Overhauling an early MG VA wet clutch gearbox

Foreword
First of all I wish to acknowledge Gordon Vogtherr's December 1981 Safety Fast article on his gearbox rebuild, it is a treasure and gave me the confidence to tackle the job with help and advice from some great friends and material:

- Local NZ VA owners – esp Les Bognuda (VA Tourer)
- Yahoo MGSVW email group members
- MG SVW Register of the MGCC - esp Charlie PJ and John Bannister
- MG SVW Register Facebook members
- Safety Fast Feb 2014 Article on MG Gearboxes

I have also discovered a great deal about these gearboxes and as a novice, had no idea of many of the finer points not found in any MG Manual or reference. I surmised this is because when a gearbox was being maintained or reconditioned, the gearbox mechanic of 1930's- to 1970+'s would have known this detail because many of the early MGs had the same type of design. This article, I am told, may be useful for a large number of early MG owners. That is why I wrote it and took many photos to use. I also chose a more conversational style of article rather than a step by step guide as I wanted to cover side points and issues eg bearing codes.

Background
I have rebuilt engines in my (poor) University days and so am pretty comfortable with mechanical things. The mystery has always been a gearbox and I also wanted to do as much mechanical work myself on the VA – this was part of the attraction of restoring a car yourself and not buying one restored.

I intend this article to be a guide on how to take apart and recondition an early VA 'wet clutch' gearbox. My one is from engine number #1143, a wet clutch car. I encourage others to have a go, it is not complex but you need take care and be prepared to be patient.

I also learned about metallurgy, metal, bronze and machining – all part of the article. Since the overhaul I also have learned a lot more about wet and dry clutch gearboxes and have made some notes at the end.

Things you will need:
- Whitworth ring spanners
- "C" spanner (also known as a pin spanner) to remove nut in the front of the gearbox bearing (**ANTI-CLOCKWISE** thread), hmmm I think about 52mm but it is easy to see, I borrowed one and forgot to note the size
- Feeler gauge to measure end float in the layshaft (more on this later)
- Calipers – I bought a digital set in mm/inches and imperial fractions eg 5/26"
- Awesome bright LED lit work space – I had two large LEDs on a stand
- If you paint the gearbox – mine was/restored to Mid Brunswick Green OEM Paint code 226
- Paint Stripper – use the top stuff, BASF Tergostrip BO
- Paint – I used a high quality paint in a spray can but from a professional paint company as it had a good fan pattern
- Petroleum Jelly – for sticking shims and thrust washers together during assembly. This melts at low temp and is replaced by lubricating oil. Do NOT use grease, it will not melt and can stop lubricating oil reaching into small spaces

- Local bearing supplier
- Local engineer – probably home based, retired and helpful. Made me a short layshaft, helped taking off the a very stuck bearing off the First Motion Shaft and also replaced felt seals with modern lip seals in the bell housing and gearbox rear tunnel
- Engineering shop – with more capability that my engineer above, made some hardened steel washers and bronze thrust washers
- Patience – still cannot find enough of that!
- Printed material
    - SVW Reviews
    - MGVA Instruction Manual, I have a full photocopy I use in the garage as you can then not worry about dirty fingers!
    - MGVA Service Parts List – photocopy pages 29, 30-34.
    - Blower pg 156 good picture (has pretty much the same words as the MGVA Manual though)
    - Fortunately I also had a Morris 12/4 Series III Parts List – it had good exploded M12/4 gearbox photos and helped resolve the riddle of the "Thrust Washer **Assembly"!**
- Digital aids
    - Phone or digital camera to take MANY MANY photos of YOUR gearbox as you take it apart ie take many photos of each step and then twice as MANY more!
    - PC/Tablet etc is very useful to show your photos as you reassemble it all – not essential but useful
    - Local NZ VA owners phone numbers and email addresses
    - Yahoo MGSVW email group members, phone, email
    - MG SVW Register of the MGCC email addresses
    - MG SVW Register Facebook
- A bit of luck

Parts

- New ball race bearings, four
- Conversion from caged to needle rollers is recommended and later gearboxes have these– see Gordon's article.
- You will need an engineer to turn a shorter layshaft to hold the needle rollers in place when you install the layshaft, I call this the 'layshaft tool' in the article.
- Bronze thrust washer material to make new washers and/or shim material to adjust your end float on the layshaft – your local engineer should be good for that
- New Seals to replace felt ones in the bell housing and rear of the gearbox

Have a very clean large work surface of good height, lots of good lighting.

Read and have available photocopied Instructions in SVW Reviews, Blower and the VA Instruction Manual. This article does not try and replicate these instructions.

I also suggest you put aside the time to do it all in a week or so. I still work and solving issues took time which meant I had about three weeks delay in getting the gearbox assembled and yes, it is hard to recall all of the details. Photos to the rescue!

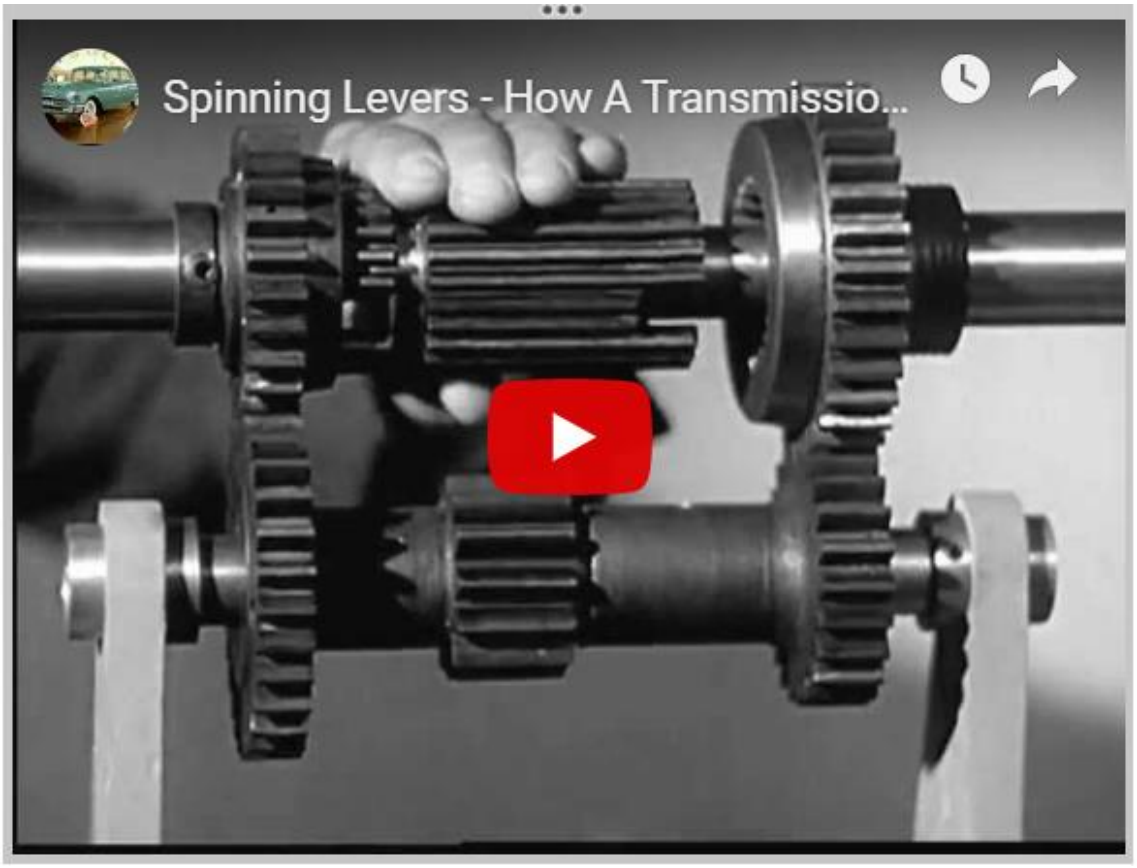
Pre work Notes

I did not need to strip any synchro's as they were in great condition (see article and photos), the MGVA Instruction Manual and Blower tell you what to do there. BUT, if you are not careful when you remove the shafts and gears, you can slip the gears off the synchro's and you will need to put back the ball bearings and springs, one of mine came off and a piston ring compressor did the job holding in all the springs and ball bearings in place as I reassembled the cluster.

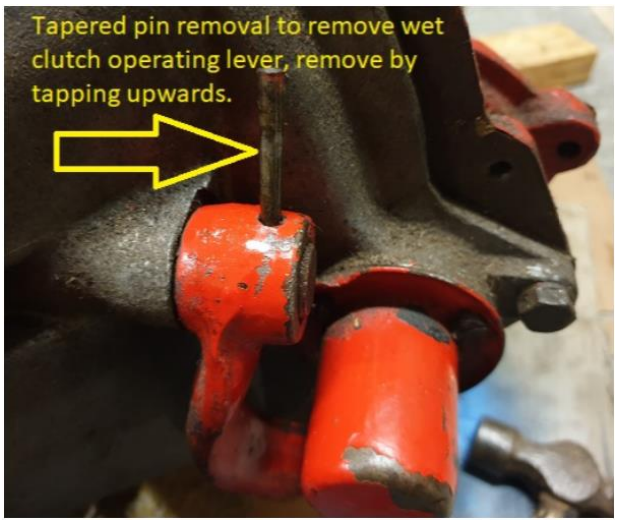
Be optimistic, you cannot really damage anything and it is more of a voyage of discovery into the unknown rather than complex.

When I mention a part number the first time, I will reference the part to the MGVA Service Parts List Sept 1946. The page and part numbers are in pages 29 for the diagram and pages 31-34 for parts and numbers.

It is useful to understand how an early gearbox works, see YouTube https://www.youtube.com/watch?v=JOLtS4VUcvQ, once you get past the early part it is pretty good and is what you will be working with. Gearbox is 1936 Chevrolet. Main shaft at the top, lay shaft at the bottom, same as ours.



Pic 1
Remove the gearbox



The MG Instruction Manual and Blower tell you how to do this. As mine was out of the car I just had to remove it from the bell housing..... BUT with the wet clutch there is a trick, you need to operate the clutch lever up to clear the clutch bearing (I have also been told to rotate the gearbox 180 degrees but cannot recall having done that), remove the pin to remove the clutch lever, it is tapered. Tap up to remove.

Pic 2

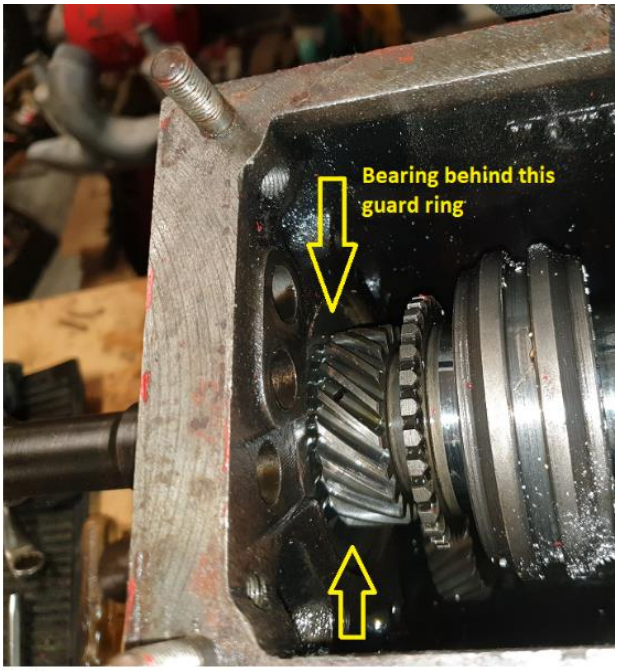
It does not say anywhere that the hardest part of stripping the gearbox is the removal of the large First Motion Shaft bearing – the largest of the three [MG735/169]. This is the one in the front of the gearbox with the circlip.

You need to remove the nut on the end of the First Motion Shaft [MG735/173]. Unlock the nut, in my case, punch back the overlap. Undo the nut but you will need a "C" spanner (also known as a pin spanner) and note the thread is anti- clockwise. I could not remove it and left that to the engineer who was doing my other work. Replace the bearing and note (and if needed, straighten) the flat bearing guard.

Pic 3

I had to replace the lock ring with a modern lock washer as mine got munted during its removal – this is NZ technical term !

Removing the First Motion Shaft was difficult. I am no engineer but I had a mechanic mate helping me and he had all the tools but we had no puller so pulling it out somehow was not an option. We used a soft drift from the inside to 'tap' (I wish!) it out BUT there is only one place you can tap it is on the oil guard for the bearing [MG735/179]. You will bend it but it can be straightened out. Also because of the gear, you cannot tap it on more than in a couple of places, it does come out eventually. Maybe there is an easier way with a puller however that is what we had to do.



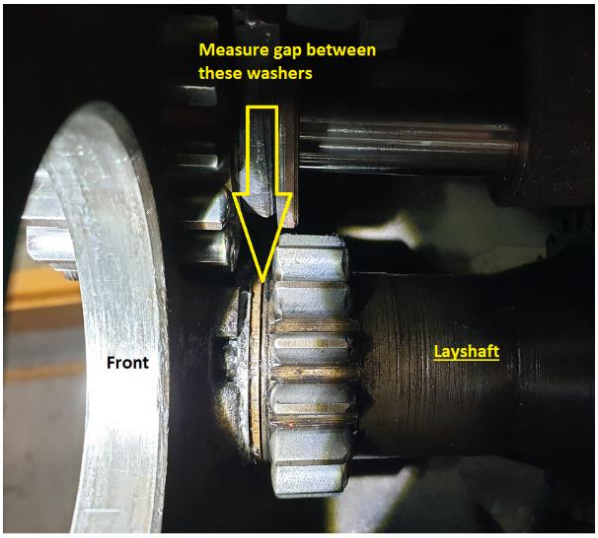
Pic 4

Pic 5

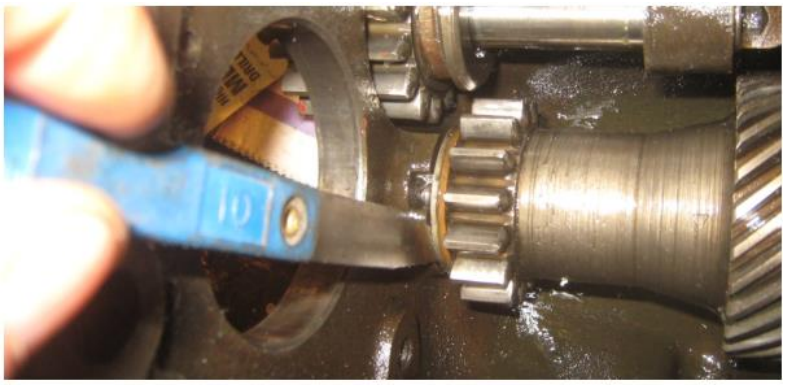
Success!! (the white stuff is just the paint off the label from my engineering gloves)

IMPORTANT

Underneath the First Motion Shaft is the Layshaft. DO NOT STRIP IT OUT AT THIS STAGE UNTIL YOU HAVE MEASURED YOUR CURRENT END FLOAT GAP *– or else you will have to reassemble it again to determine its current float, use this to make new thrust washers and/or shims if required – see photos Pic 6.*



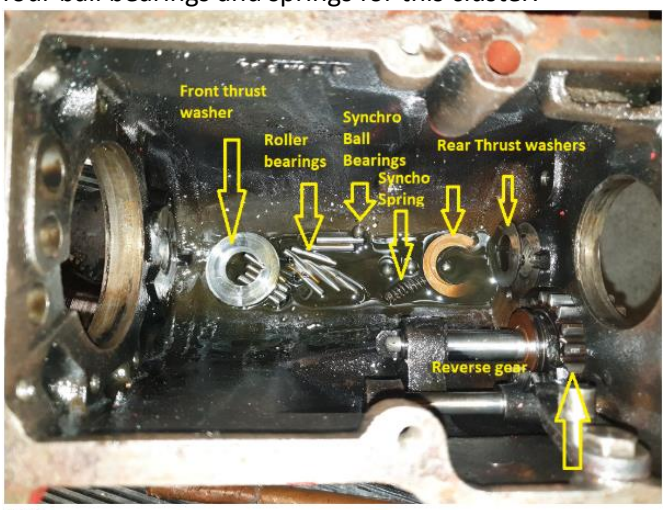
Pic 6



Pic 7 (Credit to J Bannister for this photo)

It is now easy to push out the layshaft after removing the Locating Screw underneath [MG735/203]. The layshaft cluster will now be resting on the bottom of the gearbox and makes the necessary room to remove the First Motion Shaft. If your gearbox has been converted to needle rollers, they will probably all fall out with the thrust washers, do not panic ! The photo below (after all shafts and bearings have been removed) shows a lot of parts at the bottom of the gearbox including the two sets of thrust washers. Each end has a thrust washer of a different size so they cannot be confused.

The MG VA Instruction Manual is pretty good explaining how to take the unit apart. You need to engage second gear so you have room to remove the main shaft which has to be on an angle. Once you see it and look at the manual, it makes sense! While pulling the cluster out, I accidently pulled off a synchro ring and the ball bearings and springs pinged out – not too far though so to be careful, cover the gears with a rag as you pull the cluster out. Of note, there were four not six ball bearings, two had been removed with their springs. I concluded that this is because the VA gearbox is rather notorious for sometimes being hard to shift into second gear and they probably had been deliberately removed. I do not know this for sure but on advice decided to leave the status quo of four ball bearings and springs for this cluster.

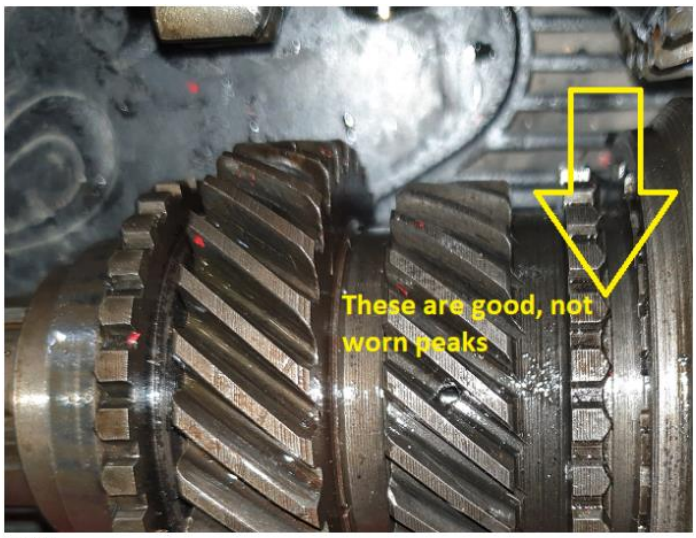


Pic 8

Pic 9

You will now have this on the bench.

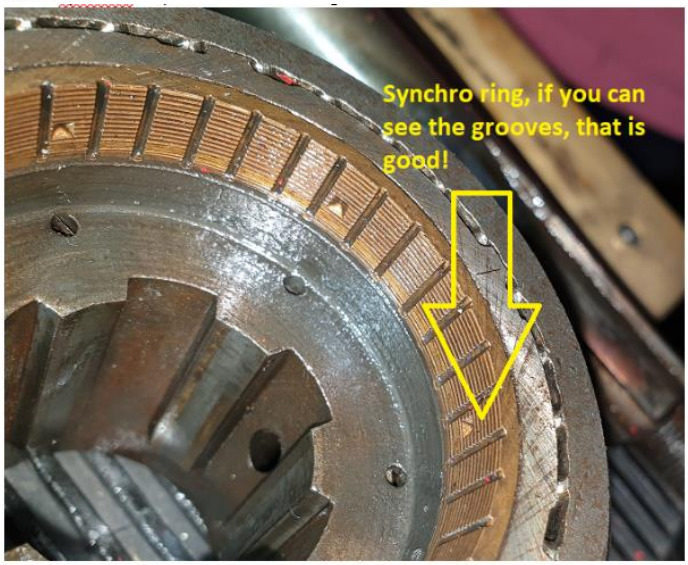
Check your syncho's and gears. My layman's explanation.... see the nice peaks on the gears in the photo. If you graunch your gear changes, these get rounded off ! There is not much metal on them.



Pic 10

Check all the gears in case there is damage and replace as necessary.

Check synchros. My ones below are in good condition.



Pic 11

Pic 12

By way of another gearbox, the one above is very worn and should not be used!!

Even though all the three ball race bearings were in excellent condition, I decided to replace them all. I enquired and was told that modern bearing material is a lot better than the early ones so was not tempted just to leave them. Note the **C3** on the part number on the three bearings, this is a design that allows slight variations with their alignment and is HIGHLY RECOMMENDED for these early (inaccurate) gearboxes.

Pic 13

The numbers are SKF and I learned a lot about bearings and their codes. They are all available off the shelf. I thought that was odd until my bearing supplier said that about every manufacturing plant still uses them and Morris did that too, cheap and cheerful, common as muck bearings, off the shelf. I purchased all the gearbox and all six wheel bearing for under NZ$300. He said that one modern 'specialist' car bearing alone would cost all that!

My supplier had a treasure trove of SKF and NZ supplier bearing catalogues dating from 1934. He allowed me to take them home and I scanned MG, Morris and Wolseley from 1932 to 1947. I have put these on my Dropbox for Shared VA material. These are:

- SKF Automotive Service List 1932-1938
- SKF Automotive Service List 1933-1939
- SKF Automotive Service List 1936-1947
- NZ Motorspecs Bearing application Manual No 61A Passenger Cars 1934-1960

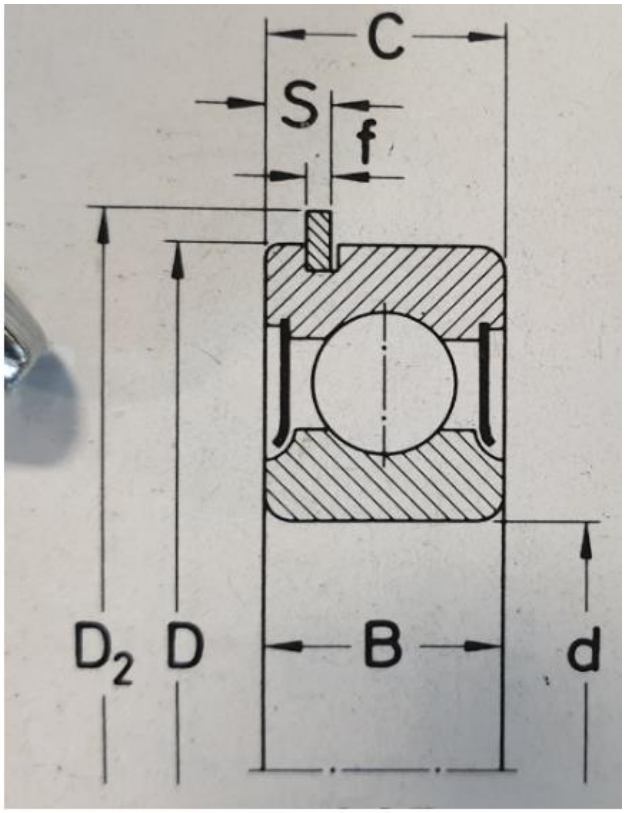
Note not all Morris bearings were SKF so only these are listed in the SKF manuals. There are no SA or WA references in these manuals. The example for the VA is:

12 HP. Series II 1½ lit. 4 cyl.
Car 1937 England

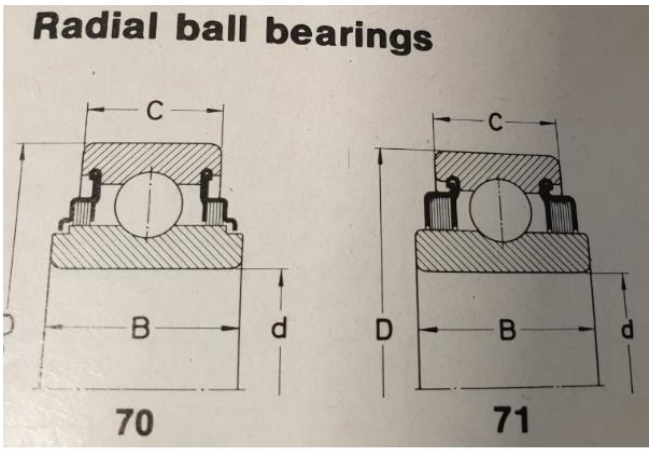
Front Wheels inner	6306
Front Wheels outer	6304
Fan	6302
Clutch spigot	1204
Clutch withdrawal	7208
Constant Mesh Pinion	RLS 10
Lay Shaft front and rear	F-99026 or F-93324
Bevel Pinion front	3206, N 306
Differential right and left	7208
Rear Wheels	6208

Pic 14

Bearing identification/specifications
For the bearings with a circlip, this is how they are defined ie SKF 6307ZNR, see Pic 15.



Pic 15



Pic 16

Radial Bearing are defined as per Pic 16

Bearings in the gearbox
MG735/181 Bearing for main shaft (rear), replaced with **SKF 6205** (LJ25 is stamped on the bearing)
6205 = Type of bearing
LJ = Light journal
25 = 25mm shaft

MG735/177 Bearing for Main Shaft (intermediate), **SKF 6305NR** (3 MJ25G is stamped on the bearing)
6305 = Type of bearing
3 = Modified in some way from a standard bearing
MJ = Medium journal
25 = 25mm shaft
G = Has a snap ring groove (Has "R" on the box number for this)

MG735/169 Bearing for First Motion shaft, replaced with **SKF 6307ZNR**
6307 = Type of bearing
Z = one oil shield
N = snap ring groove
R = Ring in the groove supplied with the bearing

BUT, after a trial fitting I noticed the large bearing's (SKF 6307ZNR) snap ring as supplied was thinner than the original as stated in Gordon's article. Even though I had purchased a very accurate digital caliper, I took the old and new bearings and snap rings back to my bearing supplier who carefully took all the measurements.

Pic 17

Original snap ring on original bearing, sizes are thickness of the snap ring.

Pic 18

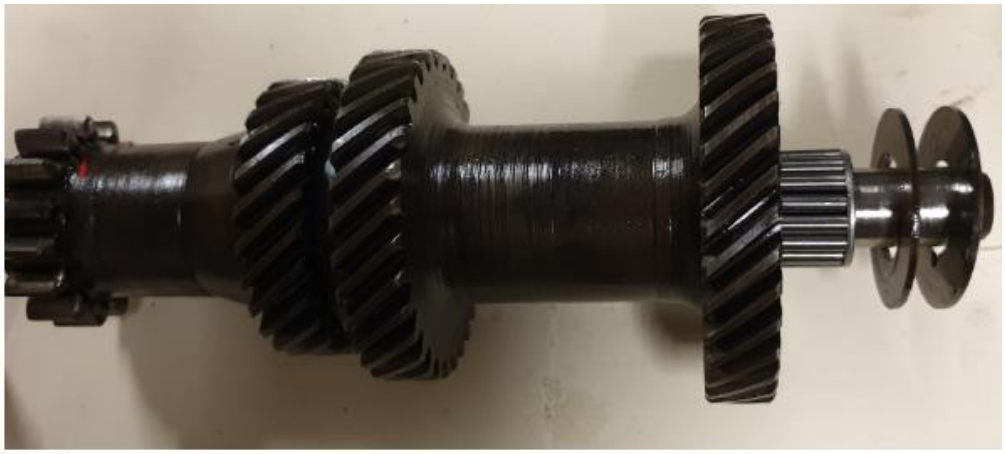
New snap ring as supplied on the new bearing

To our relief, the new bearing's groove was wide enough for the original snap ring so we just swapped it. Gordon had to have his bearing's groove ground out .... not a nice option. The difference is only 1/64" but it could have upset distances so ignore this at your peril I was told.

The other ball race bearings are as standard.

Layshaft

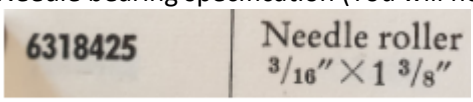
A previous owner had converted the original roller caged bearings to needle rollers, I did not have to do this. Gordon's article provides the details why you should do this and others in the SVW Register agree. It would not be a difficult job.


Pic 19

The original early VA caged lay shaft bearings setup looks like the Pic 19, it is easy to install as all the rollers are held in situ within the cage.

The First Motion Shaft [MG735/168] single caged bearing [MG735/176] and caged Bearing for Layshaft [MG 679/362] (one for each end) are replaced with needle rollers – all needle rollers are of the same size. 13 for the First Motion Shaft and 15 for each end of the lay shaft, total of 43 identical needle rollers. Mine were in top condition so did not replace them however I researched the part numbers and they are in Pic 20 below:

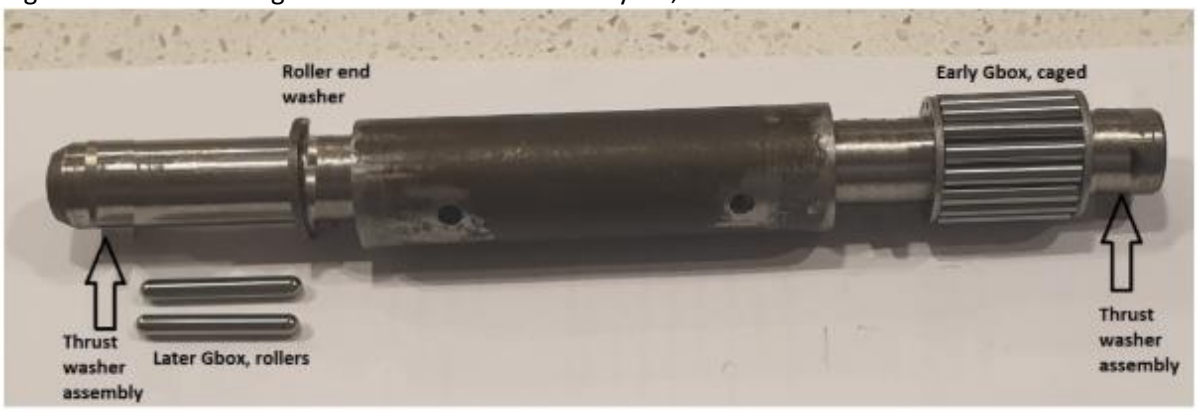
Needle bearing specification (You will need 43)



Pic 20

Until I pulled apart the gearbox, I could not understand the difference between the original caged and the later uncaged needle rollers. (I am a layman!). Because I had a set of caged bearings for the layshaft, I made up this shaft below to show the difference. It is NOT installed this way. I cannot find any manual with the non-caged needle bearing setup.

Caged to needle bearing conversion – educational layout, **NOT** as installed



Pic 21

Note: My gearbox had been already converted to a/the later specification ie from the caged needle bearing to just needle rollers.

Basically, the caged bearings can fail. Later gearboxes had the non-caged conversion from the factory, possibly from engine number TPBG1510 (wet clutch to dry clutch) or TPBG2237 ("Gearbox changed internally"). These are listed in the Service Parts List. There are 15 rollers in the cage, replaced by 13 loose ones, these must be larger. To replace the caged frame, you will also need the end washers next to the Spacer Tube [MG735/205] and of course a thrust washer at each end. Blower Pg 179 has a good diagram of the existence of the thrust washers, but with caged bearings. The M12/4SII Parts List also has this. As I had previously owned a M12/4SIII, I had the Parts List. It is invaluable for VA owners.

I learned after the first trial assembly, the bronze thrust washer and steel washer with the locating peg, should NOT have fallen apart. No manual that I found, explained the parts for the "Thrust washer assembly" (as named in the M12/4SIII Parts List). If all your bits fell apart as per my photo in Pic 8, you have a problem that needs fixing!

There is no part number nor diagram of the thrust washers used in the gearbox in the VA Service Parts List Nov 1937, updated to Sept 1946. Mine was converted but I assume to a later specification or perhaps another type of conversion.

A good diagram of the thrust washer assembly appears in the Morris Motors 12/4 Series III Service Information #TTF/24, sheet 6 and the M12/4 SIII Parts List. It has an exploded gearbox with part numbers 55 and 56 and even more importantly described as "Thrust washer assembly".

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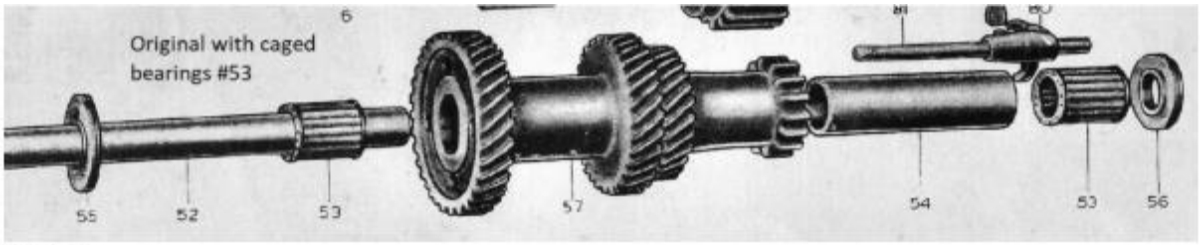


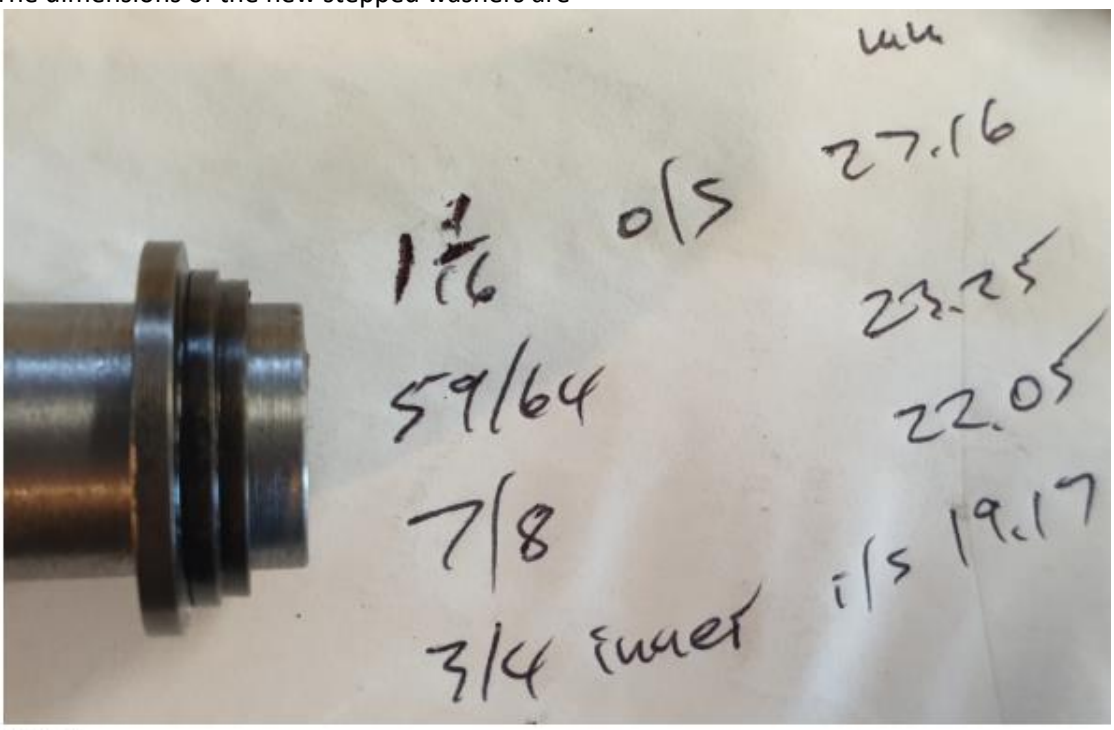
Pic 22

Les, a fellow VA owner in NZ and a mechanic, texted me photos of his VA gearbox's thrust washers and they did not look like mine. Until that point, I thought it was just one bronze and one steel washer with a guide peg in it. During the first tries at assembling the gearbox, the washers would not stay in position and just fell off, I just doubted my abilities. Les' photos showed me the 'assembly' consists of three parts.... a main stepped washer onto which a bronze thrust washer is inserted and then the steel washer with a guide peg. The latter just CLIPS on and holds all the parts together. My parts were all there but worn and ended up as individual parts when the lay shaft was withdrawn, see my photo in Pic 8 above. Now it all made sense.....but I had no new hardened steel stepped washers, one for each end.

Pic 23

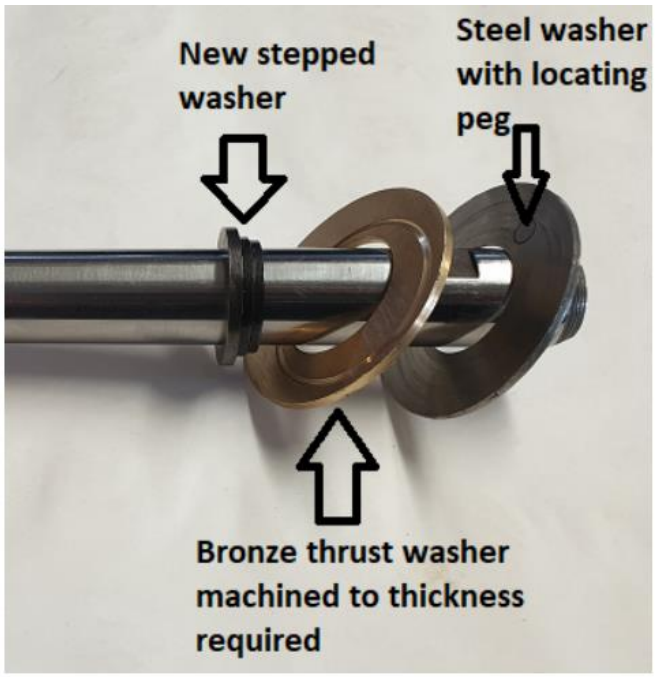
Les couriered me his end washers and my machinist machined two, heated them to about 800 Degrees C and dropped them in oil to cool them. He then repeated the process at about 400 Degrees C. This way the steel cools slowly and does not deform resulting in two new straight hardened steel washers. You cannot use water.

The dimensions of the new stepped washers are

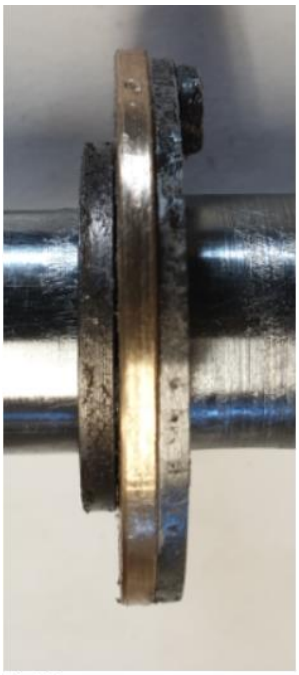


Pic 24

The assembly is then made as in the diagram below. Note the oil groove in the new bronze thrust washer. I had a new peg made for the steel washer and the smallest step in the stepped washer was made to fit the hole in the steel washer, a finger press fit.



Pic 25

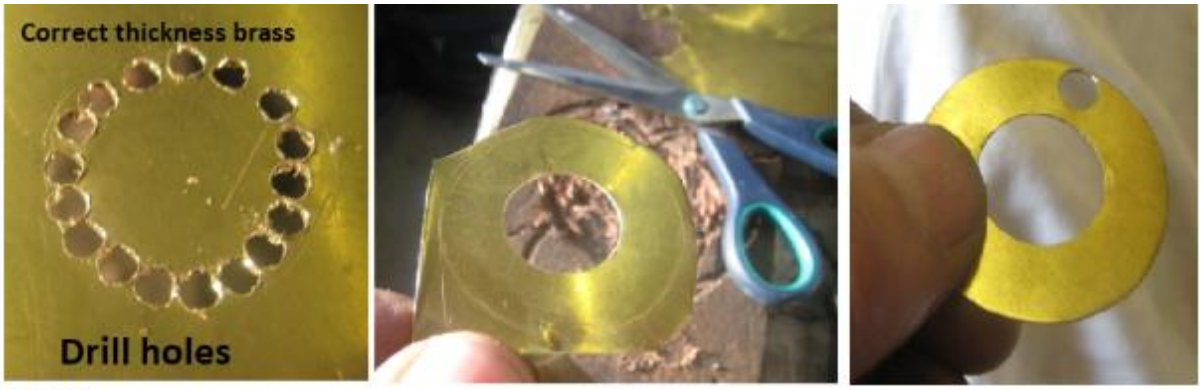


Pic 26

The finished assembly in Pic 22, parts 55 and 56, is shown in Pic 26 above. Perhaps this assembly was sold as one part hence one part number in the Parts Lists.

Hopefully you measured the thrust washer float when taking the gearbox apart and measured the end float, mine was 0.029". It is thought that about 0.006" to 0.012" is a good achievable range. By the time I assembled the gearbox, I had a variety of bronze washers (two original and two new ones made) and a set of shims I also had made for my first attempt. The final combination provided an end float of about 0.006" but this had some assembly jelly between the parts so I think it is nearer to 0.010" which will be (I hope) good.

Making shim washers
To make two shim washers, each half the thickness required. If necessary, find a local engineer. J Bannister from the SVW Register made them himself and I use his photos below. As I did not have the time, punches or material, I opted to get an engineering firm to do this. A reasonable fit is all that is required as it goes behind the thrust washer and is not a wearing surface.



Pic 27

Gearbox RE-ASSEMBLY
Paint the inside of the gearbox, this allows the splashed oil to flow freely inside. I used etch primer.

Layshaft - it is all about the layshaft, the rest is easy !!
Blower and the VA instruction manual describe at a high level how to reassemble the gearbox but there are tricks (ie experience goes a long way). Read both before you attempt this as I will not repeat their process, sequence or advice.

If you have pulled the gearbox apart without measuring the end float, you will need to install the original layshaft to measure it. See fig 3. If it is too large, the gearbox will be very noisy (I was told that more than once and an acceptable gap is about 0.06" to 0.12" (or so).

The REAL PAIN, is that the loose roller bears do not defy gravity so as you refit the layshaft, they will/can fall off and this is where patience, petroleum jelly and a short layshaft you can make, makes it all possible.

My First Attempt
My end float gap was 0.027". Because I did not have John's photos at the time, I assembled the gearbox and did not make the small hole in the shim for the locating pin on the steel washer. This made the whole assembly very tight as it stopped the peg locating in its slot. Dah!! On stripping the gearbox and punching out the new large First Motion Shaft Bearing, it was damaged and needed to be replaced. This added to the experience and I recommend making a puller tool to take off this shaft/bearing.

The shim steel material I used was quite hard to find but I managed to find an engineering shop who had some 0.014" steel shim and they made one for me. The end float would then be 0.027" less the shim 0.014" = 0.013". Cost was 6 x craft beers and $20!

Steel shim is very hard and brittle to cut so needs to be machined carefully. The front shim is circular with 40mm outside and 25mm inside.

Second trial fit
On further advice and photos from John Bannister, I decided to make two shims of equal thickness. Because they are very thin and I did not have any material, I asked my machine shop to make them. Each is 0.008" so the gap is 0.027" less 2x0.008" = an end float of 0.011". Ideal !! Now we experienced the warm glow of success because we did not know of the problems ahead.

At this point I found about the stepped washer and the reality of what we finally did follows.

Reality – final assembly
I now had a good selection of bronze and steel shims but while I was at my machine shop the manager said she was meeting up with other early car mechanics that night and secured a bit of nice new bronze material of the size I needed. Her company made me two new ones. For some reason (that defies careful measurements or logic), we ended up using one old and one new bronze washer to give the end float we wanted. My 'old' thrust washers were 0.078" (5/64") and the new 0.094" (3/32").

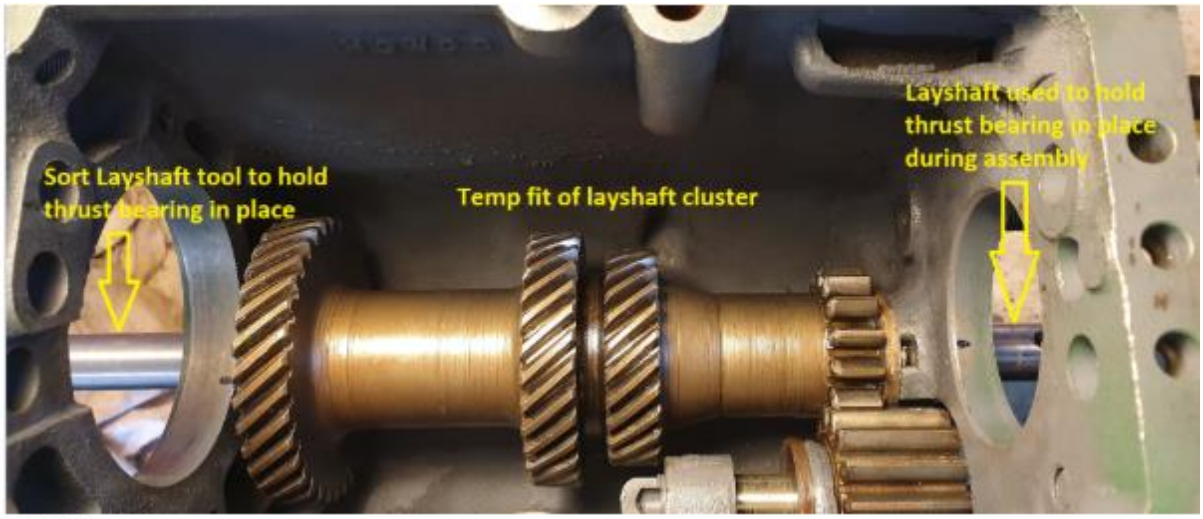
INSTALLING THE LAYSHAFT
You need to place the layshaft components with their thrust washer assemblies inside the gearbox. It is easy for the thrust washer assembly and uncaged needle rollers to collapse inside the gearbox. The VA Instruction Manual wrote about a 'tool' and it became obvious that this held all the parts together. My engineer made a short layshaft to hold the cluster components together. This is about 190mm long made out of anything (I even considered a wooden dowel too) and a little thinner than your 19mm layshaft, I used 18.8mm. This allowed the short shaft to slide easily inside the cluster.

Assemble the cluster outside the gearbox using the short layshaft. As the rollers bearings are uncaged, use petroleum jelly to hold the rollers in place (anti-gravity jelly!) as you assemble the unit. My mechanic warned me not use grease to hold gearbox parts in place as grease will not dissolve when the gearbox oil heats up and you will not have good internal oil lubrication. Use petroleum jelly as this melts at low oil temperature and readily dissipates.

Another gotcha is how you assemble the parts and where you put the parts for the layshaft. Blower Pg 188 has a good description of how to do this and also the need to engage 2nd gear to make room to install the main shaft.

The assembled short layshaft 'tool' needs to be 'placed' low down into the gearbox WITHOUT being installed into the layshaft holes. You leave it there so you have the space to assemble the First Motion Shaft with the big gear on it. The VA Instruction Manual and Blower say that. However they do not tell you that as your end float is down to, say, 0.010" you can nudge the end float washers out of the way and they can fall into the lower part of the box.....start again. We only did this five times, learning a better technique each time. A little finger in the layshaft hole is great for re-positioning the thrust washers too!

I used the actual layshaft slightly inserted on the hole to hold the rear end rear thrust washers in place but not proud into the gearbox. Measure the thrust washer bearing gap, and change bronze washes/shims as necessary by repeating the process. It does not take long.



Pic 28

Once the layshaft and thrust bearing are measured and finally assembled push out the original (longer) layshaft. The shorter layshaft tool allows the assembly to stay together as you lower it and rest it at the bottom of the gearbox.

Pic 29

Mainshaft Bearing [MG735/177] - just replaced it, no drama.

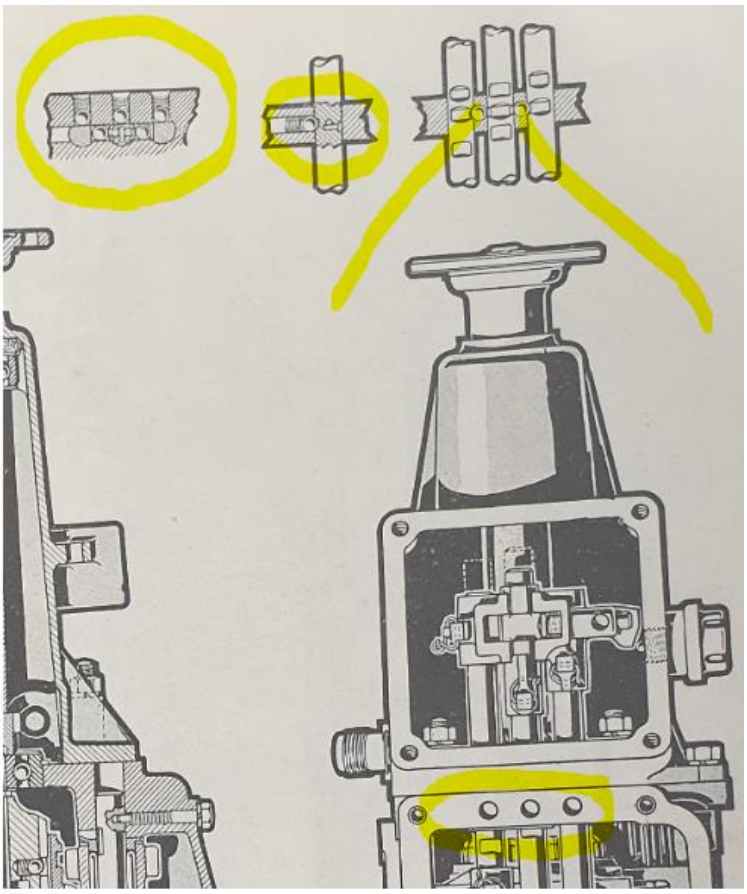
I used a screwdriver to hold the thrust washers in place because my short tool shaft was made slightly too short. Make the short layshaft a tool exactly the right internal length for the layshaft cluster, it would have made it easier as the thrust bearings would have all stayed in situ. Maybe …. if there is a next time.

You now install the First Motion Shaft cluster and also the Main shaft cluster on top. Make sure the Guard for the bearing [MG735/179] does not rub on the bearing – in case you had to straighten it! It bends easily if it is rubbing, you do not need to strip it out to do this.

Once again read the VA Instruction Manual and Blower again before you do this. You then lift up the short layshaft cluster to the holes for the layshaft and slide in the actual layshaft which will slide out the short layshaft tool.

Tip: I did try using an 18mm wood dowel and it held the needle rollers and thrust washers in place so this may save some money not having to make a steel short layshaft.

Now install the two ball bearings between the selector rods and install the selectors using new tie wire to secure them in place. This bit is easy to do but needs careful work... take lots of photos at each stage when you strip the box. The manuals are good too.



Pic 30

Almost there!

Pic 31

Just need to re-zinc the nuts black and paint them green.

Pic 32

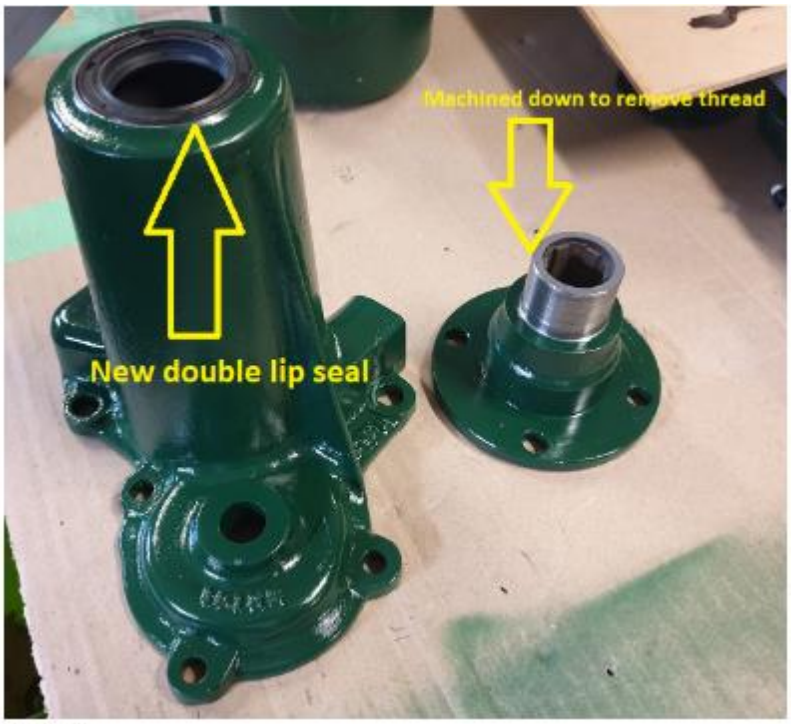
Oil

I did a lot of research. The MG VA Manual says use EP90/140 for both gearbox and diff. 1¾ and 2 pints (0.994L and 1.14L) respectively. I was told to use a GL-4 specification (GL = Gearbox Lubrication) lower detergent oil. GL-4 is recommended because more modern oils are said to destroy bronze thrust washers which are not present in modern cars.

I found an Australian Penrite product called Mild EP which is in the middle as far as viscosity goes and designed for early gearboxes.

http://www.penriteoil.com.au/applications/speciality/vintage-classic/mild-ep-gear-oil-sae-110

Seals



Pic 33

Rear gearbox seal. This is made of felt and picks up the splashed oil at the back of the *gearbox rear cover* [*MG735/30*] which attached to the *propeller shaft flange* [*MG735/259*]. It is not obvious and you need to feel around the inside lip to take it out, it is not a seal, just a circle of felt (I cannot find a part number). I took the rear cover and shaft flange to an engineer and he installed a modern double lip seal (see parts number below). He had to lathe the end of the *propeller shaft flange* slightly to remove the oil throwing thread but that did not matter as this now had a smooth surface for the modern double lip seal.

Bell housing [*MG735/164*] here is another felt seal in the bell housing, I cannot see it is the Service Parts List but it may be X679/63 *Core plug for clutch housing*. I also took this to my engineer and had the seal installed (he said its size was most odd, sort of imperial on the outside and metric on the inner – or the other way around!). He bored out the seal seat and we put in a double lip seal [replacement part number OSI-131-187-43].

Note: Both the seals for the gearbox and bell housing are the same, handy for spares. I bought two extra.

Local Part Number OSI-131-187-43 NZ$4.59 each
OSI = Oil Seal Imperial
Outside diametre = 131 = 1" + 0.31" which is the metric inch size for 5/16"
Inside diametre = 187 = 1" + 0.87" which is the metric inch size for 7/8"
Thickness = 43 = 0.43" = metric inch for 7/16"

Note: Apparently this is the standard way to describe imperial measurements in metric.

Paint
When the gearbox was stripped, I used a top quality grease remover and cleaned all the components. The outside was heavily painted with red paint and it was very hard. Took advice from a professional paint shop paint provider and used a very powerful paint stripper. [BASF TERGOSTRIP 80]. He also said, to put on gloves and eye protection. Once painted, wrap each part in glad wrap, messy but it lets the fumes work. Leave for two or so hours and while still soft, I removed 95% of the paint. A second coat of stripper and a wire brush soon dealt with that but did not remove some original green underneath which did not matter. I then sprayed inside and outside to gearbox and covers etc with grey etch primer. It did an awesome job. Next was Mid Brunswick Green [Modern paint code OEM 226].

Gaskets
I made up my own gaskets with 0.4mm gasket paper. I have photocopies of the exact sizes if required. I also used a recommended multipurpose RTV "Gasket Maker" sealant, -54 Degrees C to 260 Degrees C (-65F to 500F).

A bit of luck
If I would not have had the take the gearbox apart after the first trial, I would not have found that I had 14, not 15, needle rollers in the first motion shaft. One had slipped out onto the floor and hid itself. Just goes to show how careful you need to be and to take your time!!

Spot the difference!
It is easy to identify early oil clutch gearboxes and later dry clutch ones by their first motion shaft.

Pic 34

Pic 35

The wet clutch early gearbox (prior to #1510) has a shorter fat spline, later gearboxes from Engine Number #TPMG1510 have longer thinner splines and more of them.

Acknowledgements
All the SVW fraternity in UK, USA and NZ especially Charlie P-J, John Dutton, John Bannister and Les Bognuda in NZ.

Yes, it did end up being a bigger job than I first thought but that was through lack of knowledge. I then committed to write this article to draw together what I found so others may benefit from this experience.

Now onto the wet clutch and the engine!

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9 October 2019
MGVA 0864S TPBG #1164 Reg DLJ 917
http://mgva0864S.blogspot.com