

1 GENERAL TECHNICAL DESCRIPTION

1-1 INTENDED USE AND OPERATION INSTRUCTIONS

This equipment is a remote control device, known as a keyless entry system, comprising a hand-held transmitter and a control unit with a receiver installed to the inside of a motor vehicle. (Refer Fig. 1-1).

This system is a radio frequency apparatus which controls from a distance the locking and unlocking of a motor vehicle's door locks by operating a portable transmitter with the push buttons. The transmitter is a portable device incorporated into a door/ignition key and the control unit including the receiver which has an integral receiving antenna is a mobile device installed behind the instrument panel of the vehicle. Construction of the system is given in Section 1-2.

The transmitter is activated by loading a battery cell in it.

By pressing the "LOCK" or "UNLOCK" button for at least 50 milliseconds, the duration required for the transmitter and the receiver to recognize the state of the switch as ON or OFF, the vehicle's door lock actuators are energized.

By pressing one of the buttons, the radiation occurs in the form of coded signals that are received by the control unit installed in the vehicle. The control unit wakes-up, then compares the received ID code with the pre-stored ID code in its non-volatile memory, then activates the door lock actuators upon coincidence of both codes.

The coded signals are consisted by the wake-up signal (A) and the ID signal (B) shown in Fig. 1-2. The ID signal is consisted by unique ID portion and function portion which directs the control units lock or UNLOCK status.

When two buttons, "LOCK" and "UNLOCK" are pressed simultaneously, the transmitter stops the signal radiation immediately.

When one of button is pressed for long duration, at least 403.2 millisecond, following the wake-up signal (A) and ID signal (B), the transmitter will radiates other signal (C), however any function is assigned at the control unit to this signal (C).

When the duration is continued at least 25 second, the transmitter radiates stop code, shown Fig. 1-3, then ceases the radiation. By receiving the stop code, the control unit will stops any activity and go to sleep mode.

The transmitter operates on two different frequencies f_0 (314.85 MHz - 50 kHz) and f_1 (314.85 MHz + 80 kHz), corresponding to binary digit 0 or 1. In other words, The radiation is FSK-modulated on frequencies f_0 and f_1 according to binary codes corresponding to

either of the button pressed. We define the center frequency f_c as the average value of f_0 and f_1 , ie., $f_c = (f_0 + f_1)/2$, and therefore f_c is a virtual frequency.

1-2 SYSTEM CONSTRUCTION

The construction of the system is shown below:

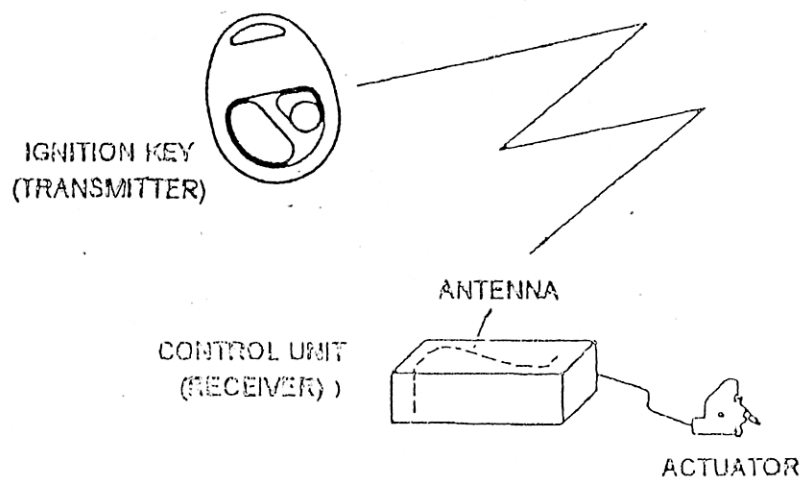


Figure 1-1 : System construction

1-3 TIMING DIAGRAM

The timing diagrams of the system are shown below:

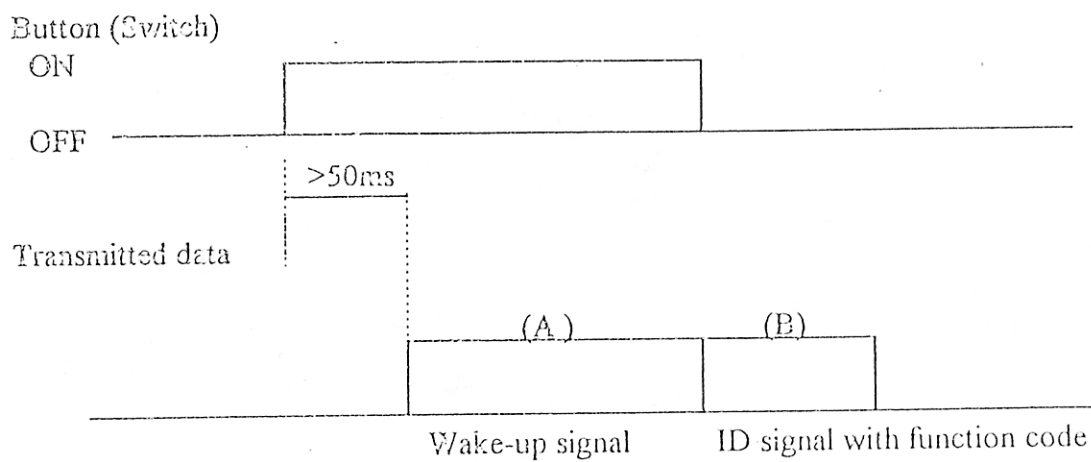


Figure 1-2 : Timing diagram

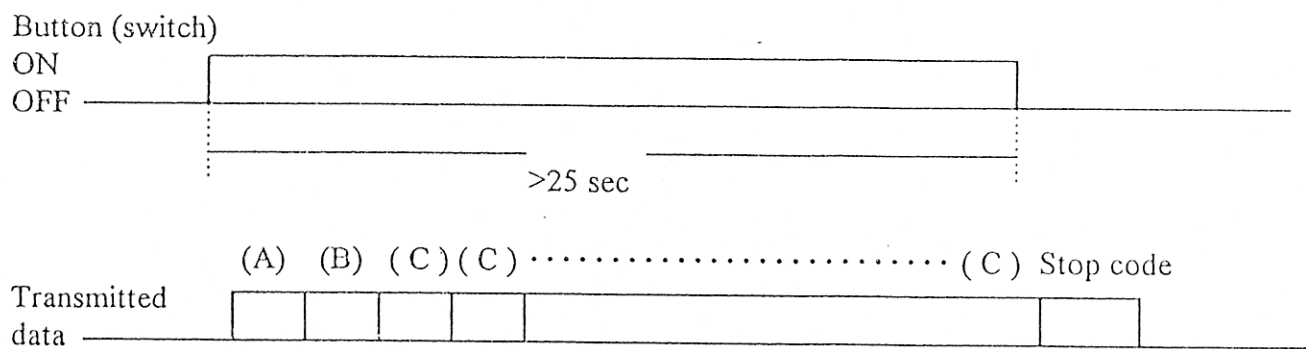


Figure 1-3 : Timing diagram