

TC 547-7

MG TB/TC Sierra Gearbox Conversion

Fitting Instructions

This gearbox conversion is designed for adapting the Ford Type 9 gearbox, 5 speed, as fitted to the Ford Sierra 1983-91, to the MG TB/TC. This gearbox is referred to as 'N' type in the Haynes owner's workshop manual for the Ford Sierra.

Safety

There is considerable work required underneath the vehicle when fitting this conversion. Consequently the use of a vehicle inspection pit or vehicle lift is recommended.

If these are not available the car will need raising front and back to give sufficient space to work safely and comfortably under the engine, gearbox / propshaft areas. To accomplish this, support the car front and rear with properly sized and located axle stands. Do not use vehicle or trolley jacks for permanent support, only for raising and lowering the car.

The conversion kit comprises the following parts:

1. Cast Aluminium Bell Housing.
2. Gasket, bellhousing to gearbox
3. Spigot bush
4. Clutch plate, driven
5. Special design gearbox mounting (2)
6. Gearbox mounting support plates (2)
7. Gear lever assembly quickshift type (chrome)
8. New propshaft assembly
9. Gearbox cover packing pieces
10. Speedo cable/circlip
11. Propshaft tunnel stiffening angles (2) RH and LH
12. Propshaft safety guard
13. All bolts and fasteners
14. Detailed fitting instructions
15. Loctite

General Philosophy

The cast aluminium bell housing replaces the Ford cast iron bell housing from the Sierra application. The TB/TC clutch operating mechanism is re-used in the new bell housing and operates exactly as before. The only changed component is the driven plate supplied with kit. A new spigot bush to accept the 15mm first motion shaft of the Ford gearbox replaces the existing bush.

The TB/TC clutch cover is re-used with the driven plate supplied, as is the original type carbon thrust bearing.

New design gearbox mountings RH and LH (these are handed), are attached to the Sierra gearbox with two 10mm bolts and spacers as shown in the gearbox diagram.

A new balanced propshaft complete with Sierra gearbox splined nose-piece is supplied which replaces the original propshaft.

A modified extended gearlever is supplied which places a new MG replica chrome gear lever into the exact position as original.

A new speedometer cable is supplied which adapts the Sierra gearbox speedometer drive to the MG instrument which must be recalibrated to suit the new gearbox speedometer drive ratios. Data sheet included with instructions.

Note: Chronometric Speedometer

This type of instrument is difficult and expensive to recalibrate. Hi-Gear Engineering has commissioned Speedograph Richfield to manufacture, to order, a small step up gearbox which will fit directly into the speedo cable entry point on the Ford Type 9 gearbox.

This step up gearbox will then drive the original cable to the speedometer.

The vehicle owner sends his speedo together with calibration data obtained from the vehicle to Speedograph Richfield who will check the instrument and supply the step up gearbox with correct ratio for accurate speed indication.

The step up gearbox Ref. is RGB 1030

See attached information sheet on Speedograph Richfield.

Sierra Gearbox Preparation

1. Remove the Sierra bell housing and clutch release mechanism from the gearbox and discard.
2. At the front of the gearbox remove the four bolts and withdraw 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 filings, 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, 9-11Nm.
5. The rear gearbox extension casing is fixed to the main case with 6 x 10mm bolts.

Remove the four lower 10mm bolts which attach the rear gearbox casing to the main case. These are marked A B C D in gearbox drawing.

Attach the two support plates to the gearbox as shown in the diagram using the 4 x 90mm bolts, washers and spacers as shown. Use Loctite on the threads and tighten to 35 lbf-ft (46Nm).

Please note that bolt A actually enters the gearbox casing. Consequently Loctite threadlocker/sealer is essential to prevent oil leaking out.

6. Remove metal from gearbox rear casing as shown in the diagram. This is to give adequate clearance between gearbox and original chassis crossmember.

Vehicle Preparation

1. Remove
Steering wheel
Seats, carpets
Gearbox cover
Floorboards
Propshaft cover
Clutch operating chain
Engine, gearbox and propshaft

OR

Gearbox and propshaft*

*It is possible to carry out the conversion without removing the engine. In this case it is advisable to loosen the toeboard and remove the gearbox downwards because the gap in the toeboard is narrower than the bell housing.

Alternatively the engine and gearbox can be removed as a unit and replaced as a unit.

2. Loosen exhaust system

14/07/03

Assembling the new bell housing

1. Remove the clutch operating shaft and fork from original bell housing.
2. Replace them in the new conversion bell housing, noting the correct orientation of all parts. If any parts are worn it is a good policy to replace them at this time.
3. Clean the four 12mm bell housing attachment bolts in solvent to remove oil/grease. Similarly clean the four 12mm threaded attachment holes on the Sierra gearbox. Assemble the bell housing and gearbox together with the supplied gasket between. Apply LOCTITE (supplied) to the threads of the attachment bolts and gearbox attachment hole threads.

Using the spring washers with the 12mm bolts torque them to 55 lb ft (75Nm). Replace carbon thrust bearing.

4. Mark the clutch cover and flywheel so that they can be reassembled in the same position to preserve engine balance.
5. Remove clutch cover and driven plate.
6. Remove spigot bush from end of crankshaft using a hacksaw blade to make one clean cut along the bearing. Clean up the hole.
7. Insert new spigot bush into the vacated hole and drive squarely and evenly in to the same depth as original.
8. Apply a little grease to the centre hole of spigot bush for initial lubrication. **Do not use copper grease.**
9. Assemble the clutch cover and new driven plate in the normal way (use a Sierra clutch alignment tool if available).
10. If the engine/gearbox are out of the car it is a good idea at this point to assemble the gearbox and bell housing to the engine to see that all is well. Bolt gearbox/bell housing to the engine using the 8mm x 35mm bolts supplied.
11. Fit gear lever assembly with the bolts supplied.
12. Remove sparking plugs, rotate engine and verify that all gears can be obtained and everything rotates freely and easily.

The above test can be done if the engine remains in the car, after gearbox is attached.

13. Refit gearbox to engine from under car OR
 14. Refit engine/ gearbox as a unit.
 15. Allow gearbox to rest on crossmember.
 16. Replace original front engine mounts and tighten.
 17. Jack up gearbox sufficiently to put loosely in place the new gearbox mountings noting the RH and LH positions.
 18. Lower gearbox slowly and put in position the four 3/8" UNF bolts, washers and nuts making sure that on RH side the bolt heads are at the rear and on LH side the bolt heads are at the front.
 19. Assemble the four bolts, washers and nuts loosely, RH side first, then LH side, and remove the jack from the gearbox and allow the system to take the weight.
 20. Tighten up the four 3/8" UNF bolts and nuts.
 21. Fit the four 3/8" UNF nuts, plain washers and spring washers underneath the new gearbox mountings, which fit in the original position and tighten.
 22. Fit new propshaft. Lubricate spline and outer surface of nose piece. Bolt up flange as before – use new locknuts. There should be approx. 10mm of sleeve showing when in position.
- Note:** Before bolting up flange: the threaded part of the pinion, which passes through locknut and is visible inside axle drive flange sometimes is long enough to prevent these new type propshaft flanges from locating correctly on axle drive flange. It may be necessary to grind off one or two threads to allow the flanges to register correctly.
23. Fit new speedo cable. The gearbox termination is secured with a circlip. You will need a fine pair of circlip pliers. This is not easy to fit.
 24. Refit modified propshaft tunnel. Fit RH/LH stiffening angles and propshaft safety guard. See diagram for method of assembly. Check adequate clearance between gearbox and tunnel.

25. Refit floorboards. Trim where necessary around gearbox to give adequate clearance (10mm) for gearbox movement. Give good clearance around speedo cable.
26. Fit gearbox cover packing pieces above floorboards and sit the original gearbox cover on top. Again, give clearance around speed cable. Check that the gearbox filler/level plug can be accessed through the aperture in the side of the gearbox cover. Bolt the cover down. Also check the circular top of the cover at the front edge on the board does not foul wiring loom.
27. Fill gearbox with Ford Synthetic Oil 1045737 or equivalent. 1.3 litres or 1.9 litres. Fill to level hole on LH side of gearbox.
28. Replace seats, carpets and steering wheel. Check all vehicle services.
29. Check car for roadworthiness.
30. Check engine and clutch operation.
31. Road test.
32. After 100 miles (160km), recheck tightness of all newly installed bolts/nuts. Recheck gearbox oil level when cold.

**Hi-gear Engineering Ltd.
82 Chestnut Avenue
Mickleover
Derby DE3 9FS
ENGLAND**

Tel/Fax: 00 44 (0)1332 514503

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).

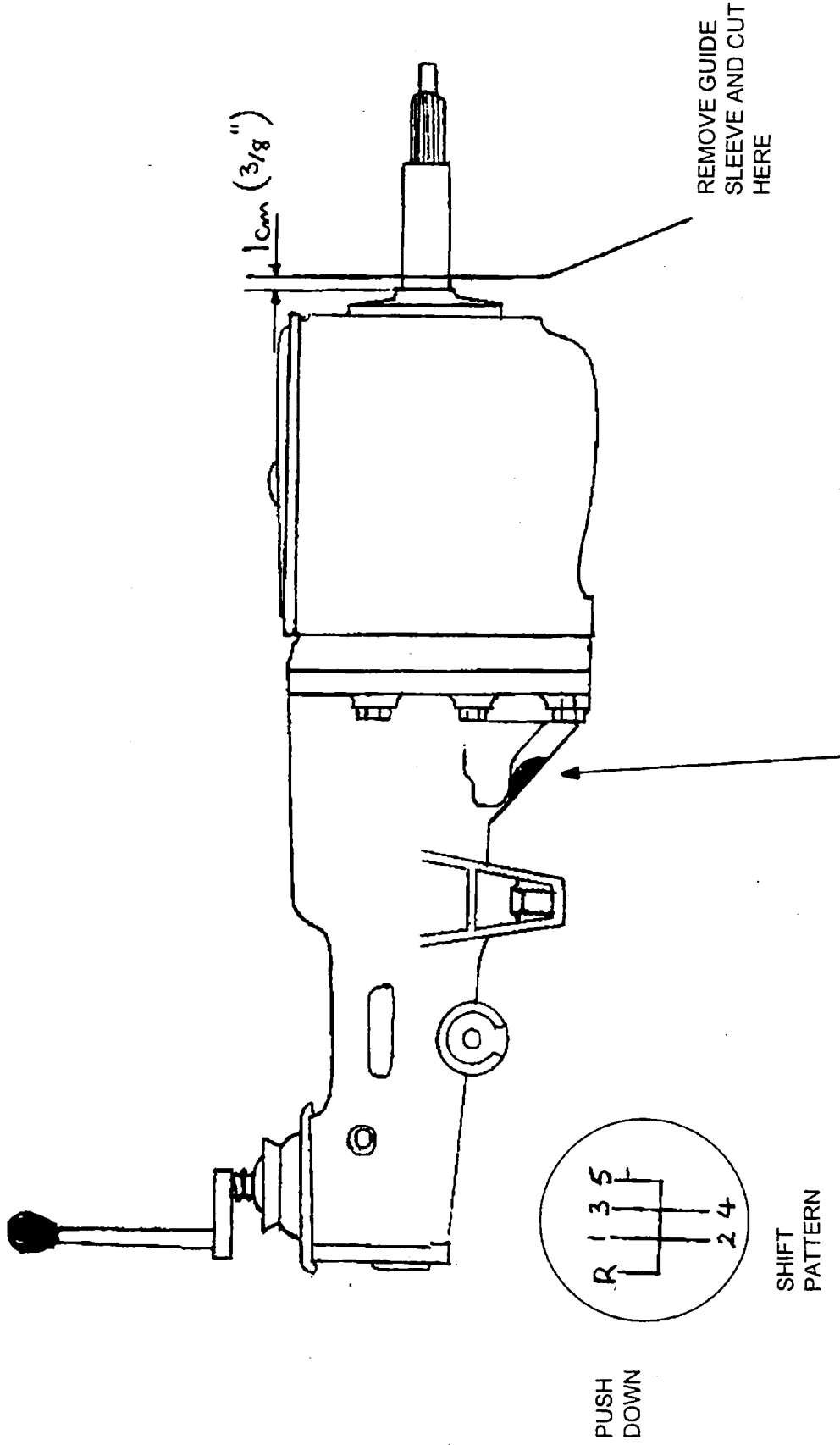
For higher torque or speed applications, Hi-Gear Engineering Ltd. can refer customer to manufacturer.

In case of any problems

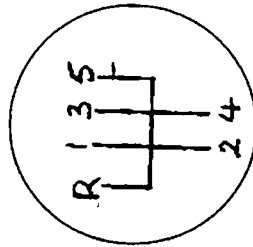
contact your supplier:

or the manufacturer:

TB/TC GEARBOX PREPARATION



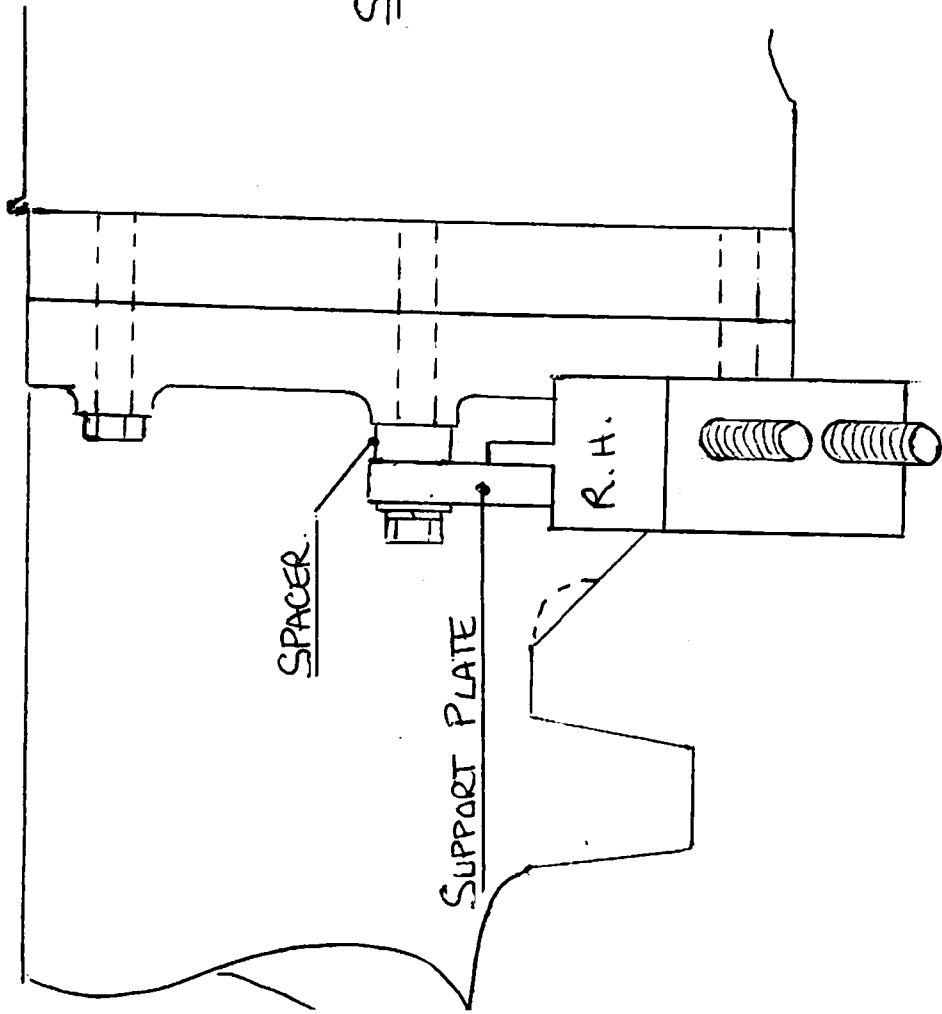
PUSH
DOWN



SHIFT
PATTERN

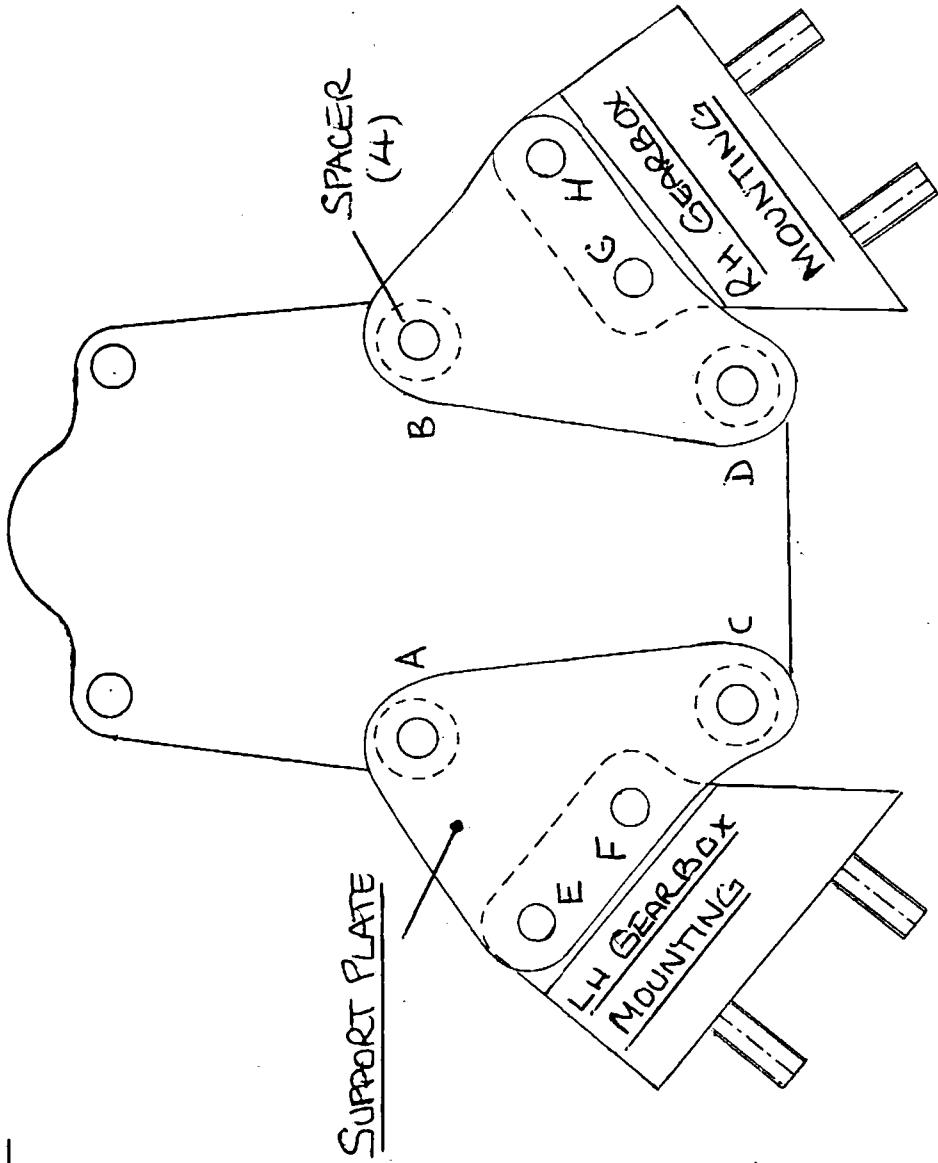
REMOVE METAL FROM
SPINE AS SHOWN TO CLEAR
CROSSMEMBER

REMOVE GUIDE
SLEEVE AND CUT
HERE



VIEW ON RHS GEARBOX

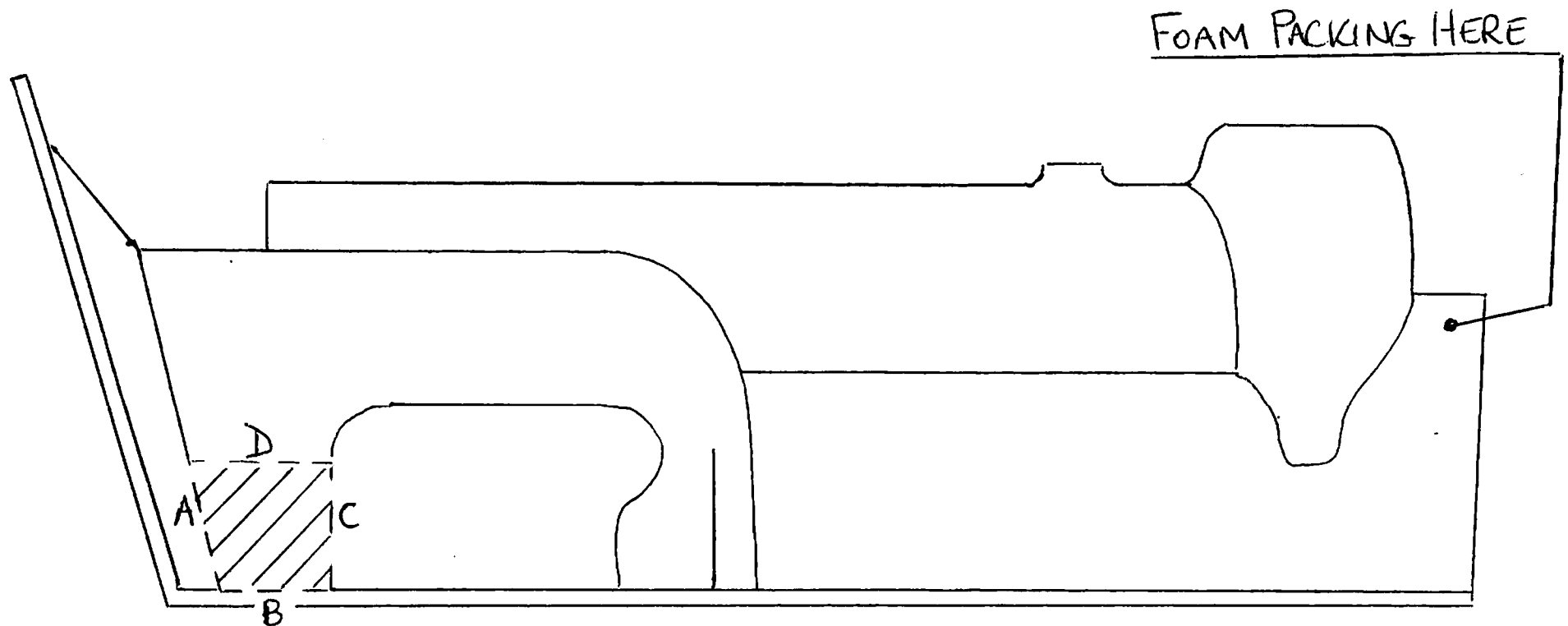
TB/TC GENERAL ARRANGEMENT OF GEARBOX SUPPORT SYSTEM.



VIEW ON REAR OF GEARBOX

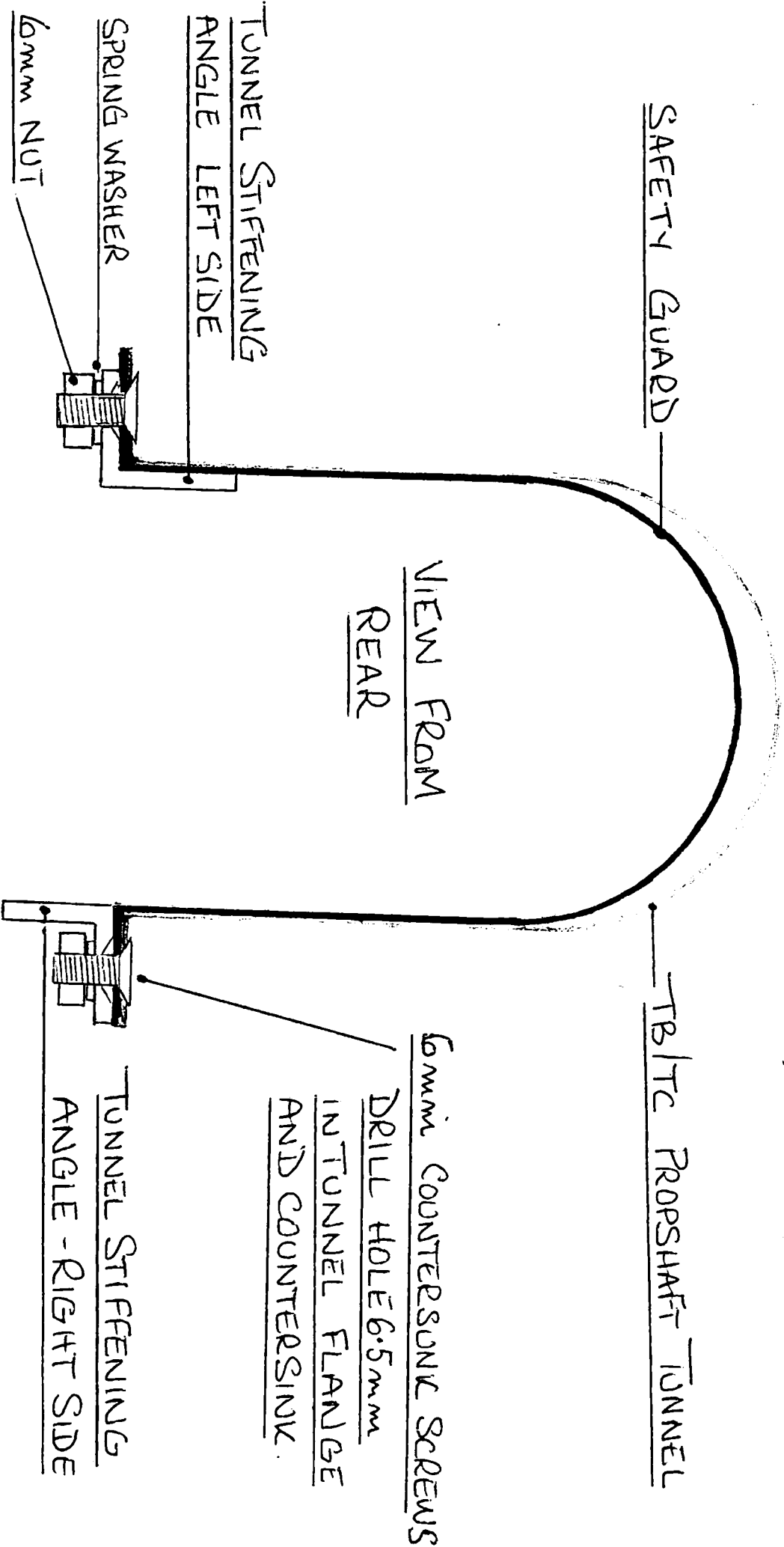
- NOTE:
- GEARBOX MOUNTING TO SUPPORT
 - PLATE BOLTS:
 - E.F. HEADS FACE TO FRONT
 - G.H. HEADS FACE TO REAR

TB/TC GEARBOX COVER MODIFICATIONS



CUT ALONG SIDES A B C D TO FORM APERTURE
TO ACCESS OIL FILLER / LEVEL PLUG

MAKE REMOVABLE METAL COVER. SECURE WITH SCREWS
TO PREVENT ENGINE BAY AIR ENTERING COCKPIT.



SAFETY GUARD

VIEW FROM REAR

TB/TC PROPSHAFT TUNNEL

6mm COUNTERSUNK SCREWS

DRILL HOLE 6.5mm IN TUNNEL FLANGE AND COUNTERSINK

TUNNEL STIFFENING ANGLE LEFT SIDE

SPRING WASHER

6mm NUT

TUNNEL STIFFENING ANGLE - RIGHT SIDE

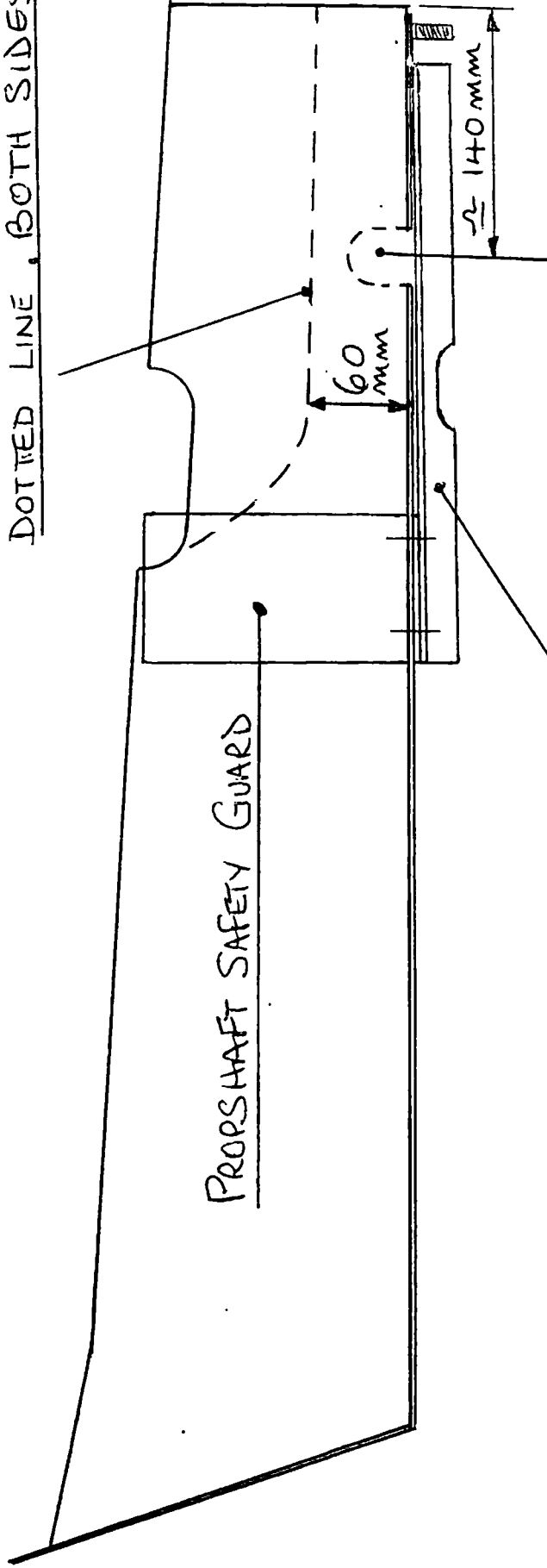
TB/TC PROPSHAFT SAFETY GUARD

FITTING DETAILS

TB/TC PROPSHAFT TUNNEL MODIFICATION

VIEW ON RIGHT SIDE

REMOVE METAL SHOWN ON
DOTTED LINE, BOTH SIDES.



CUT AWAY FOR SPEEDO CABLE

40mm X 40mm

CHECK ACTUAL POSITION
IN SITU. (CARS VARY)

TB/TC PROPSHAFT TUNNEL MODIFICATION
VIEW ON LEFT SIDE

