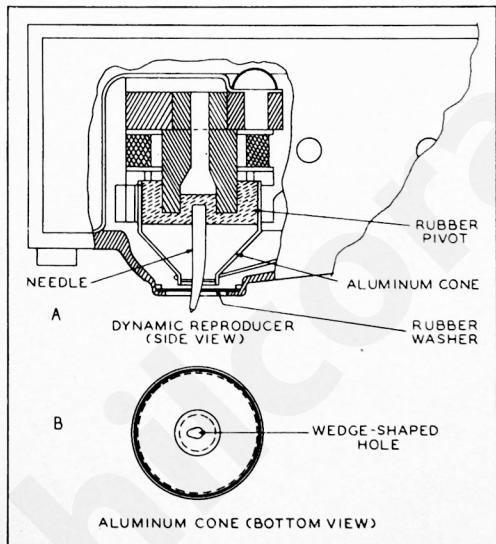




HOME RADIO

PHILCO DYNAMIC REPRODUCER NEEDLE AND GUARD REPLACEMENT

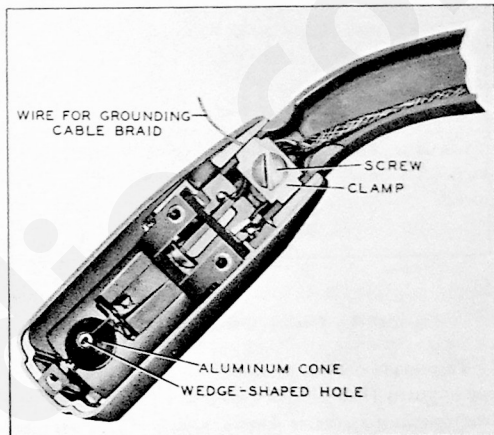
The dynamic reproducer consists essentially of a thin aluminum cone and voice-coil assembly, mounted on a rubber pivot between two magnetic pole pieces. See figures 1 and 2. The butt end of the needle is seated in a hole in the rubber pivot, the needle being supported near its point end by the apex of the aluminum cone, as shown in figure 1A. The hole (figure 1B) at the apex of the aluminum cone is made pear shaped so that, in its normal operating position, the tension of the rubber washer and the normal "drag" of the record forces the needle into the small portion of the hole.



TP-1995

Figure 1. Philco Dynamic Reproducer with Old-Type Needle

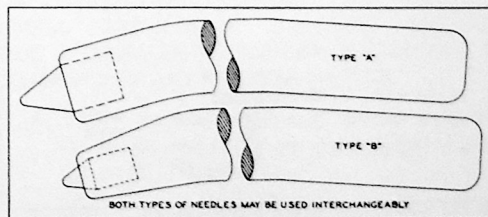
The needles shown in figure 3 were the original needles used with the dynamic pickup. The type which is now used is the new, improved, offset needle (see figure 4), which, because of its design, reduces needle talk and surface noise. This needle should be used for all replacement purposes.



TP-2031

Figure 2. Bottom View of Philco Dynamic Reproducer (Dust Cover Removed)

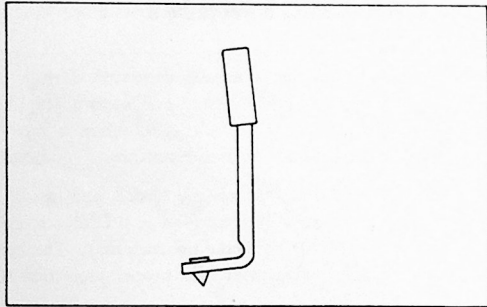
NOTE: Since the needle for the dynamic pickup is necessarily of a special design, being shorter and of smaller diameter than standard phonograph needles, no needle other than the correct replacement (Part No. 35-2661) may be used; if a needle of another type is substituted, the apex of the aluminum cone may be seriously damaged.



TP-1994

Figure 3. Two Early Types of Needles for Dynamic Reproducer (Enlarged View)

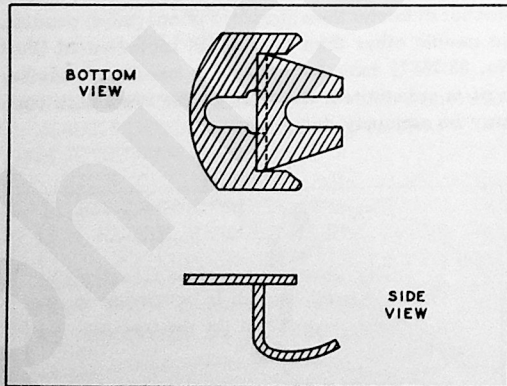
A needle designed for reduced surface noise and improved response characteristics must have a high degree of vertical compliance with respect to the record groove. In the offset type of needle, there is a possibility of the shank bending at the offset; therefore, the needle must be carefully protected. The needle and the associated assembly are capable of receiving all forces producing travel up to .020"; however, the needle will not retract much more than this amount without bending; moreover, because of the crystal-line structure of the needle, it becomes permanently weakened if any attempt is made to straighten it.



TP-2603

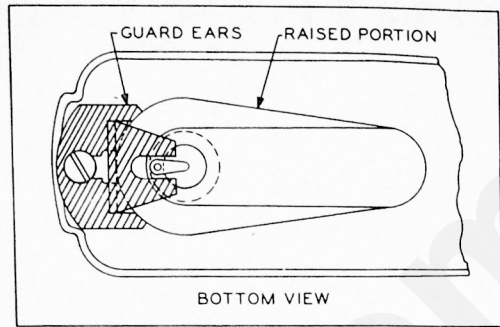
Figure 4. Philco Offset-Type Needle

To provide suitable protection for the needle, a forked type of guard (Part No. 56-4407) was developed. Two of these guards (shown in figures 5, 6, and 7) were used together as a single guard. A later development provided an improved type of guard, consisting of a knurled nut, a spring, and a threaded screw. This guard, which is mounted in the forward left-hand corner of the reproducer (see figure 8), gives improved needle protection and record reproduc-



TP-2604

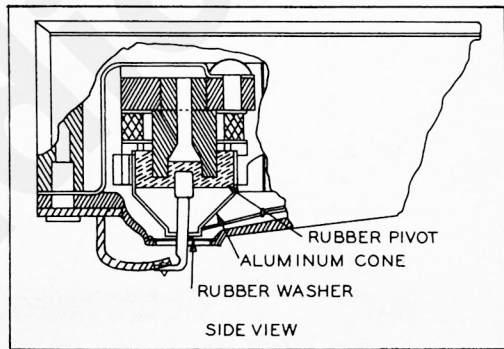
Figure 5. Forked Guard (2 Used)



TP-2602

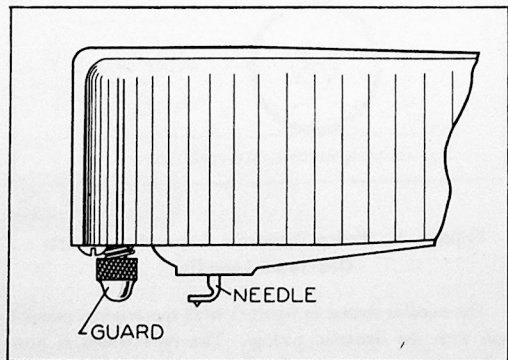
Figure 6. Correct Position of Forked Guard (2 Used)

tion. This guard should be used when replacing the original needle, or when servicing any record changer using the Philco Dynamic Reproducer. The guard is available as an assembly (Part No. 76-1623) which includes the base plate, knurled nut, spring, and screw.



TP-2601

Figure 7. Position of Needle with Respect to Guard



TP-5384

Figure 8. New-Type Guard

How to Determine When Needle Replacement is Required

The necessity for needle replacement is usually quite apparent, and may be manifested by one of the following indications:

1. Increasing distortion, accompanied by a loss of high-frequency response.
2. An increase in noise (scratch, hiss) level.
3. Imperfect needle tip. An examination of the needle (after removal) under a good magnifying glass may reveal the presence of "flats" on the tip radius of the needle.

How to Replace the Needle

The needle does not require frequent replacement; however, when replacement is necessary, care and patience are required. No difficulty should be experienced in inserting the needle; however, due to the small amount of clearance between the tone arm and the automatic record-changer base, the following replacement procedure is recommended:

1. Hold the tone arm firmly with the left hand, and, with the aid of a very short (or offset) screw driver, remove the screw and clamp (see figure 2) holding the reproducer case to the tone arm.
2. Provide a small amount of slack in the cable underneath the tone arm by sliding the cable toward the reproducer case.
3. While holding the tone arm with the left hand, lift the reproducer case upward, with the right hand, until the case is freed from the tone arm.
4. Turn the reproducer case so that the bottom side is facing upward.
5. Grasp the old needle with a pair of tweezers or long-nose pliers, and pull it straight out.
6. Examine the new needle with a magnifying glass, to make certain that the point is not chipped; also compare the shape of the needle to that shown in figure 4, to make sure that the needle shank or foot has not been bent in shipment.
7. Grasping the needle with the fingers, insert the blunt end into the small hole in the rubber washer. Gently move the needle around until the hole at the apex of the cone is located. Watch the needle as it is pushed through, to be sure that the shaft is parallel to the front of the reproducer, then gently push the needle straight into the hole in the rubber pivot.

CAUTION: IF ANY RESISTANCE IS FELT, DO NOT ATTEMPT TO FORCE THE NEEDLE; WHEN THE FLAT END IS PROPERLY POSITIONED, THE NEEDLE WILL SLIDE THROUGH THE APEX OF THE CONE EASILY.

8. After seating the needle in the rubber pivot bearing with the fingers (using very light pressure), grasp the needle by the shank with the tweezers or long-nose pliers, and further seat the needle in the bearing. Care should be exercised to avoid placing any pressure on the needle point, since this could cause the needle foot to bend.
9. Replace the case on the tone arm, being careful to avoid twisting of the leads.
10. When replacing the screw and clamp bracket, place the clamp bracket (plate) on the screw with the convex side toward the screw head, so that, when tightened down, the bracket exercises a firm clamping action.

NOTE: The plate is usually depressed slightly in the center, due to the pressure previously applied by the clamp screw. A firm clamping action is important, to eliminate tone arm resonance.

11. Place the needle point on the record, and, using a feeler gauge, adjust the knurled guard for a record clearance of .020" (twenty thousandths). The correct clearance is necessary for proper protection of the needle.

NOTE: Because of a small amount of play between the reproducer case and the tone arm, it is possible that, when the reproducer case was replaced on the tone arm, the case was displaced slightly, to one side or the other, from its original position. If this condition occurs, the needle will not set down in the proper place on the record. By loosening the clamp screw, the reproducer case can be readjusted for satisfactory needle set-down.

Instructions for Installing New Guard Assembly

1. After removing the reproducer case from the tone arm according to the instructions in steps 1, 2, 3, and 4, above, place the case bottom side up on a clean, flat surface.

CAUTION: DO NOT PLACE THE REPRODUCER HEAD WHERE IT MAY PICK UP IRON FILINGS OR DIRT. THIS HEAD CONTAINS A POWERFUL MAGNET WHICH WILL ATTRACT AND HOLD ANY SMALL PARTICLES OF MAGNETIC MATERIAL, AND A DELICATE MECHANISM WHICH WILL BE DAMAGED BY ANY FOREIGN MATTER.

2. Remove the screw which is located just in front of the needle, and discard the old-type forked guard (if used).
3. Remove the two larger screws which hold the dust cover in place.

4. Slightly raising the dust cover, elevate the near end of the cover (end furthest from needle) to an approximate 45° angle, and slide the cover gently over the needle, thereby removing the cover completely.

NOTE: If a new needle is to be installed, this should be done while the dust cover is off.

5. Install the new guard assembly (Part No. 76-1623). It may be necessary, after the needle point has entered the hole in the rubber washer, to pull the rubber toward the front end, to allow the needle a completely free entrance.
6. Align the holes before replacing the screws. Before tightening the screws, adjust the assembly so that a small opening exists in front of the needle and a slight wrinkle appears in the rubber immediately to the rear.
7. Complete the replacement by following the instructions in steps 9, 10, and 11 under HOW TO REPLACE THE NEEDLE.

Instructions for Adjusting Forked Guard

1. Position the guard so that the two ears are just touching the raised portion of the cover, to prevent the guard from turning. See figure 6.
2. Be sure the forked end of the guard is centered along the extended shank of the needle. When correctly installed, the needle jewel will be exactly centered in the guard. **MAKE ABSOLUTELY SURE THAT THE NEEDLE DOES NOT TOUCH ANY PORTION OF THE GUARD.**
3. After the guard is positioned correctly, the screw for holding it in place should be tightened, so that there is no possibility of the guard moving. Make certain that there is enough clearance between the record surface and the bottom of the guard. If necessary, the forked portion of the guard may be bent slightly upward, thus allowing the jewel to extend below the guard. When correctly positioned, the needle will extend below the guard as illustrated in figure 7.

NOTE: For service information on the record changers using the Philco Dynamic Reproducer, refer to the D-10A and M-4 Automatic Record Changer Manuals, PR-1156 and PR-1157.