

On some front-wheel-drive cars the gearbox is mounted in the engine sump and shares its oil supply. This design is widely used in Austin Rover models (see sideline, right).

In this design the gearbox cannot be removed on its own – both engine and transmission power unit must be taken out if the gearbox needs attention. Once out, the engine and gearbox can be split to do the job.

## Initial work

Drain the engine/transmission oil before removing the power unit, but if this has not been done, suspend the unit over a large drain can and remove the sump plug. It may take some time for the cold oil to fully drain. Replace the plug and move the unit away from the drain can.

Clean the outside of the engine and gearbox with engine degreaser or paraffin; make sure no dirt or grit enters either unit. Such contamina-

tion could cause serious problems when they are again in use.

Take off the starter motor and any components that fit across the parting line or restrict access to it. To reach the starter motor, you may have to free the dipstick and parts of the engine mounting assembly.

Finally, undo the bolts holding the engine and gearbox together and lift the engine off the gearbox with a hoist or crane. Remember that the crankshaft will be exposed after the split, so be careful if you lower the engine – either use suitable supports or lay the unit on its side.

Refitting is usually the reverse process, but use a new gasket to ensure an oil-tight joint. There is often an oilway passing through the mating flange that is generally sealed with an O-ring, which must be in place before mating the parts.

Although the same procedure can be used on all engines the specific operations vary from unit to unit.

## Tools and materials

- Hoist or engine crane
- Flywheel puller
- Spanners and sockets
- Screwdrivers
- Engine degreaser and stiff brush
- New gaskets and oil seals

## Cars and engines

The instructions for stripping out the gearbox are divided according to the engine type, rather than the car. The list below indicates which cars go with each engine.

**A-series:** All Minis, Austin 1100/1300, Allegro 1000, 1100 and 1300, Austin Metro.

**B-series:** Austin/Morris 1800 and Wolseley 18/85, Princess 1800.

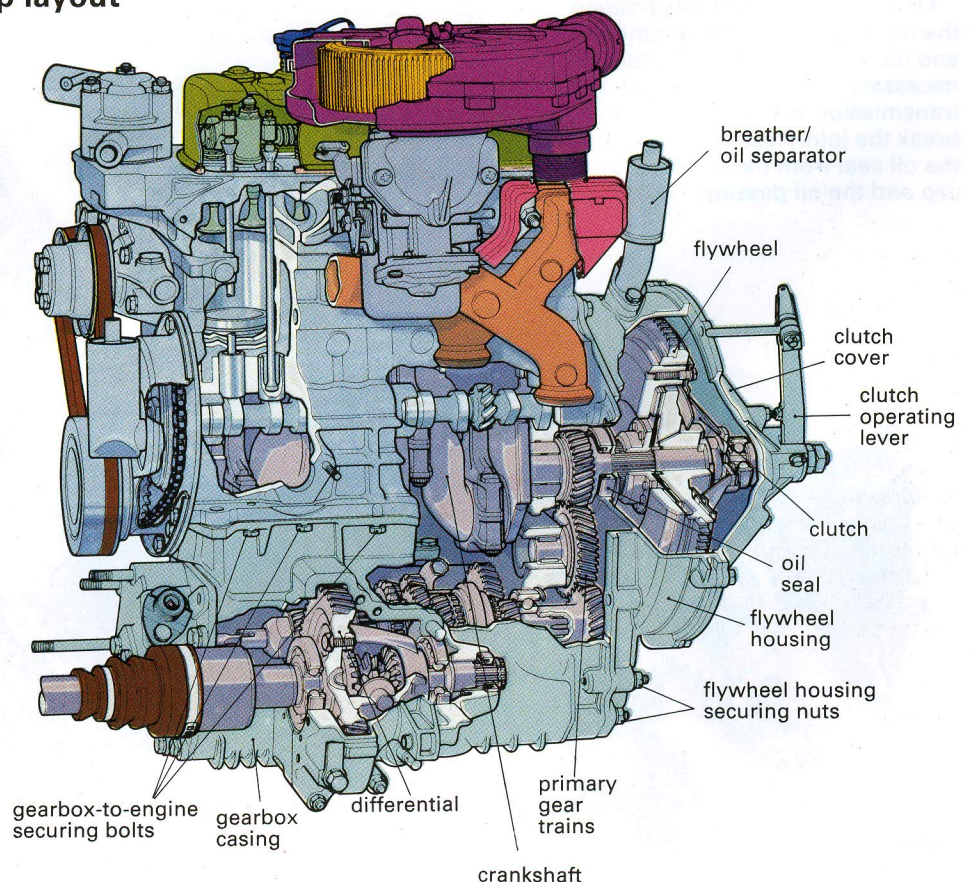
**E-series:** Austin Allegro 1500/1750, Austin Maxi, Austin 2200, Austin Princess 2200.

**O-series:** Princess 1700/2000, Ambassador 1700/2000.

## Typical gearbox in-sump layout

The gearbox on many front-wheel drive BL cars is located in the engine sump. The gear trains are clearly shown in this A-series unit from a Metro. On all versions the clutch and flywheel have to come off, and the flywheel housing must be removed before the gearbox-to-engine bolts can be undone to release the unit.

Make sure the engine is clean of all traces of dirt by scrubbing with a stiff brush and a degreasing fluid.



## A-series engines

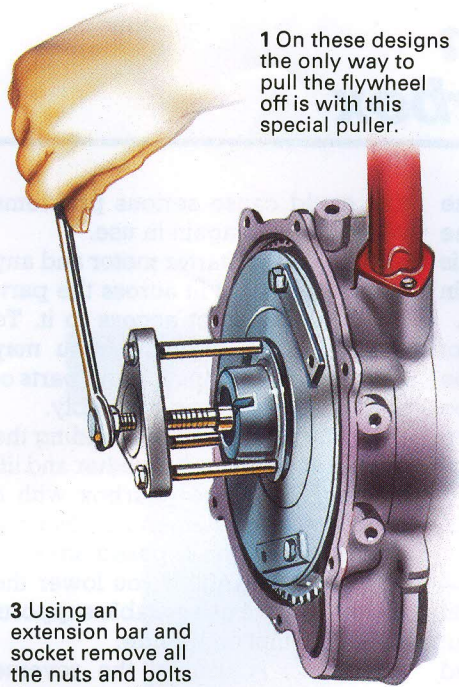
Take off the starter motor, release the bolts and remove the flywheel end cover. Undo the bolts holding the clutch diaphragm spring housing to the pressure plate and lift the housing away. Turn the crankshaft to bring the flywheel timing marks, at the driving slot in the flywheel, horizontal (this makes sure the U-shaped crankshaft thrust washer remains in position).

Knock back the lock tab and undo the flywheel retaining bolt – jam the flywheel with a screwdriver to stop it turning. Use a suitable puller (there is a BL special tool) to draw the flywheel off the crankshaft taper (1). Pull the clutch driven plate off the primary gear splines and extract the pressure plate. Alternatively, remove the clutch thrust bearing and pull the flywheel free, complete with the clutch assembly.

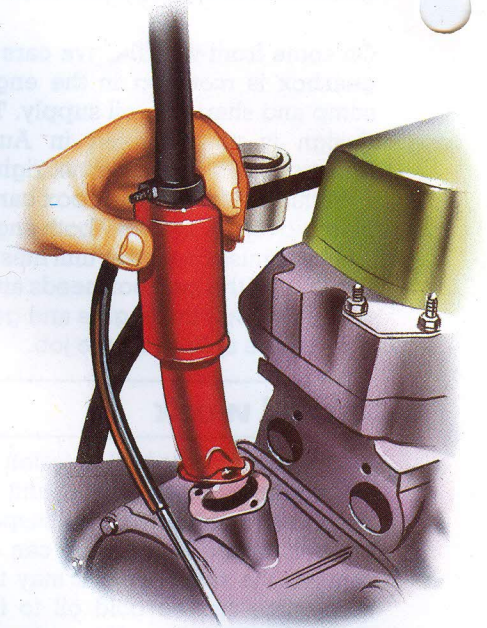
Unscrew the breather from the top of the flywheel housing (2) and take off the primary gear dust shield (where fitted). Knock back the locking tabs and undo the fixing nuts and bolts inside the housing (3). Pull the housing free (4). To avoid damage to the oil seal, first wrap the primary gear splines with tape. Remove the idler gear (5) and thrust washers.

Undo the nuts and bolts holding the transmission to the engine (6) and lift the engine off the gearbox. If necessary, lightly tap down on the transmission with a rubber mallet to break the join. Recover the gaskets, the oil seal from the main bearing cap and the oil passage O-ring.

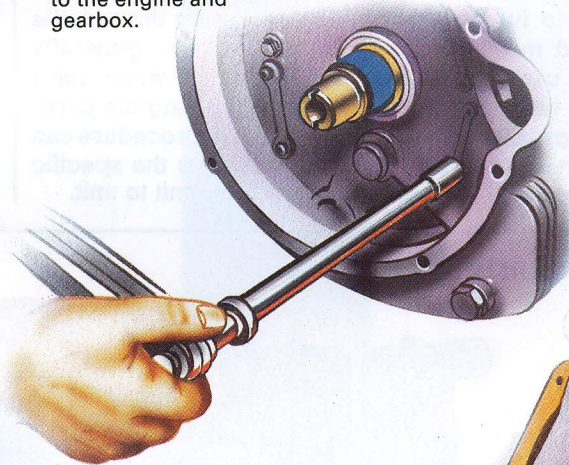
1 On these designs the only way to pull the flywheel off is with this special puller.



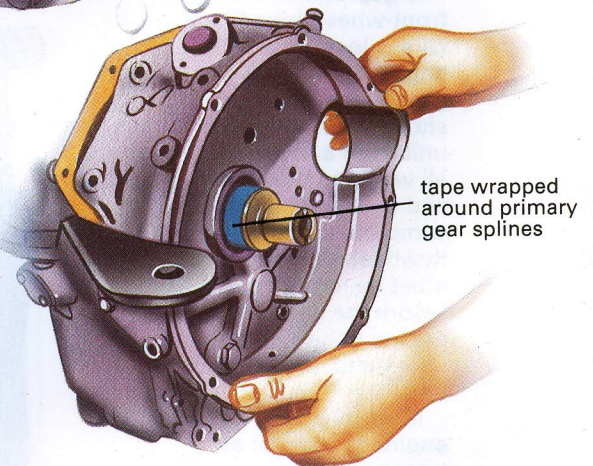
3 Using an extension bar and socket remove all the nuts and bolts that secure the flywheel housing to the engine and gearbox.



2 Undo the two bolts holding the breather/oil separator unit to the flywheel housing and pull the unit away.

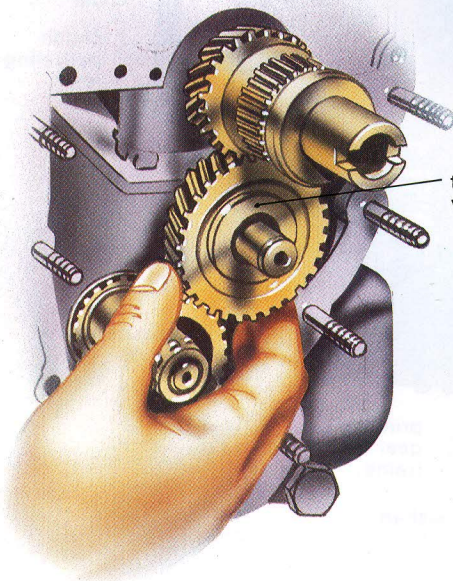


4 Gently pull the flywheel housing off, taking care to avoid damaging the oil seal.



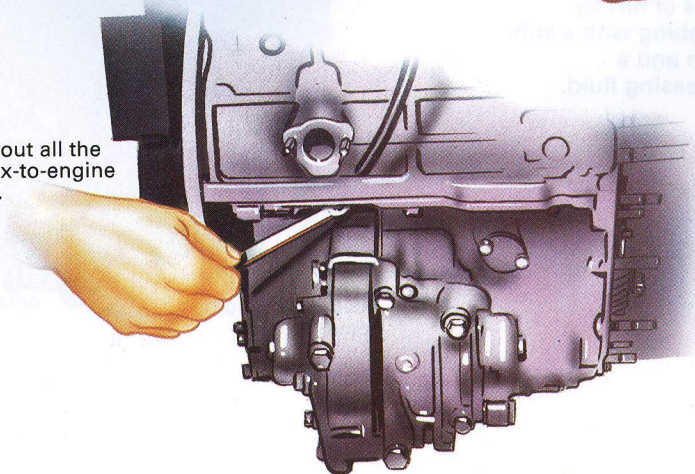
tape wrapped around primary gear splines

5 Pull the idler gear from its bearing in the gearbox casing – make sure you know which thrust washer fits on which side of the gear.



thrust washer

6 Take out all the gearbox-to-engine fixings.



## E-series engines

Release and remove the starter motor, dipstick tube and distributor – make alignment marks for refitting. Fish out the oil pump drive shaft from the centre of the distributor drive – you will need a section of tight-fitting wooden dowel to push into the end of the drive (1). Also take off the oil filter, alternator drive belt and petrol pump.

Jam the flywheel and slacken off the crankshaft pulley bolt. Unbolt the clutch cover and take it off, then unbolt and remove the thrust plate from the centre of the diaphragm

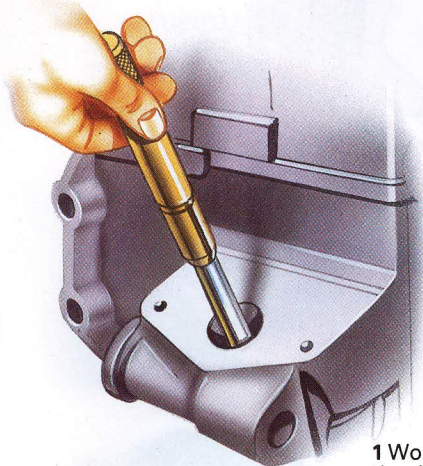
(2). Undo the central retaining bolts and withdraw the retaining plate (3). Gently tap the clutch and flywheel assembly off the crankshaft, working through the starter motor opening with a soft-faced mallet or hammer and block of wood (4).

Tape the primary gear splines, undo the fixing bolts and nuts (after knocking back the lock tabs) and remove the flywheel housing, followed by its gasket (5). Fully undo the crankshaft pulley retaining bolt and pull the crankshaft pulley off. Remove the screws holding the engine block to the transmission

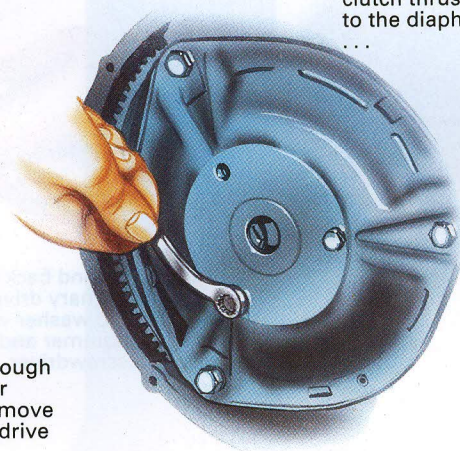
housing and lift the engine clear (6). Remove the gaskets and the oil passage O-ring.

A similar sequence is used for the six-cylinder version but you also have to remove the engine mountings and their front mounting plate, and undo the alternator mounting bracket.

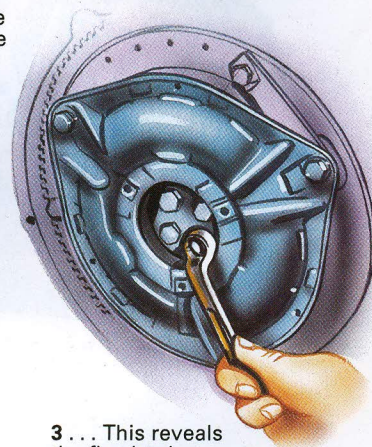
When refitting use new gaskets and oil seals. The seals fitted to the front of the engine will extend into the opening for the crankshaft pulley oil seal. Trim the excess off before fitting the seal.



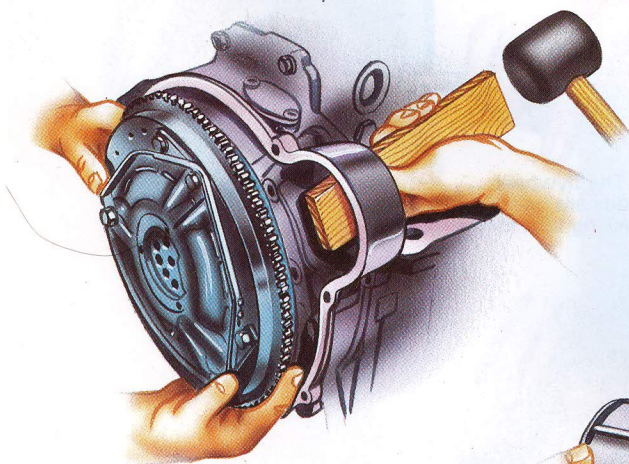
1 Working through the distributor drive hole, remove the oil pump drive shaft.



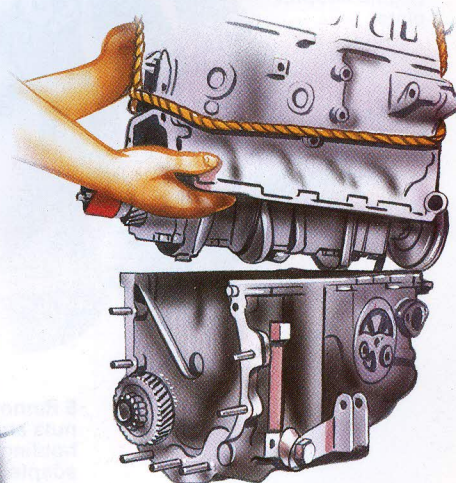
2 Undo the three bolts securing the clutch thrust plate to the diaphragm



3... This reveals the flywheel securing bolts which can now be undone.

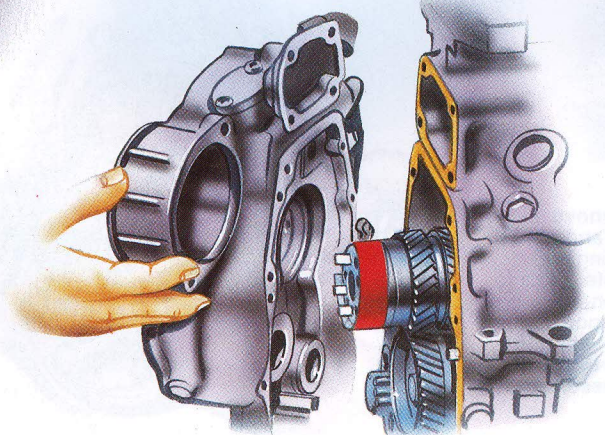


4 Have an assistant hold on to the flywheel to prevent it dropping out while you jar it free.



6 Hoist the engine from the gearbox – ask someone to steady it.

5 Undo the fixings securing the flywheel housing and pull it off – it may well stick on the gasket.



## B-series and O-series

Undo the fixing screws and nuts, and remove the primary drive end cover and its gasket (1). Remove the bolt from the recess next to the gearbox input shaft gear, then knock back the tab washer on the bolt right next to the gear – remove the bolt.

Jam the flywheel to stop the gears turning and knock back the large tab washer on the gearbox input shaft nut (2), then undo the nut with a large socket – the nut will be very tight. Mark the idler gear so you can refit it the right way round and pull it free, together with the thrust washers, noting which washer is

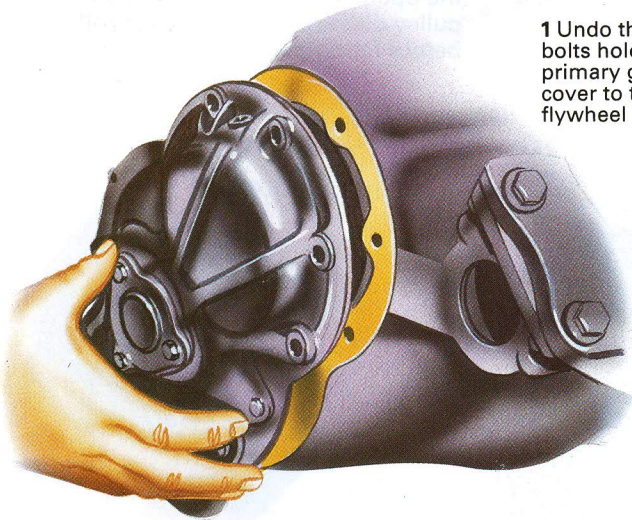
from which side. Pull the gear off the input shaft. Unbolt and withdraw the flywheel housing (3), collect the input shaft washer.

Slacken the clutch cover bolts in sequence to relieve the spring pressure, then undo the bolts fully and pull the clutch cover and drive plate free. Release the lock tabs, undo the bolts and remove the flywheel (4). Knock the C-washer from the gearbox input shaft, remove the bolts holding the adapter plate to the engine and transmission and take it off (5). Note that on some cars the bolts have

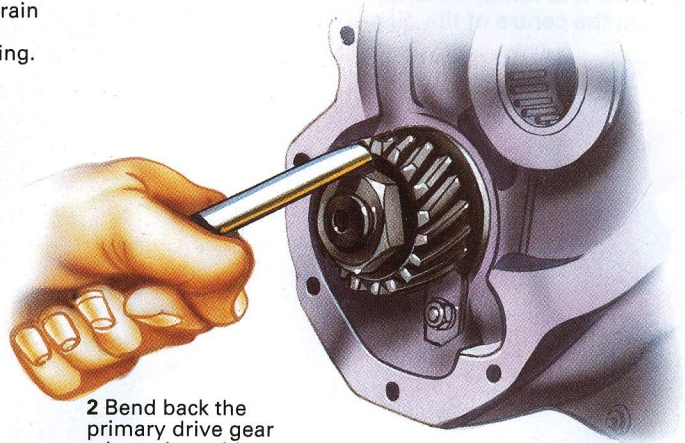
different threads so push them through a sheet of card and mark their locations on the card to keep them in order.

Withdraw the laygear thrust springs from the bores in the gearbox housing together with the selector rod retaining plate. Undo the bolts and nuts holding the engine and transmission together (watch out for the two at the front of the casing) and lift the engine free. Remove the gaskets and oil passage O-ring.

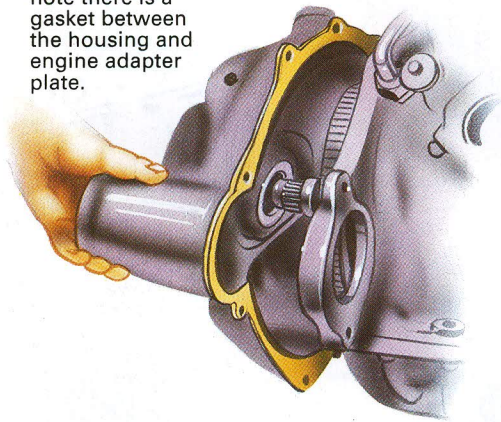
1 Undo the ring of bolts holding the primary gear train cover to the flywheel housing.



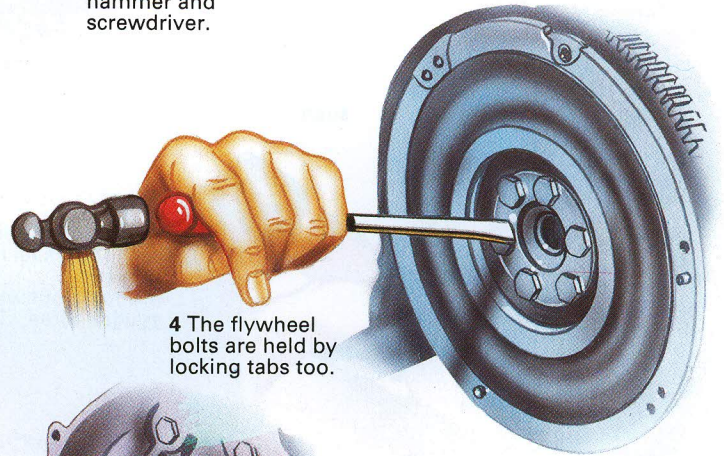
2 Bend back the primary drive gear tab washer with a hammer and screwdriver.



3 Pull off the flywheel housing – note there is a gasket between the housing and engine adapter plate.



4 The flywheel bolts are held by locking tabs too.



5 Remove all the nuts and bolts holding the adapter plate to the engine – note their position as a variety of bolt sizes and threads are used.

