RINGING CIRCUIT FOR INDIVIDUAL, TWO-PARTY, COIN, AND PBX LINES (SD-2H116-01)—TESTS NO. 2/2B ELECTRONIC SWITCHING SYSTEM

CONTENTS PAGE

1. GENERAL

1.01 This section describes the procedure for testing the ringing circuit for individual, two-party, coin, and PBX lines (SD-2H116-01) used in the No. 2/2B Electronic Switching System (ESS).

1.02 This section is reissued to include changes previously covered in an addendum and to provide a test configuration diagram for the FS2 circuit. Since this reissue is a general revision, no revision arrows have been used to denote significant changes. Equipment Test Lists are not affected.

1.03 The tests described are:

A. Circuit State and Scan Point Operation: This test verifies the operation of the circuit relays and saturation of the ferrod sensors associated with this circuit.

B. Leakage Test: This test verifies the saturation of ferrod sensor 1 when excessive leakage exists in the test states.

1.04 These tests are performed whenever a malfunction of the circuit is suspected.

1.05 The tests will be performed from the trunk test panel (TTP) in conjunction with the maintenance display buffer and teletypewriter (TTY). For detailed information about the TTP and its operation, refer to Section 232-130-301, Trunk Test Panel—Method of Operation.

1.06 The keys on the TTP may be either a locking or a nonlocking type. In order to differentiate between the two types of keys, the use of a locking type key shall be identified by the words "operate" and "release" and the use of the nonlocking type key shall be identified by the word "depress" in the ACTION column.

> ***Note:*** Nonlocking keys require a depression of at least one-half second to insure system recognition.

1.07 ***Lettered Steps:*** A letter a, b, c, etc, added to a step number in Part 3 or 4 of this section indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or series of lettered steps should be made is given in the ACTION column and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by the letter should be omitted.

1.08 New (conventional) service order codes were adopted for use with the EF-2 and 2B-EF-2 generic programs. However, the translations can be configured with the old (No. 2 ESS unique) service order codes as an option. These old codes are common to all previous No. 2 and No. 2B ESS generic programs. The EF-2 and 2B-EF-2 generic programs can be arranged to recognize either option. In this section, the term "conventional (new)" or "No. 2 ESS

unique (old)" is used to identify the service order code for the keywords in each TTY input message given.

1.09 Whenever the term TOUCH-TONE® telephone service is used, it refers to the equipment required to provide this service to the customer.

2. APPARATUS

2.01 A 35F-type test set (current flow meter) or equivalent. Equivalent apparatus must have a current metering range of 15 milliamperes. Current flow data must be obtained by means of a rheostat.

2.02 A 2P4A cord assembly consisting of a P2B cord 3 feet long and two 310 plugs.

2.03 A test lead with alligator clips at both ends.

2.04 A 2500-type telephone set.

2.05 A 3000-ohm resistor connected across the tip and ring of a 310 plug.

3. PREPARATION

3.01 Refer to the office records to obtain the following information about the circuit to be tested:

(a) trunk group number (TGN),

(b) member number (MEMN),

(c) scan point number (SPN),

(d) directed scan point number (DSP).

3.02 Verify the scan point numbers obtained in paragraph 3.01 as follows:

At maintenance TTY, type in:

A VY:SVC:aaa bbb!

aaa = TGN

bbb = MEMN

The system response for offices using No. 2 ESS unique (old) code is as follows:

AR VY SVC aaa bbb

TEN nn gcsl

.

.

.

DSP ss rrbb

SPN ss rrbb

The system response for offices using conventional (new) code is as follows:

AR VY SVC aaa bbb

OE nn gcsl

.

.

.

DSP ss rrbb

SP ss rrbb

ss = scanner number

rr = scanner row

bb = bit in row

The bb bit represents the ferrod sensor (0 for DSP or 1 for SPN) in the scanner row that is associated with the specific circuit. Refer to the output message manual (OM-2H200) for explanation of other data fields, if required.

3.03 The following is a step-by-step procedure to make the ringer circuit traffic busy and connect it to the TTP (Fig. 1 or Fig. 2).

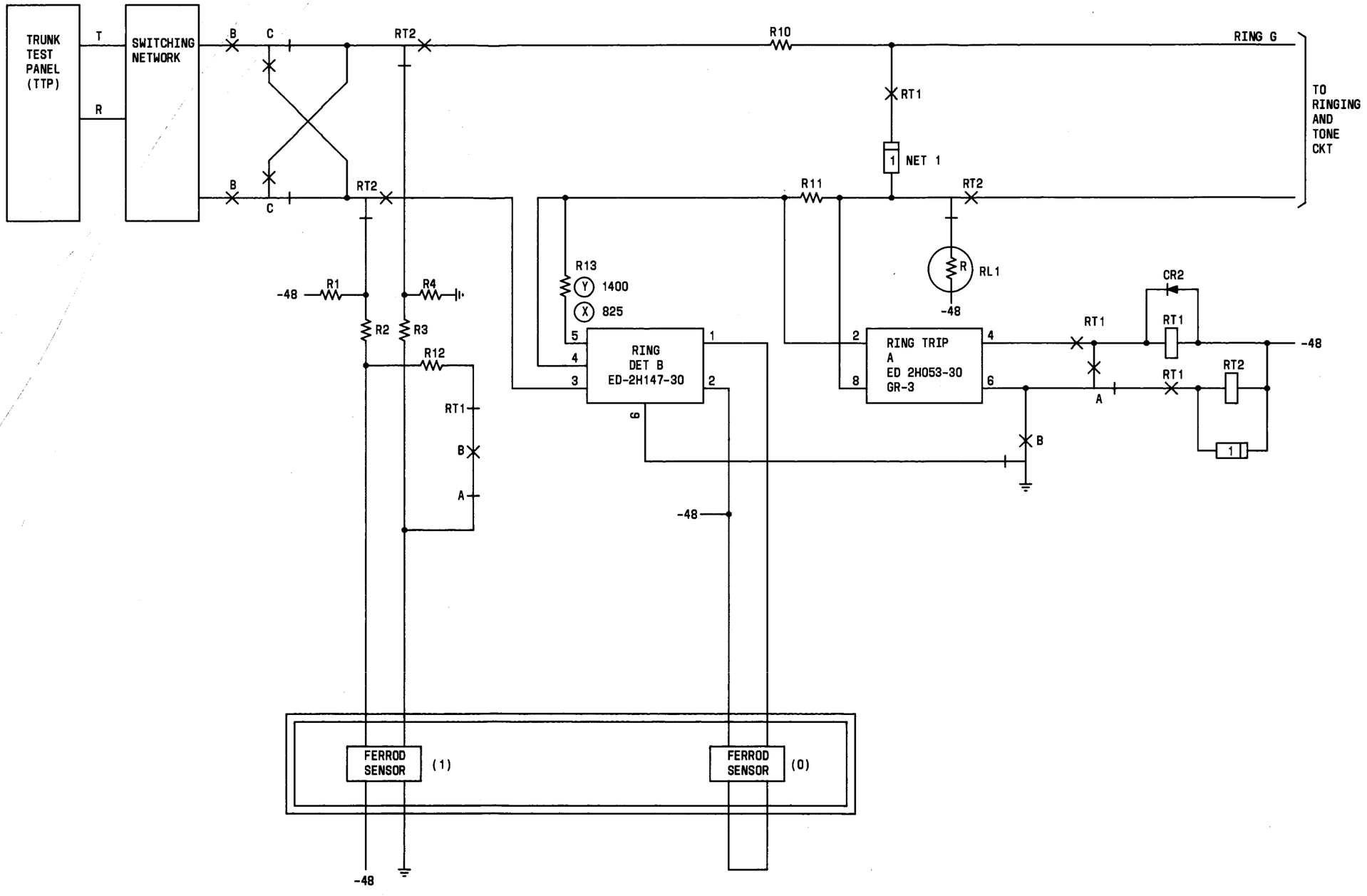

Fig. 1 — Test Configuration Using Trunk Test Panel When Testing a Ringing Circuit—FS1

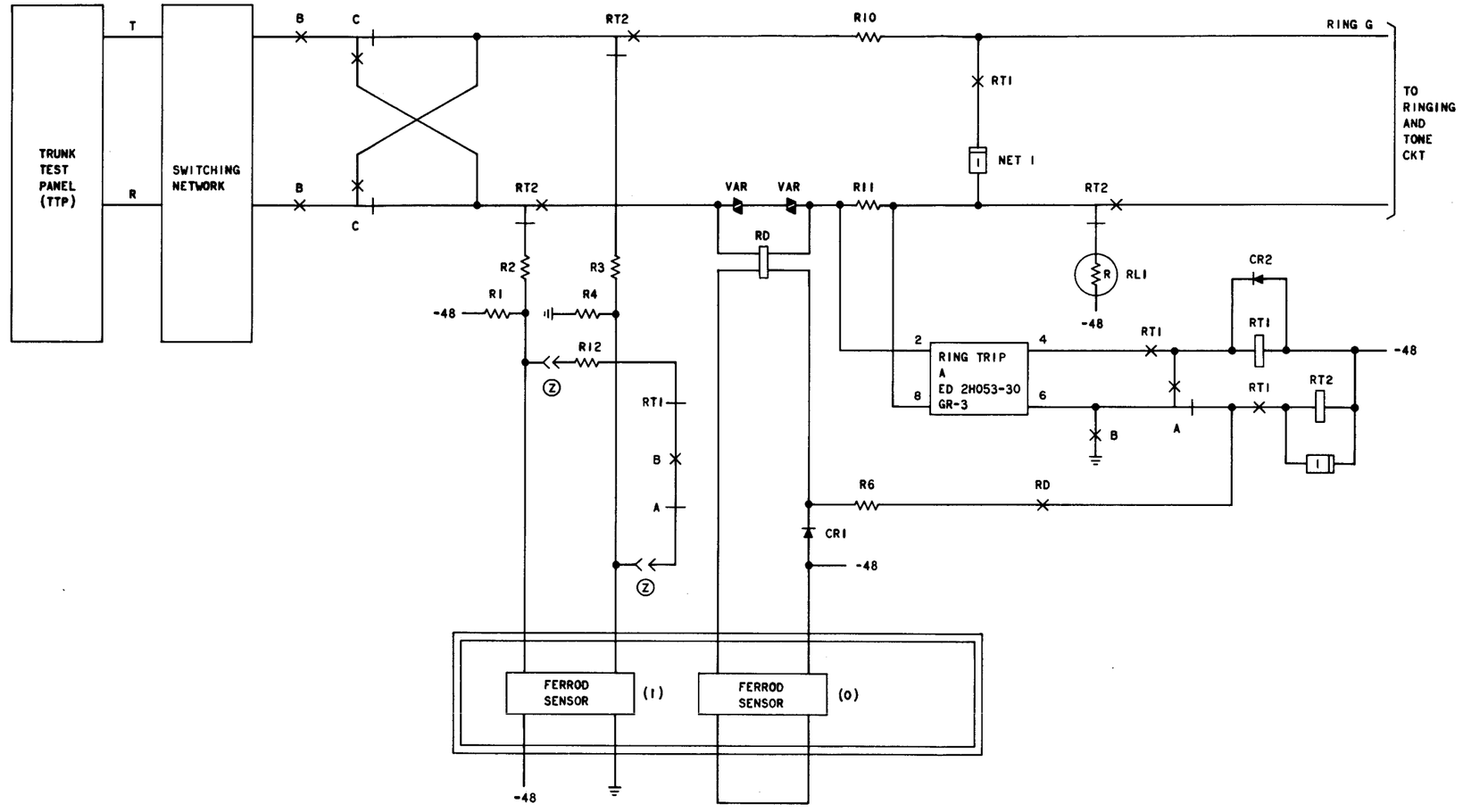

Fig. 2— Test Configuration Using Trunk Test Panel When Testing a Ringing Circuit—FS2

STEP	ACTION	VERIFICATION
All Tests		
1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + ST.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P&E lamp lighted if connection was successful. ***Note:*** If the EQPT ST lamp is flashing and the P&E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P&E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	Place handset on-hook, or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished At TEL CKT— TRFR lamp extinguished.
7	Use the TTY printout from paragraph 3.02 to determine the trunk scanner and scanner row of the SPN. The SPN is associated with ferrod sensor 1 of the ringing circuit.	
8	At maintenance TTY— For No. 2 ESS offices, type in: UBRL TS:RSN:ssrr! ss = Number of trunk scanner for SPN in decimal (0-11) from Step 7. rr = Number of scanner row for SPN in decimal (0-63) from Step 7.	At DISPLAY BUFFER— Scanner row containing specific scan points displayed on DISPLAY BUFFER. Lamp associated with ferrod sensor 1 of circuit under test lighted.

STEP	ACTION	VERIFICATION
	For No. 2B ESS offices, type in: MON:TSSN ssrr;RDT LAMPS! ss = Number of trunk scanner for SPN in decimal (00-11 for the 2B-EF-1 generic program) or (00-30 for the 2B-EF-2 generic program) from Step 7. rr = Number of scanner row for SPN in decimal (0-63) from Step 7. RDT LAMPS = Direct the result to the DISPLAY BUFFER.	

4. METHOD

4.01 If the verification procedure fails or if a malfunctioning circuit is indicated during any part of this test, proceed as follows:

(1) Discontinue the test.

(2) Troubleshoot the circuit which failed.

(3) Replace faulty circuit components using standard repair procedures.

(4) Repeat the test step which failed. If verification indicates that the faulty circuit has been repaired, continue the test.

STEP	ACTION	VERIFICATION
	A. Circuit State and Scan Point Operation	
9	At ACCESS TRUNK 1 CONTROL— Depress VM key.	At ACCESS TRUNK 1 CONTROL— VM lamp lighted. At VOLTMETER CONTROL— 100K lamp lighted. At VOLTMETER— Meter indicates 0.
10	At VOLTMETER CONTROL— Operate TR REV key.	At VOLTMETER CONTROL— TR REV lamp lighted. At VOLTMETER— Meter indicates 0.
11	Depress FEMF key.	FEMF lamp lighted. At VOLTMETER— Meter indicates 0.
12	Release TR REV key.	TR REV lamp extinguished. At VOLTMETER— Meter indicates 0.
13	Depress MET VM key.	FEMF lamp extinguished. MET VM lamp lighted.
14	Set PD GROUP switch to 0-5 position.	
15	At PERIPHERAL DECODER POINTS— Operate 0 and 1 key.	At PERIPHERAL DECODER POINTS— 0 and 1 lamps lighted.

STEP	ACTION	VERIFICATION
16	Depress AT 1 key.	At circuit under test— Relays A and B operated. At VOLTMETER— Meter indicates between 42.75 and 52.50 volts on 120-volt scale.
17	At front of writing shelf— Connect telephone set to ACCESS TRK-1 jack. ***Note:*** Telephone set on TTP and test telephone set must be on-hook.	
18	At PERIPHERAL DECODER POINTS— Release 0 key.	At PERIPHERAL DECODER POINTS— 0 lamp extinguished.
19	Depress AT 1 key.	At circuit under test— Relay A released. Relay B remains operated. At telephone— Ringing is present.
20	At front of writing shelf— Disconnect telephone set from ACCESS TRK-1 jack.	
21	Insert 310 plug with 3000-ohm resistor across tip and ring into ACCESS TRK-1 jack.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 extinguished.
22	Remove 310 plug with 3000-ohm resistor from ACCESS TRK-1 jack.	If circuit has option Z— Lamp associated with ferrod sensor 1 remains extinguished. If circuit does ***not*** have option Z— Lamp associated with ferrod sensor 1 lighted.
23	At VOLTMETER CONTROL— Operate TR REV key.	At VOLTMETER CONTROL— TR REV lamp lighted.
24	At PERIPHERAL DECODER POINTS— Release 1 key. Operate 2 key.	At PERIPHERAL DECODER POINTS— 1 lamp extinguished. 2 lamp lighted.
25	Depress AT 1 key.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 lighted. At circuit under test— Relay B released. Relay C operated.
26	At PERIPHERAL DECODER POINTS— Operate 0 and 1 keys.	At PERIPHERAL DECODER POINTS— 0 and 1 lamp lighted.

STEP	ACTION	VERIFICATION
27	Depress AT 1 key.	At circuit under test— Relay A and B operated. Relay C remains operated. At VOLTMETER— Meter indicates between 42.75 and 52.50 volts on 120-volt scale.
28	At maintenance TTY— For No. 2 ESS offices, type in: UB SY:CLB! For No. 2B ESS offices, type in: STOP:UTIL!	At DISPLAY BUFFER— Ferrod sensor display removed from DISPLAY BUFFER.
29	Use the TTY printout from paragraph 3.02 to determine the trunk scanner and scanner row of the DSP. The DSP is associated with ferrod sensor 0 of the ringing circuit.	
30	For No. 2 ESS offices, type in: UBRL TS:RSN:ssrr! ss = Number of trunk scanner for DSP in decimal (0-11) from Step 29. rr = Number of scanner row for DSP in decimal (0-63) from Step 29. For No. 2B ESS offices, type in: MON:TSSN ssrr;RDT LAMPS! ss = Number of trunk scanner for DSP in decimal (00-11 for the 2B-EF-1 generic program) or (00-30 for 2B-EF-2 generic program) from Step 29. rr = Number of scanner row for DSP in decimal (0-63) from Step 29. RDT LAMPS = Direct the result to the DISPLAY BUFFER.	Scanner row containing specific scan points displayed on DISPLAY BUFFER. Lamp associated with ferrod sensor 0 of circuit under test lighted.
31	At PERIPHERAL DECODER POINTS— Release 0 key.	At PERIPHERAL DECODER POINTS— 0 lamp extinguished.
32	At front of writing shelf— Connect telephone set to ACCESS TRK-1 jack.	
33	Depress AT 1 key.	At circuit under test— Relay A released. Relays B and C remain operated. At telephone— Ringing is present. At DISPLAY BUFFER— Lamp associated with ferrod sensor 0 extinguished when ringing begins.

STEP	ACTION	VERIFICATION
34	At telephone— Lift receiver off-hook.	At telephone— Ringing stops. At DISPLAY BUFFER— Lamp associated with ferrod sensor 0 remains extinguished.
35	At PERIPHERAL DECODER POINTS— Release 1 and 2 keys.	At PERIPHERAL DECODER POINTS— 1 and 2 lamps extinguished.
36	Depress AT 1 key.	At circuit under test— Relays B and C released. At DISPLAY BUFFER— Lamp associated with ferrod sensor 0 lighted.
37	At front of writing shelf— Disconnect telephone set from ACCESS TRK-1 jack.	
38	At VOLTMETER CONTROL— Release TR REV key.	At VOLTMETER CONTROL— VM REV lamp extinguished.
39	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— VM lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P&E lamp extinguished.
40	At maintenance TTY— For No. 2 ESS offices, type in: UB SY:CLB! For No. 2B ESS offices, type in: STOP:UTIL!	Ferrod sensor display removed from DISPLAY BUFFER.
B. Leakage Test		
	Note: Repeat Steps 1 through 8.	
9	Set PD GROUP switch to 0-5 position.	
10	At PERIPHERAL DECODER POINTS— Operate 0 and 1 keys.	At PERIPHERAL DECODER POINTS— 0 and 1 lamps lighted.
11	Depress AT 1 key.	At circuit under test— Relays A and B operated.
12	At 35F test set— Connect the GRD terminal to system ground (frame) with a test lead with alligator clips.	

STEP	ACTION	VERIFICATION
13	Operate the BATT & GRD CO key.	
14	Insert one 310 plug of 2P4A cord assembly into top T&R jack of the front of 35F test set.	
15	At front of writing shelf— Insert other 310 plug of 2P4A cord assembly into ACCESS TRK-1 jack.	
16	At 35F test set— Operate No. 1 telegraph key.	
17	Move No. 1 coarse (red) rheostat slider to left until meter indicates at least 3 mA current flow on 15 MIL AMP scale.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 remains lighted.
18	Move No. 1 coarse (red) rheostat slider to left until meter indicates approximately 6 mA current flow on 15 MIL AMP scale. ***Note:*** Lamp associated with ferrod sensor 1 must not be extinguished. If lamp extinguished, reduce current flow.	
19	Move No. 1 fine (black) rheostat slider to left until lamp associated with ferrod sensor 1 extinguished. ***Note:*** Do not exceed 20 mA current flow.	At 35F test set— If circuit under test is an FS1— Meter indicates less than 6.96 mA current flow on 15 MIL AMP scale. If circuit under test is an FS2— Meter indicates less than 7.9 mA current flow on 15 MIL AMP scale.
20	Release No. 1 telegraph key.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 lighted.
21	Remove 310 plug from 35F test set and ACCESS TRK-1 jack.	
22	At PERIPHERAL DECODER POINTS— Release 0 and 1 keys.	At PERIPHERAL DECODER POINTS— 0 and 1 lamps extinguished.
23	Depress AT 1 key.	At circuit under test— Relay A and B released.
24	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P&E lamp extinguished.

STEP	ACTION	VERIFICATION
25	At maintenance TTY— For No. 2 ESS offices, type in: UB SY:CLB! For No. 2B ESS offices, type in: STOP:UTIL!	Ferrod sensor display removed from DISPLAY BUFFER.
26	At telephone set on TTP— Operate green release key.	