

Internal Combustion Engines – MAK 493E

MIXTURE PREPERATION in SI ENGINES

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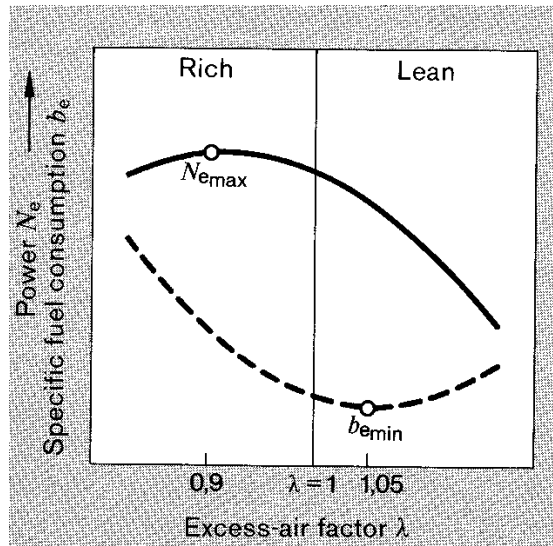


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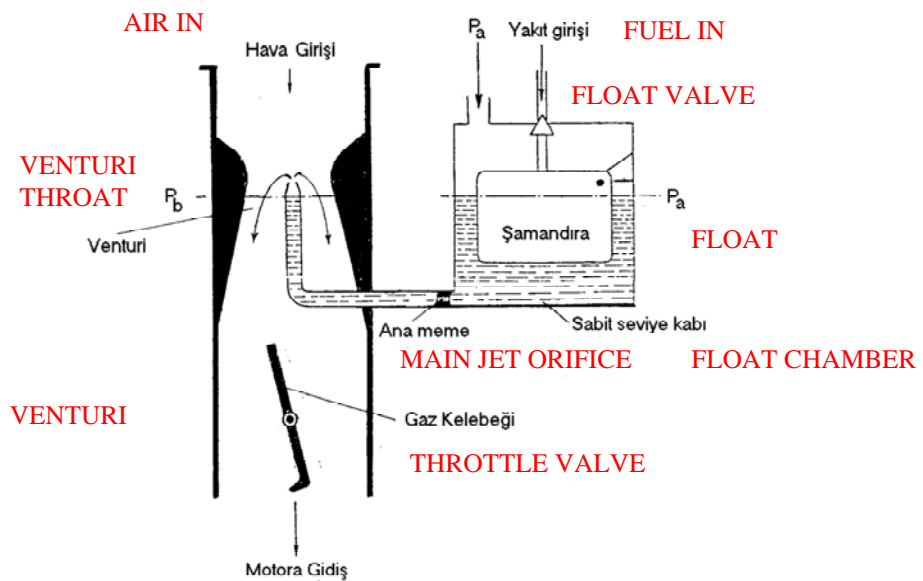
Mixture Preperation

- Introduction – engine performance and emissions
- Carburettors
- Fuel injection systems for gasoline engines

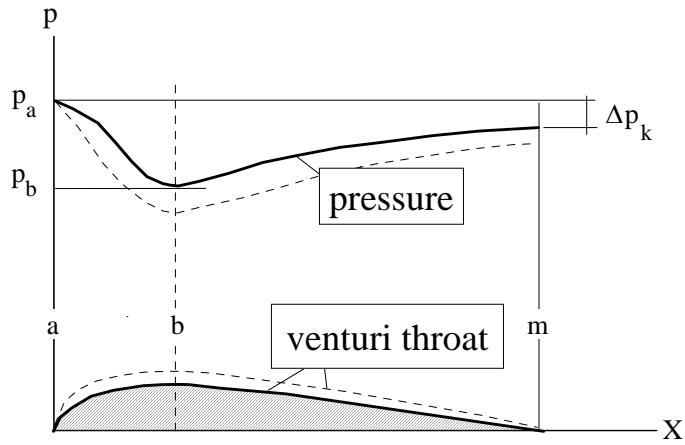
Spark Ignition Engines



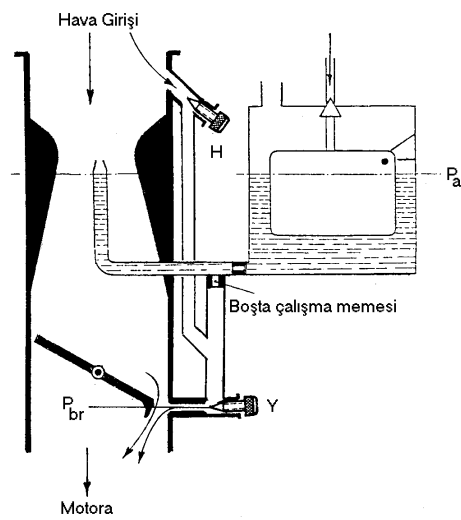
Simple Carburettor



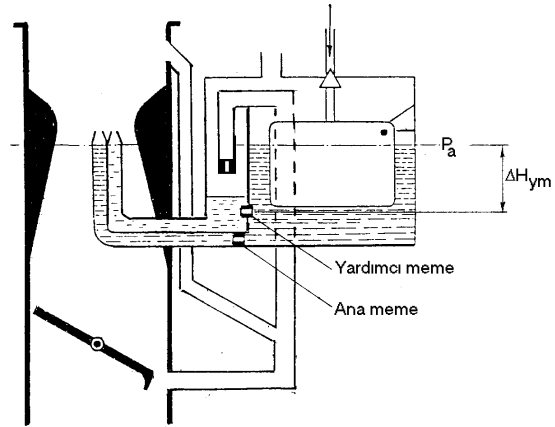
Simple Carburettor



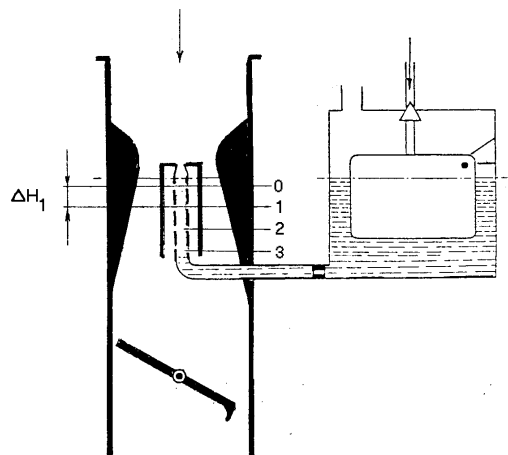
Idle Arrangement in a Carburettor



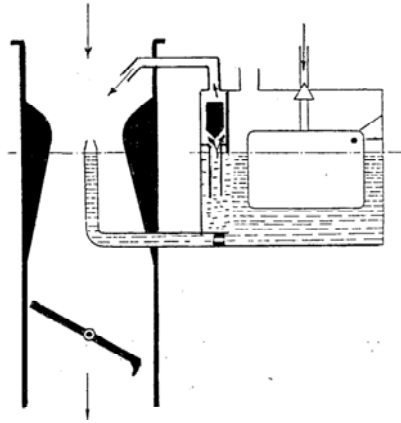
Zenith System – for fuel economy



Solex System – for fuel economy

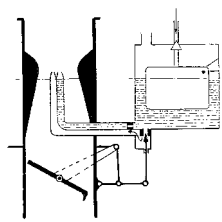


Mixture Enrichment – for high power operation

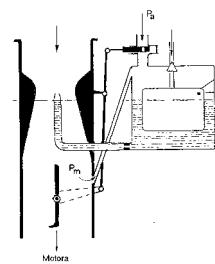


Mixture enrichment with intake manifold pressure control

Mixture Enrichment – for high power operation

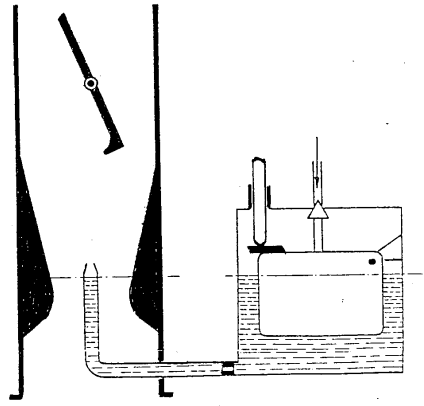


Mechanical system



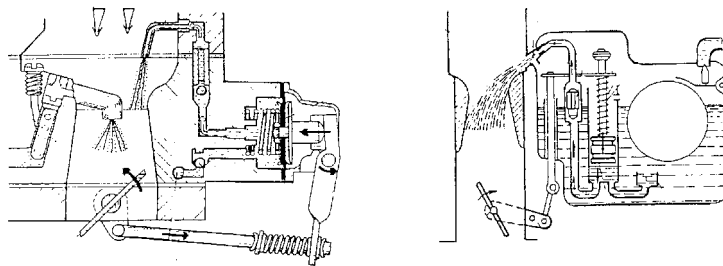
Float chamber pressure control

Start-up Mechanism



Enrichment by increase in fuel flow rate

Acceleration Mechanism



Mixture enrichment mechanisms

Fuel Injection

Classification of Gasoline Injection Systems

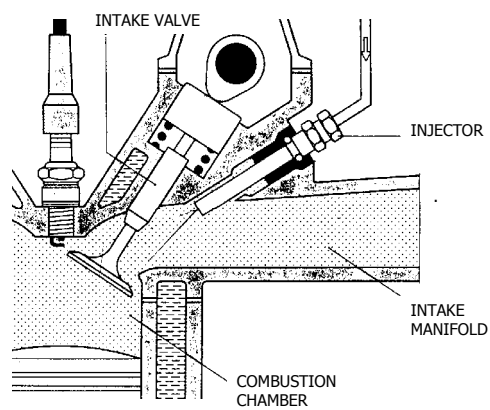
Location of injection :

intake manifold – single point injection, multi point injection
into the cylinder directly (GDI)

Timing of injection :

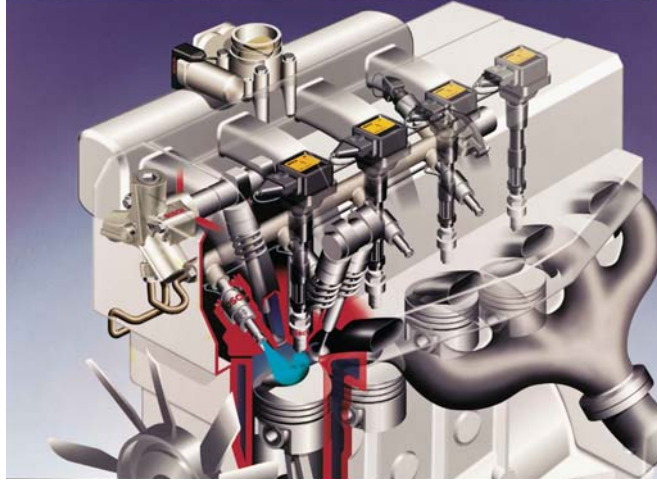
continuous injection
timed injection

Fuel Injection Systems

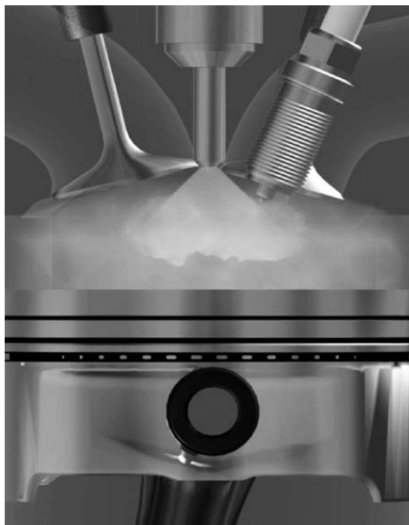


Fuel injection into the intake manifold

Fuel Injection Systems

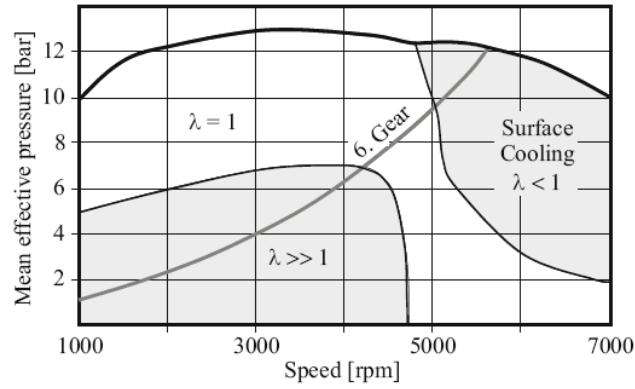


Fuel Injection Systems



Cylinder head configuration
for spray-guided concept

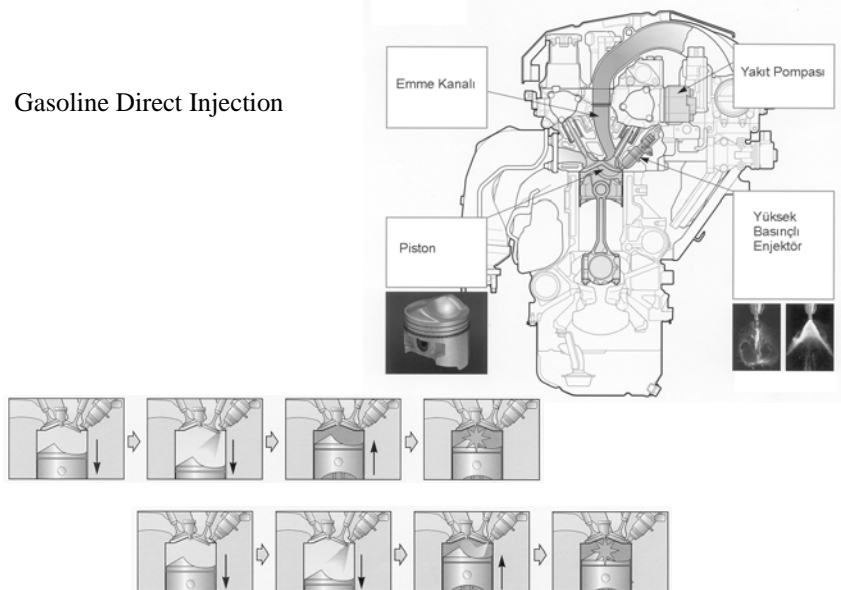
Fuel Injection Systems



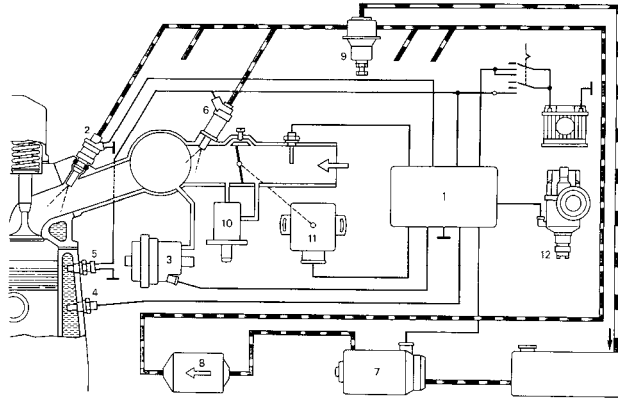
Modes of operation in the characteristic map of a DISI engine acc. to Fröhlich et al. (2003)

Fuel Injection Systems

Gasoline Direct Injection

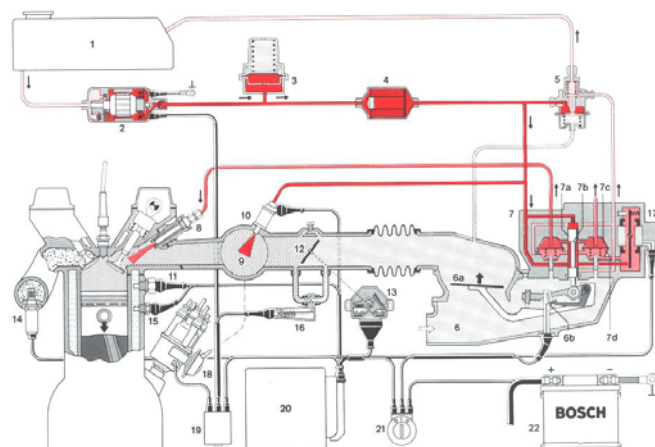


Gasoline Injection



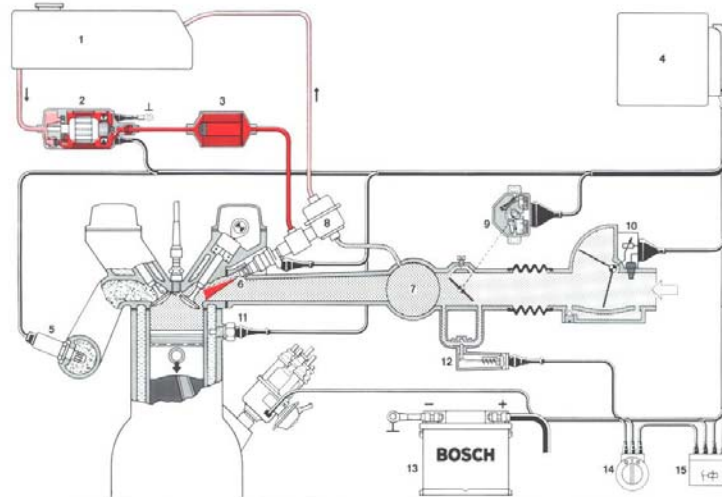
Bosch D-jetronic system

Gasoline Injection



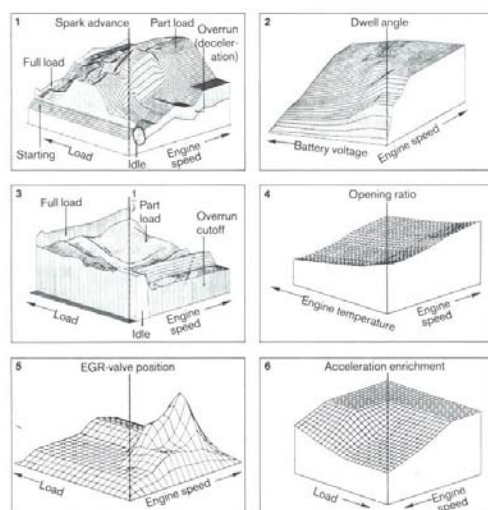
Bosch KE-jetronic system

Gasoline Injection



Bosch L-jetronic system

Control Mechanism – ignition, enrichment, EGR



Control Mechanism – engine r.p.m.

