



# F5 Cetane EFI Rating System with XCP® TECHNOLOGY *Electronic Fuel Injection*

## Cetane Innovation

At CFR Engines Inc. (CFR®), we are continuously applying advanced designs and innovative approaches to give our customers an enhanced product offering.

## Reliability

The F5 Cetane EFI brings improved fuel atomization and air / fuel mixing, a cleaner combustion chamber, and longer maintenance intervals. The EFI system is more tolerant of biodiesels and high Cetane Number (CN) alternative diesel fuels.

## Precision

Tightly controlled start of injection and injection duration is provided by the F5 Cetane EFI, resulting in stable and consistent combustion. High pressure atomized fuel spray results in improved air fuel mixing compared to the existing F5. These enhancements result in improved D613 precision.

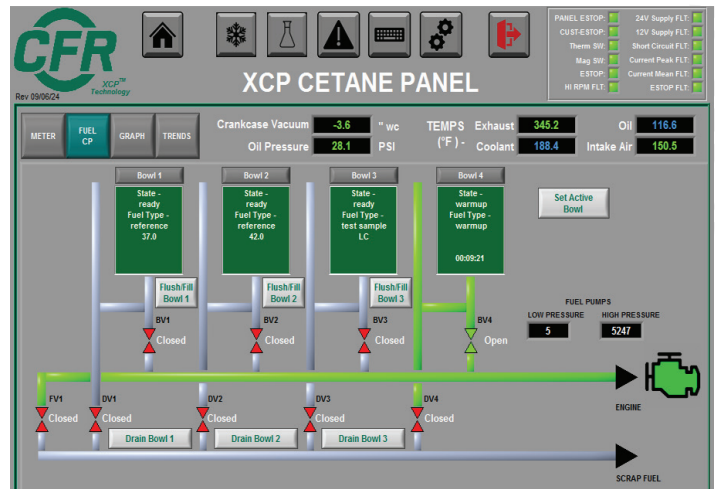


Cetane Number	r (CN) Repeatability	R (CN) Reproducibility
30	0.81	2.51
40	0.90	2.80
50	0.98	3.05
60	1.05	3.28
70	1.12	3.47
80	1.17	3.66

	Mechanical Injection	EFI
<b>Start of Injection (SOI)</b>	Fuel dependent, manually adjusted, varies with fuel	Constant
<b>Injection Duration</b>	Fuel dependent, manually adjusted, varies with fuel	Constant
<b>Injection Quantity</b>	Fuel dependent, manually adjusted, varies with fuel	Constant
<b>Start of Combustion (SOC)</b>	Very inconsistent due to injection timing and duration	Very stable due to consistent injection
<b>Injector Spray Quality</b>	Wet spray = soot and constantly degrading spray	Atomized spray places focus on chemical aspects of ignition delay
<b>Engine Position Tracking</b>	Two fixed proximity sensors = approximation only	Optical encoder, very precise tracking of SOI and SOC
<b>SOI &amp; SOC Tolerance</b>	+/- 0.2 Crank Angle Degrees	+/- 0.1 Crank Angle Degrees

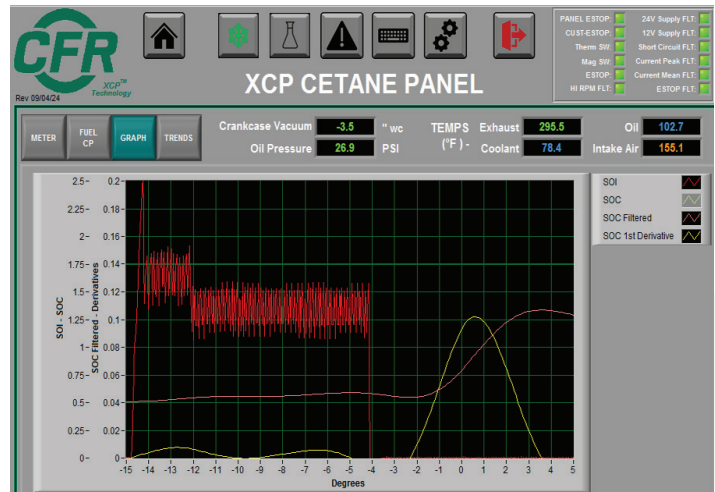
## F5 Cetane EFI System Functionality

- A modern solenoid style automotive fuel injector with a modified nozzle
- An electrically driven injection pump maintains a constant 11 ml/min @ 500 bar max pressure
- The fuel supply to the injection pump is now pressurized to eliminate sensitivity to the fuel bowl level or fuel physical properties



## Enhanced HMI

- Graphical trend display of ignition delay and exhaust temperature provide an indication of equilibrium conditions
- Switching between sample and reference fuels via software instead of manual selector valve
- Injector and handwheel maintenance interval is significantly increased due to cleaner combustion
- Elimination of ml/min burette, less fuel is required per rating
- Condition monitoring of injector and injection pump to notify if maintenance is required

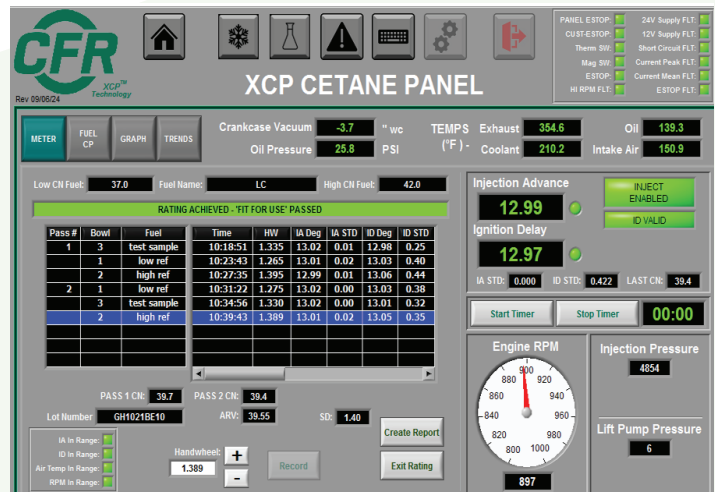


## Configurations

Available as a CFR Kit or with new units:

p/n G-802-70: Cetane EFI Upgrade Kit, Legacy

p/n G-802-71: Cetane EFI Upgrade Kit, XCP



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Form C520, Revision B

