ENGINE TUNE–UP (4A–GE)

INSPECTION OF ENGINE COOLANT

(See page CO–5)

INSPECTION OF ENGINE OIL

(See page LU–5)

INSPECTION OF AIR FILTER

(See page MA–17)

INSPECTION OF BATTERY

(See page CH–3)

> **Standard specific gravity:**
> **1.25 – 1.27 when fully charged at 20˚C (68˚F)**
> **(Delco) Green Dot visible**

INSPECTION OF HIGH–TENSION CORDS

(See page IG–9)

> **NOTICE: DO NOT pull on the cords or bend the wires.**
> **The conductor inside may be damaged.**
> **Maximum resistance: 25 kΩper cord**

INSPECTION OF SPARK PLUGS

Using plug wrench (16 mm), remove the spark plugs.
Platinum Tipped Type
(See page IG–10)

> **NOTICE:**
> - **Never use a wire brush for cleaning**
> - **Never attempt to adjust gap on used plug**
> - **Spark plugs should be replaced every 60,000 miles (100,000 km)**
>
> **Maximum electrode gap: 1.0 mm (0.039 in.)**
> **Correct electrode gap of new plug:**
> **0.8 mm (0.031 in.)**
> **Recommended spark plugs:**
> **ND PK20R8**
> **NGK BKR6EP8**

INSPECTION OF ALTERNATOR DRIVE BELT

(See page CH–3)
Belt tension gauge:
Nippondenso BTG–20 (95506–00020) or
Borroughs No. BT–33–73F

> **Drive belt tension: New belt 175 ± 5 lb**
> **Used belt 115 ± 20 lb**

INSPECTION AND ADJUSTMENT OF VALVE CLEARANCE

HINT: Inspect and adjust the valve clearance when the engine is cold.

1. REMOVE PLUG CORD COVER

2. DISCONNECT HIGH–TENSION CORDS FROM SPARK PLUGS

3. REMOVE CYLINDER HEAD COVERS (See page EM–45)

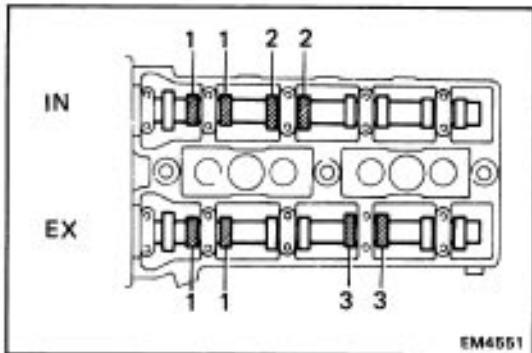**4. SET NO.1 CYLINDER TO TDC/COMPRESSION**

(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 cylinder are loose and valve lifters on the No. 4 cylinder are tight.

If not, turn the crankshaft one revolution (360˚) and align the mark as above.
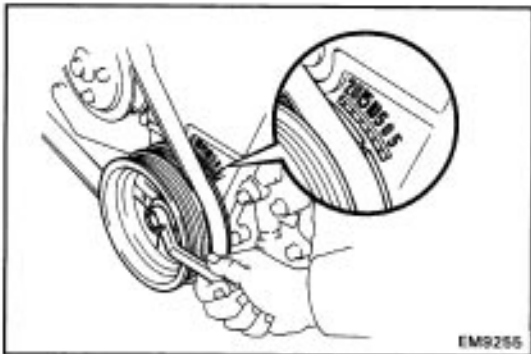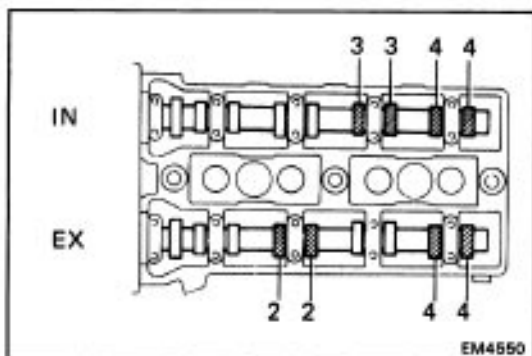
5. INSPECT VALVE CLEARANCE

(a) Check only the valves indicated as shown.

- Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

- Record the valve clearance measurements which are out of specification. They will be used later to determine the required replacement adjusting shim.

Valve clearance (Cold):

Intake 0.15 – 0.25 mm (0.006 – 0.010 in.)

Exhaust 0.20 – 0.30 mm (0.008 – 0.012 in.)

(b) Turn the crankshaft one revolution (360˚) and align the mark as above. (See procedure in step 4)

(c) Check only the valves indicated as shown.
   Measure the valve clearance.
   (See procedure in step (a)).

(d) Remove the adjusting shim.

- Turn the crankshaft to position the cam lobe of the camshaft on the adjusting valve upward.

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

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HINT: Before pressing down the valve lifter, position the notch toward the spark plug.
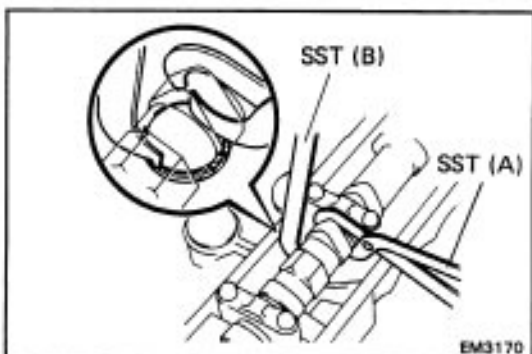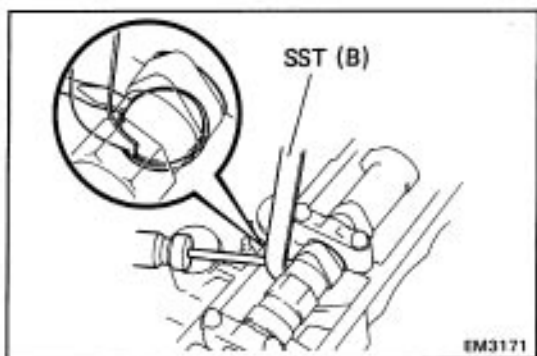
- Remove the adjusting shim with a small screwdriver and magnetic finger.
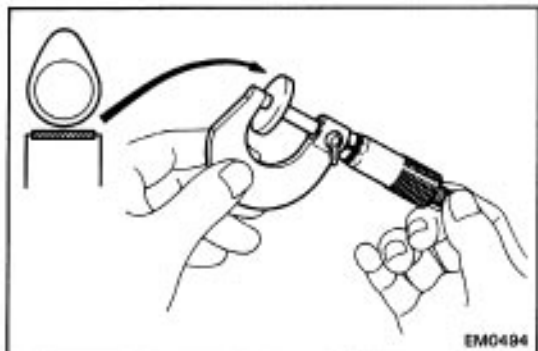
(e) Determine the replacement adjusting shim size by using the following Formula or Charts:

- Using a micrometer, measure the thickness of the shim which was removed.
- Calculate the thickness of the new shim so the valve clearance comes within specified value.

  T .... Thickness of used shim
  A .... Measured valve clearance
  N .... Thickness of new shim

Intake side N = T + (A − 0.20 mm (0.008 in.))
Exhaust side N = T + (A − 0.25 mm (0.010 in.))

- Select a new shim with a thickness as close as possible to the calculated values.

HINT: Shims are available in seventeen sizes in increments of 0.050 mm (0.0020 in.), from 2.500 mm (0.0984 in.) to 3.300 mm (0.1299 in.).

(f) Install a new adjusting shim.

- Place a new adjusting shim on the valve lifter.
- Using SST (A), press down the valve lifter and remove SST (B).

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(g) Recheck the valve clearance.

6. REINSTALL CYLINDER HEAD COVERS (See page EM–48)

7. CONNECT HIGH–TENSION CORDS TO SPARK PLUGS

8. REINSTALL PLUG CORD COVER

Adjusting Shim Selection Chart
Intake

Installed Shim Thickness (mm)

(Adjusting shim selection chart — Measured Clearance (mm) rows from 0.000–0.009 through 1.001–1.025 cross-referenced against Installed Shim Thickness columns from 2.500 to 3.300 mm, giving replacement shim numbers.)

Intake valve clearance (Cold):
  0.15–0.25mm(0.06–0.010in.)
Example: A 2.800 mm shim is installed
  and the measured clearance
  is 0.450 mm.
  Replace the 2.800 mm shim with
  shim No. 24 (3.050 mm).

Shim thickness   mm (in.)

Shim No.	Thickness	Shim No.	Thickness
02	2.500 (0.0984)	20	2.950 (0.1161)
04	2.550 (0.1004)	22	3.000 (0.1181)
06	2.600 (0.1024)	24	3.050 (0.1201)
08	2.650 (0.1043)	26	3.100 (0.1220)
10	2.700 (0.1063)	28	3.150 (0.1240)
12	2.750 (0.1083)	30	3.200 (0.1260)
14	2.800 (0.1102)	32	3.250 (0.1280)
16	2.850 (0.1122)	34	3.300 (0.1299)
18	2.900 (0.1142)		

Adjusting Shim Selection Chart
Exhaust

Installed Shim Thickness (mm) — column headers:
2.500, 2.625, 2.550, 2.575, 2.600, 2.620, 2.640, 2.650, 2.660, 2.680, 2.700, 2.720, 2.740, 2.750, 2.760, 2.780, 2.800, 2.820, 2.840, 2.850, 2.860, 2.880, 2.900, 2.920, 2.940, 2.950, 2.960, 2.980, 3.000, 3.020, 3.040, 3.060, 3.080, 3.100, 3.120, 3.140, 3.150, 3.160, 3.180, 3.200, 3.225, 3.250, 3.275, 3.300

Measured Clearance (mm) rows:

Measured Clearance (mm)
0.000 – 0.009
0.010 – 0.025
0.026 – 0.040
0.041 – 0.050
0.051 – 0.070
0.071 – 0.090
0.091 – 0.100
0.101 – 0.120
0.121 – 0.140
0.141 – 0.150
0.151 – 0.170
0.171 – 0.190
0.191 – 0.199
0.200 – 0.300
0.301 – 0.320
0.321 – 0.325
0.326 – 0.340
0.341 – 0.350
0.351 – 0.370
0.371 – 0.375
0.376 – 0.390
0.391 – 0.400
0.401 – 0.420
0.421 – 0.425
0.426 – 0.440
0.441 – 0.450
0.451 – 0.470
0.471 – 0.475
0.476 – 0.490
0.491 – 0.500
0.501 – 0.520
0.521 – 0.525
0.526 – 0.540
0.541 – 0.550
0.551 – 0.570
0.571 – 0.575
0.576 – 0.590
0.591 – 0.600
0.601 – 0.620
0.621 – 0.625
0.626 – 0.640
0.641 – 0.650
0.651 – 0.670
0.671 – 0.675
0.676 – 0.690
0.691 – 0.700
0.701 – 0.720
0.721 – 0.725
0.726 – 0.740
0.741 – 0.750
0.751 – 0.770
0.771 – 0.775
0.776 – 0.790
0.791 – 0.800
0.801 – 0.820
0.821 – 0.825
0.826 – 0.840
0.841 – 0.850
0.851 – 0.870
0.871 – 0.875
0.876 – 0.890
0.891 – 0.900
0.901 – 0.925
0.926 – 0.950
0.951 – 0.975
0.976 – 1.000
1.001 – 1.025
1.026 – 1.050
1.051 – 1.075

(Matrix cells contain shim numbers, e.g. 02, 04, 06, 08, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, intersecting each measured clearance row with each installed shim thickness column.)

Shim thickness mm (in.)

Shim No.	Thickness	Shim No.	Thickness
02	2.500 (0.0984)	20	2.950 (0.1161)
04	2.550 (0.1004)	22	3.000 (0.1181)
06	2.600 (0.1024)	24	3.050 (0.1201)
08	2.650 (0.1043)	26	3.100 (0.1220)
10	2.700 (0.1063)	28	3.150 (0.1240)
12	2.750 (0.1083)	30	3.200 (0.1260)
14	2.800 (0.1102)	32	3.250 (0.1280)
16	2.850 (0.1122)	34	3.300 (0.1299)
18	2.900 (0.1142)		

Exhaust valve clearance (Cold):
0.20–0.30mm(0.008–0.012in.)
**Example: A 2.800 mm shim is installed
and the measured clearance is
0.450 mm.
Replace the 2.800 mm shim with shim
No. 22 (3.000 mm).**

INSPECTION AND ADJUSTMENT OF IGNITION TIMING

(See page IG–19)

Ignition timing: 10˚BTDC @ idle

(w/ Terminals TE1 and E1 connected)

INSPECTION AND ADJUSTMENT OF IDLE SPEED

(See page MA–19)

Idle speed (w/ Cooling fan OFF): 800 rpm

INSPECTION AND ADJUSTMENT OF DASH POT (DP) SETTING SPEED

(**See page FI–150)**

DP setting speed (w/ Cooling fan OFF): 1,800 rpm