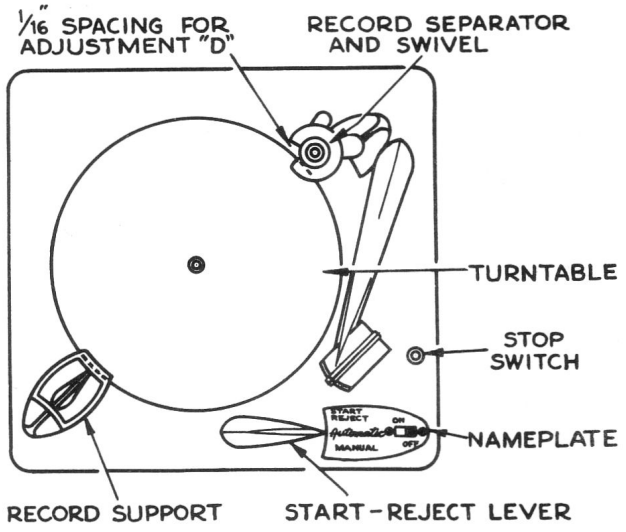
RCA Victor

RP-160C
AUTOMATIC RECORD CHANGERS
TECHNICAL INFORMATION AND SERVICE DATA

1946 No. 9

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

A Service of the Radio Corporation of America



This mechanism is designed to play a series up to twelve 10-inch, or ten 12-inch records of the 78 r.p.m. type. It will also play single records of any diameter up to 12 inches.

Features Include—

1. **Light-pressure sapphire-point** plug-in crystal pickup.
2. **Positive ratchet trip,** actuated by eccentric groove at end of record.
3. **Safety clutch,** relieves strain on mechanism due to jamming. (The clutch makes a clicking sound if the mechanism jams.)
4. **Stop switch,** shuts off the motor after the last record is played. This switch is the pickup "rest."
5. **Pickup shorting switch,** shorts pickup during record-changing cycle to prevent noise.
6. **Simplified mechanism.**

Manual Operation

1. See that the mechanism is out of cycle, with the pickup on its rest.
2. Set the "start-reject" lever at "manual."
3. Place record on turntable and push turntable switch "on."
4. Lift the pickup and set it down on the record.
5. When the record is finished, the pickup will swing in the eccentric groove, or run in the last groove, until the power is shut off.
6. Lift the pickup and place it on its rest.

Automatic Operation

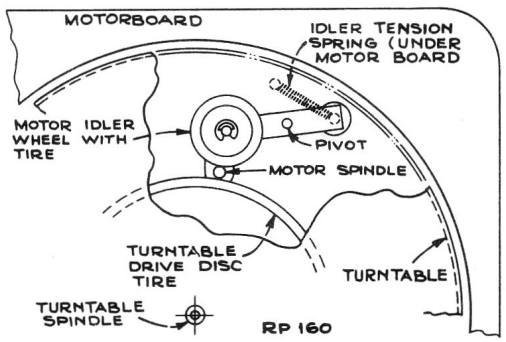
The pickup "rest" is a button on the stop switch that opens the motor circuit when the pickup comes down on the rest after completion of the cycle following the last record. Before starting automatic operation, see that the mechanism is out of cycle and that the pickup is on its rest. If it is not, start the motor and allow to run until the pickup comes down on its rest.

1. Turn the "record support" in front left-hand corner, to its position for 10-inch or 12-inch records as required. Turning the front record support automatically positions the rear support.
2. Load the records on the supports, with required selections upward, the last record to be played on top. **Be sure that the rear record support is pushed down.**
3. Push turntable switch "on."
4. Push the "start-reject" lever towards the back to its "start-reject" position, and let go. The first record drops on turntable, and the pickup moves onto the record.
5. When the last record is finished, the pickup moves out and comes down on its rest. This depresses the rest button and opens the stop switch, thus shutting off the motor.
6. To reject a record being played, push the "start-reject" lever to "start-reject," and let go.
7. For automatic operation, each record must have the standard eccentric groove.

Lubrication

The drive motor bearing is lubricated from felt washers at the bottom and top. A light machine oil should be used at these points.

On all bearing surfaces except the motor bearings Houghton Stayput No. 320 should be used. On all other surfaces Lubriplate No. 110 is recommended. *(Continued on next page.)*



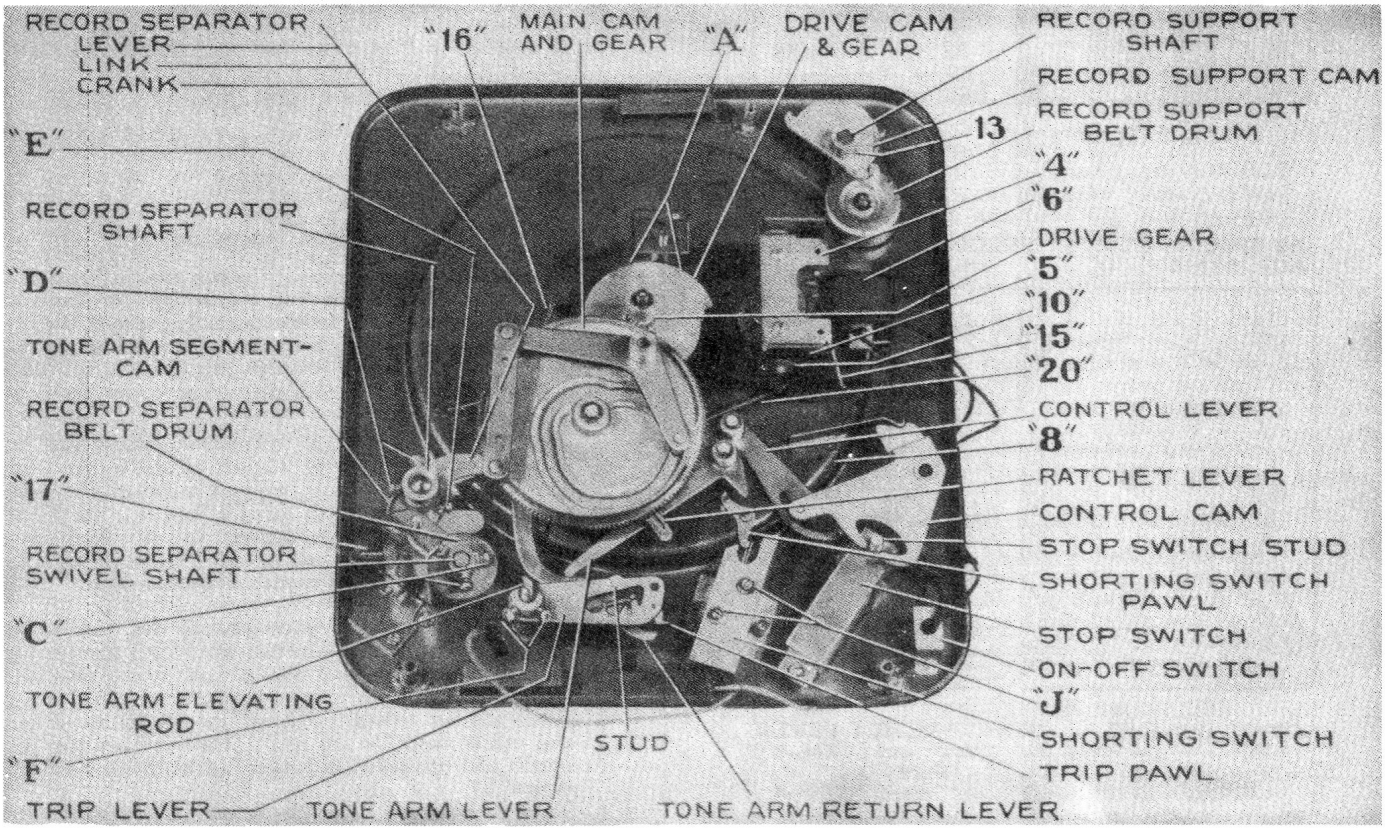
Do not oil the record separator shaft.

It is important that the drive motor spindle and the rubber tire on the friction drive disc as well as that on the idler wheel be kept clean and free from oil, grease, dirt, or any foreign material at all times. Any quick drying naphtha is satisfactory for cleaning these parts.

Cautions

Before servicing the automatic changer, inspect the assembly to see that all gears, cams, springs, levers, etc., are correctly assembled and in good working order.

1. Never use force to start or stop the motor or any part of the record changing mechanism.
2. Warped or damaged records may cause the mechanism to jam. **When jamming occurs, the safety clutch slips, causing a clicking sound.**
3. A cracked or chipped record may damage the sapphire.
4. Warped records may slide on one another while playing and result in unsatisfactory reproduction.
5. Do not leave the records on the record posts or on the turntable as they may warp, particularly in warm climates. Warped records may be flattened by placing them on a flat surface with a heavy flat article placed on top of them for a few days.
6. If, for any reason, the mechanism stalls, turn off the turntable switch and remove the records from the posts. Start the turntable by turning the switch on and allow the pickup arm to complete its cycle.
7. Do not tighten copper-plated, cone-pointed screws until final adjustment has been made.



Function of Principal Levers

Trip Lever

When the tone arm swings in the eccentric groove, the trip lever latch acts on the ratchet lever to start the automatic cycle.

Ratchet Lever

Transfers motion from trip lever or control lever to start automatic cycle by allowing pawl to engage with sprocket of safety clutch.

Drive Cam Pawl and Sprocket (This is the "safety clutch")

Engages turntable spindle to drive gear during cycle (see sketch "A").

Drive Gear

Transfers rotation of turntable spindle to main cam and gear when the clutch is engaged.

Main Cam and Gear

Has four "tracks" which control horizontal and vertical motion of tone arm, and rotation of record separator knife and shelf. The bushing on this gear governs position of the ratchet lever.

Control Cam and Lever

In **"manual"** position, it keeps the motor stop switch closed, and disengages the ratchet lever and safety clutch so the mechanism cannot go into cycle.

In **"automatic"** position, it permits operation of the ratchet lever, safety clutch, and stop switch.

In **"start-reject"** position, it closes the motor stop switch, and moves the ratchet lever away from the drive cam pawl, permitting the clutch to engage and thus start the change cycle.

Shorting Switch Pawl

Closes the pickup shorting switch when the pickup is outside the 12-inch landing position.

Tone Arm Lever

Directs horizontal motion of tone arm.

Tone Arm Return Lever

Keeps tone arm moving in with receding tone arm lever and provides proper landing.

Tone Arm Elevating Lever

Directs vertical motion of tone arm.

Tone Arm Elevating Rod

Transfers motion of elevating lever to tone arm.

Record Separator Lever Train (Lever-Link-Crank)

Directs motion of separator knife and shelf.

Separator Knife

Separates record from stack and supports stack during cycle.

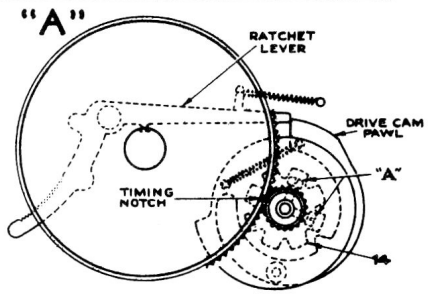
Separator Shelf

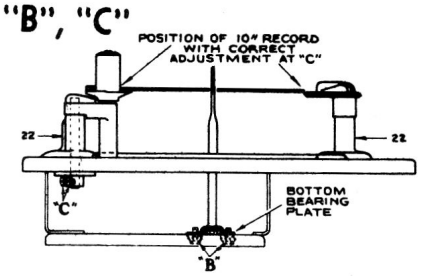
Supports stack during playing time.

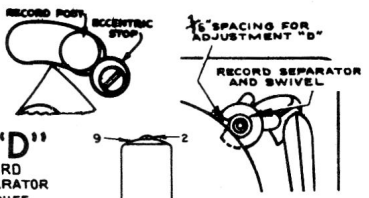
Quick-Reference Chart for

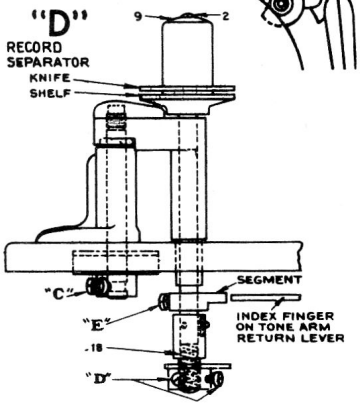
Automatic Record Changer Adjustments

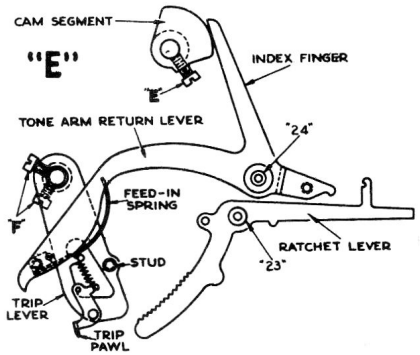
Mechanism jams. General irregularity of operation. *(Mechanism Timing)*	With the ratchet lever and the pawl on the drive shaft cam in playing position as shown, remove the bottom support bracket. Remove the "C" washer on the main cam shaft and slip the cam down far enough that it can be rotated with respect to the drive gear. Then rotate it until the timing notch is positioned as shown. Put the main gear back in mesh with the drive gear, replace the "C" washer, place the elevating lever on the cam ridge. Make certain the separator lever train is in its correct position and replace the bottom support bracket.
Turntable does not turn freely. *(Turntable Bottom Bearing Position)*	Loosen the bottom bearing screws "B" and position the bottom bearing plate until the turntable revolves freely. Tighten the screws and check by applying a.c. to the turntable motor, allowing it to reach full speed, then pull motor away from friction drive disc and noting that the turntable continues to make at least twelve revolutions.
Records strike separator post or fail to stay on record shelf. *(Spacing Between Record Posts)*	Turn the record support post to the ten-inch position. Loosen set screws "C," hold the separator post against the end of its slot in the motorboard and turn the belt drum to take up any slack in the belt. Tighten the zinc-plated, blunt-nosed screw and check to see that a ten-inch record fits the posts as shown. Then tighten the copper-plated, cone-pointed screw. The twelve-inch position is adjusted after that of the ten-inch, by changing the support post to take the twelve-inch record, and turning the eccentric stop until the edge of the record is halfway up on the record support bevel while the other edge is against the record separator post.
Records do not drop at proper time. *(Record Shelf Timing)*	Place a ten-inch record on the posts. Loosen the set screws "D" and turn the record separator shaft until the edge of the record-separating knife is one-sixteenth inch away from the edge of the record. The teeth on the inner circumference of the knife should be resting in the bottom of their slots at the time the adjustment is made. Tighten the zinc-plated screw first, run through cycle several times as a check, then tighten the copper-plated screw.
Tone arm continues to repeat playing of top record or jams when part way in on record. *(Segment-cam height or radial position)*	Take all records off the posts. Loosen the set screw "E." Set the record separator segment-cam so that the index finger of the tone arm return lever rides on the middle of the segment-cam, as shown. Rotate the segment-cam until it is in such a position that the index finger will not ride off either end. Check to see that the index finger rides in over top of the cam when the record shelf is depressed by the weight of one record. Tighten the set screw.
Sapphire does not land at correct point on 10-inch record. *(Tone Arm Position With Respect To Trip Lever)* *Correct dimension from outside edge of spindle to sapphire 4 11/16 inches.*	Place a ten-inch record on the turntable and rotate the changer through cycle until the sapphire is just ready to land. Make sure that the index finger of the pickup arm return lever is against the record separator shaft and that the tone arm trip lever stud is held firmly against the return lever. Loosen the set screws "F" and move the pickup arm to the correct landing position. See that there is a 1/32 inch clearance between the pickup arm bearing and the set screw collar. Tighten the zinc-plated screw, run the changer through cycle several times as a check, then tighten the copper-plated screw. The twelve-inch landing position is automatically maintained.
Top of pickup arm strikes stack of records or sapphire fails to clear the records on the turntable. *(Pickup Arm Height While In Cycle)*	Rotate the changer through cycle until the pickup arm has risen to its maximum height above the turntable but has not begun to move out. At this point adjust the screw "G" until the distance between the turntable and the sapphire is one and three-sixteenths inch. Tighten the locknut.

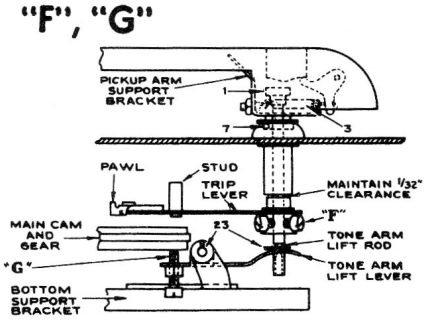




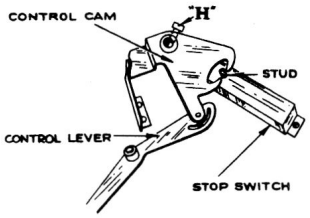
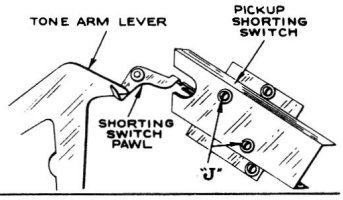








Quick-Reference Chart (Continued)

Mechanism fails to start, or automatic stop switch is inoperative in "automatic" position. *(Control Cam Position)*	Set the control lever to "automatic." Loosen set screw "H" and move the control cam until the stud on stop switch is centrally located as shown. Tighten set screw "H."	
No output, or noise during cycle. *(Position of Pickup Shorting Switch)*	Loosen screws "J." Position the switch to obtain 1/32-inch clearance between the switch blades when the tone arm is in playing position. Tighten screws "J." **Make certain that the pawl is on the correct side of the long leaf spring in the shorting switch.**	

Miscellaneous Service Hints

Mechanism trips continuously. — Check to see that the ratchet lever engages drive cam pawl at end of change cycle. Bend lever if necessary. Check adjustment "H." Bend the control cam flat spring for greater pressure.

Turntable does not stop automatically. — Check for bind in stop button bushing. Bend the flat bracket that limits outward movement of the trip lever, so that pickup lands on the stop button.

Turntable fails to start. — Check spacing of stop switch contacts to be certain that weight of stop button does not open them.

Loud clicking noise resulting from drive cam pawl slipping out of teeth in cam sprocket.
Mechanism jams. — Check mechanism timing adjustment. Make certain that pickup arm lever is not binding on its stud. Any jam will cause the clutch to slip and produce clicking sound.

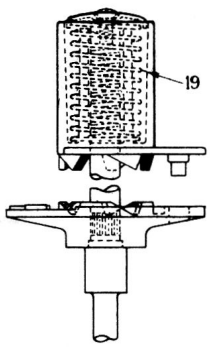
Irregular landing on 10 and 12 inch records. — Check adjustment "C." Insufficient tension on belt.

Tone arm continues to repeat playing top record of the stack. — Check adjustment "E." Record separator shaft, or the spring on which it rests, is binding on the shaft bushing. Pin on record separator shaft is binding in its slot. Shaft spring is too weak. Do not tighten set screws "D" enough to distort the housing of the separator shaft spring. Do not oil the record separator shaft.

Tone arm continues to come down in rest position. — Check adjustment "E." Record separator shaft or the spring on which it rests is binding on the shaft bushing. Pin on record separator shaft is binding in its slot. Shaft spring is too strong.

Sapphire strikes motorboard. — Bend the pickup arm support bracket until the sapphire clears the motorboard by approximately 3/32 of an inch.

Separator knife jams on last record of the stack. — Check the separator knife edge. It should not be sharp enough to dig in the record and carry the record up with it.



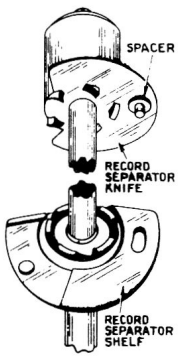
Illustrations Show Details of Record Separator

To Remove the Turntable.—

To remove the turntable, loosen set screws "A" and lift the turntable up.

To Remove Pickup Arm.—

One of the tone arm bearings has a slotted head and can be turned out to facilitate removal of the tone arm. Raise the tone arm and loosen the bearing set screw. Turn the bearing partly out through the hole in the side of the tone arm and lift the arm off.

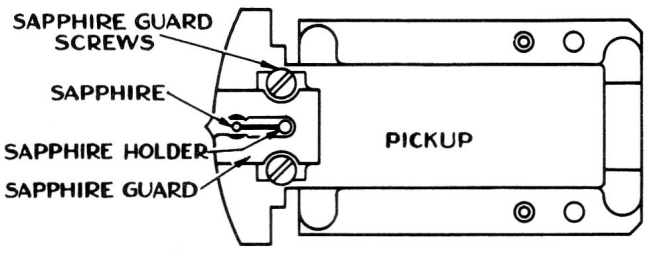


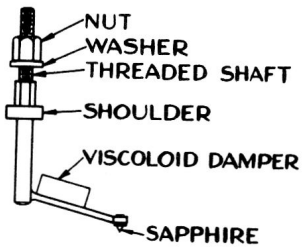
Cycle of Operation

The changer can be conveniently rotated through the change cycle by pushing the reject button and revolving the turntable by hand. Eight turntable revolutions are required for one change cycle. Block up the motor, so it is disengaged from the drive disc, to permit easier manual rotation of the turntable.

	Function	Explanation
Operator	**Turn Record Support to 10″ or 12″ Position as Desired**	1. Separator post positions itself by means of belt drive.
	Place Records on Posts	1. Separator shaft is pushed down against its spring and carries segment-cam out of path of index finger.
	Press Start Button	1. Reject lever moves in and pushes ratchet lever. 2. Ratchet lever is pushed out of eccentric step on main gear shaft and releases drive cam pawl. 3. Drive cam pawl engages cam sprocket and it revolves carrying drive gear with it.
Automatic Cycle	**Tone Arm Rises**	1. Main cam and gear revolves with drive gear. 2. Stud on tone arm lever rides in top track on main cam and directs movement of the lever. 3. Tone arm elevating lever rides up on ridge on main cam and pushes tone arm up by means of elevating rod.
	Tone Arm Moves Out	1. Tone arm lever pushes on trip lever stud. 2. Trip lever moves out. 3. Tone arm return lever is carried along by trip lever stud, and by stud on main cam top track.
	Record Knife Separates Bottom Record from Stack after Gauging Thickness of Record	1. Stud on separator lever follows main cam bottom track and directs the motion of the lever. 2. Through the separator link and crank, the separator lever turns the separator shaft. 3. Knife turns with shaft and strikes edge of bottom record. 4. Separator shaft continues to revolve and teeth on inner circumference of knife ride up on shelf teeth until knife is carried high enough against the action of spring 19 to move in over top of record.
	Record Drops to Turntable	1. Separator shaft continues to turn until knife supports stack of records and shelf moves out from under bottom record.
	Tone Arm Moves In	1. Separator shaft reverses rotation. 2. Tone arm lever moves away from trip lever stud. 3. Tone arm return lever pushes on trip lever stud. 4. Trip lever moves in.
	Tone Arm Lowers Sapphire on to Record	1. Index finger on tone arm return lever moves against separator shaft to insure proper landing position. 2. Tone arm elevating lever rides down on main cam ridge thus lowering the elevating rod and the tone arm. 3. Separator shaft returns knife to original position and allows stack of records to rest on shelf.
	Sapphire Moves In to Record Groove	1. Ratchet lever rides down into eccentric step on main gear shaft and blocks drive cam pawl. 2. Pawl is disengaged from drive cam sprocket.
	Record Begins to Play	3. Drive gear and main gear stop. 4. Tone arm lever moves into cam to maintain disengagement.

Replacing Sapphire in Pickup





Specifications....Output at 400 cycles..... 0.50 volts
Impedance at 1,000 cycles... 75,000 ohms

Replacement of Complete Unit...Simply slide the unit out of the tone arm and insert a new one.

Replacement of Sapphire.....Caution: Never bend the sapphire support wire. Slide the pickup forward out of the arm.

The nut on the sapphire holder assembly is locked by a light cement (such as Glyptal). Extreme care should be used when loosening the nut so that the twisting motion does not break the crystal.

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

Insert threaded shaft of replacement sapphire holder through viscoloid and replace the washer and nut. Make sure that the flat sides of the shaft are firmly in place in the clamp and then tighten the nut very carefully so as not to strip the threads nor 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 beyond the guard so that the guard will not strike the record. If necessary, bend the guard a little. Apply a drop of light cement (such as Glyptal) to the sapphire nut holder.

Bend the spring contacts to make good contact with the slides in the tone arm.

Tone Arm Feed-in Spring.—

When the sapphire comes down on the record, the feed-in spring (shown in adjustment sketch "E," acts to push the tone arm toward the music grooves. The spring should be adjusted to do this without causing the sapphire to skip grooves. This action is also related to—

Cabinet Leveling.—

If the sapphire fails to enter the starting groove, raise the right-hand side of the cabinet by inserting thin spacers under the legs. If the pickup slides over a few grooves, raise the left-hand side of the cabinet.

Sapphire Pressure.—

In these mechanisms, the correct pressure is from 1 to 1¼ ounces, measured at the sapphire. Adjust the spring (3) in the tone-arm base if necessary.

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK NO.	DESCRIPTION
	PICKUP AND ARM
39671	Arm-Pickup arm shell-less crystal cable and pivot arm
39672	Arm-Pivot arm and shaft for pickup arm-less spring
35694	Cable-Shielded pickup cable-connects pickup to shorting switch
39550	Crystal-Pickup crystal cartridge with sapphire and holder
38607	Cushion-Rubber cushion (1) for pickup arm push rod
38451	Damper-Viscoloid damper for sapphire holder
38452	Guard-Needle guard
38450	Nut-Special Nut and washer for sapphire holder.
38458	Nut-Speed nut to hold cable in pickup arm(Pkg.2)
39674	Rivet-Rivet to hold pivot arm spring-(Pkg.5)
38606	Rod-Pickup arm push rod-less cushion
38449	Sapphire-Sapphire and holder-less nut
37763	Screw-No. 2-56 x 1/8 screw to mount needle guard (2 required)(Pkg.2)
38609	Screw-No. 4-40 x 1/4 headless set screw for pickup arm(Pkg.2)
38608	Screw-No. 6-32 x 9/32 headless set screw for pickup arm(Pkg.3)
39673	Spring-Pivot arm spring (19-1/2 turns)
38604	Stud-Pivot arm spring stud, and nut
	MOTOR ASSEMBLIES
36954	Armature-Motor armature and shaft for 25 cycle motor
36255	Armature-Motor armature and shaft for 60 cycle motor
37108	Bearing-Bottom bearing and bracket (4)
37107	Bearing-Top bearing and bracket
37109	Bracket-Motor mounting bracket (5)
36952	Cap - Bakelite cap for motor
36951	Capacitor-1.25 mfd. for motors (2 required for 25 cycles
37111	Coil-Motor field coil assembly (6)
36726	Motor-105-125 volts, 25 cycle, complete with capacitor (91655-3 or 8)
38612	Motor-105-125 volts, 60 cycle (91706-1)
37106	Pad-Rotor thrust pad (Pkg.2)
37110	Rotor-Motor rotor complete with fan
39748	Sleeve-Motor spindle sleeve for 50 cycle conversion of motor No.91706-1,Stock No.38612
	MOTORBOARD ASSEMBLIES
38640	Arm-Motor idler arm-less wheel
3658	Ball-3/32 steel ball for tone arm bearing(Pkg.6)
10129	Ball-Bearing ball for spindle
38647	Bearing-Turntable spindle bearing
38616	Belt-Record support to separator belt (8)
38653	Board-Motorboard with all welded or riveted studs, posts, or bearings-less operating mechanism
38630	Brace-Angle brace,or bottom support bracket and bearing plate
38620	Bushing-Record separator shaft end bushing
38668	Button-Stop switch button
39386	Cable-Shielded pickup cable and plug - connects shorting switch to amplifier
38627	Cam-Drive shaft cam and pawl-less spring
38641	Cam-Main cam
38646	Cam-Record support shaft cam
38470	Cap-Record separator cap (9)
38665	Cover-Stop switch cover and stud
38657	Disc-Turntable drive disc and spindle
38463	Drum-Record separator belt drum
38617	Drum-Record support belt drum
38660	Escutcheon-Index escutcheon ("Manual," "Automatic" - "Start-Reject")

STOCK NO.	DESCRIPTION
34368	Grommet-Rubber grommet for motor mounting(10) (Pkg.4)
38467	Knife-Record separator knife
39106	Lever-Index control lever and shaft
38622	Lever-Link and lever assembly-fastens on record separator shaft
38661	Lever-Manual lever
38656	Lever-Ratchet lever
38633	Lever-Tone arm lever
38631	Lever-Tone arm lift lever
39751	Lever-Tone arm return lever
38619	Lever-Tone arm segment-fastens on record separator shaft - less screws
38632	Lever-Trip lever-less pawl spring
32943	Nut-Speed nut for stop switch button (Pkg.10).
38740	Pin-Drive pin for record separator shaft and bushing (Pkg.2)
38474	Pin-Record support shaft cam pin (13) (Pkg.2).
38663	Plate-Index control lever plate and screw
30868	Plug-Female plug for motor extension cable
30870	Plug-Male plug for motor and switch leads and extension cable
38624	Ratchet-Ratchet wheel (drive cam sprocket) for turntable spindle (14)
38469	Screw-Oval head screw for record separator cap (Pkg.2)
38626	Screw-No. 8-32 x 1/4 in. cone point set screw for ratchet wheel (drive cam sprocket) (Pkg.3)
38625	Screw-No. 8-32 x 1/4 in. set screw for ratchet wheel (drive cam sprocket) (Pkg.5)
31118	Screw-No.10-32 x 5/16 in. cone point set screw for index lever plate (Pkg.2)
32869	Screw-No.10-32 x 5/16 in. set screw for drum, tone arm segment, record separator crank and trip lever (Pkg.10)
38652	Shelf-Record separator shelf and shaft
38471	Spacer-Record separator spacer(washer)(Pkg.3).
38628	Spring-Cam pawl and ratchet lever spring
38669	Spring-Index lever plate spring
30585	Spring-Motor idler arm spring (Pkg.2)
38643	Spring-Motor tension spring (15)
39679	Spring-Ratchet lever spring (16)
38642	Spring-Record separator belt drum spring (17).
38621	Spring-Record separator shaft bottom spring (18)
38468	Spring-Record separator spring (19)
39554	Spring-Reject button spring
38634	Spring-Tone arm lever spring (20)
39599	Spring-Tone arm and return lever spring
38667	Spring-Tone arm switch spring
38562	Spring-Trip lever pawl spring
38666	Stud-Tone arm switch pivot stud (Pkg.2)
38645	Support-Record support and shaft
39085	Support-Separator support (2 used) (22)
32875	Switch-'ON-OFF' switch
38844	Switch-Pickup shorting switch
38664	Switch-Stop switch less leads
38615	Swivel-Record separator swivel and shaft
37873	Tire-Rubber tire only for drive disc
38623	Turntable-Finished turntable plate
33726	Washer "C" washer for motor idler arm or idler wheel (Pkg.5)
20165	Washer-"C" washer for ratchet lever, tone arm lift lever or tone arm lift rod (23) (Pkg.2).
2917	Washer-"C" washer for tone arm lever, tone arm return lever, record support belt drum link, or cam (24) (Pkg.5)
38560	Washer-Felt washer for tone arm bearing (Pkg.3)
38629	Washer-Felt washer for turntable spindle bottom bearing (Pkg.3)
36274	Wheel-Motor idler wheel

All parts and prices are subject to change or withdrawal without notice.