

System Functionality

The immobiliser system prevents an unauthorised attempt to start the engine. The Key Transponder Module (KTM) transmits a valid key status only after an authentic data communication has been performed between the KTM and the transponder key. When the key is turned to the Aux ignition position, the KTM energises the coil, which in turn starts a data transfer with the transponder key. If the code received matches a code stored in the KTM EEPROM, the KTM will perform a challenge / response routine with the key to determine its authenticity. Once the KTM has authenticated the key code received, it will send a "Key Valid" message to the BPM via the dedicated ISO Data link. If the key code does not match one stored in the KTM memory a "Key Invalid" message will be sent to the BPM. The BPM will transmit the SCP – key valid message containing a unique 3 byte number to the instrument cluster, the cluster upon receipt of this message will compare the data received against the unique number stored in its memory. If the comparison matches the instrument cluster will set a flag to confirm valid key received. If the comparison does not match the instrument cluster will set this flag to Invalid. If the key is turned to the ignition Run position, the instrument cluster will start the CAN data exchange and start transmitting the idle status. If the key status is valid, and the subsequent challenge / response is verified by the ECM, the ECM will allow the engine to start. Otherwise, starting of the engine is disabled. The ECM controls the following outputs: starter relay, fuel injectors, ignition coils and fuel pump.

IMMOBILIZER SYSTEM (Cont.)

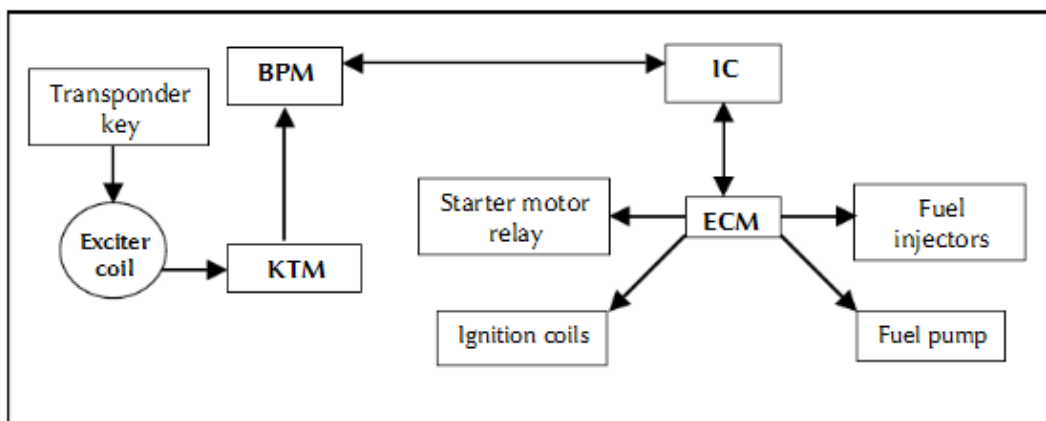
XK IMMOBILIZER SYSTEM FUNCTIONALITY

The ECM will disable the fuel injectors, ignition coils, fuel pump drive and starter if any of the following conditions apply:

- A theft signal has been received from the IC, i.e. the key code has not been received/code does not match.
- A challenge code has been transmitted to the IC but no response code has been received.
- A challenge code has been transmitted to the IC and an incorrect response received. If any of the above cases apply, the ECM will log DTC P1260. This DTC is further defined by sub-codes. The sub codes are accessed through freeze frame data. Additionally, the IC will log DTCs if the failure was a result of the key transponder exchange.

IMMOBILIZER SYSTEM (Cont.)System Diagnostics

IMMOBILIZER SYSTEM (Cont.)



Engine Fails To Crank

- The most regular occurrence for failing to crank is due to the Park & Neutral start switches, that is, gearshift not in Park or Neutral. The starter relay configuration is as follows: low side of relay coil - switched directly from ECM (if conditions correct) high side of relay coil - direct from transmission P/N position.
- Other likely causes maybe that the CAN / SCP network is malfunctioning, i.e., the CAN circuit is open/short. This would mean that the IC/ECM or IC/BPM would be unable to communicate resulting in no authentication being performed to enable the ECM.
- Transponder key may not be programmed, or the KTM has not been taken out of build mode etc

Engine Cranks but will not Start

- If the Engine is cranking it means that the ECM is enabled with respect to the immobilizer function. If the immobilizer had failed validation the ECM would not engage the starter. This could be confirmed by reading DTC from the IC and ECM.**
- In this case, the fuel pump circuit should be verified. A fuel pump module, which is controlled by the ECM, supplies the fuel pump.
- In all cases of suspected immobilizer non-start issues, the most logical failure modes should be eliminated first.
- Check all relevant supplies and grounds to the KTM, BPM, IC and ECM, check that the starter relay has a permanent 12V supply, check that the relay has a 12V supply and ground across the coil while the ignition is in the crank position.