

ROUSH[®]
INGENUITY ON DEMAND

Todd Mouw

August 10th, 2016

Headwinds for Heavy Duty Alt Fuel Market

- HD OBD waiver expires for 2018MY engines
- Diesel led and then gasoline compliance required for 2016
- Now must monitor and report on any emissions faults (O2 sensors, catalyst, fuel system, etc)
- Significant development and testing cost for compliance
 - a. \$300K plus just in testing per engine family
- Will cause some drop out in the alt fuels market where volumes don't justify the investment
- If development testing not underway now the manufacturer will be late to the party

Headwinds for Heavy Duty Alt Fuel Market

- Higher risk for alt fuels getting a bad name- if OBD is not implement properly could mean higher rates of breakdown and longer service times
- Phase 2 GHG: last proposal was recommending spark ignited heavy duty engines to be classified with diesel for certification purposes- potential large cost driver
- Low NOx: How quickly does “optional” become standard

Headwinds for Heavy Duty Alt Fuel Market

- Public perception issues/California/low carbon fuel standard
- Messaging/strategy around renewable propane
- Lack of adoption by propane industry

Ford/Roush Strategy

- Gas prep engine options from F-150 to F-750
- Beginning 2017MY F-450/550 with 6.8L V10 will automatically come with gas prep; will this roll to other applications?
- Committed to market: 6.8L 3V here through at least end of decade
- Plant consolidation at OHAP except F-53/59
- Help reduce complexity of upfits and order to delivery time

Focus/Opportunity

- Laser focus on class 4-7/diesel displacement
- Target markets: school bus, energy, transit, logistics, food & beverage
 - a. Less than 1,000 of 12,000 school districts penetrated
- Customer focus on reduction in complexity and order to delivery time
- Significant incremental costs to diesel coming the next decade for new greenhouse gas requirements

Focus/Opportunity

- NOx reduction to compete with Cummins CNG 6.7L engine currently certified at .1g/BHP-Hr
- VW settlement funding (\$2.7B)
- Upsell medium duty trucks to school districts who have adopted propane school buses
- Enhanced training for technicians
- Development of additional web based tools for technicians to further reduce downtime