REVERSE CURRENT CIRCUIT BREAKERS
AUTOMATIC ELECTRIC INC.
D-7064, D-7065, D-7066 AND D-7099
REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers the Automatic Electric Incorporated D-7064, D-7065, D-7066 and D-7099 reverse current circuit breakers used in automatic power plants and replaces issue 1 of this section.

This section is reissued to incorporate material from the addendum in its proper location.

1.02 Reference shall be made to Section 020-010-711, covering General Requirements and Definitions for additional information necessary for the proper application of the requirements listed herein.

1.03 Part 1, "General" and Part 2, "Requirements" form part of the Western Electric Company, Inc. Installation Department Handbook.

1.04 Requirements are marked with an asterisk (*) when to check for them would necessitate the dismantling or dismounting of apparatus, or would affect the adjustment involved or other adjustments. No check need be made for these requirements unless the apparatus or part is made accessible for other reasons or its performance indicates that such a check is advisable.

1.05 When any adjustments are to be made, the necessary precautions should be taken to maintain service.

2. REQUIREMENTS

2.01 Operating Test. With the core demagnetized and the operating voltage as given below applied to the shunt coil of the circuit breaker the plunger shall be pulled down and the lower spring brush shall be closed with one unhesitating movement.

When used as a circuit breaker - 54 volts
When used as a counter e.m.f. cell switch - 50 volts

2.02 Non-Operating Test. With the core demagnetized and the non-operating voltage as given below applied to the shunt coil of the circuit breaker, the lower spring brush shall remain open.

When used as a circuit breaker - 52 volts
When used as a counter e.m.f. cell switch - 48 volts
2.03 Reverse Current Test
(a) When used as a circuit breaker (with the 400 ohm resistance in series with the shunt coil) and a voltage of 50 volts applied to the shunt coil and resistance, the circuit breaker shall "hold in" with no current in the series coil.
(b) With the shunt coil energized as in (a) the plunger shall release and open the lower spring brush contacts upon a reverse current in the series winding of not more than 10% of the circuit breaker rated current.

2.04 Mounting
(a) The contact surfaces of the studs for each brush shall be in the same plane and approximately horizontal.
(b) The contact area of each brush shall fall entirely within the contact surface of the studs.
(c) The contact surfaces shall be 1-1/16" ± 1/32" apart vertically. Use scale.

2.05 Binding: The plunger and plunger pin shall not bind in their guides.

2.06 Contact Surfaces: Contacts shall be clean and free from burrs.

2.07 Plunger Stroke: At the bottom of its stroke, the plunger pin shall strike the pin on the screw "A" but the plunger shall not strike the stationary core of the solenoid.

2.08 Brushes
(a) With the plunger at the bottom of its stroke, the lower spring brush shall be compressed against the contacts and there shall be an appreciable opening between the upper brush and the associated stationary contacts.
(b) With the plunger released and at the top of its stroke, the upper spring brush shall be compressed and there shall be an appreciable opening between the lower brush and its associated contacts.

2.09 Lock Nuts: The lock nuts "B" and "D" shall be tight.
3. ADJUSTING PROCEDURES

TOOLS

File, Smooth Cut, 10", Flat
Steel Scale, 6"
Wrench, Double End, Flat, 5/16" and 3/8"
Openings Across Flat
Wrench, Double End, Flat, 1/2" and 19/32"
Openings Across Flat
Wrench, Double End, Flat, 5/8" and 3/4"
Openings Across Flat

MATERIALS

Petroleum Spirits
Cheesecloth or Equivalent
Crocus Cloth

TEST APPARATUS

Ammeter, Weston, DC, Model 280, Scale to
Suit Installation
Voltmeter, Weston, DC, Model 280, 0-60-150
Volts

3.01 OPERATING TEST (Rq. 2.01)

M-1 If the circuit breaker does not
operate with the specified volt-
age applied to the coil, check the
mechanical requirements as outlined in
paragraphs 2.04, 2.05, 2.07, 2.08 and
2.09 before making adjustments. Check
the operating voltage at the coil ter-
minals of the circuit breaker.

M-2 If the circuit breaker does not
operate, test for open circuit
using a voltmeter. Connect the volt-
meter in multiple with the shunt coil.
If the voltmeter shows no reading when
voltage is applied, the circuit is open
and should be checked. If the circuit
is not open, connect the voltmeter in
series with the coil. No reading on the
voltmeter indicates the coil is open and
should be replaced.

M-3 Should the plunger not function
when the operating voltage is im-
pressed on the shunt coil, loosen lock
nut "P" and turn out screw "C" to relieve
the compression on the spring supporting
the plunger.

3.02 NON-OPERATING TEST (Rq. 2.02)

M-1 Should the plunger operate when
the non-operating voltage is
impressed on the shunt coil, loosen
lock nut "P" and turn in screw "C" to
increase the compression on the spring
supporting the plunger. When the oper-
ate and non-operate requirements are
met with the same setting of the screw
"C", tighten lock nut "P".

3.03 REVERSE CURRENT TEST (Rq. 2.03)

M-1 Connect an ammeter in the charg-
ing circuit so that the ammeter
will read the reverse current. Start
the charging set in the usual manner.
With the circuit breaker closed, open
the line switch to the driving motor
and note the reversal of the current in
the ammeter. If the reverse current
circuit breaker does not open with a
reverse current of less than the speci-
fied value, replace the circuit breaker.

3.04 MOUNTING (Rq. 2.04)

M-1 Loosen the nut holding the stud
that is out of alignment, re-
align the stud to the correct position,
and retighten the nut.

3.05 BINDING (Rq. 2.05)

M-1 Should the plunger bind in the
solenoid, remove the brush assem-
ibly, withdraw the plunger, and wipe the
plunger with clean cheesecloth moistened
with petroleum spirits. If the plunger
pin binds, loosen lock nut "P", remove
screw "C", take out the plunger pin and
wipe the plunger pin with clean cheesecloth
moistened with petroleum spirits. Replace
the plunger and plunger pin. If the
binding continues it will be necessary
to replace the circuit breaker.
3.06 CONTACT SURFACES (Rq.2.06)
M-1 Clean contacts only when necessary and then by wiping with a clean cloth, moistened with petroleum spirits. Pitted stationary contacts should have the burrs removed by using a fine file or crocus cloth.

3.07 PLUNGER STROKE (Rq.2.07)
M-1 To prevent the plunger striking the stationary core, loosen the lock nut "B", and turn in screw "A" until the plunger strikes the pin and not the core. A finger placed against the stationary core can detect the impact of the plunger striking the core. When placed against the screw "A", it can detect the impact of the plunger striking the pin.

3.08 BRUSHES (Rq.2.08)
M-1 Loosen the lock nut "B" and adjust the screw "A" to give the desired action. If this requirement cannot be met without having the plunger strike the core, it will be necessary to replace the circuit breaker.

3.09 LOCK NUTS (Rq.2.09)
M-1 Tighten lock nuts "B" and "D" taking care not to change the settings of the screws "A" and "C".