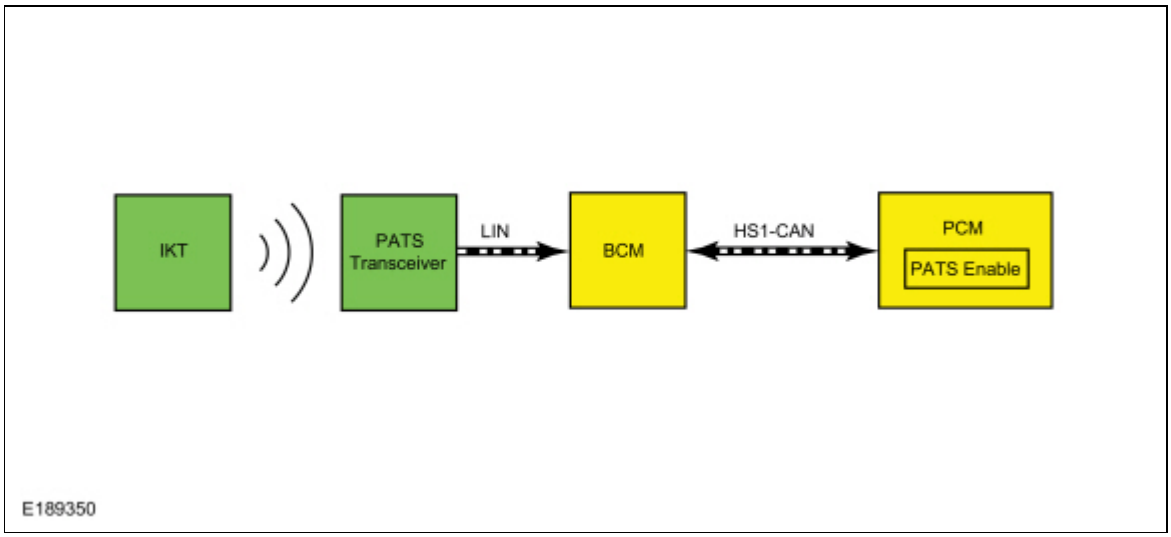
Passive Anti-Theft System (PATS) - System Operation and Component Description

System Operation

System Diagram



Network Message Chart

BCM Network Input Messages

Broadcast Message	Originating Module	Message Purpose
PATS target data	PCM	The PCM sends the BCM a challenge request for a valid ID.

PCM Network Input Messages

Broadcast Message	Originating Module	Message Purpose
PATS control command	BCM	The response from the BCM supplying the PCM challenge ID. If the BCM ID response is incorrect, then PATS prevents the vehicle from starting.

PATS

The PATS function is controlled by the BCM and the PCM. There are 2 main checks the PATS carries out before allowing the vehicle to start. These 2 checks are:

- The BCM verifying a programmed key when it is inserted into the ignition lock cylinder.
- The PCM verifying the BCM identification to make sure it matches the identification stored in memory when the ignition state changes to RUN or START.

If either of these checks fail, the PATS does not allow the vehicle to start.

When the BCM detects a key inserted into the ignition lock cylinder, it generates a challenge message. It sends the challenge message to the PATS transceiver over a LIN-based circuit. The transceiver reads the key and generates a response message to the BCM. If the message received from the PATS transceiver does not match a key stored in the BCM memory, the BCM does not respond to the PCM challenge request when the ignition transitions out of off.

The BCM activates the wake-up control circuit when a key is inserted into the ignition lock cylinder or a remote start request is received (if equipped with factory remote start). or driver door opend.

The BCM wakes up the PCM by supplying voltage on the wake-up control circuit.

Once the PCM is awake, the PCM sends the BCM a second challenge message over the HS-CAN. When the BCM receives the challenge message, it generates a response and sends it back to the PCM. If the response from the BCM does not match the data in the PCM memory, this check fails and the vehicle does not start.

If both the PCM identification and key verification pass, the PATS allows the vehicle to start. The PATS cannot disable or stall a vehicle that is already running.

PATS Parameter Identifications (PIDs)

In conjunction with Diagnostic Trouble Codes (DTCs), the PATS Parameter Identifications (PIDs) are a useful tool when diagnosing PATS concerns.

BCM PID Chart

Acronym	Name	Description
KEYS_PROGMD	PATS number of ignition key codes supported	Displays the number of keys currently programmed into the BCM (if unlimited key mode is enabled, this PID only reads 2 regardless of how many keys are programmed).
MIN_KEYS_RQD	Minimum number of keys required	Minimum number of programmed keys required. This PID always reads 2.
SPAREKEY	Spare Key Programming State	Displays the customer spare key programming mode (Enabled/Disabled). When disabled, keys cannot be programmed using 2 programmed keys.
UNL_KEY_MODE	PATS Unlimited Key Mode	Displays the status of unlimited key mode (Enable/Disable). When disabled, a maximum of 8 keys can be programmed.

PCM PID Chart

Acronym	Name	Description

PATSENABL	Vehicle enable status	Indicates if PATS allows the vehicle to be driven. Must read enabled for the vehicle to be driven.

Component Description

IKT

The IKT incorporates both the PATS functions and the RKE transmitter functions in a single device.

During key programming procedures, the PATS and the RKE transmitter of an IKT are programmed into the BCM. Conventional PATS keys can also be programmed to the vehicle if requested by the customer.

A minimum of 2 and a maximum of 8 keys can be programmed (unless in unlimited key mode).

PATS Transceiver

The PATS transceiver reads any key placed in the ignition lock cylinder. When the ignition changes to RUN or START, the BCM activates the PATS transceiver. Once the PATS transceiver activates, it activates the key in the ignition lock cylinder and receives the key data. Once the PATS transceiver receives the key data, it sends the data to the BCM.

BCM

When the BCM is replaced, program at least 2 keys and carry out the parameter reset procedure.

The BCM requires PMI when replaced.

PCM

When the PCM is replaced, carry out the parameter reset procedure. There is no need to program keys if the PCM is replaced.

The PCM requires PMI when replaced.