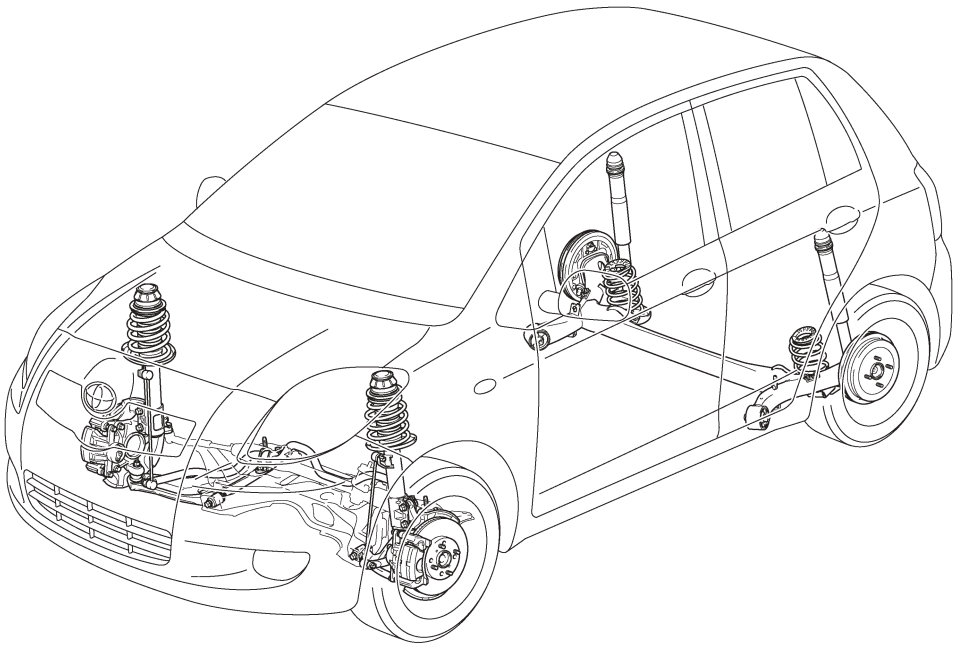
SUSPENSION AND AXLE

■ DESCRIPTION

1. General

- The MacPherson strut type is used for the front suspension and the torsion-beam type is used for the rear suspension.
- The characteristics and allocation of the components have been optimized to ensure excellent drivability, stability, and riding comfort.



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5-door Hatchback Model

▶ Specifications ◀

Destination			Europe		
Body Type			Hatchback		
Tire Size			165/70R14	175/65R14	185/60R15
Front Wheel Alignment*1	Tread	mm (in.)	1480 (58.3)	1480 (58.3), 1475 (58.1)*2	1470 (57.9) 1465 (57.7)*2
	Caster	degrees	4° 44’	4° 44’, 4° 25’*2	←
	Camber	degrees	−0° 08’	−0° 08’, 0° 08’*2	←
	Toe-in	mm (in.)	1.6 (0.063)	←	←
	King Pin Inclination	degrees	11° 14’	11° 14’, 10° 44’*2	←
Rear Wheel Alignment*1	Tread	mm (in.)	1470 (57.9)	←	1460 (57.5)
	Camber	degrees	−0° 56’	−0° 56’, −0° 54’*2	←
	Toe-in	mm (in.)	2.9 (0.114)	2.8 (0.110), 2.2 (0.087)*2	2.9 (0.110), 2.2 (0.087)*2

(Continued)

*1: Unloaded Vehicle Condition
*2: Models with Raised Vehicle Height

Destination			Australia			
Body Type			Hatchback		Sedan	
Tire Size			175/65R14	185/60R15	175/65R14	185/60R15
Front Wheel Alignment*1	Tread	mm (in.)	1480 (58.3)	1470 (57.9)	1480 (58.3)	1470 (57.9)
	Caster	degrees	4° 32’	←	4° 28’	←
	Camber	degrees	–0° 10’	←	–0° 09’	←
	Toe-in	mm (in.)	1.4 (0.055)	←	1.5 (0.059)	←
	King Pin Inclination	degrees	11° 18’	←	11° 15’	←
Rear Wheel Alignment*1	Tread	mm (in.)	1470 (57.9)	1460 (57.5)	1470 (57.9)	1460 (57.5)
	Camber	degrees	–0° 56’	←	–0° 55’	←
	Toe-in	mm (in.)	2.6 (0.102)	2.7 (0.106)	2.5 (0.098)	2.6 (0.102)

Destination			G.C.C. Countries			
Body Type			Hatchback		Sedan	
Tire Size			175/65R14	185/60R15	175/65R14	185/60R15
Front Wheel Alignment*1	Tread	mm (in.)	1480 (58.3)	1470 (57.9)	1480 (58.3)	1470 (57.9)
	Caster	degrees	4° 44’	←	4° 37’	←
	Camber	degrees	–0° 08’	←	←	←
	Toe-in	mm (in.)	1.6 (0.063)	←	←	←
	King Pin Inclination	degrees	11° 14’	←	←	←
Rear Wheel Alignment*1	Tread	mm (in.)	1470 (57.9)	1460 (57.5)	1470 (57.9)	1460 (57.5)
	Camber	degrees	–0° 56’	←	←	←
	Toe-in	mm (in.)	2.8 (0.110)	2.9 (0.114)	2.7 (0.106)	2.8 (0.110)

Destination			General Countries			
Body Type			Hatchback		Sedan	
Tire Size			175/65R14	185/60R15	175/65R14	185/60R15
Front Wheel Alignment*1	Tread	mm (in.)	1480 (58.3), 1475 (58.1)*2	1470 (57.9), 1465 (57.7)*2	1480 (58.3) 1474 (58.1)*2	1470 (57.9) 1465 (57.7)*2
	Caster	degrees	4° 44’, 4° 25’*2	←	4° 37’, 4° 21’*2	←
	Camber	degrees	–0° 08’, 0° 08’*2	←	←	←
	Toe-in	mm (in.)	1.6 (0.063)	←	←	←
	King Pin Inclination	degrees	11° 14’, 10° 44’*2	←	←	←
Rear Wheel Alignment*1	Tread	mm (in.)	1470 (57.9)	1460 (57.5)	1470 (57.9)	1460 (57.5)
	Camber	degrees	–0° 56’, –0° 54’*2	←	←	←
	Toe-in	mm (in.)	2.8 (0.110), 2.2 (0.087)*2	2.9 (0.114), 2.2 (0.087)*2	2.7 (0.106), 2.0 (0.079)*2	2.8 (0.110), 2.1 (0.082)*2

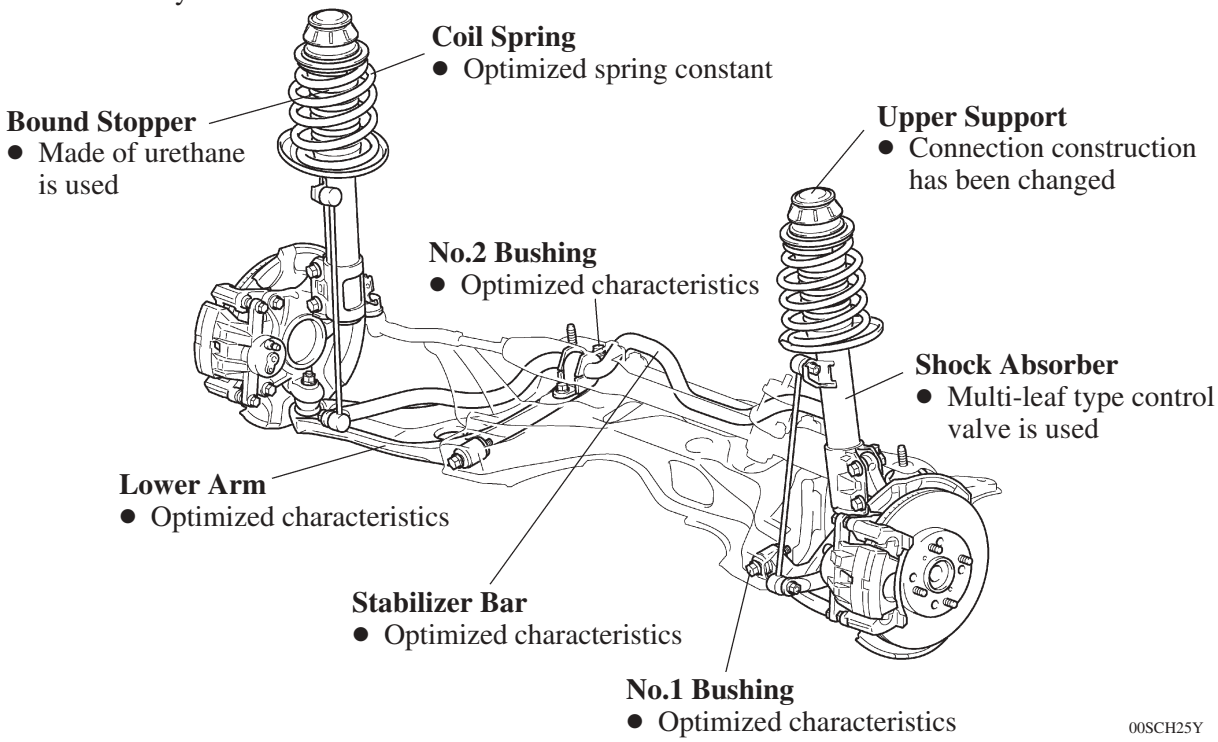
*1: Unloaded Vehicle Condition (Continued)
*2: Models with Raised Vehicle Height

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2. Front Suspension

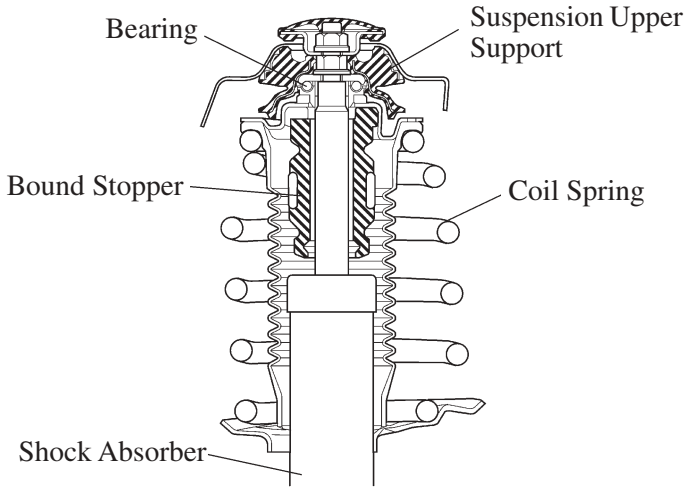
General

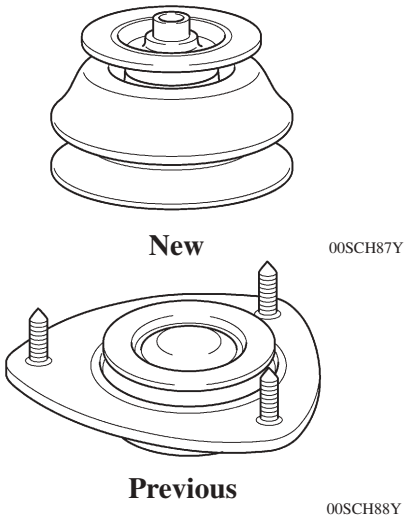
Through the optimal allocation of components, the front suspension realizes excellent riding comfort and controllability.



Suspension Upper Support and Coil Spring

- The suspension upper support has been changed from the construction that the support is connected with the body in three points on the previous models to that it is connected in one point. As a result, a compact and lightweight construction is realized.
- A pigtail type of coil spring is used where the top and bottom diameter are different, creating a compact and lightweight construction. Lateral force reduction springs are used to control the reaction force line of the coil spring, and reduce the bending force applied to the shock absorber. This reduces suspension friction, realizing a very comfortable ride.



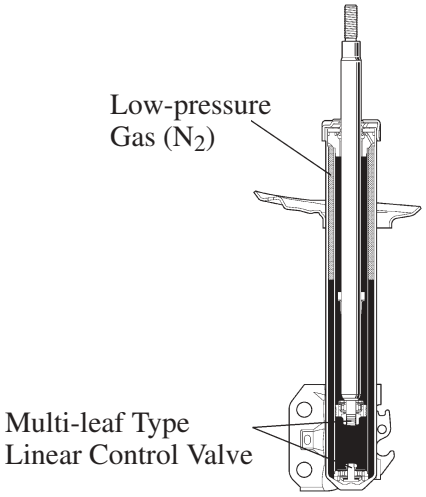


Shock Absorber

1) General

The two functions listed below are used for the shock absorber to realize both driving stability and riding comfort.

- A low-pressure (N_2) gas sealed type construction is used to suppress cavitation.
- A multi-leaf type linear control valve is used to attain linear damping force characteristics.

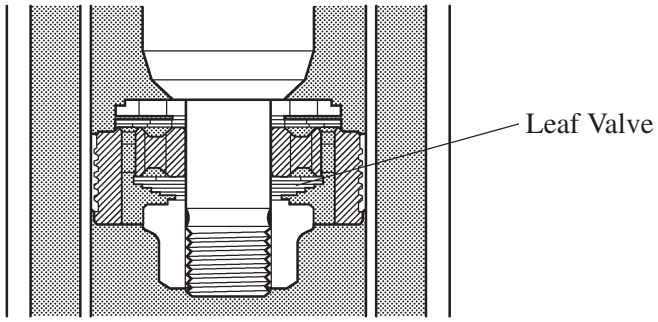


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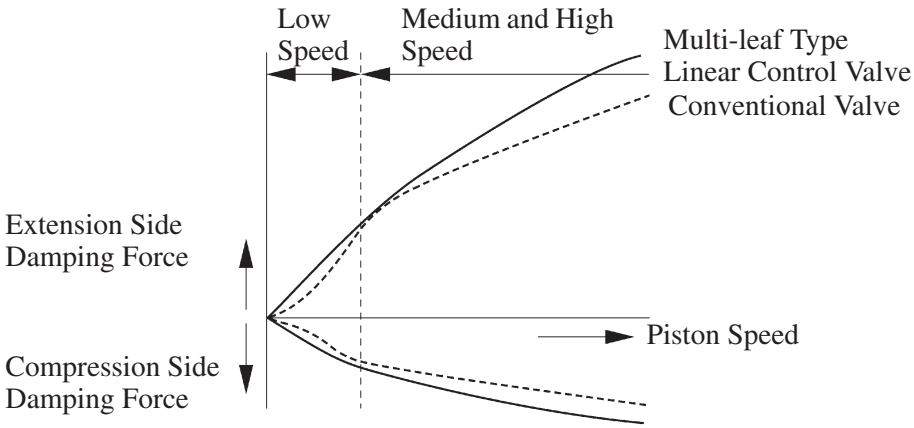
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2) Construction of Multi-leaf Type Linear Control Valve

The multi-leaf type linear control valve has a structure of several layered leaf valves with different diameter. With the adoption of the multi-leaf type linear control valve, the changes in the damping force are made constant at low piston speeds, thus realizing the excellent riding comfort and controllability.



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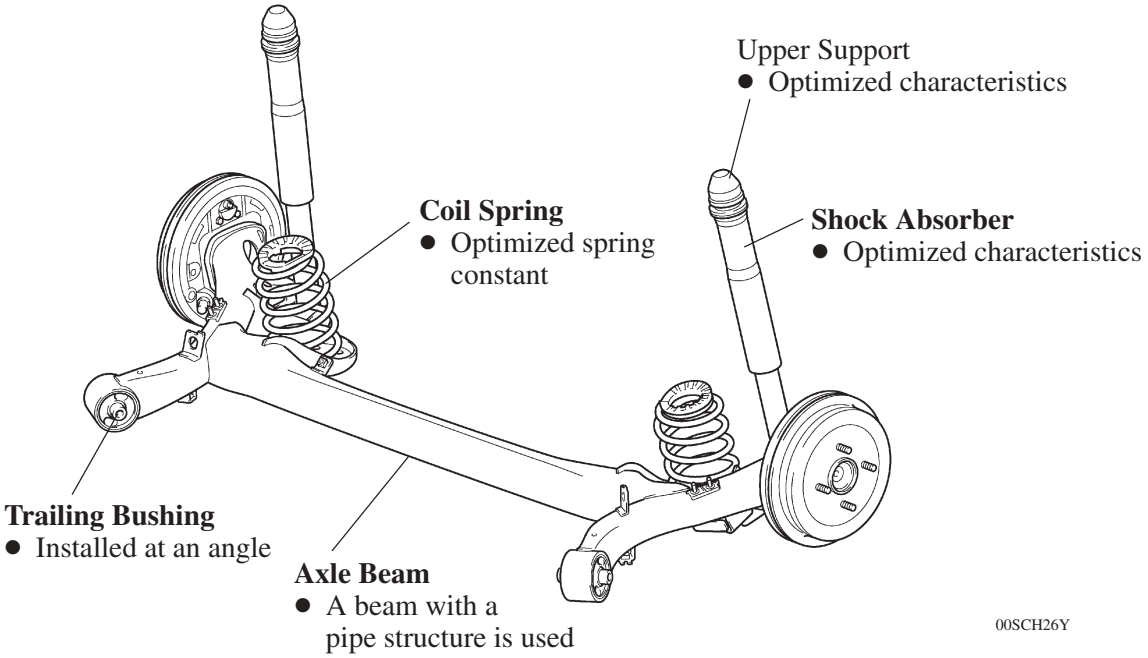
Damping Force Characteristics

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3. Rear Suspension

General

Through the optimal allocation of components, the rear suspension realizes excellent stability and controllability.



Service Tip

Be sure to use the jack-up points that are provided on the body when raising the vehicle on the jack. Never apply a jack under the torsion beam, spring seat, trailing arm, or bushing of the rear suspension.

Toe and Camber Change

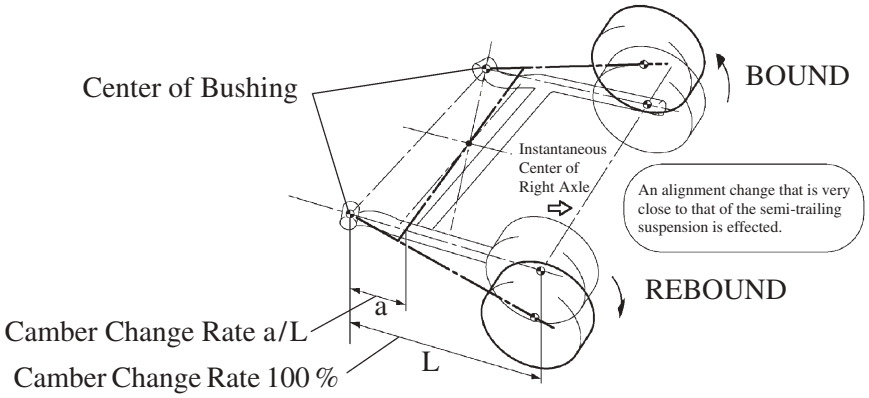
In a torsion-beam type suspension, the camber angle and the toe change differ between the bouncing case and the tramping case, offering both straight-line stability and excellent cornering stability.

1) Bouncing Case

Similar to the full-trailing arm type suspension, the axis that joins the center of the right and left trailing arm bushings is the center of the movement.

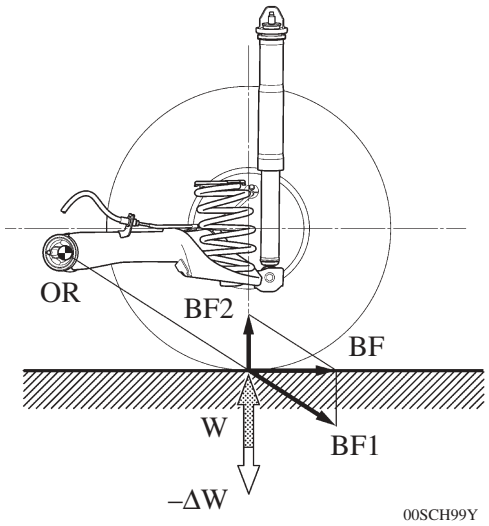
2) Tramping Case

During tramping case, or if a difference in suspension travel is created between the right and left wheels, the torsion beam twists with its shearing center as the center of its rotation.
Also, camber changes in relation to the suspension travel are determined by the ratio of the distance between the No.1 trailing arm bushing, the axle center and the shearing center ('a' in the figure below) and distance between the No.1 trailing arm bushing and the axle beam ('L' in the figure below).
Consequently, through the optimal allocation of the axle beam, the changes in the camber angle in relation to the suspension travel have been optimized, thus ensuring excellent cornering performance.



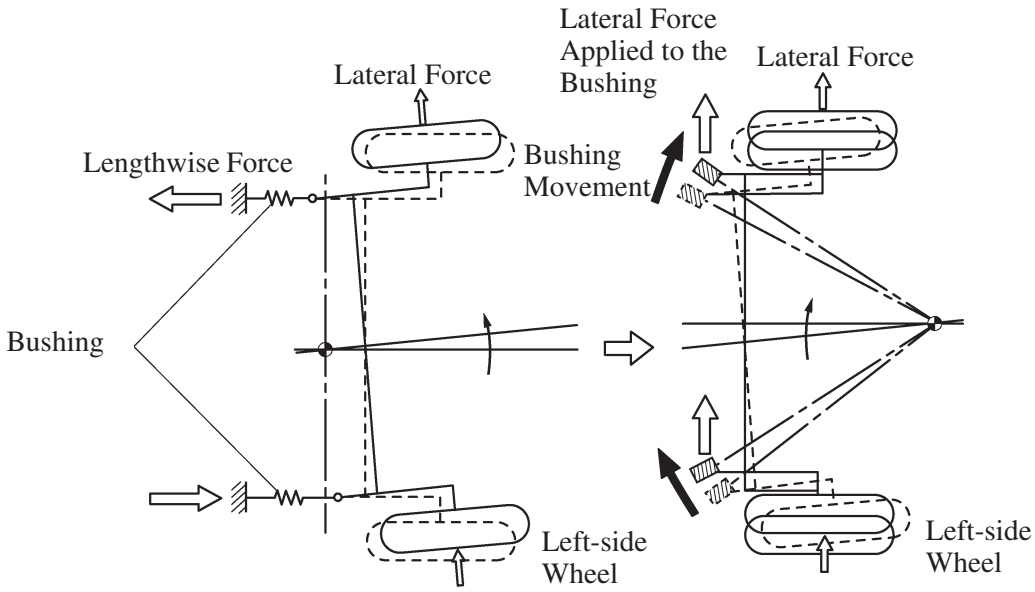
Anti-lift Geometry

The lifting of the rear end of the vehicle during braking occurs due to the shifting of the center of gravity caused by inertia.
The intersecting point (OR) supports the braking force (BF), and generates a force (BF1) in the direction of the intersecting point and a component force (BF2) in the direction of the ground contact.
The force (BF1) can change the height of the intersecting point (OR). When OR is set high, it acts in the opposite direction (–W) of the load fluctuation (W) in order to restrain the lift.



Toe-correct Function

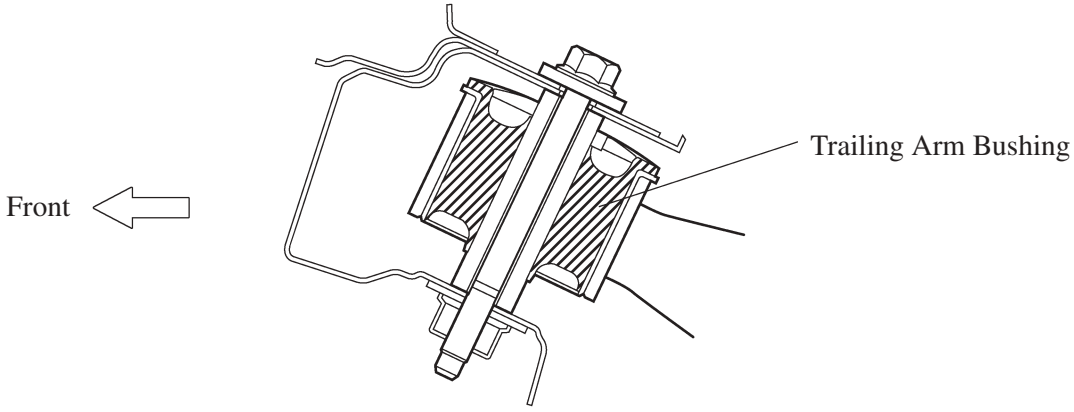
The longitudinal and lateral forces that are created in the vehicle during cornering cause the bushings in the trailing arms to deform.
On a right turn, the right trailing arm moves forward and the left trailing arms moves rearward, creating a tendency for the left wheel to toe out.
In this situation, the bushings that are installed in the trailing arms are designed to utilize the lateral force, which is applied to the bushings during cornering, to correct the left trailing arm towards the toe-in direction.



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Axle Beam and Trailing Arm

The axle beam realizes not only high rigidity but also stability by optimized shearing center position. The axle beam is welded to both trailing arm and spring seat. The trailing arm is fixed on the body via an angled bush.



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Trailing Arm Bushing Cross Section