

# RCA VICTOR

## RP-178 Series Automatic Record Changer

# SERVICE DATA



RP-178 Series Record Changer

### RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION  
CAMDEN, N. J., U. S. A.

#### RP-178

Uses 117V. 60 cycle motor. For operation on 50 cycle power supply; a spring, Stock No. 73158 is added to the motor shaft.

Used in the following models:

8TV321, 8TV323, 8V7, 8V90, 8V91, 8V112, 75ZU, 77U, 77V1.

#### RP-178-2

Uses 117V. 25 cycle motor.

Used in instruments manufactured by RCA Victor Company Limited (Canada).

#### RP-178-3

Uses 117V./234V. 60 cycle motor. For operation on 50 cycle power supply; a spring, Stock No. S-4774 is added to the motor shaft.

Used in Models 6QU3 and 6QV3.

### Index

Function of Principal Parts .....	
Adjustments .....	
Tone Arm (Out of Cycle) Height Adjustment .....	
Tone Arm Height Adjustment While in Change Cycle .....	
Pickup Landing Adjustment .....	
Record Push Cam and Gear Assembly Adjustment .....	
Removing Turntable .....	
Replacing Turntable .....	
Turntable Centering .....	
Cycle of Operation .....	
Illustrated Service Hints .....	
Pickup Repeats Grooves .....	
Continuous Tripping .....	
Premature Tripping .....	
Failure To Trip or Go Into Cycle .....	
Changer Will Not Complete Cycle .....	
Records Do Not Separate or Drop Properly .....	
Distorted Output .....	
"Wow" or Slow Turntable Speed .....	
Improper Pickup Landing .....	
Rumble .....	

### FEATURES

1. This mechanism is designed to play automatically a series of twelve 10-inch or ten 12-inch standard records of the 78 r.p.m. type.
2. It will play manually records up to 12 inches in diameter.
3. Tripping system is of "eccentric" type, insuring reliable automatic operation on all records made to RMA proposed standards.
4. It is a simple operation of sliding the record support to change from 10- to 12-inch records or vice versa.
5. Cycling mechanism is disconnected completely while records are being played. This reduces the load on the drive motor, thereby reducing the tendency for "wow" or rumble.
6. Low noise sapphire point pickup cartridge.

### AUTOMATIC OPERATION

1. With the power switch in the off position slide the record support shelf as required for 10- or 12-inch records.
2. Place the records to be played in a stack with desired selections upward and in proper sequence with the last record on top. Load them on the changer by placing them over the center post and resting on the record support shelf. Place record stabilizing clamp on top of the record stack.
3. Turn power switch on and press the reject button. The changer will play automatically one side of each record in the stack. The tone arm can be moved to the rest position any time the mechanism is not in cycle.
4. Turn the power switch off, lift the stabilizing clamp and remove the stack from the turntable by placing fingers of both hands directly opposite and under the stack. Then lift straight up—"don't tilt" or squeeze stack.

### MANUAL OPERATION

1. Slide the record support shelf in towards the center post for 10-inch or away from the center post for 12-inch position.
2. Place the record to be played on the turntable and turn the power switch on.
3. Place the pickup on the start of the record.  
**Note:** The mechanism should be allowed to complete cycle before attempting to move tone arm to the rest position.
4. Turn power switch off manually.
5. Remove the record by raising straight up without tilting.

### CAUTIONS

1. Avoid handling the tone arm or sliding the record support assembly while mechanism is in cycle.
2. Never turn the power switch off, leaving the mechanism in cycle for an extended period of time.
3. Do not allow the records to remain on supports when not in use.
4. Do not allow oil or grease to come in contact with any rubber parts.
5. Do not install instrument near source of heat. Excessive heat may damage the pickup cartridge.

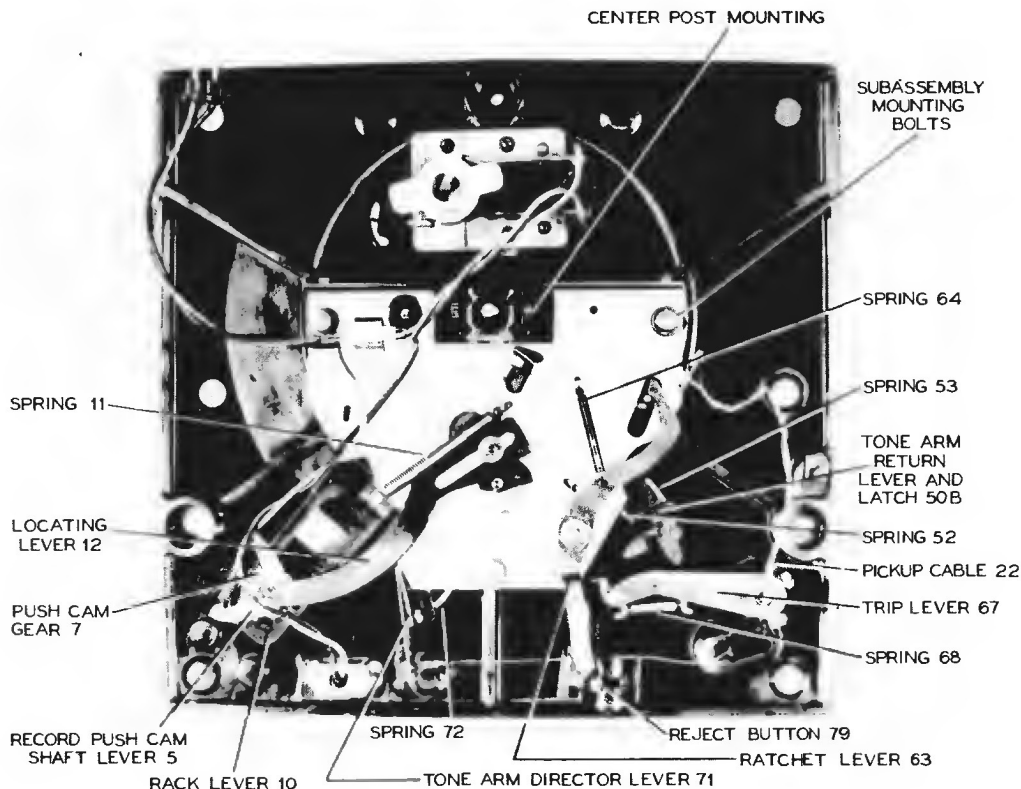


Figure 1

**FUNCTION OF PRINCIPAL PARTS**

**Trip Lever—67**

When the sapphire is riding the eccentric groove, the trip pawl engages the ratchet lever, starting cycle.

**Ratchet Lever—63**

Portion of the lever acts as a ratchet and the other portion incorporates a catch for the stud on the cycling cam carriage. The engagement of this stud prevents the mechanism from going into cycle.

**Center Post—32**

The center post performs the function of supporting and aids in the separation of the records.

**Tone Arm Return Lever and Latch—53B**

The tone-arm return lever, together with the latch, locks and stabilizes the tone arm in its outermost position. It also gives the necessary inward motion to the tone arm.

**Cycling Cam Carriage—50A**

This carriage provides a movable support for the cycling cam.

**Tone Arm Director Lever—71**

The roller on one end of this lever follows a channel in the cycling cam and thereby pulls on the cable directing the vertical and outward motion of the tone arm.

**Locating Lever—12**

The sloped portion of the lever forms a stop for the stud on the tone arm return lever thereby determining the landing position of the pickup.

**Record Push Cam Gear Assembly—5, 7**

Provides a means of coupling the push cam to the rack lever.

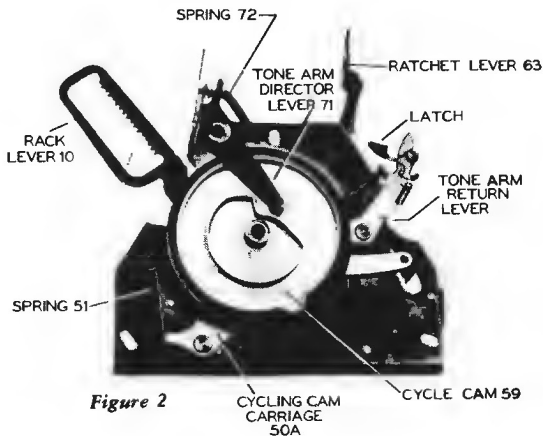


Figure 2

**Record Support—1A, B, C, D**

Provides a support for the edge of the records and a mounting for the record push cam.

**Rack Lever—10**

One end of the lever follows the eccentric elevated portion of the cycling cam causing the lever to move in and out from the center of the mechanism. The teeth on the rack lever engage the teeth in the record push cam gear producing a rotary motion necessary to push the record off the step in the center post.

**Record Push Cam—4**

The oval shaped cam located in the record support, rotates during change cycle. This cam engages and pushes the record from the step in the center post.

**ADJUSTMENTS**

**Tone arm (out of cycle) height adjustment**

1. Rotate the turntable until the change cycle is completed.
2. Move the tone arm to a position off the edge of the record and allow it to rest freely in air.
3. Bend portion of the tone arm bracket so that the sapphire is  $\frac{3}{16}$  inches above the flat surface of the motorboard. (Figure 3.)

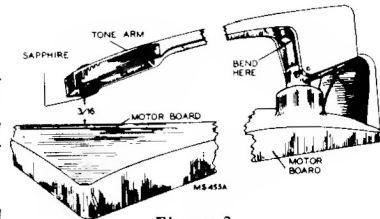


Figure 3

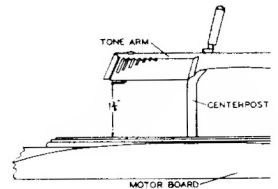


Figure 4

**Tone arm height adjustment while in change cycle**

1. Press the reject button and rotate the turntable by hand until the pickup has raised, to the maximum height in the change cycle.
2. Turn the adjustment screw "A" until the sapphire is  $1\frac{3}{8}$  inches above the turntable. This adjustment will permit the pickup to land and play one record placed on the turntable. At the same time it prevents the tone arm from touching the record resting on the centerpost while the mechanism is going through cycle. (If this height cannot be reached by the adjustment screw, take up on the cotter pin.) (Figures 4 and 5.)

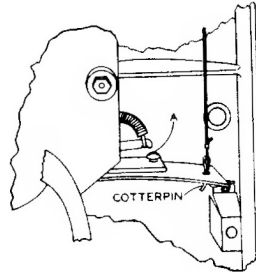


Figure 5

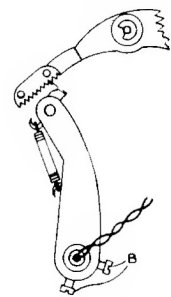


Figure 6

**Pickup landing adjustment**

1. Slide the record support as required for playing 10-inch records.
2. Place a ten-inch record on the turntable and rotate the turntable by hand until the sapphire is just ready to land. Loosen set screws "B" (Figure 6).
3. Hold the trip lever to keep it from moving while the pickup is moved to the start of the record.
4. Tighten the black screw "B" and allow the mechanism to run through cycle automatically. If landing is correct, tighten copper plated screw "B." (Figure 6.) (Note) No separate 12-inch landing adjustment is necessary.

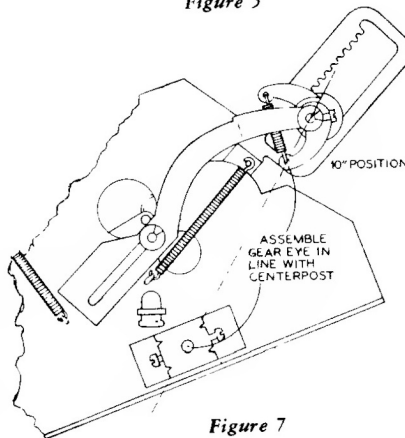


Figure 7

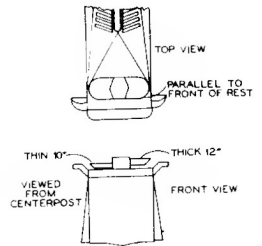


Figure 8

**Record push cam and gear assembly adjustment**

1. Have the mechanism out of cycle.
2. With the push cam in place and the record support in the 10-inch position, assemble and engage the teeth of the push cam gear with the rack lever so the eye in the lever is approximately in line with the centerpost as shown in drawing. (Figure 7.)
3. Set the push cam parallel to the front edge of the record support, make certain the thin edge of the cam is on the left side, viewed from the front or centerpost side of the support. (Figure 8.)

**Removing the turntable**

1. Loosen the two screws mounting the centerpost. (Figure 10.)
2. The centerpost, turntable and thrust bearing can now be easily lifted out.

**Replacing the turntable**

1. Slip the turntable over the lower end of the centerpost until it comes against the stop or ears. (Figure 9.)
2. Place the thrust bearing and washers on the bottom end of the centerpost and place the centerpost and turntable in position as shown. (Figure 9.)
3. Turn the spindle so the step in the centerpost is away from the record support. (Figure 11.)
4. Tighten the two mounting screws. (Figure 10.)

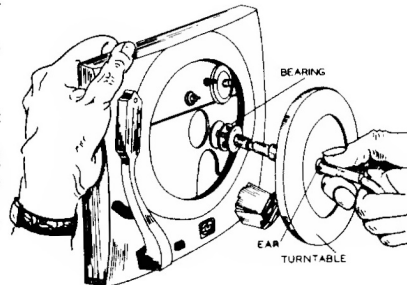


Figure 9

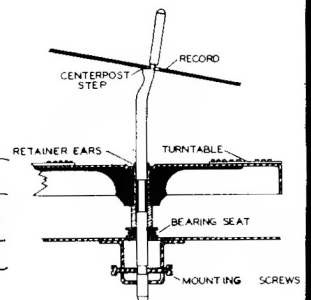


Figure 10

**Turntable centering**

If for any reason the sub-assembly had been removed from the motorboard it is necessary to re-center the turntable.

1. Loosen the three sub-assembly mounting bolts. (Figure 12.)
2. Place the turntable in place with the center post extending down through the mounting as shown. (It is not necessary to have the thrust bearing in place for this operation.) (Figure 9.)
3. Center the turntable in respect to the recess in the motorboard by shifting the position of the sub-assembly slightly. (Figure 11.)
4. Tighten the nut on the end of the square head mounting bolt. (Figure 12.)
5. Remove the turntable and tighten the other two mounting bolts. (Figure 12.)

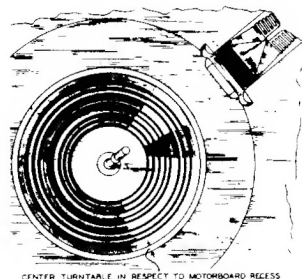


Figure 11

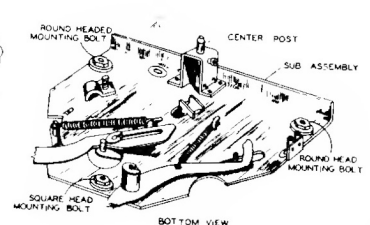
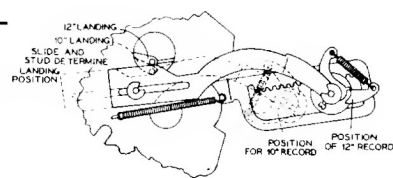


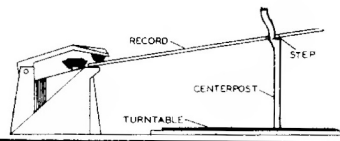
Figure 12

Function	Explanation
Lift and slide the record support to 10 or 12 inch position as desired	1. Record support locks in position and at the same time the record push cam and gear rotates and assumes a position as required for 10- or 12-inch records.

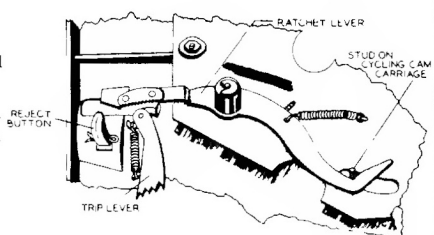


Operator

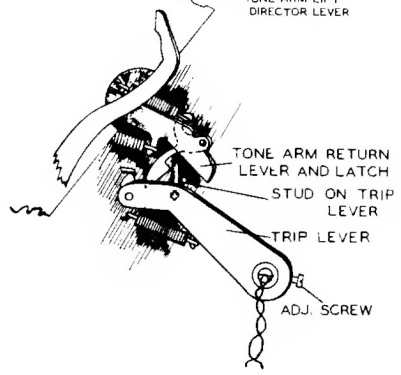
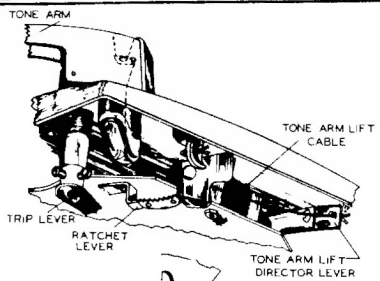
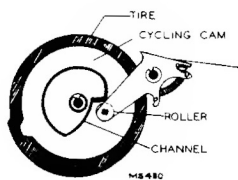
Place the stack of records over the center post	1. The lower record of the stack is sitting on the step in the centerpost, and the edge is resting on the record support.
---	---



Push reject button	<ol style="list-style-type: none"> <li>1. The end of the reject button extending through the motorboard contacts and moves ratchet lever.</li> <li>2. Ratchet lever unlatches stud which is mounted on cycling carriage. This allows the tension spring to pull the cycling cam against the rotating knurled roller and start cycle.</li> </ol>
--------------------	---

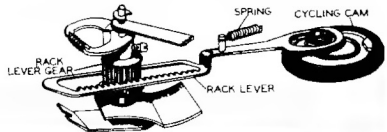
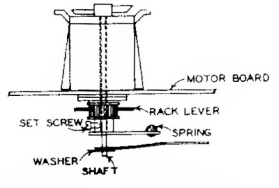


Tone arm rises and moves out	<ol style="list-style-type: none"> <li>1. As the cycling cam rotates the small roller on the tone arm director lever follows the channel in the cam and in so doing pulls on the cable connected to the tone arm.</li> <li>2. The hole in the motorboard provides a guide for the tone arm cable. It is so placed as to allow the cable to pull at an angle slightly off 90 degrees thus giving the necessary rising and outward motion of the tone arm.</li> <li>3. The trip lever which is rigidly connected to the tone arm through the tone arm pivot shaft is moved out with the tone arm.</li> <li>4. The tone arm return lever has moved out slightly ahead of the trip lever. The tone arm return lever together with the small latch assumes such a position so as to engage the stud on the trip lever and stabilize the tone arm in its outermost position.</li> </ol>
------------------------------	---



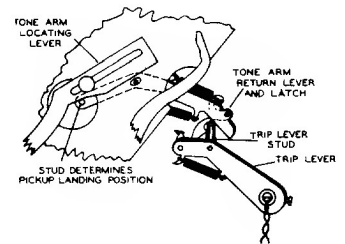
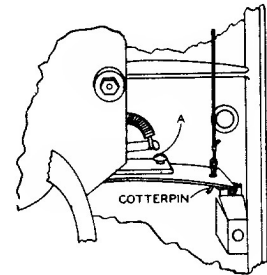
Automatic Cycle

The record push cam together with the "step" in the centerpost separates the lower record of the stack allowing it to drop to the turntable	<ol style="list-style-type: none"> <li>1. While the cycling cam is continuing to rotate, the rack lever is being pushed outward by the small eccentric elevated cam, with which it is engaged.</li> <li>2. The teeth in the rack lever being engaged with record push cam gear, converts the sliding action of the rack lever into a rotary motion.</li> <li>3. The rotary motion of the record push cam pushes the record off the step in the centerpost.</li> </ol>
---	---

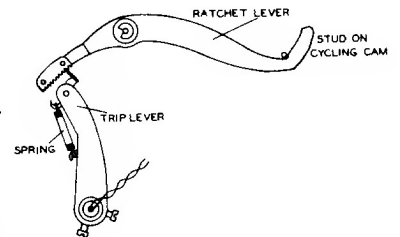


CYCLE OF OPERATION

Function	Explanation
Tone arm moves in and lands on record	<ol style="list-style-type: none"> <li>1. As the cycling cam is returning to normal position, the tone arm director lever is gradually allowing a slack in the tone arm cable.</li> <li>2. While the tone arm director lever is gradually allowing slack in cable, the tone arm return lever is tending to retain the tension on the cable by returning the tone arm to the landing position.</li> <li>3. The distance the tone arm return lever travels, while moving the pickup in for landing, is determined by the contact between the tone arm locating lever and the stud on the tone arm return lever.</li> <li>4. After the tone arm return lever has moved the tone arm to the landing position the tone arm director lever continues to move and allow enough slack in the cable so the pickup can sit down on the start of the record.</li> </ol>



Sapphire moves into record groove. Record begins to play	<ol style="list-style-type: none"> <li>1. As the sapphire moves into the playing groove, the cycling cam becomes disengaged from the rotating knurled roller as the roller falls into the step in the cam.</li> <li>2. The change cycle is completed as the stud on the cycling cam carriage becomes engaged with the ratchet lever. This engagement prevents the cycling cam from contacting the knurled roller, starting a new cycle.</li> </ol>
--	--



The record plays	<ol style="list-style-type: none"> <li>1. After the playing of the record, the pickup moves into the eccentric groove.</li> <li>2. The movement of the pickup in the eccentric groove causes the trip pawl to engage the ratchet lever starting a new cycle. (The mechanism plays one side of each record in the stack then repeats the playing of the last record until the pickup is manually placed on the rest or the power removed from the mechanism.)</li> </ol>
------------------	---

REPLACEMENT OF SAPPHIRE

**Caution:** Never bend the sapphire support wire.

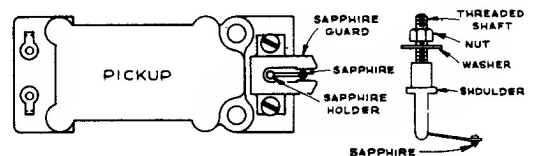
Extreme care should be used when loosening the sapphire mounting nut so that the twisting motion does not break the crystal.

Remove the two screws holding the sapphire guard in place and remove guard. Remove the small nut and washer on the threaded shaft of the sapphire holder and gently push the shaft through the hole in the armature shaft until the sapphire holder assembly comes free.

Do not use force as the crystal may be broken.

Insert threaded shaft of replacement sapphire holder through armature shaft and replace the washer and nut. Make sure that the sapphire is in the correct position. Take hold at the lower end of the shaft with a pair of pliers while tightening the nut, being very careful so as not to strip the threads or break the crystal. Replace the sapphire guard, positioning it by means of the oversize screw slots. Make certain that the sapphire and its supporting wire are centered in the guard. Tighten the guard screws. Before using, check to see that the sapphire projects far enough (approx. .020) beyond the guard so that the guard will not strike the record. If necessary, bend the guard a little.

**Note:** Pickup pressure should be approximately 1 to 1 1/4 oz.



LUBRICATION

Motor

Motor is lubricated at factory to provide normal operation for a long period of time.

If it becomes necessary to lubricate, use SAE #10 motor oil to saturate the felt wicks on the motor bearings.

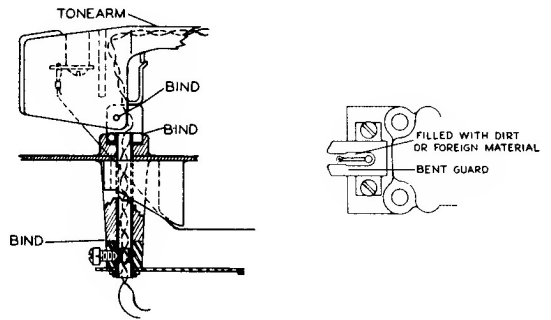
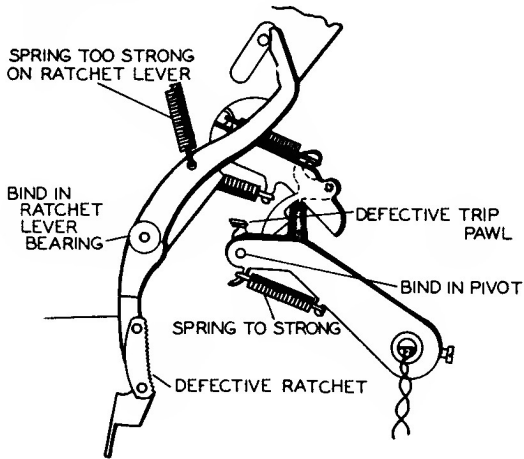
Main Bearing

Use STA-PUT #512 or SAE #30 motor oil.

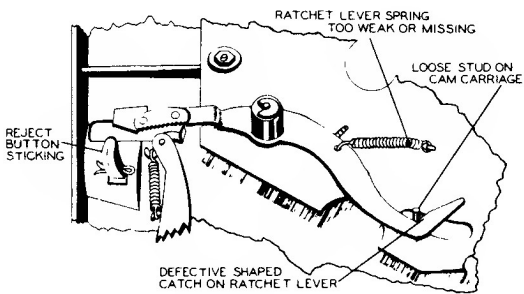
Slides and Levers

Use STA-PUT #512.

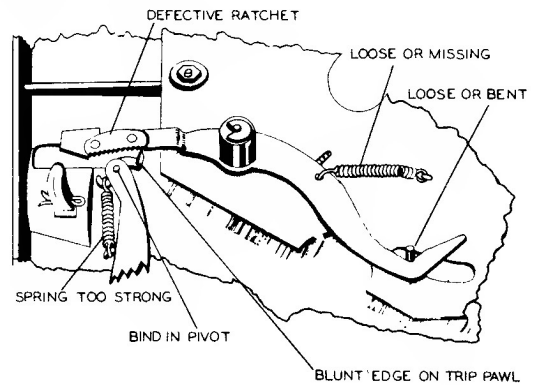
Pickup Repeats Grooves



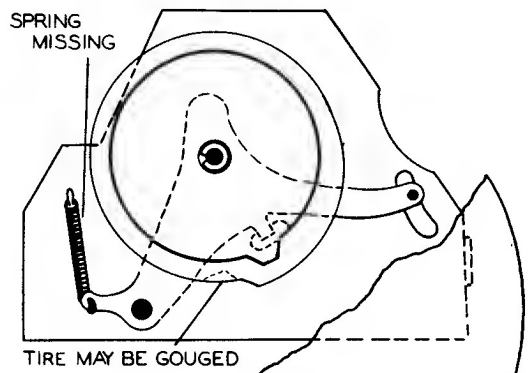
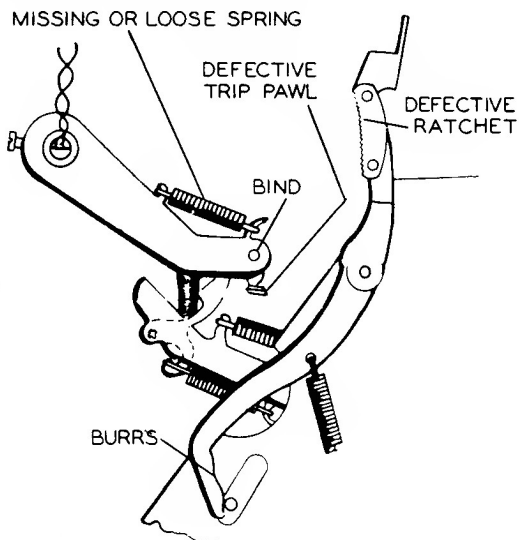
Continuous Tripping



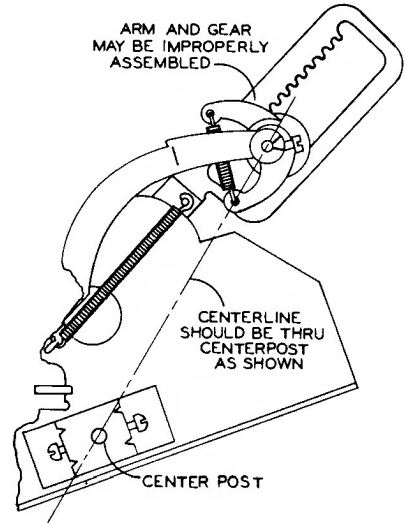
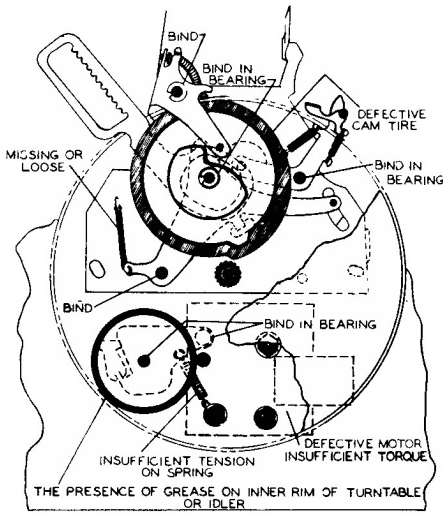
Premature Tripping



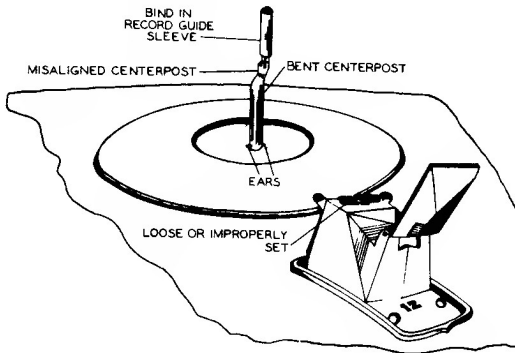
Failure To Trip or Go Into Cycle



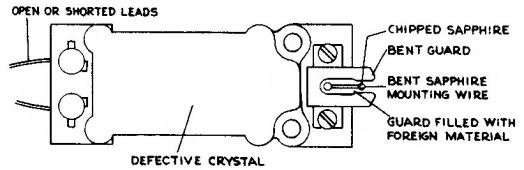
**Changer Will Not Complete Cycle**



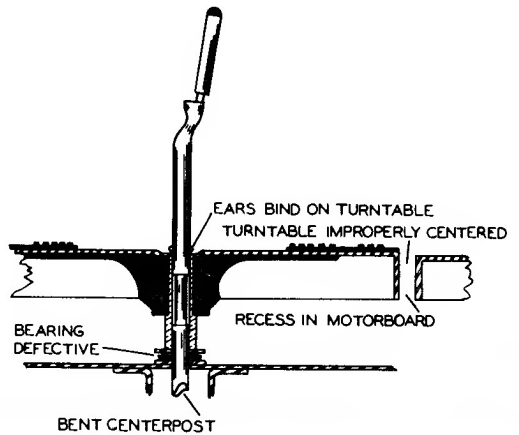
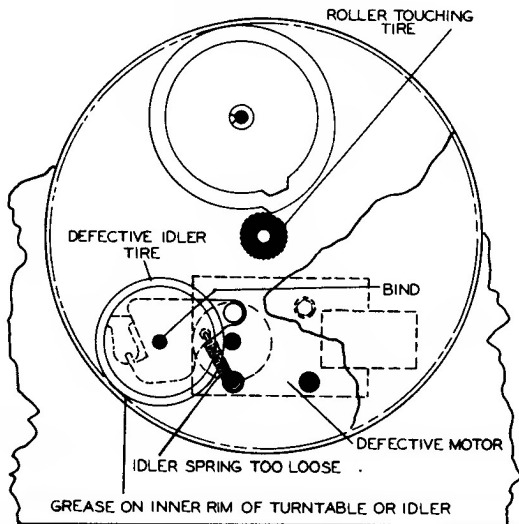
**Records Do Not Separate or Drop Properly**



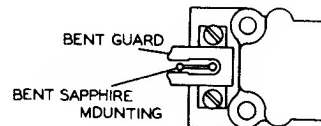
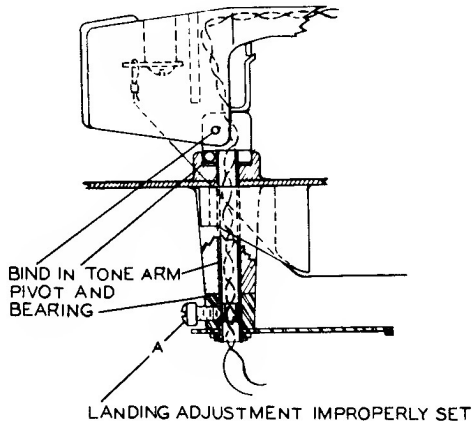
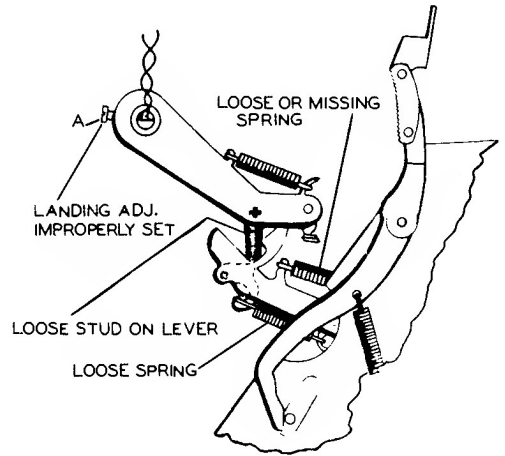
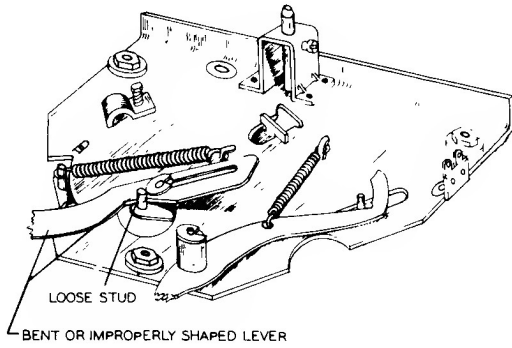
**Distorted Output**



**"Wow" or Slow Turntable Speed**



Improper Pickup Landing



Rumble

