

RELAYS

221, 222, 223, 224 AND 225 TYPES

LIST OF REQUIREMENTS BY RELAY CODES

1. GENERAL

- 1.01 This section covers supplementary requirements for the relays listed in 1.03. The application of these requirements is limited as covered in 1.04.
- 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 This section includes the following information
- (a) Mechanical requirements, for all 221, 222, 223, 224 and 225 type relays shown on circuit requirement tables which still show a schematic of the spring combination. (Table 1)
 - (b) Mechanical requirements for A.E.Co. relays similar to those in (a) shown on Bell System drawings. (The section also applies to relays shown on non-Bell System drawings if the relays are listed in this section.) (Tables 2 and 3)
 - (c) Electrical and mechanical requirements for modified 221 and 222 type and similar A.E.Co. relays (see 1.06).
 - (d) Electrical and mechanical requirements for 247 and 248 type relays used for the replacement of, or substitutes for, modified 221 and 222 type relays. (Table 4)
- 1.04 These requirements apply as follows.
- (a) Where the circuit requirement tables still show a schematic of the spring combination.
 - (b) Where modified 221 and 222 type or similar A.E.Co. relays (see 1.06) or replacing 247 and 248 type relays are not covered on the circuit requirement tables.
- 1.05 For the conditions covered above, the requirements supersede the corresponding requirements on the circuit requirement

table. The section provides a connecting link between the circuit requirement table and the spring combination figures given in Section 040-236-701.

- 1.06 Modified 221 and 222 type relays are 221 and 222 type relays equipped with a 1:1 ratio armature.

2. LIST OF RELAYS

- 2.01 The column headings in the following tables shall be interpreted in the same manner as the corresponding circuit requirement table column headings which are described in Sections 040-236-701 and 005-120-101.
- 2.02 Unless otherwise specified the information given in the column headed "Notes" is for both test and readjust purposes. Where a test only requirement is specified the readjust requirement is covered by the spring gauging requirement in BSP Section 040-236-701.
- 2.03 Requirements for All Except "B" Position and Similar Functioning Relays of Selectors, Connectors and Repeaters (See 2.04): The requirements for the W.E.Co. coded relays are covered in Table 1 on pages 2 to 19 inclusive. A.E.Co. coded relays having corresponding W.E.Co. codes are listed in Table 2 on pages 19 to 22, and the requirements for these relays will be found by referring to the corresponding W.E.Co. Code in Table 1. The requirements for A.E.Co. coded relays not having corresponding W.E.Co. codes are covered in Table 3 on pages 22 to 34 inclusive.
- 2.04 Requirements for "B" Position and Similar Functioning Relays of Selectors, Connectors and Repeaters

(a) Mechanical Requirements

- (1) Non Modified Relays: The mechanical requirements for the non-modified "B" position and similar functioning relays in selectors, connectors and repeaters are given in Tables 1 and 3 with the relays listed in their regular code order. In the notes for each of the non-modified "B" position relay codes a reference is added to Table 4 for the requirements for the modified relay of that code and to paragraph 2.04 (b) for the timing and electrical requirements.

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(2) Modified Relays: Table 4 lists the mechanical requirements for the modified relays and gives the code number of a replacing or substitute 247 or 248 type relay. Where no corresponding 247 or 248 type relay is available, a substitute 247 or 248 type relay which may have extra springs is listed, followed by the note "the 248X relay has --- extra springs." If no replacing or substitute relay is available, a note covers this fact. The requirements for the replacing or substitute 247 or 248 type relays are listed in code order following the requirements for the modified 221 and 222 type relays.

Note: The mechanical requirements listed in this section apply (except for residual - see subparagraph (b-1) below) regardless of whether timing requirements are applied.

(b) Electrical and Timing Requirements

(1) Where Timing Test Equipment is Available: The relays shall meet the residual, electrical and timing requirements covered in Section 040-013-711 instead of the residual and electrical requirements specified on the circuit requirement table for the non-modified 221 and 222 type relays and in place of the residual requirements specified in this section.

(2) Where Timing Test Equipment is not Available: The electrical requirements for the modified 221 and 222 type relays and for the replacing or substitute 247 or 248 type relays are given on Table 4. The electrical requirements for the non-modified relays are the same as those specified on the circuit requirement table.

Table 1 - Requirements for W. E. Co. Relays (See 2.03 and 2.04)

W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
221A	11	8	7-11	Armature need not touch core on operate. Contact separation shall be Test - Min. 3. Contact follow on make contact shall be Test - Min. 8.
221B	901	15	S-4	Contact pressure between springs 2 and 3 shall be Test - Min. 10 grams.
221C	1	13	4-8	Armature need not touch core on operate. (This adjustment applies except when this relay is used as a rotary hunting relay.)
	700	16	7-9	Armature need not touch core on operate. (This adjustment applies when this relay is used as a rotary hunting relay such as a selector circuit E position relay.)
221D	4	12	S-4	
221E	10	12	S-4	
221G	16	13	S-4	
221H	36	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
221J	43	18	S-4	Springs 2 and 3 shall break before 3 and 4 make (Test). Contact pressure between springs 2 and 3 shall be Test - Min. 10 grams.
221K	90	12	S-4	
221L	97	17	S-4	Springs 1 and 2 may make on non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test).
221M	3	9	S-4	Contact separation shall be Test - Min. 3. Contact follow shall be Test - Min. 8.
221P	5	8	7-11	Armature need not touch core on operate. Contact separation shall be Test - Min. 3. Contact follow on springs 2, 3, 4 and 5 shall be Test - Min. 8.
221R	6	8	7-11	Armature need not touch core on operate. Contact separation shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.
221T	15	13	S-4	
221U	20	14	S-4	
221W	31	13	S-4	
221Y	45	13	S-4	
221AA	93A	15	S-4	
221AB	103	13	S-4	
221AC	121	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate for the whole combination. Contact pressure between springs 8 and 9 shall be Test - Min. 15 grams.
221AD	45	13	S-4	
221AE	122	25	0	Springs 1 and 2 may make on non-operate. Springs 1 and 3 shall not break on the gauging specified in the "Test Arm.Trvl." column (Test). Contact pressure (armature operated) between springs 1 and 2 shall be Test - Min. 10 grams.

W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
221AF	3A	13	S-4	
221AG	5A	8	7-11	Armature need not touch core on operate. Contact separation shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.
221AH	48	11	3-7	Contact follow shall be Test - Min. 8.
221AJ	48	11	0	Contact follow shall be Test - Min. 8.
221AK	46A	13	S-4	
221AL	77	18	0	Contact separation between springs 3 and 4 shall be Test - Min. 3. Springs 1 and 2 shall make before 3 breaks from the back stop spring 2X (Test). Contact follow on springs 3 and 4 shall be Test - Min. 8.
221AM	46A	13	S-4	
221AN	4	12	S-2	
221AP	18	13	S-2	Contact pressure between springs 3 and 4 shall be Test - Min. 15 grams
221AR	55	23	S-2	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate for the whole combination. Contact separation between springs 4, 5, 7 and 8 shall be Test - Min. 3.
221AS	94	14	S-2	Contact pressure between springs 6 and 7 shall be Test - Min. 15 grams.
221AT	96	13	S-4	
221AU	45	13	S-4	
221AW	9	8	4-8	Contact separation on make contact shall be Test - Min. 3. Contact follow on make contact shall be Test - Min. 8.
221AY	2A	13	S-4	
221BA	5A	8	7-11	Armature need not touch core on operate. Contact separation shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.
221BB	5A	8	7-11	Armature need not touch core on operate. Contact separation shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.
221BC	46	11	4-8	Armature need not touch core on operate. Contact follow shall be Test - Min. 8.
221BD	78	8	0	
221BF	102	18	S-4	Contact pressure between springs 4 and 5 shall be Test - Min. 35 grams.
221BH	46	11	S-4	Contact follow shall be Test - Min. 8
221BJ	51	15	S-4	Springs 3 and 4 shall make before 6 and 7 break (Test). Contact pressure between springs 6 and 7 shall be Test - Min. 15 grams.
221BK	52	13	S-4	
221BL	2A	13	S-4	
221BM	45	13	S-4	
221BN	31	13	S-4	
221BR	82	13	S-4	
221BS	3A	13	S-4	
221BT	82	13	S-4	
221BU	3A	13	S-4	
221BY	125	17	4-8	Contact separation shall be Test - Min. 13.
221CA	10	12	S-4	
221CB	38	13	S-4	
221CC	4	12	0	
221CD	901	15	S-4	Contact pressure between springs 2 and 3 shall be Test - Min. 10 grams
221CE	97	17	S-2	Springs 1 and 2 may make on non-operate.
221CF	90	12	S-4	
221CG	43	18	S-4	Armature need not touch core on operate. Springs 2 and 3 shall break before 3 and 4 make (Test). Contact pressure between springs 2 and 3 shall be Test - Min. 10 grams.
221CH	36	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
221CJ	16	13	S-4	
221CK	4	12	S-4	
221CL	10	12	S-4	

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W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
221CM	121	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate. Contact pressure between springs 8 and 9 shall be Test - Min. 15 grams.
221CN	128	11	S-4	Contact follow shall be Test - Min. 8.
221CP	356	13	4-6	Armature need not touch core on operate and hold.
221CR	130	21	S-4	Springs 1 and 2 may break and 3 and 4 may make on the non-operate. Springs 1 and 2 shall break before 3 and 4 make and 3 and 4 shall make before 5 and 6 break (Test). Contact pressure between springs 9 and 10 shall be Test - Min. 15 grams.
221CS	13	12	See Note	When the circuit requirement table specifies a readjust operate of 7.9 MA the residual shall be 0. When the readjust operate specified is 10.3 MA the residual shall be S-4. See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
221CT	82	13	S-4	
221CU	24	15	S-4	Contact pressure between springs 2 and 3 shall be Test - Min. 15 grams.
221CW	47	13	S-2	
221CY	131	14	S-4	Springs 3 and 4 shall make before 8 and 9 break (Test). Contact pressure between springs 8 and 9 shall be Test - Min. 15 grams.
221DA	24	15	S-2	Contact pressure between springs 2 and 3 shall be Test - Min. 15 grams.
221DB	133	25	S-4	Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate. Springs 1 and 2 shall make before 1 strikes bushing on 4.
221DC	47	13	S-4	
221DD	11	8	7-11	Armature need not touch core on operate. Contact separation shall be Test - Min. 3. Contact follow on make contact shall be Test - Min. 8.
221DE	135	14	S-2	Contact pressure between springs 6 and 7 shall be Test - Min. 10 grams.
221DF	138	12	7-11	
221DG	140	16	S-4	
221DH	146	16	S-4	Springs 1 and 2 shall make before 4, 5, 7 and 8 break (Test).
221DJ	82	13	0	
221DK	84	13	0	
221DL	147	19	0	Springs 1 and 2 shall make before 3 and 4 make (Test). Contact pressure between springs 4 and 5 shall be Test - Min. 10 grams.
221DM	148	13	S-2	
221DN	150	24	S-4	Springs 1, 2, 4, 5, 6 and 7 may break and 2 and 3 may make on the secondary non-operate. Springs 2 and 3 shall make before 2 strikes the bushing on 5. Springs 4 and 5 shall make before 2, 3, 6 and 7 make (Test).
221DP	151	16	S-5	
221DR	96	13	S-2	
221DS	135	14	0	Contact pressure between springs 6 and 7 shall be Test - Min. 10 grams.
221DT	94	14	S-2	Contact pressure between springs 6 and 7 shall be Test - Min. 15 grams.
221DU	18	13	S-2	Contact pressure between springs 3 and 4 shall be Test - Min. 15 grams.
221DW	24	15	0	Contact pressure between springs 2 and 3 shall be Test - Min. 15 grams.
221DY	14	12	S-4	
221EA	143	13	S-4	
221EB	145	9	7-11	Armature need not touch core on operate. Springs 1-2 may break on the non-operate. Contact separation between springs 4 and 5, and 5 and 6 shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.

W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
221EC	144	6	S-5	
221ED	18	13	S-4	Contact pressure between springs 3 and 4 shall be Test - Min. 15 grams.
221EE	163	13	S-4	
221EF	164	13	S-4	
221EJ	168	13	S-4	
221EK	4	12	S-2	
221EL	162	14	S-2	Contact pressure between springs 5 and 6 shall be Test - Min. 10 grams.
221EM	169	15	S-4	
221EN	83	22	S-4	Springs 1 and 2 may make on non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test).
221ER	104	12	S-2	See 2.04 b for the electrical and mechanical requirement for this relay and Table 4 for the requirements for the modified relay.
221ES	170	13	7-11	
221ET	49	13	S-4	Armature need not touch core on operate.
221EU	7	8	7-11	Armature need not touch core on operate. Contact separation shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.
221EW	103	13	7-11	
221EY	2	13	7-11	
221FA	81	12	7-11	
221FB	37	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
221FC	92	29	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate for the whole combination.
221FD	50	13	0	Contact pressure between springs 6 and 7 shall be Test - Min. 10 grams.
221FE	45B	11	7-11	Armature need not touch core on operate. Contact follow shall be Test - Min. 8.
221FF	177	25	0	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
221FG	181	12	S-4	
221FH	3A	13	S-4	
221FJ	178	12	S-2	
221FL	191	13	S-4	
221FM	16	13	0	
221FN	87	13	0	
221FP	185	26	0	Springs 1 and 2 shall break and 2 and 3 shall make before 2 strikes the bushing on 5. Springs 1, 2, 4, 5, 6 and 7 may break and 2 and 3 may make on the non-operate for the whole combination.
221FR	187	15	S-4	
221FS	103	13	7-11	
221FT	311	13	S-4	
221FU	143	13	0	
221FW	10	12	0	
221FY	193	9	S-4	
221FAA	11	8	7-11	Armature need not touch core on operate. Contact separation shall be Test - Min. 3. Contact follow on make contact shall be Test - Min. 8.
221FAB	306	15	S-4	Contact pressure between springs 6, 7, 9 and 10 shall be Test - Min. 35 grams.
221GA	3A	13	0	
221GB	47	13	0	
221GC	192	8	S-4	
221GD	12	13	0	
221GE	5	8	7-11	Armature need not touch core on operate. Contact separation shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.
221GF	136	13	S-4	
221GH	58	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
221GJ	199	15	S-4	
221GK	303	13	S-4	

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W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
221GL	197	12	S-4	
221GM	304	13	10-14	Armature need not touch core on operate.
221GN	307	8	7-11	Armature need not touch core on operate. Contact separation shall be Test - Min. 3. Contact follow on make contact shall be Test - Min. 8.
221GP	306	15	S-4	Contact pressure between springs 6, 7, 9 and 10 shall be Test - Min. 35 grams.
221GR	308	12	4-8	
221GS	305	16	S-4	
221GT	303	13	S-4	
221GU	197	12	S-5	
221GW	138A	8	S-7	
221GY	79	17	0	Springs 1 and 2 shall make before 3, 4, 5 and 6 make (Test). See 2.04 b for the electrical and mechanical requirements for this relay and Table 4 for the requirements for the modified relay.
221HA	17	12	4-8	Armature need not touch core on operate.
221HB	27	16	S-4	Contact pressure between springs 2, 3, 5 and 6 shall be Test - Min. 60 grams.
221HC	143	13	0	
221HD	304	13	4-8	
221HE	50	13	S-2	Contact pressure between springs 6 and 7 shall be Test - Min. 10 grams.
221HF	119	13	S-4	
221HG	41	14	S-2	Contact pressure between springs 5 and 6 shall be Test - Min. 10 grams.
221HH	34	25	S-4	Springs 1 and 3 shall make before 1 strikes the bushing on 5. Springs 1 and 3 may make and 2 and 3 may break on the non-operate for the whole combination. Springs 2 and 3 shall break before 4 and 5 break (Test). Contact pressure between springs 2 and 3 shall be Test - Min. 15 grams.
221HJ	126	13	S-4	
221HK	313	20	S-4	Springs 1 and 2 shall make before springs 3, 4, 5, 6, 7 and 9 make (Test).
221HL	111	13	S-4	Contact pressure between springs 3 and 4 shall be Test - Min. 15 grams.
221HM	197	12	4-8	Armature need not touch core on operate.
221HN	39	13	S-4	
221HP	304	13	S-4	
221HR	70	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
221HS	3	9	S-4	Contact separation shall be Test - Min. 3. Contact follow shall be Test - Min. 8.
221HT	3	9	S-4	Contact separation shall be Test - Min. 3. Contact follow shall be Test - Min. 8.
221HU	85	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
221HW	45B	11	4-8	Contact follow shall be Test - Min. 8.
221HY	151	16	S-4	Springs 4 and 5 shall make before 2, 3, 6 and 7 make (Test).
221JA	32	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate for the primary and secondary windings connected series aiding.
221JC	76	13	S-4	
221JD	14	12	10-14	Armature need not touch core on operate.
221JE	319	10	7-11	
221JF	142	16	4-8	
221JG	116	12	7-11	Armature need not touch core on operate. Springs 1, 2, 4, 5 may break on non-operate. Springs 2 and 3 may make before 6, 7, 8 and 9 break.
221JH	145	9	7-11	Armature need not touch core on operate. Springs 1-2 may break on the non-operate. Contact separation between springs 4 and 5, and 5 and 6 shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.

W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
221JJ	45	13	S-4	
221JK	327	13	S-4	
221JL	328	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on non-operate for primary and secondary windings connected series aiding.
221JM	105	18	S-4	Contact pressure between springs 4 and 5 shall be Test - Min. 15 grams.
221JN	106	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
221JP	8	13	S-4	
221JR	197	12	7-11	
221JS	139	21	S-4	
221JT	128	11	7-11	Contact follow shall be Test - Min. 8.
221JU	329	12	7-11	Springs 1, 2, 4 and 5 may break on non-operate. Springs 2 and 3 may make before 6 and 7 break (Test).
221JW	76	13	S-4	
221JY	74	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate for the whole combination.
221KA	333	13	S-4	Springs 1, 2, 4 and 5 may break on non-operate. Springs 2, 3, 5 and 6 may make before 9 and 10 break (Test).
221KB	13	12	S-4	
221KC	13	12	S-4	
221KD	336	13	7-11	Armature need not touch core on operate. Springs 1, 2, 4 and 5 may break on non-operate.
221KE	196	13	S-4	Contact pressure between springs 8 and 9 shall be Test - Min. 10 grams.
221KF	336	13	S-4	Springs 1, 2, 4 and 5 may break on non-operate.
221KG	197	12	S-4	
221KH	339	16	4-8	Contact pressure between springs 8 and 9 shall be Test - Min. 35 grams.
221KL	54	12	S-4	
221KM	87	13	S-4	
221KN	104	12	SL	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
221KP	8	13	7-11	
221KR	344	13	SL	Contact separation between springs 6 and 8 shall be Test - Min. 3. Contact pressure between springs 7 and 8 shall be Test - Min. 10 grams.
221KS	348	17	S-4	Springs 1 and 2 shall make before 3, 4, 5 and 6 make and before 8 and 9 break (Test).
221KT	345	16	S-4	
221KU	347	29	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
221KW	176	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
221KY	86	13	S-4	
221LA	168	13	4-8	Armature need not touch core on operate.
221LB	353	16	S-4	
221LC	13	12	S-4	
221LD	10	12	S-4	
221LE	354	12	SL	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
221LF	7	8	S-4	Contact separation on make contacts shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.
221LG	192	8	S-4	
221LH	124	18	S-4	Contact pressure between springs 2, 3, 5 and 6 shall be Test - Min. 35 grams.
221LJ	301	12	0	
221LK	306	15	S-4	Contact pressure between springs 6, 7, 9 and 10 shall be Test - Min. 35 grams.
221LL	360	13	S-4	
221LM	176	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
221LN	362	12	S-4	
221LP	168	13	S-4	
221LR	168	13	4-8	Armature need not touch core on operate.

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W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
221LS	361	19	0	Contact separation shall be Test - Min. 15.
221LT	54	12	S-4	
221LY	368	15	4-6	Contact pressure between springs 2 and 3 shall be Test - Min. 15 grams.
221MA	4	12	S-4	
221MB	145	9	S-5	Contact separation between springs 4 and 5, and 5 and 6 shall be Test - Min. 3. Contact follow on springs 5 and 6 shall be Test - Min. 8.
221MC	3	9	S-4	Armature need not touch core on primary operate. Contact separation shall be Test - Min. 3. Contact follow shall be Test - Min. 8.
222A	4A	12	SL	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
222B	30	15	S-4	Springs 1 and 2 only may break on nonoperate of Readjust 22 MA; Test 20 MA. No contacts shall break on nonoperate of Readjust 12.7 MA; Test 12 MA.
222C	100	13	S-4	
222D	10	12	S-4	
222E	23	25	S-4	Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate. Springs 1 and 2 shall make before 1 strikes the bushing on 4.
222F	29	25	S-4	Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate. Springs 1 and 2 shall make before 1 strikes the bushing on 4.
222G	29	25	S-4	Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate. Springs 1 and 2 shall make before 1 strikes the bushing on 4.
222H	72	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
222J	74	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222K	73	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222L	73	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222R	88	18	SL	Springs 1 and 2 may make on non-operate. Springs 8 and 9 need not break on operate Test 27. M.A.; Readjust 26. M.A. with the primary and secondary windings connected series opposing. Contact separation between springs 7 and 9 shall be Test - Min. 3. Springs 1 and 2 shall make before 5 and 6 make and may make before 3 and 4 break (Test). Contact pressure between springs 8 and 9 shall be Test - Min. 10 grams.
222S	96	13	S-4	
222T	113A	25	S-4	Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate. Springs 1 and 2 shall make before 1 strikes the bushing on 4.
222W	26	15	S-4	Contact pressure between springs 7, 8, 10 and 11 shall be Test Min. 35 grams.
222Y	44	16	S-4	Contact pressure between springs 8, 9, 11 and 12 shall be Test Min. 35 grams.
222AA	118	15	S-4	Contact pressure between springs 3, 4, 8, 9, 11 and 12 shall be Test - Min. 35 grams.
222AC	20	15	S-4	
222AD	26	15	S-4	Contact pressure between springs 7, 8, 10 and 11 shall be Test Min. 35 grams.
222AF	61	15	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222AG	86A	13	S-4	
222AH	93	15	S-4	
222AJ	95	14	S-4	Springs 1, 2, 4, and 5 may break on nonoperate.
222AK	98	13	S-4	
222AL	99	23	S-4	Springs 5 and 6 shall break before 8 and 7 make (Test). Springs 9 and 10 shall break before 10 and 11 make (Test). Contact pressure between springs 2, 3, 5, 6, 9 and 10 shall be Test - Min. 35 grams.
222AM	109	13	S-4	

W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
222AN	120	14	S-4	Springs 1, 2, 4 and 5 may break on non-operate.
222AP	45	13	S-4	
222AR	4	12	SL	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
222AS	13	12	SL	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
222AT	13A	12	SL	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
222AU	54	12	SL	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
222AW	66	13	Q	
222AY	84	13	SL	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
222BA	110	16	S-4	Springs 1, 2, 3 and 4 may break on non-operate. Contact pressure between springs 11 and 12 shall be test - Min. 10 grams.
222BB	47	13	S-4	
222BC	47	13	S-4	
222BD	47	13	S-4	
222BE	3A	13	S-4	
222BF	45	13	S-4	
222BH	60	18	S-4	Contact separation between springs 2, 3, 5 and 6 shall be Test Min. 13.
222BJ	62	16	S-4	Contact pressure between springs 9, 10, 12 and 13 shall be Test - Min. 35 grams.
222BK	2A	13	S-4	
222BL	See	Note	S-4	When the circuit requirement table specified a readjust operate of 10.1 M.A. the "BSP Fig." shall be 28; the "Test Arm. Trvl." shall be 15. When a readjust operate of 15.5 M.A. is specified the "BSP Fig." shall be 124, the "Test Arm. Trvl." shall be 16 and the contact pressure between springs 2, 3, 5 and 6 shall be Test - Min. 15 grams.
222BM	46	11	4-8	Contact follow shall be Test - Min. 8.
222BN	78	8	0	
222BP	86	13	4-8	
222BR	57	12	S-4	
222BS	119	13	S-4	
222BT	105	18	S-4	Contact pressure between springs 4 and 5 shall be Test - Min. 15 grams.
222BU	2A	13	S-4	
222BW	46A	13	S-4	
222BY	35	17	0	Springs 4, 5, 6 and 7 shall make before 8, 10, 11 and 13 make (Test).
222CA	98	13	S-4	
222CB	124	16	S-4	Contact pressure between springs 2, 3, 5 and 6 shall be Test - Min. 35 grams.
222CC	30	15	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222CD	123	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on secondary non-operate.
222CE	82	13	0	
222CF	4	12	S-4	
222CG	127	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
222CH	45	13	S-4	
222CJ	30	15	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222CK	10	12	S-4	
222CL	96	13	S-4	
222CM	114	27	S-4	Springs 1 and 2 may make on secondary non-operate. Springs 1 and 2 shall make before 1 strikes the bushing on 4.
222CN	129	21	S-4	Springs 1, 2, 3 and 4 may break on the non-operate. Springs 8 and 9 shall make before 6, 7, 12 and 13 make (Test). Contact pressure between springs 11 and 12 shall be Test - Min. 15 grams.

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W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
222CP	117	27	SL	Springs 1 and 2 may make and 3 and 4 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test). Springs 3 and 4 shall break before 6 and 7 break (Test). Springs 4 and 5 shall make before 7 and 8 make (Test).
222CT	132	26	S-4	Springs 1 and 2 may make on non-operate. Springs 1 and 3 shall not break on the gauging specified in the "Test Arm. Trvl." column (Test). Contact pressure (armature operated) between springs 1 and 2 shall be Test - Min. 10 grams.
222CU	42	17	S-4	Springs 1, 2, 4 and 5 may break on non-operate. Contact pressure between springs 6, 7, 10 and 11 shall be Test Min. 35 grams.
222CW	10	12	0	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
222CY	134	15	0	Springs 1, 2, 3 and 4 may break on non-operate. Contact pressure between springs 8 and 9 shall be Test - Min. 10 grams.
222DA	136	13	S-4	
222DB	137	20	S-4	Springs 7 and 8 shall break before 2, 3, 4, 5, 11 and 12 make (Test). Contact pressure between springs 7, 8, 10 and 11 shall be Test - Min. 15 grams.
222DC	139	21	S-4	Contact pressure between springs 4 and 5 shall be Test - Min. 15 grams.
222DD	138	12	S-4	
222DE	89	12	S-4	
222DF	140	16	S-4	
222DG	149	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222DH	152	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222DJ	154	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222DK	142	16	4-8	
222DL	138A	8	5-7	
222DM	153	16	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222DN	156	23	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222DP	155	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
222DR	157	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
222DS	165	29	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222DT	166	29	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222DW	62	16	S-4	Contact pressure between springs 9, 10, 12 and 13 shall be Test - Min. 35 grams.
222ED	42	17	S-4	Springs 1, 2, 4 and 5 may break on non-operate. Contact pressure between springs 6, 7, 10 and 11 shall be Test Min. 35 grams.
222EE	109	13	S-4	
222EF	63	21	S-4	Springs 1 and 3 may make on non-operate. Springs 4 and 5 may break before 2 and 3 break. Springs 1 and 3 shall make before 4 and 5 break (Test).
222EG	17	12	4-8	Armature need not touch core on operate.
222EH	79	17	0	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay. Springs 1 and 2 shall make before 3, 4, 5 and 6 make (Test).
222EJ	33	15	S-4	Contact pressure between springs 4, 5, 7 and 8 shall be Test - Min. 35 grams.
222EL	82	13	SL	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
222EM	171	23	S-4	Springs 1, 2, 3 and 4 may break on non-operate.

W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
222EN	172	15	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222EP	175	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate.
222ER	174	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate.
222ES	179	25	0	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate for the whole combination.
222ET	180	12	S-4	
222EU	176	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222EW	173	25	S-4	Springs 1, 2, 3 and 4 shall make before 3 strikes the bushing on 6. Springs 1, 2, 3 and 4 may make on the secondary non-operate.
222EY	91	16	S-4	
222FA	188	15	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222FB	189	13	S-4	
222FC	182	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222FD	31	13	S-4	
222FE	183	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on secondary non-operate. Contact pressure between springs 8 and 9 shall be Test - Min. 15 grams.
222FF	186	12	S-4	
222FG	96	13	0	
222FH	194	24	SL	Springs 1 and 2 shall break and 3 and 4 shall make before 3 strikes the bushing on 6. Springs 1, 2, 5 and 6 may break and 2 and 3 may make on the secondary non-operate. Springs 6 and 7 may make before 8, 9, 10 and 11 break (Test).
222FJ	195	15	S-4	
222FK	45	13	S-4	
222FL	157	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the non-operate for the whole combination.
222FM	302	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222FN	300	15	0	Springs 1, 2, 3 and 4 may break on non-operate. Contact pressure between springs 8 and 9 shall be Test - Min. 15 grams.
222FP	196	13	0	Contact pressure between springs 8 and 9 shall be Test - Min. 10 grams.
222FR	198	15	0	Springs 1, 2, 3 and 4 may break on non-operate. Contact pressure between springs 8 and 9 shall be Test - Min. 15 grams.
222FS	301	12	0	
222FT	310	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate for the whole combination.
222FU	309	25	0	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate for the whole combination.
222FW	312	15	0	Springs 1, 2, 3 and 4 may break on non-operate.
222FY	64	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate for the whole combination. Contact separation between springs 9 and 11 shall be Test-Min. 3. Contact pressure between springs 10 and 11 shall be Test - Min. 10 grams.
222GA	56	26	S-4	Springs 1 and 2 shall break and 2 and 3 shall make before 2 strikes the bushing on 5. Springs 1 and 2 may break and 2 and 3 may make on the non-operate for the whole combination.
222GB	8	13	S-4	
222GC	106	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on secondary non-operate.

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W.I.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
222GD	112	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the non-operate for the whole combination.
222GE	75	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222GF	69	18	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222GG	71	13	S-4	Contact pressure between springs 9 and 10 shall be Test - Min. 15 grams.
222GH	314	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the non-operate for the whole combination.
222GJ	316	14	S-4	Springs 1, 2, 4 and 5 may break on non-operate.
222GK	315	12	S-4	
222GL	25	29	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate.
222GM	115	21	S-4	Contact pressure between springs 5, 6, 8, 9, 11 and 12 shall be Test - Min. 35 grams.
222GN	19	18	S-4	Contact separation shall be Test - Min. 15.
222GP	141	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate. Springs 4 and 5 may make before 12 and 13 break (Test).
222GR	197	12	S-4	
222GS	80	13	SL	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
222GT	22	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222GU	101	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222GW	322	16	S-4	Contact pressure between springs 10, 11, 13 and 14 shall be Test - Min. 35 grams.
222GY	324	31	S-4	Springs 1, 2, 3 and 5 may make and 3, 4, 7 and 8 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 5 make (Test). Contact pressure (armature operated) between springs 3 and 5 shall be Test - Min. 15 grams.
222HA	107	17	0	Springs 1, 2, 4 and 5 may break on non-operate.
222HB	40	12	S-4	
222HC	190	13	S-4	
222HD	330	27	4-8	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate. Contact pressure between springs 7, 8, 10, 11, 13 and 14 shall be Test Min. 35 grams.
222HE	128	11	7-11	Contact follow shall be Test - Min. 8.
222HF	108	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222HG	331	16	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222HH	332	15	S-4	Springs 1, 2, 4 and 5 may break on non-operate.
222HJ	334	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the non-operate for the whole combination.
222HK	45	13	S-4	
222HL	335	15	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222HM	308	12	S-4	
222HN	20	15	S-4	
222HP	340	14	S-2	Springs 1, 2, 3 and 4 may break on non-operate.
222HR	338	15	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222HS	341	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate for the whole combination.
222HT	342	6	S-4	
222HU	4	12	0	
222HW	346	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222HY	343	15	S-4	Springs 1, 2, 4 and 5 may break on non-operate.

W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
222JA	92	29	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate for the whole combination.
222JB	351	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
222JC	350	17	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
222JD	349	22	S-4	
222JE	352	29	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
222JG	363	12	S-4	
222PA	89	12	S-4	
222PB	8	13	S-4	
223A	200	16	S-4	Any two break contacts may break on non-operate.
223B	207	27	S-4	Springs 1T and 3T shall make before 1T strikes the bushing on 5T and before the armature stud strikes 2B. Any two break contacts may break, springs 1T and 3T may make and 2T and 3T may break on the non-operate for the whole combination. Springs 2T and 3T shall break before 4T, 5T, 1B and 2B break (Test). Contact pressure between springs 2T and 3T shall be Test - Min. 15 grams.
223C	205	14	S-4	Any two break contacts may break on non-operate. Contact pressure between springs 6T and 7T shall be Test - Min. 10 grams.
223D	220	15	4-8	Contact pressure between springs 8T, 9T, 8B and 9B shall be Test - Min. 35 grams.
223E	217	13	4-8	Any two break contacts may break on non-operate.
223F	223	16	0	Any two break contacts may break on non-operate.
223G	226	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T. Springs 1B and 2B shall make before 1B strikes the bushing on 4B. Springs 1T, 2T, 1B and 2B may make on secondary non-operate.
223H	229	27	S-4	Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before armature stud strikes 2T. Any two break contacts may break and springs 1B and 2B may make on the secondary non-operate.
223J	228	13	S-4	Any two break contacts may break on non-operate.
223K	231	13	S-4	
223L	236	21	S-4	Any two break contacts may break on non-operate.
223M	238	16	S-4	Any two break contacts may break on non-operate.
223N	242	25	S-4	Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before the armature stud strikes 2T. Any two break contacts may break and springs 1B and 2B may make on the non-operate for the whole combination.
223P	241	17	S-4	Any two break contacts may break on non-operate. Contact pressure between springs 9T, 10T, 7B and 8B shall be Test - Min. 35 grams.
223R	240	25	0	Springs 1T and 2T shall make before 1T strikes the bushing on 4T. Springs 1B and 2B shall make before 1B strikes the bushing on 4B. Springs 1T, 2T, 1B and 2B may make on the non-operate for the whole combination.
223S	248	12	S-4	
223T	251	29	S-4	Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before the armature stud strikes 2T. Any two break contacts may break and springs 1B and 2B may make on the non-operate for the whole combination. Contact pressure between springs 7T, 8T, 8B and 9B shall be Test - Min. 35 grams.
223U	253	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and springs 1B and 2B may make on the non-operate for the whole combination.
223W	252	16	S-4	Contact pressure between springs 5T, 6T, 5B and 6B shall be Test - Min. 35 grams.

W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
223Y	254	27	4-8	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Springs 1T and 2T may make on the non-operate for the whole combination.
223AA	215	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T. Springs 1B and 2B shall make before 1B strikes the bushing on 4B. Any two break contacts may break and spring 1T, 2T, 1B and 2B may make on the non-operate for the whole combination.
223AB	256	27	S-4	Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before the armature stud strikes 2T. Any two break contacts may break and springs 1B and 2B may make on the non-operate for the whole combination.
223AC	261	18	S-4	Any two break contacts may break on the primary non-operate of Test 45.5 M.A.; Readjust 48 M.A. Contact separation shall be Test - Min. 13.
223AD	262	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T. Springs 1B and 2B shall make before 1B strikes the bushing on 4B. Any two break contacts may break and springs 1T, 2T, 1B and 2B may make on the secondary non-operate.
223AE	263	17	S-4	Any two break contacts may break on non-operate. Contact separation between springs 2T and 3T shall be Test - Min. 13.
223AF	265	27	S-4	Springs 1T and 3T shall make before 1T strikes the bushing on 5T and before the armature stud strikes 2B. Any two break contacts may break, springs 1T and 3T may make and 2T and 3T may break on the non-operate for the whole combination. Springs 2T and 3T shall break before 4T, 5T, 1B and 2B break (Test). Contact pressure between springs 2T and 3T shall be Test - Min. 15 grams.
223AG	268	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T and 2T may make on the non-operate for the whole combination. Contact pressure between springs 5T, 6T, 3B and 4B shall be Test - Min. 35 grams.
223AH	269	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 3T. Springs 1B and 2B shall make before 1B strikes the bushing on 3B. Springs 1T, 2T, 1B and 2B may make on the non-operate for the whole combination.
223AJ	267	25	S-4	Springs 1T and 2T shall make before it strikes the bushing on 4T and before the armature stud strikes 1B. Spring 1T and 2T may make on the non-operate for the whole combination.
223AK	266	13	S-4	Any two break contacts may break on non-operate.
223AL	221	25	S-4	Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before the armature stud strikes 2T. Any two break contacts may break and springs 1B and 2B may make on the non-operate for the whole combination.
223AM	219	27	S-4	Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before the armature stud strikes 2T. Any two break contacts may break and springs 1B and 2B may make on the non-operate for the whole combination.
223AP	271	25	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T and 2T may make on the non-operate for the whole combination.
223AR	272	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T and 2T may make on the non-operate for the whole combination. Springs 4T and 5T may make before 11T and 12T break (Test)
223AS	273	13	S-4	Any two break contacts may break on non-operate.
223AT	277	17	S-4	The value specified in the Test Arm. Trvl. column for this relay is the max. gauging for 1T and 2T. Springs 3T and 4T shall break before 1B, 2B, 3B and 4B make (Test).
223AU	274	16	S-4	

W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
223AW	275	9	S-4	Any two break contacts may break on non-operate.
223AY	275	9	4-8	Any two break contacts may break on non-operate.
223BA	228	13	4-8	Any two break contacts may break on non-operate.
223BB	276	14	4-8	Any two break contacts may break on non-operate.
223BC	278	13	S-4	Any two break contacts may break on non-operate.
223BD	231	13	S-4	
223BE	279	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T and 2T may make on the secondary non-operate for the whole combination.
223BF	280	27	S-4	Springs 1T and 3T shall make before 1T strikes the bushing on 5T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T and 3T may make and 2T and 3T may break on the non-operate for the whole combination. Springs 2T and 3T shall break before 4T, 5T, 1B and 2B break (Test). Contact pressure between springs 2T and 3T shall be Test - Min. 15 grams.
223BG	201	25	S-4	Any two break contacts may break on non-operate. Contact pressure between springs 6B and 7B shall be Test - Min. 35 grams.
223BH	285	25	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Springs 1T and 2T may make on the non-operate for the whole combination.
223BJ	286	27	S-4	Springs 1T, 2T, 3T, 4T, 5T and 6T shall make before 5T strikes the bushing on 8T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T, 2T, 3T, 4T, 5T and 6T may make on the non-operate for the whole combination. Contact pressure between springs 9T, 10T, 3B and 4B shall be Test - Min. 35 grams.
223BK	287	29	S-4	Springs 1B, 2B, 3B and 4B shall make before 3B strikes the bushing on 6B and before the armature stud strikes 2T. Any two break contacts may break and springs 1B, 2B, 3B and 4B may make on the non-operate for the whole combination. Springs 2T and 3T shall make before 9T and 10T break (Test). Contact pressure between springs 9T and 10T shall be Test - Min. 35 grams.
223BL	288	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T. Springs 1B and 2B shall make before 1B strikes the bushing on 4B. Any two break contacts may break, and springs 1T, 2T, 1B and 2B may make on the primary non-operate.
223BM	291	12	S-4	
223BN	292	16	S-4	Any two break contacts may break on non-operate.
223BP	293	23	S-4	Springs 1B and 3B may make on non-operate. Contact pressure between springs 3T, 4T, 7T and 8T shall be Test - Min. 45 grams.
223BR	296	18	0	Contact separation shall be Test - Min. 15.
224A	201	17	S-4	Any two break contacts may break on non-operate. Contact pressure between springs 6T and 7T shall be Test - Min. 35 grams.
224B	202	13	S-4	Any two break contacts may break on non-operate.
224C	203	15	S-4	Any two break contacts may break on non-operate. Contact pressure between springs 5T and 6T shall be Test - Min. 35 grams.
224D	206	31	S-4	Springs 1B and 2B shall make before 1B strikes the bushing on 4B. Springs 1T, 2T, 1B and 2B may make and 3T, 4T, 3B and 4B may break on the secondary non-operate. Springs 1B and 2B shall make before 1T and 2T make and 3T and 4T break (Test). Springs 3T and 4T shall break before 3B and 4B break (Test). Springs 1T and 2T shall make before 5B and 6B break (Test).

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W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
224E	208	31	S-4	This adjustment supersedes the adjustment for this relay given immediately below. Springs 1T, 2T, 1B and 2B may make and 3T, 4T, 3B and 4B may break on the secondary non-operate. Springs 1B and 2B shall make before 1B strikes the bushing on 4B. Springs 1B and 2B shall make before 1T and 2T make and 3T and 4T break (Test). Springs 3T and 4T shall break before 3B and 4B break (Test). Springs 1T and 2T shall make before 5B and 6B break (Test).
	982	27	S-4	This adjustment is superseded by the adjustment for this relay given immediately above. Any two break contacts may break and 1T, 2T, 1B and 2B may make on the secondary non-operate. Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before 1T strikes the bushing on 4T. Springs 1B and 2B shall make before 1T and 2T make (Test). Springs 1T and 2T shall make before 3T, 4T, 3B and 4B break (Test).
224F	209	27	S-4	Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before the armature stud strikes 2T. Any two break contacts may break and springs 1B and 2B may make on the secondary non-operate.
224G	211	29	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before 1B strikes the bushing on 4B. Any two break contacts may break, springs 1T, 2T, 1B and 2B may make, and 3T and 4T may break on the secondary non-operate for the whole combination. Springs 1B and 2B may make on the secondary operate for 1T, 2T, 3T and 4T. Springs 1B and 2B shall make before 3B, 4B, 3T and 4T break (Test). Springs 1T and 2T shall make before 1B and 2B make (Test). Springs 1B and 2B shall make before 4T, 5T, 7T, 8T, 9T, 10T, 5B, 6B, 7B, 8B, 10B and 12B make (Test). Springs 3T and 4T shall break before 6T, 7T, 3B and 4B break (Test). Contact pressure between springs 11B, 12B shall be Test - Min. 15 grams.
224H	212	29	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before 1B strikes the bushing on 4B. Any two break contacts may break and springs 1T, 2T, 1B and 2B may make on the secondary non-operate. Springs 1B and 2B shall make before 3B, 4B, 3T and 4T break (Test). Springs 1T and 2T shall make before 1B and 2B make (Test).
224J	204	12	S-4	
224K	210	14	S-4	
224L	213	13	S-4	Any two break contacts may break on non-operate.
224M	214	13	S-4	Any two break contacts may break on non-operate.
224P	216	25	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T and 2T may make on the secondary non-operate.
224R	219	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T and 2T may make on the secondary non-operate.
224T	221	25	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature strikes 2B. Any two break contacts may break and springs 1T and 2T may make on the secondary non-operate.
224U	222	29	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T. Springs 1B and 2B shall make before 1B strikes the bushing on 4B. Any two break contacts may break and springs, 1T, 2T, 1B and 2B may make on the non-operate.
224W	224	14	7-11	Any two break contacts may break on non-operate.

W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
224Y	225	28	0	Springs 3T and 4T shall make before 3T strikes the bushing on 6T and before 2B strikes the bushing on 4B. Springs 1T, 2T, 1B and 2B may break and 3T and 4T may make on the secondary non-operate. Springs 1T and 2T shall break before 3T and 4T make (Test). Springs 3T and 4T shall make before 1B and 2B break (Test).
224AA	227	29	S-4	Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before the armature stud strikes 2T. Any two break contacts may break and springs 1B and 2B may make on the secondary non-operate.
224AB	233	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T and 2T may make on the secondary non-operate.
224AD	234	14	S-4	Any two break contacts may break on non-operate.
224AE	235	25	0	Any two break contacts may break and springs 1T, 2T, 4B and 5B may make on the non-operate. Springs 1B and 2B shall break before 1T, 2T, 4B and 5B make (Test). Contact pressure (armature operated) between springs 1T, 2T, 4B and 5B shall be Test - Min. 10 grams.
224AF	230	25	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T and 2T may make on the secondary non-operate.
224AG	237	27	S-4	Spring 1T may strike the bushing on 4T and the armature stud may strike 2B before springs 1T and 2T make. Any two break contacts may break and springs 1T and 2T may make on the non-operate for the whole combination. Springs 1T and 2T shall make before springs 3T, 4T, 1B and 2B break (Test). Springs 6T and 7T shall make before 9T, 10T, 12T and 13T break (Test). Contact pressure between springs 9T, 10T, 12T and 13T shall be Test - Min. 35 grams.
224AH	239	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T. Springs 1B and 2B shall make before 1B strikes the bushing on 4B. Any two break contacts may break and springs 1T, 2T, 1B and 2B may make on the secondary non-operate.
224AJ	243	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T. Springs 1B, 2B, 3B and 4B shall make before 3B strikes the bushing on 6B. Any two break contacts may break and springs 1T, 2T, 1B, 2B, 3B and 4B may make on the non-operate for the whole combination.
224AK	244	27	S-4	Springs 1T and 3T may make and 2T and 3T may break on the non-operate for the whole combination. Springs 1T and 3T shall make before 4T, 5T, 1B and 2B break (Test).
224AL	245	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T and 2T may make on the non-operate for the whole combination.
224AM	246	15	S-4	Any two break contacts may break on non-operate. Springs 2T and 3T shall make before 5T and 6T break (Test). Contact pressure between springs 5T and 6T shall be Test - Min. 35 grams.
224AN	247	25	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T and 2T may make on the secondary non-operate.
224AP	249	14	4-8	Any two break contacts may break on non-operate.
224AR	250	27	S-4	Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before 1T strikes the bushing on 4T. Any two break contacts may break and springs 1T, 2T, 1B and 2B may make on the secondary non-operate. Springs 1B and 2B shall make before 1T and 2T make (Test). Springs 1T and 2T shall make before 3T, 4T, 3B and 4B break (Test).

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W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
224AS	255	12	S-4	
224AT	257	29	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T. Springs 1B and 2B shall make before 1B strikes the bushing on 4B. Any two break contacts may break and springs 1T, 2T, 1B and 2B may make on the non-operate for the whole combination.
224AU	258	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before 1B strikes the bushing on 4B. Any two break contacts may break and springs 1T, 2T, 1B and 2B may make on the secondary non-operate. Springs 1T and 2T shall make before 1B and 2B make (Test). Springs 1B and 2B shall make before 3T, 4T, 3B and 4B break (Test).
224AW	259	33	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 1B. Springs 1T, 2T, 1B and 3B may make and 1B may break from back stop spring A on the secondary non-operate. Springs 2B and 3B shall break before 6T and 8T make (Test). Contact pressure between springs 7T, 8T, 2B and 3B shall be Test - Min. 15 grams.
224AY	260	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T and 2T may make on the secondary non-operate.
224BA	264	31	S-4	This adjustment supersedes the adjustment for this relay given immediately below. Any two break contacts may break, springs 1T, 2T, 1B and 2B may make and 3B and 4B may break on the secondary non-operate for the whole combination. Springs 1T and 2T may make on the secondary operate for 1B, 2B, 3B and 4B. Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before 1T strikes the bushing on 4T. Springs 1B and 2B shall make before 1T and 2T make (Test). Springs 1T and 2T shall make before 7T, 8T, 9T, 10T, 11T, 12T, 9B and 10B make and before 5T, 6T, 7B and 8B break (Test). Springs 3B and 4B shall break before 3T, 4T, 5B and 6B break (Test).
	1005	27	S-4	This adjustment is superseded by the adjustment for this relay given immediately above. Any two break contacts may break and springs 1T, 2T, 1B and 2B may make on the secondary non-operate. Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before 1T strikes the bushing on 4T. Springs 1T and 2T shall make before 3T, 4T, 5T, 6T, 3B, 4B, 5B and 6B break or 7T, 8T, 9T, 10T, 11T, 12T, 9B and 10B make (Test). Springs 1B and 2B shall make before 1T and 2T make (Test). Contact separation between springs 1B and 2B shall be Test - Min. 3.
224BB	253	27	S-4	Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before the armature stud strikes 2T. Any two break contacts may break and springs 1B and 2B may make on the secondary non-operate.
224BC	281	25	S-4	Any two break contacts may break, springs 1T and 3T may make and 2T and 3T may break on the non-operate for the whole combination. Springs 1T and 3T shall make before 1T strikes the bushing on 5T and before the armature stud strikes 2B. Contact pressure between springs 2T and 3T shall be Test - Min. 15 grams.
224BD	282	17	S-4	Any two break contacts may break on non-operate. Contact pressure between springs 3T, 4T, 11T, 12T, 3B, 4B, 8B and 9B shall be Test - Min. 35 grams.
224BE	283	15	S-4	Any two break contacts may break on non-operate.
224BF	284	12	S-4	

W.E.Co. Codes	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
224BG	289	25	S-4	Springs 1T, 2T, 3T, 4T, 5T and 6T shall make before 5T strikes the bushing on 8T and before the armature stud strikes 2B. Any two break contacts may break and springs 1T, 2T, 3T, 4T, 5T and 6T may make on the primary non-operate.
224BH	290	21	S-4	Any two break contacts may break on non-operate. Contact separation shall be Test - Min. 15.
225A	21	13	S-4	Contact pressure between springs 5 and 6 shall be Test - Min. 15 grams.
225B	89	13	S-4	
225C	38	13	S-4	
225D	153	16	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
225E	45	13	S-4	
225F	140	16	S-5	
225G	184	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
225H	53	16	S-4	
225J	102	18	S-4	Contact pressure between springs 4 and 5 shall be Test - Min. 35 grams.
225K	65	24	S-4	Springs 1 and 2 shall break and 2 and 3 shall make before 2 strikes the bushing on 5. Springs 1 and 2 may break and 2 and 3 may make on the non-operate for the whole combination.
225L	67	28	S-4	Springs 1 and 2 shall break and 2 and 3 shall make before 2 strikes the bushing on 5. Springs 1 and 2 may break and 2 and 3 may make on the non-operate for the whole combination. Contact pressure between springs 6, 7, 10 and 11 shall be Test Min. 35 grams.
225M	305	16	S-4	
225P	337	16	S-4	
225R	31	13	S-4	
D-85893	158	19	0	Contact separation shall be Test - Min. 23. Contact follow shall be Test - Min. 8.
D-89696	303	13	S-4	
D-90538	158	19	0	Contact separation shall be Test - Min. 23. Contact follow shall be Test - Min. 8.
D-90550	59	15	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
D-90551	317	13	0	
D-90770	321	15	S-4	
D-90771	320	9	S-4	
D-91041	323	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
D-94774	13	12	0	
D-95856	357	21	S-4	Contact pressure springs 4 and 5 shall be Test - Min. 35 grams.
D-95911	320	9	S-4	
D-96328	359	13	7-11	
D-96329	358	29	S-4	Springs 1, 2, 3 and 5 may make on the non-operate for the whole combination. Springs 1 and 2 shall make before 1 strikes the bushing on 4. Contact pressure (armature operated) between springs 3 and 5 shall be Test - Min. 15 grams.
D-176705	45	13	S-4	
D-176706	342	6	S-4	
D-176707	186	12	S-4	
D-176708	1013	29	S-4	Springs 1 and 2 shall make before spring 1 strikes the bushing on spring 4 (Test).
D-176710	120	14	S-4	Springs 1, 2, 4, and 5 may break on nonoperate.
D-176711	1014	16	4-8	Springs 3, 4, 5, and 6 shall make before springs 7 and 8 break (Test). Contact pressure between springs 7 and 8 shall be Readjust - Min 20 grams; Test - Min 15 grams.

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Table 2 - AEC Co Coded Relays Having Corresponding WEC Co Codes (or D-specification Numbers)
(See Rq 2.03)

A.E.Co. Codes	Corresponding W.E.Co. Codes	A.E.Co. Codes	Corresponding W.E.Co. Codes	A.E.Co. Codes	Corresponding W.E.Co. Codes
R18-A1A	D-176706	R363-A6	221AF	R1023-A9	221BT
R20-A2	222DL	R363-B5A	221HS	R1023-B1	221CT
R25-A9	221GW	R363-D1	221BU	R1023-B4	221DJ
R49-B8	221CP	R363-F3A	221FH	R1023-B5	221BR
R49-B9	221FE	R363-F9	221GA	R1031-A1	221P
R49-C2	221HW	R363-G1	221HT	R1031-A1A	221GE
R99-A1	221A	R363-G2	221MC	R1032-B9	222RE
R99-A3	221DD	R371-A8	221DC	R1033-A1	221AN
R99-B8	221FAA	R371-A8B	221CW	R1033-A3A	221D
R117-A4	221JP	R371-D7	221GB	R1033-A9	221CC
R117-A5	221KP	R371-D8	221JT	R1033-B7	221CK
R129-A3	221HL	R371-D9	221CN	R1033-B8	221EK
R148-A7B	222GR	R371-E1	D-97944	R1034-A1	222EN
R172-A4	222S	R403-A5	221DM	R1046-A2A	222FM
R172-A7	222CL	R466-A4	222EJ	R1051-A1	221K
R172-A8	222FG	R494-A2	222BP	R1051-B4	221CF
R196-A1	222EL	R511-A1	221AS	R1055-A1	221AB
R196-A1C	222EH	R511-A2	221DT	R1055-A2A	221FS
R196-A1D	222CE	R552-A1	222AU	R1055-B4	221EW
R196-B2A	D-99887	R555-A1	221DH	R1057-A1A	221CB
R198-A1B	222DS	R608-A5	222GU	R1059-A1	221AG
R200-A1	222B	R609-A4	D-176710	R1059-A2B	221BA
R200-A1A	222CC	R610-A5	222AN	R1059-A2C	221BB
R200-A1B	222CJ	R614-A2	222GC	R1061-A4A	221FG
R201-A6	221C	R621-A1	221W	R1071-A2A	221DG
R203-A3	221AP	R621-A3	221BN	R1071-A7	221JM
R203-A6	221DU	R628-A5	222BR	R1080-A3B	222FD
R203-A8	221ED	R637-A2	221LT	R1085-A2	221AR
R206-A4	222DH	R637-A6	221KL	R1089-A1	221R
R207-A4	221HG	R715-A2A	221HJ	R1091-A1	221AY
R208-A1	222AR	R717-A1	221HC	R1091-A2	221BL
R208-A1C	222HU	R717-A1B	221FU	R1101-A6	221H
R208-A2	222CF	R717-A4	221EA	R1101-A8	221CH
R209-A1	221E	R737-A2	221L	R1111-A4	221G
R209-A4A	221FW	R737-A3	221CE	R1111-A8	221CJ
R209-C2	221CL	R741-A1	221B	R1111-B2	221FM
R209-C4	221CA	R741-B1	221CU	R1115-A1	221J
R209-C6	221LD	R741-B2	221DA	R1115-A2	221CG
R211-A2	221DE	R741-B5	221CD	R1124-A3	222HF
R211-A3	221DS	R741-B6	221DW	R1135-A1	221AT
R216-A1	222AS	R751-B1	221LH	R1135-B3	221DR
R217-A3	221DY	R786-A1	222FS	R1137-A1	221BK
R217-B6	221JD	R814-A1A	222HH	R1138-A1	222DA
R228-A4A	222DF	R816-A3	222HA	R1143-A9	221GJ
R228-A6	222BT	R835-A1A	221GL	R1151-A3A	221CS
R239-A1A	221GH	R835-C6	221HM	R1151-B2	221KC
R248-A1	222AY	R835-C7	221JR	R1151-B3	221KB
R278-A2	222AC	R835-C8	221KG	R1151-D4	221LC
R278-A4	222HN	R835-C9	221GU	R1158-C1	222GN
R301-A2	221EU	R861-A4	221GT	R1174-A2	222AH
R301-A3	221LF	R861-A5	221GK	R1183-A4	221JC
R304-A2	222AK	R894-A5A	222FA	R1183-A5	221JW
R304-A4	222CA	R906-A1	222E	R1191-A2	221CY
R337-A4	221U	R924-A2	222GJ	R1194-A3	222FP
R339-A6	221JE	R940-A2	222JC	R1205-A6	221MA
R341-B1A	221GC	R945-A4	221HR	R1227-A2	221GS
R341-E8	221FJ	R963-A7	221DK	R1227-A3A	221HK
R341-F3	221LG	R969-A1	221HE	R1233-A1	221AC
R351-B7A	221FY	R969-A3	221BJ	R1233-A3	221CM
R355-A1	221T	R969-A4	221FD	R1235-A4B	221FN
R357-C2	221GM	R984-A3A	222FL	R1235-A4C	221KM
R357-C3	221HP	R984-A4	222DR	R1240-A2A	222CU
R357-C4	221HD	R1001-A2	221AK	R1240-A5	222ED
R359-A3	221AD	R1001-A3	221AM	R1250-A1A	222GF
R359-A7A	221Y	R1001-B6	221BC	R1259-A1A	221EM
R359-B1	221AU	R1001-B7	221BH	R1272-A7	222BM
R359-J6	221BM	R1005-A3A	221AW	R1272-A8	222BW
R359-K4	221JJ	R1008-A7	222A	R1273-A1	221AL
R363-A5B	221M	R1023-A2A	221GY	R1293-A2	221EF

<u>A.E.Co. Codes</u>	<u>Corresponding W.E.Co. Codes</u>
R1297-A1	221AA
R1302-A4	222GK
R1314-A1A	222AL
R1317-A1A	221EB
R1317-A2	221JH
R1317-A3	221MB
R1331-A1	221ET
R1333-A2	221EC
R1334-A1	222AT
R1336-A1D	222J
R1337-A1A	221GF
R1338-A1	222Y
R1348-A1	222BB
R1348-A1B	222BD
R1348-A1C	222BC
R1348-C7	222HE
R1354-A1	222D
R1354-A2	222CW
R1354-B9	222CK
R1364-A2A	222W
R1364-A4	222AD
R1367-A2	221KS
R1368-A2A	222BS
R1372-A1	222DM
R1373-A1	221AE
R1380-A1	222T
R1391-A1	221BF
R1393-A1	D-176711
R1405-A1	221BY
R1406-A2	222C
R1414-A1	222BK
R1414-A2	222BU
R1415-A2	221CR
R1416-A1	222AP
R1416-A5A	222CH
R1416-B1	D-176705
R1416-B9	222BF
R1416-F1	222FK
R1419-A1A	221FP
R1421-A2	221DB
R1423-A2	221HU
R1433-A2	221DN
R1445-A1	221DP
R1445-A2	221HY
R1448-A1	222H
R1453-A3	221KT
R1457-A1	221BD
R1473-A1	221ES
R1477-A1	221FT
R1478-A6	222HY
R1479-A1	221FR
R1481-A1	221EE
R1483-A1	221FL
R1484-A1A	222CB
R1484-B2	222BL
R1485-A1	221EL
R1487-A1	221EJ
R1487-A2	221LA
R1487-A3	221LP
R1487-A4	221LR
R1488-A2	222GH
R1489-A1	221GD
R1493-A1	221HH
R1495-A1	221HF
R1502-A1	222AM
R1502-A6	222EE
R1504-A1	222BA
R1505-A1	221HB
R1507-A1	221HA

<u>A.E.Co. Codes</u>	<u>Corresponding W.E.Co. Codes</u>
R1511-A1	221ER
R1511-A1A	221KN
R1515-A1	221EN
R1521-A1	221JS
R1523-A1	221JN
R1524-A2	222A
R1525-A1	221JU
R1526-A1	222AW
R1550-A1	222BH
R1550-A1A	221BH
R1552-A1	222AG
R1554-A1	222AJ
R1566-A3A	222EF
R1585-A1	221KE
R1587-A1	221KF
R1605-A1	221KH
R1609-A1	221FAB
R1609-A2	221GP
R1609-A3	221LK
R1614-A2	222GE
R1636-A2	222R
R1641-A1	221KR
R1643-A1	221KU
R1651-A2	221FF
R1653-A1	221FC
R1655-A1	221KW
R1655-A2	221LM
R1678-A2A	224D
R1683-A1	221LE
R1685-A1	221KY
R1687-A1	221LB
R1694-A1	D-176707
R1709-A1	221GN
R1730-A1	222BY
R1733-A1	221HN
R1748-A2	222HS
R1764-A3	223AS
R1799-A1	221KA
R1805-A1	221LJ
R1821-A1	221JY
R1821-A2	D-89593
R1838-A2A	222DW
R1838-A4	222BJ
R1853-A1	D-96329
R1868-A1	224B
R1877-A1	221JB
R1879-A1	221LN
R1887-A1	221LS
R1889-A1	221DL
R1891-A1	221JG
R1892-A1	222AA
R1894-A1	223A
R1895-A1	221LY
R1896-A1	224C
R1896-A2	224AM
R1899-A1	221JF
R1900-A1	223C
R1902-A2	224F
R1906-A2	224E
R1908-A1	223B
R1910-A1	224A
R1914-A1	222AF
R1956-A1	224J
R1960-A2	222GB
R1960-A3	222PB
R1963-A1	221GR
R1964-A1	222EG
R1968-A1	222AU
R1986-A1	222DK

<u>A.E.Co. Codes</u>	<u>Corresponding W.E.Co. Codes</u>
R1990-A1	222F
R1990-A1A	222G
R1996-A1	222K
R1996-A1A	222L
R2006-A2	222CM
R2038-A1	D-176708
R2040-A2	224H
R2042-A2	224G
R2044-A1	224K
R2048-A1	222CD
R2050-A1	224L
R2052-A1	224M
R2056-A1	222CG
R2062-A1	222CN
R2066-A2	222EY
R2072-A1A	223J
R2072-A2	223BA
R2074-A2	223K
R2078-A2	224AD
R2080-A2	224AE
R2092-A1	222DG
R2092-A2	222CP
R2094-A1	222DJ
R2100-A2	222GL
R2104-A1	222DP
R2116-A1	222CT
R2126-A2	222HC
R2128-A1	223H
R2134-A1	222FF
R2154-A1	222DN
R2156-A1	222BN
R2178-A1	224AK
R2180-A1	222ER
R2182-A1	224AA
R2192-A1	222FJ
R2194-A1	222FC
R2196-A1	222FH
R2198-A1	223L
R2200-A1	222FB
R2202-A1	224AG
R2204-A1	222FN
R2206-A1	222FR
R2208-A1	223M
R2210-A1	224AL
R2212-A1	222FE
R2214-A1	224AF
R2218-A1	222EP
R2220-A1	223S
R2222-A1	224AN
R2224-A1	223D
R2226-A1	224T
R2228-A1	222DT
R2230-A1	223G
R2232-A1	223E
R2236-A1	222EM
R2238-A1	222EW
R2240-A1	224AB
R2242-A1	224R
R2244-A1	224Y
R2246-A1	222FW
R2248-A1	222GG
R2250-A1	223AA
R2252-A1	224AS
R2256-A1	224AR
R2258-A1	224AP
R2260-A1	224AY
R2262-A1	222ET
R2264-A1	222GM
R2266-A1	222GA

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A.E.Co. Codes	Corresponding W.E.Co. Codes	A.E.Co. Codes	Corresponding W.E.Co. Codes	A.E.Co. Codes	Corresponding W.E.Co. Codes
R2268-A1	223T	R2504-A1	224BC	R3388-A1	224AT
R2270-A1	224AU	R2556-A1	223AM	R3448-A1	223P
R2272-A1	222FY	R2570-A1	223BL	R3476-A1	223AB
R2276-A1	222FA	R2578-A1	223BJ	R3486-A1	223AR
R2276-A2	222DE	R2580-A1	222HP	R3520-A1	D-97463
R2280-A1	223AD	R2590-A1	222HR	R3566-A1	222JG
R2282-A1	222EU	R2592-A1	222HT	R3646-A1	223R
R2286-A1	224BA	R2624-A1	222JD	R3648-A1	222FU
R2288-A1	224BB	R2626-A1	222JB	R3650-A1	224AJ
R2290-A1	223AE	R2638-A1	223BB	D-811157	225B
R2292-A1	222GP	R2674-A1	222HW	D-811321	225C
R2294-A1	223AC	R2676-A1	224BG	D-811412	225E
R2296-A1	222GD	R2678-A1	222JE	D-811421	225A
R2298-A1	222GT	R2718-A1	224BH	D-811560	225D
R2300-A1	222GY	R2826-A1	223BM	D-811564	225G
R2302-A1	222GW	R2838-A1	222HJ	D-811566	225M
R2304-A1	223AF	R2842-A1	223BP	D-811567	225F
R2306-A1	223AK	R2870-A1	223BN	D-811568	225H
R2308-A1	223AJ	R3116-A1	223Y	D-811569	225K
R2316-A1	223AG	R3228-A1	222GS	D-811570	225L
R2318-A1	223AH	R3232-A1	224W	D-811571	225J
R2322-A1	223AP	R3278-A1	223F	D-811580	225G
R2328-A1	222HB	R3372-A1	D-96328	D-811603	225P
R2366-A1	222HD	R3382-A1	222FT	D-811604	225R
R2502-A1	222HL	R3386-A1	223BE		

Table 3 - Requirements for A.E.Co. R Coded Relays Which Do Not Have Corresponding W. E. Co. Codes (See 2.03)

A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
R1-A1	45	13	S-4	
R5-A3	45	13	S-4	
R5-A4	45B	11	7-11	Contact follow shall be Test - Min. 8.
R13-E1	45	13	S-4	
R18-B9	192	8	S-4	
R45-A1	192	8	S-4	
R49-A6	45B	11	4-8	Contact follow shall be Test - Min. 8.
R49-B7	45B	11	4-8	Contact follow shall be Test - Min. 8.
R49-C8	356	13	S-4	
R74-A3	10	12	S-4	
R78-A3	906	14	S-4	Contact pressure between springs 2 and 3 shall be Test - Min. 15 grams.
R78-A6	24	15	S-4	Contact pressure between springs 2 and 3 shall be Test - Min. 15 grams.
R87-A1	10	12	S-4	
R99-A1B	11	8	7-11	Contact separation shall be Test - Min. 3. Contact follow on make contact shall be Test - Min. 8.
R99-A5	11	8	7-11	Armature need not touch core on operate. Contact separation shall be Test - Min. 3. Contact follow on make contact shall be Test - Min. 8.
R101-C	923	15	0	Contact separation shall be Test - Min. 13. Contact follow shall be Test - Min. 8.
R101-C7	923	15	0	Contact separation shall be Test - Min. 13. Contact follow shall be Test - Min. 8.
R117-A2	8	13	S-4	
R121-A2	1	13	0	
R148-A3	197	12	S-4	
R164-A2A	193	9	S-5	
R196-A1B	907	13	0	See 2.04b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
R196-A9	82	13	S-4	
R197-A1	996	15	S-4	
R198-A1	908	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate. Contact pressure between springs 5, 6, 9 and 10 shall be Test - Min. 15 grams.
R198-A1A	908	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate. Contact pressure between springs 5, 6, 9 and 10 shall be Test Min. 15 grams.

A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
R201-A1	1	13	4-8	Armature need not touch core on operate.
R201-A5	1	13	S-4	
R202-A1	304	13	S-4	
R202-A5	304	13	S-5	
R203-A1	18	13	S-4	Contact pressure between springs 3 and 4 shall be Test - Min. 15 grams.
R204-A1	15	13	S-4	
R205-A1	909	15	S-4	
R206-A1	152	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R206-A3	152	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R207-A1	41	14	S-4	Contact pressure between springs 5 and 6 shall be Test - Min. 10 grams.
R209-A4	10	12	0	
R209-A7	10	12	0	
R209-B2	10	12	S-4	
R212-A1	308	12	S-4	
R214-A1	121	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate. Contact pressure between springs 8 and 9 shall be Test - Min. 15 grams.
R214-A1A	121	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate. Contact pressure between springs 8 and 9 shall be Test - Min. 15 grams.
R216-A1C	13	12	7-11	
R217-B4	14	12	S-4	
R217-B5	14	12	S-4	
R229-A5	307	8	7-11	Contact separation shall be Test - Min. 3. Contact follow on make contact shall be Test - Min. 8.
R235-A3	168	13	S-4	
R238-A1	910	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R248-A1A	911	13	0	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay.
R269-A1	4	12	8-12	Armature need not touch core on operate.
R276-A1	148	13	0	
R323-A3	304	13	S-4	
R339-A4	318	10	S-4	Any two break contacts may break on non-operate.
R341-A1	192	8	S-4	
R341-A2	192	8	S-4	
R341-A9	192	8	S-4	
R341-B1	192	8	S-4	
R347-A2	912	15	S-4	Contact pressure between springs 5 and 6 shall be Test - Min. 15 grams.
R351-B2	193	9	S-4	
R351-B7	193	9	S-4	
R351-C7	193	9	7-11	
R357-A2	304	13	S-4	
R357-A3	304	13	S-4	
R357-A5	304	13	S-4	
R359-A1	45	13	S-4	
R359-A2	45	13	S-4	
R359-A6	45	13	S-4	
R359-A7	45	13	S-4	
R359-A8	45	13	S-4	
R359-A8C	45	13	7-11	
R359-A9	45	13	S-4	
R359-B1A	913	18	S-4	Contact separation shall be Test - Min. 15.
R359-B2	45	13	S-4	
R359-B3	45	13	S-4	
R359-B3B	45	13	0	
R359-B4	45	13	S-4	
R359-B4C	45	13	S-4	

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A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
R359-B6	45	13	S-4	
R359-B9	45	13	S-4	
R359-C3	45	13	S-4	
R359-C4	45	13	8-12	
R359-H1	45	13	S-4	
R362-A1	1006	15	0	
R363-A1	3A	13	S-4	
R363-A2	3A	13	S-4	
R363-A3	3A	13	S-4	
R363-A4	3A	13	S-4	
R363-A5	3A	13	S-4	
R363-A9	923	15	0	Contact separation shall be Test - Min. 13. Contact follow shall be Test - Min. 8.
R363-B1	3A	13	S-4	
R363-C9	3A	13	S-4	
R363-D7	3A	13	S-4	
R363-F5	3A	13	0	
R363-G3	3A	13	4-8	
R369-A1	304	13	S-4	
R371-A3	128	11	0	Contact follow shall be Test - Min. 8.
R371-A4	47	13	S-4	
R371-D4	47	13	S-4	
R371-D5	45	13	0	
R399-A1	328	13	S-4	
R399-A2	328	13	S-4	
R415-A2	304	13	S-4	
R419-A2	103	13	S-4	
R454-A1	914	25	S-4	Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test).
R472-A4	76	13	S-4	
R572-A6	904	15	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
R608-A1	101	14	S-4	
R614-A1	106	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R628-A1	57	12	0	
R628-A1A	57	12	S-4	
R637-A1	54	12	S-4	
R637-A5	54	12	S-4	
R641-A2	54	12	S-4	
R641-A3	54	12	S-5	
R657-A2	58	14	0	
R684-A3	306	15	S-4	Contact pressure between springs 6, 7, 9 and 10 shall be Test - Min. 35 grams.
R690-A1	303	13	0	
R698-A6	303	13	S-4	
R703-A4	197	12	S-4	
R706-A8	87	13	4-8	
R715-A1	126	13	S-4	
R717-A2	143	13	S-4	
R717-A3	143	13	S-4	
R717-A4A	143	13	0	
R719-A1	913	18	S-4	Contact separation shall be Test - Min. 15.
R722-A1A	916	25	S-4	Springs 1 and 2 may make on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test). Contact pressure between springs 8 and 9 shall be Test - Min. 15 grams.
R725-A1	917	13	S-4	Contact pressure between springs 4 and 5 shall be Test - Min. 15 grams.
R725-B1	321	15	S-4	
R725-B2	917	13	S-4	Contact pressure between springs 4 and 5 shall be Test - Min. 15 grams.
R742-A1A	30	15	S-4	Springs 1, 2, 3 and 4 may break on the non-operate.
R751-A6	124	16	S-4	Contact pressure between springs 2, 3, 5 and 6 shall be Test - Min. 35 grams.

A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
R786-A1A	301	12	0	
R786-A2	301	12	S-4	
R807-A1	5	8	S-5	Contact separation shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.
R809-A1	5	8	S-5	Contact separation shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.
R814-A1	332	15	S-4	Springs 1, 2, 4 and 5 may break on non-operate.
R826-A1	176	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
R835-A2	197	12	S-4	
R837-A6	57	12	S-4	
R857-A1	20	15	4-6	
R859-A1	918	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate of Test 84 M.A.; Readjust 92 M.A. Contact pressure between springs 5 and 6 shall be Test - Min. 10 grams.
R871-A2	74	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R873-A2	184	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
R894-A5	188	15	S-4	Springs 1, 2, 3 and 4 may break on the non-operate.
R906-A1A	174	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate.
R906-A1B	174	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate.
R925-A1	31	13	S-4	
R925-A2	31	13	S-4	
R925-A5	31	13	S-4	
R937-A2	96	13	S-4	
R945-A2	70	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
R952-A2	919	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R969-A2	50	13	S-4	Contact pressure between springs 6 and 7 shall be Test - Min. 10 grams.
R1001-A5	46A	13	S-4	
R1001-A6	46A	13	S-4	
R1001-B4	46	11	4-8	Contact follow shall be Test - Min. 8.
R1001-B6A	915	9	S-4	Contact separation shall be Test - Min. 3. Contact follow shall be Test - Min. 8.
R1005-A3	9	8	5-9	Contact separation shall be Test - Min. 3. Contact follow on make contact shall be Test - Min. 8.
R1015-A2	920	19	S-4	Contact pressure between springs 5 and 6 shall be Test - Min. 15 grams.
R1015-A6	920	19	0	Contact pressure between springs 5 and 6 shall be Test - Min. 15 grams.
R1017-A1	921	14	S-4	
R1019-A2	922	17	4-8	Contact separation shall be Test - Min. 13.
R1019-A9	4	12	S-4	
R1023-A1	82	13	S-4	
R1032-A2	3A	13	S-4	
R1032-A3	3A	13	S-4	
R1032-B1	3A	13	S-4	
R1032-B2	923	15	0	Contact separation shall be Test - Min. 13. Contact follow shall be Test - Min. 8.
R1032-B9A	3A	13	S-4	
R1032-C2	3A	13	S-4	
R1032-C3	3A	13	S-4	
R1033-A3	4	12	S-4	
R1035-A1	197	12	S-4	
R1037-A2	4	12	S-4	
R1039-A2	145	9	7-11	Contact separation between springs 4, 5 and 5, 6 shall be Test Min. 3. Contact follow on make contacts shall be Test - Min. 8.

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A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
R1041-A1	57	12	S-4	
R1041-A1A	57	12	0	
R1043-A1	181	12	S-4	
R1047-A1	924	21	S-4	
R1048-A2	96	13	S-4	
R1051-A9	90	12	S-4	
R1053-A1	925	15	S-4	Contact pressure between springs 4 and 5 shall be Test - Min. 15 grams.
R1055-A2	103	13	S-4	
R1057-A1	38	13	S-4	
R1057-B3	38	13	S-4	
R1059-A2	5A	8	4-8	Contact separation shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.
R1061-A4	181	12	S-4	
R1067-A5	926	15	S-4	Contact pressure between springs 7 and 8 shall be Test - Min. 10 grams.
R1067-A5A	926	15	0	Contact pressure between springs 7 and 8 shall be Test - Min. 10 grams.
R1067-A6	926	15	S-4	Contact pressure between springs 7 and 8 shall be Test - Min. 10 grams.
R1068-A8A	14	12	7-11	
R1068-B6A	14	12	7-11	
R1069-A1	927	15	S-4	Contact pressure between springs 7 and 8 shall be Test - Min. 10 grams.
R1069-A5	927	15	S-4	Contact pressure between springs 7 and 8 shall be Test - Min. 10 grams.
R1075-A1	928	17	S-4	Contact follow on make contacts shall be Test - Min. 20.
R1077-A1	45	13	S-4	
R1077-A2	45	13	S-4	
R1077-A5	48A	11	S-4	Contact follow shall be Test - Min. 8.
R1079-A1	929	16	S-4	
R1080-A1	31	13	S-4	
R1080-A1A	31	13	S-4	
R1080-A3	31	13	S-4	
R1082-A1	930	17	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
R1083-A1	902	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
R1084-A1	931	31	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
R1086-A1	932	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R1088-A1	112	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
R1089-A8	6	8	7-11	Contact separation shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.
R1090-A1	933	18	S-4	Contact separation on springs 13 and 14 shall be Test - Min 3. Contact follow on springs 13 and 14 shall be Test - Min 8. Contact pressure between springs 5, 6, 9, 10, 12, and 13 shall be Test - Min 15 grams. Contacts 1, 2, 3, and 4 may break on the nonoperate.
R1091-A6	2A	13	S-4	
R1091-A8	2A	13	S-4	
R1091-A9	2A	13	S-4	
R1091-B2	2A	13	S-4	
R1091-B5	2A	13	S-4	
R1099-A1	315	12	S-4	
R1101-A1	36	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
R1109-A2	14	12	S-4	
R1111-A2	16	13	S-4	
R1111-A3	16	13	S-4	
R1119-A1	308	12	S-4	
R1121-A1	76	13	7-11	Armature need not touch core on operate.
R1129-A2	46	11	S-4	Contact follow shall be Test - Min. 8.

A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
R1131-A1	934	14	S-4	Springs 2 and 3 may make before 7 and 8 break. Contact pressure between springs 5 and 6 shall be Test - Min. 10 grams. Springs 4 and 6 shall make before 7 and 8 break (Test).
R1135-A5	96	13	S-4	
R1135-B2	96	13	S-4	
R1136-A4	935	15	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
R1137-A4	52	13	S-4	
R1145-A1	1002	35	6-10	Armature weight shall rest against the heel-piece with light tension (5 grams). Springs need not be parallel to the heel-piece. Contact separation shall be Test - Min. 10. Contact follow shall be Test - Min. 55.
R1149-A4	937	11	S-4	Armature need not touch core on operate. Contact follow shall be Test - Min. 8.
R1159-A2	938	10	4-8	Armature need not touch core on operate. Springs 2 and 3 may make before 4 and 5 break. Contact separation shall be Test - Min. 3. Contact follow between springs 5 and 6 shall be Test - Min. 8.
R1165-A1	82	13	S-4	
R1174-A1	93	15	S-4	
R1177-A2	342	6	-	
R1178-A1	305	16	S-4	
R1179-A1	3A	13	S-4	
R1181-A1	98	13	S-4	
R1197-A1	191	13	S-4	
R1197-A2	191	13	S-4	
R1204-A1	936	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R1205-A1	7	8	7-11	Contact separation shall be Test - Min. 3. Contact follow on make contacts shall be Test - Min. 8.
R1231-A1	45B	11	3-7	Contact follow shall be Test - Min. 3.
R1235-A3	87	13	S-4	
R1235-A4	87	13	0	
R1235-A4A	87	13	0	
R1240-A1	939	16	S-4	Springs 1, 2, 4 and 5 may break on non-operate.
R1240-A2	939	16	S-4	Springs 1, 2, 4 and 5 may break on non-operate.
R1245-A1	940	18	7-11	Armature need not touch core on operate. Springs 2 and 3 shall make before 4, 5, 6 and 7 make (Test).
R1245-A1A	941	18	7-11	Armature need not touch core on operate. Springs 2 and 3 shall make before 4, 5, 6 and 7 make (Test).
R1259-A1	71	13	S-4	Contact pressure between springs 9 and 10 shall be Test - Min. 15 grams.
R1267-A1	148	13	S-4	
R1269-A1	81	12	S-4	
R1272-A2	46A	13	S-4	
R1272-A5	46	11	S-4	Contact follow shall be Test - Min. 8.
R1272-A6	46A	13	S-4	
R1283-A1	901	15	S-4	Contact pressure between springs 2 and 3 shall be Test - Min. 10 grams.
R1285-A1	89	12	S-4	
R1287-A1	90	12	S-4	
R1289-A1	942	10	S-5	Armature need not touch core on operate. The heelpiece air-gap shall be Min. 26; Max. 34. Springs 2, 3, 5 and 6 shall make before 4 and 5 break (Test).
R1289-A1A	943	10	S-5	Armature need not touch core on operate. The heelpiece air-gap shall be Min. 26; Max. 34. Contact separation shall be Test - Min. 3.
R1292-A2D	73	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R1293-A1	126	13	S-4	
R1302-A1	315	12	S-4	
R1304-A1	38	13	S-4	
R1304-B7	38	13	S-4	
R1306-A1	181	12	S-4	

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A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
R1314-A1	99	21	S-4	Contact pressure between springs 2, 3, 5, 6, 9 and 10 shall be Test - Min. 35 grams.
R1317-A1	145	9	7-11	Contact separation between springs 4, 5 and 5, 6 shall be Test - Min. 3. Contact follow on springs 5 and 6 shall be Test - Min. 8.
R1318-A1	10	12	8-12	Armature need not touch core on operate.
R1320-A1	958	12	S-4	Contact follow on make contacts shall be Test - Min. 8.
R1322-A1	4	12	8-12	
R1329-A1	4	12	7-11	
R1333-A1	144	6	S-5	
R1336-A1	74	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R1336-A1A	944	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R1336-A1B	944	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R1339-A1	138A	8	0	
R1340-A1	1004	29	S-4	This adjustment supersedes the adjustment for this relay given immediately below. Springs 1 and 2 shall make before 3 and 4 break (Test). Springs 3 and 4 shall break before 4 strikes the bushing on 6. Springs 9 and 10 shall make before 7, 8, 11, 12, 13 and 14 make (Test).
	945	27	S-4	This adjustment is superseded by the adjustment for this relay given immediately above. Springs 1 and 2 may make on the secondary non-operate. Springs 1 and 2 shall make before 1 strikes the bushing on 4. Contact separation for all contacts except 1 and 2 shall be Test - Min. 3. Springs 9 and 10 shall make before 7, 8, 11, 12, 13 and 14 make (Test).
R1345-A1	946	18	4-8	Springs 1, 2, 3 and 4 shall make before 5 and 6 break (Test).
R1345-A2	946	18	4-8	Contact pressure between springs 5 and 6 shall be Min. 20 grams. Springs 1, 2, 3 and 4 shall make before 5 and 6 break (Test).
R1346-A1	947	13	S-4	
R1348-A2	47	13	0	
R1348-A2A	47	13	S-4	
R1348-A3	47	13	S-4	
R1348-A7	128	11	0	Contact follow shall be Test - Min. 8.
R1350-A1	168	13	S-4	
R1354-A2A	10	12	S-4	
R1354-B8	10	12	S-4	
R1356-A1	949	16	S-4	Contact pressure between springs 4, 5, 7 and 8 shall be Test - Min. 35 grams.
R1356-A2	948	15	S-4	Contact pressure between springs 4, 5, 7 and 8 shall be Test - Min. 35 grams.
R1364-A2	26	15	S-4	Contact pressure between springs 7, 8, 10 and 11 shall be Test - Min. 35 grams.
R1366-A1	950	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R1368-A2	951	11	7-11	Contact separation shall be Test - Min. 3.
R1369-A1	952	15	4-8	Contact pressure between springs 8 and 9 shall be Test - Min. 60 grams.
R1374-A1	953	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate. Contact separation between all springs except 1 and 2 shall be Test - Min. 3.
R1379-A1	954	27	S-4	Springs 1 and 2 may make and 3 and 4 may break on non-operate. Springs 3 and 4 shall break before 1 and 2 make (Test). Springs 1 and 2 shall make before 5 and 6 break. (Test). Contact pressure between springs 9 and 10 shall be Test - Min. 15 grams.
R1380-A1A	157	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.

A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
R1380-A1B	157	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
R1380-A1D	113A	25	S-4	Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test).
R1382-A2	955	13	4-8	Armature need not touch core on operate. Contact separation between springs 9 and 11 shall be Test - Min. 3. Contact pressure between springs 10 and 11 shall be Test - Min. 10 grams.
R1385-A1	177	25	0	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R1397-A1	193	9	7-11	
R1398-A1	143	13	0	
R1398-A2	143	13	S-4	Armature need not touch core on operate.
R1399-A1	103	13	7-11	
R1400-A1	956	16	S-4	
R1406-A1	100	13	7-11	
R1407-A1	38	13	S-4	
R1408-A1	957	29	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate.
R1411-A1	958	10	S-4	Contact follow on make contacts shall be Test - Min. 8.
R1412-A1	959	17	S-4	Springs 1, 2, 4 and 5 may break on non-operate.
R1415-A1	130	21	S-4	Springs 1 and 2 shall break before 3 and 4 make (Test). Springs 3 and 4 shall make before 5 and 6 break (Test). Contact pressure between springs 9 and 10 shall be Test - Min. 15 grams.
R1416-A4	45	13	S-4	
R1416-A5	45	13	S-4	
R1416-B1	45	13	S-4	
R1416-B9A	45	13	S-4	
R1416-D3	45	13	S-5	
R1416-E1	45	13	S-4	
R1416-E4	45	13	S-4	
R1416-E5	45	13	S-4	
R1417-A1	38	13	S-4	
R1419-A1	150	24	0	Springs 1 and 2 shall break before 2 strikes the bushing on 5. Springs 1, 2, 4, 5, 6 and 7 may break and 2 and 3 may make on non-operate. Springs 2 and 3 shall make before 4 and 5 break (Test).
R1420-A1	960	24	S-4	Springs 2 and 3 shall make before 2 strikes the bushing on 5. Springs 1 and 2 may break and 2 and 3 may make on the non-operate for the whole combination.
R1421-A1	961	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
R1423-A1	962	25	S-4	Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test).
R1425-A1	963	15	S-4	
R1426-A1	191	13	S-4	
R1426-A2	191	13	S-4	
R1426-A4	191	13	S-4	
R1429-A1	150	24	S-4	Springs 1 and 2 shall break before 2 strikes the bushing on 5. Springs 2 and 3 may make and 1, 2, 4, 5, 6 and 7 may break on the secondary non-operate. Springs 2 and 3 shall make before 4 and 5 break (Test).
R1431-A1	51	15	S-4	Contact pressure between springs 6 and 7 shall be Test - Min. 15 grams. Contact follow on springs 3 and 4 shall be Test - Min. 20. Springs 3 and 4 shall make before 6 and 7 break (Test).
R1433-A1	150	24	S-4	Springs 1, 2, 4, 5, 6 and 7 may break and 2 and 3 may make on the secondary non-operate. Springs 1 and 2 shall break and 2 and 3 shall make before 4 and 5 break (Test).

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A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
R1435-A1	964	13	0	Contact pressure between springs 5, 6, 8 and 9 shall be Test - Min. 10 grams.
R1448-A1A	72	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
R1450-A1	36	14	S-4	Springs 1, 2, 3 and 4 may break on the non-operate.
R1452-A1	965	27	S-4	Springs 1 and 3 shall make before 1 strikes the bushing on 5. Springs 1 and 3 may make and 2 and 3 may break on the non-operate of Test 9.6 MA; Readjust 10.5 MA.
R1454-A1	338	15	S-4	Springs 2 and 3 shall break before 4 and 5 break (Test).
R1456-A1	966	11	S-4	Springs 1, 2, 3 and 4 may break on non-operate. Contact pressure (armature operated) between springs 1 and 2 shall be Test - Min. 10 grams. Springs 1 and 3 shall not break on the gauging specified in the "Test Arm. Trvl." column (Test).
R1471-A1	967	18	S-4	Springs 2 and 3 shall make before 4 and 5 make (Test). Contact pressure between springs 7 and 8 shall be Test - Min. 35 grams.
R1474-A1	968	25	S-4	Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test). Contact pressure between springs 11 and 12 shall be Test - Min. 15 grams.
R1476-A1	138A	8	0	
R1484-A1	124	16	S-4	Contact pressure between springs 2, 3, 5 and 6 shall be Test - Min. 35 grams.
R1494-A3	969	25	13-17	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate of Test 20.5 MA; Readjust 23 MA.
R1500-A1	970	15	S-4	Contact pressure between springs 5, 6, 8 and 9 shall be Test - Min. 35 grams.
R1512-A3	52	13	S-4	
R1534-A1	82	13	0	
R1536-A1	971	14	0	See 2.04 b for the electrical and timing requirements for this relay and Table 4 for the requirements for the modified relay. Contact pressure between springs 7 and 8 shall be Test - Min. 10 grams.
R1538-A1	90	12	S-4	
R1538-A6	90	12	S-4	
R1542-A1	126	13	0	
R1551-A4	3A	13	S-4	
R1559-A1	972	20	S-4	Springs 1 and 2 shall break before 2 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate of Test 12.8 MA; Readjust 13.9 MA.
R1561-A1	319	13	7-11	Armature need not touch core on operate.
R1570-A3	973	14	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
R1628-A1	974	26	S-4	Springs 1 and 2 may make on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test). Contact pressure between springs 10 and 11 shall be Test - Min. 15 grams.
R1640-A2	131	14	4-8	Springs 3 and 4 shall make before 8 and 9 break (Test). Contact pressure between springs 8 and 9 shall be Test - Min. 15 grams.
R1651-A1	177	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.

A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
†R1678-A1	206	31	S-4	When primary readjust operate .028 amps. non-operate .025 amps. is specified, adjust according to Fig. 206. Springs 1T, 2T, 1B and 2B may make and 3T, 4T, 3B and 4B may break on the secondary non-operate. Springs 1B and 2B shall make before 1B strikes the bushing on 4B. Springs 1B and 2B shall make before 1T and 2T make and 3T and 4T break (Test). Springs 3T and 4T shall break before 3B and 4B break (Test). Springs 1T and 2T shall make before 5B and 6B break (Test).
	903	27	S-4	When primary readjust operate .025 amps. non-operate .0215 amps. is specified, adjust according to Fig. 903. Any two break contacts may break and 1T, 2T, 1B and 2B may make on the secondary non-operate. Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before 1T strikes the bushing on 4T. Springs 1B and 2B shall make before 1T and 2T make (Test). Springs 1T and 2T shall make before 3T and 4T break (Test).
R1704-A1	978	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and 1T and 2T may make on the secondary non-operate.
R1710-A1A	1003	29	S-4	Springs 1 and 2 may make on the non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test).
R1732-A1	976	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before 1B strikes the bushing on 4B. Any two break contacts may break and 1B, 2B, 1T and 2T may make on the secondary non-operate. Springs 1T and 2T shall make before 1B and 2B make (Test). Springs 1B and 2B shall make before 3T, 4T, 3B, and 4B break (Test).
R1732-A1B	976	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before 1B strikes the bushing on 4B. Any two break contacts may break and 1B, 2B, 1T and 2T may make on the secondary non-operate. Springs 1T and 2T shall make before 1B and 2B make (Test). Springs 1B and 2B shall make before 3T, 4T, 3B and 4B break (Test).
R1734-A1	161	13	S-4	
R1742-A2	72	27	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate.
R1744-A1	30	15	S-4	Springs 1, 2, 3 and 4 may break on non-operate.
R1768-A1	189	13	S-4	
R1770-A1	977	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and 1T and 2T may make on the secondary non-operate.
R1790-A1	975	25	S-4	Springs 1 and 2 may make and 2, 3, 4, 5, 6 and 7 may break on the non-operate of Test 10 MA; Readjust 11 MA. Springs 1 and 2 shall make before 4 and 5 break. (Test). Contact pressure between springs 2 and 3 shall be Test - Min. 15 grams.
R1838-A2	62	16	S-4	Contact pressure between springs 9, 10, 12 and 13 shall be Test - Min. 35 grams.
R1838-A3	62	16	S-4	Contact pressure between springs 9, 10, 12 and 13 shall be Test - Min. 35 grams.
R1862-A1	979	27	S-4	Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before 1T strikes the bushing on 4T. Any two break contacts may break and 1B, 2B, 1T and 2T may make on the secondary non-operate. Springs 1B and 2B shall make before 1T and 2T make (Test). Springs 1T and 2T shall make before 3T, 4T, 3B and 4B break (Test).
R1864-A1	318	10	S-4	Springs 1, 2, 3 and 4 may break on the non-operate.
R1866-A1	96	13	S-4	
R1874-A2	120	14	S-4	Springs 1, 2, 4 and 5 may break on the non-operate.
R1898-A1	980	29	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and 1T and 2T may make on the secondary non-operate.

A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
R1904-A1	981	29	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and 1T and 2T may make on the secondary non-operate.
R1906-A1	208	31	S-4	This adjustment supersedes the adjustment for this relay given immediately below. Springs 1T, 2T, 1B and 2B may make and 3T, 4T, 3B and 4B may break on the secondary non-operate. Springs 1B and 2B shall make before 1B strikes the bushing on 4B. Springs 1B and 2B shall make before 1T and 2T make and 3T and 4T break (Test). Springs 3T and 4T shall break before 3B and 4B break (Test). Springs 1T and 2T shall make before 5B and 6B break (Test).
	982	27	S-4	This adjustment is superseded by the adjustment for this relay given immediately above. Any two break contacts may break and 1T, 2T, 1B and 2B may make on the secondary non-operate. Springs 1B and 2B shall make before 1B strikes the bushing on 4B and before 1T strikes the bushing on 4T. Springs 1B and 2B shall make before 1T and 2T make (Test). Springs 1T and 2T shall make before 3T, 4T, 3B and 4B break (Test).
R1918-A1	180	12	S-4	
R1928-A1	983	13	S-4	Any two break contacts may break on the non-operate.
R1952-A1	52	13	S-4	
R1988-A1	984	16	S-4	Contact pressure between springs 6, 7, 9, 10, 12 and 13 shall be Test - Min. 35 grams.
R1992-A1	968	25	S-4	Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test). Contact pressure between springs 11 and 12 shall be Test - Min. 15 grams.
R1992-A1A	968	25	S-4	Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test). Contact pressure between springs 11 and 12 shall be Test - Min. 15 grams.
R1994-A1	113A	25	S-4	Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test).
R1994-A1A	113A	25	S-4	Springs 1 and 2 may make and 3, 4, 5 and 6 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test).
R1998-A1	950	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R2006-A1	114	27	S-4	Springs 1 and 2 may make on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test).
R2008-A1	985	19	S-4	Contact pressure between springs 8, 9, 11 and 12 shall be Test Min. 15 grams.
R2010-A1	117	27	0	Springs 1 and 2 may make on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test). Springs 3 and 4 shall break before 6 and 7 break (Test).
R2014-A1	937	27	S-4	Any two break contacts may break and 1T and 2T may make on the non-operate. Contact pressure (armature operated) between springs 1T and 2T shall be Test - Min. 15 grams. Springs 1 and 3 shall not break on the gauging specified in the "Test Arm. Trvl." column (Test).
R2018-A1	179	25	0	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the non-operate for the whole combination.
R2026-A1	248	12	S-4	

A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
R2028-A2	239	27	S-4	Springs 1T, 2T, 1B and 2B shall make before 1T strikes the bushing on 4T and before 1B strikes the bushing on 4B. Any two break contacts may break and 1T, 2T, 1B and 2B may make on the primary non-operate.
R2030-A1	988	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and 1T and 2T may make on the secondary non-operate.
R2040-A1	212	29	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before 1B strikes the bushing on 4B. Any two break contacts may break and 1T, 2T, 1B and 2B may make on the secondary non-operate. Springs 1T and 2T shall make before 1B and 2B make (Test). Springs 1B and 2B shall make before 3T, 4T, 3B and 4B break (Test).
R2042-A1	989	29	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before 1B strikes the bushing on 4B. Any two break contacts may break and 1T, 2T, 1B and 2B may make on the secondary non-operate. Springs 1T and 2T shall make before 1B and 2B make (Test). Springs 1B and 2B shall make before 3T, 4T, 3B and 4B break (Test).
R2046-A1A	990	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and 1T and 2T may make on the secondary non-operate.
R2054-A1	986	17	S-4	Springs 1, 2, 6 and 7 may break on the non-operate.
R2058-A1	319	13	7-11	
R2060-A1	164	13	S-4	
R2066-A1	91	16	S-4	
R2070-A1	991	27	S-4	Springs 1T and 2T shall make before 1T strikes the bushing on 4T and before the armature stud strikes 2B. Any two break contacts may break and 1T and 2T may make on the non-operate of Test 42 MA; Readjust 46 MA.
R2072-A1	228	13	S-4	Any two break contacts may break on the non-operate.
R2074-A1	231	13	S-4	
R2078-A1	234	14	S-4	Any two break contacts may break on the non-operate.
R2080-A1	235	25	0	Any two break contacts may break and 1T, 2T, 4B and 5B may make on the non-operate. Contact pressure (armature operated) between springs 1T, 2T, 4B and 5B shall be Test - Min. 10 grams.
R2082-A1	992	14	S-4	Any two break contacts may break on the non-operate.
R2084-A1	995	13	0	Contact pressure between springs 9, 10, 12 and 13 shall be Test - Min. 10 grams.
R2096-A1	73	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R2096-A1A	73	25	S-4	Springs 1 and 2 shall make before 1 strikes the bushing on 4. Springs 1 and 2 may make on the secondary non-operate.
R2108-A1	23	25	S-4	Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test).
R2110-A1	23	25	S-4	Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test).
R2110-A1A	23	25	S-4	Springs 1 and 2 may make and 3, 4, 6 and 7 may break on the secondary non-operate. Springs 1 and 2 shall make before 3 and 4 break (Test).
R2112-A1A	119	13	7-11	
R2114-A1	905	21	S-4	Springs 1, 2, 3 and 4 may break on the non-operate. Contact pressure between springs 8, 9, 11 and 12 shall be Test Min. 15 grams.
R2118-A1	994	15	S-4	Springs 1, 2, 3 and 4 may break on the non-operate.
R2120-A1	316	14	0	Springs 1, 2, 4 and 5 may break on the non-operate.
R2122-A1	993	13	0	Any two break contacts may break on the non-operate.
D-810999	45	13	8-12	Armature need not touch core on operate.

A.E.Co. Code	BSP Fig.	Test Arm. Trvl.	Resid.	Notes
D-811152	1008	21	0	Contact separation shall be Test - Min. 15.
D-811153	1008	21	0	Contact separation shall be Test - Min. 15.
D-811154	348	6	8-4	
D-811158	4A	12	0	
D-811264	45	13	8-12	
D-811289	998	5	8-4	
D-811290	999	26	8-12	Armature need not touch core on operate. Test with the master switch spring tension relieved. Contact follow shall be Test - Min. 15. Contact separation shall be Test - Min. 30.
D-811291	45	13	8-4	
D-811292	45	13	8-4	
D-811328	1001	26	8-12	Armature need not touch core on operate. The relay shall lock with a gauge of 3 between the core and the armature. Test with the trip spring pressure relieved. Contact separation shall be Test - Min. 25. Contact follow on make contact shall be Test - Min. 15.
D-811329	1000	26	8-12	Armature need not touch core on operate. The relay shall lock with a gauge of 3 between the core and the armature. Test with the trip spring pressure relieved. Contact separation shall be Test - Min. 25. Contact follow on make contact shall be Test - Min. 15.
D-811330	997	26	8-12	Armature need not touch core on operate. Test with the lock segment pressure relieved. Contact separation shall be Test - Min. 30. Contact follow shall be Test - Min. 15.
D-811398	3A	13	8-4	
D-811542	3A	13	4-8	
D-811592	998	5	4-8	
D-812128	105	13	8-12	No armature play required between back stop and spring 2.
D-812219	1007	11	8-2	
Z-3167	1007	11	8-2	

Table 4 - Electrical and Mechanical Requirements For Modified 221 or 222 Type Relays and For the Replacing or Substitute 247 and 248 Relays (See Note 2 Below Table)

Code No.	BSP Fig.	Test Arm. Trvl.	Resid. (See Note 1)	Replacing of Substitute 247 or 248 Type Relay (See Note 3)	Notes
221CS Mod.	501	27	1.5-4	247	
221EB Mod.	505	27	1.5-4	247B	
221GY Mod.	510	39	1.5-4	247A	Springs 1 and 2 shall make before 3, 4, 5 and 6 make (Test). Substitute 247A Relay has one extra spring (spring 1).
221KN Mod.	505	27	1.5-4	247B	
221LE Mod.	501	27	1.5-4	247A	
222A Mod.	500	27	1.5-4	248A	
222AB Mod.	500	27	1.5-4	248A	
222AS Mod.	504	27	1.5-4	248D	
222AT Mod.	504	27	1.5-4	248D	
222AU Mod.	502	27	1.5-4	248B	
222AY Mod.	503	27	1.5-4	248C	
222CW Mod.	507	27	1.5-4	248A	Substitute 248A Relay has two extra springs (springs 4 and 5).
222EH Mod.	510	39	1.5-4	248D	Springs 1 and 2 shall make before 3, 4, 5 and 6 make (Test). Substitute 248D Relay has one extra spring (spring 1).
222EL Mod.	509	28	1.5-4	248D	Substitute 248D Relay has one extra spring (spring 1).

Code No.	BSP Fig.	Test Arm. Trvl.	Resid. (See Note 1)	Replacing or Substitute 247 or 248 Type Relay (See Note 3)	Notes
222GS Mod.	512	29	1.5-4	-	No replacing or substitute 248 type relay available.
247A	501	27	1.5-4	-	For use when this relay is used as a replacement for the 221CS and 221LE relays.
	511	38	1.5-4	-	For use when this relay is used as a replacement for the 221GY relay. Springs 2 and 3 shall make before springs 4, 5, 6 and 7 make (Test).
247B	505	27	1.5-4	-	
248A	500	27	1.5-4	-	
248B	502	27	1.5-4	-	
248C	503	27	1.5-4	-	
248D	504	27	1.5-4	-	For use when this relay is used as a replacement for the 222AS, 222AT and 222EL relays.
	511	38	1.5-4	-	For use when this relay is used as a replacement for the 222EH and R196-A1B relays. Where this relay is used as a replacement for the 222EH relay springs 2 and 3 shall make before springs 4, 5, 6 and 7 make (Test).
R196-A1B Mod.	510	39	1.5-4	248D	Substitute 248D Relay has one extra spring (spring 1).
R248-A1A Mod.	513	39	1.5-4	248C	
R1426-A3	525	29	1.5-4	-	No replacing or substitute 248 type relay available.
R1536-A1 Mod.	514	30	1.5-4	-	No replacing or substitute 248 type relay available.
R1968-A1 Mod.	502	27	1.5-4	248B	

Note 1. Where Timing Test Equipment is Available: The relays shall meet the residual, electrical and timing requirements covered in Section 040-013-711 instead of the residual and electrical requirements specified on the circuit requirement table for the non-modified 221 and 222 type relays and in place of the residual requirements specified in the table above.

Note 2. Where Timing Test Equipment is not Available: The relays shall meet the following electrical requirements instead of those specified on the circuit requirement table for the non-modified 221 and 222 type relays.

(a) Modified 221 and 222 Type Relays

	Soak MA	Test MA	Readj. MA
0	50	9.8	9.3
NO	50	7.7	8.2

(b) Replacing or Substitute 247 or 248 Relays

	Soak MA	Test MA	Readj. MA
0	50	10.5	10
NO	50	8.5	9

Note 3. When necessary to replace a modified 221 or 222 type relay order the 247 or 248 type relay listed in the column headed "Replacing or Substitute 247 or 248 Type Relay" and adjust in accordance with the requirements for these relays listed in the table.