

## H - TESTS W/O CODES

### Selected Block

1990 Lexus LS 400

For Lextreme Powertrain 2020 S. Hacienda Blvd. # D Hacienda Heights California 91745

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### LS400 DIAGNOSIS BY SYMPTOM

When a diagnostic code cannot be confirmed or problem in F - BASIC TESTING cannot be confirmed, find basic symptom. For example, vehicle engine will not start. The appropriate heading matching vehicle symptom is DOES NOT START. Listed under DOES NOT START are more specific conditions. Find the specific condition which best fits your vehicle malfunction. Perform checks in order given. DO NOT skip sequence.

NOTE: Symptom diagnosis will refer to testing using a diagnostic code chart, even if a diagnostic code was not set.

### DOES NOT START

#### ENGINE DOES NOT START

- \* Check starter relay. See I - SYSTEM/COMP TESTS article.
- \* Check starter for proper operation.
- \* Check ECU. See ECU POWER SOURCE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check neutral start switch. See NEUTRAL START SWITCH CIRCUIT chart in G - TESTS W/CODES article.
- \* Check theft deterrent ECU. See I - SYSTEM/COMP TESTS article.

#### STARTER RUNS, ENGINE DOES NOT CRANK

- \* Check starter for proper operation.
- \* Check for engine mechanical failure.
- \* Check flywheel or flexplate for damage.

#### NO INITIAL COMBUSTION

- \* Check ECU. See ECU POWER SOURCE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ignition signal circuit. See SPARK TEST in F - BASIC TESTING article.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ignition coil. See I - SYSTEM/COMP TESTS article.
- \* Check spark plugs.
- \* Check injectors. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check engine compression.
- \* Check cold start injector. See COLD START INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check RPM signal circuit. See CODE 12, CODE 17 and CODE 18 in

G - TESTS W/CODES article.

- \* Check engine for mechanical failure.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

## NO COMPLETE COMBUSTION

- \* Check for vacuum leaks.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ignition coil. See I - SYSTEM/COMP TESTS article.
- \* Check distributor and spark plugs.
- \* Check airflow meter circuit. See CODE 31 in G - TESTS W/CODES article.
- \* Check ignition signal circuit. See SPARK TEST in F - BASIC TESTING article.
- \* Check engine compression.
- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check cold start injector circuit. See COLD START INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check engine for mechanical failure.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

## DIFFICULT TO START

### ENGINE CRANKS SLOWLY

- \* Check starter for proper operation.
- \* Check fuel quality.
- \* Check engine for mechanical failure.

### DIFFICULT TO START NORMALLY

- \* Check for vacuum leaks.
- \* Check fuel quality.
- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ignition coil. See I - SYSTEM/COMP TESTS article.

**H - TES**

- \* Check distributor and spark plugs.
- \* Check engine compression.
- \* Check ignition signal circuit. See SPARK TEST in F - BASIC TESTING article.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check cold start injector circuit. See COLD START INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check intake air temperature sensor circuit. See CODE 24 in G - TESTS W/CODES article.
- \* Check engine for mechanical failure.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

#### DIFFICULT TO START COLD

- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check starter signal circuit. See CODE 43 in G - TESTS W/CODES article.
- \* Check for vacuum leaks.
- \* Check fuel quality.
- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check cold start injector circuit. See COLD START INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check intake air temperature sensor circuit. See CODE 24 in G - TESTS W/CODES article.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ignition coil. See I - SYSTEM/COMP TESTS article.
- \* Check distributor and spark plugs.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

#### DIFFICULT TO START HOT

- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check for vacuum leaks.
- \* Check fuel quality.
- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check fuel pressure control vacuum switching valve circuit. See FUEL PRESSURE CONTROL VACUUM SWITCHING VALVE (VSV) CIRCUIT chart in G - TESTS W/CODES article.

**H - TESTS W/O**

- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check cold start injector circuit. See COLD START INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check intake air temperature sensor circuit. See CODE 24 in G - TESTS W/CODES article.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ignition coil. See I - SYSTEM/COMP TESTS article.
- \* Check distributor and spark plugs.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

## POOR IDLE

### INCORRECT FIRST IDLE

- \* Check accelerator pedal linkage.
- \* Check dashpot. See I - SYSTEM/COMP TESTS article.
- \* Check power steering system for proper operation.
- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check intake air temperature sensor circuit. See CODE 24 in G - TESTS W/CODES article.
- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

### HIGH IDLE SPEED

- \* Check accelerator pedal linkage.
- \* Check dashpot. See I - SYSTEM/COMP TESTS article.
- \* Check power steering system for proper operation.
- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check intake air temperature sensor circuit. See CODE 24 in G - TESTS W/CODES article.
- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check A/C signal circuit. See A/C SIGNAL CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ECU power source. See ECU POWER SOURCE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check neutral start switch circuit. See CODE 51 in G - TESTS W/CODES article.
- \* Check throttle position sensor circuit. See CODE 41 and CODE 47 in G - TESTS W/CODES article.

**H - TESTS W/O CODES** Selecte

- \* Check ECU. See I - SYSTEM/COMP TESTS article.

#### LOW IDLE SPEED

- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check neutral start switch circuit. See CODE 51 in G - TESTS W/CODES article.
- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

#### ROUGH IDLE

- \* Check for vacuum leaks.
- \* Check fuel quality.
- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check ignition signal circuit. See SPARK TEST in F - BASIC TESTING article.
- \* Check engine compression.
- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check main oxygen sensor circuit. See CODE 25 and CODE 26 in G - TESTS W/CODES article.
- \* Check ignition coil. See I - SYSTEM/COMP TESTS article.
- \* Check distributor and spark plugs.
- \* Check back-up power source circuit. See BACK-UP POWER SOURCE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check airflow meter circuit. See CODE 31 in G - TESTS W/CODES article.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check cold start injector circuit. See COLD START INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check engine for mechanical failure.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

#### ENGINE MISFIRE

- \* Check for vacuum leaks.
- \* Check fuel quality.
- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check ignition signal circuit. See SPARK TEST in F - BASIC TESTING article.
- \* Check distributor and spark plugs.
- \* Check ignition coil. See I - SYSTEM/COMP TESTS article.
- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check airflow meter circuit. See CODE 31 in G - TESTS W/CODES article.
- \* Check engine compression.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check cold start injector circuit. See COLD START INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check engine for mechanical failure.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

## POOR DRIVEABILITY

### HESITATION, POOR ACCELERATION

- \* Check for vacuum leaks.
- \* Check accelerator pedal linkage.
- \* Ensure brakes do not drag.
- \* Check fuel quality.
- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check throttle position sensor circuit. See CODE 41 and CODE 47 in G - TESTS W/CODES article.
- \* Check airflow meter circuit. See CODE 31 in G - TESTS W/CODES article.
- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check intake air temperature sensor circuit. See CODE 24 in G - TESTS W/CODES article.
- \* Check main oxygen sensor circuit. See CODE 25 and CODE 26 in G - TESTS W/CODES article.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ignition signal circuit. See SPARK TEST in F - BASIC TESTING article.
- \* Check ignition coil. See I - SYSTEM/COMP TESTS article.

- \* Check distributor and spark plugs.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check cold start injector circuit. See COLD START INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Ensure transmission is functioning properly.
- \* Check sub-throttle valve for proper operation.
- \* Check engine for mechanical failure.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

## BACKFIRE

- \* Check for vacuum leaks.
- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check intake air temperature sensor circuit. See CODE 24 in G - TESTS W/CODES article.
- \* Check throttle position sensor circuit. See CODE 41 and CODE 47 in G - TESTS W/CODES article.
- \* Check airflow meter circuit. See CODE 31 in G - TESTS W/CODES article.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check engine for mechanical failure.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

## MUFFLER EXPLOSION (AFTER FIRE)

- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check intake air temperature sensor circuit. See CODE 24 in G - TESTS W/CODES article.
- \* Check throttle position sensor circuit. See CODE 41 and CODE 47 in G - TESTS W/CODES article.
- \* Check airflow meter circuit. See CODE 31 in G - TESTS W/CODES article.
- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ignition signal circuit. See SPARK TEST in F - BASIC TESTING article.
- \* Check ignition coil. See I - SYSTEM/COMP TESTS article.
- \* Check distributor and spark plugs.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in

**H - TESTS W/O**

G - TESTS W/CODES article.

- \* Check cold start injector circuit. See COLD START INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check engine for mechanical failure.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

## SURGING

- \* Check for vacuum leaks.
- \* Check fuel quality.
- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check intake air temperature sensor circuit. See CODE 24 in G - TESTS W/CODES article.
- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check throttle position sensor circuit. See CODE 41 and CODE 47 in G - TESTS W/CODES article.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check main oxygen sensor circuit. See CODE 25 and CODE 26 in G - TESTS W/CODES article.
- \* Check ignition signal circuit. See SPARK TEST in F - BASIC TESTING article.
- \* Check distributor and spark plugs.
- \* Check engine compression.
- \* Check ignition signal circuit. See SPARK TEST in F - BASIC TESTING article.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check cold start injector circuit. See COLD START INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check engine for mechanical failure.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

## KNOCKING

- \* Check fuel quality.
- \* Check knock sensor circuit. See CODE 52, CODE 53 and CODE 55 in G - TESTS W/CODES article.
- \* Check spark plugs.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check engine for mechanical failure.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

## ENGINE STALL

### ENGINE STALLS AFTER STARTING

### H - TESTS W/O C



- \* Check for vacuum leaks.
- \* Check fuel quality.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check intake air temperature sensor circuit. See CODE 24 in G - TESTS W/CODES article.
- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check airflow meter circuit. See CODE 31 in G - TESTS W/CODES article.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

#### ENGINE STALL AFTER ACCELERATION PEDAL DEPRESSED

- \* Check airflow meter circuit. See CODE 31 in G - TESTS W/CODES article.
- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check throttle position sensor circuit. See CODE 41 and CODE 47 in G - TESTS W/CODES article.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

#### ENGINE STALL AFTER ACCELERATION PEDAL RELEASED

- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check EGR system. See CODE 71 in G - TESTS W/CODES article.
- \* Check airflow meter circuit. See CODE 31 in G - TESTS W/CODES article.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

#### ENGINE STALL DURING A/C OPERATION

- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check A/C signal circuit. See A/C COMPRESSOR CIRCUIT chart.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

#### ENGINE STALL WHEN SHIFTING FROM NEUTRAL TO DRIVE

- \* Check neutral start switch circuit. See CODE 51 in

G - TESTS W/CODES article.

- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.

#### ENGINE STALL WHEN TURNING STEERING

- \* Check power steering system for proper operation.

#### ENGINE STALL WHEN STARTING OFF OR STOPPING

- \* Ensure transmission is functioning properly.

#### POOR FUEL ECONOMY

- \* Check for fuel leaks.
- \* Check fuel quality.
- \* Ensure brakes do not drag.
- \* Check accelerator pedal linkage.
- \* Ensure cooling system is functioning properly.
- \* Check water temperature sensor circuit. See CODE 22 in G - TESTS W/CODES article.
- \* Check intake air temperature sensor circuit. See CODE 24 in G - TESTS W/CODES article.
- \* Check throttle position sensor circuit. See CODE 41 and CODE 47 in G - TESTS W/CODES article.
- \* Check spark plugs.
- \* Check ignition coil. See I - SYSTEM/COMP TESTS article.
- \* Check distributor.
- \* Check engine compression.
- \* Check fuel system circuit. See FUEL SYSTEM CIRCUIT chart in G - TESTS W/CODES article.
- \* Check injector circuit. See INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check fuel pressure control vacuum switching valve circuit. See FUEL PRESSURE CONTROL VACUUM SWITCHING VALVE (VSV) CIRCUIT chart in G - TESTS W/CODES article.
- \* Check cold start injector circuit. See COLD START INJECTOR CIRCUIT chart in G - TESTS W/CODES article.
- \* Check idle speed control valve circuit. See IDLE SPEED CONTROL (ISC) VALVE CIRCUIT chart in G - TESTS W/CODES article.
- \* Check neutral start switch circuit. See CODE 51 in G - TESTS W/CODES article.
- \* Check main oxygen sensor circuit. See CODE 25 and CODE 26 in G - TESTS W/CODES article.
- \* Check sub-oxygen sensor circuit. See CODE 27 and CODE 29 in G - TESTS W/CODES article.

**H-TESTS W/O CODE**

- \* Ensure transmission is functioning properly.
- \* Check engine for mechanical failure.
- \* Check ECU. See I - SYSTEM/COMP TESTS article.