

INTRODUCING PHILLIPS 66  
CK-4 AND FA-4  
HEAVY DUTY ENGINE OILS



**LUBRICANTS**

# AGENDA

## **CK-4, FA-4 CATEGORY (PC-11)**

**WHAT IS IT?**

**WHAT ARE THE DRIVERS OF CHANGE?**

**WHAT ARE THE OPPORTUNITIES?**

**HOW IS PHILLIPS 66 PREPARING FOR THIS CHANGE?**

The information presented in this file is current as of April 7, 2016. As further research and development continues, details are subject to change.



# PC-11: WHAT YOU NEED TO KNOW.....

**NEXT GENERATION OILS CK-4 AND FA-4 WILL ARRIVE DECEMBER 2016**

**MARKET OPPORTUNITIES ARISE FROM THIS CHANGE**

**PHILLIPS 66 HAS DEVELOPED AN EXPANDED PORTFOLIO OF TECHNICALLY SUPERIOR MARKET-LEADING PRODUCTS TO CAPTURE THOSE OPPORTUNITIES**

**PHILLIPS 66 IS COMMITTED TO PROVIDING THE SUPPORT REQUIRED FOR YOU TO REALIZE THESE OPPORTUNITIES**



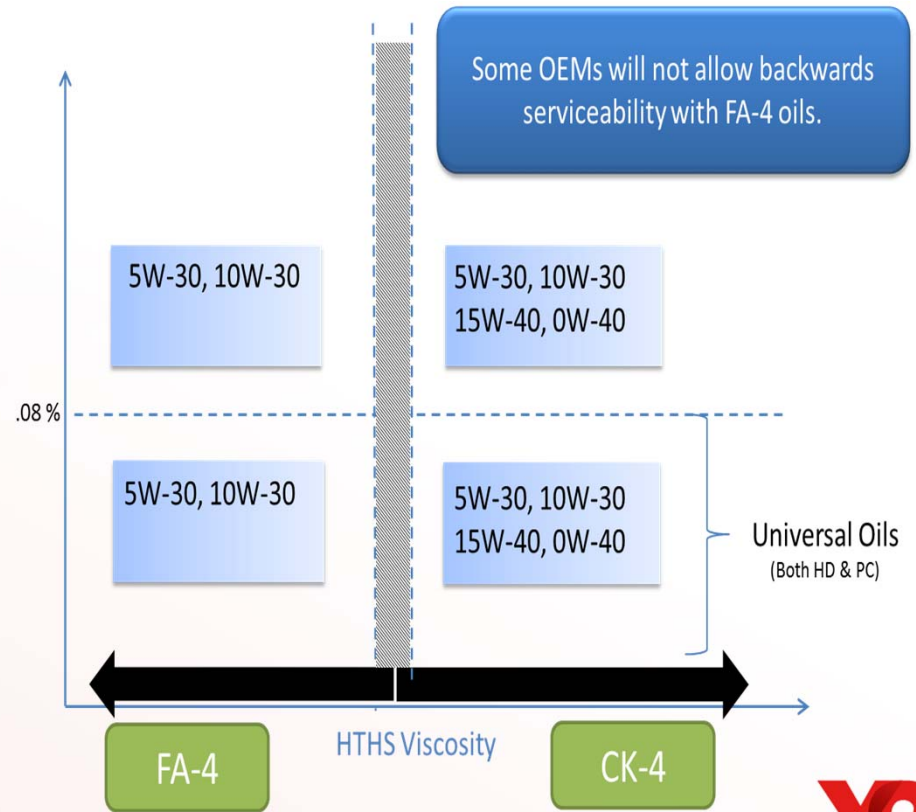
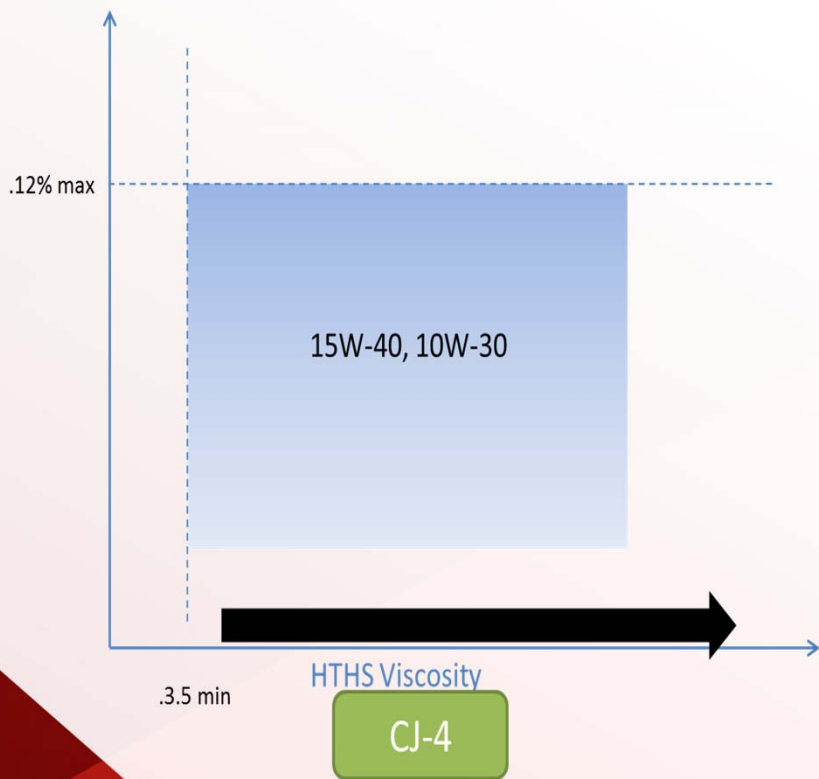
# PROPOSED CATEGORY 11 (PC-11)

## **PC-11 IS NOW OFFICIAL!**

- **2 NEW API SERVICE CLASSIFICATIONS: CK-4 AND FA-4.**
- **CK-4 ALIGNED WITH THE TRADITIONAL PROTECTIVE FEATURES OF CJ-4**
- **FA-4 NEW FUEL EFFICIENT OIL CATEGORY, SPECIFIC TO XW-30 GRADES**
- **HIGHER PERFORMANCE STANDARDS**
- **INTRODUCTION OF CHEMICAL LIMITS FOR “UNIVERSAL OILS”**



# CJ-4 VS. CK-4/FA-4 OILS



# CK-4 / FA-4 OIL DESIGN DRIVERS

## REGULATIONS

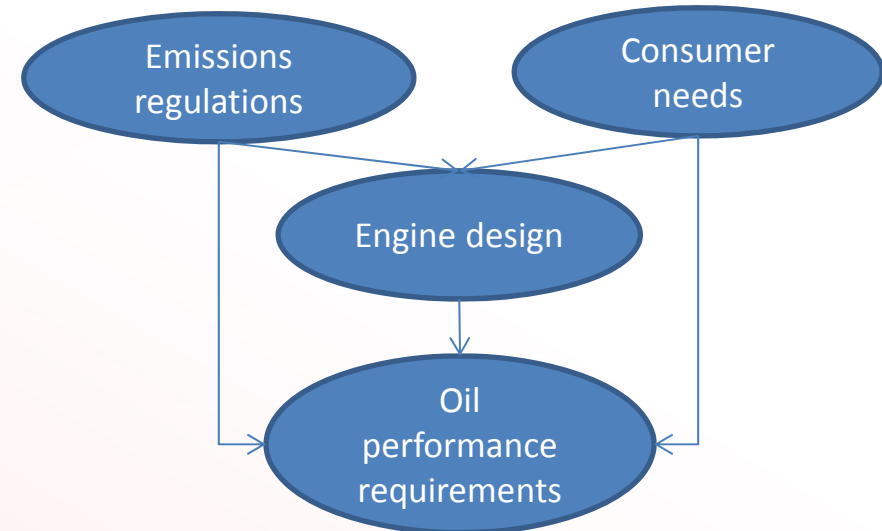
- EPA, CARB
- NO<sub>x</sub>, CO, PARTICULATE
- CO<sub>2</sub> – NEW!

## ENGINE DESIGN

- CHANGING DEMANDS ON THE OIL

## MARKET / CONSUMER

- PRODUCTIVITY
- PRICE - VALUE
- *TOTAL COST OF OWNERSHIP (TCO)*



## EMISSIONS REGULATIONS

- **RETAIN TARGETS FOR NO<sub>x</sub> AND DIESEL PARTICULATE**
- **REDUCE GREENHOUSE GAS EMISSIONS (CO<sub>2</sub>)**
  - **OVERALL AVERAGE REDUCTION OF 15% BY 2018**
  - **REDUCTION CO<sub>2</sub> = IMPROVED FUEL ECONOMY**

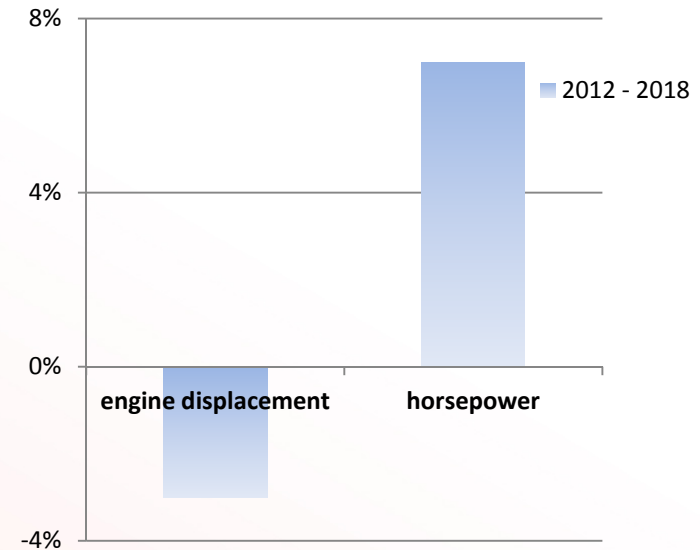
Vehicle type	Reduction targets (Y10 baseline)
Combination Tractors	9%-23%
HD pickups / vans	15%-17%
Vocational vehicles	6%-9%



## ENGINE DESIGNS

- **ENGINE DOWNSIZING**
- **POWER GENERATING TECHNOLOGIES**
  - Advanced turbocharging, waste heat recovery (WHR), advanced injection and in-cylinder improvements, etc.
- **DOWNSPEEDING**
- **ACTIVE OIL TEMPERATURE MANAGEMENT**

**POWER DENSITY TREND  
ON-HIGHWAY DIESEL ENGINES  
THROUGH 2018**



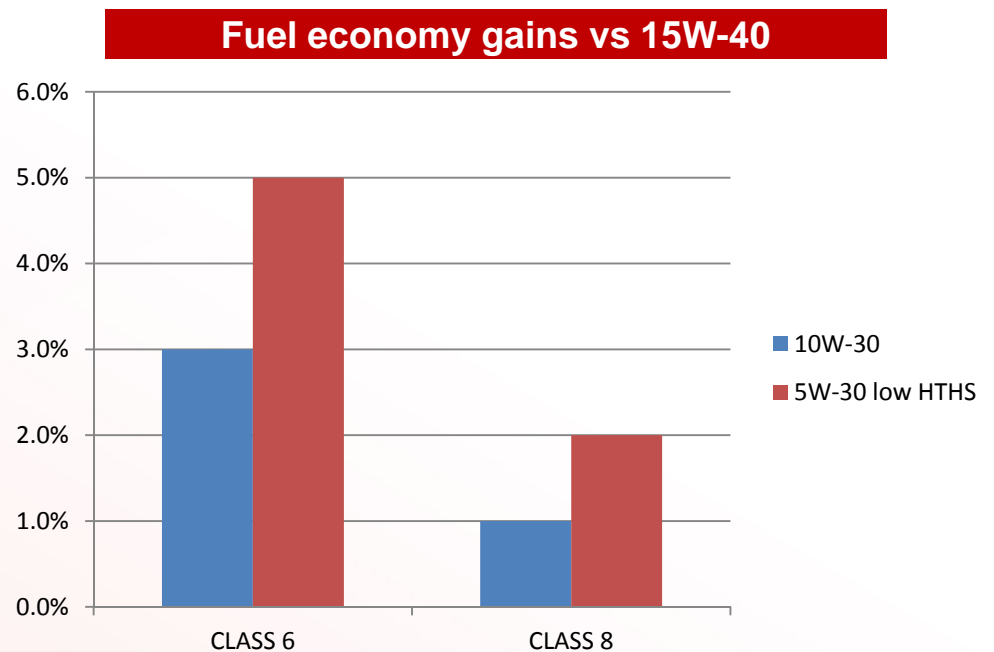


# ENGINE OIL AND FUEL ECONOMY

## REALIZED FUEL ECONOMY CAN VARY WIDELY

**Kinematic and HTHS viscosity impacts fuel economy**

**Drive cycle significant influences potential fuel economy % improvement**



# CK-4 / FA-4 OIL PERFORMANCE ESSENTIALS

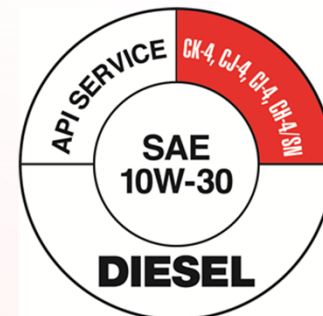
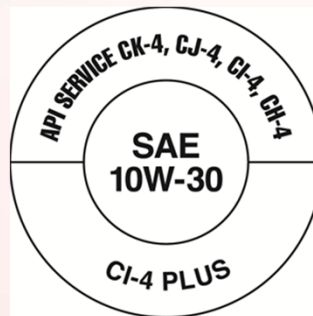
- **DURABILTIY**
  - **ADVANCES IN ENGINE DESIGN CHALLENGES OIL ABILITY TO PROTECT**
  - **BETTER OXIDATION AND CORROSION CONTROL**
  - **PROVEN PROTECTIVE QUALITIES OF PHOSPHOROUS VS ASHLESS CHEMISTRIES**
- **WEAR PROTECTION IN LOW VISCOSITY OILS**
  - **FA-4 OILS MUST PASS SAME TESTS AS CK-4 FLUIDS**
  - **DEMONSTRATED SCUFFING RESISTANCE (DDC SCUFF TEST)**
- **IMPROVED AERATION CONTROL**
  - **OFF ROAD FOCUS**



# BOTTOM LINE: INCREASED COMPLEXITY

- MORE CHOICES FOR THE CONSUMER
- CHOICES HAVE CONSEQUENCES
  - WARRANTY RISK
    - FA-4 VS CK-4, UNIVERSAL VS DIESEL
  - REPAIR, DOWNTIME
  - LOST OPPORTUNITY RISK
- PHILLIPS 66 WILL HAVE SOLUTIONS

TBD!



# INTRODUCING PHILLIPS 66 CK-4 AND FA-4 OILS

- **A “MARKET-LEADING” PRODUCT LINE**
  - **TIMELY TO MARKET**
    - Most widely used products will be available at first license
    - Will replace current CJ-4 products
  - **IMPROVED PERFORMANCE OF TRADITIONAL PRODUCT**
    - Demonstrated improvement vs CJ-4
  - **RELEVANT AND RESPONSIVE TO CURRENT AND EVOLVING MARKETS**
    - Regulations, customer, technology
  - **MORE CHOICES**
    - Expanded offering meeting wide spectrum customer needs
    - CI-4+ products will continue (Power-D & Super HD-II)



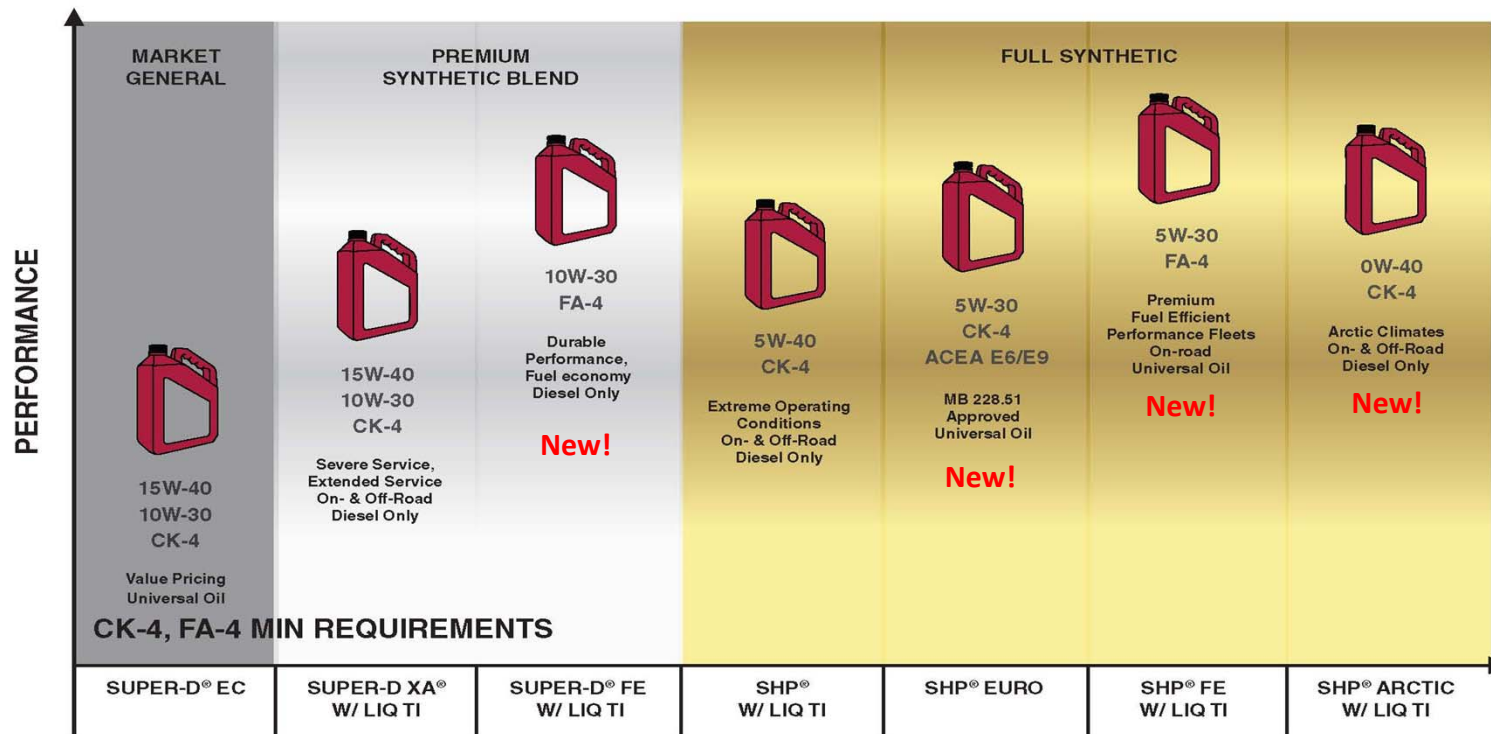
## CK-4 / FA-4 INTRODUCTION TIMING

Market General		Full Synthetic	
Phillip 66 Fleet Supreme EC	Dec-16	Phillips 66 Triton Euro HD	Mar-17
Phillips 66 Firebird EC		Kendall SHP Euro HD	
Kendall Super-D EC		Phillips 66 Triton FE 5W-30	
<b>Premium Synthetic Blend</b>		Kendall SHP FE 5W-30	
Phillips 66 Guardol ECT w/ LiqTi	Dec-16	Phillips 66 Triton 5W-40 w/ LiqTi	
Kendall Super-D XA w/ LiqTi		Kendall SHP 5W-40 w/ LiqTi	
Phillips 66 Guardol FE w/ LiqTi		Phillips 66 Triton Arctic 0W-40 w/ LiqTi	
Kendall Super-D FEw/ LiqTi		Kendall SHP Arctic 0W-40 w/ LiqTi	

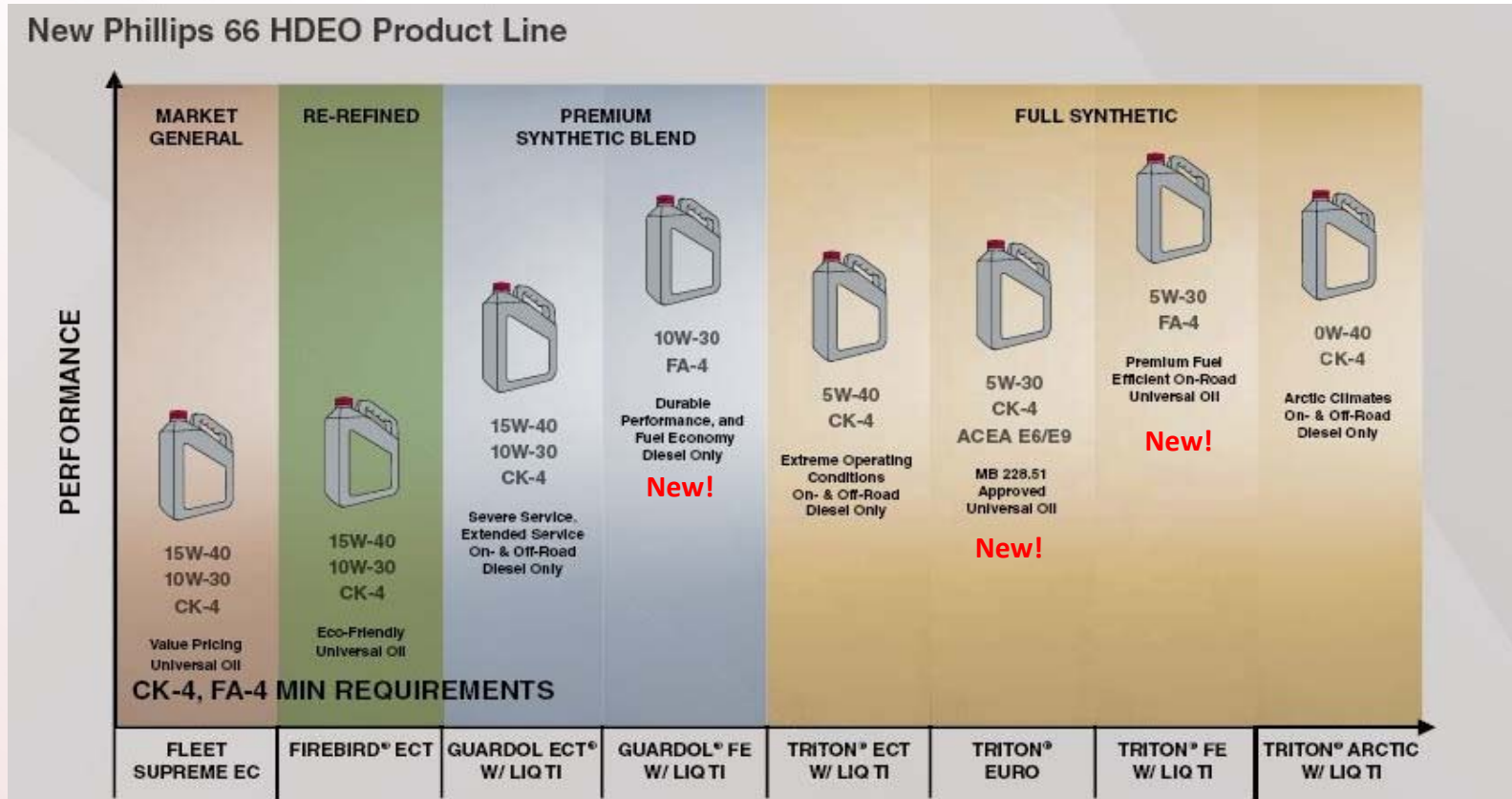


# KENDALL CK-4, FA-4

## New Kendall HDEO Product Mix



# PHILLIPS 66 CK-4, FA-4



# MARKET GENERAL

## Phillip 66 Fleet Supreme EC Kendall Super-D EC

<i>product tier</i>	Market general, universal oil
<i>viscosity grades</i>	15W-40, 10W-30
<i>Service class / OEM specs</i>	CK-4, SN / all major OEM specifications, select European specs
<i>performance features</i>	excellent performance in standard service, suitable for gasoline engines
<i>customer / applications</i>	Fleets, mixed fleets, vocational, off-road

## Phillip 66 Firebird EC

<i>product tier</i>	Market general, universal oil
<i>viscosity grades</i>	15W-40, 10W-30
<i>Service class / OEM specs</i>	CK-4, SN / all major OEM specifications, select European specs
<i>performance features</i>	Excellent performance utilizing re-refined stocks, suitable for gasoline engines
<i>customer / applications</i>	Customers seeking eco-friendly products, municipal fleets, mixed fleets





# PREMIUM SYNTHETIC BLEND

Phillips 66 Guardol ECT w/ Liq Ti  
Kendall Super-D XA w/ Liq Ti

<i>product tier</i>	Premium syn-blend performance, diesel
<i>viscosity grades</i>	15W-40, 10W-30
<i>Service class</i>	CK-4 / all major OEM specification, select European specifications
<i>performance features</i>	superior performance, excellent for severe applications, extended service
<i>Customer / applications</i>	Off-road; construction, mining, agriculture; large fleets



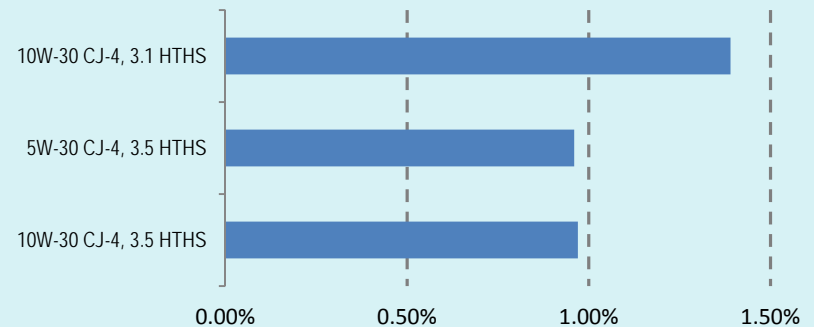
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# PREMIUM SYNTHETIC BLEND

Phillips 66 Guardol FE w/ Liq Ti (NEW!)  
Kendall Super-D FE w/ Liq Ti (NEW!)

<i>product tier</i>	Premium syn-blend performance, fuel economy, diesel only
<i>viscosity grades</i>	10W-30
<i>API service class</i>	FA-4 / all major applicable OEM specification, select European specs
<i>performance features</i>	superior fuel efficient performance
<i>customer/ applications</i>	Modern on-highway fleets seeking fuel economy w/o compromise to engine protection

Fuel Consumption, % Improvement  
SAE J1321 Fuel Consumption Test  
vs 15W-40 CJ-4 @ 4.4 HTHS viscosity



EPA SmartWay<sup>SM</sup> Class 8, SWRI Reports 08.10860.08.001



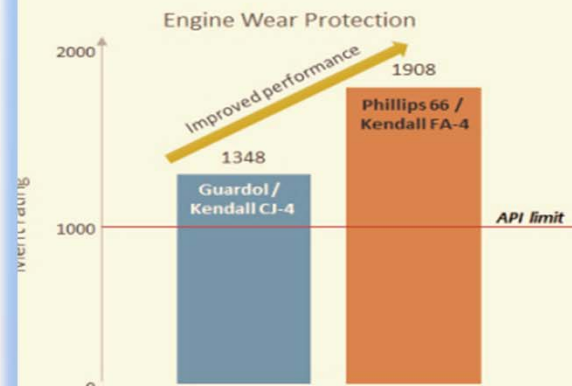
# PREMIUM SYNTHETIC BLEND

Phillips 66 Guardol FE  
10W-30 w/ Liq Ti (NEW!)

Kendall Super-D FE  
10W-30 w/ Liq Ti (NEW!)

Phillips 66 / Kendall Wear Claims  
API CJ-4 vs. API FA-4

## Fuel economy without compromising engine protection



*\*Relative performance based on results from the Cummins ISM engine test run with SAE 10W-30, low HTHS*

- API FA-4 lubricants are designed to contribute to greater fuel economy while maintaining engine protection
- Phillips 66 / Kendall API FA-4 lubricants not only provide greater fuel economy but they also contribute to more than 30%\* improvements at controlling sludge wear in the engine than previous Guardol/Kendall CJ-4 lubricants
- Less sludge means engine parts are clean and running smoothly, keeping vehicles on the road longer between oil changes and gas fill-ups

**New Phillips 66 / Kendall formulation with improved sludge wear protection**



# PREMIUM FULL SYNTHETIC

Phillips 66 Triton FE 5W-30 w/ Liq Ti (NEW!)  
Kendall SHP FE 5W-30 w/ Liq Ti (NEW!)

<i>product tier</i>	Premium full synthetic, universal oil
<i>viscosity grades</i>	5W-30
<i>API service class</i>	FA-4, SN
<i>performance features</i>	Full Syn performance w/ fuel economy, superior low temp properties, extended service capable
<i>customer/ applications</i>	On-highway fleets seeking w/ fuel economy in 5W-30 viscosity grade



# PREMIUM FULL SYNTHETIC

**Phillips 66 Triton 5W-30 Euro HD (NEW!)**  
**Kendall SHP 5W-30 Euro HD (NEW!)**

<i>product tier</i>	Ultra – high performance full synthetic, universal oil
<i>viscosity grades</i>	5W-30
<i>API service class</i>	CK-4, ACEA E6/E9, major applicable domestic and European specs, including MB 228.51
<i>performance features</i>	Ultra – high performance full synthetic, universal, extended service
<i>customer/ applications</i>	European OEMs, including DAF, Daimler, Iveco, MAN, Volvo Renault

HD OEM	Long Drain Service Fill Spec	Max ODI, km (mi)
<b>DAF</b>	(E6)	<b>150,000 (93,000)</b>
<b>Daimler</b>	<b>MB 228.51 (E6)</b>	<b>160,000 (99,500)</b>
<b>Iveco (FPT)</b>	(E6)	<b>150,000 (93,000)</b>
<b>MAN</b>	<b>MAN 3677 (E6)</b>	<b>120,000 (75,000)</b>
<b>Volvo/Renault</b>	<b>VDS-4/RLD-3 (E9)</b>	<b>120,000 (75,000)</b>



# PREMIUM FULL SYNTHETIC

Phillips 66 Triton ECT 5W-40 Full Synthetic w/ Liq Ti  
 Kendall SHP 5W-40 Full Synthetic w/ Liq Ti

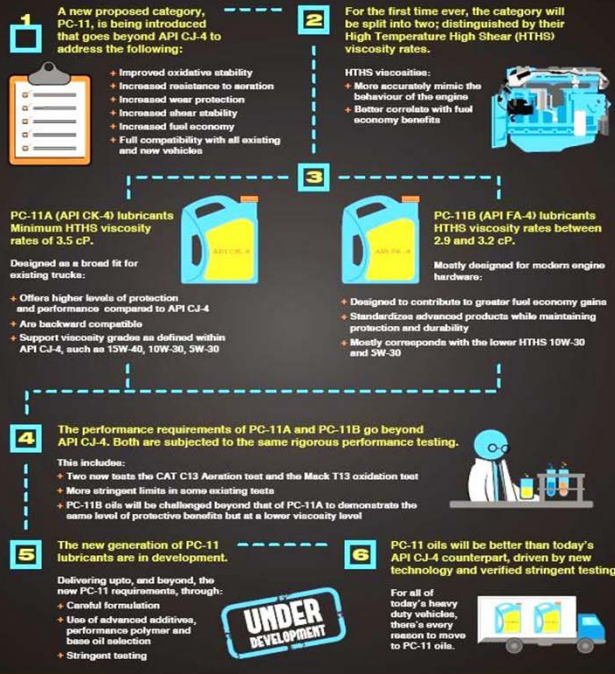
<i>product tier</i>	Premium full synthetic, Diesel
<i>viscosity grades</i>	5W-40
<i>API service class</i>	CK-4, all major applicable OEM specifications
<i>performance features</i>	Superior performance under extreme conditions, harsh cold-weather climates
<i>customer/ applications</i>	On- and off-highway operating in low temperature conditions

Phillips 66 Triton Arctic 0W-40 w/ Liq Ti  
 Kendall SHP Arctic 0W-40 w/ Liq Ti

<i>product tier</i>	Premium full synthetic, Diesel
<i>viscosity grades</i>	0W-40
<i>API service class</i>	CK-4, all major applicable OEM specifications
<i>performance features</i>	Unparalleled performance , demanding applications in arctic conditions
<i>customer/ applications</i>	On- and off-highway customers operating in arctic extremes



## PC-11: FOR ALL OF TODAY'S HEAVY DUTY VEHICLES, THERE'S EVERY REASON TO MOVE TO PC-11 OILS.

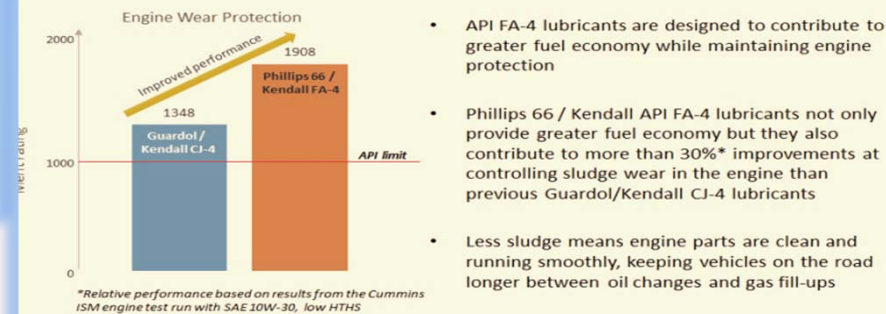


## Phillips 66 HDEO Marketing Support

- Partnering with technology resources
- Content for features and performance
- PC-11 education, new product applications
- Product specific education, proper product selection
- Trials to demonstrate field performance currently underway

### Phillips 66 / Kendall Wear Claims API CJ-4 vs. API FA-4

#### Fuel economy without compromising engine protection



- API FA-4 lubricants are designed to contribute to greater fuel economy while maintaining engine protection
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New Phillips 66 / Kendall formulation with improved sludge wear protection

## SUMMARY

- **PHILLIPS 66 HAS LEVERAGED THIS CATEGORY CHANGE AS AN OPPORTUNITY TO INTRODUCE MARKET LEADING PRODUCTS**
  - **TIMELY ENTRY TO THE MARKET**
  - **EXPANDED PRODUCT LINE RESPONSIVE TO INCREASINGLY DIVERSE CUSTOMER NEEDS**
  - **OPTIMIZED TECHNOLOGY AND FORMULATION PROVIDES SUPERIOR VALUE**
  - **TECHNICAL SUPPORT AVAILABLE TO HELP THE MARKETER TRANSITION TO THESE NEW CLASS OF PRODUCTS**

