Adventures in replacing the Second Gear Synchro

For the past couple years it has become more and more difficult to shift in and out of second gear on my 1960 MGA Roadster. Don Tremblay drove it last year for a test drive and I warned him he had to be “gentle” with the second gear and he definitely saw something amiss as well. I had been intending to get to my project for some time but my lift has been tied up for a couple years with friend’s projects. In the mean time I pulled out a spare gearbox and parts and along with some new parts built another “hybrid” gearbox. Since my MGA has a 5 main MGB engine, when I built the car in the late 1990s I had built a MGB gearbox (front housing) with an MGA tail section to make it easier to mate up to the engine. This entailed a engine rear backing plate from a 1965-1967 MGB, the front transmission housing and third motion shaft and the first motion shaft (output shaft and input shaft) from the same years MGB, MGB clutch throw out bearing, throw out fork and clutch. This particular transmission had the old style brass second gear synchro which tends to wear over time. When new the alignment sections look like a little peaked roof house, but as it wears it begins to look more like a steeple. See the picture below and you will see what it looked like when I looked at it.

Worn second gear synchro

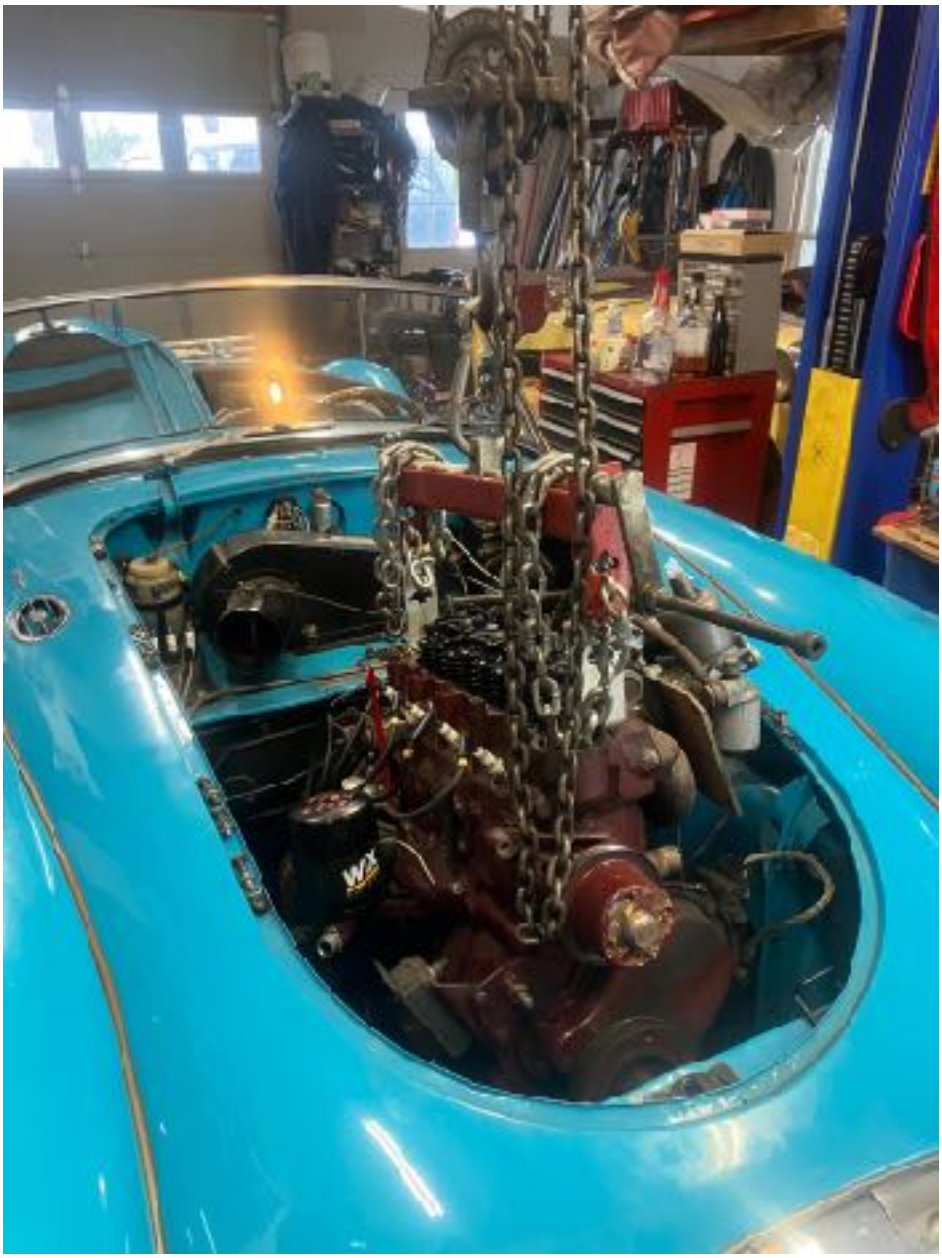
So, I put together the replacement hybrid gearbox with one major improvement. About 1967 BMC started using a steel second gear synchro which lasts a lot longer (all MGB 4 synchro

gearboxes starting in 1968 have steel synchros in all forward gears). I put in the corresponding second gear (different from those that use a brass synchro ring) and new layshaft and all new seals. I also used a good set of selectors (these are often rounded and worn which can allow the selector lever to slip between two selectors and jam the transmission in two gears at once). I made sure that all my gear teeth were in good conditions selecting the best used parts I had. Now, with the transmission read to go it was time to get the MGA on the lift.

I put the MGA on the lift and started disconnecting everything to pull the engine and transmission. The first thing I did was to remove the bonnet to allow better clearance since I was using a chain fall to lift the engine and transmission. Using and engine lift may not require the bonnet to be removed, but it makes it much easier to access everything with the bonnet off. In the past I have always separated the engine and transmission and pulled them out separately. This is because, working by myself, I found it easier to do it this way. The service manuals say you can do it either way, but the Haynes manual always shows the engine and transmission being pulled together in the pictures. So, I though it was about time I did it that way myself. Fortunately for me I had the help of Rick Valera to help me guide the engine and transmission in and out of the engine bay this time. I have had a tilt sling for about 30 years, but never found it very helpful. But, this time I used it (I modified it just a bit by putting on a longer handle and made sure it was well greased for ease of changing the angle.

When pulling the engine and transmission together it does not require removing so many things off the engine. I removed the generator, carb air filters, and the exhaust down pipe and all the coolant pipes as well as the radiator but was able to leave the starter and carbs on the engine. While disconnecting the drive line and found a worn U joint, so, I went ahead and replaced that while the drive line was out (normally I'd leave it connected to the differential). The shift tower has to be removed also for the transmission to come out.

Engine and transmission coming out together



Once the engine and transmission were out of the car we separated the two. I decided to also replace the rear main seal on the MGB engine while it was out because I had some issues with engine oil leaks the last few years. So, I pulled the clutch and flywheel and replaced the rear main seal with the “new and improved” - (I think Viton) seal. I also noticed some wear on the input shaft spigot bush, so, I replaced that as well. The clutch pressure plate also had a loose bearing surface ring, so, I replace the pressure plate with a new one. The driven clutch plate was still like new, so, it went back in, but I also replaced the throw out bearing with a new one.
I used a spare first motion shaft as my clutch alignment tool (works much better than a generic tool or those plastic alignment tools). We slid the transmission onto the engine and it went right together. This has always been the difficult part when aligning the transmission to the engine when the transmission is already mounted in the car. Before installing everything we decided to to a good cleaning of the engine compartment. This is also a good time to tough up any paint issues when everything is clean and exposed.

The next step was to drop the engine and transmission back into the engine bay. It has to be titled and just the right angle to clear. I removed the front damper pulley to allow just a bit more clearance at the front. As the engine drops in and the tail of the transmission slide into the transmission tunnel (guided by my helper) the angle of the unit has to be constantly changed to allow it to slip in without catching on the lip of the transmission tunnel. We got it almost all the way but it did not want to go that last 1/2" until I noticed that my chain from the lift was dangling down and fouling the transmission at the firewall! Once I pulled the chain out it dropped in the rest of the way. I did not replace the motor mounts as they were still like new, but this is the time to look for any and all serviceable items that should be addressed while accessible.

Engine and transmission back into engine bay

With the engine and transmission in position it was a straight forward procedure to reconnect and reinstall everything. Another thing I should mention is that the transmission cannot be filled until AFTER installation because of the tilt and without the shift tower not in place the oil would run out the opening in the tail section. I actually filled the transmission from the shift tower opening before installing it because it is a lot easier than filling at the dip stick!

And, here it is all back together

This whole endeavor only took about partial days of work in the garage but it was a great opportunity to bond again with the MGA which I have not been able to drive all winter. With the weather improving early next week I plan to take it out for it's inspection. Oh, and by the way, I installed four new Michelin XZX tires on it since the old tires were 12 years old!

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