

REVERTING CALL SELECTORS  
PULSING TESTS  
USING PULSING TEST SET SD-31481-01 (J34717A)  
STEP-BY-STEP SYSTEMS

1. GENERAL

1.01 This section describes a method of applying pulsing tests to two, four, eight and ten-party reverting call selectors. The tests are based on the use of pulsing test set SD-31481-01.

1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process marginal arrows have been omitted.

1.03 The tests covered are:

(A) Over-all Pulsing Test

(B) Magnet Pulsing Test

1.04 Test (B) is not required on a routine basis, but should be performed on any switch on which a failure is encountered under the leak condition in Test (A) in order to determine if the trouble indicated by Test (A) is due to the switch mechanism.

1.05 The general procedure for the analysis and correction of pulsing failures encountered in making pulsing tests of selectors is covered in Section 226-170-700.

1.06 Unless otherwise covered by local instructions, the pulsing tests should be made with a 1400-ohm loop and with the leak "A" condition in offices where all the reverting call selector B functional relays are of the 248 type or 222 type modified with a 1:1 ratio armature. Otherwise, the pulsing tests should be made with a 1200-ohm loop and with the leak "A" condition. Local instructions, however, may specify the use of other loop and leak conditions.

1.07 If an "out of service" failure is encountered on any selector, it should be held busy in the approved manner until the trouble is cleared.

1.08 The test equipment specified in this section is designed to apply proper marginal tests (simulated critical circuit conditions) when the circuit under test and the test equipment have an applied voltage of 48.5 to 50. In those offices where power plants are normally operated at more than 50 volts, the battery voltage should be reduced and maintained within the required limits while the tests are being made.

2. APPARATUS

Tests (A) and (B)

2.01 Pulsing Test Set J34717A (SD-31481-01).

2.02 No. 36B Test Set (Remote Control).

2.03 One P2J Cord equipped with two No. 310 Plugs (2P9B) - used where a battery supply jack is available.

2.04 One W2M Cord equipped with one No. 310 Plug, tip and sleeve connections, and two No. 59 Cord Tips (2W12A) and two No. 108 Cord Tips - used where a battery supply jack is not available.

2.05 One P3C Cord equipped at one end with a No. 310 Plug and at the other end with a No. 240A Plug (3P2A).

2.06 No. 477A (or No. 375A) Make-Busy Tools, as required.

2.07 KS-6320 Orange Stick.

Test (B) Only

2.08 One W1H Cord equipped at one end with a No. 47B Plug and at the other end with a No. 360B Tool (1W8A) and a No. 419A Tool.

3. PREPARATION

Tests (A) and (B)

3.01 Connect 48-volt battery and ground to the BAT-G jack of the test set. Use a P2J cord if a battery supply jack is provided. If a battery supply jack is not available, use a W2M cord, connecting the No. 59 cord tip of the white (tip) conductor to a spare 48-volt battery fuse or to the equipment side of a battery fuse in service, and the red (sleeve) conductor to ground. In no case should the fuse selected exceed 5 amperes.

Note: To avoid possible grounding of the battery supply lead, connect the cord to the test set first and, when disconnecting, remove the cord from the test set last.

3.02 Connect the No. 36B test set to jacks A and B of the pulsing test set. Place the stay cord of the No. 289A plug to the bottom, or the ridged side of the No. 152 plug to the left.

3.03 Insert the No. 310 plug of the P3C cord into the SW jack of the pulsing test set.

Note: When testing ten and twenty-party reverting call selectors of the No. 204

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selector type, insert the No. 310 plug into the TL jack instead of the SW jack.

one of the contact blades of the No. 240A plug, in order to trip the ringing and to release the switch.

Test (B) Only

Caution: To avoid personal contact with the ringing current, do not touch the springs of the test jack or the blades of the plug when tripping the ringing.

3.04 Insert the No. 47B plug of the WH cord into the MAG jack.

4.05 Repeat the operations described in 4.02 to 4.04 except this time use the remote control LK instead of the LP key.

4. METHOD

(A) Over-all Pulsing Test

Eight and Ten-Party Selectors (No. 197 Switch Type)

Two and Four-Party Selectors

4.01 Set up the loop and leak conditions in accordance with 1.06. The loop values are established by operating the keys indicated below:

4.06 Proceed as in 4.01 and 4.02.

<u>Loop Resistance</u>	<u>Keys Operated</u>
1000 Ohms	200 and 800
1200 Ohms	400 and 800
1400 Ohms	200, 400 and 800

4.07 Depress and hold the remote control LP key until the selector starts to rotate. Observe that the selector steps smoothly to the ninth level and then rotates smoothly to terminal 99.

Note: If the selector steps vertically on the second series of pulses it may be due to the C relay being too slow in its release.

The leak conditions are established by operating the keys indicated below:

4.08 Remove the No. 240A plug from the test jack.

<u>Leak Condition</u>	<u>Key Operated</u>
Leak B	LKB
Leak A	LKA

(a) If testing selectors arranged to serve a maximum of eight parties, observe that the switch releases.

4.02 If the selector to be tested is normal, insert the No. 240A plug into the test jack. If the switch is busy the BY lamp will light, in which case the plug may either be removed in order to proceed with other tests or left in the test jack and the test delayed until the BY lamp is extinguished.

(b) If testing selectors arranged to serve a maximum of ten parties, observe that the switch does not release. Momentarily short-circuit the ring and tip (1 and 2) springs of the test jack, using one of the contact blades of the No. 240A plug, in order to trip the ringing and to release the switch.

4.03 Momentarily depress the remote control LP key. Observe that the selector rotates smoothly to the ninth terminal.

Caution: To avoid personal contact with the ringing current, do not touch the springs of the test jack or the blades of the plug when tripping the ringing.

Note: When testing selectors on which the rotary action takes place on a minor switch (No. 204 type selector), it will be necessary to remove the switch cover to observe that the selector stops on the ninth terminal.

4.09 Repeat the operations described in 4.02, 4.07 and 4.08, except this time use the remote control LK instead of the LP key.

4.04 Remove the No. 240A plug from the test jack.

Ten and Twenty-Party Selectors (No. 204 Selector Type)

(a) In two-party offices, and in four-party full selective line switch offices arranged for message rate service, observe that the switch releases.

4.10 Remove the switch cover.

(b) In all other four-party offices observe that the switch does not release. Momentarily short-circuit the ring and tip (1 and 2) springs of the test jack, using

4.11 If the switch is idle, block the B relay operated by placing a KS-6320 orange stick between the armature lever and back stop. Insulate the make contacts of the B relay which grounds the sleeve.

4.12 Operate the K relay manually and observe that it locks operated.

4.13 Proceed as in 4.01.

4.14 Insert the No. 240A plug into the selector test jack. Depress and hold the remote control LP key until the second code selector (A) starts to rotate. Remove the KS-6320 orange stick from the B relay when the first code selector (B) starts to rotate. Observe that both code selectors rotate smoothly to the ninth terminal.

4.15 Remove the No. 240A plug from the test jack. Observe that the code selectors do not release. Momentarily short-circuit the ring and tip (1 and 2) springs of the test jack, using one of the contact blades of the No. 240A plug, in order to trip the ringing and to release the switch.

Caution: To avoid personal contact with the ringing current, do not touch the springs of the test jack or the blades of the plug when tripping the ringing.

4.16 Repeat the operations described in 4.11 to 4.15, except this time use the remote control LK instead of the LP key. Unless other tests are to be conducted on the switch, remove the contact insulation from the B relay and replace the switch cover.

#### (B) Magnet Pulsing Test

##### Two and Four-Party Selectors

4.17 With the test set connections established and the test set resistance and leak keys operated as in Test (A), operate the MAG key.

Note: The 200, 400 and 800 keys and the LKA key are ineffective when making the magnet pulsing test. The LKB key, however, is effective. This key should be in the normal position if the leak A requirement is to be met on Test (A). It should be operated to the LKB position if the leak B requirement is to be met on Test (A). By having the keys operated as in the over-all pulsing test, while conducting the magnet pulsing test, it is convenient to switch from one test to the other in the process of clearing trouble. This switching is accomplished by the release or operation of the MAG key as required.

4.18 Remove the switch cover and connect the No. 419A tool to the back contact spring of the pulsing springs on the selector A relay.

4.19 Momentarily depress the remote control LK key. Observe that the selector rotates smoothly to the ninth terminal.

Note: It is not a requirement that the C relay hold during the magnet test. If the C relay releases during this test hold it operated manually to check the rotary magnet pulsing. If the over-all pulsing test indicated a C relay failure, correction of the failure should be in accordance with 1.05.

4.20 Remove the No. 240A plug from the test jack.

(a) In two-party offices, and in four-party full selective line switch offices arranged for message rate service, observe that the switch releases.

(b) In all other four-party offices observe that the switch does not release. Momentarily short-circuit the ring and tip (1 and 2) springs of the test jack, using one of the contact blades of the No. 240A plug, in order to trip the ringing and to release the switch.

Caution: To avoid personal contact with the ringing current, do not touch the springs of the test jack or the blades of the plug when tripping the ringing.

4.21 If it is desired to hold the switch busy in the normal position while making inspections or adjustments, insert a make-busy tool in the test jack. Further pulsing tests are made by reestablishing the test connection.

4.22 At the completion of the tests, remove the No. 419A tool and replace the switch cover.

##### Eight and Ten-Party Selectors (No. 197 Switch Type)

4.23 Proceed as in 4.17 and 4.18.

4.24 Depress and hold the remote control LK key until the selector starts to rotate. Observe that the selector steps smoothly to the ninth level and then rotates smoothly to terminal 99.

Note: It is not a requirement that the C, or E (or J), relay hold during the magnet test. If the C, or E (or J), relay releases during this test hold it operated manually to check the associated magnet pulsing. If the over-all pulsing test indicated a C, or E (or J), relay failure, correction of the failure should be in accordance with 1.05.

4.25 Remove the No. 240A plug from the test jack.

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(a) If testing selectors arranged to serve a maximum of eight parties observe that the switch releases.

(b) If testing selectors arranged to serve a maximum of ten parties observe that the switch does not release. Momentarily short-circuit the ring and tip (1 and 2) springs of the test jack, using one of the contact blades of the No. 240A plug, in order to trip the ringing and to release the switch.

Caution: To avoid personal contact with the ringing current, do not touch the springs of the test jack or the blades of the plug when tripping the ringing.

4.26 If it is desired to hold the switch busy in the normal position while making inspections or adjustments, insert a make-busy tool in the test jack. Further pulsing tests are made by reestablishing the test connection.

4.27 At the completion of the tests, remove the No. 419A tool and replace the switch cover.

### Ten and Twenty-Party Selectors (No. 204 Selector Type)

4.28 Proceed as in 4.11, 4.12, 4.17 and 4.18.

4.29 Depress and hold the remote control LK key until the second code selector (A) starts to rotate. Remove the KS-6320 orange stick from the B relay when the first code selector (B) starts to rotate. Observe that both code selectors rotate smoothly to the ninth terminal.

Note: It is not a requirement that the C relay hold during the magnet test. If the C relay releases during this test hold it operated manually to check the rotary magnets of the code selectors. If the overall pulsing test indicated a C relay failure, correction of the failure should be in accordance with 1.05.

4.30 Remove the No. 240A plug from the test jack. Observe that the code selectors do not release. Momentarily short-circuit the ring and tip (1 and 2) springs of the test jack, using one of the contact blades of the No. 240A plug, in order to trip the ringing and to release the switch.

Caution: To avoid personal contact with the ringing current, do not touch the springs of the test jack or the blades of the plug when tripping the ringing.

4.31 Unless other tests are to be conducted on the switch, remove the contact insulation from the B relay and replace the switch cover.

## 5. REPORTS

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