

GROUP 54B

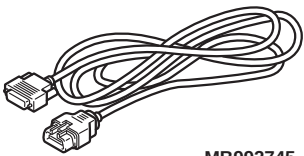
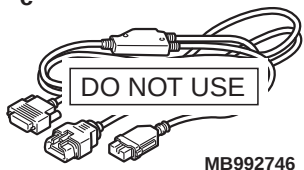
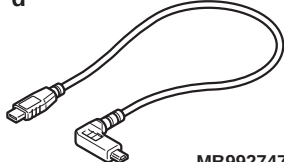
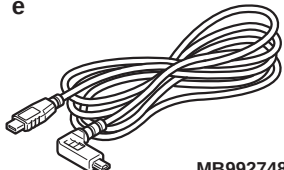
LOCAL
INTERCONNECT
NETWORK (LIN)

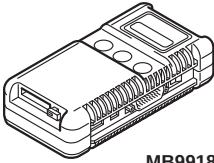
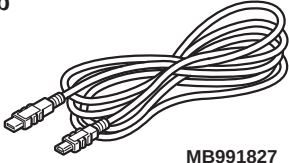
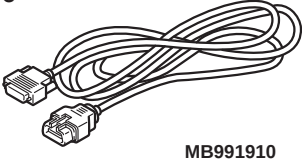
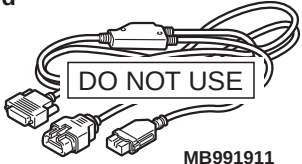
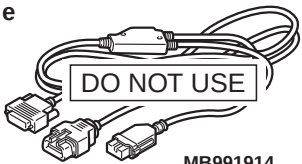
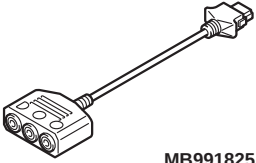
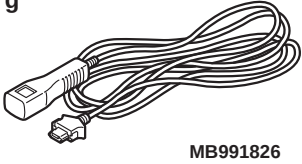
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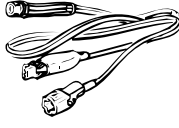
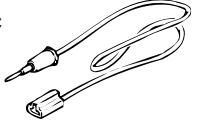
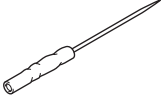
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SPECIAL TOOLS

M1545100100271

Tool	Tool number and name	Supersession	Application
a  MB992744	a. MB992744 b. MB992745 c. MB992746 d. MB992747 e. MB992748	—	LIN communication line check (diagnostic trouble codes)
b  MB992745	a. Vehicle communication interface-Lite (V.C.I.-Lite) b. V.C.I.-Lite main harness A (for vehicles with CAN communication)		
c  MB992746	c. V.C.I.-Lite main harness B (for vehicles without CAN communication) d. V.C.I.-Lite USB cable short e. V.C.I.-Lite USB cable long		
d  MB992747			
e  MB992748 ACB05421AB			

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 g  MB991826 MB991958	MB991958 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991914 f. MB991825 g. MB991826 M.U.T.-III sub-assembly a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III main harness C (for Chrysler models only) f. M.U.T.-III measurement adapter g. M.U.T.-III trigger harness	MB991824-KIT <i>NOTE: G: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.</i>	⚠ CAUTION M.U.T.-III main harness A (MB991910) should be used. M.U.T.-III main harness B and C should not be used for this vehicle. LIN communication line check (diagnostic trouble codes)

Tool	Tool number and name	Supersession	Application
a  b  c  d 	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222 Harness set a. Check harness b. LED harness c. LED harness adapter d. Probe	General service tool (jumper)	Continuity check and voltage measurement at harness wire or connector a. For checking connector pin contact pressure b. For checking power supply circuit c. For checking power supply circuit d. For connecting a locally sourced tester
 MB992006	MB992006 Extra fine probe	—	Continuity check and voltage measurement at harness wire or connector

DIAGNOSIS

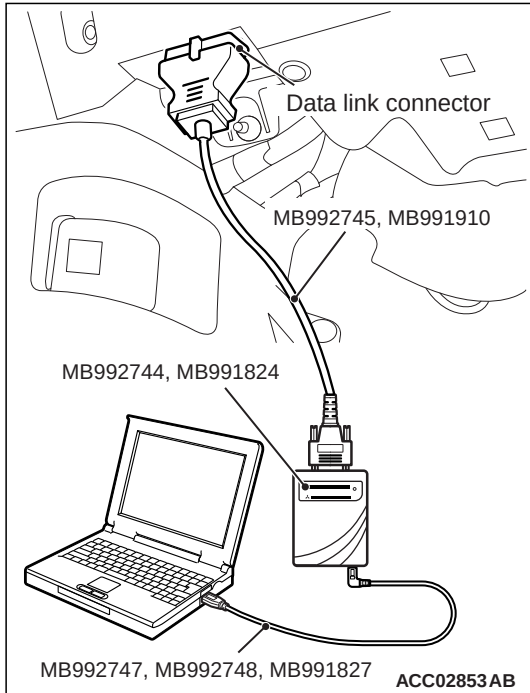
DIAGNOSIS FUNCTION

M1545104200128

HOW TO CONNECT THE SCAN TOOL (M.U.T.-III)

Required Special Tools:

- MB992744: Vehicle communication interface-Lite (V.C.I.-Lite)
- MB992745: V.C.I.-Lite main harness A
- MB992747: V.C.I.-Lite USB cable short
- MB992748: V.C.I.-Lite USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



CAUTION

To prevent damage to scan tool (M.U.T.-III), always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool (M.U.T.-III).

1. Ensure that the ignition switch is at the "LOCK" (OFF) position.
2. Start up the personal computer.
3. Connect special tool MB992747/M992748 or special tool MB991827 to special tool MB992744 or special tool MB991824 and the personal computer.
4. Connect special tool MB992745 or special tool MB991910 to special tool MB992744 or special tool MB991824.
5. Connect special tool MB992745 or special tool MB991910 to the data link connector.

NOTE: When the special tool MB992745 is connected to the data link connector, the special tool MB992744 indicator light will be illuminated in a green color.

6. Turn the power switch of special tool MB991824 to the "ON" position. <When using the special tool MB991824>

NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.

7. Start the M.U.T.-III system on the personal computer.

NOTE: Disconnecting scan tool (M.U.T.-III) is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.

HOW TO READ AND ERASE DIAGNOSTIC TROUBLE CODES

Required Special Tools:

- MB992744: Vehicle communication interface-Lite (V.C.I.-Lite)
- MB992745: V.C.I.-Lite main harness A
- MB992747: V.C.I.-Lite USB cable short
- MB992748: V.C.I.-Lite USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

NOTE: If the battery voltage is low, diagnostic trouble codes will not be stored. Check the battery if scan tool (M.U.T.-III) does not display.

1. Connect scan tool (M.U.T.-III) to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "System select" from the start-up screen.
4. Select "From 2006 MY" of "Model Year." When the "Vehicle Information" is displayed, check the contents.
5. Select "Meter" from "System List," and press the "OK" button.

NOTE: When the "Loading Option Setup" list is displayed, check the applicable item.

6. Select "Diagnostic Trouble Code" to read the DTC.
7. If a DTC is stored, it is shown.
8. Choose "Erase DTCs" to erase the DTC.

DIAGNOSTIC TROUBLE CODE CHART

M1545100201088

DTC No.	Diagnostic item	Reference page
U1500	Column ECU LIN timeout/Not equip	P.54B-6
U1507	LIN transmission bit error	P.54B-8
U1530	Column ECU LIN checksum error	P.54B-8
U1570	No bus activity error for LIN	P.54B-8

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC U1500: Column ECU LIN timeout/Not equip

CAUTION

Whenever the ECU is replaced, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

JUDGMENT CRITERIA

The ETACS-ECU will store DTC No. U1500 when no signals are received from the column switch (column-ECU).

TROUBLESHOOTING HINTS

- The column switch may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe

STEP 1. Resistance measurement at the column switch connector

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Measure the resistance between the column switch connector (GND terminal) and the ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?

YES : Go to Step 3.

NO : Go to Step 2.

STEP 2. Check of open circuit in GND line between column switch connector and ground

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

STEP 3. Voltage measurement at the column switch connector.

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Measure the voltage between the column switch connector (+B terminal) and the ground.

OK: The voltage should measure approximately 12 volts (battery positive voltage).

Q: Is the check result normal?

YES : Go to Step 5.

NO : Go to Step 4.

STEP 4. Check of short to power supply, and open circuit in +B line between column switch connector and junction block connector.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

STEP 5. Check of open circuit in LIN line between ETACS-ECU connector and column switch connector.

Q: Is the check result normal?

YES : Go to Step 6.

NO : Repair the connector(s) or wiring harness.

STEP 6. Recheck for diagnostic trouble code.

Check again if the DTC is set in the ETACS-ECU.

** CAUTION**

To prevent damage to scan tool (M.U.T.-III), always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool (M.U.T.-III).

- (1) Connect scan tool (M.U.T.-III). Refer to "How to connect the Scan Tool (M.U.T.-III) [P.54B-4](#)."
- (2) Erase the DTC.
- (3) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
- (4) Check if DTC is set.

Q: Is the DTC set?

YES : Replace the column switch.

NO : A poor connection, open circuit, or other intermittent malfunctions in the LIN bus lines between the column switch and the ETACS-ECU (Refer to GROUP 00 – How to Cope with Intermittent Malfunction [P.00-13](#)).

DTC U1507: LIN transmission bit error

JUDGMENT CRITERIA

The ETACS-ECU receives and sends data simultaneously. If the data contains a fault, the ETACS-ECU will store DTC No. U1507.

TROUBLESHOOTING HINTS

- The slave ECU may be defective
- The ETACS-ECU may be defective
- Electrical noise generated in the LIN bus lines

DTC U1530: Column ECU LIN checksum error

JUDGMENT CRITERIA

The ETACS-ECU will store DTC No. U1530 when abnormal signals are received from the column switch (column-ECU).

TROUBLESHOOTING HINTS

- The column switch may be defective.

DTC U1570: No bus activity error for LIN

** CAUTION**

Whenever the ECU is replaced, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

TROUBLE JUDGMENT

The ETACS-ECU will store DTC No. U1570 when no communication has been carried out for more than a certain period after it received last valid data.

TROUBLESHOOTING HINTS

- The ETACS-ECU may be defective
- The slave ECU may be defective
- LIN bus lines shorted to power supply
- LIN bus lines shorted to ground

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe

STEP 1. Check of open circuit in LIN line between ETACS-ECU connector and column switch connector.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the connector(s) or wiring harness.

STEP 2. Measure the voltage at the LIN bus lines.

Check the LIN bus lines for short to power supply.

- (1) Disconnect all the ECU connectors which are connected to the LIN bus lines.
- (2) Turn the ignition switch from "LOCK" (OFF) to "ON" position.
- (3) Measure the voltage between column switch connector (wiring harness side: DATA terminal) and ground.
 - The voltmeter needle does not swing.

NOTE: If the LIN bus lines are short to power supply, the voltmeter indicates a constant value.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the connector(s) or wiring harness.

STEP 3. Measure the resistance at the LIN bus lines.

Check the LIN bus lines for short to ground.

- (1) Disconnect all the ECU connectors which are connected to the LIN bus lines.
- (2) Measure the resistance value between column switch connector (wiring harness side: DATA terminal) and ground.
 - No continuity (1 k Ω or more)

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the connector(s) or wiring harness.

STEP 4. Check the column switch.

Disconnect column switch connector, and recheck whether DTC No. U1570 is set.

⚠ CAUTION

To prevent damage to scan tool (M.U.T.-III), always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool (M.U.T.-III).

- (1) Connect scan tool (M.U.T.-III). Refer to "How to connect the Scan Tool (M.U.T.-III) [P.54B-4](#)."
- (2) Connect all the relevant ECUs, and disconnect column switch connector only.
- (3) Erase the DTC.
- (4) Turn the ignition switch from "LOCK" (OFF) to "ON" position.
- (5) Check whether DTC No. U1570 is set.

NOTE: If DTC No. U1570 is not set, DTC No. U1500 is set because the column switch is disconnected. This is normal.

- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC No. U1570 set?

YES : Reconnect the column switch connector, and go to Step 5.

NO : Replace the column switch.

STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set in the ETACS-ECU.

- (1) Erase the diagnostic trouble code.
- (2) Turn the ignition switch from "LOCK" (OFF) to "ON" position.
- (3) Check whether DTC No. U1570 is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the ETACS-ECU.

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction [P.00-13](#)).