KS-14499 RELAYS
REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers the KS-14499 (polarized) relay.

1.02 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.

1.03 Asterisk: Requirements are marked with an asterisk (*) when to check for them would necessitate the dismantling or dismounting of the apparatus or would affect the adjustment involved or other adjustments. No check need be made for these requirements unless the part is made accessible for other reasons or its performance indicates that such a check is advisable.

1.04 In order to check the requirements in this section, it is necessary to remove the relay from its socket in the equipment, remove the relay cover and mount the relay on the test panel described in 3.002. After the requirements have been checked and the necessary adjustments made, remount the relay cover, taking care that the wire retaining spring is positioned so that its projections press against the relay base.

Caution: Never remount the relay in its associated equipment unless its cover and wire retaining spring are in place, since, in some cases, high potentials may be present on the contacts or armature.

1.05 Mounted Position of Relay: The mounted position of the relay for the purpose of this section is that position in which the long axis of the relay is horizontal and terminal No. 3 of the base is in the uppermost position. See Fig. 2.

1.06 Operated Position of Armature: The operated position of the armature is that position in which the armature rests against the left contact as viewed from the front of the relay.

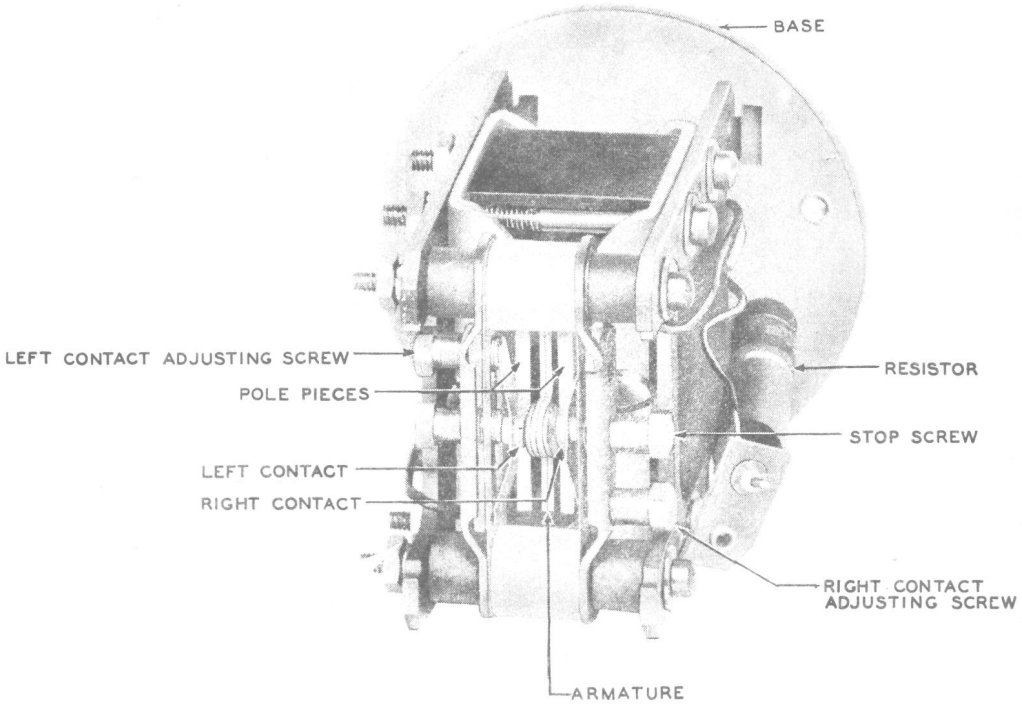


FIG. 1 - KS-14499 RELAY

1.07 Unoperated Position of Armature: The unoperated position of the armature is that position in which the armature rests against the right contact as viewed from the front of the relay.

1.08 Operate: A relay is said to operate if, when current is connected to its winding, the armature moves from its unoperated position and makes reliably the contact toward which it moves.

1.09 Release: A relay is said to release if, when the current in the winding is reduced, the armature returns to the unoperated position.

1.10 Dust and dirt on the contacts, pole pieces, or armature will seriously affect the operation of this relay. Therefore, the cover should not be removed unnecessarily and the wire retaining spring should always be installed when the cover is in place.

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 fastened securely to its base.

Gauge by feel.

2.03 Contact Alignment: The contacts shall be aligned so that the point of contact falls wholly within the circumference of the opposing disc.

Gauge by eye.

*2.04 Tightness of Contact Adjusting Screws and Stop Screws: Contact adjusting screws and stop screws shall be sufficiently tight in their brackets to hold any adjusted position.

Gauge by feel.

2.05 Resistance of Series Resistor: The resistance of the resistor in series with the relay winding, measured across the front terminal of the resistor and terminal No. 1 of the relay, shall be

Min. 1200 ohms
Max. 1800 ohms

Use the KS-14510 volt-ohm-milliammeter.

2.06 Contact Separation: When the relay is electrically energized on the readjust operate current, against a No. 92S gauge inserted between the armature and the left contact, the armature shall break from the right contact.

Gauge by eye.

Caution: While checking this requirement, take extreme care not to deflect the left contact with the No. 92S gauge.

To check this requirement, connect the KS-14250, List 1, flashlight by means of two 1W13A cords, each equipped at one end with a KS-6278 connecting clip, to terminals No. 2 and 3 of the relay. With the flashlight lighted (flashlight switch in operated position), proceed with the check. Breaking of the armature from the right contact will be indicated by the extinguishing of the light.

2.07 Clearance Between Contacts and Associated Stop Screws

(a) With the armature in the unoperated position, the clearance between the left contact and its associated stop screw shall be

Min. 0.002"

Gauge by eye.

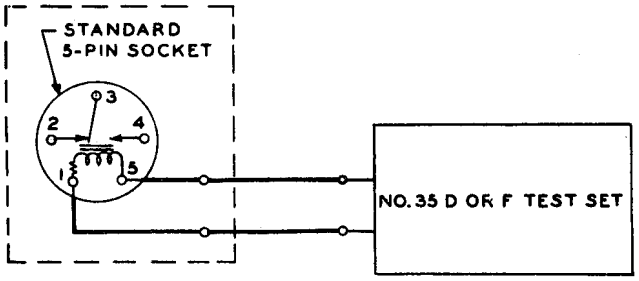
(b) With the armature in the operated position, the clearance between the right contact and its associated stop screw shall be

Min. 0.002"

Gauge by eye.

2.08 Electrical Requirements: The relay shall meet the electrical requirements specified on the circuit requirement table.

To check this requirement, mount the relay on the test panel described in 3.002. If no pulse repeating requirements are specified, connect the No. 35 D or F test set to the socket terminals as shown in Fig. 2,



NOTE: FOR TEST SET CONNECTION USE THE 2W17A CORD EQUIPPED WITH NO. 364 SPADE TERMINALS OR KS-6278 CONNECTING CLIPS AS REQUIRED.

FIG. 2 - CURRENT FLOW TEST CIRCUIT

with positive voltage on terminal No. 1. If using the panel arranged for checking pulse repeating requirements, connect the No. 35 D or F test set as directed above and open both the SPST and DPDT switches before checking the electrical requirements.

2.09 Pulse Repeating Requirements: When specified on the circuit requirement table, the relay shall meet the pulse repeating requirements as follows:

The per cent break measured at the front contacts of the relay shall be equal to the per cent break measured at the pulsing contacts of the pulsing test set plus or minus the per cent break values listed below:

Test	Readjust
+ 1	0
- 3	-2

To check this requirement, mount the relay on the test panel described in 3.002(2). Then, using the No. 35 D or F test set, the J34717A or equivalent pulsing test set, and the J64722A or equivalent pulse repeating test set connected as shown in Fig. 3, check the requirements as follows:

Close the SPST switch. Short-circuit the leads to the pulsing circuit of the pulsing test set. Operate the DPDT switch to the right as it is shown in Fig. 3. Adjust the No. 35 D or F test set until the milliammeter reads 2.25 ma. Remove the short from the leads. Operate the DPDT switch to the left. Then operate the proper keys of the pulsing test set to obtain pulsing at 12 pulses per second and approximately 60 per cent break. Read the per cent break of the pulsing contacts of the pulsing test set on the per cent break meter of the pulse repeating test set. Operate the DPDT switch to the right again and read the per cent break of the KS-14499 relay on the per cent break meter.

3. ADJUSTING PROCEDURES

3.001 List of Tools, Gauges, and Test Apparatus

Code or Spec.No.	Description
Tools	
403A	5/32" and 3/16" Hex. Double End Socket Wrench
KS-14250, L1	Flashlight

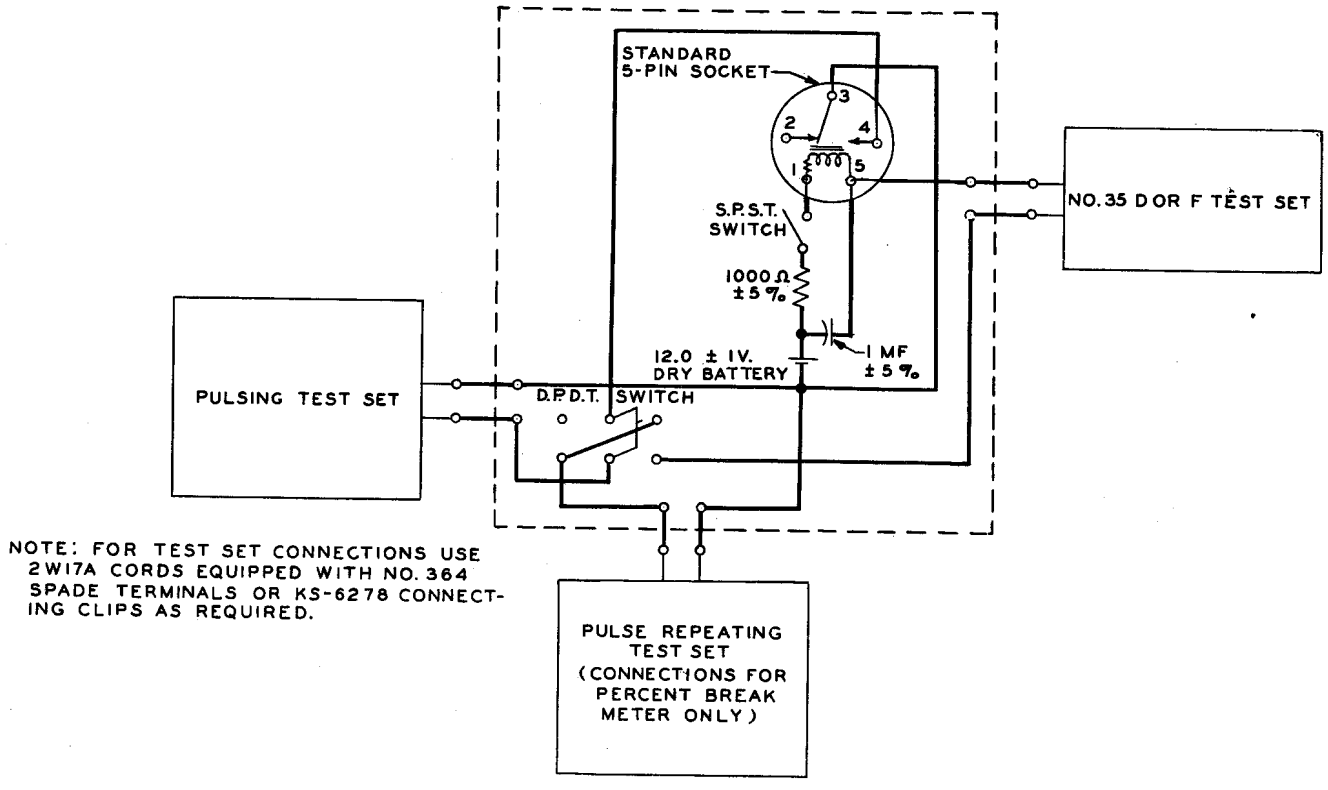


FIG. 3 - PULSING TEST CIRCUIT

Code or Spec.No.	Description
Gauges	
92S	0.002" Nonmagnetic Offset Thickness Gauge
KS-14510	Volt-Ohm-Milliammeter
Test Apparatus	
1W13A (2 required)	Cord (Equipped with a KS-6278 Connecting Clip)
	Test Equipment in accordance with Fig. 2 or Fig. 3

3.002 General

(1) Where relays are checked for electrical requirements only, mount the relay on a panel made up locally and fitted with a standard 5-pin socket (Amphenol M1P5 or equivalent) so mounted that when the relay is inserted, it will be mounted as specified in 1.05. Locate the panel so that the relay will be free from magnetic interference which might alter the characteristics of the relay.

(2) Where relays are checked for both electrical and pulse repeating requirements, mount the relay on a panel made up locally and so located that the relay will be free from magnetic interference which might alter the characteristics of the relay. The following apparatus should be mounted on the panel and connected as shown in Fig. 3: one standard 5-pin socket (Amphenol M1P5 or equivalent) so mounted that when the relay is inserted, it will be mounted as specified in 1.05; one No. 145C, 1000-ohm resistance or equivalent; one No. 144QE condenser or equivalent; one single-pole, single-throw switch; one double-pole, double-throw switch; one KS-7595 battery or equivalent, and suitable terminals for connecting external testing equipment.

3.01 Cleaning (Rq. 2.01)

(1) Clean the contacts and other parts of the relay as described in Section 069-306-801.

3.02 Relay Mounting (Rq. 2.02)

(1) If the relay is not fastened securely to its base, discard the relay.

3.03 Contact Alignment (Rq. 2.03)

(1) If the contacts are not satisfactorily aligned, discard the relay.

3.04 Tightness of Contact Adjusting Screws and Stop Screws (Rq. 2.04)

(1) If a screw does not hold its adjusted position, discard the relay.

3.05 Resistance of Series Resistor (Rq. 2.05)

(1) If the resistance of the series resistor is not within the specified limits, discard the relay.

3.06 Contact Separation (Rq. 2.06)
3.07 Clearance Between Contacts and Associated Stop Screws (Rq. 2.07)
3.08 Electrical Requirements (Rq. 2.08)
3.09 Pulse Repeating Requirements (Rq. 2.09)

(1) General: Before making any of the following adjustments, back off both stop screws slightly, using the No. 403A wrench.

(2) If the contact separation requirement is not met, back off either or both contact adjusting screws, using the same wrench, until the proper separation is obtained.

(3) If the relay fails to meet the electrical requirements, proceed as follows: To adjust the relay to meet the operate requirement, turn the right contact adjusting screw in toward the relay as required. To adjust the relay to meet the release requirement, turn the left contact adjusting screw in toward the relay as required. If either of these adjustments disturbs the contact separation, back off the opposite contact adjusting screw until the proper separation is restored.

(4) If the per cent break of the relay is too low, increase the contact separation. If the per cent break is too high, decrease the contact separation.

(5) Adjust the stop screws to the proper clearance between them and their associated contacts and recheck the electrical and pulse repeating requirements.