BASIC KNOWLEDGE

EXHAUST SYSTEM, LOCATION/TASK/DESIGN/FUNCTION - GF49.00-P-2000F

ENGINE 104, 111, 112, 113, 119, 120, 137, 166 (except, 112.96, 113.99)

Shown on model 203 with engine 112

Fig. 1: Identifying Exhaust System Location & Design - Shown On Model 203 With Engine 112

	Exhaust system position	The exhaust system is located at the underfloor of the vehicle.	
	Exhaust system task	The tasks of the exhaust system are: • Directing the exhaust gases with a slight backpressure to the rear of the vehicle • Absorbing the noise of the exhaust gases • Optimizing power output of engine • Emission control by means of TWC.	

	Exhaust system design	Engine 119 in Model 210 Engine 112, 113 in Model 215, 220 Engine 137 in model 215, 220 Engine 113 in model 230	GF49.00-P-2000-01F GF49.00-P-2000-01K GF49.00-P-2000-01L GF49.00-P-2000-01R
	Exhaust system function	The exhaust system muffles the exhaust gases which flow out of the combustion chamber with severe pulses in order to ensure that a certain noise level is not exceeded and that the exhaust gases do not encounter any major resistance when flowing off. For noise insulation, the components are partially double-walled, shields reduce the heat dissipation to the underfloor.	

COMPONENT DESCRIPTION FOR THE EXHAUST SYSTEM - GF49.00-P-3010KE

ENGINE 271.921 in MODEL 203

ENGINE 271.940 in MODEL 203, 209

ENGINE 271.941 in MODEL 211

ENGINE 271.944 in MODEL 171

ENGINE 271.946 in MODEL 203

ENGINE 271.948 in MODEL 203

ENGINE 271.955 in MODEL 209

ENGINE 271.956 in MODEL 211

Arrangement illustrated on model 211

The exhaust system is located on the underfloor of the vehicle.

a Motor
b Exhaust system

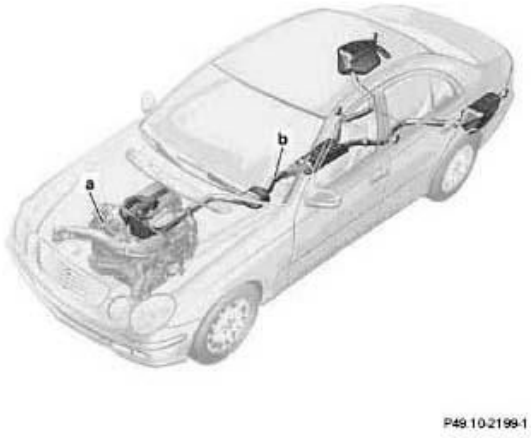

Fig. 2: Identifying Motor & Exhaust System Arrangement - Illustrated On Model 211

Task

The tasks of the exhaust system are:

- Conducting exhaust gases with a low backpressure to the rear of the vehicle
- Muffling the noises of the exhaust gases
- Optimizing power output of engine
- Exhaust cleaning through catalytic converters

157 Firewall catalytic converter (with O_2 sensors)
158 Underfloor catalytic converter
159 Center muffler (for model 211)
160 Rear muffler (for model 171 and 211 end position 2-fluted)

Fig. 3: Identifying Exhaust System Components - Shown On Model 211

Design shown on model 211

The housing for the catalytic converters are made out of stainless steel. This considerably increases the working life. The housing of the catalytic converters have a double-walled design for noise reduction (air gap insulation).

COMPONENT DESCRIPTION FOR THE EXHAUST SYSTEM - GF49.00-P-3010SM

ENGINE 113.986 in MODELS 215, 220

ENGINE 113.987 in MODEL 209

ENGINE 113.988 in MODEL 203

ENGINE 113.989 in MODEL 171

Model 171

157 Firewall catalytic converter
158 Underfloor catalytic converter
159 Center muffler
160 End muffler

a Separation point
b Mixing area (within the common center muffler)

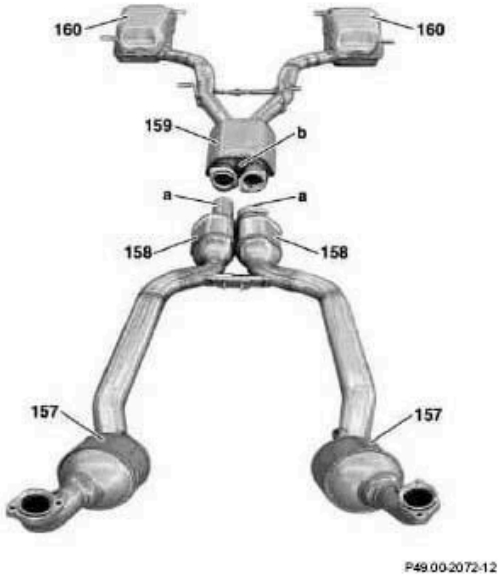

Fig. 4: Identifying Exhaust System Components - Model 171

Model 209 up to MY 03

157 Firewall catalytic converter
158 Underfloor catalytic converter
160 Rear muffler (main silencer)

a Separation point
b Mixing area

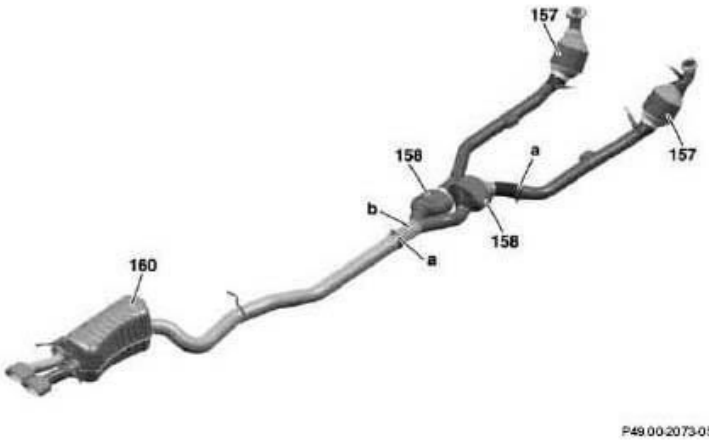

Fig. 5: Identifying Exhaust System Components - Model 209 Up To MY 03

Models 203, 209 from MY 04

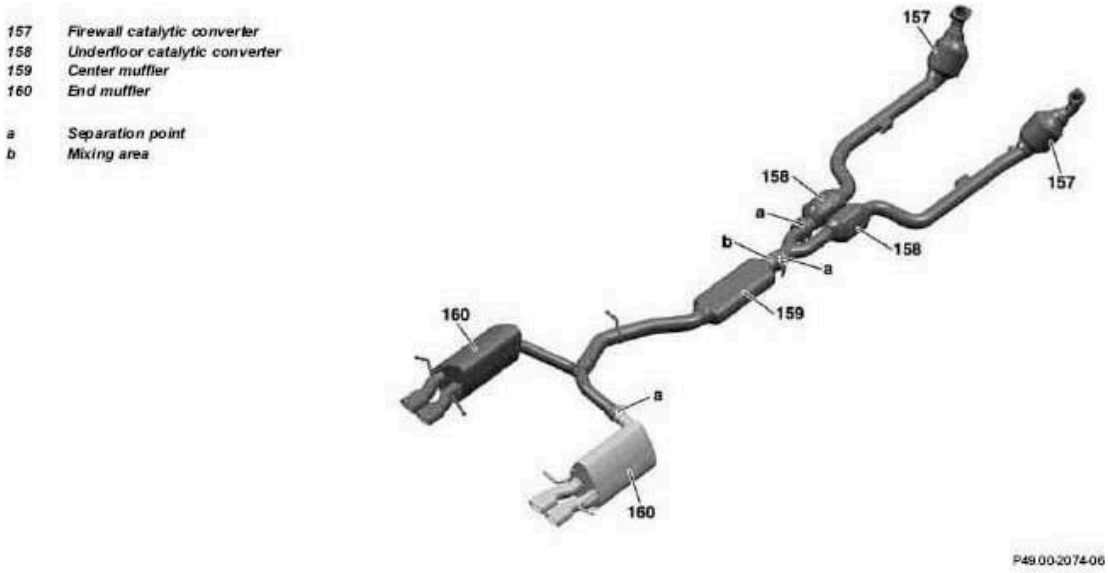

Fig. 6: Identifying Exhaust System Components - Models 203, 209 From MY 04

Model 215, 220

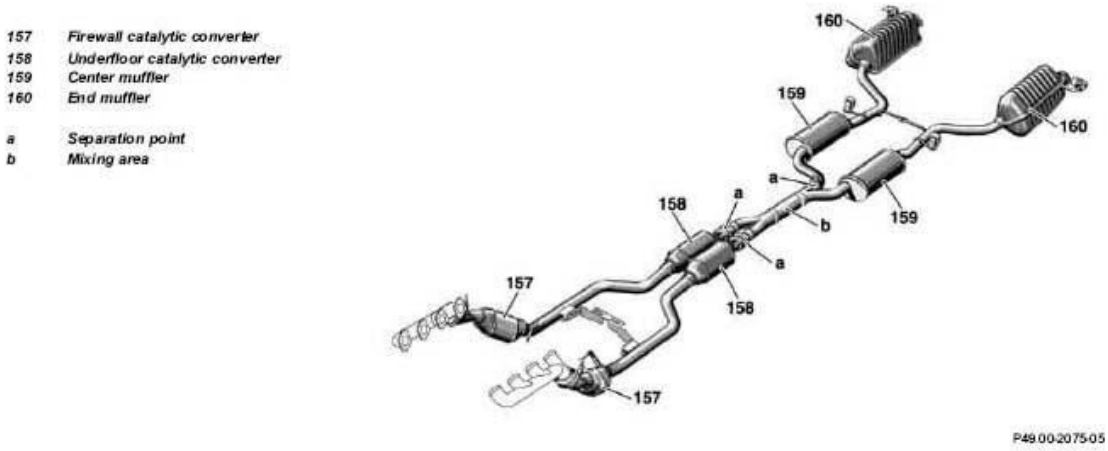

Fig. 7: Identifying Exhaust System Components - Model 215, 220

Task

The tasks of the exhaust system are:

- Directing the exhaust gases with a slight backpressure to the rear of the vehicle
- Absorbing the noise of the exhaust gases
- Optimizing power output of engine
- Exhaust cleaning through catalytic converters

i The AMG exhaust systems from models 171, 203 and 209 guarantee fulfillment of the EU 4 limits.

Design

The exhaust system is an all-stainless steel design. This increases its working life significantly.

The catalytic converter housings are designed with double walls for noise reduction (air gap insulation).

The pulsating exhaust gases in the exhaust lines are calmed in the mixing area.

COMPONENT DESCRIPTION FOR THE THREE-WAY CATALYTIC CONVERTER - GF49.10-P-2010KE

ENGINE 271.921 in MODEL 203

ENGINE 271.940 in MODEL 203, 209

ENGINE 271.941 in MODEL 211

ENGINE 271.944 in MODEL 171

ENGINE 271.946 in MODEL 203

ENGINE 271.948 in MODEL 203

ENGINE 271.955 in MODEL 209

ENGINE 271.956 in MODEL 211

Location shown on model 211

The firewall catalytic converter is located at the right rear on the engine and underfloor catalytic converter on the vehicle underbody.

Task

Reducing the exhaust gas emissions:

- Nitrogen oxides (NO_X)
- Hydrocarbon (HC)
- Carbon monoxide (CO)

157 Firewall catalytic converter
158 Underfloor catalytic converter

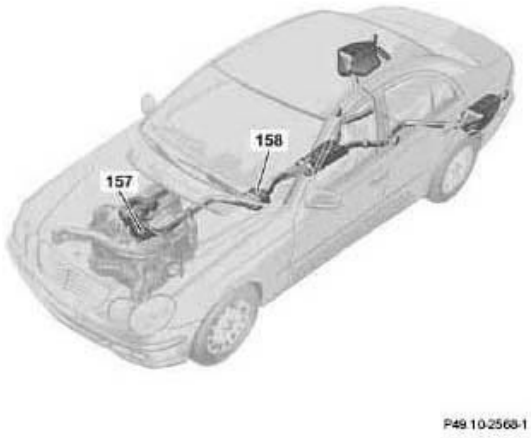

Fig. 8: Identifying Firewall And Underfloor Catalytic Converter Locations - Shown On Model 211

Body (schematic)

1 Ceramic monolith
2 Wire mesh (embedded)
3 Double-walled housing (insulation)
4 Substrate (washcoat) with a coating of rare metal

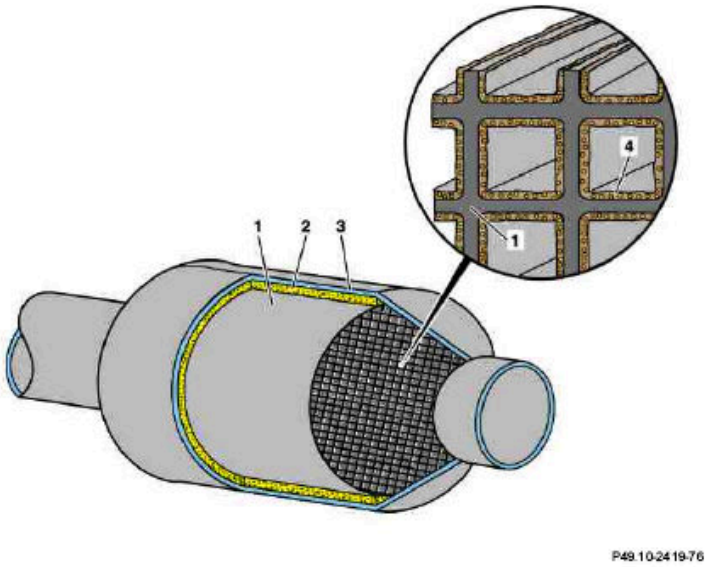

Fig. 9: Identifying Three-Way Catalytic Converter Body (Schematic) Diagram

Ceramic monoliths are ceramic bodies through which pass several thousand small passages. The exhaust gas flows through these passages. The ceramic consists of high temperature-resistant magnesium aluminum silicate.

The monolith, which is extremely sensitive to voltages, is embedded in an elastic wire mesh made of high-alloy steel wires and fitted in a double-walled stainless steel housing.

Ceramic monoliths require a substrate (washcoat) of aluminum oxide ($Al_2 O_3$) that expands the active surface of the catalytic converter by an approximate factor of 7000.

The effective catalytic layer made out of rare metal applied to the intermediate layer consists for a three-way catalytic converter up to 11/2006 of platinum and rhodium and from 12/2006 of an even higher quality coating.

Platinum accelerates oxidation of hydrocarbons (HC) and carbon monoxide (CO), whereas rhodium accelerates the reduction of nitrogen oxide (NO_X).

i 12/2006

The high-quality catalytic converter coating allows lowering of fuel grade from 98 to 95 ROM (from premium to normal gasoline).

Function (schematic)

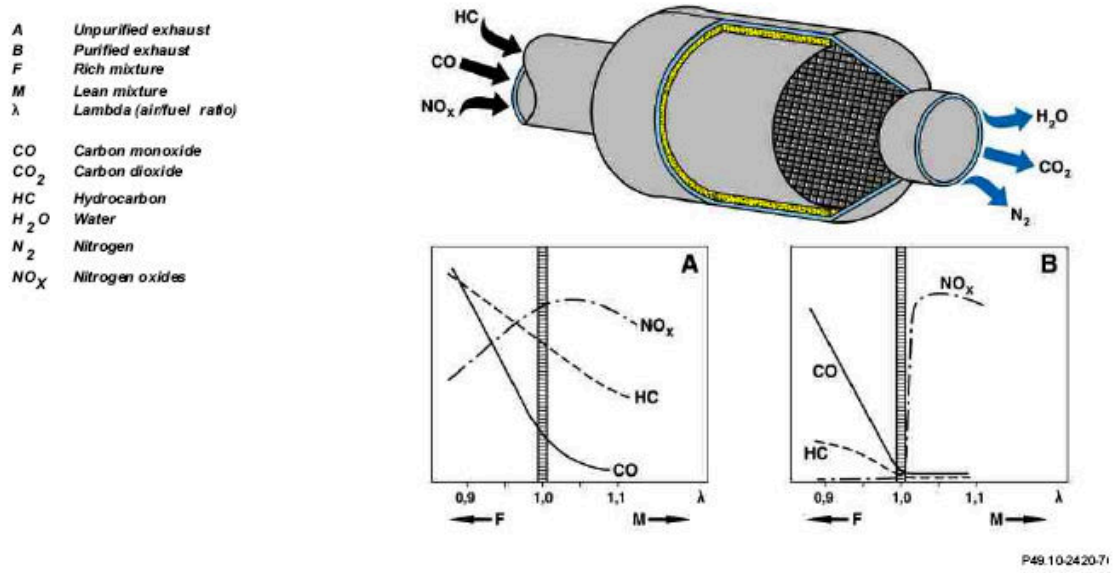

Fig. 10: Identifying Three-Way Catalytic Converter Function (Schematic) Diagram

The exhaust gases flow through the catalytic converter and, in so doing, come into contact with the rare metal platinum.

- Through oxidation, carbon monoxide (CO) is converted into carbon dioxide (CO_2) and hydrocarbons (HC) into water (H_2 O) + carbon dioxide (CO_2).
- Through reduction, nitrogen oxides (NO_X) are converted into nitrogen (N_2) + carbon dioxide (CO_2).

The remaining oxygen content in the exhaust is a crucial factor in the conversion of pollutants. The best pollutant conversion is obtained at lambda =1.

Operating conditions

For a catalytic converter the operating temperature is very important. Appreciable conversion of the pollutants does not commence until an operating temperature of approx. 250°C.

Ideal operating conditions for high conversion rates and a long life prevail at temperatures between around 400