

5 Speed 3L V6

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5 Speed 3LV6
TCD 462J

Having soldiered on last year with the old overdrive box on my 3LV6 which despite frequent rebuilds still gave trouble - from total loss of drive thru' slow overdrive engagement to no overdrive, I felt that the time had come to change it. Casting around revealed one or two options.

- 1) Fit 4 speed non od box from Capri, Granada etc.
- 2) Fit later type od box from Schimitar
- 3) Fit 5 speed od box from 2.8i Capri.

I eventually decided on the latter principally because one came my way at a reasonable price. The ratios are more suited to Marci than those in the original box.

	5sp 2.8i 3.54 axle (max mph)	4+od Zodiac 3.54 axle (max mph)
1st	3.36:1 (40)	3.163:1 (41)
2nd	1.81:1 (62)	2.214:1 (50)
3rd	1.26:1 (82)	1.412:1 (72)
3rd od	-	1.16:1 (88)
4th	1.00:1 (114)	1.00:1 (114)
5th	0.825:1 (138!)	0.8205:1 (139)

The main changes being much improved lower gear ratios.

The change from 4+ od to 5 is not simple but having completed the exercise I consider it to be well worthwhile. The main problem stems from the fact that the 5 Sp box is part of Ford's new metric range whilst the 4+ od is an old imperial system. In fact the 5 speed box seems to be a development of the 4 speed "medium" box fitted to cars like the 2.5i Granada. As the metric box was never fitted to the 3LV6 engine in any production Ford car the swap is not straightforward but can be

carried out with only moderate machining (say £15-£20 at a local engine re-builders). Basically you will need the following.

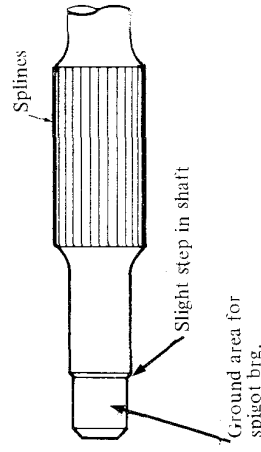
- 1) A 5Sp box from a 2.8i Capri, XR4i etc in good condition - you have to strip it anyway so bearing/synchro wear is not that important.
- 2) From a 2.5L Granada Saloon (NOT ESTATE).
- 3) Lever for 5Sp box (About £14.00 new).

Bellhousing
Flywheel (Unless your 3LV6 has post 1970 unit).
Clutch Cable, Release Arm, Thrust Brg, Release Arm Gaiter + Clip, Clutch Cover (Existing plate will fit!) Rev. Lt Connector.

As well as this lot the existing propshaft will need to be shortened (by 35mm in my case) and a new rear gearbox mount will have to be fabricated. I used the old od mounting with a 1.25" spacer underneath. Believe it or not the speedo cable will fit but you may have to change the plastic take off gear in the box.

Proceed as follows:-

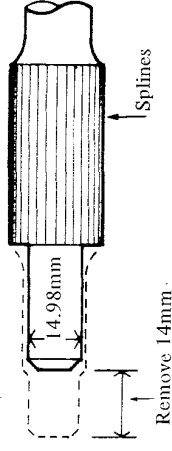
The 2.5L Granada bell housing matches the English engine to the metric gearbox except that the gearbox input shaft is too long. In exaggerated form



It must be removed from the box (easiest way is described in Haynes manual for 2.8i Granada, transmission type N) and machined as follows.

- 1) the ground area on the spigot brg end (approx 14.98mm diameter) must be extended all the way up to the splines.
- 2) Approx. 14 to 15mm must be cut off the shaft.

It should now look like



comparison with the input shaft on the od box will reveal all. Note that the shaft has been heat treated so grinding is the only viable way (turning in a lathe is a non starter) - anyone with a crank regrind machine should be able to do this. I removed the surplus 14mm length by cutting it off using a small angle grinder. Although the newly ground area will not be case hardened this is not serious as it is not subject to any significant loading. Supply the machinist with a new spigot bearing (3L Capri type) to use as a guide. Also put a slight chamfer on the shaft end to make for easier assembly of engine to bell housing.

You will need to swap the old flywheel and clutch pressure plate for the Granada ones as these have the metric bolt pattern - the old clutch won't work with the cable Granada release arrangement. My new flywheel looked like crazy paving it had so many heat cracks. I had it skimmed removing 75 thou at the same time as the input shaft was modified.

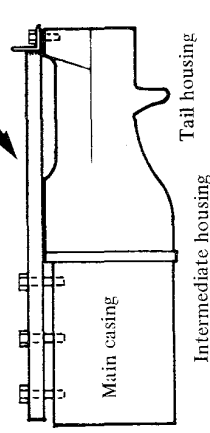
The gear change on the Zodiac box was hopeless due to the cranked gear lever and very sloppy mechanism. Unfortunately the gear lever on the 2.8i 5Spd box emerges from the box not 4" in front (which would be ideal) but 1 1/2" behind the equivalent position for the od box. This would mean

that either a larger crank would have to be put in the lever - ugh! and not easy either - or the selector will have to be moved back along the tunnel by extending the existing hole by 1 1/2", or a remote selector built - horror! Neither of these is very desirable and fortunately there is an alternative which does away with the cranked selector rod completely and only moves the gear lever by about 1 1/2". It does however require some work. Basically!!! the selector mounting has to be cut off the back of the gearbox (yes!) and repositioned 3" further forward - it is also necessary to bend the gear level about 20 degrees forward rather than the 20 degrees backward bend which it is supplied with. The selector rod in the gearbox tail housing also has to be modified.

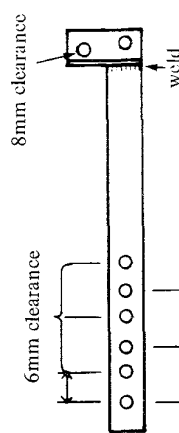
If you decide to do this have a couple of pints for dutch courage and proceed as follows.

Firstly construct a jig to ensure that the gear selector rod housing can be accurately repositioned in its new location, 3" further forward. This can be done conveniently as follows.

Jig attached to main housing via 3 6mm bolts and to selector rod mount via 2 8mm bolts.



PLAN VIEW OF JIG



2nd set holes drilled 3" from first set.

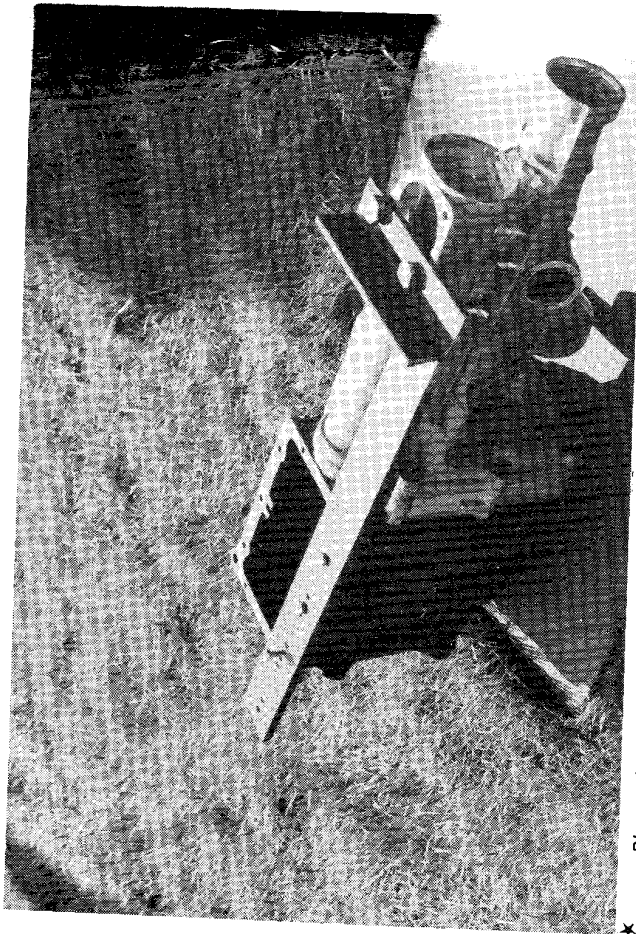
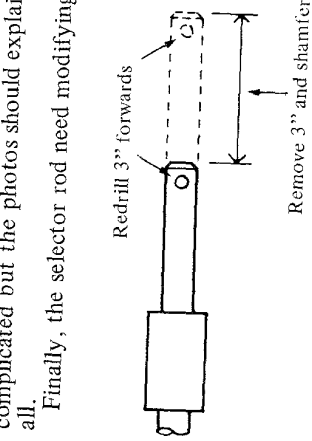


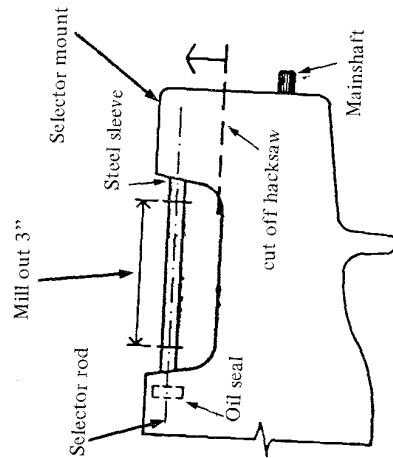
Photo showing attached jig.

Having now got two bits of tail housing, use the jig to reposition the selector mount in its new position 3" forward. Insert the selector rod through the box to ensure alignment. It is now necessary to attach the mount in its new position. I had mine welded on by a specialist (£20), but it should be possible to use an adhesive if the surfaces are properly prepared. If welding, remove all oilseals, and the white metal bush. It is necessary to preheat the casting to minimise distortion. This all sounds complicated but the photos should explain all.

Finally, the selector rod need modifying.



accuracy again is essential if the gearchange is to work well and smoothly.

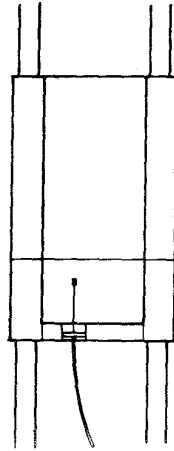


Reassemble the box with new gaskets and check operation of gear shift. New castings are over £80 so its expensive if it doesn't work at this stage. Mine worked fine first time.

The new box can now be mated to 2.5L Granada bell housing and new clutch/fly-wheel etc. The Granada bell housing uses a cable operated clutch. I couldn't think of an easy way to modify it for hydraulic operation so I converted the pedal box for cable operation. This is not too difficult (compared to the rest anyway).

Firstly remove the hydraulic cylinder and clutch pedal I used a cable from a 3L Capri but the Granada unit should fit.

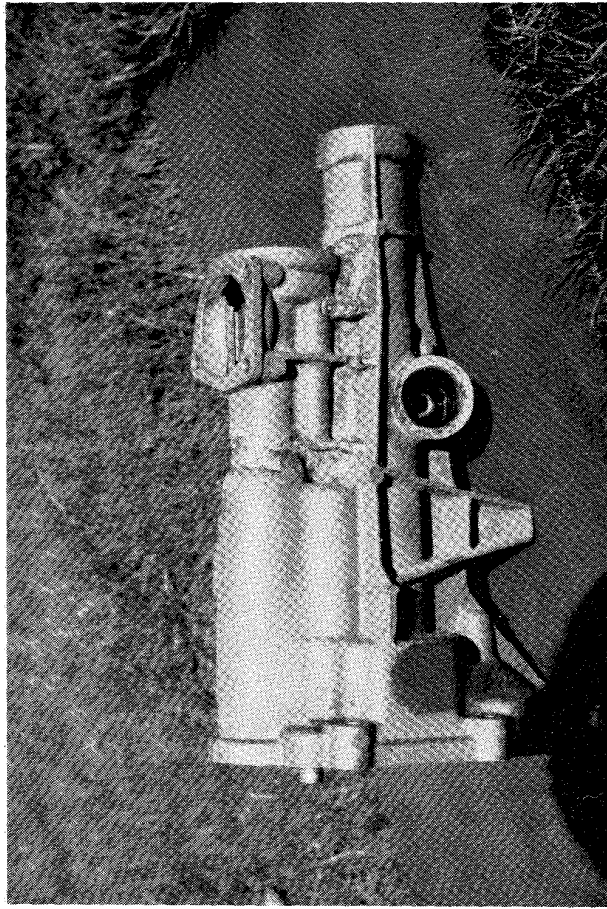
Weld a bracket to the cross member on the moving part of the pedal assembly at the back of the unit.



Above :- Diagram showing new bracket welded onto the crosspiece.

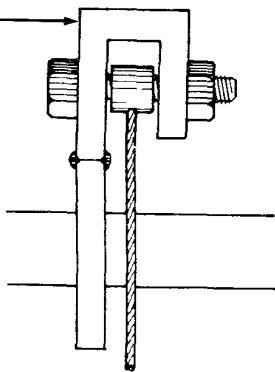
Left :- Plan view of pedal box showing location of the new bracket.

Below :- The finished job, one 5 speed gearbox !!



Also modify the clutch pedal to accept the cable end

Bracket welded on back of clutch pedal gap to accept eye on end of cable.



Cable secured with bolt through.

Refit box/engine as a unit, raise rear mounting by about 1 1/4" and re-measure prop. Rewrite reversing light and remove overdrive wiring.

Well its quite a long job but the result is a first class gear change, improved ratio's and no more overdrive problems. For best box life use Castrol SMX semi synthetic oil rather than EP80 - its not cheap at £5/litre (2 litres needed) but has much better ability to withstand the high loadings experienced under heavy acceleration.

Peter Bennell

Marcizing

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This is the first and hopefully not the last time I write in this, our own publication, but alas I must warn you that it's a sad tale.

It all began 3 years ago when I acquired a

Mini Marcos Mk 3 for the sum of £400, for which I had to trade in my Citroen 2CV.

The car had a sound body and interior, disc brakes and a race camshaft alas no MOT, tax and little oil pressure. I drove it the 20 miles home anyway, albeit a bit warily.

The MOT was achieved by fitting a new brake master cylinder, but with the oil pressure dwindling a new engine was necessary. That was done alone in a freezing single garage over Christmas and New Year.

Back on the road with Minilites fitted and what fun I had. I think I must have driven around for months with a permanent grin. It was so different from my previous car.

Anyway 6 months later - bang, hit a wall head on - I don't think I bled the brakes properly and for the last 2 1/2 years the cars been in storage.

Only recently I've started getting it together again and I've only managed to get one quote from a local firm who specialise in Lotus' so the bonding alone will cost in excess of £400.

At present I'm out of work and things don't look too good, but I'm determined to rebuild it whatever the cost.

Some of you cynics out there probably think I'm mad - my parents certainly think so - especially when complete cars are available for less, but unfortunately I'm rather attached to my Mini.

By the way, I went up to Donne for the Scottish Marcos Owners Club do and to say I was ***** off would be an understatement.

I trundled up on Saturday morning in my '67 Beetle and arrived at 2pm only to discover that all the cars were elsewhere on "the convoy". The only Marcos I saw was one of those Coupe things. I went home.

If anyone out there wants a black '67 Beetle with only 140,000 miles on the clock, no MOT and tone of character, don't hesitate to contact me. I have to raise money somehow!

A tip for budding coach painters, try Tekaloid Coach enamel, brushed on. It takes hours to dry, but I painted the Beetle with it and the results were amazing apart from the bonnet. The cat sat on it when still wet.

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Scarborough
Ontario M1V 3P6
Canada

3 litre Volvo: 3V5838
Registration: MARCOS
Previous Reg: VDV803K

Dear Colin,

I would like to compliment those involved for the colour photos that were first printed in magazine 54 and again in no. 55. Details show up far more clearly than with black and white, and are more beneficial to people like me who can't seem to coordinate a trip home with the International Rally. As they say, a good clear picture is worth a thousand words and I've gleaned many an idea for improving my car from the photos that have been printed over the years.

Looking at the label on the magazine envelope, I just realized that I haven't renewed my subscription since November '86, so thanks for not cutting me off. The enclosed cheque is to cover the past year and next year, and I guess I should provide a contribution in penance.

First of all, for the record, yes, that was my car in the photo sent in by Geoff Armstrong in mag 54. I recognized the car park of my squash club, or I should say my ex-squash club since they turned it into a mall (for the uninitiated, that's a small collection of shops/boutiques within an outer shell building). Sacrilege.

My latest venture originally began as a rebuild of a spare 3 litre engine I had picked up, but when a factory-built high-performance marine engine was made available to me (including Penta inlet tubes and triple Solex side-draft carbs) for 2/5 the rebuild cost, guess what I did! The engine is rated at around 230 hp and has chromed rocker cover, pulleys and water pipes and should provide 190-210 bhp at the rear wheels, I reckon.

The marine parts had to be replaced with automobile equivalents, so out came the engine and gearbox from the car (easier said than done, unless you own a fully equipped service bay with hoist) and off came the required parts. Wouldn't it be nice if it could be done as fast as it can be said. That was the third time now and I have it down to around three hours by myself (except removing the bonnet) having most of the right tools. A first-timer would need at least four hours and lots of help. From a lot of articles I've read in the mag over the years, people tend to think that by definition, a Marcos owner has to be a certified (especially certified) mechanic. That may not be totally true but it certainly helps. For those who aren't, here's how it's done.

Disconnect the battery. Inside the car, remove the tunnel tray and unscrew the gear stick. Disconnect the electrical connections to the bonnet and remove it. Drain the cooling system and remove the radiator and fan. Disconnect the starter motor, alternator, distributor, temperature sensor, oil pressure line, HT lead to the coil, fuel line, earthing strap, choke, heater and air control cables, accelerator linkage, heater hoses and exhaust downpipe. If you want to be ultra safe, remove the distributor as it'll get crunched if the engine falls over after removal, as once happened to me. Luckily I had a spare.

Raise the car on axle stands and make sure it's stable. Disconnect the prop shaft, gearbox mount, clutch slave cylinder, speedo cable, reversing light switch and overdrive electrical connections (if fitted). It might be desirable to place a couple of pieces of wood at each side of the bell housing to protect the chassis after removing the gearbox mount. Remove the nuts from under the engine mounts and lower the car to the ground.

Remove the rocker cover and attach the chain to the right rear head bolt and the