WORLD electronics

GFC-IIA

Manual

7000.9012

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TABLES

DESCRIPTION

A. SPECIFICATIONS

1. Supply Voltage – 220 to 240 VAC, 60 Hz, Single – Phase.

2. Control Inputs – Contact closures or NPN transistor (+20 VDC and 10 mA).

3. A. The following direction and speed functions are selected by contact closure to the common line:

Directions	Speeds
UP	**HIGH**
DOWN	**INTERMEDIATE**
	APPROACH
	LEVEL
	RELEVEL

3. B. Maximum Contract Speed – 400 fpm. Actual maximum operating speed depends on motor and generator used with this unit.

4. The speed output voltage is determined by the highest speed selected if more than one control input is activated. Any control input not connected will be ignored, and adjustment of the associated potentiometer will have no effect.

5. Generator Field Excitation
   a. Field resistance range –40 to 150 ohms.
   b. Maximum current – 5A (50 % overload for 10 minutes maximum)
   c. High speed range –0 to +140 VDC (220 V input)
   d. Intermediate speed range –0 to +75 VDC.
   e. Approach speed range –0 to +30 VDC.
   f. Level speed range –0 to (Level +10, Relevel +20)
   g. Acceleration and deceleration rates are independently adjustable from 0.5 seconds to 4 seconds.

6. Motor Field Excitation
   a. Field Resistance range –30 to 150 ohms.
   b. Maximum current – 8A.
   c. Standing voltage – 100 VDC nominal.
   d. Leveling voltage – 200 VDC (220 V input)
   e. Running voltage – automatically inversely proportional to generator field excitation voltage. When generator field is at maximum voltage the motor field running voltage is adjustable from 100 to 200 volts.
   f. Leveling (or forcing) field is applied when either an up or down direction input is selected.

7. Brake Excitation
   a. Resistance range –100 to 500 ohms.
   b. Maximum current –3 A.
   c. Output voltage –200 VDC (220 V input)
   d. Brake energizing and de-energizing delay time adjustable from 0.00 to 1.75 seconds

8. Soft Stop Power Supply - +35 VDC at 30 mA.

9. Fuse Protection
   a. Motor Field, 15A type ABC
   b. Generator field, 15A ABC
   c. Brake and internal control, 3A type ABC

10. Ambient Temperature Range - - 40ºF to +130ºF

11. Size and Weight
    a. Size – 6" high X 10" wide x 7" deep b. Weight approximately 5 lbs.

B. FRONT PANEL CONTROLS

1. Eight potentiometer control knobs are located on the front panel. These controls are referred to in this text by the names on the panel, i.e., ACCELERATION, HIGH, etc..In the adjusting procedures, the adjuster is instructed to "turn HIGH clockwise" instead of "turn the high speed knob clockwise". The name and functions of the front panel controls are listed below.

   a. ACCELERATION – adjusts the time required to accelerate from zero to the maximum speed. With the control set fully counter clockwise the time required is approximately five seconds. With the control fully clockwise, the time required is approximately one-half second. Typically, the control is set approximately mid-range (12 o'clock) for comfortable acceleration.

   b. DECLERATION 1 & 2 – adjust the voltage decay time from a maximum of approximately five seconds to a minimum of approximately one-half second. With the controls fully counter-clockwise the time is approximately five seconds. (NOTE: The acceleration and deceleration controls are activated only when high speed and intermediate speed are used). Deceleration 1 is use in conjunction with HIGH speed. Deceleration 2 is active with INTERMEDIATE speed. When job conditions require a one floor run speed, INTERMEDIATE speed and DECLERATION 2 is used. On longer runs, the combination of HIGH speed and INTERMEDIATE speed are used for slowdown.

   c. HIGH – the generator field voltage is controlled by the HIGH adjustment after the acceleration time has elapsed. With the HIGH fully counter-clockwise zero volts is produced through the generator field while maximum voltage is produced with the control fully clockwise.

   d. INTERMEDIATE – the function of INTERMEDIATE is identical to that of HIGH.

   e. APPROACH – provides accurate and regulated voltage when APPROACH speed is selected. APPROACH is selected when the HIGH speed contact opens.

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f. LEVEL - controls the generator field control voltage for leveling. With LEVEL fully clockwise, the maximum voltage is approximately 10 volts. With control set fully counter-clockwise the maximum output is 0.25 volts (240 mV).

g. RELEVEL – The generator field voltage for RELEVEL is adjustable from 0 to approximately 20 volts. This voltage is usually set to be twice the value of LEVEL speed voltage.

h. MOTOR FIELD WEAKENING – adjusts the motor field running voltage. The motor field voltage is inversely proportional to the generator field voltage, and the motor field weakening control adjusts the level to which the motor field is reduced. For example, a typical motor has a requirement for a running field voltage of 175 volts. With the motor field voltage weakening control at approximately 12 o'clock and the high speed control at near maximum, the output for the motor field voltage is approximately 175 volts. A motor with a requirement of 125 volts would require the motor field weakening control to be set at 4 o'clock.

THEORY OF OPERATION

A. THEORY

1. General – GFC II A is a solid state drive unit which interfaces the relay controller signals with the voltages and drives required to operate the machine. Separate voltages are produced in the GFC II A to drive the motor field, the brake and the generator shunt field. Since the machine is connected in a Ward-Leonard drive configuration the generator shunt-field voltage is primarily responsible for governing the speed of the car. Therefore, the generator shunt-filed voltage is varied to adjust the leveling, and finally to stop. Separate excitations are provided for the brake and motor field. The motor shunt field is varied from a standing field during the standby, to a forcing field for leveling and finally back to a standby field once the car is stopped. In summary, the GFC II A supplies all of the excitation voltages for the machine and coordinates the application of the brake power and motor field with the generator shunt-field drive.

2. Signal Inputs – The GFC II A has provision for seven signaling inputs. These inputs are divided into two categories: direction and speed. Two separate direction inputs, UP and DOWN, are required. The five speed inputs are HIGH, INTERMEDIATE, APPROACH, LEVEL AND RELEVEL speeds. The unit is designed so that the UP and DOWN signals determine the polarity of the output drive to the generator shunt field. Each of the speed controls operates circuitry in conjunction with the front panel speed adjustments which adjust the amplitude of the output drive to the generator shunt field. Thus, when the HIGH speed contact is closed, the HIGH speed adjustment knob in the front panel of the GFC II A determines the amplitude of the output voltage to the generator shunt field. Similary, when the INTERMEDIATE contact is closed, the INTERMEDIATE control on the front panel determines the amplitude of the drive to the generator. If both HIGH and INTERMEDIATE contacts are closed simultaneously, the highest of the two settings determines the amplitude of the drive to the generator field. The APPROACH, LEVEL AND RELEVEL contacts, in conjunction with the respective front panel controls, operate special circuitry which provide a very of stable slow down operation. Again, if two or more controls are enabled at the same time, the highest setting determines the output of the GFC II A.

3. Acceleration/Deceleration – is obtained by charging and discharging a capacitor with constant current sources. The current for each of these sources is adjusted by the ACCELERATION and DECELERATION controls on the front panel of the GFC II A. For example, if a normal run is initiated, a direction is commanded, and the HIGH speed is closed. The capacitor is then charged by the acceleration current source up to the voltage control by the HIGH speed adjustment. When the HIGH speed contact is open, the capacitor is discharged by current from the discharge current source causing the output to the generator field to be reduced smoothly toward zero. As the car approaches the floor, the APPROACH contact being closed causes the output of the unit to level off at APPROACH speed. When the car reaches ¾ of an inch from the floor, the output of the unit is reduce to zero because at this time the direction command is removed.

a. The GFC II A has two deceleration pots for controlling deceleration on 1 floor run requirements. Deceleration 1 is used for deceleration from HIGH speed to INTERMEDIATE speed and DECELERATION 2 is used to decelerate from INTERMEDIATE SPEED to LEVELING SPEED.

4. The Power Drive Section – As previously mentioned, the GFC II A incorporates three separate drives: one for the motor field, one for the generator drive, and one for the brake. The motor drive section includes a full wave diode bridge and a triac. Pulses are applied to the triac gate, causing the triac to conduct. The conduction angle of the triac is determined by the timing of the pulses; therefore, the output drive to the motor field is adjusted in amplitude by the timing of the pulses to the triac gate.

   Using a normal run as an example, when the direction is commanded, the pulses supplied to the triac gate cause the conduction angle to be large, thereby producing a high or forcing voltage output to the motor field. As acceleration proceeds, the output to the motor field is reduced to a weakened voltage adjusted by the MOTOR FIELD WEAKENING control. The motor field voltage is again increased to forcing for the leveling phase of the run, and reduced to standby at the termination of a run.

   The generator drive section consists of a triac triggered in phase with the 60 Hz line. Depending upon the direction commanded, the trigger causes the triac to conduct during either the negative or positive half-cycle, thus determining the direction of operation of the machine. The timing of pulses controls the speed of the operation – i.e., the earlier in a cycle the pulse occurs, the longer the conduction angel, therefore the greater the output voltage to the generator. Since the generator shunt field is an inductive load, the GFC II A requires that an external resistor and capacitor is used to compensate for the generator field inductance, and present an approximately resistive load to the GFC II A.

   The brake section consists of a triac and a diode and supplies a half-wave signal when a direction is signaled to the GFC II A.

5. Relay Interface Data – A listing of controller relay interface data is provided in Table 1 page # 6 and Interface diagram located in the back of this manual.

TABLE
RELAY INTERFACE DATA

Relay and Function	Contact Data
IR1 – Approach (High Level) Energizes when the car is more than 8" away from a landing and the intermediate (INT) and high speed (H) relays are dropped. Also energizes for INSPECT speed.	HL (1) N.O. 10mA at 20 VDC
D – Down Energizes when DOWN direction is commanded; drops while the car is at landing	D (5) N.O. 10mA at 20 VDC D (6) N.O. 10 mA at 20 VDC
U – Up Energizes when UP direction is commanded; drops while the car is at a landing	U (5) N.O. 10 mA at 20 VDC U (6) N.O. 10 mA at 20 VDC
FSP – FSP1 – High Speed Energizes at initiation of high speed run, and drops when deceleration begins	H (3) N.O. 10mA at 20 VDC

NOTE

The generator series field shunt wire, approximately six feet of No. 14 wire, is used on all installation to divert part of the generator series field current. The shunt wire can be shorter or longer to meet compounding requirements and should be coiled in the generator junction box to maintain the wire at the mean temperature of the generator.

INT – Intermediate Speed Energizes at initiation of a high speed run, and drops when the intermediate vane is reached.	INT (1) N.O. 10mA at 20 VDC

LU – LD – Level Speed UP
Down

Energizes when the FSP relay drops, and remains energized until the car reaches a landing.	10mA at 20 VDC

MOV – Potential

Energizes when the car is ready to run and drops when the car stops. (The relay coil must be in series with the safety circuits.)	P (4) N.O. 10mA at 20 VDC

RL – Relevel Speed

Energizes only when releveling	RL (1) N.O. 10mA at 20 VDC RL (1) N.C. 10mA at 20 VDC

SAF – Safety

Energizes and remains energized as long as all safety circuits are complete. (Safety circuits include cartop switch, up and down over travel limit switches, governor switch, safety clamp switch, and all primary safety devices).	SAF (2) N.O. 15 A at 240 VAC

FB – Suicide

Energizes when MOV energizes and drops following a one-second delay after MOV drops. (The one second time delay allows the soft stop voltages to become effective; when SR drops out, it connects the generator armature in a “bucking configuration”).	FB (1) N.O. 5 A at 250 VDC FB (2) N.O. 5 A at 250 VDC

B. CIRCUIT CHARACTERISTICS

The following paragraphs include information that may be helpful to the adjuster and/or trouble-shooting mechanic.

1. The GFC II A and circuits designed by **WORLD** are fail-safe in every respect. Any component failure will cause the machine to either stop or run at low speed.

2. Capacitor MFC is used to smooth the pulsating DC, thereby increasing the voltage of the motor field. If the capacitor opens, the field protection circuit will "oscillate" allowing the car to proceed (rather roughly) to a landing. At approach and level speeds, the "oscillation" will cease, and the car will "level-in" to the floor. If the MFC capacitor shorts, the motor fuse will open. These capacitors are used for dampening.

3. Capacitor GFC I functions (in a manner similar to capacitor MFC) to increase generator field voltage; if it opens, the car will run slow at all speed settings. If it shorts, the generator fuse will blow.

4. The FB relay should have a delayed dropout of about one-second; this allows the brake to remain lifted during the soft stop. The time delay also delays the suicide circuit during an emergency stop. (Otherwise, resultant high current damage the commutator).

5. If "spotting" develops, it usually results from over-compounding. An over compounded machine "spots" and/or "overshoots" high speed. For this reason, it is desirable to trim the diverter shunt until the machine is 5 to 10 percent under-compounded at level speed. The unit may need to be re-compounded after copper-oxide has built up on the commutator.

6. If performance time permits, the elevator ride will be more stable if the car is at level speed 3 inches before reaching the floor. At 7 fpm, it requires 2 seconds to travel 3 inches; this is approximately the time required to open the doors, thus the car should be stopped when the doors reach full open.

INSTALLATION AND INITIAL ADJUSTMENT

A. INSTALLATION

If required, install the GFC II A in a relay controller as follows:

1. Mount the GFC II A securely to the chassis with 2 mounting bolts.

2. Connect the interconnect cable between the controller and the GFC II A.

B. PROCEDURE FOR FIELD STARTING

1. Preliminary Steps – The steps listed below must be completed prior to field starting the elevator system. Verify each step as follows:

   a. The sling is hung on the hoist ropes. The counterweight must be filled with enough weight to balance the car weight.
   b. All hatchway accesses comply with applicable code requirements.
   c. All hoistway and machine room wiring is complete.
   d. Place sufficient weight in the counterweight to balance the platform or if the installation is complete, place balanced load on the car.
   e. The car safety has been adjusted to the manufacturer's specifications and the governor is installed and roped.

NOTE

While the car is hung on the temporary machine, test the safety by hand to ensure that it holds the car.

   f. Correct any malfunctions before proceeding.

2. Field Starting Procedure:

**********************************CAUTION**********************************

Read these instructions through carefully before starting to work and become familiar with the procedure. Follow the instructions cautiously; be alert to wiring errors, defective parts, etc.. If the elevator does not respond properly, trouble-shoot the system logically.
(SEE TROUBLESHOOTING CHART)

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   a. Check the line side of the disconnect voltage on all three legs.
   b. Remove the controller supply fuses and then remove the GFC II A connector plug.
   c. Turn on the disconnect and check the voltages at L1, L2, and L3 on the starter(s).
   d. Observe the RP (Reverse Phase) relay. If it is energized, proceed to the next step. If RP is not energized, reverse the phase to the controller by interchanging any two legs either at disconnect or any two power – input legs at the top of the starter. Check again to see if the RP is energized.
   e. Check rotation on the MG (Motor Generator).

NOTE

If the generator rotates the wrong way: Interchange T1 and T3 on the motor starter(s) for "across-the-line" start configuration; refer to the motor name plate for correct connection and instructions.

f. Set the voltmeter to the 250 VAC scale, and connect it to two adjacent sets of brushes on the generator. (Reduce the voltmeter to a lower scale when it is determined safe to do so.)

g. Check the suicide circuit by manually actuating relay FB.

NOTE

If the voltage builds up or the generator loads, drop FB immediately, and interchange GF1 and GF2 on the controller terminal strip. The generator voltage should be below 2.5V and should rise if FB and MOV are manually activated.

**********CAUTION**********

Do not let the voltage build up. The current will damage the wiring and motor commutator.

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h. Turn off the disconnect. Replace the controller fuses and reconnect the GFC-IIA.

**********WARNING**********

Generator brushes are 110 VAC to ground when power is applied to the GFC-IIA.

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i. Verify that the pit switch, buffer switches, governor, car top and safety plank switches are active and set.

NOTE

If the car is on the top final limit, temporarily jump the top limit switches until car leaves the limit.

j. Open the MA2-GA1 connection to open the loop circuit or lift the brushes on the hoist motor. Disconnect the brake wires BR1 and BR2.

k. Set the INSPECT/NORMAL switch to INSPECT, and close the door.

NOTE

Hoistway accesses must comply with applicable codes. If the cab is not installed or wired, jump the car safety circuits only on the platform terminal strip.

l. Deactivate the door motor.

m. On the GFC II A turn all speed knobs fully counter-clockwise.

n. Turn on the disconnect. (The MG should start). If the MG does not start, check the power control wiring diagram and connect the wiring as necessary. Connect a voltmeter to GF1 (-) GF 2 (+).

o. Set the controller to electrically attempt moving the car down the inspection speed. Some relays will energize and transfer.

p. Verify that the appropriate relays for moving down are operating correctly. Correct relays for direction.

q. Connect the volt meter (DC scale) from pin 5 (+) to pin 4 (-). This voltage should be 0. If not, check controller wiring and correct as necessary. Slowly turn the APPROACH knob clockwise observing the meter. The voltage should increase.

r. Move the voltmeter to GA1 (-) and GA2 (+). This polarity should be correct. If not reverse the GF4-GF5 cable wires and recheck from step "q".

s. Turn the disconnect off and reconnect the brake and loop circuits.

t. Turn on the disconnect and repeat step "p". The car should move down. If not, verify that MA1 is connected to GA2; MA2 is connected to GA1 through the series field; if these are correct reverse MF1 – MF2 field wires.

FINE TUNING

A. INTRODUCTION

After the field starting procedures have been accomplished, the GFC II A should be fine tuned. Because of differences in controllers and individuals job requirements, the control settings and indicated results are approximate.

B. GENERAL INFORMATION

Capacitor MFC smoothes out the pulsating DC and thereby raise the voltage to the motor field. If the capacitor opens, the field protection circuit will oscillate, causing the car to run roughly to a landing. At approach and level speeds, the oscillation ceases, and the car levels into the floor. If the MFC Capacitor is shorted, it will cause the motor fuse to blow. Capacitor GFC I is used similarly to raise the generator field voltage. If it opens, the car will run slow at all speeds; if it is shorted, the generator fuse will blow.

The FB (Field Protection) should have a delayed dropout time of about one second which allows the brake to remain lifted during the soft stop. It also prevents the suicide circuit from braking immediately during an emergency stop. The resultant high current might damage the commutator.

There is not acceleration curve to either the level or the relevel speed. If the car oscillates during relevel, adjust relevel to reduce releveling speed. If "spotting" develops, it is usually because the compounding has increased, and the elevator is over compounded. An over compounded machine "spots" and/or "overshoots" high speed. For this reason it is desirable to rim the diverter shunt until the machine is about 5 to 10 percent under-compounded at level speed.

C. PROCEDURE

Perform the fine tuning of the GFC II A as follows:

1. With the power off, set the ACCESS switch to NORMAL.
2. Place the TEST/RUN switch on the controller in TEST position.
3. Set ACCELERATION, HIGH, INTERMEDIATE, APPROACH and LEVEL control knobs to about 9 o'clock.
4. Set DECELERATION knobs full clockwise and MOTER FIELD WEAKENING knob at 12 o'clock.
5. Connect an ammeter (of proper value) in series with wire MF 1 to the host motor field. (Connect the positive lead of the ammeter to terminal MF 1 and the negative lead to field wire MF 1). Compare the measured current value with the value for field running current given on the hoist motor nameplate. (The motor field current should be at least as high as the nameplate value and preferably about 5 percent higher with the motor hot.)

NOTE

If an ammeter (Simpson Series 260 MULTIMETER or equal) is not available, another (but less accurate) method is to connect a voltmeter across terminal MF 1(+) and MF 2(-) and compare the measured value with the product of the nameplate values for field current and field –winding resistance.

6. Check resistors RMS 1 and RMS 2. Run the car on inspection and record the maximum current and voltage. Stop the car and wait until the field voltage has reached standing field value. Run the car again and with a stopwatch, check the time it takes for the field current to reach 90 percent of full field. Adjust standing field voltage to provide not more than one (1) second from standing field to 90% full field. However, do not adjust standing field to less than 50 percent of rated full current.

NOTE

The resistors are in series with capacitor MFC in the motor field voltage circuit. When the motor field resistance is 75 ohms or greater, there should be two 25 ohm, 200 watt resistors in series. If the field resistance is 74 ohms or less, there should be two 10 ohm, 200 watt resistors in series.

7. Turn the power on, set the INSPECT switch to normal, and place a car call to the terminal lading farthest from the car.

NOTE

The car should try to start, brake lift, etc.

8. Increase the HIGH speed setting until the car is running at about half speed.

NOTE

At the terminal landing, the car should decelerate quickly to approach speed.

9. Turn the APPROACH speed control until the car is going 15 to 30 fpm.

NOTE

When the level sensor is on a vane, the car should slow again.

10. Set the level speed for 8-12 fpm.

    a. After the car stops, send it to the opposite terminal.
    b. Check action of the selectors and slow down limit switches, and if functions are normal, run the car up and down.

11. Determine the maximum setting of the HIGH speed control knob as follows:

    a. Set a voltmeter on the 250 volt DC scale, and connect the leads between generator field terminals GFC 1 and GFC 2.

    b. Send the car on long runs, and slowly adjust HIGH clockwise. Using a hand tachometer set the car speed at 90 percent of contract speed. Record the voltmeter reading.

    c. Continue making long runs and adjust the MOTOR FIELD WEAKENING until contract speed is reached. Record the voltmeter reading.

    d. Place full load on the car.

NOTE

Be sure the brake has been properly adjusted to 125 percent of rated load. Run the car up and down and record the speed and voltmeter readings.

    e. Compare the readings for up travel with the nameplate data. Adjust HIGH speed and MOTOR FIELD WEAKENING to obtain the full load "name plate rating".

12. Adjust HIGH Speed and MOTOR FIELD WEAKENING until the car is running at full speed with proper running current in the motor field.

NOTE

As the motor speed increase, the field becomes weaker. Thus, these two knobs react on each other; all other knobs are independent. When adjusting for high speed, set the highest speed (up empty or down full load) to contract speed. If contract speed cannot be obtained without setting HIGH beyond the "do-not-exceed" point, the motor field may be weakening slightly (to not less than 90 percent of rated field current). If the problem cannot be resolved, contact WORLD engineering: 800-523-0427

13. After the HIGH speed has been set, set the DECELERATION 1 (outer knob) and DECELERATION 2 (inner knob) to 50 percent of rotation. Disconnect INTER-MEDIATE AND APPROACH INPUT (refer to typical hook-up diagram). Run the car and set leveling speed at 5-7 fpm.

    a. Adjust the series field taps for the lowest number of turns which will provide a slight over compounding (i.e. the load is lifted faster than it is lowered) at leveling speed. If series field shunts are used, remove all shunts before setting the series field, then add sufficient shunt until the machine is just under compounded at leveling speed (not more than 10% difference.).

NOTE

To reduce the effect of residual voltage in the generator, make a long run into a floor and without allowing the suicide circuit or the soft stop circuit to function, check leveling speed in the same direction. Reverse the run and check leveling speed again using the same method.

b. Adjust APPROACH as high as possible and still be able to see about 3 inches of level speed.

c. Reconnect APPROACH input and increase the approach speed until the leveling speed distance is reduced, then back off to just provide 3 inches of leveling speed.

d. Adjust DECELERATION 1 to provide a smooth slowdown to leveling speed.

e. Reconnect INTERMEDIATE speed input and make one (1) floor runs. Increase INTERMEDIATE speed until overshooting occurs. Then back off until you have 3 inches of leveling speed.

f. Check time from brake to brake for one and two floor runs. The times should be the same plus or minus 1 second. If not, check one floor run speed. It should be between 275 and 325 fpm. If one floor run speed is low, move the slow down vane closer to the floor; if higher, move the vane further away from the floor. Re-adjust per "e" above. Repeat as necessary to obtain a good one floor run time. Adjust DECELERATION 2 as necessary.

14. On cars that use the INTERMEDIATE speed, run the car up and down on one floor runs.

    a. Set INTERMEDIATE as high as possible and still be able to DECELERATE to approach speed without over shooting. (The car ride is now roughly adjusted.)

15. Check compounding as follows:

NOTE

Compounding can be checked either with a full load or an empty car. The full load give a stronger indication of the series field effect. On a high-use job, such as office buildings or hotels, compounding should always be done with a full load and the equipment at normal running temperature.

a. The series field shunt should be opened.
b. Choose the set of series field taps that will give the lowest amount of series field and still be over compounded (i.e. the load is lifted faster than lowered) at level speed.
c. To check the level speed, temporarily set DECELERATION fully counterclockwise, or until "spotting" just occurs.
d. Run the car at rated speed. Make a normal slowdown, and measure the leveling speed before the car stops.

NOTE

This is necessary to compensate for the residual effect in the iron.

e. Change the resistance of the diverter shunt (shorten or lengthen the dirverter wire until the machine is slightly under compounded at level speed. Not more than 10 percent difference).
f. Reset DECELERATION.
g. Make one and two floor runs and adjust acceleration and deceleration as necessary to obtain consistent operation and smooth transitions.
h. Check the ride under all conditions: long runs, one floor runs, and two floor runs, to all landings both up, down and with full loads, balanced lead and empty car.
i. Make any minor adjustments needed to prevent overshooting under any conditions.

D. **OVER SPEED TEST**

Over speeding of the car during safety test is accomplished as follows:

NOTE

It will be necessary to increase HIGH to maximum and may also be necessary to increase MOTOR FIELD WEAKENING to obtain governor tripping speed.

1. Using masking tape and pencil, mark the positions of the knob pointers of HIGH speed and MOTOR FIELD WEAKENING.

2. Over speed the car by first slowly turning HIGH clockwise and then turning MOTOR FIELD WEAKENING clockwise.

3. In a rare event the governor did not trip with completion of the procedure in the step, temporarily inset a 25 ohm, 200 watt resistor in series with terminal MF 1 (hoist motor field).

4. After the safety is set, return all controls to their original settings and remove the resistors.

SPEED LIMITING SAFETY CIRCUIT BOARD ADJUSTMENTS (CALIFORNIA ONLY)

A. SPECIFICATIONS

1. Power supply voltage	50 VDC ± 10%
2. Power supply maximum current	35 m A
3. Maximum input current from generator shunt field.	100 m A
4. K1, K2 relay contact paramentors	
Maximum voltage rating	200 VDC
Maximum current rating	0.5 amp
5. Circuit ambient temperature range	+ 32º F to + 135º F

B. INTIAL SETUP

1. The K1 and K2 relay series contacts in the elevator safety circuit must be shorted or jumped out so that the triggering of the over speed module will **NOT** cause the elevator to shut down.

    a. Disconnect or open the gate input so that the +50 VDC supply voltage does **NOT** exit on pin 18. Connect the over speed safety circuit input to the generator shunt field, pin 1 and 4. Connect the +50 VDC supply to pin 22 plus and pin 16 common. Turn the square, single turn potentiometer completely clockwise.

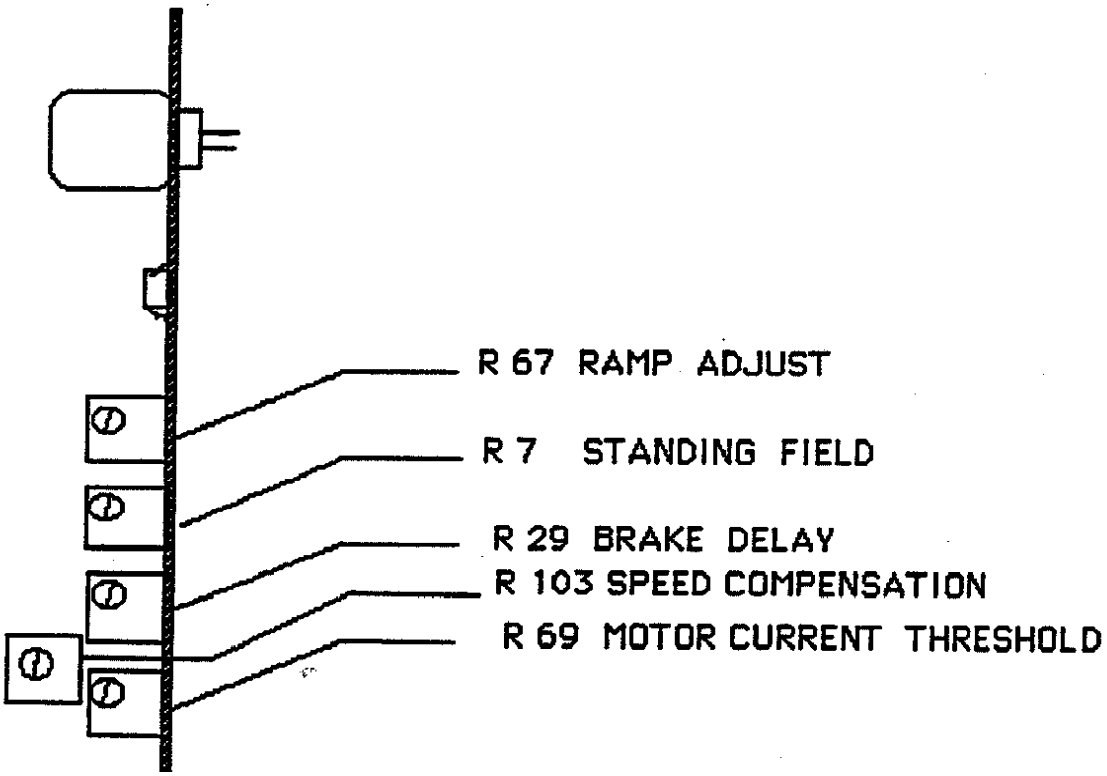
C. SLOW SPEED ADJUSTMENT

1. Run the elevator from terminal landing to the terminal landing. Adjust the high speed control so that your field tachometer reads 100 fpm. The over speed safety circuit led should be illuminated, however if it is not, momentarily press the reset button and the LED will light. While the elevator is traveling at 100 fpm slowly turn the threshold potentiometer clockwise until the reset no longer will light the LED. This completes the low speed adjustments.

D. HIGH SPEED ADJUSTMENT

1. Increase the elevator speed from 100 fpm to contract speed using the HIGH speed control and a field tachometer. Reconnect the gate input to the over speed safety circuit. The connection should place +50 VDC on the gate input terminal (pin18) when the elevator is at high speed or high leveling speed. Turn the high speed trip potentiometer completely counter clockwise. If you should turn this control more than twenty turns no harm will be done. Momentarily press the reset button, run the elevator from terminal to terminal at high or contrast speed. Slowly turn the pot clockwise until the LED is extinguished. Press the reset button. If the LED stays lit, continue to rotate the control clockwise until the LED is extinguished when reset is attempted. Carefully rotate the control 2 ½ full turns counter clockwise. Press the reset button, disconnect the jumped K1, K2 relay contacts and insert these terminals into the series safety circuit.

INTERNAL POTENTIOMETER ADJUSTMENT



INTERNAL ADJUSTMENT PROCEDURE

R-67 (RAMP ADJUSTMENT) Level Speed (R-11) Fully clockwise, adjust R-67 to 10 VDC across generator output (Pin 4 positive and Pin 5 negative leads for voltmeter).

R-7 (STANDING FIELD) With no speed and no direction, adjust R-7 to desired standing field voltage (100 VDC recommended), measure voltage across motor output (Pin 17 negative and Pin 16 negative leads to voltmeter).

R-29 (BRAKE DELAY) Factory set at approximately .75 seconds, turn pot clockwise will decrease delay time, counterclockwise will increase delay time (range is from 0.00 to 2.0 seconds)

R-103 (SPEED COMPENSATION) Select down direction, select LEVEL speed, adjust the desired voltage with the potentiometer labeled LEVEL on the front panel of the unit, drop the down and LEVEL speed, select up DIRECTION and LEVEL speed. Now adjust the voltage with the speed compensation POT to obtain the same level voltage that was adjusted with down direction.

R-69 (MOTOR CURRENT THRESHOLD) Factory set to decrease sensitivity, turn pot counterclockwise.

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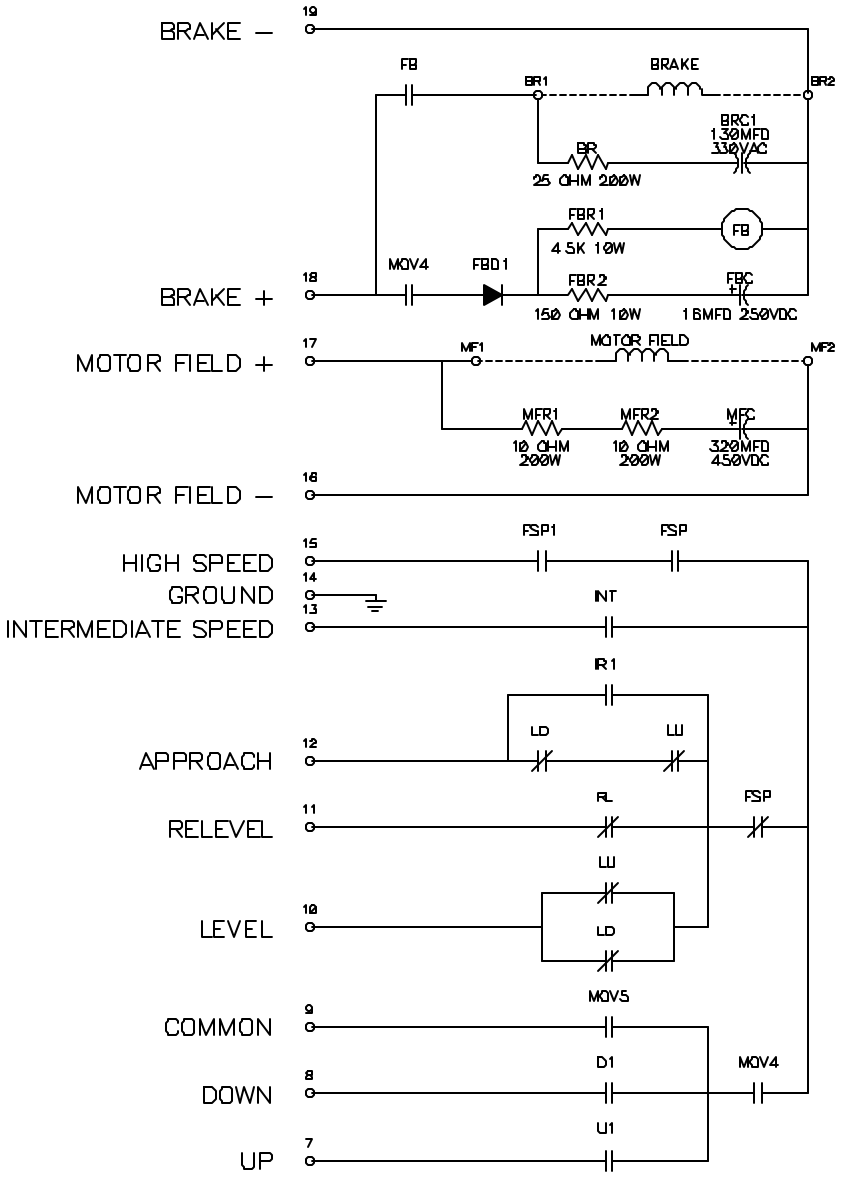
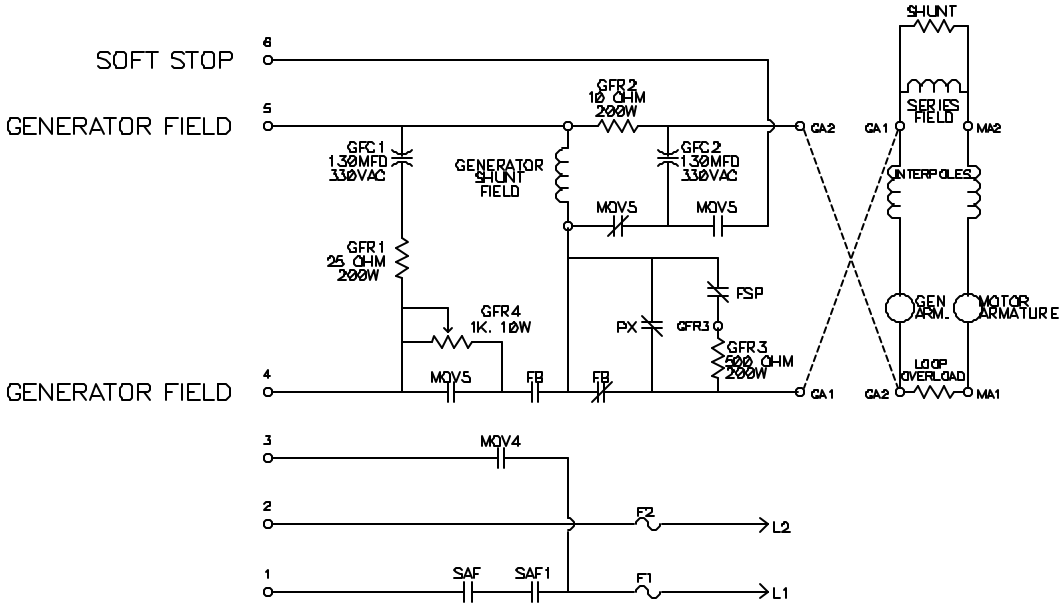
GFC – IIA TYPICAL HOOKUP





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