

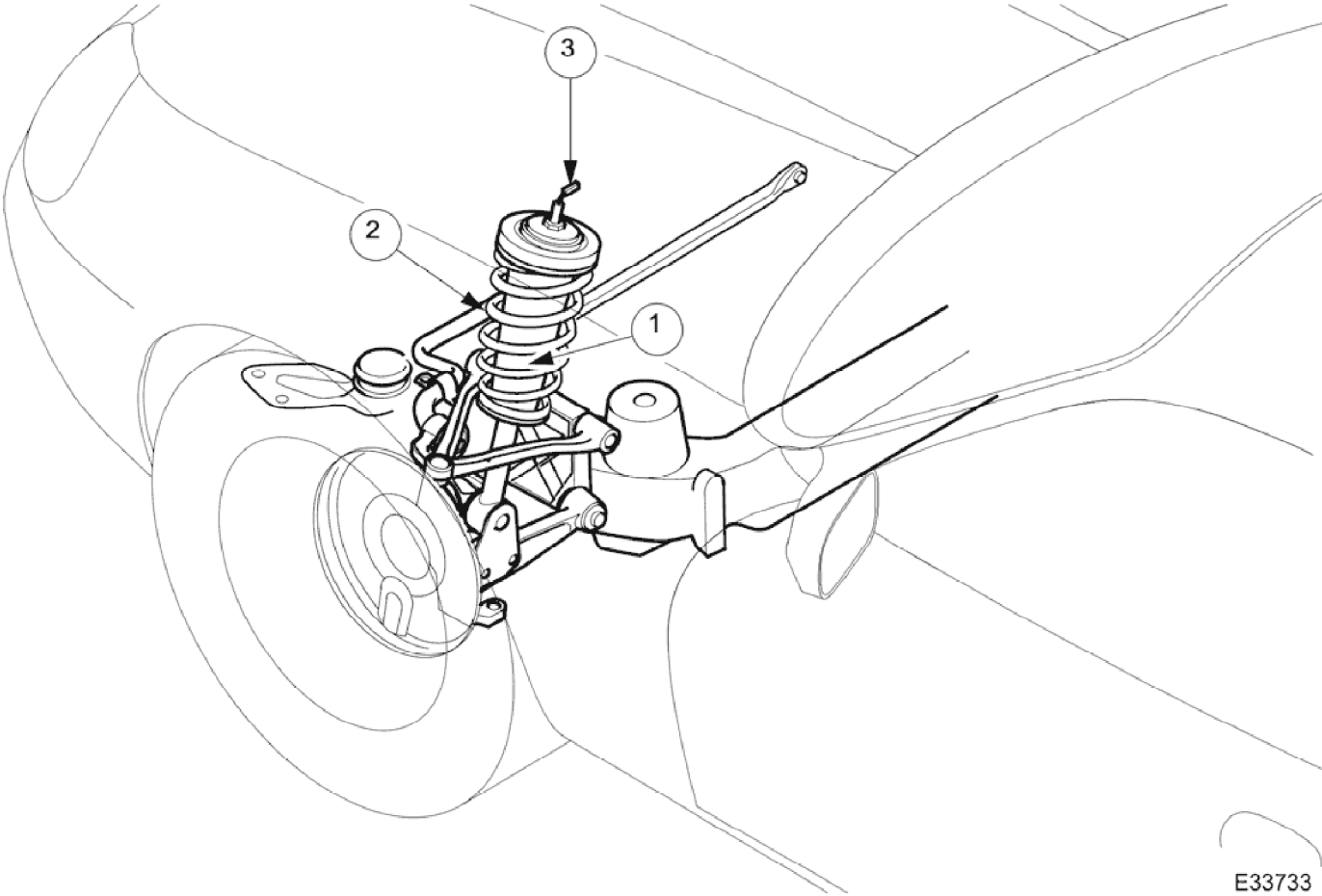
Vehicle Dynamic Suspension

Damping System

Description

Movement of each road spring is independently damped by a telescopic, hydraulically-controlled shock absorber. Each shock absorber is installed coaxially within the road spring. Front springs are located between spring seats on the shock absorber body and rod, rear springs are located between seats on the shock absorber and the lower wishbone.

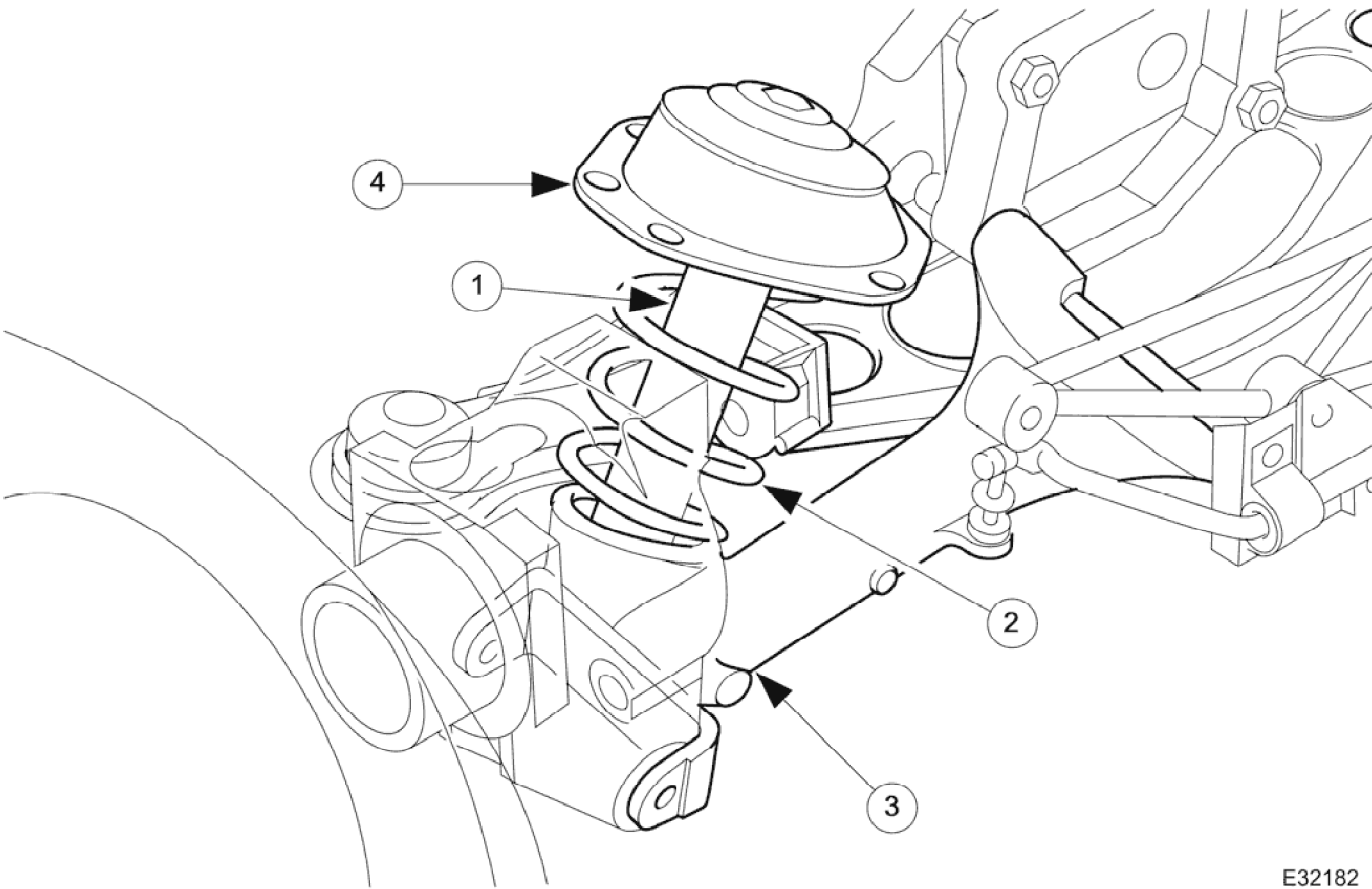
Front Shock Absorber Arrangement



E33733

Item	Description
1	Shock Absorber
2	Road Spring
3	Adaptive Damper Harness Connector

Rear Shock Absorber Arrangement



E32182

Item	Description
1	Shock Absorber
2	Road Spring
3	Lower Wishbone
4	Spring Upper seat

Operation

As a shock absorber rod rises and falls in unison with road spring movement, that movement is damped by controlling the flow of fluid from one end of a chamber to the other within each shock absorber. Any increase in the restriction of fluid flow within a shock absorber results in a corresponding increase in damping action and a firmer ride.

Adaptive Damping System

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Description

The Adaptive Damping System available as an option, matches damping effect with vehicle driving forces, to provide optimum ride and handling performance.

The system which is completely automatic and requires no driver input, comprises the following components:

- Four adaptive damping units installed in the normal shock absorber positions. These are identified by a harness connector incorporated in the top of each unit.
- An adaptive damping control module (ADCM) installed in the trunk adjacent to the battery.
- Two vertical movement sensors (accelerometers), one installed on the bulkhead below the air conditioning unit, the other in the trunk below the fuel tank.
- A lateral movement sensor (accelerometer) installed within the RH side false bulkhead.

Operation

The four adaptive damping units are simultaneously switched to either firm or soft setting to suit circumstances. When the vehicle is stationary, the system adopts the firm setting to minimize vehicle pitch during initial acceleration. From 8km/h (5mph) upwards, the system reverts to the soft setting until otherwise switched by the ADCM.

On detecting cornering forces, the lateral sensor transmits signals to the ADCM, which in turn switches the damping units to the firm setting, reducing vehicle roll-rate and improving wheel control.

On detection of a bump or depression in the road, the vertical sensors transmit signals to the ADCM, which in turn switches the damping units to the firm setting to minimize vehicle body movement.

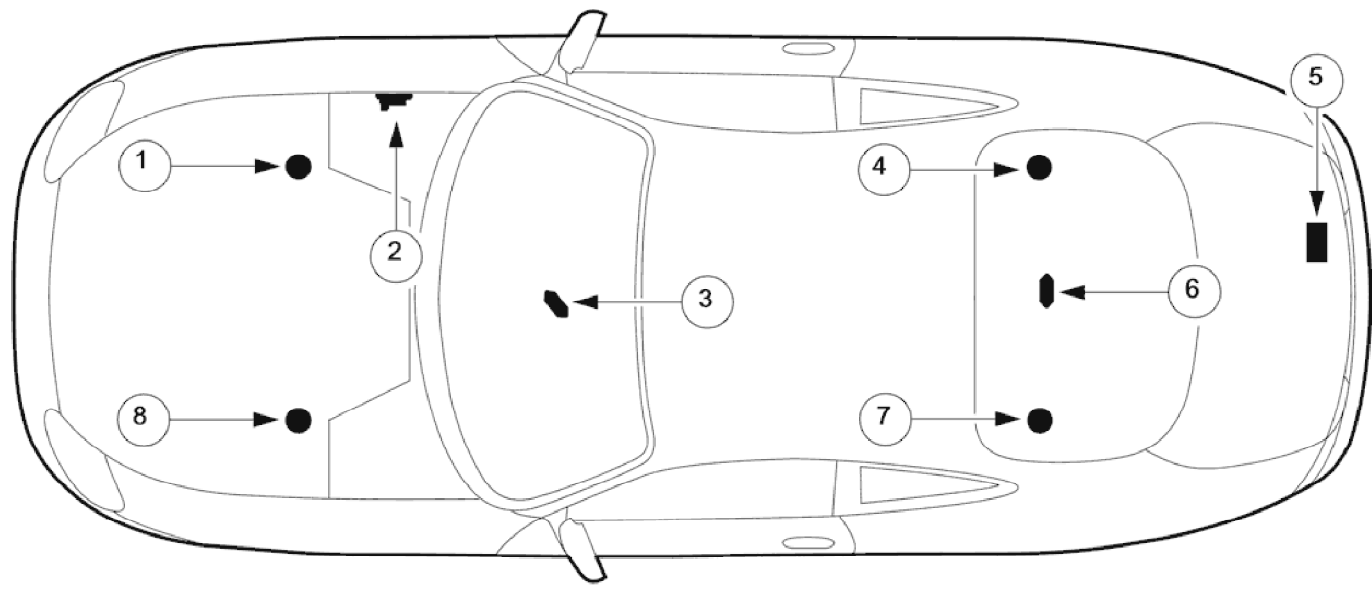
Under braking conditions, the ADCM, on receipt of a signal, commences calculation of vehicle deceleration. When deceleration exceeds a pre-determined threshold, the ADCM switches the damping units to the firm setting, reducing vehicle pitch rate and improving wheel control.

Following completion of a cornering manoeuvre, negotiation of road surface undulations, or heavy braking, that has necessitated switching to the firm setting, the ADCM always returns the damping units to the soft setting.

In the event of failure of the Adaptive Damping System, the damping units automatically revert to the Firm setting, ensuring that the vehicle remains safe to drive under all circumstances. The driver will be alerted to such a failure by illumination of a 'SUSPENSION FAULT' warning on the fascia message center and the amber warning light in the instrument cluster.

Adaptive Damping Components

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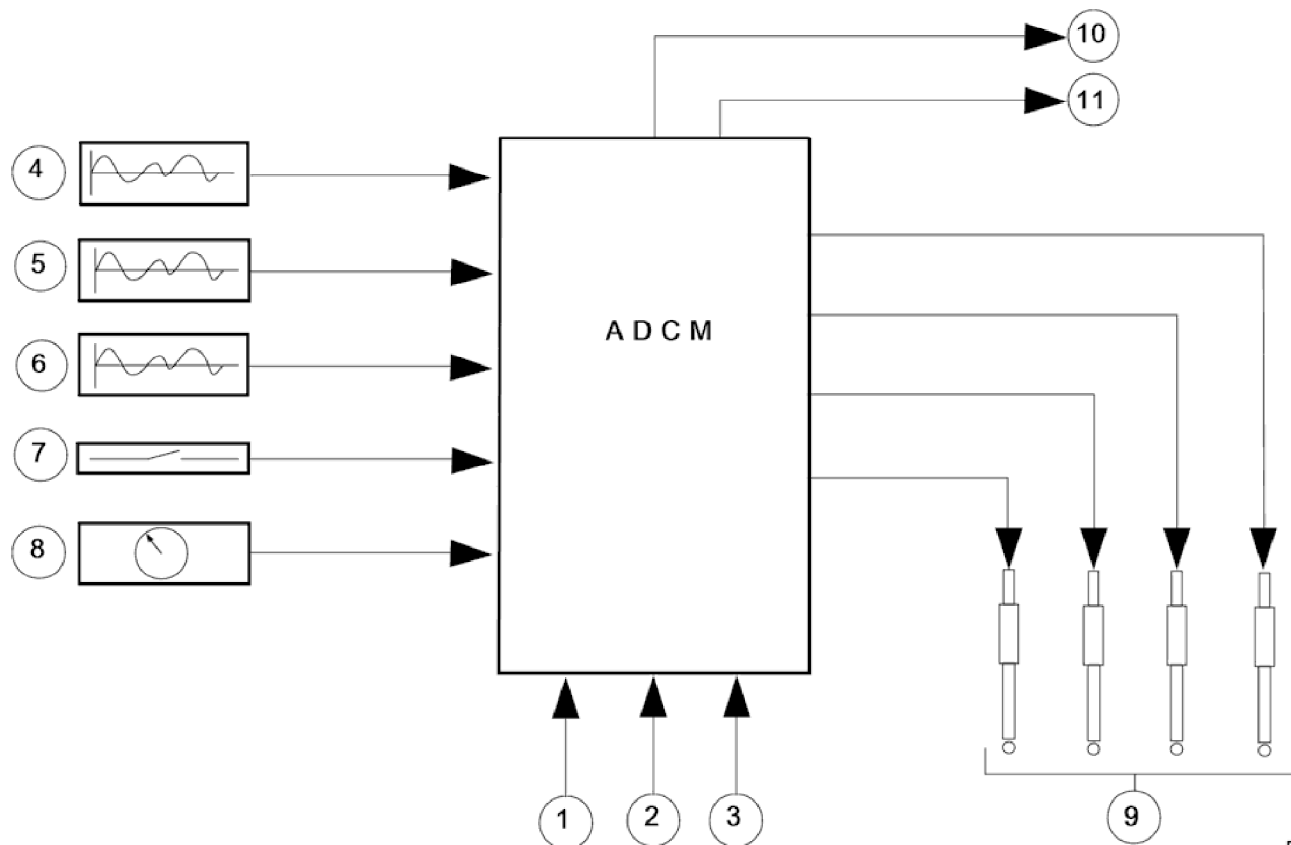


E33730

Item	Description
1	Adaptive Damper Unit Front-Right Hand
2	Accelerometer-Lateral
3	Accelerometer Vertical-Front
4	Adaptive Damper Unit Rear-Right Hand
5	Electronic Control Module (ADCM)
6	Accelerometer Vertical-Rear
7	Adaptive Damper Unit Rear-Left Hand
8	Adaptive Damper Unit Front-Left Hand

ADCM / Component Relationship

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Item	Description
1	Power
2	Ignition Supply
3	Ground
4	Vertical Accelerometer - Front
5	Vertical Accelerometer - Rear
6	Lateral Accelerometer
7	Brake Operation Signal
8	Vehicle Speed Signal
9	Output to Fascia Message Centre
10	Damper Control Signals

Three accelerometers sense vehicle body movement and generate an analogue voltage (+5V max.) output, which is proportional to the vehicle body movement. These voltages are supplied to the Adaptive Damping Control Module (ADCM).

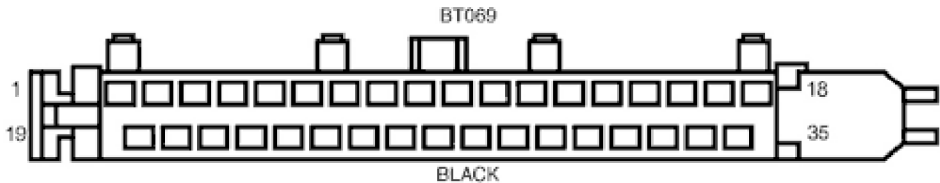
At 0g. (no movement of the body) each vertical accelerometer outputs approximately 2.5V steady voltage. The lateral accelerometer outputs approximately 1.5V. The voltage output due to body movement is proportional to acceleration in the acceleration axis, up to approximately 4.5V and down to approximately 0.5V.

The ADCM is hardwired to the Instrument Cluster. Should a fault occur, the ADCM grounds the System Error line

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which switches on the amber warning lamp and displays the message SUSPENSION FAILURE on the message centre.

Connector Pin Identity Chart for BT069



E33731

Pin Number	Circuit	Circuit Function
1		System Error Output, to Instrument Cluster
2		Traction Over-ride, from ABS/TCCM
3		Ground
10		K-Line to Diagnostic Socket
11		Ignition Supply +12V
13		Control Signal (+ve) Output to Left Hand Rear Damper
14		Control Signal (+ve) Output to Right Hand Front Damper
15		Control Signal (+ve) Output to Right Hand Rear Damper
18		Ground
20		Lateral Accelerometer Input
21		Front Vertical Accelerometer Input
22		Rear Vertical Accelerometer Input
24		Road Speed Input From Instrument Cluster
25		Power Output +5V to Supply Accelerometers
26		Brake Pedal Input
27		Battery Supply +12V
28		L-Line to Diagnostic Socket
30		Control Signal (+ve) Output to Left Hand Front Damper
31		Control Signal (-ve) Output to Left Hand Front Damper
32		Control Signal (-ve) Output to Left Hand Rear Damper
33		Control Signal (-ve) Output to Right Hand Front Damper
34		Control Signal (-ve) Output to Right Hand Rear Damper