

## D - ADJUSTMENTS

### 1998 Toyota Supra

#### 1998 ENGINE PERFORMANCE

#### Toyota - On-Vehicle Adjustments - 6-Cylinder

#### Supra

### ENGINE MECHANICAL

#### \* PLEASE READ FIRST \*

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

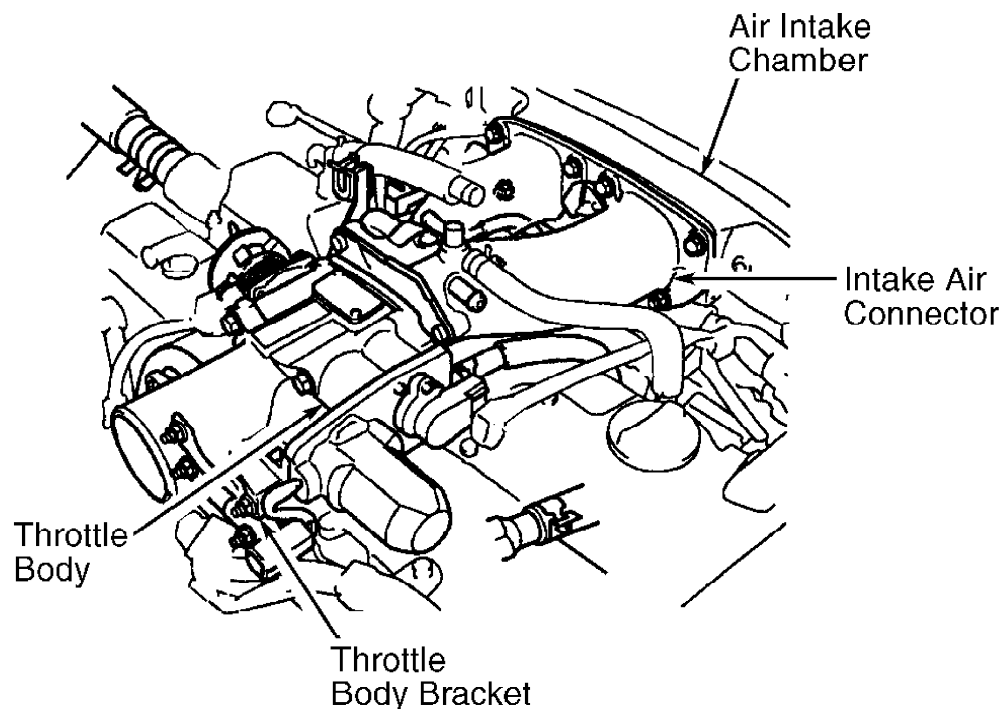
### VALVE CLEARANCE

NOTE: Check valve clearance with engine cold.

#### Non-Turbo

1) Drain cooling system. Remove air intake pipe for access to intake air connector with throttle body. See Fig. 1. Disconnect necessary electrical connectors, control cables, hoses and engine wire clamps for removal of intake air connector with throttle body.

2) Note location of throttle body bracket. See Fig. 1. Remove throttle body bracket-to-cylinder head nuts. Remove air intake connector-to-air intake chamber bolts/nuts. Remove air intake connector with throttle body and gasket from air intake chamber.



98C01393

Fig. 1: Locating Intake Air Connector & Throttle Body Bracket (Non-Turbo)

Courtesy of Toyota Motor Sales, U.S.A., Inc.

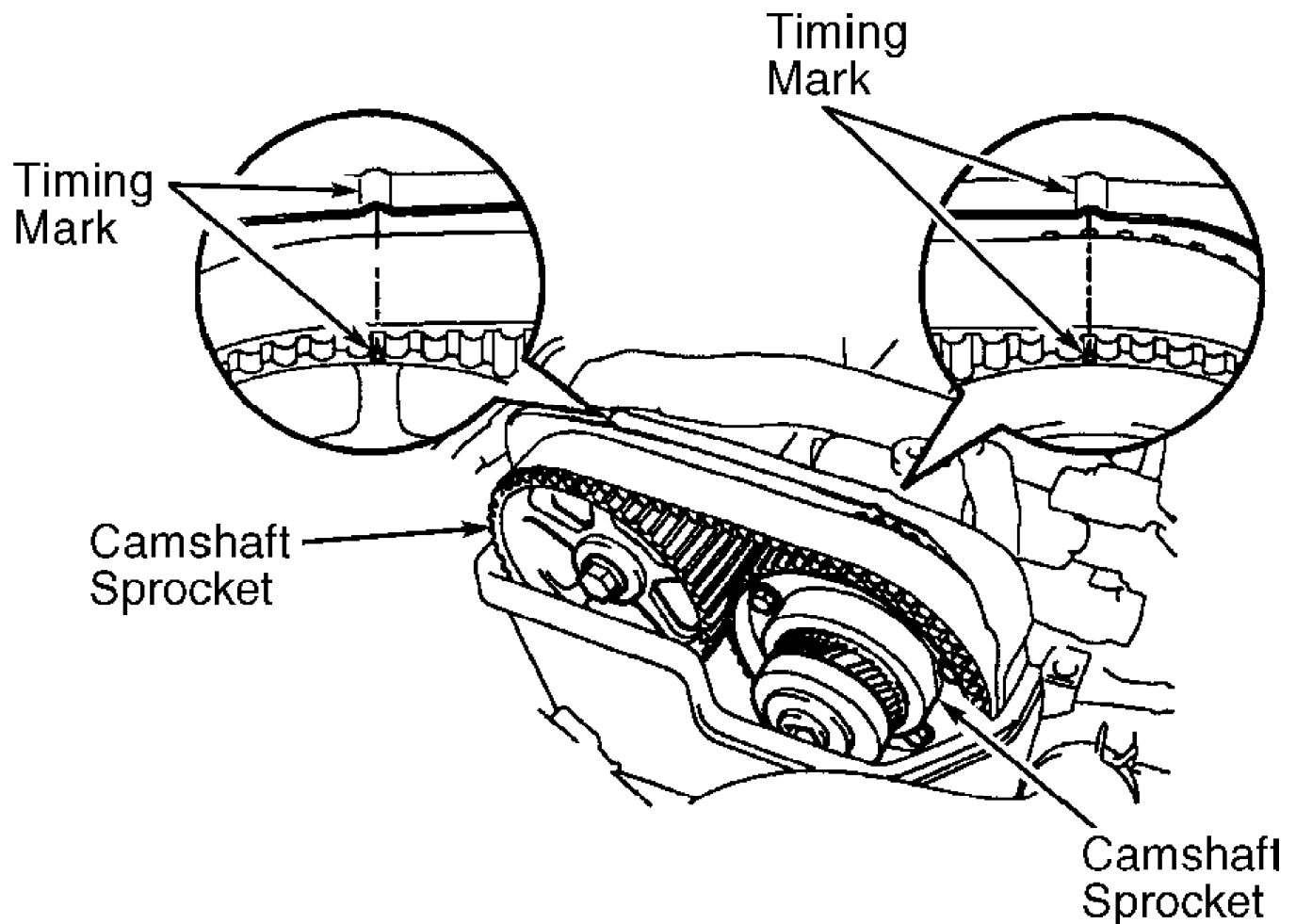
3) Remove oil filler cap. Remove bolts and upper timing belt

cover with gasket. Upper timing belt cover is located above timing belt. Disconnect electrical connectors from ignition coils, located above the spark plugs, in between the valve covers. Remove bolts and ignition coils with spark plug wires. Remove spark plugs.

4) Disconnect engine wiring harness for access to valve covers. Remove bolts/nuts, valve covers and gaskets.

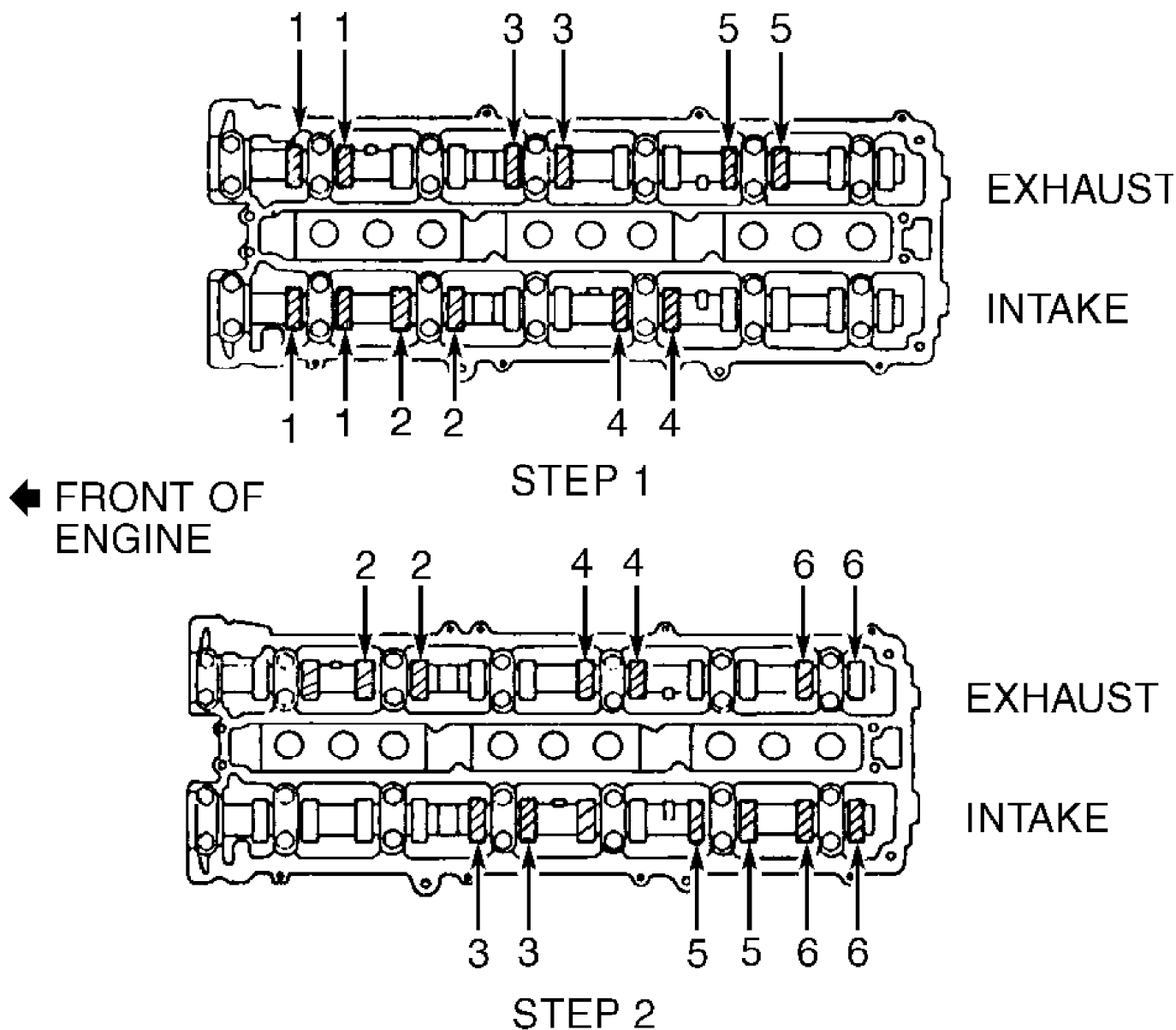
5) Rotate crankshaft pulley clockwise so crankshaft pulley groove aligns with "0" mark on timing belt cover and cylinder No. 1 (front cylinder) is at TDC on compression stroke. Ensure timing marks on camshaft sprockets are aligned with timing marks on timing belt cover. See Fig. 2. If timing marks are not aligned, rotate crankshaft pulley clockwise one full revolution (360 degrees).

6) Using feeler gauge, measure and record valve clearance of intake valves on cylinders No. 1, 2 and 4, and exhaust valves on cylinders No. 1, 3 and 5. Perform STEP 1. See Fig. 3.



98E01394

Fig. 2: Aligning Camshaft Sprocket Timing Marks (Non-Turbo)  
Courtesy of Toyota Motor Sales, U.S.A., Inc.



### 93G83044

Fig. 3: Identifying Cylinder Numbers & Valve Arrangement  
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

7) Rotate crankshaft pulley clockwise one full revolution (360 degrees) and realign crankshaft pulley groove with "0" mark on timing belt cover. Using feeler gauge, measure and record valve clearance of intake valves on cylinders No. 3, 5 and 6, and exhaust valves on cylinders No. 2, 4 and 6. Perform STEP 2. See Fig. 3.

8) Ensure valve clearance is within specification. See VALVE CLEARANCE SPECIFICATIONS table.

#### VALVE CLEARANCE SPECIFICATIONS TABLE

| Application  | (1) In. (mm)        |
|--------------|---------------------|
| Intake ..... | .006-.010 (.15-.25) |

Exhaust ..... .010-.014 (.25-.35)

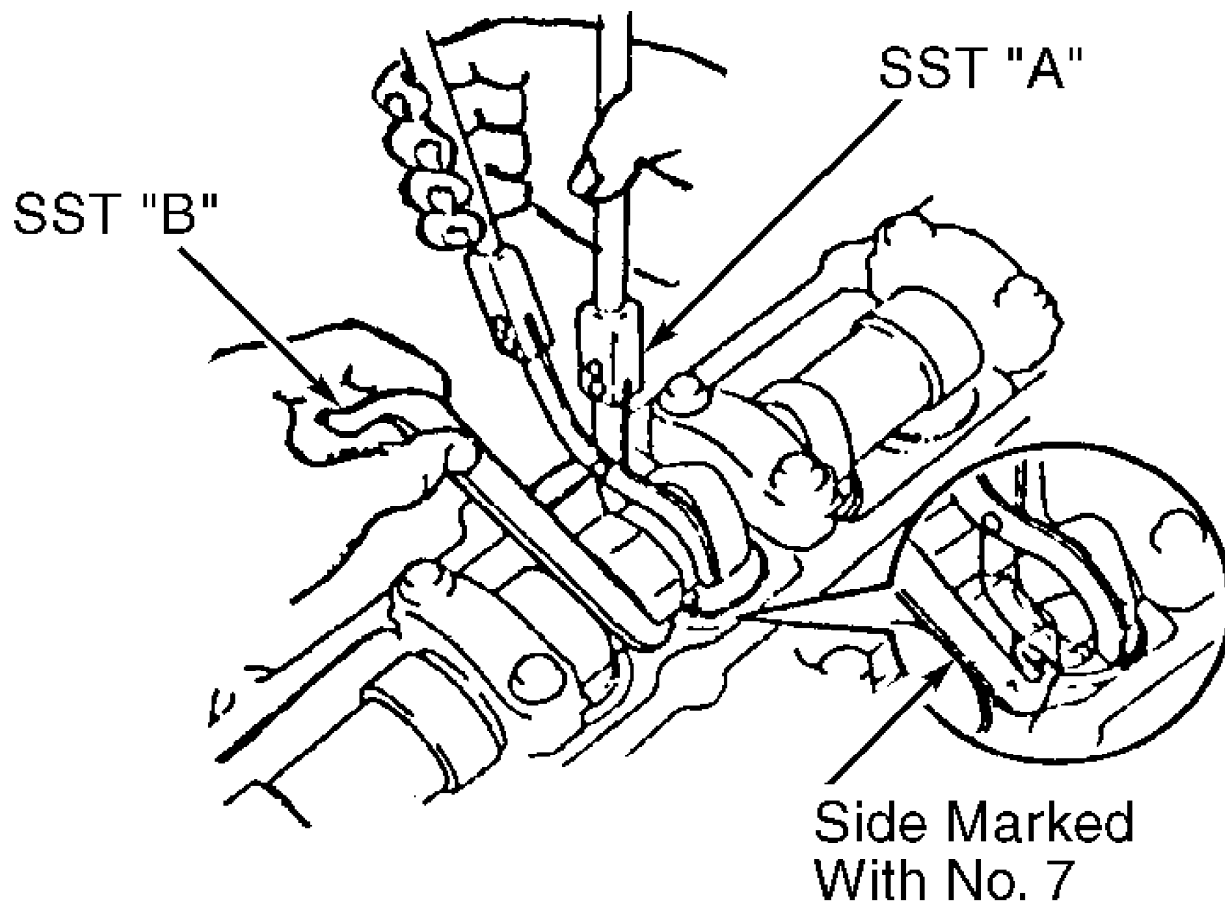
(1) - Adjust valve clearance with engine cold.

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9) If valve clearance adjustment is required, rotate crankshaft pulley so camshaft lobe is facing upward on valve to be adjusted. Rotate valve lifter so notch area on valve lifter is at 90-degree angle to camshaft. This will place notch area perpendicular to camshaft.

10) 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. 4. Install SST "B" between camshaft and valve lifter with side marked with No. 7 at designated position. See Fig. 4. Remove SST "A".

NOTE: SST "B" may be marked with a No. 9 in place of the No. 7. When adjusting valve clearance on intake valve on cylinder No. 1, it may be necessary to remove No. 2 camshaft bearing cap so SST "B" may be installed between camshaft and valve lifter.



93|83046

Fig. 4: Removing & Installing Valve Clearance Adjusting Shim  
Courtesy of Toyota Motor Sales, U.S.A., Inc.

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

Using measured clearance and adjusting shim thickness, determine correct thickness of adjusting shim to be used. See Figs. 6 and 7.

12) Install proper adjusting shim with imprinted numbers on adjusting shim facing downward, toward valve lifter. Using SST "A", press downward on valve lifter and remove SST "B". Recheck valve clearance.

13) Install No. 2 camshaft bearing cap if removed. Tighten camshaft bearing cap bolts to specification. See TORQUE SPECIFICATIONS

14) To install remaining components, reverse removal procedure using NEW gasket for air intake connector. Apply sealant at front camshaft bearing cap-to-cylinder head surfaces where valve cover gasket seals before installing valve cover. Tighten bolts/nuts to specification. See TORQUE SPECIFICATIONS. Fill cooling system.

#### Turbo

1) Remove oil filler cap. Remove bolts and upper timing belt cover. Upper timing belt cover is located above timing belt. Disconnect PCV hoses.

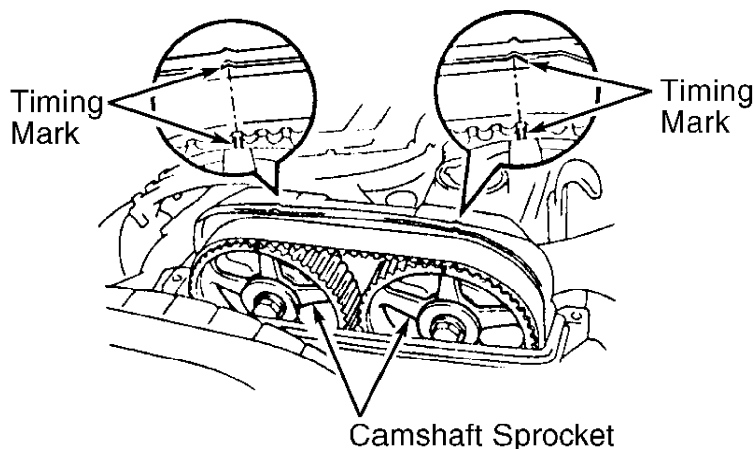
2) Disconnect electrical connectors from ignition coils located above the spark plugs, in between the valve covers. Remove ignition coil mounting bracket bolts. Remove ignition coil assemblies.

3) Disconnect engine wiring harness from clamps at front of engine, above the valve covers. Remove engine wiring harness protector from front of valve covers. Disconnect ground strap and engine wiring harness protector from firewall at rear of valve covers.

4) Disconnect hoses from Idle Air Control (IAC) valve pipe located at firewall, above rear of valve covers. Remove IAC valve pipe from valve cover. Disconnect cruise control cable and hoses for access to valve covers. Remove bolts/nuts, valve covers and gaskets.

5) Rotate crankshaft pulley clockwise so crankshaft pulley groove aligns with "0" mark on timing belt cover and cylinder No. 1 (front cylinder) is at TDC on compression stroke. Ensure timing marks on camshaft sprockets align with timing marks on timing belt cover. See Fig. 5. If timing marks are not aligned, rotate crankshaft pulley clockwise one full revolution (360 degrees).

6) Using feeler gauge, measure and record valve clearance of intake valves on cylinders No. 1, 2 and 4, and exhaust valves on cylinders No. 1, 3 and 5. Perform STEP 1. See Fig. 3.



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Fig. 5: Aligning Camshaft Sprocket Timing Marks (Turbo)  
Courtesy of Toyota Motor Sales, U.S.A., Inc.

7) Rotate crankshaft pulley clockwise one full revolution (360 degrees) and realign crankshaft pulley groove with "0" mark on

timing belt cover. Using feeler gauge, measure and record valve clearance of intake valves on cylinders No. 3, 5 and 6, and exhaust valves on cylinders No. 2, 4 and 6. Perform STEP 2. See Fig. 3.

8) Ensure valve clearance is within specification. See VALVE CLEARANCE SPECIFICATIONS table.

9) If valve clearance adjustment is required, rotate crankshaft pulley so camshaft lobe is facing upward on valve to be adjusted. Rotate valve lifter so notch area on valve lifter is at 90-degree angle to camshaft. This will place notch area perpendicular to camshaft.

10) 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. 4. Install SST "B" between camshaft and valve lifter with side marked with No. 7 at designated position. See Fig. 4. Remove SST "A".

NOTE: SST "B" may be marked with a No. 9 in place of the No. 7. When adjusting valve clearance on intake valve on cylinder No. 1, it may be necessary to remove No. 2 camshaft bearing cap so SST "B" may be installed between camshaft and valve lifter.

11) Using small screwdriver and magnet, remove adjusting shim. Using micrometer, measure thickness of removed adjusting shim. Using measured clearance and adjusting shim thickness, determine correct thickness of adjusting shim to be used. See Figs. 5 and 6.

12) Install proper adjusting shim with imprinted numbers on adjusting shim facing downward, toward valve lifter. Using SST "A", press downward on valve lifter and remove SST "B". Recheck valve clearance.

13) To install remaining components, reverse removal procedure. Apply sealant at front camshaft bearing cap-to-cylinder head surfaces where valve cover gasket seals before installing valve cover. Tighten bolts/nuts to specification. See TORQUE SPECIFICATIONS.

| Measured Clearance<br>mm (in.)  | Installed Shim Thickness<br>mm (in.) | New shim thickness mm (in.) |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | Shim No. | Thickness | Shim No. | Thickness |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   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|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 0.000 - 0.020 (0.0000 - 0.0008) | 2.500 (0.0984)                       | 1                           | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1        | 1         | 1        | 1         | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |  |

INTAKE VALVES

EXAMPLE: A 0.1102" (2.800 mm) shim is installed and measured clearance is 0.0177" (0.450 mm).  
Replace 0.1102" (2.800 mm) shim with a No. 12 shim.

Fig. 6: Intake Valve Adjusting Shim Selection Chart  
Courtesy of Toyota Motor Sales, U.S.A., Inc.





# Non-Turbo

1) Start engine and warm engine to normal operating temperature. Shut engine off. Connect scan tool to data link connector No. 3. See Fig. 8. Scan tool is used to read engine RPM.

2) Connect timing light lead to White wire at the ignitor and to battery. See Fig. 9. Ignitor is located near driver's side strut tower.

3) Apply parking brake. Place transmission in Neutral. Start engine and maintain engine at 2500 RPM for 90 seconds and then allow engine to idle. Ensure idle speed is 650-750 RPM.

4) Install Jumper Wire (SST 09843-18020) between terminals TC and E1 on data link connector No. 1. See Fig. 10. Data link connector No. 1 is located at passenger's side rear corner of engine compartment, on the firewall.

NOTE: Timing marks are located on front cover.

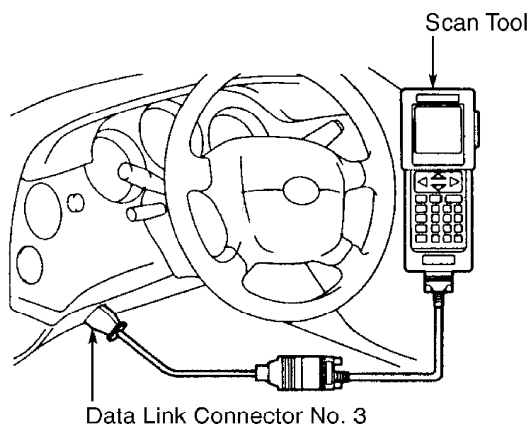
5) Ensure base timing is within specification at idle with transmission in Neutral with A/C and all accessories off. See 6-CYLINDER IGNITION TIMING table.

6) Remove jumper wire from data link connector No. 1. Ensure ECM controlled timing is within specification. See 6-CYLINDER IGNITION TIMING table. Shut engine off. Remove jumper wire, scan tool and timing light.

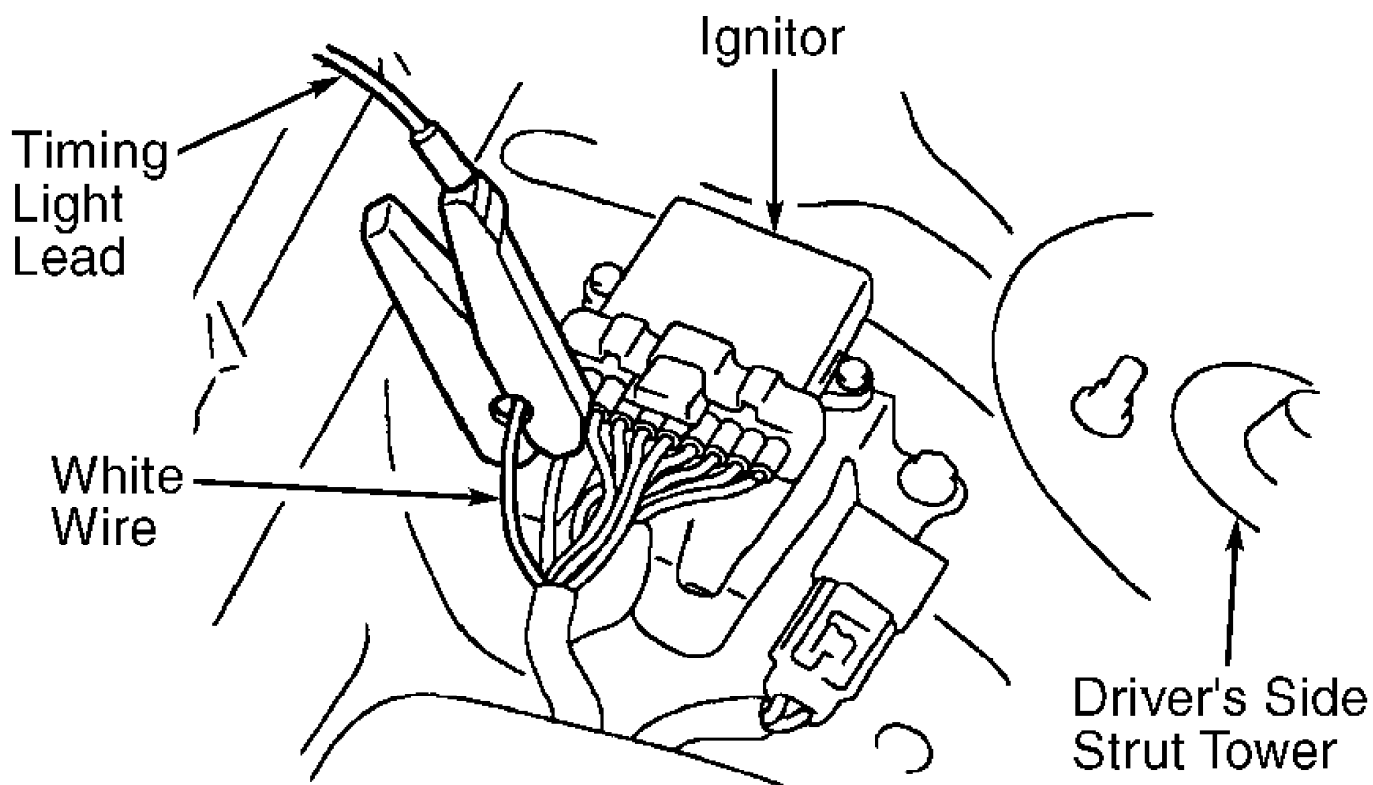
## 6-CYLINDER IGNITION TIMING (Degrees BTDC @ Idle) (1) TABLE

| Application     | (2) Base Timing | (3) ECM Controlled Timing |
|-----------------|-----------------|---------------------------|
| Non-Turbo ..... | 8-12 .....      | 6-16                      |
| Turbo .....     | 8-12 .....      | 10-20                     |

- (1) - Check with engine at normal operating temperature, transmission in Neutral, parking brake applied, A/C and all accessories off.
- (2) - With Jumper Wire (SST 09843-18020) installed between terminals TC and E1 on data link connector No. 1 for non-turbo models, or TE1 and E1 on data link connector No. 1 for turbo models.
- (3) - With jumper wire removed from data link connector No. 1.

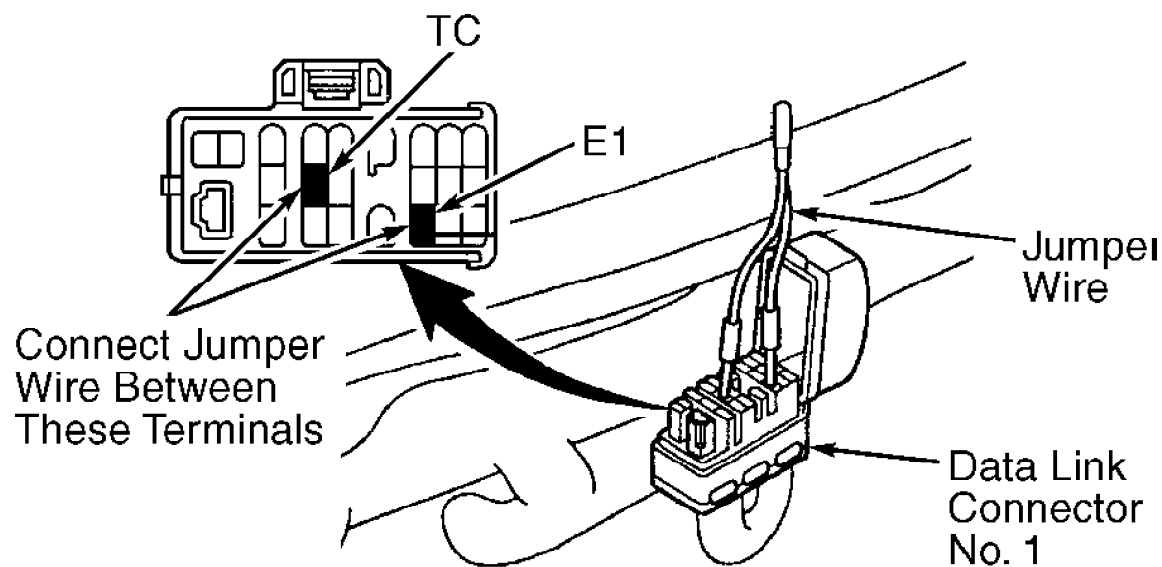


97128876  
Fig. 8: Connecting Scan Tool  
Courtesy of Toyota Motor Sales, U.S.A., Inc.



98H01395

Fig. 9: Connecting Timing Light (Non-Turbo)  
 Courtesy of Toyota Motor Sales, U.S.A., Inc.



98J01396

Fig. 10: Installing Jumper Wire Between Data Link Connector No. 1  
 Terminals (Non-Turbo)  
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

Turbo

1) Start engine and warm engine to normal operating temperature. Shut engine off. Connect scan tool to data link connector No. 3. See Fig. 8. Scan tool is used to read engine RPM.

2) Open cover located above the ignitor. Ignitor is located near driver's side strut tower. Connect timing light lead to battery and Green wire near the ignitor. See Fig. 11.

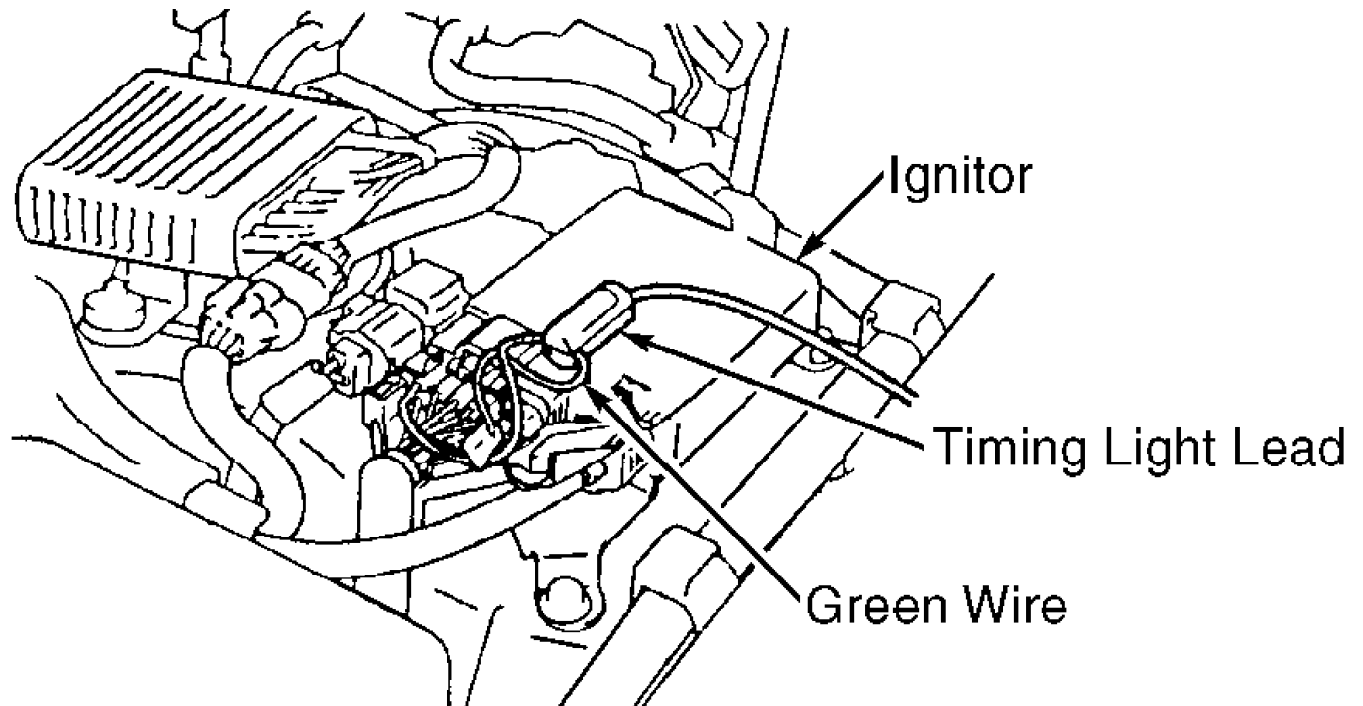
3) Apply parking brake. Place transmission in Neutral. Start engine and maintain engine at 2500 RPM for 90 seconds and then allow engine to idle. Ensure idle speed is 600-700 RPM.

4) Install Jumper Wire (SST 09843-18020) between terminals TE1 and E1 on data link connector No. 1. See Fig. 12. Data link connector No. 1 is located at passenger's side rear corner of engine compartment, on the firewall.

NOTE: Timing marks are located on front cover.

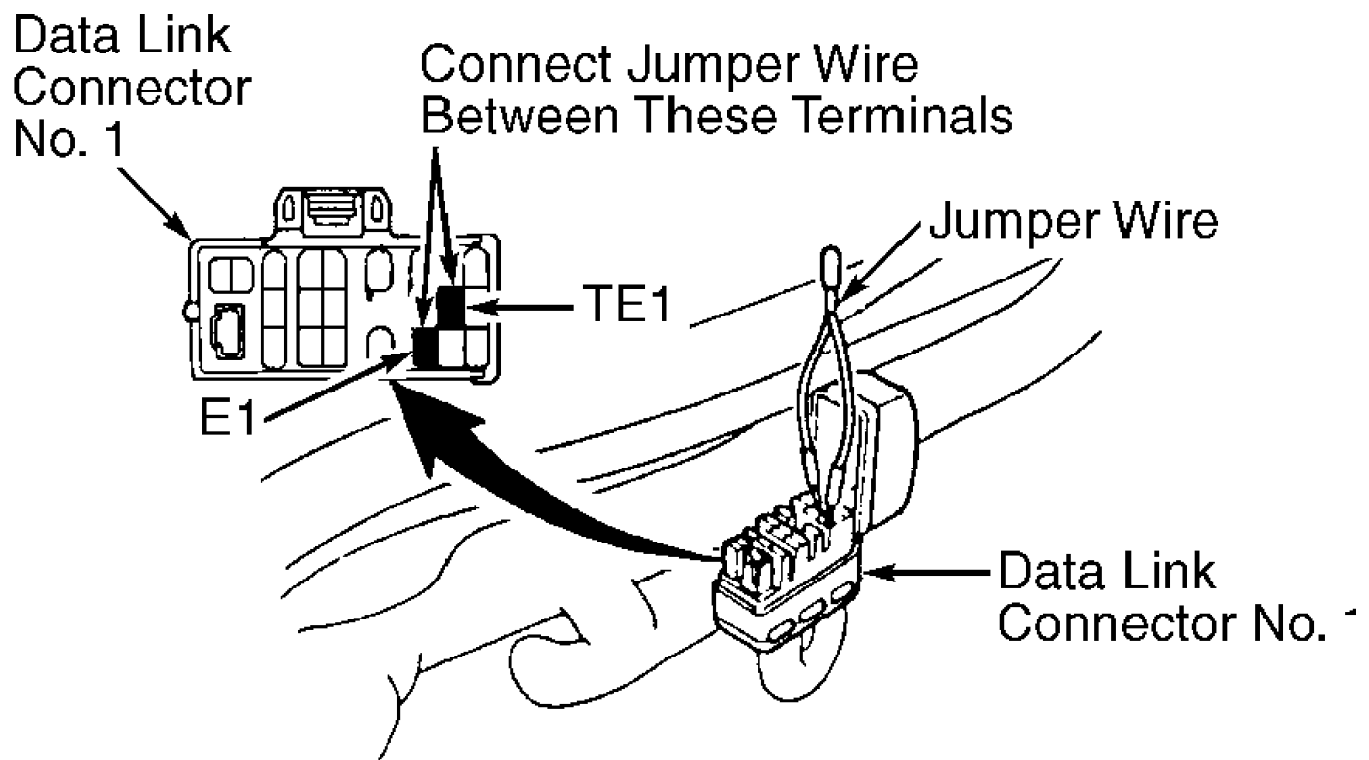
5) Ensure base timing is within specification at idle with transmission in Neutral with A/C and all accessories off. See 6-CYLINDER IGNITION TIMING table.

6) Remove jumper wire from data link connector No. 1. Ensure ECM controlled timing is within specification. See 6-CYLINDER IGNITION TIMING table. Shut engine off. Remove jumper wire, scan tool and timing light.



95D30901

Fig. 11: Connecting Timing Light (Turbo)  
Courtesy of Toyota Motor Sales, U.S.A., Inc.



## 95C30900

Fig. 12: Installing Jumper Wire Between Data Link Connector No. 1 Terminals (Turbo)

Courtesy of Toyota Motor Sales, U.S.A., Inc.

### IDLE SPEED & MIXTURE

NOTE: Mixture adjustment is not possible on any model.

NOTE: Check idle speed with air cleaner installed, all air intake system hoses and vacuum lines connected, electronic fuel injection system wiring connectors properly installed, transmission in Neutral, ignition timing properly set, A/C and all accessories off, and engine at normal operating temperature.

1) Start and warm engine to normal operating temperature. Shut engine off. Connect scan tool to data link connector No. 3. See Fig. 8. Scan tool is used to read engine RPM.

2) Apply parking brake. Place transmission in Neutral. Start engine and maintain engine at 2500 RPM for 90 seconds and then allow engine to idle. Ensure idle speed is within specification. See IDLE SPEED SPECIFICATIONS table.

3) On non-turbo models, if idle speed is not within specification, check throttle body. See IDLE CONTROL SYSTEM in I - SYSTEM/COMPONENT TESTS article. Shut engine off. Remove scan tool.

4) On turbo models, if idle speed is not within specification, check Idle Air Control (IAC) valve, wiring and Electronic Control Module (ECM). See IDLE CONTROL SYSTEM in I - SYSTEM/COMPONENT TESTS article. On all models, shut engine off. Remove scan tool.

IDLE SPEED SPECIFICATIONS (1) TABLE

---

|                 |         |
|-----------------|---------|
| Application     | RPM     |
| Non-Turbo ..... | 650-750 |
| Turbo .....     | 600-700 |

- (1) - Check with engine at normal operating temperature, transmission in Neutral, parking brake applied, air cleaner and all vacuum hoses installed, ignition timing properly set, and A/C and all accessories off.
- 

## THROTTLE POSITION SENSOR

NOTE: Turbo models contain a main throttle position sensor and a sub-throttle position sensor on throttle body. See Fig. 14. Following procedure is for main throttle position sensor. For adjustment of sub-throttle position sensor, see SUB-THROTTLE POSITION SENSOR.

### Non-Turbo

1) Slightly loosen Throttle Position (TP) sensor mounting screws. TP sensor is located on side of throttle body, facing toward the front of the engine. Slightly rotate TP sensor clockwise. Connect scan tool to data link connector No. 3. See Fig. 8. Turn ignition on.

NOTE: Ensure accelerator pedal is not depressed after turning ignition on when adjusting TP sensor.

2) Use scan tool to read throttle valve opening which is displayed as a percentage. Throttle valve opening may be read by accessing THROTTLE POS under CURRENT DATA on scan tool.

3) While reading throttle valve opening, rotate TP sensor counterclockwise (toward throttle control motor on throttle body) until throttle valve opening is 15.6 percent, as this is the center of the standard throttle valve opening of 14.4-16.8 percent. Tighten TP sensor mounting screws to 15 INCH lbs. (1.7 N.m).

NOTE: When TP sensor mounting screws are tightened, this may cause the throttle valve opening to change. Ensure throttle valve opening remains at 15.6 percent after TP sensor mounting screws are tightened. Readjust TP sensor if necessary.

4) Using screwdriver, fully close throttle valve on throttle body. Use scan tool to read throttle opening value by accessing THROTTLE POS under CURRENT DATA on scan tool. With throttle valve fully closed, throttle opening value should be 10-14 percent.

5) If throttle opening value is not within specification with throttle valve fully closed, repeat steps 2) through 4) until correct throttle valve opening value is obtained. Turn ignition off. Remove scan tool.

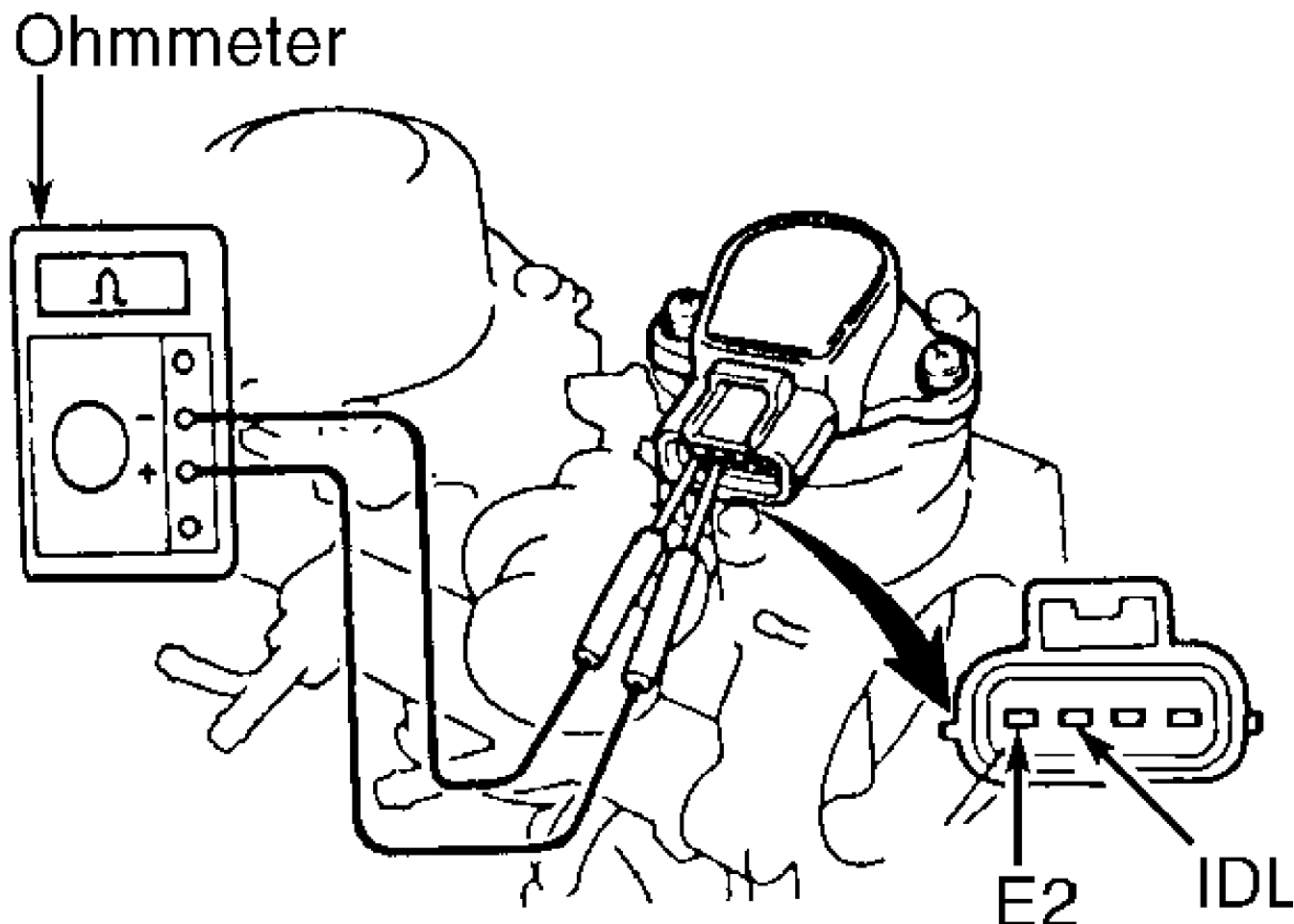
### Turbo

1) Disconnect electrical connector from Throttle Position (TP) sensor. Loosen TP sensor mounting screws. Connect ohmmeter between terminals IDL and E2 on TP sensor. See Fig. 13.

2) Apply vacuum to throttle opener. To set initial clearance, insert a .030" (.76 mm) feeler gauge between throttle stop screw and throttle lever. Gradually rotate TP sensor clockwise until ohmmeter deflects. Tighten TP sensor mounting screws. Remove feeler gauge.

3) Insert a .027" (.69 mm) feeler gauge between throttle stop screw and throttle lever. Continuity should now exist between terminals IDL and E2 on TP sensor. Remove feeler gauge.

4) Insert a .032" (.81 mm) feeler gauge between throttle stop screw and throttle lever. No continuity should now exist between terminals IDL and E2 on TP sensor. Remove feeler gauge. Disconnect ohmmeter. Install electrical connector on TP sensor.



95J30923

Fig. 13: Adjusting TP Sensor (Turbo)  
Courtesy of Toyota Motor Sales, U.S.A., Inc.

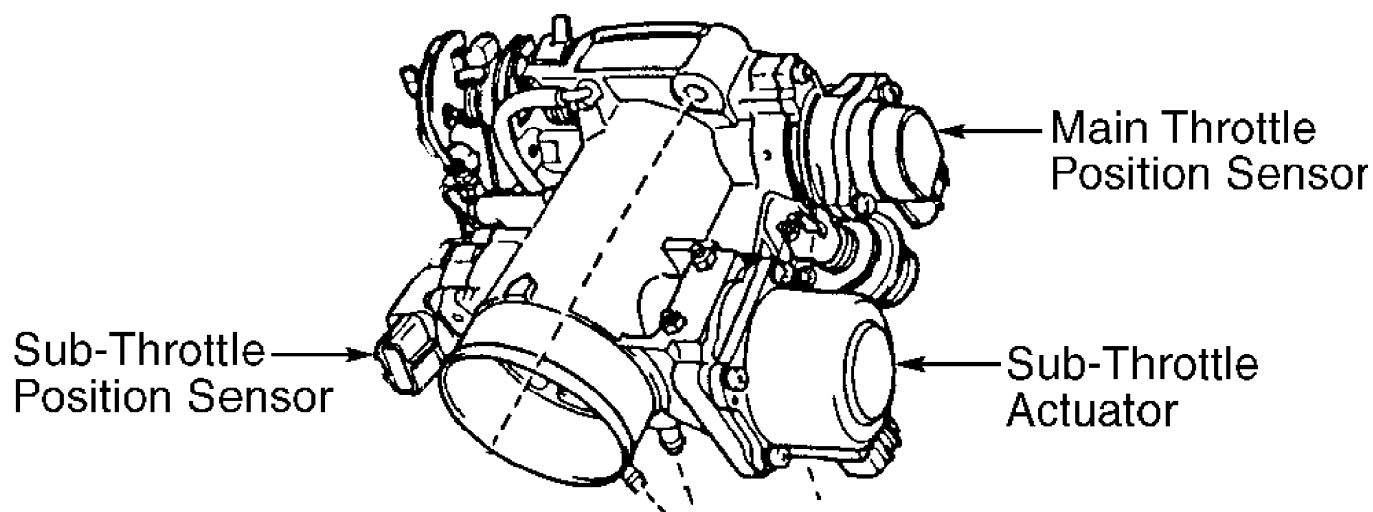
### SUB-THROTTLE POSITION SENSOR

Turbo

- 1) Remove screws and sub-throttle actuator. See Fig. 14. Disconnect electrical connector from sub-throttle position sensor.
- 2) Ensure no clearance exists between throttle stop screw and throttle valve gear with sub-throttle valve fully closed. Perform STEP 1. See Fig. 15.
- 3) Place sub-throttle valve in fully closed position. Loosen sub-throttle position sensor mounting screws. Connect ohmmeter between terminals IDL and E2. Perform STEP 2. See Fig. 15.
- 4) To set initial clearance, insert .018" (.45 mm) feeler gauge between throttle stop screw and throttle valve gear. Perform STEP 3. See Fig. 15.
- 5) Gradually rotate sub-throttle position sensor clockwise until ohmmeter deflects. Tighten sub-throttle position sensor mounting

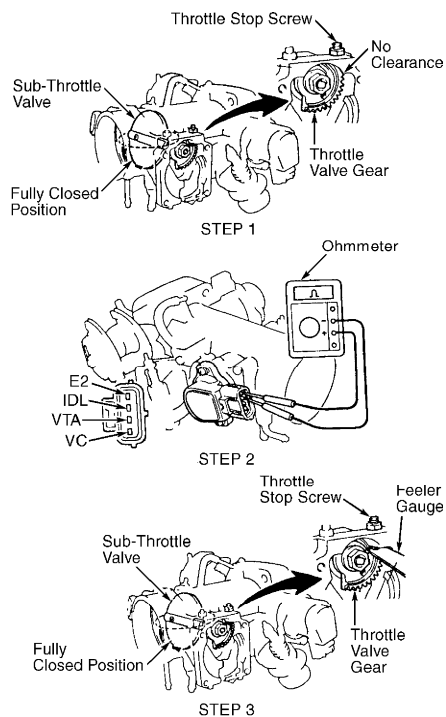
screws.

6) Remove feeler gauge. Insert a .016" (.41 mm) feeler gauge. Ensure continuity exists. Remove feeler gauge. Insert a .019" (.48 mm) feeler gauge. Ensure continuity no longer exists. Reinstall sub-throttle actuator. Install electrical connector on sub-throttle position sensor.



93G78291

Fig. 14: Locating Sub-Throttle Actuator, Main Throttle Position Sensor & Sub-Throttle Position Sensor (Turbo)  
Courtesy of Toyota Motor Sales, U.S.A., Inc.



95A30924

Fig. 15: Adjusting Sub-Throttle Position Sensor (Turbo)  
Courtesy of Toyota Motor Sales, U.S.A., Inc.

## DASHPOT CONTROL SYSTEM & THROTTLE OPENER

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

**TORQUE SPECIFICATIONS**

TORQUE SPECIFICATIONS TABLE

| Application                         | Ft. Lbs. (N.m)  |
|-------------------------------------|-----------------|
| Air Intake Connector-To-Air         |                 |
| Intake Chamber Bolt/Nut             |                 |
| Non-Turbo .....                     | 21 (29)         |
| Camshaft Bearing Cap Bolt           |                 |
| Non-Turbo .....                     | 15 (20)         |
| Throttle Body Bracket-To-Cylinder   |                 |
| Head Nut                            |                 |
| Non-Turbo .....                     | 20 (27)         |
| Spark Plug .....                    | 13 (18)         |
|                                     | INCH Lbs. (N.m) |
| Ignition Coil Bolt                  |                 |
| Non-Turbo .....                     | 71 (8.0)        |
| Ignition Coil Mounting Bracket Bolt |                 |
| Turbo .....                         | 80 (9.0)        |
| Upper Timing Belt Cover Bolt        |                 |
| Non-Turbo .....                     | 71 (8.0)        |
| Valve Cover Bolt/Nut                |                 |
| Non-Turbo .....                     | 75 (8.5)        |
| Turbo .....                         | 49 (5.5)        |