

RELAYS
B AND G TYPES
REQUIREMENTS AND ADJUSTING PROCEDURES
(FOR CONDENSED SECTION SEE SECTION 040-932-701)

1. GENERAL

1.001 This addendum supplements Section 040-506-701, Issue 7. The attached pages must be inserted in the section in accordance with the filing instructions above.

1.002 This addendum is issued to:

Revise Table A

1. GENERAL

The following change applies to Part 1 of this section:

(a) Table A—revised.

Attached:

Page 3 dated November 1973, reissued
Page 4 dated November 1973, revised
Page 4.1 dated November 1973, added
Page 7 dated December 1972, reissued
Page 8 dated December 1972, revised
Page 9 dated December 1972, reissued
Page 10 dated December 1972, revised
Page 19 dated December 1972, revised
Page 20 dated December 1972, reissued

TABLE A (Cont)

MAX ARM. TRVL (IN INCHES)			MAX ARM. TRVL (IN INCHES)			MAX ARM. TRVL (IN INCHES)			MAX ARM. TRVL (IN INCHES)			MAX ARM. TRVL (IN INCHES)		
CODE	FIG. NO.		CODE	FIG. NO.		CODE	FIG. NO.		CODE	FIG. NO.		CODE	FIG. NO.	
B251	3	0.030	B301	5	0.040	B351	2	0.030	B401	1	0.030	B451	6	0.040
B252	1	0.030	B302	1	0.030	B352	2	0.030	B402	6	0.030	B452	2	0.060
B253	7	0.035	B303	1	0.030	B353	6	0.050	B403	6	0.030	B453	3	0.030
B254	1	0.030	B304	1	0.030	B354	7	0.035	B404	6	0.030	B454	1	0.030
B255	3	0.050	B305	7	0.035	B355	6	0.050	B405	6	0.050	B455	12	0.030
B256	2	0.030	B306	3	0.030	B356	8	0.030	B406	6	0.030	B456	6	0.030
B257	1	0.030	B307	3	0.030	B357	Not Used		*B407	6	0.030	B457	10	0.030
B258	1	0.030	B308	7	0.035	B358	6	0.030	B408	6	0.050	B458	6	0.030
B259	1	0.060	B309	1	0.030	B359	8	0.030	B409	8	0.030	B459	6	0.030
B260	1	0.030	B310	1	0.030	B360	6	0.050	B410	3	0.030	B460	Cancelled	
B261	1	0.030	B311	1	0.030	B361	6	0.030	B411	2	0.030	B461	6	0.050
B262	1	0.050	B312	3	0.040	B362	6	0.030	B412	6	0.030	B462	1	0.030
B263	6	0.030	B313	3	0.050	B363	6	0.050	B413	6	0.030	B463	6	0.030
B264	1	0.030	B314	3	0.050	B364	3	0.030	B414	9	0.030	B464	6	0.030
B265	7	0.035	B315	3	0.050	B365	7	0.035	B415	6	0.030	*B465	6	0.020
B266	2	0.030	B316	1	0.030	B366	2	0.050	B416	8	0.030	B466	6	0.050
B267	7	0.050	B317	1	0.030	B367	6	0.030	B417	6	0.050	B467	7	0.035
B268	3	0.030	B318	2	0.050	B368	7	0.050	B418	6	0.030	B468	7	0.035
B269	2	0.030	B319	6	0.050	B369	2	0.030	B419	6	0.030	*B469	6	0.020
B270	1	0.030	B320	1	0.030	B370	6	0.040	B420	6	0.030	*B470	6	0.020
B271	1	0.040	B321	3	0.030	B371	6	0.030	B421	6	0.030	B471	1	0.050
B272	1	0.030	B322	2	0.030	B372	6	0.030	B422	6	0.030	*B472	6	0.020
B273	1	0.030	B323	1	0.030	B373	1	0.030	B423	13	0.030	*B473	6	0.020
B274	7	0.035	B324	10	0.050	B374	1	0.030	B424	6	0.030	*B474	7	0.025
B275	7	0.050	B325	6	0.030	B375	2	0.030	B425	7	0.035	*B475	6	0.020
B276	1	0.030	B326	6	0.050	B376	6	0.030	B426	6	0.030	B476	7	0.035
B277	3	0.030	B327	6	0.050	B377	3	0.040	B427	7	0.035	*B477	6	0.020
B278	7	0.035	B328	8	0.030	B378	3	0.030	B428	1	0.030	*B478	7	0.025
B279	5	0.040	B329	1	0.030	B379	1	0.030	B429	6	0.050	*B479	7	0.025
B280	5	0.040	B330	5	0.040	B380	3	0.030	B430	7	0.035	*B480	6	0.020
B281	3	0.030	B331	6	0.030	B381	1	0.030	B431	8	0.030	*B481	6	0.020
B282	1	0.030	B332	6	0.030	B382	1	0.030	B432	4	0.030	*B482	6	0.020
B283	1	0.050	B333	6	0.030	B383	6	0.030	B433	1	0.030	*B483	11	0.020
B284	2	0.030	B334	6	0.030	B384	7	0.050	B434	3	0.030	B484	7	0.060
B285	7	0.060	B335	6	0.030	B385	3	0.030	B435	6	0.030	B485	3	0.030
B286	1	0.030	B336	7	0.035	B386	2	0.030	B436	6	0.030	B486	6	0.050
B287	6	0.030	B337	11	0.050	B387	1	0.050	B437	7	0.035	B487	6	0.030
B288	1	0.030	B338	2	0.030	B388	1	0.050	B438	1	0.050	B488	1	0.060
B289	7	0.035	B339	Not Used		B389	1	0.050	B439	6	0.030	B489	7	0.035
B290	Not Used		B340	6	0.030	B390	1	0.050	B440	4	0.030	B490	6	0.030
B291	Not Used		B341	6	0.050	B391	1	0.050	B441	8	0.030	B491	7	0.035
B292	1	0.040	B342	6	0.030	B392	6	0.030	B442	3	0.030	B492	2	0.030
B293	1	0.030	B343	6	0.030	B393	1	0.050	B443	3	0.030	B493	6	0.030
B294	7	0.035	B344	6	0.030	B394	1	0.030	B444	6	0.030	B494	3	0.030
B295	6	0.030	B345	6	0.030	B395	3	0.060	B445	6	0.030	B495	4	0.030
B296	2	0.050	B346	6	0.030	B396	1	0.030	B446	6	0.030	B496	2	0.030
B297	1	0.030	B347	7	0.035	B397	3	0.030	B347	6	0.030	B497	1	0.030
B298	1	0.030	B348	6	0.030	B398	7	0.035	B448	3	0.030	B498	7	0.035
B299	3	0.030	B349	3	0.030	B399	6	0.030	B449	9	0.030	B499	6	0.030
B300	3	0.030	B350	5	0.040	B400	7	0.035	B450	12	B500	B500	1	0.030

*These relays have two stop pins.

The above data is for use on relays where the ARMTRVL requirement is not given in the ARMTRVL column of circuit requirement tables. All higher coded relays will have this requirement given on the circuit requirement tables.

→TABLE A (Cont)←

CODE	FIG. NO.	MAX ARM. TRVL (IN INCHES)	CODE	FIG. NO.	MAX ARM. TRVL (IN INCHES)	CODE	FIG. NO.	MAX ARM. TRVL (IN INCHES)	CODE	FIG. NO.	MAX ARM. TRVL (IN INCHES)	CODE	FIG. NO.	MAX ARM. TRVL (IN INCHES)
B501	6	0.030	B561	Mfr Disc.		B621	9	0.040	B1050	Mfr Disc.		B1110	6	0.030
B502	6	0.030	B562	No Record		B622	3	0.030	B1051	Mfr Disc.		B1111	6	0.030
B503	7	0.035	B563	0.035		B623	11	0.060	B1052	1	0.050	B1112	5	0.040
B504	6	0.030	B564	Mfr Disc.					B1053	7	0.035	B1113	8	0.030
B505	6	0.040	B565	Mfr Disc.					B1054	Mfr Disc.		B1114	8	0.030
B506	5	0.040	B566	Mfr Disc.					B1055	7	0.035	B1115	13	0.050
B507	2	0.030	B567	6	0.030				B1056	3	0.030	B1116	Mfr Disc.	
B508	6	0.030	B568	Mfr Disc.					B1057	6	0.030	B1117	8	0.030
B509	3	0.030	B569	Mfr Disc.					B1058	1	0.030	B1118	1	0.030
B510	1	0.030	B570	3	0.050				B1059	1	0.030	B1119	14	0.030
B511	6	0.050	B571	7	0.035	B1000	6	0.050	B1060	6	0.030	B1120	3	0.030
B512	1	0.050	B572	Mfr Disc.		B1001	Cancelled		B1061	1	0.030	B1121	14	0.030
B513	3	0.030	B573	6	0.30	*B1002	7	0.025	B1062	6	0.060	B1122	14	0.040
B514	6	0.030	B574	6	0.50	B1003	1	0.030	B1063	11	0.030	B1123	7	0.035
B515	1	0.030	B575	12	0.50	B1004	6	0.050	B1064	1	0.030	B1124	Mfr Disc.	
B516	7	0.035	B576	1	0.30	B1005	11	0.050	B1065	6	0.030	B1125	11	0.030
B517	1	0.030	B577	6	0.30	B1006	6	0.030	B1066	6	0.050	B1126	9	0.030
B518	1	0.050	B578	6	0.30	B1007	1	0.030	B1067	6	0.050	B1127	14	0.040
B519	4	0.030	B579	6	0.30	B1008	7	0.030	B1068	6	0.030	B1128	1	0.050
B520	3	0.030	B580	1	0.30	B1009	7	0.030	B1069	Mfr Disc.		B1129	6	0.030
*B521	9	0.020	B581	6	0.50	B1010	6	0.040	B1070	6	0.040	B1130	14	0.030
B522	8	0.030	B582	13	0.50	B1011	1	0.030	B1071	7	0.030	B1131	1	0.030
B523	4	0.030	B583	Mfr Disc.		B1012	6	0.030	B1072	11	0.030	B1132	8	0.030
B524	1	0.030	B584	13	0.30	B1013	6	0.030	B1073	6	0.030	B1133	8	0.030
B525	3	0.030	B585	Mfr Disc.		B1014	3	0.050	B1074	4	0.030	B1134	10	0.060
B526	7	0.050	B586	7	0.060	B1015	3	0.040	B1075	6	0.030	B1135	8	0.030
B527	6	0.030	B587	7	0.050	B1016	11	0.030	B1076	1	0.030	B1136	11	0.030
B528	1	0.030	B588	6	0.030	B1017	3	0.060	B1077	1	0.030	B1137	Mfr Disc.	
B529	6	0.030	B589	Mfr Disc.		B1018	3	0.030	B1078	No Record		B1138	8	0.030
B530	11	0.030	B590	7	0.035	B1019	6	0.030	B1079	5	0.060	B1139	14	0.030
B531	7	0.035	B591	Mfr Disc.		B1020	7	0.060	B1080	1	0.030	B1140	3	0.060
B532	6	0.030	B592	Mfr Disc.		B1021	2	0.050	B1081	13	0.035	B1141	7	0.035
B533	1	0.030	B593	3	0.030	B1022	1	0.050	B1082	13	0.030	B1142	Mfr Disc.	
B534	1	0.030	B594	Mfr Disc.		B1023	6	0.030	B1083	7	0.035	B1143	Mfr Disc.	
B535	9	0.030	B595	14	0.040	B1024	7	0.035	B1084	13	0.035	B1144	5	0.040
B536	6	0.030	B596	Mfr Disc.		B1025	7	0.035	B1085	4	0.030	B1145	3	0.050
B537	6	0.040	B597	Mfr Disc.		B1026	8	0.030	B1086	6	0.030	B1146	3	0.030
B538	2	0.030	B598	3	0.050	B1027	11	0.030	B1087	3	0.040	B1147	9	0.030
B539	6	0.030	B599	6	0.030	B1028	1	0.030	B1088	3	0.030	B1148	3	0.030
B540	1	0.030	B600	Mfr Disc.		B1029	7	0.035	B1089	2	0.030	B1149	14	0.040
B541	1	0.030	B601	14	0.050	B1030	3	0.030	B1090	11	0.030	B1150	11	0.030
B542	1	0.030	B602	14	0.030	B1031	7	0.035	B1091	Mfr Disc.		B1151	3	0.040
B543	3	0.030	B603	14	0.040	B1032	1	0.040	B1092	1	0.030	B1152	Mfr Disc.	
B544	1	0.040	B604	Mfr Disc.		B1033	1	0.040	B1093	13	0.040	B1153	8	0.030
B545	1	0.030	B605	14	0.050	B1034	5	0.030	B1094	Mfr Disc.		B1154	11	0.030
B546	1	0.030	B606	8	0.030	B1035	7	0.030	B1095	2	0.030	B1155	7	0.035
B547	6	0.030	B607	Mfr Disc.		B1036	1	0.030	B1096	Mfr Disc.		B1156	14	0.030
B548	11	0.030	B608	14	0.040	B1037	11	0.030	B1097	1	0.030	B1157	3	0.030
B549	6	0.030	B609	5	0.040	B1038	7	0.050	B1098	8	0.030	B1158	14	0.030
B550	7	0.035	B610	14	0.030	B1039	6	0.050	B1099	7	0.035	B1159	14	0.030
B551	7	0.035	B611	7	0.035	B1040	6	0.050	B1100	Mfr Disc.		B1160	7	0.035
B552	6	0.030	B612	Mfr Disc.		B1041	1	0.040	B1101	13	0.040	B1161	Mfr Disc.	
B553	12	0.030	B613	Mfr Disc.		B1042	6	0.030	B1102	Mfr Disc.		B1162	7	0.035
B554	4	0.050	B614	3	0.030	B1043	8	0.050	B1103	6	0.030	B1163	15	0.035
B555	6	0.030	B615	3	0.030	B1044	1	0.030	B1104	4	0.030	B1164	14	0.030

*These relays have two stop pins.

The above data is for use on relays where the ARM,TRVL requirement is not given in the ARM,TRVL column of circuit requirement tables. All higher coded relays will have this requirement given on the circuit requirement tables.

→TABLE A (Cont)←

MAX ARM. TRVL			MAX ARM. TRVL			MAX ARM. TRVL			MAX ARM. TRVL			MAX ARM. TRVL		
FIG.	(IN		FIG.	(IN		FIG.	(IN		FIG.	(IN		FIG.	(IN	
CODE	NO.	INCHES)	CODE	NO.	INCHES)	CODE	NO.	INCHES)	CODE	NO.	INCHES)	CODE	NO.	INCHES)
B556	6	0.030	B616	14	0.030	B1045	12	0.030	B1105	6	0.030	B1165	14	0.040
B557	7	0.060	B617	9	0.030	B1046	1	0.030	B1106	1	0.030	B1166	9	0.030
B558	4	0.030	B618	3	0.030	B1047	3	0.030	B1107	13	0.040	B1167	3	0.030
B559	2	0.030	B619	3	0.050	B1048	3	0.030	B1108	Mfr Disc.		B1168	14	0.040
B560	6	0.030	B620	3	0.030	B1049	6	0.030	B1109	3	0.030	B1169	3	0.030
B1170	14	0.030	G6	2	0.030	G36	7	0.040	G66	4	0.030	G96	7	0.035
B1171	14	0.030	G7	1	0.030	G37	7	0.040	G67	9	0.030	G97	12	0.040
B1172	14	0.030	G8	8	0.040	G38	7	0.040	G68	6	0.040	G98	3	0.040
B1173	8	0.030	G9	4	0.030	G39	6	0.040	G69	5	0.040	G99	8	0.030
B1174	8	0.030	G10	2	0.040	G40	7	0.030	G70	6	0.030	G100	4	0.030
B1175	8	0.030	G11	6	0.030	G41	12	0.040	G71	1	0.050	G101	14	0.040
B1176	9	0.030	G12	7	0.050	G42	1	0.060	G72	7	0.040	G102	14	0.040
B1177	16	0.020	G13	7	0.050	G43	2	0.040	G73	7	0.035	G103	5	0.050
B1178	14	0.030	G14	7	0.060	G44	4	0.050	G74	Mfr Disc.		G104	14	0.050
B1179	13	0.030	G15	6	0.040	G45	1	0.040	G75	2	0.050	G105	14	0.040
B1180	3	0.040	G16	4	0.050	G46	6	0.030	G76	7	0.030	G106	15	0.050
B1181	3	0.030	G17	3	0.040	G47	11	0.030	G77	8	0.040	G107	No Record	
B1182	14	0.030	G18	7	0.060	G48	6	0.030	G78	1	0.060	G108	7	0.050
B1183	6	0.040	G19	1	0.040	G49	6	0.050	G79	1	0.040	G109	9	0.050
B1184	9	0.030	G20	7	0.060	G50	7	0.030	G80	1	0.040	G110	7	0.030
B1185	9	0.030	G21	9	0.040	G51	7	0.040	G81	Mfr Disc.		G111	Mfr Disc.	
B1186	10	0.060	G22	6	0.040	G52	6	0.030	G82	Mfr Disc.		G112	14	0.060
B1187	9	0.030	G23	7	0.040	G53	8	0.040	G83	Mfr Disc.		G113	11	0.050
B1188	No Record		G24	7	0.040	*G54	6	0.020	G84	11	0.040	G114	4	0.030
B1189	3	0.030	G25	6	0.040	G55	2	0.030	G85	Mfr Disc.		G115	3	—
B1190	8	0.030	G26	3	0.030	G56	11	0.040	G86	7	0.035			
			G27	7	0.040	G57	4	0.030	G87	2	0.040			
			G28	2	0.040	G58	6	0.030	G88	13	0.040			
			G29	6	0.030	G59	7	0.035	G89	13	0.050			
			G30	2		G60	7		G90	14				
G1	3	0.040	G31	2	0.040	G61	7	0.030	G91	7	0.040			
G2	3	0.030	G32	2	0.040	G62	7	0.035	G92	6	0.030			
G3	2	0.040	G33	2	0.040	G63	7	0.035	G93	13	0.060			
G4	3	0.060	G34	7	0.030	G64	6	0.030	G94	13	0.040			
G5	1	0.030	G35	6	0.040	G65	7	0.030	G95	2	0.060			

*These relays have two step pins.

The above data is for use on relays where the ARM.TRVL requirement is not given in the ARM.TRVL column of circuit requirement tables. All higher coded relays will have this requirement given on the circuit requirement tables.

2. REQUIREMENTS

2.01 Cleaning: The contacts and other parts of the relay shall be cleaned when necessary in accordance with Section 069-306-801.

2.02 Relay Mounting: The relay shall be mounted approximately level and fastened securely to the mounting plate.

Gauge by eye and by feel.

2.03 Cover Clearance: The clearance between the relay cover and any adjacent apparatus including relay covers, shall be

Min 1/64 inch

Gauge by eye.

2.04 Cover Cap: The cover cap shall fit snugly but shall not be so tight as to prevent placing or removing it with the fingers.

Gauge by feel.

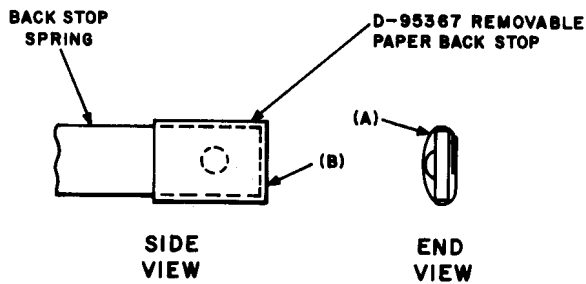


Fig. 7—Position of Removable Paper Backstop on Spring

2.10 Contact Follow: Fig. 8(A)—(Relays having spring combinations per Fig. 13, 14, and 15 in Table B)

- (a) There shall be a follow at the tip of the flexible front contact spring before the spring strikes the stop spring at the point opposite the contact of

Min 0.005 inch

Gauge by eye.

This requirement is considered met if, with the relay in the unoperated position, the clearance between the flexible spring and the stop spring measured at the point opposite the contact does not exceed 0.010 inch and there is movement of the flexible contact spring when the relay is operated manually.

- (b) When the relay is operated manually by applying pressure to the armature at a point opposite the center of the core, the flexible front contact spring shall touch the stop spring at a point opposite the contact before the armature stop pin (or the armature itself if no stop pin is provided) touches the core (or paper armature stop, if equipped).

Gauge by eye.

2.11 Flexible Front Contact Spring Position:

Fig. 8(B)—(Relays equipped with spring combinations per Fig. 13, 14, and 15 in Table B). The flexible front contact spring shall rest against the shoulder of the stop spring with the relay in the unoperated position.

Gauge by eye.

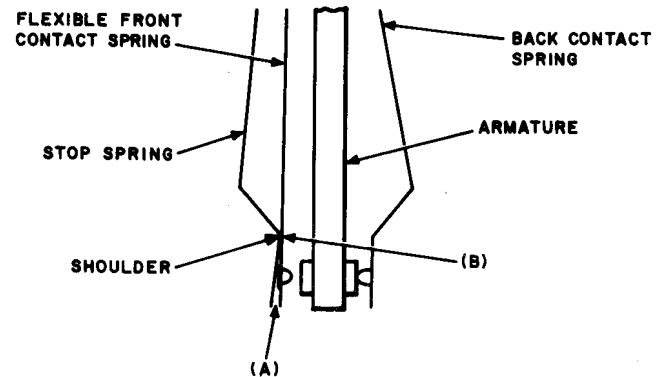


Fig. 8—Contact Follow

2.12 Minimum Front Contact Make: Fig. 9(A)

(see also Fig. 10 and 11.)—The minimum front contact make shall be as specified under Front Contact Make in the spring combination figures shown in Table B. The value of front contact make to be used shall be that corresponding to the armature travel specified in the circuit requirement table and shown on the spring combination figure.

Use the gauge specified and check the requirement as covered in (a) through (d).

(a) **Relays Not Equipped With Removable Armature Stops:**

Insert the 100 gauge of the 99A gauge nest having the thickness specified under Front Contact Make between the stop pin (or pins) and the core (or between the armature and core if no stop pin is provided). Apply sufficient pressure to the armature directly opposite the lower part of the core to hold it against the gauge but not enough to distort the armature. The armature or movable front contact spring should touch the front contact or stop.

(b) **Relays Equipped With Removable Metal Armature Stops:**

Insert the blade of the No. 74D gauge having the thickness specified under Front Contact Make between the armature and the upper flange of the removable metal armature stop. Apply sufficient pressure to the armature directly opposite the upper flange of the metal armature stop [Fig. 6(B)] to hold the armature against the gauge but not enough to distort the armature. The armature or movable contact spring should touch the front contact or stop.

TABLE B

<p>FIG. 1</p>		<p>FIG. 2</p>		<p>FIG. 3</p>																																																	
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TABLE B (Cont)

FIG. 16	
ARM. TRVL	FRONT CONT MAKE
0.020	0.005
0.030	0.005
0.035	0.010
0.040	0.015
0.050	0.025
0.060	0.035

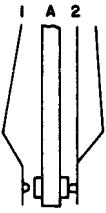
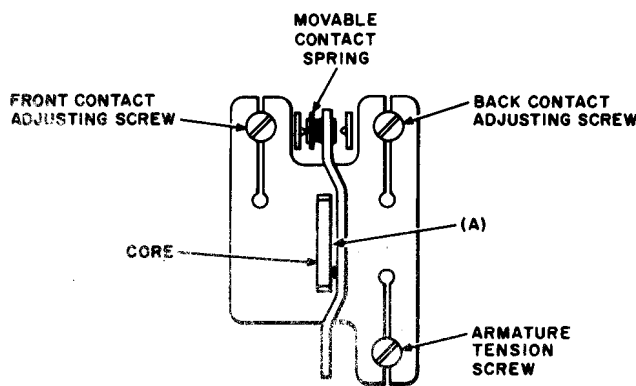



Fig. 9—Illustrating the Location of the Adjusting Screws for Spring Combinations (Fig. 4, 7, 9, and 19 Table B)

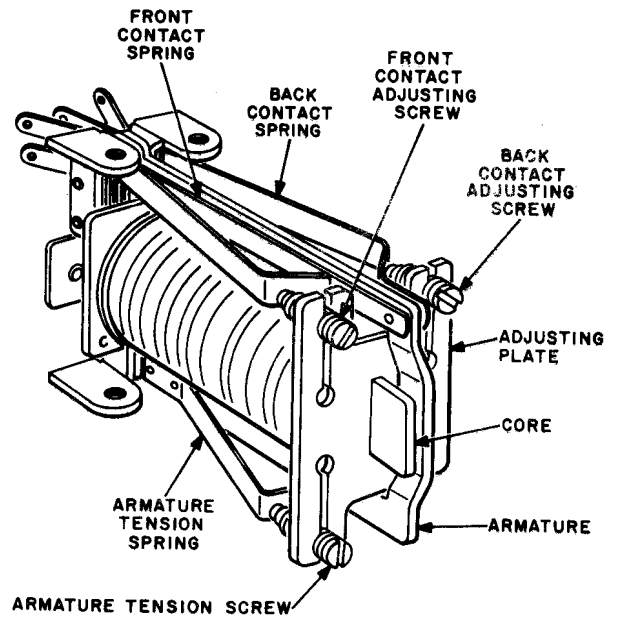


Fig. 11—B-Type Relay-Initial Design

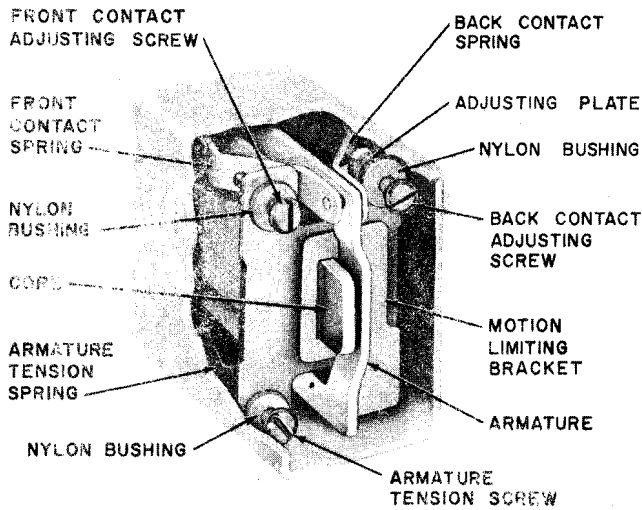


Fig. 10—B-Type Relay-Improved Design

(c) *Relays Equipped With Removable Paper Armature Stops*

Relays Having Values of 0.005 Inch Specified under Front Contact Make

- (1) Manually operate the relay by applying pressure to the armature opposite the lower part of the core. The movement of the armature after the armature or movable contact spring touches the front contact spring or stop, but before the stop pin or pins (or the armature when no stop pin is provided) strikes the paper stop should be minimum 0.005 inch as gauged by eye.

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(2) This requirement is considered met if the armature or movable contact spring touches the front contact or stop with the 0.007-inch blade of the 74D gauge inserted between the armature stop pin or pins (or the armature where no stop pin is provided) and the core with the paper armature stop removed from the relay. In making this check take care that the bottom edge of the gauge lines up with the bottom of the core. Apply sufficient pressure to the armature directly opposite the lower part of the core to hold the armature against the gauge but not enough to distort the armature.

Relays Having Values Greater Than 0.005 Inch Specified Under Front Contact Make

(3) Remove the paper armature stop from the relay and check the requirement as described under (a) covering relays not equipped with removable armature stops.

(d) **Relays Equipped With Separator:** (Consisting of a strip of paper wound directly on the core.)

Use the 100 gauge of the 99A gauge nest having the thickness specified under Front Contact Make with the clip swung to one side. If the clip is fastened to the gauge with two rivets, bend the clip back sufficiently to clear the separator. Insert the gauge between the stop pin (or pins) and the separator and check the requirement as described under (a) covering relays not equipped with removable armature stops.

2.13 Contact Separation: Fig. 12(A)—The separation between contacts normally open or between contacts that are opened when the relay is operated (Fig. 12(C), shall be

(a) For spring combinations in Fig. 5(a), Table B and the B136 type relay in Fig. 7(a), Table B, Min 0.010 inch.

(b) For other spring combinations, Table B, Min 0.005 inch.

Use the 74D gauge.

2.14 Armature Travel: Fig. 12(B)—It is desirable to adjust the Front Contact Make and Contact Separation to near minimum values as this will

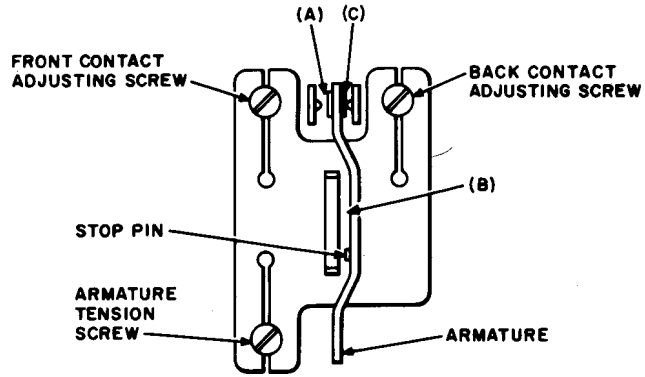


Fig. 12—Illustrating the Location of the Adjusting Screws for Spring Combinations (Fig. 1, 2, 3, 5, 6, 8, 11, 12, 13, 14, 15 and 16 Table B)

facilitate keeping the armature travel below the maximum specified value. The armature travel shall not exceed the following limits:

(a) **Relays Having One or No Stop Pin:** The armature travel (unoperated air gap) as measured between the armature and the core with the armature touching the back contact or stop shall not exceed the value specified under Arm. Trvl in the circuit requirement table.

Use the proper 101 gauge of the 99A gauge nest except where no stop pin is provided. In the latter case use the proper 100 gauge of the nest.

(b) **Relays Having Two Stop Pins:** The armature travel as measured between the nearer stop pin and the core with the armature touching the back contact or stop shall not exceed the value specified under Arm. Trvl in the circuit requirement table.

Use the proper 100 gauge of the 99A gauge nest.

(c) **Relays Equipped With Removable Metal Armature Stops:** The armature travel as measured between the armature and the core with the armature touching the back contact or stop shall not exceed the value specified under Arm. Trvl in the circuit requirement table.

Use the proper 101 gauge of the 99A gauge nest with the clip swung to one side. If the

under operating conditions. Turn the front contact adjusting screw with the KS-6854 screwdriver until the front contacts just make or the armature just touches the front stop. Make sure that the separator is not torn or otherwise injured by the insertion of the gauge.

Permissible Deviation From Minimum Front Contact Make Value Specified

(12) If upon making the armature tension adjustment as described in 3.19(1), (2), and (4), it is not possible to meet the release requirement due to the characteristics of the relay involved, adjust the front contact make to a value greater than the minimum value specified. However, the front contact gap should not be such that the contact separation requirement 2.13 and armature travel requirement 2.14 cannot be met.

Relays Equipped With Armature Spring (Spring Combination Fig. 5, 7, and 15 Table B)

(13) To position the armature spring for front contact make, adjust it with the 363 spring adjuster until it makes contact with the proper gauge inserted between the armature and the core of the relay. Apply the spring adjuster slightly above the bend in the spring as shown in Fig. 22.

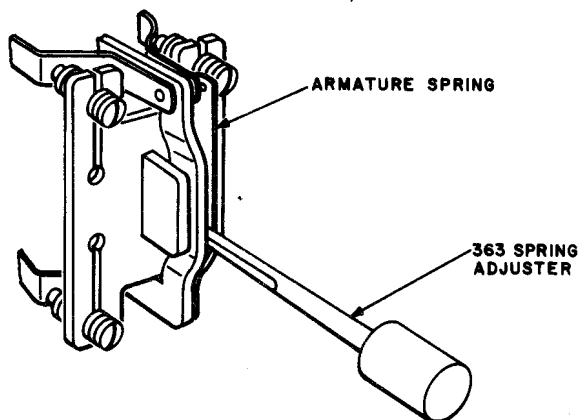


Fig. 22—Method of Adjusting Armature Spring for Minimum Front Contact Make

Contact Separation

(14) Position the back contact spring or stop so the contact separation is at or near the minimum value specified. Do this by turning the back contact adjusting screw with the KS-6854 screwdriver and then inserting the proper gauge to check the front contact separation as shown in Fig. 23. Do not turn the adjusting screw with the gauge inserted between the contacts. To position the armature spring for contact separation adjust it with the 363 spring adjuster as shown in Fig. 22. After making this adjustment check that the front contact make requirement is still met.

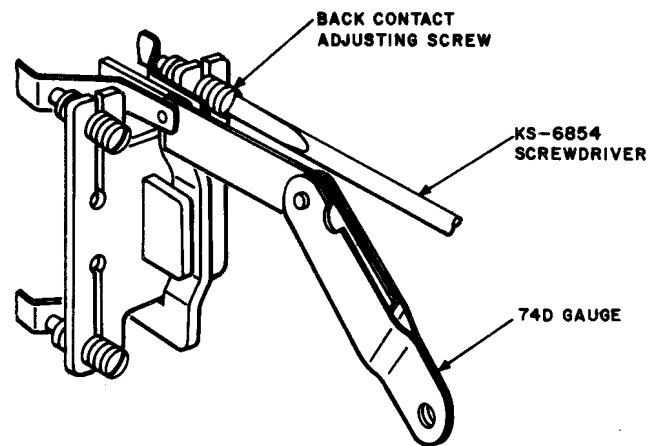


Fig. 23—Method of Adjusting Contact Separation

Maximum Armature Travel

(15) In adjusting for Front Contact Make and Contact Separation as described in (6) through (14) the armature travel (unoperated air gap) is also established. Check the armature travel with the proper gauge to determine whether it is within the maximum limit. To do this proceed as follows: Select the proper gauge and attempt to insert it in the gap between the armature and the core without forcing the gauge. (If a removable paper armature stop is on the relay remove it before inserting the gauge.) If the gauge does not enter the gap, the armature

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travel is satisfactory. If the gauge slides freely into the gap, the armature travel is too great in which case readjust the Front Contact Make or the Contact Separation closer to the minimum values specified. Mount the paper armature stop if provided. The term "armature travel" is used instead of "unoperated air gap" in order to facilitate putting the requirement on the circuit requirement table. It will be given in the column under the heading Arm. Trvl.

Contact Sequence

(16) Adjust relays on which a definite sequence of contact closure is required so the contact separation between the contacts required to make first is 0.005 inch less than that between the contacts required to make later. Use the 363 spring adjuster applying it slightly above the bend in the spring. Check the adjustment by moving the armature manually and noting that the proper sequence is obtained.

Clearance Between Armature and No. 2 Contact Spring (Spring Combination Fig. 4, 7, 9, and 10 Table B)

(17) Apply the soak current if specified or the test operate current if no soak current is specified and note that sufficient clearance exists between the No. 2 spring and the armature. If this requirement is not met, reduce the Front Contact Make toward the minimum value.

(18) If reducing the Front Contact Make to the minimum value does not provide sufficient clearance between the armature and the No. 2 spring, proceed as follows:

(19) Adjust the No. 2 spring so that it is more nearly parallel to the armature in the unoperated position using the 259 spring adjuster.

3.17 Clearance Between Armature and Motion Limiting Bracket (Reqt 2.17)

(1) If there is insufficient clearance between the armature and motion limiting bracket, proceed as follows: Tag and unsolder the leads and remove the relay from the mounting plate using the 4-inch screwdriver.

(2) Loosen the motion limiting bracket screws and position the core support bracket as required. If necessary to obtain the required clearance also loosen the screws which mount the relay structure in the cover, and shift the relay with respect to the cover. Obtain clearance between the adjusting plate and the cover and tighten all screws by following the procedures covered in 3.10 through 3.16(3).

(3) Fasten the relay cover securely to the mounting plate using the 4-inch screwdriver and reconnect all leads to the relay. Check requirements 2.02 and 2.03.

3.18 Position of Adjusting Screws (Reqt 2.18)
No procedure.

3.19 Electrical Requirements (Reqt 2.19)

3.20 Armature Tension Spring Position (Reqt 2.20)

Electrical Requirements

(1) **Operate or Hold:** If the relay fails to meet the operate or hold requirement, reduce the back tension on the armature using the KS-6854 screwdriver. On relays having adjusting screws in the positions shown in Fig. 9, turning the armature tension screw in decreases the back tension on the armature and turning it out increases the tension. On relays having adjusting screws in the position shown in Fig. 12 turning the armature tension screw out decreases the back tension on the armature.

(2) **Nonoperate or Release:** If the relay fails to meet the nonoperate or release requirements, increase the backward tension of the armature using the KS-6854 screwdriver. If it is impossible to meet the requirement or if the armature is sluggish in releasing, increase the Front Contact Make. The maximum armature travel requirement must not be exceeded. Ordinarily it will be possible to regulate the tension by the adjustment of the armature tension screw, but in the case of relays having the arrangement of adjusting screws in Fig. 9, it may be necessary to remove the relay from the mounting plate, remove the cover, and tension the No. 2 spring with the 259 spring adjuster against the armature stud sufficiently to permit a satisfactory adjustment of the armature tension.