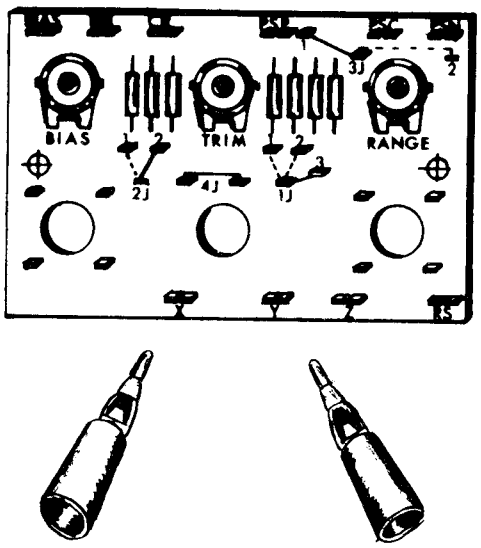
Westinghouse

22-1000
Adjustable Speed Drives



INSTALLATION INSTRUCTIONS FOR A PROCESS FOLLOWER KIT FOR 22-1000 DRIVES

I. L. 22-1000-23

Westinghouse Electric Corporation

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PROCESS CONTROLLER FOLLOWER

REFERENCE INPUT KIT S#1563A30G01

The Reference Input Kit is used to provide signal conversion and or attenuation as required for reference input intelligence to controller board styles 1459A04G01 (single-phase) and 1492A10G01 (three-phase). The kit also finds use with other types of controllers.

The kit provides various input options which are obtained through the positioning of jumpers 1, 2, 3 and 4 on the board and interconnections between the reference input board (RIB) and the drive controller board (CB).

The kit contains the reference input board (RIB) and the necessary hardware for mounting the board on the controller board CB. If the board is used with controllers other than S#1459A04G01 and S#1492A10G01 mounting hardware is not included within the kit and must be provided by the technican installing the board.

The "Kit" consists of a plastic bag containing the following components and hardware. Check the contents of the plastic bag.

1. Installation instructions I.L. 22-1000-23
2. Process controller follower board S#1563A35G01 in plastic bag.
3. Nylon spacers for mounting of board S#487B382H02 (2)
4. Jumper (wire) S#487B384G11 (1) (Long)
5. .164 Wide Stl. Washers (2)
6. .164 Stl. Lockwasher (2)
7. .164 - 32 X 1 - 1-1/2 Fil. Stl. Mach. SCR (2)
8. Jumpers (wire) S#487B384G09 (7) (Small)
9. Jumper (wire) S#487B384G10 (Long)

If a shortage exists, contact the nearest Westinghouse representative.

INSTALLATION INSTRUCTIONS - FIGURES 4 OR 5

1. Remove the AC input power from both the BC and the MC in 1 phase drives or (9CR) in 3 phase drives.
2. Insert the two nylon spacers into the two 5/16" square holes in CB, pointed end into hole.
3. Using the two sets of hardware, as shown in Figure 4 or 5 mount the RIB board on the two nylon spacers, be sure that three pots on RIB are in the position shown in Figure 1. Tighten screws securely but do not over tighten because nylon spacers could be damaged.

ELECTRICAL CONNECTIONS - FIGURE 2

Jumpers are provided for making the interconnections between RIB and CB. If the kit is to be used with a controller other than S#1459A04G01 or S#1492A10G01 these jumpers may not be useable, if not it is the responsibility of the technican installing the kit to provide suitable jumpers and interconnections, and to use good wiring practices at all times.

INPUT CONNECTION - FIGURE 3

For Constant Current (option A, B, D, 1F and 2F)
Connect the reference input to terminals 2 and 3 of the relay board (RB) with terminal 2 negative and terminal 3 positive.

For Regulator Current (option E)
Connect the base reference pot to terminals 1, 2, and 3 of the relay board (RB) respectively.

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OPTIONS

A. CONSTANT CURRENT REFERENCE INPUT CONVERSION

Constant current input intelligence is obtained from a constant current generating device or source such as a process instrument. Develops conversion from a milliampere current signal into the required voltage input signal for CB. Refer to figure 6 for 1 - phase controllers and figure 7 for 3 - phase controllers.

Figure 6 and 7 show all the wires for the options listed, make only the connections called for in the option you are using. All others are to be left off (See schematic Figure 8).

WIRING PROCEDURE:

A1. Remove jumper 3J between terminal RIN and terminal ROUT on CB.

A2. Connect a short jumper between terminal PSC on RIB and terminal PSC on CB.

A3. Connect a short jumper between terminal X on RIB and terminal ROUT on CB.

A4. Connect a short jumper between terminal Y on RIB and terminal RIN on CB.

A5. Jumper 1J on RIB should be positioned as follows:

A5.1 Position 1 for a constant current input with a maximum of 50 milliamperes.

A5.2 Position 2 for a constant current input with a maximum of 20 milliamperes.

A5.3 Position 3 for a constant current input with a maximum of 5 milliamperes.

A6. Jumper 2J on RIB should be in position 2.

A7. Jumper 3J on RIB should be removed, not used.

A8. Jumper 4J, on RIB should be removed, not used.

A9. Set minimum speed pot 2P on CB in maximum CCW position.

A10. Potentiometer 2P (Trim) on RIB is adjusted to obtain the required rated armature voltage for the maximum current input signal. Resistors 1R and 4R, inserted by number 1J, are used to de-sensitize potentiometer 2P. The armature voltage will follow the constant current signal directly, i.e. for a 5 to 1 variation of the constant current input signal a 5 to 1 change in armature voltage will be obtained. If a greater than 5 to 1 change in armature voltage is required for a 5 to 1 change in the constant current input signal option B should be used.

B. CONSTANT CURRENT REFERENCE INPUT CONVERSION. 5 TO 1 INPUT TO GREATER THAN 5 TO 1 CONTROLLER OUTPUT

Option B is used with nominal 5 to 1 constant current inputs as obtained from most standard constant current generators of process instruments. This option is an extention of option A. A fixed bias is inserted into input RN of CB to bias out the minimum (1/5th of maximum) constant current input signal, thereby holding the input signal to the controller at positive bias until the current input signal has increased enough to offset this fixed bias and cause the controller to develop a useable output. A positive bias on the controller, CB, biases the controller to cut-off and will remain at cut-off until the positive bias is offset by the minimum input current signal. Refer to figure 6 for 1 - phase and figure 7 for 3 - phase.

Figure 6 and 7 show all the wires for the options listed, make only the connections called for in the option you are using. All others are to be left off (see schematic Figure 8).

WIRING PROCEDURE:

B1. Remove jumper 3J between terminal RIN and terminal ROUT on CB.

B2. Connect a short jumper between terminal PSC on RIB and terminal PSC on CB.

B3. Connect a short jumper between terminal X on RIB and terminal ROUT on CB.

B4. Connect a short jumper between terminal Y on RIB and terminal RIN on CB.

B6. Connect a short jumper between terminal PSP on RIB and terminal PSP on CB.

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B6. Connect a long jumper between terminal RN on RIB and terminal RN on CB.

B7. Jumper 1J RIB should be positioned as follows:

A5.1 Position 1 for a constant current input with a maximum of 50 milliamperes.

A5.2 Position 2 for a constant current input with a maximum of 20 milliamperes.

A5.3 Position 3 for a constant current input with a maximum of 5 milliamperes.

B8. Jumper 2J on RIB should be in position 1.

B9. Jumper 3J on RIB should be removed, not used.

B10. Jumper 4J, on RIB should be removed, not used.

B11. Set minimum speed pot 2P on CB in maximum CCW position.

B12. Potentiometer 2P (Trim) on RIH is adjust to obtain the required rated armature voltage for the maximum current input signal. Resistors 1R and 4R, inserted by number 1J, are used to de-sensitize potentiometer 2P.
The armature voltage will follow the constant current reference input signal as it changes, however, the minimum current input signal will only offset the positive bias and will produce minimum (near zero) armature voltage. For a nominal 5 to 1 change in the input current signal a very wide (15 to 1 or greater) armature voltage change is realized. The magnitude of resistor 2R determines the available range of the armature voltage.

C. Internal Speed Control

Potentiometer 2P on RIB can be used as an internal speed control adjustment for installation where operator speed adjustment is undesireable.

Figure 6 and 7 show all the wires for the options l'sted, make only the connections called for in the option you are using. All others are to be left off (See schematic Figure 3).

WIRING PROCEDURE:

C1 Connect a short jumper between terminal PSC on RIN and terminal MIN on CB.

C2 Connect a short jumper between terminal X on RIB and terminal 2 on RB.

C3 Connect a short jumper between terminal Y on RIB and terminal MAX on CB.

C4 Jumper 1J on RIB should be in position 3.

C5 Jumper 2J on RIB should be in position 2.

C6 Jumper 3J on RIB should be removed, not used.

C7 Jumper 4J, on RIB should be removed, not used.

Maximum speed pot 1P on CB sets the maximum speed when pot 2P on RIB is in the maximum CW position. Minimum speed pot 2P on CB sets the minimum speed when pot 2P on RIB is set in the maximum CCW position.

Speed control is entirely within the controller enclosure.

D. Range Recalibration 3 Phase Only

Recalibration of the operational range of the controller by the insertion of a step bias into the internal regulator circuitry.

The polarity of the range bias signal is determined by the position by jumper 3J. Jumper 3J in position 1 provides a positive signal, or in position 2 a negative signal, from terminal Z to terminal PSC.

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The positive signal functions to provide a minimum output, minimum armature voltage with minimum input reference.

The negative signal functions to provide a maximum output, maximum armature voltage with maximum input reference.

Figure 6 and 7 show all the wires for the options listed, make only the connections called for in the option you are using. All others are to be left off (See schematic Figure 8).

WIRING PROCEDURE:

D1	Remove Jumper 3J between terminal RIN and terminal ROUT on CB.
D2	Connect a short jumper between terminal PSC on RIB and terminal PSC on CB.
D3	Connect a short jumper between terminal X on RIB and terminal ROUT on CB.
D4	Connect a short jumper between terminal Y on RIB and terminal RIN on CB.
D5	1. Connect a short jumper between terminal PSP on RIB and terminal PSP on CB for a positive signal. 2. Connect a short jumper between terminal PSP on RIB and terminal PSP on CB for a negative signal.
D6	Connect a wire Z from Pin Z on RIB to interlock on sequencing device SQR.
D7	Connect a wire OUT-1 on CB to interlock on sequencing device SQR.
D8	Set minimum speed pot 2P on CB in the maximum CCW position.
D9	With proper adjustment of pot 3P on RIB the final signal control ratio can be reduced to a selected reduced ration of the incoming reference signal.
D10	Jumper 1J on RIB should be positioned as follows:
D10.1	Position 1 for a constant current input with a maximum of 50 milliamperes.
D10.2	Position 2 for a constant current input with a maximum of 20 milliamperes.
D10.3	Position 3 for a constant current input with a maximum of 5 milliamperes.
D11	Jumper 2J on RI l should be removed, not used.
D12	Jumper 3J on RIB should be in position 1.
D13	Jumper 4J, on RIB should be removed, not used.
D14	Set minimum speed pot 2P on CB in maximum CCW position.

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E. Current Regulator Circuit 3 Phase Only

When a current regulator is required instead of the basic voltage or speed regulated controller design, the following interconnections and set-up adjustments are provided by using RIB.

Figure 6 and 7 show all the wires for the options listed, make only the connections called for in the option you are using. All others are to be left off (See schematic Figure 8).

WIRING PROCEDURE:

E1 Connect a short jumper between terminal PSC on RIB and terminal PSC on CB.

E2 Connect a short jumper between terminal PSP on RIB and terminal PSP on CB.

E3 Connect a lead between terminal CR on RIB to terminal 1 on the remote mounted current reference potentiometer.

E4 Remove jumper 4J, on CB (this removes pot 4P on CB from the circuit and transfers current control to the separately mounted current reference pot).

E5 Connect a lead between jumper 4J on CB, and terminal 2 on the remote mounted current reference potentiometer.

E6 Connect a lead between terminal PSC on CB and terminal 3 on the remote mounted current reference potentiometer.

E7 Jumper 1J on RIB should be in Position 3.

E8 Jumper 2J on RIB should be in position 1.

E9 Jumper 3J on RIB should be removed, not used.

E10 Jumper 4J, on RIB should be removed, not used.

E11 This circuitry applies only to controllers S#1492A10G01. The current reference potentiometer is set to maintain a pre-determined armature current magnitude when the drive motor is under loaded conditions. The controller is set-up as a current regulator with voltage limit.

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1F Bias Circuitry, 1. Phase Only

Single-Phase controller S#1459A04G01 is positively biased to insure regulator cut-off for zero reference input. For systems requiring close co-ordination between drive of dissimilar designs it is often necessary to minimize this positive offset bias. Potentiometer 1P on RIB, is provided for this purpose.

Figure 6 and 7 show all the wires for the options listed, make only the connections called for in the option you are using. All others are to be left off (See schematic Figure 8).

WIRING PROCEDURE:

1F1	Remove jumper 3J between terminal RIN and terminal ROUT on CB.
1F2	Connect a short jumper between terminal PSC on RIB and terminal PSC on CB.
1F3	Connect a short jumper between terminal PSP on RIB and terminal PSP on CB.
1F4	Connect a short jumper between terminal Bias on RIB and terminal Bias on CB.
1F5	Connect a short jumper between terminal X on RIB and terminal ROUT on CB.
1F6	Connect a short jumper between terminal Y on RIB and terminal RIN on CB.
1F7	Jumper 1J on RIB should be positioned as follows:
1F7.1	Position 1 for a constant current input with a maximum of 50 milliamperes.
1F7.2	Position 2 for a constant current input with a maximum of 20 milliamperes.
1F7.3	Position 3 for a constant current input with a maximum of 5 milliamperes.
1F8	Jumper 2J on RIB should be in position 2.
1F9	Jumper 3J on RIB should be in position 1.
1F10	Jumper 4J, on RIB should be used.
1F11	Set minimum speed pot 2P on CB in maximum CCW position.

When nominal process instruments having either a 1 to 5, 4 to 20, or 10 to 50 milliampere signals are used and the armaturevoltage follow must be from a minimum (near zero) to rated output. Additional jumpers or interconnections on RIB are required.

1. Jumper 2J should be changed to position 1.
2. Add jumper or lead between pin RN on RIB to screw terminal RN on CB. (Note, no wire should exist between screw terminals RN on CB and RB. Jog circuit not to be used).

Potentiometer 2P on RIB (Trim) is adjusted to obtain the rated armature voltage when the maximum constant current signal input is applied. Resistors 1R and 4R on RIB inserted by Jumper 1J, are used to de-sensitize potentiometer 2P.

With the reference input at minimum the bias potentiometer 1P on RIB is adjusted to just off-set the inherent positive bias of controller S#1459A04G01.

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2F Bias Circuitry, 1. Phase Only

Single phase controller S#1459A04G01 is positively biased to insure regulator cut-off for zero reference input. For systems requiring close co-ordination between drive of dissimilar designs it is often necessary to minimize this positive offset bias. Potentiometer 1P on RIB, is provided for this purpose.

A voltage input follower signal may be used instead of a constant current input signal as shown in Figure 3. A voltage input signal conversion from current to voltage intelligence for input into CB is not required, however, the use of trim potentiometer 2P on RIB may be used to trim the signal follower signal, SF (-) to SF (+) to the required signal for input into CB. It is suggested that pot 2P always is used and if not required to be positioned in the maximum CW position. Bias potentiometer 1P on RIB is used to minimize the inherent positive offset in CB as explained in Section 1F.

Figure 6 and 7 show all the wires for the options listed, make only the connections called for in the option used. All others are to be left off (See schematic Figure 8).

WIRING PROCEDURE:

2F1 Remove Jumper 3J between terminal RIN and terminal ROUT on CB.

2F2 Connect a short jumper between terminal PSC on RIB and terminal PSC on CB.

2F3 Connect a short jumper between terminal PSP on RIB and terminal PSP on CB.

2F4 Connect a short jumper between terminal Bias on RIB and terminal Bias on CB.

2F5 Connect a short jumper between terminal X on RIB and terminal ROUT on CB.

2F6 Connect a short jumper between terminal Y on RIB and terminal RIN on CB.

2F7 Jumper 1J on RIB should be removed not required.

2F8 Jumper 2J on RIB should be in position 2.

2F9 Jumper 3J on RIB should be in position 1.

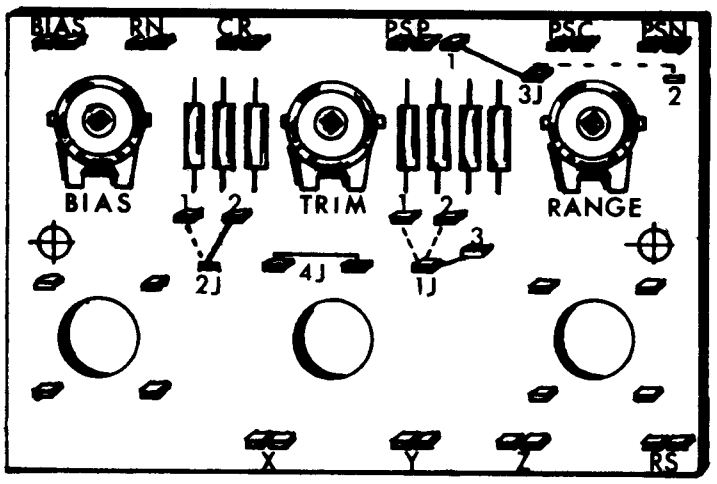
2F10 Jumper 4J, on RIB should be used.

2F11 Set minimum speed pot 2P on CB in maximum CCW position.

With the reference input set for maximum adjust trim potentiometer 2P on RIB to obtain rated output, rated armature voltage.

With the reference input set for zero volts trim Bias pot 1P on RIB to just off-set the inherent positive bias in CB S#1459A04G01.

Board RIB when used with the Accel-Decel RFG option is Pagoda mounted using customer hardware with the RFG board mounted closest to CB. The three large holes in RIB will provide access to the three potentiometers on RFG. Interconnections from CB should be to RIB and not to RFG. The necessary connections to RFG are made to the RIB board. RIB is provided with pairs of all pins to permit use of the RFG and RIB options at the same time.



REFERENCE INPUT BOARD
FIGURE 1

RIB
SCHEMATIC DIAGRAM

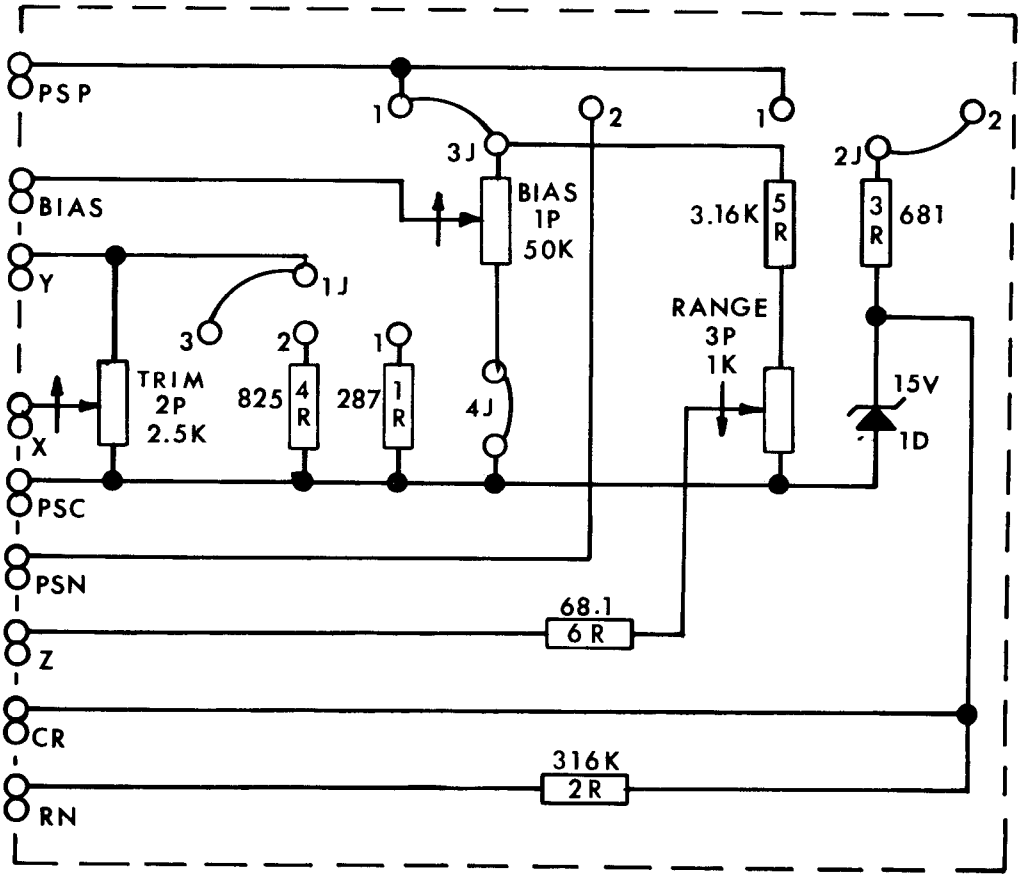


FIGURE 2

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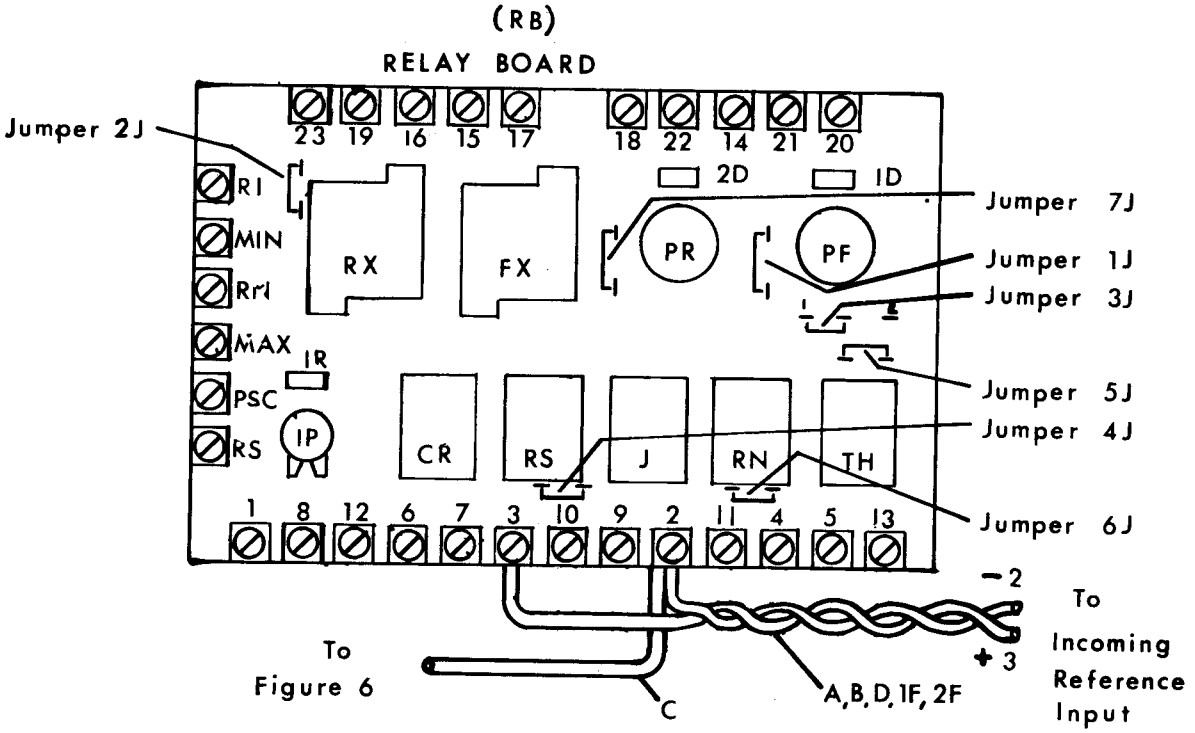

FIGURE 3

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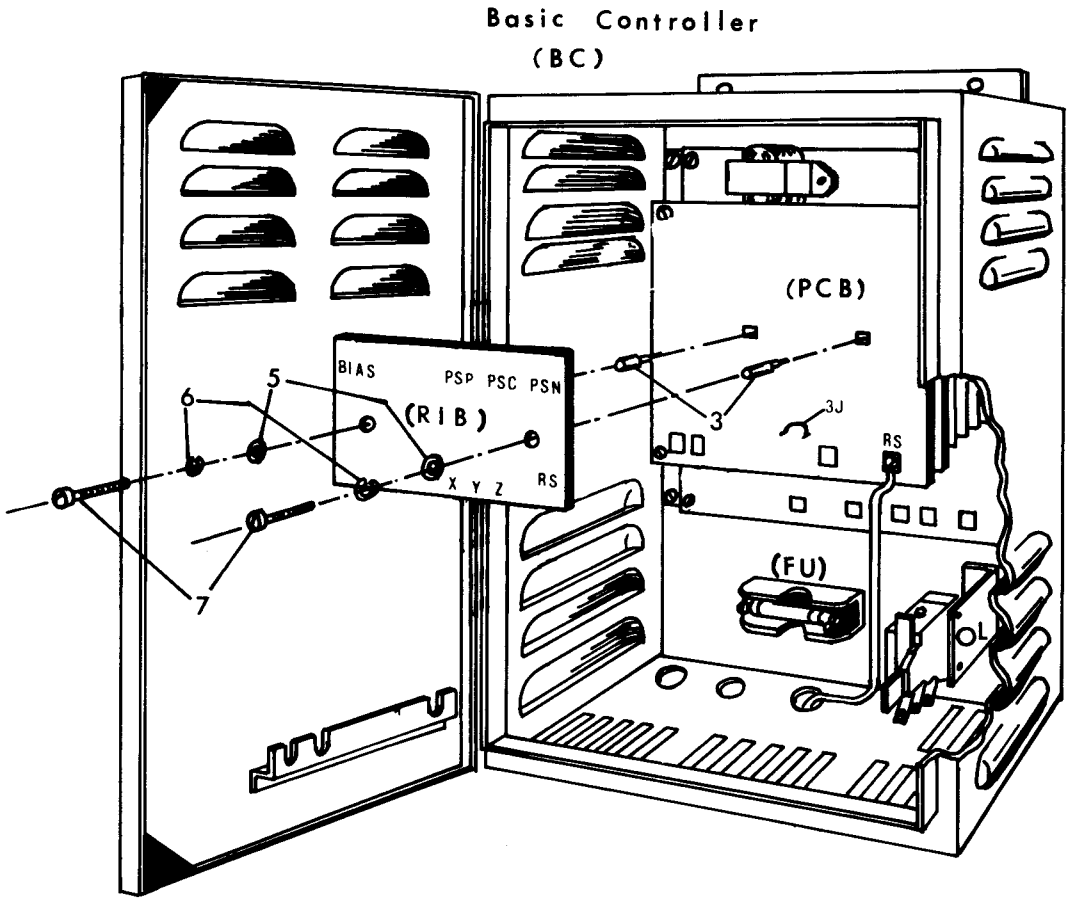

FIGURE 4

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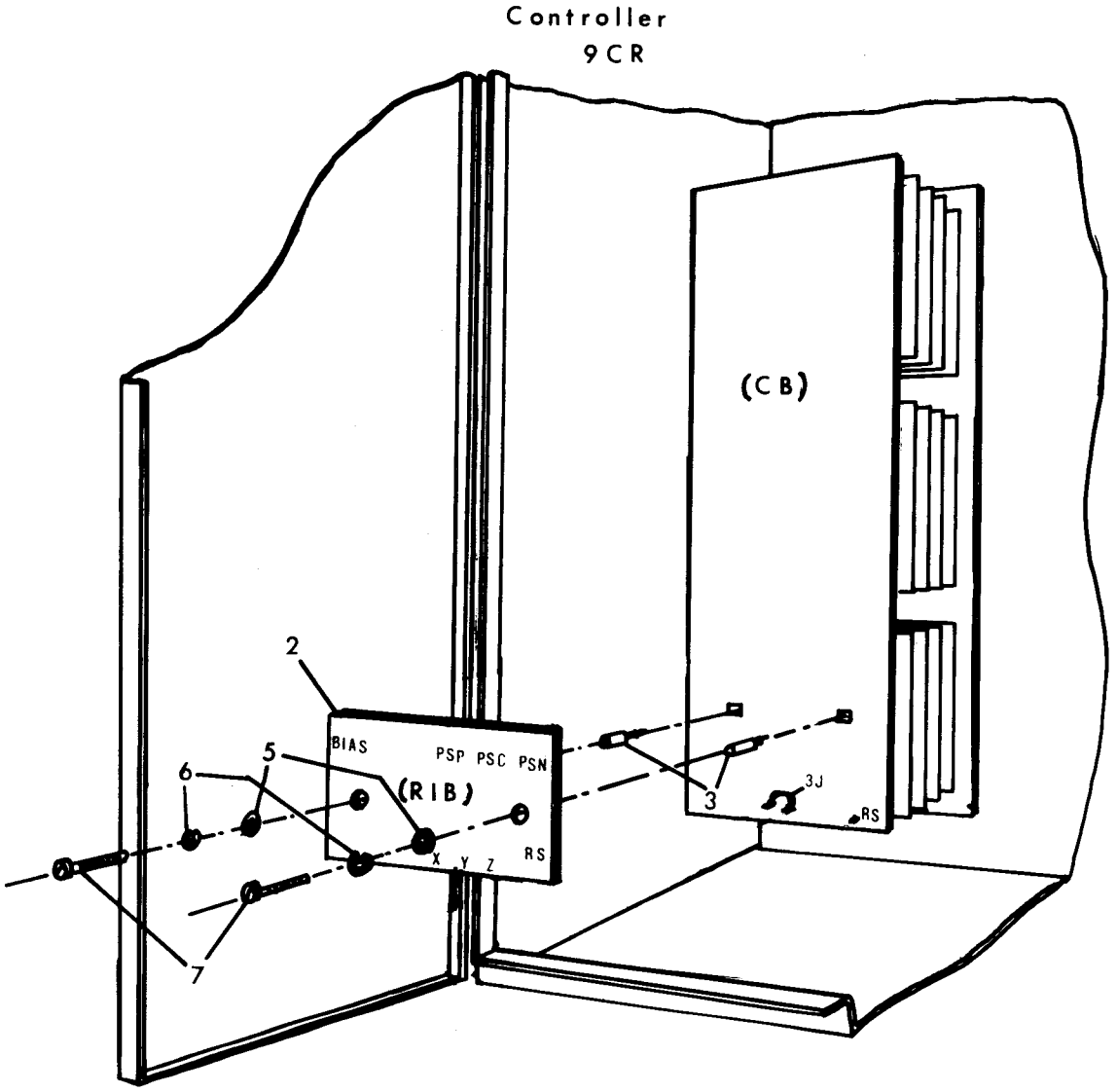

FIGURE 5

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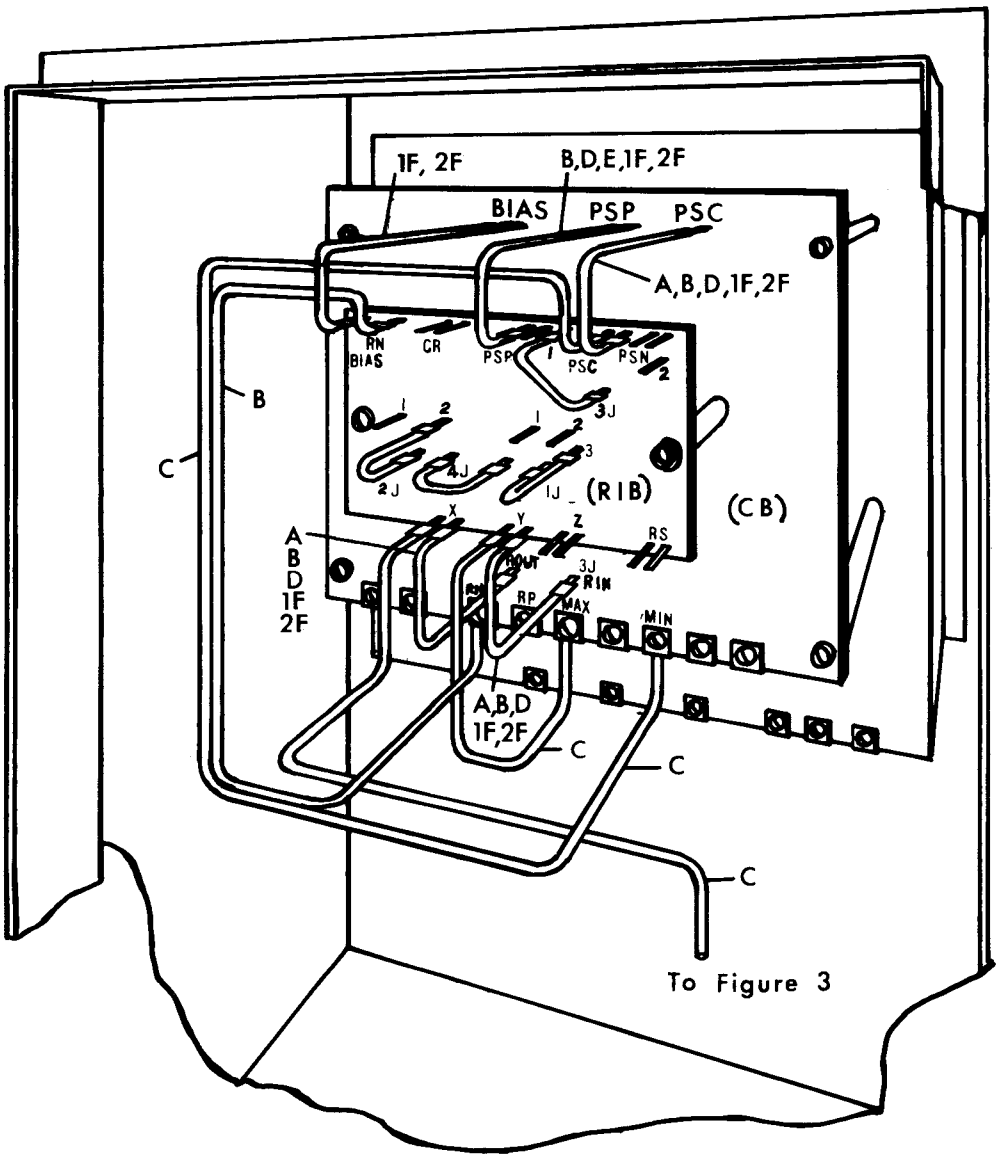

FIGURE 6

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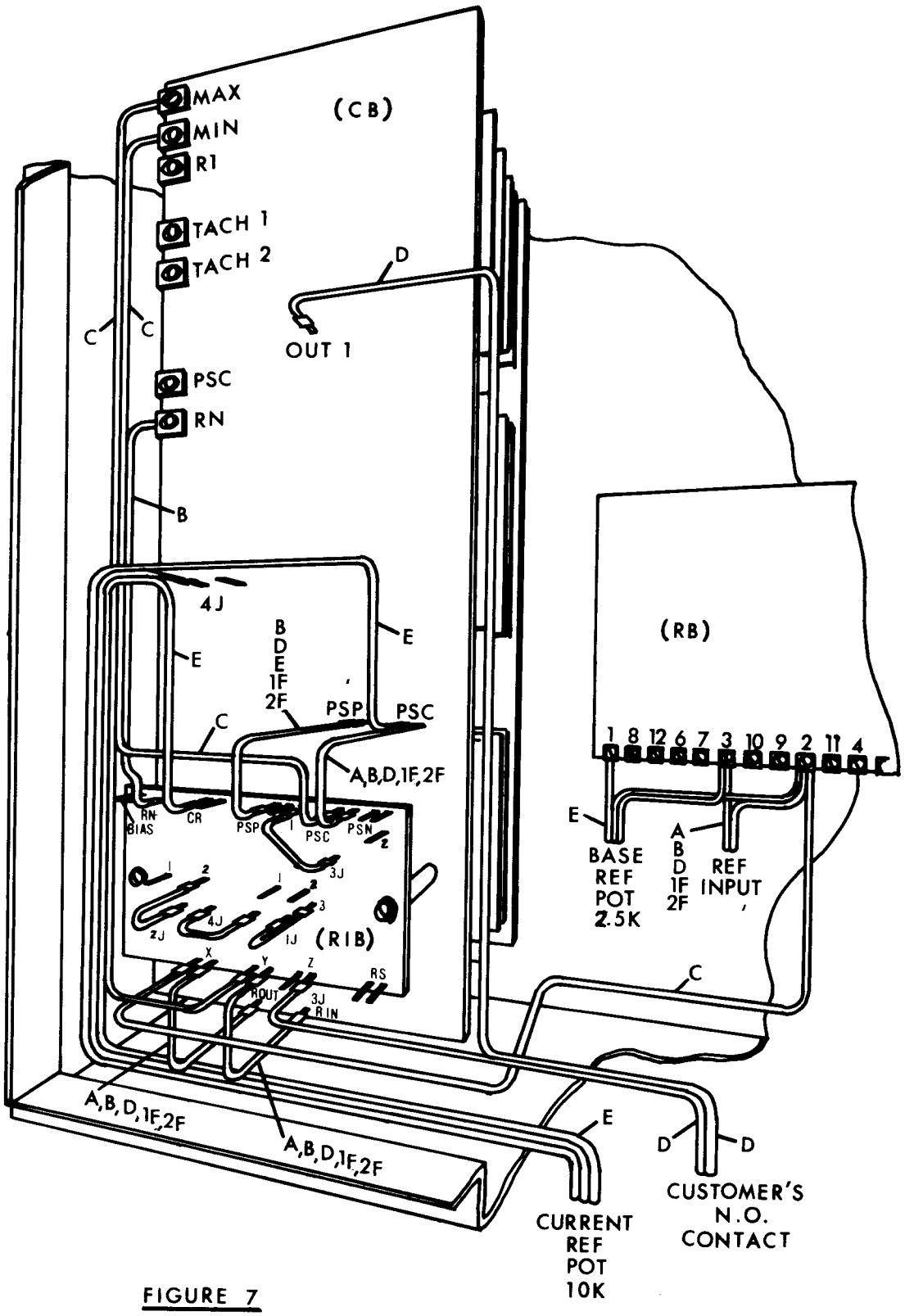

FIGURE 7

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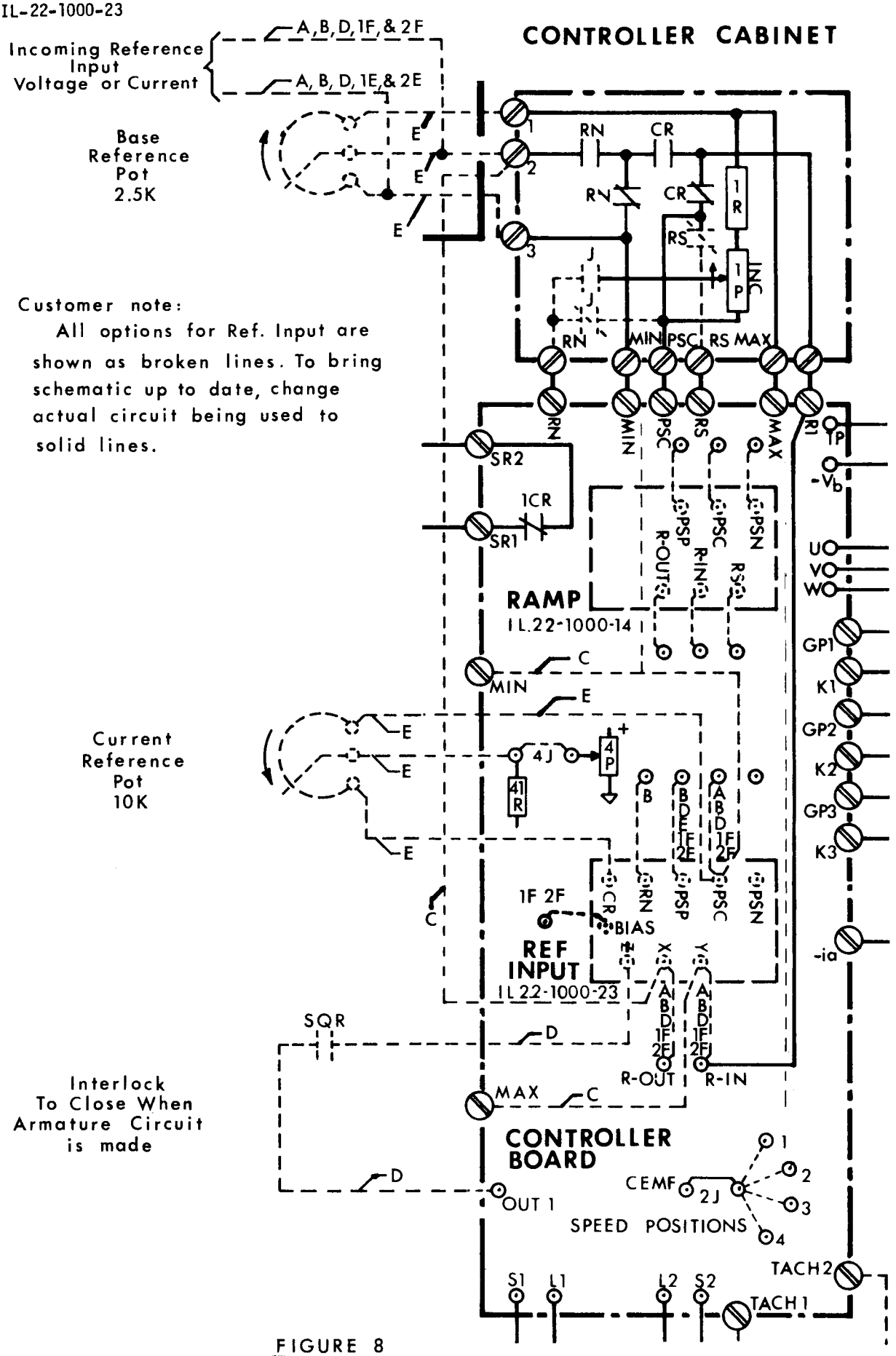

FIGURE 8

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