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## GROUP 33

# FRONT SUSPENSION

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## GENERAL INFORMATION

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The MacPherson strut type independent suspension has been adopted for the front suspension. At the same time, the crossmember has been flattened to increase the suspension rigidity as well as widening the tread and optimising the roll centre for improved steering stability and driving stability.

### TARGETS AND FEATURES OF THE MAIN TECHNOLOGIES

The new suspension has been given the following features.

#### High Steering Stability

- Individual geometries such as tread expansion, linearisation of toe change are optimised for improvement of driving stability and ride feeling.

#### Weight reduction

- Various sections of the suspension have been streamlined for weight reduction.

#### Flattened Crossmember

- We have increased the rigidity of the suspension even reducing its weight.
- A crossmember brace has been added to the lower arm assembly mount sections to reduce vibrations and road noise.

#### Review of the anti-nosedive geometry

- Nosedive movement at braking is damped to secure stability.

#### Review of the roll centre

- The roll centre height has been optimised for improved adhesion, a roll feel, and linearity.

#### Increased rebound stroke

- The roadholding quality of the suspension has been improved by securing good adhesion even on bumpy, rough roads. Even shocks received when the vehicle negotiates bumps have been reduced.

#### Lower Arm Assembly

- Mounting bolts of larger sizes are used for improved reliability.
- The shape of the rear lower arm bushings has been improved so that they softly absorb large shocks caused by road surfaces but resist cornering force utilizing its hard directional spring characteristic, thereby achieving both good steering and riding comfort.
- The friction torque of the ball joints has been lowered for an improved steering feel and riding comfort.

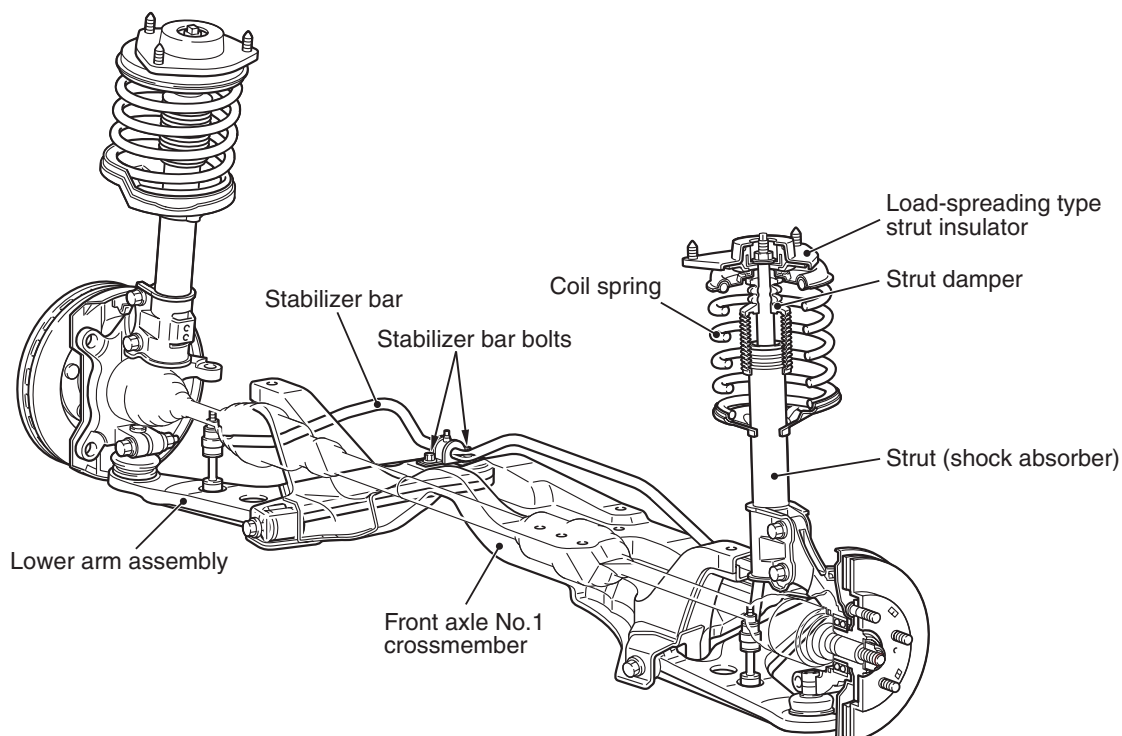
#### Strut

- Input separation type strut insulators are installed to lower road noise transmission.
- The valve structures were overhauled, and a low friction and smooth damping characteristic has been achieved for improved steering stability and riding comfort at a high level.

#### Stabilizer Bar

- Two mounting bolts are used to prevent the noise caused by lateral displacements.

## CONSTRUCTION DIAGRAM



AC304022 AD

## SPECIFICATIONS SUSPENSION SYSTEM

Item	Specification
Suspension method	MacPherson strut with coil spring

## WHEEL ALIGNMENT

Item		ES	VR-X
Camber		0° 00'	-0° 05'
Caster		2° 35'	2° 45'
Kingpin inclination		12° 40'	12° 55'
Toe-in	At the centre of tyre tread mm	1	1
	Toe-angle (per wheel)	0° 03'	0° 03'

## COIL SPRING

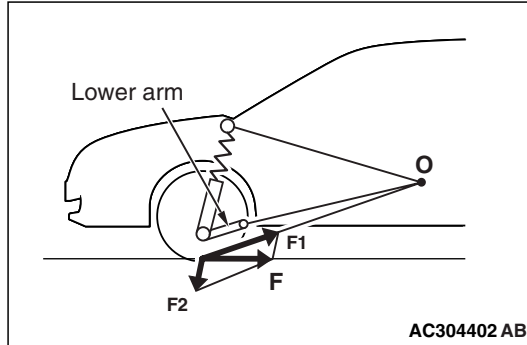
Item	ES	VR-X
Wire diameter mm	13 <M/T> 14 <A/T>	14
Average diameter mm	155 -160	155 -160
Free length mm	354 <M/T> 363 <A/T>	321

## ANTI-NOSE-DIVE GEOMETRY

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To damp the nosedive movement at braking, the anti-nosedive geometry has been improved.

### OPERATION



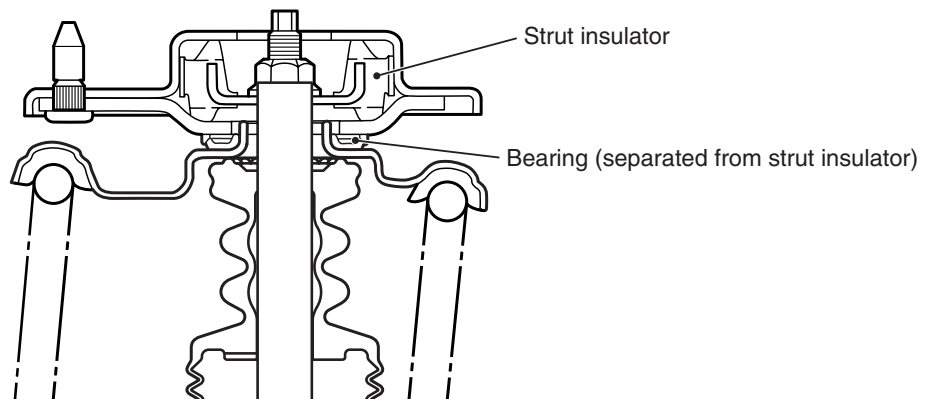
- O: Force in the forward direction
- F: Braking force
- F1: Component of braking force (in the forward direction)
- F2: Component of braking force (in the direction of strut movement)

Braking force (F) is divided into component force (F1) in the forward direction and that (F2) in the direction of strut movement. Component force (F2), working in the direction of strut movement, damps nosedive movement.

## STRUT ASSEMBLY

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### STRUT INSULATOR

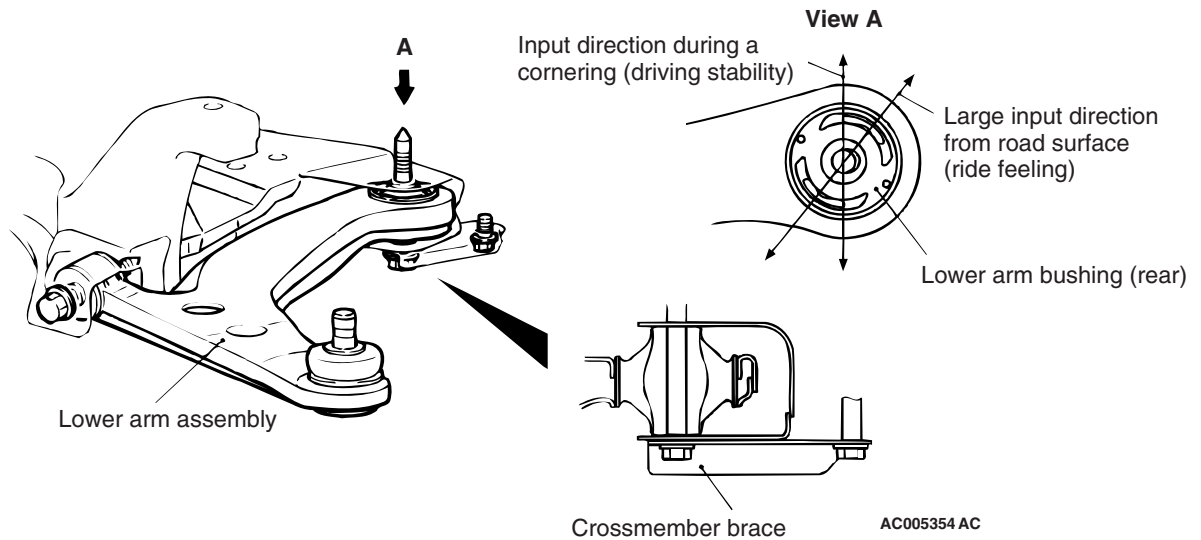


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The load-spreading type of strut insulator has been adopted to reduce road noise. This insulator has a structure to transfer coil spring input through bearing to strut mounting section, and transfer shock absorber load through strut insulator to strut mounting section.

## LOWER ARM ASSEMBLY

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Enlarging the size of mounting bolts at the front and rear sides of crossmember mounting section on lower arm assembly has increased reliability. In addition, lower arm bushing with soft spring characteristic at the rear side for the large input direction from road surface and with hard spring characteristics for the

input direction during a cornering is used to achieve both driving stability and ride feeling. Lowered ball joint friction torque has been established to enhance driving stability and ride feeling. Crossmember brace installed at lower arm mounting section on crossmember has reduced road noise.