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MGB OVERDRIVE DIAGNOSTICS

Is your overdrive not working? This seems to be fairly common question. Rather than typing up the same answer over and over, I have written this MGB Overdrive Diagnostics knowledge base article.



This article covers the [overdrive options](#) available on the MGB. They likely can apply to any other of these [Laycock Engineering](#) / [GKN Laycock](#) manufactured units based on the designs of [Edgar De Normanville](#). Also known as Laycock de Normanville overdrives.

Background

Without trying to make this a tutorial, there are 2 elements to an overdrive not working necessitating MGB Overdrive Diagnostics. The overdrive unit has two main components. If either isn't working, the unit won't work.

Overdrive Electrical

There is an electric solenoid which, simplistically, operates a plunger/ball bearing. When activated, closes off an oil passage which causes the overdrive to be engage using the approximately 450psi oil pressure this creates. If there is an electrical issue that prevents the plunger operating, then the overdrive cannot engage/work.

Oil Pressure/Clutch Sliding Member

If the solenoid is active, a ball bearing above the plunger closes an oil passage. This directs oil to operate the pistons of the clutch sliding member. This also means the outer sliding member brake surface is in contact with the stationary brake ring. When these are in contact, the sliding member and sun wheel cease to rotate and overdrive is operational.

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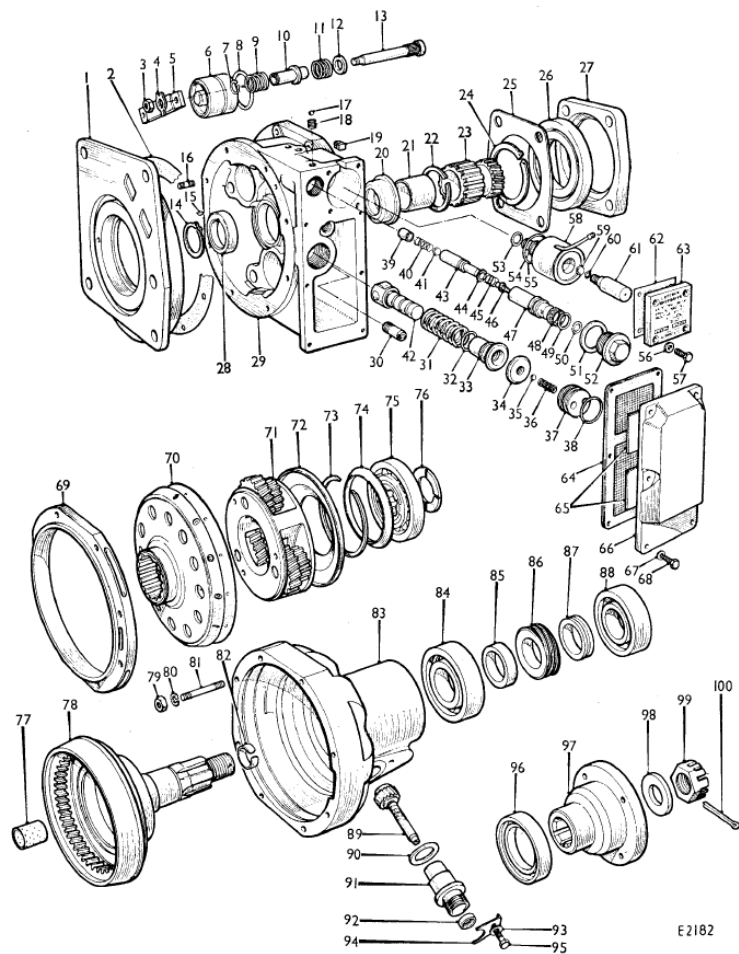


Diagram from the Bentley Workshop Manual for LH Overdrive

Overdrive Oil

I have already covered the [choice of oil for the overdrive gearbox](#). I will not repeat it here but this link to the relevant knowledge base article covers the options and my personal experience with the choices of [oil for the gearbox](#).

This is the first and most simple diagnostic. Making sure the oil is at the proper level may be all that is causing the issue. Without enough oil the overdrive unit may not be able to attain and maintain the approximate 450 psi of pressure needed to activate the overdrive. My personal choice is 20W50 oil.

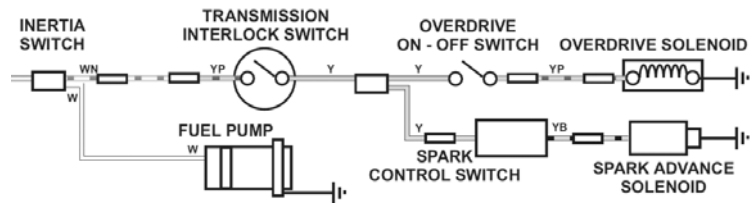
Electrical Diagnostics & Failure Points

If you don't already have a color wiring diagram, you need one! The great people at [Advance Auto Wire](#) have made these available for the MGB. Please see this article for more about getting a [color wiring diagram](#).

The following are the potential points of failure. These are well shown using extracts of the [Advance Auto Wire](#) wiring diagrams, for early and late model US specification MGBs. There may be slight differences on various MGB models but the failure points are basically the same.

- Transmission Interlock Switch

- The overdrive on/off switch (on the dash, early models, steering wheel stalk or in the top of the gear shift for 1977-1980 models)
- The Overdrive Solenoid or power to it



Extract from Advance Auto Wire's late model MGB wiring diagrams



Extract from Advance Auto Wire's 67/68 MGB wiring diagrams

Let's take a look at each failure point. These are in the order I suggest you check them. Each test should be done with the following conditions:

- The ignition must be on
- Put the car in 4th gear
- The overdrive on/off switch must be in the on position

Do not leave the ignition on for an extended period, say more than 2-3 minutes at a time. Some components like the coil, if the points are closed, won't like this. Equally an electronic ignition module may not like the circuit being hot without the car running.

Overdrive Solenoid

The overdrive solenoid is on the bottom of the LH style overdrives. You will find it under the either blue or black cover plate. There is a single wire leading to it. Originally, this will be a brown braided wire. It's external on the earlier D-type overdrives. The quick and simple check is to ensure that the solenoid is getting power.

So, you can easily do this with a volt meter/multi-meter. Use the multi-meter to see if 12v is reaching the solenoid.

Use the positive probe of the multi-meter and connect this to the bullet connector or other connection of the wire going to the solenoid. Typically this will be about 6 inches away from where the wire enters the solenoid. Use the negative probe and connect it to a good grounding (earth) point on the car. This can be any good bare metal point on the chassis.



Red box is the solenoid cover plate. Yellow is the power wire

Do you see 12 volts on the multi-meter? If not try a different or better ground to be sure the measurement is working. If there's anything less than 12 volts, or no volts, this is a problem that must be resolved. You will want to continue further up the electrical circuit. Don't forget to turn off the ignition when done.

Transmission Interlock Switch (TIS)

Let's just get this out of the way. This is extremely hard to get to with the gearbox in the car. Also, don't confuse this with an identical switch that operates the reversing lights. The overdrive TIS is on the left hand side of the gearbox when looking towards the front of the car.

Transmission Interlock Switch (TIS) Testing

For electrical testing you may not need to lower the gearbox. However, it will make it easier though. You can do this by supporting the gearbox and removing the 4 outside bolts of the cross member into the frame. Then lower the gearbox and the tail end of the gearbox will rest on the non removable cross member.

Similar to the test for 12v to the solenoid, check for 12v at the TIS. As the sequence of the components varies by year there will be slight variations. To keep it simple, test both connections/sides of the TIS for 12v. Or, if you review the wiring diagram you can make sure whether you have 12V coming into the TIS and also out of the TIS. For the later model cars the TIS feeds to the overdrive on/off switch in the top of the gear shift. Earlier cars, the TIS is between the overdrive on/off switch (dash or stalk) and the overdrive solenoid.

If you don't have 12v on both sides of the switch this may indicate a problem with the TIS. You can try to tighten the switch a little. Also, potentially you can try removing or reducing the number of fiber washers under the switch, if present. Lastly you can also try pulling on the gear shift to see if any extra movement either towards the back of the car or towards the right side of the car (looking forwards). If any of these fixes a no 12v situation on the outwards or downstream side of the TIS, then it's probably a need to replace the TIS.



Closeup of the Transmission Interlock Switch (TIS)

Overdrive On/Off Switch

Hopefully this is not a surprise, there needs to be a test of the function of the overdrive on/off switch. As with the other tests, you need to verify 12v into and out of the overdrive on/off switch. Depending on the location of the switch how you test will vary. Use your multi-meter in a similar way.

The 1977-1980 switch in the gear shift cap is fairly easy to access but the wires are short and the design with wires running up the shifter make these prone to damage/shorting out. Test for 12v on both sides of the switch with the switched closed. In my own experience, I have found issues with this style of switch, even though it appears to be working. You may find it a useful option to just change this switch if the rest of the electrical connections were OK.

The earlier switches can also be tested. Use the wiring blocks under the dash for stalk mounted switches and wherever you can get access for the very early dash mounted switches.

Replace any switch which is failing to pass 12v. If the initial input/supply 12v has failed, check the initial power from the White with Brown circuit for 1977-1980 cars and the White wire for pre-1977 cars. Refer to the wiring diagram images for additional information.

Overdrive Component Failures

Without removing the gearbox and opening up the overdrive, there are some checks to operations you can perform.

Overdrive Solenoid Removal

Even though the solenoid may have been getting 12v, it may not be functioning. This is pretty rare, but it does happen. To test this you can remove the solenoid, plunger and ball bearing from the overdrive unit. I'm not familiar with the process for the D-Type overdrives. For the LH overdrives carefully remove the 4 screws securing the blue or black cover plate on the bottom of the unit.

You should be extremely careful removing the solenoid to avoid losing the ball bearing. The picture provides a visual clue to everything that is above the cover plate. You can use this to make sure you have everything removed.

Overdrive Solenoid Testing

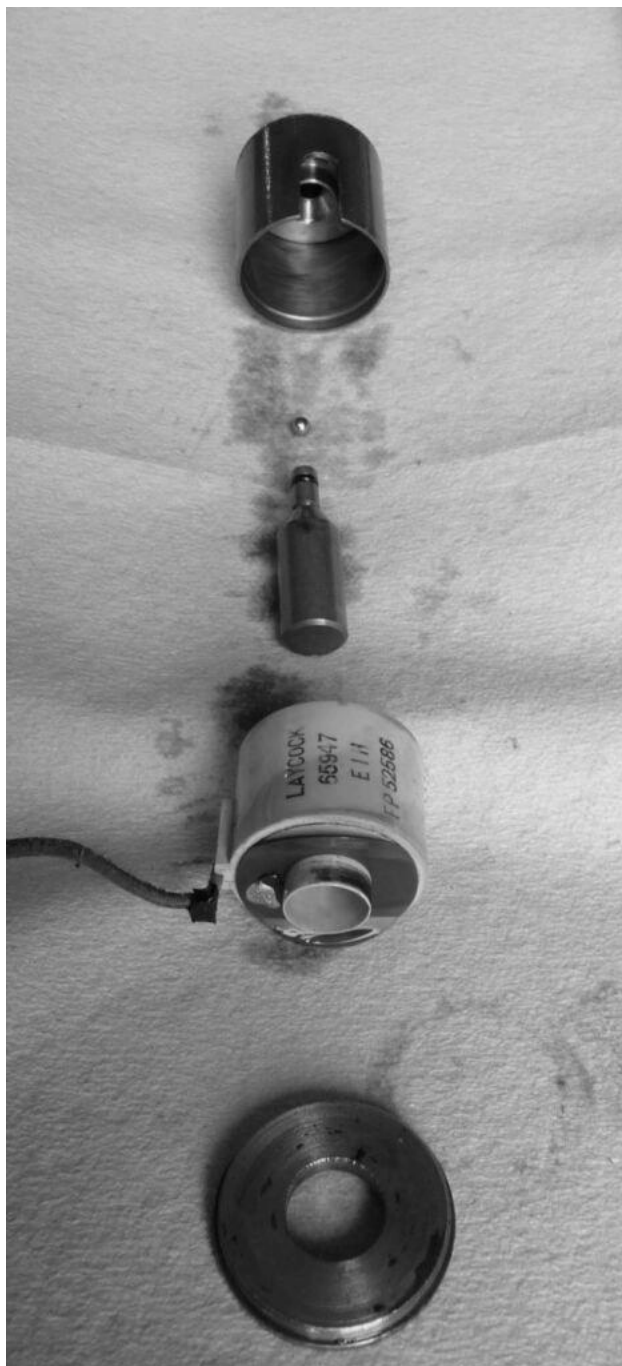
To test the solenoid, put the plunger in place inside the solenoid. Then carefully apply a negative 12v power source to the copper base of the solenoid. Afterwards, you apply a positive 12v supply to the braided wire of the solenoid. With 12v supplied the plunger should move towards the top of the solenoid. It may shoot up or move more slowly. If it barely moves check your power source. If it fails to move the plunger a new solenoid is needed.

Overdrive Solenoid Maintenance

Other maintenance to the components can be performed.

Clean carefully the copper base plate of the solenoid and the bottom of the solenoid valve body to ensure good conductivity for the negative/ground connection.

Replacing the o-rings is also a simple maintenance item. There are 3. The very tiny o-ring on the top of the plunger and 2 on the top of the solenoid valve body. Refer to the pictures for additional information and guidance.



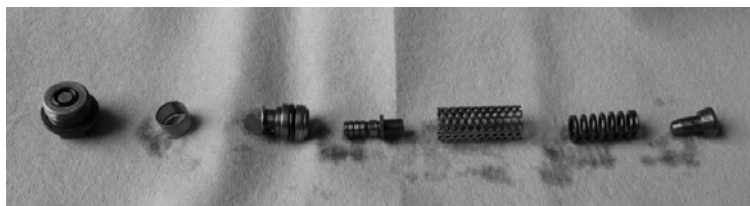
Solenoid components



Solenoid valve body

Oil Pressure Relief Valve

This unlikely to suddenly fail and cause an issue. If the car is new to you and the overdrive doesn't work, it may be worth checking. If this has been removed and not re-installed correctly, it can cause the overdrive not to work. The picture shows the correct assembly of the parts. Hopefully this is a little easier to follow, compared to the workshop manual diagrams. The parts are shown and from left being the bottom working across to the right which would be the top.



Oil pressure relief valve deconstructed. Left (bottom) to Right (top) when installed in the overdrive.

You can remove and check the assembly of the oil pressure relief valve. There are also 2 o-rings that you should replace if you have it apart. These can be seen in the recess of the plug bolt and on the middle of the valve body. There's also a filter (2nd from the left) that can be cleaned or a replacement used.

Oil Pump

Removal of this with the gearbox in the car is possible. However, I personally do not recommend it. Removal is simple, just don't lose or mix up the ball bearing with the one above the solenoid. They are not the same size. Re-install of the pump is extremely difficult.

The picture shows the oil pump installed in the overdrive adapter. The top of the pump would be resting on the cam on the main shaft. The back side of the pump is flat and the pressure of the spring is quite significant.

Hopefully this starts to explain why the re-install of the pump with the gearbox installed in the car is so difficult. You have to prevent the pump from twisting as the flat side can only face the back of the gearbox. The pressure of the spring ensures that the alignment of the pump is very difficult to maintain. All this while trying to get the threads of the pump plug started.

If you do remove it, there's not much maintenance to be done. You can make sure the roller on the top is working and not worn. There is an o-ring that can be replaced.



Image of the oil pump installed in the overdrive adapter

Other Materials

I've built this website and spent time on the [knowledge base](#) to bring together a lot of information I have collected from around the internet. The intent is making it easy to find rather than having to know about and have skills with search engine query terms to get what you were looking for. Please make use of the [knowledge base](#).

Intermediate, Tutorial

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