

RELAYS

PAPER ARMATURE STOPS, BACKSTOPS, AND SEPARATORS

APPLICATION AND LIST OF RELAYS

1. GENERAL

1.01 This section indicates whether or not removable D-93568 and D-97950 paper armature stops, D-95367 removable paper backstop, D-159461 backstop nut, or KS-7246 or KS-7743 separators may be applied to certain relays for the purpose of relieving sticking conditions; and lists the relays on which separators shall be applied by the Western Electric Company.

1.02 This section is reissued to add an additional relay and to include PBX Systems in Part 4.

1.03 Armature stops or separators shall be applied by the Western Electric Company to all relays listed in Parts 2 and 3 when these relays have a zinc-plate finish on the core, and to the E1325, R132, and No. 149P relays as listed in Part 4. Armature stops or separators are not required on relays having chromium-plated cores and zinc-plated armatures with stop pins, nor on relays having chromium finish on both the armature and the core, unless otherwise stated in this section. The B1071 relay shall have paper stops applied to the core, regardless of finish.

1.04 The procedures for applying removable paper armature stops, backstops, or separators to relays are covered in the sections covering the particular type of relay.

1.05 Removable paper armature stops and paper separators may be used on relays not listed in this section only if the relay has both hold and release timing requirements, or both hold and release current flow requirements specified in the circuit requirement tables. The specified requirements shall be met after the armature stops or separators are applied. However, removable paper armature stops or separators shall not be applied to any relay equipped with removable metal armature stops, nor to any relay having permalloy pole pieces, unless otherwise specified in this section. Pole pieces stamped with a U are permalloy.

1.06 The notes and the requirement changes covered in Parts 3 and 4 of this section are important, as they give electrical and mechanical requirements that are in addition to, or supersede, the corresponding

information given in the circuit requirement tables. Adjustment and circuit difficulties may be encountered unless the requirements given in the notes are used at the time the stop or separator is applied.

1.07 When the circuit requirement tables show operate or hold requirements greater than, or nonoperate or release requirements less than, the values specified in Parts 3 and 4, the values shown in the circuit requirement tables shall be used.

1.08 Unless otherwise specified in the circuit requirement tables, the requirements recommended in the notes and changes covered in Parts 3 and 4, for use when relays are equipped with separators or removable paper armature stops, are also satisfactory when the relays are not so equipped.

1.09 Information in this section is arranged under the following headings:

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 2. UNRESTRICTED APPLICATION - NO CHANGES IN ELECTRICAL OR MECHANICAL REQUIREMENTS
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- 4.11 Miscellaneous Trunk and Trunk Applique Circuits
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- 4.14 Miscellaneous Circuits

E964	E1632	E1867	E6296	E6436
E1351	E1717	E1870	E6358	E6440
E1367	E1736	E1875	E6380	E6442
E1510	E1767	E6037	E6402	E6450
E1609	E1815	E6138	E6403	E6482
E1610	E1822	E6168	E6416	E6495
E1624	†E1838	E6260	E6417	

STEP-BY-STEP SYSTEM

†See 4.12 Note 5

- 4.15 Call Indicator and "A" Switchboard Trunk Circuits
- 4.16 Miscellaneous Circuits

H28				
R32	R795	R1189	R1316	R1764
R39	R802	R1194	R1317	R1852
R71	R884	R1195	R1349	R1897
R82	R887	R1200	R1469	R1924
R94	R889	R1201	R1470	R1959
R122	R891	R1202	R1477	R1972
R458	R900	R1203	R1507	R1979
R493	R904	R1206	R1617	R2077
R518	R952	R1216	R1672	R6000
R586	R997	R1223	R1687	R6004
R603	R1022	R1246	R1728	R6017
R674	R1132	R1248	R1743	D-90634
R704	R1139	R1298	R1751	

TOLL SYSTEM

- 4.17 No. 3 Switchboard Trunk Circuits
- 4.18 Miscellaneous Circuits

COMMON SYSTEMS

- 4.19 Miscellaneous Circuits

→ **PBX SYSTEMS**

- ↳ 4.20 Miscellaneous Circuits

AB2

2. UNRESTRICTED APPLICATION - NO CHANGES IN ELECTRICAL OR MECHANICAL REQUIREMENTS

3. UNRESTRICTED APPLICATION - WITH CHANGES IN ELECTRICAL AND MECHANICAL REQUIREMENTS

2.01 Removable paper armature stops, backstops, or separators, may be applied by the telephone companies unconditionally to the relays covered in 2.02 and 2.03 when necessary to relieve sticking conditions. Also, see 1.03 and 1.04.

3.01 KS-7246 separators may be applied by the telephone companies to the relays listed in the following table when necessary to relieve sticking conditions. Electrical requirements, accordingly, shall be changed or added as specified in the table. (For exceptions, see 1.07.) The remaining electrical requirements (if any) specified in the circuit requirement table shall apply unchanged. It is important that the paper separator, when applied, is smooth and tight against the pole face. Also, see 1.03 to 1.08, inclusive.

2.02 B- and G-type Relays: To relieve sticking conditions between the armature and stop springs not equipped with contact metal, use the D-95367 removable paper backstop. To relieve sticking conditions between the armature and core, use the D-93568 paper armature stop.

B1	B343	B423	B578	B1071
B9	B376	B435	B579	B1076
B10	B392	B436	B581	B1086
B55	B403	B455	B582	B1131
B104	B412	B456	B584	
B144	B413	B464	B601	G41
B159	B414	B466	B1018	G80
B180	B415	B471	B1023	G81
B207	B418	B475	B1039	G88
B297	B419	B493	B1049	G94
B303	B421	B527	B1057	
B304	B422	B567	B1060	

Code Number	Req Changed	Test Wdg	Value to Be Used		See Notes
			Test MA	Readj MA	
E435	Hold	P	27	25	
	Opr	P	45	42	
E436	Hold	P/S	24	22.5	
	Opr	P/S	37	35	
E541	Opr	P	15	11	1
		P/S	14	-	1
		P	32.5	24	2
		P/S	28	-	2
E714	Hold	P/S	33	30.5	
E715	Opr	P	60	57	
E717	Hold	P	25	23.5	
E718	Hold	P	25	23.5	
E786	Hold	P	26	24.5	
E821	Hold	S	48	45.5	
E833	Hold	S	48	45.5	
E1217	Opr	P	12	11.4	
E1503	Hold	P	20	19	
E1544	Hold	P	20	19	

2.03 E-, H-, R-, and AB-type Relays: To relieve sticking conditions between the armature and adjusting nut on these relays, use either the KS-7743 paper separator or the D-159461 backstop nut. To relieve sticking conditions between armature and core, use the KS-7246 paper separator.

E133	E523	E699	E734	E822
E266	E543	E706	E735	E827
E341	E555	E707	E748	E828
E385	E593	E716	E781	E853
E467	E672	E731	E787	E892
E512	E698	E733	E792	E952

Code Number	Req Changed	Test Wdg	Value to Be Used		See Notes	Code Number	Circuit Designation	Arm. Stops or Separators Approved
			Test MA	Readj MA				
E1591	Opr	P	5.3	5		E566	TG1	Yes
E1866	Hold	P	25	23.5		E635	TG1	Yes
E1873	Hold	P	20.5	19.5		E644	LL	Yes
R92	Opr	P	40	38		E659	TG1, TG2	No
R161	Opr	P	17	13.2		E669	SD	Yes
	Nonopr	P	5.9	6.3		E823	HR6, SD5	Yes
	Hold	P	10.4	9.9				
R667	Hold	S	18	14		E1032	HC	Yes
R1264	Hold	S	16.5	15.5		E1036	ON2	Yes
R1319	Hold	S	26.5	25		E1167	ON, ON1, ON2	No
R1321	Hold	S	9.8	9.3		E1229	FO2	No
						E1303	ON1	No
						E1325	TS	Yes, See note 1
R1322	Hold	P	-	15.5				
	Hold	S	18	17		E1370	HC	Yes
R1775	Hold	P	18	-	1	E1431	DB2, DG2, DG4, OB2, OG2, OG4,	
		P	39.5	-	4		Z6	No
		S	-	11.3	1		SD	Yes
R1937	Arm. Travel	-	-	-	3 & 5	E1613		
R1938	Opr	P	-	34		E1731	CL	No
						E1982	PP	No
						E6033	FO2	No

Notes

1. For relay winding alone.
2. For circuit combination of relay and No. 18AJ resistor.
3. The Western Electric Company does not apply separators to this relay.
4. For circuit combination of relays C and Z in district selector circuits.
5. After the separator is applied, the armature travel shall be

Min 0.015 inch
Max 0.020 inch

4. RESTRICTED APPLICATION

4.01 General: The following paragraphs specify whether or not removable paper armature stops and separators may be applied to relieve sticking conditions on relays when used as designated in the circuits listed. Changes or additions to the electrical and mechanical requirements of relays approved for papering are covered in the notes referred to in the Arm. Stops or Separators Approved column for the particular relay. It is important that the separator, when applied, is smooth and tight against the pole face. Also, see 1.03 to 1.08, inclusive.

PANEL SYSTEM

4.02 Senders - Subscribers

Code Number	Circuit Designation	Arm. Stops or Separators Approved
B160	TG	No
B167	MTG, TG	Yes
B178	TG	No

R1192	BZ, CZ	See note 2
R1192	H1, H2, H4, T1, T2, T4, U1, U2, U4	No
R1193	B5, C5, ST4, TH5	No

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Code Number	Circuit Designation	Arm. Stops or Separators Approved
R1196	ST2, TH2	No
R1197	ST5, T5, TH1, TH4	No
R1210	A1, A4, B1, B2, B4, C1, C2, C4, H1, H2, H4	No
R1212	A1, A4, ST1	No
R1213	A2	No
R1214	A5	No
R1215	AC	Yes
R1230	BL, CL, HL, TL, THL	Yes
R1242	STL	Yes
R1323	CL2	No
R1365	AL	Yes
R1414	FR	See note 3
R1481	A2, A5	No
R1482	RL	Yes
R1583	UL	Yes
R1692	B5, C5, ST4, TH5	No
R1697	TMS	See note 4
R1878	TMS	Yes
R1965	CL3	Yes
149AT	SR	See note 5
149BT	RS	No
149CJ	SR	See note 5
178AD	RA	See note 6
178CL	RA	See note 6
178CW	RA	See note 6
178EG	SR	Yes
D-92525	T5	Yes

4. Separators may be applied to this relay if the following requirements are used:

Windings	Test for	Value to Be Used	
		Test MA	Readj MA
Pri/Sec	Operate	20	19
Pri/Sec	Nonoperate	8.7	9.2

5. Separators may be applied to this relay if after being applied to the relay it still functions satisfactorily under pulsing tests by sender test circuit.

6. Separators may be applied to these relays only when they are used in decoder senders and the pole piece is magnetic iron. Pole pieces stamped with a U are permalloy, and separators should not be applied.

4.03 Senders - Local Tandem, Full Selector Tandem, Call Distributing "B" Switchboard, and Semimechanical "A" Switchboard (Suburban)

Code Number	Circuit Designation	Arm. Stops or Separators Approved
B167	TG, TGM	Yes
E659	C11, TG1, TG2	No
R1524	TRA, TRB, TRC	Yes
149AR	TB	See note 1

Note

1. The release time of this relay will be shortened when a separator is applied to the armature. This will reduce the duration of the order tone pulse but is considered satisfactory.

4.04 Incoming Selectors

Code Number	Circuit Designation	Arm. Stops or Separators Approved
B15	CS1, S, S1	Yes
B44	S	Yes
B73	A, A1	No
B76	S	Yes
B268	S	Yes
B361	A, A1	No
B111	TD	Yes
F17	D, SR	No
R132	L	Yes, See note 1
R638	L	Yes

Note

1. When these relays have a zinc-plate finish on the core, separators shall be applied by Western Electric Company.

Notes

- When these relays have a zinc-plate finish on the core, separators shall be applied by Western Electric Company.
- Separators may be applied to this relay if the following requirements are used:

Winding	Test for	Value to Be Used	
		Test MA	Readj MA
Sec	Operate	-	29
Sec	Hold	18	17
Pri	Operate	18.5	-

3. Separators may be applied to this relay if the following requirements are used:

Req Changed	Value to Be Used	
	Test MA	Readj MA
Operate	37.5	35

4.05 Line Finder and District Selectors

<u>Code Number</u>	<u>Circuit Designation</u>	<u>Arm. Stops or Separators Approved</u>
B per D-92440	LT	Yes
E1325	H	See notes 1 & 2
R132	OC	See notes 2 & 3
R1270	S1	Yes
R6006	L	No
149CE	A1	Yes
149CH	D	No
149CN	A1	Yes
177E	CS	See note 4
203A	CS	See note 4

Notes

1. Separators may be applied to this relay if the armature travel is held to

Min 0.015 inch
Max 0.020 inch

after the separator is applied.

2. These relays, when used in zone and overtime district selector circuits, shall be equipped with separators by the Western Electric Company, as covered in 1.03.
3. Separators may be applied by the telephone companies to this relay when not equipped with separators if the following requirements are used:

<u>Test for</u>	<u>Value to Be Used</u>	
	<u>Test MA</u>	<u>Readj MA</u>
Operate	20	19
Nonoperate	10.4	11

When this relay is used in zone and overtime district selector circuits, the 350-ohm resistor in the district shall be short-circuited.

4. These relays may require additional maintenance effort from time to time if they are equipped with separators.

4.06 Decoders and Decoder Connectors

<u>Code Number</u>	<u>Circuit Designation</u>	<u>Arm. Stops or Separators Approved</u>
E371	DGE, OBE	Yes
R291	SG	Yes
R628	R	Yes
R1267	SAK, SA1 to SA8, SBK, SB1 to SB8	Yes

<u>Code Number</u>	<u>Circuit Designation</u>	<u>Arm. Stops or Separators Approved</u>
R1313	CLA,CLB,CLC,etc., CRA,CRB,CRC,etc., DBA,DBB,DBC,etc., DGA to DGD, OBA to OBD, OGA, OGB, OGC	Yes
R1361	CK2	Yes
R1362	CK1	Yes
R1378	SAK,SA1 to SA8, SBK,SB1 to SB8	Yes
R1468	CLO,CRO,DBO, DGO,OBO,OGO	Yes
R1471	DG3,DG6,OB6, OB7, OB9	Yes
R1729	R	Yes
R1914	CK1, CK2	See note 1
R1915	CK3	See note 1

Note

1. Separators may be applied to these relays if the following requirements are used:

<u>Code Number</u>	<u>Test for</u>	<u>Value to Be Used</u>	
		<u>Test MA</u>	<u>Readj MA</u>
R1914	Operate	47.5	45
R1915	Operate	37.5	35.5

4.07 Line, Trip, Start, and Link Circuits

<u>Code Number</u>	<u>Circuit Designation</u>	<u>Arm. Stops or Separators Approved</u>
B171	L1	Yes
E788	CO	Yes
E1149	O, O1	No
E1187	CO	Yes
E6353	SL	Yes
E6364	TR	Yes
E6465	R	No
R1496	CO	Yes
R1498	CO	Yes
R1931	CL	See note 1
R1932	Z	See note 1
R2032	L	Yes
EA8	CO	Yes
EA9	CO	Yes
D-91944	RG	Yes

Note

1. Separators may be applied to this relay on the line, trip, start, and link circuit per SD-21626-01 only.

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4.08 Panel "A" and "B" Switchboard Cord Circuits

Code Number	Circuit Designation	Arm. Stops or Separators Approved
B260	SC	Yes
B577	AS	Yes
B598	MC	Yes
B1013	CT, CT1	Yes
E81	MGA	Yes
E182	MGA	Yes
E963	MGC	Yes
E1527	MGC, MC	Yes
E1899	MGC, MC	See note 1

Note

- Separators may be applied to this relay if the following requirements are used:

Winding	Test for	Value to Be Used Readj MA
Primary (wdg alone)	Hold	62.5
Primary (Parallel comb. of SC, SLC, or SLC1, and MC or MGC relays)	Hold	72

4.09 Miscellaneous Circuits

Code Number	Circuit Designation	Description of Circuit	Arm. Stops or Separators Approved
A50	L1	Misc Reg Ckt	Yes
A57	L	Misc Reg Ckt	Yes
B135	ST	"A" Swbd OGT	Yes
B1079	TK	Rec Comp Trk	Yes
E199	L	Misc Reg Ckt	Yes
E458	L1	Misc Reg Ckt	Yes
E1229	FSI	Test Trk	Yes
E1383	TB	Final Sel	No
E1472	L,LR	Misc Reg Ckt	Yes
E1684	L1	Misc Reg Ckt	Yes
E6471	L	Misc Reg Ckt	Yes
G84	BG	Announcement Trk	Yes
G93	TK	Rec Comp Trk	Yes
R136	L	Office Sel	Yes
R289	C	Coin Control	Yes
R1306	Z4	Mess Reg Conn.	Yes
R1431	RL	"A" Swbd Keyset	Yes
R6006	SH	Cordless "B" Link	No

MANUAL SYSTEM

4.10 Panel Call Indicator Trunks

Code Number	Circuit Designation	Arm. Stops or Separators Approved
B15	S, S3	Yes
B73	A, AO	Yes
B361	A, AO	Yes
B1084	A	Yes
E34	S1	Yes
E561	RC	Yes
E945	RC	Yes
E1706	RC	Yes

4.11 Miscellaneous Trunk and Trunk Applique Circuits

Code Number	Circuit Designation	Arm. Stops or Separators Approved
B15	-	Yes
B59	A,L	Yes
B468	L	Yes
E1001	LM	No
G49	S1	Yes
G83	S	Yes
R73	SL	No
R494	WO	Yes
R550	P	No
R583	PU	Yes
R1165	SL	No
R1765	SL	Yes
R1784	R1	See note 1
R1787	P	No
T4	RC	See note 2

Notes

- Separators may be applied to this relay if the following requirements are used:

Test for	Value to Be Used	
	Test MA	Readj MA
Operate	33	31

- Separators may be applied to this relay only if timing requirements are specified in the circuit requirement tables.

4.12 Panel Call Indicator Control and Lamp Circuits

Code Number	Circuit Designation	Arm. Stops or Separators Approved
E34	Lamp	Yes
E433	ST	Yes
E437	H02	Yes

<u>Code Number</u>	<u>Circuit Designation</u>	<u>Arm. Stops or Separators Approved</u>
E576	HO2	Yes
E598	PC	Yes
E600	PC	Yes
E686	HO2	Yes
E697	Z	No
E745	KC	See note 1
E843	HO	See note 2
E956	ST	Yes
E959	DO	See note 3
E1128	Lamp	No
E1207	U1	See note 4
E1542	H, T, ST	No
E1838	Lamp	See note 5
E1839	Lamp	No
E6166	HO2	Yes
E6369	U1	See note 4
R923	KL	Yes
R1414	KL	No
R1449	HO	Yes
R1450	HO	No

Notes

1 to 4, Separators may be applied to these relays if the following requirements are used:

<u>Note Number</u>	<u>Test for</u>	<u>Value to Be Used</u>	
		<u>Test MA</u>	<u>Readj MA</u>
1	Operate	5.3	5
2	Hold	26.5	25
	Operate	35	-
3	Hold	22.5	21
	Operate	29	27.5
4	Operate	48	45.5

Note 5. Separators shall not be applied to the E1838 relay if it replaces the E1128 relay in this circuit.

4.13 "A" Switchboard Cord Circuits

<u>Code Number</u>	<u>Circuit Designation</u>	<u>Arm. Stops or Separators Approved</u>
B2	SC	Yes
B3	SA, SC	Yes
B4	SA, SC	Yes
B18	A, C	Yes
B76	A, C	Yes
B337	R	Yes
B374	SL3	Yes
B577	A3	Yes
E144	FR	No
E302	AR, AS, FL, R	Yes
E1718	F	No
E1899	MC	See note 1
R234	FR	No

Note

1. Separators may be applied to this relay if the following requirements are used:

<u>Winding</u>	<u>Test for</u>	<u>Value to be Used</u> <u>Readj MA</u>
Primary (Wdg alone)	Hold	62.5
Primary (Parallel comb. of SC, SLC, or SLC1, and MC or MGC relays)	Hold	72

4.14 Miscellaneous Circuits

<u>Code Number</u>	<u>Circuit Designation</u>	<u>Description of Circuit</u>	<u>Arm. Stops or Separators Approved</u>
A2	CO	Sub Line	Yes
A26	CO	Sub Line	Yes
AB4	CO	Sub Line	Yes
E238	R	No. 1 Position Dial Ckt	No
E1601	R	No. 1 Position Dial Ckt	No
R75	PM2	Type C Control Ckt	No
		No. 1 Swbd	Yes
R440	AV	Step-by-Step CI Recorder	No
R1070	PM	Position Control Ckt	No
R1318	TK	No. 1 or 2 Info Desk	Yes
R6002	W	ADCI Recorder	See note 1

Note

1. The requirements given for a relay equipped with separators are usually also satisfactory when the relay is not equipped with separators. This relay is an exception, and the following current flow values must be used only when the relay is equipped with separators. See the circuit requirement tables for the values to use when the relay is not equipped with separators.

<u>Test for</u>	<u>Values to Be Used</u>	
	<u>Test MA</u>	<u>Readj MA</u>
Operate	24	22.5
Nonoperate	10	10.5
Hold	13.6	12.9

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STEP-BY-STEP SYSTEM

4.15 Call Indicator and "A" Switchboard Trunk Circuits

<u>Code Number</u>	<u>Circuit Designation</u>	<u>Arm. Stops or Separators Approved</u>
B424	L	Yes
E1490	K	Yes
G45	H	Yes
G49	L	Yes
G51	L	Yes
G93	L1	Yes
J52	RR, RT	No

4.16 Miscellaneous Circuits

<u>Code Number</u>	<u>Circuit Designation</u>	<u>Description of Circuit</u>	<u>Arm. Stops or Separators Approved</u>
B598	MC	"A" Swbd Cord	Yes
E1527	MC	"A" Swbd Cord	Yes
G37	L	Test Line, No. 12C Local Test Desk	Yes
G37	L	Test Line, No. 1C Repair Service Desk	Yes
G51	L	Test Line, No. 12C Local Test Desk	Yes
G51	L	Test Line, No. 1C Repair Service Desk	Yes
G51	A	By-pass Sel	Yes
J51	MR1	Power Alarm	No
R503	CO	Line Finder	Yes
R913	L	Line Finder	Yes
149AR	SL	Test Line, No. 12C Local Test Desk	Yes
149AR	N	Nos. 1, 350A, 355A Coin Trks	Yes
149AR	SR	Nos. 1, 350A OGT	Yes
149AR	H, H1	711 PBX, 2-way Tie	Yes
149BH	SL	Test Line, No. 12C Local Test Desk	Yes
149CE	H	Dial Long Lines Nos. 1, 350A, 355A, 360A	See note 1

<u>Code Number</u>	<u>Circuit Designation</u>	<u>Description of Circuit</u>	<u>Arm. Stops or Separators Approved</u>
149CG	N	Nos. 1, 350A, 355A Coin Trks	Yes
149CG	SR	Nos. 1, 350A OGT	Yes
149CG	H, H1	711 PBX, 2-way Tie	Yes
149CH	N	N Coin Trk	Yes
149CN	H	Dial Long Line, Nos. 1, 350A, 355A, 360A	See note 1
149CN	H1	Nos. 1, 350A OGT	Yes
178EB	H2	Nos. 1, 350A OGT	Yes

Note

1. Separators may be applied to this relay if the following requirements are used in addition to the current flow requirements.

<u>Test for</u>	<u>Test MA</u>	<u>Readj MA</u>
Hold	1	0.9

TOLL SYSTEM

4.17 No. 3 Switchboard Trunk Circuits

<u>Code Number</u>	<u>Circuit Designation</u>	<u>Arm. Stops or Separators Approved</u>
B199	S	Yes
B523	S	Yes
B558	S	Yes
B560	S	Yes
B1009	F	Yes
B1024	S	Yes
B1085	S	Yes
178CA	A	Yes

4.18 Miscellaneous Circuits

<u>Code Number</u>	<u>Circuit Designation</u>	<u>Description of Circuit</u>	<u>Arm. Stops or Separators Approved</u>
B33	-	No. 2 Toll Cord	Yes
B43	BR	No. 1 Toll Cord	Yes
B191	S1	Telegraph Loop Terminal	Yes

Code Number	Circuit Designation	Description of Circuit	Arm. Stops or Separators Approved	Code Number	Circuit Designation	Description of Circuit	Arm. Stops or Separators Approved																												
B261	SL	No. 1 Toll Cord	Yes	149BL	D	No. 3 Operator Position	Yes																												
B265	B	Alarm Trk	Yes	149BL	B,K	No. 3 Position Dial	Yes																												
B458	DT	No. 1 OGT	Yes	149CD	SR	1000-cycle Signaling	Yes																												
B516	B	Alarm Trk	Yes	149CE	B,E,F	Teletype-writer Swbd	Yes, See note 1																												
B558	S	Sub Line	Yes	149CE	B,K	No. 3 Position Dial	Yes																												
B583	S	Teletype-writer Swbd	No	149CE	D	No. 3 Operator Position	Yes																												
B1019	S	Incoming Trk	Yes	162B	SR	No. 3, 3C, or 3CF Intertoll Patching Ckt	Yes																												
B1025	S, TS	No. 3 Swbd Ringdown Toll Line	Yes	162B	S3, S4	20-20 Cycle Sig Inter Ringer	See note 2																												
B1034	A	Intertoll Dial Auxiliary Trk	Yes	162B	GR1	No. 3 or 11 20-cycle Signaling	See note 2																												
B1042	DC	1000-cycle Term. Ringer	No	162B	RL	No. 1 Toll Cord	See note 4																												
B1092	L	Toll Tandem Idle Indicating	Yes	162B	SR	No. 1 Toll Line	Yes																												
B1114	F1, F1	Alarm Trk	Yes	162B	DA	Toll Tandem	Yes																												
E28	B	No. 1 Swbd Ringdown Toll Line	No	178AA	C	Aux Trk Ringing Control	Yes																												
J1	RU	1000-cycle Term. Ringer	No	Notes																															
R857	C	No. 3 Toll Cord	No																																
R1127	B	Talking Service Signaling Ckt	Yes	1. When these relays have a zinc-plated finish on the core, separators shall be applied by Western Electric Company.																															
R1292	A	No. 3 Swbd Dial Ckt	No	2. Separators may be applied to this relay if the following requirements are used:																															
R1495	WO	No. 1 Inc Trk	Yes	<table border="1"> <thead> <tr> <th rowspan="2">Test for</th> <th colspan="2">Value to Be Used</th> </tr> <tr> <th>Test MA</th> <th>Readj MA</th> </tr> </thead> <tbody> <tr> <td>Operate</td> <td>5.3</td> <td>5</td> </tr> </tbody> </table>				Test for	Value to Be Used		Test MA	Readj MA	Operate	5.3	5																				
Test for	Value to Be Used																																		
	Test MA	Readj MA																																	
Operate	5.3	5																																	
R1523	F	Alarm Ckt	Yes																																
T9	E	Teletype-writer Sel	See note 3	3. Separators may be applied to this relay only if timing requirements are specified in the circuit requirement tables.																															
T11	F	Teletype-writer Sel	No	4. Separators may be applied to these relays if the following requirements are used:																															
149P	B,E,F	Teletype-writer Swbd	Yes, See note 1	<table border="1"> <thead> <tr> <th rowspan="2">Req Changed</th> <th rowspan="2">Soak</th> <th colspan="2">Test MA</th> <th colspan="2">Readj MA</th> </tr> <tr> <th>Test MA</th> <th>Readj MA</th> <th>Test MA</th> <th>Readj MA</th> </tr> </thead> <tbody> <tr> <td>Operate</td> <td>FS</td> <td>13.3</td> <td>12.6</td> <td></td> <td></td> </tr> <tr> <td>Hold</td> <td>FS</td> <td>2.9</td> <td>2.7</td> <td></td> <td></td> </tr> <tr> <td>Release</td> <td>FS</td> <td>0.6</td> <td>0.7</td> <td></td> <td></td> </tr> </tbody> </table>				Req Changed	Soak	Test MA		Readj MA		Test MA	Readj MA	Test MA	Readj MA	Operate	FS	13.3	12.6			Hold	FS	2.9	2.7			Release	FS	0.6	0.7		
Req Changed	Soak	Test MA								Readj MA																									
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Release	FS	0.6	0.7																																
149T	GR2	No. 3 or 11 Signaling Sig 135-20 Inter. Ring.	Yes																																
149T	C	Sig 135-20 Term. Ring.	Yes																																
149T	C	Teletype-writer Line	Yes																																
149AD	-	Nos. 3 3C Rec-Compl Trk	Yes																																

SECTION 040-014-811

COMMON SYSTEMS

4.19 Miscellaneous Circuits

Code Number	Circuit Designation	Description of Circuit	Arm. Stops or Separators Approved
B1070	A	Inc Trk	Yes
B1156	LV1, LV2	800 Power Plant Ringing	Yes
R87	ZS	Emergency Alarm	Yes
R927	PG	Opr Tel and Trk, No. 3, 4, 6A, or 6B Info Desk	Yes
RL757	GA	Emergency Alarm	Yes
149CP	S, SO, S01, S02	Service Obs	Yes
178AC	R1	Trk Ckt	Yes
178CN	FL	Comp Cord No. 15C Swbd	Yes
186A	R	Long PBX Line	See note 1

Note

1. Separators may be applied to this relay if the following requirements are used:

Test for	Value to Be Used	
	Test MA	Readj MA
Hold	26.5	25
Operate	35	-

PBX SYSTEMS

4.20 Miscellaneous Circuits

Relay Code Number	Circuit Designation	Description of Circuit	Arm. Stops or Separators Approved
149AR	H, H1	No. 711A Tie Line	Yes
149AR	SR	No. 701A, 702A, or 711A Trunk	Yes
149AT	SR	No. 100 Key Eqpt	No
149BD	B	Line and Link	No
149CG	H, H1	No. 711A Tie Line	Yes

Relay Code Number	Circuit Designation	Description of Circuit	Arm. Stops or Separators Approved
149CG	SR	No. 701A, 702A, or 711A Trunk	Yes
149CJ	SR	No. 100 Key Eqpt	No
149CP	S	Line and Link	No
149CP	SR	No. 100 Key Eqpt	No
149CR	SR	Line and Link	No
178CN	T	Line and Link	No
178CN	K	No. 606A or 702A Cord	Yes
178CN	Z	No. 100 Key Eqpt	Yes
178CN	F1, T	Nos. 550C, 550SC, 551A, B, and D, and 600C Tie Trunks	Yes
178ED	T	Trunk	No
186A	R	Cord, Line, or Trunk	Yes
186B	R	Trunk	Yes
A2	CO	Subs and Tie Line	Yes
B2	A, AS	Cord and Dial	Yes
B2	A to E S & TEL	Trunk and Connecting Ckt	Yes
B3	C, CS	Cord and Dial	Yes
B10	A, B, C, N	Aux Signal	Yes
B21	BUZ, T	Ring and Buzzer	Yes
B31	R, R1	2-way Tie Line	No
B42	A, C, AS, CS	Cord	Yes
B74	H2	Trunk	Yes
B365	H	2-way Trunk	Yes
B383	RS, FS	No. 606A or 702A Cord	Yes
B552	H3	Trunk	Yes
B1048	S, AS	Cord	Yes
B1082	S	Line	Yes
B1088	A	Cord	Yes
B1089	C	Cord	Yes
E4	L	CO Trunk	Yes
G1	B	Tel and Dial	Yes
G92	BR	Tel and Dial	Yes
J12	RU	No. 606A or 702A Cord	No
R1409	L	Line and Link	Yes
(SC)206AD	C	Tel and Dial	Yes
(SC)207DD	A	Tel and Dial	Yes
(SC)228A	B	Tel and Dial	Yes
(SC)245MM	G	Cord	Yes
(SC)253AC	D	Tel and Dial	Yes
(SC)257A	L	Trunk	See Note
(SC)263BM	D	Tel and Dial	Yes
(SC)263ZBM	D	Tel and Dial	Yes
(SC)285HL	C	Tel and Dial	Yes
(SC)366A	D	Cord	Yes

(SC)—Indicates Stromberg-Carlson relay.

Note: KS-7744 separators are approved for application between armature and core and also between armature and backstop as required.