



TECHNICAL BULLETIN

A419-09v2

08/2004

Subject

Navigation System Diagnostics

Model: X-TYPE

Year: 2001.5 Onwards

VIN C00294 Onwards

Section: 419-07

Navigation System

Summary

This Technical Bulletin has been issued as information only to assist with the diagnosis of Navigation System concerns.

This version 2 has been issued due to changes to the workshop procedure for 'Nothing Appears on the Display Screen' in 'Troubleshooting from symptom' section and expected readings in 'TROUBLESHOOTING FROM DTC' section, and is a replacement for Technical Bulletin A419-09. Please destroy all copies of A419-09 and replace it with this Technical Bulletin A419-09v2.

Action

The following procedures will assist in diagnosing faults with the Navigation and Display System alone, troubleshooting from the symptom or logged Diagnostic Trouble Codes (DTCs). If a fault lies with the Audio, Telephone or Climate Control systems, diagnosis must be made using the diagnostic tools and information made available for those systems.

To retrieve any stored Navigation System DTCs; press and hold the 'Menu' and 'Telephone' hard keys simultaneously, when the keypad screen appears release the hard keys, enter the code 917 and press the 'Enter' soft key, select the 'Self Check' soft key from the 'On Screen Diagnostics' menu and if any DTCs are stored, they will be displayed on screen.

The WDS unit can be used in multi meter mode to check wiring harness integrity.

TROUBLESHOOTING FROM SYMPTOM

Unable to insert or eject map disc

- Is the ignition switch in the 'Accessory' position?
 - If NO = turn ignition switch to 'Accessory' position
 - If YES = ↓
- Check for battery voltage at navigation module electrical connector NA007 pin 11. Is battery voltage seen?
 - If NO = Check for faulty wiring harness, or faulty battery
 - If YES = Faulty navigation module

Global Positioning System (GPS) mark does not disappear from screen (unable to receive GPS signals)

Note: Position vehicle outside of workshop when carrying out this diagnosis.

Ensure ignition is switched to 'Accessory' position. Enter 'On-Screen Diagnostics' screen by simultaneously pressing and holding 'Menu' and 'Telephone' hard keys. When keypad screen is displayed release hard keys, enter code '917' and press 'Enter' soft key.

- Select the 'Navigation Info', then 'GPS Information' soft keys. After 10 or more minutes have elapsed, is a value of 'P' or 'T' displayed on the 'GPS Information' screen under any of the columns headed 'St'? This indicates that a signal is being received from a satellite.
 - If YES = Wait until three or more signals from satellites are being received so that the position can be calculated
 - If NO = ↓
- Can signals be received after the GPS antenna has been replaced?
 - If YES = Faulty GPS antenna
 - If NO = Faulty navigation module

Present position cursor does not follow the route being taken

Ensure the map DVD is to the latest level.

Ensure ignition is switched to 'Accessory' position. Enter 'On-Screen Diagnostics' screen by simultaneously pressing and holding 'Menu' and 'Telephone' hard keys. When keypad screen is displayed release hard keys, enter code '917' and press 'Enter' soft key.

- Select the 'Navigation Info', then 'Vehicle Signals' soft keys. When the vehicle is driven at a minimum speed of 5 Km/h, is a value greater than 0 displayed against 'Speed' in the 'Vehicle Info'?
 - If NO = Investigate the SCP lines. Navigation module electrical connector NA007 Pins 4 and 14
 - If YES = ↓
- Does the value displayed in the 'Vehicle Info' differ significantly from the value displayed on the Speedometer?
 - If YES = Set ignition switch to 'OFF' then back to 'Accessory' position. Switch navigation 'ON' and navigate to 'Navigation Menu', select 'Navigation Set Up', then 'Calibration', and 'Distance' soft keys. Return to the 'Navigation Info' screen and select the 'Vehicle Signals' soft key, drive the vehicle a minimum of 10 km then observe the conditions. If the value displayed in the 'Vehicle Info' differs significantly from the value displayed on the Speedometer suspect a faulty navigation module
 - If NO = ↓
- Does the value next to 'Relative Bearing' in the 'Gyro Info' change when the vehicle is turned right or left?
 - If NO = Faulty navigation module
 - If YES = Refer to the diagnostic strategy associated to DTC \$A205

Navigation does not emit voice guidance

Note: The navigation system will only support voice guidance when, a route has been calculated for a desired destination.

- Does the audio system emit sound?
 - If NO = Faulty audio system
 - If YES = ↓
- Ensure ignition is switched to 'Accessory' position, switch Navigation 'ON' and navigate to 'Navigation Menu'. Is the voice guidance enable soft key selected?
 - If NO = Select the voice guidance soft key, plan a new route and re-test
 - If YES = ↓
- Select the 'Menu' hard key, then the 'Volume Preset' soft key. Is the 'NAV' volume preset set to minimum?
 - If YES = Increase the volume level and re-test
 - If NO = ↓
- Select a desired position as a destination and allow the system to calculate the route. Press the start soft key. Is voice emitted?
 - If YES = Normal, no further action required

- If NO = ↓
- Check the D2B network fiber optic cable integrity using the D2B network tester 415-S003. Was a fault identified?
 - If NO = Faulty audio system or navigation module
 - If YES = Faulty wiring harness

Nothing appears on the display screen (blank screen)

- Was the ignition turned 'OFF' when the software was being updated to a later version?
 - If YES = Turn the ignition from 'OFF' to 'ON', insert the software update disc
 - Does the display screen recover after five minutes have elapsed from ignition 'ON'?
 - If YES = No further action required
 - If NO = ↓
 - Check both sides of map disc for contamination and damage to surfaces. Is contamination/damage evident?
 - If NO = Replace navigation module
 - If YES = ↓
 - Remove contamination from disc or replace if it is damaged, turn the ignition from 'OFF' to 'ON', and re-insert map disc into navigation module
 - Does the display screen recover after five minutes have elapsed after re-inserting the disc?
 - If YES = No further action required
 - If NO = Faulty navigation module
 - If NO = ↓
- Ensure ignition switch is set to 'Accessory' position. Check for battery voltage at navigation module electrical connector NA007 pins 1 and 11. Is battery voltage seen?
 - If NO = Check for faulty wiring harness
 - If YES = ↓
- Does the compact LCD display appear normal?
 - If NO = Ensure ignition switch is set to 'Accessory' position. Check for battery voltage at navigation switch and display module electrical connector IP070 pins 1 and 2. Is battery voltage seen?
 - If NO = Check for faulty wiring harness
 - If YES = ↓
- Enter the 'Display Inspection Menu' screen by pressing the NAV, Right Temperature Up, and Audio buttons in the following sequence;
NAV - Right Temp. Up - NAV - Right Temp. Up - NAV - Right Temp. Up - Audio - Audio - Audio
- Select the 'DIAG.' soft key. Are any DTCs logged?
 - If YES = Carry out associated diagnostic strategy and re-test
 - If NO = ↓
- Select the 'HARD SW' soft key and check all hard keys. Are all hard keys functioning correctly?
 - If NO = Faulty navigation switch and display module
 - If YES = ↓
- Select the 'SOFT SW' soft key and check soft key operation. Are soft keys functioning correctly?
 - If NO = Faulty navigation switch and display module
 - If YES = ↓
- Select the 'COLOR BAR' soft key and select each color in turn to check screen color. Is screen color management correct?
 - If NO = Faulty navigation switch and display module
 - If YES = Faulty navigation module

The TV screen does not show an image or emit sound (on a vehicle equipped with TV tuner)

Note: Position vehicle outside of workshop when carrying out this diagnosis.

- Ensure the ignition is in the 'Accessory' position. Does the 'TV' soft key appear on screen when the 'Menu' hard key is pressed?
 - If NO = Faulty display unit
 - If YES = ↓
- Select the 'TV' soft key, and then select a channel where a signal can be received (by using auto preset). Does an image appear on the TV screen?
 - If NO = ↓
 - Enter 'On-Screen Diagnostics' screen by simultaneously pressing and holding 'Menu' and 'Telephone' hard keys. When keypad screen is displayed release hard keys, enter code '917' and press 'Enter' soft key. Select the 'Manual Check' then 'Signal Input Check' soft keys. In the TV signals box 'ANT1' to 'ANT4' should be displayed with 'OK' next to each one
 - If YES = Faulty navigation switch and display module
 - If NO = Check for faulty antenna wiring, antenna, or antenna amplifier
 - If YES = ↓
- Select 'Audio' hard key, and set the audio volume to an optimum level. Does the audio emit sound?
 - If NO = Suspect faulty audio system
 - If YES = ↓
- Select the 'Menu' hard key then 'TV' soft key and select a channel where a signal can be received. Is the TV sound normal?
 - If YES = No further action is required
 - If NO = ↓
- Check electrical wiring harness between navigation module electrical connector NA002 pins 1,7,2 and 8 and navigation switch and display module electrical connector IP070 pins 19,20,21 and 22.
- Is the wiring harness OK?
 - If NO = Repair the wiring harness
 - If YES = ↓
- Check the D2B network fiber optic cable integrity using the D2B network tester 415-S003. Was a fault identified?
 - If YES = Faulty cable
 - If NO = Make all connections and select navigation hard key. Navigate to map screen and select the voice guidance soft key in lower right corner of screen. Is voice emitted?
 - If NO = Faulty navigation module
 - If YES = Faulty navigation switch and display module

Navigation screen is not displayed when 'NAV' hard key is selected

Note: A map disc must be inserted for the navigation system screen to be displayed.

Ensure ignition is switched to 'Accessory' position. Enter 'On-Screen Diagnostics' screen by simultaneously pressing and holding 'Menu' and 'Telephone' hard keys. When keypad screen is displayed release hard keys, enter code '917' and press 'Enter' soft key.

- Select 'Manual Check', 'Display Test' then 'HARD SW' soft keys. Check the 'NAV' hard switch functionality. Is the switch functioning OK?
 - If NO = Faulty navigation switch and display module
 - If YES = ↓
- Navigate back to the 'On-Screen Diagnostics' menu, select 'Navigation Info', 'Reset position' then 'Reset' soft keys. Switch ignition 'OFF' then back to 'Accessory' position. Is the navigation screen displayed when the 'NAV' hard key is selected?
 - If YES = No further action required
 - If NO = ↓
- Check electrical harness between navigation module and navigation switch and display module. Is a fault evident?

- If YES = Repair/replace harness as required
- If NO = Faulty navigation module

Map screen is not displayed

- Is there a message displayed on the navigation display screen stating 'The disk installed is not a MAP DVD'?
 - If YES = Ensure the disc inserted is a map DVD and it is installed in the correct orientation
 - If NO = ↓
- Is the inserted map disc correct for market?
 - If NO = Replace with the correct map disc
 - If YES = ↓
- Check both sides of map disc for contamination and damage to surfaces. Is contamination/damage evident?
 - If YES = Remove contamination from disc or replace if it is damaged, re-insert map disc into navigation module
 - If NO = Replace the navigation ECU

No audible feedback from hard or soft keys

- Select the 'Menu' hard key, then 'System Setup' and 'User Settings' soft keys. Select 'All' soft key against 'Audible Feedback' then 'OK' soft key. Is there now audible feedback from the hard and soft keys?
 - If YES = No further action required
 - If NO = ↓
- Check the DC-LAN wiring harness integrity between navigation module electrical connector NA001 pins 7 and 20, and navigation switch and display module electrical connector IP070 pins 4 and 15. Is there a fault with the wiring harness?
 - If YES = Replace the wiring harness
 - If NO = Faulty navigation switch and display module

Soft keys do not function

Ensure ignition is switched to 'Accessory' position. Enter 'On-Screen Diagnostics' screen by simultaneously pressing and holding 'Menu' and 'Telephone' hard keys. When keypad screen is displayed release hard keys, enter code '917' and press 'Enter' soft key.

- Select the 'Manual Check' then 'Display Test' soft keys. Select and run the soft key test within the 'Disp. Inspection Menu'. Was a fault identified?
 - If YES = Faulty display
 - If NO = ↓
- Turn the ignition switch 'OFF' then back to 'Accessory' position. Can the soft keys be operated on the navigation screen?
 - If NO = Faulty navigation ECU
 - If YES = ↓
- Can the soft keys be operated on the audio screen?
 - If NO = Check audio and related devices
 - If YES = ↓
- Can the soft keys be operated (to switch modes) on the climate control screen?
 - If NO = Check the climate control and related devices
 - If YES = ↓
- Can the soft keys be operated on the telephone screen?
 - If NO = Check telephone and other related devices
 - If YES = Check screen for damage and cleanliness

Clock is not displayed on the compact LCD display

- Select the 'Audio' hard key. Can the audio be operated using the touch screen soft keys?
 - If NO = Check SCP lines at navigation module electrical connector NA007 pins 4 and 14 for integrity
 - If YES = ↓
- Select the temperature up or down switch. Does the temperature displayed on the compact LCD screen change?
 - If NO = Faulty navigation switch and display module
 - If YES = ↓
- Check the DC-LAN wiring harness integrity between navigation module electrical connector NA001 pins 7 and 20 and navigation switch and display module electrical connector IP070 pins 4 and 15. Is a fault evident?
 - If YES = Repair/replace wiring harness
 - If NO = Check the audio system and the related devices

TROUBLESHOOTING FROM DTC

\$A197 Screen malfunction (white or dark screen)

Note: Position the vehicle outside of the workshop when carrying out this diagnosis.

- Select the 'Menu' hard key then 'TV' soft key. Does the caution 'TV ERROR' appear?
 - If YES = Replace navigation switch and display unit
 - If NO = ↓
- Measure the antenna terminal voltages at the navigation switch and display module. Does the display output 8 ± 0.5 Volts?
 - If YES = Check the TV antenna, amplifier and associated wiring harness for integrity
 - If NO = Replace the navigation switch and display unit

\$A204 Open or short circuit in GPS antenna circuit

- Disconnect GPS antenna electrical connector NA006 from the navigation module. Check circuit resistance between pins 1 and 2 is equal to or greater than 190 ohms?
 - If YES = Check for poor connection between GPS antenna electrical connector NA006 and navigation module. If fault found, rectify and re-test. If no fault found suspect faulty navigation module
 - If NO = ↓
- Disconnect GPS antenna electrical connector NA012 from the GPS antenna. Check circuit resistance between pins 1 and 2 is equal to or greater than 190 ohms?
 - If NO = Replace the GPS antenna
 - If YES = ↓
- Check wiring for integrity between NA006 and NA012. Was a fault identified?
 - If YES = Rectify and re-test
 - If NO = Suspect poor connection at NA012

\$A205 GPS receiver malfunction

Note: When the signals from three or more satellites are received, the GPS mark disappears. If two or fewer signals are received the GPS mark will continue to be displayed on screen.

- Carry out diagnostic strategy associated with DTC \$A204. Is a fault evident?
 - If YES = Rectify as required and re-test
 - If NO = Faulty navigation module

\$A206 Gyro malfunction

- Is the navigation module mounted securely?
 - If NO = Correctly mount the navigation module

- If YES = ↓
- Ensure ignition is switched to 'Accessory' position. Enter 'On-Screen Diagnostics' screen by simultaneously pressing and holding 'Menu' and 'Telephone' hard keys, when keypad screen is displayed release hard keys, enter code '917' and press 'Enter' soft key. Then select the 'Navigation Info' and 'Vehicle Signals' soft keys and monitor the voltage in the 'Gyro Info'. When the vehicle is stopped, in Park with the parking brake applied, the voltage output should be approximately 2400-2500 mV. Is it within this range?
 - If NO = Replace the navigation module
 - If YES = ↓

Note: Carry out the following step approximately five times.

When driving the vehicle does the output voltage vary when the vehicle is turned left or right?

- If NO = Replace the navigation module
- If YES = Clear DTC and re-test

\$A207 Navigation module malfunction

Replace the navigation module

\$A208 Communication failure between navigation module and navigation switch and display module

- Disconnect the navigation switch and display module electrical connector IP070 and check resistance through switch and display module between pins 4 and 15. Is it 68 ± 7 ohms?
 - If NO = Replace the navigation switch and display module
 - If YES = ↓
- Disconnect the navigation module electrical connector NA001 and check for continuity through the module at pin 7 to ground and pin 20 to ground. Is there continuity?
 - If YES = Replace the navigation module
 - If NO = ↓
- Check wiring harness for integrity between electrical connectors IP070 pins 4 and 15 and NA001 pins 7 and 20. Is a fault present?
 - If YES = Replace or repair the affected wiring harness
 - If NO = ↓
- Does the fault code 50 or 51 appear on the small LCD display
 - If YES = Replace the navigation module
 - If NO = Replace the navigation switch and display module

\$A646, \$A647, \$A648, \$A649 \$A650, \$A651, \$A652, \$A653 Open or short circuit in TV antenna, amplifier or associated wiring

- Check for an output voltage of 8 ± 0.5 volts at the navigation switch and display module antenna terminals. Is a voltage of 8 ± 0.5 volts seen?
 - If NO = Replace navigation switch and display module
 - If YES = Check for open/short circuit in TV antenna, amplifier and associated wiring harness