Cummins QSK50 Dual Fuel for Pressure Pumping
Shane Cannon
Dual Fuel Market Leader
Drivers for Natural Gas In Cummins Off Highway Applications

- Environmental Benefits
- Economic Benefits
- Energy Policy
Natural Gas Adoption By HHP Market

Supply

Stationary – O&G Gas Compression
(Traditional Spark-Ignited Market)

Demand

Stationary – Power Generation
(Traditional Spark-Ignited Market)

Now

3+ yrs

Supply

Demand

Now
Cummins QSK50 Tier 2 Dual Fuel Kit

OEM Integrated On-Engine Gas Manifold

CTT Optimized Mixers

EGT’s

Knock Detection

Dynamic Fuel Actuator Valve

Reversible Customer Connection

Off engine Gas Train

Customer Interface Panel

Stainless Steel Muffler w/ Diesel Oxidation Catalyst
QSK50 Dual Fuel Kit

- QSK50 EPA Tier 2 Dual Fuel Kit, 2250 - 2500hp
  - Retrofit and First fit

- Performance is transparent to the QSK50 diesel with no change in installation requirements or maintenance and life to overhaul intervals

- Delivers 70% peak substitution rate, 50% duty cycle average

- Gas train is rated for outdoor use and meets NFPA and CSA requirements necessary for certification

- One system warranty, supported by the Cummins Global Distribution Network
Performance, Emissions and Optimization

- Substitution Rates
- The Impacts of Gas Quality on Substitution Rates
- Dual Fuel Emissions Compared to Diesel Emissions
- Optimizing Combustion

Please contact Shane Cannon at Shane.Cannon@cummins.com for the content that was shared in this section.
Challenges and Lessons Learned

- Stable pressure in the gas delivery system is critical to achieving up time targets and protecting system components.
- An initially inconsistent HHP signal has since proven to be quite reliable.
- Cooling systems maintenance and optimization improves overall system up time and increases diesel displacement.
- Air filters should be clean and balanced bank-to-bank.
- Kits can be installed on older engines (~7500hrs) with a little routine maintenance.
- Every engine is a bit unique and a little extra time spent tuning during commissioning pays dividends on the job.
Successes and Accomplishments

- Dual Fuel Kits in operation for more than 18 months
- First in the industry to run a full spread on field gas
- 500,000 hhp by YE 2013
- 30,000+ dual fuel engine hours
- ~280,000 diesel gallons displaced
  - ~100,000 gallons of LNG
  - ~30 Mmcf of field gas
- **No** base engine failures to date!!!!
Closing Comments

- Dual Fuel Technology delivers quantifiable environmental and economic benefits when implemented properly.

- Engines are capable of running field gas but processed gas offers advantages:
  - Higher substitution rates
  - Better overall efficiencies
  - Better emissions performance
  - Lower capital cost of the kit

- Engine manufacturer’s kits provide optimized solutions offering the greatest TCO benefits, engine warranty and reassurance of emissions compliance.

- Cummins is committed to advancing the use of natural gas in off-highway engine applications.
Cummins - QSK50 Dual Fuel
Thanks!
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