"DATASPEED"* TAPE SENDER

WITH ERROR DETECTION AND CORRECTION

TYPE 4A

ADJUSTMENTS, LUBRICATION, AND DISASSEMBLY

CONTENTS PAGE

1. GENERAL

1.01 This section provides adjustments, lubrication, and disassembly information for Tape Sender 4A.

1.02 Refer to the appropriate adjustment, lubrication and disassembly sections for information on the reader unit (DX type).

ADJUSTMENTS

1.03 The adjustment procedures are arranged in a sequence that would be followed if a complete readjustment of the equipment were

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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 facilitated by the removal of these parts are made. If any adjustment is changed, related adjustments should be checked.

1.04 The spring tension values indicated are scale readings which would be obtained when proper scales are used as specified. Springs that do not meet the specified requirement and for which no adjustment procedure is given should be replaced with new springs.

1.05 Before proceeding with any adjustment, read the applicable portion of the adjustment text carefully. After the adjustment is completed, be sure to tighten any screws or nuts which may have been loosened.

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

1.07 Ordering information for parts and tools can be obtained from the appropriate parts and tool sections.

LUBRICATION

1.08 Use oil or grease as specified to lubricate the equipment. Oil both loops of all helical springs that exert a nominal tension of less than 2-1/2 lbs. Apply grease to both loops of helical springs that exert a nominal tension of 2-1/2 lbs or more.

1.09 Use TP88970 (KS7470) oil and TP142484 grease when lubricating the equipment.

Note: Teletype part no. TP143484 is a one pound can of grease. The same grease packaged in a four-ounce tube is TP145867; TP88970 is a one quart can of KS7470 oil.

1.10 Specific areas of the equipment requiring lubrication are illustrated. The following designations are used to explain the type and amount of lubrication required:

G - Apply a thin coating of grease
GL - Apply a thin coating of lubriplate
O1 - Apply one drop of oil
O2 - Apply two drops of oil

1.11 Unless otherwise specified, one or two drops of oil or 1/64 inch coating of grease at each of the places indicated should be sufficient.

DISASSEMBLY

1.12 The disassembly procedures covered in this section break the equipment down into its major subassemblies approximately in reverse order to that normally used to assemble a new unit. The appropriate parts sections illustrate the arrangement of the parts.

1.13 In most cases, except where one part or assembly may interfere with the necessary removal of another, the order of disassembly is not important. However, any affected adjustments and related adjustments should be checked after reassembly.

1.14 Before beginning disassembly, disconnect external power and signal connections.

1.15 Unless otherwise specified, remount and replace parts in the reverse order of the disassembly instructions.

1.16 Disassembly of the electronic modules is not ordinarily required and is therefore not included.

2. ADJUSTMENTS

2.01 Tape Transport and High Speed Reader Assembly

POSITIVE-DRIVE BELTS

Note 1: Reasonable attention should be given to belt handling, pulley alignment, and belt tension to assure long belt life, minimum wear, and quiet operation.

Note 2: During installation, do not force or pry a belt over the edge of a pulley flange. Instead, reduce the center-distance between the driven and driver pulleys so that the belt slides easily onto the pulley.

PULLEY ALIGNMENT

Requirement

Driver and driven pulleys and shafts should be aligned so that shafts are parallel, as gauged by eye. Misalignment results in unequal tension and uneven belt edge wear.

BELT TENSION

(1) Requirement

Tension on long positive-drive belt (between winder shaft and reversing tape puller shaft) should be taut enough to prevent belt from sagging and causing teeth to intermesh.

(2) Requirement

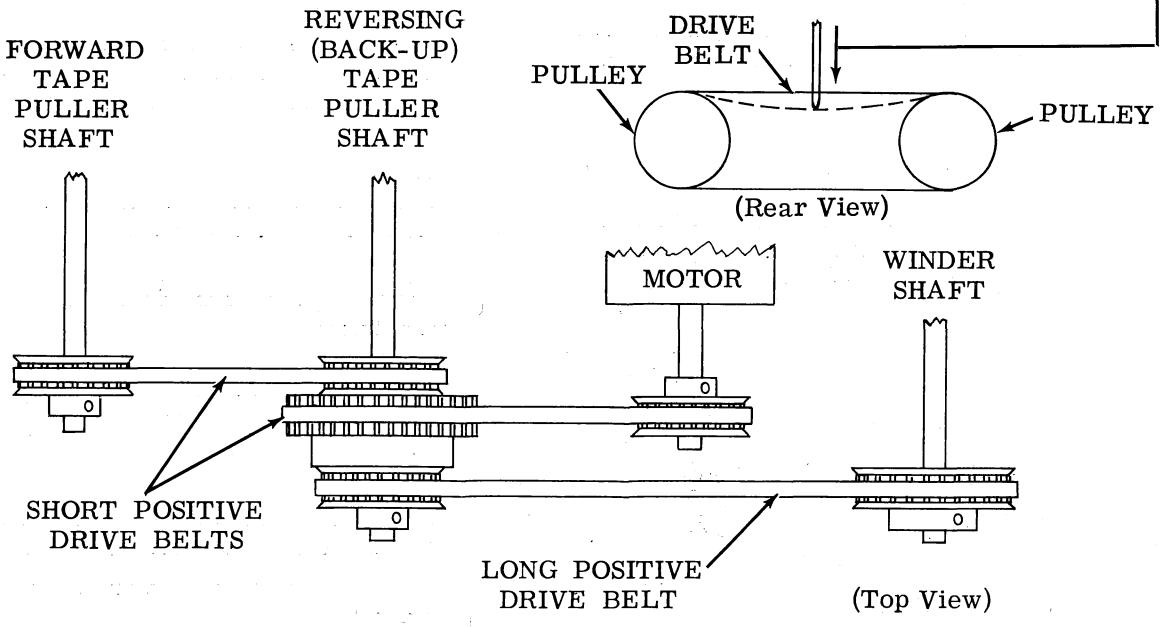
Tension on two short positive-drive belts (connecting motor drive and forward tape puller shafts to reversing tape puller shaft) should be such that 2 to 4 ounces of force applied perpendicular to belts, midway between pulleys, causes deflection of 1/4 inch, $\pm$1/8 inch.

(3) Requirement

With 2 to 4 ounces of force applied perpendicular to long positive-drive belt, midway between pulleys, belt deflects 7/16 inch, $\pm$1/8 inch.

To Adjust

Generally, adjust tension by varying center-distance between pulleys until satisfactory operation is obtained. Each belt should be installed with minimum tension (snug fit), not too tight or too loose; there should be no preloading or initial tension. A loose belt may jump teeth on starting; an extremely tight belt fails sooner, causes bearing wear, and is noisy.



2.02 Tape Transport and High Speed Reader Assembly (continued)

FORWARD TAPE PULLER SHAFT

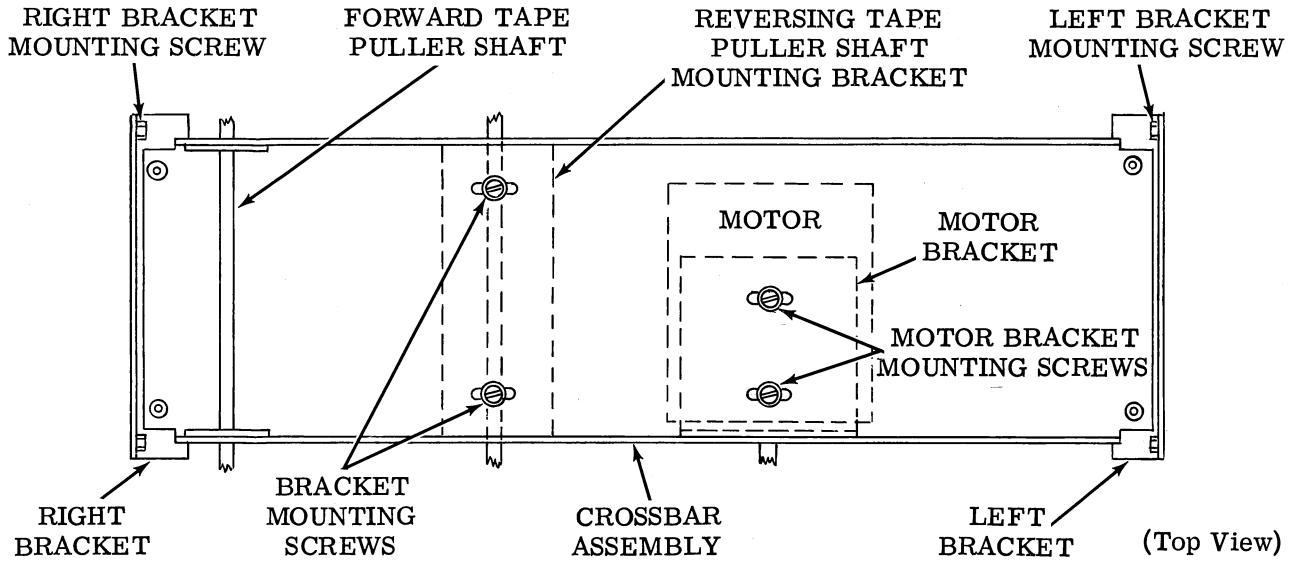
Requirement
Shaft must be positioned approximately midway between top and bottom of front panel clearance hole.

To Adjust
With two screws in left and right brackets loosened, raise or lower crossbar assembly. Edge of crossbar assembly should be parallel with shaft.

REVERSING TAPE PULLER SHAFT

Requirement
Shaft should be parallel with forward tape puller shaft, as gauged by eye, and positive-drive belt tensioned as described in BELT TENSION.

To Adjust
With reversing tape puller shaft mounting bracket screws loosened, position bracket.

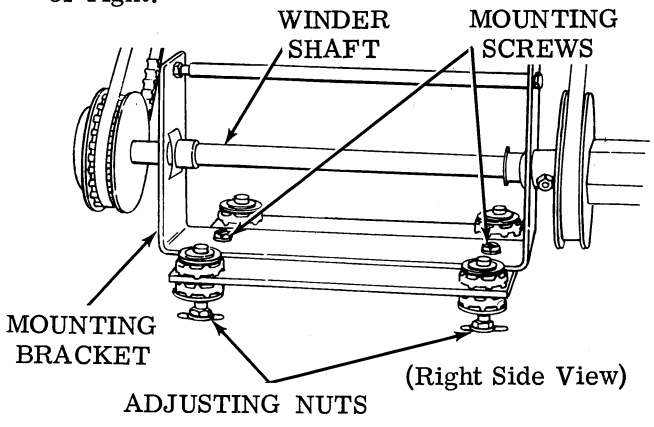


(Top View)

MOTOR BRACKET

Requirement
Motor shaft and reversing tape puller shaft should be parallel (gauge by eye). Check BELT TENSION.

To Adjust
With screws loosened, position bracket left or right.



(Right Side View)

WINDER SHAFT

Requirement
Winder shaft should be parallel with reversing tape puller shaft, as gauged by eye, and positive-drive belt tensioned as in BELT TENSION.

To Adjust
With winder shaft bracket mounting screws loosened, position bracket.

WINDER SHAFT AND FRONT PANEL ALIGNMENT

Requirement
Winder shaft extension should be in approximate center of elongated clearance hole in panel, as gauged by eye.

To Adjust
With four adjusting nuts under winder bracket loosened, position bracket up or down. Recheck REVERSING TAPE PULLER SHAFT.

2.03 Tape Transport and High Speed Reader Assembly (continued)

HIGH SPEED READER FEED ALIGNMENT

Requirement

Reader feed wheel should be in line with tape feed holes when tape is positioned around tape guides near tape entrance and exit of reader.

To Adjust

Adjustment is accomplished by correct reader positioning which primarily positions reader head for optimum tape routing.

READER VERTICAL POSITIONING

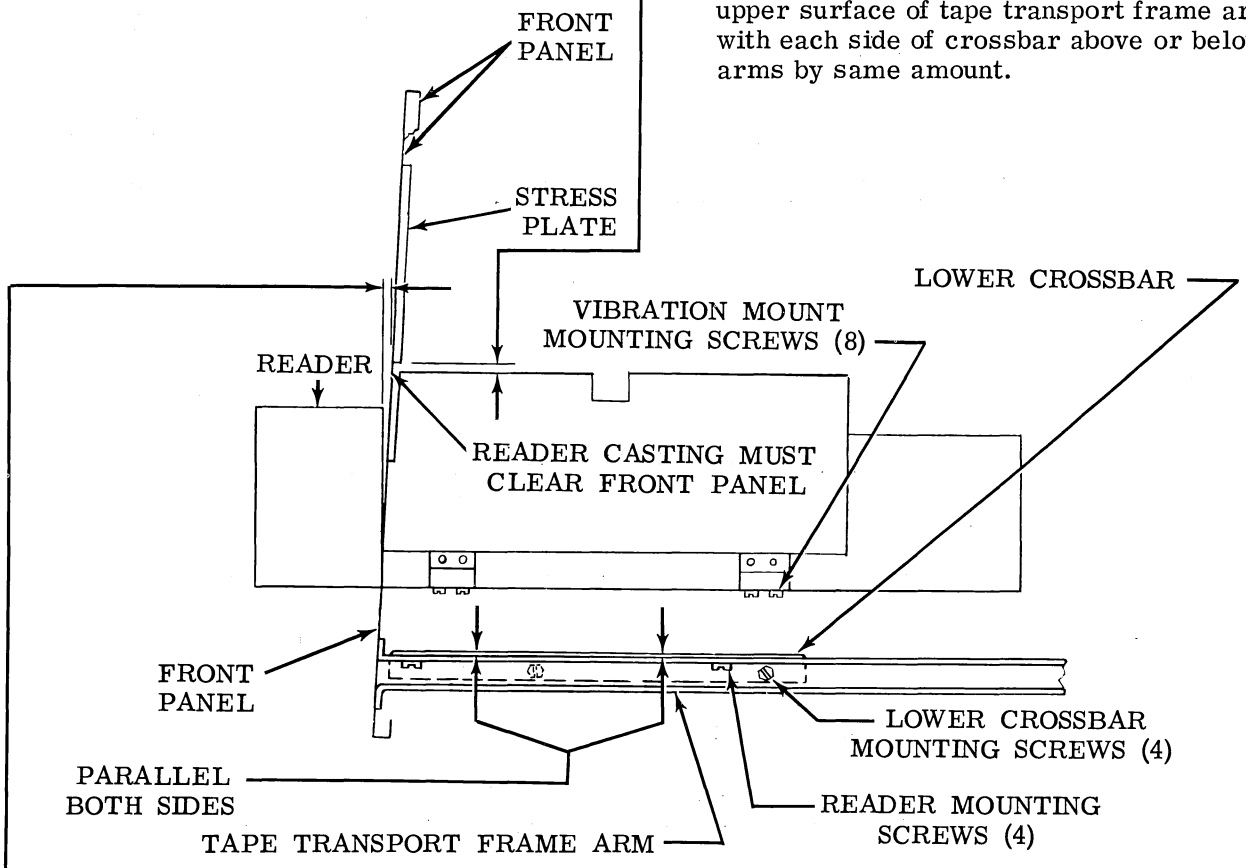
Requirement

Reader should be positioned so that top of lid is flush or just overlaps upper edge of cutout in front panel and reader casting should be below bottom of front panel stress plate by

Min 1/16 inch---Max 1/8 inch

To Adjust

With lower crossbar mounting screws loosened, position crossbar up or down. Surface of crossbar should be parallel with upper surface of tape transport frame arms with each side of crossbar above or below arms by same amount.



READER FRONT AND REAR POSITIONING

Requirement

Rear edge of reader lid should clear front surface of front panel and reader casting should clear inside surface of front panel. Gap must be approximately equal along edge of reader lid and front surface of front panel.

To Adjust

With reader mounting screws loosened, position reader toward front or rear. Make certain reader is positioned at right angles (perpendicular) to front panel surface, as gauged by eye.

2.04 Tape Transport and High Speed Reader Assembly (continued)

READER LEFT AND RIGHT POSITIONING

Requirement

Reader should be positioned so that vertical side surfaces of reader lid are approximately equidistant from vertical edge of front panel cutout on both sides of cutout, as gauged by eye.

To Adjust

With reader mounting screws loosened, position reader to left or right. Recheck REVERSING TAPE PULLER SHAFT (2.02).

If reader adjustment is unsatisfactory, tighten four reader mounting screws, loosen eight vibration mount mounting screws, and position reader to left or right.

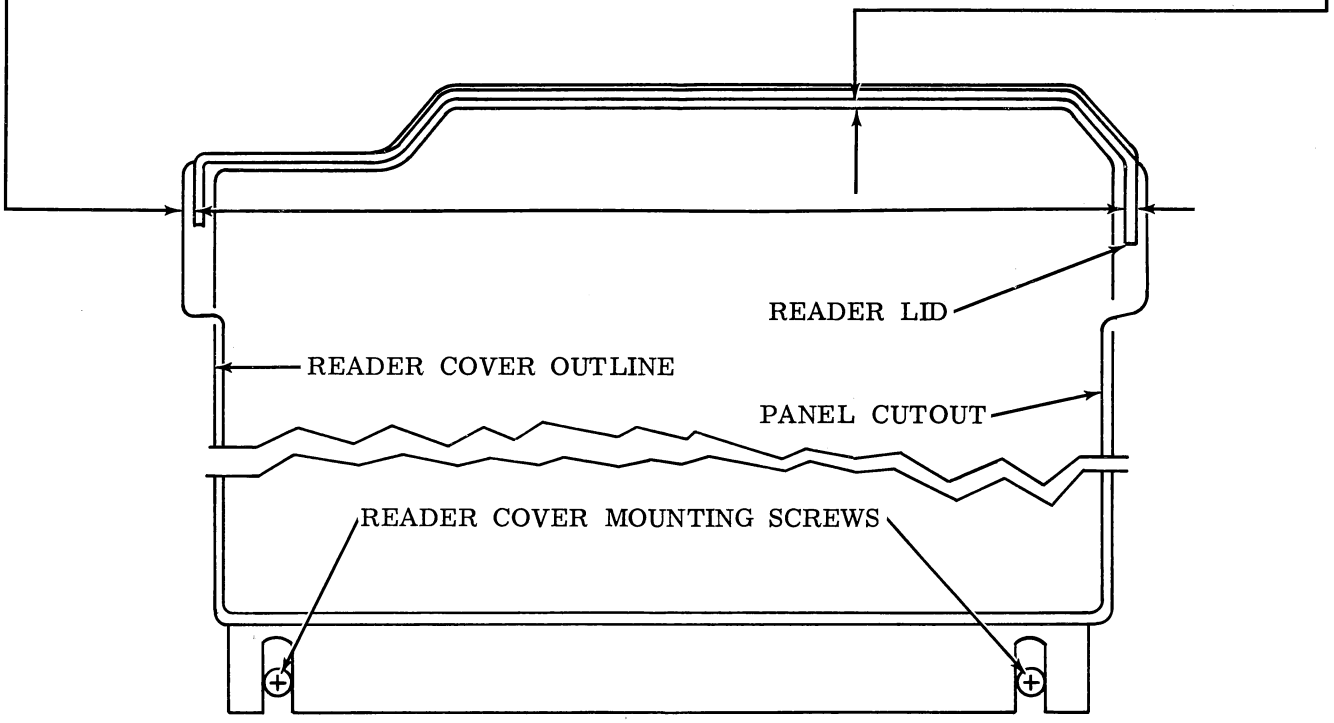
READER COVER

Requirement

Reader cover outline should closely match outline of under side of reader lid.

To Adjust

With reader cover mounting screws loosened, move cover up or down and left or right.



2.05 Tape Transport and High Speed Reader Assembly (continued)

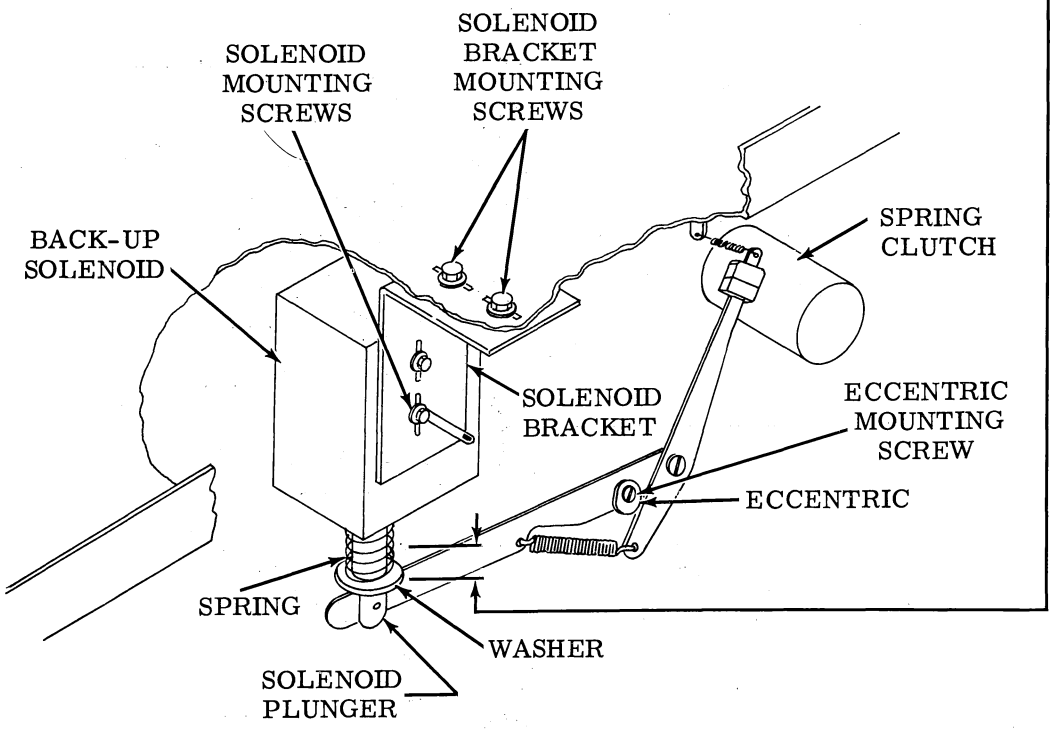
BACK-UP SOLENOID

(1) Requirement
Solenoid plunger should travel about 1/4 inch when solenoid is energized.

To Adjust
With eccentric mounting screw loosened, position eccentric to meet requirement. For additional adjustment, loosen solenoid mounting screws and position solenoid.

(2) Requirement
Solenoid plunger should move freely.

To Adjust
With solenoid bracket mounting screws loosened, position solenoid.



(Rear View)

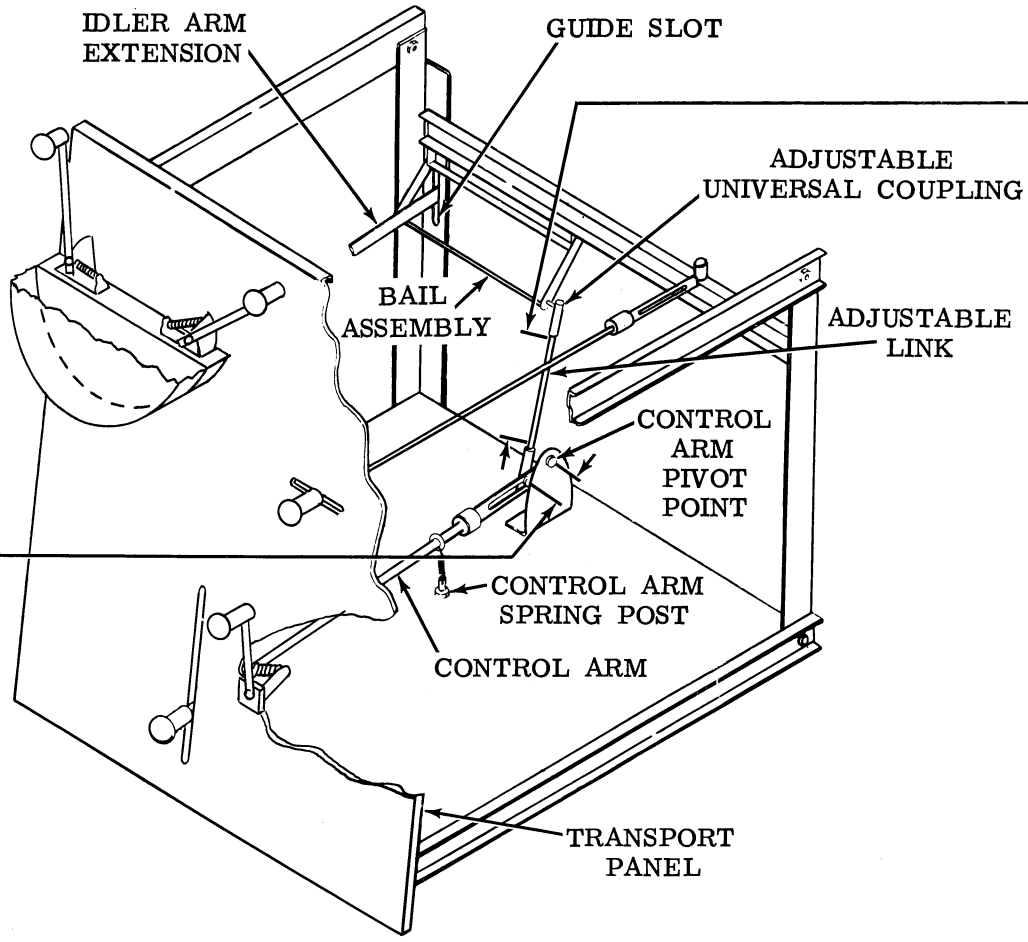
2.06 Tape Transport and High Speed Reader Assembly (continued)

V-BELT CLUTCH

Note: This adjustment continued in 2.07.

(1) Requirement
Idler arm extension should move through about 75 percent of its guide slot as control arm is moved to its travel extremes.

To Adjust
Set adjustable link length at 2-1/2 inches between adjustable universal couplings and tighten locking nuts. Set distance between lower coupling and control arm pivot point to 1-3/4 inches and tighten lower coupling.

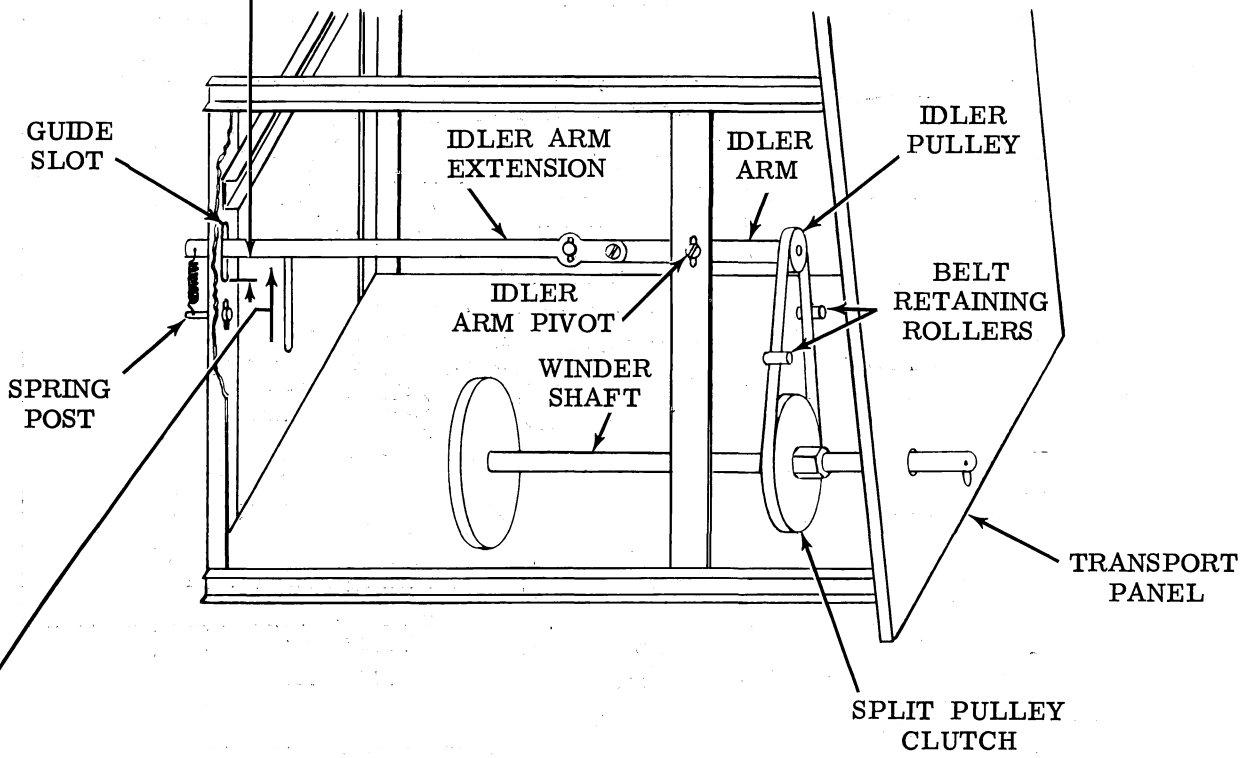


2.07 Tape Transport and High Speed Reader Assembly (continued)

Note: This is a continuation of V-BELT CLUTCH (2.06).

(2) Requirement
Clutch condition should change from fully engaged to disengaged (slipping) as idler arm extension moves through 75 percent of its guide slot.

To Adjust
With idler arm pivot loosened, slide idler arm up or down until arm is parallel to winder shaft and belt fits snug on pulleys. Tighten idler arm pivot. With both screws in idler arm extension loosened, position idler arm and idler arm extension so belt fits snugly with idler arm extension about 1/4 inch from bottom of its guide slot. Tighten both screws.



(Left Side View)

(3) Requirement
It should require
Min 37 oz---Max 45 oz
force to move idler arm extension to top of its guide slot.

To Adjust
With idler arm extension spring post nut loosened, position spring post.

2.08 Tape Transport and High Speed Reader Assembly (continued)

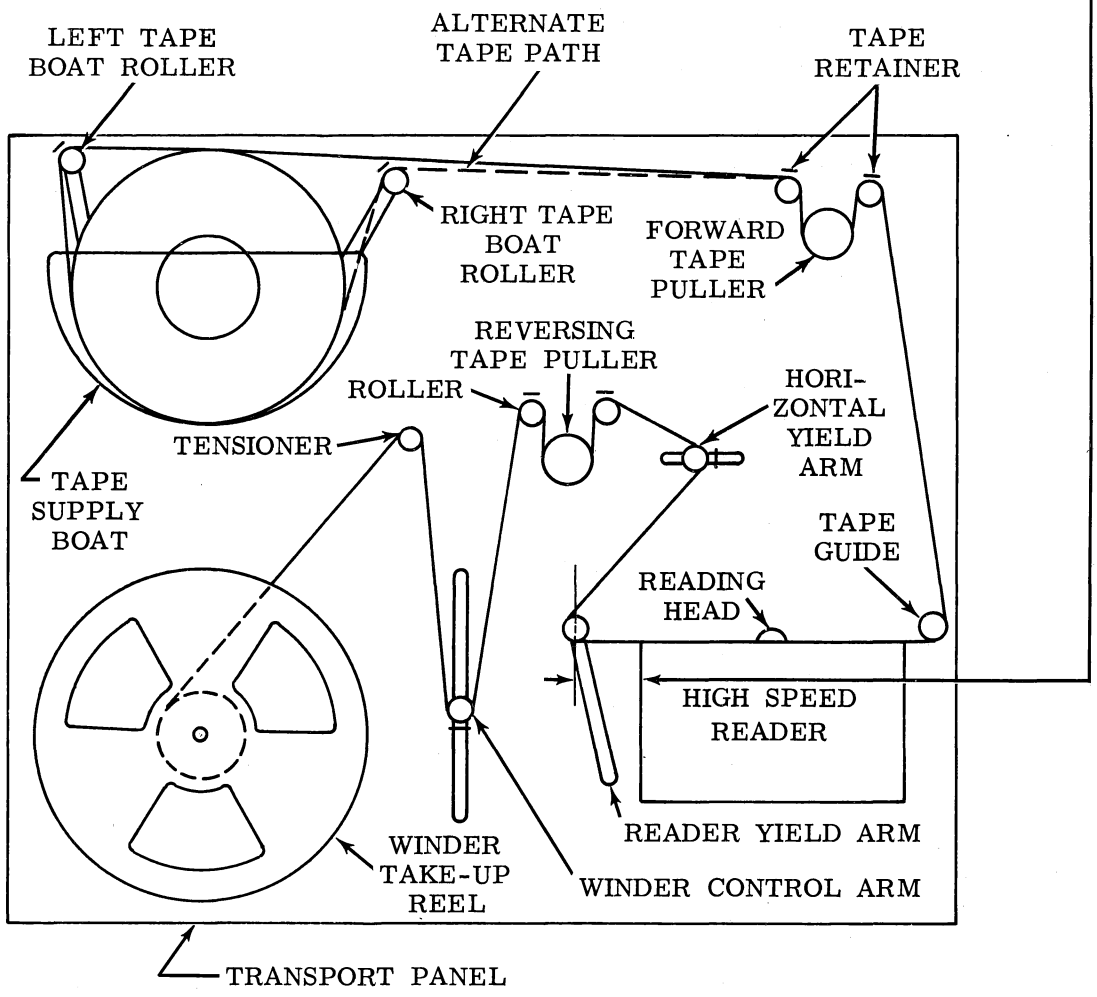
READER YIELD ARM POSITIONING

Requirement

Reader yield arm must be positioned so there is about 1-3/8 inches between its roller axis in free position (against stop) and reader cover.

To Adjust

Position reader yield arm with reader yield arm setscrew loosened.



(Front View)

2.09 Tape Transport and High Speed Reader Assembly (continued)

TAPE RETAINERS

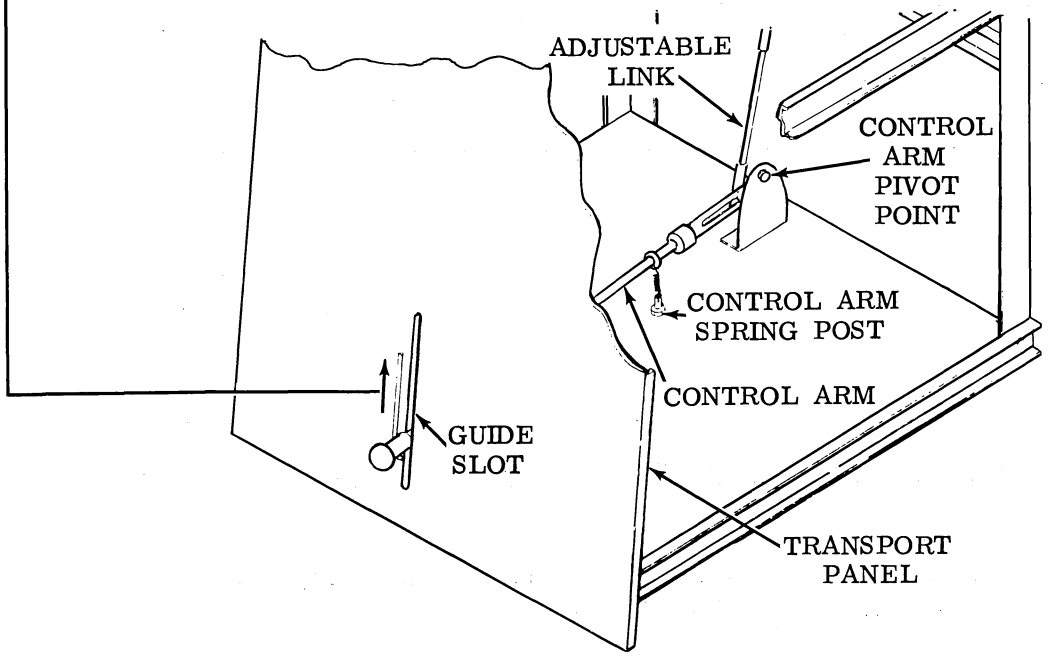
Requirement
Position of each tape retainer must be as shown in front view of transport panel.

To Adjust
Pull associated roller off its hub. With roller hub loosened, position tape retainer. Replace roller.

CONTROL ARM SPRING

Requirement
Min 22 oz---Max 30 oz
to move end of control arm to top of its guide slot.

To Adjust
With control arm spring post nut loosened, position spring post to meet requirement.



2.10 Transmitter Distributor Module

No electrical or mechanical adjustments are required in this module.

2.11 High Speed Error Detection and Correction Transmitter Control Module

Note 1: No mechanical adjustments are required in this module.

Note 2: Use an oscilloscope with dual trace inputs and dc amplifiers (Tektronix Series 516, 540, or 561) in the electrical adjustment of this module.

GATED OSCILLATOR (ZA420)

Gated oscillator is free-running and provides 10-microsecond, positive-going pulses. Connect oscilloscope input to pin A of gated oscillator card ZA420 and adjust potentiometer R1 on card to obtain time interval of 40 milliseconds, ±5 percent, between pulses.

GATED OSCILLATOR (ZA423)

Perform the following procedure:

(1) Place PROGRAM TEST switch in ON position.

(2) Advance programmer to R1 mode (R1 PROGRAM MODE indicator lights) with PROGRAM ADVANCE pushbutton switch.

(3) Connect oscilloscope input to pin A of gated oscillator card ZA423 and adjust potentiometer R1 on card to obtain time interval of 9.52 milliseconds, ±5%, between pulses for operating speed of 1050 wpm.

2.12 High Speed Reader (DX Type)

Refer to the appropriate adjustment section for information on adjustment of the high speed reader.

2.13 Sender Cabinet

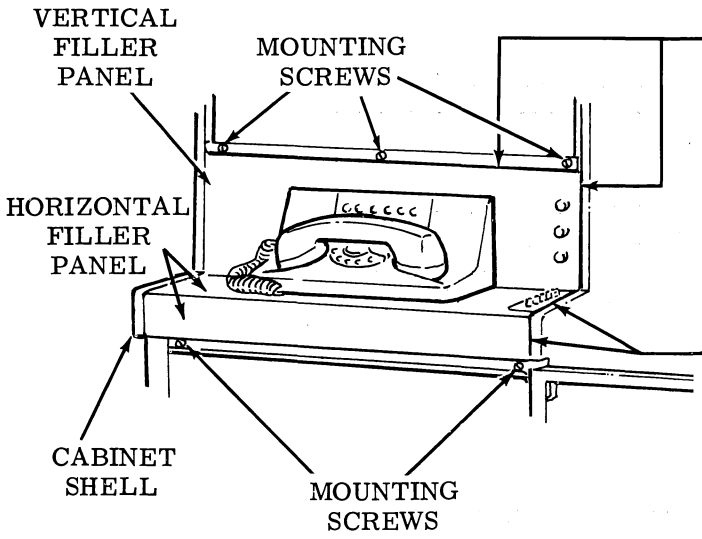
DATA SET RACK SUPPORT

Requirement
Support should retain data set (if required) in correct position within cabinet.

To Adjust
With data set rack support inserted into slot at bottom of station control area, fasten front of support with two no. 8 self-tapping screws in holes provided.

2.14 Sender Cabinet (continued)

FILLER PANELS



(1) Requirement

Vertical filler panel should be mounted with three no. 6-32 screws so that TP302790 pushbuttons are centered in their holes and equal gap is provided between end of panel and cabinet.

To Adjust

With screws loosened, position panel.

(2) Requirement

With control assembly TP302790 mounted, horizontal filler panel should be mounted with two no. 6-32 screws to provide equal gap between panel and cabinet shell.

To Adjust

With screws loosened, position panel.

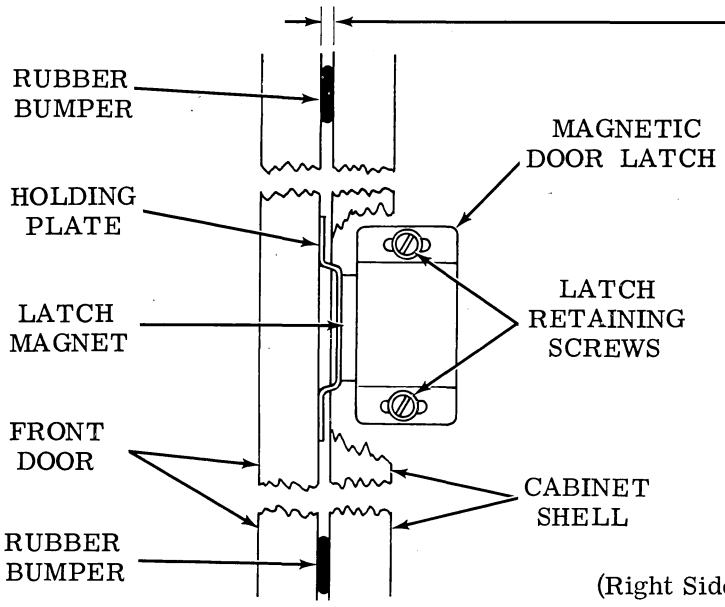
FRONT DOOR

Requirement

Front door is mounted by slipping bottom pin of hinge assembly into bottom keeper hole and by depressing pin of top hinge assembly and slipping pin into top keeper hole. Door should open and close freely without binding; and with door closed there should be a maximum of 1/16 inch gap between door and cabinet shell.

To Adjust

With both magnetic door latch retaining screws loosened, position door latch so that with door closed and rubber door bumpers against cabinet shell, latch magnet completely contacts holding plate on door for maximum retaining force to keep door closed.



(Right Side View)

2.15 Sender Cabinet (continued)

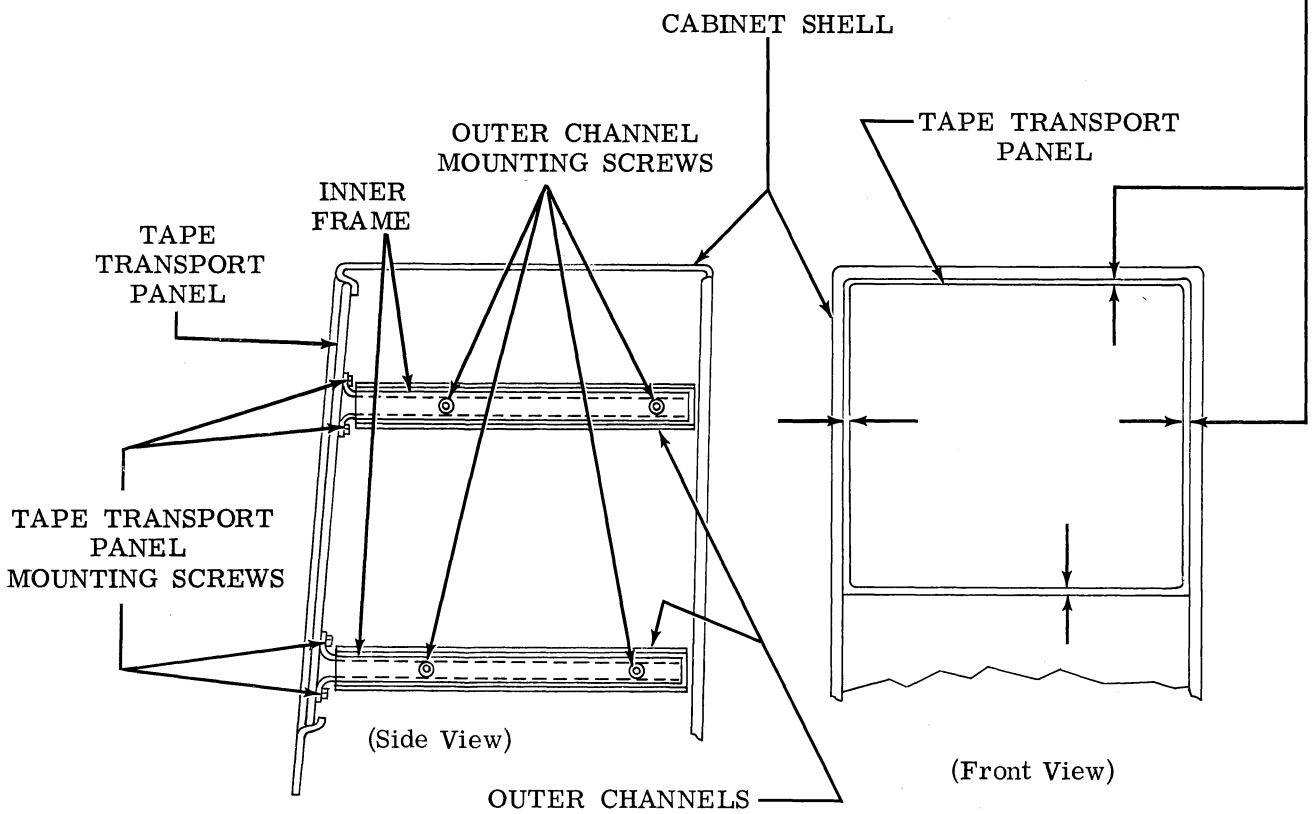
TAPE TRANSPORT PANEL

Requirement

Tape transport panel should be positioned to provide an approximately equal gap between panel and cabinet shell as gauged by eye.

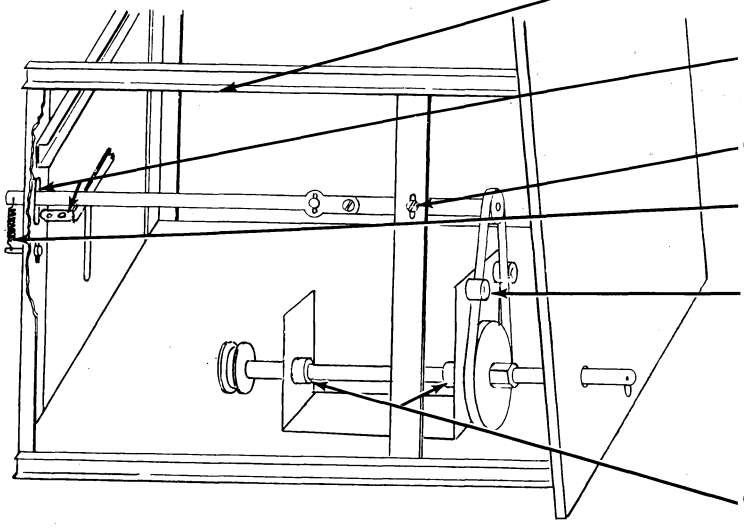
To Adjust

With outer channel mounting screws loosened, move outer channels up or down; and with tape transport panel mounting screws loosened, move panel right or left. If panel cannot be properly centered and wider gap remains between left side of panel and cabinet shell, remove star washers from between cabinet shell and outer channels and place washers between inner surfaces of outer channels and flat washers to facilitate adjustment.



3. LUBRICATION

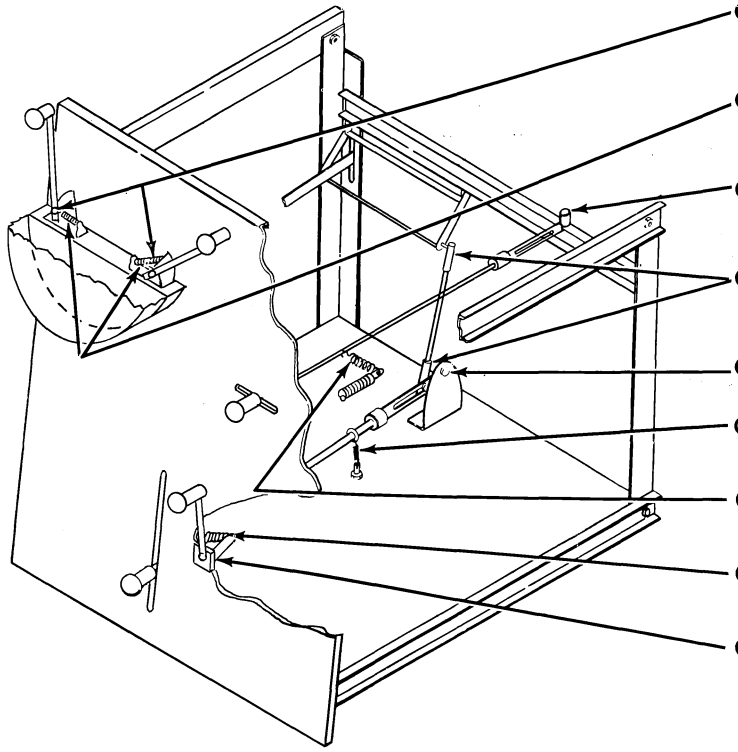
3.01 Tape Transport Assembly



(Left Side View)

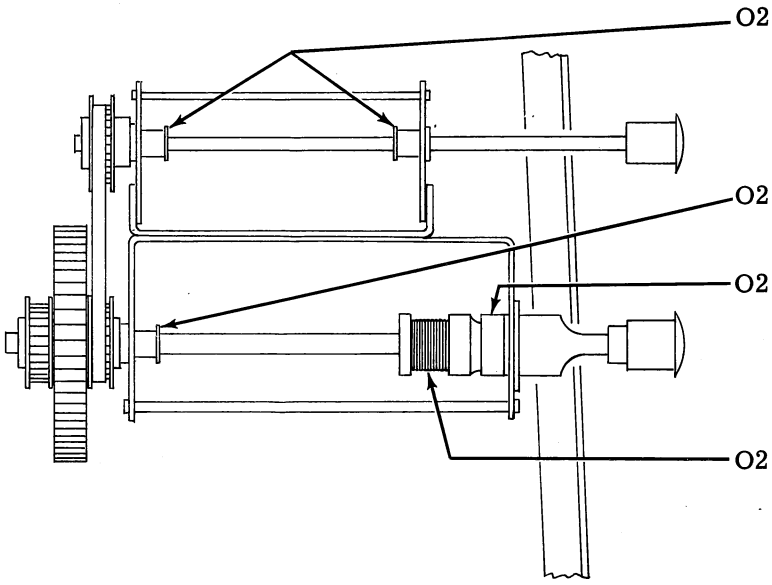
GL	Lower Flange - Bottom (2 Channels)	Slide Channels
G	Contacting Surfaces	Idler Arm Extension
O1	Pivot	Idler Arm
O1	Hooks - Each End	Idler Arm Extension Spring
G	Contacting Surface - Retaining Rings and Rollers Removed (2 Shafts)	Belt Retaining Roller Shafts
O2	Retaining Ring Side (2 Bearings)	Tape Winder Shaft Bearings

3.02 Tape Transport Assembly (continued)



O1	Pivot	Tape Boat Yield Arms
O1	Hooks - Each End	Tape Boat Yield Arm Springs
O1	Pivot	Horizontal Yield Arm
O1	Pivot	Universal Couplings
O1	Pivot	Control Arm
O1	Hooks - Each End	Control Arm Spring
O1	Hooks - Each End	Horizontal Yield Arm Spring
O1	Hooks - Each End	Reader Yield Arm Spring
O1	Pivot	Reader Yield Arm

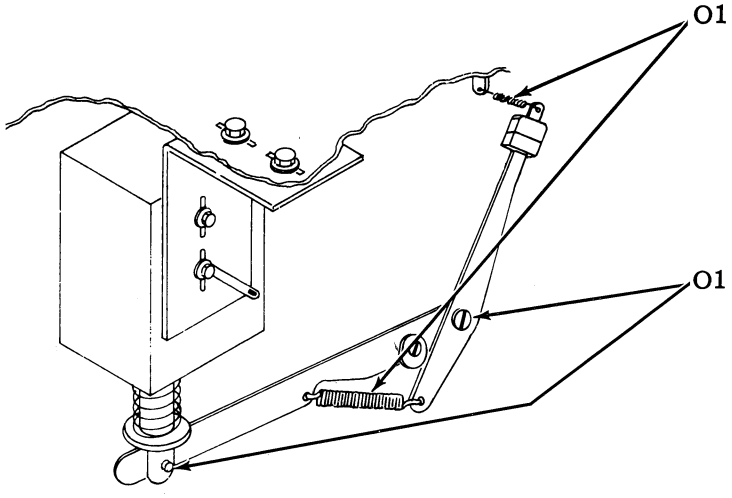
3.03 Tape Transport Assembly (continued)



O2	Retaining Ring Side (2 Bearings)	Forward Tape Puller Bearings
O2	Retaining Ring Side	Back-Up Puller Bearing
O2	Clutch Side	Back-Up Puller Needle Bearing
O2	Spring Surface	Back-Up Clutch Spring

(Left Side View)

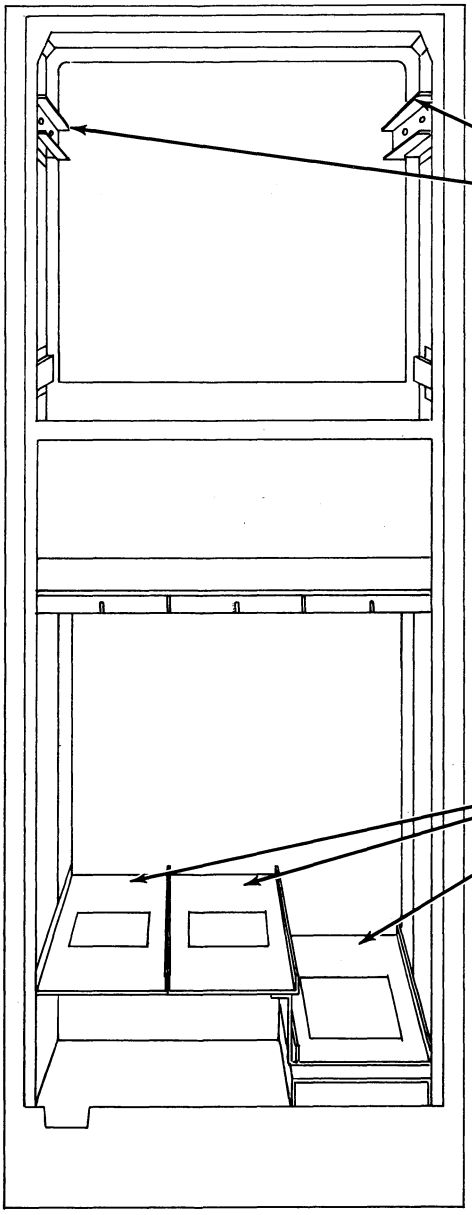
3.04 Tape Transport Assembly (continued)



O1	Hooks - Each End (2 Springs)	Back-Up Solenoid Plunger Assembly Springs
O1	Pivots (Both)	Back-Up Solenoid Plunger Assembly

(Rear View)

3.05 Sender Cabinet



(Rear View)

GL	Upper Flange - Bottom (2 Channels)	Slide Channels
GL	Top Surface (3 Trays)	Trays

Note 1: Refer to the appropriate section for lubrication instructions for the tape reader (DX type).

Note 2: Electronic modules require no lubrication.

4. DISASSEMBLY AND REASSEMBLY

TAPE TRANSPORT AND HIGH SPEED READER ASSEMBLY

A. Tape Reader Removal

4.01 To remove the tape reader from the tape transport assembly, first disconnect the connector from the back of the reader and the grounding strap from the tape transport assembly.

4.02 Remove the reader cover by removing its 2 screws and washers.

4.03 Remove 4 screws and washers holding the tape reader to the base of the tape transport assembly.

4.04 Remove the tape reader by lifting and sliding it to clear the tape transport front panel.

B. Tape Reader Replacement

4.05 To install the tape reader on the tape transport assembly, reverse the procedure for tape reader removal.

C. Tape Reader Disassembly and Reassembly

4.06 Refer to the applicable DX type tape reader disassembly and reassembly section for instructions.

MODULES AND CABINET

4.07 The modules should not be disassembled; however, the electronic circuitry is contained on electronic circuit cards which may be removed and replaced if required. Cabinet disassembly instructions are not required.