FORD MOTOR CO. INTEGRAL HOUSING (WGX TYPE)

Fairmont, Zephyr

DESCRIPTION

Hypoid design ring and pinion gear is encased in the integral cast iron housing. A one piece differential case contains a conventional two pinion differential assembly. Semi-floating axle shafts are retained by "C" washer locks at splined end of shafts.

AXLE RATIO & IDENTIFICATION

A metal tag stamped with Axle Model, Date of manufacture, Ratio, Ring Gear Diameter and Assembly Plant is attached to one of the rear cover attaching bolts.

Axle Ratio Identification

Axle Ratio	Code	Ring Gear Diam. Inches
2.73-1	WGX-A	7½
3.08-1	WGX-B	7½
2.47-1	WGX-C	7½

REMOVAL & INSTALLATION

AXLE SHAFTS & BEARINGS

1) Raise vehicle to desired working height and remove wheels and brake drums. Remove housing cover and drain lubricant. Remove lock bolt from carrier and push out differential pinion

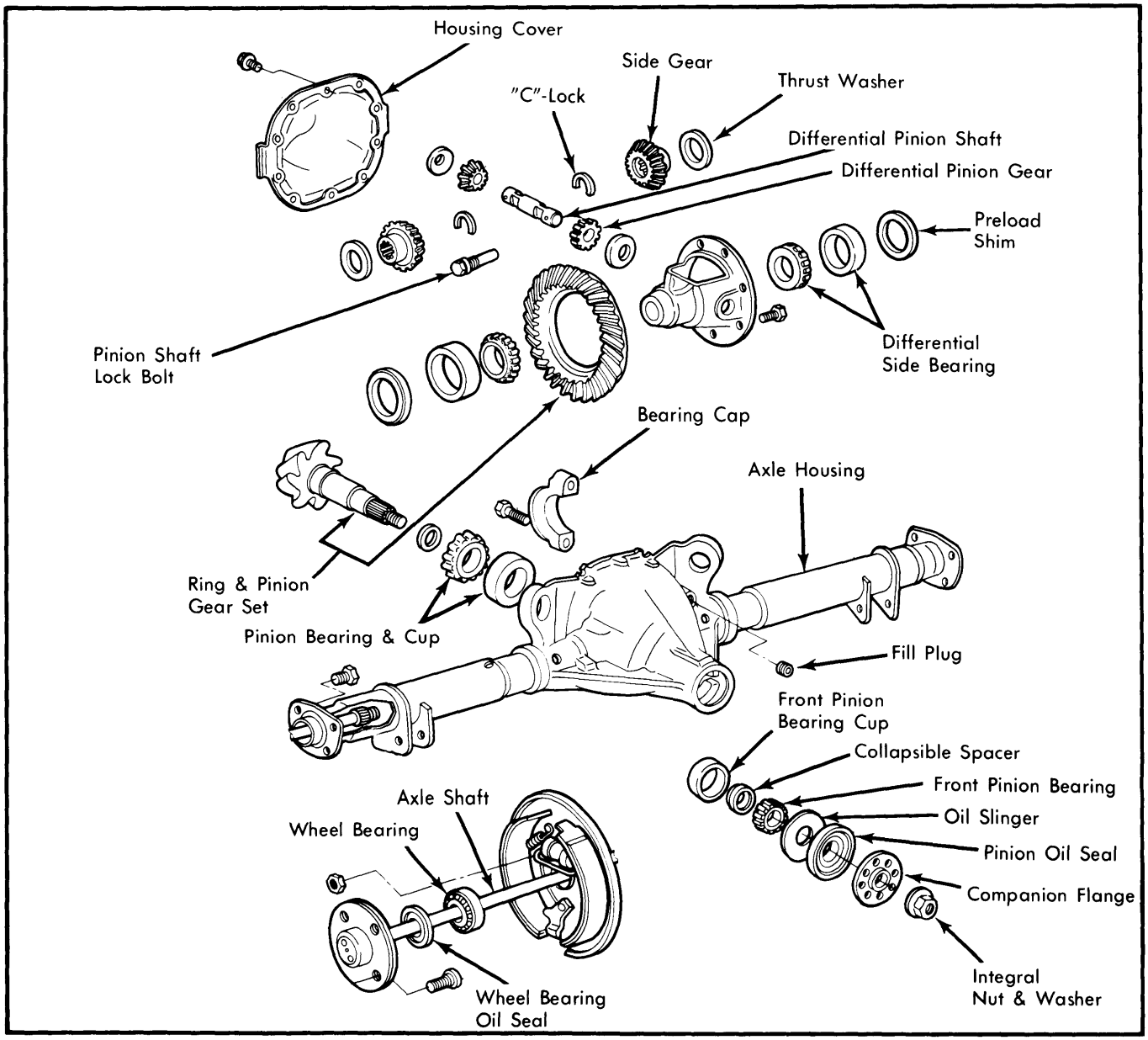

Fig. 1 Ford Motor Co. Integral Carrier Axle (WGX Type)

Copyright (c) 2003 Mitchell Repair Information Company

FORD MOTOR CO. INTEGRAL HOUSING (Cont.)
(WGX TYPE)

shaft. Push axle shafts toward center and remove "C" locks. Carefully remove axle.

2) Using suitable puller, remove bearing and seal as a unit. Note that either Bower (loose fit) or Torrington (snug press fit) axle shaft bearings are used.

3) Lubricate bearing with rear axle lubricant and install with suitable tool (T78P-1225-A). Install seal with suitable driver (T78P-1177-A).

NOTE – *Proper tools must be used for bearing and seal assembly to avoid cocking and premature failure. If seal becomes cocked during installation, remove it and replace with a new one.*

4) Insert axle in housing with care to avoid damage to oil seal. Install "C" locks and push shafts outboard to seat locks in counterbore of differential side gears. Replace pinion gears and washers (if removed) and install pinion shaft and lock bolt. Use silicone sealant applied in a $\frac{1}{8}$" to $\frac{3}{16}$" bead on face of carrier casting and install housing cover.

NOTE – *No gasket other than the silicone seal is used. Cover assembly must be installed within 15 minutes of application or new sealant must be applied.*

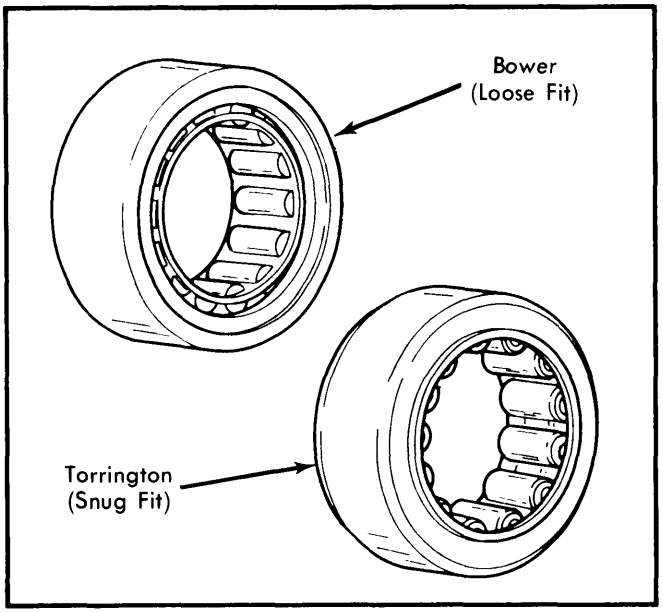

Fig. 2 Bower and Torrington Wheel Bearings

REAR AXLE ASSEMBLY

1) Raise vehicle and support under rear frame crossmember. Remove axles as in previous section and remove brake backing plates. Mark and disconnect driveshaft at companion flange.

2) Disconnect vent from axle housing at brake junction block and disengage brake line clips from axle. Disconnect upper arms and shock absorbers from axle housing. Lower housing on jack until coil springs can be removed. Disconnect lower arms from housing and remove housing from vehicle.

3) To install, reverse removal procedure. Note that Loctite, or equivalent, must be used on threads holding axle vent and brake block to axle.

PINION FLANGE & OIL SEAL

NOTE – *Although the pinion oil seal and flange replacement involves only removal of pinion shaft nut and flange, this operation disturbs pinion bearing preload and must be carefully reset during assembly.*

1) Remove rear wheels and brake drums. Scribe mark on companion flange and drive shaft to insure proper position during assembly and disconnect driveshaft from companion flange. Using an INCH lb. torque wrench, record torque required to rotate pinion through several revolutions.

2) Hold companion flange with suitable tool and remove pinion nut. Mark flange and pinion shaft for reference during reassembly. Remove companion flange and seal with suitable pullers.

3) Install seal using tool (T77P-4676-B or equivalent). Align marks on flange and pinion shaft, then install new integral nut and washer. Hold companion flange and tighten nut gradually, rotating pinion occasionally, until original preload is obtained.

CAUTION – *Under no circumstances should pinion nut be backed off to lessen preload. If this is done, a new pinion bearing spacer must be installed and nut tightened until proper preload is obtained.*

OVERHAUL

DIFFERENTIAL CASE & DRIVE PINION

Removal – Drain housing and remove cover. Remove axles and mark differential bearing caps for reassembly. Loosen cap bolts and bearing caps until differential case, bearing cups and shims can be pried out of housing, then remove caps and differential assembly from housing.

Disassembly – **1)** Remove companion flange and drive pinion out of front bearing cone with a soft faced hammer. If pinion bearing cups are to be replaced, tap alternately on opposite sides of cup using a brass drift.

NOTE – *Do not remove cups unless they are damaged.*

2) To remove rear bearing, use suitable press and adapters. Note thickness of shim under rear bearing cone. Remove ring gear bolts and press ring gear from case or tap off with soft faced hammer. Differential bearings may be removed with suitable puller.

NOTE – *If new components have been installed, proper gear set assembly must be checked using a Rear Axle Pinion Depth Gauge Tool (T76P-4020-A) to determine correct pinion shim. If bearing cups have been replaced, new cone and roller assemblies should also be installed. Cups must be seated in bores so that .0015" feeler gauge will not fit between cup and bottom of bore. Rear pinion bearing must be pressed on so that it is firmly seated against spacer shim and pinion gear.*

Copyright (c) 2003 Mitchell Repair Information Company

FORD MOTOR CO. INTEGRAL HOUSING (Cont.)
(WGX TYPE)

Pinion Depth Check – 1) Assemble tool with proper gauge disc (T78P-4020-A, .894" thick) and bearings which will be used in final assembly. Center gauge tube in differential bearing bores and tighten bearing caps (arrows pointing outboard).

2) With tool handle screw tightened to 20 INCH lbs. and gauge block off-set behind center of gauge tube, measure gap between block and tube with feeler gauge. This is the thickness of the shim required under the rear pinion bearing, providing the replacement pinion is not marked with a plus or minus.

3) If pinion has a plus (+) or minus (-) reading shown on it, this amount should be added or subtracted to obtain final shim thickness. Place selected shim on pinion shaft and firmly seat bearing on shaft with press.

Reassembly – 1) Use new attaching bolts with Loctite (or equivalent) and install ring gear to differential case. Press new bearings on case.

2) Lubricate and place front bearing, oil slinger, and pinion oil seal in housing. Place new preload spacer on pinion shaft and insert shaft from rear of carrier. Install companion flange and new integral nut & washer. Hold companion flange and tighten nut gradually, rotating pinion occasionally to seat bearings. Use INCH lb. torque wrench to check bearing preload.

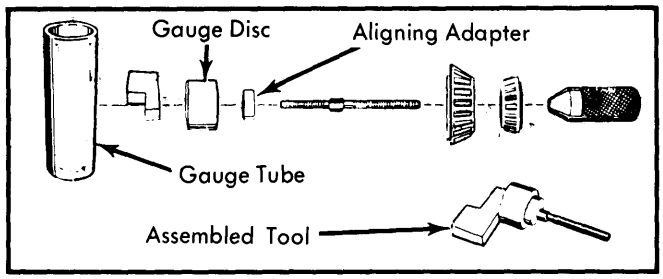

Fig. 3 Rear Axle Pinion Depth Gauge Tool Set

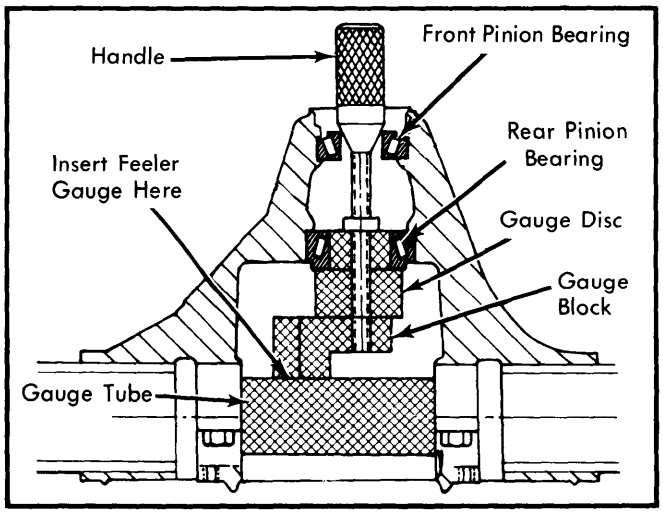

Fig. 4 Using Pinion Depth Gauge Tool

SIDE BEARING PRELOAD & BACKLASH

1) Place differential assembly into carrier bores with a .200" gauge disc spacer in ring gear (left) side between bearing cup and case. Install .300" gauge disc spacer on pinion gear (right) side and tighten bearing caps to 30 INCH lbs.

2) Attach adjuster rod (T78P-4135-A) to left side of axle tube and torque adjusting rod to 40 INCH lbs. while rotating ring gear several times. Select the thickest feeler gauge that will fit with a slight drag between gauge disc and carrier bore on ring gear (left) side. Add this thickness to .500" and record for TOTAL clearance.

3) Back out adjuster rod to allow .300" (right) gauge disc spacer to be removed after removing right bearing cap. Install bearing preload spacer disc (T78-4136-B3) and tighten cap bolts to 30 INCH lbs. Rock ring gear back and forth while tightening adjuster rod until zero backlash is obtained. Determine gap between gauge disc and LEFT carrier bore with feeler gauge (drag fit). Select the proper left shim thickness by adding feeler gauge reading to .200" and subtracting .008" for preload. See *example*.

4) Right (pinion gear) side shim thickness may be determined by subtracting thickness of feeler gauge plus .200" found in step 3 from TOTAL clearance in step 2. Add .016" for preload to obtain shim thickness.

NOTE – *Differential side shims are available in steps of .002" from .2450" to .3030"+ .0005".*

EXAMPLE: Feeler gauge reading of .040" in step 2) added to .500" gives TOTAL clearance of .540".

Step 3) Feeler Gauge Reading	*.086"*
Plus Gauge Disc Spacer Thickness	*.200"*
Total	*.286"*
Subtract	*.008"*
CORRECT RING GEAR (LeftSide) Shim size	*.278"*

Total Clearance (Step 2)	*.540"*
Subtract Step 3) Clearance	*.286"*
Remainder	*.254"*
Add (Preload)	*.016"*
CORRECT SHIM SIZE PINION GEAR (Right Side)	*.270"*

Installation – 1) Carrier spreader tool (T78P-4000-E) and adapters (T78P-4000-A) are required to install differential assembly and shims. Attach dial indicator and spread housing .016". Do NOT exceed this dimension. Install proper shim as determined in *Step 3* on ring gear (left) side and push differential case and cups as far to left as possible.

2) Install right side shim using plastic hammer to tap in until seated. Remove spreader and adapters and install bearing caps with arrows pointed outboard. Marks made during disassembly should be aligned.

3) With a dial indicator, determine backlash and variance around ring gear. Install pinion side gears and thrust washers, axle shafts and "C" locks. Align differential pinion gears and thrust washers and install pinion shaft and lock bolt.

Copyright (c) 2003 Mitchell Repair Information Company

FORD MOTOR CO. INTEGRAL HOUSING (Cont.)
(WGX TYPE)

4) Apply a bead of silicone seal and install housing cover. Fill with lubricant as specified. Normal level is 1¼" below filler hole with axle in a normal curb attitude. (Overfilling can result in lubricant leakage at the axle vent.)

ADJUSTMENT SPECIFICATIONS

Application	Inches
Ring Gear Backface Runout	.003
Side Gear Thrust Washer Thickness	.030-.032
Pinion Gear Thrust Washer Thickness	.030-.032
Differential Carrier Spread	.016
Nominal Pinion Locating Shim Thickness	.030
Ring Gear to Pinion Backlash	.008-.012
Maximum Backlash Variation	.003

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Bearing Cap Bolts	70-85
Pinion Shaft Lock Bolt	15-22
Ring Gear Attaching Bolts	70-85
Rear Cover Screws	25-35
Pinion Flange Nut (Minimum)	①140

① – Pinion bearing preload 8-14 INCH lbs. for used bearings or 17-27 INCH lbs. for new bearings (oil seal installed). If preload is exceeded before this torque is obtained, a new collapsible spacer must be installed.

Copyright (c) 2003 Mitchell Repair Information Company