1.6 16V HDI GTD12 and GTD12 Hybrid turbo upgrade guide

This short guide is written to help in the fitment of a more modern and also upgraded turbo to the 1.6 16V HDI engine fitted to the Peugeot, Citroen, Ford, Mini, Mazda, Volvo vehicles using the engine code DV6TED4.

This turbo will also fit on to the 8V 1.6 HDI engine, with different fitment for which a guide is also available on the HDI Tuning website.

Both turbos are available in our webshop:

GTD1244VZ – and GTD12 49mm Hybrid turbo

GTD1244VZ standard turbo as an upgrade

The turbo in its standard form is a great upgrade over the TD02 (90BHP) turbo, and also a great replacement for a faulty GT1544V (110BHP) The GTD12 is good for 150 BHP and very early spool thanks to the fourth generation VNT system and also boasts better reliability.

The GTD12 turbo uses a small turbine coupled with a more advanced compressor wheel, and stronger bearings which allows it to spool early and run high levels of boost reliably, this means that you can have very high torque much earlier than is possible with the GT1544V turbo.

Considering that almost all of the GT1544V turbos available on the market are cheap rebuild turbos, it makes sense to upgrade to a GTD12 turbo instead and use an original low mileage part rather than a rebuilt unit. Most rebuild turbos use sub standard parts which result in higher rotating mass, and mis-calibrated VNT mechanisms, which results in poor spool and poor behaviour.

GTD12 185 BHP Hybrid 185 BHP 370Nm

The GTD12 is a great base for a Hybrid turbo, and thanks to HDI Tuning's experience with the 1.6 HDI engine and after setting up many hybrid versions of the GT15 we came up with a great hybrid design.

When compared to the hybrid GT1544v, the GTD12 hybrid is far superior and offers much greater drivability and extremely early spool for a hybrid of this size.

Our Hybrid GTD12 uses a larger compressor wheel which is then machined in to the compressor housing, this is matched with upgraded thrust bearings along with other mods to HDI Tunings specification. The VNT is calibrated on a VNT flow bench to set the stop limits and actuator length.

Warning: Not all Hybrids are created equal, and every turbo manufacturer will make theirs slightly different. If you would like your remapped software to be written by HDI Tuning, then you will have to order your Hybrid turbo through HDI Tuning to our specifications. We will no longer work on Hybrid turbos which are not made by our supplier as we have found that other companies just do not do a good job of building and calibrating the turbos, usually making the remapping work extra strenuous or in most cases impossible until the turbo has been set properly.

When ordering a Hybrid turbo through HDI Tuning you can have confidence that our advanced remap software will be a perfect match to the turbo charger.

Parts List:

1. GTD1244VZ Turbo charger – 9804119380 819872 standard form or Hybrid setup.
2. Turbo oil feed pipe and banjo bolts – 9806878180
3. Turbo outlet pipe (resonator) – 9687261180
4. Resonator to intercooler pipe – 9678562180
5. Oil drain – usually comes with turbo charger
6. Injectors 0445110297 –re-seat the head properly and fit new copper washers.
7. 3.1 Bar MAP sensor – use Delphi PS10197
8. Large front mounted intercooler plus various silicone hoses and pipe work
9. DPF / Decat pipe – not legal for road use
10. Free flowing or straight through exhaust system.
11. Turbo gasket set.

Important: DPF delete is not road legal, as such you can only do this mod for track cars if you use a straight through pipe from the turbo.

Before You start

Remove the original turbo, and the DPF or catalytic converter canister to give you access to the turbo.

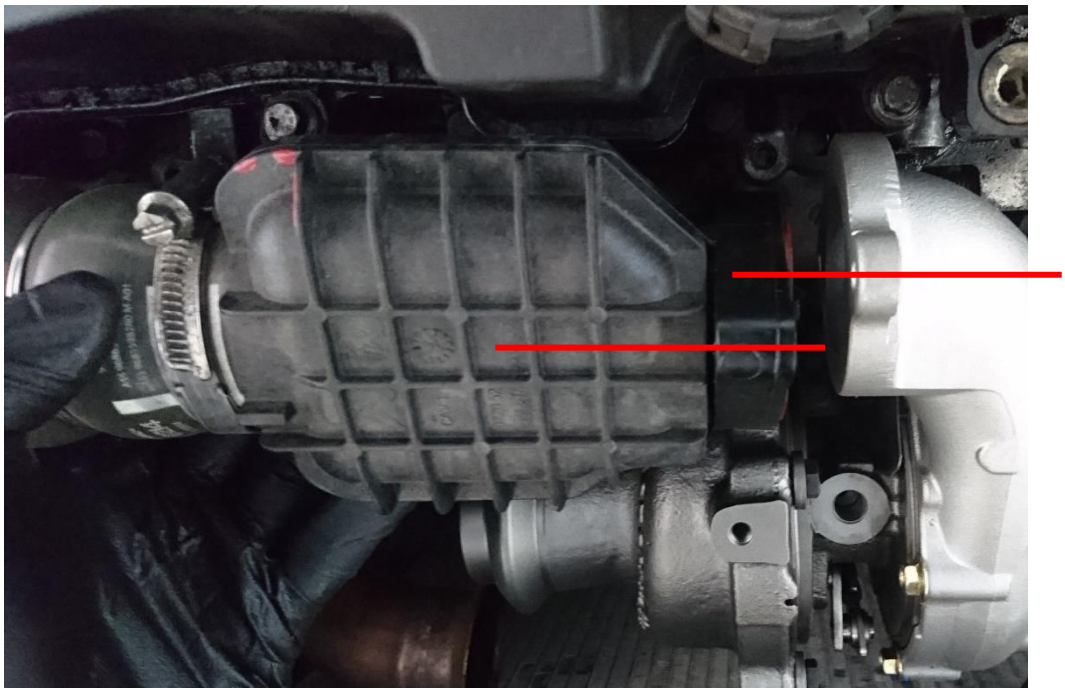
Fitment Guide

The turbo upgrade is *almost* a straight swap. The exhaust flange is the same, and the turbine outlet is the same, the oil feed and drain pipe from the 1.6 8V is used meaning the work left to do is minimal.

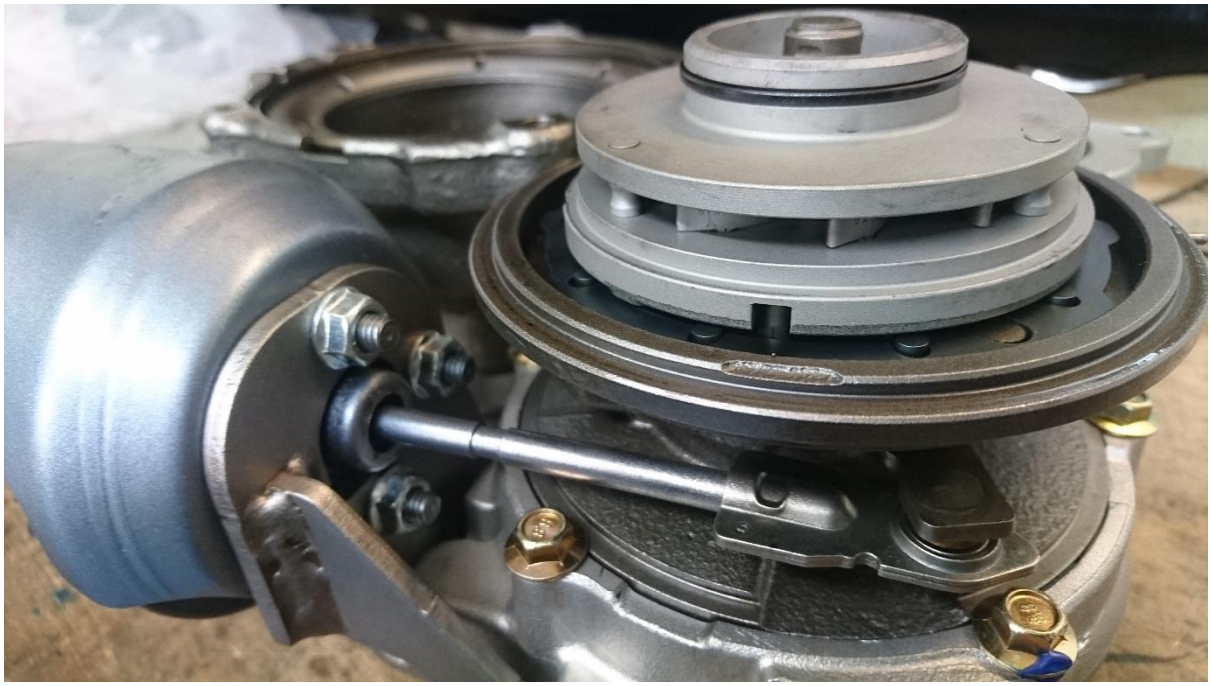
The first step is to rotate the turbine within the turbine housing. This step is required because the resonator pipe will hit on the rocker cover as we are fitting this to the 16v engine instead of the 8v engine.

Normally we would tell you to never adjust the turbine core, but in this case the VNT is built in to the core, and not the turbine housing so it will be unaffected by the rotation. **Warning: do not rotate the compressor housing you will lose vnt actuator calibration.**

Image 1 here shows how big the gap will need to be to prevent collision of the two parts. Also take account of the engine cover.



Start by removing the 10mm bolts which hold the turbine housing to the core. When these are out, carefully remove the core by puling apart. Watch for the order or the spacer shims so that you can put them back in the correct configuration, these will shoot out as they are sprung.



Pull out the alignment pin, this is what locks the core in to position. |You can now refit the two parts together and the will rotate freely amongst each other.

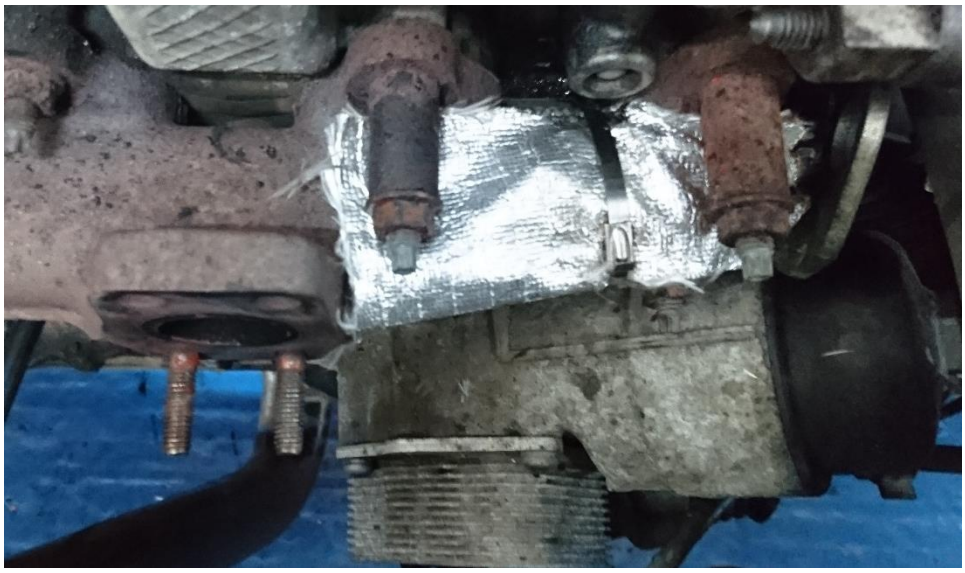
Rotate the core by approximately 13mm as shown below. Loosely tighten the bolts and then check for alignment. If all is good, remove the turbo and tighten fully in an opposing pattern to ensure the core is pulled in to the housing straight. **Warning: If you rotate the core too much the oil feed will not be at the top and oil starvation problems will occur.**

As you have now rotated the core, you also need to check that the oil drain pipe has sufficient clearance relative to the exhaust manifold. This is extremely important to avoid a fire, you do not want the drain hose to be in contact with the exhaust manifold.

With the pipe bolts to the turbo core, it can easily be manipulated. Check fitment.

When finished fit a new gasket to the oil drain, you will have to cut off the side of the oil gasket using a Stanley knife so that it can align with the centre hole and the bolt holes without hitting the core on the side.

Before you fit the turbo, apply some heat wrap to the exhaust manifold in the region where the oil drain pipe will be passing and secure with a metal heat wrap tie, this will act as an extra preventative measure to stop the pipe from melting.



Fit the turbo using a new exhaust manifold gasket.

Fit the oil drain pipe to the original drain point.

Fit the new turbo oil feed pipe, you may need to bend slightly to align to the core as you have rotated it. Be careful not to forcefully tighten the bolt if it is not aligned, this will damage the thread and swarf will enter the turbo. Tip – leave the 4 11mm nuts slightly loose until you have aligned the oil feed pipe.

Pipework

The pipework will vary from build to build, but we have found the easiest way is to use the outlet pipe from a 1.6 8V and then cut off the part which isn't required, this gives a nice 90-degree bend. You could also use an aftermarket tight radius 90-degree stainless bend this will give a much cleaner look.

Refit the exhaust down pipe and run all remaining intercooler hoses and an HDI Tuning Air doser delete pipe if required. Fit the 3.1 bar map sensor.

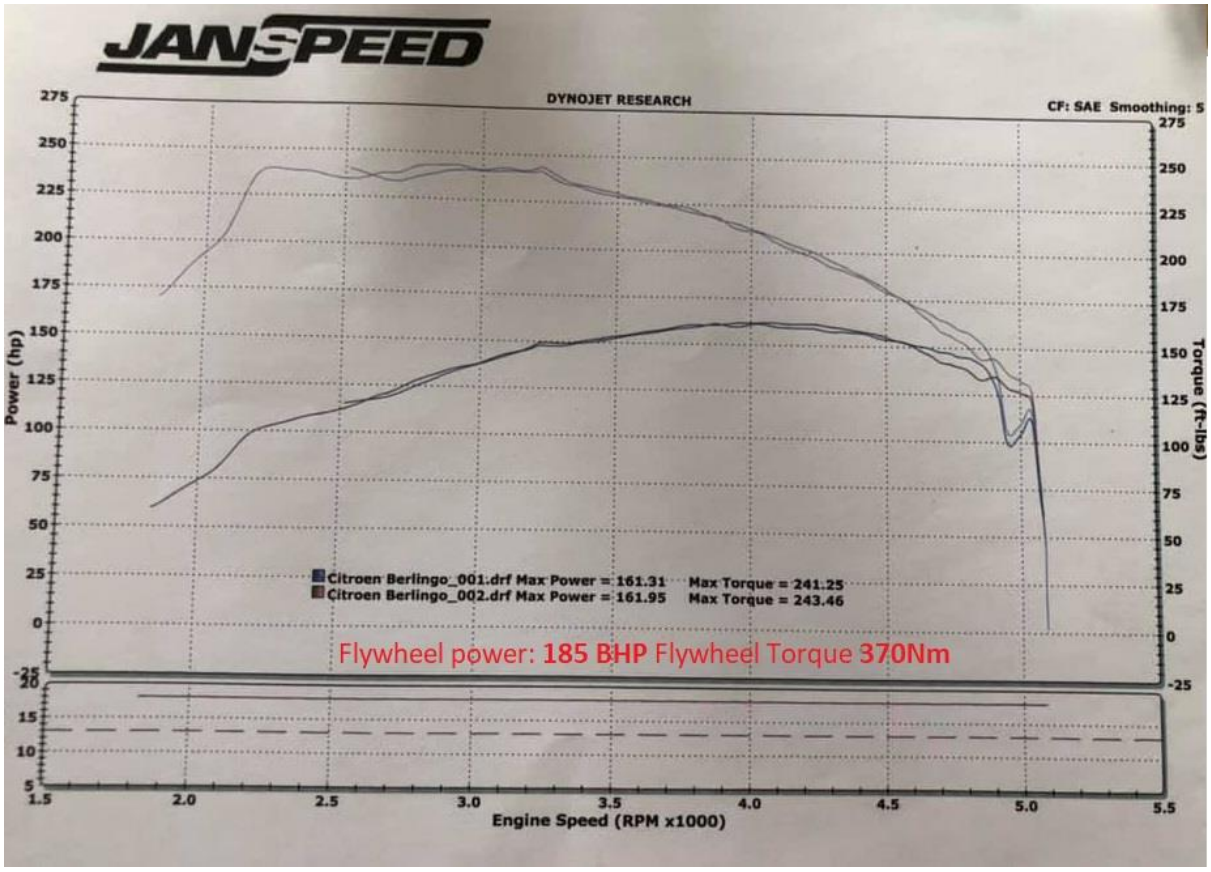
We like big intercoolers, and contrary to popular belief you won't get a noticeable turbo lag as long as your pipework and intercooler is efficient. Remember what goes in must come out.

Warning: You can't really drive the car like this until it has been remapped, this is because the turbo settings and the map sensor, and injectors are not for this ecu setup. You can either send your ECU to us in the post, or you can program the ECU yourself using BDM100 or Kess V2. This is the better option, and then if you need to make any alterations to the software you can easily reflash it.

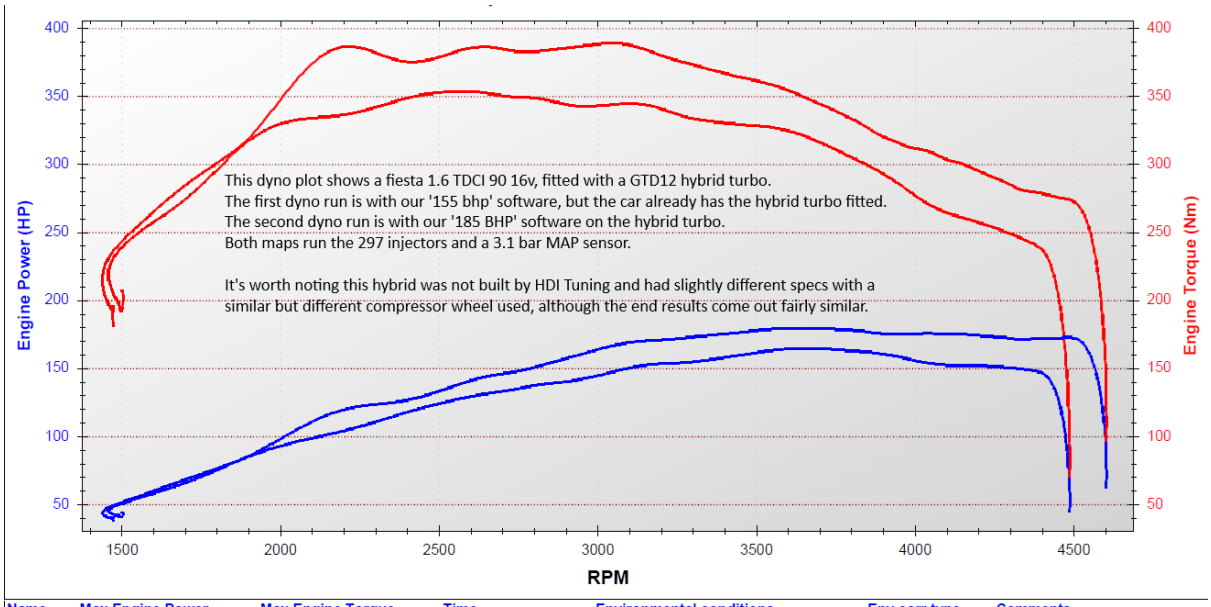
Remember a stage 3 setup is very complicated on the mapping front, so it's likely we will need to tweak the custom software to your build.

Dyno results

Here's a dyno plot from a 2007 75 BHP Berlingo with quite high miles, it still pulled 185 BHP and 370Nm with excellent early spool.

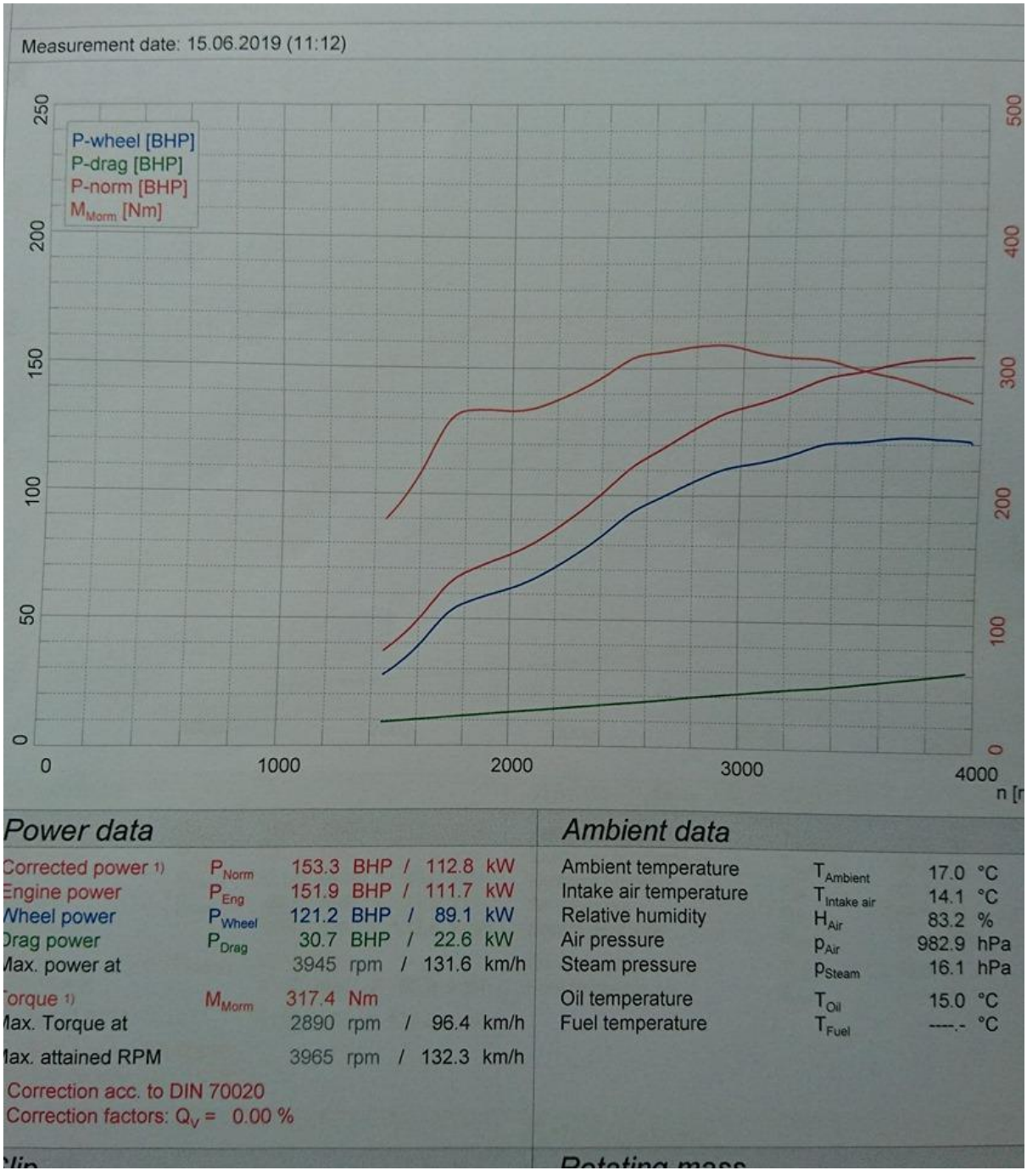


Here's a dyno plot from a Fiesta 1.6 TDCI 90 16v with a GTD12 hybrid fitted



Name	Max Engine Power	Max Engine Torque	Time	Environmental conditions	Env corr type	Comments
Fiesta_1	164,44 HP @ 3648 RPM	353,55 Nm @ 2571 RPM	08/09/2023 12:17:58	T: 31,4C, Hum: 42,1%, P: 1017,8mBar	SAE J1349-2004	
Fiesta_2	179,11 HP @ 3617 RPM	388,95 Nm @ 3044 RPM	08/09/2023 13:13:39	T: 32,4C, Hum: 40,6%, P: 1017,7mBar	SAE J1349-2004	

Here's a dyno plot of a C2 1.6 16v 110 that already had the 297 injectors from the factory, we fitted the GTD12 and a 3.1 bar MAP sensor, intercooler was stock. This pulled 153.3 BHP.



Power data

Corrected power 1)	P_{Norm}	153.3 BHP / 112.8	kW
Engine power	P_{Eng}	151.9 BHP / 111.7	kW
Wheel power	P_{Wheel}	121.2 BHP / 89.1	kW
Drag power	P_{Drag}	30.7 BHP / 22.6	kW
Max. power at		3945 rpm / 131.6	km/h
Torque 1)	M_{Norm}	317.4 Nm	
Max. Torque at		2890 rpm / 96.4	km/h
Max. attained RPM		3965 rpm / 132.3	km/h

Correction acc. to DIN 70020
Correction factors: Q_V = 0.00 %

Ambient data

Ambient temperature	$T_{Ambient}$	17.0	°C
Intake air temperature	$T_{Intake\ air}$	14.1	°C
Relative humidity	H_{Air}	83.2	%
Air pressure	p_{Air}	982.9	hPa
Steam pressure	p_{Steam}	16.1	hPa
Oil temperature	T_{Oil}	15.0	°C
Fuel temperature	T_{Fuel}	----.-	°C

What's Inside the GTD turbo?

Take a look at this YouTube video to see the GTD technology.

https://www.youtube.com/watch?v=HBUGwJyvMAg

How do I buy the turbo?

The Hybrid turbo, air doser delete, and dpf delete pipe are all available in our web shop:

Please allow 1 to 2 weeks for manufacture of the turbo charger.

https://hdi-tuning.co.uk/product/gtd1244vz-turbo-charger/