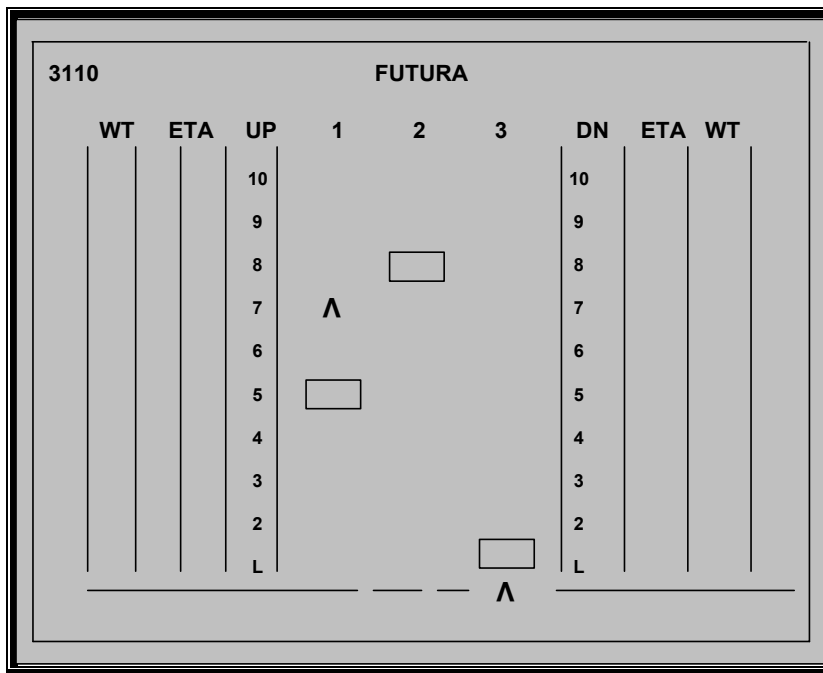


Figure 11-10

Note that the CEC job # is shown in the upper left corner of the screen. The left side of the display represents the wait time and estimated time of arrival for UP calls. DOWN call information is displayed on the right side of the screen.

From this screen, the push buttons can be used to perform various functions:

1. The Rotate Screen button is used to rotate the screen from the group display to the car diagnostic screen. Pressing this button once from the group screen will display the diagnostic screen for car one.

2. To see the next car, press the Rotate Screen button again. It is possible to scroll directly to a desired car's diagnostic screen without scrolling through all of the cars' screens.
3. By pressing the Scroll Left button or the scroll right button, a specific car number can be highlighted at the top of the screen.
4. Once the desired car is highlighted, press the Rotate Screen button to scroll directly to that car's diagnostic screen.



The functions available from the group screen include setting hall and car calls, changing the appearance of the group screen, and hiding the ETA and wait times.

To access the list of functions available from the group screen:

1. Press the Enter button. The command 'Hall Call' will appear at the bottom of the screen.
2. To scroll through the available commands, press the Scroll Left or Scroll Right buttons.

SETTING A HALL CALL FROM THE GROUP SCREEN

1. Once the command 'Hall Call' appears at the bottom of the screen, press the enter key. The option 'Set Up Call' will appear to the right.
2. To select 'Set Down Call' press the scroll right button.
3. Pressing the scroll right button again will bring up the 'Exit' option.
4. Once the desired function is selected (up call, down call, or exit) press the enter key. If an up or down call was selected, the command 'Select Floor' will appear.
5. Use the scroll left and scroll right buttons to set the desired floor and press the enter key. The call will be set at that floor and the commands will clear from the bottom of the screen.
6. You also have the option to exit from the 'Select Floor' option. If 'Exit' is selected, all the commands will clear from the bottom of the screen and no calls will be set.

SETTING A CAR CALL FROM THE GROUP SCREEN

In order to set a car call, you must first select a car. To do this:

1. Press the scroll right or scroll left button until the desired car is highlighted.

2. Then press the Enter key once, select the option 'Car Call', and press enter. The option 'Set Car Call' will appear to the right.
3. You can also select the option 'Exit' from here.
4. To set a call, select 'Set Car Call' and press Enter. The command 'Select Floor' will appear to the right.
5. Use the scroll left and right buttons to select the desired floor and press Enter. The call will be set at that floor and the commands will clear from the bottom of the screen.

CANCELING CAR CALLS FROM THE GROUP SCREEN

This option can only be selected if a car call has been set for the highlighted car:

1. Press the Enter key, select 'Car Call', and press Enter. The option 'Set Car Call' will appear.
2. Press the scroll right button once and the command 'Cancel Car Call' will appear.
3. Press Enter to activate this command. This cancels **ALL** of the car calls for that car.

CHANGING THE APPEARANCE OF THE GROUP SCREEN

This option allows the user to select different preset colors for the group screen as well as to hide/show the ETA and wait times:

1. Press Enter once, select the option 'Group Screen', and press Enter. The command 'Hide ETA & Wait Time' will appear.
2. Pressing Enter will cause the ETA and wait time columns to disappear from the display. Also, the service type and job number will not be displayed. The next time this option appears, it will read 'Show ETA & Wait Time'.
3. Press Enter to return to the original display.
4. If you do not wish to select this option, use the scroll right button to select 'Select Preset Colors' or 'Exit'.



5. If 'Select Preset Colors' is chosen, the command 'Preset Color 1' appears. There are 10 preset color options. Use the scroll left and right buttons to choose a preset color and press Enter.
6. The screen will change colors and the commands will clear from the bottom of the screen.

THE CAR DIAGNOSTIC SCREEN

To access a car diagnostic screen:

1. Press the rotate screen button from the group screen.
2. To scroll to the next car, press the rotate screen button again. Pressing the rotate screen button from the last car in the group will return you to the group screen.
3. To return to the group screen without scrolling through all of the cars, press and hold in the rotate screen button for two seconds and then release it. This will return you to the group screen, regardless of which car diagnostic screen was being displayed.

There are eight SMI blocks displayed on a car diagnostic screen. **To rotate the SMI blocks:**

4. Press either the scroll left or scroll right button. This will rearrange the blocks and allow the user to see any remaining SMI blocks. Only eight blocks can be displayed at one time.
5. As with the group screen, pressing the Enter key will bring up an options menu. This menu will appear in the middle of the screen. The available commands are:

Set Car Call
Arm/Trigger
Error Codes
Reset Errors
Exit

In addition, if any car calls have been set for this car, the option '**Cancel Car Call**' will appear. (The option '**Error Codes**' will only appear for SPU version 17 and above and only when the car being viewed has any faults listed.)

6. Use the scroll left and right buttons to select the desired option and press Enter to activate it.

SETTING A CAR CALL FROM THE DIAGNOSTIC SCREEN

After selecting the 'Car Call' option, the command 'Set Car Call' will appear to the right:

1. Press Enter. The command 'Set Floor' will appear.
2. Again, use the scroll left and right buttons to select a desired floor and press Enter to set the call.

CANCELING CAR CALLS FROM THE DIAGNOSTIC SCREEN

This option can only be selected if a car call has been set for the car being viewed:

1. Press the Enter key.
2. Select 'Cancel Car Call', and press Enter.
3. Press Enter to activate this command. This cancels **ALL** of the car calls for that car.

TRIGGERING FOR ERRORS (Frame Capture)

After selecting the option '**Arm/Trigger**', you have the option to 'Trigger Now' or 'Arm for Error'. If you select 'Trigger Now,' the screen will turn red and the Enter button will flash. The total number of frames and the current frame will be displayed. **To scroll through these frames:**

1. Press and hold in the rotate screen button and press the scroll left and right buttons.
2. For more trigger options press the Enter key and select 'Arm/Trigger'. The options are:

Set Frame Increment
Jump Frame
Jump To Current Frame
Play Backward
Play Forward
Reset
Exit.



Selecting 'Exit' will exit from this menu and leave the RVU in trigger mode. To exit trigger mode, select 'Reset'.

The RVU can also be set to trigger only for certain errors:

1. Select 'Arm/Trigger' and press Enter.
2. Scroll to the option 'Arm for Error' and press Enter. The error and its error code will appear to the right.
3. Use the scroll buttons to select the error desired for the RVU to trigger on and press Enter. When the error occurs, the screen will appear with a red frame and the Enter key will flash.
4. Press the scroll left button once (while holding in the rotate screen button) to find where the error occurred. Scroll left will then show the frames before the error, and scroll right will show the frames after the error.

VIEWING ERROR INFORMATION

1. Select the option 'Error Codes' from the diagnostic screen menu and press Enter.

The screen will turn blue and the message "DOWNLOADING CONTROLLER FAULTS Please Wait..." will appear. After a few seconds, the Fault List screen will appear. Along the left side of the screen, there is a menu and directions on how to use the push buttons. The lower left corner displays the number of pages to view or the number of bytes.

- A. The first screen displayed is the fault list. This list displays the faults (by corresponding error code) in the order they occurred. Also listed with each fault is the number of times the fault occurred, the floor the car was on, and so on. Use the scroll left and right buttons to view the other pages of information.
- B. To switch to the Description list, press both of the scroll buttons simultaneously. This will bring up a list of all of the error codes and their descriptions. The descriptions are in the same order as the Fault List.

C. Pressing both scroll buttons again will bring up the Details screen. This is a visual representation of the car's status when the error occurred. Information such as the door status, motor field status, and brake status can be viewed. Each fault has three pages of information. The pages can be scrolled through using the scroll left and right buttons.

D. To see the List Description screen, press both scroll buttons. This will bring up a list of all of the acronyms used in the fault list (i.e. DMD, demand velocity). Each acronym is shown with a brief description. The control status words are also explained in detail. Scroll through this list and become familiar with the information it contains.

2. To exit the error diagnostics, press the Enter key. The car diagnostic screen will be displayed.

RESETTING ERRORS

- Select 'Reset Errors' and press Enter from the diagnostic screen menu. This will clear all of the faults on the diagnostic screen.



SECTION 12 - CAR COMMANDS

From the Human Interface terminal, type <CAR> to establish communication with the car functions. The prompt in Car Human Interface mode is:

C# 1=>

CAR DIAGNOSTIC COMMANDS

<COMMAND>	DESCRIPTION OF CAR COMMAND
ASU	<p>Automatic Set Up: (Hoistway Scan) Limit switch position and Floor Center of Target (COT) Position Reference Set-up.</p> <p>Note: <i>The following sequence must be performed to adjust the car (refer to Position Reader Tape Installation):</i></p> <ol style="list-style-type: none"> 1. Adjust the Leveling Vane for accurate floor level. 2. Adjust the terminal slow-down limit switches. 3. Put the car in Panel Test and position below the bottom terminal.
BAS	<p>BASe of output: Output base setting can be either 10 or 16. If set to 10, all values returned by the controller will be in decimal notation (easiest to read). If set to 16, all values returned by the controller will be in hexadecimal notation. It is advisable to leave it at 10.</p>
BBT	<p>Break to Break last travel Time: This command returns time period of last run performed by car.</p>
BDC	<p>Brake Duty Cycle. Typing "BDC=[number 1 to 255]<enter>" while the care is on inspection sends a turn on duty cycle to the brake device. Manually pushing in MC and BK contactors will lift the brake. Typing "BDC<enter>", placing the car on automatic, or pressing the SPU button on the front panel, will turn off the brake.</p>
BFM	<p>Building Floor Marking: This command returns the building floor marking e.g. L, M, 3 through 12, 14, 15, 16, etc. for the current position of the elevator.</p>
CCS	<p>Car Call pilot Status: Displays the pilot status of the car. An UP pilot is a call above current car position. A DOWN pilot is a call below current car position. The hexadecimal numbers below indicate the pilot status:</p> <p style="margin-left: 40px;"> 0H - no pilot 1H - up pilot 2H - down pilot 3H - up and down pilot 4H - at call floor 5H - at call floor and up pilot 6H - at call floor and down pilot 7H - at call floor and up and down pilot </p>
CCT	<p>Car Call Test. The car call test automatically activates car calls at selected floors to allow the car to run continuously in a test mode unattended. The command CCT toggles the car call test operation on and off. To select the desired floor, type "CCTF" for front or "CCTR" for rear car calls and follow the prompt to select the individual floor. More than one car call must be selected to activate the test. Loss of power or activation of fire service will cancel the car call test operation.</p>
CLS	<p>CLear terminal Screen. Clears the terminal screen on the wizard or human interface terminal device.</p>



<COMMAND>	DESCRIPTION OF CAR COMMAND																																																																																																																																										
CMC	<p>This command displays Car smart controllers CoMmunication status (Communication Status of the following Devices):</p> <p style="text-align: center;"><u>COMMUNICATION STATUS (CAR)</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>LOC</th> <th>ST</th> <th>RCV</th> <th>FAIL</th> <th>CAR</th> <th>ST</th> <th>RCV</th> <th>FAIL</th> <th>DRV</th> <th>ST</th> <th>RCV</th> <th>FAIL</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>OK</td> <td>13544</td> <td>0</td> <td>8</td> <td>OK</td> <td>13544</td> <td>0</td> <td>2</td> <td>OK</td> <td>6774</td> <td>0</td> </tr> <tr> <td>11</td> <td>OK</td> <td>13544</td> <td>0</td> <td>18</td> <td>OK</td> <td>13544</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>12</td> <td>OK</td> <td>13544</td> <td>0</td> <td>20</td> <td>OK</td> <td>6774</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Note: ST (status) line indicates "OK" when the device is communicating; RCV = the # of packets received; FAIL = the # of failed packets; LOC = local port; CAR = car port and DRV = drive port.</p> <p>The following indicates the corresponding address to each board:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th><u>DEVICE NAME</u></th> <th><u>COMMUNICATION ADDRESS</u></th> <th><u>DESCRIPTION</u></th> </tr> </thead> <tbody> <tr><td>DRV</td><td>2</td><td>DRiVe System</td></tr> <tr><td>CPT</td><td>8</td><td>Car Position Transducer</td></tr> <tr><td>BK</td><td>9</td><td>BraKe Board</td></tr> <tr><td>MF</td><td>10</td><td>Motor Field</td></tr> <tr><td>VFC</td><td>11</td><td>Velocity Fault Controller SMI</td></tr> <tr><td>VFC-HS</td><td>11</td><td>Velocity Fault Controller SMI-High Speed</td></tr> <tr><td>MRC</td><td>12</td><td>Motor Room Controller SMI</td></tr> <tr><td>GLB</td><td>13</td><td>Gate Lock Bypass SMI</td></tr> <tr><td>GP1</td><td>13</td><td>General Purpose SMI 1</td></tr> <tr><td>GP2</td><td>14</td><td>General Purpose SMI 2</td></tr> <tr><td>GP3</td><td>15</td><td>General Purpose SMI 3</td></tr> <tr><td>GP4</td><td>16</td><td>General Purpose SMI 4</td></tr> <tr><td>TOC</td><td>18</td><td>Top Of Car Device</td></tr> <tr><td>COP</td><td>19</td><td>Car Operating Panel</td></tr> <tr><td>CC1</td><td>20</td><td>Car Call Board Number 1</td></tr> <tr><td>CC2</td><td>21</td><td>Car Call Board Number 2</td></tr> <tr><td>CC3</td><td>22</td><td>Car Call Board Number 3</td></tr> <tr><td>CC4</td><td>23</td><td>Car Call Board Number 4</td></tr> <tr><td>CC5</td><td>24</td><td>Car Call Board Number 5</td></tr> <tr><td>RCC1</td><td>25</td><td>Rear Car Call Board Number 1</td></tr> <tr><td>RCC2</td><td>26</td><td>Rear Car Call Board Number 2</td></tr> <tr><td>RCC3</td><td>27</td><td>Rear Car Call Board Number 3</td></tr> <tr><td>RCC4</td><td>28</td><td>Rear Car Call Board Number 4</td></tr> <tr><td>GP5</td><td>29</td><td>General Purpose SMI 5</td></tr> <tr><td>GP6</td><td>30</td><td>General Purpose SMI 6</td></tr> <tr><td>GP7</td><td>31</td><td>General Purpose SMI 7</td></tr> <tr><td>GP8</td><td>32</td><td>General Purpose SMI 8</td></tr> <tr><td>GP9</td><td>33</td><td>General Purpose SMI 9</td></tr> <tr><td>GP10</td><td>34</td><td>General Purpose SMI 10</td></tr> </tbody> </table>	LOC	ST	RCV	FAIL	CAR	ST	RCV	FAIL	DRV	ST	RCV	FAIL	9	OK	13544	0	8	OK	13544	0	2	OK	6774	0	11	OK	13544	0	18	OK	13544	0					12	OK	13544	0	20	OK	6774	0					<u>DEVICE NAME</u>	<u>COMMUNICATION ADDRESS</u>	<u>DESCRIPTION</u>	DRV	2	DRiVe System	CPT	8	Car Position Transducer	BK	9	BraKe Board	MF	10	Motor Field	VFC	11	Velocity Fault Controller SMI	VFC-HS	11	Velocity Fault Controller SMI-High Speed	MRC	12	Motor Room Controller SMI	GLB	13	Gate Lock Bypass SMI	GP1	13	General Purpose SMI 1	GP2	14	General Purpose SMI 2	GP3	15	General Purpose SMI 3	GP4	16	General Purpose SMI 4	TOC	18	Top Of Car Device	COP	19	Car Operating Panel	CC1	20	Car Call Board Number 1	CC2	21	Car Call Board Number 2	CC3	22	Car Call Board Number 3	CC4	23	Car Call Board Number 4	CC5	24	Car Call Board Number 5	RCC1	25	Rear Car Call Board Number 1	RCC2	26	Rear Car Call Board Number 2	RCC3	27	Rear Car Call Board Number 3	RCC4	28	Rear Car Call Board Number 4	GP5	29	General Purpose SMI 5	GP6	30	General Purpose SMI 6	GP7	31	General Purpose SMI 7	GP8	32	General Purpose SMI 8	GP9	33	General Purpose SMI 9	GP10	34	General Purpose SMI 10
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DATE	<p>Set the real time calendar clock DATE. The date is entered as month/day/year. To exit this command without changing the date, hit <enter ↵> before typing in new date values.</p> <p style="margin-left: 40px;">Current date: 6/21/94 Enter new date: 7/26/94</p>																																																																																																																																							
DCS	<p>Down Call pilot Status:</p> <p>a) Up Pilot -- down hall call above current car position</p>																																																																																																																																							



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	<p>FLT = Fault number COUNT = Number of occurrences FLR = Floor where the error occurred TIME = The time the fault occurred (from the system real time clock) DATE = Date of occurrence DPP = Digital Position Pulse count DMD = Demand velocity VEL = Car's Velocity calculated from the Digital Position Pulse DZ = Door Zone status</p> <p>To interpolate the information below, convert the hexadecimal number under the DZ heading into a binary number. The 8-bit binary number will correspond to the bits shown below. Bit 0 will be the least significant, or the "right-most" bit. Wherever there is one (1) on the specified bit, this signifies that the item described next to the bit was active when the fault occurred.</p> <p>BITS</p> <table border="0"> <tr><td>0</td><td>up level zone</td></tr> <tr><td>1</td><td>up final level zone</td></tr> <tr><td>2</td><td>down final level zone</td></tr> <tr><td>3</td><td>down level zone</td></tr> <tr><td>4</td><td>dz</td></tr> <tr><td>5</td><td>Not Used</td></tr> <tr><td>6</td><td>Not Used</td></tr> <tr><td>7</td><td>Not Used</td></tr> </table>	0	up level zone	1	up final level zone	2	down final level zone	3	down level zone	4	dz	5	Not Used	6	Not Used	7	Not Used																																																											
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<COMMAND>	DESCRIPTION OF CAR COMMAND																											
	<p>SV = Car service type Numbers shown correspond directly to status (no conversion needed)</p> <table border="0"> <tr> <td>0=INVALID</td> <td>1=SAFETIES</td> <td>2=DRIVE OFF</td> </tr> <tr> <td>3=PWR LOSS</td> <td>4=INSPECT</td> <td>5=### INIT</td> </tr> <tr> <td>6=DRIVE FLT</td> <td>7=CWT DRL</td> <td>8=CTL SHUTDN</td> </tr> <tr> <td>9=EARTH Q.</td> <td>10=FIRE PH 2</td> <td>11=FIRE PH 1</td> </tr> <tr> <td>12=CODE BLUE</td> <td>13=EM RECALL</td> <td>14=HOMING</td> </tr> <tr> <td>15=INDEPEND</td> <td>16=ATT</td> <td>17=DOOR DISC</td> </tr> <tr> <td>18=REAR DISC</td> <td>19=VIP</td> <td>20=LBY IND</td> </tr> <tr> <td>21=DISP LOSS</td> <td>22=STOP SW</td> <td>23=SERV PROT</td> </tr> <tr> <td>24=LOAD BP</td> <td>25=SECURITY</td> <td>26=AUTOMATIC SERV</td> </tr> </table> <p>CS = Car Status Convert hexadecimal numbers to binary as in DZ above.</p> <p>BITS</p> <ul style="list-style-type: none"> 0 start sequence 1 run sequence 2 EMST (Emergency Stop Output) 3 EMSD (Emergency Stop Input) 4 SRU (Speed Reference Up) 5 SRD (Speed Reference Down) 6 up motion 7 down motion <p>DS = Door Status Convert hexadecimal numbers to binary as in DZ and CS above.</p> <p>BITS</p> <ul style="list-style-type: none"> 0 door open limit (DOL) 1 door close limit (DCL) 2 rear door close limit (RDCL) 3 rear door open limit (RDOL) 4 door open pilot 5 door close pilot 6 rear door open pilot 7 rear door close pilot 	0=INVALID	1=SAFETIES	2=DRIVE OFF	3=PWR LOSS	4=INSPECT	5=### INIT	6=DRIVE FLT	7=CWT DRL	8=CTL SHUTDN	9=EARTH Q.	10=FIRE PH 2	11=FIRE PH 1	12=CODE BLUE	13=EM RECALL	14=HOMING	15=INDEPEND	16=ATT	17=DOOR DISC	18=REAR DISC	19=VIP	20=LBY IND	21=DISP LOSS	22=STOP SW	23=SERV PROT	24=LOAD BP	25=SECURITY	26=AUTOMATIC SERV
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<p>FLTXn (See p.8-29 for Error Code)</p>	<p>Faults (errors - see FLTn): This command shows the eXtended fault buffer corresponding to the faults shown with the above <FLT> command. The "n" value is set to the fault index number label from 0 to 23. From the <FLT> command example shown below, the "n" number is selected to retrieve additional fault information for fault code 80 stored at index number 0. Convert the hexadecimal numbers to binary for bit settings.</p> <p>C# 1>FLT0</p> <pre> FLT CNT FLR TIME DATE DPP DMD VEL DM DZ SV CS DS GR FLT0= 80 1 11 4:39:22p 6/02/94 5279 350 350 3 00H 0 00H 00H 0 OFH 201 FLT1= 0 0 0 0:00:00a 0/00/94 0 0 0 0 00H 0 00H 00H 0 FLT2= 0 0 0 0:00:00a 0/00/94 0 0 0 0 00H 0 00H 00H 0 FLT3= 0 0 0 0:00:00a 0/00/94 0 0 0 0 00H 0 00H 00H 0 </pre>																											



<COMMAND>	DESCRIPTION OF CAR COMMAND
	<p>C# 1>FLTX0 CS1, CS2, CS3, CS4, VS1, VS2, VFCV, MFS, BKS, DS1, DS2, DS3, DRVCM, FT 0= 04H, 28H, 80H, 00H, 00H, 00H, 0, 00H, 00H, 00H, 00H, 00H, 0003H, 00H, ..., 00H</p> <p>The following details the headings in the above table, which are NOT to be confused with Control Status Word Bits (see page 8-18). In the event of a support call to CEC, you may be asked to provide the appropriate bit description as listed below. Convert hexadecimal numbers to binary for bit settings:</p> <p>CS1 = Car Status 1 BITS 0 Rope Gripper Trip 1 Rope Gripper Fault 2 Fault Trip 3 Relay Fault 4 Controller Fault 5 Motion Fault 6 Gate & Lock (GLR) Fault 7 Run Time-Out Fault</p> <p>CS2 = Car Status 2 BITS 1 Motion Master (elevator motion allowed) 2 g11 Input On Fault 3 Drive Fault 4 Communication Initialized Ok 5 Tach Direction (SPU DPP quadrature: 1=up, 0=dn) 6 Tach Direction Error 7 SPU Tach Direction Error</p> <p>CS3 = Car Status 3 BITS 0 Up Call Pilot 1 Down Call Pilot 2 At Floor Call Pilot 3 Drop Leveling Velocity Output (LVE) 4 Moving 5 Leveling 6 Lev DZ 7 SPU Thermal Sensor</p>



<COMMAND>	DESCRIPTION OF CAR COMMAND
	<p>CS4 = Car Status 4 BITS 0 SYSTEM MASTER (SRD/SRU ok) 1 Proximity 2 g11 3 Gate & Lock (GL) 4 SM Input From Contactor 5 MC Input From Contactor 6 BKR (Brake Relay) 7 Door Operation</p> <p>VS1 = VFC Board Status 1 BITS 0 Slowdown Limit Fault (SLF) 1 Inspection Speed Fault (ISF)/fault at limit 7 (EX0 hs board) 2 GL Speed Fault (GLF)/fault at limit 8 (EX0 hs board) 3 Emergency Terminal Limit Fault (TLF) 4 DF-Deceleration Expected (DF) 5 Moving Up 6 Moving Down 7 Emergency Stop Fault (ESF)</p> <p>VS2 = VFC Board Status 2 BITS 0 Slowdown Fault at Limit 1 1 Slowdown Fault at Limit 2 2 Slowdown Fault at Limit 3 3 Slowdown Fault at Limit 4 4 Slowdown Fault at Limit 5 5 Fault at ETS Limit 6 0=Up Limit Fault; 1=Dn Limit Fault 7 Fault at Limit 6 (High Speed VFC Board)</p> <p>VFCV = Car's velocity from VFC board Digital Position Pulse</p> <p>MFS = Motor Field Board Status BITS 0 +24v fail 1 +15v fail 2 -15v fail 3 No AC Input to Board 4 Motor Field Fault 5 Not Used 6 Not Used</p>



<COMMAND>	DESCRIPTION OF CAR COMMAND
	<p style="text-align: right;">7 Not Used</p> <p>BKS = Brake Board Status</p> <p style="padding-left: 40px;">BITS</p> <p style="padding-left: 80px;">0 +24v fail 1 +15v fail 2 -15v fail 3 No AC Input to Board 4 Brake Board Fault 5 Not Used 6 Not Used 7 Not Used</p> <p>IF DSD-412 DRIVE: (If applicable, reference DSD Drive Manual - Book 3, especially fault codes f97 through f905)</p> <p>DS1 = Drive Status 1</p> <p style="padding-left: 40px;">BITS</p> <p style="padding-left: 80px;">0 Set to 1 for Synchronization (Comm. Status between drive and controller). 1 Set to 1 for Synchronization 2 Tach Direction Is Up 3 Tach Direction Is Down 4 Tach Overspeed Fault (f97) 5 Tach Loss Fault (f98) 6 Reverse Tach Fault (f99) 7 Serial Comm Fault</p> <p>DS2 = Drive Status 2</p> <p style="padding-left: 40px;">BITS</p> <p style="padding-left: 80px;">0 Motor Fault (f400) 1 Excessive Field Current (f401) 2 Contactor Failure (f402) 3 Drive is at CEMF Limit 4 DH Input Fault (f405) 5 E-Stop Fault (f406) 6 A Drive Fault exists 7 Drive is Ready</p> <p>DS3 = Drive Status 3</p> <p style="padding-left: 40px;">BITS</p> <p style="padding-left: 80px;">0 A "No Loop Fault" Exists (f900) 1 PCU 1st Fault (f901) 2 Line Synchronization Failure (f903) 3 Low Line Fault (f904) 4 Field Loss Fault (f905)</p>



<COMMAND>	DESCRIPTION OF CAR COMMAND
	<p style="text-align: right;">5 Not Used 6 Not Used 7 Not Used</p> <p>DRVCM = Drive Command BITS</p> <p style="text-align: right;">0 Set To 1 For Synchronization 1 Set To 1 For Synchronization 2 Run Command (SMC) 3 Fault Reset (AFR) 4 Run Down (SRD) 5 Run UP (SRU) 6 Full Field Command (FEI) 7 Not Used 8 Not Used 9 Not Used 10 Not Used 11 Not Used 12 Not Used 13 Not Used 14 Not Used 15 Not Used</p> <p>END DSD-412</p>
	<p>IF VCD-703 DRIVE:</p> <p>DS1 = Drive Status 1 BITS</p> <p style="text-align: right;">0 Forward Running 1 Running Zero Speed 2 Reverse Running 3 Reset Signal on 4 Drive has Frequency input 5 Drive Ready 6 Minor Fault 7 Major Fault</p> <p>DS2 = Drive Status 2 BITS</p> <p style="text-align: right;">0 Command Fault 1 Recovery From Power Loss 2 Operation Mode 3 Not Used 4 Multifunction Input 1 5 Multifunction Input 2 6 Multifunction Input 3 7 Multifunction Input 4</p> <p>DS3 = Drive Status 3 (always 0)</p> <p>DRVCM = Drive Command</p>



<COMMAND>	DESCRIPTION OF CAR COMMAND
	<p style="text-align: center;">BITS</p> <p>0 Run Command (SMC) 1 Reverse Run Command (SRD) 2 Baseblock 3 Not Used 4 Run Down (SRD) 5 Fault Reset (AFR) 6 Not Used 7 Not Used 8 Not Used 9 Not Used 10 Not Used 11 Not Used 12 Not Used 13 Not Used 14 Not Used 15 Not Used</p> <p>END VCD-703</p> <p>EX1 = Extended Error Data 1 (programmer defined, call CEC) EX2 = Extended Error Data 2 (programmer defined, call CEC) EX3 = Extended Error Data 3 (programmer defined, call CEC) EX4 = Extended Error Data 4 (programmer defined, call CEC) EX5 = Extended Error Data 5 (programmer defined, call CEC)</p>



FPR	Floor P osition Reference at present floor:
FWL	Flash W rite access L og. When data or program is written to flash memory or EEPROM the SPU bios software will log the event in battery backed ram. This command prints the data log to the terminal screen. FWLC clears the write access log.
GET	GET /load the parameters from EEPROM: This command restores modified parameters. (Also verifies the checksum and displays any errors.) Note: FCP, ULR, DLR & TSV parameters must all be valid for <GET> to return an 'OK'.
GRP	Enter the GR oup Human Interface (Prompt: Group =>)
LWR	Load W eigher R eading. Displays the load weigher voltage and percent load.
LWUn	Load Weigher User interface setup. This command guides the user though the load weigher setup starting with the car on independent and the sensor verified with an empty car at the bottom floor, car fully loaded at the top floor and finally empty at the top floor. If the LWU command is entered without a number immediately following, a list of four options are given for the user to select from those shown below: <ol style="list-style-type: none"> 1. Proximity sensor setup. 2. Strain gauge sensor setup. 3. Observe sensor setup parameters. 4. Activate offset calibration procedure. <p>If proximity or strain gauge sensor setup is selected, the user is prompted for additional information to start the setup procedure. Once setup is activated, the following "LWU" commands are entered to validate the load condition of the car.</p> <p>LWU1 – Command is entered when the sensor voltage is setup between 1.0 and 1.4 volts and the car is empty at the bottom landing.</p> <p>LWU2 – Command is entered when the car has full load at the bottom floor.</p> <p>LWU3 – Command is entered when the car has full load at the top floor.</p> <p>LWU4 – Command is entered when the car is empty at the top floor.</p>
MEN	SPU BIOS M ENU: Use to upload the software into FLASH memory
PAE	Last four (4) Floors which had a P Arity Error, e.g. <PAE> <enter ↵> 7, 5; ... " 7 is the DPP computed floor and 5 is the preset code which was read by computer with an Odd parity error.
PAR	P ARameters: This command offers a speedy way to Enter or Review all of the above adjustment parameters. Typing <PAR> <enter ↵> displays all parameters with a slight delay.
PARA	The ' A ' (Alter) suffix permits changing or reviewing all P ARameters. Each command is displayed with the current value followed by a question mark. You can now change its value or hit <enter ↵> to skip to the next one.
POS	True Car P OSition, e.g. 1 through 15 (including 13)
PSE	Last four (4) Floors which had P reSet Error but Odd parity OK. (See <PAE> command for display explanation.)
RCC	R eset all Car Calls
RCM	R eset C oMmunication status log. Resets failure counts for all COMM devices (See <CMC> command)



RDE	Reset Device Errors: Resets communication errors for the following boards: RDED Drive RDEV VFC device RDEB Brake Board device RDEM Motor Field Board
RFL	Reset the FauLt Hold memory
RMA	Request Master. When entered at the terminal of a car that is not the group, this car will request to become the master car, i.e. the group. The existing master car will relinquish group control to this car.
RPU	RPU Hall call unit status commands. RPUC – Reset comm errors for HPU devices on RPU comm buss. RPUR – Software reset of RPU hall call board. RPUD – SPU to send hall call setup information to RPU board. RPU _n – Show HPU device “n” comm status from RPU.
RSL	Request Slave. When entered at the terminal of a car that is currently the group controller, this car will relinquish group control to the next available car with the lowest number. If no car is available, this car will time out and become the group again.
SCC _n	Set Car Call at floor (n)
SDC _n	Set Down Call at floor (n)
STD	STart Down: The <STU> and <STD> commands can be used while in automatic operation to provide a one (1) floor run up or down respectively.
STM	SeT Up Mode: This command allows car to run on inspection mode without the Digital Position Pulse while setting up the car. This operating mode bypasses the normal safety check and prevents car from shutting down. This operating mode can also be initiated from front panel push buttons in the circuit breaker panel. While elevator is on inspection mode, press and hold SPU push button on front panel of the controller for approximately 3 seconds: DISPLAY button will then light green. Release SPU push button and then press DISPLAY push button momentarily. DISPLAY button lights red and green alternately, indicating car is in Setup mode. If car loses power or if inspection switch is moved to automatic mode, elevator will automatically be removed from Setup mode.
STU	STart Up (similar to the Attendant Buttons): The <STU> and <STD> commands can be used while in automatic operation to provide a one (1) floor run up or down respectively.
SUC _n	Set Up Call at floor (n)
TIM	Computer up TIME since the last power-up (day-hour:min:sec)
TIME	Set real TIME calendar clock. Time is entered as hour:min:sec followed by ‘a’ for am or ‘p’ for pm. To exit this command without changing the time, hit <enter ↵> before typing new time value. Eg: Current time: 11:12:32p Enter new time: 10:22:30 a
UCS	Up Call pilot Status (See CCS for explanations.)



ULBn	Car Velocity when the Up Limit(n) first Break open: This command is useful when adjusting TSV. It permits "freezing" the car velocity at the instant each terminal limit switches open.																																								
VEL	Actual Car VELOCITY in FPM																																								
VER	Displays software VERsions for all communications boards. See <CMC> command for description of devices: <p style="text-align: center;">DEVICE VERSION (SYS= system; LOC= local; DRV= drive; HC= hall call)</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>SYS</th> <th>Ver</th> <th>LOC</th> <th>Ver</th> <th>CAR</th> <th>Ver</th> <th>DRV</th> <th>Ver</th> <th>HC</th> <th>Ver</th> </tr> </thead> <tbody> <tr> <td>201</td> <td>010</td> <td>9</td> <td>008</td> <td>8</td> <td>006</td> <td>2</td> <td></td> <td>44</td> <td>006</td> </tr> <tr> <td>202</td> <td>010</td> <td>11</td> <td>008</td> <td>18</td> <td>005</td> <td></td> <td>211</td> <td>006</td> <td></td> </tr> <tr> <td>212</td> <td>003</td> <td>12</td> <td>007</td> <td>19</td> <td>006</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	SYS	Ver	LOC	Ver	CAR	Ver	DRV	Ver	HC	Ver	201	010	9	008	8	006	2		44	006	202	010	11	008	18	005		211	006		212	003	12	007	19	006				
SYS	Ver	LOC	Ver	CAR	Ver	DRV	Ver	HC	Ver																																
201	010	9	008	8	006	2		44	006																																
202	010	11	008	18	005		211	006																																	
212	003	12	007	19	006																																				
VFC	<p>Velocity Fault Controller Status: <u>Velocity Fault Controller Status</u></p> <ul style="list-style-type: none"> *Slowdown Limit Fault *Inspection Speed Fault *Gate and Lock Speed Fault *GL Velocity: 150 fpm (0.76 m/s) *Emergency Terminal Limit Fault *ETS Velocity: 350 fpm (1.78 m/s) Moving Dn Moving Up VFC Velocity: 500 fpm (2.54 m/s) <p>Note: Car must be traveling at velocity greater than 52 fpm (0.26 m/s) for VFC board to display velocity greater than 0. * Displayed only if corresponding fault condition occurs.</p>																																								
VLt	Velocity Limit Test. Sets a test variable to disable the SPU from limiting the velocity when a slowdown limit is hit. This flag is set for a single run.																																								
WRT	WRiTe parameters to EEPROM: This command stores changes in non-volatile memory. <p>Note: It is not necessary to write <WRT> altered parameters immediately to EEPROM. You can test operation, continue to operate elevator, and store to EEPROM when satisfied. In case of removal of power to CPU, or if terminal is disconnected, parameters are restored to former value (no change occurs).</p>																																								
ZON	ZONE floor: Displays floor to which car is zoning.																																								
ZPS	Zone Pilot Status (Refer to <CCS> command for explanation)																																								



SECTION 13 - CAR ADJUSTMENT PARAMETERS

The **FUTURA™** operating system provides a series of adjustment parameters which allow the user to fine tune elevator operation, and control the operation of some devices associated with the elevator. For example, the parameter ACR controls the elevator acceleration rate, while the parameter DOD controls door timing.

PARAMETER	RANGE	DEFAULT	UNITS	DESCRIPTION/UNITS OF CAR ADJUSTMENT PARAMETER
ABT	0-65535	0	SEC	Attendant Buzzer Time. Duration timer for the attendant buzzer to sound while a hall call is not being serviced.
ACB	0-65535	16	DPP	Bottom ACcess offset from SLD1 (Slow Down Limit Switch input): On access mode, this parameter value equals the number of DPP counts at which the car will stop when traveling UP from the SLD1 limit switch.
ACF	1-X	1	FL.#	ACcess Floor when mid-shaft.
ACR	75-300	150	Feet/ min/ sec	ACceleration Rate: The rate of constant acceleration for the car to top speed. Divide ACR parameter by 60 to convert value into feet-per-second. (multiply ACR by 0.00508 to convert to m/s ²)
ACT	0-65535	0	DPP	Top ACcess offset from SLU1: On access mode, this is the number of DPP counts at which the car will stop when traveling down from the SLU1 limit switch.
AND	0-10	0	# Car calls	ANti- nuisance Dumping: Number of Car Calls which must be registered to enable dumping all the car calls when the Anti-Nuisance Load switch is not triggered.
AST	5-180	30	SEC	Automatic Service Time-out: After this time, car is taken out of group service or hall service.
BAL	0-100	0	%CWT	BAL anced load (percent). Set to the percent that the car is counterweighted to obtain balanced load. Set to a value of 45 for 45% counterweighting.
BCD	0-64	16	1/64 SEC	Brake Control Drop delay timer. Controls drop time for Brake Controller (BKC output) after car stops.
BCL	0-64	16	1/64 SEC	Brake Control Lift timer delay. This parameter delays BKC output from energizing BK contactor: Note: Only used on VVVF drives.
BDD	0-320	16	1/64 SEC	Brake Drop Delay. Time delay after the 2" (5 cm) door zone point is reached to begin reducing the brake voltage to zero volts.
BDT	0-320	16	1/64 SEC	Brake Drop Time. The rate at which the brake voltage is dropped from the Brake Hold Voltage to zero volts.
BED	1-65535	JOB	NUM.	Building Elevator Designation number (Shown on Car Diagnostic screen.)
BHD	0-320	128	1/64 SEC	Brake Hold Delay. Time delay before dropping to Hold voltage. During delay time the brake voltage is set to the brake lift voltage.
BHV	0-500	JOB	VOLTS	Brake Hold Voltage.
BLD	0-65535 SEC	16	1/64 SEC	Brake Lift Delay: Brake lift delay after a start sequence is initiated.
BLT	0-320	16	1/64 SEC	Brake Lift Time. Rate in which brake voltage is changed starting from Brake Start Lift voltage to Brake Lift Voltage.



PARAMETER	RANGE	DEFAULT	UNITS	DESCRIPTION/UNITS OF CAR ADJUSTMENT PARAMETER
BLV	10-500	JOB	VOLTS	Brake Lift Voltage. This voltage value must be less than 90% of the Brake Maximum Voltage (BMV) parameter.
BMA	1-20	JOB	AMPS	Brake Maximum Amps. This value should match the board's DC current configuration jumper setting.
BMV	20-500	JOB	VOLTS	Brake Maximum Line Voltage. AC line voltage supplied to brake board. Value of this voltage parameter times 0.9 must be > Brake Lift Voltage (BLV parameter).
BRS	0-500	JOB	VOLTS	Brake Re-level Start lift Voltage. This brake voltage value is immediately output to the brake when a re-level is initiated.
BRT	0-320	4	1/64 SEC	Brake Re-level lift Time. The rate in which the brake voltage is increased from the Brake Re-level Start voltage to the Brake Re-level Lift Voltage.
BRV	1-500	JOB	VOLTS	Brake Re-level Voltage. Lift voltage during a re-level.
BSL	0-100	JOB	VOLTS	Brake Start Lift Voltage. This brake voltage value is immediately output to the brake when a run is initiated.
CCD	1-128	3	# CALLS	Car Call Dumping: Number of Car Calls that a car will answer without the Electric Eye (EE input) activated (before canceling the remaining Car Calls).
CCN	1-15	JOB	NUMERIC	Car Communications Number. This parameter identifies the car for Car To Group communications.
CDH	1000-65535	1000	DPP	Counter-weight Derailment High collision zone: The Counter-weight derailment collision zone must be established at the job site. When traveling up in inspection mode, the CDL parameter (Counter-weight Derailment Low) point is when the Top of the Car meets the bottom of the counter-weight. The CDH point is when the Bottom of the Car meets the Top of the counter-weight. These two points must be established and the Digital Position Count (DPC or DPP) must be entered with the CDL and CDH parameters. The CDH point can be approximated by measuring the total length of the Car and the Counter-weight. This length can then be translated into Digital Position Count (or DPP). This length Value can be added to CDL in order to determine the CDH point.
CDL	1000-65535	1000	DPP	Counter-weight Derailment Low collision zone. Refer to CDH parameter for definition.
CDT	16-200	46	1/16 SEC	Door Open (Standing) Time (1 to 12.5 seconds) for a Car Call Stop (no hall calls).
CIT	0-65535	48	SYS TIME	CPU Interrupt Test. Individual bits are set to display system timing. BITS 0 - Real time clock interrupt 1 - Sequence clock interrupt 2 - Group to Car communications timer
CKT	0-128	80	1/16 SEC	Coded Call Keypad entry Time (Use with optional keypad security) Entry time limit to press the four push-button codes required during security mode. If this time elapses without completing the code, process is aborted & you must restart.
CS1	0-65535			Control Status Word (Car) 1 (See Section 14)
CS2	0-65535			Control Status Word (Car) 2 (See Section 14)
CS3	0-65535			Control Status Word (Car) 3 (See Section 14)
CS4	0-65535			Control Status Word (Car) 4 (See Section 14)
CS5	0-65535			Control Status Word (Car) 5 (See Section 14)



PARAMETER	RANGE	DEFAULT	UNITS	DESCRIPTION/UNITS OF CAR ADJUSTMENT PARAMETER
CS6	0-65535			Control Status Word (Car) 6 (See Section 14)
CS7	0-65535			Control Status Word (Car) 7 (See Section 14)
CS8	0-65535			Control Status Word (Car) 8 (See Section 14)
CSW	0-65535			Control Status Word (Car) 0 (See Section 14)
DCT	1-128	10	1/16 SEC	Drive Run Control Time: Time in which the drive stays energized after the car stops at the floor.(some jobs only)
DCC	0-20	6	DOOR CYCLES	Door Cycle Protection Counter: Number of time the Doors cycle without getting the Door close limit or the Door locks.
DCP	5-20	12	SEC	Door Close Protective time: The amount of time the doors are given to close before taken out of service on Door Protect.
DDT	0-80	8	1/16 SEC	Door Open Time after activation of DOB (Door Open Buzzer) input.
DER	70-300	107	Feet/ min/ sec	Deceleration Rate: The rate of Constant Deceleration of the car to the transfer to leveling. Divide DER by 60 to convert to feet per second. (or multiply DER by 0.00508 to convert to m/s ²).
DHT	0-64	15	1/16 SEC	Door Hold Time: Delay time before high speed door opening. Only used on Dover OHS door operator circuits.
DIT	0-16	1	1/16 SEC	Door Interlock Time: Time delay between switching from door close to door open.
DLR	0-65535	SCAN	DPP	Down Limit position count Reference: The position (p) associated with the limit (n) -- (n) must be entered and has a range of 1 through 5; (p) is the absolute position in DPP of the limit (n). The value of (p) must increase at the bottom floor with (n=1) to (n=5), and for the top floor with (n=5) to (n=1). Note the Up limit (1) is further away from the bottom floor than the Up limit (5).
DMD	Calculated			Digital Multiplier for Down direction. NON-Serial Interfaced Drives Only. The top speed can also be individually fine tuned. The programmed value for 'DMD' is (512,000 /Top-Speed for 12 bit DAC) or 1024 for a 500 fpm job. The adjustment range is +/- 24 bits from this calculated value. For a 16 bit DAC, the programmed value for 'DMD' is (4,096,000/Top-Speed) or 8192 for a 500 fpm job and a range of +/- 196 bits from the calculated value.
DMU	Calculated			Digital Multiplier for Up direction. NON-Serial Interfaced Drives Only. The top speed can also be individually fine tuned. The programmed value for 'DMU' is: (512,000 /Top-Speed for 12 bit DAC) or 1024 for a 500 fpm job. The adjustment range is +/- 24 bits from this calculated value. For a 16 bit DAC, the programmed value for 'DMU' is (4,096,000/Top-Speed) or 8192 for a 500 fpm job and a range of +/- 196 bits from the calculated value.
DOD	0-32	12	1/16 SEC	Door Open Delay time: Only used on OTIS 6970 operators
DOH	0-360	15	SEC	Extra Door Open button Hold time: Only used with Door Hold buttons.



PARAMETER	RANGE	DEFAULT	UNITS	DESCRIPTION/UNITS OF CAR ADJUSTMENT PARAMETER
DOP	5-20	12	SEC	Door Open Protective time: Amount of time allowed to open the doors before taken out of service on Door Protect.
DOT	0-60	15	SEC	Door Open Button Time-out: Maximum amount of time doors are allowed to remain open from the Door open button input.
DPD	0-60	0	DPP	Digital Position ADjustment: DPP (Digital Position Pulse) adjustment at the 12 inch (30 cm) and at the 6 inch (15 cm) leveling zone. If there is an error from the DPP at the 12" or at the 6" target, DPD parameter is the correction adjustment. If no correction is desired, such as during set-up, set DPD to zero. (Some Jobs Only)
DPF	160-1200	JOB	DPP	Dpp Per Foot (dpp x 10). The number of dpp counts per foot that the controller is expecting to count. Set to 320 for 32.0 dpp per foot on standard jobs.
DPL	0-120	32	DPP	Digital Position at 12 inch Leveling: Digital Position is calculated from floor position reference that should be at the 12 inch (30 cm) target. It is normally set to 31 or 32. ($12" / 0.375" = 32$ (or 30 cm/ 0.95 cm)
DPZ	0-60	15	DPP	Digital Position at 6 inch Zone: Digital position, calculated from floor position reference, that should be at the 6 inch (15 cm) target. It is normally set to 15 or 16. ($6" / 0.375" = 16$ (or 15 cm/ 0.95 cm)
DRT	1-48	1	¹ / ₁₆ SEC	Deceleration Roll Time: Transition Time necessary (from top speed) to engage constant deceleration mode.
DRV	0-80	0	SEC	Door ReVersal (Optional) used with a Door Reversal Limit switch and operates at 1/2 the Door Reversal time. Prevents the door from fully opening during Electric Eye (EE input) reopening when the DRV parameter time expires. The doors will continue to operate until Door Open Limit (DOL) input deactivated.
DTA	8-270	20	DPP	Deceleration TArget (DPP Count): This is the distance from the floor level that deceleration speed reference is calculated.
DZD	2008-2088	2048	Number	Digital Zero offset for Down direction: True zero speed is 2048. To compensate for low velocity error (leveling speed), zero offset can be adjusted by ± 40 bits (Some Jobs Only)
DZU	2008-2088	2048	Number	Digital Zero offset for Up direction: True zero speed is 2048. To compensate for low velocity error (leveling speed), zero offset can be adjusted by ± 40 bits (Some Jobs Only)
DZO	CALCULATED			Digital Zero Offset. NON-Serial Interfaced Drives Only. True zero speed is 2048 for a 12 bit DAC and 32768 for a 16 bit DAC. To compensate for low velocity error (leveling speed), the zero offset can be adjusted by ± 40 bits OR ± 640 bits for 12 and 16 bit DACs respectively.
EDR	0-65535	0	DPPs	Distance in DPPs that the Down Emergency Terminal Switch opens.



EDS	Total Number of Landings			<p>Emergency Dispatch floor Setting: If car communication is lost with dispatcher, car will stop at floors set with this command.</p> <p>Setup in the Terminal mode of Wizard only. Note that the direction in which stops are made can also be set. When prompted, answer `Y' or `N' if a stop is desired for that floor, and `U', `D' or `B' for Up, Down or Both Up and Down respectively, for the direction of stop.</p>
EPF	1- # FLs	1	FLOOR #	Emergency Power recall Floor: The default recall floor for automatic emergency power sequence.
EMF	0-70	1	FLOOR #	Emergency Service Floor. This is used for emergency medical technician service (EMT) operation.
ESV	0-65535	JOB	FPM	Emergency Slowdown Velocity: Maximum speed reference output at the (n) th slowdown limit switch. If car velocity exceeds limit velocity, speed reference will be clamped to ESV parameter setting.
ETV	0-65535	JOB	FPM	Emergency Terminal slowdown Velocity: Maximum velocity allowed at ETS limit switch.
EUR	0-65535	0	DPPs	Distance in DPPs that the UP Emergency Terminal Switch opens.
FAL	1- # FLs	2	FLOOR #	Fire Recall Alternate Floor: The alternate floor to which cars recall when main default fire floor sensors are activated (See FIR param).
FBC	0-400	30	AMPS	Field Board Current rating. Amperage for which the motor field board is jumpered.
FBT	1-65535	1	1/64 SEC	Fire Bypass Timer for fire GSA standard.
FCP	1-Top Landing	SCAN	Floor DPP	Floor position Count Preset: This value equals the DPP position associated with each floor. ULR, DLR and FCP parameters are normally set during auto-setup.
FDZ	1-32	5	DPP	Floor Dead Zone: The number of counts the car must go out of dead level to cause the car to re-level. (Some Jobs Only)
FEV	0-2000	0	FPM	Feed forward End Velocity. When the car is slowing down and the car velocity is less than this parameter value, the controller will signal the drive to remove the speed reference feed forward. The drive must be setup for this feature and CS9 BIT 2 must also be set in the controller.
FIR	1- # FLs	1	FLOOR #	FIR e Recall Floor: The main fire floor default for phase 1 recall mode.
FLV (MG Only)	0-667	290	VOLTS	Field Line Voltage: The nominal single phase AC line voltage that is input to the field power circuit.
FRC	1-8	3	RESETS	Fault Retry Count. The number of times the controller will try to recover from a motion fault and return to automatic service before shutting down.
FSD	0-6	0	1/64 SEC	Final Stop Damping. Velocity Damping during the final stop. The damping time represents the number of samples that are averaged every 1/64 second. On final stop, the demand velocity is changed from the leveling velocity to zero instantly. Having a damping of 8 would cause the velocity to



				slope down from the leveling velocity to zero in 1/8 second (8/64).
FSR (MG Only)	0-128	8	1/16 SEC	Field Strength Rate. Rate at which Weak Field Voltage (WFV) parameter increased to Run Field Voltage (RFV) parameter.
FSS (MG Only)	10-2500	2000	FPM	Field Strength Speed: The car speed (fpm) at which the field regulator begins to strengthen the motor field voltage during deceleration.
FTK	0-192	2	Number	Flat Top travel Constant: Value used in the calculation of "roundness" of the speed reference (curve) during transition from acceleration to deceleration.
FWR (MG Only)	0-128	8	1/16 SEC	Field Weaken Rate: The time in which Motor Field Voltage will decrease from Run (full) Field Voltage (RFV) to Weak Field Voltage (WFV) parameter value.
FWS (MG Only)	10-2500	2000	FPM	Field Weakening Speed: The car speed (fpm) at which the field regulator begins to weaken the motor field voltage during acceleration.
GCT	0-32	12	1/16 SEC	Gong Cycle Time: Total On & Off time for the Down Lantern signal (1/16 sec).
GDB	4-64	4	1/64 SEC	Gate and lock DeBounce time: Time to debounce the gate and lock signals to prevent a false start caused by the gate or lock bouncing.
GLV	0-200	160	FPM	Gate and Lock Velocity limit. Maximum car velocity allowed by VFC board when GL1 input is deactivated.
GOT	0-32	7	1/16 SEC	Gong Off Time: On time = GCT - GOT; Off time = GOT
GP1	0-65535 (Software Specific)			General Purpose parameter
GP2	0-65535 (Software Specific)			General Purpose parameter
GP4	0-65535 (Software Specific)			General Purpose parameter
GP5	0-65535 (Software Specific)			General Purpose parameter
GRT	20-360	180	SEC	Generator Run Time: This is time period that Motor Generator (MG) will be ON after the last call.
HBT	0-32	8	1/16 SEC	Handicap Buzzer Time (HBZ output) Floor Passing Tone. OnTime (pulse function of Handicap Buzzer)
HDT	0-60	15	SEC	Car Homing Door open Time
HLD	0-60	0	SEC	Hall Lantern Delay: Delay from slowdown initiation to send lantern output signal (ULT & DLT parameters).
HM1	1- # FLs	1	FLOOR #	Car HoMing floor designation 1: A maximum of four (4) floors can be designated for Homing. The HM1 through HM4 parameters match the HM1 through HM4 input names. The floor designation does not have to be sequential.
HM2	1- # FLs	1	FLOOR #	Car HoMing floor designation 2
HM3	1- # FLs	1	FLOOR #	Car HoMing floor designation 3
HM4	1- # FLs	1	FLOOR #	Car HoMing floor designation 4
HTT	0-65535	35	FLOOR #	High Speed Travel Timer: Maximum time the car is allowed to run at high speed.
IFT	0-301	15	SEC	Independent to Fire Time: Time system takes to override independent service during Fire Phase I operation.
IRV	0-150	150	FPM	Inspection Run Velocity limit. VFC board velocity limit when car is running on inspection mode.
IVE	0-100	35	FPM	Inspection VELOCITY: The Inspection velocity is set at 50 FPM (0.25 m/s) when the controller is shipped.
LBY	1- # FLs	1	FLOOR #	LobBY Floor: Default recall floor during regular zoning services.



LDT	32-200	48	1/16 sec	Long Door Open (Standing) Time (2 to 12.5 seconds) for a hall call.
LFT	0-600	60	sec	Light and Fan Time: Special time out (in seconds) to turn off lights and fan inside car when car is parked. (Optional. The normal time is the same as GRT)
LIC	16-25	20	msec	Low Intensity Cycle time (msec). Used to pulse the car call lights so they glow slightly while the call is not selected. Once the call is energized, the car call light turns on bright. This parameter controls the total on-off time (how fast the car call light is pulsed). A cycle time set to 16 would be 62.5 Hz.
LIO	2-9	4	msec	Low Intensity On time (msec). The amount of time that car call light is on during each cycle time. If LIC is set to 16 milliseconds and LIO is set to 4 milliseconds, then the light will be pulsed with a 25% duty cycle.
LND	0-65535	0	1/16 sec	Local Next-Up Door time: Only used for simplex car when Lobby Recall feature enabled
LPE	1-65535	50	DPP	Terminal Limit switch Position Error: Position error that will result in an emergency slow-down. When car approaches a terminal landing, the instantaneous position when the limit switch opens is compared with the Limit Position Reference (see ULR and DLR parameters). If this differential value is larger than LPE parameter values, the car will go into emergency slowdown.
LTR	0-1000	300	Fpm/s	Linear Time Rate (feet/min/sec). Maximum change in demand velocity while the SM contactor is energized.
LVE	1-20	7	fpm	Leveling VELOCITY (feet per minute).
LWT	0-32	0	1/16 sec	Load Weighing de-bounce. The number of samples that are averaged each 1/16 second from the load weigher input. A value of 16 would give 16 samples continuously averaged over 1 second.
MAR	75-300	150	Fpm/s	Acceleration Rate when using MMS parameter for setting top speed. (MAR then replaces ACR parameter for setting Acceleration Rate).
MBT	0-65535	1	sec	Motor Blower Timer. Drop out timer for motor blower output.
MCT	4-48	18	1/16 SEC	Master contactor Control Timer. Delays the drop of MCC output. MCC can shorten the RC drop out time of the MC contactor but cannot energize MC must be greater than SCT
MDR	27-300	107	Fpm/s	Deceleration Rate when using MMS parameter for setting top speed (MDR then replaces DER parameter for setting Deceleration Rate).
MDT	8-270	20	DPP	Deceleration Target when using MMS parameter for setting top speed (MDT then replaces DTA parameter for setting Deceleration Target).
MFC	0-400	30	1/10 amp	Minimum Field Current. The minimum current required for the motor field board to detect that there is no field loss. This parameter is set in 1/10 amp increments.
MLV	0-180	160	Fpm	Maximum Level Velocity: When leveling, maximum velocity at which the car can run with doors open.



MMS	0 - top speed	Top speed	Fpm	Maximum Car Speed. Sets top speed of car. Only functional when bit 5 on Control Status Word 7 (CS7) is set. Note: <i>IF MMS IS USED</i> , then the following parameters must be substituted also: Use MAR vs. ACR; Use MDR vs. DER; Use MDT vs. DTA; Use MMS vs. SST; Use MTL vs. TLM.
MSS	1-96	24	Fpm/s ²	Start Roll Rate into acceleration using MMS operation.
MRT	0-65535	45		Maximum Run Timer: Maximum time the car is allowed to run per trip.
MRV	0-80	60	Fpm	Maximum Re-level Velocity: Maximum velocity the car can run with the doors open when re-leveling.
MTL	10-300	25	DPP	Transfer to Leveling mode when using MMS parameter for <u>setting top speed</u> (MTL then replaces TLM parameter for setting Transfer to Leveling Mode)
MVD	0-11	6	1/64 sec	Minimum Velocity Damping Time period: Minimum time value for filtering out step value in the speed reference. The filtering time begins decreasing from VDT parameter value to MVD value when the speed reference is in deceleration mode.
NCF	0-12	0	Num	Number of Coded calls per Floor (Use with optional keypad security) Number of codes available per floor for keypad security. This number (*n) multiplied by the number of floors +1 must be less than the maximum of 300 code storage allocation. Note: If this value is changed, all new codes must be re-entered.
NDT	5-120	15	sec	Nudging Door Time
OFC	0-65335	0	N/A	Parameter to select between FUTURA Overlay or regular FUTURA. For example, if there is a 6 car group, cars 1-3 are Futura Overlay and cars 4-6 are regular Futura. Therefore, we can set OFC = 000 0111 (Binary) = 07H (Hexadecimal)
OST	0-65535	0	1/16 sec	Overlay Slowdown Timer. Used to control NS output.
PDT	0-128	0	1/64 sec	Preconditioning Delay Time. Used for both torque compensation and preconditioning. With torque compensation, this is the amount of time the torque compensation value is held for the drive. With preconditioning, this is the time delay before the speed reference soft start begins. The preconditioning offset of the speed reference starts immediately during the preconditioning delay time.
PEK	0-96	Calculated	Number	PErformance Constant: Drive system value calculated during acceleration to optimize car flight time. PEK enabled when maximum car velocity not reached. Raising this value will initiate earlier slowdown.
PPS	0-128	0	1/64 sec	Preconditioning Phase-out Start time. Delay time before starting the preconditioning speed reference offset.
PPT	0-196	0	1/64 sec	Preconditioning Phase-out Time. The duration to fade out the preconditioning speed reference offset.
RFV (MG Only)	1-288	120	volts	Rated Field Voltage: This is the Rated Field Voltage per the motor nameplate.
RSV	0-50	0	FPM	Re-level Start Velocity.
RVE	1-24	9	FPM	Re-leveling VELOCITY (feet per minute)



RVT	8-100	20	FPM	Roll Velocity for Top speed (feet per minute): Velocity at which the transition from acceleration mode to flat top (top speed) begins, e.g. for RVT=25, the transition will start at 325 FPM for a rated 350 FPM car. (Where 200 FPM is about 1 m/s)
SCT	2-44	14	1/16 sec	System Master Control Timer. Delay timer for SMC output that controls the SM contactor. This timer uses increments of 1/16 second to delay SMC input. must be less than MCT
SDT	4-80	8	1/16 sec	Short Door Time (0.5 to 5 seconds) after Electric Eye (EE input) or Safety Edge (SE input) activation
SFV (MG Only)	10-500	60	VOLTS	Standby Field Voltage. Motor field voltage maintained when car not running.
SPC	0-20	6	cycles	Start Sequence Protection Counter: Normally adjusted for 6 cycles to try starting motion. Refer to Error code 18.
SST	0-96	24	1/64 SEC	Soft Start Time (1/64 of a second): Time period needed to attain rated acceleration from zero speed (ACR parameter).
SSD	2-64	2	1/16 SEC	Stop Sequence Delay (1/16 second). Minimum time required for the car to stop and test for BK, SM and MC contacts to drop out before attempting another run.
SSV	0-36	0	FPM	Soft Start Velocity (fpm). This parameter offsets the initial starting velocity. Typically set to 0. This parameter does not account for load changes in the car.
TDF	0-16	8	1/16 SEC	Time Damping before Fault: Fault damping time causes the car to shut-down when an out of sequence Tach signal or an out of sequence direction occurs. The greater the number, the more fault detection time necessary to cause the car to shutdown. (See Control Status Word Bit settings CS2 and CS3 - p.8-20,21)
TDT	0-7	3		Tach Damping Time (from Top of Car Transducer): Digital tach damping time period. (Filtering)
TFD	1-300	1	Number	Top speed Flat top travel Distance: Similar to FTK parameter but used only when Top speed is reached.
TLM	0-300	25	DPP	Transfer to Leveling Mode (DPP): Distance from floor level at which the computation changes from Deceleration to Leveling mode. The ratio between the TLM and DTA parameters determines the slope at which the car will level. NOTE: The leveling mode does not refer to the leveling operation. In this mode the velocity is directly proportional to the distance remaining from floor. TLM must be the larger value.
TLV	0-30	5	DPP	Transfer to Leveling Vane (DPP): Distance from floor level at which the constant leveling velocity takes effect. NOTE: When car enters the 2 inch Leveling Zone (5 cm), a constant leveling velocity is introduced.
TRC	0-10,000	0		ToRque Compensation (units). For drive torque compensation, with 100% load, a value of 10,000 will dictate 100% motor torque. For speed reference preconditioning, with 100% load, a value of 10,000 will dictate a 10% offset in the speed reference.



TSV	1-65535	JOB	FPM	Terminal Slowdown limit Velocity: Maximum velocity reference (v) at the (n) th terminal slowdown limit switch. If the car velocity exceeds the Limit velocity, the computer will initiate an emergency slow-down. (n) must be entered and has a range of 1 through 5; (v) is the velocity associated with the terminal limit (n). The value of (v) must be increasing with (n=1) to (n=5).
TZO	2008-2088	32128-33408		Torque Zero Offset. DAC offset for an analog torque compensation output. True zero is set to 2048 for a 12 bit DAC and 32768 for a 16 bit DAC. This parameter allows a +/- 40 bit OR +/- 640 bit offset to compensate for a voltage offset error in the analog voltage amplifier.
ULR	1-65535	JOB	DPP	Up Limit position count Reference: The position (p) associated with the limit (n): (n) must be entered and has a range of 1 through 5; (p) is the absolute position in DPP of the limit (n). The value of (p) must increase at the bottom floor with (n=1) to (n=5), and for the top floor with (n=5) to (n=1). Note the Up limit (1) is further away from the bottom floor than the Up limit (5).
VDD	0-24	8	1/64 sec	Velocity Damping Decrement. During deceleration, the VDT filtering time will decrement by the VDD value until the filtering time has reached the MVD parameter value.
VDF	0-20	16	1/16 sec	Velocity error for Drive Fault: Value of fault filtering or damping time causing the car to shut-down via panic motion fault when the velocity error is excessive. The greater the number, the more time is necessary to detect the fault causing the car shutdown. (See CS2, bits 2, 3 - p. 8-20, 21)
VDT	4-31	12	1/64 sec	Velocity Damping Time Period: The filtering or damping time period needed to remove any step values introduced during speed reference calculations.
VEE	50-350	150	FPM	Velocity Error for Emergency slow-down: Velocity error that will result in an emergency timed slow-down. If the velocity difference between the digital demand and the digital velocity computed by DPP exceeds this value, the car will go into emergency slowdown. When the demand reaches top speed, this value is replaced by a percentage of top speed.
VPT	0-600	300	Second	Under VIP service, the selected car is removed from Group operation. The car is then expressed to the VIP floor after the car calls are answered. The car remains at the floor with its doors open until a car call is registered. The car will remain in VIP service until the car call has been serviced. The car will then revert back into automatic operation. If after an adjustable (VPT) time period no car call was registered, the car reverts back to automatic.
WFV (MG Only)	0-500	100	volts	Weak Field Voltage: Voltage value for Weak Motor Field Voltage.
XDT	0-200	16	1/64	EXtra Door open (Standing) Time (0-3 seconds): During a car/hall call stop, XDT parameter adds "door open" time to the Short Door Time (SDT parameter) once the Electronic Eye (EE device) is activated. Permits extra transfer time.

SECTION 14 - CONTROL STATUS WORD BIT COMMANDS (CAR)

The **Futura™** operating system provides Control Status Words for customizing the operation of the elevator. An example would be the ability to enable or disable pre-opening of the doors. Each Control Status Word is made up of 16 bits labeled 0-15. Each bit controls a specific operation of the elevator or one of its devices. Each bit can be set (1) or reset (0) and the operation which each bit controls is affected by the state (set or reset) of the bit.

The following command <BIT> is used to set or reset the individual control flags (bits) of the control status word parameters. Each bit of a control status word is used to activate or deactivate a particular service or function. These control status words are found both in the individual car controllers and in the group controller.

- ✓ Set designates that a bit is a logic 1 (True).
- ✓ Reset designates that a bit is a logic 0 (False).
- ✓ There are 16 bits per control status word, referenced 0-15
- ✓ Control status words (CAR) available: CSW (CS0), CS1, CS2, CS3, CS4, CS5, CS6, CS7, CS8.

Note: *The number of Control Status Words used on a particular job depends on the job itself. Your particular job may not contain all the Control Status Words.*

CSW Car (Control Status Word 0)

BIT	AFFECT	DEFAULT	DESCRIPTION
0	EDS	R	When set, prevents Emergency Dispatching (EDS parameter) from enabling when a Dispatch Loss occurs, even if EDS is activated.
1	DPP	S	When set, permits presetting the Digital Position Pulse (DPP) at start sequence. Note: must always be set in normal operation.
2	DRIVE	S	When set, permits Fault Reset of an internal Drive Fault after car stops.
3			Not used on FUTURA™.
4	CALL	S	Dumps all calls after consecutive car calls answered per Car Call Dump (CCD parameter) number order with no Electronic Eye (EE device) break.
5			Not used on FUTURA™.
6	DOOR	R	Set to allow doors to reverse before reaching Door Open Limit (DOL input): Presently used only with an extra Door Reversal Limit (DLR input) switch.
7	LOBBY	R	When set, car will return to lobby floor after the last call (Lobby Recall).
8	EMP	R	During Manual Emergency power selection, setting this bit causes the car NOT to recall to the main floor if car loses communication with the dispatcher.
9	IND	R	When set and on Independent service mode, calls are accepted only when the doors are closed.
10	IND	R	When set and on Independent service mode, car calls are canceled when a slowdown is initiated.



CSW Car (Control Status Word 0) *continued*

11	DRIVE	R	When set, if Motor Generator (MG) switch input is deactivated, car will be returned to the main lobby floor and no calls will be accepted.
12	DRIVE	R	When set, doors remain open when MG switch is deactivated.
13	DOOR	R	When set and on Independent Service, the doors will close automatically when a car call is registered.
14	GONG	R	When set, no double gong occurs with the down hall lantern.
15			Not used on <i>FUTURA</i>™.

CS1 Car (Control Status Word 1)

BIT	AFFECT	DEFAULT	DESCRIPTION
0			Not used on <i>FUTURA</i>™.
1			Not used on <i>FUTURA</i>™.
2	DOOR	R	When set, pre-opening is disabled for the rear door operation.
3	DOOR	R	When set, rear door pre-opening will occur at the 2" (5cm) leveling zone.
4	DOOR	R	When set, pre-opening is disabled for the front door operation.
5	DOOR	R	When set, front door pre-opening will occur at the 2" (5 cm) leveling zone.
6	HOMING	R	When set, all calls are answered. When reset, calls are canceled immediately if a homing recall occurs.
7	DOOR	R	When set, rear door operation disabled. (Similar to door disconnect switch.)
8	FIRE	R	When set, the fire buzzer is pulsed.
9	FIRE	R	When set, the fire emergency light is pulsed.
10	FIRE	R	When set, the stop switch is not bypassed. When reset, it is bypassed according to bit 11.
11	FIRE	R	When set, s is bypassed all the time. When reset, the stop switch is bypassed according to ANSI code standard.
12	FIRE	R	When set and on Fire Phase II, the doors will open automatically when the car returns to the designated floor. If reset, the fireman must open doors.
13	FIRE	R	When set, the in-car fire service light also operates during Phase II.
14	FIRE	R	When set, the doors will close when a car call is registered. If reset the door must be closed with the Door Close Button (DCB input).
15	FIRE	R	If set, car is not a designated car. If reset, car is a designated car: Under Fire Phase II (New York City only)



CS2 Car (Control Status Word 2)

BIT	AFFECT	DEFAULT	DESCRIPTION
0	DOOR	R	If set, wait for the generator to be running before opening the doors.
1	DOOR	R	If set, pressing the Door Close Button (DCB input) shortens the door open time (transfer time). If reset DCB has no affect on door open time.
2	FAULT	R	If set, allows a reset of a panic motion fault. Note that if the fault keeps recurring, the processor will not continue to reset the fault.
3	FAULT	R	Must be set to activate the panic motion fault feature. (See VDF & TDF parameters and bit 2 of this status word.) When a panic fault is detected, an error 9 is registered and the processor immediately begins to shutdown the car by removing the SYSTEM MASTER (SM output) and the direction signals. The brake will apply immediately.
4	IND	R	If set, Independent Service mode will be disabled after IFT parameter time when a Fire Recall is initiated.
5	BRAKE	R	If set, applies brake on Run time-out.
6	DOOR	R	Allows short rear door reversal. Allows doors to reverse before reaching Rear Door Open Limit.
7	BUZZER	R	If set and car door is closing on Nudging Mode, nudging buzzer activates only when a Door Open Device is activated. If reset, nudging buzzer sounds while doors are nudging closed.
8	DOOR	R	Does not allow reopening of doors with the Safety-edge (SE input) or the Electric-Eye (EE input) during nudging.
9	DOOR	R	If set, simultaneous front and rear door operation instead of selective.
10	MG	R	If set, Motor Generator (MG) always remains on when doors are open.
11		R	Reserved.
12	VIP	R	If set, enables buzzer to sound during VIP mode to alert passenger that car is in VIP operation mode.
13	VIP	R	If set, enables the buzzer to sound at VIP floor.
14	SEC	R	If set, a special buzzer sounds during security with push-button keypad operation. A brief sound indicates acceptance of security code and registration of call while extended sound indicates rejection of security code. (Per contract basis.)
15	LANT	R	Must be set for software version that utilizes a Lantern Master I/O module for controlling the lantern's power supply.



CS3 Car (Control Status Word 3)

BIT	AFFECT	DEFAULT	DESCRIPTION
0			Not used on FUTURA™.
1	DOOR	R	If set, allows call pilots to be accepted when on door protection mode.
2	DOOR	R	If set, allows Door Open Delay (DOD output) to operate every time door opens.
3	FIRE	R	If set, allows car to shut door automatically after Phase II key switch is set to "OFF" and Phase I condition exists.
4	INDEP	R	Independent Service: If reset, independent service mode overridden by fire service after Independent/Fire service override time (IFT parameter) expires.
5	FIRE	R	When set, the door open button is disabled during Phase I fire service.
6		R	Reserved
7	MOTION	R	Enables preconditioning operation.
8	CALL	R	If set, no slowdown for hall calls and the floor is secured by the <SFL> command from the Human Interface.
9	ZONE	R	If set, no ZONE slowdown at floors secured by <SFL> command from Human Interface.
10	LOBBY	R	If set, car can be removed from lobby independent service at any floor when the key switch is turned off. If reset, the car must be at lobby floor.
11	LOBBY	R	If set, Short Door Timer (SDT parameter) disabled when car at lobby floor.
12		R	Reserved
13	DOOR	R	If set, door nudging operation is disabled.
14	FIRE	R	If set, door nudging operation is activated during Phase I fire service operation while door is closing. This bit will override Bit 13 (Disable nudging).
15	DOOR	R	If set, the Electric Eye (EE) time-out feature (nudging) is disabled.



CS4 Car (Control Status Word 4)

BIT	AFFECT	DEFAULT	DESCRIPTION
0	FIRE	R	If reset, car will open front door automatically when it reaches the fire floor during Phase I.
1	FIRE	R	If reset, car will open rear door automatically when it reaches fire floor during Phase I.
2	CALL	R	If set, Car Calls are latched internally.
3	CALL	R	If set, Hall Calls are latched internally for a simplex car.
4	LANT	R	If set, cab lantern is triggered when door reaches Door Open Limit switch (DOL input).
5	DOOR	R	If set, front door pre-opening will occur when car levels into mid level zone.
6	DOOR	R	If set, rear door pre-opening will occur when car levels into mid level zone.
7	INDEP	R	If set, a car on independent service mode will answer car calls secured from the secure floor <SFL> command with the human interface.
8	POSIT	R	If set, the position output is disabled when the car is out of service.
9	POSIT	R	If set, the position output will flash when the car is out of service.
10	CALL	R	If set, Car Calls will not be canceled when the car has a reversal slowdown.
11	CALL	R	If set, cancel car calls for positions above the car when the car is moving down and cancel car calls below the car when the car is moving up.
12	LOBBY	R	When set, car will stop at lobby if it is above lobby and calls are placed below lobby or if car is below lobby and calls are placed above lobby.
13	VIDEO	R	If set, do not blink the car symbol in the video display.
14	ELD	R	If set, do not "refresh" the ELD display in the car.
15		R	Reserved



CS5 Car (Control Status Word 5)

BIT	AFFECT	DEFAULT	DESCRIPTION
0	DOOR	R	If set, the Electric Eye (EE device) is disabled when the door is closing.
1	DOOR	R	If set, then full door reversal after the Safety Edge (SE device) is activated when the door is on nudging operation.
2	MG	R	If set, system checks (using SUF input) to ensure voltage is not building across hoist motor armature when generator in suicing operation (only used for European standard EN81). (also called MG suicide fault check)
3	DOOR	R	If set, car will shutdown if car goes out of level zone and doors are open.
4	LOBBY	R	Set to use lobby independent service as lobby recall service.
5	LOBBY	R	Set to open the rear door when car is on lobby recall service.
6	LOBBY	R	Set to take car out of group svc. when car is returning on lobby recall svc.
7	HOMING	R	Set to allow door to close & Motor Generator (MG) to deactivate when car in homing service mode.
8			Not used on FUTURA™.
9	ERROR	R	Set to disable interrupt error display.
10			Not used on FUTURA™.
11			Not used on FUTURA™.
12			Not used on FUTURA™.
13	ELD	R	If set, no lines are displayed on the ELD screen.
14	ELD	R	If set, ELD screen remains on all the time.
15	DOOR	R	If set, drops Door Close (DC) module output after car in motion for 0.5 seconds.

CS6 Car (Control Status Word 6)

BIT	AFFECT	DEFAULT	DESCRIPTION
0			Not used on FUTURA™
1			Not used on FUTURA™
2			Not used on FUTURA™
3	DOOR	R	Set to disable electronic Detector Edge time out.
4	DOOR	R	Set to enable electronic Detector Edge operation vs. mechanical Safety Edge (SE).
5	DOOR	R	Set to enable electronic Proximity Edge operation vs. mechanical Safety Edge (SE).
6	BUZZER	R	Set to enable handicap buzzer all the time. If reset, the Audible Service Button (ASB input) must be pressed on each run to enable the handicap buzzer.
7	DRIVE	R	Set to disable Auto Fault Reset for the Drive unit.
8	DRIVE	R	Set to enable Analog Speed Reference.
9	DRIVE	R	Set to disable drive communications check (must have bit 8 set).
10	DRIVE	R	Set for direction from DPP pulses instead of from 703 drive.
11	INSP	R	Set to allow hydro controller to run high speed on inspection mode.
12	DOOR	R	Set to disable Door Open Buzzer (DOB input) when front door is secured with lockout switches.
13	DOOR	R	Set to disable Rear Door Open Buzzer (RDOB input) when rear door is secured with lockout switches.
14	DOOR	R	Set to enable drive fault GLR (Gate & Lock input) error. (Both GLR input and DOL input active while level at the floor).



CS7 Car (Control Status Word 7)

BIT	AFFECT	DEFAULT	DESCRIPTION
0	FAULT	R	Set to cause motion fault when tach direction error occurs with DRIVE unit, SPU board, or VFC board.
1	FAULT	R	Set to disable deceleration check in emergency mode
2	FAULT	R	Set to disable ESV and ETS parameter checks at slowdown limit switches
3	MOTION	R	Set to disable linear time (max change in speed ref) parameter
4	DPP	R	Set to disable updating position count when error is detected (more than 5 counts off)
5	MOTION	R	Set to adjust cars maximum velocity from MMS parameter
6	LW	R	Set to have load anti-nuisance service enabled
7	LW	R	Set to have load bypass service enabled
8	LW	R	Set to have load dispatch service enabled
9	LW	R	Set to have load weight overload enabled
10	DOOR	R	Set to invert detector edge input
11	DOOR	R	Set to enable door close button to latch during attendant service.
12	BUZZER	R	Set to enable attendant buzzer at every floor (adj ABT for buzz duration)
13	ATT	R	Set to enable AUB/ADB inputs (attendant Up/Down buzzer) to latch
14	FAULT	R	Set to cause motion fault when SPU, VFC, OR VFC_HS boards emit velocity error
15	CALL	R	Set to pulse car call output for low intensity light

CS8 Car (Control Status Word 8)

BIT	AFFECT	DEFAULT	DESCRIPTION
0	CPU	R	Unused.
1	FAULT	R	Set to disable DPP velocity window check. Velocity window is a difference (tolerance) of ± 100 fpm (0.5 m/s) from previous velocity calculation per CPU. If difference $> \pm 100$ fpm, error 119 occurs.
2	DPP	R	Set to use tach direction from Drive Unit to count DPP instead of using DPP quadrature to count DPP.
3	BRAKE	R	Set to disable Brake Lift Switch feature
4	BRAKE	R	Set to invert the Brake Lift Switch input
5	CWD	R	Set to invert the Counter Weight Derailment (CWD parameter) input
6	MOTION	R	Set for PEK parameter compensation instead of RVT parameter compensation
7		R	Unused.
8	LW	R	Set to disable analog load weighing.
9	MOTION	R	Set to enable torque compensation.
10	MOTION	R	Set to have analog reference show speed reference and pre-conditioning offset. This is used with a digital drive to see an analog speed reference with the pre-conditioning offset for debugging. CS6 bit 8 must also be set.
11	MOTION	R	Set for pre-conditioning during re-leveling.
12	MOTION	R	Set to reset VCD-703 drive integral gain during slowdown.
13	MOTION	R	Set to enable quicker communications packets to the VCD-703 drive.
14		R	Unused.
15	MOTION	R	Set to enable timed leveling mode. Should only be used for test.



CS9 Car (Control Status Word 9)

BIT	AFFECT	DEFAULT	DESCRIPTION
0	GROUP	R	Set for slave car to execute group commands. Note that parameters will be overwritten by whichever car is the master (i.e. the group).
1	DOOR	R	Set to disable SRU or SRD inspection door close option.
2	DRIVE	R	Set to use speed reference feed forward for DSD-412 drive.
3	DOOR	R	Set to disable door field economy voltage on door close.
4	MOTION	R	Set to zero speed reference quickly on stop.
5	DOOR	R	Set to require DCL on (with GL1 and GL) to start the car.
6	LW	R	Set to disable automatic load weighing calibration.
7	MOTION	R	Set to disable pre-start. Pre-start allows the controller to prepare to run when the DCL6 limit is made.
8	BUZZER	R	Set to disable nudging buzzer with EESW in OFF position.
9	DOOR	R	Set to disable DCR if door is open in SAFETIES.
10	DOOR	R	Set to enable hall call door re-open.
11	MOTION	R	Set to delay start for PDT time.
12	LIMIT	R	Set to disable software ETS limits.
13	PI & BUZZER	R	Set for PI and HBZ to ring at dpp position.
14	MOTION	R	Set to run 500 fpm down out of the blind hoistway.
15	FAULT	R	Set to disable deceleration rate check during emergency deceleration.

CS10 Car (Control Status Word 10)

BIT	AFFECT	DEFAULT	DESCRIPTION
0	PILOT	R	If set then release (SU & SD) Pilot at leveling.
1	PILOT	R	If set then release (SU & SD) Pilot at reversal.
2	MOTION	R	If set then Start Sequence at DCL point.
3	MOTION	R	If set then Start Sequence at DCL6 point.
4	CALL	R	If set then do not latch car call outputs. Mostly used for Overlay.
5	MOTION	R	If set then enable one floor run sequence.
6	MOTION	R	If set to initiate Start master (ASM) at door close.
7	PILOT	R	If set then do not set PS on reversal car call.
8	LANTERN	R	If set then activate pawl to ring lantern when car parked.
9	MOTION	R	If set then hold EBR until fully stopped.
10		R	Not Used.
11		R	Not Used.
12		R	Not Used.
13		R	Not Used.
14		R	Not Used.
15	LCD DISPLAY	R	If set then LCD cursor location blinks when changing parameters.



CS11 Car (Control Status Word 11)

BIT	AFFECT	DEFAULT	DESCRIPTION
0	DOOR	R	If set then enable front DHB time out.
1	DOOR	R	If set then enable front DOB time out.
2	DOOR	R	If set then enable rear DHB time out.
3	DOOR	R	If set then enable rear DOB time out.
4	FIRE	R	If set to assign the car as fire fighting car. For UK jobs only.
5	SECURITY	R	If se to invert security inputs to use card reader rather than lockouts.
6	LIGHT	R	If set to blink GLBL output.
7	FIRE	R	If set then allow secondary fire bypass (Input HFBPA) to work.
8	LIGHT	R	If set to invert the logic of in service light. (Output ISL)
9		R	Not Used.
10		R	Not Used.
11		R	Not Used.
12		R	Not Used.
13		R	Not Used.
14		R	Not Used.
15		R	Not Used.



SECTION 15 - CONTROLLER ERROR CODE DEFINITION

The following sequential list of error codes indicates various fault conditions on the controller and elevator.

ERROR	DEFINITION OF CONTROLLER ERROR CODE
1	Division by zero.
2	Program Sequencing error
3	Real Time Clock program processing error: Indicates that insufficient time was available to process the control information.
4	Invalid internal car position (such as zero): The position of car was internally set to zero in program.
5	Not used on Futura™.
6	Invalid Motion Control sequence or control parameter: This is related to the Digital drive system.
7	Calculated slowdown target to floor was negative during Deceleration or Leveling modes.
8	Velocity of the car is 25% in excess of contract speed. Verify Car top encoder alignment and associated wiring. Digital encoder feedback from digitizer was under 9 fpm (0.046 m/s) while demand velocity exceeded VEE parameter setting.
9	Panic motion fault error: This error occurs when: a) There is an opposite direction between demand and velocity. b) There is a demand direction but no velocity. c) There is a velocity direction but no demand.
10	Digital Tach error: Indicates excessive differential between the "Demand" velocity (digital speed pattern) and the Digital speed reference (from encoder DPP). <u>Possible problems:</u> a) Improper setting of the Regulator on the drive. Check response and inertia settings. b) Verify the connections to DPP from encoder and the encoder alignment on the rail alignment. c) The drive system motor field response (Make sure that motor field is producing proper torque). d) Check DPP alignment with hole in tape.
11	Limit position reference error: When a terminal slowdown limit switch first opens, the switch's actual position count is compared against its reference position count (ULR or DLR parameter settings), check ULB and DLB. If the <u>difference</u> between the actual position and the reference position is greater than the LPE parameter setting, an emergency slowdown will occur. Remedy this problem by adjusting ULR and DLR accordingly.
12	Preset Parity error.
13	Invalid Direction error: Mismatch between Up or Down direction signal & encoder. Check Motor encoder coupling for tightness.
14	Terminal limit position error: The position of the car was invalid at the bottom most or top most limit switch (SD1 or SU1). Check to see if there were preset errors prior to this. (See error 15)
15	Position preset error: Error 12 is a parity error from input signals. Position of car is not altered. When a preset position error occurs, the car position is altered and the DPP will be reset to floor position reference when car leaves the floor. Run the car floor to floor to ascertain that floor preset signals are valid. This error is more likely to occur after an emergency stop, or from inspection to auto operation. It is also possible for DPP to go "off" but that is not usually the source of problem.
16	Dispatch communication time-out: Verify serial communication link connections to each controller. This error usually occurs if the dispatch controller or car #1 for duplex installation is operational.
17	Motion time-out: This error occurs when too much time elapses during a run sequence.
18	Control response time-out: Occurs when a start sequence is initiated from computer and the



ERROR	DEFINITION OF CONTROLLER ERROR CODE
	BK relay fails to energize. Verify connections to the Up and Down output modules, the SM and MC circuitry, and connections to the BK input module. Check hoistway doors for any bounce when final close occurs. Check door interlock time parameter DIT and increase if necessary.
19	Up Pilot and Down Pilot signal wire on at the same time. Check wiring.
20	Digital Encoder loss time-out: No DPP input signal. This will initiate an emergency slowdown. Check operation and alignment of car top encoder.
21	FLASH EPROM Read/Write error: This error will prevent the car from operating. Verify the settings of PAR, FCP, ULR, DLR, TSV and ESV parameters with the terminal.
22	Terminal limit switch emergency slowdown: Velocity of car > TSV adjustment at terminal landing. Verify car velocity when terminal limit switches open with <ULB> and <DLB> commands.
23	Digitizer board fault.
24	Drive fault: Indicates an encoder fault. This error occurs when there is excessive variance between the demand velocity and the reference velocity.
25	Start Sequence Error: A start sequence was initiated, in auto or inspection, during a drive fault. Reset and/or correct fault trip condition on drive. Also, verify associated wiring. Check SPU display
26	Motion Fault Error: If doors were closed, there was an Up or Down signal without Delta (M.G.), ICS, or GLR input modules. Check SPU display. If doors were already open, either of the following occurred: <ul style="list-style-type: none"> a) an up or down signal without Delta, ICS, GV, HS, CS, Normal Power or Auto input modules; or b) an up or down signal without LVE output.
27	BK or MC control failure: If either BK or MC controls are closed when no directional relays are energized, the processor prevents a start sequence from occurring. Check aux contacts that are connected to the related input.
28	The brake switch did not function. (This error is valid only for jobs with a brake switch.) Check brake to ensure it is picking fast enough to open the brake contacts when car starts.
29	Slowdown Terminal Limit Switch Error: Occurs when start sequence is in up direction with an up slowdown limit open and position count indicates that car is not at that limit switch. The reverse is true for a start sequence in down direction with a bottom limit switch incorrectly open.
30	Car is moving without a demand velocity from SPU, meaning that SM, MC, BK and Up or Down relays were on.
31	Car was on Next-Up (dispatch mode) and went into service protect mode. Check AST parameter.
32	Reserved
33	Reserved
34	Reserved
35	Look-ahead distance calculated too short. Decel Roll Time is set too long (DRT); or Distance Look Ahead Multiplier (DLM), Performance Constant (PEK) or Top Speed Travel Distance (TFD) are set too small.
36	Variable has wrong value
37	Not used on Futura™
38	Not used on Futura™
39	Not used on Futura™
40	Level velocity too high when car reached final leveling. Velocity of car was greater than 70 fpm (0.36 m/s) at 2 inch (5 cm) point. Check DER, TLM, Drive response.
41	Trying to re-level in level mode. Indicates software error. Should not occur - Call CEC.
42	Doing a final stop in wrong digitizer mode. Indicates software error. Should not occur - Call



ERROR	DEFINITION OF CONTROLLER ERROR CODE
	CEC.
43	Gate and Lock switch opened when car velocity was greater than maximum level (MLV parameter). Check Approach Speed. Check Door Lock clearances.
44	The Gate and Lock (GLR) input was not activated when the doors were fully closed. Check interlock clearance.
45	The Door Closed Limit (DCL) input was not activated when the doors closed. Check limit switch for proper operation.
46	The Door Open Limit (DOL) input was not activated when the doors open. Check limit switch for proper operation.
47	Reserved
48	Reserved
49	Reserved
50	The generator voltage increased without demand from SPU. The SUF input was activated while car was not trying to move. Car SPU must be powered off and then on to allow car to run.
51	The SUF input did not occur during a run. On cars with Motor Generator (MG) sets, the SUF relay must pick up each run to indicate that the relay functions properly.
52	Car out of mid level zone with gate and lock input modules not activated (GLR); Car not moving. Car SPU must be powered off and then on to allow the car to run. Check brake re-level setting.
53	Car out of mid level zone with gate and lock input modules not activated; Car still moving without demand from the SPU. Check Brake.
54	Up or Down encoder motion detected 1.5 seconds after the brake dropped.
55	SCR temperature overload activated.
56	Max run timer timed-out during a run: Run sequence of elevator exceeded the Maximum Run Timer (MRT parameter) adjustment.
57	Not Used on Futura™
58	An auto fault reset occurred. A fault condition (Drive/MG or Trip/SCR) caused by drive system has been reset by SPU. If fault occurs more than 3 times within 1 hour, CPU will not reset automatically. After the 3rd time, the fault must be reset manually. Check Drive for faults.
59	Up or Down motion but no Up or Down signal.
60	Up or Down signal but no Up or Down motion.
61	Car did not decelerate during a drive fault.
62	Drive had a frequency over speed.
63	Drive went into Base Block during a run.
64	Rope Gripper fault error.
65	Gripper time trip expires
66	Both ACU & ACD input modules on simultaneously, or, AUTO input module was on with either ACU or ACD input module on. Check module and wiring.
67	Both PTU & PTD input modules on simultaneously, or, AUTO input module was on with either PTU or PTD input module on. Check module and wiring.
68	Both TIU & TID input modules on simultaneously, or, AUTO input module was on with either TIU or TID input module on. Check Module and wiring.
69	Top slowdown limit switch open while in bottom access mode. Check switch and wiring.
70	Bottom slowdown limit switch open while in top access mode. Check switch and wiring.
71	VFC device error has occurred. Check CMC Command for proper COMM status.
72	Brake device error has occurred. Check CMC Command for proper COMM status.
73	Motor field device error has occurred. Check CMC Command for proper COMM status.
74	Communication packets were lost on local COMM port (VFC, BK, MF or MRC devices) while the car was moving.



ERROR	DEFINITION OF CONTROLLER ERROR CODE
75	Communication packets were lost on car COMM port (TOC or COP devices) while car was moving.
76	Communication packets to the TOC board were lost while the car was moving.
77	Motor field device error. Verify motor field current jumper configuration is set to correct current setting.
78	Lost the GV (Governor) input while the car was moving.
79	Lost the HS (Hatch Safety) input while the car was moving.
80	Lost the CS (Car Safety) input while the car was moving.
81	Lost the ICS (In-Car Stop Switch) input while the car was moving.
82	Lost the DRV (Drive) module input while the car was moving.
83	Lost the RDY (Ready) module input while the car was moving.
84	Lost the SM (System Master) module input while the car was moving.
85	Lost the MA (Master Contactor) input while the car was moving.
86	Lost the BK (Brake Contactor) input while the car was moving.
87	Car cannot be a master (dispatcher). GRPO was asserted but the GRPI input was not activated.
88	Real time clock control interrupt failed. Detected by secondary watchdog timer.
89	Dispatch sequencer clock interrupt failed. Detected by secondary watchdog timer.
90	Second interrupt timer failed.
91	In car inspection input module on while car was on auto or while both top and bottom car calls on. Check wiring.
92	GL, DLS, or CGS input modules on when door reached full open (DOL switch input) at the floor.
93	Intelligent device powered up reset after previous initialization.
94	EMSD was lost unexpectedly: lost FLT, BK (FLT), EMST, or Drive's Fault contact.
95	Drive encoder not in UP direction when car running up. Check encoder wiring.
96	SPU board encoder signal not in UP direction when car running up. Check DPP wiring.
97	VFC device encoder signal not in UP direction when car running up. Check DPP wiring.
98	Drive encoder signal not in DOWN direction when car running down. Check encoder wiring.
99	SPU board encoder signal not in DOWN direction when car running down. Check DPP wiring.
100	VFC board encoder signal not in DOWN direction when car running down. Check DPP wiring.
101	Car did not decelerate as expected in an emergency stop.
102	VFC board tach not in up direction when car running up.
103	VFC board tach no in down direction when car running up.
104	DZ in the motor room not on when expected (on from the TOC). Check wiring.
105	DZ on TOC board no on when expected (on from the CPT). Check wiring.
106	DPP count off by more than 5 counts when car is level at floor. Check car top encoder alignment. Check DPP alignment with tape.
107	Both UP and DOWN motion true during DPP interrupt. DPP count not updated.
108	No UP or DOWN motion during DPP interrupt. DPP count not updated.
109	DZ signal from MRC board & TOC board is on despite an absence of command from CPT board.
110	Car tried to re-level 25 consecutive times. Check Brake and LVE parameter. Drive Response
111	SPU velocity feedback zero when demand > 40 fpm. (0.2 m/s)
112	VFC velocity feedback zero when demand > 40 fpm. (0.2 m/s)
113	VFC-HS velocity feedback zero when demand > 40 fpm. (0.2 m/x)
114	GL lost during a start sequence. Check DZ aux contacts in GL circuit.



ERROR	DEFINITION OF CONTROLLER ERROR CODE
115	CGS or DLS lost during a start sequence.
116	LVE not dropped during a start sequence. Check module and wiring.
117	Multiple cars master at the same time. Check CTG cross connect wiring.
118	Too many Hall Call (HC) devices selected.
119	Encoder velocity greater than window.
120	Brake did not lift when expected: no Brake Lift Switch (BLS) input was generated when Brake Contactor (BKC) output was generated and/or no Brake Relay (BKR).
121	Brake did not drop when expected: no Brake Lift Switch (BLS) input was generated when Brake Contactor (BKC) output was generated and/or no Brake Relay (BKR).
122	Deceleration roll error: roll target velocity higher than demand velocity.
123	Car was placed on gate and lock bypass while the car is on inspection.
124	BKC output was turned on but SM and MC did not turn on in a maximum time allowed. Check BK input signal.
125	Car EEPROM checksum error.
126	Car battery RAM checksum error.
127	Car EEPROM and battery RAM checksum error.
128	Group EEPROM checksum error.
129	Group battery RAM checksum error.
130	Group EEPROM and battery RAM checksum error.
131	Invalid access code EEPROM byte write.
132	Invalid access code EEPROM word write.
133	Selector up advance error (Overlay's only).
134	Selector down advance error (Overlay's only).
135	Load weigher offset error. Load weigher must be re-adjusted.
136	SPU thermal switch fault. The SPU temperature is too high.
137	There was a one floor run detection but no slowdown when the position changed. <i>Used on KM White overlay controllers only!</i>
138	Selector error for Westinghouse overlay controller.
139	Terminal position error for Westinghouse overly controller.
140	ETS Up limit error: The switch did not activate when expected from the position count reference. Check switch activation from cam and EUR parameter.
141	ETS Up Software limit error: The switch activated but it did not match the position count reference. Check switch activation from cam and EUR parameter.
142	ETS Down limit error: The switch did not activate when expected from the position count reference. Check switch activation from cam and EDR parameter.
143	ETS Down Software limit error: The switch activated but it did not match the position count reference. Check switch activation from cam and EDR parameter.
144	Not used on Futura
145	LTR parameter rate set too low during emergency deceleration at terminal limit.
146	DZ relay failed on (for 2000 Code Compliant)
147	CEC String did not drop when expected (for 2000 Code Compliant).
148	CGDL (Gate Door Lock Contact) did not drop during CEC test (for 2000 Code Compliant).
149	110 Percent governor over-speed switch tripped (for 2000 Code Compliant).
150	Not Used on Futura™
151	Not Used on Futura™



SECTION 16 – GROUP COMMANDS

Type <GRP> to establish communication with group functions. The Group Human Interface mode prompt is:

Group =>

GROUP DIAGNOSTIC COMMANDS

<COMMAND>	DESCRIPTION OF GROUP DIAGNOSTIC COMMAND										
RCB	Reset all Code Blue calls										
RDC	Reset all Down Calls										
REE	Set the RE ference E levator. Many commands require that REE is set to either the System (REE = 0) or to a car (REE = 1 through 8) for cars 1 through 8.										
RFL	Reset the System (REE = 0) or car related Fau Lts REE = 1 through 8										
RTC	Real Time Clock time (day-hour:minute:second) since last power-up or reset										
RUC	Reset all Up Calls										
SCA	Review the floor SCA n assignment table for Car <REE> command.										
SCAA	Alter/Load the floor SCA n assignment Table for Car REE										
CAR	Enter the CAR Human Interface (Prompt: C# 1=>)										
FLTn	Display last four Fau Lts starting at position (n). 'n' equal to 0 is the most recent fault. NOTE: REE parameter must be set accordingly.										
GET	GET /Load all the parameters from EEPROM. This command restores the parameters from EEPROM - All Parameters (PAR) and the Scan Table (SCA).										
NCU	Display the car number of the Next-Up Car (some jobs only)										
PAR	Review all the PAR ameters										
PARA	Alter/Load all the PAR ameters with prompting. Each parameter is listed with its value. Pressing <enter ↵> will leave it unchanged. Entering a value and then pressing <enter ↵> will alter this parameter with the new value which is displayed.										
PARI	Initialize the PAR ameters as per factory default (as shipped)										
PMI	Display the PMI Bit status in Hex (some jobs only)										
SCAI	Initialize the floor SCA n Assignment for Car REE as per factory default (as shipped). The following values with their designations can be entered with the <SCA> command: <table border="0"> <tr> <td><u>Value</u></td> <td><u>Definition</u></td> </tr> <tr> <td>0</td> <td>Do not accept Up or Down Hall Calls for that floor</td> </tr> <tr> <td>1</td> <td>Accept only Up Hall Calls for that floor</td> </tr> <tr> <td>2</td> <td>Accept only Down Hall Calls for that floor</td> </tr> <tr> <td>3</td> <td>Accept both Up and Down Hall Calls for that floor</td> </tr> </table>	<u>Value</u>	<u>Definition</u>	0	Do not accept Up or Down Hall Calls for that floor	1	Accept only Up Hall Calls for that floor	2	Accept only Down Hall Calls for that floor	3	Accept both Up and Down Hall Calls for that floor
<u>Value</u>	<u>Definition</u>										
0	Do not accept Up or Down Hall Calls for that floor										
1	Accept only Up Hall Calls for that floor										
2	Accept only Down Hall Calls for that floor										
3	Accept both Up and Down Hall Calls for that floor										
SCBf	Set a Code Blue call at floor (f)										



SCT	Screen for Motor Room CRT display monitor. Rotates CRT display from Dispatch to Diagnostics. Type <E> to determine the type of display. e = 0 is for the Dispatch Screen e = 1 through 8 is for the car diagnostic screen														
SDCf	Set Down Call at floor (f)														
SUCf	Set Up Call at floor (f)														
TES	Type of Elevator Service in HEX <table><thead><tr><th><u>Value</u></th><th><u>Definition</u></th></tr></thead><tbody><tr><td>1</td><td>Out of service from Car Controller</td></tr><tr><td>2</td><td>Loss of Communication</td></tr><tr><td>4</td><td>Timed-Out service protection (AST) from Group</td></tr><tr><td>8</td><td>Code Blue Service</td></tr><tr><td>10H(16)</td><td>Emergency Power Recall Service</td></tr><tr><td>20H(32)</td><td>Loss of Hall Call Power Service</td></tr></tbody></table>	<u>Value</u>	<u>Definition</u>	1	Out of service from Car Controller	2	Loss of Communication	4	Timed-Out service protection (AST) from Group	8	Code Blue Service	10H(16)	Emergency Power Recall Service	20H(32)	Loss of Hall Call Power Service
<u>Value</u>	<u>Definition</u>														
1	Out of service from Car Controller														
2	Loss of Communication														
4	Timed-Out service protection (AST) from Group														
8	Code Blue Service														
10H(16)	Emergency Power Recall Service														
20H(32)	Loss of Hall Call Power Service														
WRT	Write/Store the parameters to EEPROM - All Parameters (PAR) and the Scan Table (SCA)														



SECTION 17 - GROUP ADJUSTMENT PARAMETERS

The **FUTURA™** operating system provides a series of adjustment parameters which allow the user to fine tune the operation of the elevator as well as control the operation of some of the devices associated with the elevator. For example, the parameter ACR controls the acceleration rate of the car while the parameter DOD controls door timing.

NOTE:

To adjust these parameters, terminal must connected to group (Master) controller and be in group mode.

PARAMETER	RANGE	DEFAULT	UNITS	DESCRIPTION OF GROUP ADJUSTMENT PARAMETER
ALR	0-# cars	1	#cars	Alternate Lobby minimum car Request
ALY	1 - # Fl.	2	Fl. #	Alternate Lobby floor.
AST	0-1600	640	Sec.	Automatic Service protection Time: This "Group" parameter is similar to the car controller AST parameter. Group AST must always be set higher than the Car AST by a minimum of 15 seconds (n=240).
BDP	0-720	0	1/16 sec	Blind-crossing Dispatch Penalty time: Valid only for an express hoistway. This prevents assigning calls across express hoistway when cars are available.
BEx=n	0-Top Landing			Building Elevator number One through Eight: Sets the building designation number for car number x. Similar to BED for the Car controller. (x=CCN*, n=BED*) *car parameter
BGC	0-7	0		BackGround Color for video display
BLK	1-2	0		1= BLinKs the text on the group screen. 2= Blinks the background of text on the group screen.
CBH	0-120	15	Sec.	Code Blue door Hold time: Amount of time doors will remain open at Code Blue designated floor. If after this time the Hospital service switch has not been activated, doors will close and car will return to normal operation.
CBR	0-5	0	0 - 5	Communication Baud Rate: 0=1200, 1=300, 2=600, 3=2400, 4=4800, 5=9600
CBx	0-# cars			Code Blue car pre-selection order: It is possible to establish which cars are better able to respond to a Code-Blue Call and prioritize these cars per CB1 through CB8 order. When there is a Code-Blue Call, car designated by CB1 will be evaluated first, then CB2 car if first one was not available.
COx	0-# cars			Car Order: The order in which car number x is displayed on Video Screen. These parameters can change the left-to-right relationship of cars 1 through 8 respectively. This is for the Dispatch screen.



CS1	0-65535			Control Status Word (Group) 1
CS2	0-65535			Control Status Word (Group) 2
CS3	0-65535			Control Status Word (Group) 3
CS4	0-65535			Control Status Word (Group) 4
CS5	0-65535			Control Status Word (Group) 5
CS6	0-65535			Control Status Word (Group) 6
CS7	0-65535			Control Status Word (Group) 7
CS8	0-65535			Control Status Word (Group) 8
CS9	0-65535			Control Status Word (Group) 9
CSW	0-65535			Control Status Word (Group) 0: Used to manipulate all 16 bits of CSW simultaneously. Number to be entered must be hexadecimal equivalent of the 16 bits.
DCC	1 - 8	4	# calls	Down Call Count trigger
DDT	10-255	20	Sec.	Down-Peak Duration Time: Minimum duration of Down Peak after being triggered.
DLB	1 - # Fl.	2	Fl. #	Dual LoBby floor
DLR	0-# cars	1	# cars	Dual Lobby number of car Requests
DTT	10-960	800	Sec.	Down-Peak Trigger Time: If the average forecast Down Call ETA exceeds this value, Down Peak operation will occur.
DWT	0-65535	20	Sec.	Down Call long Wait Time trigger
EPF	1 - # Fl.	1	Fl.#	Emergency Power Floor: Floor to which cars will return if emergency condition occurs.
EPx	0-# cars			Emergency Power car selection order: During an Emergency power automatic recall operation, all the cars must be returned to the designated floor. The car at EP1 will be the first car to be returned, followed by EP2 through EP8.
FAL	1 - # Fl.	2	Fl.#	Fire Alternate Floor
FBT	1-65535	1	Sec.	Fire Bypass Timer
FIR	1 - # Fl.	1	Fl.#	Fire Recall Floor
GP0	0-65535			General Purpose Reserved variable used on a per job basis. Documentation on the use of this parameter (if implemented) provided with the job.
GP1	0-65535			General Purpose Reserved variable used on a per job basis. Documentation on the use of this parameter (if implemented) provided with the job.
GP2	0-65535			General Purpose Reserved variable used on a per job basis. Documentation on the use of this parameter (if implemented) provided with the job.
GP3	0-65535			General Purpose Reserved variable used on a per job basis. Documentation on the use of this parameter (if implemented) provided with the job.
IRC	0-# cars	0	Car #	Must be set to select which car will be the Inconspicuous Riser Car when the IR switch is activated. If set to 0, no IR Car will be selected.
LBY	1 - # Fl.	1	Fl.#	LoBbY Floor: Main lobby designation
LER	0-#cars	1	# Cars	Lobby Elevator Request: Number of cars that must be at lobby floor is equal to 'n'.
LRP	0-960	8	1/16 Sec.	Lobby Request Penalty time



MEP	1-# Cars	1	# cars	Maximum cars for Emergency Power: Maximum number of car which can operate simultaneously under emergency power
MID	2-320	18	1/16 Sec.	Minimum ETA Differential: Min differential ETA during call SCAN to prevent reassignment. For example, if MID is set at 3/4 sec (12), no calls will be reassigned when the Minimum ETA is less than MID.
MIE	0-65535			Minimum Eta compare. Used with job specific software to set a minimum limit on the ETA to execute a specific function.
MTT	0-32767	300	1/16 Sec.	Max allowed Travel Time: Maximum (ETA) to lobby in order to consider a car in a good position to become next-up or to be dispatched to the lobby floor.
MXD	2-120	12	Sec.	Maximum ETA Differential: Max differential ETA during call SCAN to force a reassignment. For example, if MXD is set for 2 seconds (32), another car must be in a better position by more than MXD to force a reassignment to that car.
MXE	0-65535	0		Maximum ETA compare. Used with job specific software to set a maximum limit on the ETA to execute a specific function.
NCF	1-149	0	# Codes	Number of Codes available per Floor for keypad security. This number multiplied by number of floors must be 299 or less. NOTE: If this value is changed, all new codes must be entered.
NDH	5-480	220	1/16 Sec.	Next-Up Door Hold time: Door hold time at lobby terminal. Note: when calls are registered, this value becomes smaller in order to release the car faster.
NDP	10-1440	350	Sec.	Next-Up Dispatch Penalty time: When a car is Next-Up, a call's ETA must be greater than NDP parameter. For better traffic handling, this value should be smaller in a Duplex operation to enable lobby car to be more responsive.
NZN	0-6	0	# Zones	Number of Zone floor pointers (ZN1 through ZN6).
PFT	0-60	8	2 Sec.	Time the car must be Free to Park
RLB	1-# floors	2	Rear Fl.#	Rear Lobby floor
RLR	0-# cars	1	# Cars	Rear Lobby number of car Requests
RRT	0-65535	20	Sec.	Remote car Travel Time. Time allowed for remote car to travel to emergency power floor during Recall operation.
RST	0-65535	5	Sec.	Remote car Sequence Time. Time delay to select next remote car during emergency power recall operation.
RTO	0-65535	25	Sec.	Remote car Time-Out during emergency power recall operation. Time delay for remote car to give drive running signal after group has given a drive enable signal.
S5C	0-FFFF	0		Special Communications between a SWIFT®-5000 car and SWIFT® FUTURA™ car/group. Bits 0-7 are set for the corresponding SWIFT®-5000 cars 1-8. Special software and hardware is required for this option.
TXC	0-7	0		Text Color



UCC	1-20	6	# Trips	Up-Peak Car-Call Count trigger: Number of trips from Lobby registering more than 2 Car Calls will trigger Up Peak operation mode.
UDP	10-960	60	1/16 Sec.	Up-Peak Dispatch Penalty time.
UDT	10-255	15	Sec.	Up-Peak Duration Time: The minimum duration of Up Peak after being triggered.
ULC	1-20	5	# Trips	Up-Peak Load Switch Count trigger: Number of trips (in a time interval) from the lobby floor which will trigger Up Peak operation.
VP1	1-# floors	0		Selects the floor at which the VIP1 input is used. i.e. if set to 4 then floor 4 would be the VIP floor when VIP1 input is activated.
VP2	1-# floors	0		Selects the floor at which the VIP2 input is used. i.e. if set to 4 then floor 4 would be the VIP floor when VIP2 input is activated
ZN1	1-# floors	1	Fl.#	ZoNe One (1) floor pointer: The car remains at the last floor served for normal operation.
ZN2		1	Fl.#	ZoNe Two (2) floor pointer
ZN3		1	Fl.#	ZoNe Three (3) floor pointer
ZN4		1	Fl.#	ZoNe Four (4) floor pointer
ZN5		1	Fl.#	ZoNe Five (5) floor pointer
ZN6		1	Fl.#	ZoNe Six (6) floor pointer



GROUP RELATED CAR ETA PARAMETERS

Note: <REE> command must be equal to the car number to access these parameters.

PARAMETER	RANGE	DEFAULT	UNITS	DESCRIPTION OF GROUP ADJUSTMENT PARAMETER
ACC	16-255	30	1/16 Sec.	Average ACC eleration Time: Average time car needs to Accelerate to top speed.
ATT	8-160	60	1/16 Sec.	A verage (passengers) T ransfer T ime: The average time the doors are fully opened. A value of 64 (4 seconds) is about normal.
BTT	0-720	0	1/16 Sec.	B lind T ravel T ime: The time it takes to travel through blind shaft at top speed. See SPE for calculation. Multiply SPE by number of floors covered by blind shaft.
DCT	16-160	40	1/16 Sec.	D oor C losing T ime. Average time car needs to close its doors.
DEC	16-255	30	1/16 Sec.	DEC eleration Time: Average time it takes car to decelerate from top speed.
DOT	16-160	30	1/16 Sec.	D oor O pening T ime. Average time car needs to open its doors.
GPT	0-720	240	1/16 Sec.	G enerator S tart P enalty T ime: GPT is the penalty used in the ETA calculation to assign a call to a car with its Motor Generator (MG) set off. This is a potential energy-saving feature.
SPE	4-48	12	Calc.	S peed of E levator in Time Units: One typical floor travel time. If the average floor height (H) is 12 feet, and the speed (S) of the car is 500 FPM then one floor travel time in "tu", or "time units" (16 "tu" in one second) is: $(h / (s / 60)) * 16$ (12 / (500/60)) * 16 = 23 tu or $\{H \text{ in meters} * 3.28\} / \{(S \text{ in m/s}) / 0.3048\} * 16 = \text{tu}$



SECTION 18 - CONTROL STATUS WORD BIT COMMANDS (GROUP)

The **FUTURA™** operating system provides Control Status Words for customizing the operation of the elevator. An example would be the ability to enable or disable pre-opening of the doors. Each Control Status Word is made up of 16 bits labeled 0-15. Each bit controls a specific operation of the elevator or one of its devices. Each bit can be set (1) or reset (0) and the operation which each bit controls is affected by the state (set or reset) of the bit.

The command <BITS> and <BITR> are used to set or reset the individual control flags (bits) of the control status word parameters. Each bit of a control status word is used to activate or deactivate a particular service or function. These control status words are found both in the individual car controllers and in the group controller.

- ✓ Set designates that a bit is a logic 1 (True)
- ✓ Reset designates that a bit is a logic 0 (False)
- ✓ There are 16 bits per control status word, referenced 0-15
- ✓ Control Status Words (GROUP) available: CSW (CS0), CS1, CS2, CS3, CS4.

Note: *The number of Control Status Words used on a particular job depends on the job itself. Your particular job may not contain all the Control Status Words.*

<COMMAND>	FUNCTION
BITRx,n <enter ↵>	Resets bit n of CSx (where x = 0-4, n = 0-15)
BITsx,n, <enter ↵>	Sets bit n of CSx (where x = 0-4, n = 0-15)
BITD <enter ↵>	Displays the current bit status of all control status words in tabular form.

Figure 18-1

CSW Group (Control Status Word 0)

BIT	AFFECT	DEF	DESCRIPTION
0	CALL	R	Hall Call Latching (Reset) or Canceling (Set) mode of operation: When set, allows cross-cancellation of hall calls with existing dispatch controller. (useful during installation)
1	NEXTUP	R	When set, doors close on Next-Up car after initial Next-up courtesy time expires as set by NDH. When reset, doors remain open till Motor Generator (MG) set shuts-down.
2	NEXTUP	R	When set, doors close after Motor Generator (MG) time out.
3	NEXTUP	R	When set, rear doors close on Next-Up car after initial Next-Up courtesy time expires per NDH. When Reset, rear doors remain open till Motor Generator (MG) set shuts-down.
4	ZONING	R	If set, free (available) cars are parked at zone floors (ZN1 through ZN5).
5	ZONING	R	If set, free (available) cars are parked at specific floors by priority.
6	ZONING	R	If set, cars not required at lobby floor park at zone floors (ZN1 through ZN5).
7			Not used on Futura™
8	BLUE	R	Controls assignment of a Code Blue call. When reset, a Code Blue call is assigned to the closest car that can respond. When Set, a Code blue call is assigned in a pre-established order as defined by commands CB1 through CB8.



BIT	AFFECT	DEF	DESCRIPTION
9	LOBBY	R	If set, use alternate lobby Next-Up floor (ALY) parameter instead of normal lobby floor (LBY).
10	LOBBY	R	When set, initiates DUAL lobby next-up mode.
11	LOBBY	R	When set any cars with rear lobby doors go into rear lobby Next-Up mode.
12		R	Reserved
13		R	Reserved
14		R	Reserved
15	CALL	R	Rear Hall Call Latching (Reset) or Canceling (Set) mode of operation. When set, allows cross-cancellation of REAR hall calls with existing dispatch controller. (Useful during installation.)

Figure 18-2

CS1 Group (Control Status Word 1)

BIT	AFFECT	DEF	DESCRIPTION
0			Not used on Futura™
1			Not used on Futura™
2		R	Reserved
3		R	Reserved
4		R	Reserved
5		R	Reserved
6		R	Reserved
7	FIRE	R	Fire Operation: When set, the Fire Light for hallway will flash On and Off.
8	CALL	R	If set, no hall call latching if the call cannot be assigned. (On certain jobs only.)
9	BLUE	R	If set, no Code Blue call latching if call cannot be assigned to an automatic operation car.
10	RCALL	R	If set, no Rear hall call latching if call cannot be assigned (On certain jobs only.)
11	VIP	R	If set, the VIP call is self latching. (Configured on certain jobs only. The job must be purchased with VIP call option.)
12	VIP	R	If set, the VIP call is self latching.
13		R	Reserved
14		R	Reserved
15	UPPEAK	R	If set, all cars requested to lobby during Up Peak.

Figure 18-3

CS2 Group (Control Status Word 2)

BIT	AFFECT	DEF	DESCRIPTION
0	VIP	R	This bit must be set to allow car # 1 to answer a VIP call.
1	VIP	R	This bit must be set to allow car # 2 to answer a VIP call.
2	VIP	R	This bit must be set to allow car # 3 to answer a VIP call.
3	VIP	R	This bit must be set to allow car # 4 to answer a VIP call.
4	VIP	R	This bit must be set to allow car # 5 to answer a VIP call.
5	VIP	R	This bit must be set to allow car # 6 to answer a VIP call.
6	VIP	R	This bit must be set to allow car # 7 to answer a VIP call.
7	VIP	R	This bit must be set to allow car # 8 to answer a VIP call.
8		R	Reserved
9		R	Reserved
10		R	Reserved
11		R	Reserved



BIT	AFFECT	DEF	DESCRIPTION
12	VIDEO	R	Not used on Futura™
13	VIDEO	R	Not used on Futura™
14	VIDEO	R	Set to display car status on group screen.
15	VIDEO	R	If set, do not blink car on lobby screen.

Figure 18-4

CS3 Group (Control Status Word 3)

BIT	AFFECT	DEF	DESCRIPTION
0			Not used on Futura™
1	CALL	R	If set, then front Hall Call inputs will internally latch.
2	CALL	R	If set, then rear Hall Call inputs will internally latch.
3	CALL	R	If set, then Hall Call will only latch if a car is available.
4	DNPEAK	R	If set, down peak zoning is active even if there is no blind shaft.
5	ZONE	R	If set, zone to floor with most calls, else zone to floor with the longest wait.
6	ZONE	R	If set, zone car with a pilot.
7	ZONE	R	If set, remove zone as soon as call is assigned.
8	ZONE	R	If set, disables up peak zoning with a pilot on up peak.
9	ZONE	R	If set, will not zone a car to the lobby on up peak if ETA to lobby is too great.
10	NEXTUP	R	Reset to allow multiple Next Up cars.
11	BLUE	R	If set, then Code Blue call inputs will internally latch.
12		R	Reserved
13		R	Reserved
14		R	Reserved
15		R	Reserved

Figure 18-5

CS4 Group (Control Status Word 4)

BIT	AFFECT	DEF	DESCRIPTION
0	COMM	R	Not used on Futura™
1	COMM	R	Not used on Futura™
2	COMM	R	Not used on Futura™
3		R	Set to disable EDS with loss of HPU comm.
4	CALL	R	Enable cross cancellation operation.
5	CALL	R	Set to use I2C for Hall Calls else HPUs
6	COMM	R	Not used on Futura™
7		R	Reserved
8	COMM	R	Not used on Futura™
9	ERROR	R	Set to disable interrupt error display.
10	EMP	R	Set to activate inter-group emergency power.
11		R	Reserved
12		R	Reserved
13	CALL	R	Set to enable front auxiliary riser.
14	CALL	R	Set to enable rear auxiliary riser.
15		R	Reserved

Figure 18-6



CS5 Group (Control Status Word 5)

BIT	AFFECT	DEFAULT	DESCRIPTION
0		R	Unused.
1		R	Unused.
2		R	Unused.
3		R	Unused.
4		R	Unused.
5		R	Unused.
6		R	Unused.
7		R	Unused.
8		R	Unused.
9		R	Unused.
10		R	Unused.
11		R	Unused.
12		R	Unused.
13		R	Unused.
14		R	Unused.
15		R	Unused.

Figure 18-7

CS6 Group (Control Status Word 6)

BIT	AFFECT	DEFAULT	DESCRIPTION
0		R	Unused.
1		R	Unused.
2		R	Unused.
3		R	Unused.
4		R	Unused.
5		R	Unused.
6		R	Unused.
7		R	Unused.
8		R	Unused.
9		R	Unused.
10		R	Unused.
11		R	Unused.
12		R	Unused.
13		R	Unused.
14		R	Unused.
15		R	Unused.

Figure 18-8

CS7 Group (Control Status Word 7)

BIT	AFFECT	DEFAULT	DESCRIPTION
0		R	Unused.
1		R	Unused.
2		R	Unused.
3		R	Unused.
4		R	Unused.
5		R	Unused.
6		R	Unused.
7		R	Unused.
8		R	Unused.



BIT	AFFECT	DEFAULT	DESCRIPTION
9		R	Unused.
10		R	Unused.
11		R	Unused.
12		R	Unused.
13		R	Unused.
14		R	Unused.
15		R	Unused.

Figure 18-9

CS8 Group (Control Status Word 8)

BIT	AFFECT	DEFAULT	DESCRIPTION
0		R	Unused.
1		R	Unused.
2		R	Unused.
3		R	Unused.
4		R	Unused.
5		R	Unused.
6		R	Unused.
7		R	Unused.
8		R	Unused.
9		R	Unused.
10		R	Unused.
11		R	Unused.
12		R	Unused.
13		R	Unused.
14		R	Unused.
15		R	Unused.

Figure 18-10

CS9 Group (Control Status Word 9)

BIT	AFFECT	DEFAULT	DESCRIPTION
0		R	Unused.
1		R	Unused.
2		R	Unused.
3		R	Unused.
4		R	Unused.
5		R	Unused.
6		R	Unused.
7		R	Unused.
8		R	Unused.
9		R	Unused.
10		R	Unused.
11		R	Unused.
12		R	Unused.
13		R	Unused.
14		R	Unused.
15		R	Unused.

Figure 18-11



SECTION 19 - TECHNICAL INFORMATION

INTRODUCTION

The SWIFT **FUTURA™** is a full elevator control system (Drive & Dispatch) intended for the High to Mid-Rise elevator market. It is designed for speeds up to 1400FPM (7m/s) with a wide range of duty loads. Three drive systems are available with the FUTURA controller (DC SCR, MG and AC VVVF flux vector).

The standard **FUTURA™** controller is fabricated in a very compact RETMA enclosure [22.5" (57cm) W, 32.5" (82.6cm) D, 74.25" (188.6cm) H] with front and rear access. The front and rear louvered doors are removable. The top has a removable section to permit punching or cutting access hole(s) for the wiring conduit(s). Both side panels are an integral part of the cabinet structure and have top and bottom openings. Make sure to leave at least 2 inches (5cm) of clearance when mounting cabinets next to each other.

Futura Controller

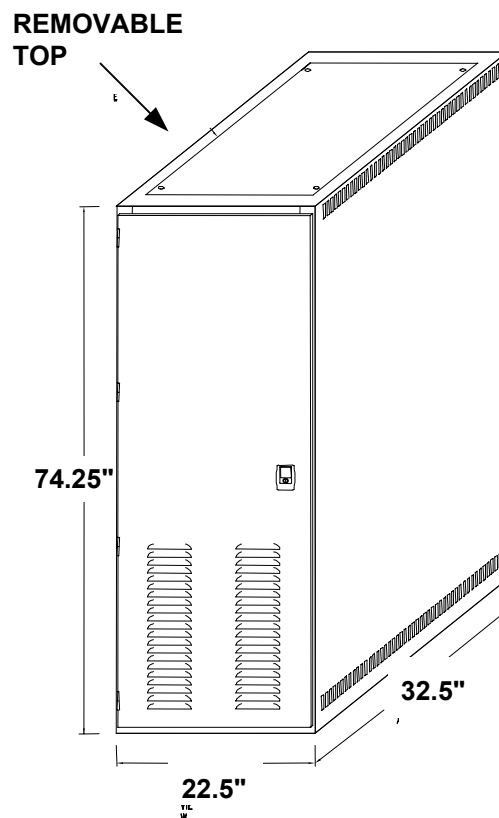


Figure 19-1

Controller Front Panel

Controller Front Panel Device Identification

The front of the controller houses, from top to bottom, the following components:

FRONT PANEL: The front panel is located on top of the controller front. It contains the SPU control panel on the left, the circuit breakers (or fuses) in the center, and the Inspection control switches on the right (Note: With fuses, the SPU and I/O switches are located adjacent to the Inspection switches).

SPU CHASSIS: The SPU chassis contains the SPU (System Processing Unit), the 5VDC SPU power supply, the 24VDC I/O power supply, two fans, and optionally a PC compatible VGA controller. The SPU-LINK board mounts on the front of the chassis and plugs into the SPU P1 connector.

RELAY/CONTACTOR SECTION: This section contains all the safety contactors (DZ, DZ1, MC, BK, SM & CEN) and other optional job related contactors or relays. If additional relays/contactors are required, they are mounted on the rear sub-panel.

SMI: This section contains the VFC (Velocity Fault Controller) and the MRC (Motor Room Controller) SMIs in addition to the BKC (Brake Controller). Mounted above the BKC, are the rectifiers and RC networks for the BK, SM and MC dc-operated contactors. Space is available to mount an additional three (3) SMIs. As with the relay section, additional SMIs can be located on the rear.

TERMINAL BLOCKS: This section has room for four (4) columns of TBs. The TBs are arranged from left to right as follows: Car Traveling Cable, Hoistway and Motor Room.

TRANSFORMERS: The transformers are located on the bottom of the cabinet and are accessible from the front.

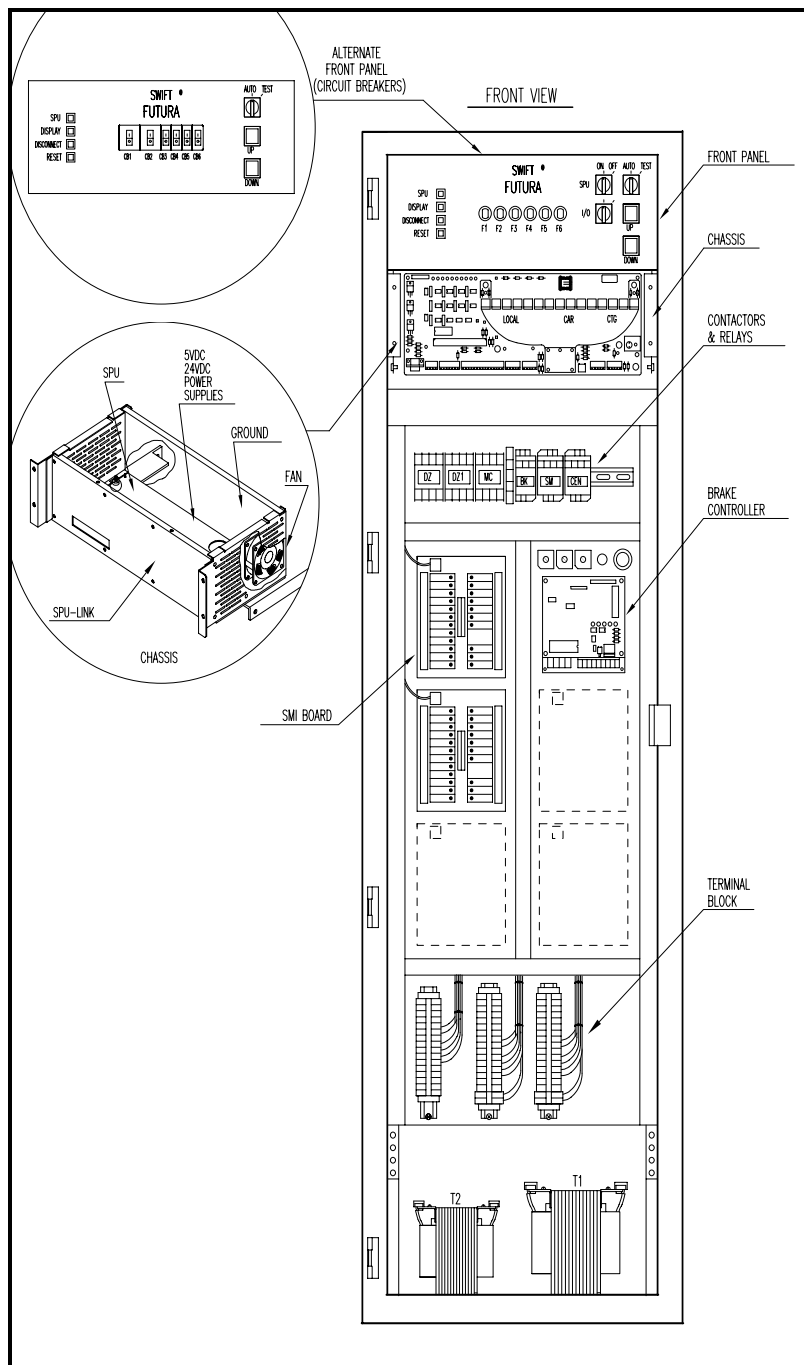


Figure 19-2

**Controller Rear Panel
Device Identification**

The rear of the RETMA enclosure contains the drive system (DSD 412 or MG). Refer to the following sections for drive component identification.

DC SCR (DSD-412)

The Magnetek DSD 412 is a microprocessor based, digital drive and can be utilized for geared or gearless installations.

Magnetek DSD-412 Rear Panel

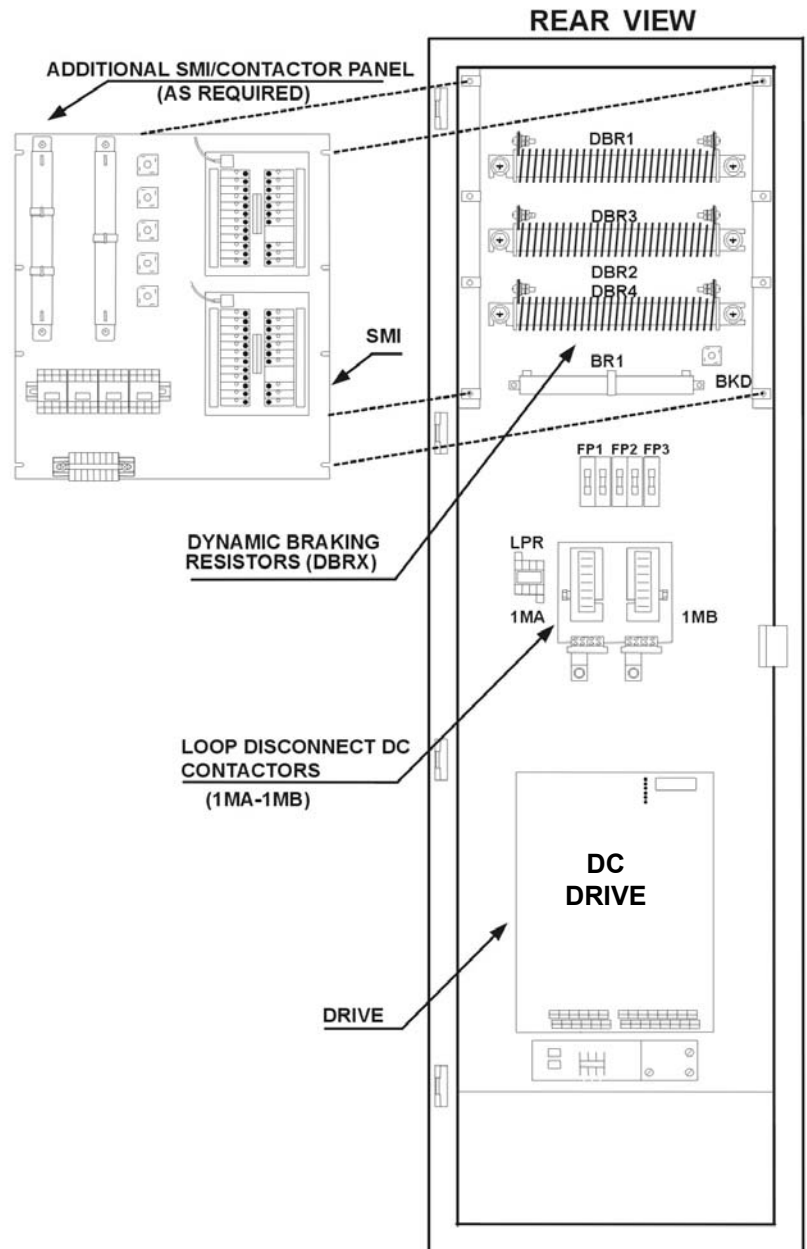


Figure 19-3



MOTOR GENERATOR (MG)

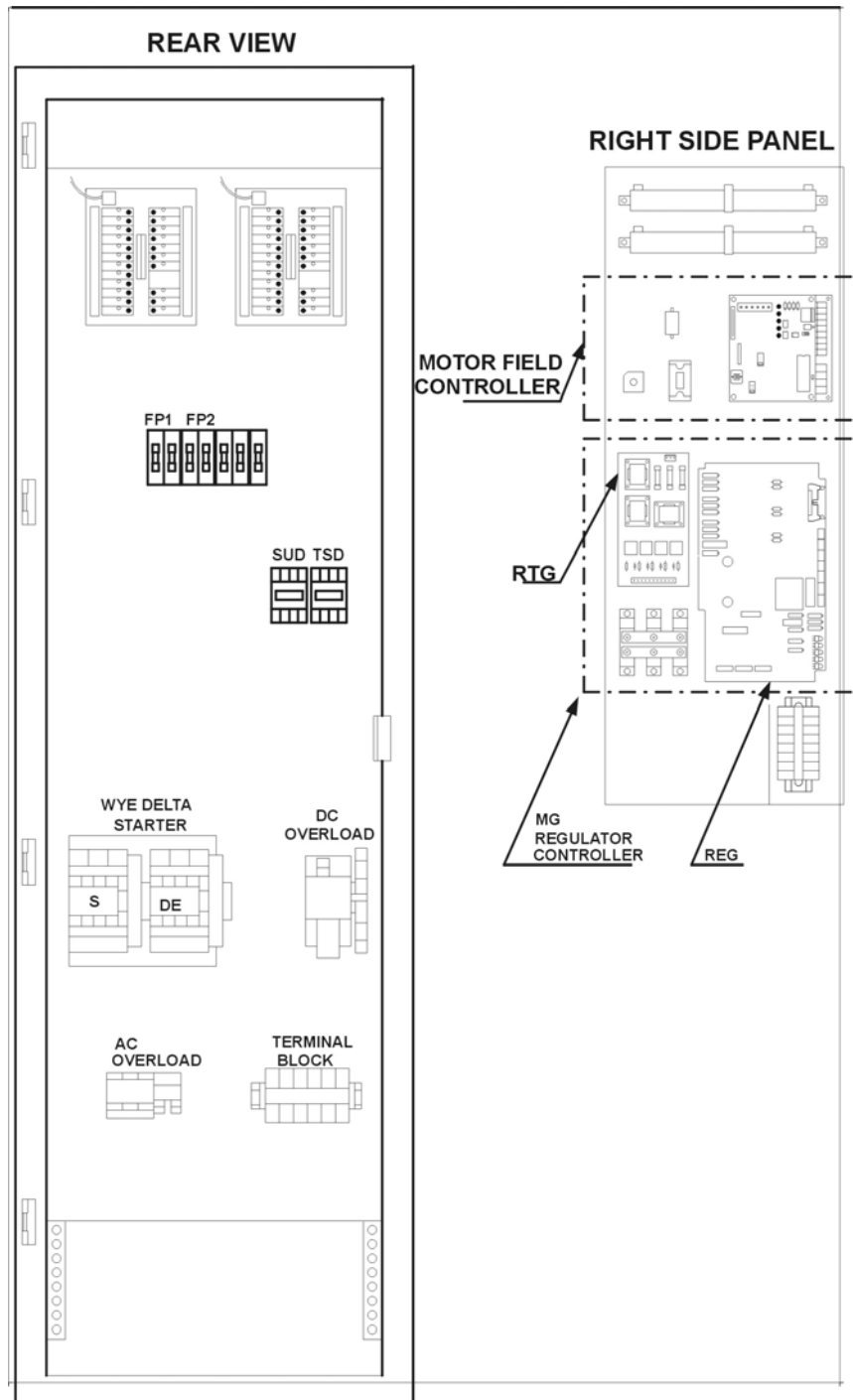


Figure 19-4



AC VVVF

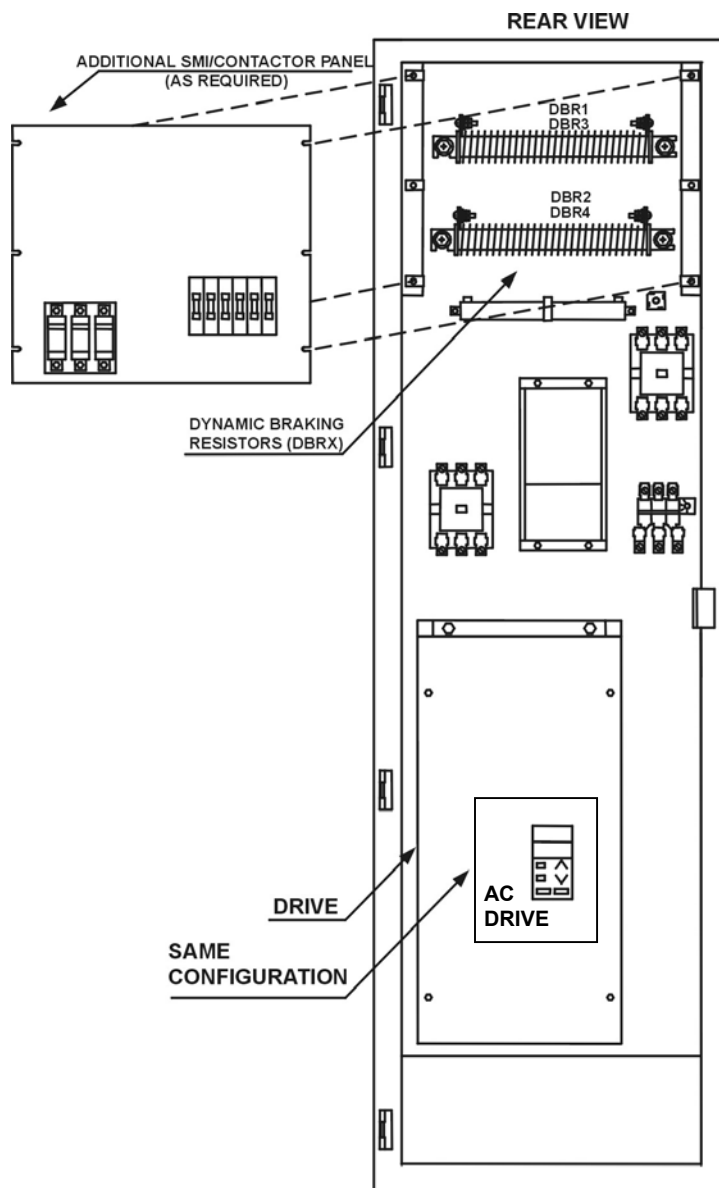


Figure 19-5

Controller Devices

Introduction

The **FUTURA**™ controller is based on distributed processing technology. The main system processor (System Processing Unit [SPU]) communicates with “smart” microcontrollers (reviewed in this section) over a high speed communication network (SWIFT LINK) providing an all digital, powerful, multiprocessor system. For example, with minimal commands from the SPU, the brake controller directs the voltage/current

profile of the brake, providing smooth start and stop transition. The EPU COP processor handles all **Car Operating Panel** functions, including car call latching, lamp illumination intensity, and access codes, when in the security operation. Without additional burden to the SPU, the **FUTURA**™ PI fixtures provide all required COP buzzer tones and illumination levels to match the car lighting. Most of these “smart” controllers connect as easily as a telephone extension, providing quick installation and servicing.



The following chart illustrates the *FUTURA* functional block diagram for an installation utilizing all the car and hall "smart" micro-controllers.

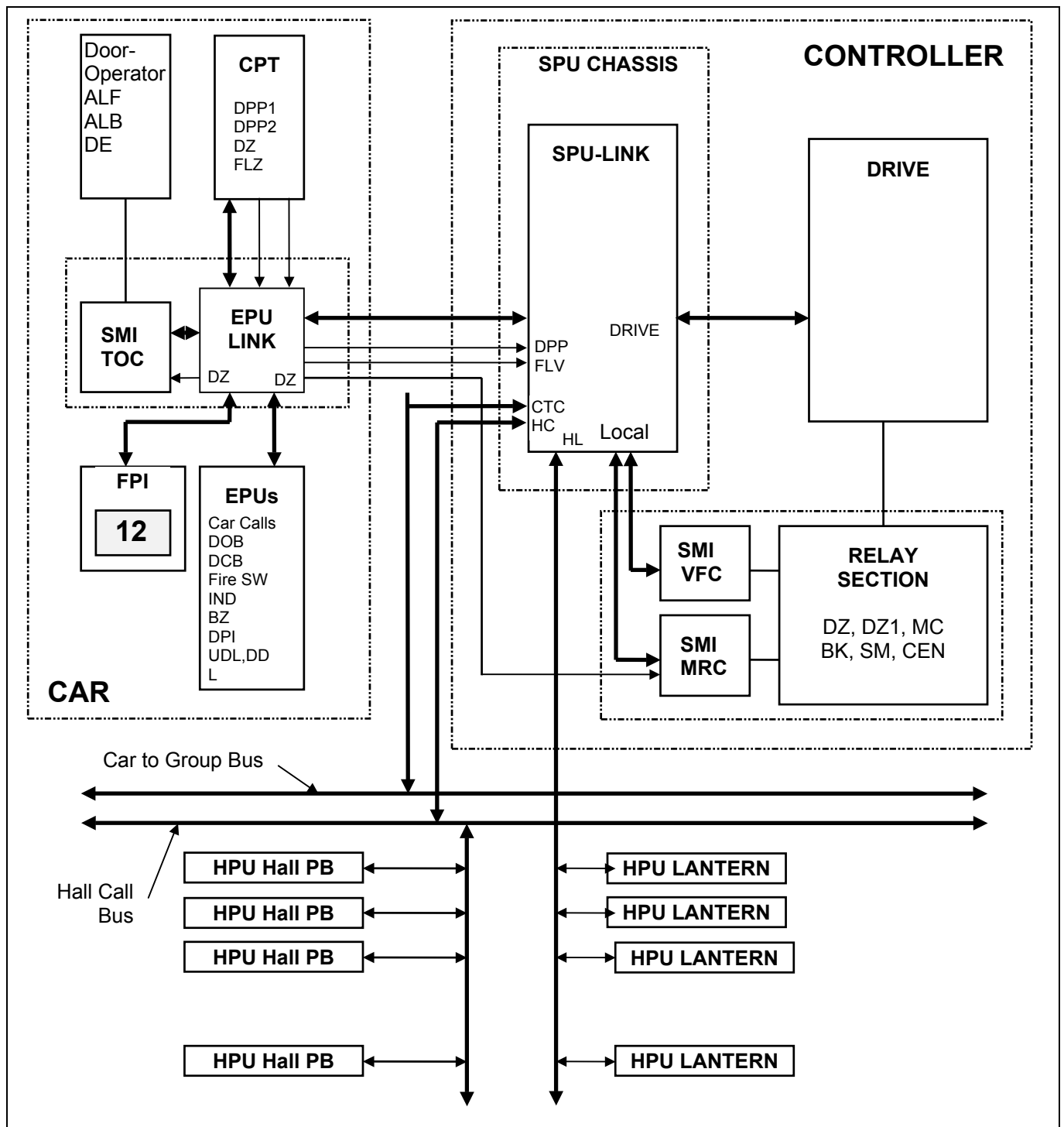


Figure 19-6



System Processing Unit (SPU)

Introduction

The system processor 'U1' is based on a highly integrated Intel 20MHZ 16-bit embedded micro-controller using 256K bytes of CMOS nonvolatile memory, 512K bytes of FLASH memory for the program and 128K bytes of EEPROM memory for the SWIFT BIOS. The CMOS memory and a Real Time Clock controller chip is powered by two batteries during power loss. The Lithium batteries have a shelf life of 10 years. Note that the program memory and the system parameters are located in the Flash memory and are not affected by loss of battery power. An SBX expansion port is provided and used for an MG drive system. An optional VGA interface (J3A and J3B) is also provided.

The SPU has a temperature control chip, which will trigger at 140°F (60C). This will cause the cars to stop normally at the nearest floor and open their doors. The service type will be displayed as Overload (Thermal Overload).

The SPU requires only 5VDC to operate (adjust to 5.1VDC on SPU-LINK test points). For MG jobs, an additional +/- 15VDC supply is located in the chassis and provides power for the SBX interface.

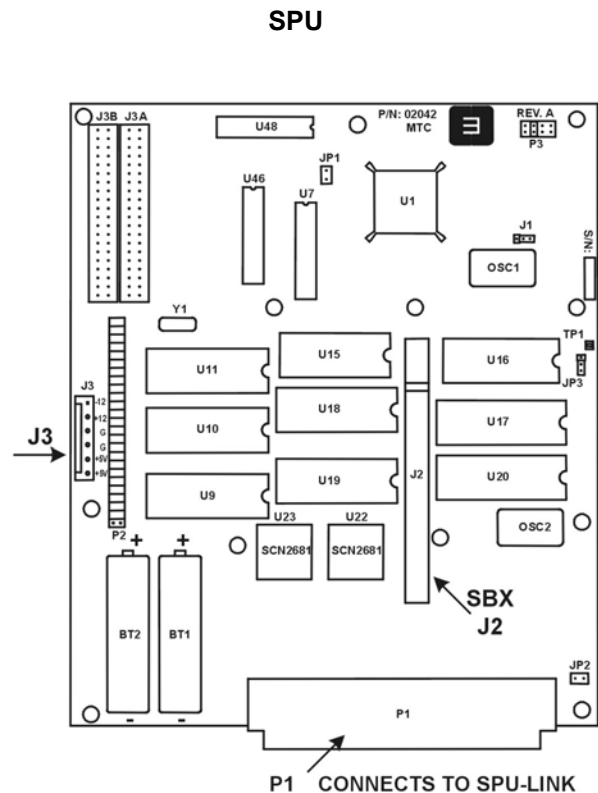


Figure 19-7

Jumper Configuration

J#	PIN	REQ	FUNCTION
JP1	1-2	OUT	186 Watchdog to the SPU watchdog timer
JP2	1	OUT	SBX option 1
	2	OUT	SBX OPTION 2
JP3	1-2	OUT	+12VDC power for Flash memory. DO NOT CONNECT
	2-3	IN	Enables Flash memory paging.
J1	1-2	IN	Software operation strobe to the SPU watchdog timer
J1	2-3	OUT	Dagnostic strobe to the SPU watchdog timer. Note: If this jumper is inserted, the SPU <u>will not reboot</u> under certain conditions.
P2	1-2 * thru 47-48	IN	SPU interrupt control matrix. Note: * (15-16, 29-30) are OUT (see below)
P2	15-30	IN	Wire-wrap: One second clock update
P2	16-29	IN	Wire-wrap: Real Time Clock
P2	49-50	OUT	SPU interrupt control matrix
P3	5-6	IN	Bus Clock. All other jumper on P3 must be removed

Table-1



Component Identification Table

FUNCTION	LOCATION	DEFINITION
CMOS RAM	U18, U17	Battery-backed CMOS Non Volatile Static Memory
FLASH	U19, U20	Non Volatile FLASH program and parameter memory
EEPROM	U15, U16	Non Volatile Read Only Memory (System BIOS)
PALS	U7, U46, U48	Programmable Array Logic
Power Connector	J3	Power connector: -12V, +12V, COM, COM, +5V, +5V Note: +/- 15VDC for MG SBX-414
VGA Conn.	J3A, J3B	VGA interface board connector

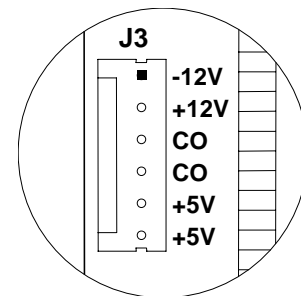


Table 2

The SPU-LINK is mounted on the front of the SPU chassis and provides the communication interface to the “Smart” peripherals. The primary function of the SPU-LINK is to protect and provide the drivers for the communication lines, the DPP interface, and three input and output control ports. It has an RS-232 (P11, DB-9 connector) port to permit communication with a terminal or a PC. Note that the Radio Shack, or other similar terminal PC’s used with the SWIFT-5000, can also operate with the **FUTURA** controller (Port Setting: 19,200 Baud, 8-bits and no parity).

System Processing Unit Link Board (SPU-LINK)

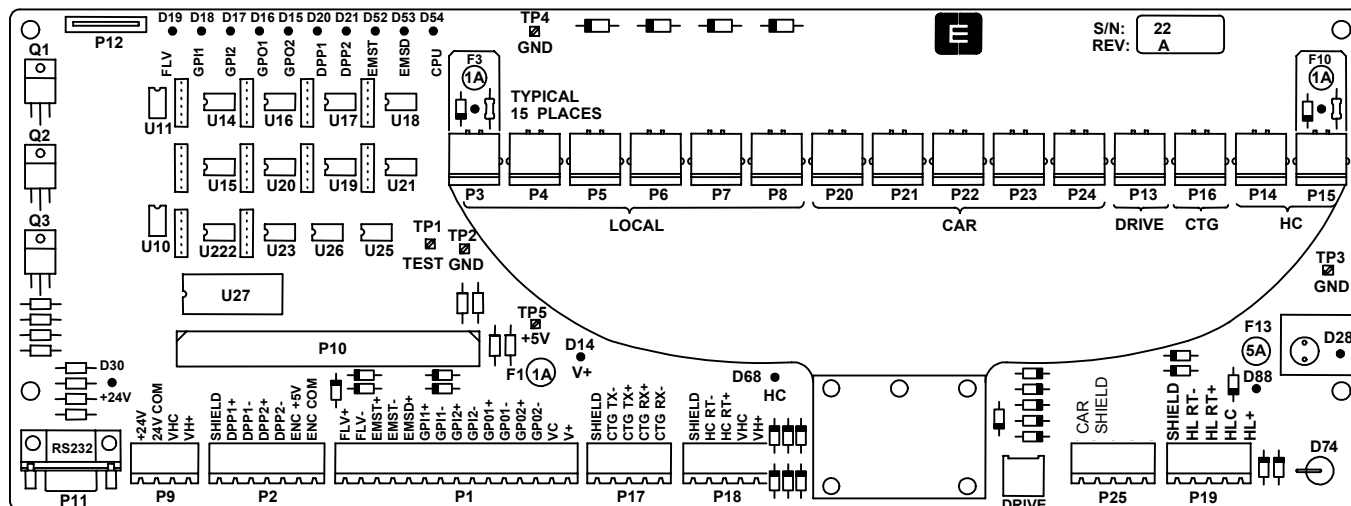


Figure 19-8

+5VDC SPU supply (+5V TP5 should read between +5 to +5.1 VDC), and a special “TEST” (TP1) used in conjunction with some Human Interface commands to monitor SPU operation.

Control Panel

The Control Panel interface port (P12) interconnects to the push-button/LED PC board via a flat cable type connector. To insert the cable, the top portion of the connector must be pulled to permit the ribbon cable (with the blue plastic facing down) to be inserted. The top portion is then pushed-back to squeeze the ribbon cable and provide the connection. The following table describes the control panel operation:



Control Panel Operation			
PB NAME	PB FUNCTION	LED	LED FUNCTION
SPU	STM: Setup Mode commands on Inspection. Press SPU until the Display LED turns Green (3 sec), then release and press the Display button momentarily. The Display button will alternately flash Red/Green.	OFF RED GREEN	Invalid condition Power Up or Reset (SPU not running) Normal
DISPLAY	Rotate the motor room diagnostic screen from car to car (x) to group.	OFF RED GREEN	Flashing Red/Green: Special operation during inspection. See SPU PB function
DISCONNECT	Changes the car service from Normal to Door Disconnect to Group Disconnect back to Normal	OFF RED RED	In service One flash: Door Disconnect Two rapid flashes: Group disconnect
RESET	Reset the CounterWeight or Earthquake latch (LED RED)	OFF RED RED	Normal One flash: Counterweight derailment Two flash: Earthquake

Table 3

LED Indicators on SPU Link

Numerous indicators are provided for quick diagnostics. The following table describes the LED status:

LED STATUS	
NAME	DESCRIPTION
FLV	at Floor Level
GPI1	General Purpose Input # 1
GPI2	Group Comm. handshake
GPO1	General Purpose Output # 1
GPO2	Group Comm. handshake. If ON, then this car is in the Group
+24VPWR	+24V Input (P9 +24V, 24VCOM)
HC PWR	+24Volt Hall Call interface power (connector P9 VHC , VH+)

Table 4

LED STATUS	
NAME	DESCRIPTION
DPP1	Digital Position Pulse #1 (Input)
DPP2	Digital Position Pulse #2 (Input)
EMST	Emergency Stop Output (controls CEN)
EMSD	Emergency Stop Input (CEN feedback)
CPU	FLASHING indicates if that the SPU is running.
V+ PWR	+24V Output (Check F1 if LED is Off)
HL PWR	+24V for Hall Lanterns (Check F13 if LED is Off)
TELCO JACK	All LEDs associated with the 8-pin jacks (except HC ports). Check fuses if LED is Off. The input power is from +24VPWR (D30).
TELCO HC ports	D71 and D72 HC power. Hall Call SMI power. NOTE: Diode D74 prevents reverse voltage to be applied to the HC ports.



Communication Ports

The SPU LINK has six discrete communication channels routed to twenty physical ports. These ports are available from an 8-pin TELCO connector or from a removable screw type terminal block to be used with twisted pair communication cables. The following table describes the communication channels and their associated ports:

COMM NAME	COM	PORT	DEVICES	TERMINATION	PROTECTION	CONTROLLER FUNCTION
RS 232	1	P11	U27 (235CPG)	none	D44-D51	Human Interface
CTG	2	P17	Rx: U22 (75176) Tx: U21 (75176)	J14 (+) J15 (T) J13 (-)	D59+, D60 D58+, D57	Car To Group Communication. Links all the cars for dispatching functions. Note: P16 (TELCO) port is used for diagnostic purpose.
LOCAL	5	P3, P4, P5, P6, P7, P8	Rx: U18 (75176) Tx: U17 (75176)	J5 (+) J6 (T) J4 (-)	D26+, D27 D25+, D24	VFC, MRC, BRAKE, MF(mg)
DRIVE	3	P13	Rx: U26 (7601) Tx: U16 (75176)	J17 (+) J16 (T) J18 (-)	D65+,D66 D64+,D63	Isolated Digital Drive Comm. DSD 412, GPD 503, GPD-575, VCD 703
CAR LOCAL	6	P20, P21, P22, P23, P24	Rx: U20 (75176) Tx: U15 (75176)	J23 (+) J24 (T) J22 (-)	D79+, D80 D78+, D77	TOC, COP, CC1-CC4, POS, HL (smi)
CAR Remote	6	P25	Rx: U25 (7601) Tx: U19 (75176)	J29 (+) J28 (T) J30 (-)	D91+, D92 D90+, D89	Isolated Car communication to the CPT or the CDP boards. TOC, EPU-COP, EPU-(CC1-CC4), FUTURA PI
HC	4	P14, P15 P18	Rx/Tx: U14 (75176)	J8 (+) J7 (T) J9 (-)	D62+, D61	Half Duplex Hall Call communication. Interconnects all the cars with the Hall Call interface. The VGA communication adapter also plugs on this bus.
HL	6	P19	Rx/Tx: U23 (75176)	J26 (+) J27 (T) J25 (-)	D82+,D81	Half Duplex Hall Lantern communication

Table 5

+24VDC Power “P9”

Car functions: The SPU-LINK distributes the 24VDC power to all the SMI interface ports, to the I/O interface (V+ & VC) and to the Hall Lantern interface (HLC & HL+). The 24VDC local car power is connected to connector P9-1&2 (+24V & 24V COM) at the factory.

Group functions: According to the job configuration, the group 24VDC power is connected to P9-3&4 (VHC & VH+) and is distributed to the Hall Call (HC) ports.

Encoder Interface “P2”

Car Position Transducer (CPT): The DPP signals, DPP1 and DPP2, are sent from the car top position reader and must be shielded at P2-1 (SHIELD). These signals are in quadrature and are used to locate the car and to calculate the velocity (DPP1), and to determine the car direction (DPP2). Indicator LEDs are provided. Note that the voltage level at this connector is 5VDC.

Motor Room Encoder: When a motor room encoder is used, it must be driven from the governor or from a perforated tape driven sheave. The power for the encoder is available at connector P2-6&7 (ENC +5V & ENC COM). The operation is the same as for a car-top mounted encoder as provided by the SWIFT position reader interface.

Input / Output Interface “P1”

The following table describes the I/O interface:

FUNCTION	TB Marking	I/O	VOLT	DEVICE	DESCRIPTION
FLV	FLV+, FLV-	Input	24VDC	U5	At Floor Level. Signal from the CPT.
EM Stop	EMST+, EMST-	Output	24VDC	U6, Q1	Emergency stop control from the SPU. Located in the control line of the CEN contactor.
EM Slowdown	EMSD+	Input	24VDC	U4	Emergency stop in the CEN control line. Indicates that a device has shut the car down.
GPI1	GPI1+, GPI1-	Input	24VDC	U3	General Purpose Input
GPI2	GPI2+, GPI2-	Input	24VDC	U2	General Purpose Input
GPO1	GPO1+,GPO1-	Output	24VDC	U7, Q2	General Purpose Output
GPO2	GPO2+,GPO2-	Output	24VDC	U8, Q3	General Purpose Output

Table 6

Serial Module Interface (SMI & SMIC)

The SMI and SMIC boards are always used in pairs, permitting an interface with 24 I/O circuits. The SMI connects to the communication link via an 8-pin TELCO connector (P4). This connector provides the serial communication transmit and receive signals as well as the 24VDC power.

The SMI can accept all of the I/O functions. It can be used with dedicated functions or with general purpose optional features. Example:

The Car Call interface can be located in the COP using an Elevator Processing Unit (EPU) board or can be located on the controller using a SMI board. The Car Call functions are named CC1 through CC4. The CC1 through CC4 functions, being a Car feature, must therefore communicate on the Car communication link which can be local (CAR on SPU-LINK) or remote via the P25 port which interconnects the car to the SPU-LINK. The Car Distribution Panel (CDP) located on the car has the necessary interface to interconnect the EPU to the SPU-LINK.

Serial Module Interface I/O Base Board (SMI)

The I/O modules plug in directly in the sockets provided at each module M1 through M24. Each

I/O module has both input connections brought to the terminal block. Refer to the SMI data sheets for TB/Module pin relationship. No addressing is required on the SMI. The addressing is performed on its controller, the SMIC.

The 5VDC power required for the I/O modules and the SMIC controller is provided by a high performance isolated DC-DC converter located at “U1” (HDF-2405). The isolated converter plugs-in at U1.

Card guides are provided to hold and secure the SMIC.

SMI Board

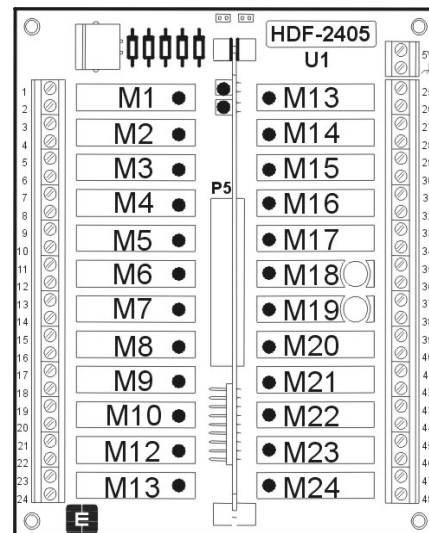


Figure 19-9

Serial Module Interface Controller Board (SMIC)

The SMIC is based on a highly integrated 8052 type microcontroller. It interconnects to the SMI via "P1". Two LEDs are provided to indicate: D1 (red LED) a reset condition which occurs at power-up or a watchdog timer reset, and D2 (green LED)

J#	PIN	REQ	FUNCTION
J1	1-2	OUT	Termination Common
	3-4	OUT	Termination +5V
	5-6	OUT	Termination
J1	7-8	Refer to SMI data	Address 32
	9-10		Address 16
	11-12		Address 8
	13-14		Address 4
	15-16		Address 2
	17-18		Address 1
J2	1-2	Refer to SMI	Module 17 Normal mode
	2-3		Module 17 gated by module 6
J3	1-2	Refer to SMI	Module 19 Normal mode
	2-3		Module 19 gated by module 8

Table 7

which pulses when the micro-controller is communicating. The following table lists the jumper configuration.

SMIC Board

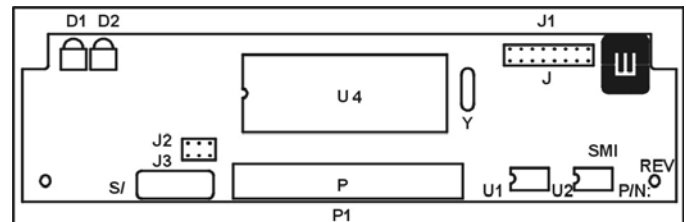


Figure 19-10

Brake and Motor Field Controller (BKMF Power & Control)

The *FUTURA* BKMF Brake and Motor Field controller is a single phase DC power conversion unit consisting a 2-SCR/2-DIODE bridge rectifier (U5). Current feedback is provided by U1 or by an external LEM device for higher current applications. The input voltage self adjusts to 145VAC or 290VAC as provided by the T2 transformer. the 145VAC tap configuration is used for DC voltage up to 120VDC while the 290VAC tap can provide 240VDC. Note that with MG jobs, the Input voltage can also be 208VAC providing a 170VDC output voltage. The controller current rating is 8 amps at 100% duty cycle using the internal SCR bridge, and up to 35 amps using an external bridge/current device combination.

An input filter, SCR protection, and transient protection are provided. The controller is powered from the SPU-LINK 24VDC (V+) supply. The controller has a watchdog timer and will shut down the car (SPU communication sense or directly via the CEN contactor from the FLT1 & FLT2 output) in case of malfunction.

This controller consists of a two-board combination as described in the following sections.

Brake Power Board

For Brake Requirements Over 3 Amps.

The power section has the SCR bridge and the current feedback device mounted directly on the board for DC current up to 10 amps. For higher current rating, external devices are used (refer to job drawings).

J#	Pin	Req	Description
J1	1-2	IN	Common to Ground
	3-4	IN	Common to Ground
J2 **	1-2	IN	Brake
	2-3		Motor Field
JP4	1-2	IN	Common Reference

** Only (1-2) or (2-3) must be inserted

Table 8

Brake Power Board

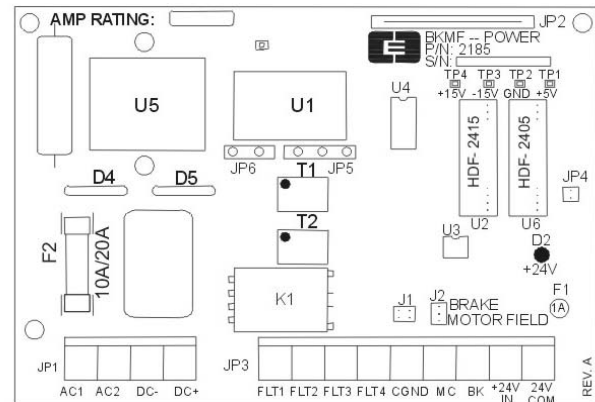


Figure 19-11

Brake Controller Board

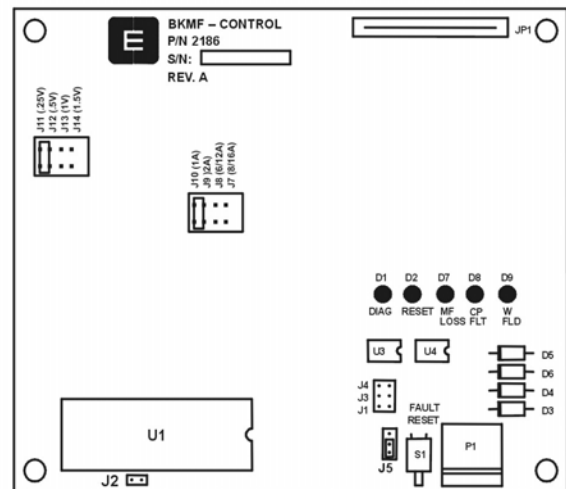


Figure 19-12

Brake Controller Under 3 Amps (DBC)

The FUTURA Brake controller (DBC) is a single phase DC power conversion unit. See figure 19-13. The input voltage is factory set for either 145VAC or 290VAC as provided by the T2 transformer. The 145VAC tap configuration is used for DC voltage up to 120VDC while the 290VAC tap can provide 240VDC. Note that with MG jobs, the Input voltage can also be 208VAC providing a 170VDC output voltage. The controller current rating is 3 amps at 100% duty cycle using the internal SCR Q1. The machine specific voltage is set up using the parameters mentioned before in the start-up procedure sections. In conjunction with the DBC, there will also be a BKM module (brake modulator) located on the MRC SMI board that will trigger the SCR. The module is connected, via a factory installed, twisted shielded pair to the BKM+/- terminals on the DBC. The power will be delivered to the brake coil at the BK+/- terminals on the DBC. Refer to job drawings for complete connection instructions.

Digital Brake Controller Board

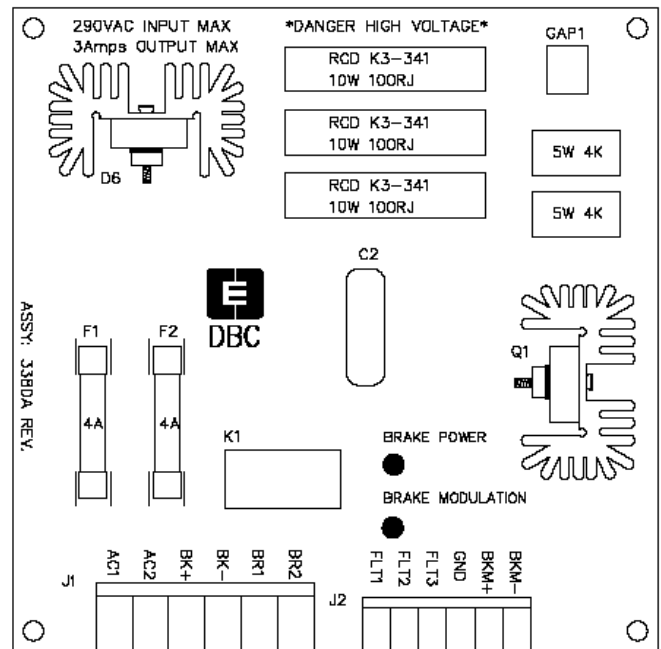


Figure19-13

CAR CONTROLLER DEVICES

Car Position Transducer (CPT)

The primary position transducer, located on the car top, has its own microcontroller, which interfaces with the digitizer, leveling, and preset transducers. The car position in the hoistway is digitized through a stationary steel perforated tape. The position digitizer uses two sensors (DPP1 & DPP2) to determine the direction (quadrature), velocity (within one percent) and the car position. It permits a 0.1875 inch (4.8 mm) resolution accuracy for the entire length of the hoistway. Other sensors are used to interface with the leveling (ULZ, UFLZ, MLZ, DFLZ, & DLZ) and absolute preset vanes (OP, PR1-PR32) located on the tape. During setup, the SPU learns the floor position as well as the Slowdown Limit Position and stores this data in Flash memory.

Leveling

The automatic two way leveling device provided is designed to govern the leveling of the car to within 1/4" (6.4 mm) above or below the landing sill. Any over travel, under travel, or rope stretch returns the car level to the landing sill.

The DZ connector sends the At Floor Level (FLV) and the Door Zone (DZ) signals to the main controller.

Load weighing

Another function of the Car Position Transducer "CPT" is to interface with compatible load cells to measure the car load. Two distinct interfaces, located on P17, are available; the first interfaces with a top-of-car strain gauge transducer (P17 LW1) and the second interfaces (P17 LW2) with an under-the-platform linear measuring transducer. After initial calibration, the controller will compensate for load cell variation and for the car position in the hoistway. This data is used by the dispatching system for car load information required in measuring traffic intensity and also for the main terminal dispatching. The car uses this data for anti-nuisance, by-passing, and for an overload condition.

SPU-LINK direct connections (w/o EPU-LINK):

The CPT can be configured to operate directly from the SPU-LINK twisted-pairs communication cables. The two communication cables connect at

J1 while the DPP, DPP1, FLV & DZ signals connect at P20. The JP5 communication configuration jumper must be inserted.

SPU-LINK connections with CDP:

If a Communication Distribution Panel CDP is used, the 8-pin telephone cable connects at P1, and the two 4-conductor TELCO cables connect at DZ and DPP. The JP5 communication configuration jumper must be removed.

The CPT requires 24VDC to operate. The power connects at J1 (+24V, 24VCOM). When the microcontroller is powered and operates normally, the D1 (RUN) LED should illuminate. Note that the DC/DC converter U9 (HDF-2405) must be present for the CPT to operate. If the Load Weighing function is desired, U8 (HDF-2415) must be inserted.

Car Position Transducer

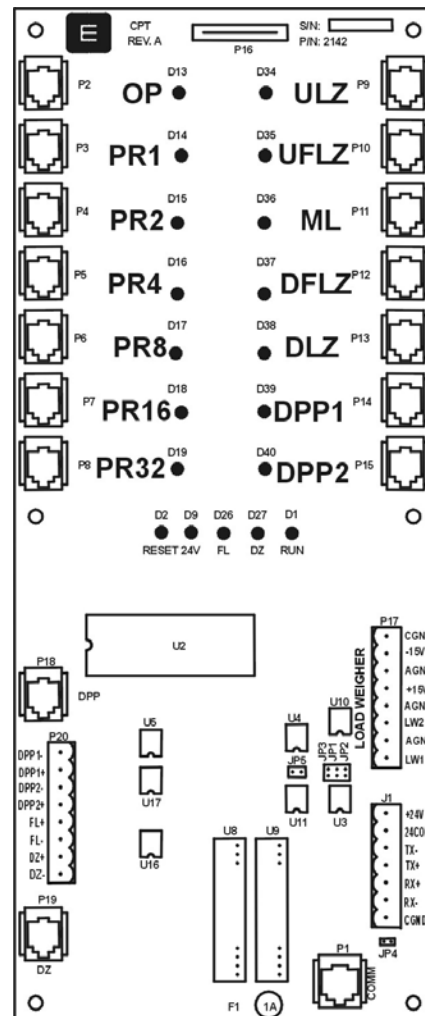


Figure 19-12

Car Distribution Panel (EPU-Link)

The Car Distribution communication Panel (EPU-Link) is always located on the car (normally in the Top of Car [TOC] chassis).

The TOC operates from the 24VDC supply (connector JP11 +24V & 24VCOM) and requires a 5VDC DC/DC converter located at U6.

The primary function of the EPU-Link is to interface the traveling cable to the car "smart controllers". Connectors JP8, JP9 & JP10 provide the traveling cable terminal connections while the 4-pin TELCO connectors DZ and DPP and the 8-pin TELCO connectors CPT, FDOOR, RDOOR, PI-1, PI-2, COPS, CC1, CC2, CC3, CC4 & DIAG provide the quick connection to the "smart controllers". Status indicating LEDs and fuses are provided for the "smart" links.

Video and Intercom connectors are also provided for convenience.

EPU-Link

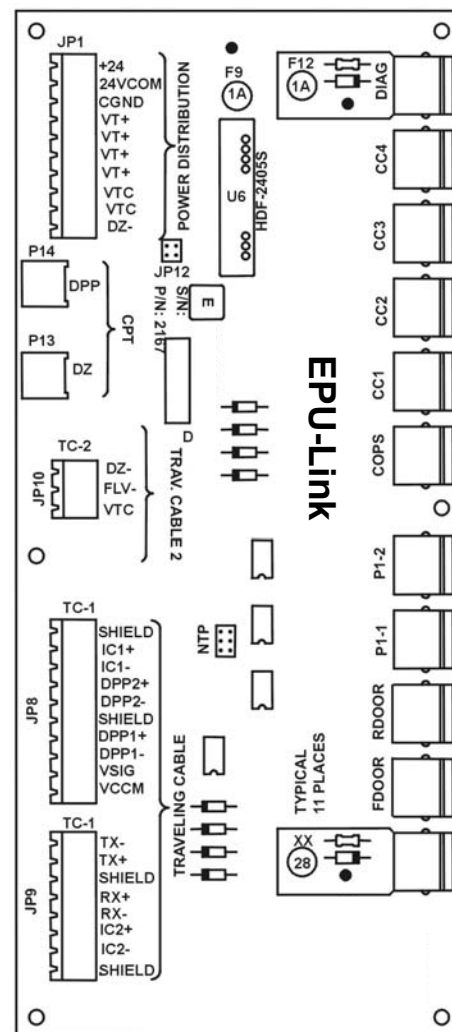


Figure 19-13



Door Board Setup

Steps: In sequence for direction	1		2		3		4	
CLOSE	Close Inputs High	Pot Adj.	Close Inputs High	Pot Adj.	Close Inputs High	Pot Adj.	Close Inputs High	Pot Adj.
	NONE	CL SPD HI	HS ONLY	CL SPD MED	HS and MS	CL SPD LO	XXXXXXXX	XXXXXXXX
OPEN	Open Inputs High	Pot Adj.	Open Inputs High	Pot Adj.	Open Inputs High	Pot Adj.	Open Inputs High	Pot Adj.
	HS and MS	OPEN SPD LO	NONE	OPEN SPD HI	HS ONLY	OPEN SPD MED	HS and MS	OPEN SPD LO

Table 9

- Place the car on cartop inspection, level at the top floor.
- Verify the door operator stroke has been adjusted per manufacturers recommendations.
- Verify all wiring has been completed and is correct from the Door Control box to the existing door operator.
- Set the door operator slow down switches according to Table 9.
- Pre-set the potentiometers on the door board according to Table 10.

Caution Failure to verify wiring can cause serious damage to the door board and possibly void the warranty.

Note: All door motion adjustments must be made with the hoistway door engaged to the car.

POTENTIOMETER PRE-ADJUSTMENTS	
CL SPEED HI	FULLY CCW
CL SPEED MED	FULLY CCW
CL SPEED LO	FULLY CCW
OPEN SPEED HI	FULLY CCW
OPEN SPEED MED	FULLY CCW
OPEN SPEED LO	FULLY CCW
ACCEL/DECEL	FULLY CCW
NUDGE	FULLY CCW
CL STALL FORCE	FULLY CW
CL TRIP FORCE	FULLY CW
FIELD VOLTAGE STANDBY	ACCORDING TO SPECS
FIELD VOLTAGE RUN	ACCORDING TO SPECS (RANGE IS 80 TO 220 VOLTS)

Table 10

Door Adjustment Potentiometers

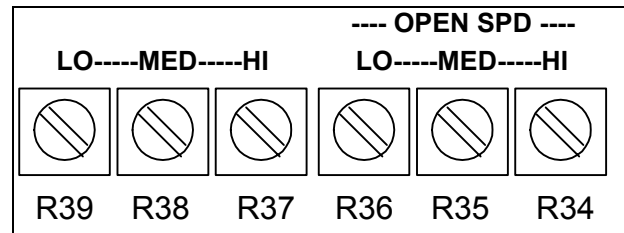


Figure 19-14

- Set the desired motor field voltage with the field voltage run potentiometer (if applicable.)
- Rotate the door operator so that both the car and hall doors are fully open.
- With the CL-HS and CL-MS inputs high for low speed, press the door close button on the door board and set CL Speed LOW pot to close the doors without stalling. [See Figure 19-14.]
- With the CL-HS input high press the door close button and adjust the CL Speed MED pot for a speed slightly faster than in step 8.
- With no CL input high press the door close button and adjust the CL Speed HI for a speed slightly higher than in step 9.

Note: Adjust pots CL Speed HI and CL Speed MED to obtain desired closing speeds.

- With the Open-HS and Open-MS inputs high for low speed, press the door open button and set Open Speed LOW pot to open the doors without stalling.



12. With the Open-HS input high press the door open button and adjust the Open Speed MED pot for a speed slightly faster than in step 12.
13. With no Open input high adjust the Open Speed HI for a speed slightly higher than in step 13.
14. Adjust the Accel/Decel pot to obtain a smooth transition between speeds.
15. With the nudging input high adjust the Nudge pot for the desired nudging speed.
16. With the doors fully open press the door close button and adjust the CL Trip Force pot counter-clockwise until the CL Trip Force LED lights. [See Figure 19-15.]
20. Place the car on Automatic service and observe operation. Verify all door opening devices work.
21. As the doors start to go closed stand in the door opening and verify the nudging circuit activates and closes with reduced torque (depending upon nudging parameters, see adjustments).

Door Force Potentiometers

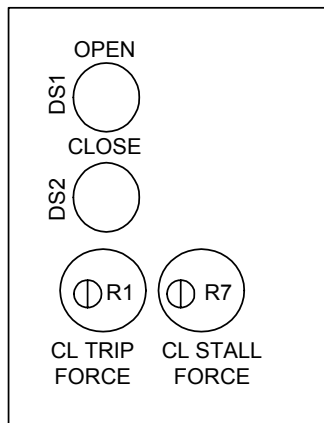


Figure 19-15

17. Once the CL Trip Force LED lights turn the CL Trip Force pot back clockwise $\frac{1}{2}$ to 1 full turn clockwise.
18. Open and close the doors several times to verify the CL Trip Force LED does not come on.
19. With the doors opening and closing from the door operator board buttons, stall the doors with a door pressure guage and adjust the CL Stall Force pot until the closing pressure is 30lbs. of torque or less (depending on code requirements).

Note: *The CL Trip Force must be done first before proceeding with the CL Stall Force.*



Control Status Word/Bit Description Summarized by Function

DRIVE

CSn	Bit	DEFAULT	DESCRIPTION
0	2	S	When set, permits fault reset of an internal drive fault after the car stops.
0	11	R	When set, if motor generator switch is deactivated, car will be returned to the main lobby and no calls will be accepted.
0	12	R	When set, doors remain open when MG switch is deactivated.
2	10	R	When set, MG remains on when doors are open.
5	2	R	When set, system checks to ensure voltage is not building across hoist motor armature when generator is in suicide operation. (Only used in Europe)
6	7	R	Set to disable auto fault reset for the drive unit.
6	8	R	Set to enable analog speed reference.
6	9	R	Set to disable drive communications check. (must have bit 8 set)
6	10	R	Set for direction from DPP pulses instead of from AC VVVF drive.
9	2	R	Set to use speed reference feed forward for DSD 412 drive.

MOTION

CSn	Bit	DEFAULT	DESCRIPTION
3	7	R	Enables preconditioning operation.
7	3	R	Set to disable linear time parameter. (Max change in speed ref.)
7	5	R	Set to adjust cars maximum velocity using MMS parameter
8	6	R	Set for PEK parameter compensation instead of RVT parameter compensation.
8	9	R	Set to enable torque compensation.
8	10	R	Set to have analog reference show speed reference and preconditioning offset. This is used with a digital drive to see an analog speed reference with the pre-conditioning offset for debugging. CS6 bit 8 must also be set.
8	11	R	Set for pre-conditioning during re-leveling.
8	12	R	Set to reset AC-VVVF drive integral gain during slowdown.
8	13	R	Set to enable quicker communications packets to the AC-VVVF drive.
8	15	R	Set to enable timed leveling mode. Should only be used for testing.
9	4	R	Set to zero speed reference quickly on stop.
9	7	R	Set to disable pre-start. Pre-start allows the controller to prepare to run when the DCL6 limit is made.

DOORS

CSn	Bit	DEFAULT	DESCRIPTION
0	6	R	Set to allow doors to reverse before reaching door open limit, presently used only with an extra door reversal limit switch. (DRL)
0	13	R	When set and on independent service, the doors will close automatically when a car call is registered.
1	2	R	When set, pre-opening is disabled for the rear doors.



1	3	R	When set, rear door pre-opening will occur at the 2" leveling zone.
1	4	R	When set, pre-opening is disabled for the front doors.
1	5	R	When set, front door pre-opening will occur at the 2" leveling zone.
1	7	R	When set, rear door operation is disabled.
2	0	R	If set, car will wait for the generator to be running before opening the doors.
2	1	R	If set, pressing the door close button shortens the door open time. If reset DCB has no affect on door open time.
2	6	R	Allows short rear door reversal. Allows doors to reverse before reaching Rear door open limit.
2	8	R	Does not allow reopening of doors with the safety-edge or the electric eye during nudging.
2	9	R	If set, simultaneous front and rear door operation instead of selective.
3	1	R	If set, allows call pilots to be accepted when on door protection mode.
3	2	R	If set, allows door open delay to operate every time door opens.
3	13	R	If set, door-nudging operation is disabled.
3	15	R	If set, the electric eye time-out feature is disabled. (NUDGING)
4	5	R	If set, front door pre-opening will occur when car reaches 6" from floor level.
4	6	R	If set, rear door pre-opening will occur when car reaches 6" from floor level.
5	0	R	If set, the electric eye is disabled when the door is closing.
5	1	R	If set, then full door reversal after the safety edge is activated.
5	3	R	If set, car will shutdown if car goes out of level zone and doors are open.
5	15	R	If set, drops door close module output after car is in motion for .5 seconds.
6	3	R	Set to disable electronic detector edge time out.
6	4	R	Set to enable electronic detector edge operation vs. mechanical safety edge.
6	5	R	Set to enable electronic proximity edge operation vs. mechanical safety edge.
6	12	R	Set to disable door open buzzer when front door is secured with lockout switches.
6	13	R	Set to disable rear door open buzzer when rear door is secured with lockout switches.
6	14	R	Set to enable drive fault GLR error. (both GLR input and DOL input active while @ the floor)
7	10	R	Set to invert detector edge input.
7	11	R	Set to enable door close button to latch during attendant service.
9	1	R	Set to disable SRU and SRD inspection door close option.
9	3	R	Set to disable door field economy voltage on door close.
9	5	R	Set to require DCL on (with GL1 And GL) to start car.

FIRE

CSn	Bit	DEFAULT	DESCRIPTION
1	8	R	When set, the fire buzzer is pulsed.
1	9	R	When set, the fire emergency light is pulsed.
1	10	R	When set, the stop switch is not bypassed. When reset, it is bypassed according to bit 11.
1	11	R	When set, stop switch is bypassed all the time. When rest, the stopswitch is bypassed according to ANSI code standard.
1	13	R	When set, the in-car fire service light also operates during phase II.



1	14	R	When set, the doors will close when a car call is registered. If reset, the door must be closed with the door close button.
1	15	R	If set, car is not a designated car. If reset, car is a designated car. Under fire phase II (New York City Only).
3	3	R	If set, allows car to shut automatically after phase II key switch is set to "OFF" and phase I condition exists.
3	5	R	When set, the door open button is disabled during phase I fire service.
3	14	R	If set, door-nudging operation is activated during phase I fire service operation while the door is closing. This bit will override bit 13 (disable nudging).
4	0	R	If reset, car will open front door automatically when it reaches the fire floor during phase I.
4	1	R	If reset, car will open rear door automatically when it reaches the fire floor during phase I.
CALL			
CSn	Bit	DEFAULT	DESCRIPTION
0	4	R	Dumps all calls after consecutive car calls answered per CCD parameter number order with no electric eye break.
3	8	R	If set, no slowdown for hall calls and the floor is secured by the SFL command from the human interface.
4	2	R	If set, car calls are latched internally.
4	3	R	If set, hall calls are latched internally for a simplex car.
4	10	R	If set, car calls will not be cancelled when the car has a reversal slowdown.
4	11	R	If set, cancel car calls for positions above the car when the car is moving down and cancel car calls below the car when the car is moving up.
7	15	R	Set to pulse car call output for low intensity lights.
INDEPENDENT SERVICE			
CSn	Bit	DEFAULT	DESCRIPTION
0	9	R	When set and on independent, calls are accepted only when the doors are closed.
0	10	R	When set and on independent, car calls are canceled when a slowdown is initiated.
2	4	R	If set, independent service will be disabled after IFT parameter time when a fire recall is initiated.
3	4	R	If reset, independent service overridden by fire serve after IFT parameter expires.
4	7	R	If set, a car on independent will answer car calls secured from a secured floor when set by SFL command.



FAULT			
CSn	Bit	DEFAULT	DESCRIPTION
2	2	R	If set, allows a reset of a panic motion fault. If fault keeps recurring, the processor will not continue to reset the fault.
2	3	R	Must be set to activate the panic motion fault feature. When a panic fault is detected, an error 9 is registered and the processor immediately shutdown the car. The brake will apply immediately.
7	0	R	Set to cause motion fault when tach direction error occurs with drive unit, SPU board, or VFC board.
7	1	R	Set to disable deceleration check in emergency mode.
7	2	R	Set to disable ESV and ETS parameter checks at slowdown limit switches.
7	14	R	Set to cause motion fault when SPU, VFC, or VFC_HS boards emit velocity error.
8	1	R	Set to disable velocity window check. Velocity window is a difference of +/- 100 FPM from previous velocity calculation per CPU. If difference > +/- 100 FPM, error 119 occurs.
DPP			
CSn	Bit	DEFAULT	DESCRIPTION
0	1	S	When set, permits presetting the digital position pulse at start sequence.
7	4	R	Set to disable updating position count when error is detected.
8	2	R	Set to use tach direction from drive to count DPP instead of using DPP quadrature to count DPP.
LANTERNS, GONG, BUZZERS, POSITION INDICATORS			
CSn	Bit	DEFAULT	DESCRIPTION
0	14	R	When set, no double gong occurs with the down hall lantern.
2	7	R	If set and car door is closing on nudging, nudging buzzer activates only when a door open device is activated. If reset, nudging buzzer sounds while doors are nudging closed.
2	15	R	Must be set for software version that utilizes a lantern I/O module for controlling the lantern's power supply.
4	4	R	If set, cab lantern is triggered when door reaches DOL switch.
4	8	R	If set, the position output is disabled when car is out of service.
4	9	R	If set, the position output will flash when car is out of service.
6	6	R	Set to enable handicap buzzer all the time. If reset, the audible service button must be pressed on each run to enable the handicap buzzer.
7	12	R	Set to enable attendant buzzer at every floor.

**LOBBY**

CSn	Bit	DEFAULT	DESCRIPTION
0	7	R	When set, car will return to lobby floor after the last call.(lobby recall)
3	10	R	If set, car can be removed from lobby independent service at any floor when the key switch is turned off. If reset, the car must be at lobby floor.
3	11	R	If set, short door timer disabled when car at lobby floor.
4	12	R	When set, car will stop at lobby if it is above lobby and calls are placed below lobby or if car is below lobby and calls are placed above lobby.
5	4	R	Set to use lobby independent service as lobby recall service
5	5	R	Set to open the rear doors when car is on lobby recall service.
5	6	R	Set to take car out of group service when car is returning on lobby recall service.

BRAKE

CSn	Bit	DEFAULT	DESCRIPTION
2	5	R	If set, applies brake on run time-out.
8	3	R	Set to disable brake lift switch feature.
8	4	R	Set to invert the brake lift switch input.

LOADWEIGHER

CSn	Bit	DEFAULT	DESCRIPTION
7	6	R	Set to have load anti-nuisance service enabled
7	7	R	Set to have load bypass service enabled
7	8	R	Set to have load dispatch service enabled.
7	9	R	Set to have load weight overload enabled.
8	8	R	Set to disable analog load weighing.
9	6	R	Set to disable automatic load weighing calibration.

VIDEO, LOBBY MONITORS

CSn	Bit	DEFAULT	DESCRIPTION
4	13	R	If set, do not blink the car symbol in the display in the car.
4	14	R	If set, do not "refresh" the ELD display in the car.
5	13	R	If set, no lines are displayed on the ELD screen.
5	14	R	If set, ELD screen remains on all the time.



MISCELLANEOUS			
CSn	Bit	DEFAULT	DESCRIPTION
0	1	EMERGENCY DISPATCH	When set, prevents emergency dispatching from enabling when a dispatch loss occurs, even if EDS is activated.
0	8	EMERGENCY POWER	During manual emergency power selection, setting this bit causes car not to recall to the main floor if car loses communication with the dispatcher.
2	12	VIP	If set, enables buzzer to sound during VIP mode to alert passenger that car is in VIP operation mode.
2	13	VIP	If set, enables the buzzer to sound at VIP floor.
2	14	SECURITY	If set, a special buzzer sounds during security with push-button keypad operation. A brief sound indicates an acceptance of security code and registration of a call while extended sound indicates rejection of security code. (Per Contract Basis)
3	9	ZONE	If set, no zone slowdown at floors secured via SFL.
5	7	HOMING	Set to allow door to close & MG to deactivate when car is in homing service mode.
5	9	ERROR	Set to disable interrupt error display.
6	11	INSPECTION	Set to allow hydro controller to run high speed on inspection mode.
7	13	ATTENDANT	Set to enable AUB/ADB inputs to latch.
8	0	CPU	Set to request for group parameter checksum every minute.
8	5	CWD	Set to invert the counter weight derailment input.
9	0	GROUP	Set for slave car to execute group commands. Note that parameters will be overwritten by whichever car is the master.



Adjustment Parameter Descriptions Summarized by Function

MOTION			
PAR	RANGE	UNIT	DESCRIPTION
ACR	75-300		Acceleration Rate
DER	80-300		Deceleration Rate
DLM	0-16		Deceleration Lookahead Multiplier: Increasing value will initiate slowdown earlier.
DMD	2001-2095		Digital Multiplier for Down: Top speed can be fine tuned, for non-serial drives.
DMU	2001-2095		Digital Multiplier for Up: Top speed can be fine tuned, for non-serial drives.
DRT	1-48		Deceleration Roll Time: Transition time necessary (from top speed) to engage constant deceleration mode.
DTA	8-40		Deceleration Target: This is the distance from the floor level that deceleration speed reference is calculated.
DZD	2008-2088		Digital Zero offset for Down: To compensate for low velocity error.
DZO	2008-2088		Digital Zero Offset: To compensate for low velocity error.
DZU	2008-2088		Digital Zero offset for Up: To compensate for low velocity error.
FEV	0-2000	FPM	Feed forward End Velocity: When the car is slowing down and the car velocity is less than this value, the controller will signal the drive to remove the speed reference feed forward.
FSD	0-24	1/64s	Final Stop Damping: Velocity damping during the final stop.
FSV	0-2000	FPM	Feed forward Start Velocity: At the start of a run when the car velocity is greater than this value, the controller will signal the drive to use some amount of speed reference feed forward.
FTK	0-31		Flat Top travel Constant: Value used in the calculation of "roundness" of the speed reference during transition from accel to decel on a one floor run.
HTT	0-65535		High speed Travel Time: Max time car is allowed to run at high speed.
IVE	0-100	FPM	Inspection Velocity: Speed of car when on inspection.
LTR	0-100		Linear Time Rate: Maximum change in demand velocity while SM contactor is energized.
LVE	1-20	FPM	Leveling Velocity: Speed at which car levels.
MAR	75-300		Acceleration Rate: When using MMS parameter.
MCT	4-22		Master contactor Control Timer: Delays the drop of MCC output. MCC can shorten the RC drop out time of the MC contactor but can't energize MC.
MDR	80-300		Deceleration Rate: When using MMS parameter.
MDT	8-40		Deceleration Target: When using MMS parameter.
MMS	0-TPS	FPM	Maximum car Speed: Sets top speed of car. Must set CS7 bit 5.
MTL	10-50	DPP	Transfer to Leveling: When using MMS parameter.
MVD	0-24	1/64s	Minimum Velocity Damping: Minimum time value for filtering out step value in the speed reference. The filtering time begins decreasing from VDT value to MVD value when the speed reference is in decelerating mode.



PDT	0-128	1/64s	Preconditioning Delay Time: Delay period before soft start begins on the speed reference.
PEK	0-31		Performance Constant: Drive system value calculated during acceleration to optimize car flight time. PEK enabled when max velocity not reached. Raising value will initiate slowdown earlier.
PPS	0-128	1/64s	Preconditioning Phase out time Start delay: Delay period before preconditioning offset begins to phase out.
PPT	0-196	1/64s	Preconditioning Phaseout Time: The amount of time that system takes to phase out speed reference offset caused by reconditioning.
RVE	1-24	FPM	Re-level Velocity.
RVT	8-60	FPM	Roll Velocity for Top speed: Velocity at which transition from accel to top speed begins. Higher the number, the more rounding.
SCT	2-18	1/16s	System master Control Timer: Delay timer for SMC output that controls the SM contactor.
SSD	2-64	1/16s	Stop Sequence Delay: Minimum time required for the car to stop and test for BK, SM, and MC contacts to drop out before attempting another run.
SST	0-96	1/64s	Soft Start Time: Time period needed to attain rated acceleration from zero speed to ACR value.
SSV	0-36	FPM	Soft Start Velocity: Offsets the initial starting velocity. This parameter doesn't account for load changes in the car. Typically set at 0.
TDF	0-16	1/16s	Time Damping before Fault: Fault damping time causes the car to shutdown when an out of ssequence tach signal or an out of sequence direction occurs. The greater the number, the more fault detection time necessary to cause the car to shutdown.
TDT	0-7		Tach Damping Time: Digital tach damping time period. (filtering)
TFD	1-40		Top speed Flat trave Distance: similar to FTK aparameter but used only when top speed is reached.
TLM	10-50	DPP	Transfer to Leveling Mode: Distance from floor level at which the computation changes from deceleration to leveling mode. The ratio between the TLM and DTA parameters determines the slope at which the car will level.
TLV	0-10	DPP	Transfer to Leveling Vane: Distance from floor level at which the constant leveling velocity takes affect.
TRC	0-10000		Torque Compensation: A constant used by the system during torque compensation setup to compensate for rollback occurring with a load greater than the balanced load. Used with analog loadweigher.
TZO	2008-2088		Torque Zero Offset: DAC offset for an analog torque compensation output.
VDD	0-24	1/64s	Velocity Damping Decrement: During deceleration, the VDT filtering time will decrement by the VDD value until the filtering time has reached the MVD value.
VDT	4-31	1/64s	Velocity Damping Time period: The filtering or damping time period need to remove any steps values introduced during speed reference calculations.

MOTION ERRORS

PAR	RANGE	UNIT	DESCRIPTION
GLV	0-200	FPM	Gate and Lock Velocity limit: Maximum car velocity allowed by VFC board when GL1 input is deactivated.
IRV	0-150	FPM	Inspection Run Velocity: VFC board velocity limit when car is running on inspection mode.
MLV	0-65535		Maximum Level Velocity: When leveling, maximum velocity at which the car can run with doors open.



MRV	0-65535		Maximum Re-level Velocity: Maximum velocity the car can run with the doors open when re-leveling.
VDF	0-20	1/16s	Velocity error for Drive Fault: Value of fault filtering or damping time causing the car to shutdown via panic motion. The greater the number, the more time is needed to detect the fault causing the shutdown.
VEE	50-350	FPM	Velocity Error for Emergency slow-down: Velocity error that will result in an emergency timed slow-down.

BRAKE

PAR	RANGE	UNIT	DESCRIPTION
BCD	0-64	1/64s	Brake Control Drop delay timer. Controls drop time for brake controller after car stops.
BCL	0-32	1/64s	Brake Control Lift timer delay: This parameter delays BKC output from energizing BK contactor: Note: Only used on VVVF drives.
BDD	0-320	1/64s	Brake Drop Delay: Time delay after the 2" (5 cm) door zone point is reached to begin reducing the brake voltage to zero volts.
BDT	0-320	1/64s	Brake Drop Time: The rate at which the brake voltage is dropped from the Brake Hold Voltage to zero volts.
BHD	0-320	1/64s	Brake Hold Delay: Time delay before dropping to hold voltage. During delay time the brake voltage is set to the brake lift voltage.
BHV	0-500	Volts	Brake Hold Voltage.
BLD	0-65535	1/64s	Brake Lift Delay: Brake lift delay after a start sequence is initiated.
BLT	0-320	1/64s	Brake Lift Time: Rate in which brake voltage is changed starting from Brake Start Lift voltage to Brake Lift Voltage.
BLV	10-500	Volts	Brake Lift Voltage: This voltage value must be less than 90% of the brake maximum parameter.
BMA	1-20	Amps	Brake Maximum Amps: This value should match the board's DC current configuration jumper setting.
BMV	20-500	Volts	Brake Maximum Line Voltage: AC line voltage supplied to brake board. Value of this parameter times 0.9 must be > Brake Lift Voltage (BLV parameter).
BRS	0-500	Volts	Brake Re-level Start lift Voltage: This brake voltage value is immediately output to the brake when a re-level is initiated.
BRT	0-320	1/64s	Brake Re-level lift Time: The rate in which the brake voltage is increased from the brake re-level start voltage to the brake re-level lift voltage.
BRV	1-500	Volts	Brake Re-level Voltage: Lift voltage during a re-level.
BSL	0-100	Volts	Brake Start Lift Voltage: This brake voltage value is immediately output to the brake when a run is initiated.
DBD	0-65535	1/64s	Dc Brake Delay time: Delay before starting DC voltage injection.
DBH	0-65535	1/64s	Dc Brake Hold time: Length of time for DC voltage injection.

POSITION

PAR	RANGE	UNIT	DESCRIPTION
DPD	0-20	DPP	Digital Position Adjustment: DPP (Digital Position Pulse) adjustment at the 12 inch (30 cm) and at the 6 inch (15 cm) leveling zone. If there is an error from the DPP at the 12" or at the 6" target, DPD parameter is the correction adjustment. If no correction is desired, such as during set-up, set DPD to zero.



DPL	0-40	DPP	Digital Position at 12 inch Leveling: Digital Position is calculated from floor position reference that should be at the 12 inch (30 cm) target. It is normally set to 31 or 32. ($12" / 0.375"$) = 32 (or 30 cm/ 0.95 cm)
DPZ	0-20	DPP	Digital Position at 6 inch Zone: Digital position, calculated from floor position reference, that should be at the 6 inch (15 cm) target. It is normally set to 15 or 16. ($6" / 0.375"$) = 16 (or 15 cm/ 0.95 cm)
FCP	0-65535	DPP	Floor position Count Preset: This value equals the DPP position associated with each floor. ULR, DLR and FCP parameters are normally set during auto-setup.
HMn	1-#FLs	Unit	Car HoMing designation: A maximum of four (4) floors can be designated for homing. The HM1 through HM4 parameters match the HM1 through HM4 input names. The floor designation does not have to be sequential.
LBY	1-#FLs	Unit	Lobby Floor: Default recall floor during regular zoning services.

DOORS

PAR	RANGE	UNIT	DESCRIPTION
CDT	16-200	1/16s	Door Open Time: Time for doors after answering a car call.
DCC	2-20	Units	Door Cycle protection Counter: Normally adjusted for 6 cycles before removing power form doors.
DCP	5-20	Sec.	Door Close Protection time: The amount of time the doors are given to close before taken out of service on door protect.
DDT	0-80	Sec.	Door open Time after activation of DOB input.
DHT	0-64	1/16s	Door Hold Time: Delay time before high-speed door opening. Only used on Dover OHS door operator circuits.
DOD	0-32	1/16S	Door OPEN Delay time: Only used on Otis 6970 door operators.
DOH	0-360	Sec.	Extra Door Open button Hold time: Only used with door hold buttons.
DOP	5-20	Sec.	Door Open Protective time: Amount of time allowed to open the doors before taken out of service on door protects
DOT	0-60	Sec.	Door Open button Time-out: Maximum amount of time doors are allowed to remain open form the door open input.
DRV	0-60	Sec.	Door Reversal: Used with a door reversal limit switch and operates at 1/2 door reversal time. Prevents the door from fully opening during electric eye reopening when the DRV parameter expires. The door will continue to open, to the DOL if the EE input is still active after the time has expired.
HDT	0-60	Sec.	Car Homing Door open Time: Amount of time door remains open when set on homing.
LDT	32-200	1/16s	Long Door open Time: Time used when car answers a hall call.
LDN	0-65535	1/16s	Local Next-up Door time: Only used for simplex car when lobby recall feature is enabled.
NDT	5-120	Sec.	Nudging Door Time: Time doors are allowed to be held open before nudging goes into effect.
SDT	4-48	1/16s	Short Door Time: Door time after electric eye or safety edge has been activated.
XDT	0-200	1/64s	Extra Door open Time: During a hall/car call stop, XDT parameter adds "door open" time to the SDT time once the electric eye is activated. Permits extra transfer time.



FIRE			
PAR	RANGE	UNIT	DESCRIPTION
FAL	1-# FLs	Unit	Fire recall Alternate Floor: The alternate floor to which car recalls when main fire floor sensor is activated.
FBT	1-65535	1/64s	Fire Bypass Timer for GSA fire standard.
FIR	1-# FLs	Unit	Fire Recall Floor: The main fire floor for phase 1 recall mode.
IFT	0-300	Sec.	Independent Fire Time: Time system takes to override independent service during fire phase 1 operation.
MOTOR FIELDS			
PAR	RANGE	UNIT	DESCRIPTION
FBC	0-400	Amps	Field Board Current rating. Amperage for which the motor field board is set.
FLV	0-480	Volts	Field Line Voltage: The nominal single phase AC line voltage that is input to the field power circuit.
FSR	0-128	1/16s	Field Strength Rate. Rate at which Weak Field Voltage (WFV) parameter increased to Run Field Voltage (RFV) parameter.
FSS	10-2000	FPM	Field Strength Speed: The car speed (fpm) at which the field regulator begins to strengthen the motor field voltage during deceleration.
FWR	0-128	1/16s	Field Weaken Rate: The time in which Motor Field Voltage will decrease from Run (full) Field Voltage (RFV) to Weak Field Voltage (WFV) parameter value.
FWS	0-2000	FPM	Field Weakening Speed: The car speed (fpm) at which the field regulator begins to weaken the motor field voltage during acceleration.
MFC	0-400	1/10A	Minimum Field Current. The minimum current required for the motor field board to detect that there is no field loss.
RFV	1-600	Volts	Rated Field Voltage: This is the Rated Field Voltage per the motor nameplate.
SFV	10-300	Volts	Standby Field Voltage. Motor field voltage maintained when car not running.
WFV	0-500	Volts	Weak Field Voltage: Voltage value for Weak Motor Field Voltage.
SLOWDOWNS AND LIMITS			
PAR	RANGE	UNIT	DESCRIPTION
DLR	0-65535	DPP	Down Limit position count Reference: The position associated with the limit must be entered and has a range of 1 through 5; is the absolute position in DPP counts of the limit.
EDR	1-65535	DPP	Emergency Down Reference: Position associated with emergency down limit switch. If car is out of position at this limit and exceeding a set speed, car will do an emergency shutdown.
ESV	0-65535	FPM	Emergency Slowdown Velocity: Maximum speed reference output at the slowdown limit switch. If car velocity exceeds limit velocity, speed reference will be clamped to ESV parameter setting.
ETV	0-65535	FPM	Emergency Terminal Velocity: Maximum velocity allowed at ETS limit switch.
EUR	1-65535	DPP	Emergency UP Reference: Position associated with emergency up limit switch. If car is out of position at this limit and exceeding a set speed, car will do an emergency shutdown.
LPE	1-65535	DPP	Terminal Limit switch Position Error: Position error that will result in an emergency slowdown. When car approaches a terminal landing, the instantaneous position when the limit switch opens is compared with the Limit Position Reference. If this differential value is larger than LPE value, the car will go into emergency slowdown.



TSV	1-65535	FPM	Terminal Slowdown limit Velocity: Maximum velocity reference at the terminal slowdown limit switch. If the car velocity exceeds the limit velocity, the computer will initiate an emergency slow-down.
ULR	1-65535	DPP	Up Limit Reference: The position associated with the limit must be entered and has a range of 1 through 5; is the absolute position in DPP of the limit.

MISCELLANEOUS

PAR	RANGE	UNIT	DESCRIPTION
ABT	0-65535	Sec.	Attendant Buzzer Time: Duration timer for the attendant buzzer to sound while a hall call is not being serviced.
ACB	0-65535	DPP	Bottom Access: On access mode, this parameter value equals the number of DPP counts at which the car will stop when traveling UP from the SLD1 limit switch.
ACF	1-6	FL.#	Access Floor when mid-shaft.
ACT	0-65535	DPP	Top Access: On access mode, this is the number of DPP counts at which the car will stop when traveling down from the SLU1 limit switch.
AND	0-10	Count	Anti-nuisance Dumping: Number of Car Calls which must be registered to enable dumping all the car calls when the Anti-Nuisance Load switch is not triggered.
AST	5-180	Sec.	Automatic Service Time-out: After this time, car is taken out of group service or hall service.
BAL	0-100	%	Balanced Load: Percentage of full load, only used for torque compensation with an analog load weigher.
BED	1-65535	Number	Building Elevator Designation: Number shown on Car Diagnostic screen.
CCD	1-128	Number	Car Call Dumping: Number of Car Calls that a car will answer without the Electric Eye activated then dump the remaining calls.
CCN	1-15	Number	Car Communications Number: Identifies the car for Car To Group communications.
CDH	1000-65535	DPP	Counter-weight Derailment High collision zone: The CDH point is when the bottom of the car meets the top of the counter-weight.
CDL	1000-65535	DPP	Counter-weight Derailment Low collision zone. The CDH point is when the top of the car meets the bottom of the counter-weight.
CKT	0-128	1/16s	Coded Keypad Time: Entry time limit to press the four push-button codes required during security mode. If this time elapses without completing the code, process is aborted & you must restart.
DIT	0-16	1/16s	Door Interlock Time: Time delay between switching from door close to door open.
DPF	160-960	DPP	Dpp Per Foot: The number of DPP counts per foot that the controller is expecting to count. Set to 320 for 32.0 DPP per foot on standard jobs.
EDS	None		Emergency Dispatch Setting: If car communication is lost with dispatcher, car will stop at floors set with this command.
EPF	1- #FLs	FL#	Emergency Power Floor: The recall floor for automatic emergency power service.
GCT	0-32	1/16s	Gong Cycle Time: Total On & Off time for the Down Lantern signal.
GOT	0-32	1/16s	Gong Off Time: On time = GCT - GOT; Off time = GOT
GP1,5	0-65535		General Purpose parameter: Settings are software specific. Set according to special instructions when used.
GRT	20-360	Sec.	Generator Run Timer: Time period that Motor Generator will be ON after the last call is answered.
HBT	0-32	1/16s	Handicap Buzzer Timer: OnTime for pulse of Handicap Buzzer.
HLD	0-60	Sec.	Hall Lantern Delay: Delay from slowdown initiation to send lantern output signal.



LFT	0-600	Sec.	Light and Fan Timer: Special time out to turn off lights and fan inside car when car is parked. (Optional, normal timer is same as GRT.)
LIC	16-25	msec	Low Intensity Cycle time: Used to pulse the car call lights so they glow slightly while the call is not selected.
LIO	2-9	msec	Low Intensity On time: The amount of time that car call light is on during each cycle time
LWT	0-64	1/16s	Load Weigher Time: Debounce time for analog load weigher signal.
MBT	0-65535	Sec.	Motor Blower Timer. Drop out timer for motor blower output.
NCF	0-12	Number	Number of Coded calls per Floor: Number of codes available per floor for keypad security. This number multiplied by the number of floors +1 must be less than the maximum of 300-code storage allocation.
OST	0-65535	1/16s	Overlay Slowdown Timer: Used to control NS output.
SPC	0-20	Unit	Start Sequence Protection Counter: Normally adjusted for 6 cycles to try starting motion before shutting car down.
TRC	0-10000	Unit	Torque Compensation: For drive torque compensation, with 100% load, a value of 10,000 will dictate 100% motor torque. For speed reference preconditioning, with 100% load, a value of 10,000 will dictate a 10% offset in the speed reference.



SECTION 20 - GLOSSARY

Below is list of commonly used terms that you will find throughout this manual. This section is developed to assist in understanding the meanings of these terms.

TERM	Description of Term
Address	A communication location given to a device usually using header jumpers.
Binary	A mathematical way to count using only 1 and 0 used in Digital communications.
Bit	A variable setting, which determines enabling, or disabling of specific features in the system.
Bite	A digital word that consists of 1 and 0.
Brake	An electro/mechanical device used to prevent the elevator from moving when the car is at rest and no power applied to the hoist motor.
Brake Coil	The wiring coil in the brake assembly that when energized allows the car to move.
CC1	The first Car Call board on the elevator car. Mostly mounted in the Car Operating Panel.
Choke	An inductor/capacitor network used to help smooth out the ripple voltage in a rectified direct current circuit (SCR Drives).
Circuit Breakers	A resettable device designed to open a circuit when excessive current flows in that circuit.
Commands	A request entered by the user, which orders the controller to perform a specific function.
Confidence Test	A self test displayed in the terminal mode of a laptop during startup of the CCU.
Control Status Words	A series of Digital words that consists of bits that are field changeable.
COP	A car operating board where the ar key switches and buzzers wire to
CPT	Car position transducer board (tape Selector assembly)
Device	A physical/mechanical component monitored by and used to execute/trigger input and output signals.
Discrete device	An external device that only accepts an output from the Microprocessor.
Download	A process of taking information from the controller and storing it on the laptop.
DPP	Digital Position Pulse
Emergency Terminal Slowdown Vanes	Vanes located at the top and bottom of the hoistway that monitor the speed of the elevator in those regions.
Encoder	A device used to change motion into a digital signal.
EPROM	Erasable programmable read-only memory.
EPU-Link	Extended Processor Unit Link for communication CPT, EPU and TOC board
Error Codes	A failure status indicator, which is returned by the system in order to locate the source/resolution of a problem occurrence.
Fault Code	See Error Codes.



TERM	Description of Term
Feedback	The transmission of current or voltage from the output of a circuit or device back to the input, where it interacts with the input signal to modify the operation of the circuit or device.
Final Limits	Mechanical switches wired into the safety circuit located a specified distance beyond normal travel at the top and bottom of the hoistway.
Flash	
Full Load	Rated capacity of the elevator
Fuses	A non-resettable device that opens when its current rating is exceeded.
Generator	An electro/mechanical device that converts AC current to DC current.
Governor	A mechanical speed control mechanism.
GP1	General purpose I/O board
Group	A system that controls 2 or more elevators by governing assignments in response to hall calls.
Hall Lantern	A corridor mounted signal light indicating that an elevator car is approaching that landing and the direction in which the car is to travel.
Header Jumper	A small jumper assembly made to slip over pins in order to complete a circuit.
Hoist Machine	The machine used in hoisting the elevator.
HPU	Hall processing unit used to convert or invert the push button or hall lantern signal to serial communication.
HPU Term	A termination board located at the bottom of the serial riser to load the voltage and communication signal.
IGBT	High current transistor used in ac motor drives
Input	Data entered by the user or from external mechanical devices, which is necessary for the system to process information and execute commands.
Leveling Vanes	Vanes located at each floor at a specific height from the floor that is used to tell the system where exact floor level is located.
Load Weigher	A device used to determine the weight on the car by means of using electro/mechanical switches or a proximity sensor.
Log On	A process where the user enters a command that will allow access to the microprocessors information.
Loop Circuit	A continuous circuit connecting the motor and generator armatures in series with each other.
Loop Filter	See Choke.
Magnetek DSD 412	The brand and model of DC drive used to send control voltage to the DC motor.
Magnetek HPV 900	The brand and model of the AC drive used to send control voltage to the AC motor.
Mainline	The mechanically operated switch in the machine room that applies or removes power to the elevator system.
Motor Field	The portion of a DC motor which produces the magnetic field for the armature.
MRC	Motor room controller SMI board
Normal Limits	Mechanical switches at each end of the hoistway that is wired to the direction circuits.
NVRAM	Non-volatile Ram memory used in the Magnetek drives.
Optical Leveling Unit	A car device consisting of emitters and detectors that provide signal to the controller as they pass hoistway vanes.



TERM	Description of Term
Output	Data (signals) sent from the Controller to the mechanical devices to (de) activate.
Parameters	Field adjustable settings that allow the user to program the system.
Response	(Gain) Refers to how closely the motor control systems responds to system changes.
Rollback	Refers to when the car slightly moves at the start of a run in the opposite direction for a short period of time.
RVU	Remote Video Unit found in the machine room that accesses the controller information.
S Curve	An adjustable speed pattern profile used to accelerate/decelerate and stop the car at the desired floor.
SCR	Silicon Controlled Rectifier used in Magnetek DC drives.
SEM	Serial Expansion Module
Serial communication	Information transmission in which the characters of a word are transferred in sequence over a single line.
Shunt Field	The primary magnetic field of a DC generator connected in parallel with the armature.
Single Phase	An AC voltage source consisting of 2 wires where only one wire is energized.
Slowdown Limits	Mechanical switches at the top and bottom of the hoistway that are used as backups to slow the car down should the main S-curve pattern fail.
System Inertia	The time it takes to accelerate at rated torque to motor base speed.
Tach	A small DC generator used in providing speed feedback to the controller in a generator drive system.
Temporary Jumpers	Short pieces of wire filed connected to temporarily bypass critical circuit.
Terminal Mode	A process of connecting to the microprocessor where information is exchanged back and forth by the use of characters.
Three Phase	An AC voltage source consisting of 3 wires each energized with 3 different power sources that are displaced 120 degrees apart in their AC sine wave.
TOC	Top of Car controller
Transformer	A static electrical device that uses electro/magnetic induction to transfer electrical energy between 2 circuits.
Upload	A process of taking information stored in the laptop and transferring it to the controller.
VFC	Velocity fault controller.
Volt Ohm Meter	A hand held device that allows the user to measure voltage or resistance in a circuit.
VVVF	Variable Voltage Variable Frequency is a way of controlling an AC motor.
Wizard	The windows based program provided by CEC to communicate with the controller.
Zones	Field programmable areas of a hoistway consisting of a certain group of floors that when instructed will have an unassigned elevator park at



Diagram Terminology

Below is a list of acronyms and their meanings used throughout this manual.

Acronym	Meaning
_C	Car Call Input
ACB	Access Bottom Switch
ACD	Access Down Button
ACT	Access Top Switch
ACU	Access Up Button
AFR	Auto Fault Reset
ALF	Auto Light Fan
ASB	Audible Signal Button
AU	Automatic Operation
BK	Brake Relay and Brake Relay Input
BKC	Brake Control
BKM	Brake Modulator
BLS	Brake Lift Switch
CDL	Cab Down Lantern
CEN	Controller Enable Relay
CFCF	Car Fire Switch Off
CFON	Car Fire Switch On
CGL	Car and Gate Lock monitor
CS	Car Safety Circuit
CTL	Car To Lobby
CUL	Cab Up Lantern
DC	Door Close Relay and Door Close Output
DCB	Door Close Button
DCL	Door Close Limit Switch
DET	Detector Edge
DFLZ	Down Floor Level Zone
DI	Door lock input (freight/swing doors)
DI1	Door lock aux. input (freight/swing doors)
DL	Main Door Lock monitor
DL6	Door Close Limit Switch @ 6"
DLZ	Down Level Zone
DNL	Down Normal Limit Switch
DO	Door Open Relay and Door Open Output
DOB	Door Open Button
DOL	Door Open Limit Switch
DPP1	Digital Pulse Line 1 from Tape Selector or Encoder
DPP2	Digital Pulse Line 2 from Tape Selector or Encoder
DRV	Drive Ready Verification
DRVS	Drive Shutdown Switch
DZ	Door Zone
EMSD	Emergency Stop Indicator
EMST	Emergency Stop Output from CCU



Acronym	Meaning
EPA	Emergency Power Automatic Lower
EPL	Emergency Power Light
EPX	Emergency Power car select
ESP	Emergency Power Sequence Transfer
ETSD	Emergency Terminal Stop UP
ETSU	Emergency Terminal Stop Down
FAL	Fire Recall Alternate
FBP1	Fire Bypass (Stop Switch)
FBP2	Hall Fire Bypass Aux (Stop Switch)
FLT	Fault Output
FLV	Floor Level Indicator
FR	Fire Recall Phase I
FSL	Fire Service Light
FSLH	Fire Service Light Hall
GL	Gate Lock Relay/Input
GL1	Aux. Gate Lock Input
GRP	Group
GV	Governor
HFBP	Lobby Fire Bypass Switch
HFON	Lobby Fire Switch On
HS	Hoistway Safety Circuit
IC	Independent Service Car
ICA	In Car Access
ICI	In Car Inspection
ICS	In car Stop Switch
IL	Independent Service Lobby
INB	Inspection Bypass Monitor
LBE	Lock Bypass Enable
LBP	Lock Bypass Monitor
LVE	Leveling Enable
LVE1	Leveling Enable 1
MA	Main Armature Contactor
MACC	Master Access Enable
MCC	Master Contractor Control
NP	Normal Power
NR	Nudging Relay and Nudging Output
OLF	Overload Fault
PI	Position Indicator
PT	Panel Test
PTB	Panel Test Button
PTD	Panel Test Down
PTU	Panel Test Up
RC	Retiring Cam Output
RDY	Ready To Run
RSB	Car Call Reset Button for Fire and Independent
RX+/-	Receive Lines of Communication



Acronym	Meaning
SD1	Down Slowdown Switch 1
SD2	Down Slowdown Switch 2
SM	Start Master
SMC	Start Master Control
SU1	Up Slowdown Switch 1
SU2	Up Slowdown Switch 2
TAKR	Access Relay
TCI	Top Car Inspection
TID	Top Car Inspection Down
TIU	Top Car Inspection Up
TX+/-	Transmit Lines of Communication
UFLZ	Up Floor Level Zone
ULZ	Up Level Zone
UNL	Up Normal Limit Switch

Table 9



COMPUTERIZED ELEVATOR CONTROL CORP.

Moving People. Moving Business.

RMA

Job Number: _____

Job Name: _____

Date: _____

RMA Number: _____

Company: _____

Address: _____

Returned Part:

Reason for return: (if defective, explain defect)



COMPUTERIZED ELEVATOR CONTROL CORP.

Moving People. Moving Business.

RMA

Job Number: _____

Job Name: _____

Date: _____

RMA Number: _____

Company: _____

Address: _____

Returned Part:

Reason for return: (if defective, explain defect)



COMPUTERIZED ELEVATOR CONTROL CORP.

Moving People. Moving Business.

RMA

Job Number: _____

Job Name: _____

Date: _____

RMA Number: _____

Company: _____

Address: _____

Returned Part:

Reason for return: (if defective, explain defect)



COMPUTERIZED ELEVATOR CONTROL CORP.

Moving People. Moving Business.

RMA

Job Number: _____

Job Name: _____

Date: _____

RMA Number: _____

Company: _____

Address: _____

Returned Part:

Reason for return: (if defective, explain defect)



COMPUTERIZED ELEVATOR CONTROL CORP.

Moving People. Moving Business.

RMA

Job Number: _____

Job Name: _____

Date: _____

RMA Number: _____

Company: _____

Address: _____

Returned Part:

Reason for return: (if defective, explain defect)



COMPUTERIZED ELEVATOR CONTROL CORP.

Moving People. Moving Business.

RMA

Job Number: _____

Job Name: _____

Date: _____

RMA Number: _____

Company: _____

Address: _____

Returned Part:

Reason for return: (if defective, explain defect)
