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1544 pages

1450 technical illustrations and diagrams

All about automotive engineering in a pocketbook

The first incarnation of the Automotive Handbook was published in 1932 by Robert Bosch GmbH. Since then, the book has increased in size and stature to be considered an indispensable reference source of precise information on the subject of automotive technology. With this ninth English-language edition, the book has been revised and extended throughout into a larger format designed for ease of use by the professional automotive technician.

Contents - central themes (selection)

- Physics, thermodynamics, chemistry, mathematics, materials, operating fluids, machine parts, joining and bonding techniques
- Internal-combustion engines, engine cooling, air-intake systems, turbochargers and superchargers, exhaust-gas system
- Emission-control and diagnosis legislation, exhaust-gas measuring techniques
- Emission-control and diagnosis legislation
- Management for spark-ignition engines, manifold injection, gasoline direct injection, alternative gasoline-engine operation
- Management for diesel engines, common rail, start-assist systems
- Hybrid drives, fuel cell
- Fundamentals of vehicle engineering, motor-vehicle dynamics, vehicle acoustics, vehicle aerodynamics
- Suspension, wheel suspension, wheels, tires, steering, brake systems
- Antilock braking system, driving-dynamics control system
- Vehicle bodies, lighting equipment
- Vehicle electrical systems, starter batteries, drive batteries, electrical machines, alternators
- ECU, automotive networking, buses, architecture of electronic systems, sensors
- Driver-assistance systems, computer vision, Adaptive Cruise Control

644 Engine management for spark-ignition (SI) engines

K-Jetronic

The K-Jetronic system operates without a drive and injects fuel continuously. The injected fuel mass is not determined by the fuel injector, but is preset by the fuel distributor.

Operating concept

- Continuous fuel injection
- Direct air-flow measurement

K-Jetronic is a mechanical system which does not require an engine-driven fuel-injection pump. It meters a continuous supply of fuel proportional to the air flow rate in the engine intake duct.

Owing to direct air-flow measurement, K-Jetronic also takes into account changes caused by the engine, and per-

mits the use of emission-control equipment, for which precise intake-air monitoring is an essential requirement.

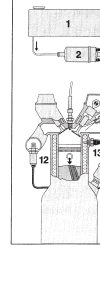
Operating concept

The intake air flows through the air filter, the air-flow sensor, and the throttle valve, before entering the intake manifold and continuing to the individual cylinders.

The fuel is delivered from the fuel tank by an electric (roller-cell) fuel pump. It then flows through the fuel accumulator and fuel filter to the fuel distributor. A primary-pressure regulator in the fuel distributor maintains the fuel at a constant primary pressure. The fuel flows from the fuel distributor to the injectors. Excess fuel not required by the engine is returned to the fuel tank.

Schematic of a K-Jetronic system

1 Fuel tank, 2 Electric fuel pump, 3 Fuel accumulator, 4 Fuel filter, 5 Warm-up regulator, 6 Injector, 7 Intake manifold, 8 Electric cold-start valve, 9 Fuel distributor, 10 Air-flow sensor, 11 Pulse valve, 12 Lambda oxygen sensor, 13 Thermo-time switch, 14 Ignition distributor, 15 Auxiliary-air valve, 16 Throttle-valve switch, 17 ECU, 18 Ignition switch, 19 Battery.



Electronically controlled braking system (ELB) for commercial vehicles 871

DRM pressure-control modules (Figure E)

a) Single-channel pressure-control module

b) Two-channel pressure-control module

1 Electronic control unit

2 Wheel-speed sensor

3 Brake-lining wear sensor

4 CAN + monitoring module

5 "Backup" valve

6 Inlet valve

7 Outlet valve

8 Pressure sensor

9 Filter

10 Relay valve

11 Silencer

12 "Backup" circuit

13 Supply

14 Brake cylinder

15 ALB

16 ECU

17 PCM-ECU

18 PCM-ECU

19 PCM-ECU

20 PCM-ECU

21 PCM-ECU

22 PCM-ECU

23 PCM-ECU

24 PCM-ECU

25 PCM-ECU

26 PCM-ECU

27 PCM-ECU

28 PCM-ECU

29 PCM-ECU

30 PCM-ECU

31 PCM-ECU

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Sample page
spreads
from the
Bosch
Automotive
Handbook

Pressure-control modules

The pressure-control modules

form the interface between the electronic braking

system and the pneumatic braking force.

They convert the required braking pressures

transmitted via the brake CAN to

pneumatic pressures. Conversion is

carried out by "proportional solenoids" or an

inlet/outlet solenoid combination. A pressure

sensor measures the braking pressure

delivered. Thus, braking pressure

can be controlled in a closed control loop.

The electrically activated "backup" solenoid

shuts off the pneumatic control circuits

of the FSM in order to permit interference-

free electrical pressure control.

Mounting the pressure-control modules

close to the wheels means that the elec-

trical wires for connecting the wheel-

speed sensors and the brake-lining wear

sensors can be kept short. The signals

are transmitted to the central ECU via the

braking-system CAN. This minimizes the

amount of wiring required on the vehicle

substantially.