

# Command PRO EFI Product Updates

# Agenda

- Command PRO EFI Background
- Planned Product Changes

# Kohler Command PRO EFI Background

- Command PRO EFI engine launched in 2009
- We understand the commercial user expects reliability and durability from their equipment
- Kohler Command PRO EFI offers superior reliability to the commercial user through
  - More reliable starting
  - Fewer bad fuel problems
  - Only Kohler's closed-loop technology adjusts to operating conditions to provide the user with consistent performance from day 1 to end of life
- Kohler continues to strive to maintain the Command PRO EFI as the most reliable engine for the commercial user

# Kohler Command PRO EFI Planned Product Changes

- Engine performance will not change
- Engine fit will not change (except wire guard)
- New Reliability Improvements:
  - Regulator Rectifier
  - Other miscellaneous changes

# Kohler Command PRO EFI Planned Product Changes

- Created a Kohler designed 20/25 amp reg/rec with overvoltage protection
  - Automatic reset after 8-10 sec
  - Existing design requires key off to reset
  - Potentially prevents dead batteries
- Introducing a 15 amp reg/rec with overvoltage protection
  - Has same protection as 20/25 amp
  - Applications review required to ensure this can be applied

# Kohler Command PRO EFI Planned Product Changes

- Other Part Changes
  - Current MAP sensor and temperature sensor combined into new T-MAP sensor (T-MAP is now the standard for automotive)
    - Requires changes to manifold to accommodate new sensor
    - Requires changes to wire harness (no impact to customer interface)
  - Throttle Position Sensor change from contacting (brush) to contactless (magnet) to prevent wear
  - Nitride Exhaust Valves provide better durability and emissions
  - Fuse Block change from fir connectors (current) to wing clip connectors (used on 999cc engine) for a more secure fit
    - Requires modification to barrel baffles
  - Crank position sensor bracket
    - Redesign to eliminate creep

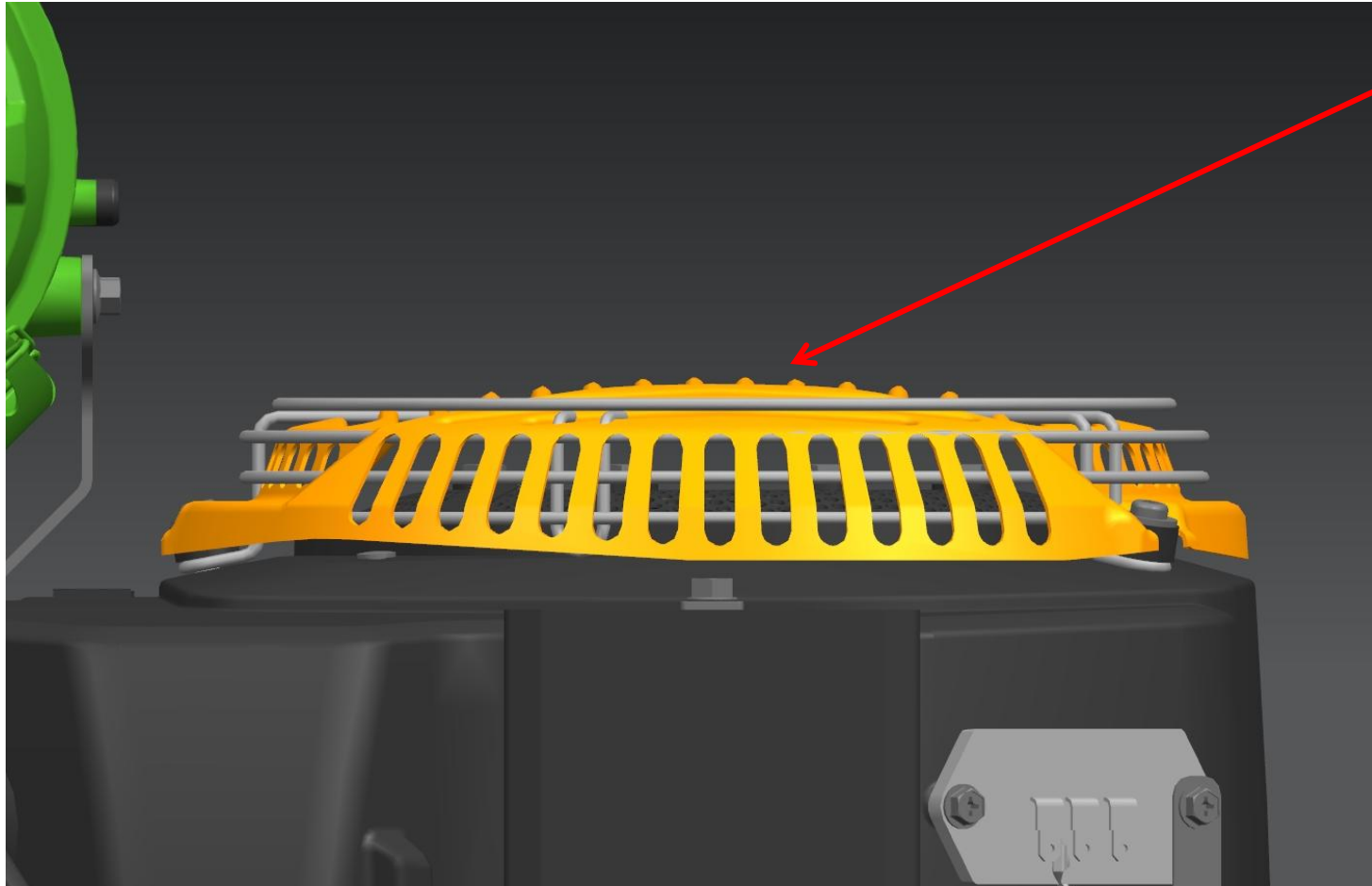
# Grass Screen Guard (All Commercial Engines)

- Replacing the round wire formed guard with a stylized stamped steel guard
  - No change in function
  - Provides distinctive look for Kohler commercial engines



# Grass Screen Guard (All Commercial Engines)

- Size Change (3.5 mm  $\pm$  1 mm)





# Timeline

- New spec numbers assigned
  - New spec numbers allow for easier service by dealers
  - Tracking improved quality
- New specs released: 8-31-2014
- SOP: 10-1-2014

# Appendix

# Sensors

- Replaced individual MAP sensor & temperature sensor with a combination T-MAP sensor
  - Delphi part (T-MAP is now the standard in automotive)
  - Better calibration consistency
  - Slight manifold changes to accommodate new sensor



Temperature Sensor

MAP Sensor



T-MAP Sensor

# Throttle Position Sensor

- Replaced contacting TPS with contactless TPS
  - Extends life by replacing brushes that wear with a magnet to achieve same function



Existing Contacting TPS  
(bushes)



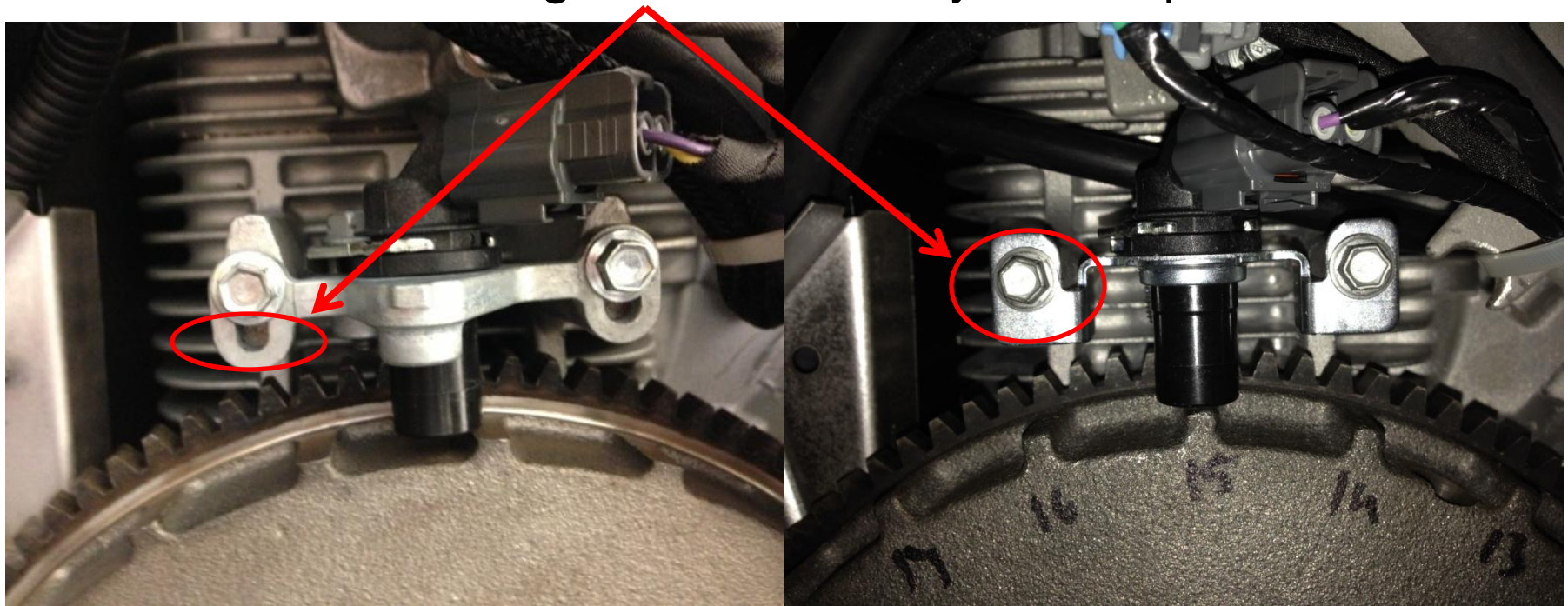
New Contactless TPS  
(magnetic)



Section view of Contactless TPS

# Crank Sensor

- Change in Crank Sensor bracket
  - Prevents teeth from breaking
  - Bracket no longer has the ability to creep



# Exhaust Valves

- Implementing Nitride exhaust valves
  - Improved durability which results in reduced emissions and improved power over the life of the engine



# Fuse Blocks & Barrel Baffles

- Replacing fir tree fuse block connectors with wing clip connectors & modifying baffles to accept clips
  - More secure fit than existing design
  - Wing clip design currently used on Command Pro 999cc

