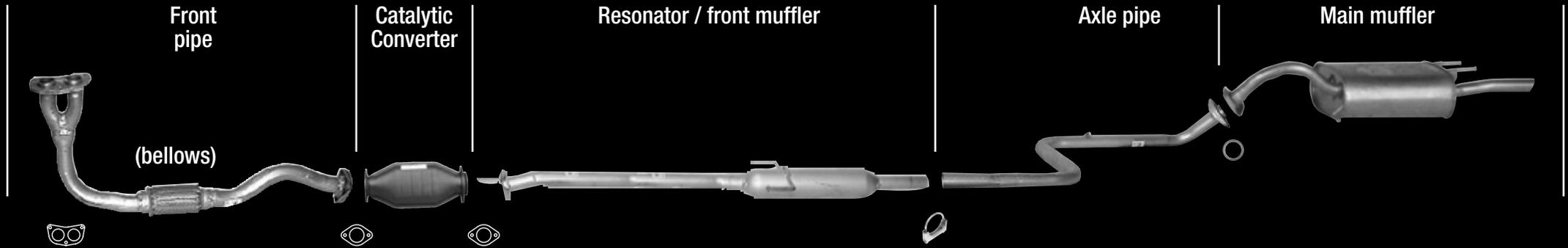


TYPICAL EXHAUST SYSTEM



Why do mufflers rust?

Mufflers suffer corrosion failures for a number of reasons. Located beneath the car the exhaust system of a motor vehicle must deliver hot **dangerous gases** from the engine to a safe exit point near the rear of the vehicle.

Any escape of these dangerous gases back into the vehicle can be potentially **fatal** to the driver or passengers.

The exhaust system must also be free to move with the engine whilst avoiding the moving parts of the suspension and drive train. It can be **physically knocked** by stones or debris yet must have sufficient clearance from the body to allow heat to dissipate into the atmosphere.

Engine reverberation and **vibration** are carried down the system which is normally bolted directly to the cylinder head and requires a stainless flexible joint to allow some movement near the rear of a vehicle.

Amid all this a muffler must deal with vacuum and pressure waves plus a wide variety of **noise levels** and resonations which must be reduced before the gas leaves the vehicle.

Inside the exhaust system a variety of corrosive gases and “acidic soups” created by the combustion of fossil fuels and oils additives attack the metal interior as they are carried to the exit point of the system. A modern engine will also create **extreme temperatures**, ranging from well below zero to more than 400 °C, which effect the chemical reactions within the muffler.



Factors which influence a muffler's life are:-

- Materials used to make the muffler
- Your driving patterns and habits
- The location of muffler on the vehicle
- Climate temperature, rain and humidity.
- Salt or chemicals use to de ice roads
- Salt water corrosion ie launching a boat

Internal corrosion of the exhaust system is caused primarily by cold condensate corrosion and high temperature oxidation while external corrosion is generally a result of high temperature oxidation of the base materials used in construction.

As a muffler cools, the exhaust gases trapped inside condense onto the interior metal surfaces. This liquid actually is quite acidic, with traces of hydrobromic, hydrochloric and other acids, and begins to attack the interior surfaces of the muffler as it accumulates. The exact recipe of this internal “acidic soup” is dependent on a number of factors: grade of petrol, air-to-fuel ratio, engine setup and whether a catalytic converter is connected to the car.

As it accumulates, the “acidic soup” begins to attack the interior surfaces of the muffler. If the car is run for some distance, the muffler will heat up to a point where this mixture will boil right off, allowing the muffler to dry up inside.

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