

Wheel Alignment Procedures

The alignment of chassis according to the specifications will prevent misadjustment, which can affect tire wear, directional stability, and steering wheel alignment. Check alignment at regular intervals and particularly after front suspension has been subjected to extremely heavy service or severe impact loads. Before checking and adjusting alignment, components such as wheel bearings, tie rods, steering gear, shock absorbers, and tire inflation should be inspected and corrected where necessary.

The procedure for checking and adjusting alignment should be followed; namely, checking king pin inclination, camber, caster, and toe-in.

NOTE: The alignment specifications for the Spicer non-drive steering axles are established by the vehicle manufacturer. Do not use specifications other than those of the vehicle manufacturer to adjust wheel alignment. Therefore, this section contains only procedures, not specifications.

CAUTION: Some dimensions of the alignment geometry are machined into the axle when manufactured. These include camber and king pin inclination. Bending of the I-beam to alter any dimension or to correct bent axle is strictly prohibited.

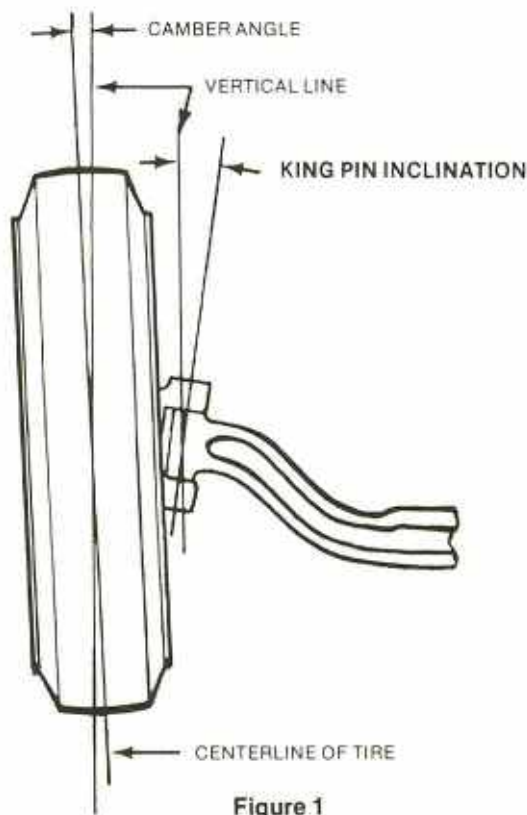


Figure 1

KING PIN INCLINATION

King pin inclination is the amount in degrees that the top of the king pin inclines away from the vertical toward the center of the truck as viewed from the front of the truck, shown in figure 1.

King pin inclination effects steering effort and influences directional stability in the vehicle.

There is no way to adjust this angle; therefore, it will not change unless the front axle has been bent. Corrections or changes to this angle are accomplished by replacement of bent, or worn components.

CAMBER ANGLE

Camber angle is the angle in degrees that the wheel varies from vertical, as viewed from the front of the vehicle as shown in figure 1.

"Positive" camber is an outward tilt or inclination of the wheel at the top.

"Negative" camber is an inward tilt of the wheel at the top.

Again, do not bend I-beam. Replace if not within specifications.

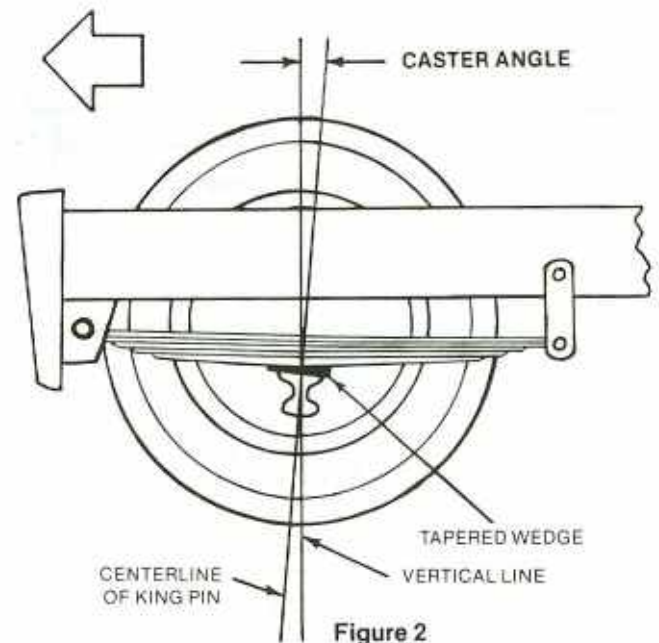


Figure 2

CASTER ANGLE

Viewed from the side of the truck, caster angle is the inclination of the king pin toward the front or rear of the truck.

"Positive" caster, as shown in figure 2, is the tilting of the king pin toward the rear of the truck.

"Negative" caster is the tilting of the king pin toward the front of the truck.

The correct amount of caster helps to keep the front wheels in the straight-ahead position. When in a turn, caster acts as a lever, assisting the driver to return the front wheels to the straight-ahead position.

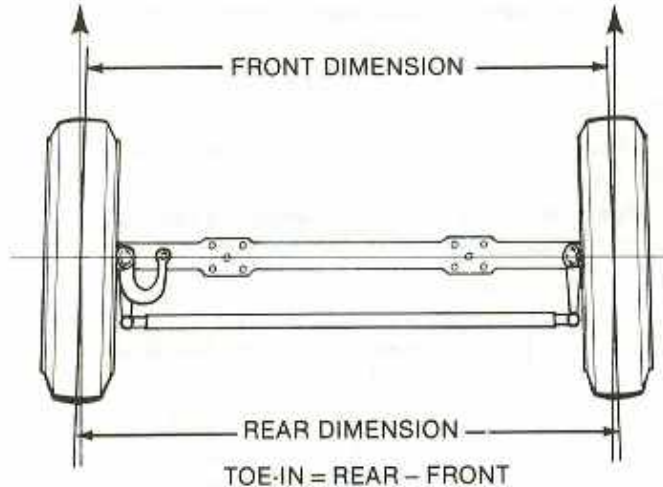
Caster specifications are based on vehicle design load (no payload) which will usually result in a level frame. If the frame is not level when alignment checks are made, this must be considered in determining whether the caster setting is correct.

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Wheel Alignment Procedures (continued)

Possible causes of incorrect caster are sagging springs, bent or twisted axle, or unequally tightened spring U-bolts. Do not bend I-beam to correct improper caster.

If caster must be corrected, tapered shims can be used as required between the springs and axle. Spring U-bolts should be tightened evenly and to specified torque after the addition or removal of shims. Adjust to vehicle manufacturer's specifications.



TOE-IN

Toe-in is the amount in fractions of an inch (mm) that the front wheels are closer together at the front than at the back as viewed from the top of the truck, figure 3. With the camber on the front wheels, the left front wheel tries to steer to the left and right front wheel tries to steer to the right. This is due to the wheels wanting to turn in the same direction each wheel leans. To overcome this condition, the wheels are given a certain amount of toe-in.

The most familiar reason for toe-in is the forces acting on the front wheels tend to make the wheels toe out.

Incorrect toe adjustment will result in rapid tire wear. Excessive toe-in will produce a scuffing or "feather-edge" at the inside of the tire tread. Toe-out will produce a like wear at the outside of the tire tread. Follow vehicle manufacturers specifications when setting toe-in.

1. To adjust toe-in raise vehicle and scribe a center line on both front tires, as shown in figure 3. Lower vehicle and center steering gear. Move ahead 12-15 feet to neutralize the suspension.

Measure, in front of axle and behind axle. The difference in the two measurements is the toe-in or toe-out.

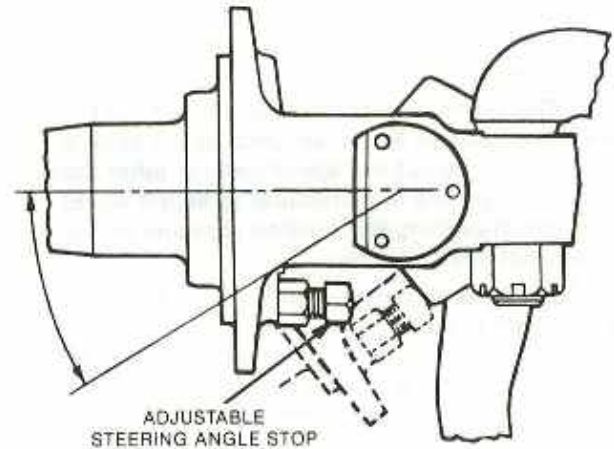
2. If setting is not correct, loosen the clamping bolts on the tie rod.

3. Turn the tie rod in the direction necessary to bring toe-in within specified limits.

CAUTION: If tie rod ends are not indexed properly, the intended movement of the tie rod assembly will be restricted and could cause premature failure of tie rod ends.

Index tie rod ends (left tie rod end parallel to right tie rod end), and be certain thread engagement is completely through clamp on both ends.

4. Retighten clamp bolts to 40-50 ft. lbs. (54-68 N-m) torque on I-50 thru I-80 models, and 45-65 ft. lbs. (61-88 N-m) torque on I-90 thru I-120 models. The I-132 model, or the I-120 model equipped with a deep dropped tie rod end, requires 120-140 ft. lbs. (183-190 N-m) torque.



TURNING ANGLE

Turning angle is the degree of movement from a straight-ahead position of the front wheels to either an extreme right or left position.

To avoid tire interference or bottoming of the steering gear, adjustable stop screws are located on the steering knuckles.

To adjust the turning angle, loosen the jam nuts. Adjust to vehicle manufacturer's specifications using appropriate alignment equipment. Set steering knuckle stopscrews and re-tighten jam nuts.

Recommended Maintenance Schedule

INTERVAL	COMPONENT	PROCEDURE
Break-In After completing 100 hours or 4,000 miles of operation	Wheel Bearings (All Models) Wheel Bearings (Oil) King Pins* Tie Rod Ends	Adjust Check level daily during break-in. Lubricate with NLGI-1 or NLGI-2 (EP-1 or EP-2) Grease
4,000 miles or monthly (whichever comes first)	Wheel Bearings (Oil)	Check level and fill with GL-5 gear lubricant
10,000 miles or every 5 months (whichever comes first)	King Pins* Tie Rod Ends	Lubricate with NLGI-1 or NLGI-2 (EP-1 or EP-2) Grease
32,000 miles or annually (whichever comes first)	Wheel Bearings (Grease)	Repack with NLGI-1 or NLGI-2 (EP-1 or EP-2) Grease
96,000 miles or annually (whichever comes first)	Wheel Bearings (Oil)	Change lubricant GL-5 Gear Lubricant

*Raise front axle wheels off the floor, prior to lubrication of kingpins. This allows sufficient grease to circulate through king pin bushings and thrust bearings.

Specifications

Spicer Models	I-50 thru I-80		I-90 thru I-132	
	5,000 thru 8,000 lbs.		9,000 thru 13,200 lbs.	
Load Rating				
King Pin Bushing I.D.	1.3615 inch*	34.58 mm	1.612 inch*	40.945 mm
	1.3600 inch*	34.54 mm	1.610 inch*	40.894 mm
King Pin Diameter	1.3592 inch*	34.52 mm	1.6092 inch*	40.8737 mm
	1.3587 inch*	34.51 mm	1.6087 inch*	40.8603 mm
King Pin Length	7.97 inch	202.4 mm	9.66 inch**	245.4 mm
I-Beam Bore I.D.	1.3607 inch*	34.56 mm	1.611 inch*	40.9194 mm
	1.3597 inch*	34.55 mm	1.610 inch*	40.8940 mm

* Service King Pin Kits are available in standard size for dual draw key applications; or standard and .002 inch (.051 mm) oversize for single draw key applications. Measure the inside diameter of the I-beam bore to determine which size pin is necessary.

** King Pin length of the I-90 axle is 9.16 inch (232.7 mm).

NOTE: For alignment specifications, such as toe-in, caster, and turning angle, refer to vehicle manufacturer's maintenance manual.

Torque Chart

Position	Model	Thread	Ft. Lbs.	N-m
Tie Rod End Nut	I-50 thru I-80	3/4-16	85-105 (Note 1)	115-143 (Note 1)
	I-90 thru I-132	7/8-14	140-160 (Note 1)	190-218 (Note 1)
Tie Rod Clamp Bolt	I-50 thru I-80	1/2-13	40-50	54-68
	I-90 thru I-120	5/8-11	45-65	61-88
	I-120 and I-132 (Note 3)	5/8-11	120-140	163-190
Steering Arm Nut Tie rod Arm Nut	All models	1 1/8-12	300-400 (Note 1)	407-544 (Note 1)
King Pin Draw Key Nut	I-50 thru I-75	3/8-16	25-30 (Note 2)	27-37 (Note 2)
King Pin Cap Bolts	All Models	5/16	12-16	16-22

NOTE 1: If cotter pin cannot be installed after minimum torque is attained, the nut must be advanced until cotter pin can be installed. Torque specified is for taper and threads which are clean and oil free.

NOTE 2: Torque to specifications, tap unthreaded end of draw key sharply with a hammer, and retorque draw key nut to specifications.

NOTE 3: I-120 equipped with deep dropped tie rod end.