

RCAVICTOR

BERKSHIRE

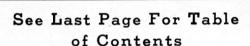
Automatic Record Changer (Thorens Mod. "CONCERT" CD. 40)

SERVICE DATA

-1948 . . . No. CCP-4-

RADIO CORPORATION OF AMERICA CONSUMER CUSTOM PRODUCTS DEPT. RCA VICTOR DIVISION

745 FIFTH AVE., NEW YORK 22, N. Y.



Features

- This record changer is a center support intermix mechanism designed to play automatically a series of ten, ten-inch or eight, twelve-inch records of the standard 78 RPM type. It will also play a series of eight intermixed ten or twelve inch records automatically.
- The mechanism is equipped with a light weight high quality variable reluctance type pickup having a long life sapphire point.
- The mechanism will automatically stop and the tone arm return to rest position after the completion of the last selection.
- The automatic tripping device depends upon the acceleration of the pickup as it leaves the recorded section of the record.
- 5. The mechanism has an accessible variable speed control.
- A repeat action is provided which enables the record being played to be repeated.
- 7. A pause action is also provided, which produces a $2\frac{1}{2}$ minute pause between each selection.

Automatic Operation

- 1. Raise the overarm from the center post.
- Place a stack of records over the end of the center post having the edge of the records resting on the record support.
- 3. Lower the overarm down over the end of the center post.
- Push the "start-stop" control to start position. (Make certain the control is pushed hard enough to remain engaged.)
- 5. To reject a record being played, move reject knob to reject
- To repeat a selection being played, push repeat knob to repeat before the mechanism starts into change cycle.
- To pause between records for 2½ minutes, move pause knob to pause position. The mechanism will pause between

each selection until the pause lever is moved back to normal position.

 To remove records from turntable, raise the overarm and remove center post. Records may then be raised easily from the turntable.

Manual Operation

This mechanism is primarily designed to play a series of records automatically, but a single record can be played. Place the record over the center post and proceed as for automatic operation.

Helpful Suggestions

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.

- Never use force to start or stop the motor or any part of the record changing mechanism.
- 2. If for any reason, the mechanism stalls, turn off the "on-off" switch, lift the overarm gently and remove the records from the center post. Remove the center post. The turntable should rotate very easily by hand if the "on-off" switch is in the "on" position.
- 3. A cracked or chipped record may damage the sapphire.
- 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. Most 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.

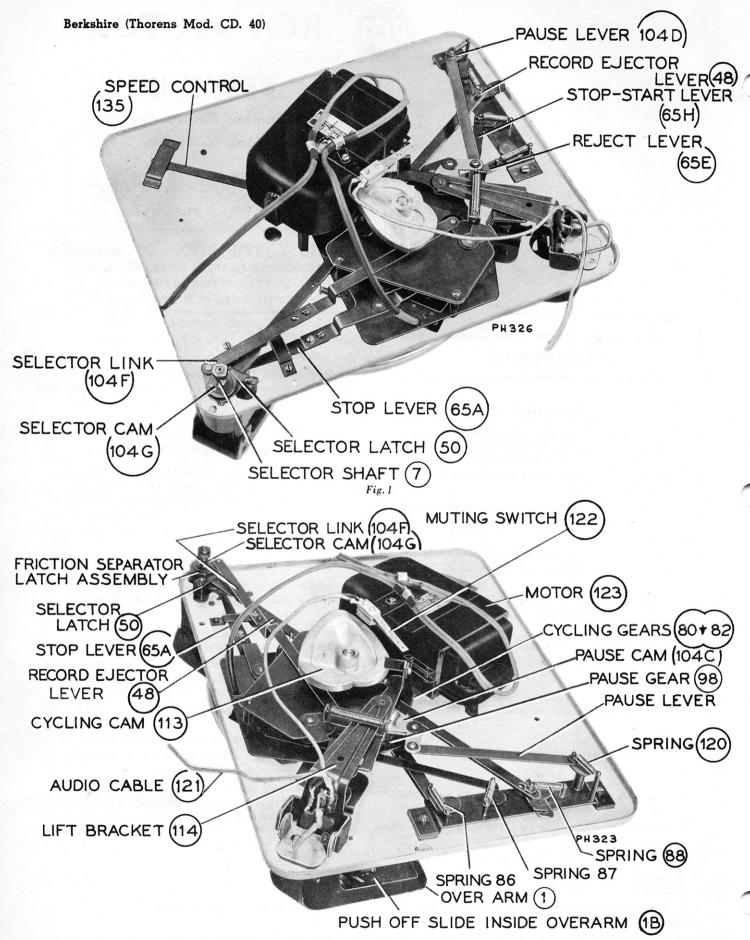
Power Consumption 15 watts.

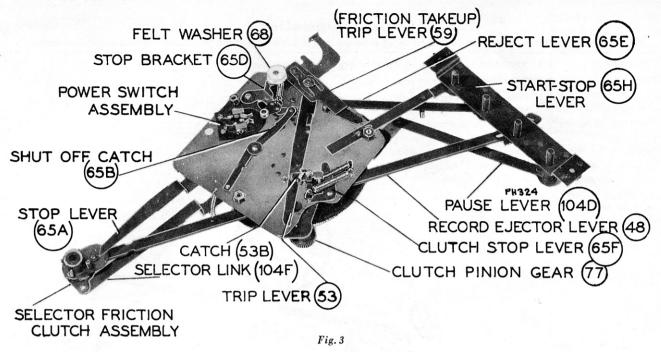
Switch for adaption to following Voltages:

100 - 125

125 - 150 Volts AC 50 to 60 cycles.

200 - 250





FUNCTION OF PRINCIPAL PARTS

Overarm (1), Fig. 2

Overarm functions as a support for the center post, and houses the push-off slide which actuates the push-off lever during change cycle.

Push-off Lever (8A), Fig. 11

The push-off lever is the movable element in the top end of the center post which separates the records.

Push-off Slide (1B), Fig. 2

The push-off slide consists of a flat piece of metal located inside the overarm. It connects the selector shaft (7) to the push-off lever (8A) thereby transmitting the rotary motion of the selector shaft to a sliding action necessary for record separation.

Record Ejector Lever (48), Fig. 1

The record ejector consists of α long lever which transmits the action from the cycling gear to the record separator shaft.

Lift Bracket (114), Fig. 2

The lift bracket forms a link between the cycling cam and the tone arm, and governs the vertical movement of the tone arm.

Selector Link and Cam (104F and 104G), Fig. 1

The selector Link and Cam assembly transmits motion from the selector shaft assembly, regulating the landing position.

Selector Latch (50), Fig. 1

Selector latch consists of a small "U" shaped piece of metal which contacts and

locks cam (104G). This locking action positions the tone arm for landing on 12 inch records.

Latch does not remain engaged when the tone arm assumes a position for landing on 10 inch records.

Cycling Cam (113), Fig. 2

The cycling cam consists of a channeled cam which directs the horizontal and vertical motion of the tone arm.

Muting Switch (122), Fig. 2

The muting switch functions as a device which automatically shorts out the pickup while the mechanism is going through change cycle.

Trip Lever (53), Fig. 3

The function of the trip lever is to automatically disengage the clutch stop lever (65F) and start the mechanism through change cycle.

Striker Pad (129) (Located on Motor Spindle), Fig. 11

The striker pad functions as part of the tripping device. Before the pickup enters the eccentric groove of the record the striker pad pushes the trip lever back with each revolution of the spindle, thereby preventing tripping. After the pickup enters the eccentric groove of the record, the trip lever latches and the striker pad strikes the trip lever as before, but this time it trips the mechanism.

Stop Lever (65A), Fig. 1

The stop lever assembly functions as a device to stop the mechanism automatically after last selection of the stack has been played. One end of the lever is held by contacting stop feeler (32B) while the other end is pushed outward momentarily from the contact made by stud (80A) located on cycling gear (80). The movement of the stop lever unlatches stop bracket (65D) allowing the felt washer to apply pressure against the rim of the turntable and at the same time opens power switch, removing power from the drive motor.

Clutch Pinion Gear (77), Fig. 3

The clutch pinion gear consists of a gear mounted on a movable carriage. This gear engages the main drive gear (128) during change cycle.

Speed Control (135), Fig. 1

The speed control is an accessible control to regulate the speed of the drive motor by acting on the pressure plate of the motor governor.

Pause Gear (98) (103), Fig. 2

The pause gear assembly consists of a star gear and a small flat gear mounted on the same shaft. It functions in conjunction with a small piece of spring steel (103) located on cycling gear (82). This spring steel piece contacts the star wheel once on each revolution. This momentary contact develops an intermittent motion which is transmitted to cycling gear (80) producing the timing device. For normal operation the pause gear acts as a tie between both upper and lower cycling gears.

Cycle of Operation

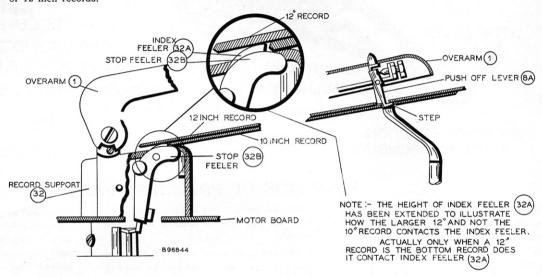
NOTE: In selecting the starting point for the following description, it is assumed that the mechanism has stopped automatically.

FUNCTION

Place a stack of 10 or 12 inch records over the center post. (Intermixed if so desired.)

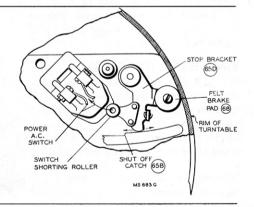
Rotate center post to such a position so as to permit the overarm to fit down over the end of the center post.

- 1. Records are supported by notch or step in the center post.
- 2. Edge of records rest on support (32).
- Both 10 and 12 inch records rest on and actuate the stop feeler (32B) which determines whether the records are played or whether the mechanism stops.
- 4. The 12 inch records rest on and actuate both the stop and indexing feelers (32B) and (32A). The action of index feeler (32A) determines whether the pickup lands in position for 10 or 12 inch records.



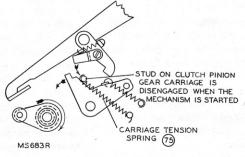
Push the "Startstop" knob to start position.

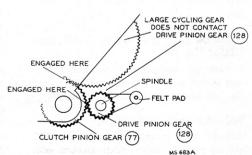
- The "start-stop" control knob actuates the stop bracket (65D)
 thereby releasing the pressure applied against the rim of the
 turntable by the felt brake pad (68). At the same time the
 power switch is closed applying power to the drive motor.
- The stop bracket is held in this operating position by the engagement with shut-off catch (65B).



Cycling starts.

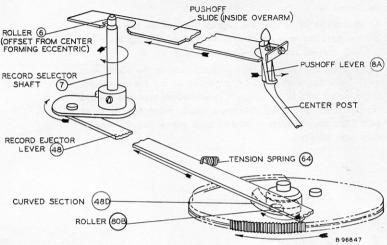
- Clutch pinion gear (77) meshed with both cycling gears start rotating.
- Cycling gears (80), (82) and cycling cam (113) rotate in the same direction.





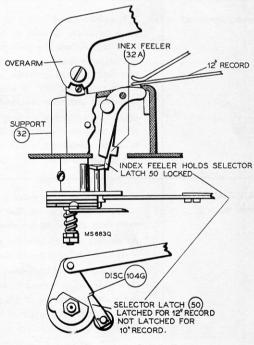
Record drops to the turntable.

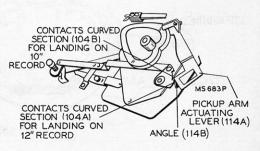
- Roller (80B) on upper cycling gear (80) slides along curved section (48D) pushing the record ejector lever (48) outward away from the center of the gear.
- 2. The outward movement of the record ejector lever (48) which has one end connected to separator clutch assembly (located beneath support post) causes the rotation of the record selector shaft (7).
- 3. The rotation of record selector shaft (7) actuates the push-off slide inside the over-arm. This action is produced by the small roller (6) offset from the center of the shaft. This forms an eccentric on the end of the shaft.
- 4. The sliding action of the push-off slide actuates push-off lever (8A) thereby pushing records off step in center post.



Tone arm moves in for landing.

- 1. As the innermost roller (80B) on the upper drive gear slides off the curved section (48D) on the record ejector lever (48) the clutch and shaft assembly snap back from force applied by spring (64).
- While the clutch and shaft assembly is snapping back, the record push-off lever (8A) is returning to normal position. This allows the next record to drop down into position on the step in the center post.
- 3. The controlling elements in pickup landing for 10 or 12 inch records are determined by the contact between the angle (114B) and portions of the cam designated by (104B) and (104A). The 12 inch record resting on support, pushes feeler (32A) down thus holding selector latch (50) in position for engagement with the notch, in the lower disc (104G) of the clutch assembly. This engagement between selector latch (50) and the lower disc (104G) of clutch assembly, positions selector link assembly, so the angle (114B) contacts at portion of the cam designated by (104A). This contact causes the pickup to assume the position for landing on 12 inch records. At this point it is important to understand that the engagement between selector latch (50) and the lower disc (104G) of the clutch assembly is only maintained while the pickup is landing. The next instant before the cycling is completed the outer stud (80A) on upper cycling gear momentarily contacts the outside of the curved section (48D) of the record ejector lever, pushing the ejector lever inward. This second snap action unlatches selector latch (50). When a 10 inch record rests on the record support it does not extend sufficiently to contact feeler (32A) so the feeler (32A) remains undisturbed. As the clutch assembly snaps back selector latch (50) does not engage notch in disc (104G). In this case the angle (114B) contacts portion of the cam designated by (104B). This causes the pickup to assume the position for landing on 10 inch records. Selector latch (50) never contacts notch in lower disc (104G) when playing a complete stack of 10 inch records. Therefore the snap back action of the record ejector lever is completed in one motion since the curved section (48D) has moved sufficiently to allow stud (80A) to pass without making contact.



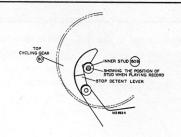


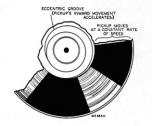
Berkshire (Thorens Mod. CD. 40)

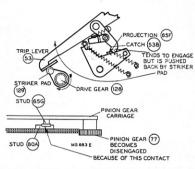
 As the cycling cam continues to rotate the stud (114D) slides down the incline in the cycling cam (113) and allows the pickup to land on the start of the record.

Cycling complete, and record plays.

- An instant after pickup lands the roller (80A) momentarily contacts stud (65G) on carriage supporting pinion gear (77) and disengages the pinion gear from the drive gear (128).
- 2. The cycling stops as the stud (80B) is locked in position with the detent lever.
- As the record plays and the pickup approaches the eccentric groove traveling at a constant rate of speed the trip lever (53) is being carried towards the center post.
- 4. Catch (53B) is tending to engage projection on the clutch stop lever (65F) but is prevented from doing so by the movement of the striker pad (129), which is synchronized with the inward movement of trip lever. Therefore, each revolution of drive gear (128), the trip lever is pushed back preventing the mechanism from tripping.

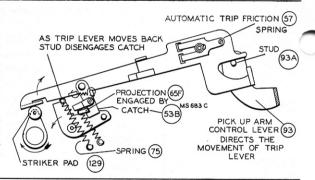






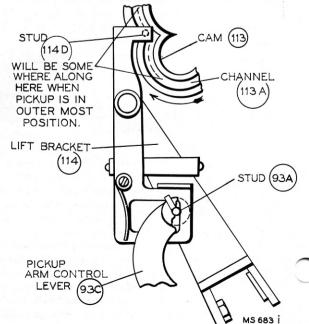
Mechanism trips.

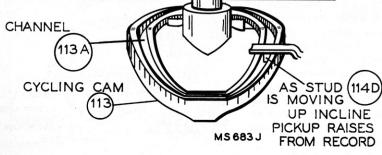
- This synchronized action of the striker pad (129) and the trip lever continues as long as the pickup moves inward at a constant rate. When the pickup reaches the eccentric groove the inward movement of the pickup is accelerated to such an extent that contact between catch (53B) and projection on the clutch stop lever (65F) is made before the striker pad has time to make a complete revolution and push it away.
- Since the projection on stop lever (65F) is latched with catch (53B) the striker pad strikes trip lever as before but it now trips the mechanism which allows the spring (75) to pull gear (77) against rotating drive gear.



Pickup raises and moves out.

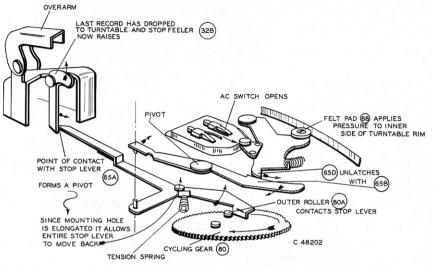
- The engagement between the drive gear (128) and the clutch pinion gear (77) starts the main cycling gears rotating. The main cam pinned to the shaft rotates also.
- As cycling cam rotates the stud (114D) [located on the end of lever (114)] follows the channel (113A) of the cycling cam.
- 3. When the stud (114D) moves up the inclined portion of the cam (113) the pickup raises from the record. As this stud reaches the horizontal portion of the cam, the pickup is pushed outward until it clears the edge of the record at which time another record drops to turntable.





Last record of the stack has been played and the mechanism stops automatically.

- 1. As the last record of the stack is being pushed off the stationary post, the feeler (32B) raises since the force produced by the weight of the record has been removed.
- 2. The feeler (32B) raises, causing the other end of the feeler to form a stop for the stop lever (65A).
- 3. As the cycling gears rotate the outer roller (80Å) located on upper cycling gear (80) contacts and pushes stop lever (65Å) outward. The contact between feeler (32B) and the end of the stop lever (65Å) forms a pivot in such a manner as to cause (65B) and (65D) to unlatch. This unlatching opens the ÅC switch contacts and allows the felt pad (68) to apply pressure against the turntable rim, thereby stopping the mechanism instantly. The stop control knob also returns to stop position.
- 4. The tone arm gradually coasts to the outside of the motorboard and clearing the edge of the turntable.



Repeat action.

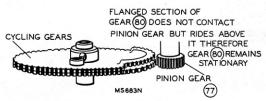
- Pushing the repeat knob actuates record ejector lever (48) and places the curved section (48D) in such a position which permits the roller (80B) to touch the curved section lightly but does not produce sufficient movement to actuate the record separating mechanism. Therefore no record drops.
- 2. The outer roller (80A) on the cycling gear (80) pushes the record ejector lever (48) back to normal position while going through cycle following the completion of the repeated selection. At this time the repeat knob assumes the off position also.

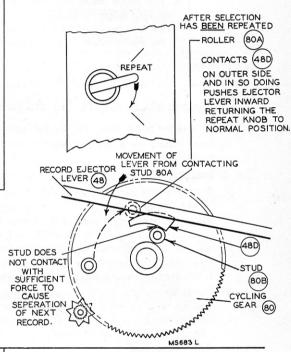
The mechanism will continue automatically without repeating.

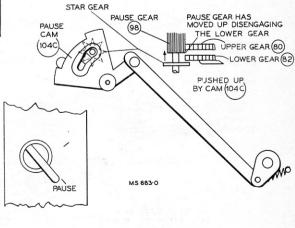
NOTE: The lower cycling gear (82) is not pinned to shaft but free to rotate in either direction when not meshing with any of the gears.

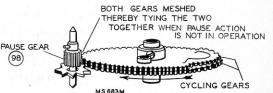
Pause action.

- When the mechanism is operating normally without the pause action, both cycling gears are rotating as one since both are meshed with pause gear (98).
- When the pause knob is pushed to pause position the cam (104C) raises the pause gear so it only engages the upper cycling gear.
- The upper cycling gear (80) has a section of the gear edge flanged in such a manner as to displace the teeth for approximately 1/5 of the circumference.
- 4. This flange in the upper cycling gear (80) allows that section of the gear to extend above the rotating pinion gear (77) and in so doing remains stationary.



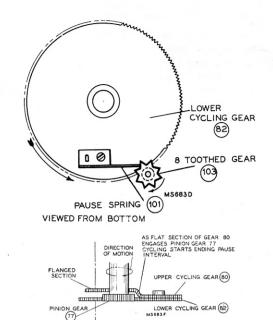






Berkshire (Thorens Mod. CD. 40)

- 5. As the lower cycling gear continues to rotate a small piece of spring steel (101) fastened on the bottom side of the gear engages the small eight toothed star gear (103). On each revolution of lower cycling gear (82) the small spring steel piece of metal (101) rotates the pause gear assembly the distance between teeth.
- This slight rotation of the pause gear produced by each revolution of cycling gear (82) rotates the upper cycling gear slightly.
- 7. After 20 revolutions of the lower cycling gear (82) the pause gear has rotated the upper cycling gear (80) sufficiently, to enable the flat section of the gear (80) to contact pinion gear (77) and make one complete rotation. One rotation being one change cycle which starts the next record through the playing cycle.
- This pause action will take place after each record has been played unless the pause knob is placed in the "off" position or the last record of the stack has been played, at which time the mechanism will stop automatically.

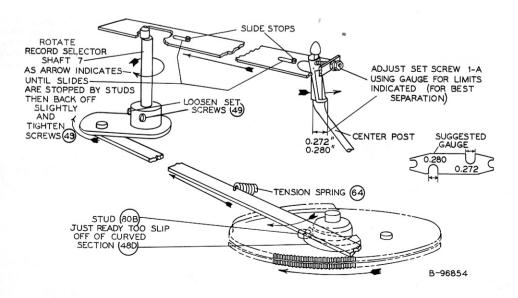


Separator Shaft (7) Adjustment

- 1. Remove the power plug from the AC receptacle.
- Make certain the pause and reject knobs are in the "off" position.
- 3. Push the "start-reject" knob to the start position.
- Remove center post and place the overarm down to the normal operating position.
- 5. Rotate the turntable by hand in the normal direction noting the engagement between the stud (80B) on the upper cycling gear (80) and the curved section (48D) of the record ejector lever (48). Continue rotating turntable until the stud (80B) is just ready to slip off the end of the curved section (48D).
- 6. Loosen set screws (49) in separator clutch assembly and turn the separator shaft (7) in a counterclockwise direction (viewed from the bottom) until the slide in the overarm has reached its limits. Back off slightly and tighten set screws (49).

Separation Adjustment (Push-off Lever) (8A)

- 1. Remove the power plug from the AC receptacle.
- Make certain the pause and reject knobs are in the "off" position.
- 3. Push the "start-reject" knob to the start position.
- 4. Place overarm down over center post and rotate the turn-table by hand in the normal direction, until the slide in the overarm has completed the maximum backward travel. ["Push-off" lever (8A) is now extending the maximum distance.] The limit of travel of "push-off" lever should be 0.272 to 0.280 inches as indicated below. If these limits are not reached adjust screw (1A) under overarm for dimensions indicated.
- 5. Try a stack of records to determine performance. Readjust screw (1A) if necessary, for better separation. [Tighten lock nut (1C).]



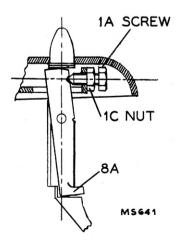


Fig. 4

Fig. 5

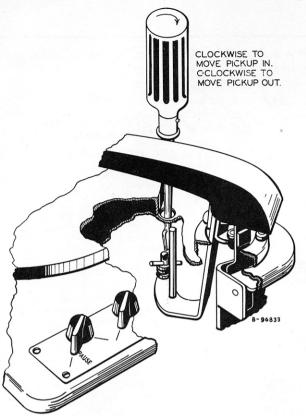
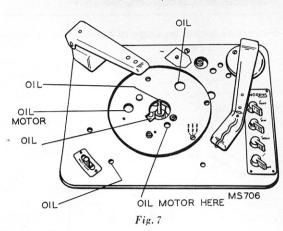


Fig. 6-Landing Adjustment



LUBRICATION

A light machine oil (SAE No. 10) should be used to oil the bearings of the drive motor (painted red) and points indicated in drawing above. On all gears and other surfaces, STA-PUT No. 512, or equivalent, is recommended. STA-PUT can be purchased from E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia, Pa.

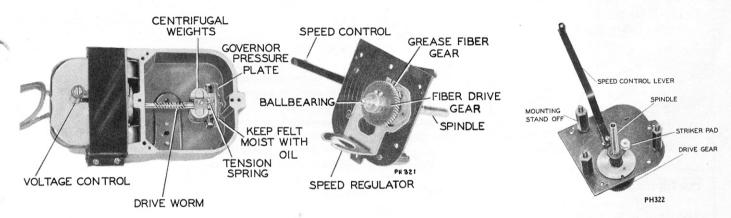


Fig. 8—Motor Showing Governor

Fig. 9-Motor Top Plate and Gear

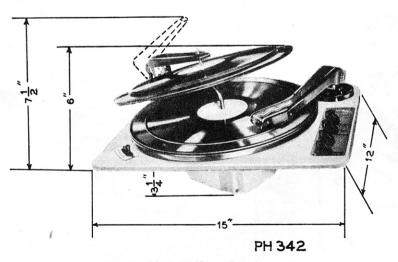
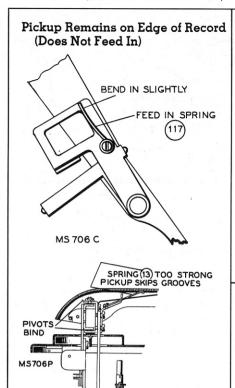
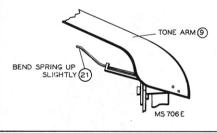


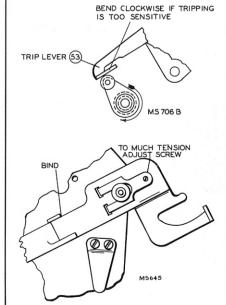
Fig. 10-Mounting Space Requirements

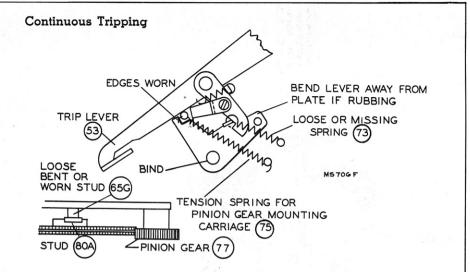


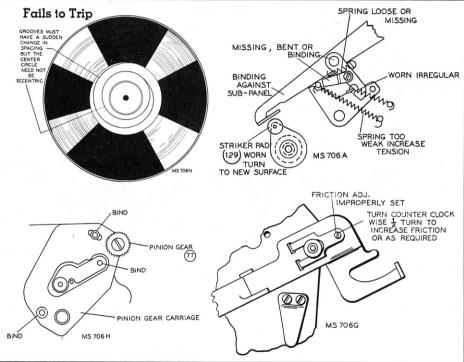
Pickup Does Not Raise Sufficiently to Play Entire Stack



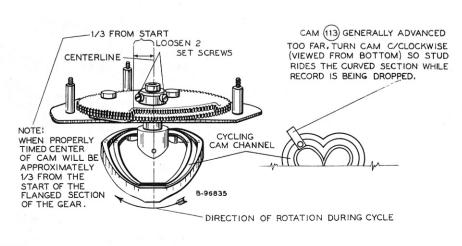
Pre-Tripping

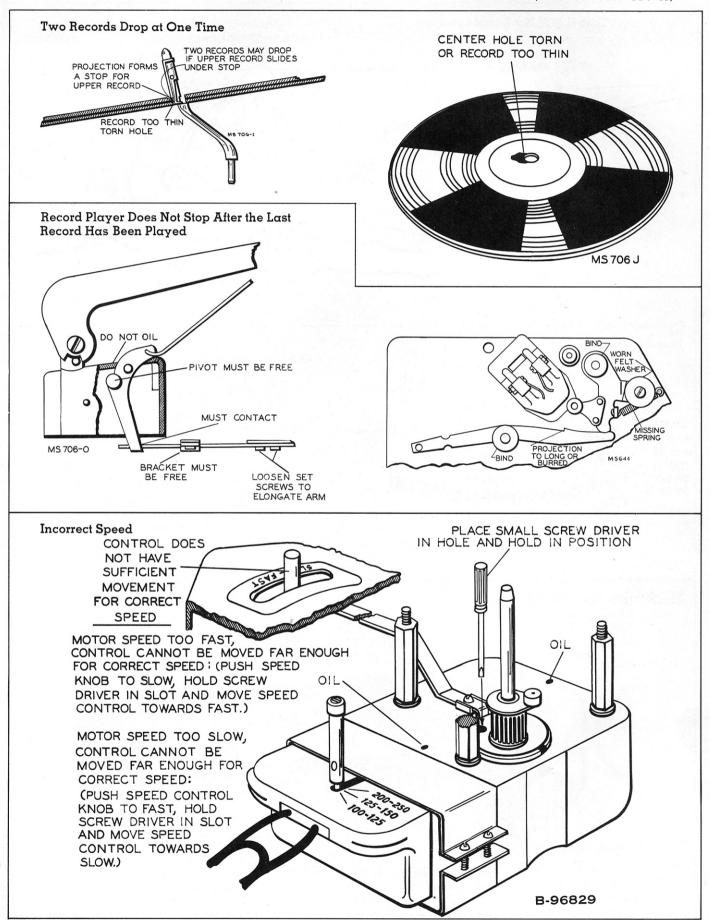


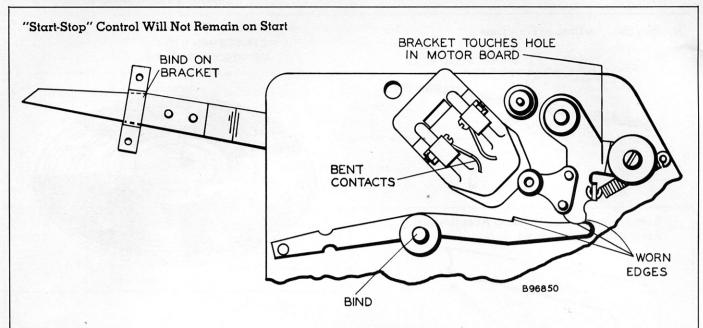


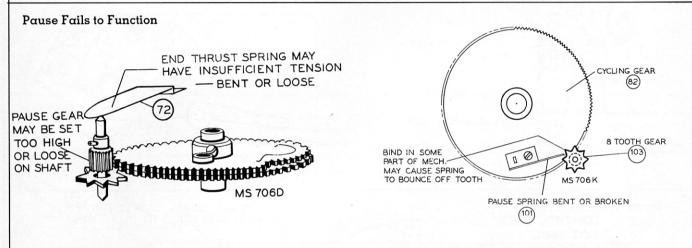


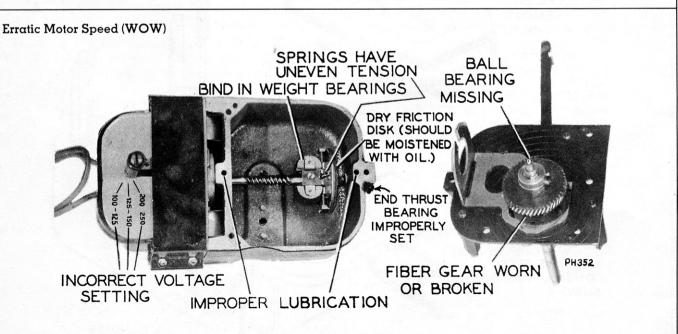
Twelve Inch Records Strike Tone Arm While Dropping

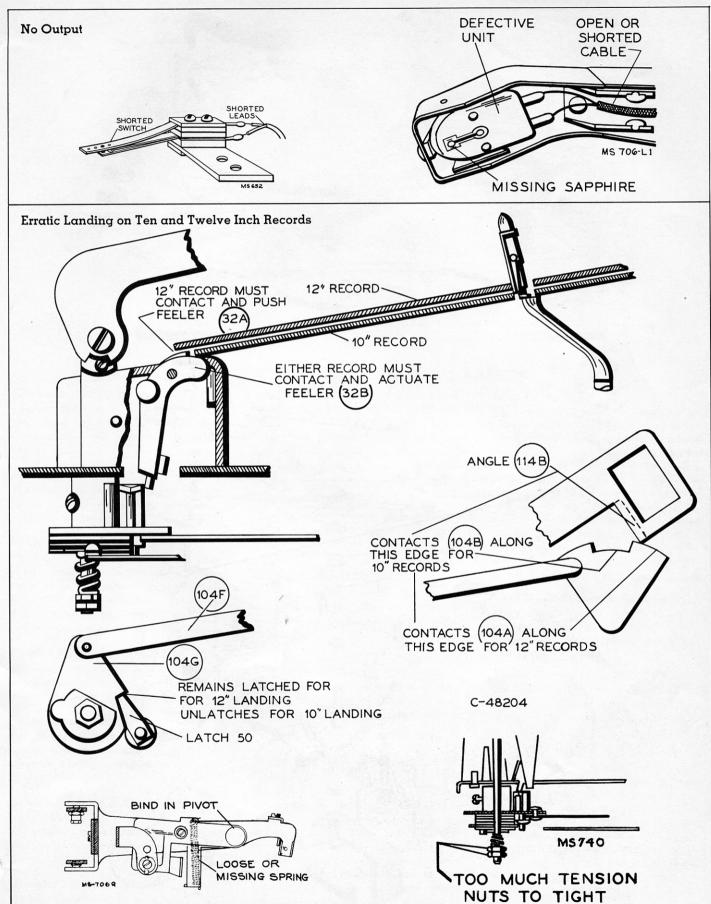












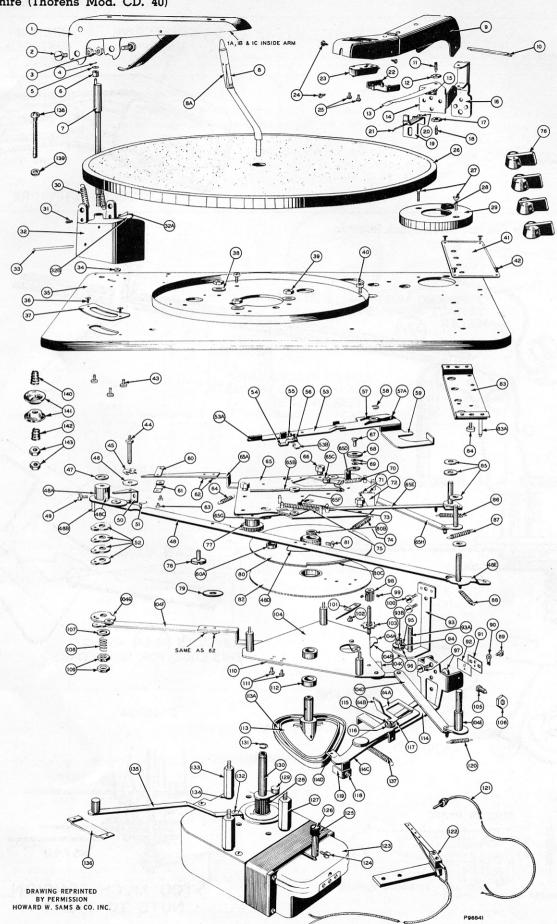


Fig. 11—Exploded View

REPLACEMENT PARTS

Stock No.		Ref. No.	Stock No.	DESCRIPTION
	Overarm	77	7	Clutch pinion gear
	Screw (Part of overarm)	78	100	Mounting screw for item 77
	Push-off slide (Part of overarm)	79		Washer
	Nut (Part of overarm)	80	2/3/3/3	Upper cycling gear
5545 5545		81 82		Mounting screws for item 80
3343	"C" washer	83		Lower cycling gear Control shaft mounting plate
100	Flat washer	83A		Stud part of item 83
	Roller	84	^	Mounting screw for item 83
- 1	Record selector shaft	85		Washers for control shafts
5737		86	55441	Reject lever spring
	Push-off lever (Part of centerpost)	87	55442	Stop start lever spring
	Tone arm Pivot rods	88	55443	Repeat lever spring (same as item 120) Terminal board mounting screw
	Cone point set screw	90		Pickup cable connection lug
	Lock nut for item 11	91)		그 사람들은 경우를 하는 사람들이 가장 하나 있다면 하는 사람들이 되었다. 그리는 사람들이 나를 하는 것이다.
	Tone arm counter balance spring	92 }	57373	Pickup leads terminal board
	Tone arm mounting hinge	93		Tone arm control lever
	Mounting screws for mounting item 14	93A 93B		Stud Landing adjustment screw
	Tone arm pivot bracket Same as item 12	94		Stud part of item 93B
	Same as item 11	95	950	Washer
	Tone arm lift bracket	96		Tension spring on landing adjustment screw
5544	7 Mounting screw for pickup lift spring	97	55446	Mounting screws for item 114
5543	9 Pickup lift spring	98		Pause gear
5733		99	55450	Set screw for pause pinion
5733	Pickup cartridge complete with sapphire Screws to mount item 22	100	1000	Mounting screws for item 93
	Screws to mount item 22 Screws to mount item 23	101		Pause spring Mounting screw for item 101
1	Turntable	103		Pause star wheel
	Mounting screws for item 29	104		Lower control plate assembly
1	Rubber grommet	104A)		
	Tone arm pivot base cover	104B		Landing position cam
5737		104C		Pause cam
	Stop screw for overarm	104D 104E		Pause lever Pause control knob shaft
	Overarm platform Selector feeler \ Part of item 22	104E		Selector link
	Stop feeler Part of item 32	104G		Selector cam
1000	Pin for spring, item 30	105	7.50	Pivot screw
	Mounting nut for item 44	106		Pivot screw lock nut
The same	Motor board	107		Washer part of selector clutch assembly
	Mounting screws for speed control escutcheon	108	55438	Selector clutch friction spring
	Speed control escutcheon	109		Selector clutch friction adjustment nut
	Washer (motor mounting)	110		Spring (blade) Mounting screws for item 110
1	Motor mounting nut Control plate mounting screw	112		Spacer sleeve
5737	2 Control escutcheon	113		Cycling cam
5544		113A		Channel in cam part of item 113
	Mounting screws for item 32	114		Lift bracket
	Selector pivot pin	114A		Part of lift bracket) Lift
	Spring washer for selector latch	114B		
37.32%	Washer for selector latch	114C 114D		Part of lift bracket Stud Stud
	Flat washer Record ejector lever	115		Feed in spring mounting screw
	Fiector lever crank	116		Washer
	Mounting pin for selector clutch assembly of	117	57374	Feed in spring
1000	Stop stud for selector latch	118		Mounting screw for retaining bracket
1 2 9 3	Curved section of record ejector lever	119		Retaining bracket
3 34	Repeat return lever	120 121	55443	Pause lever spring Pickup plug and shielded lead
	Screw for selector feeding shaft Selector latch	122		Muting switch and shielded lead assembly
	Pin for selector guide rod	123		Motor complete
	Clutch washers	124		Screw
	Trip lever assembly	125	300	Sleeve
	End of trip lever Part of item 53	126		Slotted shaft (switch)
	Trip eaten	127		Stand-off
554	Stabilizer connected to trip lever	128		Drive gear
5544	Mounting screw for item 54	129 130		Striker pad Spindle
5544		131		"C" washer
5543		132		Mounting screw for speed control lever
	"C" washer for mounting trip lever assembly	133		Stand-off
	Part of trip lever assembly	134		Washer
1	Spacer guide plate	135		Speed control lever
1	Guide bracket	136		Guide bracket
1	Screws for stop lever Mounting screws for items 59 and 60	137		Spring
	Ejector lever tension spring	139)		
1	Upper control plate assembly	140	55455	Suring manufing
	Stop lever	141 (55455	Spring mounting assembly
	Shut-off catch	142)		
1	Power switch roller Part	143		D. D
1	Stop bracket of			PARTS NOT IDENTIFIED ON EXPLODED VI
1	Reject lever (item Clutch stop lever 65		55453	Power switch complete with contacts
. 29	Clutch stop lever 65 Stud		55454	Screw to hold switch cover
1	Start stop lever			MOTOR DEPT
	Spacer nut mounted between upper control panel			MOTOR PARTS
1	and motor board		57380	End thrust ball
1	Mounting screw for felt washer		57381	Motor stator complete
5760			57382	Turntable main spindle (extending into moto
	Washers		57383	Motor governor complete with weights
5737			55456	Thrust ball for rotor shaft and bottom of r spindle
5737	Mounting screws for pause pinion spring Pause pinion spring		57384	Governor spring
5543			57385	Thrust plate for bottom of main spindle
3546	Tension spring		55457	Screw for speed control friction bearing (on
				side of spindle)
5544	0 Clutch plate spring		55458	Thrust plate cover screw (bottom of motor hous

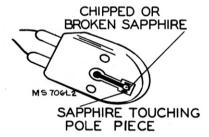
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Howl or Rumble

The Berkshire instruments are shipped with the Thorens record changer mounted firmly and not suspended on springs. However, in certain cases if acoustic feedback or rumble is encountered, mounting the changer on springs may make a noticeable improvement.

Distorted Output



Pickup Force Adjustment

