UNITED MOTORS SERVICE

DIVISION OF GENERAL MOTORS CORPORATION

General Offices - Detroit

AUTO RADIO BULLETIN

Bulletin	6D-619
Delco	TUNER
Date	1-1-52
Page	1

Supersedes ~~XXXX~~ Pages dated 4-1-49 1 & 2

SUBJECT: SERVICE INSTRUCTIONS FOR THE PUSH-PULL LOCKUP TUNERS

GENERAL:

Push-Pull Lockup Tuners are used on the following radios:

BUICK

CADILLAC

CHEVROLET

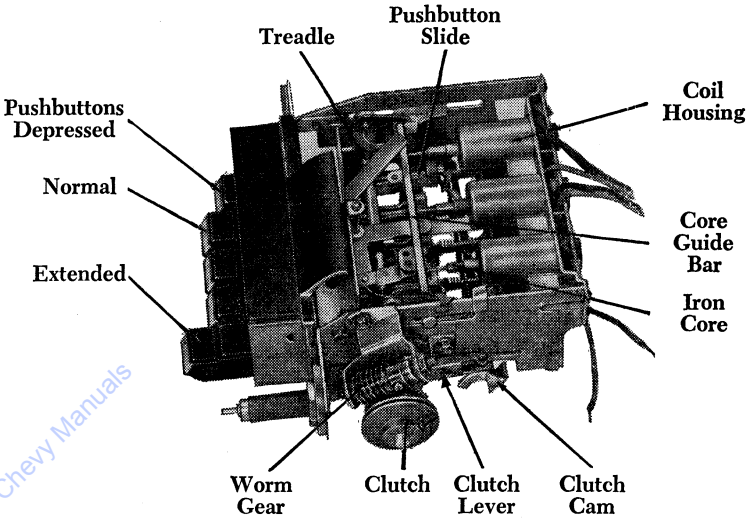
GMC TRUCK

KAISER-FRAZER

OLDSMOBILE

PACKARD

PONTIAC



The service bulletin for any radio using this type of tuner, will refer to this bulletin for tuner service.

The push-pull lockup tuner is a mechanism used to tune the radio through the broadcast band. This tuner uses permeability tuning. The tuning is done either with the manual tuning control or any of five push buttons.

TUNER OPERATION

MANUAL TUNING MECHANISM

In a permeability tuned radio the tuning is done by moving powered iron cores in and out on the tuning coils. Therefore, the manual drive mechanism connects the rotary motion of the manual tuning knob to the straight line motion of the iron cores. This is done as follows: (See Illustration #1)

1. The manual knob (1) and shaft (2) turn the worm gear (3) in its bracket.

2. The worm gear (3) then turns at a slower speed the flat anti-backlash gear (4) which is fastened through the clutch (5) to the treadle shaft (6).

3. As the treadle (7) rotates it moves the

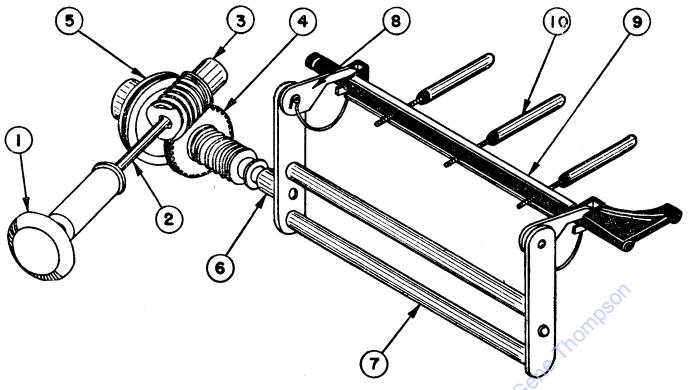


Illustration #1

core guide bar (9) which is connected to it by the links (8), in or out along the slots in the tuner side plates (not shown).

4. The iron cores (10) are fastened to the core guide bar (9) and move in or out of the coil forms (not shown).

The worm gear drive acts as a positive brake to hold the tuning cores in position even though the radio is jarred. A worm gear drive can only be turned from the worm gear (manual tuning knob) end of the drive. This brake eliminates any mechanical drift of the tuner.

PUSH BUTTON OPERATION

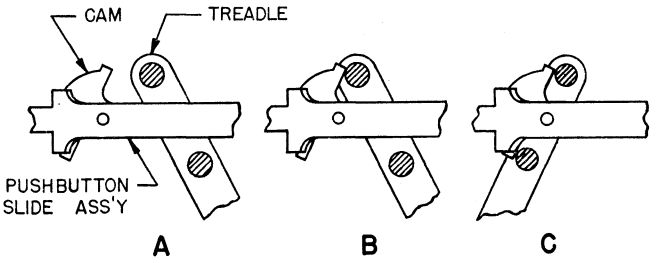


Illustration #2

The push button is operated by pushing the button all the way in and releasing. The sequence of operation is as follows: (See Illustration #2).

1. The push button is in its normal position and the relationship between the push button slide assembly and the treadle is shown in Illustration 2, Figure A.
2. As the push button is pushed in to the position shown in Illustration 2, Figure B, the clutch is disengaged (see clutch operation) allowing the treadle to move easily.
3. When the push button is pushed all the way in, the treadle takes a position in accordance with the setting of the cam on the push button slide assembly, (See Illustration 2, Figure **C**) thereby changing the frequency to which the radio is tuned.
4. The push button is released allowing the button slide assembly to return to its normal position shown in Illustration 2, Figure **A**. During this operation the clutch is re-engaged.

PUSH BUTTON SET-UP PROCEDURE

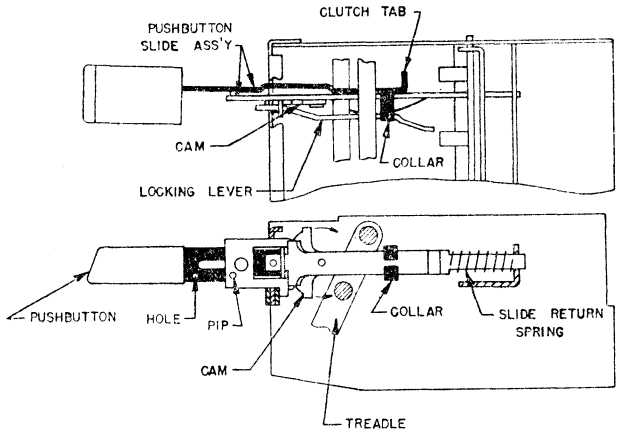
1. Tune the desired station in manually.
2. Select the button to be set up and push it to the side or down (see bulletin for radio involved) and pull all the way out (about ½ inch).
3. Push the button all the way in.

How It Works:

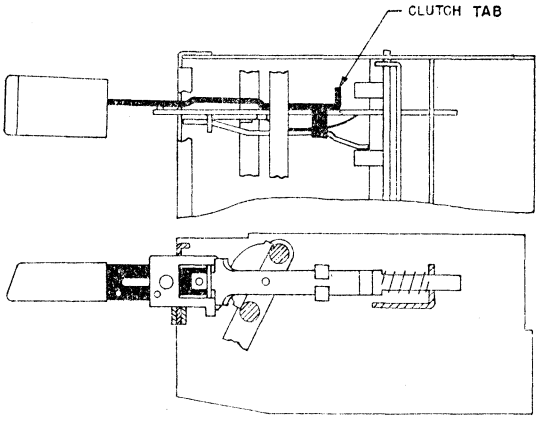
To set up the push buttons to tune in a station it is necessary to position the cam on the push button slide assembly so that when the push button is depressed it will move the treadle to the correct position to tune the radio to the desired frequency. This is done as follows:

1. The desired station is tuned in manually. This positions the treadle correctly for the desired frequency and holds it securely in position.
2. The push button is moved to the side. This moves the black portion of the push button slide away from the white portion (See Illustration 3, Step 1) disengaging the pip from the hole.
3. The push button is pulled all the way out to the extended position as shown in Step 1. In this position the locking lever exerts no pressure on the cam, allowing the cam to move freely.
4. As the push button slide assembly is pushed in, it remains extended until the cam is positioned against the treadle as shown in Illustration 3, Step 2. This places the cam in a position so that when the cam is locked, the push button will return the treadle to the same position whenever it is operated.
5. As the push button is pushed further in, the white portion remains stationary while the black portion moves forward past the white portion as shown in Step 3. During this part of the operation the collar slides along the inclined plane of the locking lever causing the locking lever to exert pressure on the cam to hold it securely in position thus setting up the push button. Immediately after the cam has been locked the clutch tab operates the clutch mechanism. (See "Clutch Operation"). This clutch action has nothing to do with the push button set-up operation.
6. The push button is released and assumes its normal position as shown in Illustration 3, Step 4.

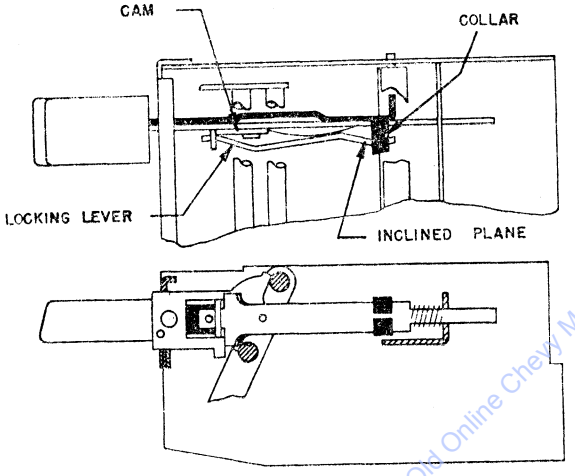
The push button is now set up and any time the push button is operated it will tune the radio to the frequency for which it has been set.



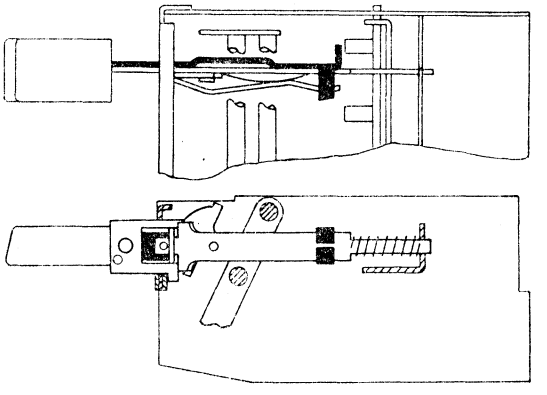
STEP 1- BUTTON EXTENDED- CAM FREE



STEP 2- BUTTON EXTENDED- CAM ALIGNED



STEP 3- BUTTON LOCKED- CAM LOCKED IN POSITION



STEP 4- CAM LOCKED- BUTTON IN NORMAL POSITION

Illustration #3

CLUTCH OPERATION

The clutch in this tuner is used to release the braking action of the manual tuning mechanism by completely disengaging the manual drive mechanism from the treadle while the push button is operated. The clutch operates as follows:

1. As the push button is depressed the clutch operating tab "B" (See Illustration 4) pushes the finger "C" on the clutch cam assembly "D."

2. This rotates the clutch cam "D", causing the roller on the clutch lever "E" to move toward the tuner.

3. This lever "E" is fastened to the inside face of the clutch "A" and moves the inside face away from the outer face of the clutch "A."

4. The inside face of the clutch "A" is fastened to the flat anti-backlash gears and therefore to the manual drive. The outer face of the clutch is fastened to the shaft of the treadle and when the faces of the clutch "A" are separated the treadle is free to move easily.

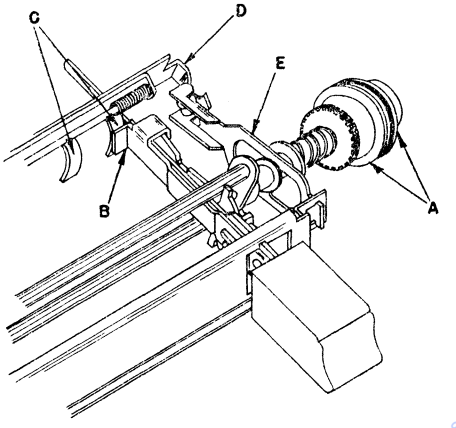


Illustration #4

TUNER ADJUSTMENTS

No tuner adjustments should be necessary unless some parts have been changed in the tuner. The factory makes all adjustments with precision equipment. Always be sure an adjustment is necessary before it is made.

POINTER CALIBRATION ADJUSTMENT

The procedure for calibrating the pointer is as follows:

1. Connect the signal lead of a signal generator to the antenna connector of the radio and the return lead to chassis.
2. Tune the signal generator to the frequency specified under "Alignment Procedure" in the service bulletin for the radio involved. (This is important because the adjustment screw is not accessible at all frequencies)
3. The pointer should then be adjusted by turning the pointer adjustment screw (See Illustration 5) until the pointer indicates the correct frequency on the dial. Any special instructions for this adjustment will be included in the service bulletin for the particular radio.

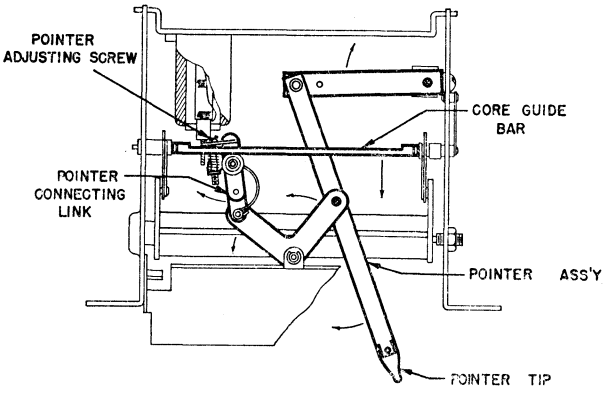


Illustration #5

ANTI-BACKLASH GEAR ADJUSTMENT

An anti-backlash gear is a special gear used to take out any looseness or "play" in the mesh of two gears. The anti-backlash gear of this tuner consists of two flat gears, side by side. One of these gears is fastened to the shaft on which it is mounted while the other is free to rotate around the shaft. These gears are spring loaded against each other so their teeth will completely fill the space between the teeth of the mating gear (worm gear) even though this space may vary. The anti-backlash gear is adjusted as follows:

1. Loosen or remove the worm gear and bracket assembly.
2. Turn the part of the gear that is free to rotate against the spring tension between the halves of the gear a distance of five teeth.
3. Replace the worm gear and bracket assembly, being careful not to lose the spring tension between the anti-backlash gears.

CLUTCH ADJUSTMENT

The only clutch adjustment on this tuner controls the amount of pressure between the faces of the clutch and the timing of the clutch operation. It must be made anytime the clutch disc driven is removed and is made as follows:

1. Place a 20 to 30 thousandth shim between the clutch lever roller and the clutch cam assembly (See Illustration 6).
2. Push the outer clutch disc on the treadle shaft up snug to the other face of the clutch. Do not use force.

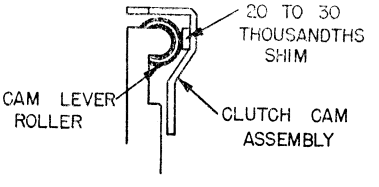


Illustration #6

3. Tighten the set screws on the clutch disc and remove the shim.

TUNER PARTS REPLACEMENTS

The replacement of most of the tuner parts is straight forward, in accordance with the blown up view shown in the Illustration 11. The tuners used on the various models listed in this bulletin will vary in detail from this illustration, but their operation is identical and the replacing of parts is very similar. Whenever parts are replaced on a tuner, careful consideration should be given to the removal of the tuner from the radio. Many times this removal is made when it is not necessary.

The procedure for making some special replacements is described below to aid in a speedy and efficient replacement.

REPLACING TUNING COILS — ALL RADIOS USING SHEET METAL COIL HOUSINGS

Before attempting the replacement of the tuning coils examine the radio involved carefully to determine the necessity of removing the complete tuner from the radio. Whenever possible leave the tuner in the radio.

1. Dissolve the cement from the iron tuning core stud at the core guide bar with acetone and remove the iron core from the core bar and coil.
2. Remove the fiber board support at the front of the shield cans.
3. Remove the nuts which hold the sheet metal can in place (on the rear of the tuner) and remove the can from the coil.
4. Remove the defective coil from the rubber grommet to which it is mounted and replace with a new coil.
5. Reassemble the parts that have been removed and realign the radio in accordance with the alignment instructions in the Radio Service Bulletin.

REPLACING TUNING COILS — ALL RADIOS USING DIE CAST COIL HOUSINGS

It is necessary to remove only the rear cover of the radio to make this replacement on all tuners using the die cast coil housing with the exception of the Chevrolet model 986240. On this model it is necessary to remove the rear cover and wraparound from the R.F. unit and to loosen the R.F. chassis enough to have free access to the coil mounting strip. The procedure for making this replacement on these tuners is as follows:

1. Remove the four screws holding the coil mounting strip to the die cast coil housing.
2. Remove the coil assembly from the housing.
3. Remove the defective coil from the rubber grommet to which it is mounted and replace with a new coil.
4. Reassemble all the parts and realign the radio in accordance with the alignment instructions in the Radio Service Bulletin.

CLUTCH REASSEMBLY

When the clutch is reassembled the clutch operating lever must be in the position shown in the Illustration 7. The procedure for positioning this lever is as follows:

1. Depress the clutch spring until the assembly bottoms.
2. Assemble the clutch lever on the side of the clutch operating collar toward the gears and slide the lever into its fulcrum as shown.
3. Release the clutch face and adjust the clutch in accordance with "Clutch Adjustment."

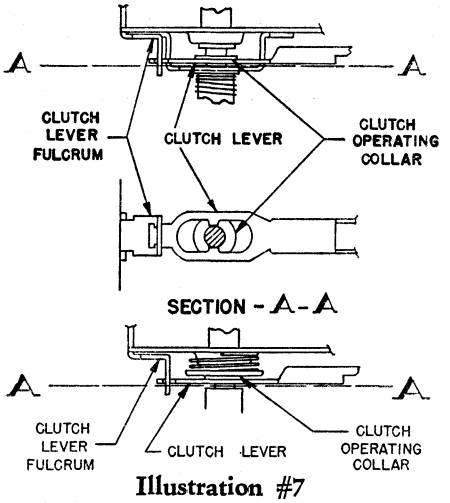


Illustration #7

Note: Both of the above types of clutch assemblies have been used. The only difference is in the position of the spring.

BEARING REPLACEMENTS

This tuner uses ball bearings on the treadle and worm gear. A small amount of grease will hold these bearings in place during assembly and will also provide lubrication for the bearings.

REPLACING THE POINTER ASSEMBLY

Use the following procedure to replace the complete pointer assembly. On radios having plastic pointers it is not necessary to replace the complete pointer assembly to replace the pointer tip. In such cases the pointer tip will be listed separately in the service parts list.

1. Remove the tuner from the radio.
2. Unfasten the pointer connecting link from the pointer assembly by removing the pointer connecting link spring. (See Illustration #5)
3. Remove the screw which fastens the pointer assembly to the tuner side plate.
4. Remove the "C" washer holding the pointer to the dial light shield.
5. Remove the pointer from the tuner.
6. Mount the new pointer assembly by making the same connections that were removed.

REPLACING PUSH BUTTON AND SLIDE ASSEMBLIES

In this bulletin the replacement of push button and slide assemblies in the 1949 or later model radios (assemblies using the cam that has an ear on each end) is described. For the replacement of this assembly in earlier models see the December 1947, Volume 4, No. 5 issue of "Testing Tips." The procedures are similar in both cases.

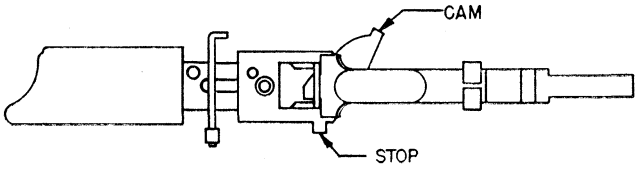


Illustration #8

1. Remove the tuner from the radio and tear it down as shown in the Illustration 11 until you have the front bearing plate and the five push button and slide assemblies.
2. Place the push button and slide assembly that is to be removed in the extended position as shown in Illustration 8 (move the button to the side or down and pull all the way out).
3. Position the slide with respect to the holes in the front bearing plate as shown in Illustration 9.

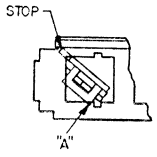


Illustration #9

4. Pull the slide in the direction of the button until the stop hits the front bearing plate. Work this stop through the bearing plate.
5. Turning the slide slightly, guide point "A" through the notch in the hole of the front bearing plate. (See Illustration 9)
6. Pull the slide on through the front bearing plate until the cam hits the front bearing plate. One end of the cam should readily pass through the bearing plate when this is done.
7. Maneuver the cam with your fingers until it is roughly perpendicular to the center line of the slide assembly and work the cam through the hole.
8. Pull the slide the rest of the way out of the front bearing plate. NO EXCESSIVE FORCE IS NECESSARY IN ANY OF THIS PROCEDURE.

The new push button and slide assembly can be put in the front bearing plate by using the exact reverse of this procedure.

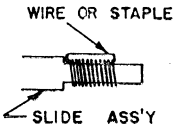
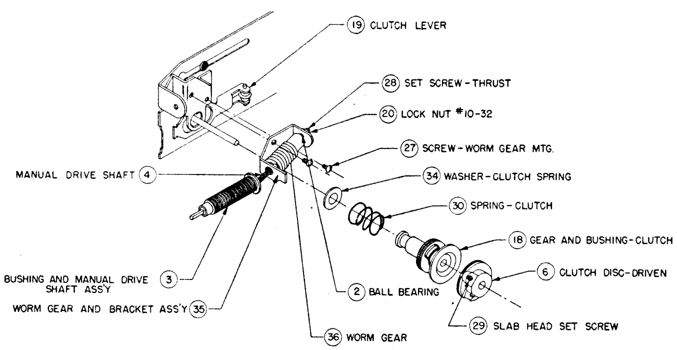


Illustration #10

When the bearing plate and the five push button and slide assemblies are put back in the tuner the slide return springs may make the reassembly difficult. However, this can be avoided by holding these springs in a compressed position on the ends of the slides with a paper staple or piece of wire during the assembly operation as shown in the Illustration 10. Be sure to remove the staple or wire before returning the tuner to the radio.

Alternate Clutch Assembly



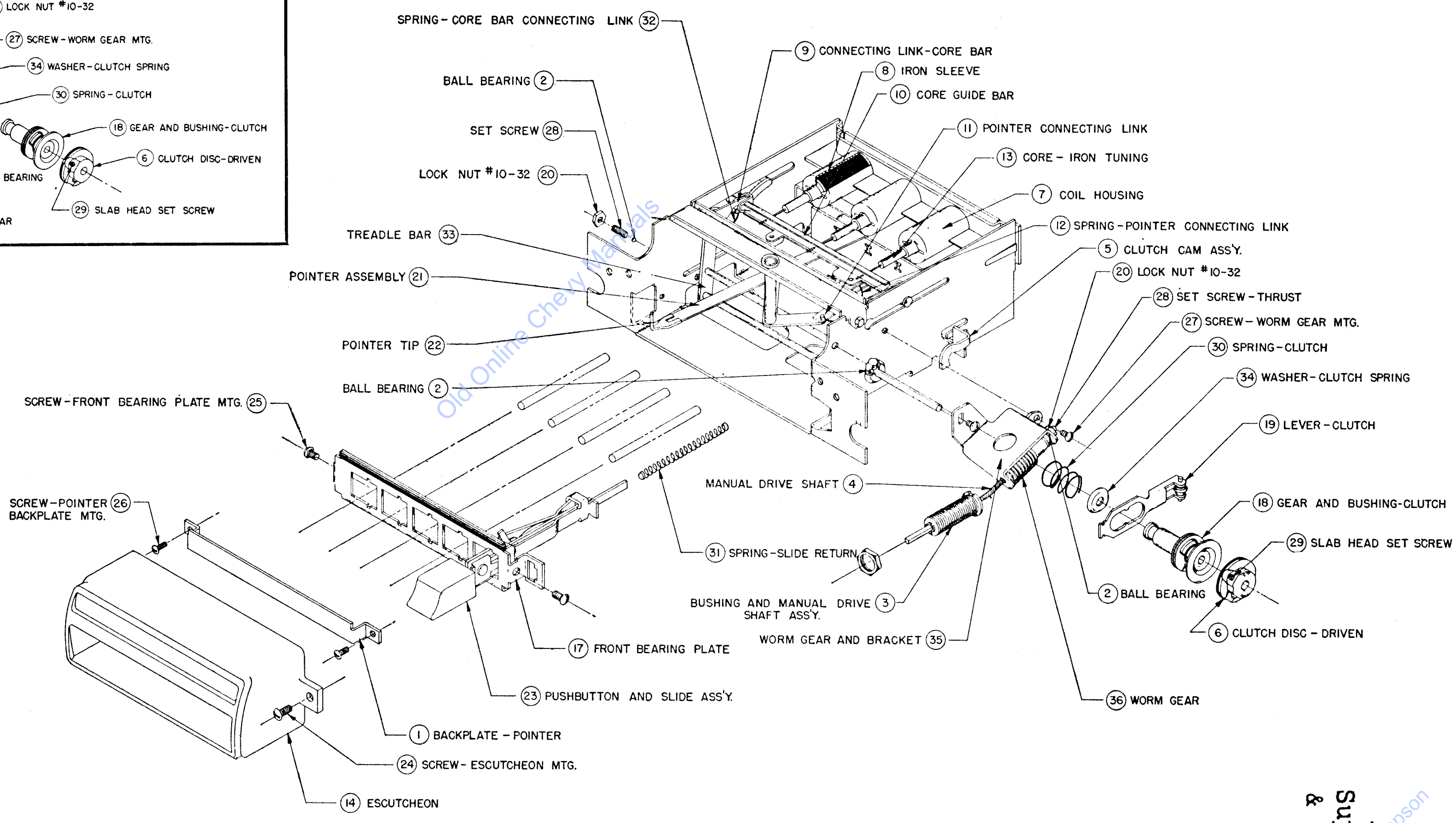


Illustration #11

Bulletin 6D-619
Delco TUNER
Date 1-1-52
Page 7
Supersedes pages 7 & 8 dated 4-1-49

SERVICE PARTS LIST

The service part numbers shown below are identical for all Push-Pull Lock-up Tuners 1948 through 1952. The parts designated (See Radio Bulletin) are different for the various radios and part numbers may be found in the individual bulletins. (Tuner parts shown on page 7, Illustration 11)

Illus.No.	Part No.	Description
1	(See Radio Bulletin)	Backplate - Pointer
2	147481	Ball Bearings
3	(See Radio Bulletin)	Bushing and Manual Drive Shaft
4	(See Radio Bulletin)	Manual Drive Shaft
5	*(Description and Model)	Clutch Cam Assembly
6	7258072	Clutch Disc - Driven
7	*(Description and Model)	Coil Housing Assembly
8	*7257965	Iron Sleeve
9	7258203	Connecting Link Core Bar
10	(See Radio Bulletin)	Core Guide Bar
11	7256271	Pointer Connecting Link
12	7255992	Spring - Pointer Connecting Link
13	(See Radio Bulletin)	Core - Iron Tuning
14	(See Radio Bulletin)	Escutcheon Assembly
	(See Radio Bulletin)	Dial Backplate
	(See Radio Bulletin)	Dial Package
17	*(Description and Model)	Front Bearing Plate
18	(See Radio Bulletin)	Gear and Bushing - Clutch
19	*7256181	Lever - Clutch
20	*120614	Lock Nut
21	(See Radio Bulletin)	Pointer Assembly
22	(See Radio Bulletin)	Pointer Tip
23	(See Radio Bulletin)	Push Button and Slide Assembly
24	*(Description and Model)	Screw - Escutcheon Mtg.
25	*(Description and Model)	Screw - Front Bearing Plate Mtg.
26	*(Description and Model)	Screw - Pointer Backplate Mtg.
27	*(Description and Model)	Screw - Worm Gear Mtg.
28	*7258600	Set Screw - Thrust
29	*7240313	Slab Head Set Screw
30	(See Radio Bulletin)	Spring - Clutch
31	7255984	Spring - Slide Return
32	7257415	Spring - Core Bar Connecting Link
33	*(Description and Model)	Treadle Bar
34	*(Description and Model)	Washer - Clutch Spring
35	(See Radio Bulletin)	Worm Gear and Bracket
36	*(Description and Model)	Worm Gear

* These parts are not required normally for service but may be ordered by specifying part number or illustration number, model number and description of part as shown in this parts list.