

# A Look Towards The Future

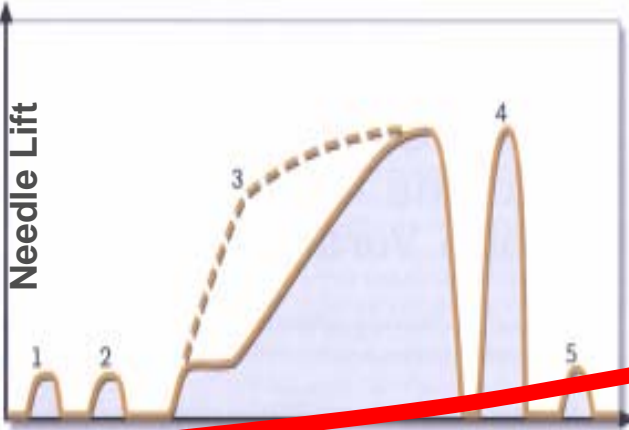
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- Fuel Injection Systems
- Combustion Systems
- Induction and Charge Air Systems
- Valve Actuation Systems
- Engine Control Systems
- Advanced Fuels
- Lube Oil Formulations
- Catalytic Exhaust Emission Control Systems

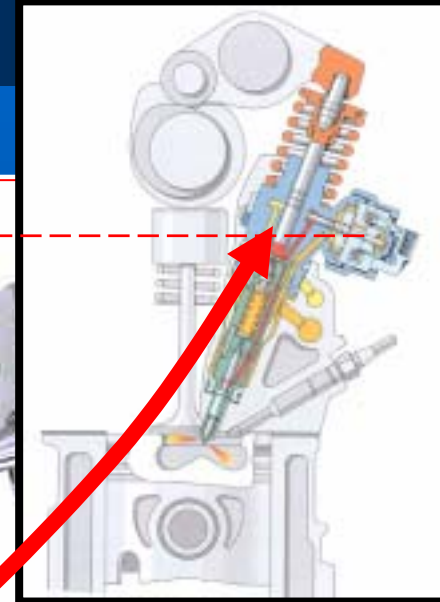
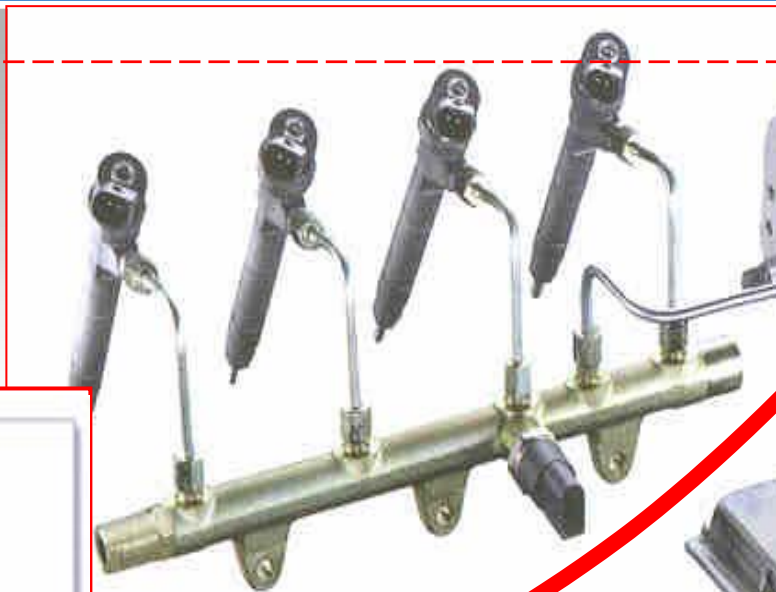
# Fuel Injection Systems

Injection Pressure, Bars

2500 Bar



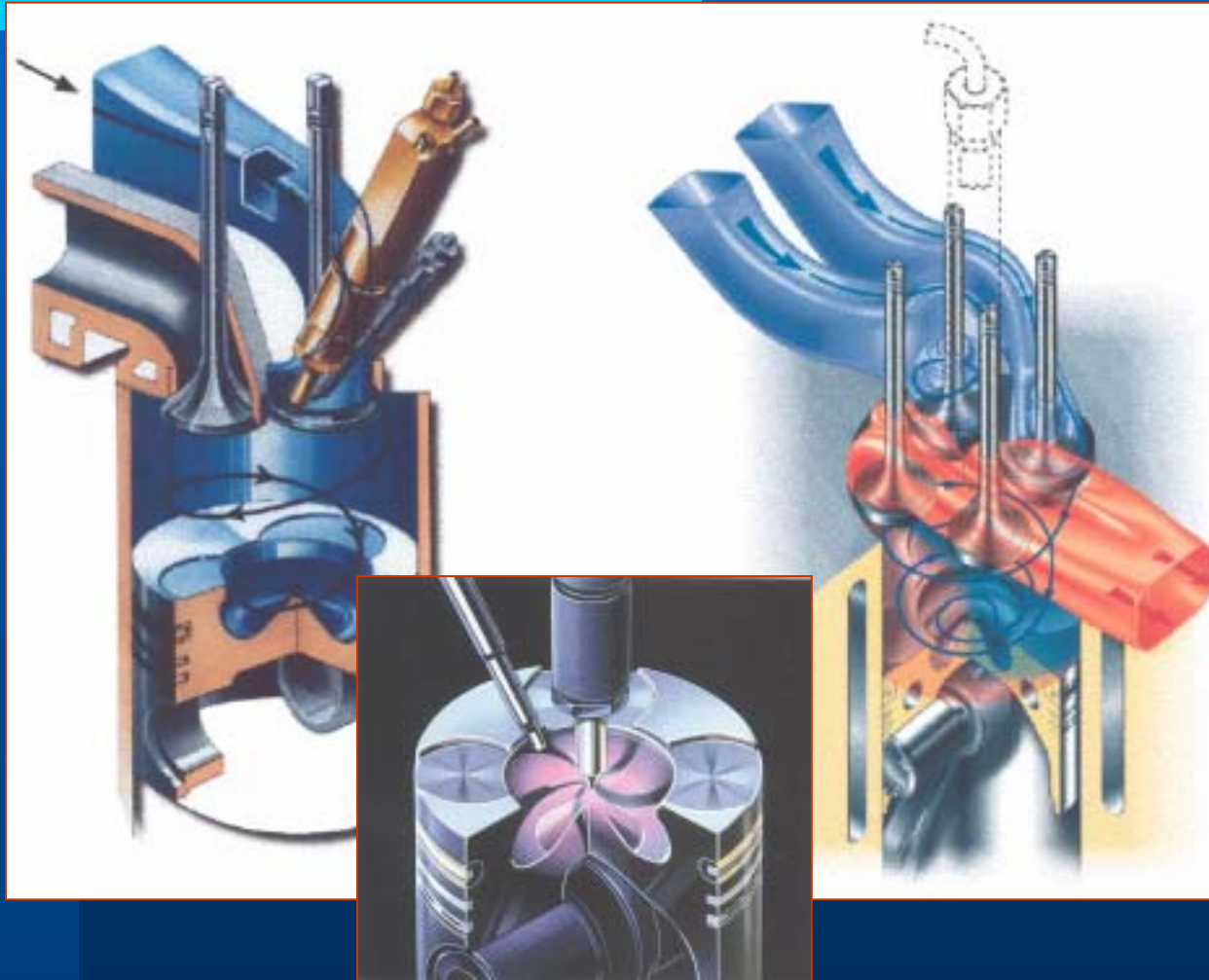
Time



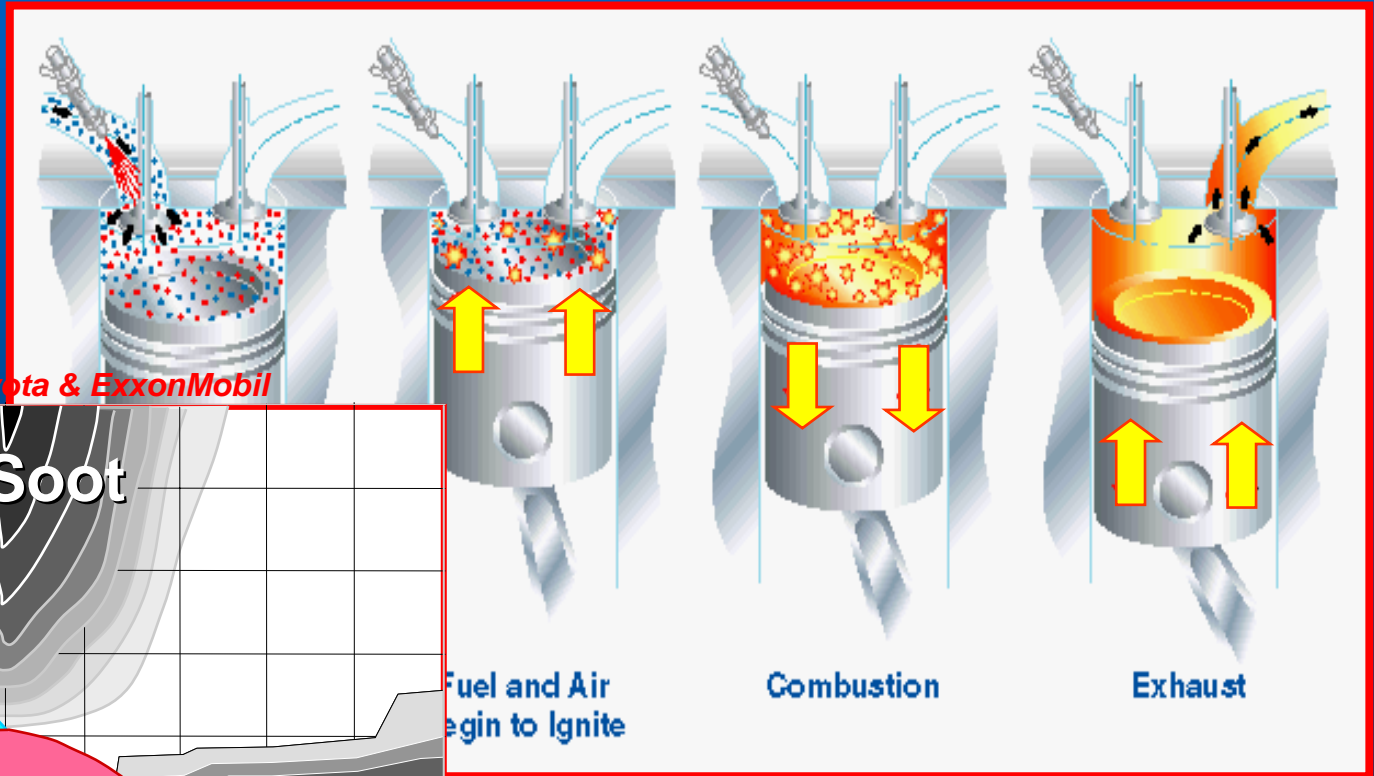
1990

2010

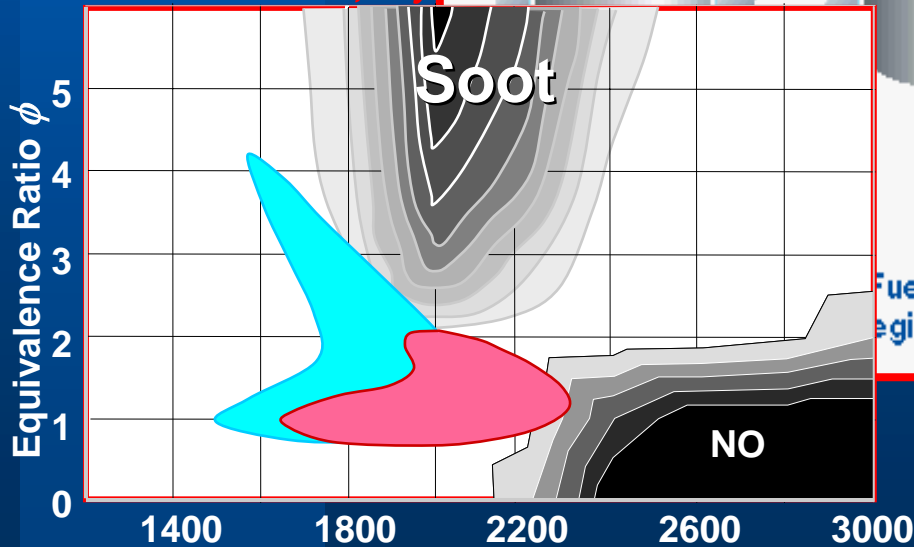
# Upgraded Combustion Systems



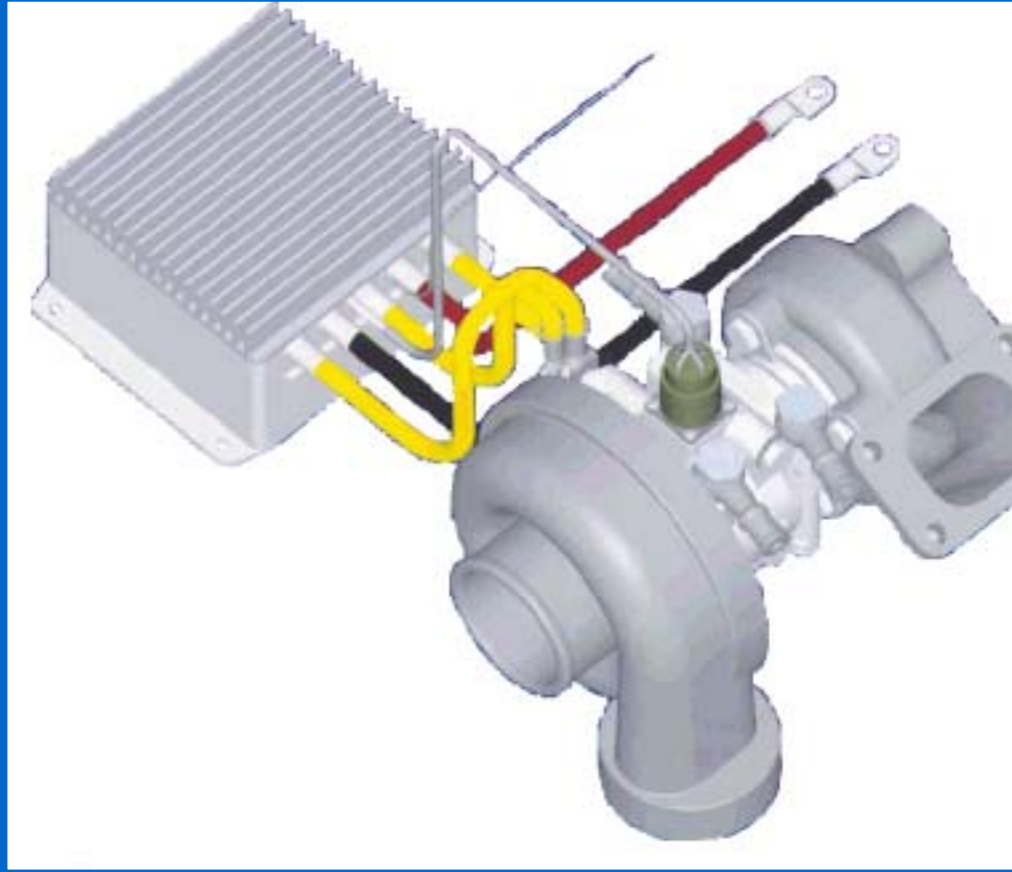
# Novel Combustion Systems



SAE 2001-0-0655 ; Toyota & ExxonMobil



# Induction & Charge Air Systems



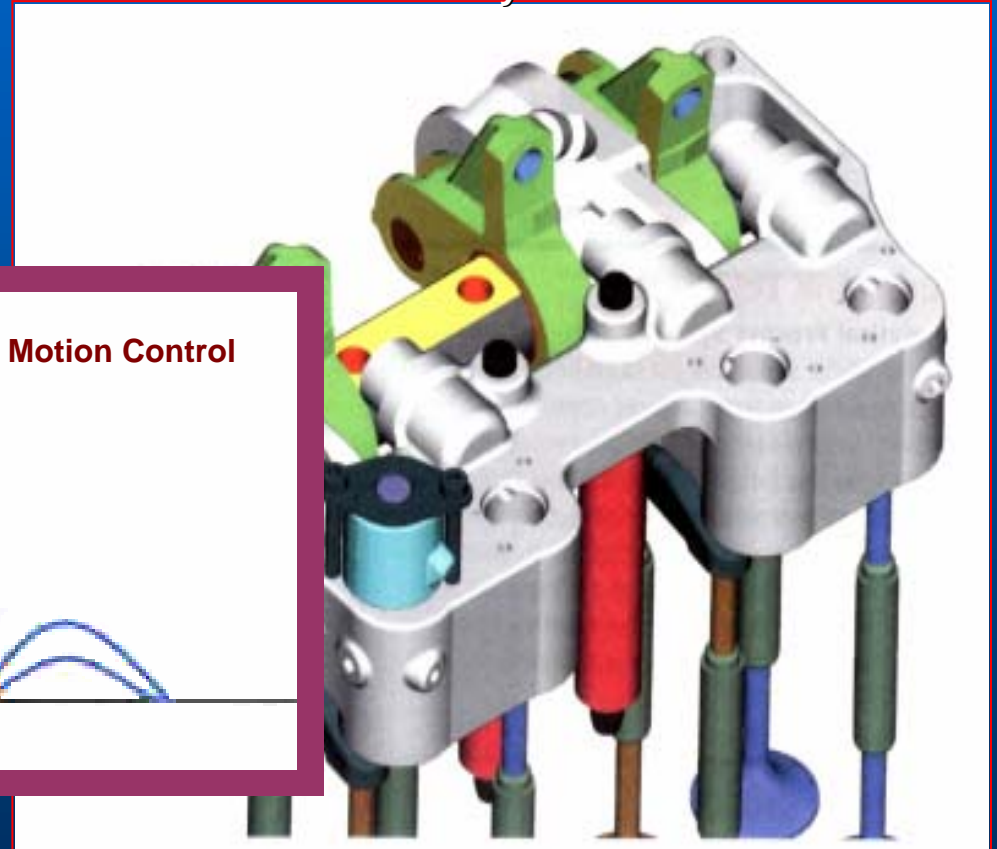
**Acceleration & Smoke Control**

# Valve Actuation Systems

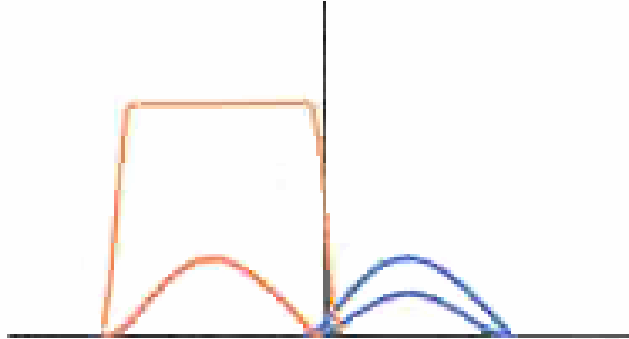
Electro-Mechanical



Electro-Hydraulic

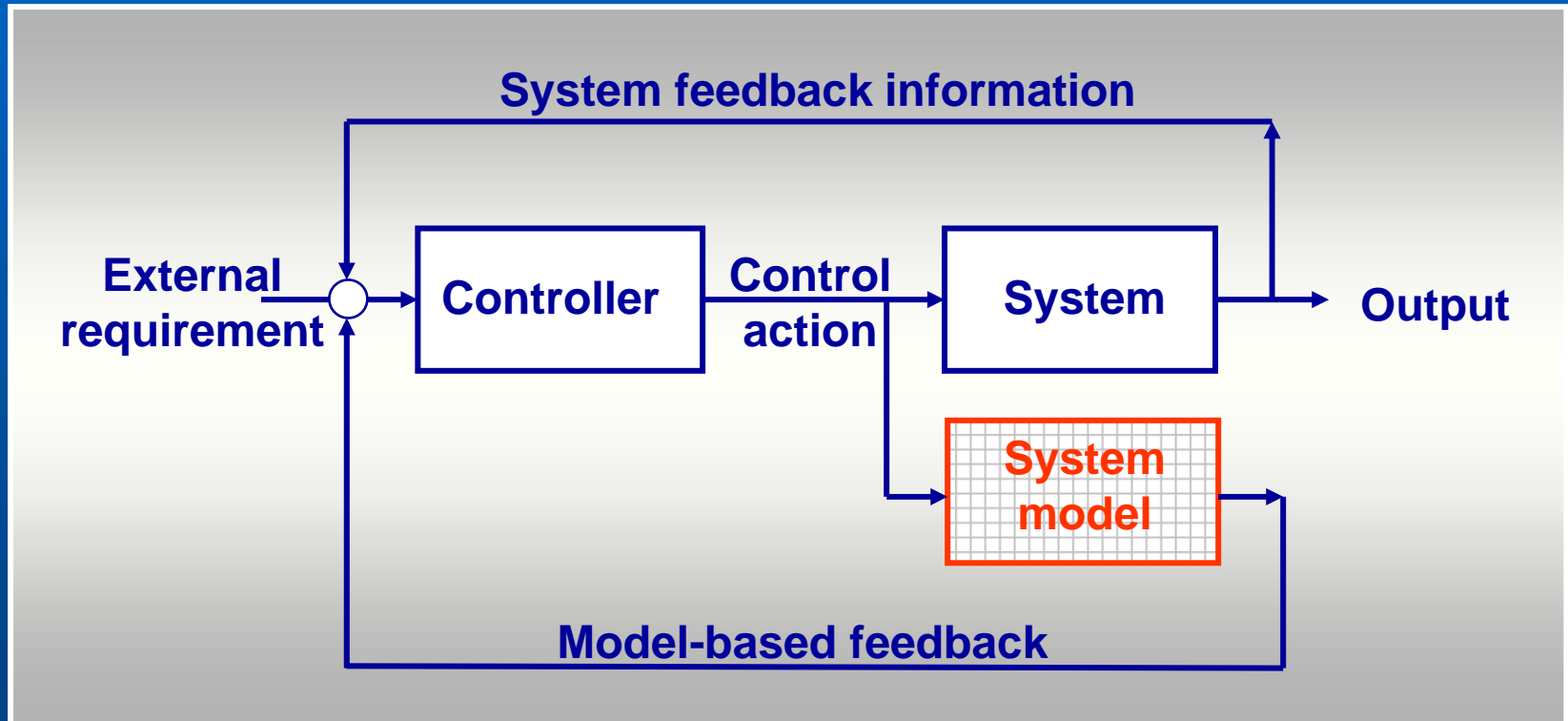


Valve Lift and Valve Motion Control



For Valve Timing and Rate Control

# Engine Controls



More features can be introduced using a mathematical model.