

ELECTRIC OIL PUMP FOR TRANSMISSION

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PACIFICO YOKOHAMA

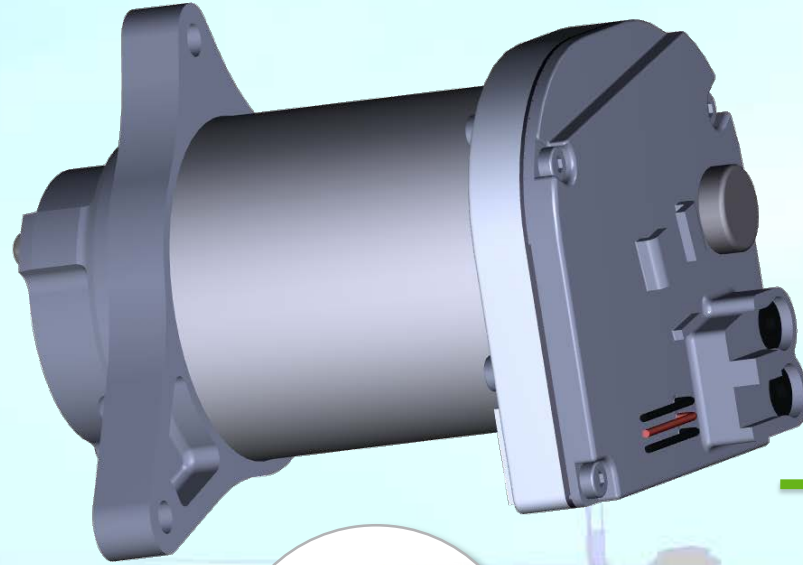
Automotive Steering Japan

Electric Oil Pump for Transmission

Short Introduction of Electric Oil Pump (eLOP)



For Vehicle



Transmission



Smart Electric

Electric Oil Pump for Transmission

Today' Big Issue in The Motorization

Still today,
these are
the issues



Electric Oil Pump for Transmission

Proven Strategies How to Improve Fuel Efficiency



Stop Internal Combustion Engine (ICE) longer

- Coasting, EV mode driving for HEV



Minimize usage of accessories

- Because it is driven by ICE and drain power. For example, Mechanical Oil Pump(MOP)



Run ICE at most efficient region

- Too low/Too high revolution speed both inefficient. Choose optimal gear-ratio all the time

Electric Oil Pump for Transmission

What Limit The Improve Strategies?



Stop ICE longer

- Coasting, EV mode driving for HEV

Cool-down & Lubricate transmission necessary



Minimize usage of accessories

- Because it is driven by ICE and drain power. For example, Mechanical Oil Pump(MOP)

MOP always in proportion with ICE rev.



Run ICE at most efficient region

- Too low/Too high revolution speed both inefficient. Choose optimal gear-ratio all the time

Transmission cannot be actuated while ICE stopping

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Bosch eLOP breakthrough the limits



Stop ICE longer

- Coasting, EV mode driving for HEV

Transmission can be cooled and lubricated when ICE shut-off



Minimize usage of accessories

- Because it is driven by ICE and drain power. For example, Mechanical Oil Pump(MOP)

eLOP boost and assist MOP and optimize oil supply



Run ICE at most efficient region

- Too low/Too high revolution speed both inefficient. Choose optimal gear-ratio all the time

Transmission can be actuated while ICE stopping

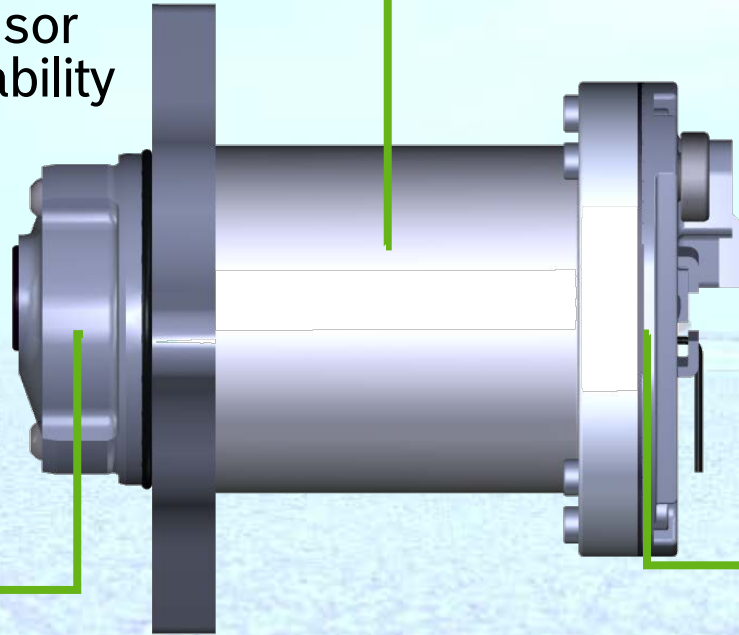
Electric Oil Pump for Transmission

Bosch eLOP breakthrough the limits

Motor

- High performance 700W class
- Integrated rotor position sensor
- High torque and speed capability

- Double stroke vane pump
- Max. pressure of 4.0 MPa
- Max. flow rate of 17 l/min



Design

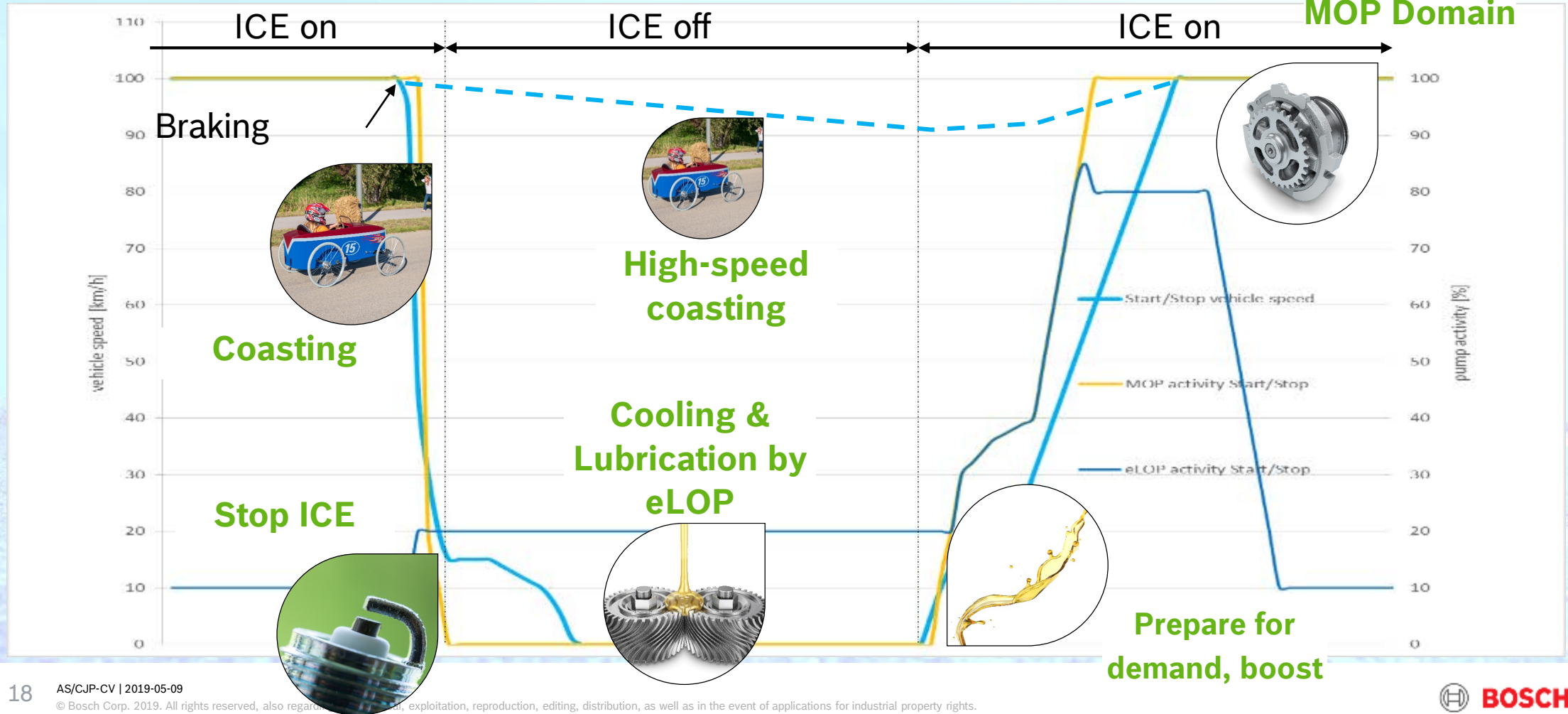
- Cartridge design
- Modular design
- 48V expansion possible
- Automotive grade NVH and reliability
- 32bit Microcontroller
- CAN interface
- Low ohmic power MOSFETs
- Reverse polarity protection

Pump

ECU

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Bosch eLOP Application Model



Electric Oil Pump for Transmission

Summary

- ▶ **Improve fuel economy and reduce emission are the greatest challenges even today**
- ▶ **Let's make it happen with Bosch eLOP**
 - ▶ Stop ICE engine longer such as coasting, EV-mode for HEV
 - ▶ Minimal use of accessories
 - ▶ Run engine at most efficient region
- ▶ **Bosch eLOP features**
 - ▶ High pressure/flow electric oil pump
 - ▶ The system in combine with MOP and Bosch eLOP