(5) REMOVE LOWER LEVERS. Loosen clamp bolt in declutching control lower inner lever and slide lever off end of shaft. Remove Woodruff key from shaft. Slide high and low control lower lever off end of shaft. Loosen clamp bolt in declutching control lower outer lever and slide lever outward (to right) on shaft until Woodruff key is exposed. Remove Woodruff key, then slide shaft inward (toward transmission) and remove lever from right-hand end of shaft.

g. Control Levers Installation.

(1) INSTALL LOWER LEVERS. Insert control lever shaft through bracket inner bushing with keyway end of shaft toward center of vehicle. Position declutching control lower outer lever on right-hand end of shaft with stop pad toward center of vehicle. Move shaft outward (to right) through support bracket inner bushing and declutching control lever until keyseat in shaft is exposed between lever and inner bushing in bracket. Tap Woodruff key into keyseat in shaft, aline key with keyway in lever, and move shaft outward (to right) until outer end of shaft enters right-hand bushing in bracket. Place high and low speed control lower lever over left-hand end of shaft with groove in lever toward center of vehicle. Tap Woodruff key into keyseat in inner end of shaft and install declutching control lower inner lever on shaft, with key alined with keyway in lever. With inner end of shaft even with inner side of declutching control lower inner lever, tighten clamp bolt in declutching control lower inner lever. Locate shaft in support bracket so levers are free and with declutching control outer lever against inner bushing in bracket; then tighten clamp bolt in declutching control lower outer lever.

(2) INSTALL TRANSMISSION COVER ASSEMBLY. Position a new gasket on top of transmission case. Place gearshift lever into neutral position and place cover assembly over transmission case with one edge of cover resting on corresponding edge of case and other edge tilted up. Visually check alinement of shift forks in cover with collars on gears in transmission. If gears have been moved, slide them on shaft as necessary to aline collars with forks. Make sure first and reverse rocker arm is positioned to engage rocker lug on left-hand shift rod in cover, then lower cover assembly into place on transmission. Install eight cover to case cap screws, and install power take-off support bracket on left-hand side (if used). Attach speedometer cable clip to left side of cover, using cap screw and lock washer. Move gearshift lever to all positions. If gearshift lever binds, or if gears cannot be easily shifted, remove cover and recheck alinement of shift forks and collars in gears.

(3) INSTALL HAND BRAKE LEVER AND BRACKET. Position hand brake lever and bracket assembly on right-hand side of transmission cover and attach with two cap screws and lock washers. The forward cap crew also attaches the engine ground strap, using a flat washer between the ground strap and lock washer. Connect hand brake rod to hand brake lever, using clevis pin and new cotter pin, and adjust hand brake (par. 193).

(4) INSTALL UPPER LEVERS. Install upper levers on high and low speed control lower lever and declutching control lower outer

lever, attaching each with two bolts, nuts, and lock washers.

(5) INSTALL FLOOR PAN. Install floor pan over levers in cab and attach with 12 cap screws and lock washers. Install floor seal over hand brake lever and transfer case control levers.

h. High and Low Speed Control Cross Shaft and Brackets Installation.

(1) ASSEMBLE LEVERS, CROSS SHAFT, AND RIGHT-HAND BRACKET. Insert cross shaft through right-hand cross shaft support bracket, with grooved end of shaft toward left side of vehicle. Slide anti-rattle over left end of cross shaft. Tap Woodruff key into keyseats in shaft and install cross shaft levers on shaft. Tighten clamp bolts in levers firmly.

(2) INSTALL RIGHT-HAND SUPPORT BRACKET AND CROSS SHAFT ASSEMBLY. Position right-hand bracket and cross shaft assembly with holes in bracket over two studs in right-hand side of transmission. Install nuts and lock washers on studs and tighten firmly.

(3) INSTALL LEFT-HAND SUPPORT BRACKET. On vehicles without power take-off, place left-hand bracket over studs in left-hand side of transmission and over left-hand end of cross shaft. Install nuts and lock washers on studs and tighten firmly. Install retainer spring on left-hand end of cross shaft. Connect and adjust transmission strut rod (par. 155). On vehicles with power take-off, the procedure is the same except that the rear stud is replaced by a power hoist and/or winch control lever stud. Install power hoist and/or winch control levers (pars. 157 and 158).

i. Control Rods Installation. Check clevis pins for wear and discard any that are not full size. Obtain new pins for installation. Attach high and low speed control rod (rear) to high and low speed shifter shaft at transfer case and to left-hand cross shaft lever, using clevis pins and new cotter pins. Attach high and low peed control rod (front) to right-hand cross shaft lever in same manner, with adjustable yoke toward front of vehicle. Connect declutching control rod to declutching shifter shaft, using clevis pin and new cotter pin, with adjustable yoke toward front of vehicle. Adjust controls and connect rods to their respective control levers (subpars. **b** and **c** above). Lubricate linkage as directed in Section VIII.

161. TRANSFER CASE REMOVAL.

a. Drain Lubricant. Remove drain and filler plugs and allow lubricant to drain from transfer case. After draining, install and tighten plugs.

b. Disconnect Control Rods (fig. 144 or 145). Disconnect high and low speed control rod (rear) and declutching control rod from shifter shafts at transfer case by removing cotter pins and clevis pins.

c. Disconnect Speedometer Cable. Disconnect speedometer cable from transfer case idler shaft front cap by unscrewing knurled nut with pliers and pulling cable out of speedometer driven gear shaft.

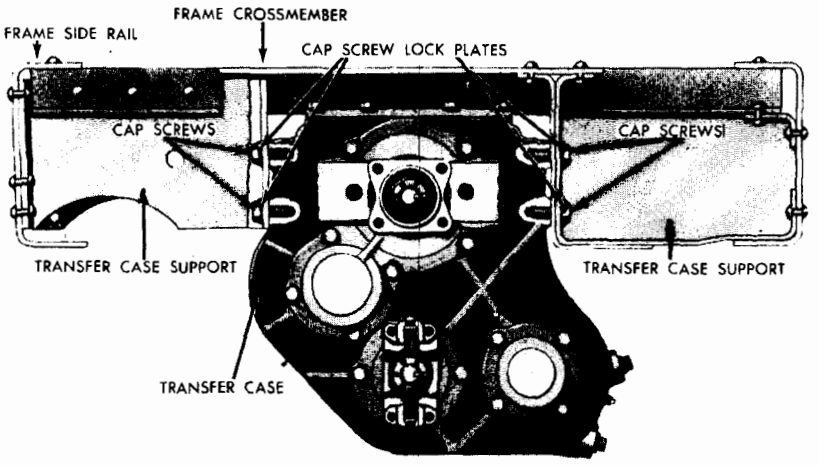


Figure 146—Transfer Case Mounting (Used with Banjo Type Axles)

d. Disconnect Hand Brake Control Rod and Propeller Shafts. Disconnect hand brake control rod at rear of transfer case by removing cotter pin and clevis pin. Disconnect propeller shafts at transfer case, two in front and two at rear.

e. Remove Transfer Case.

(1) WITH BANJO TYPE AXLES (fig. 146). Place dolly jack under transfer case and raise into position to support case. Bend cap screw lock plates away from cap screw heads and remove eight cap screws, four on each side. Lower transfer case on jack and withdraw from under vehicle.

(2) WITH SPLIT TYPE AXLES (fig. 147). Lift co-driver's seat up and latch in raised position. Remove access plate from cab floor just to the right of the driver's seat. On late vehicles, remove spare parts container from under co-driver's seat. Position jack under transfer case and raise into position to support case. Bend cap screw lock plates away from cap screw heads and remove four cap screws, two from crossmember and two from transfer case support. Lower transfer case on jack and remove from under vehicle. Do not lose spacers from top of transfer case.

f. Remove Hand Brake Assembly. Remove hand brake assembly from rear of transfer case (pars. 194 and 195).

162. TRANSFER CASE INSTALLATION.

a. Install Hand Brake Assembly. Install hand brake assembly on rear of transfer case (pars. 194 and 195).

b. Install Transfer Case.

(1) WITH BANJO TYPE AXLES (fig. 146). Place transfer case assembly on dolly jack and roll into approximate position under

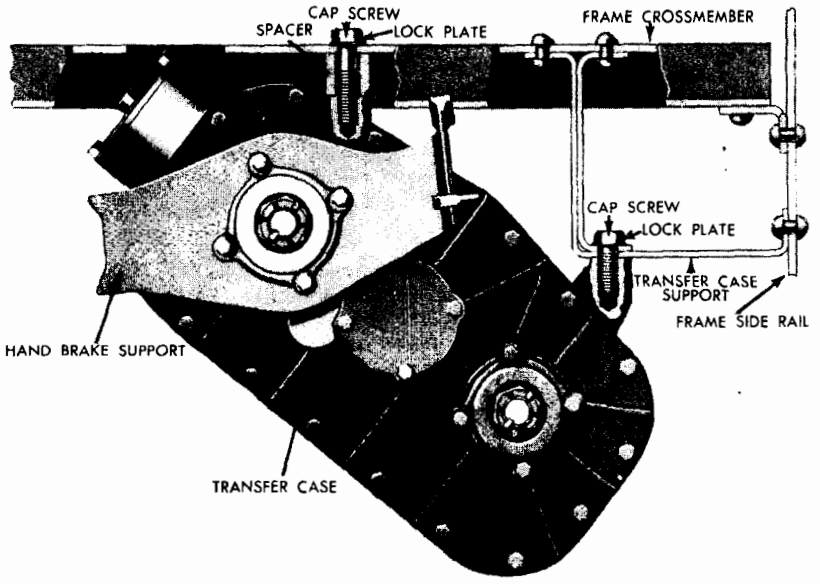


Figure 147—Transfer Case Mounting (Used with Split Type Axles)

vehicle. Raise transfer case into position between supports and aline holes in supports with threaded holes in case. With lock plates under cap screw heads, install eight cap screws, four in each side. Tighten cap screws firmly and bend lock plates against cap screw heads. Lower dolly jack and remove from under vehicle.

(2) WITH SPLIT TYPE AXLES (fig. 147). Place transfer case on dolly jack and roll into approximate position under vehicle. Raise transfer case into position, being sure spacers are in place between top of transfer case and crossmember. With lock plates installed under cap screw heads, install four cap screws, two through crossmember and spacers and two through transfer case support. Tighten cap screws firmly and bend lock plates against cap screw heads. Install access plate on cab floor and install spare parts box (if used). Lower jack and remove from under vehicle.

c. Connect Hand Brake Control Rod and Propeller Shafts. Connect hand brake control rod at rear of transfer case, using clevis pin and new cotter pin. Adjust hand brake (par. 193). Connect propeller shafts to transfer case, two at front and two at rear (par. 176).

d. Connect Speedometer Cable. Connect speedometer cable to transfer case idler shaft front cap. Be sure that tongue on end of cable meshes with speedometer driven gear shaft and tighten knurled nut with pliers.

e. Connect Control Rods (fig. 144 or 145). Connect high and low speed control rod (rear) and declutching control rod to their

respective shifter shafts at transfer case, using clevis pins and new cotter pins. Adjust transfer case control linkage (par. 160).

f. **Lubricate.** Check condition of magnetic drain plug [(GM-602745) G85-32-02340], and replace if necessary. Fill transfer case to proper level with lubricant as recommended in Section VIII. Make sure drain and filler plugs are tight.

Section XXX

FRONT AXLE

163. DESCRIPTION.

a. **Description.** This section covers two types of axles, the split type and the banjo type (fig. 7, Section II). The split or two-piece type is so called since the housing is made in two pieces, bolted together at the differential. The banjo type housing is of one-piece construction. Each is a single-reduction, bevel-gear driving unit with full-floating axle shafts having constant velocity universal joints at the steering knuckles. Both types are mounted on semi-elliptic springs.

b. **Operation.** Power is transmitted from the transfer case to the front axle by a tubular propeller shaft. The engagement and disengagement of the front axle is controlled at the transfer case by a shift lever in the cab. Detailed instructions covering front axle engagement and disengagement are given in paragraph 16.

c. **Data.**

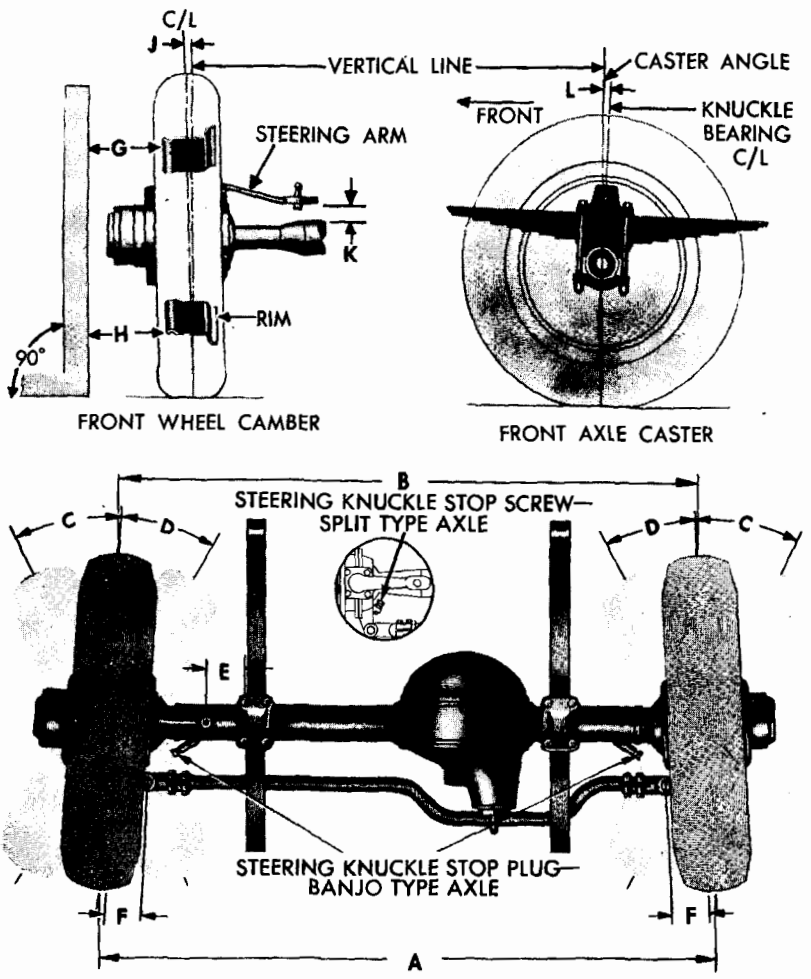
Type	*GM Number*
Banjo Type (with conventional brake drums)	3663017
Banjo Type (with demountable brake drums)	3678601
Split Type (with Bendix-Weiss universal joints)	2162378
Split Type (with Rzeppa universal joints)	2170974

164. FRONT WHEEL ALINEMENT.

a. Front wheel alinement has a major effect on steering from a standpoint of control, ease of steering, and safety. Front wheel misalinement is a major cause of premature and uneven tire wear. The factors involved in front wheel alinement are caster, camber, turning angle, and toe-in. These factors apply to both the split type and banjo type axles.

b. **Caster.** Front axle caster is the inclination of the center line through the upper and lower steering knuckle trunnions toward the rear of the vehicle (L, fig. 148). Caster is established by design and will be changed only by the shifting of the front axle on the

TRUCK, 2½-TON, 6 x 6



A MINUS B TOE-IN
C TURNING ANGLE (INSIDE)
D TURNING ANGLE (OUTSIDE)
E CENTER LINE OF STEERING ARM BALL TO OUTSIDE OF SPRING
F BRAKE FLANGE PLATE TO CENTER LINE OF TIE-ROD YOKE BOLT
H MINUS G WHEEL CAMBER (INCHES)
J WHEEL CAMBER (DEGREES)
K BOTTOM OF STEERING ARM TO TOP OF AXLE HOUSING
L CASTER ANGLE (DEGREES)

RA PD 332781

Figure 148—Front Wheel and Axle Alinement Chart

springs or by the distortion of the chassis frame or springs. There is no adjustment for caster.

c. **Camber.** Front wheel camber is the outward inclination of the wheels as viewed from the front of the vehicle, that is, the wheels are farther apart at the top than at the bottom (J, fig. 148). There is

no adjustment for camber; however, loose wheel bearings, loose knuckle trunnion bearings, a bent steering knuckle, or bent axle housing will affect camber.

d. **Turning Angle.** Front wheel turning angle is the maximum angle through which the wheels may be turned from the straight-ahead position. This angle is greater for the inside wheel (C, fig. 148), than for the outside wheel (D, fig. 148).

e. **Toe-in.** Front wheel toe-in is the amount by which the wheels are closer together at the front than at the rear, with the wheels in a straight-ahead position. (A minus B, fig. 148.) Camber causes both wheels to have a tendency to turn outward from the vehicle. Toe-in counteracts this tendency and causes the wheels to roll straight ahead with no scuffing action.

165. TOE-IN ADJUSTMENT.

a. **Toe-in Check** (fig. 148). Inflate tires to correct pressure (par. 198), and place vehicle on a smooth, level surface with the wheels in straight-ahead position. Place gage (41-G-510) between the wheels ahead of the axle, with the ends of the gage bearing against the tire side walls and with both pendant chains just touching the ground. Set gage so pointer registers zero. Move the vehicle forward until gage is brought into position in back of the axle, with both pendant chains just touching the ground. The pointer will indicate the amount of toe-in or toe-out. Correct toe-in on both the banjo and split type axles is $\frac{1}{16}$—$\frac{3}{16}$ inch.

b. **Toe-in Adjustment.** Loose wheel bearings, worn bushings in steering knuckle supports, damaged wheels, a bent steering knuckle,

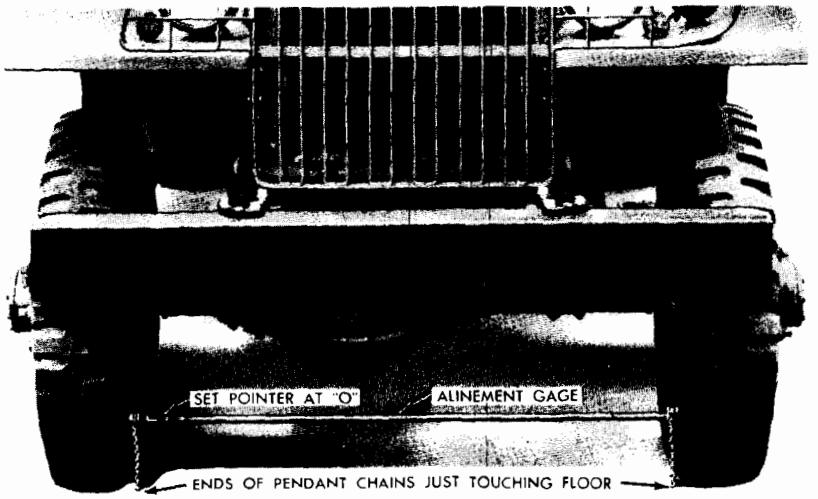


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Figure 149—Checking Toe-In (Gage 41-G-510)

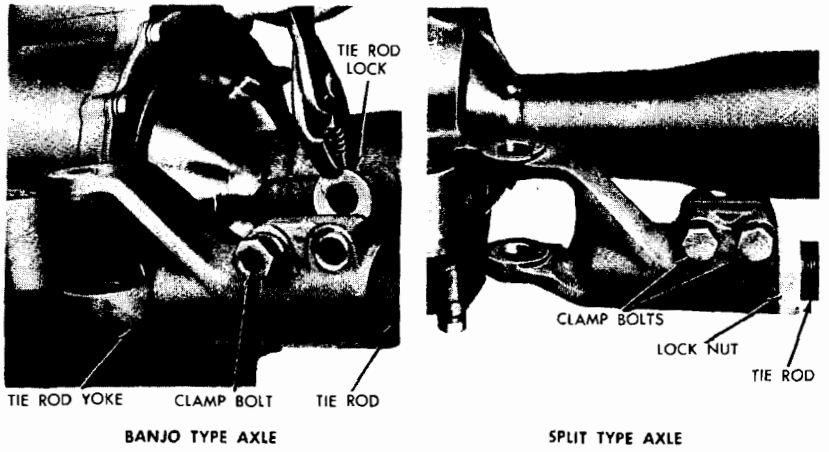


Figure 150—Tie Rod Yokes

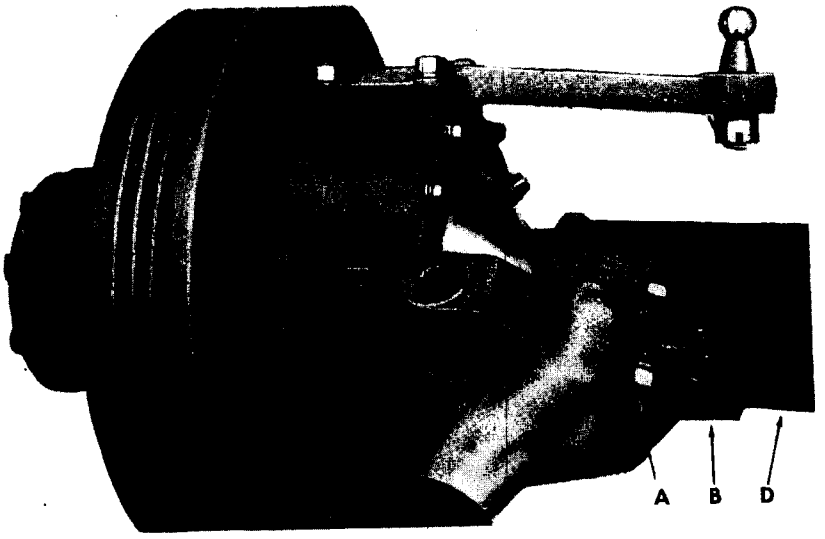
a bent axle housing, or a bent or improperly adjusted tie rod will affect toe-in. Adjust the wheel bearings (par. 199) and replace the wheels, if damaged (par. 197), before adjusting the tie rod to correct toe-in.

(1) REMOVE TIE ROD (fig. 150). Remove tie rod (par. 166). On banjo type axles, remove the inner tie rod yoke clamp and lock from left-hand tie rod yoke and loosen all clamp bolts. On split type axles, loosen the yoke clamp bolts and loosen the lock nut at the left end yoke.

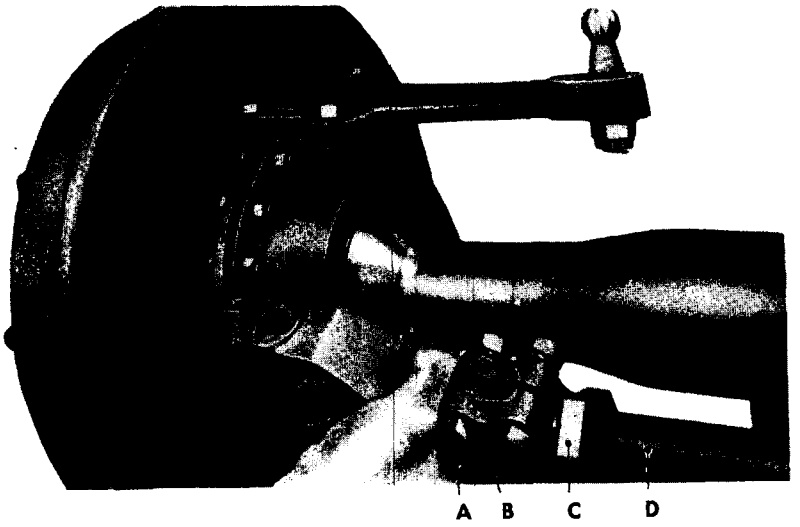
(2) ADJUST TIE ROD (fig. 151). Screw yokes onto or off of tie rod as required to correct toe-in. Toe-in will be increased about ⅛ inch by backing right-hand yoke (coarse threads) one turn further onto rod. Reversing this procedure will decrease toe-in by the same amount.

(3) CHECK ADJUSTMENT. After adjusting tie rod yokes, install tie rod yokes on steering knuckle supports (or inner flanges), and install each tie rod yoke bolt (fig. 152). It is not necessary to install nuts on yoke bolts until final adjustment has been made. Measure toe-in and readjust tie rod if necessary until toe-in measurement is correct.

(4) INSTALL TIE ROD. When adjustment is correct, reassemble tie rod yokes to steering knuckle supports (or inner flanges), install tie rod yoke bolts (fig. 152), and install nuts on bolts. Tighten nuts securely and install new cotter pins. On split type axles, tighten tie rod yoke clamp bolts and tighten lock nut at left-hand yoke (fig. 150). On banjo type axles, insert lock in left-hand tie rod yoke, making certain it is seated in keyway in tie rod, and aline hole in lock with clamp bolt hole (fig. 150). Insert clamp bolts, install nuts and lock washers, and tighten securely.



BANJO TYPE AXLE



SPLIT TYPE AXLE

A TIE ROD YOKE CLAMP BOLT
B TIE ROD YOKE
C TIE ROD YOKE LOCK NUT
D TIE ROD

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Figure 151—Adjusting Toe-In

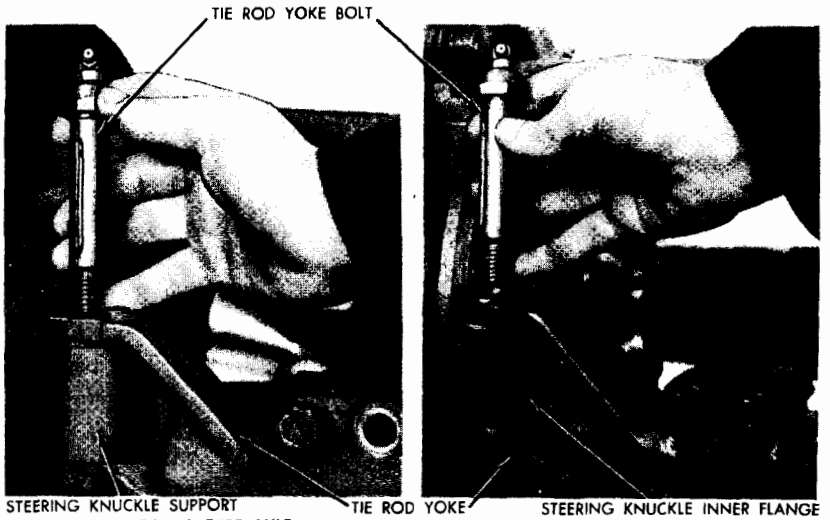

Figure 152—Installing Tie Rod Yoke Bolts RA PD 332846

166. TIE ROD.

a. The tie rod is a solid rod, threaded at each end with a double offset to clear the differential and pinion housing. The tie rod is connected to the steering knuckle supports (or inner flanges) by means of yokes, screwed onto the ends of the rod, and attached to the steering knuckle supports (or inner flanges) by tie rod yoke bolts, nuts, and cotter pins. On the banjo type axle (fig. 150), the tie rod is held in the correct relative position to the pinion housing by a lock at left end which is fitted into a keyway in the rod and held in place by the tie rod yoke inner clamp bolt. On the split type axle (fig. 150), this is accomplished by a lock nut tightened against the left end yoke. The threaded portion of each yoke is split and is held tightly on the rod by clamp bolts.

b. Removal.

(1) POSITION VEHICLE. Place vehicle on a level surface and apply hand brake. Place a jack under front axle housing and raise enough to take weight of vehicle off front wheels.

(2) REMOVE TIE ROD YOKE BOLTS. Remove cotter pin and nut from tie rod yoke bolt at each end of tie rod. Force bolts up out of tie rod yokes, and slide tie rod yokes off steering knuckle supports (or inner flanges).

c. Installation. Toe-in must be adjusted when installing tie rod. Complete instructions on adjusting toe-in and installing tie rod on both the split and banjo type axles are given in paragraph 165.

FRONT AXLE

167. AXLE SHAFT AND UNIVERSAL JOINTS.

a. General. The following procedures are to be used only to remove the axle shaft and universal joint assemblies for cleaning and inspection (par. 46), and special lubrication operations (Section VIII). Procedures apply to both the right- and left-hand assemblies unless otherwise stated in text.

b. Axle Shaft and Universal Joint Removal (Banjo Type Axles).

(1) REMOVE WHEEL. Jack up front end of vehicle, remove wheel stud nuts, and remove wheel and tire assembly.

(2) REMOVE DRIVE FLANGE. Remove eight cap screws and lock washers (or lock plate) attaching drive flange to hub. Install two drive flange cap screws in the two tapped holes in drive flange and pull drive flange off splined outer end of axle shaft by alternately turning in the two cap screws. Remove drive flange to hub gasket [(GM-3659733) G85-31-05780].

(3) REMOVE HUB AND DRUM ASSEMBLY. Remove wheel bearing adjusting nuts and remove hub and drum assembly.

(4) REMOVE ANCHOR PLATE AND BRAKE SHOE ASSEMBLY (fig. 168). Install wheel cylinder clamp on wheel cylinder to prevent ends coming off and remove brake shoe return spring. Remove six cap screws and lock washers attaching brake shoe anchor plate to anchor plate spacer and remove anchor plate and brake shoe assembly.

(5) REMOVE ANCHOR PLATE SPACER AND OIL DEFLECTOR. Remove 12 cap screws and lock washers attaching brake shoe anchor plate spacer, inner oil deflector, brake flange plate, and steering knuckle to steering knuckle support and remove anchor plate spacer and oil deflector.

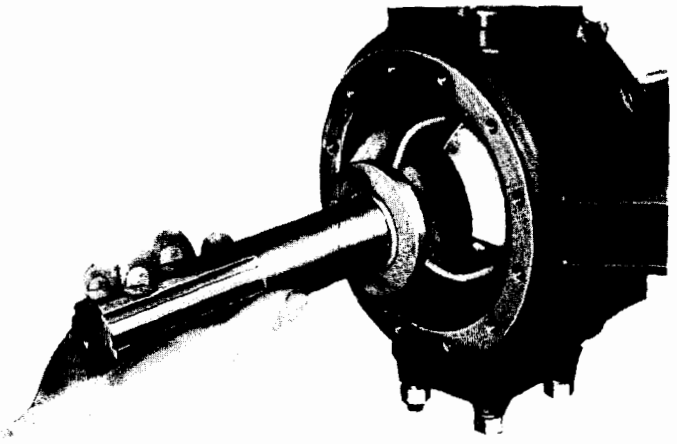

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Figure 153—Removing Axle Shaft and Universal Joint Assembly (Banjo Type Axle)

(6) REMOVE BRAKE FLANGE PLATE AND STEERING KNUCKLE. Slide brake flange plate off steering knuckle and support it with a piece of wire to eliminate disconnecting brake hose. Remove steering knuckle and gasket from steering knuckle support.

(7) REMOVE AXLE SHAFT AND UNIVERSAL JOINT ASSEMBLY (fig. 153). Pull axle shaft and universal joint assembly out of axle housing.

c. Cleaning, Inspection, and Special Lubrication Operations (Banjo Type Axles).

(1) CLEANING. Thoroughly wash axle shaft and universal joint in dry-cleaning solvent to remove all old lubricant; also wash inside of steering knuckle support and housing outer end.

(2) INSPECTION. Inspect balls and ball races for grooved, scratched, or pitted condition. To determine if excessive play or backlash exists in the universal joint, place the assembly in a vise in a vertical position with the outer shaft up, and with vise jaws gripping the inner shaft just below the universal joint. Use soft metal or wood protectors in jaws of vise. Firmly push down on outer shaft so that it rests on center ball, and at the same time attempt to twist the joint in both directions. If any play or backlash is evident, report to higher authority. Inspect axle shaft thrust washers in steering knuckle and axle housing for excessive wear or damage. Examine axle shaft splines for nicks, cracks, or other damage. Report all worn or damaged conditions to higher authority.

(3) SPECIAL LUBRICATION. Pack new lubricant (Section VIII), well into universal joint until it fills all space between balls and universal joint yokes. Also spread lubricant on surfaces which contact thrust washers and bushing in steering knuckle.

d. Axle Shaft and Universal Joint Installation (Banjo Type Axles).

(1) INSTALL AXLE SHAFT AND UNIVERSAL JOINT. Using care not to damage oil seal in housing outer end, insert axle shaft and universal joint assembly into axle housing, guiding splined end of inner shaft into splined differential side gear.

(2) INSTALL STEERING KNUCKLE. Place steering knuckle over outer end of axle shaft and position against steering knuckle support, using a new gasket between knuckle and support. Milled slot on threaded end of steering knuckle must be at the top.

(3) INSTALL BRAKE FLANGE PLATE, INNER OIL DEFLECTOR, AND BRAKE SHOE ANCHOR PLATE SPACER. Place brake flange plate, inner oil deflector, and brake shoe anchor plate spacer on steering knuckle support, and install 12 cap screws and lock washers. Anchor plate spacer must be positioned with center line through any two opposite bosses horizontal. Tighten cap screws firmly.

(4) INSTALL ANCHOR PLATE AND BRAKE SHOE ASSEMBLY. Using six cap screws and lock washers, attach anchor plate and brake shoe assembly to anchor plate spacer and tighten cap screws firmly. Install brake shoe return spring and remove wheel cylinder clamp.

(5) INSTALL HUB AND DRUM ASSEMBLY. Install hub and drum assembly and adjust wheel bearings (par. 199).

(6) INSTALL DRIVE FLANGE. Using a new drive flange gasket coated with grease, install drive flange over splined outer end of axle shaft and position against hub. Install drive flange cap screws and lock washers, and tighten to 85 - 95 foot-pounds.

(7) INSTALL WHEEL. Install wheel and tire assembly on hub, install wheel stud nuts, and tighten firmly. Lower jacks and remove from under vehicle.

(8) LUBRICATE. Lubricate steering knuckle and universal joint (Section VIII).

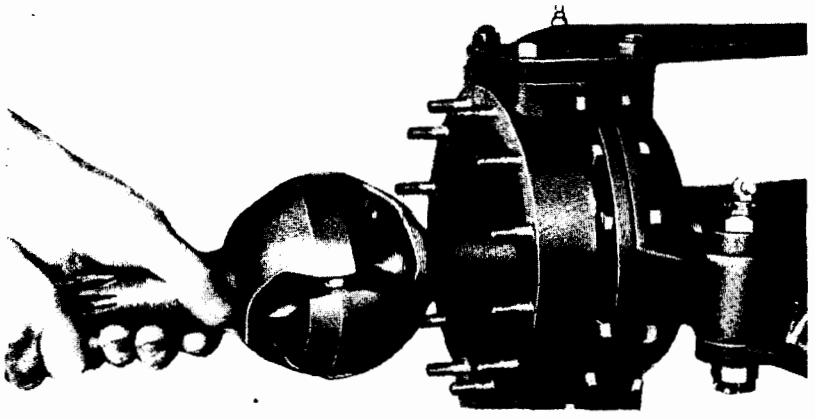
e. Axle Shaft and Universal Joint Removal (Split Type Axles). NOTE: *Two types of axle shaft and universal joints are used in split type axles—Bendix Weiss and Rzeppa. The following procedures cover both types with exceptions noted in text.*

(1) REMOVE WHEEL. Jack up front end of vehicle, remove wheel stud nuts, and remove wheel and tire assembly.

(2) REMOVE DRIVE FLANGE. Remove eight nuts and lock washers from studs attaching drive flange to hub. Remove universal joint stop bolt and stop from center of drive flange. Install two 3/8-inch cap screws in two tapped holes in drive flange. Pull drive flange off axle shaft and out of hub by alternately turning in the two cap screws. Remove drive flange to hub gasket [(GM-2144671) G57-01-94016].

(3) REMOVE HUB AND DRUM ASSEMBLY. Remove wheel bearing adjusting nuts and remove hub and drum assembly.

(4) REMOVE OIL SHIELD AND BRAKE DUST SHIELD. Remove 12 nuts and lock washers from studs attaching brake dust shield, oil shield, and steering knuckle to outer steering knuckle flange. Remove oil shield and brake dust shield; support brake dust shield with a piece of wire to eliminate disconnecting brake hose.



RA PD 64662

Figure 154—Removing Axle Shaft and Universal Joint Assembly (Split Type Axle)

(5) REMOVE STEERING KNUCKLE. Remove steering knuckle from outer steering knuckle flange. Knuckle can be loosened from flange by tapping on side of knuckle with a brass hammer and driving wedge blocks between the knuckle and flange.

(6) REMOVE AXLE SHAFT AND UNIVERSAL JOINT ASSEMBLY (fig. 154). Withdraw axle shaft and universal joint assembly from axle housing.

f. Cleaning, Inspection, and Special Lubrication Operations (Split Type Axles).

(1) BENDIX-WEISS. The Bendix-Weiss axle shaft and universal joint assemblies used in split type axles are essentially the same as those used in banjo type axles, and procedures given under subparagraph c above apply equally to these assemblies. CAUTION: *Do not disturb spacer pins in inner ends of shafts.*

(2) RZEPPA.

(a) Cleaning. Thoroughly wash axle shaft and universal joint assembly in dry-cleaning solvent to remove all old lubricant; also wash inside of steering knuckle flanges and housing outer end.

(b) Inspection. Check universal joint for excessive wear or rough operation by mounting the assembly in a vise with universal joint bell up and vise jaws gripping the shaft just below the universal joint. Use soft metal or wood protectors in vise jaws. Swing universal joint bell through its normal operating range and note any roughness or excessive looseness. If such a condition is evident, report to higher authority. Also check splines on axle shaft and universal joint bell for nicks, cracks, or other damage.

(c) Special Lubrication. Pack new lubricant (Section VIII) well into universal joint until it fills all space between balls, cage, inner race, and universal joint bell. Also spread grease on surface of universal joint bell which contacts bushing in steering knuckle.

g. Axle Shaft and Universal Joint Installation (Split Type Axles).

(1) INSTALL AXLE SHAFT AND UNIVERSAL JOINT. Using care not to damage oil seal in axle housing near differential, insert axle shaft and universal joint assembly into axle housing, guiding splined end of inner shaft into splined differential side gear.

(2) INSTALL STEERING KNUCKLE, BRAKE DUST SHIELD, AND OIL SHIELD. Slide steering knuckle over outer end of axle shaft and position on studs in outer steering knuckle flange with milled slot in threaded end at top. Install brake dust shield and oil shield on studs and attach with 12 nuts and lock washers.

(3) INSTALL HUB AND DRUM ASSEMBLY. Install hub and drum assembly and adjust wheel bearings (par. 199).

(4) INSTALL DRIVE FLANGE. Install drive flange over splined outer end of axle shaft, using a new gasket coated with grease between flange and hub. Aline holes in flange with studs in hub and push flange in against hub. Place universal joint stop in center of drive flange, install stop bolt through stop into end of axle shaft,

and tighten firmly. Install eight nuts and lock washers on drive flange to hub studs and tighten nuts to 58-62 foot-pounds.

(5) INSTALL WHEEL. Install wheel and tire assembly on hub, install wheel stud nuts, and tighten firmly. Lower jacks and remove from under vehicle.

(6) LUBRICATE. Lubricate steering knuckle and universal joint (Section VIII).

168. FRONT AXLE REMOVAL.

a. Both the banjo and split type axles may be removed by the same procedure with exceptions noted in text.

b. Position Vehicle. Place vehicle on a level surface and apply hand brake to prevent vehicle from rolling. Place a dolly jack under differential housing and raise front end of vehicle high enough to permit withdrawing axle assembly. Place blocks under frame side rails at rear of front spring hanger brackets. Lower dolly jack until entire front end weight rests on blocks. Leave dolly jack raised high enough to support axle assembly.

c. Remove Wheels. Remove wheel stud nuts and remove wheel and tire assembly from each side.

d. Disconnect Propeller Shaft. Disconnect propeller shaft at differential. Tie propeller shaft up to prevent universal joint from becoming damaged or filled with dirt.

e. Disconnect Drag Link. Disconnect drag link at axle steering arm (par. 207).

f. Disconnect Flexible Brake Hoses. Turn off the front brake shut-off cock inside of right-hand frame side rail (fig. 185). Loosen connections at frame side rails, then remove hoses from wheel cylinders.

g. Disassemble Spring to Axle Mounting. The spring to axle mounting is slightly different on the two types of axles, therefore, this part of removal procedure is explained separately for each axle.

(1) BANJO TYPE AXLE. Remove nuts from U-bolts on both sides, remove shock absorber link bracket and spring bumper blocks, and remove U-bolts.

(2) SPLIT TYPE AXLE. Remove four nuts from spring bolts on left side and remove shock absorber link bracket and spring bumper block, and remove spring clip bolts. On right-hand side, remove four nuts from studs and remove shock absorber link bracket and spring bumper block. (The four studs will be removed from housing after axle assembly is withdrawn from under vehicle.)

h. Remove Axle Assembly. Lower dolly jack until axle assembly clears under side of chassis and withdraw from under vehicle. (On split type axles, remove the four studs from axle housing at right-hand spring seat.)

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169. FRONT AXLE INSTALLATION.

a. The following procedures are applicable to both the banjo and split type axles, with exceptions noted in text.

b. Position Axle Assembly. (If axle to be installed is split type, install four studs in tapped holes in housing at right-hand spring seat.) Place axle assembly on dolly jack and move into position under vehicle. Raise axle assembly into position against springs, being certain spring center bolt heads enter alinement holes in axle spring seats.

c. Assemble Spring to Axle Mounting. This operation differs on the two types of axles, and will be described separately for each type.

(1) BANJO TYPE AXLE. Install U-bolts. U-bolts of three different lengths are used. The two shortest ones are used on the left-hand mounting and the remaining two are used on the right-hand mounting. The longer of the two on the right side is used on the inside, adjacent to the differential. Install spring bumper blocks and shock absorber link brackets on U-bolts, install nuts, and tighten to 170-185 foot-pounds.

(2) SPLIT TYPE AXLE. Install spring bolts, bolt guard, spring bumper block, and shock absorber link bracket on left-hand mounting and install nuts on spring clip bolts. The bolt guard at the bottom and the shock absorber link bracket at the top necessitates using the two longer bolts at the front. On right-hand mounting, install bumper block and shock absorber link bracket on studs and install nuts. Tighten nuts on both right- and left-hand mounting to 170-185 foot-pounds.

d. Connect Propeller Shaft. Connect propeller shaft at differential (par. 176).

e. Connect Flexible Brake Hoses. Install flexible hoses in wheel cylinders and tighten connections at frame side rails. Turn front brake shut-off cock on.

f. Connect Drag Link. Refer to paragraph 207 for instructions on installing and adjusting drag link on steering arm ball.

g. Install Wheels. Install wheel and tire assemblies on hubs, install wheel stud nuts, and tighten firmly.

h. Remove Blocks and Dolly Jack. Raise front of vehicle with dolly jack and remove blocks from under frame side rails. Lower dolly jack and withdraw from under vehicle. Check all nuts on spring mounting bolts for tightness with full weight of vehicle resting on springs.

i. Bleed Brakes. Bleed front wheel brakes (par. 180).

j. Lubricate. Check lubrication of complete axle assembly and propeller shaft universal joint as instructed in Section VIII. Check condition of filler plug gasket [(GM-344830) G85-31-05800] and replace if necessary.

Section XXXI

REAR AXLES

170. DESCRIPTION.

a. Description. The rear driving unit is a centrally supported unit consisting of two single-reduction, spiral-bevelled driving axles. Each axle is attached to the frame by three independent torque rods. Both driving and braking load is transferred directly to the chassis frame by these rods. Two types of axles are used, the banjo type and the split type (fig. 7). The split or two-piece type is so-called since the housing is made in two pieces, bolted together at the differential. The banjo type housing is of one-piece construction.

b. Operation. Power is transmitted from the transfer case to the forward rear (intermediate) axle by a single propeller shaft. Power to the rearward rear axle is transferred from the transfer case to a pillow block attached to the top of the forward rear (intermediate) axle, and thence to the rearward axle by another propeller shaft.

c. Data.

Type	GM Number	
	Front (Intermediate) Unit	Rear Unit
Banjo Type (with conventional brake drums)	3665609	3665610
Banjo Type (with demountable brake drums)	3678649	3678650
Split Type	2181204	2181205

171. AXLE SHAFT (BANJO TYPE AXLES).

a. Description. Axle shafts are full floating type with flanges forged at the outer ends. The axle shafts carry the driving force from the differential to the wheels. Flanges are attached to the hubs by

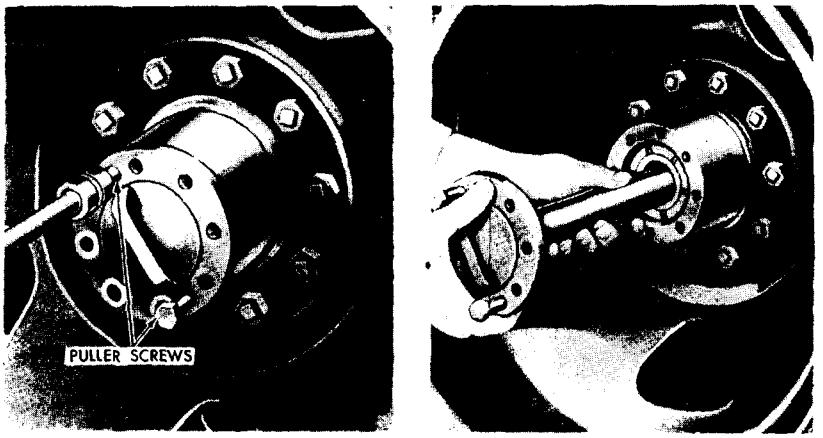

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Figure 155—Removing Rear Axle Shaft (Banjo Type Axle)

cap screws and the inner ends of the shafts are splined to the differential side gears.

b. Removal. Remove eight cap screws and lock washers attaching drive flange to hub. Using two of these cap screws as puller screws, thread them into the two tapped holes in flange (fig. 155). Pull shaft out by alternately turning in the two cap screws. Withdraw axle shafts from hub (fig. 155) and remove gasket [(GM 3660100) G85-31-06160].

c. Installation. Make sure axle shaft is clean. Slide gasket over end of shaft and hold in place on flange. Insert splined end of shaft through hub and guide splines into differential side gear. Aline holes in flange and hub and install eight cap screws with lock washers. Tighten cap screws alternately to 70-80 foot-pounds.

172. AXLE SHAFT (SPLIT TYPE AXLES).

a. Description. Axle shafts are full-floating type with flanges forged at the outer ends. The axle shafts carry the driving force from the differential to the wheels. Flanges are attached to the hubs by studs, nuts, and tapered dowels. Inner ends of the shafts are splined to the differential side gears.

b. Removal (fig. 156). Remove eight nuts and lock washers from flange to hub studs. Loosen puller screws and back lock nuts out to end of threads. Alternately turn puller screws in, pulling axle shaft and tapered dowels toward end of studs. Back puller screws out and drive axle shaft in until flange is against hub. Pull tapered dowels off studs. NOTE: *If tapered dowels are not loose, remove puller screws and remove lock nuts from screws. Install puller screws and again turn them in alternately to pull tapered dowels farther out toward end of studs. Drive axle shaft in and then remove dowels from studs.* Withdraw axle shaft from hub and remove two gaskets [(GM-2087553) G57-01-94022] and wheel bearing oil seal from studs.

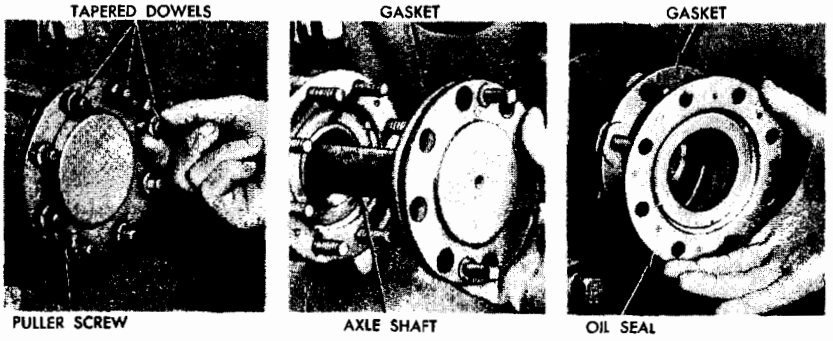

Figure 156—Rear Axle Shaft Removal (Split Type Axle)