

MG TD GIRLING FRONT SHOCK ABSORBERS REPAIR

There is not much written on the different MG forums about how the Girling shock absorbers can be serviced and repaired. I will here try to make a description on how I did it, and hopefully it will be helpful for others and maybe there will be posted comments from those who really know how to do it.



Spare parts

I bought my spare parts from: **VCSA, Vintage & Classic Shock Absorbers, Sanderstead, South Croydon, Surrey, UK**

Graham Brown E-mail: grahamvcsa@hotmail.co.uk

4 New rubber seals,

1 axle shaft

2 bearings for the Axle shaft big end

They only had the "big end" bearings, they were a bit too long, so I had to cut them

The small end bearings I got from **Simply Bearings Ltd. UK**. Only they were 1/4" too short. The alternative is to accept that, or do like I did, buy one extra and cut off a piece to add in.



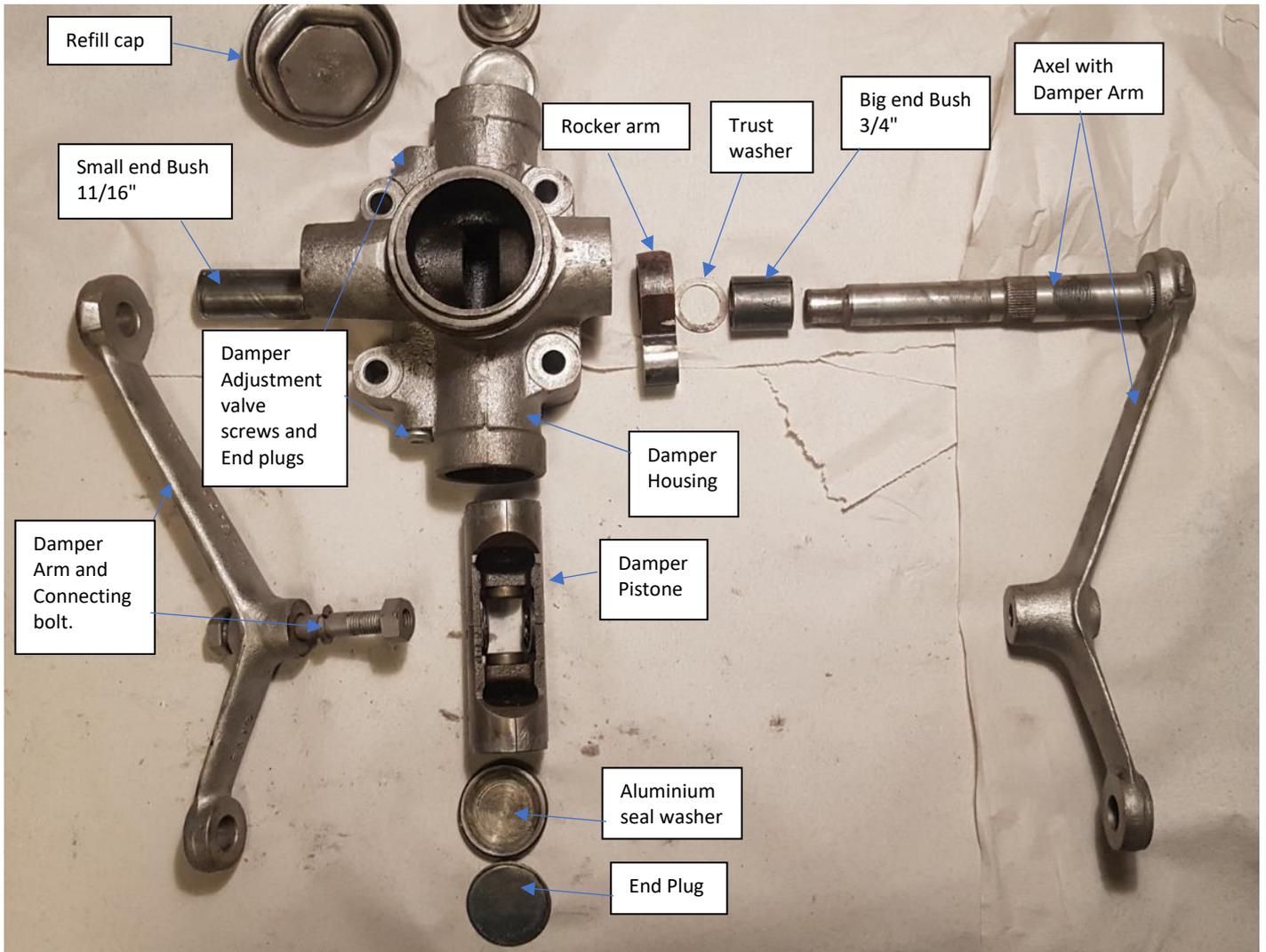
Tools needed:

- Hydraulic press, 10 - 20 T.
- $\text{Ø } 1 \frac{1}{2}''$ (38 mm) x $\frac{3}{16}''$ (5 mm) thick washer, for unscrewing the end plugs.
- Drive bolt for pressing out the axle.
- Drive bolts for pressing out the bearing bushes (Inside diameter bearing $\frac{11}{16}''$ and $\frac{3}{4}''$)
- Piece of a steel tube or a suitable socket wrench to support and make room for the axle shaft coming out through the arm, a few mm at the small end, when pressing the axle shaft back in through the damper housing.



The shock absorbers various parts:

(The Damper Adjustment Valve Screws and valve Plugs is not taken out here)



1. Disconnect the *shock absorber* from the front of the car and clean the outside of it.
2. Unscrew the *refill cap* and empty the *damper housing* from oil and dirt. Unscrew the two *end plugs* at each end of the *pistons*, by the use of a 5 mm (3/16") thick washer or similar (a 125 mm angel grinder clamp nut is what I use here). Behind each of the end plug there is an aluminum seal disk that is working as a hydraulic gasket and must be taken out carefully and treated gently.



Refill cap



End plug



Aluminum seal disk

3. Unscrew the bolt that is connecting the two *damper arms*.

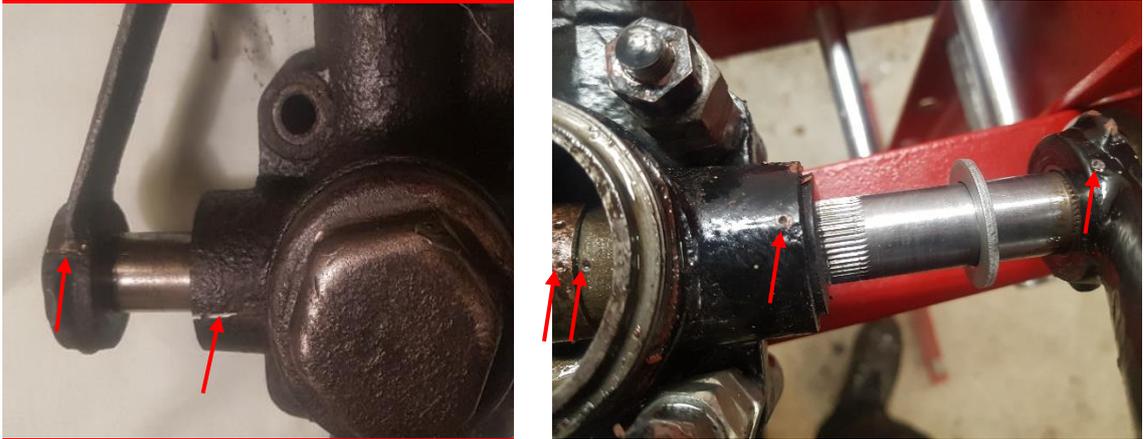


4. Pull off the "small end" arm with a pulley. (It will also come off when the *axle* is pressed out through it.) The other arm is fixed to the "big end" of the *axle* with a spline and is coming off together with the *axle*.



5. The *axle* can be removed from the "big end" arm by using a hydraulic press and a drive bolt.
6. With the *damper arms* in its top position, mark up the *splined arm* and the *rocker arm* against the *damper housing*. Ex. A scratch or a punch mark on the *damper housing* and on the arm hub and the

rocker arm inside. The piston inside will now be on its full stroke at the direction towards the side where the *damper arms* are pointing.



7. Arrange it so the *damper housing* can rest steady on its side in the hydraulic press, with the *splined damper arm* facing down through a hole in the footboard /base plate. (See photo)
Be careful to not damage the threads for the refill cap on the *damper housing*.

On the photo under, two bolts and 3-4 square washers at each end is used to stabilize it.



8. Press out the *axle shaft*. See that the *damper arm* under is not hooked up in anything while pressing the *axle* and *damper arm* down.



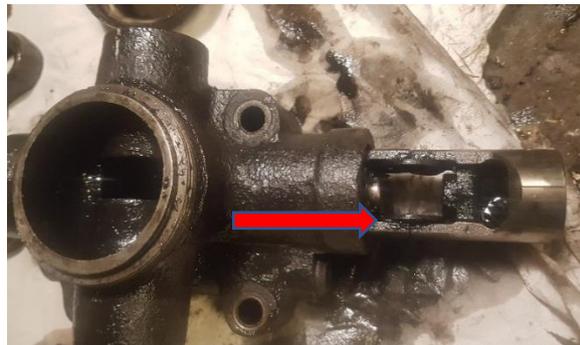
9. Take the *rocker arm* out up through the filler hole. It can be a bit tricky to get it out because its fitment down into the *piston* is slightly spring loaded, and the clearance against the internal sides of the *damper housing* is tight.



10. Be aware of the washer on the side of the rocker arm that is facing the “small end” of the *damper housing*. This washer is a *thrust washer* for the *axle shaft*, and the *axle shaft* will stop against it when it is pressed back inn to the *damper housing*.



11. The *piston* can now be pushed out of the *damper housing* either way.



12. Be careful with the two valves with small circular conical springs at each end of the *piston*. They are the *recuperating valves* that let the oil flow through to the front of the *piston* when the *piston* is moving from side to side. (Returning after a compression stroke.) They can be removed by taken out the circlip and carefully take of the conical spring. Remove the aluminum disk and clean the disk and its seat.



13. Assembly the valve with the center top of the spring facing down against the aluminum disk. See that the “lose end” on the big diameter of the spring is not hooking in to or getting caught in the groove for the circlip when the circlip is put back.

14. Take of the two *Valve Adjusting Plugs* (7/32" Allen screw) on each side and unscrew the two *Valve Adjusting Screws*. Count and write it down the numbers of turns when unscrewing the *Valve Adjusting Screws*. And do not mix up the different *Valve Springs* and *Valve Adjustment Screws*. This makes it easier to find the "old" set point when re-adjusting the dampers afterwards.

The plug covering the Valve adjusting screw.



The Valve Adjusting Screw under the plug.



15. Clean out the internal of the *damper housing* and clean all the parts. Scrape/clean away all the remains from the old rubber seals on the housing and the axle shaft. Soak it in solvent, kerosene or diesel. Use a small brush and compressed air to clean out the internal of the damper housing.

16. Inspect all the parts. See if the *axle shaft* is not worn or pitted around the *bearing* and sealing surface. Check if there is any slack between the *axle* and the *bearing bushes*. If needed replace both the *axle* and the *bearing bush*, or only the *bearings bush*.





17. Make a suitable tool/drive pin for driving out and putting back the two *bearing bushes*.
18. Now it is time for sandblasting/grinding and painting of the *damper housing* and the *damper arms*.
19. NB! Remember the markings on the *damper house* and the arm, and do not mix up parts between the two dampers.
20. Before sand blasting: Screw back on the **top lid**, the two **end plugs for the piston** and the two **plugs over the valve adjustment screws**, and seal of the two axle holes with two wine corks, wood plugs or just fill it up with paper.
21. Use a suitable steel primer and paint to paint the external of the *damper housing* and *damper arms*.
22. In any case, always replace the oil seals on both sides with, either the "original type" from **VSCA in UK**, or it is possible to use modern lip seals (two on each side). I have no experience with modern lip seals but think the Size of lip seals are: 1.125" OD. X 0.6875" ID X 0.250" and 1.1875" OD. X 0.750" ID X 0.250" (Different ID from side to side.)
23. Screw back in the two *Valve Adjustment Screws* with its *springs* and *plugs* (ref #14)
24. Fit the *rubber oil seals*.



25. Install the *Piston* and the *Rocker Arm* into the *Damper housing* and fit and tighten the two *End plugs*.



26. Move the *piston* to its end position towards the direction of the *Damper arms*.

27. Oil and push the axle halfway inn. Remember to put on the ***thrust washer*** on the side of the rocker arm, and the ***distance washer*** between the arm and the damper housing.

28. Align the punch marks on the *Damper housing*, *damper arm* and *rocker arm*. And push the *axle* in (use a clamp) till the axle spline hooks up on the spline inside the *rocker arm*.

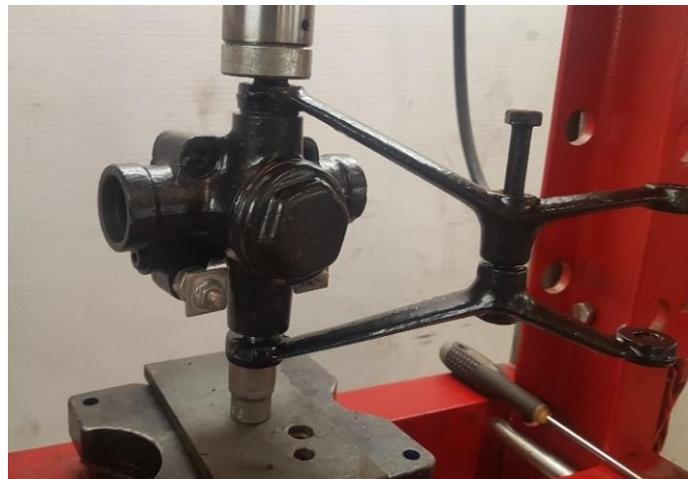


distance washer

29. Press the *axle* through the *damper housing* in a bench press.



30. Align and press the other *damper arm* onto the axle on the other side. Make sure that the *damper arms* are moving freely. There will be some resistance because of the (old fashion) *rubber seals*.



31. I will, like Declan Burns, recommend making a *rubber gasket* that covers the whole inside of the *Refill cap*.



32. Fill up the *damper housing* with hydraulic oil ISO 32, or any motorcycle front fork damper oil. It is important to write down and use the same type (viscosity) of oil when/if refilling. Because the damper setting (next chapter) is based on that type of oil.
33. On the other hand, the need of refilling means there is an oil leakage somewhere.

34. Adjustment of the dampers.

FRONT DAMPERS (Series "TD")

Range of movement

35 degrees either side of centre line.

Rebound stroke setting

20 degrees per sec. at 400 lb./in. (4.6 m./kg.) torque at a temperature of 18° C. (65° F.).

(Weight applied at end of 8 in. (20.32 cm.) arm = 50 lb. (22.67 kg.))

Compression stroke setting

20 degrees per sec. at 200 lb./in. (2.3 m./kg.) torque at a temperature of 18° C. (65° F.).

(Weight applied at end of 8 in. (20.32 cm.) arm = 25 lb. (11.34 kg.))

REAR DAMPERS

Rebound stroke setting

20 degrees per sec. at 400 lb./in. (4.6 m./kg.) torque at a temperature of 18° C. (65° F.).

(Weight applied at end of 6 in. (15.24 cm.) arm = 66 lb. 11 oz. (30.27 kg.))

Compression stroke setting

20 degrees per sec. at 250 lb./in. (2.9 m./kg.) torque at a temperature of 18° C. (65° F.).

(Weight applied at end of 6 in. (15.24 cm.) arm = 41 lb. 11 oz. (18.93 kg.))

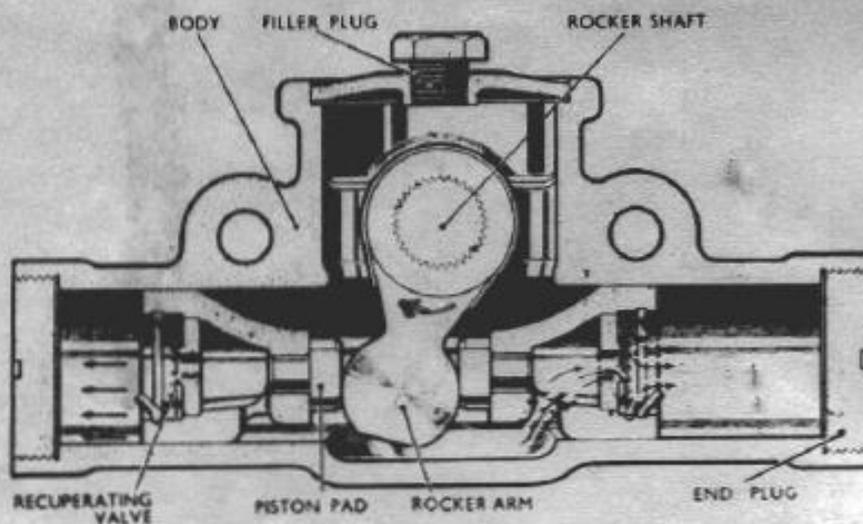


Fig. 9. Vertical Section through P.V. Type Unit. Arrows indicate flow of fluid with shaft rotating clockwise.

BLUE ARROW INDICATES FLUID UNDER PRESSURE. RED ARROW INDICATES FLUID RECUPERATING (PISTON MOVING TOWARDS THE LEFT)

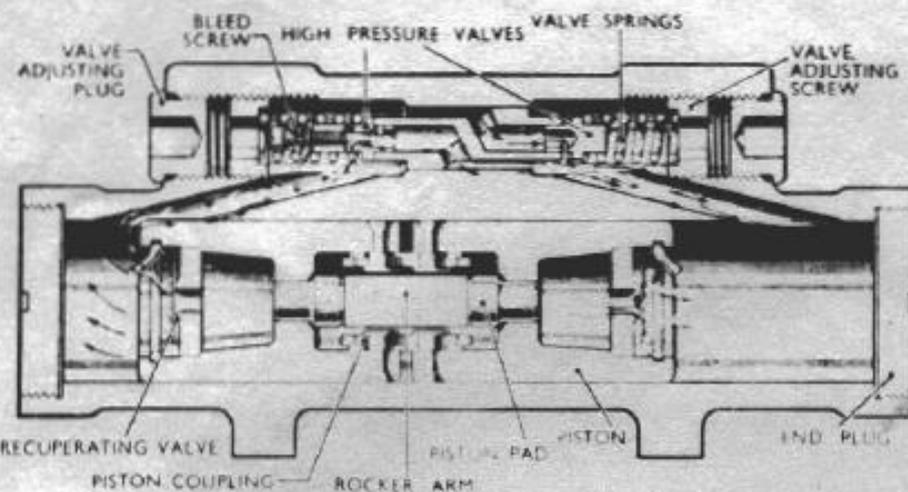


Fig. 10. Sectional view from underside of P.V. Unit.

BLUE ARROW INDICATES FLOW OF FLUID AT HIGH PRESSURE WITH PISTON MOVING TOWARDS THE RIGHT. RED ARROW INDICATES FLOW THROUGH BLEED VALVE AND RECUPERATION

35. The total stroke of the *damper arms* is 70 degrees that should take 3,5 sec.
36. Fix the *damper* to a plank of wood with 4 screws and clamp it all to your work bench. Use a rope and a pulley fixed to the sealing for the adjustment of the Compression stroke.
37. Use a suitable container filed with water to the right weight. (**Rebound stroke is down**, and **Compression stroke is up**.)
38. Clock the time for the *damper arms* movement of a full stroke from top to bottom, and from bottom to top for the compression stroke. (It is best to have somebody clocking the time when performing this adjustment.)

Rebound stroke down:



Compression stroke up: (Use a rope going over a pulley that is connected to the ceiling)



39. Adjust the damper force (time of the movement for a full stroke from top to bottom or bottom to top) with the two *Valve Adjustment Screws*. See #14.
40. The *Valve Adjustment Screw* that is facing to that side of where the arms are pointing, is adjusting the force of the **Compression stroke**. (up).
41. The *Valve Adjustment Screw* that is facing to the opposite side is for adjusting the **Rebound stroke**. (down)



GOD LUCK

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