Instructions

Snap-on®

Wheel Alignment Equipment

CONTENTS

PRINCIPLES OF WHEEL ALIGNMENT

The purpose of correct wheel alignment is to make the front wheels roll without scuffing, dragging or slipping under all road operating conditions. The result is safer driving, easier steering, longer tire life and less strain on front end parts.

Front wheel aligning provides the correct relationship between caster, camber, ball joint inclination, toe-in and turning radius. Each has a specific purpose, yet all are interrelated. Each depends on the correctness of the others if the front wheels are to perform properly.

In the following sections we will discuss each of these five subjects in detail as well as give instructions on proper settings.

Caster

Definition of Caster: Caster is the forward or backward tilt of the spindle support (ball joints or kingpin) at the top. By spindle support, we mean the points through which the front wheels turn.

Caster is measured in the number of degrees the center line of the spindle support is tilted from true vertical, as illustrated in Figure 1. If the top of the spindle support is tilted back toward the driver's seat, the caster is positive. If the top of the spindle is tilted forward toward the front of the vehicle, the caster is negative. Caster is zero when the spindle support is straight up and down.

Positive caster, as shown in Figure 1, gives the front wheels the tendency to maintain straight ahead position by projecting the center line of the spindle support ahead of the point of load and establishing a lead point for the wheels to follow. The front wheel of a bicycle is a good example of positive caster. It is possible to ride a bicycle "no hands" because positive caster is built into the bicycle king pin.

What Caster Does: Caster affects the handling of the vehicle but is **not** a tire wearing angle. Where caster is unequal, the vehicle will pull to the side having the least amount of positive caster or the greatest amount of negative caster. The rule to remember is that a vehicle will always pull to the side of the leading spindle support (ball joint).

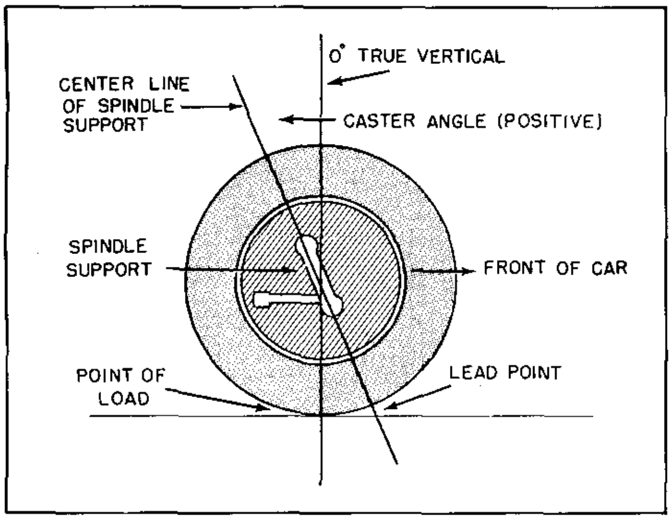

Figure 1—Principles of Caster

It is very important to set caster within the specifications of the manufacturer. Caster not within specifications can cause:

1. Pulling to the side
2. Wander and weave
3. Instability at high speeds
4. Hard steering
5. Excessive road shock and shimmy.

In recent years, many manufacturers of automobiles have changed to positive caster specifications to achieve easier steering and handling qualities. Ball joint inclination is used to achieve the tracking and steering characteristics that were primarily controlled by negative caster settings in the past. This indicates the importance of setting caster within the manufacturer's specifications for each car.

How to set caster: If caster were set exactly equal on both sides of a vehicle, there would be a definite pull to the right due to the crown of the road. To counteract this pull, we recommend setting caster within the manufacturer's specifications, but with approximately ¼° to ½° more positive setting on the right than on the left. For example, if specifications call for 0° to 1° positive caster, we could set the left at 0° and the right at +½° or we could set the left at +¼° and the right at +¾°. If the specifications were negative we could set the left at —1° and the right at —½°.

Anywhere within the manufacturer's specifications would be acceptable as long as we maintain approximately ½° more positive on the right. To save time and unnecessary adjustments, always check both sides first. Often one side is already within specifications and by allowing the ½° difference, we can properly set caster by making all adjustments on the one side. On some vehicles it may be necessary to have more than ½° difference in caster to eliminate pulling.

The arrows in the small chart (Figure 2) give a good rule of thumb for remembering caster adjustments. For example, if a car pulls to the right, block out the offending arrows that point to the right. The remaining arrows show that to correct the condition any adjustments on the right wheel should be in the direction of positive caster and adjustments on the left wheel should be in the direction of negative caster.

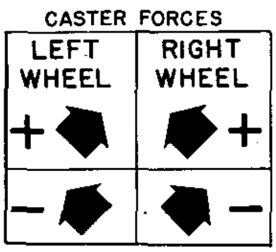

Figure 2

Camber

Definition of Camber. Camber is the inward or outward tilt of the wheel at the top. The amount the center line of the wheel is tilted from true vertical is measured in degrees. The outward tilt is positive camber. The inward tilt is negative camber. See Figure 3.

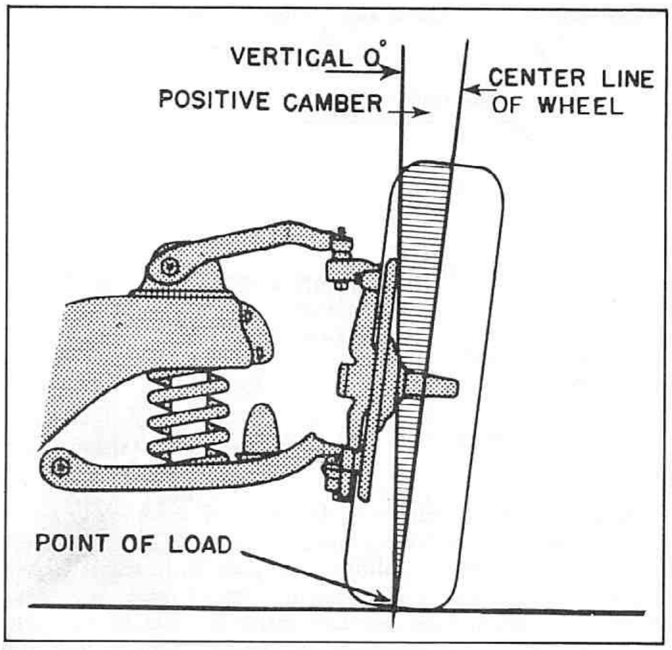

Figure 3—Principles of Camber

What Camber Does:

1. Brings the road contact of the tire more nearly under the point of load.
2. Provides easy steering by having the weight of the vehicle borne by the inner wheel bearing and spindle.

Here are the harmful effects of incorrect camber:

1. Excessive wear to wheel bearings and ball joints.
2. Excessive wear to one side of tire tread. Too much positive camber causes wear on the outside edge. Figure 4 shows this type of wear.
3. Excessive unequal camber will cause the car to pull to one side.

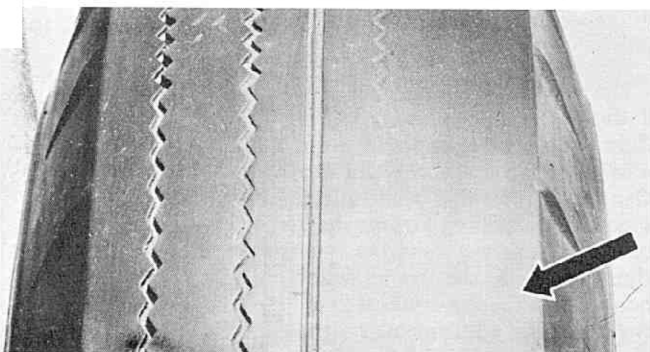

Figure 4—Bad effects of incorrect camber

How to set camber: Camber is a tire wearing angle and must be set correctly within the manufacturer's specifications. The ideal camber setting for most cars would be the middle of the manufacturer's specifications for both wheels. However, if one wheel is set somewhere within specifications it is not necessary to change the setting of that wheel. The important point is to align the other wheel to agree with it. For example, if camber specifications called for 0 to 1 degrees then the ideal setting would be ½ degree on each wheel. However, if one wheel was ¼° and the other —½° a satisfactory camber setting could be obtained by changing the —½° to +¼° thereby adjusting only one side. Adjusting camber this way would result in a setting within specifications and with both wheels equal.

Toe

Definition of toe-in or toe-out: Toe-in is the distance the front of the front wheels at (A) in Figure 5 are closer together than the rear of the front wheels at (B). Toe-out is the distance the front of the front wheels are farther apart than the rear of the front wheels.

What toe does: The correct setting for toe on a vehicle prevents side scuffing of the tires while the vehicle is in motion. Toe is the most critical tire wearing angle and all toe settings are striving for zero toe while the car is in motion.

It will be noted that manufacturers give toe-in specifications due to the fact that there is a slight amount of slack in steering linkage. This is taken up as the vehicle gains momentum and the tires force themselves in the straight ahead position, providing toe is properly set.

The wear from improper toe adjustment appears as a feather-edged scuff across the face of both tires. However, it has been found that a little too much toe-in will result in wear appearing on the outside of the right front tire only. Just the opposite, a little too much toe-out will result in wear appearing on the inside of the left front tire only. Figures 6A and 6B illustrate the effects of improperly set toe on a left front wheel.

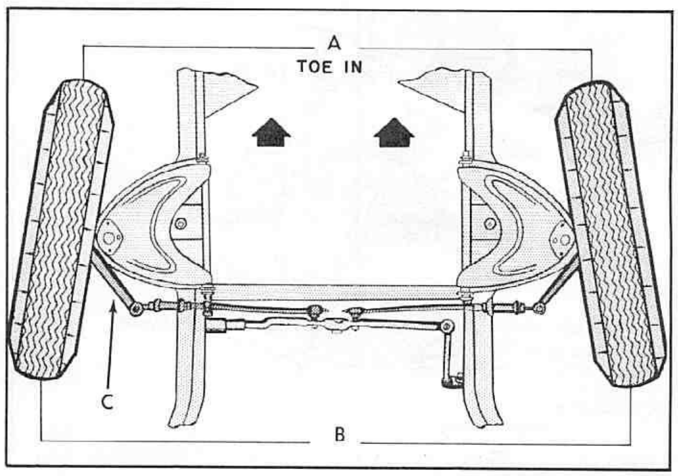

Figure 5—Principles of toe

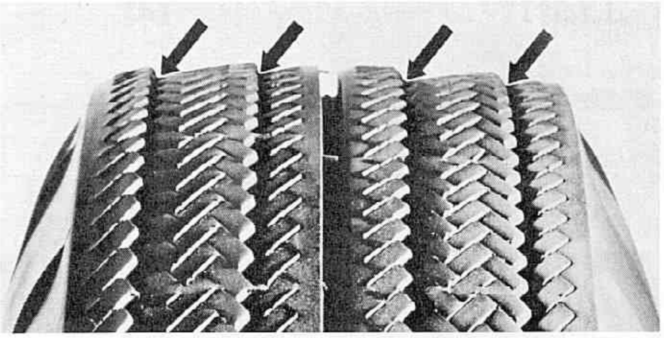

Figure 6A—Bad effect of excessive toe-in on left front wheel

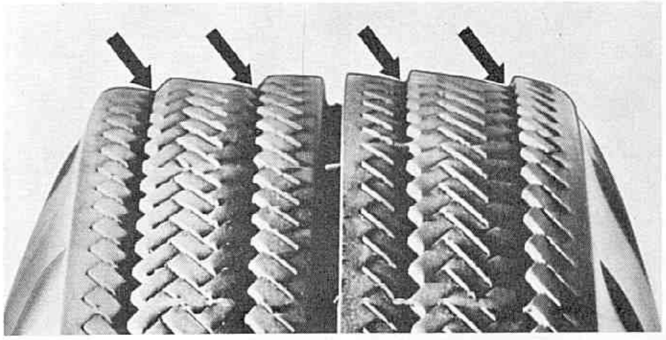

Figure 6B—Bad effect of excessive toe-out on left front wheel

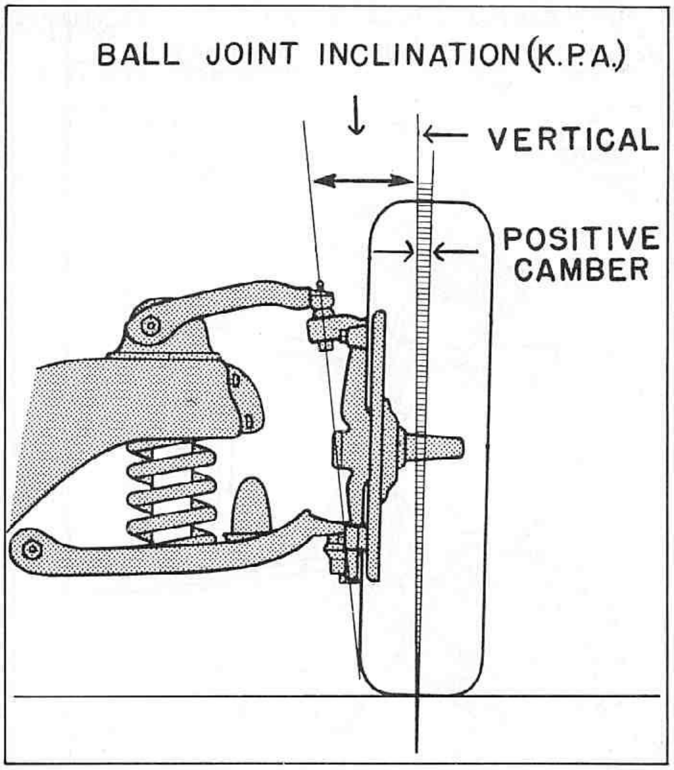

Figure 7—Ball Joint Inclination

Equipment for checking toe:

The WA110 Optical Toe Gauge: This dual projection toe gauge is the most advanced method known for measuring toe-in or toe-out as well as ensuring correct center steering. Less than ten minutes is needed for accurate reading and resetting of toe and center steering.

The gauge consists of two projector assemblies that attach by powerful magnets to the hub flanges of each front wheel. Current for the projectors can be obtained from the vehicle battery or from a wall socket through an adaptor.

A high intensity light beam from each projector falls on the scale of the projector assembly on the opposite wheel. The alignment of the front wheels is thus visually outlined. Toe can be read on the scales while you are under the vehicle adjusting the tie rod sleeves.

This method of setting toe and center steering is based on the consistence of the wheel hubs as reference points. It is independent of wear factors such as tire tread. A full description of use is given in Form SB499C **INSTRUCTIONS FOR THE WA110 OPTICAL TOE GAUGE,** available from your *Snap-on* representative.

The WA151A Trammel Bar: The trammel bar calculates toe by measuring the distances A and B in Figure 5, using the tire center lines as reference points. This is an accurate method on new automobiles. However, as mileage on a vehicle increases, allowances must be made on the toe-in setting to compensate for the increased wear and resulting slack in the steering linkage. Full instructions are given in Form SB532 **INSTRUCTIONS FOR THE WA151A TRAMMEL BAR,** available from your *Snap-on* representative.

Ball Joint Inclination (K.P.A.)

Ball joint or steering axis inclination is also called king ping angle or theoretical king pin inclination. Refer to Figure 7. It is the inward tilt of the spindle support arm (ball joint) at the top. This angle is measured in degrees and is the amount the spindle support center line is tilted from true vertical with zero camber angle. The specifications for this angle are always given with a zero degree camber reading. It is important, therefore, to take the actual camber reading into consideration when checking ball joint inclination. If camber is positive add this reading to the KPA angle. If negative, subtract it. Since this angle is non-adjustable it can only be corrected by the replacement of bent or damaged parts. If the ball joint inclination is not according to specifications when caster and camber is correct, then look for a bent spindle.

Here are the reasons for the ball joint inclination angle:

1. To reduce the need for excessive camber.
2. To put the weight of the car more nearly under the road contact of the tire.
3. To provide a pivot point around which the wheel will turn to produce easy steering.

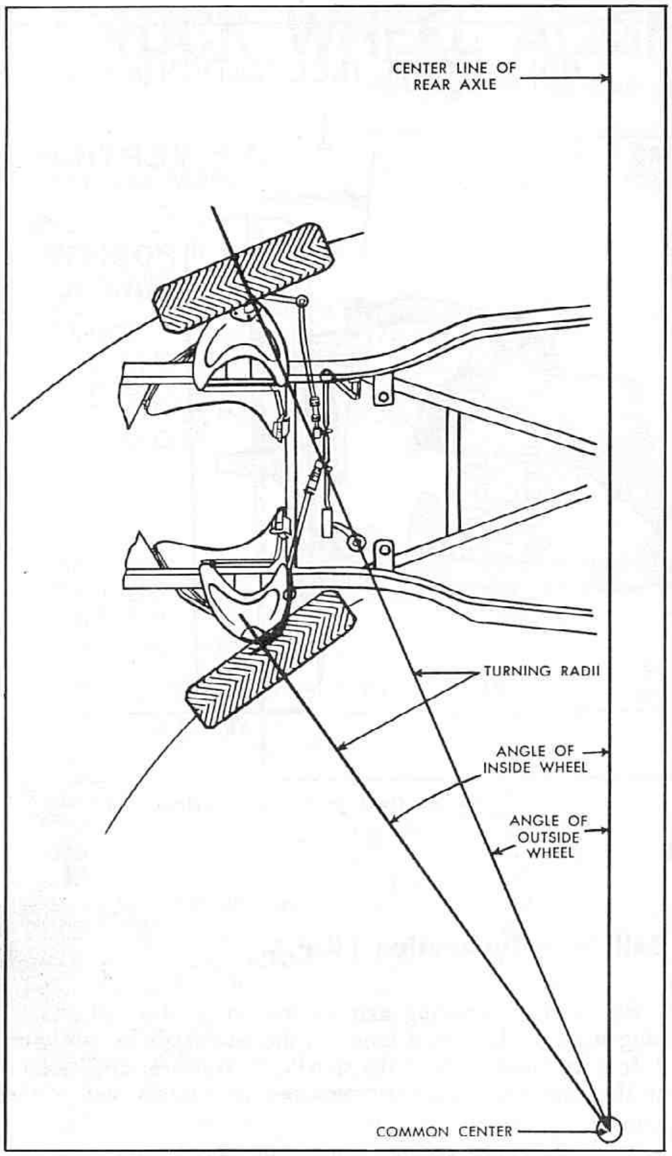

Figure 8—Toe-Out on Turns

Toe-out on Turns

To avoid dragging or scuffing the tire as a car turns, the wheel on the inside of the turn must angle in slightly more than the outside wheel. To do this, the wheels separate slightly at front as they are turned, the exact amount varying with the sharpness of the turn. This is called "toe-out on turns." (See Figure 8.)

The importance of having the correct toe-out on turns is shown by the fact that 60% or more of the average driving is on a turn of some degree—corners, curves and pulling out to pass. Improper toe-out on turns causes tire squealing and excessive tire wear. When incorrect, the steering arm is bent and should be replaced. See Figure 5, point "C".

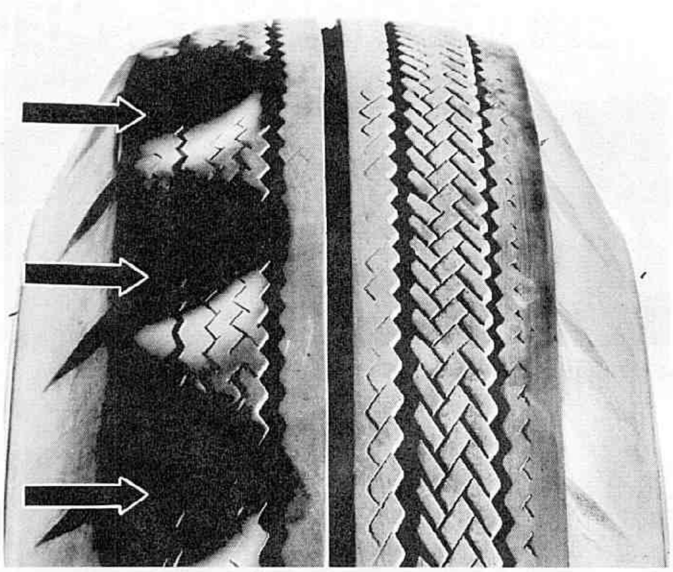

Figure 9A—Spotty Wear caused by mis-alignment and unbalance.

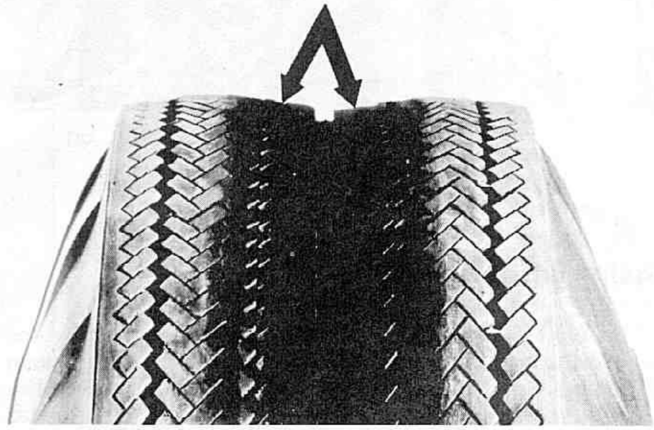

Figure 9B—Over-inflation wear

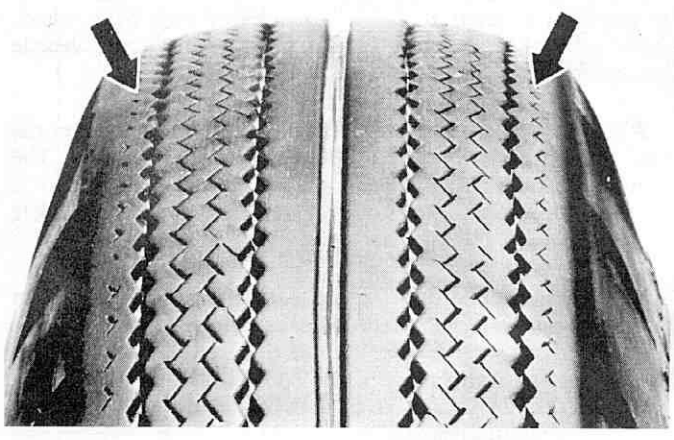

Figure 9C—Under-inflation wear

Other Tire Wearing Factors

Other factors that cause steering trouble and excessive tire wear are faulty brakes and brake drums, bent frame; improperly adjusted front wheel bearings; improper tire inflation; faulty shock absorbers; loose spring shackles; weak springs and out of round tires. See Figures 9A, 9B and 9C.

WHEEL ALIGNMENT DIAGNOSTIC CHART

	PROBABLE CAUSE					
SYMPTOM	CAMBER	CASTER	TOE-OUT ON TURNS	TOE-IN	STEERING LINKAGE	WHEELS
CUPPY TIRE WEAR					Worn	Bent or Unbalanced
EXCESSIVE TIRE WEAR	Incorrect		Incorrect	Incorrect		
PULLING TO ONE SIDE	Unequal	Unequal				
WANDER OR WEAVE		Not Enough		Incorrect	Excessively Loose or Tight	
HARD STEERING		Too Much	Incorrect		Tight	
EXCESSIVE ROAD SHOCK		Too Much			Loose or Worn	
LOW SPEED SHIMMY		Too Much			Loose or Worn	Bent or Unbalanced
HIGH SPEED SHIMMY						Bent or Unbalanced

HOW TO SET UP THE FLOOR STANDS

The WA-204C set of four car stands is a great convenience and space saver for garages or service stations having only a limited amount of space. They provide a level work area and enable the mechanic to make both under-the-car and over-the-fender repairs and adjustments. The car can be placed on the stands with a frame contact hoist or with a jack designed for this type of lifting. Figure 10 shows this set of stands.

The best way to set up these stands is as follows:

1. Position the stands where you want them and place the turntables on the front stands.
2. Place a level lengthwise on one of the front stands and level it.
3. Place the level crosswise on the same stand and level it.
4. Level the other front stand the same way but also make the height equal to the first stand.
5. Level the two back stands the same way and then use a string level diagonally to make them the same height as the front stands.
6. Lock all adjusting bolts.

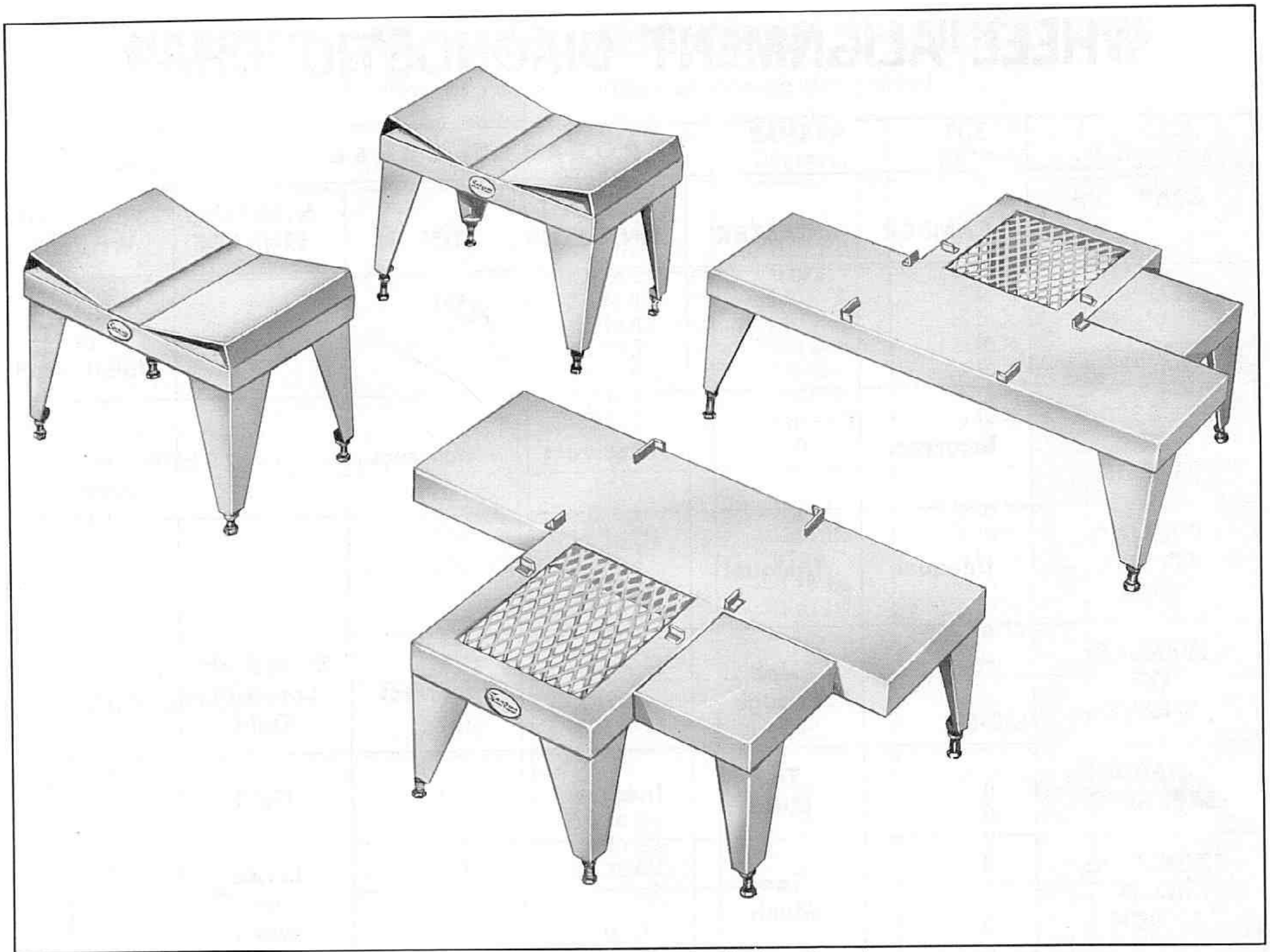

Figure 10—The WA-204C Set of Floor Stands

PERMANENT WHEEL ALIGNMENT INSTALLATIONS

If permanent wheel aligning installations are preferred, SNAP-ON has the following:

1. The WA-201C Drive-on Ramp

This is a permanent installation that has no front end center obstructions and allows full and easy access to adjustments and repairs made under the car. It will raise the entire vehicle to a level position 17″ from the floor. It is adjustable so it will handle all compacts, passenger cars and light trucks up to 6000 pounds. Installation requires only 12 hold-down bolts making it unnecessary

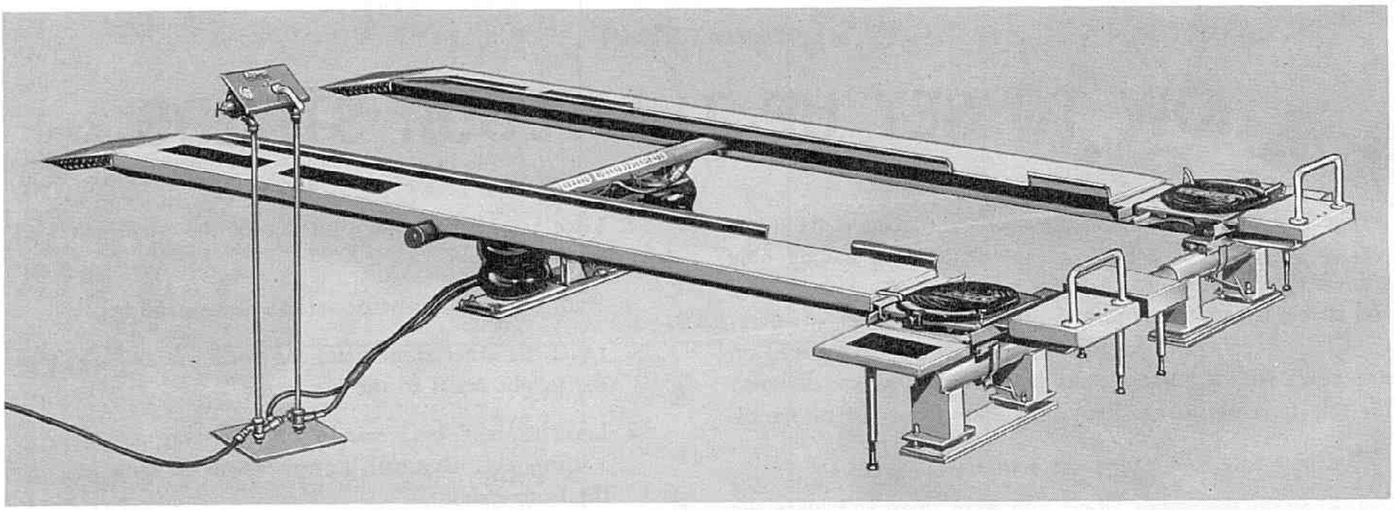

Figure 11—The WA-201C Drive-on Ramp

to tear up the floor. (Figure 11)

2. The WA-73 Ramp-Pit Installation

This consists of the plans and hardware necessary to build a pit installation for front end work. The plans can be obtained from your SNAP-ON representative. Figure 12 illustrates this ramp-pit installation. (Turntables extra).

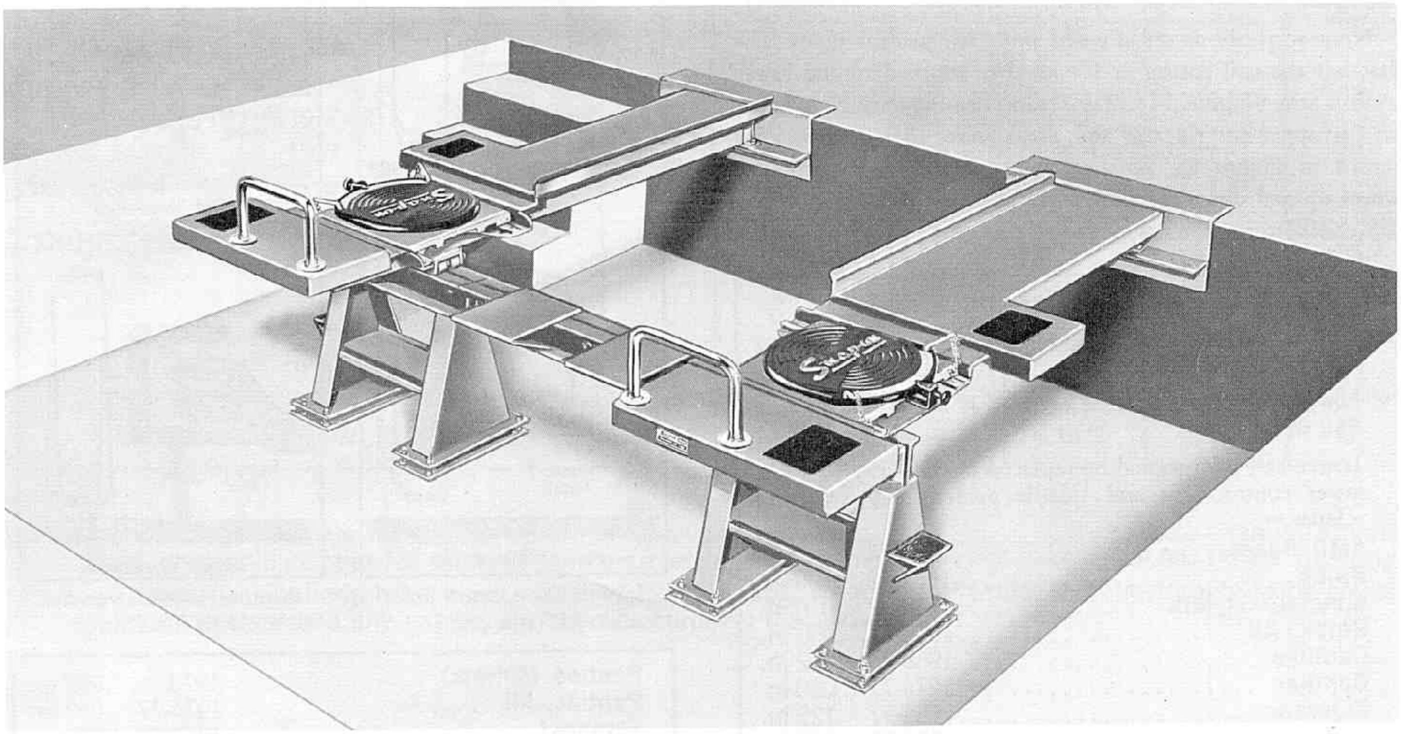

Figure 12—The WA-73 Ramp-pit Installation

INSPECTION BEFORE ALIGNMENT

Inspection of front end parts before the alignment job is begun is most important. Loose ball joints, worn parts in steering linkage, poor shock absorbers and faulty brakes can all contribute to tire wear and faulty handling. Unless the worn parts are replaced **before** alignment, the end result will not be satisfactory. Since replacement of worn parts is profitable work, this inspection of front end parts should be given top priority. Time spent in this inspection will pay big dividends in increased earnings and will result in better customer satisfaction.

Proper Inspection Method:

1. **Ball joints**—Ball joints should be checked for looseness. More detailed information about ball joints is given on page 10.

2. **Wheel bearings**—Spin the wheel and check for dragging brake shoes and noisy bearings. Grasp the wheel at the top and bottom and check bearing play by moving the whole wheel in and out.

3. **Steering Linkage**—Alternately push and pull the front wheels together and apart at the front. Excessive movement indicates worn parts.

4. **Idler Arm and Pitman Arm**—Move them up and down to check for excessive play.

5. **Shock Absorbers**—Check for leakage. With the wheels on the turntables, bounce the car and note the condition of the shock absorbers.

6. **Sagging Springs**—Replace any springs, front or rear, if they are sagging. Both front springs should be approximately the same height.

7. **Bolts and Bushings**—Visually check for loose bolts and worn bushings. If any bent parts are found, they should be replaced.

BALL JOINT CHECKS

Ball joints can quickly be checked by using the procedures and specifications given below. This is a fast method to check for excessive wear or looseness.

Front suspensions are divided into two general types. The first has the coil spring or torsion bar attached to the lower control arm (Figure 14). The second has the spring mounted on the upper control arm and should have the support point shown in Figure 13. Both types are tested by moving the wheel up and down to check axial play and rocking it at the top and bottom to measure radial play.

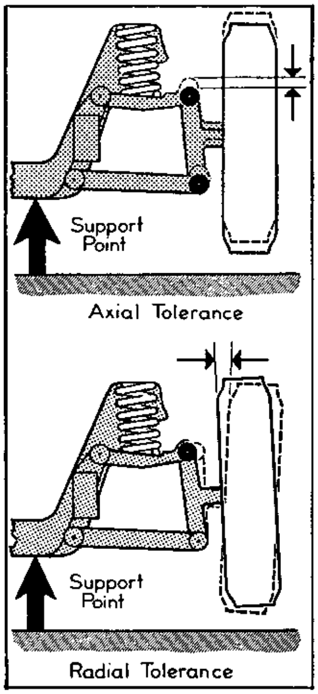

Figure 13—Upper Ball Joint Tolerance

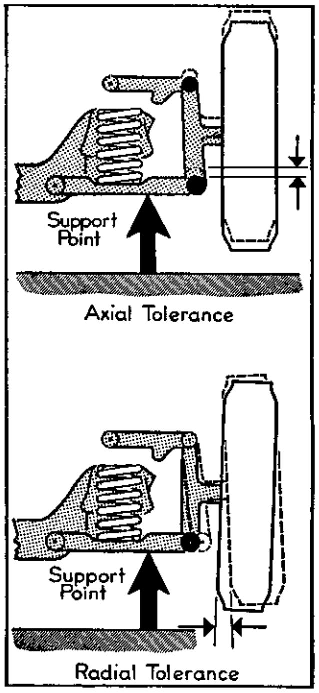

Figure 14—Lower Ball Joint Tolerance

Spring on Lower Control Arm:

- Upper ball joint should be replaced if there is any noticeable looseness at the joint.
- Lower ball joint should be replaced if radial play exceeds .250 in.
- Lower ball joint should be replaced if axial play between lower control arm and spindle exceeds the following tolerances:

AMC Pacer	1975-78	Zero
Buick	1961-72	.100 in.
Special, Skylark	1962-72	.070 in.
Buick, All	1973-77	.050 in.
Cadillac	1968-73	.062 in.
Cadillac	1974-77	.050 in.
Eldorado	1968-77	.125 in.
Chevorlet	1964-72	.060 in.
Chevrolet	1973-77	.050 in.
Chrysler, Dodge	1969-74	.070 in.
Chrysler Imperial	1969-74	Zero
Chrysler, Dodge	1975-76	.020 in.
Chrysler, Dodge, Plymouth	1977-78	.030 in.
Dart	1969-76	.070 in.
***Ford**	1962-77	Zero
***Torino, Mustang, Cougar**	1972-78	Zero
***Meteor**	1964-77	Zero
***Lincoln**	1962-77	Zero
***Mercury**	1962-77	Zero
***Montego**	1972-77	Zero
Oldsmbile	1967-72	.125 in.
Oldsmobile	1973-77	.050 in.
Plymouth, Valiant	1967-68	.050 in.
	1969-76	.070 in.
Plymouth, All	1977	.050 in.
Pontiac	1965-71	.050 in.
Catalina, Firebird	1972	Zero
Others	1972	.050 in.
Lemans, Grand Prix, Firebird	1973	Zero
Pontiac (Others)	1973	.050 in.
Pontiac, All	1974-77	.050 in.
Tempest	1965-70	.050 in.
Thunderbird	1961-77	Zero

*Entire suspension arm must be replaced.

Spring on Upper Control Arm:

- Lower ball joint should be replaced if there is any noticeable looseness at the joint.
- Upper ball joint should be replaced if radial play exceeds .250 in.
- Upper ball joint should be replaced if axial play between upper arm and spindle exceeds the following tolerances:

AMC (Except Pacer)	1970-78	.080 in.
Chevy II	1962-68	.093 in.
Cougar, Torino, Montego, Comet	1963-71	Zero
Cougar, Mustang	1972-73	Zero
Fairlane	1962-69	Zero
Falcon	1963-70	Zero
***Comet, Maverick**	1966-78	Zero
***Versailles, Granada, Monarch**	1978	Zero

BASIC ALIGNMENT PROCEDURE USING FLOOR STANDS OR DRIVE-ON RAMPS

1. Equalize tire pressure.
2. Road-test the car.
3. Raise the vehicle on the hoist to approximately shoulder height.
4. Spin the front wheels to check for bearing noise and dragging brake shoes. Tighten the wheel bearings if necessary.

5. Inspect the steering linkage, checking for excessive looseness in upper and lower ball joints, tie rod ends, steering arms, idler arms, drag link and pitman arm. Parts that show damage or excessive looseness due to wear should be replaced before the alignment job is done. See the section on "Inspection Before Alignment" on page 9.

6. Place WA-204C Stands in place and lower the car onto the stands, making certain front wheels are centered on turntables.

7. Check steering gear for play and adjust if necessary.

8. Place the B-240A Brake Pedal Jack in position and remove pins from the turntables.

9. If the car is a Chrysler product, check torsion bar suspension height and adjust as necessary. If the car has coil springs, check for weak springs. (See page 18).

10. Remove hub cap and bearing dust cap. Inspect for nicks and burrs on the machined surface of the hub flange and wipe off excess grease and dirt. Place the WA-402A Set of Alignment Gauges on the wheels, making sure they are on securely.

11. Bounce the car down in the front, from the center of the bumper, so that the shock absorbers are in their normal position. Check the condition of the shock absorbers.

12. Take the initial camber and caster readings, and check both readings against manufacturer's recommended specifications. Make adjustments as necessary.

13. Tighten all adjustment nuts to manufacturer's recommended torque. Remove gauges, stands and brake pedal jack and replace dust covers and hub caps.

14. Check toe and make the necessary corrections as explained on page 16.

15. Road test the vehicle.

HOW TO CHECK CASTER-CAMBER

Positioning the Gauge:

1. Remove the hub cap or wheel cover and the dust cap from the front wheels.

2. Wipe off the machined end of the hub flange.

3. Holding the *Snap-on* Magnetic Caster and Camber Gauge near the hub flange, set the self-centering plunger in the lathe center hole in the end of the front wheel spindle. See Figure 15. Powerful alnico magnets will attach the gauge to the machined hub flange of the wheel. Twist the gauge about a quarter-turn several times to let it get a positive seat on the flange. (If there is a rocking motion, remove the gauge and check the flange and the gauge for grit or foreign particles. The self-centering plunger makes sure that readings will be taken from the exact center of the spindle.

Note: For wheels with inaccessible hubs use the WA-702A Universal Rim Adaptor Set as explained below.

How to Attach the Universal Rim Adaptor Set

These adaptors will fit the rims of most wheels from 6 to 22 inches in diameter which do not have machined hubs.

For small wheels (down to 8 inches), loosen the two knurled screws at the base that fits against the lower part of the wheel rim (see Figure 16). Slide it to the upper set of screw holes. Be sure that the tips of the knurled screws are in the holes before tightening them. For wheels down to 6 inches, remove the two screws at the bar that fits against the upper part of the rim. Reverse the bar and refasten with the two screws. If the fender obstructs the adaptor, move the lower base to the upper set of screw holes.

For large wheels, remove the two screws at the bar that fits against the upper part of the rim. Use the holes at the end of this bar and refasten it with the screws.

The adaptors are equipped with three knife-edged rollers for attachment to the wheel rim. These rollers are used for shallow rims. For deep rims, use the black steel washers next to the rollers. Put the adaptor on the rim with the two legs at the bottom as shown in the illustration. When the adaptor is snugly in place on the wheel rim, press the lever down, which locks the adaptor to the wheel.

To check for wheel runout—

Before making any caster-camber checks on the vehicle, it is necessary to check for wheel runout. Do this as follows:

1. Raise the car so the front wheels are free to turn.

2. Place the magnetic gauge on the adapor as shown in Figure 16.

3. Zero the bubble in the caster vial by turning the adjusting screw on the caster gauge.

4. Turn the wheel 180°. Turn the gauge back 180° and read caster. If there is a change in the caster reading, reduce it to one-half by adjusting the runout screw. For example, if this reading is 4°, adjust it to 2°.

5. Set the bubble in the caster vial to zero again by turning the adjusting screw on the caster gauge.

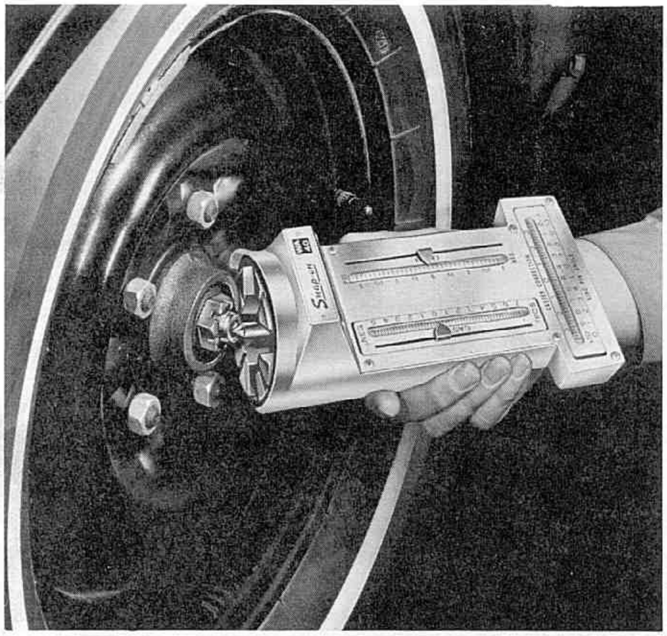

Figure 15—Positioning the gauge

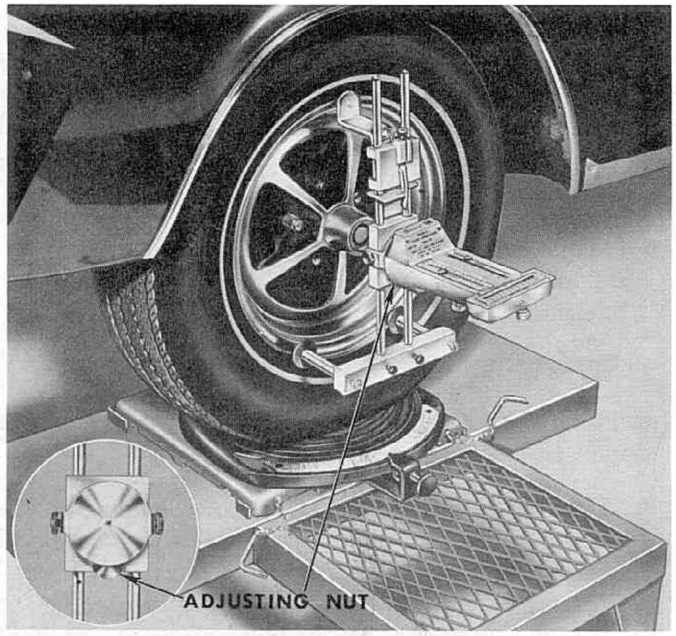

Figure 16—Universal wheel rim adaptor

6. Turn the wheel 180° again. Turn the gauge back 180°. The bubble in the caster vial should still be on zero. If not, carefully repeat steps 3 through 6.
7. Lower the car on the turntables, while keeping the rim adaptors in an upright position and perform the wheel alignment tests.

To Check Camber:

1. With the gauge in position on the wheel, turn the turntable until the pointer is on zero.
2. Read the camber scale on the right-hand side of the gauge. The position of the bubble will indicate the camber of the wheel being checked.
3. Write down the camber reading.
4. Check the camber reading against specs and set the camber pointer on the reading desired.
5. Check the other front wheel in the same manner described above. Corrections for caster and camber should be made at the same time since changing one affects the other. The pre-set pointers help to make caster-camber adjustments easier since they show the readings which should be obtained.

To Check Caster and Ball Joint Inclination (K.P.A.):

1. Be sure the pointers on both turntables are on 0°. Turn the front of the wheel being checked, out to 20° on the turntable dial. (Figure 18).
2. Zero the caster bubble and the K.P.A. bubble. For the right wheel, the 0 is the extreme right of the scale and for the left wheel, it's at the extreme left.
3. Turn front of wheel in 20° on the turntable dial.
4. Take a reading on the caster and K.P.A. scale. Compare with specifications. K.P.A. specifications are usually given at zero camber so take the camber reading into consideration. The caster pointer can be set to the desired setting to aid in making adjustments. (Figure 19).
5. Note the turntable reading on the opposite wheel. This is toe-out on turns.

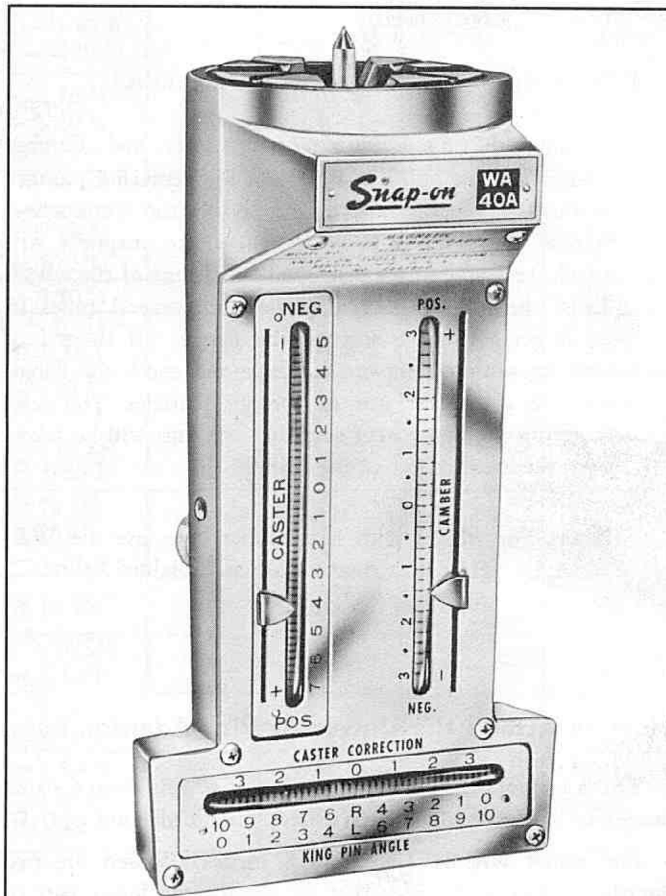

Figure 17—WA-40A Caster-camber gauge

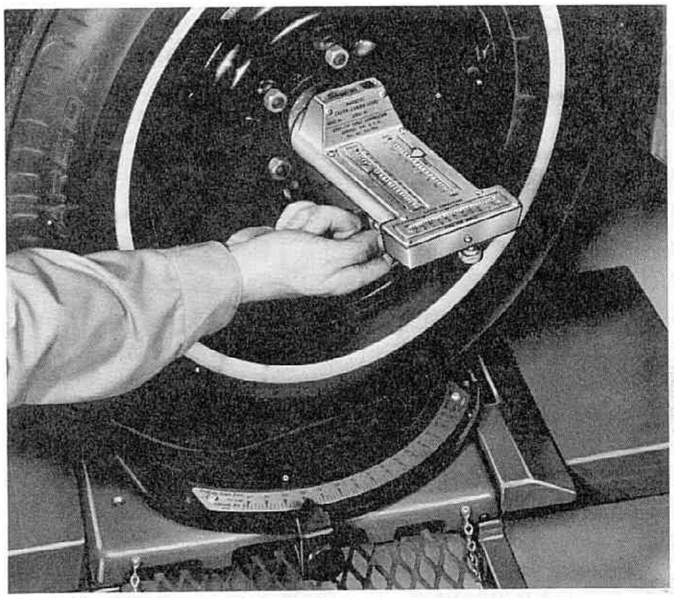

Figure 18—Checking caster, 20° out

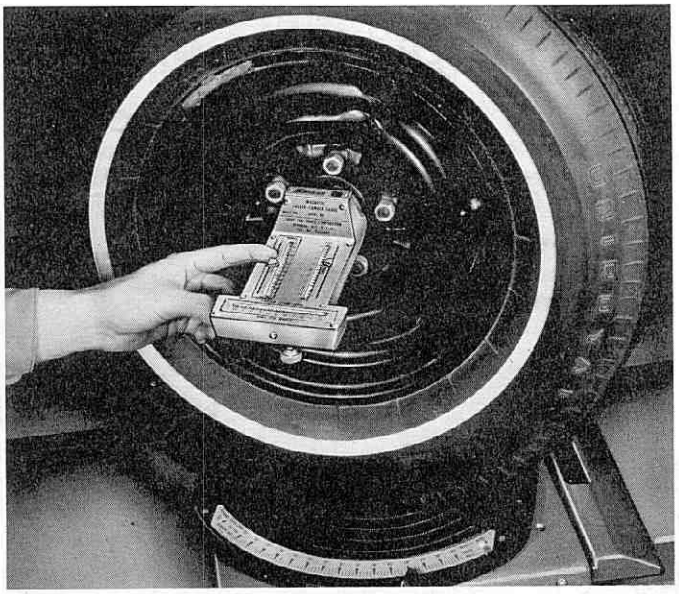

Figure 19—Checking caster, 20° in

6. Repeat the procedure on the opposite wheel.
7. Above the K.P.A. vial is a scale marked "caster correction" which has readings of 3° on each side of zero. With the wheels in the straight ahead position, this can be used to make caster corrections. Set the bubble to the amount of correction needed. When working on the right side of the vehicle set the bubble to the left of zero for more positive caster. For more negative caster set it to the right of zero. Reverse this procedure for use on the left side of the vehicle and when the bubble is on zero the caster adjustment will be correct.

Note: K.P.A. readings greater than 10° can be checked as follows:

1. After applying the gauge to the hub, turn the wheel out 20°. Set the King Pin Angle Gauge to zero and turn the wheel to a straight ahead position. Read the K.P.A. gauge.
2. Zero the K.P.A. gauge, then turn the wheel in 20° and read the gauge again. Add the two readings to get the total king pin angle.

HOW TO ADJUST CASTER AND CAMBER

Most caster-camber adjustments on American passenger cars and light trucks are made by one of the following methods:

1. Use of shims
2. Use of eccentrics
3. Moving upper control arm in slotted holes
4. Use of adjustable strut and eccentric bushing
5. Moving serrated upper arm shaft.

Adjustments with Shims

Shims are used on most General Motors and a few Ford products. In many cases both caster and camber can be adjusted at the same time by adding or removing shims. The cars which use shims and the location of these shims, is given in the chart on page 30.

As a general guide for setting caster-camber on most **General Motors** cars, the following suggestions will be of help: (See Figure 20).

1. **To change camber more positive**—remove an equal amount of shims at the front and rear bolt.
2. **To change camber more negative**—add an equal amount of shims at the front and rear bolt.
3. **To change caster more positive**—decrease the amount of shims at the front bolt and increase by an equal amount at the rear bolt.
4. **To change caster more negative**—increase the amount of shims at the front bolt, and decrease by an equal amount at the rear bolt.
5. **To change caster and camber toward positive simultaneously**—remove shims at the front bolt only.
6. **To change caster and camber toward negative simultaneously**—add shims at the front bolt only.

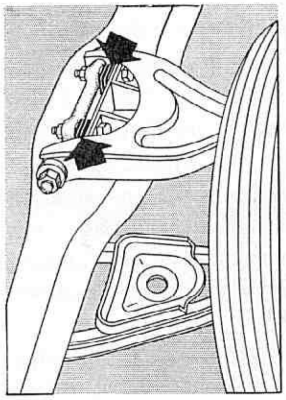

Fig. 20—GM shims

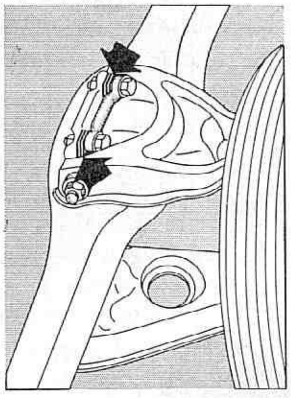

Fig. 21—Ford shims

Some **Ford products** using shims are adjusted in just the opposite manner because shims are placed between the frame bracket and pivot shaft, (Figure 21). These cars are adjusted as follows:

1. **To change camber more positive**—add an equal amount of shims at the front and rear bolt.
2. **To change camber more negative**—remove an equal amount of shims at the front and real bolt.
3. **To change caster more positive**—increase the amount of shims at the front bolt and decrease by an equal amount at the rear bolt.
4. **To change caster more negative**—decrease the amount of shims at the front bolt and increase by an equal amount at the rear bolt.
5. **To change caster and camber toward positive simultaneously**—add shims at the front bolt only.
6. **To change caster and camber toward negative simultaneously**—remove shims at the front bolt only.

The amount of caster or camber change depends upon the size of the shims added or removed. It varies somewhat with different models but in general a 1/16" shim at both front and rear bolts changes camber about ¼ degree. This same size shim at only one bolt changes caster about ¼ degree.

Tips on Time Saving When Making Caster-Camber Adjustments with Shims

Before making any adjustments, be sure to take initial caster-camber readings on both sides of the front end. At this point an analysis of these readings can result in great savings to confine adjustments to only one side. Here is an example to illustrate this point.

Caster specification		0° ± ½°
Camber specification		½° ± ½°
Initial Readings	Left Side	Right Side
Caster	—¼°	—¼°
Camber	+⅛°	—¼°

We have previously stated that caster should be set within manufacturer's specifications but with the left side approximately ½° less positive or more negative than the right to compensate for the crown of the road. By studying the specifications in the example above and our initial readings we can see that caster on our left side can remain as is since we are at the negative end of the specifications. By setting caster on the right at ¼° we would have the ½° spread and be within specifications.

Now let's consider camber. Again we have stated that camber should be set the same for both wheels. Certainly our +⅛° reading in the example above is within specifications for this car so here again we can leave camber as is on the left side and confine the adjustments to the right side only. Keep in mind we must keep the camber of the two wheels equal.

Initial Readings	Left Side	Right Side Present	Reading Desired
Caster	—¼°	—¼°	—¼°
Camber	+⅛°	—¼°	+⅛°

Thus far we have eliminated adjustments on the left side, saving time and effort. Let's continue with this example to show how additional work can be eliminated in making adjustments on the right side.

Caster is —¼° and we want approximately +¼°. Camber is —¼° and we want +⅛°. Thus, caster must be changed ½° toward positive while the camber change should be at least ⅜° toward positive. At this point, study the General Motors shim assembly in Figure 20. Note that we can change both caster and camber toward positive by removing shims at the front shim assembly. A 1/16" shim will usually change caster approximately ¼° and camber ¼°. Therefore, by removing 2/16" in shim thickness at the front shim assembly, caster should change approximately ½° toward positive and camber should change ½° toward positive. We would now have the following:

Caster specification		0° ± ½°
Camber specifications		½° ± ½°
Alignment Readings	Left Side	Right Side
Caster	—¼°	+¼°
Camber	+⅛°	+¼°

Although we wanted ⅛° for camber on the right wheel, ¼° is within specifications and close enough to give us the alignment we desire and we accomplished all of this with only **two shim changes.** Although this may not hold true in all cases considerable time can be saved if it does hold true.

Use of Eccentrics

Almost every car previous to ball joint systems used some form of eccentric bolt in the upper end of the spindle support for adjusting caster and camber. Ford products used both an eccentric bolt in the upper end of the spindle support and a threaded bolt in the lower end. The threaded bolt in the lower end controlled caster while the eccentric controlled camber. The upper eccentric bolt was adjusted by wrenches, or on General Motors cars by removing a grease fitting and inserting a hexhead wrench. On this type of adjustment, caster must be adjusted before camber.

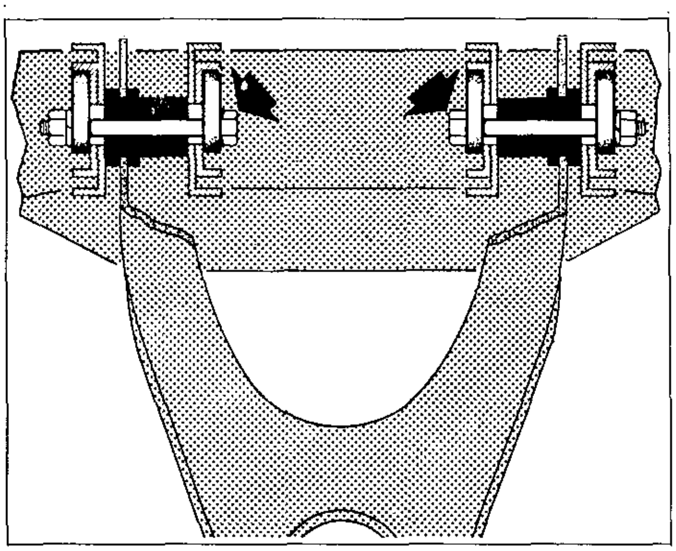

Figure 22—Eccentric adjusting bolts

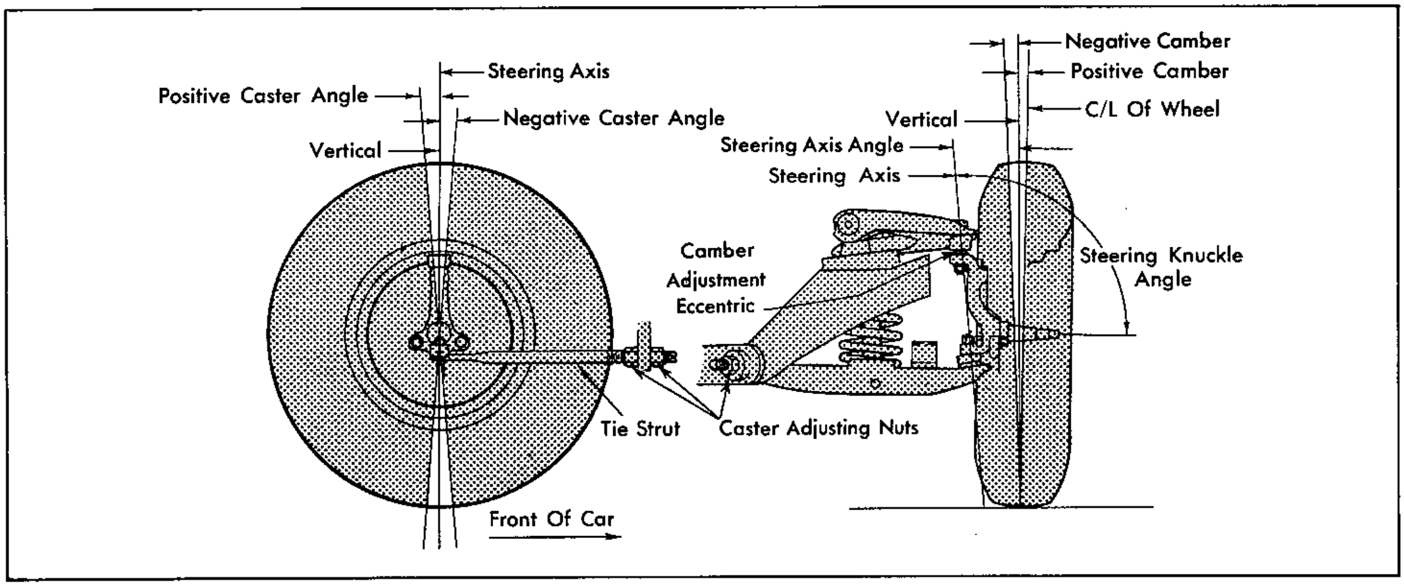

Figure 23—Location of Cadillac adjustments

Some Chrysler products and American Motors cars use eccentric bolts or washers at the inner end of the upper control arm to make caster-camber adjustments. Access holes in fender shields have been provided in some Chrysler products to reach the cam adjusting bolts.

Ramblers using eccentrics have the eccentrics on the upper control arm attaching bolts. Loosening the attaching bolt nuts will permit turning the bolt and eccentrics to provide caster-camber adjustments. (See Figure 22). The caster correction feature on the **Snap-on** caster-camber gauge is especially helpful in speeding adjustments on cars having eccentrics.

Adjustment by Moving Upper Control Arm in Slotted Holes

Ford and Mercury 1966-78

On these cars caster and camber can be adjusted by loosening the bolts that attach the upper suspension arm inner shaft to the frame side rail, and moving the arm assembly in or out in the elongated bolt holes. Use the **WA-171B Ford Caster-Camber Tool or WA-25A Set** to make the adjustments.

Adjusting with a Strut and Eccentric Ball Joint

Cadillacs have an adjustable strut for adjusting caster and an eccentric ball joint for adjusting camber. See Figure 23. Caster is adjusted by turning the lock nuts on the forward ends of the tie-struts at the frame front cross member. To provide more negative caster lengthen the tie-strut. One turn of the lock nuts results in ½ degree change in caster approximately.

Camber is adjusted at the camber eccentric located in the upper ball joint support. Loosen the lock nut and turn the eccentric to adjust camber. Tighten the lock nut to 60 foot-pounds when finished.

Serrated Upper Arm Shaft Adjustments

Lincolns adjust caster and camber by movement of a serrated upper arm shaft. See Figure 24. Loosen the bolts that secure the upper suspension arm shaft to the frame member and with the aid of a pry bar move the shaft as required. Movement of 3/32" at front or rear bolt changes caster about ½ degree. A movement of the entire shaft of 3/64" changes camber about ¼ degree. The retaining bolts should be tightened to 100-125 ft. lbs. after adjustments have been made.

Chevrolet Caster-Camber Adjustments

Some Chevrolets have a strut at the lower control arm for adjusting caster and a cam to move the lower control arm for camber. Adjust caster by turning the two nuts at the front of the lower control arm strut rod. (Figure 25.) Adjust camber by loosening the lower control arm pivot bolt and rotating the cam. Tighten the pivot bolt securely while maintaining the camber setting. (Figure 26).

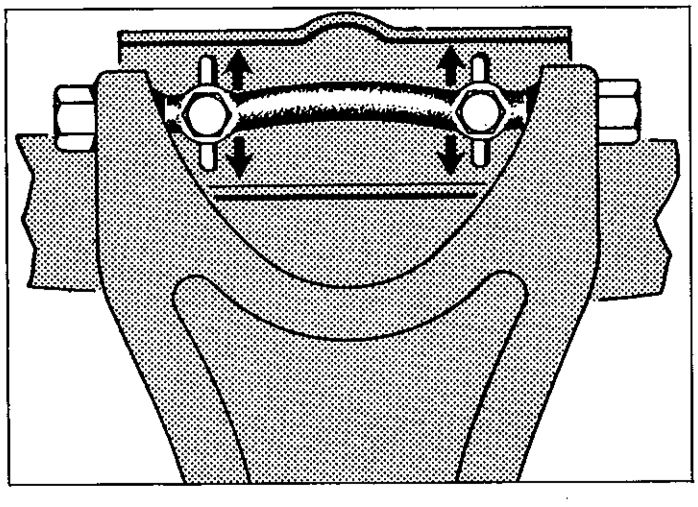

Figure 24—Lincoln adjustments

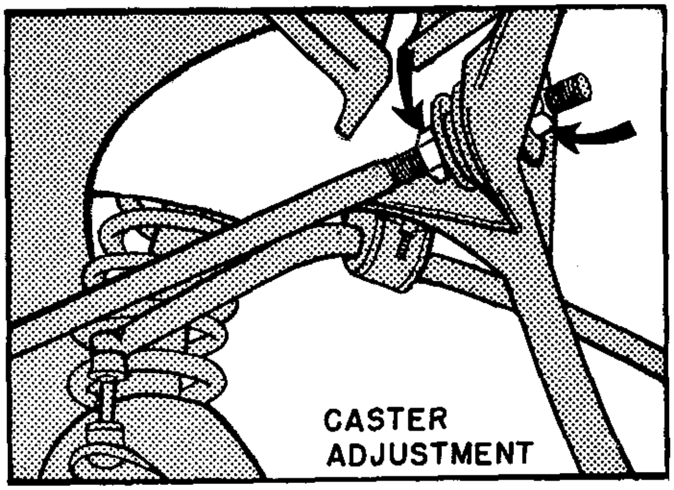

Figure 25—Chevrolet caster adjustment

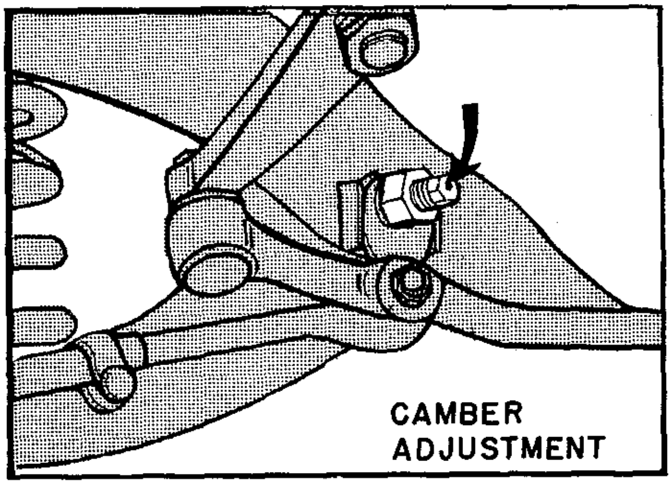

Figure 26—Chevrolet camber adjustment

Chevette Caster-Camber Adjustments

To adjust caster on the Chevette it is necessary to re-arrange the shims on the upper inner control arm. Factory installed shims are 6 mm thick and the total of the two shims combined must always be 12 mm. The smaller diameter shim goes to the front. (A in Figure 27).

Camber is determined by the mounting of the upper ball joints. Rotate the upper ball joint flange a half-turn to adjust camber approximately one degree. (Figure 27).

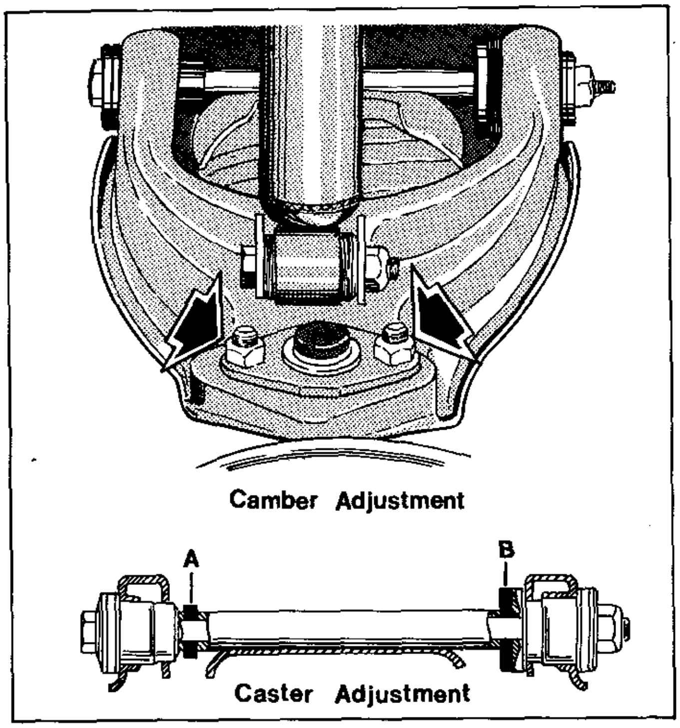

Figure 27—Chevette Adjustments

Vehicles with Radial Tires

To obtain the best caster-camber settings for vehicles equipped with radial tires the following procedure is recommended:

1. Set camber as close to zero as possible but within manufacturers specifications.
2. Set caster to the most positive end of specifications.
3. Set toe-in to the minimum of specifications.
4. Road test the vehicle and if it pulls to one side or another correct by changing the caster setting.

TORSION BAR HEIGHT

Check Torsion Bar Height on late model Chrysler Products as follows:

1. Grasp the rear bumper and bounce the car up and down several times. Bounce the car at the front bumper the same number of times and release the bumper at the same point in the cycle each time.
2. On 1975-78 models except 1976-77 Aspen and Volare and 1978 LeBaron and Diplomat, measure the distance from a point 1″ forward of the rear face of the torsion bar anchor to the floor or ground. The distance should be as listed on page 17.
3. On 1976-78 Aspen and Volare and 1978 LeBaron and Diplomat, measure the distance from the lowest point of the lower control arm pivot pushing to the floor or ground. The distance should be as listed on page 17.
4. Measure both sides of the car in the same manner. Adjust by turning the torsion bar anchor adjusting nut clockwise to increase the height or counterclockwise to decrease the height. The difference from side to side should not exceed ⅛″.
5. After adjusting, bounce the car and recheck the measurements on both sides, even if only one side may have been adjusted.

Riding Height Specifications

1975-78 Charger .... 10¾"
Coronet Exc. Wag. .... 10¾"
Coronet Sta. Wag. .... 11¼"
Monaco .... 10⅛"
Fury .... 10¾"
Gran Fury .... 10⅛"
Suburban .... 11¼"
LeBaron .... 10¼"
1978 Monaco .... 10¾"

Dart .... 10¼"
Valiant .... 10¼"
Aspen .... 10¼"
Volare .... 10¼"
Cordoba .... 10¾"
Newport, New Yorker .... 10⅛"
Imperial .... 10⅛"
Diplomat .... 10¼"
Chrysler .... 10⅛"

WHEEL ALIGNMENT SPECIFICATIONS

All Figures positive unless otherwise designated

MAKE and MODEL	YEAR	CASTER (Degrees)	SHIMS ①	CAMBER (Degrees)	SHIMS ②	TOE-IN (Inches)	TOE-OUT (On Turns)	K.P.A. (Degrees)
A.M.C.								
All (Except Amb.)	1967-69	M.S. —½ to ½ P.S. ½ to 1½		—⅜ to ⅜		1/16 to 3/16	23	—
Ambassador	1967-69	0 to —1		—⅜ to ⅜		1/16 to 3/16	23	—
All	1970	M.S. —½ to ½ P.S. ½ to 1½		—⅜ to ⅜		1/16 to 3/16	23	—
All	1971	½ to 1½	—	—⅜ to ⅜	—	1/16 to 3/16	—	—
All	1972	1	—	L. ⅜, R. ⅛	—	⅛	—	—
Hornet, Gremlin	1973-75	0	—	L. ⅜, R. ⅛	—	⅛	23	—
All Others	1973-75	1	—	L. ⅜, R. ⅛	—	⅛	23	—
Matador, Pacer	1976-77	½ to 1½	—	L. ⅛ to ⅝ R. 0 to ½	—	⅛	23	7¾
Gremlin, Hornet	1976-77	—½ to ½	—	L. ⅛ to ⅝ R. 0 to ½	—	⅛	23	7¾
Pacer	1978	1 to 3	—	L. ⅛ to ⅝ R. 0 to ½	—	⅛	—	—
All Others	1978	0 to 2	—	L. ⅛ to ⅝ R. 0 to ½	—	⅛	—	—
BUICK								
All Others	1967-68	½ to 1½	⅜	¼ to ¾	¼	¼	22 to 23	10⅔
Special, Skylark	1968	—¾ to —¼	⅜	¼ to ¾	¼	⅛ to ¼	21½	9
Special, Skylark	1969-70	—1 to 1	⅜	0 to 1	¼	⅛ to ¼	21½	9
Riviera	1969-70	½ to 1½	⅜	—¼ to ¾	¼	7/32	23¼	10¾
All Others	1969-70	¼ to 1¼	⅜	—½ to ½	¼	¼	20½	10¾
Skylark, G. S.	1971-72	0 to —1	⅜	0 to 1	¼	⅛ to ¼	21½	—
All Others	1971	½ to 1½	⅜	—¼ to ¾	¼	⅛ to ¼	20½	—
All Others	1972	½ to 1½	⅜	0 to 1	¼	3/16	20½	—
Century, Regal	1973-74	M.S. —½ to —1½ P.S. —½ to ½	⅜	L. ½ to 1½ R. 0 to 1	¼	1/16	20¾	9⅝
All Others	1973-74	½ to 1½	⅜	L. ½ to 1½ R. 0 to 1	¼	1/16	21½	10½
Skyhawk	1975	—¼ to —1¼	—	0 to 1	¼	0 to ⅛	20¾	9⅝
Skylark, Apollo	1975-77	M.S. —1½ to —½ P.S. ½ to 1½	⅜	¼ to 1¼	¼	0 to ⅛	20¾	9⅝
Century, Regal Radials	1975-77	1½ to 2½	⅜	L. ½ to 1½ R. 0 to 1	¼	0 to ⅛	20¾	9⅝
LeSabre, Electra, Riveria	1975-76	1 to 2	⅜	L. ½ to 1½ R. 0 to 1	¼	0 to ⅛	21½	10½
Skyhawk	1976-78	—1¼ to —¼	—	—¼ to ¾	¼	0 to ⅛	20¾	9⅝
Century, Regal Bias	1977-78	½ to 1½	⅖	L. 0 to 1 R. ½ to 1½	⅖	0 to ⅛	—	9⅝
Le Sabre, Electra, Riviera	1977-78	2½ to 3½	⅖	¼ to 1¼	⅖	1/16 to 3/16	—	10½

WHEEL ALIGNMENT SPECIFICATIONS

All Figures positive unless otherwise designated

MAKE and MODEL YEAR	CASTER (Degrees)	SHIMS ①	CAMBER (Degrees)	SHIMS ②	TOE-IN (Inches)	TOE-OUT (On Turns)	K.P.A. (Degrees)
CADILLAC							
Fleetwood, Eldorado 1967-68	—1½ to —2½	—	—⅜ to ⅜	—	1/16	22	6
All Others 1967-68	—½ to —1½	—	L. ⅜ to—⅛ R. ⅛ to —⅜	—	3/16 to ¼	22	6
Standard 1969	—1 to —2	—	L. ⅜ to—⅛ R. ⅛ to —⅜	—	¼ to 5/16	22	6
Autolevel 1969	—½ to 1½	—	L. ⅜ to—⅛ R. ⅛ to —⅜	—	¼ to 5/16	22	6
Eldorado 1970	—1½ to —2½	—	⅜ to —⅜	—	0 to ⅛	22	6
All Others 1970	—½ to —1½	—	⅜ to —⅜	—	⅛ to ¼	22	6
Eldorado 1971-72	—½ to —1½	—	—⅜ to ⅜	—	0	22	—
Eldorado 1973	—½ to ½	—	—⅜ to ⅜	—	0	22	—
All Others 1971-73	—½ to —1½	—	L. —⅜ to ⅜ R. ⅛ to —⅝	—	⅛ to ¼	22	—
Eldorado 1974	—½ to ½	—	L. —⅜ to ⅜ R.—⅛ to —⅞	—	0	22	—
Fleetwood 75 1974	—½ to —1½	—	L. —⅜ to ⅜ R.—⅛ to —⅞	—	1/16 to 3/16	22	—
All Others 1974	—½ to ½	—	L. —⅜ to ⅜ R.—⅛ to —⅞	—	1/16 to 3/16	22	—
75 Series 1975	—½ to —1½	—	L. —⅜ to ⅜ R. —⅝ to ⅛	—	0 to 1/16	22	—
All Others 1975	—½ to ½	—	L. —⅜ to ⅜ R. —⅝ to ⅛	—	0 to 1/16	22	—
Seville 1976	1 to 3	—	L. —¼ to 1¼ R. —½ to 1	—	0 to ⅛	—	—
Eldorado 1976	—½ to ½	—	L. —⅜ to ⅜ R. —⅝ to ⅛	—	—1/16 to 1/16	22	11
All Others 1976	—½ to ½	—	L. —⅜ to ⅜ R. —⅝ to ⅛	—	1/16 to 3/16	22	6
Seville 1977-78	1½ to 2½	—	—⅜ to ⅜	—	0 to ⅛	—	—
Eldorado 1977-78	—½ to ½	—	—⅜ to ⅜	—		—	—
All Others 1977-78	2½ to 3½	—	⅛ to ⅞	—	0 to 1/16	—	—
CHEVROLET							
Chevelle 1964-70	—1½ to —½	½	0 to 1	⅖	⅛ to ¼	22	8¼
Camaro, Nova 1967-70	0 to 1	½	—¼ to ¾	⅖	⅛ to ¼	22	8¾
SS, El Camino 1967-70	—1 to 0	½	0 to 1	⅖	⅛ to ¼	22	8¼
All Others 1965-70	¼ to 1¼	—	—¼ to ¾	—	⅛ to ¼	22	7½
Chevy II 1968-69	0 to 1	—	—¼ to ¾	—	⅛ to ¼	22	8¾
Monte Carlo 1970	—1 to 0	½	0 to 1	⅖	⅛ to ¼	22	8¼
Vega 1971-74	—1¼ to —¼	—	—¼ to ¾	—	3/16 to 5/16	—	—
Chevelle, Monte Carlo 1971	—½ to —1½	½	¼ to 1¼	⅖	⅛ to ¼	22	8¼
El Camino, Z-28 1971-72	—½ to —1½	½	¼ to 1¼	⅖	⅛ to ¼	22	8¼
Nova 1971-74	0 to 1	½	—¼ to ¾	⅖	⅛ to ¼	22	8¾
Camaro 1971-73	—½ to ½	½	½ to 1½	⅖	⅛ to ¼	22	9½
All Others 1971	—½ to —1½	½	0 to 1	⅖	⅛ to ¼	22	10
Monte Carlo 1972	—½ to ½	½	¼ to 1¼	⅖	⅛ to ¼	—	—
Chevelle 1972	—½ to —1½	½	¼ to 1¼	⅖	⅛ to ¼	—	8¼
Monte Carlo 1973-77	4½ to 5½	½	L. ½ to 1½ R. 0 to 1	⅖	0 to ⅛	—	10½
Chevelle, El Camino 1973-74	M.S. —½ to —1½ P.S. —½ to ½	½	L. ½ to 1½ R. 0 to 1	⅖	0 to ⅛	—	10½
All Others 1972-73	½ to 1½	—	0 to 1	—	⅛ to ¼	—	—

① Degrees change in caster for each 1/16″ shim on models using shims.
② Degrees change in camber for each 1/16″ shim on models using shims.

M.S.—Manual Steering
P.S.—Power Steering

WHEEL ALIGNMENT SPECIFICATIONS

All Figures positive unless otherwise designated

MAKE and MODEL / YEAR	CASTER (Degrees)	SHIMS ①	CAMBER (Degrees)	SHIMS ②	TOE-IN (Inches)	TOE-OUT (On Turns)	K.P.A. (Degrees)
CHEVROLET (Cont.)							
Camaro (Std.) 1974	—½ to ½	½	½ to 1½	2/5	⅛ to ¼	—	9½
Camaro (Z-28) 1974	—½ to —1½	½	¼ to 1¼	2/5	⅛ to ¼	—	9¾
Others 1974	½ to 1½	—	L. ½ to 1½ R. 0 to 1	—	0 to ⅛	—	10½
Vega, Monza 1975	—1¼ to —¼	—	—¼ to ¾	—	0 to ⅛	—	—
Nova 1975	M.S. —½ to —1½ P.S. ½ to 1½	½	¼ to 1¼	2/5	0 to 1/16	22	—
Chevelle, El Camino 1975	M.S. ½ to 1½ P.S. 1½ to 2½	½	L. ½ to 1½ R. 0 to 1	2/5	0 to 1/16	—	—
Camaro 1975	—½ to ½	½	½ to 1½	2/5	0 to 1/16	—	—
All Others 1975	1 to 2	½	L. ½ to 1½ R. 0 to 1	2/5	0 to 1/16	—	—
Chevette 1976	4 to 5	—	—¼ to ¾	—	0	—	—
Vega, Monza 1976	—1¾ to ¼	—	—¼ to 1¼	—	3/16 to 5/16	—	8½
Camaro 1976	0 to 2	½	¼ to 1¾	2/5	—1/16 to 3/16	—	10¼
Camero 1977	½ to 1½	½	½ to 1½	2/5	0 to ⅛	—	—
Chevelle 1977	1½ to 2½	½	L. ½ to 1½ R. 0 to 1	2/5	0 to ⅛	—	9½
Nova 1976	M.S. —2 to 0 P.S. 0 to 2	½	0 to 1½	2/5	—1/16 to 3/16	22	10
All Others 1976	1 to 2	½	L. ½ to 1½ R. 7/16 to 9/16	2/5	0 to ⅛	—	9
Chevette 1977	½ to 2½	—	—3/16 to 9/16	—	0 to ⅛	—	—
Vega, Monza 1977	5/16 to 1 5/16	—	—5/16 to 11/16	—	0 to ⅛	—	—
Nova, Concours 1977	M.S. —1½ to —½ P.S. ½ to 1½	½	5/16 to 1 5/16	½	0 to ⅛	—	—
Malibu, El Camino .1977	M.S. ½ to 1½ P.S. 1½ to 2½	½	L. ½ to 1½ R. 0 t 1	½	0 to ⅛	—	—
Impala, Caprice 1977	2½ to 3½	½	5/16 to 1 5/16	½	⅛ to ¼	—	—
Chevette 1978	2½ to 6½	—	—½ to 7/16	—	—1/64 to 9/64	—	—
Monza 1978	—1¾ to ¼	—	—¼ to 1¼	—	1/16 to 3/16	—	—
Nova 1978	M.S. —2 to 0 P.S. 0 to 2	—	0 to 1½	—	—1/16 to 3/16	—	—
Malibu, El Camino, Monte Carlo 1978	M.S. 0 to 2 P.S. 2 to 4	—	—5/16 to 1 5/16	—	0 to ¼	—	—
Impala, Caprice 1978	2 to 4	—	0 to ⅛	—	0 to ¼	—	—
CHRYSLER, IMPERIAL							
All 1961-68	M.S. —1 to 0 P.S. ¼ to 1¼		L. ¼ to ¾ R. 0 to ½		⅛	21½	6½-7½
All 1969-76	M.S. —1 to 0 P.S. ¼ to 1¼	—	L. ¼ to ¾ R. 0 to ½	—	⅛	21½	—
All Others 1977-78	M.S. —1¾ to ¾ P.S. —¾ to 1¾	—	L. 0 to 1 R. —¼ to ¾	—	1/16 to ¼	—	—
LeBaron 1978	1½ to 3¾	—	L. 0 to 1 R. —¼ to ¾	—	1/16 to ¼	—	—
COMET							
All 1971-72	0 to 2		—¼ to 1¼		1/16 to 5/16	22	—
All 1973-75	—2½ to 1½	—	—¾ to 1¼	—	1/16 to 5/16	22	—
All 1976-77	—1¼ to ¼	—	—½ to 1	—	0 to ⅜	22	—

① Degrees change in caster for each 1/16″ shim on models using shims.
② Degrees change in camber for each 1/16″ shim on models using shims.

M.S.—Manual Steering
P.S.—Power Steering

WHEEL ALIGNMENT SPECIFICATIONS

All Figures positive unless otherwise designated

MAKE and MODEL — YEAR	CASTER (Degrees)	SHIMS ①	CAMBER (Degrees)	SHIMS ②	TOE-IN (Inches)	TOE-OUT (On Turns)	K.P.A. (Degrees)
CORVETTE 1968	M.S. ½ to 1½ P.S. 1¾ to 2¾		¼ to 1¼		3/16 to 5/16	22	7
1969	M.S. ½ to 1½ P.S. 1¾ to 2¾		½ to 1¼		1/16	22	7
1970-75	M.S. ½ to 1½ P.S. 1¾ to 2¾		¼ to 1¼		3/16 to 5/16	22	7
1976-77	M.S. ½ to 1½ P.S. 1¾ to 2¾	—	¼ to 1¼	—	3/32 to 5/32	22	7
1978	1⅞ to 2⅞	—	3/16 to 1 3/16	—	—1/32 to 1/32	—	—
DODGE, DART, PLYMOUTH							
All 1965-76	M.S. —1 to 0 P.S. ¼ to 1¼		L. ¼ to ¾ R. 0 to ½		3/32 to 5/32	22	—
Aspen, Volare, Diplomat 1977-78	1½ to 3¾	—	L. 0 to 1 R. —¼ to ¾	—	1/16 to ¼	—	—
All Others 1977-78	M.S. —1¾ to ¾ P.S. —¾ to 1¾	—	L. 0 to 1 R. —¼ to ¾	—	1/16 to ¼	—	—
FORD							
All exc. Fairlane ... 1965-68	0 to 2	—	—¼ to 1¼		1/32 to 9/32	22	—
Fairlane, Falcon ... 1967-68	—1½ to ½	—	—½ to 1	—	⅛ to ¼	22¼	—
Mustang 1967-69	—¾ to 1¼	—	¼ to 1¾	—	3/16	21¼	—
Fair., Torino, Fal. .. 1969-72	—1¾ to ¼	—	—½ to 1	—	⅛ to ⅜	22¼	—
Mustang 1970	—1 to 1	—	¼ to 1¾	—	1/16 to 5/16	21	—
Maverick 1970-72	—1½ to ½	—	—½ to 1	—	1/16 to 5/16	21	—
Mustang 1971-72	—1 to 1	—	0 to 1½	—	1/16 to 5/16	21	—
All Others 1969-72	0 to 2	—	—¼ to 1¼	—	1/16 to 5/16	21	—
Pinto 1971	1 to 2	—	0 to 1½	—	0	21	—
Pinto 1972	—½ to 3½	—	—¼ to 1¾	—	1/16 to 7/16	21	—
Maverick 1973-75	—2½ to 1½	—	—¾ to 1¼	—	1/16 to ⅜	21¾	—
Mustang 1973	—2 to 2	—	—½ to 1½	—	1/16 to ⅜	22¼	—
Torino 1973	—¾ to 2¼	—	—¼ to 1¾	—	3/16 to 9/16	22¼	—
Pinto 1973	—1 to 3	—	—¼ to 1¾	—	0 to ¼	21	—
Ford 1973	0 to 4	—	—1 to 1	—	1/16 to 7/16	20¾	—
Mustang 1974-75	—¼ to 1¾	—	—½ to 1½	—	0 to ¼	21	—
Torino 1974	½ to 3½	—	L.—⅜ to 1⅝ R. —⅞ to 1⅛	—	0 to ⅜	22¼	—
Ford 1974-75	0 to 4	—	L.—½ to 1½ R. —¾ to 1¼	—	1/16 to 7/16	20¾	—
Pinto 1974-75	—¾ to 3¼	—	—¼ to 1¾	—	⅛ to ⅜	21	—
Torino 1975	2½ to 5½	—	—⅜ to 1⅝	—	0 to ⅜	22¼	—
Maverick 1976-77	—1¼ to ¼	—	—½ to 1	—	0 to ⅜	21¾	6¾
Mustang II 1976-78	⅛ to 1⅝	—	—¼ to 1¼	—	0 to ¼	21	9¾
Torino 1976	3¼ to 4¾	—	L.—¼ to 1¼ R. ⅝ to ⅞	—	0 to ⅜	22¼	9
Granada 1976-77	—1¼ to ¼	—	—½ to 1	—	0 to ⅜	—	6¾
Pinto 1976	½ to 2	—	0 to 1½	—	⅛ to ⅜	21	10
Pinto 1977-78	¼ to 1¾	—	—¼ to 1¼	—	0 to ¼	—	—
Ford LTD 1976-77	1¼ to 2¾	—	L. —¼ to 1¼ R. —½ to 1	—	1/16 to 7/16	20¾	9½
Fairmont 1978	⅛ to 1⅝	—	—⅜ to 1⅛	—	3/16 to 7/16	—	—
LTD II 1978	3¼ to 4¾	—	L. ¼ to 1¼ R. —½ to 1	—	0 to ¼	—	—

① Degrees chage in caster for each 1/16″ shim on models using shims.
② Degrees change in camber for each 1/16″ shim on models using shims.

M.S.—Manual Steering
P.S.—Power Steering

WHEEL ALIGNMENT SPECIFICATIONS

All Figures positive unless otherwise designated

MAKE and MODEL YEAR	CASTER (Degrees)	SHIMS ①	CAMBER (Degrees)	SHIMS ②	TOE-IN (Inches)	TOE-OUT (On Turns)	K.P.A. (Degrees)
FORD (Cont.)							
Ford 1978	1¼ to 2¾	—	L. ¼ to 1¼ R. —½ to 1	—	1/16 to 5/16	—	—
All Others 1978	⅛ to 1⅝	—	—¼ to 1¼	—	0 to ¼	—	—
LINCOLN 1967-70	—½ to —2½	—	—¼ to 1¼	—	⅛	22¼	—
Mark III, IV 1969-72	0 to 2	—	—¼ to 1¼	—	⅛	22¼	—
Continental 1971-72	½ to 2½	—	—¼ to 1¼	—	0	22¼	—
Continental 1973-75	—½ to 3½	—	—½ to 1½	—	0 to ⅜	21½	—
Mark IV 1973-74	—½ to 3½	—	—¼ to 1¾	—	1/16 to 7/16	21½	—
Mark IV 1975	2¼ to 5¼	—	L. —¼ to 1¾ R. —¾ to 1¼	—	1/16 to 7/16	21½	—
Continental 1976-78	1¼ to 2¾	—	L. —¼ to 1¼ R. —½ to 1	—	0 to ⅜	21½	9½
Mark IV, V 1976-77	1¼ to 2¾	—	L. —¼ to 1¼ R. —½ to 1	—	1/16 to 7/16	21½	9
Mark V 1978	3¼ to 4¾	—	L. —¼ to 1¼ R. —½ to 1	—	0 to ¼	—	—
MERCURY							
All except below ... 1965-72	0 to 2	—	—¼ to 1¼	—	1/32 to 9/32	21	—
Cougar 1967-69	—¾ to 1¼	—	¼ to 1¾	—	3/16	21½	—
Montego 1968	—1½ to ½	—	—½ to 1	—	3/16	22	—
Montego 1969-72	—1¾ to ¼	—	—½ to 1	—	⅛ to ⅜	22	—
Cougar 1970	—1 to 1	—	¼ to 1¾	—	1/16 to 5/16	21½	—
Cougar 1971-72	—1 to 1	—	0 to 1½	—	1/16 to 5/16	21½	—
Cougar 1973	—2 to 2	—	—½ to 1½	—	1/16 to ⅜	22¼	—
Montego 1973	—¾ to 2¼	—	—¼ to 1¾	—	3/16 to 5/16	22¼	—
Mercury, Meteor ... 1973	0 to 4	—	—1 to 1	—	1/16 to 7/16	20¾	—
Cougar, Montego .. 1974	½ to 3½	—	L.—⅜ to 1⅝ R. —⅞ to 1⅛	—	0 to ⅜	22¼	—
Mercury, Meteor ... 1974-75	0 to 4	—	L. —½ to 1½ R. —¾ to 1¼	—	1/16 to 7/16	20¾	—
Cougar, Montego .. 1975	2½ to 5½	—	—⅜ to 1⅝	—	0 to ⅜	22¼	—
Montego, Cougar ... 1976-78	3¼ to 4¾	—	L. —¼ to 1¼ R. —½ to 1	—	0 to ¼	22¼	9
Monarch 1976-78	—1¼ to ¼	—	—½ to 1	—	0 to ⅜	—	6¾
Bobcat 1976	½ to 2	—	0 to 1½	—	⅛ to ⅜	—	—
Bobcat 1977-78	¼ to 1¾	—	—¼ to 1¼	—	0 to ¼	—	—
Mercury 1976-78	1¼ to 2¾	—	L. —¼ to 1¼ R.—½ to 1	—	1/16 to 7/16	20¾	9½
OLDSMOBILE							
88, 98 1965-70	—½ to —1½	⅜	—¼ to ½	½	⅛ to 3/16	21½ to 22½	11
Toronado 1966-70	—1½ to —2½	—	—¼ to ½	—	0 to 1/16	22	11
F-85 1967-69	—½ to —2	⅜	—¼ to ½	½	⅛ to 3/16	22	9
88, 98 1971	0 to 2	⅜	R.—1 to ½ L.—½ to 1	½	0	22	—
F-85, Cutlass, Vista C. 1971	—2¼ to —¼	⅜	R.—1 to ½ L.—½ to 1	½	0	22	—
Toronado 1971	—3¼ to —1¼	—	R.—1 to ½ L.—½ to 1	—	0	22	—
88, 98 1972-73	½ to 1½	⅜	L.—¼ to ¾ R. —¾ to ¼	½	0	22	—

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② Degrees change in camber for each 1/16″ shim on models using shims.

M.S.—Manual Steering
P.S.—Power Steering

WHEEL ALIGNMENT SPECIFICATIONS

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MAKE and MODEL YEAR	CASTER (Degrees)	SHIMS ①	CAMBER (Degrees)	SHIMS ②	TOE-IN (Inches)	TOE-OUT (On Turns)	K.P.A. (Degrees)
OLDSMOBILE (Cont.)							
F-85, Cutlass, Vista C. 1972	—1¾ to —¾	⅜	L.—¼ to ¾ R. —¾ to ¼	½	0	22	—
Toronado 1972	—2½ to —1½	—	L.—¼ to ¾ R. —¾ to ¼	—	0	22	—
Omega 1973-74	0 to 1	—	—¼ to ¾	—	⅛ to ¼	—	—
Cutlass 1973-74	M.S. ½ to 1½ P.S. —½ to ½	⅜	L. ½ to 1½ R. 0 to 1	½	0 to ⅛	—	—
Toronado 1973-74	1 to 3	—	L. ½ to 1 R. —1 to ½	—	0	—	—
88, 98 1974	½ to 1½	⅜	L. ½ to 1½ R. 0 to 1	½	0 to ⅛	—	—
Omega 1975-78	M.S. —1½ to —½ P.S. ½ to 1½	⅜	¼ to 1¼	½	1/16 to 3/16	—	—
Cutlass 1975-77	1½ to 2½	⅜	L. ½ to 1½ R. 0 to 1	½	0 to ⅛	—	—
Cutlass 1978	M.S. ½ to 1½ P.S. 2½ to 3½	—	0 to 1	—	1/16 to 3/16	—	—
Starfire 1975-78	—1¼ to —¼	—	—¼ to ¾	—	0 to ⅛	—	—
88, 98 1975-76	1 to 2	⅜	L. ½ to 1½ R. 0 to 1	½	0 to ⅛	—	—
88, 98 1977-78	2½ to 3½	⅜	0 to 1½	⅜	0 to ¼	—	—
Toronado 1975-78	0	—	L. —½ to ¾ R. —¾ to ¼	—	—1/16 to 1/16	—	—
PONTIAC, TEMPEST 1966-70	—1 to —2		—¼ to ¾	¼	0 to ⅛	21	9
Firebird 1968-70	0 to 1	¾	—¼ to ¾	¼	⅛ to ¼	21	8⅜
Firebird 1971-72	—½ to ½	¾	½ to 1½	¼	⅛ to ¼	21	8⅜
Grand Prix, T-37, Le Mans, GTO ...1971-72	—1 to —2	¾	—½ to ½	¼	3/16 to 5/16	21	9
Ventura II 1972	0 to 1	¾	—¼ to ¾	¼	1/16 to 3/16	—	—
All Others 1971-72	½ to 1½	¾	¼ to 1¼	¼	⅛ to ¼	21	8½
Ventura 1973	—¼ to ¾	¾	—¼ to ¾	¼	3/16	—	
Grandville, Cat., Bon. 1973-74	½ to 1½	¾	L. ½ to 1½ R. 0 to 1	¼	1/16	—	10½
Lemans, Grand AM 1973-74	M.S. —½ to —1½ P.S. ½ to —½	¾	L. ½ to 1½ R. 0 to 1	¼	1/16	—	10½
Grand Prix 1973-78	2½ to 3½	¾	L. ½ to 1½ R. 0 to 1	¼	1/16	—	10½
Firebird 1973	—¾ to ¼	¾	½ to 1½	¼	3/16	—	—
Firebird 1974-78	½ to 1½	¾	½ to 1½	¼	⅛	—	9½
Ventura 1974	0 to 1	¾	—¼ to ¾	¼	3/16	—	8¾
Ventura 1975-77	M.S. —1½ to —½ P.S. ½ to 1½	¾	¼ to 1¼	¼	0 to ⅛	—	8¾
Cat., Bon., Gran. ...1975	½ to 2½	¾	L. ½ to 1½ R. 0 to 1	¼	0 to ⅛	—	10½
Lemans, Grand AM . 1975-78	M.S. ½ to 1½ P.S. 1½ to 2½	¾	L. ½ to 1½ R. 0 to 1	¼	0 to ⅛	—	10½
Astre 1975	—1¼ to —¼	—	—¼ to ¾	—	3/16 to 5/16	—	—
Bon., Cat. 1976	1 to 2	¾	L. ½ to 1½ R. 0 to 1	¼	0 to ⅛	—	10½

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MAKE and MODEL	YEAR	CASTER (Degrees)	SHIMS ①	CAMBER (Degrees)	SHIMS ②	TOE-IN (Inches)	TOE-OUT (On Turns)	K.P.A. (Degrees)
PONTIAC, TEMPEST (Cont.)								
Safari, Catalina, Bonneville	1977-78	2½ to 3½	¾	¼ to ¾	¼	⅛ to ¼		10½
Astre, Sunbird	1977	—1¼ to —¼	—	—¼ to ¾	—	0 to ⅛	—	8½
Phoenix	1978	M.S. —1½ to —½ P.S. ½ to 1½	—	¼ to 1¼	—	1/16 to 3/16	—	—
THUNDERBIRD								—
	1968-72	0 to 2		—¼ to 1¼		1/16 to 3/16	21⅞	—
	1973	—½ to 3½		—¼ to 1¾		1/16 to 7/16	22¼	—
	1974	½ to 3½		—¼ to 1¾		1/16 to 3/16	22¼	—
	1975	2½ to 5½	—	L. 0 to 2 R. —½ to 1½	—	1/16 to 7/16	22¼	—
	1976-78	3¼ to 4¾	—	L. —¼ to 1¼ R. —½ to 1	—	1/16 to 7/16	22¼	9

① Degrees change in caster for each 1/16" shim on models using shims.
② Degrees change in camber for each 1/16" shim on models using shims.

M.S.—Manual Steering
P.S.—Power Steering

Note: These specifications have been compiled from reliable sources and while we believe them to be correct, we do not assume any liability for any inaccuracies that may exist.

IMPORTED CAR WHEEL ALIGNMENT SPECIFICATIONS

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MAKE and MODEL	YEAR	CASTER (Degrees)	CAMBER (Degrees)	TOE-IN (Inches)	K.P.A. (Degrees)
AUDI					
90	1972	—1/3 to 1/3	—1/3 to 1/3	0 to 5/64	—
100	1972-75	—1/3 to 1/3	—1/6 to 1/2	0 to 5/64	—
80, Fox	1973-75	—1/2 to 1/2	0 to 1	0	—
100LS	1976	M.S. —1/6 to 1/2 P.S. 1/3 to 1/2	—1/3 to 1/3	3/64 to 1/8	—
Fox	1976	0 to 1	0 to 1	0	—
AUSTIN					
Austin-Healy Sprite, A-40	1959-72	3	1	1/8	6 1/2
1100, 1300	1973	4 1/2 to 6 1/2	—1/4 to 1 3/4	1/16 (Out)	10
Maxi 1500, 1750	1973	3 to 5	3/4 to 2 1/4	1/16 to 1/8	12
1800, 2200	1973	1 to 3	3/4 to 2 1/4	1/8	12
Marina	1973-75	2	1/3	1/16	—
BMW					
1600, 2002, 2000 Ti	1971-75	3	0	.079	—
6 cyl.	1971-75	9 1/2	0	.04	—
2002	1976	4	1/2	.06	—
530 i	1976	7 2/3	1/2	.06	—
3.0 si	1976	9 2/3	1/2	.06	—
CITROEN					
SM	1972	1 3/4	—1/4 to 1/4	0	—
DS21, DV	1972	1 1/2	—1/4 to 1/4	5/64 to 5/32	—
SM	1973	1 1/2 to 1 3/4	—1/4 to 0	1/8 to 3/16	—
DS23 Models	1973	1 3/4	—1/4 to 0	5/64 to 5/32	—
COLT					
All	1971-75	1/2 to 1 1/4	1/2 to 1 1/2	1/16 to 3/16	8 5/6
CRICKET					
All	1971-74	1 1/2	1 3/4	1/32 to 1/8	11
DATSUN					
2000	1969-70	0 to 1	1 1/2	3/16	—
2000	1971	2/3 to 1/3	1 1/3 to 2 1/3	3/32 to 5/32	—
1600	1969	1 2/3	1	1/4 to 11/32	—
1600 (510)	1970-72	2	1 1/6	0 to 1/32	—
240Z	1971-72	3	1	1/16 to 1/8	—
100A, 120A	1973	1/2 to 2	1 to 2 1/2	1/8 to 23/64	10
1200	1973	1 to 2 1/4	0 to 2	5/64 to 5/16	8
160B, 180B	1973	1 to 2 1/3	1 to 2 1/2	25/64	6 1/4 to 7 3/4
200L	1973	1 1/3 to 3	1 to 2 1/3	5/32	6 1/4 to 7 3/4
240Z, 260Z	1973-74	3	1	5/64 to 13/64	12
260C	1973	1/2	1 1/3	23/64 to 7/16	6 2/3
B-210	1974	1 1/4 to 2 1/4	3/4 to 1 3/4	0 to 1/64	—
610	1974	1 1/4 to 2 3/4	1 1/2 to 2 3/4	7/16	—
610	1975	3/4 to 2 1/4	1 to 2 1/2	1/4 to 5/16	6 1/3 to 7 3/4
710	1975	1 1/4 to 2 1/2	1 1/4 to 2 3/4	5/32 to 7/32	—
280Z	1975	2 1/4 to 3 1/2	0 to 1 1/2	3/32 to 5/32	—
610, 710	1976	1 to 2 1/2	1 1/4 to 2 3/4	5/32 to 1/4	7
280Z	1976	2 to 3	1/3 to 1 2/3	0 to 1/8	12
FIAT					
124	1968	2 1/4	1 1/2	1/4	4 1/2
124, 125	1969-72	3 1/4	1/2	1/8	—
500, 600D, 850	1969-72	8 to 10	2	1/8	—
124	1973-75	2 1/4	0	15/64 to 5/16	6
124 Sport Coupe	1973-75	3	1/2	5/64 to 5/32	6
127	1973	3	1	1/32 to 5/64	—
128	1973	2 1/4	1	0	—
500	1973	8 to 10	1	0 to 5/64	6
128	1974-75	1 1/3 to 1 5/6	1 1/3 to 1 2/3	—1/16 to 1/16	—

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MAKE and MODEL	YEAR	CASTER (Degrees)	CAMBER (Degrees)	TOE-IN (Inches)	K.P.A. (Degrees)
FIAT (Cont.)					
124	1976	3⅙	⅙	¼	—
128 Sedan	1976	1⅔	1⅔	3/64 Toe-out	—
120 Coupe	1976	1⅓	1⅓	1/64	—
131	1976	3¾	1 11/12	21/64	—
X1-9	1976	7	—½	11/64	—
FORD					
Cortina GT	1967-71	—1 to ½	1 to 2½	1/16	—
Cortina 1300, 1600, GT	1972	—1 to ½	1 to 2½	3/32	—
Cortina 1300, 1600, GT	1973	2¼ to 3¾	0 to 1	0 to 15/64	3 to 4
Courier	1972-75	¾ to 1¼	1 to 1¾	⅛	—
Capri 2300, 2800	1976	1½	1½	5/32	—
HILLMAN					
Minx, Hunter, G.T.	1968-72	1 to 2	—¾ to ¾	⅛	—
Hunter (All Models)	1973	¼ to —¾	—¾ to ¾	⅛	11¾
HONDA					
600	1971-72	1	1	.08 Toe out	—
Civic	1973-74	1¾	½	.04 Toe-out	—
C.V.C.C. Stat. Wag.	1976	1	½	.04 Toe-out	—
Civic, C.V.C.C. Others	1976	1¾	½	.04 Toe-out	—
Accord	1976	1⅚	⅔	.04 Toe-out	—
JAGUAR					
XK-E	1968-70	2	¼	1/16 to ⅛	4¼
E Type	1971-72	2½	½	1/16	—
E Type	1973-74	2 to 3	—¼ to ¼	1/16	2
XJ-6, XJ12	1975	2¼ to 2¾	¼ to ¾	1/16 to ⅛	—
XJ-6, XJ-12	1976	2 to 2½	¼ to ¾	1/16 to ⅛	1½
MAZDA					
RX-2	1972-74	½ to 2	—¼ to 1¾	¼	—
RX-3, 808	1973-74	1 to 2½	0 to 2	¼	—
RX-4	1974	1¼ to 2¾	1 to 2	¼	—
808	1975	⅔ to 2⅙	—¼ to 1¼	0 to ¼	8¾
RX-3	1975	1⅙ to 2⅔	0 to 2	0 to ¼	8½
RX-4	1975	1¼ to 2¾	0 to 2	0 to ¼	9¾
808 (Sedan)	1976	⅚ to 2⅓	0 to 2	0 to ¼	8½
RX-3	1976	1 to 2⅓	—⅙ to 1⅚	0 to ¼	8⅔
RX-4	1976	1 to 2½	0 to 2	0 to ¼	9¾
MERCEDES BENZ					
220-8, 230-8, 250-8, 280, 350	1968-72	3½	0	3/16	6
200, 220, 230, 250, 280	1973-74	M.S. 2⅓ to 3 P.S. 3⅓ to 4	0 to ½	3/64 to 5/32	—
280S, 280SE, 350SE, 450SE, SEL	1973-75	9½ to 10½	0	3/64 to 5/32	—
350SL, 350SLC, 450SL, 450SLC	1973-75	3⅓ to 4	0	1/32 to ⅛	—
230, 240D, 280, C, 300D	1976	3⅔	¼	⅛	—
280S, 450 SE/SEL	1976	10	⅙	⅛	—
450 SL/SLC	1976	3⅔	0	5/64	—
MG					
1100	1968	5½	¾	1/16	10
MCG	1969-70	5	0	0	—
MG Midget	1971-72	3	¾	0 to ⅛	
MGB	1971-72	7	1	1/16 to 3/32	
Midget	1973-74	3	¾	0 to ⅛	5½ to 8
MGB	1973-74	5 to 7¼	1¼ to —¼	1/16 to 3/32	7¼ to 9
Midget	1975-76	3	¾	0-⅛	—
MGB	1975-76	7	1	1/32-1/16	—

IMPORTED CAR WHEEL ALIGNMENT SPECIFICATIONS

All Figures positive unless otherwise designated

MAKE and MODEL	YEAR	CASTER (Degrees)	CAMBER (Degrees)	TOE-IN (Inches)	K.P.A. (Degrees)
OPEL					
Olympia	1968-70	—1/2 to 2 1/2	—1/2 to 1 1/4	1/32 to 7/64	—
Rekord	1968-70	—1 to 1	0 to 1	5/64 to 5/32	—
Diplomat	1968-70	0 to 1	0 to 1	5/64 to 5/32	—
1900	1971-72	2 1/2 to 4 1/2	—1/2 to —1 1/2	1/8 to 3/16	—
GT	1971-72	2 to 4	1/2 to 1 1/2	1/32 to 1/8	—
Opel	1971-72	1 to 3	1/2 to 1 1/2	1/32 to 1/8	—
1900	1973	3 1/2 to 6 1/2	—1 1/2 to 1/2	1/8 to 3/16	—
GT	1973	2 to 4	1/2 to 1 1/2	1/32 to 1/8	—
1900, Manta	1974-75	3 to 6	—1/2 to —1 1/2	1/8 to 3/16	—
1.8 Litre, Isuzu	1976	5	0	1/8	—
PEUGEOT					
204, 304	1968-72	0 to 1	—1/4 to 1 1/4	1/16 to 3/32	—
404	1968-70	1 1/2 to 2 1/2	—1/4 to 1 1/4	1/16 to 3/32	—
504	1969-72	2 to 3	0 to 1	5/32 to 3/16	—
204, 304, 304S	1973	0 to 1	—1/4 to 1 1/4	1/32 to 1/8	9 1/2
404	1973	1 to 3	—1/4 to 1 1/4	1/32 to 1/8	9 1/2
504, 504C	1973-75	2 2/3	2/3	5/32 to 13/64	9
504 Gas, Diesel	1976	2 2/3	1/2	1/8	—
PLYMOUTH ARROW					
98, 122	1976	1 3/4	1	.08-.023	—
PORSCHE					
900	1968-70	6 3/4	0	0	11
911	1971-72	5 5/6 to 6 1/3	0	0	—
914	1971-72	5 1/2 to 6 1/2	0	0	—
911, 914	1973-76	5 3/4 to 6 1/4	0	0	11
RENAULT					
1133, 1132, R-1190	1966-70	7 to 11	1 3/4	0	—
1150	1966-70	4	3/4	0	
R-12	1971-72	4	1 1/2	—1/8 to 0	—
R-16	1971-72	2 2/3	3/4	—1/8 to 0	—
12TL, 12TS	1973-75	4	1 to 2	0	8
5	1976	13	3/4 rear	3/64-3/16 Toe out	—
12	1976	4	1	3/64-5/32 Toe-out	—
15, 17TL, 17	1976	4	1 1/2	3/64-5/32 Toe-out	—
SAAB					
95, 96	1968-72	1 1/2 to 2 1/2	1/2 to 1	3/64 to 1/8	—
99	1969-72	1 to 1 1/2	1/2 to 1	—3/64 to 3/64	—
95, 96, 97	1973-74	1 1/2 to 2 1/2	—1/4 to 1/4	1/32 to 1/8	6 to 8
99	1973-74	1/4 to 1 1/4	1/4 to 1 1/4	0	10 1/2 to 12 1/2
99	1975	1/2 to 1	1/2 to 1	0	—
99GL	1976	1	1/2	3/64	—
SIMCA					
1000	1968	10	1	1/4 to 1/8	—
1000, 1200	1969-72	7 to 9	1 to 2	1/8	—
1100	1969-72	1 1/2 to 2 1/2	—1/4 to 3/4	1/32 to 1/8	—
1501	1968-72	2 to 3	1 to 1 3/4	1/32 to 1/8	—
1000	1973	8 1/4 to 10 1/4	1/4 to 3/4	5/64 to 5/32	5 1/2
1100	1973	3	0	0	12 3/4
1301, 1501	1973	2 1/2 to 3 1/2	1 to 2	1/8 to 13/64	8 1/2
SUBARU					
All	1971-72	2	1 5/6	1/5	—
All	1973-74	3/4	1 1/3	.08-.32	—
All	1975	3/4	1	0-5/16	—
2 Wh. Drive	1976	3/4	1 1/2	5/64-5/16	—
4 Wh. Drive	1976	3/4	2 1/2	15/64-15/32	—

IMPORTED CAR WHEEL ALIGNMENT SPECIFICATIONS

All Figures positive unless otherwise designated

MAKE and MODEL	YEAR	CASTER (Degrees)	CAMBER (Degrees)	TOE-IN (Inches)	K.P.A. (Degrees)
TOYOTA					
RT-60, 62, 66, 70, 72, 76, 78	1969-71	0 to 1	¾ to 1¾	5/32	6¾
Corona, Mark II	1972	⅓	1⅓	5/32 to ¼	—
Corolla	1972	2	1	⅛	—
Crown	1972	1	1	5/64	—
Corona, Mark II	1973	—¼ to ¾	½ to 1½	5/32 to 15/64	7
Corolla	1973-74	2	1	⅛	8
Crown	1973	—1 to 0	0 to 1	⅛ to 3/16	7⅓
Celcia, Carina	1973-74	½ to 1½	½ to 1½	13/64 to 9/32	7 to 8
Carina, Celica	1975-76	½ to 1½	½ to 1½	3/64 to ⅛	7⅔
Corona	1975-76	⅓ to 1⅓	0 to 1	3/64 to ⅛	7
Corolla	1975-76	1⅓ to 2⅓	½ to 1½	1/32	7⅔
TRIUMPH					
GT-6	1968-72	3½	2¾	1/16	6
GT-6, Spitfire 1500	1973-74	2½ to 4½	1¾ to 3¾	1/16 to ⅛	5 to 7
Spitfire	1975-76	4¼ to 5	1½ to 2½	0 to 1/16	6 to 7½
TR-7	1975-76	2½ to 4½	—¾ to 1¼	1/16 to ⅛	—
VAUXHALL					
Cresta, Victor	1965-69	1½ to 2	¾	⅛ to ¼	3¾ to 4½
Viva	1967-69	1 to 2	0 to 2	¼	—
Cresta, Viscount	1970-72	2	¾	⅛ to ¼	
Viva	1970-72	2½ to 4	0 to —1	1/32 to 1/16	
Victor, Ventora, VX	1970-72	2½ to 3½	½ to 1½	1/32 to 3/32	
Viva, Firenza	1973	2½ to 4	0 to 2	0	8 to 10½
Victor, Ventura	1973	¼ to —1¾	¾ to —¾	½ to 4½	7 to 9
VOLKSWAGEN					
1500 Sedan	1968-71	3⅓ to 4⅔	1 to 1⅔	⅛	—
1600	1968-71	4	1⅓	3/16	
1700	1969-71	½ to 1¾	½ to 1½	⅛	—
K70	1971	—⅓ to ⅓	—¾ to ¾	⅛	—
Sedan	1972	3⅓	½	3/32 to 13/64	—
Super Beetle	1972	2	1⅓	3/32 to 3/16	—
Type 3	1972	4	1⅓	9/64 to 15/64	—
Type 4	1972	1	1¼	1/32 to 5/32	—
Type 1 1200, 1300, 1303,111	1973-76	2⅓ to 4⅓	⅙ to ⅚	¼ to ¾	—
Type 1 1303S, 113	1973-76	1½ to 2½	⅔ to 1⅓	¼ to ¾	—
Type 2	1973-76	2⅓ to 3⅔	⅓ to 1	0	—
Type 3	1973	3⅓ to 4⅔	1 to 1⅔	⅔	5¼
Type 4	1973	½ to 1½	½ to 1½	⅓	8¼
K-70	1973	—⅓ to ⅓	—¾ to ¾	0	9 to 10
Type 4	1974	1¼ to 2¼	⅔ to 1⅔	—¼ to ¼	—
Dasher	1974-76	0 to 1	0 to 1	0 to ⅓	—
Rabbit, Sirocco	1975-76	1½ to 2½	0 to 1	⅙	—
VOLVO					
120, 140,180	1968	½	¼	0 to 5/32	
All	1969-72	0 to ½	0 to ½	1/16 to 3/16	
142, 144	1973	1 to 2	0 to ½	0	7½
1800ES	1973	0 to 1	0 to ½	0 to ⅛	8
164, 164E	1973	0 to 1	0 to ½	0 to 5/32	7½
All	1974	2 to 2½	0 to ½	0 to ⅛	—
164	1975	1 to 2	0 to ½	⅛	—
240, 264	1976	2 to 3	1 to 1½	¼	—

TRUCK WHEEL ALIGNMENT SPECIFICATIONS*

All Figures positive unless otherwise designated

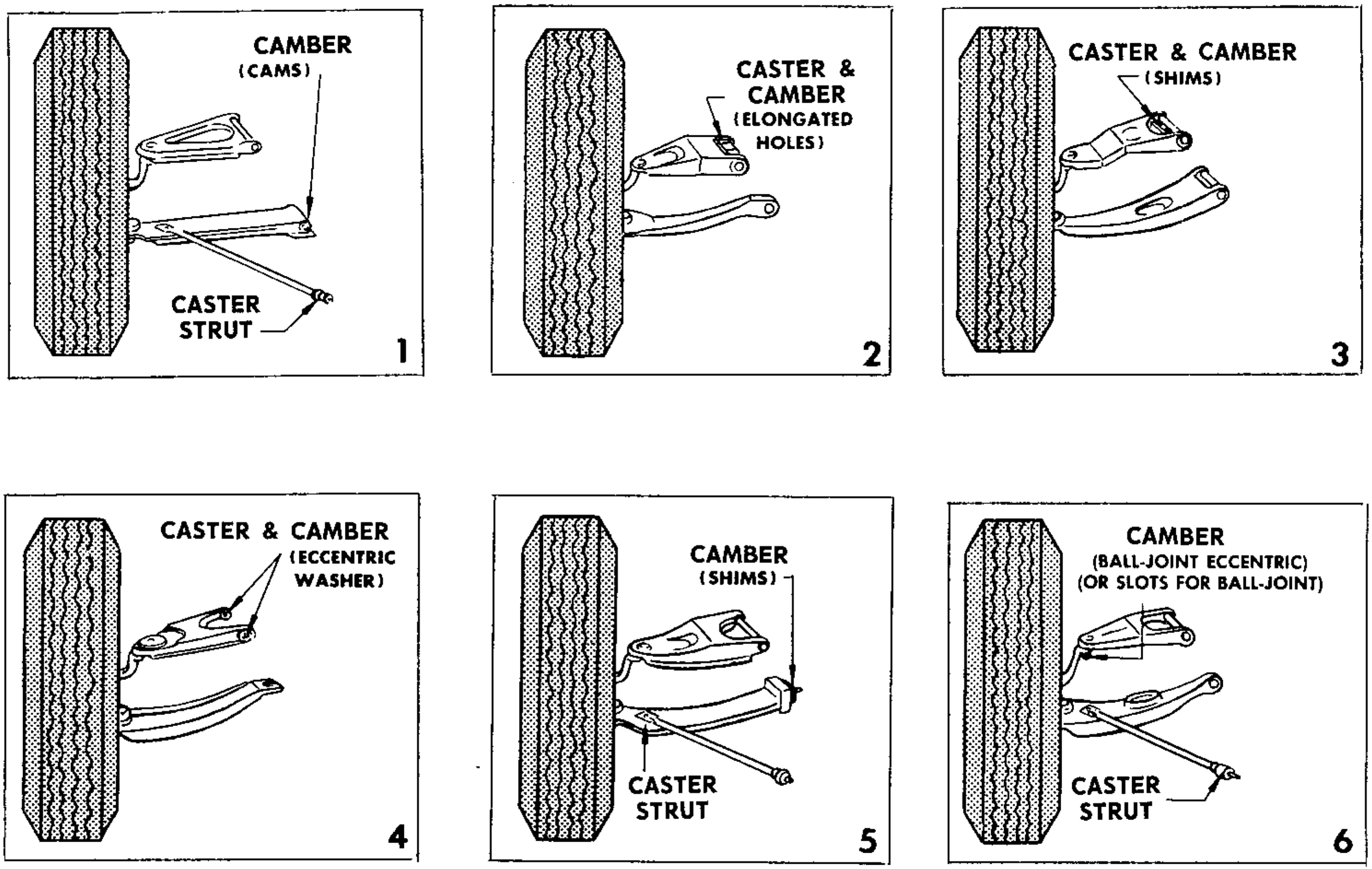
MAKE and MODEL	YEAR	CASTER (Degrees)	CAMBER (Degrees)	TOE-IN (Inches)	K.P.A. (Degrees)
CHEVROLET					
CA-PA10, CP-10	1967-68	2½	¾	1/16	—
CA-20, 30, CP-20, 30	1967-68	3¼	1¾	1/16	—
Series 10, 20, 30 Except "G"	1969-72	0 to 2	¼	⅛ to ¼	7⅙
G-10, G-20	1964-70	3⅓	1½	⅛	8½
G-10, G-20, G-30	1971	0	¼	3/16	—
C-10, P-10	1973-76	1¼	¼	3/16	—
C-20, C-30, P-20, P-30	1973-76	¾	¼	3/16	—
G-10, G-20, G-30	1973-76	1	¼	3/16	
K-10, K-20	1973-76	4	1½	3/16	
LUV	1977	—1/16	½	—1/16 to 1/16	7½
DODGE					
D-100, P-100	1964-71	2	1½	⅛	4
D-200, P-200	1964-71	1½	1½	⅛	4
D-300, P-300	1964-71	1½	2	⅛	7
A-100, A-108, Sportsman	1964-70	5	1½	3/16	—
B-100, 200, 300 Van, Sportsman	1971-77	M.S. ½ P.S. 2¼	½	3/32	—
D-100, D-200, D-300	1972-77	¼	¼	3/32	—
FORD					
F100, F250	1969-71	4	1	⅛	4
F-350	1964-66	4	⅜	⅛	—
P-350	1964-69	4½	⅝	⅛	—
F-350	1970-71	5	½	⅛	—
Econoline, Club Wagon	1969-71	5	½	⅛	—
F-100, F-250	1972	6	1	3/32	—
F-350	1972	6	1½	3/32	—
F-100, F-250, F-350	1973-76	4½	2	3/32	—
Bronco	1966-75	3½	1½	5/32	—
Econoline E-100, E-200	1972-77	4½	2	1/32	—
Econoline E-300, E-350	1972-77	5	2	1/32	—
G.M.C.					
1000	1963-70	2½ to 3½	0 to 1	3/16 to ¼	—
1500, 2500	1963-70	2½ to 3½	—¼ to ¾	3/16	8
All	1970-71	0	¼	⅛ to ¼	—
G-1500, G-2500, G-3500	1972	½	¼	3/16	—
CP-1500, CP-2500, CP-3500	1972	1½	¼	3/16	—
C-1500, P-1500	1973	1¼	¼	3/16	—
C-1500, C-2500, P-1500, P-2500	1973	¾	¼	3/16	—
G-1500, G-2500, G-3500, PA-1500	1973-75	4	¼	3/16	
K-1500, K-2500	1973-75	4	1½	3/16	
INTERNATIONAL					
110, 120, 130, 900, 908, 1100, 1200, 1300, 1110, 1210, 1310	1964-75	1	2	⅛	—
150, 1500, 1510	1964-75	1	1	⅛	—
Scout 80, 100, 800, 1000, 1010	1964-73	0	1	1/16 to ⅛	—
C-1000	1964-68	—2	1	⅛	—
D-1000	1965-70	—2	1	⅛	—
A-1000, B-1000	1966-68	—2	1	⅛	—
D-1100, 1200, 1300, 1500	1969-70	1	2	⅛	—
JEEP					
All Independent Suspension	1964-73	3¾ to 4¾	1¾ to 2¼	3/64 to 3/32	8½
CJ	1974	2 to 4	1 to 2	3/64 to 3/32	8½
All Others	1974-77	3 to 5	1 to 2	3/64 to 3/32	8½

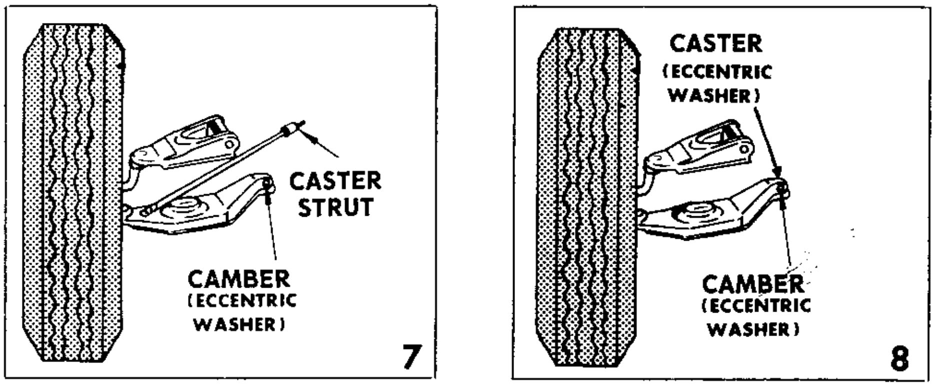
*Note: Make front alignment adjustments following the procedures in the service manual for the particular make and model truck. Adjustments should be made with the vehicle in a normally loaded condition. Trucks which are consistently operated with heavy loads should have toe-in adjusted with the truck under heavy load. This will result in longer tire life. Riding height and frame angle under loaded conditions figure into these calculations. Refer to the tables in the service manual of the particular make and model truck for these calculations.

CASTER-CAMBER ADJUSTMENT CHART

MAKE AND MODEL	YEAR	NO.*	METHOD OF ADJUSTMENT
AMERICAN MOTORS			
All except Pacer	1964-78	7	Eccentric for camber, strut for caster.
Pacer	1975-78	8	Eccentrics on lower control arm.
BUICK			
Skyhawk	1975-78	8	Eccentrics on lower control arm.
All Others	1965-78	3	Shims between upper control arm shaft and frame.
CADILLAC	1965-76	6	Adjustable strut for caster, eccentric for camber.
Eldorado	1967-78	4	Adjustable cams on upper control arms.
All except Eldorado	1977-78	3	Shims between upper control arm and frame.
CHEVROLET			
Chevelle, Nova, Monte Carlo, Corvette	1965-70	3	Shims between upper control arm shaft and frame.
All Others	1965-70	1	Adjustable strut for caster, eccentric for camber.
Vega, Monza	1971-78	8	Eccentrics on lower control arm.
Chevette	1976	9	Rotate upper ball joint for camber, add washers at upper control arm for caster.
All Others	1971-78	3	Shims between upper control arm shaft and frame.
CHRYSLER	1965-73	4	Eccentrics at inner end of upper control arm.
	1974-78	2	Move upper control arms in slotted holes.
Imperial	1968-75	2	Move upper control arm in slotted holes.
DODGE			
Charger, Coronet	1966-76	2	Move upper control arm in slotted holes.
All Others	1966-73	4	Eccentrics at inner end of upper control arm.
All Others	1974-78	2	Move upper control arm in slotted holes.
FORD			
Falcon, Maverick	1966-73	7	Adjustable strut for caster, eccentric for camber.
Fairlane, Mustang, Torino	1966-71	7	Adjustable strut for caster, eccentric for camber.
Torino	1972-76	2	Move upper control arm in slotted holes.
Mustang	1972-73	7	Adjustable strut for caster, eccentric for camber.
Mustang II	1974-78	2	Move upper control arm with adjustable bolts.
Pinto	1971-78	2	Move upper control arm with adjustable bolts.
Thunderbird	1966	5	Adjustable strut for caster, shims for camber.
Thunderbird	1967-78	2	Move upper control arm with adjustable bolts.
Maverick, Granada	1977-78	7	Adjustable strut for caster, eccentric for camber.
All Others	1966-78	2	Move upper control arm with adjustable bolts.
LINCOLN	1965-78	2	Move serrated upper arm shaft.
MERCURY			
Comet, Monarch, Versailles	1966-78	7	Adjustable strut for caster, eccentric for camber.
Montego	1966-71	7	Adjustable strut for caster, eccentric for camber.
Montego	1972-76	2	Move upper control arm in slotted holes.
Cougar	1966-73	7	Adjustable strut for caster, eccentric for camber.
Mercury, Meteor	1966-78	2	Move upper control arm with adjustable bolts.
Bobcat	1975-78	2	Move upper control arm with adjustable bolts.
OLDSMOBILE	1965-78	3	Shims between upper control arm shaft and frame.
Toronado, Starfire	1966-78	4	Adjustable cams on upper control arms.
PLYMOUTH	1966-73	4	Eccentrics at inner end of upper control arm.
All	1974-78	2	Move upper control arm in slotted holes.
PONTIAC	1965-78	3	Shims between upper control arm shaft and frame.
Astre, Sunbird	1975-78	8	Eccentrics on lower control arm.

*Refer to figure 30 for location of adjustments.





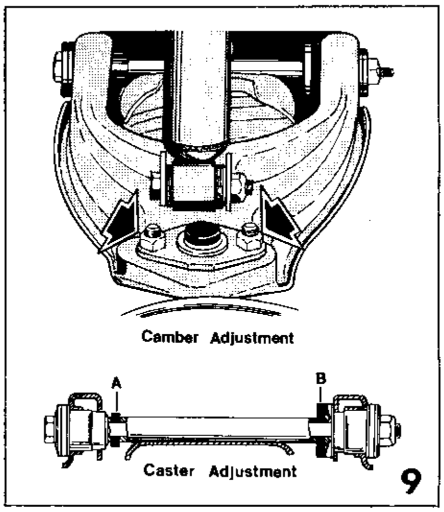


Figure 30—Location of caster-camber adjustments

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