

The music of the engine

The heart of every sports car is the engine. Its technology, performance and its sound shape the character of a sports car like no other component. The famous conductor Herbert von Karajan once characterized the sound of his 911 as the most beautiful sound. The air-cooled engine makes up a large portion of the fascinating sound. With introduction of the water cooling for the Porsche Carrera, the characteristic sound suffered clearly. In the last years sound design has developed as an independent discipline, in order to lend, in particular to sport vehicles, the sound characteristics wished by customers. Despite ever sharper regulations for the reduction of the noise levels, a good sound for most sport oriented drivers is an indispensable component of the driving experience. Imagine sometime motor sport without any engine noise. And even if according to advertisements for the new Porsche turbo, that peace were to prevail in the center of the gale, more than a few Porsche drivers would like to hear the gale nevertheless. The so-called sound package is not in vain so well liked as an accessory.

During the engine development and tuning of series vehicles many compromises must be entered into, the adherence to world-wide noise level standards and as low costs as possible in production prevent really good results. Conventional exhaust systems always represent a compromise concerning sound and performance development. On the other hand, the equation loud = powerful, is only in rare cases true.

As an optimal solution for sport vehicles the innovative Lenz PowerFlow® system connects an increase in output with sporty configured engine sound in an ideal way. A valve system controlled by the engine management activates performance and torque reserves by a variable oscillation and flow attitude of the exhaust gases. The sound characteristic ranges from quiet at low rpms and little load to super sporty at high rpms and high load.

PowerFlow® – functional principles

The flow of air, fuel and exhaust in an engine is a technically complex vibration process. The effectiveness of this process determines the efficiency of the engine. The most well-known principle for an increase in output, the active induction by means of turbochargers or compressors, increases the filling of the combustion chambers and provides in such a way, for more performance. As a passive system for an increase of the filling of the combustion chamber, already for some years switching flaps or adjustable passages have been used, with which the torque development can be clearly improved by an appropriate design. On the exhaust side the induction effects and improvement of the gas flow by purposeful oscillation optimization have so far been hardly used. Due to exhaust gases up to 1000° C, components for the influence of the exhaust gas streams have been, for cost reasons, forgone. However, with a combination of a tuned header and an exhaust system with adjustable flap valves, different lengths and vibration optimized passages through the muffler to the outlet, substantial improvements in the torque and performance development can be obtained.

System components

The **Lenz PowerFlow®** system for the Porsche models 911-964-993 consists of the following components:

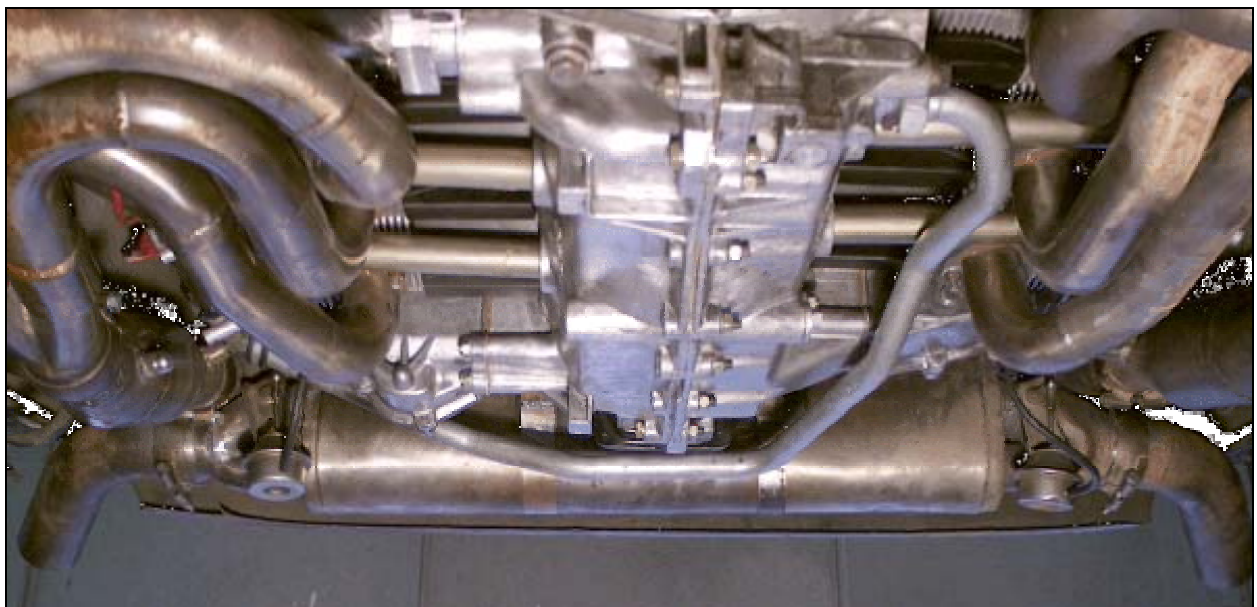


- stainless steel headers
- 2 magnet valves with pressure control lines
- special muffler with two outlets
- heating from catalyts or supplemental heater
- 2 metal sport catalyts and 2 lambda sensors
- 2 electronically controlled high temperature resistant exhaust valves
- wiring to the **Lenz PowerTronic®** engine management system

Results

As part of a performance kit, Lenz PowerFlow® combined with the Lenz PowerTronic® engine management offers the following improvements:

- considerable performance increase
- wider usable torque band
- significantly improved torque development
- reduction of throttle loss at higher rpms
- load and rpm dependent variable engine sound from moderate to super sporty
- thermal relief of the engine through minimized exhaust back pressure and lack of heater boxes



Lenz PowerFlow® in Porsche 911 C1 with 280HP.

Models / Technical Data

the following Porsche models can be fit with the Lenz PowerFlow ® system:

- Porsche 911 Carrera yr. 84-89
- Porsche 964 Carrera 2/4 yr. 89-92
- Porsche 993 yr. 93-98
- Porsche 996 yr. 96-
- Porsche 911 Turbo 1 - 3.3
- Porsche 911 Turbo 2 – 3.3/3.6

In connection with the corresponding engine modifications and the Lenz PowerTronic ® engine management system, the following performance data can be realized with the **Lenz PowerFlow®** system:

- Porsche 911 Carrera yr. 84-89 : 280 HP, 310 Nm Torque
- Porsche 964 Carrera yr. 89-92 : 325 HP, 350 Nm Torque
- Porsche 993 Carrera yr. 93-98 : 340 HP, 360 Nm Torque
- Porsche 911 Turbo 1 / 2 up to : 500 HP
- Various performance kits in preparation

Technische Änderungen bleiben vorbehalten.

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