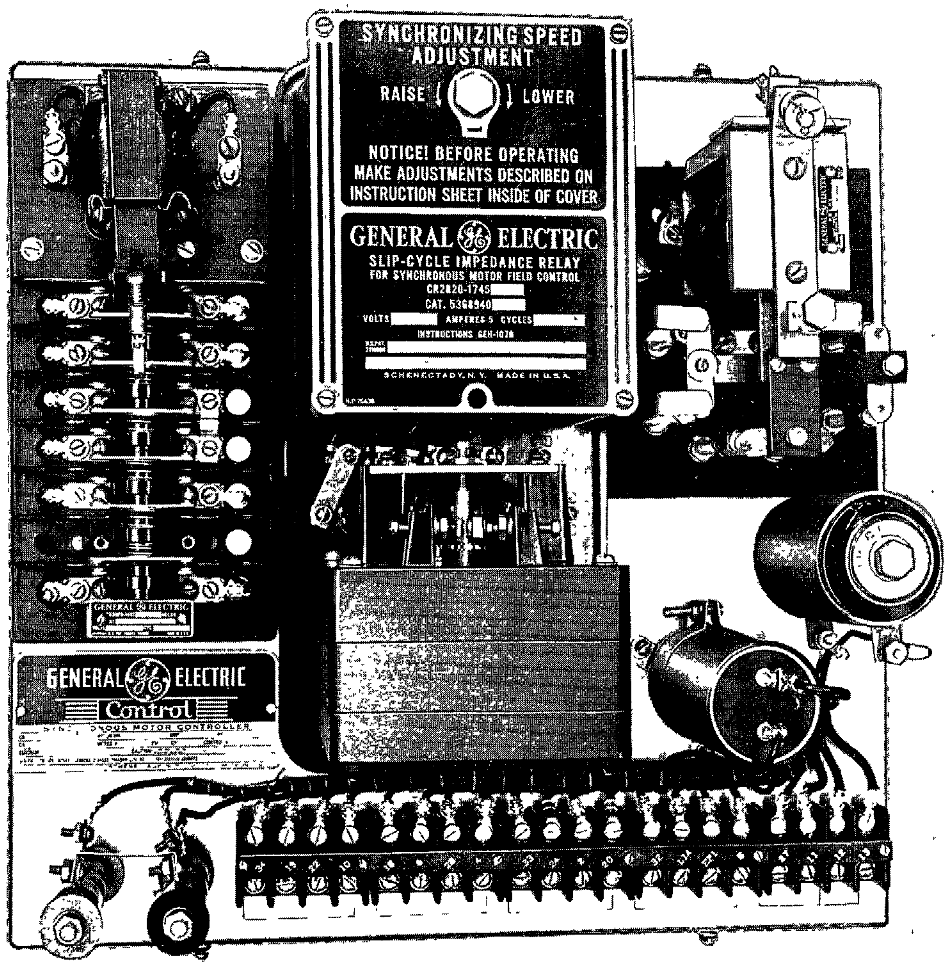
INSTRUCTIONS (Obsolete)

SYNCHRONOUS-MOTOR CONTROL
WITH SLIP-CYCLE IMPEDANCE RELAY
AND
CR7069-B1B FIELD PANEL



GENERAL ELECTRIC

CONTENTS

SYNCHRONOUS-MOTOR CONTROL

WITH SLIP-CYCLE IMPEDANCE RELAY

AND

CR7069-B1B FIELD PANEL

GENERAL

Synchronous-motor controllers for a particular motor rating can be operated magnetically or semi-magnetically by any one of five most common starting methods, the use of each depending on the requirements of the given installation. These starting methods and the controller nomenclature of the General Electric Company are classified as follows:

METHOD	MAGNETIC*	SEMI-MAGNETIC†
Full voltage	CR7065	CR7066
Reduced voltage (autotransformer)	CR7061	CR7062
Reduced voltage (resistor)	CR7063	
Reduced voltage (reactor)	CR7073	
Part-winding	CR7067	

* Magnetic control of a-c power with automatic field control.

† Manual control of a-c power with automatic field control.

For any of the above General Electric starting methods employed to apply a-c power to the motor stator, a reliable and an accurate means to control the application and removal of field excitation is provided by use of the slip-cycle impedance relay.

The system of field control, as included herein, provides the following features:

1. Accurate speed selection
2. Favorable angle selection
3. Simple adjustment
4. Prompt pull-out (field removal) protection

In conjunction with the automatic field control, complete motor protection is provided which consists of the following:

1. Motor shutdown (or field removal for re-synchronizing as required) immediately after pull-out

2. Temperature overload relays (hand-reset) for individual protection of stator and squirrel-cage windings. (Because of the widely different heating characteristics of these windings, individual protection assures that full use is made of the thermal-storage ability of the motor under all conditions.)

INSTALLATION

Installation of this equipment requires that the controller be mounted rigidly in the vertical position. Then REMOVE all packing, bracing, or blocking from all contacts on each device, which is for transit purposes only. OPERATE each movable contact device manually to assure free movement and full-contact action, and REMOVE all traces of any foreign matter from all contact surfaces.

Where such oil-immersed devices as contactors, oil-circuit breakers, or oil dashpots (undervoltage or current trip coils) are employed, remove each oil tank or container and fill to the indicator level with the oil supplied with the controller. It is to be noted that no oil substitutions should be made without first consulting the nearest General Electric Sales Office.

Inspect all wiring and see that the connections are clean and tight, and that there are adequate clearances for all devices.

All external wiring from the controller must be made in strict accordance with the main connection diagram supplied with the controller (refer to PURCHASER'S NOTES listed on the main connection diagram).

Any separate switching means for reversing the direction of motor rotation must be connected in the circuit between the controller and motor

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company for correct functioning of the field control relay (FR).

As indicated on the main connection diagram supplied with the controller, inspect the wiring to determine definitely that the starting and field-discharge resistor circuit is connected, in parallel with the motor field, through the discharge (closed) contact of the field-applying contactor (F) and the squirrel-cage protective relay (SCR).

DO NOT APPLY power to the controller or motor until the instructions under "Operation and Adjustment" have been studied.

OPERATION

For information concerning the operational sequence of the a-c power switching to the motor windings for the particular type of controller involved, reference should be made to the main connection diagram supplied with the controller.

A-C POWER SWITCHING TO THE MOTOR

Magnetic Full-voltage Starting

Pressing the START button will cause the main line contactor or breaker to close and full voltage to be applied to the motor terminals.

Magnetic Reduced Voltage

Pressing the START button will cause the starting contactor or breaker to close and reduced voltage to be applied to the motor terminals. After a predetermined time interval, an adjustable-time transfer relay will operate to reconnect the motor from the starting connection to the running- or full-voltage connection. The time setting of the transfer relay should be set for the average maximum time required for the motor to reach maximum speed under operating conditions. An initial trial start should be made, using a temporary maximum time setting of the transfer relay to determine the interval required. The most economical practice is to use the highest voltage tap and the shortest accelerating time consistent with the limitations imposed by the line, the load, or the motor.

Magnetic Part-winding Starting

The sequence of operation of the a-c power switching for part-winding is equivalent to paragraph 1 (b), when a portion of the motor winding is first connected to the power source. After a predetermined time interval, a second portion of the motor winding is connected in parallel with the first portion; or, in effect, normal or full voltage is applied to all windings of the motor.

Semimagnetic Starting

This method of starting is similar to magnetic starting, except that manual operation of the a-c power switching devices is required.

OVERLOAD PROTECTION

When the motor is operating in synchronism, the squirrel-cage winding will not overheat, and under such conditions adequate protection to the entire motor is provided by the stator temperature overload relay.

If, however, the motor is pulled out of synchronism, or if the starting period is unusually long or frequent, the squirrel-cage winding, being designed for normal starting duty only, will almost invariably reach a dangerous temperature more quickly than the stator winding. Since the stator temperature overload relay follows the heating curve of the stator winding, it cannot also be made to protect the squirrel-cage winding adequately and, at the same time, always prevent the motor from being shut down unnecessarily or prematurely.

In order to prevent unnecessary shutdown, and at the same time provide adequate protection to the squirrel-cage winding, all General Electric controllers are equipped with a temperature squirrel-cage protective relay. This relay is independent of the stator temperature overload relay, and, therefore, permits the design of the controller to be such that both the stator and the squirrel-cage windings are fully protected at no sacrifice of motor performance.

In detail, the temperature squirrel-cage protective relay consists of a single-heater element connected in the field discharge circuit in parallel with a small reactor. Whenever the motor is running out of synchronism, induced field current flows through the relay heater and reactor. Near synchronism, the slip frequency is low; therefore, the impedance of the reactor is also low. As a result, only a small portion of the total current passes through the relay heater. On the other hand, when the motor is near standstill, the slip frequency and the impedance of the reactor are high, so that most of the current passes through the relay heater. Thus, the division of current between the relay heater and the reactor depends upon the slip frequency, which in turn, is inversely proportional to the motor speed. Since the squirrel cage also heats more rapidly near standstill and less rapidly near synchronism, the relay heater and reactor can be proportioned to follow accurately the heating curve of the squirrel-cage winding. On all controllers, the relay heater and reactor of the squirrel-cage protective relay are designed specifically to suit the motor with which they are used.

THE FIELD CONTROL RELAY

The CR2820-1745C slip-cycle impedance relay is used automatically to apply and remove field excitation of a synchronous motor. In order for the machine to exert its maximum pull-in torque without torque surges and to reduce line current pulsations, it is necessary that excitation be applied at the correct speed and at a favorable angle for synchronizing. Likewise, when the machine pulls out of step because of abnormal operating conditions, it is highly essential that excitation be removed as rapidly as possible. Both of these functions are performed by use of the slip-cycle impedance relay.

Construction

The CR2820-1745C relay is an induction cylinder type. The principle on which torque is developed is the same as that employed in an induction disk relay with a watt-hour meter element, although in arrangement of parts, the relay is more like a split-phase induction motor. The relay (see Fig. 9) consists of a shaft upon which is mounted a cup-type aluminum rotor operating in the air gap of a magnetic structure which carries the operating coils. A set of movable tips mounted on an arm attached to the shaft operates between two stationary tips mounted on the molded frame. The relay element, together with auxiliaries, is mounted on a molded base. The stator has eight laminated magnetic poles projecting inward and arranged symmetrically around a central magnetic core which is fixed to the stator frame. The poles are fitted with two separate sets of potential coils and one set of current coils as indicated in Fig. 1. In the annular air gap between the poles and the central core, the cylindrical portion of the cup-like rotor turns freely.

Operation

Field Application

The reaction between the potential coils (A) and the potential coils (B) causes a torque in the direction that closes the field-applying contacts (C1) of the relay. The torque produced by the reaction between potential coils (A) and current coils (C) will be in a direction to open these field-applying contacts.

The phase relation between the current and potential, together with the magnitudes of current and potential, determine whether the field-applying contact is open or closed. The capacitor in series with the coils (B) is for the purpose of obtaining an internal phase angle to produce torque from the potential-potential combination.

The current coils (C) carry a current which is proportional to the current drawn by the motor,

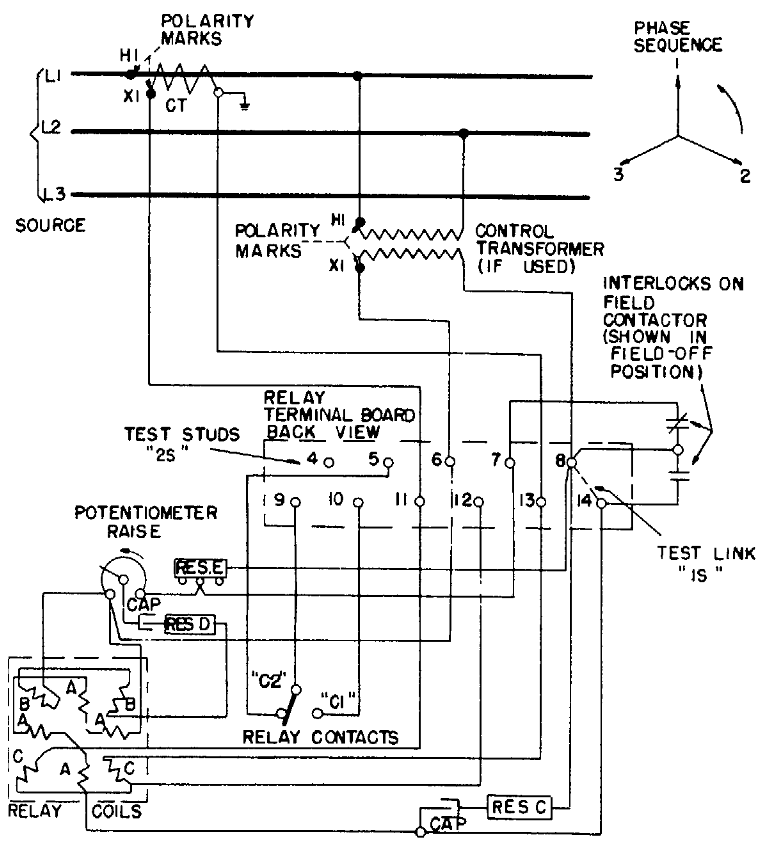
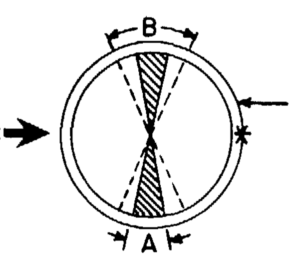


Fig. 1. Wiring diagram showing the internal connections of the CR2820-1745C slip-cycle impedance relay

while the potential coils (A) and (B) carry currents proportional to the line voltage. Thus, the resulting torque produced on the movable element of the relay is a function of the impedance (magnitude and phase angle) of the motor to which it is connected. A slip cycle on the motor represents two pole pitches, and twice during each slip cycle the reluctance of the magnetic circuit at any given point between motor stator and rotor is changed by the passage of a salient pole. For this reason, it will be seen that as synchronous speed is approached, the resultant relay torque undergoes a succession of reversals, the frequency of which depends on the slip of the motor rotor. These reversals alternately open and close contacts (C1) as shown in Fig. 5. As acceleration continues, contacts (C1) remain closed for longer and longer periods of time. When this time interval increases to a predetermined value (as measured by a timing means associated with the field contactor described under "Field Application"), field excitation can be applied at the desired slip frequency. To permit some adjustment for varying conditions, it is necessary only to adjust the time during which the relay operating torque predominates the restraining torque; in other words, the time during which contacts (C1) remain closed for any given motor speed. This is accomplished by means of the speed-adjusting rheostat which changes the voltage applied to the potential coils (B) of the relay.

The following diagram, Fig. 2, illustrates graphically the relay-contact action previously described. In this diagram the complete circle represents one slip cycle, during which time the shaded portions represent that period in which the relay contacts for field application are closed.

Fig. 2
Relay-contact action



The size of the segment indicating the closed contact position is adjustable by means of the speed-adjusting rheostat. With this potentiometer set in the extreme RAISE direction, the size of the segment is a minimum, as indicated by "A," which means that the machine must attain a higher speed before field-applying action is attempted With the potentiometer set in the extreme LOWER position, field-applying action is begun at a lower speed, since contacts (C1) are closed for a longer period, as indicated by "B."

Field Removal

The relay is designed to have two different characteristics; one for field application, the other for field removal. The change from one characteristic to the other is accomplished by means of interlocks on the field contactor. The angular position of the field-application characteristic is determined by the resistor-capacitor combination in series with coils (A), as indicated in Fig. 1. Short-circuiting this resistor-capacitor combination will shift the relay characteristic from field applying to field removal. The location of the field-removal characteristic with respect to the origin is dependent upon the same potentiometer used to control the field-application characteristic, and upon resistor (E) in Fig. 1.

When operating on the field-removal characteristic, the torque acting on the relay is in the direction to keep contacts (C1) closed as long as the motor remains in synchronism. However, should the motor pull out of step for any reason, the impedance of the motor stator circuit changes abruptly and the relay torque reverses, opening contacts (C1) and causing immediate removal of field excitation. The opening of the field contactor shifts the relay characteristic back to that required for field application.

Adjustment

Just as the induction motor depends on phase sequence for its direction of rotation, so does the slip-cycle impedance relay for its successful operation. Therefore, it is highly essential that, at installation, tests be made to insure proper connection of the relay for use on the system to which it is to be assigned. The following vector diagrams and associated description should clearly indicate the proper connection for phase sequence on any power system.

THREE-PHASE SYSTEMS.

Referring to Fig. 3, there are shown three vectors 120 degrees apart, representing voltages V1, V2, and V3 on a three-phase system. The direction of phase rotation is 1-2-3 as indicated by the vectors rotating about the center point in a counterclockwise direction in the conventional

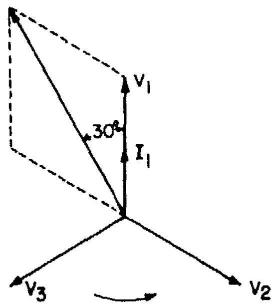


Fig. 3

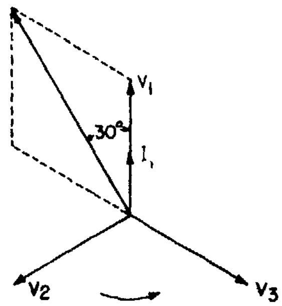


Fig. 4

manner. Current of a unity power factor in line ONE is indicated by Vector I_1. With the current coil of the relay connected in line ONE, voltage applied to the relay potential coils must be taken from V1 and V2. This is equivalent to saying that the voltage applied to the relay must lead the unity power-factor current by 30 degrees.

For a phase rotation 1-3-2 as shown in Fig. 4, the voltage applied to the relay must be taken from lines ONE and THREE; thus, the same phase relation as before occurs between the current and potential on the relay.

While the procedure just outlined may save time in making correct connections to the relay where the actual phase rotation is known, the following adjustment procedure should, nevertheless, be followed as a check. Moreover, it will give successful operation in any case, even though the phase rotation of the power system or polarities of the current and potential transformers is not known.

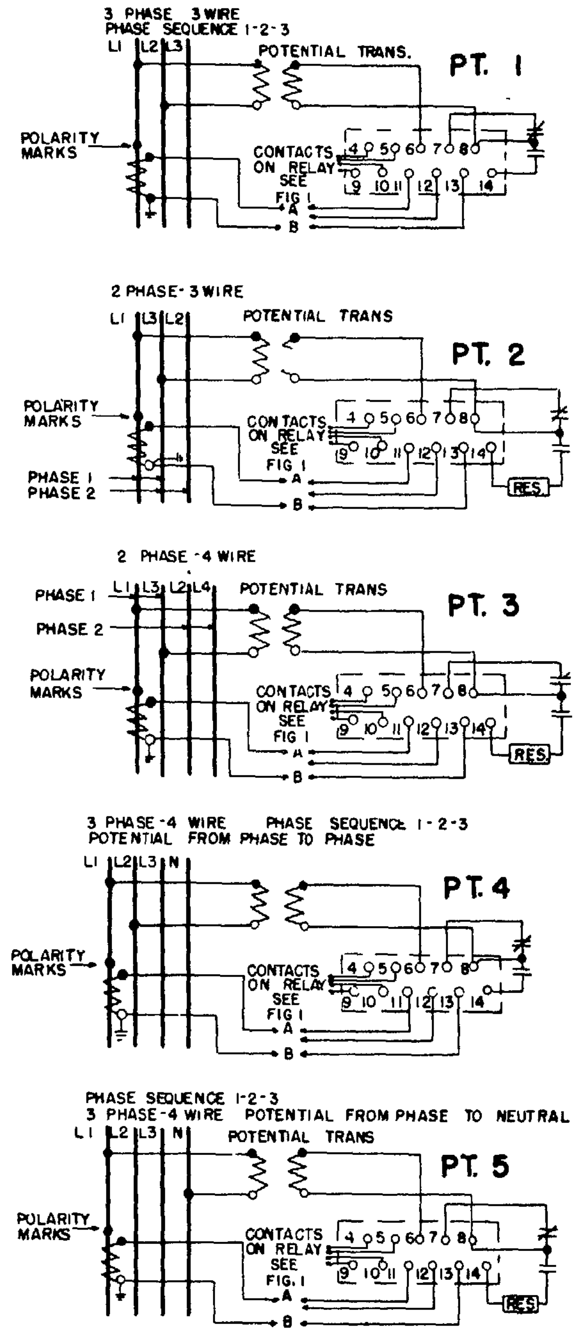
(1) Check the connections to the relay with Fig. 5 and with the connection print furnished with the control, making sure that the potential-coil control wire to terminal (6) of the relay is connected directly, or through a potential transformer, to the power line in which the transformer supplying the current coil of the relay through wire (A) is located.

(2) Check to see that the synchronizing speed adjustment is turned to the extreme RAISE position.

(3) Check to see that link (L) is on studs (S1) as in Fig. 6.

(4) Start the motor and note carefully whether relay contacts (C1) remain open or whether they close as the motor starts.

(5) Disconnect all power from the controller



CURRENT CONNECTIONS

CURRENT RANGE AT 95% SPEED	CT LEADS CONNECT TO RELAY TERMINALS	
LESS THAN 6A	A TO 11	B TO 13
6 TO 10 AMP	A TO 12	B TO 13
10 TO 14.5 AMP	A TO 11	B TO 12

Fig. 5. Connection diagram for slip-cycle impedance relay. (Each interlock position is shown with the field excitation removed.)

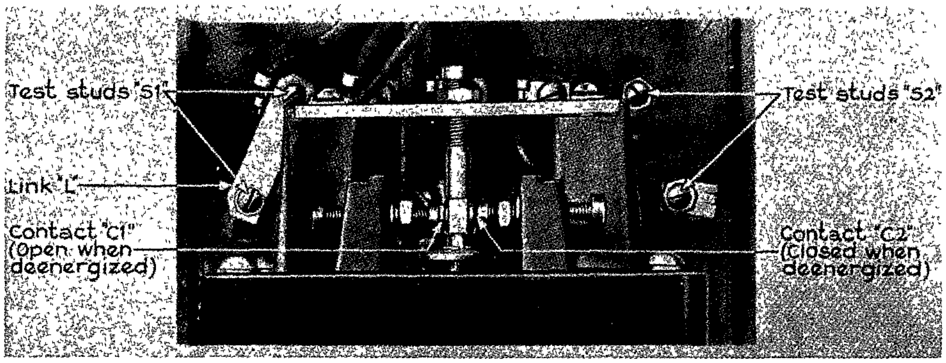


Fig. 6. Location of contacts and test studs

and remove link (L) from studs (S1), retaining the link for later use. Then start the motor and again note carefully whether relay contacts (C1) remain open or whether they close as the motor starts.

(6) The changes in connections (if any) which are required, depend upon whether relay contacts (C1) remain open or whether they close during tests 4 and 5 (paragraphs 4 and 5). The possible action of contacts (C1) during tests 4 and 5, and the changes that should be made in case the action is not correct, are as follows:

TEST 4	TEST 5	CONNECTION CHANGE
Remain open	Remain open	Connections are correct; no change necessary.
Close	Close	Reverse the current-coil control wires (A) and (B) at the relay terminals.
Close	Remain open	Three-phase power: Make the connection change indicated by Note A in the wiring diagram furnished with the controller. If this change was made before making tests 4 and 5, now transfer to the original connection.
Remain open	Close	Three-phase power: Reverse the current coil control wires (A) and (B) at the relay terminals. Also, make the connection change indicated by Note A in the wiring diagram furnished with the controller. If this change was made before making tests 4 and 5, now transfer to the original connection.

(7) Repeat tests 4 and 5. If, in both tests, relay contacts (C1) still do not remain open as the motor starts, it indicates that the connections do not coincide with those originally described in paragraph 1. In this case, recheck the connections and make the necessary change. Then repeat the procedure outlined in paragraphs 2 to 7 of this section.

(8) When connections are obtained which result in relay contacts (C1) remaining open in tests 4 and 5, disconnect all power from the controller and place link (L) on studs (S2).

(9) Start the motor and wait for acceleration to maximum speed. Turn the synchronizing-speed adjustment slowly in the LOWER direction until the field ammeter indicates current. This adjustment should be made with the highest load the motor will be required to synchronize. If the load to be synchronized increases subsequently, it may be necessary to readjust the relay by turning the synchronizing-speed adjustment farther in the LOWER direction.

(10) Stop and restart the motor to make sure that the adjustment permits successful synchronizing.

TWO-PHASE SYSTEMS.

In systems that have two-phase power supply, the potential coil and the current coil of the relay must be supplied with power of the same phase.

(1) Phase sequence does not affect two-phase systems. It is necessary, therefore, to check the relay connections only. (See Fig. 5 and the connection print furnished with the control.) Make sure that the potential-coil control wire to relay terminal 6 is connected (either directly or through a potential transformer) to the same power line as the transformer which supplies the relay current coil through wire A.

(2) Check to see that the synchronizing speed ad-

justment is turned to the extreme RAISE position.

(3) Remove the test link L and retain it for later use.

(4) Start the motor and note carefully whether relay contacts C1 remain open or whether they close when the motor starts. If they remain open, connections are correct and no change is necessary. If they close, reverse the current-coil connections A and B at the relay terminals.

(5) Proceed as directed in steps (8), (9), and (10) listed above under "Three-phase Systems."

It will be noted from the main connection diagram included with the controller that three connection (current) studs, terminals No. (11), (12), and (13), are provided on the slip-cycle impedance relay (FR), two of which are connected to the secondary circuit of the current transformers, the primary of which is connected in the motor circuit. These connection studs or current taps are provided in order that the correct connection can be made at the factory for the particular motor involved.

In order to reduce the number of adjustments of the field relay for the initial operation of the motor, the current stud-connection taps provided on relay (FR) assure, for a given motor, the maximum sensitivity and most accurate means of controlling field excitation. In extreme cases, where data is not available for the motor involved, current connections can be made in accordance with those shown in Fig. 5. The values of current indicated under the above connection reference is the current impressed on relay (FR) at approximately 95 per cent of synchronous speed (less field excitation and 100 per cent applied terminal voltage), and does not necessarily represent the limitations of the operating range of the relay. If connections or changes are made in the current connection studs of relay (FR), readjustment should be made in strict accordance with the adjustment tests previously listed.

Maintenance

If, for any reason, the factory adjustments have been disturbed, the following points should be observed in restoring them:

SHAFT END PLAY: The upper guide bearing can be moved up or down after loosening the lock nut. The shaft end play should be between 1/63 inch and 1/32 inch.

THE CONTROL SPRING TENSION should hold the right-hand contacts (C2) lightly closed when the relay is de-energized.

CONTACT GAP: The contact gap can be changed by screwing the left-hand stationary contact of (C1) in or out after partially loosening the lock nut. The contact gap should be a little more than 1/32 inch (about 0.04 inch).

STATIONARY CONTACT: Loosen the lock nut completely. The contact assembly can then be lifted out of the contact block. On reassembling, be sure that the lug on the contact lead is in place.

MOVING CONTACTS: These can be removed by taking out the three screws holding the contact arm on the shaft. On reassembling, be sure that the contact arm is approximately midway between the two moving contacts.

If, for any reason, the relay element is removed from the relay base, be sure to tag the leads so that they can be reconnected to the proper terminals.

THE FIELD CONTACTOR AND TIMING RELAY

In addition to the slip-cycle impedance field control relay, a field contactor and associated control devices are provided. Fig. 7 shows a general type of control scheme as applied to a low-voltage, magnetic full-voltage controller.

Operation of Field Application

Relay (FR) operates on variation in the impedance of the stator winding, which occurs during each slip-cycle out of synchronism. The contacts of relay (FR) alternately open and close as synchronous speed is approached. As acceleration continues, contacts (9-5) remain open and contacts (9-10) remain closed for longer and longer intervals of time. As a measure of the time that contacts (9-10) of relay (FR) are closed, timing relay (TR) is provided with a capacitor (C), which receives a charge from the half-wave rectifier through resistor (2R). This charge is removed through resistor (1R) each time that contacts (9-10) of relay (FR) open and (9-5) close. When contacts (9-10) remain closed for the interval of time required for the voltage across the coil of timing relay (TR) to build up to the proper value, relay (TR) picks up and closes its contacts (4-18) and (10-19) and opens (5-17). Thus, relay (TR) remains closed regardless of subsequent action of relay (FR).

The next closure of contacts (9-10) of relay (FR) will then energize the coil of field contactor (F), which will pick up and be sealed closed through contacts (10-19) of timing relay (TR) and

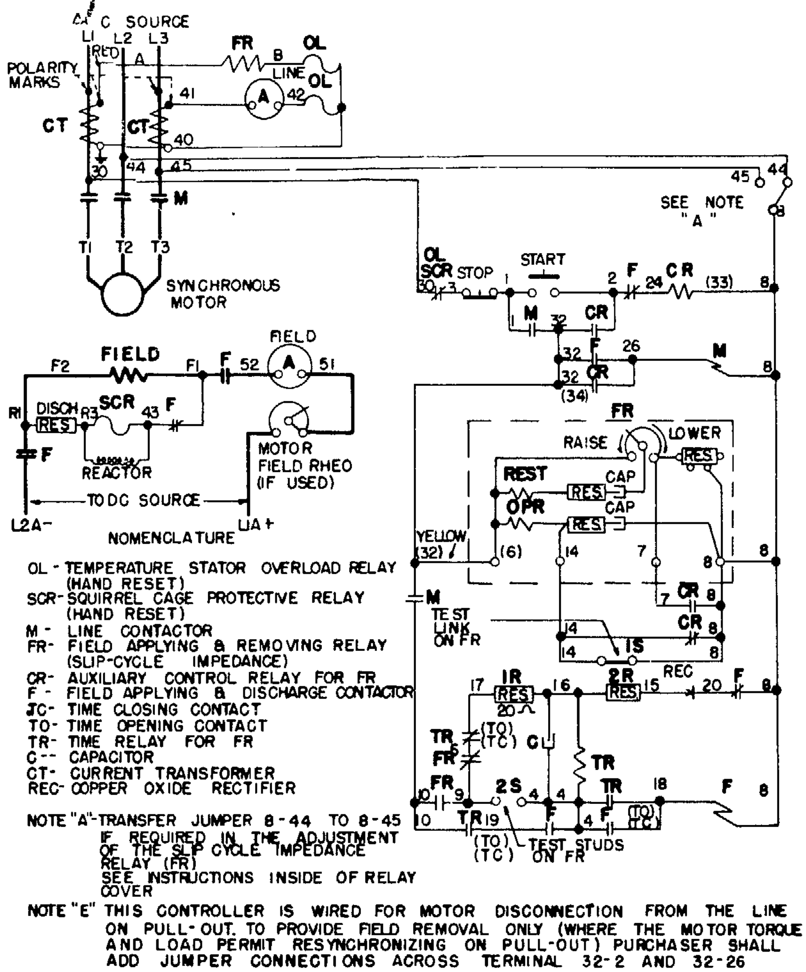


Fig. 7. Elementary diagram for magnetic full-voltage synchronous-motor controller

contacts (19-4) and (4-18) of field contactor (F). Contact (20-8) of field contactor (F) opens, removing power from the coil of timing relay (TR); but this relay is held closed for a time by the discharge of capacitor (C) through its coil. The purpose of this time delay is to allow the machine to stabilize after synchronizing and to permit contacts (10-9) to remain closed. After the charge from capacitor (C) has been bled off, relay (TR) drops out and the field-contactor coil receives its energy through contacts (10-9) of relay (FR), test studs (9-4), and interlock (4-18). Note that control relay (CR) is picked up through interlock (2-24) of field contactor (F) at the instant of start, and its contact (7-8) remains closed until field is applied; thus, relay (FR) is made to operate on its pull-in characteristic. When the field contactor closes, relay (CR) opens, and through its contacts (7-8) and (14-8), relay (FR) is recalibrated to operate on its pull-out characteristic.

Operation of Field Removal on Pull-out

If the motor pulls out of step for any reason, the impedance of the stator circuit changes abruptly and the torque of relay (FR) reverses, opening contact (9-10) and removing excitation from the motor. With the circuit as shown in Fig. 7, removal of excitation will at the same time cause disconnection of the motor from the line. Addition of the jumpers as indicated by Note "E" on this print will allow the motor to continue to run as an induction motor; then control relay (CR) is immediately energized, relay (FR) is recalibrated for pull-in, and if conditions of load and motor torque permit, the machine and control will resume the sequence as described under "Field Application."

RENEWAL PARTS

When ordering renewal parts other than those listed by catalog number, describe the part in detail and give the complete nomenclature as it appears on the nameplate and main connection diagram. Renewal parts for field control devices are listed below. Those for other apparatus used to make up specific and complete equipment can be found in the instructions included as a part of such equipment.

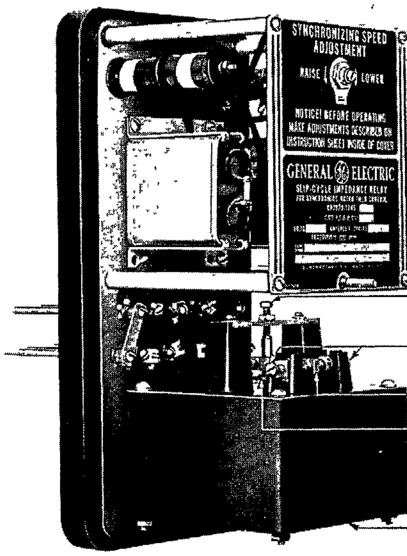


Fig. 8. CR2820-1745C slip-cycle impedance relay

No. Req	Description	Cat. No.
	CR2820-1745C RELAY (FR)	
2	Adjustable stationary contact assembly (right and left)	6178820G1
1	Movable contact assembly	6178820G2
1	Control spring	6961910
1	Pivot screw (upper bearing) adjusting screw)	6178829G1
1	Jewel screw assembly (lower bearing)	4237850G1
	CR2820-1097HK RELAY (CR)	
6	Movable contact tip	3763767G2
6	Spring	2413966
5	Stationary contact tip, left-hand, normally open	4900573G1
5	Stationary contact tip, right-hand, normally open	4900573G2
1	Stationary contact tip, left-hand, normally closed	4900573G3
1	Stationary contact tip, right-hand, normally closed	4900573G4
	CR2820-1054QA RELAY (TR)	
1	Compression spring for armature support	235184
3	Compression spring for auxiliary contact plate	2411917
4	Auxiliary stationary contact plate with tip	3614137G1

No. Req	Description	Cat. No.
	CR2820-1054QA RELAY (TR) (Cont'd)	
3	Auxiliary movable contact plate with tip	3667572G1
2	Auxiliary stationary contact plate with tip	3805671G2
1	Contact screw with tip	2840219G1
	CR2810-1357AK CONTACTOR (F)	
3	Movable contact tip	2890181G1
3	Stationary contact tip	4379461G2
2	Main shunt	2840225G3
2	Compression spring for normally closed contact	189703
1	Shunt	3840496G3
1	Compression spring for normally closed contact	178313
3	Arc chute side (right)	4915466
3	Arc chute side (left)	4915467
	INTERLOCKS FOR CR2810-1357AK	
5	Movable contact tip	3667572G1
10	Stationary contact tip	3614137G1
5	Compression spring for interlock	2415957
2	Stationary contact tip	3667572G2
1	Movable contact tip	3805658G3
1	Compression spring for contact plate	2411917

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* Baton Rouge 70815 ... 633 Oak Villa Blvd.
* Lake Charles ... 422 Seventh St.
* † ‡ § New Orleans 70112 ... 837 Gravier St.
* † Shreveport 71101 ... 206 Beck Bldg.
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* Bangor 04402 ... 77 Central St.

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* † ‡ Minneapolis 55402 ... 12 S. Sixth St.

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* † Jackson 39201 ... 203 W. Capitol St.

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* † ‡ Kansas City 64105 ... 106 W. Fourteenth St.
* † ‡ St. Louis 63101 ... 818 Olive St.

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* † Albuquerque 87108 ... 120 Madeira Dr., N.E.

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† Binghamton 13902 ... 19 Chenango St.
* † ‡ Buffalo 14202 ... 625 Delaware Ave.
* † § New York 10022 ... 570 Lexington Ave.
* † ‡ Rochester 14604 ... 89 East Ave.
* † Syracuse 13201 ... 3532 James St.
* Utica 1 ... 1001 Broad St.
‡ Waverly ... P.O. Box 308

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* Greensboro ... 801 Summit Ave.
* † Raleigh 27602 ... 16 W. Martin St.

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* Fargo 58101 ... 802 S. Park Drive

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* † ‡ § Cleveland 44104 ... 4966 Woodland Ave.
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* ‡ Dayton 45402 ... 11 W. Monument Bldg.
† § Dayton 45402 ... 118 W. First St.
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* † ‡ Toledo 43604 ... 420 Madison Ave.
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* † El Paso 79901 ... 215 N. Stanton St.
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* † § Salt Lake City 84110 ... 200 S. Main St.

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