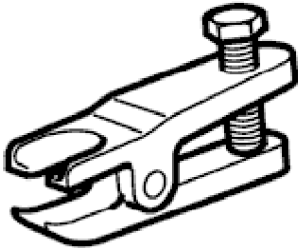


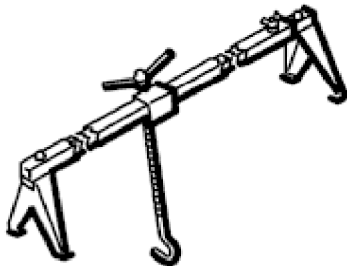
Front Axle Crossmember

Special Service tools



E36397

Tie-Rod-End Taper Separator
211-098 (JD 100)



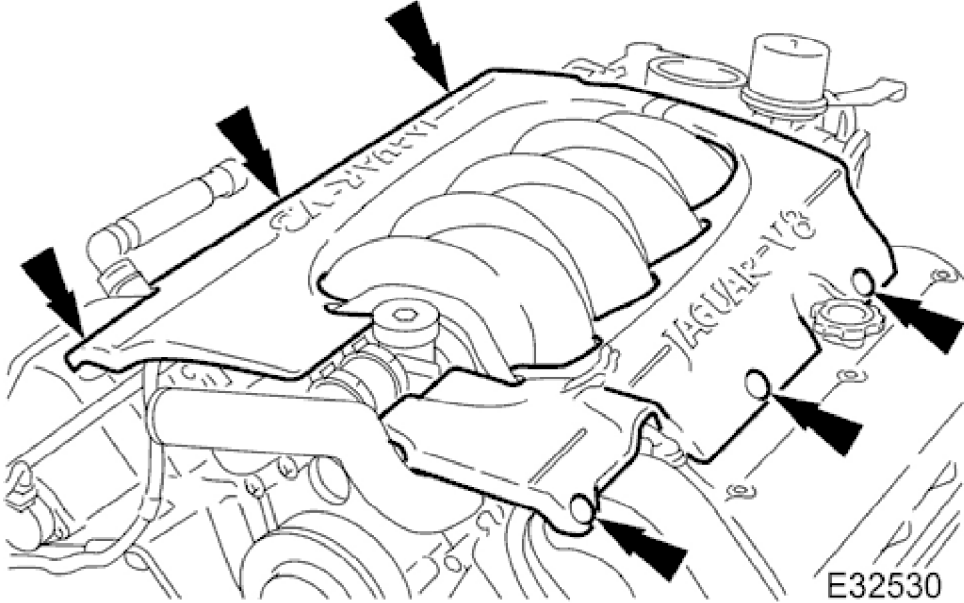
E36400

Engine Support Beam
303-021 (MS 53D)

Removal  **CAUTION:**
Replacement of nuts and bolts: Various thread-locking devices are used on nuts and bolts throughout the vehicle. These devices restrict the number of times a nut or bolt can be used. See section <<100-00>> for information.

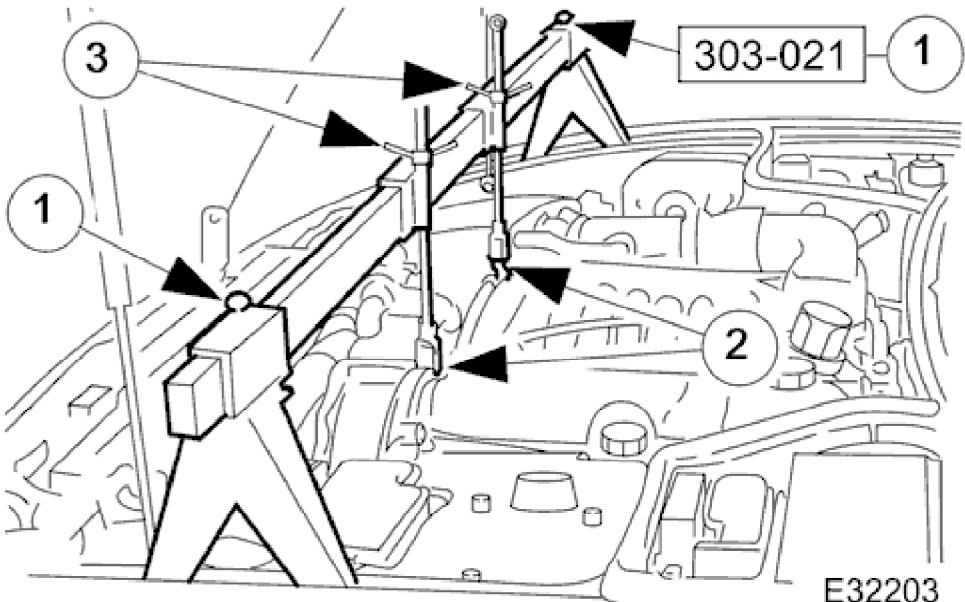
1. Position vehicle on a four-post lift.
2. Raise front of vehicle and support on stands.
3. Remove battery cover and disconnect ground cable from battery terminal. Refer to section <<86.15.15>>.
4. Open hood to service position, and fit covers to fenders.

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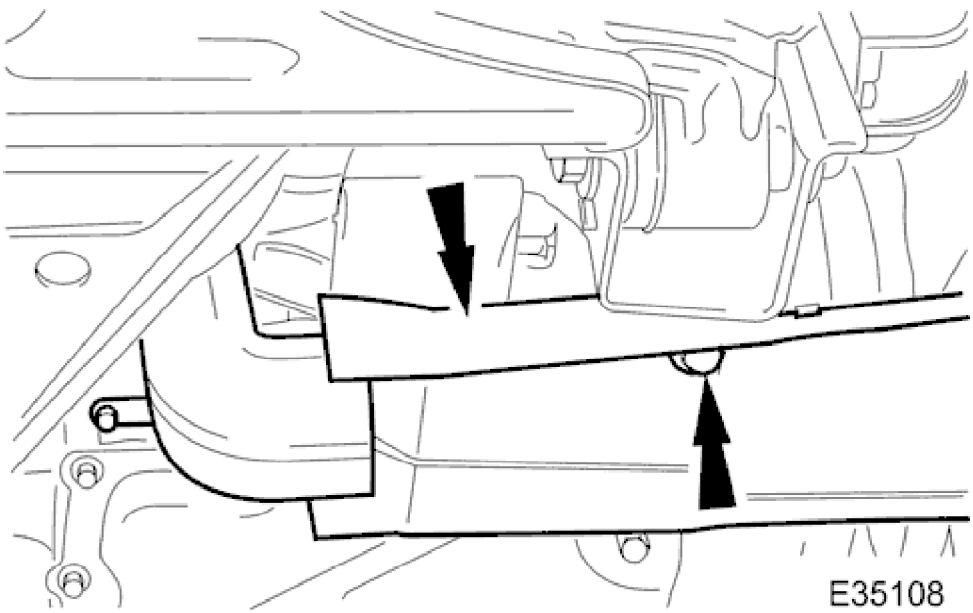


- 5. Remove both engine covers (normally aspirated vehicles only).
 - Release pegs.
 - Remove covers.

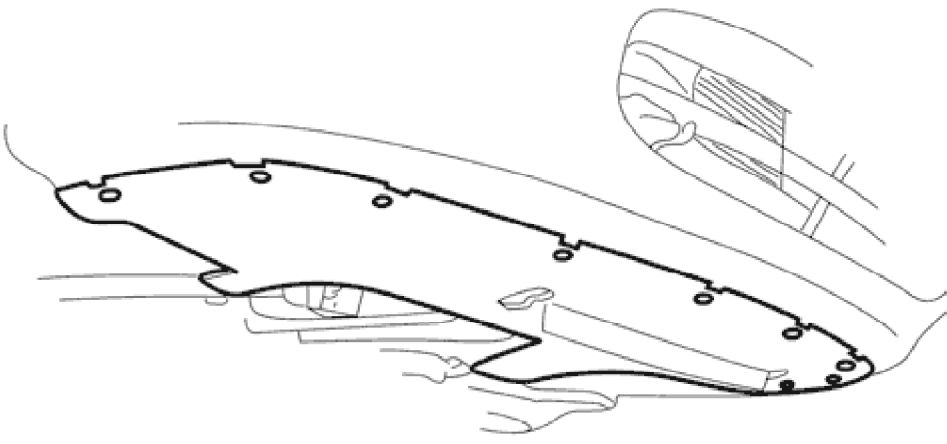
6. Remove air intake tube/meter/ cleaner cover assembly. Refer to 19.10.30



- 7. Support weight of engine.
 - 1. Position special tool 303-021 in RH and LH fender channels and tighten beam fixings.
 - 2. Engage hooks in the engine front lifting eyes.
 - 3. Tighten hook adjustment nuts until weight of engine is supported.

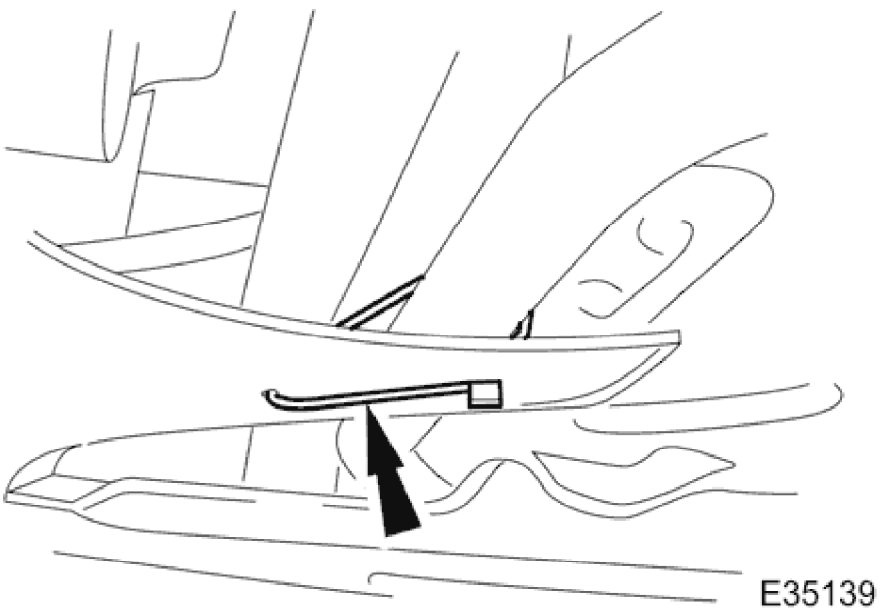


8. Remove generator front cooling duct.
- Remove bolt.
 - Move duct rearwards to release tang from undertray.
 - Release front duct from rear vertical duct.

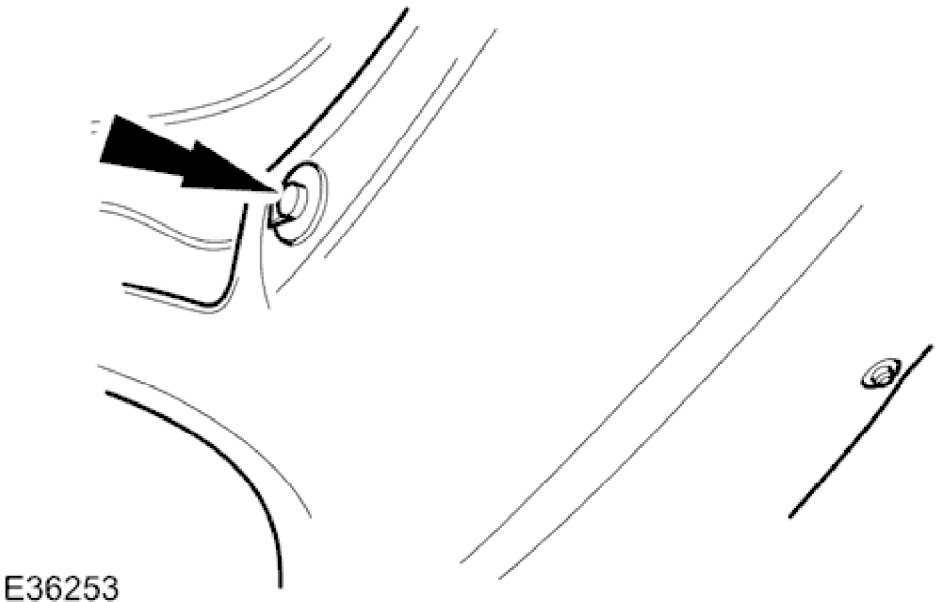


- E36252
9. Remove scrivets or screws securing undertray to bumper cover. Discard scrivets.

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10. Remove and discard tiestrap securing undertray to body brace.

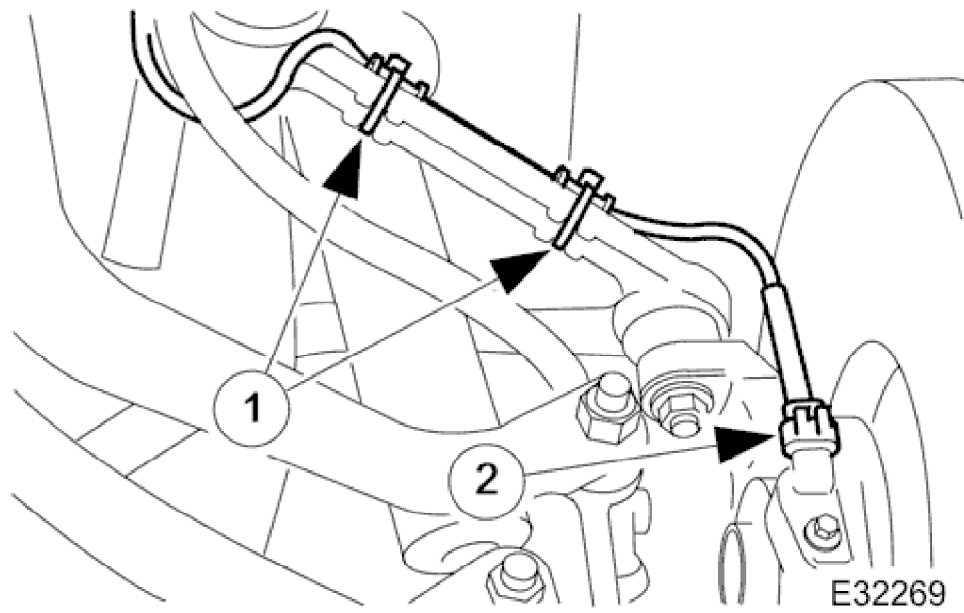


11. At each side of vehicle, remove and discard scrivet securing undertray to wheelarch liner.

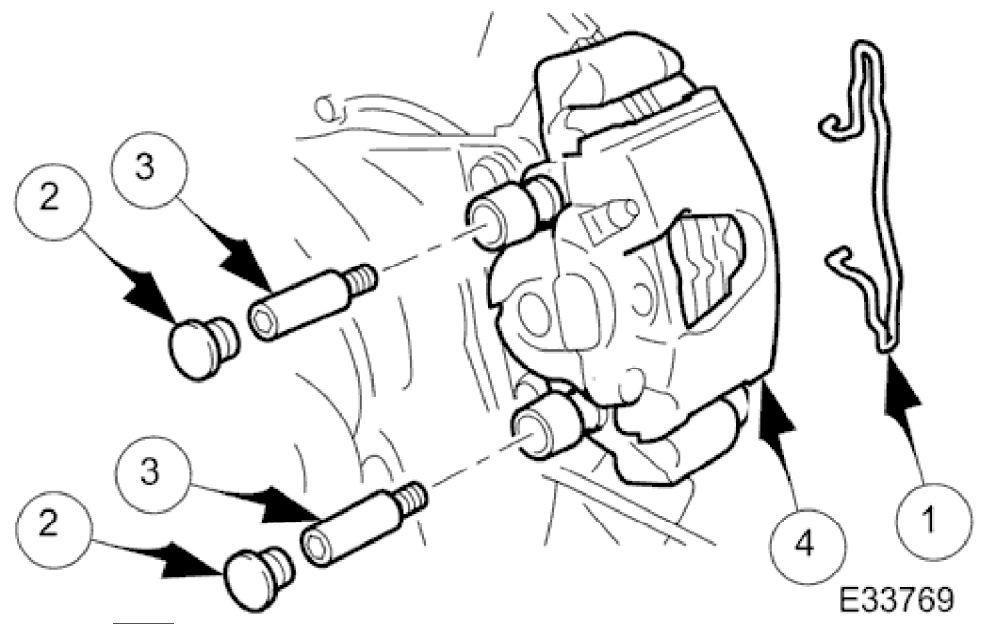
12. Remove undertray from vehicle.


13. Remove both front road wheels. Refer to Section <<100-02>>.

14. Remove both front road springs. Refer to 60. 20.02.



15. Disconnect wheel speed sensor harness connectors.
- 1. Sever and discard tiestraps securing front wheel speed sensor harness to upper wishbone.
 - 2. Disconnect harness connector from sensor.
- Repeat procedure to disconnect opposite side wheel speed sensor harness.

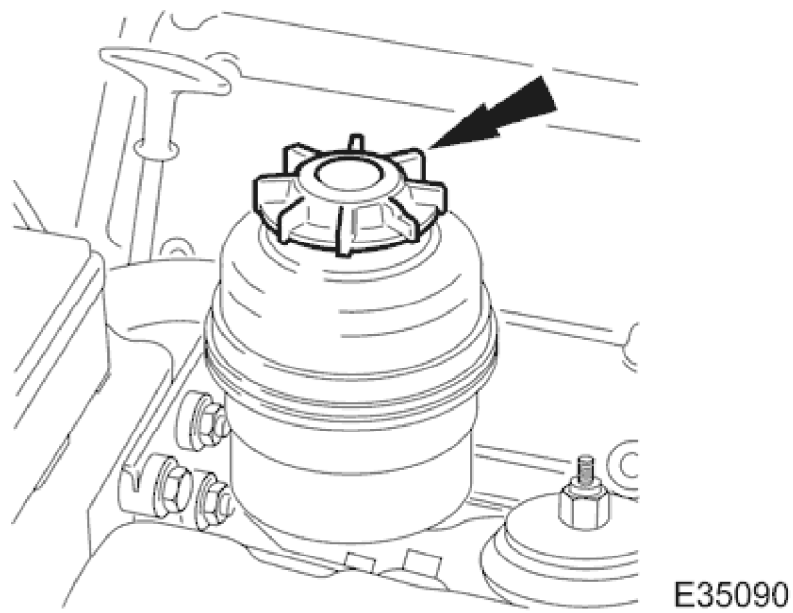


16.  **CAUTION:**
Do not suspend caliper from brake hose as this will damage the hose.

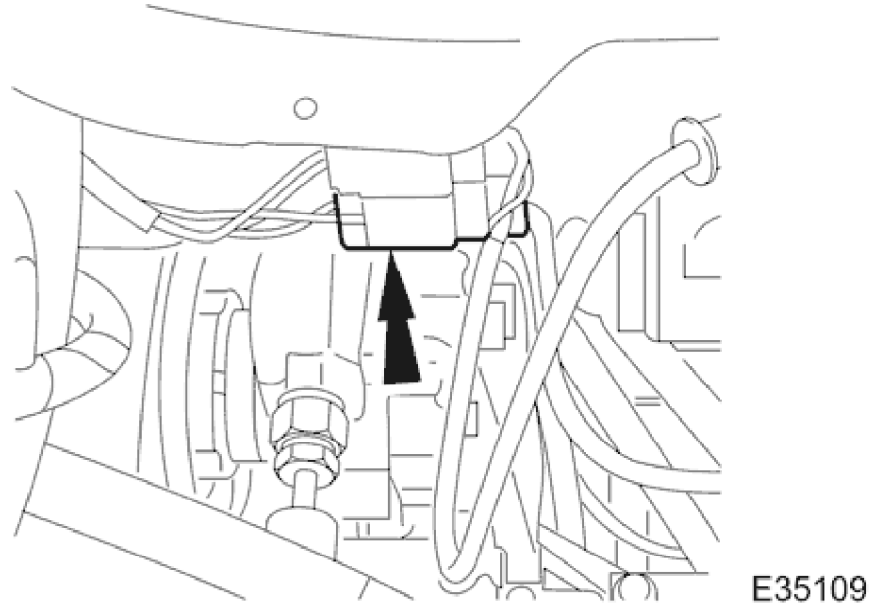
- Remove brake calipers from carriers.
- 1. Remove caliper spring clip.
 - 2. Remove guide pin dust caps.
 - 3. Slacken and withdraw guide pins.
 - 4. Remove caliper from carrier and tie to suspension mounting bracket.

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- Repeat procedure to remove opposite side front brake caliper.



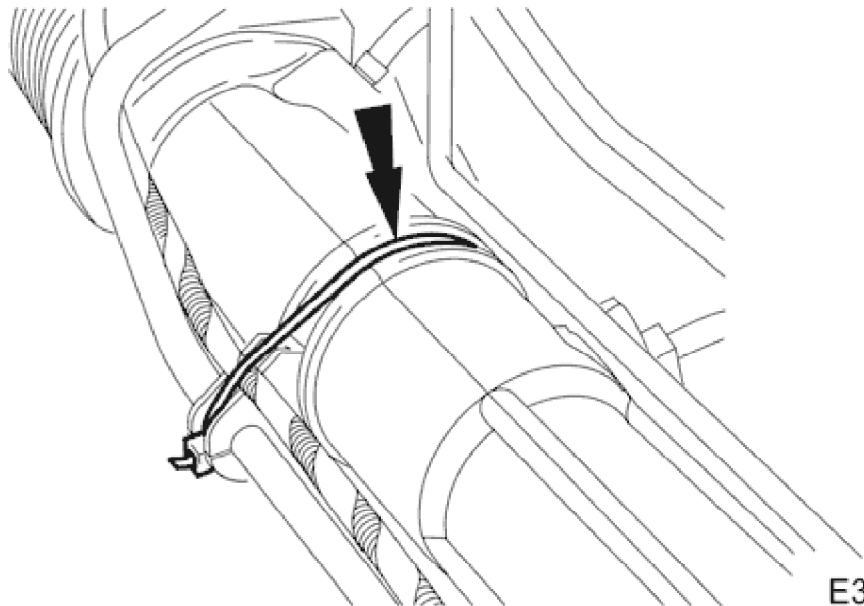
17. Remove filler cap from power steering fluid reservoir.



18. Disconnect steering rack transducer harness front connector.

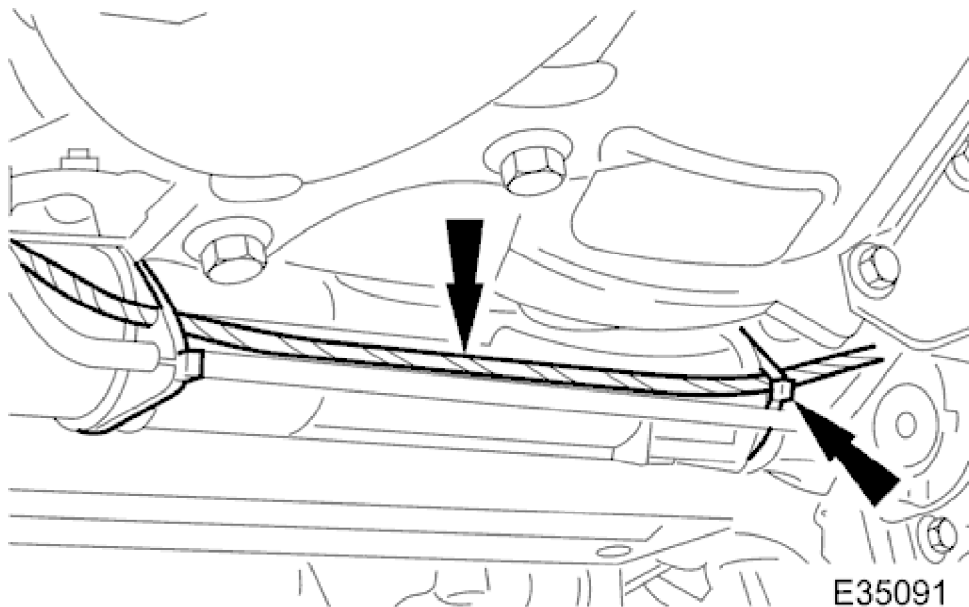
- Release harness connector from body retaining clip.
- Disconnect connector.

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E35113

19. Sever and discard tie strap securing return pipe, harness (RHD only) and rubber support to steering rack.

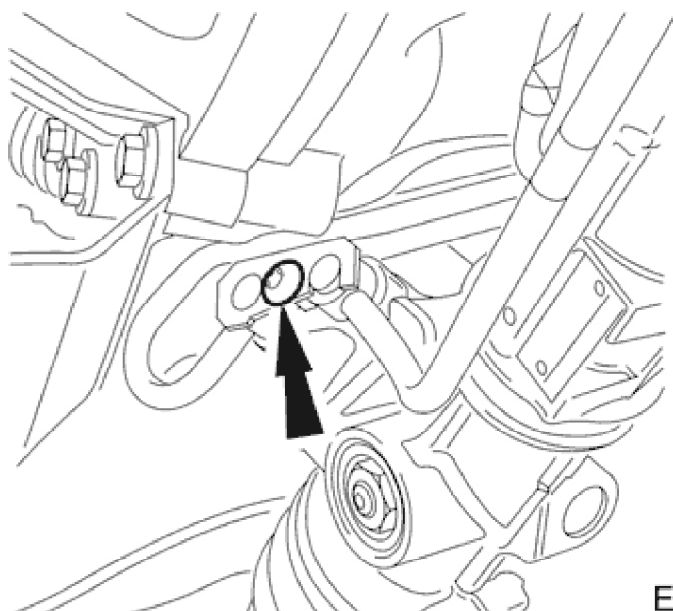


E35091

20. RHD vehicles. Sever and discard tie strap securing harness to steering rack.

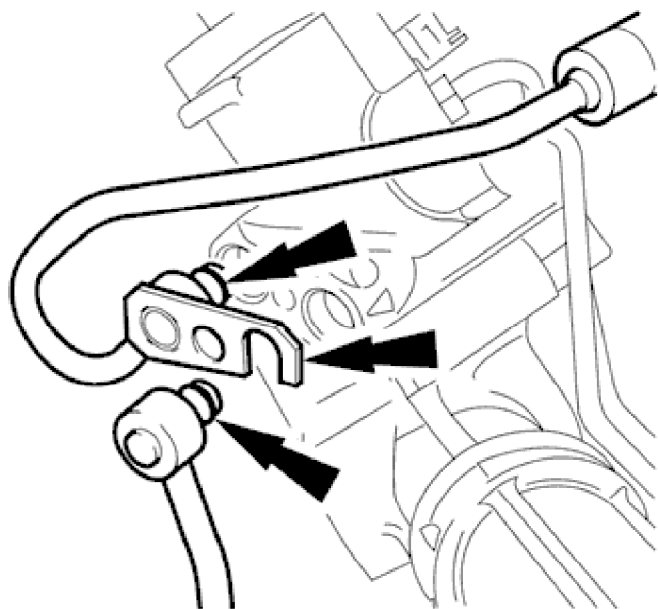
21. Route harness from behind steering return pipe.

22. Position a drain receptacle below pinion housing.



E35110

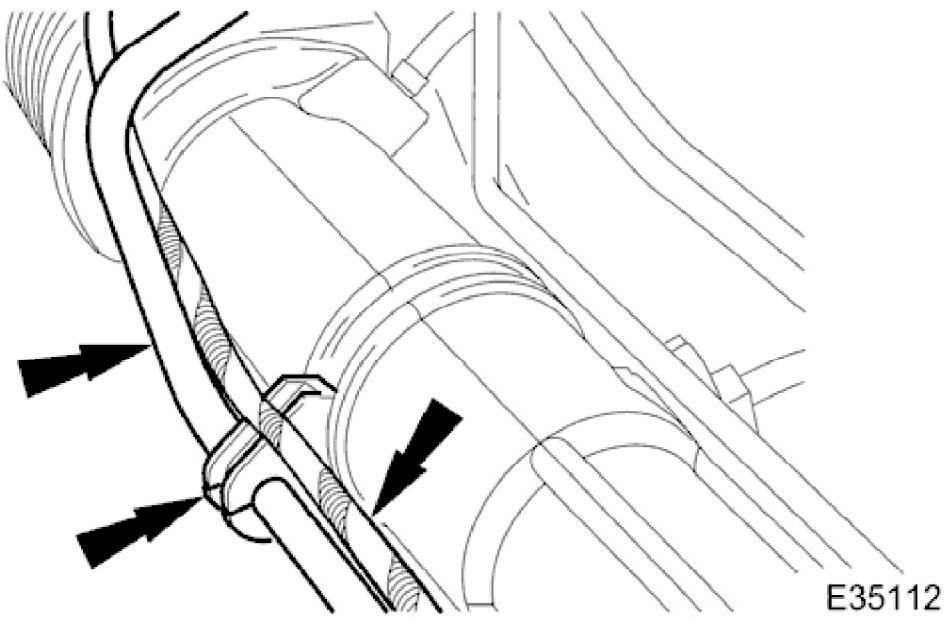
23. Remove pipe retaining plate securing bolt and withdraw plate.



E35111

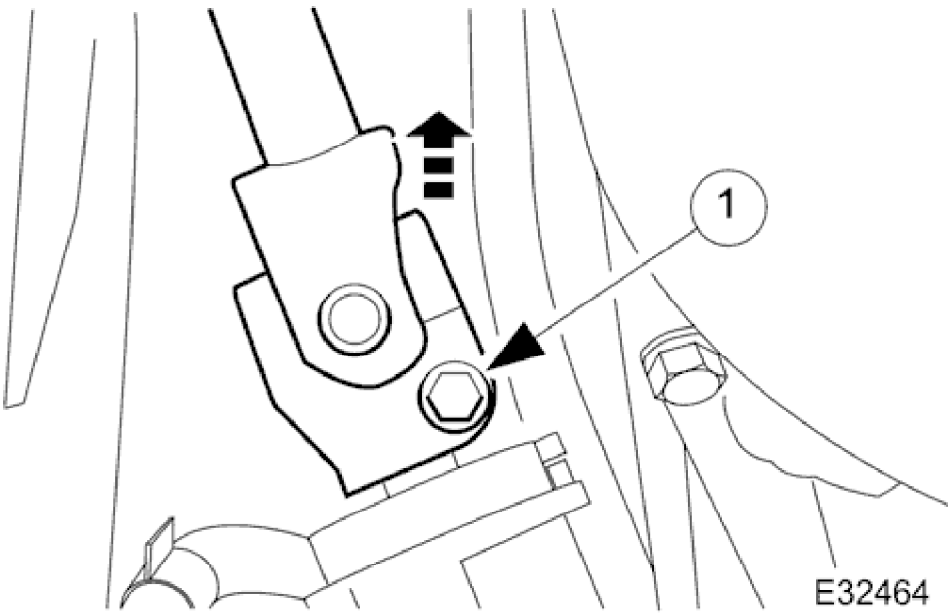
24. Drain power steering fluid.
- Disconnect pipes and allow fluid to drain.
 - Remove and discard 'O'-ring seals from pipe connectors.
 - Fit blanking plugs to pipe connectors and pinion housing ports.

25. Remove drain receptacle.

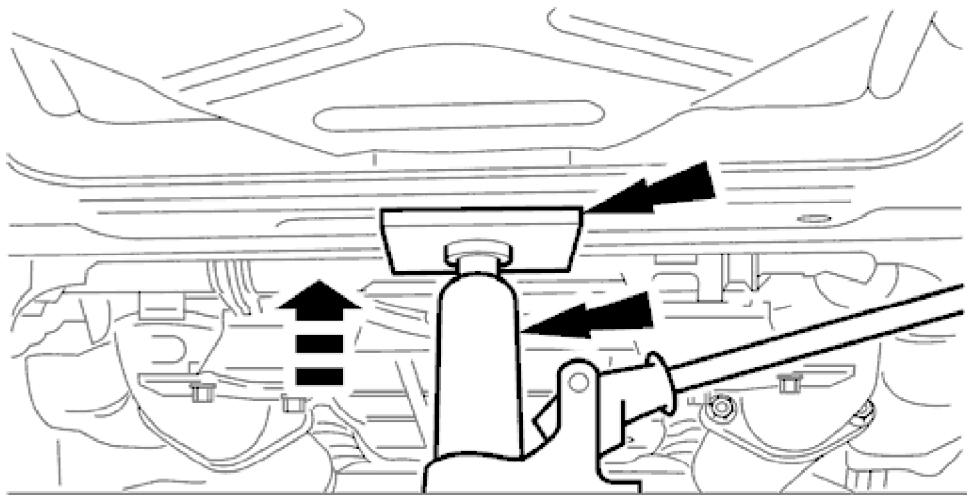


26. Remove pipe support from steering rack.
- Release return pipe from support.
 - Remove support from rack.

27. Ensure that steering is in central position.

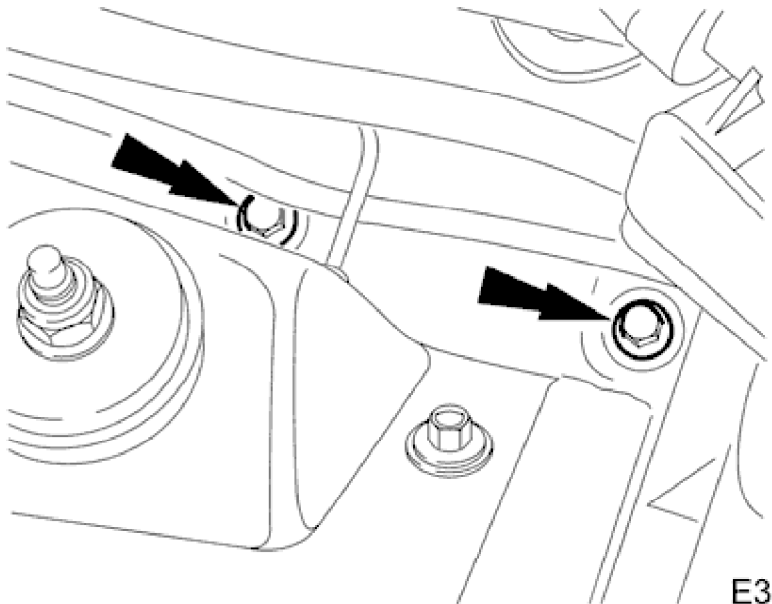


28. Release lower steering column from pinion shaft.
1. Remove lower steering column securing nut and bolt.
- Move column upwards to release it from pinion shaft.



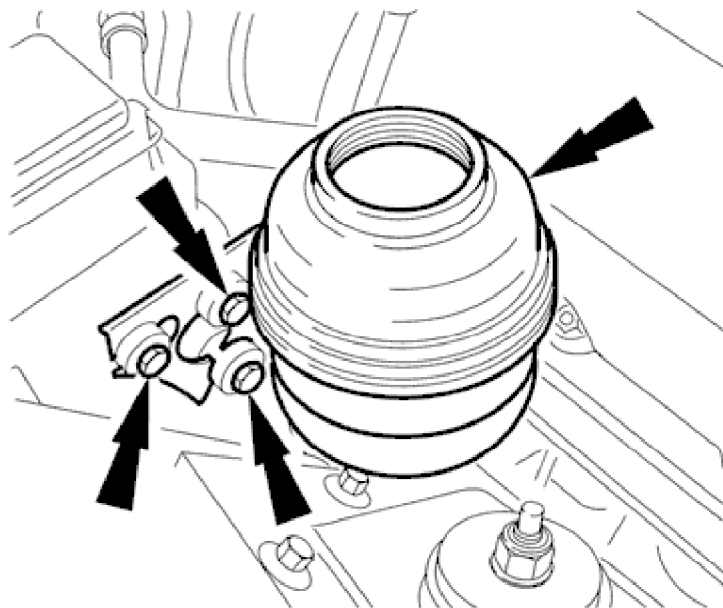
E35093

29. Support weight of crossbeam.
- Position a jack under crossbeam.
 - Place a piece of wood between jack and crossbeam.
 - Raise jack to just support crossbeam.



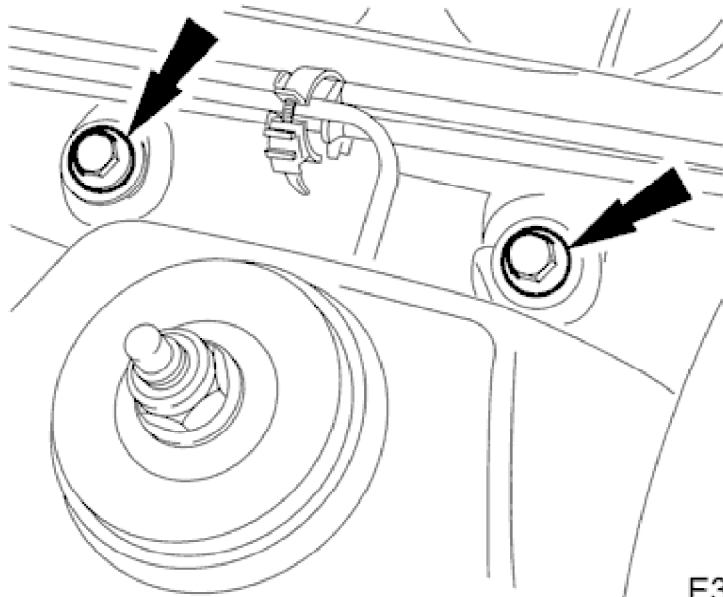
E35094

30. From engine compartment, remove crossbeam front RH securing bolts.



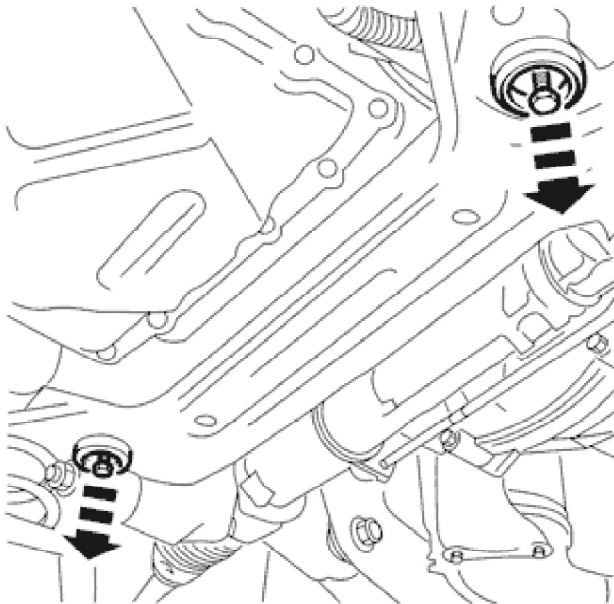
E35095

31. Remove power steering fluid reservoir for access.
- Remove reservoir securing nuts and bolts.
 - Position reservoir for access.



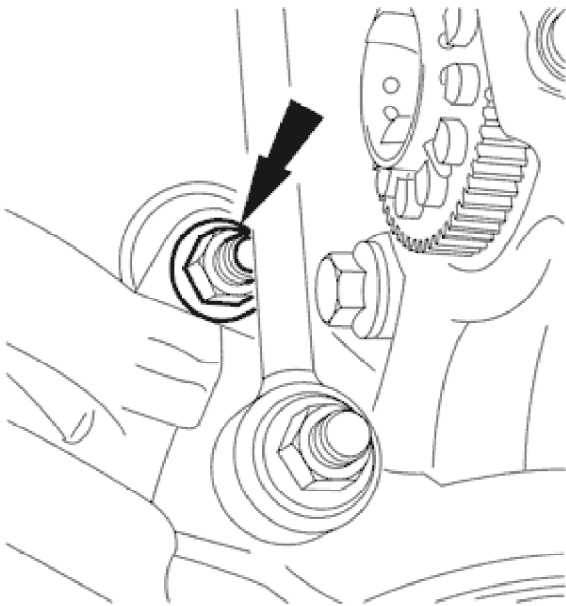
E35096

32. From engine compartment, remove crossbeam front LH securing bolts.




E35097

33. Remove crossbeam to engine Hydramount securing bolts.
- Remove bolt securing crossmember to Hydramount.
 - Fully withdraw bolt into crossmember insert.
 - Repeat procedure to remove and withdraw bolt on opposite side



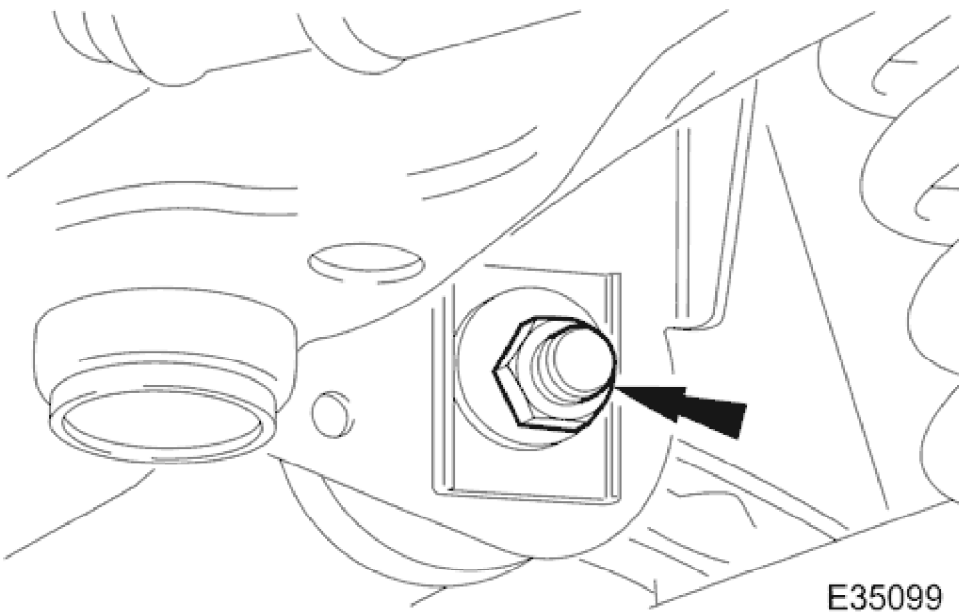
E35098

34.  **CAUTION:**
To prevent damage to ball joints, secure each hub assembly to suspension turret using strong wire.

Remove lower nut and bolt from front shock absorber.

- Repeat procedure to remove bolt from opposite side shock absorber.

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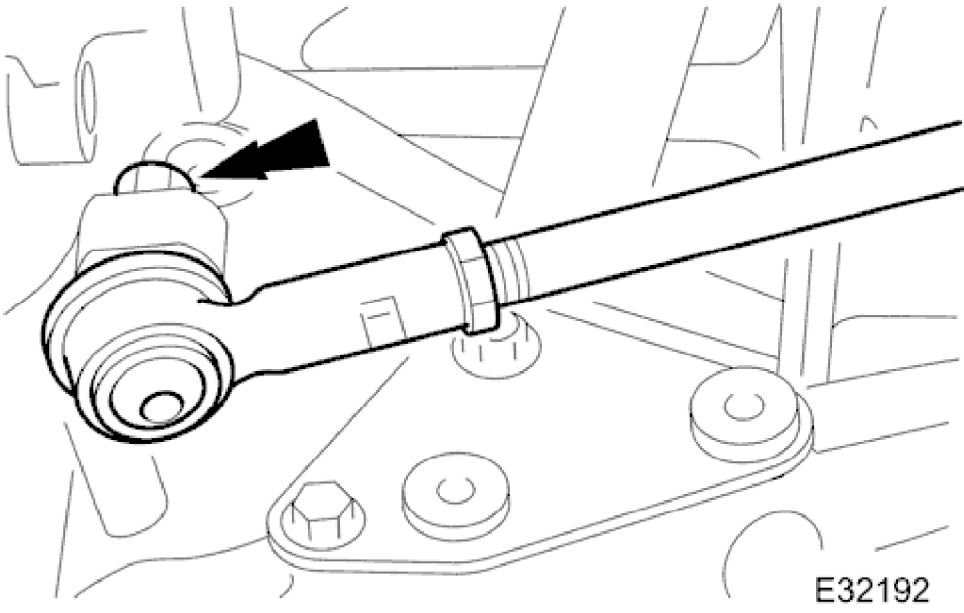


- 35. Remove crossbeam rear securing bolts.
 - Remove bolt from crossbeam LH rear mounting.
 - Repeat procedure to remove bolt from crossbeam RH rear mounting.

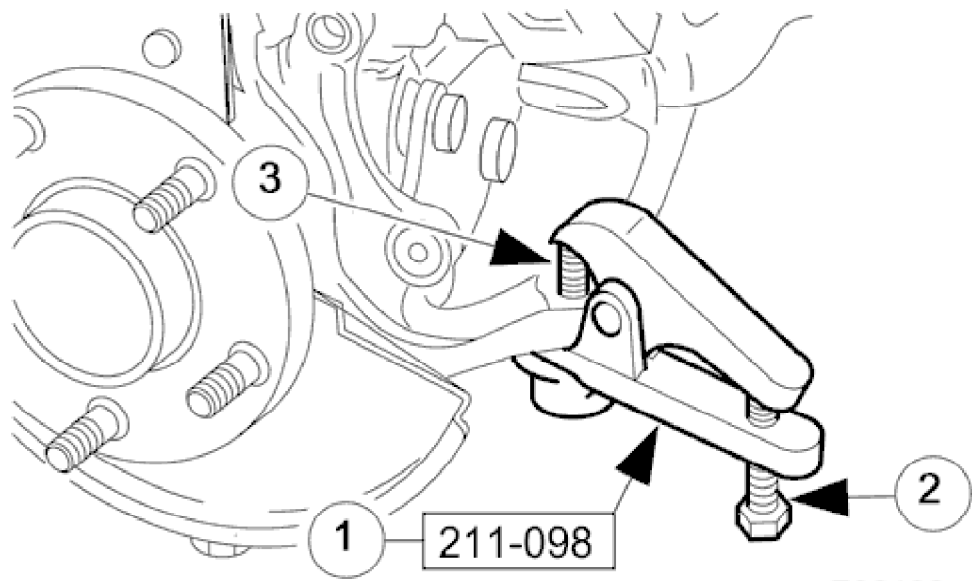
- 36. Ensure that steering transducer harness is clear of return pipe and LH side body.

- 37. Lower and traverse front suspension assembly clear of vehicle.

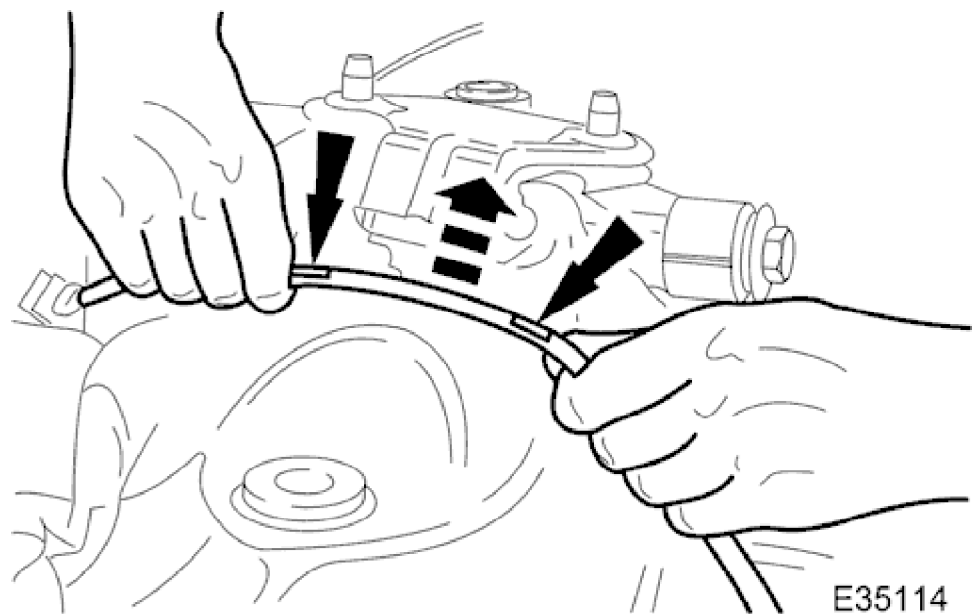
- 38. With assistance, lift front suspension assembly onto bench.



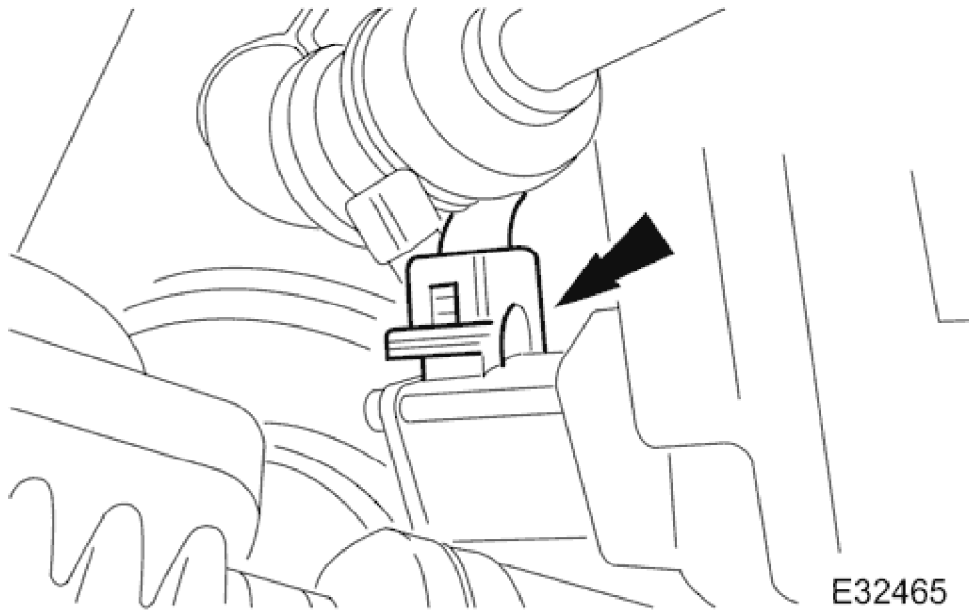
- 39. Remove nut securing each tie rod outer ball joint to steering arm.



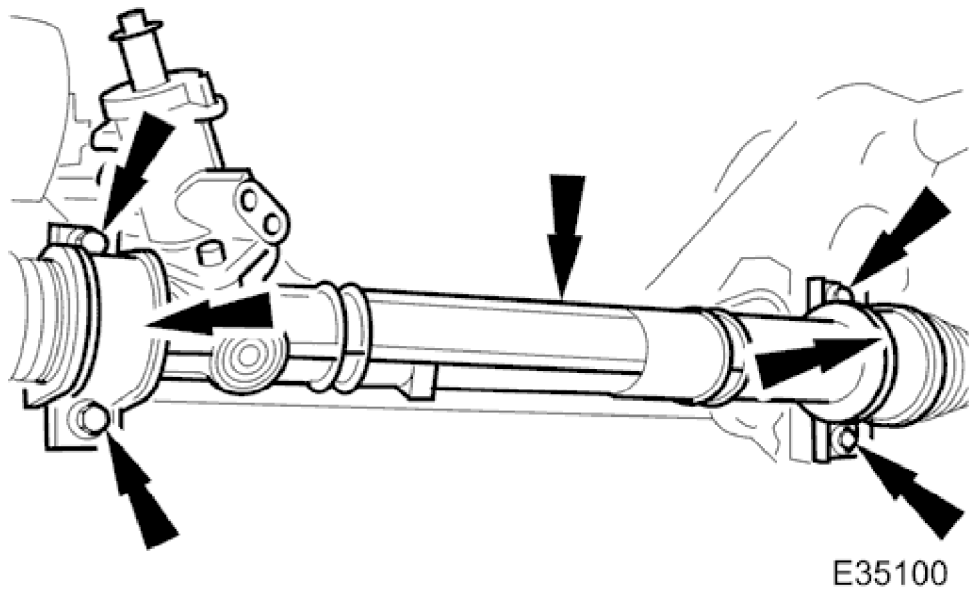
40. Release tie rod ball joint from steering arm.
- 1. Install special tool 211-098 on tie rod outer ball joint.
 - 2. Tighten tool bolt to release ball joint taper pin.
 - 3. Remove tool and release tie rod from steering arm.
 - Repeat procedure to release opposite side tie rod ball joint.



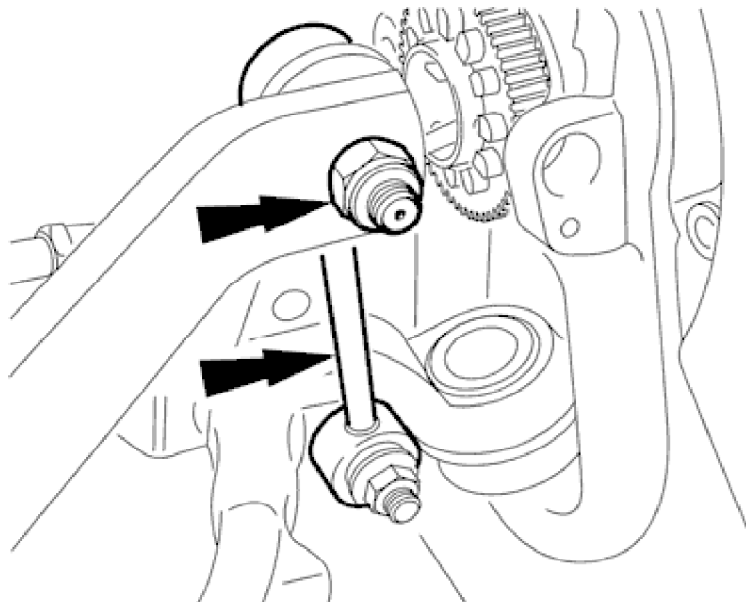
41. Remove steering harness from LH suspension turret.
- Release harness securing clips from suspension turret.
 - Mark position of clips on harness.
 - Remove tape securing clips to harness and discard clips.



42. Disconnect and remove steering harness.
- Disconnect harness connector from transducer.
 - Remove harness from suspension assembly.

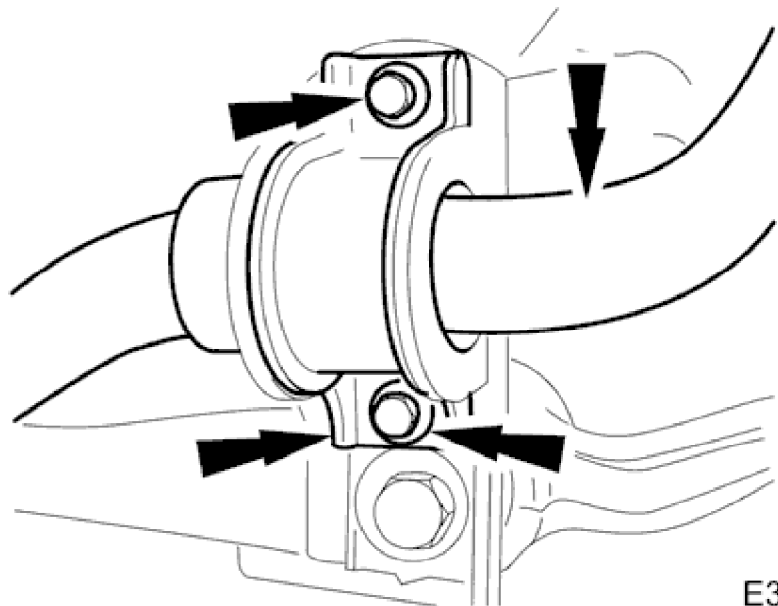


43. Remove steering rack from crossbeam.
1. Remove steering rack securing bolts.
 2. Remove steering rack and mounting brackets.



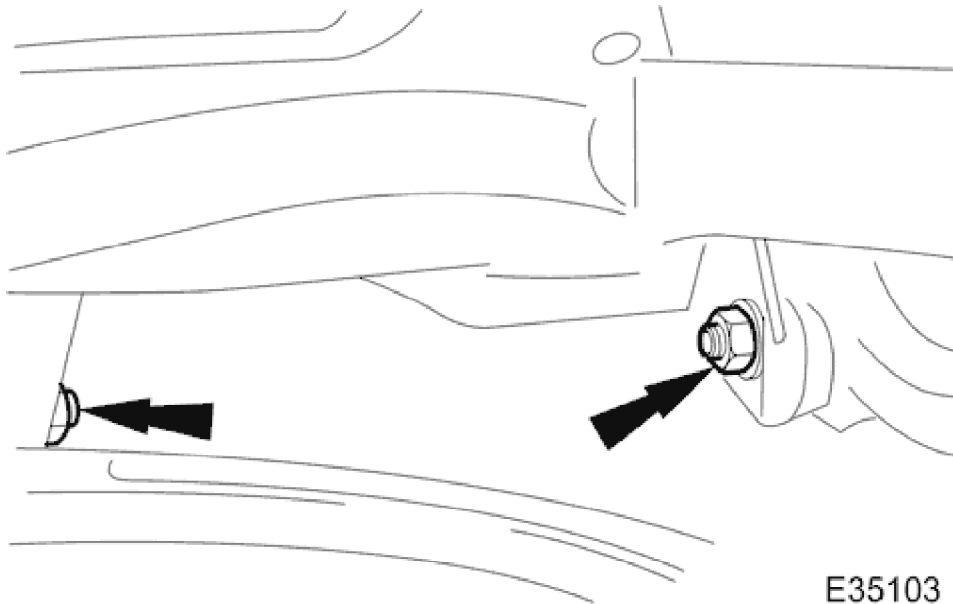
E35101

44. Release stabilizer bar from link arms.
- Remove link arm to stabilizer bar securing nut.
 - Release link arm from stabilizer bar.
 - Repeat procedure to release opposite end of stabilizer bar from link arm.



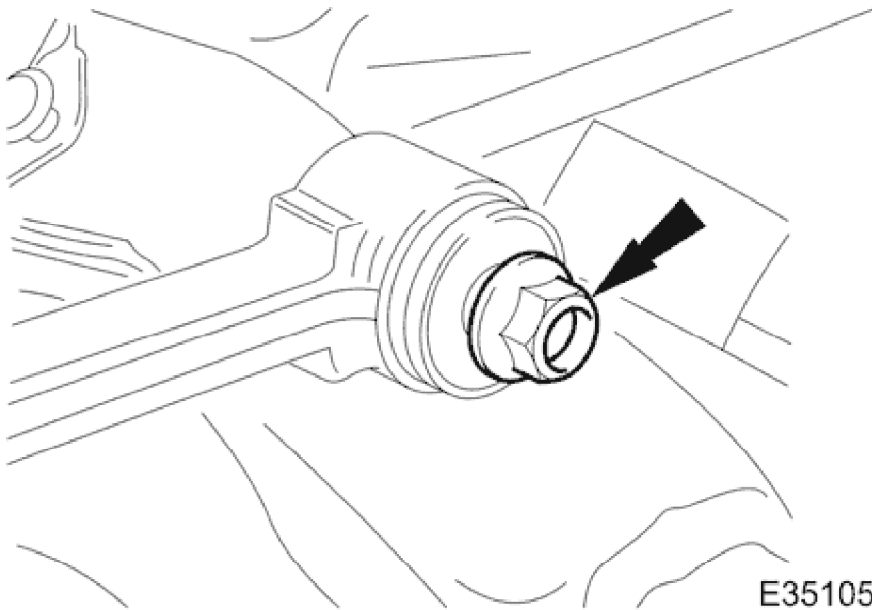
E35102

45. Remove stabilizer bar from crossbeam.
- Remove stabilizer bar securing bolts.
 - Remove stabilizer bar mounting brackets and remove bar from crossbeam.



E35103

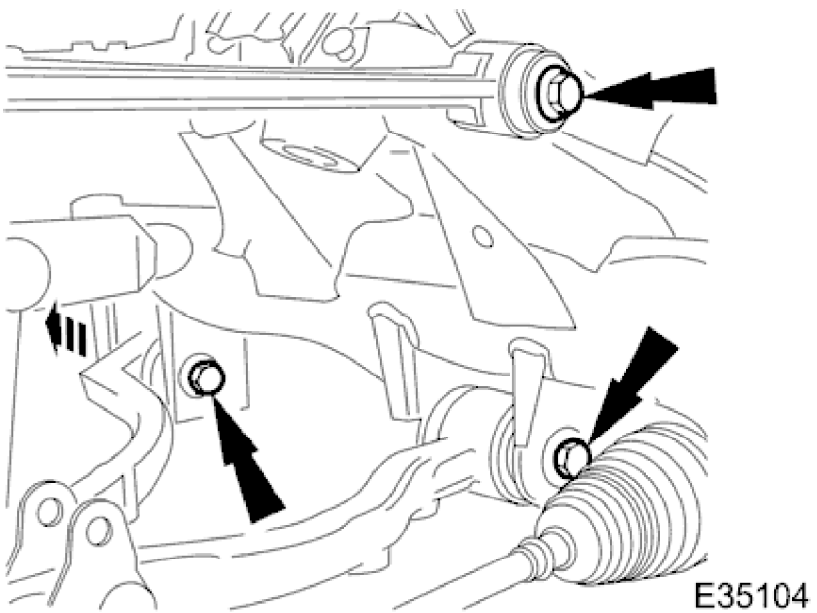
46. Remove wishbone securing nuts.
1. Remove lower wishbone front arm eccentric bolt securing nut.
 2. Remove lower wishbone rear arm eccentric bolt securing nut.
- Repeat procedure to remove wishbone securing nuts from opposite side.



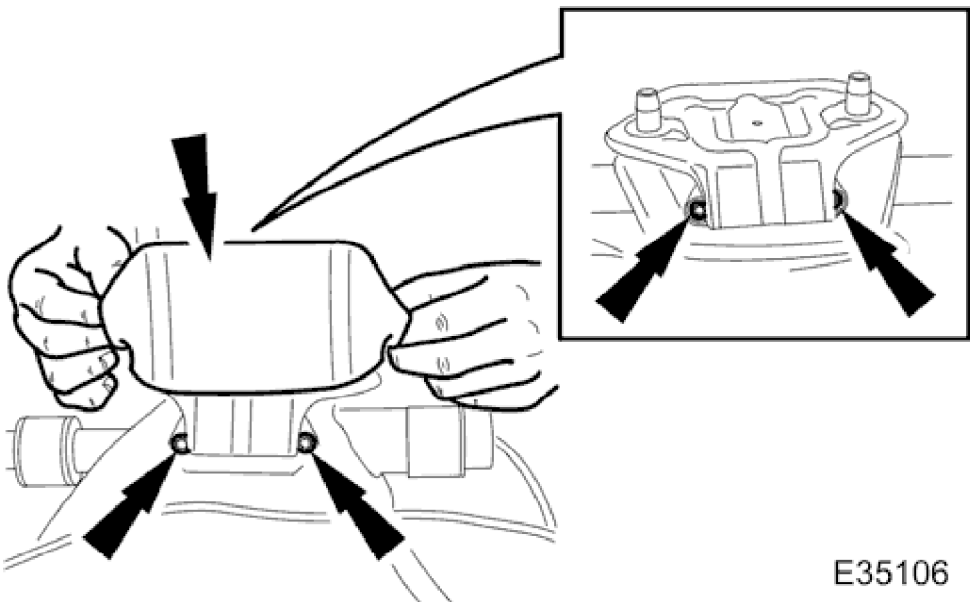
E35105

47. Remove upper wishbone fulcrum shaft securing nut.
- Repeat procedure to remove securing nut from opposite side fulcrum shaft .

48. Remove wire temporarily supporting hub assembly.

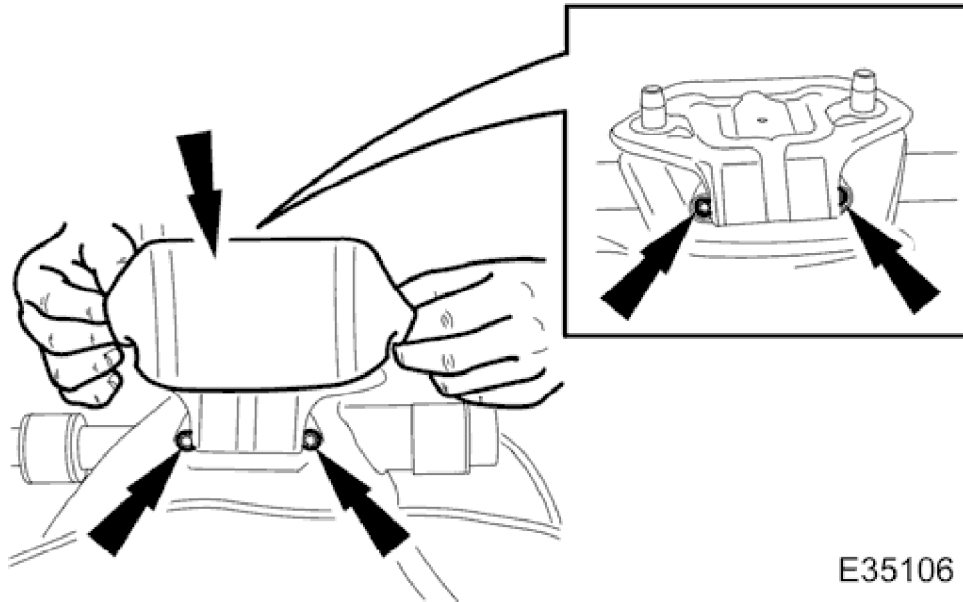


49. Remove wishbone/hub assembly from crossbeam.
- Supporting hub assembly, withdraw lower wishbone eccentric bolts.
 - Supporting hub assembly, withdraw fulcrum shaft from upper wishbone.
 - Remove wishbone/hub assembly from crossbeam.
 - Repeat procedure to remove wishbone/hub assembly on opposite side.

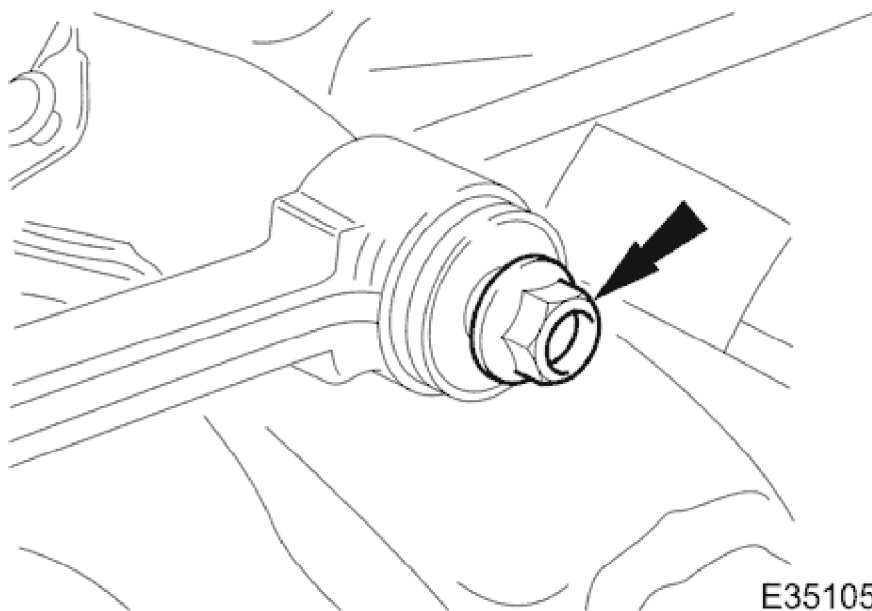


50. Remove crossbeam front mountings.
- Remove front mounting heatshield.
 - Remove four bolts securing mounting to crossbeam.
 - Repeat procedure to remove mounting on opposite side.

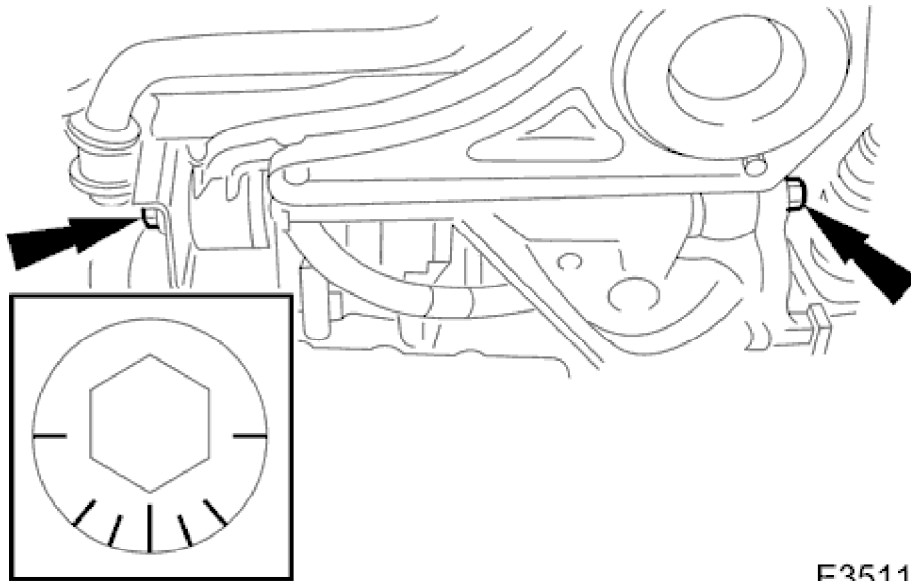
Installation



1. Install front mounting brackets.
- Position and fully seat mounting bracket on crossbeam.
 - Install the four bolts and tighten to 22-28Nm.
 - Install heatshield .
 - Repeat procedure to install mounting bracket on opposite side of crossbeam.



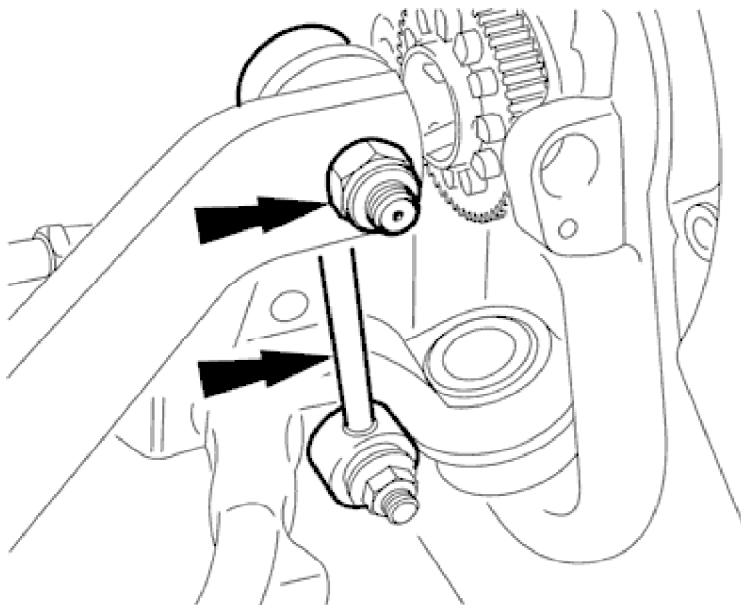
2. Install upper wishbone/hub assemblies on crossbeam.
- Position upper wishbone on crossbeam.
 - Install fulcrum shaft threaded end facing rearward.
 - Install fulcrum shaft securing nut and tighten to 60-80Nm.
 - Repeat procedure to install opposite side upper wishbone/hub assembly.



E35118

3. Install lower wishbone assemblies.

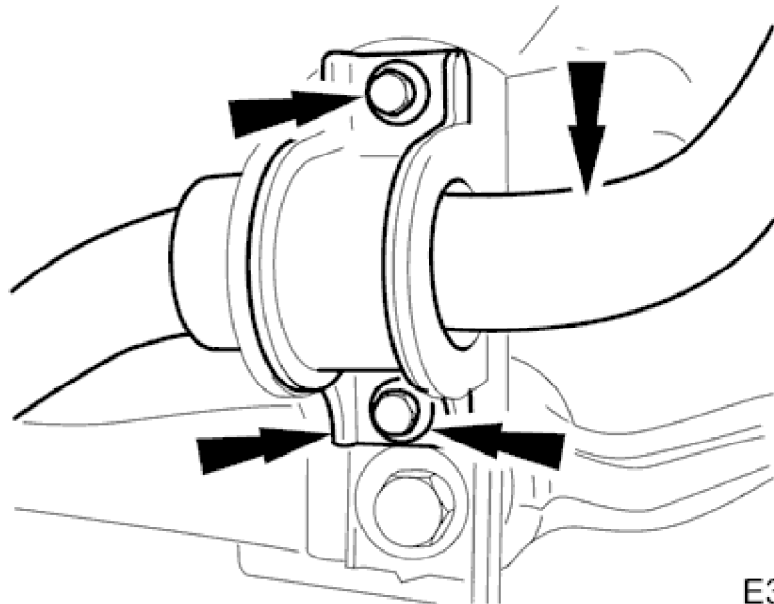
- Position lower wishbone on crossbeam.
- Install but do not tighten wishbone front and rear arm eccentric bolts and nuts.
- Rotate each eccentric bolt to position largest graduation mark vertically.
- Ensuring that eccentric bolts do not rotate out of position, partially tighten securing nuts.
- Repeat procedure to install opposite side upper wishbone/hub assembly.



E35101

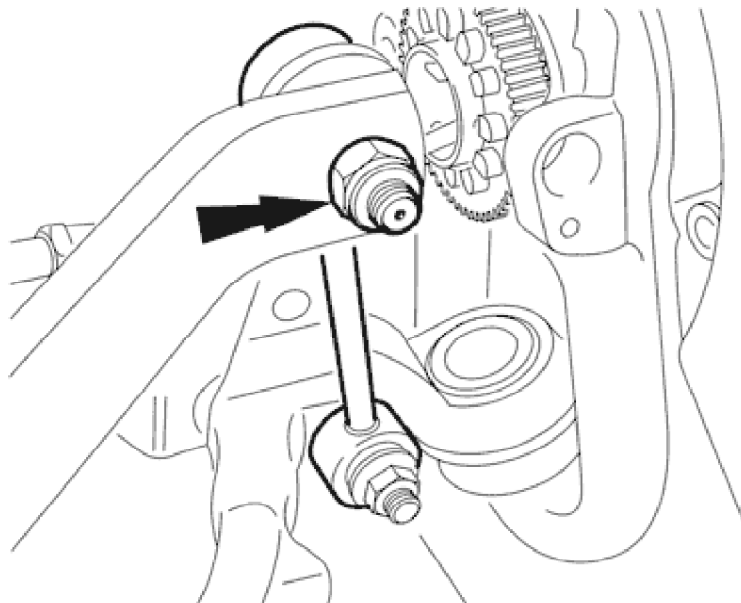
4. Install stabilizer bar to link arms.

1. Position stabilizer bar and install link arm pin in bar.
 2. Install but do not tighten link arm pin to stabilizer bar securing nut.
- Repeat procedure to install link arm at opposite end of stabilizer bar.



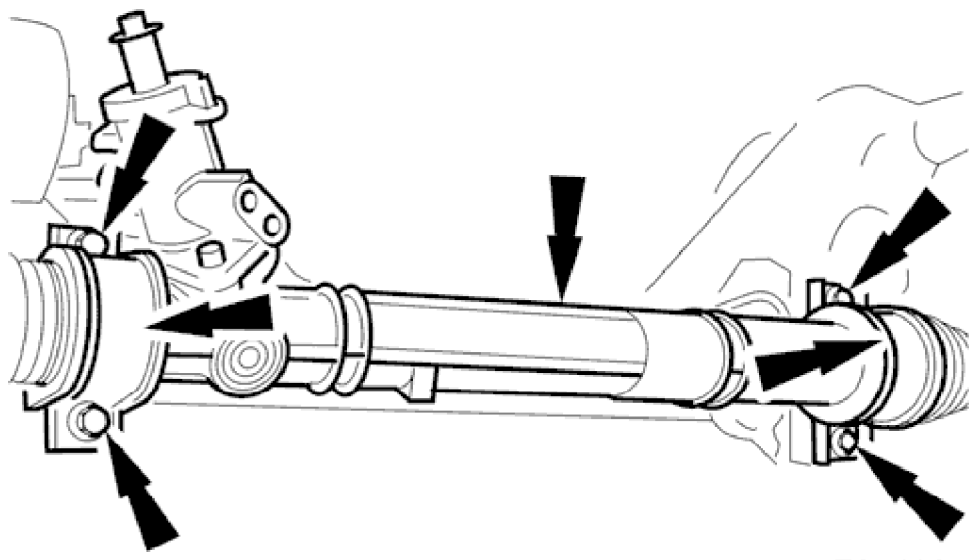
E35102

- 5. Install stabilizer bar to crossbeam.
 - Ensure bushes are correctly positioned on stabilizer bar.
 - Install support brackets over bushes.
 - Position stabilizer bar on crossbeam.
 - Install and tighten bolts to 30-40Nm.
 - Repeat procedure at opposite end of stabilizer bar.



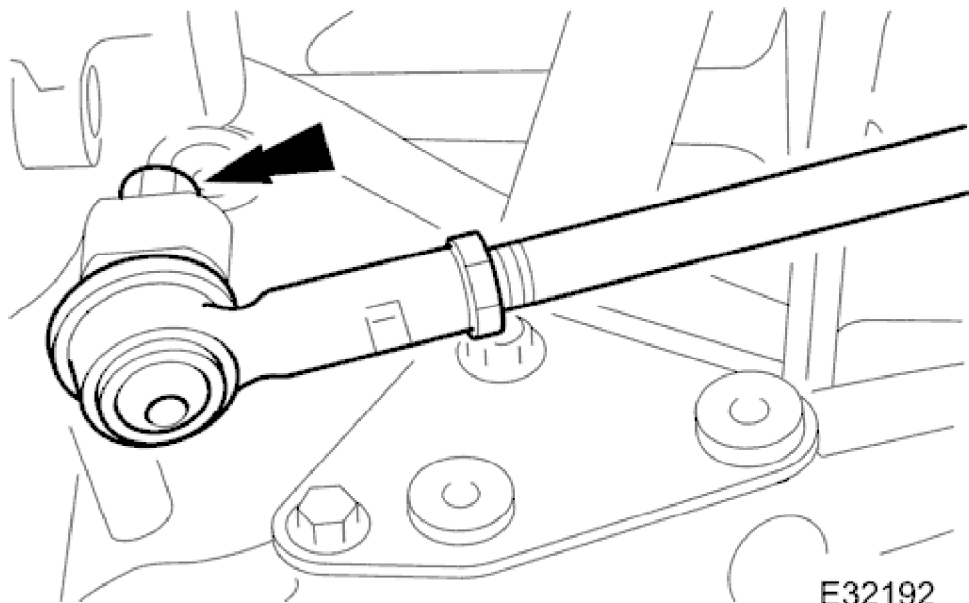
E35117

- 6. Tighten link arm to stabilizer bar securing nut to 60-80Nm.
 - Repeat procedure at opposite end of stabilizer bar.



E35100

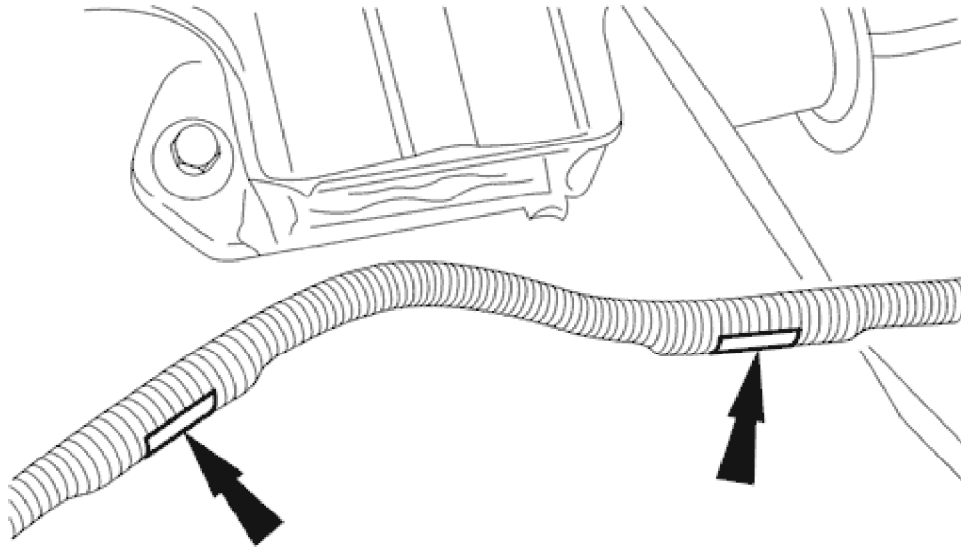
7. Install steering rack on crossbeam.
- Ensure that bushes are correctly positioned on steering rack.
 - Position steering rack on crossbeam.
 - Position support brackets over bushes.
 - Install mounting bracket bolts and tighten to 40-54Nm.



E32192

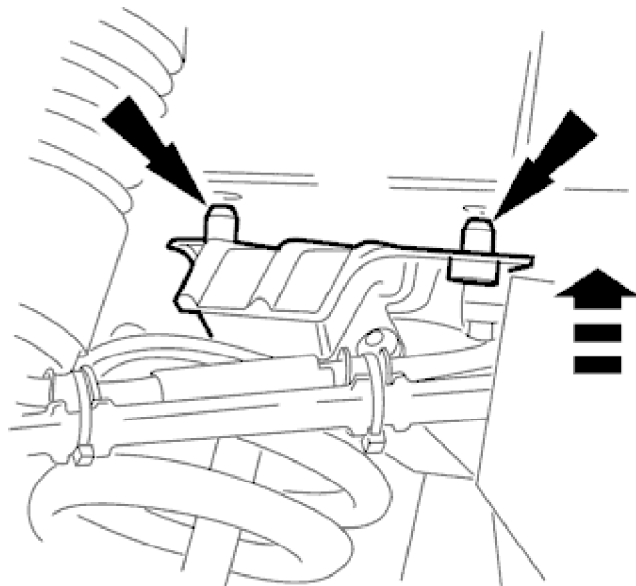
8. Install tie rods on steering arms.
- Position and fully seat tie rod ball joint taper pin on steering arm.
 - Install tie rod ball joint nut and tighten to 71-85Nm.
 - Repeat procedure to install opposite side tie rod ball joint.

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E35092

9. Install harness on suspension turret.
 - Noting positions marked during removal, tape new securing clips to steering harness.
 - Install securing clips/harness on LH turret.
10. With assistance position crossbeam/suspension assembly on jack with protective wood under.
11. Traverse assembly into position below vehicle.
12. Ensure steering harness connector is positioned to avoid damage during crossbeam lift .



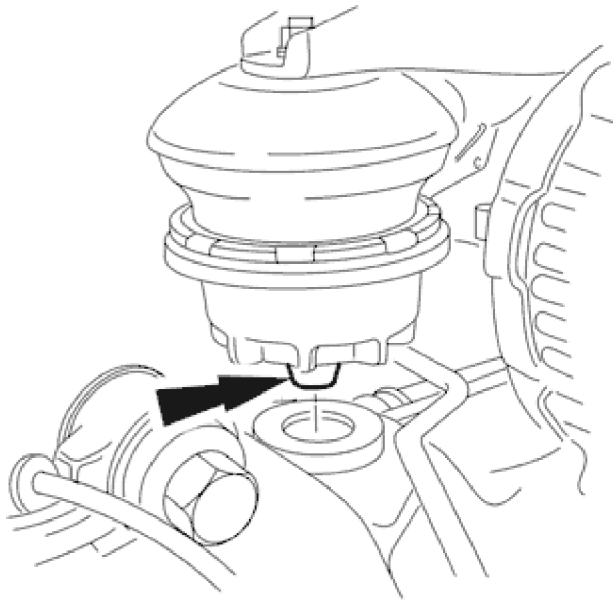
E35149

13. **NOTE:**
It may be necessary to use a hammer and drift to finally align new mounting with body location.

2001 XJ RANGE - Uni-Body, Subframe and Mounting System - 502-00

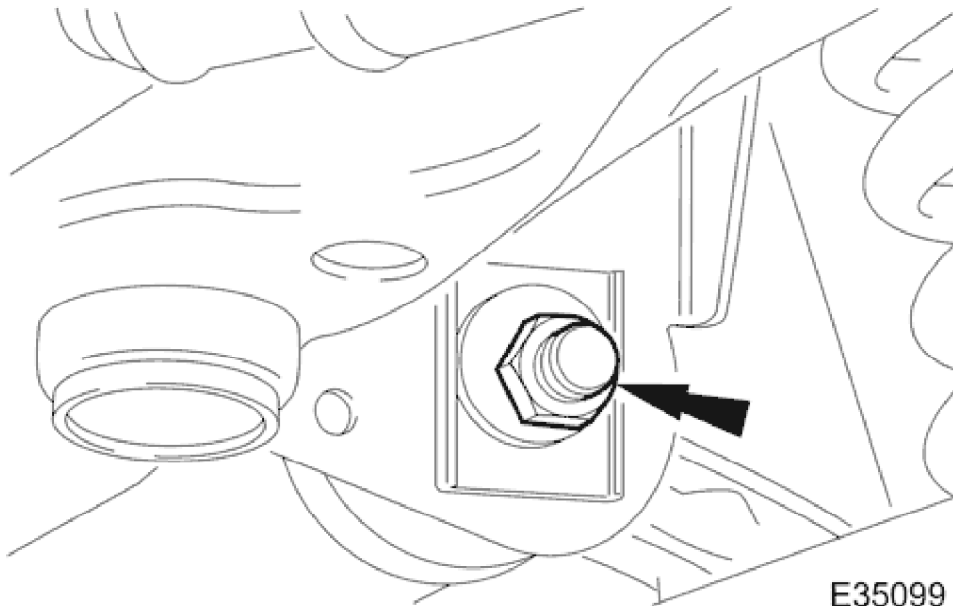
Carefully raise crossbeam assembly into position.

- Ensure that dowels of both crossbeam mountings are correctly seated in body locations.



E35128

14. Ensure that both engine hydramounts are correctly seated in crossbeam locations.

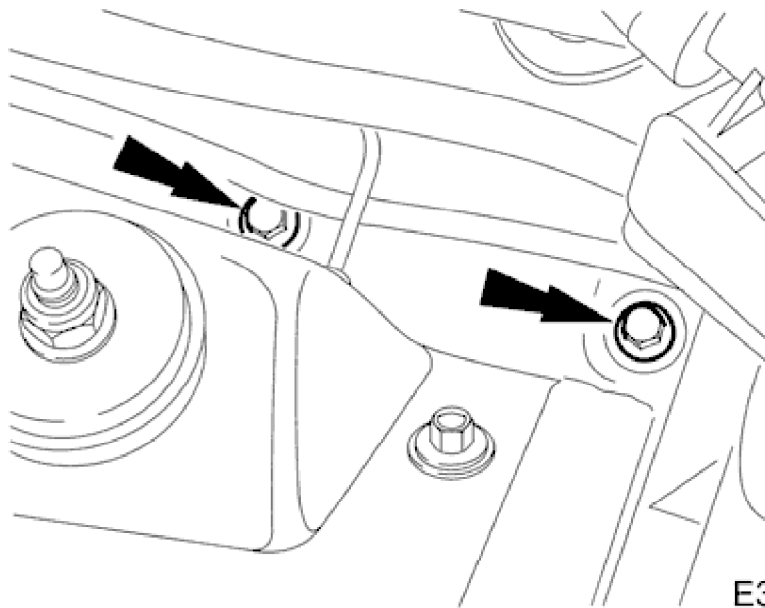


E35099

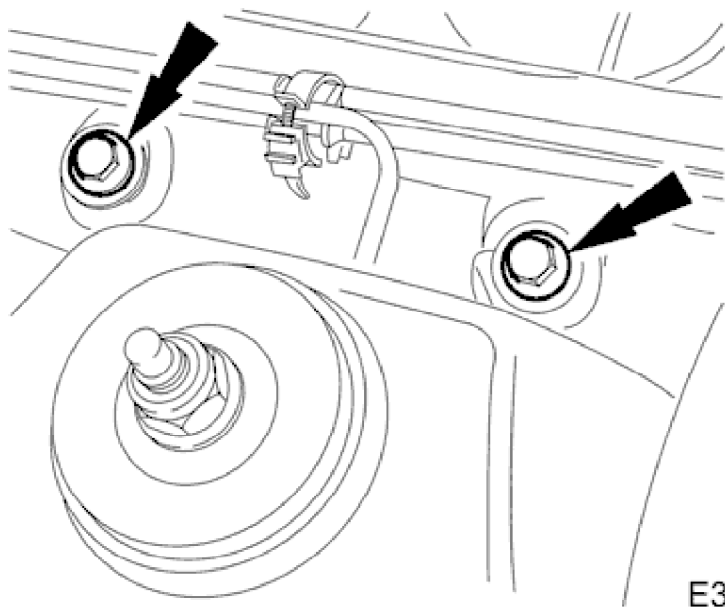
15. Install crossbeam rear mountings.

- Align rear mounting rubber with body location.
- Install rear mounting securing bolt and nut and tighten nut to 131-185 Nm.
- Repeat procedure to install opposite side rear mounting bolt and nut.

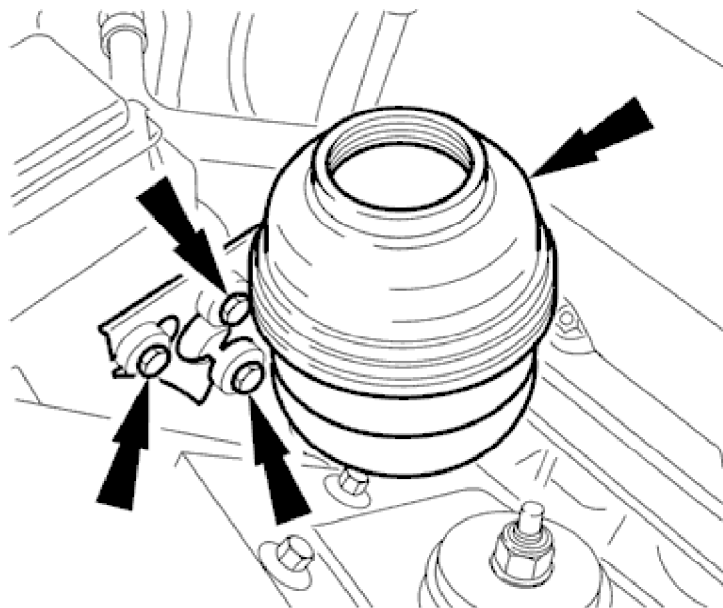
2001 XJ RANGE - Uni-Body, Subframe and Mounting System - 502-00



16. From engine compartment, install but do not tighten crossbeam front RH bolts.

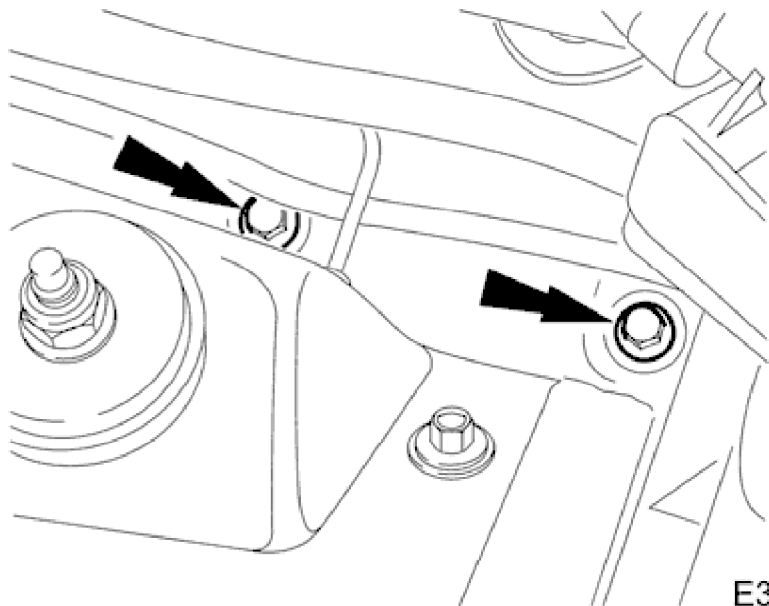


17. From engine compartment, install crossbeam front LH bolts and tighten to 22-28Nm..



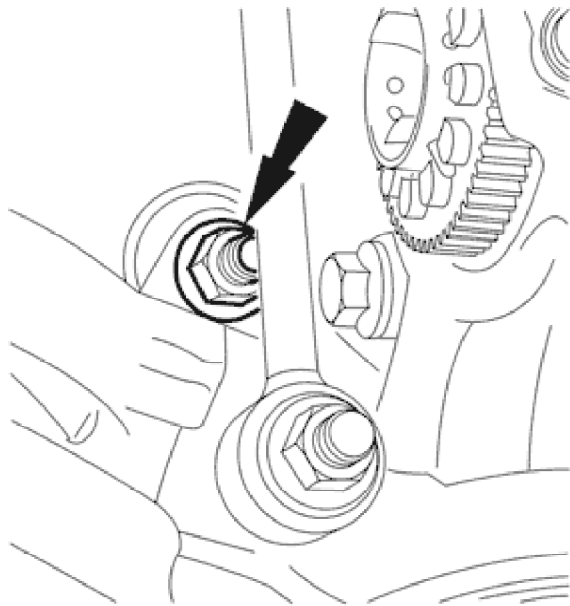
E35095

18. Install power steering fluid reservoir.
- Position reservoir on mounting bracket.
 - Install reservoir securing nuts and bolts.



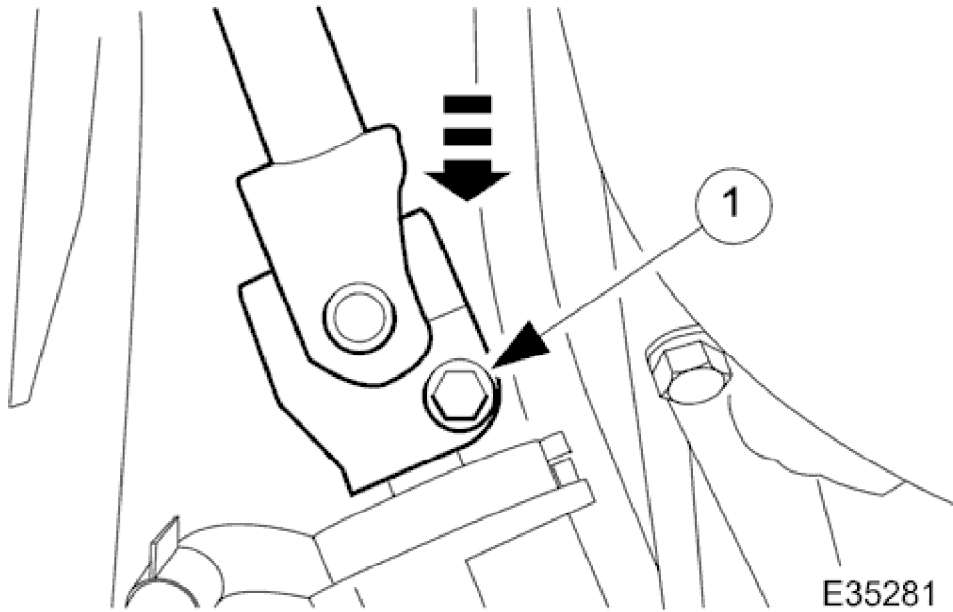
E35094

19. From engine compartment, tighten crossbeam front RH bolts to 22-28Nm.



E35098

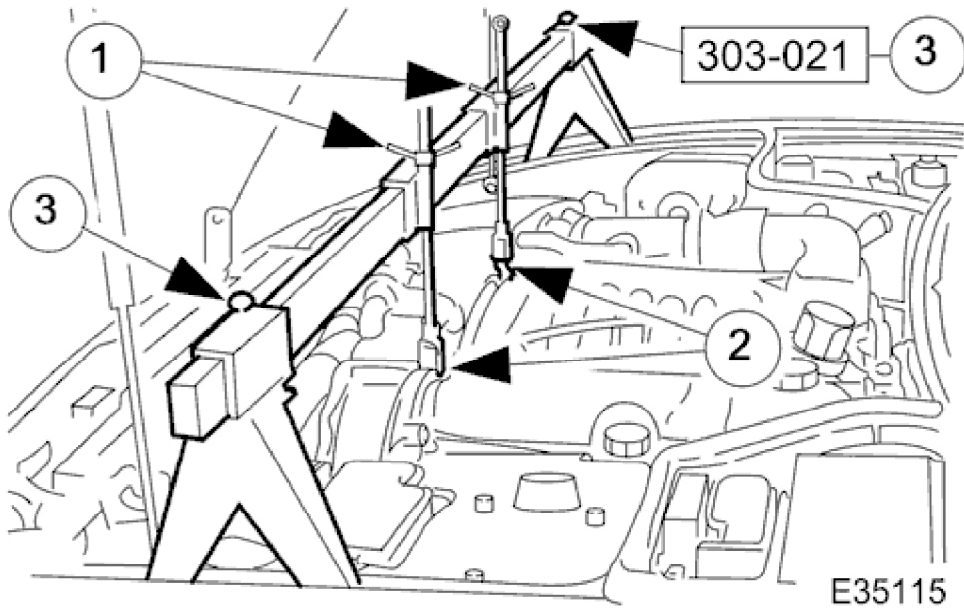
- 20. Install shock absorber on lower wishbone.
 - Lift lower wishbone to align shock absorber lower mounting.
 - Install bolt and nut and tighten nut to 43-57Nm.
 - Repeat procedure to install opposite side shock absorber.



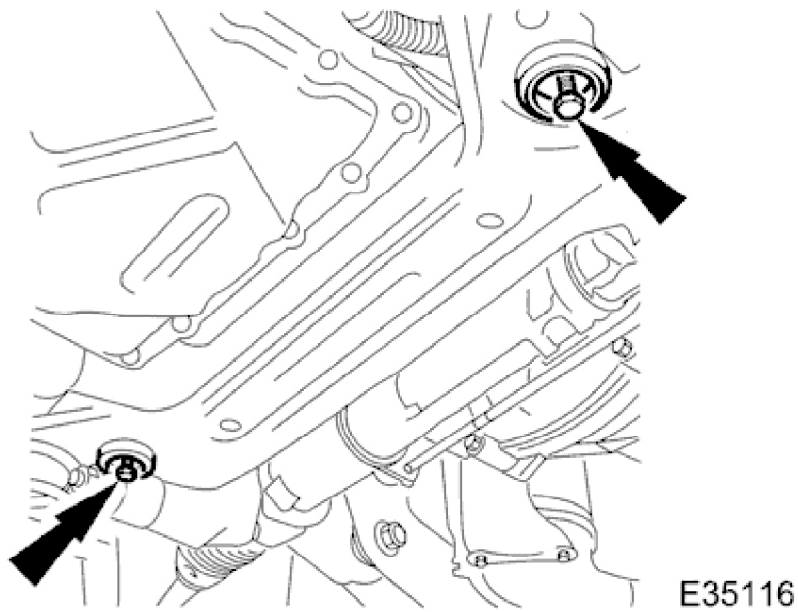
E35281

- 21. Install lower steering column on pinion shaft.
 - Move column downwards to engage coupling splines on pinion shaft.
 - 1. Install nut and bolt and tighten to 22-28Nm.

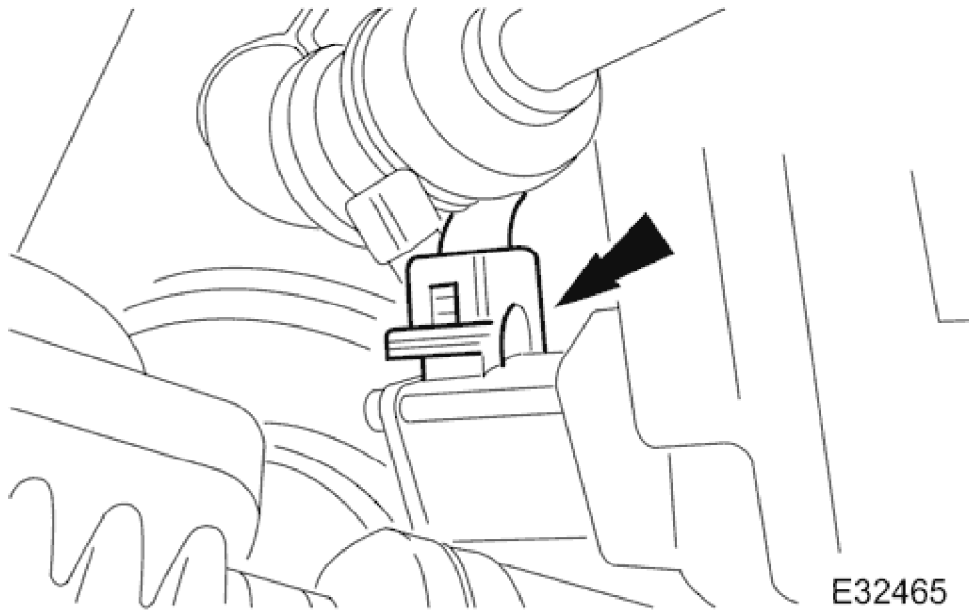
22. Lower and withdraw jack from crossbeam.



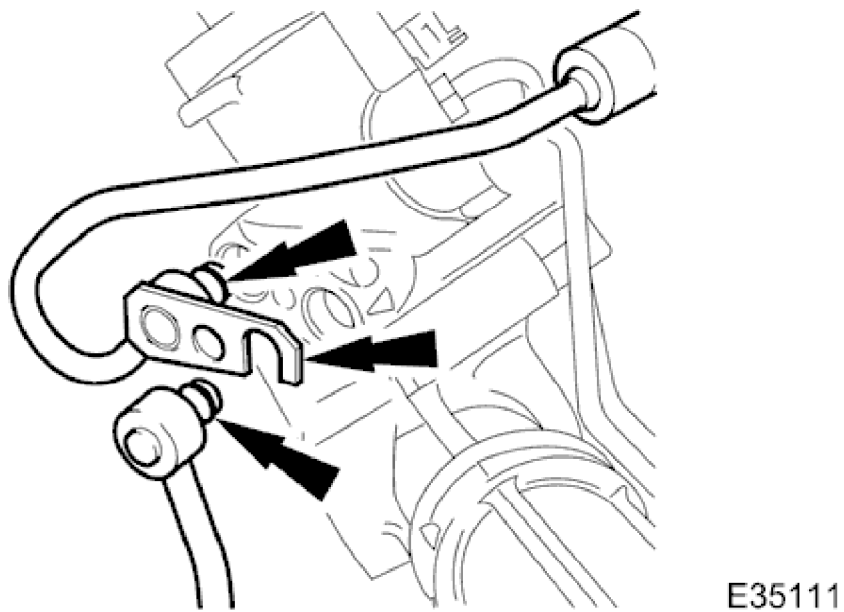
23. Release engine from support tool.
- 1. Slacken hook adjustment nuts until weight of engine is released.
 - 2. Remove hooks from engine front lifting eyes.
 - 3. Remove special tool 303-021 from fender channel.



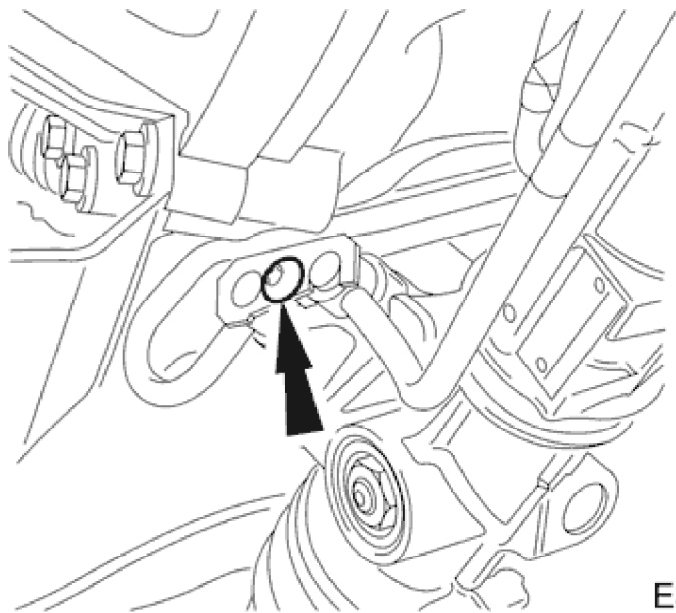
24. Install crossbeam to engine Hydramount securing bolts.
- Install bolt securing Hydramount to crossmember and tighten to 22-28Nm.
 - Repeat procedure to install crossmember opposite side securing bolt.



25. Position and connect harness to steering transducer.
- RHD vehicles. Position steering harness behind return pipe.
 - Connect harness to transducer.

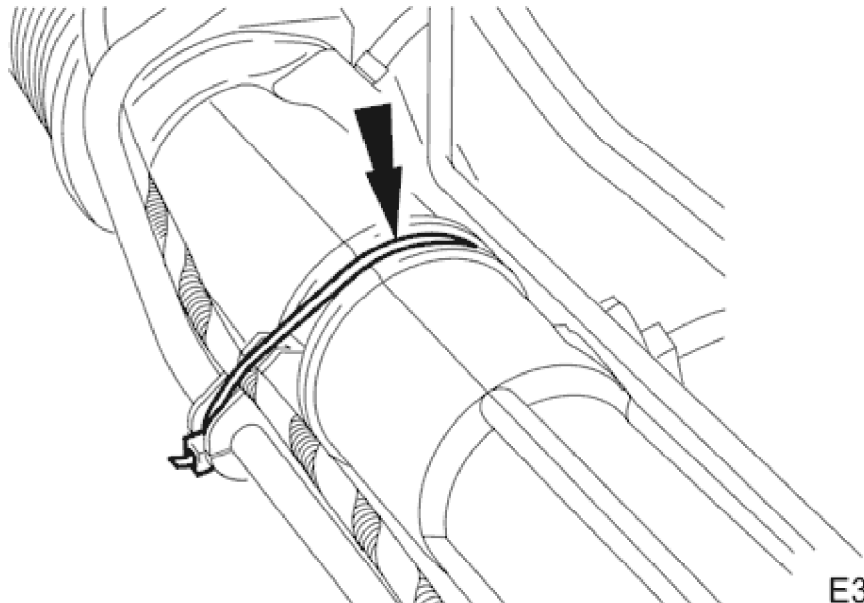


26. Install power steering pipes on pinion housing.
- Remove blanks and install new 'O'-ring seals in pipe connectors.
 - Apply power steering fluid to 'O' ring seals.
 - Remove blanking plugs from pinion housing ports.
 - Position pipes on pinion ports and seat 'O' rings.



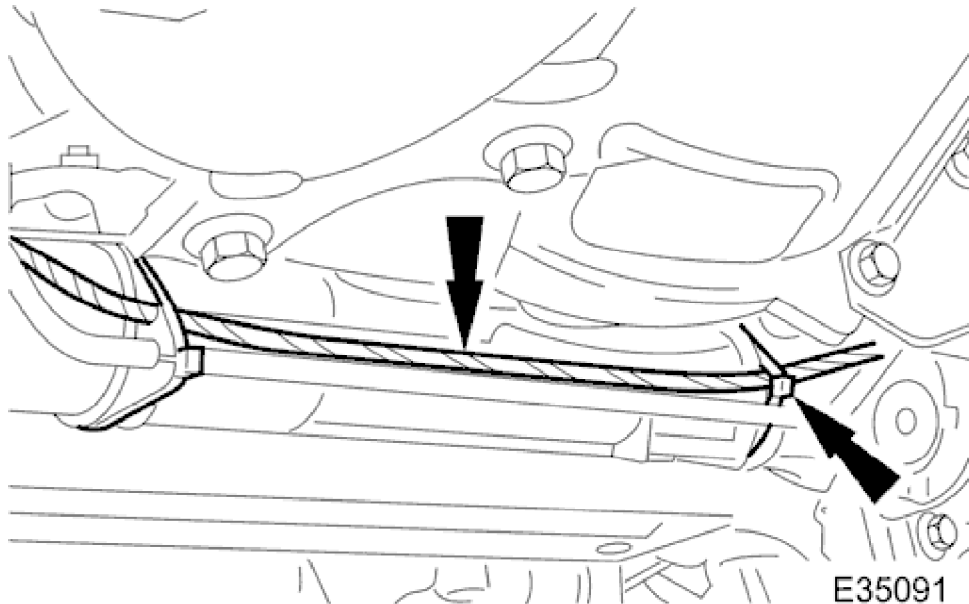
E35110

- 27. Secure pipes to pinion housing.
 - Ensure pipes and retaining plate are correctly seated.
 - Install bolt and tighten to 9-12Nm.

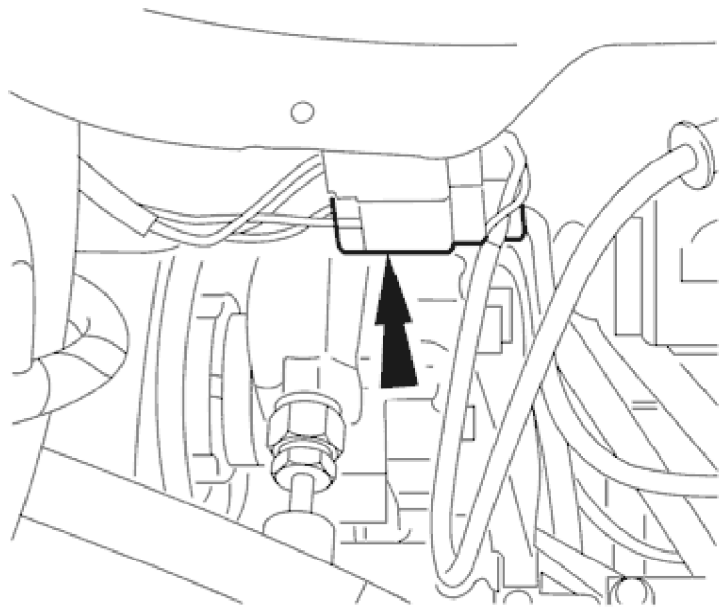


E35113

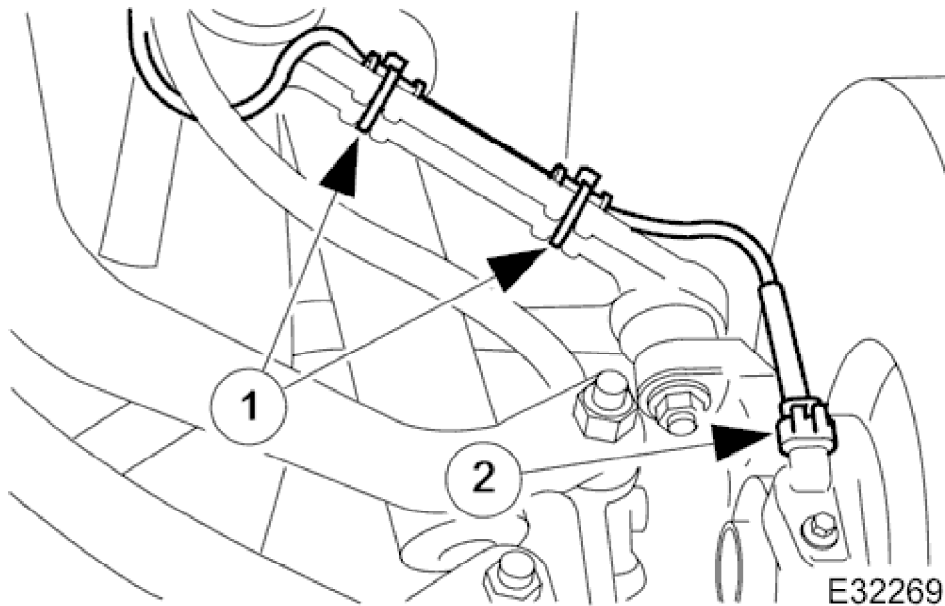
- 28. Secure return pipe on steering rack.
 1. Position pipe rubber support on steering rack.
 2. Position pipe on support .
 3. RHD vehicles. Position harness on pipe support rubber.
 4. Secure pipe and harness to support with new tiestrap.



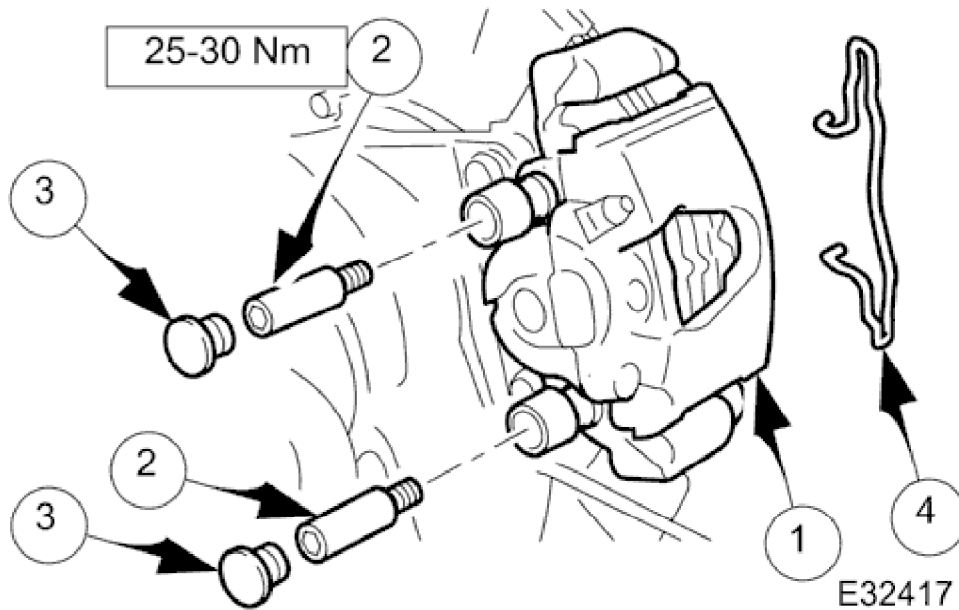
E35091
29. RHD vehicles. Using new tiestrap, secure harness to steering rack.



E35109
30. Connect steering harness.
• Route harness connector to body front location.
• Connect steering harness connector.
• Install connector in body retaining clip.

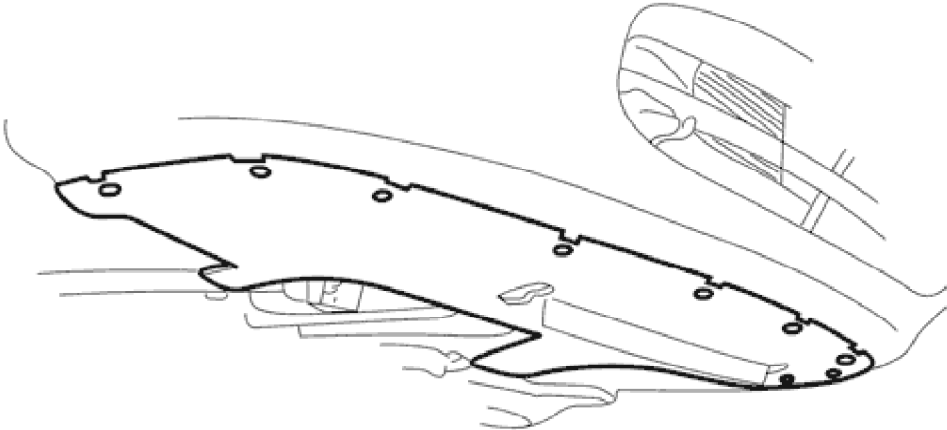


31. Connect wheel speed sensor harness.
- 1. Connect wheel speed sensor harness to sensor.
 - 2. Using new tiestraps secure wheel speed sensor harness to upper wishbone.
- Repeat procedure to connect opposite side wheel speed sensor.



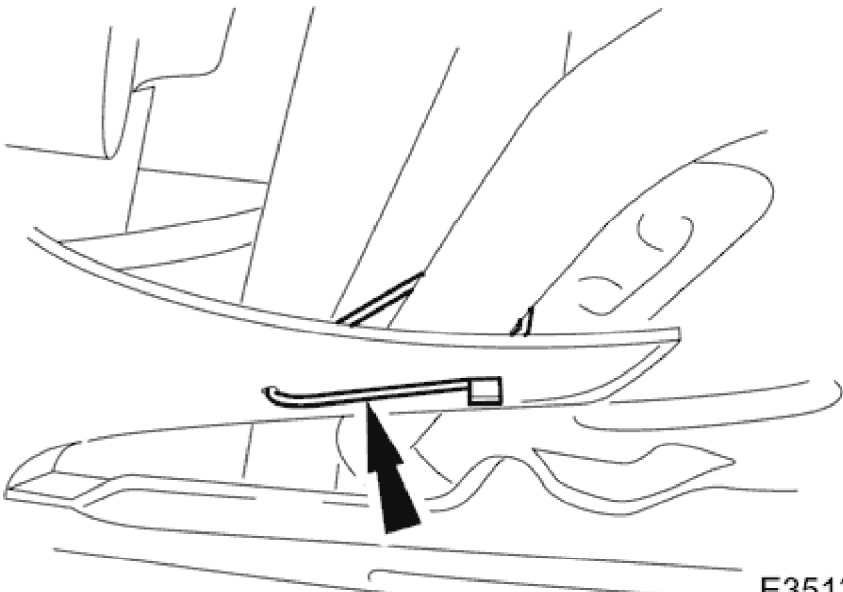
32. Install brake calipers.
- 1. Install caliper on carrier.
 - 2. Install guide pins.
 - 3. Install guide pin dust caps.
 - 4. Install caliper spring clip.
- Repeat procedure to install opposite side front brake caliper.

33. Install both front road springs. Refer to 60. 20.02.



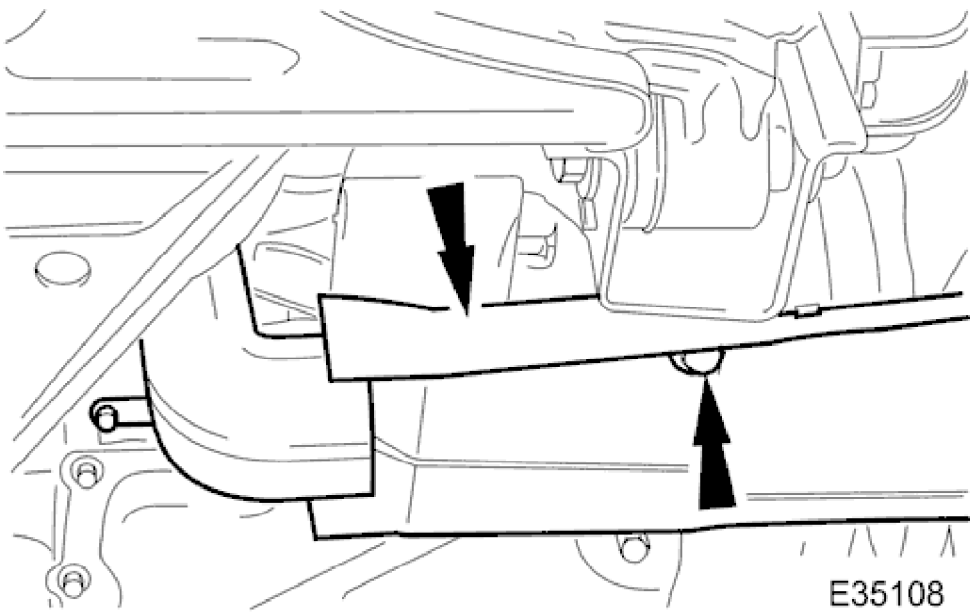
E36252

34. Using screws or new scrivets, secure undertray to front bumper cover.

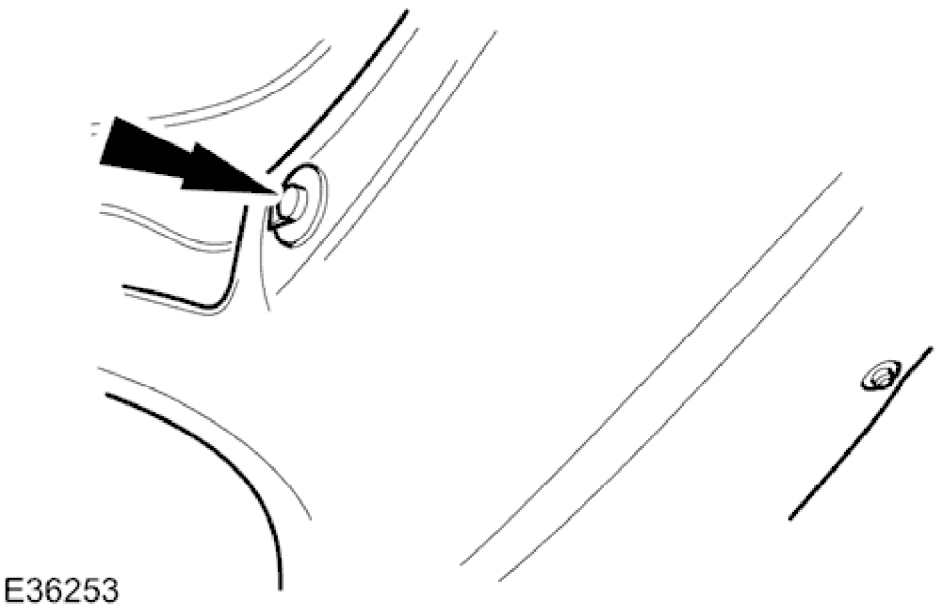


E35139

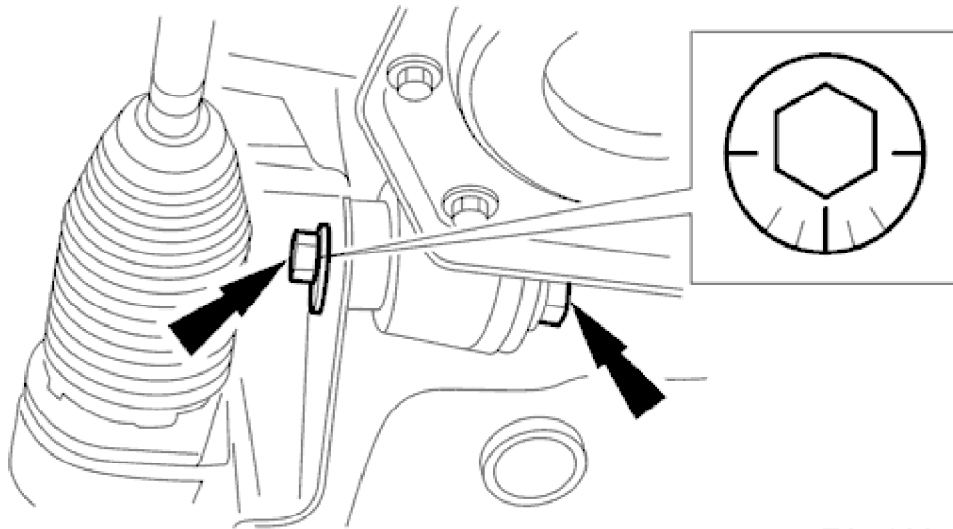
35. Using new tiestrap, secure undertray to crossbeam brace.



36. Install generator cooling duct deflector.
- Position deflector over rear vertical duct.
 - Slide deflector forward to engage center tang over undertray.
 - Install bolt and tighten to 17-23Nm.

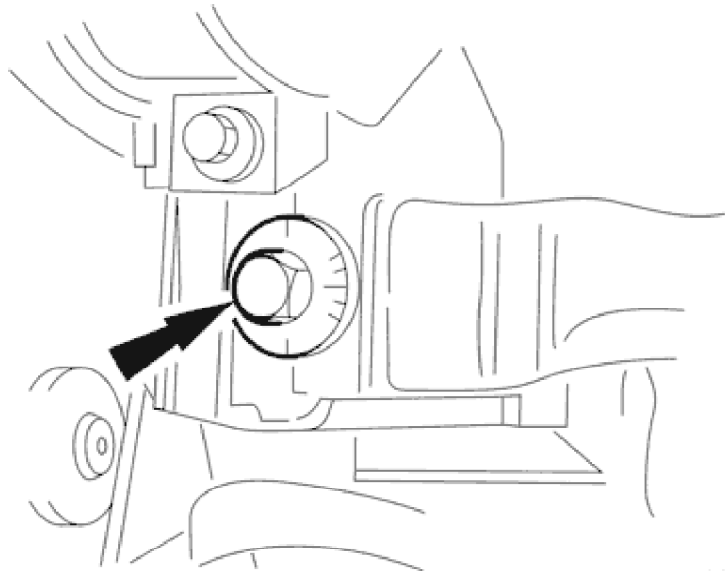


37. Using new scrivets, secure undertray to each wheelarch liner.
38. Install both front road wheels. Refer to Section <<100-02>>.
39. Raise vehicle, remove stands and lower vehicle.



E35126

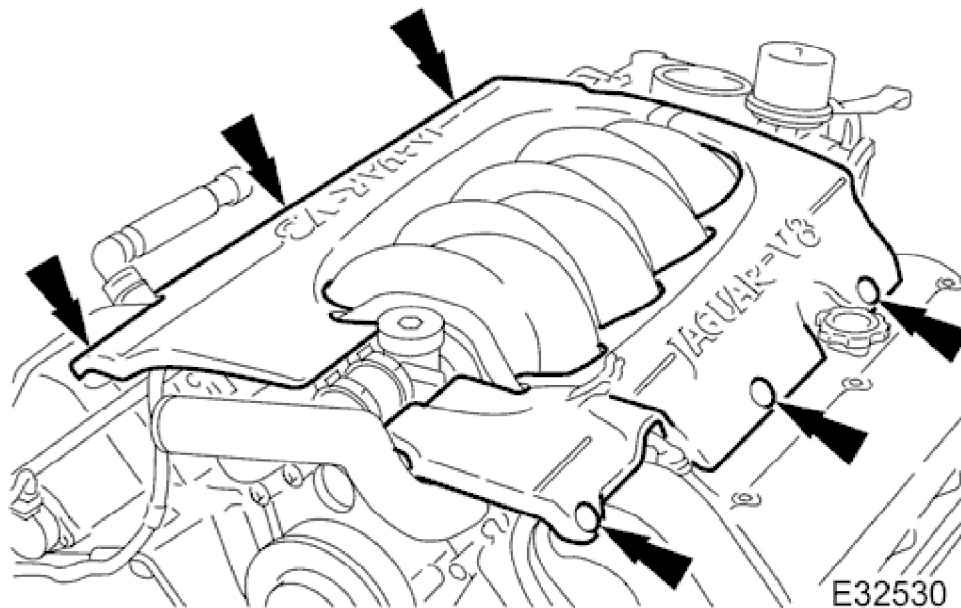
40. Ensuring graduation mark remains aligned, finally tighten wishbone rear eccentric bolt to 113-153Nm.



E35140

41. Ensuring graduation mark remains aligned, finally tighten wishbone front eccentric bolt to 113-153Nm.

42. Install air intake tube/meter/ cleaner cover assembly. Refer to 19.10.30



43. Install both engine covers (normally aspirated vehicles only).
 - Position covers over engine.
 - Install securing pegs.

44. Fill power steering system. Refer to Section <<211-02>>.

45. Remove fender covers and close hood.

46. Connect ground cable to battery terminal and fit battery cover. Refer <<86.15.19>>.

47. Carry out steering geometry and wheel alignment checks and adjust as necessary. Refer to <<57.65.03>>