268 TYPE RELAYS
REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers 268 type relays.

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 Reference shall be made to Section 020-010-711 covering General Requirements and Definitions for additional information necessary for the proper application of the requirements listed herein.

1.04 *Operate:* A relay is said to operate if, when current is connected to its winding, the armature moves from the backstop screw and causes the front contact to make.

1.05 *Non-Operate:* A relay is said to non-operate if, when current is connected to its winding, the armature does not move sufficiently to close the front contact.

1.06 *Release:* A relay is said to release if the armature moves from the core sufficiently to break the front contact.

2. REQUIREMENTS

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

2.02 *Relay Mounting*

(a) The cores and rear pole-piece shall be securely fastened to the relay frame and the relay frame shall be securely fastened to the relay base.

Gauge by feel.

(b) The relay base shall be securely fastened to the mounting plate.

Gauge by feel.

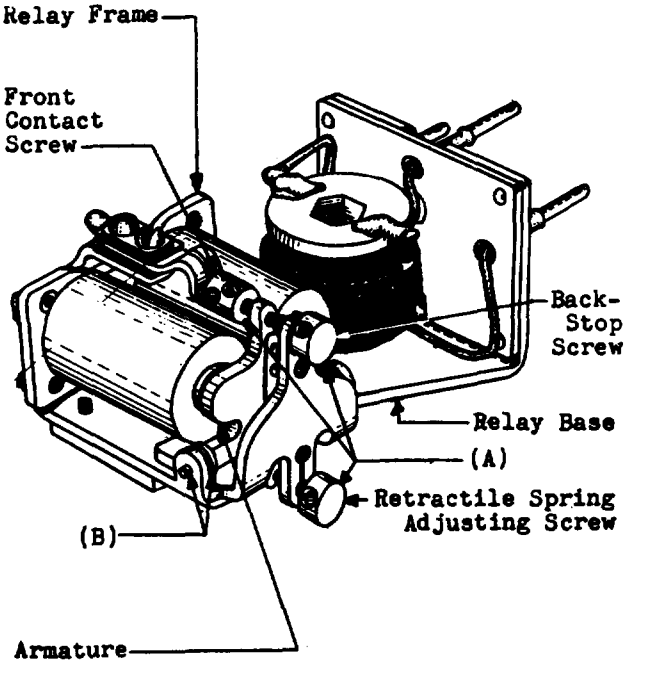

Fig. 1 – General View — 268A Relay

2.03 *Front Contact and Back Stop Screw Alignment* — Fig. 2(A): The following requirements shall be met with the end play of the armature taken up in both directions.

(a) The front contact shall line up so that the point of contact falls wholly within the boundary of the armature disc.

Gauge by eye.

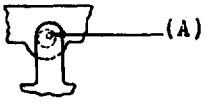

Fig. 2 – Contact Alignment Showing Maximum Permissible Misalignment

(b) The point of the back stop screw shall fall wholly within the boundary of the armature disc.

Gauge by eye.

2.04 ***Tightness of Adjusting Screws*** — Fig. 1(A): The adjusting screws shall be sufficiently tight to hold their adjusted positions.

Gauge by feel.

2.05 ***Bonding Strap Clearance***

(a) Fig. 3(A) — The bonding strap shall clear the front corner of the armature by

1/32 inch

Gauge by eye.

(b) Fig. 3(B) — There shall be a clearance between the bonding strap and retractile spring at all points beginning 1/8 inch below the lower rivet of

Min 1/64 inch

Gauge by eye.

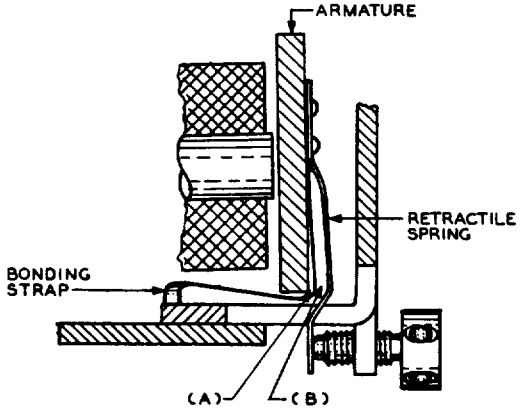

Fig. 3 – Bonding Strap Position

2.06 ***Armature Movement*** — Fig. 1(B)

(a) The armature shall move freely in its bearings and the end play when measured in line with the axis of the bearings shall be maximum .008".

Gauge by eye and feel.

(b) The bearing play in the vertical direction shall be maximum .007".

Gauge by eye and feel.

2.07 ***Armature and Core Alignment*** — Fig. 4(A): The surface of the armature shall be approximately parallel to the surfaces of the pole faces with the relay in the operated position.

Gauge by eye.

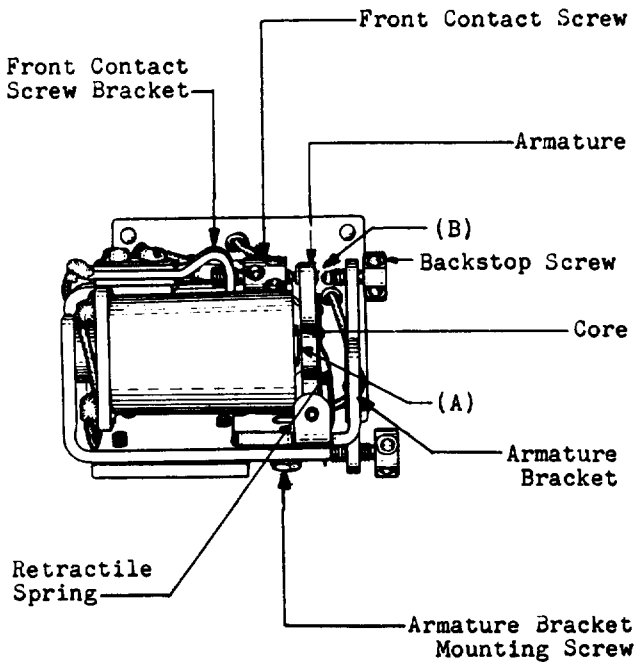

Fig. 4 – Front View — 268 Type Relay

2.08 ***Contact Make:*** With the relay electrically energized on a soak current of 35 MA against a magnetic gauge of the thickness indicated below inserted between the armature and both cores the following conditions shall be met.

CONTACTS SHALL NOT MAKE	CONTACTS SHALL MAKE
.013"	.011"

Use the KS-6909 gauge. See 2.10. Connecting the No. 510C test lamp in series with the relay contact to battery or ground as required by the circuit, will facilitate determining whether the contact is open or closed.

2.09 ***Separation Between Armature and Backstop Screw*** — Fig. 4(B): With the relay electrically operated on a soak current of 35 MA the separation between the armature and the backstop shall be

Min. .005"
Max. .006"

Use the KS-6909 gauge. See 2.10.

2.10 ***Magnetic Condition*** — After checking either or both of the requirements specified in paragraphs 2.08 and 2.09 and after the gauges have been removed from the armature

gap and back stop screw gap, the residual magnetism shall be removed by applying a reverse soak of 35 MA before attempting to check any of the electrical requirements.

Note: In certain cases it may be necessary to use non-grounded battery to obtain the soak current.

2.11 ***Electrical Requirements:*** The relay shall meet the electrical requirements specified on the circuit requirement tables.

3. ADJUSTING PROCEDURES

3.001 *List of Tools, Gauges, Materials and Test Apparatus*

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
340	Adjusting Key
363	Spring Adjuster
474A	3/16" x 1/4" Hex. Closed Double End Offset Wrench
485A	Smooth Jaw Pliers
510C	Test Lamp
563A	90° Offset Screwdriver
564A	45° Offset Screwdriver
—	3" Cabinet Screwdriver
—	Watchmakers Screwdriver No. 5 — William Dixon, Inc.
GAUGES	
KS-6909	Thickness Gauge Nest
MATERIALS	
KS-7187	Bell Seal Bond Paper 1/2" x 2-1/2"
TEST APPARATUS	
35 Type	Test Set

3.01 ***Cleaning*** (Reqt 2.01)

(1) Clean the contacts and other parts in accordance with Section 069-306-801 covering cleaning of relay contacts and parts.

3.02 ***Relay Mounting*** (Reqt 2.02)

(1) To tighten loose mounting screws, use the 3" cabinet screwdriver. If the cores are loose, tighten the screws in the cores with the 3" cabinet screwdriver or the Nos. 563A and 564A screwdrivers.

3.03 ***Front Contact and Backstop Screw Alignment*** (Reqt 2.03)

(1) If the backstop screw is not properly positioned with respect to the armature disc, refer the matter to the supervisor.

(2) To adjust the front contacts horizontally, reposition the armature as covered by 3.07 — 3.11(7). If the contacts cannot be readjusted horizontally in this manner, loosen the contact screw bracket mounting screws with the 3" cabinet screwdriver or the 563A and 564A screwdrivers and move the bracket as required to align the contacts. Tighten the bracket screws securely. Check requirements 2.08 to 2.11 inclusive and readjust as required.

(3) To adjust the contact alignment vertically, grasp the front contact screw bracket between the terminal pileup and the contact screw with the No. 485A pliers and adjust the bracket up or down, as required, using care not to injure the relay coils. Check requirements 2.08 to 2.11 inclusive and readjust as required.

3.04 ***Tightness of Adjusting Screws*** (Reqt 2.04)

(1) If an adjusting screw is not sufficiently tight in its bracket remove the screw from the bracket and force the two parts of the bracket together with the No. 485A pliers sufficiently to insure that the screws will hold any adjusted position, then replace the screw. Use the No. 340 adjusting key to remove and replace contact screws. If necessary remove the relay mounting screws and pull the relay forward sufficiently to obtain access to the adjusting screw bracket. After making adjustments remount the relay and tighten the mounting screws securely.

3.05 ***Bonding Strap Clearance*** (Reqt 2.05)

(1) If the bonding strap clearance is not satisfactory, adjust the strap as required with the No. 363 spring adjuster.

(2) If the requirements cannot be met without changing the position of the retractile spring, adjust the retractile spring as required with the No. 363 spring adjuster.

3.06 ***Armature Movement*** (Reqt 2.06)

(1) If the armature does not move freely or there is insufficient end play, refer the matter to the supervisor.

3.07 ***Armature and Core Alignment*** (Reqt 2.07)
3.08 ***Contact Make*** (Reqt 2.08)
3.09 ***Separation Between Armature and Back Stop Screw*** (Reqt 2.09)
3.10 ***Magnetic Condition*** (Reqt 2.10)
3.11 ***Electrical Requirements*** (Reqt 2.11)

(1) Connect the No. 510C test lamp in series with the relay contact to battery or ground as required by the circuit, to facilitate determining when the relay operates and releases.

(2) ***Armature and Core Alignment:*** If the misalignment of the armature and core is excessive or if difficulty is encountered in making the adjustments outlined in (3) to (6) inclusive, reposition the armature as outlined in (7).

(3) ***Contact Make:*** If the contact make requirement is not met adjust the contact screw with the No. 340 adjusting key until the requirement is met. If the "not make" requirement is not met turn the contact screw in. If the "make" requirement is not met turn the contact screw out.

(4) ***Separation Between Armature and Backstop Screw:*** Adjust the backstop screw using the No. 340 adjusting key. To increase the separation turn the screw out and to decrease the separation turn the screw in.

(5) After the adjustment has been made, insert a piece of KS-7187 bond paper between the armature and backstop screw and while holding the armature against the backstop screw withdraw the paper. Repeat this operation until the paper shows no evidence of dirt when it is withdrawn. Burnish the backstop to insure that no paper remains.

(6) ***Electrical Requirements:*** If the electrical requirements are not met, adjust the tension of the retractile spring, as required, by turning the retractile spring adjusting screw using the No. 340 adjusting key.

(7) When necessary to reposition the armature as outlined in (2), proceed as follows:

(a) Turn the retractile spring adjusting screw in as far as possible without binding or forcing at the armature bracket. Using the No. 474A wrench, loosen the armature bracket mounting screws, taking care not to strike the end of the retractile spring with the wrench. Insert the .013" blade of the KS-6909 gauge between the armature and both cores, backing off the backstop screw slightly, if necessary, to permit insertion of the gauge. Operate the relay on the soak current of 35 MA, and using the No. 340 adjusting key, turn the contact screw in approximately one-half turn so that there will be an observable contact separation. Shift the armature bracket until the gauge is held flat against both cores and against the armature and so that the contacts and backstop screw are aligned horizontally. Tighten the armature bracket mounting screws securely. Disconnect the current from the relay.

(b) Replace the .013" gauge with a .011" gauge in the armature gap so that the gauge spans both cores. Again energize the relay on the soak current and turn the front contact screw out so that it just makes contact as indicated by the test lamp. Remove the soak current and withdraw the .011" gauge. Reapply the soak current and using the No. 340 adjusting key turn the backstop screw in or out, as required, until the requirement for separation between the armature and backstop screw is met. Remove the soak current.

(c) Apply the specified operate current, turning the retractile spring adjusting screw out until the armature operates. Remove the operate current. Insert the .011" gauge and energize the relay on the soak current. The front contacts should make. Remove the soak current and replace the .011" gauge with the .013" gauge. Apply the soak current and observe that the front contacts do not make. If the contacts fail to make with the .011" gauge applied or make with the .013" gauge applied, turn the con-

tact screw in or out, as required, until the requirement is met. Remove the soak current and the gauge.

(d) Reapply the soak current and check the separation between the armature and backstop screw. If this requirement is not met turn the backstop screw in or out, as required, until the requirement is met. Proceed as in (5).

(e) Apply the soak current of 35 MA in the reverse direction to remove excessive residual caused by adjusting with a magnetic gauge. Again apply the specified soak. Apply the specified operate current and if the relay operates turn the retractile spring adjusting screw in until the relay just fails to operate. Turn the retractile spring adjusting screw out until the relay just operates.