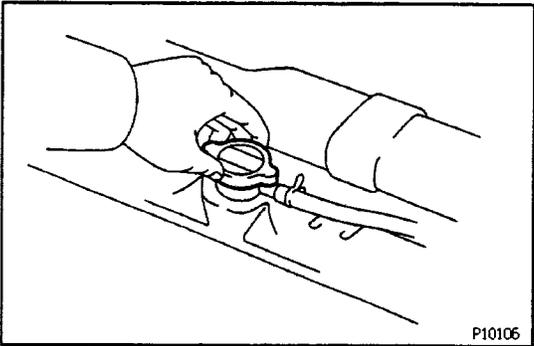


## TUNE-UP

### 1. CHECK ENGINE COOLANT LEVEL AT RESERVOIR TANK

The engine coolant level should be between the "LOW" and "FULL" lines.

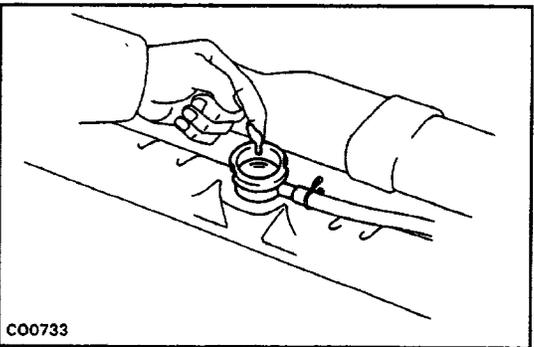
If low, check for leaks and add engine coolant up to the "FULL" line.



### 2. CHECK ENGINE COOLANT QUALITY

(a) Remove the radiator cap.

**CAUTION:** To avoid the danger of being burned, do not remove it while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.



(b) There should not be any excessive deposits of rust or scales around the radiator cap or radiator filler hole, and the hole, and the coolant should be free from oil. If excessively dirty, clean the coolant passages and replace the coolant.

#### Capacity (w/ Heater):

**9.9 liters (10.5 US qts, 8.7 Imp.qts) for 2WD M/T**

**9.7 liters (10.3 US qts, 8.5 Imp.qts) for 2WD A/T**

**10.0 liters (10.6 US qts, 8.8 Imp.qts) for 4WD M/T**

**9.8 liters (10.4 US qts, 8.6 Imp.qts) for 4WD A/T**

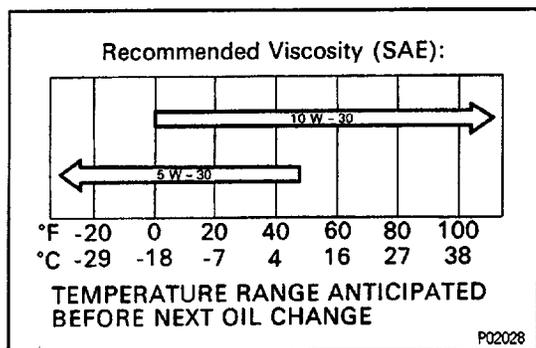
#### HINT:

- Use a good brand of ethylene-glycol base coolant and mix it according to the manufacturer's directions.
- Using coolant which includes more than 50% ethylene-glycol (but not more than 70%) is recommended.

#### NOTICE:

- **Do not use an alcohol type coolant.**
- **The coolant should be mixed with demineralized water or distilled water.**

(c) Reinstall the radiator cap.



## ENGINE OIL INSPECTION

### 1. CHECK OIL QUALITY

Check the oil for deterioration, entry of water, discoloring or thinning.

If oil quality is poor, replace the oil.

#### Oil grade:

API grade **SG Energy-Conserving II** multigrade engine oil. Recommended viscosity is as shown,

#### Drain and refill capacity (2WD):

w/ Oil filter change

4.3 liters (4.5 US qts, 3.8 Imp. qts)

w/o Oil filter change

4.0 liters (4.2 US qts, 3.5 Imp. qts)

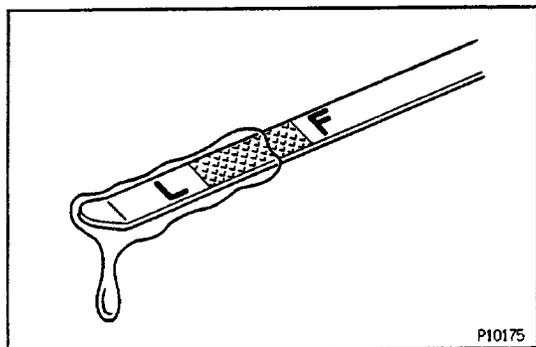
#### Drain and refill capacity (4WD):

w/ Oil filter change

4.5 liters (4.8 US qts, 4.0 Imp. qts)

w/o Oil filter change

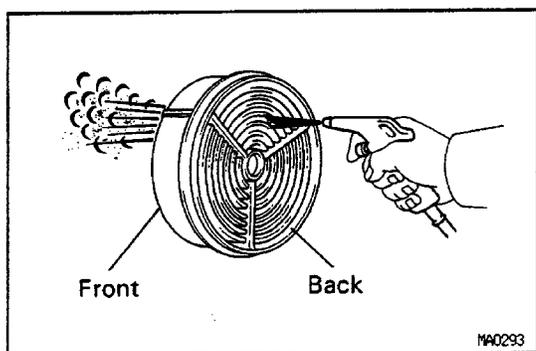
4.2 liters (4.4 US qts, 3.7 Imp. qts)



### 2. CHECK ENGINE OIL LEVEL

The oil level should be between the "L" and "F" marks on the dipstick.

If low, check for leakage and add oil up to the "F" mark.



## AIR FILTER INSPECTION AND CLEANING

### 1. REMOVE AIR FILTER

### 2. INSPECT AND CLEAN AIR FILTER

(a) Visually check that the air filter is not excessively damaged or only.

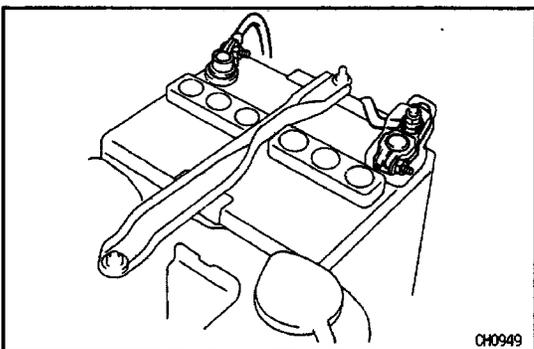
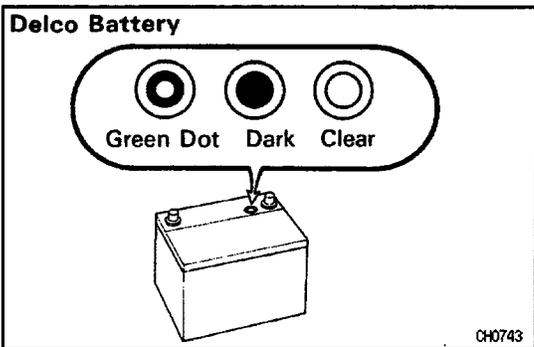
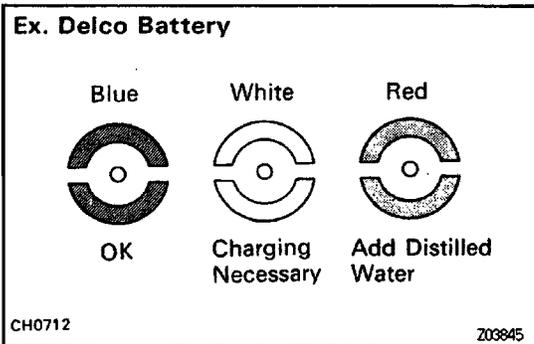
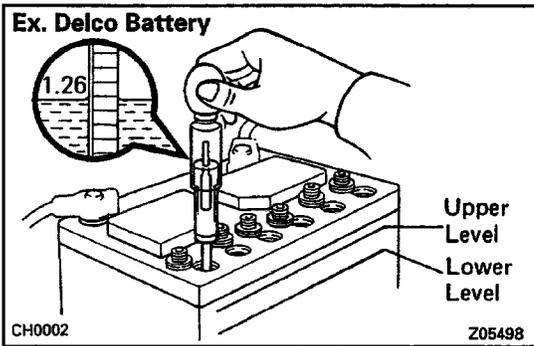
HINT: Oiliness may indicate a stuck PCV valve.

If necessary, replace the air filter.

(b) Clean the air filter with compressed air.

First blow from the inside thoroughly, then blow off the outside of the air filter.

### 3. REINSTALL AIR FILTER



## BATTERY INSPECTION

### 1. (Ex. Delco Battery)

#### CHECK BATTERY SPECIFIC GRAVITY AND ELECTROLYTE LEVEL

- Check the electrolyte quantity of each cell.  
If insufficient, refill with distilled (or purified) water.
- Check the specific gravity of each cell.

**Standard specific gravity at 20°C (68°F):**

1.25 – 1.27 for 55D 23R type

1.27 – 1.29 for 80D 26R type

If not within specifications, charge the battery.

HINT: Check the indicator as shown in the illustration.

### 2. (Delco Battery)

#### CHECK HYDROMETER

Green Dot visible:

Battery is adequately charged.

Dark (Green Dot not visible):

Battery must be charged.

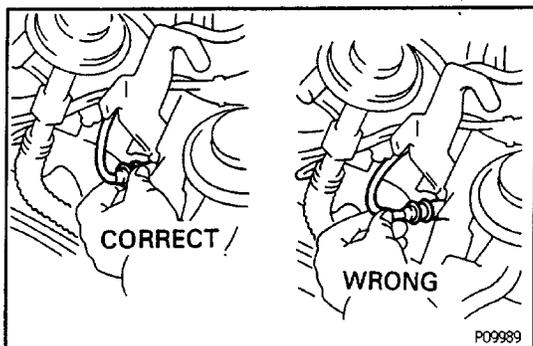
Clear or Light Yellow:

Replace battery.

HINT: There is no need to add water during the entire service life of the battery.

### 3. CHECK BATTERY TERMINALS, FUSIBLE LINK AND FUSES

- Check that the battery terminals are not loose or corroded.
- Check the fusible link and fuses for continuity.



## HIGH-TENSION CORDS INSPECTION

### 1. DISCONNECT HIGH-TENSION CORDS FROM SPARK PLUGS

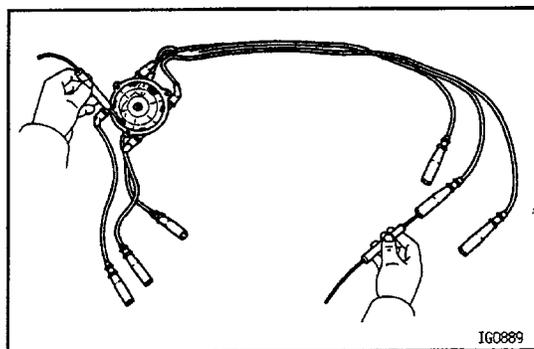
Disconnect the high - tension cords at the rubber boot. Do not pull on the cords.

**NOTICE:** Pulling on or bending the cords may damage the conductor inside.

### 2. REMOVE DISTRIBUTOR CAP WITH HIGH-TENSION CORDS

### 3. INSPECT HIGH-TENSION CORD TERMINALS

Check the terminals for corrosion, breaks or distortion. Replace cords as required.



### 4. INSPECT HIGH-TENSION CORD RESISTANCE

Using an ohmmeter, measure the resistance without disconnecting the distributor cap.

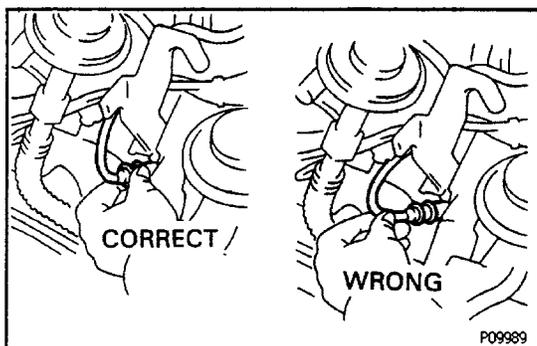
**Maximum resistance:**

**25 kΩ per cord**

If the resistance is greater than maximum, check the terminals. If any defect has been found, replace the high-tension cord and/or distributor cap.

### 5. REINSTALL DISTRIBUTOR CAP AND HIGH-TENSION CORDS

### 6. RECONNECT HIGH-TENSION CORDS TO SPARK PLUGS

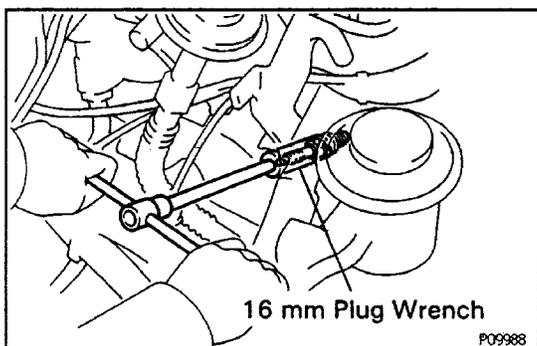


## SPARK PLUGS INSPECTION

### 1. DISCONNECT HIGH-TENSION CORDS FROM SPARK PLUGS

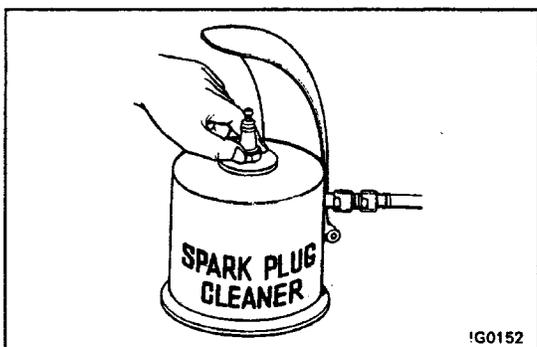
Disconnect the high - tension cords at the rubber boot. Do not pull on the cords.

**NOTICE:** Pulling on or bending the cords may damage the conductor inside.



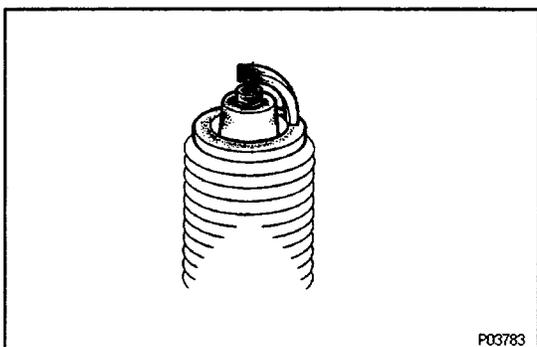
### 2. REMOVE SPARK PLUGS

Using a 16 mm plug wrench, remove the six spark plugs.



### 3. CLEAN SPARK PLUGS

Using a spark plug cleaner or wire brush, clean the spark plug.



### 4. VISUALLY INSPECT SPARK PLUGS

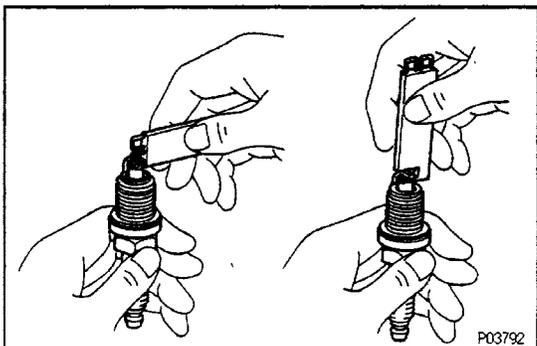
Check the spark plug for electrode wear, thread damage and insulator damage.

If abnormal, replace the spark plug.

**Recommended spark plug:**

**K16R- U for ND**

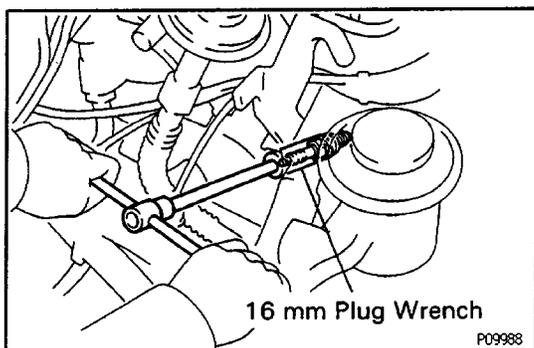
**8KR5EYA for NGK**



### 5. ADJUST ELECTRODE GAP

Carefully bend the outer electrode to obtain the correct electrode gap.

**Correct electrode gap: 0.8 mm (0.031 in.)**

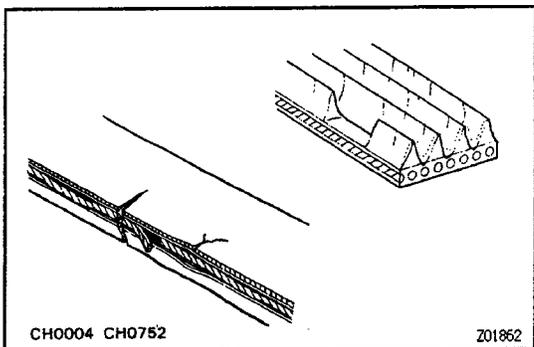


## 6. INSTALL SPARK PLUGS

Using a 16 mm plug wrench, install the six spark plugs.

**Torque: 18 N-m (18o kgf-cm, 13 ft-lbf)**

## 7. RECONNECT HIGH-TENSION CORDS TO SPARK PLUGS



## GENERATOR DRIVE BELT INSPECTION

### INSPECT DRIVE BELTS

(a) Visually check the belt for excessive wear, frayed cords etc.

If necessary, replace the drive belt.

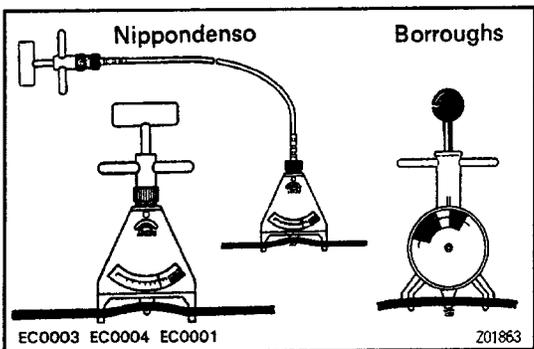
**HINT:** Cranks on the rib side of a belt are considered acceptable. If the belt has chunks missing from the ribs, it should be replaced.

(b) Using a belt tension gauge, measure the belt tension.

Belt tension gauge:

BTG-20 (95506-00020) for nippondenso

No. BT-33-73F for borroughs



### Drive belt tension:

#### New belt

**160 ±20 lbf**

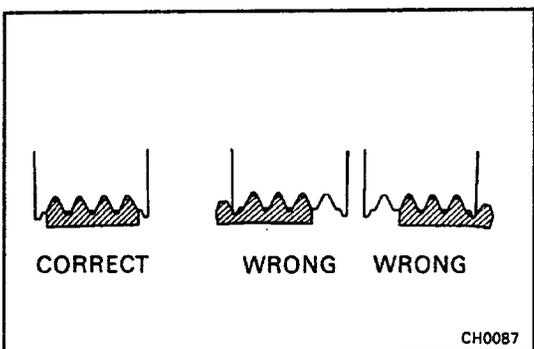
#### Used belt

**100 ±20 lbf**

If necessary, adjust the belt tension.

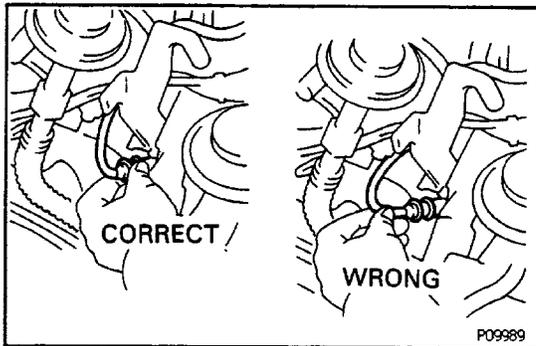
### HINT:

- "New belt" refers to a belt which has been used less than 5 minutes on a running engine.
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.
- After installing the belt, check that it fits properly in the ribbed grooves.
- Check by hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.
- After installing a new belt, run the engine for about 5 minutes and recheck the belt tension.



## VALVE CLEARANCE INSPECTION AND ADJUSTMENT

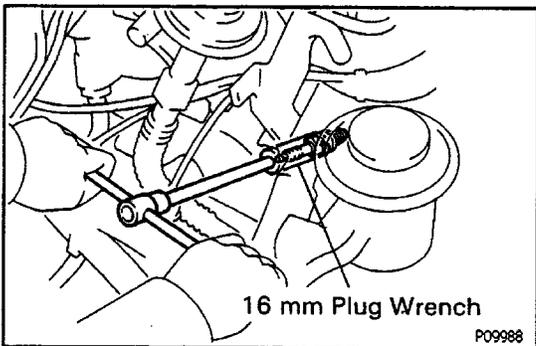
HINT: Inspect and adjust the valve clearance when the engine is cold.



### 1. DISCONNECT HIGH-TENSION CORDS FROM SPARK PLUGS

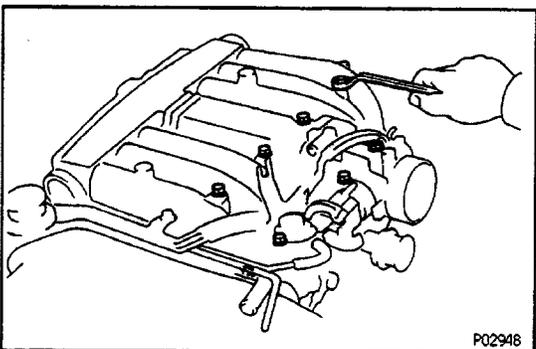
Disconnect the high – tension cords at the rubber boot. Do not pull on the cords.

**NOTICE:** Pulling on or bending the cords may damage the conductor inside.

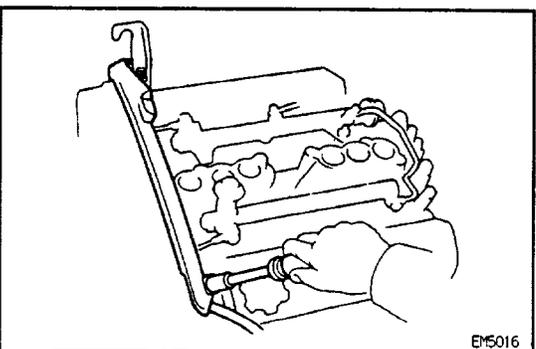


### 2. REMOVE SPARK PLUGS

Using a 16 mm plug wrench, remove the six spark plugs.



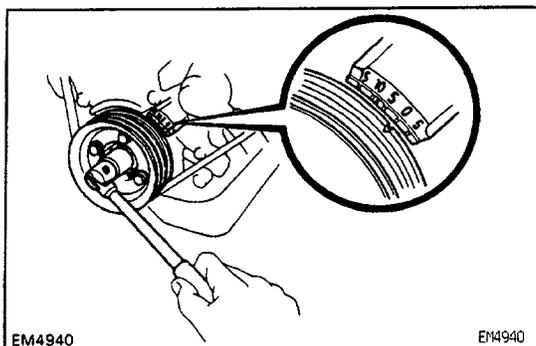
### 3. REMOVE AIR INTAKE CHAMBER (See step 18 on pages [EG2-53](#) to [55](#))



### 4. REMOVE ENGINE WIRE

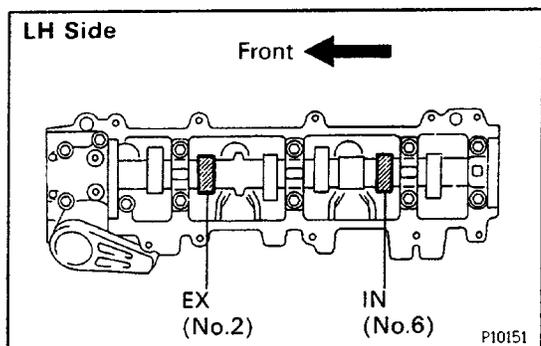
Remove the two bolts and engine wire.

### 5. REMOVE CYLINDER HEAD COVERS (See step 35 on page [EG2-58](#))



## 6. SET NO.1 CYLINDER TO TDC/COMPRESSION

- Turn the crankshaft pulley and align its groove with timing mark "0" of the No.1 timing belt cover.
- Check that the valve lifters on the No.1 cylinder are loose and valve lifters on the No.4 are tight. If not, turn the crankshaft one revolution (360°) and align the mark as above.



## 7. INSPECT VALVE CLEARANCE

- Check the clearance of the 1N (No.6) and EX (No.2) valves.

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

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

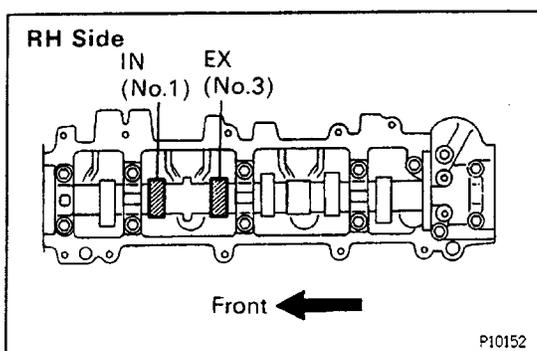
### Valve clearance (Cold):

#### Intake

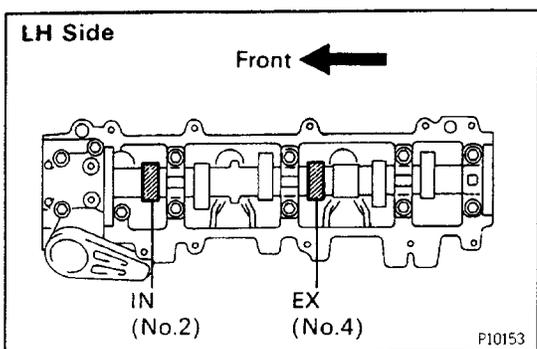
**0.18 – 0.28 mm (0.007 – 0.011 in.)**

#### Exhaust

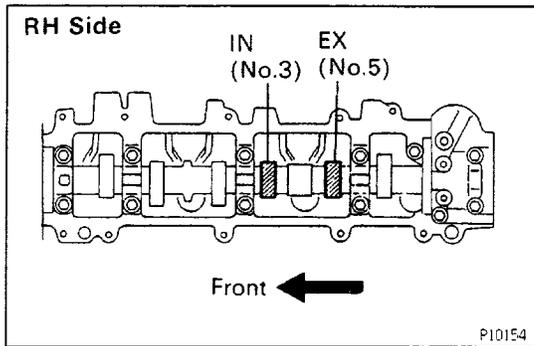
**0.22 – 0.32 mm (0.009 – 0.013 in.)**



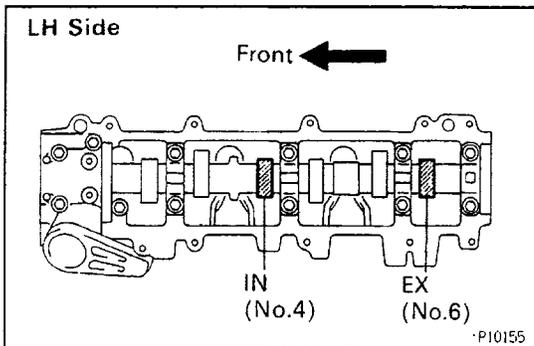
- Turn the crankshaft 1/3 revolution (120°), check the clearance of the IN (No. 1) and EX (No. 3) valves. Measure the valve clearance. (See procedure in step (a))



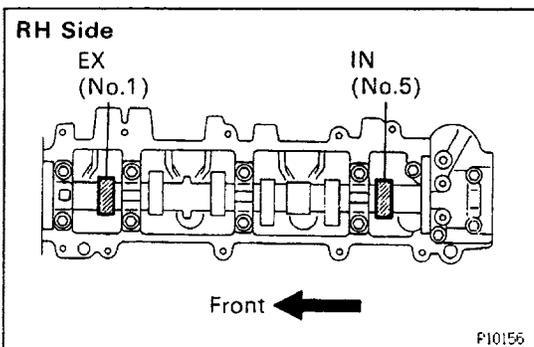
- Turn the crankshaft 1/3 revolution (120°), check the clearance of the IN (No. 2) and EX (No. 4) valves. Measure the valve clearance. (See procedure in step (a))



- (d) Turn the crankshaft 1/3 revolution ( $120^\circ$ ), check the clearance of the IN (No. 3) and EX (No. 5) valves. Measure the valve clearance.  
(See procedure in step (a))



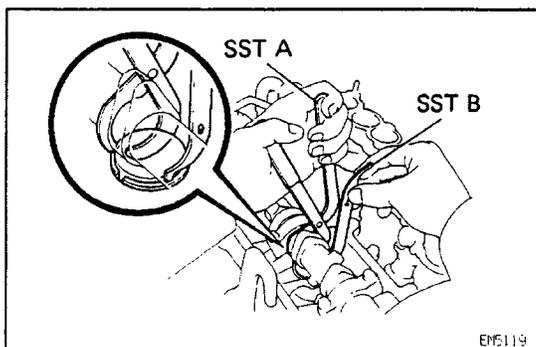
- (e) Turn the crankshaft 1/3 revolution ( $120^\circ$ ), check the clearance of the IN (No. 4) and EX (No. 6) valves. Measure the valve clearance.  
(See procedure in step (a))



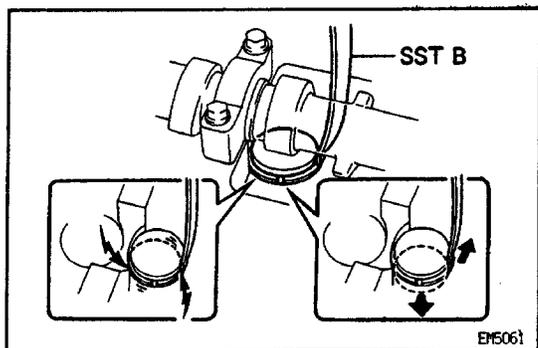
- (f) Turn the crankshaft 1/3 revolution ( $120^\circ$ ), check the clearance of the IN (No. 5) and EX (No. 1) valves. Measure the valve clearance.  
(See procedure in step (a))

## 8. ADJUST VALVE CLEARANCE

- (a) Remove the adjusting shim.
- Turn the crankshaft so that the cam lobe of the camshaft on the adjusting valve upward.
  - Position the notch of the valve lifter facing the spark plug side.

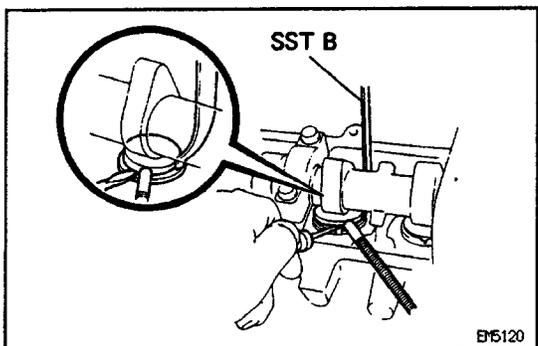


- Using SST (A), press down the valve lifter and place SST (B) between the camshaft and valve lifter. Remove SST (A).  
SST 09248-55020 (09248-05011, 09248-05021)



HINT: For easy removal of the shim, When setting SST 8, set it on the lifter so there is a wide space in the removal direction.\*

- Remove the adjusting shim with a small screwdriver and magnetic finger.



(b) : Determine the replacement adjusting shim size by following—the Formula or Chart:

- Using a micrometer, measure – the thickness of the removed shim.
- Calculate the thickness of a new shim so that the valve clearance comes within specified value.  
 T ..... Thickness of removed shim  
 A ..... Measured valve clearance  
 N ..... Thickness of new shim

**Intake:**

$$N = T + (A - 0.23 \text{ mm (0.009 in.)})$$

**Exhaust:**

$$N = T + (A - 0.27 \text{ mm (0.011 in.)})$$

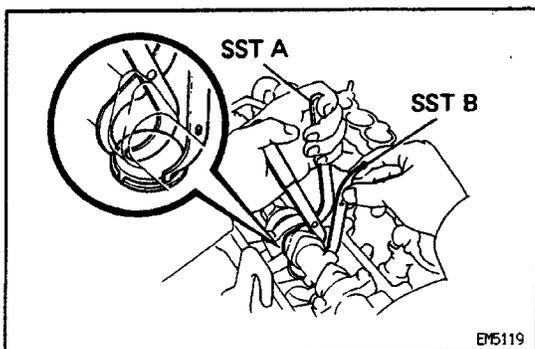
- Select a new shim with a thickness as close as possible to the calculated value.

HINT: Shims are available in twenty-five sized in increments of 0.05 mm (0.0020 in.), from 2.20 mm (0.0866 in.) to 3.40 mm (0.1339 in.).

(c) Install a new adjusting shim.

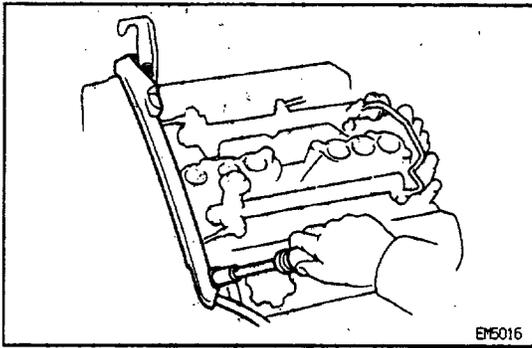
- Place a new adjusting shim on the valve lifter.
- Using SST (A), press down the valve lifter and remove SST (B).

SST 09248 - 55020 (09248-05011, 09248-05021)





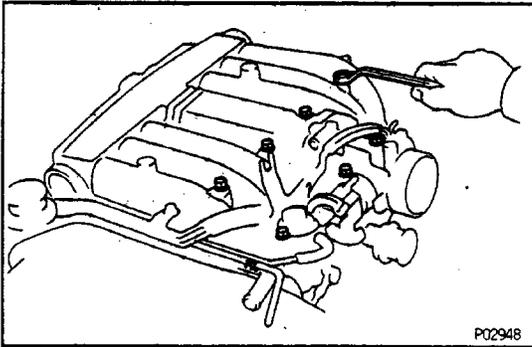


**9. INSTALL CYLINDER HEAD COVERS**

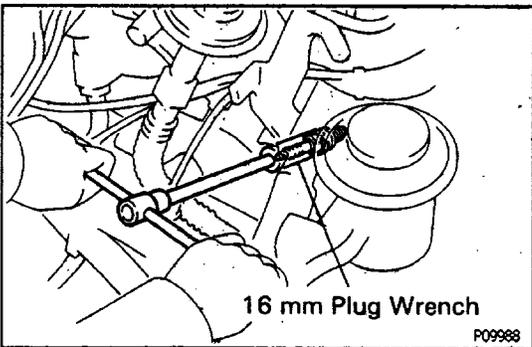
(See step 7 on page [EG2-80](#))

**10. INSTALL ENGINE WIRE**

Install the engine wire with the two bolts.

**11. INSTALL AIR INTAKE CHAMBER**

(See step 24 on pages [EG2-84](#) to 87)

**12. INSTALL SPARK PLUGS**

Using a 16 mm plug wrench, install the six spark plugs.

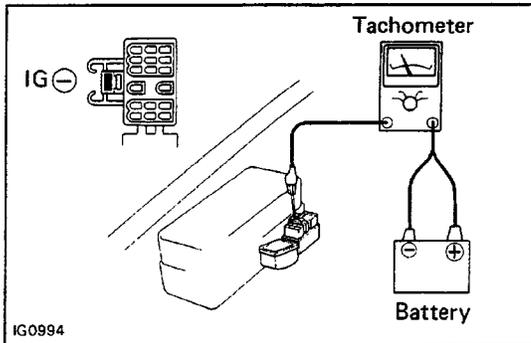
Torque: 18 N-m (18a kgf-cm, 13 ft-lbf)

**13. RECONNECT- HIGH -TENSION CORDS TO SPARK PLUGS**

# IGNITION TIMING INSPECTION AND ADJUSTMENT

## 1. WARM UP ENGINE

Allow the engine to warm up to normal operating temperature.



## 2. CONNECT TACHOMETER AND TIMING LIGHT TO ENGINE

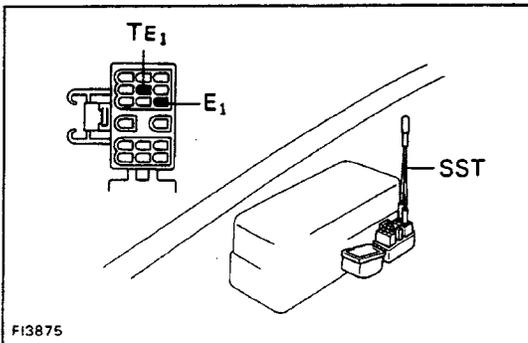
Connect the test probe of a tachometer to terminal IG (-) of the data link connector 1.

### NOTICE:

- Never allow the tachometer terminal to touch ground as it could result in damage to the igniter and/or ignition coil.
- As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of your unit before use.

## 3. ADJUST IGNITION TIMING

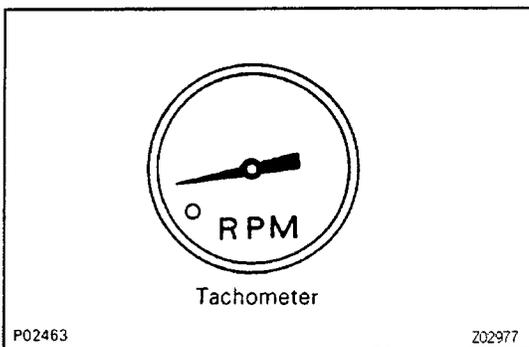
- (a) Using SST, connect terminals TE1 and E1 of the the data link connector 1.
- SST 09843–18020



- (b) Check the idle speed.

**Idle speed:**

**800 ± 50 rpm**



- (c) Using a timing light, check the ignition timing.

**Ignition timing:**

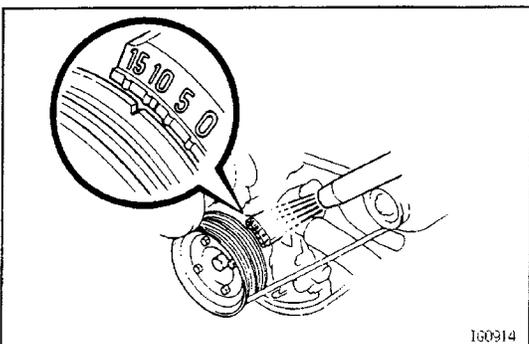
**10 ° BTDC @ idle**

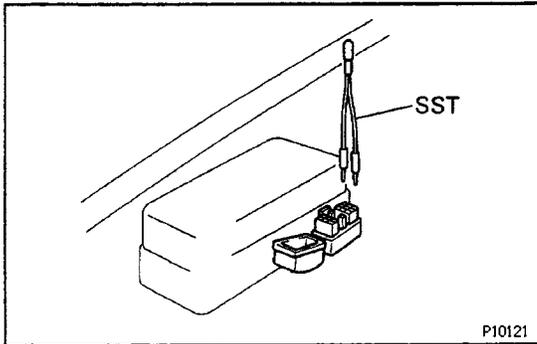
**(Transmission in neutral position)**

- (d) Loosen the hold-down bolt, and adjust by turning the distributor.

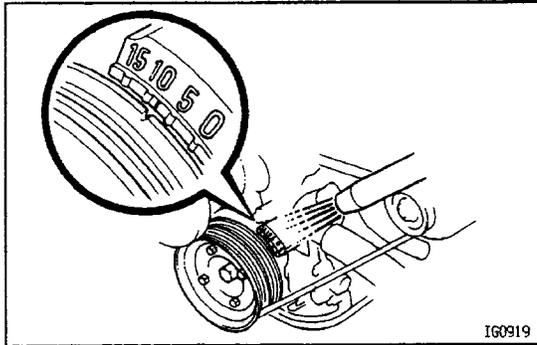
- (e) Tighten the hold-down bolt, and recheck the ignition timing.

**Torque: 18N–m (185 kgf–cm, 13 ft–lbf)**





- (f) Remove the SST from the data link connector 1.  
SST 09843-18020



#### 4. FURTHER CHECK IGNITION TIMING

Check that the ignition timing advances.

Ignition timing:

8° BTDC @ idle

#### 5. DISCONNECT TACHOMETER AND TIMING LIGHT FROM ENGINE

## IDLE SPEED INSPECTION AND ADJUSTMENT

### 1. INITIAL CONDITIONS

- Engine at normal operating temperature
- Air cleaner installed
- All pipes and hoses of air induction system connected
- All accessories switched OFF
- All vacuum lines properly connected

HINT: All vacuum hoses for EGR systems, etc. should be properly connected.

- MFI system wiring connectors fully plugged
- Ignition timing set correctly
- Transmission in neutral position

### 2. CONNECT TACHOMETER

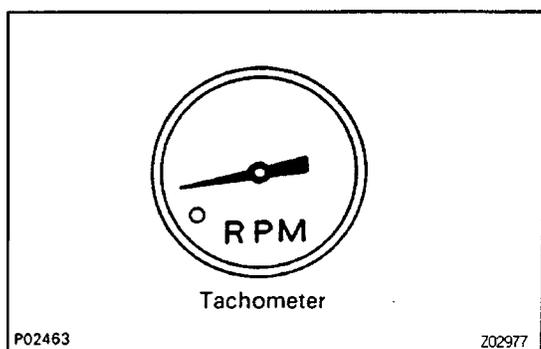
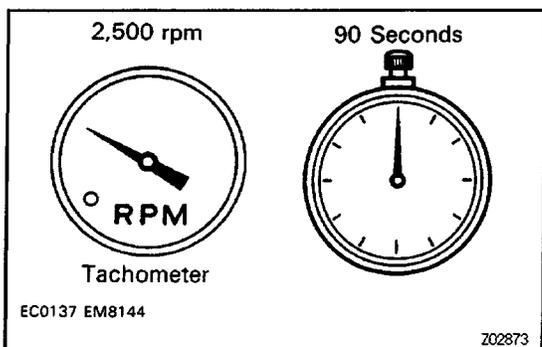
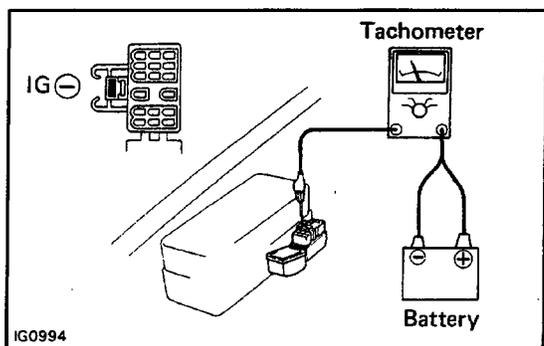
Connect the test probe of a tachometer to terminal IG (-) of the data link connector 1.

#### NOTICE:

- Never allow the tachometer terminal to touch ground as it could result in damage to the igniter and/or. ignition coil.
- As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of your unit before use.

### 3. ADJUST IDLE SPEED

- Race the engine speed at 2,500 rpm for approx. 90 seconds.



- Check the idle speed.

Idle speed:

$800 \pm 50$  rpm

- Adjust the idle speed by turning the idle speed adjusting screw.

### 4. DISCONNECT TACHOMETER

