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VEHICLE ALIGNMENT PROCEDURE FOR PULLING RIGHT OR LEFT

New diagnostic procedures have been developed to correct pulling to the left or right. This bulletin contains step by step procedures for correcting pulling problems including new information on:

- Alignment verification and tire rotation.
- New camber adjusting bolts.

NOTE: Vehicles which are out of wheel alignment specifications due to a collision or worn out parts, should be inspected for damaged and/or worn out parts before performing an alignment.

STEP 1

A. Check for tire wear and proper tire pressures (as shown below).

Cold tire inflation pressure:

Model	Tire Size		Inflation Pressure (PSI, kPa)	
Tercel	P145/80R13		32, 221	
	155SR13, 155SR13 AS, P155/80R13 AS		28, 196	
Corolla	2WD	155SR13	28, 200	
		P155/80R13, P175/70R13	29, 210	
		175/70R13 82S, 175/70SR13 185/60R14 82H	26, 180	
	4WD	165SR13	28, 200	
		185/70SR13, 185/70R13 85S	26, 180	
MR-2	195/60R14 85H, 205/60R14 87H, 195/60R14 85V, 205/60R14 87V		Front 29, 200	Rear 33, 225

B. Make sure front and rear brakes are not dragging.

VEHICLE ALIGNMENT PROCEDURES (CONT'D)

C. Check vehicle ride height (see chart below).

NOTE: Refer to the repair manual for measuring locations.

Model		Tire size		Front	Rear
Corolla	2WD	155SR13 P155/80R13	Coupe	183 mm (7.20 in)	238 mm (9.37 in)
			EX. Coupe	186 mm (7.32 in)	242 mm (9.53 in)
		175/70R132 82S 175/70SR13 P175/70R13	Coupe	184 mm (7.24 in)	239 mm (9.41 in)
			EX. Coupe	187 mm (7.36 in)	243 mm (9.57 in)
		185/60R14 82H		178 mm (7.01 in)	236 mm (9.29 in)
	4WD	All Models		211 mm (8.31 in)	242 mm (9.53 in)
Tercel	P145/80R13			184 mm (7.24 in)	249 mm (9.80 in)
	155SR, 155SR13 AS, P155/80R13 AS			191 mm (7.52 in)	256 mm (10.0 in)
MR-2	All Models			224 mm (8.82 in)	203 mm (7.99 in)

NOTE: If the vehicle's ride height is not within the specifications, try to level the vehicle by bouncing the body. If the correct ride height is still not obtained, check for bad springs or bent suspension components.

D. Test drive vehicle to verify that it does not pull left or right. If vehicle tracks straight, verify that the steering wheel is centered and return to customer. If vehicle still pulls, go to step 2.

STEP 2

A. Reposition the two front tires from right to left (see fig. 1).

B. Road test to verify that the pulling condition is corrected.

C. If the vehicle pulls in the same direction after repositioning the two front tires, follow procedure A.

D. If the vehicle pulls to the opposite direction after repositioning the two front tires, follow procedure B.

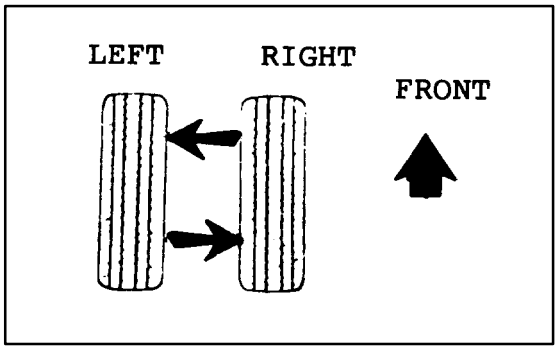


fig. 1

VEHICLE ALIGNMENT PROCEDURES (CONT'D)

PROCEDURE A

A. Perform four wheel alignment. (If camber is out of spec., go to step 3.)
B. Road test to verify that the pulling condition is corrected.

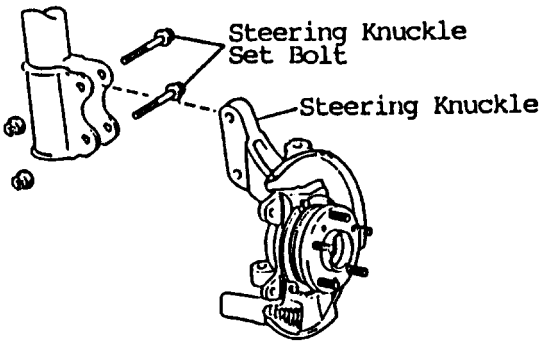
NOTE: If the pulling condition still exists, go to step 3

PROCEDURE B

A. Remove the left front tire, turn it inside out on the same wheel and rebalance.
B. Road test to verify that the pulling condition is corrected. (MR2 Only: If the vehicle still pulls, go to Step E).
C. If the vehicle pulls in the same direction, rotate right front tire and wheel assembly with the right rear. **Except MR-2**
D. If the vehicle pulls in the opposite direction, rotate the left front tire and wheel assembly with the left rear. **Except MR-2**
E. Perform four wheel alignment. (If camber is out of spec., go to step 3.)
F. Road test to verify that the pulling condition is corrected.

NOTE: If the pulling condition still exists, go to step 3

STEP 3



NEW CAMBER ADJUSTING BOLTS

To provide camber adjustment capability, the steering knuckle set bolts can be replaced with the new style camber adjusting bolts.

DESCRIPTION AND PART NO. INFORMATION

The camber adjustment bolt has a smaller shank diameter than the original steering knuckle set bolt. This creates a gap between the bolt hole in the steering knuckle and the set bolt. Camber adjustment is performed by reducing the gap on either the positive or the negative side of the hole in the knuckle assembly. If the alignment is within spec's and vehicle still pulls, change front camber settings by using new style camber adjustment bolts.

Diameter	Part No.	Adjustable value	Head mark	Remarks
13.9 mm (0.547 in.)	90105-15004	± 15′	Dot	The different camber adjusting bolts can be distinguished by the number of projecting dots on the bolt head.
13.3 mm (0.524 in.)	90105-15005	± 30′	Dot	
12.4 mm (0.488 in.)	90105-15006	± 45′	Dot	

VEHICLE ALIGNMENT PROCEDURES (CONT'D)

CAMBER ADJUSTMENT PROCEDURE WITH CAMBER ADJUSTING BOLT

A. Check and record front camber settings.

NOTE: Bounce the vehicle to stabilize the suspension before measuring the camber.

Determine whether the recorded camber setting is excessive or inadequate based on the chart below.

Model	Adjustment range			Cross camber
Corolla	2WD	4A–FE	–10' ± 45'	30' (1/2°) or less
		4A–GE	–15' ±45'	
	4WD	0 10' ± 30'		
Tercel	0 ± 45'			
MR-2	0 55' ± 30'			

NOTE: Cross camber represents the difference from side to side.

B. Eliminate the gap between the steering knuckle bolt hole and the bolt.

I. Jack up the vehicle and support the body at the point shown in fig. 2.

NOTE: If the support is placed under the lower control arm, the knuckle assembly cannot be moved to take up the gap between the bolt and the bolt hole.

II. Remove the front wheels.

III. Loosen the nuts and eliminate the gap of the steering knuckle set bolts, by pushing or pulling the lower side of the shock absorber in the direction which the camber adjustment is required (see fig. 3). Then torque the nuts, making sure not to move the bolts.

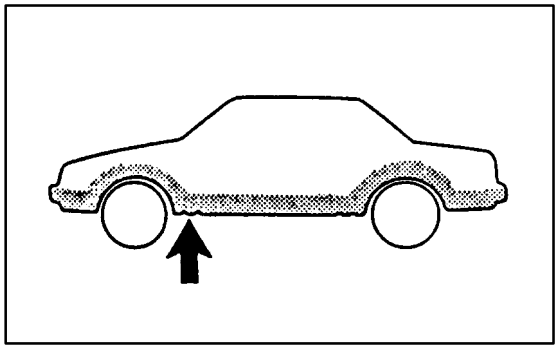


fig. 2

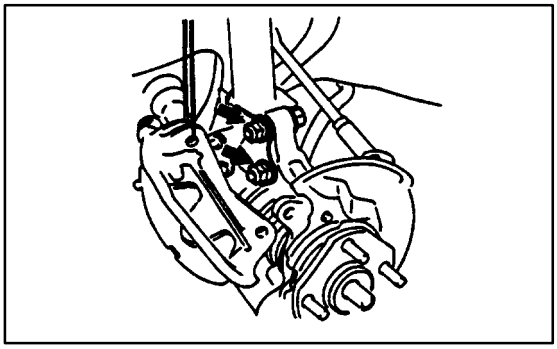


fig. 3

Torque:

Tercel	2,300 kg-cm (166 ft-lb, 226 N-m)
Corolla	2,800 kg-cm (203 ft-lb, 275 N-m)
MR-2	2,600 kg-cm (188 ft-lb, 255 N-m)

NOTE: The amount of camber change due to the gap between the original bolt and the hole in the knuckle can vary from 0.1 to 0.5'.

VEHICLE ALIGNMENT PROCEDURES (CONT'D)

IV. Install the front wheels and lower the vehicle.

V. Recheck the camber settings. If necessary, estimate how much additional camber adjustment the vehicle is going to require.

NOTE: Bounce the vehicle to stabilize the suspension before measuring the camber.

C. Select camber adjusting bolt(s).

Select camber adjusting bolt(s) according to the amount of additional adjustment needed (see chart below).

Camber adjusting bolt:

PART NO.	APPROXIMATE ADJUSTMENT VALUE
90105–15004	± 15'
90105–15005	± 30'
90105–15006	± 45'

NOTE: When making an adjustment of more than 45', replace the upper and lower steering knuckle set bolts with the adjusting bolts. The chart below shows the amount of camber change when using a combination of camber adjusting bolts.

ADJUSTING BOLT USED		APPROXIMATE ADJUSTMENT VALUE
upper side	lower side	
15'	45'	1.00'
30'	45'	1.15'
45'	45'	1.30'

D. Replace steering knuckle set bolt(s) with camber adjusting bolts.

I. Jack up the vehicle and support the body.

II. Remove the front wheels.

III. Replace the steering knuckle set bolt(s) one at a time with the selected adjusting bolt(s). Coat the threads of the bolts with oil.

VEHICLE ALIGNMENT PROCEDURES (CONT'D)

NOTE: When replacing only one set bolt, install the adjusting bolt in the bottom hole of the steering knuckle (see fig 4).

When replacing both upper and lower steering knuckle set bolts use the smaller diameter adjusting bolt in the bottom hole of the steering knuckle (see fig 5).

IV. Push or pull the lower side of the shock absorber in the direction in which the camber adjustment is required (see fig. 6). Then torque the nuts making sure not to move the bolts.

Torque:

Tercel 2,300 kg-cm (166 ft-lb, 226 N-m)

Corolla 2,800 kg-cm (203 ft-lb, 275 N-m)

MR-2 2,600 kg-cm (188 ft-lb, 255 N-m)

NOTE: If the tightening torque is insufficient, the steering knuckle may move and cause the camber angle to change.

V. Install the front wheels and lower the vehicle.

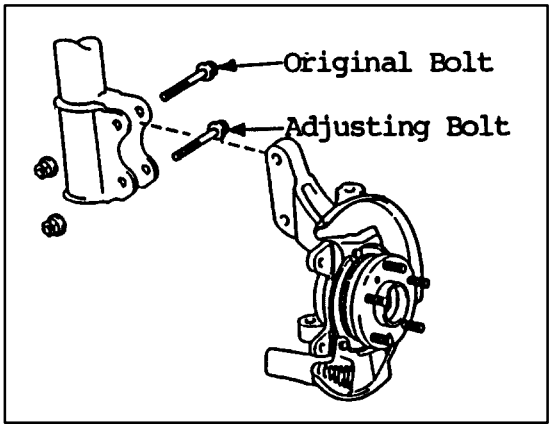


fig. 4

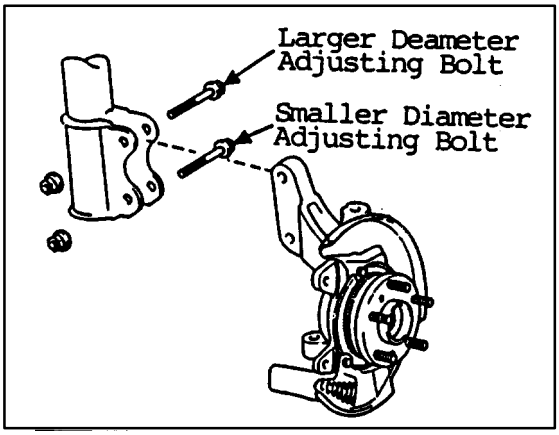


fig. 5

E. Adjust the toe-in.

I. Set the front wheels in the straight-ahead position.

II. Loosen the tie rod locking nuts.

III. Turn the left and right tie rod ends an equal amount to adjust toe-in.

COROLLA: 1±1 mm (0.04+/–0.04 in)

TERCEL: 0±1 mm (0+/–0.04 in)

MR-2: 1±1 mm (0.04+/–0.04 in)

IV. Torque tie rod locking nuts.

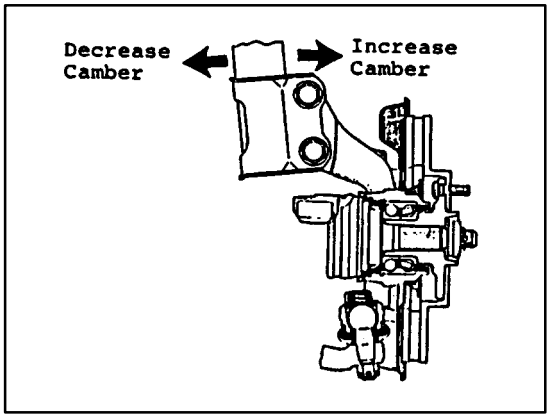


fig. 6

Torque: Corolla & MR-2 570 kg-cm (41 ft-lb, 56 N-m)

Tercel 480 kg-cm (35 ft-lb, 47 N-m)

VEHICLE ALIGNMENT PROCEDURES (CONT'D)

F. Recheck camber settings.

NOTE: Bounce the vehicle to stabilize the suspension before measuring the camber.

G. Inspect steering wheel position for off center.

CAUTION: Before removing the steering wheel on the MR-2, refer to the repair manual for the proper procedure and care that is to be taken when working with the SRS system.

I. If steering wheel off center is 6 degrees or more, first remove the steering wheel and reinstall it as close as possible to the center position. If steering wheel is off center less than 6 degrees, center the wheel by turning the left and right tie rod ends an equal amount in opposite directions.

NOTE: One turn of the tie rod will change the steering wheel angle **13.5 degrees.**

II. Road test to verify that the pulling condition is corrected before returning the vehicle to the owner.