



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

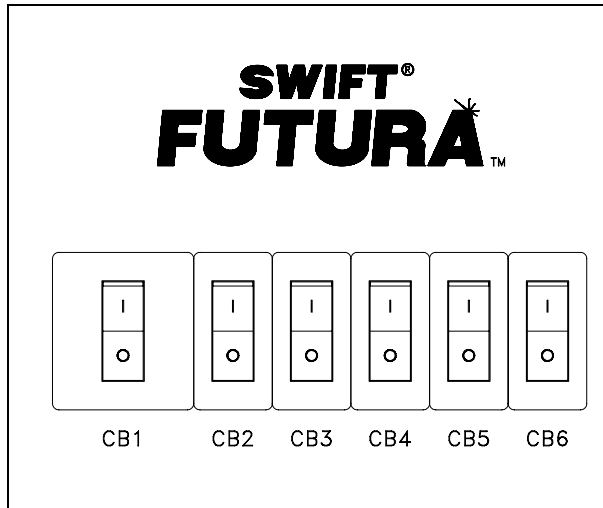


Figure 3-1

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

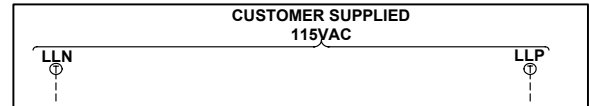


Figure 3-2

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

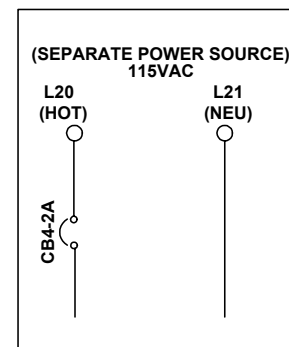


Figure 3-3

- 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

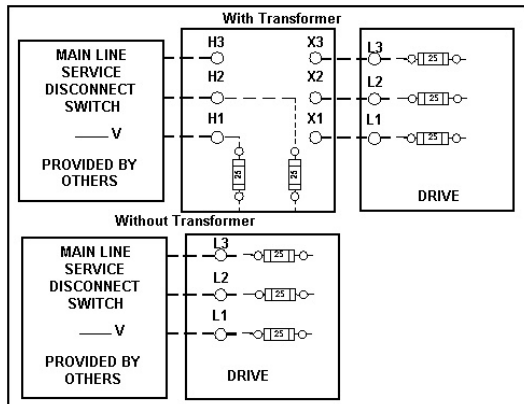


Figure 3-4

- 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

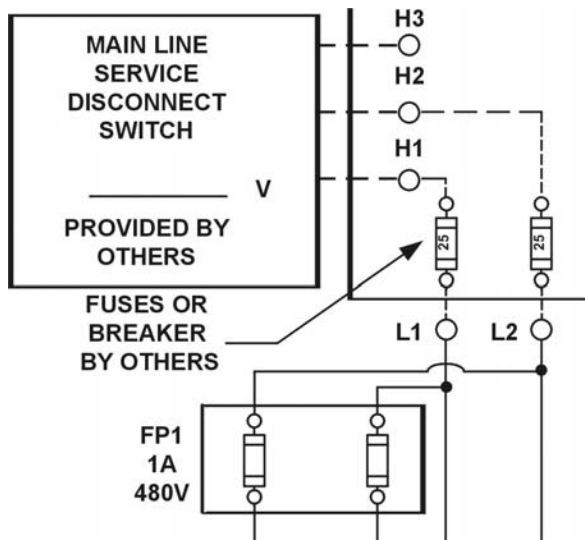


Figure 3-5



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

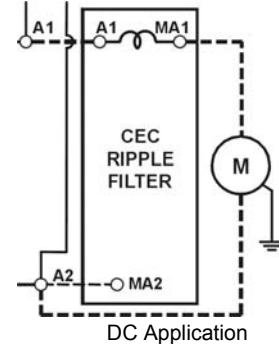


Figure 3-6

- 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.]

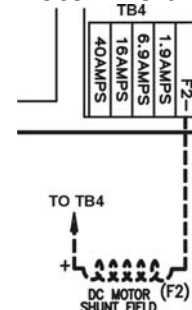
Brake Wiring



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



SCR Application

Figure 3-8

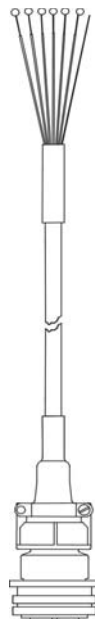


- 4) The fourth circuit is for the brake switch (if required). These 2 wires can be run with the motor wires.

- 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
	DINAPAR 7 PIN	DINAPAR 10 PIN	KUBLER 9 PIN	RELAND 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

- Check the brake coil:
 - Disconnect the brake coil leads (BK- & BK+).
 - With an ohmmeter, measure the coil resistance and verify it matches the value given on the straight-line diagram power distribution page.
 - Next measure the brake coil leads to ground and verify that neither brake lead is grounded.
- 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

- Verify all transformer taps are connected for proper voltage according to the Power Distribution page of the wiring diagrams.
- Verify the mainline voltage:
 - Measure and record the input voltage at the mainline disconnect.
 - Ensure the voltage agrees with the job voltage +/- 10%. See the Power Distribution page of the wiring diagrams.
 - 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.
 - Turn on CB1 and verify there is 115 VAC or 230 VAC (see wiring diagram) for proper voltage requirement) between terminals LD1 and LD2.
 - 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 (NOT FOR TEMPORARY SWITCH)	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.

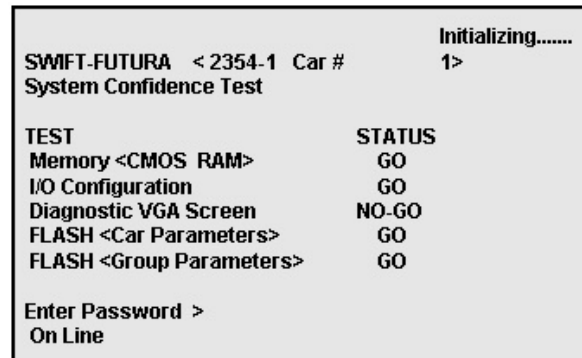


Figure 3-10



6. 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.*

7. Enter the password – "INSTALL."
8. Verify the prompt returned on the screen matches the car number. C# 1=> is car 1 of this group.
9. Enter IVE=50. (Inspection Velocity)
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 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)

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 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 3-11.*

1. At the password prompt enter the following password – **HUDSON.BAY**
2. Enter the following command – **EPI2374**, wait for "EPI ok", then 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.

SWIFT-FUTURA < 2325-1 Car #		Initializing.....
System Confidence Test		1>
TEST	STATUS	
Memory <CMOS RAM>	GO	
I/O Configuration	GO	
Diagnostic VGA Screen	NO-GO	
FLASH <Car Parameters>	### EEPROM No EEPROM	
NO-GO		
FLASH <Group Parameters>	NO-GO	
### EEPROM No EEPROM		
WAIT ... Initializing drive ...		
Enter Password >		
On Line		

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.*



STARTUP PROCEDURES DSD 412

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.

STARTUP PROCEDURE DSD 412

MOVING THE CAR ON INSPECTION FOR SERIAL DRIVES

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

Car Diagnostic Display

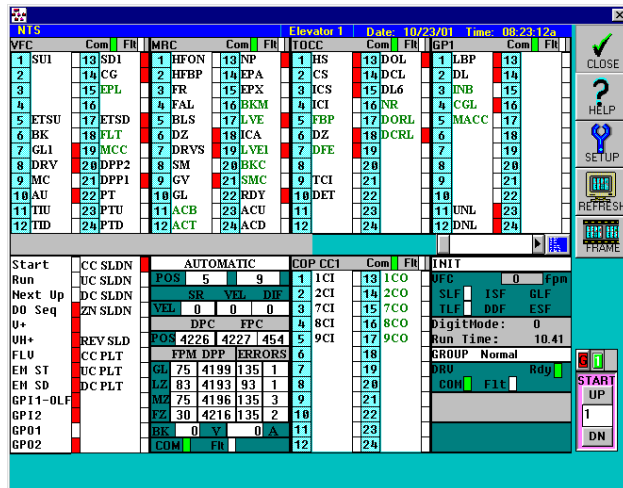


Figure 3-12

2. Uncouple motor encoder from the machine.
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

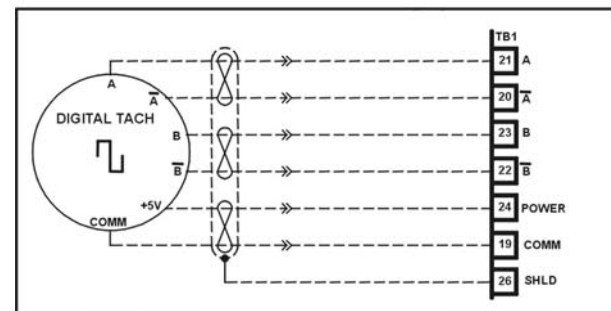


Figure 3-13

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

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
CGDLA (2Kcode)	CGL	FLT

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.
9. **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.*
10. Run the elevator in both directions verifying it runs without vibrations. See Drive information for eliminating vibrations.
11. 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.

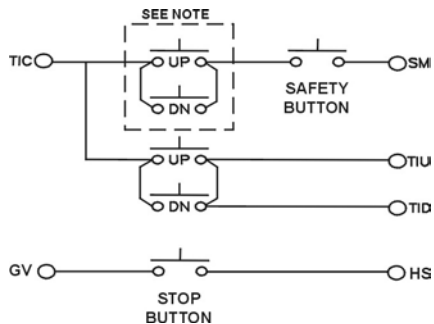


Figure 3-15

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

