LEXUS

Technical Service Information Bulletin

April 19, 2005

Title:

RAIN SENSOR DIAGNOSTICS AND SYSTEM OPERATION

Models:

'04 – '05 RX 330

TSIB

ELECTRICAL

EL005-05

Introduction

The information provided in this bulletin is designed to improve diagnostic accuracy and improve general understanding of the rain sensor ("AUTO" Wiper) system operation. Should a customer describe problems with intermittent or improper rain sensor operation, please follow the "Diagnostic Information" section of this bulletin.

Applicable Vehicles

- **2004 – 2005** model year **RX 330** vehicles.

Required Tools & Material

TOOLS & MATERIAL	PART NUMBER	QUANTITY
Rain Sensor Tape	89944–50011	1

NOTE:

When the windshield is replaced, the Rain Sensor Tape MUST be replaced. However, the rain sensor itself does NOT need to be replaced, unless damaged.

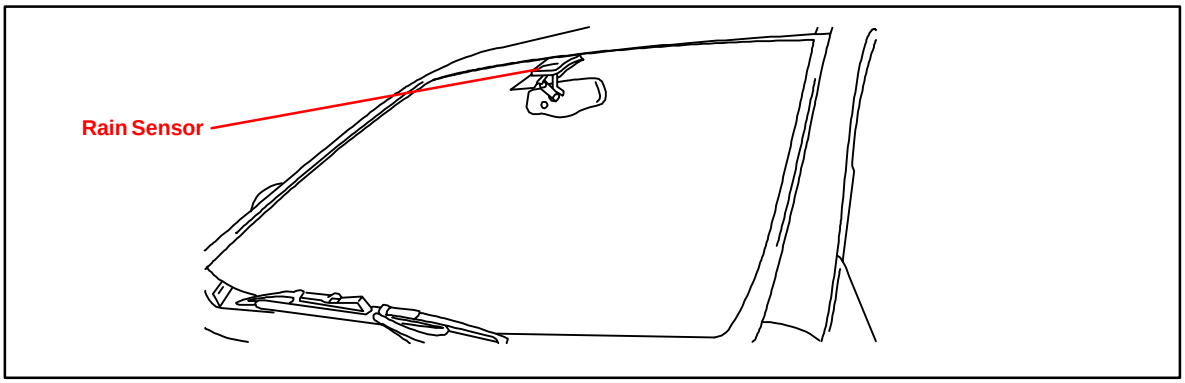
Warranty Information

OP CODE	DESCRIPTION	TIME	OFP	T1	T2
N/A	Not Applicable to Warranty	–	–	–	–

Diagnostic Information

1. Verify whether the vehicle has a Lexus original equipment windshield or an aftermarket installation.

> **NOTE:**
> **If the vehicle windshield is not Lexus original equipment, the rain sensor may NOT operate properly due to variations in the glass, tinting, etc.**



2. View the Rain Sensor Tape through the windshield, and verify if there are bubbles or contaminants visible.

   If there are bubbles or contaminants visible in the Rain Sensor Tape, please remove and replace the Rain Sensor Tape (P/N: 89944–50011) as described in the the “Rain Sensor Tape Replacement” section in this bulletin.

3. Test the rain sensor operation by spraying/misting water in the rain sensor area of the windshield with the wipers in the “AUTO” mode.

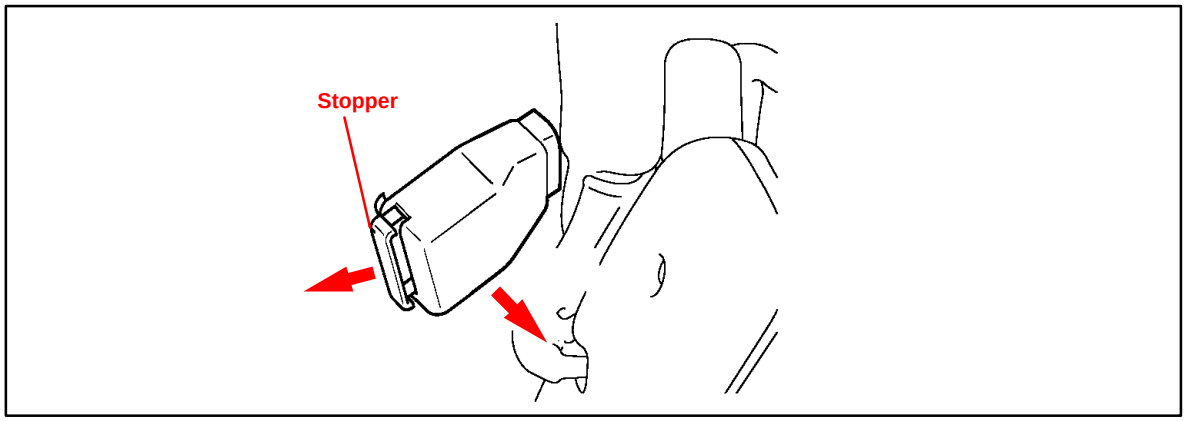
> **NOTE:**
> **The rain sensor may NOT operate properly if a large stream of water (i.e., garden hose) is applied directly to the rain sensor area of the windshield.**

4. If the system does not operate, diagnose problems by referring to the Technical Information System (TIS): 2004 – 2005 model year RX 330 Repair Manual: *Diagnostics: Wiper and Washer System: Problem Symptoms Table.*

   If the system operates as described in this bulletin, it is operating as designed.

Rain Sensor Tape Replacement

1. Remove the rain sensor.
   A. Unlock the stopper by pulling it down, and remove the rain sensor.



   B. Disconnect the connector.
2. Remove the used Rain Sensor Tape from the windshield or rain sensor.

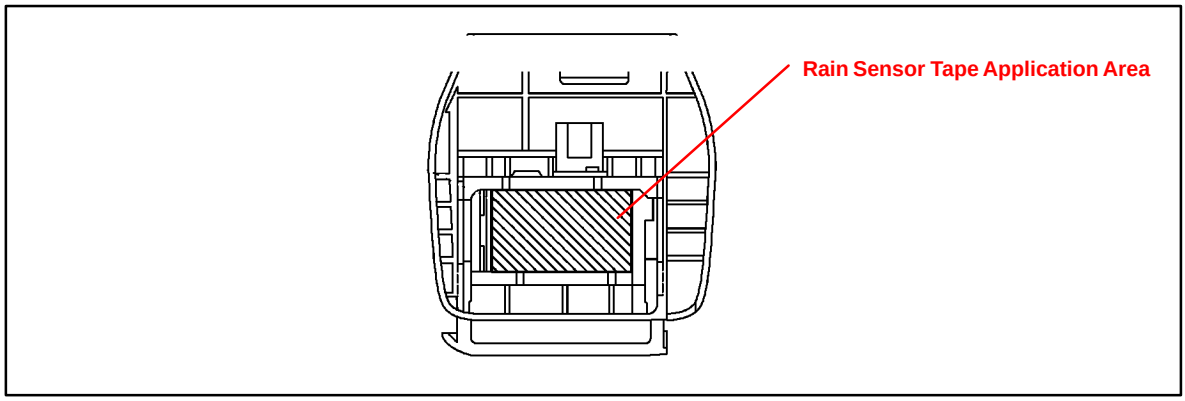
NOTE:
Be sure NOT to touch the lens surface of the rain sensor.

3. Clean the surface of the glass with an alcohol–based cleaner.

NOTE:
Do NOT use a shop rag to clean the window prior to installation as oil/grease substances on the windshield will inhibit a good bond between the Rain Sensor Tape and the windshield.

4. Apply the new Rain Sensor Tape on the lens surface of the rain sensor as indicated.

NOTE:
- **Be sure NOT to touch the lens surface of the rain sensor or the Rain Sensor Tape itself.**
- **If there are bubbles or contaminants present in the tape, apply new tape.**



Rain Sensor Tape Replacement (Continued)

5. Install the rain sensor.

NOTE:
- **Check whether bubbles or contaminants are present in the tape.**
- **If there are bubbles or contaminants in the tape, return to step 1.**

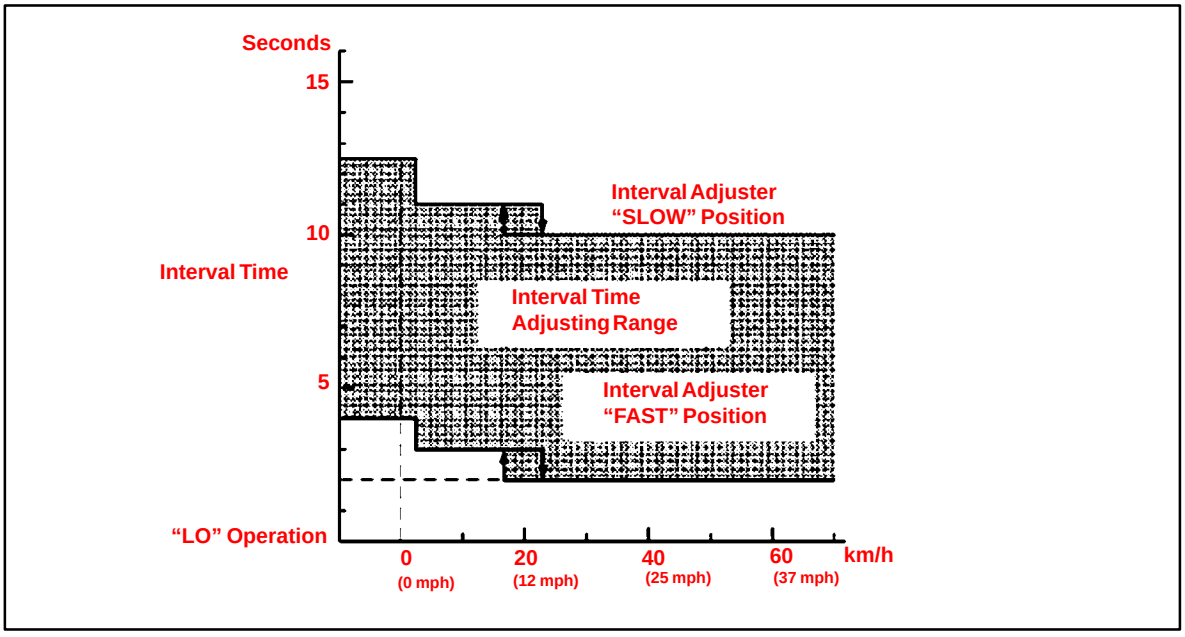
Wiper System Description

A wiper system with a raindrop sensing function has been adopted as optional equipment. As a rule, the control of the wiper operation is affected by the wiper ECU. However, the control of the raindrop sensing function is affected by the rain sensor. This system has the following functions:

FUNCTION	OUTLINE
Vehicle Speed–Sensing, Adjustable Interval “INT” Function	This function controls the wiper interval time in accordance with the vehicle speed when the wiper switch is in the “AUTO” position.
Vehicle Speed Switching Function	When the wiper switch is in the “LO” position, this function automatically switches the operating condition of the wipers while the vehicle is stopped or accelerating from a stopped position.
Washer–linked Wiper With Drip–preventive Function	To prevent the fluid from dripping after the washer has been operated, this function operates the wipers once after they have operated in unison with the washer.
Raindrop Sensing Function	This function controls the wiping timing in accordance with the amount of raindrops when the wiper switch is in the “AUTO” position.

Vehicle Speed–Sensing, Adjustable Interval (“INT”) Function

This function controls the interval time of the wipers in accordance with the vehicle speed when the wiper switch is in the “AUTO” position. The interval time adjusting range consists of 3 steps, which can be selected by operating the interval adjuster. The interval time can be controlled steplessly within each range.

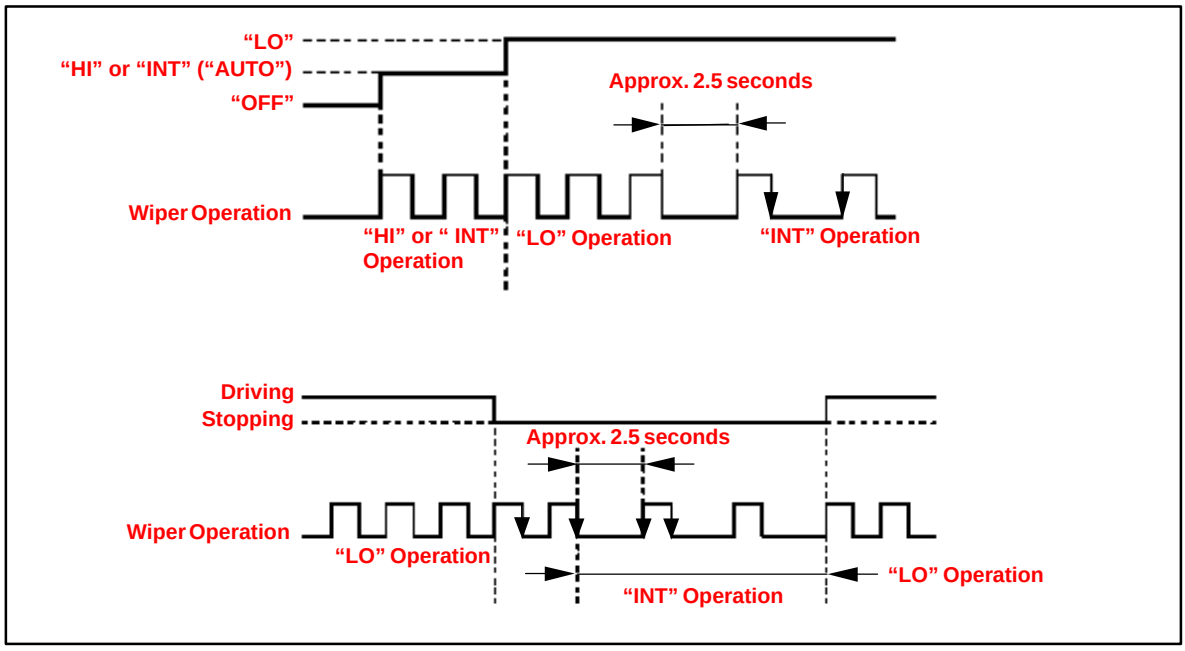


Vehicle Speed Switching Function

This function automatically switches to the intermittent operation when the wiper switch is in the “LO” position and the vehicle is stopped. To perform this function, the stopping and driving conditions of the vehicle are determined as described below.

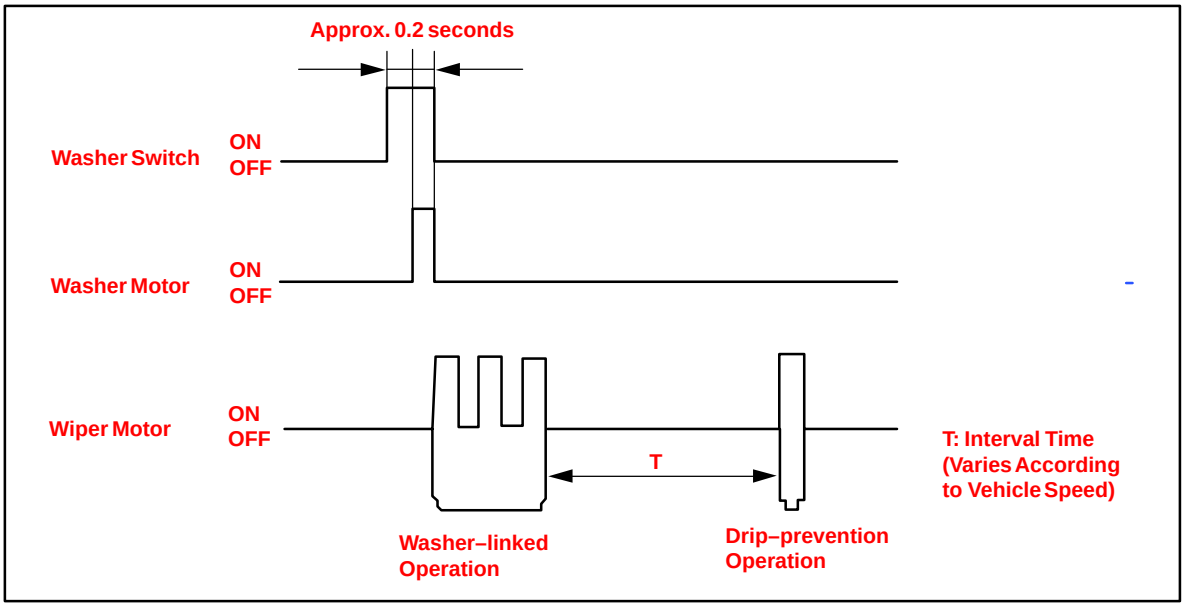
- **Driving Judgement:** When the vehicle speed is other than 0 mph (0km/h) or the stop light and the parking brake are “OFF” and the shift lever is in a position other than “P” or “N”.
- **Stopping Judgement:** When a condition other than the driving judgement has been detected.

When the vehicle is stopped, moving the wiper switch from the “AUTO” or “HI” position to the “LO” position causes the wipers to operate 3 times at the low speed and then automatically switch to intermittent operation with an interval time of approximately 2.5 seconds. When the vehicle is being driven and the switch is in the “LO” position, stopping the vehicle causes the wipers to operate twice and then switch to intermittent operation with an interval time of approximately 2.5 seconds.



Vehicle Speed Switching Function (Continued)

With this function, when the wiper switch is in the “OFF” or “AUTO” position, turning the washer switch “ON” for approximately 0.2 seconds or longer causes the washers to operate, and after the washer switch has been turned “OFF,” the wipers operate in unison 3 times at the low speed. Approximately 3 seconds (when the vehicle speed is between 0 to 36 mph [0 to 59 km/h]) after the low–speed operation of the wipers has been completed, the wipers operate once again to wipe off the washer fluid that has dripped. The drip prevention interval times are shown in the table below according to the vehicle speed.



VEHICLE SPEED	INTERVAL TIME
0 to 37 mph (0 to 59 km/h)	Approximately 3 seconds
37 to 49 mph (60 to 79 km/h)	Approximately 5 seconds
50 to 74 mph (80 to 119 km/h)	Approximately 7 seconds
75 to 99 mph (120 to 159 km/h)	Approximately 5 seconds
99 to 105 mph (160 to 169 km/h)	Approximately 3 seconds
106 mph or more (170 km/h or more)	No Operation

Raindrop Sensing Function

When the wiper switch is in the “AUTO” position, this function uses a rain sensor that is mounted on the front windshield glass to detect the amount of raindrops and controls an optimal wiping timing accordingly.

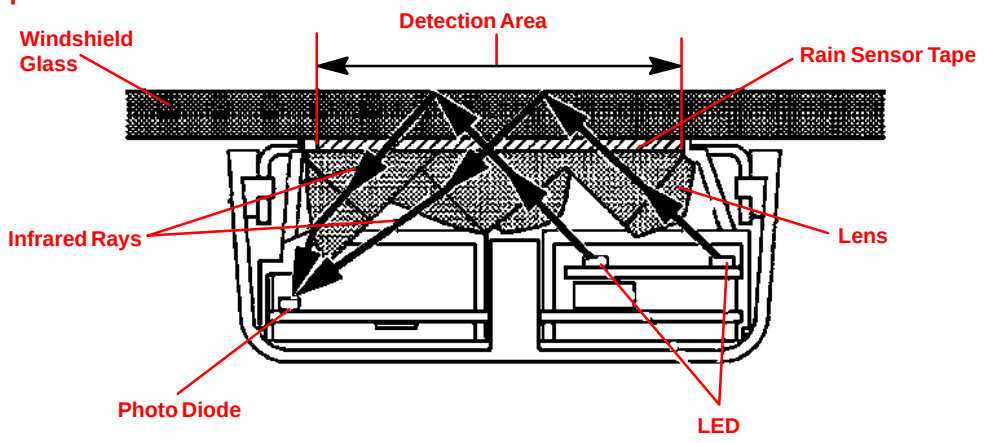
The rain sensor consists mainly of 4 LEDs (Light Emitting Diodes) that emit infrared rays and 2 photo diodes that receive those rays. The detection method is based on the infrared rays that are reflected by the front windshield glass.

For example, if no raindrops are present in the detection area, the infrared rays emitted by the LED are all reflected from the windshield glass and are received by the photo diode. If raindrops are present in the detection area, a portion of the emitted infrared rays penetrates the windshield glass via the raindrops, thus reducing the amount of infrared rays that are received by the photo diode. The amount of this reduction is then used to detect the amount of raindrops. Thus, this function controls the “INT,” “LO,” and “HI” operations in order to operate the wipers at an optimal wiping timing.

NOTE:

If the Rain Sensor Tape has been peeled during a windshield glass replacement, make sure to affix new Rain Sensor Tape. Failure to do so will lead to a system malfunction.

If NO Raindrops are Present



If Raindrops are Present