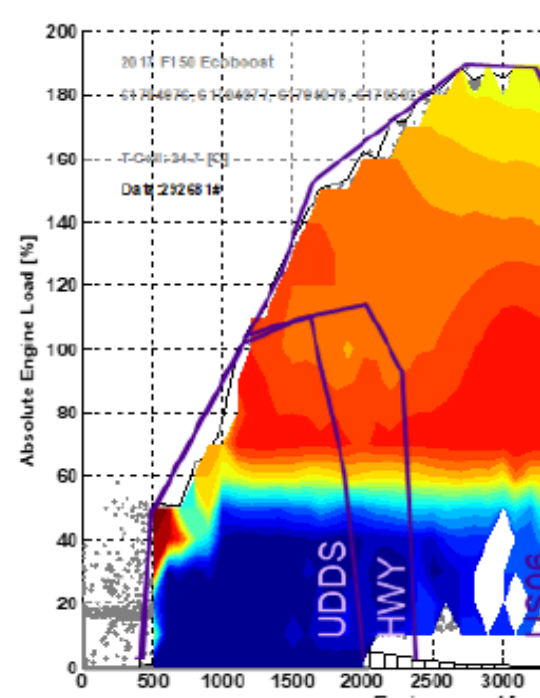




'839 Patent Claim Element	Preliminary Infringement Theory
	<p style="text-align: right;"><i>5.4.3.2. DI vs PFI</i></p> <p>The fuel can be fed to the engine through the PFI map of the PFI and DI strategy. The PFI system p                      lute engine load is below 40 percent. The DI syste                      lute engine load. Between 60 percent to 140 perc                      the fuel is delivered through the DI system. At ab                      system provides an increase proportion of the fue                      load above 2,000 rpm 60 percent of the fuel is pro                      PFI system that corresponds to the values shown</p>  <p style="text-align: right;"><i>Figure 29: DI and PFI usage map as a function of the engine speed</i></p> <p>The island of 100 percent DI operation at 575 rpm                      the engine starting on the DI system before switch                      ous section.</p> <p>Ex. 9 [EBS-00002974, at 026].</p>
	<p>Further, it has been reported that Ford's use of PFI "allows engineers to shut down the dir                      emissions." Ex. 16 [EBS-00003177, at 180]. And it has been reported that the ratio of dir                      that only "5 to 10 percent of the fuel delivery" is provided via port injection. Ex. 1 [EBS-</p>
<p>[1c] and wherein                      the engine is                      operated at a</p>	<p>The engine may be operated at a substantially stoichiometric fuel/air ratio.</p>

'839 Patent Claim Element	Preliminary Infringement Theory
substantially stoichiometric fuel/air ratio.	<p>As noted above, the Accused Instrumentalities include a fuel management system, which both port fuel injection (PFI) and direct fuel injection (DI). Ex. 10 [EBS-00003074, at 07].</p> <p>Ford vehicles equipped with the Accused Instrumentalities utilize what are known in the art as port fuel injection (PFI) systems, which are known to be operating at a stoichiometric fuel/air ratio. <i>See, e.g.</i>, Ex. 8 [EBS-00002969, at 971] (“In port fuel injection, the fuel composition at stoichiometric.”); <i>see also, e.g.</i>, Ex. 12 [EBS-00003091, at 123] (providing a list of stoichiometric fuel/air ratios).</p> <p>As shown below, the laboratory testing performed by the National Highway Traffic Safety Administration shows that the Accused Instrumentalities operate at a substantially stoichiometric fuel/air ratio, where <math>\Lambda \cong 1</math>.</p>

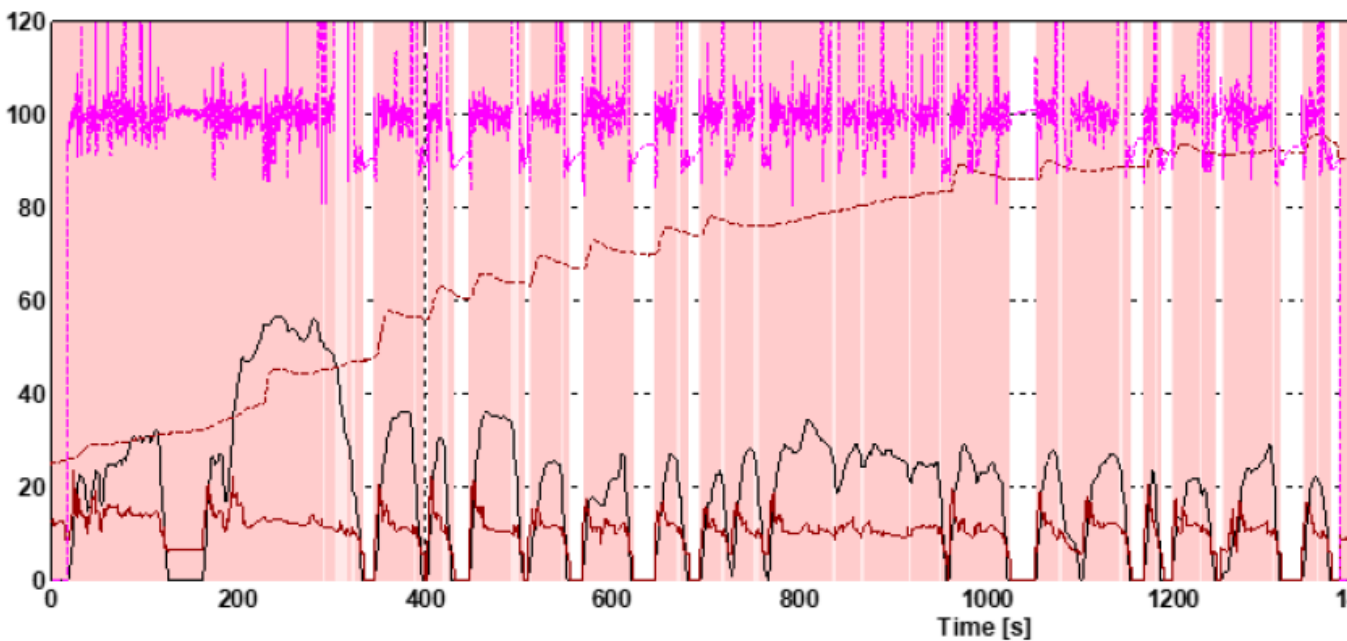



Figure 21: Engine start stop behavior on cold start UDDS

Ex. 9 [EBS-00002974, at 018].

2. The spark ignition engine of claim 1 where the ratio of directly injected fuel to port injected fuel increases with increasing torque.	<p><i>See</i> Claim 1.</p> <p>The ratio of directly injected fuel to port injected fuel increases with increasing torque.</p> <p>The Accused Instrumentalities include a fuel management system, which Ford identifies as port fuel injection (PFI) and direct fuel injection (DI). Ex. 10 [EBS-00003074, at 075]; <i>see also</i> Ex. 9 [EBS-00002974, at 026] that, “[a]s rpm and load increase, fuel delivery becomes a programmed blend of PI and DI.”</p> <p>Laboratory testing performed by the National Highway Traffic Safety Administration confirms that the DI system is quickly blended in above 40 percent absolute engine load. Ex. 9 [EBS-00002974, at 026].</p>
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'839 Patent Claim Element	Preliminary Infringement Theory										
<p>The more intense the knock, the more timing will be pulled</p> 	<p>Response (Knock Sensor): Knock Sensor Timing D Viewing Comparison Values</p>										
	<p>Engine Speed (RPM) - Read-only</p>										
	0.000	-1.50	-1.50	-1.00	-1.00	-1.00	-1.00	-1.00	-1.50	-1.50	
	0.500	-1.50	-1.50	-1.50	-1.50	-1.50	-1.50	-1.50	-1.50	-1.50	
	1.250	-2.25	-2.25	-2.25	-2.25	-2.25	-2.25	-2.25	-2.25	-2.25	
2.000	-2.50	-2.50	-2.50	-2.50	-2.50	-2.50	-2.50	-2.50	-2.50		
<p>Knock Intensity (Raw) - Read-only</p>											
<p>Ignit</p>											

Ex. 6 [EBS-00002962, at 963].

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