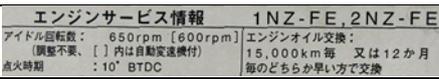


Active Test "Control the VVT System (Bank 1)" Data List Comparison

Note. Test Description	<ul style="list-style-type: none"> • Engine stalls or idles roughly when camshaft timing oil control valve assembly turned on • Normal engine running or idling when camshaft timing oil control valve assembly off • Test possible while vehicle stopped and engine idling 			
1NZ-FE Data List of Corolla BR-Prod 2009 MY, NZE141R- (U340E)	NORMAL CONDITION ¹ *1	1NZ-FE Data Fielder 2008MY, NZE141G-AWXNK (CVT K31#)		
		Engine not Warmed	Engine Warmed	
		Test OK	Test NG²	DIAGNOSTIC NOTES
Injector (Port)	1 to 3 msec.: Idling	2.81	1.43	
IGN Advance	BTDC 0 to 14°: Idling	1.0	0.5	
Calculate Load	20 to 40%: Idling	35.2	30.9	
Vehicle Load	0%, Max.: 25700%	-	-	
MAF ³	1 to 3 g/sec :Idling	1.92	1.43	
Engine Speed	650 to 750 rpm: Idling	682	609	
Coolant Temp	80 to 100°C warming up	68	91	
Air-Fuel Ratio	0.8 to 1.2: During idling	1.006	0.995	Aka AF Lambda S1
Purge Density Learn Value	-40 to 10: Idling	0.000	1.000	
Evap PurgeFlow	0 to 10%: Idling	0.0	1.8	
EVAP (Purge) VSV	10 to 50%: Idling	0.0	7.4	Order signal from ECM
Knock Correct Learn Value	0 to 20°C: Driving at 70 km/h	13.5	15.1	
Knock Feedback Value	-20 to 0°C: Driving at 70 km/h(44 mph)	-1.5	-1.5	
Check Mode		OFF	OFF	INFO ⁴
Accelerator Position No. 1	10 to 22%: Accelerator pedal released	16.0	16.0	Accel Sens. No.1 Volt %
Accelerator Position No. 2	24 to 40%: Accelerator pedal released	32.1	32.1	Accel. Sens. No.2 Volt %
Accelerator Position No. 1	0.5 to 1.1 V: Accelerator pedal released	0.8	0.8	Accelerator Sensor Out No.1
Accelerator Position No. 2	1.2 to 2.0 V: Accelerator pedal released	1.6	1.6	Accelerator Sensor Out No.2
Throttle Position deg		0.00	0.0	
Throttle Fully Close Learn	0.4 to 0.8 V	0.6	0.7	
Throttle Require Position	0.5 to 1.0 V: Idling	0.7	0.7	
Throttle Sensor Position	0%: Throttle fully closed	0.0	0.0	Recognition value for throttle opening angle on ECM
Throttle Sensor Volt %		15.6	14.9	
Throttle Position No. 1	0.5 to 1.1 V: Throttle fully closed	0.7	0.7	
Throttle Position	2.1 to 3.1 V: Throttle	2.3	2.3	

¹ Refer to RM0841E (covers all information in the previously issued Pub. No. RM0840E)

² Possible OCV Filter clogged , insufficient pressure in VVT-I System , etc.

³ Engine not running and 30 seconds after ignition switch is turned to the ON Position: MAF below 0.15 g/sec.

⁴ Compared to normal mode, Check Mode is more sensitive to malfunctions.

Therefore, Check Mode can detect the malfunctions that cannot be detected by normal mode.

No. 2	fully closed			
Throttle Position Command	0.5 to 4.9 V	0.7	0.7	
Throttle Sens Open #1 (AD)	0.5 to 4.9 V	- ⁵	-	
Total FT #1	-0.2 to 0.2	0.000	0.019	
Short FT #1	-20 to 20%	0.7	1.5	
Long FT #1	-20 to 20%	0.7	0.0	
O2FT B1 S1	-20 to 20%			
O2S B1S2		0.72	0.74	
Catalyst Temp (B1 S1 / B1 S2)		-	-	
Sub O2S Impedance B1S2	10 to 1500 Ω	-	-	
Injection Volume (Cylinder 1)	0 to 0.15 ml: Idling	0.082	0.068	Quantity of fuel injection volume for 10 times (of 10 injections)
VVT Control Status (Bank 1)		ON	OFF	Status Before Start Test
		ON	ON	Status After Start Test
VVT Aim Angle (Bank 1)*2 0 to 100%		0.0	0.0	Status Before Start Test
		46.6	37	Status After Start Test
VVT Change Angle (Bank 1)*2 0 to 56°FR		0.0	0.0	Status Before Start Test
		46.4	0.0	Status After Start Test
VVT OCV Duty (Bank 1)*2 0 to 100%		0.0	0.0	Status Before Start Test
		100	100	Status After Start Test
Distance from DTC Cleared		136	101	
Model Code	NZE1#	-	-	Identifying model code
Engine Type	1NZFE	-	-	Identifying engine type

HINT:

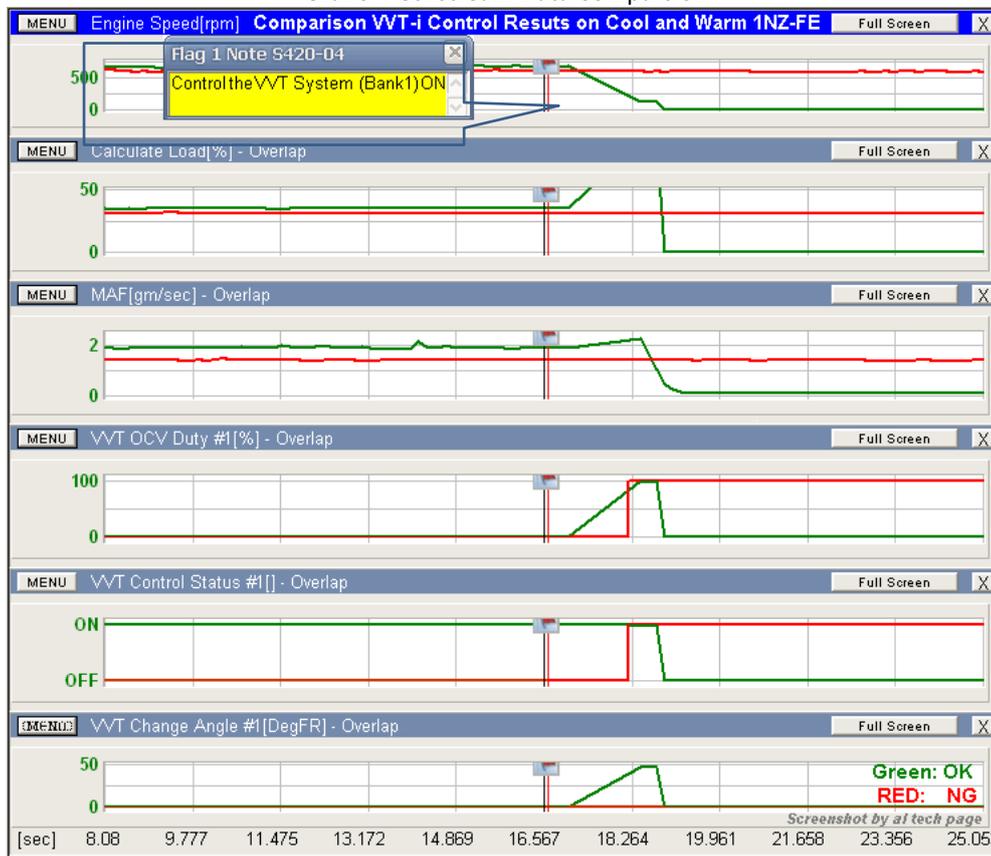
*1: If no idling conditions are specified, the transmission gear selector lever should be in the N or P position, and the A/C switch and all accessory switches should be OFF.

*2: Data List values are only displayed when performing the following Active Tests: Control the VVT (Bank 1). For other Active Tests, the Data List value will be 0.

For Clarification

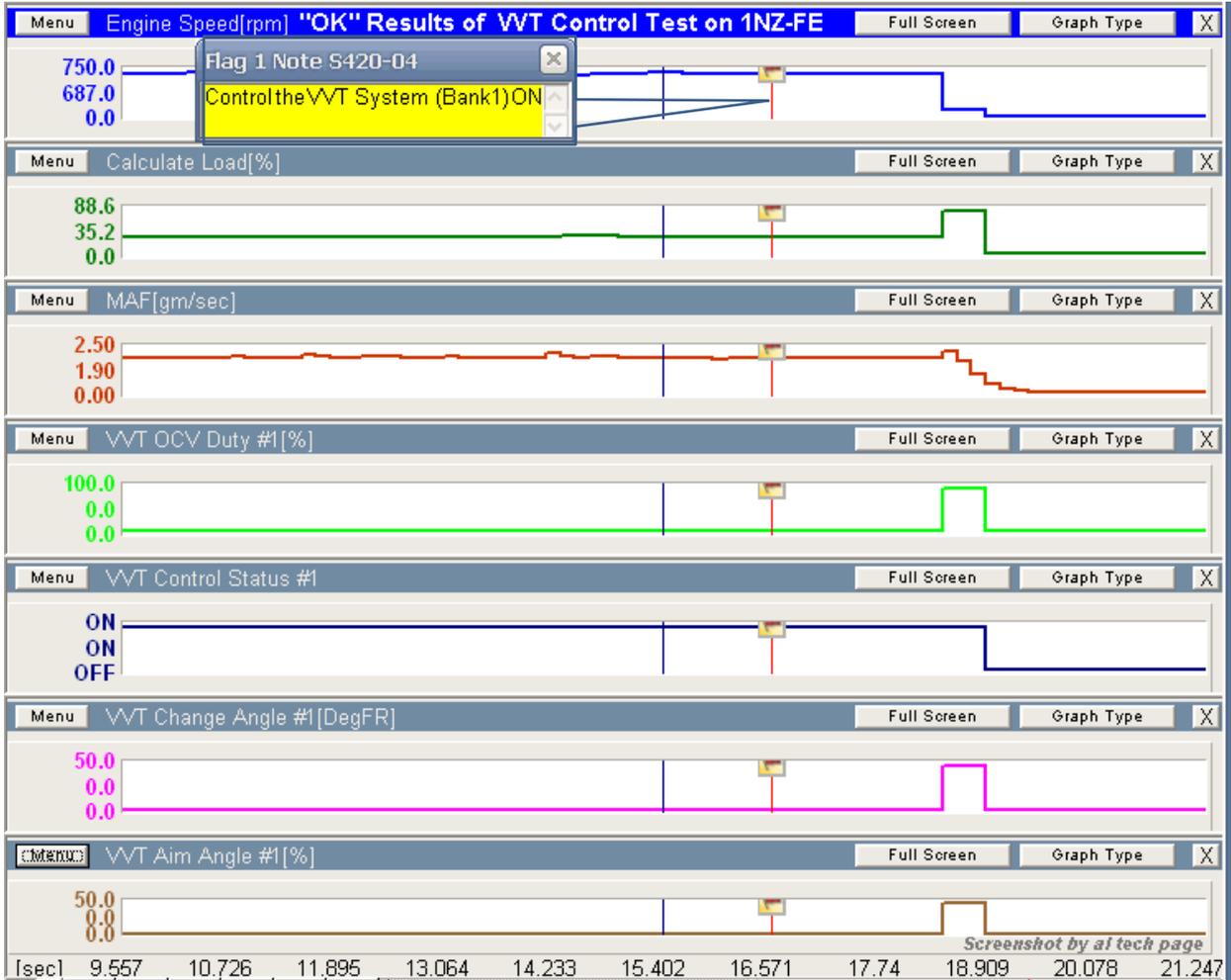
Log Files (.TSE) courtesy Vovankms

Graf of Techstream Data Comparison

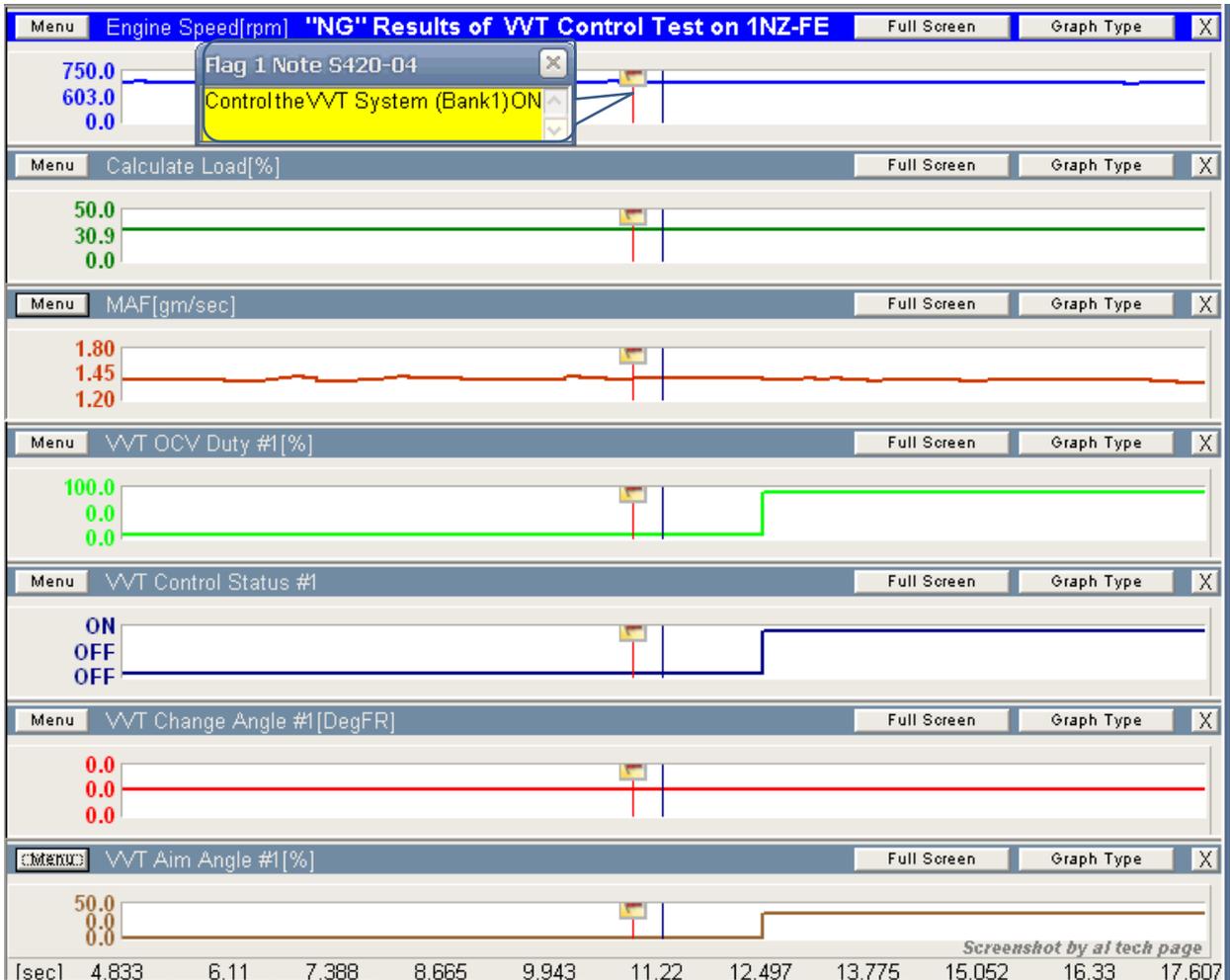


⁵ No Parameters in "All Data List" on this RHD Vehicle.

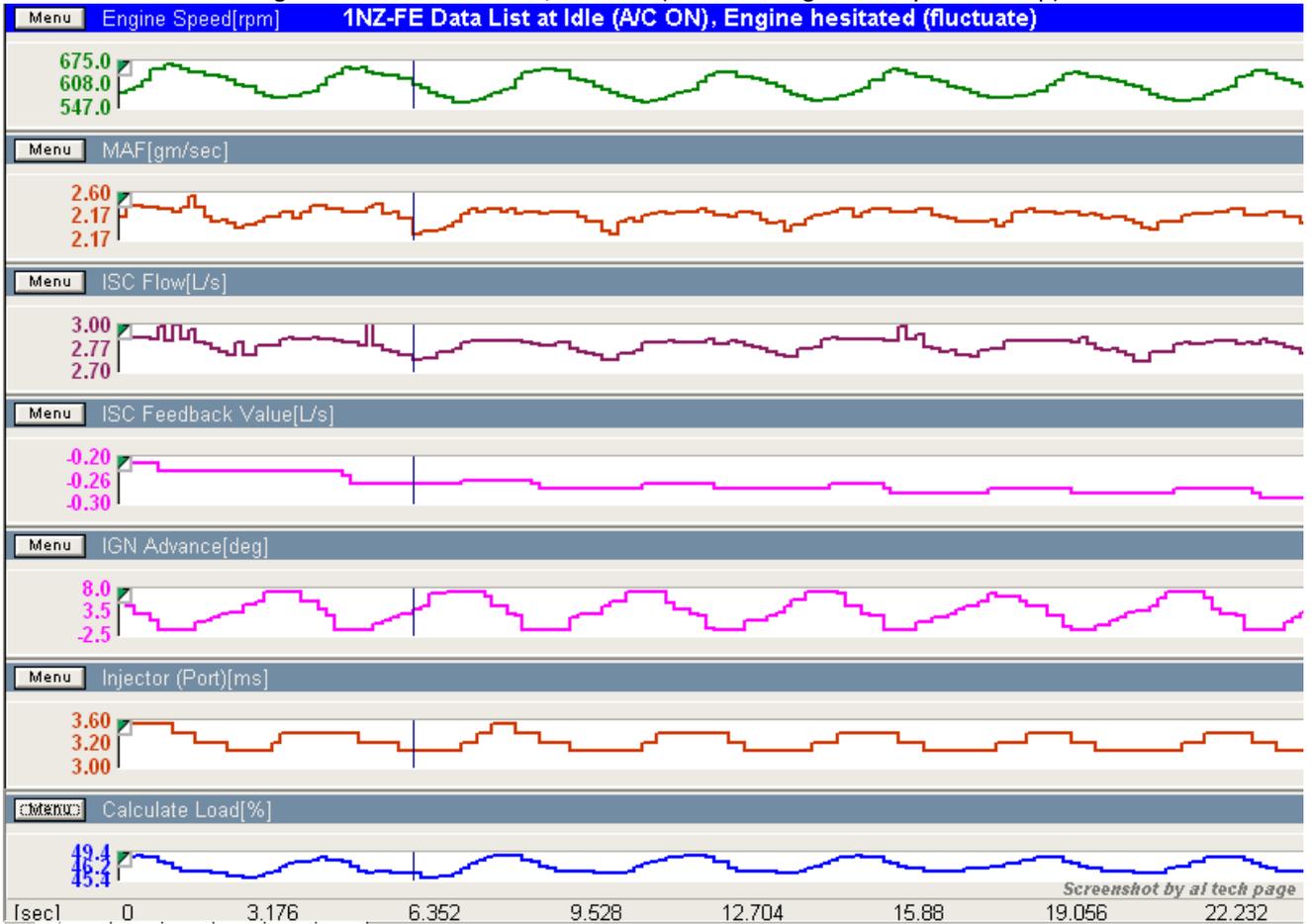
Active Test "OK"



Active Test "NG"



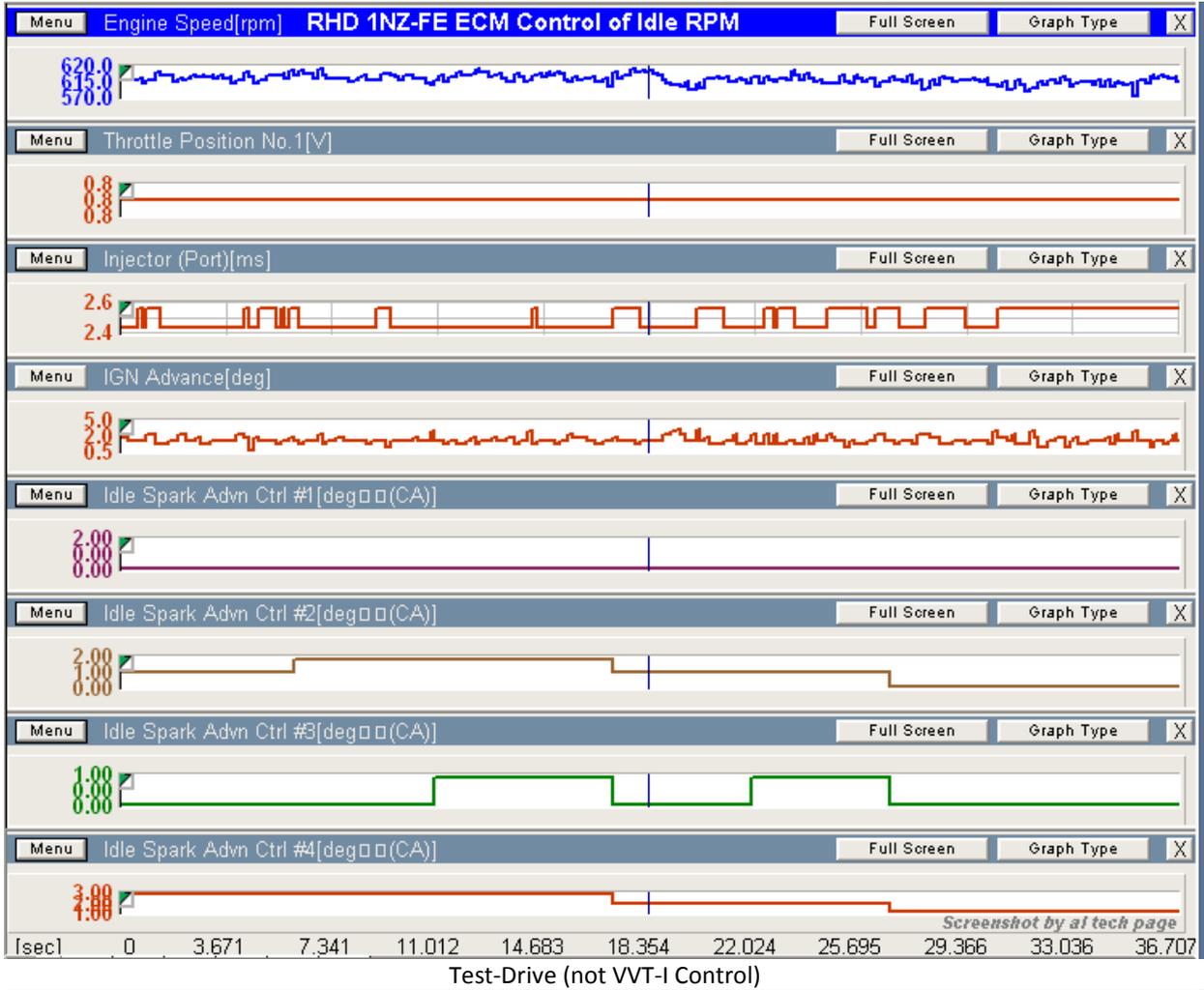
Engine Idle RPMs hesitation/fluctuate (when the engine is fully warmed up)



Idle RPM Control by variations of Pulse Width of Fuel Injection and of Ignition Timing (1)



Idle RPM Control by variations of Pulse Width of Fuel Injection and of Ignition Timing (2)

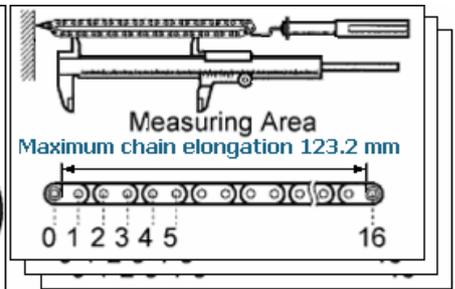
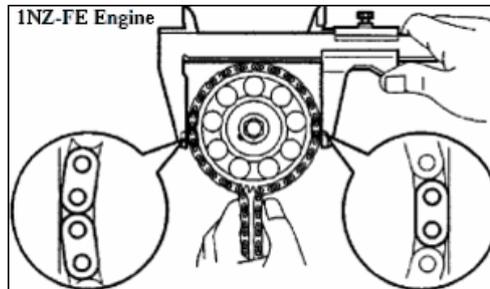
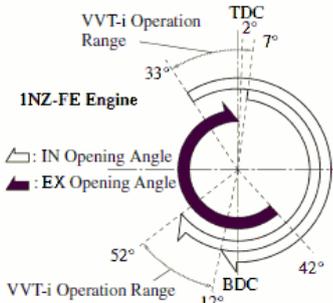


ПРЕДОСТЕРЕЖЕНИЕ

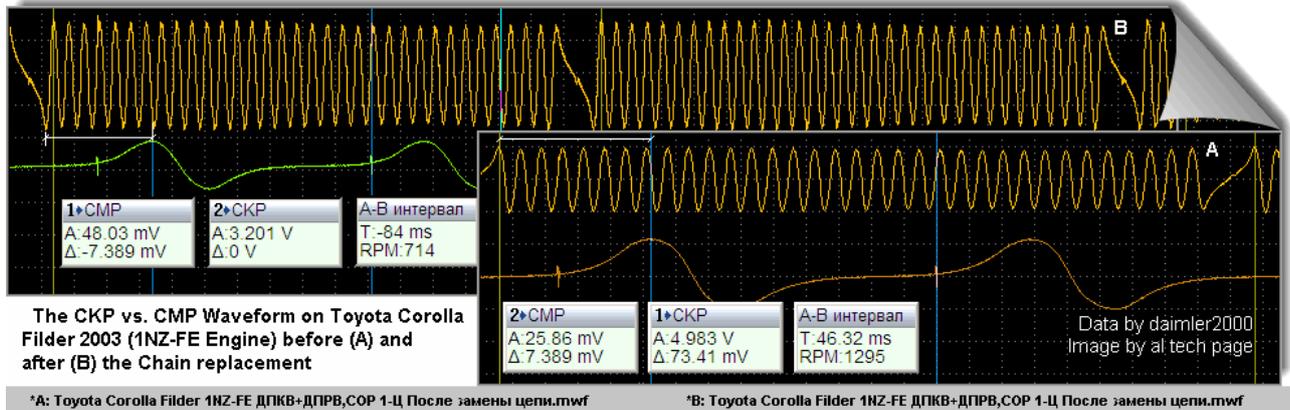
■ Примечания для анализа данных (система VVT-I с гидравлическим клапаном)

- На некоторых двигателях давление масла в режиме холостого хода не достигает значения, необходимого для установки муфты в положение максимального опережения для последующего вождения. В этом случае необходимо повысить частоту вращения холостого хода, включив систему кондиционирования.

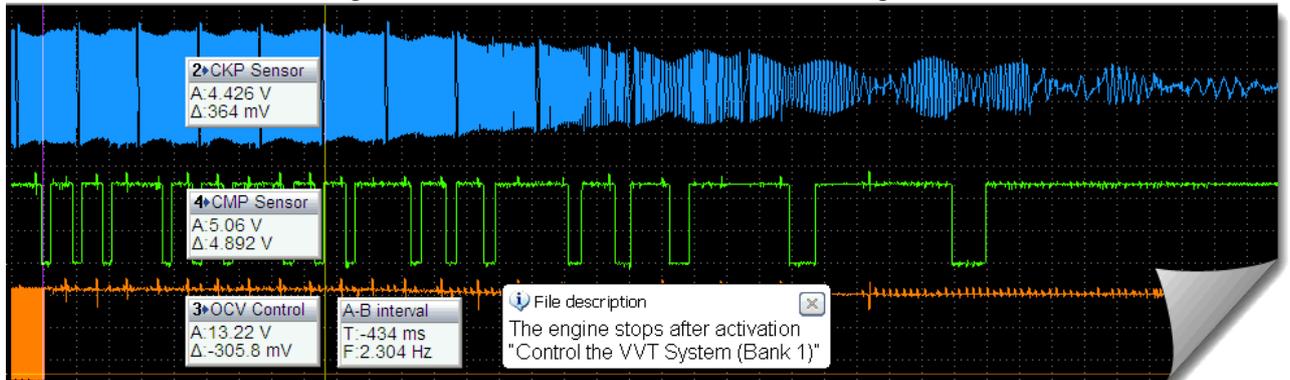
Service Data



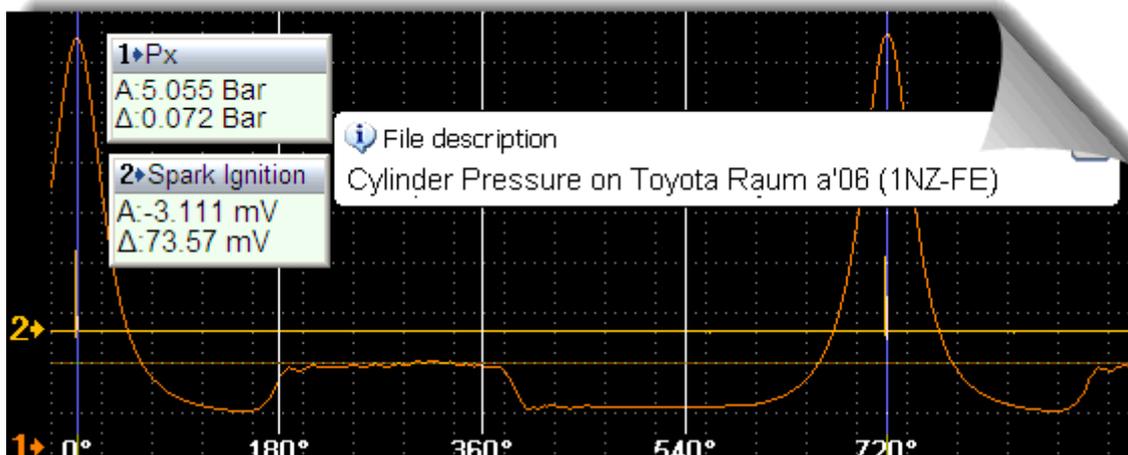
1NZ_FE CKP vs. CMP waveform by PC-based Oscilloscope:



Engine Shutdown after "VVT-I Control" Active Test go to ON:



1NZ-FE Cylinder Pressure on Raum 2006MY:



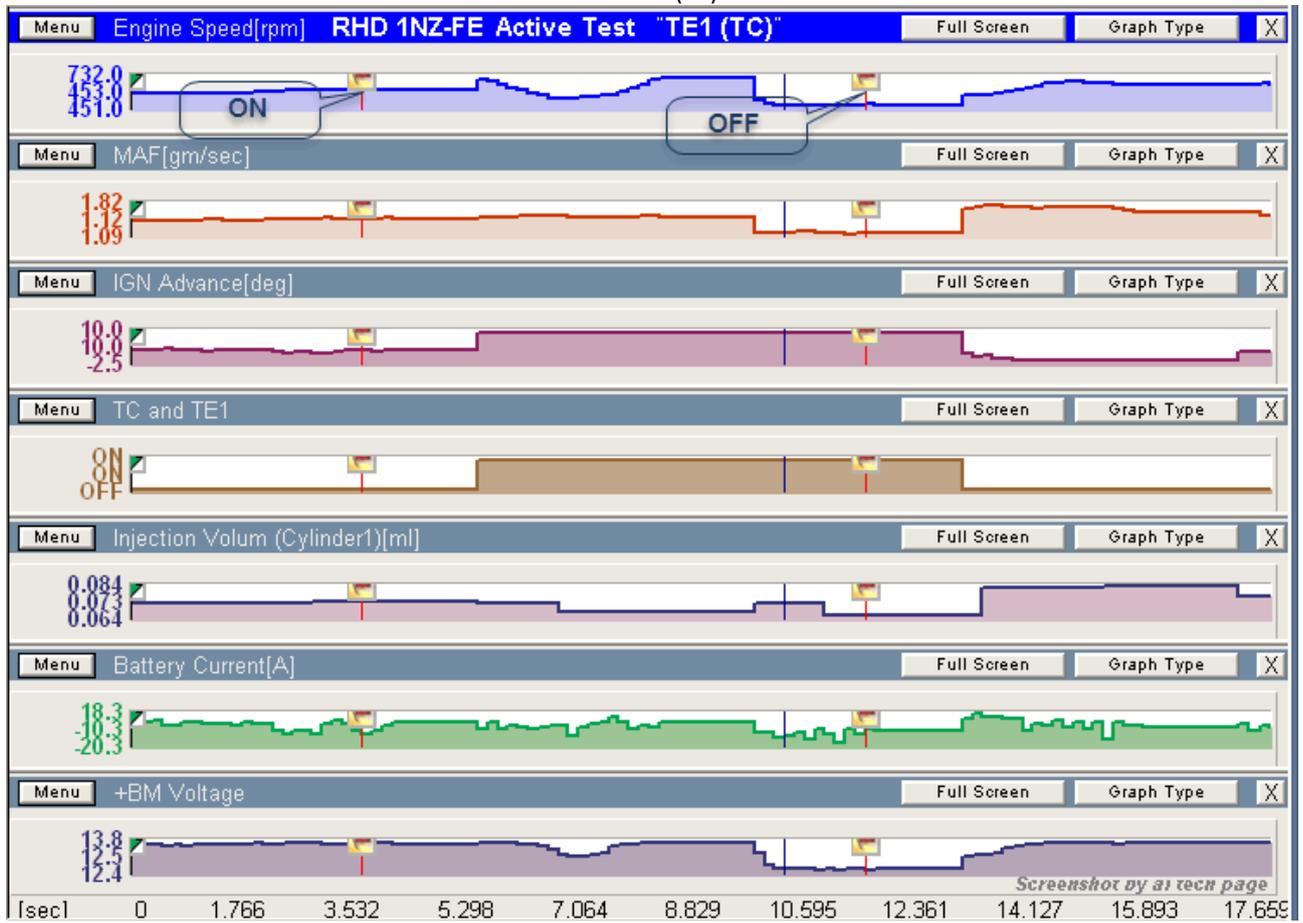
OCV Interior



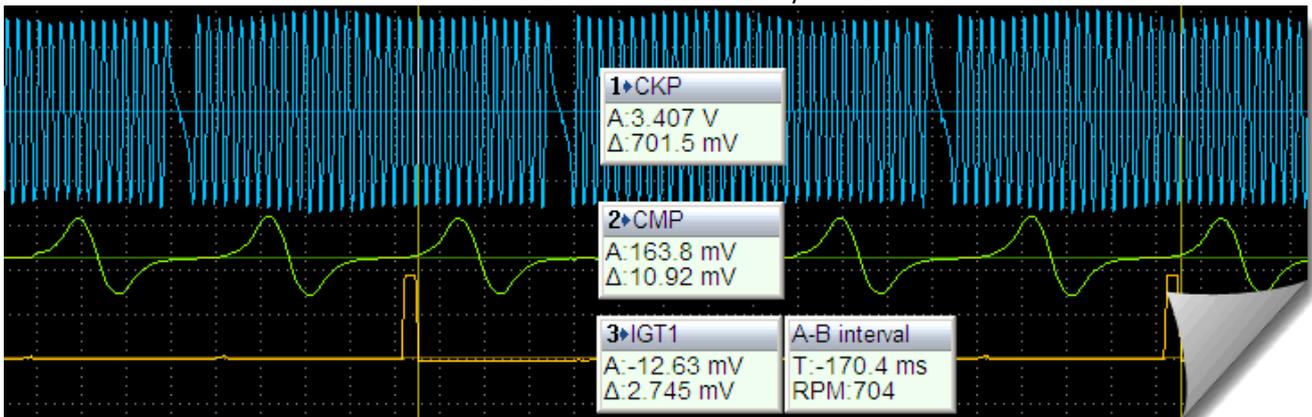
VVT-I Actuator Interior

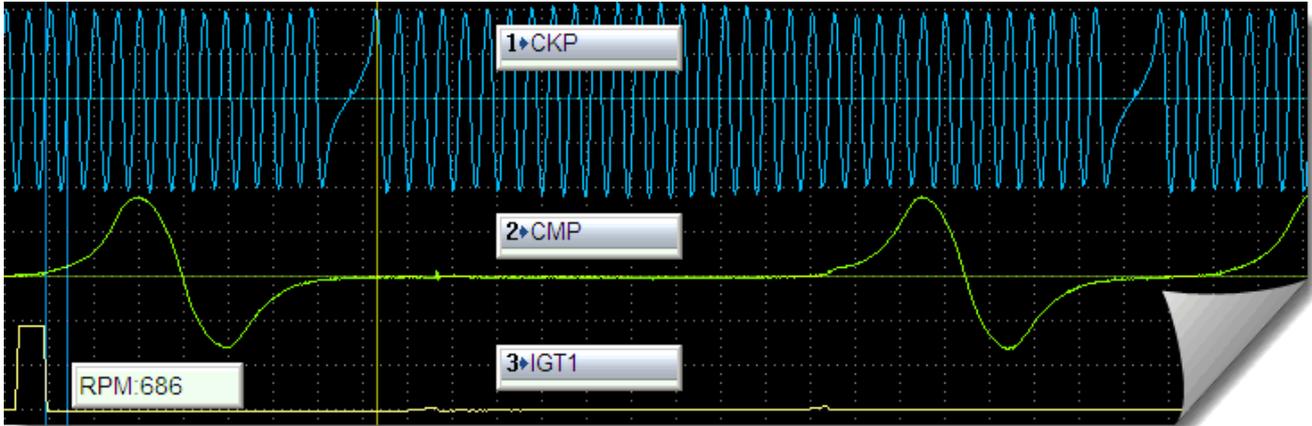


Data Stream at "TE1(TC)" active test



CKP vs. CMP Waveforms of 1NZ-FE Toyota Raum a'06





Note. The engine control module (ECM) optimizes the valve timing using the VVT system to control the intake valve camshaft. The VVT system includes the ECM, the oil control valve (OCV) and the VVT controller (actuator).

The ECM sends “duty-cycle” control signals to the OCV. This electrical control signal, applied to the OCV, regulates the oil pressure supplied to the VVT controller (actuator).

The ECM compares the target valve timing with the actual valve timing calculated by using the signals from both the VVT sensor and the crankshaft position sensor. If a difference occurs between them, the ECM interprets it as a malfunction and sets a DTC.

