

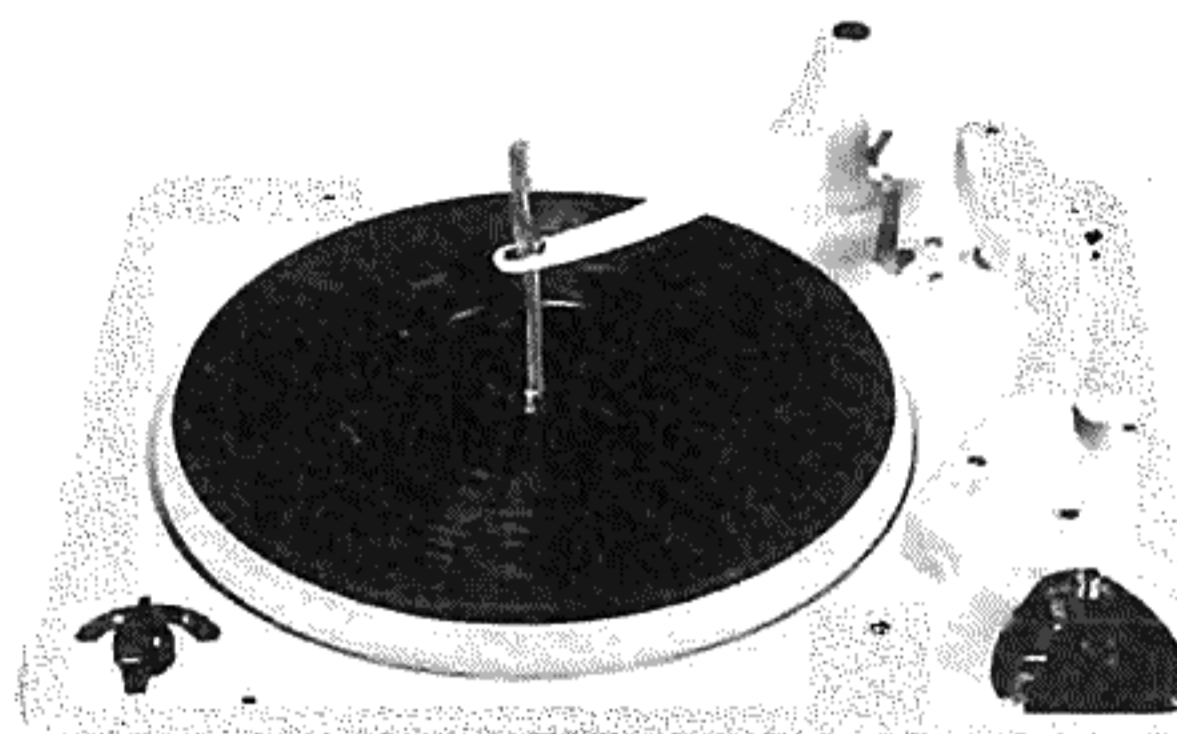
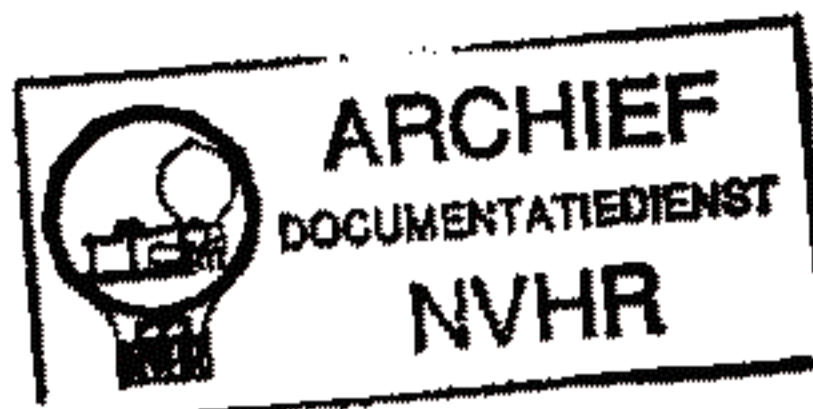
**Ned. Ver. v. Historie v/d Radio**

Figure 1. Model 3RC-531

Figure 2. Model 3RC-532

GENERAL INFORMATION

The Collaro Record Changer Models 3RC-531 and 3RC-532 are fundamentally identical in construction. Both are three speed units, the major difference being that Model 3RC-531 is a non-intermixing changer while Model 3RC-532 is an intermixing unit incorporating a trip lever which gives automatic pickup positioning for 10" and 12" records, allowing them to be mixed in any order.

These changers automatically shut off after the last record has been played.

Connect these units only to an outlet supplying 117 volts, 60 cycle AC unless otherwise specified.

Manufactured by:

Collaro Limited
Ripple Works, By-Pass Road
Barking, Essex

Distributed in U. S. by:

Rockbar Corporation
211 East 37th Street
New York 16, N. Y.

**COLLARO
MODELS 3RC-531, 3RC-532**

This material compiled and published by

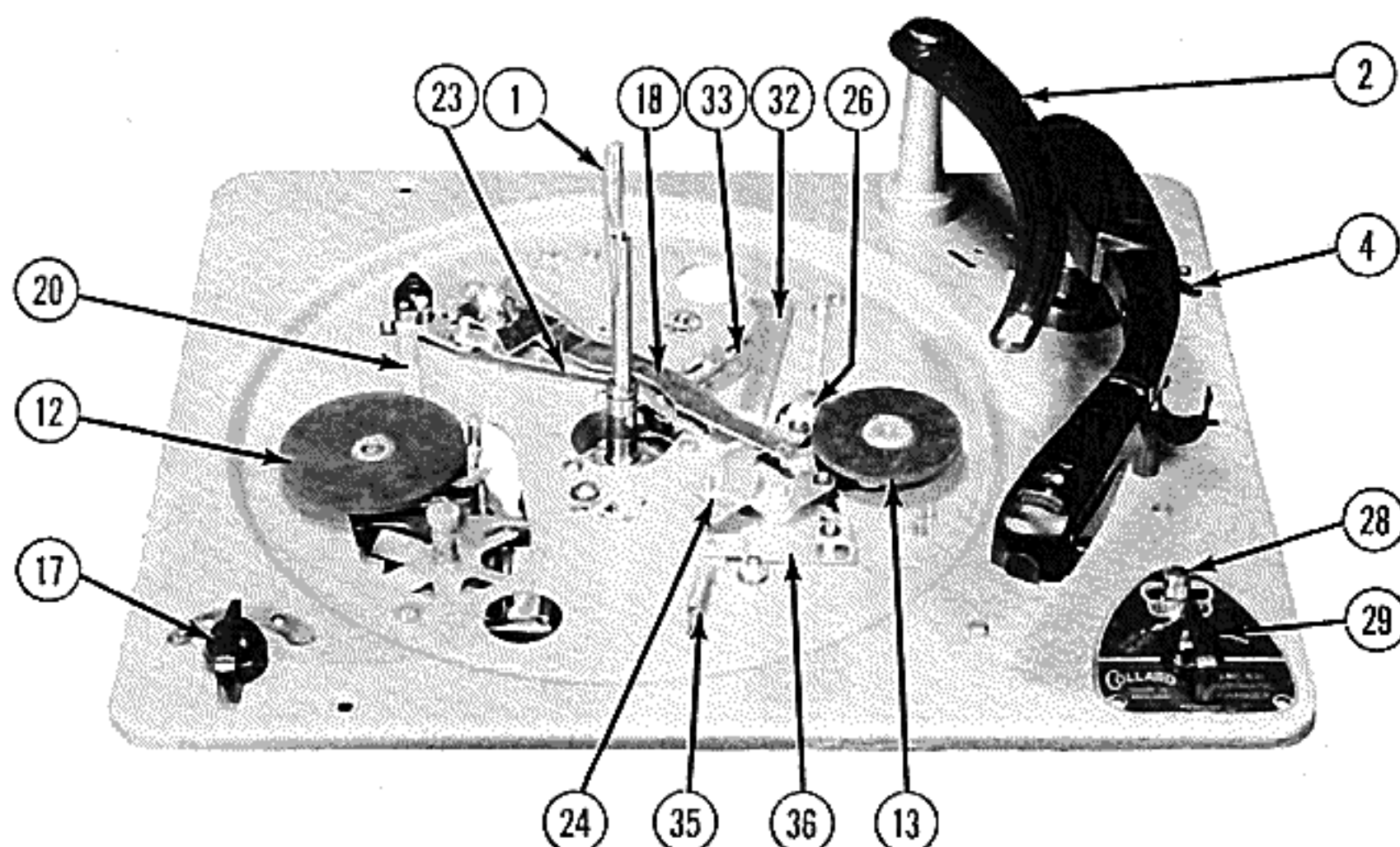


Figure 3

OPERATING INSTRUCTIONS

Capacity-

These Collaro changers will play up to nine records. In the case of Model 3RC-532 10" and 12" records, of the same type, may be played intermixed. 7" records cannot be intermixed with other sizes. A position control knob (28) is provided with Model 3RC-531 and must be preset to the particular position equivalent to the size of the record to be played. In both models the speed control knob (17) must also be preset to give an appropriate turntable speed.

To Load-

To load records, the balancing arm (2) is lifted out of engagement with spindle (1) and then swung to the right until it is clear of the turntable. Records, up to a maximum of nine in number, are then placed on the spindle in the order in which they are to be played. The slot in the record balancing arm should then be engaged with the spindle, and the arm allowed to rest on top of the stack of records.

NOTE: Do not attempt to intermix 33 1/3, 45 or 78 RPM records by operating speed change knob (17) while the changer is running.

To Start-

To start the machine, after checking that position and speed controls are correctly set, control knob (29) is turned fully to the left, held momentarily, and then released. After playing the last record, the pickup arm is automatically lifted from the record and the supply to the motor is switched off.

To Unload-

To unload records after they have been played, the balancing arm (2) is lifted out of engagement with the spindle and swung to the right until clear of the records. The complete stack of records may then be lifted straight up and off the spindle.

Rejecting-

Any record may be rejected during playing by turning control knob (29) gently to the left. The pick-up arm will immediately lift from the record, and the next record will be released and commence to play.

Stopping-

The changer may be stopped at any time by turning control knob (29) fully to the right and releasing. The pickup arm will immediately lift from the record and swing to its outward position, when the supply to the motor will be automatically switched off.

SPECIAL FEATURES

Muting-

The pickup cartridge is muted during the change cycle, thus avoiding the reproduction of undesirable noises during the interval between records, and also avoiding the unpleasant "running down" effect due to slowing of the turntable when a record is rejected or when the "Stop" control is operated. The pickup cartridge, however, becomes "live" again when the machine switches off.

Retractable Drive-

Rubber tired pulleys (12 and 13) are automatically retracted when the unit is switched off. The development of flats on the tires, due to prolonged contact under pressure during periods of disuse, and consequential noisy running and unevenness of turntable speed are thus positively avoided.

CHANGE CYCLE

It is recommended that the change cycle operation be observed by rotating the turntable by hand.

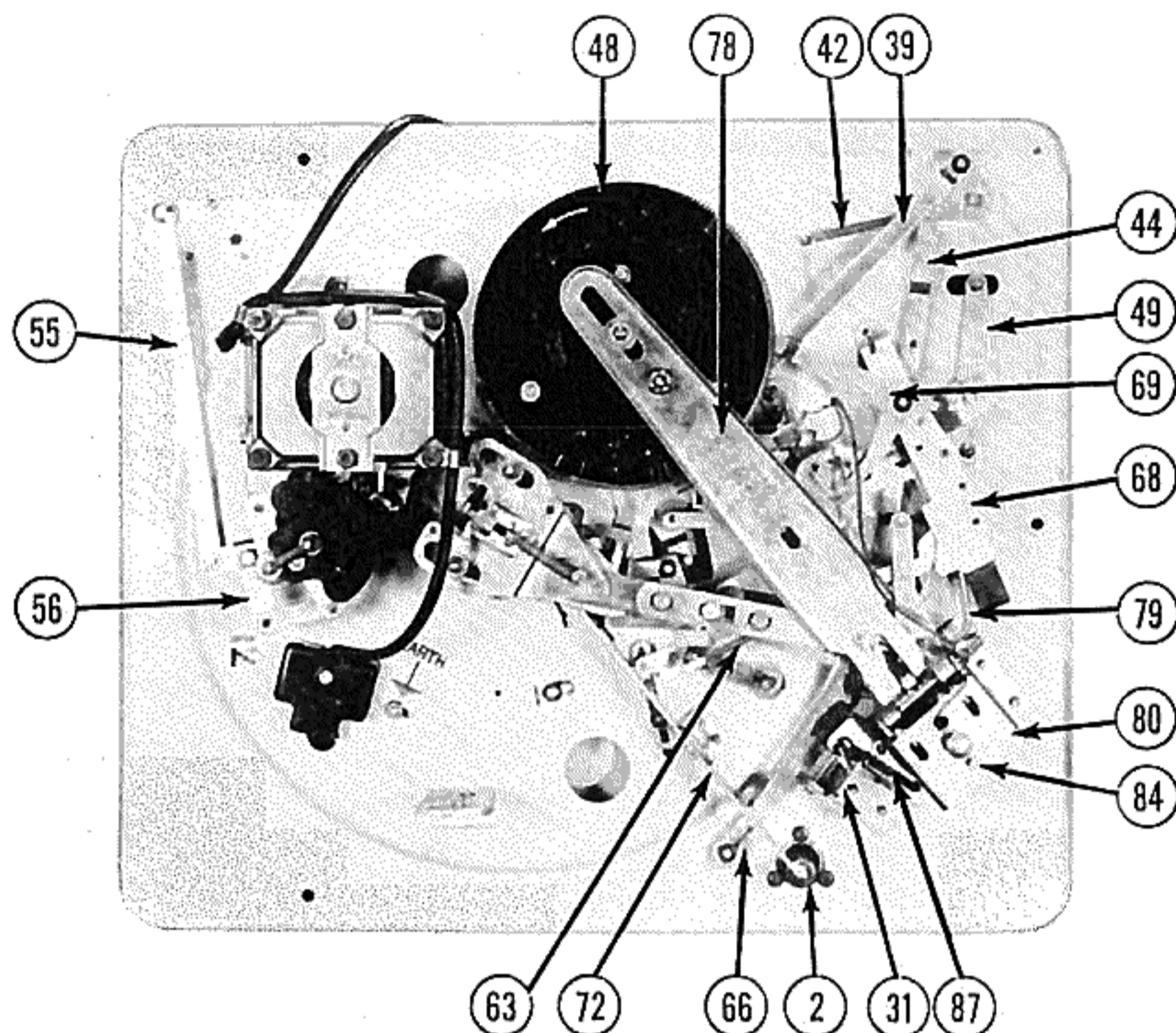


Figure 4

The action described below can then be readily followed and the function of each part more easily understood.

This changer is provided with what is known as a velocity trip mechanism. The change cycle is started by the faster inward motion of the pickup arm when the needle enters the lead-out groove at the end of a record.

The pickup arm assembly and the pickup tripping arm (41) are secured at opposite ends of the pickup arm shaft and bearing assembly (30) so that they move in unison. As the pickup arm nears the end of a record, the pickup tripping arm (41) pushes the push trip lever (64), which in turn carries striker arm (58) in toward the turntable hub. Striker arm (58) is fed inward by the friction provided by its own weight resting on the curved end of push trip lever (64).

While a record is playing, the small motions of striker arm (58) are not sufficient to trip the mechanism because, on each revolution of the turntable, the wiping action by the turntable hub projection (point "A" on exploded view) moves striker arm (58) back far enough to clear the hub projection.

When the needle enters the lead-out groove, causing the pickup arm to advance rapidly toward the spindle, striker arm (58) is moved far enough to definitely engage the turntable hub projection (point "A" on exploded view). As the hub projection engages with striker arm (58), the striker arm is pushed away from the turntable hub (toward the pickup arm) far enough to contact and push pin (point "B" on exploded view). This action releases swing bracket locking lever (26) from slide bar (32) which, in turn, allows swinging bracket (50), carrying cycle drive

wheel (13), to move outward through action of spring (25). Since the turntable is rotating, the cycle drive wheel (13) also rotates, starting main cam (48) to revolve by action of the gear train associated with swinging bracket (50).

Simultaneously, the main slide (78) starts its forward travel, by following the movement of the cam follower (78A), and the cam surfaces (point "C" on exploded view) ride up on rollers (85) lifting the pickup arm clear of the record. The pickup arm actuating lever (74A) is now pulled forward by main slide (78), swinging the pickup arm clear of the turntable.

At this time, the spindle actuating lever (89A) moves towards the turntable hub (90) and contacts the spindle slide (94), which in turn, is moved far enough to allow the record selector pawl (92) to ride down the incline on the spindle slide (point "D" on exploded view). The record selector pawl (92) now rises vertically until its upper end engages the center hole of the lower-most record in the stack and then moves sideways sufficiently to push the record off the spindle shelf.

During this sequence of operations the main slide (78) has reached its extreme forward travel and now starts moving toward the rear of the changer. As this takes place, the pickup arm actuating lever (74A), which is connected to main slide (78), also moves towards the rear of the changer and by engaging with the pins in the pickup arm actuating plate (74) moves the pickup arm in over the record.

At this time, the stud (point "E" on exploded view) on the end of the pickup positioning arm (73) engages with one of the slotted tabs (65) on the pickup arm positioning plate, thus stopping the inward travel of the pickup arm. The spring loaded rollers (85)

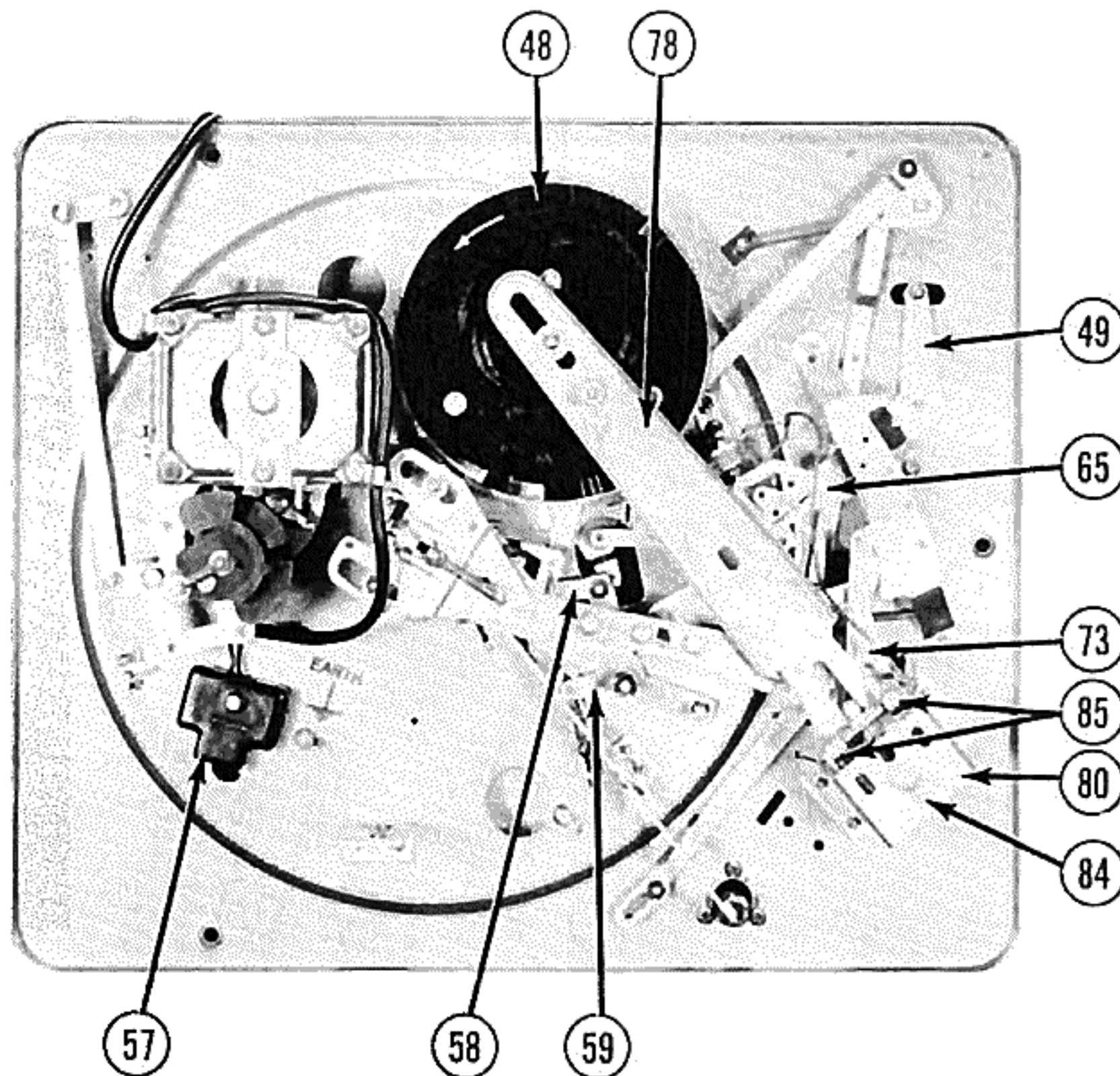


Figure 5. Underside of Model 3RC-531. Note the manually operated position control lever (49) which must be set to the position corresponding to the size record to be played. With Model 3RC-532 positioning is entirely automatic for 10" and 12" records. Note also that items (31, 63, 69, 79, 86 and 87) are not employed on this model.

ride down the cam surface (point "C" on exploded view) lowering the pickup arm to the record.

As the bakelite cam (48) nears the completion of its course, the innermost stud on the cam drive gear (47) rides against the cycle release cam (52), and in so doing, pivots the cycle release cam (52) far enough to release it from the lower middle stud on slide bar (32), thus allowing the slide bar to be pulled forward by action of spring (35). Since the notch in the swing bracket locking lever (26) is engaged with the top stud on slide bar (32), the swing bracket locking lever (26) is also pulled forward pivoting swing bracket (50), which is associated with cycle drive wheel (13), away from the turntable rim. The change cycle is now completed and the pickup arm is free to ride across the record until the needle enters the eccentric tripping groove, at which time, the next change cycle will be started.

As soon as the last record has been dropped, the record balancing arm (2) drops below the shelf on spindle (1) and the balancing arm shaft contacts shut-off lever (72). The balancing arm shaft, when in this position, lifts the lower forked end of shut-off lever (72) into contact with the underside of the baseplate. When the last record has finished playing, the change cycle starts again; however, this time, the automatic stop trip lever (33) moves in behind the stud on shut-off link (23) and the notch in the cycle release cam (52) is prevented from engaging with the lower middle stud on slide bar (32). As soon as the pickup arm has reached a position directly over the arm rest (9), the front lower stud on slide bar (32) clears the drive gear cam (47A) allowing slide bar (32) to return to its forward position by action of spring (35). As slide bar

(32) moves forward it carries the swing bracket locking lever (26) with it, which in turn, pivots the swinging bracket (50) and cycle drive wheel (13) away from the turntable rim, thus stopping the cycling mechanism.

Simultaneously, the automatic stop trip lever (33) contacts shut-off link (23) and releases it from its notch in the baseplate. This permits idler wheel (12) to be disengaged from the turntable rim and for the motor power switch to be opened by action of spring (27), thus switching the machine off.

ADJUSTMENTS

Needle Set-Down-

The pickup arm is located to the mechanism underneath the unit plate by means of a spring-loaded roller which normally engages a slot in the pickup tripping arm (41). This is to prevent damage or strain to the mechanism should the pickup arm be inadvertently moved sideways by hand, i.e., while changing the pickup head or stylus, such movement causing the roller to disengage from the slot. If left so displaced, the set-down position will be affected. It is, therefore, important to ensure that the roller is located in the slot before determining whether adjustment of the set-down position is necessary. To do this, bring machine to switched-off position, move pickup arm inwards until its head touches spindle and then move outwards to position over pickup arm rest (9). It will be distinctly felt when the roller springs into position in its slot.

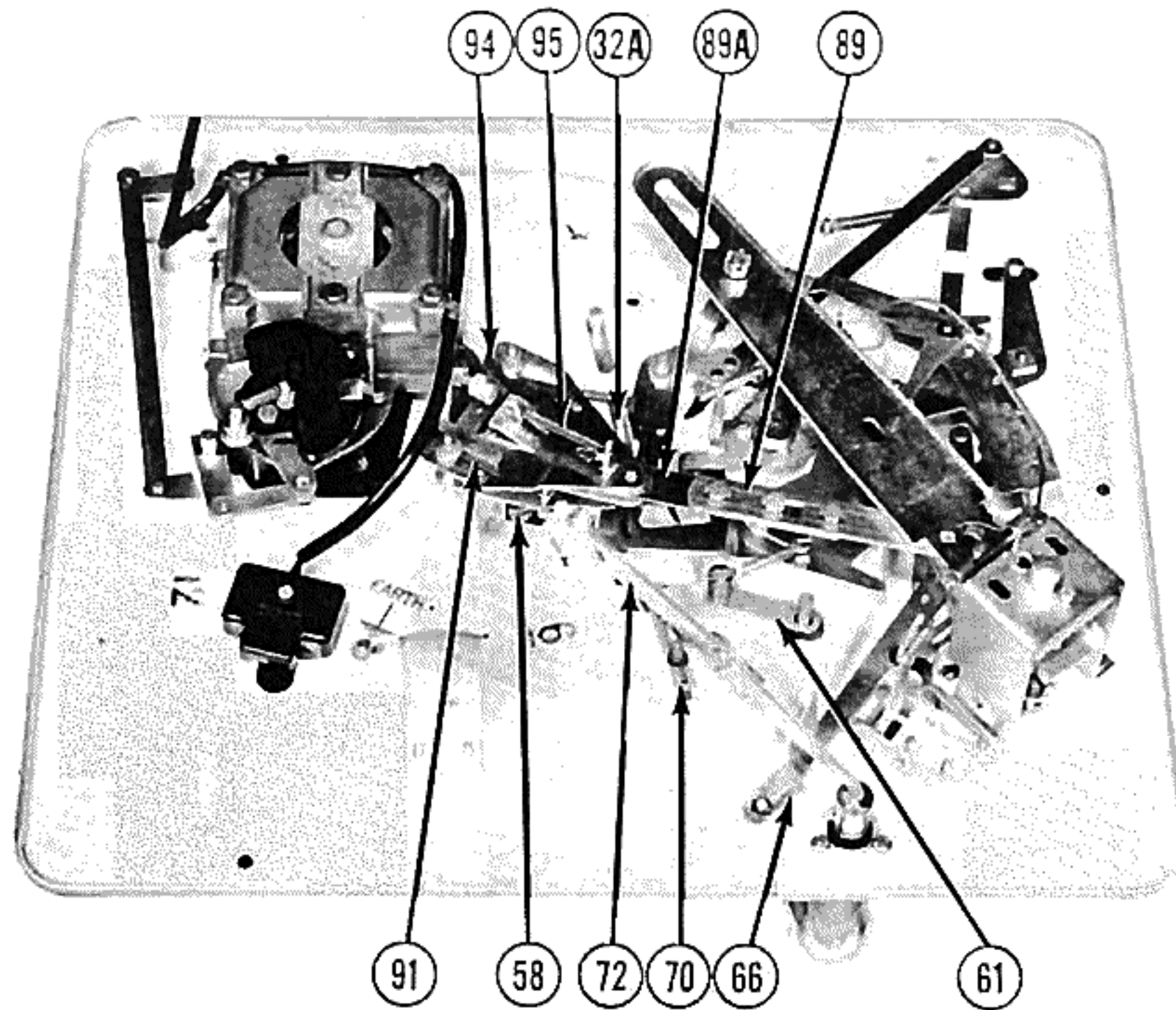


Figure 6

CAUTION: Attempting to operate the changer while the pickup arm is clamped to its rest may result in displacement of the pickup arm set-down position as described above.

The position at which the needle lands on the record may be adjusted by means of screws (7). To move needle set-down point inward, loosen the left-hand screw and tighten the right-hand screw the same amount. To move needle set-down point outward, reverse the above procedure.

NOTE: This adjustment is very sensitive; turn the screw only about one-eighth of a turn at a time until the desired position is obtained, and finally make sure that both screws are really tight. This adjustment affects equally all positions (whether for 7", 10" or 12" records). Independent adjustment is provided for 10" and 12" records by means of slotted tabs in the positioning plate (65) which act as stops for these positions. By bending these tabs slightly inwards or outwards the needle set-down position will be correspondingly affected.

Pickup Arm Height Adjustment-

Minor adjustments may be made by means of screw (A1) (Figure 9). Turning this screw counter-clockwise will increase the lift of the pickup arm and vice-versa. Correct adjustment is when the upper side of the pickup head clears the underside of a stack of records by 1/8" when the pickup arm is in its fully lifted position.

Major adjustments may be made as follows:
(Refer to exploded view and Figure 9).

1. Allow the changer to complete a cycle and with the pickup arm resting on a record switch off the AC supply.

2. Adjust screw (A1) so that the underside of the pickup head (not the needle) comes level with the turntable covering.

3. Cycle changer to see if upper side of pickup head clears the underside of a stack of records by 1/8" when the pickup arm is in its fully lifted position. If not, loosen locknut and adjust screw (84). Retighten locknut securely and recheck all adjustments.

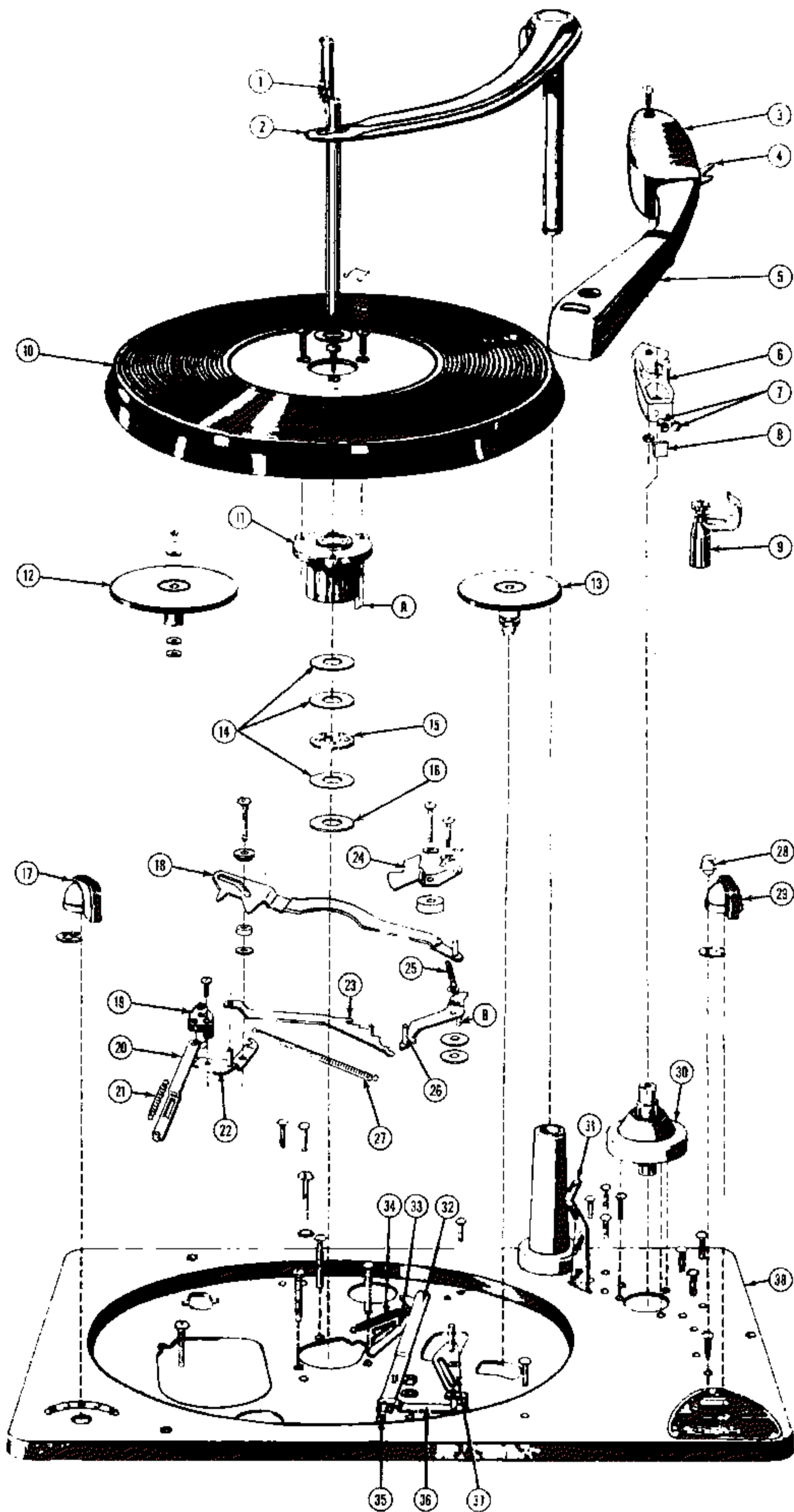
NOTE: Adjustment of screw (A1) affects equally both height to which pickup arm is lifted and the extreme depth to which it may fall. Adjustment of screw (84) affects height only. Hence it is essential to adjust screw (A1) correctly before adjusting screw (84).

Needle Pressure (Refer to Figure 9)-

1. The Collaro is designed to track at as little as 3 grams, however, most present day cartridges are designed to track at from 5 to 12 grams. Before attempting to adjust the needle pressure refer to the cartridge manufactures specifications for the recommended needle pressure.

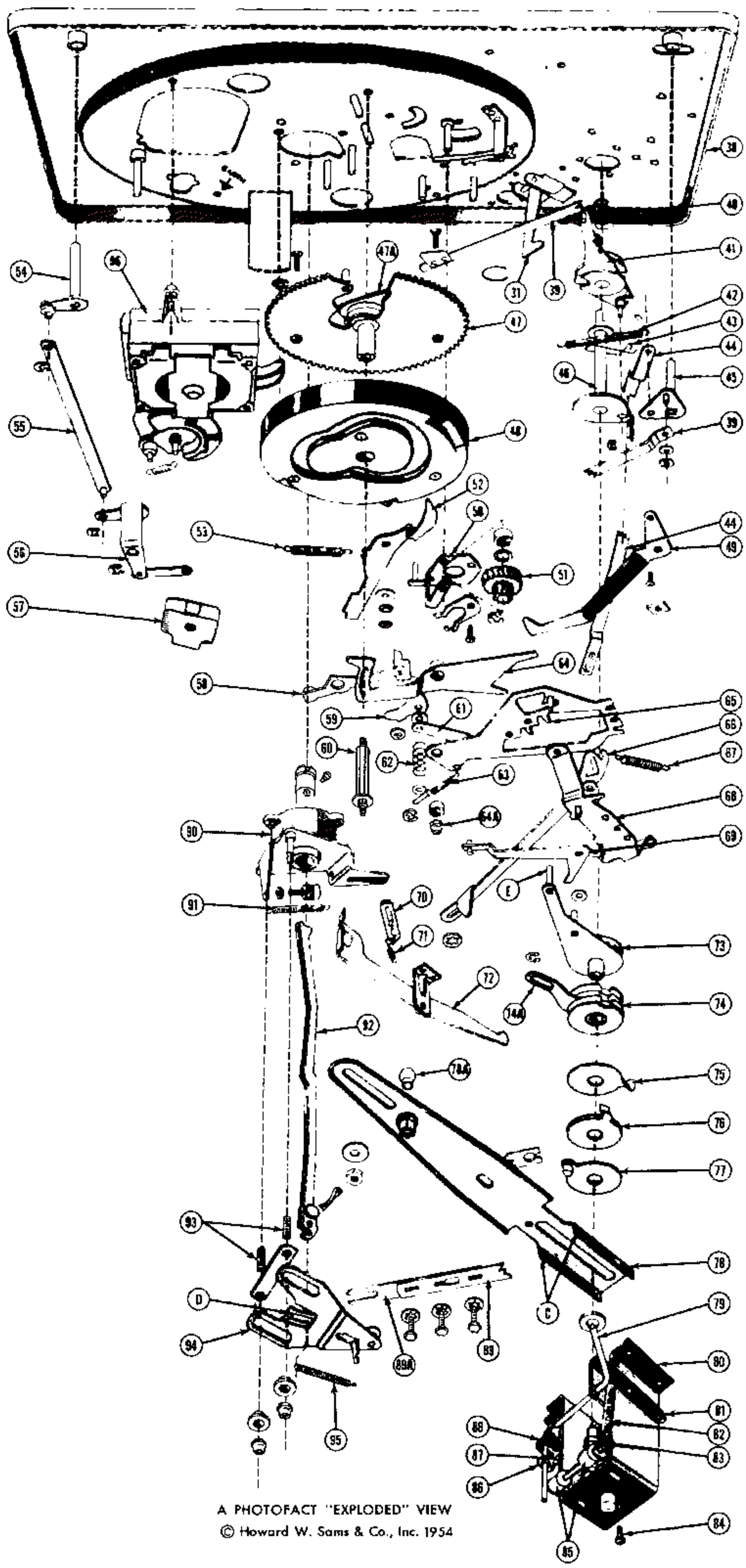
2. Set the weight compensating control (4) in the "LP" position. Use a suitable gram scale and check the needle pressure at the point where the needle lands on a record. When the needle pressure is obtained for the "LP" position, the pressure for the "Std" position will also be correct.

The needle pressure may be adjusted, if necessary, as follows:



A PHOTOFAC "EXPLODED" VIEW
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Figure 7A, Exploded View of Parts Above Baseplate.



A PHOTOFAC "EXPLODED" VIEW
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Figure 7B. Exploded View of Parts Below Baseplate.

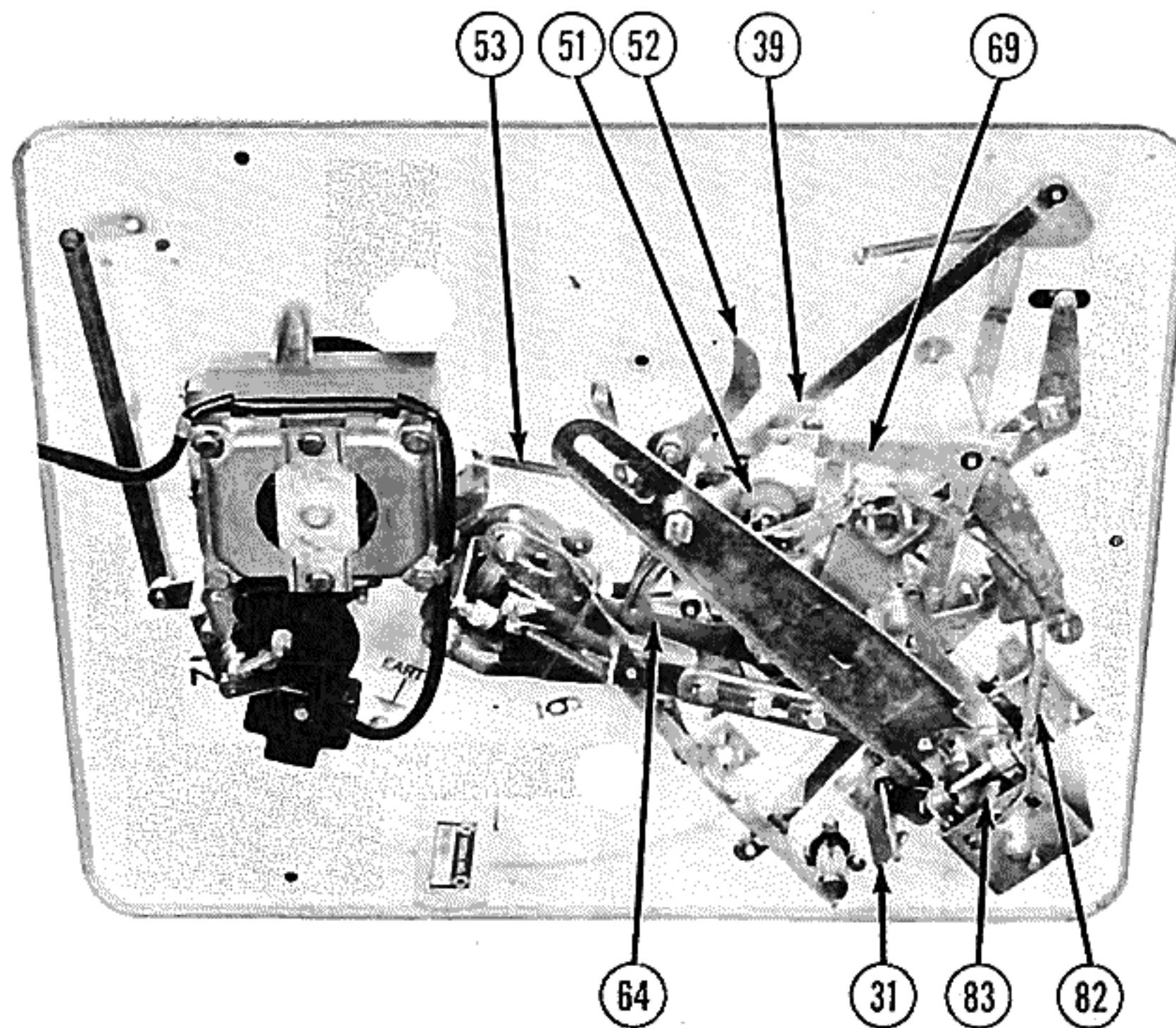


Figure 8

Loosen screw (A2), then turn adjustment screw (A3) clockwise to decrease needle pressure or counterclockwise to increase pressure. After adjustment is made tighten screw (A2).

TROUBLES

Record Dropping (Refer to Figure 10)-

1. More than one record drops at a time.

(A) If more than one record drops at a time examine the center holes of your records. If these are badly worn their use should be avoided. Also make sure that the record retaining slide (A) drops freely under its own weight. If not, it is probable that some foreign matter has become lodged between the slide and the side of the groove in which it works. This may best be dislodged by means of a thin razor blade. Grease or oil on the slide may also be the cause of its failure to drop freely. In this connection, care should be taken if ever the turntable is removed, to see that grease or oil from turntable bearing is not deposited on the slide. Carbon tetrachloride or other solvent applied with a small brush should be used to clean the parts if this cause of failure is suspected.

(B) Too great a projection of the record selector pawl (B) above step (C) may result in two records dropping at once (especially thin records of the long-playing variety). If the projection is excessively great it may result in records failing to drop by restricting the sideways movement of the record selector pawl.

2. If records fail to drop.

(A) Worn or chipped center holes can be the cause, but if failure in this respect occurs when using undamaged records, the action of record selector pawl (B) should be observed. This should first of all rise vertically until its upper end engages the center hole of the lower record in a stack and then move sideways enough to push the record off step (C). Failure of pawl (B) to rise vertically before starting its sideways movement will result in inconsistent dropping of records, and may be due to: Weakening or displacement of spring (95) or the lower end of the record selector pawl (92) binding in the slot through which it protrudes. The split pin (X) may be the cause of such binding if its ends are not spread open sufficiently to prevent partial rotation of the pin.

(B) Insufficient sideways movement of the record selector pawl (B) to push the record off step (C) could be due to: Excessive projection of pawl (B) above step (C) or the record selector pawl itself having been accidentally bent.

(C) Too small a projection of the record selector pawl (B) above step (C) may result in records failing to drop.

(D) Excessive engagement between stop (Y) and the lower end of record selector pawl (92) when at the extreme of its sideways movement can restrict the sideways movement of the upper end of pawl (B) and result in records failing to drop.

(E) Make sure sliding plate (94) is returned freely and positively by action of spring (91).

Change Fails To Shut-Off After Last Record Has Been Played-

1. Balancing arm (2) is not falling to its full extent and making contact with lever (72). This is due to the balancing arm shaft sticking in its housing, and this should be freed by cleaning thoroughly. Remove the spindle if necessary by first removing the wire retaining ring at the bottom of the shaft. Use of oil is not recommended.

2. Lever (72) is not working freely up and down. The balancing arm shaft should, when fully dropped, lift the lower forked end of lever (72) into contact with the underside of the baseplate, thus preventing the notch in cycle release cam (52) from engaging with pin (32A, Figure 6). This allows slide (32) to return under action of spring (35), thus switching the machine off.

3. The auto-stop trip lever (33) is not working freely under the action of its spring (34), which may have been accidentally stretched or displaced.

Changer Shuts-Off When Needle Lands On Last Record-

1. Check to see if the record balancing arm (2) has become bent upwards, thus allowing the balancing arm shaft to fall into partial engagement with lever (72) while there is still one record resting on the spindle shelf. Loosening of the staking holding the balancing arm (2) to its shaft may have a similar effect.

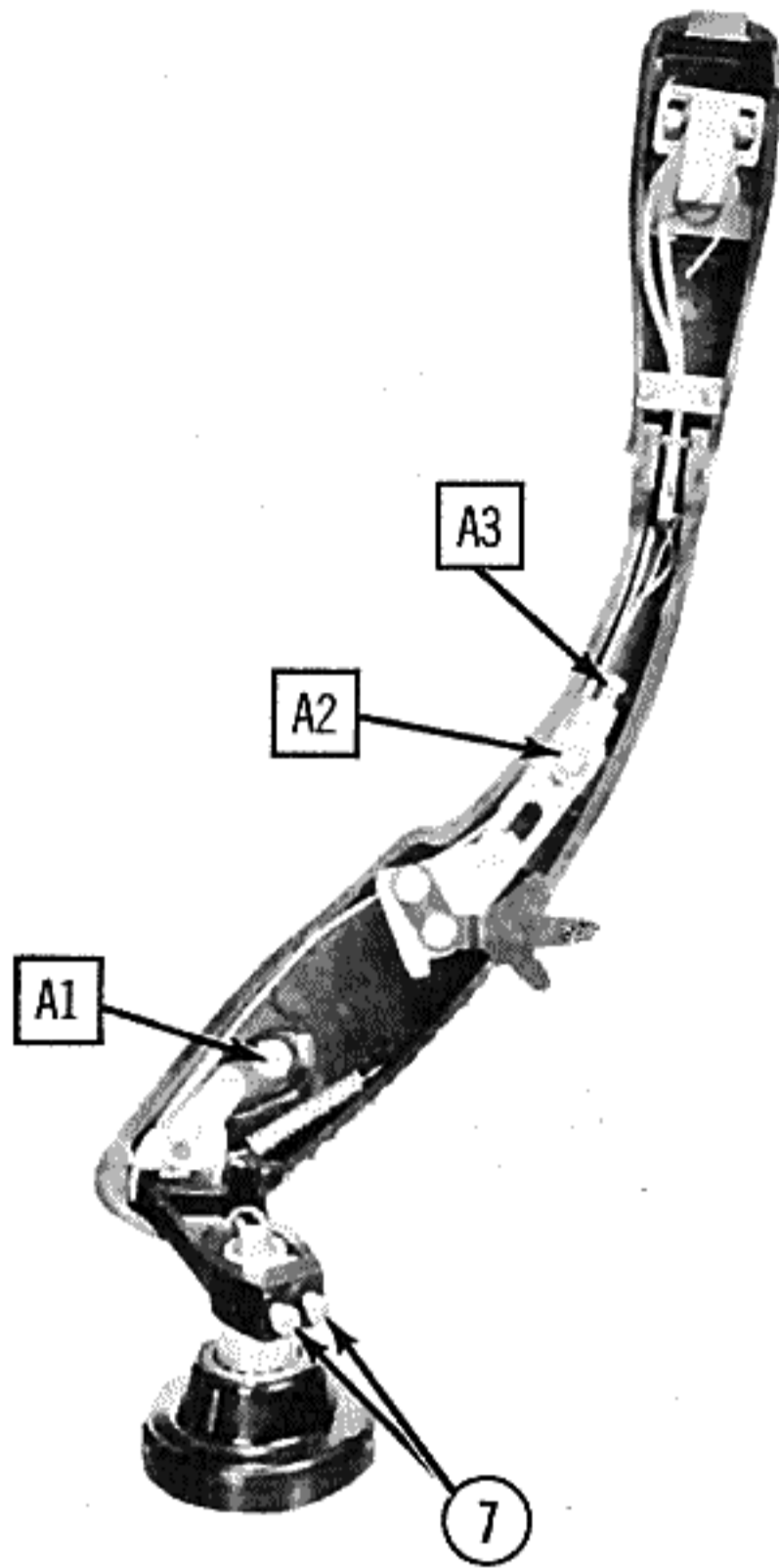


Figure 9

Failure in this respect will result in inconsistent record dropping.

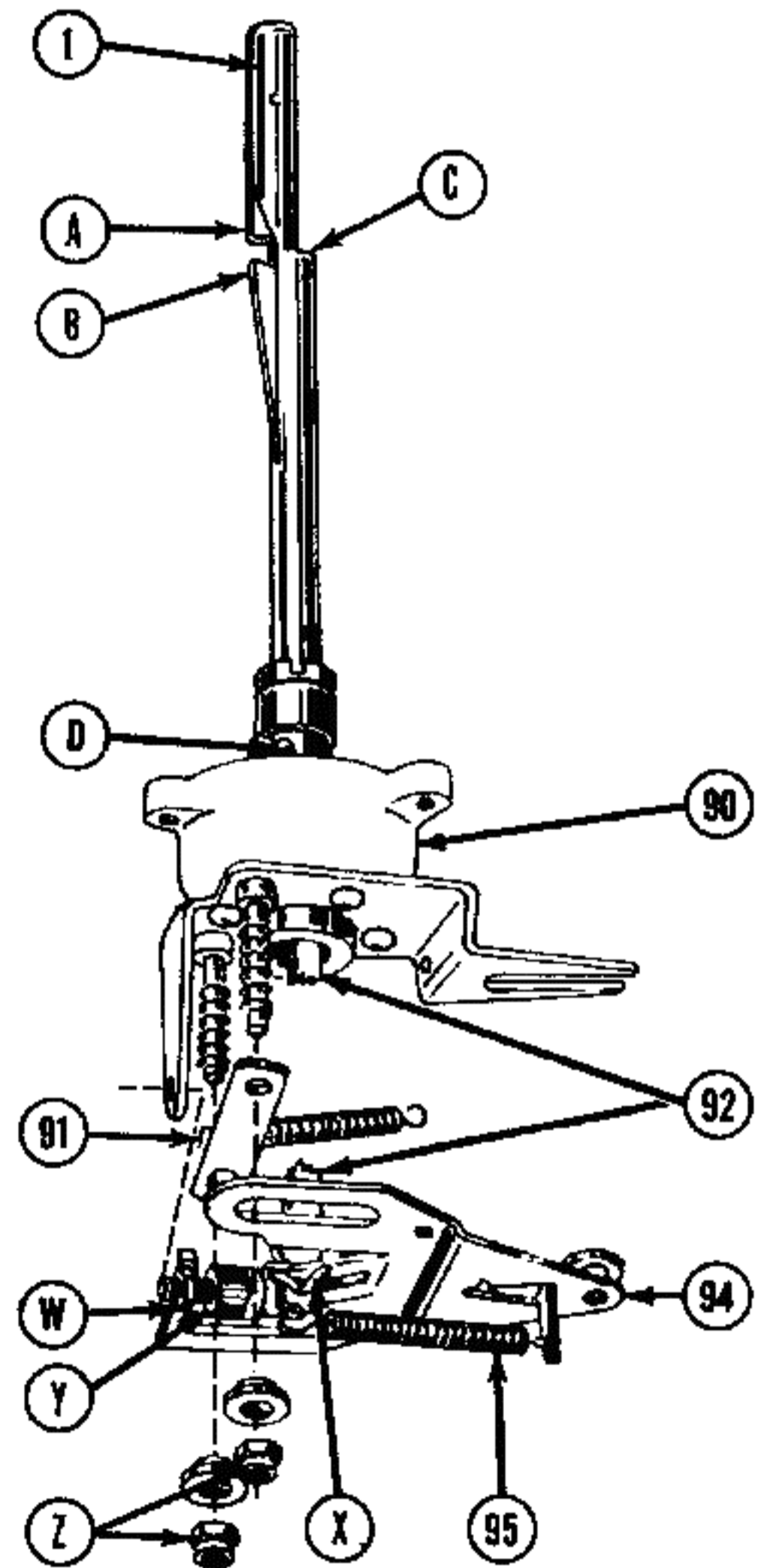
ADJUSTMENTS

The following procedure should be followed if the record dropping mechanism has been dismantled or its adjustment disturbed in any way.

1. Turn the bakelite cam (48) in the direction indicated by arrow in Figure 5 until record selector pawl (B) has started to move sideways.

2. Adjust the pair of self-locking nuts (Z) so that the upper edge of record selector pawl (B) projects a little less than 1/16" above the flat part of step (C). When making this adjustment be sure to adjust both nuts (Z) equally so as to keep the sliding plate (94) level. Also be sure to push record selector pawl (B) gently downwards before measuring its projection above step (C) so as to take up any free movement.

3. Loosen nut (W) and screw stop (Y) inwards until there is a definite gap between it and the lower end of record selector pawl (92) when the latter is pushed towards it as far as it will go. Turn bakelite cam (48) in direction of arrow (Figure 5) until the main slide (78) is at the extreme of its inward movement. With the cam still held in the same position, adjust stop (Y) until it barely touches the lower end of the record selector pawl (92), and lock with nut (W).



A PHOTOFACT "EXPLODED" VIEW

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Figure 10

(A) Correct operation will be obtained by setting the balancing arm (2) so the slotted end drops about 3/16" below the spindle shelf when the last record drops.

Changer Does Not Cycle When Needle Reaches End Of Record-

1. Check to see if self-locking nut (64A) is set so that the striker arm (58) rests in a horizontal position with its free end just clearing the bottom of the diecast housing (90) carrying the turntable bearing stud.

2. Make sure that striker arm (58) is pivoting quite freely, as it is only fed inwards by the friction provided by its own weight resting on the curved end of lever (64).

3. Check to see that swinging bracket (50) carrying drive pulley (13) is not restricted in its movement. This could be caused by damage or displacement of spring (25).

Operation Of Reject Knob Fails To Bring Change Cycle Into Operation-

1. Check items described in paragraph 3 above.

Interruption Of Change Cycle-

If the change cycle is interrupted between records (i.e. the turntable continues to revolve but the pickup arm remains stationary over its rest) it will be found that operation of the "Reject" knob will cause the cycle to be completed. The cause of this fault is as follows:

1. Failure of notch in cycle release cam (52) to engage with pin (32A) Figure 6. This may be due to:

- (a) Cycle release cam (52) not working freely.
- (b) Spring (53) may be weakened or displaced.
- (c) Pin (32A) may be loose in slide bar (32) into which it is rivited.

Changer Continues To Cycle-

If the change mechanism cycles continuously without allowing each record to play to the end, the cause may be associated with failure of the control knob (29) to return to its central position under the influence of its spring (42). This causes pin (26) to strike against the edge of trip cam (24) at the end of the change cycle, thus tripping the mechanism back into cycle again. To test whether this is the cause, turn the knob very slightly towards the "Stop" position immediately after switching on. If this cures the trouble, then check to see if stop link (44) is binding against the underside of the baseplate. If so, gently pry away with a screwdriver until perfectly free.

If this fault is only apparent after the mechanism goes into cycle at the end of a record, but not if a record is rejected, it is due to the auto-trip resetting lever (59) not being rotated fully during the change cycle by the action of spring (71) owing to weakening or displacement of the spring or undue stiffness of lever (59) on its pivot.

This fault may also be caused by the lower end of the peg to which spring (25) is attached having been accidentally bent towards the center of the changer. There should be a clearance of about 1/16" between the peg and the edge of the auto-trip resetting lever (59) when the turned up end of the latter is set in contact with the end of the gap in the baseplate through which it protrudes.

PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1		Spindle Assembly	31		12" Record Selector (Used on Model 3RC-532 only)
2		Record Balancing Arm	32		Slide Bar
3		Pickup Arm	33		Automatic Stop Trip Lever
4		Weight Compensating Control	34		Automatic Stop Trip Lever Spring
5		Plug-In Pickup Head	35		Slide Bar Return Spring
6		Pickup Arm Hinge Assembly	36		Slide Bar Pivot Link
7		Set-Down Adjustment Screws	37		Swing Bracket Delay Link
8		Pickup Arm Hinge Shim	38		Baseplate
9		Pickup Arm Rest	39		Manual Reject Lever
10		Turntable	40		Compression Spring
11		Turntable Bearing & Trip Cam	41		Pickup Tripping Arm
12		Idler Wheel	42		Control Return Spring
13		Cycle Drive Wheel	43		Spring
14		Bearing Washers	44		Stop Link
15		Bearing (Ball Race)	45		Control Knob Shaft & Link
16		Damper Washer	46		Actuating Cam
17		Speed Change Knob	47		Pickup Arm Shaft
18		Motor Actuating Lever	48		Drive Gear for Bakelite Cam
19		On-Off Switch Actuating Cam	49		Bakelite Cam
20		Idler Wheel Positioning Link	50		Set-Down Position Lever
21		Spring	51		Pinion Gear Swing Bracket
22		Switch & Idler Wheel Actuating Lever	52		Pinion Gear
23		Shut-Off Link	53		Cycle Release Cam
24		Trip Cam	54		Spring
25		Swing Bracket Locking Lever Spring	55		Speed Control Knob Mounting Shaft
26		Swing Bracket Locking Lever	56		Speed Change Link
27		Shut-Off Link Spring	57		Speed Change Pivot Lever
28		Position Control Knob	58		On-Off Switch
29		Start-Reject-Stop Control Knob	59		Striker Arm
30		Pickup Arm Shaft & Bearing	60		Automatic Trip Resetting Lever
					Cam Mounting Axle

PARTS LIST - Cont.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
61		Automatic Trip Resetting Lever	78A		Cam Follower
		Friction Link	79		12" Selector Wire Lever (Used on Model 3RC-532 only)
62		Compression Spring			Mounting Bracket for Pickup Arm Actuating Assembly
63		Pickup Arm Positioning Plate	80		Mounting Bracket for Item 79
		Tension Spring (Used on Model 3RC-532 only)	81		Tension Spring
64		Push Trip Lever	82		Compression Spring
65		Pickup Arm Positioning Plate	83		Height Adjustment Screw
66		Manual Stop Lever	84		Pickup Arm Lifting Rollers
67		Manual Stop Lever Spring	85		Spring Eyelet (Used on Model 3RC-532 only)
68		Positioning Plate Indexing Assy.	86		12" Selector Wire Lever Tension Spring (Used on Model 3RC-532 only)
69		Pickup Arm Positioning Plate			Mounting Bracket for Item 79
		Reset Lever (Used on Model 3RC-532 only)	87		Spindle Actuating Link
70		Slide Bar Connecting Link			Spindle Actuating Lever
71		Spring, Automatic Trip Resetting Lever	88		Turntable Hub & Slide Plate
			89		Mounting Bracket
72		Shut-Off Lever	89A		Slide Plate Return Spring
73		Pickup Positioning Arm	90		Record Selector Pawl
74		Pickup Arm Actuating Plate			Compression Spring
74A		Pickup Arm Actuating Lever	91		Sliding Plate
75		Pickup Arm Shaft Engagement Washer	92		Record Selector Pawl Return Spring
			93		Motor & Speed Change Assembly
76		Pickup Arm Actuating Plate	94		
		Engagement Washer	95		
77		Slide Engagement Stud & Washer			
78		Main Slide	96		