*REPLACING PAGE ADDENDUM*
*Filing Instructions:*

1. REMOVE FROM THE SECTION THE PAGES NUMBERED THE SAME AS THOSE ATTACHED TO THIS PINK SHEET.
2. INSERT THE ATTACHED PAGES INTO THE SECTION IN THEIR PLACE.
3. PLACE THIS PINK SHEET AHEAD OF PAGE 1 OF THE SECTION.



# RELAYS

# B AND G TYPES

# REQUIREMENTS AND ADJUSTING PROCEDURES

# (FOR CONDENSED SECTION SEE SECTION 040-932-701)

## 1. GENERAL

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

**1.002** This addendum is issued to:

Revise Table A

**Attached:**

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

## 1. GENERAL

The following change applies to Part 1 of this section:

(a) Table A—revised.

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## TABLE A (Cont)

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

*These relays have two stop pins.

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

→TABLE A (Cont)←

| CODE | FIG. NO. | MAX ARM. TRVL (IN INCHES) |
|---|---|---|
| B501 | 6 | 0.030 |
| B502 | 6 | 0.030 |
| B503 | 7 | 0.035 |
| B504 | 6 | 0.030 |
| B505 | 6 | 0.040 |
| B506 | 5 | 0.040 |
| B507 | 2 | 0.030 |
| B508 | 6 | 0.030 |
| B509 | 3 | 0.030 |
| B510 | 1 | 0.030 |
| B511 | 6 | 0.050 |
| B512 | 1 | 0.050 |
| B513 | 3 | 0.030 |
| B514 | 6 | 0.030 |
| B515 | 1 | 0.030 |
| B516 | 7 | 0.035 |
| B517 | 1 | 0.030 |
| B518 | 1 | 0.050 |
| B519 | 4 | 0.030 |
| B520 | 3 | 0.030 |
| *B521 | 9 | 0.020 |
| B522 | 8 | 0.030 |
| B523 | 4 | 0.030 |
| B524 | 1 | 0.030 |
| B525 | 3 | 0.030 |
| B526 | 7 | 0.050 |
| B527 | 6 | 0.030 |
| B528 | 1 | 0.030 |
| B529 | 6 | 0.030 |
| B530 | 11 | 0.030 |
| B531 | 7 | 0.035 |
| B532 | 6 | 0.030 |
| B533 | 1 | 0.030 |
| B534 | 1 | 0.030 |
| B535 | 9 | 0.030 |
| B536 | 6 | 0.030 |
| B537 | 6 | 0.040 |
| B538 | 2 | 0.030 |
| B539 | 6 | 0.030 |
| B540 | 1 | 0.030 |
| B541 | 1 | 0.030 |
| B542 | 1 | 0.030 |
| B543 | 3 | 0.030 |
| B544 | 1 | 0.040 |
| B545 | 1 | 0.030 |
| B546 | 1 | 0.030 |
| B547 | 6 | 0.030 |
| B548 | 11 | 0.030 |
| B549 | 6 | 0.030 |
| B550 | 7 | 0.035 |
| B551 | 7 | 0.035 |
| B552 | 6 | 0.030 |
| B553 | 12 | 0.030 |
| B554 | 4 | 0.050 |
| B555 | 6 | 0.030 |

| CODE | FIG. NO. | MAX ARM. TRVL (IN INCHES) |
|---|---|---|
| B561 | Mfr Disc. | |
| B562 | No Record | |
| B563 | | 0.035 |
| B564 | Mfr Disc. | |
| B565 | Mfr Disc. | |
| B566 | Mfr Disc. | |
| B567 | 6 | 0.030 |
| B568 | Mfr Disc. | |
| B569 | Mfr Disc. | |
| B570 | 3 | 0.050 |
| B571 | 7 | 0.035 |
| B572 | Mfr Disc. | |
| B573 | 6 | 0.30 |
| B574 | 6 | 0.50 |
| B575 | 12 | 0.50 |
| B576 | 1 | 0.30 |
| B577 | 6 | 0.30 |
| B578 | 6 | 0.30 |
| B579 | 6 | 0.30 |
| B580 | 1 | 0.30 |
| B581 | 6 | 0.50 |
| B582 | 13 | 0.50 |
| B583 | Mfr Disc. | |
| B584 | 13 | 0.30 |
| B585 | Mfr Disc. | |
| B586 | 7 | 0.060 |
| B587 | 7 | 0.050 |
| B588 | 6 | 0.030 |
| B589 | Mfr Disc. | |
| B590 | 7 | 0.035 |
| B591 | Mfr Disc. | |
| B592 | Mfr Disc. | |
| B593 | 3 | 0.030 |
| B594 | Mfr Disc. | |
| B595 | 14 | 0.040 |
| B596 | Mfr Disc. | |
| B597 | Mfr Disc. | |
| B598 | 3 | 0.050 |
| B599 | 6 | 0.030 |
| B600 | Mfr Disc | |
| B601 | 14 | 0.050 |
| B602 | 14 | 0.030 |
| B603 | 14 | 0.040 |
| B604 | Mfr Disc. | |
| B605 | 14 | 0.050 |
| B606 | 8 | 0.030 |
| B607 | Mfr Disc. | |
| B608 | 14 | 0.040 |
| B609 | 5 | 0.040 |
| B610 | 14 | 0.030 |
| B611 | 7 | 0.035 |
| B612 | Mfr Disc. | |
| B613 | Mfr Disc. | |
| B614 | 3 | 0.030 |
| B615 | 3 | 0.030 |

| CODE | FIG. NO. | MAX ARM. TRVL (IN INCHES) |
|---|---|---|
| B621 | 9 | 0.040 |
| B622 | 3 | 0.030 |
| B623 | 11 | 0.060 |
| B1000 | 6 | 0.050 |
| B1001 | Cancelled | |
| *B1002 | 7 | 0.025 |
| B1003 | 1 | 0.030 |
| B1004 | 6 | 0.050 |
| B1005 | 11 | 0.050 |
| B1006 | 6 | 0.030 |
| B1007 | 1 | 0.030 |
| B1008 | 7 | 0.030 |
| B1009 | 7 | 0.030 |
| B1010 | 6 | 0.040 |
| B1011 | 1 | 0.030 |
| B1012 | 6 | 0.030 |
| B1013 | 6 | 0.030 |
| B1014 | 3 | 0.050 |
| B1015 | 3 | 0.040 |
| B1016 | 11 | 0.030 |
| B1017 | 3 | 0.060 |
| B1018 | 3 | 0.030 |
| B1019 | 6 | 0.030 |
| B1020 | 7 | 0.060 |
| B1021 | 2 | 0.050 |
| B1022 | 1 | 0.050 |
| B1023 | 6 | 0.030 |
| B1024 | 7 | 0.035 |
| B1025 | 7 | 0.035 |
| B1026 | 8 | 0.030 |
| B1027 | 11 | 0.030 |
| B1028 | 1 | 0.030 |
| B1029 | 7 | 0.035 |
| B1030 | 3 | 0.030 |
| B1031 | 7 | 0.035 |
| B1032 | 1 | 0.040 |
| B1033 | 1 | 0.040 |
| B1034 | 5 | 0.030 |
| B1035 | 7 | 0.030 |
| B1036 | 1 | 0.030 |
| B1037 | 11 | 0.030 |
| B1038 | 7 | 0.050 |
| B1039 | 6 | 0.050 |
| B1040 | 6 | 0.050 |
| B1041 | 1 | 0.040 |
| B1042 | 6 | 0.030 |
| B1043 | 8 | 0.050 |
| B1044 | 1 | 0.030 |

| CODE | FIG. NO. | MAX ARM. TRVL (IN INCHES) |
|---|---|---|
| B1050 | Mfr Disc. | |
| B1051 | Mfr Disc. | |
| B1052 | 1 | 0.050 |
| B1053 | 7 | 0.035 |
| B1054 | Mfr Disc. | |
| B1055 | 7 | 0.035 |
| B1056 | 3 | 0.030 |
| B1057 | 6 | 0.030 |
| B1058 | 1 | 0.030 |
| B1059 | 1 | 0.030 |
| B1060 | 6 | 0.030 |
| B1061 | 1 | 0.030 |
| B1062 | 6 | 0.060 |
| B1063 | 11 | 0.030 |
| B1064 | 1 | 0.030 |
| B1065 | 6 | 0.030 |
| B1066 | 6 | 0.050 |
| B1067 | 6 | 0.050 |
| B1068 | 6 | 0.030 |
| B1069 | Mfr Disc. | |
| B1070 | 6 | 0.040 |
| B1071 | 7 | 0.030 |
| B1072 | 11 | 0.030 |
| B1073 | 6 | 0.030 |
| B1074 | 4 | 0.030 |
| B1075 | 6 | 0.030 |
| B1076 | 1 | 0.030 |
| B1077 | 1 | 0.030 |
| B1078 | No Record | |
| B1079 | 5 | 0.060 |
| B1080 | 1 | 0.030 |
| B1081 | 13 | 0.035 |
| B1082 | 13 | 0.030 |
| B1083 | 7 | 0.035 |
| B1084 | 13 | 0.035 |
| B1085 | 4 | 0.030 |
| B1086 | 6 | 0.030 |
| B1087 | 3 | 0.040 |
| B1088 | 3 | 0.030 |
| B1089 | 2 | 0.030 |
| B1090 | 11 | 0.030 |
| B1091 | Mfr Disc. | |
| B1092 | 1 | 0.030 |
| B1093 | 13 | 0.040 |
| B1094 | Mfr Disc. | |
| B1095 | 2 | 0.030 |
| B1096 | Mfr Disc. | |
| B1097 | 1 | 0.030 |
| B1098 | 8 | 0.030 |
| B1099 | 7 | 0.035 |
| B1100 | Mfr Disc. | |
| B1101 | 13 | 0.040 |
| B1102 | Mfr Disc. | |
| B1103 | 6 | 0.030 |
| B1104 | 4 | 0.030 |

| CODE | FIG. NO. | MAX ARM. TRVL (IN INCHES) |
|---|---|---|
| B1110 | 6 | 0.030 |
| B1111 | 6 | 0.030 |
| B1112 | 5 | 0.040 |
| B1113 | 8 | 0.030 |
| B1114 | 8 | 0.030 |
| B1115 | 13 | 0.050 |
| B1116 | Mfr Disc. | |
| B1117 | 8 | 0.030 |
| B1118 | 1 | 0.030 |
| B1119 | 14 | 0.030 |
| B1120 | 3 | 0.030 |
| B1121 | 14 | 0.030 |
| B1122 | 14 | 0.040 |
| B1123 | 7 | 0.035 |
| B1124 | Mfr Disc. | |
| B1125 | 11 | 0.030 |
| B1126 | 9 | 0.030 |
| B1127 | 14 | 0.040 |
| B1128 | 1 | 0.050 |
| B1129 | 6 | 0.030 |
| B1130 | 14 | 0.030 |
| B1131 | 1 | 0.030 |
| B1132 | 8 | 0.030 |
| B1133 | 8 | 0.030 |
| B1134 | 10 | 0.060 |
| B1135 | 8 | 0.030 |
| B1136 | 11 | 0.030 |
| B1137 | Mfr Disc. | |
| B1138 | 8 | 0.030 |
| B1139 | 14 | 0.030 |
| B1140 | 3 | 0.060 |
| B1141 | 7 | 0.035 |
| B1142 | Mfr Disc. | |
| B1143 | Mfr Disc. | |
| B1144 | 5 | 0.040 |
| B1145 | 3 | 0.050 |
| B1146 | 3 | 0.030 |
| B1147 | 9 | 0.030 |
| B1148 | 3 | 0.030 |
| B1149 | 14 | 0.040 |
| B1150 | 11 | 0.030 |
| B1151 | 3 | 0.040 |
| B1152 | Mfr Disc. | |
| B1153 | 8 | 0.030 |
| B1154 | 11 | 0.030 |
| B1155 | 7 | 0.035 |
| B1156 | 14 | 0.030 |
| B1157 | 3 | 0.030 |
| B1158 | 14 | 0.030 |
| B1159 | 14 | 0.030 |
| B1160 | 7 | 0.035 |
| B1161 | Mfr Disc. | |
| B1162 | 7 | 0.035 |
| B1163 | 15 | 0.035 |
| B1164 | 14 | 0.030 |

*These relays have two stop pins.

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

→TABLE A (Cont)←

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

*These relays have two step pins.

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

## 2. REQUIREMENTS

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

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

Gauge by eye and by feel.

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

Min 1/64 inch

Gauge by eye.

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

Gauge by feel.

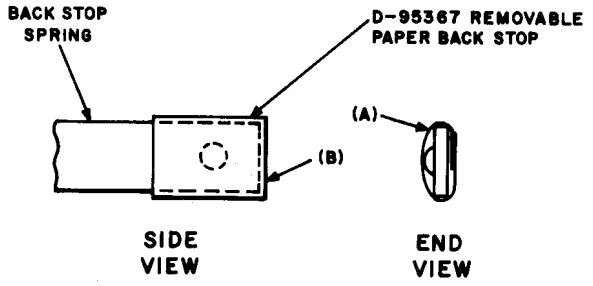



**Fig. 7—Position of Removable Paper Backstop on Spring**

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

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

Min 0.005 inch

Gauge by eye.

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

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

Gauge by eye.

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

Gauge by eye.

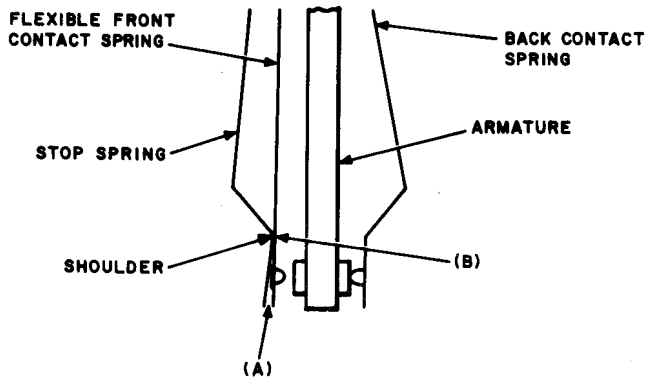



**Fig. 8—Contact Follow**

**2.12** ***Minimum Front Contact Make:*** Fig. 9(A) (see also Fig. 10 and 11.)—The minimum front contact make shall be as specified under Front Contact Make in the spring combination figures shown in Table B. The value of front contact make to be used shall be that corresponding to the armature travel specified in the circuit requirement table and shown on the spring combination figure.

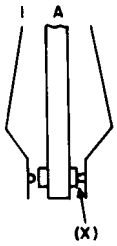
Use the gauge specified and check the requirement as covered in (a) through (d).

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

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

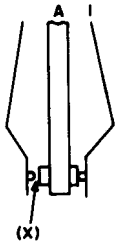
TABLE B

FIG. 1



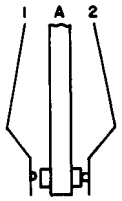

| ARM. TRVL | FRONT CONT MAKE |
|---|---|
| 0.030 | 0.005 |
| 0.040 | 0.015 |
| 0.050 | 0.025 |
| 0.060 | 0.035 |
| | |
| | |

FIG. 2



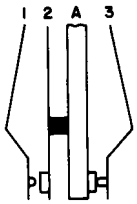

| ARM. TRVL | FRONT CONT MAKE |
|---|---|
| 0.030 | 0.005 |
| 0.040 | 0.015 |
| 0.050 | 0.025 |
| 0.060 | 0.035 |
| | |
| | |

FIG. 3



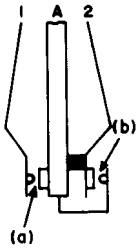

| ARM. TRVL | FRONT CONT MAKE |
|---|---|
| 0.030 | 0.005 |
| 0.040 | 0.015 |
| 0.050 | 0.025 |
| 0.060 | 0.035 |
| | |
| | |

FIG. 4



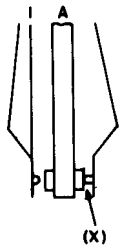

| ARM. TRVL | FRONT CONT MAKE |
|---|---|
| 0.030 | 0.005 |
| 0.040 | 0.015 |
| 0.050 | 0.025 |
| 0.060 | 0.035 |
| | |
| | |

FIG. 5



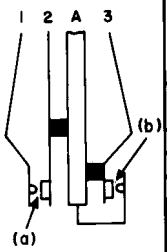

| ARM. TRVL | FRONT CONT MAKE | |
|---|---|---|
| | SPG 1 | SPG 2 |
| 0.030 | 0.005 | 0.010 |
| 0.040 | 0.010 | 0.015 |
| 0.050 | 0.020 | 0.025 |
| 0.060 | 0.030 | 0.035 |
| | | |

FIG. 6




| ARM. TRVL | FRONT CONT MAKE |
|---|---|
| 0.020 | 0.005 |
| 0.030 | 0.005 |
| 0.040 | 0.015 |
| 0.050 | 0.025 |
| 0.060 | 0.032 |
| | |

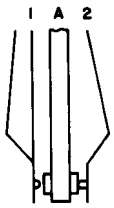
FIG. 7




| ARM. TRVL | FRONT CONT MAKE | |
|---|---|---|
| | SPG. 1 | SPG 3 |
| 0.025 | 0.010 | 0.010 |
| 0.030 | 0.005 | 0.005 |
| 0.035 | 0.010 | 0.010 |
| 0.040 | 0.015 | 0.015 |
| 0.050 | 0.025 | 0.025 |
| 0.060 | 0.035 | 0.035 |
| *0.060 | 0.035 | 0.040 |

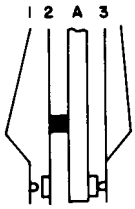
* B136 RELAY ONLY

FIG. 8



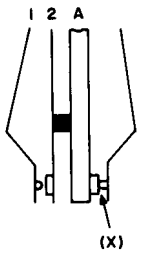

| ARM. TRVL | FRONT CONT MAKE |
|---|---|
| 0.030 | 0.005 |
| 0.040 | 0.015 |
| 0.050 | 0.025 |
| 0.060 | 0.035 |
| | |
| | |

FIG. 9



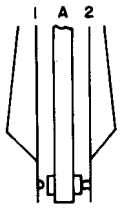

| ARM. TRVL | FRONT CONT MAKE |
|---|---|
| 0.020 | 0.005 |
| 0.030 | 0.005 |
| 0.040 | 0.015 |
| 0.050 | 0.025 |
| 0.060 | 0.035 |
| | |
| | |

FIG. 10



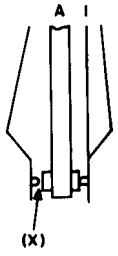

| ARM. TRVL | FRONT CONT MAKE |
|---|---|
| 0.030 | 0.005 |
| 0.040 | 0.015 |
| 0.050 | 0.025 |
| 0.060 | 0.035 |
| | |
| | |

FIG. 11



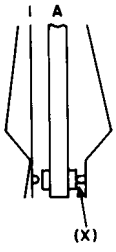

| ARM. TRVL | FRONT CONT MAKE |
|---|---|
| 0.020 | 0.005 |
| 0.030 | 0.005 |
| 0.040 | 0.015 |
| 0.050 | 0.025 |
| 0.060 | 0.035 |
| | |

FIG. 12



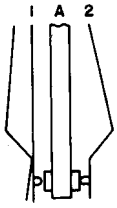

| ARM. TRVL | FRONT CONT MAKE |
|---|---|
| 0.030 | 0.005 |
| 0.040 | 0.015 |
| 0.050 | 0.025 |
| 0.060 | 0.035 |
| | |
| | |

FIG. 13



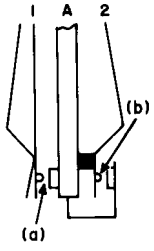

| ARM. TRVL | FRONT CONT MAKE |
|---|---|
| 0.030 | 0.005 |
| 0.035 | 0.010 |
| 0.040 | 0.015 |
| 0.050 | 0.025 |
| 0.060 | 0.035 |
| | |

FIG. 14




| ARM. TRVL | FRONT CONT MAKE |
|---|---|
| 0.030 | 0.005 |
| 0.035 | 0.010 |
| 0.040 | 0.015 |
| 0.050 | 0.025 |
| 0.060 | 0.035 |
| | |

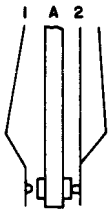
FIG. 15




| ARM. TRVL | FRONT CONT MAKE | |
|---|---|---|
| | SPG 1 | SPG 2 |
| 0.030 | 0.005 | 0.005 |
| 0.035 | 0.010 | 0.010 |
| 0.040 | 0.015 | 0.015 |
| 0.050 | 0.025 | 0.025 |
| 0.060 | 0.035 | 0.035 |

TABLE B (Cont)

FIG. 16




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

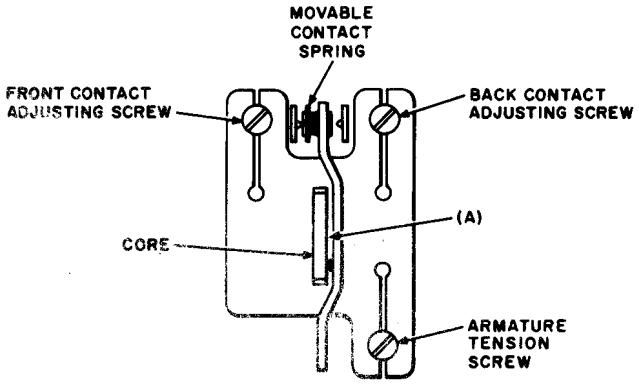



**Fig. 9—Illustrating the Location of the Adjusting Screws for Spring Combinations (Fig. 4, 7, 9, and 19 Table B)**

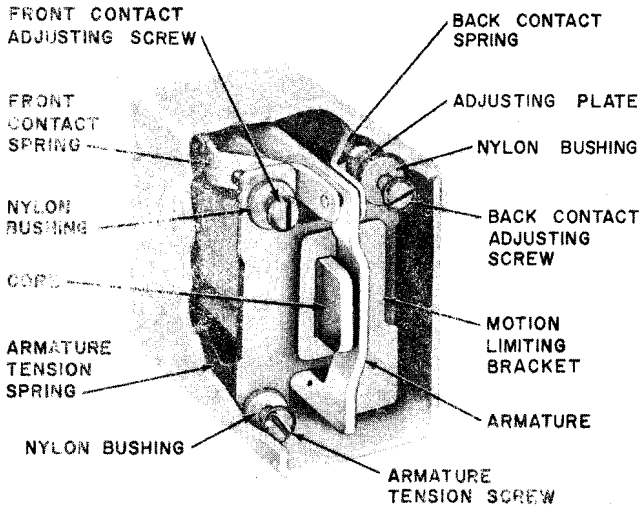



**Fig. 10—B-Type Relay-Improved Design**

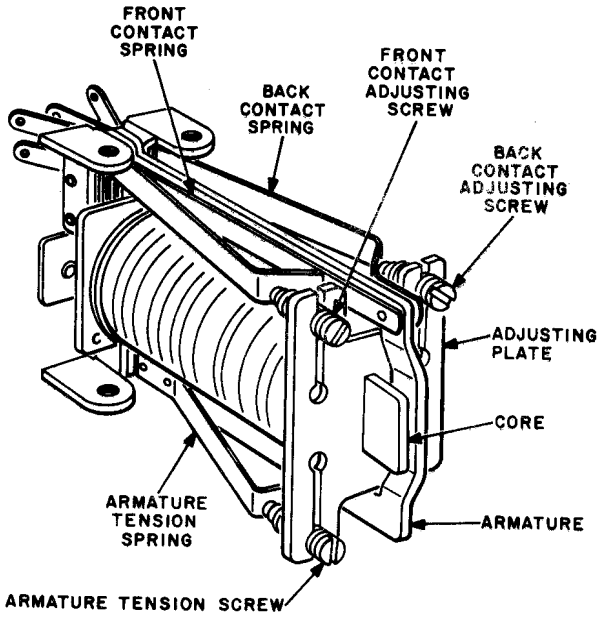



**Fig. 11—B-Type Relay-Initial Design**

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

**Relays Having Values of 0.005 Inch Specified under Front Contact Make**

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

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

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

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

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

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

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

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

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

Use the 74D gauge.

**2.14** ***Armature Travel:*** Fig. 12(B)—It is desirable to adjust the Front Contact Make and Contact Separation to near minimum values as this will facilitate keeping the armature travel below the maximum specified value. The armature travel shall not exceed the following limits:

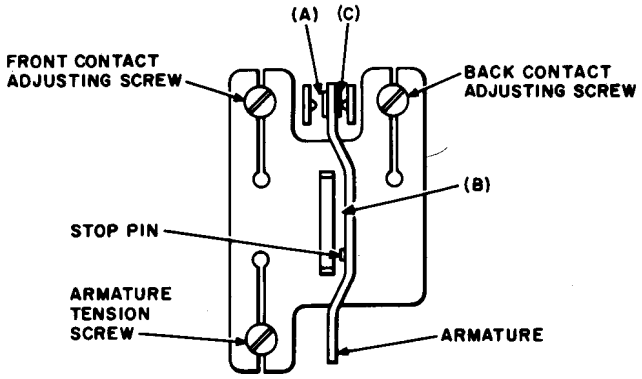



**Fig. 12—Illustrating the Location of the Adjusting Screws for Spring Combinations (Fig. 1, 2, 3, 5, 6, 8, 11, 12, 13, 14, 15 and 16 Table B)**

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

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

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

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

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

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

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

**Permissible Deviation From Minimum Front Contact Make Value Specified**

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

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

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

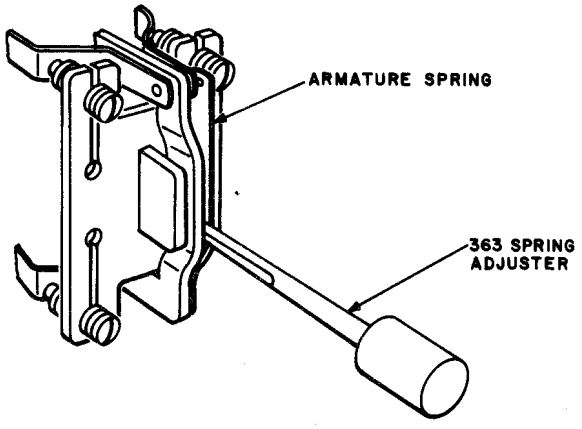



**Fig. 22—Method of Adjusting Armature Spring for Minimum Front Contact Make**

*Contact Separation*

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

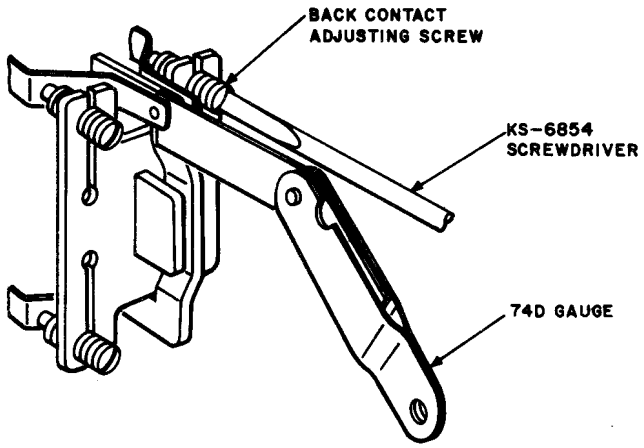



**Fig. 23—Method of Adjusting Contact Separation**

*Maximum Armature Travel*

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

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

*Contact Sequence*

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

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

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

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

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

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

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

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

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

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

**3.19** ***Electrical Requirements*** (Reqt 2.19)

**3.20** ***Armature Tension Spring Position*** (Reqt 2.20)

*Electrical Requirements*

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

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