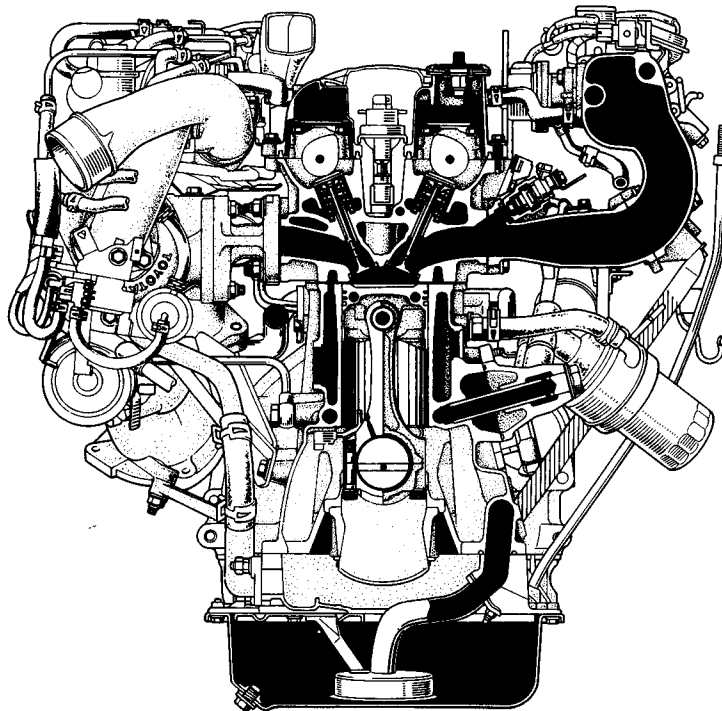
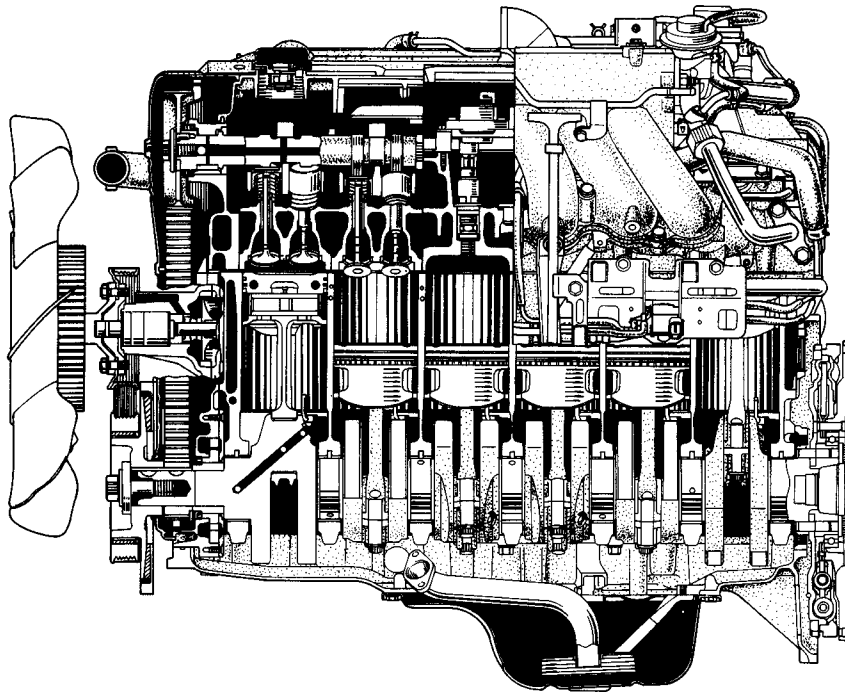


## 2JZ-GTE ENGINE

### ■ DESCRIPTION

An inline 6-cylinder, 3.0-liter, 24-valve DOHC engine with twin turbochargers and charge air cooler [intercooler], the 2JZ-GTE engine is a newly developed engine which replaces the previous 7M-GTE engine. By using two turbochargers, this Two-Way Twin Turbo System offers both superior power output and responsiveness. Furthermore, this engine adopts the DIS (Direct Ignition System) which discontinues the use of distributor and high-tension cords for an efficient secondary current delivery to the spark plugs. These improvements have made the 2JZ-GTE engine the most powerful and responsive engine in the 3.0-liter class.

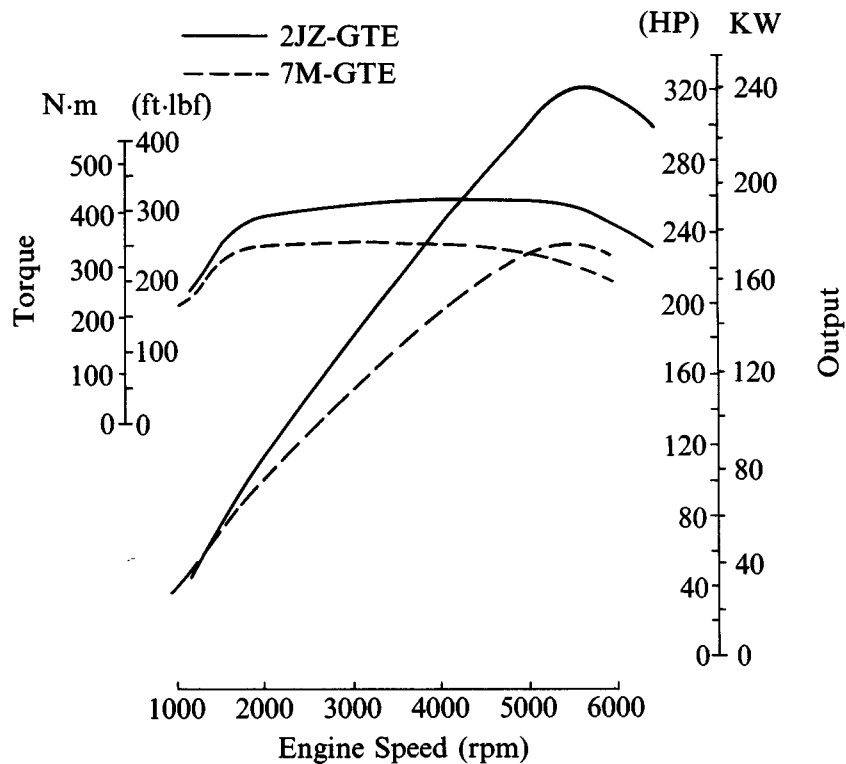


## ENGINE SPECIFICATIONS AND PERFORMANCE CURVE

| Engine                     |                           | 2JZ-GTE                                       | 7M-GTE  |
|----------------------------|---------------------------|---|---|
| Item                       |                           |   |   |
| No. of Cyls. & Arrangement |                           | 6-Cylinder, In-Line                           | ←   |
| Valve Mechanism            |                           | 24-Valve DOHC,<br>Belt Drive                  | ←   |
| Combustion Chamber         |                           | Pentroof Type                                 | ←   |
| Manifold                   |                           | Cross-Flow                                    | ←   |
| Fuel System                |                           | SFI* <sup>1</sup> [EFI]                       | MFI* <sup>2</sup> [EFI]                       |
| Displacement               | cm <sup>3</sup> (cu. in.) | 2997 (182.9)                                  | 2954 (180.3)                                  |
| Bore x Stroke              | mm (in.)                  | 86.0 x 86.0 (3.39 x 3.39)                     | 83.0 x 91.0 (3.27 x 3.58)                     |
| Compression Ratio          |                           | 8.5 : 1                                       | 8.4 : 1                                       |
| Firing Order               |                           | 1-5-3-6-2-4                                   | ←   |
| Max. Output                | [SAE-NET]                 | 239 kW @ 5600 rpm<br>(320 HP @ 5600 rpm)      | 173 kW @ 5600 rpm<br>(232 HP @ 5600 rpm)      |
| Max.Torque                 | [SAE-NET]                 | 427 N·m @ 4000 rpm<br>(315 ft·lbf @ 4000 rpm) | 344 N·m @ 3200 rpm<br>(254 ft·lbf @ 3200 rpm) |
| Valve Timing               | Intake                    | Open  | 3° BTDC                                       |
|                            |                           | Close   | 50° ABDC                                      |
|                            | Exhaust                   | Open  | 52° BBDC                                      |
|                            |                           | Close   | 4° ATDC                                       |
| Fuel Octane Number RON     |                           | 96  | 91  |
| Oil Grade                  |                           | API SG, EC-II                                 | API SG  |

\*1: SFI (Sequential Multiport Fuel Injection)

\*2: MFI (Multiport Fuel Injection)



## ■ FEATURES OF 2JZ-GTE ENGINE

Features of the 2JZ-GTE engine are as listed below.

| Features                       | Contents  |
|--------------------------------|---|
| High Performance and Economy   | <ul style="list-style-type: none"> <li>• The Two-Way Twin-Turbo System, in which two small turbochargers are used, offers high power output and response.</li> <li>• The DIS (Direct Ignition System) contributes to the high powerful output by providing a powerful spark to the engine.</li> <li>• The hot-wire type mass air flow meter improves the accuracy of the intake air volume measurement.</li> <li>• Together with the adoption of the pentroof type combustion chamber, the cylinder head intake port has been offset from the combustion chamber center. This causes a swirl to generate in the cylinder and improve the combustion efficiency.</li> <li>• Higher intake and exhaust efficiency is realized by a large valve diameter and a high valve lift.</li> <li>• A water-cooled, multi-plate full-flow type oil cooler is adopted.</li> <li>• A large-capacity air cleaner is adopted.</li> <li>• Twin knock sensors.</li> </ul> |
| Lightweight and Compact Design | <ul style="list-style-type: none"> <li>• A compact, lightweight accessory drive system by means of a serpentine single belt and bracketless accessory installation.</li> <li>• The oil pan, engine mounting bracket, engine mounting insulator housing and crankshaft pulley's torsional damper hub are made of aluminum.</li> </ul>  |
| Low Noise and Vibration        | <ul style="list-style-type: none"> <li>• An aluminum oil pan having an integral stiffener.</li> <li>• Aluminum engine mount brackets and liquid filled compound engine mounts.</li> <li>• A rigid and accurately balanced crankshaft assembly.</li> <li>• An aluminum torsional damper hub for the crankshaft pulley.</li> <li>• Bracketless accessory installation.</li> <li>• In addition to the automatic tensioner for the V-ribbed belt provided on the newly adopted V160 manual transmission model, a hydraulic damper is used to prevent the occurrence of belt deflection and whine in conjunction with a variation in engine rpm.</li> </ul>  |
| Good Serviceability            | <ul style="list-style-type: none"> <li>• The new DIS makes the ignition timing adjustment unnecessary.</li> <li>• Automatic tensioners are provided the timing belt and V-ribbed belt.</li> <li>• An engine oil level sensor is used.</li> <li>• A highly durable timing belt is used.</li> </ul>   |

## IGNITION SYSTEM

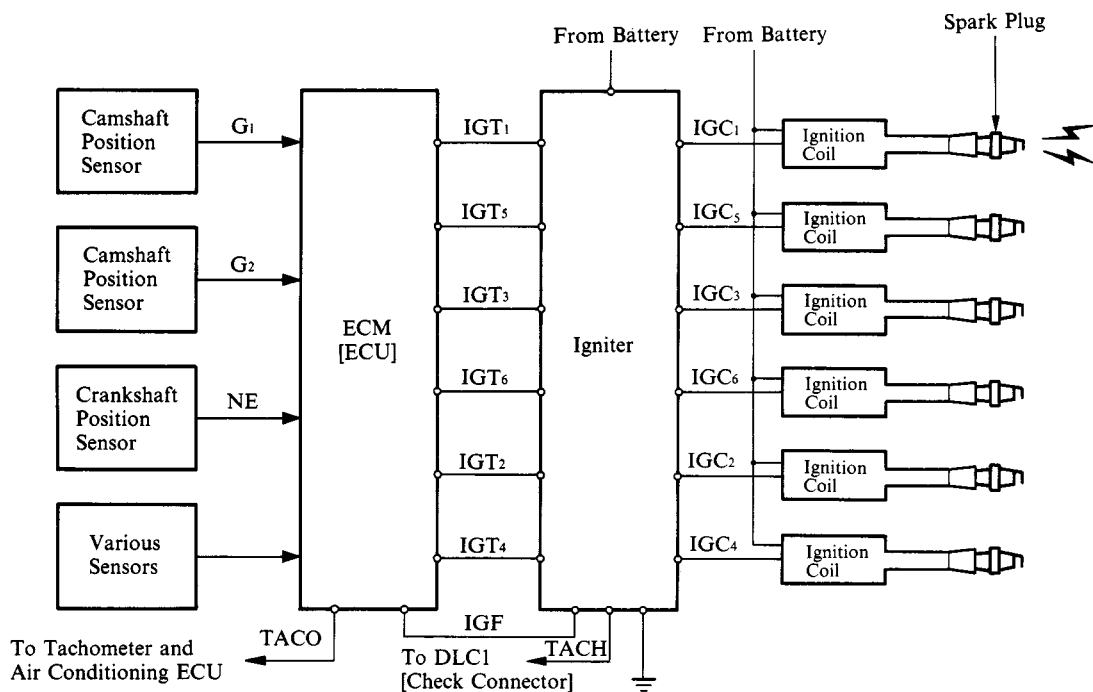
### 1. General

In place of the DLI (Distributor-Less Ignition) system used in the 7M-GTE engine, the DIS (Direct Ignition System) is newly adopted in the 2JZ-GTE engine.

While both systems do not use a distributor, the DIS differs from the DLI in the following areas:

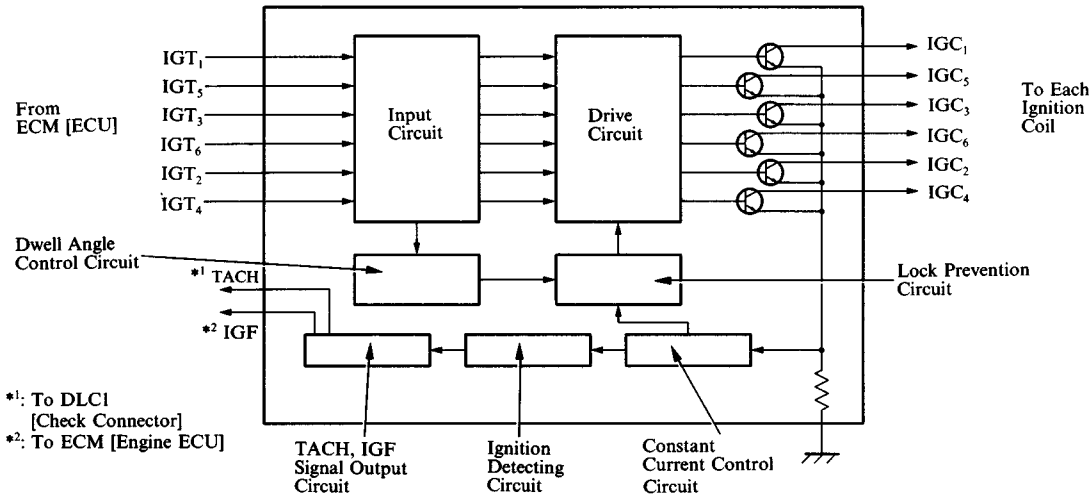
- There are six ignition coils provided, and each of the coils fits over each spark plug. High-tension cords have been eliminated, greatly decreasing the losses involved in the high-voltage transmission, and increasing the ignition reliability.
- Each cylinder is provided with an independent wire harness through which the ignition trigger signal (IGT) from the ECM\* [engine ECU] is output.
- Each cylinder is provided with independent ignition in place of the 2-cylinder simultaneous ignition of the DLI system for the 7M-GTE engine.

\* : ECM (Engine Control Module)



## 2. Igniter

The internal system diagram of the igniter is shown below. A characteristic of this igniter is that it contains the 6 power transistors as illustrated. Based on the IGT signals input for each cylinder, the drive circuit activates the respective power transistors to control the primary ignition signals (IGC) for all cylinder.

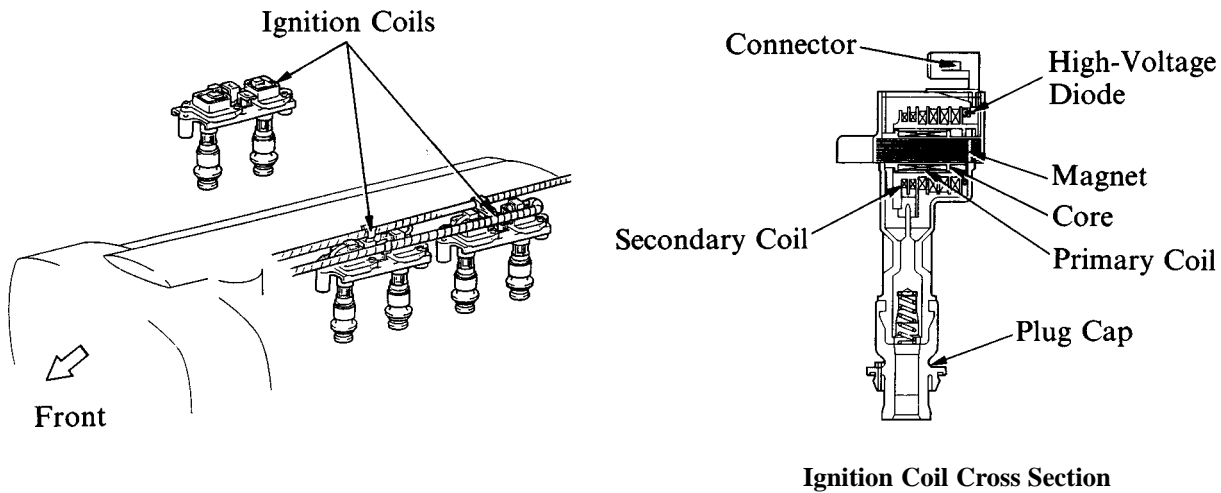


## 3. Ignition Coils

In the DIS system, there are six ignition coils provided, and each cylinder is provided with a coil. A plug cap is integrated with each ignition coil to provide direct contact with each spark plug. High-tension cords have thus been eliminated, allowing the secondary voltage to be supplied directly to each spark plug. This greatly decreases the losses involved in the high-voltage transmission and helps provide a strong spark.

These ignition coils have a magnet instead of an iron core. Since the magnetic flux is thus strengthened, the number of coiled wires within the coil can be reduced, making the coil compact and lightweight.

By accommodating the coils and harnesses between the cylinder head covers through the adoption of these ignition coils, the appearance of the 2JZ-GTE engine under the hood has been enhanced.



### Service Tip

Since the secondary coil in this ignition coil is equipped with a high voltage diode inside, coil resistance cannot be measured. In order to determine whether or not the coil is defective, first swap the coil in question with another coil, and check for a spark.