

INCOMING AND FINAL SELECTOR CIRCUITS TEST OF TRAFFIC REGISTERS PANEL OFFICES

1. GENERAL

1.01 This section describes methods of testing the various traffic registers associated with all types of incoming and final selector circuits in panel offices. The tests described are as follows:

- (A) Call Distributing "B" Switchboard Incoming All Trunks Busy Register Test Without Assistant
- (B) Call Distributing "B" Switchboard Incoming All Trunks Busy Register Test With Assistant
- (C) Key Pulsing, Key Indicator and Dialing Incoming All Trunks Busy Register Test Without Assistant
- (D) Key Pulsing, Key Indicator and Dialing Incoming All Trunks Busy Register Test With Assistant
- (E) Key Listening and Position Distributing "B" Switchboard Incoming All Trunks Busy Register Test Without Assistant
- (F) Key Listening and Position Distributing "B" Switchboard Incoming All Trunks Busy Register Test With Assistant
- (G) Incoming Trunk Overflow Register Test Without Assistant
- (H) Incoming Trunk Overflow Register Test With Assistant
- (I) Incoming Selector Peg Count Register Test Without Assistant (Except Key Listening "B" Registers Wired to Assignment Keys)
- (J) Incoming Selector Peg Count Register Test With Assistant (Except Key Listening "E" Registers Wired to Assignment Keys)
- (K) Key Listening "B" Switchboard Incoming Selector Register Test With Assistant (Registers Wired to Assignment Keys)
- (L) Final Selector Peg Count Register Test Without Assistant
- (M) Final Selector Peg Count Register Test With Assistant

1.02 Two methods of testing a register, one without an assistant and the other with an assistant are covered in this section. Either method can be used for the majority of circuits but in some cases only one method will apply. In general, the test without an assistant is made in those cases where extreme accuracy in checking the register operation is not essential and for making operation tests of the register. In making this test a portable lamp arrangement employing a switchboard type lamp is used to indicate whether a particular circuit presents the proper condition to the register lead for operating the register and to check the wiring. In addition, in many cases, this arrangement will provide a check for sticky register circuit relays, an open contact on the register or a failure of the register to operate. It will not, however, detect mechanically defective registers unless the defect is of a nature that results in an appreciable error in registrations. The method employing an assistant is performed in the same manner except that an assistant is required at the register rack and the operation of the register for each circuit tested is noted by means of a talking connection over the frame line circuit between the register rack and the frames. This method is normally used where an accurate check of the register is necessary and for checking trouble conditions.

1.03 Ordinarily the test of peg count registers associated with key pulsing incoming circuits from the DSA switchboard and call distributing and key listening "B" switchboard incoming circuits would be made at the same time that an operation test is made of these circuits. A separate test of these registers as described in tests (I) and (J) of this section would normally be employed for checking trouble conditions on such registers.

1.04 Since it is necessary to check key listening "B" switchboard incoming circuit peg count registers wired to assignment keys, at the switchboard positions where it is not convenient to arrange for the test lamp connection, the test is always made with an assistant as covered by test (K).

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1.05 When an assistant is required at the traffic register rack another maintenance attendant or an operator may perform the necessary duties. The assistant, in addition to the required duties, should carefully watch for the simultaneous operation of any registers other than the register under test. This is for the purpose of detecting crosses in the register leads or any irregular wiring arrangements.

1.06 These tests should preferably be made during a period of very light traffic to minimize any interference from service calls. In general, traffic registers should not be tested on peg count days.

1.07 The traffic register readings should be entered on the proper form or chart before and after the test is made and the form forwarded in accordance with local instructions.

2. APPARATUS

- *2.01 267B Tools, as require
- *2.02 Two 267B Tools as required
- 2.03 One 184 Plug, as required
- 2.04 One 136B Tool, as required
- 2.05 Toothpicks
- 2.06 Test Receiver, 528 or equivalent, equipped with a 365 Tool and a 411A Tool.
- 2.07 One W2W Cord, 6 ft. long, equipped with a 110 Plug on one end and a 38A Lamp Socket, 2Y (or 2G) Lamp and Lamp Cap on the other end.
- 2.08 One W2W Cord, 10 ft. long, equipped with a 110 Plug on one end and 360 and 365 Tools on the other end.

	Tests										
	A	B	E	F	G	H	I	J	K	L	M
C	D										
*2.01	x	x	-	-	-	-	-	-	-	-	-
*2.02	-	-	-	-	-	-	x	x	-	-	-
2.03	-	-	-	-	-	-	x	x	-	x	x
2.04	-	-	-	-	-	-	x	x	-	-	-
2.05	-	-	x	x	-	-	-	-	-	-	-
2.06	-	-	-	-	x	x	-	-	-	-	-
2.07	x	x	x	x	x	x	x	x	-	x	x
2.08	x	x	x	x	x	x	x	x	-	x	x

* In some circuits only one cam spring can be opened without interfering with the circuit operation. In such cases the 267B Tool should be modified locally.

3. PREPARATION

All Tests

3.01 Obtain a list of the circuits associated with each register to be tested. This is necessary in order to insure an accurate check of a register with the circuit or circuits connected to it.

All Tests Except Test (K)

3.02 Connect the W2W cord equipped with the 365 tools to a spare jack on the jack panel of the frame on which the circuits associated with the register to be tested are located or where the test is to be made. Then connect one of the leads to the 48-volt (24 volt battery for 24-volt registers) test battery terminal on the frame connecting block and connect the other lead to one of the frame terminal strip terminals associated with the register to be tested. This terminal is made common to all the circuits in the group by wiring or strapping at the frame terminal strips and at the distributing frame. In order to insure a proper check of the inter-frame and distributing frame connections of the register lead, particularly on

tests made without an assistant, this connection should not be changed during the test of any one register circuit. The cross-connection to a particular register at the distributing frame is checked by comparing the number of registrations with the number of circuits tested.

3.03 Connect the W2W cord equipped with the lamp to the corresponding spare jack or equivalent on another jack panel in the same group of frames in such a manner that the lamp will be visible during the test. The lamp should light in those cases where the register lead is arranged to have ground connected to the common lead until all circuits in the group are busy. This cord can be moved from one frame to another, as required, during the test of a register.

Tests Without Assistant

3.04 Proceed to the traffic register rack and record the readings of several of the registers to be tested and then return to the frame where the test is to be performed. In the case of peg count registers it is necessary, in addition, to operate the associated battery supply key at the traffic register rack. The number of

registers read at one time will, of course, depend upon the amount of traffic and the type of circuit. Not too great an interval, however, should elapse between readings of the registers, particularly peg count registers, if there is no definite indication that the register has operated the proper number of times.

Tests With Assistant

3.05 Establish a talking connection between the frame where the test is to be made and the traffic register rack by connecting an operator's telephone set to the local frame line jacks at each point.

4. METHODS

(A) Call Distributing "B" Switchboard Incoming All Trunks Busy Register Test Without Assistant

4.01 Open the all trunks busy register leads of all the circuits except one in the group by inserting a 267B tool (modified when necessary) between the proper sequence switch spring and its associated cam. This procedure does not interfere with service on any circuit in the event the circuit is selected on a call. The circuits need not be made busy during this test.

4.02 In the same manner open the all trunks busy register lead of the remaining circuit in the group when it is idle and observe the lamp associated with the register lead. The lamp should be extinguished during the interval that the lead is open. This checks the interframe wiring of the register leads of all circuits in the group and indicates whether all circuits have removed ground from the register lead. An open in the register lead between the distributing frame and the register relay or a failure of the relay or the register is indicated by insufficient registrations.

4.03 Remove and reinsert the 267B tools of the other circuits in the group when idle, one at a time, until all circuits in the group have been tested. Then remove all the 267B tools.

4.04 Record the reading of the register and note that the reading is equal to or greater than the number of circuits in the group after making allowance for calls served by an idle circuit while the other circuits were made busy. During tests without an assistant it will probably be more convenient to check several groups of circuits before reading the registers.

(B) Call Distributing "B" Switchboard Incoming All Trunks Busy Register Test With Assistant

4.05 Advise the assistant at the register rack to record the reading of the register under test.

4.06 Proceed as described in 4.01 to 4.03.

The assistant should observe that one registration is made each time that the register lead is opened. After all the 267B tools have been removed advise the assistant to again record the reading of the register.

(C) Key Pulsing, Key Indicator and Dialing Incoming All Trunks Busy Register Test Without Assistant

4.07 Proceed as described under Test (A) for a test of the all trunks busy register associated with these circuits.

(D) Key Pulsing, Key Indicator and Dialing Incoming All Trunks Busy Register Test With Assistant

4.08 Proceed as described under Test (B) for a test of these registers.

(E) Key Listening and Position Distributing "B" Switchboard Incoming All Trunks Busy Register Test Without Assistant

4.09 Open the all trunks busy register leads of all the incoming circuits except one in the group by placing a toothpick between the No. 2B spring and the spoolhead of the SR (or D) relay. This procedure does not interfere with service if the incoming circuit is selected on a call. The circuits need not be made busy during this test.

4.10 In the same manner open the all trunks busy register lead of the remaining circuit in the group when it is idle and observe the lamp associated with the register lead. The lamp should be extinguished during the interval that the lead is open. This checks the interframe wiring of the register leads of all circuits in the group and indicates whether all circuits have removed ground from the register lead. An open in the register lead between the distributing frame and the register relay or a failure of the relay or the register is indicated by insufficient registrations.

4.11 Remove for a short interval and then replace the toothpicks of the other circuits in the group when idle, one at a time, until all circuits in the group have been tested. The lamp should light during the interval that the toothpick is removed. Then remove the toothpicks from all the circuits in the group.

4.12 Record the reading of the register as described in 4.04 one registration should be made for each circuit tested.

(F) Key Listening and Position Distributing "B" Switchboard Incoming All Trunks Busy Register Test With Assistant

4.13 Advise the assistant at the register rack to record the reading of the register under test.

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4.14 Proceed as described in 4.09 to 4.11. The assistant should observe that one registration is made each time that the register lead is opened. After all the toothpicks have been removed advise the assistant to again record the reading of the register.

(G) Incoming Trunk Overflow Register Test Without Assistant

4.15 On incoming multiple banks the top set of terminals of a trunk group is known as the overflow terminal. The tip terminal of this set is connected to a register circuit. A selector hunting over the terminals in the trunk group and finding them all busy, stops on the overflow terminal and connects ground to the tip, thereby causing the register to operate.

4.16 At the frame farthest electrically from the register connection, locate the overflow terminal with which the register is associated. Then connect one side of the test receiver to ground and touch the tip overflow terminal with the test pick five times. Each application of ground should be long enough to operate the register. The lamp connected to the register lead should light and be extinguished each time. If the lamp remains lighted after the test pick is removed it indicates that the register L relay has failed to release, an open contact on the register or the failure of the register to operate.

Note: In some of the older installations the register relay is not arranged to connect ground to the common register lead when operated and in some cases a register relay is not provided. Under these conditions sticky register relays or register failures cannot be detected with the lamp.

4.17 After checking the tip terminal, touch the associated sleeve terminal to detect any crosses between the tip and sleeve terminals.

4.18 Connect one side of the test receiver to battery and while holding the receiver away from the ear touch the sleeve terminal with the test pick. No click should be heard in the receiver. If a click is heard it indicates that the terminal is grounded and steps should be taken to remove the ground to prevent the selector from hunting into the next trunk group.

4.19 Record the reading of the register as described in 4.04. One registration should be made for each application of ground to the tip terminal.

(H) Incoming Trunk Overflow Register Test With Assistant

4.20 Advise the assistant to record the reading of the register under test.

4.21 Proceed as described in 4.16 to 4.18. The assistant should observe that a registration is made each time that ground is connected to the tip overflow terminal. After the test is completed advise the assistant to again record the reading of the register.

(I) Incoming Selector Peg Count Register Test Without Assistant (Except Key Listening "B" Registers Wired to Assignment Keys)

4.22 Incoming selector circuits are grouped as specified by the traffic department and each group is connected by a common lead to a group peg count register. With the peg count battery key operated, when provided, any circuit used on a call connects ground to the common lead to operate the register at some point during the revolution of the sequence switch.

4.23 Arrange to have the trunks which are associated with two-wire incoming circuits to be tested made busy at the originating office. The number of trunks to be made busy at one time should depend on the size of the trunk group and the volume of traffic at the time of testing. However, at no time should an entire trunk group be made busy. Any three-wire circuits should be made busy by inserting a 184 plug into the make busy jack or by making the circuit busy at the DSA switchboard.

Note: The incoming circuit for completing intercepting and verification request calls from the central DSA switchboard is made busy by making the associated trunk finder and outgoing trunk circuit busy.

4.24 Observe that the sequence switch of one of the circuits which has been made busy is in its normal position and that the associated brush rod is normal.

4.25 Regular interoffice and key indicator incomings and key pulsing incomings from toll. Manually advance the sequence switch one complete revolution and observe the lamp connected to the register lead. The lamp should light as the sequence switch passes through the register position and should then be extinguished. If the lamp remains lighted, it indicates a failure of the register L relay to release, an open contact on the register or a failure of the register to operate.

4.26 Call distributing "B" incoming circuits. Insulate by means of 267B tools the proper sequence switch cam springs to open the H and ST leads to avoid interference with common link leads. Then block the D or D1 relay or the A relay on toll incomings operated with a 136B tool. Manually rotate the switch one complete revolution and observe the lamp. After each circuit is checked remove the 267B and 136B tools.

4.27 Key listening and Position distributing "B" incomings, key pulsing incomings from DSA switchboard and dialing incomings. Block the proper relay operated with a 136B tool to close part of the register lead. Then manually rotate the switch one complete revolution and observe the lamp. After each circuit is checked remove the 136B tool.

4.28 Proceed in the same manner for the other circuits in the group. After the circuits have been checked, restore them to service.

4.29 Record the reading of the register as described in 4.04 and restore the battery supply key to normal. One registration should be made for each circuit checked.

(J) Incoming Selector Peg Count Register Test With Assistant (Except Key Listening "B" Registers Wired to Assignment Keys)

4.30 Advise the assistant to record the reading of the register under test and to operate the battery supply key, if provided, at the register rack.

4.31 Proceed as described in 4.23 to 4.28. The assistant should observe that a registration is made each time that a sequence switch makes a revolution. After the test is completed on all circuits in the group, advise the assistant to again record the reading of the register and to restore the battery supply key to normal.

(K) Key Listening "B" Switchboard Incoming Selector Register Test With Assistant (Registers Wired to Assignment Keys)

4.32 Advise the assistant to record the reading of the register under test and to operate the battery supply key, if provided, at the register rack. The lamp arrangement is not used for this test.

Note: In most cases no provision is made for a direct talking line between the "B" position and the traffic register rack. However, if it is possible to do so, a telephone circuit should be established between these two points to facilitate the test.

4.33 Operate the AS (or ASSIGN) key of the first trunk in the group under test. Then operate the DISC key for a short interval and the circuit restores to normal. As the assignment key is depressed the assistant should observe that a registration is made.

Note 1: A call served by any circuit in the group during the test will also operate the register. A record should be kept of these calls so that the register readings can be checked accurately after all the

circuits associated with the register have been tested. Any circuit on which the guard or busy lamp is lighted should be tested after the circuit has restored to normal.

Note 2: In some of the older installations the DISC key is not effective until four numerical digits have been set up on the keyset. In this case key four digits and then operate the DISC key.

4.34 Proceed in accordance with 4.33 for the other circuits in the group. After all circuits in the group have been tested, advise the assistant to again record the reading of the register and to restore the battery supply key, when provided, to normal when all registers associated with the key have been tested.

(L) Final Selector Peg Count Register Test Without Assistant

4.35 Final selector circuits are grouped as specified by the traffic department and each group is connected by a common lead to a group peg count register. With the peg count battery key operated, when provided, any circuit used on a call connects ground to the common lead to operate the register at some point during the revolution of the sequence switch.

4.36 Make busy the first idle circuit in the group, after observing that the associated sequence switch and brush rod are normal, by inserting a 184 plug into the TMB jack.

4.37 Manually advance the sequence switch one complete revolution. During this interval observe the lamp connected to the register lead. The lamp should light as the switch passes through a certain position on the switch. If the lamp remains lighted, it indicates a failure of the register L relay to release, an open contact on the register or the failure of the register to operate.

4.38 Remove the plug from the TMB jack after first noting that the sequence switch is normal.

4.39 Proceed in the same manner for the other circuits in the group.

4.40 Record the reading of the register as described in 4.04 and then restore the battery supply key to normal. One registration should be made for each circuit tested.

(M) Final Selector Peg Count Register Test With Assistant

4.41 Advise the assistant to record the reading of the register under test and to operate the associated battery supply key, if provided at the register rack.

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4.42 Proceed as described in 4.36 to 4.38 for each circuit in the group. The assistant should observe that a registration is made each time that a sequence switch makes a revolution. After the test is completed on all circuits in the group, advise the assistant to again record the

reading of the register and to restore the battery supply key to normal.

5. REPORTS

5.01 The required record of these tests should be entered on the proper form.