Operating Manual
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INTRODUCTION

The AE Invisible Signal Tester (IST) offers a simple and cost effective way to diagnose and test problems relating to the vehicle immobiliser system, which is made up of a number of components.

The AE-IST enables the transponder key, remote control operation, external vehicle antenna transmitters, internal vehicle antenna transmitters and transponder antenna to be fully tested to ensure that all parts of the system are working.

The AE-IST can display signal levels, frequency measurements, signal waveforms and a number of other useful features.

Features include:

- Standard transponder key test
- Infra Red (IR) remote control test
- Radio Frequency (RF) remote control test
- Proximity/Smart key test
- Proximity/Smart vehicle antenna transmitter test
- Proximity/Smart key signal amplitude level indication
- Radio Frequency (RF) remote control amplitude level indication
- Transponder frequency indication
- Oscilloscope waveform function (FAST and SLOW)
- Proximity/Smart key system scan modes
- Audible signal indication
- Transponder vehicle antenna test
SMART/PROXIMITY SYSTEM OPERATION

SYSTEM COMPONENTS

The Proximity Smart Key systems all work in a similar way. The system compromise’s of a number of components, some are linked to other systems to enhance the security of the whole vehicle.

1. ABS Anti Braking System Module ECU
2. TCM Traction Control Module ECU
3. KVM Keyless Vehicle Module ECU
4. Low Frequency Transmitter (125kHz/134kHz) Doors, Boot/Trunk and Internal
5. Smart/Proximity Key
6. RF Radio Frequency Receiver Module ECU (315MHz/433MHz)
7. Engine Start/Stop button
8. Security System Module ECU
9. ECM Engine Control Module ECU
10. Instrument Cluster Module
11. Steering Control Module ECU

OPERATION

The Smart/Proximity key receives low frequency signals on 125kHz or 134kHz frequency

The key has a transponder, which when you operate the vehicle door by either pulling the handle or pressing the button (this varies on vehicles and models) the transponder is energised through a 125kHz or 134kHz signal. The key then responds to the vehicle on a higher RF frequency 433MHz or 315MHz sending a security message.

If the vehicle and the key communicate with the correct security messages, then the vehicle will open the door and allow the starting of the vehicle using the start/stop button.

There are a number of sensors transmitting the 125KHz/134KHz signal around the vehicle, normally in the doors, boot/trunk, external bumper, center console, rear seats, glove box area, etc., depending on the make and model.
GENERAL OPERATION

INSERTING/REPLACING BATTERIES

Slide cover to expose battery compartment.

Insert 4 AAA batteries.

Normal Alkaline or rechargeable can be used.

Slide cover back.
GENERAL OPERATION

SWITCHING ON/OFF AND MENU NAVIGATION

Press the On Button to turn On.

Press the On Button for 2 seconds to turn Off.

Up, down, and OK Buttons to navigate the menu selections.

Press OK to select a function.

To return to the main menu press the OK Button again.
GENERAL OPERATION

ANTENNA RECEIVING LOCATIONS

Infra Red (IR) Remote Control Receiver

Vehicle Transmitter Antenna

Transponder Key Antenna

Radio Frequency (RF) Remote Control Antenna
TRANSPONDER KEY TESTING

Select the Transponder Test from the main menu.

Place the key in the key slot or on top of the key slot.

Some remote keys will need to be placed horizontally, vertically or inside the key slot to locate the transponder.

The AE-IST will indicate the transponder is detected and the frequency the transponder operates on.
REMOTE CONTROL RADIO FREQUENCY (RF) TESTING

Select the Remote RF Test from the Main Menu.

Place the Remote Key close to the base of the AE-IST and press each of the buttons to test.

The AE-IST will display the frequency of the remote control and also the signal level on the bar graph.

See Page 7 for AE-IST RF Antenna Location.
REMOTE CONTROL INFRA RED (IR) Testing

Select the remote Infra Red from the main menu.

Point the remote at the IR receiver and press each button on the remote control.

The AE-IST will display Infra Red Signal OK if a Signal is received.

See page 7 for IR Receiver location.

TRANSPONDER COIL ANTENNA TESTING

Select the Coil Antenna Test from the main menu.

Hold the base of the AE-IST close to the ignition, and insert the transponder key and switch ignition on.

The AE-IST will indicate communication between the car and the key by a series of beeps.
Select the Proximity Full Test from the main menu.

Hold the proximity remote at the base of the unit.

Place the AE-IST vehicle transmitter antenna close to the proximity transmitter on the vehicle.

Operate the Proximity System by touching the sensor, button or opening the door.

The AE-IST will give a visual and audible signal to indicate the signal level of the vehicle transmitter and the proximity remote key.

The AE-IST will also display the frequency of the proximity remote signal. If the proximity signal is difficult to read, adjust the sensitivity using the up and down buttons.
PROXIMITY/SMART KEY SYSTEM SCAN MODES

Select Prox Full Scan Mode from the main menu.

The AE-IST will display a rolling signal waveform to show the key and car signals.

Select Prox Key Scan Mode from the main menu.

The AE-IST will display a rolling signal waveform to show the key signal only.

Select Prox Car Scan Mode from the main menu.

The AE-IST will display a scrolling signal waveform to show the signal only.

Use the up and down buttons to adjust the sensitivity.
OSCILLOSCOPE MODE

In the Oscilloscope mode the signal level of the Smart/Proximity key can be viewed and compared.

There are two Oscilloscope modes, slow and fast for the different frequency smart keys used.

The measurement sensitivity can be adjusted using the up and down buttons.

SETTINGS INFORMATION

The settings options can be selected by selecting settings from the main menu.

Sounder control allows you to select either:
- Proximity/Smart Key On
- Vehicle Proximity Sensor On
- Off

Coil Antenna enables you to select the type of transponder signal:
- 125kHz Philips
- 134kHz Texas

Note: If you are not sure, try both options to see which reads the best.
## SPECIFICATIONS

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<th>Feature</th>
<th>Details</th>
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<tr>
<td>Batteries</td>
<td>4x AAA niMh Rechargeable or Alkaline</td>
</tr>
<tr>
<td>Battery Level</td>
<td>Battery Level Indication on LCD Screen</td>
</tr>
<tr>
<td>Battery Life</td>
<td>&gt; 5 Hours (Based on 750 mA/h Nimh</td>
</tr>
<tr>
<td>Weight</td>
<td>4.06 oz</td>
</tr>
<tr>
<td>Oscilloscope Mode</td>
<td>20mS/Div (Slow), 10mS/Div (fast) Scan Mode: 2 Seconds across Screen</td>
</tr>
<tr>
<td>Size</td>
<td>90mm (W) x 170 mm (H) x 38 mm (D)</td>
</tr>
<tr>
<td>Current Consumption</td>
<td>90 mA</td>
</tr>
<tr>
<td>Transponder Test</td>
<td>125kHz Amplitude Modulation 134.2kHz Frequency Shift Keying (FSK) Audible Tone for Data Signal</td>
</tr>
<tr>
<td>LCD</td>
<td>Backlit Blue 128x64 dots</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>32 to 122 Degrees F or 0 to 50 Degrees Celsius</td>
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<tr>
<td>Radio Frequency Test</td>
<td>150 to 999 MHZ, Resolution : 0.1 MHz Graph &amp; Oscilloscope Modes</td>
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<td>Infra Red Test</td>
<td>Universal Detection Receiver</td>
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CONTACT INFORMATION

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PROXIMITY TRANSMITTER LOCATION

AUDI KEYLESS ENTRY SYSTEM
A4
Q7
PROXIMITY TRANSMITTER LOCATION

CHEVROLET KEYLESS ENTRY SYSTEM
CRUZE
PROXIMITY TRANSMITTER LOCATION

DODGE KEYLESS ENTRY SYSTEM
CHARGER
DURANGO
PROXIMITY TRANSMITTER LOCATION

FORD PROXIMITY SYSTEM
FIESTA
FOCUS
MONDEO
PROXIMITY TRANSMITTER LOCATION

HYUNDAI KEYLESS ENTRY SYSTEM
SONATA
IX35
PROXIMITY TRANSMITTER LOCATION

INFINITI KEYLESS ENTRY SYSTEM
FX35
PROXIMITY TRANSMITTER LOCATION

KIA KEYLESS ENTRY SYSTEM
CEE’D
PROXIMITY TRANSMITTER LOCATION

LEXUS SMART ACCESS
CT200H
PROXIMITY TRANSMITTER LOCATION

LEXUS SMART ACCESS
GX460  RC350
HS250H  RC F
IS SERIES  RX450H
PROXIMITY TRANSMITTER LOCATION

LEXUS SMART ACCESS
ES300H    LS600H
ES350
GS450H
PROXIMITY TRANSMITTER LOCATION

LINCOLN
MKC
MAZDA ADVANCED KEYLESS ENTRY
6 & 3 (Advanced Keyless)
6 & 3 (Without Advanced Keyless) - 1 Transmitter in centre of vehicle only.
PROXIMITY TRANSMITTER LOCATION

MITSUBISHI KEYLESS OPERATION SYSTEM (KOS)
ASX
MIRAGE G4
LANCER EVOLUTION X
PROXIMITY TRANSMITTER LOCATION

RANGE ROVER PASSIVE ENTRY SYSTEM
EVOQUE
DISCOVERY 4
RANGE ROVER SPORT
FREELANDER
PROXIMITY TRANSMITTER LOCATION

RENAULT KEYLESS ENTRY SYSTEM
MEGANE
PROXIMITY TRANSMITTER LOCATION

RENAULT KEYLESS ENTRY SYSTEM
CAPTUR
SSANGYONG SMART KEY SYSTEM
KORANDO

PROXIMITY TRANSMITTER LOCATION
SUBARU SMART KEY SYSTEM
WRX
FORESTER
PROXIMITY TRANSMITTER LOCATION

SUZUKI KEYLESS START SYSTEM
KIZASHI
SWIFT
PROXIMITY TRANSMITTER LOCATION

TOYOTA SMART ACCESS
IQ  CAMRY  CAMRY HV  HIGHLANDER
4RUNNER  SEQUOIA  SIENNA  HIGHLANDER HV
AVALON  VENZA
VAUXHALL/OPEL SMART
PROXIMITY ACCESS
ASTRA J

PROXIMITY TRANSMITTER LOCATION
PROXIMITY TRANSMITTER LOCATION

VOLVO KEYLESS DRIVE
XC60
XC70
PROXIMITY TRANSMITTER LOCATION

VOLVO KEYLESS DRIVE
S60
PROXIMITY TRANSMITTER LOCATION

VOLVO KEYLESS DRIVE
S80
VOLVO KEYLESS DRIVE
C30
C70

PROXIMITY TRANSMITTER LOCATION