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Front Suspension -

Coil Spring Suspension

Item	Specification
Front	Conventional coil spring with a twin tube damper and a high stress stabilizer bar

Road Spring Identification

Part Number	Specification	Isolator
LR 001131	Green/Yellow/Orange.	LR 001145

Torque Specifications

Description	Nm	lb-ft
Damper locknut*	80	59
Front subframe crossbrace:		
M10*	45	33
M16*	140 + 240°	103 + 240°
Front subframe to body bolts*	140 + 240°	103 + 240°
Front ride height sensor	10	7
Halfshaft to hub bolt*	45 + 80°	33 + 80°
Lower control arm front bolt	140 + 45°	104 + 45°
Lower control arm rear nut and bolt	175	129
Lower control arm taper ball joint locknut*	100	74
Spring and damper assembly top mounting nuts	30	22
Stabilizer bar clamp bolts	175	129
Stabilizer bar link nuts*	60	44
Wheel knuckle to damper clamp bolt	110	81

*** New nuts/bolts must be fitted**

Part Number

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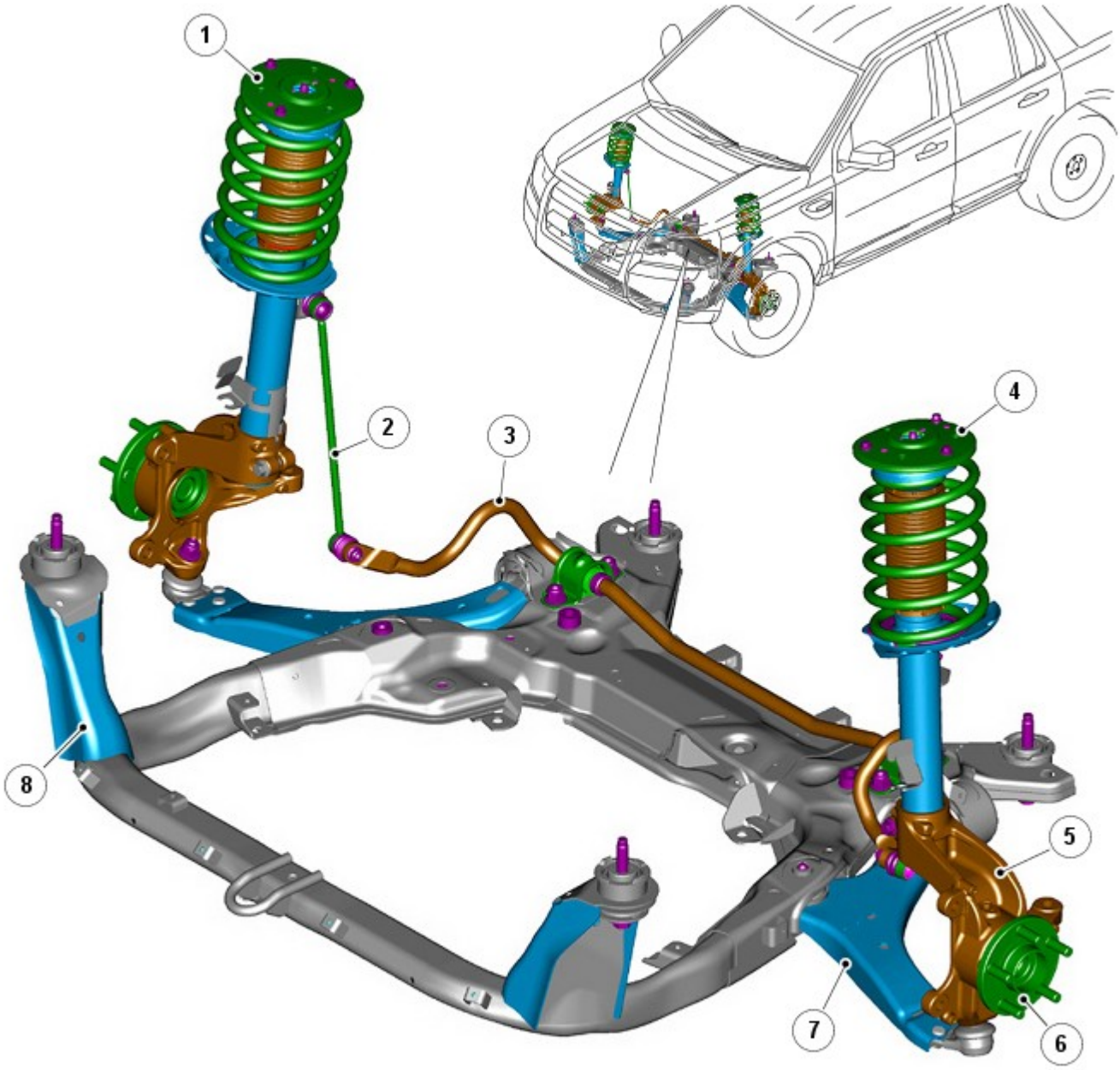
Front Suspension - Front Suspension

Description and Operation

COMPONENT LOCATION



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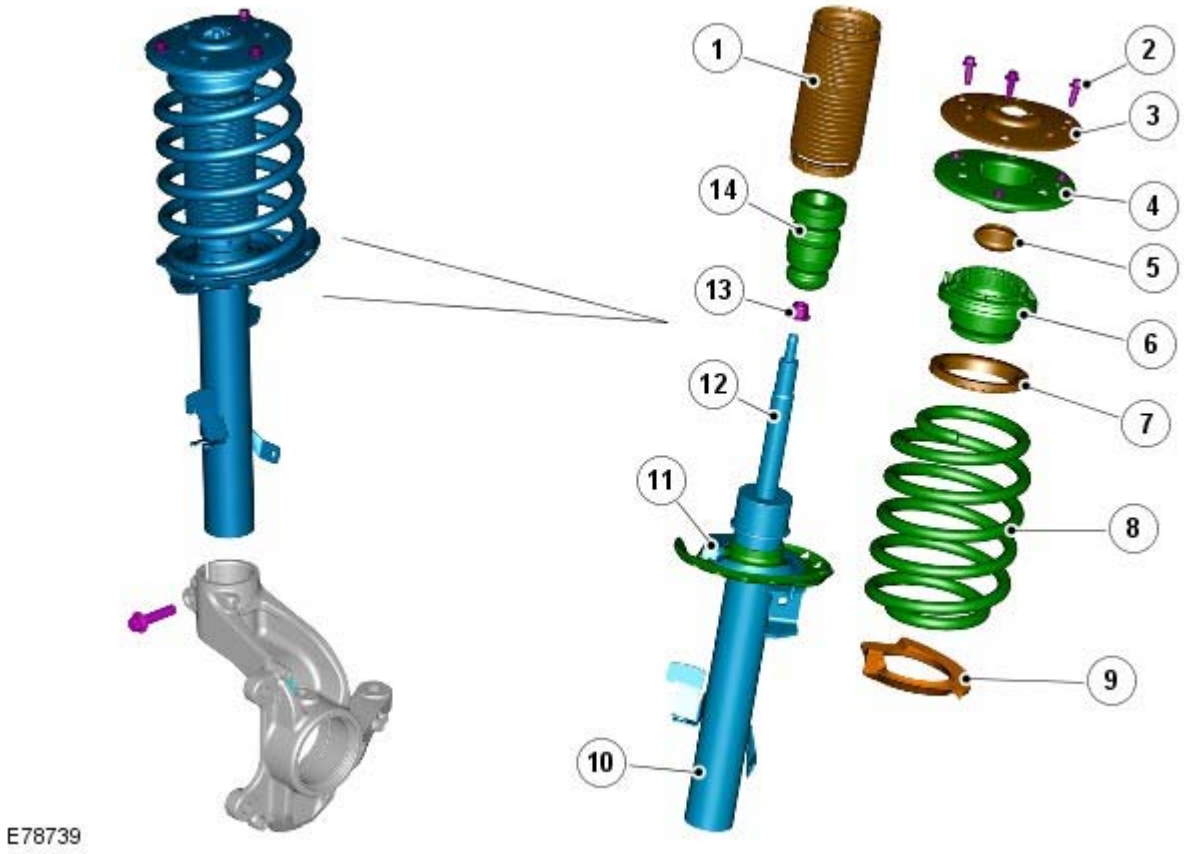
Item	Part Number	Description
1	-	Right Hand (RH) spring and damper assembly
2	-	Stabilizer bar link
3	-	Stabilizer bar
4	-	Left Hand (LH) spring and damper assembly
5	-	Wheel knuckle
6	-	Hub and bearing assembly
7	-	Lower control arm
8	-	Subframe

OVERVIEW

The front suspension features long travel McPherson struts to optimize on and off road performance.

The suspension components are mounted on a subframe. The subframe is mounted on 4 bushes which have differing compression rates to absorb lateral and longitudinal loading. This provides a rigid platform for front suspension cornering loads, frontal impact absorption and also provides a towing point for off-road recovery.

SPRING AND DAMPER



Item		Description
1		Boot
2		Bolts - Top mount (3 off)
3		Upper top mount plate
4		Lower top mount plate
5		Bump washer
6		Top mount bearing
7		Spring isolator
8		Spring
9		Spring Isolator
10		Damper body
11		Spring seat
12		Damper piston rod
13		Locknut
14		Spring aid

The spring and damper assembly is a twin tube design with the conventional coil spring located on a welded spring seat on the damper tube. The lower end of the damper body locates in the wheel knuckle which is clamped with a bolt.

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.

The damper rod is located through a central hole in the top mount assembly. The rod is threaded at its outer end. A self-locking nut secures the top mount to the damper rod. A spring aid is fitted to the damper rod to prevent the top mount contacting the top of the damper during full suspension compression and also assists the suspension tune. A boot is fitted between the damper body and the top mount and protects the damper piston rod from damage.

The coil spring fitted differs with vehicle specification. Each spring is colour coded to identify its rating and fitment

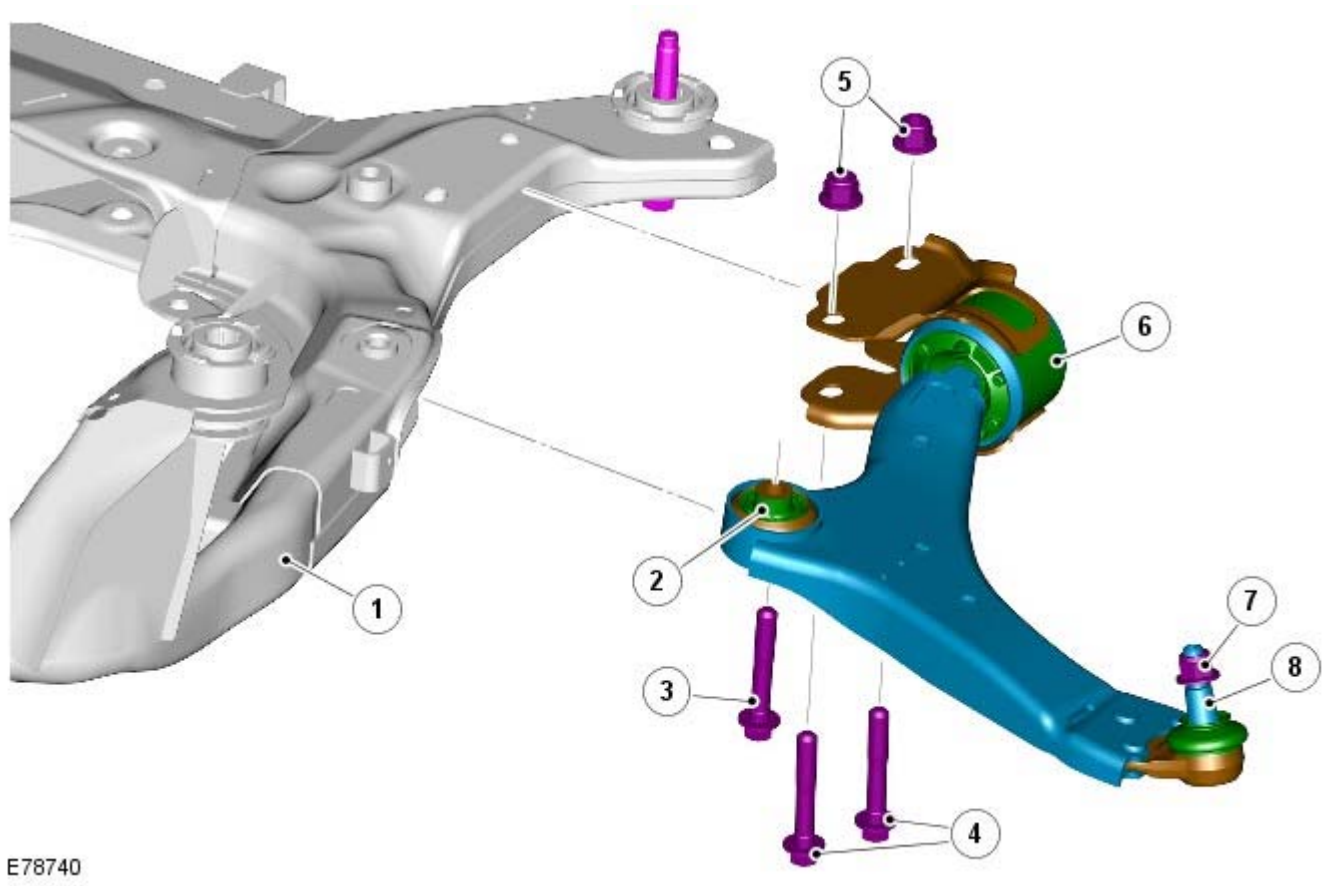
requirements.

The coil spring is located in a spring seat which is an integral part of the damper body and contains a spring isolator. The design of the spring seat prevents the spring rotating. The spring has a linear rate compression and is inclined to counter cornering forces. The opposite end of the coil spring is also located in a spring isolator which is fitted in the top mount assembly. Both spring isolators are made from rubber and prevent any noise produced during damper and spring compression/extension from being transmitted to the vehicle body.

The top mount is fitted with a top mount bearing which is located between the 2 top mount plates and the damper rod. A self locking nut secures the damper rod to the top mount. The top mount bearing reduces steering resistance by preventing the spring from 'winding' up when the steering in turned. The top mount attaches to a strengthened turret on the chassis with 3 integral studs and self-locking nuts.

Two brackets are welded to the damper body. One bracket provides for the attachment of the stabilizer link. The second bracket provides for the attachment of the brake hose and wheel speed sensor cable. This bracket also positively locates the damper into the wheel knuckle and its location is critical to controlling the vehicle trim height.

LOWER CONTROL ARM



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Item		Description
1		Subframe
2		Ball bush
3		Bolt - front attachment
4		Bolt - rear attachment (2 off)
5		Nut - rear attachment (2 off)
6		Hydrabush
7		Locknut
8		Taper ball joint

The lower control arm assembly comprises the control arm, a rubber bush, a hydrabush and a ball joint.

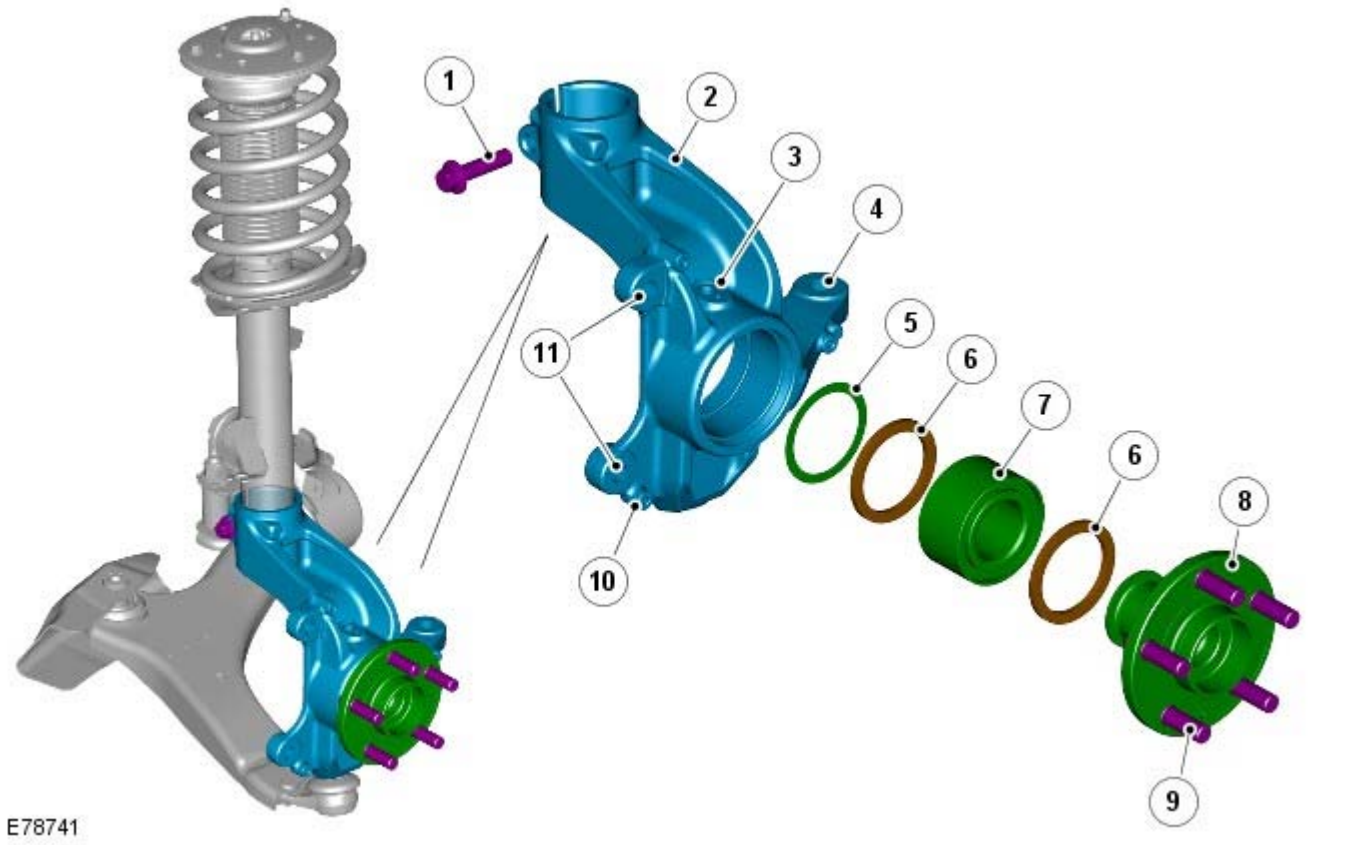
The control arm is a pressed steel fabrication. The outer end is fitted with a non-serviceable taper ball joint which mates with the wheel knuckle.

The 2 inner attachments locate in the subframe. The forward attachment is a non-serviceable rubber bush which is pressed into the control arm. This joint locates in a slot in the subframe and is secured with a bolt which is screwed into a threaded boss on the subframe.

The rearward attachment is a hydrabush which is located on a spigot on the control arm. The hydrabush has 2 welded

brackets which provides for its attachment to the subframe with 2 bolts and nuts. The hydrabush contains hydraulic fluid and valves which allow controlled displacement of the bush to improve bump and handling characteristics and also reduce road noise transmission. The bush becomes progressively stiffer as the forces on it increase, such as severe braking.

WHEEL KNUCKLE AND HUB ASSEMBLY



Item		Description
1		Clamp bolt
2		Wheel knuckle
3		Anti-lock Brake System (ABS) wheel speed sensor mounting
4		Steering tie-rod attachment
5		ABS wheel speed sensor pulse ring
6		Seal
7		Wheel bearing
8		Hub
9		Wheel stud
10		Disc shield attachment
11		Brake caliper attachment

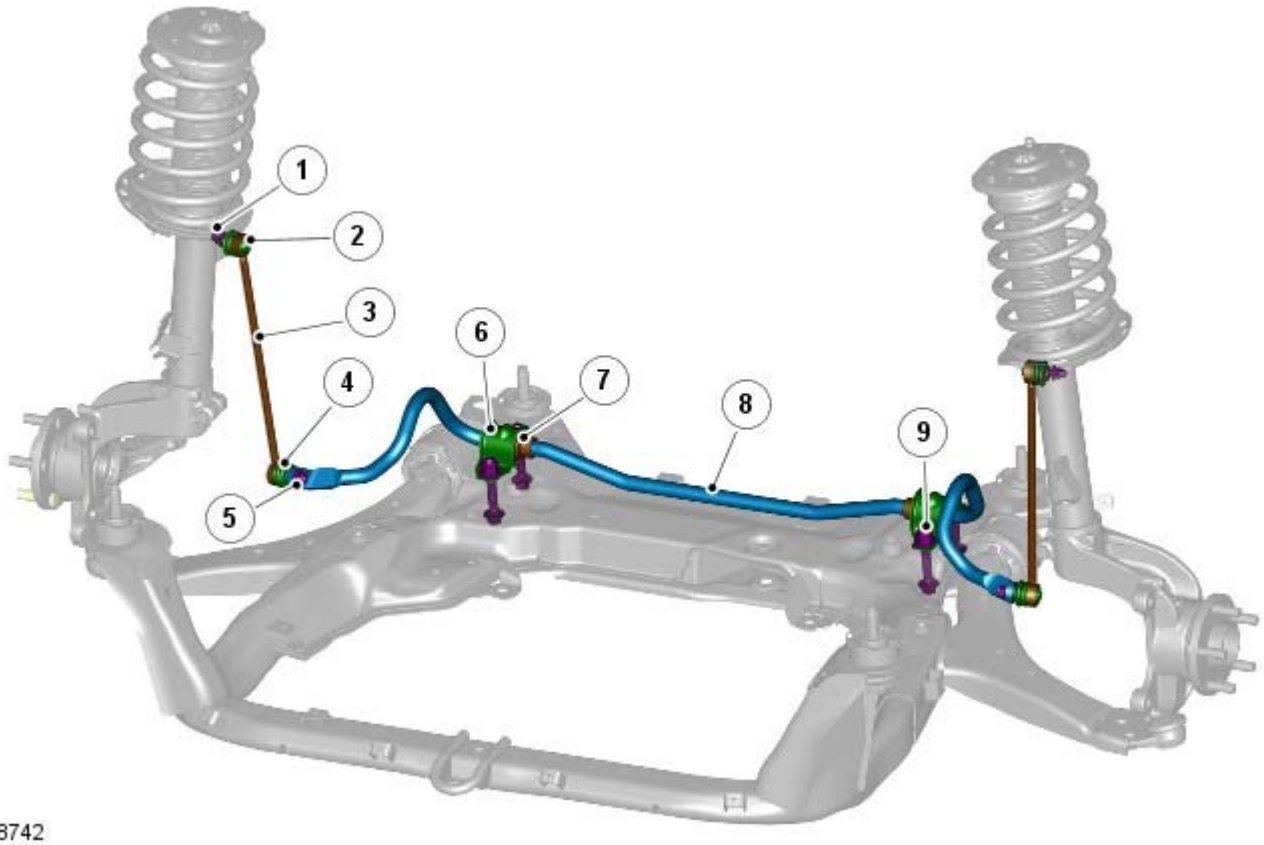
The cast steel wheel knuckle provides the attachment for the lower control arm, spring and damper assembly, wheel hub and bearing assembly and the steering tie-rod.

The extended lower boss on the knuckle provides for the attachment of the steering gear tie-rod ball joint. The ball joint is a taper fitting and is secured with a locknut. The tie-rod allows for the adjustment of the front wheel toe angle.

The upper section of the wheel knuckle has a location hole for the damper body. The damper body slides into the hole and locates against an abutment. The rear face of the hole is split and allows the damper body to be secured in the wheel knuckle with a clamp bolt.

Mounting locations are provided for the brake caliper and the brake disc shield. A hole in the top face of the wheel knuckle provides the location for the ABS wheel speed sensor which is secured with a bolt.

STABILIZER BAR



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Item		Description
1		Locknut (hidden)
2		Ball joint
3		Link
4		Ball joint
5		Locknut
6		Clamp
7		Bush
8		Stabilizer bar
9		Bolt (2 off)

The stabilizer bar is attached to the rear of the subframe with bushes and mounting brackets. The pressed steel brackets locate over the bushes and are attached to the cross member with bolts screwed into threaded locations in the subframe. The stabilizer bar has 'anti-shuffle' collars pressed in position on the inside edges of the bushes. The collars prevent sideways movement of the stabilizer bar.

The stabilizer bar is manufactured from 20.5 mm diameter, manganese steel bar. Each end of the stabilizer bar curves forwards to attach to a ball joint on a stabilizer link. Each stabilizer link is secured to a bracket on the damper body with a locknut. The links, which are not handed, allow the stabilizer bar to move with the wheel travel providing maximum effectiveness.

The stabilizer bar bushes are the compression type which grip the bar under compression by the mounting brackets. When fitting replacement bushes, it is important to ensure the bushes are correctly orientated to the bar. Failure to correctly align the bushes will result in excessive pre-load (wind-up) in the bushes when the suspension is at its nominal ride height.

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Front Suspension - Front Suspension

Diagnosis and Testing

For additional information.
REFER to: Suspension System (204-00 Suspension System - General Information, Diagnosis and Testing).

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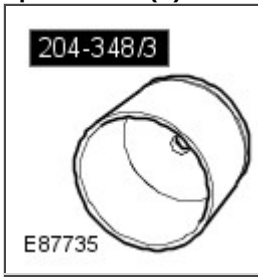
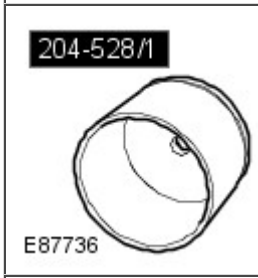
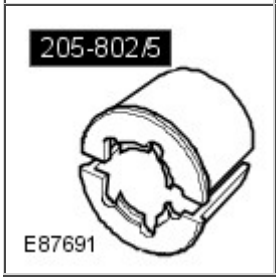
Front Suspension - Front Wheel Bearing

Removal and Installation

Special Tool(s)

	204-348/3 Remover/Installer, Wheel Hub/Wheel Bearing
	204-348-01 Adapter for 204-348
	204-528/1 Remover/Installer, Bushing
	204-536/2 Remover/Installer, Bushing
	205-802/5 Remover, Wheel Hub/Bearing

Removal

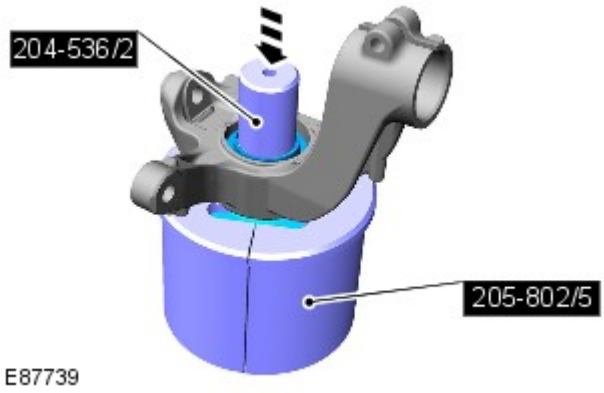
NOTE: The wheel bearing is supplied as part of the drive flange assembly.

1. WARNING: Make sure to support the vehicle with axle stands.

   Raise and support the vehicle.

2. Remove the wheel knuckle.

   Refer to: Wheel Knuckle (204-01 Front Suspension, Removal and Installation).



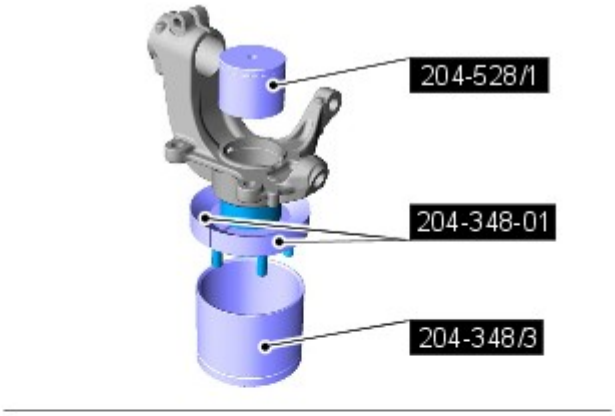
3.

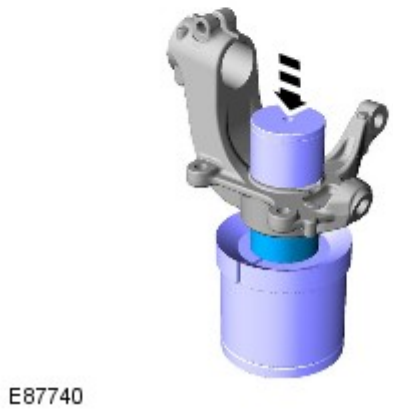
- Position the wheel knuckle assembly in a press and support on special tool.

  Special Tool(s): 205-802/5
- Using the special tool, press the drive flange assembly out of the wheel knuckle.

  Special Tool(s): 204-536/2

Installation





1. CAUTION: Make sure that a new drive flange assembly is installed.

   - Position the new drive flange assembly in the special tools.

     Special Tool(s): 204-348/3, 204-348-01
   - Using the special tool, press the drive flange assembly into the wheel knuckle.

     Special Tool(s): 204-528/1

2. Install the wheel knuckle.

   Refer to: Wheel Knuckle (204-01 Front Suspension, Removal and Installation).

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Front Suspension - Lower Arm

Removal and Installation

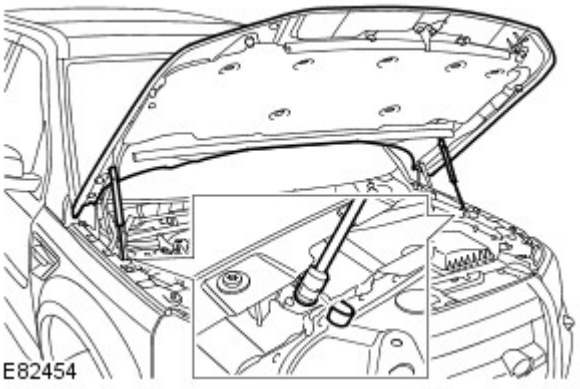
Special Tool(s)

	204-619 G-Clamp
	205-857 Remover, Halfshaft
	211-316 Separator, Ball Joint

Removal

1. Remove the plenum chamber panel.

   Refer to: Plenum Chamber (412-01 Climate Control, Removal and Installation).



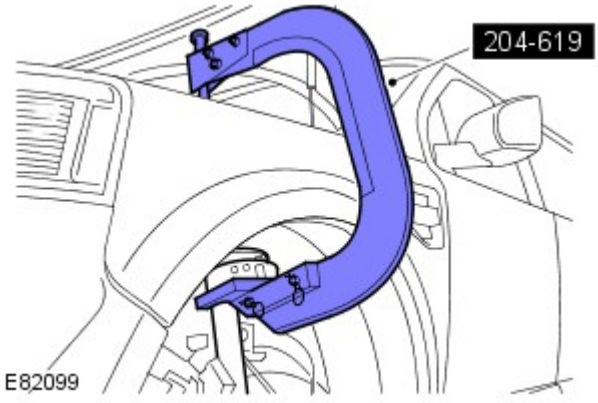
2. Release the hood support struts and secure the hood in an upright position.

3. WARNING: Make sure to support the vehicle with axle stands.

   Raise and support the vehicle.

4. Remove the wheel and tire.

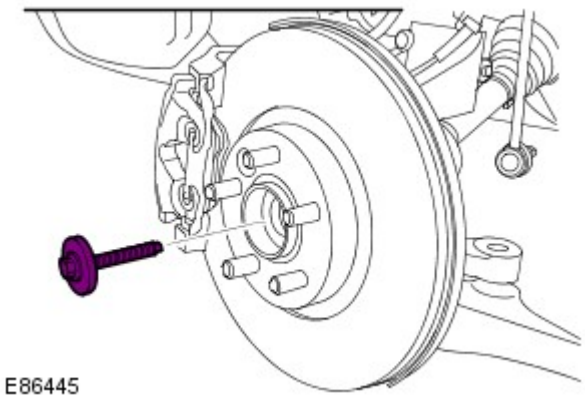
   Refer to: Wheel and Tire (204-04 Wheels and Tires, Removal and Installation).



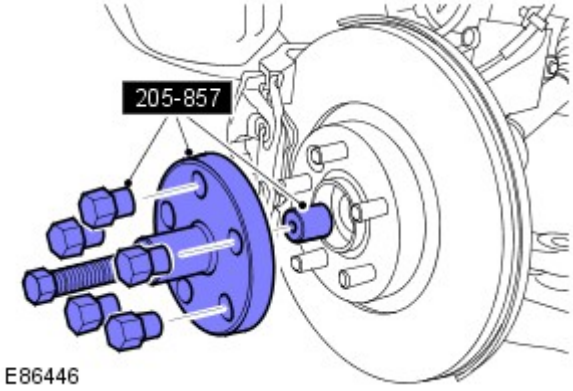
5. NOTE: This step requires the aid of another technician.

   Compress the spring and damper assembly.

   Special Tool(s): 204-619

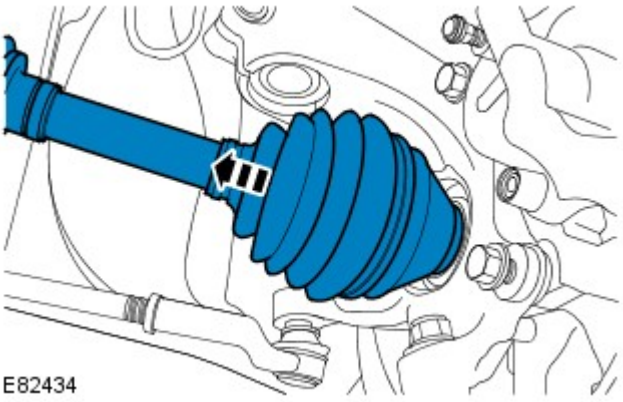


6. Remove and discard the front halfshaft bolt.



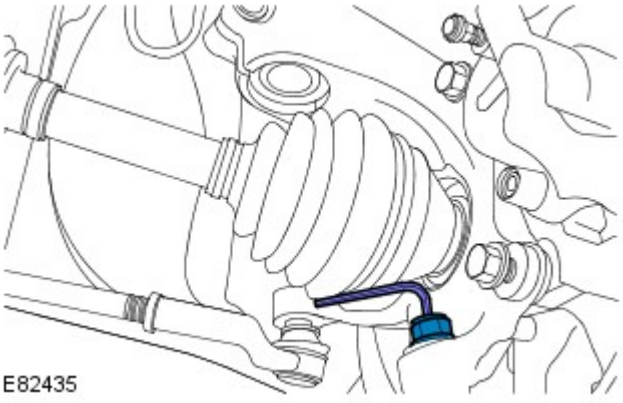
7. Partially release the front halfshaft from the wheel knuckle.

   Special Tool(s): 205-857



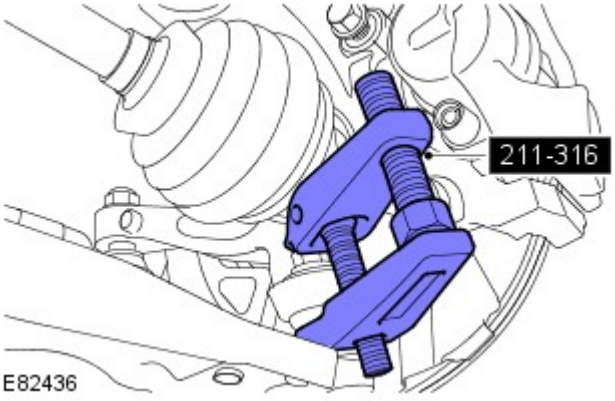
8. CAUTION: Do not allow halfshafts to hang unsupported at one end or joint damage will occur.

   Partially release the front halfshaft from the wheel knuckle.

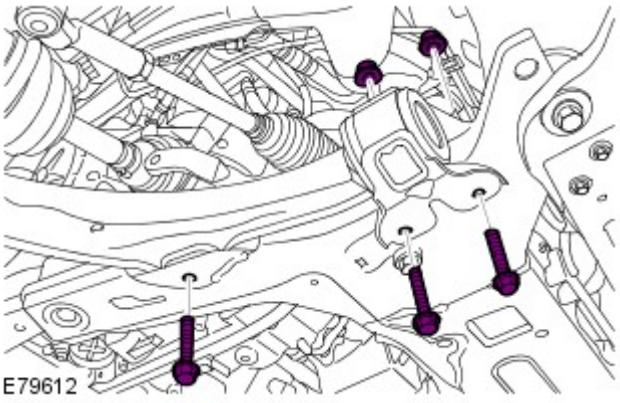


9. WARNING: Make sure that a new lower arm ball joint nut is installed.

CAUTION: Make sure that the ball joint ball does not rotate.

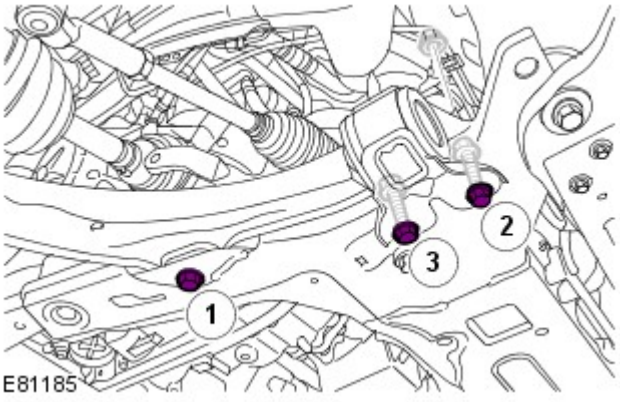


10. *Special Tool(s):* 211-316



11. Remove and discard the lower arm bolts.

Installation

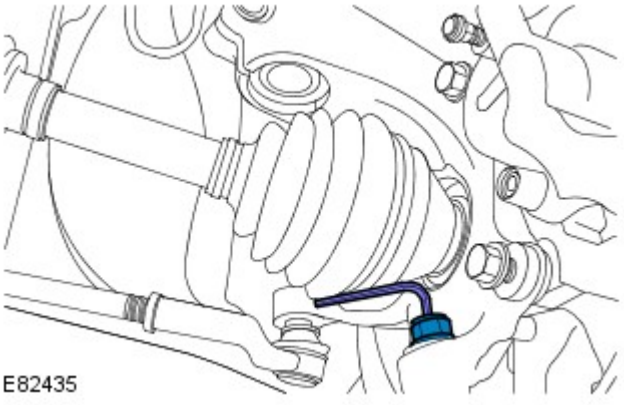


1. NOTE: Make sure that new nuts and bolts are installed.
   - Install the lower suspension arm.
   - Tighten bolt 1.

     Torque:
     Stage 1: 140 Nm
     Stage 2: 45°
   - Tighten bolt 2 to

     Torque: 175 Nm
   - Tighten bolt 3 to

     Torque: 175 Nm



2. WARNING: Make sure that a new lower arm ball joint nut is installed.

   CAUTION: Make sure that the ball joint ball does not rotate.

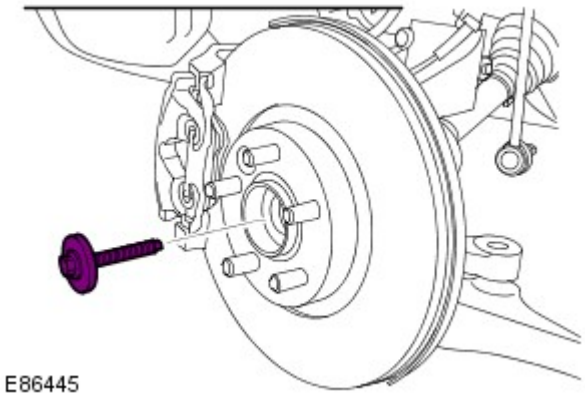
   Torque: 100 Nm

3. CAUTION: Do not allow halfshafts to hang unsupported at one end or joint damage will occur.

   Fully insert the front halfshaft into the wheel knuckle.

4. NOTE: This step requires the aid of another technician.

   Release the tension from the spring and damper assembly and remove the special tool.



5. CAUTIONS:

   Make sure that a new bolt is installed.

   Make sure that the brake hose is not twisted and is correctly located.

   Install a new front halfshaft bolt.

   Torque:
   Stage 1: 45 Nm
   Stage 2: 80°

6. Install the wheel and tire.

   Refer to: Wheel and Tire (204-04 Wheels and Tires, Removal and Installation).

7. Lower the hood and secure the support struts with the clips.

8. Install the plenum chamber panel.

   Refer to: Plenum Chamber (412-01 Climate Control, Removal and Installation).

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Front Suspension - Front Stabilizer Bar

Removal and Installation

Removal

CAUTION: Nuts and bolts must be tightened with the weight of the vehicle on the suspension.

NOTE: Only use clean water as a lubricant for the bushing, if required.

NOTE: Removal steps in this procedure may contain installation details.

1. WARNING: Make sure to support the vehicle with axle stands.

   Raise and support the vehicle.

2. Remove the front wheels and tires.

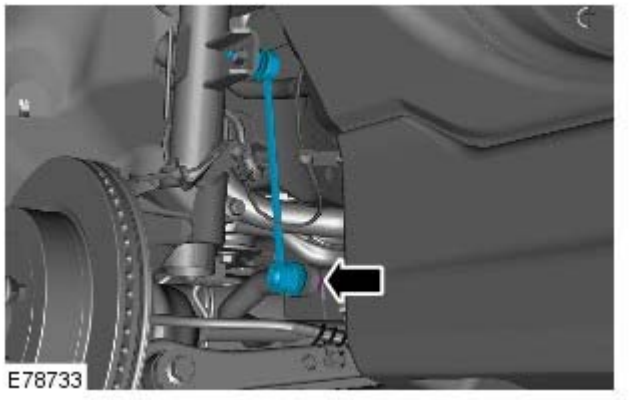
   Refer to: Wheel and Tire (204-04 Wheels and Tires, Removal and Installation).

3. Remove the driveshaft.

   Refer to: Driveshaft - Vehicles Without: Diesel Particulate Filter (DPF) (205-01 Driveshaft, Removal and Installation).

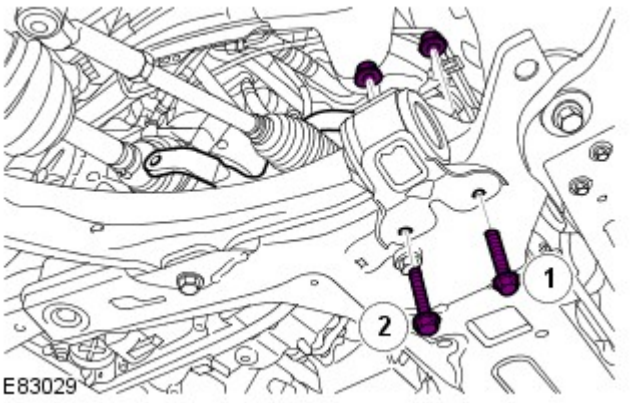
4. Remove the catalytic converters.

   Refer to: Catalytic Converter (309-00A Exhaust System - I6 3.2L Petrol, Removal and Installation).



5. CAUTION: Make sure that the ball joint ball does not rotate.
   - Disconnect both stabilizer bar links.

     Torque: 60 Nm
   - Discard the nuts.



6. WARNING: Make sure that new nuts are installed.
   - Tighten in the sequence shown.

     Torque: 175 Nm
   - Repeat the above procedure for the other side.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7. NOTE: Do not disassemble further if the component is removed for access only.

   Remove the stabilizer bar bushings.

Installation

1. CAUTION: Nuts and bolts must be tightened with the weight of the vehicle on the suspension.

   To install, reverse the removal procedure.