

Instructions for Installing Warford Frame Extension With Six Speed Transmission

Read Carefully and Completely Before Beginning Work

When using Warford Frame Extension and thus extending the wheel base of the Ford Truck to 139 $\frac{3}{4}$ inches the following modifications to the instructions for installing "WITHOUT EXTENDING WHEEL BASE" should be followed. Read carefully.

1. Place jack under each side of frame and raise just enough to relieve the load on the rear spring. Then, block up under running boards and remove jacks.

2. Remove muffler and exhaust pipe and then measure forward from the front side of the rear cross member 37 inches on each frame rail. Mark frame rails and saw in two with a hack saw at the mark. Then, remove bolts from the pressed steel flange that holds the propeller shaft housing ball against the rear flange of the Ford Transmission. Disconnect the brake rods at their front ends, and roll the rear axle assembly with the rear portion of the frame back out of the way.

3. For next steps see paragraphs 6, 7, 8 and 9 on reverse page.

4. On the rear axle unit, take out the universal joint housing pin plugs, drive pin out and remove universal joint. Next, drill a $\frac{3}{4}$ inch hole on the left side of the housing ball on approximately the same line as the old hole in the top. See Fig. 1 on reverse page. Use a $\frac{1}{4}$ inch drill to start this hole and then enlarge to $\frac{3}{4}$ inch. **BE SURE TO REMOVE ALL DRILL CUTTINGS AND CHIPS.**

Next, replace universal joint pin permanently, and replace housing pin plugs. Then pack universal joint full of grease.

5. Next, assemble rear axle unit under chassis, using cork gasket, (Ford part No. 2580) on the ball cap. Turn the ball cap one quarter way round so that the large grease cup stands to the LEFT. Use the two special Warford cap screws in top holes, draw up hard and pass the wire through the holes in their heads. Use the special Warford bolts, lock washers and nuts in the bottom holes, and tighten securely.

6. Cut off the two body brackets, then place the frame extension channels on the frame, drive up from the rear until tight on the frame taper. Drill the holes in the rear portion and bolt channels onto frame, using the bolts, lock washers and nuts furnished with the channels. As the Ford frame stock is very hard, it is best to first drill $\frac{1}{4}$ inch holes and then follow with a $\frac{1}{2}$ inch drill.

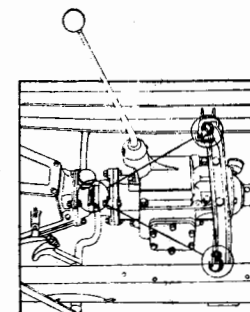
7. Now measure between the cut ends of the Ford frame EXACTLY 15 $\frac{3}{4}$ INCHES, and bolt the channels onto the front portion of the frame in the same manner. Be sure that BOTH SIDES of the frame show EXACTLY 15 $\frac{3}{4}$ inches separation.

8. Attach the brake rod extensions furnished with the channels, and adjust emergency brakes. Replace muffler and exhaust pipe.

9. To complete the installation, see paragraphs 11 and 12 on reverse page.

Warford
AUXILIARY TRANSMISSION

Instructions for Installing and Operating the Heavy Duty Six Speed Warford Transmission



in the
Ford Model "TT" Truck

THE WARFORD CORPORATION
44 WHITEHALL ST., N. Y.

*Neither the Warford Corporation nor its manufacturers
has any connection whatsoever with any company
manufacturing motor cars*

Instructions for Operating the Warford Heavy Duty Transmission

Read These Instructions Carefully and Completely Before You Start to Drive the Truck

A careful study of Fig. 9 and the table of gear ratios should be made in advance of operation, in order that the most efficient use may be made of the advantages of the Warford transmission. Fig. 9 shows the available positions of the

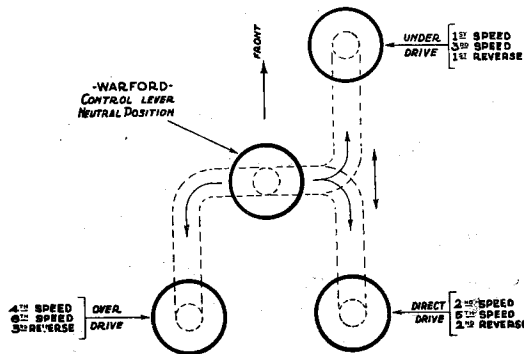


Fig. 9

Warford control lever and the manner in which the ball on the end of the lever should be moved to make the various shifts. The Warford control lever should be placed in the center or NEUTRAL POSITION ONLY WHEN STARTING THE FORD ENGINE. At all other times the control lever should be in one of the three other positions. When in any one of the three gear positions, the car is started by means of the regular Ford foot pedal—first in Ford “low” and then back into Ford “high.” The Ford “low,” “high” and “reverse” all operate when the Warford control lever is in any of its three gear positions, and the Ford foot brake operates with the Warford control lever in all of its positions EXCEPT THE NEUTRAL POSITION.

The table of gear ratios indicates the combination ratios of the Ford and Warford transmission. It will be noted that when in either the THIRD, FIFTH or SIXTH speeds, the Ford transmission is in “high” and the Ford transmission

brake bands are not working. When in the SECOND and FIFTH speeds (when the Warford transmission is in “direct drive,”) the Warford transmission offers no reduction and the speeds are strictly Ford speeds.

TABLE OF WARFORD GEAR RATIOS
ON FORD MODEL TT TRUCK

Speed	Ford	Warford	Low Speed Axle Ratio	High Speed Axle Ratio
First	Low	Underdrive	40.61	28.93
Second	Low	Direct	19.94	14.23
Third	High	Underdrive	14.77	10.53
Fourth	Low	Overdrive	14.62	10.42
Fifth	High	Direct	7.25	5.167
Sixth	High	Overdrive	5.31	3.79
1st Rev.	Rev.	Underdrive	59.17	42.10
2nd Rev.	Rev.	Direct	29.00	20.65
3rd Rev.	Rev.	Overdrive	21.24	15.13

TO START THE TRUCK

1. Assuming that the Warford Control Lever is in the Neutral position and the engine has been started, slightly depress the Ford high-low speed pedal and at the same time push on the Ford brake pedal. This will slow down the Ford transmission when the Control Lever can be moved to any desired speed position (See Fig. 9). Applying the Ford foot brake for shifting gear ONLY APPLIES WHEN THE TRUCK IS STANDING STILL.

2. Now when the Control Lever has been moved to the desired position, the truck is started in motion with the Ford “low” speed pedal. When moving sufficiently fast, the Ford pedal is let back into “high” as usual.

3. To shift the Warford Control into another position when the truck is in motion, slightly depress the Ford clutch pedal (checking the tendency of the engine to race by means of the throttle) and quickly move the Warford Control lever into the new desired position, and then let the Ford clutch pedal back into its “high” position. IT IS NOT NEC-

CESSARY TO STOP THE TRUCK TO SHIFT THE WARFORD GEAR.

4. The truck can be operated a large majority of the time on Third, Fifth and Sixth speeds when the Ford transmission bands are not being used. The best procedure in order to take advantage of this condition, is to first place the Warford Control Lever in the Underdrive position (to the right and forward—See Fig. 9), then use the Ford “low-speed” pedal to get the truck moving sufficiently to let this pedal back into Ford “high”. Then when well under way, slightly depress the “high-speed” clutch pedal and pull the Warford Control Lever straight back into Direct Drive position and then let the Ford “high-speed” pedal back as described in Paragraph 3. Then, if conditions permit more speed and the Ford engine will handle additional speed, the clutch pedal can be slightly depressed and the Warford Control Lever can be shifted into the Overdrive position—to the left and back—See Fig. 9) letting the clutch pedal back after the shift is made. This sequence of operations gives a very desirable and well graduated succession of speeds and the Ford low speed band is only used once.

5. In shifting down in speeds, say from Sixth to Fifth, or from Fifth to Third, the Ford engine will have to be accelerated a trifle just as the Warford Control Lever is shifted when the Ford clutch is out. This slight acceleration of the engine, speeds the gears up a little bit so that the shift can be made easily and without undue noise.

6. When leaving the driver’s seat with the engine running, it is not necessary or desirable to put the Warford Control Lever in its neutral position. The emergency brake lever should be pulled up in the usual way which puts the Ford transmission in neutral and holds the truck stationary.

Instructions for Installing Warford Heavy Duty 6-Speed Transmission in Ford TT Truck

Read These Instructions Carefully and Completely Before Beginning Work.

Frame Extension Instructions on Reverse Page.

1. Remove the rear axle assembly from the chassis by disconnecting the brake rods at their front ends, disconnecting the rear springs at their shackles and unbolting pressed steel flange that holds the propeller shaft housing ball against the rear flange of the Ford transmission.

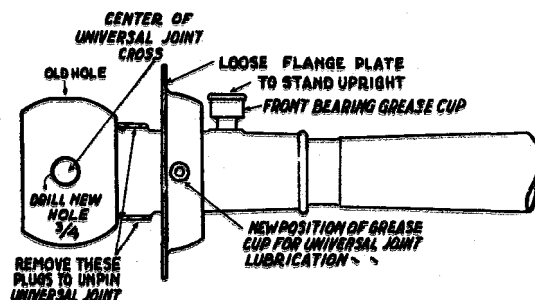


Fig. 1

Take out the universal joint housing pin plugs. See Fig. 1. Drive out pin and remove the universal joint. Next remove the propeller shaft housing flange cap screws, disconnect and remove the housing from the rear axle. Be sure to remove the paper gasket and the felt washer and its retainer from the housing flange and assemble them on the new flange coupling furnished with the Warford transmission.

2. Drive out the rear pin in the propeller shaft sleeve that holds the sleeve to the worm shaft. By tapping the sleeve with a heavy hammer, the old propeller shaft with the sleeve attached is easily removed. It is advised and recommended that a NEW sleeve (Ford Part No. 1041-B—TT-85-B) be obtained from stock (use Genuine Ford Part) for attaching the shorter Warford propeller shaft to the worm shaft. First fasten this sleeve to the worm shaft, being sure to get it on correctly. It should be a tight driving fit and be pinned in place with a new pin (Ford Part No. 1042) riveting over the ends of the pin. Now drive (or press) the Warford shaft into the rear end of the sleeve until the pin

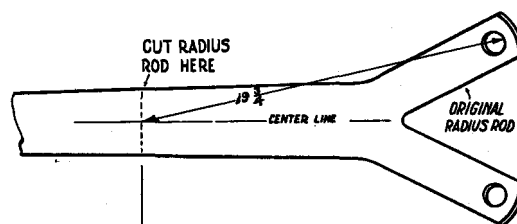


Fig. 3

Next, bolt the shortened radius rods back in their place being sure to use the new cotter pins in the castellated nuts. Pack universal joint full of grease and tighten the tube clamp bolts permanently.

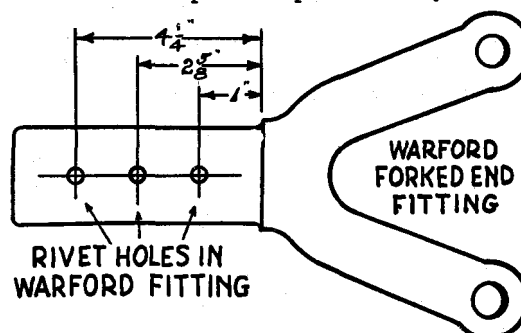


Fig. 4

6. Drain the gasoline tank, disconnect gasoline line at sediment bulb, remove bulb from tank, insert pipe elbows furnished with transmission, so that the bulb will stand to the right as shown in Fig. 5. Then insert bulb, using plenty of White Lead on all threads and draw tight so there will be no gasoline leaks, then connect gasoline line.

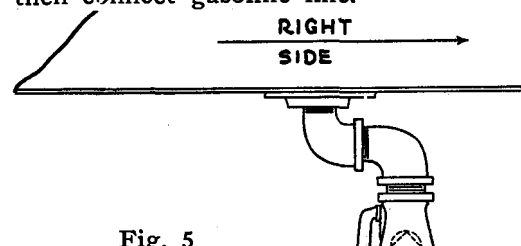


Fig. 5

Warford transmission as near as possible to the proper height and replace the bolts, nuts and cotter pins in the top holes of the flange, and the cap screws in the bottom holes, rewiring the heads of the cap

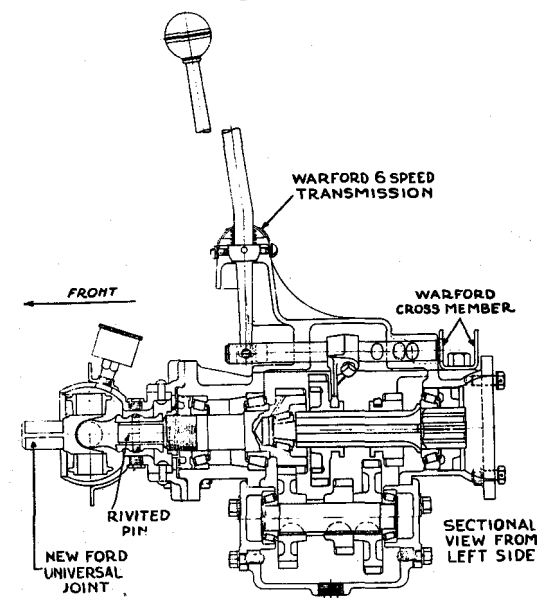


Fig. 7

screws. **TIGHTEN UP HARD.** Next, assemble the Warford Cross Member. See Fig. 8 to the Warford Transmission using the two 1/2 inch bolts with their lock washers and nuts as furnished with the Warford transmission. Draw these bolts up tight and hard. Be sure that the hole in the flange of the Warford Cross Member is **TOWARD THE FRONT** so that the shifter rod will pass into it properly in the "underdrive" position. Next, clamp the cross member to the Ford frame with the plates and U-bolts, securing the nuts with the lock washers permanently. See Fig. 8.



pin (Ford Part No. 1042) properly riveted.

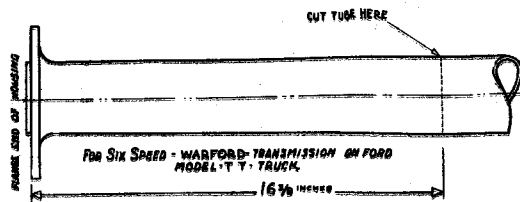


Fig. 2

3. Cut $16\frac{1}{8}$ inches from the rear end of the propeller shaft housing tube, measuring from the machined face of the flange as shown in Fig. 2. Make the cut as square as possible. Drill a $\frac{1}{4}$ inch hole in the LEFT side of the housing ball on the same line as the old hole in the top. SEE FIG. 1. Use a $\frac{1}{4}$ " drill to start this hole and then enlarge to $\frac{3}{4}$. **BE SURE TO REMOVE ALL DRILL CUTTINGS AND CHIPS.** Fit the Warford flange coupling on to the sawed-off end of the tube. Housing tubes vary in diameter so if the tube proves small it must be brought up to a fit with metal shims, and if large it must be dressed off with a file. If the installation is being made on a used truck, inspect the babbit drive shaft bushing (Ford Part No. 1076) in the front end of the drive shaft housing. If this bushing shows wear, replace it with a new one, because looseness will cause propeller shaft whip. Be sure and drill the grease hole through the new bushing for the small compression grease cup.

4. Assemble the propeller shaft tube over the propeller shaft, replace the universal joint, pin permanently and replace the housing pin plugs. See Fig. 1. Then bolt the new flange hard against the axle, and wire the bolt heads securely, leaving the tube clamping screws slightly loose.

5. Remove the radius rods and cut them off EXACTLY as shown in Fig. 3. Make the measurement carefully and have the two alike. Any error in this cutting dimension will throw a strain on the coupling sleeve and cause serious difficulty. Then insert the Warford Radius Rod forks in the open ends of the cut radius rods and DRIVE IN UP TO THE SHOULDER—See Fig. 4. Then drill the rivet holes, insert the rivets furnished for the purpose, and rivet in place.

As an alternative if the proper facilities are at hand, take the gasoline tank from the chassis and move the bulb attachment flange two inches to the right, closing up the old hole and making a new one in the new location. In this operation, care should be exercised to have the tank entirely empty and free from any gasoline vapor that might cause an explosion. When placing the bulb back in the old flange in the new location be sure all soldering acid has been removed and use White Lead on the threads of the bulb to insure a gasoline tight joint. See Fig. 6. Then re-connect the gasoline line.

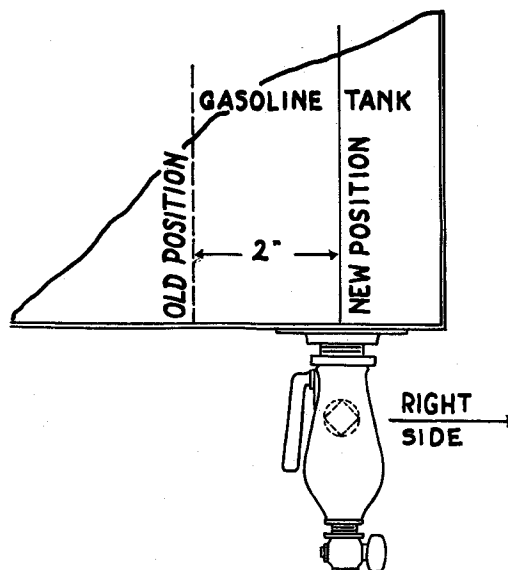


Fig. 6

7. Obtain a NEW Genuine Ford Universal joint (Ford Part No. 2571) from stock and attach it to the square shaft on the front end of the Warford Transmission—See Fig. 7—pinning securely in place using pin furnished with Warford transmission. Then replace the pin hole plugs and pack universal joint with grease.

8. Next, enter the universal joint now on the front end of the Warford transmission, into the rear end of the Ford transmission, using cork gasket (Ford Part No. 2580) on each side of the Ford ball socket. Block up under the

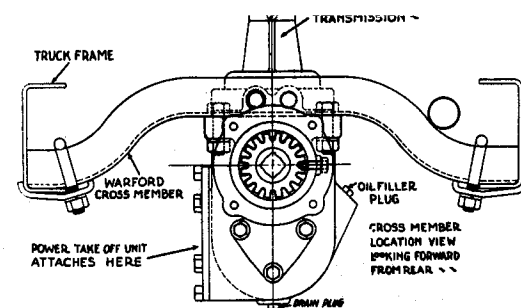


Fig. 8

9. Remove the oil filler plug on the right hand side of the Warford transmission case—See Fig. 8—, USE OIL GUN filling the case up to the level of the filling hole with 600-W gear oil or equivalent. Never use grease, non-fluid-oil or thick compounded lubricants, as these kind of lubricants will not lubricate the tapered roller bearings used in the Warford transmission.

If difficulty in gear shifting is encountered in extremely cold weather, add one pint of engine oil. **DO NOT REMOVE WARFORD TRANSMISSION CASE COVER FOR FILLING.** Oil level should be examined every 2500 miles.

10. Next, assemble the rear axle unit under the chassis, using cork gasket (Ford Part No. 2580) at the ball cap. Turn the ball cap so that the large grease cup on it stands to the LEFT. See Fig. 1. Use the two special Warford cap screws in the top holes, draw up hard and pass the wire through the holes in their heads. Use the special Warford bolts, lock washers and nuts in the bottom holes and tighten securely. Next, replace spring shackles using new cotter pins in the castellated nuts. Replace brake rods and guides and carefully adjust emergency brakes being sure that the brake rods do not bind in the guides when brakes are applied and released.

11. Cut floor boards for $\frac{1}{2}$ inch clearance around the Warford control lever. Draw up all bolts, cap screws and nuts every day or two for the first week until they are firmly set.

12. Make a final inspection of all work done to be sure that everything is correctly done and that all wires, cotter-pins, etc., are in place before starting car and as a final caution be sure that the transmission has been FILLED WITH OIL as per paragraph 9.