

TROUBLE SHOOTING 75/ZT/TD4 PERFORMANCE ISSUES

This guide is aimed at helping you get the best possible performance and economy from your vehicle. It also suggests reasons why you may not be getting the anticipated results, well proven over 12years, from the Synergy 2.

Simply amazing - it's like having a new car (ROVER 75)

OH WOW!!! What have you done to my car! AMAZING :) Thank you! (R75)

MOST OF THE ITEMS COVERED BELOW COST LITTLE OR NOTHING TO FIX.

INTRODUCTION

Occasionally we receive a call or email from an owner who has performance issues with their 75/ZT or TD4, or tells us that the Synergy and maf haven't made much difference, or that the improvement was great for a week, or a month but now the the engine won't rev, is poor at low revs, like the maf has failed again or loses power and often the engine warning light comes on. They say, "disconnecting the maf, or the Synergy cures the problem so either or both must be faulty".

In fact I have yet to find a fault with either box or maf when returned under these circumstances because the box is just **highlighting** a problem.

Some issues are TD4 specific – namely the fuel rail pressure sensor water ingress and vnt turbo over/under boosting issues. - see pages 3 & 4.

POSSIBILITIES COMMON TO ALL: bear in mind there may be more than one causing the problem. Generally speaking, a lot of exhaust smoke is due to lack of air, rather than too much fuel – typically due to items 2, 3, and 4 plus the vnt issues on the TD4.

1. One common & daft cause of less than expected performance is simply due to a footwell mat preventing full travel of the accelerator pedal – 100% travel is required and the last 10% makes more difference on a tuned engine.
2. **MAF SENSOR OUT OF SPEC.** If you haven't fitted the Pierburgh maf, an overfuelling maf will give good performance (& mask the effect of the Synergy) at least low down, but give worse mpg. A weak maf will give poor performance at low rpm which the Synergy's maf compensator can help with. But ultimately we recommend changing the maf - if its still on the original, this means it will be at least 11years old.
3. **EGR VALVE** – clogged, stuck partially open = exhaust smoke, hesitation & flat spots as well. An egr bypass is a common mod and also improves the airflow into the engine.
4. **CRANKCASE VENTILATION VALVE (PCV)** if clogged = exhaust smoke as well. Best replaced with the BMW 118d version which does not have the felt filter to clog up again. **DO NOT DISMISS THIS ITEM** since a clogged valve will also cause excessive crankcase pressure, forcing oil out of the dipstick tube and past the turbo oil seals potentially causing the engine to rev out of control by running on the oil until it self destructs.
5. **INTERCOOLER HOSES AND SEALS** – splits and leaking hose clips. The 'o' rings on the 75/ZT intercooler joints are very prone to disintergrating. If there is an oily build up around the joints this is a good indicator. (oil is normal as it is from the crankcase ventilation system and does not mean turbo oil seal problems) The hoses are also prone to split on the TD4 so best replaced with Silicone ones.
6. **MAP SENSOR** on the end of the intake manifold is clogged up. May require inlet manifold removal but worth cleaning. *NB If on TD4 you have got boost pressure fault codes, its probbaly not the map sensor, but the VNT problem discussed on page 4.*
7. **WORN PRESSURE REGULATOR NEEDLE VALVE** / clogged microfilter on the fuel pressure regulator. (on the end of the injection pump.)

8. **WORN OR CLOGGED INJECTORS.** (or leak back, which will also cause bad hot starting) These can be ultrasonically cleaned but if mileage is high, are best overhauled & balanced by experts such as Lynxdiesels.com

9. **WORN INJECTION PUMP.** Usually causes bad starting and cutting out.

10. MISCELLANEOUS

- Recently an owner had erratic running which was traced to a bad electrical connection on an injector. *Also worth checking all the other connectors you can find and giving them all a squirt of switch / contact cleaner.*
- A faulty cam sensor only affects starting.
- Electric fuel pump weak, or in-tank one failed.
- Air leaks: Recently I was made aware of a cause of a return of poor low rev performance and warning light illumination, as if the nearly new Pierburgh maf had failed. It turned out that the U shaped duct which connects the maf housing to the turbo had worked loose progressively. This means intake air is drawn in, bypassing the maf causing it to give a low signal, just like a weak maf.
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- SERVICE ITEMS. All the bolt-on ancillaries have a working life measured in hours eg 4000 (the MTBF or mean time before failure) so you can expect injectors, sensors, high & low pressure pumps etc to need replacing sooner or later. Mileage is not the determining factor, it is the hours so a town runabout may have only done 80k miles at an average speed of 20mph to clock up 4000hrs, whereas a repmobile may done 160k for the same hours.
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- SERVICE HISTORY. If you've bought a previously owned vehicle, even with a service history, you cannot be sure how well it has been maintained. Some owners never lift the bonnet between services and if its ever been filled with petrol and the engine run, this will drastically reduce the injection pump life.

FINALLY, DON'T FORGET THE ITALIAN TUNE-UP

Its not good for diesel engines to be driven gently and with light load such as typical town use.

The injector nozzles become clogged leading to rough running and idling as well as a drop in mpg. So we recommend a weekly out of town thrash for a mile or two. Once a year do this with a bottle of Cataclean in the fuel and regularly use Millers Ecomax.

I also recommend ZX1 additive which is for the oil, coolant, gearbox, auto box and fuel. Its NATO approved friction reducing properties coats moving metal parts and can help extend the life of all moving parts as well as improve mpg, and reduce cold start wear. (speeds up cranking too so the battery has an easier time)

TD4 SPECIFIC ISSUES:

SYNERGY 2 FEEDBACK FROM TD4 OWNERS.

Excellent product can t believe the difference this has made to my tired td4

Very happy! Thanks got rid of my miss fire too! (TD4)

THE FUEL RAIL SENSOR WATER INGRESS ISSUE.

This is covered in LR tech bulletin LRTB0052 and it states, as you can see below:

- ENGINE HESITATION
- POOR PERFORMANCE (also rough running)
- POOR IDLING (unstable/hunting/juddering/shunting)
- POOR STARTING (any or all of the above and the symptoms can also be confused with a out of spec maf, especially as disconnecting the maf plug can produce an improvement)

Summary:

A customer may report a concern of engine hesitation, poor performance, poor engine idle or poor starting.

Cause: Investigation using diagnostic equipment points to the fuel pressure sensor, which when renewed can rectify the problem. However, the root cause of this issue is likely to be corroded connections in the fuel pressure sensor harness connector and renewing the sensor alone may not permanently repair the problem.

Action: Should a customer express concern regarding the above and diagnosis indicates the fuel pressure sensor to be the cause, refer to the Service Procedure detailed in this bulletin to renew the sensor and harness connector.

Parts Required:

Description	Part Number	Quantity
Harness repair kit	YMQ503320	1
Fuel pressure sensor	STC4768	1
O-Ring	MYX000040	1

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If you see grey/green discolouration of the fuel rail sensor plug inner body and seal, and can see this inside the sensor, this is undoubtedly the cause. Disturbing the connection is why its now become an issue, but will have done so sooner or later anyway.



This plug should be as clean as a whistle, and this one is not the worst we've seen. Usually the seal has a greenish deposit on it and the contacts can be seen to be corroded.

Once the moisture has gotten into the plug it will also be in the sensor so you will have to change both sensor and wiring.

THIS FAULT IS OFTEN RESPONSIBLE FOR THE LACK OF THE USUAL DRAMATIC IMPROVEMENT AFTER FITTING THE BOX AND MAF BUT ALSO REFER TO THE VNT ISSUES IF YOU HAVE A TD4.

THE TURBO VNT ISSUE. (applies to all diesels with a vnt turbo)

Any tuning will produce more energetic exhaust gas which will cause the turbo to speed up (that's how they work) producing higher boost. Normally the ecu can control this using the map sensor signal to adjust the vnt mechanism. The mechanism acts to increase the boost at low rpm for better torque and then adjusts the vanes to control the boost as the revs rise to prevent overboosting.

However in the standard low state of tune, the mechanism rarely operates over its full range – it doesn't have to as there isn't enough fuel to raise the boost too high. When the engine is tuned, the operating lever needs to travel further to keep the boost under control, and often can't due to a build up of carbon (soot) or it tries to and then sticks causing low boost at lower rpm. Fortunately diagnosing vnt related causes is often quite easy.

STICKING TOWARDS THE LOW REV END:

Normal or better than normal performance at low revs, then loses power at higher revs due to overboosting and the ecu cutting the fuel. May never happen in town but then occurs around 70mph on the motorway when you accelerate, or at lower speeds when towing, especially uphill.

If you accelerate gently and never use full throttle it never loses power because it never overboosts, floor the throttle, or come to a hill or tow, and as soon as it overboosts, it will lose power. If you lift off, the power will usually return. Mil comes on or flickers, usually temporarily. *Switching off the Synergy or using a lower setting reduces the problem by reducing the fuelling and hence boost, again leading to a false conclusion that the Synergy is the cause or is faulty.*

STICKING TOWARDS THE HIGH REV END:

The performance below 2500rpm or so is or becomes poor or very poor, but above 2500rpm the performance picks up greatly. Although this is also a sign of a weak maf, and since disconnecting it improves low down torque, only when you change the maf or fit a Synergy 2 and the performance does not improve much, do you know its not maf related.

DON'T PANIC: The cure is simply a matter of disconnecting the linkage to the actuator and moving

the lever from end to end, making sure it is free and there are no sticking points. If this doesn't work, then remove the turbo and dismantle it. You could also try some Cataclean in the fuel – this burns off the soot and may work. I've recently had feedback about an engine cleaning process called Engine Carbon Clean which uses oxy-hydrogen to remove carbon from the entire engine, intake and turbo. The results are smoother running, correctly operating vnt mechanism, and better mpg.

RELATED ITEMS: As well as the mechanism, you should also investigate the actuator which operates in a very hostile environment being attached to the turbo.

Check the vacuum pipes from the brake servo line to the boost control valve and from this to the actuator.

Check the boost control solenoid since it can fail or leak vacuum.

Did you know?

Because vnt problems are common on all vehicle fitted with one, the motor manufacturers have now started using twin scroll turbos on diesels as well as petrol engines (single turbo with twin exhaust inlet ports prevents cancellation of the exhaust pulses to maintain a higher turbo rpm and hence boost at low rpm). A standard ecu controlled wastegate controls the max boost and allows for 'overboost'.

I've had them on a DS3 1.6 & Giulietta 1.8tbi, both petrol turbos with max boost and torque around 1500rpm – even lower than on the diesels so I can vouch for how effective they are.

CONCLUSIONS:

The Synergy range has been on sale for over 12 years with 1000s of satisfied customer as you can see if you check out our feedback on the websites and Ebay shop (stores.ebay.co.uk/tuning-diesels).

In addition, we've dyno charts showing the 75/ZT cdt producing upto 150bhp and the TD4, around 140 so it stands to reason that if you are not getting a similar result, its not going to be down to the Synergy, but to one or more of the above issues. Of course raw figures from a dyno do not tell you how much smoother and more responsive your vehicle will be, how much less gear changing is needed and about the improved mpg.

If the results are not as expected please don't expect a remap to work properly either so you will still end up disappointed and probably disillusioned with your vehicle.

If the maf is out of spec you will still have to replace it and when you come to change the vehicle, you cannot take the remap, whereas you can transfer the Synergy 2 for £10-£36 depending on whether it just needs reprogramming or new cables as well.

We are always willing to help out any owner with engine related problems. Just email us at ron@tuning-diesels.com and we'll do our best or take a look at our archived website for more troubleshooting and fault finding guides at tuning-diesels.info

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