

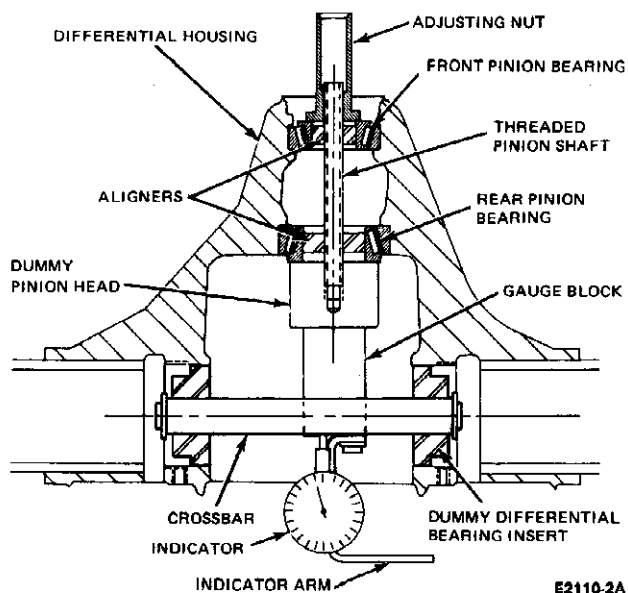


FIG. 22 Pinion Depth Gauge Application (T70P-4020-A)

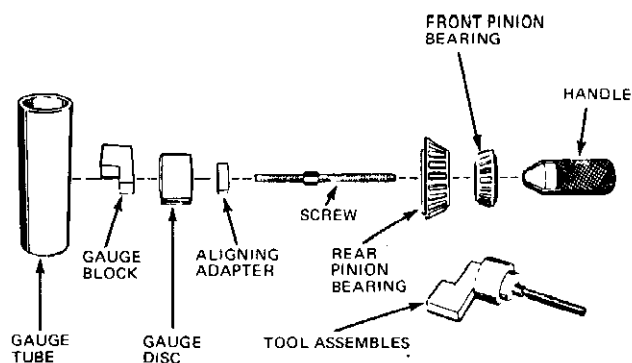


CHART I

Dash Number	Description	Integral Carriers		
		6.75	8.5	8.7
-A1	Aligning Adapter (1.300 O.D.)	X		
-A	Aligning Adapter (1.612 O.D.)		X	X
-A4	Gauge Disc (1.458 thick)	X		
-A6	Gauge Disc (1.314 thick)		X	X
-A7	Gauge Tube (2.563 O.D.)	X		
-A8	Gauge Tube (2.892 O.D.)		X	X
-A9	Screw	X	X	X
-A10	Gauge Block (1.700 thick)	X	X	X
-A11	Handle	X	X	X

F2527-1A

FIG. 23 Rear Axle Pinion Depth Gauge Tool (T75P-4020-A)

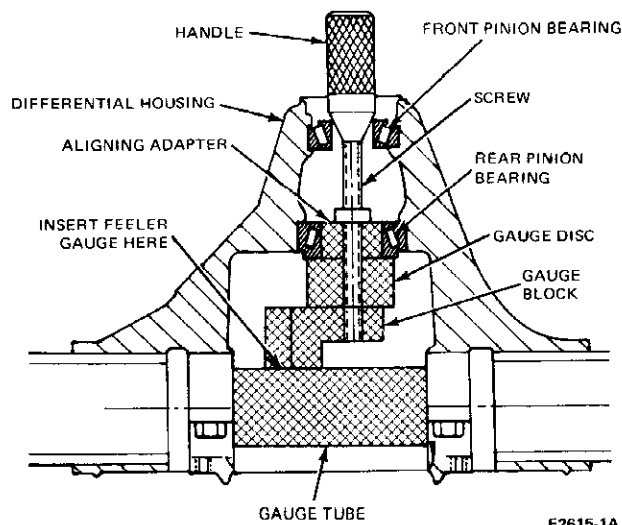


FIG. 24 Using Pinion Depth Gauge Tool T75P-4020-A

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 THE FINAL ASSEMBLY OF THE AXLE.

8. Place the selected shim(s) on the pinion shaft and press on the pinion bearing.
9. **A tooth pattern check with the gear marking compound supplied with the ring and pinion set is not required when this tool is used.**

DIFFERENTIAL CASE, BEARINGS, AND RING GEAR

If the ring gear runout check (before disassembly) exceeded specifications, the condition may be caused by a warped gear, a bent case, or excessively worn differential bearings.

To determine the cause of excessive runout, proceed as follows:

1. Assemble the two halves of the differential case together without the ring gear, and press the two differential side bearings on the case hubs.
2. Place the cups on the bearings and set the differential case in the carrier.
3. Install the bearing caps and adjusting nuts as outlined in Steps 11 thru 14 under Differential Case and Drive Pinion Installation.
4. Tighten the right nut two notches beyond the position where it first contacts the bearing cup. Rotate the differential case several revolutions in each direction while the bearings are loaded, to seat the bearings in their cups. **This step is important.**
5. Now, loosen the right nut to release the preload. Check to see that the left nut contacts the bearing cup. Using the dial indicator set-up, adjust the preload to 0.004 to 0.008 case spread for new bearings, or 0.003 to 0.005 for the original bearings, if re-used.
6. Check the runout of the differential case flange with a dial indicator. **If the runout does not now exceed specification, install a new ring gear. If the runout still exceeds specification, the ring gear is true, and the trouble is due to either a defective case or worn bearings.**
7. Remove the differential case from the carrier and remove the side bearings from the case.
8. Install new bearings on the case hubs, and place the differential assembly in the carrier **without** the ring gear.
9. Check the case runout with the new bearings. If the runout is now within limits, the old bearings were excessively worn. Use the new bearings for assembly. If the runout is still excessive, the case is damaged and should be replaced.

ASSEMBLY OF AXLE

Refer to Part 15-01 for Cleaning and Inspection before starting assembly operations.

DIFFERENTIAL CASE

Assembly

1. Lubricate all the differential parts with axle lubricant, before they are installed in the case.
2. Place the side gears and thrust washers in the case.
3. Place the two pinion gears and thrust washers exactly opposite each other in the case openings, and in mesh with the side gears.
4. Turn the pinions and thrust washers until the holes in the pinion gears align with the pinion shaft holes in the case.
5. Start the pinion shaft into the differential case. Carefully align the shaft lock pin hole with the pin hole in the case. Drive the shaft into place and install the lock pin. Position the left-hand case on the right-hand case. Align the marks and press the two halves together.
6. Place the ring gear on the differential case. If the new bolts to be used show a green coating over approximately 1/2-inch of the threaded area, install as is. If not coated, apply a small amount of Loctite (Part Number C3AZ-19554-A) or equivalent. Torque to specifications. It is mandatory that bolts used once should not be used again.
7. If the differential bearings have been removed, press them on as shown in Fig. 25.

DIFFERENTIAL CASE AND DRIVE PINION

Installation

1. Place the shim and pinion rear bearing cone on the pinion shaft. Press the bearing and shim firmly against the pinion shaft shoulder (Fig. 17).
2. Place a new pinion bearing preload spacer on the pinion shaft. The end with the largest diameter (the shortest end) should go on the pinion shaft first. **Failure to do this will cause loss of preload.**
3. Lubricate the pinion rear bearing with axle lubricant.
4. Lubricate the pinion front bearing cone and place it in the housing.
5. Install a new pinion oil seal in the carrier casting (Fig. 10).
6. Insert the drive pinion shaft flange into the seal and hold it firmly against the pinion front bearing cone. From the rear of the carrier casting, insert the pinion shaft into the flange.
7. Start a new pinion shaft nut. Hold the flange with the tool shown in Fig. 8 and tighten the pinion shaft nut. As the nut is tightened, the pinion shaft is pulled into the front bearing cone and into the flange.

As the pinion shaft is pulled into the front bearing cone, pinion shaft end play is reduced. While there is still end play in the pinion shaft, the flange and bearing cone will be felt to bottom on the collapsible spacer.

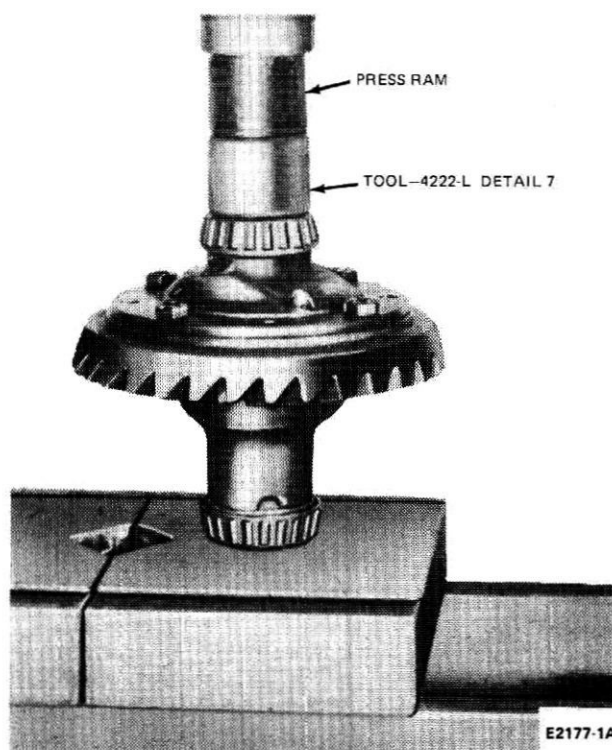


FIG. 25 Differential Bearing Installation

From this point, a much greater torque must be applied to turn the pinion shaft nut, since the spacer must be collapsed. Very slowly, tighten the nut, but check the pinion shaft end play often, to see that the pinion bearing preload does not exceed the limits (Fig. 6).

If the pinion shaft nut is tightened to the point that pinion bearing preload exceeds the limits, the pinion shaft must be removed and a new collapsible spacer installed. **Do not decrease the preload by loosening the pinion shaft nut.** This will remove the compression between the pinion front and rear bearing cones and the collapsible spacer and may permit the front bearing cone to turn on the pinion shaft.

8. As soon as there is preload on the bearings, **turn the pinion shaft in both directions several times to set the bearing rollers.**
9. Adjust the bearing preload to specification. Measure the preload with the tool shown in Fig. 6.
10. Apply a thin coating of lubricant on the bearing bores so that the differential bearing cups will move easily.
11. Place the cups on the bearings and set the differential case assembly in the carrier casting (Fig. 15).

If the gear set is of the **nonhunting or partial nonhunting** type, assemble the differential case and ring gear assembly in the carrier so that the marked tooth on the pinion indexes between the marked teeth on the ring gear as shown in Fig. 26.

Be sure to match gears as indicated. When assembled out of time, noise, excessive wear, and possible failure may result.



FIG. 26 Typical Gear Set Timing Marks

When installing the hunting-type gear set (no timing marks), place the differential case and ring gear assembly in the carrier without regard to the matching of any particular gear teeth.

12. Slide the case assembly along the bores until a slight amount of backlash is felt between the gear teeth. Hold the differential case in place.
13. Set the adjusting nuts in the bores so that they just contact the bearing cups.
14. Carefully position the bearing caps on the carrier casting. Match the marks made when the caps were removed.
15. Install the bearing cap bolts and lockwashers. As the bolts are tightened, turn the adjusting nut with the tool shown in Fig. 27.

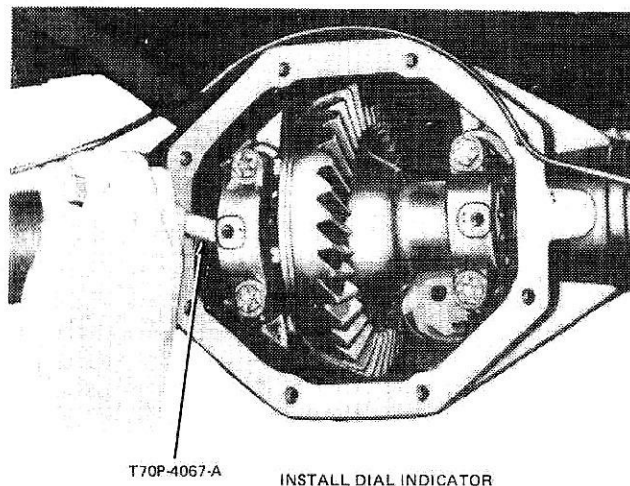


FIG. 27 Backlash and Bearing Preload Adjustment

16. If the adjusting nuts do not turn freely as the cap bolts are tightened, remove the bearing caps and inspect for damaged threads or incorrectly positioned caps. Tighten bolts to the specified torque, to be sure that the cups and adjusting nuts are seated. Loosen the cap bolts, and torque them to only 5 ft-lbs before making adjustments. Refer to Part 15-01 for backlash and bearing preload adjustment procedures.

SPECIFICATIONS

DRIVING AXLE IDENTIFICATION (INTEGRAL CARRIER) – CONVENTIONAL

Ident. Tag	Ratio	Ring Gear Dia. (Inches)	Diff. Type	Ident. Tag	Ratio	Ring Gear Dia. (Inches)	Diff. Type
WGF-K1	3.18:1	6 3/4	C2	WGF-AA	3.18:1	6 3/4	C2
WGF-U1	3.18:1	6 3/4	C2	WGF-AJ	2.73:1	6 3/4	C2

ADJUSTMENT TORQUE SPECIFICATIONS (INTEGRAL CARRIER) – CONVENTIONAL

Description	Torque	Torque
	In. Lb.	Ft. Lb.
Minimum torque required to tighten pinion flange nut to obtain correct pinion bearing preload	–	140 ①
Pinion Bearing Preload – (Collapsible spacer) ② Original Bearings – 6 3/4 inch New Bearings – 6 3/4 inch	6-12	–
	17-27	
① If pinion bearing preload exceeds specifications before this torque is obtained, install a new spacer		
② 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 – 6 3/4 inch	0.021-0.037
Differential Pinion Gear Thrust Washer Thickness	0.030-0.032		
Differential Bearing Preload (Case spread across Differential) New Bearings – 6 3/4 inch	0.004-0.008	Backlash between ring gear and pinion teeth	0.008-0.012
		Maximum backlash variation between teeth	0.003
Original Bearings – 6 3/4 inch	0.003-0.005	Maximum radial runout of U-joint flange in Assembly	0.012 T.I.R.

ATTACHING TORQUE SPECIFICATIONS (INTEGRAL CARRIER) – CONVENTIONAL

Description	Torque Ft.-Lb.	Description	Torque Ft.-Lb.
Differential Bearing Cap Bolt 6 3/4 inch	40-55	Rear Cover Screw and Washer Assemblies	25-35
		Oil Filter Plug	25-50
Differential Bearing Adjustment Nut Lock Bolt	12-25	Rear Axle Shaft Bearing Retainer Bolt Nuts	20-40
Ring Gear Attaching Bolts 6 3/4 inch ①	45-60		
① Using Loctite			

LUBRICANT CAPACITIES AND CHECKING PROCEDURES (INTEGRAL CARRIER) – CONVENTIONAL

Vehicle	Engine	Axle	U.S. Measure Capacity (Pints) ①	Imperial Capacity (Pints) ①
Pinto/Bobcat	2.3L	6 3/4 Inch Ring Gear	2.2 ②	1.8 ②
Mustang	2.3L, 2.8L	6 3/4 Inch Ring Gear	3.0	2.5

① All conventional axles use ESW-M2C-105-A lubricant.

② Approximate refill capacity – Actual lubricant capacities are determined by filling to 1/4 inch below bottom of filter plug hole.

SPECIAL TOOLS

Tool Number	Description	Tool Number	Description
T50T-100-A	Impact Slide Hammer	T70P-4067-A	Differential Bearing Adjuster Nut Wrench
T00L-1175-AC or T00L-1175-AE	Grease Seal Remover (Use with Slide Hammer T50T-100-A)	T68P-4602-AB	Vial
T66F-1177-A	Axle Shaft Oil Seal Replacer	T68P-4602-AC	Magnet
T60K-1177-B	Rear Wheel Bearing Oil Seal Replacer	T00L-4615-G	Drive Pinion Front Bearing Cup Remover
T70P-4020-A	Pinion Depth Gauge Set	T60K-4616-A	Pinion Bearing Cups Replacer (Inner and Outer)
T75P-4020-A	Pinion Depth Gauge Set	T67P-4616-A	Pinion Bearing Cups Replacer
T70P-4067-A	Differential Bearing Adjuster Wrench	T53T-4621-C	Drive Pinion Bearing Installer
T00L-4201-C -4201-D	Differential Backlash and Runout Gauge, with Universal Bracket Dial Indicator and Bracket	T62F-4621-A	Rear Wheel Bearing
T57L-4220-A	Differential Bearing Assembly Remover	T71P-4621-B	Remover and Installer
T57L-4221-A	Differential Side Bearing Cone Replacer	T55P-4676-A	Drive Pinion Oil Seal Replacers
T00L-4221-C	Differential Side Bearings Remover	T58L-4676-A	
T70P-4221-A	Differential Side Bearings Remover	T62F-4676-A	
T00L-4222-L	Differential Bearing Cones Replacer	T71P-4676-A	
T00L-4222-H	Differential Bearing Cones Replacer	T65L-4851-A	Flange (Universal Joint) Axle End Remover
T66L-4234-A T71P-4234-A	Rear Axle Shaft Assembly Remover Adapter (Use with T50T-100-A)	T00L-4851-K	Universal Joint Flange Holder
T00L-OTC-951	Pinion Rear Bearing Remover	T68P-4946-A	Locking Differential Gauge (Traction-Lok Clutch Pack)
T68P-4602-A	Pinion Angle Level Gauge	T00L T60K-7697-B	Rear Axle Shaft Bearing Installer
T68P-4602-AA	Frame	T00L T66L-12132-B	Thread Reducing Adapter

CE2321-2B

Integral Carrier Axle — Ford — (WER)

**PART
15-03**

Applies To Ford/Mercury, Granada/Monarch

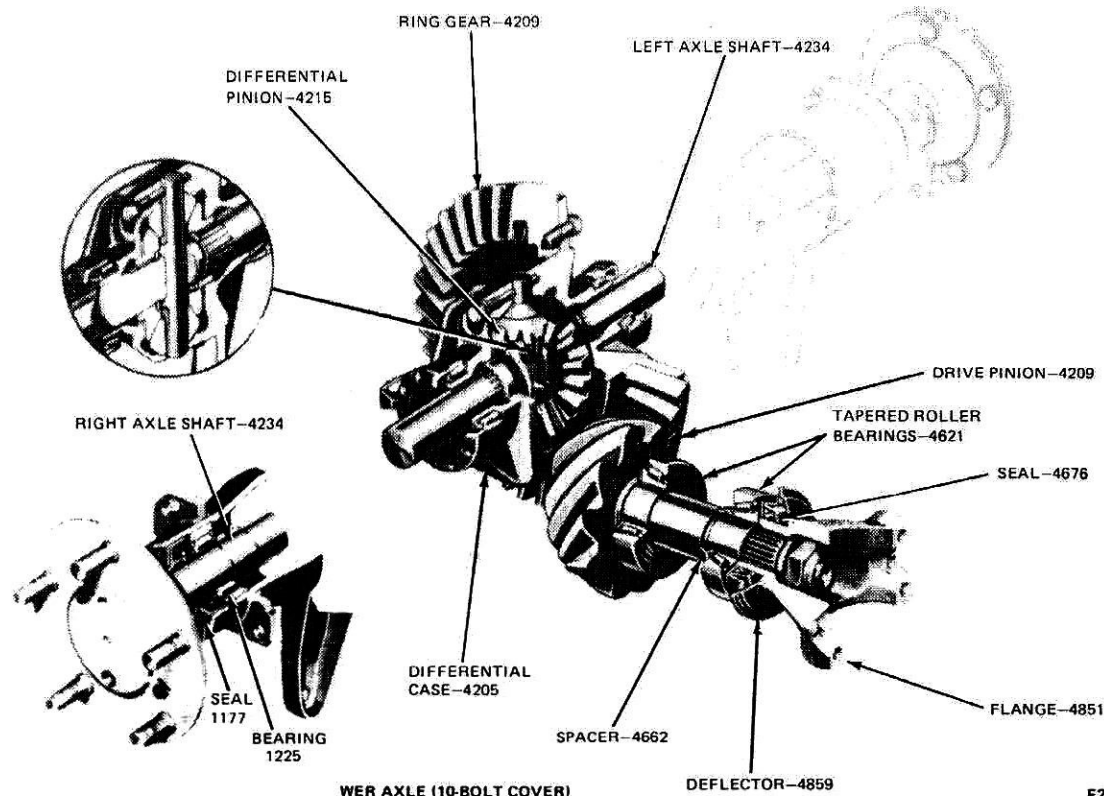
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Installation Of Drive Pinion and		And Oil Seal	03-2
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CF2529-2A

DESCRIPTION

An integral-carrier rear axle assembly (Fig. 1) is used in passenger vehicles equipped with 5.8L(351) and 6.6L(400) engines in the Ford/Mercury cars, and

4.1L(250), 5.0L(302) and 5.8L(351) in the Granada/Monarch lines. The WER axle incorporates the following features:



E2285-2C

FIG. 1 Rear Axle Assembly—(WER) Axle