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What is an intercooler

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Basically it is a radiator found on turbo-charged and super-charged cars. Intercoolers are fitted to both petrol and diesel cars.

It's purpose is to reduce the temperature of the air going into the engine.

Intercoolers are also referred to as charge coolers.



Here is a typical performance intercooler.

Why does my car need an intercooler ?

Turbochargers and superchargers compress the air being fed to the engine. When air is compressed it heats up and this makes it less dense, meaning that for a set volume there will be less air available for the engine and hence less power. Your intercooler will cool this compressed air and therefore the engine will have more power.

This is why intercoolers are not found on non-turbo or non-supercharged vehicles. These vehicles are using cool external air, filtered and sent straight into the engine. The air has nothing done to it, it is not compressed and therefore not heated up.

Where are intercoolers mounted ?

They are normally mounted at the front of the car behind the front bumper or grille so that they are in the path of cool air. However, the Subaru Impreza has its intercooler mounted underneath the bonnet and relies on a bonnet scoop to force air over it when moving.

How does an intercooler work ?

It works in exactly the same way as your cars water radiator. The heated air is fed through the intercooler and it passes over vanes which are cooled by the external air passing over the vanes. So your intercooler system is external air (passes over vanes) cooling down internal air (passes through vanes), an air-to-air heat exchanger where the hot and cold air never actually touch. Compare this with your water radiator in your engines cooling system which is a water-to-air heat exchanger. The hot water passes through vanes inside the radiator and the vanes help to remove heat from the water as the cool external air passes over the outside of the vanes.



Here is a photo showing the internal vanes of an intercooler.

Will an uprated intercooler give me more power ?

Yes it will, however most road cars are restricted by space as to the size of intercooler that can be fitted. Vehicles running large amounts of turbo boost often have different bumpers fitted, allowing more air into the engine bay and often giving more room for a bigger uprated intercooler right at the front of the car.



Here is an example of a performance intercooler install.

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