Evolution of the RS Turbo B5 transmission.

FOREWORD:

I’ve always maintained that Ford didn’t do any favours by serving up their hot little hatch without a stronger transmission to go with it. What you have to remember is that in the early 80’s when the Mk3 Escort was the most popular car on Britain’s roads, FMC were intending to develop it into all aspects of motor sport, the RS 1600I being its flagship marque. Unfortunately it failed to carry on were the beloved Mk1 & 2 Escorts had blazed so many trails, and left an indelible mark in Ford’s motor sport history. This failure however also coincided with the Audi Quatro bursting on the rally scene and generally obliterating the opposition. Suddenly, Ford’s “Plan A” (FWD) was dead in the water and development of a vehicle to compete with this German bruiser now took complete priority; with all the effort and emphasis being halted on FWD and applied to the newly announced Sierra, and the next generation in the pipeline to compete with the “Group B” monsters, in the guise of the totally radical 4wd RS200.

FMC though had to keep its home-base clientele reasonably contented, so performance Escorts and Fiestas continued, but with only enough interest from themselves to please everyone and maintain high-volume sales figures. Hindsight though is always 20/20, and the amount of dedication, enthusiasm and not to mention expense that has retained since the demise of the XR’s, RS Turbo and Cosworth vehicles can’t have gone unnoticed by the FMC hierarchy, which to me makes a mockery of the excuses used to pull the plug too early on these vehicles in the first place.

There’s been too much misinformation & rumour spoken about Turbo gearboxes (as is the B5 gearbox in general), that everything seems shrouded in a mysterious haze. I find it very hard trying to explain certain technical information to potential clients when their heads have been loaded with misinformation, so I’m going to try and attempt to straighten the situation out, so that owners & customers will have a better idea as to what they are looking for. The bottom line here is plain and simple:

THE B5 IS THE TRANSMISSION DESIGNED TO FIT THE RS TURBO, SO WE’VE TO DEAL WITH IT. IT REALLY ISN’T UP TO THE JOB, BUT IT’S WHAT WE HAVE TO USE.

In this article, I will only be discussing the B5 transmissions, which use the closer ratio gear sets, namely those of 1.6 litre, upwards. This will therefore incorporate the XR and RS Turbo range.

At this point though I’ll briefly mention the RS 1600I B5. This vehicle was often referred to as a posh XR3I, when the purists know that was far from the truth. The transmission though was based around the early pre-injected XR3 5-speed, with the first 4 gears being of the same ratio, and also sharing the same 3.84: 1 final drive, but without any viscous limited slip differential. There were however 2 subtle differences; the 5th gear was lower ratio (and not “taller” or “higher” as often referred to) than in any of the other B5’s at 0.83: 1 as opposed to 0.76: 1, and the bellhousing casing was machined to take a crank / timing sensor for the totally different twin coil ignition system. If this system has remained intact, then only this unique transmission could ever be used, otherwise the engine simply wouldn’t start. Many owners though have long since ditched this arrangement in favour of a distributor system, as the original system was plagued with problems, for having an ignition or crank position sensor at the bottom of a bellhousing was asking for trouble. I’m pretty sure that the lower 5th ratio was entirely due to keeping the engine cooking nicely from 4th into 5th, with only the minimal of rev reduction. The final drive was reasonably high and with the unique 15” rims at that time, the 0.83:1 5th gear ratio was well suited to the overall package. We carry overhauled units for the RS 1600I, in standard form with a normal planetary differential, and can supply units with viscous LSD installed, subject to a diff unit be available to sell outright.

HOW IT BEGAN: The B5 1983 to 1992:

The first of the B5 transaxles used an 81TT casing number on the bellhousing, 81 relating to the year when a major development or change occurred (The MK3 Escort arrived on the scene in 81). The “TT” indicates 4-speed, but as the bellhousing for both 4 and 5 speed is identical, Ford continued with this. The top case was an 83WT item (WT indicating 5-speed), which incorporated a threaded cast boss to take the front gearbox mounting the Mk3 used. The RS1600I utilised one of these, with the special sensor hole, mentioned in the previous paragraph, machined into the bottom of the bellhousing. The 81TT bellhousing became 84TT (yes you’ve guessed it after 1984), which had a smaller aperture for the starter motor (but not all casings), as now everything was using a pre-engaged starter and not the earlier inertia type; it also had an extra threaded hole to take the imminent Mk2 Fiesta (and the early Mk4 Escort)
front cross-member mounting bracket. The original Series 1 RS Turbo however used a different casing – a V85TT bellhousing and a V85WT top casing. Although identical looking to the 84TT, this had extra strengthening webs cast into the inner part of the casing, and extra webbing cast around the front mount boss; an area that was prone to breaking.

Don’t be dismayed though if yours isn’t of the V85TT persuasion, for if the unit had suffered pinion bearing failure during its life, then the chances are that the bellhousing was unserviceable and was scrapped and the other casing has been utilised. “Proper” Series 1 casings were always thin on the ground, even back then. The RS Turbo saw the arrival of the first viscose limited slip differential (which is referred to in depth later). The Series 1 unit used a 6-bolt crownwheel fixing, which was changed to an 8-bolt fixing on the Series 2 transmission.

The only external change from the MK3 Escort and S1 Turbo, to the Mk4 and S2 initially was in the mounting design, which now used a cross member to connect front and rear gearbox mounts, instead of separate items attaching box to body. This was very similar to the Mk2 Fiesta design (which probably saved FMC a great deal of money). There was now no need for the earlier top casing, so this was replaced by the Fiesta case, which was numbered 86WT. This had a small tapped hole below the N/S driveshaft oil seal bore designed with 2 extra studded bolts on the top of the case as fixings for the mechanical ABS system, which had been developed for the S2 Turbo, and an option on the XR3I vehicles. The clutch-operating arm was increased in length at this time, with an extra positioning hole for the clutch cable provided in this 86WT top case. This lightened the load on the driver’s left foot with larger stronger clutches now being fitted.

All these early B5 units, and the Series 2 Turbo up to 1987, used a gear-change mechanism with a press down action to engage reverse. This was controlled entirely by springs and plungers in the gear lever mechanism itself. From past history I know how this would wear and give terrible gear changes and even causing reverse gear to slip out. You could buy the various components separately to repair the unit, but it usually was far easier and simpler to just buy the whole gear change assembly linkages and all; and what a difference that made.

From 1987 on though, Ford re-designed the gear change completely, so that it was controlled from inside the transmission itself. This was by way of an interlock bracket with a spring-loaded pawl designed to prevent the driver accidentally engaging reverse when changing down from 5th gear into 4th, with obvious disastrous results. There now was no need to press down to select reverse; you simply pulled the lever to you and back, the rest was done in the gearbox. These units used the new 87TT bellhousing, the early of which used the long-standing clutch arm design with the blue bolt through the clutch fork, whilst from 1988 ford changed this design to a splined clutch fork and shaft with a separate arm attached to these splines by way of a bolt and lock-nut. Also, the early Series 2 & the last of the Series 1 Turbos and subsequent Ford Series 1 Turbo exchange units used a stronger 87TT bellhousings, with a BB suffix.

The subject of wide and close ratio gears, together with high and low differential ratios crops up quite a lot, so perhaps this will help sort it out, and then you will have a better idea what you exactly are looking for.

Wide and close ratios indicate the gaps between the ratios from one gear to another. If you look at the standard gear ratios for the Turbo’s below you will see how the 13 teeth on the layshaft (or Input shaft) 1st gear takes 3.15 revolutions to rotate the mainshaft’s 41 tooth 1st gear once. Likewise through 2nd, 3rd, 4th & 5th gears the rotation of the layshaft reduces as the momentum of the car combined with the power from the engine reduces the amount of effort required to propel the vehicle forward. That’s why starting from a standstill is crucial and the most important part in sorting the right ratio for the job in hand, as we all know what it feels like when you accidentally try to pull away in 2nd gear for example.

There is only 1 basic set of gear ratios for the B5 gear set, although the early XR3I and Series 1 Turbo had a slightly different teeth numbers on 3rd gear, 29 driving 37, as opposed to the later version being 32 driving 41. The ratio was fundamentally the same however.
B5 XR & RS GEAR & DIFFERENTIAL RATIOS:

<table>
<thead>
<tr>
<th>Gear Type</th>
<th>Gear Ratio</th>
<th>Overall Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st gear:</td>
<td>13 : 41</td>
<td>3.15 : 1</td>
</tr>
<tr>
<td>2nd gear:</td>
<td>23 : 44</td>
<td>1.91 : 1</td>
</tr>
<tr>
<td>3rd gear (early):</td>
<td>29 : 37</td>
<td>1.27 : 1</td>
</tr>
<tr>
<td>3rd gear (later):</td>
<td>32 : 41</td>
<td>1.28 : 1</td>
</tr>
<tr>
<td>4th gear:</td>
<td>41 : 39</td>
<td>0.95 : 1</td>
</tr>
<tr>
<td>5th gear:</td>
<td>45 : 34</td>
<td>0.76 : 1</td>
</tr>
<tr>
<td>5th gear: (RS 1600I)</td>
<td>42 : 35</td>
<td>0.83 : 1</td>
</tr>
</tbody>
</table>

Final Drive (series 1):
- 15 : 64 = 4.26 : 1 (6-bolt fixing LSD)

Final Drive (series 2):
- 17 : 65 = 3.82 : 1 (8-bolt fixing LSD)

Final Drive (RS 1600I):
- 19 : 73 = 3.84 : 1 (6-bolt fixing)

Final drive XR3 (pre inj.):
- 19 : 73 = 3.84 : 1 (6-bolt fixing)

Final drive XR3I (to 1986):
- 17 : 73 = 4.29 : 1 (6-bolt fixing)

Final drive XR3I (1986 on):
- 15 : 64 = 4.26 : 1 (6-bolt fixing)

Final drive XR2 (1984 – 86):
- 19 : 61 = 3.58 : 1 (6-bolt fixing)

Final drive XR2 (1986 – 89):
- 17 : 65 = 3.82 : 1 (6-bolt fixing)

Final drive XR21:
- 17 : 69 = 4.06 : 1 (8-bolt fixing)

Final drive Fiesta RS 1800:
- 17 : 65 = 3.82 : 1 (8-bolt fixing)

Final drive Fiesta RS Turbo:
- 17 : 65 = 3.82 : 1 (8-bolt fixing)

This is your main gear ratio, but combined with your differential or final drive ratio, gives you your “overall ratio”. Let me explain further; high and low diff ratios are a bit tricky as they work opposite to what you naturally think. The higher the number (or ratio) the lower it is e.g. on the chart above you will notice the Series 2 turbo uses a 3.82 : 1 ratio as opposed to the 4.26 : 1 on the Series 1. Although lower numerically than a 4.26 : 1, the Series 2 ratio is in fact a higher ratio, because it takes fewer rotations of the mainshaft pinion (3.82 rather than 4.26) to rotate the differential crown wheel (and therefore your road wheels) once. It also takes more of an effort to move a vehicle with a high diff ratio so performance cars in general have a much lower final drive ratio than your bog standard family hatchback as they rev more freely with the less resistance of a lower final drive, which keeps the engine cooking and on song.

We have fitted units with a higher 3.59 : 1 final drive for customers with large powered engines (usually with Cosworth management). With this engine management set-up, it appears to cope ok with the raised final drive ratio, although some drivers do notice a slight edge missing in performance with the higher diff fitted.

We hold all the various F/D ratios on stock, to suit the customer’s requirement.

OVERALL RATIOS:

<table>
<thead>
<tr>
<th>Gear Type</th>
<th>Series 1 (4.26 F/D)</th>
<th>Series 2 (3.82 F/D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st gear:</td>
<td>(3.15)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>13.42 : 1</td>
<td>12.03 : 1</td>
</tr>
<tr>
<td>2nd gear:</td>
<td>(1.91)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.13 : 1</td>
<td>7.29 : 1</td>
</tr>
<tr>
<td>3rd gear:</td>
<td>(1.28)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.45 : 1</td>
<td>4.88 : 1</td>
</tr>
<tr>
<td>4th gear:</td>
<td>(0.95)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.04 : 1</td>
<td>3.62 : 1</td>
</tr>
<tr>
<td>5th gear:</td>
<td>(0.76)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.23 : 1</td>
<td>2.90 : 1</td>
</tr>
</tbody>
</table>

Over the years, I’ve known many Turbo owners who’ve owned both Series 1 and 2 models, and the majority definitely prefer the driving aspect of the Series 1. I’m pretty sure this is entirely due to the lower diff ratio of the Series 1, which allows the engine to rev more freely at each gear change, due to the gaps between the individual gears being ideally suited to the management of the engine and turbo, reducing the dreaded turbo lag. They termed the early cars more macho, which they believe was lost on the Series 2. This they say became more of an all round road car, but looking at it from Ford’s point of view, they were making a product that had to sell to a variety of potential clients, and not the all out racers. So the Series 2 was a somewhat cooled-down version of the Series 1 hedonistic warrior.

I would like to at this point address the misnomer of the B5 diesel transmission, as it has been implied that this is the answer to the turbo’s prayer i.e. that it is somehow a stronger transmission – NOT!

The diesel B5 (up to 1992) is no way different to a bog standard petrol gearbox in other that the 1st gear was a lower ratio than the petrol version i.e. 12 teeth driving 43 teeth giving you a lower 1st gear ratio of 3.58 : 1. This was employed due to the nature of diesel engines not revving easily, so they usually incorporated a higher final drive to hit a top speed at a lower rev range. The lower 1st gear made it less of an effort for the diesel engine to move off and once moving it’s greater torque meant it coped ok with the standard petrol 2nd, 3rd, 4th and 5th gears.
The Mk4 Escort diesel vans had a final drive ratio of 3.84:1 (similar to a turbo or 1.4 petrol), whilst the cars had a ratio of 3.59:1, the same as carburetted 1.6 litre petrol-engined cars. The Mk3 Fiesta 1.8 diesel however is actually a 1.6 petrol transmission with a normal 1\textsuperscript{st} gear and a 3.59:1 final drive.

It amazes me time after time when owners state in their facts that their Turbo is fitted with a diesel gearbox; why? The 1\textsuperscript{st} gear is a little lower that, ok they could realistically tear off the line slightly quicker from a standstill, but the gap from 1\textsuperscript{st} to 2\textsuperscript{nd} has increased so that has to be made up. This could leave you short of boost & the dreaded turbo lag, and of course the diesel has no viscose LSD. As I mentioned earlier, we’ve built units specifically with the higher 3.59 final drive, for high-powered Turbos, so I feel that as some of the diesel B5’s also use that F/D ratio, people have assumed that the diesel transmission is the way to go. In my opinion it is a gimmick and not a solution.

All the gearbox bearings were standard right through the Mk3 & Mk4, S1 & S2 Turbos, although the synchro rings were altered after 1987, the 1\textsuperscript{st} / 2\textsuperscript{nd} rings being much larger in diameter than previous and all gears had a different angle where the syncro ring meets the tapered surface of the driving gear. Subsequently the 1\textsuperscript{st} / 2\textsuperscript{nd} gears and synchro hub was larger and had to use a new selector fork to fit this larger hub. This transmission prefixed 87WT, was slightly heavier than the earlier one, entirely due to the increased weight of these modified components.

1992 on:
By 1992, the Escort had become Mk5 (which was back to the earlier design of front mounting bracket on the top casing, now a 91WT), and the Fiesta was well into its Mk3 reign. The B5 hadn’t altered that much until the arrival of the 1.8 Zetec engine. FMC for some reason chose this point in time to do what should have been done years before – but only got it part right, and the changes were piecemeal. It involved the 3 main bearings in the bellhousing casing, that were all enlarged on their respected outer diameters. These casings, now numbered 92WT (this was purely for 5-speed application) seemed the way to go, but internal components were basically identical as before. The laygear / 5\textsuperscript{th} gear spline angle was altered (see “problem areas” below), but the mainshaft was exactly the same design as previous, so these were equally liable to fail (as they did) as frequently as the pre 92 units, so in reality Ford put their name to major modifications in this area, but in reality the Achilles heel was continuing to fail spectacularly. Units using this 92WT casing were used in the 1.8 petrol (105 bhp) and diesel version only, each sharing the 3.82:1 final drive. To me it seemed stupid to have the 1.6 and 1.8 Zetec units with identical internals, but the 1.6 still using the old 87TT, whilst the 1.8 used the 92WT bellhousings.

**Problem areas:** There are 4 main problem areas with the B5 Turbo box:

1. **Gearbox bearing collapse**
2. **Laygear / 5\textsuperscript{th} gear spline wear**
3. **Mainshaft pinion wear**
4. **Viscose Differential planet gears**

These defects (apart from the LSD) are no way particular to only Turbos. In fact all the 5-speed units are liable to suffer from any of the problems either singularly or collectively, but the turbo unit being subjected to an increase in engine power from the onset, plus the fact that the vehicle was intended for performance driving, it doesn’t take Einstein to work out that problems will ultimately occur, especially when you immediately realise that the bearings coping with all this extra power, torque and a heavy right foot are exactly the same as those in a 950 Fiesta Popular. As I previously mentioned, FMC did nobody, especially themselves, any favours by not up-rating this transmission from the beginning of the RS Turbo range.

1: **Gearbox bearings.**
The problem areas were the collapse of the small bearing on the input shaft and the pinion mainshaft roller bearing, mentioned in detail in section 3.

Once the input bearing failed, the input shaft was able to move around in an eccentric manner, destroying the input oil seal causing transmission fluid to pour through this damaged oil seal, draining the transmission & flooding the clutch.

The Turbo differential bearings seldom gave trouble in their own right, due entirely to the bearing preload being set with a spacer and shims, as opposed to the belvo spring washers that non-turbo transmissions were fitted with. These non-turbo units were plagued by offside bearing failure, first noticeable by a flickering speedometer needle and oil leaks from the diff seals. XR owners take note!

2: **Severe wear to the external splines on the end of the laygear, and internal splines on the 5\textsuperscript{th} gear.**
The 5\textsuperscript{th} gear should be a very tight press-fit on the splines at the end of the laygear (input shaft), and has to be removed using a special puller and refitted using a press. For some reason ferric corrosion builds up in this area and causes wear between these splines, eventually making the 5\textsuperscript{th} gear loose and able to be simply lifted off without using the puller at
all. If ignored or retained this wear between the splines will increase until eventually these splines will round off, leaving you with a 4-speed box with a horrendous rattle. Whenever this corrosion has occurred, the laygear and 5th gear are unserviceable and should be scrapped. It took until 1992 for Ford to realise this and altered the spline angle and interference fit between the laygear and 5th gear, making it a tighter fit and a much better job all round. We managed to secure the purchase of all the remaining Ford O.E. stock of this 92WT laygear, which comprises of a new gear cluster (with modified splines) and a new 5th gear with corresponding modified splines to suit. This is a direct replacement for the original 85WT item & we can offer these components to anyone who are rebuilding their own unit and require this component to replace their worn-out one. Contact us for details.

3: Pinion and pinion bearing failure.
This most common problem occurs around the bearing surface at the end of the mainshaft pinion. The pinion was designed to run in a roller bearing that is pressed into the bellhousing casing, but instead of having a 2-part bearing with separate inner sleeve, the pinion journal itself was designed to run on the bearing rollers itself. Now the powers that be at Ford thought that this would suffice, as it had been used relatively successfully on the early 4-speed Fiesta and Escort Mk3’s. I’ve already mentioned the fact that the bearings were basically the same all through the entire Mk 3 and 4 ranges, and to put it bluntly were not up to the job.

Turbo mainshafts (inc. the pinion teeth) and the respective crownwheels are allegedly made from a different steel and hardened to a better specification than the standard items. They use different part and component numbers then their identical counterparts in the ratio dept., but they fail as spectacularly as the standard ones, so you have to ask yourself why?

The rollers in the pinion bearing are of a very hard steel, so the pinion has to be of equal quality, but in reality something isn’t right, as the pinion journal would first show tiny little spalling marks across its bearing surface and then tiny particles of the hardened surface would break away, leaving little pot marks. If left, this acts like an abrasive as it is revolving at great speed over the bearing rollers, eventually leading to grooves being formed in the pinion itself. This makes the pinion run eccentrically instead of straight and true, causing serious damage to other internal components. You can only imagine the noise this creates, especially on the over-run when the road wheels are driving through the transmission, rather than the other way, when the engine is accelerating. You can tell if the pinion is on its way out by the transmission omitting a droning noise on over-run, usually in 2nd gear. This noise however tends to disappears once the clutch is depressed, as this action stops the resistance through the transmission to the engine.

A relatively easy solution to this (providing the journal isn’t worn too severely) is to have the damaged journal machined to take a 2-piece bearing, and many reconditioners use the MT75 laygear bearing, which is the same diameter as the standard pinion bearing but uses a separate inner sleeve. This isn’t as simple as it seems, as there are 3 downsides to this:

1: The mainshaft has to be reduced in thickness from 27.5mm down to 25mm plus the removal of a shoulder of metal between the shaft journal and the pinion teeth. This by definition, actually weakens that most delicate area of the mainshaft, and in some cases increases its chances of snapping off, if not machined correctly. (see photo)

2: The amount of tolerance needed to keep the bearing sleeve in position once pressed on to the machined journal is critical, and not just machined to a nominal 25mm. I’ve stripped units down that have undergone one of these mainshaft repairs, and more often than not, the bearing sleeve simply falls off in your hand. The other scenario is when the tolerance is not quite right and the sleeve creeps down the shaft, jamming the whole transmission.

3: The MT75 bearing is thicker than the standard B5 one, which means it sits proud of the casing where it fits and cannot be staked to fix in position. If not a tight fit in its borehole, then it is likely to move and drift in its position, eventually causing pinion failure once more.

We don’t recommend repairing a damaged mainshaft with an MT75 pinion bearing for anything other than a standard unit.

When utilising the MT75 bearing, we have the mainshaft tested for weak spots around the pinion area and secure the inner sleeve by means of a circlip & groove. With the bearing itself, we machine the bearing bore depth to accept the correct fitment, thus eliminating potential problems. Also it is noticeable when the case is set up, how much ovality has been created in the standard bore due to the wear aspect of the diff / pinion gears attempting to push themselves apart during rotation, and this is exacerbated in units that have suffered pinion bearing failure. The new bearing not being held in place correctly due to this ovality of the bearing bore will compromise the reliability of simply replacing these components. We can supply components to avoid the risk of these problems, but from experience I would suggest that transmissions using a repaired pinion should only be risked on a standard-engined vehicle.
MAINSHAFT DEVELOPMENTS:

Over the past few years we’ve made some developments to this most problem area of the B5 transmission.

1. We’ve had special sleeves manufactured to fit the B5 mainshaft so that the later IB5 pinion bearing be utilised.
2. We’ve developed a way of using special tapered bearings for the top & bottom of the mainshaft. This comes as part of a B5 plus unit that we are putting together right now. (see photos)

4: The LSD.
The viscose part of the LSD is very reliable, unless becomes so overheated that the fluid boils away leaving the viscose resistance virtually non-existent. The differential as a complete unit is plagued with its own problems, and these occur around the 8 small planet gears that surround the centre viscose and rotate in the diff housing. They are fixed into the viscose unit by tiny 11mm diameter spindle shafts, on which they are designed to rotate.

What you have to remember is that this unit was designed to work with around 135 BHP at the flywheel. The viscose diff unit assembly was a complete replacement for the standard planet-gereared differential, so FMC were spared the expense of totally re-jigging everything for a completely different casing for a totally larger and stronger diff assembly.

The Series 1, 6-bolt diff unit was only used for a very short period, being replaced by the 8-bolt diff in Series 2 cars.

Now the bottom line here is that basically the diff unit as a whole can be fine in a standard car, but even with the meagre power from a standard engine, the small planetary gears can seize on their support shafts and strip a tooth under heavy acceleration and wheel spinning. What happens then of course is these gears jam up and basically lock the diff up itself, making it virtually impossible to turn corners, as the diff is driving through solidly to the 2 road wheels, making the vehicle want to travel in a straight line.

Realistically, anything over about 175 / 180 BHP should not be relying on this original viscose diff unit, due to its limitations. I know there’ll be loads of readers with powerful RS Turbos who’ll claim that they’ve had no problem in the diff area. Sure and they may be right – for now! I can virtually state that if their transmission was in for an overhaul and the diff unit was split and checked through, some or many of those little spindles the gears rotate on will have either seized to the gears themselves or will have worn oval their fixed holes in the viscose unit, due to them becoming seized and spinning in their bores. This, I’m certain in the initial stage that happens, and as the little gears are struggling to deal with all the stresses and pressures of trying to maintain traction to the road wheels. They are constantly running out of line due to the wear aspect as mentioned above, and it is only a matter of time before a tooth shears and the diff stops working as it should and causes the lock-up scenario.

But of course the Fiesta RS Turbo didn’t have that problem, as it had no LSD of any description. Talk about FMC saving money! They put the same powered engine in a smaller, lighter vehicle and somehow forgot about the transmission again! The powers that be decided that the standard 1.6 transaxle would do nicely; usual gear ratios with a 3.82: 1 normal planetary differential. What a joke! I’ve been a passenger in standard S1 and 2 Turbos, and my god they spin the wheels, so how on earth do RS Fiesta drivers get the power down evenly to the front wheels? It must be a nightmare.

We carry up-rated viscose units with a resistance of 120nm compared with the standard resistance of around 60nm. These units have been chosen for the up-rate as they are in pristine condition to begin with. The extra resistance helps eliminate wheel spin thus protecting the most vulnerable components within the diff unit. We’ve fitted these in conjunction with a very low final drive, for customers of track-based vehicles, and the response has been a unanimous success.

But we would always recommend a Quaife ATB differential to any potential customer with a seriously powered Turbo, but of course they are expensive – about £550+ in fact. This is what in my eyes shows to me how determined and serious the customer is about long-term reliability. £550 or so is very little when some people I know have fitted 7 standard units in their 220bhp-powered Turbo, and wonder why they keep breaking them. It’s false economy really! Good quality performance components are expensive – you simply can’t do upgrades on the cheap.

If you want a unit that will be better than standard you have to pay for it. I bet the engine reconditioners who work on the turbo engines will bear me out on this – specialist parts, components and labour cost money. Incidentally, the RS Fiesta owners have an easier decision on a replacement transmission (with a LSD) for their vehicle. Unfortunately with their own old unit not having the necessary viscose diff, as standard, they would have to pay a considerable surcharge to offset the loss of a viscose diff unit, I usually find that in these cases the owners specify a Quaife
differential in their replacement transmission, over the standard viscose unit. The other thing too of course, is that as more old units come in with wrecked differentials, my supply of serviceable units becomes ever more scarce.

We keep in stock both standard rate and up-rated viscose differentials, ready to be installed into a requested unit. As we deal with Quaife on a regular basis, we carry an ATB diff on the shelf to keep this option open to the customer.