Theory of Operation

There are three main components that comprise the PATS. The first component is the mechanical ignition key, which has been fitted with a transponder for electronic authentication. This transponder also supplied by Texas Instruments is completely encapsulated and has no hard wire connections. The second component and subject of this exhibit checklist is the transceiver, which is mounted onto the ignition lock cylinder assembly. The transceiver provides power and communicates to the transponder within the key via a low frequency magnetic field antenna at a nominal frequency of 134.2kHz. This transceiver has four hard wire connections, Ign Run/Start, Ground, Tx Signal and Rx Signal, which interface with a control module the third component of the PATS. The control module is typically located within the automobiles instrument cluster. Additional components are used to enable or disable the automobile.

The transceiver is powered when the automobiles ignition switch is in the Run/Start position. The transceiver antenna is formed by a coil of wire connected in series with a capacitor to form a series resonance circuit. An internal H-Bridge circuit drives the antenna differentially from the TMS3705A IC. Authentication is performed once during an initial start attempt. After successful authentication the transceiver enters a sleep mode until the next occurrence of a start attempt.