

Speed R.P.M.	Cue Allowance Maximum	Rumble
33-1/3	1/6 turn	- 40db
45	1/4 turn	- 38db
78	1 turn	- 33db

Wow: .15% Max.

Flutter: .07% Max.

Power Requirements: 105-125 V., 35 W.

Motor: Hysteresis synchronous, single phase, 600 R.P.M. with 2.0 mfd. running capacitor and 40° temperature rise.

Chassis Size: 16 X 16 X 1-5/16"

Motor Hang Below Bottom of Chassis: 5-3/4"

Platter Size: 13-3/8"

Weights: 30 lb. Net  
40 lb. Shipping

#### INTRODUCTION

The Gates CB-77 transcription turntable is surprisingly simple in operation, yet over-simplification has been avoided in the interest of quality, standards of performance, and low mechanical noise. Certain features that have proven themselves over the years have been retained, such as the shear type idler wheel, oilite bearings, heavy cast aluminum platter and chassis, "Monoball" self-aligning bearings, self-centering idler wheel (that insures exact tension at all times) and the direct speed shift mechanism.

New features are the hub drive, the improved motor mounting (to insure low noise rumble free operation) and the rocker type mercury OFF-ON switch.

The result is a transcription turntable built for low noise: long rugged service; and positive in operation with reduced maintenance.

#### INSTALLATION

The turntable is packed in a shipping carton with a piece of heavy corrugated board to separate the platter from the rest of the assembly. Lift the platter out of the assembly and remove the separator. Then remove the rest of the assembly from the shipping carton.

Before installing remove the metal bar that locks the control mechanism in the neutral position.

Add about a tablespoon of oil supplied with each unit to the center bearing housing, before the platter is set in place.

The turntable should be installed with clearances as indicated on drawing A-33146. When installed, the rubber stripping around the edge is the only part of the turntable that comes in contact with the cabinet. The turntable platter and arm should be carefully leveled when placed in operation. This is very important if pickups with very low tracking force are used.

#### OPERATION

This turntable is specifically designed for three speed operation; 78, 45 and 33-1/3 RPM. The speed is selected by moving the control lever to the desired index. This lever engages and disengages the neoprene idler from the three step motor pulley. The floating action of the idler assembly, transfers the optimum torque from the motor pulley to the platter, at all speeds.

The motor is energized with the rocker type switch on the control plate. The "ON" position is indicated when the translucent lever is illuminated. This is a mercury switch so its operation is silent. It is located close to the turntable platter so it can be actuated while holding a record.

#### MAINTENANCE

Under normal use the CB-77 turntable should be cleaned and oiled once every month. Place a drop of oil at each point indicated by an "O" in figures 1 and 5. Care should be taken to keep oil off the surfaces of the motor pulley, the idler wheel and the drive surface of the platter. It is a good plan to clean the driving surfaces with lighter fluid, or a similar solvent on a lint free cloth as part of the monthly maintenance program. This should be done when the platter is removed for servicing. Oil the idler wheel bearing by putting a drop of oil in the gap of the idler wheel retaining ring. About a tablespoon of oil should be placed in the center bearing housing when the unit is first placed in service.

When the turntable is not in use the control lever should be in the neutral position. (See Fig. 2). This disengages the idler wheel from the motor drive pulley. If the idler wheel is left resting against the motor pulley for a length of time a flat spot will develop on the driving face of the idler. This flat spot will usually smooth out after a period of running the turntable. Some undesirable thumping will occur until it regains the original shape. It is suggested that a spare idler wheel be kept on hand.

**CAUTION:** Under no circumstances should the motor pulley be removed from the motor shaft. The motor shaft and pulley constitute a very close and precise fit. After the motor and pulley are assembled at the factory, a finish cut is taken on the pulley to assure perfect concentricity and the proper diameter for very accurate speed. Any attempt to remove the pulley from the motor will result in damage to the motor shaft and also to the pulley itself. Any adjustments to the motor and pulley assembly should be handled at the factory.

When oiling the various points mentioned, including the motor, use only "Gulfoil Electric Motor Oil". Oils with a paraffin base will gum up in use, so they should not be used.

#### TROUBLE SHOOTING

##### 1. Idler Wheel Hangs Up On Motor Pulley

The idler wheel is adjusted at the factory to have approximately 1/64" clearance between each step on the motor pulley and the bottom of the drive surface of the wheel when in the 33-1/3 and 45 RPM positions. (See Fig. 3). There should also be 1/64" clearance between the driving surfaces of the idler wheel and the motor pulley (See Fig. 3). When the control lever is in the neutral position (Fig. 2). This clearance can be checked as follows; remove the platter, place the control lever in neutral, and slide the idler wheel all the way back on the idler arm. (See Fig. 5). If there is not enough clearance at these two points, the idler will hang up on the motor pulley.

To adjust this clearance, lengthen or shorten the rod which disengages and engages the idler (Fig. 1). This can be done by backing off the locknut on the ball joint, and removing the fillister head screw at the bottom of the idler assembly. (Fig. 5). Turn the ball joint in or out a half turn at a time until the proper clearance is obtained. Too much clearance will not allow the idler to seek the proper location when "floating" from one speed change to another. Be sure to replace the lock washer and tighten the lock nut, as shown in Fig. 5.

The idler will also hang up on the motor pulley steps if the control lever is not adjusted properly in relation to the three slots of the index plate.

To check this, remove the platter and place the idler arm in the 45 RPM position. You can feel the idler arm fall into the ball detent on the idler arm shaft. (Fig. 1). The control lever should be perfectly centered in the 45 RPM index slot. If the lever is not centered, this can be remedied by removing one of the screws on the ball joint transfer mechanism (Fig. 1) just below the control lever, and turning the ball joint in, or out a half turn at a time until the lever is centered in the index slot.

When the control lever is not centered correctly in the three index slots it will not allow sufficient travel when changing from one speed position to another. The control lever should never touch the sides of the index slots when in the engaged position.

## 2. Idler Wheel Will not Float Properly.

The CB-77 is equipped with a floating idler wheel which allows the idler to seek the proper relation or position between the motor pulley and the drive surface of the platter (Fig. 5). If the two shafts (on which the idler floats) should become dirty or gummed up, the idler will not move back and forth when changing from one speed to another. This will result in the loss of speed and torque, or possibly the platter may start with a jerk.

To correct this condition, slip the idler from the two shafts and wipe the shafts with a clean cloth. Place a drop of oil on each shaft and replace the idler. Move the idler back and forth by hand until it slides freely. Repeat the operation, if necessary, to clean the holes in the block.

The idler will not float if the clearance between the idler and pulley is not correct. See instruction #1 in this section for treatment of this condition.

## 3. Control Lever Shifts Hard; Too Much Play.

Keep all the moving joints and pivot points clean and well oiled. This will help to keep the control lever moving freely.

If the control lever has considerable play and does not move easily it is possible that some of the hardware has become loose. There may be too much clearance between the pivot blocks or some of the pivot pins are loose. (See Fig. 4). Loosen the screws that mount the pivot blocks to the motor plate. Also loosen the set screws which hold the pivot shafts in place. Squeeze the pivot blocks together and tighten the mounting screws and set screws. Move the parts back and forth while tightening the screws so they will not bind.

## 4. Torque

Torque is affected greatly by the idler hanging up or not floating properly. These two problems can be corrected by following instruction #1. The set screws, located in front of the index plate are not torque adjustments. They are for the purpose of preventing the idler wheel from pulling in too far when the platter is being accelerated.

They are properly adjusted when there is about 1/64" gap between the shift lever arm and the rubber tip on the set screw, observed while the turntable is running and engaged in one of the three speeds. Check each of the three speeds to see if the set screws are in the proper position. If the arm is allowed to ride on the rubber tips during operation, the rumble level will be increased. Turning the set screws in too far will result in loss of torque.

Torque is also affected by dirt or oil on the idler wheel, motor pulley or platter. Oil on the driving surfaces will cause the platter to slip. Clean these surfaces as indicated in the MAINTENANCE section.

## 5. Turntable Will Not Start Smoothly.

If the idler wheel hangs up on the motor pulley, the platter will start with a sudden jerk. This is also caused by failure of the idler to float freely as you change from one speed position to another. Correct these faults as outlined in instruction #1.

## 6. Platter Wobble

The CB-77 is equipped with a hardened, ground center spindle and runs in a porous type bronze bearing which retains the oil for a long period of time.

If the oil supply in the center bearing housing should get low, and the platter seems to wobble slightly when you press on the outer rim, simply replenish the oil and the wobble will disappear.

Very little wear will occur on the center spindle or bearing even after long periods of operation.

## 7. Wow.

This could be caused by low torque, idler wheel hang up or failure of idler to float properly. The adjustments are covered under instructions #1, #2 and #4.

## 8. Transcription Arm Does Not Track Properly.

Tracking trouble usually indicates that the arm or turntable is not level. Check the turntable with a spirit level. Refer to the instructions supplied with the transcription arm for correct adjusting procedures and stylus pressure.

## 9. Tighten All Hardware Securely.

It is a good practice to check all of the mounting screws, etc., as part of the routine maintenance procedure.

Be sure to tighten all screws, etc., after making any adjustment.

Gates Radio Company  
Quincy, Illinois

NOTE: Refer to drawing for part location. (813 6346 001)

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
2	842 2591 002	Turntable Base
3	913 1605 003	Turntable Platter Assembly
4	837 8456 002	Motor Plate
5	926 7605 001	Motor Plate & Shockmount Assembly
6	910 2400 002	Center Bearing Housing Assembly
7	911 0857 001	Idler Wheel Assembly
8	913 1606 002	Speed Change Arm Assembly
9	646 0449 000	Control Plate
10	911 0869 001	Idler Arm Assembly
11	811 0837 001	Change Arm Support
12	811 0836 001	Speed Change Shaft
13	811 0845 001	Speed Change Stud
14	811 0829 002	Stop Collar
15	811 0831 002	Spring for Ball Detent
16	811 0863 001	Idler Arm Shaft
18	811 0833 001	Spacer for Ball Joints
19	813 2284 001	Idler Control Rod
20	813 2573 001	Idler Tension Spring
22	811 0843 001	Control Arm Pivot Block
23	811 0841 001	Control Arm Bearing
24	811 0842 002	Speed Control Link
25	813 1591 001	Speed Change Lever Pivot Pin
26	911 0868 002	Speed Control Link Assembly
27	813 2282 001	Control Lever
28	811 0839 001	Speed Change Arm Bearings
29	450 0003 000	Ball Joint (Female)
31	813 1592 001	Idler Spring Stud
32	826 6926 001	Topping Felt
33	(913 5785 001)	Motor Assembly (60 cycles)
	(913 5785 002)	Motor Assembly (50 cycles)
34	250 0026 000	A.C. Line Cord
36	406 0009 000	Socket
37	396 0018 000	Lamp, Double Contact Bay. 130V. 6W.
38	650 0053 000	Knob, 1" dia.
39	344 0008 000	#8-32 x 1-1/4" Allen Head Cup Point Set Screw
40	604 0135 000	Mercury Switch
42	926 5797 001	Switch Assembly
43	813 1595 001	Switch Stop
44	813 1611 001	Switch Shaft Support
47	424 0067 000	#12-9425 Sponge Rubber Stripping, 1/2 x 9/16 x 85" lg.
49	450 0007 000	1/2" dia. Ball Bearing, Steel
57	(646 0478 000)	60 cycle Stroboscope
	(646 0477 000)	50 cycle Stroboscope
61	358 0409 000	#8-32 x 7/16" Spade Bolt (1-5/32" lg.)
65	450 0006 000	5/32" dia. Ball Bearing, Steel
68	358 0413 000	Retaining Ring, 7/16"
69	357 0004 000	W27 Nylon Washer, 1/32" thick
70	913 1648 001	Filter Assembly
72	358 0411 000	Retaining Ring, 1/4"
76	450 0004 000	Ball Joint (Male)
77	(510 0366 000)	Motor Capacitor, 2.0 uf (60 cycle)
	(510 0369 000)	Motor Capacitor, 3.75 uf (50 cycle)
86	424 0062 000	Handle Stop

## WARRANTY

This equipment is warranted by Gates Radio Company of Quincy, Illinois to be free from defects in workmanship and material and will be repaired or replaced in accordance with the terms and conditions set forth below:

1. Gates Radio Company believes that the purchaser has every right to expect first-class quality, materials and workmanship and has created rigid inspection and test procedures to that end, and excellent packing methods to assure arrival of equipment in good condition at destination.
2. Gates Radio Company will endeavor to make emergency shipments at the earliest possible time giving consideration to all conditions.
3. Gates Radio Company warrants new equipment of its manufacture for one (1) year and (six (6) months on moving parts), against breakage or failure of parts due to imperfection of workmanship or material, its obligation being limited to repair or replacement of defective parts upon return thereof f.o.b. Gates Radio Company's factory, within the applicable period of time stated. Electron tubes shall bear only the warranty of the manufacturer thereof in effect at the time of the shipment to the purchaser. Other manufacturers' equipment covered by a purchaser's order will carry only such manufacturers' standard warranty. These warranty periods commence from the date of invoice and continue in effect as to all notices, alleging a defect covered by this warranty, received by Gates Radio Company prior to the expiration of the applicable warranty period.

The following will illustrate features of the Gates Radio Company warranty:

Transmitter Parts: The main power or plate transformer, modulation transformer, modulation reactor, main tank variable condensers all bear the one (1) year warranty mentioned above.

Moving Parts: As stated above, these are warranted for a period of six (6) months.

Electron Tubes: As stated, electron tubes will bear such warranty, if any, as provided by the manufacturer at the time of their shipment. Gates Radio Company will make such adjustments with purchasers as given to Gates Radio Company by the tube manufacturer.

All other component parts (except as otherwise stated): Warranted for one (1) year.

Abuse: Damage resulting from abuse, an Act of God, or by fire, wind, rain, hail, in transportation, or by reason of any other cause or condition, except normal usage, is not covered by this warranty.

4. Operational warranty - Gates Radio Company warrants that any new transmitter of its manufacture, when properly installed by purchaser and connected with a suitable electrical load, will deliver the specified radio frequency power output at the output terminal(s) of the transmitter, but Gates Radio Company makes no warranty or representation as to the

coverage or range of such apparatus. If a transmitter does not so perform, or in the event that any equipment sold by Gates Radio Company does not conform to any written statement in a contract of sale relative to its operating characteristics or capabilities, the sale liability of Gates Radio Company shall be, at the option of Gates Radio Company, either to demonstrate the operation of the equipment in conformance with its warranty, or to replace it with equipment conforming to its warranty, or to accept its return, f.o.b. purchaser's point of installation and refund to purchaser all payments made on the equipment, without interest. Gates Radio Company shall have no responsibility to the purchaser under a warranty with respect to operation of equipment unless purchaser shall give Gates Radio Company a written notice, within one (1) month after arrival of equipment at purchaser's shipping point, that the equipment does not conform to such warranty.

5. Any item alleged by a purchaser to be defective, and not in conformance with a warranty of Gates Radio Company shall not be returned to Gates Radio Company until after written permission has been first obtained from the Gates Radio Company home office for such return. Where a replacement part must be supplied under a warranty before the defective part can be returned for inspection, as might be required to determine the cause of a defect, purchaser will be invoiced in full for such part, and if it is determined that an adjustment in favor of the purchaser is required, a credit for an adjustment will be given by Gates Radio Company upon its receipt and inspection of a part so returned.

6. All shipments by Gates Radio Company under a warranty will be f.o.b. Quincy, Illinois or f.o.b. the applicable Gates Radio Company shipping point.

7. Gates Radio Company is not responsible for the loss of, or damage to, equipment during transportation or for injuries to persons or damage to property arising out of the use or operation of Gates equipment. If damage or loss during transportation occurs, or if the equipment supplied by Gates Radio Company is otherwise damaged, Gates will endeavor to make shipment of replacement parts at the earliest possible time giving consideration to all conditions. It is the responsibility of a purchaser to file any claim for loss or damage in transit with the transportation company and Gates will cooperate in the preparation of such claims to the extent feasible when so requested.

8. Gates Radio Company, in fulfilling its obligations under its warranties, shall not be responsible for delays in deliveries due to depleted stock, floods, wars, strikes, power failures, transportation delays, or failure of suppliers to deliver, acts of God, or for any condition beyond the control of Gates that may cause a delayed delivery.

9. This warranty may not be transferred by the original purchaser and no party, except the original purchaser, whether by operation of law or otherwise, shall have or acquire any rights against Gates Radio Company by virtue of this warranty.

10. Gates Radio Company reserves the right to modify or rescind, without notice, any warranty herein except that such modification or rescission shall not affect a warranty in effect on equipment at the time of its shipment. In the event of a conflict between a warranty in a proposal and acceptance and a warranty herein, the warranty in the proposal and acceptance shall prevail.

11. This warranty shall be applicable to all standard Gates catalog items sold on or after March 1, 1960.

Gates Radio Company  
Quincy, Illinois

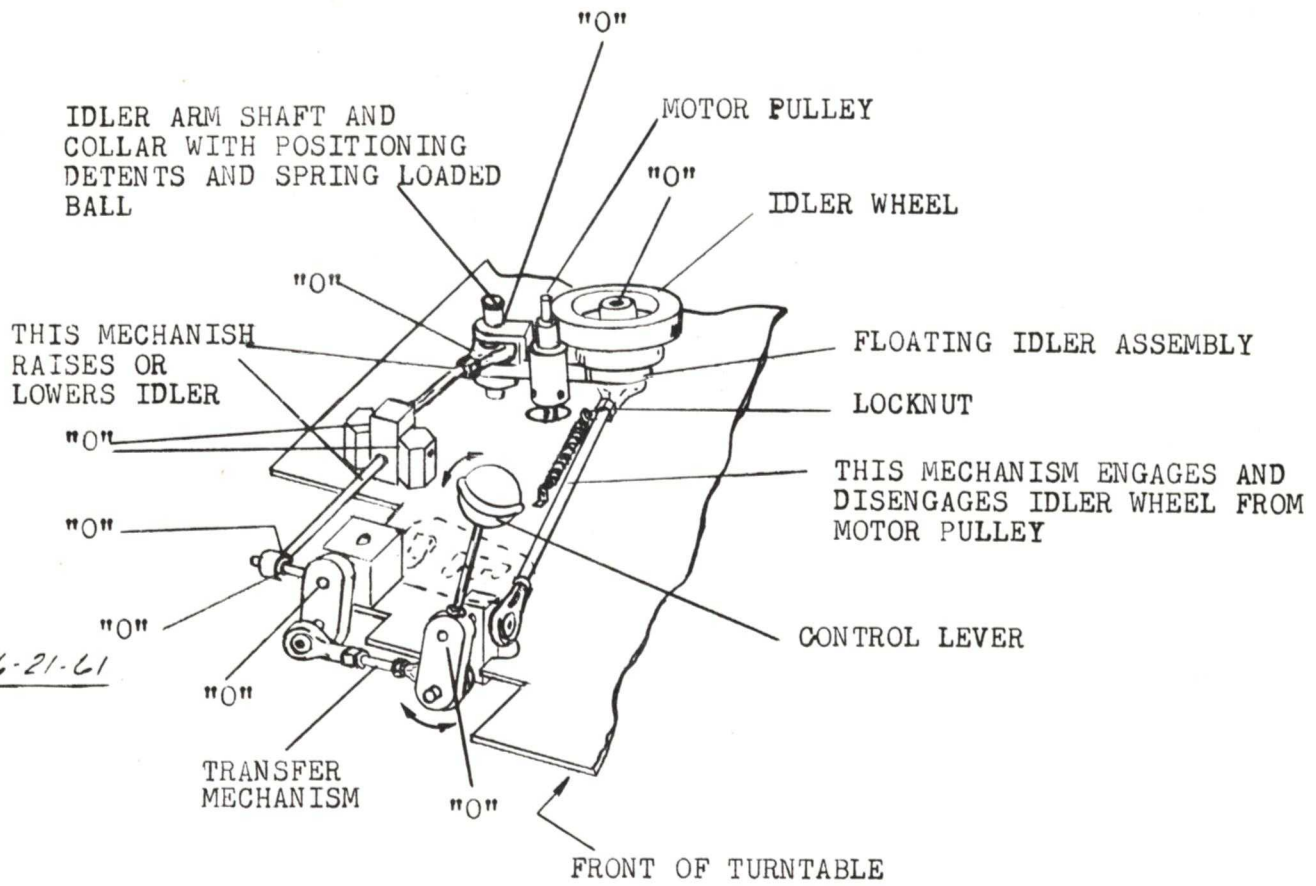


Fig. 1

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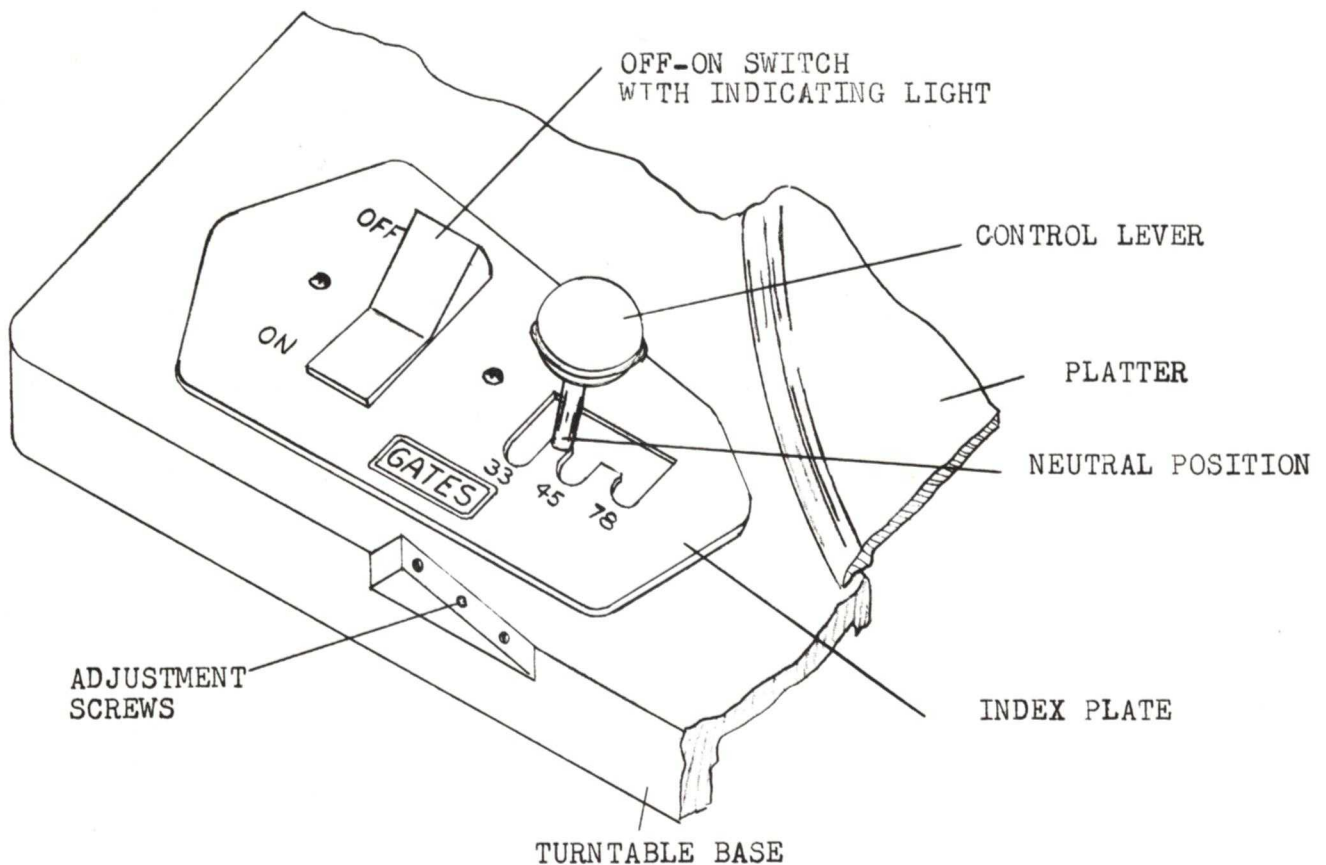


Fig. 2

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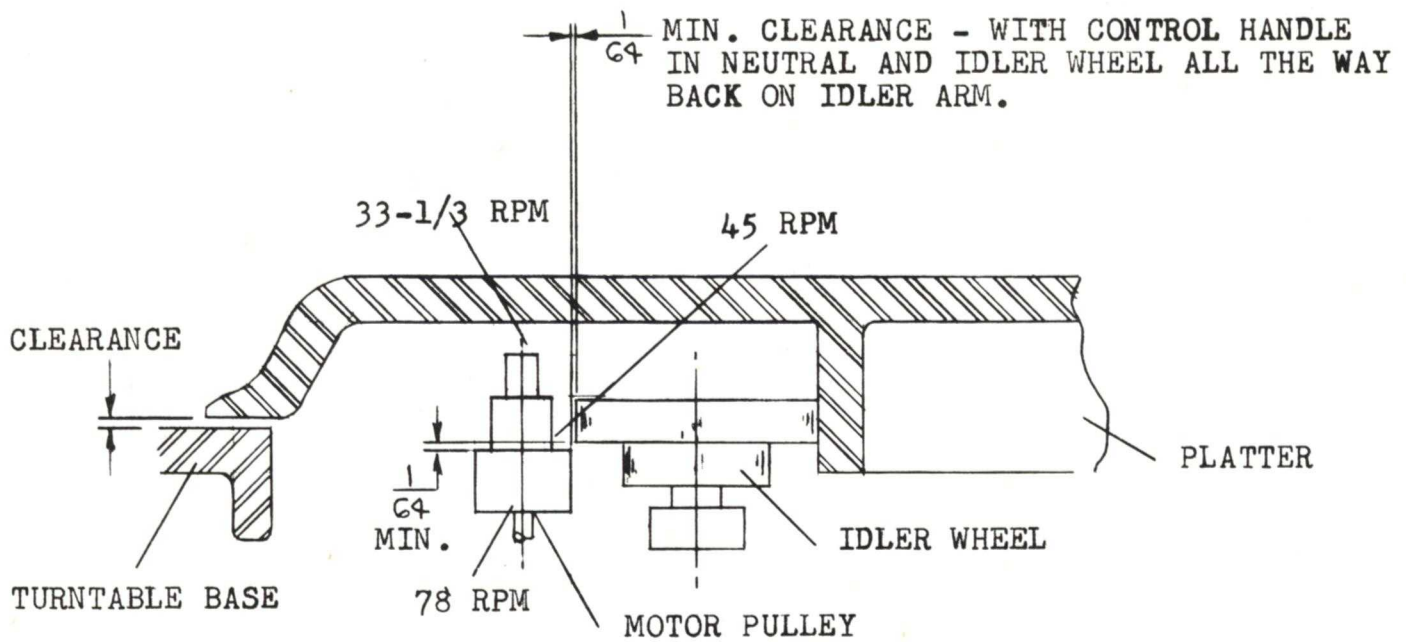
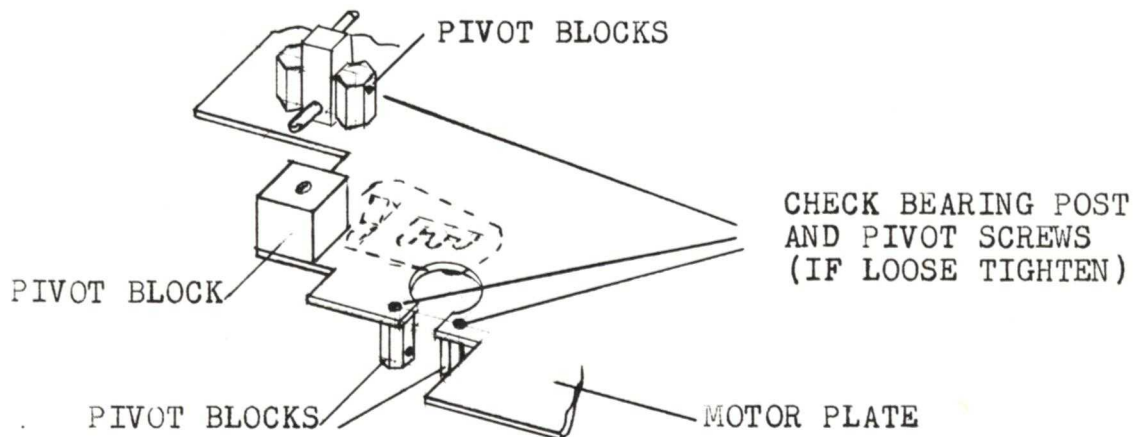


Fig. 3

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Fig. 4

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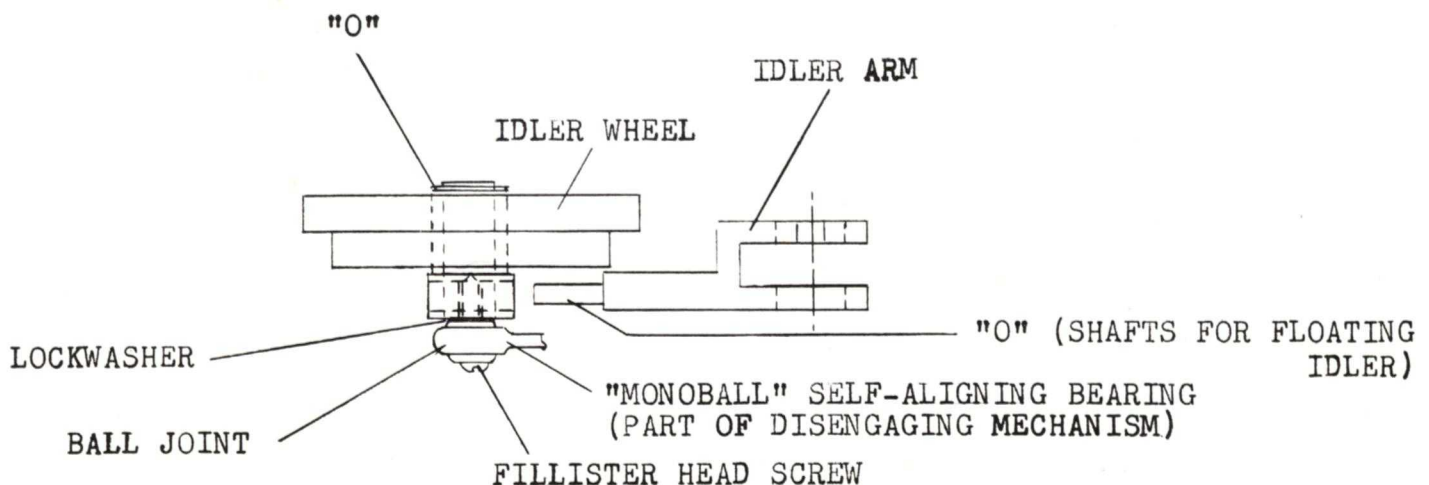


Fig. 5

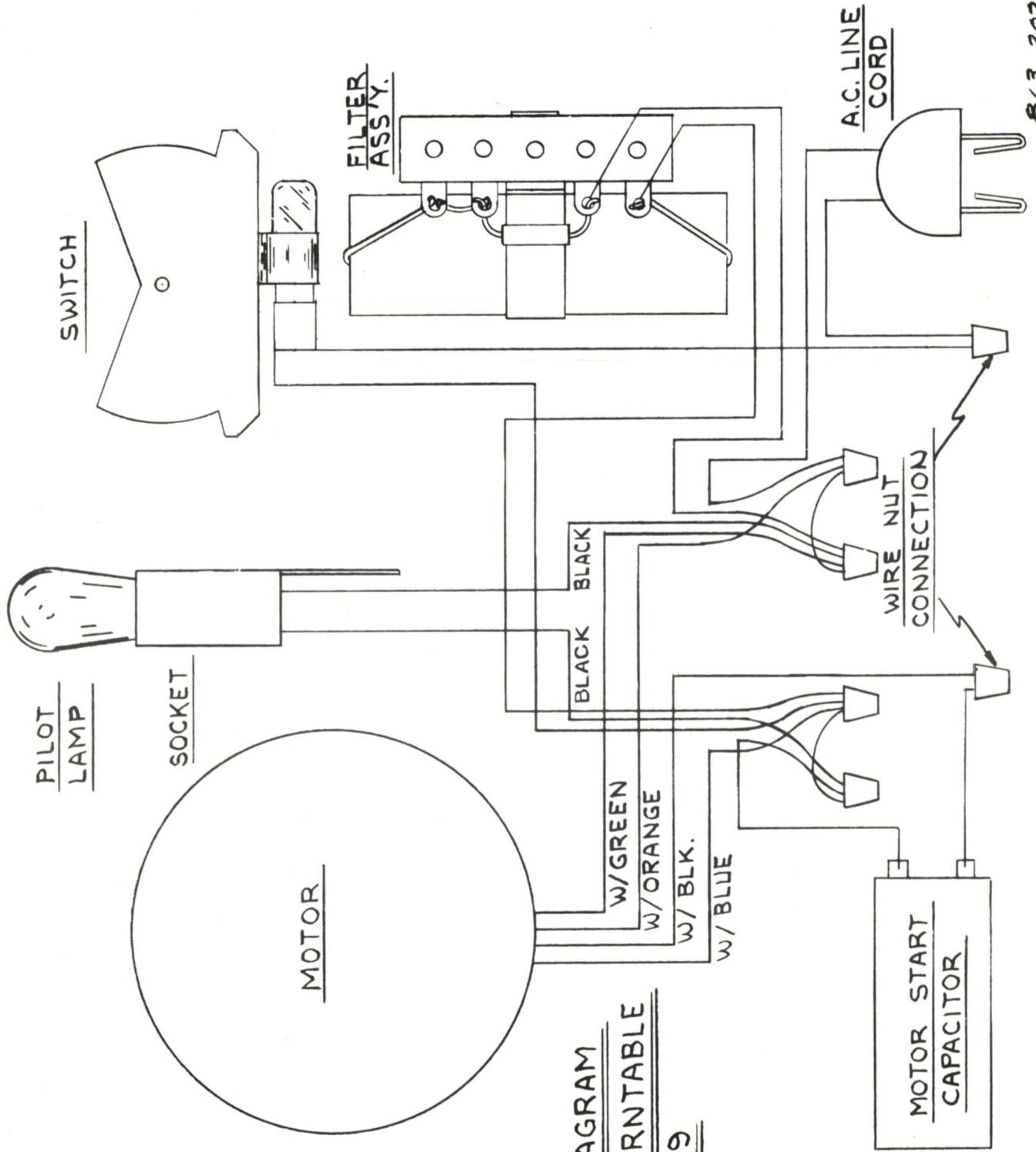
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WIRING DIAGRAM  
CB 500 TURNTABLE

M 5739





813 6346 001