

2000 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
3RZ-FE (4RUNNER)	OFF malfunction		
	Intake air temperature	-10 °C (14 °F) or more	Less than 90 °C (194 °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	-	Less than 10° CA
	Transfer range "Hi"[4WD]		
	Throttle valve opening angle	0 % or more	-
	Vehicle speed	5 km/h (3 mph) or more	-
	ECM selected gear	4th with lock up	
	ON malfunction		
	Intake air temperature	-10 °C (14 °F) or more	Less than 90 °C (194 °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	-	Less than 10° CA
	Transfer range "Hi" [4WD]		
	Throttle valve opening angle	0 % or more	-
	Vehicle speed	5 km/h (3 mph) or more	-
	ECM selected gear	4th	

Component T/M Outputs – Solenoid

5VZ-FE	OFF malfunction		
	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]		
	Throttle valve opening angle	0 % or more	
	Vehicle speed	5 km/h (3 mph) or more	-
	ECM selected gear	4th with lock up	
	ON malfunction		
	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]		
	Throttle valve opening angle	0 % or more	
	Vehicle speed	5 km/h (3 mph) or more	-
	ECM selected gear	4th	
	Throttle valve opening angle	7 % or more	-
1MZ-FE (AVALON, ES300, CAMRY, CAMRY SOLARA)	OFF malfunction		
	Engine coolant	60 °C (140 °F) or more	-
	Vehicle speed	25 km/h (16 mph) or more	-
	Transmission range	"D"	
	ECM lock-up command	ON	
	Actual gear	3rd or 4th	
	Actual gear at 2nd gear selected	Except 1st	
	ON malfunction		
	Engine coolant	60 °C (140 °F) or more	-
	Vehicle speed	25 km/h (16 mph) or more	-
	Transmission range	"D"	
	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), 2ZZ-GE	OFF malfunction		
	Engine coolant	60 °C (140 °F) or more	–
	Transmission range	"D"	
	Transmission fluid temperature	–20 °C (–4 °F) or more	–
	ECM lock-up command	OFF	
	ECM selected gear	3rd or 4th	
	Actual gear	3rd or 4th	
	Vehicle speed	25 km/h (16 mph) or more	–
	ON malfunction		
	Engine coolant	60 °C (140 °F) or more	–
	Transmission range	"D"	
	Transmission fluid temperature	–20 °C (–4 °F) or more	–
	ECM lock-up command	ON	
	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)
1UZ-FE, 2JZ-GE (GS300)	OFF malfunction		
	Engine coolant	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 lock-up command	ON (duty ratio 90 % or more)	
	Actual gear	5th	
	Actual gear at 2nd gear selected	Except 1st	
	Vehicle speed	–	Less than 100 km/h (62 mph)
	ON malfunction		
	Engine coolant	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 lock-up command	OFF (duty ratio 10 % or less)	
	Actual gear	4th	
	Throttle valve opening angle	9 % or more	–
	Vehicle speed	–	Less than 60 km/h (37 mph)

Component T/M Outputs – Solenoid

2UZ-FE (LX470, LAND CRUISER)	OFF malfunction		
	Intake air temperature	-10 °C (14 °F) or more	Less than 90 °C (194 °F)
	Engine coolant	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 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		
	Intake air temperature	-10 °C (14 °F) or more	Less than 90 °C (194 °F)
	Engine coolant	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 lock-up command	OFF	
	Actual gear	3rd	
	Throttle valve opening angle	9 % or more	-
	Vehicle speed	-	Less than 60 km/h (37 mph)
1MZ-FE (SIENNA)	ON malfunction		
	Intake air temperature	-10 °C (14 °F) or more	Less than 90 °C (194 °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	10° CA or more	-
	ECM selected gear	4th with lock up	
	OFF malfunction		
	Intake air temperature	-10 °C (14 °F) or more	Less than 90 °C (194 °F)
	Engine coolant	40 °C (104 °F) or more	-
	Transmission range	"D"	
	Battery voltage	10 V or more	-
	Spark retard by KCS control	10° CA or more	-
	ECM selected gear	4th with lock up	
	Throttle valve opening angle	7 % or more	-

2JZ-GE (SC300)	OFF malfunction (A)		
	Engine coolant	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	10° CA or more	—
	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		
	Engine coolant	−10 °C (14 °F) or more	—
	Vehicle speed	25 km/h (16 mph) or more	—
	Transmission range	"D"	
	Spark advance from Max. retard by KCS control	10° CA or more	—
	ECM lock-up command	OFF	
	Actual gear	3rd	
	Throttle valve opening angle	10 % or more	—
	Vehicle speed	—	Less than 60 km/h (37 mph)
1ZZ-FE (CELICA), 1NZ-FE	OFF malfunction		
	Engine coolant	60 °C (140 °F) or more	—
	Vehicle speed	25 km/h (16 mph) or more	—
	Transmission range	"D"	
	ECM selected gear	3rd or 4th	
	ECM lock-up command	ON	
	Actual gear	3rd or 4th	
	Actual gear at 2nd gear selected	Except 1st	
	ON malfunction		
	Engine coolant	60 °C (140 °F) or more	—
	Vehicle speed	25 km/h (16 mph) or more	—
	Transmission range	"D"	
	ECM selected gear	3rd or 4th	
	ECM lock-up command	OFF	
	Actual gear	3rd	
	Throttle valve opening angle	8 % or more	—
	Vehicle speed	—	Less than 60 km/h (37 mph)

Component T/M Outputs – Solenoid

2UZ-FE (TUNDRA)	OFF malfunction		
	Intake air temperature	–10 °C (14 °F) or more	Less than 90 °C (194 °F)
	Engine coolant	40 °C (104 °F) or more	–
	Transmission range	"D"	
	Battery voltage	10 V or more	–
	Spark retard by KCS control	–	Less than 8° CA
	Transfer range "Hi" [4WD]		
	Throttle valve opening angle	0 % or more	–
	Vehicle speed	5 km/h (3 mph) or more	–
	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		
	Intake air temperature	–10 °C (14 °F) or more	Less than 90 °C (194 °F)
	Engine coolant	40 °C (104 °F) or more	–
	Transmission range	"D"	
	Battery voltage	10 V or more	–
	Spark retard by KCS control	–	Less than 8° CA
	Transfer range "Hi" [4WD]		
	Throttle valve opening angle	0 % or more	–
	Vehicle speed	5 km/h (3 mph) or more	–
	ECM lock-up command	OFF	
	Actual gear	3rd	
	Throttle valve opening angle	9 % or more	–
	Vehicle speed	–	Less than 60 km/h (37 mph)
5S-FE	OFF malfunction		
	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
	ECM selected gear	4th with lock up	
	ON malfunction		
	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
	ECM selected gear	4th	
	Throttle valve opening angle	7 % or more	–

1ZZ-FE (COROLLA)	OFF malfunction		
	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	9° CA or more	-
	ECM selected gear	4th with lock up	
	ON malfunction		
	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	9° CA or more	-
	ECM selected gear	4th	
	Throttle valve opening angle	7 % or more	-
3S-FE (4WD)	OFF malfunction		
	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	10° CA or more	-
	ECM selected gear	4th with lock up	
	ON malfunction		
	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	10° CA or more	-
	ECM selected gear	4th	
	Throttle valve opening angle	7 % or more	-
3S-FE (2WD)	OFF malfunction		
	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	10° CA or more	-
	ECM selected gear	4th with lock up	
	ON malfunction		
	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	10° CA or more	-
	ECM selected gear	4th	
	Throttle valve opening angle	7 % or more	-

TYPICAL MALFUNCTION THRESHOLDS

Engine family	Detection criteria	Threshold
1MZ-FE (SIENNA), 3RZ-FE, 5VZ-FE, 1ZZ-FE (COROLLA), 3S-FE, 5S-FE	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	
	ON malfunction	
	Engine speed	$\geq$ 4th gear ratio x NO – 50 rpm < 4th gear ratio x NO + 50 rpm
2ZZ-GE, 1NZ-FE, 1ZZ-FE (CELICA), 1MZ-FE (RX330)	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	
	ON malfunction	
	Engine speed – Input speed (NE – NT)	Less than 35 rpm
1UZ-FE	OFF malfunction	
	Engine speed – output speed 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	
	ON malfunction	
	Engine speed – Input speed (NE – NC0)	Less than 35 rpm
2UZ-FE	OFF malfunction	
	Engine speed – Output speed 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	
	ON malfunction	
	Engine speed – Input speed (NE – NC0)	Less than 35 rpm
1MZ-FE (ES300, CAMRY, CAMRY SO- LARA)	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

2JZ-GE (SC300)	OFF malfunction	
	Output speed x 4th gear ratio (NE – NO x 4th gear ratio)	150 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 – NC0)	Less than 70 rpm
2JZ-GE (GS300)	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	
	ON malfunction	
	Engine speed – Input speed (NE – NC0)	Less than 35 rpm
1MZ-FE (AVALON)	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	
	ON malfunction	
	Engine speed – Input speed (NE – NC2)	Less than 35 rpm