



HIGHWAY 411 EAST  
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### PREPARATION FOR REBUILDING PTO

It is highly recommended that you read these instructions thoroughly before beginning.

#### MATERIALS REQUIRED

- 1 - pto rebuild kit
- 1 - No. 2 phillips screwdriver
- 1 - 1/4 inch open end wrench
- 1 - long nose pliers
- 1 - quantity of isopropyl alcohol
- 2 or 3 cotton swabs
- 1 tube super glue
- Several clean rags or paper towels

This procedure is written for right hand core drive rods used in most Ten-Tec pto's. However, Models 580, 579, and 2510 use left hand core drive rods and therefore when performing steps marked with an asterisk (\*) you should REVERSE the direction in the instructions.

\* Turn pto tuning shaft CW before starting. For Analog Rigs -- remove the dial cord and pin from pto shaft.

Remove pto BOX from rig.

These instructions refer to the drawing on the last page and correspond to the parts labeled A through R. Note that some parts are not removed due to their critical nature. These include the pto oscillator board and the pto coil.

#### Parts supplied with rebuild kit

#### Labeled

4 - black washers	#51035	C
2 - washers	#51006	D & F
1 - spring	#50009	E
1 - ramp washer	#90315	G
3 - bearings	#38015	I
1 - tuning shaft	#90201	J
1 - retainer	#90299	Q
1 - bearing race	#78010	R
1 - quantity of grease		
2 - <i>PINS</i>	<i>*38025</i>	<i>H</i>
1 - <i>Retainer</i>	<i>#90283</i>	<i>B</i>

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### REBUILDING OF PTO

1. Remove 2 screws (A) and washers (C) from rear of pto.
2. Remove rear cap (B).
3. Remove washer (D), spring (E), another washer (F) and ramp washer (G). Note the first washer (D) may be inside rear cap (B) and should be carefully removed without damaging the rear cap which will be re-used.
4. Push tuning shaft (J) back far enough to remove stop pin (H) using long nose pliers. Note the position of this pin as it must be put back in the same hole.
5. Remove the 3 bearings (I). Sometimes shaft (J) can be pushed in and out to loosen bearings.
6. Remove tuning shaft (J).
- \* 7. Turn core drive rod (K) CCW until you can remove it from the pto box.
8. Use the 1/4 inch open end wrench and loosen nut (M) 3 or 4 turns. Use long nose pliers on the rear of shaft (N) and turn shaft CCW to unscrew shaft from the front end of the pto box. Remove nut (M) from shaft (N). Pull shaft (N) out the rear of the box. Retain wedge (O) and spring (P).
9. Using long nose pliers, remove bearing race (R) and retainer (Q). These parts are sometimes glued in and all old glue must be removed before re-assembly of pto.
10. Remove pistol (L). Leave all other parts intact.
11. At this point you have disassembled the pto. Parts B, L, K, M, N, O, and P must be cleaned thoroughly and re-used. The pistol (L) must be cleaned inside by using cotton swabs soaked in alcohol. Note that the pistol has threads inside. These threads must be cleaned of all old grease. The core drive rod (K) must be cleaned inside the front opening and all grease from the threads.
12. You are now ready for re-assembly. All parts must be kept free of dirt after this step.

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13. Apply grease inside the pistol (L) threads. Insert pistol back into the pto coil which was left in the box.
14. Assemble new bearing race (R) and new retainer (Q) into the front opening. Retainer and race both must be seated firmly into each other and into the box. Apply a small quantity of super glue on each side of the retainer. Use glue sparingly.
15. Grease rod (N) and spring (P) and assemble with wedge (O) and nut (M) back into box. The wedge has one side indented. This goes toward the spring. Screw rod (N) CW into the front of the box so that it is even with the outside edge of the box. Tighten nut (M). Again check to see that rod (N) does not protrude beyond the front of the box.
- \* 16. Apply grease liberally into the front end of core drive rod (K) and into the threads. Carefully screw drive rod CW into the pistol (L) until it stops.
17. Apply grease to tuning shaft (J) and insert into core drive rod (K).
18. Push tuning shaft and core drive rod to the rear and insert new pin (H) into the hole in the core drive rod. The pin must go into the hole on top of the thread. The inserted end should be flush with the groove on the opposite side.
19. While holding tuning shaft and core drive rod to the rear, insert the 3 new bearings (I) into the 3 holes in the core drive rod. Make sure the bearings seat firmly into the bearing race. Apply more grease as needed.
- \* 20. Apply grease to new ramp washer (G) and turn CW onto the rear of the core drive rod (K) until it stops. The ramp washer is flat on one side and has a lip on the other side. The lip goes towards the threads.
21. Select washer (F). One side is smooth. Apply grease to the washer and slide the smooth side against the ramp washer.
22. Apply grease liberally to spring (E). Slide on the core drive rod.
23. Apply grease to the second washer (D) and slide onto the core drive rod with the smooth side away from the spring. Note the last washer just barely goes on the shaft.

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24. Apply a small amount of grease inside the rear cap (B). The next step can be difficult as you must insert the rear cap into the rear opening and the core drive rod must protrude through the hole in the rear cap, while compressing the spring inside. When you get this accomplished, hold the rear cap tightly while doing the next step.
25. Place 2 washers on each side under the end cap. Insert the 2 screws (A) and tighten securely.
26. Temporarily install the knob on the tuning shaft and hold the pto to a level surface while tuning the pto shaft through it's range several times. Check for rough spots, etc. Sometimes another washer (C) must be installed for smooth operation. Installing the 3rd washer is not usually desirable on analog rigs due to the increased tension caused by the dial cord.
27. Remove knob and clean all grease from the exterior of the box.
28. Reinstall pto in rig.
29. On analog rigs -- turn tuning shaft fully CCW. Install pin in shaft and reinstall dial cord.
30. Check for proper operation of pto through it's range.

NOTE: Apply grease to

- CDR threads (90202)
- CDR ballbearing holes
- Tuning shaft (90201)
- Backlash rod (90205)
- 51006 washers
- Between wedge and pistol (80236P/90254)

Install 51006 washers with burr side against spring and in bottom of 90283 retainer.

