

2012.0 RANGE ROVER (LM), 100-00

GENERAL INFORMATION

DESCRIPTION AND OPERATION

SOLVENTS

WARNING:

Always handle all solvents, sealers and adhesives with extreme care. Some contain chemicals or give off fumes which can be dangerous to health. Always follow the manufacturers instructions. If in doubt about any substance, particularly a solvent, DO NOT use it.

CAUTION:

If in doubt about the suitability of any proprietary solvent or sealer for a particular application, contact the manufacturer of the product for information.

The Health and Safety Precautions subsection refers to some commonly used chemicals and materials, hazards associated with their use, and safety measures to be taken. Some of these chemicals may be included as an ingredient in a sealer or adhesive.

SEALERS

Certain procedures in this manual involve the use of sealants during installation of components. Where a sealant is required, the application, together with the Land Rover part number is given in the General

Specification at the start of each section and an instruction that a sealant must be used appears in the relevant repair procedure.

It is essential that the sealant(s) specified for a particular procedure are used, DO NOT use any other sealant.

Always remove traces of old sealant using a plastic scraper or suitable solvent, never use emery cloth or metal scrapers.

ADHESIVES

Whenever a procedure involves the use of an adhesive, the adhesive specified must be used and the manufacturer's instructions regarding application together with any health and safety precautions must be followed.

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SERVICE TOOLS

Special service tools have been developed to facilitate removal, dismantling and assembly of mechanical components in a cost effective and time efficient manner. The use of such special tools also helps prevent the potential for damage to components.

Some operations described in this manual cannot be carried out properly without the aid of the relevant service tools.

All orders and enquiries should be sent direct to:
<https://jlrequipment.service-solutions.com>.

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INTRODUCTION

This manual has been written in a format that is designed to meet the needs of technicians worldwide. The objective is to use common formats and include similar content in each manual.

This manual provides general descriptions for accomplishing diagnosis and testing, service and repair work with tested and effective techniques. Following them will help to ensure reliability.

IMPORTANT SAFETY INSTRUCTIONS

Appropriate service methods and correct repair procedures are essential for the safe, reliable operation of all motor vehicles as well as the personal

the safe, reliable operation of all motor vehicles as well as the personal safety of the individual carrying out the work.

Anyone who departs from the instructions provided in this manual must first establish that personal safety or vehicle integrity is not compromised by the choice of method, tools or components.

WARNINGS, CAUTIONS AND NOTES IN THIS MANUAL

WARNING:

Warnings are used to indicate that failure to follow a procedure correctly may result in personal injury.

CAUTION:

Cautions are used to indicate that failure to follow a procedure correctly may result in damage to the vehicle or equipment being used.

NOTE:

Notes are used to provide additional essential information required to carry out a complete and satisfactory repair.

Generic warnings or cautions are in their relevant description and operation procedure within section 100-00. If the generic warnings or cautions are required for a procedure, there will be a referral to the appropriate description and operation procedure.

If a warning, caution or note only applies to one step, it is placed at the beginning of the specific step.

PROCEDURES

NOTE:

TAS style procedures can be identified by steps that have no accompanying step text and the magenta color of the electrical connectors and fasteners such as nuts, bolts, clamps or clips.

A TAS removal and installation procedure uses a sequence of color illustrations to indicate the order to be followed when removing/disassembling or installing/assembling a component.

Many of the TAS procedures will have the installation information within the removal steps. These procedures will have the following note at the beginning of the procedure:

NOTE:

Removal steps in this procedure may contain installation details.

Items such as O-ring seals, gaskets, seals, self-locking nuts and bolts are to be discarded and new components installed unless otherwise stated within the procedure. Coated nuts or bolts are to be reused, unless damaged or otherwise stated within the procedure.

Specification procedures will contain all technical data that are not part of a repair procedure.

TAS Graphics

Colors used in the graphic are as follows:

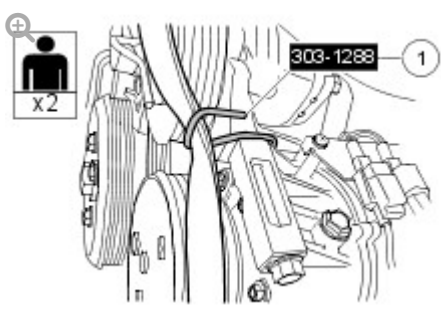
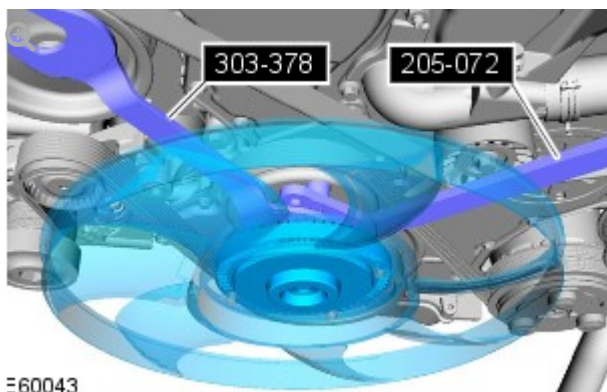
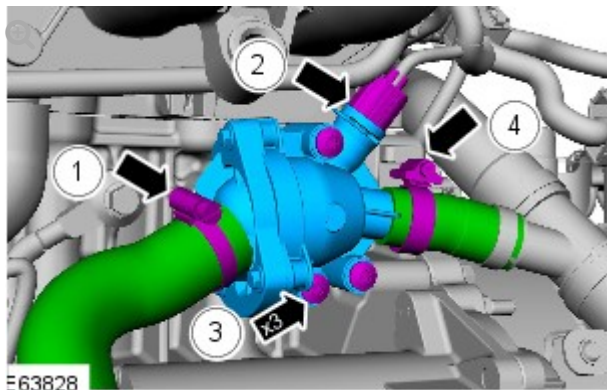
- Blue - Indicates the target item, item to be removed/installed or disassembled/assembled
- Green and Brown - Indicates a secondary item that needs to be detached, removed/installed or disassembled/assembled prior to the target item
- Yellow - Component that is touched or affected in a way but remains in

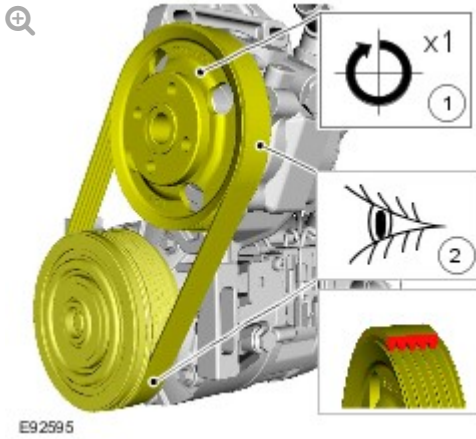
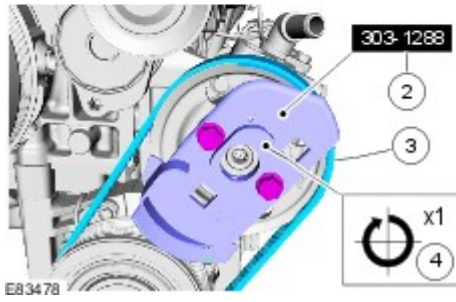
- Yellow - Component that is touched or affected in a way but remains in the vehicle. It may be detached, attached, moved, modified, checked, adjusted etc.
- Magenta - Indicates electrical connectors and fasteners such as nuts, bolts, clamps or clips
- Pale Blue - is for the special tool(s) and general equipment.

There may be multiple steps assigned to one illustration.

Numbered pointers are used to indicate the number of electrical connectors and fasteners such as nuts, bolts, clamps or clips.

Items in the illustration can be transparent or use cutouts to show hidden detail(s).

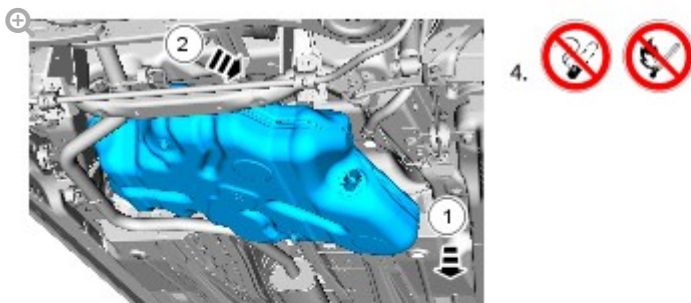




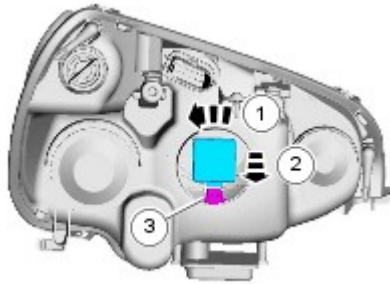
TAS Symbols

Symbols are used inside the graphics and in the text area to enhance the information display. The following paragraphs describe the various types and categories of symbols.

Prohibition symbols advise on prohibited actions to either avoid damage or health and safety related risks.



Health and Safety symbols recommend the use of particular protection equipment to avoid or at least reduce the risk or severity of possible injuries.

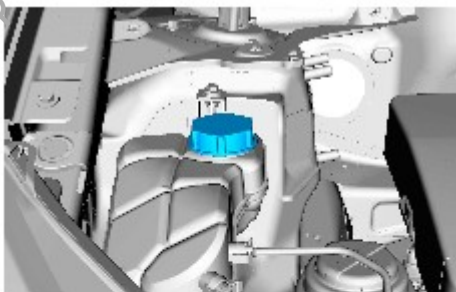


2.



E85027

Warning symbols are used to indicate potential risks resulting from a certain component or area.



3.



E85028

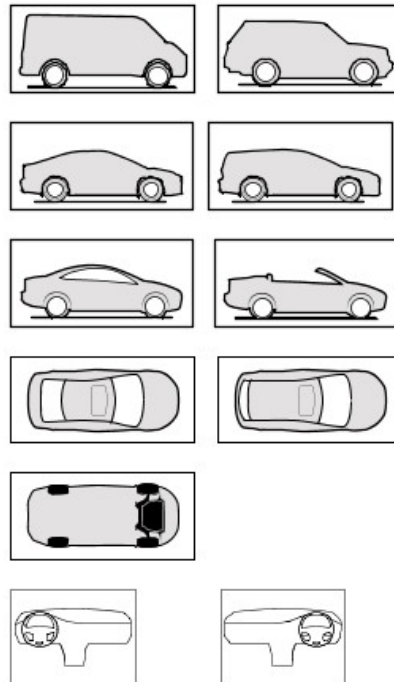
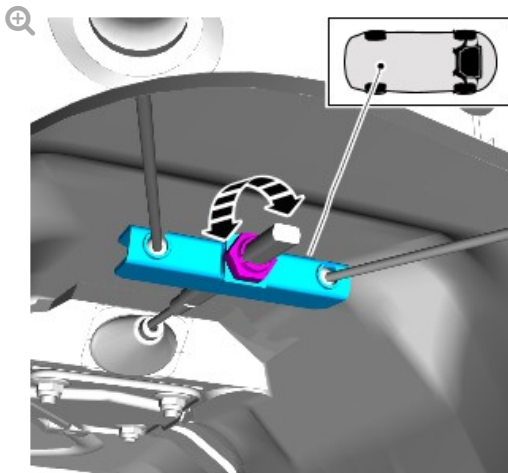
Instruction symbols are used to apply sealer, lubricant, weight, tape or cleaning detergent to a component.





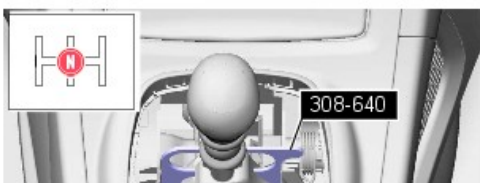
E84834

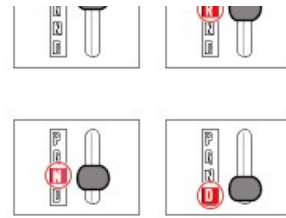
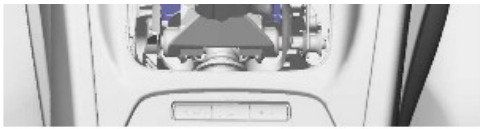
Location symbols are used to show the location of a component or system within the vehicle.



E84835

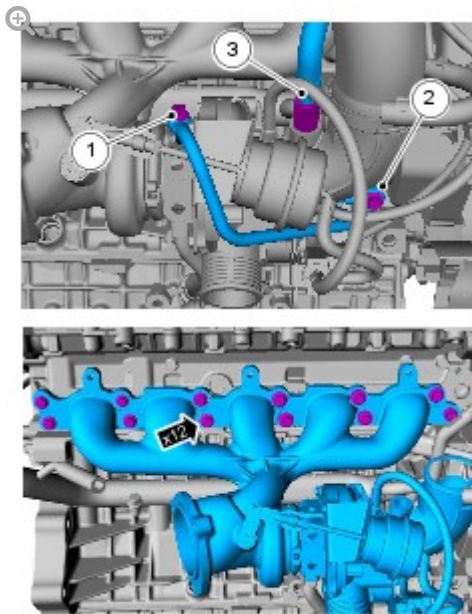
Gearshift lever or selector lever position symbols are used to show which gearshift lever or selector lever position is to be set.



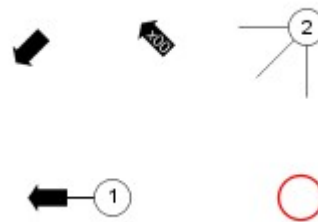


E84836

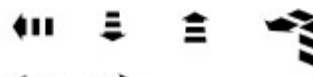
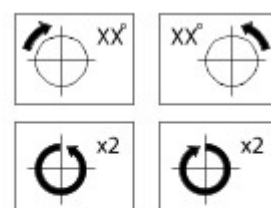
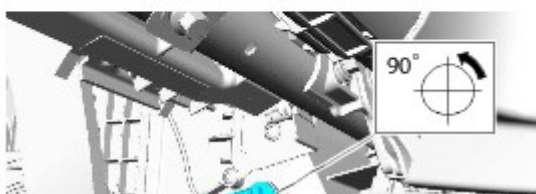
Pointer symbols are used to draw the attention to components and give special instructions such as a required sequence or number of components. The number of components is reflected by the value inside the luty arrow. A sequence number is located inside the circle. Numbers inside circles are also used to allocate special information such as tightening torques or chemicals to a particular component.

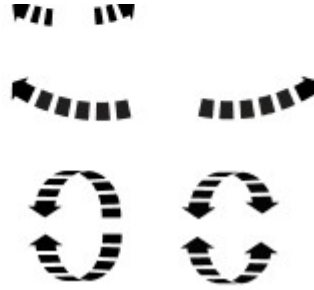


E84837



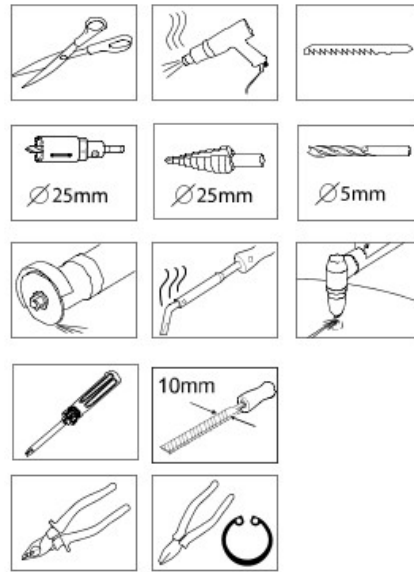
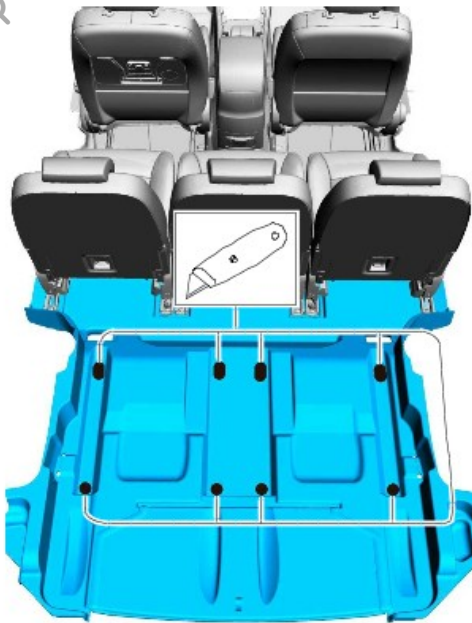
Movement arrows are used to show three dimensional or rotational movements. These movements can include specific values inside the symbol if required.





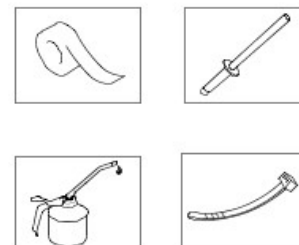
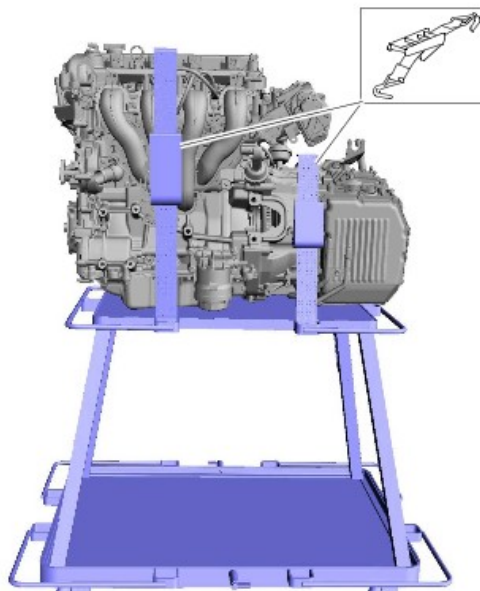
E84838

Standard tool symbols recommend the use of certain standard tools. These tools can include dimension values if required.



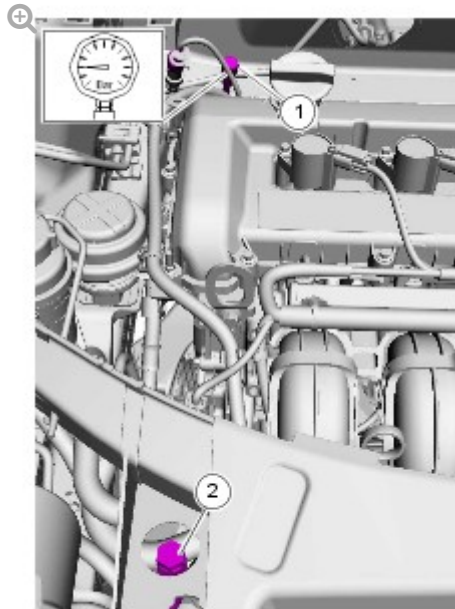
E84839

The following graphic illustrates a set of symbols that are used to provide detailed information on where to apply a material.

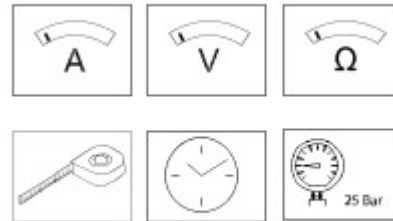


E84840

Measurement symbols provide detailed information on where to carry out a specific measurement. These symbols can include specific values if required.



E84841



Special Tools and Torque Figure(s)

Special tools will be shown with the tool number in the illustration. The special tool number(s), general equipment, material(s) and torque figure(s) used for the procedure step will be shown in the text column.

2012.0 RANGE ROVER (LM), 100-01

IDENTIFICATION CODES

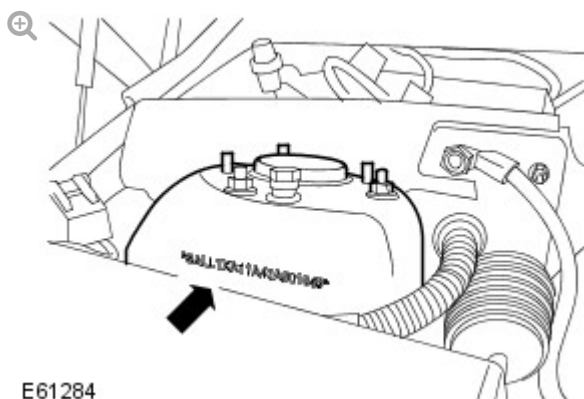
DESCRIPTION AND OPERATION

VIN Number

The VIN number will be found in three locations:

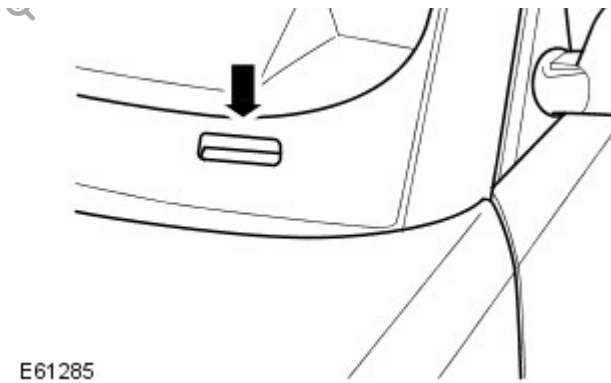
- **1.** Stamped on the front of the RH front suspension turret.
- **2.** At the bottom of the windshield glass on the LH side of the vehicle and visible from the outside.
- **3. UK, Europe and ROW - Not NAS/Canada** -On the VIN plate attached to the LH inner wing, forward of the suspension turret.
- **4. NAS/Canada** - On the Tire Data/Specification label attached to the front of the LH B-pillar.

RH Front Suspension Turret VIN



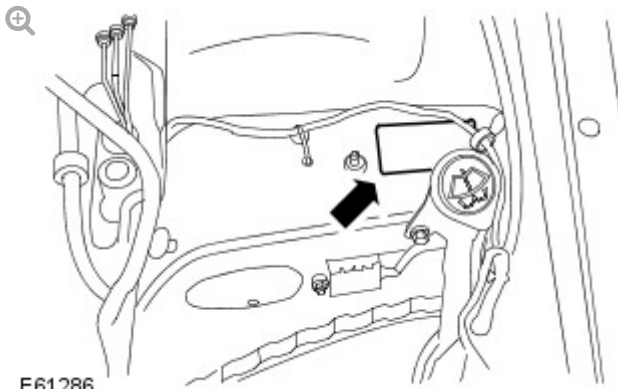
E61284

Windscreen VIN



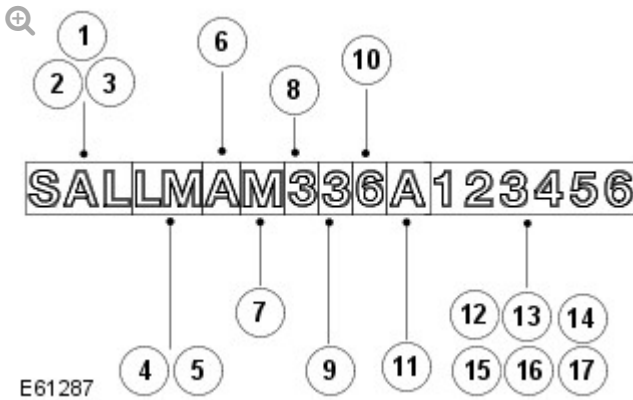
E61285

LH Inner Wing VIN



E61286

VIN number - UK, EU and ROW

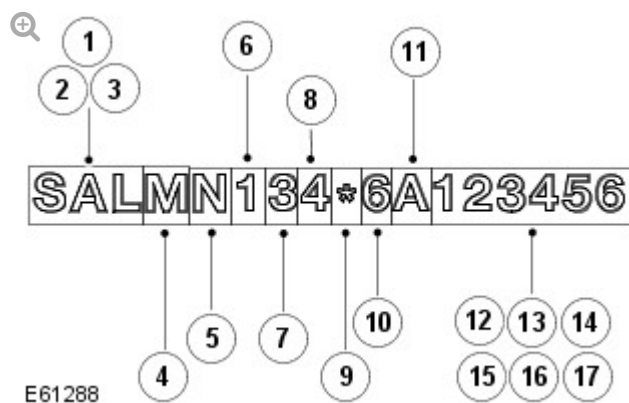


E61287

VIN POSITION	CHARACTER	IDENTIFIES
1 - 3 - World identifier	SAL	Land Rover (UK)
4,5 - Vehicle type	LM	Range Rover
6 - Class	A	Standard
7 - Body style	M	4 Door
7 - Body style	K	Armoured

8 - Engine	2	368DT - V8 3.6 Diesel
8 - Engine	H	448DT - V8 4.4 Diesel
8 - Engine	J	448DT - V8 4.4 Diesel with DPF
8 - Engine	D	508PN - AJ V8 5.0 NA Petrol
8 - Engine	E	508PS - AJ V8 5.0 SC Petrol
9 - Transmission and steering	3	RHD Automatic
9- Transmission and steering	4	LHD Automatic
10 - Model year	B	2011
11 - Plant	A	Solihull
12 - 17 - Serial number	1 2 3 4 5 6	Unique six digit serial number

VIN number - NAS and Canada



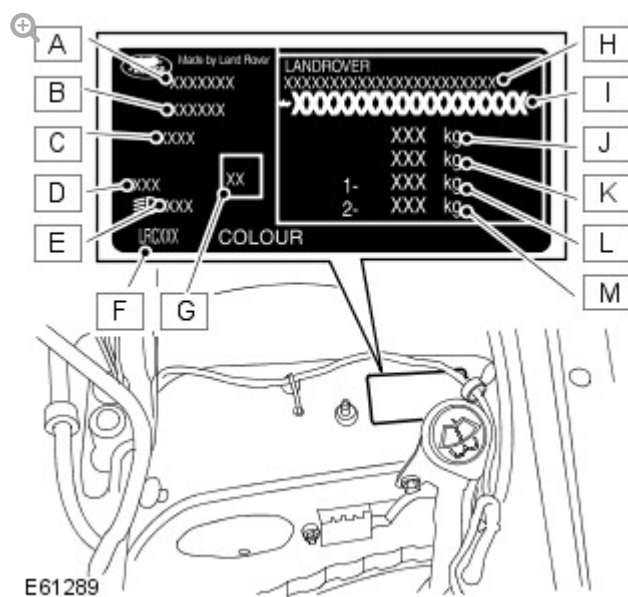
NOTE:

Active belts with driver and passenger frontal air bags and side inflatable restraint (1st and 2nd row) and driver knee air bag.

VIN POSITION	CHARACTER	IDENTIFIES
1 - 3 - World identifier	SAL	Land Rover (UK)
4 - Model range	M	Range Rover
5 - Class	E	#HSE (without luxury pack, with logic 7 and Bi-Xenon)
5 - Class	F	#HSE (with luxury pack, logic 7 and Bi-Xenon)

		Agency
5 - Class	H	#Westminster
5 - Class	N	#China
5 - Class	P	#Autobiography
6 - Body style	1	4 Door Station Wagon
7 - Engine	2	368DT - V8 3.6 Diesel
7 - Engine	H	448DT - V8 4.4 Diesel
7 - Engine	D	508PN - V8 5.0 NA Petrol
7 - Engine	E	508PS - V8 5.0 SC Petrol
8- Transmission and steering	4	LHD Automatic
9 - Check digit	*	Derived by calculation
10 - Model year	B	2011
11 - Plant	A	Solihull
12 -17 - Serial number	1 2 3 4 5 6	Unique six digit serial number

LH Inner Wing, Forward of Suspension Turret, VIN Plate - Not NAS/Canada

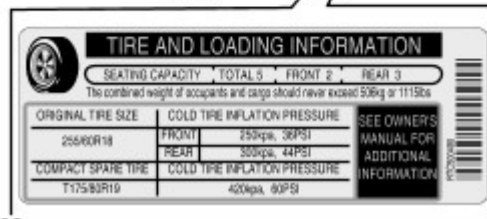
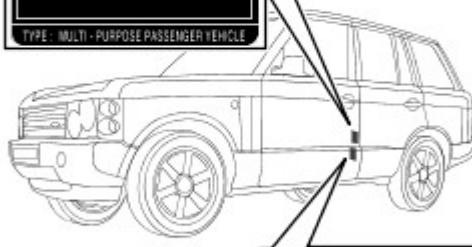


The VIN plate contains the following information:

- **A** - Reserved
- **B** - Engine Description

- **E** - Engine Description
- **C** - Country
- **D** - Diesel Indicator
- **E** - Reserved
- **F** - Headlamp Code/initial aim value - If shown
- **G** - Colour code/group
- **H** - Type/Approval Number - If shown
- **I** - VIN Number
- **J** - Gross Vehicle Weight
- **K** - Gross Train Weight
- **L** - Front Axle Weight
- **M** - Rear Axle Weight

VIN/Certification/Tire Data Label - NAS only



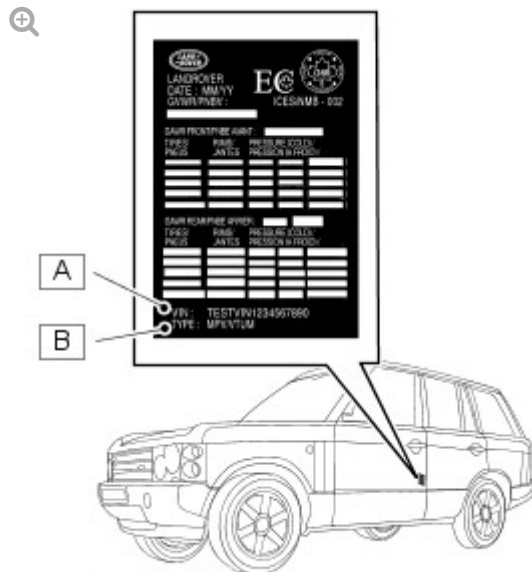
The Certification Label contains the following VIN information:

- **A** - VIN Number

- A - VIN NUMBER

- B - Bar code identification

VIN/Tire Pressure Specification Label - Canada only



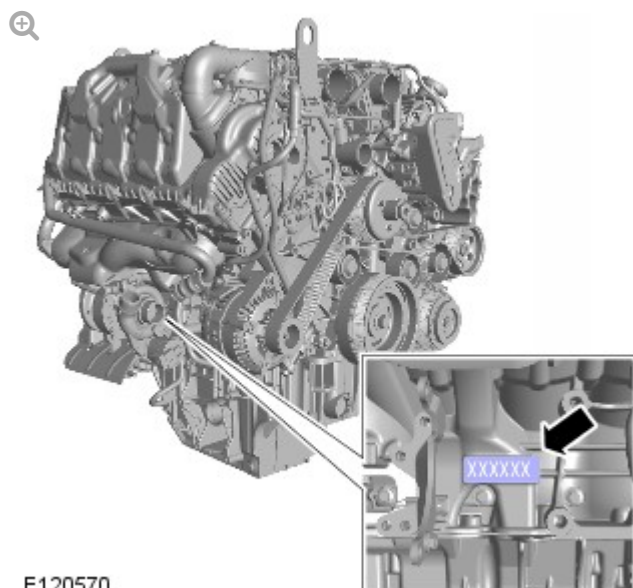
E61291

The Tire Pressure Certification Label contains the following VIN information:

- A - VIN Number
- B - Vehicle Type

Unit/Assembly Serial Number Locations

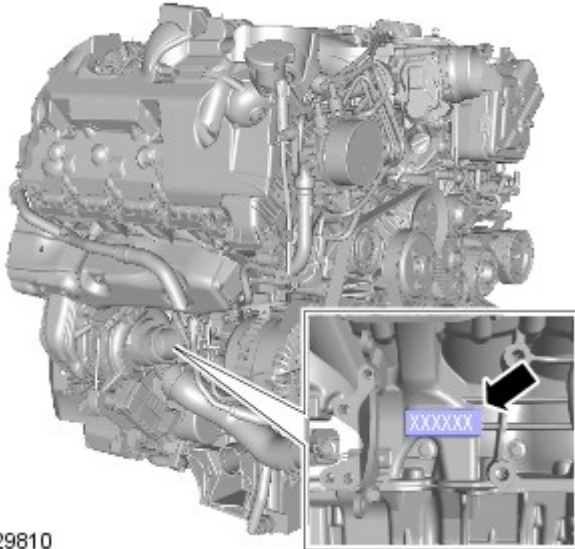
3.6 Litre V8 Diesel Engine Serial Number



E120570

The 3.6 Litre V8 Diesel Engine Serial Number is stamped on the RH side of the cylinder block.

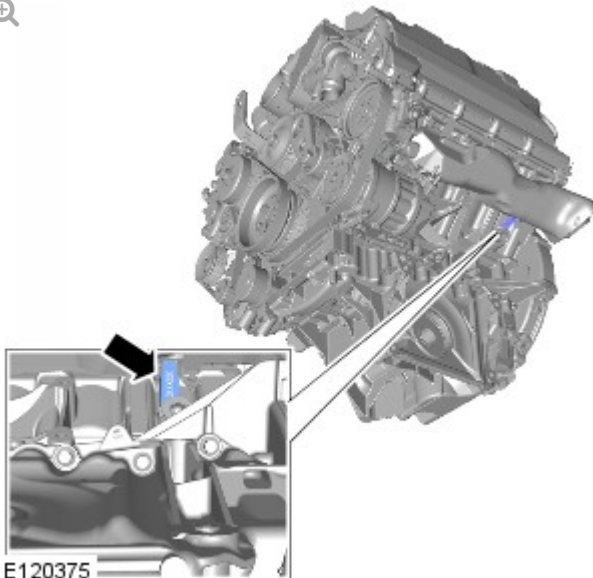
4.4 Litre V8 Diesel Engine Serial Number



E129810

The 4.4 Litre V8 Diesel Engine Serial Number is stamped on the RH side of the cylinder block.

5.0 Litre SC and 5.0 Litre NA V8 Petrol Engine Serial Number



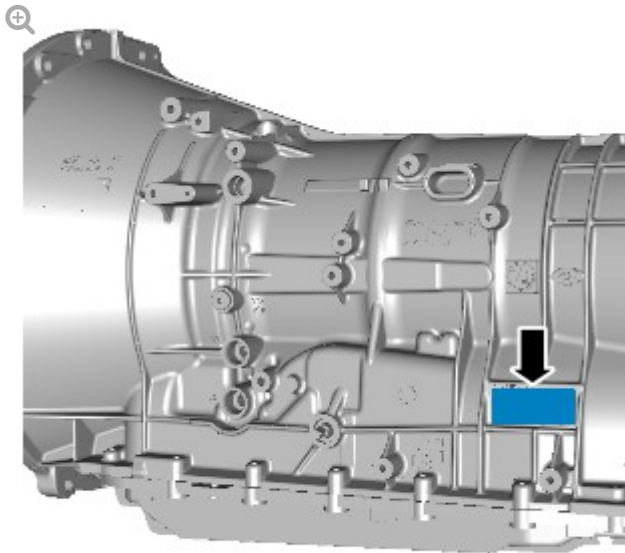
E120375

The 5.0 Litre SC and 5.0 Litre NA V8 Petrol Engine Serial Number is stamped on the LH side of the cylinder block.

Transmission Serial Number

NOTE:

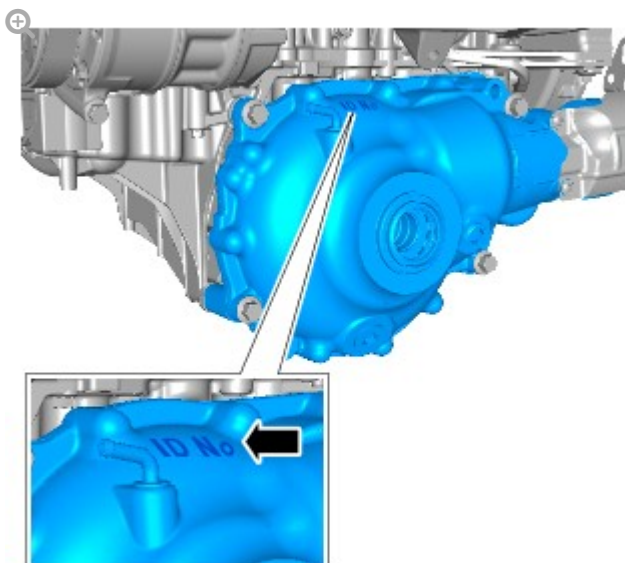
Some variation in the illustrations may occur, but the essential information is always correct.



E120916

The transmission serial number is on a plate attached to the LH side of the transmission casing.

Front Differential Serial Number

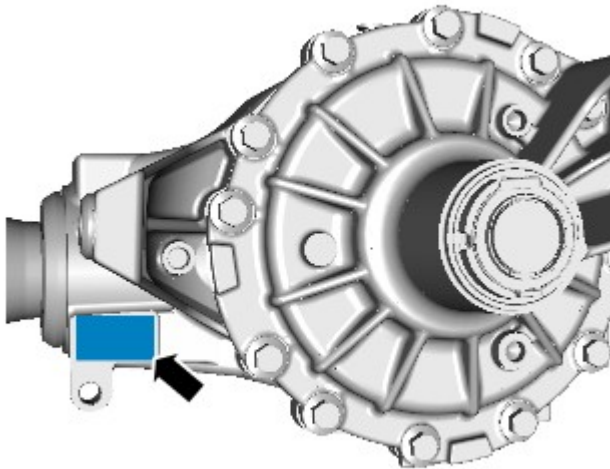


E120809

The Front Differential Serial Number is stamped on top of the differential

casing and is located above the removable cross member.

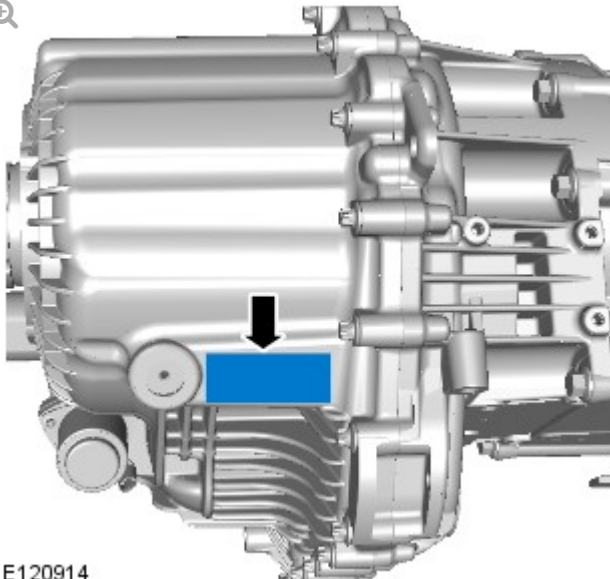
Rear Differential Serial Number



E120915

The Rear Differential Serial Number is stamped on the underside of the differential casing adjacent to the front mounting.

Transfer Case Serial Number



E120914

The Transfer Case serial number is stamped on the RH side of the transfer case and may also be on a bar coded self-adhesive label attached to the case.

2012.0 RANGE ROVER (LM), 100-01

IDENTIFICATION CODES

DESCRIPTION AND OPERATION

Commission plate



The commission plate is mounted on the hood locking platform and contains the contact details for Land Rover Special Vehicles, the paint code, contract number and date of commission of the vehicle.

2012.0 RANGE ROVER (LM), 100-02

JACKING AND LIFTING

DESCRIPTION AND OPERATION

GENERAL

WARNING:

The following instructions must be adhered to before raising the vehicle off the ground:

- Position vehicle on a solid, level surface.
- Apply the parking brake.
- Select 'P' - PARK on automatic transmission selector and 'H' High on

transfer case.

WARNING:

If the drive shaft(s) are to be disconnected, it will be necessary to raise all four wheels off the ground in order that the shaft(s) can be rotated. DO NOT use the customer jack and ensure that the vehicle is adequately supported on axle stands. With the vehicle raised, it will be necessary to release the park brake and select Neutral - 'N' in the main transmission to enable the drive shaft(s) to be rotated

CAUTIONS:

- To avoid damage to the underbody components of the vehicle, the following instructions must be adhered to:
- Do not position jacks or axle stands under the following components:
 - Body structure other than any approved jacking or lifting points
 - Bumpers
 - Fuel lines
 - Fuel tank
 - Brake lines
 - Front or rear suspension arms
 - Steering linkage
 - Transfer case
 - Front or rear differential units
 - Transmission
 - Engine oil pan - See note below

NOTE:

For certain repair operations, it may be necessary to support the engine under the oil pan. In this case, a block of hardwood or a rubber pad must be positioned on the jack lifting pad to protect the oil pan.

VEHICLE JACK

The jack provided with the vehicle is only intended for use in an emergency such as changing a tire. **DO NOT** use the jack for any other purpose. Refer to the Owner's Handbook for the vehicle jack location points and jacking procedures.

WARNING:

Never work under a vehicle supported solely by the vehicle jack.

HYDRAULIC JACK

A hydraulic jack with a minimum lifting capacity of 1500 kg, (3,300 lbs) must be used.

WARNINGS:

- Do not commence work on the underside of the vehicle until suitable axle stands have been placed in the correct position.
- Always chock the wheels when jacking. The parking brake may be ineffective when the wheel(s) are off the ground.

RAISING AND SUPPORTING THE VEHICLE

To assist in raising the vehicle, jacking points are provided as shown in the following illustrations.

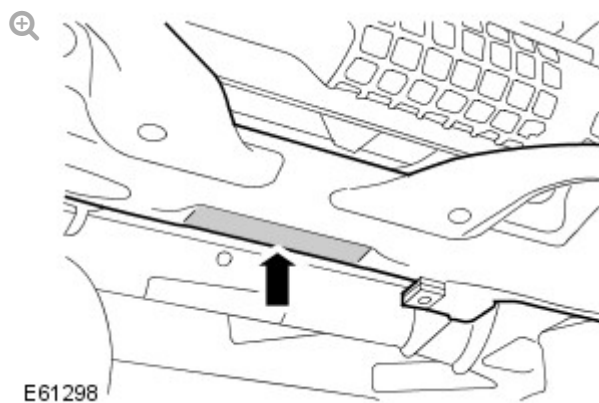
RAISING THE FRONT OF THE VEHICLE

Apply the parking brake.

Select 'P' - PARK on automatic transmission selector.

WARNING:

Always chock the rear wheels when jacking the front of the vehicle.



Position the lifting pad of the hydraulic jack under the centre of the front sub-frame, front cross member.

With the vehicle raised to the desired height, position axle stands under, either, the front sub-frame or the recommended customer jacking points.



CAUTION:

Position suitable material between axle stands and component/body

to prevent damage.

Carefully lower jack until vehicle rests on axle stands.

WARNING:

Before commencing work on the underside of the vehicle, ensure that axle stands are correctly positioned and vehicle is securely supported.

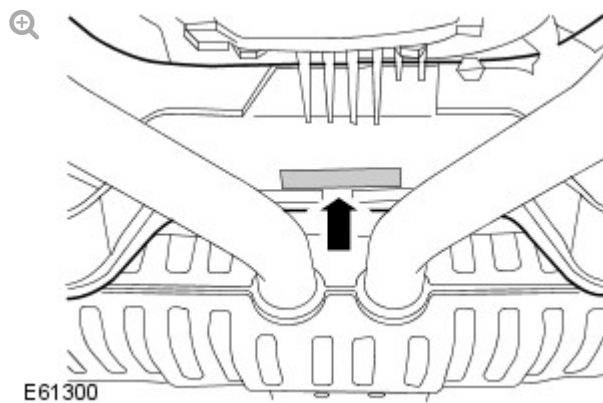
Reverse procedure when removing vehicle from stands.

RAISING THE REAR OF THE VEHICLE

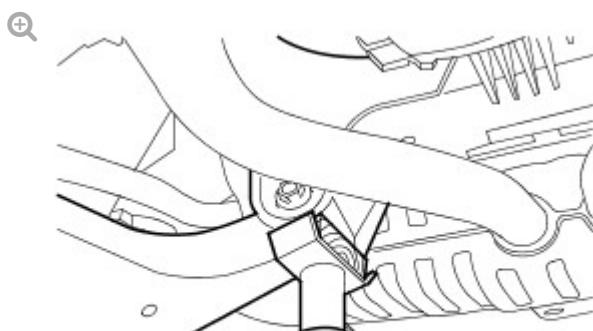
Select 'P' - PARK on automatic transmission selector.

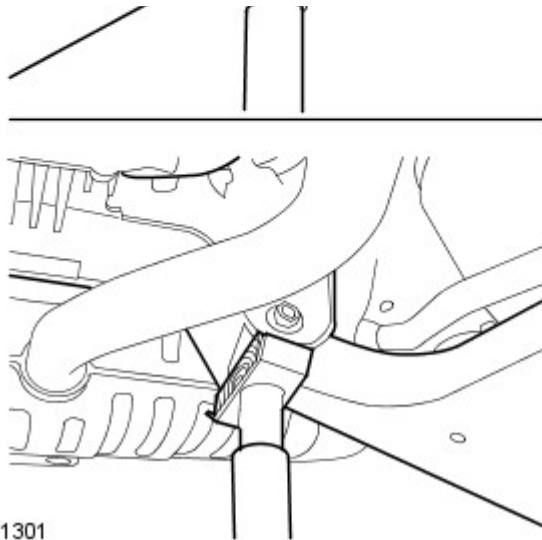
WARNING:

Always chock the front wheels when jacking the rear of the vehicle.



Position the lifting pad of the hydraulic jack under the centre of the rear sub-frame, rear cross member as shown.





With vehicle raised to desired height, position axle stands under the rear sub-frame. Alternatively, the axle stands may be positioned under, either, the recommended customer jacking points or the front mounting points of the rear sub-frame.

CAUTION:

Position suitable material between axle stands and component/body to prevent damage.

Carefully lower jack until vehicle rests on axle stands.

WARNING:

Before commencing work on underside of vehicle, ensure that axle stands are correctly positioned and vehicle is securely supported.

Reverse procedure when removing vehicle from stands.

2012.0 RANGE ROVER (LM), 100-02

JACKING AND LIFTING

DESCRIPTION AND OPERATION

Vehicle on Wheels - Four-Post Ramp

WARNING:

If the drive shaft(s) are to be disconnected, it will be necessary to raise all four wheels off the ramp in order that the shaft(s) can be rotated. Refer to the 'Wheel Free Lift - Four-Post Ramp' section below for lifting instructions then release the parking brake and select NEUTRAL 'N' in the transmission.

WARNING:

Do not push the vehicle backwards and forwards along the ramp in order to gain access to the drive shaft fixings.

Position the vehicle on the ramp with the front and rear of the vehicle equidistant from the ends of the ramp. Chock the wheels, select NEUTRAL in the transmission and where practicable, apply the parking brake.

Wheel Free Lift - Four-Post Ramp

WARNING:

The vehicle cannot be supported safely in a wheel free condition using the wheel free facility of a four-post ramp, and under no circumstances must this method be used.

Raising and Supporting the Vehicle

1. Position vehicle on ramp.
2. Position suspension in 'off-road' height.
3. Apply parking brake.
4. Raise ramp to desired height.
5. Using suitable equipment, raise the vehicle to the desired height and position axle stands to recommended customer jacking points.

CAUTION:

Place suitable material between axle stands and body to avoid damage to vehicle.

6. Lower vehicle slowly until weight of vehicle rests on axle stands and road wheels are just clear of ramp.
7. Ensure that the vehicle is correctly supported on all four axle stands.
8. Lower the ramp to suitable working height.

WARNING:

Make sure that the vehicle is stable before commencing work.

NOTE:

Return the suspension to 'normal ride height' when the vehicle is removed from the ramp.

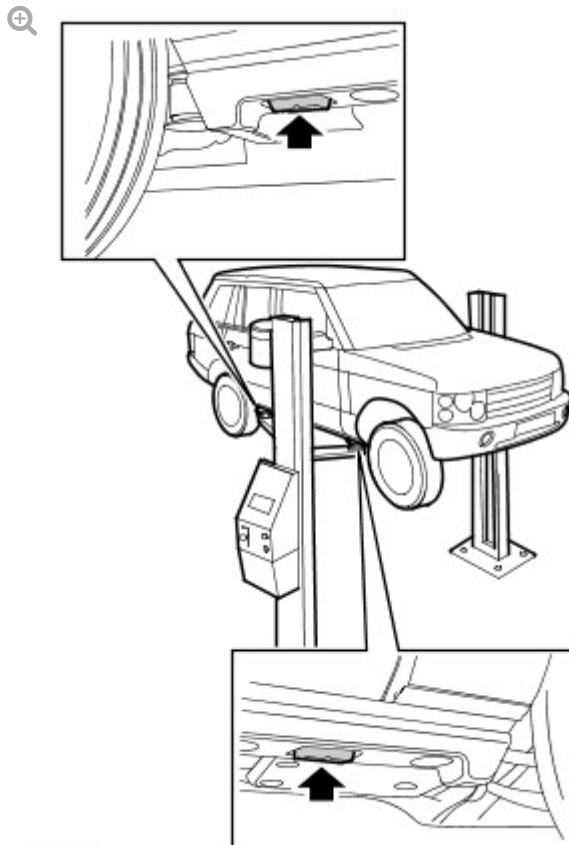
removed from the ramp.

Two-Post Lift

CAUTION:

If the drive shaft(s) are to be removed, release the parking brake and select NEUTRAL 'N' in the transmission in order that the shaft(s) can be rotated when the vehicle is raised to the desired height.

1. Position the vehicle with the centre of the lift pillars aligned approximately with the front of the driver/passenger seat cushions.



E61430

2. Extend the lifting arms and position the pad of each lifting arm beneath the recommended customer jacking points.
3. Raise the vehicle until the wheels are just clear of the ground and check that the pads of each lifting arm are still correctly positioned.
4. Raise the vehicle to the desired height.

5. Ensure that the vehicle is correctly supported on all four lifting pads, that pads are still correctly positioned and are in full contact with the body.

WARNING:

Ensure that the vehicle is stable before commencing work.

2012.0 RANGE ROVER (LM), 100-02

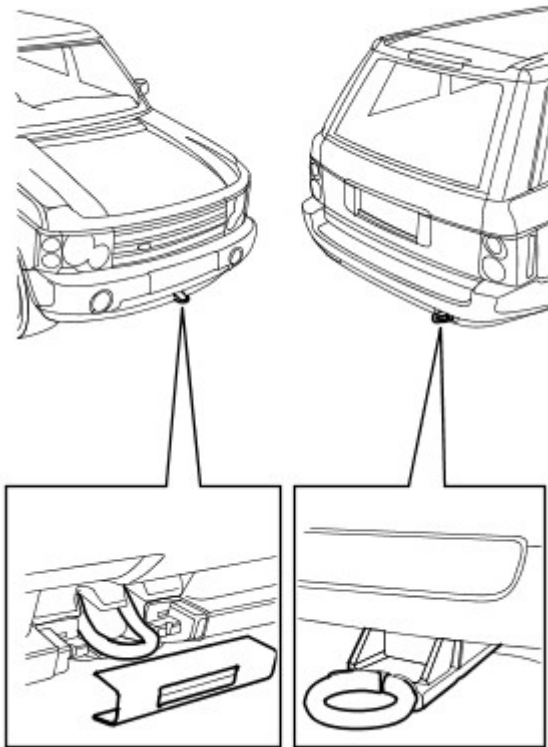
JACKING AND LIFTING

DESCRIPTION AND OPERATION

TOWING/LASHING EYES

CAUTION:

The single towing/lashing eyes at the front and rear of the vehicle are designed for vehicle recovery purposes only and **MUST** not be used to tow a trailer or caravan.



E61431

The front towing/lashing eye is accessible after releasing the towing eye access panel and removing the panel.

CAUTIONS:

- Ensure that during towing, the towing attachment does not contact the bumper.
- The rear towing/lashing eye should only be used for towing another vehicle or for recovery purposes to enable this vehicle to be

positioned in order that the front towing eye may be used for recovery/towing.

4 WHEEL TOWING

CAUTIONS:

- Suspended towing of this vehicle **MUST NOT** be attempted, if four wheel towing is not possible, vehicle must be recovered on a suitable trailer.
- The vehicle may be towed for a maximum of 1 hour or 31 miles (50 km) at a maximum speed of 31 mph (50 km/h), these limits **MUST NOT** be exceeded.
- The following procedures must be followed to ensure that the vehicle is towed in a safe condition and damage to the vehicle transmission system is prevented.

1. Remove the front towing/lashing eye access panel.
2. Secure the towing attachment from the recovery vehicle to the towing/lashing eye.

CAUTION:

Ensure that the towing attachment will not contact the front bumper during towing.

3. Apply the parking brake.
4. Insert ignition key and turn the ignition switch to position 'II'.

CAUTION:

If 'N' - Neutral cannot be selected, front and rear driveshafts must be removed before vehicle is towed

removed before vehicle is towed.

6. Apply the footbrake and move the automatic transmission selector lever to the 'N' Neutral position.

NOTE:

If electrical power is not available, use the manual interlock release tab on the selector lever to move the selector lever to the Neutral position.

7. Select 'H' - HIGH on the transfer box.

CAUTION:

If electrical power is not available, and 'H' - HIGH cannot be selected, the vehicle may not be towed but must be recovered on a suitable trailer. If, however, the transfer box was in 'H' - HIGH when electrical power was lost, the vehicle may still be towed.

8. Release the parking brake.

WARNING:

Do not release the parking brake until towing is about to commence. Whilst towing, do not attempt to remove the ignition key and do not turn the key to any position other than 'II'. With the engine switched off, the power assisted steering system and brake booster will be inoperative thereby resulting in an increase in the effort required to turn the steering wheel and apply the brakes.

CAUTION:

The vehicle tow connections should only be used in normal road conditions, 'snatch' recovery must be avoided.

ON COMPLETION OF 4 WHEEL TOWING

1. Apply the parking brake.
2. Detach towing equipment from towing/lashing eyes.
3. Install the towing eye access panel.

TRANSPORTING BY TRAILER

CAUTION:

Use the towing/lashing eyes at the front and rear of the vehicle, DO NOT secure lashing hooks or restraints to any other part of the vehicle.

Position the vehicle, apply the parking brake and select 'N' - Neutral on the automatic transmission selector lever.

2012.0 RANGE ROVER (LM), 100-02

JACKING AND LIFTING

DESCRIPTION AND OPERATION

GENERAL

WARNING:

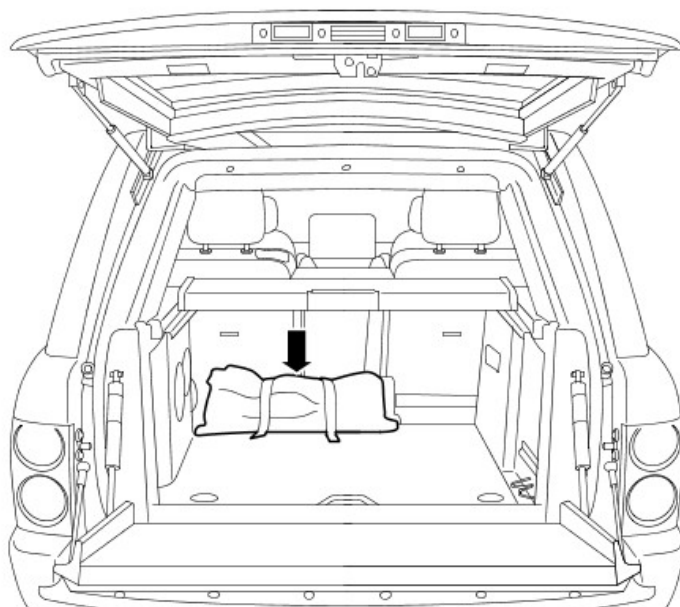
Due to the additional weight of the armoured vehicle, an hydraulic jack is NOT recommended for lifting. A wheel free lift should always be used.

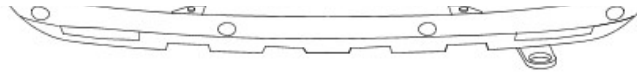
CAUTIONS:

- To avoid damage to the underbody components of the vehicle, the following instructions must be adhered to:
- Do not position jacks or axle stands under the following components:
 - Body structure other than any approved jacking or lifting points
 - Bumpers
 - Fuel lines
 - Fuel tank
 - Brake lines
 - Front or rear suspension arms
 - Steering linkage
 - Transfer case
 - Front or rear differential units
 - Transmission

For certain repair operations, it may be necessary to support the engine under the oil pan. In this case, a block of hardwood or a rubber pad must be positioned on the jack lifting pad to protect the oil pan.

VEHICLE JACK





E72397

WARNING:

Never work under a vehicle supported solely by the vehicle jack.

The jack provided with the vehicle is only intended for use in an emergency such as changing a tire. DO NOT use the jack for any other purpose. Refer to the Owner's Handbook for the vehicle jack location points and jacking procedures.

HYDRAULIC JACK

Due to the additional weight of the armoured vehicle, an hydraulic jack is NOT recommended for lifting. A wheel free lift should always be used.

2012.0 RANGE ROVER (LM), 100-02

JACKING AND LIFTING

DESCRIPTION AND OPERATION

WARNING:

Always ensure that any jacks or stands that you plan to use, when working on the vehicle, have sufficiently capacity to carry the additional weight.

General Precautions

All the jacking and lifting points for the armoured version of the Range Rover are exactly the same as the standard vehicle. However, because of the specification of the glass and the body armour this vehicle is significantly heavier than the standard Range Rover.

Vehicle on Wheels - Four-Post Ramp

WARNINGS:

- If the drive shaft(s) are to be disconnected, it will be necessary to raise all four wheels off the ramp in order that the shaft(s) can be rotated. Refer to the 'Wheel Free Lift - Four-Post Ramp' section below for lifting instructions then release the parking brake and select NEUTRAL 'N' in the transmission.

- Do not push the vehicle backwards and forwards along the ramp in order to gain access to the drive shaft fixings.

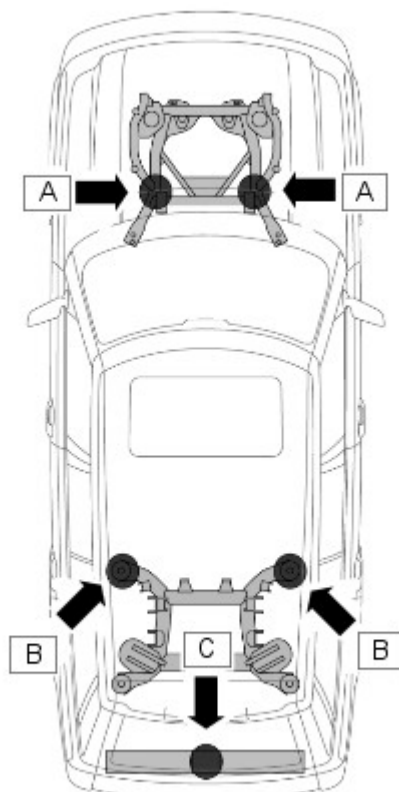
Position the vehicle on the ramp with the front and rear of the vehicle equidistant from the ends of the ramp. Chock the wheels, select NEUTRAL in the transmission and where practicable, apply the parking brake.

Wheel Free Lift - Four-Post Ramp

WARNING:

The vehicle cannot be supported safely in a wheel free condition using the wheel free facility of a four-post ramp, and under no circumstances must this method be used.

A wheel free condition may only be achieved on a four post ramp by using a 2.6 tonne jacking beam together with appropriate adaptors beneath the recommended customer jacking points.



E72398

Raising and Supporting the Vehicle

1. Position vehicle on ramp.
2. Position suspension in 'off-road' height.
3. Apply parking brake.
4. Raise ramp to desired height.
5. Using suitable equipment, raise the vehicle to the desired height and position axle stands to recommended customer jacking points (A, B or C).

CAUTION:

Place suitable material between axle stands and body to avoid damage to vehicle.

6. Lower vehicle slowly until weight of vehicle rests on axle stands and road wheels are just clear of ramp.
7. Ensure that the vehicle is correctly supported on all four axle stands.
8. Lower the ramp to suitable working height.

WARNING:

Make sure that the vehicle is stable before commencing work.

NOTE:

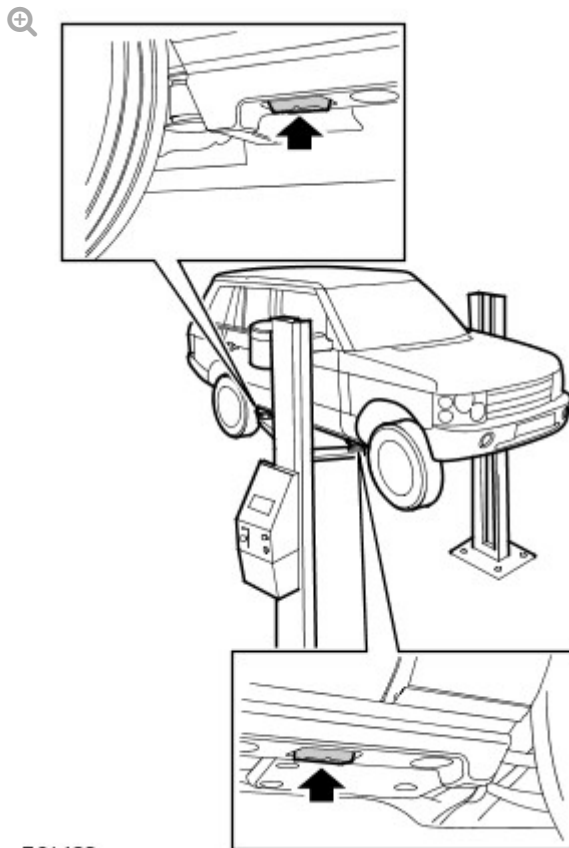
Return the suspension to 'normal ride height' when the vehicle is removed from the ramp.

Two-Post Lift

CAUTION:

If the drive shaft(s) are to be removed, release the parking brake and select NEUTRAL 'N' in the transmission in order that the shaft(s) can be rotated when the vehicle is raised to the desired height.

1. Position the vehicle with the centre of the lift pillars aligned approximately with the front of the driver/passenger seat cushions.



E61430

2. Extend the lifting arms and position the pad of each lifting arm beneath the recommended customer jacking points.
3. Raise the vehicle until the wheels are just clear of the ground and check that the pads of each lifting arm are still correctly positioned.
4. Raise the vehicle to the desired height.

WARNING:

Ensure that the vehicle is stable before commencing work.

5. Ensure that the vehicle is correctly supported on all four lifting pads, that pads are still correctly positioned and are in full contact with the body.

2012.0 RANGE ROVER (LM), 100-03

MAINTENANCE SCHEDULES

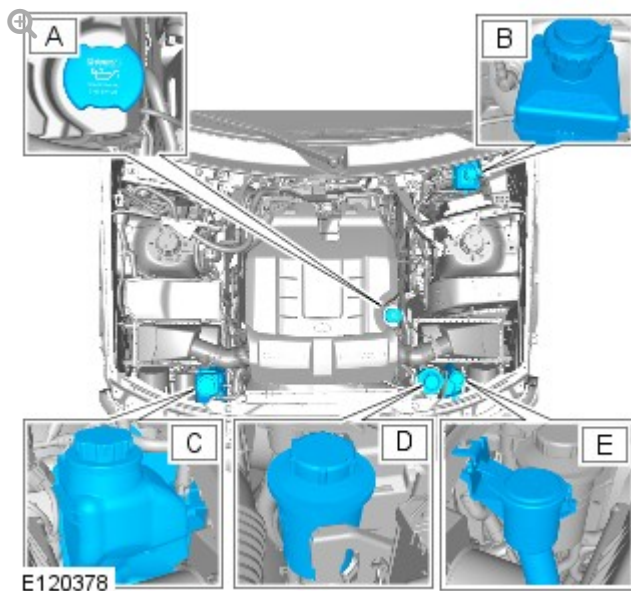
Torque Specifications

DESCRIPTION	NM	LB-FT
Seat frame fixing Torx screws	40	30
Seat belt fixing Torx screws	40	30
Road wheel nuts	140	103

CAUTION:

Unless stated otherwise, the following operations must be carried out at every indicated service interval.

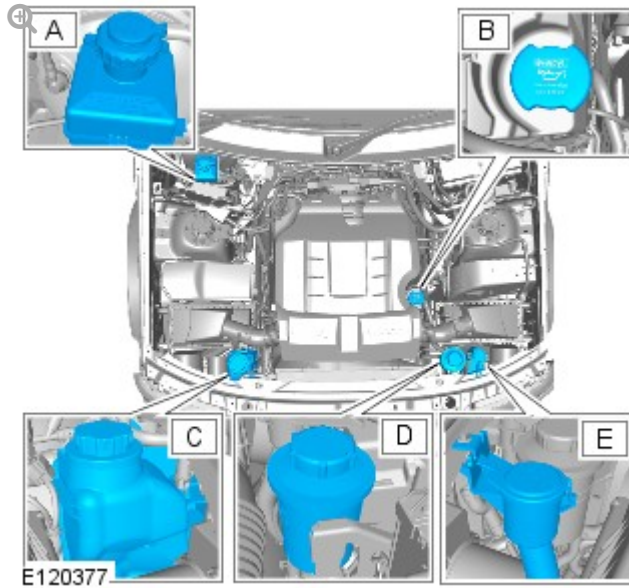
UNDERBONNET VIEW - 5.0 LITRE NA



- **A.** Engine oil filler cap
- **B.** Brake fluid reservoir - LHD illustrated, RHD on opposite side
- **C.** Coolant expansion tank
- **D.** Power steering fluid reservoir
- **E.** Windshield washer fluid reservoir

- E. windshield washer fluid reservoir

UNDERBONNET VIEW - 5.0 LITRE SC



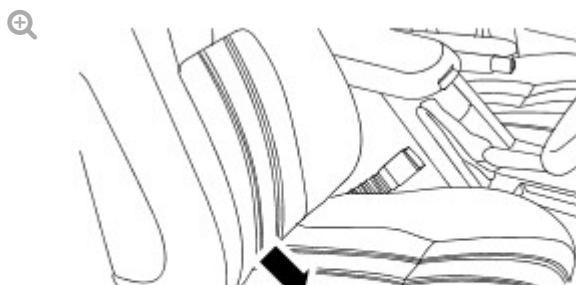
- A. Brake fluid reservoir - RHD illustrated, LHD on opposite side
- B. Engine oil filler cap
- C. Coolant expansion tank
- D. Power steering fluid reservoir
- E. Windshield washer fluid reservoir

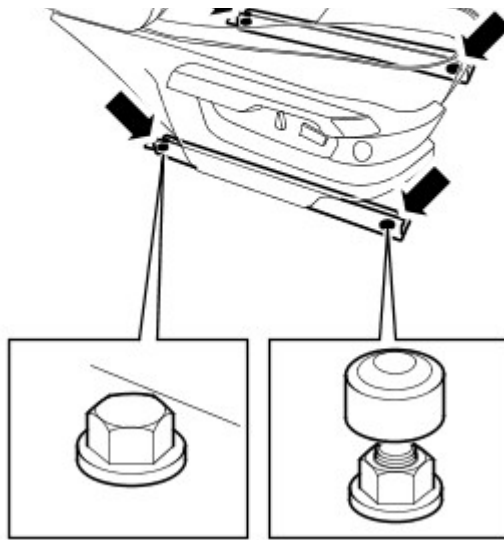
MAINTENANCE OPERATIONS

Seats and Safety Belts

Note: The following procedures should only be completed when carrying out Service Inspection 1 and Service Inspection 2.

Front seat fixings

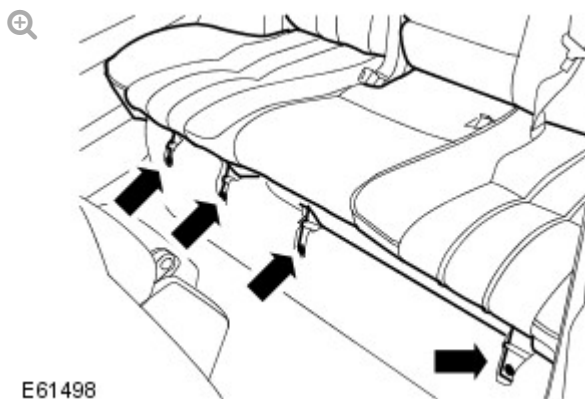




E61497

1. Check front seat fixings are secured to the floor and that the seat frames show no signs of movement.

Rear seat frame front fixings



E61498

2. Check that the rear seat frame front fixings are secure and that the seat frames show no signs of movement.

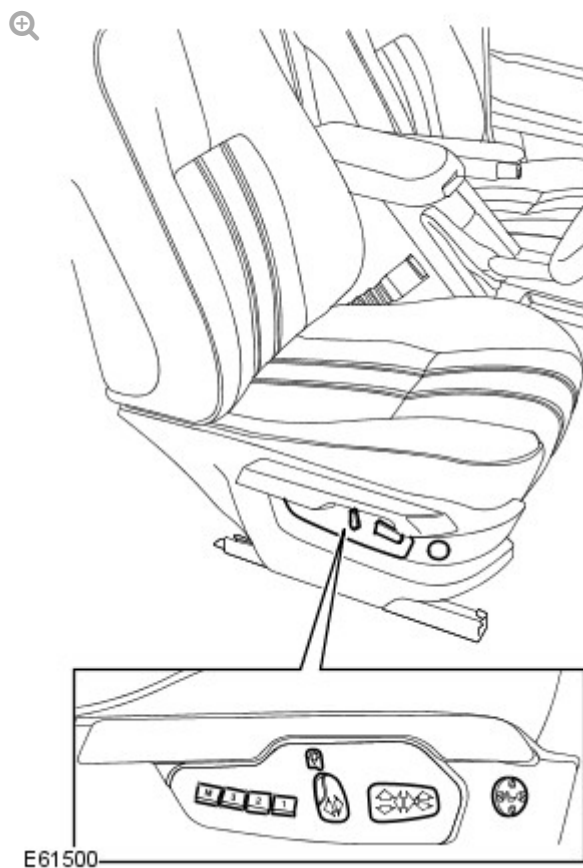
Rear seat frame rear fixings



E61499

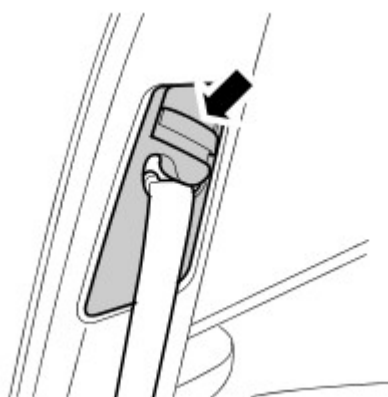
3. Release the catch and fold the rear seats forwards, check that the rear seat frame rear fixings are secured to the floor and that the seat frames show no signs of movement.
4. Check rear seat catch locking bars are secured to the floor and show no signs of movement.
5. Fold the rear seats back on completion.

Front seat controls



6. Check operation of all seat controls.
7. Fully extend each safety belt and check that it returns unassisted; repeat for all belts.
8. Check entire length of safety belt webbing for signs of fraying or damage; repeat for all belts.
9. Connect each safety belt to the correct buckle, check safety belt buckle and tongue are secure; check that buckle releases tongue correctly.

10. Check all safety belt and buckle mountings and fixings for security.



E54871

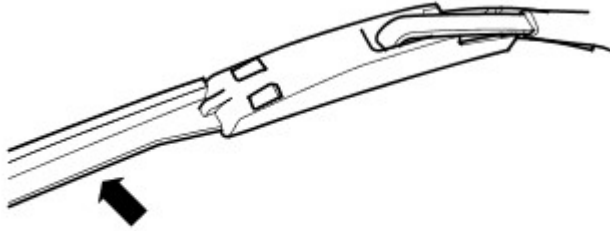
11. Check front safety belt height adjusters for correct operation.

LAMPS, HORNS AND WARNING INDICATORS

1. Check side, head, fog, reversing and tail lamps for correct operation.
2. Check operation of headlamp automatic levelling system - if installed.
3. Check turn signals and hazard warning lamps for correct operation.
4. Check brake (stop) lamps for correct operation.
5. Check all exterior lamp lenses for clarity and condition; pay particular attention to headlamp and fog lamp lenses for stone chips or damage.
6. Check horn for loud, clear sound.
7. Switch on side/headlamps and check that side/headlamp reminder warning sounds when door is opened.
8. Check operation of interior courtesy lamps.
9. Check operation of all instrument pack warning and indicator lamps.

WASHERS AND WIPERS





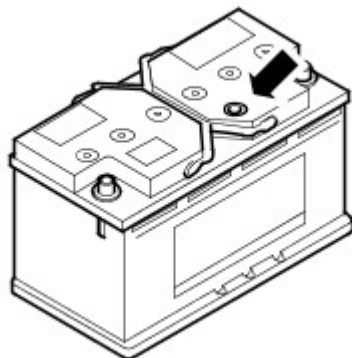
E54838

1. Check all wiper blades for condition and signs of splits or damage.
2. Check security of wiper arms.
3. Operate front and rear windshield washers, check that jets are clear and correctly aimed.
4. Operate front and rear wipers at all speeds and check for smooth, smear free operation.

CHECK HIGH/LOW GEAR ENGAGEMENT

1. Select LOW range gear, drive vehicle forwards 3 to 4 vehicle lengths, stop vehicle and select HIGH range gear - gears must engage smoothly.

BATTERY



E61710

1. Check battery condition by checking color of condition indicator.
 - Green = O.K.
 - Black = Battery requires charging

- Yellow = New battery required

POLLEN FILTER

1. Replace pollen filter.

For additional information, refer to: Plenum Chamber (412-01 Air Distribution and Filtering, Removal and Installation).

CORROSION/COSMETIC INSPECTION

1. Carry out the annual corrosion/cosmetic inspection using the Annual Corrosion Inspection Sheet.

WHEELS AND TIRES

1. Check that tires comply with manufacturer's specification.

For additional information, refer to: Specifications (204-04 Wheels and Tires, Specifications).

2. Check/adjust tire pressures including spare.

For additional information, refer to: Specifications (204-04 Wheels and Tires, Specifications).

3. **Vehicles with Uni-directional tires installed:** Mark the wheel to stud relationship of each road wheel and note location of each road wheel to its respective hub.

4. Loosen road wheel nuts. Raise vehicle to a wheel free condition.

For additional information, refer to: Lifting (100-02 Jacking and Lifting, Description and Operation).

5. Remove the road wheels.

6. Visually check tires for condition, lumps or bulges. Check tread depth across the width of the tire and around the circumference; ensure that remaining tread depth does not contravene local legislative requirements.

NOTE:

Do not install wheels at this stage.

BRAKING SYSTEM

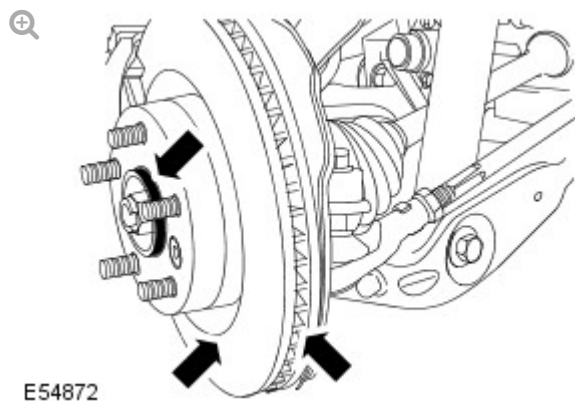
1. Inspect front brake pads for wear.

For additional information, refer to: Specifications (206-03 Front Disc Brake, Specifications).

2. Inspect rear brake pads for wear.

For additional information, refer to: Specifications (206-04 Rear Disc Brake, Specifications).

3. Check brake calipers for signs of fluid leaks.



4. Check brake discs for condition.

5. Check all brake booster and brake system pipes and hoses for condition, chafing and leaks.

6. Clean road wheel hub spigots and apply grease, Land Rover Part Number RYL 105020 to the wheel mating surface of each spigot.

7. Vehicles with Uni-directional tires installed: Install road wheels on their respective hubs ensuring that stud to wheel relationship is maintained.

8. Vehicles with NON uni-directional tires installed: Install wheels on the opposite side of the vehicle but ensure that they are on the same axle as they were originally installed.

9. Install road wheel nuts and tighten to 140 Nm (103 lb-ft).

10. Every 3 years or 45,000 miles (72,000 km): Replace brake fluid.

For additional information, refer to: Brake System Bleeding - Vehicles With: High Performance Brakes (206-00 Brake System - General Information, General Procedures) /

Brake System Bleeding - Vehicles With: Standard Brakes (206-00 Brake System - General Information, General Procedures).

Parking Brake

1. Check the adjustment of the parking brake.

For additional information, refer to: Parking Brake Shoe and Lining Adjustment (206-05 Parking Brake and Actuation, General Procedures).

COOLING SYSTEM

1. Check specific gravity of coolant using a hydrometer.

NOTE:

A suitable hydrometer is available from the Equipment Programme under Part Number 511 3302 001 00.

2. Top-up cooling system if necessary.

For additional information, refer to: Specifications (303-03 Engine Cooling - 5.0L, Specifications).

CAUTION:

Anti-freeze concentration must be maintained at 50%.





WARNING:

Since injury such as scalding could be caused by escaping steam or coolant, do not remove the filler cap from the coolant expansion tank whilst the system is hot.

CAUTION:

Engine coolant will damage the paint finished surfaces. If coolant is spilled, immediately remove the coolant and wash the area with water.

3. Check the level of coolant in the expansion tank. With the engine cold, the coolant level must be to the '**UPPER LEVEL**' indicator mark above the '**COLD FILL RANGE**' text on the side of the expansion tank. Ignore any coolant which may be visible in the top section of the tank.

4. If topping-up is required, remove expansion tank filler cap and top-up coolant level to the '**UPPER LEVEL**' indicator mark.

For additional information, refer to: Specifications (303-03 Engine Cooling - 5.0L, Specifications).

CAUTION:

Always top-up with a 50% mixture of anti-freeze and water.

5. Install expansion tank filler cap, tighten cap until ratchet is heard to 'click'.

6. **Every 10 years or 150,000 miles (240,000 km):** Replace the coolant.

For additional information, refer to: Cooling System Draining, Filling and Bleeding - Vehicles With: Supercharger (303-03 Engine Cooling - 5.0L,

General Procedures) /

Cooling System Draining, Filling and Bleeding - Vehicles Without:
Supercharger (303-03 Engine Cooling - 5.0L, General Procedures).

IGNITION SYSTEM

1. Every 7 years or 105,000 miles (168,000 km) - 5.0 Litre NA and 5.0 Litre SC litre V8 engines: Replace spark plugs.

For additional information, refer to: Ignition Coil-On-Plug (303-07 Engine Ignition - 5.0L, Petrol, Removal and Installation).

AIR FILTERING

1. Every 4 years or 60,000 miles (96,000 km) - 5.0 Litre SC: Replace the air cleaner elements.

For additional information, refer to: Air Cleaner Element (303-12 Intake Air Distribution and Filtering - 5.0L, Vehicles With: Supercharger, Removal and Installation).

2. Every 5 years or 75,000 miles (120,000 km) - 5.0 Litre NA: Replace the air cleaner elements.

For additional information, refer to: Air Cleaner Element (303-12 Intake Air Distribution and Filtering - 5.0L, Petrol, Vehicles Without: Supercharger, Removal and Installation).

FRONT END ACCESSORY DRIVE (FEAD) BELT

1. Check the condition of the FEAD belt.

2. Remove all traces of mud and dirt from the belt and pulleys.

3. Check the belt for signs of oil contamination, splitting and wear.

4. Every 10 years or 150,000 miles (240,000 km): Replace the FEAD belt.

For additional information, refer to: Accessory Drive Belt - Vehicles With: Supercharger (303-05 Accessory Drive - 5.0L, Removal and Installation) / Accessory Drive Belt - Vehicles Without: Supercharger (303-05 Accessory

Drive - 5.0L, Removal and Installation).

SUPERCHARGER/COOLING FAN DRIVE BELT

1. Check the condition of the supercharger/cooling fan drive belt.
2. Remove all traces of mud and dirt from the drive belt and pulleys.
3. Check the drive belt for signs of oil contamination, splitting and wear.
4. **Every 7 years or 105,000 miles (168,000 km):** Replace the supercharger drive belt.

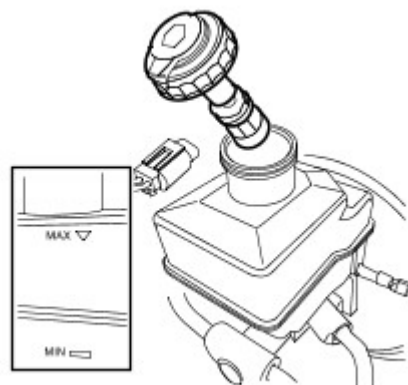
For additional information, refer to: Supercharger Belt (303-05 Accessory Drive - 5.0L, Removal and Installation).

5. **Every 7 years or 105,000 miles (168,000 km):** Replace the cooling fan drive belt.

For additional information, refer to: Cooling Fan Belt (303-05B, Removal and Installation).

FLUID LEVELS

Brake fluid reservoir



E54845

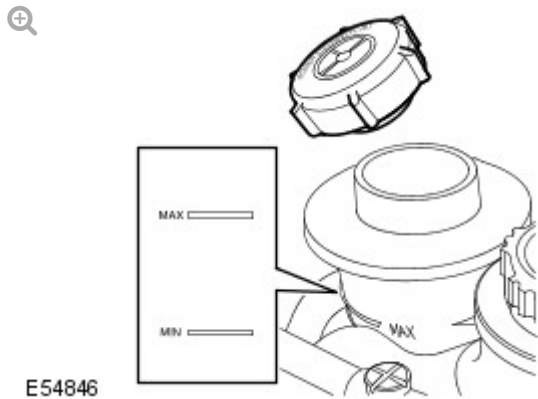
1. Check the fluid level in the brake fluid reservoir, the level must be to the '**MAX**' mark on the reservoir; top-up if necessary.
2. Clean the area around the reservoir filler cap, remove cap.
3. If necessary, top-up using the recommended fluid to the '**MAX**' mark on

3. If necessary, top-up using the recommended fluid to the **MAX** mark on the reservoir.

For additional information, refer to: Specifications (206-00 Brake System - General Information, Specifications).

4. Install the reservoir filler cap.

Power steering fluid reservoir



CAUTION:

To prevent over filling, check/top-up the system with the engine switched off and the system cold. Ensure that the steering wheel is in the straight ahead position, do not turn the steering wheel prior to checking the fluid level.

1. Check that the fluid level is to the mid-way mark between the '**MAX**' and '**MIN**' marks on the fluid reservoir, top-up if necessary.

2. Clean the area around the reservoir filler cap, remove cap.

3. If necessary, top-up using the recommended fluid to the mid-way mark on the reservoir.

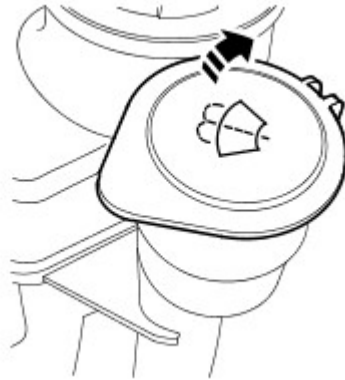
For additional information, refer to: Specifications (211-02 Power Steering, Specifications).

CAUTION:

Do not fill reservoir above the 'MAX' mark.

4. Install the reservoir filler cap.

Windshield washer reservoir



E54847

1. Remove the windshield washer reservoir filler cap.
2. Top-up the reservoir using a mixture of an approved windshield washer fluid and water until the level is to the bottom of the gauze filter in the reservoir filler neck.
3. Install the reservoir filler cap.

ENGINE OIL AND FILTER

1. Renew engine oil and filter.

For additional information, refer to: Specifications (303-01 Engine - 5.0L, Petrol, Vehicles Without: Supercharger, Specifications) /

Oil Filter Element (303-01 Engine - 5.0L, Petrol, Vehicles Without: Supercharger, Removal and Installation) /

Specifications (303-01 Engine - 5.0L, Vehicles With: Supercharger, Specifications) /

Oil Filter Element (303-01 Engine - 5.0L, Vehicles With: Supercharger, Removal and Installation).

AUTOMATIC TRANSMISSION

1. **Every 10 years or 150,000 miles (240,000 km):** Renew automatic

transmission fluid.

For additional information, refer to: Specifications (307-01 Automatic Transmission/Transaxle - 5.0L, Petrol, Specifications) / Transmission Fluid Pan, Gasket and Filter (307-01 Automatic Transmission/Transaxle - 5.0L, Petrol, Removal and Installation).

TRANSFER CASE

1. Every 5 years or 75,000 miles (120,000 km): Renew transfer case oil.

For additional information, refer to: Specifications (308-07 Transfer Case, Specifications) / Transfer Case Draining and Filling (308-07 Transfer Case, General Procedures).

DRIVE AXLE/DIFFERENTIAL

1. Every 10 years or 150,000 miles (240,000 km): Renew front drive axle/differential oil.

For additional information, refer to: Differential Draining and Filling (205-03 Front Drive Axle/Differential, General Procedures).

2. Every 10 years or 150,000 miles (240,000 km): Renew rear drive axle/differential oil.

For additional information, refer to: Differential Draining and Filling (205-02 Rear Drive Axle/Differential, General Procedures).

SUSPENSION AND BODY MOUNTINGS

Note: The procedures in this section should only be completed when carrying out Service Inspection 1 and Service Inspection 2.

1. Check for free play in all suspension and body mounting rubbers.
 2. Check condition of suspension rubber boots and gaiters.
-

FUEL SYSTEM

1. Check fuel system pipes, hoses and unions for chafing, leaks and

corrosion.

2. Every 10 years or 150,000 miles (240,000 km): Renew the fuel filter.

For additional information, refer to: Fuel Filter (310-01 Fuel Tank and Lines - 5.0L, Petrol, Removal and Installation).

OIL/FLUID LEAKS

1. Check for oil/fluid leaks.

POWER STEERING

Note: The procedures in this section should only be completed when carrying out Service Inspection 1 and Service Inspection 2.

1. Check power steering rod ball joint fixings, gaiters and condition of ball joints and dust covers.

2. Check power steering pipes, hoses and unions for chafing, leaks and corrosion.

FAULT LAMP(S)

1. If fault lamp(s) are illuminated, test the associated system using the diagnostic tool and report findings.

ROAD TEST

1. Carry out road test of vehicle.

For additional information, refer to: Road/Roller Testing (100-00 General Information, Description and Operation).

GENERAL

1. Endorse Service Record.

2. Report any unusual features of vehicle condition and any additional work required.

2012.0 RANGE ROVER (LM), 100-03

MAINTENANCE SCHEDULES

DESCRIPTION AND OPERATION

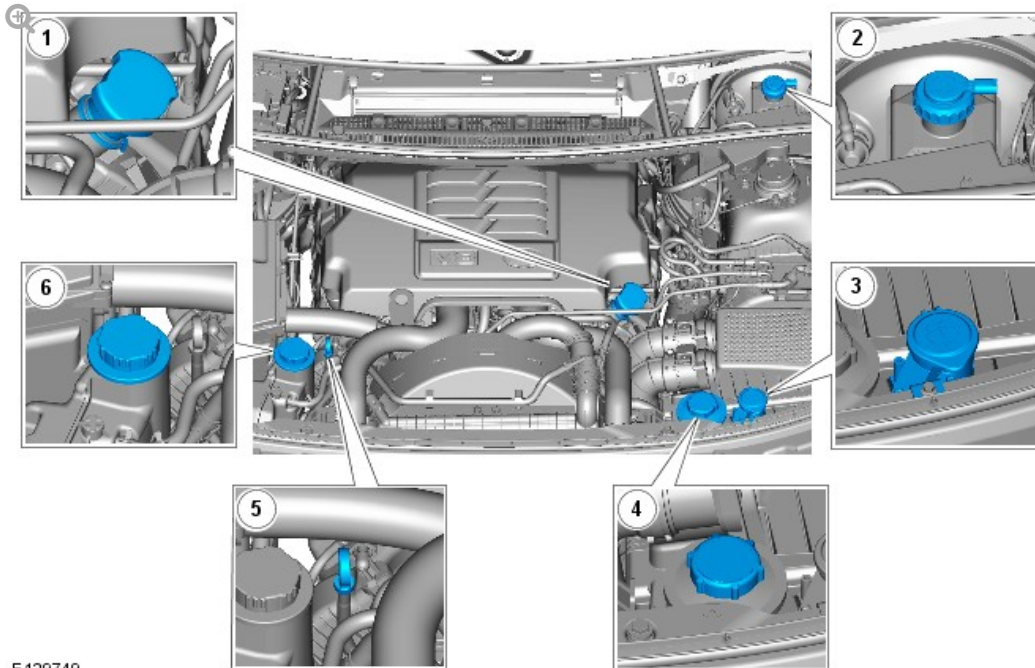
Torque Specifications

DESCRIPTION	NM	LB-FT
Seat frame fixing Torx screws	40	30
Seat belt fixing Torx screws	40	30
Road wheel nuts	140	103

CAUTION:

Unless stated otherwise, the following operations must be carried out at every indicated service interval.

UNDERBONNET VIEW - 3.6 LITRE TDV8

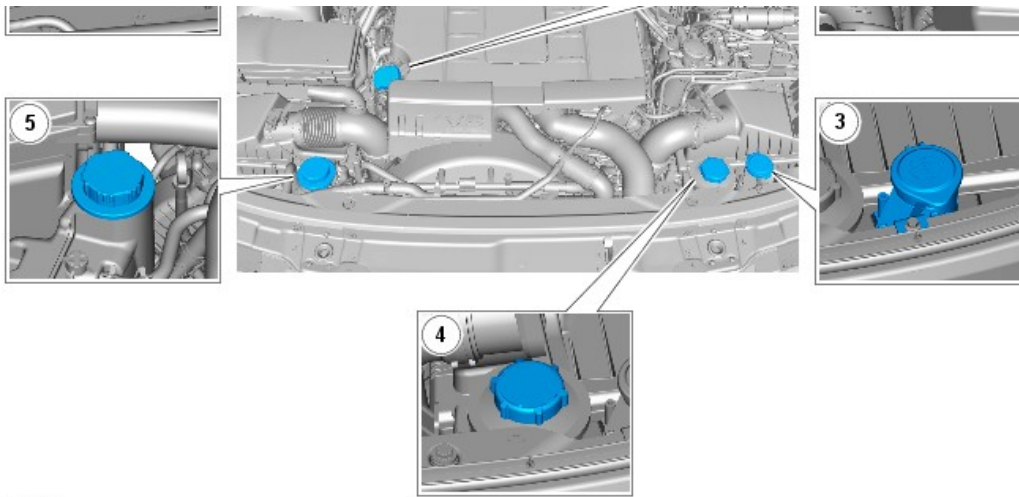


E 129749

1. Engine oil filler cap
2. Brake fluid reservoir - LHD illustrated, RHD on opposite side
3. Windshield washer fluid reservoir
4. Power steering fluid reservoir
5. Engine oil level indicator
6. Coolant expansion tank

UNDERBONNET VIEW - 4.4 LITRE TDV8





E 129806

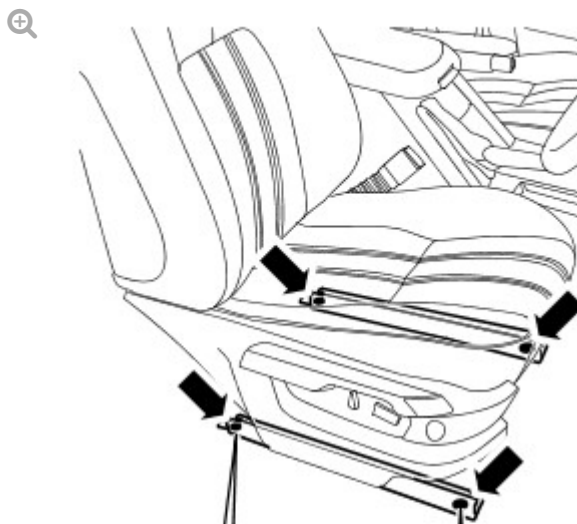
1. Brake fluid reservoir - RHD illustrated, LHD on opposite side
2. Engine oil filler cap
3. Windshield washer fluid reservoir
4. Power steering fluid reservoir
5. Coolant expansion tank

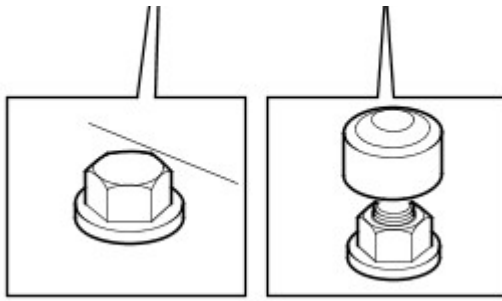
MAINTENANCE OPERATIONS

Seats and Safety Belts

Note: The procedures in this section should only be completed when carrying out Service Inspection 1 and Service Inspection 2.

Front seat fixings

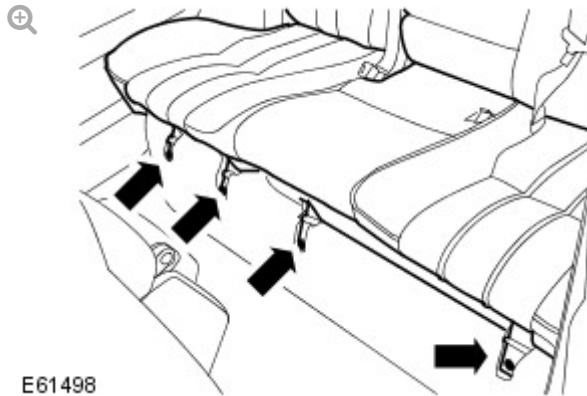




E61497

1. Check that the front seat frame fixing Torx screws are secure and that the seat frames show no signs of movement.

Rear seat frame front fixings



E61498

2. Check that the rear seat frame front fixings are secure and that the seat frames show no signs of movement.

Rear seat frame rear fixings

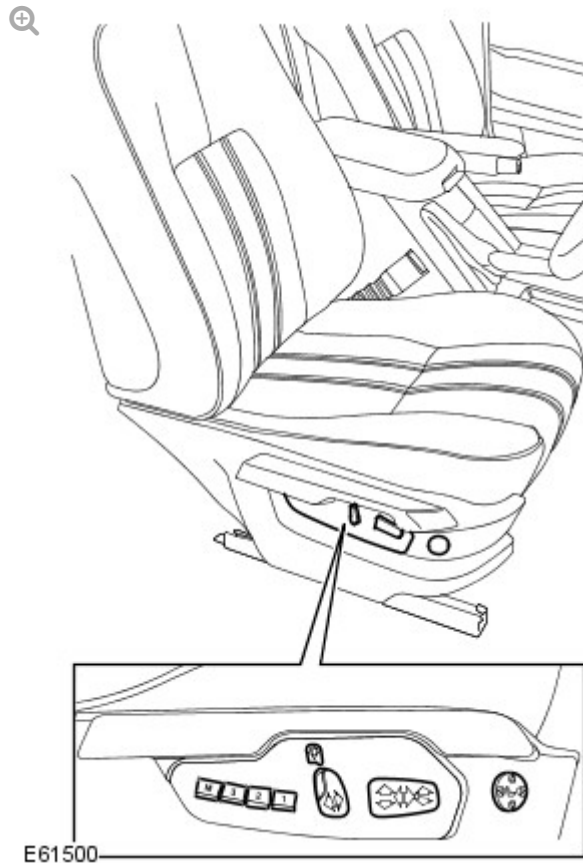


E61499

3. Release the catch and fold the rear seats forwards, check that the rear seat frame rear fixings are secure and that the seat frames show no signs of movement.

4. Check that the rear seat catch locking bars are secured to the floor and show no signs of movement.
5. Fold the rear seats back on completion.

Front seat controls



6. Check operation of all seat controls.
7. Fully extend each safety belt and check that it returns unassisted; repeat for all belts.
8. Check entire length of safety belt webbing for signs of fraying or damage; repeat for all belts.
9. Connect each safety belt to the correct buckle, check safety belt buckle and tongue are secure; check that buckle releases tongue correctly.
10. Check all safety belt and buckle mountings and fixings for security.



E54871

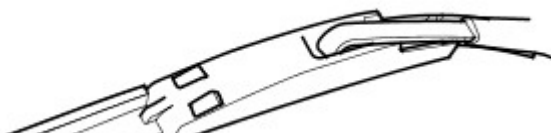


11. Check front safety belt height adjusters for correct operation.
12. Replace climate controlled seat cushion motor filters (where fitted).

LAMPS, HORNS AND WARNING INDICATORS

1. Check side, head, fog, reversing and tail lamps for correct operation.
2. Check operation of headlamp automatic levelling system - if installed.
3. Check turn signals and hazard warning lamps for correct operation.
4. Check brake (stop) lamps for correct operation.
5. Check all exterior lamp lenses for clarity and condition; pay particular attention to headlamp and fog lamp lenses for stone chips or damage.
6. Check horn for loud, clear sound.
7. Switch on headlamps and check that side/headlamp reminder warning sounds when door is opened.
8. Check operation of interior courtesy lamps.
9. Check operation of all instrument pack warning and indicator lamps.

WASHERS AND WIPERS





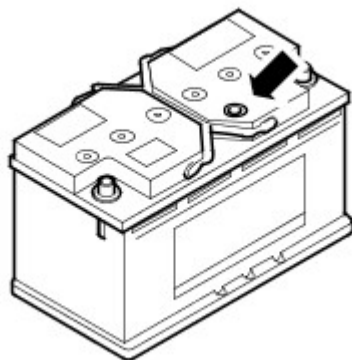
E54838

1. Check all wiper blades for condition and signs of splits or damage.
2. Check security of wiper arms.
3. Operate front and rear windshield washers, check that jets are clear and correctly aimed.
4. Operate front and rear wipers at all speeds and check for smooth, smear free operation.

CHECK HIGH/LOW GEAR ENGAGEMENT

1. Select LOW range gear, drive vehicle forwards 3 to 4 vehicle lengths, stop vehicle and select HIGH range gear - gears must engage smoothly.

BATTERY



E61710

1. Check battery condition by checking color of condition indicator (where fitted).
 - Green = O.K.
 - Black = Battery requires charging
 - Yellow = New battery required

POLLEN FILTER

1. Replace pollen filter.

For additional information, refer to: Plenum Chamber (412-01 Air Distribution and Filtering, Removal and Installation).

CORROSION/COSMETIC INSPECTION

1. Carry out the annual corrosion/cosmetic inspection using the Annual Corrosion Inspection Sheet.

WHEELS AND TIRES

1. Check that tires comply with manufacturer's specification.

For additional information, refer to: Specifications (204-04 Wheels and Tires, Specifications).

2. Check/adjust tire pressures including spare.

For additional information, refer to: Specifications (204-04 Wheels and Tires, Specifications).

3. **Vehicles with Uni-directional tires installed:** Mark the wheel to stud relationship of each road wheel and note location of each road wheel to its respective hub.

4. Loosen road wheel nuts. Raise vehicle to a wheel free condition.

For additional information, refer to: Lifting (100-02 Jacking and Lifting, Description and Operation).

5. Remove the road wheels.

6. Visually check tires for condition, lumps or bulges. Check tread depth across the width of the tire and around the circumference; ensure that remaining tread depth does not contravene local legislative requirements.

NOTE:

Do not install wheels at this stage

Do not install wheels at this stage.

BRAKING SYSTEM

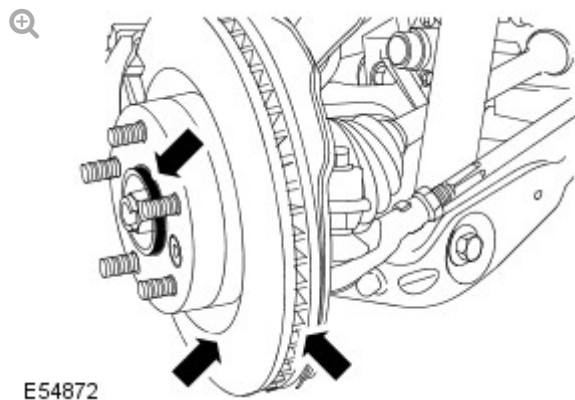
1. Inspect front brake pads for wear.

For additional information, refer to: Specifications (206-03 Front Disc Brake, Specifications).

2. Inspect rear brake pads for wear.

For additional information, refer to: Specifications (206-04 Rear Disc Brake, Specifications).

3. Check brake calipers for signs of fluid leaks.



4. Check brake discs for condition.

5. Check all brake booster and brake system pipes and hoses for condition, chafing and leaks.

6. Clean road wheel hub spigots and apply grease, Land Rover part number RYL 105020 to the wheel mating surface of each spigot.

7. **Vehicles with Uni-directional tires installed:** Install road wheels to their respective hubs ensuring that stud to wheel relationship is maintained.

8. **Vehicles with NON uni-directional tires installed:** Install wheels on the opposite side of the vehicle but ensure that they are on the same axle as they were originally installed.

9. Install road wheel nuts and tighten to 140 Nm (103 lb-ft).

10. Every 3 years Replace brake fluid.

For additional information, refer to: Brake System Bleeding (206-00 Brake System - General Information, General Procedures).

Parking Brake

1. Check the adjustment of the parking brake.

For additional information, refer to: Parking Brake Shoe and Lining Adjustment (206-05 Parking Brake and Actuation, General Procedures).

COOLING SYSTEM

1. Check specific gravity of coolant using a hydrometer.

NOTE:

A suitable hydrometer is available from the Equipment Programme under part number 511 3302 001 00.

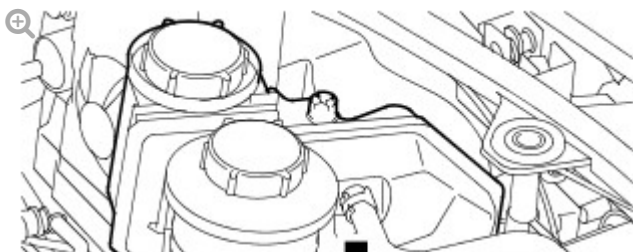
2. Top-up cooling system if necessary.

CAUTION:

Anti-freeze concentration must be maintained at 50%.

NOTE:

Some variation in the illustrations may occur, but the essential information is always correct.





WARNING:

Since injury such as scalding could be caused by escaping steam or coolant, do not remove the filler cap from the coolant expansion tank whilst the system is hot.

CAUTION:

Engine coolant will damage the paint finished surfaces. If coolant is spilled, immediately remove the coolant and wash the area with water.

3. Check the level of coolant in the expansion tank. With the engine cold, the coolant level must be to the '**UPPER LEVEL**' indicator mark above the '**COLD FILL RANGE**' text on the side of the expansion tank. Ignore any coolant which may be visible in the top section of the tank.
4. If topping-up is required, remove expansion tank filler cap and top-up coolant level to the '**UPPER LEVEL**' indicator mark.
5. Install expansion tank filler cap, tighten cap until ratchet is heard to 'click'.
6. **Every 10 years:** Replace the coolant.

For additional information, refer to: Cooling System Draining, Filling and Bleeding (303-03 Engine Cooling - 4.4L V8 - TdV8, General Procedures) / Cooling System Partial Draining, Filling and Bleeding (303-03D, General Procedures).

AIR FILTERING

1. This procedure should only be completed when carrying out **Service Inspection 1** and **Service Inspection 2**: Replace the air cleaner element.

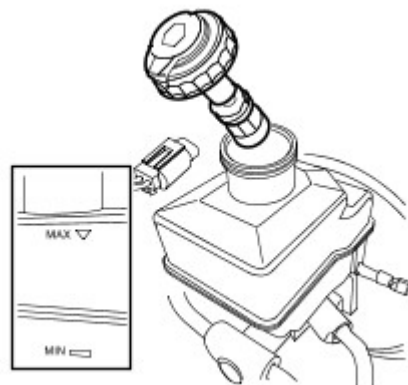
For additional information, refer to: Air Cleaner Element (303-12 Intake Air Distribution and Filtering - 3.6L V8 - TdV8, Removal and Installation) / Air Cleaner Element (303-12 Intake Air Distribution and Filtering - 4.4L V8 - TdV8, Removal and Installation).

FRONT END ACCESSORY DRIVE (FEAD) BELT

1. Check the condition of the ancillary FEAD belt.
2. Remove all traces of mud and dirt from the belt and pulleys.
3. Check the belt for signs of splitting and wear.

FLUID LEVELS

Brake fluid reservoir



E54845

1. Check the fluid level in the brake fluid reservoir, the level must be to the '**MAX**' mark on the reservoir; top-up if necessary.
2. Clean the area around the reservoir filler cap, remove the cap.
3. If necessary, top-up using the recommended fluid to the '**MAX**' mark on the reservoir.

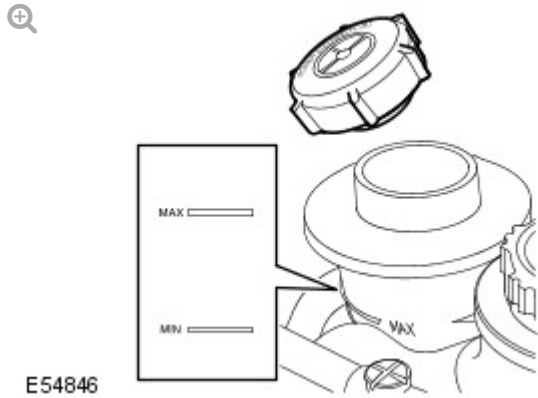
For additional information, refer to: Specifications (206-00 Brake System - General Information, Specifications).

4. Install the reservoir filler cap.

Power steering fluid reservoir

NOTE:

Some variation in the illustrations may occur, but the essential information is always correct.



CAUTION:

To prevent over filling, check/top-up the system with the engine switched off and the system cold. Ensure that the steering wheel is in the straight ahead position, do not turn the steering wheel prior to checking the fluid level.

1. Check that the fluid level is to the mid-way mark between the '**MAX**' and '**MIN**' marks on the fluid reservoir, top-up if necessary.
2. Clean the area around the reservoir filler cap, remove the cap.
3. If necessary, top-up using the recommended fluid to the mid-way mark on the reservoir.

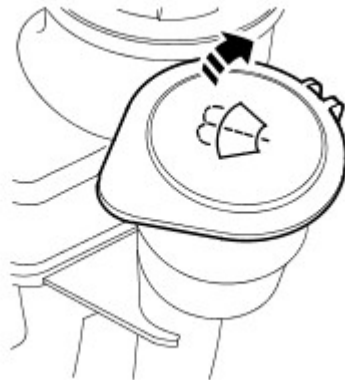
For additional information, refer to: Specifications (211-02 Power Steering, Specifications).

CAUTION:

Do not fill reservoir above the 'MAX' mark.

4. Install the reservoir filler cap.

Windshield washer reservoir



E54847

1. Remove the windshield washer reservoir filler cap.
2. Top-up the reservoir using a mixture of an approved windshield washer fluid and water until the level is to the bottom of the gauze filter in the reservoir filler neck.
3. Install the reservoir filler cap.

ENGINE OIL AND FILTER

1. Renew engine oil and filter.

For additional information, refer to: Engine Oil Vacuum Draining and Filling (303-01 Engine - 4.4L V8 - TdV8, General Procedures) /

Engine Oil Draining and Filling (303-01 Engine - 3.6L V8 - TdV8, General Procedures).

SUSPENSION AND BODY MOUNTINGS

Note: The procedures in this section should only be completed when carrying out Service Inspection 1 and Service Inspection 2.

1. Check for free play in all suspension and body mounting rubbers.
 2. Check condition of suspension rubber boots and gaiters.
-

FUEL SYSTEM

1. Check fuel system pipes, hoses and unions for chafing, leaks and corrosion.

2. Renew the fuel filter element.

For additional information, refer to: Fuel Filter Element (310-01 Fuel Tank and Lines - 4.4L V8 - TdV8, Removal and Installation) /

Fuel Filter Element (310-01C, Removal and Installation).

OIL/FLUID LEAKS

1. Check for oil/fluid leaks.

POWER STEERING

Note: The procedures in this section should only be completed when carrying out Service Inspection 1 and Service Inspection 2.

1. Check power steering rod ball joint fixings, gaiters and condition of ball joints and dust covers.

2. Check power steering pipes, hoses and unions for chafing, leaks and corrosion.

FAULT LAMP(S)

1. If fault lamp(s) are illuminated, test the associated system using T4 and report findings.

ROAD TEST

1. Carry out road test of vehicle.

For additional information, refer to: Road/Roller Testing (100-00 General Information, Description and Operation).

GENERAL

1. Endorse Service Record.

2. Report any unusual features of vehicle condition and any additional work required.

2012.0 RANGE ROVER (LM), 100-11

VEHICLE TRANSPORTATION AIDS AND VEHICLE STORAGE

DESCRIPTION AND OPERATION

INTRODUCTION

STANDARDS

Vehicles may require storage for varying periods of time before the customer takes delivery. It is essential that a new Land Rover vehicle is stored correctly, in order to ensure total customer satisfaction after the car is removed from storage and prepared for sale.

This document establishes the MINIMUM STANDARDS required of franchise holders and appointed vehicle storage companies by Land Rover for the storage of new vehicles, and may only be deviated from with the Company's agreement. Any concerns should be discussed with your Franchise Regional Manager.

This information should be used in conjunction with the relevant Pre-Delivery Inspection (PDI) information.

AREAS OF RESPONSIBILITY

PREVENTATIVE MEASURES

Adequate preventative measures must be taken to ensure that each vehicle in stock is maintained in peak condition.

ARRIVAL

It is your responsibility to notify delivery companies immediately of any losses and/or transit damage identified on receipt of the vehicle.

Where applicable, Vehicle Condition Reports (VCR's) must be endorsed accordingly, otherwise it is unlikely that the transit insurance company will accept any claims for missing items or damage rectification.

STORAGE

Correct preparation of vehicles for storage is essential. The majority of new vehicles leaving Land Rover are provided with the appropriate protection for transit. It is your responsibility to ensure that a vehicle storage department, or specialist company, is sufficiently equipped to undertake the storage requirements endorsed in this publication. **Whilst vehicles are in storage, any deterioration or damage sustained is the sole responsibility of the storage operator and must NOT be made the subject of a warranty claim.**

DISPATCH

When removing vehicles from storage, you are responsible for procedures that ensure they are in a safe and roadworthy condition.

VEHICLE STORAGE

VEHICLE IDENTIFICATION UPON ARRIVAL

- 1 A New Vehicle Storage History Sheet must be raised for every new vehicle upon arrival and should remain inside the vehicle until despatch. This must contain a record of the vehicle condition and any rectification work carried out during the storage period (see Storage History Sheet).**

- 2** Vehicles must be checked for correct specification and/or shortages. Where this is incorrect the required parts should be procured through normal channels and costs claimed back via the DDW system using the appropriate shortage or misbuild program code.
- Claims for rectifying incorrect specification items and/or shortages must be made in accordance with the conditions detailed in Section C of the Warranty Policy and Procedures Manual.
 - **NOTE:** All missing items should be recorded on the New Vehicle Storage History Sheet and countersigned by an authorized person.
- 3** Vehicles must be inspected for transit damage.
- Delivery damage is not the responsibility of Land Rover and must not be made the subject of a warranty claim. It is the responsibility of the Dealer/Retailer or vehicle storage company to identify any such damage at the time of the new vehicle receipt and to ensure that the full details are recorded on the Delivery Receipt. Claims for rectification of such damage must be directed to the Delivery Company.
 - Failure to notify the Delivery Company of damage details at the time of vehicle delivery will result in claims for subsequent rectification being rejected.
 - Warranty claims for damage repairs may only be submitted where Land Rover's responsibility is clearly indicated. Examples falling into this category are paintwork damage during the fitment of trim or outward facing dents on the door skin.
 - Warranty claims will not be accepted for any transit damage repaired or identified after the vehicle has been placed into service.
- 4** A label should be suitably affixed to the inside of the windshield indicating the date of vehicle arrival. Labels must not be stuck directly to the windshield but placed in a transparent licence holder, or alternatively stuck to a piece of cling film and attached to the inside of the windshield. This will avoid damage to the windshield when removing labels.

5 Ignition and door keys must be suitably labelled and when the vehicle is locked, they must be held in a suitably identified and secure office. All key numbers must be recorded on the New Vehicle Storage History Sheet. All keys, including spares, must be removed from the vehicle during storage for security reasons.

VEHICLE INSPECTION

The entire vehicle exterior must be inspected and, if necessary, washed thoroughly, including the underside and wheel arches, to remove all dirt and mud deposits.

Any defects found during inspection must be rectified before the vehicle is stored.

Ensure that bumper and body side protectors are correctly located.

There are two main methods of vehicle storage:

- 1** Collective storage of several vehicles in an open compound.
- 2** Collective storage of a small number of vehicles, normally at the dealership/retailer and possibly under cover.

IDEALLY ALL VEHICLES SHOULD BE STORED IN A WELL VENTILATED AND TEMPERATURE-CONTROLLED BUILDING.

However, it is recognised that the majority of all vehicle storage is done in an open compound. Therefore, the following site requirements must be observed and should be authorised with your Regional Manager.

- 1** The site should have a well-drained hard standing surface, preferably concrete or tarmac, which is free from undergrowth.
- 2** The site and driveways must be kept clean and clear of any obstruction at all times.
- 3** The site must be enclosed by a secure intruder-proof perimeter fence and the gates securely locked. The site should be under daily surveillance, with unauthorised access prevented at all times.
- 4** The site should be located away from areas subject to industrial fallout, sea spray or wind-blown dust and sand. Where fallout conditions are

unavoidable it will be necessary to monitor the exterior condition of all cars and wash as necessary. Heavy contamination may require vehicles to have the transit protection coating removed and problems arising from the contamination rectified. Once the transit coating has been removed, the vehicle must not be returned to outdoor storage unless it is fully covered to provide the necessary protection against deterioration.

- 5** Mains water, tyre inflation and battery charging facilities must be available on site.
- 6** Hedges, shrubs and trees adjacent to the site should be kept trimmed and clear of parked vehicles.
- 7** Vehicles must not be parked under trees, overhead cables or other overhanging structures as bird droppings or other types of contamination could occur.

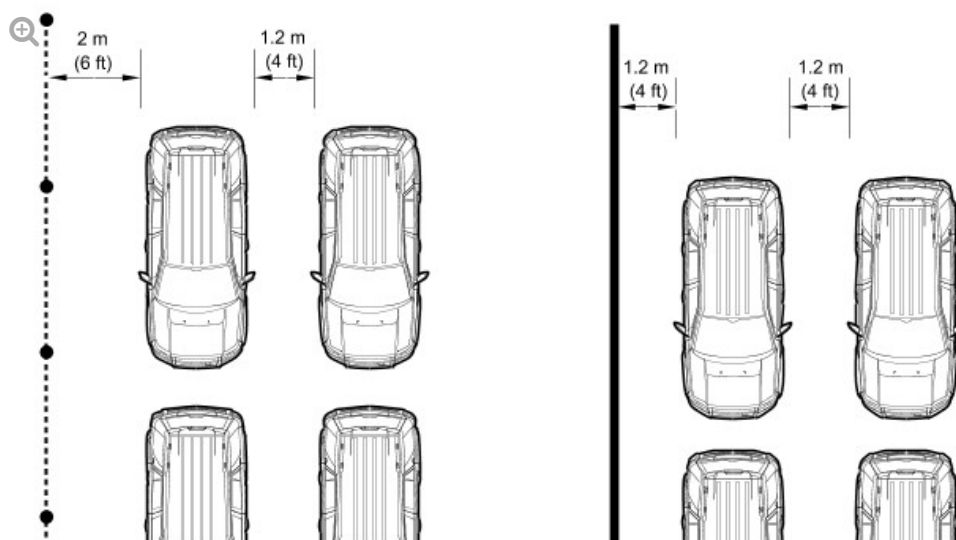
VEHICLE PARKING

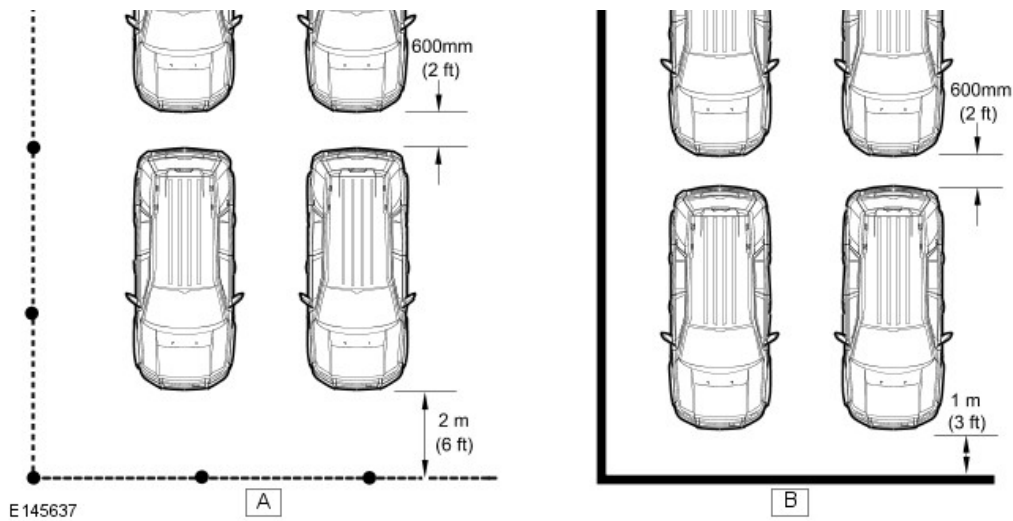
Vehicles must be parked tidily with a minimum of 600 mm (2 feet) between bumpers, front and rear.

There must be a full doors width clearance between the driver's door and any adjacent vehicle or obstruction.

Vehicles must be parked at least 1.2 metres (4 feet) away from any interior wall or, for outside storage, at least 2 metres (6 feet) away from any perimeter fence.

Vehicles must be moved on a first-in-first-out basis, subject to specification.





ITEM	DESCRIPTION
A	Storage Outside
B	Storage Inside

FACILITIES AND EQUIPMENT

The following equipment used must be functionally capable of meeting the compliance requirements. Please refer to the approved equipment document.

- Car wash facilities.
- KATS' (Special Tool) Decoater Gun.
- 'KATS 8077 Remover Fluid'.
- Tyre inflation equipment with calibrated gauge 0 - 4.05 bar (0 - 60lbf/in²).
- Jacking equipment.
- Wheel brace.
- Approved battery tester.

The following materials must be available and must meet Land Rover specifications:

- Engine oil.
- Transmission fluid.
- Brake fluid.

- Distilled water.
- Windscreen washer fluid.
- Anti-freeze.

Access to trailer/recovery vehicle (Vehicles should not be towed).

Comprehensive filing system for vehicle records.

NOTE:

Tools supplied with the vehicle must not be used for any rectification work prior to the prospective purchaser.

OPERATIONS REQUIRED DURING STORAGE PERIOD

REFERENCE CHART

The following chart gives a quick reference to the requirements necessary during the time a vehicle is in storage. A detailed explanation of each operation is provided on subsequent pages.

If a vehicle remains in storage after 150 days from receipt of vehicle, a new form must be started.

1. IDENTIFICATIONX.....2. INSPECTIONXXXXXX3. BATTERIESXXXXXX4. COOLING SYSTEMXXXXXX5. ENGINEXXXXXX6. AIR CONDITIONINGXXXXXX7. TIRESXXXXXX8. PARKING BRAKEXXXXXX9. DOORS, WINDOWS AND VEHICLE INTERIORX..X..10. WINDSHIELD WIPER BLADESX..X..11. PAINTWORK.All marketsREMOVE 'WRAPGUARD' AFTER 180 DAYS

OPERATION	UPON RECEIPT	30 DAYS FROM RECEIPT	60 DAYS FROM RECEIPT	90 DAYS FROM RECEIPT	120 DAYS FROM RECEIPT	150 DAYS FROM RECEIPT

STORAGE OPERATIONS

BATTERIES

To make sure the correct standard of battery care, please see the 'Battery Care Requirements for New Vehicles (Dealer and Retailer).

For requirements for receipt of a new vehicle, new vehicle storage and replacement batteries please see the battery care requirements for new vehicles (dealer and service)

Place a label on the vehicle (or on New Vehicle Storage History Sheet) to indicate when a recharge will be required. The battery condition should be checked prior to starting and/or moving the vehicle.

For additional information, refer to: Battery Care Requirements (414-00 Battery and Charging System - General Information, Description and Operation).

The storage, handling and charging of batteries is not dangerous provided that the relevant battery manufacturers' recommendations are followed. However, a suitable storage and charging facility must be available and should be in accordance with local legal requirements.

HYBRID ELECTRIC VEHICLE (HEV) BATTERY PACK

CAUTION:

Always keep the high voltage battery charged, failure to do so may cause damage to the battery.

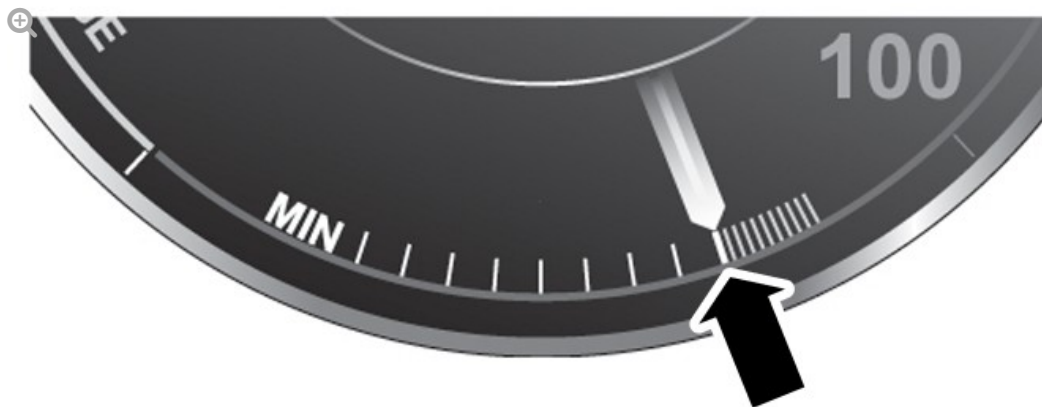
NOTE:

In extreme cold climate conditions (circa -30°C), store the vehicle in a warmer area to protect it from the environment.

If the vehicle is not used for 30 days or more, it is essential that the high voltage battery is charged. For longer storage periods, charge the high voltage battery every 30 days.

Charge the HEV battery pack as follows:

- Start the vehicle (using the engine Start/Stop button and brake pedal sequence).
- To view the Tachometer, open the instrument cluster menu, then select Instrument Display, Hybrid Content and Reduced Hybrid Display.
- Raise the engine to approximately 1500 rpm.
- When the battery charge level has reached the position indicated in the following graphic, the vehicle may be switched off.



E161503

COOLING SYSTEM

It is ESSENTIAL to maintain the concentration of anti-freeze at the factory-fill condition. Failure to do so may cause oxidisation of the cooling system leading to corrosion of the engine and heater.

The coolant mixture specification is 50% plain water and 50% Land Rover anti-freeze, Coolant and Corrosion Inhibitor for frost protection down to -36°C (-33°F).

Coolant specific gravity must be checked monthly using a high quality hydrometer with an appropriate range. At a coolant temperature of 15°C (60°F), the correct specific gravity reading is 1.074. If the coolant is above or below this temperature, the following corrections will enable accurate specific gravity readings to be taken:

- For higher temperatures: add 0.004 to the specific gravity for each 5°C (10°F).

- For lower temperatures: deduct 0.004 from the specific gravity for each 5°C (10°F).

If the specific gravity is correct but the cooling system requires additional coolant, mix anti-freeze and water to the correct proportions and to the correct volume, then add to the system. Examine for leaks from the radiator and hoses and rectify as necessary.

If the check shows that the coolant contains less than the required anti-freeze content, proceed as follows:

- 1 Carefully examine the radiator and all hoses for leaks and security of hose clamps.
- 2 Remove the header tank pressure cap and drain the cooling system as instructed in the relevant service manual.
- 3 Mix anti-freeze and water in the correct proportions and to the correct volume.
- 4 Close the drain plug and add the coolant until the level in the header tank is steady at 'MAX'.

WARNING:

DO NOT REMOVE THE HEADER TANK PRESSURE CAP WHILE THE ENGINE IS HOT.

CAUTION:

DO NOT use radiator anti-freeze solution in the windshield washer equipment or paint work will be damaged.

ENGINE OIL LEVEL

Where fitted, remove the dipstick and check the engine oil level. If necessary, top up with the approved grade of engine oil.

On vehicles with an electronic oil level and temperature sensor, check the engine oil level using the procedures described in the applicable Workshop

engine on level using the procedures described in the applicable Workshop Manual.

ENGINE AND AIR CONDITIONING SYSTEM

If the vehicle is stored for 30 days or more, the engine and air conditioning system should be operated using the following process:

- Set the ignition to power mode 6
- Ensure the air conditioning system is switched off
- Start the engine and run for 1 minutes at idle
- Raise the engine speed to 2000 RPM for 5 minutes
- Return the engine speed to idle
- Set the air conditioning temperature to 22° and the fan blower speed to 75% of the maximum blower speed
- Switch on the air conditioning system
- Ensure all the instrument panel air ducts are open
- Run the air conditioning system for minimum of 5 continuous minutes with the engine at idle

TIRES

For storage purposes, tires on fitted wheels must be inflated to and maintained at a maximum pressure of 3.60 bar (52 lbf/in²).

NOTE:

Wheels must be rotated through 90 degrees in the forward direction monthly, to ensure that the tread is rotated evenly during the storage period.

The spare wheel tire pressure must be maintained at the appropriate pressure specified in the Owners Handbook.

Tire condition should be inspected and defective tires replaced prior to removal from storage.

Guidance for Rotation of Tires

To ensure tires are rotated through a minimum of 90 degrees, apply a chalk mark on a front wheel tire wall at the current centre contact point with the road surface. Move the car forwards until the chalk mark is at the horizontal position. This process can be applied to a single car or to a row of vehicles and should ensure that all four wheels on each vehicle is rotated by 90 degrees.

PARKING BRAKE

Vehicles with Manual Park Brake

The parking brake must NOT remain 'on' during storage.

After parking:

- Manual transmission vehicles: select first or reverse gear and release the parking brake
- Automatic transmission vehicles: select 'P' and release the parking brake.

Vehicles with Electric Park Brake (EPB)

For vehicles with EPB, the park brake will remain locked onto the brake disc during storage. Refer to the Workshop Manual, General Procedures, Parking Brake and Actuation for EPB release procedure.

NOTE:

For all vehicles with an Electronic Parking Brake (EPB), on manual transmission vehicles, first or reverse gear must be selected before releasing the EPB. On automatic transmission vehicles 'Park' (P) must be selected before releasing the EPB.

Where possible the EPB must not remain on during storage. If, for any reason, it is not possible to perform the release procedure, the operation of the EPB must be checked/monitored monthly during the road wheel rotation procedure.

AIR SUSPENSION (IF FITTED)

During storage the air suspension system should be left in the transit mode

During storage the air suspension system should be left in the transit mode. No other checks are necessary during storage for this system.

DOORS, WINDOWS AND VEHICLE INTERIOR

Doors, windows, bonnet, boot lid and fuel filler flap must be closed and locked to prevent water and moisture ingress. A check should be done each month for any signs of water ingress into the cars interior and luggage compartment. Any water ingress points should be rectified immediately.

WINDSHIELD WIPER BLADES

Depending on the model, where possible move the wiper arms and blades away from the windshield and leave in the extended position.

PAINTWORK

Paintwork can be damaged if the protective coating remains on the vehicle for an extended period of time. In markets with high levels of ultraviolet light (tropical or semi-tropical conditions), the protective coating **MUST** be removed after six months. For all other markets the protective coating **MUST** be removed after nine months.

If storage is subsequently continued, the vehicle must be kept under cover and should be washed regularly (at least every month).

REMOVAL FROM STORAGE

PROCEDURES

Before removal from storage area, all fluid levels including coolant, hydraulic fluids and lubricating oils must be checked and replenished where necessary. Where a substantial loss has occurred the cause must be traced prior to moving the vehicle.

The New Vehicle Storage History Sheet must be checked and safety related faults rectified before the vehicle is moved from the storage site. These checks are essential to ensure that the vehicle is safe to drive.

Tires must be adjusted to the pressures recommended in the relevant service manual or owners handbook.

Reconnect the battery negative terminal (when applicable).

Check the operation of the lighting and signalling equipment.

TRANSIT PROTECTION COATING (WHERE FITTED)

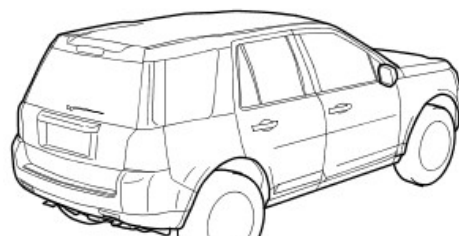
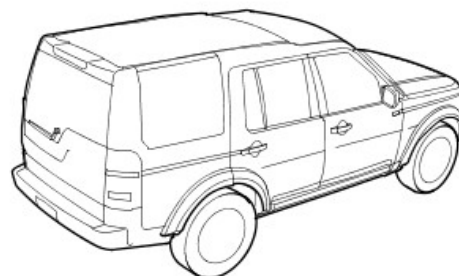
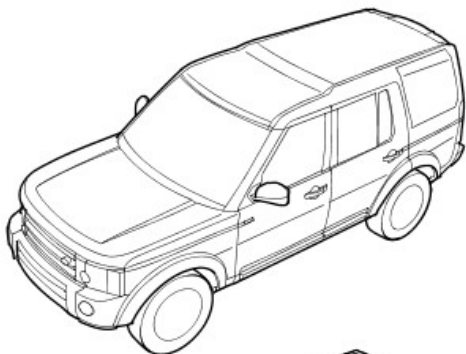
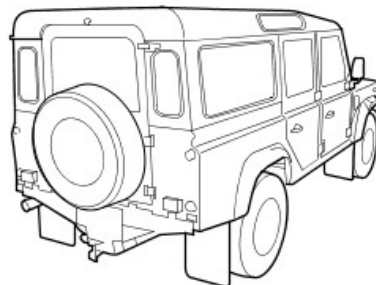
REMOVAL OF TRANSIT PROTECTION COATING

During storage, the protective coating will collect airborne dirt and grit. Great care must be taken when removing the transit coating so that damage to the paint film and exterior trim is avoided.

Removal of the transit protection coating should be carried out in accordance with the procedure detailed in the Pre-Delivery Inspection (PDI) information.

When the vehicle is dispatched from the storage area, remove the New Vehicle Storage History Sheet and file in the vehicle records.

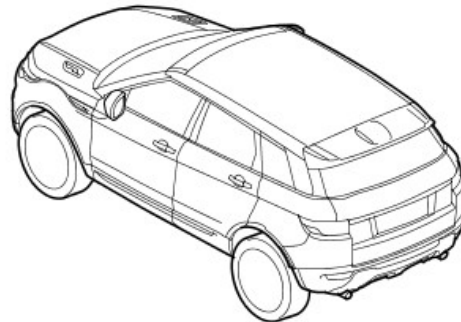
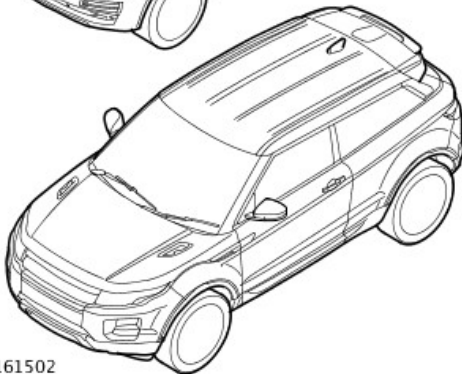
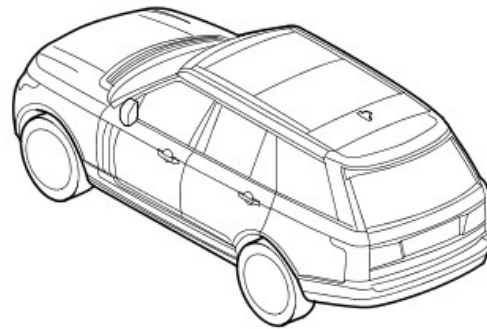
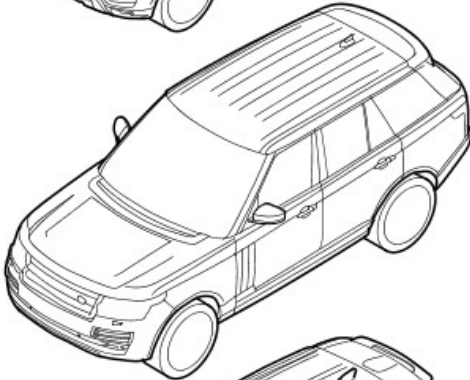
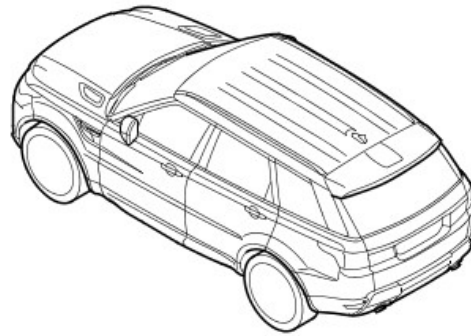
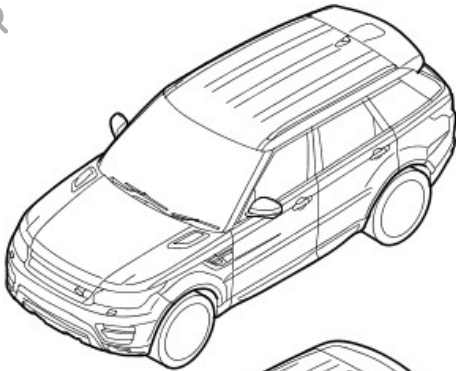
STORAGE HISTORY SHEET



E145630



STORAGE HISTORY SHEET (Continued)



E161502

2012.0 RANGE ROVER (LM), 100-11

VEHICLE TRANSPORTATION

VEHICLE BATTERY CONDITION AIDS AND VEHICLE STORAGE

DESCRIPTION AND OPERATION

Before carrying out any battery assessments, refer to the battery care requirements.

This form is to be used to record the battery condition for vehicles and parts by the dealer / retailer prior to handover to the customer. If the vehicle is kept in storage longer than 150 days, a new form must be started and the old form retained.

Follow the instructions on the approved battery tester.

Battery Tester Code (if applicable) Battery Tester Code (if applicable) Date

ACTIVITY	
Initial battery voltage and date of reading taken	
	Battery Tester Code (if applicable)
	Voltage
	Date
Post charge test if applicable	
	Battery Tester Code (if applicable)
	Voltage
	Date
30 days from initial battery reading	
	Battery Tester Code (if applicable)
	Voltage
	Date

	Signature
Post charge test if applicable	
	Battery Tester Code (if applicable)
	Voltage
	Date
	Signature
60 days from initial battery reading	
	Battery Tester Code (if applicable)
	Voltage
	Date
	Signature
Post charge test if applicable	
	Battery Tester Code (if applicable)
	Voltage
	Date
	Signature
90 days from initial battery reading	
	Battery Tester Code (if applicable)
	Voltage
	Date
	Signature
Post charge test MANDATED AT 90 DAYS	
	Battery Tester Code (if applicable)
	Voltage
	Date
	Signature
120 days from initial battery reading	
	Battery Tester Code (if applicable)
	Voltage
	Date

	Signature
Post charge test if applicable	
	Voltage
	Date
	Signature
Battery Tester Code (if applicable)	150 days from initial battery reading
Voltage	
Date	
Signature	
Post charge test if applicable	
	Battery Tester Code (if applicable)
	Voltage
	Date
Pre Delivery Inspection (PDI)	
	Battery Tester Code (if applicable)
	Voltage
	Date
Post charge test if applicable	
	Voltage
	Date
Customer Handover.	
	The battery voltage must be 12.55 volts or above.
	Battery Tester Code (if applicable)
	Voltage
	Signature

Please make sure that any transit relays are refitted and / or the vehicle is

put into transportation mode if the vehicle is stored

Transit relay removal / vehicle placed in normal mode should only be completed a maximum of 72 hours prior to handover to customer

STORAGE HISTORY SHEET

MODEL:	COLOR:	ARRIVAL DATE:
KEY NUMBER:		
VIN: TEST		

	OPERATIONS	IDENTIFICATION	INSPECTION	COOLING SYSTEM	ENGINE	TIRES	PARKING BRAKE - OFF
UPON RECEIPT	.	.	.	.	.	.	.
30 DAYS	.	.	.	.	.	.	.
60 DAYS	.	.	.	.	.	.	.
90 DAYS	.	.	.	.	.	.	.
120 DAYS	.	.	.	.	.	.	.
150 DAYS	.	.	.	.	.	.	.
OPERATIONS	WINDSHIELD WIPER BLADES	PAINTWORK	COMMENTS ON VEHICLE CONDITION	INSPECTORS SIGNATURE AND DATE			
UPON RECEIPT	.	.	NOTE: RECORD ANY VEHICLE	.			

			BODY DAMAGE ON SILHOUETTES THAT FOLLOW		
30 DAYS	
60 DAYS	
90 DAYS	
120 DAYS	
150 DAYS	

2012.0 RANGE ROVER (LM), 101-01

PRE-DELIVERY INSPECTION MANUAL

DESCRIPTION AND OPERATION

1. Transportation: Make sure that the vehicle has arrived with the transportation seals intact. Remove and discard the transportation seals.

1.1 During production of the vehicle, a transportation relay is fitted to the battery positive terminal. This is to minimize battery drain during vehicle storage and delivery. To start the vehicle when a transit relay is fitted, press

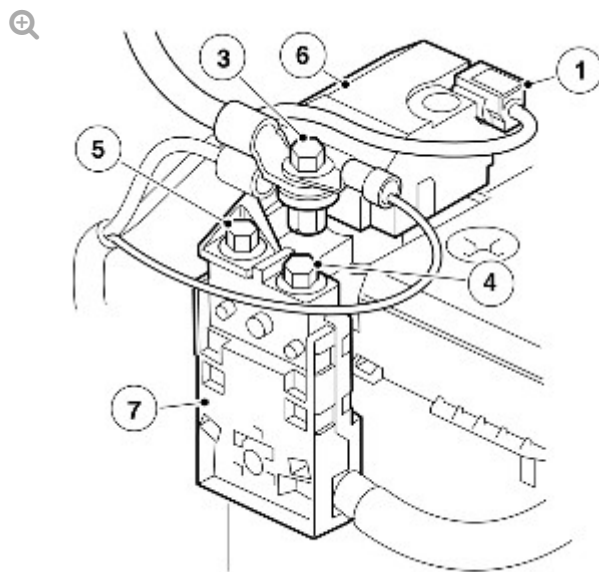
the hazard warning switch. This activates the transit relay to power-up and allow the engine to be started. If the ignition is turned on but the engine is not started the vehicle will return to transport mode after 15 seconds. After parking the vehicle in a work bay, remove the keys.

1.2 Check the integrity of factory fitted door and tailgate closure seals. Should a seal be broken or missing, make sure the tool kit and spare wheel are present. Also check that no internal damage to trim has occurred.

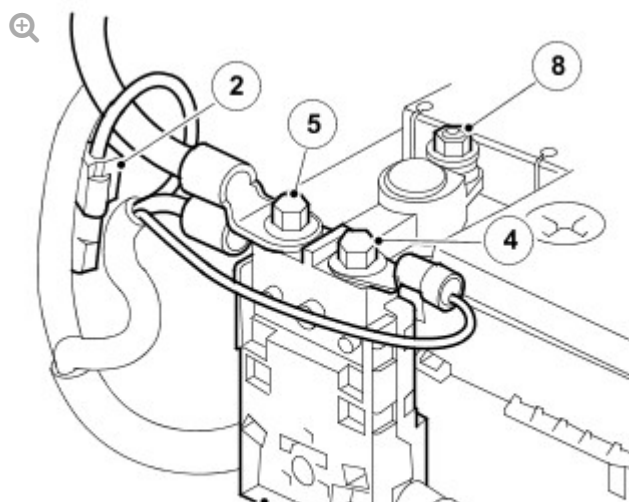
1.3 Remove door and tailgate closure seals.

1.4 Open bonnet for access.

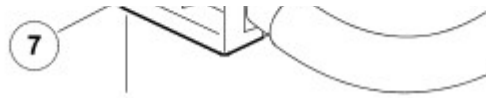
2. Vehicle Transportation Relay: A transit relay is fitted to the battery. This allows the vehicle to be driven when necessary, but isolates the vehicle during transit and storage to prevent the battery becoming discharged.



E145370



E145374



2.1 To remove the transit relay:

2.1.1 Disconnect the battery negative lead from the battery negative terminal.

2.1.2 Disconnect the electrical connector (1) from the transit relay. Secure the electrical connector to the stowage position (2) provided on the main wiring harness.

2.1.3 Remove the bolt (3), that secures the battery positive cables to the top of the transit relay. Discard this bolt.

2.1.4 Remove the two bolts (4), and (5), that secure the transit relay to the mega-fuse assembly (7). Discard the transit relay (6).

2.1.5 Replace the bolts (4), and (5), to the mega-fuse (7). Make sure that all the positive leads removed from the top of the transit relay (6), are reconnected to the top of the mega-fuse (7). Tighten the bolts finger tight at this point.

2.1.6 Loosen the battery positive terminal pinch bolt (8), twist the mega-fuse clockwise until it stops hard against the battery.

2.1.7 Torque the bolts (4), and (5), to 12 Nm (9 lb.ft).

2.1.8 Twist the mega-fuse back to the straight position, and torque the battery positive terminal pinch bolt (8), to 6 Nm (4 lb.ft).

2.1.9 Reconnect the battery negative terminal, and torque to 6 Nm (4 lb.ft). Make sure this is carried out in one clean connection, this will avoid creating electrical 'spikes' in the system.

2.1.10 After the transit relay has been removed and the battery re-connected, a Battery Monitor System (BMS), reset will need to be carried out using the Integrated Diagnostic System, (IDS).

NOTE:

Information regarding the BMS reset can be found in the Battery Care Manual on GTR.

CAUTIONS:

- Damage to battery. The battery terminal posts have a rotational torque threshold of 9 Nm (6 lb.ft). Extreme care **MUST** be observed when torquing the bolts (4), and (5), to 12 Nm (9 lb.ft).
- Damage to equipment. Failure to remove the transit relay before carrying out the PDI checks may result in damage to the IDS equipment.
- Damage to vehicle. Do not disconnect the battery while the ignition is switched on:
 - Electrical modules will not be allowed to shut down correctly and will result in fault codes being stored and spurious faults being induced.
 - Permanent damage to the instrument cluster may also result if the battery is disconnected with the ignition switched on.

3. Battery Care Requirements

Make sure the correct standard of battery care is applied to the battery, For additional information, refer to: Battery Care Requirements (414-00, Description and Operation).

NOTES:

- All equipment used must be functionally capable of meeting the compliance requirements.
- The vehicle may need to be taken out of transit mode to carry out the preconditions.

3.1. Carry out the battery test process shown below.

It is recommended that this test is conducted at least 24 hours after the vehicle engine has been run or the battery charged to avoid the need of surface charge removal. If time constraints make this unacceptable then the surface charge must be removed.

Surface Charge Removal

A vehicle which has had its battery charged or been driven in a 24 hour period before the test, must have its surface charge removed.

- Turn on the ignition but do not start the vehicle
- Switch on the headlamps on high beam for a minimum 3 minutes
- Switch off the headlamps
- Wait a minimum of 5 minutes before recording test results for any battery measurements

Battery Test

The battery may be tested either on a bench or on the vehicle.

The battery condition must be checked in accordance with the battery test process utilizing an appropriate tester as outlined in **the equipment section (Section 5)**

For additional information, refer to: Battery Care Requirements (414-00, Description and Operation).

NOTE:

The midtronics code must be recorded on the form.

Any actions must be carried out in accordance with the table shown in the **determining battery condition section (Section 6)**

For additional information, refer to: Battery Care Requirements (414-00, Description and Operation).

. The details must be recorded on the New Vehicle Storage Form which is part of the new vehicle storage document.

For additional information, refer to: [New Vehicle Storage Form \(100-11\)](#)

For additional information, refer to: [New Vehicle Storage Form \(100-11 Vehicle Transportation Aids and Vehicle Storage, Description and Operation\)](#).

CAUTION:

DO NOT connect the tester to any other circuit or chassis point other than the battery negative terminal.

3.2. If the battery is disconnected again after conducting the PDI, certain vehicle electrical systems that are calibrated during the PDI will lose the calibration and will require resetting again once the battery is reconnected. This may include the PDI application and Market configurations shown in section 10.

3.3. The battery must be tested to determine that the battery is in good condition, and there is sufficient charge to carry out the PDI. Certain electrical systems require a precise voltage to operate correctly.

- Check the battery positive terminal cable and BMS clamp pinch bolts are tightened to 6 Nm.

NOTE:

It is imperative, to make sure correct vehicle functionality, that the battery terminal is pushed fully home and is tightened to the specified torque figure.

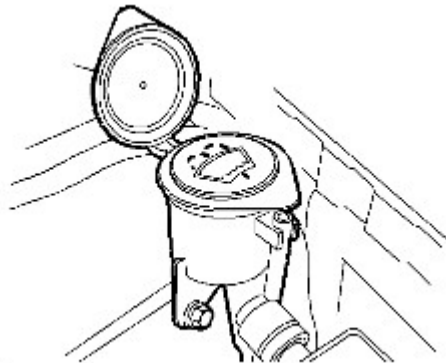
- Connect the Land Rover recommended battery tester to the battery.
- Check and record on the PDI check sheet, the battery condition as indicated by the Land Rover recommended battery tester.

NOTE:

The voltage check must be carried out before connecting the diagnostic equipment. Failure to do this may result in vehicle configuration failure

3.4. Check security of battery carrier clamp and that it is tightened to a torque of 5 Nm (4 lb.ft).

4. Under bonnet levels: Check/top-up all underbonnet fluid levels. Investigate cause of any low level readings.



E145369

4.1 Remove filler cap, check and top-up windscreen, headlamp and rear washer reservoir with diluted Land Rover screen wash fluid. Refit the cap.

4.2 Vehicles with 3.6L diesel engines: With the vehicle standing on level ground and the engine off, withdraw the engine oil dipstick and check that the oil level is to the 'MAX' mark on the dipstick. The engine oil should be checked from cold. If necessary, remove the engine oil filler cap and top-up the engine oil, using oil to the correct specification. Install the engine oil filler cap.

NOTE:

Diesel 3.6L: SAE 5W-30 meeting Land Rover specification WSS M2C913-B A1.





E145368

4.3 Vehicles with 5.0L petrol and 4.4L diesel engines: The engine must be switched off and allowed to stand for a period of at least 10 minutes before checking the oil level. Checking the oil level soon after the engine has been run will provide a false low level reading which may result in overfilling.

To allow for the actual oil level to be verified, a service mode exists to give access to 'live' oil readings. In order to have a correct reading, the following conditions must be met:

- The vehicle **MUST** be parked on a level area of ground. The sensor installation is very sensitive to vehicle tilt in the fore-aft direction: 0.5 degree vehicle tilt corresponds to an, up-to-0.5 litre measurement error.
- The gear selector must be in the 'PARK' (P) position and the hood must be open.
- A minimum time of 10 minutes must be allowed to pass after running the engine. This drain-down time is to allow the oil to return to the sump.

To access service mode, the following procedure should be followed:

- 1.** With the ignition 'ON', engine not running, use the controls on the steering wheel, select on the Message Centre: **Service Menu > Oil Level Display > OK**
- 2.** Press the cruise control CANCEL button twice within 2 seconds.
- 3.** The instrument pack display will revert back to the normal display in the trip computer.
- 4.** Using the controls on the steering wheel, access the Oil Level Display again.

Messages to the right of the gauge will advise of any action that may need

to be taken. If the oil level is below the required operating range, a message advising how much oil to add will be displayed; i.e., 'Add 0.5 litres'. If necessary, add the recommended quantity of oil then re-check the level.

CAUTION:

Serious damage to the engine and components will result from overfilling engine with oil. When filling the engine with oil, make sure any spilt oil is immediately cleaned from the engine, components and/or bodywork.

5. With the ignition 'ON', engine not running, remove the oil filler cap.

NOTES:

- Petrol engines: SAE 5W-20 meeting Land Rover specification WSS M2C925-A (Castrol SLX Professional OE 5W-20). For Japan Only use: ILSAC GF4 and API SM.
- Diesel 4.4L with DPF: SAE 5W-30 meeting Land Rover specification WSS M2C934-B (Castrol SLX Professional Powerflow C1 5W-30).
- Diesel 4.4L without DPF: SAE 5W-30 meeting Land Rover specification WSS M2C913-B (Castrol SLX Professional Powerflow C1 5W-30).

6. If the oil level is within the required operating range, the message 'Level OK' will be displayed.

7. If indicated by the Message Centre oil level display, add the appropriate quantity of oil (as advised). Wait 5 minutes to let the oil level stabilise and re-check the level.

8. Clean up any oil spilt during the top-up process.

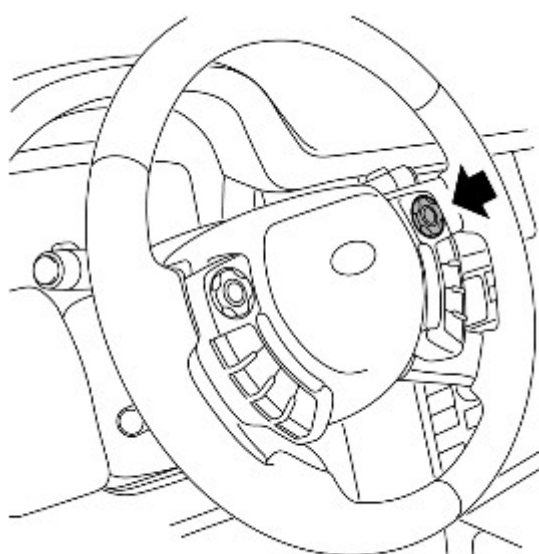
9. Install the oil filler cap.

CAUTION:

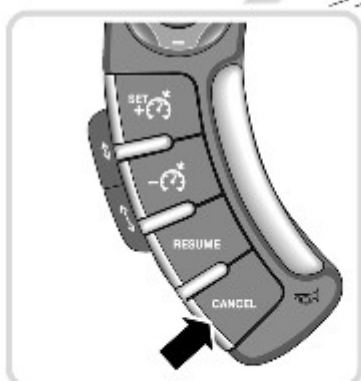
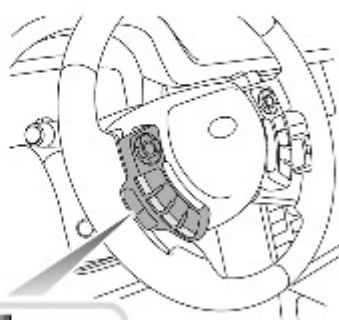
The ignition must be left on during the top-up, so that the electronic dipstick can register and display the new oil level. This enables an accurate level recheck.

NOTE:

Investigate the cause of any low fluid levels.

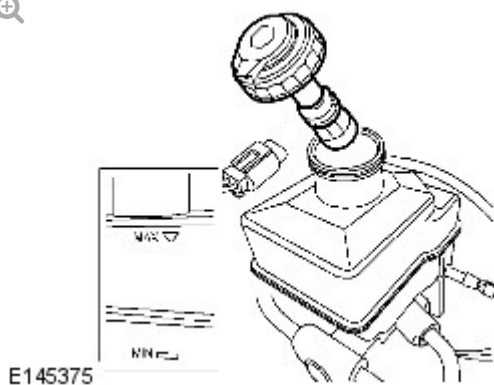


E145365



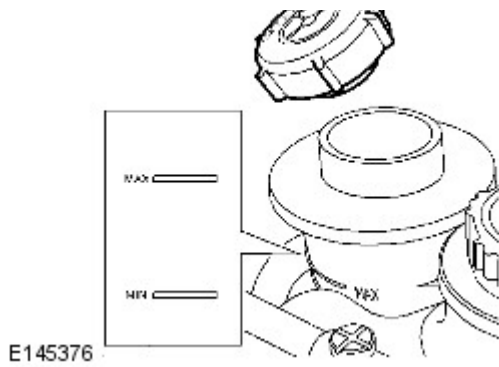
4.4 Reset the oil level indicator: Vehicles with 5.0L petrol and 4.4L diesel engines. To reset the oil level indicator the following steps must be followed in order:

- With the ignition 'ON', engine not running, use the controls on the steering wheel to select on the instrument cluster menu: Service Menu > Oil Level Display.
- Press the cruise control CANCEL button twice within 2 seconds.
- The instrument pack display will revert to the normal display in the trip computer.
- Using the controls on the steering wheel, access the Oil Level Display again.
- Press and hold the cruise control CANCEL button for 10 seconds to reset the oil level indicator.
- The trip menu display will revert to the normal display mode on the Message Centre.
- Turn the ignition OFF.



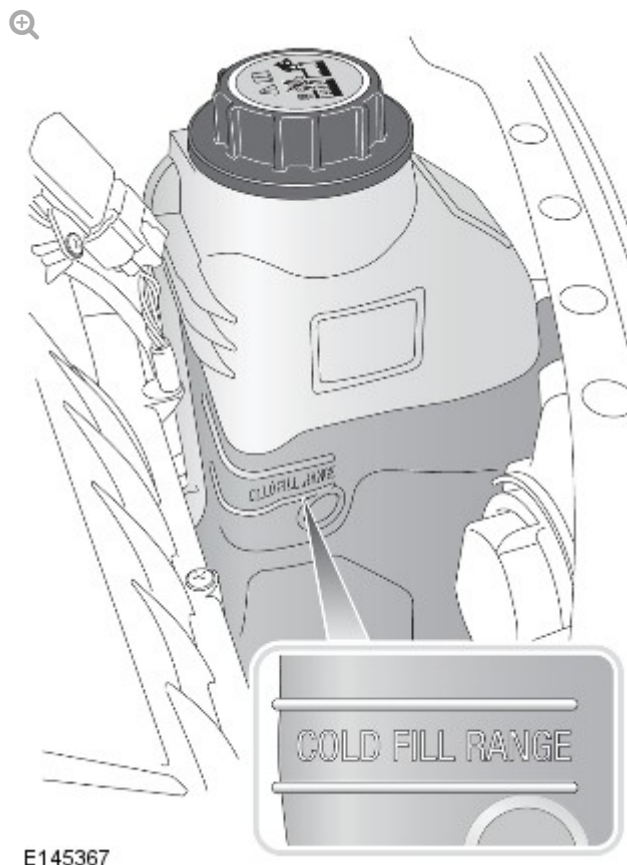
4.5 Remove the auxiliary battery box cover. Check the fluid level in the brake fluid reservoir. The level must be to the 'MAX' mark on the reservoir, top-up if necessary. Top-up the fluid level using Shell DOT4 ESL brake fluid to the 'MAX' mark on the reservoir. Install the auxiliary battery box cover.





4.6 Check that the power steering fluid level is midway between the 'MAX' and 'MIN' marks on the fluid reservoir, top-up if necessary. Top-up the fluid level using Texaco Cold Climate fluid PSF 14315.

4.7 If installed: Check that the dynamic response fluid level is mid-way between the 'MAX' and 'MIN' marks on the fluid reservoir, top-up if necessary. Top-up the fluid level using Texaco Cold Climate fluid PSF 14315.



4.8 Check the coolant level in the expansion tank. With the engine cold, the coolant level must be to the upper level of the cold fill range indicator mark, above the text on the side of the expansion tank. Ignore any coolant which may be visible in the top section of the tank.

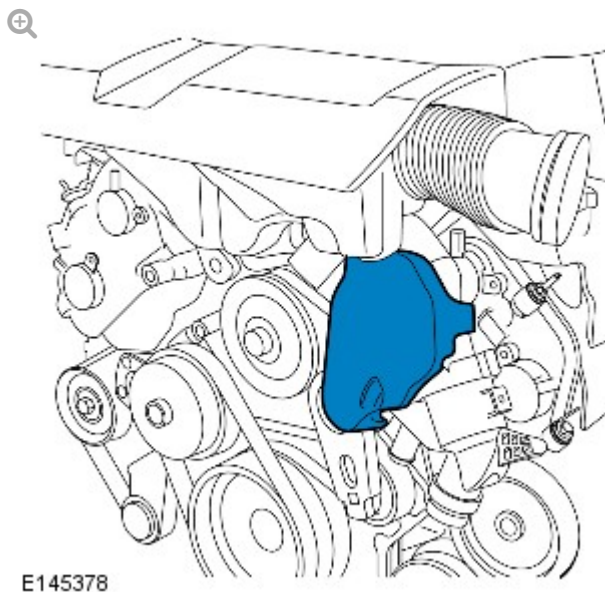
4.9 Top-up the coolant to the upper level mark on the tank using a 50% mixture of water and Castrol SF antifreeze or any ethylene glycol based anti-freeze containing no methanol with only Organic Acid Technology (OAT) corrosion inhibitors. Install the expansion tank filler cap, tighten the cap until the ratchet is heard to 'click'.

NOTE:

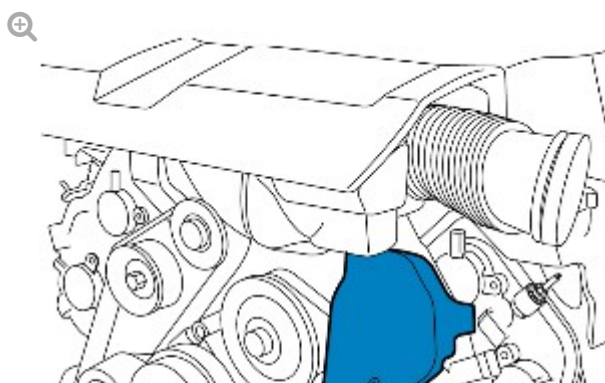
Anti-freeze concentration **MUST** be maintained at 50%.

5. Cold air deflector: Make sure that the cold air deflector has been fitted on vehicles with 5.0L normally aspirated and supercharged engines that operate in severe cold markets: (Russia and Nordic countries).

Normally Aspirated



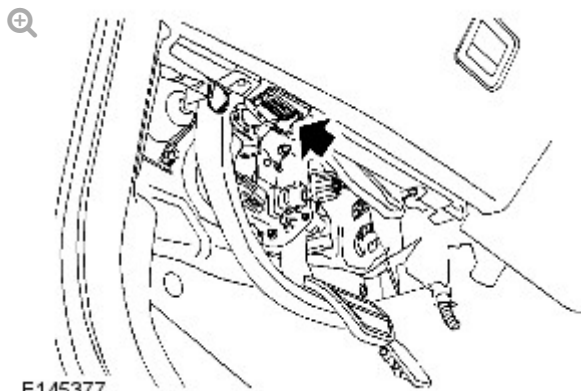
Supercharged





E145379

5.1 The cold air deflector should be secured to both of the Multi-Stage Thermostat (MST) hoses and visually flat to the front of the engine. If necessary, push on the centre of the deflector to firmly seat between both MST hoses. Make sure the deflector is retained and is flat to the front of the engine.



E145377

6. Connect battery charger and diagnostic equipment: Connect the approved Land Rover battery power supply, then connect the Land Rover approved diagnostic equipment to the vehicle diagnostic socket. Insert IDS/SDD disc 122 or later.

NOTE:

To charge the battery, connect the positive booster cable to the positive terminal on the battery. The negative booster cable **MUST** be connected to a suitable earth point on the vehicle. The earth point should be at least 0.5 meters, (20 inches) away from the battery and as far away as possible from any fuel pipes, brake pipes and moving parts.

CAUTION:



Damage to vehicle. Failure to charge the battery in this manner will cause the BMS to NOT register the charge increase. This can cause certain systems to be inhibited during the first few days of driving while the BMS re-calibrates.

7. PDI application: Following the battery condition test and transit relay removal, IDS is to be connected to the vehicle and the System Driven Diagnostics (SDD) PDI application run. The PDI application will enable certain vehicle systems and reset the flight recorder. These systems include:

- Switch the ignition ON.
- Enter VIN and vehicle details into diagnostic equipment.
- Select the correct model year.
- Select 'Vehicle Configuration' icon.
- Select 'Special Applications'.
- Select the 'Pre-delivery Inspection' application.
- Follow the on-screen instructions. This will take the vehicle out of transit mode, sets the Service Interval Announcer (SIA), on petrol models 'flight recorder' data, and the EMS adaption values.

The flight recorder captures certain diagnostic data under special conditions. During vehicle production, certain Diagnostic Trouble Codes (DTC's) are captured as high priority events. These events will subsequently overwrite any stored lower priority events. This may have the effect of capturing irrelevant build data and not retain any relevant vehicle DTC's.

7.1 Run the SDD, PDI application:

- 1** Connect the IDS equipment to the vehicle J1962 diagnostic connector.
- 2** Switch the ignition ON.
- 3** SDD will read the vehicle identification details from the vehicle.
- 4** Confirm that these details are correct.
- 5** If the details are incorrect, manually enter the vehicle identification details.
- 6** Check the Vehicle Specifications used by SDD match the actual vehicle.

- 6 Check the vehicle specifications read by SDD match the actual vehicle specifications.
- 7 Select the 'PDI' tab.
- 8 Select the 'Recommendations' tab.
- 9 From the menu, select 'Pre-Delivery Inspection' and click 'RUN'.
- 10 Follow the on-screen instructions. This will take the vehicle out of transit mode, sets the Service Interval Announcer (SIA), on petrol models 'flight recorder' data, and EMS adaption values.

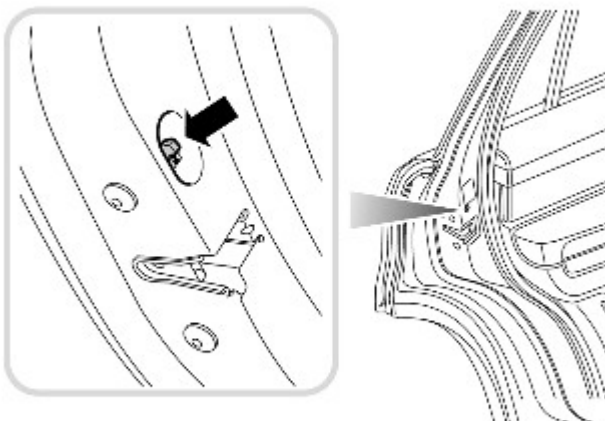
NOTE:

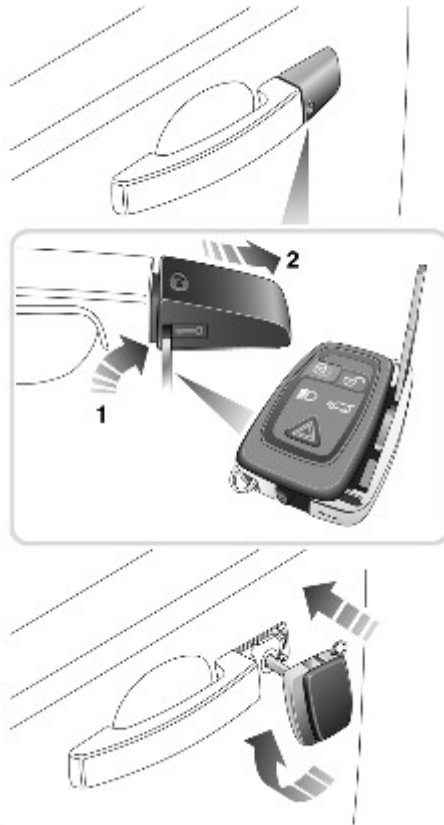
Refer to Sections 10 to 15 for further information on configuring the vehicle to market via the Message Centre.

8. Vehicle updates: Check the register of Service Action Bulletins, and applicable Recall Actions or Update Prior to Sales notices, to make sure the customer receives the vehicle in a fault free state. Also make sure that the vehicle is clear of fault codes.

NOTE:

Once the PDI application has been completed and the vehicle is in a fault free state remove the diagnostic equipment from the vehicle.





E145371

9.Entry systems and alarm: Check the doors, door locks and child safety locks for correct operation. Install the door lock cover.

9.1 Check operation of the internal 'master lock' and 'unlock switch' on the centre console.

9.2 Check the hood release and safety catch for correct operation.

9.3 Check the operation of every button on both the supplied key fobs, to make sure the expected functionality is carried out as indicated by each buttons legend.

9.4 Check for correct operation of the vehicle alarm system:

- Make sure all doors, windows and sunroofs are closed.
- Press the lock button once. This will activate the perimetric alarm but NOT the interior space protection.
- Press the unlock button and make sure the alarm has been disarmed.
- Press the lock button on the remote handset twice within 3 seconds. This

will 'super lock' the vehicle (interior and exterior vehicle protection). The interior protection will only work if the feature has not been disabled via the Vehicle Settings menu.

- Press the unlock button and make sure the alarm has been disarmed.
- Open a window and/or the sunroof so the Global Closing can be checked.
- Press and hold the lock button on the remote handset for 3 seconds. This will activate Global Closing. The alarm will be activated, all doors and the luggage compartment will lock and, after 3 seconds the windows and sunroof will close.

NOTE:

To carry out this procedure in the correct manner the battery charger should be removed.

2012.0 RANGE ROVER (LM), 101-01

PRE-DELIVERY INSPECTION MANUAL

DESCRIPTION AND OPERATION

1. Transportation: Make sure that the vehicle has arrived with the transportation seals intact. Remove and discard the transportation seals.

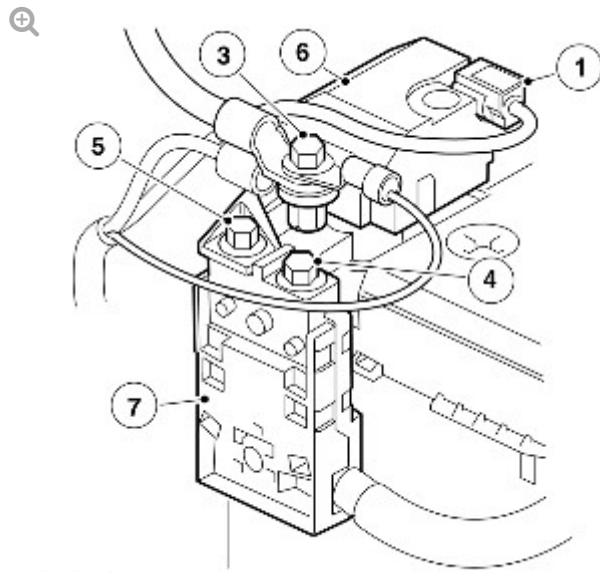
1.1 During production of the vehicle, a transportation relay is fitted to the battery positive terminal. This is to minimize battery drain during vehicle storage and delivery. To start the vehicle when a transit relay is fitted, press the hazard warning switch. This activates the transit relay to power-up and allow the engine to be started. If the ignition is turned on but the engine is not started the vehicle will return to transport mode after 15 seconds. After parking the vehicle in a work bay, remove the keys.

1.2 Check the integrity of factory fitted door and tailgate closure seals. Should a seal be broken or missing, make sure the tool kit and spare wheel are present. Also check that no internal damage to trim has occurred.

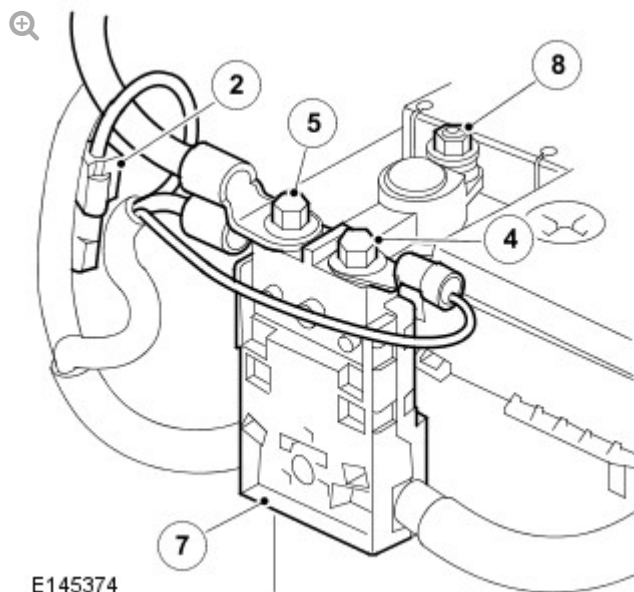
1.3 Remove door and tailgate closure seals.

1.4 Open bonnet for access.

2. Vehicle Transportation Relay: A transit relay is fitted to the battery. This allows the vehicle to be driven when necessary, but isolates the vehicle during transit and storage to prevent the battery becoming discharged.



E145370



E145374

2.1 To remove the transit relay:

2.1.1 Disconnect the battery negative lead from the battery negative terminal.

2.1.2 Disconnect the electrical connector (1) from the transit relay. Secure the electrical connector to the stowage position (2) provided on the main wiring harness.

2.1.3 Remove the bolt (3), that secures the battery positive cables to the

top of the transit relay. Discard this bolt.

2.1.4 Remove the two bolts (4), and (5), that secure the transit relay to the mega-fuse assembly (7). Discard the transit relay (6).

2.1.5 Replace the bolts (4), and (5), to the mega-fuse (7). Make sure that all the positive leads removed from the top of the transit relay (6), are reconnected to the top of the mega-fuse (7). Tighten the bolts finger tight at this point.

2.1.6 Loosen the battery positive terminal pinch bolt (8), twist the mega-fuse clockwise until it stops hard against the battery.

2.1.7 Torque the bolts (4), and (5), to 12 Nm (9 lb.ft).

2.1.8 Twist the mega-fuse back to the straight position, and torque the battery positive terminal pinch bolt (8), to 6 Nm (4 lb.ft).

2.1.9 Reconnect the battery negative terminal, and torque to 6 Nm (4 lb.ft). Make sure this is carried out in one clean connection, this will avoid creating electrical 'spikes' in the system.

2.1.10 After the transit relay has been removed and the battery re-connected, a Battery Monitor System (BMS), reset will need to be carried out using the Integrated Diagnostic System, (IDS).

NOTE:

Information regarding the BMS reset can be found in the Battery Care Manual on Topix.

CAUTIONS:

- Damage to battery. The battery terminal posts have a rotational torque threshold of 9 Nm (6 lb.ft). Extreme care **MUST** be observed when torquing the bolts (4), and (5), to 12 Nm (9 lb.ft).
- Damage to equipment. Failure to remove the transit relay before carrying out the PDI checks may result in damage to the IDS

equipment.

- Damage to vehicle. Do not disconnect the battery while the ignition is switched on:
 - Electrical modules will not be allowed to shut down correctly and will result in fault codes being stored and spurious faults being induced.
 - Permanent damage to the instrument cluster may also result if the battery is disconnected with the ignition switched on.

3. Battery Care Requirements

Make sure the correct standard of battery care is applied to the battery, For additional information, refer to: Battery Care Requirements (414-00, Description and Operation).

NOTES:

- All equipment used must be functionally capable of meeting the compliance requirements.
- The vehicle may need to be taken out of transit mode to carry out the preconditions.

3.1. Carry out the battery test process shown below.

It is recommended that this test is conducted at least 24 hours after the vehicle engine has been run or the battery charged to avoid the need of surface charge removal. If time constraints make this unacceptable then the surface charge must be removed.

Surface Charge Removal

A vehicle which has had its battery charged or been driven in a 24 hour period before the test, must have its surface charge removed.

- Turn on the ignition but do not start the vehicle
- Switch on the headlamps on high beam for a minimum 3 minutes

- Switch on the headlamps on high beam for a minimum of 5 minutes
- Switch off the headlamps
- Wait a minimum of 5 minutes before recording test results for any battery measurements

Battery Test

The battery may be tested either on a bench or on the vehicle.

The battery condition must be checked in accordance with the battery test process utilizing an appropriate tester as outlined in **the equipment section (Section 5)**

For additional information, refer to: Battery Care Requirements (414-00, Description and Operation).

NOTE:

The midtronics code must be recorded on the form.

Any actions must be carried out in accordance with the table shown in the **determining battery condition section (Section 6)**

For additional information, refer to: Battery Care Requirements (414-00, Description and Operation).

. The details must be recorded on the New Vehicle Storage Form which is part of the new vehicle storage document.

CAUTION:

DO NOT connect the tester to any other circuit or chassis point other than the battery negative terminal.

3.2. If the battery is disconnected again after conducting the PDI, certain vehicle electrical systems that are calibrated during the PDI will lose the calibration and will require resetting again once the battery is reconnected. This may include the PDI application and Market configurations shown in section 11.

3.3. The battery must be tested to determine that the battery is in good condition, and there is sufficient charge to carry out the PDI. Certain electrical systems require a precise voltage to operate correctly.

- Check the battery positive terminal cable and BMS clamp pinch bolts are tightened to 6 Nm.

NOTE:

It is imperative, to make sure correct vehicle functionality, that the battery terminal is pushed fully home and is tightened to the specified torque figure.

- Connect the Land Rover recommended battery tester to the battery.
- Check and record on the PDI check sheet, the battery condition as indicated by the Land Rover recommended battery tester.

NOTE:

The voltage check must be carried out before connecting the diagnostic equipment. Failure to do this may result in vehicle configuration failure.

3.4. Check security of battery carrier clamp and that it is tightened to a torque of 5 Nm (4 lb.ft).

4. Teak rear loadspace floor: Teak oil must be applied to the teak floor using a pre-mixed teak oil (specifications below) and a lint free cloth. To apply the oil:

- 1** Remove the load space floor, RH panel, LH panel and hinged panel from the vehicle to a suitable work station, the tailgate panel must not be removed.
- 2** Using a lint free cloth, apply the oil in a small test area to make sure the colour matches.
- 3** Apply the oil in the direction of the wood grain until completely

covered.

4 Remove any excess oil.

5 Allow time to dry then refit panels after the PDI has been completed.

SPECIFICATION OF BARTOLINE TEAK OIL:

Colour	Brown
Flash Point Deg C	41
Non volatile content	24 – 26%
Viscosity @ 20 Deg C (B2 Flow Cup)	32 - 37 Seconds
Auto ignition Temperature Deg C	450 solvent fraction
Specific gravity at 20 deg C	0.820 ± 0.01
Voc Content	700g/l

WARNING:

Avoid flames, sparks or lighted substances.

CAUTIONS:

- Take extra care when applying the oil to avoid contact with the vehicle trim panels.
- Make sure that the workshop area in which the loadspace floor is being worked on is as clean and as dust free as possible and is well ventilated.

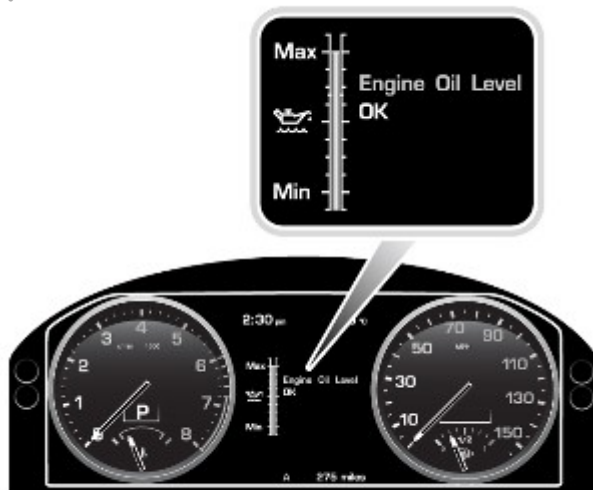
5. Under bonnet levels: Check/top-up all underbonnet fluid levels. Investigate cause of any low level readings.



E145369



5.1 Remove filler cap, check and top-up windscreen, headlamp and rear washer reservoir with diluted Land Rover screen wash fluid. Refit the cap.



E145368

5.2 Vehicles with 5.0L petrol and 4.4L diesel engines: The engine must be switched off and allowed to stand for a period of at least 10 minutes before checking the oil level. Checking the oil level soon after the engine has been run will provide a false low level reading which may result in overfilling.

To allow for the actual oil level to be verified, a service mode exists to give access to 'live' oil readings. In order to have a correct reading, the following conditions must be met:

- The vehicle **MUST** be parked on a level area of ground. The sensor installation is very sensitive to vehicle tilt in the fore-aft direction: 0.5 degree vehicle tilt corresponds to an, up-to-0.5 litre measurement error.
- The gear selector must be in the 'PARK' (P) position and the hood must be open.
- A minimum time of 10 minutes must be allowed to pass after running the engine. This drain-down time is to allow the oil to return to the sump.

To access service mode, the following procedure should be followed:

1. With the ignition 'ON', engine not running, use the controls on the steering wheel, select on the Message Centre: **Service Menu > Oil Level Display > OK**
2. Press the cruise control CANCEL button twice within 2 seconds.
3. The instrument pack display will revert back to the normal display in the trip computer.
4. Using the controls on the steering wheel, access the Oil Level Display again.

Messages to the right of the gauge will advise of any action that may need to be taken. If the oil level is below the required operating range, a message advising how much oil to add will be displayed; i.e., 'Add 0.5 litres'. If necessary, add the recommended quantity of oil then re-check the level.

CAUTION:

Serious damage to the engine and components will result from overfilling engine with oil. When filling the engine with oil, make sure any spilt oil is immediately cleaned from the engine, components and/or bodywork.

5. With the ignition 'ON', engine not running, remove the oil filler cap.

NOTES:

- Petrol engines: SAE 5W-20 meeting Land Rover specification WSS M2C925-A (Castrol SLX Professional OE 5W-20). For Japan Only use: ILSAC GF4 and API SM.
- Diesel 4.4L with DPF: SAE 5W-30 meeting Land Rover specification WSS M2C934-B (Castrol SLX Professional Powerflow C1 5W-30).
- Diesel 4.4L without DPF: SAE 5W-30 meeting Land Rover specification WSS M2C913-B (Castrol SLX Professional Powerflow C1 5W-30).

6. If the oil level is within the required operating range, the message 'Level OK' will be displayed.

7. If indicated by the Message Centre oil level display, add the appropriate quantity of oil (as advised). Wait 5 minutes to let the oil level stabilise and re-check the level.

8. Clean up any oil spilt during the top-up process.

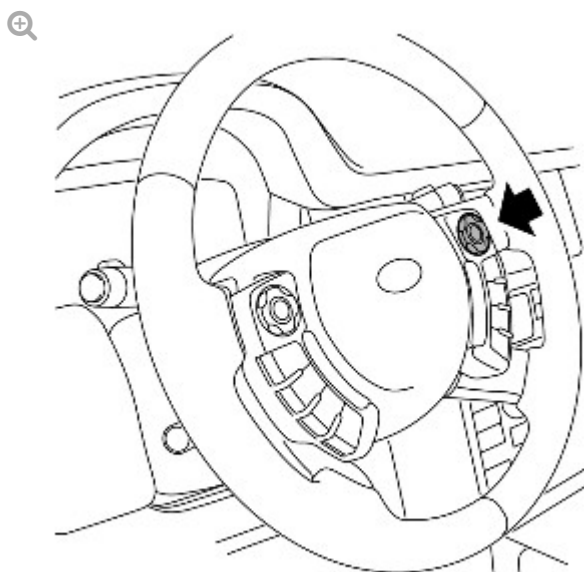
9. Install the oil filler cap.

CAUTION:

The ignition must be left on during the top-up, so that the electronic dipstick can register and display the new oil level. This enables an accurate level recheck.

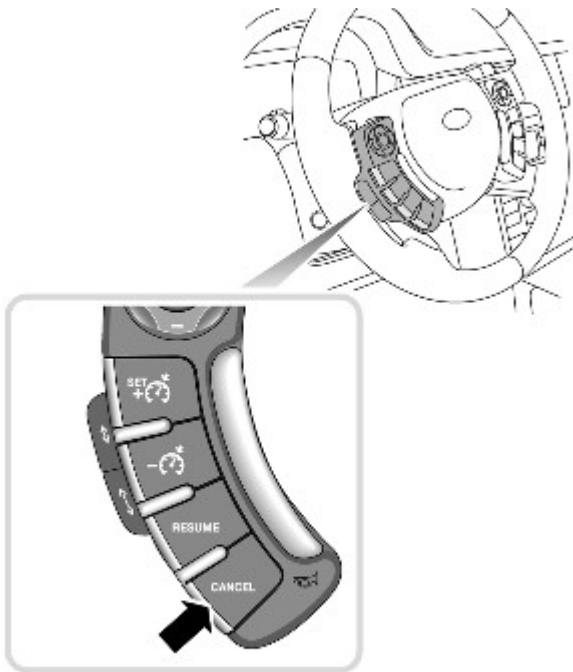
NOTE:

Investigate the cause of any low fluid levels.



E145365



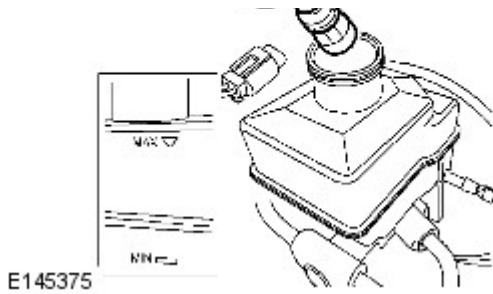


E145372

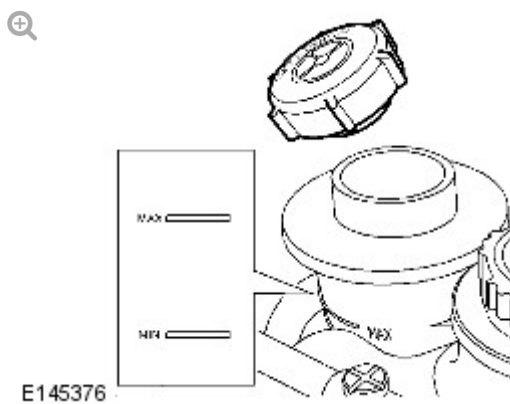
5.3 Reset the oil level indicator: Vehicles with 5.0L petrol and 4.4L diesel engines. To reset the oil level indicator the following steps must be followed in order:

- With the ignition 'ON', engine not running, use the controls on the steering wheel to select on the instrument cluster menu: Service Menu > Oil Level Display.
- Press the cruise control CANCEL button twice within 2 seconds.
- The instrument pack display will revert to the normal display in the trip computer.
- Using the controls on the steering wheel, access the Oil Level Display again.
- Press and hold the cruise control CANCEL button for 10 seconds to reset the oil level indicator.
- The trip menu display will revert to the normal display mode on the Message Centre.
- Turn the ignition OFF.



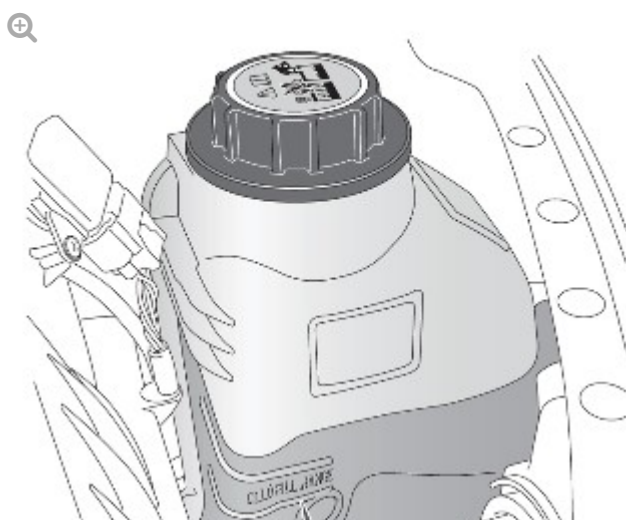


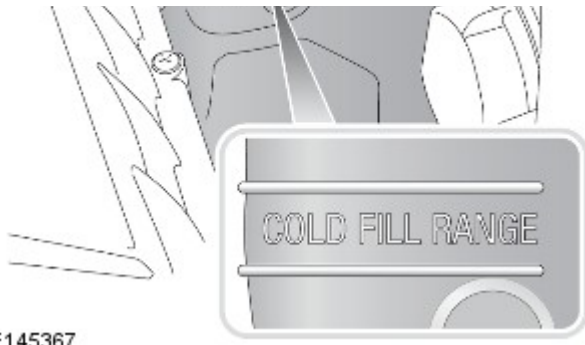
5.4 Remove the auxiliary battery box cover. Check the fluid level in the brake fluid reservoir. The level must be to the 'MAX' mark on the reservoir, top-up if necessary. Top-up the fluid level using Shell DOT4 ESL brake fluid to the 'MAX' mark on the reservoir. Install the auxiliary battery box cover.



5.5 Check that the power steering fluid level is midway between the 'MAX' and 'MIN' marks on the fluid reservoir, top-up if necessary. Top-up the fluid level using Texaco Cold Climate fluid PSF 14315.

5.6 If installed: Check that the dynamic response fluid level is mid-way between the 'MAX' and 'MIN' marks on the fluid reservoir, top-up if necessary. Top-up the fluid level using Texaco Cold Climate fluid PSF 14315.





E145367

5.7 Check the coolant level in the expansion tank. With the engine cold, the coolant level must be to the upper level of the cold fill range indicator mark, above the text on the side of the expansion tank. Ignore any coolant which may be visible in the top section of the tank.

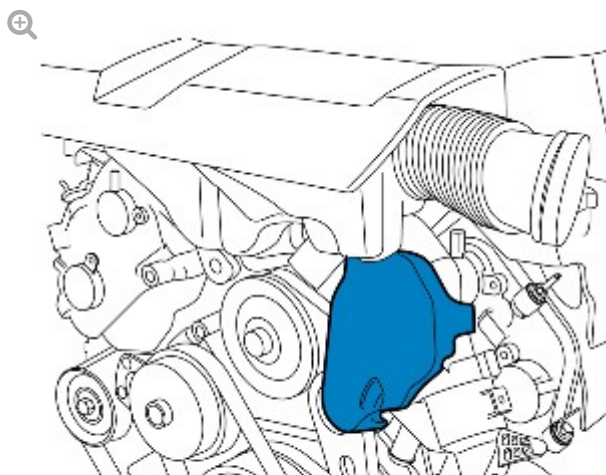
5.8 Top-up the coolant to the upper level mark on the tank using a 50% mixture of water and Castrol SF antifreeze or any ethylene glycol based anti-freeze containing no methanol with only Organic Acid Technology (OAT) corrosion inhibitors. Install the expansion tank filler cap, tighten the cap until the ratchet is heard to 'click'.

NOTE:

Anti-freeze concentration **MUST** be maintained at 50%.

6. Cold air deflector: Make sure that the cold air deflector has been fitted on vehicles with 5.0L normally aspirated and supercharged engines that operate in severe cold markets: (Russia and Nordic countries).

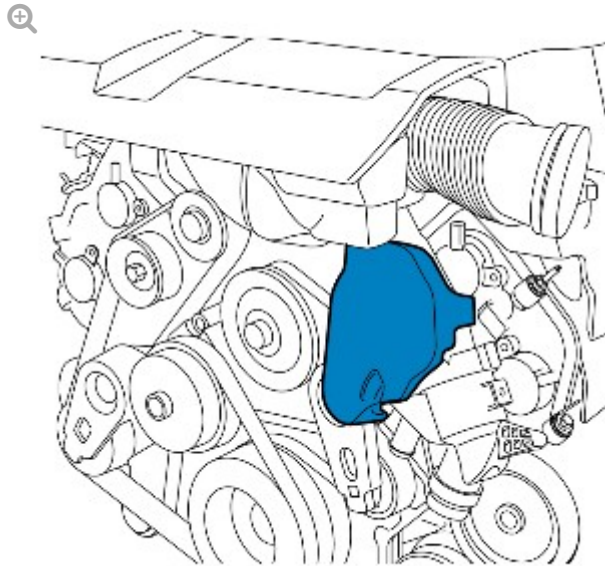
Normally Aspirated



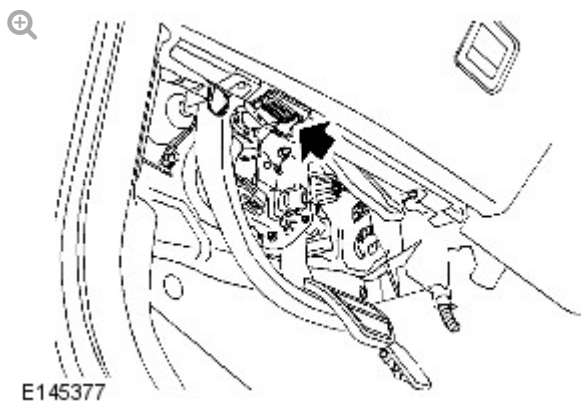


E145378

Supercharged



6.1 The cold air deflector should be secured to both of the Multi-Stage Thermostat (MST) hoses and visually flat to the front of the engine. If necessary, push on the centre of the deflector to firmly seat between both MST hoses. Make sure the deflector is retained and is flat to the front of the engine.



7. Connect battery charger and diagnostic equipment: Connect the approved Land Rover battery power supply, then connect the Land Rover approved diagnostic equipment to the vehicle diagnostic socket. Insert IDS/SDD disc 122 or later.

NOTE:

To charge the battery, connect the positive booster cable to the positive terminal on the battery. The negative booster cable **MUST** be connected to a suitable earth point on the vehicle. The earth point should be at least 0.5 meters, (20 inches) away from the battery and as far away as possible from any fuel pipes, brake pipes and moving parts.

CAUTION:

Damage to vehicle. Failure to charge the battery in this manner will cause the BMS to NOT register the charge increase. This can cause certain systems to be inhibited during the first few days of driving while the BMS re-calibrates.

8. PDI application: Following the battery condition test and transit relay removal, IDS is to be connected to the vehicle and the System Driven Diagnostics (SDD) PDI application run. The PDI application will enable certain vehicle systems and reset the flight recorder. These systems include:

- Switch the ignition ON.
- Enter VIN and vehicle details into diagnostic equipment.
- Select the correct model year.
- Select 'Vehicle Configuration' icon.
- Select 'Special Applications'.
- Select the 'Pre-delivery Inspection' application.
- Follow the on-screen instructions. This will take the vehicle out of transit mode, sets the Service Interval Announcer (SIA), on petrol models 'flight recorder' data, and the EMS adaption values.

The flight recorder captures certain diagnostic data under special conditions. During vehicle production, certain Diagnostic Trouble Codes (DTC's) are captured as high priority events. These events will subsequently

overwrite any stored lower priority events. This may have the effect of capturing irrelevant build data and not retain any relevant vehicle DTC's.

8.1 Run the SDD, PDI application:

- 1 Connect the IDS equipment to the vehicle J1962 diagnostic connector.
- 2 Switch the ignition ON.
- 3 SDD will read the vehicle identification details from the vehicle.
- 4 Confirm that these details are correct.
- 5 If the details are incorrect, manually enter the vehicle identification details.
- 6 Check the Vehicle Specifications read by SDD match the actual vehicle specifications.
- 7 Select the 'PDI' tab.
- 8 Select the 'Recommendations' tab.
- 9 From the menu, select 'Pre-Delivery Inspection' and click 'RUN'.
- 10 Follow the on-screen instructions. This will take the vehicle out of transit mode, sets the Service Interval Announcer (SIA), on petrol models 'flight recorder' data, and EMS adaption values.

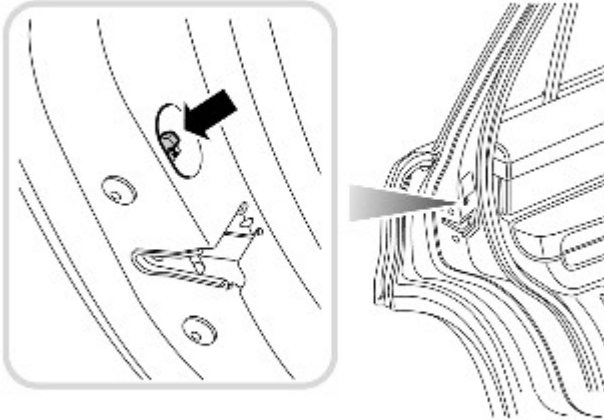
NOTE:

Refer to Sections 10 to 15 for further information on configuring the vehicle to market via the Message Centre.

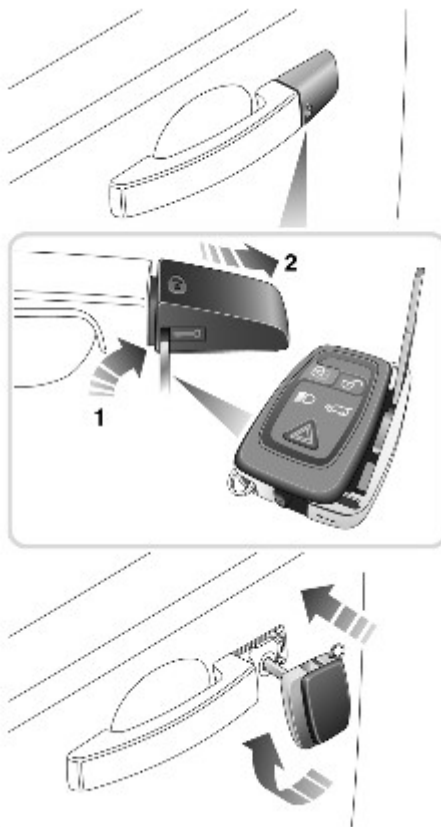
9. Vehicle updates: Check the register of Service Action Bulletins, and applicable Recall Actions or Update Prior to Sales notices, to make sure the customer receives the vehicle in a fault free state. Also make sure that the vehicle is clear of fault codes.

NOTE:

Once the PDI application has been completed and the vehicle is in a fault free state remove the diagnostic equipment from the vehicle.



E145373



E145371

10.Entry systems and alarm: Check the doors, door locks and child safety locks for correct operation. Install the door lock cover.

10.1 Check operation of the internal 'master lock' and 'unlock switch' on the centre console.

10.2 Check the hood release and safety catch for correct operation.

10.3 Check the operation of every button on both the supplied key fobs, to make sure the expected functionality is carried out as indicated by each buttons legend.

10.4 Check for correct operation of the vehicle alarm system:

- Make sure all doors, windows and sunroofs are closed.
- Press the lock button once. This will activate the perimeter alarm but NOT the interior space protection.
- Press the unlock button and make sure the alarm has been disarmed.
- Press the lock button on the remote handset twice within 3 seconds. This will 'super lock' the vehicle (interior and exterior vehicle protection). The interior protection will only work if the feature has not been disabled via the Vehicle Settings menu.
- Press the unlock button and make sure the alarm has been disarmed.
- Open a window and/or the sunroof so the Global Closing can be checked.
- Press and hold the lock button on the remote handset for 3 seconds. This will activate Global Closing. The alarm will be activated, all doors and the luggage compartment will lock and, after 3 seconds the windows and sunroof will close.

NOTE:

To carry out this procedure in the correct manner the battery charger should be removed.

PRE-DELIVERY INSPECTION MANUAL

DESCRIPTION AND OPERATION

NOTES:

- The battery charger should be reconnected whilst carrying out the sections 10 - 19 of this PDI manual.
- To charge the battery, connect the positive booster cable to the positive terminal on the battery. The negative booster cable **MUST** be connected to a suitable earth point on the vehicle. The earth point should be at least 0.5 meters, (20 inches) away from the battery and as far away as possible from any fuel pipes, brake pipes and moving parts.

CAUTION:

Damage to vehicle. Failure to charge the battery in this manner will cause the BMS to NOT register the charge increase. This can cause certain systems to be inhibited during the first few days of driving while the BMS re-calibrates.



E145454

10. Market and Display settings: The first time the system is switched on the Home Menu will be displayed. From the 'Home Menu', select the 'Settings' screen by pressing the 'Settings' icon on the Touch-Screen.



E145455

10.1 From the 'System Settings' screen, press the 'Screen Settings' icon.



E145456

10.2 From the 'Screen Settings' screen, select the 'Display Settings' icon.



E145458

10.3 Adjust the brightness setting from the default of the maximum negative setting, to the middle range setting, via the '+' icon.

NOTE:

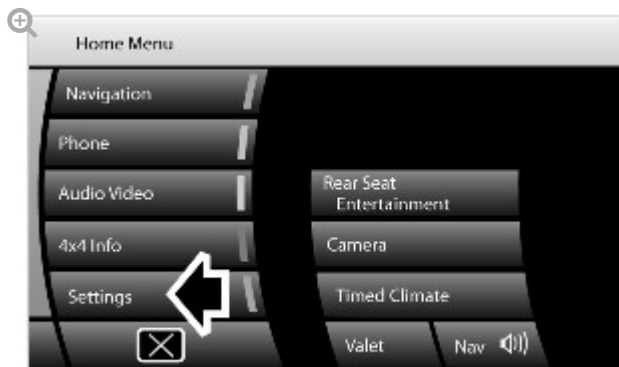
NOTE:

The brightness setting needs to be changed on Dual View vehicles only.



E145459

10.4 Press the 'Return' icon to confirm the brightness settings, and return to the 'Home Menu' screen.



E145431

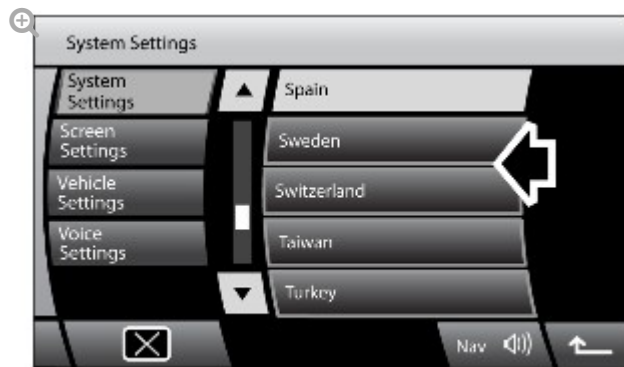
10.5 From the 'Home Menu' screen, press the 'Settings' icon.



E145432

10.6 On the 'Settings' screen press the 'System Settings' icon (1), and select

the 'Language' icon (2).



E145433

10.7 From the 'New Vehicle Configurations Options' sheet, select the required System Language from the list.

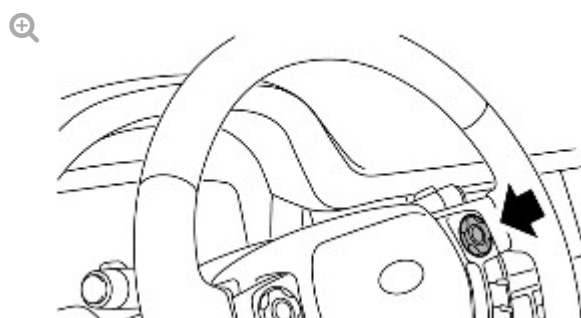
NOTE:

For all UK vehicles, the system language must be set to 'UK English' and not left on the factory default of 'US English'.



E145434

10.8 Press 'OK' to confirm the language and return to the 'Home Menu' screen.





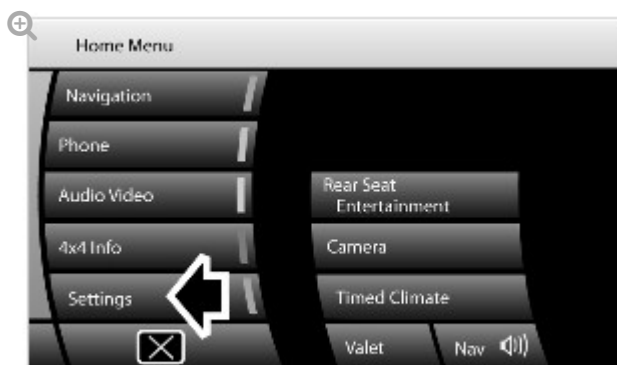
E145365

10.9 The automatic headlamp system has an additional feature called HBA (High Beam Assist). The 'Hand of Traffic' must be set in the Message Centre and the feature enabled to make sure of correct operation of the system. To set the HBA the following steps must be followed in order:

- With the ignition 'ON', engine not running, use the controls on the steering wheel to select on the instrument cluster menu:
- Main Menu > Vehicle Set-up > High Beam Assist.
- Configure the 'Hand of Traffic' setting by selecting the appropriate Drive on Left (of road) or Drive on Right (of road) to Market condition.
- 'Enable' the feature by setting Activate Assist.
- Carry out a visual check to make sure that there are no stickers, or labels, directly in view of the HBA camera sensor.

NOTES:

- The HBA feature can be enabled (or disabled) by selecting (or de-selecting) Activate Assist.
- Enabling or disabling HBA will not affect previous 'Hand of Traffic' settings.



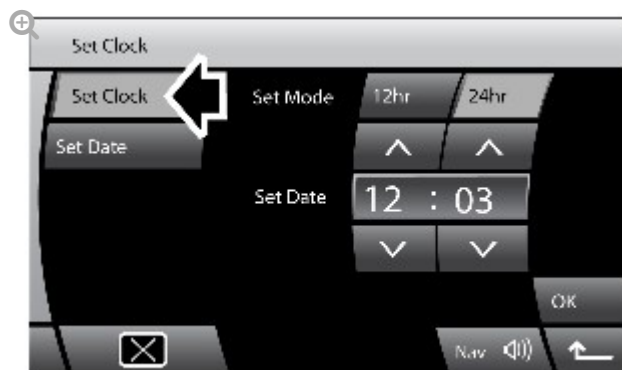
E145431

11. Time and Date: From the 'Home Menu', select the 'Settings' icon.



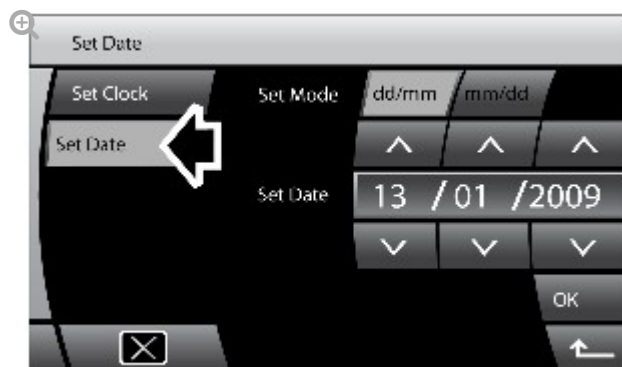
E145461

11.1 From the 'System Settings Menu', select the 'Screen Settings' icon and then the 'Clock' icon.



E145446

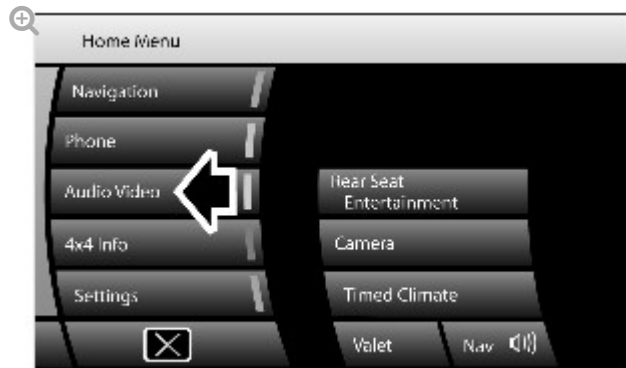
11.2 Press the 'Set Clock' icon and select the correct time in either 12hr or 24hr format as specified by the customer.



E145447

11.3 Press the 'Set Date' icon and select the correct date in either dd/mm or mm/dd format as specified by the customer. Return to the 'Home Menu'

screen.



E145430

12. Audio and TV: From the 'Home Menu', select the 'Audio Video' icon.



E145435

12.1.1 Press the 'Radio' icon.



E145437

12.1.2 Press the 'Settings' icon on the Radio screen.





E145438

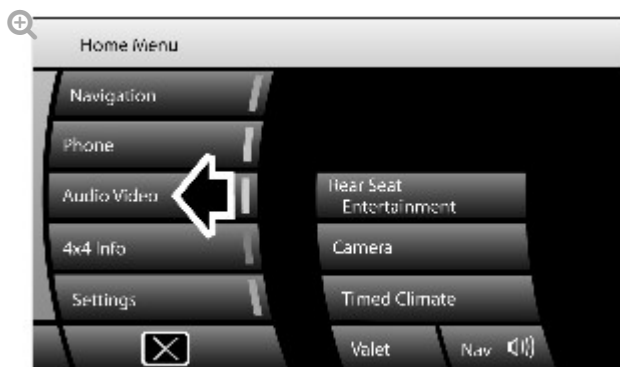
12.1.3 Press the 'RDS Settings' icon (1), and select the 'ON' icon (2).



E145439

12.1.4 Set the pre-set radio stations.

- Press the 'Seek' button (3).
- When the 'Seek' function has found a radio station, set to the numbered pre-set button (4) by holding down for 2 seconds.
- Repeat this process for all of the pre-set radio stations.



E145430

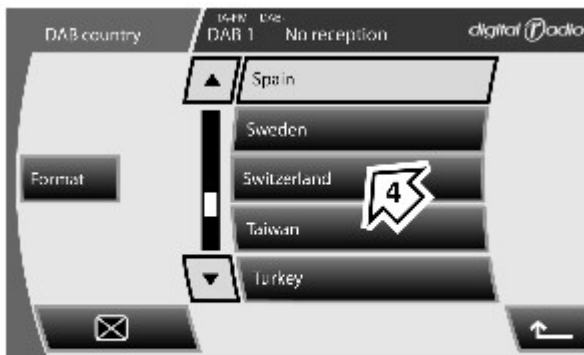
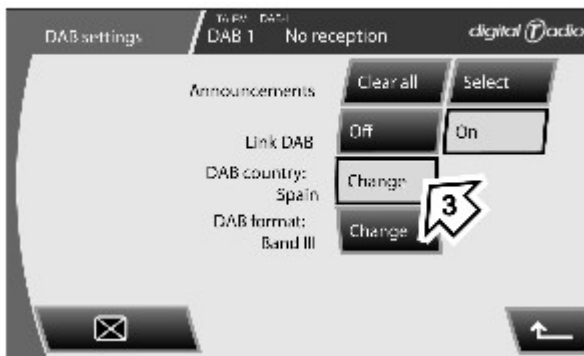
12.2.1 From the 'Home Menu', select the 'Audio Video' icon.





E145486

12.2.2 Press the 'DAB' icon (1), and select the 'Settings' icon (2) on the DAB screen.



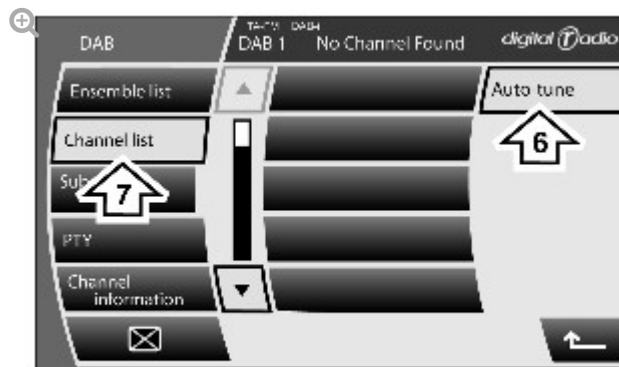
E145425

12.2.3 Press the 'DAB Country' Icon (3) and from the 'New Vehicle Configurations Options' sheet, select the required 'DAB Country' from the list (4). Return to the DAB screen.



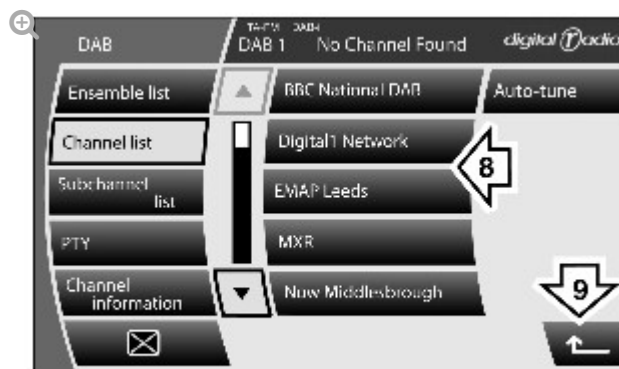
E145426

12.2.4 Press the 'DAB Search' icon (5).



E145427

12.2.5 Press the 'Auto-tune' icon (6), and select the 'Channel list' icon (7), to view the results in the channel list.



E145428

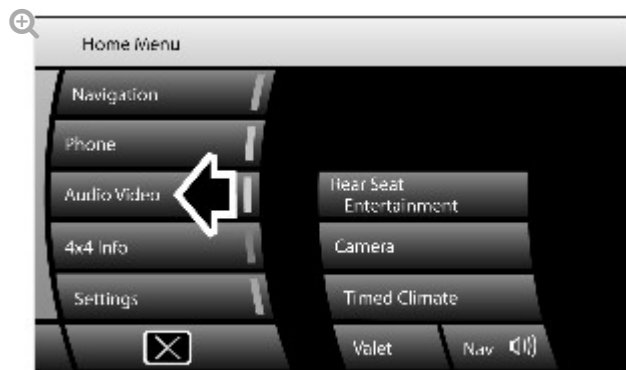
12.2.6 Select the DAB radio channel you wish to set as a pre-set from the channel list (8). Return to the DAB screen by pressing the 'Back' icon (9).



E145429

12.2.7 Press and hold the 'Pre-set' icon (10) for 2 seconds to save the selected DAB radio station from the channel list. Repeat these steps a

further 17 times to set the 6 DAB 1, 6 DAB 2 and 6 DAB 3 pre-sets.



E145430

12.3.1 From the 'Home Menu', select the 'Audio Video' icon.



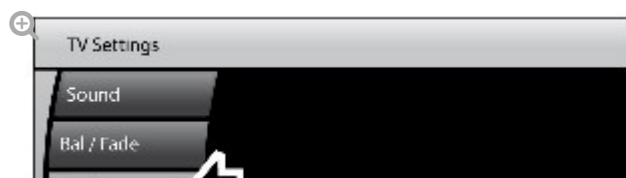
E145443

12.3.2 Press the 'TV' icon.



E145444

12.3.3 Press the 'Settings' icon from the TV screen.





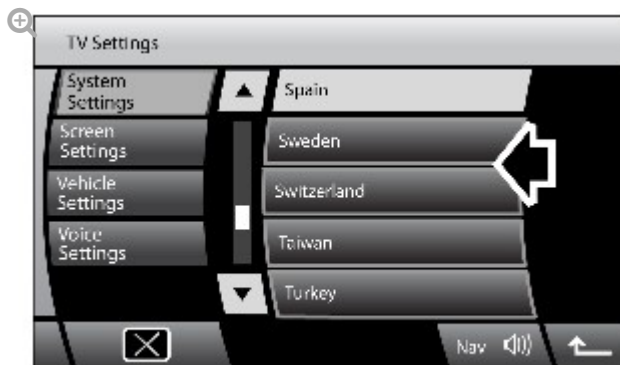
E145450

12.3.4 Press the 'Options' icon from the TV Settings screen.



E145451

12.3.5 Press the TV Country 'Change' icon from the TV Settings screen.



E145448

12.3.6 From the 'New Vehicle Configurations Options' sheet, select the required System Language from the list.



E145449

12.3.7 Press 'OK' to confirm the language and return to the TV screen.



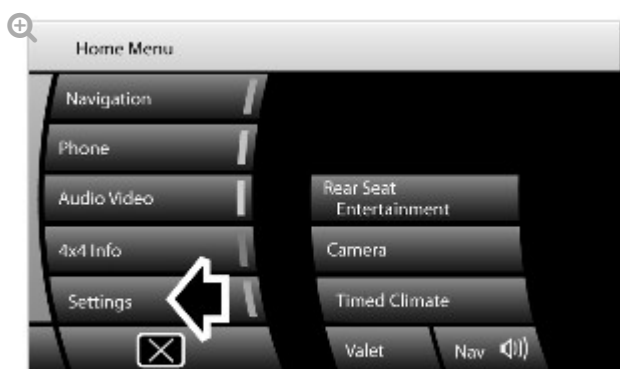
E145445

12.3.8 Press the 'Seek' icon (1) to find a TV channel, and store this on pre-set '1' (2).

CAUTION:

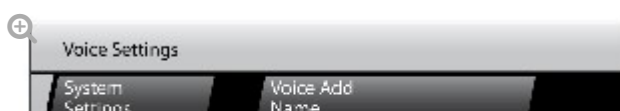
From the factory, pre-set number 1 has a default to a 'UK English' setting. Failing to store a channel on pre-set 1 at PDI, will cause the TV country language changes NOT to be saved.

13. Navigation: Check the Navigation screen, make sure that the correct country map has been uploaded onto the Navigation hard drive.



E145431

14. Voice: From the 'Home Menu', select the 'Settings' icon.





E145440

14.1 From the 'Settings Menu', press the 'Voice Settings' icon (1), and select the 'Voice Language' icon (2).



E145441

14.2 Select the any non-english System Language from the list.

NOTE:

To overwrite the factory default settings, first: select any non english language, then repeat the process, and select the voice language that the customer has chosen. This is shown in the following repeated steps.



E145442

14.3 Press (OK) to confirm the language and return to the 'Voice Language' /

14.3 Press **OK** to confirm the language and return to the **voice Language** screen.



E145452

14.4 From the 'New Vehicle Configurations Options' sheet, select the required System Language from the list.



E145453

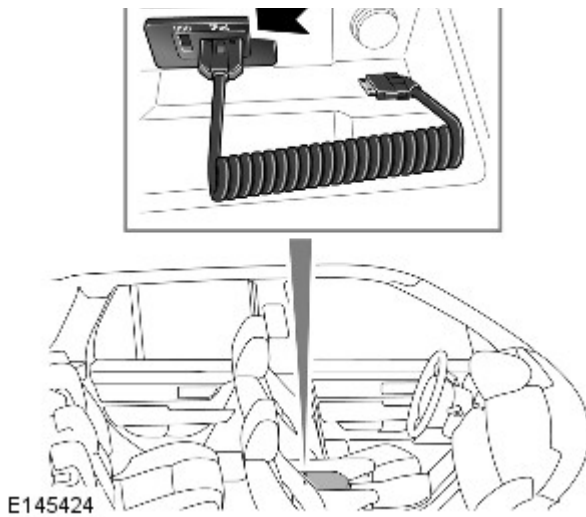
14.5 Press **'OK'** to confirm the language and return to the **'Home Menu'** screen.

15. Bluetooth: Using a Bluetooth capable phone: search for the vehicle. Input the Land Rover Bluetooth access pin (2121). Make a test call from the vehicle.

NOTE:

When the customer configures a Bluetooth phone, this will overwrite the last configured phone.





16. iPod™ Lead: If requested on the 'New Vehicles Configurations Options' sheet place the iPod™ lead into the centre console glove compartment.

17. Venture Cam: Set up the venture cam, if fitted.

17.1 Fit the Venture Cam into the docking station.

17.2 After 90 seconds the audio display unit will show a screen asking: 'Do you wish to learn the Venture Cam to the vehicle?'

17.3 After a further 90 seconds, select 'YES'.

NOTE:

This additional 90 seconds allows the Venture Cam time to charge.

17.4 The Venture Cam set up is now complete and an image should now appear on the display unit.

18. CD Multichanger: Make sure that the CD multichanger in the top glove box, contains a multi CD loading tray.

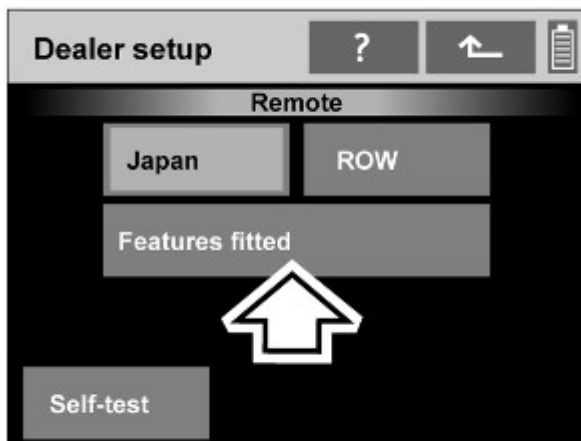
19. Rear Seat Entertainment: The Rear Seat Entertainment headphones, Touchscreen Remote Control (TsRC) rechargeable Lithiumion battery, and rubber bung screw head covers, will be attached to the Export Bag. The following **MUST** be carried out:

- Fit the AAA batteries to both sets of headphones. Each set of

headphones requires 2 AAA batteries.

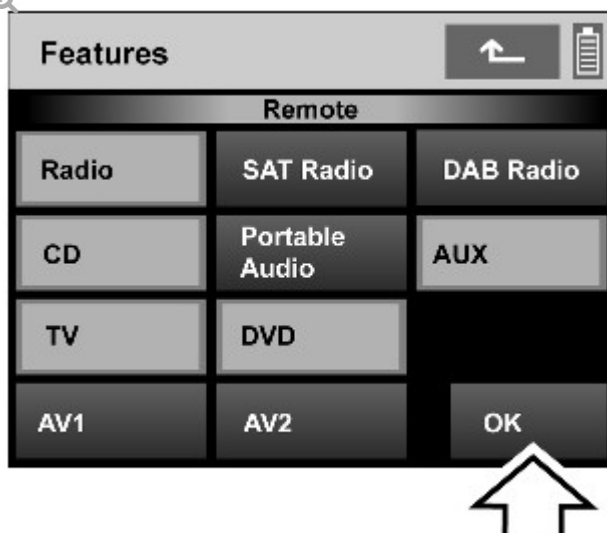
- Place the headphones in the rear door cards - one in each side.
- Fit and connect the TsRC battery into the remote by removing the rear battery cover, and connecting the battery.
- Replace and re-secure the battery cover. Put the 2 black rubber bung screw head covers supplied, directly over the screw heads on the battery cover.

19.1 Configure the TsRC remote unit to Market (Dealer Setup Instructions).



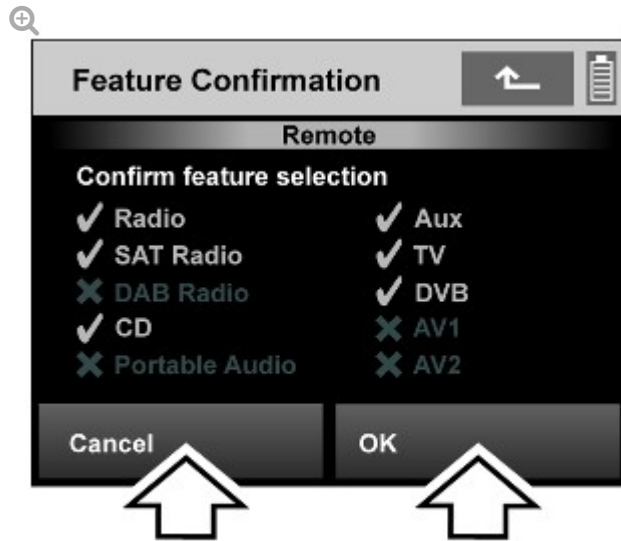
E145412

- After inserting the battery for the first time the above screen will appear. Highlight either 'Japan' or 'ROW', then press 'Features fitted'.



E145414

- Highlight the features fitted to the vehicle, then press 'OK'.



E145416

- Check the features fitted are correct, then press 'OK' to finish, or 'Cancel' to start again.
- Dock the TsRC unit back into the docking station in the Rear Centre Armrest, observe until at least 2 charge segments are illuminated.

NOTE:

The TsRC remote unit is docked by locating the bottom of the remote onto the locating pins in the docking station, then pushing down on the 'raised blip' on the top centre of the remote control.

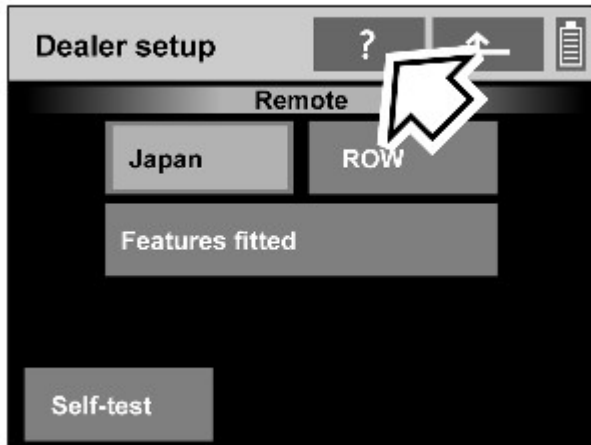
A positive lock will be denoted by a 'click' from the remote and docking connector.

19.2 Getting back to the Dealer setup screen (if required):

NOTE:

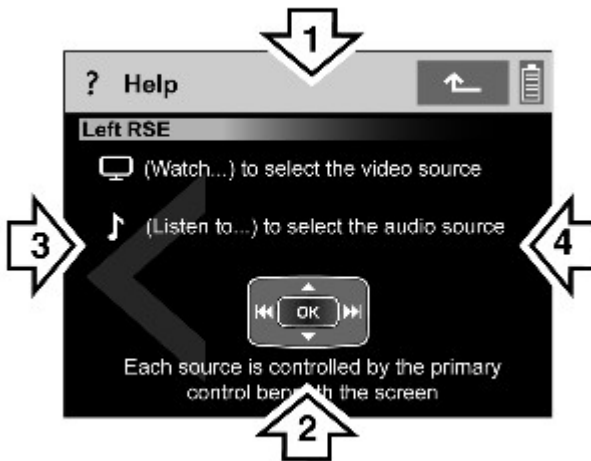
This procedure must be followed should the Market, or Features need to be updated from what was previously set.

- Press the 'Home' hard key on the TsRC.



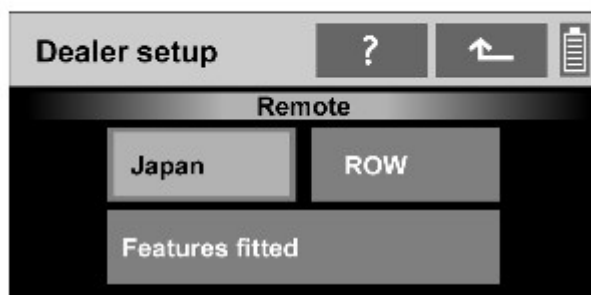
E145485

- On the Home screen, press the '?' to access the Help screen.



E145420

- Immediately press the screen at the Top, Bottom, Left and Right, as shown in the above graphic.



Self-test

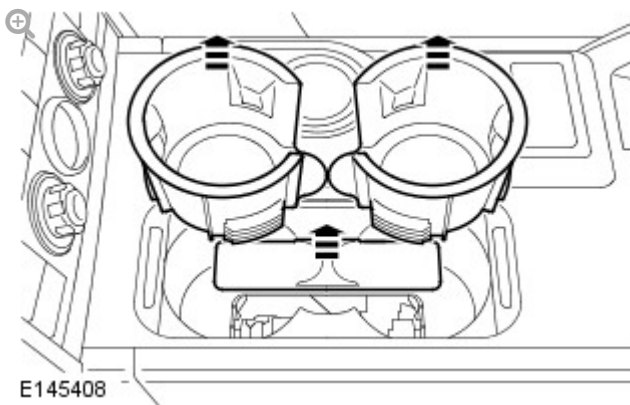
E145422

- The Dealer Set up screen will appear, and the Market and features can be amended accordingly.

20. Emergency Park Release System 4.4L diesel vehicles only: The Range Rover Drive Selector is now incorporated with the automatic transmission.

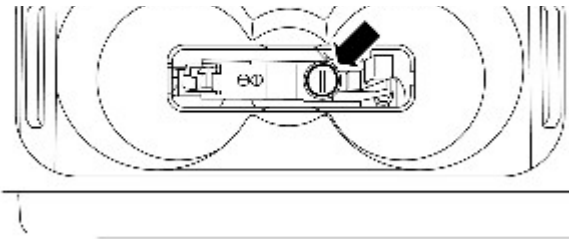
- In the event of a vehicle transmission failure a mechanical means of selecting neutral is now available, an Emergency Park Release (EPR) provides this functionality
- In an emergency, the EPR hand lever can be operated to release the park pawl within the transmission. The park pawl will not be allowed to re-engage until the hand lever is locked down in the closed position.
- Actuation of the EPR requires the operator to be seated in the drivers' seat with the foot brake applied. Turn the locking device 90 degrees anti-clockwise and lift using the pull strap.

20.1 Check that the EPR lever locking device is in the correct locked position:



- Remove the cup holders and the EPR lever cover by lifting upwards.





E145410

- Make sure the EPR lever locking device is in the locked position as shown.

21. Remove battery charger: Disconnect the approved battery charger/power supply from the vehicle.

22. Transit protection: Remove all internal transit protection. Stow the rear outer seat belts in the stowage clips.

23. Cosmetics Check: Check that the vehicle interior is clean and undamaged. Refer to the 'Cosmetics Standards Manual' on GTR, for further details.

2012.0 RANGE ROVER (LM), 101-01

PRE-DELIVERY INSPECTION MANUAL

DESCRIPTION AND OPERATION

NOTES:

- The battery charger should be reconnected whilst carrying out the sections 10 - 19 of this PDI manual.

- To charge the battery, connect the positive booster cable to the positive terminal on the battery. The negative booster cable **MUST** be connected to a suitable earth point on the vehicle. The earth point should be at least 0.5 meters, (20 inches) away from the battery and as far away as possible from any fuel pipes, brake pipes and moving parts.

CAUTION:

Damage to vehicle. Failure to charge the battery in this manner will cause the BMS to NOT register the charge increase. This can cause certain systems to be inhibited during the first few days of driving while the BMS re-calibrates.



E145454

11. Market and Display settings: The first time the system is switched on the Home Menu will be displayed. From the 'Home Menu', select the 'Settings' screen by pressing the 'Settings' icon on the Touch-Screen.



E145455

11.1 From the 'System Settings' screen, press the 'Screen Settings' icon.



E145456

11.2 From the 'Screen Settings' screen, select the 'Display Settings' icon.



E145458

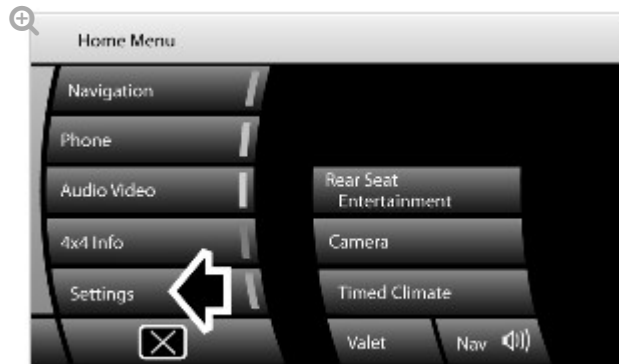
11.3 Adjust the brightness setting from the default of the maximum negative setting, to the middle range setting, via the '+' icon.

NOTE:

The brightness setting needs to be changed on Dual View vehicles only.



11.4 Press the 'Return' icon to confirm the brightness settings, and return to the 'Home Menu' screen.



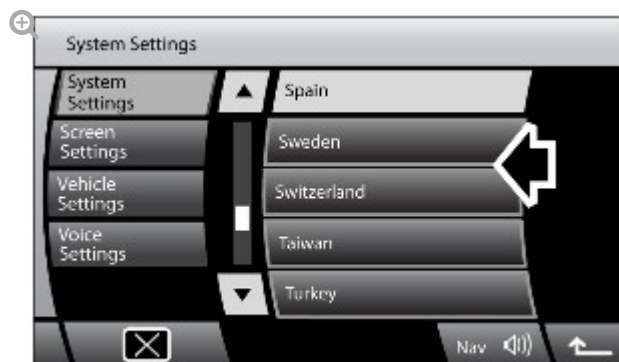
E145431

11.5 From the 'Home Menu' screen, press the 'Settings' icon.



E145432

11.6 On the 'Settings' screen press the 'System Settings' icon (1), and select the 'Language' icon (2).



E145433

11.7 From the 'New Vehicle Configurations Options' sheet, select the

required System Language from the list.

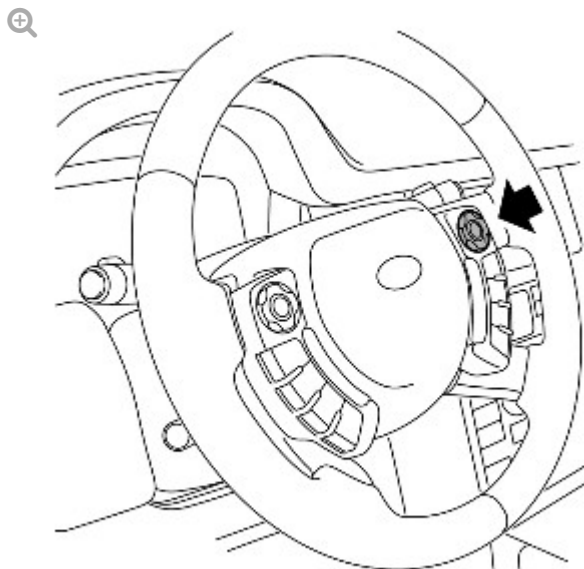
NOTE:

For all UK vehicles, the system language must be set to 'UK English' and not left on the factory default of 'US English'.



E145434

11.8 Press 'OK' to confirm the language and return to the 'Home Menu' screen.



E145365

11.9 The automatic headlamp system has an additional feature called HBA (High Beam Assist). The 'Hand of Traffic' must be set in the Message Centre and the feature enabled to make sure of correct operation of the system. To set the HBA the following steps must be followed in order:

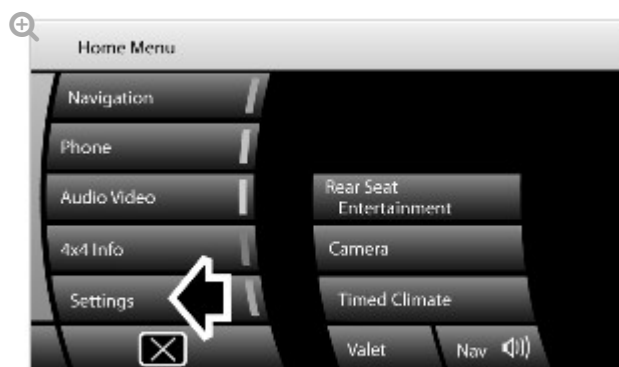
- With the ignition 'ON', engine not running, use the controls on the

steering wheel to select on the instrument cluster menu:

- Main Menu > Vehicle Set-up > High Beam Assist.
- Configure the 'Hand of Traffic' setting by selecting the appropriate Drive on Left (of road) or Drive on Right (of road) to Market condition.
- 'Enable' the feature by setting Activate Assist.
- Carry out a visual check to make sure that there are no stickers, or labels, directly in view of the HBA camera sensor.

NOTES:

- The HBA feature can be enabled (or disabled) by selecting (or de-selecting) Activate Assist.
- Enabling or disabling HBA will not affect previous 'Hand of Traffic' settings.



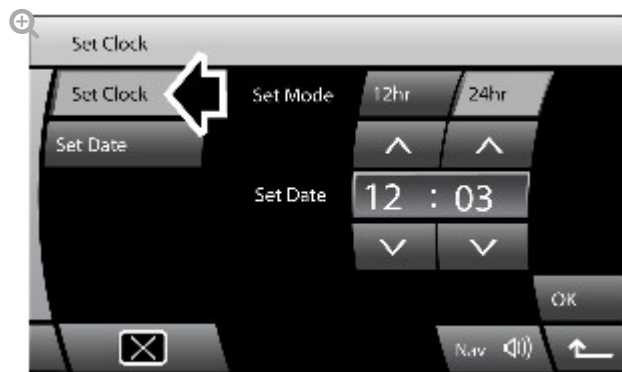
E145431

12. Time and Date: From the 'Home Menu', select the 'Settings' icon.

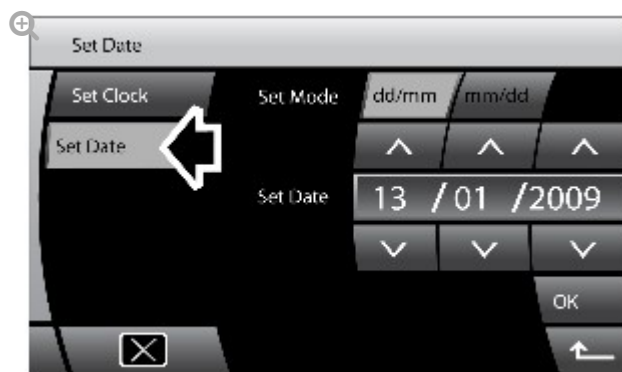


E145461

12.1 From the 'System Settings Menu', select the 'Screen Settings' icon and then the 'Clock' icon.



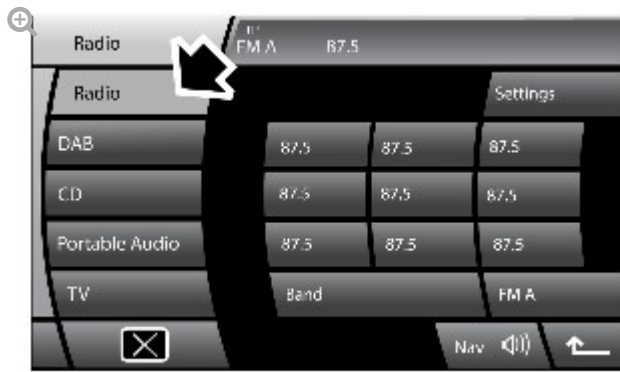
12.2 Press the 'Set Clock' icon and select the correct time in either 12hr or 24hr format as specified by the customer.



12.3 Press the 'Set Date' icon and select the correct date in either dd/mm or mm/dd format as specified by the customer. Return to the 'Home Menu' screen.



13. Audio and TV: From the 'Home Menu', select the 'Audio Video' icon.



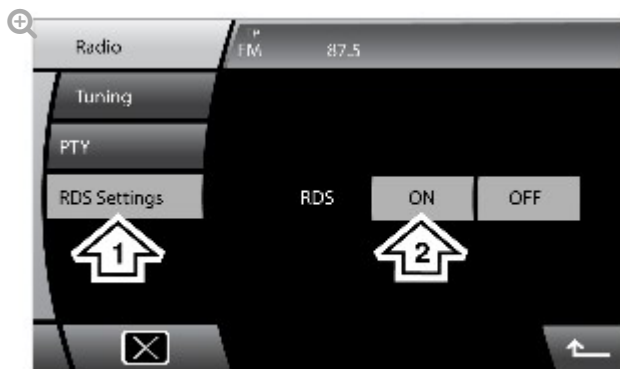
E145435

13.1.1 Press the 'Radio' icon.



E145437

13.1.2 Press the 'Settings' icon on the Radio screen.



E145438

13.1.3 Press the 'RDS Settings' icon (1), and select the 'ON' icon (2).

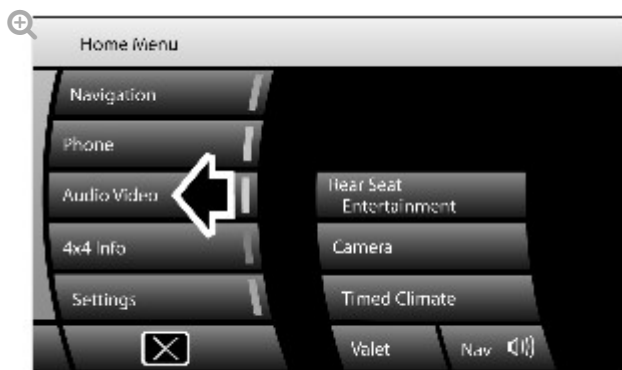




E145439

13.1.4 Set the pre-set radio stations.

- Press the 'Seek' button (3).
- When the 'Seek' function has found a radio station, set to the numbered pre-set button (4) by holding down for 2 seconds.
- Repeat this process for all of the pre-set radio stations.



E145430

13.2.1 From the 'Home Menu', select the 'Audio Video' icon.



E145486

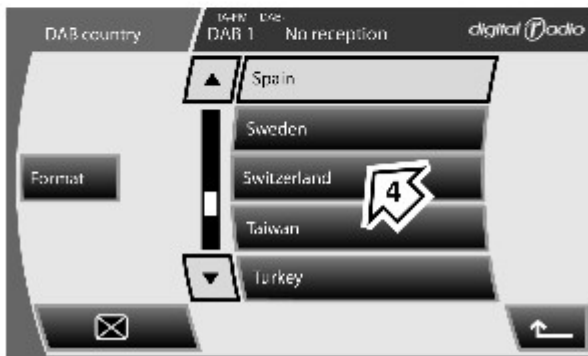
13.2.2 Press the 'DAB' icon (1), and select the 'Settings' icon (2) on the DAB screen.





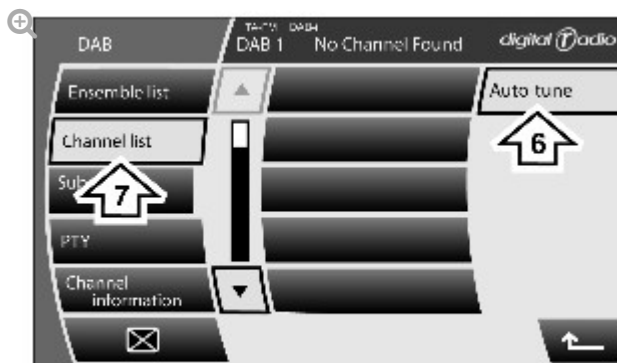
E145425

13.2.3 Press the 'DAB Country' Icon (3) and from the 'New Vehicle Configurations Options' sheet, select the required 'DAB Country' from the list (4). Return to the DAB screen.



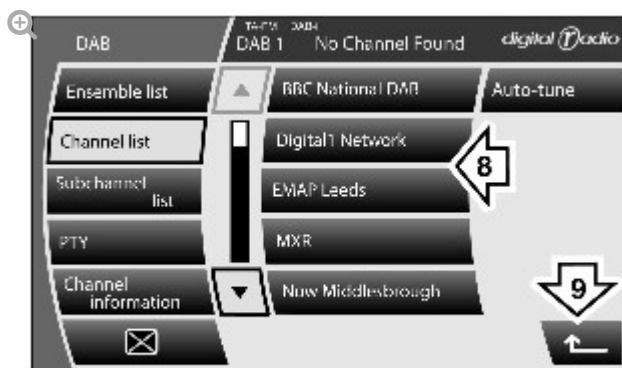
E145426

13.2.4 Press the 'DAB Search' icon (5).



E145427

13.2.5 Press the 'Auto-tune' icon (6), and select the 'Channel list' icon (7), to view the results in the channel list.



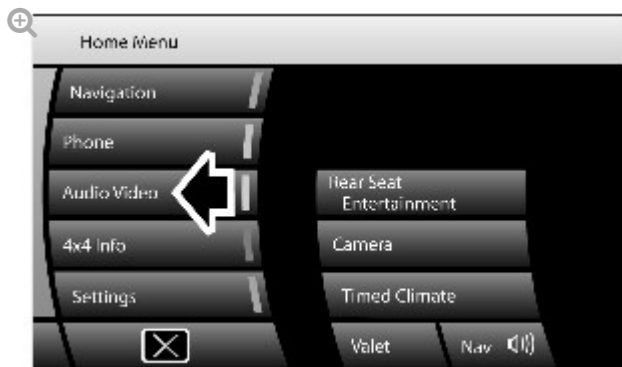
E145428

13.2.6 Select the DAB radio channel you wish to set as a pre-set from the channel list (8). Return to the DAB screen by pressing the 'Back' icon (9).



E145429

13.2.7 Press and hold the 'Pre-set' icon (10) for 2 seconds to save the selected DAB radio station from the channel list. Repeat these steps a further 17 times to set the 6 DAB 1, 6 DAB 2 and 6 DAB 3 pre-sets.



E145430

13.3.1 From the 'Home Menu', select the 'Audio Video' icon.



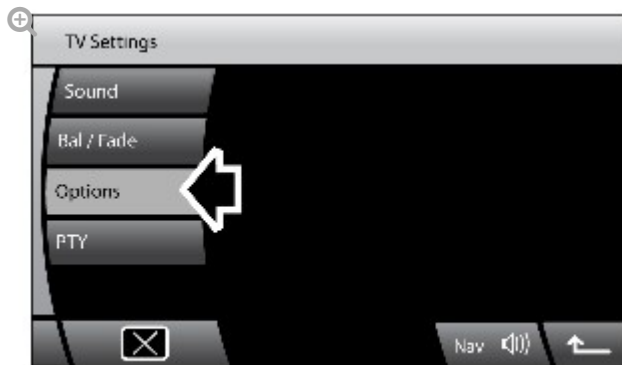
E145443

13.3.2 Press the 'TV' icon.



E145444

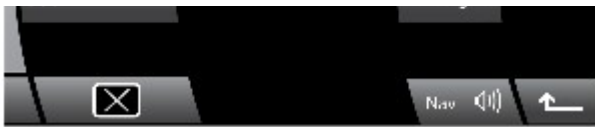
13.3.3 Press the 'Settings' icon from the TV screen.



E145450

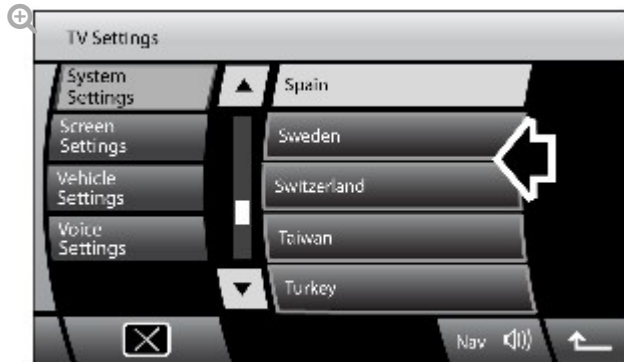
13.3.4 Press the 'Options' icon from the TV Settings screen.





E145451

13.3.5 Press the TV Country 'Change' icon from the TV Settings screen.



E145448

13.3.6 From the 'New Vehicle Configurations Options' sheet, select the required System Language from the list.



E145449

13.3.7 Press 'OK' to confirm the language and return to the TV screen.



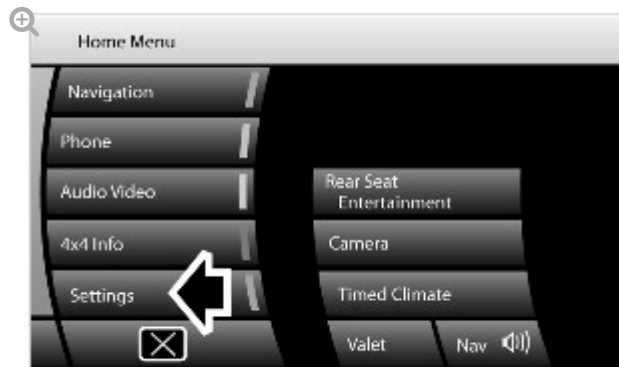
E145445

13.3.8 Press the 'Seek' icon (1) to find a TV channel, and store this on pre-set '1' (2).

CAUTION:

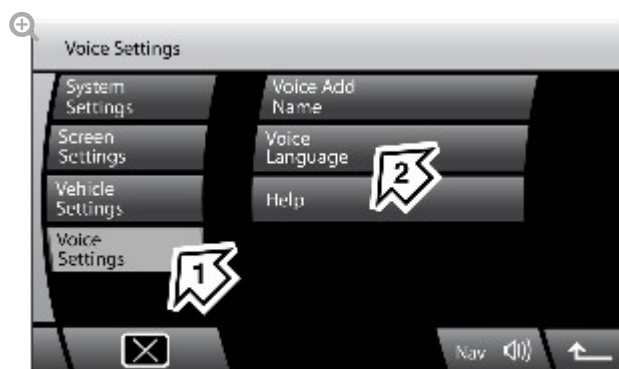
From the factory, pre-set number 1 has a default to a 'UK English' setting. Failing to store a channel on pre-set 1 at PDI, will cause the TV country language changes NOT to be saved.

14. Navigation: Check the Navigation screen, make sure that the correct country map has been uploaded onto the Navigation hard drive.



E145431

15. Voice: From the 'Home Menu', select the 'Settings' icon.



E145440

15.1 From the 'Settings Menu', press the 'Voice Settings' icon (1), and select the 'Voice Language' icon (2).





E145441

15.2 Select the any non-english System Language from the list.

NOTE:

To overwrite the factory default settings, first: select any non english language, then repeat the process, and select the voice language that the customer has chosen. This is shown in the following repeated steps.



E145442

15.3 Press 'OK' to confirm the language and return to the 'Voice Language' screen.



E145452

15.4 From the 'New Vehicle Configurations Options' sheet, select the

From the 'New Vehicle Configurations Options' sheet, select the required System Language from the list.



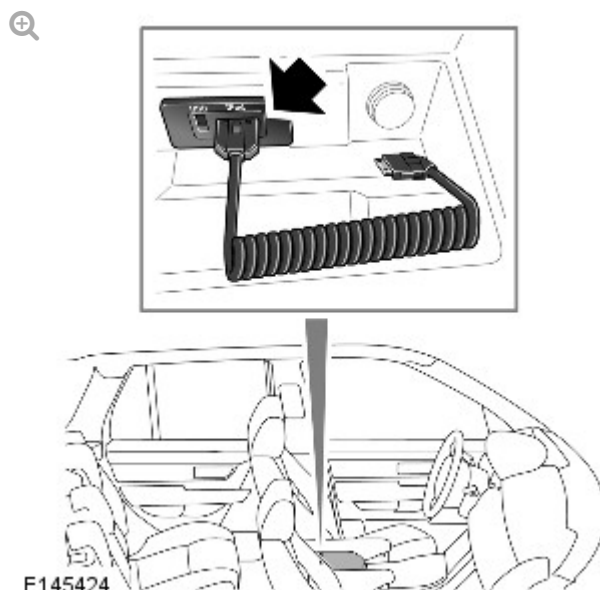
E145453

15.5 Press 'OK' to confirm the language and return to the 'Home Menu' screen.

16. Bluetooth: Using a Bluetooth capable phone: search for the vehicle. Input the Land Rover Bluetooth access pin (2121). Make a test call from the vehicle.

NOTE:

When the customer configures a Bluetooth phone, this will overwrite the last configured phone.



E145424

17. iPod™ Lead: If requested on the 'New Vehicles Configurations Options' sheet place the iPod™ lead into the centre console glove compartment

simply place the iPod/iPad lead into the centre console glove compartment.

18. Venture Cam: Set up the venture cam.

18.1 Fit the Venture Cam into the docking station.

18.2 After 90 seconds the audio display unit will show a screen asking: 'Do you wish to learn the Venture Cam to the vehicle?'

18.3 After a further 90 seconds, select 'YES'.

NOTE:

This additional 90 seconds allows the Venture Cam time to charge.

18.4 The Venture Cam set up is now complete and an image should now appear on the display unit.

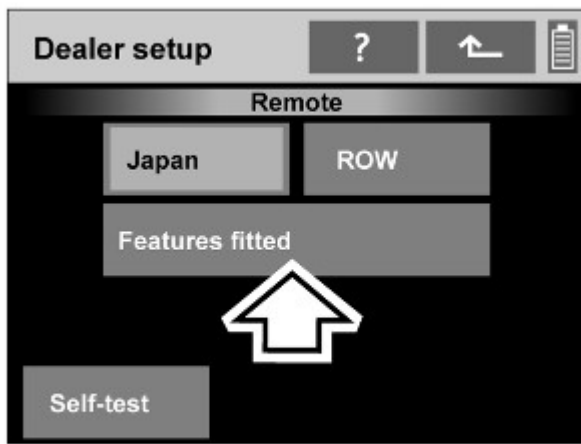
19. CD Multichanger: Make sure that the CD multichanger in the top glove box, contains a multi CD loading tray.

20. Rear Seat Entertainment: The Rear Seat Entertainment headphones, Touchscreen Remote Control (TsRC) rechargeable Lithiumion battery, and rubber bung screw head covers, will be attached to the Export Bag. The following **MUST** be carried out:

- Fit the AAA batteries to both sets of headphones. Each set of headphones requires 2 AAA batteries.
- Place the headphones in the rear door cards - one in each side.
- Fit and connect the TsRC battery into the remote by removing the rear battery cover, and connecting the battery.
- Replace and re-secure the battery cover. Put the 2 black rubber bung screw head covers supplied, directly over the screw heads on the battery cover.

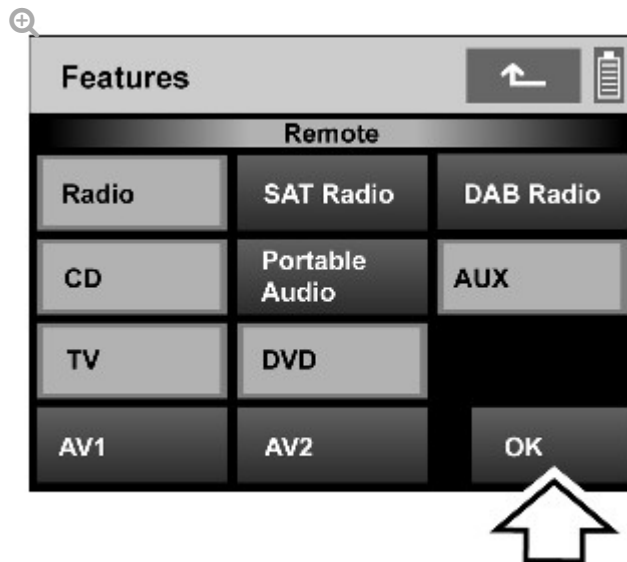
20.1 Configure the TsRC remote unit to Market (Dealer Setup Instructions).





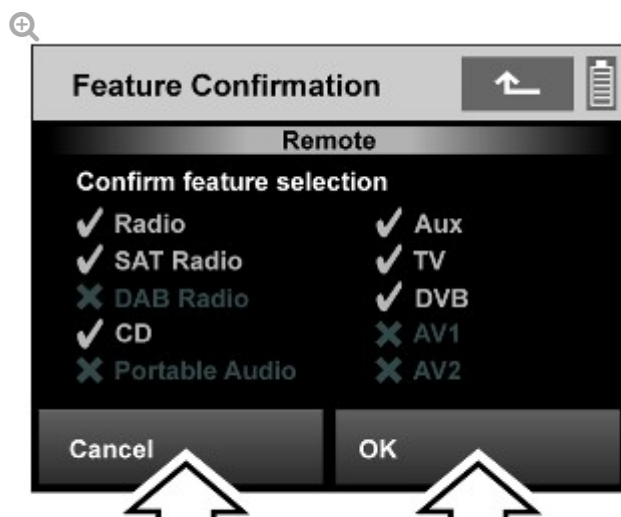
E145412

- After inserting the battery for the first time the above screen will appear. Highlight either 'Japan' or 'ROW', then press 'Features fitted'.



E145414

- Highlight the features fitted to the vehicle, then press 'OK'.



- Check the features fitted are correct, then press 'OK' to finish, or 'Cancel' to start again.
- Dock the TsRC unit back into the docking station in the Rear Centre Armrest, observe until at least 2 charge segments are illuminated.

NOTE:

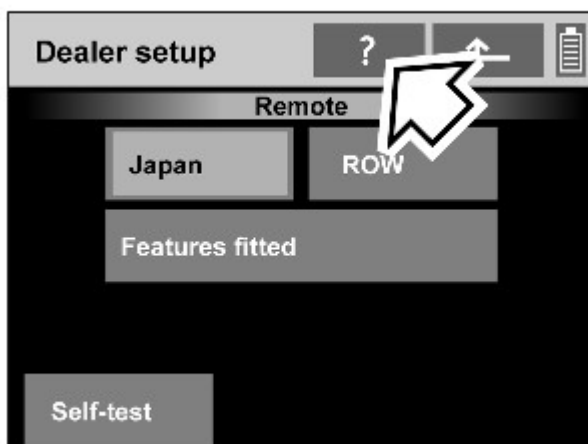
The TsRC remote unit is docked by locating the bottom of the remote onto the locating pins in the docking station, then pushing down on the 'raised blip' on the top centre of the remote control.

A positive lock will be denoted by a 'click' from the remote and docking connector.

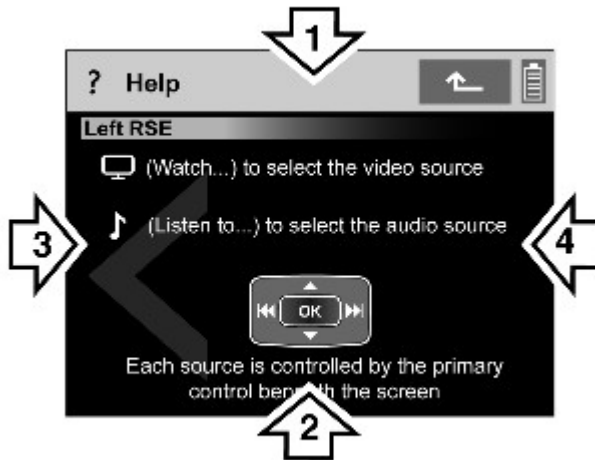
20.2 Getting back to the Dealer setup screen (if required):**NOTE:**

This procedure must be followed should the Market, or Features need to be updated from what was previously set.

- Press the 'Home' hard key on the TsRC.

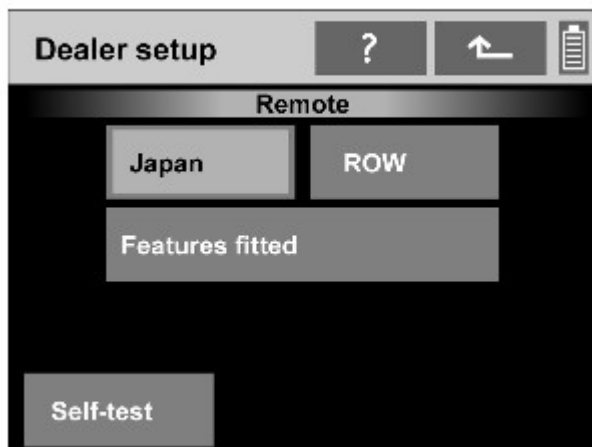


- On the Home screen, press the '?' to access the Help screen.



E145420

- Immediately press the screen at the Top, Bottom, Left and Right, as shown in the above graphic.



E145422

- The Dealer Set up screen will appear, and the Market and features can be amended accordingly.

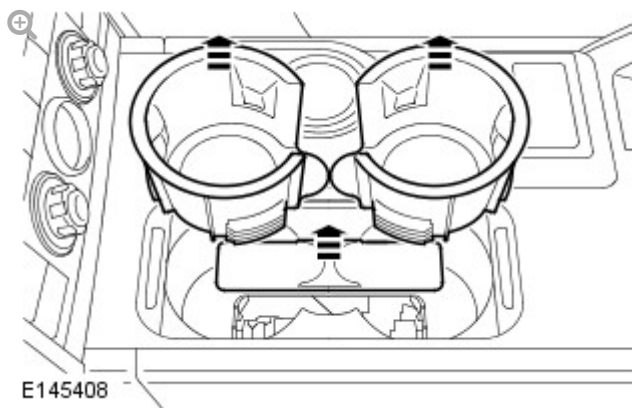
21. Emergency Park Release System 4.4L diesel vehicles only: The Range Rover Drive Selector is now incorporated with the automatic transmission.

- In the event of a vehicle transmission failure a mechanical means of

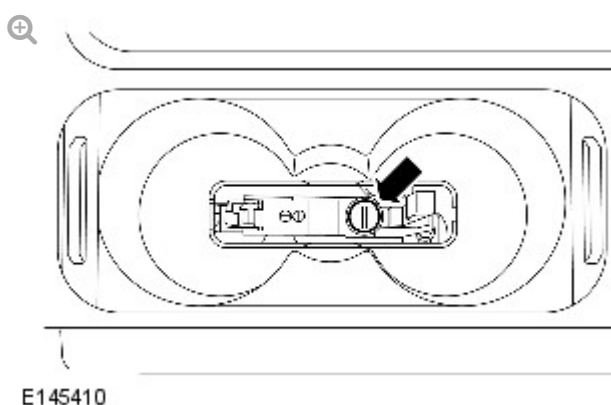
selecting neutral is now available, an Emergency Park Release (EPR) provides this functionality

- In an emergency, the EPR hand lever can be operated to release the park pawl within the transmission. The park pawl will not be allowed to re-engage until the hand lever is locked down in the closed position.
- Actuation of the EPR requires the operator to be seated in the drivers' seat with the foot brake applied. Turn the locking device 90 degrees anti-clockwise and lift using the pull strap.

21.1 Check that the EPR lever locking device is in the correct locked position:



- Remove the cup holders and the EPR lever cover by lifting upwards.



- Make sure the EPR lever locking device is in the locked position as shown.

22. Remove battery charger: Disconnect the approved battery charger/power supply from the vehicle.

23. Transit protection: Remove all internal transit protection. Stow the rear

outer seat belts in the stowage clips.

24. Cosmetics Check: Check that the vehicle interior is clean and undamaged. Refer to the 'Cosmetics Standards Manual' on GTR, for further details.

2012.0 RANGE ROVER (LM), 101-01

PRE-DELIVERY INSPECTION MANUAL

DESCRIPTION AND OPERATION

24. Fuel flap: Check operation of fuel flap and lock and check the misfuel protection device is located in the loadspace.

25. Road wheels: Inspect the road wheels and tires for damage. Check the wheel retaining nuts for correct torque, 140 Nm (103 lb.ft).

26. Tire pressures: The vehicle is delivered with the tire pressures set higher than the normal operating pressures. Set the tire pressures to 2.0 bar (29psi) for the road test.

CAUTION:

When the tire pressures are reduced from the high transit / storage pressure to the road test pressures, the final pressure will rise. The initial high drop in pressure from transit / storage pressure to normal pressure will cause the tire pressure to rise after 2 minutes, giving incorrect tire pressures by up to 0.4 bar (6psi)

increase the pressures by up to 0.4 bar (6psi).

Initially drop each tire pressure to approximately 0.1-0.3 bar (2-4psi) below the recommended pressure and then inflate the tires to the desired pressure.

CAUTION:

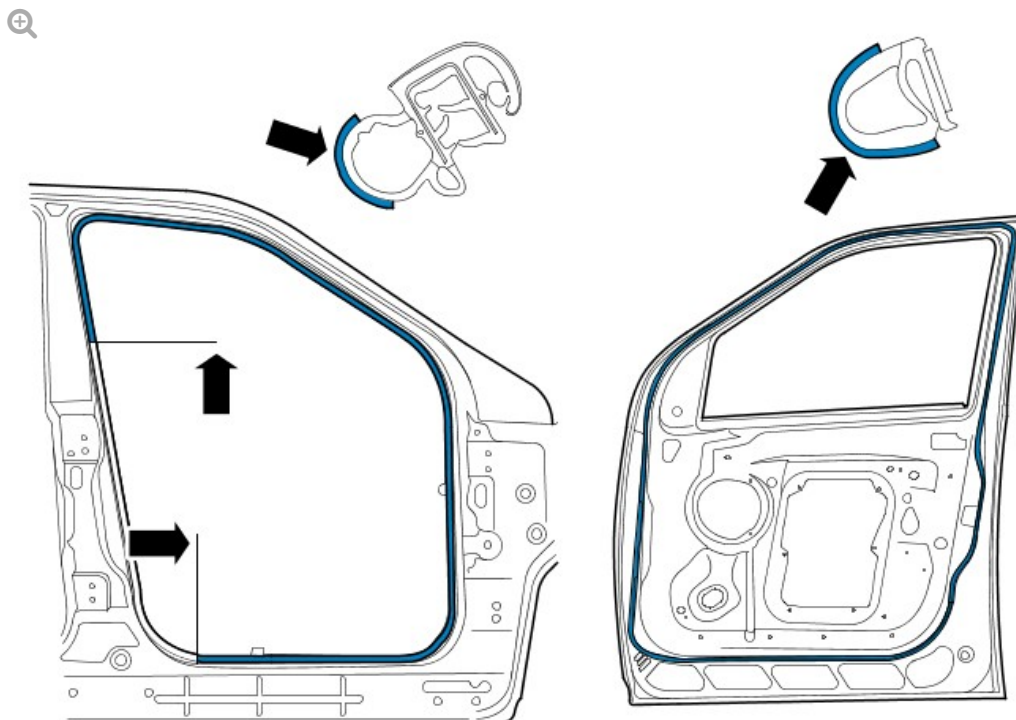
If the vehicle is returned to storage after the PDI, the tire pressures must be raised to 3.60 bar (52psi).

27. Transit protection: Remove all external transit protection.

28. Cosmetics Check: Check that the vehicle exterior is clean and undamaged. Refer to the 'Cosmetics Standards Manual' on TOPIx, for further details.

29. Door seals: Apply lubricant to the door seals on vehicles that operate in severe cold markets: **(Russia and Nordic countries).**

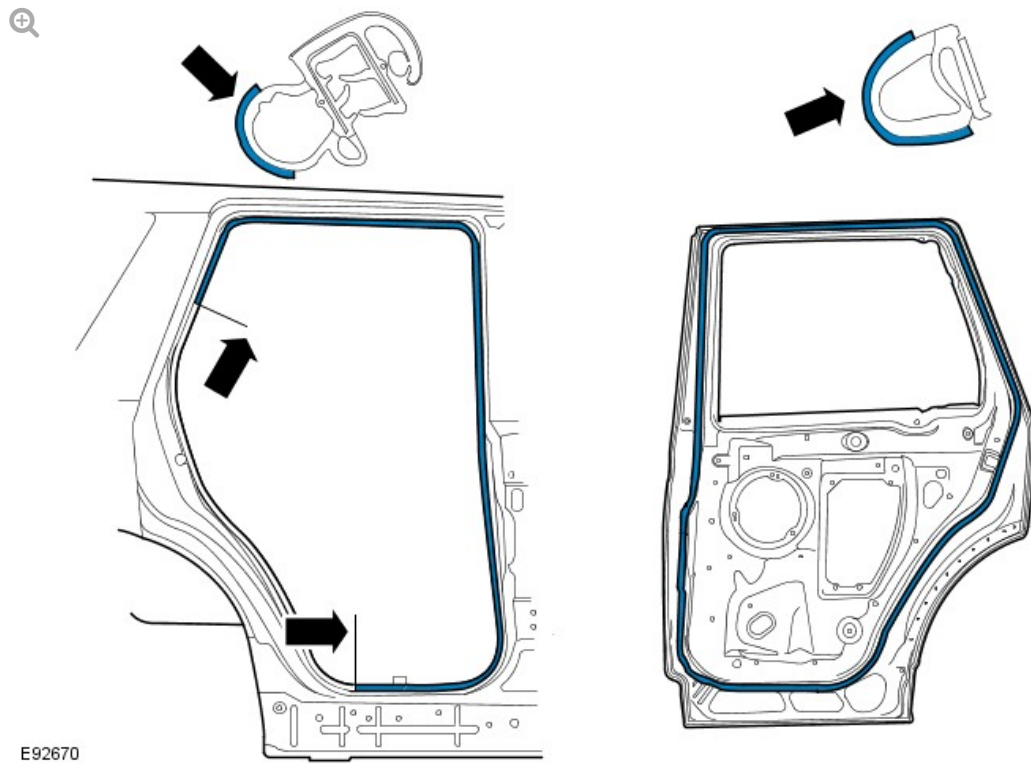
Front door seals



E92669

29.1 Vehicles operated in severe cold markets (Russia and Nordic countries): Apply the Carboflo pen, Land Rover Part No. CYK500010 to the primary and secondary front door seals as illustrated above.

Rear door seals



29.2 Vehicles operated in severe cold markets (Russia and Nordic countries): Apply the Carboflo pen, Land Rover Part No. CYK500010 to the primary and secondary rear door seals as illustrated above.

PRE-DELIVERY INSPECTION MANUAL

DESCRIPTION AND OPERATION

25. Fuel flap: Check operation of fuel flap and lock and check the misfuel protection device is located in the loadspace.

26. Road wheels: Inspect the road wheels and tires for damage. Check the wheel retaining nuts for correct torque, 140 Nm (103 lb.ft).

31. Tire pressures: The vehicle is delivered with the tire pressures set higher than the normal operating pressures. Set the tire pressures to 2.0 bar (29psi) for the road test.

CAUTION:

When the tire pressures are reduced from the high transit / storage pressure to the road test pressures, the final pressure will rise. The initial high drop in pressure from transit / storage pressure to normal pressure will cause the tire pressure to rise after 2 minutes, giving incorrect tire pressures by up to 0.4 bar (6psi).

Initially drop each tire pressure to approximately 0.1-0.3 bar (2-4psi) below the recommended pressure and then inflate the tires to the desired pressure.

CAUTION:

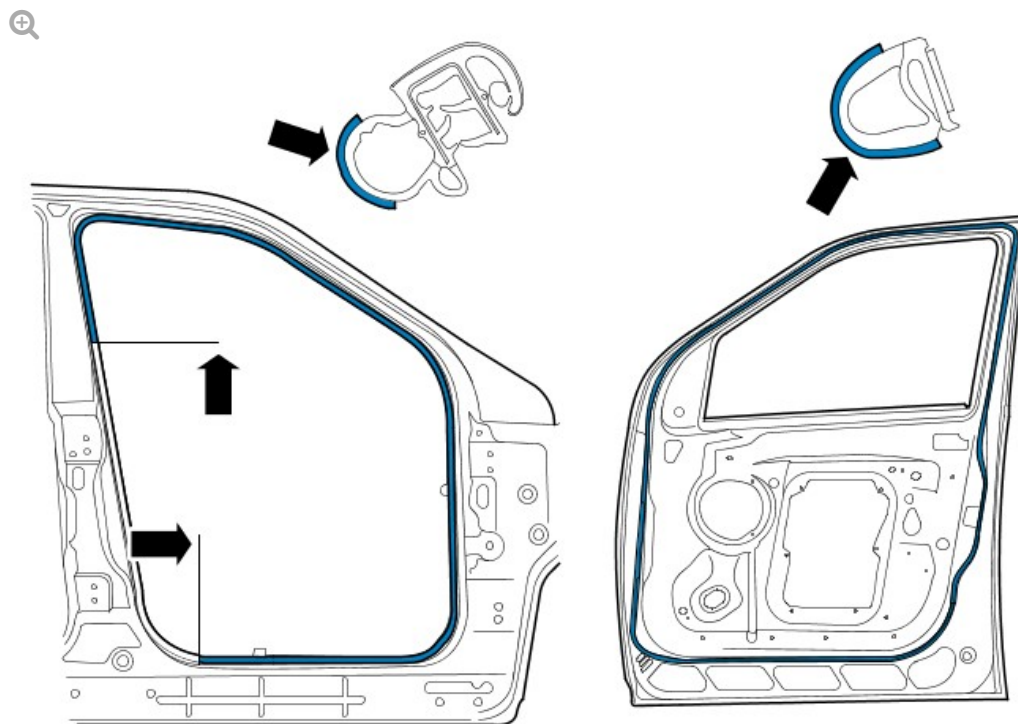
If the vehicle is returned to storage after the PDI, the tire pressures must be raised to 3.60 bar (52psi).

28. Transit protection: Remove all external transit protection.

29. Cosmetics Check: Check that the vehicle exterior is clean and undamaged. Refer to the 'Cosmetics Standards Manual' on TOPIx, for further details.

30. Door seals: Apply lubricant to the door seals on vehicles that operate in severe cold markets: **(Russia and Nordic countries)**.

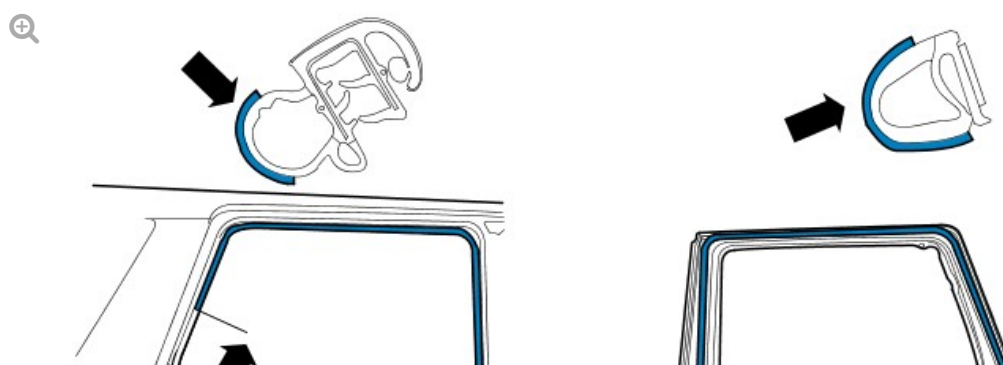
Front door seals

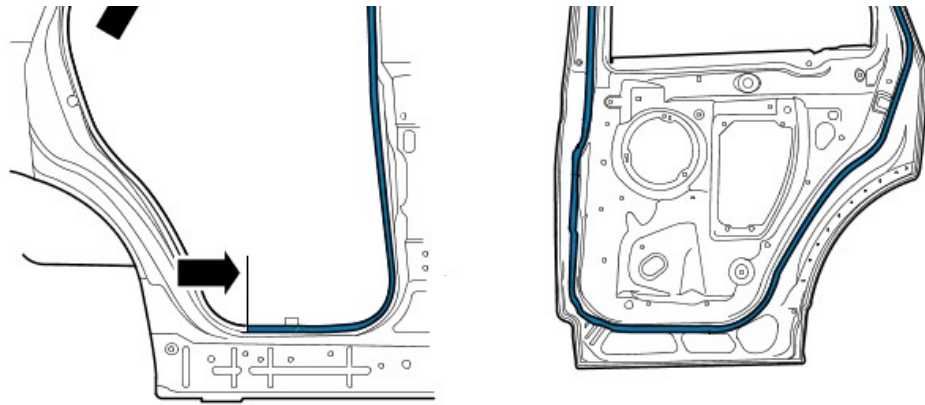


E92669

30.1 Vehicles operated in severe cold markets (Russia and Nordic countries): Apply the Carboflo pen, Land Rover Part No. CYK500010 to the primary and secondary front door seals as illustrated above.

Rear door seals





30.2 Vehicles operated in severe cold markets (Russia and Nordic countries): Apply the Carboflo pen, Land Rover Part No. CYK500010 to the primary and secondary rear door seals as illustrated above.

2012.0 RANGE ROVER (LM), 101-01

PRE-DELIVERY INSPECTION MANUAL

DESCRIPTION AND OPERATION

Before road testing the vehicle on a public highway, make sure the driver's vision is not obscured by labels.

The road test is the only opportunity to assess the quality of ride, handling, general performance and noise levels under differing traffic and road conditions. Every care must be taken to make sure the vehicle performs to the standard of excellence expected by Range Rover customers. Investigate and report any issues with the: quality of ride, handling, general performance and noise levels, during the road test.

Optimum braking efficiency is only achieved after bedding in brake disc/pads. It is important to avoid repeated hard use of the brakes during the PDI road test.

NOTE:

Before driving the vehicle, check the operation of:

- Lights, indicators, wipers, wash/wipe and hazard warning.
- Seats and seat belts.
- Fascia switches.
- Electric park brake.

30. Transmission: Vehicles with 5.0L petrol and 3.6L diesel engines. Make sure that the automatic transmission starter isolator, operates in all gears with the exception of '**P**' - Park and '**N**' - Neutral.

30.1 Vehicles with 4.4L diesel engines. Make sure the Range Rover Drive Selector is operating correctly.

30.1.1 Ignition and Gearshift Interlocks - Check the following:

- The Range Rover Drive selector is locked in the '**P**' (Park) position and also locks in the '**N**' (Neutral) position.
- That when the ignition is switched on (engine running for the Range Rover 4.4L Drive selector) and the brake pedal depressed, the Range Rover Drive selector can now be moved from the '**P**' or '**N**' positions.

CAUTION:

Risk of injury. Apply the parking brake, chock the wheels and ensure that all personnel are clear of the vehicle before carrying out the above procedure.

30.1.2 Starting - Check the following:

CAUTION:

Make sure the climate control is set in the off position.

- The engine will only start when the Range Rover Drive selector lever is in the '**P**' or '**N**' positions, when in hold neutral mode or when the Emergency Park Release is pulled.
- The starter motor operates without undue noise and the engine starts easily.
- The tachometer registers as the engine is started.
- The warning lamps and Message Centre are not displaying any warnings or messages after the engine is started.
- The fuel and oil level gauges are registering correctly.
- The oil pressure and battery condition warning lamps are extinguished.

30.1.3 On the Road - Check the following:

- The transmission operates correctly.
- All gear changes in automatic and manual modes are smooth.
- Message Centre displays '**P R N D S**', and that the current Range Rover Drive selector position is highlighted.
- Check that the manual gear change operates correctly both in the '**D**' and '**S**' positions when the steering column shift paddles are used.
- Also check that when the Range Rover Drive selector is moved to the '**D**' and '**S**' positions and a shift paddle is operated, the Message Centre now displays the current gear selection (i.e. '**D2**' or '**S2**').

- Throttle pedal action.
- The 'kick down' feature operates correctly when changing down gear.

NOTE:

Refer to Service Information – Workshop Manual, Description & Operation, in GTR for full Range Rover sequential shift mode details.

31. Driver controls: Check for the correct operation of all the driver controls and systems. Including the Terrain Response indicators, wheel direction/differential locking indicators and the low tire pressure monitoring system, if fitted.

31.1 Start vehicle and check operation of:

- Starter/Inhibitor switch.
- Electric mirrors, including power fold.

31.2 During the road test, make sure the transfer box range change functionality is tested by using the following method.

- With engine running and parking brake applied, select neutral on automatic gearbox.
- Request range change for low gear with switch - wait until change is complete.
- Request range change into high gear with switch - wait until change is complete.
- Repeat 5 times.
- Make sure high range is left selected.
- Press the fascia mounted Tire Pressure Monitor button to calibrate the tyre pressure ECU, if fitted.

31.3 Make sure the correct operation of the shift interlock (where applicable).

CAUTION:

CAUTION:

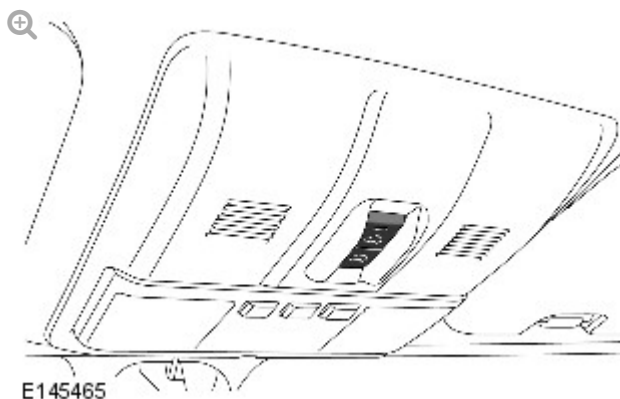
Risk of injury. Apply the parking brake, chock the wheels and ensure that all personnel are clear of the vehicle before carrying out the above procedure.



31.4 Check the electric windows for correct operation. Open and close all the windows fully. Check that the rear window isolation switch is operational.

31.5 If the battery is disconnected, becomes discharged or the power supply is interrupted, the one-touch 'window up' operation is disabled until the window position is reset. To reset the window position:

- Close the window fully.
- Release the switch, the pull up and hold for one second.
- Repeat the procedure on each window.



31.6 Check the sunroof for correct operation. Make sure both the sunroof

open/close, and the sunroof tilt are fully operational. Initialize the sunroof by:

- Using the switch, move the roof opening panel to the full tilt position and hold for 20 seconds.
- Release the switch.
- Using the switch, close the roof opening panel.
- Using the switch, slide the roof opening panel fully open, then fully closed.
- With care, check the anti-trap function.

31.7 Check operation of the air conditioning (A/C) system.

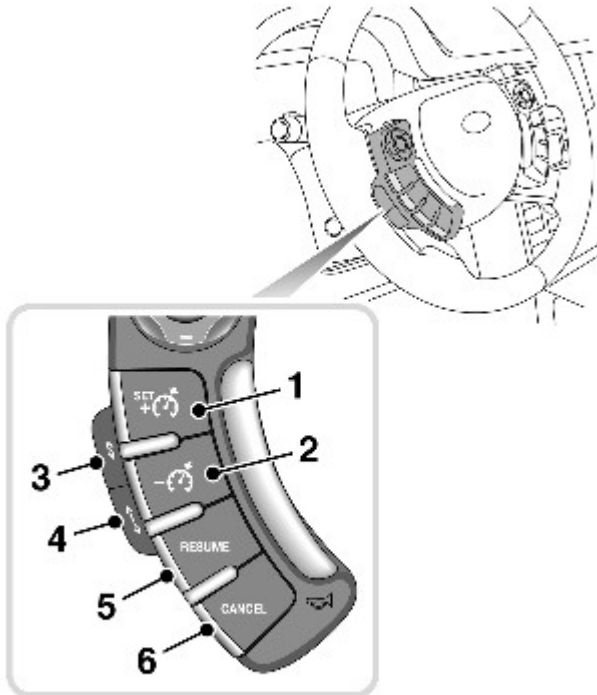
- When the vehicle is at operating temperature, set the heater control to 22°C and run the fan speed at 75%.
- Switch on the A/C system and run for 5 minutes.

32. Cruise Control and ACC: Check for correct operation of the cruise control or adaptive cruise control (ACC) system.

WARNINGS:

- Damage to vehicle. Adaptive cruise control is not a collision warning or avoidance system.
- Risk of injury. It is the driver's responsibility to stay alert, drive safely and be in control of the vehicle at all times.
- Only use cruise control when conditions are favourable, e.g. on straight, dry, open roads with light traffic.

32.1 The cruise control and ACC system are operated by switches mounted on the steering wheel. The driver can also intervene at any time by use of the brake or accelerator pedals. The Forward Alert function can be manually turned on or off in the Message Centre. Using the Message Centre steering wheel controls select: **Vehicle Set-up** and then **Forward Alert** from the menu; using the **OK** button will turn the function on or off.



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32.2 Controls - all cruise control switches are located on the steering wheel switch-pack:

- 1 SET +: Set the speed (+) or increase.
- 2 SET -: Set the speed (-) or decrease.
- 3 GAP: Gap decrease (ACC only).
- 4 GAP: Gap increase (ACC only).
- 5 RESUME: Resume set speed.
- 6 CANCEL: Cancels without erasing memorised speed.

32.3 Setting a speed:

- Accelerate as normal until required speed is reached.
- Press the 'SET' button (1). The vehicle speed will be stored in the memory and cruise control should be engaged.
- The message centre will display the selected speed - 'SETSPEED 80KM/H 50MPH'.





32.4 Checking the ACC gap: After the ignition is switched on a default gap will be automatically selected (setting No 3). There are 4 gaps available to select.

- After selecting cruise control, check that the vehicle slows when a vehicle ahead is detected by the system.

WARNING:

If the adaptive cruise control system predicts that its maximum braking level will not be sufficient, then an audible warning will sound while the system continues to brake. 'DRIVER INTERVENE' will also be displayed on the message centre.

- When a vehicle ahead is detected the vehicle will be in 'follow mode'.

WARNING:

When in 'follow mode' the vehicle will not decelerate automatically to a stop, nor will the vehicle always decelerate quickly enough to avoid a collision without driver intervention.

- Check that when in 'follow mode' a warning light in the instrument pack is illuminated and the message centre displays 'CRUISE GAP'.

32.5 Altering the cruise gap to the vehicle ahead:

- Press, the top part of the switch (**3**) to decrease the gap, and the bottom part of the switch (**4**) to increase the gap.

- Check 'follow mode' functions correctly.

32.6 Check the operation of the 'Forward Alert' system. Make sure that the ACC system is disengaged: this will allow the GAP buttons to be used to adjust Forward Alert. Switch on 'Forward Alert'

- Set the 'Forward Alert' gap.
- Using the GAP increase button (**4**), on the steering wheel switch-pack, select the largest gap available.

Check that when a vehicle is detected close ahead, an audible warning sounds and the message centre displays: 'FORWARD ALERT'.

This is easiest to achieve by following a lead vehicle as it slows down.

WARNING:

The 'Forward Alert' system DOES NOT provide vehicle braking.

NOTE:

The 'Forward Alert' system provides warnings if a vehicle is detected close ahead.



32.7 Set the 'Forward Alert' gap:

- Using the GAP decrease button (**3**), on the steering wheel switch-pack, select the smallest gap available.

32.8 Switch OFF the Forward Alert system so that the customer receives the vehicle set in this condition.

33. Check for noise: Check for any unusual noises from the power train, suspension or braking systems.

34. Check for noise: Check for any squeaks or rattles from the vehicle interior.

35. Navigation: Check the operation of the satellite navigation system (if fitted).

2012.0 RANGE ROVER (LM), 101-01

PRE-DELIVERY INSPECTION MANUAL

DESCRIPTION AND OPERATION

Before road testing the vehicle on a public highway, make sure the driver's vision is not obscured by labels.

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Optimum braking efficiency is only achieved after bedding in brake disc/pads. It is important to avoid repeated hard use of the brakes during the PDI road test.

NOTE:

Before driving the vehicle, check the operation of:

- Lights, indicators, wipers, wash/wipe and hazard warning.
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- Fascia switches.
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31.1.1 Ignition and Gearshift Interlocks - Check the following:

- The Range Rover Drive selector is locked in the 'P' (Park) position and also locks in the 'N' (Neutral) position.
- That when the ignition is switched on (engine running for the Range Rover 4.4L Drive selector) and the brake pedal depressed, the Range Rover Drive selector can now be moved from the 'P' or 'N' positions.

CAUTION:

Risk of injury. Apply the parking brake, chock the wheels and ensure that all personnel are clear of the vehicle before carrying out the above procedure.

31.1.2 Starting - Check the following:

- The engine will only start when the Range Rover Drive selector lever is in the 'P' or 'N' positions, when in hold neutral mode or when the Emergency Park Release is pulled.
- The starter motor operates without undue noise and the engine starts

easily.

- The tachometer registers as the engine is started.
- The warning lamps and Message Centre are not displaying any warnings or messages after the engine is started.
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32.1 Start vehicle and check operation of:

- Starter/Inhibitor switch.

- Electric mirrors, including power fold.

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- Repeat 5 times.
- Make sure high range is left selected.
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CAUTION:

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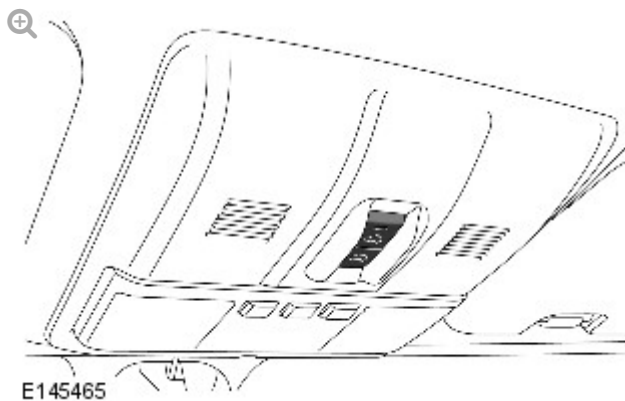


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- Repeat the procedure on each window.



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- Using the switch, move the roof opening panel to the full tilt position and hold for 20 seconds.
- Release the switch.
- Using the switch, close the roof opening panel.
- Using the switch, slide the roof opening panel fully open, then fully closed.
- With care, check the anti-trap function.

33. Cruise Control and ACC: Check for correct operation of the cruise control or adaptive cruise control (ACC) system.

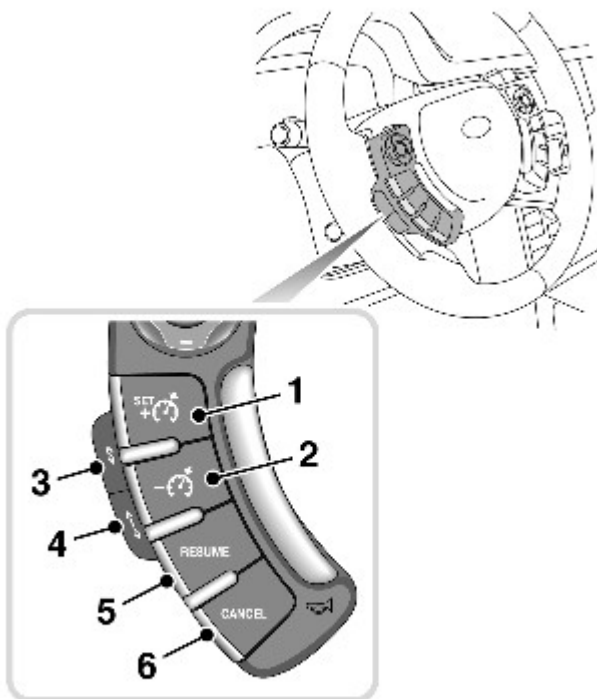
WARNINGS:

- Damage to vehicle. Adaptive cruise control is not a collision

warning or avoidance system.

- Risk of injury. It is the driver's responsibility to stay alert, drive safely and be in control of the vehicle at all times.
- Only use cruise control when conditions are favourable, e.g. on straight, dry, open roads with light traffic.

33.1 The cruise control and ACC system are operated by switches mounted on the steering wheel. The driver can also intervene at any time by use of the brake or accelerator pedals. The Forward Alert function can be manually turned on or off in the Message Centre. Using the Message Centre steering wheel controls select: **Vehicle Set-up** and then **Forward Alert** from the menu; using the **OK** button will turn the function on or off.



E145463

33.2 Controls - all cruise control switches are located on the steering wheel switch-pack:

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- 2 SET -: Set the speed (-) or decrease.
- 3 GAP: Gap decrease (ACC only).

4 GAP: Gap increase (ACC only).

5 RESUME: Resume set speed.

6 CANCEL: Cancels without erasing memorised speed.

33.3 Setting a speed:

- Accelerate as normal until required speed is reached.
- Press the 'SET' button (1). The vehicle speed will be stored in the memory and cruise control should be engaged.
- The message centre will display the selected speed - 'SETSPEED 80KM/H 50MPH'.



33.4 Checking the ACC gap: After the ignition is switched on a default gap will be automatically selected (setting No 3). There are 4 gaps available to select.

- After selecting cruise control, check that the vehicle slows when a vehicle ahead is detected by the system.

WARNING:

If the adaptive cruise control system predicts that its maximum braking level will not be sufficient, then an audible warning will sound while the system continues to brake. 'DRIVER INTERVENE' will also be displayed on the message centre.

- When a vehicle ahead is detected the vehicle will be in 'follow mode'.

WARNING:

When in 'follow mode' the vehicle will not decelerate automatically to a stop, nor will the vehicle always decelerate quickly enough to avoid a collision without driver intervention.

- Check that when in 'follow mode' a warning light in the instrument pack is illuminated and the message centre displays 'CRUISE GAP'.

33.5 Altering the cruise gap to the vehicle ahead:

- Press, the top part of the switch (3) to decrease the gap, and the bottom part of the switch (4) to increase the gap.
- Check 'follow mode' functions correctly.

33.6 Check the operation of the 'Forward Alert' system. Make sure that the ACC system is disengaged: this will allow the GAP buttons to be used to adjust Forward Alert. Switch on 'Forward Alert'

- Set the 'Forward Alert' gap.
- Using the GAP increase button (4), on the steering wheel switch-pack, select the largest gap available.

Check that when a vehicle is detected close ahead, an audible warning sounds and the message centre displays: 'FORWARD ALERT'.

This is easiest to achieve by following a lead vehicle as it slows down.

WARNING:

The 'Forward Alert' system DOES NOT provide vehicle braking.

NOTE:

The 'Forward Alert' system provides warnings if a vehicle is detected close ahead



33.7 Set the 'Forward Alert' gap:

- Using the GAP decrease button **(3)**, on the steering wheel switch-pack, select the smallest gap available.

33.8 Switch OFF the Forward Alert system so that the customer receives the vehicle set in this condition.

34. Check for noise: Check for any unusual noises from the power train, suspension or braking systems.

35. Check for noise: Check for any squeaks or rattles from the vehicle interior.

36. Navigation: Check the operation of the satellite navigation system.

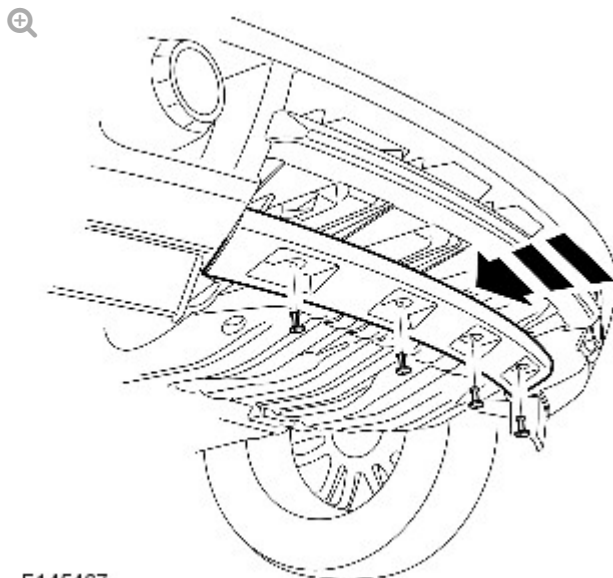
2012.0 RANGE ROVER (LM), 101-01

PRE-DELIVERY INSPECTION MANUAL

DESCRIPTION AND OPERATION

36. On completion of road test:

- Position the vehicle on lift.
- Raise the vehicle on lift.
- Visually check beneath the vehicle for leaks from the powertrain components.
- Lower the vehicle.



E145467

37. Install the front towing eye cover, secure with the 4 toggle fasteners.

38. Reconnect the approved Land Rover battery power supply and IDS, use SDD to read fault codes. Rectify any logged faults.

39. Check the register of Service Action Bulletins - make sure a fault free

delivery to the customer.

40. If fault lamp(s) are illuminated, interrogate that system using SDD, report findings and clear faults.

40.1 Disconnect IDS and the approved Land Rover power supply.

41. Retain copy of this schedule in the Customer/ Vehicle History file.

42. Make sure the vehicle details are included in the Service Portfolio and endorse with the dealer stamp.

43. Record locking wheel nut code and place in Customer/Vehicle History file, (if applicable).

44. Record the Bluetooth code and place in Customer/Vehicle History file, (if applicable).

45. Make sure vehicle literature pack and security item contents are correct.

46. Place vehicle literature pack, mats and security items in the vehicle, (if applicable).

47. Make sure the tire pressures are set to the correct pressure.

47.1 For vehicles that will be delivered to the customer: Set all tire pressures (including spare) with the tires cold to the recommended tire pressures for 'normal' conditions (up to 100mph [160kph]). The recommended tire pressures are provided on a label attached to the 'B' pillar.

47.2 For vehicles being returned to storage: Set all tire pressures with the tires cold to 3.6 bar (52psi).

48. Valet vehicle prior to customer release.

49. Attach correct type approval labels to the handsets (where applicable).

NOTES:

- A vehicle must not be left without a transportation switch/relay

installed for longer than two days, prior to customer handover

- If the transit relay has been refitted prior to release to customer; step 2 will need to be repeated, to remove the transit relay. Step 8 will need to be repeated, using the necessary diagnostic equipment, to clear DTCs.

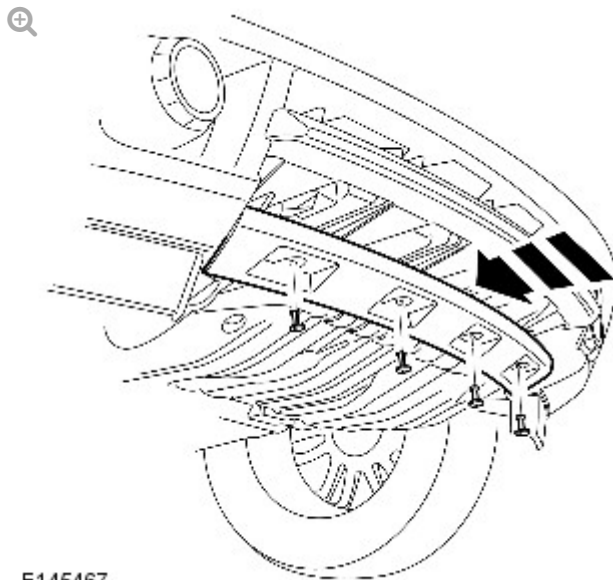
2012.0 RANGE ROVER (LM), 101-01

PRE-DELIVERY INSPECTION MANUAL

DESCRIPTION AND OPERATION

37. On completion of road test:

- Position the vehicle on lift.
- Raise the vehicle on lift.
- Visually check beneath the vehicle for leaks from the powertrain components.
- Lower the vehicle.



- 38.** Install the front towing eye cover, secure with the 4 toggle fasteners.
- 39.** Reconnect the approved Land Rover battery power supply and IDS, use SDD to read fault codes. Rectify any logged faults.
- 40.** Check the register of Service Action Bulletins - make sure a fault free delivery to the customer.
- 41.** If fault lamp(s) are illuminated, interrogate that system using SDD, report findings and clear faults.
- 41.1** Disconnect IDS and the approved Land Rover power supply.
- 42.** Retain copy of this schedule in the Customer/ Vehicle History file.
- 43.** Make sure the vehicle details are included in the Service Portfolio and endorse with the dealer stamp.
- 44.** Record locking wheel nut code and place in Customer/Vehicle History file (if applicable)

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45. Record the Bluetooth code and place in Customer/Vehicle History file, (if applicable).

46. Make sure vehicle literature pack and security item contents are correct.

47. Place vehicle literature pack, mats and security items in the vehicle, (if applicable).

48. Make sure the tire pressures are set to the correct pressure.

48.1 For vehicles that will be delivered to the customer: Set all tire pressures (including spare) with the tires cold to the recommended tire pressures for 'normal' conditions (up to 100mph [160kph]). The recommended tire pressures are provided on a label attached to the 'B' pillar.

48.2 For vehicles being returned to storage: Set all tire pressures with the tires cold to 3.6 bar (52psi).

49. Valet vehicle prior to customer release.

50. Attach correct type approval labels to the handsets (where applicable).

NOTES:

- A vehicle must not be left without a transportation switch/relay installed for longer than two days, prior to customer handover
- If the transit relay has been refitted prior to release to customer; step 2 will need to be repeated, to remove the transit relay. Step 8 will need to be repeated, using the necessary diagnostic equipment, to clear DTCs.

2012.0 RANGE ROVER (LM), 101-02

SHOWROOM PREPARATION

DESCRIPTION AND OPERATION

NOTE:

The information given in this document is subject to change for different model years.

Prior to the vehicle being placed into the showroom, the following components must be removed.

FUNCTION	FUSE	RATING	LOCATION
Starter motor - Petrol	10EK	40amp	Engine junction box (EJB)
Starter motor - Diesel	22E	40amp	EJB
Horn	16E	15amp	EJB
Wipers	8E	30amp	EJB

Washers	F52	15amp	Central junction box (CJB)
Power washers	F2EB	30amp	EJB

2012.0 RANGE ROVER (LM), 204-00

SUSPENSION SYSTEM - GENERAL INFORMATION

SPECIFICATIONS

Air Spring Suspension

ITEM	SPECIFICATION
Type - Front	Independent MacPherson strut with air springs, gas twin tube dampers, height sensors and stabilizer bar. Driver selectable ride heights - Standard, off-road and access.
Type - Rear	Independent with air springs, gas single tube dampers, height sensors and stabilizer bar. Driver selectable ride heights - Standard, off-road and access.
* Nominal heights from hub centre to wheel arch (not liner):	
Front	493 mm (19.4 in)
Rear	483 mm (19.0 in)

*** Measurement taken with vehicle at unladen weight**

Wheel Alignment Specification (All Markets) - Front - Vehicles with V8 Naturally Aspirated Engines

NOTE:

All figures are with vehicle at 'Showroom' ride height - full fluids, full tank of fuel, no occupants/luggage, tires inflated to normal pressures

ITEM		LEFT-HAND		RIGHT-HAND		TOTAL/BALANCE	
Camber		Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
	Decimal degrees	-0.33°	± 0.75°	-0.33°	± 0.75°	0°	± 0.75°
	Degrees/minutes	-20'	± 45'	-20'	± 45'	0'	± 45'
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
	Decimal degrees	-1.08°	0.42°	-1.08°	0.42°	-0.75°	0.75°
	Degrees/minutes	-1°5'	25'	-1°5'	25'	-45'	45'
Castor		Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
	Decimal degrees	6.09°	± 0.75°	6.09°	± 0.75°	0°	± 0.75°
	Degrees/minutes	6°5'	± 45'	6°5'	± 45'	0'	± 45'
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
	Decimal degrees	5.34°	6.84°	5.34°	6.84°	-0.75°	0.75°
	Degrees/minutes	5°20'	6° 50'	5°20'	6° 50'	-45'	45'
Toe		Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
	Decimal degrees	0°	±0.10°	0°	±0.10°	0°	±0.20°
	Degrees/minutes	0'	±6'	0'	±6'	0'	±12'
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
	Decimal degrees	-0.10°	0.10°	-0.10°	0.10°	-0.20°	0.20°
	Degrees/minutes	-6'	6'	-6'	6'	-12'	12'

Wheel Alignment Specification (All Markets) - Front - Vehicles with V8 Supercharged and Diesel Engines

NOTE:

All figures are with vehicle at 'Showroom' ride height - full fluids, full tank of fuel, no occupants/luggage, tires inflated to normal pressures

ITEM		LEFT-HAND		RIGHT-HAND		TOTAL/BALANCE
------	--	-----------	--	------------	--	---------------

Camber		Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
	Decimal degrees	-0.33°	± 0.75°	-0.33°	± 0.75°	0°	± 0.75°
	Degrees/minutes	-20'	± 45'	-20'	± 45'	0'	± 45'
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
	Decimal degrees	-1.08°	0.42°	-1.08°	0.42°	-0.75°	0.75°
	Degrees/minutes	-1°5'	25'	-1°5'	25'	-45'	45'
Castor		Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
	Decimal degrees	6.09°	± 0.75°	6.09°	± 0.75°	0°	± 0.75°
	Degrees/minutes	6°5'	± 45'	6°5'	± 45'	0'	± 45'
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
	Decimal degrees	5.34°	6.84°	5.34°	6.84°	-0.75°	0.75°
	Degrees/minutes	5°20'	6° 50'	5°20'	6° 50'	-45'	45'
Toe		Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
	Decimal degrees	0.08°	±0.10°	0.08°	±0.10°	0.15°	±0.20°
	Degrees/minutes	5'	±6'	5'	±6'	9'	±12'
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
	Decimal degrees	-0.03°	0.18°	-0.03°	0.18°	-0.05°	0.35°
	Degrees/minutes	-2'	11'	-2'	11'	-3'	21'

Wheel Alignment Specification - Rear

NOTE:

All figures are with vehicle at 'Showroom' ride height - full fluids, full tank of fuel, no occupants/luggage, tires inflated to normal pressures

Degrees/minutes

ITEM	LEFT-HAND		RIGHT-HAND		TOTAL/BALANCE	
Camber	Nominal	Tolerance	Nominal	Tolerance		

	Decimal degrees	-1.00°	± 0.75°	-1.00°	± 0.75°		
	Degrees/minutes	-1°	± 45'	-1°	± 45'		
		Minimum	Maximum	Minimum	Maximum		
	Decimal degrees	-1.75°	-0.25°	-1.75°	-0.25°		
	-1°45'	-15'	-1°45'	-15'			
Toe		Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
	Decimal degrees	0.10°	± 0.14°	0.10°	± 0.14°	0.20°	± 0.20°
	Degrees/minutes	6'	± 8'	6'	± 8'	12'	± 12'
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
	Decimal degrees	-0.04°	0.24°	-0.04°	0.24°	0°	0.40°
	Degrees/minutes	-2'	14'	-2'	14'	0'	24'

2012.0 RANGE ROVER (LM), 204-00

SUSPENSION SYSTEM - GENERAL INFORMATION

DIAGNOSIS AND TESTING

PRINCIPLES OF OPERATION

For a detailed description of the suspension system and operation, refer to the relevant description and operation section of the workshop manual.

REFER to:

[Front Suspension](#) (204-01 Front Suspension, Description and Operation),

[Rear Suspension](#) (204-02 Rear Suspension, Description and Operation).

INSPECTION AND VERIFICATION

WARNING:

Before carrying out a road test, make sure the vehicle is safe to do so.
Failure to follow this instruction may result in personal injury

CAUTION:

Diagnosis by substitution from a donor vehicle is **NOT** acceptable.
Substitution of control modules does not guarantee confirmation of a fault and may also cause additional faults in the vehicle being checked and/or the donor vehicle

NOTE:

Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests

1. Gather as much information from the driver as possible and verify the customer concern by carrying out a road test, as closely as possible reproducing the conditions under which the fault occurs
1. Visually inspect for obvious signs of mechanical damage

Visual Inspection

visual inspection

MECHANICAL

- Tire pressures
- Damaged wheels or tires
- Wheel bearing(s)
- Loose or damaged front or rear suspension components
- Loose, damaged or missing suspension fastener(s)
- Damaged or leaking air suspension components
- Worn or damaged suspension bushing(s)
- Loose, worn or damaged steering system components
- Damaged axle components
- Damaged chassis

1. If an obvious cause for an observed or reported condition is found, correct the cause (if possible) before proceeding to the symptom chart

1. If the cause is not visually evident, verify the symptom and refer to the symptom chart, alternatively check for diagnostic trouble codes (DTCs) and refer to the DTC index

SYMPTOM CHART

SYMPTOM	POSSIBLE CAUSES	ACTION
Crabbing	<ul style="list-style-type: none">▪ Incorrect rear thrust angle▪ Front or rear suspension components	<ul style="list-style-type: none">▪ Check the rear alignment▪ Check the front and rear suspension for signs of damage or wear
Drift/pull/wander	<ul style="list-style-type: none">▪ Tire pressures▪ Uneven tire wear▪ Damaged steering components▪ Wheel alignment▪ Brake drag▪ Unevenly loaded or overloaded vehicle	<ul style="list-style-type: none">▪ Check and adjust the tire pressures (see visual inspection)▪ Check for uneven tire wear, investigate the cause and rectify as necessary▪ Check the steering for wear/damage▪ Check and adjust the wheel alignment as necessary▪ Check for binding brakes, rectify as

		<p>necessary</p> <ul style="list-style-type: none"> ▪ Advise the driver of the load issues
Front bottoming or riding low	<ul style="list-style-type: none"> ▪ Damaged suspension components ▪ Air spring fault 	<ul style="list-style-type: none"> ▪ Check the suspension components for damage ▪ Check the dynamic suspension
Uneven tire wear	<ul style="list-style-type: none"> ▪ Incorrect tire pressure (rapid center rib or inner and outer edge wear) ▪ Incorrect front or rear toe (rapid inner or outer edge wear) ▪ Incorrect camber (rapid inner or outer edge wear) ▪ Tires out of balance (tires cupped or dished) 	<ul style="list-style-type: none"> ▪ Check and adjust the tire pressures (see visual inspection) ▪ Check and adjust the wheel alignment as necessary ▪ Balance the wheels and tires as necessary
Harsh ride	<ul style="list-style-type: none"> ▪ Damaged suspension components ▪ Air spring fault 	<ul style="list-style-type: none"> ▪ Check the suspension components for damage ▪ Check the dynamic suspension
Shimmy or wheel tramp	<ul style="list-style-type: none"> ▪ Wheels/tires ▪ Loose wheel nut(s) ▪ Loose front suspension fasteners ▪ Front wheel bearing(s) fault ▪ Worn or damaged suspension component bushing ▪ Loose, worn or damaged ball joint(s) ▪ Loose, worn or damaged steering components ▪ Front wheel alignment 	<ul style="list-style-type: none"> ▪ Check the wheels and tires for condition and balance ▪ Check and tighten the wheel nuts and suspension fasteners to specification ▪ Check the front wheel bearings, suspension bushings, ball joints and steering components for wear or damage ▪ Check and adjust the wheel alignment as necessary
Poor return ability of the steering (self-centering)	<ul style="list-style-type: none"> ▪ Steering column ▪ Ball joints ▪ Steering components 	<ul style="list-style-type: none"> ▪ Check the steering column universal joints, etc ▪ Check the ball joints and other steering components

Sway or roll	<ul style="list-style-type: none"> ▪ Loose front or rear stabilizer bar ▪ Worn lower suspension arm stabilizer bar insulators ▪ Air spring fault 	<ul style="list-style-type: none"> ▪ Check the stabilizer bar security and condition ▪ Rectify as necessary ▪ Check the function of the active stabilization system (where installed) ▪ Check the air springs
Vehicle leans to one side	<ul style="list-style-type: none"> ▪ Front or rear suspension components ▪ Air spring fault 	<ul style="list-style-type: none"> ▪ Check the front and rear suspension ▪ Check the air springs
Evidence of fluid on rear shock absorber	<ul style="list-style-type: none"> ▪ Fluid on shock absorber from an external source ▪ Fluid leaking from shock absorber 	<ul style="list-style-type: none"> ▪ Shock absorber not faulty, do not renew ▪ GO to Pinpoint Test A.

PINPOINT TESTS

NOTES:

- Residual oil left over from the shock absorber assembly process may create oil staining on the shock absorber tube. This will not affect the function of the shock absorber.
- Slight seepage is considered normal.

PINPOINT TEST A : SHOCK ABSORBER FLUID LEAK DIAGNOSIS

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
A1: ASSESS LEAK	
	1 Assess the extent of the oil leakage
	Is the leakage serious enough to indicate that the shock absorber seal has failed? Yes GO to Pinpoint Test B .

	No Shock absorber not faulty, do not renew
--	--

PINPOINT TEST B : CONFIRM LEAK	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
B1: ROAD TEST	
	1 Clean all traces of oil from the shock absorber
	2 Drive the vehicle over a speed bump or similar ten times
	Is any fluid visible on the outside of the shock absorber? Yes Install a new shock absorber No Shock absorber not faulty, do not renew

D T C I N D E X

For a list of diagnostic trouble codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: (100-00 General Information)

[Diagnostic Trouble Code \(DTC\) Index - DTC: Module Name: Air Suspension Control Module](#) (Description and Operation),

[Diagnostic Trouble Code \(DTC\) Index - DTC: Module Name: Adaptive Damping Control Module](#) (Description and Operation),

[Diagnostic Trouble Code \(DTC\) Index - DTC: Module Name: Terrain Response Control Module](#) (Description and Operation).

2012.0 RANGE ROVER (LM), 204-00

SUSPENSION SYSTEM - GENERAL INFORMATION

FOUR-WHEEL ALIGNMENT

[G1235834]

GENERAL PROCEDURES

57.65.02	STEERING GEOMETRY - CHECK (INCLUDES CASTER, CAMBER, KING PIN INCLINATION, TOE- IN/TOE-OUT ON TURNS AND REAR WHEEL ALIGNMENT)	ALL DERIVATIVES	0.8	USED WITHINS	+
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57.65.04 STEERING GEOMETRY - CHECK +ADJUST (INC CASTOR, CAMBER, KING PIN INCLINATION, TOE IN/TOE OUT ON TURNS, REAR WHEEL ALIGNMENT) ALL DERIVATIVES 1.2 USED WITHINS +

SPECIAL TOOL(S)



211-318(LRT-57-045)
Camber setting tool

NOTE:

A change in camber means a change in toe, therefore camber must always be adjusted first.



All vehicles

1.

NOTE:

Only use calibrated equipment recommended by Land Rover.

Check the tie rod ends, suspension joints, wheel bearings and wheels and tires for damage, wear and free play.

- Check and adjust the tire pressures.
- Roll the vehicle backwards and forwards to settle the steering and suspension.
- Make sure the wheel alignment equipment is properly calibrated.

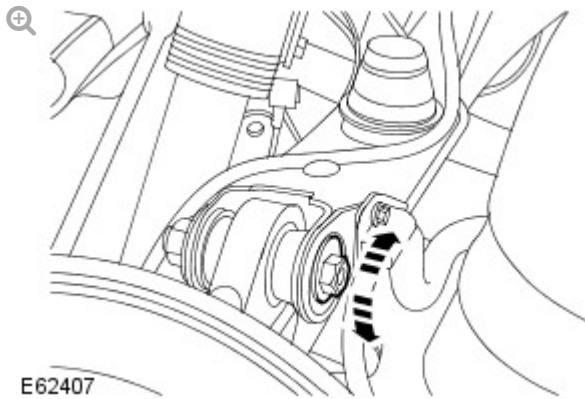


All vehicles

1. Note the readings from the steering geometry test equipment and adjust the geometry as required.

2. Adjust the rear wheel alignment.

3.

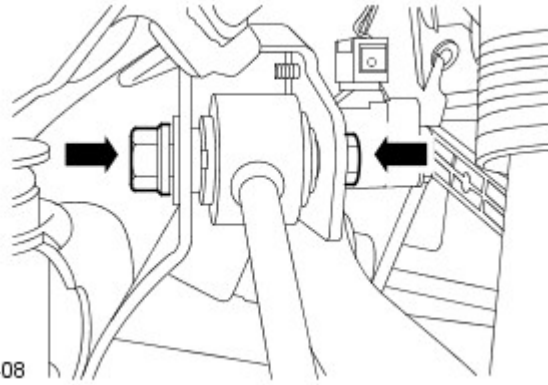


Adjust the rear camber.

- Rotate the rear camber adjusting bolt until the correct value is obtained.
- Tighten the nut to 165 Nm (121 lb.ft).
- Repeat the above procedure for the other side.

Loosen the rear camber adjusting bolt.

4.



E62408

Adjusting the toe.

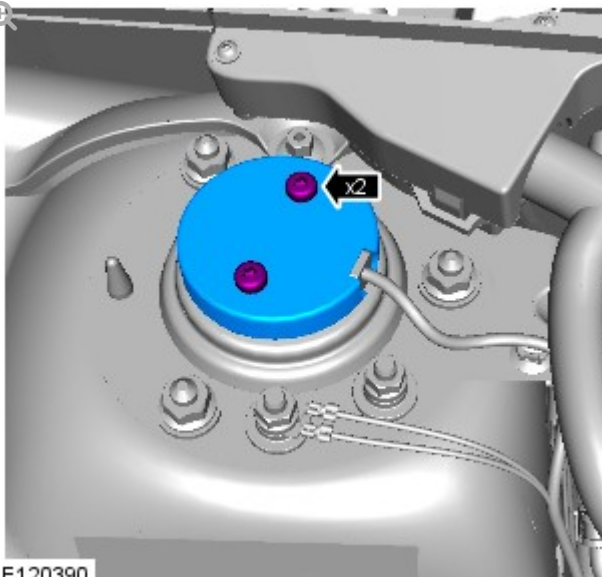
- Loosen the tie-rod end lock nut.
- Turn the eccentric and adjust the toe to the specified value.
- Tighten the nut to 165 Nm (121 lb.ft).
- Repeat the above procedure for the other side.

5. Adjust the front wheel alignment.



Vehicles with active damping

1.



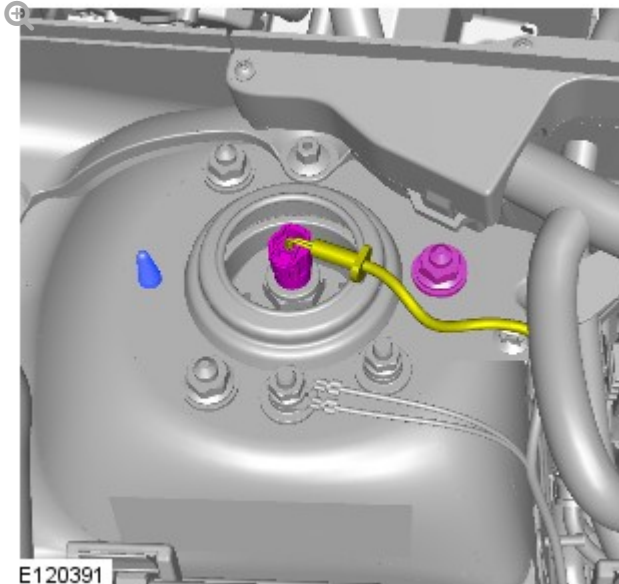
E120390

Remove the mass damper assembly.

- Remove the 2 mass damper bolts.

Repeat the above procedure for the other side.

2.



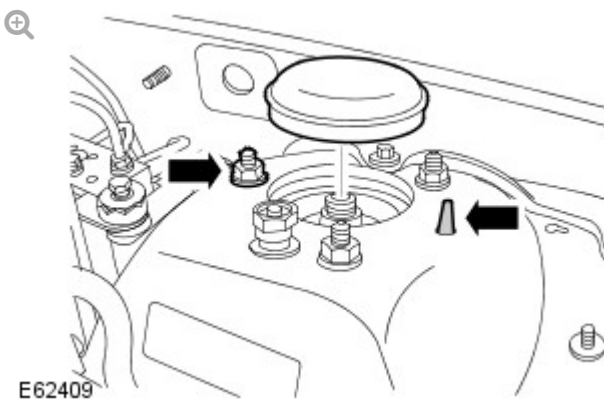
Adjust the front camber.

- Disconnect the active damping wiring.
- Break off the damper location pin.
- Loosen the damper nut illustrated.
- Repeat the above procedure for the other side.



All vehicles

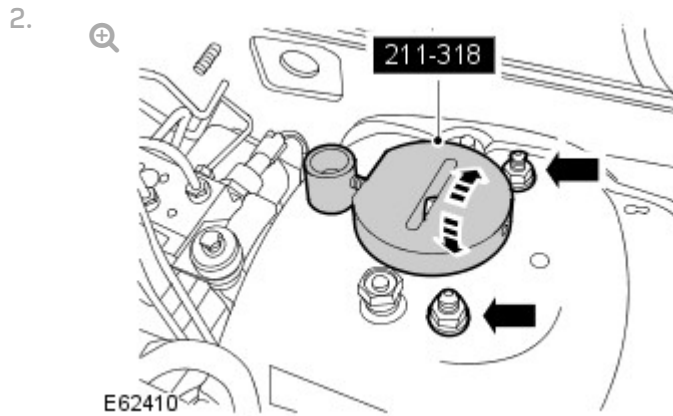
1.



Adjust the front camber.

- Remove the suspension turret cap.
- Break off the damper location pin.
- Loosen the damper nut illustrated.

- Repeat the above procedure for the other side.



Install the special tool.

- Loosen the 2 remaining damper nuts.
- Adjust the camber to the specified value by rotating the nut on the special tool.
- Tighten the 3 strut nuts to 56 Nm (41 lb.ft).
- Repeat the above procedure for the other side.



Vehicles with active damping

1. Attach the active damping wiring.
 - Repeat the above procedure for the other side.

2. Install the mass damper.
 - Tighten the mass damper bolts to 9 Nm (7 lb.ft).
 - Repeat the above procedure for the other side.



All vehicles

1. Adjust the front toe.

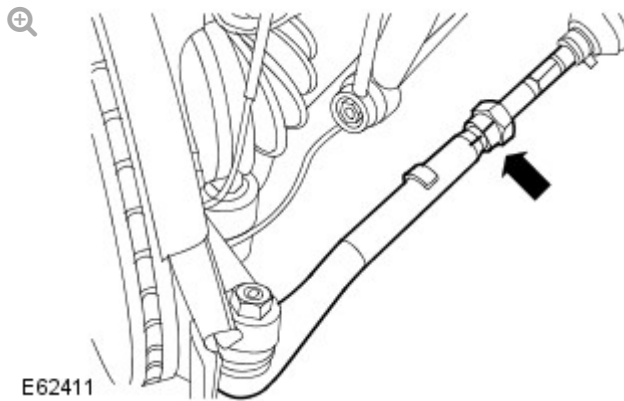
2.

CAUTIONS:

- Do not allow the gaiter to twist.
- To prevent damage to the tie rods, use an additional wrench when loosening or tightening the components.

NOTE:

Both tie rods must be rotated by an equal amount.



Loosen the tie-rod end lock nut.

- Align the steering to straight ahead.
- Adjust the steering gear tie rod, rotate using the hexagon on the tie rod.
- Check, and if necessary, repeat the wheel alignment procedure until the correct values are obtained.
- Tighten the tie rod end lock nut to 55 Nm (40 lb.ft).
- Repeat the above procedure for the other side.

2012.0 RANGE ROVER (LM), 204-00

SUSPENSION SYSTEM - GENERAL INFORMATION

FRONT WHEEL BEARING AND WHEEL HUB RUNOUT CHECK

[G1348313]

GENERAL PROCEDURES

NOTES:

- Some variation in the illustrations may occur, but the essential information is always correct.
- LH illustration shown, RH is similar.

1.

WARNING:

Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

2. Remove the road wheel.

3.

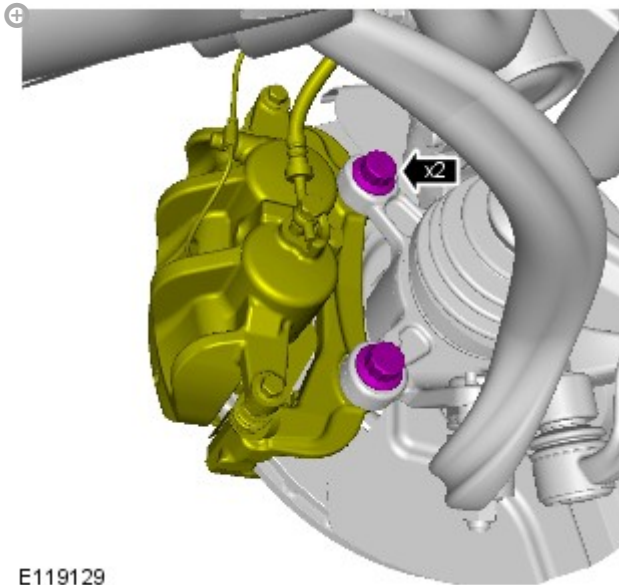
CAUTIONS:

- Do not allow the brake caliper to hang on the brake hose.

- LH side: Do not allow the brake caliper to hang on the brake pad wear warning sensor lead.

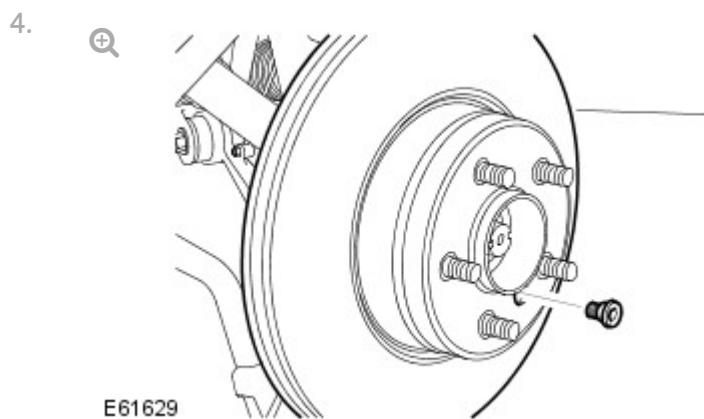
NOTE:

Models with standard brakes shown, models with high performance brakes similar.



E119129

Release the brake caliper and tie aside.

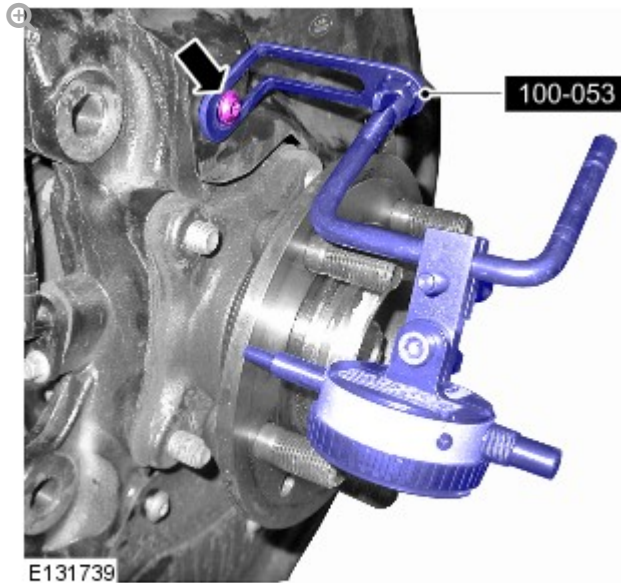


Remove the front brake disc.

- Remove the Allen screw.

5. Thoroughly clean the hub mounting face.

6.



Using special tool (100-053) mount a Dial Test Indicator (DTI) to and secure to the backplate using the upper backplate fixing.

7.

CAUTION:

Make sure the DTI is positioned clear of the wheel studs.

Position the DTI probe on the outer edge of the hub face.

8. Zero the DTI and rotate the hub one complete revolution to measure hub runout.

- The hub runout limit is 0.0135 mm.

9.

NOTE:

If the hub runout exceeds the limit replace the hub.

For additional information, refer to: Front Wheel Bearing and Wheel Hub (204-01, Removal and Installation).

10. Remove the DTI.

11. Install the brake disc.

- Tighten the Torx screw to 35 Nm (26 lb.ft).

12. Install the brake caliper and tighten the bolts. TORQUE: 275 Nm

13. Install the road wheel and tighten nuts to 140Nm (103 lb-ft).

14. Repeat the above procedure on the opposite side.

15. Depress the brake pedal several times to set brake pads.

16. Lower the vehicle.

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

SPECIFICATIONS

Torque Specifications

DESCRIPTION	NM	LB-FT
Stabilizer bar link nuts +	100	74
Stabilizer bar clamp nuts	56	41
Subframe to body bolts +		
Stage 1 - All bolts	165	122
Stage 2 - Rear bolts	Then a further 90 degrees	Then a further 90 degrees
Subframe to front crossmember bolt	132	97
Rear lower arm ball joint bolts +	60	44
Rear lower arm ball joint nut	80	59
Front lower arm ball joint nut	80	59
Rear lower arm to subframe bolt +		
Stage 1	165	121
Stage 2	Then a further 90 degrees	Then a further 90 degrees
Rear lower arm to subframe bolt +		
Stage 1	165	121
Stage 2	Then a further 90 degrees	Then a further 90 degrees
Wheel knuckle to shock absorber bolts	250	184
Shock absorber and spring assembly top mounting nuts	56	41
Mass damper bolts #	9	7

Vehicles with active damping suspension

+ New nut/bolts must be installed

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

SPECIFICATIONS

Torque wrench settings

TORQUE DESCRIPTION	METRIC	IMPERIAL
Stabilizer bar bush clamp nuts	48 to 65 Nm	35 to 48 lbf.ft
Anti-shuffle collar screws	9 Nm	7 lbf.ft
Brake calliper bracket to upright mounting bolts	90 Nm	66 lbf.ft

ITEM	DESCRIPTION
1	right-hand (RH) front damper assembly
2	RH tie rod
3	Subframe body mounts
4	Front cross link valve
5	Stabilizer bar
6	left-hand (LH) front damper assembly
7	LH tie rod
8	LH front hub assembly
9	LH lower arm
10	LH stabilizer bar link
11	LH front height sensor
12	Front subframe
13	RH front height sensor (hidden)
14	RH lower arm
15	RH stabilizer bar link
16	RH front hub assembly
17	Hardened washer (2 off)

The front suspension on vehicles from 2007 model year features a common tubular stabilizer bar across all engine variants.

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 air suspension 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.

NOTE:

Overall wheel travel stated above will still be achieved when both wheels are moving in parallel together.

The front suspension comprises:

- Two air spring damping struts
- Subframe
- Stabilizer bar
- Stabilizer 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 fender 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 fender, between the inner fender 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.

NOTE:

The dampers fitted to TDV8 vehicles differ to the dampers fitted to petrol vehicles to compensate for the extra weight and handling characteristics of the vehicle.

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 cross-link valve. The piston is made from plastic and is shaped to allow the air bag to roll over its outer diameter.

TDV8 and supercharged vehicles also feature mass attached to the top mount. The mass has no function with the vehicle suspension but is fitted to improve NVH produced by the braking system.

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 stabilizer bar is attached across the rear of the subframe and is mounted in flexible bushes which are secured with 'D' shaped clamp plates.

STABILIZER BAR AND LINKS

The stabilizer bar is fabricated from 31 mm diameter, spring steel tube with a 5.5 mm wall thickness. The stabilizer bar operates, via a pair of links, from a bracket mounted on each strut.

The stabilizer 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 stabilizer bar is secured to the subframe with the clamp plates which are located on studs on the subframe and secured with nuts.

Each end of the stabilizer bar is attached to a bracket on each strut via a stabilizer link. This arrangement allows the stabilizer bar to act on a 1:1 ratio with the wheel travel providing maximum stabilizer bar effectiveness. A hardened washer is fitted between the ball joint and the strut mounting plate. The hardened washer prevents the ball joint damaging the bracket, which could lead to loosening of the torque on the nut. It is important that this washer is in the correct position and the correct, hardened washer is fitted. 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 the strut.

Each stabilizer link has a ball joint fitting at each end mounted at 90° to the axis of the link. The ball joints improve the response and efficiency of the stabilizer bar. The top ball joint attaches directly to a bracket on the strut and the lower ball joint attaches to a hole in the stabilizer bar. Both ball joints are secured with self-locking nuts.

Each link must be attached to the stabilizer bar with the ball joint on the outside of the bar and the locknut facing inwards. The ball joints on the stabilizer links are not serviceable and if replacement of either is necessary, a new stabilizer link will be required.

SUSPENSION LINKS

The front suspension hub assembly is secured to the subframe via two suspension links:

Lower Arm

Each lower arm is fitted with a bush which is secured with a bolt between two brackets on the subframe. The opposite end of the lower arm is fitted with a tapered ball joint which attaches to the hub assembly. The arm has a bracket on its upper face which provides for attachment of the air suspension height sensor.

Tie Rod

The tie rod is located rearward of the lower arm. The tie rod is fitted with a compliance bush which is secured with a bolt between two brackets on the subframe. The opposite end of the tie rod 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 calliper.

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 tie rod. A further tapered hole allows for the attachment of the lower arm ball joint.

A hole is machined at 90° to the hub bearing. This hole allows for the fitment of the anti-lock brake system (ABS) wheel 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.

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

DIAGNOSIS AND TESTING

For additional information.

REFER to: Suspension System (204-00, Diagnosis and Testing).

2012.0 RANGE ROVER (LM), 204-01

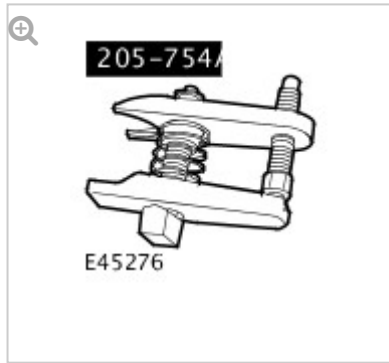
FRONT SUSPENSION

FRONT LOWER ARM (G928131)

REMOVAL AND INSTALLATION

60.35.03	SUSPENSION ARM - LOWER FRONT - RENEW	ALL DERIVATIVES	0.3	USED WITHINS	+
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SPECIAL TOOL(S)



**205-
754(LRT-
54-027)**
Ball joint separator

REMOVAL

NOTE:

LH illustration shown, RH is similar.

1.

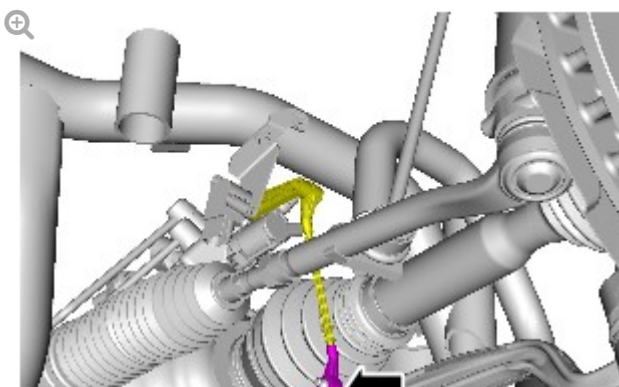
WARNING:

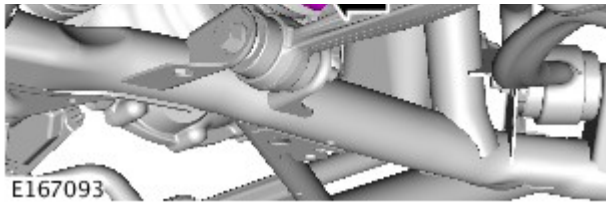
Do not work on or under a vehicle supported only by a jack.
Always support the vehicle on safety stands.

Raise and support the vehicle.

2. Remove the wheel and tire.

3.



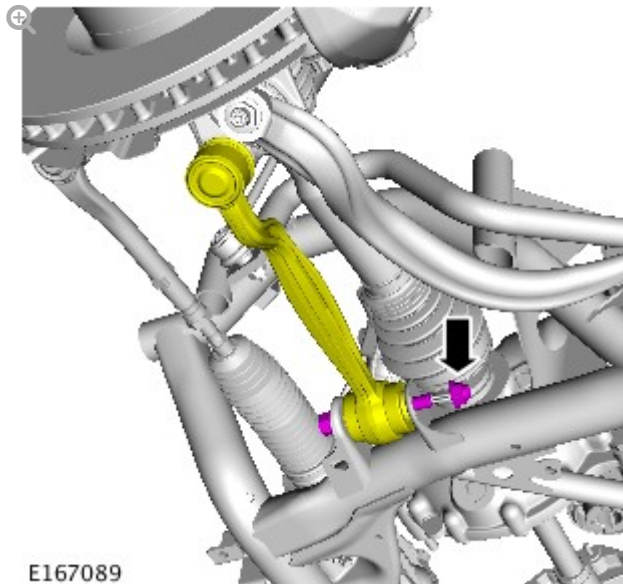


Release the suspension height sensor link.

4.

NOTE:

Remove and discard the nut and bolt.

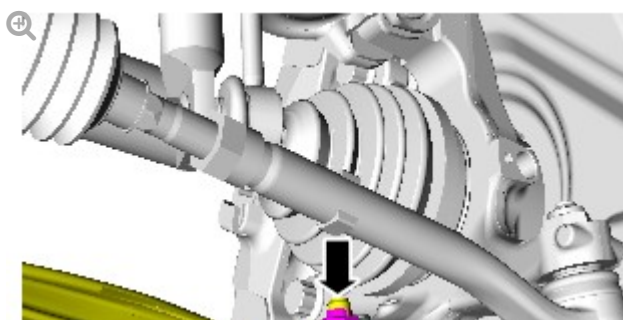


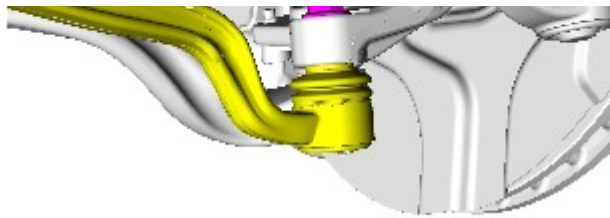
Release the front lower arm from the subframe.

5.

NOTE:

Remove and discard the nut.



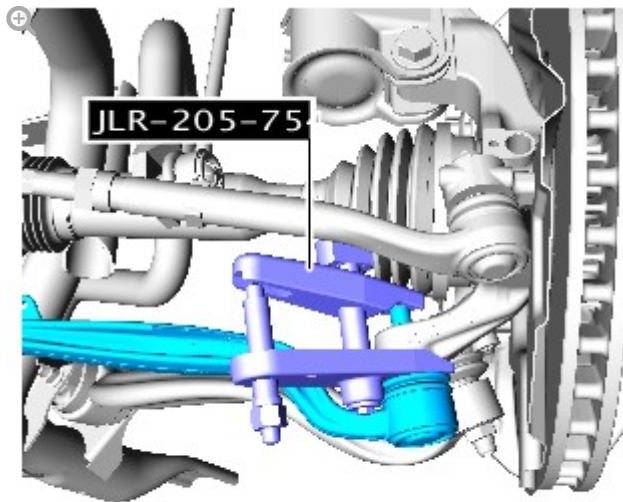


E167090

6.

CAUTION:

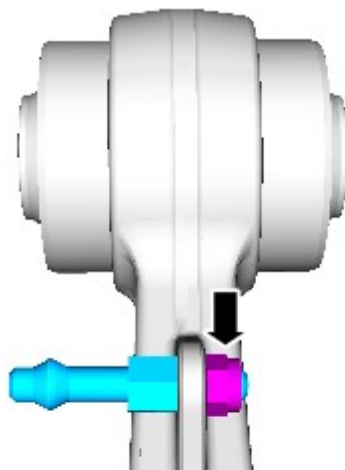
Make sure the ball joint seal is not damaged. A damaged seal will lead to the premature failure of the joint.



E167091

Using the special tool, release the front lower arm from the wheel knuckle.

7.

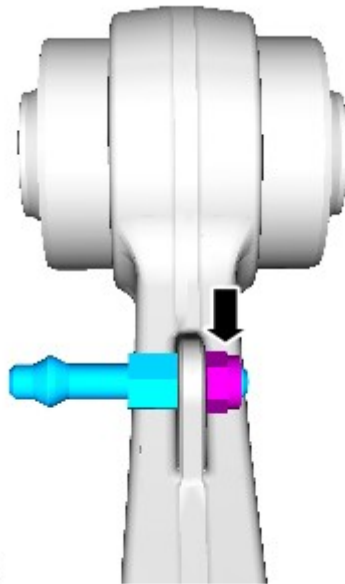


E167092



INSTALLATION

1.

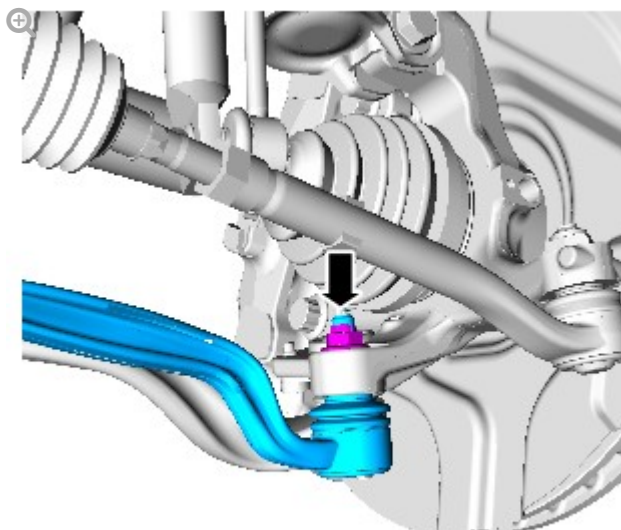


E167092

2.

CAUTION:

Make sure that a new nut is installed.



E167094

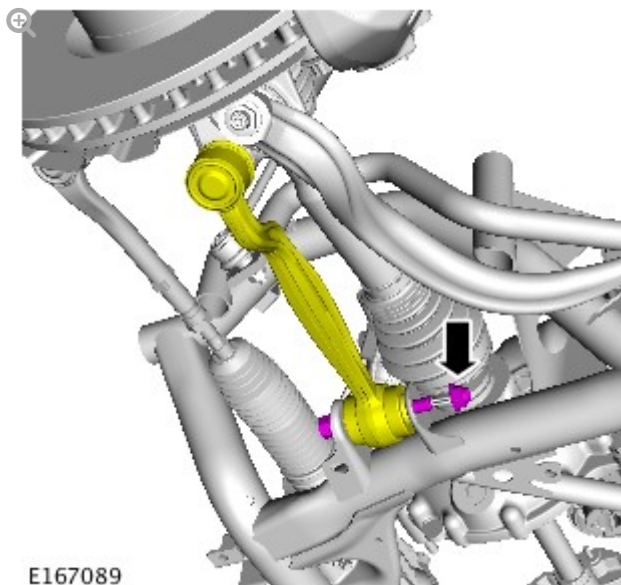
Secure the wheel knuckle to the front lower arm.

- Tighten the nut to 80 Nm (59 lb.ft).

3.

CAUTIONS:

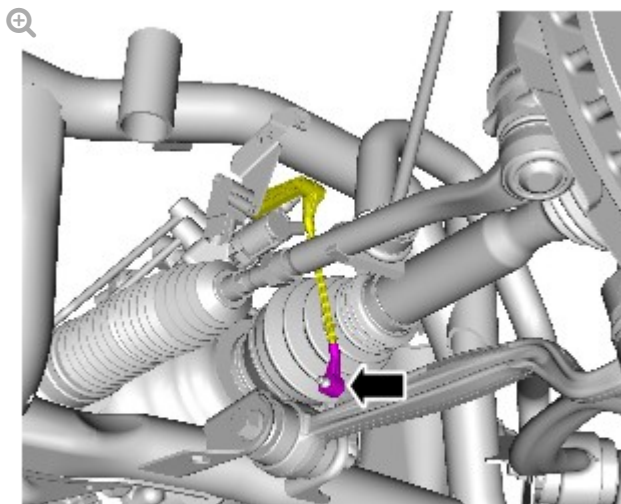
- Make sure that a new nut and bolt is installed.
- Only tighten the nuts and bolts when the suspension is in the normal drive position.

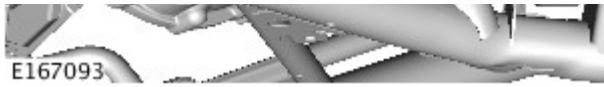


Install the front lower arm.

- Tighten the nut and bolt to 165 Nm (121 lb.ft). plus a further 90 degrees.

4.





Secure the suspension height sensor link.

5. Install the wheel and tire.

- Tighten the wheel nuts to 140 Nm (103 lb.ft).

6. Calibrate the suspension ride height.

7. Check, and if necessary, adjust the wheel alignment.

For additional information, refer to: [Four-Wheel Alignment](#) (204-00 Suspension System - General Information, General Procedures).

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

FRONT LOWER ARM BUSHING (G928132)

REMOVAL AND INSTALLATION

60.35.26	BUSHING - SUSPENSION LOWER ARM - PAIR - RENEW	ALL DERIVATIVES	1	USED WITHINS	+
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SPECIAL TOOL(S)



204-507

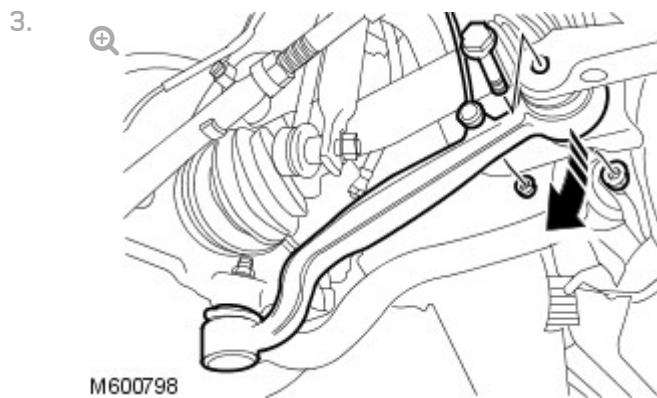
Remover/installer

REMOVAL

NOTE:

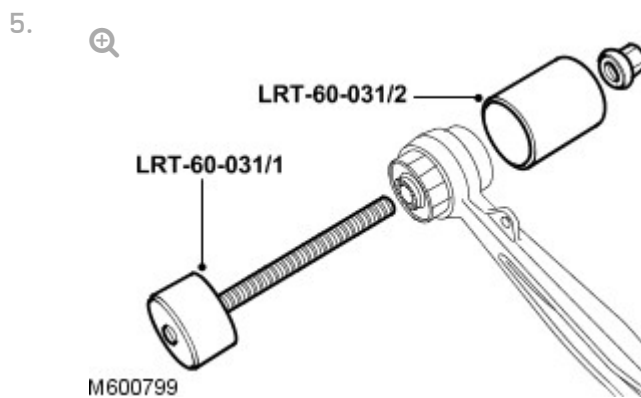
bushes must be replaced as a pair

1. Raise and support the vehicle.
2. Remove the wheels and tires.



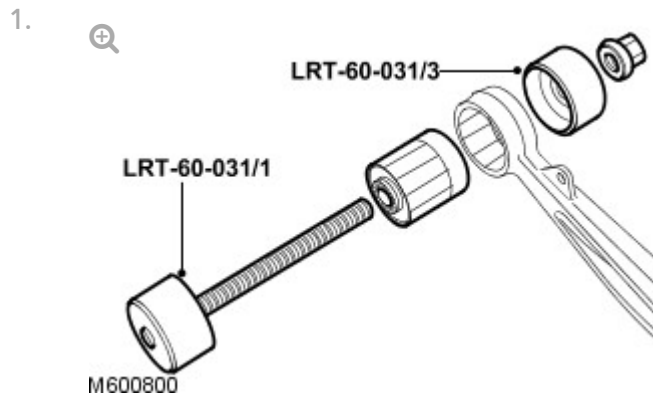
LH front: Release the suspension height sensor link.

4. Release the LH front lower arm.
 - Remove and discard the nut and bolt.



Using the special tools, remove the front lower arm bushes.

INSTALLATION



Using the special tools, install the front lower arm bushes.

2. **CAUTIONS:**

- Make sure that a new nut and bolt is installed.
- Only tighten the nuts and bolts when the suspension is in the normal drive position.

Secure the LH front lower arm.

- Tighten the nut and bolt to 165 Nm (121 lb.ft). plus a further 90 degrees.

3. LH front: Secure the suspension height sensor link.

4. Repeat the above procedure for the RH side.

5. Install the wheels and tires.

- Tighten the wheel nuts to 140 Nm (103 lb.ft).

6. Check, and if necessary, adjust the wheel alignment.

For additional information, refer to: [Four-Wheel Alignment](#) (204-00 Suspension System - General Information, General Procedures).

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

FRONT STABILIZER BAR (G1226571)

REMOVAL AND INSTALLATION

60.10.01	STABILIZER BAR - RENEW	ALL DERIVATIVES	1.6	USED WITHINS	+
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REMOVAL

1. **WARNING:**

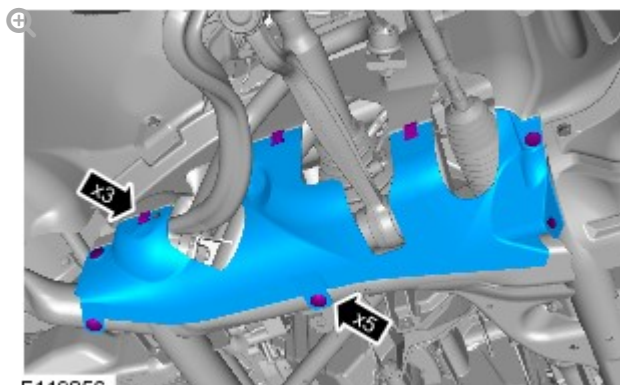
Make sure to support the vehicle with axle stands.

Raise the front of the vehicle.

2. Remove the front wheels and tires.
3. Remove the engine undershield.
For additional information, refer to: [Engine Undershield \(501-02 Front End Body Panels, Removal and Installation\)](#).

4. **NOTE:**

RH side only.

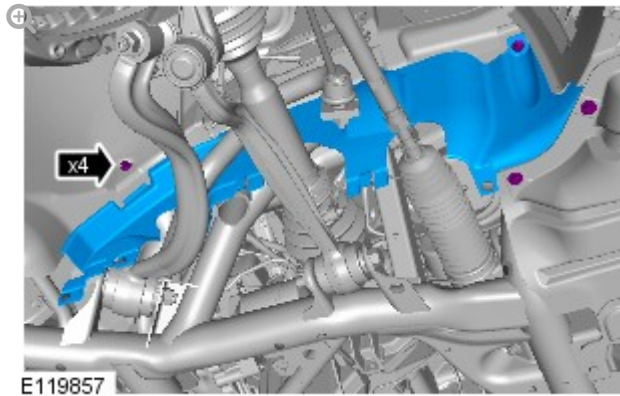


Remove the fender splash shield lower extension panel.

5.

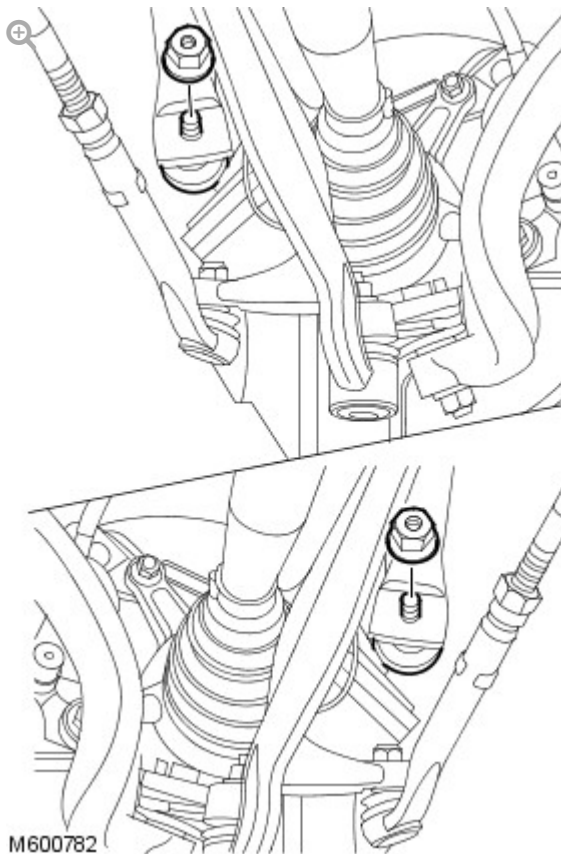
NOTE:

RH side only.



Remove the fender splash shield upper extension panel.

6.



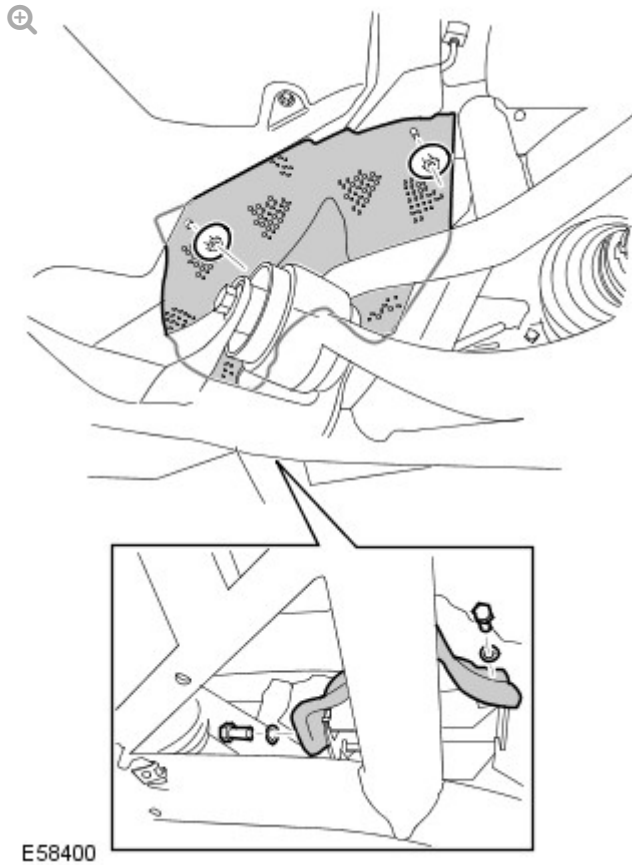
Release the stabilizer bar links from the stabilizer bar.

- Remove the 2 nuts.

7.

NOTE:

RH illustration shown, LH is similar.



Remove the stabilizer bar RH heatshield.

- Remove the 2 nuts and 2 bolts.

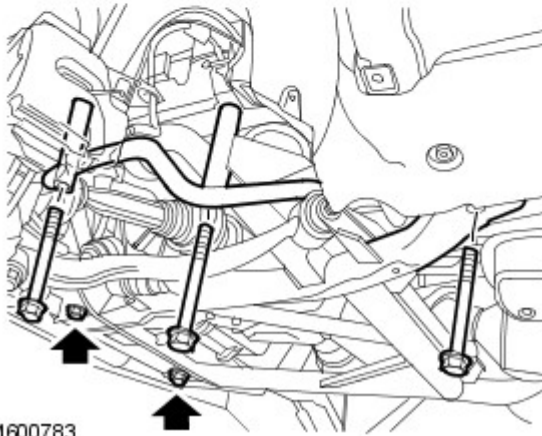
8. Remove the LH heatshield retaining bolts.

- Remove the 2 nuts and 2 bolts.

9. Support the front subframe.

10.



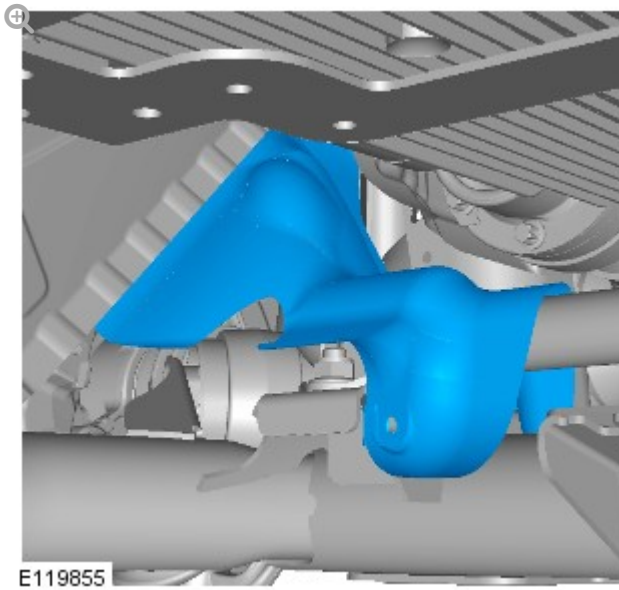


M600783

Lower the rear of the front subframe.

- Loosen the 2 bolts.
- Remove and discard the 6 bolts.

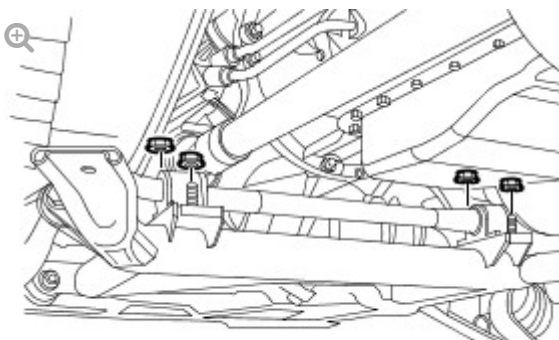
11.



E119855

Remove the stabilizer bar LH heatshield.

12.



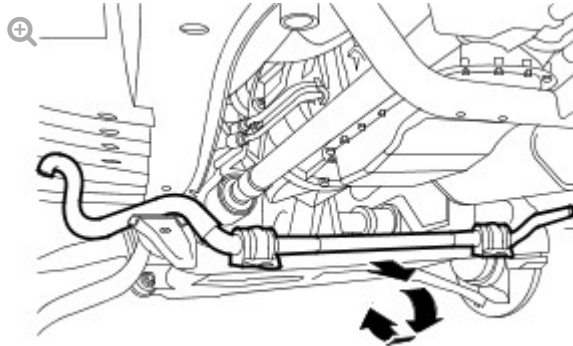
M600784



Release the front stabilizer bar.

- Remove the 4 nuts.

13.



M600785

Remove the front stabilizer bar.

INSTALLATION

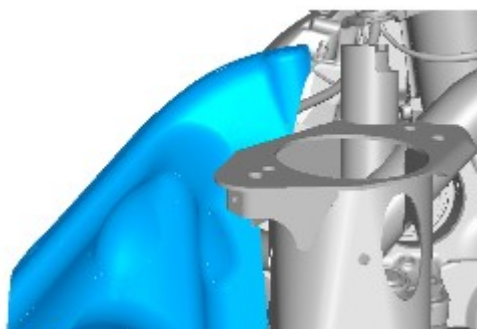
1. Install the front stabilizer bar.

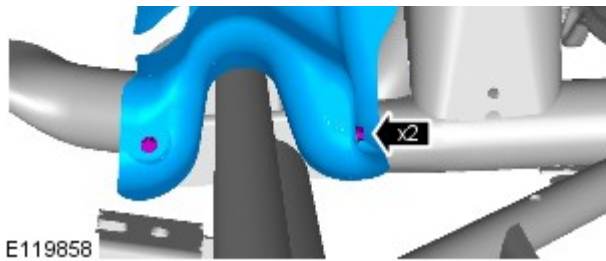
- Locate the front stabilizer bar clamps.
- Tighten the front stabilizer bar clamp nuts.
- Stage 1: 56 Nm (41 lbft).
- Stage 2: 56 Nm (41 lbft).

2.

NOTE:

Sub-frame shown removed for clarity.





Install the stabilizer bar LH heatshield.

- Fit the bolts securing the heatshield to the subframe but do not fully tighten at this stage.

3. Secure the front subframe.

- Tighten the new bolts to 165 Nm (122 lb.ft).
- Tighten the 2 rear bolts a further 90 degrees.
- Tighten the two front subframe bolts to 133 Nm (98 lb.ft).

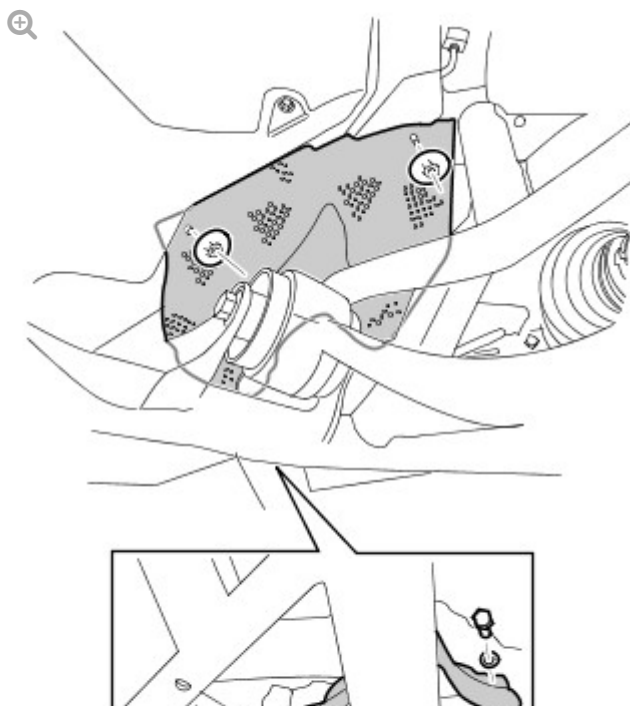
4. Secure the stabilizer bar links.

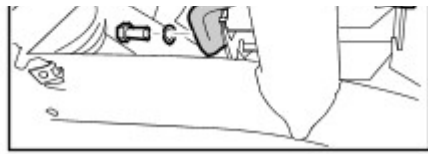
- Tighten the nuts to 100 Nm (74 lb.ft).

5.

NOTE:

RHD illustration shown, LHD is similar.





E58400

Install the stabilizer bar RH heatshield.

- Tighten the nuts to 8 Nm (6 lb.ft).
- Tighten the bolts to 8 Nm (6 lb.ft).

6. Install the stabilizer bar LH heatshield retaining bolts.

- Tighten the bolts to 8 Nm (6 lb.ft).

7.

NOTE:

RH side only.

Install the fender splash shield upper extension panel.

- Tighten the Torx bolts to 8 Nm (6 lb.ft).

8.

NOTE:

RH side only.

Install the fender splash shield lower extension panel.

9. Install the engine undershield.

For additional information, refer to: [Engine Undershield](#) (501-02 Front End Body Panels, Removal and Installation).

10. Install the front wheels and tires.

- Tighten the wheel nuts to 140 Nm (103 lb.ft).

11. Check, and if necessary, adjust the wheel alignment.

For additional information, refer to: [Four-Wheel Alignment](#) (204-00 Suspension System - General Information, General Procedures).

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

FRONT STABILIZER BAR - ARMoured (G839648)

REMOVAL AND INSTALLATION

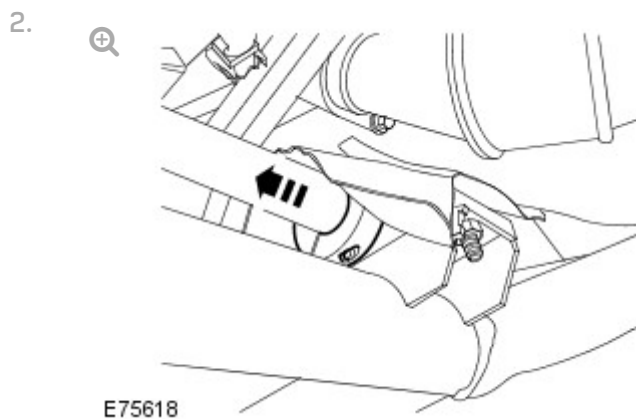
60.10.01	STABILIZER BAR - RENEW	ALL DERIVATIVES	1.6	USED WITHINS	+
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REMOVAL

NOTE:

The stabilizer bar bushes can be replaced without completely removing the stabilizer bar from the vehicle.

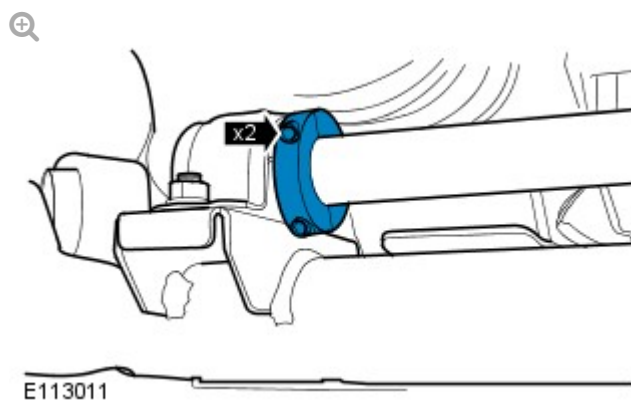
1. To remove the stabilizer bar, carry out steps 1 to 9 as detailed for the non armoured vehicle.



Loosen the 2 screws securing the RH anti-shuffle collar and slide the collar along the stabilizer bar.

3. **NOTE:**

Vehicles fitted with short anti-shuffle collar on the LH side.



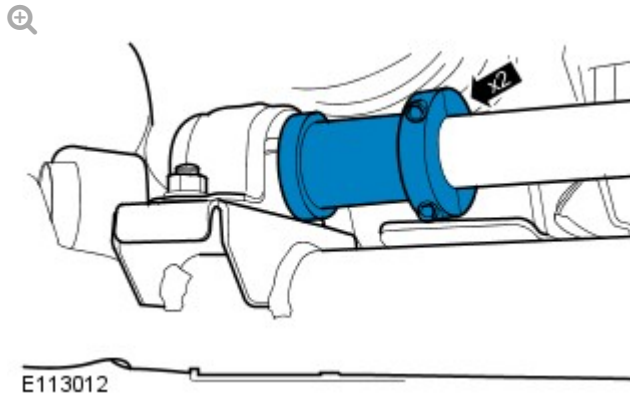
Loosen the 2 screws securing the LH anti-shuffle collar and slide the collar along the stabilizer bar

collar along the stabilizer bar.

4.

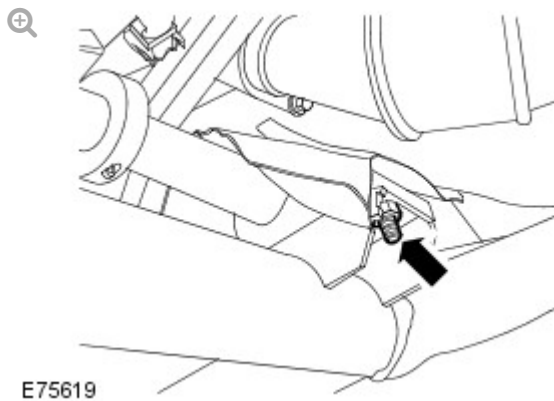
NOTE:

Vehicles fitted with long anti-shuffle collar on the LH side.



Loosen the 2 screws securing the LH anti-shuffle collar and slide the collar along the stabilizer bar.

5.



Remove 2 nuts securing each stabilizer bar bush clamp.

6. Manoeuvre stabilizer bar over sub frame and remove from vehicle.

INSTALLATION

1. To install the stabilizer bar, carry out steps 1 to 9 as detailed for the non armoured vehicle.

2. Tighten stabilizer bar bush clamp nuts to 65 Nm (48 lbf.ft).

3. **CAUTION:**

Evenly and progressively tighten the anti-shuffle collar bolts.
Failure to follow this instruction may result in damage to the vehicle.

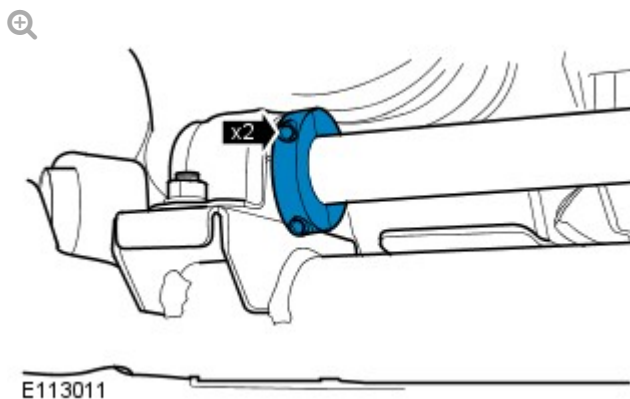
Position RH anti-shuffle collar adjacent to the RH stabilizer bar clamp and tighten the screws to 18 Nm (13 lbf.ft).

4. **CAUTION:**

Evenly and progressively tighten the anti-shuffle collar bolts.
Failure to follow this instruction may result in damage to the vehicle.

NOTE:

Vehicles fitted with short anti-shuffle collar on the LH side.



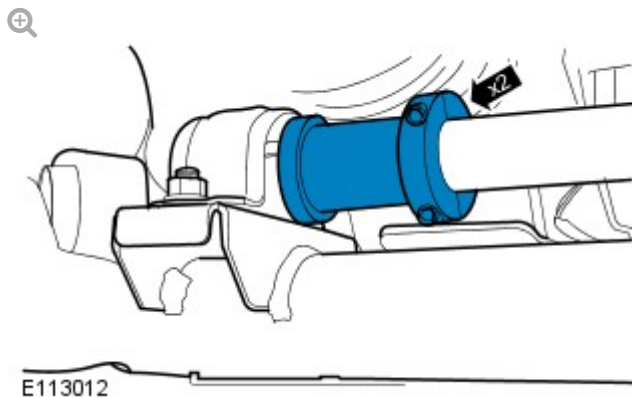
Position LH anti-shuffle collars adjacent to the LH stabilizer bar clamp and tighten the screws to 18 Nm (13 lbf.ft).

5. **CAUTION:**

Evenly and progressively tighten the anti-shuffle collar bolts.
Failure to follow this instruction may result in damage to the vehicle.

NOTE:

Vehicles fitted with long anti-shuffle collar on the LH side.



Position LH anti-shuffle collars adjacent to the LH stabilizer bar clamp and tighten the screws to 18 Nm (13 lbf.ft).

-
6. Fit stabilizer bar heat shields and tighten fixings.
-
7. Check wheel alignment, as detailed for the non armoured vehicle.

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

FRONT STABILIZER BAR LINK

[G513964]

REMOVAL AND INSTALLATION

60.10.02	LINK - STABILIZER BAR - ONE - RENEW	ALL DERIVATIVES	0.3	USED WITHINS	+
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REMOVAL

1.

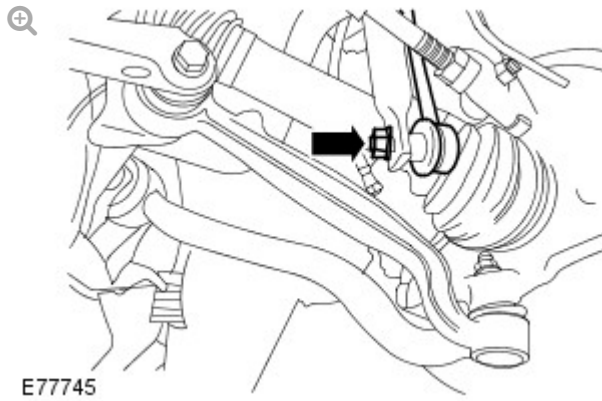
WARNING:

Do not work on or under a vehicle supported only by a jack.
Always support the vehicle on safety stands.

Raise the front of the vehicle.

2. Remove the wheel and tire.

3.



Release the stabilizer bar link.

- Remove the nut.

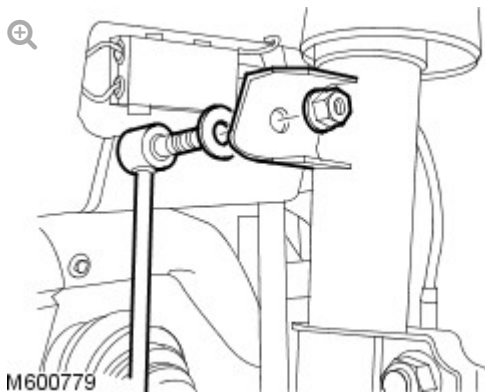
4.

CAUTION:

Note the fitted position of the special washer.

NOTE:

Discard the nuts.



Remove the stabilizer bar link.

- Remove the nut.
- Collect the washer.

1.

NOTE:

Install new nuts.

Install the stabilizer bar link.

- Install the special washer.
- Tighten the nuts to 100 Nm (74 lb.ft).

2. Install the wheel and tire.

- Tighten the wheel nuts to 140 Nm (103 lb.ft).

REAR LOWER ARM (G928133)

REMOVAL AND INSTALLATION

60.40.09 TIE-ROD ALL 0.5 USED +
- RENEW DERIVATIVES WITHINS

REMOVAL

NOTE:

LH illustration shown, RH is similar.

1. **WARNING:**

Do not work on or under a vehicle supported only by a jack.
Always support the vehicle on safety stands.

Raise and support the vehicle.

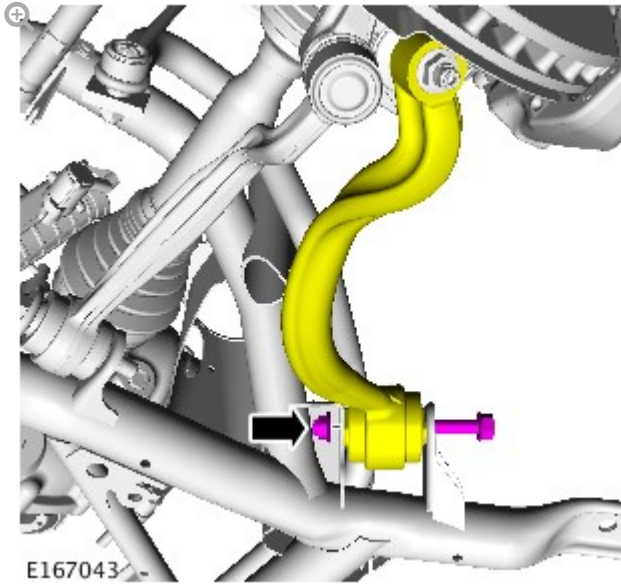
2. Remove the wheel and tire.

3. **CAUTION:**

Make sure the rear lower arm does not over articulate. Failure to follow this instruction may result in damage to the rear lower arm ball joint.

NOTE:

Discard the nut and bolt.

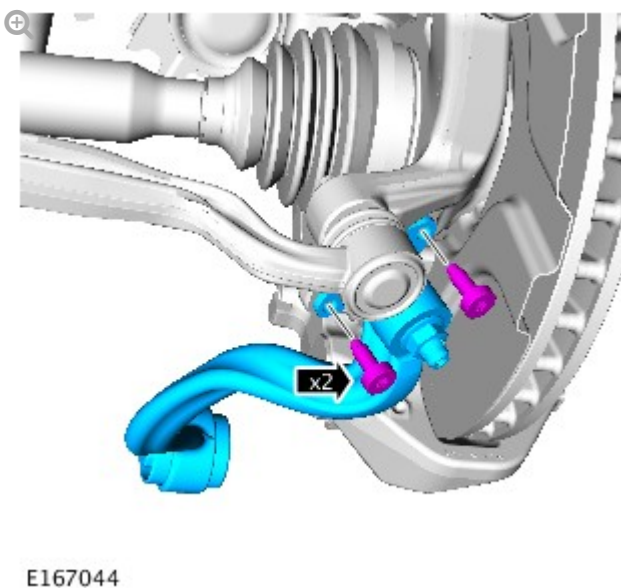


Release the rear arm from the subframe and position to one side.

4.

NOTES:

- Discard the bolts.
- Do not disassemble further if removed for access only.

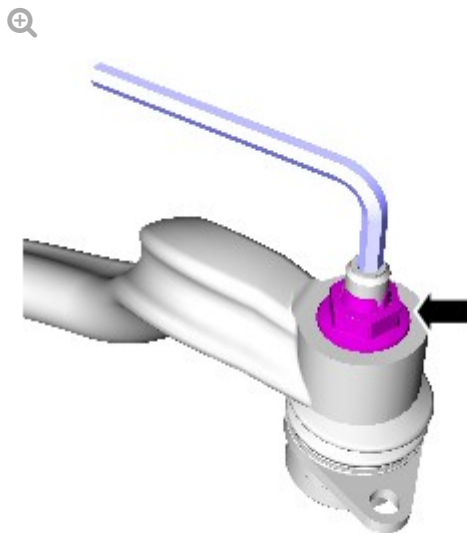


Remove the rear lower arm and ball joint from the knuckle.

5.

NOTES:

- Discard the nut.
- Use a wrench on the hexagon provided to prevent the ball joint rotating.



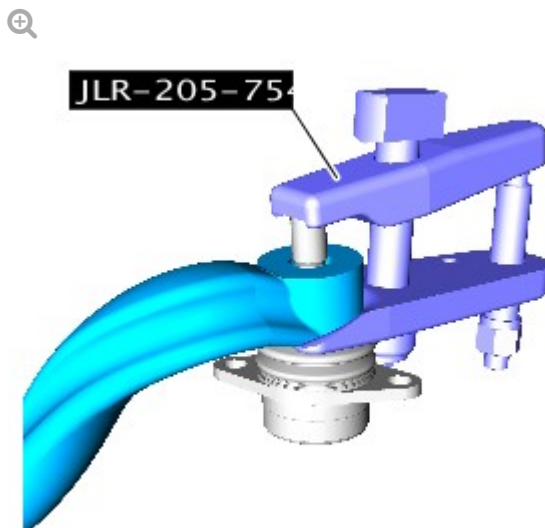
E167045

Remove the nut.

6.

CAUTION:

Make sure the ball joint seal is not damaged. A damaged seal will lead to the premature failure of the joint.



Using the special tool, release the ball joint.

INSTALLATION

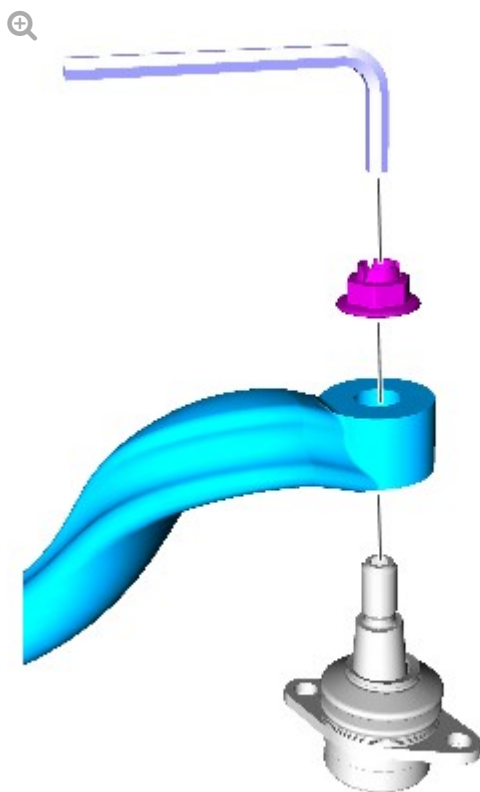
1.

WARNING:

Make sure that a new nut is installed.

NOTE:

Use a wrench on the hexagon provided to prevent the ball joint rotating.



E167125

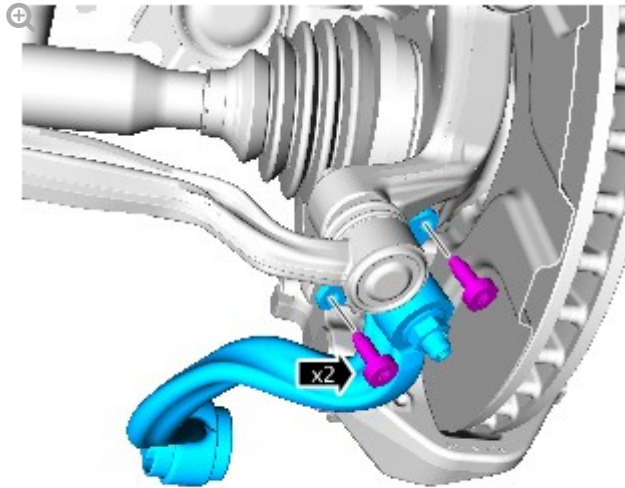
Install the ball joint to the rear lower arm.

- Tighten the nut to 80 Nm (59 lb.ft).

2.

WARNING:

Make sure that new bolts are installed.



E167044

Install the rear lower arm and ball joint to the knuckle.

- Tighten the bolts to 60 Nm (44 lb.ft).

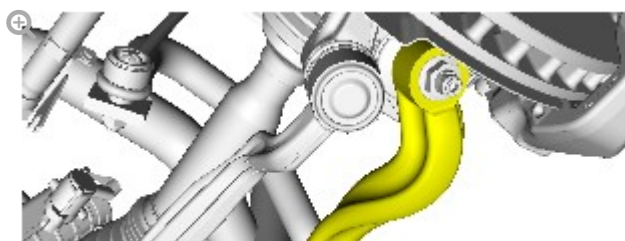
3.

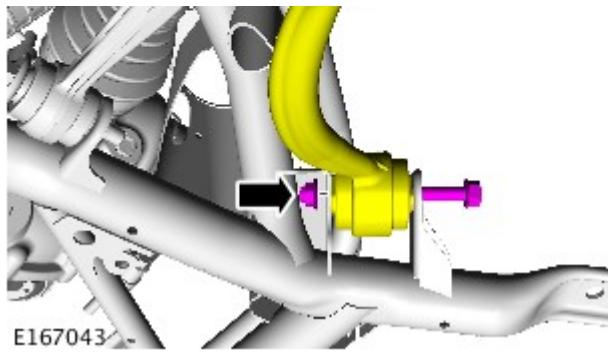
WARNING:

Make sure that a new nut and bolt is installed.

CAUTION:

Only tighten the nuts and bolts when the suspension is in the normal drive position.





Install the rear lower arm to the subframe.

- Tighten the nut and bolt to 165 Nm (121 lb.ft). plus a further 90 degrees.

4. Install the wheel and tire.

- Tighten the wheel nuts to 140 Nm (103 lb.ft).

5. Check, and if necessary, adjust the wheel alignment.

For additional information, refer to: [Four-Wheel Alignment](#) (204-00 Suspension System - General Information, General Procedures).

2012.0 RANGE ROVER (LM), 204-01

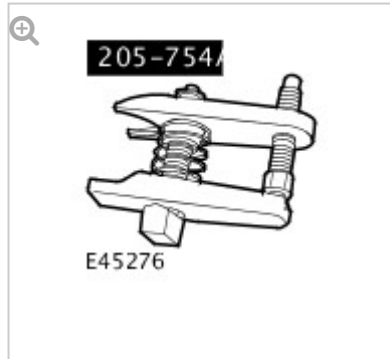
FRONT SUSPENSION

REAR LOWER ARM BALL JOINT (G928134)

REMOVAL AND INSTALLATION

60.15.04	BALL JOINTS - LOWER - BOTH SIDES -	ALL DERIVATIVES	0.7	USED WITHINS	+
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SPECIAL TOOL(S)



**JLR-205-
754(LRT-
54-027)**
Ball joint separator

REMOVAL

NOTE:

The rear lower ball joints can be replaced individually.

1. **WARNING:**

Do not work on or under a vehicle supported only by a jack.
Always support the vehicle on safety stands.

Raise and support the vehicle.

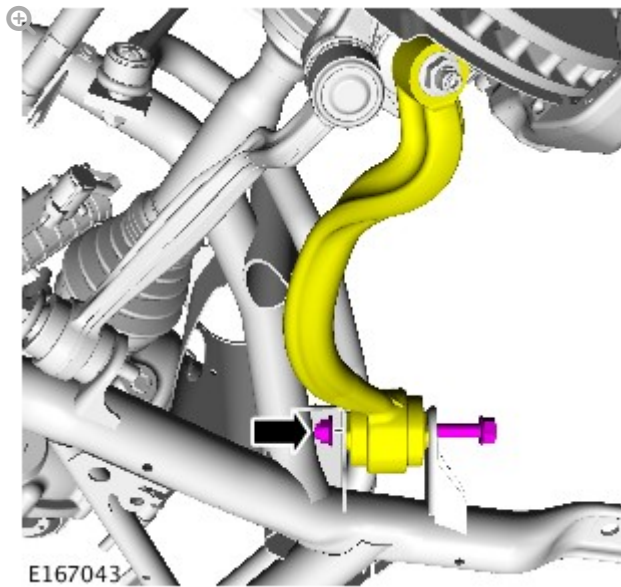
2. Remove the wheel and tire.

3. **CAUTION:**

Make sure the rear lower arm does not over articulate. Failure to follow this instruction may result in damage to the rear lower arm ball joint.

NOTE:

Discard the nut and bolt.

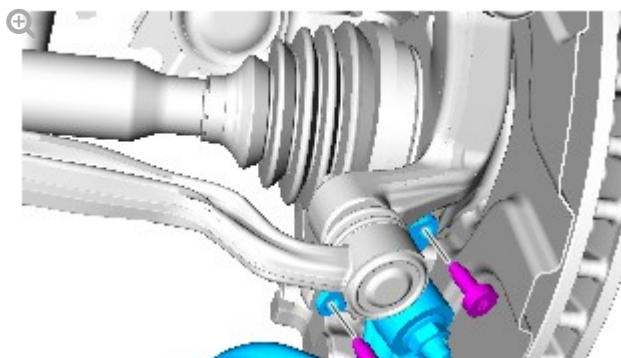


Release the rear arm from the subframe and position to one side.

4.

NOTES:

- Discard the bolts.
- Do not disassemble further if removed for access only.





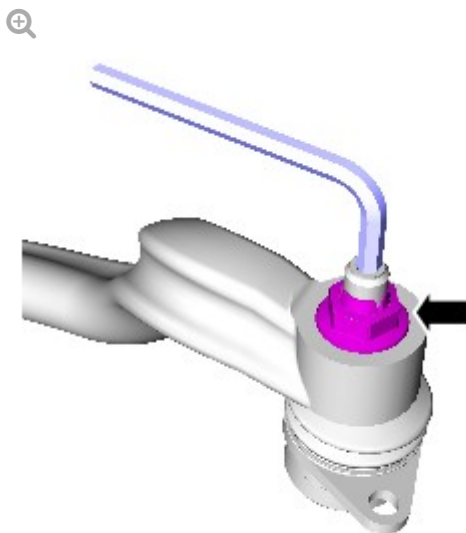
E167044

Remove the rear lower arm and ball joint from the knuckle.

5.

NOTES:

- Discard the nut.
- Use a wrench on the hexagon provided to prevent the ball joint rotating.



E167045

Remove the nut.

6.

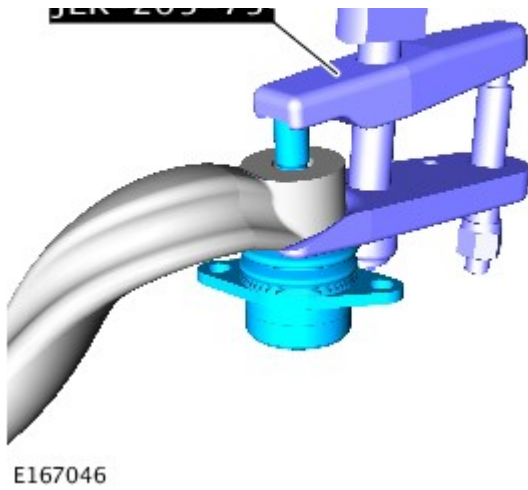
CAUTION:

Make sure the ball joint seal is not damaged. A damaged seal will lead to the premature failure of the joint.



ILR-205-75





E167046

Using the special tool, release the ball joint.

INSTALLATION

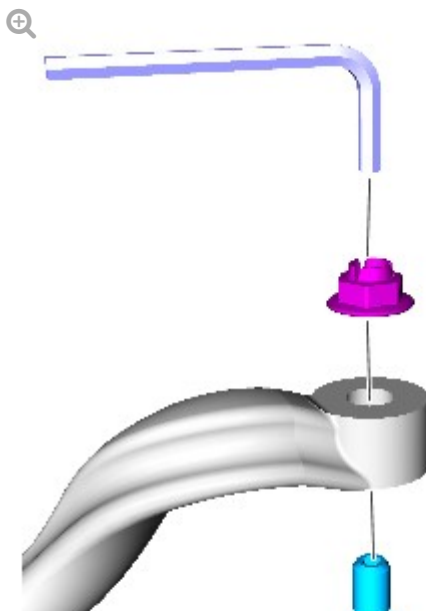
1.

WARNING:

Make sure that a new nut is installed.

NOTE:

Use a wrench on the hexagon provided to prevent the ball joint rotating.





E167069

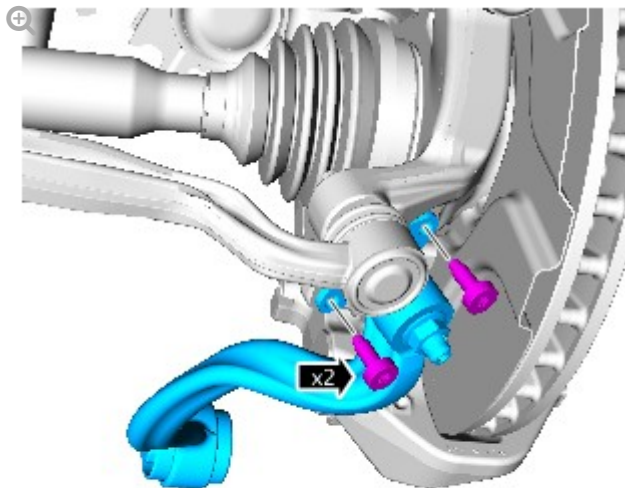
Install the ball joint to the rear lower arm.

- Tighten the nut to 80 Nm (59 lb.ft).

2.

WARNING:

Make sure that new bolts are installed.



E167044

Install the rear lower arm and ball joint to the knuckle.

- Tighten the bolts to 60 Nm (44 lb.ft).

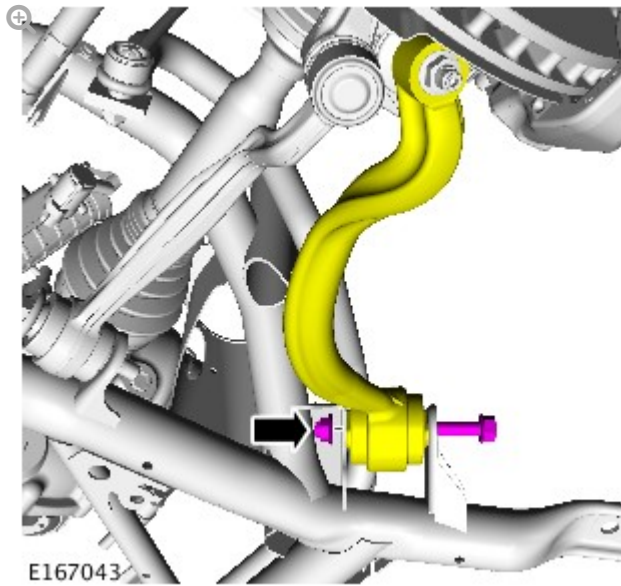
3.

WARNING:

Make sure that a new nut and bolt is installed.

CAUTION:

Only tighten the nuts and bolts when the suspension is in the normal drive position.



Install the rear lower arm to the subframe.

- Tighten the nut and bolt to 165 Nm (121 lb.ft). plus a further 90 degrees.

4. Install the wheel and tire.

- Tighten the wheel nuts to 140 Nm (103 lb.ft).

5. Check, and if necessary, adjust the wheel alignment

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

REAR LOWER ARM BUSHING

[G928135]

REMOVAL AND INSTALLATION

60.40.10	BUSHING - TIE-ROD - ONE SIDE - RENEW	ALL DERIVATIVES	0.6	USED WITHINS	+
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SPECIAL TOOL(S)

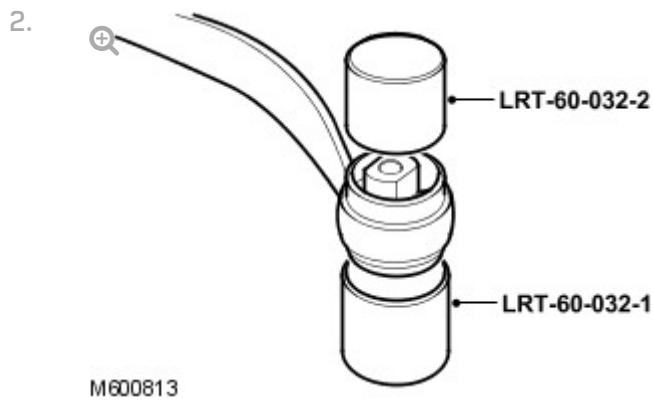


204-508

Remover/Installer

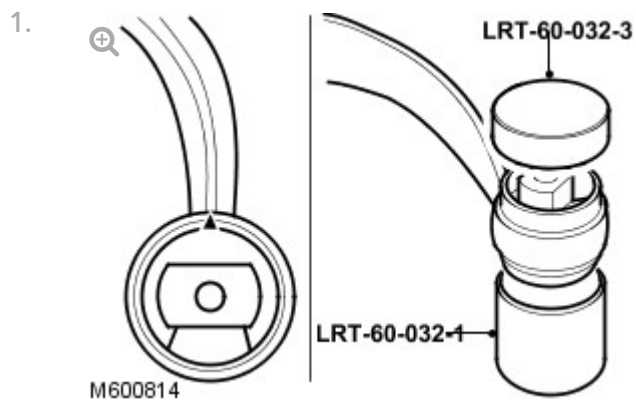
REMOVAL

1. Remove the LH rear lower arm.
For additional information, refer to: [Rear Lower Arm](#) (204-01 Front Suspension, Removal and Installation).



Using the special tools, remove the rear lower arm bushes.

INSTALLATION



Using the special tools, install the rear lower arm bushes.

2. Install the LH rear lower arm.

For additional information, refer to: [Rear Lower Arm](#) (204-01 Front Suspension, Removal and Installation).

-
3. Repeat the procedure for the RH side.

FRONT SUSPENSION

SHOCK ABSORBER AND SPRING ASSEMBLY (G1475886)

REMOVAL AND INSTALLATION

60.21.01	AIR SPRING ASSEMBLY - ONE SIDE - RENEW	ALL DERIVATIVES	1	USED WITHINS	+
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REMOVAL

1.

WARNING:

Do not work on or under a vehicle supported only by a jack.
Always support the vehicle on safety stands.

Raise and support the vehicle.

2. Remove the front road wheel.

3. Using the Land Rover approved diagnostic system, depressurize the air suspension.

For additional information, refer to: [Air Suspension System Depressurize and Pressurize](#) (204-05 Vehicle Dynamic Suspension, General Procedures).

4. Release the ABS sensor lead and brake line.

- Release from the 3 clips.

5.



LH side: Release the brake pad wear sensor lead.

- Release from the clip.

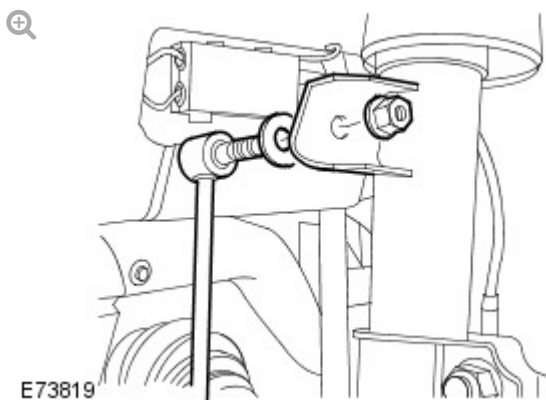
6.

CAUTION:

Note the fitted position of the special washer.

NOTE:

Use an additional wrench to prevent the ball joint rotating.



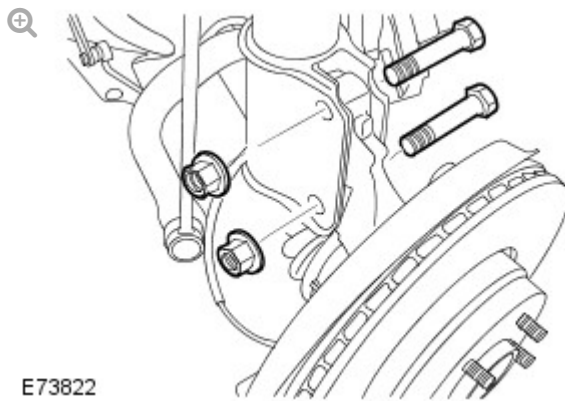
Release the stabilizer bar link.

- Remove and discard the nut.

7.

WARNING:

Use a jack to support the hub and lower arm.

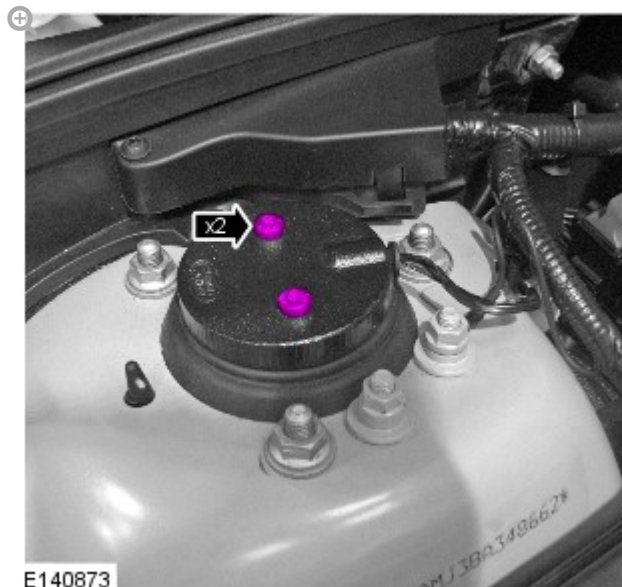


E73822

Release the hub from the air suspension spring.

- Remove the 2 nuts and 2 bolts.
- Lower the jack.

8.



E140873

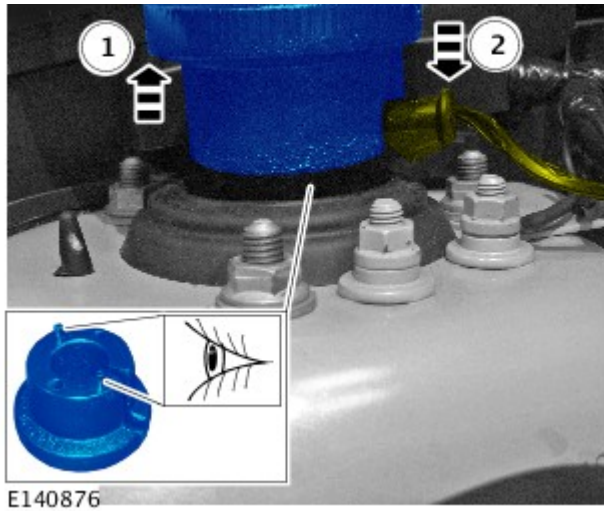
Remove damper retaining bolts.

9.

NOTE:

Note the orientation of the damper.



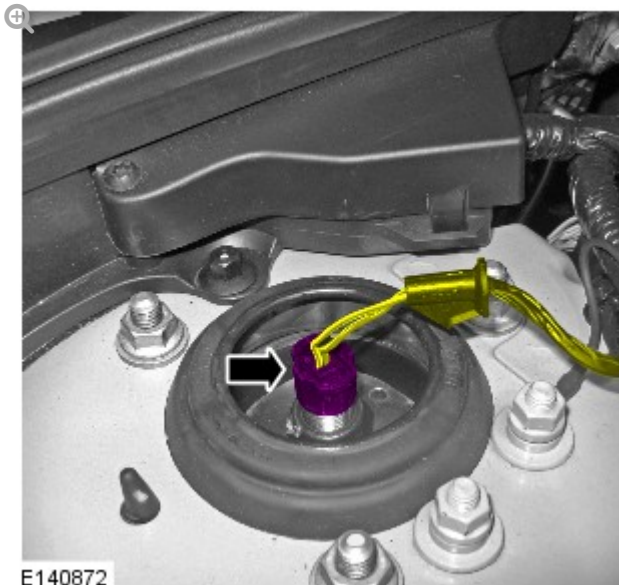


E140876

Remove the damper.

- Lift the damper.
- Release the wiring harness and remove the damper.

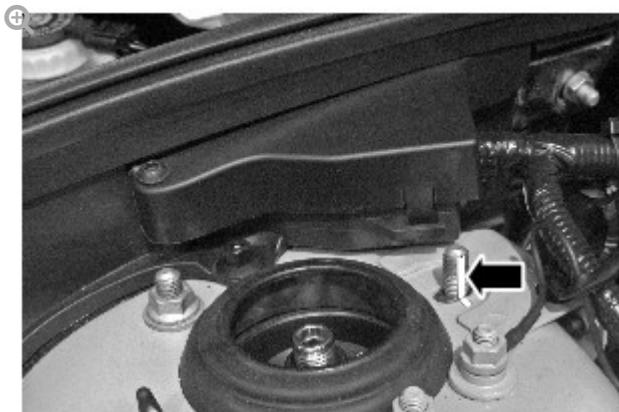
10.



E140872

Remove the electrical connector.

11.





Mark the fitted position of the stud to aid assembly.

- Remove the nut.

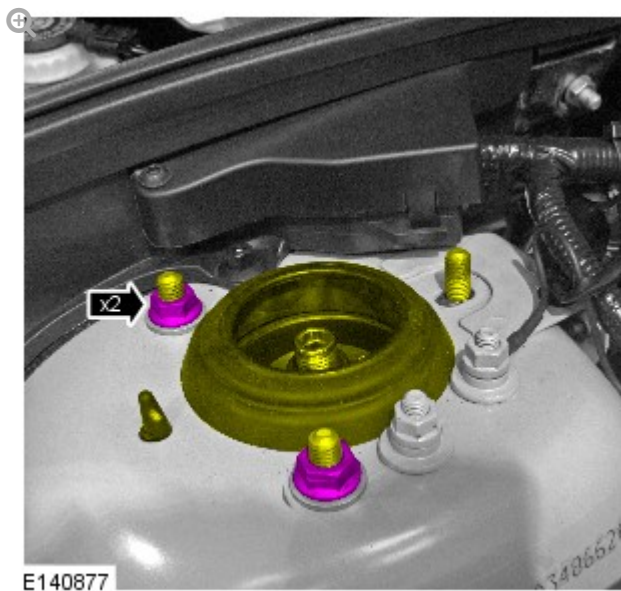
12.

CAUTIONS:

- Lower the air suspension spring sufficiently to release the air line connection.
- Do not allow the brake caliper to hang on the brake hose.

NOTE:

Models with standard brakes shown, models with high performance brakes similar.



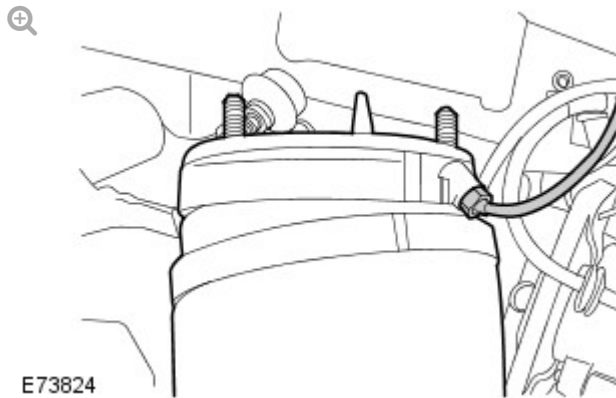
Release the air suspension spring.

- Remove the cap.
- Remove the 2 remaining nuts.

13.

CAUTION:

Before disconnecting or removing the components, make sure the area around the joint faces and connections are clean and dry. Plug open connections to prevent contamination.



Remove the air suspension spring.

- Disconnect the air line.
- Remove and discard the gasket.

INSTALLATION

1.

CAUTIONS:

- Make sure the tag on the gasket is visible.
- The final tightening of the shock absorber and spring assembly retaining nuts must be carried out with the vehicle on its wheels.

NOTES:

- If installing a new air suspension spring, remove the air line union

union.

- Align stud to mark made on removal.
- Models with standard brakes shown, models with high performance brakes similar.

Install the air suspension spring.

- Clean the component mating faces.
- Install a new gasket.
- Install the air line but do not tighten the union fully at this stage.
- Tighten the nuts to 56 Nm (41 lb.ft).

2. Tighten the air line union to 3.5 Nm (2.6 lb.ft).

3. Connect the active suspension damper electrical connector.

4.

NOTE:

Make sure that the damper is installed in the correct orientation.

Install the damper.

- Tighten the bolts to 10 Nm.

5. Connect the hub to the air suspension spring.

- Clean the component mating faces.
- Tighten the nuts and bolts to 250 Nm (184 lb.ft).

6.

CAUTION:

The washer is hardened and must be fitted in the correct position.

NOTE:

Use an additional wrench to prevent the component from rotating.

Connect the stabilizer link.

- Install the special washer.
- Install a new locknut.
- Tighten the nut to 100 Nm (74 lb.ft).

7. Secure ABS sensor lead and brake line.

- Secure into the 3 clips.

8. LH side: Secure the brake pad wear sensor lead.

- Secure in the clip.

9.

CAUTION:

The air springs must be fully pressurised before the weight of the vehicle is applied to them.

Using the Land Rover approved diagnostic system, pressurize the air suspension.

For additional information, refer to: [Air Suspension System Depressurize and Pressurize](#) (204-05 Vehicle Dynamic Suspension, General Procedures).

10. Install the road wheel.

- Tighten nuts to 140 Nm (103 lb.ft).

11. Check, and if necessary, adjust the wheel alignment.

For additional information, refer to: [Four-Wheel Alignment](#) (204-00 Suspension System - General Information, General Procedures).

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

WHEEL KNUCKLE - VEHICLES WITH: HIGH PERFORMANCE BRAKES (G1225066)

REMOVAL AND INSTALLATION

SPECIAL TOOL(S)



211-314



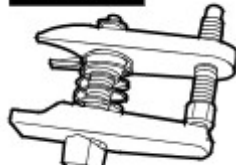
E74092

211-314(LRT-57-036)

Ball joint separator



205-754



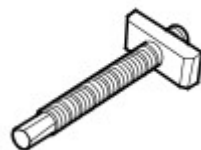
E45276

205-754(LRT-54-027)

Ball joint separator



204-506/3



E49620

204-506/3(LRT-60-030/3)

Halfshaft
remover/replacer



204-506



E49618

204-506/1(LRT-60-030/1)

Halfshaft
remover/replacer



**204-
506/2(LRT-
60-030/2)**

Halfshaft
remover/replacer



**204-
506/5(LRT-
60-030/5)**

Retainers - halfshaft
remover/replacer

REMOVAL

NOTES:

- If a new knuckle is installed a new wheel bearing must be installed.
- Some variation in the illustrations may occur, but the essential information is always correct.
- RH illustration shown, LH is similar.

1.

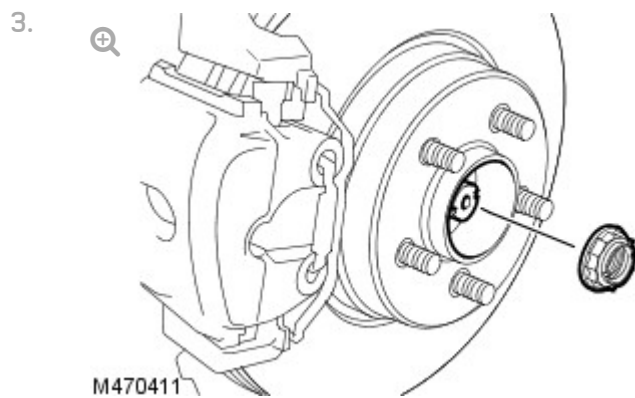
WARNING:

Make sure to support the vehicle with axle stands.

Raise the front of the vehicle

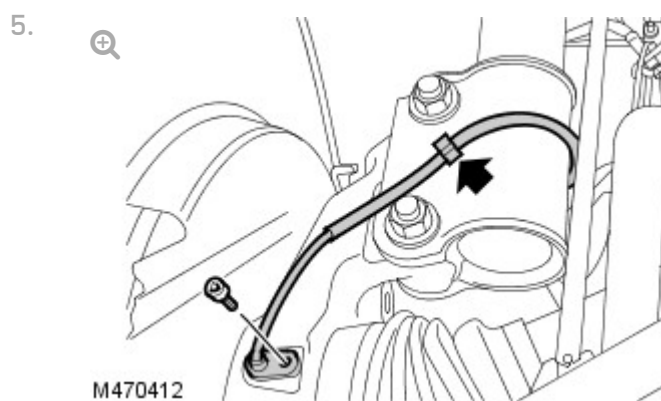
raise the front of the vehicle.

2. Remove the front wheel and tire.



With assistance, remove and discard the halfshaft nut.

4. Remove the RH front brake disc.
For additional information, refer to: [Brake Disc - Vehicles With: Standard Brakes](#) (206-03 Front Disc Brake, Removal and Installation).



Release the RH front anti-lock brake system (ABS) sensor and wiring harness.

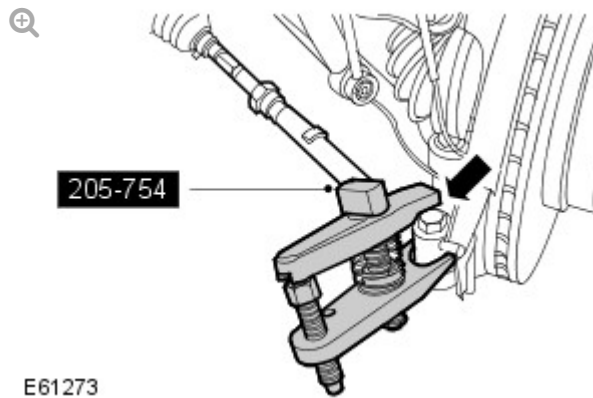
- Release the clip.
- Remove the bolt.

6. Loosen the RH tie rod end locking nut.

7. **CAUTION:**



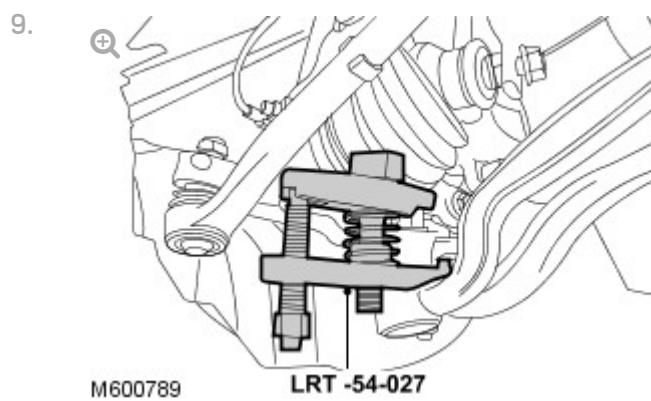
Make sure the ball joint seal is not damaged. A damaged seal will lead to the premature failure of the joint.



Using the special tool release the RH tie rod end.

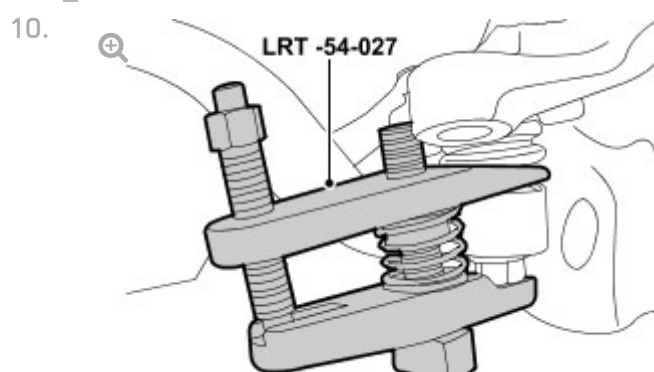
- Remove and discard the nut.

8. RH side front: Release the suspension height sensor.



Using the special tool release the RH front lower arm.

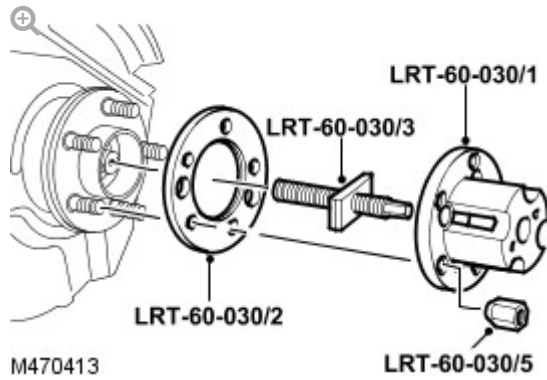
- Remove the nut.
- Loosen the nut and bolt.



Using the special tool release the RH rear lower arm.

- Loosen the nut and bolt.
- Remove the nut.

11.

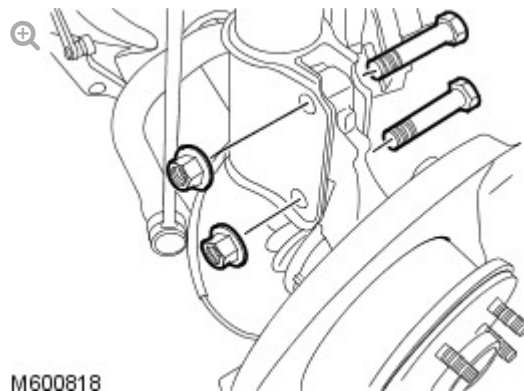


Using the special tools, release the halfshaft from the wheel hub.

12. Remove the special tools.

13. Release the halfshaft from the wheel hub.

14.



Remove the wheel knuckle assembly.

- Remove the 2 nuts and 2 bolts.

INSTALLATION

1. Install the wheel knuckle assembly.

- Tighten the nuts and bolts to 250 Nm (184 lb.ft).

-
2. Locate the halfshaft in the wheel hub.
 - Lightly lubricate the halfshaft splines.
 - Clean the halfshaft and wheel hub splines.

-
3. Using the special tool, pull the halfshaft in to the wheel hub.

-
4. Remove the special tool.

-
5. **CAUTION:**

Only tighten the nuts and bolts when the suspension is in the normal drive position.

Secure the RH rear lower arm.

- Tighten the nut to 80 Nm (59 lb.ft).
- Tighten the rear lower arm nut and bolt to 165 Nm (122 lb.ft) plus a further 90 degrees.

-
6. **CAUTION:**

Only tighten the nuts and bolts when the suspension is in the normal drive position.

Secure the RH front lower arm.

- Tighten the nut to 80 Nm (59 lb.ft).
- Tighten the lower arm nuts and bolts to 165 Nm (122 lb.ft) plus a further 90 degrees.

-
7. RH side front: Secure the suspension height sensor.

-
8. Secure the RH tie rod end.
 - Install a new nut and tighten to 80 Nm (59 lb.ft).

9. Secure the RH front ABS sensor and wiring harness.

- Apply anti-seize compound to the ABS sensor.
- Tighten the bolt to 8 Nm (6 lb.ft)
- Secure in the clip.

10. Install the RH front brake disc.

For additional information, refer to: [Brake Disc - Vehicles With: Standard Brakes](#) (206-03 Front Disc Brake, Removal and Installation).

11. With assistance tighten the wheel hub nut to 420Nm (311 lb.ft).

- Use a new nut.
- Stake the nut to the halfshaft.

12. ■ Install the wheel and tire.

- Tighten the wheel nuts to 140 Nm (103 lb.ft).

13. Check, and if necessary, adjust the wheel alignment.

For additional information, refer to: [Four-Wheel Alignment](#) (204-00 Suspension System - General Information, General Procedures).

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

WHEEL KNUCKLE - VEHICLES WITHOUT: HIGH PERFORMANCE BRAKES (G1225404)

REMOVAL AND INSTALLATION

SPECIAL TOOL(S)



211-
314(LRT-57-
036)

Ball joint separator



205-754(LRT-54-027)
Ball joint separator



204-506/3(LRT-60-030/3)
Halfshaft remover/replacer



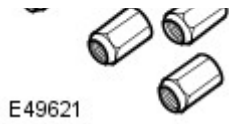
204-506/1(LRT-60-030/1)
Halfshaft remover/replacer



204-506/2(LRT-60-030/2)
Halfshaft remover/replacer



204-506/5(LRT-60-030/5)
Halfshaft remover/replacer



E49621

60-030/5J

Retainers - halfshaft
remover/replacer



204-506/4

E130576

**204-
506/4**

Installer,
Halfshaft

REMOVAL

NOTES:

- If a new knuckle is installed a new wheel bearing must be installed.
- Some variation in the illustrations may occur, but the essential information is always correct.
- RH illustration shown, LH is similar.

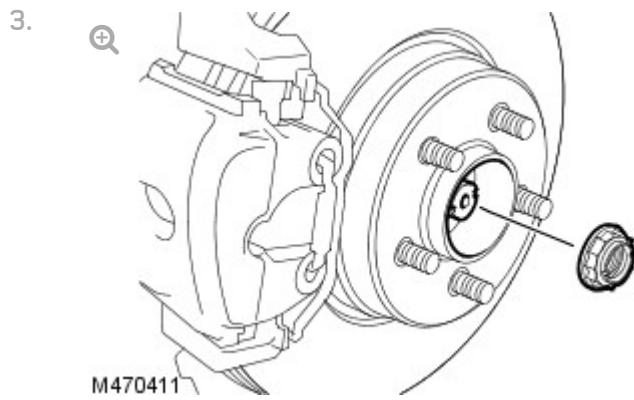
1.

WARNING:

Make sure to support the vehicle with axle stands.

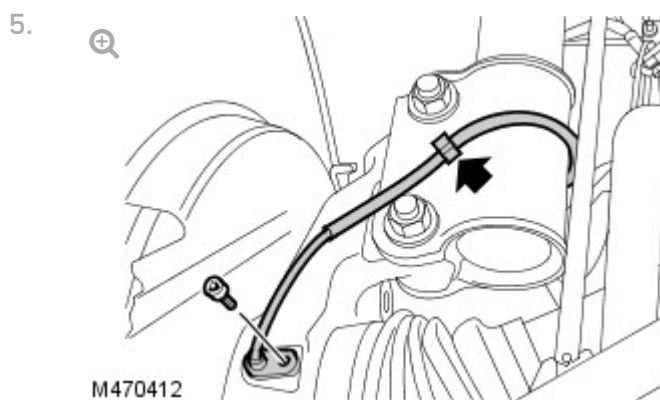
Raise the front of the vehicle.

2. Remove the front wheel and tire.



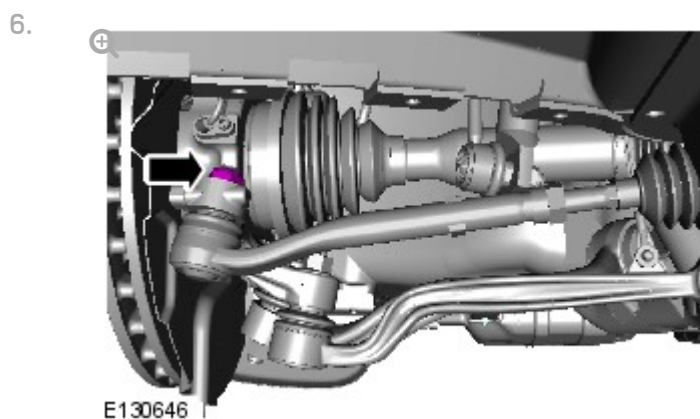
With assistance, remove and discard the halfshaft nut.

4. Remove the RH front brake disc.
- For additional information, refer to: [Brake Disc - Vehicles With: Standard Brakes](#) (206-03 Front Disc Brake, Removal and Installation).



Release the RH front anti-lock brake system (ABS) sensor and wiring harness.

- Release the clip.
- Remove the bolt.

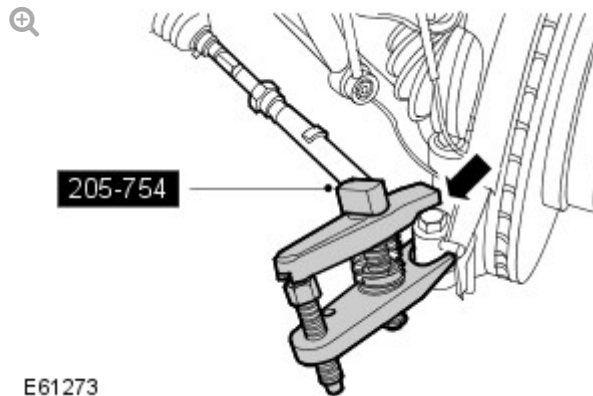


Loosen the RH tie rod end locking nut.

7.

CAUTION:

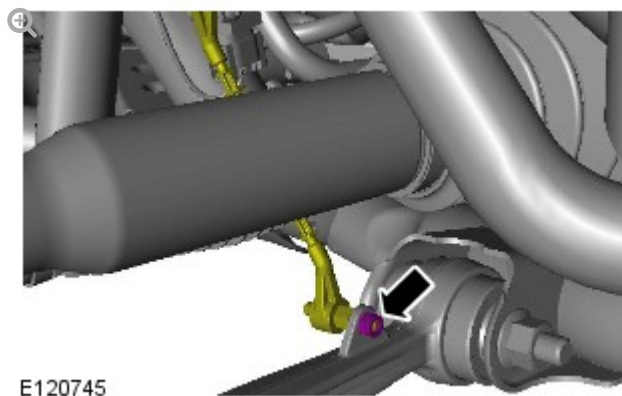
Make sure the ball joint seal is not damaged. A damaged seal will lead to the premature failure of the joint.



Using the special tool release the RH tie rod end.

- Remove and discard the nut.

8.

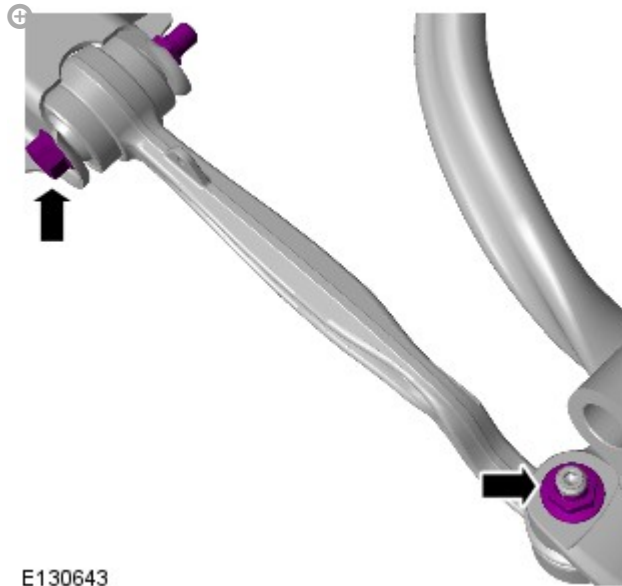


RH side front: Release the suspension height sensor.

9.

NOTE:

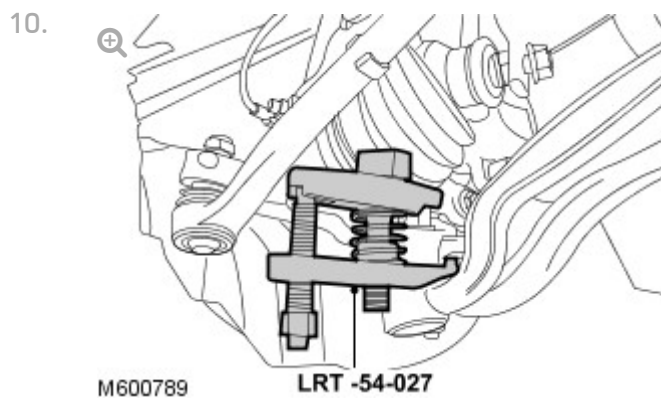
LH illustration shown, RH is similar.



E130643

Loosen the front lower arm retaining nut and bolt.

- Loosen the lower arm ball joint retaining nut.



Using the special tool release the RH front lower arm.

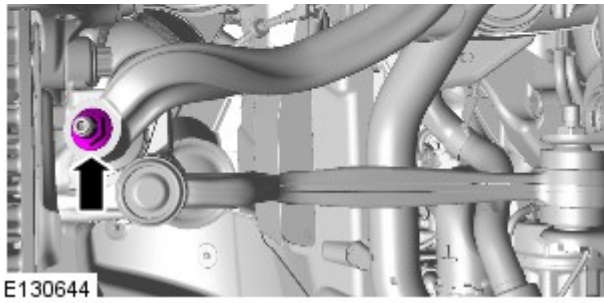
- Remove the nut.

11.

NOTE:

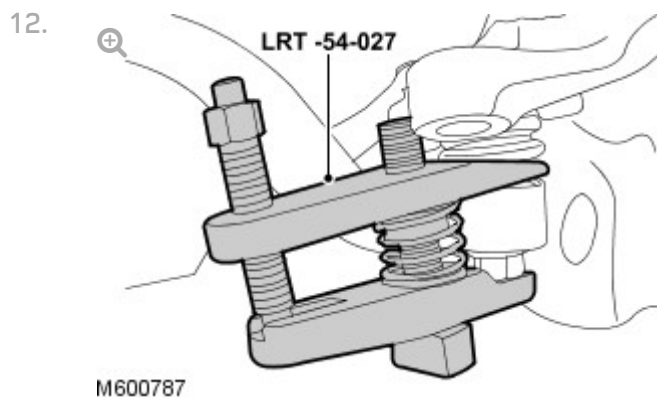
LH illustration shown, RH is similar.





Loosen the rear lower arm retaining nut and bolt.

- Loosen the lower arm ball joint retaining nut.

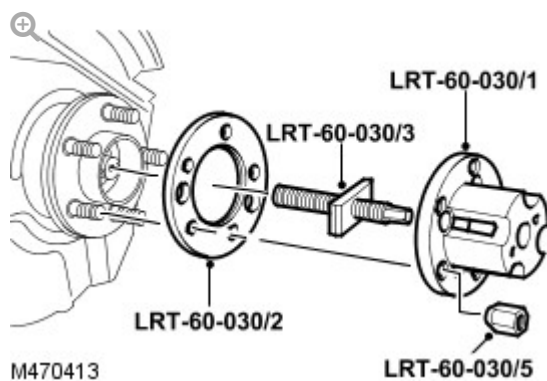


Using the special tool release the RH rear lower arm.

- Remove the nut.

13. **CAUTION:**

Do not use a hammer to detach the halfshaft from the hub assembly, failure to follow this instruction may result in damage to the halfshaft.

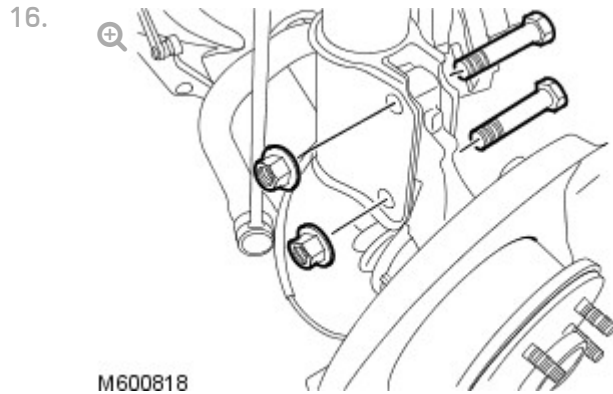


Using the special tools, release the halfshaft from the wheel hub.

Using the special tools, release the halfshaft from the wheel hub.

14. Remove the special tools.

15. Release the halfshaft from the wheel hub.



Remove the wheel knuckle assembly.

- Remove the 2 nuts and 2 bolts.

INSTALLATION

1. Install the wheel knuckle assembly.

- Tighten the nuts and bolts to 250 Nm (184 lb.ft).

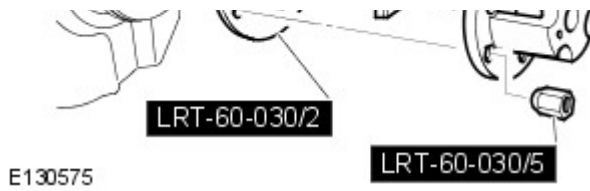
2. Locate the halfshaft in the wheel hub.

- Lightly lubricate the halfshaft splines.
- Clean the halfshaft and wheel hub splines.

3. **CAUTION:**

Install the halfshaft nut finger tight.





Using the special tools, pull the halfshaft in to the wheel hub.

4. Remove the special tool.

5.

CAUTION:

Only tighten the nuts and bolts when the suspension is in the normal drive position.

Secure the RH rear lower arm.

- Tighten the nut to 80 Nm (59 lb.ft).
- Tighten the rear lower arm nut and bolt to 165 Nm (122 lb.ft) plus a further 90 degrees.

6.

CAUTION:

Only tighten the nuts and bolts when the suspension is in the normal drive position.

Secure the RH front lower arm.

- Tighten the nut to 80 Nm (59 lb.ft).
- Tighten the lower arm nuts and bolts to 165 Nm (122 lb.ft) plus a further 90 degrees.

7. RH side front: Secure the suspension height sensor.

8. Secure the RH tie rod end.

- Install a new nut and tighten to 80 Nm (59 lb.ft).
-

9. Secure the RH front ABS sensor and wiring harness.

- Apply anti-seize compound to the ABS sensor.
- Tighten the bolt to 8 Nm (6 lb.ft)
- Secure in the clip.

10. Install the RH front brake disc.

For additional information, refer to: [Brake Disc - Vehicles With: Standard Brakes](#) (206-03 Front Disc Brake, Removal and Installation).

11.

CAUTION:

Do not use air tools to install the nut. Failure to follow this instruction may result in damage to the component.

With assistance tighten the wheel hub nut to 420Nm (311 lb.ft).

- Use a new nut.
- Stake the nut to the halfshaft.

12. ■ Install the wheel and tire.

- Tighten the wheel nuts to 140 Nm (103 lb.ft).

13. Check, and if necessary, adjust the wheel alignment.

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

FRONT WHEEL BEARING AND WHEEL HUB - VEHICLES WITH: HIGH PERFORMANCE BRAKES (G1451331)

REMOVAL AND INSTALLATION

SPECIAL TOOL(S)



**100-
005A**

Remover, Puller



**204-509-
02**

Remover, Front and
Rear Hub and
Bearing



204_509_



E130890

204-509-
04

Adapter, Front and
Rear Hub and
Bearing



E130891

204-509-
05

Remover, Front and
Rear Hub and
Bearing



E130892

204-509-
06

Remover, Front and
Rear Hub and
Bearing



E130893

204-509-
10

Adapter, Front and
Rear Hub and
Bearing



204-509-
11

Adapter, Front and
Rear Hub and

E130894

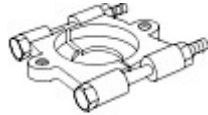
Bearing



E130895

204-509-12

Installer, Front and Rear Hub and Bearing



TI15091

205-310

Remover, Bearing/Gear



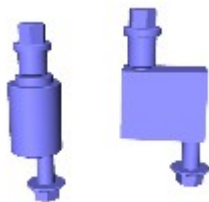
307-486



E62808

307-486

Installer



E131023

JLR-204-509-13

Adapter, Front and Rear Hub and Bearing

REMOVAL

NOTE:

RH illustration shown, LH is similar.

1.

WARNING:

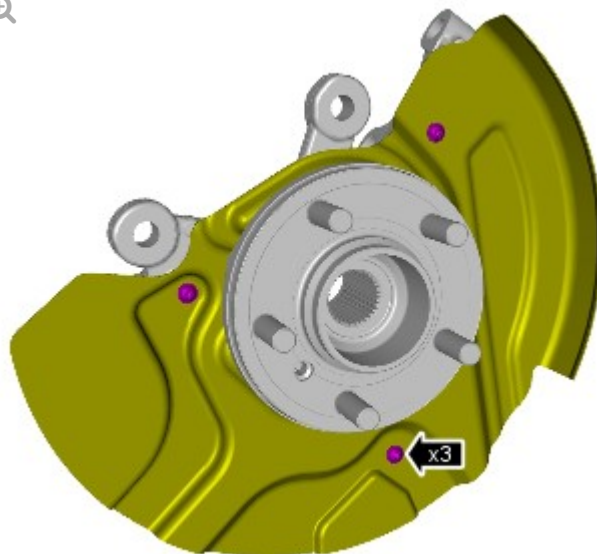
Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

2. Remove the wheel and tire.

3. Refer to: [Wheel Knuckle - Vehicles With: High Performance Brakes](#) (204-01 Front Suspension, Removal and Installation).

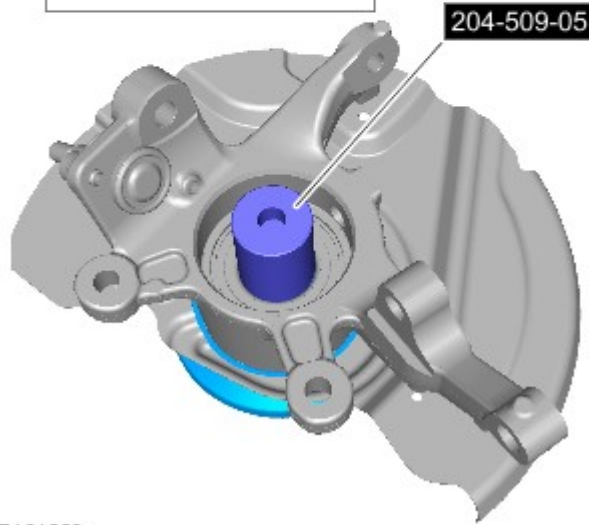
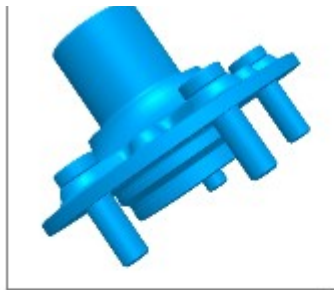
4.



E131025

5.

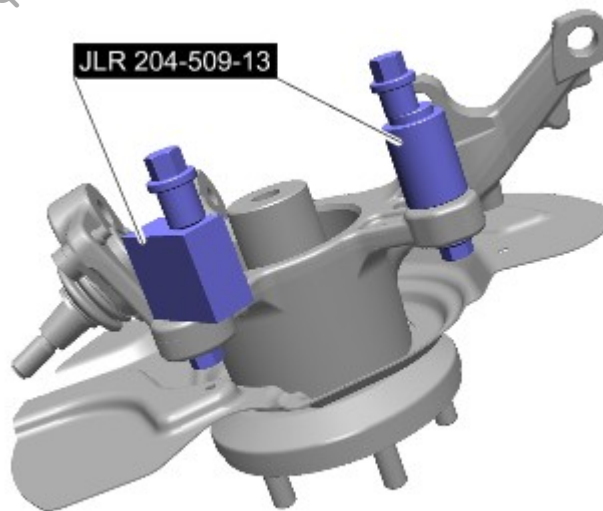




E131026

Special Tool(s): [204-509-05](#)

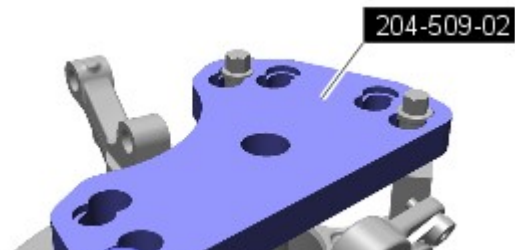
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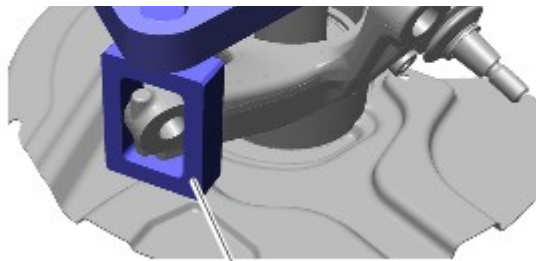


E131027

Special Tool(s): [JLR-204-509-13](#)

7.



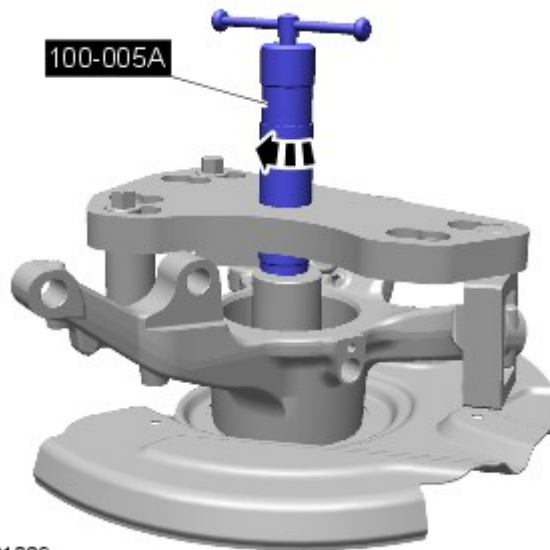


204-509-04

E131028

Special Tool(s): [204-509-02](#), [204-509-04](#)

8.



100-005A

E131029

Special Tool(s): [100-005A](#)

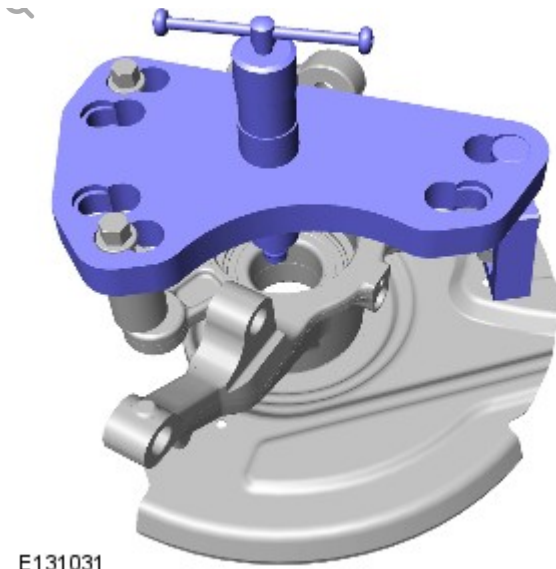
9.



E131030

10.

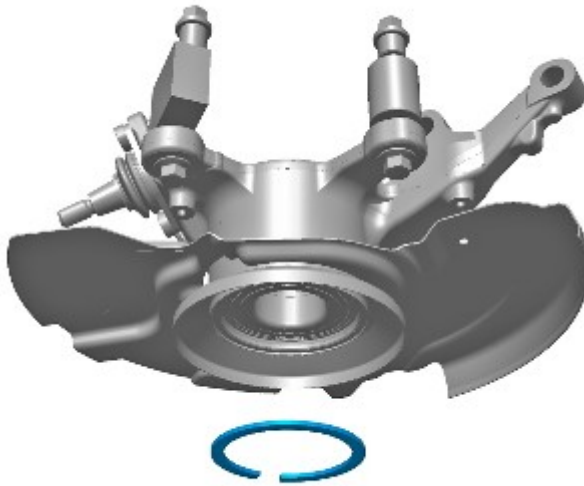




E131031

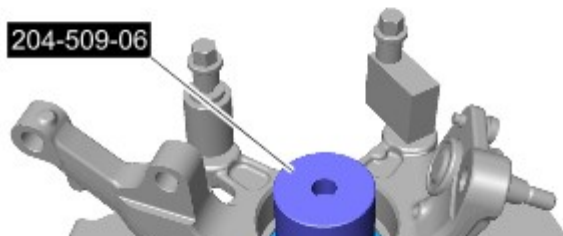
Remove the special tools.

11.

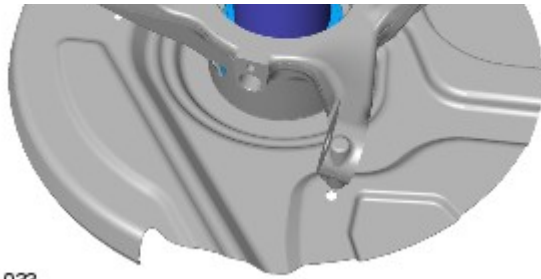


E131032

12.



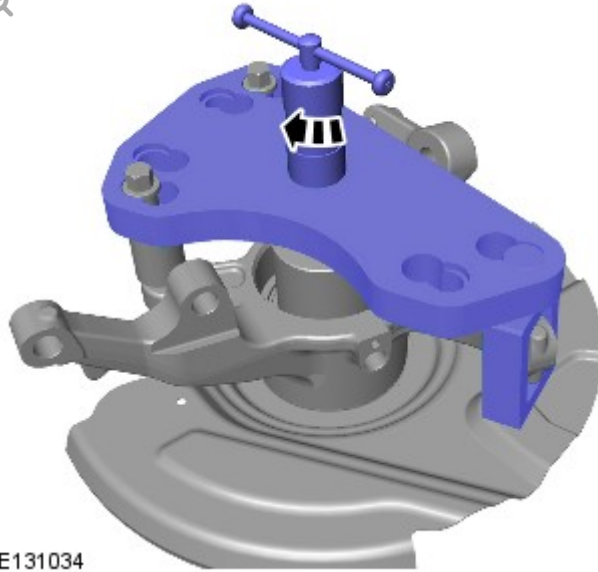
204-509-06



E131033

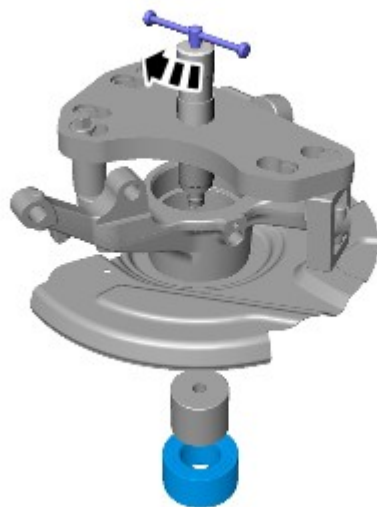
Special Tool(s): [204-509-06](#)

13.



E131034

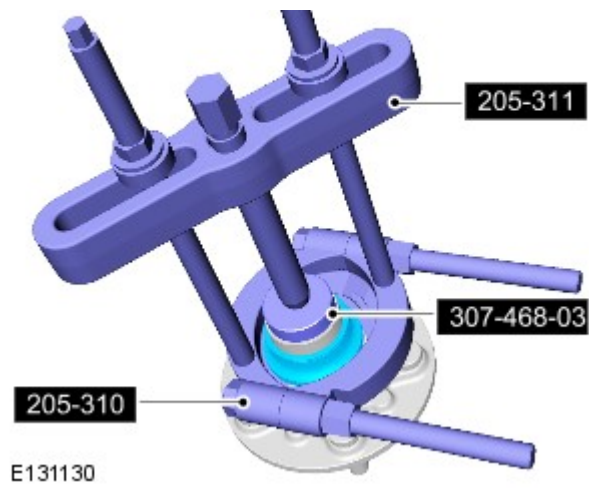
14.



E131035

15.

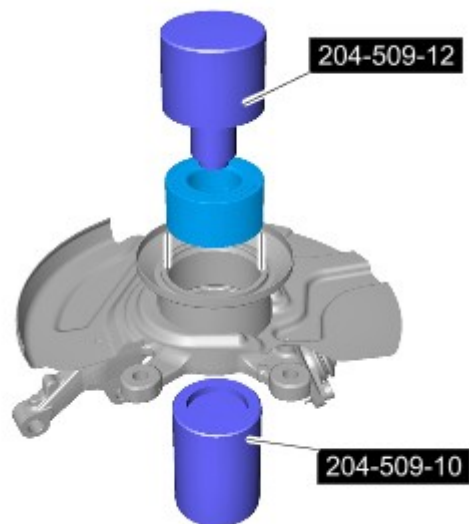





Special Tool(s): [205-310](#), [307-486](#)

INSTALLATION

1. 



- Using a hydraulic press, install the wheel bearing into the wheel knuckle assembly.
- Special Tool(s): [204-509-12](#), [204-509-10](#)

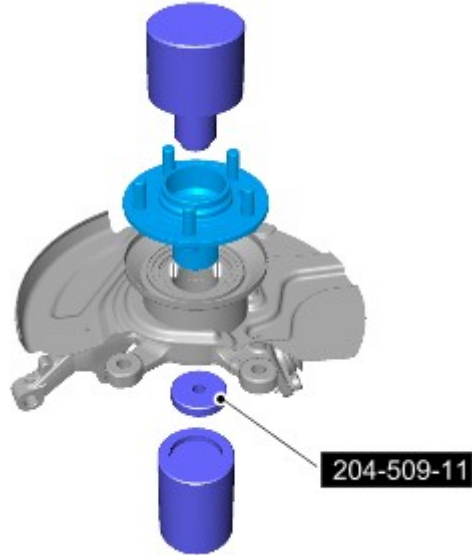
2. 





E131038

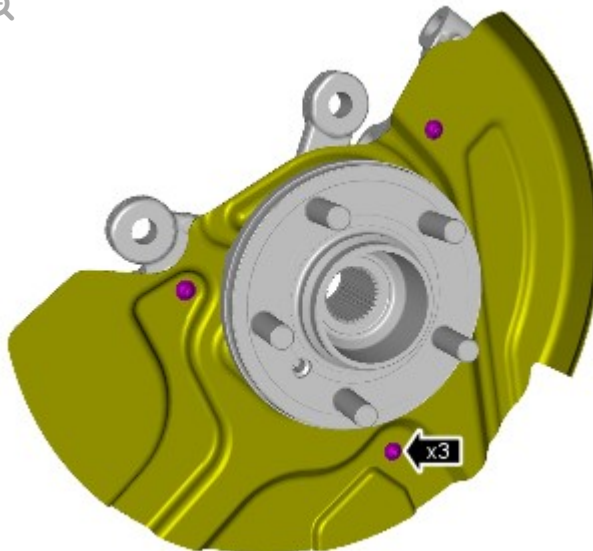
3.



E131129

- Using a hydraulic press, install the wheel hub into the wheel bearing.
- *Special Tool(s):* [204-509-11](#)

4.



E131025

Torque: 15 Nm

5. Refer to: [Wheel Knuckle - Vehicles With: High Performance Brakes](#)
(204-01 Front Suspension, Removal and Installation).
6.
 - Install the wheel and tire.
 - Tighten the wheel nuts to 140 Nm (103 lb.ft).

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

**FRONT WHEEL BEARING AND
WHEEL HUB - VEHICLES
WITHOUT: HIGH
PERFORMANCE BRAKES** (G1451332)

SPECIAL TOOL(S)



**100-
005A**
Remover, Puller



**204-509-
02**
Remover, Front and
Rear Hub and
Bearing



**204-509-
04**
Adapter, Front and
Rear Hub and
Bearing



**204-509-
05**
Remover, Front and
Rear Hub and
Bearing



E130891

Bearing



E130892

204-509-06

Remover, Front and Rear Hub and Bearing



E130893

204-509-10

Adapter, Front and Rear Hub and Bearing



E130894

204-509-11

Adapter, Front and Rear Hub and Bearing



E130895

204-509-12

Installer, Front and Rear Hub and Bearing



205-310

Remover,
Bearing/Gear



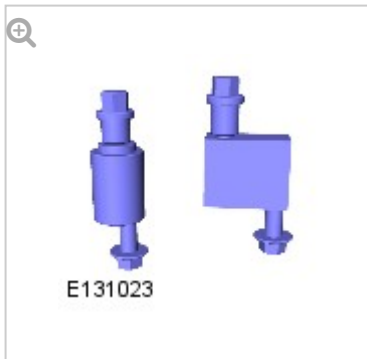
205-311

Remover,
Bearing/Gear



307-468- 03

Adapter, Differential
Bearing Remover



JLR-204- 509-13

Adapter, Front and
Rear Hub and
Bearing

REMOVAL

NOTE:

RH illustration shown, LH is similar.

1.

WARNING:

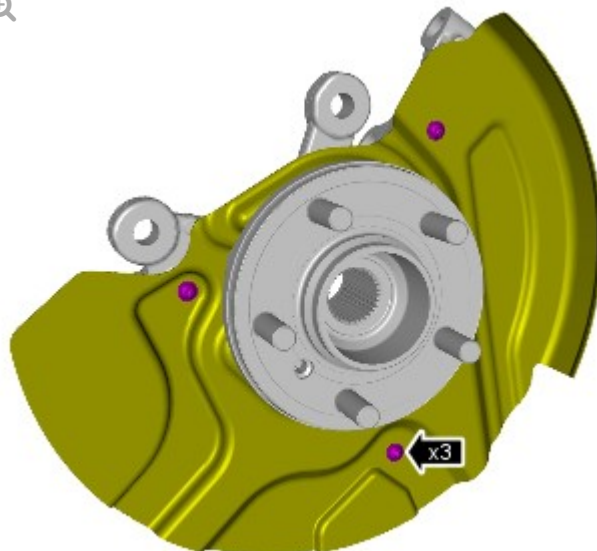
Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

2. Remove the wheel and tire.

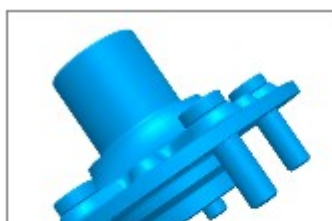
3. Refer to: [Wheel Knuckle - Vehicles Without: High Performance Brakes](#) (204-01 Front Suspension, Removal and Installation).

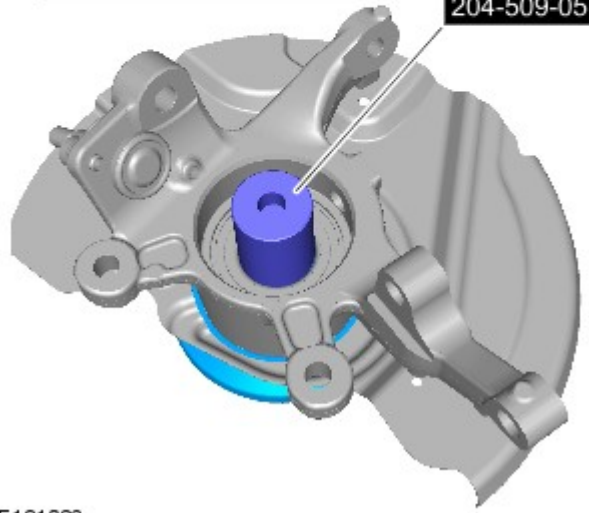
4.



E131025

5.

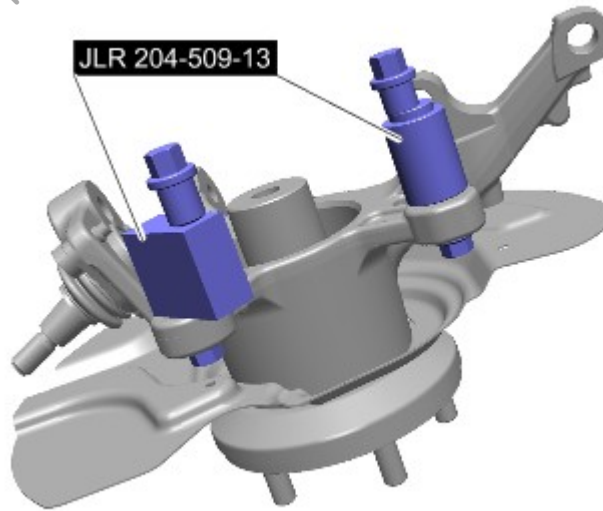




E131026

Special Tool(s): [204-509-05](#)

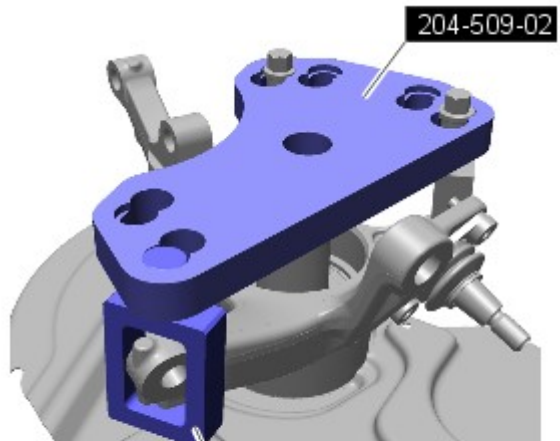
6.



E131027

Special Tool(s): [JLR-204-509-13](#)

7.



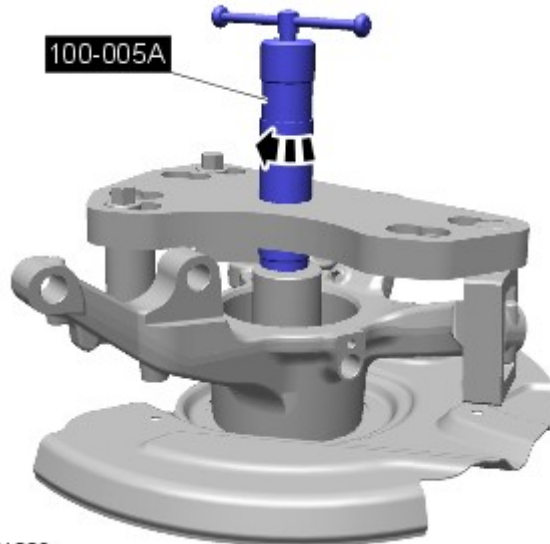


204-509-04

E131028

Special Tool(s): [204-509-02](#), [204-509-04](#)

8.



100-005A

E131029

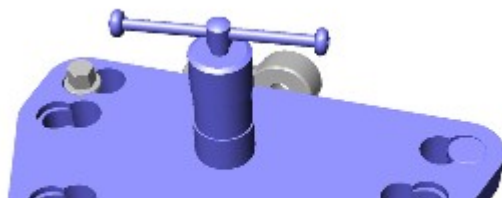
Special Tool(s): [100-005A](#)

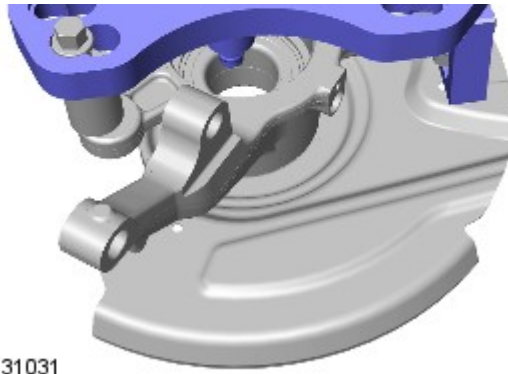
9.



E131030

10.

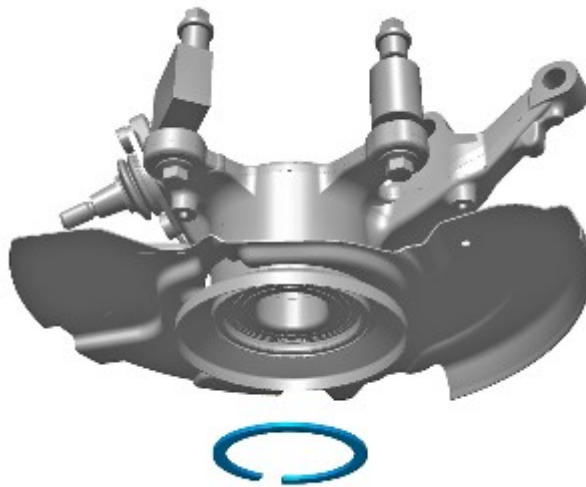




E131031

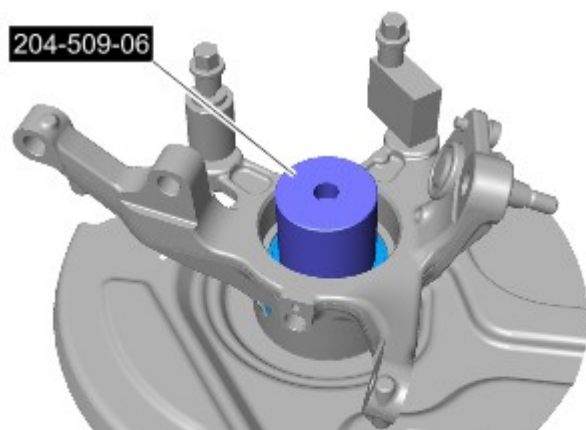
Remove the special tools.

11.



E131032

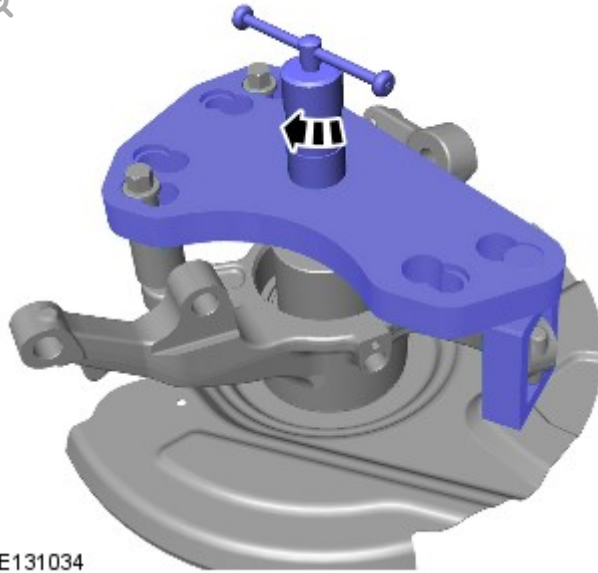
12.



E131033

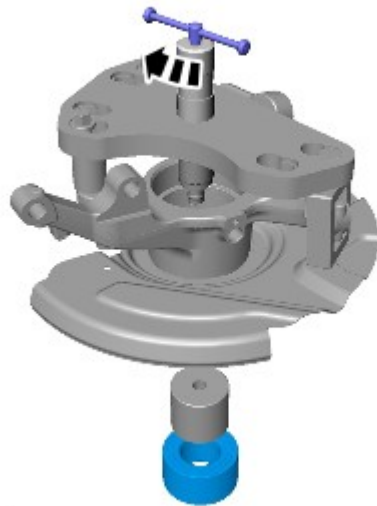
Special Tool(s): [204-509-06](#)

13.



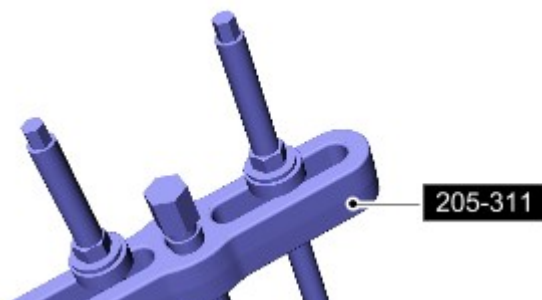
E131034

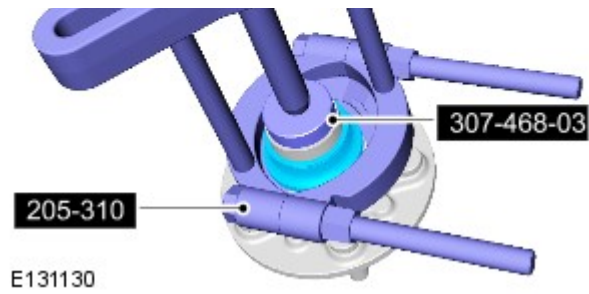
14.



E131035


15.

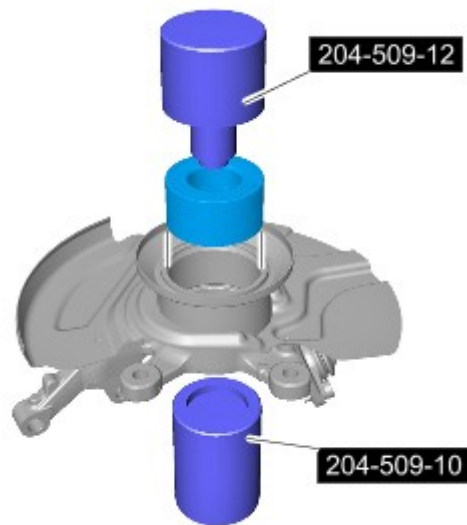




Special Tool(s): [205-310](#), [205-311](#), [307-468-03](#)

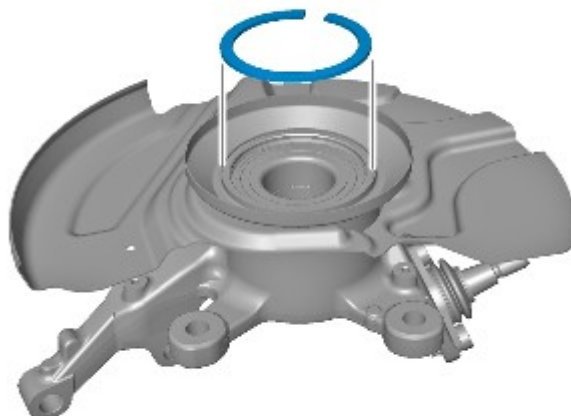
INSTALLATION

1. 



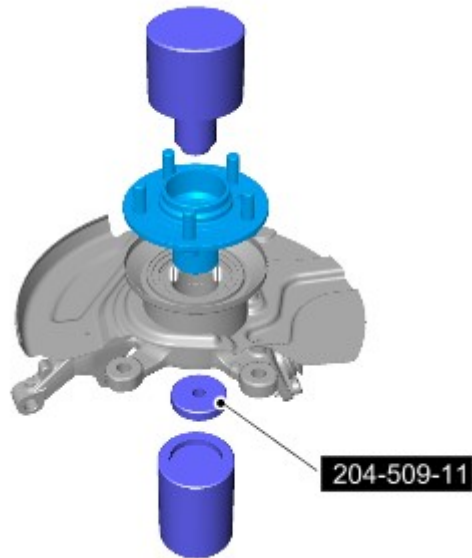
- Using a hydraulic press, install the wheel bearing into the wheel knuckle assembly.
- Special Tool(s): [204-509-12](#), [204-509-10](#)

2. 



E131038

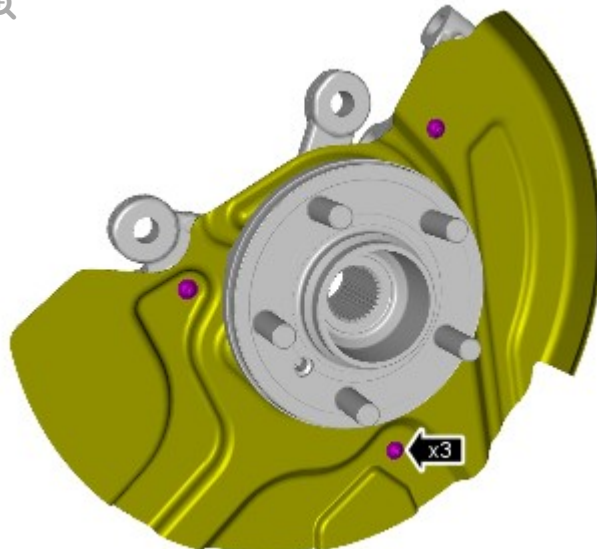
3.



E131129

- Using a hydraulic press, install the wheel hub into the wheel bearing.
- *Special Tool(s):* [204-509-11](#)

4.



E131025

Torque: **15 Nm**

5. Refer to: [Wheel Knuckle - Vehicles Without: High Performance Brakes](#) (204-01 Front Suspension, Removal and Installation).

6.
 - Install the wheel and tire.
 - Tighten the wheel nuts to 140 Nm (103 lb.ft).

2012.0 RANGE ROVER (LM), 204-01

FRONT SUSPENSION

SHOCK ABSORBER AND SPRING ASSEMBLY (G513973)

DISASSEMBLY AND ASSEMBLY

DISASSEMBLY

WARNINGS:

- Ensure the spring compressor Safe Working Load (SWL) meets or exceeds the spring rating quoted in the Specifications section. For additional information, refer to: Specifications (204-00, Specifications).
 - Always follow the spring compressor manufacturer's instructions.
-

1.

WARNING:

Do not work on or under a vehicle supported only by a jack.
Always support the vehicle on safety stands.

Raise and support the vehicle.

2. Remove the shock absorber and spring assembly.

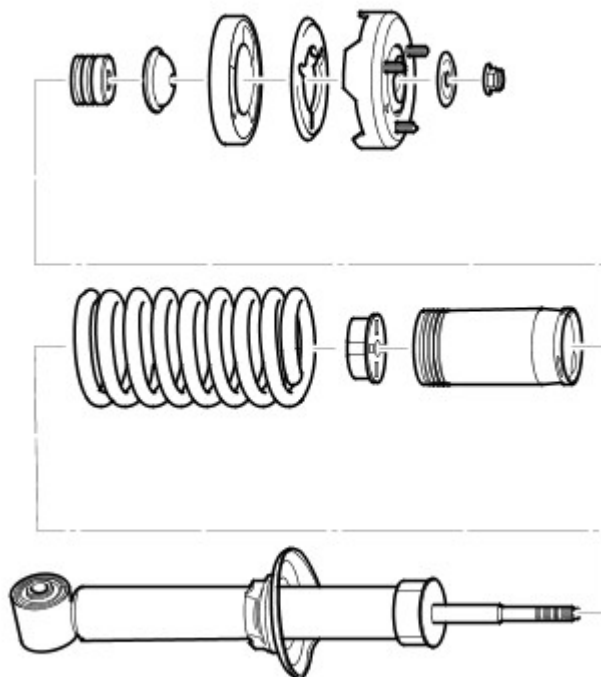
For additional information, refer to: Shock Absorber and Spring Assembly (204-01, Removal and Installation).

3. Install a suitable spring compressor in a vise.

4. Install the shock absorber and spring assembly in the spring compressor.

- Compress the spring just sufficiently to relieve the spring tension.

5.



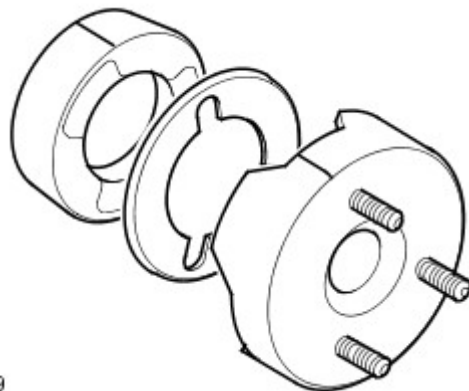
E51728

Remove the shock absorber.

- Restrain the shock absorber spindle, remove and discard the nut.
- Remove the upper bush rebound plate and upper bush.
- Remove the upper mounting assembly.
- Remove the dust tube and rebound plate assembly.
- Remove the spring aid.

6. Remove the spring from the spring compressor.

7.



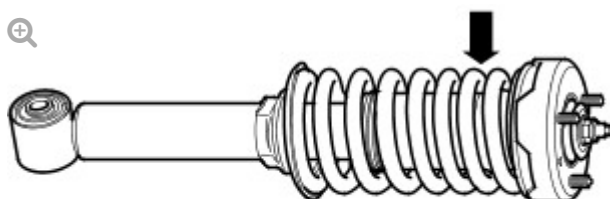
E51729

Clean and inspect the components for deterioration.

- To aid reassembly, mark the position of the rubber insulator in relation to the upper mounting plate.
- Remove the rubber insulator.
- Remove the spacer.
- Remove the rebound plate from the dust tube.

ASSEMBLY

1.



E51726

Install the spring in the spring compressor.

- Make sure the spring is installed with the close coils positioned towards the top of the shock absorber.

2. Install the spring aid.

3. Install the dust tube.

- Install the rebound plate into the dust tube.

4. Install the shock absorber.

- Make sure the spring is correctly located in the spring seat.

5. Install the upper mounting.

- Install the spacer and rubber insulator, making sure the spacer drops over the stud heads and the insulator is aligned with the mark made previously.
- Install the upper bush and upper bush rebound plate.
- Install a new nut and tighten to 98 Nm (72 lb.ft).

6. Install the shock absorber and spring assembly.

For additional information, refer to: Shock Absorber and Spring Assembly (204-01, Removal and Installation).

2012.0 RANGE ROVER (LM), 204-02

REAR SUSPENSION

SPECIFICATIONS

Torque Specifications

DESCRIPTION	NM	LB-FT
Lower arm to wheel knuckle bolt +	250	184
Upper arm to wheel knuckle bolt +	165	121
Shock absorber to lower arm bolt +	90	66
Shock absorber top nut	27	20
Shock absorber mounting nuts +	63	46
Stabilizer bar clamp bolts	56	40
Stabilizer bar link nuts +	100	74
Toe link ball joint nut +	165	121
Toe link to subframe bolt +	165	121
Height sensor link to lower arm nut	19	14
Height sensor to bracket bolts	5	3.7
Lower arm to subframe bolts +	165	121
Upper arm to subframe bolts +	180	133
Subframe to body bolts +	165	121

+ A new nut or bolt must be installed

2012.0 RANGE ROVER (LM), 204-02

REAR SUSPENSION

SPECIFICATIONS

Torque wrench settings

TORQUE DESCRIPTION	METRIC	IMPERIAL
Stabilizer bar bush clamp nuts	48 to 65 Nm	35 to 48 lbf.ft
Anti-shuffle collar screws	9 Nm	7 lbf.ft
Brake calliper bracket to upright mounting bolts	60 Nm	44 lbf.ft

2012.0 RANGE ROVER (LM), 204-02

REAR SUSPENSION

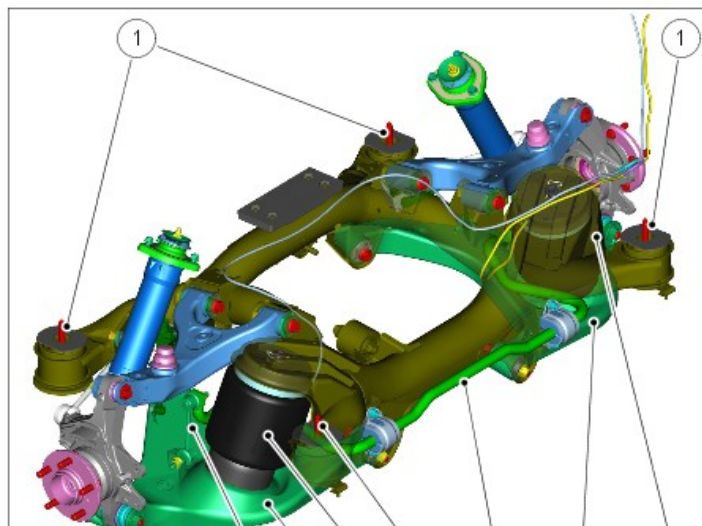
DESCRIPTION AND OPERATION

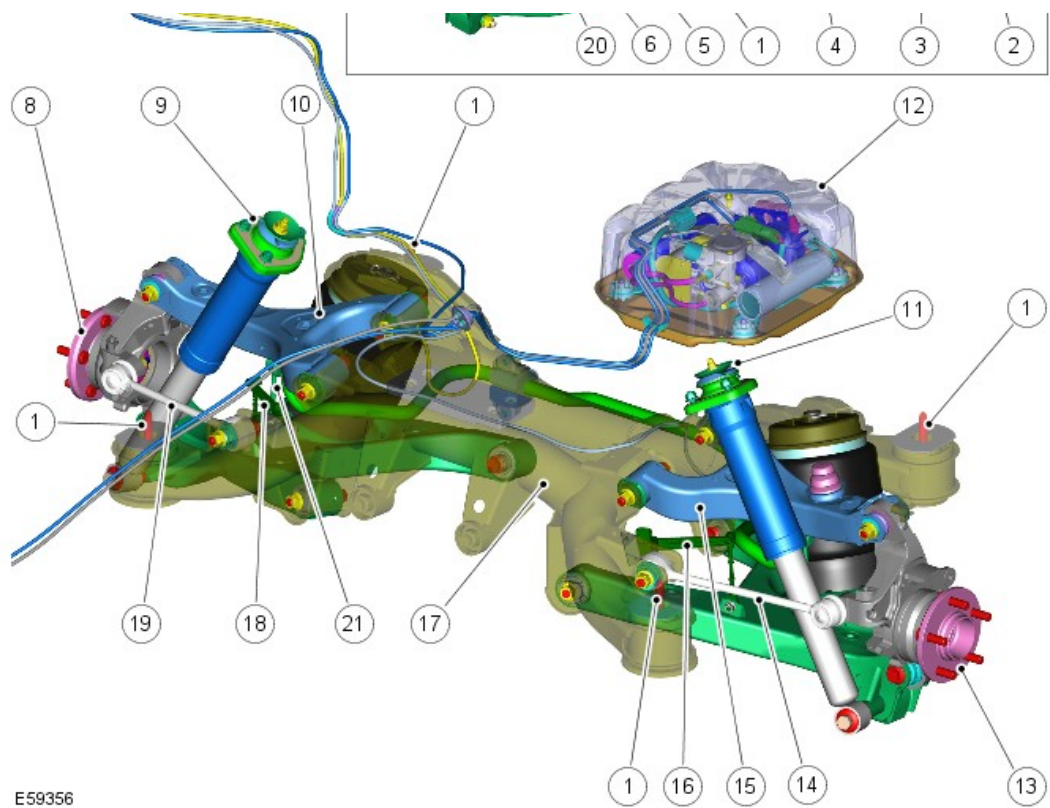
REAR SUSPENSION

Rear Suspension Components



7





ITEM	DESCRIPTION
1	Subframe mounts
2	right-hand (RH) air spring
3	RH lower wishbone
4	Stabilizer bar
5	left-hand (LH) air spring
6	LH lower wishbone
7	Rear cross link valve
8	RH rear hub assembly
9	RH damper
10	RH upper wishbone
11	LH damper
12	Compressor assembly
13	LH rear hub assembly
14	LH toe control arm
15	LH upper wishbone
16	LH rear height sensor

17	Rear subframe
18	RH rear height sensor
19	RH toe control arm
20	LH stabilizer bar link
21	RH stabilizer bar link

The independent rear suspension arms have been designed for maximum ground clearance. Wheel alignment can be adjusted for camber and toe-in using eccentric bolts.

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 rear 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:

- 190 mm bump
- 140 mm rebound
- This gives a total of 330 mm off road suspension travel.

The on road standard height wheel travel is:

- 140 mm bump
- 190 mm rebound
- This gives a total of 330 mm on road suspension travel.

NOTE:

Overall wheel travel stated above will still be achieved when both wheels are moving in parallel together.

The rear suspension comprises:

- Two dampers

- Two dampers
- Two air springs
- Subframe
- Two upper wishbones
- Two lower wishbones
- Two toe control arms
- Stabilizer bar
- Two stabilizer bar links
- Two hub assemblies.

DAMPERS

The rear dampers are unique to Range Rover and are of a mono-tube design manufactured by Bilstein. The mono-tube design gives the following advantages over conventional twin tube dampers:

- Lightweight construction
- Excellent high frequency response
- Consistent performance - mono-tube design eliminates fluid aeration and emulsification
- Larger diameter piston produces increased fluid displacement for a given damper stroke resulting in more accurate damping control.

The damper comprises a single tube which forms the operating cylinder. The lower end of the cylinder has an eye which accepts the bush for mounting to the lower wishbone. A piston and rod slides inside the cylinder. The rod emerges from the top of the cylinder which is fitted with a rod guide and a seal.

A dust cover is fitted to the top of the piston rod and protects the rod from damage. A bump stop is fitted to the top of the piston rod, under the dust cover, and protects the damper from full travel impacts. A top mount is attached to the top of the piston rod and is secured with a flanged nut. A hardened washer is fitted between the shoulder on the piston rod and the bump washer which is fitted inside the dust cover. When the damper is removed and replaced, care must be taken to ensure that the correct hardened

washer is refitted in the correct position. The washer prevents the piston rod shoulder causing damage to the bump washer.

The piston is fitted with reed valves which cover a series of holes, through which oil can pass. A chamber at the base of the damper is sealed by a free floating piston. The chamber is filled with inert gas. When the damper is assembled and filled with oil, the gas is in a compressed condition below the piston. On the bump stroke, the downward movement of the piston displaces oil from the full area (bottom) of the cylinder to the cylinder annulus (top). The energy required to pump the oil through the piston drillings and reed valves creates the damping action.

As the piston moves downwards, the volume available on the annulus side of the piston is less than required by the displaced oil from the full area side. When this occurs, the free floating piston moves downwards, further compressing the gas and providing the additional volume for the displaced oil and further enhancing the damping process.

The dampers are located between the lower wishbone and the vehicle body. The lower mounting is fitted with a bush which provides for the attachment to the wishbone with a bolt and nut. The damper top mounting is located in a turret in the body and secured to the body with three nuts. A paper gasket is located between the damper top mounting and the body and prevents the ingress of dirt and moisture into the mounting studs and corresponding holes in the body. It is important that this gasket is discarded and replaced with a new item when the damper is removed.

NOTE:

The dampers fitted to TDV8 vehicles differ to the dampers fitted to petrol vehicles to compensate for the extra weight and handling characteristics of the vehicle.

AIR SPRINGS

Each air spring comprises 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. The top

allows the bag to expand with air pressure and deform under load. The top plate assembly comprises the plastic top plate with a spigot which protrudes through a hole in the subframe. On the side of the top cap is a connector which allows for the attachment of the air hose from the cross-link valve. The piston is made from plastic and is shaped to allow the air bag to roll over its outer diameter. The base of the piston has a splined stud in the center and an offset timing peg for correct orientation of the air spring into the lower wishbone.

The air springs are located rearward of the dampers and are retained between the subframe and the lower wishbone. The air spring is attached to the lower wishbone with a screw which is fitted from the underside of the wishbone into the splined stud on the base of the piston. The air spring top plate is attached to the subframe via an integral 'D' shaped spigot which is secured with a retaining clip.

NOTE:

The air spring fitted to TDV8 vehicles differs to the air spring fitted to petrol vehicles to compensate for the extra weight of and handling characteristics the vehicle.

SUBFRAME

The subframe is fabricated from steel tubing to provide a robust platform for the mounting of the suspension and the rear differential. The subframe is attached to the vehicle body via four, voided rubber mounts.

Two bushes at the front of the subframe and one at the rear allow for the attachment of the rear differential. Additional brackets, bolted to the subframe, allow for the attachment of the height sensors. The stabilizer bar is attached across the rear of the subframe and is mounted in flexible bushes which are secured with 'D' shaped clamps.

UPPER AND LOWER WISHBONES

Upper Wishbone

The steel fabricated upper wishbone has two bushes pressed into housings which provide for the attachment to the subframe. The bushes are located

between brackets on the subframe and are secured with bolts and nuts. The outer end of the upper wishbone has two brackets with slotted holes. A boss on the hub is fitted with a ball joint which locates between the brackets and is secured with an eccentric bolt, washer and nut. This allows for the adjustment of the rear wheel camber. Rotation of the bolt moves the eccentric head against a recessed slot in the bracket, moving the location of the hub in the upper wishbone slots, allowing the camber to be adjusted to within the set limits. A rubber bump stop is fitted centrally on the upper wishbone to cushion the wishbone movement when the suspension is at the extremes of its travel.

Lower Wishbone

The lower wishbone is larger than the upper wishbone and is a steel fabrication. Two bushes are pressed into the wishbone and provide for the attachment to the subframe. The bushes are located between brackets on the subframe and secured with bolts and nuts. The lower wishbone has a platform which provides for the attachment of the air spring. A welded bracket allows for the attachment of the anti-roll bar link. A boss on the hub is fitted with a ball joint which locates between brackets on the lower wishbone. The hub is secured to the lower wishbone with a bolt and nut. A bracket with a tubular extension provides for the attachment of the damper lower mounting.

TOE CONTROL ARMS

The toe control arm is a forged steel component. One end is fitted with a taper ball joint and the opposite end has a bush pressed into an integral housing.

The bush locates between brackets on the subframe and is secured with a special eccentric bolt, washer and nut. This allows for the adjustment of the rear wheel toe-in. Rotation of the bolt moves the eccentric head within a recessed slot in the bracket, allowing the toe-in to be adjusted within the set limits.

The taper ball joint locates in a tapered hole in the hub and is secured with a nut.

STABILIZER BAR AND LINKS

The stabilizer bar is fabricated from 24.5mm diameter solid section steel

The stabilizer bar is fabricated from 20.5 mm diameter, solid spring steel. The stabilizer bar operates, via a pair of links, from a bracket on the upper face of each lower arm.

The stabilizer 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 stabilizer bar is secured to the subframe with the clamp plates which are secured with bolts.

The ends of the stabilizer bar are attached to the lower arms via stabilizer bar links.

Each stabilizer bar link has a ball joint fitting mounted at 90° to the axis of the link at each end which improves response and efficiency. The top ball joint attaches to the stabilizer bar and is secured with a nut. The lower ball joint attaches to the lower wishbone and is secured with a nut. The ball joints on the stabilizer bar links are not serviceable and if replacement of either is necessary, a new stabilizer bar link will be required.

A hardened steel washer is fitted between the lower ball joint and the bracket on the lower wishbone. The hardened washer prevents the ball joint damaging the bracket which could lead to loosening of the nut torque. When the link is removed it is important to ensure that the correct hardened washer is replaced in the correct position.

HUB ASSEMBLY

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

The cast wheel hub has a vertical boss with a cross hole. A ball joint is pressed in the hole and provides the attachment point for the upper wishbone. The upper wishbone is secured to the wheel hub with a bolt and nut. An additional boss with two cross holes provide location for the brake caliper.

A second vertical boss with a cross hole at the bottom of the wheel hub provides for the attachment of the lower wishbone. A ball joint is pressed in the hole and the lower wishbone is secured with a bolt and nut. A further

tapered hole in the wheel hub allows for the attachment of the toe control arm ball joint.

A hole is machined in the wheel hub at 90° to the hub bearing. This hole allows for the fitment of the anti-lock brake system (ABS) wheel 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.

