

MECHANICAL PARTS LIST (CONT'D.)

| Ref. No. | Part No.    | Description                                 | Ref. No. | Part No.     | Description   |
|----------|-------------|---|----------|--------------|---|
| 47       | 400B745-1   | Switch and Reject Arm Ass'y.                | 93       | 404B46-1     | Leveling Arm Bearing                                |
| 48       | 400A620-1   | Gear Indexing Arm and Stud Ass'y.           | 94       | 414B64-1     | Speed Shift Wire Link                               |
| 49       | 415A31-1    | Drive Gear Bearing                          | 95       | 414A63-1     | On-Off-Reject Wire Link                             |
| 50       | 405A140-1   | Spring, Reject Arm and Shut-Off Link Return | 96       | 402A369-1    | Screw (#6-32 x 5/16HH SL STS)                       |
| 51       | 402A376-1   | Screw (#6-32 x 3/8RH PH STS)                | 97       |              | Screw   |
| 52       | 405A161-1   | Spring, Set-Down Pivot                      | 98       | 405A162-1    | Spring, Leveling Arm Return                         |
| 53       | 400A652-1   | 12" Set-Down Slide Assembly                 | 99       | 405A140-1    | Spring, Reject Arm Return                           |
| 54       | 405A159-1   | 12" Set-Down Slide Spring                   | 100      | 401A388-6    | Washer, Steel (.254ID x 1/2OD x 1/32)               |
| 55       | 1C191-78-47 | Screw (#6-32 x 3/16RH PH SEMS)              | 101      | 405A167-1    | Retaining Ring                                      |
| 56       |             | Baseplate                                   | 102      | 401A355-7    | "E" Retaining Ring (3/8")                           |
| 57       | 403B107-1   | Knob, Off-On Reject (Series 9)              | 103      | 405A173-1    | Spring, Gear Indexing                               |
|          | 403B107-2   | Knob, Off-On Reject (Series 10)             | 104      | 405A99-1     | Retaining Washer (39/64ID x 1 1/4OD x 5/64)         |
|          | 403B107-1   | Knob, Off-On Reject (Series 12)             | 105      | 415A29-2     | Thrust Bearing Assembly                             |
|          | 403B107-3   | Knob, Off-On Reject (Series 14)             | 106      | 406B38-1     | Washer, Neoprene                                    |
| 58       | 403B106-1   | Knob, Speed Change                          | 107      | 402A296-1    | Set-Screw, Knurled Point                            |
| 59       | 401A497-1   | On-Off Reject Link                          | 108      | 404B48-1     | Turntable Support Hub                               |
| 60       | 401A496-1   | Speed Shift Link                            | 109      | 401A355-1    | "E" Retaining Ring (3/16")                          |
| 61       | 405A139-2   | Spring, Float                               | 110      |              | Washer  |
| 62       | 414A57-1    | Shut-Off Link Hold Down                     | 111      | 400A682-1    | Push-Off Lever and Stud Ass'y.                      |
| 63       | 401A355-1   | "E" Ring Retainer (3/16")                   | 112      | 405A154-1    | Push-Off Safety Spring                              |
| 64       | 412A52-1    | Washer, Fishpaper (196ID x 3/8OD x .015)    | 113      | 400A605-1    | Drive Eccentric Ass'y.                              |
| 65       | 402A370-1   | Screw (#6-32 x 3/16RH PH STS)               | 114      | 401A388-1    | Washer, Steel (.196ID x 1/2OD x .031)               |
| 66       | 400A606-1   | Switch and Mounting Plate Ass'y.            | 115      | 1C194-553-47 | Screw (#8-32 x 1/4BH SL SEMS)                       |
| 67       | 401A388-4   | Washer, Brass (.196ID x 5/16OD x .015)      | 116      | 401A450-1    | Push-Off Link                                       |
| 68       | 401A355-1   | "E" Retainer Ring (3/16)                    | 117      | 401A388-1    | Washer, Steel (.196ID x 1/2OD x .031)               |
| 69       | 514A37-1    | Cocking Roller                              | 118      | 401A355-1    | "E" Retaining Ring (3/16")                          |
| 70       | 401A355-1   | "E" Retainer Ring                           | 119      | 405A152-1    | Spring, Shut-Off Return                             |
| 71       | 400A653-3   | Set-Down Index Ass'y. (Series 9)            | 120      | 412A52-1     | Washer, Fishpaper (.196ID x 3/8OD x .015)           |
|          | 400A653-1   | Set-Down Index Ass'y. (Series 10)           | 121      | 401A355-1    | "E" Retaining Ring (3/16")                          |
|          | 400A653-1   | Set-Down Index Ass'y. (Series 12)           | 122      | 401A388-1    | Washer, Steel (.196ID x 1/2OD x .031)               |
|          | 400A653-1   | Set-Down Index Ass'y. (Series 14)           | 123      | 401A355-1    | "E" Retaining Ring (3/16")                          |
| 72       | 406A29-3    | 10" Index Finger Cap (Series 9)             | 124      | 401A398-1    | Shut-Off Delay Stop                                 |
|          | 406A29-1    | 10" Index Finger Cap (Series 10)            | 125      | 405A153-1    | Shut-Off Engagement Spring                          |
|          | 406A29-1    | 10" Index Finger Cap (Series 12)            | 126      | 407C35-4     | Motor Assy., 4-Speed, 117V, 60 Cycle AC (Series 9)  |
|          | 406A29-1    | 10" Index Finger Cap (Series 14)            |          | 407C35-4     | Motor Assy., 4-Speed, 117V, 60 Cycle AC (Series 10) |
| 73       | 405A143-1   | Spring, Index Return                        |          | 409C35-4     | Motor Assy., 4-Speed, 117V, 60 Cycle AC (Series 12) |
| 74       | 405A146-1   | Spring, Arm Return                          |          |              | Spring (Part of 126)                                |
| 75       | 415A35-1    | Set-Down Arm Spacer                         |          |              | Rubber Grommet, Speed Change                        |
| 76       | 400A616-1   | Set-Down Arm Assembly                       |          |              | Retaining Ring (Part of 126)                        |
| 77       | 412A40-1    | Set-Down Friction Washer                    | 127      |              |   |
| 78       | 401A396-4   | "C" Retaining Ring (5/16")                  | 128      | 406A36-1     | *Idler Wheel (Part of 126)                          |
| 79       | 400B715-1   | Tone Arm Control Lever Ass'y.               | 129      | 98C15-118    | Retaining Ring (Part of 126)                        |
| 80       | 405A144-1   | Set-Down Engagement Spring                  | 130      |              | Speed Change Spring Retaining Cap (Part of 126)     |
| 81       | 402A284-1   | Lift Rod                                    | 131*     | 98C15-114*   | Spring, Speed Change (Part of 126)                  |
| 82       | 401A388-4   | Washer, Brass (.196ID x 5/16OD x .015)      | 132      | 98C15-117    | Motor Mounting Grommet (Part of 126)                |
| 83       | 401A355-1   | "E" Retainer Ring (3/16")                   | 133      | 98C15-119    | Washer, Steel (.196ID x 1/2OD x .031)               |
| 84       | 405A145-1   | Spring, Safety                              | 134      | 98C15-120    | "E" Retaining Ring (3/16")                          |
| 85       | 400A629-1   | Shut-Off Link and Arm Ass'y.                | 135      | 98C15-117    | Spring, Idler                                       |
| 86       | 405A151-1   | Spring, Shut-off Arm                        | 136      | 401A388-1    | 50 Cycle Conversion Kit (not shown)                 |
| 87       | 400A621-2   | Control Plate Assembly                      |          |              |   |
| 88       | 400A622-1   | Safety Arm and Stud Ass'y.                  |          |              |   |
| 89       | 401A355-2   | "E" Retaining Ring (1/4")                   |          |              |   |
| 90       | 401A448-1   | Drive Link                                  |          |              |   |
| 91       | 401A388-5   | Washer, Brass (.196ID x 1/2OD x .028)       |          |              |   |
| 92       | 401A355-1   | "E" Retaining Ring (3/16")                  |          |              |   |

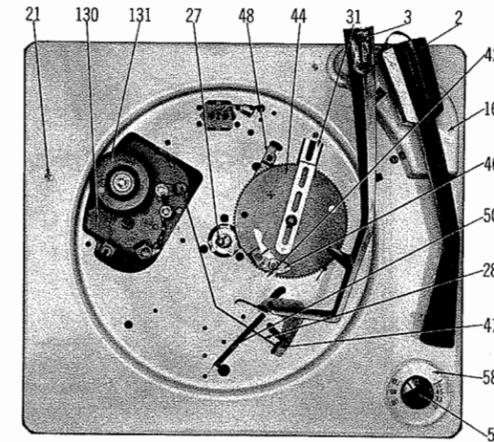
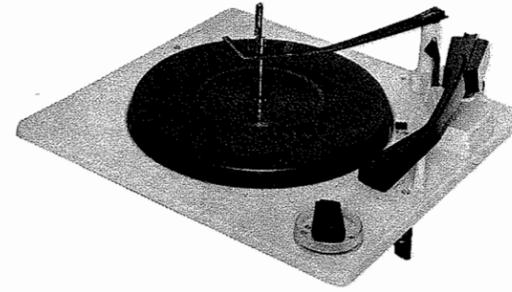
▲ Includes Ref. No. 5, 6, 7, 8, 9, 10, 11

\* Idler Wheel WALSCO Replacement Part No. 1490-03

SET 671 FOLDERIO

PHOTOFACT® Folder

ENSIGN MODELS 400B752-5/-9/-10/-12/-14/-20



|              |  |
|--------------|--|
| TRADE NAME   | Ensign Model 400B752 Series 5, 9, 10, 12, 14, & 20   |
| SUPPLIER     | Ensign Industrial Sales, 3800 Cortland Street, Chicago 47, Illinois  |
| TYPE SET     | AC Operated 4 Speed Automatic Record Changer Playing 7", 10", or 12" Records, which may be intermixed if they are of the same speed. |
| POWER SUPPLY | 110 - 120 Volts AC, 60 Cycles  |

PREPARING FOR OPERATION

1. Float the changer on its mounting springs by turning the hold-down screws in a clockwise direction until the screw heads are flush with the changer baseplate.
2. Remove needle guard from pick-up cartridge.
3. Lift tone arm free of rest post.
4. Level the record changer.

SPECIAL INSTRUCTIONS

1. When changer is not in use, place the speed selector in the neutral (N) position to prevent flat spots from developing on the idler wheel (131).
2. Do not turn off the power to the changer, or handle the tone arm during the change cycle.

CLEANING

Clean the following parts: idler wheel (131), inside rim of turntable, trip slider (31), engagement

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LUBRICATION

- CAUTION: Do not apply grease or oil to the trip slider (31). Under normal operating conditions, the motor should never require lubrication. Gear engagement panel (40), fiber washer (41), and trip motion arm (42) must be kept clean and dry.
1. Leveling arm shaft (97) must be free of binding in its bearing in the tone arm base. Lubricate the leveling arm shaft using a thin coat of light grease.
  2. The turntable hub should be lubricated with a good grade of light oil. The oil must be fluid so it will penetrate and be absorbed by the bearing material. Do not use grease of any kind.
  3. The pivot points of the set-down index (71) should not be lubricated. They must be kept clean and dry so it will pivot from its own weight. However, a nonhardening grease should be applied to the set-down position slides.

pawl (40), motor pulley, and trip motion arm (42) with alcohol to remove any grease or oil.

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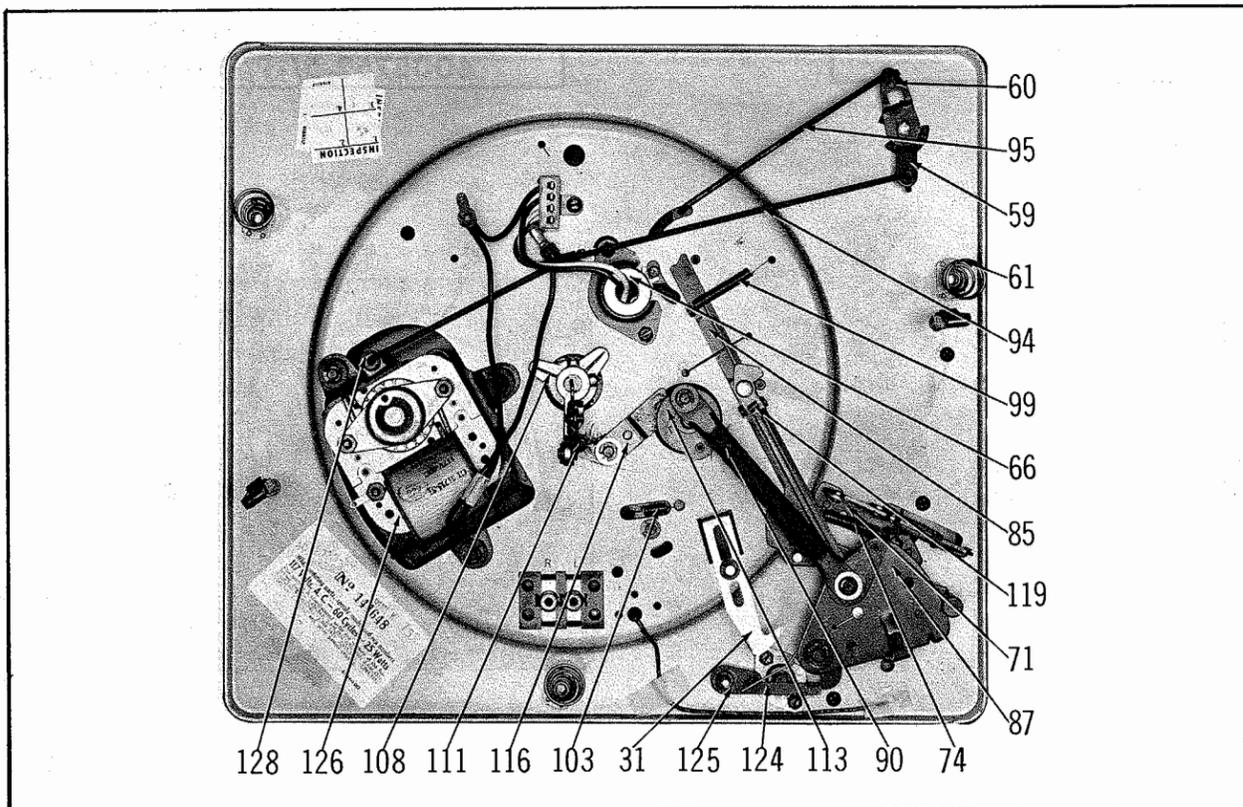


The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. C827

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DATE 12-63

SET 671 FOLDERIO



CHANGE CYCLE

It is recommended that a geared hub (normally riveted to the turntable) be obtained so the change cycle can be observed by rotating the geared hub by hand in a clockwise direction. The change cycle can then be more readily followed and the function of each part more easily understood.

The turntable is driven by idler wheel (131) riding against the inside rim of the turntable (25). Speed is determined by the diameter of the stepped motor shaft (either 78, 45, 33, or 16) driving the idler wheel (131).

The cycling mechanism is driven through its change cycle by drive gear (44) powered by the geared hub of the turntable. When the changer is out of cycle, the "open space" on the drive gear is held next to the turntable hub by the gear indexing arm (48) and spring (103).

This mechanism utilizes what is commonly known as a velocity trip consisting of two main parts: the trip motor arm (42) and the gear engagement pawl (40).

While a record is being played, the trip slider (31) is moved slowly by the stud on the tone arm control lever (79), which is moved by the tone arm. The stud on the trip slider (31) rides against the trip motion arm (42), moving it slightly. Since the gear engagement pawl (40) is held against the trip motion arm (42) by the trip friction spring (39), the gear engagement pawl (40) is also moved towards the turntable hub. Since this movement is slight, the vertical catch on the gear engagement pawl (40) is just touched and kicked away by the lug on the turntable hub. This occurs with each revolution of the turntable until the gear engagement pawl is moved in rapidly and posi-

tioned in front of the lug during the next rotation of the turntable.

As the stylus enters the trip groove of the record, the trip slider (31) is moved in rapidly by the tone arm. The gear engagement pawl (40) moves in front of and engages with the lug on the turntable hub. This causes the drive gear (44) to rotate far enough so the teeth will engage with those on the turntable hub and start the change cycle.

The change cycle may also be actuated by moving the Rej-On-Off knob to the "Rej" position momentarily. The arm on the end of reject arm (47) moves the gear engagement pawl (40) into position to engage the lug on the turntable hub.

As the teeth on the turntable hub and drive gear (44) mesh, starting the rotation of the drive gear, the drive eccentric also rotates since both are mounted on the same shaft. As the drive eccentric rotates clockwise, the drive link (90) pivots the control plate (87) causing the inclined cutout to move from beneath the tone arm lift rod (81). This raises the tone arm from the record. The safety arm (88) travels with control plate (87) so the stud on the safety arm engages the tone arm control lever (79) to move the tone arm away from the spindle.

When the tone arm clears the record, the roller on drive eccentric (113) engages the push-off link (116). The push-off link then moves the push-off lever (111) so it engages the push-off adjustment nut (23) on the end of the shaft in the spindle, moving the push-off shaft up into the spindle. The push-off shaft engages the ejector and pushes it up and out at the shelf of the spindle.

TROUBLE CHART (CONT'D.)

| Symptom   | Cause  | Remedy  |
|---|--|---|
| Records fall to turntable unevenly.                     | <ol style="list-style-type: none"> <li>1. Spindle dirty.</li> <li>2. Push-off lever (111) binding.</li> <li>3. Push-off shaft out of adjustment.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Polish spindle with a soft cloth dampened with oil.</li> <li>2. Be sure it is free of any foreign material and pivots freely.</li> <li>3. See "Push-Off Adjustment".</li> </ol>   |
| Records do not push off, or more than one record falls. | <ol style="list-style-type: none"> <li>1. Lever return spring in spindle weak or broken.</li> <li>2. Push-off return spring (22) weak or broken.</li> <li>3. Push-off shaft out of adjustment.</li> <li>4. Foreign material between record shelf and ejector in the spindle.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Replace spindle (27).</li> <li>2. Replace.</li> <li>3. See "Push-Off Adjustment".</li> <li>4. Clean out any foreign material that may be between the record shelf and ejector.</li> </ol>   |
| Changer fails to trip.                                  | <ol style="list-style-type: none"> <li>1. Trip slider (31) binding.</li> <li>2. Trip motion arm (42) and gear engagement pawl (40) dirty.</li> <li>3. Trip slider return spring on control plate (87) loose, bent, or misplaced.</li> <li>4. Gear index assembly (48) binding.</li> <li>5. Drive gear assembly (44) binding in bushing (49).</li> <li>6. Tone arm leads too tight, preventing the tone arm from moving freely.</li> <li>7. Tone arm control lever and shaft assembly (79) does not rotate freely in set-down arm assembly (76), causing tone arm to bind.</li> </ol> | <ol style="list-style-type: none"> <li>1. Clean any oil, grease, or dirt from the trip slider (31) so that it moves freely.</li> <li>2. Clean or replace parts.</li> <li>3. Replace control plate (87).</li> <li>4. Free gear index assembly (48) and replace if necessary.</li> <li>5. If drive gear shaft is bent, replace. If bushing is worn, replace.</li> <li>6. Dress tone arm leads so tone arm can move freely throughout its travel.</li> <li>7. Set-down friction washer (77) should be replaced if it is oil soaked.</li> </ol> |
| Tone arm skips grooves on records.                      | <ol style="list-style-type: none"> <li>1. Grooves on records dirty or damaged.</li> <li>2. Record changer not level.</li> <li>3. Stylus worn.</li> <li>4. Binding at bearing (34) in the tone arm base (16) or between the shaft of the tone arm control lever (79) and the shaft of the set-down arm (76).</li> <li>5. Trip slider (31) dirty, greasy, or oily; is bent or has burrs on it.</li> <li>6. Trip motion arm (42) and gear engagement pawl (40) binding.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Clean records or replace.</li> <li>2. Level record changer from front to back and from side to side.</li> <li>3. Replace stylus.</li> <li>4. Clean these parts and polish the shafts with a soft cloth slightly dampened with oil.</li> <li>5. Clean any dirt, grease or oil from trip slider (31). If bent, re-shape trip slider or replace.</li> <li>6. If these parts cannot move freely, replace so they will not load the trip slider (31).</li> </ol>                                       |
| Changer rumble or noise.                                | <ol style="list-style-type: none"> <li>1. Changer does not float freely on its mounting springs.</li> <li>2. Neoprene washer (106) worn.</li> <li>3. Mechanical part near motor rubbing.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Be sure the changer hold-down screws are flush with baseplate.</li> <li>2. Replace.</li> <li>3. If a mechanical part is bent; straighten, if worn, replace.</li> </ol>  |
| Changer will not shut off automatically.                | <ol style="list-style-type: none"> <li>1. Binding between leveling arm shaft (3) and bearing (93) in tone arm base.</li> <li>2. Not enough tension in shut-off delay engagement spring (125).</li> <li>3. Shut-off delay stop (124) binding.</li> <li>4. Cam on shut-off link (85) binding.</li> <li>5. Shut-off arm spring (86) weak.</li> <li>6. Felt washer (12) damaged.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Clean leveling arm shaft (3) and polish shaft with a cloth dampened with oil.</li> <li>2. Replace.</li> <li>3. Clean any foreign material from delay stop (124) and make sure it moves freely.</li> <li>4. Clean or replace.</li> <li>5. Replace.</li> <li>6. Replace.</li> </ol>   |

400B752-9/-10/-12/-14/-20  
ENSIGN MODELS

FOLDER 10

- Adjust the set-down adjustment screw (6) so the stylus will land in the lead-in groove of the 10" record.
- Check the set-down point with each size record. Touch up the set-down adjustment until the tone arm sets down properly for all record sizes.

### Velocity Trip

The velocity-type trip used depends on a rapid movement of the tone arm toward the spindle in any area between 2 1/4" and 1 15/16" from the center of the record. There is no adjustment for this type of trip. In order to function properly there must be sufficient friction between the trip motion arm (42) and the gear engagement pawl (40). If there is insufficient friction, or these parts do not turn together readily, both parts should be replaced.

### Push-Off

The push-off adjustment must be checked whenever the spindle has been moved or replaced. Record push-off is accomplished by an ejector and push-off shaft built into the spindle. The ejector and push-off shaft are actuated during the change cycle by safety spring (112). If ejector travel is insufficient for record push-off, adjustment may be required.

The ejector travel can be adjusted by nut (23). When properly adjusted, the ejector should extend just slightly beyond the edge of the shelf on the spindle at push-off.

**IMPORTANT:** Additional travel must be allowed for the push-off shaft and ejector after the

push-off lever has traveled its full distance.

To adjust the push-off, proceed as follows:

- Rotate the turntable clockwise by hand. Move the Rej-On-Off control to the Rej. position, and let it return to the On position.
- Continue the turntable rotation slowly until the roller on the drive eccentric (113) engages the push-off link (116). Rotate the turntable until the roller has moved the push-off link its full distance. Push-off lever (111) now is extended its maximum travel.
- Check the position of the ejector at the shelf on the spindle. If necessary, use a 1/4" open-end wrench to turn the push-off adjustment nut (23) counterclockwise until the ejector extends just beyond the edge of the shelf.
- Press the push-off adjustment nut (23) to check for additional travel before the push-off shaft stops. The ejector should move out past the shelf slightly more than necessary for push-off.
- Slide a seven-thousandth inch (.007) feeler gauge between the flat surface of the adjustment nut (23) and the safety spring (112). Adjust until the feeler gauge passes between them freely.

**NOTE:** The additional travel for the push-off shaft may vary. In order to obtain proper push-off, the clearance of seven-thousandth inch must not vary more than plus or minus five-thousandth inch.

As the ejector moves up, it engages the center hole of the bottom record on the shelf. As the ejector moves out of the spindle, the record moves with it until the center hole is clear of the shelf on the spindle, dropping the record down the spindle onto the turntable. The remaining records are held on the shelf by the spindle slide above the ejector.

As the drive eccentric (113) starts into the second half of the change cycle, the push-off return spring (22) returns the safety spring (112), push-off lever (111), and push-off link (116) to the proper position, letting the push-off ejector return to position ready for push-off of the next record.

After push-off, and during the second half of the change cycle, the tone arm is returned to the edge of the record on the turntable. The tone arm is mounted to the tone arm control lever (79).

Engagement spring (80) presses the tone arm control lever against the cork friction washer (77) on set-down arm (76), and as the set-down arm return spring (74) draws the set-down arm toward the spindle, the cork friction washer returns the tone arm control lever.

As control plate (87) is returned by the drive link (90), the inclined cutout moves beneath the tone arm lift rod (81) allowing it to descend into the inclined cutout and the tone arm is lowered to the record.

The set-down index (71) automatically determines the correct set-down position of the tone arm for each record size. A long stud on the safety arm (88) moves the set-down arm (76) and index finger on set-down arm (76) engages the set-down index (71). The set-down index is released by the index pin on the set-down arm to permit the set-down index to pivot of its own weight and lift the index finger to the edge of the turntable.

When 7" records are being changed, the index finger moves to its extreme upward position. The set-down arm return spring (74) draws the set-down arm (76) toward the spindle. In this position, the index pin on the set-down arm (76) will travel to the front slot in the set-down index. Since the index pin is held in the front slot, it is prevented from moving further toward the spindle, and the inward travel of the tone arm will stop directly over the lead-in groove.

A 10" record extends past the edge of the turntable far enough for the index finger cap (72) to contact the edge of the record. Since the index finger

cannot raise as high as when 7" records are being changed, the rear of the set-down index drops just far enough to allow the index pin on the set-down arm (76) to ride into the middle slot of the set-down index. When the index pin is located in this middle slot, the inward travel of the tone arm will stop directly over the lead-in groove of a 10" record.

A 12" record extends far enough to trip the set-down trigger (34). The 12" set-down slide (53) is released, and is pulled by spring (54) until it moves into a slot on the set-down index (71). Since the set-down index (71) is held by the 12" set-down slide (53), the index pin on the set-down arm (76) enters the slot for 12" set-down.

The 12" set-down slide (53) is reset at the beginning of each change cycle. It is triggered by the 12" set-down trigger (34), by means of the pin on the safety arm and stud assembly (88). The pin is actuated by a roller on the underside of the pan attached to the 12" set-down slide (53).

When playing 10" or 12" records the rubber cap (72) of the index finger feels the equivalent of a 10" record, so the 12" set-down trigger (34) corrects this action for 12" records and permits intermixing of 10" and 12" records.

### Automatic Shutoff

As the last record drops the leveling arm (4) falls below the shelf on the spindle and its shaft extends far enough beneath the changer pan to lower the shut-off delay stop (124). This permits the shut-off link control arm (on the shut-off link) to pivot since its spring (86) has one end fastened to the control plate (87). The shut-off link control arm draws the shut-off link, and engages its cam that positions the shut-off link in line with the stud on the reject arm (47).

As the shut-off link (85) is drawn toward the control plate (87), the stop on the shut-off link moves into the path of the stud on the tone arm lever (79). When the control plate (87) begins its return in the second half of the change cycle, a stud on the control plate moves the shut-off link (85) forward to turn off the motor switch and return the "Rej-On-Off" control to the "Off" position. Also, the tone arm control lever (79) is held by the tone arm stop on the shut-off link (85) as the control plate (87) goes through the second half of the change cycle. The tone arm is held suspended above the tone arm rest (32) until the inclined cutout moves under the tone arm lift rod (81) letting the tone arm be lowered onto the tone arm rest.

### ADJUSTMENTS

#### Height

Place a stack of records on the spindle shelf. Rotate the turntable by hand and start the change cycle. As the tone arm raises from a record, it should be 3/16" to 1/4" below the record on the spindle shelf. To regulate tone arm height, adjust screw (1) which is accessible through a hole on the top of the tone arm near its base. To raise the height of the tone arm, turn the adjusting screw clockwise.

#### Set-Down

The tone arm will automatically set down properly on 7" or 12" records if the set-down is properly

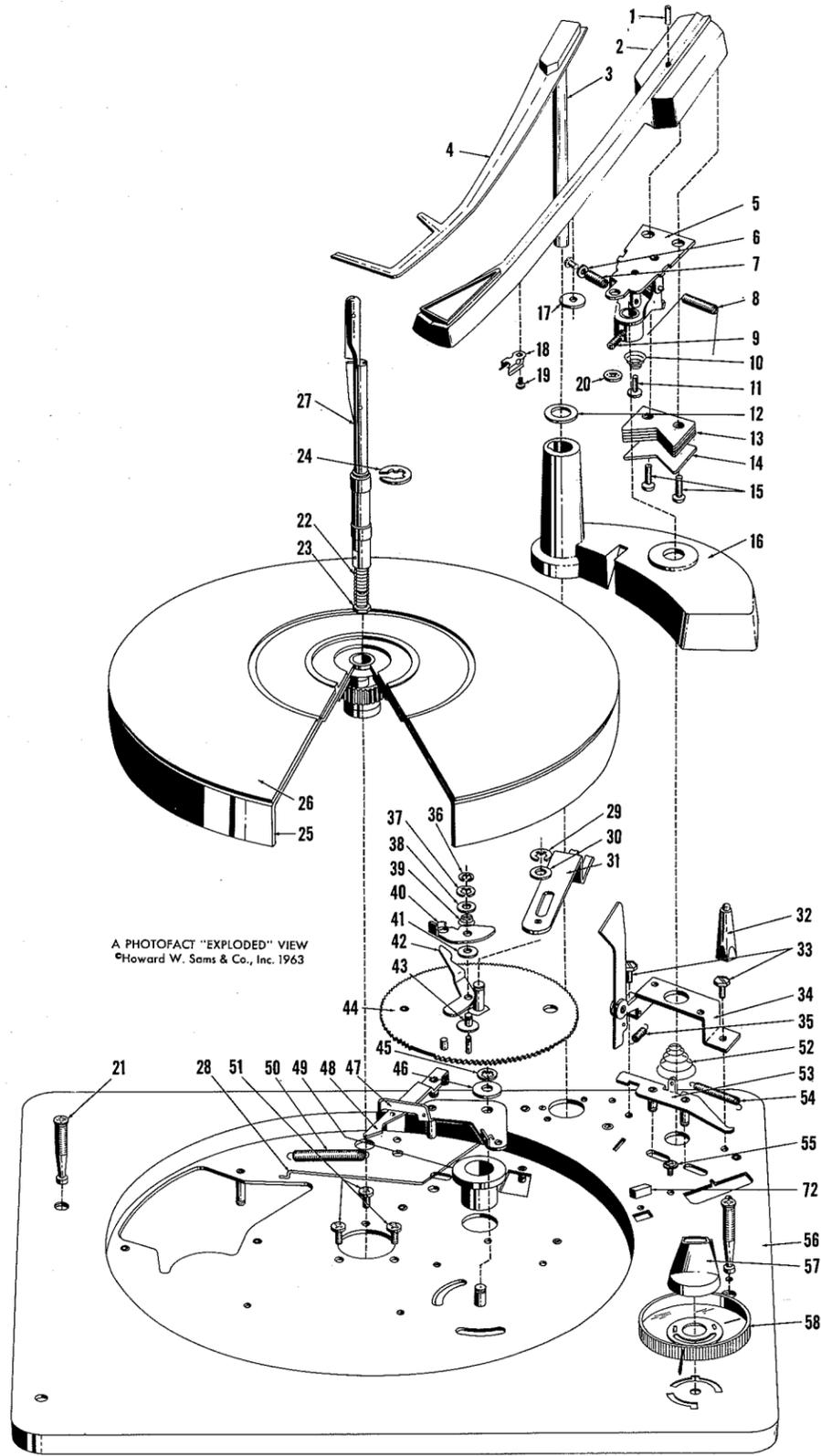
adjusted on a 10" record. The set-down adjustment screw (6) is accessible through a hole in the left side of the tone arm. Turning this screw counterclockwise moves the arm closer to the spindle and turning it clockwise moves it away from the spindle. Make the set-down adjustment as follows:

- Grasp the leveling arm (3) at the shaft and swing the arm to the right as far as possible.
- Place a 10" record on the turntable.
- Trip the Rej-On-Off control and rotate the turntable by hand until the tone arm starts its downward travel to the record.

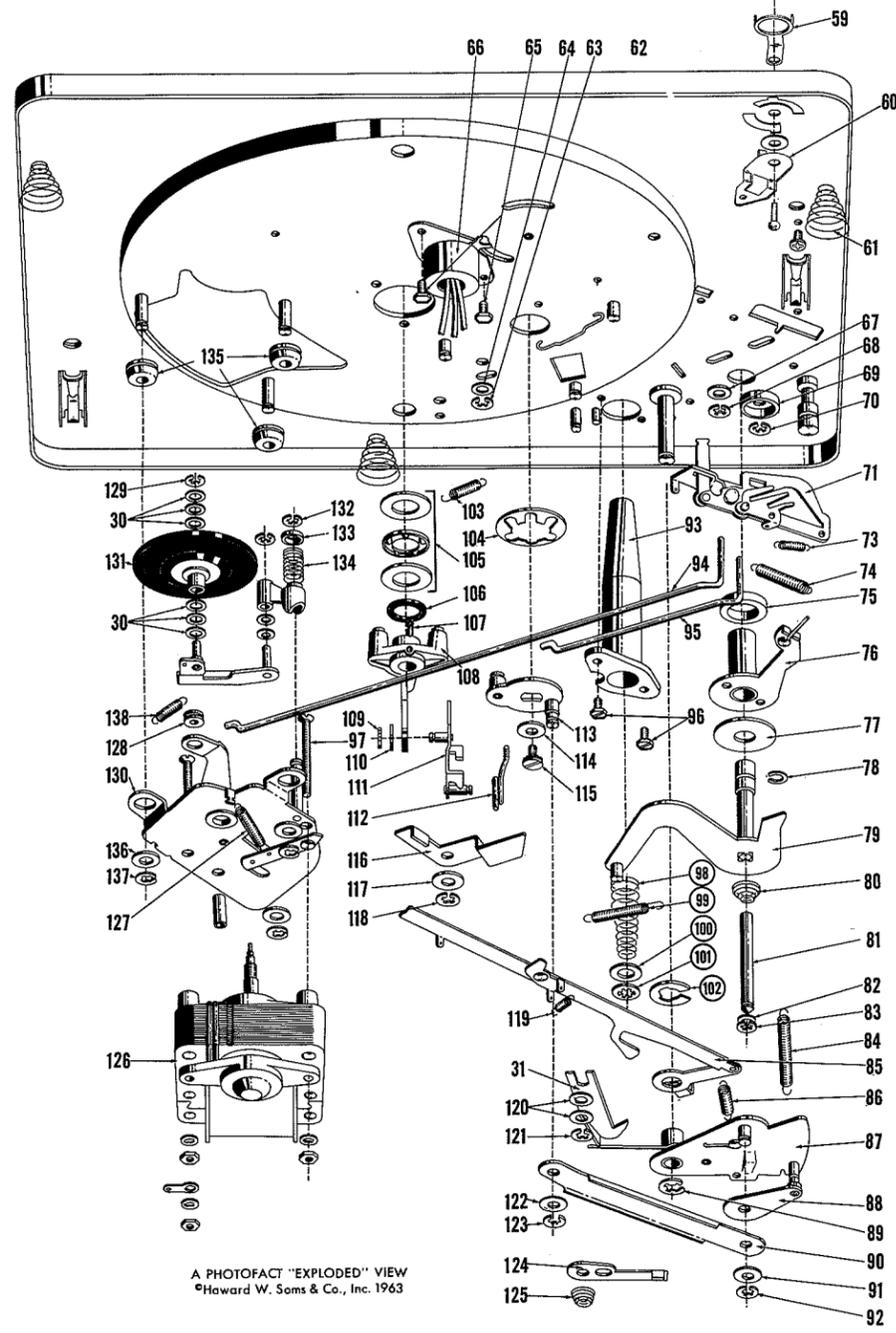
SET 671 FOLDER 10

### TROUBLE CHART

| Symptom  | Cause  | Remedy   |
|--|--|--|
| Continuous tripping.                                     | 1. Gear indexing spring (103) tension insufficient.                        | 1. Replace.  |
|  | 2. Trip slider return spring on control plate (87) bent.                   | 2. Straighten or replace.  |
|  | 3. Trip slider (31) bent.  | 3. Straighten or replace.  |
|  | 4. Gear index arm assembly (48) binding against baseplate.                 | 4. Free gear index arm assembly (48) so it will function without binding.                              |
| Tone arm does not set down properly.                     | 1. Set-down misadjusted.   | 1. See "Set-Down" Adjustment.  |
|  | 2. Set-down index assembly (71) binding.                                   | 2. Clean all pivot points, Make sure the half punches are interlocked into the holes of the baseplate. |
| Record squeaks on turntable.                             | 1. Label burrs folded into center hole.                                    | 1. Carefully remove the label burrs with a small knife.  |
|  | 2. Spindle surface dirty.  | 2. Put a few drops of light machine oil on a soft cloth and polish the spindle.                        |
| Changer trips into change cycle before finishing record. | 1. Foreign material between trip motion arm (42) and engagement pawl (40). | 1. Clean and wipe dry.   |
|  | 2. Trip slider return spring on control plate (87) bent.                   | 2. Bend back to its original position.   |
|  | 3. Trip slider (31) bent.  | 3. Bend to its original form or replace.   |
| Changer stalls in change cycle.                          | 1. Oil on idler wheel (131), motor pulley, and turntable rim.              | 1. Clean all drive surfaces with alcohol.  |
|  | 2. Push-off adjustment has improper clearance.                             | 2. See "Push-Off Adjustment".  |
|  | 3. Defective motor (126).  | 3. Replace.  |



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MECHANICAL PARTS LIST

| Ref. No. | Part No.    | Description                              |
|----------|-------------|--|
| 1        | 403D110-1   | Screw, Height Adj.                       |
| 2        | 403D110-3   | Tone Arm, (Series 9)                     |
|          | 403C110-3   | Tone Arm, (Series 10)                    |
|          | 403D105-1   | Tone Arm, (Series 12)                    |
|          | 403C110-3   | Tone Arm, (Series 14)                    |
| 3        | 400D740-1   | Shaft, Leveling Arm                      |
| 4        | 400D740-3   | Leveling Arm (Series 9)                  |
|          | 400D740-3   | Leveling Arm (Series 10)                 |
|          | 400D740-4   | Leveling Arm (Series 12)                 |
|          | 400D740-3   | Leveling Arm (Series 14)                 |
| 5▲       | 400A727-4 ▲ | ▲ Tone Arm Suspension Ass'y. (Series 9)  |
|          | 400A727-4 ▲ | ▲ Tone Arm Suspension Ass'y. (Series 10) |
|          | 400A727-7 ▲ | ▲ Tone Arm Suspension Ass'y. (Series 12) |
|          | 400A727-3 ▲ | ▲ Tone Arm Suspension Ass'y. (Series 14) |
| 6        | 4C1-19-47   | Washer, Set Down Adj.                    |
| 7        | 405A137-1   | Spring, Set-Down Adj. Lock               |
| 8        | 402A296-1   | Spring, Counterbalance                   |
| 9        | 405A148-1   | Set-Screw, Knurled Point                 |
| 10       | 402A290-1   | Spring, Lift Adjust Lock                 |
| 11       | 402A290-1   | Screw, Lift Adjust                       |
| 12       | 412A47-1    | Washer, Neoprene                         |
| 13       | 401A481-2   | Tone Arm Counterweight                   |

| Ref. No. | Part No.  | Description                                |
|----------|-----------|--|
| 14       | 401A481-1 | Tone Arm Counterweight                     |
| 15       | 402A375-2 | Screw (#4 x 5/16RH PH STS)                 |
| 16       | 403C95-9  | Tone Arm and Leveling Arm Base (Series 9)  |
|          | 403C95-4  | Tone Arm and Leveling Arm Base (Series 10) |
|          | 403C95-4  | Tone Arm and Leveling Arm Base (Series 12) |
|          | 403C95-8  | Tone Arm and Leveling Arm Base (Series 14) |
| 17       | 412A50-1  | Clip, Tone Arm                             |
| 18       | 401A510-1 | Screw                                      |
| 19       | 2C10-5-59 | Speed Nut                                  |
| 20       | 27A319-13 | Screw, Hold Down (Series 9)                |
| 21       | 27A319-13 | Screw, Hold Down (Series 10)               |
|          | 27A319-11 | Screw, Hold Down (Series 12)               |
|          | 27A319-14 | Screw, Hold Down (Series 14)               |
| 22       | 405A142-1 | Spring, Push-Off Return                    |
| 23       | 403A87-1  | Nut, Push-Off Adj.                         |
| 24       | 401A355-9 | "E" Retaining Ring (5/16")                 |
| 25       | 400D741-1 | Turntable Ass'y. (Series 9)                |
|          | 400D741-4 | Turntable Ass'y. (Series 10)               |
|          | 400C718-5 | Turntable Ass'y. (Series 12)               |
|          | 400D741-7 | Turntable Ass'y. (Series 14)               |

| Ref. No. | Part No.  | Description   |
|----------|-----------|---|
| 26       | 406B37-3  | Turntable Mat, Rubber (Series 9)  |
|          | 406B37-4  | Turntable Mat, Rubber (Series 10)   |
|          | 406B37-3  | Turntable Mat, Rubber (Series 12)   |
|          | 406B37-2  | Turntable Mat, Rubber (Series 14)   |
| 27       | 400B681-1 | Centerpost Assembly   |
| 28       | 414A65-1  | Idle Wheel Pull-Out Wire (Series 12)  |
| 29       | 401A355-1 | "E" Retaining Ring (3/16")  |
| 30       | 412A52-1  | Washer, Fishpaper   |
| 31       | 400B719-1 | Trip Slider and Stud Ass'y.   |
| 32       | 403B65-11 | Tone Arm Rest (Series 9)  |
|          | 403B65-6  | Tone Arm Rest (Series 10)   |
|          | 403B65-6  | Tone Arm Rest (Series 12)   |
|          | 403B65-6  | Tone Arm Rest (Series 14)   |
| 33       | 402A373-1 | Screw(#6-32 x 1/4RH PH STS)   |
| 34       | 400A651-2 | Tone Arm Alignment Bracket and Trigger Assembly                             |
| 35       | 405A160-1 | Spring, 12" Trigger Cocking   |
| 36       | 401A355-6 | Spring  |
| 37-43    | 400A588-2 | "E" Retaining Ring (1/4") Gear Engagement Pawl and Trip Motion Arm Assembly |
| 44       | 400A587-3 | Drive Gear, Shaft, and Stud Assembly  |
| 45       | 401A355-1 | "E" Retaining Ring (3/16")  |
| 46       | 401A388-1 | Washer, Steel (.196ID x 1/2OD x .031)                                       |

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