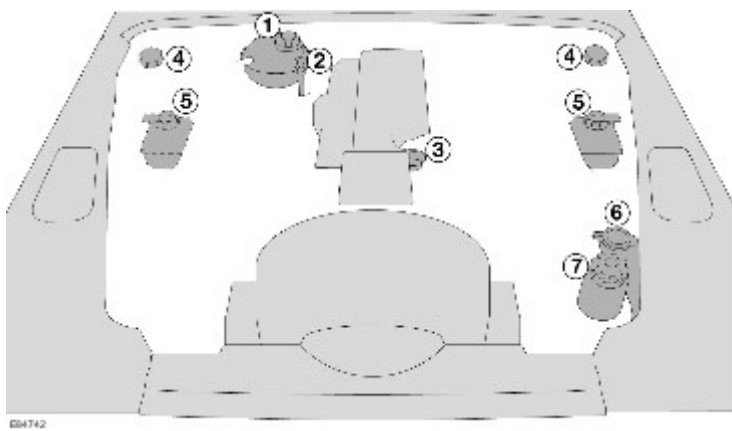


Maintenance Schedules - Diesel Engines

Torque Specifications

Description	Nm	lb-ft
Wheel nuts - steel wheels	100	80
Wheel nuts - alloy wheels	130	96
Wheel nuts - Heavy duty wheels	170	125
Transfer box filler plug	30	22
Transfer box drain plug	30	22

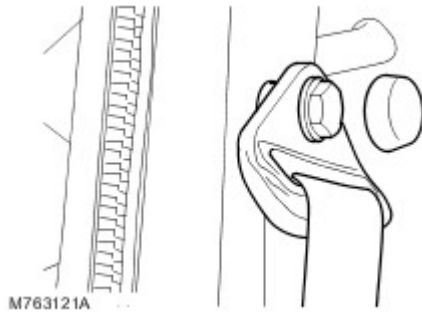
Under Bonnet View



Item	Part Number	Description
1		Coolant expansion tank
2		Engine oil dipstick
3		Engine oil filler cap
4		Clutch fluid reservoir filler cap
5		Brake fluid reservoir filler cap
6		Windscreen washer reservoir
7		Power steering fluid reservoir

Seats and Safety Belts

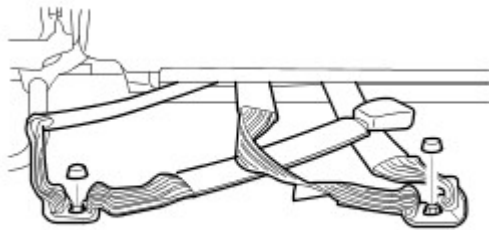
1. Check seat frames are secured to floor and show no signs of movement.
2. Check operation of seat slide and tilt mechanisms, making sure there is no excessive play between seat cushion and seat back.
3. Check tightness of accessible seat fixings.
4. Fully extract seat belt and allow it to return under its own recoil mechanism.
5. Check entire length of seat belt webbing for signs of fraying or damage. Repeat for all belts.
6. Check security of seat belt upper mountings.



7. Check security of seat belt buckle mountings.

8. Connect each belt to the correct buckle, check seat belt buckle and tongue are secure. Release seat belt buckle and check for correct operation.

9. Check tightness of accessible seat belt mountings



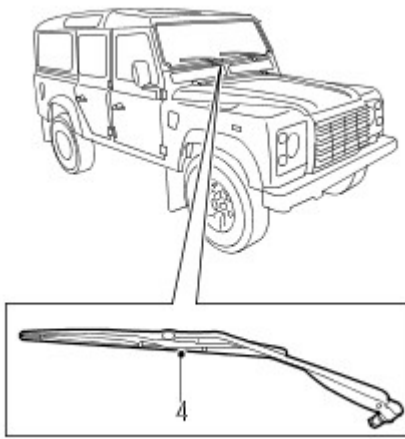
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Lamps, Horns and Warning Indicators

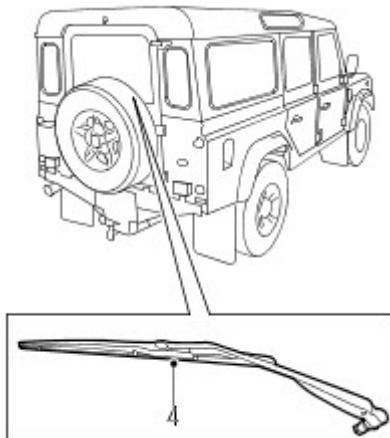
1. Check side, head, fog, reversing and tail lamps for correct operation.
2. Check operation of headlamp automatic levelling system - if installed.
3. Check turn signals and hazard warning lamps for correct operation.
4. Check brake (stop) lamps for correct operation.
5. Check all exterior lamp lenses 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

1. Operate screen washer and switch on wipers. Check washer jets are correctly aimed and check for smooth seamless operation across screen of wiper blades at all speeds, including intermittent.
2. Repeat operation for rear screen wipers and washers.
3. Check all wiper blades for condition and signs of splits or damage.
4. Check security of wiper arms.



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Parking Brake

1. With the vehicle stationary, apply the parking brake and check for correct operation. For additional information, refer to [Parking Brake Shoe and Lining Adjustment](#) (206-05 Parking Brake and Actuation)

Release parking brake and check for correct operation.

Battery Condition

NOTE:

The vehicle may be fitted with an alarm and immobilisation system. To prevent the alarm from sounding, it is important that the following procedure is used when disconnecting the battery.

1. Remove drivers seat base.
2. Release clip securing battery cover.
3. Remove battery cover.
4. Turn the ignition switch to position 'II', and then to position '0'.
5. Remove the ignition key.

NOTE:

Always disconnect the -ve terminal first. When replacing, connect the +ve terminal first.

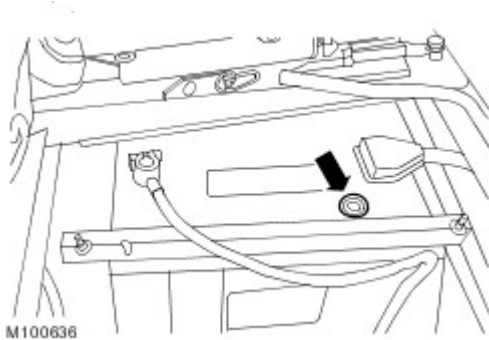
6. Disconnect the vehicle -ve terminal within 15 seconds.

7. The battery is designed to be maintenance free, so topping-up is not possible. On the top of the battery is a battery indicator. When the indicator shows:

- GREEN - The battery is in a good state of charge.
- DARK (turning to black) - The battery needs charging.
- CLEAR (or light yellow) - The battery needs replacing. Do not charge the battery or jump start the vehicle in this condition.
- If the green dot is missing, the battery needs charging.

NOTE:

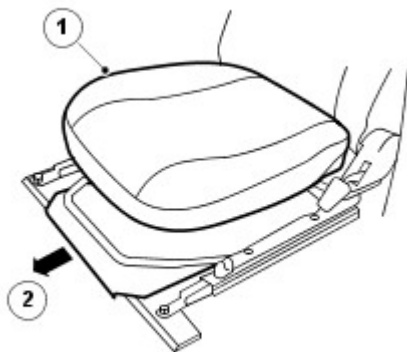
If the indicator shows clear or yellow, tap the indicator with the handle of a screwdriver to disperse any air bubbles. If the indicator colour remains unchanged, the battery will need replacing.



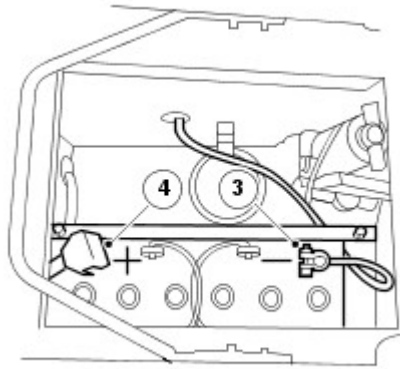
8. Clean and grease battery terminals and leads with petroleum jelly.
9. Connect leads to battery (+ve first) and tighten clamp bolts.
10. Fit battery cover and secure with clip.
11. Fit drivers seat base.

Clean Battery Terminals

1. Remove drivers seat base.
2. Release clip securing battery cover. Remove battery cover.



3. Disconnect both battery terminals, -ve terminal first. Clean off corrosion and neutralise. Smear terminals with petroleum jelly.
4. Reconnect battery terminals +ve first, when maintenance operations have been completed.



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5. Fit battery cover and secure with clip.
6. Fit drivers seat base.

Handset Battery

NOTE:

Do not remove a battery until you are ready to install the replacement. Always fit a Land Rover STC4080 or a Panasonic CR2032 replacement battery.

1. Unlock the vehicle and disarm the alarm system.
2. Turn the ignition switch to position 'II', then turn to position '0' and remove the key.



CAUTION: Do not allow moisture to get inside the handset.

3. Carefully prise the handset apart, starting from the keying end. Avoid damaging the seal between the two halves of the case.
4. Slide the battery out of its clip, taking care to avoid touching the circuit board or the contact surfaces of the clip.
5. Press and hold one of the buttons for at least 5 seconds to drain any residual power from the handset.
6. Fit the new battery, making sure that correct polarity is maintained (+ve side facing up). Finger marks will adversely affect battery life. Avoid touching the flat surfaces of the battery, and wipe clean before fitment.
7. Reassemble the two halves of the handset. Operate the Padlock symbol button at least 4 times within range of the vehicle to resynchronise the handset.

Headlamp Alignment

1. Check alignment of headlamps. For additional information, refer to [Headlamp Adjustment](#) (417-01 Exterior Lighting)

Road Wheels

1. Loosen wheel nuts. Raise vehicle for wheel free condition and remove the wheel nuts.
2. Mark the wheel to stud relationship to make sure that the wheels are refitted in the same orientation.
3. Apply a thin coat of anti-seize compound to wheel hub centre.

NOTE:

When refitting road wheel nuts do not over tighten using powered tools. Make sure the wheel nuts are correctly tightened in the correct sequence.

4. Refit wheels to original hub position.
5. Tighten wheel nuts.
 - Steel wheels - 100 Nm (80 lbf/ft)
 - Alloy wheels - 130 Nm (96 lbf/ft)
 - Heavy Duty wheels - 170 Nm (125 lbf/ft)

Tire Pressures, Condition and Tread Depth

1. Check for any apparent damage to tires, paying particular attention to side walls.

NOTE:

Any adjustments to steering or suspension will be subject to additional labour and/or material cost and should not be carried out without the authorisation of the customer.

2. Look at tires treads and check for any unusual wear patterns which may indicate out of specification adjustment of steering or suspension.

NOTE:

Any requirement to replace tires should be advised to the customer before any remedial work is carried out. This will be subject to additional labour and/or material cost and should not be carried out without the authorisation of the customer.

3. Measure the tread depth across the width of the tire and around the circumference. Annotate the maintenance check sheet with the lowest figure obtained from each tire.

Brake Pads, Calipers and Discs

1. With front road wheels removed, check brake pad thickness and make sure that both pads are wearing evenly.

NOTE:

Any requirement to replace brake pads or brake disc should be advised to the customer as this will incur additional labour and/or material cost and should not be carried out without the authorisation of the customer.

2. Check brake discs for signs of cracking, excessive scoring or oil contamination.
3. Check for any signs of brake fluid leakage from caliper seals, hoses or unions.
4. Using brake cleaner, remove excessive deposits of brake dust from pads, calipers and disc shields.

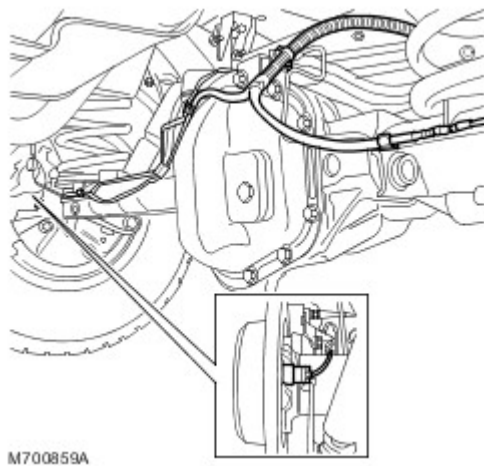
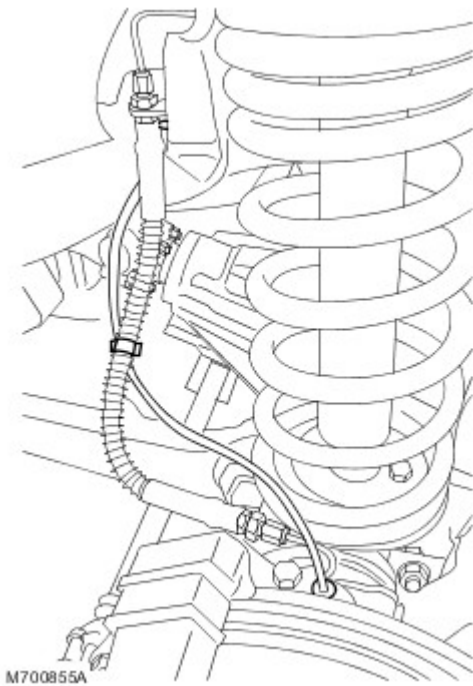
Road Wheel Speed Sensor Harness

1. Check each road wheel speed sensor harness is correctly and securely routed.

NOTE:

Any requirement to replace a road wheel speed sensor should be advised to the customer as this will incur additional labour and/or material cost and should not be carried out without the authorisation of the customer.

2. Inspect each harness for chafing or damage.



Fuel Filter



WARNING: Fuel vapour is highly flammable and in contained spaces is also explosive and toxic. Always have a fire extinguisher containing FOAM, CO2, GAS OR POWDER close at hand when handling or draining fuel.

Replace fuel filter. For additional information, refer to [Fuel Filter](#) (310-01 Fuel Tank and Lines - 2.4L Diesel)

Charge Air Cooler

1. Visually check for any obstructions in the radiator and charge air cooler matrix and remove debris as necessary.
2. Visually check fan blades for damage.
3. Check cooling, charge air cooler and heating systems for leaks, hoses and oil pipes for security and condition.
4. Check accessible hose clips for tightness.
5. Check coolant level, top-up if necessary

Charge Air Cooler Flush

1. Remove charge air cooler. For additional information, refer to [Charge Air Cooler](#) (303-12 Intake Air Distribution and Filtering - 2.4L Diesel)
2. Flush charge air cooler element using Unicorn Chemicals 'C' Solve following the manufacturers instructions.
3. Thoroughly dry charge air cooler and making sure that no trace of solvent remains in the element.
4. Install charge air cooler. For additional information, refer to [Charge Air Cooler](#) (303-12 Intake Air Distribution and Filtering - 2.4L Diesel)

Cooling System Top-Up

1. With engine cold, remove expansion tank filler cap.
2. Top-up with recommended mixture of coolant until level reaches mark on expansion tank.
3. Fit expansion tank filler cap.

Coolant Renew

1. Renew engine coolant. For additional information, refer to [Cooling System Draining, Filling and Bleeding](#) (303-03 Engine Cooling - 2.4L Diesel)
2. Fit expansion tank filler cap.

Door Locks and Hinges

1. Open each door in turn and lubricate door hinges and check strap using recommended lubricant.
2. Lubricate door lock, striker and private lock using PTFE lubricant. Remove excessive lubricant, particularly from door striker area, to avoid customer complaint.
3. Check tightness of accessible door lock and striker fixings
4. Open and close door to check for smooth, noise-free operation. Make sure door closes securely.
5. Check for smooth operation of private lock.
6. With bonnet open, lubricate hinges, striker, lock and safety catch using a suitable lubricant.

Air Cleaner Element

1. Replace air cleaner element. For additional information, refer to [Air Cleaner Element](#) (303-12 Intake Air Distribution and Filtering - 2.4L Diesel)

Accessory Drive Belt

Check accessory drive belt for signs of splits, fraying, oil contamination and wear.

NOTE:

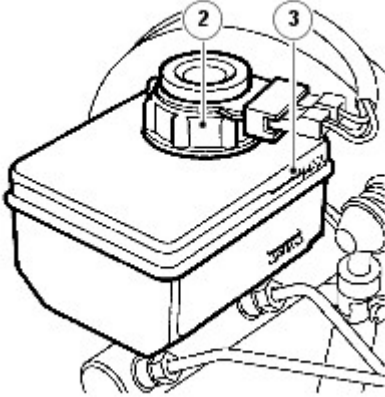
Any requirement to replace the accessory drive belt should be advised to the customer as this will incur additional labour and/or material cost and should not be carried out without the authorisation of the customer.

1. Renew a damaged or contaminated accessory drive belt.

Fluid Levels

Brake Fluid Reservoir

1. Check the fluid level visually through transparent side of reservoir without removing cap.
2. If level is below "**MAX**" mark clean the area around the reservoir filler cap and remove cap.
3. Top up to '**MAX**' mark with recommended brake fluid. For additional information, refer to [Specifications](#) (206-00 Brake System - General Information)

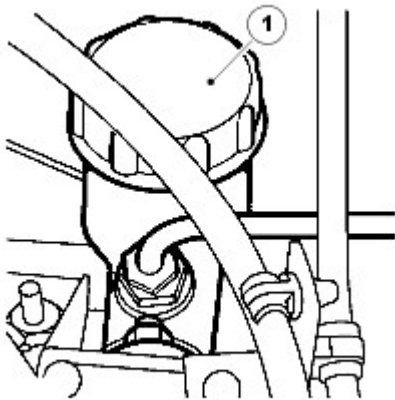


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4. Reinstall the reservoir filler cap.

Clutch Fluid Reservoir

1. Clean area around clutch fluid reservoir cap, and remove cap.



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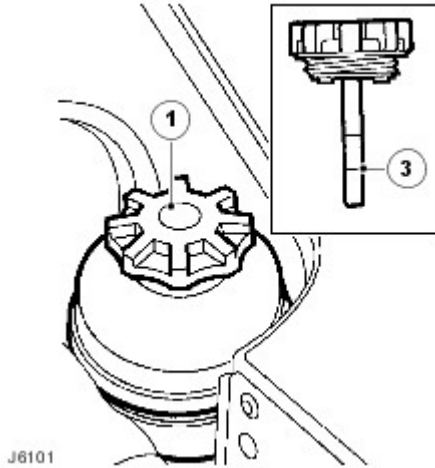
2. Check fluid level in clutch fluid reservoir.
3. Clean the area around the reservoir filler cap, remove the cap.
4. If necessary, top-up using the recommended fluid to the '**MAX**' mark on the reservoir. For additional information, refer to [Specifications](#) (206-00 Brake System - General Information)
5. Reinstall the reservoir filler cap.

Power Steering Fluid



CAUTION: To prevent over filling, check/top-up the system with the engine switched off and the system cold. Make sure 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](#) (206-00 Brake System - General Information)



CAUTION: Do not fill reservoir above the 'MAX' mark.

4. Reinstall the reservoir filler cap.

Windshield Washer Reservoir

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 reservoir filler neck.
3. Reinstall the reservoir filler cap.

Engine Oil and Filter

1. Renew engine oil and filter. For additional information, refer to [Engine Oil Draining and Filling](#) (303-01 Engine - 2.4L Diesel)

Steering Box

1. Check steering box for leaks.
2. Check there is no backlash in steering box with the road wheels in the straight ahead position. Adjust if necessary. For additional information, refer to [Steering Gear Adjustment](#) (211-00 Steering System - General Information)

Manual Gearbox Oil



WARNING: Avoid excessive skin contact with used gearbox oil. Used gearbox oil contains potentially harmful contaminants which may cause skin cancer or other serious skin disorders.

1. Renew gearbox oil. For additional information, refer to [Transmission Draining and Filling](#) (308-03 Manual Transmission/Transaxle)

Transfer Case Oil

Check and Top-Up



WARNING: Avoid excessive skin contact with mineral oil. Mineral oils remove the natural fats from the skin, leading to dryness, irritation and dermatitis.



CAUTION: The transfer case oil filler plug must not be used as a transfer case oil level plug. Failure to follow this instruction may result in damage to the vehicle.

1. Drain and measure the transfer case oil. For additional information, refer to [Transfer Case Draining and Filling](#) (308-07A)
2. Refill the transfer case with the recommended oil. For additional information, refer to [Specifications](#) (308-07A)

Transfer Case Oil Replace



WARNING: Avoid excessive skin contact with mineral oil. Mineral oils remove the natural fats from the skin, leading to dryness, irritation and dermatitis.

1. Renew transfer case oil. For additional information, refer to [Transfer Case Draining and Filling](#) (308-07 Transfer Case - 2.4L Diesel)

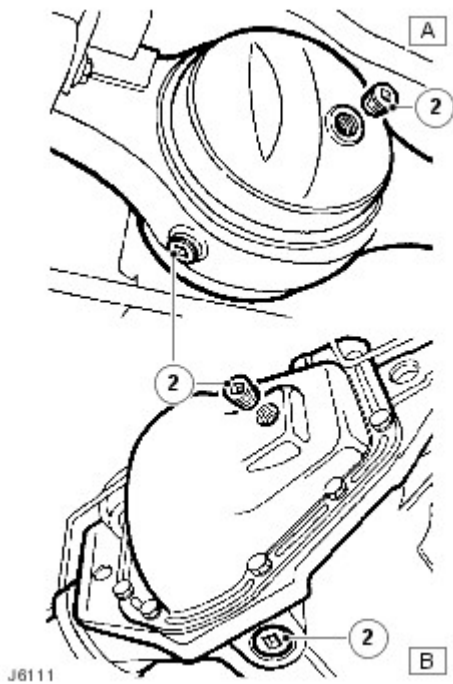
Front and Rear Axles

Check



WARNING: Avoid excessive skin contact with used axle oil. Used axle oil contains potentially harmful contaminants which may cause skin cancer or other serious skin disorders.

1. Make sure vehicle is level.
2. Using 13 mm square drive wrench, remove filler/level plug.



Item	Part Number	Description
A		Front and rear axle - 90 models; Front - 110/130 models
B		Rear axle - 110/130 models

3. If necessary inject new oil until oil runs out from filler/level hole. Allow excess oil to drain and wipe clean. For additional information, refer to [Specifications](#) (205-02 Rear Drive Axle/Differential)

4. Clean and refit filler/level plug.

Replace

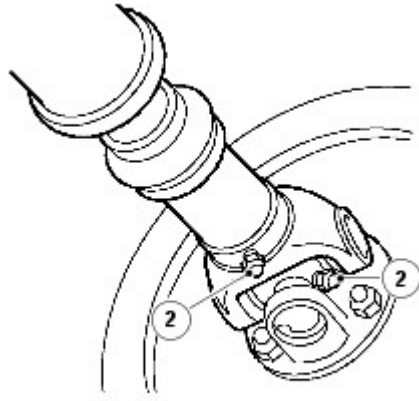


WARNING: Avoid excessive skin contact with used axle oil. Used axle oil contains potentially harmful contaminants which may cause skin cancer or other serious skin disorders.

1. Make sure vehicle is level and place suitable tray under axle to be drained.
2. Using 13mm square drive wrench, remove drain and filler/level plugs from axle and allow oil to drain completely.
3. Clean and refit drain plug.
4. Inject new oil, until it runs out from filler/level hole. Allow excess oil to drain and wipe clean.
5. Clean and refit filler/level plug.

Drive Shafts

1. Clean area around front universal joint grease nipple.
2. Apply recommended grease to the grease nipple.



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Clutch Pipes and Unions

1. Check clutch pipes and unions for chafing, leaks and corrosion.

Power Steering Pipes and Unions

1. Check clutch pipes and unions for chafing, leaks and corrosion.

Engine, Gearbox, Transfer Case and Axles

1. Check for oil leaks from Engine, Gearbox, Transfer box, and axles. Pay particular attention to areas around oil seals.

Exhaust System

1. Visually check condition of exhaust system for signs of damage.
2. Check condition of exhaust heat shields.
3. Check exhaust system is firmly secured and check condition of exhaust mounting rubbers, clamps and brackets.

Steering Box and Suspension

1. Check steering box fixings. For additional information, refer to [Specifications](#) (204-00 Suspension System - General Information)
2. Check LH and RH front radius arm fixings. Tighten if necessary. For additional information, refer to [Specifications](#) (204-00 Suspension System - General Information)
3. Check Panhard rod fixings. Tighten if necessary. For additional information, refer to [Specifications](#) (204-00 Suspension System - General Information)
4. Check all rear axle fixings. Tighten if necessary. For additional information, refer to [Specifications](#) (205-02 Rear Drive Axle/Differential)

Steering Ball Joints

1. Check for wear in joints by attempting to move the joint from side to side and backwards and forwards. If free movement is apparent, fit a new joint assembly.



CAUTION: Do not check for wear by having an assistant move the steering wheel from side to side while observing the joint.

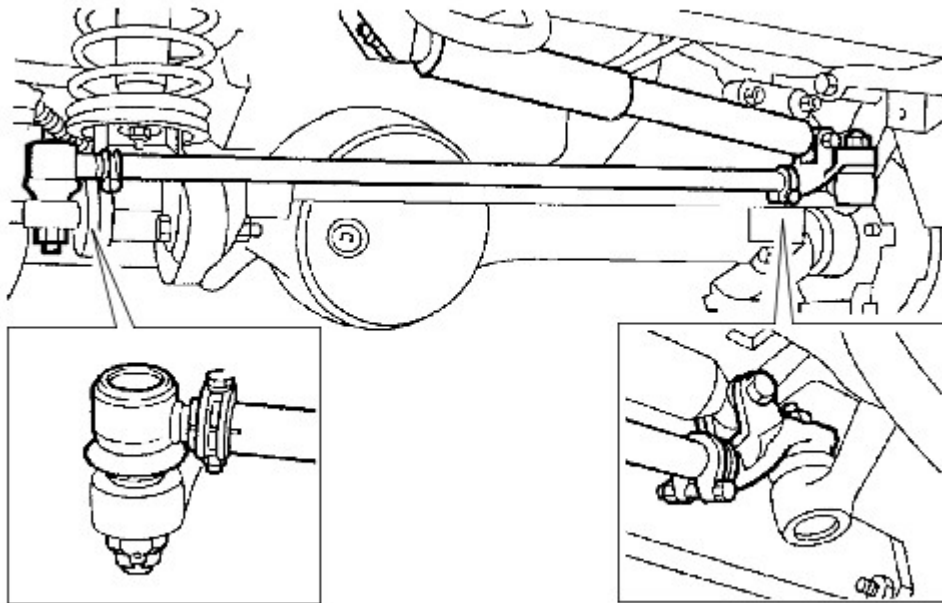
2. Check condition of steering ball joints paying particular attention to dust covers.

NOTE:

Any requirement to replace the steering ball joints should be advised to the customer as this will incur additional labour and/or material cost and should not be carried out without the authorisation of the customer.

NOTE:

Ball joints are lubricated for life during manufacture and require no further lubrication unless the rubber boot has been dislodged or damaged. All joints should be checked at specified service intervals, but more frequently if vehicle is used under arduous conditions.



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Shock Absorbers

1. Check for signs of leakage from suspension dampers.
2. Check for signs of suspension damper damage.

Towing Bracket

1. Check security of towing bracket.

Engine and Transmission Mountings

1. Check condition of front LH engine mounting. Tighten fixings if necessary. For additional information, refer to [Specifications](#) (303-01 Engine - 2.4L Diesel)
2. Check condition of front RH engine mounting. Tighten fixings if necessary. For additional information, refer to [Specifications](#) (303-01 Engine - 2.4L Diesel)
3. Check condition of rear LH gearbox mounting. Tighten fixings if necessary. For additional information, refer to [Specifications](#) (308-03 Manual Transmission/Transaxle)
4. Check condition of rear RH gearbox mounting. Tighten fixings if necessary. For additional information, refer to

Road Test



WARNING: Two wheel roller tests where rollers are driven by the vehicle MUST NOT be carried out. For details of rolling road testing,

1. Check for correct operation of starter switch. Make sure the engine starts in a correct manner. Leave the engine running.
2. With vehicle stationary, turn steering from lock to lock. Check for smooth operation and make sure there is no undue noise from the power steering pump or drive belt.
3. Depress clutch and select all gears in turn. Check for smooth notch free engagement.
4. Drive vehicle on a short road test. Check all vehicle systems for correct operation. Pay particular attention to:
 - Manual gear selection.
 - Gear selection/noise - high/low range.
 - Steering for abnormal noise/effort.
 - Steering for free play.
 - Engine noise
 - Gearbox noise or vibration
 - Suspension noise or irregularities
 - Body noise
 - Braking system operation
 - Engine performance
 - Excessive exhaust smoke.
 - All instruments, gauges and warning indicators.
 - Heater and air conditioning systems.
 - Fully extend seat belt, check operation of retraction and latching. Inertia belts lock when snatched or vehicle on slope.
 - Seat reclining and latching.
5. Check for correct operation of all instruments and warning devices where practical.
6. After road test, carry out a final inspection of the vehicle on vehicle ramps.
7. Check all underbonnet fluid levels and top-up if necessary.

General

1. Endorse Service Record.
2. Report any unusual features of vehicle condition and any additional work required.