



PARTS LIST—Continued

Ref. No.	Part No.	DESCRIPTION	List Price	Ref. No.	Part No.	DESCRIPTION	List Price
44	1821	Ejector and fulcrum assembly—consists of:	\$.36	66	1806	Index slide assembly—consists of:	\$.47
		669 Ejector arm	.31			712 Nut (item 69)	.01
		705 Rivet	.01			1663 Spring (item 67)	.04
		1766 Ejector arm fulcrum	.02			1785 Index (item 70)	.09
45	2772	Idler wheel	1.15			1786 Slide bracket (item 66)	.12
46		Felt washer (part of item No. 49)				2177 Index screw (item 68)	.10
47	2773	Motor mounting grommet (part of item No. 49)	.04	67	1663	Index spring	.04
48		Idler wheel tension spring (part of item No. 49)		68	2177	Index screw	.10
49	2727	Motor (Gen. Industries 117V, 60 cy. AC) includes:	12.50	69	712	Nut	.01
		2772 Idler wheel	1.15	70	1785	Index	.09
		2773 Mounting grommet	.04	71	1748	Switch bracket assembly—consists of:	.47
		2797 Drive belts, 2 used	ea. .46			94 Rivet	.01
50	1685	Motor snap fasteners	.04			467 Switch	.32
51		Bearing mounting screw				1769 Switch bracket	.08
52	2411	Sub-frame assembly—consists of:	2.08			1788 Cam spring (item 72)	.02
		680 Worm (item 54)	.48	72	1788	Cam spring	.02
		707 Set screw	.07	73	1660	Control bearing nut	.01
		724 Ball bearing	.01	74	2685	Trip crank assembly—consists of:	.72
		875 Follower guide (item 53)	.05			833 Lift pin	.25
		1805 Turntable shaft assembly (item 22)	.51			1796 Trip crank	.29
		2409 Sub-frame bushing	.08			1983 Spring (item 75)	.04
		2415 Sub-frame (item 52)	.72			2679 Screw	.03
53	875	Follower guide	.05	75	1983	Spring	.04
54	680	Worm	.48	76	1800	Control cam assembly—consists of:	.19
55	1807	Screw No. 6-32 Phillips hd.	.01			1770 Control cam shaft	.09
56	2705	Ratchet assembly—consists of:	.22			1774 Control cam	.04
		2330 Ratchet	.12	77	996	Cotter pin	.01
		2686 Rod and plate assembly	.08	78	2708	Control link	.14
56A	2305	Ratchet assembly bearing (part of item No. 40)		79	1909	Control link spring	.10
57	1909	Spring control	.10	80	2750	Shaft and arm assembly—consists of:	.25
58	2327	Spring trip	.38			1719 "C" washer	.01
59	926	Fulcrum	.48			2355 Arm	.04
60	2709	Trip link	.15			2367 Shaft	.16
60A	2302	Trip link bearing	.02	81	1876	Spring—follower arm	.13
61	1660	Control bearing nut	.01	82	1791	Follower arm assembly—consists of:	.59
62	2623	Crank and ratchet pawl assembly—consists of:	.62			1792 Follower arm bushing	.06
		711 Screw	.01			1797 Follower arm	.51
		1547 Pin	.01	83	1795	Follower	.23
		1606 Pawl	.06	84	2661	Cotter pin	.01
		2329 Pawl spring	.10	85	2741	Motor link	.16
		2621 Pickup crank	.38	86	2749	Adapter and sticker assembly—consists of:	.25
63	711	Screw No. 10-32 x 5/8				2683-B Adaptor (for playing 7" records)	
64	2623	Ratchet pawl arm assembly				2695 Sticker	
65	2329	Pawl spring	.10	87	478	Spring	.01

STANDARD PRODUCT WARRANTY

The manufacturer warrants each of its products manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part in exchange for any part of any unit of its manufacture which under normal installation, use and service discloses such defect, provided the unit is delivered by the owner to us intact, for our examination, with all transportation charges prepaid to our factory within ninety days from the date of sale to original purchaser and provided that such examination discloses in our judgment that it is thus defective.

This Warranty does not extend to any of our products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, or to use in violation of instructions furnished by us, nor extend to units which have been repaired or altered outside of our factory nor to cases where the serial number thereof has been removed, defaced or changed.

Any part of a unit approved for remedy or exchange hereunder will be remedied or exchanged by us without charge to the owner.

This Warranty is in lieu of all other Warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our products.

V-M CORPORATION
BENTON HARBOR, MICHIGAN

V-M
MODEL 802 TRIO-SPEED



MODEL 802 TRIO-SPEED

GENERAL INFORMATION

The V-M Model 802 Trio-Speed Record Changer is designed to play automatically twelve 10-inch or ten 12-inch, standard 78 RPM or Micro-groove 33 1/3 RPM records, not intermixed.

The 7-inch 33 1/3 RPM records and the 7-inch 45 RPM records (in conjunction with a record adaptor) may be played on this changer manually.

Any 10 or 12-inch record may be rejected, while playing, by turning the control knob to reject momentarily. The last record will be repeated until the changer is turned off.

Manufactured by
V-M CORPORATION • BENTON HARBOR, MICHIGAN

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V-M
MODEL 802 TRIO-SPEED
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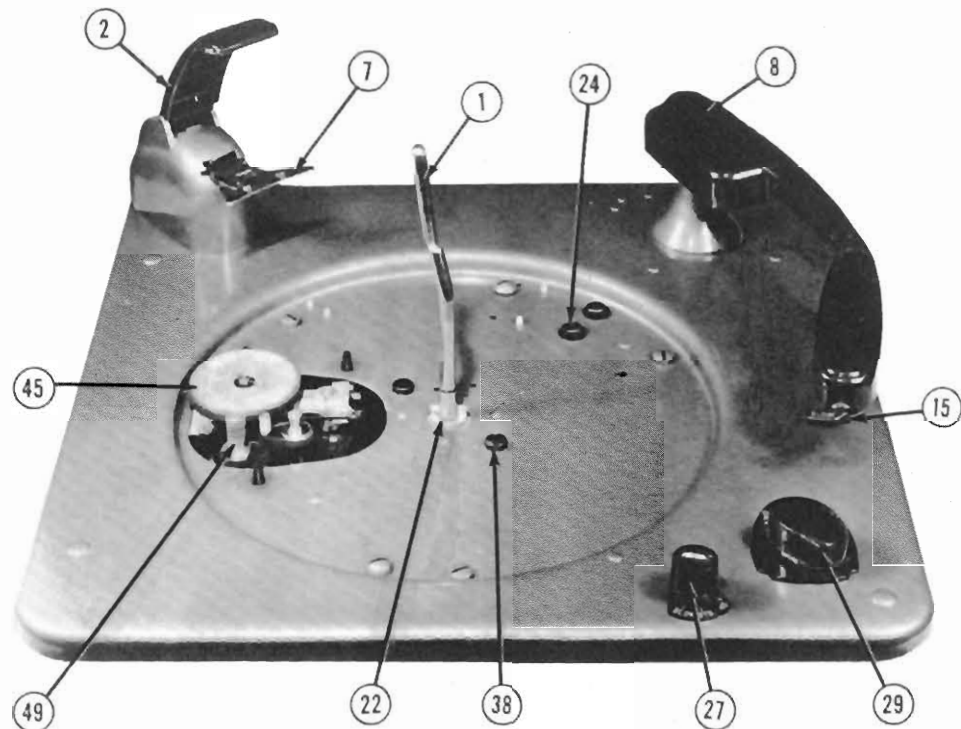


FIGURE 2

Specifications:

The V-M Model 802 Trio-Speed Record Changer is designed to play automatically twelve 10-inch or ten 12-inch, standard 78 RPM or Microgroove 33 1/3 RPM records, not intermixed.

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Any 10 or 12-inch record may be rejected, while playing, by turning the control knob to reject momentarily. The last record will be repeated until the changer is turned off.

Power Requirements:

Connect this changer only to 117-volt, 60-cycle A.C. supply unless otherwise specified.

PREPARING FOR OPERATION

Shipping Bolts:

Before placing in operation, the machine must be floated freely on the mounting springs. During shipping, the mechanism is secured by means of the two shipping bolts. To float the changer, remove the turntable by lifting it straight up the spindle. Turn the two shipping bolts in a clockwise direction as far as they will go and replace the turntable. Before the turntable can be fully seated, the drive wheel must be gently pushed back out of the way to prevent damage to rubber tire.

Leveling Record Changer:

It is essential to have the record changer absolutely level. Use a torpedo or similar type level on the record changer baseplate. Use adequate shims to level the record changer pan or radio combination cabinet to achieve perfect level.

OPERATING

Loading of Records on Spindle:

1. Raise HOLD DOWN (2) to upright position.
2. Adjust RECORD EJECTOR (7): For ten-inch records, lift the ejector and pull toward the SPINDLE (1) until it latches in its most forward position. For twelve-inch records, lift the RECORD EJECTOR (7) and push it back into its housing until it is fully retracted.
3. Place stack of records on the SPINDLE (1) and lower stack to the off-set shoulder. Records must rest on both the off-set shoulder of the SPINDLE and the shelf on the Record Ejector.
4. Lower the HOLD DOWN on records.

Caution:

This automatic changer will play ten 12-inch or twelve 10-inch records of either type, long-play or standard. ATTENTION: These two types of recordings must not be mixed together in a stack to be played. The motor speed and needle control knobs must be reset for each type that will be played.

To Play Standard Records—78 RPM 10 and 12-inch

1. The motor SPEED CONTROL KNOB (27) must be in "STD." position.
2. The dual needle REVERSIBLE CARTRIDGE CONTROL LEVER (15) must be in the "STD." position.
3. To start, turn the CHANGER CONTROL KNOB (29) to "REJ." and release. The changer will operate automatically. The last record will keep repeating until the CHANGER CONTROL KNOB (29) is turned to the "OFF" position.

Rejecting:

To reject a record at any time while the player is in operation, turn the CONTROL KNOB to "REJ." and release.

To Play Long-Play Records 33 1/3 RPM 10 and 12-inch:

1. The motor SPEED CONTROL KNOB (27) must be turned to the "SLOW" position.
2. The dual needle REVERSIBLE CARTRIDGE CONTROL LEVER (15) must be turned to the "SLOW" position.
3. To start, turn the CHANGER CONTROL KNOB (29) to "REJ." and release. The changer will operate automatically. The last record will keep repeating until the CHANGER CONTROL KNOB (29) is turned to the "OFF" position.

Manual Operation:

Odd-size or warped records, also home recordings, should be played manually. Turn the CHANGER CONTROL KNOB to "MAN." position, raise the PICKUP ARM (8), and place the needle on the record at its outer edge.

To Play 7-Inch 45 RPM Records:

Turn the MOTOR SPEED CONTROL KNOB (27) to 45 and the CARTRIDGE CONTROL LEVER (15) to "SLOW," and place the record over the spindle and record adaptor. These records can ONLY be played MANUALLY.

To Play 7-Inch 33 1/3 RPM Records:

Turn the MOTOR SPEED CONTROL KNOB (27) to "SLOW" and the CARTRIDGE CONTROL LEVER (15) to "SLOW." Place the record over the SPINDLE. These records can ONLY be played MANUALLY.

enable it to dig into the ratchet teeth. Sharpen with stone if necessary.

8. Ratchet sector too far away from ratchet pawl:

If the ratchet sector (56B) is too far away from the pawl (64A), the eccentric motion required to operate the trip will be excessive. If necessary, bend the trip bracket in slightly to reduce this distance. If the sector is too close to the pawl, excessive trip pressure will result.

9. Needle jumps out of eccentric groove in record:

- (a) Check trip pressure (see paragraph 4A).
- (b) The record may be defective. The trip groove is often too shallow. Check with a record which is known to be good.
- (c) The needle point may be damaged or affected by an excessive accumulation of dust, lint, etc. Check needle pressure as described under "Adjustments."
- (d) There may be binding in the pickup bearing or ratchet arm (see 2 and 3 "Needle Does Not Track Across Record Properly").

Defective Cartridge (Shure P77):

To remove cartridge, proceed in the following manner:

1. Remove the plastic cartridge control lever.
2. Carefully pull the cartridge lead up from the rear section of the arm until adequate slack is obtained.
3. Remove the two screws that are used to attach pickup cartridge to the pickup cartridge mounting bracket.
4. Disconnect the pickup leads and remove cartridge.
5. Replace cartridge and connect pickup leads.
6. Secure pickup cartridge to pickup cartridge mounting bracket.
7. Push excess pickup lead into rear section of pickup arm and reinstall plastic cartridge control lever.

Damaged Needle (Shure P77):

To remove the needle, proceed in the following manner:

1. Rotate cartridge control lever to correspond with needle to be removed.

2. Loosen knurled thumb nut that secures needle to the cartridge.

3. Carefully remove the needle and replace with a new needle of the same part number. CAUTION: MAKE SURE THAT THE COLORED NEEDLE IS USED ON THE SIDE OF THE PICKUP CARTRIDGE HAVING THE CORRESPONDING COLOR SPOT. The replacement needle will have to be adjusted before it is tightened in the pickup cartridge to assure that the needle shank is securely held by the knurled thumb nut. DO NOT USE PLIERS ON KNURLED THUMB NUT. TIGHTEN WITH FINGERS ONLY.

To remove the needle from Webster Cartridge:

1. Remove the cartridge control knob (15).
2. Loosen set screw holding needle in place.
3. Turn needle 180° and remove it. Replace only with identical type of needle. CAUTION: Insert so that the needle end marked with red is on same side of cartridge marked with red dot.

To remove the needles from Astatic Cartridge:

1. The needles may be removed from the Astatic Cartridge by merely pulling them from the cartridge, being careful not to damage the cartridge in any way.

No Sound During Playing:

1. Defective cartridge.
2. Defective wiring: Check pickup leads for a shorted or open lead.
3. Defective amplifier.

Excessive Record Wear:

1. Binding in pickup arm (see 1 and 2—"Needle Does Not Track Across Record Properly").
2. Use of "Std." needle on long-play record will cause excessive wear.

PARTS LIST FOR V-M 802 TRIO-SPEED

Ref. No.	Part No.	DESCRIPTION	List Price	Ref. No.	Part No.	DESCRIPTION	List Price
1	2414	Spindle assembly—consists of:	\$ 1.65	12	713	Strengthen mounting screw	\$.10
	1535	Pin	.04	13		Rivet	
	1676	Spindle guide	.21	14		Cartridge (see item 8 for cartridge and needle)	
	1687	Spring	.02	15	2336	Knob (cartridge control)	.12
	2413	Spindle shaft	1.05	16	2370	Screw—knob	.02
2	1746	Plastic hold down	.23	17	2376	Pickup hinge assembly—consists of:	.60
3	2757	Hold-down cup	.03		48	Fiber washer (item 20)	.01
4	428	Push spring	.01		698	Shaft	.24
5	941-A	Hinge pin	.10		940	Hinge	.16
6	760	Housing assembly—consists of:	4.80		2309	Hinge pin	.05
	428	Push spring (item 4)	.01		2314	Bracket	.03
	595	Ejector link (item 35)	.04	18	1520	Height adjustment screw and nut assembly	.02
	341-A	Hinge pin (item 5)	.10	19	2738	Turntable	2.00
	1746	Plastic hold-down (item 2)	.23	20	48	Fiber washer 3/8 x 9/16 x 1/32	.02
	1793	Housing (item 6)	1.19	21	681	Pickup post	.44
	1802	Ejector slide (item 7)	.34	22	1805	Turntable shaft assembly—consists of:	.62
	777	Trigger assembly (item 36)	.45		679	Lock	.07
7	1802	Ejector slide	.34		1804	Shaft	.53
8	2633	Tone arm assembly—consists of:	10.85				.15
	713	Screw	.01	23	981-B	Pickup rest	
	2310	Screw pivot (item 8A)	.02	24	409	Fulcrum mounting screw	
	2317	Screw	.02	25	136	Lockwasher internal No. 6	.01
	2336	Knob (item 15)	.12	26	126	Flatwasher	.01
	2370	Screw—knob	.02	27	2198	Knob—speed control	.18
	2372	Tone arm (item 8)	.77	28	1719	"C" washer	
	2376	Hinge assembly (item 17)	.60	29	1711-B	Knob	.15
	2377	Strengthen assembly (Webster cartridge)	.19	30	1719	"C" washer 1/2 O.D.	.01
	2378	Cable and clip assembly (Webster cartridge)	.13	31	1789	Control shaft bearing (on-off-reject)	.17
	2493	Spring and chain assembly	.21	32	963-3G	Scotchcon	.18
	2197	Cartridge (Webster F-14 with needle)	8.75	33	2354	Control shaft bearing (motor speed control)	.15
	2630	Dual needle for Webster cartridge	2.60	34	2739	Scotchcon—speed	.13
	2606	Cartridge (Shure P-77) with needles	8.75	35	695	Ejector link	.45
	2628	One Mil needle for Shure cartridge	1.35	36	777	Trigger assembly	.01
	2629	Three Mil needle for Shure cartridge	1.20	37	428	Trigger assembly return spring	
	2631	Screw mounting (for Shure cartridge)	.01	38		Screw—sub-frame	
	2693	Strengthen and bracket assembly (for Shure cartridge)	.27	39		Internal lock washer	
	2694	Cable and clip assembly (Shure cartridge)	.13	40	2746	Base plate assembly—consists of:	4.00
	2353	Cartridge (Astatic LQDM) with needles	8.75		89	Clamp	.02
	2754	One Mil needle for LQDM cartridge	1.35		127	Clamp	.04
	2755	Three Mil needle for LQDM cartridge	1.20		478	Spring	.01
9 & 10	2493	Spindle and chain assembly	.21		681	Post	.44
11	2377	Strengthen and pivot assembly—consists of:	.19		1806	Index slide assembly (item 66)	.47
	2307	Eyelet	.01		1895	Terminal strip	.05
	2312	Spring	.04		2740	Leg stud	.09
	2313	Strengthen	.05		2077	Shipping bolt	.03
	2318	Pivot bracket	.05		2305	Bearing	.09
					2743	Base plate	2.40
					2494	Rubber grommet	.04
				41	1668	Screw No. 6-32 x 1/2 B.H.	.01
				42	884	Index spring	.13
				43		"C" washer (part of item No. 49)	

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

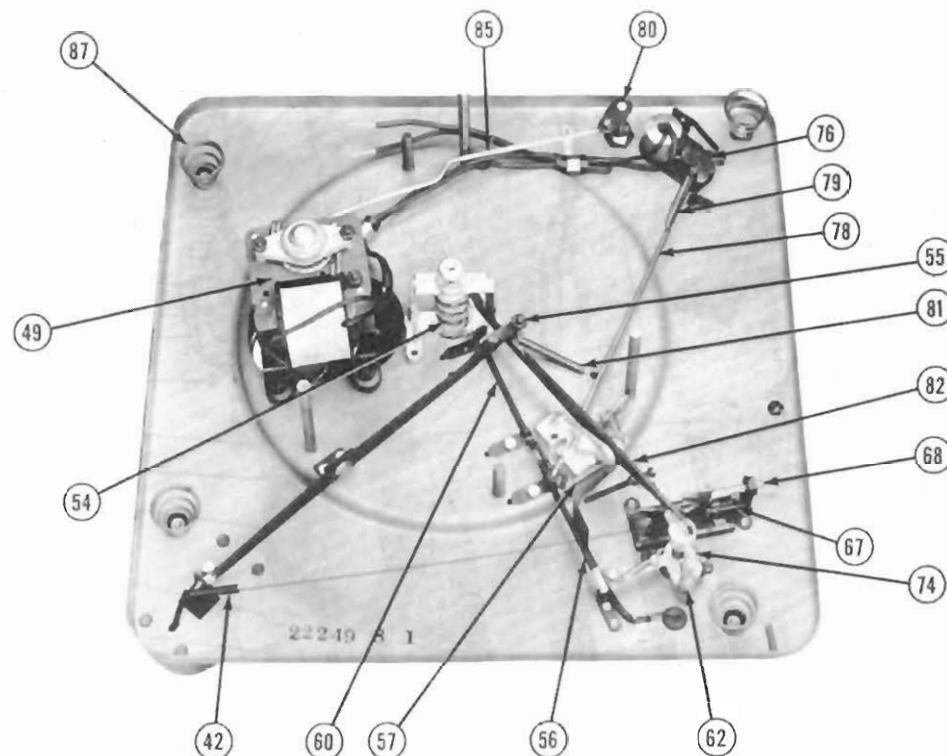


FIGURE 3

Turntable Continues to Rotate When Control Knob Is Turned to "Off" Position:

- Switch defective.
- Check switch (71) for defects and replace, if necessary.

Changer Trips Before Needle Reaches End of Record:

- Hole in record too large:
If hole in record is too large, the groove may turn eccentric with the spindle and cause premature tripping.
- Insufficient tension on trip spring:
The trip spring (57) should have enough tension to pull the trip rod (56) back to a fully engaged position if an eccentric record is being played.
- Binding in trip rod bearings:
With the trip released, check the trip rod (56) for play in the bearings. It should be free to turn without binding.

Pickup Arm Strikes Records on Spindle When it Raises or Pickup Arm Rest When It Moves Out:

Pickup arm height not adjusted properly. (See instructions for adjusting the pickup arm height under "Adjustments.")

Turntable Will Not Rotate:

- Motor link (85) not being actuated by the control arm (80).
- Idler (45) not engaging the drive pulleys or motor shaft.
(a) Spring (48) loose, therefore not pulling the idler (45) in contact with the motor shaft or drive pulleys.
- Rubber belts on motor broken or out of place.

Changer Continues to Cycle:

- The trip link (60) must turn freely, and the trip rod return spring (57) must be of the proper tension to provide positive latching of the trip link to the follower (83). Make certain the butterfly spring is adjusted in such a manner so as to hold the trip link (60) and the trip rod (56) together at all times.
- Reject control holding trip open. Check the control cam assembly (76) and control link (78) for binding to determine if the control assembly is holding the trip rod in a disengaged position from the follower.

Trip Crank (74) Jams on Index (70):

- Check for lubrication on index at point of bearing with trip crank.
- Check for burrs on the inclined surface of the index (70). Surface must be very smooth. Polish with crocus cloth.
- Check for grooves worn into trip crank arm (74) at contact point with index. File smooth with fine file, if necessary.

Changer Does Not Cycle When Record Has Been Played:

- Check to be sure the control knob is in "AUT." position.
- If the changer does not trip, push the trip rod (56) back, by hand, and see if the hook on the trip link (60) is pulled back sufficiently to release the worm follower. If the trip link does not release the follower, check for the following:
(a) Bind between trip link bracket (60A) and trip link.
(b) If the above doesn't show trouble, bend the tail of the trip link (60) in toward the side of the fulcrum. This will allow the hook on the other end of the trip link to pull back farther.
(c) Spring (57) weak or unhooked.
- If the changer continues to trip, check for the following:
(a) Too much clearance between the hook on the trip link and the follower; correct by bending the tail of the trip link assembly away from the side of the fulcrum. This will cause the hook end of the trip link to engage the follower more closely.
- If the needle jumps out of the eccentric groove on record:
(a) Check trip pressure. The lateral pressure should not exceed 6 grams (if the pressure is excessive see "Changer Trips Before Needle Reaches End of Record"). Suspend the pickup arm approximately two inches above the turntable by means of a long length of heavy sewing thread attached to an overhead bracket approximately 2 feet to 5 ft. above the record changer. Using a gram scale, measure the amount of horizontal pull on the pickup arm after the arm has become engaged with the ratchet trip assembly. If the trip pressure is too high, check:
1. For binding.
2. Spring (57) too strong. May be weakened by carefully stretching out one of the center loops.
3. Record may be defective. The trip grooves are often too shallow. Check with a record known to be good.
4. Needle point may be worn.
5. Check hinge bearing for binding. (See "Needle Does Not Track Across Record Properly"—4.)
6. Binding in trip rod bearings: (See "Changer Trips Before Needle Reaches End of Record"—3.)
7. No eccentric trip groove on record:
All standard records made today have an eccentric trip groove, but some records made in the past did not have this groove. When records of this type are being played, the control knob must be turned to "Rej." at the end of the record.
8. Ratchet pawl not engaging the ratchet sector:
The ratchet pawl (64A) must press against the ratchet sector forcing it back when the motion of the pickup arm is reversed. If the pawl does not contact the ratchet sector or slides over it:
(a) Check the pawl (64A) for burrs around the hole.
(b) Be sure the pawl is free to turn on the bearing. If the drive pin is driven down too far causing binding, the pin may be relieved by tapping up on the shank.
(c) Check the pawl spring (65) for insufficient tension.
(d) Check the point on the pawl. It should be sharp to

GENERAL INFORMATION

Suggestions:

When not in use, it is suggested that both controls—motor and cartridge—be left in "Standard" 78 RPM position. Check needle frequently for damaged tip. CAUTION: When changing needle, put slow needle on slow side of cartridge. A distinctive color identifies slow needle and slow side of cartridge.

Care of Records:

To insure long life for your records, little effort is required. Do not expose them to heat from the sun or from nearby stoves or radiators. Store them preferably in albums, but in any case, keep them always in a cool, dry place, resting vertically. Remove dust and dirt, using a soft cloth and a light circular motion. Records should never be left resting on the Turntable or Spindle of the Changer.

If Noise Develops:

Noisy scratching indicates worn records or defective needle. Some records will wear longer than others, even if kept equally clean. This is due not only to quality of manufacture and care given the records, but also the kind of music recorded. Be sure that the power cord plug is making good contact in its receptacle.

THE CHANGE CYCLE

The change cycle may be started by one of two actions:

- Turning the control knob to "Rej." causes the control cam (76) to actuate the control link (78) and allows the trip link (60) to be pushed away from the follower (83). The follower then tilts and engages the worm (54).
 - As the pickup arm moves into the eccentric groove of the record, the movement of the pickup (8) causes the ratchet (64) to pivot the trip rod (56). As the trip rod pivots, the trip link (60) is also turned, by action of spring (58), releasing the follower (83). The follower, which transmits power for the change cycle, then engages the worm (54) and moves downward. The trip crank and lift rod assembly (74) is now pushed upward through the action of the follower arm (82). The long arm of the trip crank rides up the inclined portion of the index (70), raising the pickup and swinging it out clear of the records. As the follower (83) continues to move downward, the follower arm (82) is pivoted against the adjusting screw (55) of the ejector arm (44), actuating the trigger assembly (36), which, in turn, moves the ejector slide (7) and drops a record to the turntable.
- At this point, the follower (83), guided by the follower guide (53), moves up the worm. As the follower arm (82) moves away from the adjusting screw (55) of the ejector arm (44), the ejector slide (7) returns to its rest position. Also, through the action of the follower arm (82), the trip crank and lift rod assembly (74) rides off the inclined portion and down the face of the index (70), positioning the pickup and lowering it to the record. The follower now moves off the worm and is latched by the trip link (60).

Set-Down Point:

To adjust the set-down point, cycle the changer and stop the turntable just before the needle comes down on the record. Loosen the lock nut (69) and adjust the index screw (68). Turning the screw clockwise will move the pickup toward the center; counter-clockwise, the pickup will move away from the record. Adjust the pickup so the needle rests $\frac{1}{8}$ " in from the edge of the record.

The set-down adjustment may be made with either 10-inch or 12-inch records and should be correct for both. If the set-down has been disturbed by holding the pickup arm during cycle, or if the pickup crank (62) is loose, the following approximate adjustment should be made before adjusting the index screw. Loosen the set screw (63) in the pickup crank and turn the crank until it is stopped by the screw in the baseplate. With the crank in this position, move the pickup arm to about $\frac{1}{4}$ " from the spindle and tighten the set screw.

Needle Pressures (Shure P77):

With the pickup arm control lever (15) in "Std." position, the needle pressure should be between 1 and 1.25 ounces. There is no adjustment for "Std." play pressure inasmuch as the pickup arm is designed to give this needle pressure.

In no case should the needle pressure in the "Slow" position be less than 8 grams. If this pressure is lower than 8 grams, the needle will not track in the record grooves. This may be recognized by "skidding" of the pickup arm across the record and by failure of the changer to cycle at the end of the record. Improper tracking may also be due to other causes (see "Needle Does Not Track Across Record Correctly").

An accurate scale calibrated in grams must be used in checking this needle pressure.

Pickup Arm Height:

To adjust the height of the pickup arm, loosen the lock nut on screw (18) and turn this screw until the correct adjustment

is obtained. To get to this screw, raise the pickup to a vertical position; adjust so the pickup arm clears the unplayed stack of records by about $\frac{1}{8}$ " at its highest point during the change cycle.

Timing of Record Drop:

The timing of the record drop is adjusted by the screw (55) on the end of the ejector arm (44). The adjustment should be such as to release the bottom record of a stack of ten 12-inch records in cycle.

Ejector Slide Adjustment:

The ejector slide is adjusted by the screw (41). The adjustment should be such that the tabs are normally about $\frac{1}{32}$ " from the edge of a record.

LUBRICATION

Additional lubrication should not be required for the life of the changer, but in cases of unusual use, or high-operating temperature, the changer should be lubricated as follows:

Apply Lubriplate to:

- Worm threads (54).
 - Lift rod (74).
 - Contact point between pickup crank (62) and trip crank (74).
 - Follower Arm (82).
(a) At pivot of fulcrum (59).
(b) At contact point of trip crank (74).
(c) At contact point of sub-frame (52).
 - Ejector arm (44).
(a) At contact point with trigger (36).
(b) At contact point of follower arm (82) and screw head (55).
 - Index (70) on surfaces of slide for trip crank arm (74).
 - Follower guide (53) where follower (83) bears.
- Apply a Small Quantity of Light Oil to:
- Between turntable shaft (22) and spindle (1).
 - Follower (83) at pivot with follower arm (82).
 - Ejector arm (44) at pivot with ejector fulcrum.
 - Index (70) at bearing with slide bracket (66).

SERVICE INFORMATION

Turntable Does Not Revolve When Control Knob Is Turned to "On" Position:

- Machine stalled in cycle:
Turn the turntable (19) clockwise, by hand, until it starts rotating under its own power.
- No current at motor:
(a) Check to determine if current is reaching A.C. leads of changer.

- Motor defective:
(b) Check the switch (71) to determine if it is closing.
(c) Check wiring and soldered terminals in the changer.

Remove turntable to allow motor to operate without load. If current is reaching motor and idler wheel (45) does not rotate, the motor is defective. Repair or replace.

- Motor idler wheel (45) not engaging turntable rim. If motor pulley is turning but turntable is not:

- (a) Check motor idler assembly to determine if it is free to contact the motor pulley and the turntable.
(b) Wipe off the inside rim on the turntable to remove flock, or if oily, clean the turntable rim and rubber tire of the idler wheel (45), shown in exploded view, with carbon tetrachloride.

Changer Does Not Cycle When Control Knob Is Turned to "Rej." Position:

- Motor stalled or not driving turntable.
- Manual reject not actuating trip.
Turn the control knob to "Rej." position, hold, and see if the hook on the end of the trip link (60) is pulled back sufficiently to allow the worm follower (83) to drop and engage in the worm threads (54).
(a) If the trip link does not release the follower, check the control link rod (78).
If the rod is bent, carefully straighten it and check for trip again.
(b) If the trip link is not restricting the follower, but the follower still does not engage in the worm, the follower must be removed from the follower arm (82) and dirt, or other foreign matter, cleaned from the pivot point and from between the line of contact where the two parts meet. Excessive grease may cause this binding.

To Remove the Follower:

- Be sure the changer is not in cycle.
- Remove the turntable.
- Remove the two screws from base plate and sub-frame (52).
- Carefully work the sub-frame assembly out of the base plate and revolve the assembly counterclockwise to work off the follower and follower arm.

5. Remove the follower.
 - (c) If the follower drops but does not engage in the worm:
 1. Check for excessive wear in the pivot of the follower and follower arm.
 2. Check to see if the spring (81) has become unhooked.
 3. Check for dirt in the follower arm pivot.
 4. Turntable not engaging turntable lock.
 5. Turntable lock loose on turntable shaft.

Record Does Not Drop When Changer Cycles:

1. Check for bent spindle (1).
2. Check for under or over-size record, or enlarged center hole.
3. Check position of ejector slide (7) as given under "Adjustments."
4. Check the screw in the ejector arm (44) to see if it hits the follower arm (82) when the follower is at the bottom of the worm. If the lock nut on this screw has worked loose, reset the screw as given under "Adjustments."
5. Check to see if the ejector slide (7) is properly seated with its pushing mechanism on the trigger (36).
6. Check for a defective trigger by slowly pulling the ejector arm (44) down by hand.
 - If a record does not drop, the trigger (36) must be repaired or replaced.
 - To remove the trigger:
 - (a) Unhook the index spring (42) from the ejector link (35).
 - (b) Remove the four screws from the base plate and the housing assembly.
 - (c) Lift the trigger from the housing and check for broken weld on strengthening brace.

Needle Does Not Track Across Record Properly:

1. Check for lack of vertical play of the pickup shaft in the pickup post (21). There should be .003" to .010" play here. To correct, loosen the screw (63) in the pickup crank (62), place a shim between the pickup hinge washer and the pickup post and reset the pickup and pickup crank.
2. Needle may be clogged by accumulation of lint, dirt, etc., or point may be chipped.
3. Follower Arm (82) does not clear the pickup arm trip crank assembly (74) when a cycle is completed:
 - (a) There should be a .010"-.015" gap between the follower arm (82) and the pickup arm trip crank assembly (74) when the machine is not in cycle. If the gap is small enough to allow the parts to touch and bind as the needle moves across the record, the follower arm (82) should be bent down slightly.
 4. Hinge bearing binds:
 - Place a block between pickup arm (8) and the hinge plate (17) to prevent the needle from touching the turntable. With sensitive gram scale, check the amount of force required to move the pickup arm (8) across the turntable (19). The force required should not exceed two grams. If the pressure required is excessive, check the bearing in the pickup arm post for binding.
5. Changer not level:
 - (See "Leveling Record Changer" under "Preparing for Operation.")
6. Excessive vibration during a long play:
 - Any vibration caused by (1) unsteady mounting, (2) floor vibrations, or (3) passing of heavy vehicles may cause the pickup to glide across the record grooves.
7. Check for lack of lubrication between the pickup shaft and the pickup post.

Noise During Playing of Record:

1. Rumble:
 - (a) From motor: If a low-pitched rumbling sound comes from the loud speaker while a record is being played, check the motor grommets to be sure the motor is setting freely on them. The motor lead wires should have enough slack to allow the motor to float. Motor rumble may also come from an out-of-balance motor rotor. In this case, the motor should be replaced.
 - (b) From bearings: Defective turntable shaft bearings can cause rumble. Check for foreign matter. Lubricate with lubricant or light oil.
2. Defective Motor Idler Wheel (45):
 - A rapid thumping sound while the motor is running may indicate a flat spot on the motor idler wheel (45). Remove the turntable and check the rubber tire on the idler. If the surface of the rubber tire is not smooth and even, replace the idler.
3. Defective Needle:
 - A bad needle will cause loud needle scratch or hiss through both the speaker and the air directly from the needle.
4. Turntable Scrapes:
 - If a scraping sound occurs as the turntable (8) revolves, check:
 - (a) Turntable warped, causing outer rim to rise and fall.
 - (b) Motor idler (45) bent.
5. Squeaks:
 - Squeaking sound, as changer operates, indicates lack of lubrication. Lubricate points indicated under "Lubrication."

Turntable Stalls in Cycle:

1. Motor idler (45) not engaging turntable with sufficient tension.

2. Turntable bearing tight.
3. Operating temperature too low.
4. Line voltage too low.
5. Binding between follower and worm:
 - (a) Check lubrication of follower arm (82) at point of bearing with sub-frame (52).
 - (b) Check lubrication of worm (54) threads.
 - (c) File some metal from the follower arm (82) at the point of bearing with the sub-frame (52) to allow more clearance between the worm (54) and the follower (83). The follower arm (82) may be disassembled in the following manner:
 1. Remove spring (81).
 2. Remove cotter pin (77).
 3. Remove follower arm.
 Reassemble in the reverse order above.

Excessive Record Wear:

1. Binding in pickup arm.
2. Defective needle.
3. Excessive needle pressure.

Distortion of Recorded Sound:

1. Defective record.
2. Defective amplifier:
 - Check phonograph amplifier and speaker.
3. Bad cartridge.

Needle Does Not Set Down Properly on Either 10" or 12" Records:

1. Check the needle for 10" position by holding the index (70) in with the fingers as far as it will go and cycling the changer.
2. Check the needle set down for 12" position by holding the index out with the finger as far as it will go and cycling the changer.
3. If these positions are correct when the index is held in either position, check for "creeping index."
4. Check for bind between guide tabs on the index and the index screw (68).
5. Check for bind between the index and the index slide bracket (66).

Record Hits Pickup Arm:

1. Check timing of changer cycle, as given under "Adjustments."
2. Check for a creeping index (70). Index "creeps" if it moves when changer goes through cycle. To correct this condition:
 - (a) Be sure that the pickup (8) and the pickup crank (62) are aligned, as given under "Adjustments."
 - (b) Place the ejector slide (7) in 12" position, cycle the changer until the follower is at the bottom of the worm. The index spring (42) should be just barely slack. The ejector link (35) may be bent forward or back to give the index spring this required slack.
3. Check for too much gap between the follower arm (82) and the trip crank (74). This gap should be about the thickness of a sheet of paper (.005" to .016"). To reduce the gap, do one of the following:
 - (a) Bend the follower arm up.
 - (b) Replace the follower arm.

Two Records Drop at Once:

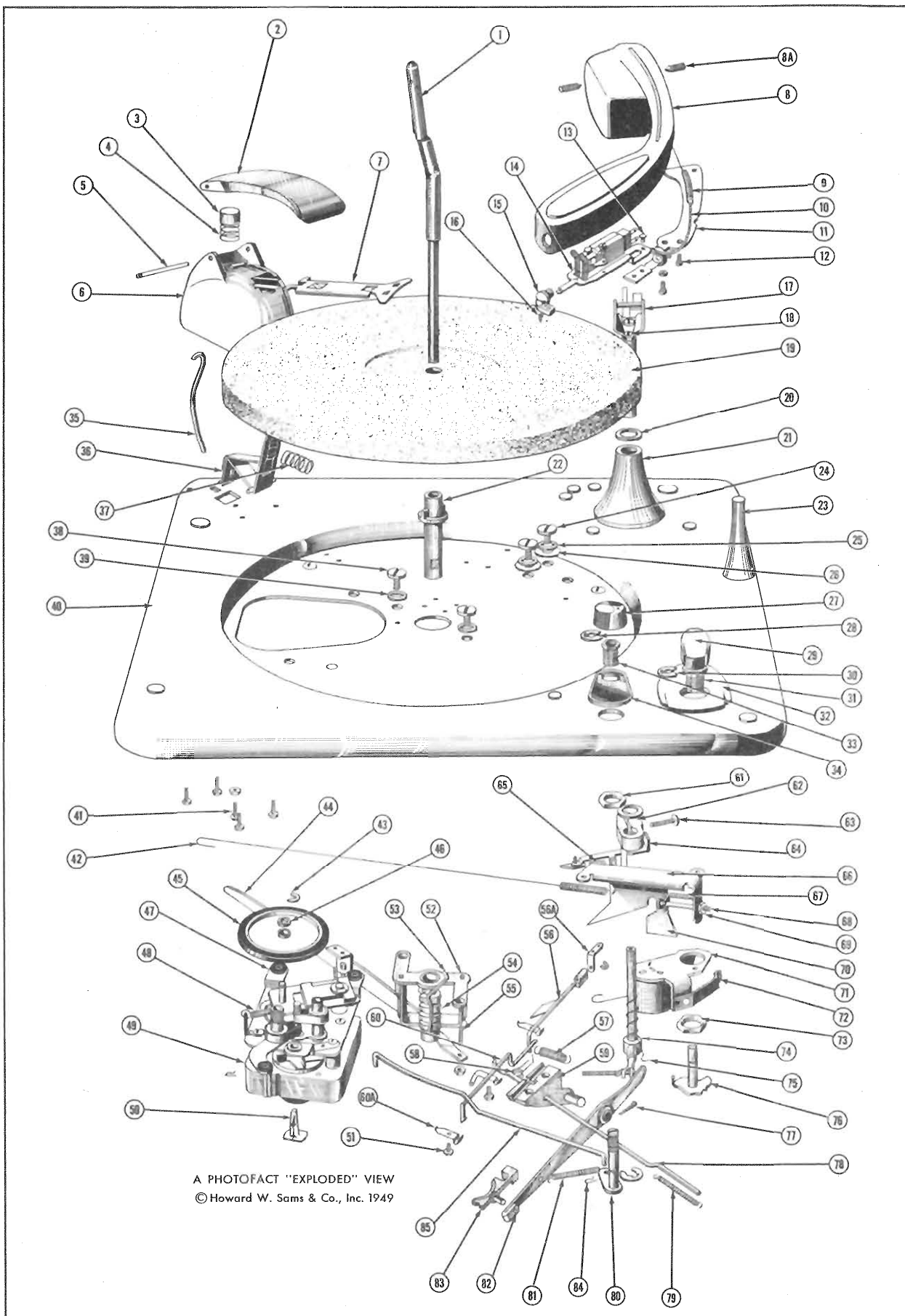
1. Hole in record too large or records too thin.
2. Slide in spindle not fully down.
 - (a) Check slide to be sure it is free and does not bind at any point. Clean out foreign matter or straighten, if necessary. Do not oil.
 - (b) When records are placed on spindle, be sure the slide is all the way down.
3. Check for position of ejector slide (7).

Turntable Speed Too Slow:

- (Refer to the exploded view).
1. Binding in turntable bearing.
 - Check the turntable bearing (22) for freedom. Hold the motor idler wheel (45) out of engagement with the turntable and spin the turntable, by hand, to see if it turns readily and coasts for a long time. If binding occurs, remove turntable, foreign matter and lubricate with light mineral oil.
 2. Motor drive shaft too small in diameter. Replace the motor or spring bushing with one having a greater diameter.
 3. Line voltage too low. The line voltage should not be less than 100 volts or the turntable may be too slow.
 4. Operating temperature too low. If the machine has been stored in a cold place or operated in surroundings at a temperature of less than 60°F., the turntable speed may be too slow.

Turntable Speed Too Fast:

- Motor drive shaft or spring bushing too large in diameter. Replace the motor with one having a smaller diameter shaft or spring bushing.



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