CABLE INSULATION ALARM CIRCUIT SD-96348-01

TESTS

1. GENERAL

1.01 This section describes a method of testing the cable insulation alarm circuit SD-96348-01.

1.02 This section is reissued to revise the identification tables in Part 4 for clarity, to add a new table to conform with a drawing change on Issue 11-D and to bring the section up to date. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The tests covered are:

- **A. Automatic Operation Test**
- **B. Particular Terminal and Continuity Test**
- **C. Cable Insulation Conditions — Where CAL Switch Is Not Provided**
- **D. Cable Insulation Conditions — Where CAL Switch Is Provided**

1.04 Where alarms are extended to another location, it is advisable to request the operator or distant office to disregard such signals when Test B, C, or D is to be made.

1.05 *Lettered Steps:* A letter a, b, c, etc, added to a step number in Part 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.

1.06 Test B involves optional wiring. To determine if "T" or "V" wiring is provided, with all keys normal, manually operate and hold the A relay. If the MP lamp lights, "T" wiring is furnished.

2. APPARATUS

Tests B and C

2.01 35-Type Test Set.

2.02 W2C Cord, 10 feet long, equipped with a No. 310 Plug and two No. 59 Cord Tips (2W6A Cord).

3. PREPARATION

STEP	ACTION	VERIFICATION
Tests A, B, and C		
1	At relay rack — Simultaneously operate MT (manual test) and ST (start) keys	

4. METHOD

STEP	ACTION	VERIFICATION
	A. Automatic Operation Test	
2a	If crossbar switch is used for connecting to test terminals — At relay rack — Restore MT key to normal	Crosspoints closed in succession as indicated by selecting and hold magnets

STEP	ACTION	VERIFICATION
3b	If relay arrangement is used for connecting to test terminals — At relay rack — Restore MT key to normal	HS relays operate in succession as indicated by position of H selector TR relay operates every second revolution of H selector
4	After complete cycle of test, restore ST key to normal	Selectors cease stepping
	B. Particular Terminal and Continuity Test	
2	At MDF — Set up 35-type test set to obtain a resistance of approximately 40,000 ohms as covered in Section 100-101-301.	
3	Operate BAT and GRD CO key of 35-type test set	
4	Insert plug of W2C cord into TEST T and R jack of 35-type test set	
5	Connect No. 59 cord tips of W2C cord to tip and ring of cable test terminal to be tested ***Note:*** It is advisable to connect to different cable test terminals each time these tests are performed. In this manner, every cable test terminal will eventually be tested.	
6a	If crossbar switch is used — Operate and release SEL key as required to step S selector to position corresponding with terminal to be tested (See identification table)	S selector steps with each operation and release of SEL key
7a	Operate and release HLD key as required to step H selector to position corresponding with terminal to be tested (See identification table)	H selector steps with each operation and release of HLD key
8b	If relay arrangement is used with "T" wiring — Operate and release HLD key as required to step H selector to position corresponding with terminal to be tested (See identification table)	H selector steps with each operation and release of HLD key TR relay operates in position 22 and holds through next cycle
9c	If relay arrangement is used with "V" wiring — Operate and release HLD key as required to step H selector to position corresponding with terminal to be tested (See identification table) ***Note:*** If the identification table shows TR relay operated to reach the desired test terminal, it will be necessary to first step the H selector to position 22 and momentarily restore ST key.	H selector steps with each operation and release of HLD key
10d	If "T" wiring is provided — With cable insulation alarm circuit on terminal under test — Restore ST key	CI1 or CI2 sensitrol relay operates MP (red) lamp lights Audible alarm sounds Aisle pilot (where provided) lights

STEP	ACTION	VERIFICATION
11e	If "V" wiring is provided — With cable insulation alarm circuit on terminal under test — Restore ST key	CI1 or CI2 sensitrol relay operated as indicated by pointer being at extreme left.
12	Insulate 1T and 2T of J relay	
13e	If "V" wiring is provided — Restore MT key	
14e	Operate ST key	MP (red) lamp lights Audible alarm sounds Aisle pilot (where provided) lights
15	Operate AL key	Alarms retired
16f	If alarm checking terminal is provided — Using any available telephone, dial appropriate code to reach terminal	Steady tone is heard in receiver MP lamp remains lighted
17f	Release connection	
18	Momentarily operate RS key	CI1 or CI2 relay restores and reoperates as indicated by movement of pointer
19	Block H relay operated	
20f	If alarm checking terminal is provided — Using any available telephone, dial appropriate code to reach terminal and release connection	CI1 or CI2 relay restored MP lamp extinguished
21g	If alarm checking terminal is not provided — Momentarily operate RS key	CI1 or CI2 relay restored MP lamp extinguished
22	Restore ST key	
23	Remove block from H relay	
24	Remove insulator from contacts of J relay	
25	At MDF — Disconnect No. 59 cord tips of W2C cord from terminal tested	

C. Cable Insulation Conditions — Where CAL Switch Is Not Provided

2	Using 35-type test set as a variable resistance as covered in Section 100-101-301, set up resistance values to apply operate and nonoperate current to CI relay in accordance with table of working limits on circuit drawing and actual circuit arrangement. Use No. 3 and No. 4 rheostat slides for operate and nonoperate values, respectively	
3	Operate BAT and GRD CO key of 35-type test set	
4	With all short-circuiting switches open, insert plug of W2C cord into TEST T and R jack of 35-type test set	

STEP	ACTION	VERIFICATION
5	Insulate contacts 3B and 3T of G relay	
6	Block G relay normal	
7	Operate and release HLD key as required to step H selector to position which will provide test condition set up in Step 2.	H selector steps with each operation and release of HLD key
8	Connect one of No. 59 cord tips of W2C cord to contact 2B of G relay and the other No. 59 cord tip to ground	
9	Close short-circuiting switch associated with No. 4 telegraph key of 35-type test set	
10	Restore ST key	Pointer of CI1 sensitrol relay in normal position
11	Restore short-circuiting switch associated with No. 4 telegraph key	
12	Close short-circuiting switch associated with No. 3 telegraph key of 35-type test set	Pointer of CI1 sensitrol relay at extreme left
13	Open short-circuiting switch associated with No. 3 telegraph key	
14	Momentarily operate RS key	Pointer of CI1 sensitrol relay restored to normal
15	Repeat Steps 2, 7, and 9 through 14 for each of other insulation resistance conditions for which circuit is arranged	
16a	If CI2 sensitrol relay is provided — Remove No. 59 cord tip from 2B and connect to 2T of G relay and repeat Steps 2, 7, and 9 through 15	
17	If no further tests are to be made, remove insulating and blocking tools from G relay	
18	Remove W2C cord from G relay contact	
19	Restore MT key	
	D. Cable Insulation Conditions — Where CAL Switch Is Provided	
1a	If CI2 sensitrol relay is provided — Operate TEST key to CKT 1	
2	Rotate CAL selector switch to positions 2 to 5 in sequence	At each setting, CI1 sensitrol relay does not operate sufficiently to close contact as indicated by failure of A relay to operate
3	Rotate CAL selector switch to position 6	CI1 sensitrol relay fully operates A relay operated
4	Rotate CAL selector switch to position 7	

STEP	ACTION	VERIFICATION
5	Momentarily operate RS key	CI1 sensitrol relay releases, then reoperates to close contact A relay operated
6	Repeat procedures in Steps 4 and 5 for positions 8 and 9 of CAL switch	
7	Rotate CAL selector switch to position 1	
8	Momentarily operate RS key	CI1 sensitrol relay releases and does not reoperate
9a	If CI2 sensitrol relay is provided — Operate TEST key to CKT 2	
10a	Repeat Steps 2 through 8, substituting CI2 for CI1 in VERIFICATION	
11	When tests are completed, restore TEST key to normal and leave CAL selector switch in position 1	

IDENTIFICATION TABLE

Crossbar Switch Arrangement

	(H) SEL. POS.										
(S) SEL. POS.	1 or 12	2 or 13	3 or 14	4 or 15	5 or 16	6 or 17	7 or 18	8 or 19	9 or 20	10 or 21	11 or 22
1 or 12	0 / 100	1 / 101	20 / 120	21 / 121	40 / 140	41 / 141	60 / 160	61 / 161	80 / 180	81 / 181	— / —
2 or 13	2 / 102	3 / 103	22 / 122	23 / 123	42 / 142	43 / 143	62 / 162	63 / 163	82 / 182	83 / 183	— / —
3 or 14	4 / 104	5 / 105	24 / 124	25 / 125	44 / 144	45 / 145	64 / 164	65 / 165	84 / 184	85 / 185	— / —
4 or 15	6 / 106	7 / 107	26 / 126	27 / 127	46 / 146	47 / 147	66 / 166	67 / 167	86 / 186	87 / 187	— / —
5 or 16	8 / 108	9 / 109	28 / 128	29 / 129	48 / 148	49 / 149	68 / 168	69 / 169	88 / 188	89 / 189	— / —
6 or 17	10 / 110	11 / 111	30 / 130	31 / 131	50 / 150	51 / 151	70 / 170	71 / 171	90 / 190	91 / 191	— / —
7 or 18	12 / 112	13 / 113	32 / 132	33 / 133	52 / 152	53 / 153	72 / 172	73 / 173	92 / 192	93 / 193	— / —
8 or 19	14 / 114	15 / 115	34 / 134	35 / 135	54 / 154	55 / 155	74 / 174	75 / 175	94 / 194	95 / 195	— / —
9 or 20	16 / 116	17 / 117	36 / 136	37 / 137	56 / 156	57 / 157	76 / 176	77 / 177	96 / 196	97 / 197	— / —
10 or 21	18 / 118	19 / 119	38 / 138	39 / 139	58 / 158	59 / 159	78 / 178	79 / 179	98 / 198	99 / 199	— / —
11 or 22	— / —	— / —	— / —	— / —	— / —	— / —	— / —	— / —	— / —	— / —	— / —

IDENTIFICATION TABLE

Relay Arrangement

Prior To Drawing Issue 11-D

(H) SEL. POS.	(TR) RELAY	
	NO OP.	OP.
1	1	3
2	2	4
3	9	11
4	10	12
5	17	19
6	18	20
7	25	27
8	26	28
9	33	35
10	34	36
11	—	—
12	5	7
13	6	8
14	13	15
15	14	16
16	21	23
17	22	24
18	29	31
19	30	32
20	37	39
21	38	40
22	—	—

Drawing Issue 11-D or Later

(H) SEL. POS.	(TR) RELAY	
	NO OP.	OP.
1	0	2
2	1	3
3	8	10
4	9	11
5	16	18
6	17	19
7	24	26
8	25	27
9	32	34
10	33	35
11	—	—
12	4	6
13	5	7
14	12	14
15	13	15
16	20	22
17	21	23
18	28	30
19	29	31
20	36	38
21	37	39
22	—	—