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’s Big Issue in The Motorization

Still today, these are the issues

Better Fuel Economy
Lower Emission
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
What Limit The Improve Strategies?

**Stop ICE longer**
- Coasting, EV mode driving for HEV

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**Run ICE at most efficient region**
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**Cool-down & Lubricate transmission necessary**

**MOP always in proportion with ICE rev.**

**Transmission cannot be actuated while ICE stopping**
Electric Oil Pump for Transmission
Bosch eLOP breakthrough the limits

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• Coasting, EV mode driving for HEV

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• 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

Transmission can be cooled and lubricated when ICE shut-off

eLOP boost and assist MOP amd optimize oil supply

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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

Pump

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

ECU
Electric Oil Pump for Transmission
Bosch eLOP Application Model

ICE on ICE off ICE on

MOP Domain

Braking
High-speed coasting
Cooling & Lubrication by eLOP
Prepare for demand, boost

Coasting
Stop ICE
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