

2001 MY for Torque Converter Clutch Solenoid Performance (Shift Solenoid Valve SL) Monitor (P0770)

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MONITOR STRATEGY

Required sensors/Components	Main	Shift solenoid valve SL (DSL)
	Sub	None
Frequency of operation	Continuous	
Duration	Less than 10 sec.	
MIL operation	2 driving cycles	
Sequence of operation	None	

TYPICAL ENABLING CONDITIONS

Item	Specification	
	Minimum	Maximum
The monitor will run whenever the following DTCs are not present.	See page In-39	

Engine family	Item	Specification	
		Minimum	Maximum
5VZ-FE	Condition (A)		
	Intake air temperature	-10 °C (14 °F) or more	Less than 70 °C (158 °F)
	Engine coolant	60 °C (140 °F) or more	Less than 105 °C (221 °F)
	Transmission range	"D"	
	Battery voltage	10 V or more	-
	Spark retard by KCS control	-	Less than 8° CA
	Transfer range "Hi" [4WD]		
	Vehicle speed	5 km/h (3 mph) or more	-
	Throttle valve opening angle	0 % or more	-
	OFF malfunction		
	ECM selected gear	4th with lock up	
	ON malfunction		
	ECM selected gear	4th	
	Throttle valve opening angle	7 % or more	-

1MZ-FE (SIENNA)	Condition (A)		
	Engine coolant	60 °C (140 °F) or more	—
	Vehicle speed	25 km/h (16 mph) or more	—
	Transmission range	"D"	
	OFF malfunction		
	ECM lock-up command	ON	
	ECM selected gear	3rd or 4th	
	ECM selected gear at 2nd gear selected	Except 1st	
	ON malfunction		
	ECM lock-up command	OFF	
	Actual gear	3rd	
	Throttle valve opening angle	8 % or more	—
	Vehicle speed	—	Less than 60 km/h (37 mph)
1MZ-FE (AVALON)	Condition (A)		
	Engine coolant	60 °C (140 °F) or more	—
	Vehicle speed	25 km/h (16 mph) or more	—
	Transmission range	"D"	
	OFF malfunction		
	ECM lock-up command	ON	
	Actual gear	3rd or 4th	
	Actual gear at 2nd gear selected	Except 1st	
	ON malfunction		
	ECM lock-up command	OFF	
	Actual gear	3rd	
	Throttle valve opening angle	8 % or more	—
	Vehicle speed	—	Less than 60 km/h (37 mph)
5S-FE	Condition (A)		
	Intake air temperature	–10 °C (14 °F) or more	Less than 70 °C (158 °F)
	Engine coolant	60 °C (140 °F) or more	Less than 105 °C (221 °F)
	Transmission range	"D"	
	Battery voltage	10 V or more	—
	Spark retard by KCS control	—	Less than 10° CA
	OFF malfunction		
	ECM selected gear	4th with lock up	
	ON malfunction		
	ECM selected gear	4th	
	Throttle valve opening angle	7 % or more	—

Component T/M Outputs – Solenoid

1MZ-FE (CAMRY, CAMRY SOLARA)	Condition (A)		
	Engine coolant	60 °C (140 °F) or more	–
	Transmission range	"D"	
	Vehicle speed	25 km/h (16 mph) or more	–
	OFF malfunction		
	ECM lock-up command	ON	
	Actual gear	3rd or 4th	
	Actual gear at 2nd gear selected	Except 1st	
	ON malfunction		
	ECM lock-up command	OFF	
	Actual gear	3rd	
	Throttle valve opening angle	8 % or more	–
	Vehicle speed	–	Less than 60 km/h (37 mph)
	1MZ-FE (RX300, HIGH LANDER), 2AZ-FE, 2ZZ-FE, 1AZ-FE	Condition (A)	
Engine coolant		60 °C (140 °F) or more	–
Transmission range		"D"	
Transmission fluid temperature		–20 °C (–4 °F) or more	
OFF malfunction			
ECM lock-up command		ON	
ECM selected gear		3rd or 4th	
Actual gear		3rd or 4th	
Vehicle speed		25 km/h (16 mph) or more	–
ON malfunction			
ECM lock-up command		OFF	
ECM selected gear		3rd or 4th	
Actual gear		3rd or 4th	
Throttle valve opening angle		8 % or more	–
Vehicle speed		25 km/h (16 mph) or more	Less than 60 km/h (37 mph)
1ZZ-FE (CELICA), 1NZ-FE		Condition (A)	
	Engine coolant temperature	60 °C (140 °F) or more	–
	Vehicle speed	25 km/h (16 mph) or more	–
	Transmission range	"D"	
	ECM selected gear	3rd or 4th	
	OFF malfunction		
	ECM lock-up command	ON	
	Actual gear	3rd or 4th	
	Actual gear at 2nd gear selected	Except 1st	
	ON malfunction		
	ECM lock-up command	OFF	
	Actual gear	3rd	
	Throttle valve opening angle	8 % or more	–
	Vehicle speed	–	60 km/h (37 mph) or more

1ZZ-FE (COROLLA)	Condition (A)		
	Intake air temperature	-10 °C (14 °F) or more	Less than 70 °C (158 °F)
	Engine coolant	55 °C (131 °F) or more	Less than 105 °C (221 °F)
	Transmission range	"D"	
	Battery voltage	10 V or more	-
	Spark retard by KCS control	0° CA or more	-
	OFF malfunction		
	ECM selected gear	4th with lock up	
	ON malfunction		
	ECM selected gear	4th	
	Throttle valve opening angle	7 % or more	-
	2JZ-GE	Condition (A)	
Engine coolant temperature		40 °C (104 °F) or more	-
Vehicle speed		25 km/h (16 mph) or more	-
Transmission range		"D"	
Spark advance from Max. retard timing by KCS control		0° CA or more	-
ECM selected gear		4th or 5th	
OFF malfunction			
ECM lock-up command		ON (SLU duty ratio 90 % or more)	
Actual gear		5th	
Actual gear at 3rd gear selected		Except 1st	
Vehicle speed		-	Less than 100 km/h (62 mph)
ON malfunction			
ECM lock-up command		OFF (SLU duty ratio 10 % or more)	
Actual gear		4th	
Throttle valve opening angle		9 % or more	-
Vehicle speed		-	Less than 60 km/h (37 mph)
1MZ-FE (ES300)	Condition (A)		
	Engine coolant temperature	60 °C (140 °F) or more	-
	Transmission range	"D"	
	Transmission fluid temperature	-20 °C (-4 °F) or more	-
	OFF malfunction		
	ECM lock-up command	ON	
	ECM selected gear	3rd or 4th	
	Actual gear	3rd or 4th	
	Vehicle speed	25 km/h (16 mph) or more	-
	ON malfunction		
	ECM lock-up command	OFF	
	ECM selected gear	3rd or 4th	
	Actual gear	3rd or 4th	
	Throttle valve opening angle	8 % or more	-
	Vehicle speed	25 km/h (16 mph) or more	Less than 60 km/h (37 mph)

Component T/M Outputs – Solenoid

3UZ-FE	Condition (A)		
	Engine coolant temperature	40 °C (104 °F) or more	—
	Vehicle speed	25 km/h (16 mph) or more	—
	Transmission range	"D"	
	Spark advance from Max. retard timing by KCS control	0 ° CA or more	—
	ECM selected gear	4th or 5th	
	OFF malfunction		
	ECM lock-up command	ON (SLU pressure 513 kPa or more)	
	Actual gear	5th	
	Actual gear at 3rd gear	Except 1st	
	Vehicle speed	—	Less than 100 km/h (62 mph)
	ON malfunction		
	ECM lock-up command	OFF (SLU pressure less than 4 kPa)	
	ECM selected gear	4th	
	Throttle valve opening angle	9 % or more	—
	Vehicle speed	—	Less than 60 km/h (37 mph)
2UZ-FE (SEQUOIA, LX470, LAND CRUISER)	Condition (A)		
	Intake air temperature	-10 °C (14 °F) or more	Less than 90 °C (194 °F)
	Engine coolant temperature	40 °C (104 °F) or more	—
	Transmission range	"D"	
	Transfer range "Hi" [4WD]		
	Throttle valve opening angle	0 % or more	—
	Vehicle speed	5 km/h (3 mph) or more	—
	ECM selected gear	3rd or 4th	
	OFF malfunction		
	ECM lock-up command	ON	
	Actual gear	4th	
	Actual gear at 2nd gear selected	Except 1st	
	Vehicle speed	—	Less than 100 km/h (62 mph)
	ON malfunction		
	ECM lock-up command	OFF	
	Actual gear	3rd	
	Throttle valve opening angle	9 % or more	—
	Vehicle speed	—	Less than 60 km/h (37 mph)

3RZ-FE	Condition (A)		
	Engine coolant temperature	55 °C (131 °F) or more	Less than 105 °C (221 °F)
	Transmission range	"D"	
	Battery voltage	10 V or more	–
	Spark retard by KCS control	–	Less than 10° CA
	Transfer range "Hi" [4WD]		
	Throttle valve opening angle	0 % or more	–
	Vehicle speed	5 km/h (3 mph) or more	–
	OFF malfunction		
	Intake air temperature	–10 °C (14 °F) or more	Less than 90 °C (194 °F)
	ECM selected gear	4th with lock up	
	ON malfunction		
	Intake air temperature	–10 °C (14 °F) or more	Less than 90 °C (194 °F)
	ECM selected gear	4th	
	Throttle valve opening angle	8 % or more	–
2UZ-FE (TUNDRA)	Condition (A)		
	Intake air temperature	10 °C (50 °F) or more	Less than 90 °C (194 °F)
	Engine coolant temperature	40 °C (104 °F) or more	–
	Transmission range	"D"	
	Transfer range "Hi" [4WD]		
	Throttle valve opening angle	0 % or more	–
	Vehicle speed	5 km/h (3 mph) or more	–
	ECM selected gear	3rd or 4th	
	OFF malfunction		
	ECM lock-up command	ON	
	Actual gear	4th	
	Actual gear at 2nd gear selected	Except 1st	
	Vehicle speed	–	Less than 100 km/h (62 mph)
	ON malfunction		
	ECM lock-up command	OFF	
	Actual gear	3rd	
	Throttle valve opening angle	9 % or more	–
	Vehicle speed	–	Less than 60 km/h (37 mph)

TYPICAL MALFUNCTION THRESHOLDS

Engine family	Detection criteria	Threshold
3RZ-FE, 5VZ-FE, 1ZZ-FE (COROLLA), 5S-FE	(A) & OFF malfunction	
	Engine speed	$\geq$ 4th gear ratio x NO + 100 rpm < 3rd gear ratio x NO – 100 rpm
	It is necessary 2 judgments/driving cycle 1st judgment; temporary flag ON 2nd judgment; pending fault code ON	
	(A) & ON malfunction	
	Engine speed	$\geq$ 4th gear ratio x NO – 50 rpm < 4th gear ratio x NO + 50 rpm
1MZ-FE (SIENNA, AVALON)	Following conditions met	
	(A) & OFF malfunction	
	Engine speed – Input speed (NE – NC2)	130 rpm or more
	It is necessary 2 judgments/driving cycle 1st judgment; temporary flag ON 2nd judgment; pending fault code ON Vehicle speed must be under 10 km/h (6 mph) once before 2nd judgment	
	(A) & ON malfunction	
1MZ-FE (CAMRY, CAMRY SOLARA)	OFF malfunction	
	Engine speed – Input speed (NE – NC2)	200 rpm or more
	It is necessary 2 judgments/driving cycle 1st judgment; temporary flag ON 2nd judgment; pending fault code ON	
	ON malfunction	
	Engine speed – Input speed (NE – NC2)	Less than 35 rpm
1MZ-FE (HIGH LANDER, ES300), 2AZ-FE, 1ZZ-FE (CELICA), 2ZZ-GE, 1NZ-FE	(A) & OFF malfunction	
	Engine speed – Input speed (NE – NT)	100 rpm or more
	It is necessary 2 judgments/driving cycle 1st judgment; temporary flag ON 2nd judgment; pending fault code ON	
	(A) & ON malfunction	
	Engine speed – Input speed (NE – NT)	Less than 35 rpm
2JZ-GE	(A) & OFF malfunction	
	Engine speed – Output speed x 5th gear ratio (NE – NO x 5th gear ratio)	150 rpm or more
	It is necessary 2 judgments/driving cycle 1st judgment; temporary flag ON 2nd judgment; pending fault code ON	
	(A) & ON malfunction	
	Engine speed – Input speed (NE – NC0)	Less than 35 rpm

3UZ-FE	(A) & OFF malfunction	
	Engine speed – Output speed x 5th gear ratio (NE – NO x 5th gear ratio)	70 rpm or more
	It is necessary 2 judgments/driving cycle 1st judgment; temporary flag ON 2nd judgment; pending fault code ON	
	(A) & ON malfunction	
	Engine speed – Input speed (NE – NC0)	Less than 35 rpm
2UZ-FE (SEQUOIA, LX470, LAND CRUISER)	(A) & OFF malfunction	
	Engine speed/Transmission output speed (NE/NO) x 4th gear ratio	70 rpm or more
	It is necessary 2 judgments/driving cycle 1st judgment; temporary flag ON 2nd judgment; pending fault code ON	
	(A) & ON malfunction	
	Engine speed/Input shaft speed (NE – NC0)	Less than 35 rpm
1AZ-FE	Following condition met	
	(A) & OFF malfunction	
	Engine speed – Input speed (NE – NT)	100 rpm or more
	(A) & ON malfunction	
	Engine speed – Input speed (NE – NT)	Less than 35 rpm
1MZ-FE (RX300)	(A) & OFF malfunction	
	Engine speed – Input speed (NE – NT)	100 rpm or more
	It is necessary 2 judgments/driving cycle 1st judgment; temporary flag ON 2nd judgment; pending fault code ON Vehicle speed must be under 10 km/h (6 mph) once before 2nd judgment	
	(A) & ON malfunction	
	Engine speed – Input speed (NE – NT)	Less than 35 rpm
2UZ-FE (TUNDRA)	(A) & OFF malfunction	
	Engine speed – Output speed x 4th gear ratio (NE – NO x 4th gear ratio)	70 rpm or more
	It is necessary 2 judgments/driving cycle 1st judgment; temporary flag ON 2nd judgment; pending fault code ON Vehicle speed must be under 10 km/h (6 mph) once before 2nd judgment	
	(A) & ON malfunction	
	Engine speed – Input speed (NE – NC0)	Less than 35 rpm