

**197- AND 198-TYPE SWITCHES
ROTARY, VERTICAL, AND RELEASE MECHANISMS
REQUIREMENTS AND ADJUSTING PROCEDURES**

1. GENERAL

1.001 This addendum supplements Section 030-705-702, Issue 11. The attached pages must be inserted in the section in accordance with the filing instructions above.

1.002 This addendum is issued to change the requirement in 2.09 and to revise 3.001, List of Tools, Gauges, Materials, and Test Apparatus.

2. REQUIREMENTS

The following change applies to Part 2 of this section:

- (a) 2.09(b)—revised.

3. ADJUSTING PROCEDURES

The following change applies to Part 3 of this section:

- (a) 3.001—revised.

ATTACHED:

Page 5 dated March 1974, revised
Page 6 dated March 1974, reissued
Page 17 dated March 1974, reissued
Page 18 dated March 1974, revised

the alignment of the pawl by sighting between the mounting bracket and the vertical pawl guide. Partially operate the rotary armature manually several times to aid in determining the position of the rotary pawl with respect to the rotary tooth.

(2) When viewing the alignment of the pawl **from the bottom**, insert the mirror from the left of the shaft so that it is behind and slightly to the left of the shaft. Rest the mirror against the bottom and vertical portion of the switch casting, inclining the mirror at an angle of approximately 30 degrees to the horizontal. Check the alignment of the pawl by sighting into the mirror to the left of the shaft. Partially operate the rotary armature manually several times to aid in determining the position of the rotary pawl with respect to the rotary tooth.

(b) Fig. 5(A)—When the rotary armature is operated manually, after the rotary magnet has been electrically operated and released, with one corner of the pawl edge touching the cylindrical surface of the hub, a .003-inch feeler gauge shall not enter between the other corner and the hub.

Use the 92P gauge.

(c) The edge of the pawl shall touch the cylindrical surface of the hub at both the top and bottom corners. These requirements shall be checked on the eleventh rotary step of the ninth level (or fifth level on switches arranged to take five vertical steps) and on the operating level on 198-type switches. This requirement is considered met if satisfactory alignment can be obtained by shifting the loop of the pawl spring.

2.10 Rotary Magnet Position: Fig. 6(A)

(a) With the rotary magnets electrically operated, there shall be a space between the stopping face of the rotary dog and the radial face of the rotary tooth of

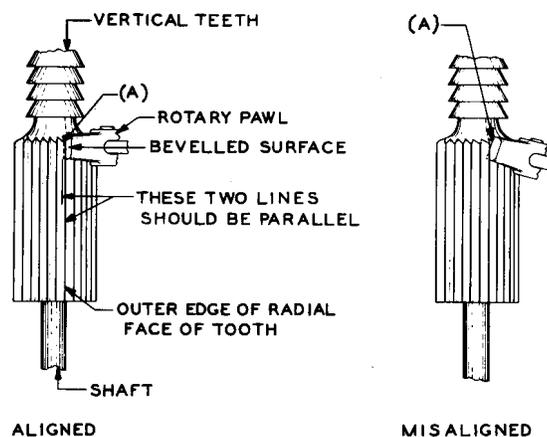


Fig. 4—Illustrating Rotary Pawl Aligned and Misaligned With Respect to the Outer Edge of the Radial Face of the Tooth

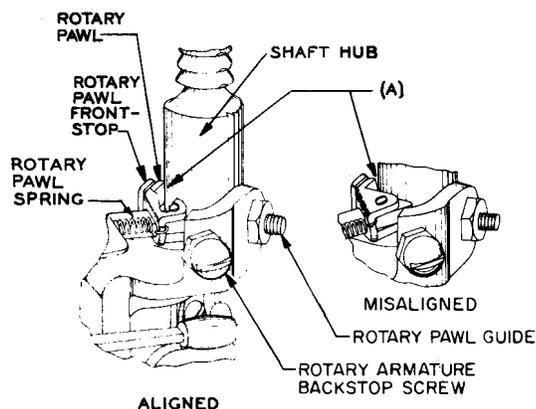


Fig. 5—Illustrating Rotary Pawl Aligned and Misaligned With Cylindrical Part of Shaft Hub

Test—Min 0.005 inch

Test—Max 0.012 inch

Readjust—Min 0.006 inch

Readjust—Max 0.011 inch

This requirement shall be met on one of the first ten teeth on the fifth level with clearance between the rotary pawl and the rotary pawl frontstop.

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Use the KS-6909 gauge, as shown in Fig. 7.
(See 1.05.)

(b) With the rotary magnets electrically operated, the rotary armature shall strike both magnet cores. This requirement is met if, when the armature is in contact with one core, the gap between the armature and the closest point on the other core does not exceed

0.002 inch

Use the KS-6909 gauge.

To check this requirement, place the 0.002-inch blade of the KS-6909 gauge between the armature and one of the rotary magnet cores so the gauge completely covers the core; then energize the rotary magnets. The gauge should be tight. Repeat the check on the other rotary magnet. The gauge should also be tight. (See 1.05.)

2.11 Rotary Pawl Frontstop Position: Fig.

6(B)—With the rotary magnets electrically operated on the first, fifth, and tenth rotary steps of the fifth level, the clearance between the rotary pawl and the rotary pawl frontstop shall be

Test — Min pawl shall not touch frontstop

— Max 0.008 inch

Readjust — Min 0.002 inch

— Max 0.006 inch at two check points, 0.008 inch at third point

Gauge the minimum test value by eye using the 510C portable lamp with the 562B offset tip.

Use the 92S gauge for minimum readjust and 117A gauge for all maximum values (Fig. 8).

Check the minimum test requirement by observing for light between the pawl and frontstop with the tip of the lamp behind the frontstop.

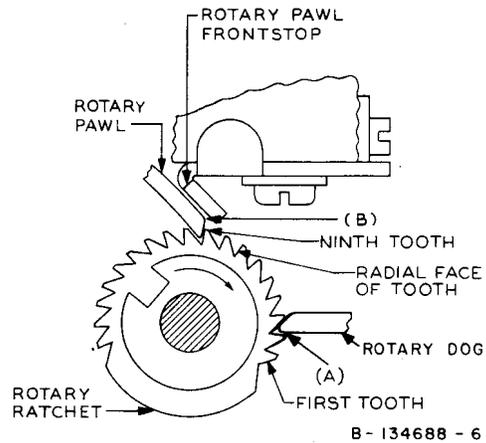


Fig. 6—Position of Rotary Magnet and Rotary Pawl Frontstop

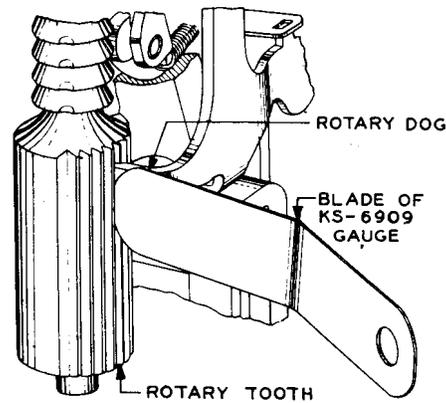


Fig. 7—Method of Checking the Clearance Between the Stopping Face of the Rotary Dog and the Radial Face of the Rotary Tooth

in order to meet this requirement. Take care when doing this not to disturb the sidewise position of the armature.

(c) Requirements (a) and (b) shall be checked after the release magnet has been electrically energized, de-energized, and again electrically energized. With the release magnet electrically re-energized, check (a) and (b) by raising the release link with a KS-6320 orange stick. In (a), note that the release link drops completely over the double-dog release tooth when the orange stick is removed. In (b), note that the release link does not drop over the double-dog release tooth when the orange stick is removed. (See 1.05.)

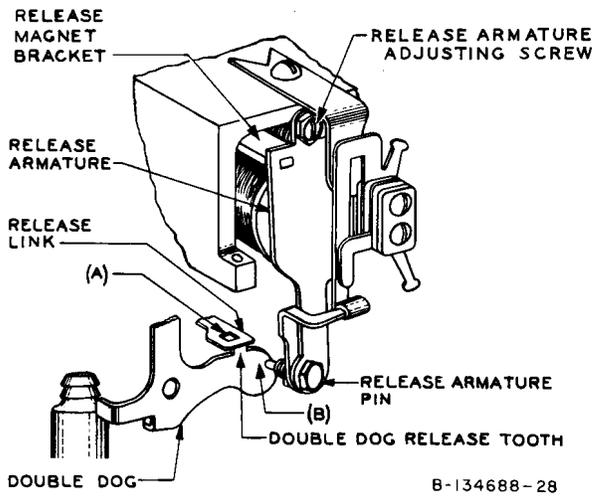


Fig. 28—Release Magnet and Earlier-Type Associated Parts

2.40 Clearance Between Release Armature Pin and Double Dog: Fig. 28(B)—The clearance between the double dog and the end of the release armature pin shall be

Min 0.060 inch

Max 0.120 inch

Use the R-80223 gauge.

This requirement shall be met with the shaft on the first rotary step of the first bank level, with the rotary dog resting on the rotary ratchet, with the release magnet de-energized, and with the release armature resting against the shoulder of the release magnet bracket.

2.41 Application of P-290471 Attachable Stop to Release Magnet: The attachable stop shall be applied in the field to release magnets when the release armature fails to release properly, as judged by circuit operation, and this failure is due to a worn or missing core cap on the release magnet.

2.42 Electrical Requirements: (Switches Having Release Spring Assembly per Fig. 506, Section 030-705-703) The release magnet shall meet the requirements specified on the circuit requirements table.

To check this requirement, first open the circuit to the release magnet as covered under make-busy information in Section 030-705-701. Then step the switch to the first rotary step of the first vertical level.

Note: Make sure that the switch has the release armature and retractile spring covered in 3.42(1).

3. ADJUSTING PROCEDURES

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

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
416B	Spring adjuster
417A	1/4- and 3/8-inch open double-end flat wrench
418A	5/16- and 7/32-inch open double-end flat wrench
485A	Smooth jaw pliers
510C	Portable lamp [equipped with 561A tool (straight tip) and 562B tool (offset tip) and W2BL (48V) cord]
556A	7/32-inch double-end offset socket wrench
563A	90-degree offset screwdriver
564A	45-degree offset screwdriver

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CODE OR SPEC NO.	DESCRIPTION
TOOLS	
565A	90-degree offset screwdriver
566A	45-degree offset screwdriver
581A	25/64-inch flat open-end wrench
KS-6320	Orange stick (2 required)
KS-6854	3-1/2 inch screwdriver
KS-6257	3/8-inch straight socket wrench
KS-7782	Parallel jaw pliers
R-1681	5/16-inch straight socket wrench
R-2739	Double-end offset screwdriver
—	Double-dog adjuster, AEC0 H-7067
—	Armature adjuster, AEC0 H-13398-1
—	Switch supporting fixture, AEC0 H-26221
P-220366	Dental mirror
—	B long-nose pliers
—	3-inch C screwdriver
—	4-inch E screwdriver
—	6-inch straight tweezers, American Piano Supply Co, No. 56 (or equivalent)
GAUGES	
62B	0-700 gram gauge
79B	0-1000 gram push-pull tension gauge
92A	0.010-inch nonmagnetic offset thickness gauge
◆92P	.003-inch nonmagnetic offset thickness gauge◆
92S	0.002-inch nonmagnetic offset thickness gauge

CODE OR SPEC NO.	DESCRIPTION
GAUGES	
117A	0.006- and 0.008-inch double-end thickness gauge
KS-6909	Thickness gauge nest
KS-6938	Thickness gauge nest
R-80223	Thickness gauge
MATERIALS	
KS-2423	Cleaning cloth
KS-7860	Petroleum spirits
TEST APPARATUS	
35-type	Test set
3.01 Cleaning and Lubrication (Reqt 2.01): When necessary, clean the parts in accordance with Section 069-501-801 and lubricate them in accordance with Section 030-705-706.	
3.02 Position of Adjusting Screws (Reqt 2.02): No procedure.	
3.03 Freedom of Shaft to Return to Vertical Normal (197-Type Switches Only) (Reqt 2.03)	
(1)	Failure to meet this requirement may be due to a bind in the shaft caused by shifting of the shaft bearings in service due to loosening of the bearing mounting screws from switch vibration. In this case, realign the bearings to permit the shaft to move freely and then tighten the bearing mounting screws securely with the 4-inch E screwdriver or the 563A and 564A offset screwdrivers.
(2)	Failure of the shaft to return to vertical normal may also be due to bind in its bearing caused by a bent shaft. To determine whether the shaft is bent, proceed as follows. Raise the shaft to the first level with the double dog engaged in the release link. Cut off one tip of a KS-6320 orange stick so the end is squared. Then cut the orange stick in two at a point