

WHEEL ALIGNMENT PROCEDURES

PRE-ALIGNMENT INSTRUCTIONS

Before making wheel alignment adjustments, check the following:

- All tires of same construction and tread style, approximately equal in tread wear and overall diameter, radial and axial runout not excessive, and inflation at manufacturer's specifications.
- Steering linkage and suspension must not have excessive looseness. Check for wear in tie rod ends and ball joints. Springs must not be sagging. Control arm and strut rod bushings must not have excessive play. See Fig. 1.

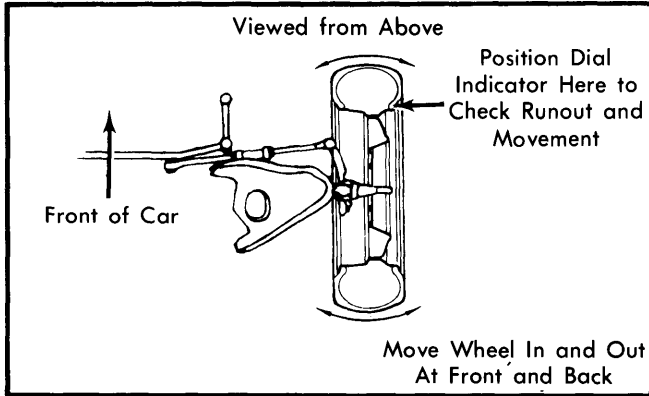


Fig. 1 Checking Steering Linkage

- Car must be on level floor with full fuel tank, no passenger load, spare tire in place and no load in trunk. Bounce front and rear end of car a number of times, releasing bumper at bottom of down stroke. Check that car is at normal running height.
- Ensure that steering wheel is centered with wheels in straight ahead position. If required, shorten 1 tie rod adjusting sleeve and lengthen opposite sleeve. See Fig. 2.

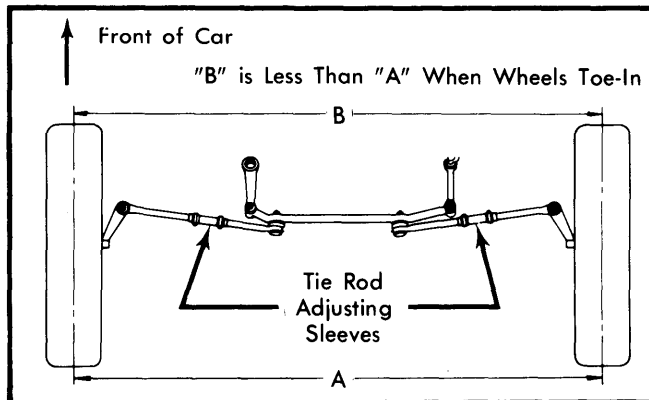


Fig. 2 Adjusting Tie Rod Sleeves (Top View)

- Wheel bearings must be properly adjusted and lug nuts tightened to manufacturer's specifications. Adjust camber, caster and toe-in in order. Follow instructions of alignment equipment manufacturer.

CAMBER

1) Camber is the tilting of the wheel, outward at either top or bottom, as viewed from the front of vehicle. See Fig. 3.

2) When wheels tilt outward at the top (from centerline of vehicle), camber is said to be positive. When wheels tilt inward at the top, camber is said to be negative. Amount of tilt is measured in degrees from vertical.

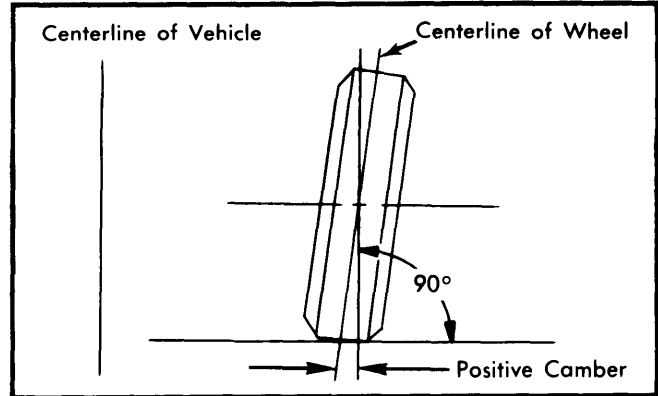


Fig. 3 Determining Camber Angle

CASTER

1) Caster is the tilting of the front steering axis either forward or backward from vertical, as viewed from the side of the car. See Fig. 4.

2) When axis is tilted backward from vertical, caster is said to be positive. This creates a trailing action on front wheels. When axis is tilted forward, caster is negative, causing a leading action on front wheels.

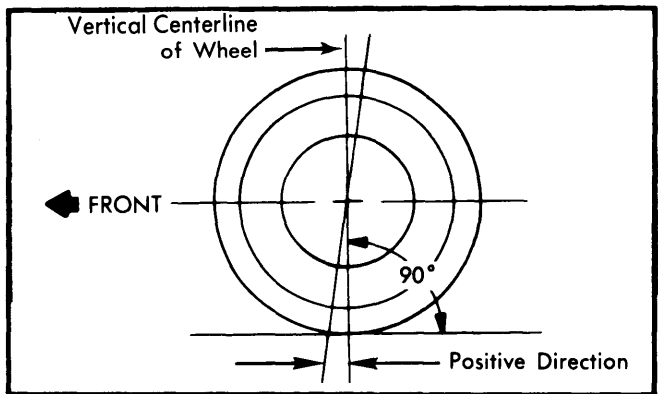


Fig. 4 Determining Caster Angle

TOE-IN ADJUSTMENT

Toe-in is the difference in the distance measured between the front and rear of the front wheels. To adjust:

1) Measure toe-in with front wheels in straight ahead position and steering wheel centered. To adjust toe-in, loosen clamps and turn adjusting sleeve or adjustable end on right and left hand tie rods. See Figs. 2 and 5.

2) Turn equally and in opposite directions to maintain steering wheel in centered position.

CAUTION — Face of tie rod end must be parallel with machined surface of steering rod end to prevent cocking and binding of the ball end in service.

Wheel Alignment

WHEEL ALIGNMENT PROCEDURES (Cont.)

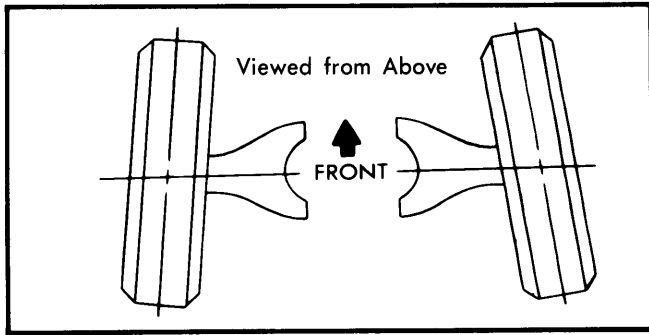


Fig. 5 Illustrating Wheel Toe-In

3) When tightening clamps, make certain that clamp bolts are positioned so there will be no interference with other parts throughout the entire travel of linkage.

TOE-OUT ON TURNS

1) Toe-out is a check for bent or damaged parts, and not a service adjustment. With caster, camber, and toe-in properly adjusted, check toe-out with weight of car on wheels. See Fig. 6.

2) Use a full floating turn table under each wheel, repeating test with each wheel positioned for right and left turns.

3) Incorrect toe-out generally indicates a bent steering arm. Replace arm and recheck all wheel alignment adjustments.

CAUTION – Do not attempt to correct by straightening parts.

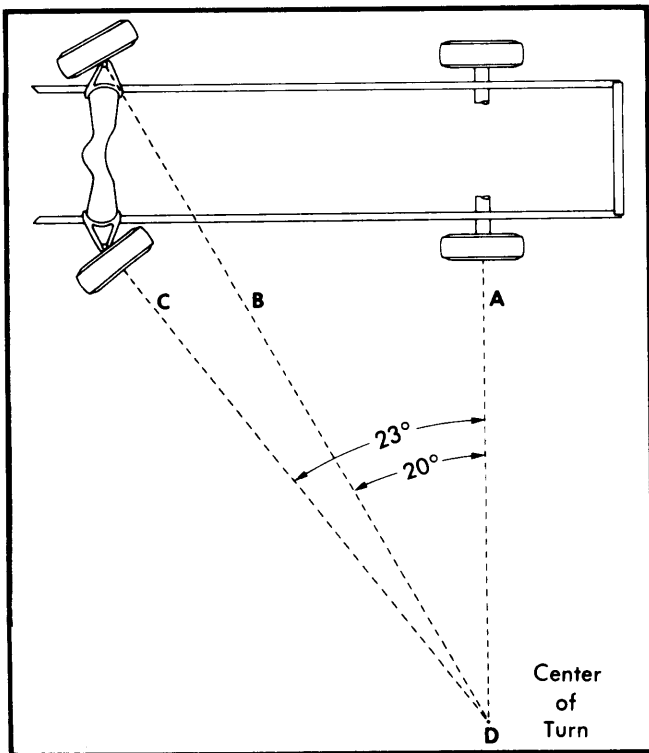


Fig. 6 Wheel Toe-Out on Turns

STEERING AXIS INCLINATION

1) Axis inclination is a check for bent or damaged parts, and not a service adjustment. Car must be level (both crosswise and

lengthwise) and camber should be properly adjusted. See Fig. 7.

2) If camber cannot be brought within limits and steering axis inclination is correct, steering knuckle is bent. If camber and steering axis inclination are both incorrect by approximately the same amount, the upper and lower control arms are bent. Replace parts, and recheck all front end adjustments

CAUTION – Do not attempt to correct by straightening parts.

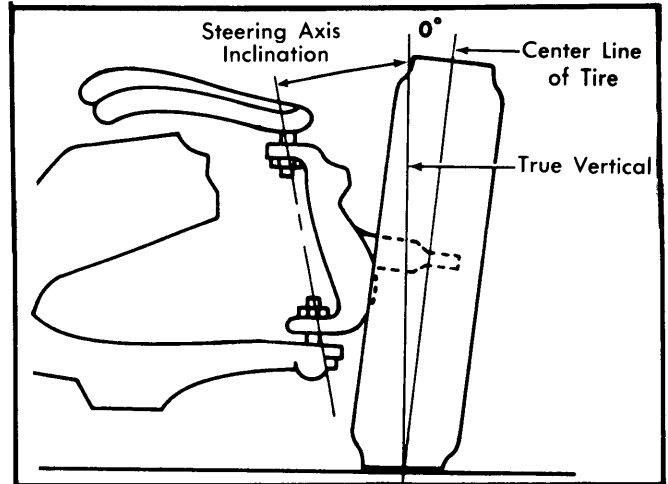


Fig. 7 Checking Steering Axis Inclination

TIGHTENING SPECIFICATIONS Wheel Lug Nuts

Application	Ft. Lbs. (N·m)
American Motors	75 (102)
Chrysler Corp.	
Omni, Horizon, Aries, Reliant, 400, LeBaron & Rampage	80 (109)
Diplomat, Mirada, Cordoba, Imperial, New Yorker & Gran Fury	85 (115)
Ford Motor Co.	
All Models	80-105 (109-142)
General Motors	
Buick	
Skylark, Riviera	100 (136)
Century Aluminum Wheels	90 (122)
All Other Models	80 (109)
Cadillac	100 (136)
Chevrolet	
Citation, Caprice Wagon & Impala	100 (136)
Camaro Aluminum Wheels	90 (122)
All Other Models	80 (109)
Oldsmobile	
Omega, 88 Wagon, 98 & Toronado	100 (136)
Cutlass Aluminum Wheels	90 (122)
All Other Models	80 (109)
Pontiac	
Phoenix & Bonneville	100 (136)
Firebird & Grand Prix Aluminum Wheels	70 (95)
All Other Models	80 (109)