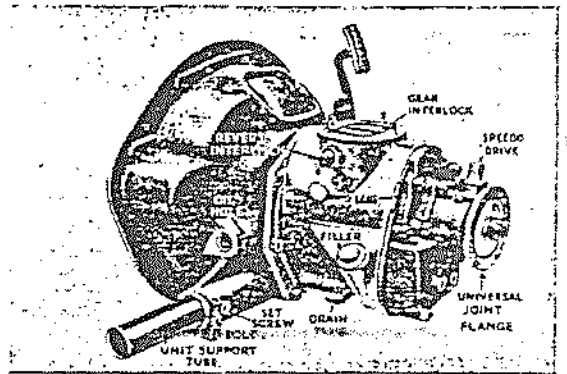


THE GEAR BOX

The picture to the right is from the Blower shop manual which covers the gear box for the J and P Midgets, the K, KN and N Magnettes, and L type Magna.

The gear box on the J is often called the Wolseley because of its origins.

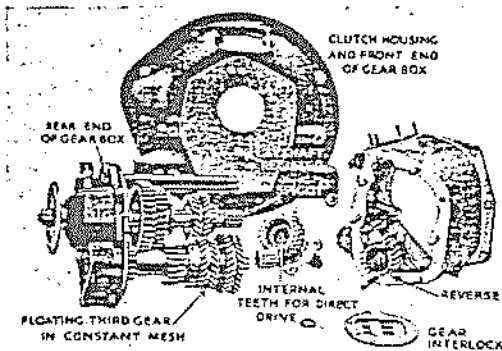
The gear changer is mounted on top (gear interlock area in picture on right).



There is no unit support tube on the J-type, as the engine rear motor mounts are a part of the engine casting just ahead of the bell housing for the clutch.

When lubricating your car, do not forget the clutch cross shaft oil holes. A little oil helps keep from wear of the cross shaft!

The gear box itself is only a small portion of the above picture. The bell housing is on the left with the rear cover on the right.



The gear box is a four speed system. The first and second gears are spur gears (straight teeth). The third and fourth gears are double-helical gears.

The gate on top is provided with a reverse stop on later model on the the extension selector to keep from inadvertent engagement into reverse. This is not true on the J-type!

The gears are operated by a series of forks coupled to three selection rods (which you can see in the photo above). Steel balls in the top of the gear box (presumed by this ignorant individual to be located under the gear interlock) secure the shifting forks in position.

(OVER)

With reference to the drawing on page 3, the following material was taken from the article from Barry Linger, MMM Register Year Book 1983:

With reference to the drawing the object of the gear-box is to change the speed ratio between the input shaft (1) and the output shaft (19). Most gearboxes have input and output shafts concentric and use a layshaft (21). Gears are used with different numbers of teeth to change the ratio between the input and output shafts. In the drawing shown gears for 1st are (1) driving (28) known as 'constant mesh' as they work in 1st, 2nd and 3rd, and (22) driving (14). 2nd gear, (1) driving (28) again then (25) to the small part of (14). 3rd, (1) and (28) plus (27) driving (31). Top is dogged straight through (1) driving (31) splined to (19).

Well this is all very fine, lots of different gears to give us the speeds we need, but they cannot work all at once. So how do we select just the gear we require.

Boxes had all sliding mesh engagement, this means gears are selected by sliding the actual driving teeth in and out of mesh. You can see this in the drawing 1st and 2nd gear cluster then (14) slides on shaft (19) to engage with the mating gear (25). The same system is used in the ENV. This type of gear change is not easy, and unless you get the speed just right the gearbox lets you know what a mess you have made of it. Who's never missed the change down to 2nd and heard the consequences? To help gear changing 'constant mesh' gears were invented. In this system gears run together all the time and are dogged to the shaft when required to drive. This gives a more reliable change with much less wear and tear. You can see this type with 3rd gear in the drawing, gears (27) and (31). 3rd gear dog is actually between gears (25) and (27). Synchromesh for the record just brings both parts of the dog to the same speed before you engage.

Everyone should have followed to this point and you now know how the gear-box works. Not very complicated it is really? The ENV is slightly different. 3rd gear is right at the back of the box with 1st and 2nd in the middle. Reverse by the way is an extra gear not shown which engages with (22) and (14). This gives a ratio identical to 1st, but opposite in direction.

Gears are selected through the gear lever and a series of selector forks and interlocks. Above the gears are 3 rods (9) each carrying a small bronze casting (11) which extends down to engage a gear.

A lever pointing down from the gearlever shaft passes through interlock plates (12) and can engage one of the 3 selectors.

Moving the gear lever from side to side positions the lever in one or other of the selectors either 1st/2nd, 3rd/top or reverse. Hence the gear lever through its linkage can now be made to move a selected gear forwards or backwards.

If we have selected 1st/2nd for example gear cluster (14) will be moved back to engage 1st or forward to engage 2nd. Opposite to the gear lever as it pivots in the middle.

The gear lever on the ENV box pivots at its base and hence the motion is not reversed if you see what I mean. In brief, therefore, side motion of the gear lever engages one selector. For or aft gear lever motion engages gear or dog.

The interlock system stops two gears being engaged at the same time. If this occurred the box and rear wheels would lock solid with desperate consequences.

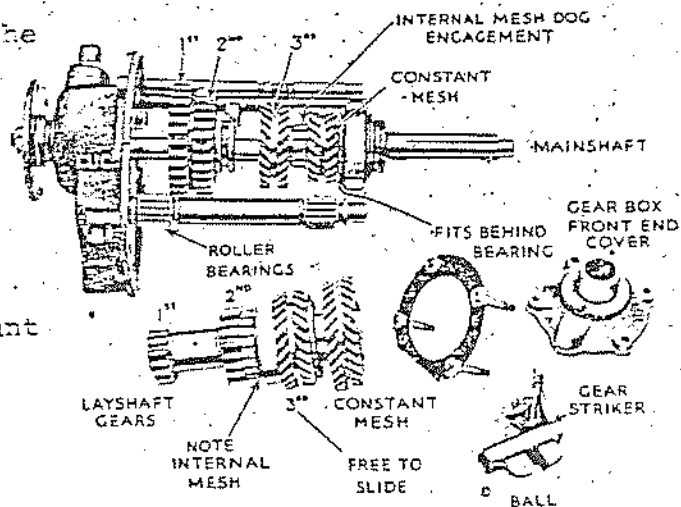
Going back to the first picture, the filler plug on the side of the gear box serves also as the oil level indicator. The drain plug is accessible from underside by removing a trap door in the undershield.

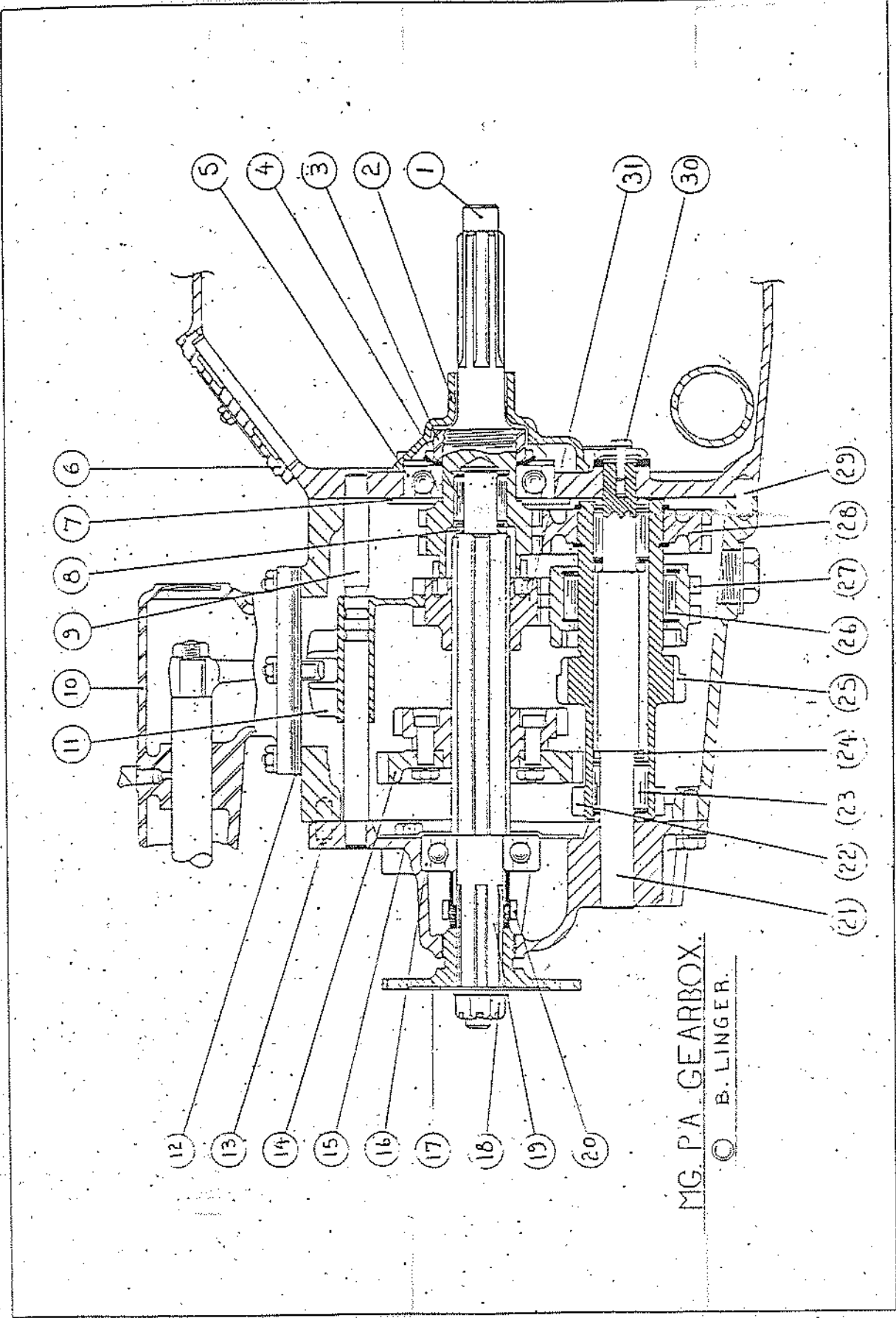
When dismantling the gearbox, it is not needed to remove the two bolts marked "A" in the first picture. (page 1)

The picture to the right shows the internal parts of the gear box.

This picture should help as you examine the PA drawing on the next page.

Except for 4th gear, which is direct drive 1:1, all other gear motion goes from the constant mesh gear to the layshaft gears and then back up to the gear engaged, the out the rear side.





MG PA GEARBOX.
© B. LINGER.

Without knowing how to rewrite the Blower Shop manual into my own words, I have taken the liberty to copy and print below the instructions on removing, dismantle, and reassembly of the Gear Box.

REMOVAL AND REPLACEMENT OF GEARBOX.

Disconnect the mixture and slow running controls just forward of the gear lever. Remove the seats, carpet, and floor boards. Take out the foot ramp.

Take off the four nuts holding the remote control assembly to the centre casing which can then be lifted off. Now cover the aperture in the centre casing with a piece of cardboard. Undo the propeller shaft flange from the gearbox universal joint flange. Mark the flanges for reassembly purposes.

Disconnect the speedometer drive at the gearbox end. Remove the nuts holding the clutch pit to the flywheel housing. (On the J type Midget the gearbox can now be removed.)

NOTE: When removing the gearbox, make quite sure that no load is placed on the drive gear shaft and clutch centre.

DISMANTLING THE GEARBOX.

It is much easier to dismantle the gearbox if it is held in a vice, and this can be done by machining a thread on the end of a square piece of bar to screw into the gearbox drain plug hole.

1. Remove the seven nuts securing the end cover, leaving the three nuts round the mainshaft undisturbed. Take off the $\frac{1}{8}$ in. nut holding the reverse shaft and remove the locking screw holding the layshaft in the rear cover. Leave the universal joint flange attached to the mainshaft and remove the rear cover complete. The change-speed rods and reverse shaft remain in the gearbox.

If the rear cover sticks a little on the dowels, a few sharp taps with a lead hammer on the lugs will loosen it. Do not use a chisel or screwdriver to break this joint.

2. Place the reverse gear lever in the engaged position. This holds the spring loaded plunger and the first and second change-speed fork can be removed. Now push the selector fork and the first and second sliding gear as far forward as possible. Now drive out the change-speed rod from the front end (this procedure will save the trouble of reassembling the ball and spring in the fork). The fork, rod and gear can now be withdrawn from the gearbox.

3. The third and fourth-speed selector rod and fork can be removed if you follow the procedure in (2) above.

4. Drive out the layshaft from the front end and withdraw the layshaft gears complete.

5. The rollers in the third-speed layshaft gear can be taken out without withdrawing the layshaft constant mesh gear.

6. Do not remove the constant mesh gear unless it is absolutely necessary. This gear is a press fit on a shallow spline and considerable care would be needed for removal and replacement. It is necessary for a clock reading to be taken in order to make sure that the gear is running true with the sleeve (laterally, this dimension must be within .0015 in.).

7. To remove the speedometer driving gear, or the rear main bearing, the universal joint flange must be taken off. This job is made easier if an extractor is used.

With the flange removed, take off the bearing securing plate by undoing the three bolts on the rear cover. This will allow the mainshaft and the bearing to be taken out.

REASSEMBLY OF THE GEARBOX.

Reassembly is the reverse of the dismantling procedure and the following points should be noted. When the layshaft gears are in position and a straight edge laid across the face of the gearbox, the clearance between the straight edge and the first-speed layshaft gear should be .005 in. (minimum). The layshaft must be free to move endways; it is positioned by the meshing of the double-helical constant mesh gears.

It will be noticed that the spring loaded plunger is carried in an eccentric sleeve. This is to give adjustment for lining up the slot in the reverse lever with the slots in the change-speed forks. This adjustment may be necessary if the plunger sleeve is taken out at any time.