

## P7510 EXHAUST CATALYTIC REACTOR UNIT

General arrangement of Exhaust Catalytic Reactor Unit P7510 including requisite temperature measurement system (P8025 and P8028)

### APPLICATIONS

- ◆ Comprehensive investigations to determine 'catalytic conversion' efficiency
- ◆ Examines air/fuel ratio, stoichiometric air to fuel ratio, and equivalence ratio
- ◆ Determination of catalyst temperatures

### FEATURES

- ◆ Ability to operate the catalyst converter in 'oxidising', 'reducing', or 'three way action modes'
- ◆ Steel fabrication and containing a specially treated ceramic honeycomb monolith coated with a precious metal preparation
- ◆ Three thermocouple probes
- ◆ Temperature monitoring system

### INTRODUCTION

Specific legislation relating to the emission of pollutants from the exhaust fumes of internal combustion engines has already been introduced in many countries and the areas where controls are exercised are spreading. The main pollutants to be dealt with are carbon monoxide (CO), a wide range of hydrocarbons (HC) and various oxides of nitrogen (NO<sub>x</sub>). These may be removed from the exhaust of an engine by the use of a 'catalytic converter' such as that contained in the Cussons P7510 Exhaust Catalytic Reactor Unit.

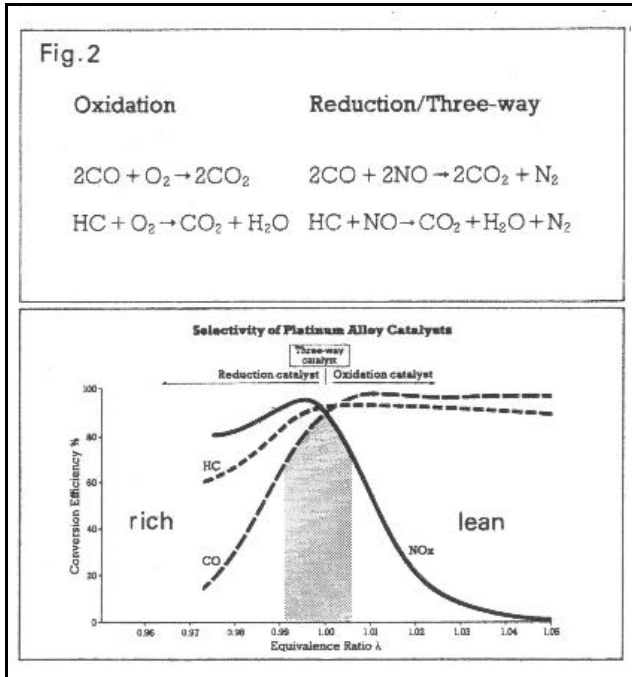
The concentrations of CO, HC and NO<sub>x</sub> emitted from an engine are dependant on many factors which include basic engine design, the load speed condition of the engine and the air/fuel ratio (hence 'λ' the equivalence ratio). The efficiency of a 'catalytic converter' in reducing the levels of the above pollutants is dependent on variables such as exhaust gas temperature and 'λ', and the P7510 enables a wide range of investigations of the catalyst behaviour to be undertaken since there are built in monitoring and temperature determination facilities.

### DESCRIPTION

#### SELECTIVITY OF CATALYST CONVERTER

The selectivity of the catalyst converter used in P7510 is illustrated and the importance of 'λ' the equivalence ratio can be seen. The graph shows that NO<sub>x</sub> emission is most efficiently converted under 'RICH' running conditions and that CO and HC are best converted under 'lean' running conditions. There is however, a relatively narrow 'window' where all three exhaust components are converted with high efficiency.

The catalytic converter used here, is optimised as an oxidising agent but can operate in the 'oxidising', 'reducing' or 'three way action' modes under the appropriate test conditions, and thus the reactor unit with the appropriate Gas Analytical System etc. enables comprehensive investigations to be made in order to determine 'catalytic conversion' efficiency over a wide range of operating conditions. The investigations include ascertaining the significance of such factors as air/fuel ratio, stoichiometric air to fuel ratio, and equivalence ratio, when dealing with catalyst conversion efficiency.



## SPECIFICATION

Exhaust Catalytic Reactor Unit suitable for fitting in the exhaust systems of diesel and spark ignited, (not using leaded petrol), engines. Fabricated in steel and containing a specially treated ceramic honeycomb monolith coated with a precious metal preparation, together with sampling points for the analysis of exhaust gas prior to, and after passing over the monolith. Fitted with three thermocouple probes for temperature sensing before and after the catalyst temperature. Complete with temperature monitoring system (P8025 with 5m of compensating cable P8028).

## SERVICE REQUIREMENTS

Multi-point Thermometer requires 240V supply.

## DIMENSIONS

1.0m (40") x 0.5m (20") x 0.5m (20")

P8025 Weight 8.75 Kg (19 lbs)

490 mm (19.5") x 130 mm (5") x 200 mm (8")

## RECOMMENDED AIR/FUEL RATIO ANALYSIS SYSTEM



Cussons Lamdascan Air/Fuel Ratio Analyser P1300/1

This is an ideal instrument to be used in conjunction with the P7510 Exhaust Catalytic Reactor Unit. It enables 'λ', the equivalence ratio to be simply and effectively monitored over the wide range of operating conditions which may be investigated with P7510.

### P8025 MULTI-POINT DIGITAL THERMOMETER

The Cussons Multi-Point Digital Thermometer provides the required display unit for the temperatures to be measured on the P7510 Exhaust Catalytic Reactor Unit. The range is 0-1199°C and the signals from the Ni-Cr/Ni-Al thermocouple probes can be selected by means of a selector switch and displayed on the instrument's digital scale. The signal channel being monitored is shown on the instrument's title panel.

### P8028 COMPENSATING CABLE

Suitable for use with P8025. Longer lengths of compensating cable can be supplied if the standard 5m length not sufficient.