

## Overdrive in Volvo Amazon

WHEN THE NEW GEARBOXES M30, M31, M40 and M41 were introduced with the 1961 model year, the body had been provided with a wider tunnel to fit them. The same year, the Laycock de Normanville overdrive TYPE D was introduced together with M31 and M41. M31 was option only on the 121 and the M41 was option only on the 122S. This was the only model year with overdrive in combination with the B16 engine, since the B18 engine came in 1962. 1961 was also the only model year with the M31. When the *top of the line* model 123GT was introduced in 1967, overdrive was no longer available as option on the 122S. Overdrive is exclusively found on the 123GT during the model years 1967 – 1970.

Except for the 123GT all cars with overdrive had a badge on the left side of the trunk lid, aligned with the license plate. From chassis number 84 601 on the P130 (model year 1965) the later style badge was mounted.



Early overdrive badge, 1961 – 1964



Late overdrive badge, 1965 – 1966

In 1969 the B20 engine was introduced also on the Volvo Amazon and overdrive is provided as standard only on the few 123GT produced in 1969 and 1970. The Laycock de Normanville overdrive unit is now of TYPE J.



The differences between TYPE D and TYPE J are essentially that TYPE D provides a higher reduction of the RPM (0.756:1 or around 24%), but has a somewhat weaker construction and is more prone to break. The TYPE J has a more robust and reliable construction, but has a lower RPM reduction (0.797:1 or around 20%). The TYPE J also comes with an improved hydraulic system that provides smoother kick in/out and is less sensitive to pollutions thanks to an added fine particle filter in the pressure line. TYPE D is only found in combination with the B16 and B18 engines (model years 1961 – 1968) and the TYPE J only in combination with the B20 engine (model years 1969 – 1970). The TYPE J persisted into the 1980s all the way up to the Volvo 700-series. One distinction between TYPE D from TYPE J from the outside is that the solenoid is placed on the left side on the TYPE J and on the right side on the TYPE D.



*Type D*



*Type J*

The wiring is also different, where the TYPE D is wired over a relay in the engine room while the TYPE J is wired directly to +12VDC.

## Guide

START BY DISCONNECTING THE BATTERY and inspect the new gearbox. Make sure it is emptied of oil and that the inhibitor switch on the lid is in place and connected to the solenoid. The switch prevents the overdrive to kick in on all gears but the fourth (on the M4I, second *and* third on the M3I). Should the overdrive kick in at the same time as the reverse gear is in, the whole overdrive unit would break, something this switch is meant to prevent. Attach the new speedometer cable to the new gearbox. Also check that the locating key on the new box fits with the shorter propeller shaft.

Raise the front of the car or park it above a grease pit. Disconnect the gear lever inside the car, including the rubber cover. Remove the cable to the reverse lights, the speedometer cable and disconnect the front drive line shaft from the old gearbox. This is done from under the car.

Next step is to remove the old gearbox from the car. Use a floor jack to hold back the gearbox and loosen the transmission support cross member, which is secured to the underside of the floor with four bolts. Lower the gearbox somewhat so that it may be detached from the bell housing. This requires close attention to the throttle linkage, coolant hoses, fuel line, clutch wire, etc. Loosen the bolts that hold the gearbox and bell housing together (there is no easy way to get access to the upper bolts). Carefully slide the gearbox out of the bell housing so that the input shaft passes through the throwout bearing and remove it from the car. Detach the front part of the propeller shaft and remove it.

It's now time to mount the new gearbox in the car, which will be something of a reversed previous step. Start by attaching the shorter front propeller shaft to the rear one. Use a floor jack to raise and position the gearbox in the tunnel. This can be tricky. Don't drop the gearbox! Attach the gearbox with the rubber cushion intended for the M4I, which is more robust than the corresponding one for the M4O. Connect the cable to the reverse lights and pull the speedometer cable via the engine room to the instrument panel. Attach the speedometer cable to the speedometer. Pull the cable from the inhibitor switch on the gearbox lid. This should go from the gearbox to the engine room in a TYPE D installation and to the instrument panel inside the car in a TYPE J installation. Well in position, the gearbox is attached to the bell house and the shorter shaft to the locating key of the gearbox.

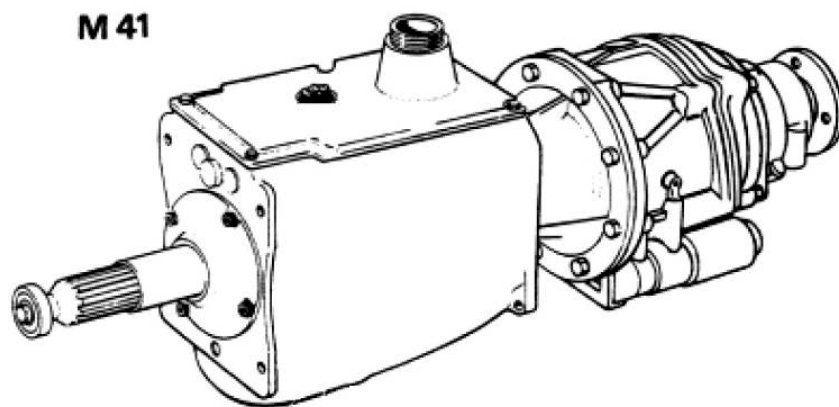
Drill a hole in the instrument panel for the overdrive indicator lamp. The location of the hole is approximately 0.4" above and exactly in between the cigarette lighter and the fan knob. Insert the lamp housing into the hole and fasten it from the inside of the instrument panel, using the nut. Connect the wires to the lamp according to the wiring diagram for your gearbox (TYPE D or TYPE J) below. Connect the rocker switch to the steering wheel pole cover. To do this, there is *no* need to remove the steering wheel. Use your index finger to feel the inside of the pole cover's right side. On the opposite side of the turn signal switch, slightly higher up and slightly further back towards the instrument panel there is a molded section. Carefully drill a hole in the middle of that section. Connect the wires to the switch according to the wiring diagram you are using (TYPE D or TYPE J) below and stick the switch wand into the hole from inside the steering wheel pole cover (if you have an underdash mounted, you will need to remove this first). Attach the switch with the nuts that came with it. Attach the knob to the end of the wand and align it in the right position (compare with the turn signal switch).

For TYPE D installations, the overdrive relay is fixed into place in the engine room in front of the relays for headlights and reverse lights. Connect the cable from the rocker switch to connection 85 on the relay. Connect the cable from the switch on the gearbox lid and the cable from the indicator lamp to connection 87. Connect a cable to 30/51 to the 25 A fuse in the fuse box. Two connections now remain – one on the indication lamp and one on the rocker switch – both of whom are connected to earth (-12 VDC).

For TYPE J installations, a cable is connected to the 25 A fuse in the fuse box and to the rocker switch by the steering wheel. To the other connection of the rocker switch, both the indicator lamp and the switch on the gearbox lid are connected. The other connection on the lamp is connected to earth.

Fix the overdrive badge on the trunk lid. Correct placement is on the left side, and aligned in the middle of the license plate exactly in between the license plate and the left edge of the lid. If you glue it to the lid there is no need to drill any holes. If this is done, bend or remove the pegs on the back of the badge.

Fill the gearbox with engine oil and attach the gear shift lever inside the car. Fill again with more oil after the first test run. Reconnect the battery.



*Waiver. The text in this summary has been prepared with uttermost care but is, despite of this, strictly a guide to be used in conjunction with normal and cautious vehicle shop practice, including the safe operation of electric equipment. I cannot accept liability for your actions. Work smart! Work safely!*

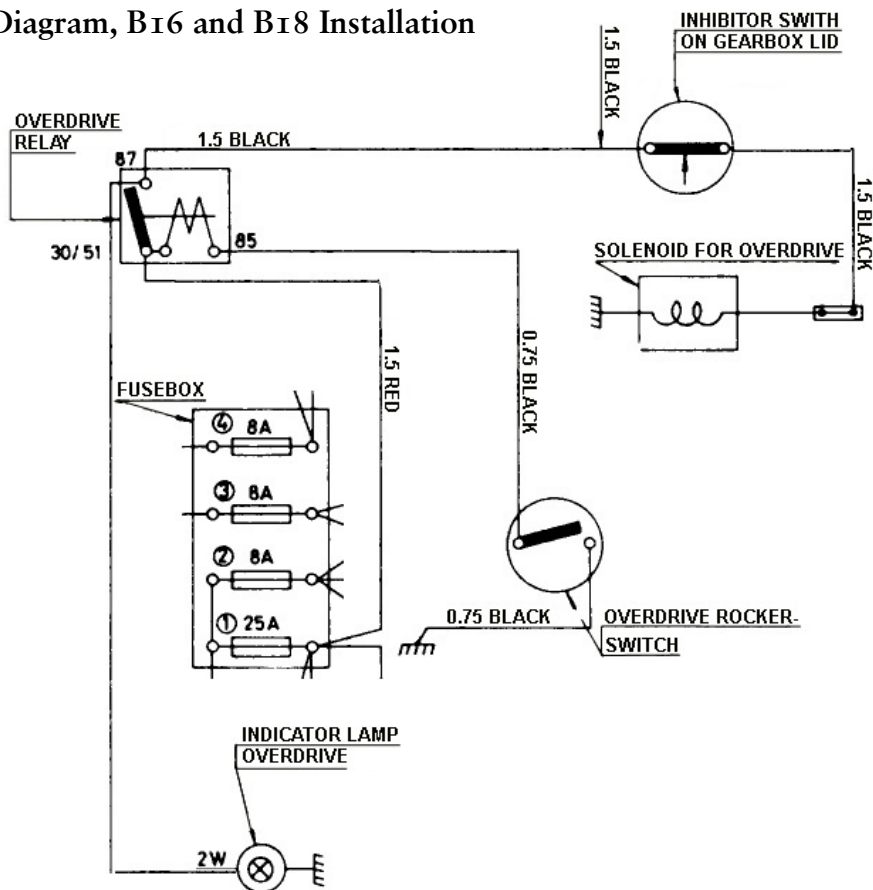
## Comments

- The front drive line shaft from the original gearbox can be shortened and used with the new gearbox, but this must then be done very precise after which the whole drive line must be balanced to avoid vibrations (which can damage gearbox, engine and rear axis). Different installations may require different lengths – measure your own gearbox and shaft before any shortening is done.
- The original speedometer cable can be used together with the new gearbox, but it then needs an alternate, shorter path to the speedometer instrument which will result in a *very* stretched cable. If possible, use the right speedometer cable, which is about one foot longer.
- It is possible to connect a TYPE J gearbox according to the TYPE D wiring diagram, and the other way around.
- It is not possible to mount only the overdrive unit on a M40 or M30 gearbox, partly because the outgoing shaft from the gearbox is too short.
- The lids of the gearboxes are interchangeable. What differs an M40 lid from an M41 lid is the hole made for the inhibitor switch (662292) on the M41 lid, which can be drilled and threaded on a M40 lid (the right position is even marked). Lids for the short gear shift lever of a Volvo 140 will also fit, but it is then required to make a new hole in the tunnel (and to weld the old hole shut) or that a Volvo 140 tunnel is fitted in the car.
- If you look at the wiring diagram you realize that the overdrive lamp will only show the position of the wand – not whether or not the overdrive is active. For instance, driving in fourth gear with overdrive and downshifting to third will have the inhibitor switch deactivate the overdrive (since the solenoid circuit is cut) and you end up driving on third gear, but the overdrive lamp will still be on. To get the lamp to indicate “right” you need to wire the lamp to after the inhibitor switch on the gearbox lid. Many prefer this and it is a common alteration – but not original.
- If you save the M40 box and the longer front propeller shaft and avoid to fix the badge on the trunk lid and avoid to drill holes for the indicator lamp and rocker switch, you have avoided to make permanent changes to the car and can reassemble it to original shape. The rocker switch can be any one pole switch and need not be located in the steering wheel pole cover. An indicator lamp will help, but is not a must. One of the neatest “hidden” overdrive installations I’ve seen involved a switch for the overdrive that was positioned on the clutch pedal (much like the switch for the brake lights) that activated the overdrive only when the pedal was *all* the way down, plus a resistor connected to the AMP lamp on the dash so that the lamp was lit vaguely when the overdrive active.
- Volvo has recommended different kinds of oils in their gearboxes over the years, including ATF oil and engine oil. Today’s oils are of incomparably better quality than those available in the 1960s, and today Volvo recommends the same quality and kind in both gearbox and engine: engine oil.
- A change of gearboxes affects the type designation of the car. The fifth digit in the type information is no longer correct.
- Remember to add the changes made to the wiring diagram of the car, or at least print a copy of one of the two following pages and keep it together with the instruction book.

Necessary Parts, B16 and B18 Installation (Type D)

Qty.	Part number	Description	Comment
1	254382	M41 with overdrive TYPE D	
1	677627	Front drive line shaft	
1	663605	Gearbox cushion	
1	669102	Relay	
2	955137	Screw for relay	
1	663047	Rocker switch	
1	658225	Knob	
2	663048	Nut	
1	663089	Indicator lamp	
1	662292	Inhibitor switch	On gearbox lid
1	11996	Copper gasket	
1	670505	Speedometer cable	
1	951188	Bracket for speedometer cable	
1	663558	Badge	Chassis number -84.600
1	670556	Badge	Chassis number 84.601-
0.5 gal		Engine oil	I.e. SAE 10W-40

Wiring Diagram, B16 and B18 Installation



**Necessary Parts, B2o Installation (Type J)**

Qty.	Part number	Description	Comment
1	254570	M41 with overdrive TYPE J	
1	677627	Front drive line shaft	
1	663605	Gearbox cushion	
1	663047	Rocker switch	
1	658225	Knob	
2	663048	Nut	
1	663089	Indicator lamp	
1	662292	Inhibitor switch	On gearbox lid
1	111996	Copper gasket	
1	670505	Speedometer cable	
1	951188	Bracket for speedometer cable	
1	670556	Badge	
0.5 gal		Engine oil	I.e. SAE 10W-40

**Wiring Diagram, B2o Installation**

