

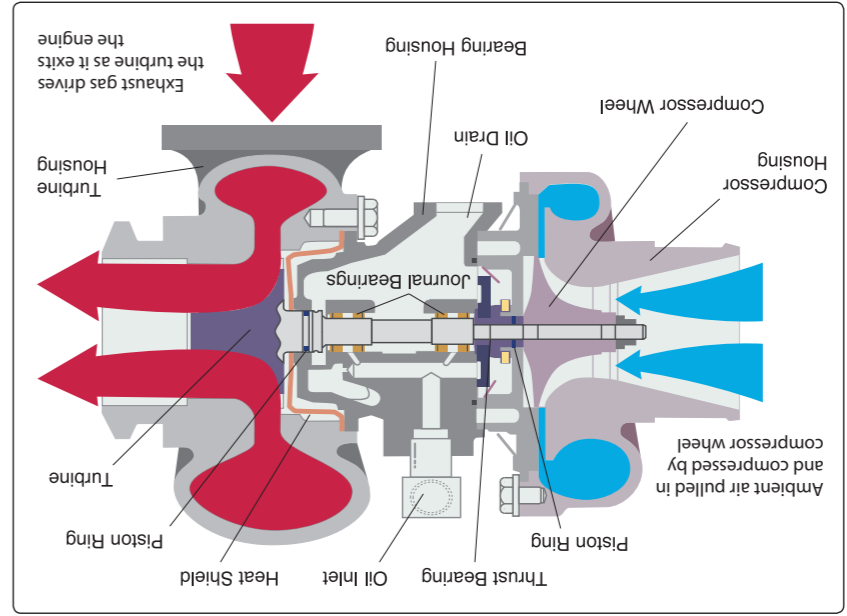


In theory a turbo is simply a hot air pump that forces more air into the engine. With more power more efficiently – improving performance, reducing fuel consumption, and cutting emissions.

In practice, the turbo is a highly efficient, complex piece of engineering built to tolerances of thousandths of a millimetre. It comprises a turbine and compressor, connected by a shaft supported on bearings. The turbo is driven by the waste energy from the exhaust gas. The turbo is mounted in the exhaust manifold and the exhaust pipe. As exhaust gas exits the engine it drives the turbine, which turns

How turbochargers work

The compressor pulling in air and compressing it. Oil passes through the turbo, providing vital lubrication. The exhaust gas enters via the turbine housing, turns the turbine and leaves through the exhaust outlet. Exhaust gas temperatures can reach 950°C, which means that special high temperature materials are needed for the turbine wheel and housing. The speed and load of the engine determines how fast the turbine is compressed as the blades spin at



with the engine at idle, the turbine spins at minimal speed. As the turbine spins at high velocity, low-pressure air stream into low velocity, high pressure air at the outlet. Air enters the compressor at ambient temperature, but leaves at up to 200°C. As air temperature increases, its density decreases, which reduces power – so it is usually passed through a Charge Air Cooler or Intercooler, which uses air or water to cool the hot, high pressure air. The forged shaft linking the turbine and compressor runs in a bearing housing, lubricated by oil from the engine. The oil is fed under pressure into the bearing housing, to the journal bearings and thrust system. The oil also acts as a coolant taking away heat generated by the turbine. The journal bearings float on a film of oil between bearing and shaft and bearing and housing. The clearances for these oil films are critical. At both ends of the bearing housing are unique oil seals. Totally unlike normal engine oil seals, they are specially designed to cope with the turbo's extreme temperatures and pressures, and help ensure that oil does not leak into either compressor or turbine housings.

Turbochargers - an opportunity for profit



Turbochargers are now commonplace on diesel and petrol engines, with around 20 million turbos entering the European market each year. As emissions legislation gets tougher, many more engines will be turbocharged. At some stage, these turbos will need replacing. The increasing demand for replacement turbos represents a valuable profit opportunity, and BTN Turbo should be your first choice.

BTN Turbo is the largest independent turbo distributor in the world, supplying new and remanufactured turbos for over 40 years. BTN is the UK's only turbo supplier with distribution rights to all the major manufacturers: Garrett, BorgWarner, Mitsubishi, Holset and IHI, covering virtually all car, truck and marine turbo applications. We also supply a wide range of turbos for agricultural and plant applications.

All turbos supplied by BTN are 100% OE (Original Equipment), to perform exactly as the vehicle manufacturer intended. We sell brand new first fit OE turbos

straight from the turbo manufacturers' production lines, and our range of Original Manufacturer's Remanufactured turbos.

Available through our exclusive OMX exchange programme, these remanufactured turbos are rebuilt and calibrated by the original manufacturer, on the original production lines. They offer significant savings compared to the equivalent brand new unit.

We also remanufacture commercial turbos using OE parts, again ensuring they are 100% OE.

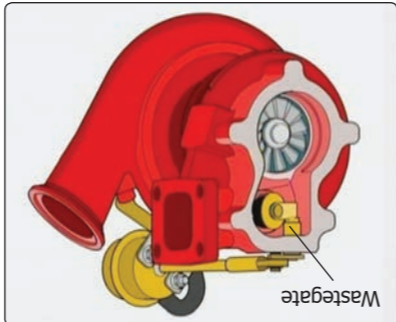
With over 18,000 turbos in stock, we are the preferred supplier to all major factors across the UK.

98% of turbos from BTN include a FitKit, with fitting instructions, studs, gaskets and an oil-filled injector to help prime and protect the turbo.

BTN Turbo is exacting, conscientious and dependable – qualities that should reassure you and will help you build a strong relationship with your customers.

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A small turbine will give a good response at low engine speeds. However, at higher engine speeds, it can overspeed and overboost the

Turbos with wastegates



engine. To prevent this happening, some turbos are also fitted with a wastegate to control boost pressure. As soon as the pressure reaches a preset maximum level, a valve opens allowing the excess exhaust gas to bypass the turbine wheel and go straight out through the exhaust.

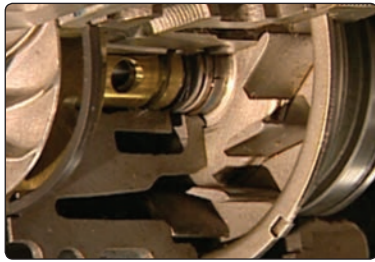
In a wastegated turbo, the turbine wheel can safely be smaller, giving better engine response and yet still maintaining maximum power output. **BTN supplies brand new or remanufactured wastegate turbos. Remanufactured units are built using 100% OE parts to the original specification and are fully compatible with the vehicle's ECU.**



In conventional turbos, the amount of airflow into the engine is determined by the design of the turbine and compressor wheels and their housings, with an inevitable compromise in performance between low and high engine speeds. Variable turbine turbos adapt turbo characteristics to improve engine performance at all engine speeds.

Depending on the manufacturer, variable turbine turbos use moving vanes or a moving nozzle to alter the turbine stage while the engine is running. This allows more efficient use of exhaust gas energy and airflow, to provide the desired boost level across the widest range of engine speeds. This improves operating range, improves fuel economy, enhances engine braking and allows vehicle manufacturers to use smaller engine packages to achieve a given power output.

Variable turbine turbos



Early variable turbine turbos used pressure or vacuum actuators to regulate the position of the vanes or nozzle. Most modern units use electronic control governed by the engine management system, with the turbo having its own ECU.

Variable turbine turbos are highly complex and lose their vital calibration the moment they're dismantled. That's why we offer both OE brand new turbos, and a range of Original Manufacturer's Remanufactured turbos through our exclusive OMX exchange programme. Each one is 100% OE, expertly rebuilt and calibrated by the original manufacturer, and totally compatible with the vehicle's individual ECU. **To protect your business reputation, BTN only supplies brand new or Original Manufacturer's Remanufactured variable turbos.**

Everything you need to know about turbochargers



How turbochargers work.

We explain the fundamentals of turbocharging, using illustrations and clear, easy to understand descriptions.



How to diagnose faults.

It's vital to know why the turbo failed before you fit a replacement. We reveal the three turbo killers and explain the telltale signs.



How to identify and order the right replacement.

Save time, money and hassle by getting the right replacement turbo, first time. We tell you which details you should look for and how to order.

How to fit a turbo.

Ensure a straightforward installation by following our step-by-step guide, with every key stage clearly explained.

Order your BTN turbo from your local factor



The turbocharger people

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- 2 year warranty on all turbos.
- Over 18,000 turbos in stock for next day delivery.
- Oil feed pipes available for recommended applications.



The turbocharger people

Version 3.0

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