



# Navistar Engines for 2017

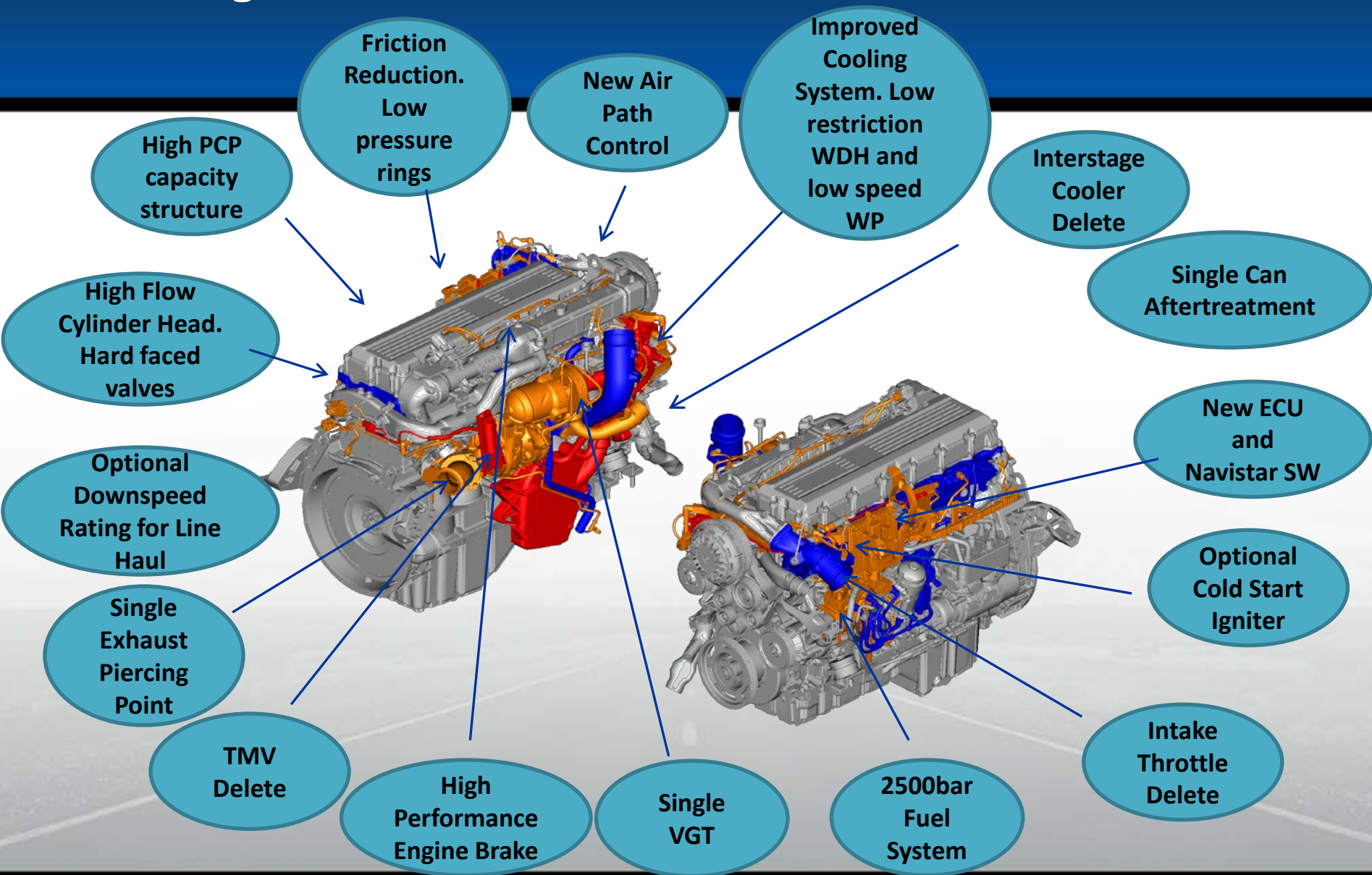
J.Pirie

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# N13 Engine what is new...

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# Proposed Category (PC)-11 Performance and Timing

- First licensing in early 2017.
- The main objective of PC-11 is **fuel economy**
- Due to the desire for lower viscosity/improved fuel economy oils, backward compatibility is not expected. Thus, there will be two oil categories.
  1. Traditional viscosities are covered by PC-11A and will be licensed as API CK-4. Replaces CJ-4.
  2. Lower High Temperature High Shear (HTHS) oils for improved fuel economy are covered by PC-11B and will be licensed as API FA-4.
- Viscosity designations between CK & FA as well as labeling TBD.

# PC-11 Performance Requirements

- Piston Deposits
- Valve-train Wear - three tests
- Ring and Liner Wear
- Adhesive Wear?????
- Oxidation and Nitration
- Aeration – New test example
- Soot induced viscosity increase
- Shear Stability
- Elastomer Compatibility
- Volatility
- SAPS (sulfated ash, phosphorus, sulfur) for aftertreatment compatibility
- High Temperature High Shear (HTHS) – two categories
  - 2.9-3.2 cP
  - 3.5 cP min

# Navistar Plans for PC-11

- Develop 2016/17 engines on both PC-11A and PC-11B oils.
- Evaluate engine durability with PC-11.
  - Testing with PC-11B viscosity grade oils in current engines started in 2011. Various dynamometer and field tests have been completed.
  - Testing will continue as final formulations and engine technologies are available.
- Understand fuel economy benefits of PC-11 with 2016/17 technology.