

**TEST DISTRIBUTORS
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 test distributors. The tests are based on the use of the pulsing test set SD-31481-01 and pulse repeating test set SD-31667-01, the latter set being employed only when testing long range test distributors (2000-ohm pulsing range).

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 - Maximum Pulsing Loop Not Over 1200 Ohms

(B) Over-all Pulsing Test - Maximum Pulsing Loop of 2000 Ohms

(C) Over-all Pulsing and J Relay Hold Test

(D) Magnet Pulsing Test

1.04 Tests (A) and (C), or (B) and (C), are alternative methods. Test (C) is intended for use when it is desired to include a check of the holding time of the J relay in offices where the relay timing test set is not available. Ordinarily, Test (C), if applied on a routine basis, would be made at less frequent intervals than Test (A), or (B), either one or the other, but not both, being made on any one testing cycle. Test (C) should be applied as a final check after clearing any trouble involving adjustment of the J relay.

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

1.06 These tests do not apply to test distributors arranged only for five-level operation.

1.07 The general procedure for the analysis and correction of pulsing failures encountered in making pulsing tests of test distributors is covered in a separate section.

1.08 While conducting these tests the preceding trunk should be made busy in the approved manner.

1.09 If an "out of service" failure is encountered on any test distributor, it should be made busy in the approved manner until the trouble is cleared.

1.10 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), (B), (C) and (D)

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.

Tests (B), (C) and (D) - Maximum Pulsing Loop of 2000 Ohms

2.07 Pulse Repeating Test Set J34720A (SD-31667-01).

2.08 One P3K Cord equipped with two No. 310 Plugs (3P15A).

Test (C) Only

2.09 One No. 893 Cord equipped with two No. 360A Tools (1W13A), a No. 365 Tool on one end and a No. 419A Tool or a KS-6278 Connecting

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Clip on the other end. The No. 419A Tool is for use where the wiper cords terminate at the test jack assembly; otherwise use the KS-6278 connecting clip.

Test (D) Only

2.10 One WLH 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), (B), (C) and (D)

3.01 Connect 48-volt battery and ground to the BAT-G jack of the pulsing 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.

Tests (A), (C) and (D) - Maximum Pulsing Loop Not Over 1200 Ohms

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

Tests (B), (C) and (D) - Maximum Pulsing Loop of 2000 Ohms

3.04 Connect the TL jack of the pulsing test set to the INT jack of the pulse repeating test set using the P3K cord.

3.05 Insert the No. 310 plug of the P3C cord into the R jack of the pulse repeating test set.

Test (C) Only

3.06 Connect the No. 365 tool of the No. 893 cord to ground.

Test (D) Only

3.07 Insert the No. 47B plug of the WLH cord into the MAG jack.

4. METHOD

(A) Over-all Pulsing Test - Maximum Pulsing Loop Not Over 1200 Ohms

4.01 Resistance keys provided in the pulsing test set are used for setting up loop conditions approximating those encountered in service. The following resistance values are inserted in the pulsing circuit of the test set by operating the keys indicated below:

<u>Test Set Resistance</u>	<u>Keys Operated</u>
200 ohms	200
400 ohms	400
600 ohms	200 and 400
800 ohms	800
1000 ohms	200 and 800
1200 ohms	400 and 800

In those cases where the compensating resistance in the test distributor is in the circuit when connection is made to the test jack, the proper test set resistance value to be used is the one which most nearly represents the external pulsing loop over which the switch operates in service. In those cases where the compensating resistance in the test distributor is not in the circuit when connection is made to the test jack, the proper test set resistance value to be used is the one which most nearly represents the maximum external pulsing loop for which the test distributor is arranged as shown on the circuit drawing.

4.02 Operate the LKC key if the test distributor is arranged for a 750-ohm maximum external circuit pulsing loop. Otherwise, all leak keys should be normal.

4.03 If the test distributor 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.

Note: In case the test distributors are associated with test distributor control circuits, used with trunks from a No. 14 local test desk, it is necessary in some offices to block the SB relay of the control circuit in the non-operated position. The SB relay should be made free to operate when the tests are completed. This procedure is required with certain type control circuits in which the SB relay would otherwise operate when the plug is inserted in the test jack of the test distributor. The operation of the SB

relay would result in placing a low resistance bridge across the LINE-T and LINE-R leads, thereby holding the A and G relays in the test distributor permanently operated. In other type control circuits the SB relay cannot operate unless the loop is closed at the test desk.

4.04 If the test distributor is the combined one and two-digit operation type, with one-digit operation on the ninth level, remove the switch cover and block the K relay non-operated.

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

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

4.06 Momentarily depress the remote control RLS key. Observe that the switch releases. Disregard any momentary lighting of the BY lamp as the switch releases.

4.07 Repeat the operation in 4.05, except this time depress the remote control LK key instead of the LP key.

4.08 Unless other tests are to be conducted on the switch, remove the No. 240A plug from the test jack. Observe that the switch releases. Remove the blocking from the K relay, if used, and replace the switch cover. (See Note under 4.03.)

(B) Over-all Pulsing Test - Maximum Pulsing Loop of 2000 Ohms

4.09 Establish the loop values by operating the keys indicated below:

Loop Resistance	Keys Operated	
	Pulsing Test Set	Pulse Repeating Test Set
2000 ohms	200 and 800	200 and 800

4.10 If the test distributor to be tested is normal, insert the No. 240A plug into the test jack. If the switch is busy the BY lamp of the pulsing test set 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.

Note: In case the test distributors are associated with test distributor control circuits, used with trunks from a No. 14 local test desk, it is necessary in some offices to block the SB relay of the control circuit in the non-operated position. The SB relay should be made free to operate when the tests are completed. This procedure is required with certain type control circuits in which the SB relay would otherwise operate when the plug is inserted in the test jack of the test distributor. The operation of the SB relay would result in placing a low resistance bridge across the LINE-T and LINE-R leads, thereby holding the A and G relays in the test distributor permanently operated. In other type control circuits the SB relay cannot operate unless the loop is closed at the test desk.

4.11 Operate the SL key of the pulse repeating test set.

4.12 If the test distributor is of the combined one and two-digit operation type, with one-digit operation on the ninth level remove the switch cover and block the K relay non-operated.

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

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

4.14 Momentarily depress the remote control RLS key. Observe that the switch releases.

4.15 Operate the D key of the pulse repeating test set to establish the leak condition.

4.16 Repeat the operation in 4.13 except this time depress the remote control LK key instead of the LP key.

4.17 Unless other tests are to be conducted on the switch, momentarily depress the remote control RLS key and remove the No. 240A plug from the test jack. Observe that the switch releases. Restore the SL and D keys of the pulse repeating test set to normal. Remove the blocking from the K relay, if used, and replace the switch cover. (See Note under 4.10.)

(C) Over-all Pulsing and J Relay Hold Test

4.18 If the test distributors are arranged for a maximum pulsing loop of not over 1200 ohms, proceed as in 4.01 to 4.06. If testing switches arranged for a maximum pulsing loop of 2000 ohms, proceed as in 4.09 to 4.15.

4.19 Momentarily depress the remote control LK key. Observe that the test distributor steps smoothly to the ninth level.

4.20 Connect the No. 419A tool of the No. 893 cord to the "line" sleeve wiper cord terminal at the test jack assembly in order to ground the sleeve.

Note: In offices where the wiper cords do not terminate at the test jack assembly, connect the KS-6278 clip of the No. 893 cord directly to the "line" sleeve wiper.

4.21 Again momentarily depress the remote control LK key. Observe that the test distributor rotates smoothly to terminal 99. Remove the No. 419A tool (or KS-6278 clip) upon completion of the rotary action.

Note: If the switch stops on one of the lower numbered terminals it may be due to the J relay being too fast in its release.

4.22 Unless other tests are to be conducted on this switch, momentarily depress the remote control RLS key and remove the No. 240A plug from the test jack. Observe that the switch releases. Restore the SL and D keys of the pulse repeating test set to normal, if this test set is being used. Remove the K relay blocking, if used, and replace the switch cover. (See Note under 4.03 or 4.10.)

(D) Magnet Pulsing Test

4.23 With the test set connections established and the test set keys operated as in Test (A), (B) or (C), operate the MAG key of the pulsing test set.

Note: The loop resistance keys and the LKC and D keys are ineffective when making the magnet pulsing test. The LKB key, however, is effective and should be in the normal position. 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.

4.24 Remove the switch cover, if it has not already been removed, and connect the No. 419A tool of the WJH cord to the back contact spring of the pulsing springs of the test distributor A relay.

4.25 If Test (D) is made as a consecutive operation with Test (A), (B) or (C), and the switch has been left off normal at the completion of Test (A), (B) or (C), momentarily depress the remote control RLS key.

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

Note: It is not a requirement that the C, or J, relay hold during the magnet test. If the C, 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 J, relay failure, correction of the failure should be in accordance with 1.07.

4.27 If it is desired to repeat test (A), (B), (C) or (D) release the switch by momentarily depressing the remote control RLS key.

4.28 If it is desired to hold the switch busy in the normal position while making inspections or adjustments, momentarily depress the remote control RLS key and remove the No. 240A plug from the test jack. Insert a make-busy tool in this jack. Further pulsing tests are made by reestablishing the test connection.

4.29 At the completion of the tests, momentarily depress the remote control RLS key and remove the No. 240A plug from the test jack. Observe that the switch releases. Restore the SL key of the pulse repeating test set and remove the K relay blocking, if used. Replace the switch cover. (See Note under 4.03 or 4.10.)

5. REPORTS

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