

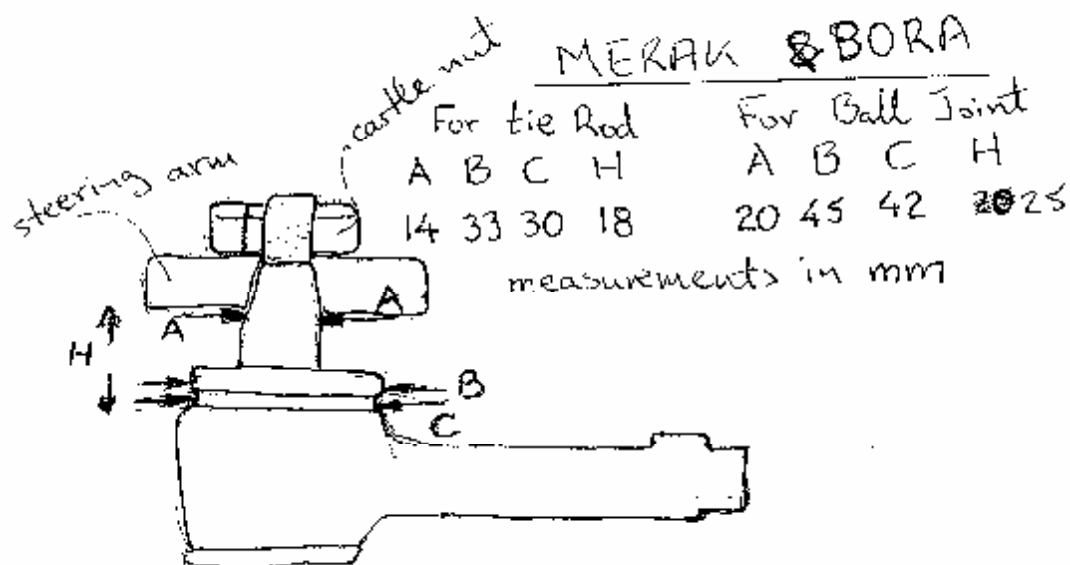
Replace ball joint boot and tie rod boot (Ver Jan2010)

Any comments for clarification, corrections and improvements are quite welcome which I will incorporate in a new version.

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Here I will describe how I have replaced LH lower ball joint boot and the tie rod boot. For the tie rod boot I investigated the use on Energy suspension polyurethane boots.

First I present the relevant dimensions of the tie rod and ball joint.



1. Replacement of the tie rod boot.

This type of tie rod connection not only rotates about its axis but also tilts from one side to the other. Because of these movements, the boot has to be **very** flexible.

- Raise the car and remove the tire.
- Remove safety pin and undo the castle nut (17mm) (parts book Table 20 part 2).
- Using a ball joint separator and by hitting with the hammer on the steering arm (parts book Table 16 part 45) separate the tie rod.
- Remove the damaged boot.
- Clean the moving surface and put some grease (avoid placing grease at the places where the new boot will be contacting).
- After you trim about 3mm from the Energy suspension boot (part number 9.13103) install it.



- Place the rod back into the arm and tighten the castle nut.



- Place the safety split pin.
- After testing the effectiveness of the **energy suspension boot** I have decided that it **does not function as expected**. After you turn the steering all the way to the right or left, due to the stiffness and construction (cannot be tighten on the rod lip) of the energy suspension

polyurethane boot, part of the ball in the tie rod is exposed to the elements (dust water etc).



- I use a locally sourced boot which has a shape like a tire which ensures a lot of flexibility. Unfortunately its height is only 15 mm while in my case I need 18 mm. It fits very nicely top and bottom without the securing circlips. I have tried to use my old circlips but it was very hard and it was possible to damage the boot, so I have decided not to use them. Maybe there is a trick on how to install boots with the circlip on them which I do not know.
- Since it did not install the circlips, in order to ensure that the boot will not come loose, I use 12 mm heater hose 4-5 mm long which I place on top of the boot.
- In case you remove the outer tie rod from the inner rod, count the turns so that you can place back at the exact position. After I did this, I checked the wheel alignment with the Gunsons' trackrite.



- As you can see my solution works very well for the moment. Definitely we will know in a few months

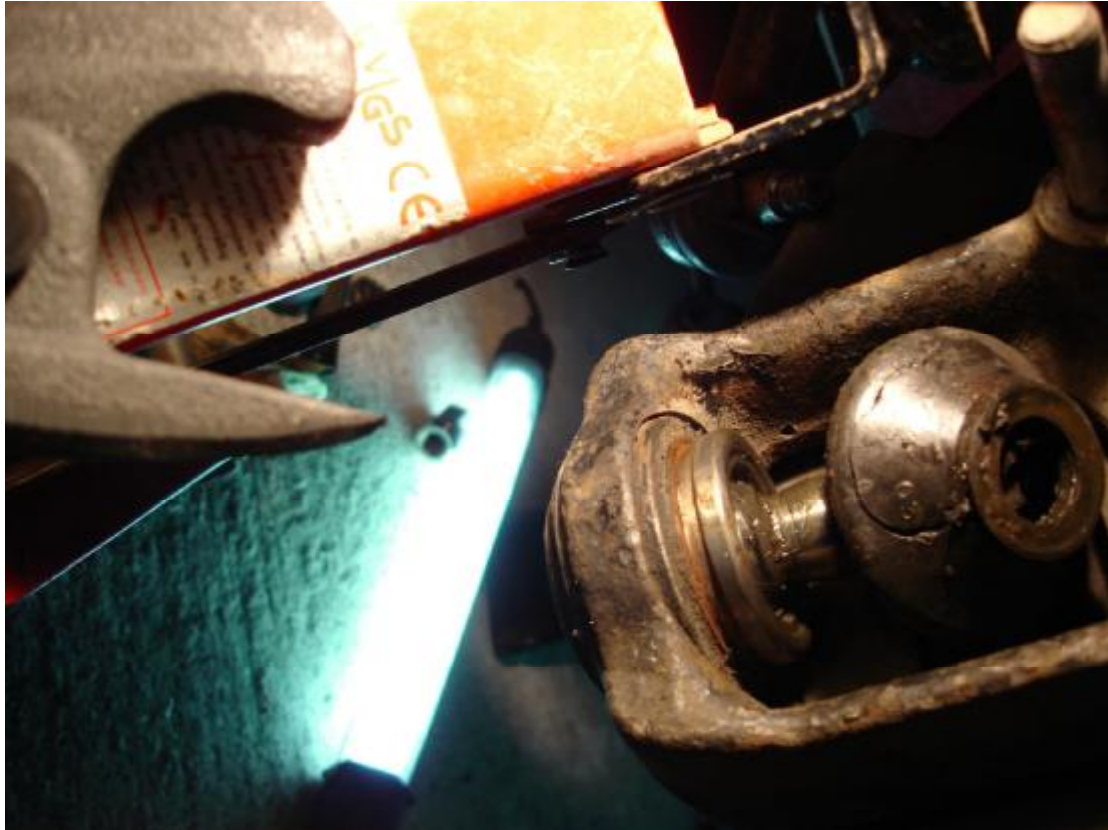


2. Replacement of the ball joint boot.

- You need to get access to the castle nut (parts book Table 16 part 34) on top of the ball joint.



- Separate the tie rod as described above.
- Remove the steering arm (parts book Table 16 part 45)
- Unbolt the brake caliper and tie it with a steel wire somewhere so that it does not hang down.
- Remove safety pin from the castle nut and then undo the castle nut (parts book Table 16 part 34).
- Place a floor jack under the lower A arm (parts book Table 16 part 25) as close as possible to the ball joint (ie close to (parts book Table 16 part 30)). The objective is to use the jack to lift the A arm up and separate the joint.
- Use a ball joint separator and by hitting with the hammer on the bracket (parts book Table 16 part 30) separate the ball joint. You have to utilize together the jack, the ball joint separator and the hammer for the separation of the joint. This will be achieved with a loud bang.
- Remove the damaged boot (parts book Table 16 part 38).



- Clean the moving surface and put some grease (avoid placing grease at the places where the new boot will be contacting).
- The Energy suspension boot 13009 (part numbers 5.13102 or 9.13125) seem to be suitable for a replacement boot (you might need to trim 3mm from it). Unfortunately I do not have them now so I use a locally sourced boot.
- Unfortunately its height is only 20 mm while in my case I need 25 mm. It fits very nicely top and bottom without the securing circlips. I have tried to use my old circlips but it was very hard and it was possible to damage the boot, so I have decided not to use them. Maybe there is a trick on how to install boots with the circlip on them which I do not know.
- Since it did not install the circlips, in order to ensure that the boot will not come loose I use $\frac{3}{4}$ inch ID heater hose 5-6 mm long which I place on top of the boot.



- As you can see my solution works very well for the moment. Definitely we will know in a few months