TEST – Catalysts in Classics

A Translated Article from the Swedish magazine 'Klassiker', January 2020
(for the original article, please ask Jetex for a copy)

Edited by Jetex Exhausts Ltd, UK – UK distributor for the Classic Car Converter

Start of Article

Just over two years ago, we installed a catalyst intended for classic cars on a Volvo 1800S and clearly noted lower emissions. Now we go back to the test lab to see if the effects are lasting.

In Klassiker October 2017, we fitted catalysts on two classic cars to see how much cleaner the exhaust gases would be on 50-60 year old test cars.

Previously, there have been no catalysts developed for older cars, but in 2017, Redback launched the Classic Car Converter. It was not designed to meet some special legal emission requirements but simply to work like other catalysts; when hot exhaust gases containing nitric oxides (NOX), carbon monoxide (CO) and hydrocarbons (HC) meet the combination of precious metals; platinum, rhodium and palladium they are converted to (less harmful) carbon dioxide, oxygen, water vapour and nitrogen. The Classic Car Converter does not have a traditional washcoat formula used with ceramic mantles like you'd find with standard catalysts. Instead, a larger quantity of rhodium is used to lower nitric oxide levels.

The mounting of the Classic Car Converter is reasonably uncomplicated; a piece of straight exhaust is replaced with the Classic Car Converter, welded in place. According to the manufacturer, the Classic Car Converter should be fitted within 1m of the manifold in order to reach sufficient working temperature (280°C).

We mounted the smaller version of the Classic Car Converter to a 1967 Volvo 1800 and the larger version to a 1975 Rover 3500 V8.

Before fitting, Rolf Lundblad Motor AB in Rågsved measured the levels of carbon monoxide (CO) and hydrocarbons (HC) in the exhaust gases of the test cars at idle, a constant 50kmph and full throttle on a rolling road. He also measured the engine power. None of the cars had engines in top condition and we did nothing to enhance them before the test.

When we came back a few days later with the catalysts fitted, both cars were noticeably cleaner; carbon monoxide emissions were zero or near zero. Also the levels of hydrocarbons had significantly reduced. We also smelled less exhaust gas around the cars.

Were there any effects on the cars apart from emissions/smells? The Volvo had lost 1bhp, while the Rover was marginally more powerful! The small changes however were within the normal margin of error.

A catalyst that works right after you have fitted it is not strange in itself, but the big question was how it would last over time. The tests took place in the autumn of 2017 after which the Volvo went into winter storage while the Rover managed a few more miles. 100 more miles passed when we returned to Rolf Lundblad to see if the results were still the same or if the catalyst had lost its cleaning effect. Rolf quickly established that the catalyst still worked and by fitting two Stromberg

carburettors he got the values down further. The Rover was sold, still fitted with the Classic Car Converter. Since the initial test, Frans Johansson who owns the Volvo has driven around 400 miles. He has used it like many enthusiasts drive their cars - locally and further afield. The car has run as normal, says Frans. Oil usage has been as usual and the engine has been easy to start and been reliable. The only difference is that the exhaust gases smell less. This is a sign that the catalyst is continuing to work. However we wanted to know if there had been any other changes and again we took the car to Rolf Lundblad and his rolling road. Here, Rolf has tested thousands of cars through over the years and he really knows the equipment he has had since the 1980s. It is something very reliable. Rolf straps down the Volvo onto the rollers and adjusts the double SU carburettors a little before he starts measuring. It produces results. The values that come out of the rolling road is even better than two years ago. The catalyst therefore works despite normal engine wear and tear and some period of use.

Many have read about the original test in Klassiker and there has been a lot of curiosity around this test, says Frans Johansson. One reader who has taken it a step further is Lars Fryk-Islet from Enebyberg. He has a Citroën SM 1970 which he happily drives a lot. Of the 23,000 miles the car has been driven, Lars accounts for the last 15,000, for example last summer, with a trip to Holland. “I think the exhaust fumes from the SM smell worse than from many other cars”, says Lars. “I think this is due to modern petrol, so wasn’t so bad when they were new and using leaded petrol.”

The hope of less intrusive gas smell prompted Lars to turn to a catalyst and the Classic Car Converter. The larger (4”) version fitted perfectly next to the front silencer where the exhaust pipes from the V6's two cylinder banks join together.

“Now I have driven about 400 kilometers and probably the (gas) smells a little less”, says Lars. “Although I'm not entirely sure, the difference is not as significant as I thought.”

To find out if Lars's catalyst has had any affect we also drive his Citroën to Rolf Lundblad's facility. Here we have no measurement values without the catalyst to compare with but we will be able to decide if it works. Tightening down a Citroën SM to the rolling road is as simple as the Volvo 1800S. The gas hydraulic suspension struggles against Rolf's moorings and the super-sensitive steering makes the car want to go sideways, but Rolf finally succeeds in getting some data that clearly shows that the catalyst does work. At idle, the CO content is 0.19% and the HC value is 81 ppm.

“It does work then”, says Lars Frykholm and Rolf Lundblad agrees.

One can argue that the resources needed to retrofit classic cars with a Classic Car Converter does not mean any significant benefit for the environment at all; Historic vehicles account for such an extremely small part of the total emissions from road traffic. But there are other reasons to fit a catalytic converter to the exhaust system. Most commonly is that you want to reduce the odour from exhaust gases - both for the driver and the general public. A catalyst on a classic car should perhaps primarily be seen as a comfort item for those interested in technology.

TEST RESULTS 2017-2020	VOLVO 1800S 1967	ROVER 3500 V8 1975
Idle	**HC value / CO content**	**HC value / CO content**
Without catalyst:	283ppm / 2.73%	304ppm / 5.50%
Newly installed catalyst:	74ppm / 0%	296ppm / 4.36%
After 100-400 miles and adjustment:	46ppm / 0%	101ppm / 0.05%
Smooth speed 70km/h		
Without catalyst:	213ppm / 2.86%	197ppm / 0.61%
Newly installed catalyst:	129ppm / 1.48%	88ppm / 0%
After 100-400 miles and adjustment:	46ppm / 0.03%	49ppm / 0.05%
Measured engine power		
Without catalyst:	63.3hp DIN / 4,575rpm	96hp DIN / 4,275rpm
With catalyst:	62.1hp / 4,545rpm	96.9hp / 4,460rpm

End of Article