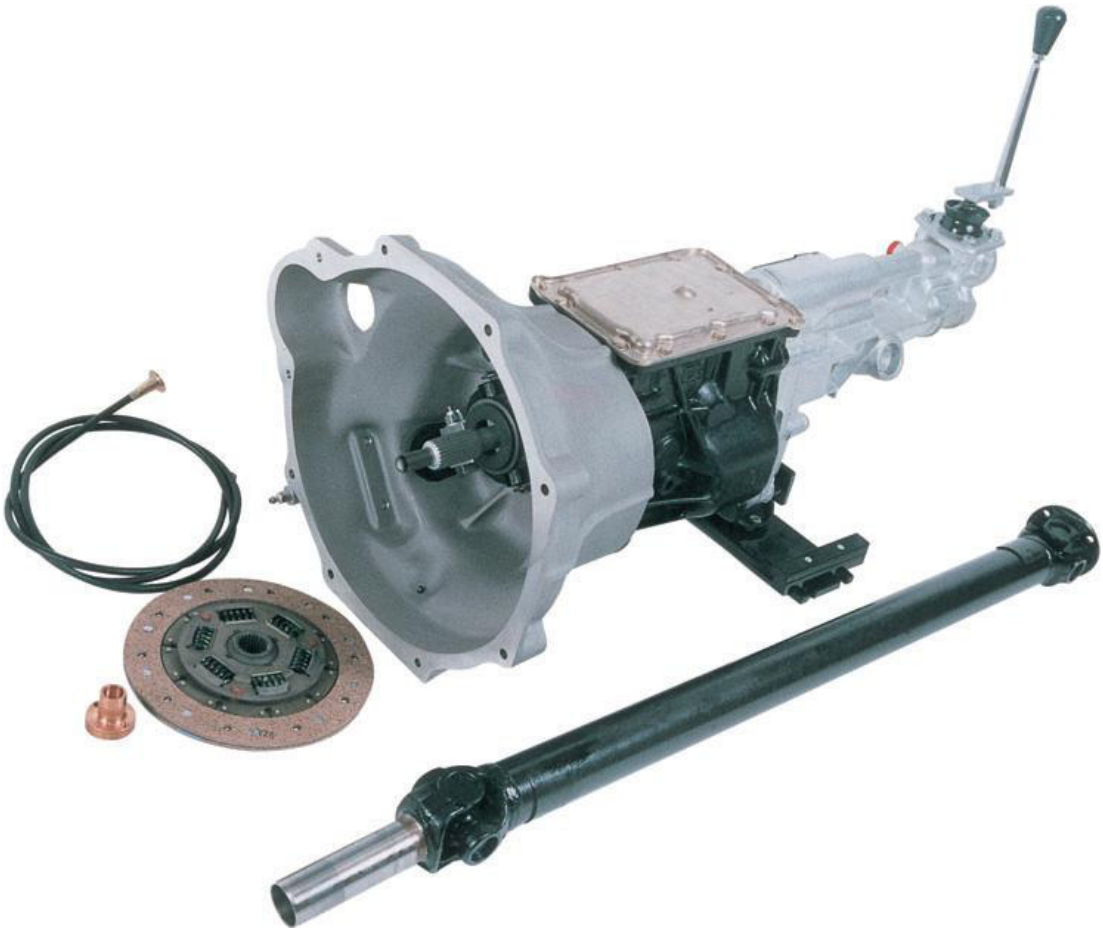
Hi-Gear Engineering Ltd

MGA 5 Speed Gearbox Conversion



The MGA is an excellent road car and a driver's delight. One of the very few criticisms of this car on modern roads is its original gearbox and low overall gearing. The standard axle ratio of 4.3/1 gives 17 mph per 1000 rpm in 4th gear. These characteristics give a very lively performance right up to maximum speed. The major drawback is apparent when cruising on motorways at 70mph for long periods. The engine rpm at this speed is 4118 rpm which is high compared to modern vehicles with 5 gears.

This continuous high rpm causes increased engine wear and vibration with passenger and driver fatigue.

The conversion adapts a Ford Sierra Type 9 gearbox (5 speed, 1.6L & 1.8L: 1982-91, & 2.0L: 1982-87) to the MGA 1500, 1600 MkI, MkII and twin cam engines. MGB 1800 engines can be installed with additional parts, which we can supply.

The conversion is supplied as a kit complete with all parts, nuts and bolts, fitting instructions for the competent owner to fit.

The Type 9 Sierra gearbox is not part of the kit but is either supplied by the owner or can be supplied from Hi-Gear Engineering Ltd. Various alternative gear ratios can be provided including a close ratio gearbox and a standard ratio gearbox with a higher first gear ratio of 2.98:1.

The vehicle speedometer will need calibrating. Several companies are able to do this. Instructions on how to measure the vehicle speedometer characteristics for re-calibration are included.

The Kit Comprises:

1.Cast aluminium Bell Housing.
2. Clutch release lever pivot & bolt.
3. Gasket, Bell Housing to gearbox.
4. Extended spigot bush.
5. Rear mounting bracket/distance pieces.
6. Rear rubber mounting.
7. Rear mounting crossmember.
8. Crossmember spacers. (2)
9. Crossmember tapped securing plates.
10. Modified gear lever assembly.
11. Clutch plate (driven).
12. New propshaft assembly.
13. Speedo cable/circlip.
14. All bolts & fasteners.
15. Detailed fitting instructions.
16. Loctite (2 types)

Gear Ratios	MGA	Standard Ford	Modified Ford	Closer Ratio
First	3.65	3.65	2.98	3.36
Second	2.214	1.97	1.97	1.81
Third	1.374	1.37	1.37	1.26
Fourth	1.0	1.0	1.0	1.0
O'Drive/ Fifth	-	0.82	0.82	0.825

The Bell Housing is cast in high-strength LM25TF heat treated aluminium alloy and is robustly constructed. The standard MGA clutch cover, release lever and clutch operating hydraulic cylinder are all re-used. A suitable clutch driven plate is provided.
A modified Sierra gear change mechanism is supplied with replica MGA chrome gear lever which is situated in exactly the right place in the car so the conversion is undetectable.
A quickshift gear lever is supplied as standard giving a precision gear shift with reduced gear lever movement.
The propeller shaft provided in the kit is to the original manufacturer's specification:
Torque: 570 Nm, 422lbft (short duration) MAXIMUM
Speed: 7000 Rpm MAXIMUM.
This corresponds to 5740 engine rpm in fifth gear (ratio 0.82:1) and 7000 engine rpm in fourth gear (ratio 1:1). For any higher values of torque or speed, Hi-Gear Engineering Ltd can refer the customer to the manufacturer.
The results are dramatic, relaxed cruising at 70mph and 3376 rpm in 5th gear (20.73 mph per 1000 rpm). Better acceleration due to the higher second gear of 1.97:1 (MGA 2.214:1) and synchromesh on all forward gears. Improved fuel economy is an added bonus.

A new speedometer cable is supplied which adapts the Sierra gearbox speedo drive to the MGA instrument, which must be re-calibrated to suit the new gearbox speedo drive ratios.
A modified, extended gear lever is supplied, on exchange basis which puts a new MG replica chrome gear lever into the exact position as originally, using the same gear lever gaiter (with security screws). The gear lever turret gaiter aperture is enlarged to accommodate the greater movement of the Sierra gearbox.

Sierra Gearbox preparation

****This is done for you if you purchase your gearbox conversion from MGOC Spares****

1. Remove the Sierra bell housing and clutch release mechanism from gearbox and discard.
2. At the front of the gearbox remove the four bolts and w ithdraw the clutch release bearing guide sleeve, note the orientation of the guide sleeve base. The small protuberance on the base points towards the bottom of the gearbox.
3. Carefully, using a hacksaw, saw off the parallel sleeve from the base leaving approximately 1 cm of sleeve on the base. De- burr and remove tilings, clean oil seal thoroughly. The sleeve is not required.
4. Lubricate oil seal and shaft and replace base in correct position on gearbox. Replace cork gasket if damaged, again noting orientation, with the gasket cut out at the bottom. Replace and tighten bolts. 7-8 lb ft. 9-11 Nm.
5. At the rear of the gearbox is the extension housing, in aluminium alloy. Just forwards of the speedometer drive housing is a vertical downwards projection in the form of a narrow ’V' which engages into the rear gearbox mounting (Sierra).
6. This projection needs to be removed to clear the MGA chassis. Using a hacksaw, cut off this projection horizontally, just above the lower threaded area of the projection - see diagram. De burr and file edges smooth, round off.

Vehicle Preparation.

1. Remove MGA Engine, gearbox and propeller shaft from the car as per the MGA workshop manual, observing relevant safety precautions.
2. Remove gearbox tunnel turret. This will need modifying later.
3. Separate engine and gearbox (if removed as a unit)
4. Remove the clutch slave cylinder from MGA gearbox.
5. Remove the clutch release lever and carbon thrust bearing from the MGA gearbox.
6. Remove the MGA speedometer drive cable from car.
7. Remove the MGA clutch cover and driven plate. If cover plate is to be re-used mark flywheel and cover plate before removal and re-use in the same position to preserve engine balance.
8. Examine the 'C' section gearbox tunnel and floorboard support rails which run alongside gearbox and bell housing. If not in excellent condition with welding in good state- replace and re-weld, as these take the load of gearbox mounting.

Assembling the new bell housing

1. Clean the four 12 mm bell housing attachment bolts in solvent to remove oil/grease. Similarly clean the four 12 mm threaded attachment holes on the Sierra gearbox. Assemble the bell housing and gearbox together, with supplied gasket between. Apply LOCTITE (supplied) to the threads of the attachment bolts and gearbox attachment hole threads. Using the spring washers with the 12 mm bolts torque them to 55 lb ft each (75 Nm)..
2. Bolt the aluminium alloy clutch release lever pivot into position using the M8 bolts and spring washers supplied, clean all threads and apply LOCTITE as in (1) above, torque the bolts to 15 lb ft.(20 Nm)
3. Assemble the original MGA clutch release lever and carbon thrust bearing into position, secure the release lever with the pivot bolt supplied, fit washer, locknut and tighten. Apply a little engine oil to the pivot bolt/ bearing.
4. Remove the original spigot bush from the rear of crankshaft, ensure that the vacated hole is smooth and without damage.
5. Apply bearing Loctite to the new spigot bush and drive it into the rear of the crankshaft as far as it will go. This is an interference fit into the crankshaft. Use an aluminium or copper drift to drive it in without damage.
6. Apply a little grease to the centre hole of the spigot bush to lubricate.
7. Assemble the clutch cover plate/ new driven plate in the normal way. (use a Sierra clutch alignment tool if available.)
8. At this point it is a good idea to assemble the gearbox/ bell housing to the engine to see if all is well. Bolt gearbox/ bell housing to the engine using bolts supplied.
9. Fit gear lever assembly with attachment bolts.
10. Remove engine sparking plugs, rotate engine and verify that all gears can be obtained and everything rotates freely and easily.

11 .Remove bell housing / gearbox assembly from engine, remove gear lever assembly.

Fitting Gearbox to Car

1. Remove the two lower 10 mm gearbox extension housing retaining bolts and loosely assemble the new gearbox mounting bracket to the gearbox using the 10 mm bolts and distance collars supplied. The distance collars are positioned between the mounting bracket and the casing, one on each side, the longer 10 mm bolts hold the bracket to the casing.
2. Place a support under the car below the position of the gearbox and place the gearbox / bell housing in position as far back as possible with the rear extension resting between the cheeks of the original MGA rear mounting bracket.
3. Insert the two top bell housing to engine bolts into the bell housing. It is not possible to fit them with engine in position.
4. Replace the engine in position, and carefully guide the gearbox input shaft into the clutch assembly on the engine.. When engaged, bring engine / bell housing together and bolt together with bolts provided. Bolt up engine mountings.
5. Bolt new gearbox mounting onto new bracket on gearbox extension casing with 3/8" UNF bolt/ spring washer supplied. Note, the highest side of mounting should be towards the front of car.

6. Bolt new crossmember onto the bottom of gearbox mounting with 5/16"UNF bolts, spring washers and nuts, do not tighten at this stage.
7. Raise gearbox until new crossmember contacts ***'C'*** section rails alongside gearbox. Centralise crossmember and mark bottom face of rails where crossmember is slotted, two positions each side. Mark centre of rail width and drill 11/32" holes in these positions.
8. Lower gearbox about 3/4". Place 5/8" spacer between bottom of rail and crossmember each side and place tapped plate above rail bottom face with chamfered edge facing inward and down, -see diagram.
9. Fit the four attachment bolts/ washers/ spring washers and fully tighten.
10. Fully tighten the 10 mm lower gearbox extension bolts which now retain the new gearbox mounting bracket. Tighten to 30 lb ft.(40 Nm) and use LOCTITE after cleaning threads in solvent.
11. Final bolts to tighten are the two securing the gearbox mounting to the new crossmember which run in slots in the crossmember. Push the gearbox to the right of car until the gearbox is clearing the tunnel side by 4-5 mm. this is in the area of the rear extension bolt heads and new mounting bracket. When clearance is determined by inspection, tighten up bolts/nuts.
12. Check that the new gearbox crossmember is level to the car chassis. Sometimes the C-sections are welded to the chassis not level to each other. If the crossmember does need levelling make a suitable thickness packing piece and place between spacer and C-section to level the crossmember.
13. Fit new propshaft; lubricate spline and outer surface of nosepiece with gearbox oil before pushing into place through oil seal. Bolt up rear flange as before - use new locknuts.
14. Fitting Speedo Cable see diagram
15. Drill a hole and enlarge to 11 8" in RH side of gearbox tunnel. The speedo cable passes through this hole, sealed by large grommet supplied. The cable runs above floorboard in the angle formed by the tunnel and floorboard, and under the carpet. It runs forward to the RH toe board. Drill a 5/8" hole in the corner of the wooden toeboard. seal with mastic. The cable then runs up into the engine compartment and back through the bulkhead to the speedometer as before.
16. Gear Lever and Gaiter
17. Fit gear lever assembly to gearbox extension, tighten bolts. Check all gears available. On turret, remove metal around gaiter hole as pattern diagram. Check all gears can be obtained with good clearance. Fit gaiter and attach with self tapping screws to hold it in position. Leave out screws in the area of reverse
18. Check operation with gaiter in place. If necessary remove more metal. It is important that gear change is not impeded by gaiter/ metalwork as the car could go out of gear while moving.
19. Fill gearbox with Ford synthetic oil (Part No 5 015 547) Fill to level hole on LH side of gearbox.
20. Ensure all engine services/ parts are correctly installed.
21. Fit clutch slave cylinder, push rod clevis pin /split pin. Renew push rod clevis pin if worn.
22. Attach flexible hydraulic pipe.
23. Bleed clutch system - test.

24. Check car for roadworthiness.
25. Road Test
26. The speedometer will need re-calibrating to the new gearbox. A data sheet is enclosed for Speedy Cables who can do this work. Any competent instrument company can do this.
27. After 100 miles (160) km, recheck tightness of all newly installed accessible bolts /'nuts.
28. At normal services intervals, lubricate propshaft as per vehicle service manual, and always check and replenish gearbox oil levels as necessary.

SPECIAL NOTE

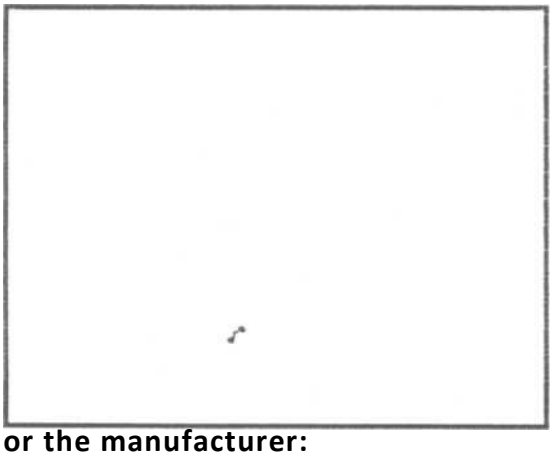
The propeller shaft supplied with this kit is manufactured to the original manufacturer's specification:

Torque rating (short duration) 570 Nm MAXIMUM (422 lb. f ft)
Rpm rating of propeller shaft: 7000 rpm. MAXIMUM

This corresponds to an engine speed of 5740 rpm in 5th gear (ratio 0.82:1), or an engine speed of 7000 rpm in 4th gear (ratio 1:1).

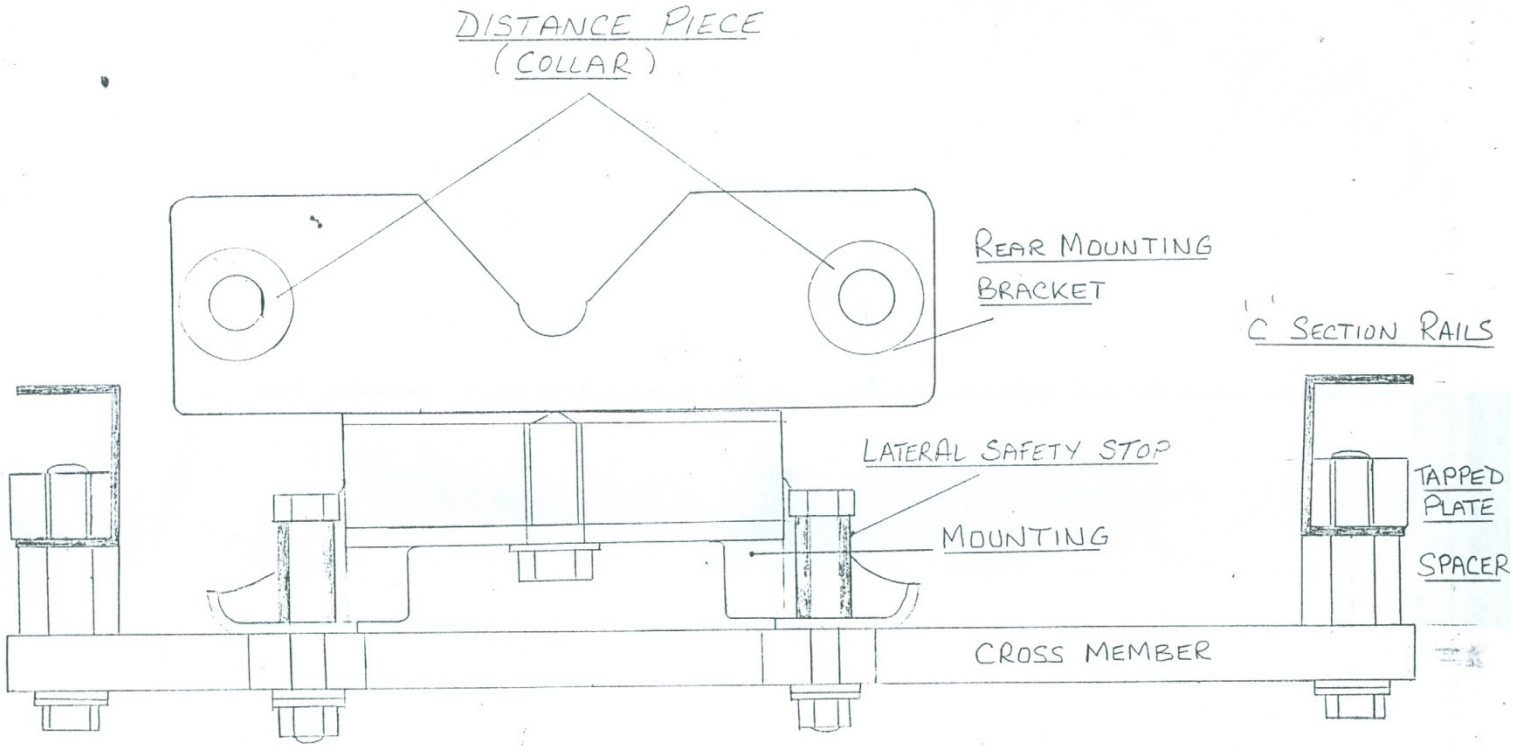
For higher torque or speed applications, Hi-Gear Engineering Ltd. can refer customer to manufacturer.

In case of any problems contact your supplier:



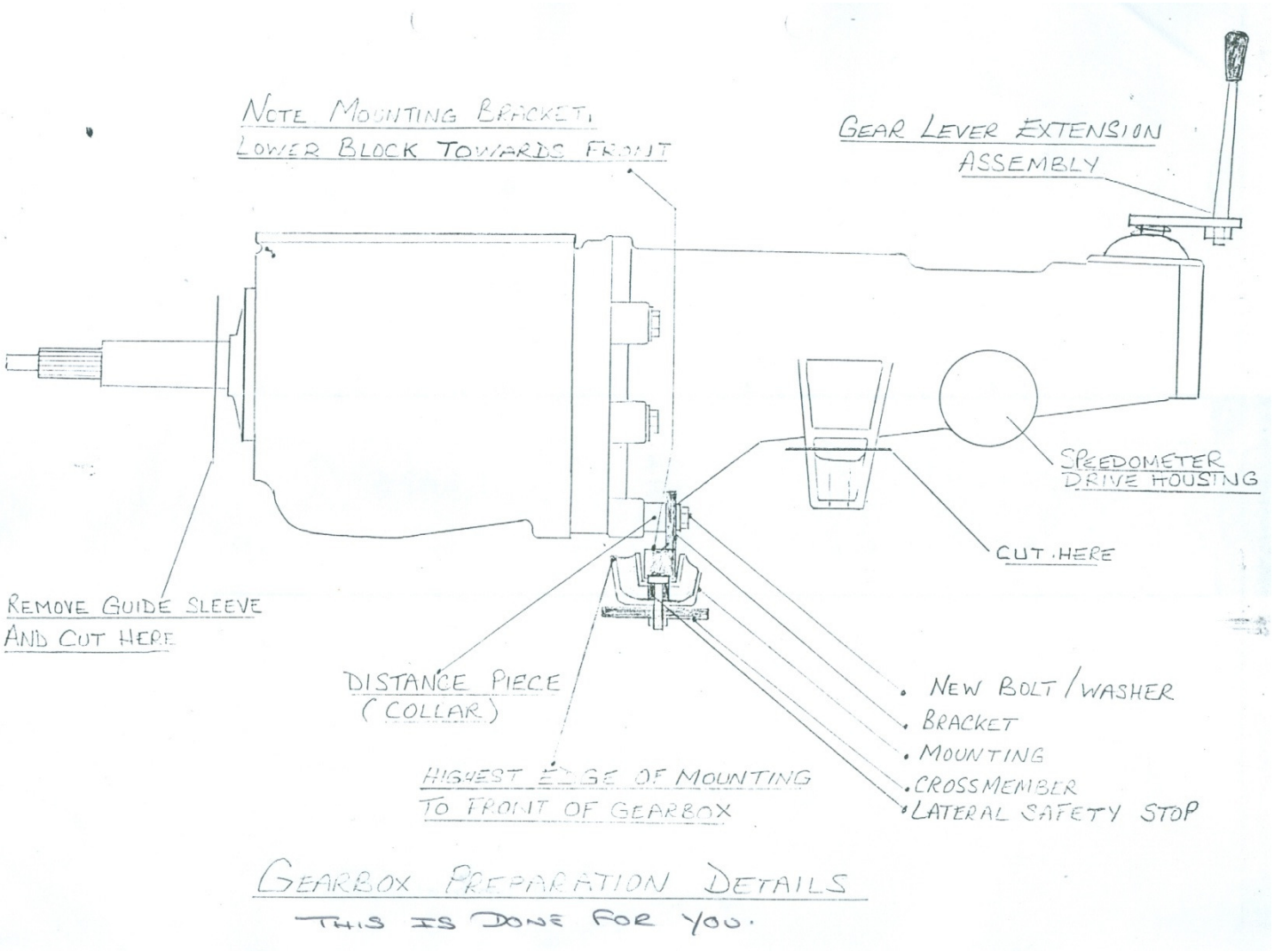
or the manufacturer:

Hi-Gear Engineering Ltd.
82 Chestnut Avenue
Mickleover Derby
DE3 5FS ENGLAND
Tel/Fax: 00 44 (0)1332 514503



ARRANGEMENT OF REAR MOUNTING ASSEMBLY
PART SECTION

VIEW TOWARDS REAR OF VEHICLE



GEARBOX PREPARATION DETAILS

THIS IS DONE FOR YOU.