The independent front suspension offers a reduction of un-sprung mass over the conventional beam axle design. The suspension geometry features...
negative ground level off-set for improved control under braking. The suspension arms have been designed for maximum ground clearance.
Suspension geometry can be adjusted via the strut top mount for camber and on the steering rack track rod ends for toe-in.

The following wheel travels are shown for on road and off-road vehicle operation. The difference between the two operating conditions is a result of operation of the front cross-link valve. When the cross-link valve is opened the suspension travel is as given for off-road wheel travel. When the cross-link valve is closed the suspension travel given for on road applies.

The off road mode wheel travel is:
- ^175 mm^ bump
- ^95 mm^ rebound
- This gives a total of ^270 mm^ off road suspension travel.

The on road standard wheel travel is:
- ^115 mm^ bump
- ^155 mm^ rebound
- This gives a total of ^270 mm^ on road suspension travel.

The front suspension comprises:
- Two air spring damping struts
- Subframe
- Anti-roll bar
- Anti-roll bar links
- Suspension arms
- Two hub assemblies.

**Struts**
The front suspension struts are a MacPherson twin tube design with the conventional coil spring replaced by an air spring. The lower end of the strut is connected to the front hub assembly with two bolts. The upper top mount is attached to the inner wing with three studs and nuts.

The top mount has a bearing installed which reduces the force required on the steering when the strut rotates. A paper gasket is fitted on the underside of the inner wing, between the inner wing and the top mount. The gasket prevents the ingress of dirt and moisture into the bearing. When the strut is removed, this gasket must be replaced with a new item to maintain the performance of the bearing and care must be taken to ensure that the gasket is correctly positioned.

The damper functions by restricting the flow of hydraulic fluid through internal galleries within the damper. A damper rod moves axially within the damper. As the rod moves, its movement is limited by the flow of fluid through the galleries thus providing damping of undulations in the terrain. The damper rod is sealed at its exit point from the damper body to maintain fluid within the unit and to prevent the ingress of dirt and moisture. The seal also acts as a wiper to keep the rod outer diameter clean.

The air spring is fitted on the upper part of the strut. Within the strut module the air spring elements comprise a top plate assembly, an air bag and a base piston. The air bag is attached to the top plate and the piston with a crimped ring. The air bag is made from a flexible rubber material which allows the bag to expand with air pressure and deform under load. On the side of the top cap is a connector which allows for the attachment of the air hose from the crosslink valve. The piston is made from plastic and is shaped to allow the air bag to roll over its outer diameter.

**Subframe**
The subframe is fabricated from steel tubing to provide a robust platform for the mounting of the suspension and engine. The subframe is attached to the vehicle body via six mountings.

The subframe fabrication provides accurate location for the suspension components and the steering rack. Additional brackets allow for the attachment of the height sensors and the engine mountings. The anti-roll bar is attached across the rear of the subframe and is mounted in flexible bushes which are secured with 'D' shaped clamp plates.

**Anti-Roll Bar and Links**
The anti-roll bar is fabricated from 30mm diameter, solid spring steel bar. The anti-roll bar operates, via a pair of links, from a bracket mounted on each strut.

The anti-roll bar is attached to the rear of the subframe with two bushes which are bonded to the bar and cannot be removed. Clamp plates are pressed onto the bushes and must not be removed. The anti-roll bar is secured to the subframe with the clamp plates which are located on studs on the subframe and secured with nuts.

The ends of the anti-roll bar are attached to each strut spring seat via an anti-roll bar link. This arrangement allows the anti-roll bar to act on a 1:1 ratio with the wheel travel providing maximum roll bar effectiveness. A hardened washer is fitted between the ball joint and the strut mounting plate. The hardened washer prevents the ball joins damaging the bracket, which could leads loosening of the torque on the nut. When the link is removed from the strut, it is important to ensure that the correct hardened washer is replaced in the correct position.
Each anti-roll bar link has a ball joint fitting at each end which improves response and efficiency. The top ball joint is mounted at 90° to the axis of the link and attaches directly to the strut and is secured with a locknut. The lower ball joint is mounted at 90° to the axis of the link. The ball joint attaches to the anti-roll bar and is secured with a locknut. The link must be attached to the anti-roll bar with the ball joint on the outside of the bar and the locknut facing inwards. The ball joints on the anti-roll bar links are not serviceable and if replacement of either is necessary, a new anti-roll bar link will be required.

**Suspension Links**

**Transverse Link**
The front suspension hub assembly is secured to the subframe via two suspension links. Each transverse link is fitted with a bush which is secured with a bolt between two brackets on the subframe. The opposite end of the transverse link is fitted with a ball joint which attaches to the hub assembly.

**Compression Link**
The compression is located rearward of the transverse link. The compression link is fitted with a compliance bush which is secured with a bolt between two brackets on the subframe. The opposite end of the compression link has a tapered hole which locates on a ball joint which is bolted to the hub assembly.

**Hub Assembly**
The hub assembly comprises a swivel hub, drive flange and bearing. A seal and bearing are fitted in the swivel hub and are secured with a circlip. The drive flange has the wheel studs attached to it and locates on the splined drive shaft and is secured with a stake nut.

The forged swivel hub has a vertical boss with two cross holes. This provides location for the strut assembly which is secured with bolts and nuts to the swivel hub. Two additional bosses provide location for the brake caliper.

The lower part of the swivel hub has two threaded holes which allow for the attachment of the ball joint which locates the outer end of the compression link. A further tapered hole allows for the attachment of the transverse link ball joint.

A hole is machined at 90° to the hub bearing. This hole allows for the fitment of the ABS speed sensor which is secured with a screw into an adjacent threaded hole. The speed sensor reads off a target which is part of the drive shaft assembly.