



**Donaldson**<sup>®</sup>  
*Filtration Solutions*

**West Coast Collaborative  
Hawai'i Partners Meeting  
June 25, 2008**

# Topics

- Retro fit of Passive Systems
- CARB Level 1
- CARB Level 2
- CARB Level 3
- Closed Crankcase Systems

# CARB Level 1

- DOCM, DOC – Flow through system
- 25% + PM Reduction
- Minimum temperature requirements
- Most cases direct replacement
- School bus kits
- Different styles

# CARB Level 1

- Some Fabrication
- No maintenance
- Replacement issues – Engine failure
- Pricing - \$1000 - \$1200 installed
- Up to a 5 year warranty

# CARB Level 2

- DMF – Flow through system
- 50% + PM Reduction
- Temperature requirements – Understand  
Understand flow rates and duty cycles  
cycles
- Data logging
- Software

# CARB Level 2

- Most cases direct replacement
- School bus kits
- Different styles
- No maintenance
- Replacement Issues

# CARB Level 2

- Pricing \$5000 to \$6000
- Up to a 5 year warranty

# CARB Level 3

- DPF – Wall through flow
- 85% + PM Reduction
- Higher temperature requirements
- Data logging – Duty cycle
- Duty cycle needs to remain the same

# CARB Level 3

- Most cases direct replacement
- School bus kits
- Many styles
- Some additional parts

# CARB Level 3

- Flow rates – determine size of cores
- Additional hard ware for size of cores  
cores
- Back pressure – build up of soot/ash
- Back pressure monitor/software

# CARB Level 3

- Cleaning requirements/duty cycle
- Air systems
- Heating systems
- Pricing \$9000 – \$12,000
- Warranty up to 5 years

# Closed Crankcase Systems

- 100% PM reduction
- Most applications are able to retro fit
- Some fabrication for mounting brackets  
brackets
- Flow testing
- Look for specifications to determine if  
if engine is a good candidate

# Closed Crankcase Systems

- Important to have a experienced installer installer
- Maintenance for the system and filter filter
- Up to a 5 year warranty
- Pricing \$700 - \$900

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