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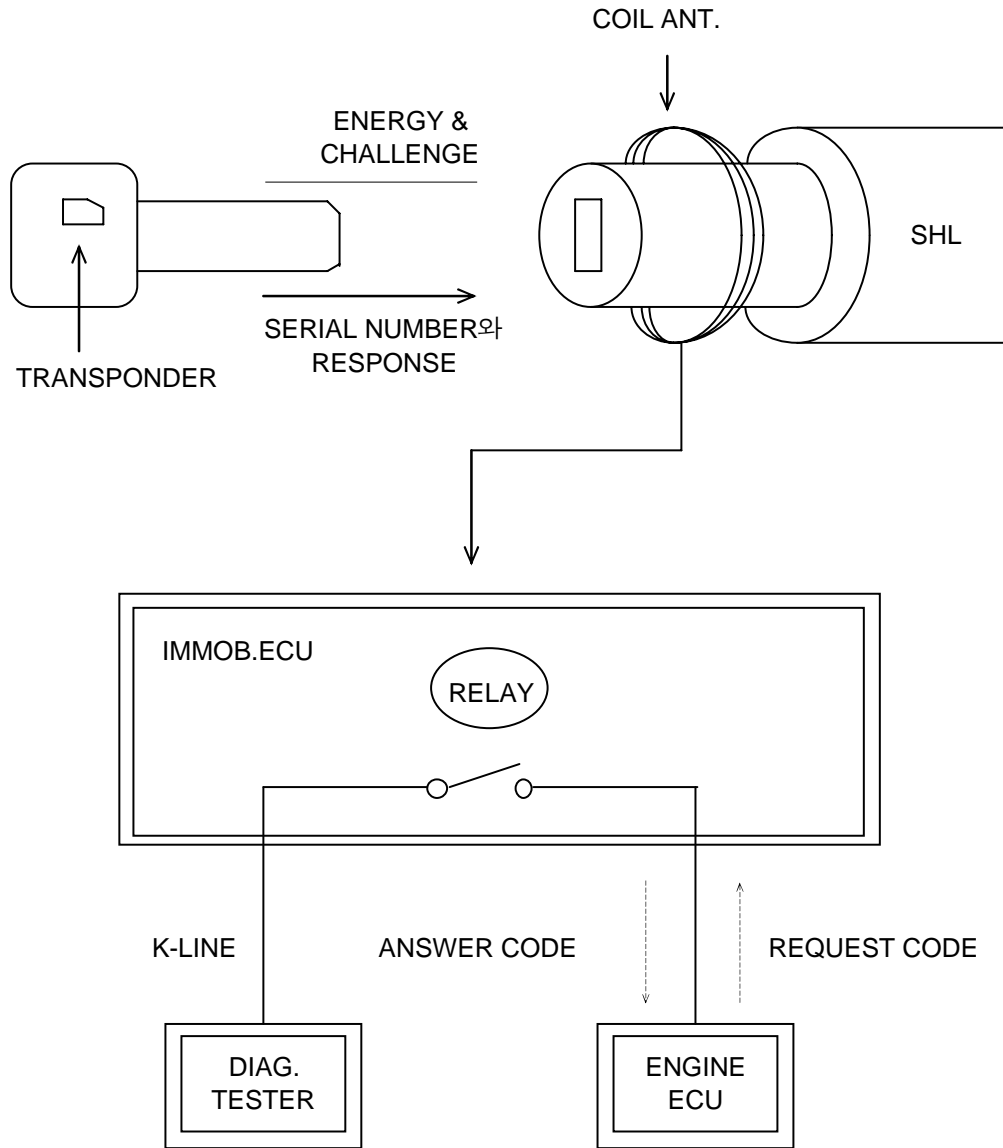
1. Abstract

This Specification is described an Anti-Theft System for automotive.

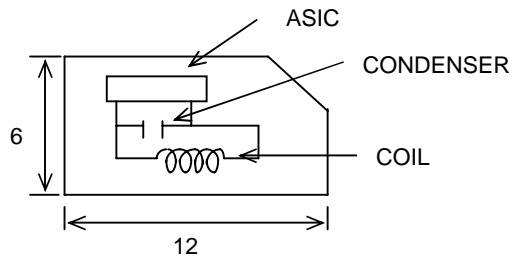
2. Overview

This Immobilizer System allows for an engine starting only if correct mechanical key as well as electrical matching by RF signal.

3. System Configuration



3.1. TRANSPONDER



After energizing by RF signal from immobilizer, Transponder receives challenge signals and then transmits response calculated by its own algorithm which is stored in ASIC.

3.2. COIL ANTENNA

Ls (Inductance) : 447uH ± 20uH (IGN Lock barrel installation state)
Rs (Resistance) : ?Ω Low
Q(Quality factor) : 25Low

Antenna coil works as a medium for RF communication between transponder and immobilizer. It is located on the ignition lock barrel.

3.3. IMMOBILIZER ECU

It drives coil antenna and analyze data from transponder. And also it transmit answer code to ECU.

3.4. ENGINE ECU(ECM or EMS)

ECU analyzes the answer data from immobilizer and then ECU decides to engine start or not

3.5. DIAGNOSTIC TESTER

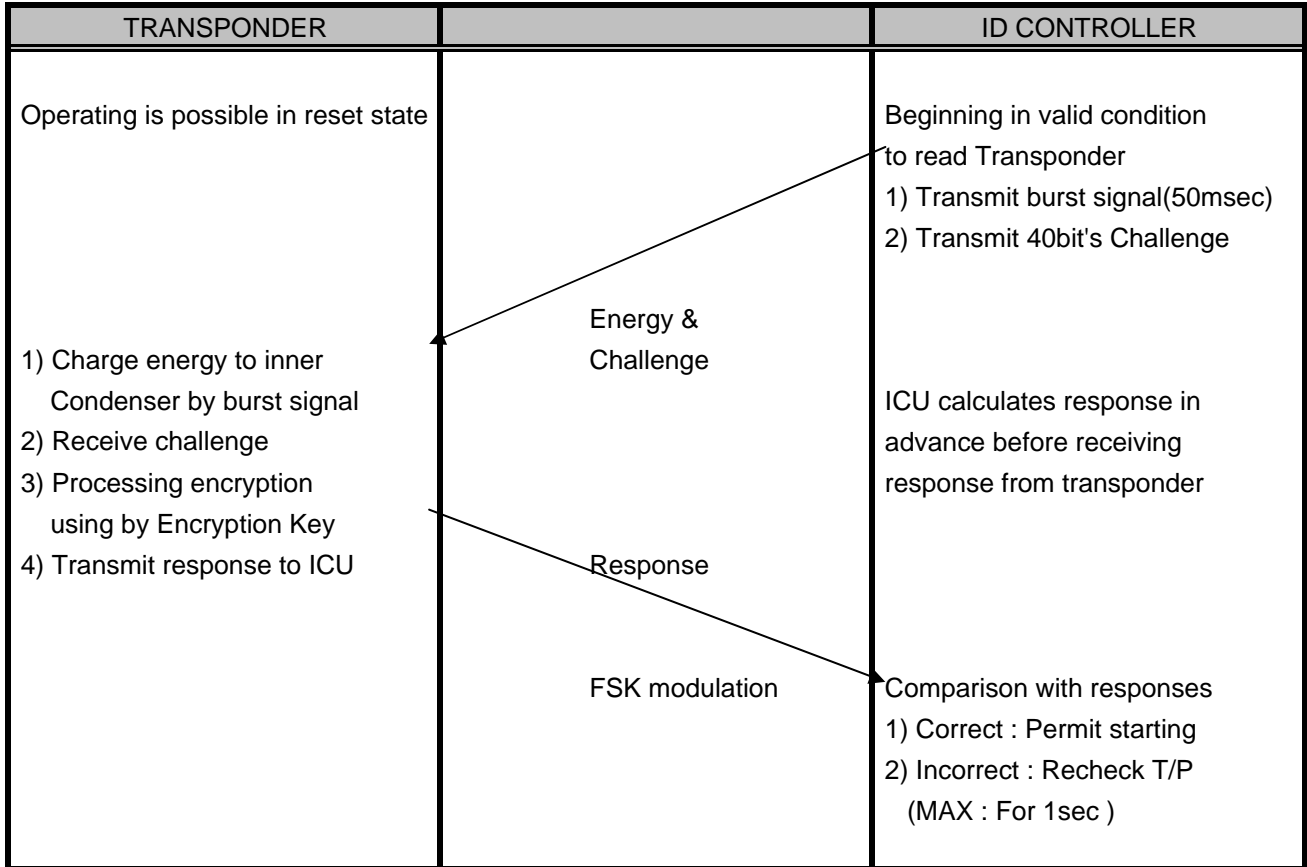
It has diagnosis function, key teaching to immobilizer and entering user password.

3.6. STATUS INDICATOR

It indicates the status of immobilizer such as lock or unlock.

4.3. GENERAL FUNCTION.

4.3.1. Communication specification for ID KEY CONTROLLER(ICK) and T/P



4.3.2. Transponder Code Reading Procedure

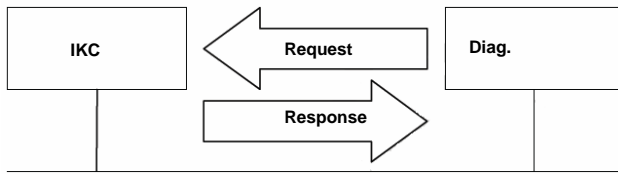
- ① IKC transmits challenge data to the transponder and then check the receiving response from it.
 - ② IKC challenges again in case of incorrective response.
 - ③ If the response is correct, IKC does not send challenge signal any more.
- If response is not correct, IKC sends challenge again up to 5 times until response is correct.

4.3.3. Status Indicator output specification

Mode	Busy Lamp	Immobilizer Status	Notes
Mode A	ON	Immobilizer Inactive	- Acc ON - Valid key detected - Learnt mode
Mode B	OFF	Immobilizer Active	- Acc OFF

4.4. Diagnostic Communication

4.4.1. Block



4.4.2. Frame

29 bit CAN Identifier bit position						CAN frame data field byte position														
28	27	26	25	24	23	16	15	...	8	7	...	0	1	2	3	4	5	6	7	8
Priority			R	D	PGN	TA	SA	PCI	DATA											

- ① Communication Protocol : J1939
- ② Polling Cycle : 100ms

1) Command Frame

- Priority : 3
- R/DP bit : 0 / 0
- PGN : FF33h
- SA : 88h

-Data Format:

1byte	3byte	4byte
Command (PCI)	Challenge	Command Parameter (Encrypted)

*Command :

- Typical Command : MSB 0
- Test Command : MSB 1

2) Result Frame

- Priority : 3
- R/DP bit : 0 / 0
- PGN : FF32h
- SA : 80h

-Data Format :

1byte	3byte	4byte
Result (PCI)	Response	Result Parameter (Encrypted)
	Status 1byte	Parameter 3byte

FCC Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This Device may not cause harmful interface, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for CLASS B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try correct the interference by one or more of the following measures:

- 1.1. Reorient or relocate the receiving antenna.
- 1.2. Increase the separation between the equipment and receiver.
- 1.3. Connect the equipment into an outlet on a circuit different from that to which receiver is connected.
- 1.4. Consult the dealer or experienced radio/TV technician for help.

WARNING

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

"CAUTION: Exposure to Radio Frequency Radiation.

Antenna shall be mounted in such a manner to minimize the potential for human contact during normal operation. The antenna should not be contacted during operation to avoid the possibility of exceeding the FCC radio frequency exposure limit. The minimum separation distance of 20cm from the antenna to the body of user required."