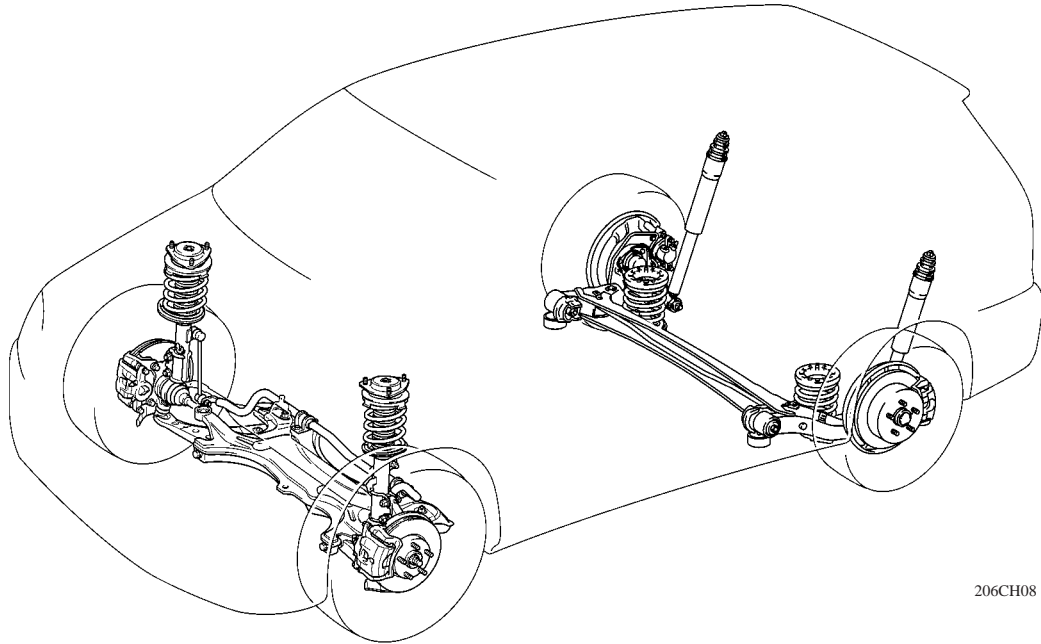


SUSPENSION AND AXLE

■ SUSPENSION

1. General

The table below lists the specifications for the suspension.



206CH08

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► Specifications ◀

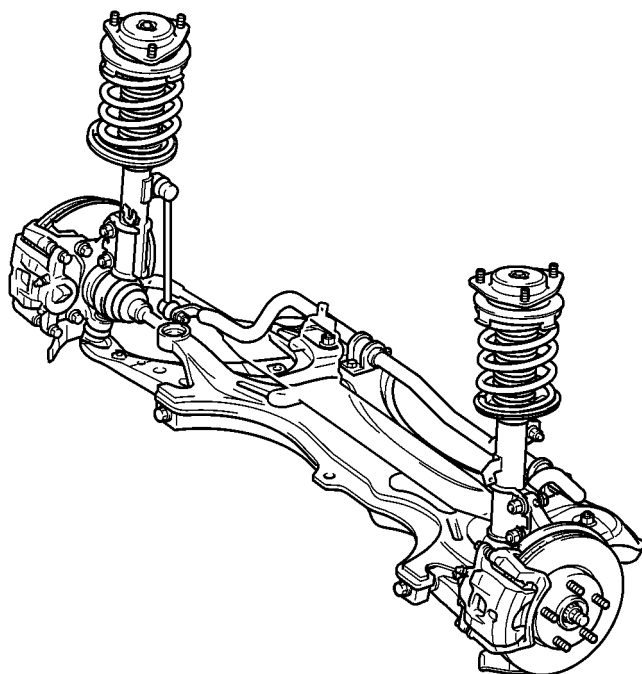
Front Suspension	Type		MacPherson Strut
	Stabilizer Bar		STD
	Tread* ¹	mm (in.)	1505 (59.3)
	Caster* ¹	degrees	3°03'
	Camber* ¹	degrees	-0°04'
	Toe-In* ¹	mm (in.)	1 (0.04)
	King Pin Inclination* ¹	degrees	10°09'
Rear Suspension	Type		Torsion-Beam
	Stabilizer Bar		STD
	Tread* ¹	mm (in.)	1498 (58.98)
	Camber* ¹	degrees	-1°17'
	Toe-In* ¹	mm (in.)	2.3 (0.09)

*¹: Unloaded Vehicle Condition

2. Front Suspension

General

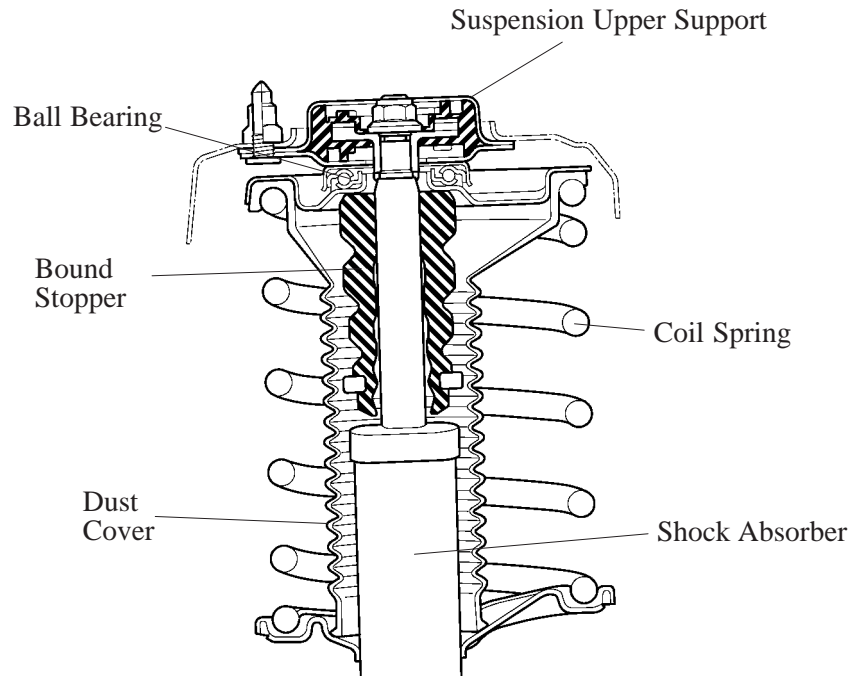
- A MacPherson strut type independent suspension with an L-shaped lower arm, which also provides the function of a strut bar, has been adopted.
- Through the optimal allocation of components, and the adoption of the anti-dive geometry, the front suspension realizes excellent riding comfort, stability, and controllability.
- Low-pressure (N₂) gas sealed shock absorbers with a linear control valve have been adopted.



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Suspension Upper Support and Coil Spring

- The suspension upper support transmits the load that is applied via the spring through its metal structure, while the rubber portion receives only the load that is applied through the shock absorber.
- The center axis of the coil spring is slanted toward the outside of the vehicle compared to the center axis of the shock absorber. This reduces the lateral force bearing on the shock absorber piston rod and piston, and prevents increased sliding resistance while helping to maintain riding comfort.
- The dust cover is designed to completely cover the piston rod to reduce the intrusion of dust and thus realizing excellent durability of the shock absorber.

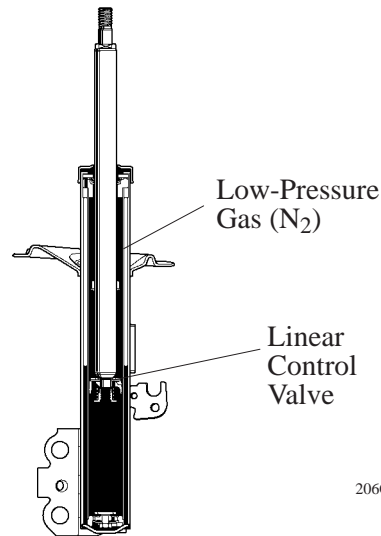


Shock Absorber

1) General

The shock absorber has adopted the two functions listed below to realize both driving stability and ride comfort.

- A low-pressure (N_2) gas sealed type construction has been adopted to suppress the generation of cavitation.
- A linear control valve has been adopted to linearize the damping force characteristics



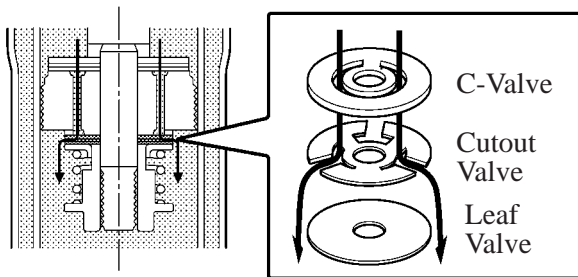
206CH12

Service Tip

To prevent hazardous conditions, make sure to empty the gas from the shock absorber before discarding a low-pressure (N_2) gas sealed shock absorber. For details, refer to the Avensis Verso/Picnic Chassis & Body Repair Manual (Pub. No. RM864E).

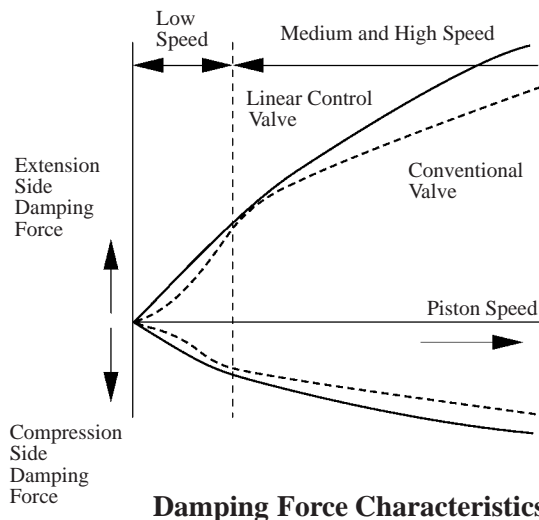
2) Linear Control Valve

The linear control valve consists of a C-valve, a cutout valve, and a leaf valve. These valves have adopted a laminate construction and form orifices. When the vehicle is rolling due to a steering operation, the piston in the shock absorber is in the low-speed state. At that time, the oil flows through the cutouts of the valves to achieve a linear damping force. Through the adoption of the linear control valve, the changes in the damping force are made constant at low piston speed, thus making the vehicle behave more smoothly in relation to the steering operation.



Low Speeds

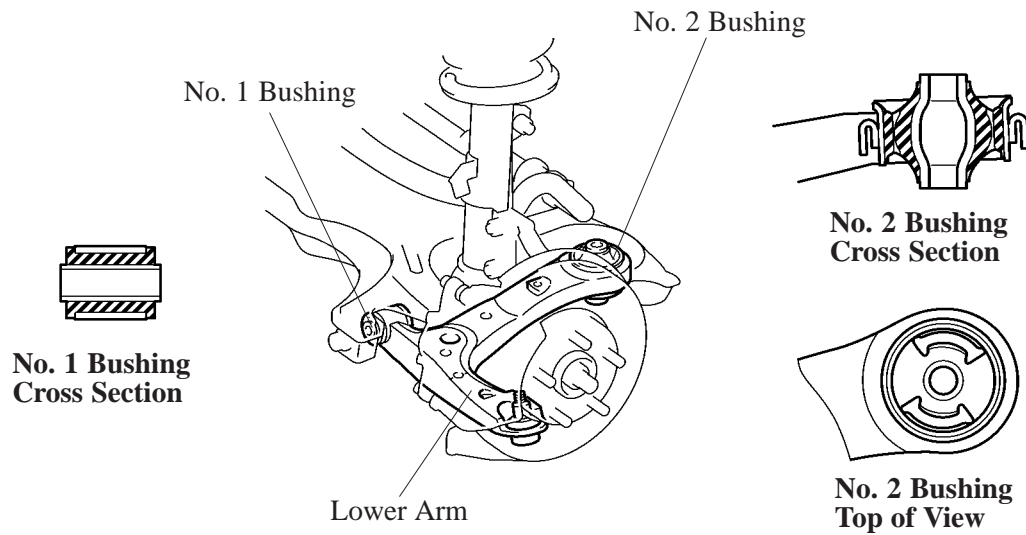
206CH29



199CH110

Lower Arm

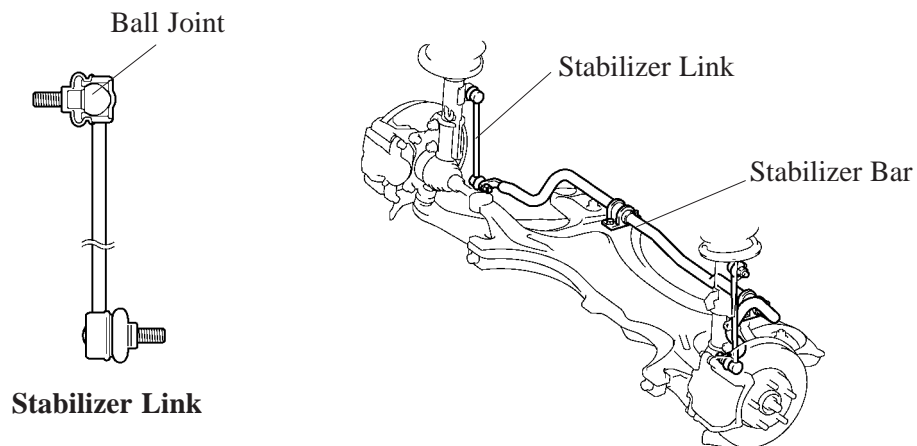
- An L-shaped stamped sheet steel lower arm has been adopted.
- Rubber bushings have been adopted, and the mounting position and the construction of the lower arm have been optimized to improve the steering feel.



206CH13

Stabilizer Bar

A ball-joint type stabilizer link has been adopted. Also, by mounting the stabilizer link to the shock absorber, the stabilizing efficiency has been improved while realizing both steering stability and riding comfort.

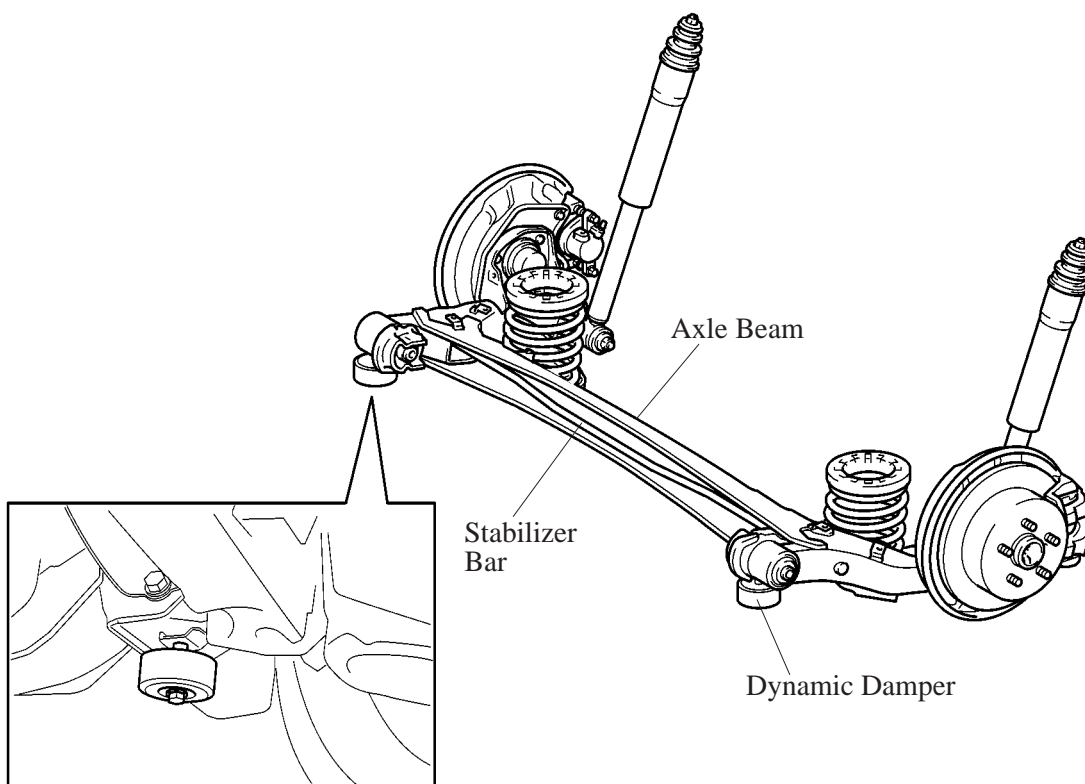


206CH14

3. Rear Suspension

General

- A torsion beam type suspension has been adopted, in which an axle beam is located in the middle of the trailing arm.
- The coil spring and the shock absorber are positioned separately. In addition, the coil spring is offset from the trailing arm to locate it lower. As a result, a lower floor and a flatter interior have been realized.
- The stabilizer bar has been adopted to realize excellent drivability and stability.
- Through the optimal allocation of components, the optimized changes in toe and camber during bound and rebound, and the adoption of the anti-lift geometry, excellent stability and controllability have been realized.
- A toe-correct function has been adopted in the suspension bushing to realize riding comfort, stability, and controllability.
- A dynamic damper has been adopted under the axle beam bushing to reduce road noise.



206CH15

NOTICE

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

Service Tip

To prevent the dynamic damper from coming in contact with the body, remove the dynamic damper before removing and reinstalling the coil spring. For details, see the Avensis Verso/Picnic Chassis & Body Repair Manual (Pub. No. RM864E).

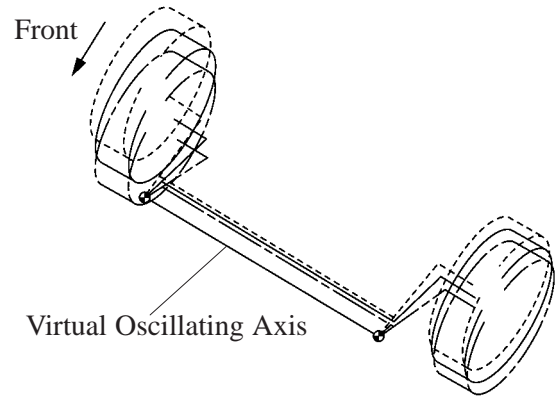
Toe and Camber Change

This suspension is characterized by the difference in the tire locus behavior, which varies according to whether the right and left wheels undergo the same-direction stroke or an opposite-direction stroke. As a result, this suspension realizes excellent stability both during straightline and cornering operation:

1) Same Direction Stroke (Straightline)

The right and left trailing arms move in the same direction, with the axis on the line which links the bushings at the right and left trailing arm mounting points.

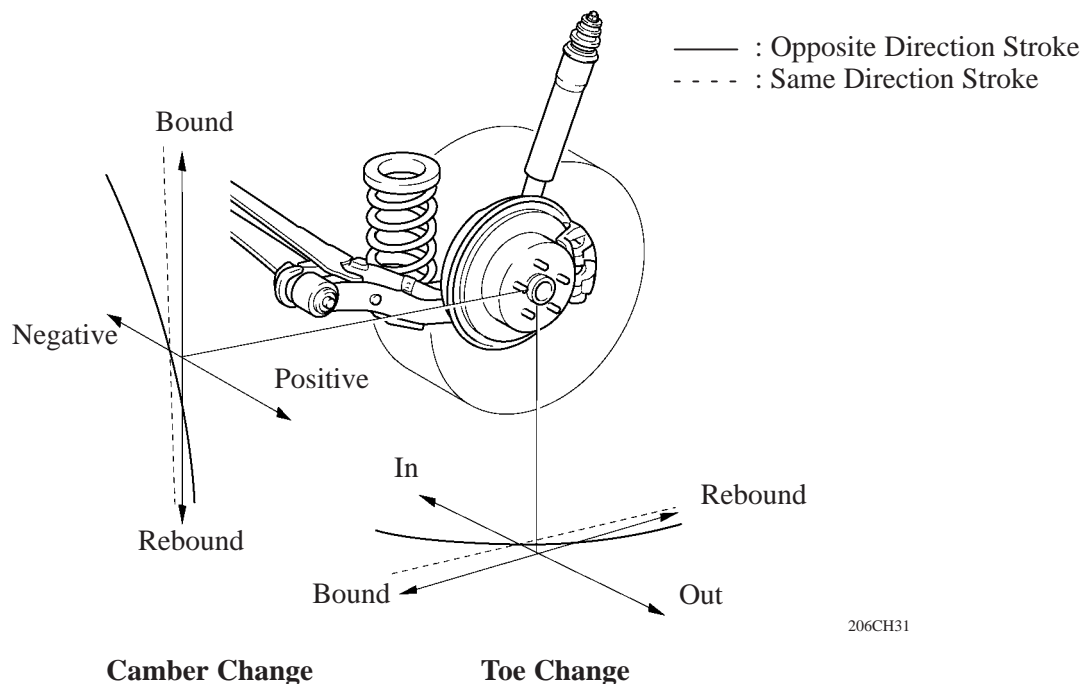
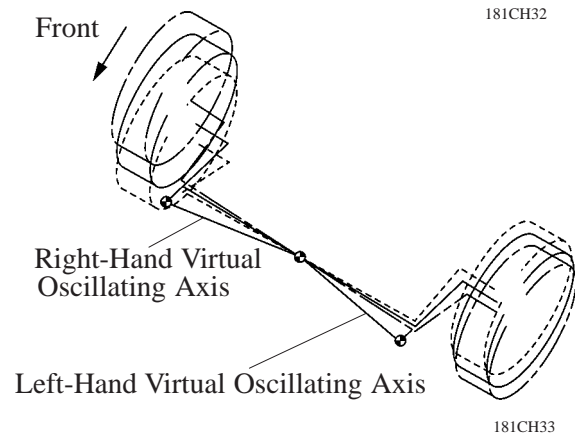
The toe and camber changes that are associated with the same-direction stroke (during straightline driving) are practically constant during bounds and rebounds, which help realize excellent straightline stability.



2) Opposite Direction Stroke (Cornering)

The right and left trailing arms move in opposite directions, with the center being the line which links the bushings (at the right and left trailing arm mounting points) to the shear center in the middle of the axle beam.

When the vehicle undergoes an opposite direction stroke (during cornering), this suspension allows a greater range in the toe and camber changes occurring in the outer (bound) wheel of the turn, which are caused by the vehicle's postural changes. As a result, excellent maneuverability has been realized.



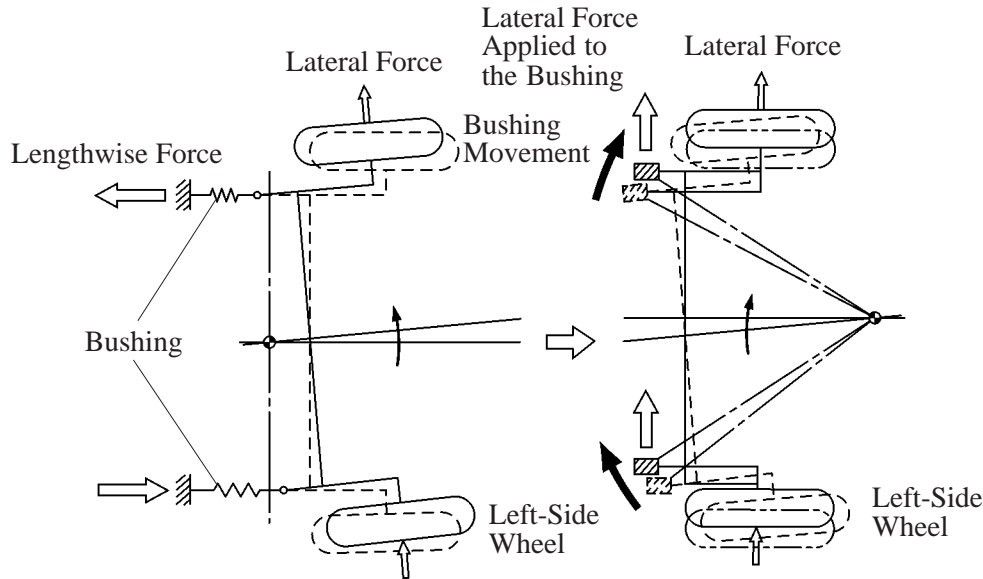
Toe-Correct Function

The longitudinal and lateral forces that are created in the vehicle during cornering causes the bushings in the trailing arms to become deformed.

On a right turn, the right trailing arm moves forward and the left trailing arm 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.

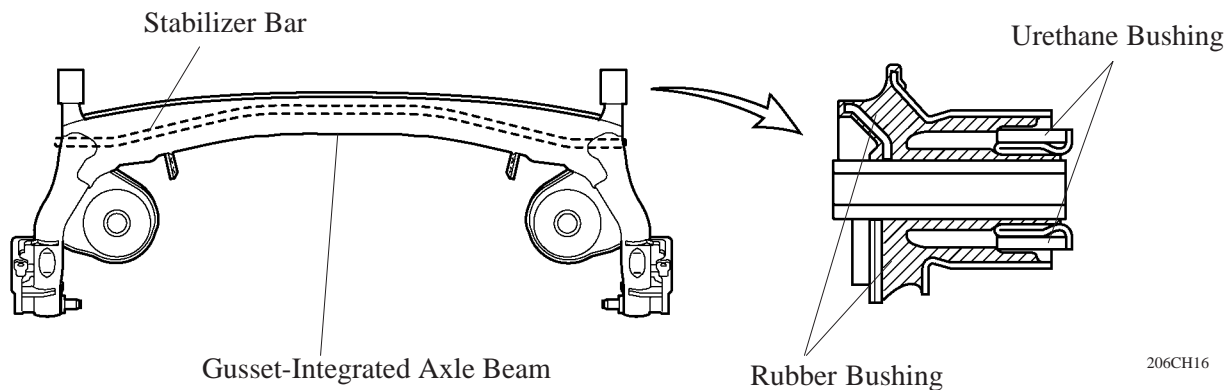
As a result, excellent stability and controllability are realized.



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Trailing Arm and Axle Beam

A gusset-integrated axle beam has been adopted, and bushings in which rubber and urethane are combined have been adopted. In addition, the rolling rigidity has been optimized through the adoption of the stabilizer bar.



206CH16