

SWITCHES

197- AND 198-TYPES

LUBRICATION

REQUIREMENTS AND PROCEDURES

1. GENERAL

1.01 This section covers requirements and procedures for lubrication of 197- and 198-type switches.

1.02 This section is reissued to:

- Revise 1.04
- Add 2.01(b)
- Revise Table A
- Revise Table B.

This reissue does not affect the Equipment Test List.

1.03 *Preparation of KS-16832 L2 Lubricant:*

This lubricant is provided in 2-ounce and 1-pint containers. A small wide-mouth container, such as the 2-ounce jar in which the lubricant is available, should be used as a receptacle from which to dispense the lubricant. If allowed to stand more than 1 day without agitation, the lubricant ingredients tend to separate; therefore, before using each day, shake the container of lubricant for approximately 30 seconds to ensure mixing of the ingredients. The proper method of shaking the lubricant consists of repeated, rapid turning of the container to an upside down position and back to the upright position. If the lubricant from a 1-pint container is to be used, the lubricant must be mixed as just described before it is poured into the smaller container. Under storage conditions, the cover should be tight on the container.

1.04 One dip of KS-16832 L2 lubricant, for the purpose of this section, is the amount of lubricant retained on a KS-14208 brush after being dipped into the lubricant to a depth of 1/2-inch and the tip lightly touched against the edge of the container to remove any surplus.

1.05 *Lubrication Interval:* It is very important to apply the KS-16832 L2 lubricant in the amounts specified in requirement 2.01 and as covered in 3.01. If less lubricant is applied, adequate lubrication will not be realized for an extended interval.

1.06 If the oil is properly mixed, it should not creep; however, if creepage of the lubricant from the point of application occurs, the lubricant will not damage wiper insulators or other parts such as the lever spring stud of rotary stop springs.

1.07 *Make-Busy Information:* Before lubricating any parts covered in this section, make the switch busy as covered in Section 030-705-701.

2. REQUIREMENTS

2.01 *Lubrication:* The 197- and 198-type switches shall be lubricated with KS-16832 L2 lubricant as follows:

(a) *Before turnover*, the installer shall lubricate the switches as specified in Table A and Table B if more than 1 year has elapsed between the date of manufacture (as indicated by the date stamped on the capacitor strap on the rear of the switch) and the date of turnover.

(b) *After turnover*, the switches shall be lubricated as specified in Table A and Table B.

2.02 *Record of Lubrication:* During the period of installation, a record shall be kept, by date, of lubrication and this record shall be turned over to the telephone company with the equipment. If no lubrication has been done, it shall be so stated.

TABLE A
LUBRICATION

TYPES OF SWITCHES	MAXIMUM LUBRICATION INTERVAL	PART TO BE LUBRICATED	QUANTITY, APPLICATION AND DISTRIBUTION OF LUBRICANT	LUBRICATION POINT
197 ONLY	3 YEARS	Vertical Ratchet — Front Half (all teeth)	Distribute one dip with horizontal strokes of brush beginning at top.	Fig. 1 — A
		Vertical Ratchet — Rear Half (all teeth)	Distribute one dip with vertical strokes of brush beginning at top.	Fig. 1 — B
		Rotary Ratchet — Upper Half (all teeth, starting with teeth for 10th and 11th rotary steps)	Distribute one dip with vertical strokes of brush beginning at top.	Fig. 1 — C
		Shaft	Apply one dip to each point D and E on the shaft just above the bearings; then divide one dip between points D and E (1-1/2 dips per bearing). Raise and lower the shaft as covered in Note.	Fig. 1 — D and 1 — E
		Normal Post — Both Sides	Distribute one dip along point J ₁ . Apply on surfaces engaged by shaft spring bracket with or without a spring assembly mounted on normal post.	Fig. 2 — J ₁
198 ONLY	3 YEARS	Vertical Ratchet Tooth at Operating Level — Front Half	Distribute one dip over surface contacted by stationary dog using horizontal strokes of brush.	Fig. 14 — N
		Rotary Ratchet (all teeth)	Apply one dip opposite operating level.	Fig. 14 — P
		Shaft	Apply one dip to each point Q and R on the shaft just above the bearings; then divide one dip between points Q and R (1-1/2 dips per bearing).	
			Apply above upper shaft bearing.	Fig. 14 — Q
			Apply above lower shaft bearing.	Fig. 14 — R

Note: On 197-type switches, raise the shaft to the highest position and apply the lubricant to the shaft just above each bearing. After applying lubricant, raise and lower the shaft a minimum of six times until a red-black film is observed along the shaft below each bearing.

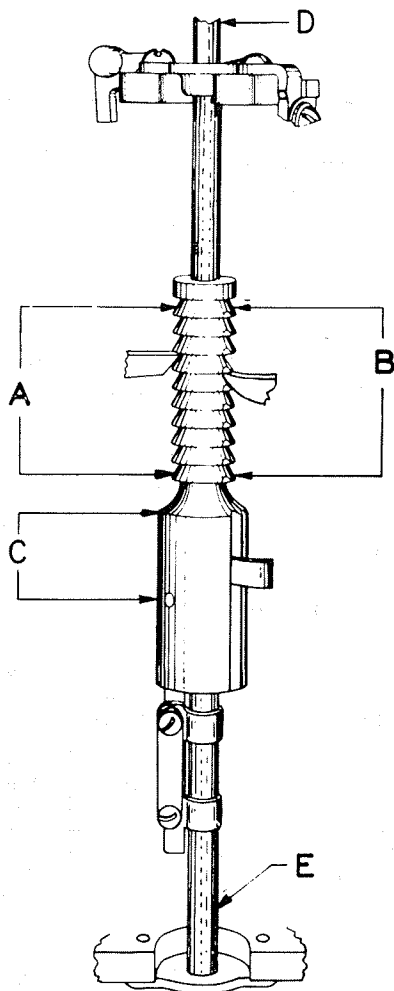


Fig. 1—Lubrication Points for Shaft and Associated Parts of 197-Type Switches

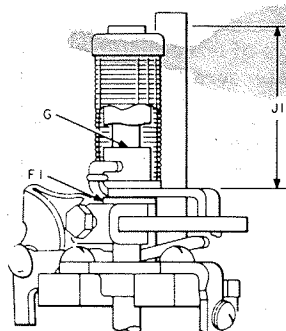


Fig. 2

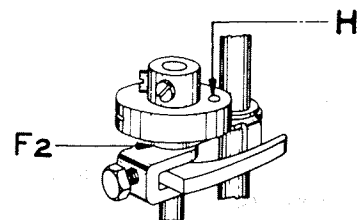


Fig. 3

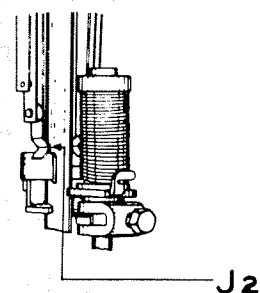


Fig. 4

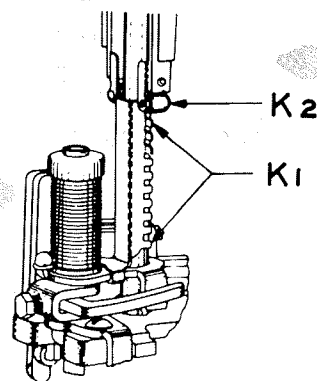


Fig. 5

Fig. 2-5—Lubrication Points for Parts Associated with Various Types of Shaft Springs and Normal Post Spring Assemblies of 197- and 198-Type Switches

Fig. 1-5—Lubrication Points Covered in Table A and Table B

TABLE B
LUBRICATION

TYPES OF SWITCHES	MAXIMUM LUBRICATION INTERVAL	PART TO BE LUBRICATED	QUANTITY, APPLICATION AND DISTRIBUTION OF LUBRICANT	LUBRICATION POINT
197 ONLY	6 YEARS	Shaft Spring Bracket Cam	Apply on surfaces engaging normal post operating springs.	Fig. 4 — J ₂
		Normal Post Cam Teeth (assemblies having metal rollers only)	Distribute one dip between points K ₁ and K ₂ in that order.	Fig. 5 — K ₁ (see Note 1)
		Normal Post Spring Assembly — Roller Bearings (assemblies having metal rollers only)		Fig. 5 — K ₂ (see Note 1)
197 AND 198	6 YEARS	Normal Pin Clamp	Apply one dip to surface of clamp that bears against shaft spring bracket.	Fig. 2 — F ₁ or 3 — F ₂
		Shaft Extension Sleeve and Shaft Spring	Apply one dip just above shaft spring bracket bearing (see Note 2).	Fig. 2 — G
		Spring Cup — Oil Hole (where provided)	Apply one dip.	Fig. 3 — H
		Double Dog Bearing Pin	Distribute one dip to points L ₁ through L ₈ in that order.	
			Apply above both top and bottom bearing lugs.	Fig. 6 — L ₁ and 6 — L ₂
		†Vertical Pawl	Apply between the pawl bearing lugs and the end of armature, and to the vertical pawl finger where it contacts the vertical pawl guide.	Fig. 7 — L ₃ and 7 — L ₈
		Rotary Pawl	Apply between the pawl bearing lugs and the end of armature.	Fig. 8 — L ₄
		Rotary Pawl Guide	Apply to tip of guide.	Fig. 9 — L ₅
		†Double Dog Tooth	Apply to tip of tooth where it engages the release link (where link is provided).	Fig. 6 — L ₆
		Double Dog Spring	Apply to tip where it contacts double dog.	Fig. 6 — L ₇
		†Vertical Armature Bearing Pin	Distribute one dip to points M ₁ through M ₇ in that order.	
			Apply at inner surface of left armature bearing lug and at outer surface of right bearing lug.	Fig. 10 — M ₁ and 10 — M ₂
		Rotary Armature Bearing Pins (2)	Apply where pins emerge from the upper surface of the rotary armature bearing lugs.	Fig. 11 — M ₃ and 11 — M ₄
		†Vertical Interrupter Arm — Bearing Pin (where provided)	Apply at points shown.	Fig. 12 — M ₅
		†Vertical Interrupter Arm	Apply where arm contacts the vert armature (where arm is provided).	Fig. 12 — M ₆
		†Off-Normal Lever	Apply on bearing slightly to right of center of bearing at point shown	Fig. 13 — M ₇

† These parts are not used on 198-type switches.

Note 1: If normal post spring assemblies have rubber rollers, no oil shall be applied to the teeth of the normal post cam or to the rollers.

Note 2: If abnormal wear, as indicated by the presence of metal particles, is experienced after turnover on switches equipped with a helical shaft spring, perform the additional lubrication at the shaft spring as shown in 3.01(7).

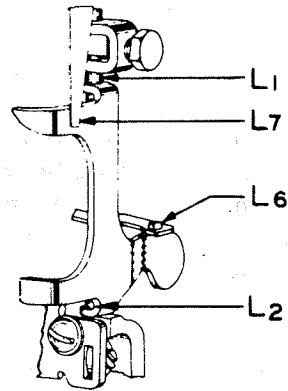


Fig. 6

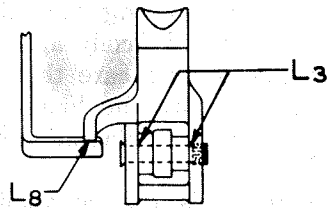


Fig. 7

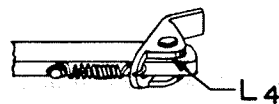


Fig. 8

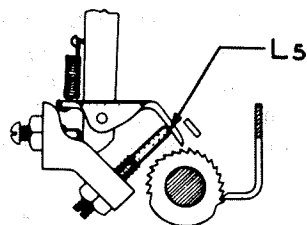


Fig. 9

Fig. 6-9—Lubrication Points for Pawls, Double Dog, and Associated Parts of 197- and 198-Type Switches

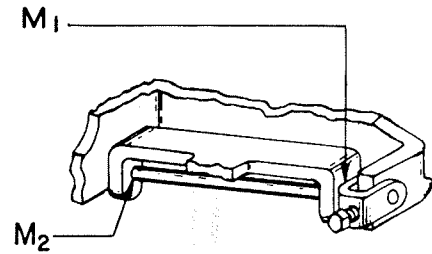


Fig. 10

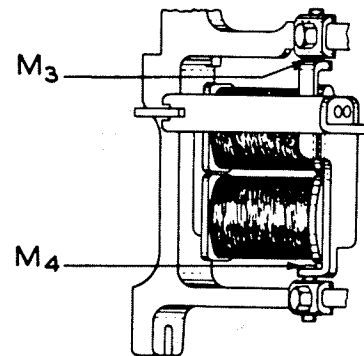


Fig. 11

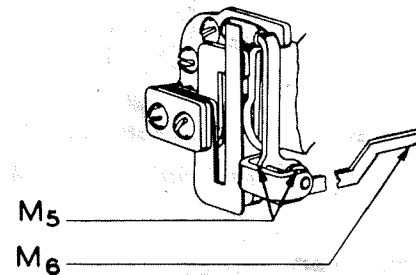


Fig. 12

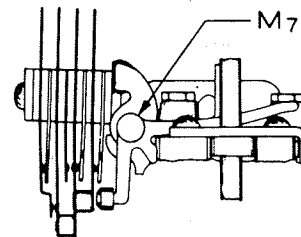


Fig. 13

Fig. 10-13—Lubrication Points for Armature Bearings, Vertical Interrupter Arm Bearing Pin, Vertical Armature Arm, and Off-Normal Lever of 197- and 198-Type Switches

Fig. 6-13—Lubrication Points Covered in Table A and Table B

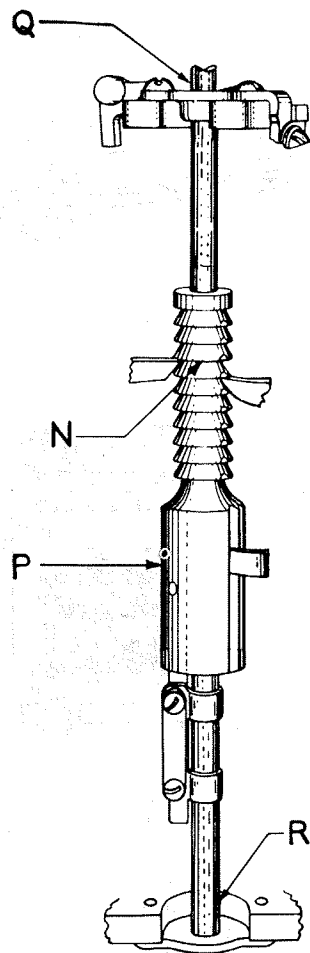


Fig. 14—Lubrication Points for Shaft and Associated Parts of 198-Type Switches Covered in Table A

3. ADJUSTING PROCEDURES

3.001 List of Tools and Materials

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
KS-6320	Orange Stick
KS-14208	Brush
MATERIALS	
KS-2423	Cloth
KS-7860	Petroleum Spirits
KS-16832 L2	Lubricant

3.01 Lubrication (Reqt 2.01)

- (a) Before lubricating the ratchets and shaft, remove old lubricant and foreign material from the surfaces of the vertical and rotary ratchets and from the shaft between the lower bearing and the top wiper, with the shaft at vertical normal. Use the rolled, dry KS-2423 cloth as covered in the section for cleaning these parts.
- (2) Make sure the container of lubricant has been shaken as covered in 1.03.
- (3) Lubricate the various parts of the switch using the KS-14208 brush. Distribute the lubricant retained by the brush after each dip as specified. In applying the lubricant, the brush should be wiped firmly against the parts being lubricated, taking care that most of the lubricant retained by the brush is actually deposited at the various lubrication points.
- (4) If the lubricant is properly applied, 2 ounces of lubricant will be used on 65 to 75 switches. If an appreciably larger number of switches is lubricated with this quantity of lubricant, make sure that the brush has not become worn and pay particular attention to (3) of this procedure and 1.04.
- (5) If, after a few days, lubricant is observed on the hub of a sleeve wiper, this may indicate a worn shaft bearing. In this case, consider replacement of the lower shaft bearing and felt washer as covered in Section 030-705-802. If excessive lubricant has accumulated on the hub of the sleeve wiper, it may be advisable to remove lubricant from this point with a KS-14208 brush, taking care not to remove lubricant from the bearing surfaces of the shaft. If the brush is used in this manner, flush it with KS-7860 petroleum spirits and wipe it with a clean KS-2423 cloth.
- (6) To lubricate the normal pin clamp surface that bears against the shaft spring bracket, lift the shaft spring bracket and insert the KS-14208 brush between the bracket and the top of the normal pin clamp.
- (7) To lubricate the shaft extension sleeve and shaft spring, insert the end of a KS-6320 orange stick between two turns of the shaft

spring approximately 1/4 inch above the lower end of the spring and spread the turns of the spring. Then apply lubricant to the shaft extension sleeve just above the bearing hub of the shaft spring bracket, using the KS-14208 brush. If there is evidence of abnormal wear, as indicated by the presence of metal particles, distribute an additional dip between the following two points in this order:

- (a) To the shaft spring sleeve between two turns of the shaft spring approximately 3/4 inch above the lower end of the spring, and
- (b) To the spring end as retained in the bayonet slots of the shaft extension sleeve. If a need for cleaning is evident, place a vertical pencil mark on the shaft spring below the cap to make it easier to rewind the shaft spring with the same number of quarter turns. Then grasp the spring cap with the fingers and turn it in a clockwise direction as far as the bayonet slot in the shaft extension sleeve will permit. Lift the cap until the crossbar is free of the bayonet slot and allow the spring to unwind slowly. Disengage the lower loop of the spring from the lug on the shaft spring bracket and lift the spring and bracket off the shaft extension sleeve. Using a clean KS-2423 cloth, clean the shaft extension sleeve and the bearing of the shaft spring bracket. Then apply lubricant with the KS-14208 brush to the portion of the shaft extension sleeve that rotates in the shaft spring bracket bearing.

(8) Remount the shaft spring bracket and shaft spring and engage the lower loop of the spring with the lug on the shaft spring bracket. Then turn the shaft spring cap in a clockwise direction. After each quarter turn, the crossbar in the spring cap may be dropped into the slots in the shaft extension sleeve to maintain the tension while a new hold is secured for any further increase in tension that may be required. Continue to turn the shaft spring until the pencil marks placed on the spring again form a vertical line. The shaft spring will then have the same tension as it did prior to its removal. When finally adjusted, observe that the crossbar in the spring cap is engaged in the bayonet slots to lock the spring in the adjusted position. Check that the tension of the shaft spring meets the requirement and readjust, if necessary, as covered in Section 030-705-702.

(9) After the parts have been lubricated, operate the switch a few times to work the lubricant into the bearings. Replace cover as soon as is practicable after lubricating the switch.

(10) Remove any excess lubricant with a clean KS-14208 brush to prevent the lubricant from creeping to parts where it might cause trouble.

3.02 *Record of Lubrication* (Reqt 2.02)

No procedure.

