



## **Tech Tips:**

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### **GE098 - 5 Speed TC Gearbox Assembly**

The 5 speed gearbox conversion is a popular item to improve the drivability of your TC. This kit is aimed at TB/TC owners who really want to use their cars on modern roads. The primary benefit is that is that the 5<sup>th</sup> gear provides the equivalent of an overdrive, reducing engine RPM for normal cruise on the motorways. The end result is economy, comfort and increased engine life.

General information is as follows:

- This conversion adapts a Ford Sierra 5 speed gearbox to the XPAG engine.
- The assembly is complete, essentially replacing most items from the bell housing back to the differential.
- A list of those items included in the kit is attached along with installation instructions.
- The engine stays in the same position so there is not cutting or drilling of the chassis.
- The new shift lever sit in the exact position as the old one, consequently the conversion is not easily detectable.
- The front end of the pro tunnel must be modified to accommodate the longer gearbox.
- Please note the specific lubricant required for the gearbox. Initial supply to fill is included for installation.

There can be a variance in required length of the propeller shaft for the TB/TC. Therefore, when ordering this assembly provide the following measurement:

- Distance between the aft face of the old gearbox flange and the Forward face of the differential prop shaft flange.
- If the old gearbox has been removed, then provide the measurement at the front engine mount center hole back to the face of the differential flange.

Thank you for your purchase.

**SAFETY FAST!**

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## MG TB/C 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/C. 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. Aluminum 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.

Toe 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.

### 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  
14ftJ7/03

## 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. Sincerely 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 liters or 1.9 liters. 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.

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 1000 rpm in 1st gear (ratio 1:1).

In case of any problems

contact your supplier:

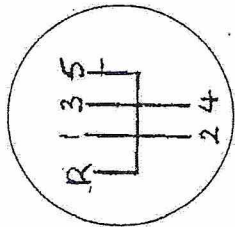
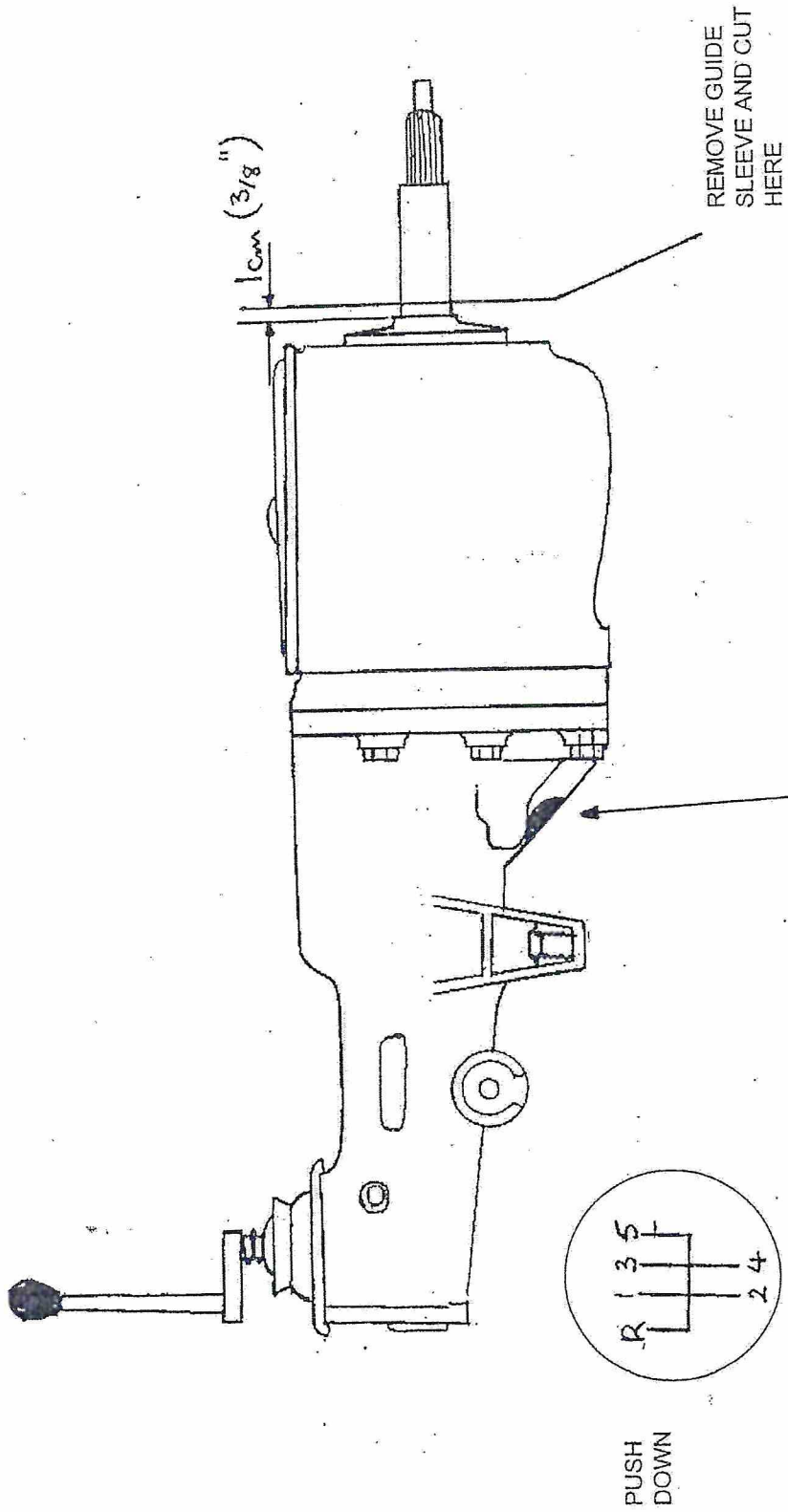
or the manufacturer:

## FROM THE FRAME UP



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# TB/TC GEARBOX PREPARATION

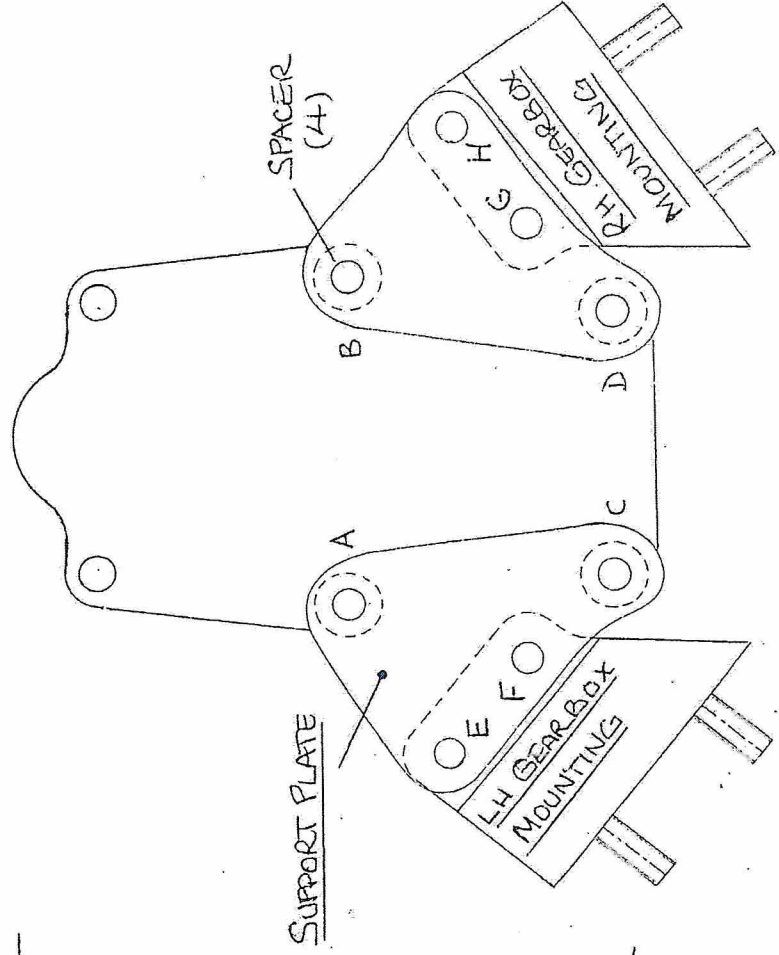


PUSH  
DOWN

SHIFT  
PATTERN

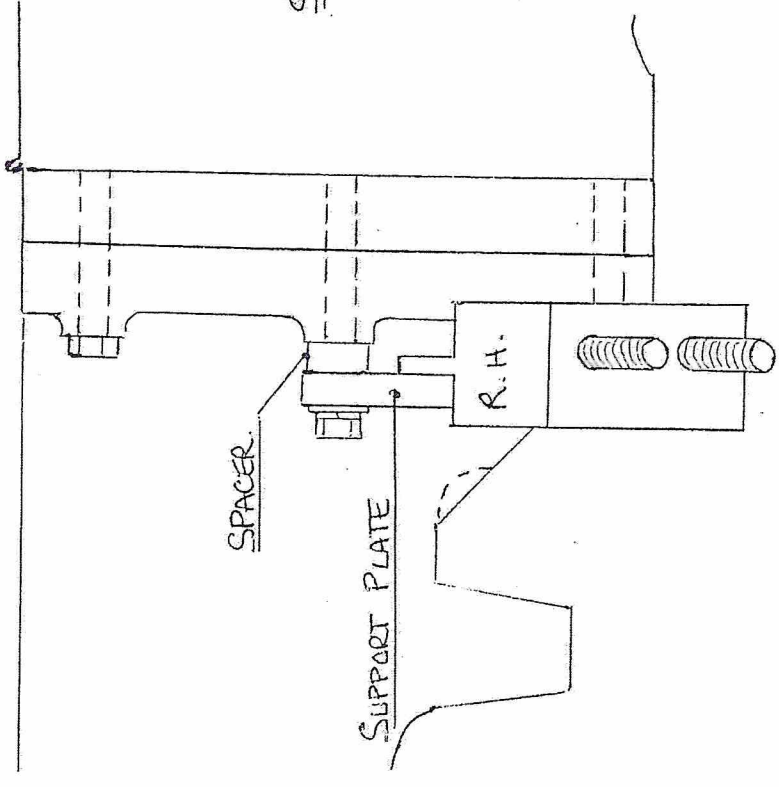
REMOVE METAL FROM  
SPINE AS SHOWN TO CLEAR  
CROSSMEMBER

REMOVE GUIDE  
SLEEVE AND CUT  
HERE



VIEW ON REAR OF GEARBOX

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

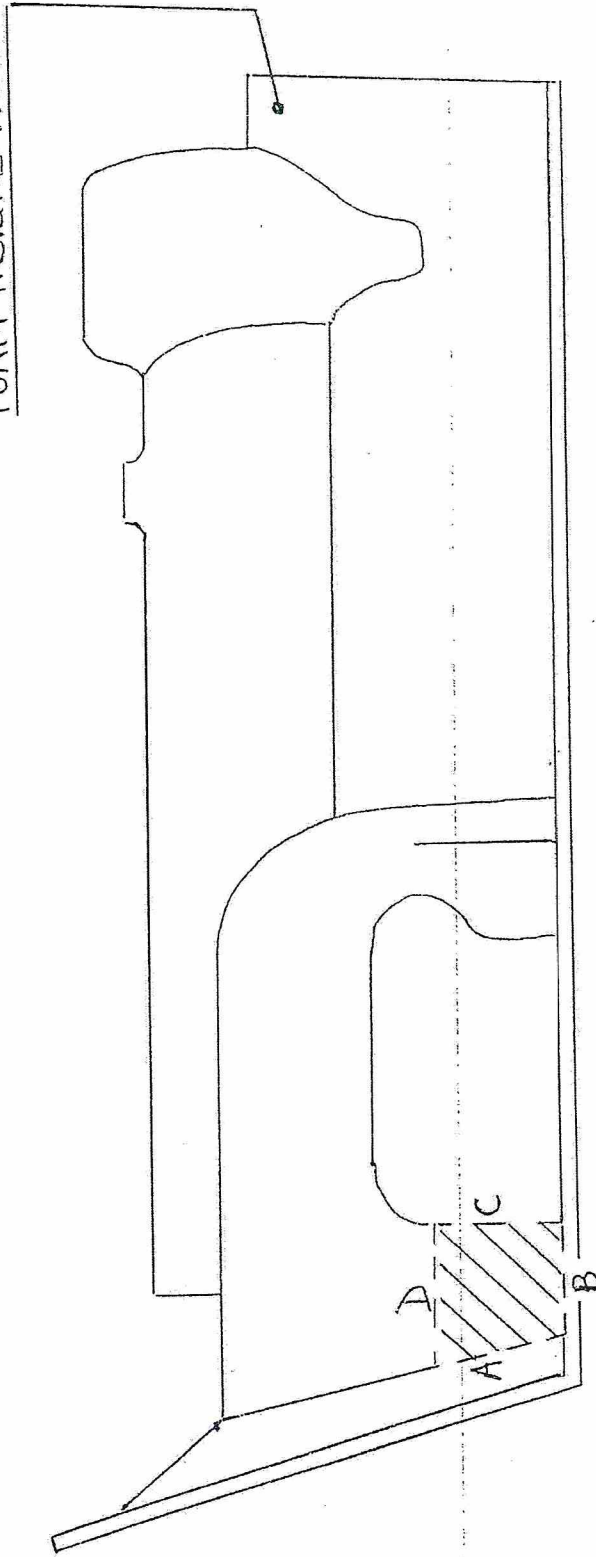


VIEW ON RHS GEARBOX

B/T C GENERAL ARRANGEMENT  
F GEARBOX SUPPORT SYSTEM.

# TB1TC GEARBOX COVER MODIFICATIONS

FOAM PACKING HERE



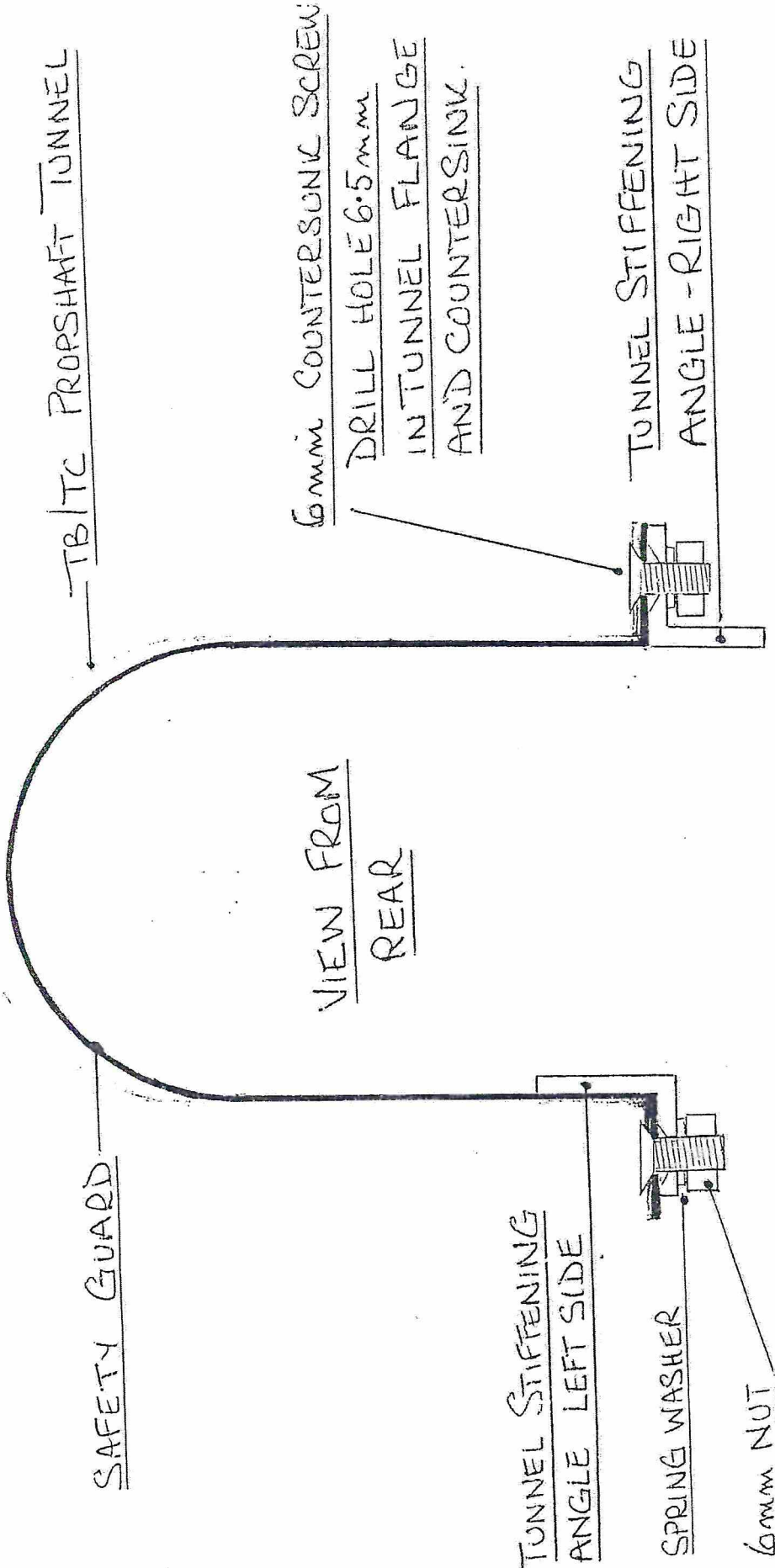
CUT ALONG SIDES A B C D TO FORM APERTURE

TO ACCESS OIL FILLER / LEVEL PLUG

MAKE REMOVABLE METAL COVER. SECURE WITH SCREWS

TO PREVENT ENGINE BAY AIR ENTERING LOCKPIT.

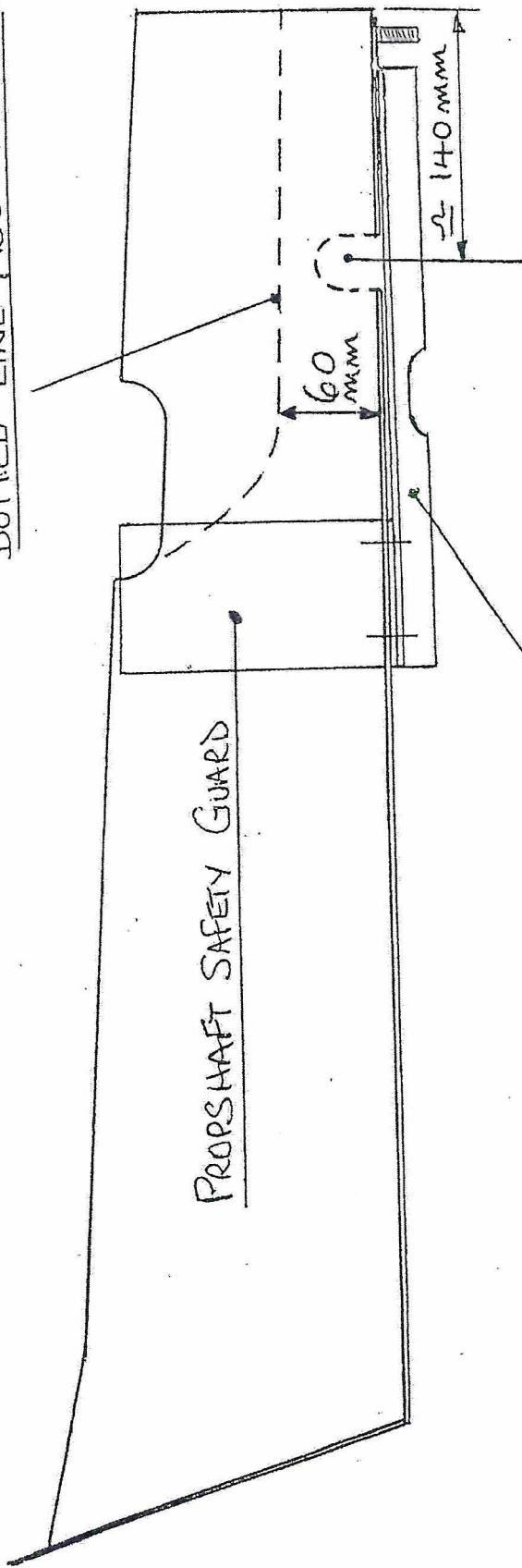




TB/TC PROPSHAFT SAFETY GUARD  
FITTING DETAILS

TB/TC PROPSHAFT TUNNEL MODIFICATION  
VIEW ON RIGHT SIDE

REMOVE METAL SHOWN ON  
DOTTED LINE, BOTH SIDES.



CUTAWAY FOR SPEEDO CABLE  
40mm X 40mm  
CHECK ACTUAL POSITION  
IN SITU. (CARS VARY)

TUNNEL STIFFENING ANGLE,

TB/TC PROPSHAFT TUNNEL MODIFICATION  
VIEW ON LEFT SIDE

