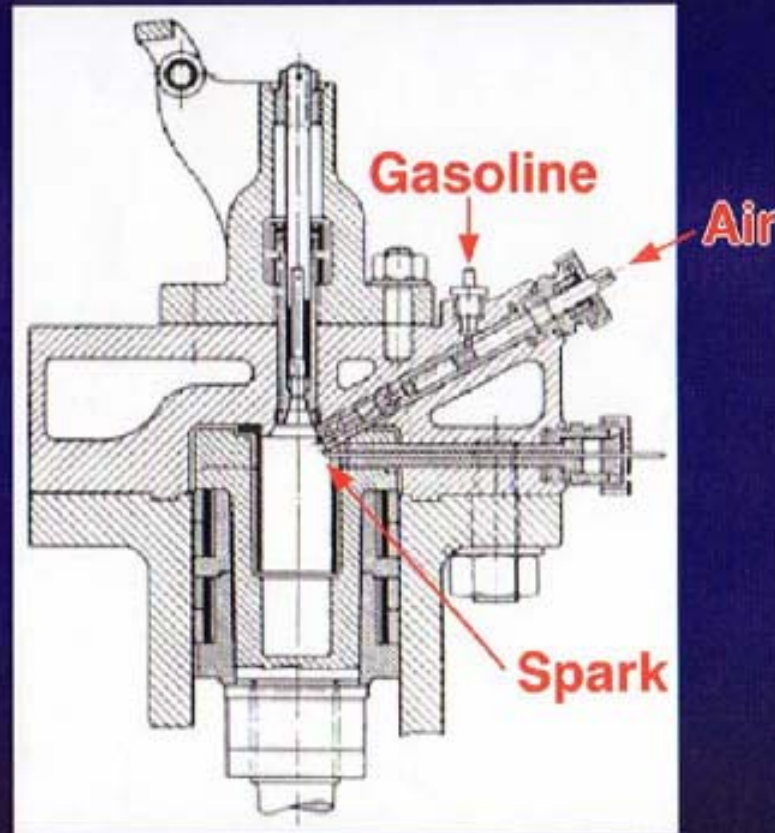




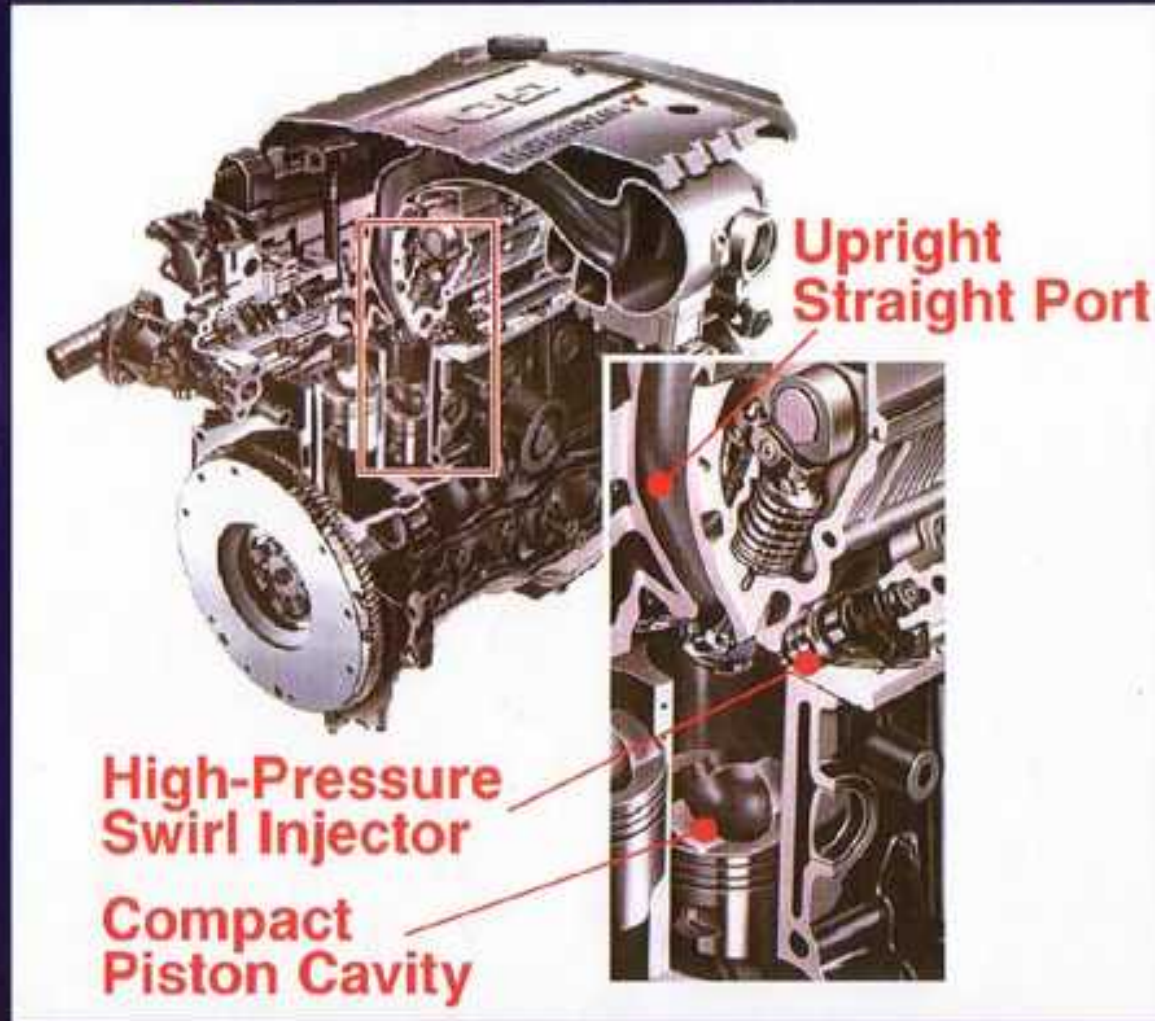
GDI™

Gasoline Direct Injection

Direct Injection SI Engine by R. Diesel (1884)



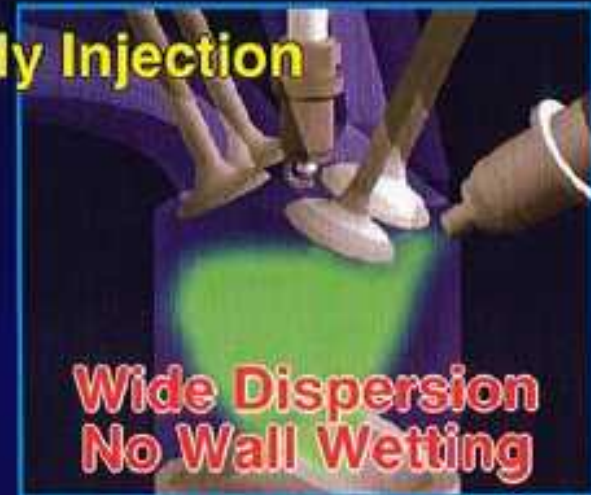
Cutaway View of Mitsubishi GDI



Requirements to Fuel Spray



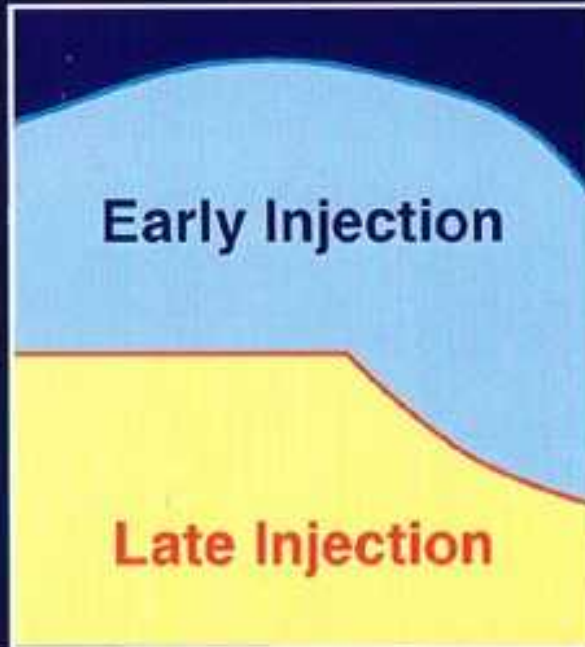
Early Injection



Late Injection



IMEP
MPa

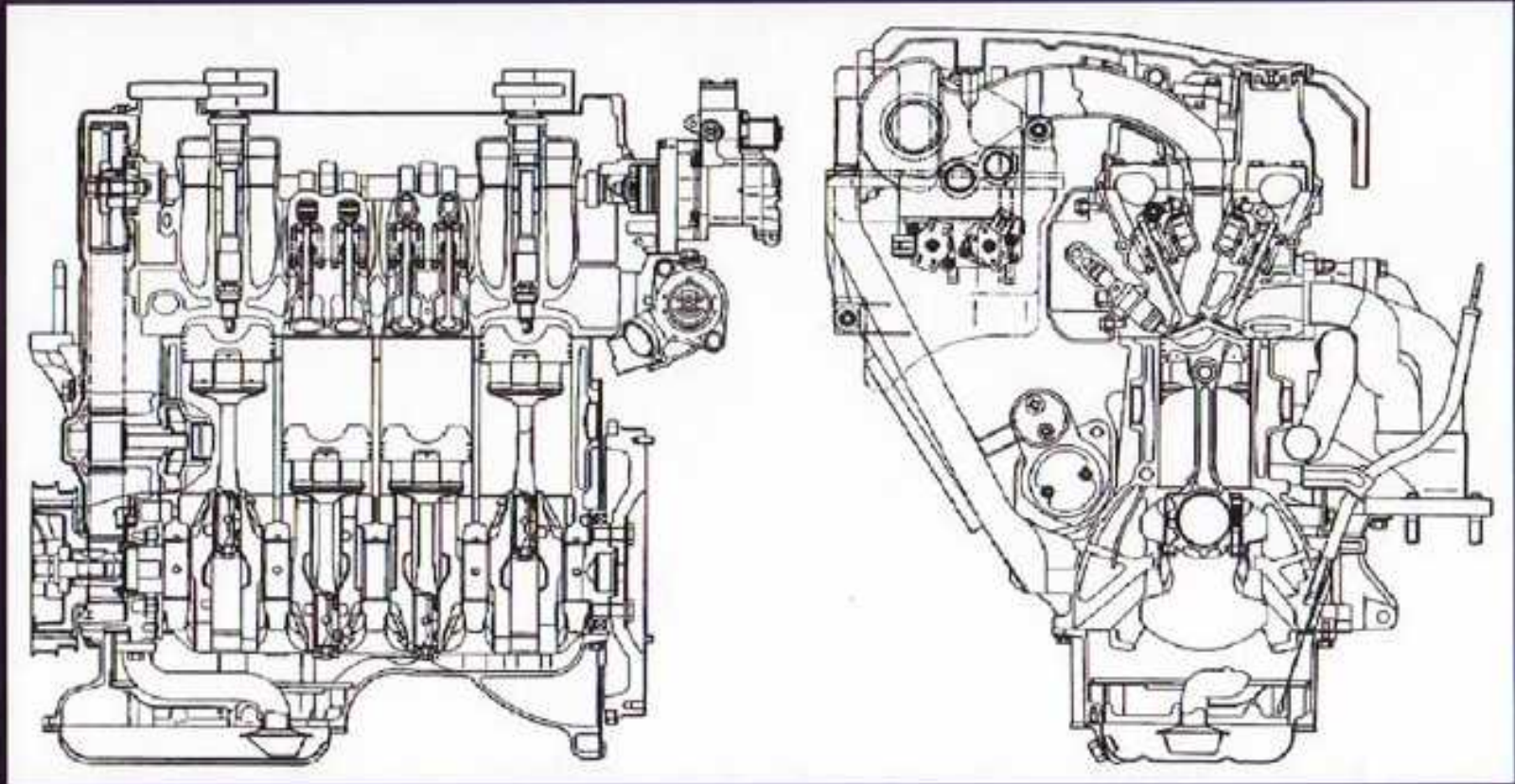


Ne min⁻¹



- CONSTANTLY VARIABLE TRANSMISSION
- HYBRID ELECTRIC VEHICLE
- AUTOMATIC STOP AND GO
- TURBOCHARGING

Cutaway View of Mitsubishi GDI



Side View

Front View



- RICH MODE

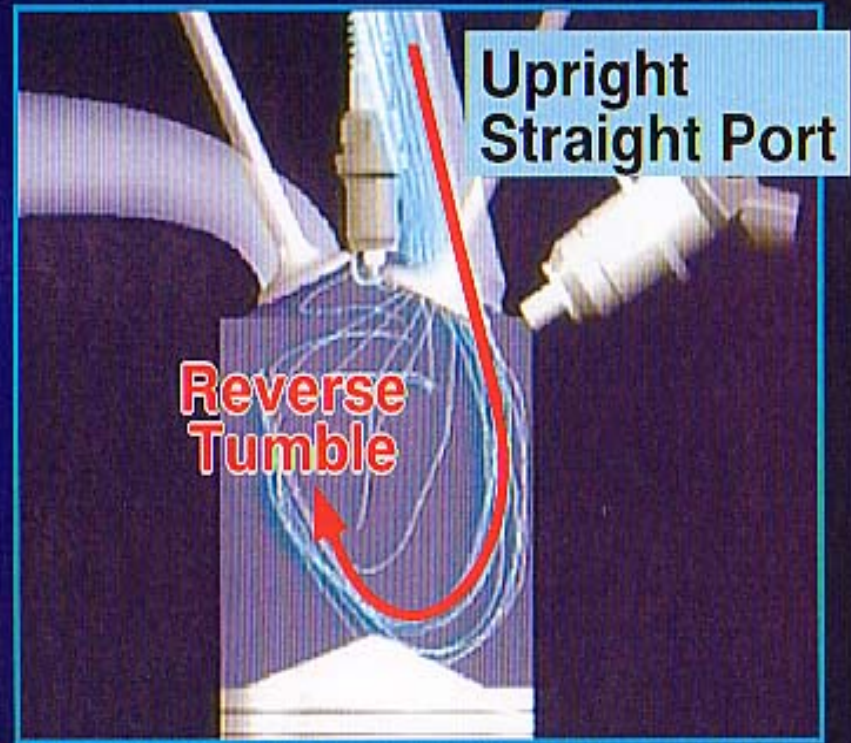
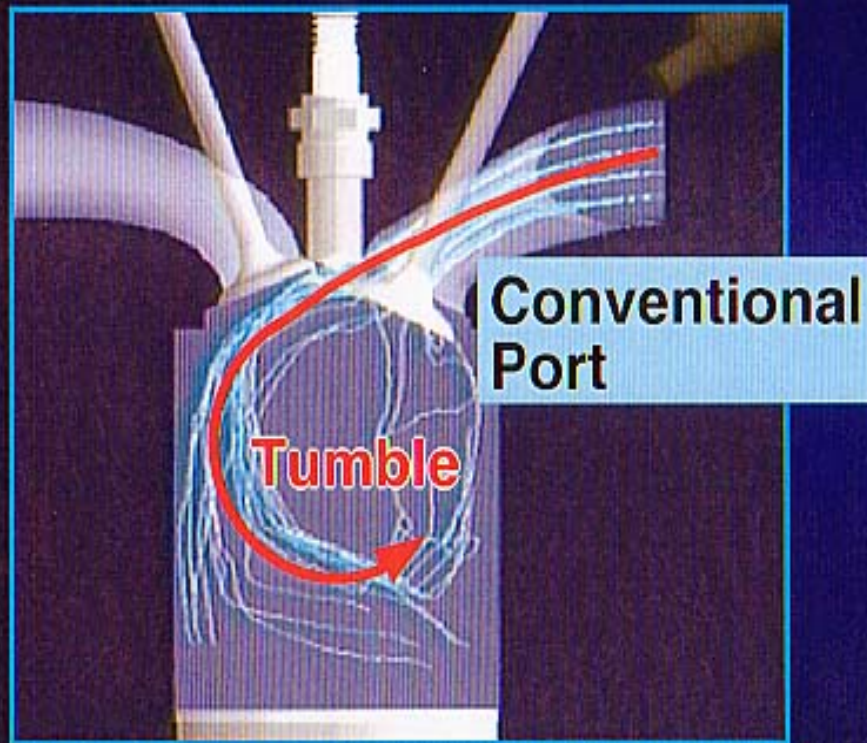
- STOICHIOMETRIC MODE

- COMPRESSION LEAN MODE

Combustion Camber Swirl



Reverse Tumble Generated by Upright Straight Port



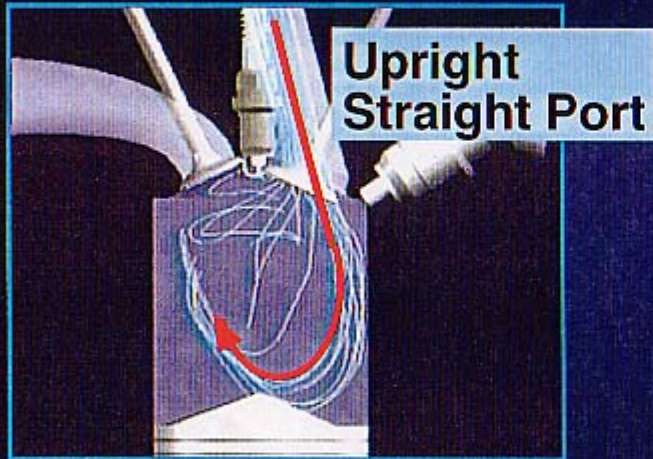
Flow Structures at the End of Intake Stroke

Spherical Piston Cavity



- 1. Control of Spray Impingement**
- 2. Control of Flame Propagation**
- 3. Reverse Tumble Enhancement**
- 4. Reverse Tumble Preservation**

Base Technologies for Mitsubishi GDI



Reverse Tumble



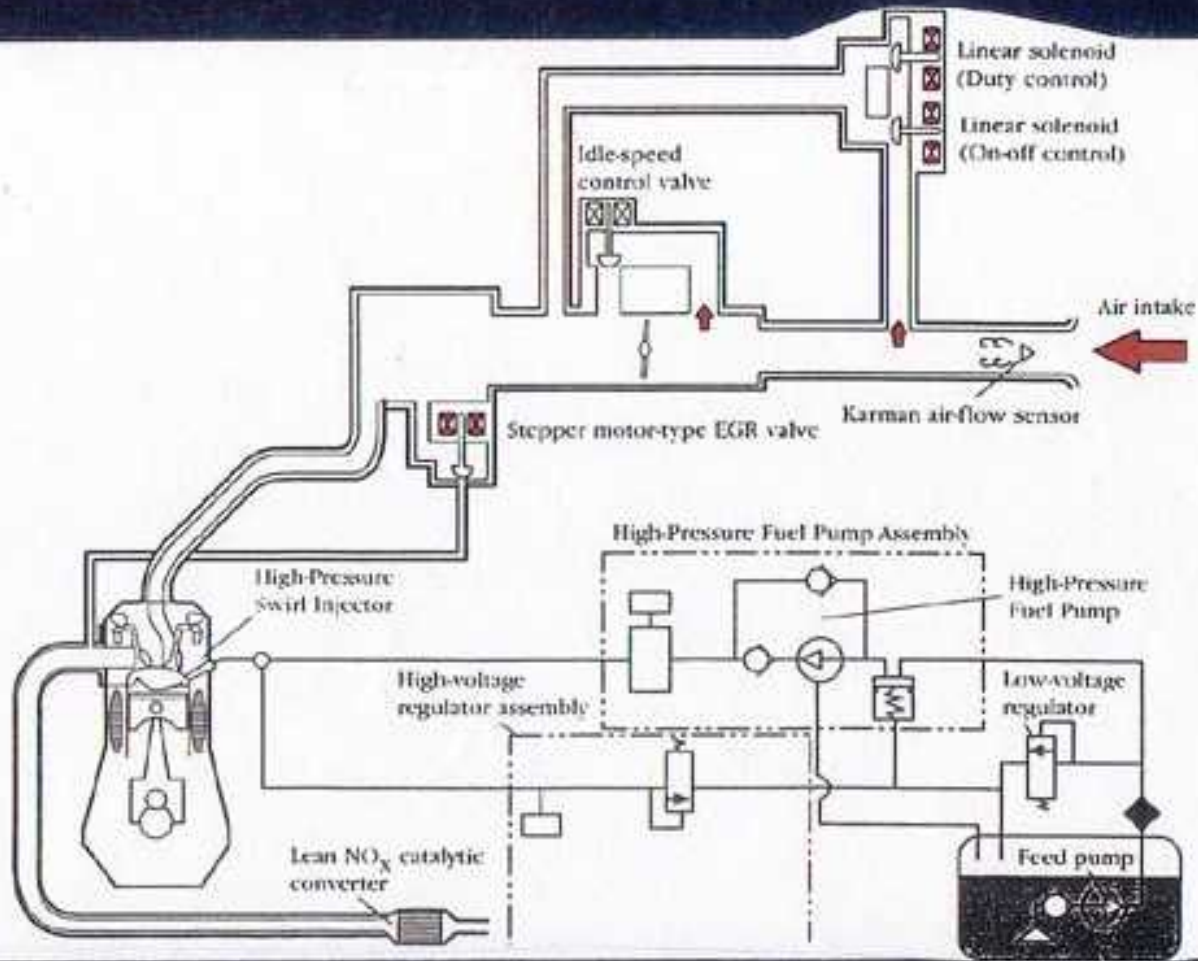
**Spherical
Piston Cavity**



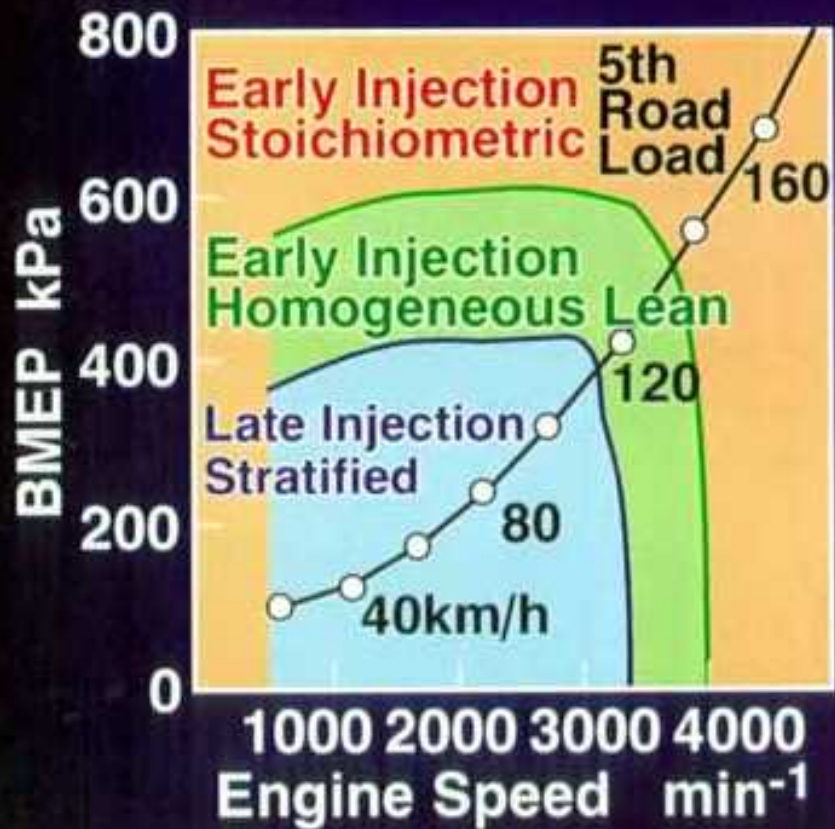
Swirling Spray



System Configuration



Combustion Mode Calibration



Early Injection (A/F:15)

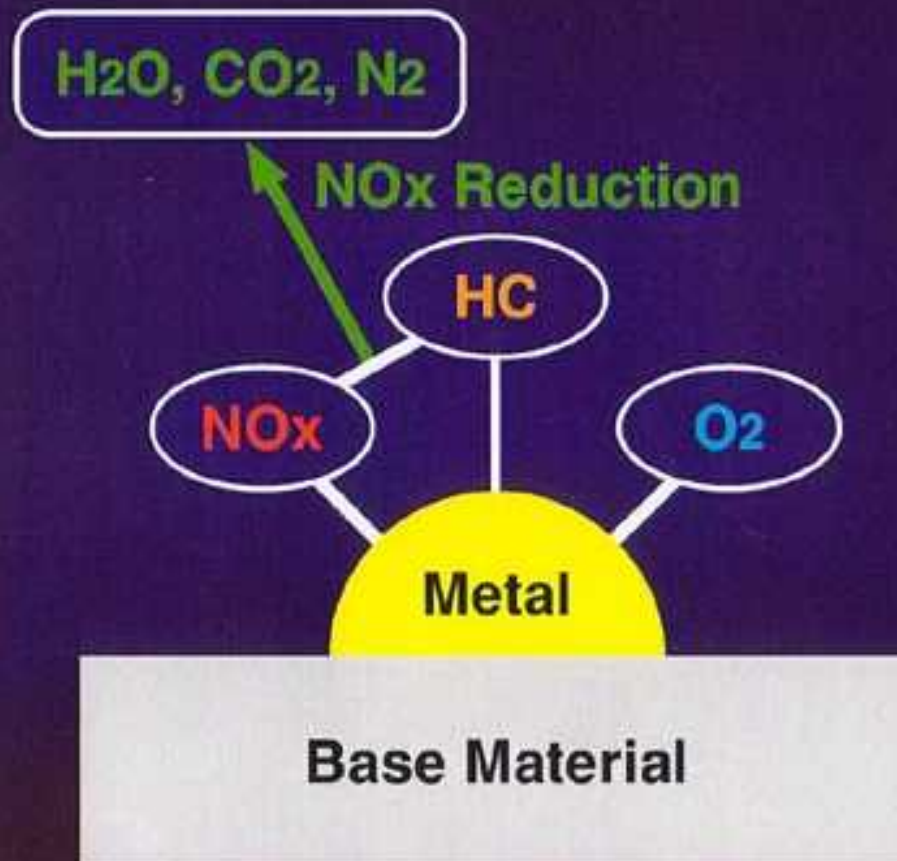


Late Injection (A/F:40)

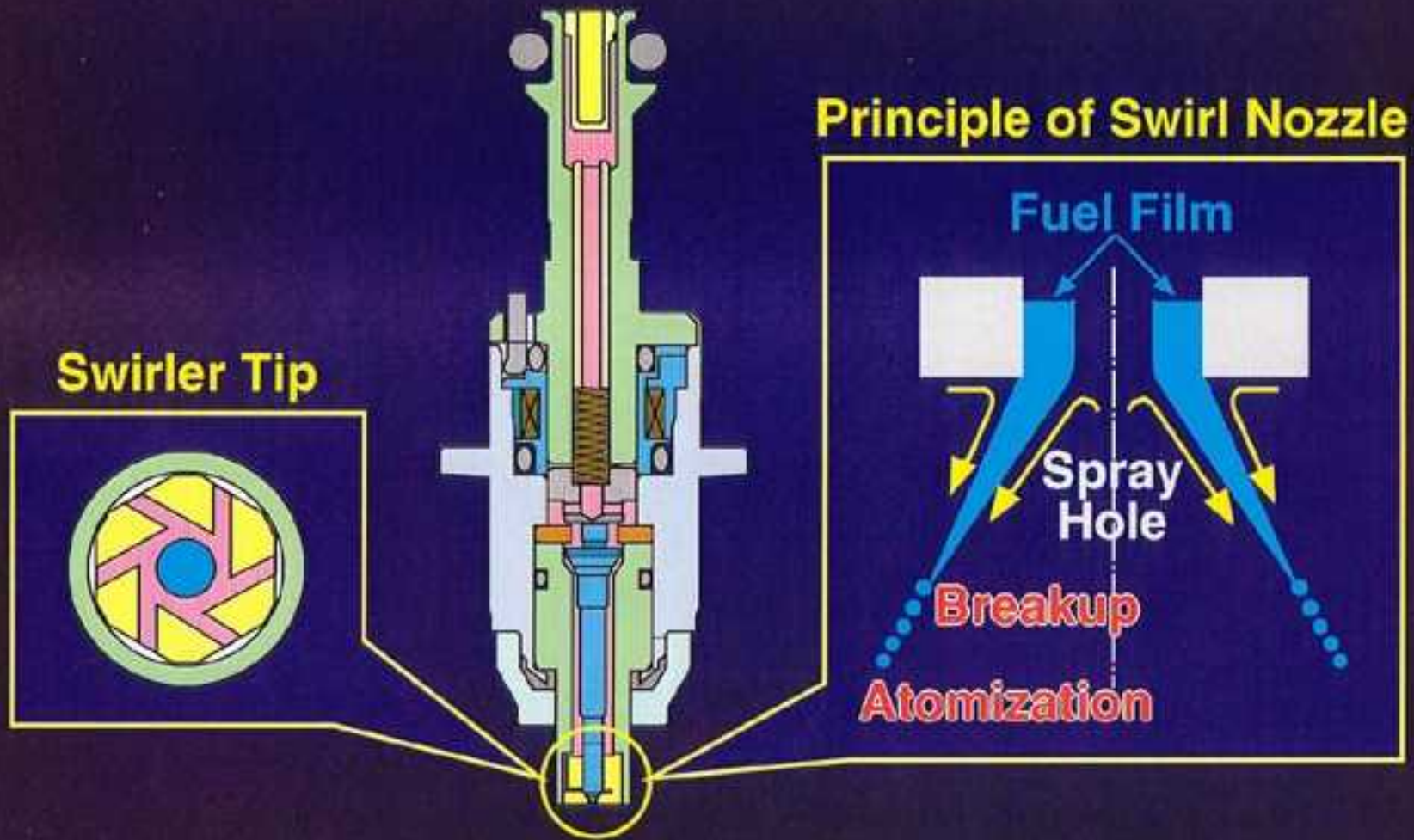


Catalytic NO_x Reduction

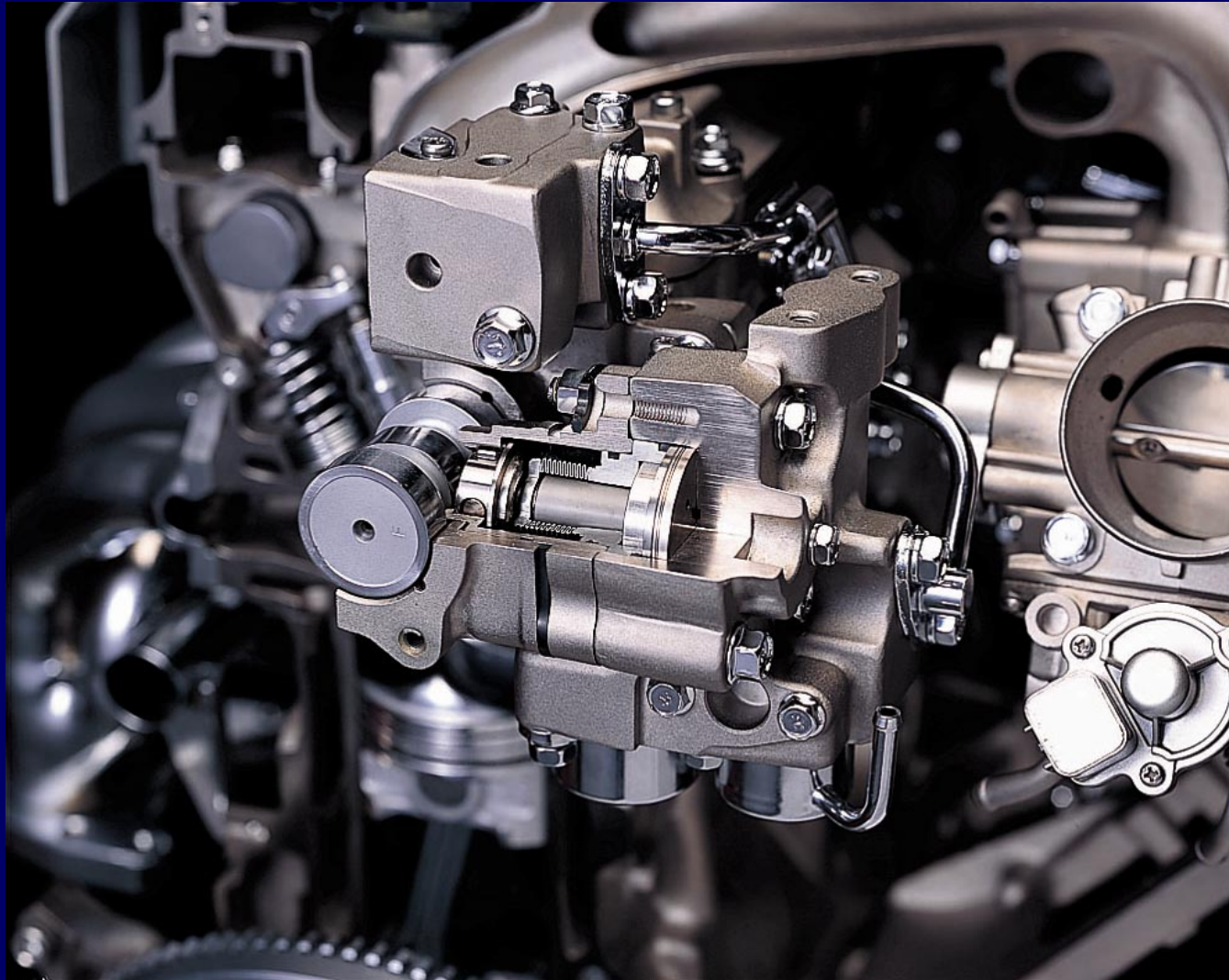
Selective Reaction of HC with NO_x
under Lean Condition



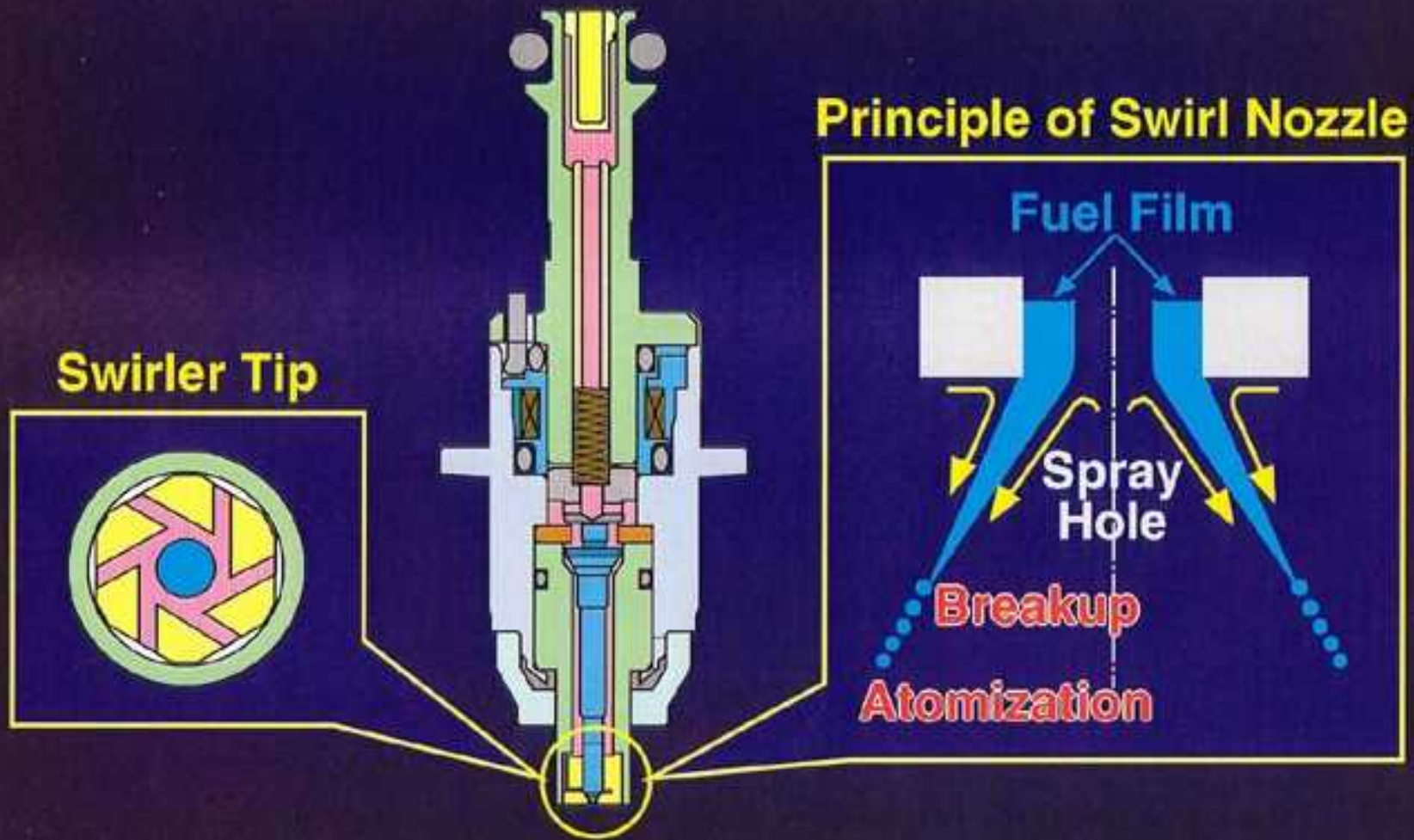
High-Pressure Swirl Injector



High Pressure Fuel Pump



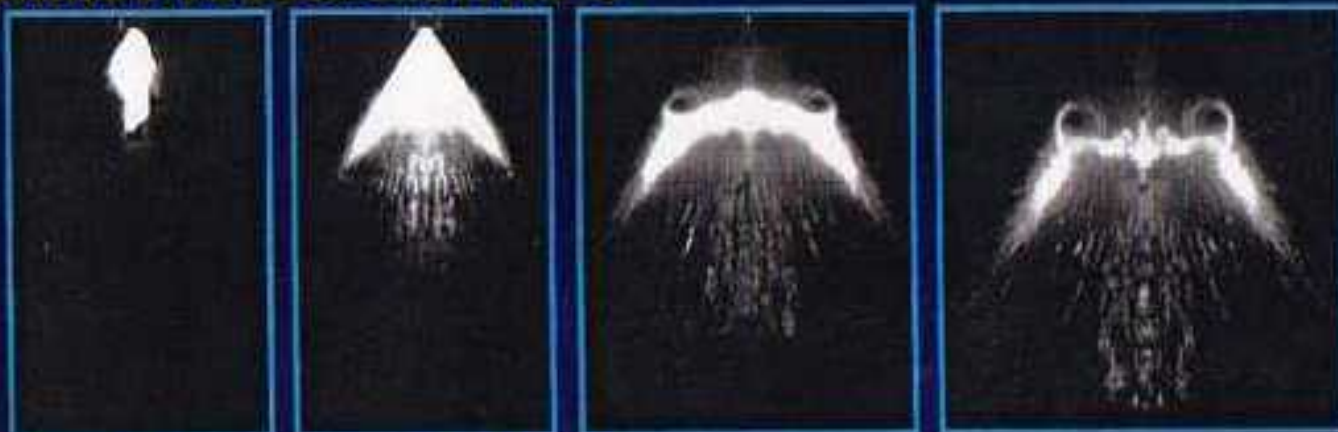
High-Pressure Swirl Injector



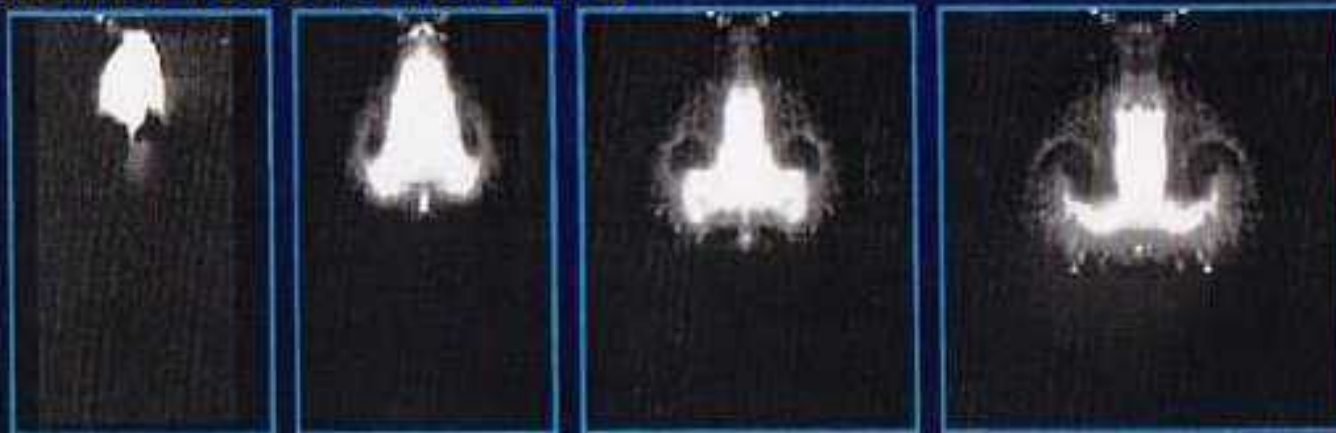
Fuel Spray Structures



Ambient Pressure: 0.1MPa



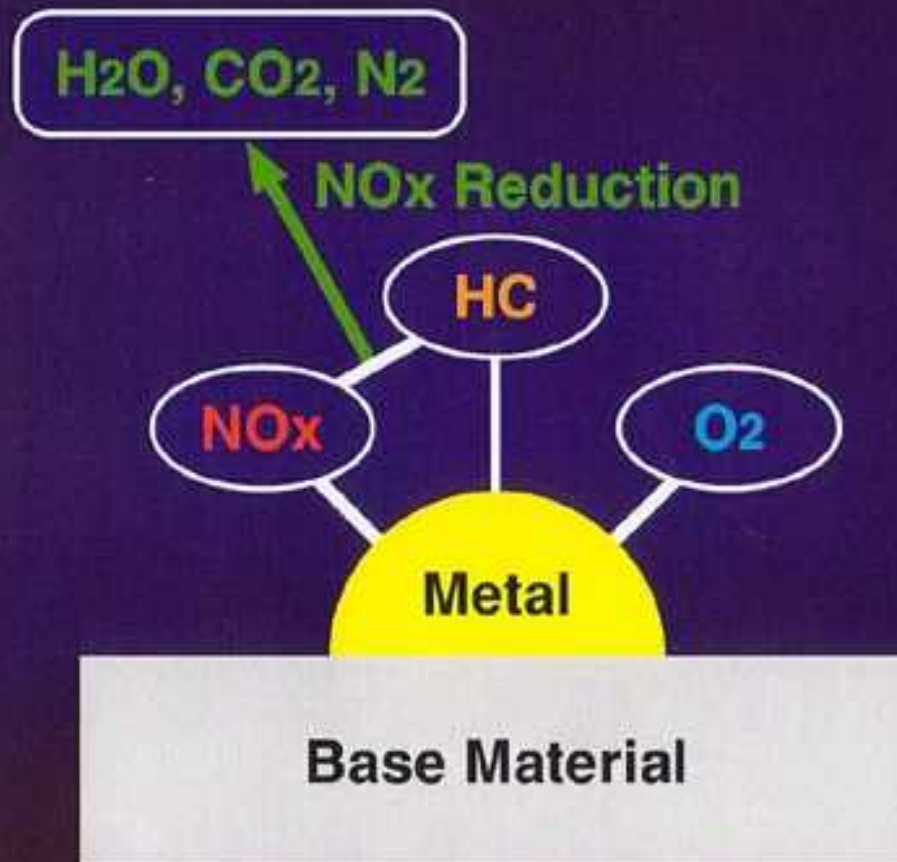
Ambient Pressure: 0.5MPa



End of Injection → Elapsed Time

Catalytic NO_x Reduction

Selective Reaction of HC with NO_x
under Lean Condition



JAPANESE H12 STANDARD



- T. L. E. L 13%
- L. E. V 25%
- U. L. E. V 50%

Benefits of GDI

Less Fuel Consumption

More Power

Less CO₂ Emissions

