2010 ENGINE

Engine Mechanical (2ZR-FE) (Service Information) - Corolla

ENGINE

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. **INSPECT ENGINE COOLANT**

   HINT:

   Refer to **ON-VEHICLE INSPECTION** .

2. **INSPECT ENGINE OIL**

   HINT:

   Refer to **ON-VEHICLE INSPECTION** .

3. **INSPECT BATTERY**

   HINT:

   Refer to **INSTALLATION** .

4. **INSPECT AIR CLEANER FILTER ELEMENT SUB-ASSEMBLY**
   a. Remove the air cleaner cap.
   b. Remove the air filter element.
   c. Visually check that the air filter is not excessively damaged or oily. If necessary, replace the air filter.
5. **INSPECT SPARK PLUG** . Refer to **ON-VEHICLE INSPECTION - Step 2**
6. **INSPECT V-RIBBED BELT** See step 1
7. **INSPECT VALVE AND ADJUSTER NOISE**
   a. Rev up the engine several times. Check that the engine does not emit unusual noises. If unusual noises occur, warm up the engine and idle it for over 30 minutes. Then perform the inspection above again. If any defects or problems are found during the inspection above, perform a lash adjuster inspection See step 2.
8. **INSPECT IGNITION TIMING**
   a. When using the Techstream:
      1. Warm up and stop the engine.
      2. Connect the Techstream to the DLC3.
      3. Turn the ignition switch to ON.
      4. Enter Data List Mode on the Techstream.

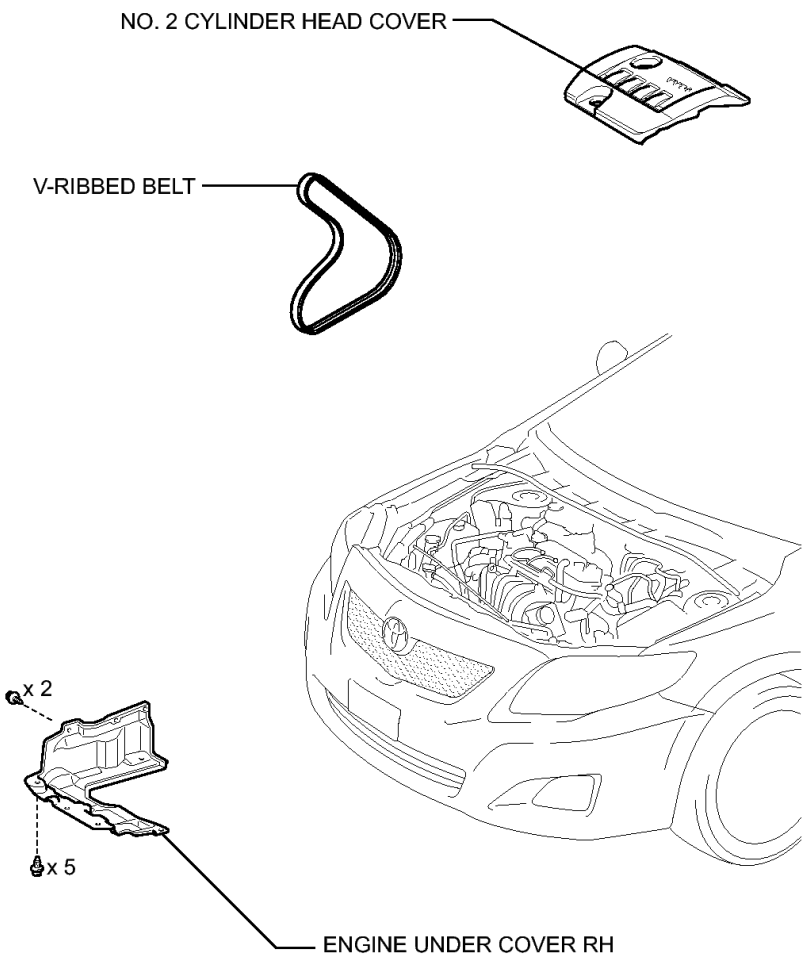

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Fig. 4: Identifying Drive Belt Replacement Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. **INSPECT V-RIBBED BELT**
    a. Check the belt for wear, cracks or other signs of damage.

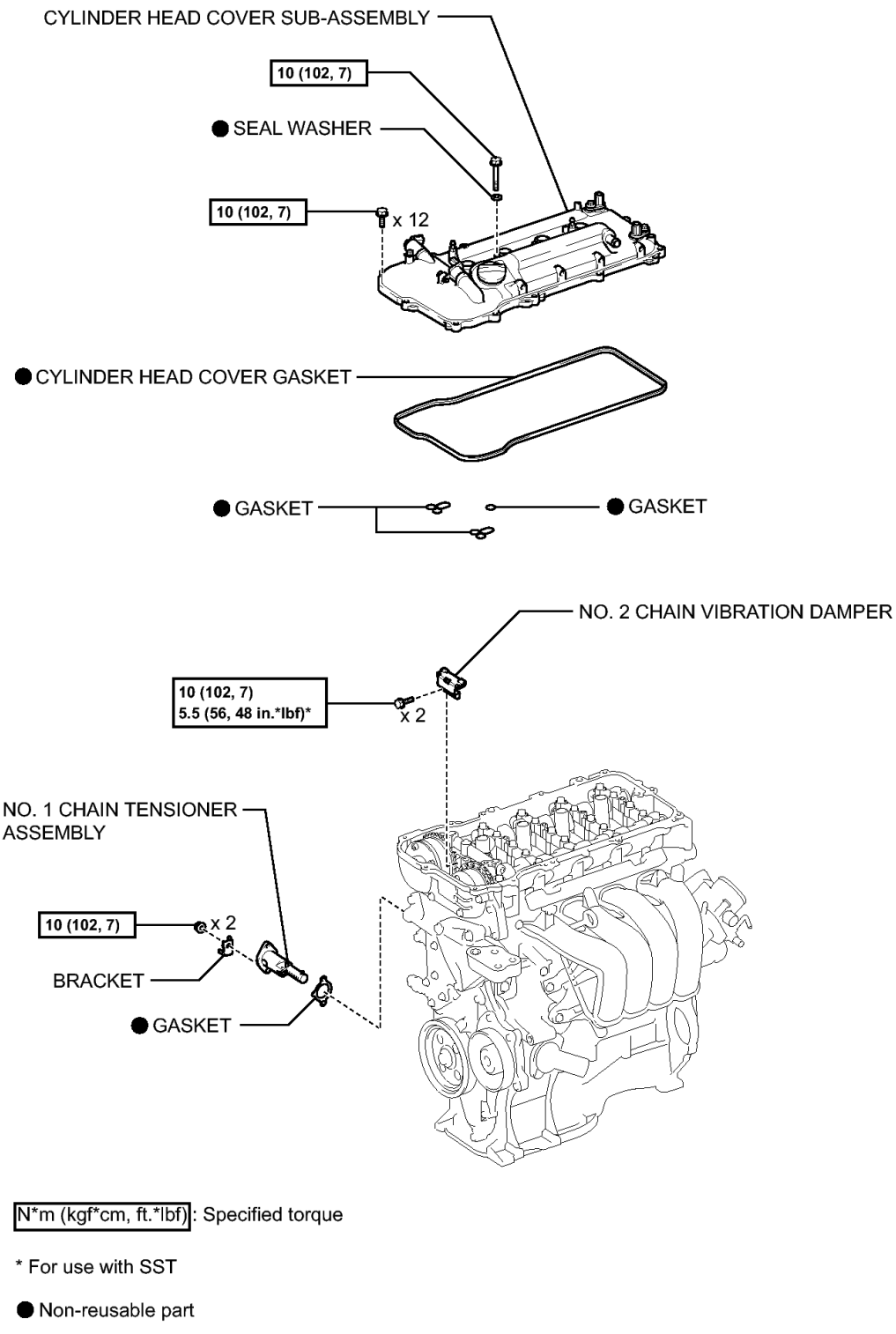

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Fig. 12: View Of Cylinder Head Components With Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION

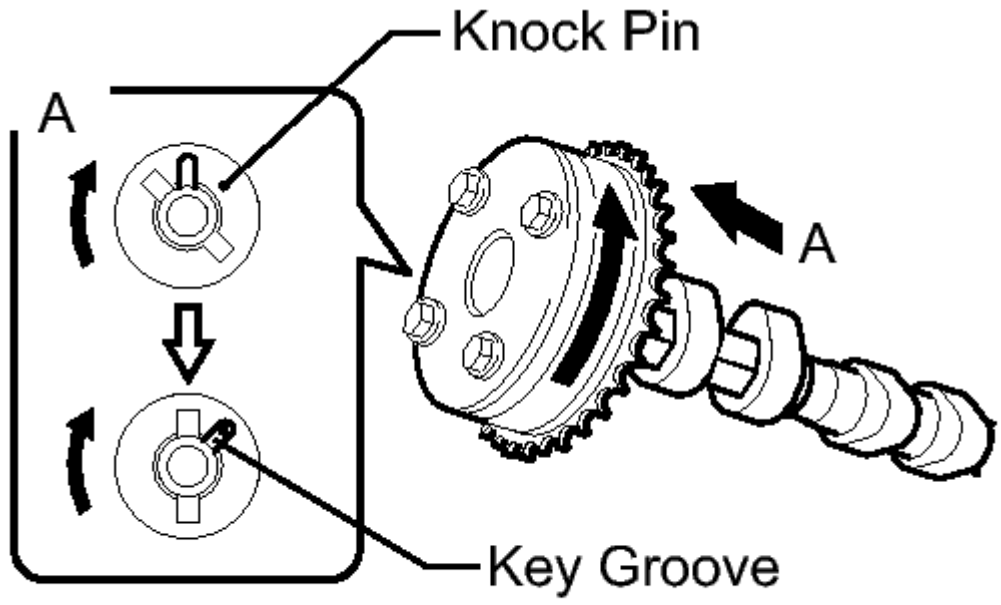

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Fig. 41: Turning Camshaft Timing Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Do not turn the camshaft timing gear in the retard direction (the right angle).

e. Check that there is no clearance between the camshaft timing gear and camshaft flange.

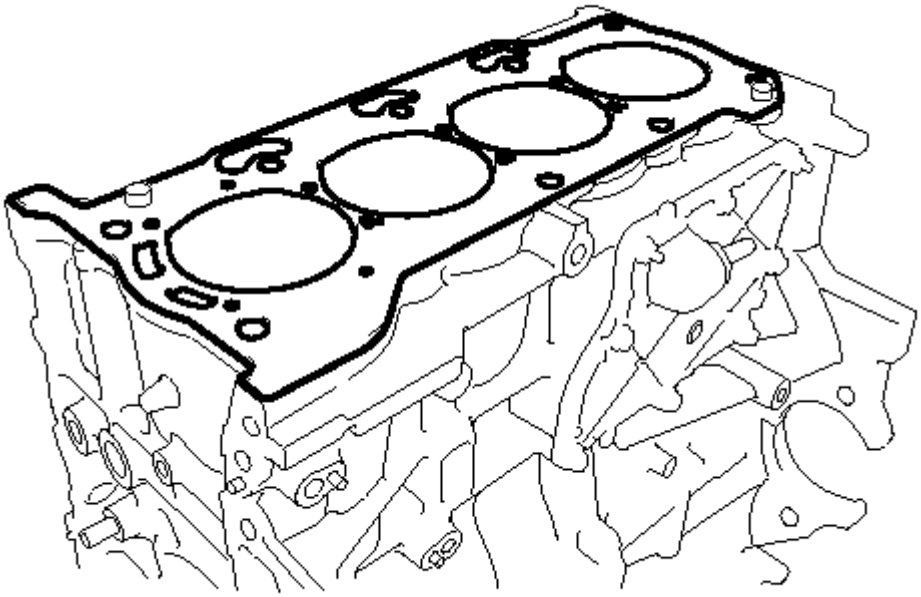

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Fig. 83: Identifying Cylinder Head Gasket
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

44. **INSPECT NO. 1 VALVE ROCKER ARM SUB-ASSEMBLY** See step 1
45. **INSPECT VALVE LASH ADJUSTER ASSEMBLY** See step 2
46. **INSPECT CYLINDER HEAD SET BOLT** See step 19

INSTALLATION

INSTALLATION

1. **INSTALL CYLINDER HEAD GASKET**
    a. Place a new gasket on the cylinder block surface with the Lot No. stamp facing upward.

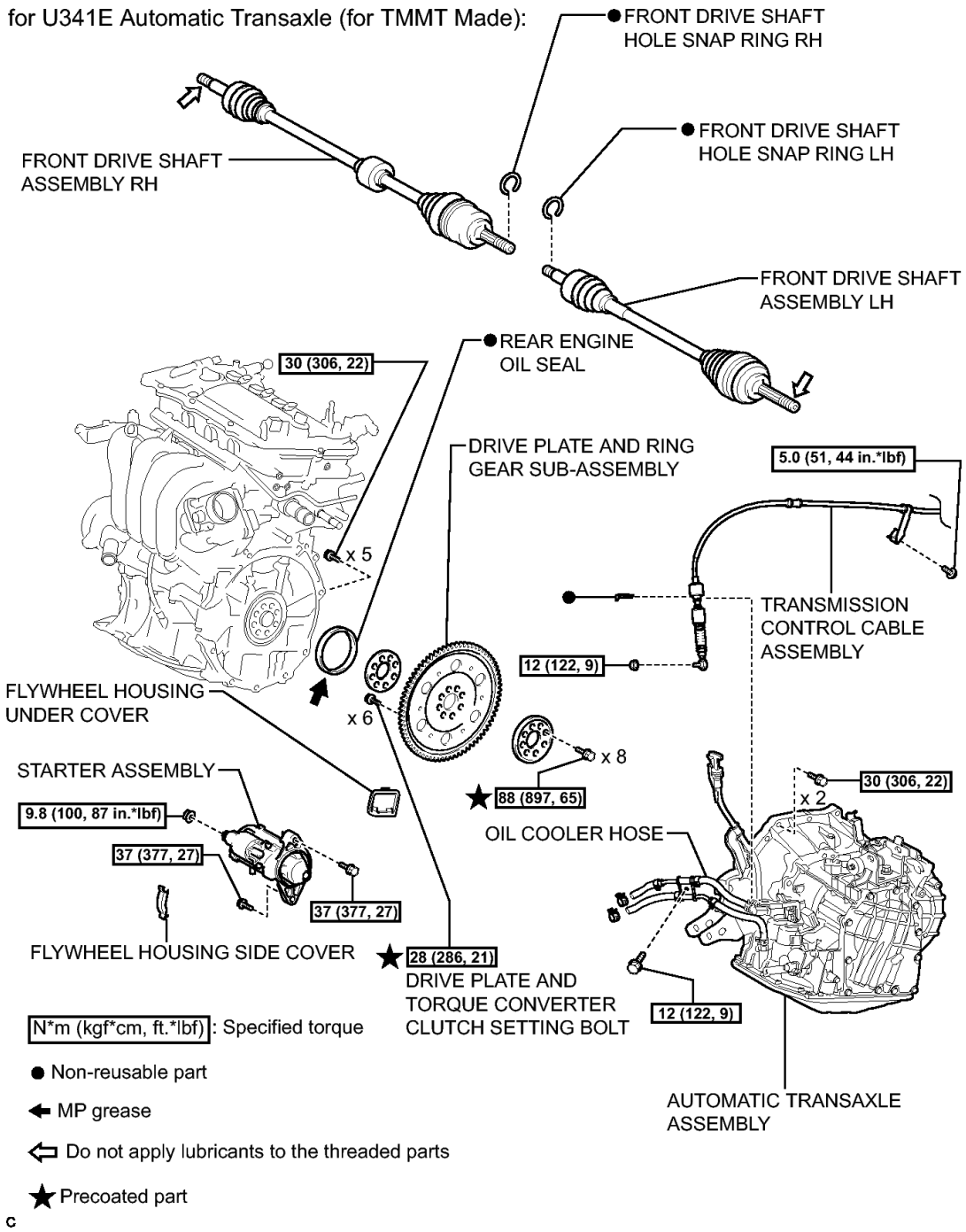

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Fig. 119: Identifying Rear Crankshaft Oil Seal Replacement Components With Torque Specifications (3 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

1. **REMOVE ENGINE ASSEMBLY WITH TRANSAXLE**

   HINT:

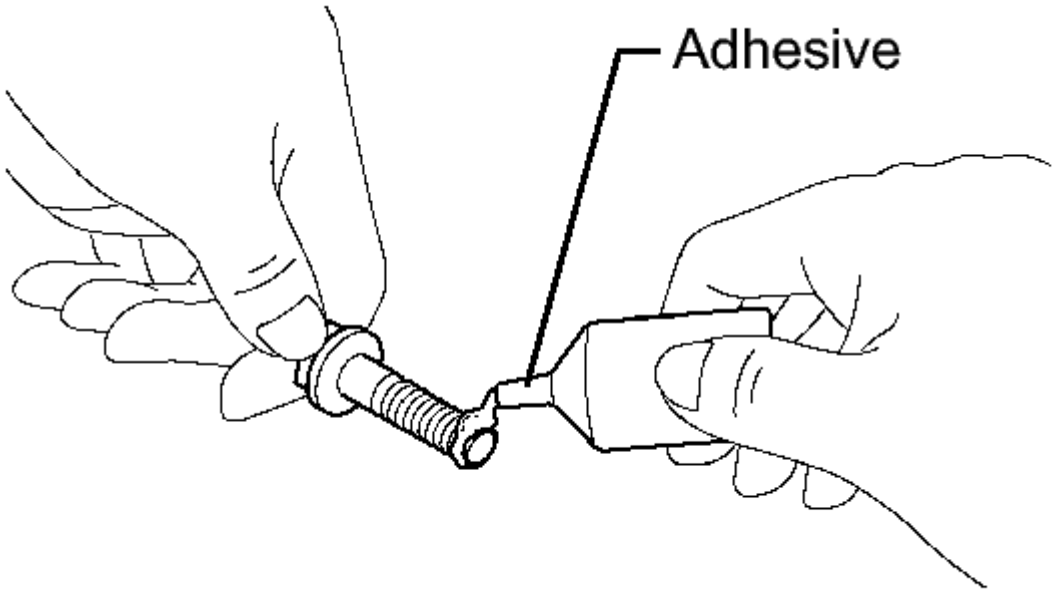

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Fig. 131: Applying Adhesive To End Or Threads Of Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Adhesive

Toyota Genuine Adhesive 1324, Three Bond 1324 or equivalent

d. Install the front spacer, drive plate and rear spacer with the 8 bolts. uniformly tighten the 8 bolts in the sequence shown in the illustration.

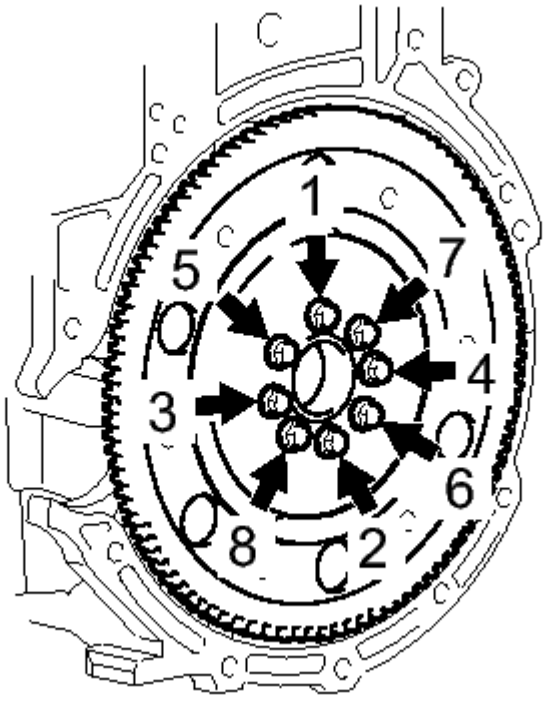

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Fig. 132: Identifying Drive Plate Bolts Tightening Sequence
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

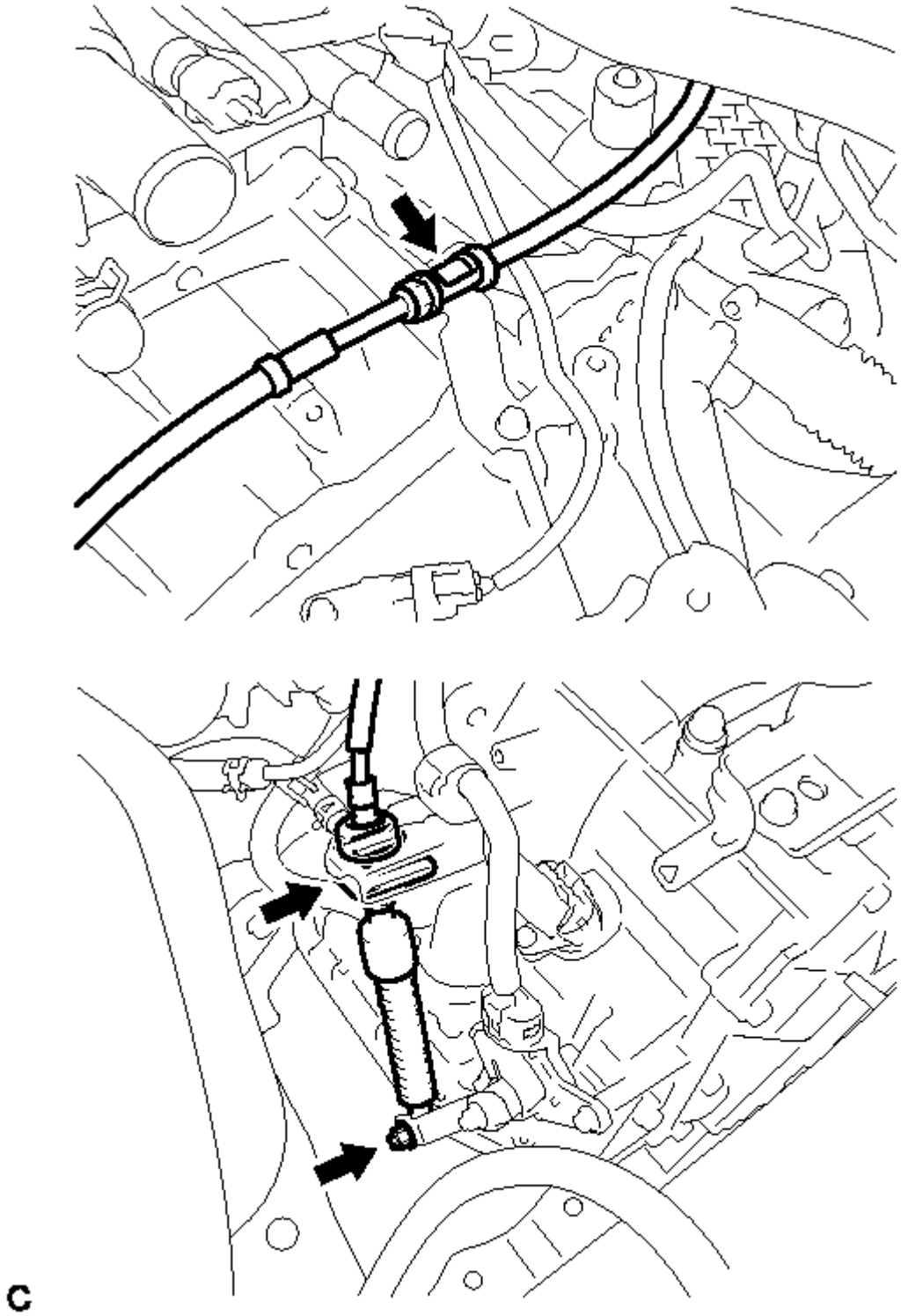

Fig. 149: Locating Transmission Control Cable Assembly (Automatic Transaxle)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Remove the nut and disconnect the control cable from the control shaft lever.
c. Remove the clip and disconnect the control cable from the control cable bracket.
d. Remove the bolt and disconnect the clamp of the control cable.

19. **DISCONNECT FUEL VAPOR FEED HOSE ASSEMBLY**
    a. Disconnect the fuel vapor feed hose.

Torque: 26 N*m (260 kgf*cm, 19 ft.*lbf)

c. Install the wire harness with the 2 nuts.

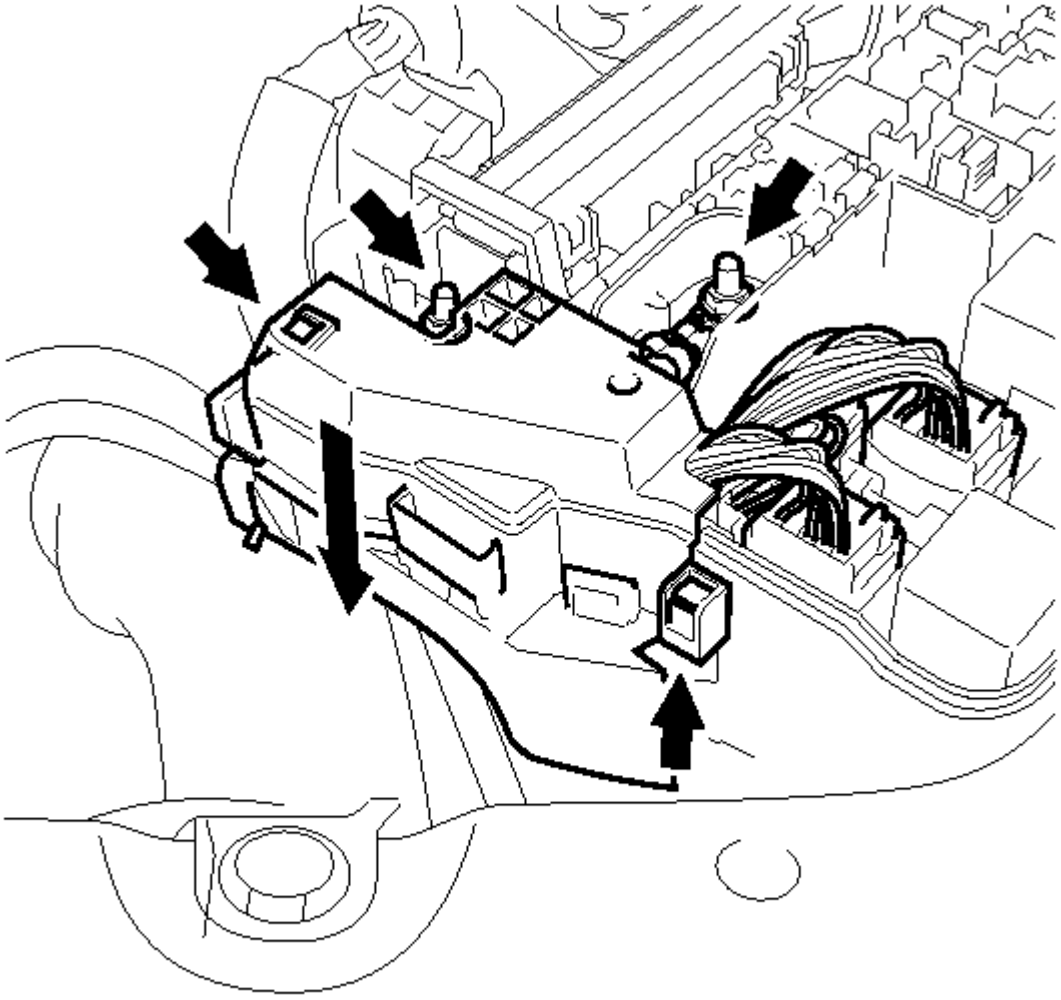

Fig. 187: Identifying Wire Harness With Nuts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque: 8.4 N*m (85 kgf*cm, 74 in.*lbf)

d. Connect the 3 connectors and 2 wire harness clamps to the engine room junction block.
e. Connect the connector to the ECU with the lock lever and connect the clamp.

16. **REMOVE OIL FILTER CAP ASSEMBLY** . Refer to **REPLACEMENT - Step 2**
17. **REMOVE TIMING CHAIN COVER SUB-ASSEMBLY** . Refer to **REMOVAL - Step 24**
18. **REMOVE TIMING CHAIN COVER OIL SEAL**
    a. Using a screwdriver and hammer, remove the oil seal.

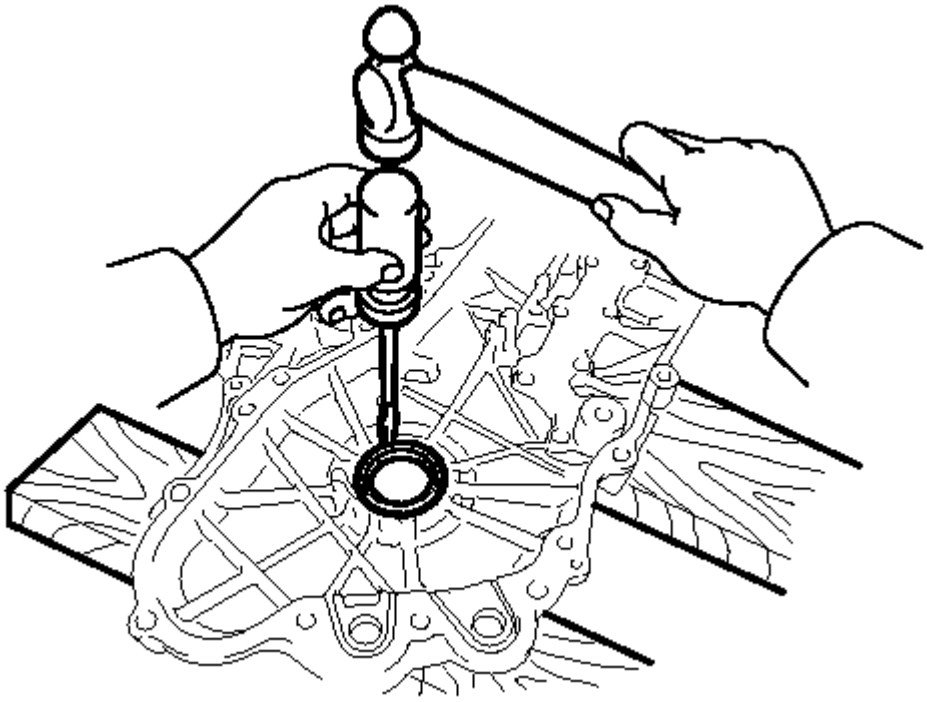

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Fig. 236: Removing Oil Seal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Be careful not to damage the timing chain cover.

HINT:

Tape the screwdriver tip before use.

19. **REMOVE INLET WATER HOUSING**
    a. Remove the 3 bolts, gasket and inlet water housing.

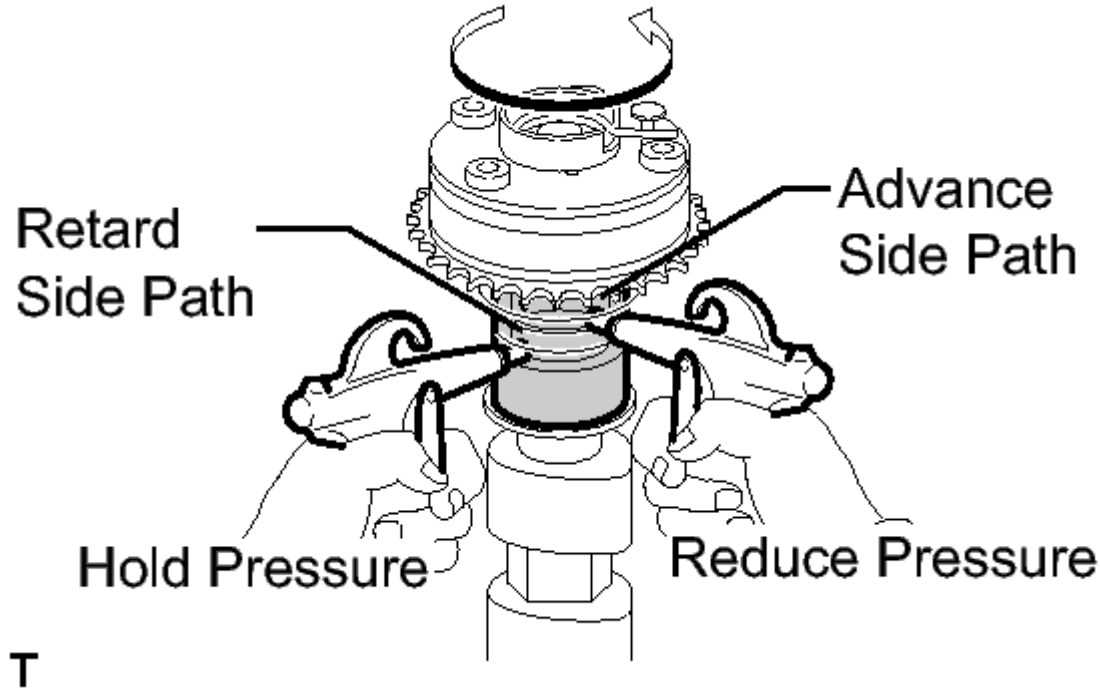

Fig. 268: Applying Air Pressure To Advance Side Path
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

The lock pin is released and the camshaft timing exhaust gear turns in the retard direction.

5. When the camshaft timing exhaust gear moves to the most retarded position, release the air pressure from the advance side path, then release the air pressure from the retard side path.

NOTE: **Be sure to release the air pressure from the advance side path first. If the air pressure of the retard side path is released first, the camshaft timing exhaust gear may abruptly shift in the advance direction and break the lock pin or other parts.**

d. Check for smooth rotation.
   1. Turn the camshaft timing exhaust gear within its movable range (19 to 21°) 2 or 3 times, but do not turn it to the most advanced position. Make sure that the gear turns smoothly.

NOTE: **When the air pressure is released from the advance side path, then from the retard side path, the gear automatically returns to the most advanced position due to the advance assist spring operation and locks. Gradually release the air pressure from the retard side path before performing the smooth rotation check.**

e. Check the lock at the most advanced position.
   1. Make sure that the camshaft timing exhaust gear is locked at the most advanced position.

c. Using a vernier caliper, measure the distance between the bearing cap edge and the camshaft bearing edge.

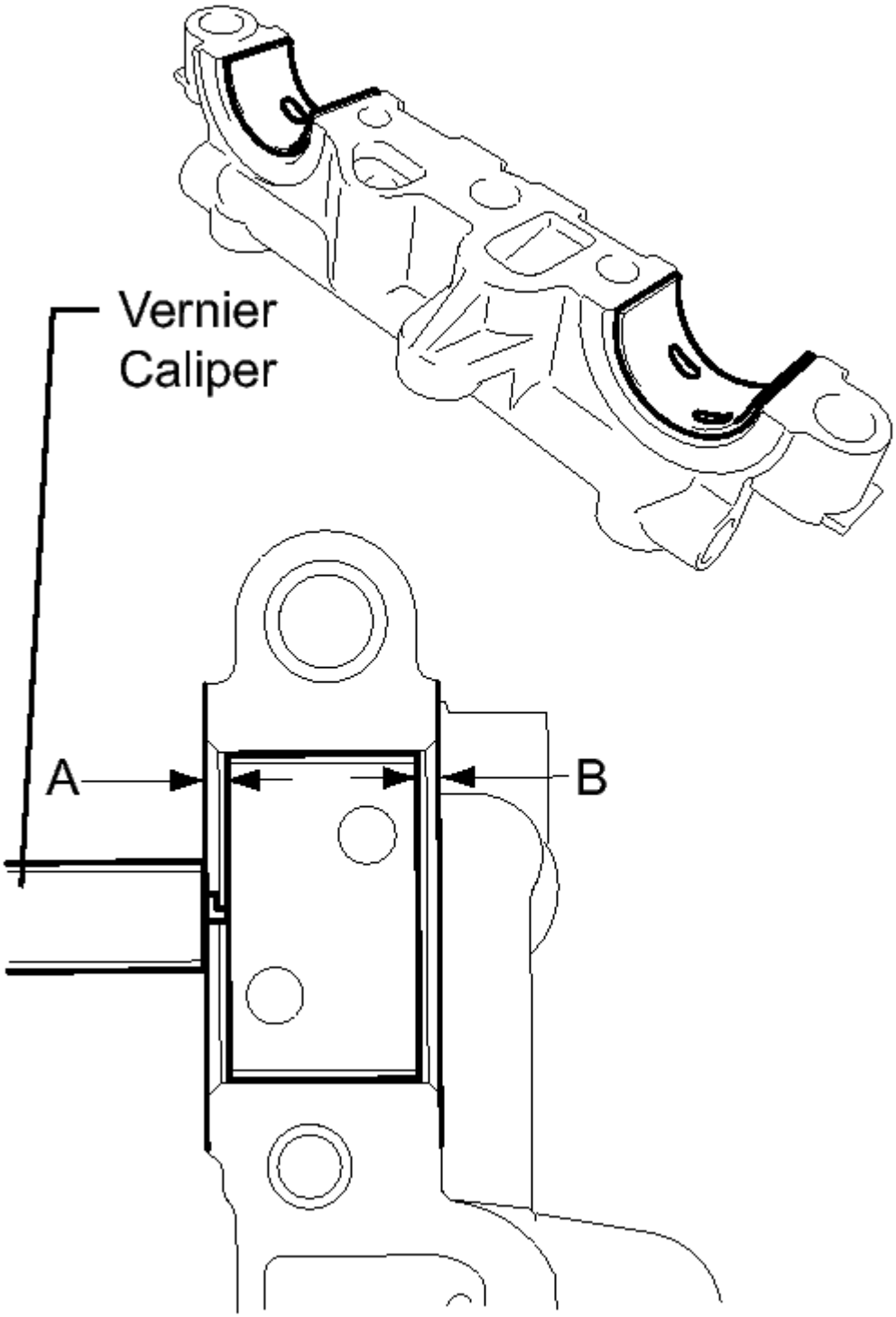

Fig. 309: Measuring Distance Between Bearing Cap Edge And Camshaft Bearing Edge
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Dimension (A - B)

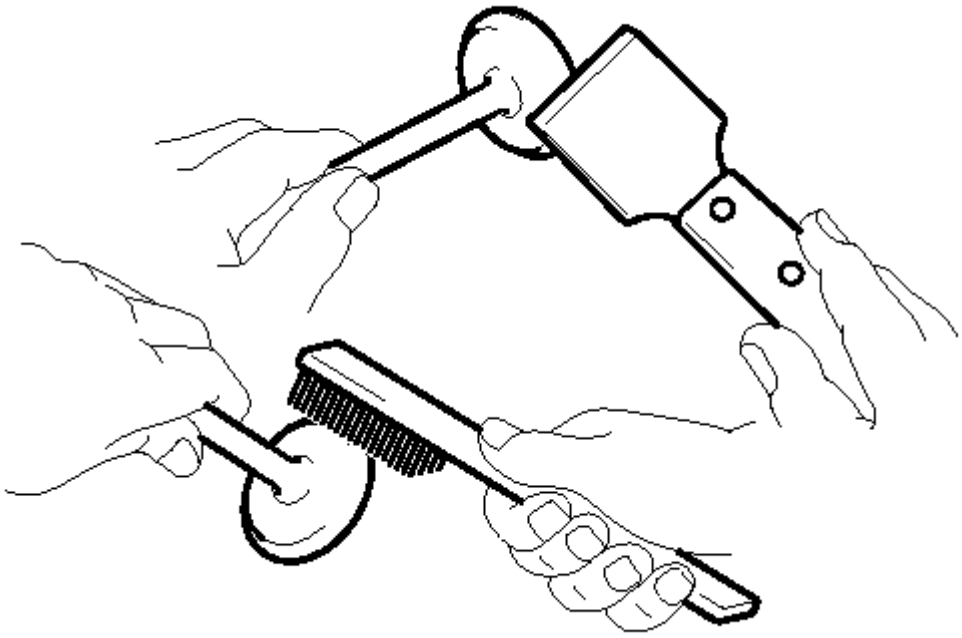

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Fig. 384: Cleaning Valve Head
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Using a vernier caliper, measure the overall length of the valve.

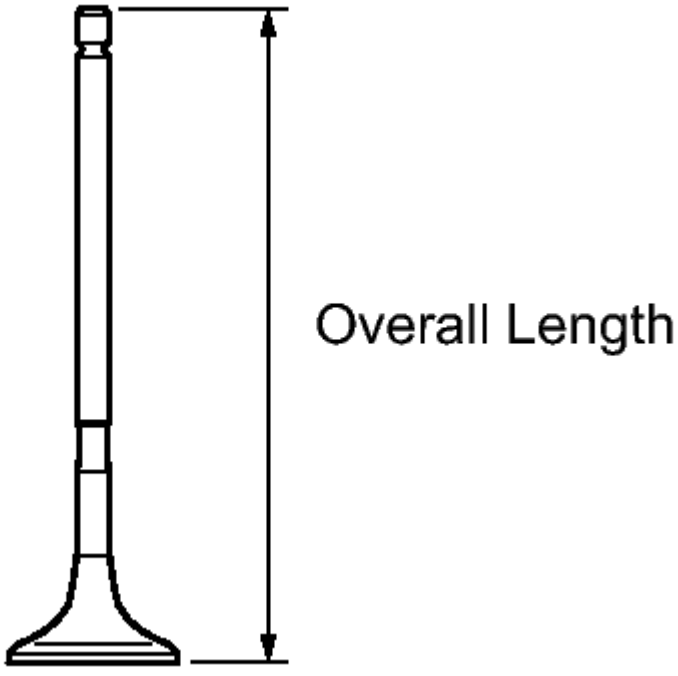

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Fig. 385: Identifying Valve Overall Length
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard overall length

108.25 mm (4.2618 in.)

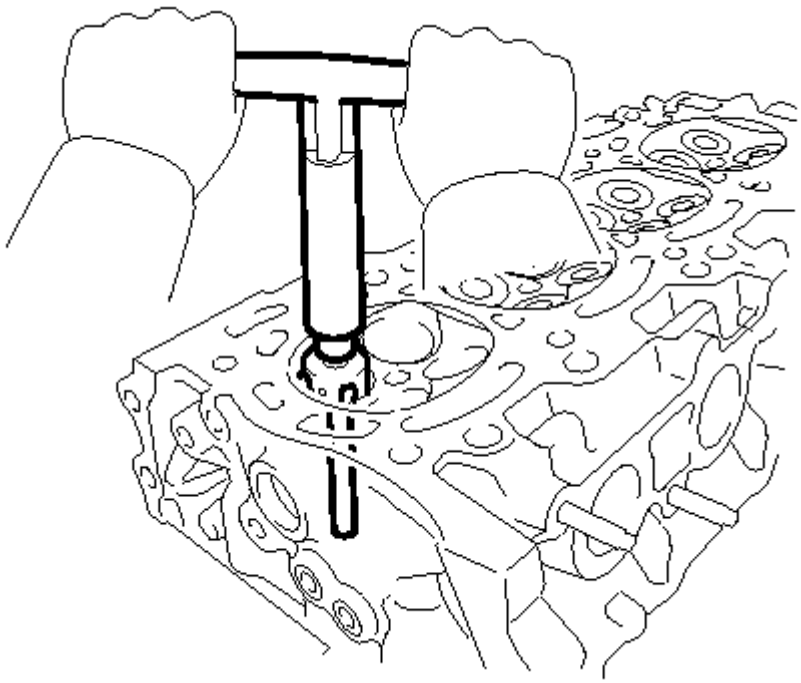

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Fig. 408: Grinding Valve Seat Using Cutter
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Using 30° and 75° cutters, correct the valve seat so that the valve contacts the entire circumference of the seat. The contact should be in the center of the valve seat, and the valve seat width should be maintained within the specified range around the entire circumference of the seat.

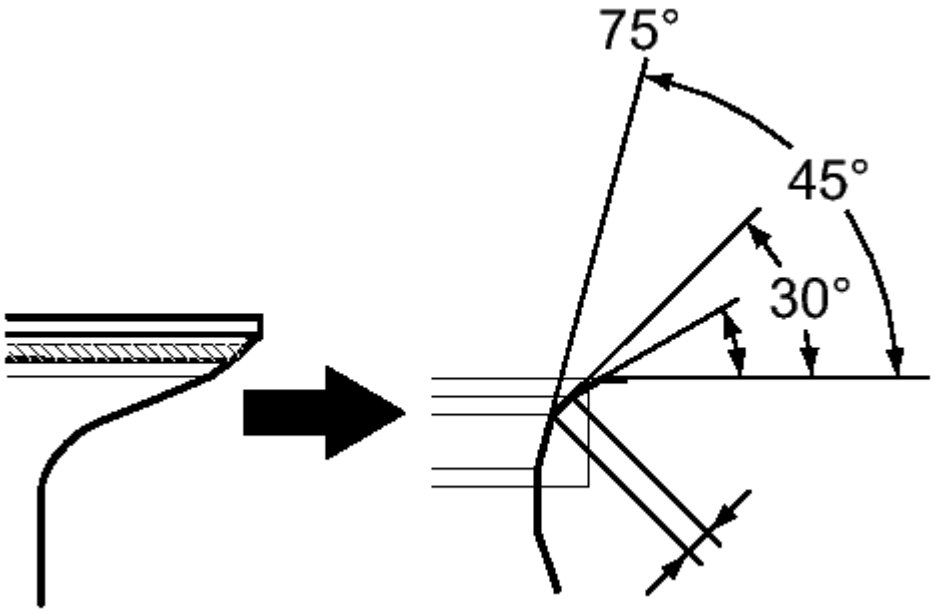

Fig. 409: Identifying Valve Seat Angle
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

c. Check each main journal for taper and distortion as shown in the illustration.

Maximum taper and distortion

0.004 mm (0.0002 in.)

If the taper and distortion are greater than the maximum, replace the crankshaft.

Standard Diameter (Reference)

Mark	Specified Condition
0	47.999 to 48.000 mm (1.8897 to 1.8898 in.)
1	47.997 to 47.998 mm (1.8896 to 1.8897 in.)
2	47.995 to 47.996 mm (1.8896 to 1.8896 in.)
3	47.993 to 47.994 mm (1.8895 to 1.8895 in.)
4	47.991 to 47.992 mm (1.8894 to 1.8894 in.)
5	47.988 to 47.990 mm (1.8893 to 1.8894 in.)

d. Using a micrometer, measure the diameter of each crank pin.

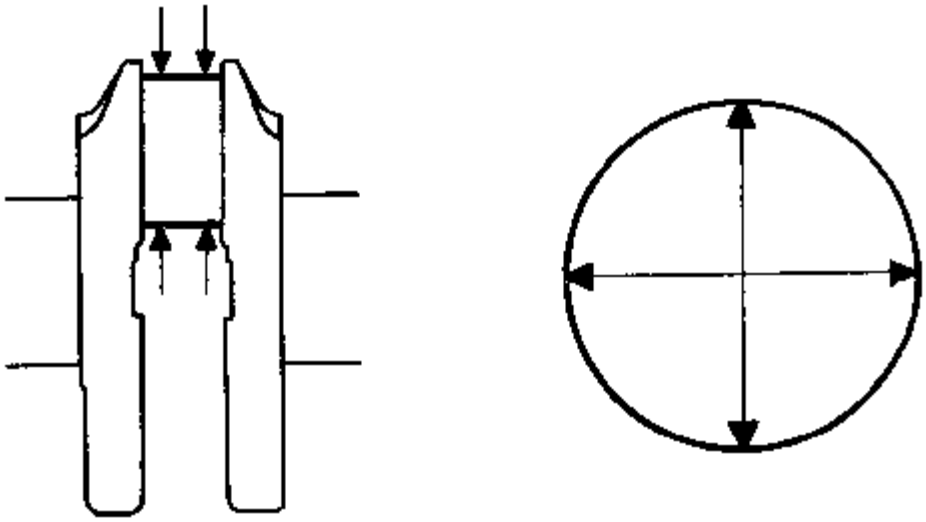

Fig. 450: Measuring Diameter Of Each Crank Pin
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard diameter

43.992 to 44.000 mm (1.7320 to 1.7323 in.)

If the diameter is not as specified, check the connecting rod oil clearance.

e. Inspect each crank pin for taper and distortion as shown in the illustration.