■ SUSPENSION

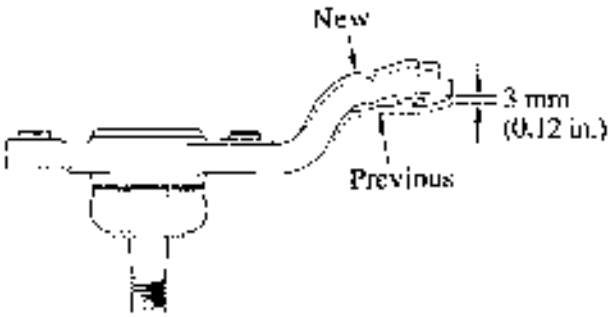
1. General

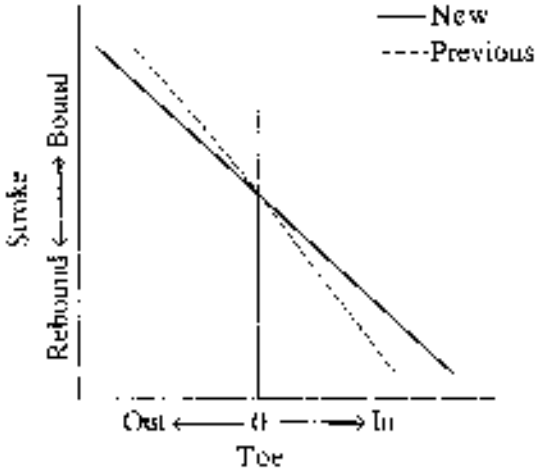
- The characteristics of the shock absorbers and suspension upper support have been changed in the ’93 LS400 to further improve steering stability and riding comfort. Together with the adoption of 16 inch wheels, the shapes of the stabilizer bar, strut bar and steering knuckle have been changed.
- In the electronic modulated air suspension system, when the LRC (Lexus Ride Control) switch is set in the “SPORT” position, both the damping force and the spring rate are fixed on “firm” to provide a more sporty response. The self–diagnosis and input signal check have been changed to improve serviceability.

2. Front Suspension

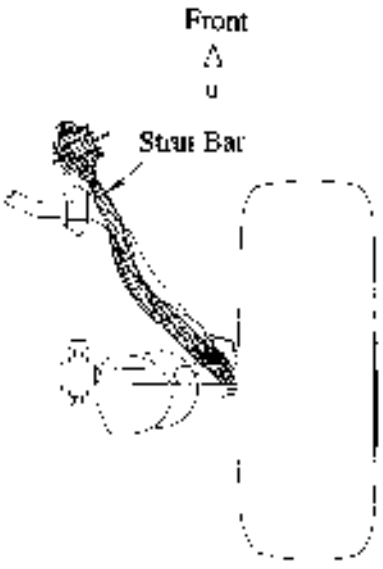
- The mounting position of the tie–rod end of the steering knuckle has been moved up 3 mm (0.12 in.) to modify the toe change characteristics and optimize roll steering.

▶Toe Change Characteristics◀

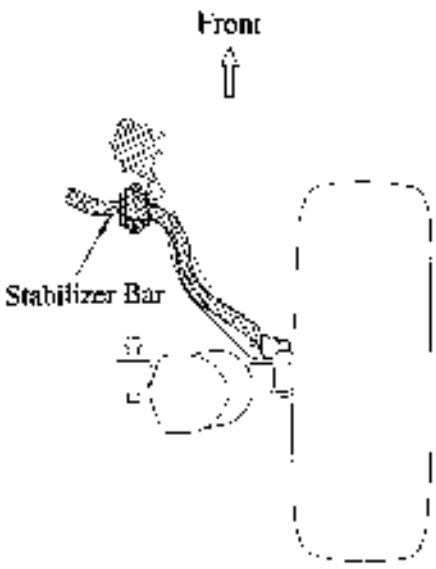




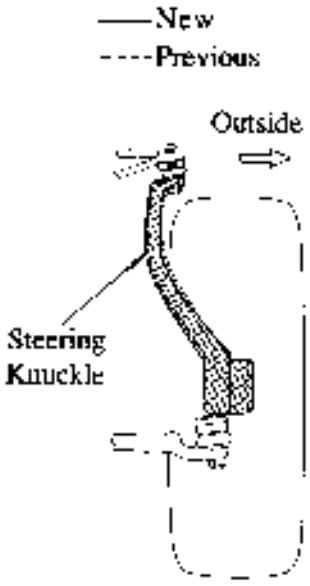
- Together with the adoption of 16 inch wheels, the shapes of the stabilizer bar, strut bar and steering knuckle have been changed.



Top View



Top View



Front View

3. Electronic Modulated Air Suspension

Suspension ECU

1) Damping Force and Spring Rate Control

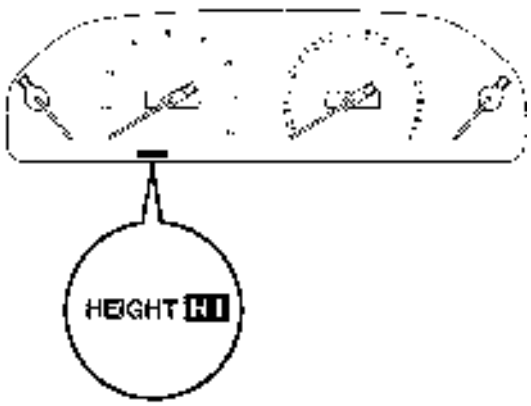
In the previous model, when the LRC (Lexus Ride Control) switch was set in the “SPORT” position, the suspension ECU switched the damping force to “firm” or “soft” according to the driving conditions, but in the ’93 model, this setting fixes the damping force in the “firm” condition.

The damping force and spring rate control when the LRC switch is in the “NORM” position are the same as in the previous model.

2) Input Signal Check Function

a. General

Diagnostic trouble codes have been added to the input signal check (sensor check) function used in the previous model. The diagnostic trouble codes can be determined by reading the blinking of the vehicle height indicator light. Refer to the ’93 LS400 Repair Manual (Pub. No. RM300U1) for the operation method. The “low” and “normal” positions of the vehicle height indictor light in the previous model have been eliminated in the ’93 LS400.



Vehicle Height Indicator Light

b. Operation

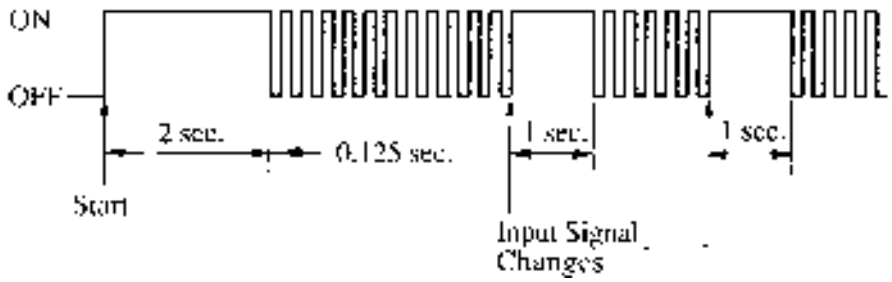
When the input signal check starting requirements are met, the vehicle height indicator goes on for 2 seconds. After that, it flashes 4 times per second. Then, every switch and sensor is checked, as in the input signal checks on the previous models. If a change is detected in the input signals, the indicator light will come on for 1 second every time a change occurs.

Input Signal Check Starting Conditions Procedure

① Ts and E_1 terminals of the data link connector (check connector) are connected.

② Ignition switch is turned form the off to the on position.

If there is no change in the input signal even during the check operation, or if the check operation is not being executed, the ECU records a malfunction as the diagnostic trouble code.



NOTE:
- In the input signal check, the damping force, spring rate and vehicle height controls continue their operation.
- When the input signal check starting requirements are met the LRC indicator light lights up together with the vehicle height indicator light for 2 seconds.

▶Diagnostic Trouble Code for Input Signal Check◀

Code No.	Check Item	Check Starting Requirements	Input Signal Requirements
82	Steering Sensor	Steering straight ahead	Steering angle 36 degrees or larger
83	Stop Light Switch	OFF (Brake pedal not depressed)	ON (Brake pedal depressed)
84	Door Courtesy Switch	OFF (Door closed)	ON (Door opened)
85	Throttle Position Sensor	Accelerator pedal not depressed	Accelerator pedal fully depressed
91	No. 1 Vehicle Speed Sensor	Vehicle speed below 20 km/h (12 mph)	Vehicle speed 20 km/h (12 mph) or higher
92	Height Control Switch	Normal position	High position
93	LRC Switch	Normal position	Sport position

3) Self–Diagnosis

Diagnostic trouble code No. 61 has been eliminated and code Nos. 73, 74 and 75 have been added. The code access method is the same as in the previous model.

▶Diagnostic Trouble Code◀

Code No.	Model		Diagnosis	Memory *3
	'93	'92		
11	○	○	Open circuit in front right height control sensor circuit	●
12	○	○	Open circuit in front left height control sensor circuit	●
13	○	○	Open circuit in rear right height control sensor circuit	●
14	○	○	Open circuit in rear left height control sensor circuit	●
21	○*1	○	Open or short circuit in front suspension control actuator circuit	●
22	○*1	○	Open or short circuit in rear suspension control actuator circuit	●
31	○	○	Open or short circuit in No. 1 height control valve circuit	●
33	○	○	Open or short circuit in No. 2 height control valve circuit (for right suspension)	●
34	○	○	Open or short circuit in No. 2 height control valve circuit (for left suspension)	●
35	○	○	Open or short circuit in exhaust valve circuit	●
41	○	○	Open or short circuit in No. 1 height control relay circuit	●
42	○	○	Compressor motor locked or short circuited	●
51	○*1	○*1	Electric current supplied to No. 1 height control relay, which drives compressor motor, exceeded a predetermined time.	●
52	○*1	○*1	Electric current supplied to exhaust valve, which decreases vehicle height, exceeded a predetermined time.	●
61	—	○	Malfunction of ECU	x
71	○	○	Height control ON/OFF switch is turned OFF or switch circuit shorted	x
72	○*2	○*2	Open or short circuit in ECU power source circuit (+B)	x
73	○*1	—	The generator (alternator) is not generating electricity.	x
74	○*1	—	Low battery voltage (8.5V or lower)	x
75	○*1	—	Rough road condition is detected at a vehicle speed of 8 km/h (5 mph) or lower	x

— Not applicable

*1 Codes 51, 52, 73, 74 and 75 are only stored if malfunctions occur. The warning light does not turn on.

*2 Codes 72 indicates that a malfunction occurred and all indicators went off.

*3 The codes with ● mark are stored in the ECU memory even after the ignition switch is turned off. The codes with x mark are stored in the memory only while the ignition switch is turned on.

4) Fail–Safe

Due to changes in the diagnostic trouble codes, a portion of the controls in the event of a failure has also been changed.

Code No.	Control During Failure			
	Damping Force and Spring Rate Control		Height Control	
	'93 Model	'92 Model	'93 Model	'92 Model
11	○	○	○	○
12	○	○	○	○
13	○	○	○	○
14	○	○	○	○
21	○	●	—	—
22	○	●	—	—
31	—	●	○	●
33	—	●	○	●
34	—	●	○	●
35	—	●	○	●
41	—	●	○	●
42	—	●	○	●
51	—	○	○	○
52	—	○	○	○
61*1	●	○	●	○
71	—	—	○	○
72	○	○	—	○
73*2	—	—	○	○
74*2	○	—	○	○
75*2	—	—	○	○

○ Control suspended ● Control prohibited — Control continued

*1 Code 61 is not included in the '93 LS400, but control is executed during a failure.

*2 Codes 73, 74, and 75 were not included in the '92 LS400, but control was executed during a failure.