

# Wheel Alignment

## WHEEL ALIGNMENT PROCEDURES

### PRE-ALIGNMENT

#### VEHICLE CHECKS

Before making wheel alignment adjustment, perform the following checks:

1) Tires should be equal in size and runout must not be excessive. Tires and wheels should be in balance, and inflated to manufacturer's specifications.

2) Wheel bearings must be properly adjusted.

3) Steering linkage and suspension must not have excessive looseness. Check for wear in tie rod ends and ball joints.

4) Steering gear box must not have excessive play. Check and adjust to manufacturer's specifications.

5) Vehicle must be at curb height with full fuel load, but no extra load, no passengers and spare tire in vehicle.

6) Vehicle must be floor level with suspension settled. Bounce front and rear of vehicle several times and allow it to settle to normal riding height.

7) If steering wheel is not centered with front wheels in straight ahead position, correct by shortening one tie rod adjusting sleeve and lengthening opposite sleeve equal amounts.

8) Ensure wheel lug nuts are tightened to manufacturer's specifications.

#### WHEEL LUG NUTS TIGHTENING SPECIFICATIONS

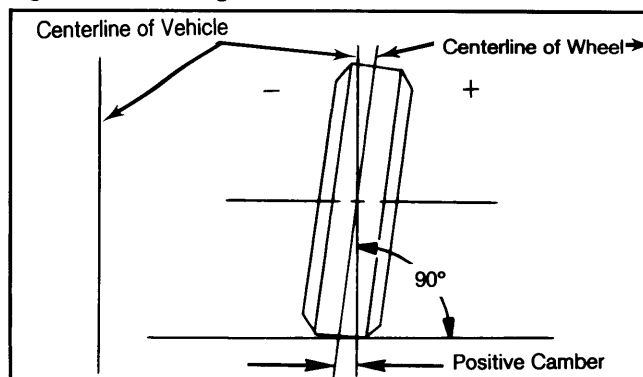
Application	Ft. Lbs. (N.m)
<b>Chevrolet &amp; GMC</b>	
C, P, G10 & G20 .....	75-100 (102-136)
All K Models .....	70-90 (95-122)
<b>C, P &amp; G30</b>	
W/Single Rear Wheels .....	90-120 (122-163)
<b>C, P &amp; G30</b>	
W/Dual Rear Wheels .....	110-140 (150-190)
W/Dual Rear Wheels & $\frac{5}{8}$ " Studs .....	150 (204)
All S Models .....	90 (122)
<b>Dodge &amp; Plymouth</b>	
All Models	
$\frac{1}{2}$ "-20 .....	105 (143)
$\frac{5}{8}$ "-18 .....	200 (272)
W/Flanged Type Nut .....	325 (442)
<b>Ford Motor Co.</b>	
All Models	
$\frac{1}{2}$ "-20 .....	90 (122)
$\frac{5}{16}$ "-18 W/Single Rear Wheels .....	145 (197)
$\frac{5}{16}$ "-18 W/Dual Rear Wheels .....	220 (299)
<b>Jeep</b>	
All Models (Exc. J20 Truck) .....	75 (102)
J20 Truck .....	130 (177)

### DESCRIPTION

#### CAMBER

Camber is the tilting of the wheel, outward at either top or bottom, as viewed from front of vehicle. When wheels tilt outward at top from centerline of vehicle, camber is said to be positive. When wheels tilt inward at top, camber is said to be negative. Amount of tilt or camber angle, is measured in degrees from vertical.

Fig. 1: Camber Angle

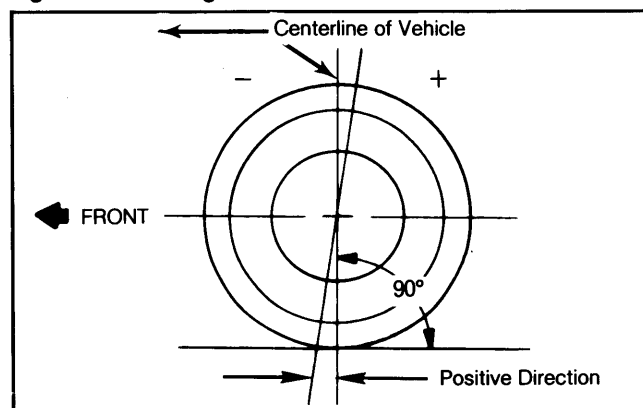


Camber is amount of tilt inward or outward from vertical.

#### CASTER

Caster is the tilting of front steering axis. This forward or backward tilt from vertical is viewed from side of vehicle. When axis is tilted backward from vertical, caster is said to be positive, creating a trailing action on front wheels. When axis is tilted forward, caster is negative, causing a leading action on front wheels.

Fig. 2: Caster Angle



Caster is amount of tilt forward or backward from vertical.

#### TOE-IN

Toe-in is the turning in of the front wheels. Amount of toe-in is generally only a fraction of an inch. The toe specification ensures a parallel rolling of the front wheels.

### ADJUSTMENT

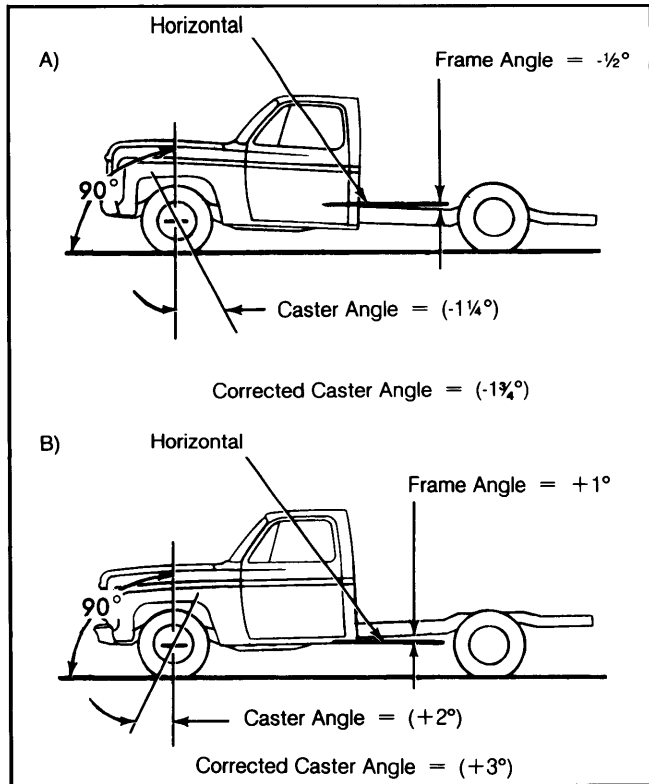
#### TOE-IN

Measure toe-in with front wheels in straight ahead position and steering wheel centered. Adjust toe-in by loosening clamps and adjusting sleeve or adjusting ends on right and left tie rods equally and in opposite directions to maintain steering wheel in centered position. When tightening clamps, make sure that clamp bolts are positioned so there will be no interference with other parts throughout entire travel of steering linkage.

**NOTE:** Face of tie rod end must be parallel with machined surface of steering rod end.

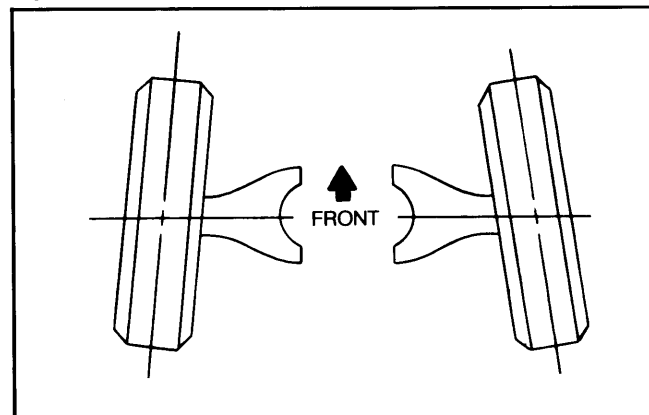
## WHEEL ALIGNMENT PROCEDURES (Cont.)

**Fig. 3: Determining Corrected Caster Angle**



When caster is tilted backward from vertical, caster is positive; when tilted forward, caster is negative.

**Fig. 4: Wheel Toe-In**



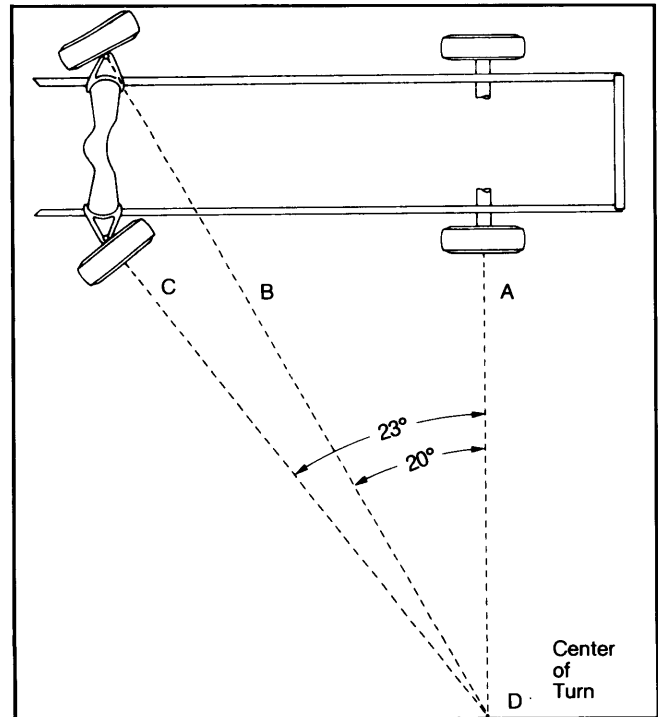
To adjust, turn sleeve on right and left tie rods an equal amount in opposite directions.

### TOE-OUT ON TURNS

1) Toe-out check 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 vehicle on wheels. Use full-floating turn table under each wheel and repeat test with each wheel positioned for right and left turns.

2) Incorrect toe-out generally indicates a bent steering arm. Replace arm and recheck wheel alignment adjustments. Do not attempt to correct by straightening parts.

**Fig. 5: Wheel Toe-Out on Turns**



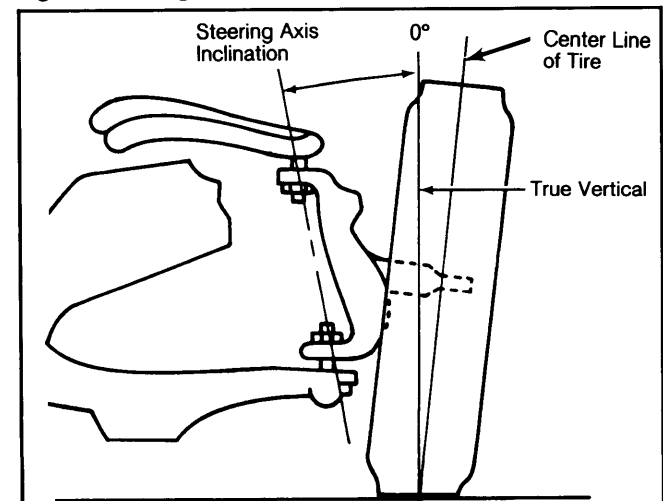
Test each wheel in right and left turn positions.

### STEERING AXIS INCLINATION

1) This is a check for bent or damaged parts, and not a service adjustment. Vehicle must be level, both crosswise and lengthwise. Camber should be properly adjusted. If camber cannot be brought within limits and steering axis inclination is correct, steering knuckle is bent.

2) If camber and steering axis inclination are both incorrect by approximately the same amount, upper and lower control arms are bent. Replace parts and recheck all wheel alignment adjustments. Do not attempt to correct by straightening parts.

**Fig. 6: Steering Axis Inclination**



If axis and camber inclination are incorrect, check upper and lower control arms for bends.