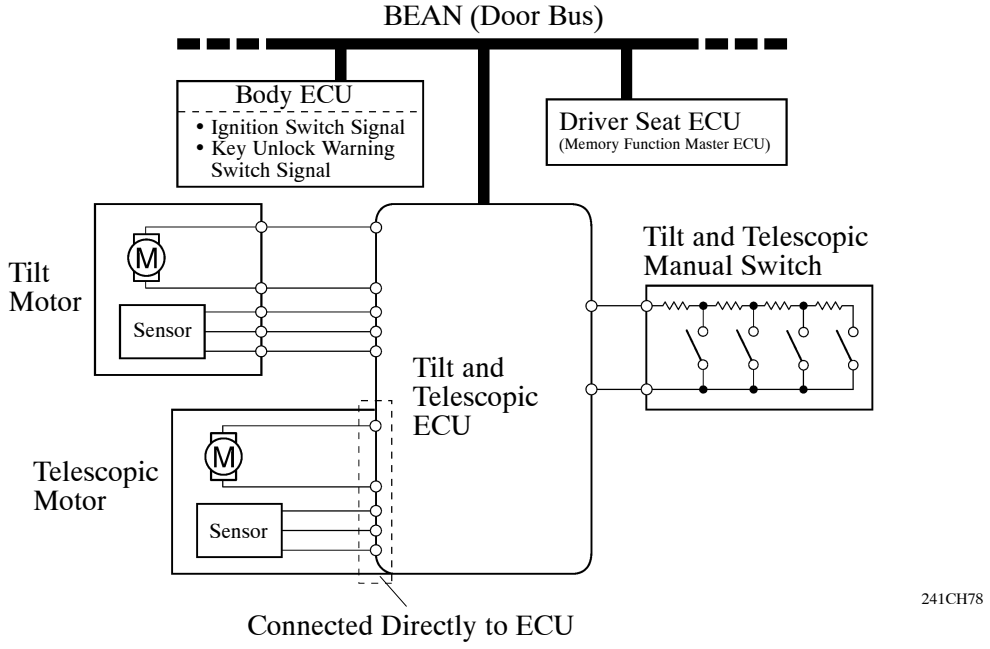
■STEERING COLUMN

1. Power Tilt and Power Telescopic Steering Column

General

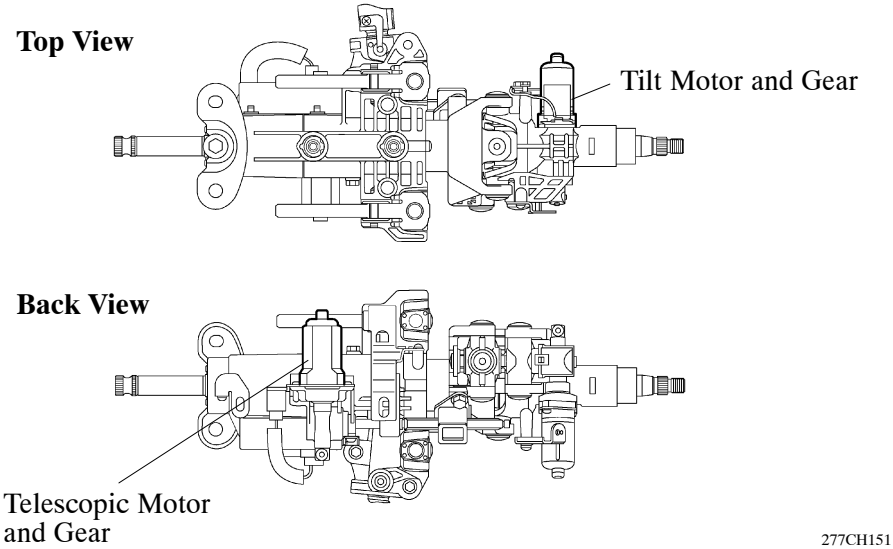
- A compact and lightweight power tilt and power telescopic steering column is used.
- The automatic set (Away and Return) function is used.
- This system is controlled by the tilt and telescopic ECU and the tilt and telescopic ECU maintains communication through the multiplex communication system.
- This steering column contains a driving position memory function, which operates in unison with the driver's seat and the outside rearview mirror. This function memorizes two driving positions.

▶ System Diagram ◀



Construction

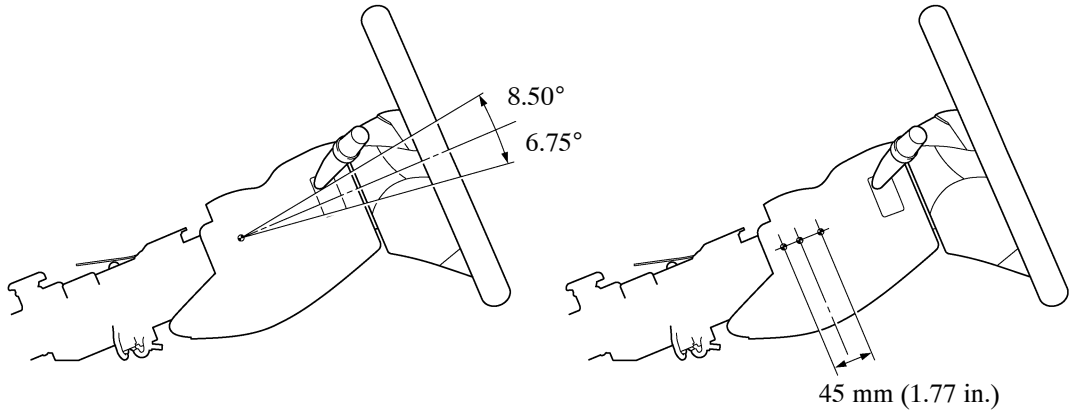
The power tilt and power telescopic steering column consists of the tilt and telescopic ECU, a tilt motor, telescopic motor and gears.
The tilt and telescopic motor contains position sensor that use hall elements.



Operation

1) Manual Operation

The tilt position and the telescopic position can be adjusted as desired by operating the tilt and telescopic manual switch.
A stepless adjustment enables the tilt mechanism to be tilted 15.3° vertically, and the telescopic mechanism to be moved 45 mm (1.77 in.) longitudinally.



Tilt **Telescopic**

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2) Automatic Set (Away and Return) Function

When the ignition key is removed, the steering column moves forward away from the driver and also tilts up for easy exit and entry.
When the ignition key is inserted in the ignition switch, the steering column returns to the previously set position.
The automatic set function can be prohibited by using an intelligent tester II.

3) Driving Position Memory Function

The steering column moves to the position last saved in memory by pressing the driving position memory switch.

4) Position Detection

To detect the position of the tilt and telescopic steering column, a position sensor that uses a hall elements are located in the tilt and telescopic motors to detect the changes in the magnetic field of the magnets, which are attached to the shafts of the motors.

Diagnosis

If the tilt and telescopic ECU detects a malfunction in the power tilt and power telescopic system, the ECU stores the malfunction data in memory. Then, by connecting a hand-held tester to the DLC3 terminal, the DTCs (Diagnostic Trouble Codes) can be accessed and an active test can be performed to verify operation of the tilt motor and the telescopic motor. For details, refer to the LEXUS RX400h Repair Manual (Pub. No. RM1139E).

Fail-Safe

- If a malfunction in the tilt position sensor signal or telescopic position sensor signal occurs while operating the power tilt or power telescopic function, the tilt and telescopic ECU stops the operation of the power tilt and telescopic system.
- If the power voltage to the ECU drops below approximately 8 V while operating the power tilt or power telescopic function, the ECU stops the operation of the power tilt and telescopic system.
- If the tilt and telescopic ECU detects that the motor has locked during the operation of the power tilt or power telescopic function, the ECU stops the operation of the power tilt and telescopic system.
- If the communication of an ECU that is related to the power tilt and power telescopic steering column system is interrupted, the tilt and telescopic ECU effects the controls listed below.

Function	Body ECU Communication Interruption	Driver Seat ECU Communication Interruption	All ECUs*1 Communication Interruption
Manual	×*2	○	×*2
Automatic Away	×	○	×
Automatic Return	×*3	○	×*3
Memory	×	×	×

○: Actuated
×: Not actuated

*1: All ECUs that are related to the power tilt and power telescopic steering column system.

*2:
- The operation is permitted if the ignition switch signal is ON while the signal from Body ECU is interrupting.
- The operation is prohibited if the ignition switch signal is OFF while the signal from Body ECU is interrupting.

*3:
- The operation continues if the ignition switch signal is ON while the signal from Body ECU is interrupting.
- The operation is prohibited if the ignition switch signal is OFF while the signal from Body ECU is interrupting.

For details, refer to the LEXUS RX400h Repair Manual (Pub. No. RM1139E)

2. Energy Absorbing Mechanism

- The energy absorbing mechanism mainly consists of a lower bracket, breakaway bracket, energy absorbing plate, main shaft, and column tube.
- When an impact is transmitted to the steering wheel in a collision (secondary collision), the steering wheel and the steering wheel pad help absorb the impact. In addition, the breakaway bracket and the lower bracket separate, causing the entire steering column to move forward.
  At this time, the energy absorbing plate becomes deformed to help absorb the impact of the secondary collision.

▶ Energy Absorbing Mechanism ◀