# 28 Teletypewriter Keyboard and Base (KSR and RO)

## Lubrication

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#### Later Design Keyboard

- Breaklever: 4
- Codebar: 5
- Codebar bail: 9
- Codelever: 4
- Codelever universal bail: 11
- Contact box: 7
- Electrical line break: 10
- Function clutch: 7
- Intermediate gear: 8
- Keyboard lock: 4
- Keylever: 3
- Local carriage return: 5
- Local line feed: 8
- Local paper feed-out: 11
- Lockbar latch: 11
- Locking bail: 9
- Margin indicator: 8
- Nonrepeat lever: 6
- Shaft: 8
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- Universal bail latchlever: 10

#### Variable Features (Keyboard)

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#### Earlier Design Keyboard

- Answer-back blinding (pulsing) contact: 33
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- Codebar: 28, 29
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- Keyboard selector: 29
- Local carriage return: 26
- Local line feed: 26
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- Repeat on space: 36
- Signal generator clutch: 32
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- Signal generator shaft: 31
- Signal line break (electrical): 36
- Time delay mechanism: 32

#### Receive-Only (RO) Base

- Signal line break: 37

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1.02 The photographs show the paragraph numbers referring to particular line drawings of mechanisms, and where these mechanisms are located on the unit. The line drawings are provided to illustrate the points of lubrication and the quantity of lubricant to be used. Parts in the line drawings are shown in an upright position unless otherwise specified.

1.03 The symbols on the illustrations indicate lubrication as follows:

- O1: Apply 1 drop of oil.
- O2: Apply 2 drops of oil.
- O3: Apply 3 drops of oil.
- G: Apply thin film of grease.
- SAT: Saturate (felt oilers, washers, wicks) with oil.

1.04 Use TP88970 (KS7470) oil at all locations where the use of oil is indicated. Use TP88973 (KS7471) grease on all surfaces where grease is indicated.

1.05 Lubricate the unit just prior to placing it in service. After a few weeks in service, relubricate to make certain that all points receive lubrication. The following lubrication schedule should be followed thereafter:

<table>
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<th>Operating Speed (WPM)</th>
<th>Lubrication Intervals</th>
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<tr>
<td>60</td>
<td>3000 hours or 1 year*</td>
</tr>
<tr>
<td>75</td>
<td>2400 hours or 9 months*</td>
</tr>
<tr>
<td>100</td>
<td>1500 hours or 6 months*</td>
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*Whichever occurs first.

1.06 All spring eyes, spring wicks and felt oilers should be saturated. The friction surfaces of all moving parts should be thoroughly lubricated. However, over-lubrication, which will permit oil or grease to drip or be thrown on other parts should be avoided.

CAUTION: SPECIAL CARE MUST BE TAKEN TO PREVENT ANY OIL OR GREASE FROM GETTING BETWEEN ELECTRICAL CONTACTS.

1.07 Apply a thick film of grease to all gears. Apply oil to all cams, including the camming surfaces of each clutch discs.
2. LATER DESIGN KEYBOARD

2.01 Keyboard - Bottom View

2.02 Spacebar

2.03 Keylever
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2.04 Breaklever

2.05 Codelever

2.06 Keyboard Lock
2.07 Keyboard - Top View

2.08 Codebar

- Hooks - Each End (7 Springs)
- Guide Slots (Left and Right - Top and Bottom)
- Codebar Guides

2.09 Local Carriage Return

- Hooks - Each End
- Bearing Surface (2 Places)
- Engaging Surface
- Spring
- Local Carriage Return Function Bail
- Local Carriage Return Function Lever
2. 10 Signal Generator Mechanism - Top Rear View

2. 11 Nonrepeat Lever

(Front View)

O1 Bearing Surface
SAT Felt Washer (Rear View)
O2 Bearing Surface
O1 Hooks - Each End
G Engaging Surface
O2 Bearing Surface
O2 Guide Slot

Codebar Bail Roller
Nonrepeat Lever Crank
Nonrepeat Lever Crank
Spring
Nonrepeat Lever
Nonrepeat Lever
Nonrepeat Lever

2. 12 Transfer Lever

O1 Guide Slots
O1 Hooks - Each End (7 Springs)
O1 Guide Slots
SAT Felt Washers (4 Washers)
O1 Guide Slots

Transfer Levers (7 Levers)
Spring
Transfer Levers (7 Levers)
Camming Surfaces
Transfer Levers (7 Levers)
2.13 Contact Box

Note: Contact box cover must be removed prior to lubrication. To remove contact box cover, remove securing nut and lockwasher.

G Engaging Surface Contact Toggle

O1 Hooks - Each End Spring

CAUTION: GREASE SPARINGLY - KEEP CONTACTS FREE OF OIL OR GREASE.

2.14 Transfer Bail

SAT Felt Washers (2 Washers) Latches

G Engaging Surface Transfer Bail

O1 Hooks - Each End (2 Springs) Spring Transfer Bail

O2 Bearing Surface Transfer Bail

SAT Oil Wick Transfer Bail

2.15 Function Clutch

O2 Latching Surface Clutch Stop Lever and Clutch Latchlever

O1 Hooks - Each End (2 Springs) Spring Clutch Tripbail

SAT Felt Washers (2 Front & Rear)
2.16 Margin Indicator

O1 Engaging Surface (See Note) Margin Indicator Switch
O1 Bearing Surface Switch Lever
O1 Hooks - Each End Spring

Note: Engaging surface of switch and lever shall not be lubricated if switch has a nylon actuator.

2.17 Local Line Feed

O2 Guide Slot Local Line Feed
O1 Bearing Surface Trip Link
O1 Hooks - Each End Local Line Feed Function Lever
O1 Bearing Surface Function Bail
O1 Bearing Surface Local Line Feed Function Lever

2.18 Shaft

SAT Felt Washer Signal Generator Shaft
G Gear Teeth Signal Generator Shaft
O20 Oil Hole Signal Generator Shaft
G Each Hook Shoe Lever Spring
G Internal Mechanism Keyboard Clutch
SAT Felt Wick
O20 Oil Hole Signal Generator Cam
O2 Camming Surface Each Cam Signal Generator Cam
SAT Felt Washer Signal Generator Shaft

2.19 Intermediate Gear

O6 Each Oiler (Total 4 Oilers) Motor Shaft
G Teeth (2 Gears) Intermediate Gears
O2 Ball Bearing (2 Bearings) Intermediate Gear Shaft
2.20 Signal Generator Mechanism - Right Top View

2.21 Locking Bail

- O1 Hooks - Each End
- SAT Felt Washers (2 Front & Rear)
- SAT Felt Wick
- O1 Guide Slots (3 Slots)
- Spring
- Locking Bail Post
- Camming Surfaces
- Locking Bail

2.22 Codebar Bail

- SAT Felt Washers (2 Washers)
- O1 Bearing Surface (2 Places)
- O1 Hooks - Each End (2 Springs)
- SAT Felt Washer
- O4 Bearing
- O2 Bearing Surface
- O2 Engaging Surface
- Codebar Bail
- Codebar Bail
- Spring
- Codebar Bail Latch
- Codebar Bail Latch
- Eccentric Follower
2.23 Universal Bail Latchlever

- O1 Hooks - Each End
- SAT Felt Washer
- O2 Guide Slot (Each Side of Slot)
- G Engaging Surface
- Spring
- Universal Bail Latchlever
- Universal Bail Latchlever
- Reset Bail Latch

2.24 Keyboard - Left Front View

2.25 Electrical Line Break

- O1 Hooks - Each End
- G Contact Surface
- SPRING Sensitive Switch
- Breaklever

- O1 Bearing Surface
2.26 Codelever Universal Bail

2.27 Lockbar Latch

2.28 Local Paper Feed-Out

(Later Design)
3. VARIABLE FEATURES (KEYBOARD)

3.01 Local Backspace and Line Feed Mechanisms - Left Top View

3.02 Local Backspace

- Bearing Surface
- Hooks - Each End
- Engaging Surface
- Guide Slots (2 Places)
- Function Lever
- Spring
- Guide Bracket
- Operating Bail

3.03 Local Reverse Line Feed

- Bearing Surface
- Engagement Surface
- Guide Slots (2 Slots)
- Bearing Surface (2 Places)
- Hooks - Each End
- Function Lever
- Spring
3.04 Answer-Back Mechanism - Top Rear View

3.05 Answer-Back - Sensing Levers

- O1 Camming Surfaces (5 Places) Sensing Levers
- O2 Bearing Surface Detent Lever
- O2 Bearing Surface Detent Lever and Roller
- O1 Hook - Each End Spring
- O1 Bearing Surface Detent Lever Roller
- O1 Hooks - Each End (5 Springs) Springs
- O1 Hook - Each End Spring

3.06 Answer-Back - Armature

- O1 Hook - Each End Spring
- O1 Bearing Surfaces (2 Places) Armature and Shaft
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3.07  Answer-Back Stop Lever

(Front View)

O1  Contacting Surface  Latch and Stop Lever

O1  Latching Surface  Latch and Stop Lever

O1  Camming Surface  Stop Lever

O2  Bearing Surface (2 Places)  Stop Lever and Lever Pivot
3.08 Answer-Back - Codebars and Sensing Levers

(Top View)

- O1 Engaging Surfaces (5 Places)
- Sensing Levers and Codebars
- O1 Bearing Surface (Both Sides)
- Levers Pivot and Side Plate
- O2 Bearing Surfaces (5 Levers)
- Sensing Levers and Levers Pivot
- O1 Guiding Surfaces (5 Places)
- Sensing Levers and Mounting Plate
3.09 Answer-Back Driving Mechanism

(Front View)

- O2 Bearing Surface
- O1 Hook - Each End
- O1 Engaging Surface
- O2 Bearing Surface (2 Plates)
- O1 Engaging Surface
- O2 Bearing Surface
- O1 Engaging Surface

- Eccentric Stud and Drive Link Spring
- Blocking Lever and Stop Lever
- Drive Plate
- Drive Plate Shaft and Side Plate
- Drive Link and Stud
- Blocking Lever and Lever Pivot
- Blocking Lever and Extension

3.10 Answer-Back Stepping Pawl

(Front View)

- O2 Bearing Surface
- O1 Contacting Surfaces
- O1 Hook - Each End
- O1 Contacting Surface
- O1 Contacting Surface

- Stepping Pawl and Eccentric Stud
- Stepping Pawl and Codeblades
- Spring
- Adjusting Screw
- Lever and Latch
3.11 Answer-Back Keyboard Lock Ball

- O1 Engaging Surfaces
- O1 Bearing Surfaces
- G Contacting Surface

Engaging Surfaces Eccentric and Locklever
Bearing Surfaces Function Lever and Bail
Contacting Surface "Here Is" Lever and Bail

(BOTTOM VIEW)
3.12 Variable Speed Drive Mechanism - Rear View

3.13 Variable Speed Drive - Speed Selecting Mechanism

G Gears (11 Including Motor Pinion and Printer Driven Gear) Variable Speed Drive
G Shaft Change Gear Slide
O3 Shoulder Screw Selector Eccentric
O3 Pivot Screw Selector Lever

(Top View from Rear)
3.14 Variable Speed Drive - Speed Selecting Mechanism (Continued)

![Diagram of the speed selecting mechanism with labels for O3, Pivot Post, G, Roller and Sides of Gears, SAT, Felt Washer, Selecting Lever, Selector Link, Selecting Lever, and Roller.]

3.15 Blinding (Pulsing) Contact - Left Rear View

3.16 Cam Follower

![Image of the cam follower with labels for G, Engaging Surface, Cam Follower Extension, O2, Camming Surface, and Cam Segment.]

Note: Avoid getting grease or oil on contact surfaces.
3. 17 Remote Control Gear Shift Mechanism - Top View (Tilted Forward)

3. 18 Remote Control Gear Shift

![Diagram of Remote Control Gear Shift Mechanism]

- **O2 Oilite Bearing (2)** (Oil Each Side Of Bearings)
- **Driven Gear Bearings**
- **G Gear Teeth**
- **Eight Gear Including Motor Pinion**
- **SAT Felt Wicks (2)**
- **Spring Clutches**
- **SAT Felt Wick**
- **Idler Gear**
- **O1 Loops - Each End**
- **Armature Spring**
- **O2 Bearing Points**
- **Armature Shaft**
- **O1 Clutch Springs and Hubs (Light Film During Reassembly)**
- **Idler Gear Bearings**
- **O2 Oilite Bearings (2)** (Oil Each Side Of Bearings)
- **Spring Clutches**
- **O2 Oilite Bearing Washers (4)**
- **60 and 100 wpm**
- **Driver Gear Bearings**
- **O2 Oilite Bearings (2)** (Oil Each Side)
3. 19  Form Feed-Out - Left Rear View

3. 20  Form Feed-Out

- O1 Pivots
- O1 Loops - Each End
- O1 Sliding Surface
- Trip Lever
- Solenoid Torsion Spring
- Form Feed-Out Link

- O1 Pivot
- O1 Loops - Each End
3.21 Lockbar Contact

![Diagram of Lockbar Contact](Bottom View)

Note: Avoid getting oil or grease on contact surfaces.

3.22 Repeat on Space Mechanism

![Diagram of Repeat on Space Mechanism](Front View)
3.23 Keyboard - Top View

3.24 Solenoid Bail

G Fork and Pin Solenoid Armature

O1 Hooks - Each End Spring

Bearing Surface and Retaining Ring Solenoid

Engaging Surface Backspace Link

3.25 Off-Line Contacts

G Engaging Surface Contact Insulator
3.26 Switch Operating Lever

- O1: Hooks - Each End
- O2: Sliding Surface
- G: Engaging Surface

3.27 Universal Keyboard Switch (Not Shown on a Locator Photograph)

- O1: Bearing Surface
- G: Bearing Surface

Function Lever and "Here Is" Keylever Assembly

Contact Insulator
4. EARLIER DESIGN KEYBOARD

4.01 Keyboard - Bottom View

4.02 Codelever

- G: Contacting Surface
- O1: Guide Slots (34 Levers)
- SAT: Felt Washers (7 Washers)
- O1: Bearing Surfaces (34 Wedges)
- O1: Hooks - Each End (38 Springs)
- Codelever Bail
- Codelever
- Codelever Shaft
- Lock Ball Track
- Spring
4.03 Local Carriage Return

- Hook - Each End
- Bearing Surface
- Engaging Surface
- Spring
- Local Carriage Return Trip Shaft
- Local Carriage Return Function Arm

4.04 Local Line Feed

- Guide Slot
- Hooks - Each End
- Bearing Surface
- Bearing Surface
- Engaging Surface
- Spring
- Local Line Feed Trip Link
- Local Line Feed Arm
- Local Line Feed Trip Shaft
- Local Line Feed Function Arm
4.05 Keyboard Lock

- O2 Guide Slot
- O1 Hooks - Each End
- O2 Bearing Surface
- G Engaging Surface
- O2 Bearing Surface

- Keyboard Lock Plunger
- Spring
- Keyboard Lock Plunger
- Keyboard Lock Function Arm
- Keyboard Lock Arm Trip Shaft

4.06 Codebar Mechanism - Top Front View

4.07 Margin Indicator

- O2 Bearing Surface
- O1 Hooks - Each End
- O1 Contacting Surface

- Margin Indicator Contact Lever
- Spring
- Switch Plunger
4.08 Contact Box

Disassembly: Remove nut and lockwasher securing contact box cover and remove cover.

4.09 Codebar

4.10 Codebar (Continued)

4.11 Codelever Bail
4.12 Codebar (Continued)

4.13 Codebar Bail and Eccentric Follower

4.14 Keyboard Selector
4.15 Intermediate Gear - Front View

4.16 Signal Generator Mechanism - Left Rear View

4.17 Intermediate Gears

- O6: Each Oilier (Total 4 Oilers)
- G: Teeth (2 Gears)
- O2: Ball Bearing
- Motor Shaft
- Intermediate Gears
- Intermediate Gear Shaft

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4.18 Signal Generator Shaft

- SAT Felt Washer
- G Gear Teeth
- O20 Oil Hole
- SAT Internal Mechanism
- O2 Camming Surface
- G Each Eye
- SAT Felt Oiler
- O2 Camming Surface
- Each Cam
- SAT Felt Washer

Signal Generator Shaft
Signal Generator Gear
Signal Generator Shaft
Keyboard Cam Clutch
Clutch Disc
Shoe Lever Spring
Cam Sleeve Felt
Signal Generator Cam Sleeve
Signal Generator Shaft

4.19 Intermediate Levers

- O2 Bearing Surface
  (3 Guides)
- O2 Engaging Surfaces
  (3 Places)
- O1 Hooks (Each
  End)
- O2 Bearing Surface

Intermediate Lever Rollers
Intermediate Levers
Spring
Flutter Lever
4.20 Signal Generator Mechanism

- Bearing Surface
- Detent Toggle
- SAT Felt Washer
- Detent Toggle
- O1 Hooks - Each End (2 Springs)
- Spring
- O2 Engaging Surface
- Break Bail
- O2 Bearing Surface
- Oscillating Lever
- O2 Bearing Surface
- Break Rod
- O2 Bearing Surface
- Break Lever
- O2 Guide Hole
- Break Rod

4.21 Signal Generator Clutch

- SAT Felt Washers (2 Front & Rear)
- Throwout Bail and Tripbail
- O2 Engaging Surface
- Clutch Tripbail

4.22 Time Delay Mechanism

- SAT Felt Washer
- Eccentric Follower Pawl
- Bearing Surface
- Eccentric Follower Pawl
- Guide Slot
- Eccentric Follower Pawl
- Engagement Surface
- Eccentric Follower Pawl
- Teeth (2 Wheels)
- Ratchet Wheels
- O2 Bearing Surface
- Ratchet Wheel Each End Shaft
- SAT Felt Washer Contact Pawl
- SAT Felt Washer Latch Pawl
- O1 Hooks - Each End (3 Springs)
- SAT Felt Washer Latchlever
- SAT Felt Washer Spring
4.23 Paper Feed-Out Mechanism - Top View

4.24 Paper Feed-Out

4.25 Answer-Back Blinding (Pulsing) Contact (not shown on Locator Photograph)

Note: Keep oil and grease off of contacts
4.26 Answer-Back Drive Mechanism

- **O1** Pivot Point
- **O2** Bearing Surfaces (2 Places)
- **O1** Engaging Surface
- **O1** Hook - Each End
- Operating Bail
- Drive Plate Shaft and Side Plates
- Blocking Lever and Stop Lever
- Drive Link Spring

*(Front View)*
4.27 Answer-Back Drive Mechanism (Continued)

Note: Lubricate Sensing Lever and Codebar Mechanisms per Paragraphs 3.05, 3.06, 3.07 and 3.08.
4.28 Repeat Space and Signal Line Break - Left Rear View

4.29 Repeat on Space

4.30 Signal Line Break (Electrical)
5. RECEIVE-ONLY (RO) BASE

5.01 Signal Line Break

5.02 Signal Line Break Mechanism - Left Top View