IGNITION SYSTEM

SPECIFICATIONS

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GENERAL SPECIFICATIONS DISTRIBUTOR

Items	1.8L Engine
Туре	Contact pointless type
Identification No.	T6T5737 1
Part No.	MD1 55852
Advance mechanism	Controlled by engine control unit
Firing order	1–3–4–2

CRANK ANGLE SENSOR

TypeContact pointless typeIdentification No.T1T49571Part No.MD1 48855	Items	2.0L DOHC Engine
Advance mechanism Controlled by engine control unit Firing order 1-3-4-2	Type Identification No. Part No. Advance mechanism	Contact pointless type T1T49571 MD1 48855 Controlled by engine control unit 1-3-4-2

IGNITION COIL

Iterns	Specifications
Түре	Mold dual-coil
Identification No.	F-089
Part No.	MD1 58956

SPARK PLUG

Manufacturer	1.8L Engine, 2.0L DOHC Engine (Non-Turbo)	2.0L DOHC Engine (Turbo)
	BPR6ES-11	BPR6ES
CHAMPION	RN9YC4	RN9YC

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SERVICE SPECIFICATIONS

Items	Specifications
Standard value	
Basic ignition timing at curb idle speed	5°BTDC
Actual ignition timing at curb idle speed	
1.8L Engine	10°BTDC
2.0L DOHC Engine	8°BTDC
Ignition coil	
Primary coil resistance at 20°C (68°F) Ω	
1.8L Engine	0.9–1.2
2.0L DOHC Engine	0.77–0.95
Secondary coil resistance at 20°C (68°F) kΩ	
1.8L Engine	19-27
2.0L DOHC Engine	10.3–13.9
Spark plug gap mm (in.)	
1.8L Engine, 2.0L DOHC Engine (Non-Turbo)	1.0–1.1 (.039–.043)
2.0L DOHC Engine (Turbo)	0.7–0.8 (.028–.031)

TORQUE SPECIFICATIONS

Items	Nm	ft.lbs.
Spark plug	20–30	14–22
Distributor mounting nut	10–13	7-9
Crank angle sensor mounting nut	10–13	7 - 9
Nut tightened together with throttle body stay	15–22	11-16
Ignition coil mounting bolt		
2.0L DOHC Engine	20–27	14–20
Center cover installation bolt	2.5-3.5	1.8-2.5
Power transister mounting bolt	10–12	7 - 9
Steering wheel installation nut	35-45	25-33

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TROUBLESHOOTING



OPERATION

<1.8L Engine >

- When the ignition switch is turned to "ON", battery voltage is applied to the ignition coil primary winding.
- As the distributor shaft rotates, ignition signals are transmitted from the multi-point injection control unit to the power transistor.
- These signals activate the power transistor to cause ignition coil primary winding current to flow from the ignition coil negative terminal through the power transistor to ground or be interrupted, repeatedly.
- This action induces high voltage in the secondary winding of the ignition coil. From the ignition coil, the secondary winding current produced flows through the distributor and spark plug to ground, thus causing ignition in each cylinder.

< 2.0L DOHC Engine >

- When the ignition switch is turned to "ON", battery voltage is applied to the ignition coil primary winding.
- As the crank angle sensor shaft rotates, ignition signals are transmitted from the multi-point injection control unit to the power transistor.
- These signals activate the power transistor to cause ignition coil primary winding current to flow from the ignition coil negative terminal through the power transistor to ground or be interrupted, repeatedly.
- This action induces high voltage in the secondary winding of the ignition coil. From the ignition coil, the secondary winding current produced flows through the spark plug to ground, thus causing ignition in each cylinder.

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< 2.0L DOHC Engine >



TROUBLESHOOTING HINTS

- 1. Engine cranks, but does not start.
 - (1) Spark is insufficient or does not occur at all (on spark plug).
 - Check ignition coil.
 - Check distributor. <1.8L Engine>
 - Check crank angle sensor. < 2.0L DOHC Engine >
 - Check power transistor.
 - Check spark plugs.
 - (2) Spark is good.
 - Check ignition timing.
- 2. Engine idles roughly or stalls
 - Check spark plugs.
 - Check ignition timing.
 - Check ignition coil.
- 3. Poor acceleration
 - Check ignition timing.
- 4. Engine overheats or consumes excessive fuel
 Check ignition timing.

COMPONENTS LOCATION



SERVICE ADJUSTMENT PROCEDURES IGNITION TIMING ADJUSTMENT < 1.8L Engine>

PRE-CONDITIONS FOR INSPECTION

- Engine coolant temperature: 85-95°C(185-205°F) •
- Lights, electric cooling fan and accessories: OFF
- Steering wheel: neutral position
- Transaxle: neutral (N or P for A/T)
- 1. Connect timing light.
- 2. Insert paper clip into the CRC filter connector (3-pole connector, 0.5-W cable).
- 3. Connect the tachometer to the inserted clip.
- 4. Check curb idle speed.

Curb idle speed: 700 ± 100 rpm

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5. With the engine stopped, connect a jumper wire to the' terminal for ignition-timing adjustment (located in the engine compartment), and ground it.

- 6. Start and run the engine at curb idle speed.
- 7. Check basic ignition timing and adjust if necessary. **Basic ignition timing: 5°BTDC**





- 8. If not within the standard value range, loosen the distributor mounting nut and adjust by turning the distributor. Turning it to the right retards timing, and to the left advances it.
- Tighten the nut after adjustment.
 Caution
 Be careful, when tightening the nut, that the distribu-
- tor does not move. 10. Stop the engine.
- 11. Disconnect the lead wire connected at step 4.
- 12. Start and run the engine at curb idle speed.
- 13. Check to be sure that the idling ignition timing is the correct timing.

Actual ignition timing: 10°BTDC

NOTE

- 1. Actual ignition timing may vary, depending on the control mode of the engine control unit. In such a case, recheck the basic ignition timing. If there is no deviation, the ignition timing is functioning normally.
- 2. At high altitudes more than approximately 700 m (2,300 ft.) above sea level, the actual ignition timing is further advanced to ensure good combustion.

IGNITION TIMING ADJUSTMENT < 2.0L DOHC Engine > NOBGIIG

PRE-CONDITIONS FOR INSPECTION

- Engine coolant temperature: 85–95°C (185–205°F)
- Lights, electric cooling fan and accessories: OFF
- Steering wheel: neutral position
- Transaxle: neutral



- 1. Connect timing light.
- 2. Insert paper clip into the engine revolution speed detection terminal provided in the engine compartment, and connect the tachometer to the inserted paper clip.

Check curb idle speed.
 Curb idle speed: 750 ± 100 rpm

IGNITION SYSTEM – Service Adjustment Procedures



Spark plug cable

4. With the engine stopped, connect a jumper wire to the terminal for ignition-timing adjustment (located in the engine compartment), and ground it.

- 5. Start and run the engine at curb idle speed.
- 6. Check basic ignition timing and adjust if necessary. **Basic ignition timing: 5°BTDC**

- 7. If not within the standard value range, loosen the crank angle sensor mounting nut and adjust by turning the crank angle sensor. Turning it to the right advances timing, and to the left retards it.
- 8. Tighten the nut after adjustment.

Caution

Be careful, when tightening the nut, that the crank angle sensor does not move.

- 9. Stop the engine.
- 10. Disconnect the lead wire connected at step 4.
- 11. Start and run the engine at curb idle speed.
- 12. Check to be sure that the idling ignition timing is the correct timing.

Basic ignition timing: 8°BTDC

NOTE

- 1. Actual ignition timing may vary, depending on the control mode of the engine control unit. In such a case, re-check the basic ignition timing. If there is no deviation, the ignition timing is functioning normally.
- 2. At high altitudes more than approximately 700 m (2,300 ft.) above sea level, the actual ignition timing is further advanced to ensure good combustion.

SPARK PLUG CABLE TEST

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(1) Disconnect, one at a time, each of the spark plug cables while the engine is idling to check whether the engine's running performance changes or not.

Caution

Wear rubber gloves while doing so.

(2) If the engine performance does not change, check the resistance of the spark plug cable, and check the spark plug itself.



SPARK PLUG TEST

(1) Remove the spark plug and connect to the spark plug cable.(2) Ground the spark plug outer electrode (body), and crank the

engine. Check to be sure that there is an electrical discharge between the electrodes at this time.

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REMOVAL AND INSTALLATION <1.8L Engine>





Plug cleaner 01U0089

SERVICE POINTS OF REMOVAL 1. REMOVAL OF SPARK PLUG CABLE

When disconnecting cable, hold cap.

INSPECTION SPARK PLUG

(1) Check the following items to see that electrodes **are** not burnt, and insulators are not broken, and how porcelain insulator is burnt.

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- Broken insulators
- Wearing electrodes
- Deposited carbon

For cleaning, use a plug cleaner or wire brush. Clean porcelain insulator above shell as well.

IGNITION SYSTEM – Ignition System



- Damaged or broken gasket.
 - Burnt condition of porcelain insulator at spark gap. Dark deposit of carbon indicates too rich a fuel mixture or extremely low air intake. Also, misfiring due to excessive spark gap is suspected.
 White burn indicates too lean a fuel mixture or excessively advanced ignition timing. Also insufficient plug tightening is suspected.
- (2) Clean with a plug cleaner. Use an air gun to remove dust deposited on plug threads.
- (3) Check plug gap using a plug gap gauge and adjust if it is not as specified.

Standard value:

<1.8L Engine, 2.0L DOHC Engine (Non-Turbo)> 1.0–1.1 mm (.039–.043 in.)
<2.0L DOHC Engine (Turbo)> 0.7–0.8 mm (.028–.031 in.)



SPARK PLUG CABLE

- (1) Check cap and coating for cracks.
- (2) Measure resistance.

Unit: kΩ *

Spark plug cable			
No. 1	No. 2	No. 3	No. 4
10.1	11.5	12.0	13.0

SERVICE POINTS OF INSTALLATION 3. INSTALLATION OF DISTRIBUTOR

- (1) Turn the crankshaft so that the No. 1 cylinder is at top dead center.
- (2) Align the distributor housing and gear mating marks.
- (3) Install the distributor to the engine while aligning the fine cut (groove or projection) of the distributor's installation flange with the center of the distributor installation stud.

1. INSTALLATION OF SPARK PLUG CABLE

Improper arrangement of spark plug cables will induce voltage between the cables, causing miss firing and developing a surge at acceleration in high-speed operation. Therefore, be careful to arrange the spark plug cables properly by the following procedure.

- 1. Install the spark plug cable clamps as shown in the illustration.
- 2. The numerals on the support and clamp indicate the spark plug cable No.
- 3. Pay attention to the following items when the spark plug cables are installed.
 - (1) Install the cables securely to avoid possible contact with metal parts.
 - (2) Install the cables neatly, ensuring they are not too tight, loose, twisted or kinked.



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REMOVAL AND INSTALLATION <2.0L DOHC Engine>





SERVICE POINTS OF REMOVAL 2. REMOVAL OF SPARK PLUG CABLE

When disconnecting cable, hold cap.

INSPECTION SPARK PLUG

Refer to P.8-177 for inspection procedures.

SPARK PLUG CABLE

(1) Check cap and coating for cracks.(2) Measure resistance.

Spark plug cable			
No. 1	No. 2	No. 3	No. 4
5.8	8.4	10.6	9.7

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IGNITION COIL

- (1) Measurement of the primary coil resistance.
- (2) Measure the resistance between connector terminals 3 and 2 (the coils at the No. 1 and No.4 cylinder sides) of the ignition coil, and between terminals 3 and 1 (the coils at the No.2 and No.3 cylinder sides).

Standard value: 0.77–0.95 Ω

- (3) Measurement of secondary coil resistance.
- (4) Measure the resistance between the high-voltage terminals for the No. 1 and No. 4 cylinders, and between the high-voltage terminals for the No. 2 and No. 3 cylinders.

Standard value: 10.3–13.9 k Ω

Caution

Be sure, when measuring the resistance of the secondary coil, to disconnect the connector of the ignition coil.

POWER TRANSISTOR

NOTE

An analog-type circuit tester should be used.

Power transistor for coil for No. 1 and No. 4 cylinders

 Connect the negative (-) terminal of the 1.5V power supply to terminal ③ of the power transistor; then check whether there is continuity between terminal ⑦ and terminal ③ when terminal ⑥ and the positive (+) terminal are connected and disconnected.

NOTE

Connect the negative (-) probe of the tester to terminal \bigcirc of the power transistor.

Terminal ⑥ and (+) terminal	Terminal ⑦ and terminal ③
Connected	Continuity
Unconnected	No continuity

Power transistor for coil for No. 2 and No. 4 cylinders

 Connect the negative (-) terminal of the 1.5V power supply to terminal ③ of the power transistor; then check whether there is continuity between terminal ① and terminal ③ when terminal ② and the positive (+) terminal are connected and disconnected.

NOTE

Connect the negative (-) probe of the tester to terminal (1) of the power transistor.

Terminal ② and (+) terminal	Terminal (1) and terminal (3)
Connected	Continuity
Unconnected	No continuity

If the results of the tests are not as shown above, replace the power transistor(s).





2. INSTALLATION OF SPARK PLUG CABLE

following procedure.

Improper arrangement of spark plug cables will

induce voltage between the cables, causing miss

firing and developing a surge at acceleration in

high-speed operation. Therefore, be careful to

arrange the spark plug cables properly by the

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SERVICE POINTS OF INSTALLATION

- 7. INSTALLATION OF CRANK ANGLE SENSOR
 - (1) Turn the crankshaft so that the No. 1 cylinder is at top dead center.
 - (2) Align the punch mark on the crank angle sensor housing with the notch in plate.
 - (3) Install the crank angle sensor on the cylinder head.
 - 1. Install the spark plug cable clamps as shown in the illustration.
 - 2. The numerals on the support and clamp indicate the spark plug cable No.
 - 3. Pay attention to the following items when the spark plug cables are installed.
 - (1) Install the cables securely to avoid possible contact with metal parts.
 - (2) Install the cables neatly, ensuring they are not too tight, loose, twisted or kinked.

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"The spark plug cables should each be routed in the directions indicated by the arrows on the rocker cover.



DISTRIBUTOR

DISASSEMBLY AND REASSEMBLY



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IGNITION SYSTEM – Distributor



POWER TRANSISTOR

NOTE

Use an analog type circuit tester.

(1) Connect the negative (-) terminal of the 1.5V power supply to terminal (5) of the power transistor; then check whether there is continuity between terminal (5) and terminal (8) when terminal (6) and the positive (+) terminal are connected and disconnected.

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NOTE

Connect the negative (-) probe of the tester to terminal B of the power transistor.

Terminal (6) and (+) terminal	Terminal (5) and terminal (8)
Connected	Continuity
Unconnected	No continuity