

SUSPENSION

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WHEEL ALIGNMENT

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DESCRIPTION AND OPERATION

WHEEL ALIGNMENT INFORMATION

Proper vehicle wheel alignment is the proper adjustment of all interrelated front and rear suspension angles (Fig. 1). These angles are what affects the handling and steering of the vehicle when it is in motion.

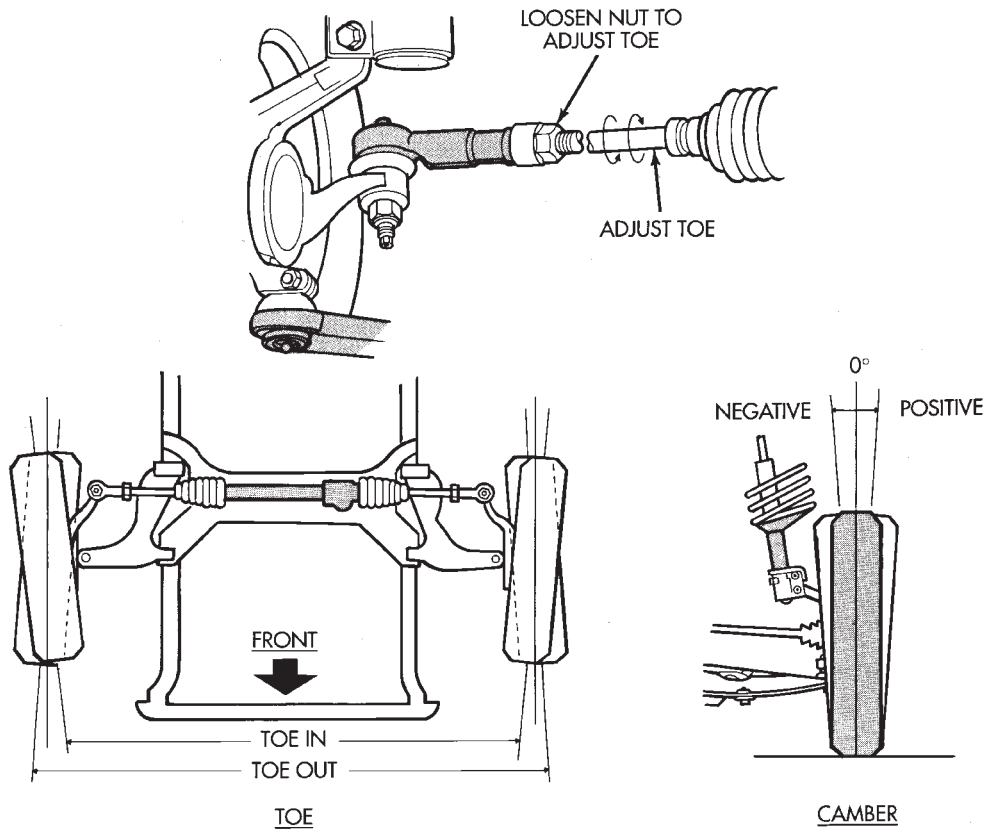
The method of checking a vehicle's front and rear wheel alignment will vary depending on the type and manufacturer of the equipment being used. Instructions furnished by the manufacturer of the equipment being used should always be followed to ensure accuracy of the alignment, except alignment specifications recommended by Chrysler Corporation **MUST ALWAYS** be used.

CAUTION: Do not attempt to modify any suspension or steering components by heating or bending of the component.

Wheel alignment adjustments should always be made in the following sequence, to ensure that an accurate alignment is performed.

- (1) Adjust rear camber to be at the preferred setting specification.
- (2) Adjust rear wheel Toe to be at the preferred setting specification..
- (3) Adjust front wheel Toe to be at the preferred setting specification for individual wheel Toe and for total Toe.
- (4) **Toe** is measured in degrees or inches and is the distance that the front edges of the tires are closer (or farther apart) than the rear edges (Fig. 1). See Front Wheel Drive Specifications for correct front and rear wheel Toe specifications.
- (5) **Thrust Angle** is defined as the average of the Toe settings on each rear wheel. If this measurement is out of specification, re-adjust rear wheel Toe so that each wheel has 1/2 of the total Toe measurement. When re-adjusting, do not exceed the total Toe specification.

DESCRIPTION AND OPERATION (Continued)



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Fig. 1 Alignment Camber/Toe

DIAGNOSIS AND TESTING

SUSPENSION AND STEERING DIAGNOSIS

CONDITION	POSSIBLE CAUSES	POTENTIAL CORRECTIONS
Front End Whine On Turns	<ol style="list-style-type: none"> 1. Defective Wheel Bearing 2. Incorrect Wheel Alignment 3. Worn Tires 	<ol style="list-style-type: none"> 1. Replace Wheel Bearing 2. Check And Reset Wheel Alignment 3. Replace Tires
Front End Growl Or Grinding On Turns	<ol style="list-style-type: none"> 1. Defective Wheel Bearing 2. Engine Mount Grounding Against Frame Or Body Of Vehicle. 3. Worn Or Broken C/V Joint 4. Loose Wheel Lug Nuts 5. Incorrect Wheel Alignment 6. Worn Tires 	<ol style="list-style-type: none"> 1. Replace Wheel Bearing 2. Check For Motor Mount Hitting Frame Rail And Reposition Engine As Required 3. Replace C/V Joint 4. Verify Wheel Lug Nut Torque 5. Check And Reset Wheel Alignment 6. Replace Tires
Front End Clunk Or Snap On Turns	<ol style="list-style-type: none"> 1. Loose Wheel Lug Nuts 2. Worn Or Broken C/V Joint 3. Worn Or Loose Tie Rod Or Ball Joint 4. Worn Control Arm Bushing 5. Loose Sway Bar Or Upper Strut Attachment 	<ol style="list-style-type: none"> 1. Verify Wheel Lug Nut Torque 2. Replace C/V Joint 3. Tighten Or Replace Tie Rod End Or Ball Joint 4. Replace Control Arm Bushing 5. Tighten Sway Bar Or Upper Strut Attachment To Specified Torque
Front End Whine With Vehicle Going Straight At A Constant Speed	<ol style="list-style-type: none"> 1. Defective Wheel Bearing 2. Incorrect Wheel Alignment 3. Worn Tires 	<ol style="list-style-type: none"> 1. Replace Wheel Bearing 2. Check And Reset Wheel Alignment 3. Replace Tires
Front End Growl Or Grinding With Vehicle Going Straight At A Constant Speed	<ol style="list-style-type: none"> 1. Engine Mount Grounding 2. Worn Or Broken C/V Joint 	<ol style="list-style-type: none"> 1. Reposition Engine As Required 2. Replace C/V Joint
Front End Whine When Accelerating Or Decelerating	<ol style="list-style-type: none"> 1. Worn Or Defective Transaxle Gears Or Bearings 	<ol style="list-style-type: none"> 1. Replace Transaxle Gears Or Bearings
Front End Clunk When Accelerating Or Decelerating	<ol style="list-style-type: none"> 1. Worn Or Broken Engine Mount 2. Worn Or Defective Transaxle Gears Or Bearings 3. Loose Wheel Lug Nuts 4. Worn Or Broken C/V Joint 5. Worn Or Loose Ball Joint 6. Worn Or Loose Control Arm Bushing 7. Loose Crossmember Bolts 	<ol style="list-style-type: none"> 1. Replace Engine Mount 2. Replace Transaxle Gears Or Bearings 3. Verify Wheel Lug Nut Torque 4. Replace C/V Joint 5. Tighten Or Replace Ball Joint 6. Tighten To Specified Torque Or Replace Control Arm Bushing 7. Tighten Crossmember Bolts To Specified Torque
Road Wander	<ol style="list-style-type: none"> 1. Incorrect Tire Pressure 2. Incorrect Front Or Rear Wheel Toe 3. Worn Wheel Bearings 4. Worn Control Arm Bushings 5. Excessive Friction In Steering Gear 6. Excessive Friction In Steering Shaft Coupling 7. Excessive Friction In Strut Upper Bearing 	<ol style="list-style-type: none"> 1. Inflate Tires To Rcommended Pressure 2. Check And Reset Front Wheel Toe 3. Replace Wheel Bearing 4. Replace Control Arm Bushing 5. Replace Steering Gear 6. Replace Steering Coupler 7. Replace Strut Bearing

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	POTENTIAL CORRECTIONS
Lateral Pull	<ol style="list-style-type: none"> 1. Unequal Tire Pressure 2. Radial Tire Lead 3. Incorrect Front Wheel Camber 4. Power Steering Gear Imbalance 5. Wheel Braking 	<ol style="list-style-type: none"> 1. Inflate All Tires To Recommended Pressure 2. Perform Lead Correction Procedure 3. Check And Reset Front Wheel Camber 4. Replace Power Steering Gear 5. Correct Braking Condition Causing Lateral Pull
Excessive Steering Free Play	<ol style="list-style-type: none"> 1. Incorrect Steering Gear Adjustment 2. Worn Or Loose Tie Rod Ends 3. Loose Steering Gear Mounting Bolts 4. Loose Or Worn Steering Shaft Coupler 	<ol style="list-style-type: none"> 1. Adjust Or Replace Steering Gear 2. Replace Or Tighten Tie Rod Ends 3. Tighten Steering Gear Bolts To The Specified Torque 5. Replace Steering Shaft Coupler
Excessive Steering Effort	<ol style="list-style-type: none"> 1. Low Tire Pressure 2. Lack Of Lubricant In Steering Gear 3. Low Power Steering Fluid Level 4. Loose Power Steering Pump Belt 5. Lack Of Lubricant In Steering Ball Joints 6. Steering Gear Malfunction 7. Lack Of Lubricant In Steering Coupler 	<ol style="list-style-type: none"> 1. Inflate All Tires To Recommended Pressure 2. Replace Steering Gear 3. Fill Power Steering Fluid Reservoir To Correct Level 4. Correctly Adjust Power Steering Pump Drive Belt 5. Lubricate Or Replace Steering Ball Joints 6. Replace Steering Gear 7. Replace Steering Coupler

PRE-WHEEL ALIGNMENT INSPECTION

Before any attempt is made to change or correct the wheel alignment factors. The following part inspection and the necessary corrections should be made to those parts which influence the steering of the vehicle.

(1) Check and inflate all tires to recommended pressure. All tires should be the same size and in good condition and have approximately the same wear. Note the type of tread wear which will aid in diagnosing, see Wheels and Tires, Group 22.

(2) Check front wheel and tire assembly for radial runout.

(3) Inspect lower ball joints and all steering linkage for looseness.

(4) Check for broken or sagged front and rear springs.

(5) Check vehicle ride height to verify it is within specifications.

(6) Alignment **MUST** only be checked after the vehicle has the following areas inspected and or adjusted. Recommended tire pressures, full tank of fuel, no passenger or luggage compartment load and is on a level floor or a properly calibrated alignment rack.

SERVICE PROCEDURES

WHEEL ALIGNMENT CHECK AND ADJUSTMENT PROCEDURE

CASTER CAMBER DESCRIPTION

On this vehicle, the front suspension caster and camber settings and the rear suspension caster settings, are determined at the time the vehicle is designed. This is accomplished by very accurately locating the vehicle's suspension components when designing and assembling the vehicle. This is called a Net Build vehicle and results in no required or available adjustment of front and rear caster and front camber after the vehicle is built or when servicing the suspension components. Thus Caster and Camber are not normally considered an adjustable specification when performing an alignment on this vehicle. Though Caster and Camber are not adjustable they must be checked to ensure they meet vehicle specifications.

If a vehicle's front camber is found to be outside of the required specifications, the vehicles front suspension components should be inspected for any signs of damage or bending.

Rear Camber on this vehicle is adjustable. The rear camber on this vehicle is adjusted using the

SERVICE PROCEDURES (Continued)

adjusting screw located in the forward and rear lateral links of the vehicles rear suspension (Fig. 2).

Rear Caster on this vehicle is not adjustable and is not shown as an alignment specification.

CAUTION: Do not attempt to adjust the vehicles Caster or Camber by heating, bending or any other modification of the suspension components.

CAUTION: When checking the rear alignment on this vehicle the alignment rack must be equipped with rear skid plates.

Correctly position vehicle on alignment rack and install all required equipment on vehicle, per the alignment equipment manufacturers specifications.

NOTE: Prior to reading each alignment specification, front and rear of vehicle should be jounced an equal number of times. Induce jounce (rear first then front) by grasping center of bumper and jouncing each end of vehicle an equal number of times. Bumper should always be released when vehicle is at the bottom of the jounce cycle.

Correctly jounce vehicle and read front and rear alignment settings and compare to vehicle specifications for camber, caster and Toe. See Alignment Specifications in this group of the service manual for required specifications.

FRONT WHEEL TOE AND REAR WHEEL TOE AND CAMBER SETTING PROCEDURE

- (1) Prepare vehicle as described in the Pre-Alignment Vehicle Inspection procedure.
- (2) Center steering wheel and lock in place using a steering wheel clamp.

NOTE: When performing the Front Toe and Rear Camber and Toe setting procedure, the rear wheel Camber and Toe **MUST** be set to the preferred specification first, then set front wheel Toe to the preferred specification.

CAUTION: Do not attempt to straighten or repair a lateral link. Do not apply heat to the lateral link adjusting screws or to the jam nuts, (Fig. 2) when loosening or adjusting the lateral links.

- (3) Loosen the adjusting screw jam nuts (Fig. 2) on all 4 of the rear lateral arm adjusting screws.

CAUTION: Do not attempt to move the adjusting screws without properly loosening the jam nuts. Note that each adjusting screw has one right-handed nut and one left-handed nut.

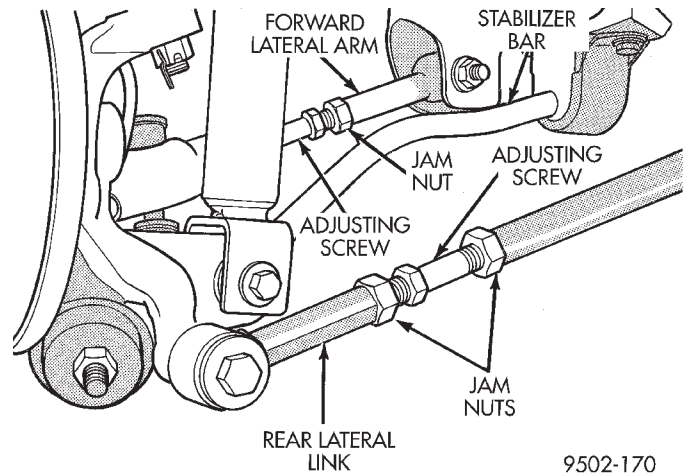


Fig. 2 Lateral Arm Adjusting Screw Jam Nuts

CAUTION: When setting rear Camber and Toe on the vehicle, the maximum lengths of the adjustable lateral link at the locations shown in (Fig. 3) must not be exceeded. If these maximum lengths are exceeded, inadequate retention of adjustment link to the inner and outer link may result.

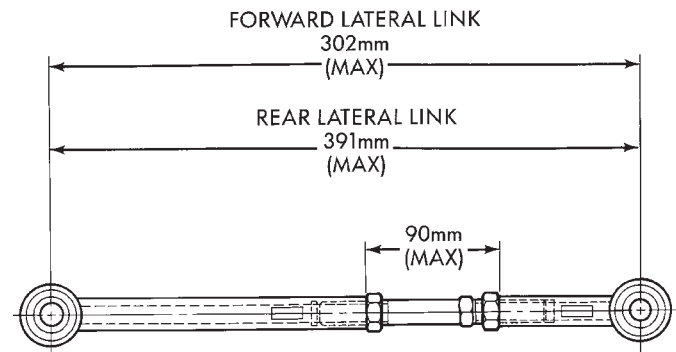


Fig. 3 Rear Lateral Link Maximum Length Dimensions

(4) Rough in Rear Camber setting as close as possible to the preferred specification first, by mainly adjusting the rear lateral link adjusting screw (Fig. 2). Some adjustment of the forward lateral link adjusting screw (Fig. 2) will also be required to get Rear Camber setting to preferred specification. See Alignment Specifications in this group of the service manual for preferred specification.

(5) Adjust the forward lateral link adjusting screw (Fig. 2) to set rear Toe to preferred specification. See Alignment Specifications in this group of the service manual for preferred specification.

- Adjusting Toe will cause a slight change in the Camber setting. If during setting of Toe, Camber no longer is at the preferred specification, continue to

SERVICE PROCEDURES (Continued)

adjust Camber and Toe until both are at their preferred specifications.

(6) While holding adjustment screws from turning, use a crow foot and torque wrench, and tighten all lateral link adjusting screw jam nuts to a torque of 65 N·m (48 ft. lbs.). This will securely hold adjusting screws from turning.

CAUTION: Do not twist front inner tie rod to steering gear rubber boots during front wheel Toe adjustment.

(7) Loosen front inner to outer tie rod end jam nuts (Fig. 4). Grasp inner tie rods at serrations (Fig. 4) and rotate inner tie rods of steering gear to set front Toe to the preferred Toe specification. See Alignment Specifications in this group of the service manual for preferred specification

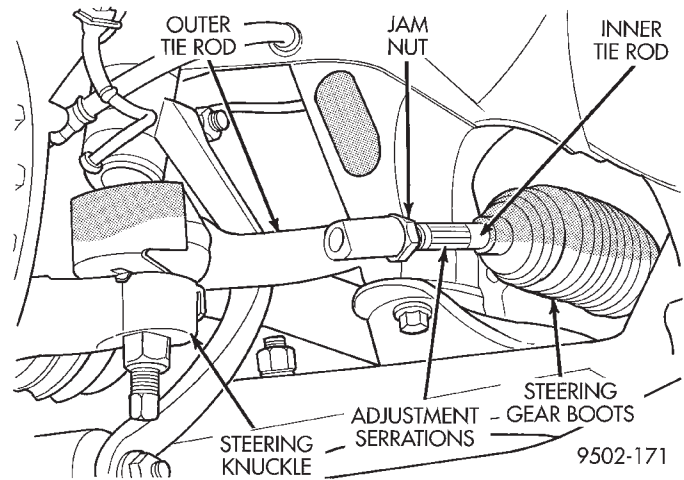


Fig. 4 Inner To Outer Tie Rod Jam Nut

- (8) Tighten tie rod locknuts (Fig. 4) to 61 N·m (45 ft. lbs.) torque.
- (9) Adjust steering gear to tie rod boots (Fig. 4) at inner tie rod.
- (10) Remove steering wheel clamp.

SPECIFICATIONS

VEHICLE ALIGNMENT SPECIFICATIONS AT CURB HEIGHT

FRONT WHEEL ALIGNMENT	ACCEPTABLE ALIGNMENT RANGE AT CURB HEIGHT	PREFERRED SETTING
CAMBER.....	:-0.6° to +0.6°	+0.0°
TOE— RIGHT/ LEFT.....	0.05°out to 0.15° in	0.05° in
TOTAL TOE..... Specified In Degrees (See Note)	0.1°out to 0.3°in	0.1° in
CASTER*.....	+2.3° to +4.3°	+3.3°
*Side To Side Caster Difference Not To Exceed.....	1.0° or less	0.0°
REAR WHEEL ALIGNMENT	ACCEPTABLE ALIGNMENT RANGE AT CURB HEIGHT	PREFERRED SETTING
CAMBER.....	:-0.6° to +0.2°	-0.2°
TOE— RIGHT/ LEFT.....	0.05° out to 0.15° in	0.05° in
TOTAL TOE..... Specified In Degrees (See Note) TOE OUT: When Backed On Alignment Rack Is TOE In When Driving	0.1° out to 0.3° in	0.1° in
THRUST ANGLE.....	+ or - 0.15°	0.0°
<p>Note: Total Toe is the arithmetic sum of the left and right wheel Toe settings. Positive is Toe-in, negative is Toe-out. Total Toe must be equally split between each front wheel to ensure the steering wheel is centered after setting Toe. Left and Right Toe must be equal to within 0.02 degrees.</p>		