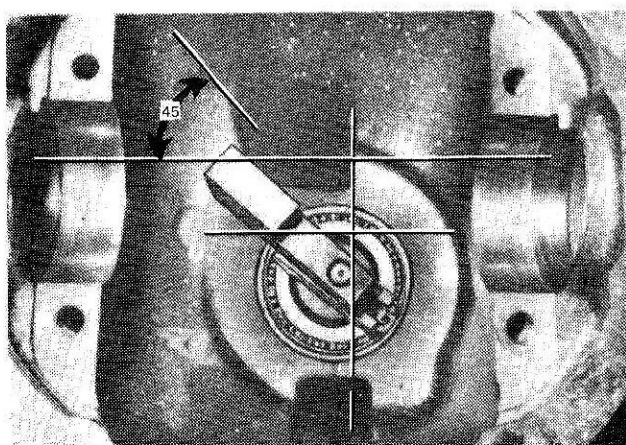


T76P-4020-A11



F2693-1A

FIG. 35 Installation of Pinion Depth Gauge Block in 7.5 Axle

3. Center the gauge tube into the differential bearing bore. Install the bearing caps and torque the bolts to specification. (Caps to be installed with the arrows pointing outboard).
4. Using a feeler gauge tool, select the thickest feeler blade that will enter between the gauge tube and the gauge block and then insert the feeler gauge blade directly along the gauge block to insure a correct reading. The feeler gauge fit should be a slight drag-type feel.
5. After the correct feeler gauge feel is obtained, check the reading. This is the thickness of the shim required, providing the replacement pinion has no plus or minus reading shown on it.
6. If the replacement pinion gear is marked with a plus (+) reading, the amount shown as a plus must be **subtracted** from the thickness dimension obtained in Step 5.
7. If the replacement pinion gear is marked with a minus (-) reading, the amount shown must be **added** to the thickness dimension obtained in Step 5.

NOTE: THE SAME REAR PINION BEARING USED IN THIS PROCEDURE MUST BE USED IN FINAL ASSEMBLY OF THE AXLE.

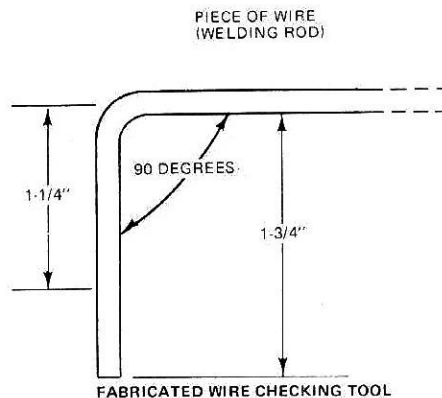
8. Place the selected shim(s) on the pinion shaft and press the pinion bearing until firmly seated on the shaft.

NOTE: A TOOTH PATTERN CHECK WITH THE MARKING COMPOUND SUPPLIED WITH THE RING AND PINION SET IS NOT REQUIRED WHEN TOOL T76P-4020-A IS USED, AND ROAD TESTING IS NOT REQUIRED.

LUBRICANT CHECKING PROCEDURE 7.5 INCH RING GEAR

Using a clean, straight piece of wire (such as welding rod), bend it at a 90° angle approximately 1-3/4" down on one end (Fig 36) and insert it approximately 1-1/2" into the axle filler hole. Rest it on the lower edge of the hole. Remove the wire and measure the distance from the bend to the lubricant line on the wire. With the axle in a normal curb attitude, the lubricant level should be 1-1/4" below the bend. If the level is within the mentioned specification, the axle contains the correct amount of lubricant. (Overfill of the axle can result in lubricant leakage at the axle vent).

NOTE: THE LUBRICANT LEVEL MUST BE 1-1/4" BELOW THE FILLER HOLE.



F2694-1A

FIG. 36 Fabricated Wire Checking Tool

SPECIFICATIONS

DRIVING AXLE IDENTIFICATION (INTEGRAL CARRIER) – CONVENTIONAL

Identification Tag	Ratio	Ring Gear Diameter (Inches)	Differential Type
WGX-A	2.73:1	7-1/2	C2
WGX-B	3.08:1	7-1/2	C2
WGX-C	2.47:1	7-1/2	C2

ADJUSTMENT TORQUE SPECIFICATIONS (INTEGRAL CARRIER) – CONVENTIONAL

Description	Torque In. Lb.	Torque Ft. Lb.
Minimum torque required to tighten pinion flange nut to obtain correct pinion bearing preload	—	140 <u>1/</u>
Pinion Bearing Preload – (Collapsible spacer) <u>2/</u> Original Bearings – 7.5 inch New Bearings – 7.5 inch	8-14 17-27	—
<u>1/</u> If pinion bearing preload exceeds specification before this torque is obtained, install a new spacer. <u>2/</u> With Oil Seal		

CLEARANCE, TOLERANCE AND ADJUSTMENTS (INTEGRAL CARRIER) – CONVENTIONAL

Description	Inches	Description	Inches
Maximum Runout of Backface of Ring Gear	0.003	Nominal Pinion Locating Shim	0.030
Differential Side Gear Thrust Washer Thickness	0.030-0.032	Available Pinion Gear Shims in Steps of 0.001 – 7.5 Inch	0.021-0.037
Differential Pinion Gear Thrust Washer Thickness	0.030-0.032	Backlash between ring gear and pinion teeth	0.008-0.012
Differential Carrier Spread	0.016	Maximum backlash variation between teeth	0.003
		Maximum radial runout of companion flange in assembly	0.010 T.I.R.

ATTACHING TORQUE SPECIFICATIONS (INTEGRAL CARRIER) – CONVENTIONAL

Description	Torque Ft. Lb.	Description	Torque Ft. Lb.
Differential Bearing Cap Bolt – 7.5 Inch	70-85	Rear Cover Screw and Washer Assemblies	25-35
Differential Pinion Shaft Lock Bolt	15-22	Oil Filler Plug	25-50
Ring Gear Attaching Bolts – 7.5 Inch <u>1/</u>	70-85	Brake Backing Plate Bolts and Nuts	20-40
<u>1/</u> Using Loctite (or Equivalent)			

LUBRICANT CAPACITIES AND CHECKING PROCEDURES (INTEGRAL CARRIER) – CONVENTIONAL

Vehicle	Engine	Axle	U.S. Measure Capacity (Pints) <u>1/</u>	Imperial Capacity (Pints) <u>2/</u>
Fairmont/Zephyr	All	7-1/2 Inch Ring Gear	3.50/3.75	2.8/3.0
<u>1/</u> All conventional axles use ESW-M2C-105-A lubricant.				
<u>2/</u> The lubricant level must be 1-1/4 inches below the filler hole, checked with a wire gauge such as shown in Figure 36.				

SPECIAL TOOLS

Tool Number	Description
T50T-100-A	Impact Slide Hammer
T00L-1175-AC or T00L-1175-AE	Grease Seal Remover (Use with Slide Hammer T50T-100-A)
T76P-4020-A	Pinion Depth Gauge
T00L-4201-C -4201-D	Differential Backlash and Runout Gauge with Universal Bracket Dial Indicator and Bracket
T57L-4220-A	Differential Bearing Assembly Remover
T57L-4221-A	Differential Side Bearing Remover
T00L-4221-C	Differential Side Bearing Remover
T70P-4221-A	Differential Side Bearing Remover
T00L-4222-L	Differential Bearing Cones Replacer
T00L-4222-H	Differential Bearing Cones Replacer
T66L-4234-A T71P-4234-A	Rear Axle Shaft Assembly Remover Adapter (Use with T50T-100-A)
T00L-0TC-951	Pinion Rear Bearing Remover
T68P-4602-A	Pinion Angle Level Gauge
T68P-4602-AA	Frame
T68P-4602-AB	Vial
T68P-4602-AC	Magnet
T00L-4615-G	Drive Pinion Front Bearing Cup Remover
T60K-4616-A	Pinion Bearing Cups Replacer (Inner and Outer)
T67P-4616-A	Pinion Bearing Cups Replacer
T53T-4621-C	Drive Pinion Bearing Installer
T78P-1225-A	Wheel Bearing Installer
T78P-1177-A	Wheel Seal Installer
T78P-4851-A	Companion Flange Holder
T77P-4676-B	Pinion Seal Installer
T78P-4136-A	Differential Adjuster Rod
T78P-4136-B1	Differential Gauge Disc (.200" Thick)
T78P-4136-B2	Differential Gauge Disc (.300" Thick)
T78P-4136-B3	Differential Bearing Preload Spacer
T78P-4000-A	Differential Carrier Spreader Adapters
T78P-4000-E	Differential Carrier Spreader

Removable Carrier Axle — Ford

**PART
15-10**

Applies To All Cars Except Fairmont/Zephyr

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION		IN-VEHICLE ADJUSTMENTS	
Conventional Axle	10-1	AND REPAIRS (Cont'd.)	
		Rear Axle Shaft, Wheel Bearing and	
DISASSEMBLY AND ASSEMBLY		Oil Seal Replacement — (Tapered	
Differential Carrier Assembly	10-20	Roller Bearing Equipped)	10-3
Differential Carrier Disassembly	10-15		
Differential Case Bearings and Ring		REMOVAL AND INSTALLATION	
Gear Test	10-20	Axle Housing — Coil Spring Suspension	
		— Ford, Mercury and	
IN-VEHICLE ADJUSTMENTS		Lincoln Continental	10-9
AND REPAIRS		Axle Housing — Coil Spring Suspension	
Drive Pinion Oil Seal Replacement	10-7	— LTD II, Cougar, Thunderbird and	
Drive Shaft Pinion Angle — Refer to		Continental Mark V	10-10
Group 14		Axle Housing — Leaf Spring Suspension	10-13
Original U-Joint Flange (In-Vehicle		Carrier Assembly	10-8
Replacement)	10-8		
Rear Axle Shaft, Wheel Bearing and		SPECIFICATIONS	10-26
Oil Seal Replacement — (Ball			
Bearing Equipped)	10-2	SPECIAL TOOLS	10-29

F2520-2B

DESCRIPTION

CONVENTIONAL AXLE

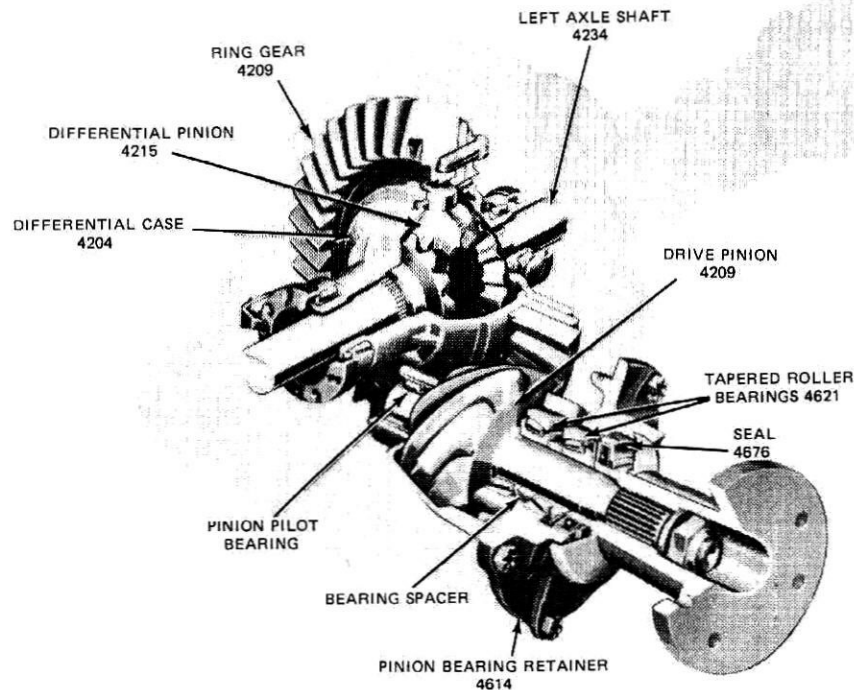
The rear axle is of the banjo housing, hypoid gear-type using an 8, or 9-inch ring gear, in which the centerline of the pinion is mounted below the centerline of the ring gear (Fig. 1). The 9-inch ring gear axle features an optional single sensor (Sure-Track) brake control system. The Sure-Track rotor unit is located on the rear axle companion flange, with the sensor mounted in the pinion bearing retainer. The retainer to carrier attaching stud (in the 10 o'clock position) holds the wiring harness bracket.

The pinion gear and the pinion bearings are assembled in a pinion retainer, which is bolted to the carrier. The pinion is straddle mounted; that is, supported by bearings both in front of and to the rear

of the pinion gear. Two opposed tapered roller bearings support the pinion shaft in front of the pinion gear with a collapsible spacer. A straight roller (pilot) bearing supports the pinion shaft at the rear of the pinion gear. Pinion and ring gear tooth contact is adjusted by adding or removing shims from between the pinion retainer and the carrier housing.

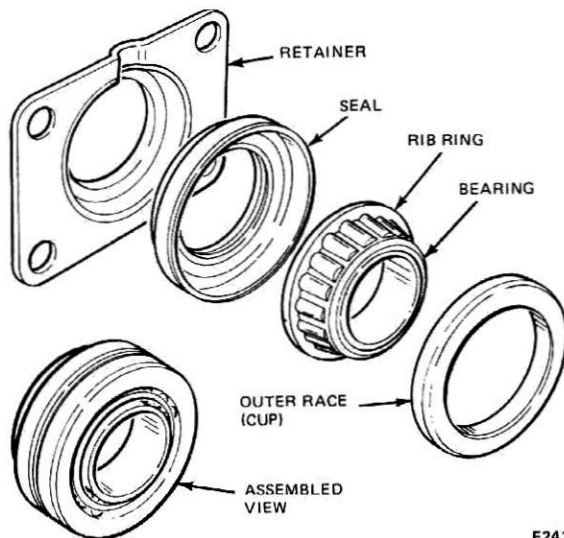
The differential assembly is mounted on two opposed tapered roller bearings, which are retained in the carrier by removable caps. The entire carrier assembly is bolted to the axle housing.

Ball bearing assemblies (rear wheel bearings) are pressed onto the outer ends of the axle shafts and set in the outer ends of the axle housing.



E1781-2B

FIG. 1 Rear Axle Assembly—Removable Carrier Type—Typical



E2416-1C

FIG. 2 Tapered Roller Bearing Assembly

Certain vehicles are equipped with tapered roller bearings, with which a different type of oil seal is used (Fig. 2). These bearings support the semi-floating axle shafts at the outer ends. The inner ends of the shafts spline to the differential side gears. Bearing retainer plates or disc brake adapters (when disc brake equipped) hold the shafts in the housing. The left and right axle shafts are not interchangeable, the left shaft being shorter than the right. An identification tag is secured to the axle assembly by one of the carrier-to-housing bolts.

It is important to use the axle model designation to obtain correct replacement parts.

IN-VEHICLE ADJUSTMENTS AND REPAIRS

REAR AXLE SHAFT, WHEEL BEARING AND OIL SEAL REPLACEMENT—(BALL BEARING EQUIPPED)

The rear axle shafts, wheel bearings, and oil seal can be replaced without removing the differential assembly from the axle housing.

AXLE SHAFT Removal

Synthetic wheel bearing seals are used. Removal and insertion of rear axle shafts must be performed with caution. The entire length of the shaft (including spline) must pass through the seal without cutting the seal element or early seal failure will result.

1. Remove the wheel cover, wheel and tire from the brake drum.
2. Remove the nuts that secure the brake drum to the axle shaft flange, then remove the drum from flange.
3. Working through the hole provided in each axle shaft flange, remove the nuts that secure the wheel bearing retainer plate. Then pull the axle shaft assembly out of the axle housing (Fig. 3). Remove the brake backing plate and secure it to the frame rail by wire.

REAR WHEEL BEARING AND SEAL

Removal

Synthetic seals must not be cleaned, soaked or washed in cleaning solvents. Removal of the wheel bearings from the axle shaft makes them unfit for further use.

1. Loosen the inner retainer ring by nicking it deeply with a cold chisel in several places (Fig. 4). It will then slide off easily.

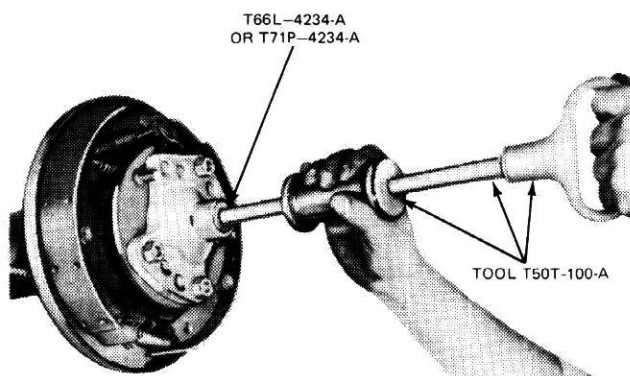
On Ford and Mercury models, it is necessary to first drill a 1/4-inch hole **not more than 5/16 inch deep** in the retainer ring surface before using the cold chisel.

2. Remove the bearing from the axle shaft with the tool shown in Fig. 5. Never apply heat to make it easier to remove the bearing retainer ring, or the bearing. This will weaken the axle shaft bearing journal area.
3. Whenever a rear axle shaft is replaced, the oil seal must be replaced. Remove the seal with Tool 1175-AB and a slide hammer (Fig. 6).

REAR WHEEL BEARING AND SEAL

Installation

1. Inspect the machined surface of the axle shaft and the axle housing for rough spots or other irregularities which would affect the sealing action of the oil seal. Check the axle shaft splines for burrs, wear or twist. Carefully remove any burrs or rough spots. Replace worn or damaged parts.
2. Place the bearing retainer plate on the axle shaft; then, press the new wheel bearing on the shaft with the tool shown in Fig. 7. **Do not attempt to press on both the bearing and the inner retainer ring at the same time.**
3. Using the bearing installation tool (Tool 4621-A or T75L-1165-D), press the bearing inner retainer ring on the shaft until the retainer seals firmly against the bearing. **On Ford and Mercury models, before assembling the retainer onto the axle shaft, the shaft journal and the inside diameter of the retainer should be wiped clean with a dry cloth. These parts must not be degreased or lubricated. Never use heat to make it easier to install the bearing retainer ring, or the bearing. This will weaken the axle shaft bearing journal area.**
4. Install the new oil seal with the tools shown in Fig. 8. Wipe a small amount of oil-resistant sealer on the outer edge of the seal before it is installed. **Do not put sealer on the sealing lip.**



E1032-1E

FIG. 3 Removing Axle Shaft

5. Install a new brake backing plate gasket.
6. Install the brake backing plate.

AXLE SHAFT

Installation

1. Carefully slide the axle shaft into the housing so that the rough forging of the shaft will not damage the oil seal. Start the axle splines into the side gear, and push the shaft in until the bearing bottoms in the housing.
2. Install the bearing retainer plate and the nuts that secure it. Torque the nuts to specification.
3. Install the brake drum and the drum attaching nuts.
4. Install the wheel and tire on the drum. Install the wheel cover.

REAR AXLE SHAFT, WHEEL BEARING AND OIL SEAL REPLACEMENT (TAPERED ROLLER BEARING EQUIPPED)

AXLE SHAFT

Removal

If the vehicle is equipped with rear disc brakes, remove the necessary brake parts; then slide off the brake rotor. Refer to Group 12, Part 20 for brake parts removal. When installing the brake parts, **new bolts must be used on the anchor plate.**

Remove the axle shaft retainer nuts and bolts from the housing. The tapered bearing cup will normally stay in place in the axle housing when the axle shaft is removed. **The bearing cup must be removed from the axle housing.** A standard slide-hammer-type puller can be used (Fig. 9). On replacements other than bearing and seal, remove the axle shaft carefully so as not to damage the outer seal rubber. On installation, the outer cup **must be placed on the shaft, mated to the bearing as a unit and carefully placed in the housing. Under no condition should it be left in the housing bore before assembly or damage to the outer seal will result.**