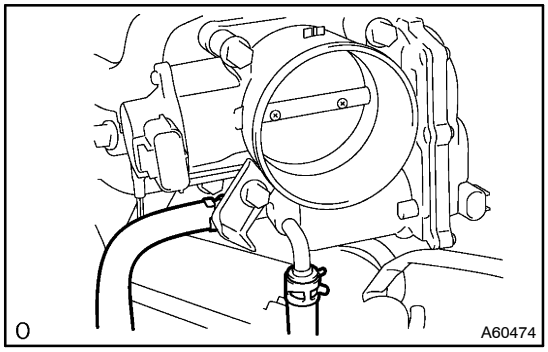
VALVE CLEARANCE (1MZ–FE)

140I0–01

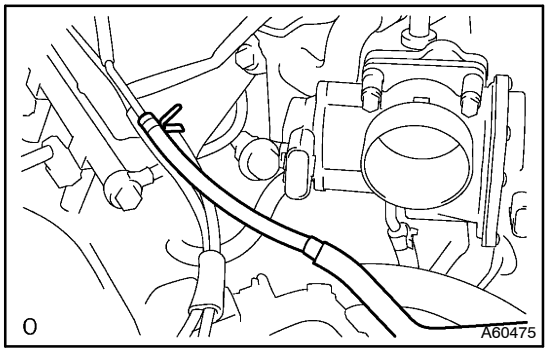
ADJUSTMENT

1. DRAIN COOLANT (See page 16–31)
2. REMOVE FRONT FENDER APRON SEAL RH
3. REMOVE V–BANK COVER SUB–ASSY (See page 14–156)
4. REMOVE RADIATOR HOSE INLET
5. REMOVE FRONT SUSPENSION UPPER BRACE CENTER (W/ FRONT SUSPENSION BRACE UPPER CENTER)
6. REMOVE AIR CLEANER ASSEMBLY WITH HOSE (See page 10–18)
7. REMOVE INTAKE AIR SURGE TANK

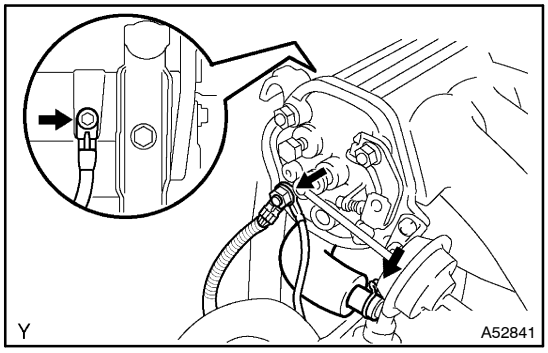
(a) Disconnect the throttle position sensor connector.
(b) Disconnect the throttle control motor sensor connector.
(c) Disconnect the EGR gas temperature sensor connector.
(d) Disconnect the EGR valve position sensor connector.



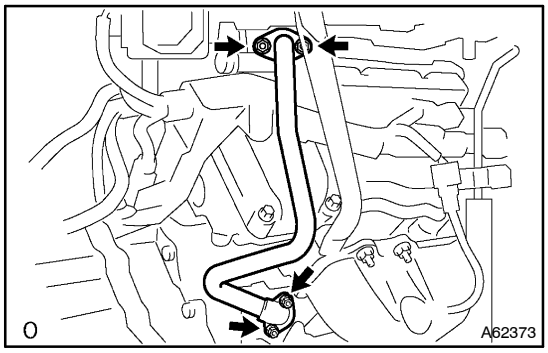
(e) Disconnect the 2 water by–pass hoses.



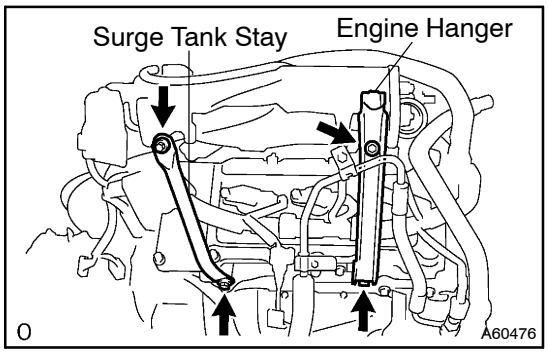
(f) Disconnect the purge hose.



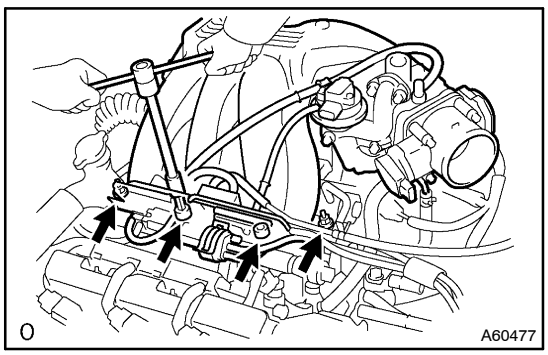
(g) Disconnect the hoses and cables.



(h) Remove the 4 nuts, EGR pipe and 2 gaskets.



(i) Remove the 2 bolts and No.1 engine hanger.
(j) Remove the 2 bolts and surge tank stay No. 1.

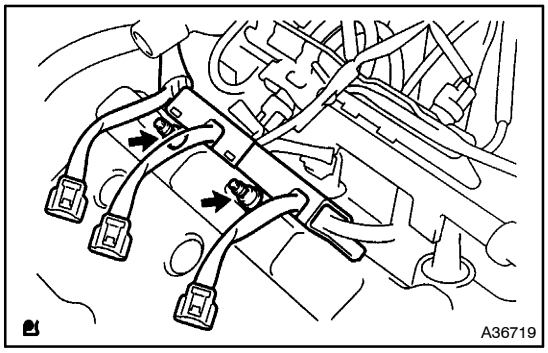


(k) Disconnect the engine wire from emission control valve set.
(l) Using an 8 mm socket hexagon wrench, remove the 2 bolts, 2 nuts and intake air surge tank.

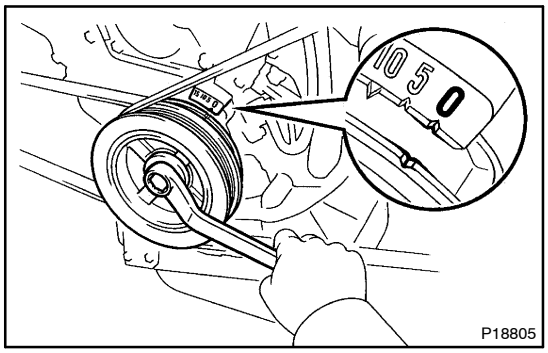
8. REMOVE IGNITION COIL ASSY

9. REMOVE CYLINDER HEAD COVER SUB–ASSY

10. REMOVE CYLINDER HEAD COVER SUB–ASSY LH



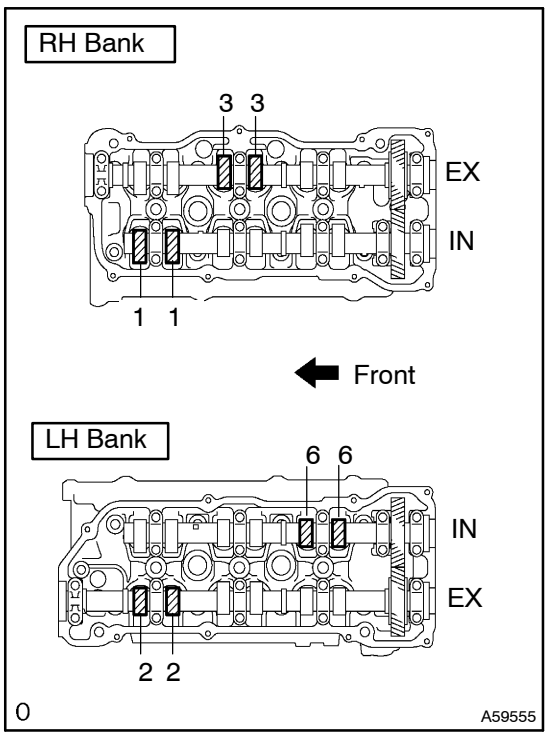
(a) Using an E6 torx socket wrench, remove the 2 bolts, and disconnect the engine wire protector.
(b) Remove the 9 bolts and cylinder head cover.



11. INSPECT VALVE CLEARANCE

(a) Turn the crankshaft pulley, and align its groove with the timing mark ”0” of the No. 1 timing belt cover.
(b) Check that the valve lifters on the No. 1 (IN and EX) are loose.

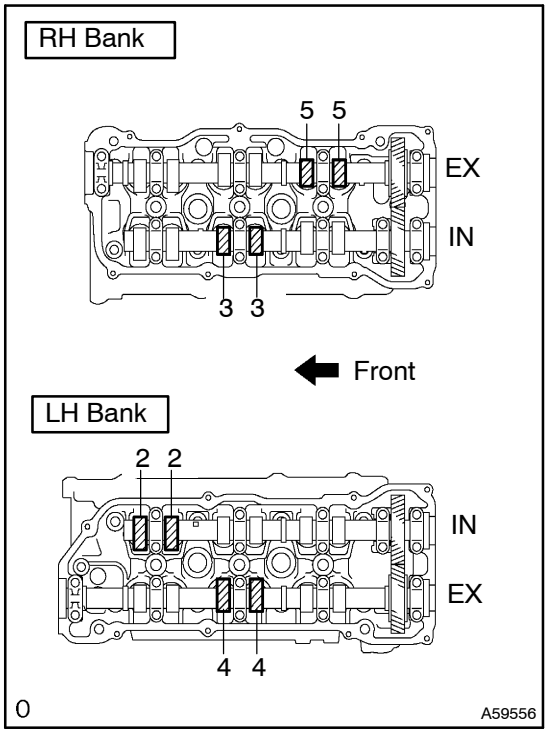
If not, turn the crankshaft 1 revolution (360°) and align the mark as above.



(c) Check only those valves indicated in the illustration.
  (1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

  Valve clearance (Cold):
  Intake 0.15 – 0.25 mm (0.006 – 0.010 in.)
  Exhaust 0.25 – 0.35 mm (0.010 – 0.014 in.)

  (2) Record out–of–specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

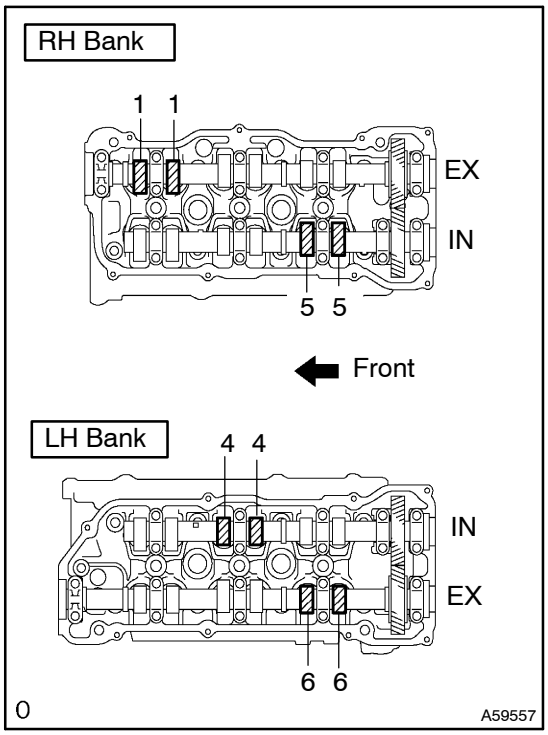


(d) Turn the crankshaft 2/3 of a revolution (240°), and check only the valves indicated in the illustration.

(1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

Valve clearance (Cold):
Intake 0.15 – 0.25 mm (0.006 – 0.010 in.)
Exhaust 0.25 – 0.35 mm (0.010 – 0.014 in.)

(2) Record out–of–specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

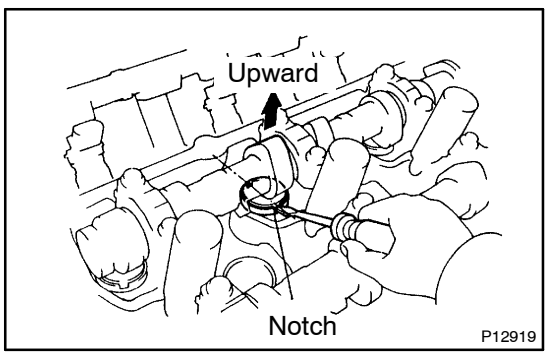


(e) Turn the crankshaft 2/3 of a revolution (240°), and check only the valves indicated in the illustration.

(1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

Valve clearance (Cold):
Intake 0.15 – 0.25 mm (0.006 – 0.010 in.)
Exhaust 0.25 – 0.35 mm (0.010 – 0.014 in.)

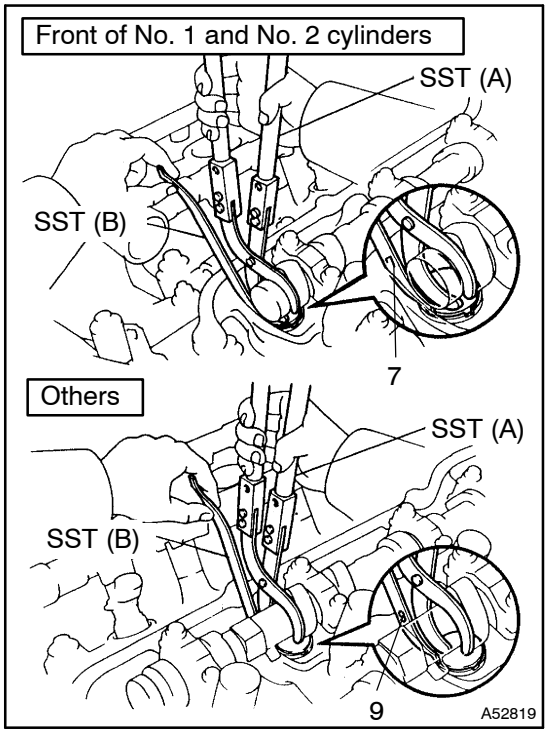
(2) Record out–of–specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.



12. ADJUST VALVE CLEARANCE

(a) Turn the camshaft so that the cam lobe for the valve to be adjusted faces up.

(b) Turn the valve lifter with a screwdriver so that the notches are perpendicular to the camshaft.



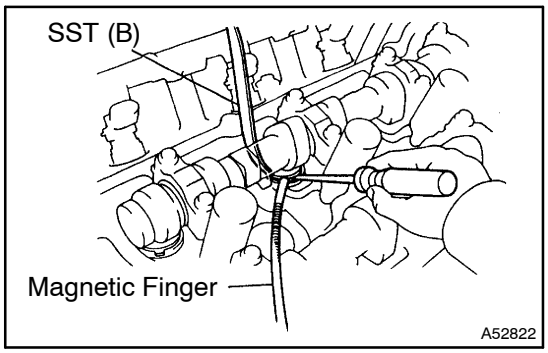
(c) Using SST (A), press down the valve lifter and place SST (B) between the camshaft and valve lifter. Remove SST (A).

SST 09248–55040 (09248–05410, 09248–05420)

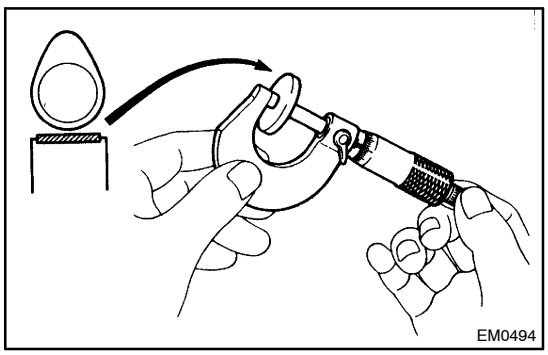
HINT:

- Apply SST (B) at a slight angle on the side marked with ”9” or ”7”, at the position shown in the illustration.
- When SST (B) is inserted too deeply, it will get pinched by the shim. To prevent it from being stuck, insert it gently from the intake side, at a slight angle.

SST (A)	09248–05410
SST (B)	09248–05420



(d) Using a small screwdriver and magnetic finger, remove the adjusting shim.



(e) Using a micrometer, measure the thickness of the removed shim.

(f) Calculate the thickness of a new shim so the valve clearance comes within the specified value.

A	Thickness of new shim
B	Thickness of used shim
C	Measured valve clearance

Specified value (Cold):

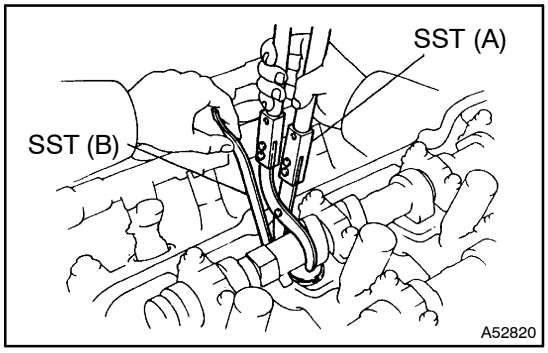
Intake A = B + (C – 0.20 mm (0.008 in.))

Exhaust A = B + (C – 0.30 mm (0.012 in.))

(g) Select a new shim with a thickness as close as possible to the calculated values.

HINT:

Shims are available in 17 sizes in increments of 0.05 mm (0.0020 in.), from 2.50 mm (0.0984 in.) to 3.30 mm (0.1299 in.).

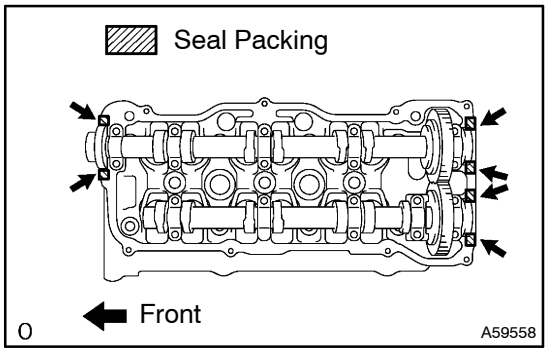


(h) Place a new adjusting shim on the valve lifter, with imprinted numbers facing down.

(i) Press down the valve lifter with SST (A), and remove SST (B).

SST 09248–55040 (09248–05410, 09248–05420)

(j) Recheck the valve clearance.



13. INSTALL CYLINDER HEAD COVER SUB–ASSY

(a) Apply seal packing to the cylinder head as shown in the illustration.

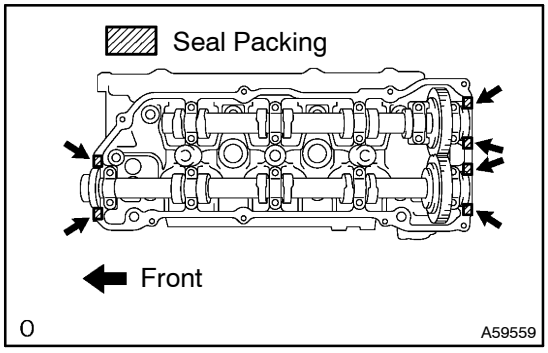
Seal packing: Part No. 08826–00080 or equivalent

NOTICE:

- **Remove any oil from the contact surface.**
- **Install the cylinder head cover within 3 minutes after applying seal packing.**
- **Do not start the engine within 2 hours after installing.**

(b) Install the cylinder head cover with the 9 bolts. Uniformly tighten the bolts, in several passes.

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)



14. INSTALL CYLINDER HEAD COVER SUB–ASSY LH

(a) Apply seal packing to the cylinder head as shown in the illustration.

Seal packing: Part No. 08826–00080 or equivalent

NOTICE:

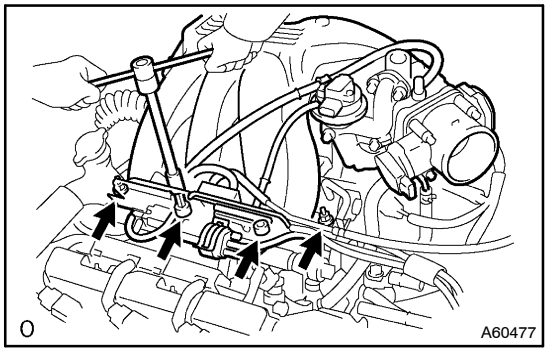
- **Remove any oil from the contact surface.**
- **Install the cylinder head cover within 3 minutes after applying seal packing.**
- **Do not start the engine within 2 hours after installing.**

(b) Install the cylinder head cover with the 9 bolts. Uniformly tighten the bolts, in several passes.

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

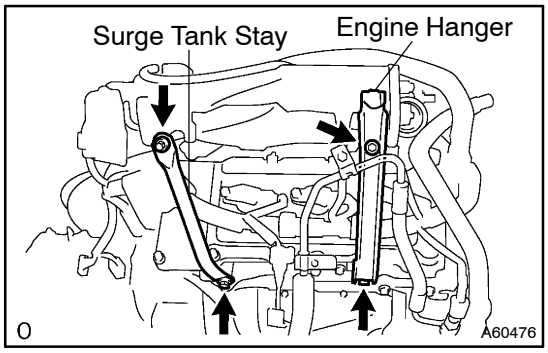
15. INSTALL IGNITION COIL ASSY

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)



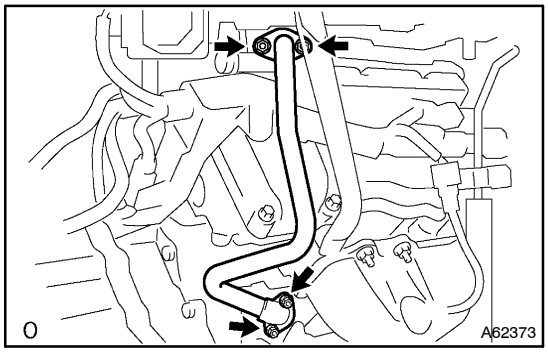
16. INSTALL INTAKE AIR SURGE TANK

(a) Using an 8 mm hexagon wrench, install a new gasket and the air intake chamber assembly with the 2 bolts and 2 nuts. Uniformly tighten the bolts and nuts in several passes.
Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)



(b) Install the No.1 engine hanger with the 2 bolts.
Torque: 39 N·m (398 kgf·cm, 29 ft·lbf)

(c) Install the surge tank stay No.1 with the 2 bolts.
Torque: 20 N·m (199 kgf·cm, 14 ft·lbf)



(d) Install the 2 new gaskets and EGR pipe with the 4 nuts.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

17. INSTALL AIR CLEANER ASSEMBLY WITH HOSE (See page 10–18)
18. CONNECT VACUUM HOSE (See page 14–156)
19. INSTALL FRONT SUSPENSION UPPER BRACE CENTER (W/ FRONT SUSPENSION BRACE UPPER CENTER)
20. INSTALL V–BANK COVER SUB–ASSY (See page 14–156)
21. ADD COOLANT (See page 16–31)
22. CHECK ENGINE COOLANT LEAK (See page 16–31)