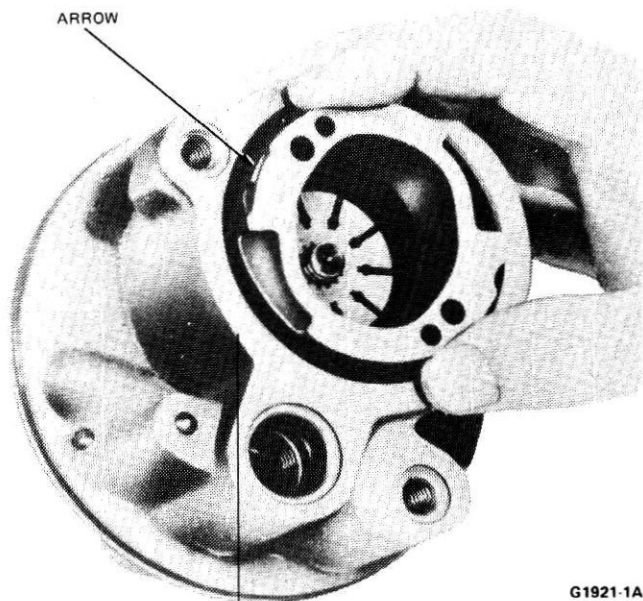


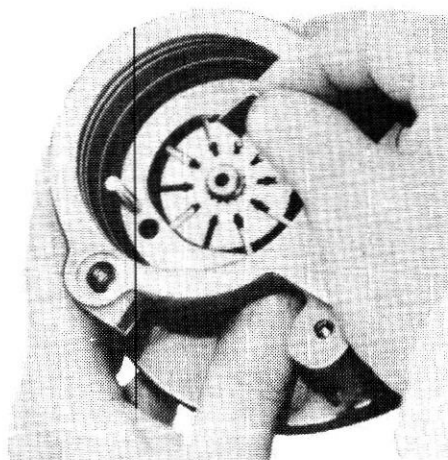
10. Install the cam ring on the dowel pins with the rotation arrow toward the rear of the housing (Fig. 8).



G1921-1A

FIG. 8 Installing the Cam Ring

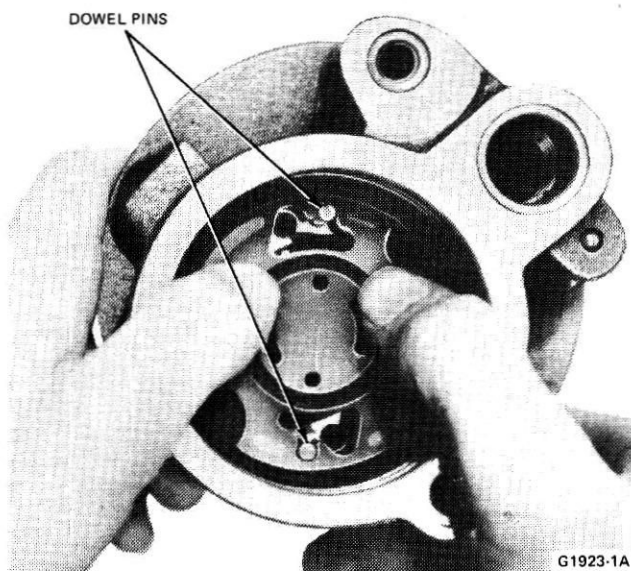
11. Install the vanes in the rotor slots with the rounded edge of the vanes outward. Be sure the vanes slide freely (Fig. 9).



G1922-1A

FIG. 9 Installing the Vanes in the Rotor

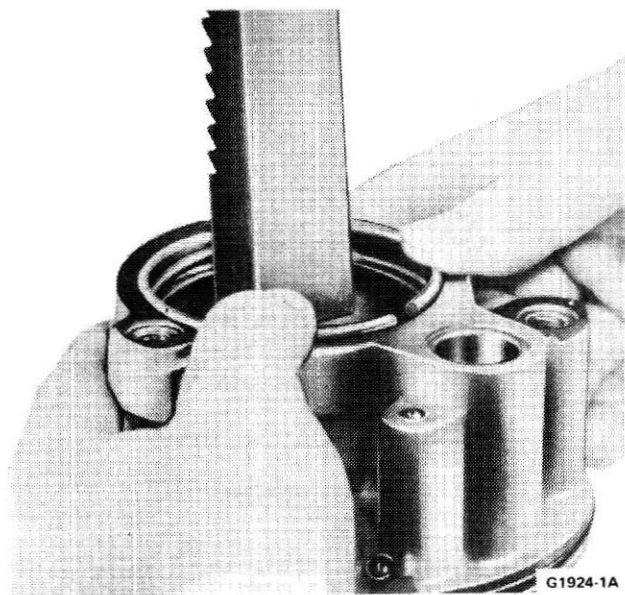
12. Lubricate the pressure plate with power steering fluid to prevent damage to the pressure plate O-ring seal.
13. Install the pressure plate on the dowel pins with the circular spring depression toward the rear of the housing (Fig. 10). The narrow slots in the plate should engage the dowel pins. To seat pressure plate press it about 1/16 inch over the O-ring.
14. Lubricate a new end plate O-ring with power steering fluid and install it in the second groove from the rear of the housing.
15. Install the pressure plate spring in the groove in the pressure plate.



G1923-1A

FIG. 10 Installing the Pressure Plate

16. Lubricate the end plate with power steering fluid to prevent damage to the O-ring, and press it into the housing with an arbor press (Fig. 11). Depress the end plate only far enough to allow installation of the retaining ring in its groove.



G1924-1A

FIG. 11 Installing the End Plate Retaining Ring

17. Install the end plate retaining ring. Release the arbor press.
18. Place the control valve spring in its hole and insert the control valve with the screened end towards the front of the housing.
19. Install new mounting bolt and pressure union seals in the countersunk holes. Lubricate a new reservoir O-ring seal with power steering fluid and install it on the housing.
20. Lubricate the inside edge of the reservoir with power steering fluid and install it on the housing. Align the holes in the reservoir and housing.

Replacement reservoirs do not have an identification number. If a new reservoir is installed, imprint the model number of the defective reservoir on the new part for future identification.

21. Insert the mounting bolts and torque to specification.
22. Lubricate a new O-ring with power steering fluid, *and install it on the pressure union in the groove*

next to the head hex. Insert the pressure union in the flow control valve hole in the back of the reservoir and torque to specification.

23. Attach the mounting bracket and pulley to the pump.

SPECIFICATIONS

SAGINAW POWER STEERING PUMP TORQUE LIMITS (FT-LB)

Description	Torque
Reservoir Mounting Bolt	25-50
Pressure Union	35
Bracket Nuts	30-45
Pressure Line to Pump Nut	25-34

SPECIAL SERVICE TOOLS

Tool No.	Description
T69L-10300-A	Pulley Remover
T68P-3B592-B	Seal Protector
T72P-3B592-A	Seal Installer
T65P-3A733-C	Pulley Installer

CG1930-2E

SUSPENSION

GROUP
14
(3000 &
5000)

PART TITLE	PART NO.	PART TITLE	PART NO.
Front Suspension – Single Lower Arm	14-05	Manual Fill Load Leveler System – Air	
Front Suspension – Spring on Upper Arm	14-04	Sleeve Rear Shock Absorbers	14-45
Front Suspension – Spring on Lower Arm	14-03	Rear Suspension – Coil Springs	14-32
General Suspension Service	14-01	Rear Suspension – Leaf Springs	14-30

General Suspension Service

PART
14-01

Applies To All Models

SUBJECT	PAGE	SUBJECT	PAGE
ADJUSTMENTS		SPECIFICATIONS AND	
Caster and Camber Adjustments	01-3	SPECIAL TOOLS	01-13
Toe and Steering Wheel Spoke		TESTING	
Position Adjustments	01-5	Camber	01-2
CLEANING AND INSPECTION		Caster	01-2
Front-End General Inspection	01-10	Equipment Installation	01-1
Lower Ball-Joint Inspection	01-10	Front Wheel Alignment Checks	01-1
Shock Absorber Checks	01-11	Front Wheel Turning Angle	01-3
Upper Ball Joint Inspection	01-10	Toe	01-3

TESTING

FRONT WHEEL ALIGNMENT CHECKS

Do not attempt to check and adjust front wheel alignment without first making a preliminary inspection of the front-end parts

Check all the factors of front wheel alignment except the turning angle before making any adjustments. Check the turning angle only after caster, camber, and toe have been adjusted to specifications. Check the front wheel alignment under the following curb load conditions:

1. Gasoline tank and radiator filled and oil level to specification.
2. Spare tire, wheel, jack and jack handle in design position.

3. Front seats in rearmost position.
4. All other loading removed.
5. All tires inflated to specified pressure (cold).
6. All excessive mud, dirt and road deposit accumulation removed from chassis and underbody.

The front wheel alignment specifications are given in the Specifications Section of this Part.

EQUIPMENT INSTALLATION

Equipment used for front wheel alignment inspection must be accurate. Whenever possible, front wheel alignment checks should be performed on stationary wheel aligning equipment. In the absence of such equipment, portable equipment may be used and the

work performed on a level floor. The floor area should be level within 1/4 inch from front to rear of the vehicle and within 1/8 inch from side to side.

1. Check the runout of each front wheel and tire using a dial indicator against the rim outer band. If the runout exceeds 1/8 inch, correction may be made by rotating the wheel on the drum. When the minimum runout has been obtained, mark the point of greatest runout so the wheels can be positioned as shown in Fig. 1 when checking the front end alignment. Hold a piece of chalk against the wheel rim or the tire sidewall while spinning the wheels. The chalk will mark the rim or tire at the point of greatest runout.

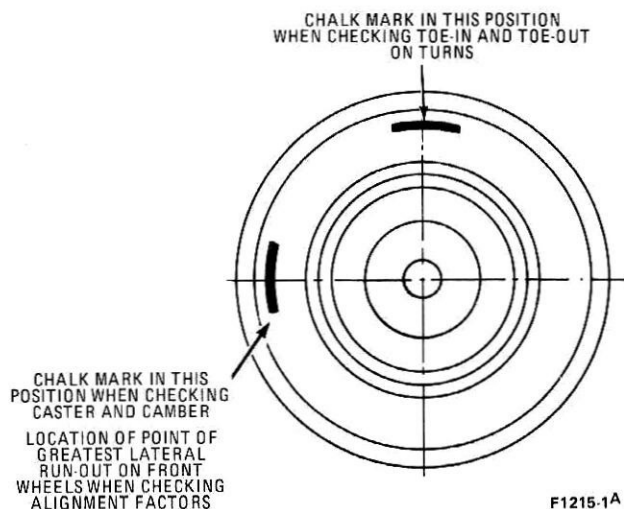


FIG. 1 Front Wheel Position for Checking Alignment

2. Drive the vehicle in a straight line far enough to establish the straight-ahead position of the front wheels, and then mark the steering wheel hub and the steering column collar (Fig. 2). **Do not adjust the steering wheel spoke position at this time.** If the front wheels are turned at any time during the inspection, align the marks to bring the wheels back to the straight-ahead position.

The maximum caster difference (side-to-side) is specified at the end of this Part.

CAMBER

Camber is the amount the front wheels are tilted at the top (Fig. 3). If a wheel tilts outward, camber is positive. If the top of a wheel tilts inward, camber is negative. For correct camber angle, see Specifications at end of this Part.

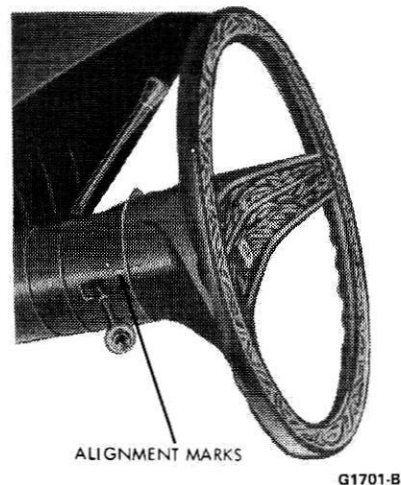


FIG. 2 Straight-Ahead Position Marks—Typical

3. Install the wheel alignment equipment on the vehicle, and follow the installation and inspection instructions provided by the equipment manufacturer.

CASTER

The caster is the forward or rearward tilt of the top of the front wheel spindle (Fig. 3). If the top of the spindle tilts to the rear, caster is positive. If the top of the spindle tilts to the front, caster is negative. For correct caster angle, or tilt, see Specifications at end of this Part.

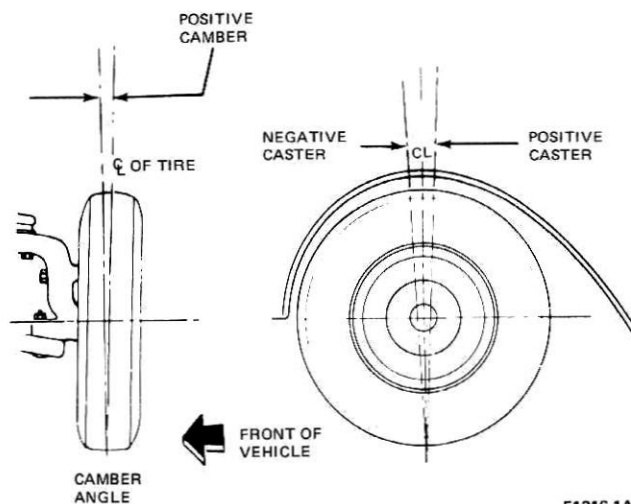


FIG. 3 Caster and Camber Angles

The maximum camber difference (side-to-side) is specified at the end of this Part.

TOE

Toe should only be checked and adjusted after the caster and camber have been adjusted to specifications.

Check the toe with the front wheels in the straight-ahead position. Run the engine so that the power steering control valve will be in the center (neutral) position (if equipped). Measure the distance between the extreme front and also between the extreme rear of both front wheels. The difference between these two distances is the toe-in or toe-out.

Correct toe-in setting, or inward pointing of both front wheels, is given in the Specifications at the end of this Part.

FRONT WHEEL TURNING ANGLE

When the inside wheel is turned 20 degrees, the turning angle of the outside wheel should be as specified in the Specifications at end of this Part. The turning angle cannot be adjusted directly, because it is a result of the combination of caster, camber, and toe adjustments and should, therefore, be measured only after these adjustments have been made. If the turning angle does not measure to specifications, check the spindle or other suspension or steering parts for a bent condition.

ADJUSTMENTS

NOTE: On Fairmont/Zephyr vehicles, the caster and camber are set at the factory and cannot be changed only the toe is adjustable.

After front wheel alignment factors have been checked, make the necessary adjustments. **Do not attempt to adjust front wheel alignment by bending the suspension or steering parts.**

CASTER AND CAMBER ADJUSTMENTS

All Except Versailles, Fairmont, Zephyr, Granada, Monarch, Mustang II, Pinto, and Bobcat

See Fig. 5.

Special tools (T69P-3000-A) are used in order to accurately adjust caster and camber.

Using these special tools and three Alignment Charts allow the inter-related caster/camber adjustments to be made as a single operation. Both angles are set at one time.

The Alignment Charts indicate the "hex flats" to be counted while rotating the hex nuts (on the alignment tools) to adjust caster and camber within specifications.

A "hex flat" is 1/6 of a full turn. Do not interpret it as a full turn.

A portion of the Front Wheel Alignment Chart used in adjusting the camber and caster on frame-body units is shown in Fig. 5. This chart does not apply to unit-body vehicles. In the following explanation, the paragraph numbers refer to the circled numbers on the chart in Fig. 5.

1. Caster readings . . . shown top of Chart.
2. Camber readings . . . for left and right wheels shown on left side of Chart.
3. Front . . . indicates "front" alignment tool (T69P-3000-A) and the numbers across are "hex flats" to be counted while rotating the hex nuts (on alignment tools) to adjust caster and camber within specifications.
4. Rear . . . indicated "rear" alignment tool and the number of "hex flats" to be rotated.
5. Plus sign (+) . . . in front means number of "hex flats" to be rotated to tighten the alignment tool.

6. Minus sign (—) . . . indicates tool must be loosened that number of "hex flats."
- See Fig. 6.

In Fig. 6 parallel lines have been drawn on the Chart to represent two theoretical alignment readings. The point of intersection of the parallel horizontal lines and the parallel vertical lines indicates whether or not adjustment is required. In this case, Example No. 2 is out of tolerance, while Example No. 3 is within tolerance because the lines intersect inside the colored block on the Chart. The paragraphs in the explanation below are number-keyed to the Chart shown in Fig. 6.

1. Minimum to maximum tolerances . . . of caster and camber alignment are represented by colored block within body of each Chart.
2. Out-of-specification . . . if caster and camber readings intersect outside the colored block (tolerance range), caster and camber adjustment is required.
3. Within specification . . . if caster and camber readings intersect within the colored block on tolerance range, caster and camber adjustment is not usually required.
4. Nominal setting . . . occasionally, a vehicle within specifications may require alignment adjustment to the nominal setting (zero degrees) because side-to-side setting is out-of-specification and must be corrected.

NOTE: Maximum caster difference between wheels (left minus right) to be within $3/4^\circ$ to $+3/4^\circ$ with caster set to specification.

Maximum camber difference between wheels (left minus right) to be within $1/2^\circ$ to -1° with camber set to specification.

The Front Wheel Alignment Charts should be used whenever current model frame-body units are brought in for front-end alignment. Use the following general procedure.

Be sure alignment equipment is calibrated and in good working condition in order to obtain accurate and acceptable results.

Check caster and camber as outlined in the Shop Manual.

Record and compare these caster/camber readings with the nominal specifications on the chart to determine if adjustment is required.

See Fig. 7.

Fig. 7 shows the recorded readings and adjustment required in a theoretical case that will be used as an example in the following instruction. Using the example shown in Fig. 7, note the nominal specification listed.

Using the chart in Fig. 8:

Locate the specification for both LEFT and RIGHT CASTER (+2°) at the top of the chart.

Locate the specification for both LEFT CAMBER (+1/2°) and RIGHT CAMBER (+1/4°) at the left side of the chart.

Where these lines intersect in the chart (zero degrees) indicates that these alignment readings are the NOMINAL SETTING for this vehicle.

Next . . . note how caster and camber adjustments for the RIGHT WHEEL are determined to bring the vehicle to the nominal setting, using the example readings:

Locate the specification recorded for RIGHT CASTER (+1/4°) at the top of the chart.

Locate the specification recorded for RIGHT CAMBER (+1 1/4°) at the left side of the chart.

Where these lines intersect in the chart indicates adjustments (FRONT—11 and REAR—26) required on the right wheel.

FRONT—11 means that front alignment tool must be loosened 11 "hex flats" or 1-5/6 full turns to adjust RIGHT CASTER to nominal specification.

REAR—26 means that rear alignment tool must be loosened 26 "hex flats" or 4-2/6 full turns to adjust RIGHT CAMBER to nominal specification.

NOTE: When chart indicates loosening the alignment tools, back-off the hex nuts 3 additional "hex flats" more than shown on the chart. Then retighten the hex nuts (3), "hex flats" so that tools remain in tension at end of adjustment operation.

Finally . . . note how caster and camber adjustments for the LEFT WHEEL are determined to bring the vehicle to the setting, using the example readings:

Locate the specification for LEFT CASTER (+3/4°) at the top of the chart.

Locate the specification for LEFT CAMBER (- 1/2°) at the left side of the chart.

Where these lines intersect in the chart indicates adjustments (FRONT+24 and REAR+13) required on left wheel.

FRONT +24 means that front alignment tool must be tightened 24 "hex flats" or 4 full turns to adjust LEFT CASTER to nominal specification.

REAR +13 means that rear alignment tool must be tightened 13 "hex flats" or 2-1/6 full turns to adjust LEFT CAMBER to nominal specification.

See Fig. 9

Remembering the previous instructions on use of the special Tool T69P-3000-A (Fig. 9) and the Front Wheel Alignment Charts, use the following procedure in

correcting alignment on current frame-body units. **The alignment equipment must be calibrated and in good working condition for accurate and acceptable results.**

1. Check caster and camber and record the readings.
2. Compare camber and caster readings with nominal specifications on appropriate chart (depending on car line) to determine if adjustment is required to bring vehicle to nominal setting.

NOTE: As mentioned earlier, a vehicle within the minimum to maximum tolerances may require alignment adjustment to the nominal setting (zero degrees) because side-to-side setting is out-of-specification and must be corrected.

Maximum caster difference between wheels (left minus right) to be within -3/4° to +3/4° with caster set to specification.

Maximum camber difference between wheels (left minus right) to be within -1/2° to +1° with camber set to specification.

3. If adjustment is required, insert alignment tools into frame holes and "snug" the tool hooks fingertight against the upper arm inner shaft. Then tighten hex nut of each alignment tool 4 additional "hex flats."
4. Loosen upper arm inner shaft-to-frame attaching bolts so that lockwashers on bolts are unloaded. Then firmly tap bolt heads to assure loosening of the lower assemblies.
5. Adjust camber and caster on each wheel as determined by the alignment chart.
6. Torque upper arm inner shaft-to-frame attaching bolts to 120-140 ft-lbs. It is not necessary to recheck caster and camber after this adjustment procedure is performed.
7. Check toe-in and steering wheel spoke position and adjust both (as required) at the same time.

GRANADA, MONARCH AND VERSAILLES

Caster

Caster is controlled by the front suspension strut (Fig. 10). To obtain positive caster, loosen the strut rear nut and tighten the strut front nut against the bushing. To obtain negative caster, loosen the strut front nut and tighten the strut rear nut against the bushing.

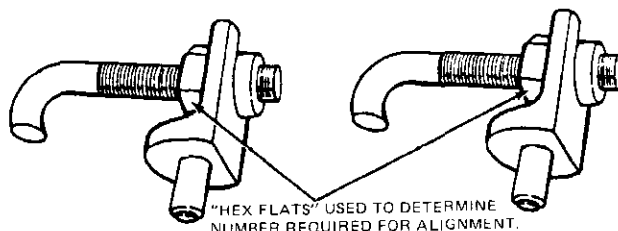


FIG. 4 Camber and Caster Adjusting Tools

F2478-1A

FRONT WHEEL ALIGNMENT CHART

1

CASTER READING IN DEGREES

		-1/2	-1/4	0	+1/4	+1/2	+3/4	+1	+1 1/4	+1 1/2	+1 3/4	+2	+2 1/4	+2 1/2	+2 3/4	+3	+3 1/4	+3 1/2	+3 3/4	
CAMBER READING IN DEGREES	2	LEFT CAMBER	RIGHT CAMBER																	
	3	+2 3/4	+2 1/2	Front	-33	-34	-34	-35	-36	-37	-38	-39	-40	-42	-43	-44	-45	-46	-48	-50
	4	+2 1/2	+2 1/4	Rear	-54	-53	-52	-51	-49	-48	-47	-46	-45	-44	-43	-42	-41	-40	-39	-38
				Front	-28	-29	-30	-31	-32	-33	-34	-35	-36	-37	-38	-39	-40	-42	-43	-44
				Rear	-50	-48	-47	-46	-45	-43	-42	-41	-40	-39	-38	-37	-36	-35	-34	-33
				Front	-23	-24	-25	-26	-27	-28	-29	-30	-31	-32	-33	-34	-36	-37	-38	-39
				Rear	-45	-43	-42	-41	-40	-39	-37	-36	-35	-34	-33	-32	-31	-30	-29	-28
				Front	-18	-19	-20	-21	-22	-23	-24	-25	-26	-27	-28	-30	-31	-32	-33	-35
				Rear	-40	-39	-37	-36	-35	-34	-33	-32	-31	-29	-28	-27	-26	-25	-24	-23
				Front	-14	-15	-15	-16	-17	-18	-19	-20	-21	-23	-24	-25	-26	-27	-28	-30
				Rear	-35	-34	-33	-31	-30	-29	-28	-27	-26	-25	-24	-23	-22	-21	-20	-19
				Front	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19	-20	-21	-23	-24	-25
				Rear	-31	-29	-28	-27	-26	-24	-23	-22	-21	-20	-19	-18	-17	-16	-15	-14
				Front	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19
				Rear	-26	-24	-23	-22	-21	-20	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9
				Front	0	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-11	-12	-13	-14	-16
	5	+1 1/2	Rear	-21	-20	-18	-17	-16	-15	-14	-13	-12	-10	-9	-8	-7	-6	-5	-4	-3
				Front	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
				Rear	-15	-14	-13	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1
				Front	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5
	6	+1/4	Rear	-12	-10	-9	-8	-7	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
				Front	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-2	-1	0	1
				Rear	-7	-6	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9
				Front	-19	-19	-18	-17	-16	-15	-14	-13	-12	-11	-9	-8	-7	-6	-5	-3
			Rear	-2	-1	0	2	3	4	5	6	7	8	9	10	11	12	13	14	
			Front	-24	-23	-22	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-9	-8	
			Rear	-3	-4	-5	-6	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19	
			Front	-29	-28	-27	-26	-25	-24	-23	-22	-21	-20	-19	-18	-17	-15	-14	-13	
			Rear	-7	-9	-10	-11	-12	-14	-15	-16	-17	-18	-19	-20	-21	-22	-23	-24	
			Front	-34	-33	-32	-31	-30	-29	-28	-27	-26	-25	-24	-22	-21	-20	-19	-18	
			Rear	-12	-13	-15	-16	-17	-18	-19	-20	-22	-23	-24	-25	-26	-27	-28	-29	
			Front	-38	-37	-36	-36	-35	-34	-33	-32	-31	-29	-28	-27	-26	-25	-24	-22	
			Rear	-17	-18	-19	-21	-22	-23	-24	-25	-26	-27	-28	-29	-30	-31	-32	-33	
			Front	-43	-42	-41	-40	-39	-38	-37	-36	-35	-34	-33	-32	-31	-30	-28	-27	
			Rear	-22	-23	-24	-25	-26	-28	-29	-30	-31	-32	-33	-34	-35	-36	-37	-38	
			Front	-48	-47	-46	-45	-44	-43	-42	-41	-40	-39	-38	-37	-35	-34	-33	-32	
			Rear																	

E2479-2

F2479-2A

FIG. 5 Front Wheel Alignment Chart—Sample No. 1

Camber

Camber is controlled by the eccentric cam located at the lower arm attachment to the side rail (Fig. 10).

To adjust the camber, loosen the camber adjustment bolt nut at the rear of the body bracket. **Spread the body bracket at the camber adjustment bolt area just enough to permit lateral travel of the arm when the adjustment bolt is turned.** Rotate the bolt and eccentric as required to increase or decrease camber.

After the caster and camber have been adjusted to specification, torque the lower arm eccentric bolt nut and the strut front nut to specification.

PINTO, BOBCAT AND MUSTANG II

- Working from inside the front wheel housing, install the special service Tool T74P-3000, one at each end of the upper arm inner shaft (Fig. 11). Turn special tool bolts inward until the bolt ends contact the body metal.
- Loosen the two upper arm inner shaft-to-body attaching nuts. The upper arm inner shaft will then move inboard until stopped by the special tool bolt ends.

- Turn the special tool bolt(s) inward or outward until caster and camber are within specifications. Tightening the special tool bolts forces the arm outward; while loosening the adjustment bolts on the special tool permits the arm and inner shaft to move inboard due to weight force.
- When caster and camber specifications are attained, torque the upper arm inner shaft-to-body attaching nuts to 95 to 120 ft-lb.
- Loosen the special tool bolts and remove tools.

TOE AND STEERING WHEEL SPOKE POSITION ADJUSTMENTS

All Car Lines Except Pinto, Bobcat and Mustang II

After adjusting caster and camber, check the steering wheel spoke position with the front wheels in straight-ahead position. If the spokes are not in their normal position, they can be properly adjusted while toe is being adjusted.

- Loosen the two clamp bolts on each spindle connecting rod sleeve (Fig. 12).
- Adjust toe. If the steering wheel spokes are in their normal position, lengthen or shorten both rods

FRONT WHEEL ALIGNMENT CHART

CASTER READING IN DEGREES

CAMBER READING IN DEGREES

LEFT CAMBER	RIGHT CAMBER		-½°	-¼°	0°	+¼°	+½°	+¾°	+1°	+1¼°	+1½°	+1¾°	+2°	+2¼°	+2½°	+2¾°	+3°	+3¼°	+3½°	+3¾°
+2¾°	+2½°	Front	-33	-34	-34	-35	-36	-37	-38	-39	-40	-42	-43	-44	-45	-46	-48	-49	-50	-51
		Rear	-54	-53	-52	-51	-49	-48	-47	-46	-45	-44	-43	-42	-41	-40	-39	-38	-37	-36
+2½°	+2¼°	Front	-28	-29	-30	-31	-32	-33	-34	-35	-36	-37	-38	-39	-40	-42	-43	-44	-45	-46
		Rear	-50	-48	-47	-46	-45	-43	-42	-41	-40	-39	-38	-37	-36	-35	-34	-33	-32	-31
+2¼°	+2°	Front	-23	-24	-25	-26	-27	-28	-29	-30	-31	-32	-33	-34	-36	-37	-38	-39	-41	-42
		Rear	-45	-43	-42	-41	-40	-39	-37	-36	-35	-34	-33	-32	-31	-30	-29	-28	-28	-28
+2°	+1¾°	Front	-18	-19	-20	-21	-22	-23	-24	-25	-26	-27	-28	-30	-31	-32	-33	-35	-36	-37
		Rear	-40	-39	-37	-36	-35	-34	-33	-32	-31	-29	-28	-27	-26	-26	-25	-24	-23	-22
+1¾°	+1½°	Front	-14	-15	-15	-16	-17	-18	-19	-20	-21	-23	-24	-25	-26	-27	-28	-30	-31	-32
		Rear	-35	-34	-33	-31	-30	-29	-28	-27	-26	-25	-24	-23	-22	-21	-20	-19	-18	-17
+1½°	+1¼°	Front	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19	-20	-21	-23	-24	-25	-26	-27
		Rear	-31	-29	-28	-27	-26	-24	-23	-22	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12
+1¼°	+1°	Front	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-17	-18	-19	-20	-21	-22
		Rear	-26	-24	-23	-22	-21	-20	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7
+1°	+¾°	Front	0	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16
		Rear	-21	-20	-18	-17	-16	-15	-14	-13	-12	-10	-9	-8	-8	-7	-6	-5	-4	-3
+¾°	+½°	Front	+5	+4	+3	+2	+1	0	-1	-3	-4	-5	-6	-7	-8	-10	-11	-12	-13	-14
		Rear	-16	-15	-14	-13	-12	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	0	0
+½°	+¼°	Front	+10	+9	+8	+7	+6	+5	+4	+3	+2	+1	0	-1	-2	-4	-5	-6	-7	-8
		Rear	-12	-10	-9	-8	-7	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6	+7
+¼°	0°	Front	+15	+14	+13	+12	+11	+10	+9	+8	+7	+6	+5	+4	+2	+1	0	-1	-2	-3
		Rear	-7	-6	-4	-3	-2	-1	0	+2	+3	+4	+5	+6	+7	+8	+9	+9	+9	+9
0°	-¼°	Front	+19	+19	+18	+17	+16	+15	+14	+13	+12	+11	+9	+8	+7	+6	+5	+3	+2	+1
		Rear	-2	-1	0	+2	+3	+4	+5	+6	+7	+8	+9	+10	+11	+12	+13	+14	+14	+14
-¼°	-½°	Front	+24	+23	+22	+21	+20	+19	+18	+17	+16	+15	+14	+13	+12	+11	+10	+9	+8	+7
		Rear	+3	+4	+5	+6	+8	+9	+10	+11	+12	+13	+14	+15	+16	+17	+18	+19	+20	+21
-½°	-¾°	Front	+29	+28	+27	+26	+25	+24	+23	+22	+21	+20	+19	+18	+17	+15	+14	+13	+12	+11
		Rear	+7	+9	+10	+11	+12	+14	+15	+16	+17	+18	+19	+20	+21	+22	+23	+24	+25	+26
-¾°	-1°	Front	+34	+33	+32	+31	+30	+29	+28	+27	+26	+25	+24	+22	+21	+20	+19	+18	+17	+16
		Rear	+12	+13	+15	+16	+17	+18	+19	+20	+22	+23	+24	+25	+26	+27	+28	+29	+30	+31
-1°	-1¼°	Front	+38	+37	+36	+35	+34	+33	+32	+31	+30	+29	+28	+27	+26	+25	+24	+23	+22	+21
		Rear	+17	+18	+19	+21	+22	+23	+24	+25	+26	+27	+28	+29	+30	+31	+32	+33	+34	+35
-1¼°	-1½°	Front	+43	+42	+41	+40	+39	+38	+37	+36	+35	+34	+33	+32	+31	+30	+29	+28	+27	+26
		Rear	+22	+23	+24	+25	+26	+27	+28	+29	+30	+31	+32	+33	+34	+35	+36	+37	+38	+39
-1½°	-1¾°	Front	+47	+46	+45	+44	+43	+42	+41	+40	+39	+38	+37	+36	+35	+34	+33	+32	+31	+30
		Rear	+27	+28	+29	+30	+31	+32	+33	+34	+35	+36	+37	+38	+39	+40	+41	+42	+43	+44

F2480-2A

FIG. 6 Front Wheel Alignment Chart—Sample No. 2

EXAMPLE:

Alignment Readings			Nominal Specifications		Adjustment Required	
	Left	Right	Left	Right	Left	Right
Caster	+¾°	+¼°	+2°	+2°	Front +24	Front -11
Camber	-½°	+1¼°	+½°	+¼°	Rear +13	Rear -26

F2507-1A

FIG. 7 Finding Adjustment Required

FRONT WHEEL ALIGNMENT CHART

		CASTER READING IN DEGREES																	
CAMBER READING IN DEGREES	LEFT CAMBER	RIGHT CAMBER		-1/2	-1/4	0	+1/4	1/2	+3/4	1	+1 1/4	+1 1/2	+1 3/4	+2	+2 1/4	+2 1/2	+2 3/4	+3	+3 1/4
	+2 3/4	+2 1/2	Front	-31	-32	-33	-34	-35	-36	-37	-38	-39	-40	-42	-43	-44	-45	-47	-48
			Rear	-52	-51	-50	-49	-48	-47	-46	-45	-44	-43	-42	-41	-40	-39	-38	-37
	+2 1/2	+2 1/4	Front	-26	-27	-28	-29	-30	-31	-32	-34	-35	-36	-37	-38	-39	-41	-42	-43
			Rear	-48	-47	-45	-44	-43	-42	-41	-40	-39	-38	-37	-36	-35	-34	-33	-33
	+2 1/4	+2	Front	-22	-23	-24	-25	-26	-27	-28	-29	-30	-31	-32	-34	-35	-36	-37	-39
			Rear	-43	-42	-41	-40	-38	-37	-36	-35	-34	-33	-32	-31	-30	-29	-28	-28
	+2	+1 3/4	Front	-17	-18	-19	-20	-21	-22	-23	-24	-25	-27	-28	-29	-30	-31	-33	-34
			Rear	-38	-37	-36	-35	-34	-33	-32	-31	-30	-29	-28	-27	-26	-25	-24	-23
	+1 3/4	+1 1/2	Front	-13	-13	-14	-15	-16	-17	-19	-20	-21	-22	-23	-24	-26	-27	-28	-29
CAMBER READING IN DEGREES			Rear	-34	-33	-31	-29	-28	-27	-26	-25	-24	-23	-22	-21	-20	-19	-18	-17
	+1 1/2	+1 1/4	Front	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18	-20	-21	-22	-23	-25
			Rear	-29	-28	-27	-25	-23	-22	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12
	+1 1/4	+1	Front	-3	-4	-5	-7	-8	-9	-10	-12	-13	-14	-15	-16	-18	-19	-20	-20
			Rear	-25	-23	-22	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-10
	+1	+3/4	Front	-1	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-12	-13	-14	-16
			Rear	-20	-19	-18	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-5
	+3/4	+1/2	Front	-6	-5	-4	-3	-2	-1	0	-1	-2	-3	-5	-6	-7	-8	-10	-11
			Rear	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0
	+1/2	+1/4	Front	-10	-10	-9	-8	-7	-6	-5	-3	-2	-1	0	-1	-2	-4	-5	-6
CAMBER READING IN DEGREES			Rear	-11	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	-1	-2	-4	-5	-6
	+1/4	0	Front	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-3	-2	-1	0	-2
			Rear	-6	-5	-4	-3	-1	0	1	2	3	4	5	6	7	8	9	9
	0	-1/4	Front	-20	-19	-18	-17	-16	-15	-14	-13	-12	-10	-9	-8	-7	-6	-4	-3
			Rear	-1	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14
	-1/4	-1/2	Front	-24	-23	-22	-21	-20	-19	-18	-17	-16	-15	-14	-13	-11	-10	-9	-8
			Rear	-3	-4	-6	-7	-8	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19	-20
	-1/2	-3/4	Front	-29	-28	-27	-26	-25	-24	-23	-22	-21	-20	-18	-17	-16	-15	-13	-12
			Rear	-8	-9	-10	-11	-12	-14	-16	-17	-18	-19	-20	-21	-22	-23	-24	-25
	-3/4	-1	Front	-33	-33	-32	-31	-30	-28	-26	-25	-24	-23	-22	-21	-19	-18	-17	-16
			Rear	-12	-14	-15	-16	-17	-18	-19	-20	-21	-22	-23	-24	-25	-26	-27	-28

F2481-2A

FIG. 8 Front Wheel Alignment Chart—Sample No. 3

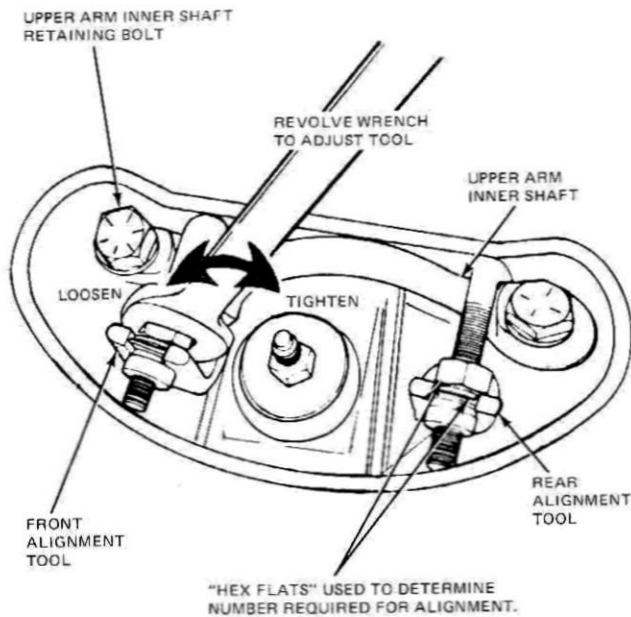
equally to obtain correct toe (Fig. 12). If the steering wheel spokes are not in their normal position, make the necessary rod adjustments to obtain correct toe and steering wheel spoke alignment (Fig. 13).

3. Recheck toe and the steering wheel spoke position. If toe is correct and the steering wheel spokes are still not in their normal position, turn both connecting rod sleeves upward or downward the same number of turns to move the steering wheel spokes (Fig. 12).
4. When toe and the steering wheel spoke position are both correct, lubricate clamp, bolts, and nuts and torque the clamp bolts on both connecting rod sleeves to specification. **The sleeve position should not be changed when the clamp bolts are tightened.**

Pinto, Bobcat, Mustang II, Fairmont and Zephyr

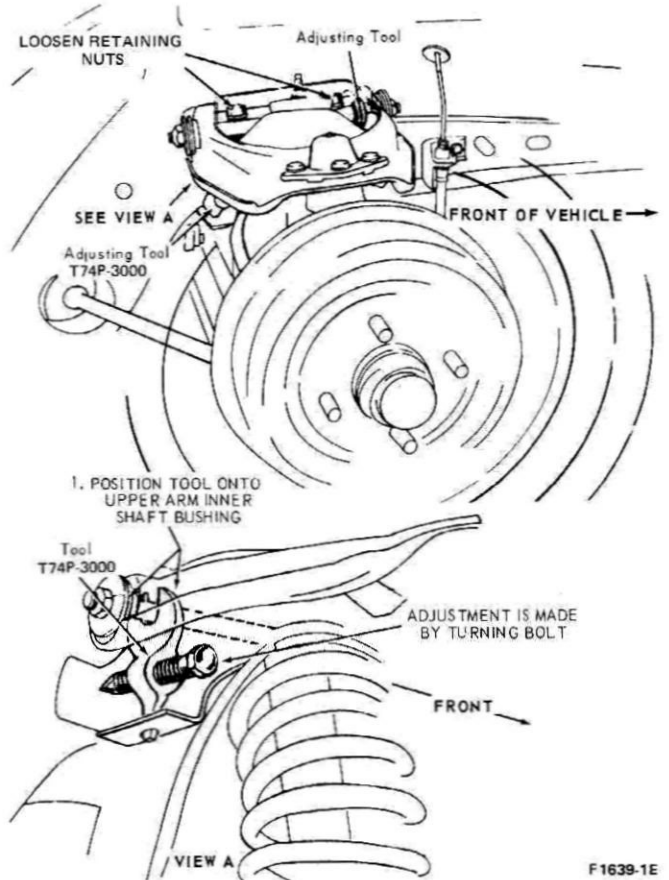
1. Check to see that the steering shaft and steering wheel marks are in alignment and in the top position.

2. Loosen the clamp screws on the tie rod bellows and free the seals on the rods, to prevent twisting of the bellows during Step 4.
3. Use an open-end wrench on the flats of the tie rod socket that will prevent the socket from turning while loosening the tie rod jam nut.
4. Use suitable pliers to turn both tie rod inner end to get toe within specifications (Fig. 14). **Do not position the pliers on the tie rod threads.** Turning to reduce the number of threads showing will increase toe. Turning in the opposite direction will reduce toe.
5. When toe is properly set and the steering wheel is in the straight-ahead position, use an open-end wrench on the flats of the tie rod socket, to hold the sockets from turning while tightening the tie rod jam nuts to 35 to 50 ft.-lb. Tighten the bellows clamp screws securely. This procedure applies to both left and right tie rod ends.



F2504-1A

FIG. 9 Using Special Tool No. T69P-3000-A



F1639-1E

FIG. 11 Caster and Camber Adjustment—Pinto, Bobcat and Mustang II

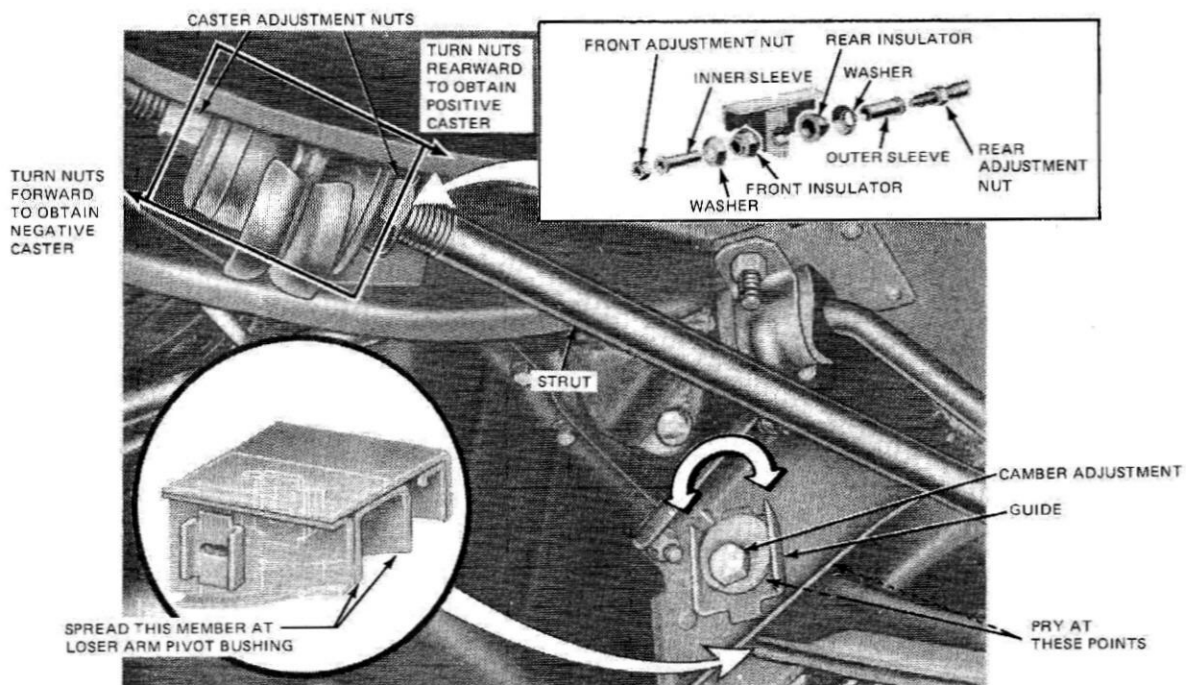
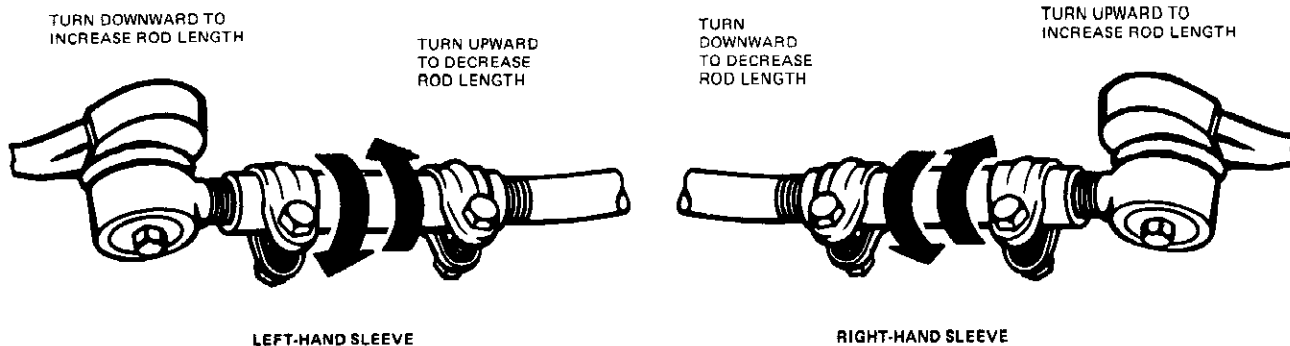


FIG. 10 Caster and Camber Adjustment Procedures

F1371-2^B

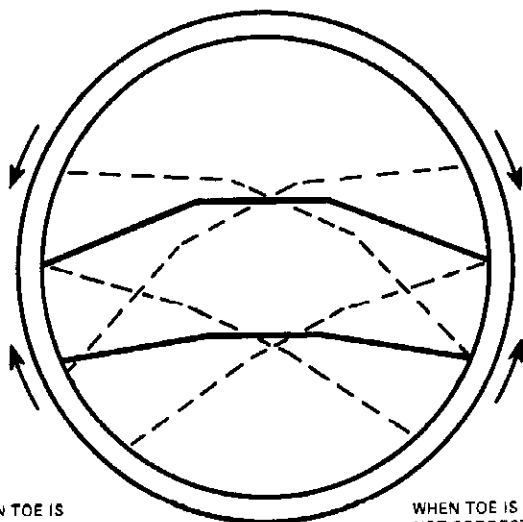


F1433-2A

FIG. 12 Spindle Connecting Rod Adjustment (Looking Forward)

WHEN TOE IS CORRECT
TURN BOTH CONNECTING ROD
SLEEVES UPWARD TO ADJUST
SPOKE POSITION

WHEN TOE IS CORRECT
TURN BOTH CONNECTING ROD
SLEEVES DOWNWARD TO
ADJUST SPOKE POSITION



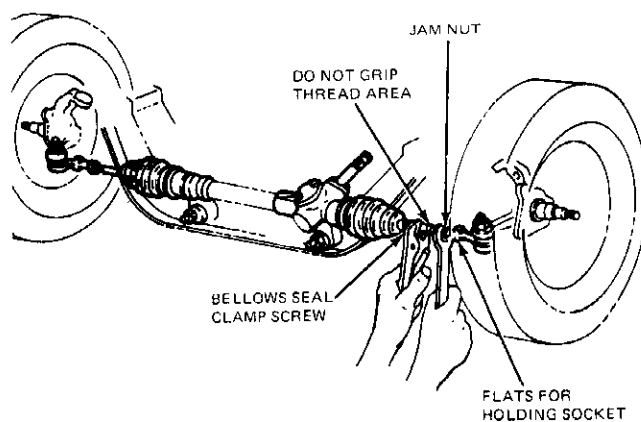
WHEN TOE IS
NOT CORRECT
LENGTHEN LEFT ROD
TO INCREASE TOE-IN
SHORTEN RIGHT ROD
TO DECREASE TOE-IN

WHEN TOE IS
NOT CORRECT
SHORTEN LEFT ROD
TO DECREASE TOE-IN
LENGTHEN RIGHT ROD
TO INCREASE TOE-IN

ADJUST BOTH RODS EQUALLY TO MAINTAIN NORMAL SPOKE POSITION

F1434-1B

FIG. 13 Toe and Steering Wheel Spoke Alignment Adjustments—Ford, Mercury, LTD II, Cougar, Thunderbird, Continental Mark V and Lincoln Continental



F1640-1D

FIG. 14 Toe Adjustment—Pinto, Bobcat, Mustang II, Fairmont and Zephyr

CLEANING AND INSPECTION

FRONT-END GENERAL INSPECTION

Do not check and adjust front wheel alignment without first making the following inspection for front-end damage, or wear.

1. Check for specified air pressures in all four tires.
2. Raise the front of the vehicle off the floor. Grasping the upper and lower surfaces of the tire, shake each front wheel to check for worn bearings. Check the front suspension ball joints and mounts for looseness, wear, and damage. Check the brake backing plate mountings. Torque all loose nuts and bolts to specification. Replace all worn parts as outlined in Parts 14-03 and 14-04.
3. Check the steering gear mountings and all steering linkage connections for looseness. Torque all mountings to specifications. If any of the linkage is worn or bent, replace the parts as outlined in Part 13-20.
4. Check the front wheel bearings. If any in-and-out free play is noticed, adjust the bearings to specifications. Replace worn or damaged bearings as outlined in Part 11-10.
5. Spin each front wheel with a wheel spinner, and check and balance each wheel as required.
6. Check the action of the shock absorbers. If the shock absorbers are not in good condition, the vehicle may not settle in a normal/level position, and front wheel alignment may be affected.

UPPER BALL JOINT INSPECTION

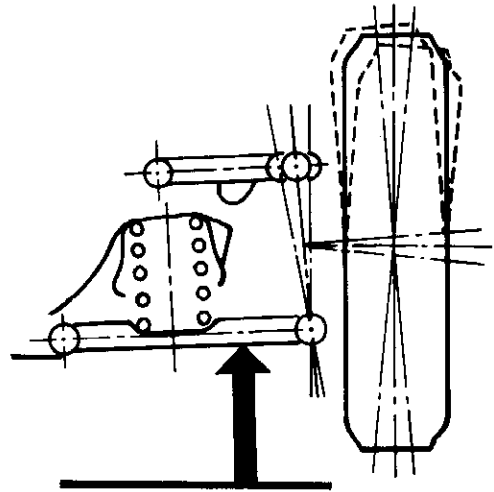
Ford, Mercury, LTD II, Cougar, Thunderbird, Continental Mark V, Lincoln Continental, Mustang II, Pinto and Bobcat

Prior to performing any ball joint inspection, adjust the front wheel bearings as described in Part 11-10.

1. Raise the vehicle and place floor jacks beneath the lower suspension arms (Fig. 15).
2. Ask an assistant to grasp the lower edge of the tire and move the wheel in and out.
3. While the wheel is being moved observe the upper end of the spindle and the upper suspension arm. (Any movement between the upper end of the spindle and the upper suspension arm indicates abnormal ball joint wear.)
4. If any such movement is observed, install new upper suspension arm.

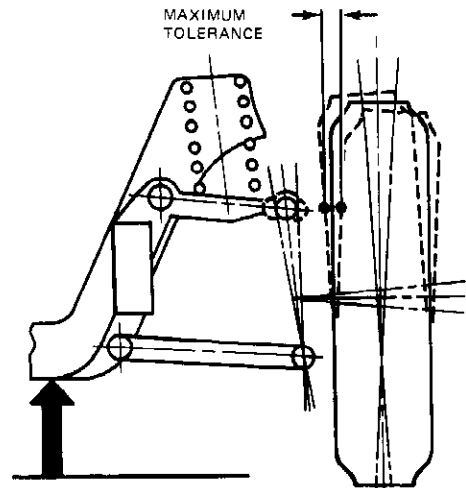
Granada, Monarch and Versailles

1. Raise the vehicle on a frame contact hoist or by floor jacks placed beneath the underbody until the wheel falls to the full-down position as shown in Fig. 16.
2. Ask an assistant to grasp the tire at the top and bottom and slowly move the tire in and out (Fig. 16).
3. While the wheel is being moved, observe the upper end of the spindle and the upper suspension arm. (Any movement between the upper end of the



F2505-1A

FIG. 15 Upper Ball Joint Inspection



F1500-1C

FIG. 16 Measuring Upper Ball Joint Radial Play

spindle and the upper suspension arm indicates abnormal ball joint wear.) See Fig. 16.

4. If any such movement is observed, install new upper suspension arm.

NOTE: Granada and Monarch upper ball joints have polyethylene liners and do not require lubrication, therefore, no grease fitting is provided.

LOWER BALL JOINT INSPECTION

Ford, Mercury, LTD II, Cougar, Thunderbird, Continental Mark V, Lincoln Continental, Mustang II, Pinto, Bobcat, Fairmont and Zephyr

1. Raise the vehicle and place jacks under the lower suspension arms as shown in Fig. 17. This will unload the lower ball joints.
2. Attach a dial indicator to the lower suspension arm and position the indicator so that the plunger rests against the inner side of the wheel rim adjacent to the lower ball joint.
3. Grasp the tire at the top and bottom and slowly move the tire in and out (Fig. 17). Note the reading

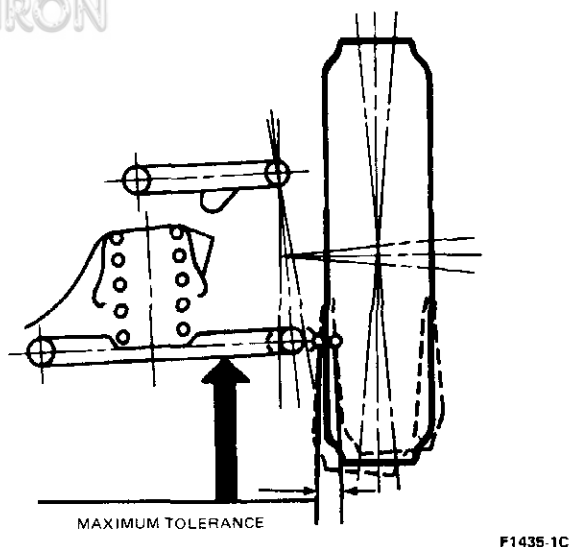


FIG. 17 Measuring Lower Ball Joint Radial Play

(radial play) on the dial indicator. If the reading exceeds specifications, replace the lower suspension arm.

Granada, Monarch and Versailles

1. Raise the vehicle on a frame contact hoist or by floor jacks placed beneath the underbody, until the wheel falls to the full down position (Fig. 18).
2. Ask an assistant to grasp the lower edge of the tire and move the wheel in and out.
3. As the wheel is being moved in and out, observe the lower end of the spindle and the lower suspension arm. (Any movement between the lower end of the spindle and the lower arm indicates abnormal ball joint wear.)
4. If any such movement is observed, install new lower suspension arm.

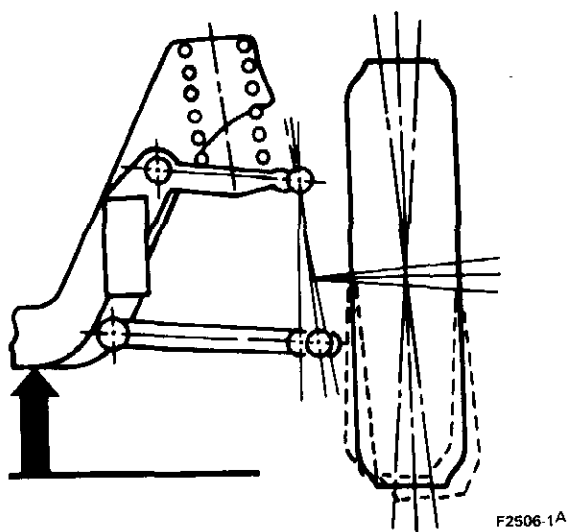


FIG. 18 Lower Ball Joint Inspection

FAIRMONT/ZEPHYR

1. Support the vehicle in normal driving position, with both ball joints loaded.

2. Wipe the grease fitting and checking surface so they are free of dirt and grease. The checking surface is the round boss into which the grease fitting is threaded (Fig. 19).
3. The checking surface should project outside the cover (Fig. 19). If the checking surface is inside the cover (Fig. 19), replace the lower arm assembly.

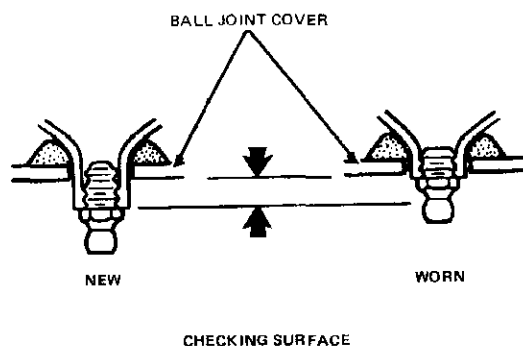


FIG. 19 Checking Lower Ball Joint—Fairmont/Zephyr

SHOCK ABSORBER CHECKS—EXCEPT FAIRMONT/ZEPHYR

NOTE: Fairmont and Zephyr front shock absorbers are part of the front shock tower and require disassembly of the front suspension in order to replace. This procedure is covered in Part 14-05.

All vehicles are equipped with hydraulic shock absorbers of the direct-acting type and are nonadjustable and nonrefillable. They cannot be repaired.

Before replacing a shock absorber, check the action of the shock absorbers as follows:

On Vehicle Tests

1. Check the shock absorber to be sure it is securely and properly installed. Check the shock absorber insulators for damage and wear.
Replace any defective insulators and tighten attachments to the specified torque (on a shock absorber which incorporates integral insulators, replace the shock absorbers).
2. Inspect the shock absorber for evidence of fluid leakage. (A light film of fluid is permissible. Be sure any fluid observed is not from sources other than the shock absorber.)
Replace the shock absorber if leakage is severe.
3. Disconnect the lower end of the shock absorber. Extend and compress the shock absorber as fast as possible, using as much travel as possible.
Action should become smooth and uniform throughout each stroke. Higher resistance on

extension than on compression is a normal condition. Faint swish noises are also normal.

Remove the shock absorber for a bench test if action is erratic. If the action is smooth, but the shock absorbers are suspected of being weak, follow Step 4:

4. Repeat Step 3 on the mating shock absorber on the opposite side of the vehicle, and compare results of both tests. If the action is similar, it is unlikely that either shock absorber is defective. Reconnect both shock absorbers.

Replace the shock absorber having the lower resistance. Ensure that the part number of the replacement is the same as that of the original

shock absorber. The replacement shock absorber resistance will appear to be higher than either original due to initial friction of the rod seal.

Bench Test

With the shock absorber right side up (as installed in vehicle), extend it fully. Then turn the shock absorber upside down and fully compress it. Repeat this procedure at least three times to ensure that any entrapped air has been expelled. Now place the shock absorber right side up in a vise, and hand stroke the shock absorber as described in On Vehicle Tests, Step 3. If action is not now smooth and uniform, install a new shock absorber.

SPECIFICATIONS

WHEELBASE AND TREAD WIDTH - INCHES

Vehicle	Wheelbase	Tread Width	
		Front	Rear
Pinto/Bobcat	94.2	55.0	55.8
Fairmont/Zephyr	105.5	56.4	57.0
Monarch/Granada	109.9	58.5	57.7
Mustang II	96.2	55.6 ①	55.8 ①
Cougar XR7	114.0	63.4	63.5
Thunderbird	114.0	63.0	63.1
LTD II	2-Door	114.0	63.4
	4-Door	118.0	62.8
Cougar	2-Door	114.0	63.4
(Except XR7)	4-Door	118.0	63.4
Ford (All)		121.0	64.1
Mercury	2-Door	124.0	64.1
	4-Door	124.0	64.1
	Sta. Wag.	121.0	64.1
Continental Mark V	120.4	62.9	62.8
Lincoln Continental	127.2	64.3	64.3

① Add 0.3 for 0.45" optional offset wheel usage. Optional tread standard on Mustang II 302-V8 models.

FRONT WHEEL ALIGNMENT

Vehicle Model	Alignment Factors	Nominal	Minimum	Maximum
Ford Mercury	Caster ① Camber Toe-inches	+2° L +1/2° R +1/4° 3/16"	+1-1/4° L -1/4° R -1/2° 1/16"	+2-3/4° L +1-1/4° R +1° 5/16"
LTD II Thunderbird Cougar	Caster ① Camber Toe-inches	+4° L +1/2° R +1/4° 1/8"	+3-1/4° L -1/4° R -1/2° 0"	+4-3/4° L +1-1/4° R +1° 1/4"
Mark V	Caster ① Camber Toe-inches	+4° L +1/2° R +1/4° 3/16"	+3-3/4° L -1/4° R -1/2° 1/16"	+4-3/4° L +1-1/4° R +1° 5/16"
Lincoln	Caster ① Camber Toe-inches	+2° L +1/2° R +1/4° 1/8"	+1-1/4° L -1/4° R -1/2° 0"	+2-3/4° L +1-1/4° R +1° 1/4"
Monarch Granada Versailles	Caster ② Camber Toe-inches	-1/2° +1/4° 1/8"	-1-1/4° -1/2° 0"	+1/4° +1° 1/4"
Mustang II	Caster ② Camber Toe-inches	+7/8° +1/2° 1/8"	+1/8° -1/4° 0"	+1-5/8° +1-1/4° 1/4"
Pinto Bobcat (Sedan)	Caster ② Camber Toe-inches	+1° +1/2° 1/8"	+1/4° -1/4° 0"	+1-3/4° +1-1/4° 1/4"
Pinto Bobcat (Wagon)	Caster ② Camber Toe-inches	+1/4° +1/2° 1/8"	-1/2° -1/4° 0"	+1° +1-1/4° 1/4"
Fairmont ③ Zephyr	Caster Camber Toe-Inches	+7/8° +3/8° 5/16	+1/8° -3/8° 3/16	+1-5/8° +1-1/8° 7/16

- ① Maximum caster difference between wheels (left minus right) to be within -3/4° to +3/4° with caster set to specification. Maximum camber difference between wheels (left minus right) to be within -1/2° to 1° with camber set to specification.
- ② Maximum caster and camber difference between wheels (left minus right) to be within -3/4° to +3/4° with caster and camber set to specification.
- ③ Caster and Camber is factory-set and cannot be adjusted.

SPECIAL SERVICE TOOLS

Tool No.	Description
T69P-3000-A (Except Mustang II/Pinto/Bobcat)	Caster and Camber Adj. Tools
T74P-3000	Caster and Camber Adj. Wrenches
T74P-3000-A1	Mustang II Left Front
T74P-3000-A2	Mustang II Right Front
T74P-3000-A3	Mustang II/Pinto/Bobcat Left Rear
T74P-3000-A4	Mustang II/Pinto/Bobcat Right Rear
T74P-3000-A5	Pinto/Bobcat Right Front
T74P-3000-A6	Pinto/Bobcat Left Front

FRONT WHEEL TURNING ANGLE

Vehicle Model	Turning Angle Of Outside Wheel With Inside Wheel Turned 20°
Ford/Mercury	18.72°
LTD II Thunderbird Cougar	18.06°
Continental Mark V	18.09°
Lincoln Continental	18.16°
Fairmont/ Zephyr	With P/S 19.74° Without P/S
Granada/Monarch/ Versailles	With P/S 18.20° Without P/S 18.43°
Mustang II/Pinto/Bobcat	18.84°

BALL JOINTS - RADIAL PLAY

Vehicle Model	Description	Radial Play - Max. Allowable
Ford/Mercury LTD II/Thunderbird/ Cougar	Lower Ball Joint	0.250 Inch
Mark V, Lincoln, Mustang II/ Pinto/Bobcat	Upper Ball Joint	Replace the arm if ball joint is perceptibly loose.
Granada/Monarch/ Versailles	Lower Ball Joint	Replace the arm if ball joint is perceptibly loose.
	Upper Ball Joint	

Front Suspension— Spring On Lower Arm

PART
14-03

Applies To All Cars Except Granada/Monarch/Versailles/Fairmont/Zephyr

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION		REMOVAL AND INSTALLATION (Cont'd.)	
Front Suspension	03-1	Front Wheel Spindle	03-6
		Lower Arm	03-4
REMOVAL AND INSTALLATION		Lower Arm Strut and/or Bushing	03-4
Adjustable Shock Absorbers	03-7	Stabilizer Bar End Bushing	03-3
Ball Joint Seal — Lower	03-8	Stabilizer Bar Insulator	03-3
Ball Joint Seal — Upper	03-8	Upper Arm	03-6
Front Shock Absorber	03-7	Upper Arm Bushings	03-7
Front Spring	03-4	SPECIFICATIONS	03-9

CF2513-2B

DESCRIPTION

FRONT SUSPENSION

Each front wheel rotates on a spindle. The upper and lower ends of the spindle are attached to ball joints, which are mounted onto an upper and lower arm. The upper arm pivots on a bushing and shaft assembly which is bolted to the Number 2 crossmember. The lower arm pivots on a bolt in the Number 2 crossmember (Figs. 1 and 2). A coil spring seats between the lower arm and the top of the spring housing. A double action shock absorber is bolted to the arm and the top of the spring housing.

Lower suspension arms must always be replaced as a unit. Ball joints and other subcomponents should not be installed in a used suspension arm.

Upper arm bushings may be replaced, but ball joints cannot be replaced. Ball joint seals on Mustang II, Pinto and Bobcat lower arms cannot be replaced.