

## NO.4 HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK [ZJ, Z6]

B3E010318881W37

4	HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>• The starter cranks the engine at normal speed but the engine requires excessive cranking time before starting.</li> <li>• The battery is in normal condition.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Erratic signal to ignition coil</li> <li>• Vacuum leakage</li> <li>• Poor fuel quality</li> <li>• Starting system malfunction</li> <li>• Spark plug malfunction</li> <li>• Air leakage from intake-air system</li> <li>• Erratic signal from CKP sensor</li> <li>• Erratic signal from CMP sensor</li> <li>• Improper air/fuel mixture ratio control</li> <li>• Air cleaner restriction</li> <li>• IAC valve malfunction</li> <li>• PCV valve malfunction</li> <li>• Inadequate fuel pressure</li> <li>• Purge solenoid valve malfunction</li> <li>• MAF sensor contamination</li> <li>• Incorrect MAF sensor GND voltage</li> <li>• Restriction in exhaust system</li> <li>• EGR valve malfunction</li> <li>• Pressure regulator malfunction</li> </ul> <p style="text-align: center;"><b>Warning</b></p> <p>The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:</p> <ul style="list-style-type: none"> <li>• Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.</li> <li>• Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual. (See <a href="#">BEFORE SERVICE PRECAUTION [ZJ, Z6, LF]</a>.) (See <a href="#">AFTER SERVICE PRECAUTION [ZJ, Z6, LF]</a>.)</li> </ul> <p style="text-align: center;"><b>Caution</b></p> <ul style="list-style-type: none"> <li>• If there is foreign material on the connecting area of the quick release connector, it might damage the connector or fuel pipe. To prevent this, disconnect the connector and clean the connecting area before connecting.</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
	Inspect for the following: • Vacuum leakage • Proper fuel quality (such as proper octane, contamination, winter/summer	Yes	Go to the next step.

1	blend) • Loose bands on intake-air system • Cracks on intake-air system parts • Air cleaner restriction Are all items normal?	No	Service if necessary. Repeat Step 1.
2	Connect the WDS or equivalent to the DLC-2. Retrieve any KOEO and KOER DTCs using WDS or equivalent. Is any KOEO or KOER DTC displayed?	Yes	<b>DTC is displayed:</b>  Go to the appropriate DTC inspection. (See <a href="#">DTC TABLE [ZJ, Z6].</a> )
		No	<b>No DTC is displayed:</b>  Go to the next step.
3	Is the engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".
		No	Go to the next step.
4	Inspect the ignition coil related wiring harnesses condition (intermittent open or short circuit) for all cylinders. Are wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the wiring harnesses.
5	Inspect the spark plug conditions. Is the spark plug wet, covered with carbon or grayish white?	Yes	<b>Spark plug is wet or covered with carbon:</b>  Inspect for fuel leakage from the fuel injector.  <b>Spark plug is grayish white:</b>  Inspect for clogged the fuel injector.
		No	Install spark plugs on original cylinders. Go to the next step.
6	Visually inspect the CKP sensor and teeth of the crankshaft pulley. Are the CKP sensor and teeth of the crankshaft pulley normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
7	Measure gap between the CKP sensor and teeth of the crankshaft pulley.  <b>Specification</b>  <b>0.5-1.5 mm {0.02-0.05 in}</b>  Is the gap within specification?	Yes	Go to the next step.
		No	Replace the crankshaft pulley.
8	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
9	Install fuel pressure gauge between the fuel pipe and the fuel distributor. Connect WDS or equivalent to DLC-2. Turn ON fuel pump using FP PID in output state control of datalogger function. Is fuel line pressure correct? (See <a href="#">FUEL LINE PRESSURE INSPECTION [ZJ, Z6, LF].</a> )	Yes	Go to the next step.
		No	<b>Zero or low:</b>  Inspect the fuel pump relay and the fuel pump unit related circuits. Inspect the fuel line for clogging. • If normal, replace the fuel pump unit. (See <a href="#">FUEL PUMP UNIT REMOVAL/INSTALLATION [ZJ, Z6, LF].</a> )  <b>High:</b>  Replace the fuel pump unit. (See <a href="#">FUEL PUMP UNIT</a> )

			<a href="#">REMOVAL/INSTALLATION [ZJ, Z6, LF].)</a>
10	Is fuel line pressure held after FP PID is turned OFF? (See <a href="#">FUEL LINE PRESSURE INSPECTION [ZJ, Z6, LF].)</a>	Yes	Go to the next step.
		No	Inspect the pressure regulator diaphragm condition. • If condition is normal, inspect the fuel injector. • If condition is not normal, replace the pressure regulator.
11	Disconnect a vacuum hose from the purge solenoid valve and plug opening end of the vacuum hose. Start the engine. Is starting condition improved?	Yes	Inspect if the purge solenoid valve is stuck open.
		No	Go to the next step.
12	Inspect the MAF sensor for the following: • Contamination • MAF sensor terminal B voltage (GND circuit) Is there any contamination?	Yes	Replace the MAF sensor.
		No	Go to the next step.
13	Visually inspect the exhaust system part. Is there any deformed exhaust system part?	Yes	Replace the part.
		No	Go to the next step.
14	Inspect engine condition while tapping the EGR valve housing. Does the engine condition improve?	Yes	Replace EGR valve.
		No	Go to the next step.
15	Inspect the starting system. (See <a href="#">STARTER INSPECTION.</a> ) Is the starting system normal?	Yes	Inspect for loose connectors or poor terminal contact. • If normal, remove the EGR valve and visually inspect for mechanically stuck EGR valve.
		No	Repair or replace the components as required.
16	Verify test results. • If normal, return to diagnostic index to service any additional symptoms. (See <a href="#">ENGINE SYMPTOM TROUBLESHOOTING [ZJ, Z6].)</a> • If malfunction remains, inspect related Service information perform repair or diagnosis.  - If vehicle repaired, troubleshooting completed. - If vehicle not repaired or additional diagnostic information not available, replace the PCM. (See <a href="#">INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [ZJ, Z6].)</a>		