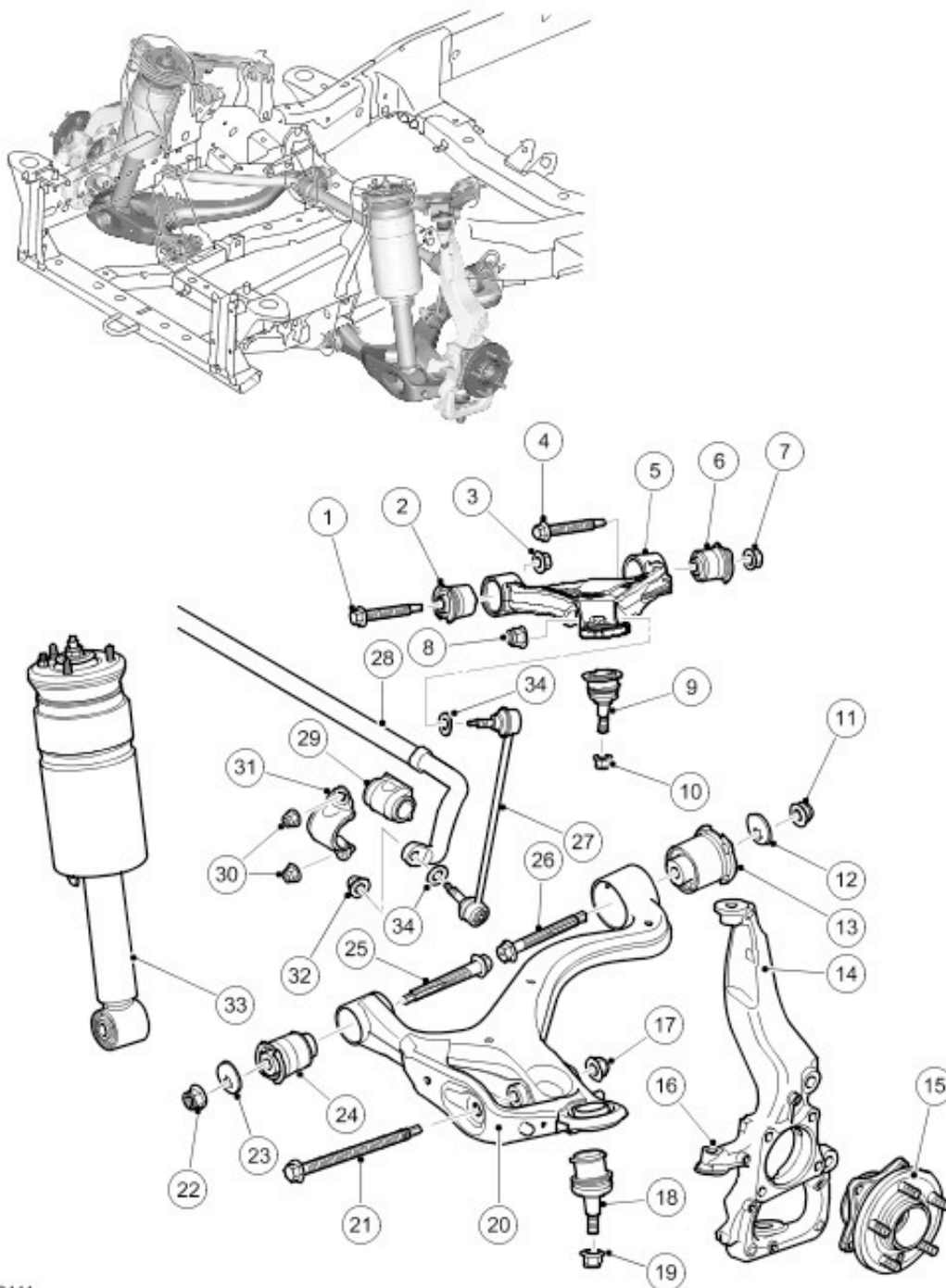


Front Suspension

Front Suspension Component Layout

NOTE:

Without Dynamic Response version shown



E52441

Item	Part Number	Description
1		Flanged bolt (Upper arm forward bush)
2		Bush - forward (Upper arm)

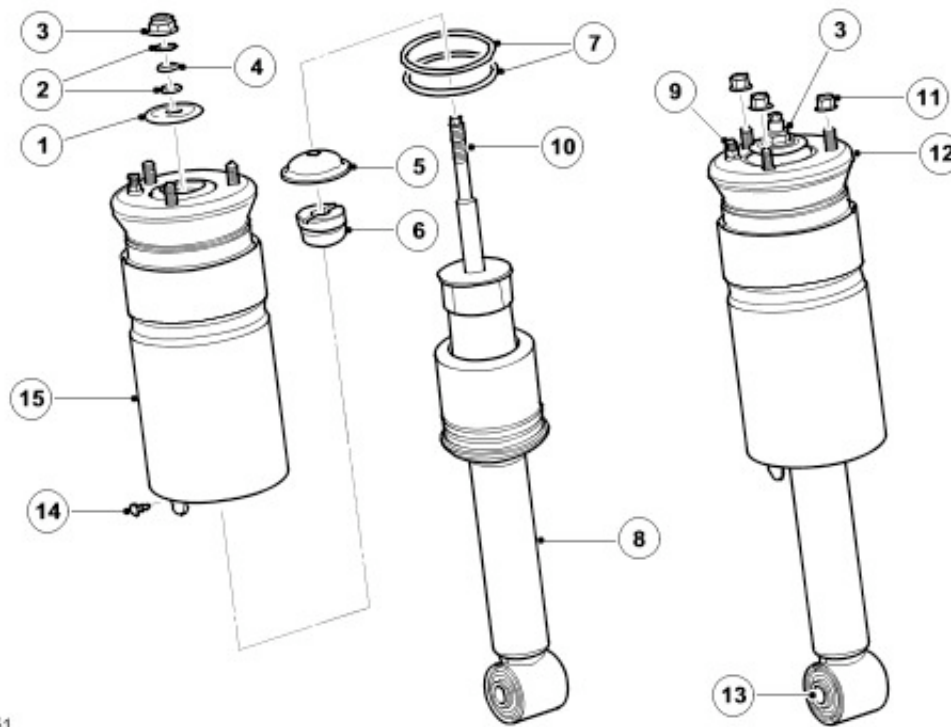
3		Nut (Upper arm forward bush)
4		Flanged bolt (Upper arm forward bush)
5		Bush - rearward (Upper arm)
6		Nut (Upper arm rearward bush)
7		Nut (Stabilizer bar link to upper arm)
8		Upper arm
9		Ball joint (Upper arm to swivel hub)
10		Nut (Ball joint to swivel hub attachment)
11		Nut (Lower arm rearward bush)
12		Cam washer (Lower arm rearward bush)
13		Bush - rearward (Lower arm)
14		Wheel knuckle
15		Wheel hub and bearing assembly
16		Steering gear attachment
17		Nut (Damper assembly lower attachment)
18		Ball joint (Lower arm to swivel hub)
19		Nut (Ball joint to swivel hub attachment)
20		Lower arm
21		Bolt (Damper assembly lower attachment)
22		Nut (Lower arm forward bush)
23		Cam washer (Lower arm forward bush)
24		Lower arm forward bush
25		Bolt (Lower arm forward bush)
26		Bolt (Lower arm rearward bush)
27		Stabilizer bar link
28		Stabilizer bar
29		Stabilizer bar bush
30		Nut (Stabilizer bar bracket)
31		Stabilizer bar bracket
32		Nut (Stabilizer bar link to stabilizer bar)
33		Damper assembly
34		Hardened washer (2 off per link)

GENERAL

The front suspension is a fully independent design which offers a reduction in unsprung weight over the beam axle design. The front suspension comprises an upper arm, a lower arm, a wheel knuckle and hub, a stabilizer bar and links assembly and an air damper assembly. A conventional stabilizer bar is fitted to some models, with a Dynamic Response stabilizer bar system available as a standard or optional fitment. For additional information, refer to [Active Stabilization System](#) (204-06)

The suspension lower arms have been designed for maximum ground clearance and also allow for adjustment of the camber and castor using cam adjusters.

AIR SUSPENSION DAMPER MODULE



E45851

Item	Part Number	Description
1		Rebound washer*
2		O-ring - damper rod (2 off)*
3		Self-locking nut*
4		Spacer - damper rod*
5		Bump washer
6		Spring aid*
7		O-ring - air spring sleeve support (2 off)*
8		Damper assembly*
9		Voss air fitting
10		Damper rod
11		Self-locking nut (3 off)
12		Top mount
13		Bush
14		Retaining pin - air spring assembly*
15		Air spring assembly*

NOTE:

* shows service items

The damper module comprises an air spring assembly, top mount and a damper assembly. The damper and air spring are only serviceable as complete assemblies.

Damper

The damper assembly is a mono tube design with an air spring. The lower end of the damper is fitted with a bush and is attached to the lower arm with a bolt and nut.

The damper functions by restricting the flow of hydraulic fluid through internal galleries within the damper. The damper rod moves axially within the damper, its movement limited by the flow of fluid through the galleries, providing damping of

undulations in the terrain. The damper rod is sealed at its exit point from the damper body to maintain the fluid within the unit and to prevent the ingress of dirt and moisture. The seal also incorporates a wiper to keep the rod clean.

Air Spring

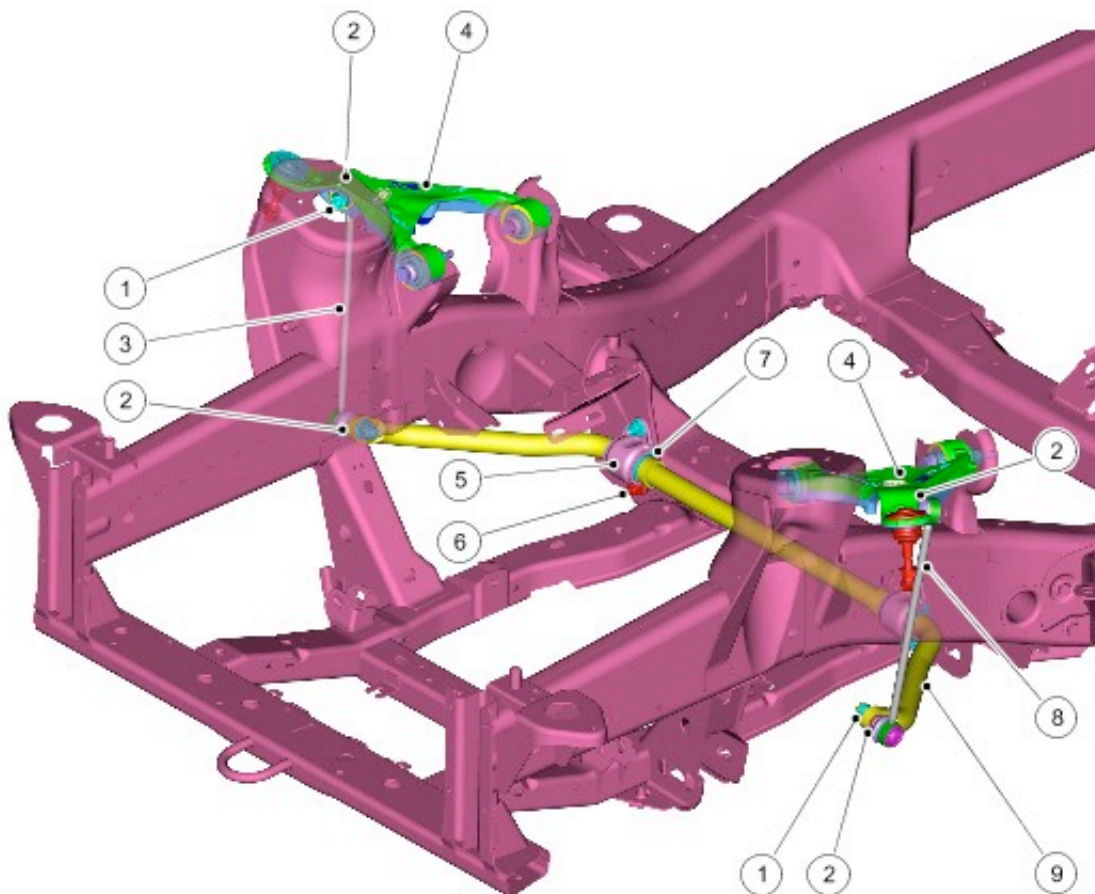
The air spring comprises an aluminium restraining cylinder, top mount, spring aid, air sleeve and an inner support sleeve.

The air sleeve is made from a flexible rubber material which allows the sleeve to roll up and down the air spring piston as the vehicle changes height. The air sleeve is attached to the restraining cylinder and support sleeve by crimp rings which provide an air tight seal. The support sleeve contains a seal carrier which has two O-rings sealing the support sleeve and two O-rings sealing to the damper body. The top of the air sleeve is crimped to the top mount which attaches to the chassis frame with three integral studs and self-locking nuts.

A spring aid is fitted to the damper rod and prevents the top mount contacting the top of the damper during full suspension compression and assists the suspension tune. The lower end of the air spring is located over the damper body and seats on a fabricated seat on the damper body. The air sleeve is positively attached to the seat with a retaining pin. The damper rod is located through a central hole in the top mount. The rod is threaded at its outer end. A self-locking nut secures the air spring to the damper rod.

The top mount is an integral part of the air spring and is fitted with a bush and a rebound washer. A bump washer is located between the top mount plate and the damper rod. The top mount is secured to the damper rod with a self-locking nut. The top mount attaches to a housing on the chassis with three integral studs and self-locking nuts. The top mount also incorporates a 6 mm Voss air fitting which allows for the attachment of the air harness.

STABILIZER BAR



E56035

Item	Part Number	Description
1		Nut - link to stabilizer bar/upper arm (4 off)
2		Hardened washer (4 off)
3		Right hand Link
4		Upper arm
5		Bracket (2 off)
6		Locknut (4 off)
7		Bush (2 off)
8		Left hand link
9		Stabilizer bar

Vehicles with the Dynamic Response system use an active stabilizer bar. For additional information, refer to [Active Stabilization System](#) (204-06)

The stabilizer bar is fabricated from induction hardened, 31 mm diameter solid spring steel bar. The stabilizer bar operates, via a pair of links, from their attachment to the upper arm.

The stabilizer bar is mounted on the forward face of the chassis front cross member and is attached to the cross member with two, Teflon lined bushes. Brackets, which are pressed onto the bushes, are attached to the cross member with nuts, screwed onto studs in the cross member. The stabilizer bar has crimped, 'anti-shuffle' collars pressed in position on the

inside edges of the bushes. The collars prevent sideways movement of the stabilizer bar.

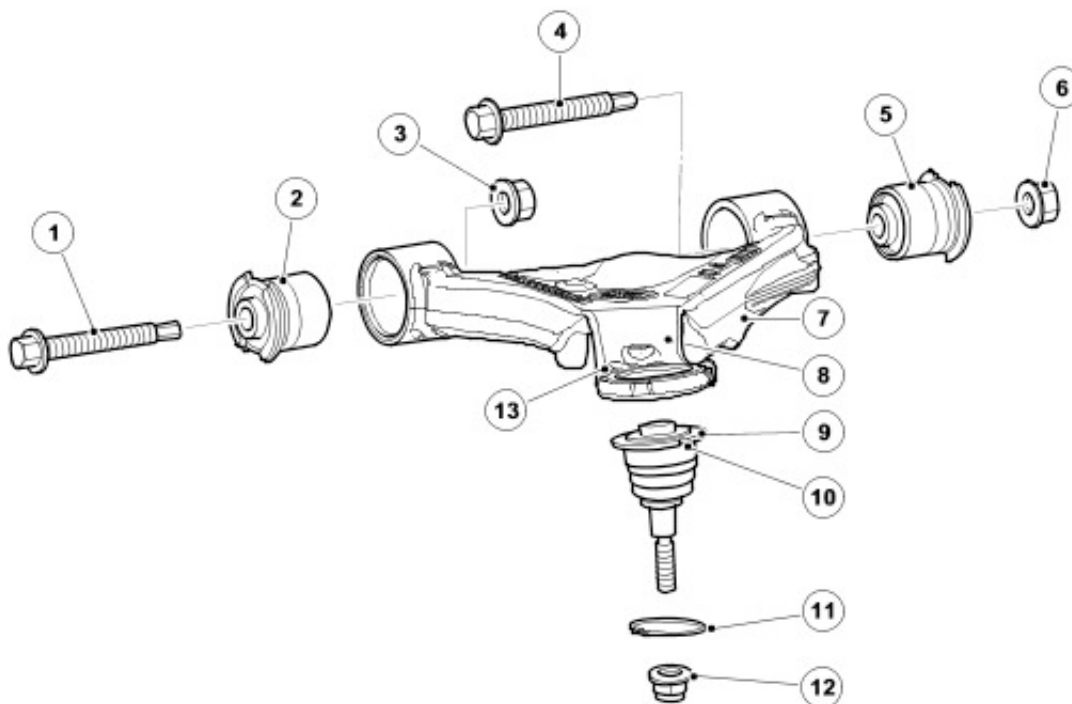
The links, which are handed and have a ball joint at each end, are fitted with hardened steel washers at both ends. The top ball joint is attached to the link at 90 degrees to the link axis. The ball joint is located in a hole in the side of the upper arm and secured with the hardened steel washer on one side of the interface and a self-locking nut on the other. The bottom ball joint is attached to the link at 90 degrees to the link axis. The ball joint is located in a hole in the end of the stabilizer bar and secured with the hardened steel washer on one side of the interface and the self-locking nut on other.

It is important that hardened steel washer is in the correct position between the stabilizer bar and the link ball joint and the upper arm and the link ball joint and the correct, hardened washer is fitted.



CAUTION: Failure to fit the washer or using an incorrect washer will result in relaxation of the torque on the self-locking nut and damage will be caused to the stabilizer bar, link and suspension upper arm.

UPPER ARM



E56034

Item	Part Number	Description
1		Flanged bolt
2		Bush
3		Self locking nut
4		Flanged bolt
5		Bush
6		Self locking nut
7		Upper arm
8		Stabilizer bar link attachment hole (hidden)
9		Ball joint
10		Timing mark
11		Circlip

12		Self locking nut
13		Timing mark

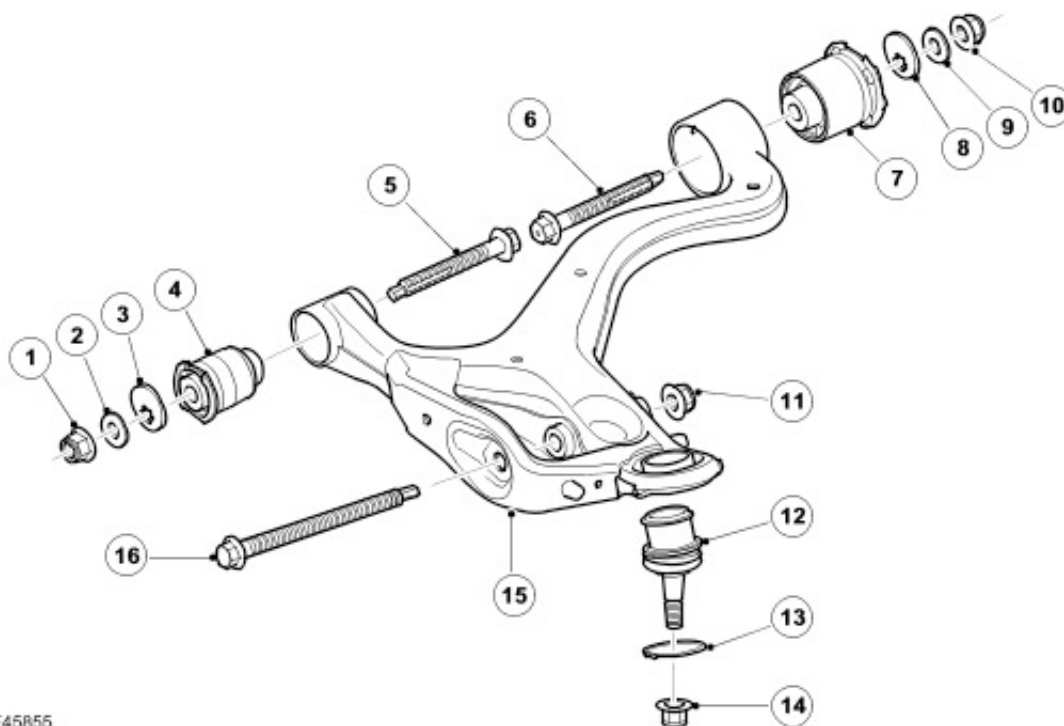
The upper arm assembly comprises, the upper arm, two bushes and a ball joint. The upper arm is made from cast and machined iron. Its outer end has a hole to accept the ball joint. A small indentation is located adjacent to the ball joint hole and is used to obtain the correct orientation of the ball joint. A hole on the rear side of the arm provides for the attachment of the stabilizer bar link.

The inner end of the arm has two bush housings which are machined in the arm casting. A bush is pressed into each housing. The bushes are located between lugs on the chassis and are secured with bolts and self-locking nuts through metal inserts in the centre of the bushes.

The ball joint is pressed into the upper arm. The ball joint is an interference fit in the hole which prevents the ball joint from moving. A circlip is fitted to the ball joint to retain it in the hole. The top face of the ball joint has two semi-circular cut-outs. One of these cut-outs must be aligned with the small indentation in the upper arm to ensure the correct operation of the ball joint.

A bracket, located on on the underside of the upper arm, provides for the attachment of the air suspension height sensor drop link.

LOWER ARM



E45855

Item	Part Number	Description
1		Self locking nut
2		Washer
3		Cam washer
4		Bush
5		Bolt
6		Bolt
7		Hydrobush
8		Cam washer
9		Washer
10		Self locking nut

11		Self locking nut - damper lower attachment
12		Ball joint
13		Circlip
14		Self locking nut
15		Lower arm
16		Bolt - damper lower attachment

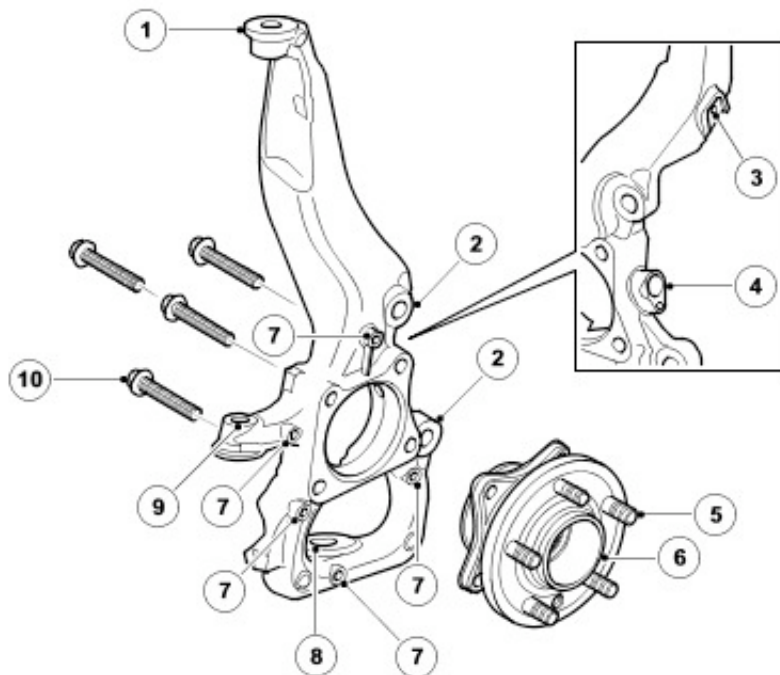
The lower arm assembly comprises, the lower arm, two bushes and a ball joint. The lower arm is a pressed steel fabrication with a hole at its outer end to accept the ball joint.

The inner end of the arm has two fabricated bush housings which are welded to the arm pressing. A bush is pressed into each housing. The rear bush is a hydrobush which provides a progressive increase in the hardness of the bush as the deflection of the wheel increases. The bushes are located between lugs on the chassis and are secured with bolts and self-locking nuts through metal inserts in the centre of the bushes. The forward bush, self-locking nut, has a cam washer located beneath it. The cam washer is located between lugs on the chassis bracket and its orientation can be adjusted to set the front camber. The rear bush, self-locking nut, also has a cam washer located beneath it. The cam washer is located between lugs on the chassis bracket and its orientation can be adjusted to set the front castor.

A central aperture in the arm provides for the attachment of the damper module lower bush. The damper is secured with a long bolt which is positioned through holes in the lower arm and secured with a self-locking nut.

The ball joint is pressed into the lower arm. The ball joint is an interference fit in the hole which prevents the ball joint from moving. A circlip is fitted to the ball joint to retain it in the hole.

WHEEL KNUCKLE, HUB AND BEARING ASSEMBLY



E45856

Item	Part Number	Description
1		Upper arm attachment
2		Brake caliper attachment holes
3		Brake hose bracket attachment point
4		Wheel speed sensor location
5		Wheel studs

6		Wheel hub
7		Brake disc dust shield attachment holes
8		Lower arm ball joint attachment
9		Steering gear ball joint attachment
10		Wheel hub bolts (4 off)

The wheel knuckle is a machined casting which is located between the ball joints of the upper and lower arms. The knuckle has four clearance holes which allow for the fitment of four bolts which secure the wheel hub housing. A cast boss on the forward edge of the knuckle provides for attachment of the steering gear, tie rod ball joint.

The wheel hub and bearing assembly comprises the wheel hub housing, wheel hub and taper roller bearing. The wheel hub and bearing assembly is a non-serviceable component. Five M14 studs are pressed into the wheel hub and provide for the attachment of the road wheel with wheel nuts.

The wheel hub housing is a machined forging which houses a taper roller bearing. The housing has four threaded holes which provide for the attachment to the wheel knuckle with four bolts.

The wheel hub has a splined centre bore which mates with corresponding splines on the half shaft. Rotation of the half shaft is passed, via the splines, to the wheel hub which rotates on the taper roller bearing.