M-LEAD PULSE CORRECTOR

SD-99766-01

OUT-OF-SERVICE TESTS

1. GENERAL

1.01 This section describes a method of making out-of-service tests for evaluating the performance of the M-lead pulse corrector, using the SF testing and monitoring circuit, SD-96519-01 or SD-96519-02.

1.02 This section is reissued to include the use of the 4A signaling test set. This section affects the Equipment Test List.

1.03 The tests covered are:

1.04 If the requirements of Tests B and C are not met, the defective unit should be sent to a repair center, since special techniques are involved in testing and clearing trouble in the precision timing circuits.

1.05 The plug-in circuit pack is referred to in this section as pulse corrector.

1.06 The 2B signaling test set is referred to as 2B test set.

1.07 Adjustment of the 2B test set for percent break values above 70 must be made ***slowly*** to prevent pulsing out incorrect values. Incorrect values will be obtained, if the vibration rate of the PERCENT BREAK meter pointer is not the same as that of the PULSES PER SECOND meter pointer. To restore correct percent break values, turn the ADJ % BK control counterclockwise until both pointers are vibrating at the same rate; then turn the control ***slowly*** clockwise until the desired percent break value is obtained. It may also be necessary to change the coarse ADJ % BK switch S, M, or L setting to obtain the desired range on the PERCENT BREAK meter.

1.08 Before using the 2B test set, it should be known to be correctly calibrated.

Note: This calibration requires special attention, since the pulse corrector contains precision timing circuits that must be checked carefully.

1.09 The J98613AY SF testing and monitoring circuit (SD-96519-01 or SD-96519-02) is referred to in this section as test circuit.

1.10 The KS-14510, L5 volt-ohm-milliammeter is referred to in this section as VOM.

1.11 The 4A signaling test set is referred to as 4A test set.

1.12 ***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 a 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 that letter should be omitted.

2. APPARATUS

Test A

2.01 KS-14510, L5, volt-ohm-milliammeter (VOM) including test leads.

2.02 Adapter, ED-99983-30, Group 1 (SD-99766-01, Issue 2 or later) used as a test connection between the pulse corrector and the folding test fixture of the test circuit.

2.03 2B signaling test set—J64730, L1 (SD-56134-02) including patching cords for E and M leads (2P1D and 2P3B cords) and power cords.

2.04 ▶4A signaling test set—J94743A, including the E&M interface unit, J94743AD.◀

2.05 Test circuit—J98613AY (SD-96519-01 or SD-96519-02).

2.06 Patching cord—P2A, 6 feet long, equipped with two 347A plugs (2P1D cord).

2.07 Patching cord—P2A, 6 feet long, equipped with two 347B plugs (2P3B cord).

2.08 Patching cord—P3E, 6 feet long, equipped with two 310 plugs (3P15A cord).

2.09 ▶Patching cord—P3N cord, 6 feet long, equipped with a 310 plug and a 241 plug (3P17B cord).◀

3. METHOD

STEP	ACTION	VERIFICATION
A. Supply Voltage Test		
1	Set VOM scale select switch to 60 VOLTS DC.	
2	Connect positive lead of VOM to ground.	
3	With pulse corrector plugged into mounting shelf— Connect negative lead of VOM to pin 3 of 906J connector at rear of mounting shelf.	VOM indicates 18 to 26 volts.
4	Move negative lead of VOM to pin 6 of 906J connector.	VOM indicates 42 to 53 volts.
5	Remove VOM leads from pin 6 and ground.	
B. Performance Test—Using 2B Test Set		
1	At test circuit— Set all keys to normal postion. ***Note:*** The twist keys in the test circuit are operated when the white line is in the vertical position and are normal when the white line is in the horizontal position. The OG-BG key of the 2B test set is operated when in the BG (white line horizontal) position and is normal when in the OG (white line vertical) position.	

STEP	ACTION	VERIFICATION
2	At 2B test set— Set SCALE SEL switch to PPS.	
3	Plug power cords of 2B test set into A and B jacks of test circuit.	After 1 minute, PULSES PER SECOND and PERCENT BREAK meters indicates other than 0.
4	Operate CONT PLS key to DIAL PLS.	PERCENT BREAK meter indicates 0 on ***black*** scale.
5a	If the requirement of Step 4 is not met— Adjust pointer adjustment screw of PERCENT BREAK meter to obtain 0 reading.	
6	Insert 258D plug into P jack.	PERCENT BREAK meter indicates 100 on ***black*** scale.
7b	If the requirement of Step 6 is not met— Unlock CAL % BK control and adjust to obtain reading of 100 on ***black*** scale. Relock control, taking care not to change reading.	
8	Remove 258D plug. ***Note:*** Repeat Steps 6, 7b, and 8 if test extends beyond 30 minutes.	
9	Restore CONT PLS key to normal.	
10	Set SCALE SEL switch to 200V.	
11	At test circuit— Set KEYERS switch and RECEIVER switch to position 1.	
12	Operate M key.	
13	Using 2P3B and 2P1D cords patch E and M jacks of test circuit to E and M jacks of 2B test set.	
14	Plug pulse corrector adapter into folding test fixture of test circuit.	
15	Plug pulse corrector into adapter.	
16	Using 3P7A cord, patch SENS-1 jack of test circuit to VM jack of 2B test set.	At 2B test set— VOLTS meter indicates between −18 and −26 volts.
17	Remove cord from SENS-1 and VM jacks.	

STEP	ACTION	VERIFICATION
18	At 2B test set— Set SCALE SEL switch to PPS.	
19	At 2B test set— Adjust ADJ PPS control to 10 pps on PULSES PER SECOND meter.	
20	Set ADJ % BK switch to S.	
21	Adjust ADJ % BK control to 10 on ***black*** scale of PERCENT BREAK meter.	
22	Operate TWD L key to OFF HK and TWD D key to ON HK.	
23	Operate PLS and MEAS % BK keys to LINE.	PERCENT BREAK meter indicates 1 or less on ***red*** scale.
24	Restore PLS and MEAS % BK keys to normal.	
25	Adjust ADJ % BK control to 16.5 on ***black*** scale of PERCENT BREAK meter.	
26	Operate PLS and MEAS % BK keys to LINE.	PERCENT BREAK meter indicates between 46 and 55 on ***red*** scale.
27	Restore all test set keys to normal.	
28	Using 3P7A cord, patch D jack to L jack.	
29	At 2B test set— Operate TWD L key to ON HK.	
30	Operate PLS key to DROP.	
31	Operate MEAS % BK to LINE.	
32	Set ADJ % BK switch to M.	
33	Adjust ADJ % BK control to 65 on ***red*** scale of PERCENT BREAK meter.	
34	Operate TWD L key to OFF HK and TWD D key to ON HK.	
35	Operate PLS key to LINE.	PERCENT BREAK meter indicates between 60 and 70 on ***red*** scale.
36	Restore PLS and MEAS % BK keys to normal.	
37	Adjust ADJ PPS control to 12 pps on PULSES PER SECOND meter.	

STEP	ACTION	VERIFICATION
38	Carefully adjust ADJ % BK control clockwise to 75 on ***black*** scale of PERCENT BREAK meter.	
39	Operate PLS and MEAS % BK keys to LINE.	PERCENT BREAK meter indicates between 64.5 and 73.5 on ***red*** scale.
40	Remove all cords, restore all keys to normal, and return pulse corrector to service or spare position.	

C. Performance Test—Using 4A Test Set

1	▶At test circuit— Set all keys to normal position. ***Note:*** The twist keys in the test circuit are operated when the white line is in the vertical position and are normal when the white line is in the horizontal position.	
2	Plug pulse corrector adapter into folding test fixture of test circuit.	
3	Plug pulse corrector into adapter.	
4	Insert 310 plug of W2CF cord into SENS-1 jack of test circuit.	
5	Set scale selector switch of VOM to 60 VOLTS DC.	
6	Connect positive (+) lead of VOM to 360C (white) tool of W2CF cord.	
7	Connect negative (−) lead of VOM to 360B (black) tool of W2CF cord.	VOM indicates 18 to 26 volts.
8	Remove W2CF cord from SENS-1 jack.	
9	Connect 4A test set to 110 volts ac.	
10	Equip 4A test set with E&M interface unit.	
11	Using P3N cord, connect LINE/R jack of 4A test set to E and M jacks of test circuit, with notched side of 241 plug toward E jack.	
12	At test circuit— Set KEYERS switch and RECEIVER switch to position 1.	

STEP	ACTION	VERIFICATION
13	Operate M key.	
14	At 4A test set— Operate POWER switch to ON.	
15	Set MS RANGE switch to 999.	
16	Set SELECTOR switch to NORM.	
17	Set FUNCTION switch to MSEC BK.	
18	Set READ switch to MSEC UPDATE.	
19	Set RECEIVE switch to EM.	
20	Set SEND switch to EM.	
21	Set PULSE MODE switch to CONT.	
22	Set E&M/CX-S/R switch to E&M/CX.	
23	Operate PULSE/MEAS key to LINE.	
24	Operate TWD DROP key to ON HK.	
25	Operate TWD LINE key to OFF HK.	
26	Set PULSE PERIOD switch to 100.	
27	Set PULSE WIDTH switch to 10.	
28	Operate GEN SUPV key to OFF HK.	
29	Operate START-STOP key. ***Note:*** The OPERATE-CLEAR key and the START-STOP key are operated when the lamp behind the key is lighted and released when the lamp is extinguished.	
30	Operate OPERATE-CLEAR key.	4A display indicates 0 ms break. LINE lamp extinguished.
31	Set PULSE WIDTH switch to 17.	4A display indicates 46 to 55 ms break.
32	Set PULSE WIDTH switch to 65.	4A display indicates 60 to 70 ms break.
33	Set FUNCTION switch to MSEC MK.	
34	Operate GEN SUP key to ON HK.	
35	Set PULSE PERIOD switch to 83.	

STEP	ACTION	VERIFICATION
36	Set PULSE WIDTH switch to 62.	4A display indicates 54 to 62 ms make.
37	Release OPERATE-CLEAR key.	
38	Restore all keys to normal, remove test cords, and restore all circuits to normal.	