

K - SENSOR RANGE CHARTS

1996 Toyota Supra

1996 ENGINE PERFORMANCE
Toyota Sensor Operating Range Charts

Supra

INTRODUCTION

Sensor operating range information can help determine if a sensor is out of calibration. An out-of-calibration sensor may not set a diagnostic trouble code, but it may cause driveability problems.

NOTE: Unless stated otherwise in testing procedure, perform all voltage tests using a Digital Volt-Ohmmeter (DVOM) with a minimum 10-megohm input impedance.

AIRFLOW METER

Airflow meter may be referred to as Mass Airflow (MAF) meter. For terminal identification and testing, see I - SYSTEM/COMPONENT TESTS article.

AIRFLOW METER RESISTANCE SPECIFICATIONS TABLE

Temperature	Ohms
Avalon, Camry 3.0L V6, Land Cruiser, Previa, Tacoma 3.4L V6, T100 3.4L V6 & 4Runner 3.4L V6	
-4°F (20°C)	10,000-20,000
32°F (0°C)	4000-7000
68°F (20°C)	2000-3000
104°F (40°C)	900-1300
140°F (60°C)	400-700
176°F (80°C)	200-400
Supra	
-4°F (-20°C)	10,000-20,000
32°F (0°C)	4000-7000
68°F (20°C)	2000-3000
104°F (40°C)	900-1300
140°F (60°C)	400-700

CAMSHAFT POSITION SENSOR

For camshaft position sensor testing, see F - BASIC TESTING article.

CAMSHAFT POSITION SENSOR RESISTANCE TABLE

Application	Ohms
Avalon & Camry 3.0L V6	
Cold (1)	835-1400
Hot (2)	1060-1645
Paseo	
Cold (1)	985-1600
Hot (2)	1265-1890
Supra	
Turbo	
Aisan Sensor	

Cold (1)	985-1600
Hot (2)	1265-1890
Nippondenso Sensor	
Cold (1)	835-1400
Hot (2)	1060-1645
Tacoma 3.4L V6	
Cold (1)	835-1400
Hot (2)	1060-1645
Tercel	
Cold (1)	985-1600
Hot (2)	1265-1890
T100 3.4L V6 & 4Runner 3.4L V6	
Cold (1)	835-1400
Hot (2)	1060-1645

- (1) - Cold is with temperature of 14-122°F (-10-50°C).
(2) - Hot is with temperature of 122-212°F (50-100°C).

CRANKSHAFT POSITION SENSOR

For crankshaft position sensor testing, see F - BASIC TESTING article.

CRANKSHAFT POSITION SENSOR RESISTANCE TABLE

Application	Ohms
Avalon	
Cold (1)	1630-2740
Hot (2)	2065-3225
Camry	
2.2L 4-Cyl.	
Cold (1)	985-1600
Hot (2)	1265-1890
3.0L V6	
Cold (1)	1630-2740
Hot (2)	2065-3225
Celica	
1.8L (7A-FE)	
Cold (1)	1630-2740
Hot (2)	2065-3225
2.2L (5S-FE)	
Cold (1)	985-1600
Hot (2)	1265-1890
Corolla	
Cold (1)	1630-2740
Hot (2)	2065-3225
Land Cruiser	
Cold (1)	1630-2740
Hot (2)	2065-3225
Paseo	
Cold (1)	985-1600
Hot (2)	1265-1890
Previa	
Cold (1)	1630-2740
Hot (2)	2065-3225
RAV4	
Cold (1)	985-1600
Hot (2)	1265-1890
Supra	
Non-Turbo	
Cold (1)	1630-2740

Hot (2)	2065-3225
Turbo	
Cold (1)	835-1400
Hot (2)	1060-1645
Tacoma	
Cold (1)	1630-2740
Hot (2)	2065-3225
Tercel	
Cold (1)	985-1600
Hot (2)	1265-1890
T100 & 4Runner	
Cold (1)	1630-2740
Hot (2)	2065-3225

(1) - Cold is with temperature of 14-122°F (-10-50°C).
(2) - Hot is with temperature of 122-212°F (50-100°C).

EGR GAS TEMPERATURE SENSOR

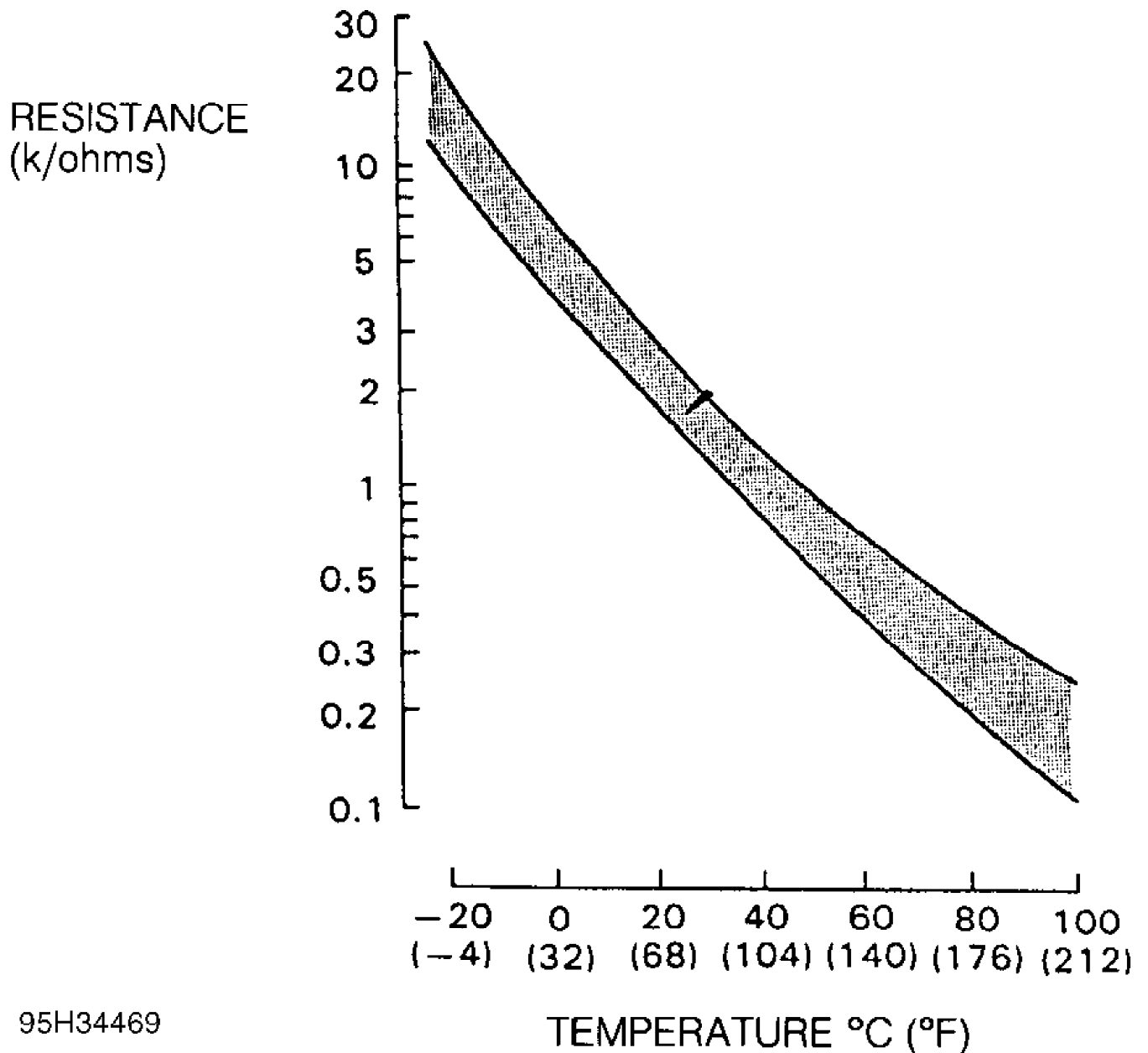
For EGR gas temperature sensor testing, see information in I - SYSTEM/COMPONENT TESTS article.

EGR GAS TEMPERATURE SENSOR SPECIFICATIONS TABLE

Temperature °F (°C)	Ohms
4-Cylinder	
Previa, Tacoma, T100 & 4Runner	
122 (50)	64,000-97,000
212 (100)	11,000-16,000
302 (150)	2000-4000
6-Cylinder	
Land Cruiser & Supra	
122 (50)	64,000-97,000
212 (100)	11,000-16,000
302 (150)	2000-4000
V6	
Avalon, Camry, Tacoma 2WD All Models & 4WD Regular Cab, & T100 2WD 1/2 Ton	
122 (50)	64,000-97,000
212 (100)	11,000-16,000
302 (150)	2000-4000

ENGINE COOLANT TEMPERATURE (ECT) SENSOR

For engine coolant temperature sensor location, see information in I - SYSTEM/COMPONENT TESTS article. Using ohmmeter, check resistance between electrical terminals on engine coolant temperature sensor. Ensure resistance is within specification in relation to specified temperature. See Fig. 1.



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Fig. 1: Checking ECT Sensor Or IAT Sensor
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

HEATED OXYGEN SENSOR

For heated oxygen sensor application and sensor testing, see I - SYSTEM/COMPONENT TESTS article.

INTAKE AIR TEMPERATURE SENSOR

Camry 2.2L 4-Cyl., Celica, Corolla, Paseo, RAV4, Tacoma 2.4L & 2.7L 4-Cyl., Tercel, T100 2.7L 4-Cyl. & 4Runner 2.7L 4-Cyl.

For intake air temperature sensor testing, see information in I - SYSTEM/COMPONENT TESTS article. Using ohmmeter, check resistance between electrical terminals on intake air temperature sensor. Ensure resistance is within specification in relation to specified

temperature. See Fig. 1.

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR

Camry 2.2L 4-Cyl. Celica, Corolla, Paseo, RAV4 & Tercel
 For MAP sensor testing, see I - SYSTEM/COMPONENT TESTS
 article.

SUB-OXYGEN SENSOR HEATER

Supra Turbo
 Using ohmmeter, check resistance between sub-oxygen sensor
 terminals +B and HT. For terminal identification, see information in
 I - SYSTEM/COMPONENT TESTS article. Replace sub-oxygen sensor if
 resistance is not 11-16 ohms at 68°F (20°C).

THROTTLE POSITION (TP) SENSOR

For terminal identification and testing procedures, see
 I - SYSTEM/COMPONENT TESTS article.

AVALON THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)	Terminals	Ohmmeter Reading	
3.0L (1)	0 (0)	VTA & E2	280-6400	
	.014 (.35)	IDL & E2	500 Or Less	
	.028 (.70)	IDL & E2	No Continuity	
	Fully Open	VTA & E2	VC & E2	2000-11,600
			VC & E2	2700-7700

(1) - Apply vacuum to throttle opener before checking TP
 sensor.

CAMRY THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)	Terminals	Ohmmeter Reading	
2.2L 4-Cyl. (1)	0 (0)	VTA & E2	200-5700	
	.020 (.50)	IDL & E2	Continuity	
	.028 (.70)	IDL & E2	No Continuity	
	Fully Open	VTA & E2	VC & E2	2000-10,200
			VC & E2	2500-5900
3.0L V6 (1)	0 (0)	VTA & E2	280-6400	
	.014 (.35)	IDL & E2	500 Or Less	
	.028 (.70)	IDL & E2	No Continuity	
	Fully Open	VTA & E2	VC & E2	2000-11,600
			VC & E2	2700-7700

(1) - Apply vacuum to throttle opener before checking TP
 sensor.

CELICA THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)	Terminals	Ohmmeter Reading
1.8L (7A-FE) (1)	0 (0)	VTA & E2	200-5700
	.016 (.40)	IDL & E2	2300 Or Less

	.035 (.90)	.	IDL & E2	.	No Continuity
	Fully Open	.	VTA & E2	...	2000-10,200
			VC & E2	.....	2500-5900
2.2L (5S-FE) (1)	.. 0 (0)	...	VTA & E2	.....	200-5700
	.020 (.50)	.	IDL & E2	....	Continuity
	.028 (.70)	.	IDL & E2	.	No Continuity
	Fully Open	.	VTA & E2	...	2000-10,200
			VC & E2	.....	2500-5900

(1) - Apply vacuum to throttle opener before checking TP sensor.

COROLLA THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)	Terminals	Ohmmeter Reading
1.6L (4A-FE) & 1.8L (7A-FE) (1)	... 0 (0)	... VTA & E2	..... 200-5700
	.016 (.40)	. IDL & E2	. 2300 Or Less
	.035 (.90)	. IDL & E2	No Continuity
	Fully Open	. VTA & E2	.. 2000-10,200
		VC & E2	..... 2500-5900

(1) - On models with throttle opener, apply vacuum to throttle opener before checking TP sensor.

LAND CRUISER THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)	Terminals	Ohmmeter Reading
4.5L (1)	..... 0 (0)	..... VTA & E2	..... 200-5700
	.020 (.50)	... IDL & E2	.. 2300 Or Less
	.030 (.75)	... IDL & E2	. No Continuity
	Fully Open	... VTA & E2	... 2000-10,200
		VC & E2	..... 2500-5900

(1) - Apply vacuum to throttle opener before checking TP sensor.

PASEO THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)	Terminals	Ohmmeter Reading
1.5L (1)	..... 0 (0)	..... VTA & E2	..... 200-5700
	.020 (.50)	.... IDL & E2	... 2300 Or Less
	.028 (.70)	.... IDL & E2	.. No Continuity
	Fully Open	.... VTA & E2	.... 2000-10,200
		VC & E2	..... 2500-5900

(1) - On A/T models, disconnect throttle cable from linkage before checking TP sensor.

PREVIA THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)	Terminals	Ohmmeter Reading
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2.4L (1)	0 (0)	VTA & E2	200-5700
	.020 (.50)	..	IDL & E2	2300 Or Less
	.037 (.95)	..	IDL & E2	...	No Continuity
	Fully Open	..	VTA & E2	2000-10,200
			VC & E2	.....	2500-5900

(1) - Apply vacuum to throttle opener before checking TP sensor.

RAV4 THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)		Terminals		Ohmmeter Reading
2.0L (1)	0 (0)	....	VTA & E2	.....	200-5700
	.020 (.50)	..	IDL & E2	.....	Continuity
	.028 (.70)	..	IDL & E2	...	No Continuity
	Fully Open	..	VTA & E2	.....	2000-10,200
			VC & E2	.....	2500-5900

(1) - Apply vacuum to throttle opener before checking TP sensor.

SUPRA MAIN THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)		Terminals		Ohmmeter Reading
Non-Turbo (1)	0 (0)	....	VTA & E2	.....	340-6300
	.016 (.40)	..	IDL & E2	....	500 Or Less
	.024 (.60)	..	IDL & E2	..	No Continuity
	Fully Open	..	VTA & E2	....	2400-11,200
			VC & E2	.....	3100-7200
Turbo (1)	0 (0)	....	VTA & E2	.....	340-6300
	.021 (.54)	..	IDL & E2	....	500 Or Less
	.028 (.70)	..	IDL & E2	..	No Continuity
	Fully Open	..	VTA & E2	....	2400-11,200
			VC & E2	.....	3100-7200

(1) - Apply vacuum to throttle opener before checking TP sensor.

TACOMA THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)		Terminals		Ohmmeter Reading
2.4L & 2.7L 4-Cyl. (1)	0 (0)	....	VTA & E2	.....	200-5700
	.022 (.57)	..	IDL & E2	....	2300 Or Less
	.029 (.74)	..	IDL & E2	...	No Continuity
	Fully Open	..	VTA & E2	.....	2000-10,200
			VC & E2	.....	2500-5900
3.4L V6 (1)	0 (0)	....	VTA & E2	.....	280-6400
	.013 (.32)	..	IDL & E2	.....	500 Or Less
	.021 (.54)	..	IDL & E2	...	No Continuity
	Fully Open	..	VTA & E2	.....	2000-11,600
			VC & E2	.....	2700-7700

(1) - Apply vacuum to throttle opener before checking TP sensor.

TERCEL THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)	Terminals	Ohmmeter Reading
1.5L (1)	0 (0)	VTA & E2	200-5700
	.020 (.50)	IDL & E2	2300 Or Less
	.028 (.70)	IDL & E2	No Continuity
	Fully Open	VTA & E2	2000-10,200
		VC & E2	2500-5900

(1) - On A/T models, disconnect throttle cable from linkage before checking TP sensor.

T100 THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)	Terminals	Ohmmeter Reading
2.7L 4-Cyl. (1)	0 (0)	VTA & E2	200-5700
	.020 (.50)	IDL & E2	2300 Or Less
	.030 (.75)	IDL & E2	No Continuity
	Fully Open	VTA & E2	2000-10,200
		VC & E2	2500-5900
3.4L V6 (1)	0 (0)	VTA & E2	280-6400
	.013 (.32)	IDL & E2	500 Or Less
	.021 (.54)	IDL & E2	No Continuity
	Fully Open	VTA & E2	2000-11,600
		VC & E2	2700-7700

(1) - Apply vacuum to throttle opener before checking TP sensor.

4RUNNER THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)	Terminals	Ohmmeter Reading
2.7L 4-Cyl. (1)	0 (0)	VTA & E2	200-5700
	.022 (.57)	IDL & E2	2300 Or Less
	.029 (.74)	IDL & E2	No Continuity
	Fully Open	VTA & E2	2000-10,200
		VC & E2	2500-5900
3.4L V6 (1)	0 (0)	VTA & E2	280-6400
	Fully Open	VTA & E2	2000-11,600
		VC & E2	2700-7700

(1) - Apply vacuum to throttle opener before checking TP sensor.

SUB-THROTTLE POSITION (THROTTLE POSITION) SENSOR

Supra Turbo

For terminal identification and testing, see information in I - SYSTEM/COMPONENT TESTS article.

SUB-THROTTLE POSITION SENSOR RESISTANCE SPECIFICATIONS TABLE

Application	Clearance In. (mm)	Terminals	Ohmmeter Reading
Turbo	0 (0)	VTA & E2	300-6300
	.016 (.40)	IDL & E2	500 Or Less
	.019 (.48)	IDL & E2 ...	No Continuity
	Fully Open	VTA & E2	200-10,800
		VC & E2	3500-6500

TURBO PRESSURE SENSOR

Supra Turbo

For turbo pressure sensor testing, see information in
I - SYSTEM/COMPONENT TESTS article.

VAPOR PRESSURE SENSOR

Avalon, Camry 2.2L 4-Cyl. With A/T, RAV4, Tacoma 4WD
& 4Runner

For vapor pressure sensor testing, see information in
I - SYSTEM/COMPONENT TESTS article.