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JUNE 1996
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500bhp TRANNY

IF YOU CAN READ THIS
THEN SOME GIT'S
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AT THE CHECK-OUT
AND THEY'LL SORT YOU
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THERE'S LIFE IN THE OLD BIDDY YET

● ROUGH GUIDE TO RS TURBO TUNING ● MICHELIN TYRE TEST ● B5 GEARBOX GUIDE



TRANSMISSION VAMP

After thirteen years of production, you'd have thought any problems with Ford's B5 transmission would have been ironed out by now. Well, if anyone can tell us Peter Formby can.

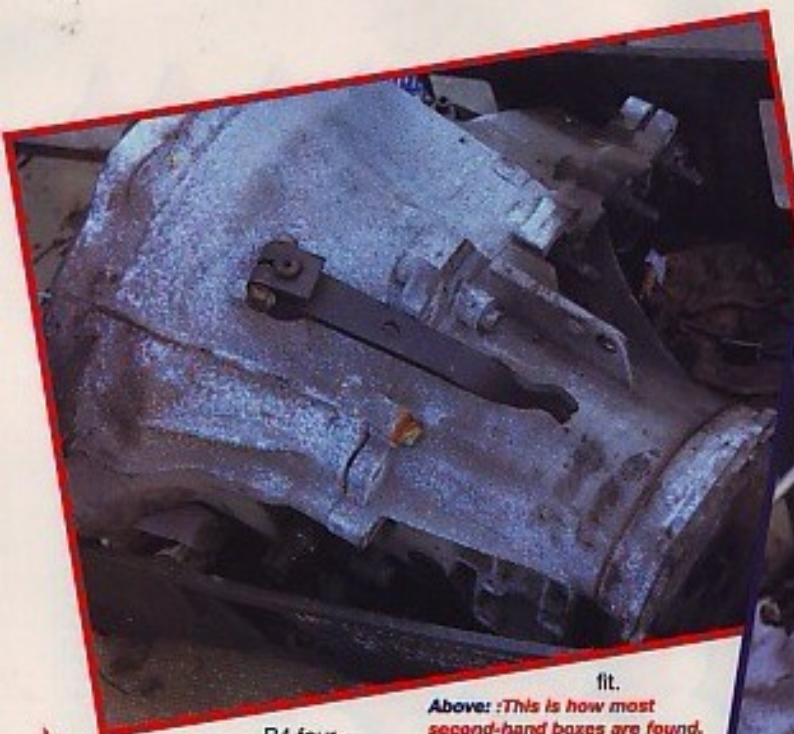
Peter runs a Transmission servicing company which shares his name. What he's going to share with us is some of his extensive knowledge as we put the versatile transaxle under the microscope.

Ford's B5 five-speed was first seen in 1982, fitted to the later run of carburated XR3s. Ford had been left behind in the five-speed stakes by the likes of VW and Vauxhall, who were now fitting them to their 'hot hatches' as a matter of course. A five-speed box made sense, it allowed manufacturers to keep a relatively low final drive – always good for acceleration – but also a relaxed cruising speed thanks to a tall-g geared fifth. This gave not only less noise, but also improved fuel economy.

Ford's B5 was an evolution of the earlier



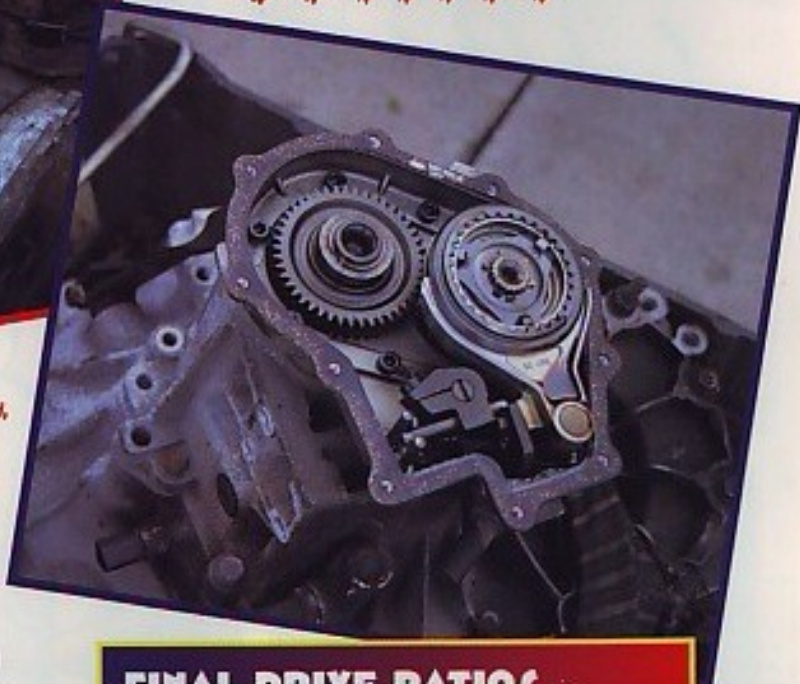
TRANSMISSION VAMP



fit.

Above: This is how most second-hand boxes are found, off the car and in a carrying crate. So how do you know what's inside its casing?

Right: Remove the end cover and check that there is no excess slack in the splines holding fifth gear



B4 four-speed box first found in Fiestas. The creation followed common design theories by having its extra gear tagged onto the end of the original 4-speed in its own special casing and looking very much like an afterthought. The gear change mechanism has been altered internally to allow the additional selector to function correctly, hence on four-speed units reverse is selected by moving the lever left and forwards, whereas the B5 requires force to the right and backwards.

B5 transmissions are built in three countries, Germany, Britain and France; hence the casing identification tags are stamped with either FOG (Ford of Germany) FOB (Ford of Britain) or FOF (Ford of France). All units have similar problems regardless of where they were built. Virtually all gearboxes from 1977 to date have the same size bearings; the only exception is the 1.8 Zetec box, which has updated items.

WHAT TO WATCH FOR

There are three areas which cause the most problems:

1 The input shaft (Lay gear)
The small race bearing at the clutch spline end collapses, causing oil to leak past the front seal (ruining the clutch in the process). And if that doesn't happen, then the other problem is at the other end of the 'box, when the splines at the fifth gear end wear, causing excessive slop and leading to a rattle when the engine is idling - fifth gear should be a very tight

2 Main shaft (Pinion shaft)
Apart from the usual synchromesh trouble, the most common problem here is that the case hardness on the shaft breaks up, causing the pinion bearing (which is an open roller type) to disintegrate. This can destroy the transmission. Once the hardness starts to break up the problem will develop very quickly and makes itself known by a howl from the transmission on over-run which, initially at least, disappears when the clutch is depressed.

3 The differential
By far the biggest problem are of all with both B4 and B5 gearboxes is that the offside differential bearing collapses, allowing the diff carrier to wobble about which in turn destroys the seals and speedo drive. In fact some people only realised that they have a problem when the speedo stops working and a new cable doesn't so the trick. By removing the speedo cable drive it is possible to see that the teeth have worn away to the point where they become concave. In fact sometimes the bearing collapse problem is so bad that the differential's crown wheel has dug into the gearbox casing, effectively scraping it.

But it isn't all doom and gloom. The B5 is a well-proven unit capable of many thousands

FINAL DRIVE RATIOS

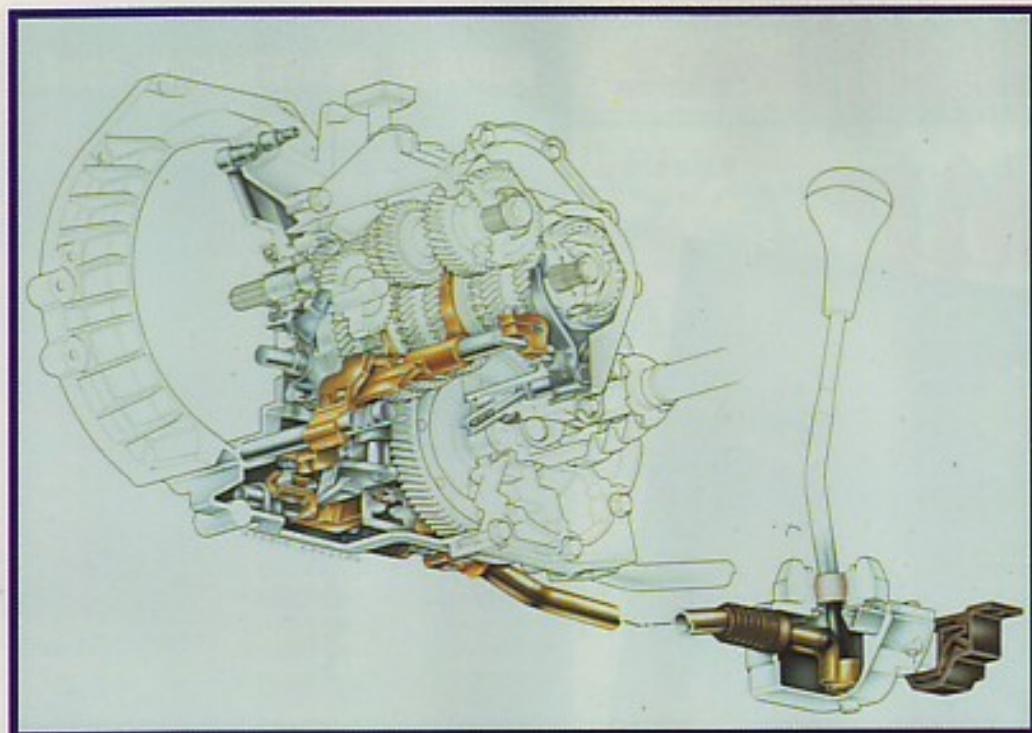
MODEL	ENGINE SIZE	RATIO
Escort & Orion	1.1, 1.3, 1.4	3.94:1
	1.6 carburettor	3.58:1
	1.6i XR3i	4.27:1 & 4.29:1
	1.6 injection	3.84:1 & 3.82:1
	RS1600i	3.82:1
	RS Turbo Series 1	4.27:1
FIESTA	RS Turbo Series 2	3.84:1
	1.1	4.06:1
	1.3 & 1.4	3.82:1 & 3.84:1
	1.6 XR2	3.58:1 & 3.82:1
	1.6i	3.82:1
	1.6 XR2	3.82:1
	RS1800	3.82:1

GEAR RATIOS

There are two mainsets of gear clusters, but the RS1600i's were different again, and these, when combined with different final drive ratios, were all that Ford needed to satisfy their gearing requirements

GEAR	HIGH RATIO SET	LOW RATIO SET
5th	0.76:1	0.76:1
4th	0.95:1	0.95:1
3rd	1.28:1	1.35:1
2nd	1.91:1	2.04:1
1st	3.15:1	3.58:1
Reverse	3.62:1	3.62:1

MODEL	ENGINE	RATIOS
Escort & Orion	1.1 & 1.4 litre CVH	Low set
	1.3, 1.6, 1.8 CVH & Zetec	High set
Fiesta	1.1, 1.3, 1.4 Valencia, HCS, CVH	Low set
	1.6, 1.8 Valencia, CVH & Zetec	High set
	1.25 Zetec SE	Low set



Above: The inside of a B5 gearbox

of miles of trouble-free motoring. Units from Escort and Orion taxis have been known to cover more than a quarter of a million miles before the input shaft bearing has finally given up. But then 1.6 XR3i

again, I have had to overhaul units that have covered less than 30,000 miles. It's a mystery why some of these boxes are good when other aren't. Or is it? As a general rule any damage to transaxles (as distinct from wear and tear) is down to power and torque; the slow-shifting driving style of taxi drivers perhaps explains why their transmissions tend to last longer.

There isn't a great deal that can be done to uprate or strengthen the basic B5 without some expensive machining work on the casing, but by fitting uprated bearings and by taking time to set up the unit correctly it should stand the test of time.

Another piece of important advice is to always use a

synthetic oil. The B5 is very prone to running hot, and needs the protection of a high quality synthetic transmission lubricant if problems are to be averted. The position of the filler plug doesn't help matters – it is positioned level with the centre of the main shaft – as it is possible to get only the bare minimum of fluid into it. Jacking up the front of the car as high as it can go enables slightly more oil to be put into the gearbox, and this helps life. All later units are sealed for life, so it is impossible to get all of the oil out of the casing to change it when the gearbox is still in the car.

Finally, nothing hurts these transmissions more than power-shifting. If you want your gearbox to have a long and healthy life use the clutch properly, and take your time when changing up or down so that the synchromesh clusters have as easy a time as possible. Second gear synchromesh is especially vulnerable and the sure sign of a car that has been driven hard is that there is a

marked crunching, grinding or other show of resistance when going down from third to second gear.

NEW OR RECONDITIONED?

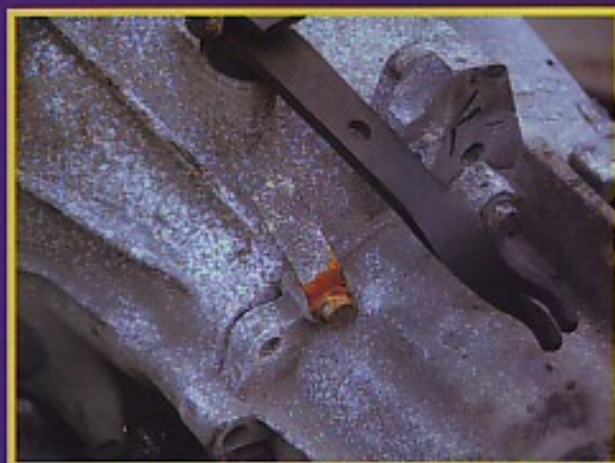
You have a gearbox problem – so what do you do? There are generally three options, buying a completely new Ford unit from your local dealership, buying a second-hand unit, or buying a reconditioned transmission.

If you can afford the £600 or so that it will cost, buying a Ford unit makes obvious sense; you will be getting completely new parts throughout and will also have the benefit of a full manufacturer's warranty.

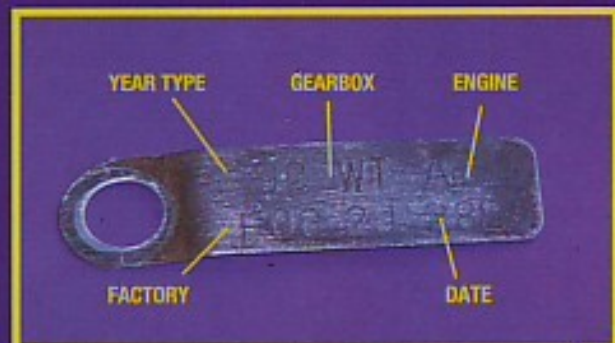
So far as reconditioned units are concerned bear in mind that the parts needed to rebuild a 'box are expensive; a

RECOGNISING THE CONTENTS

The only guide to the origins of a second-hand 'box is the identification tag that is attached to one of the 13mm bolts which join the two main parts of the casing. This is often corroded but a few minutes spent cleaning and reading it can make all the difference. By reading off the data on the tag (arranged as shown below) and then cross-checking it against our tables, you will be able to tell precisely which set of gears and final drive ratio is in the casing.



The tag is the ideal way of checking out the contents, but the aluminium is usually pretty badly pitted...



... so it is worth cleaning it off so that the numbers can be read.

CODE	ESCORT MODEL	CODE	FIESTA MODEL
83WT	Mk3 to Jan '86	84WT	Mk2 '84 - '86
86WT	Mk4 Jan '85 - Feb '87	86WT	Mk2 Jan '85 - Feb '87
87WT	Mk4 Feb '87 on	87WT	Mk2 Feb '87 - on
H83WT	RS1600i	V84WT	XR2
V83WT	Mk4 XR3i		
V85WT	S1 RS Turbo		

The V prefix, used to denote a high performance version, was discontinued from '86

The RS1600i gearbox was unique in having a bellhousing machined to take the ignition sensor

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Top: The speedo drive gear is removed by pulling out this split pin...

Above... then gently drawing the outer threaded bush out.

complete original equipment bearing, seal and gasket set costs in excess of £80 at trade rates, and synchro rings are about £11. By the time that any new gear clusters, selector forks and hubs are taken into account it figures that you won't be getting much for your apparent bargain of a £175 reconditioned unit. As with everything you get what you pay for – and a good rebuilt unit won't see you with much change out of £300. Ask what goes into the rebuild (original equipment parts are essential, especially as there are some

real rubbish spares on the market at present) and ask about a warranty.

The biggest minefield of all is second-hand buying. For a start all B5's look much the same from the outside, so unless you know precisely what you are buying you could end up with anything. And there is rarely any comeback if the unit should prove to be a duffer.

When buying second-hand the gearbox should turn over freely and smoothly, and it should be easy to select all gears. Always remove the tin-plate pressed cover from the main casing and inspect the fifth gear spines, and remove the speedo drive gear and check that over too. ●

POPULAR IDENTIFICATION CODES

ID CODE	MODEL	DIFF RATIO
Fiesta 1100		
84WT GB	Aug '83 - Jan '86	3.84
84WT GC	Jan '86 - Feb '87	3.84
87WT FAA	Feb '87 - Mar '88	4.06
87WT FAB	Mar '88 - ON	4.06
Fiesta 1300CVH		
84WT GB	02-84-01:86	3.84
Fiesta 1.3/1.4		
84WT GC		3.84
87WT CA		3.84
87W CB		3.84
XR2		
V84WT BA	Feb '84 - Jan '86	3.58
86WT JBO	Jan '86 - Feb '87	3.82
87WT NA	Feb '87 - Mar '88	3.82
87WT NB	Mar '88 - on	3.82
Escort Mk3		
83WT AB	1.3CVH	3.84
83WT BB	1.6 CVH Carb	3.58
V03WT EB	1.6 XR3i	4.29
V05 CA	1.6 RS Turbo	4.27
Escort Mk4 to Feb '87		
86WT CA	1.3 OHV	3.84
86WT DB	1.4 CVH	3.84
86WT SB	1.6 Carb	3.58
86WT TB	1.6i Orion	3.82
86WT ZB	1.6 XR3i	4.27
86WT VB	1.6 RS Turbo	3.82
Escort Mk4 Feb '87 - July '90		
87WT HA/HB	1.3 OHV	3.84
87WT JA/JB	1.4CVH	3.94
87WT MA/MB	1.6 Carb	3.58
87WT RA/RB	1.6i Orion	3.82
87WT VA/VB	1.6 XR3i	3.82
87WT VA/VB	1.6 RS Turbo	3.82

IF IT'S MISSING...

● If there is no identification tag the following information will help with working out year ranges – but unfortunately it won't tell you what engine the gearbox was originally mated to.
Casting number on top of bellhousing:

81TT – early Mk3 Escort.

● Will match with a top case having provision for a front mounting.

84TT – late Mk3/early Mk4 Escort, Fiesta Mk2 to Feb 1987.

● Will have a top case similar to above if from a Mk3 Escort, or a plain top case with five blue mounting studs if from a Mk4 or Fiesta.

87TT – Later casing for Mk4 Escort and Fiesta.

● Will have a plain top case and was used right through to Mk3 Fiesta.

CONTACT

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