## RECORDER AND PAPER TRANSPORT
### FOR "INKTRONIC®" PAGE PRINTER SET (RO)

### ADJUSTMENTS AND LUBRICATION

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#### Line Feed Mechanism
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- Escapement eccentric
- Escapement pawl clearance
- Line feed drive belt
- Line feed one-way clutch
- Line feed torque
- Lower magnet armature
- Paper feed guide
- Paper guideplate
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1. **GENERAL**

1.01 This section provides the adjustments and lubrication procedure for the maintenance of the recorder and paper transport of the INKTRONIC printer. It is being reissued to incorporate recent engineering changes. Since it is a general revision, marginal arrows ordinarily used to indicate changes and additions are omitted.

2. **ADJUSTMENTS**

**CAUTION: REMOVE POWER FROM SET BEFORE CHECKING OR MAKING ADJUSTMENTS UNLESS OTHERWISE STATED.**

2.01 The adjustments are arranged in a sequence that should be followed as if a complete readjustment of the unit were being undertaken. In following such a procedure, parts or assemblies that are removed to facilitate adjustments should not be replaced until all other adjustments, which would be affected by the removal of these parts, have been made. If any adjustment is changed, related adjustments should be checked. Read the adjustment instructions thoroughly before attempting to make the adjustment. After an adjustment is completed, be sure to tighten any nuts or screws which may have loosened.

2.02 The cover must be removed for most adjustments on the recorder and transport. To check or make adjustments that require power (for example, line feed adjustments), place jumper connector TP330131 into the interlock...
SECTION 592-820-700TC

socket at the left front of the base. If the jumper connector is not available, insert a jumper wire between terminals 3 and 4 of the interlock socket.

CAUTION: DO NOT TOUCH PLATEN AREA WHEN POWER IS ON.

2.03 The recorder must be separated from the transport to provide access to many of the transport mechanisms. For some adjustments you may also find it convenient to separate the transport frame from the transport base. See Section 592-820-703TC for disassembly instructions.

CAUTION: ALWAYS KEEP RECORDER IN AN UPRIGHT POSITION TO AVOID SPILLING INK. THIS INK HAS POWERFUL STAINING PROPERTIES.

2.04 The spring tension values indicated are scale readings which should be obtained when the proper scales are used. Springs that do not meet the requirements, and for which no adjustment procedure is given, should be replaced by new springs.

2.05 Check all moving parts to make sure they are free from binds before operating the unit under power.

2.06 References to right or left, up or down, front or rear, apply to the units as viewed when facing them from front or recorder side.

2.07 Parts ordering information can be obtained from Section 592-820-800TC. For the tools necessary in making the adjustments, refer to Section 570-005-800TC. The following tools are also necessary to adjust the recorder and transport:

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<th>Description</th>
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<tr>
<td>TP310430</td>
<td>Feeler gauge set</td>
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<tr>
<td>TP331041</td>
<td>Go-no-go gauge</td>
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</table>
2.08 Paper Feed Mechanism

THROAT GUIDE SPRING

Requirement
Min 9 oz --- Max 13 oz
to pull spring to installed length.

IDLER PRESSURE ROLLER SPRING

Requirement
With spring scale positioned between idler roller arms (with roller idler arm in the down and locked position), it should require
Min 7 lb --- Max 10 lb
for the spring to just clear the idler roller arms.

BAIL LATCH MOUNTING SCREW
BACKSTOP BRACKET
BRACKET MOUNTING SCREWS

(Right Side View)

PAPER THROAT

Requirement
Clearance between the loop sensing switch arm and the paper throat guide should be
Min 0.280 inch --- Max 0.320 inch

To Adjust
Position backstop bracket for paper throat guide with mounting screws loosened.
2.09 Line Feed Mechanism

**DRIVE PULLEY ENDPLAY**

**Requirement**

With the drive pulley held parallel to side frame, there should be some motion, left to right, between drive pulley and its mounting.

**To Adjust**

Loosen two setscrews on inertia disc and position disc to meet requirement while holding feed roller assembly at right end to make clearance a minimum. Tighten setscrews.

**Note:** There are two flats on the torsion rod at either end. The setscrews should be tightened against the flats.
2.10 Line Feed Mechanism (continued)

ESCAPEMENT PAWL CLEARANCE

Requirement
Clearance between the end of a tooth on escapement wheel and top of each pawl should be

Min 0.004 inch -- Max 0.008 inch

To Adjust

Note 1: When undertaking a complete readjustment, loosen the escapement eccentric bushing and position the eccentric with the slot in the large side of the bushing pointing at a 45 degree angle toward the top rear of the transport.

Note 2: Power is required for this adjustment. However, the line feed motor should be off or its drive belt removed. To remove drive belt, grasp the drive pulley, remove the belt, and let the drive pulley unwind slowly to prevent damage to the spiral spring.

With the escapement bushing tight, loosen two magnet pole mounting screws friction tight. With upper magnet energized (1 amp dc is the normal operating current), position the escapement wheel so that a tooth on the wheel is lined up with the lower tip of escapement pawl. Position magnet assembly by using pry point. Tighten mounting screws. Place drive belt back on pulleys.
2.11 Line Feed Mechanism (continued)

LOWER MAGNET ARMATURE

Note: This and the UPPER MAGNET ARMATURE adjustment require removal of the magnet assembly from the transport. They should be made only if the preceding adjustments related to the escapement pawl are not satisfactory, and if there is improper line feed action. For quickest access to the magnet assembly, remove the guide assembly that covers the lower part of the platen. Since power is required for the adjustment, leave the magnet leads connected. However, remove the high voltage cover from the power supply so the platen area will not be "hot" while making the adjustment.

Requirement
Armature should be in contact with both sides of lower magnet core when magnets are electrically energized (1 amp dc is the normal operating current).

To Adjust
Position lower magnet with three mounting screws loosened. Tighten screws.

UPPER MAGNET ARMATURE

(1) Requirement
With armature in firm contact with upper magnet core, clearance between armature and lower magnet core should be

Min 0.025 inch—Max 0.029 inch

where clearance is least.

(2) Requirement
Armature should be in contact with both sides of upper magnet core when magnets are electrically energized (1 amp dc is the normal operating current).

To Adjust
Position upper magnet with three mounting screws loosened. Tighten screws. Restore magnet assembly to transport. Recheck ESCAPEMENT PAWL CLEARANCE (2.10) adjustment.
2.12 Line Feed Mechanism (continued)

ESCAPEMENT ECCENTRIC

Requirement
With the transport under power and stepping at the local line feed rate of 16 operations per second, there should be no perceptible variation in the notches on the collar next to the escapement wheel when wheel is stopped between steps.

To Adjust
Loosen lower magnet assembly mounting screw and escapement bushing friction tight. Rotate eccentric until there is no perceptible change in motion of notches on collar. Keep large part of eccentric toward upper rear of unit. Tighten screws. Recheck ESCAPEMENT PAWL CLEARANCE (2.10) adjustment and refine, if necessary, to meet the 0.004 inch to 0.008 inch requirement.

Note: If stepping action stops or begins to skip during this adjustment, stop and tighten mounting screws. Readjust ESCAPEMENT PAWL CLEARANCE (2.10) adjustment and then resume the ESCAPEMENT ECCENTRIC adjustment.

LINE FEED TORQUE

Note: If transport is being operated for the first time, or if it has been out of service for a long period of time, operate it for at least seven minutes to make sure all parts are operating freely.

To Check
With no paper in unit, place release arm in the engaged position. Press paper advance button for at least five seconds to make sure spiral spring is fully wound. Grasp outer surface of line feed drive pulley to prevent it from moving. Press and quickly release paper advance button so line feed mechanism advances one line at a time. Count the number of times the mechanism advances as you continue to press and release the button.

Requirement
Spiral spring should store enough energy to drive line feed mechanism 29 to 31 steps with no additional input from the line feed motor.

To Adjust
Remove cover nut from potentiometer on right side frame. Adjust potentiometer to meet requirement. When viewing potentiometer from right side counterclockwise rotation increases the number of steps (torque); clockwise rotation decreases the number of steps (torque). Replace cover nut on potentiometer.
2.13 Line Feed Mechanism (continued)

**PAPER GUIDEPLATE**

To Check
Gauge clearance between platen and guideplate approximately 1/4 inch from each end of paper guideplate. Minimum clearance across entire length should not be less than 0.008 inch nor more than 0.015 inch at any point.

Requirement
Clearance between platen and paper guideplate (measured at designated points) should be
Min 0.008 inch --- Max 0.014 inch

To Adjust
With paper guideplate mounting screws loosened, position guideplate. Tighten mounting screws and recheck requirement.

**PRE-PAPER PULLER DRIVE BELT**

Requirement
Pre-paper puller drive belt should deflect
Min 0.219 inch --- Max 0.281 inch
when a force of 8 ounces is applied to the belt.

To Adjust
With the four motor adjusting screws loosened, position motor. Tighten adjusting screws.
2.14 Paper Feed Mechanism (continued)

DETENT ARM

Requirement
With detent arm in released position, clearance between detent arm and paper pan arm should be

- Min 0.100 inch
- Max 0.125 inch

To Adjust
With two screws securing detent pivot arm loosened, position pivot arm using pry point. Tighten screws.

DETENT ARM SPRING

Requirement
With detent arm in released position

- Min 2-1/2 lb

should be required to start arm moving.
2.15 Paper Tensioner Mechanism

**PAPER TENSIONER**

1. **To Check**
   Insert a piece of teletypewriter paper in paper tensioner assembly. Turn on motors. Attach spring scale through hole in paper and allow paper to move forward slowly (about 1/2 inch per second) for at least a distance of 2 inches.

   **Requirement**
   Pulling force of paper tensioner should be
   Min 1-1/4 oz --- Max 2-1/2 oz
   When paper is moved, it should move slowly without jerks.

2. **To Adjust**
   No adjustment possible. If tensioner fails to meet requirement, it should be replaced.

3. **To Check**
   Apply spring scale to stretch each tensioner spring to installed length.

   **Requirement**
   Tension should be equal within 1/2 ounce on both springs.

4. **To Adjust**
   No adjustment possible. If requirement cannot be met, replace spring(s) and recheck.
2.16 Line Feed Mechanism (continued)

**LINE FEED DRIVE BELT**

**Requirement**
Inside dimensions across belt loop, when an 8 oz force is applied to one side of belt should be
Min 1/2 inch---Max 3/4 inch

**To Adjust**
Position line feed motor with its mounting screws loosened. Tighten screws.

*Note:* Be sure that motor shock mounts do not deflect when force is applied to belt.

**LINE FEED ONE-WAY CLUTCH**

**Requirement**
With clearance taken up between one-way clutch and motor mounting bracket
Min 0.010 inch---Max 0.035 inch

**To Adjust**
With one-way clutch mounting screws loosened, bias one-way clutch against vibration pad provided in motor mounting bracket. Position drive sprocket pulley. Tighten screws.
2.17 Line Feed Mechanism (continued)

**PAPER FEED GUIDE**

(1) Requirement
Clearance between upper guideplate and lower guideplate should be
Min 0.040 inch --- Max 0.055 inch

(2) Requirement
Clearance between lower edge of platen and upper edge of paper guide should be
Min 0.020 inch
and should be parallel within 0.015 inch.

To Adjust
If requirements cannot be met, paper feed guide assembly should be replaced.
2.18 Printing Mechanism

PLaten-Manifold Clearance

Requirement
Clearance between platen and recorder manifold should be
Min 0.584 inch -- Max 0.594 inch

To Adjust
Remove recorder tank cover. Loosen four mounting screws on left and right side brackets, attached to paper transport, which mount the recording head to paper transport. Retighten top mounting screws friction tight. Place go-no-go gauge (TP31041) between front edge of left end of manifold and the platen. Use pry slot to position manifold against gauge. Tighten top mounting screw on left side. Place gauge between right side of manifold and the platen, and use pry slot to position manifold against gauge. Tighten the two mounting screws on right side plate, and bottom screw on left side plate. Check platen-manifold clearance from right to left using go-no-go gauge. Refine adjustment, if necessary, and replace tank cover.
3. LUBRICATION

3.01 The general servicing interval for the recorder and paper transport mechanisms is 5000 operating hours or 1000 rolls of paper run through the transport, whichever occurs first. At this point the unit should be disassembled, cleaned, lubricated, reassembled, and adjusted.

3.02 The following are secondary servicing intervals at which time partial servicing should be accomplished. The secondary servicing intervals are necessary because of the need for: (1) paper lint accumulation, dependent maintenance, and (2) time dependent maintenance.

(a) At 6 month intervals or 100 rolls of paper run through the machine, whichever comes first, perform the following:

1. The escapement wheel and escapement pawl should be cleaned and lubricated.

2. Oil (2 drops) the line feed bearings.

3. Disassemble, clean, reassemble, adjust, and lubricate the paper tensioner assembly.

4. Clean the paper tensioner pressure roller (nylon covered) with a shop towel (TP310397) moistened with trichloroethylene.

5. Check to see if any ink or lubricant has dripped onto the escapement armature or magnet pole faces; if it has, clean them thoroughly.

(b) At the general servicing interval, or when servicing is required due to improper operation, the following parts should be checked for wear or cracks:

1. Escapement wheel
2. Escapement pawl
3. Escapement pawl pivot shaft

4. Line feed roller (rubber covered)
5. Pre-paper puller roller (rubber covered)
6. "O" rings on paper tensioner roller
7. All drive belts (line feed, paper tensioner, and pre-paper puller).

CAUTION: REMOVE POWER FROM SET BEFORE AN ATTEMPT IS MADE TO INSPECT, LUBRICATE, OR CLEAN ANY PORTION OF THE UNIT.

3.03 The photograph shows paragraph numbers referring to particular line drawings of mechanisms and illustrates the location of these mechanisms on the unit. Parts are shown in an upright position, viewed from the front of the unit, unless otherwise specified.

3.04 Spring loops, felt washers, and certain shafts should be oiled. The friction surfaces of all exposed moving parts should be lubricated; however, overlubrication should be avoided. Exercise care to prevent oil or grease from getting between magnet armature pole faces. Keep all electrical contacts free of ink, oil, or grease. Also, keep the cover gasket free of contamination.

3.05 Refer to Section 570-005-800TC for lubricant ordering information.

3.06 The following symbols are used to indicate the type and amount of lubricant required:

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<th>Symbol</th>
<th>Meaning</th>
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<tr>
<td>O1</td>
<td>Apply one drop of oil (KS7470)</td>
</tr>
<tr>
<td>O2</td>
<td>Apply two drops of oil (KS7470)</td>
</tr>
<tr>
<td>O3</td>
<td>Apply three drops of oil (KS7470)</td>
</tr>
<tr>
<td>G</td>
<td>Thin coat of tacky grease (TP145887)</td>
</tr>
<tr>
<td>AL</td>
<td>Areo Lubriplate (TP301313) or Lubriplate 105 (TP108805)</td>
</tr>
<tr>
<td>D</td>
<td>Keep dry — do not lubricate</td>
</tr>
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Note: Before lubricating, remove old lubricant and clean parts wherever possible.
3.06 Paper Transport

3.07 Paper Feed Mechanism

3.09

D Bearing Surface

O1 Bearing Surfaces (4 Places)

AL Bearings (2)

DO NOT LUBRICATE SWITCH ARM

3.10

3.11

3.12

3.13

3.15

3.16

3.17

(Rear - Below Frame)

Slide

Pressure Bail

Pressure Roller

O1 Bearing Surfaces (2 Places)

O2 Hooks (Each End) Bail Springs (2)

D Bearing Surfaces (2 Places) Paper Loop Switch Arm

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3.08 Clutch Assembly

- O3: Spiral Surface (Light Coating)
- O1: Engaging Surface
- O2: Bearing Surface
- G: Engaging Surface of Teeth
- AL: Fill Cavity
- AL: Bearing Surface
- O2: Bearing Surface
- Drive Pulley Spiral Spring
- Spiral Spring Anchor Pin
- Nylon Bushing and Bearing
- Escapement Wheel
- One-Way Clutch
- Drive Pulley
- Paper Drive Pulley

3.09 Escapement Mechanism

- G: Teeth
- G: Engaging Surfaces
- O1: Pivot
- D: Armature
- Escapement Wheel
- Escapement Pawl
- Pawl Shaft
- Note: Whenever the escapement mechanism is disassembled, grease (G) the pawl shaft.
- Magnet
3.10 Tensioner Mechanism

Note: Disassemble paper tensioner to facilitate lubrication. Procedure — remove tensioner shaft assembly from printer and remove retaining ring from each end of roller assembly. Rotate drive roller counterclockwise while holding shaft stationary and exerting approximate 8 ounces pull to separate the shaft and roller. Clean and oil; then reassemble in the reverse order.

CAUTION: KEEP DRIVE MEMBERS FREE OF CONTAMINATION BY GREASE, OIL OR INK.

TENSIONER DRIVE ROLLER

DRIVE ROLLER SHAFT

RETAINING RINGS

IDLERS

TENSIONER ROLLER

AL Bearings (2) Drive Roller Shaft

O1 Hooks (Each End) (2 Places) Spring (2)

O1 Pivot (2) Pressure Roller Shaft Tensioner Shaft
3.11 Pre-Paper Puller Roller Assembly

AL Fill Cavity One-Way Clutch

Note: In order to lubricate the one-way clutch and roller bearings, the roller assembly must be disassembled from its shaft.

AL Bearings (2) Roller Bearings

3.12 Pre-Paper Puller Motor Assembly

O2 Bearings (3) Motor Bearings
3.13 Line Feed Motor Assembly

Note: In order to lubricate the one-way clutch, it must be removed from the motor shaft.

3.14 Paper Tensioner Motor Assembly
3.15 Paper Guide Assembly

- O1 Hooks (Each End) Ball Springs (2)
- G Bearing and Engaging Surfaces Ball
- G Bearing Surfaces Guide Shaft
- O1 Threads Guide Shaft
3.16 Right Side Frame

(Right Side View)

3.17 Power Supply Cap Retainers

(Rear View)