

## Lagondaforum: 2ltr clutch

### Re: 2ltr clutch

Written by Peter S30 at Jul 02, 2015 8:15 am

Now two more thoughts:

1. Greasing/oiling the floating pins in the clutch cover plate: attached photo shows their condition (after cleaning and sanding with fine paper). Some are nice some quite corroded. A common recommendation is to oil them instead of greasing (as originally intended, see the reprint of the instruction book). I am not sure if oiling is good because the lubricant has to reach the right place through the two radial holes bored in the first and third quarter on its length. If these holes by chance are facing down, oil will trickle in. If they are facing up, it will not. Grease under some pressure can be forced through. But of course it will go the easiest way, so if the play in the bush in the flywheel is large, much may go straight through the axial bore of the pin and leave via this bush. Greasing requires a special screw on greaser (5/16 BSF thread) make or buy?. Oil or grease?, comments welcome.

2. Driving plate: it is thin, so heats up very quickly. The one supplied by club spares, is it a special steel or would it make sense to find a better steel? Make it a little thicker (my old one is 2.5mm thick)?

(attached the clutch assembly photo, taken from the instruction book, for better understanding of the whole story)

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#### Attachments:

[clutch-assembly.jpg](#) (filesize: 91.68 KB)

[floating\\_pins.jpg](#) (filesize: 56.59 KB)

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### Re: 2ltr clutch

Written by Peter S30 at Jul 02, 2015 8:17 am

(26.5.2015:) It seems I am the only one at the moment interested in the 2ltr clutch. I received the new springs from the club. They are about 1mm longer uncompressed (the old ones have lost this length). Now the scientific approach: I measured the spring rate of both. I misused a powder cake compression and stability tester for this and got these two curves for the old and new springs. Fitted a curve in Excel. Important are the two rates (not the absolute position of the curves in the diagrams). The old spring has a rate of 17.4 N/mm and the new one 19.9 N/mm. So the old one has lost about 15% of its strength. Putting the new ones plus shims will certainly help.

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#### Attachments:

[springs\\_result.jpg](#) (filesize: 34.81 KB)

[springs\\_compression.jpg](#) (filesize: 68.09 KB)

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### Re: 2ltr clutch

Written by Peter S30 at Jul 02, 2015 8:18 am

Done ! last Saturday and Sunday all went back in. Every muscle was hurting afterwards. The clutch pack (see picture) that has to be moved in while working under the dashboard weighs 23kg! It has to be put in as one pack and it only worked by lifting the rear side of the engine by more than an inch.

Relining of the plates had been done by Midland Brakes, total cost 80 GBP for the two plates (linings included, they provided them). Somehow they managed to put one of the linings on the wrong side despite they were doing 2 other 2ltr clutches at the same time. So one more shipment back and forth but they did a good job at a very reasonable price.

Why it took 2 days to mount it? next time I will be faster and when you creep in and under your car you find always several other things that should be fixed or improved. I must say I really love the mechanics of the 2ltr, still vintage design. At least as an engineer this is most delightful, much more fun than working on later cars for me.

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I did not put shims to the clutch springs. In the end I thought it should be enough with new springs and also was recommended this by a Club friend.

I lifted the engine 2-3mm by putting additional rubber under the mountings, because the pushrod to the clutch brake was fouling the brake cross bar (see picture clutch adjustments).

Yesterday I did the test drive, seems all ok. I will probably check again for the settings of clutch ejector, clutch brake and may be even alignment of the engine to the gearbox after a short while. This alignment is important because if it is not good, there may be some tilting of the clutch plate when disengaged.

See also attached drawing of clutch and clutch ejector.

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### Attachments:

[clutch package.jpg](#) (filesize: 46.94 KB)

[clutch drw.JPG](#) (filesize: 144.42 KB)

[clutch adjustments.JPG](#) (filesize: 48.81 KB)

[clutch new.jpg](#) (filesize: 67.15 KB)

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### Re: 2ltr clutch

*Written by Colin M34 at Jul 02, 2015 2:21 pm*

Hello Peter

Thank you for your most useful information about the clutch job on the 2L. Yes it is a vile job! I am pleased to hear that a fellow engineer has been enjoying the fun of working on vintage machinery – much as I do.

Colin M34

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### 2ltr clutch

*Written by Peter S30 at Jul 02, 2015 8:14 am*

Uff! I almost lost this story by mistake managing the forum. So here it is again what was starting in beginning of May:

Owning this 2ltr for a good year now, and after about 2000km driving, I only recently had severe clutch slip. If it was my driving or if it was worn out in the beginning is not sure. I always tried not to let the clutch slip. I will know if clutch slip is soon back after overhaul.

Driving up a hill finally was difficult, I had to drive with limited power. Cleaning the clutch with brake cleaner, checking the clutch adjustment, did not help. The clutch adjustment was ok, the adjustable tappets giving more than 1mm play when pressing them in against the little springs before touching the clutch cover plate. The only thing not correct was that the clutch ejector always was positioned fully to the front, so when depressing the clutch pedal, it could not move further forward, thus beeing out of operation. Therefore this nice mechanism would not work and make gearchange a bit more crashy. But it would not explain the clutch slip. The reason it could not move further forward, I think, is that the clutch shaft coupling on my car should be mounted a few mm further forward using shims or a thicker hardy discs. I found one triple and one only double hardy disc (thinner) on the short shaft between engine and gearbox, this might be the reason.

Anyway the clutch had to be removed, looks quite straightforward in the beginning but then lifting it out is a pain. I was not able to remove the lower aluminium casting hanging on the clutch driving shaft, so had to remove the whole package including the complete clutch.

There are reports about clutch overhaul in Club magazines 212 (by Peter Sowle) and 216 (by Alan Elliot). Both were helpful. Alan described the use of a turnbuckle as used for tightening wire fences, to pull up the whole package towards the aluminium bulkhead above. Which I did and it worked. Alan suspects that the chassis cross member on many but not all 2ltrs is in the way. On mine it is.

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Inspection: Smell was like burned electronic boards. Linings were dry and brittle, with holes where material had broken out and some lining particles as fine sand on the surfaces. The driving plate was slightly distorted but especially had thicker and thinner areas. This can be seen on the photo and felt by finger. The thickness of the linings on both sides was about 4mm, surprisingly thick. The club replacement ones have 4.8mm, I was told. The springs were maximum 1mm shorter than the standard 1 7/8".

Springs: the ones supplied by the club are nominal "130lb" I wonder what that means, the rate of a spring is given as force/compressed length, so it is 130lb per a certain distance of compression. Knowing this I could measure the rate of the old ones and compare if they have weakened. In club magazine articles authors mention the practice to put a florin in to compress the springs more (British coin used 1849-1970, changing size a bit over time, from 1893 on it had 28.5 mm diameter and 2.1mm thickness). The pocket in the flywheel allows for max. 30.5mm diameter coins or shims. Large washers (DIN 9021) for M10 screws should fit (outer diameter 30mm, thickness 2.5mm).

I will have the the cover plate and floating plate relined and fit a new driving plate (club spares) and new springs probably. And I will report the refitting and result.

A few thoughts about the clutch design: a bit complicated but the idea was to have low mass on the driving plate, this should allow faster gearchange on an unsynchronized gearbox. The clutch ejector will make sure that the driving plate will move away from the cover plate when the clutch is pressed and the clutch ejector stop prevents that it moves too much forward, then touching the floating plate. The clutch brake: when changing gears up you want to slow down the driving shaft into the gearbox. The clutch brake will do this when pressing the clutch pedal down far enough. You do not want this effect when changing gears down (the opposite, you want to speed up the driving shaft, therefore double declutching and revving up the engine a bit in between. To avoid a counteracting clutch brake, the clutch should be depressed less when changing down gears and depressed only that much, the clutch brake must not come into action yet. There are two adjusting nuts on the threaded rod to the clutch brake arm. The one closer to the clutch brake determines how early it comes and the second can compress the spring on the rod if it shall come stronger. The experienced among you of course all know this, but I really understand it better (I hope) after having dismantled it all.

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### Attachments:

[clutch\\_removed.jpg](#) (filesize: 107.09 KB)

[driving\\_plate.jpg](#) (filesize: 58.40 KB)

[working\\_area.jpg](#) (filesize: 41.07 KB)

[cover\\_plate.jpg](#) (filesize: 70.69 KB)

[clutch\\_removal.jpg](#) (filesize: 36.02 KB)

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### Re: 2ltr clutch

*Written by H 54 John at Jan 10, 2017 3:46 pm*

I'm somewhat clutch-obsessed at the moment, an occupational hazard for 2 Litre owners and it led me to read Peter's really excellent description of the device. Perhaps the main difficulty with the clutch is its well known inability to tolerate slipping when the driven plate heats up and warps. It occurs to me that a solution that preserves all the device's vintage charms, such as they are, would be to remove the linings from the cover plate and floating plate and place them on a stronger driven plate. I've that sinking feeling that there must be an obvious reason why this would not work and that this will be gently pointed out to me very shortly but as the total thickness of linings plus driven plate would not change it does seem feasible. Comments please?

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### Re: 2ltr clutch

*Written by Colin M34 at Jan 10, 2017 4:47 pm*

Hi John,

Yes the "Inside out" clutch is a good idea. I have it on my M45 and it works well.

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Colin

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### **Re: 2ltr clutch**

*Written by bill at Jan 10, 2017 5:23 pm*

Yes, I also used this on my M45 and is a known "mod" I think. No problem as far as I was concerned. No reason why it wouldnt it work on a 2 litre ?

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### **Re: 2ltr clutch**

*Written by H 54 John at Jan 12, 2017 4:51 pm*

So nothing new under the sun then! Thanks gents, good to know the idea is sound. I would love to know if a 2 Litre owner has done this and what the snags are. Fabricating the driven plate would definitely not be trivial.

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### **Re: 2ltr clutch**

*Written by bill at Jan 12, 2017 7:53 pm*

I dont know the 2 litre clutch but would this really be as difficult as you think ? Firstly check that the club does not have them - I believe that they do for the M45 mod ?

If the driven plate is straightforward try Precision Clutch Components (Wincanton) 01963 362484 who made up a driven plate for me (for another car) by fixing the centre of one clutch (metric size splines) to the friction bit of another (larger imperial o/d). Not very expensive either - under £100 when I had it done.

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