



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.

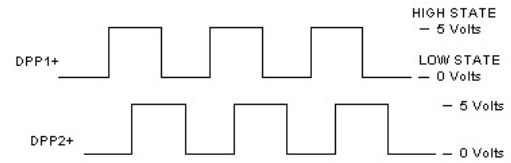


Figure 8-1

- 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.)

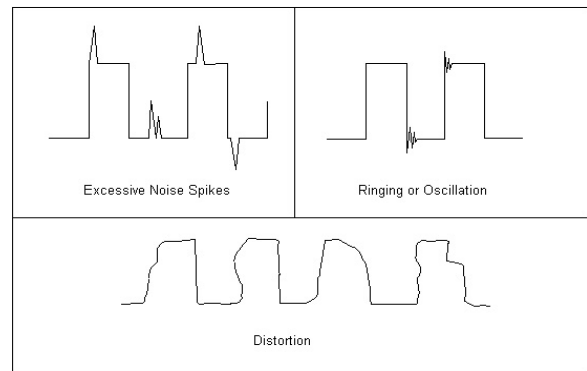


Figure 8-2

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

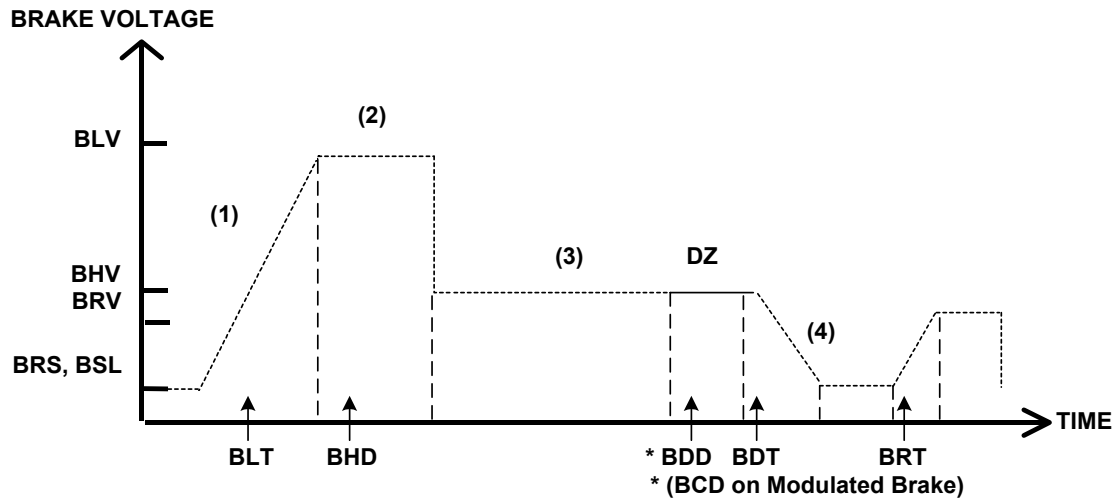


Figure 8-6

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 ½ 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.*

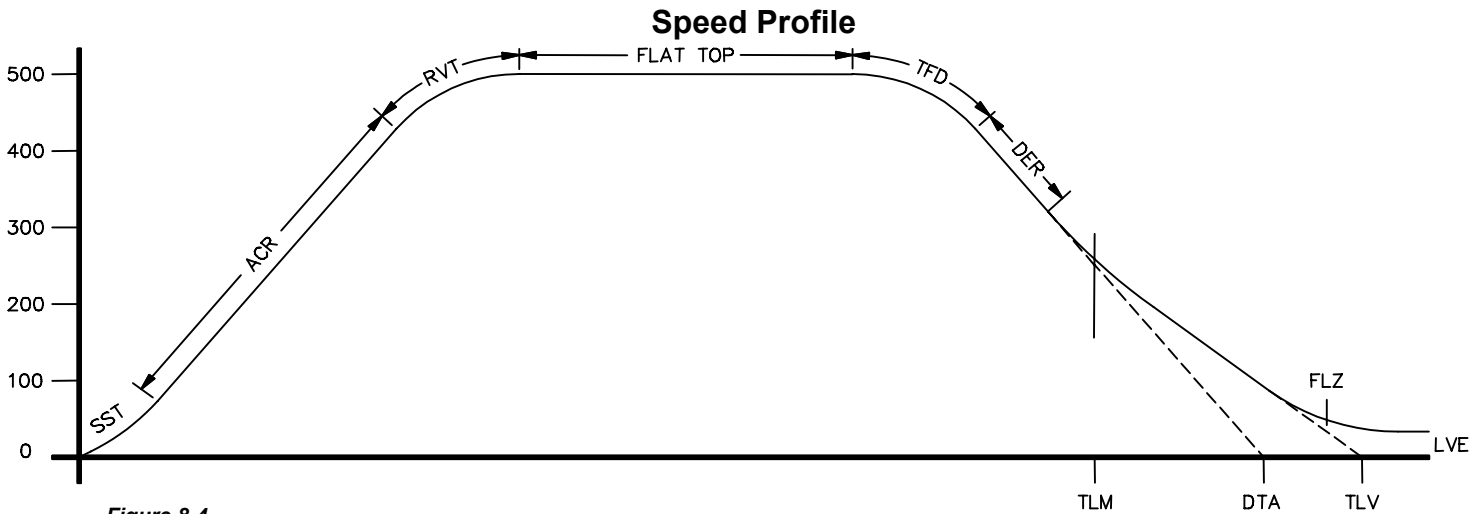


Figure 8-4

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 FL at 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 TA rget (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

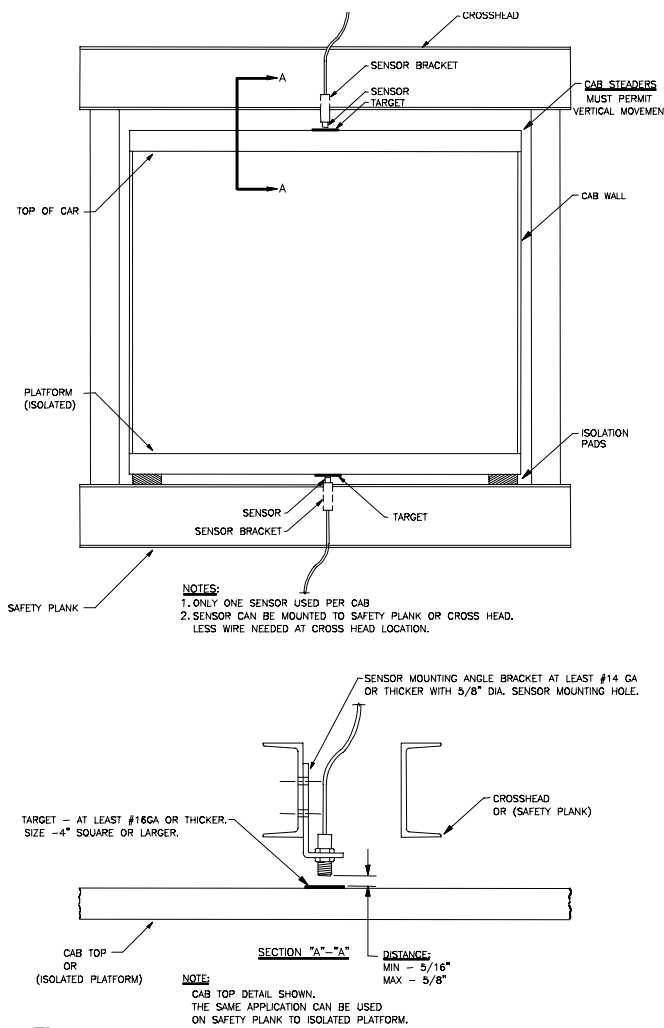


Figure 7-7

Load Weigher Wiring

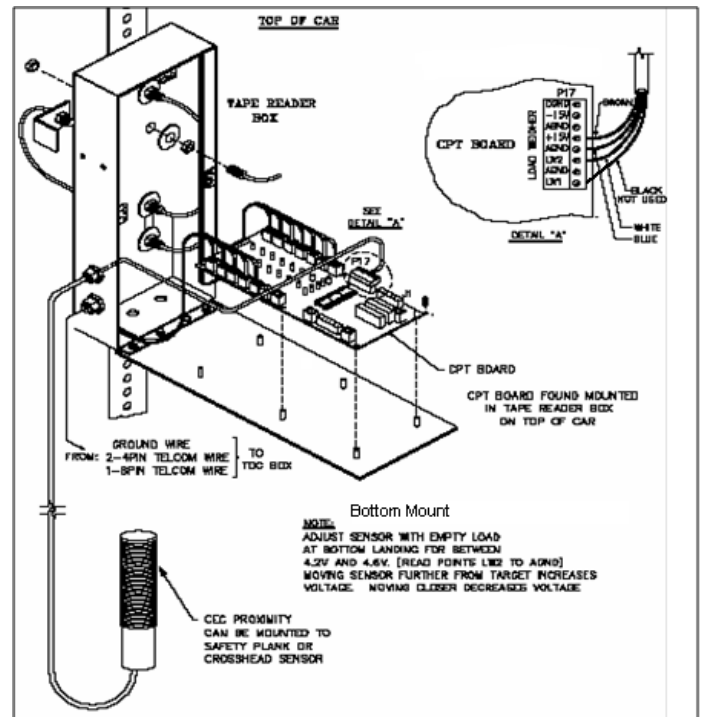


Figure 7-8

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 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 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.

