GEARBOXES

As mentioned elsewhere on this website, the power unit (engine and gearbox) came to Australia CBU (completely built up). These were then 'married' to the appropriate drive shaft and rear axle. With the evolution of these units, they required a distinct combination of components, depending on the gearbox used.

From the outset, the MGB was designed to accommodate a 4-speed gearbox with an optional overdrive (this option was not introduced in Australia until 1967).

MkI-3 synchro/no overdrive (photo MG Spare Parts & Services)

MkI-3 synchro + overdrive (photo MG Spare Parts & Services)

The electric overdrive (on third and fourth gear) allowed for an 8% reduction in engine speed, saving fuel and reducing engine noise. As the position where the gear lever entered the body

was different with either of the two configurations, the hole in the transmission tunnel was elongated to take either option. Due to the differing point of entry of the gear lever, it was necessary to fashion two different levers. The non-overdrive option, which entered the body further forward of the driver, had an obvious 'bend' in the lever, with the overdrive option sporting a 'straight, lever that entered rearward nearer the driver. These levers are not really interchangeable as they differ in shape at the other end (see photos).

Different levers used (photo: Pooch2)

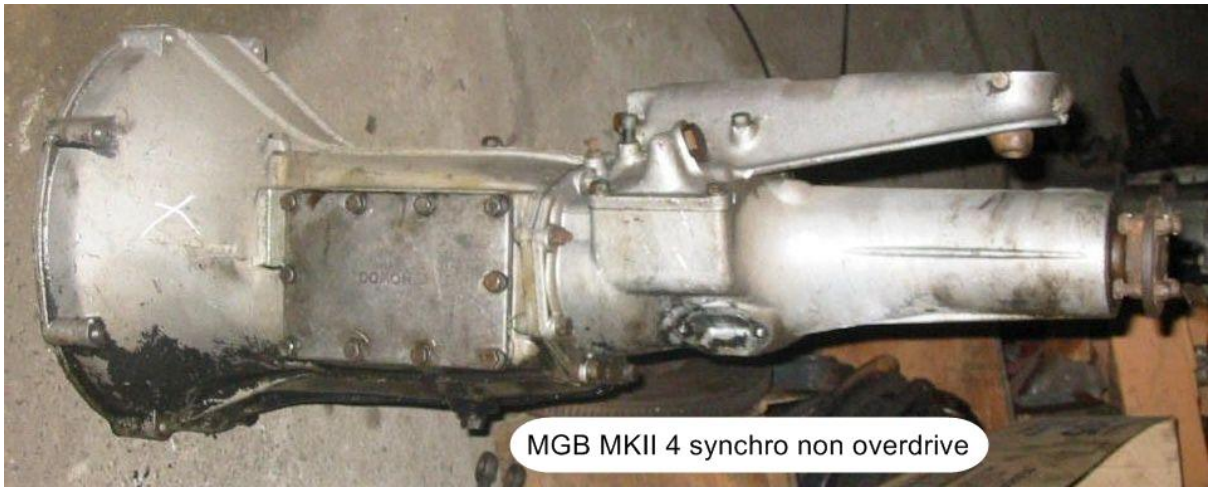
MkI gearshift surround c/f MkII gearshift surround

The gearboxes used on Australian-assembled MGBs went through three distinct variations (this would have been four if the assembly had continued past 1972)

The first combination was the 3 bearing engine, with no synchromesh on 1st gear (1963-64). It was offered with or without overdrive in the UK/USA but only without in Australia . The **overdrive** option (which was offered in Australia late 1967 and only on the last 200 or so YGHN3 vehicles) used a Laycock de Normanville (Type D) overdrive. This featured an external solenoid, a hole in the bell housing to allow the starter motor to protrude and a 'shield-shaped' access cover. The inclusion of the overdrive allowed a reduction of engine speed by 8%. The speedometer calibration for the non-overdrive version was 1 040 TPM (Turns Per Minute) and 1 020 TPM for the overdrive version.

The second combination was circa 1965, when the MGB engine was upgraded to a 5 bearing crankcase, still with no synchromesh on 1st gear. These were not readily changeable with the earlier combination as there were changes to the input shaft, the flywheel, engine backing plate and the spigot bush. The Laycock (Type D) overdrive was still used for the overdrive version.

Note: A lot has been written about the 'narrow' tunnel (transmission tunnel) that was found on the early MGBs and modifications necessary to accommodate the overdrive unit. Whilst the hole was extended to allow for the rearward location of the gearshift lever, it is possible today to purchase fibreglass covers that simplify the modification.



MkII-4 synchro, no overdrive (photo: MG Spare Parts & Service)

MkII-4 synchro + overdrive (photo: MG Spare Parts & Service)

Mid 1967, at car YGHN3/4487, automatic reversing lights were fitted as standard equipment.

The third combination used in Australia was circa 1968, due to the inclusion of synchromesh on all gears. The overdrive unit changed to a Laycock (Type LH). This unit was slightly over-engineered for this gearbox as it was designed for the larger MGC engine. Its features were: 'rectangular'-shaped access cover; oval clutch fork boot; a dipstick for checking oil; label on overdrive solenoid cover, stamped '22/61972'; speedometer calibration of 1 280 TPM (for both non-overdrive and overdrive versions).

Note of Interest #1: "Wheels" magazine (July 1969), reported that in a demonstration vehicle the speedo of the new automatic MGB recorded a top speed of 126 mph! Upon comparison, it was found to be 20% out – no doubt the wrong combination of components was used.

Note of Interest #2: An interesting promotion of overdrive can be found on Youtube - https://www.youtube.com/watch?v=mlhuVs-hIUg

3-brg/3sync c/f 5-brg/3&4 sync (photos: MG Spare Parts & Service)

All of the above, along with the change that occurred in rear axles ('Banjo' to 'Salisbury') necessitated a change in drive shafts. These are detailed in the 'Driveshaft' section of this website.

The 'Automatic' option, offered with the Mk II upgrade was of the Borg Warner Type 35. This was the reason that BMC had to replace the previous 'narrow' transmission tunnel with a wider, flatter alternative, to accommodate the automatic gearbox. Whilst the narrow tunnel could be modified to include the overdrive option, it was not able to accommodate the automatic transmission.

Borg Warner Type 35 Automatic gearbox and shifter

According to Clausager (p 86) there were 228 CKD kits sent to Australia with the automatic gearbox, between August 1968 to July 1970, making them a fairly rare vehicle.
(NB: much of the above information is attributed with thanks to Tom Sotomayor)

The Borg Warner automatic gearbox was first developed in the US in the '50s. It was fitted to a wide variety of European and Australian-built cars (Chrysler Valiant, Ford Cortina and Capri, Leyland P76 and the Humber Hawk.

BMC/L, Ford and Chrysler fitted the Type 35 as standard equipment in their Australian-built cars.

Also, as a note of interest, it was scheduled to be fitted to the Australian-designed and built Ilinga sports car (production of the car didn't proceed past 2 vehicles, partly due to the gearbox being unable to handle the power of a modified V8 from the Leyland P76, delivering about 220bhp.
(NB: Information taken from Trove article)

The Australian production of these gearboxes was at the BW plant in Fairfield, NSW, though it should be noted that the Australian-assembled MGB never used these, receiving theirs (already attached to the engine) from the UK.

I have read in various places that a point of conjecture was the reason for the inclusion of the map-reading light on the dashboard of the automatics was to illuminate the

gear lever. Stuart Ratcliff of leaves one with no doubt as to the company's intention by pointing out the name of the part:

Parts book, BHA4483 , **Lamp Assembly gear illumination**. G-HN4 , G-HD4-138401 to 258000 (Automatic except N America)

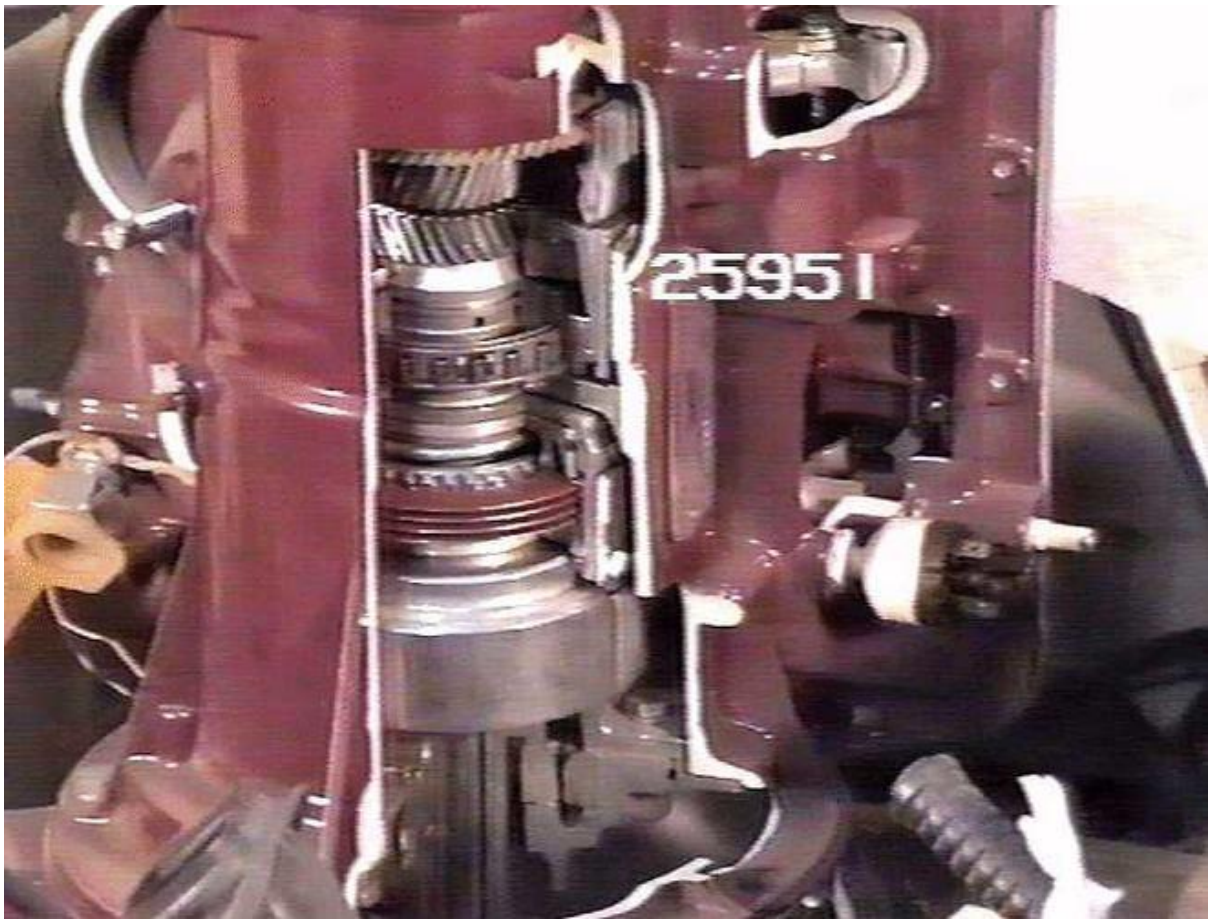


Photo of sectioned BW35 automatic gearbox

Photo showing automatic shifting lever and Lamp Assembly Gear Illumination

Gearshift knob:

Original BMC Documents (Technical Bulletins)

1967 – GEARBOX – Synchromesh on 2nd gear

1967 – GEARBOX – Non interchangeability of gearbox gears

1965 – AUTOMATIC – Centre support and plug assembly

1965 – AUTOMATIC – Inhibitor switch

1966 – AUTOMATIC - Transmission fluid

1968 – AUTOMATIC - Deletion of rear pump

1968 – AUTOMATIC – Rear clutch spring seat

1969 – AUTOMATIC – Transmission fluid

How to use your overdrive

The following article by John Esposito (highly respected gearbox specialist – US), discusses the ways to prolong the life of MGB overdrives…

http://www.quantumechanics.com/

Topic of the Month

Proper shifting of a Laycock overdrive

OK everybody, calm down out there. We have received some interesting emails over the last few months asking (and telling) us about the proper way to shift in and out of overdrive on the Laycock deNormanville overdrives as used on the British cars (A, J, LH, D and compact A types). We received some spirited responses – use the clutch, don't use the clutch, etc. I would like to express our opinion on the proper method to shift in and out of these overdrive units.

First let me admit that when I had cars with overdrive, especially Big Healeys, I did not shift the recommended way. It is way too cool and impossible to resist the temptation to pull up next to someone at 50 or 60 MPH and, as you shift into overdrive, accelerate away into the great beyond. This usually gets very interesting and surprised looks from the other drivers and passengers and really impresses the people who are with you in the car. What was that, warp drive? Like, you still have another gear? How many gears does his car have???!!!! It is also way too cool to kick down from overdrive at 50 (80kph) or 60 (100kph) and watch the expression on the faces of other people as the engine revs on the downshift. This is especially true on the Big Healey, as the 6 cylinder really sounds great at speed. You get the fantasy of what it must feel like downshifting at the end of the straight at LeMans.

Anyway, back to the proper way to do it. Let's think for a minute why overdrives were put in cars in the first place. I mean after all, anyone can put in a 5th gear on a transmission, why an overdrive? First of all the British never do anything the way we expect or anyone else does it. This was especially true in the 40's, 50's and 60's and is why we have such interesting cars from that period. Laycock overdrives are really like a manually initiated mini automatic transmission. (I personally think a guy

named Rube Goldberg had a major part in their design). The important thing to remember is that it was added as an option on most cars in order to reduce engine RPM (and consequently wear) on the highway and increase fuel mileage. Secondarily it was also used to increase the number of speeds forward, giving a better selection of gear ratios for driving. Given this objective, we can understand that the proper way to shift into overdrive is to reduce the engine RPM's, not increase the road speed of the vehicle. In fact, it is somewhat damaging to the overdrive clutch to accelerate under power during the shift process. This is akin to slipping the clutch or power shifting during the normal shifting of a regular gear. It can tend to lead to premature overdrive brake ring and clutch wear and failure. You do not need to use the regular clutch pedal at all.

Get to a reasonable speed, say 45 (72kph) to 50 MPH (80kph). Activate the overdrive switch. As the overdrive engages, feather the throttle so that the road speed of the car remains the same and the engine RPM's are reduced. Voila, you have shifted the overdrive with minimum stress to it and now are cruising at a lower engine RPM. Objective achieved. Now you can accelerate to any cruising speed you desire as the overdrive is fully engaged. It is not recommended shifting into overdrive at too low a speed as this also can cause stress on the clutch and lugging the engine is not a good practice either. In fact the early overdrives had a mini Lucas centrifugal type regulator on the output shaft of the overdrive that would not allow the overdrive to be engaged below a specified speed. Shifting out of overdrive is the reverse of this process. Turn the overdrive switch to the off position. As the overdrive disengages back to normal drive, push down on the throttle to keep the car's road speed the same and increase the engine RPM until the overdrive shift is complete. This again minimizes wear to the overdrive clutch and brake ring. You can now decelerate the car as you would normally. Again, you would not want to shift out of overdrive at too high a speed as you could over-rev the engine and cause damage to it as a result.

As you can see, the basic objective of proper shifting is to reduce the wear on the internal overdrive clutch during the shifting process. This can easily be done with some practice and will significantly increase the life of the overdrive unit. We have determined this shift procedure from observing many overdrive units and the wear on the key overdrive clutch components, as well as just plain common sense.

We hope this will clear up any questions on the proper way to shift these overdrives to reduce the wear on them and keep them running longer. Most likely we will generate a new set of questions on the procedure, but

that is what it is all about! As always, comments and feedback are welcome!

SLS Docs – GEARBOX