

STEERING BOX SLACK

GENERAL

Sometimes post-war 6-cylinder motor cars experience unstable steering, associated with longitudinal road deformations (lorry prints), or as a result of crosswinds at high speeds, radial tyres enhancing the phenomena of steering wobble.

In general, a large part of these inconveniences are due to excessive play in the steering controls. The most obvious parts to look at first are:

- The ball joint at the rear end of the side steering tube (bottom of the pendulum lever); according to TSD2292, page H.14, the clearance should be 0.180". However, it will be found that a clearance tending to zero will give better results. It is easy to adjust this clearance by screwing in the end nut a little.
- Secondly, a lot of slack can be found inside the steering box. Put the front wheels straight ahead. Oscillate the steering wheel and observe the pendulum lever at the same time. If the pendulum lever does not respond very precisely, then keep on reading!

THEORY

The slack in your steering box may be due to a poor mesh between the steering cam and the cam roller. The adjustment of these components is explained in TSD2292 as an operation to be performed with the steering box removed from the car. However, you will note it is possible to do almost the same operation without dismantling the unit.

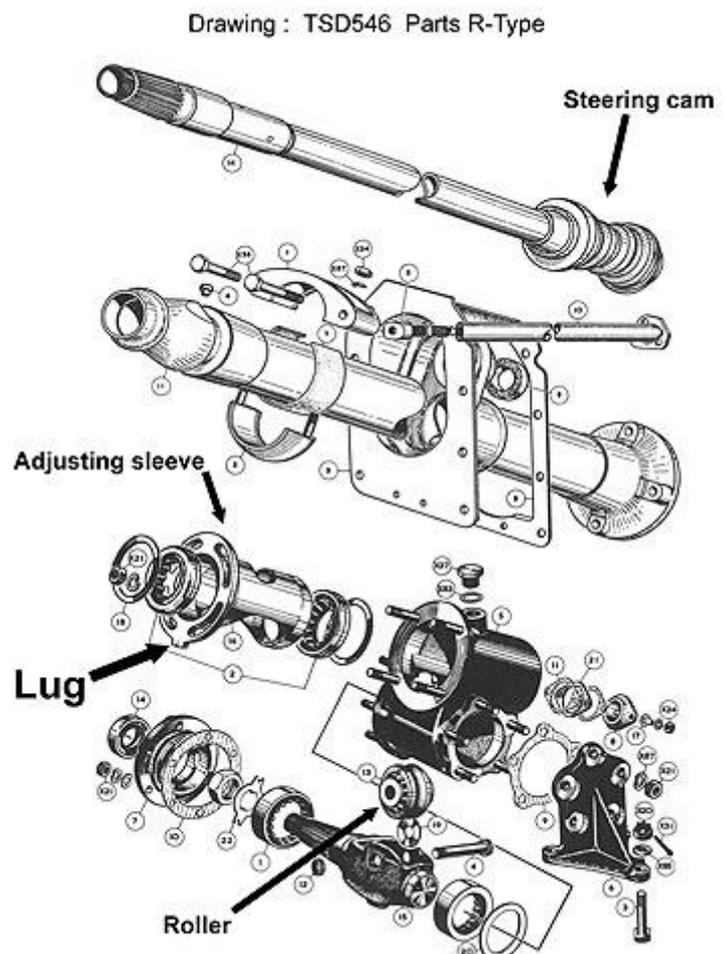
Within the steering box, the cam is supported in an eccentric adjusting sleeve. The trick consists of rotating the eccentric adjusting sleeve in order to adjust the mesh between the cam and the roller: push the lug anti-clockwise and you eliminate the slack.

Of course, this is not a cure for steering play caused by worn front suspension components, worn steering box bearings, etc.

HANDS-ON

The following procedure is applicable to all RHD chassis 1946-55 and to later Silver Wraith chassis without power steering. The LHD cars are dealt with in a similar way.

1. Open the right side of the bonnet and remove the screen washer bottle, eventually the complete bottle stand – for easy access to the top of the steering box.
2. Remove the fuse box cover and remove the third fuse from the left (the interior light will switch off and will not drain your battery during this “exercise”).



3. Jack up rather high the car at the front.
4. Open the driver's door. Put the front wheels in the straight forward direction. With one hand you fiddle with the steering wheel, and at the same time you take a close look at the pendulum lever that comes out of the steering box. The free play is the amount you can move the steering wheel without the pendulum lever moving simultaneously. It will be found that free play is minimum when the wheels are straight ahead and free play is more when the turning of the wheels is complete: that is a normal situation, due to the technical concept of the box. My car had some 2 cm "play" on the steering wheel, in the middle position – it should have none. Now we will eliminate this free play by rotating the adjusting sleeve (presenting it selves as one big Alu spacer washer in the steering box).
5. Clean the top of the steering box with a rag, and put a mark as on the photograph. I did use tip-ex. I believe punch marks are "not done". (It is always good practice to mark things when doing adjustments: at least you see and follow what you are doing.)
6. Slacken the two nuts (5/16" BSF) on the top of the steering box by approx. one complete turn.
7. Remove the engine under tray below the steering box, and slacken the two nuts on the bottom of the steering box by approx. one complete turn. A very little oil will start flooding out of the steering box – that is a good sign; it proves your steering box is not empty.
8. For easy access, I removed the fuel supply line and the shock damper control rod. However, lucky

people with spaghetti-fingers and ditto limbs may not need to do so.

9. The stud slots in the big Alu spacer washer are reamed in order to allow movement of the adjusting sleeve relative to the studs that protrude. The sleeve may be rotated without any danger of everything falling apart. Moving the lug (lump) on the bottom of the sleeve towards the near side of the car (towards the engine) will create more free play. Moving the lug towards the off-side of the car will decrease free play. Attention: when the free play becomes too little, then you will end up with a very stiff steering wheel, eventually ruining the expensive parts inside your steering box!

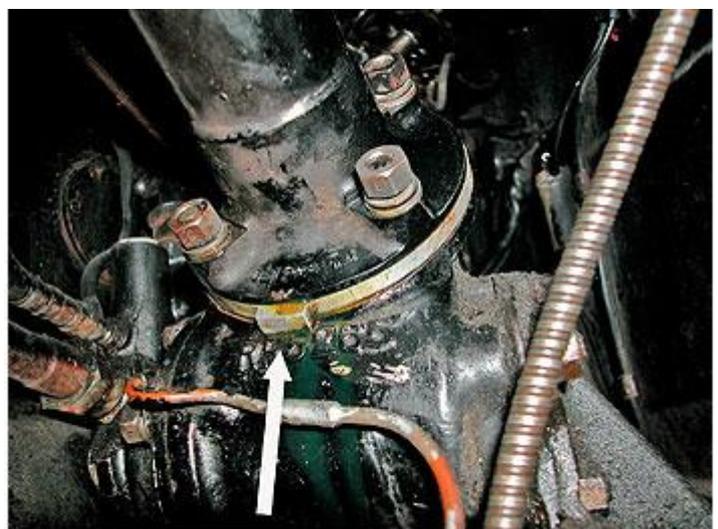
a. Moving the lug is done with a large metal bar and a wooden block: put one end of the

metal bar against the lug, and put the wooden block between the bar and the engine. Then you can use the metal bar as a lever in order to move the lug gently. Do not try to use a hammer: you will end up damaging other components, including the lug. Remember: hammers are used by handy carpenters, while smart RR-mechanics try to use their brains and appropriate tools.

10. How to execute the adjustment:
 - a. Put the wheels straight ahead (minimum free play): this is the 12 o'clock position of the steering wheel. Put a mark on the steering wheel, e.g. a piece of self-adhesive tape on the top of the wheel.
 - The slack in the steering box can be checked in two



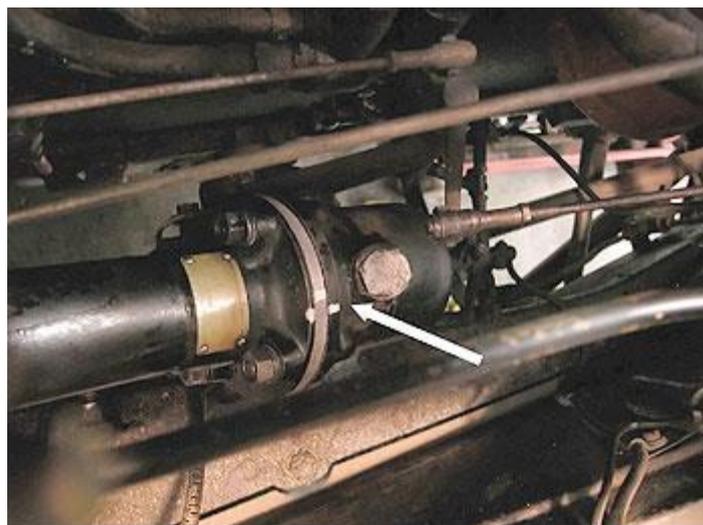
Top view, a white mark on the top of the steering box (the bottom of the box is generally too dirty to put marks on)



The lug on the underside of the adjusting sleeve. Note also the marks left by the hammer in the hands of my predecessors

different ways:

- Drag on the steering wheel should always be light, but it should increase perceptibly between 9 and 3 o'clock if the cam mesh is satisfactory. If you do not feel any drag change between these limits of the steering wheel, then continue the job.
 - Wobble with the steering wheel at the 12 o'clock position and SEE what is happening with the pendulum lever: you will be able to determine the slack in your steering box. The pendulum lever should move exactly together with the movement of the steering wheel.
 - Gently move the lug to the off-side of the car (anti-clockwise). Check your marks. A first difference of about 3 mm (1/8 ") between these marks should do the job. Tighten the nuts slightly. Note that when tightening up these nuts, the play in the steering box will become even more reduced.
 - Check the free play using one (or both) of the methods described before. There should be less free play.
 - Proceed whenever necessary by loosening the 4 nuts and turning the adjustment sleeve a little further until all slack is just eliminated.
 - If you are going too far, then the steering gets "heavy". This should NOT happen!
 - It is good practice to test the steering of the car on the road. I started with 3 mm difference between my marks, and then I made a road test. In different stages I ended up with 5 mm between my marks.
 - By means of a guidance : undisturbed, but worn out steering boxes could use some 4 mm, completely worn out steering boxes will need up to 10 mm !
11. Tighten the 4 clamping nuts fully and make a final check. Drag on the steering wheel should be light, but it should increase perceptibly between 9 and 3 o'clock. The pendulum lever should follow exactly the movement of the steering wheel. Pay attention not to make the steering too heavy!
 12. Assemble all items you did remove (fuel supply line, shock damper control rod, under trays, screen washer bottle)
 13. Top up the steering box with correct oil (generally gearbox oil 80 W 90 will give good service).
 14. Put your car on the road and enjoy the pleasure of a proper steering!



I ended up with some 5 mm difference between the marks