



Technical Service Bulletin

No.LTB00123
18 March 2008

Subject/Concern: Front Suspension Knock Diagnosis

Models:

Discovery 3 / LR3		VIN-range: 000360 Onwards
Range Rover Sport (LS)		VIN-range: 900290 Onwards

Markets: All **Section:** 204-01

Summary:

A customer may report a concern of a 'knock' from the front suspension when driving over rough roads, sunken drain covers etc.

Cause: Various; refer to the steps outlined below.

Action: If a customer reports a concern of a 'knock' from the front suspension when driving over rough surfaces, refer to the steps outlined in the Diagnostic Procedure below.

Diagnostic Procedure

NOTE: Check suspension bushings and ball joints both loaded (wheels on the ground/ramp) and unloaded (wheels free).

General Ramp Check - Front Suspension

1 . **NOTE:** The majority of knocks can be heard at approximately 25 mile/h (40 km/h) on rough roads or over single wheel inputs e.g. sunken drains.

NOTE: Refer to GTR for all torques and ride heights.

Check torque of stabilizer bar stabilizer link fixings (upper & lower).

2 . Check torque of damper lower fixing and bushing.

3 . Check torques of control lower arm ball joint nuts and steering gear tie rod end nuts.

4 . Check torque of front differential cross member and undertray fixings.

5 . Check torque of front upper suspension arm forward and rear bushing fixings (if torque-tightening is necessary this must be carried out at the correct ride height to prevent pre-loading of bushings).

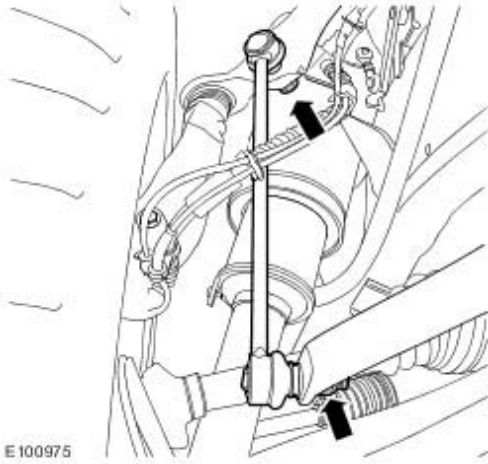
6 . Check torque of front lower suspension arm forward and rear bushing fixings (if torque-tightening is necessary this must be carried out at the correct ride height to prevent pre-loading of bushings).

7 . On vehicles not fitted with Dynamic Response, check torque of stabilizer bar clamp fixings.

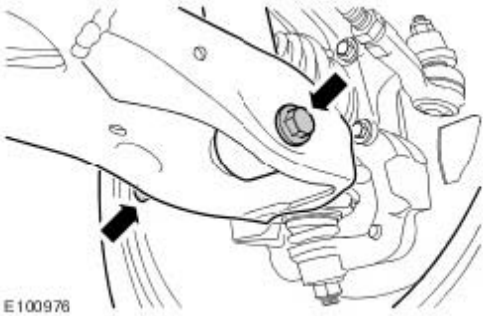
8 . On vehicles fitted with Dynamic Response, check front actuator clamp fixings are to the correct torque. Use special service tool 204-703 and 204-705 to torque fixings.

9 . On Range Rover Sport, check torque of front and rear body mount damper fixings.

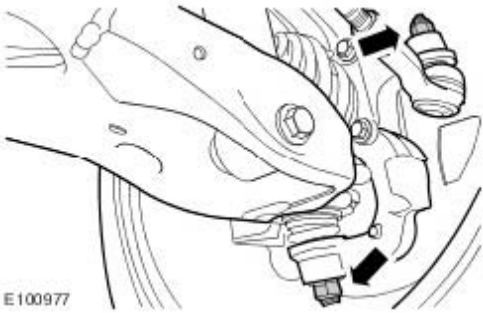
10 . If any torque-tightening is necessary, retest the vehicle on a rough road to check for other knocks.



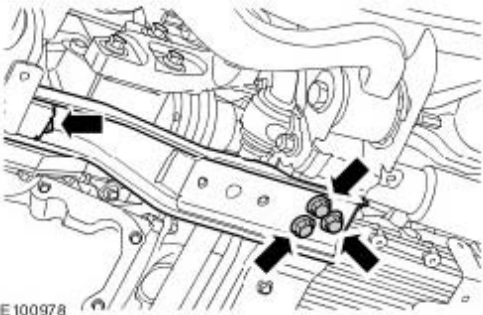
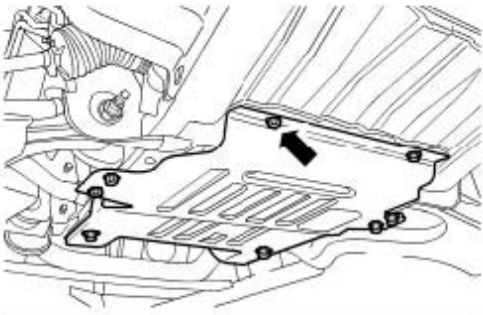
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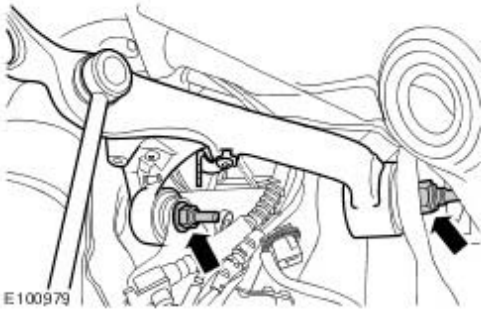
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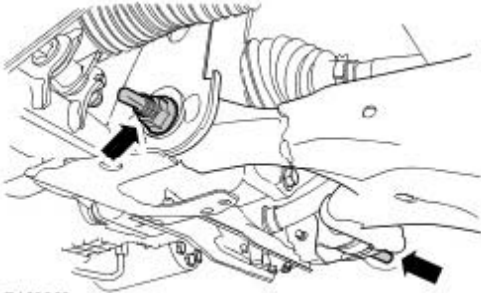
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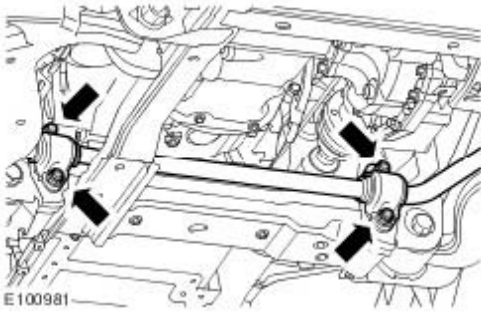
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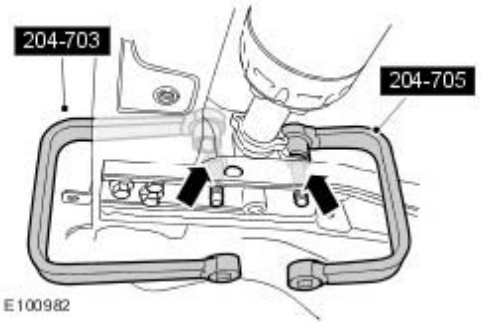
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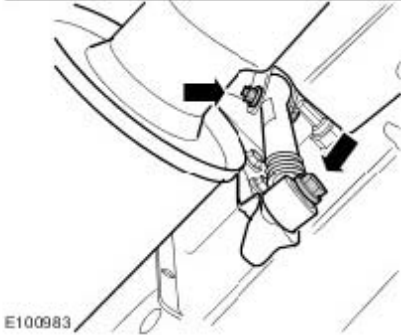
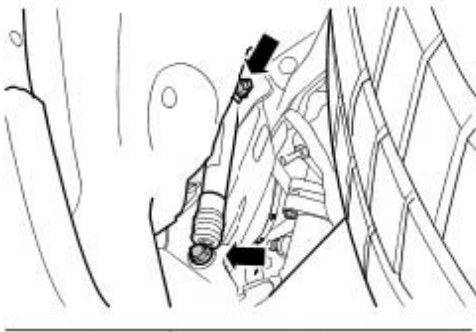
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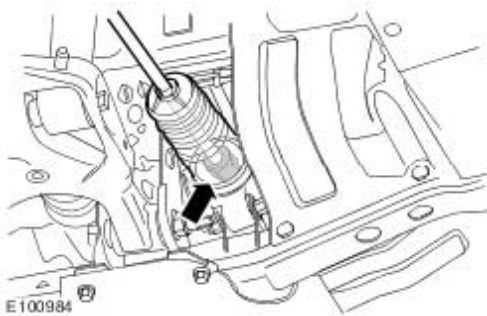
Ball Joints

- 11 . **NOTE:** To isolate the steering gear design clearance, check the right-hand linkage with the steering held against the right lock stop. Likewise, check the left-hand linkage with the steering held against the left lock stop.

With the aid of another person holding the steering wheel firmly against the lock stops, firmly grasp the road wheel and apply a rocking motion. Check for any free play in the steering linkage.

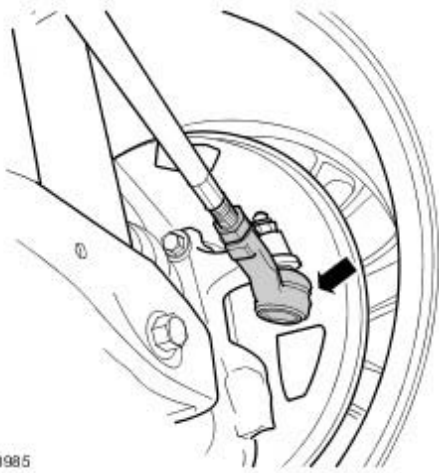
1 If free play is detected, establish where the play is by compressing the boot. Feel for any . play in the inner ball joint while continuing to rock the road wheel.

2 Renew the ball joint if any free play is detected.

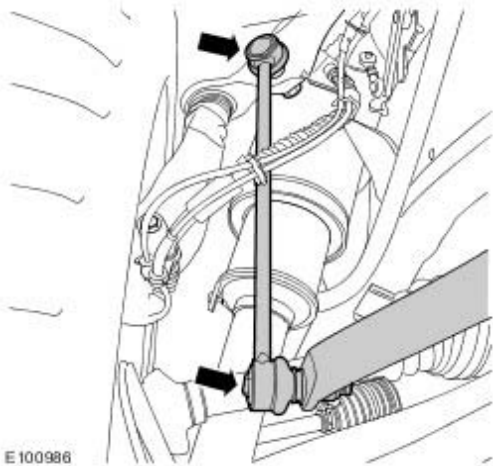


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- 12 . Check the steering gear tie rod end for free play. Replace if required.
 13 . Check the stabilizer bar links for free play at both ends. Replace if required.
 14 . Lift the vehicle so that front wheels are clear of ground/ramp to enable insertion of a suitable lever (e.g. a 1200mm long steel tube). Check the lower ball joints for free play by placing the lever between the ground/ramp and the tire, and lifting the wheel assembly with the lever. A second person will be required to check simultaneously for any ball joint lift. If free play (knock) is noted in the ball joint, replacement is required.
 15 . Retest the vehicle on a rough road to check for other knocks.



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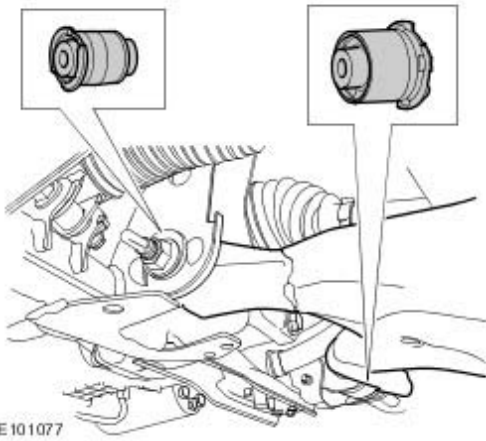
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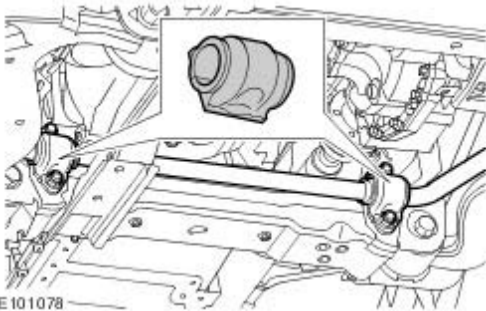
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Bushings

- 16 . Check the lower wishbone bushings for cracks/splits. Replace as necessary.
- 17 . Check stabilizer bar bushings for crack/splits. Replace as necessary (for vehicles with Dynamic Response, see 'Dynamic Response Vehicles Only (below)').
- 18 . Retest the vehicle on rough road to check for other knocks



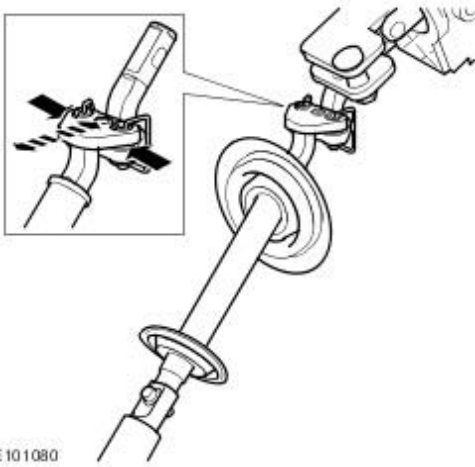
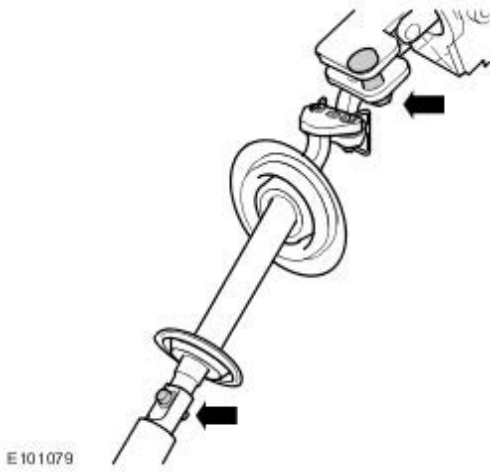
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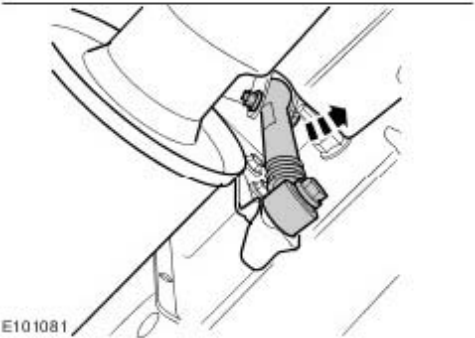
Steering Column

- 19 . Check the steering column fixing torques. Refer to GTR for torques.
- 20 . **NOTE:** There is an amount of backlash in the steering system. If in doubt compare with another vehicle. Grasp shaft and move up and down.
With the engine off, check the steering column for free play by gently rocking the steering wheel side to side.
- 21 . **NOTE:** A revised lower shaft has been introduced for production at assured VIN 444606/122778. Refer to bulletin LTB00097.
If free play is evident, remove the lower fascia scuttle and check the intermediate shaft breakaway joint for free play. If relative movement can be felt across this joint change the intermediate shaft. If no relative movement can be felt across the intermediate shaft joint but relative movement is still evident, change the lower shaft.
- 22 . Retest the vehicle on rough road to check for other knocks.



Body Mount Dampers (Range Rover Sport)

23 . Remove dampers in pairs (front, then rear) and retest vehicle to check if noise is eliminated. If so, replace dampers as appropriate.



Dynamic Response Vehicles Only.

- 24 . Confirm all associated pipe routings have no inadvertent pipe to frame/body contact and no small stones, soil etc which are shorting out the pipes or valve block to the frame/body. (These are the main recognized routes for increased system noise transfer).
- 25 . If the vehicle is prior to VIN 996253, download the latest Dynamic Response software.
- 26 . Confirm front actuator clamp fixings are to correct torque. (Use Special Service Tools 204-703 and 204-705).
- 27 . Retest the vehicle on rough road to check for other knocks.
- 28 . **NOTE:** Fixings should be replaced every time clamps are removed.
If knock is still present, remove actuator clamps and replace both stabilizer bar bushings and fixings. Tighten actuator clamps fixings to correct torque. (Use Special Service Tools 204-703 and 204-705).
- 29 . Retest the vehicle on a rough road to check all knocks have been eradicated. Drive the vehicle at approx 20 mile/h, gently rocking the steering wheel from side to side once a second. This can demonstrate 'thud' which is a hydraulic noise caused by the Dynamic Response control valves switching. Refer to TSB LS204-012 for further details. Having verified that all the checks described in the first four sections above (down to and including 'Steering Column') are completed, remove the fuse (fuse 9, LHS of engine bay) and repeat the test. The 'thud' should be eliminated - if so this is a normal consequence of system operation (check pipe routings again - step 24 - as this can affect noise levels). If the noise is reduced but still evident, and all previous checks described are verified, this suggests another failure mode; contact Dealer Technical Support.