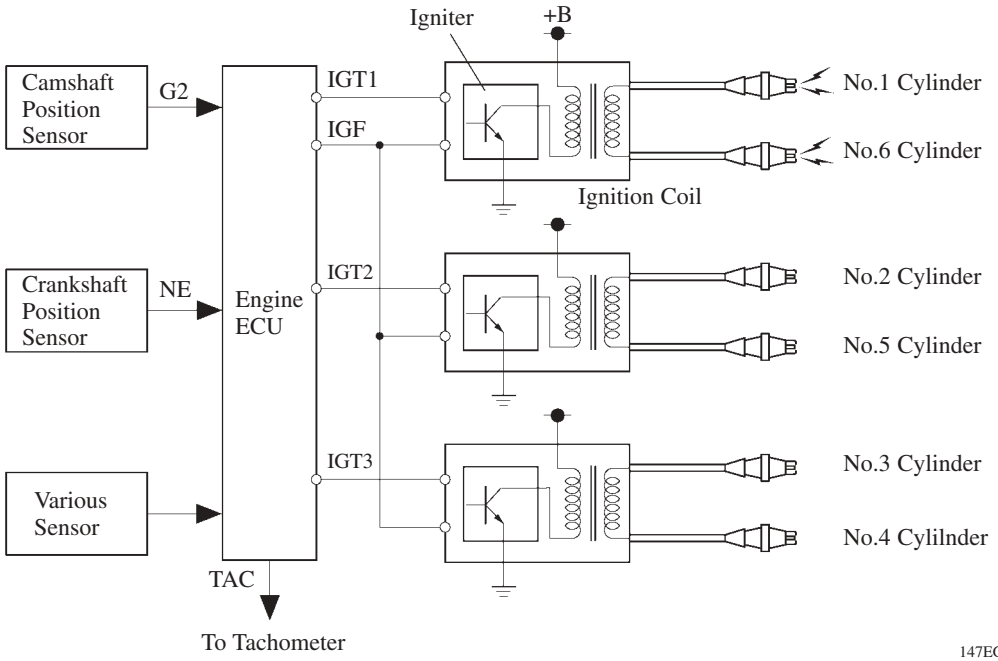
■IGNITION SYSTEM

1. General

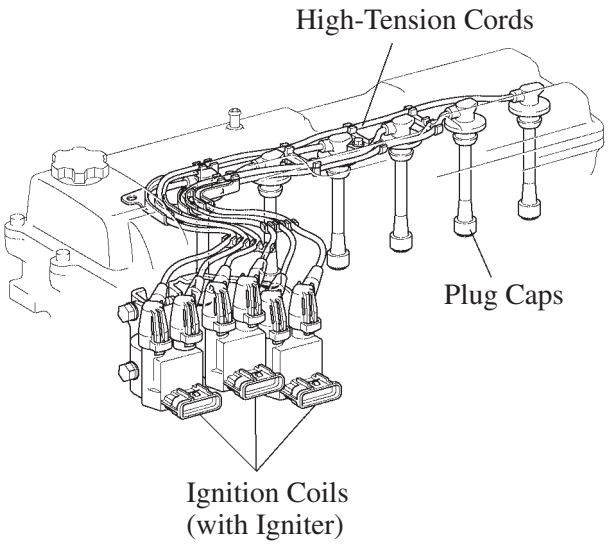
A DIS (Direct Ignition System) has been adopted in the new 1FZ-FE engine. The DIS improves the ignition timing accuracy, reduces high-voltage loss, and enhances the overall reliability of the ignition system by eliminating the distributor.
The DIS in new 1FZ-FE engine is a 2-cylinder simultaneous ignition system which ignites 2 cylinders simultaneously with one ignition coil.

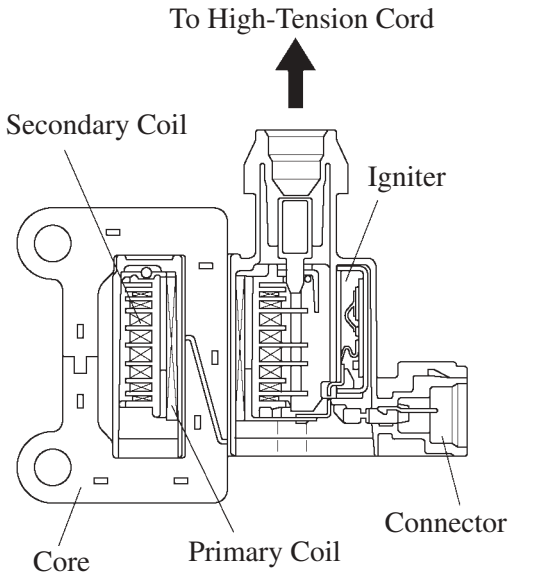


2. Ignition Coil

Construction

Construction of the DIS system of the 1FZ-FE engine consists of 3 sets of ignition coils integrated with the igniter and with the high-tension cords attached directly to the ignition coil.



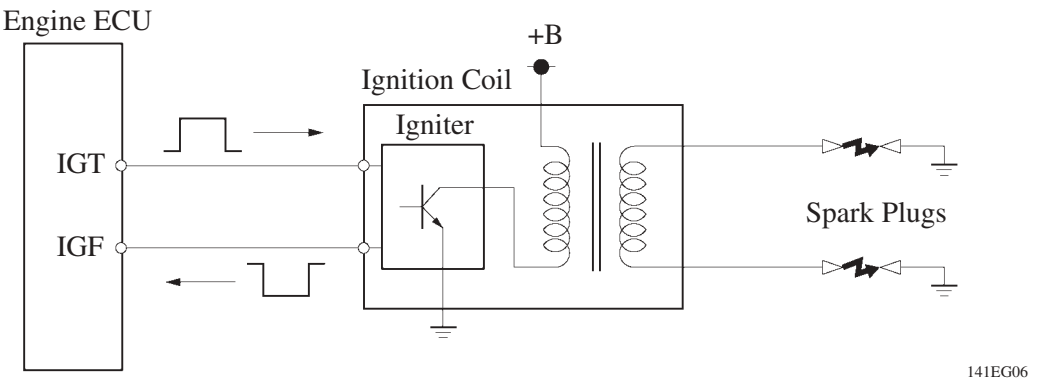


Ignition Coil Cross Section

EG

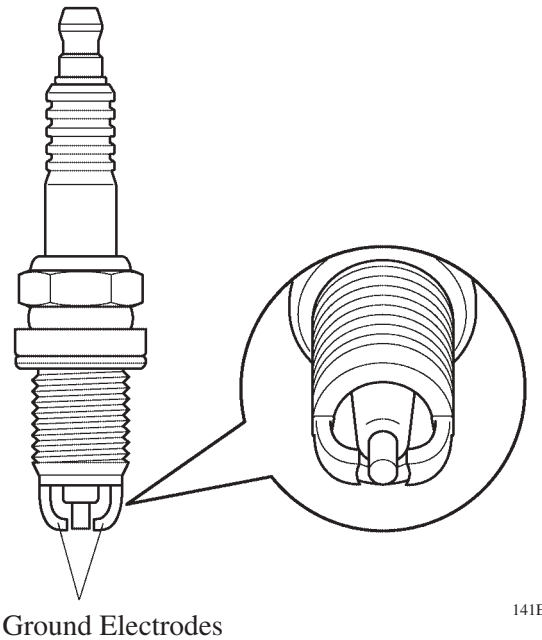
Operation

Prompted by the IGT signal received from the engine ECU, the power transistors in the igniter cut off the current to the primary coil in the ignition coil. Accordingly, the high voltage generated in the secondary coil is supplied simultaneously to the 2 spark plugs via the high-tension cords that are connected to the both ends of the secondary coil. At the same time, the igniter also sends an ignition confirmation signal (IGF) as a fail-safe function to the engine ECU.



3. Spark Plugs

Twin ground electrode spark plugs are used on the 1FZ-FE engine. Due to the adoption of the DIS system, the number of sparks produced is double that produced in the conventional ignition system. To maintain spark plug durability, the ground electrodes have been made bipolar.



▶ Recommended Spark Plugs ◀

DENSO	K16TR11
NGK	BKR5EKB11
Plug Gap	1.0 – 1.1 mm (0.039 – 0.043 in.)