

D - ADJUSTMENTS

1994 Toyota Celica

1994 ENGINE PERFORMANCE
Toyota On-Vehicle Adjustments

Celica

ENGINE MECHANICAL

Before performing any on-vehicle adjustments to fuel or ignition systems, ensure engine mechanical condition is okay.

VALVE CLEARANCE

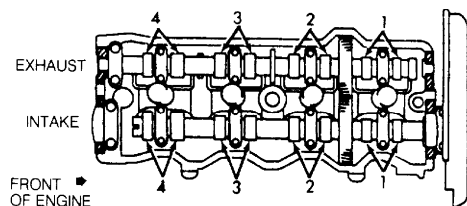
NOTE: Adjust valve clearance with engine cold.

NOTE: If valve cover uses grommets below retaining nuts or bolts, keep grommets in order so they are installed in original locations during reassembly.

Celica 2.2L

1) Remove valve cover(s) and gasket(s). Rotate crankshaft so timing mark on crankshaft pulley aligns with "0" mark on front cover and cylinder No. 1 (front cylinder at timing belt or timing chain end) is at TDC on compression stroke.

2) Ensure valves on cylinder No. 1 are closed. If valves are not closed, rotate crankshaft 360 degrees (one full revolution). With cylinder No. 1 at TDC, check valve clearance on specified valves. See VALVE CLEARANCE ADJUSTMENT SEQUENCE table. See Fig. 1.



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Fig. 1: Typical 4-Cylinder Valve Arrangement
Courtesy of Toyota Motor Sales, U.S.A., Inc.

3) Using feeler gauge, measure and record valve clearance between valve lifter and camshaft. Ensure valve clearance is within specification. See VALVE CLEARANCE SPECIFICATIONS table.

4) To check remaining valves, rotate crankshaft 360 degrees (one full revolution) until cylinder No. 4 is at TDC on compression stroke. Measure valve clearance on specified valves. See VALVE CLEARANCE ADJUSTMENT SEQUENCE table.

5) If valve clearance requires adjustment, rotate crankshaft so camshaft lobe on valve to be adjusted is facing upward, away from valve lifter. Rotate valve lifter so notch on valve lifter is toward spark plug.

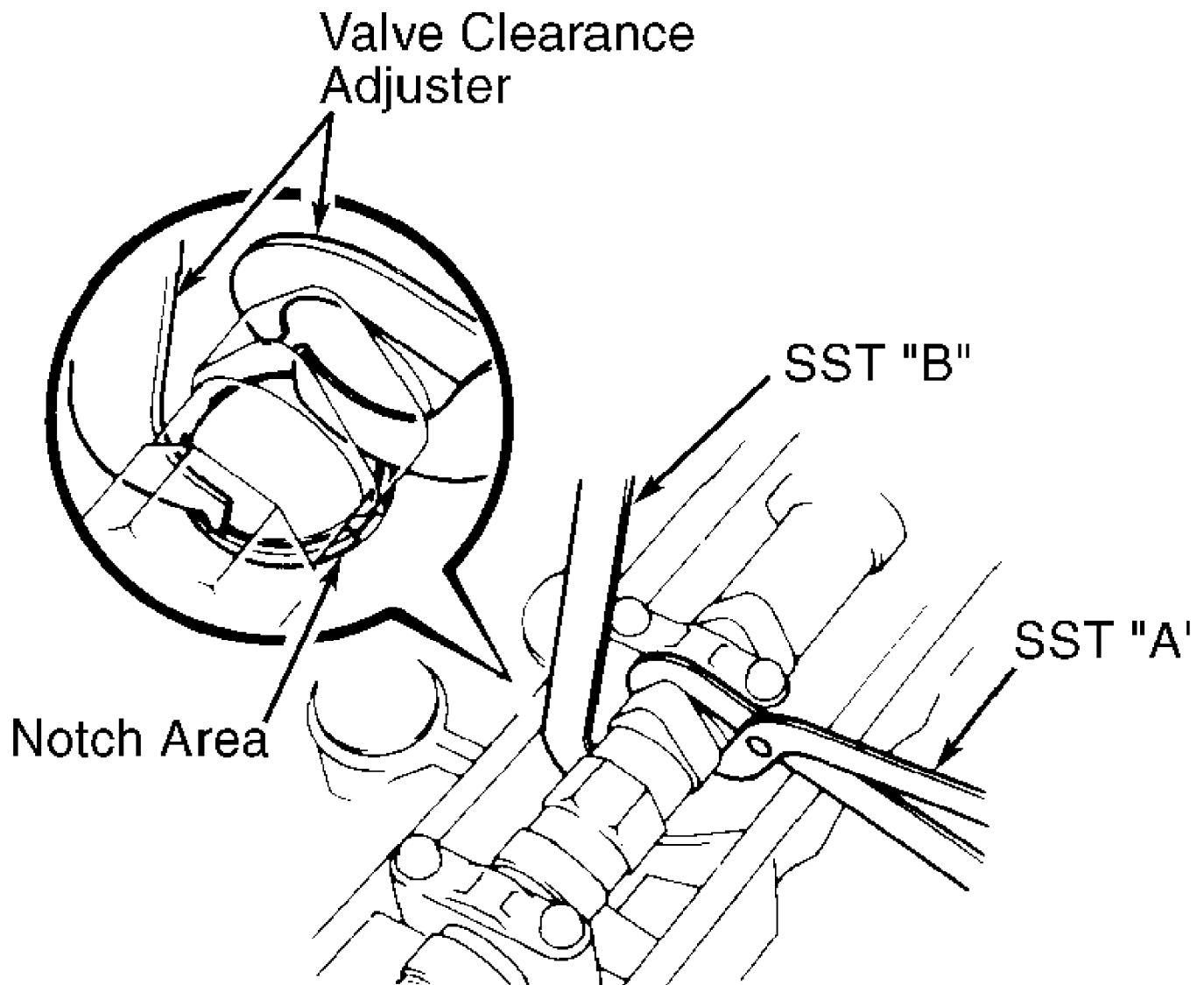
6) Valve Clearance Adjuster (SST 09248-55040) is used for adjusting valve clearance. Press valve lifter downward using SST "A" of valve clearance adjuster. See Fig. 2. Install SST "B" between camshaft and valve lifter. Remove SST "A".

7) Using small screwdriver and magnet, remove adjusting shim. Using micrometer, measure thickness of adjusting shim removed. Using

measured clearance and adjusting shim thickness, determine correct thickness of adjusting shim to be used. See SHIM THICKNESS table. Install adjusting shim. Recheck valve clearance.

NOTE: Before installing valve cover gasket, apply sealant at camshaft bearing caps-to-cylinder head surfaces where valve cover gasket seals.

8) Install valve cover using NEW gasket. On Previa, remove bolt from accessory drive shaft. On all models, reverse removal procedure to install remaining components.



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Fig. 2: Removing & Installing Valve Clearance Adjusting Shim
Courtesy of Toyota Motor Sales, U.S.A., Inc.

Celica 1.8L

1) Remove valve cover and gasket. Rotate crankshaft so timing mark on crankshaft pulley aligns with "0" mark on front cover and cylinder No. 1 (front cylinder at timing belt end) is at TDC on

compression stroke.

2) Ensure valves on cylinder No. 1 are closed. If valves are not closed, rotate crankshaft 360 degrees (one full revolution). With cylinder No. 1 at TDC, check valve clearance on specified valves. See VALVE CLEARANCE ADJUSTMENT SEQUENCE table. See Fig. 1.

3) Using feeler gauge, measure and record valve clearance between valve lifter and camshaft. Ensure valve clearance is within specification. See VALVE CLEARANCE SPECIFICATIONS table.

4) To check remaining valves, rotate crankshaft 360 degrees (one full revolution) until cylinder No. 4 is at TDC on compression stroke. Measure valve clearance on specified valves. See VALVE CLEARANCE ADJUSTMENT SEQUENCE table.

5) If valve clearance on intake valve requires adjustment, manufacturer states to remove intake camshaft for access to adjusting shim. See appropriate article listed below:

- 1.8L 4-CYL VIN [A]
- 2.2L 4-CYL - VIN [S]

6) If valve clearance on exhaust valve requires adjustment, rotate crankshaft so camshaft lobe on valve to be adjusted is facing upward, away from valve lifter. Rotate valve lifter so notch on valve lifter is toward front of vehicle.

7) Valve Clearance Adjuster (SST 09248-55040) is used for adjusting valve clearance. Press valve lifter downward using SST "A" of valve clearance adjuster. See Fig. 2. Install SST "B" between camshaft and valve lifter. Remove SST "A".

8) On all valve applications, using small screwdriver and magnet, remove adjusting shim. Using micrometer, measure thickness of adjusting shim removed. Using measured clearance and adjusting shim thickness, determine correct thickness of adjusting shim to be used. See SHIM THICKNESS table. Shim thickness can also be determined by using the following formula: $N = T + A$.

- * N = Thickness of adjuster shim required.
- * T = Thickness of adjuster shim removed.
- * A = Measured clearance minus valve clearance specification.

NOTE: Before installing valve cover gasket, apply sealant at camshaft bearing caps-to-cylinder head surfaces where valve cover gasket seals.

9) Install adjusting shim. Recheck valve clearance. Install valve cover using NEW gasket. To install remaining components, reverse removal procedure.

VALVE CLEARANCE ADJUSTMENT SEQUENCE TABLE

Piston No. On TDC	Adjust	
	Intake Valves	Exhaust Valves
1	1 & 2	1 & 3
4	3 & 4	2 & 4

VALVE CLEARANCE SPECIFICATIONS TABLE

Application	(1) In. (mm)
1.8L (7A-FE)	
Exhaust .....	.010-.014 (.25-.35)
Intake .....	.006-.010 (.15-.25)
2.2L (5S-FE)	

Exhaust .....	.011-.015 (.28-.38)
Intake .....	.007-.011 (.18-.28)

(1) - Adjust valve clearance with engine cold.

SHIM THICKNESS TABLE

Thickness mm (in.)	Shim No.
2.50 (0.0984)	1
2.55 (0.1004)	2
2.60 (0.1024)	3
2.65 (0.1043)	4
2.70 (0.1063)	5
2.75 (0.1083)	6
2.80 (0.1102)	7
2.85 (0.1122)	8
2.90 (0.1142)	9
2.95 (0.1161)	10
3.00 (0.1181)	11
3.05 (0.1201)	12
3.10 (0.1220)	13
3.15 (0.1240)	14
3.20 (0.1260)	15
3.25 (0.1280)	16
3.30 (0.1299)	17

IGNITION TIMING

CAUTION: Some tachometers may not be compatible with ignition system. Consult tachometer manufacturer before connecting tachometer to system. To avoid possible damage to ignitor and/or coil, DO NOT allow tachometer terminal to become grounded.

1) Warm engine to normal operating temperature. Shut engine off. Connect timing light. Connect tachometer to proper terminals of data link connector. See Fig. 3.

2) Install Jumper Wire (SST 09843-18020) between terminals TE1 and E1 of data link connector. On all models except Previa, data link connector is located in engine compartment. On Previa, data link connector is located near emergency brake lever. See Fig. 4.

3) On all models, apply parking brake. Start engine. Ensure engine returns to idle.

NOTE: Timing marks are located on front cover.

4) Ensure base timing is within specification with engine at specified RPM with transmission/transaxle in Neutral and all accessories off. See appropriate IGNITION TIMING table.

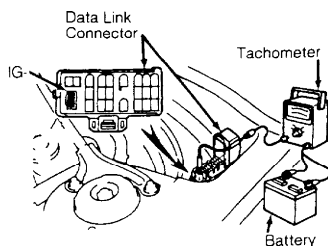
5) If ignition timing is incorrect, loosen distributor hold-down bolt or nut. Adjust ignition timing by rotating distributor. Tighten distributor hold-down bolt or nut. Remove jumper wire from data link connector. Ensure advance timing is within specification. See appropriate IGNITION TIMING table.

IGNITION TIMING TABLE (Degrees BTDC @ RPM)

Application (1) (2) Base Timing (3) Advance Timing

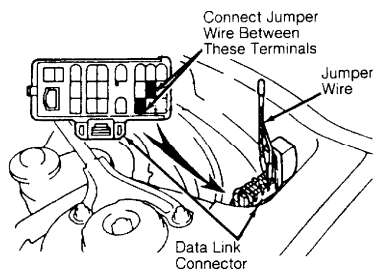
1.8L (7A-FE)	10 @ 700	5-15 @ 700
2.2L (5S-FE)	10 @ 750	0-10 @ 750

- (1) - Check with transmission/transaxle in Neutral, parking brake applied, electric cooling fan (if equipped) and A/C off.
- (2) - With jumper wire installed between data link connector terminals TE1 and E1.
- (3) - With jumper wire removed from data link connector.



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Fig. 3: Connecting Tachometer
 Courtesy of Toyota Motor Sales, U.S.A., Inc.



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Fig. 4: Installing Jumper Wire Between Data Link Connector Terminals
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

IDLE SPEED & MIXTURE

NOTE: Mixture adjustment is not possible on any model.

IDLE SPEED

CAUTION: Some tachometers may not be compatible with ignition system. Consult tachometer manufacturer before connecting tachometer to system. To avoid possible damage to ignitor and/or coil, DO NOT allow tachometer terminal to become grounded.

NOTE: Check and adjust idle speed with air cleaner installed, all air intake system hoses and vacuum lines connected, electronic fuel injection system wiring connectors tight, transmission/transaxle in Neutral, all accessories and electric cooling fan off (if equipped), and engine at normal operating temperature.

- 1) Install tachometer on proper terminals of data link connector. See Fig. 3. Start and operate engine at 2500 RPM for about 90 seconds.
- 2) Allow engine to idle. Ensure idle speed is within

specification. See IDLE SPEED SPECIFICATIONS table. If idle speed is not within specification, check Idle Air Control (IAC) valve, wiring and Electronic Control Module (ECM). See IDLE CONTROL SYSTEM information in I - SYSTEM/COMPONENT TESTS article. Remove tachometer.

IDLE SPEED SPECIFICATIONS TABLE

Application (1)	RPM
1.8L (7A-FE)	700
2.2L (5S-FE)	750

(1) - Check with transmission/transaxle in Neutral, parking brake applied and all accessories off.

THROTTLE POSITION SENSOR

1) Disconnect electrical connector from Throttle Position Sensor (TPS). Loosen TPS mounting screws. Connect ohmmeter between terminals IDL and E2. See Figs. 5 and 6.

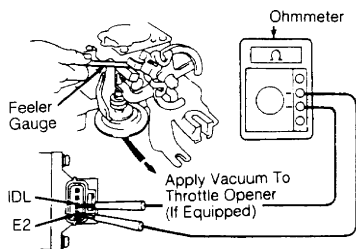
2) Apply vacuum to throttle opener (if equipped). To set initial clearance, insert proper thickness feeler gauge between throttle stop screw and throttle lever. See appropriate THROTTLE POSITION SENSOR ADJUSTMENT table.

3) With ohmmeter showing no continuity, rotate TPS clockwise until continuity exists. Tighten TPS mounting screws. Using specified feeler gauge, recheck adjusted clearance. Disconnect ohmmeter. Install electrical connector on TPS.

THROTTLE POSITION SENSOR ADJUSTMENT TABLE

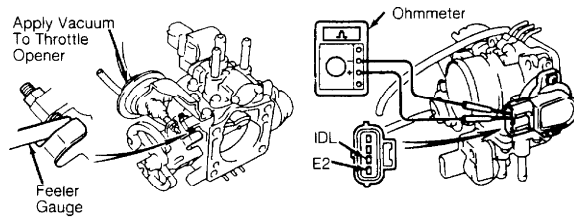
Application	Initial Clearance In. (mm)	Adjusted Clearance In. (mm)	Ohmmeter Reading
1.8L (1) .....	.028 (.71) ...	.016 (.41)	Continuity
		.035 (.89) ..	No Continuity
2.2L (1) .....	.024 (.61) ...	.020 (.51)	Continuity
		.028 (.71) ..	No Continuity

(1) - Apply vacuum to throttle opener before checking TPS adjustment.



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Fig. 5: Adjusting Throttle Position Sensor (1.8L)
 Courtesy of Toyota Motor Sales, U.S.A., Inc.



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Fig. 6: Adjusting Throttle Position Sensor (2.2L)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

DASHPOT & THROTTLE VALVE OPENER CONTROL SYSTEM

For testing and adjustment procedures, see THROTTLE CONTROLS
in I - SYSTEM/COMPONENT TESTS article.