

EVERYTHING YOU NEED TO KNOW ABOUT CATALYTIC CONVERTERS

EXHAUST GASSES IN

Hydrocarbons (HC)
Carbon Monoxide (CO)
Nitrogen Oxides (NO2)

EXHAUST GASSES OUT

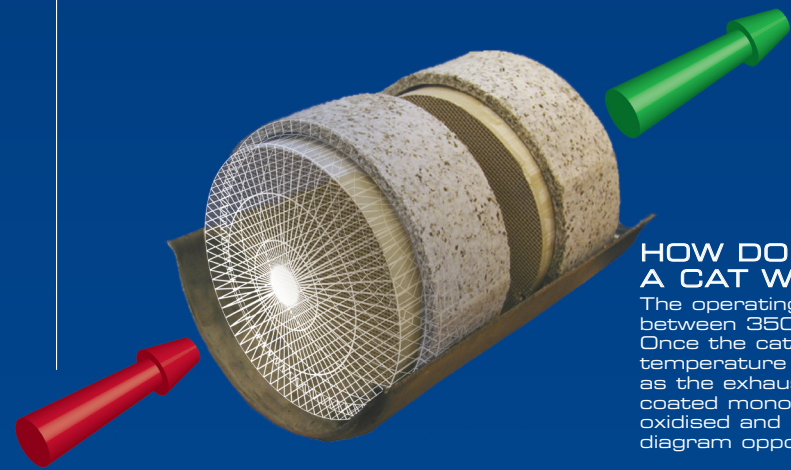
WATER (H2O)
CARBON DIOXIDE (CO2)
NITROGEN (N)

COMPONENTS OF A CAT

A honeycomb monolith coated with precious metals (usually Platinum, Palladium and Rhodium) is encased in a steel can. Between the monolith and the can is matting. Upon running a cat in, this matting expands when subjected to heat. Once expanded, the matting holds the monolith in place.

HOW DOES A CAT WORK?

The operating temperature of a cat is between 350 to 400 degrees Celsius. Once the cat has reached this temperature a chemical reaction occurs as the exhaust gases flow through the coated monolith. The harmful gases are oxidised and converted as shown in the diagram opposite.



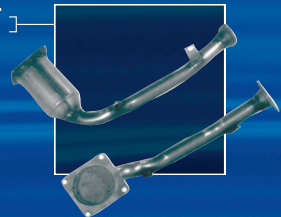
WHAT IS A CATALYTIC CONVERTER

A Catalytic Converter (or Cat) is an Exhaust Emissions Device located underneath a vehicle. It uses a combination of heat and precious metals to promote a chemical reaction, which breaks down harmful gases, making the emissions less detrimental to the environment.



DIFFERENT TYPES OF CAT

Underfloor Cats Older cats tend to be underfloor cats. Thus meaning there is a length of pipe between the cat and the manifold.
Manifold Cats Also known as "close-coupled." These fit direct to the manifold.
Maniverter These are more common on newer vehicles. The cat is part of the manifold.

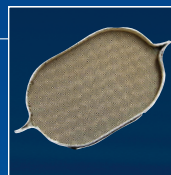


DIFFERENT TYPES OF SUBSTRATES

There are 2 different types of substrates:

Ceramic These account for about 95% of aftermarket cat sales. The monolith is a ceramic brick with a honeycomb structure, held in place by matting.

Metallic Constructed from a corrugated metallic matting, which is rolled to form the monolith, they are more durable than the ceramic cats.



WHAT CAN GO WRONG?

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POOR FITTING

Over tightening can cause flanges to crack. Also non-usage of spring bolts where required can cause excessive vibrations, which can break up the monolith. Using worn gaskets can cause similar problems, hence why we recommend using new fittings if possible.



ROAD DAMAGE

External damage caused by hitting an object in the road i.e. speed bumps. It causes the monolith to get damaged if crushed by the movement of the steel can. Signs are dents and scratches on the cat.



USE OF EXHAUST PASTE

Automatic warranty failure if exhaust paste is used before the catalyst. This is because the paste hardens and small pellets may break away and fire into the cat. Over time the monolith will gradually be broken down by the pellets, causing it to fail.



PLUGGED AND CONTAMINATED

Black soot deposits (hydrocarbons) coat the monolith and prevent the precious metals converting the gases. It can cause the monolith to become blocked therefore causing increased backpressure. A build up of black soot deposit in the pipe work is often a sign of this.



EMISSIONS FAILURE

High HC levels indicate either over-fuelling or petrol leaking into the exhaust system. An increase in CO levels from the natural idle test to the fast idle test indicates a misfire. The perfect lambda level is 1, anything below this indicates the car is running rich, anything above this indicates the car is running lean.



MELTED

A melted monolith is caused by over-fuelling. Excess fuel enters the exhaust system and ignites when it hits the catalyst. The cat therefore "super-heats" hence why the brick melts. The external casing turns a bluish colour when this happens.

CATFACTS & FITTING ADVICE

- Catalytic Converters have been a legality on all petrol cars since 1983.
- The "European Emission Control Legislation" enforces the limits for toxic emissions.
- A cat is located close to the cars engine for heat purposes.
- All internal ceramic monoliths have E9 Type 103-R approval under current European legislation.
- The use of new fittings is recommended where available when fitting Cats.
- An Emissions report is required for all emissions failures, as this gives an indication how the car is running.
- Hydrocarbons are unburned fuel.
- Ceramic Cats carry a 2-year warranty, Metallic Cats carry a 3-year warranty.
- When fitting a Cat alone, put it into place & loosely fix it to the vehicle, if you tighten up one end you may not get the Cat to line up correctly.
- A Cat isn't designed to get a vehicle through its MOT. A Cats purpose is to reduce the amount of harmful gases being released into the atmosphere!
- Don't hit the catalytic converter with a mallet, hammer or chisel gun to try and force it into place.
- Silicone can be used as a sealant in front of the Cat, but never use exhaust paste.
- It is advisable to fit a Cat whilst the vehicle is on a ramp, rather than on axle stands.



WHAT'S NOT COVERED BY MANUFACTURERS WARRANTY?

Road Damage
Melted Monolith
Exhaust Paste
Plugged and Contaminated

External damage caused by solid objects, therefore it isn't a manufacturing defect. Caused by over-fuelling, is therefore a vehicle related problem, not a faulty cat. Immediately invalidates a warranty if used in front of a cat. Caused by using the wrong fuel, or oil entering the exhaust system. Again this is a vehicle related problem, not a faulty cat.

BM CATALYSTS TECHNICAL HELPLINE

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