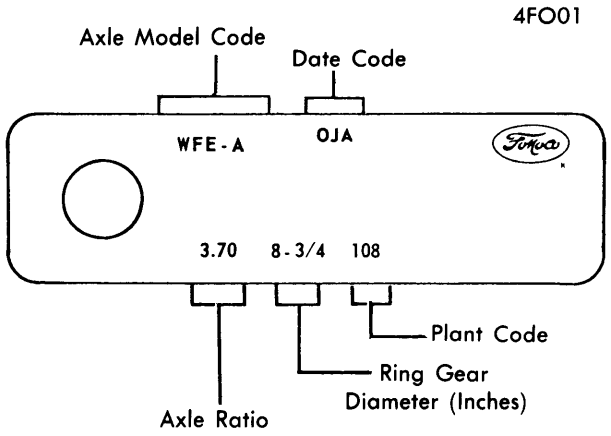
1965-74 FORD MOTOR CO. SEPARATE HOUSING

DESCRIPTION

Axle housing is banjo type with removable differential carrier and semi-floating axles. Ring and pinion gears are hypoid type with straddle mounted pinion. Differential may be either two or four pinion design.

AXLE RATIO & IDENTIFICATION

Axle ratio and model identification numbers may be found on metal tag attached to axle by one carrier-to-housing bolt. Other information included on tag includes; date code, ring gear diameter, and assembly plant code.



REAR AXLE IDENTIFICATION TAG

AXLE RATIO CODES

FORD MOTOR CO.

1965

Axle Ratio	Conventional	Locking
3.00-1	WCR-F, WCF-L	WDF-D, WDF-H
3.20-1	WCC-K, WCC-L	
3.25-1	WDM-A	
3.50-1	WCR-K, WDM-B	WDF-C, WDF-G
3.70-1	WDM-C	
4.11-1	WCR-A, WCR-H, WDM-D	WDF-A, WDF-E
4.57-1	WCR-B, WCR-J	WDF-B, WDF-F

1966-69

Axle Ratio	Conventional	Locking
3.00-1	WCR-S	WDF-M
3.25-1	WDM-H, WDM-S, WEW-J	
3.50-1	WCC-M, WCR-R, WDM-J, WDM-T, WDM-W, WEW-C	WDF-L
3.70-1	WDM-K, WDM-U	
4.00-1	WCC-N	
4.11-1	WCR-M, WDM-L, WDM-V, WDM-Z, WDM-AB, WEW-A	WDF-J
4.57-1	WCR-N, WEW-B	WDF-K

1970-71

Axle Ratio	Conventional	Locking
3.00-1	WEV-B	
3.25-1	WDM-S, WDM-AC, WDM-AF, WEV-G, WEW-J, WEY-A	WFE-B, WFF-A
3.50-1	WDM-T, WDM-W, WDM-AD, WEM-E1, WEN-E1, WEV-A, WEW-C, WEY-B	WFE-C, WFF-B, WFP-B, WFR-B
3.70-1	WDM-U, WDM-AE	WFE-A
4.11-1	WDM-V, WDM-Z, WDM-AB, WEM-A1, WEN-A1, WEV-C, WEW-A	WFE-D, WFP-A, WFR-A
4.57-1	WEM-C1	

1972-73

Axle Ratio	Conventional	Locking
3.00-1	WDM-AG1	
3.25-1	WDM-AC, WDM-AF, WDM-AH, WEV-G, WEW-J	
3.50-1	WDM-AJ1, WDM-T, WDM-W, WEM-E2, WEV-A, WEW-C	WFP-B2, WFR-B2
3.70-1	WDM-U, WEV-H, WEW-K	WFE-A
4.11-1	WDM-AB1, WEM-A2, WEW-A	WFP-A2, WFR-A2
4.57-1	WEM-C2	

1974

Axle Ratio	Conventional	Locking
3.00-1	WDM-AM, WDM-AG1	WDM-AV, WFE-K
3.25-1	WDM-AC, WDM-AH, WDM-AF, WDM-AN, WDM-AT, WDM-AY, WDM-AU, WEV-G1, WEW-J	WFE-L
3.50-1	WDM-AJ1, WDM-T, WEM-E3, WEV-A1, WDM-AK, WDM-AS, WDM-BA, WEW-C, WDM-AZ	WFE-J, WFR-B2, WFE-E, WFE-F
3.70-1	WDM-U, WDM-AL, WDM-AR, WEV-H1, WEW-K	WFE-A, WFE-M
4.11-1	WDM-AB1, WEM-A3, WEW-A, WFR-A2, WDM-BB	WFR-A2, WFE-G, WFE-H
4.57-1	WEM-C3	

REMOVAL & INSTALLATION

AXLE SHAFTS

Remove wheel and tire assembly, then remove brake drum. Work through hole in axle shaft flange to remove wheel bearing retainer nuts. Use suitable adaptor and slide hammer to remove axle shaft. Install one backing plate nut to hold plate in position. To install, reverse removal procedure, making sure that bearing is firmly seated in axle housing.

AXLE BEARINGS & SEALS

With axle shaft removed from vehicle, nick bearing retainer with chisel to loosen it for removal. Press or pull bearing from axle shaft after bearing retainer is removed. Remove axle shaft oil seal using suitable tool which will grip inside of seal. Install new bearing and retainer onto axle shaft by reversing removal procedure. *NOTE — Do not attempt to press bearing and inner*

1965-74 FORD MOTOR CO. SEPARATE HOUSING (Cont.)

retaining ring onto axle shaft at same time. Soak new oil seal in SAE 10 oil for at least ½ hour, then press seal into axle housing and seal outer edge with small amount of oil resistant sealer. Replace axle shaft, using care not to damage oil seal.

CAUTION — Whenever axle shaft is removed, oil seal should be replaced.

PINION FLANGE & SEAL

Removal — Mark propeller shaft end yoke and pinion flange for reassembly reference, then disconnect propeller shaft and tie out of way. Scribe marks on pinion shaft and pinion flange for reassembly reference, then measure and record pinion bearing preload. Remove pinion nut, washer and flange, then pry pinion oil seal from bore in bearing retainer.

Installation (Differential with Collapsible Spacer) — Press new oil seal into bore in bearing retainer and seal outer edge with oil resistant sealer. Install pinion flange, washer and new nut. Tighten pinion shaft nut slowly while rotating pinion flange to insure proper seating of pinion bearings. Continue tightening nut, taking frequent preload readings, until original preload is obtained. Once this reading is reached, tighten until an additional 8-14 inch lbs. of preload is obtained. *CAUTION — Do not exceed this preload or bearing failure may result. Do not back off pinion nut to lessen preload. If this is done, a new spacer MUST be installed.* Install propeller shaft.

Installation (Differential with Solid Spacer) — Press new oil seal into bore in bearing retainer and seal outer edge with oil resistant sealer. Install pinion flange, washer and new nut. Tighten pinion shaft nut slowly while rotating pinion flange to insure proper seating of pinion bearings. Continue tightening nut to 180-200 ft. lbs. Install propeller shaft.

DIFFERENTIAL CARRIER

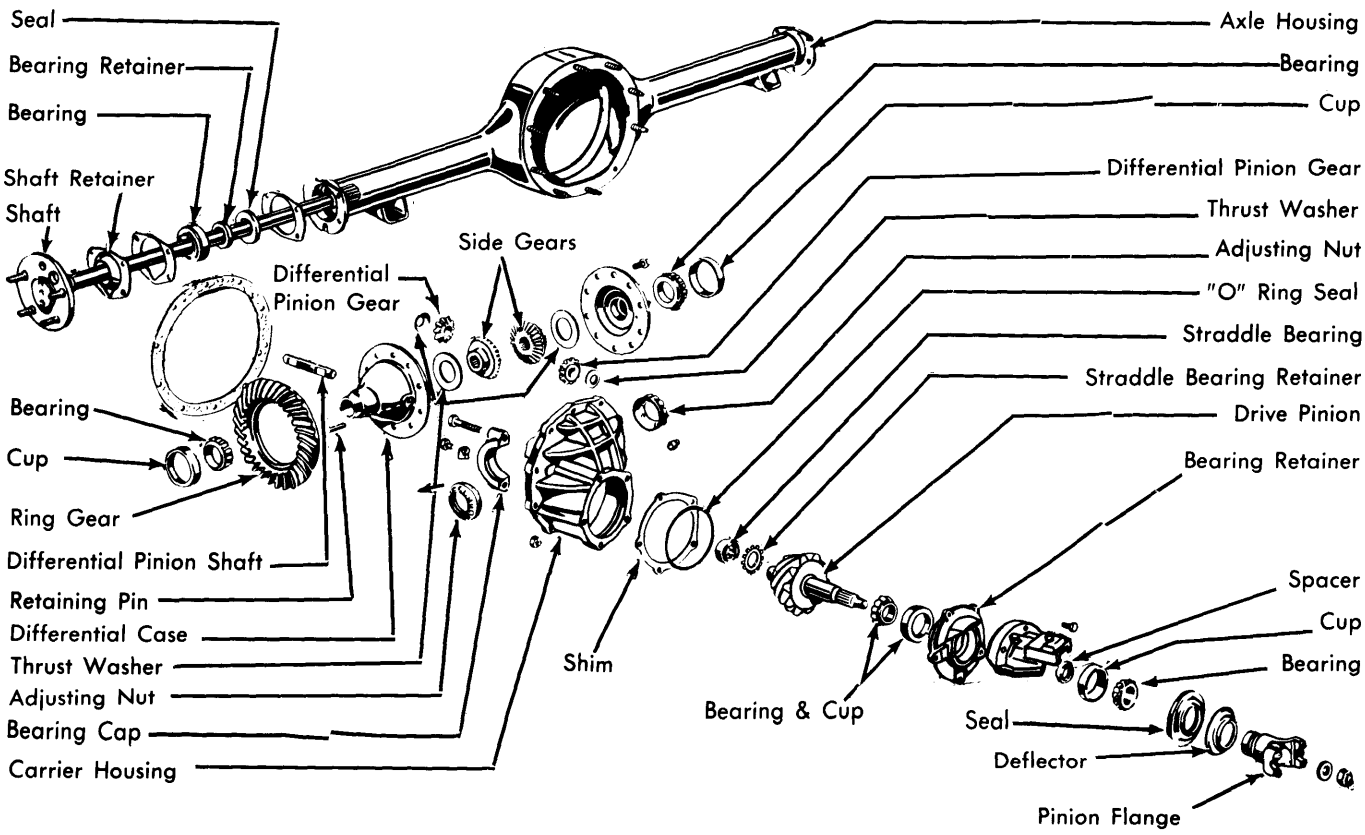
Remove both axle shafts, then mark propeller shaft end yoke and pinion flange for reassembly reference and remove propeller shaft. Drain rear axle lubricant, then remove carrier attaching bolts and differential carrier. To install, reverse removal procedure.

OVERHAUL

DISASSEMBLY

1) Mark differential bearing caps for reassembly reference, then remove adjusting nut locks, bearing caps and adjusting nuts. Remove differential case from carrier. Remove differential side bearings from case. Remove ring gear attaching bolts and tap ring gear from case using soft face hammer.

2) On 2-pinion differentials, drive out differential pinion shaft retaining pin, then mark case halves for reassembly reference



4FO03

FORD MOTOR CO. SEPARATE HOUSING AXLE ASSEMBLY

1965-74 FORD MOTOR CO. SEPARATE HOUSING (Cont.)

and separate case. Using brass drift, drive out pinion shaft. Remove differential side gears, pinion gears and thrust washers from case.

3) On 4-pinion differentials, drive out three differential pinion shaft retaining pins, then mark case halves for reassembly reference and separate case. Drive out long pinion shaft from end opposite retainer hole. Then drive two short shafts from case, working from center outward. Remove pinion shaft center block, side gears, pinion gears and thrust washers from case.

4) Remove pinion shaft nut, washer, pinion flange and seal from carrier. Remove pinion shaft and bearing retainer, noting number and thickness of shims between retainer and carrier. Remove straddle bearing and retainer from carrier using suitable driver and press pinion bearings from pinion shaft. Press bearing cups from bearing retainer.

REASSEMBLY & ADJUSTMENT

NOTE — Lubricate all parts with hypoid gear lubricant during assembly.

Case Assembly (2-Pinion Differential) — Place differential side gear and thrust washer into case bore. From outside of case, drive differential pinion shaft into case just far enough to retain pinion thrust washer and pinion gear, then place second pinion thrust washer and gear into position in case. Drive pinion shaft into place, making sure shaft retainer holes are in alignment with holes in case. Install second side gear and thrust washer, assemble case halves and install retainer pin. Install differential side bearings and ring gear and tighten ring gear bolts.

Case Assembly (4-Pinion Differential) — Place differential side gear and thrust washer into case bore. Place thrust washers and pinion gears into position on side gear, making sure holes in gears and washers are in alignment with holes in case. Install center block, making sure it is aligned with pinion gears, then drive two short pinion shafts into place in case. Drive long shaft into place in case from retainer hole end of case. Place second side gear and thrust washer into position in case. Assemble case halves; install differential side bearings, shaft retaining pins and ring gear, then tighten ring gear bolts.

Drive Pinion Depth — 1) Press new pinion bearing cups into bearing retainer until fully seated. Install straddle bearing into bore in carrier, then install NEW straddle bearing retainer in carrier and fully seat bearing and retainer. Press rear pinion bearing onto pinion shaft.

2) Determine pinion shim thickness as follows: If same ring, pinion and axle housing being reused, intall shim pack of same thickness as originally used. If new components being used, install "nominal" thickness shim and make tooth contact pattern check to determine further shim requirements.

Pinion Bearing Preload (W/Collapsible Preload Spacer) — 1) Place NEW preload spacer on drive pinion shaft. Install front pinion bearing and bearing retainer. Press bearing into position being careful not to crush spacer. Install "O" ring in groove in bearing retainer, place selected pinion depth shim on carrier housing, then install pinion assembly and tighten bolts.

2) Install pinion flange, washer and nut. Tighten pinion flange nut to 175 ft. lbs. *NOTE — Do not exceed 175 ft. lbs. at this time.* Check pinion bearing preload. Continue to tighten pinion flange nut until proper preload is obtained. *CAUTION — Do not overtighten nut.* If excessive preload is obtained as a result of overtightening, replace collapsible spacer. *CAUTION — Do not back off nut to obtain preload. If torque on pinion shaft is less than 175 ft. lbs. after preload is established, a new collapsible spacer MUST be installed.*

Pinion Bearing Preload (W/Solid Preload Spacer) — 1) Place thickest available preload spacer against rear bearing on pinion shaft. *NOTE — Thickest spacer must be tried first because bearing preload can be measured accurately only when pinion nut is fully tightened. If smaller spacer used first, high torque on pinion nut will damage bearings.* Install front pinion bearing and bearing retainer on pinion shaft and place assembly in suitable holding fixture.

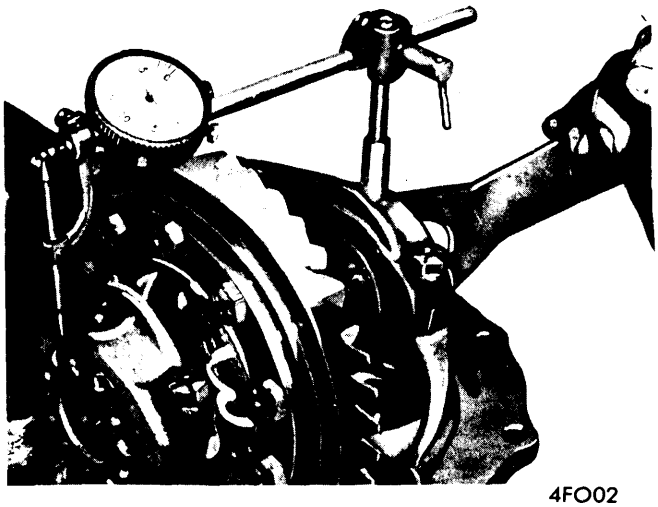
2) Install pinion flange and OLD pinion flange washer and nut. Tighten nut to 180-220 ft. lbs. while rotating pinion gear. Note beginning of slight drag on gear which indicates preload. If no preload obtained, install smaller preload spacer, then repeat preload procedure until correct preload is obtained.

CAUTION — Both pinion nut torque and pinion bearing preload must be obtained simultaneously.

3) With preload properly adjusted, remove OLD pinion nut and install and tighten NEW pinion nut. Install pinion assembly in carrier and tighten bolts.

Backlash & Side Bearing Preload — 1) Place cups on differential side bearings and set differential case in carrier. Slide assembly along bores until a slight amount of backlash is felt between gear teeth. Set adjusting nuts in bores so nuts just contact bearing cups (each nut should be engaging approximately same number of threads). Carefully position bearing caps on carrier, install bearing cap bolts and tighten to 20 ft. lbs.

2) Loosen right adjusting nut until nut is away from cup. Tighten left adjusting nut until there is no backlash. Tighten right nut two notches past initial contact with cup, then rotate ring gear several revolutions in each direction to properly seat loaded bearings.



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DIAL INDICATOR INSTALLATION TO ADJUST SIDE BEARING PRELOAD

1965-74 FORD MOTOR CO. SEPARATE HOUSING (Cont.)

3) Loosen right adjusting nut and eliminate any existing backlash by tightening left adjusting nut. Carefully tighten right adjusting nut until it just contacts bearing cup. Continue to tighten right nut to obtain correct case spread (2.5-3 notches in 1965).

4) Install dial indicator on carrier so contact tip of indicator bears against face of gear tooth on outer diameter of ring gear. Measure backlash at several locations around ring gear. If measurements vary more than .003", there is excessive runout in gear or mounting. If backlash not correct, loosen one adjusting nut and tighten opposite nut an equal amount to move ring gear into adjustment. *NOTE — When moving adjusting nuts, final movement should always be made in a tightening direction. If nut must be loosened one notch, loosen nut two notches and tighten it one notch.*

TIGHTENING SPECIFICATIONS

Application	Torque (Ft. Lbs.)
Side Bearing Cap Bolts	75-85
Ring Gear Bolts	60-80
Pinion Flange Nut	
W/Collapsible Spacer	175
W/Solid Spacer	180-220
Bearing Retainer-to-Carrier Bolts	30-45
Carrier-to-Housing Bolts	30-40
Adjusting Nut Lock Bolts	12-15

5) Make gear tooth pattern check and install carrier into axle housing.

AXLE ASSEMBLY SPECIFICATIONS

Ring Gear Backlash	
1965	.004-.009"
1966-74	.008-.012"
Ring Gear Runout (Maximum)	.003"
Backlash Variation (Maximum)	.003"
Side Bearing Preload	
1965	2.5-3 Notches
1966-74	
New Bearings	.008-.012"
Used Bearings	.005-.008"
Pinion Bearing Preload	
Solid Spacer	12.5-31.5 in. lbs.
Collapsible Spacer	
New Bearings	22-32 in. lbs.
Used Bearings	10-14 in. lbs.
Side Gear Thrust Washer Thickness	.030-.032"
Pinion Gear Thrust Washer Thickness	.030-.032"
Nominal Pinion Shim Thickness	
1965-67	.020"
1968-74	.015"