

GROUP 51B

WIPER AND WASHER

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REMOVAL AND INSTALLATION. 51B-55

INSPECTION. 51B-56

REAR WIPER AND WASHER. 51B-57

REMOVAL AND INSTALLATION. 51B-57

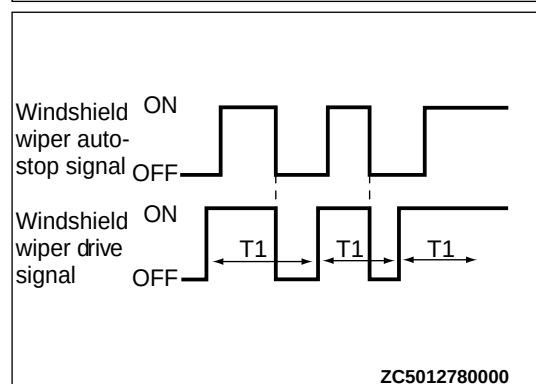
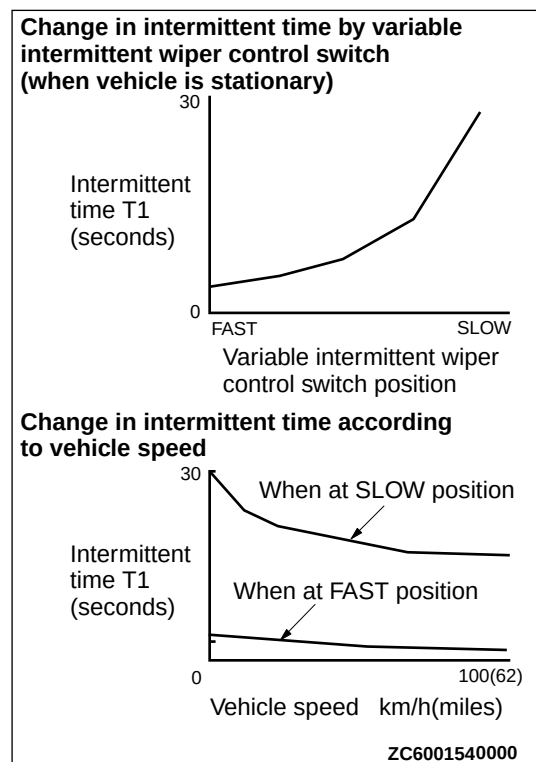
INSPECTION. 51B-59

GENERAL INFORMATION

M15102100032USA0000010000

WINDSHIELD WIPER AND WASHER: DESCRIPTION OF CONSTRUCTION AND OPERATION

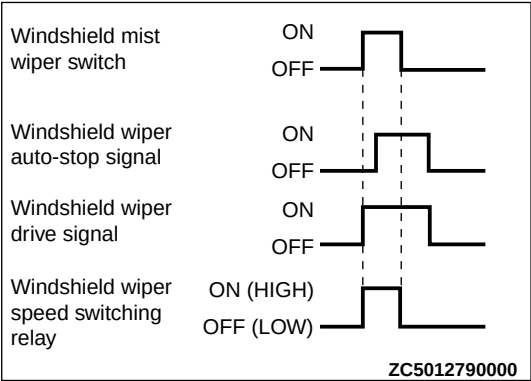
Intermittent control (Vehicle speed-dependent variable type) Initial condition: with function



1. ETACS calculates the windshield intermittent wiper interval T1 from the position of the windshield intermittent wiper switch on the column switch and the vehicle speed signal (sent from the TCM to ETACS via CAN communication).

NOTE: Using the customization function, the vehicle speed-dependent intermittent function can be invalidated. (Refer to P. 51B-48.)

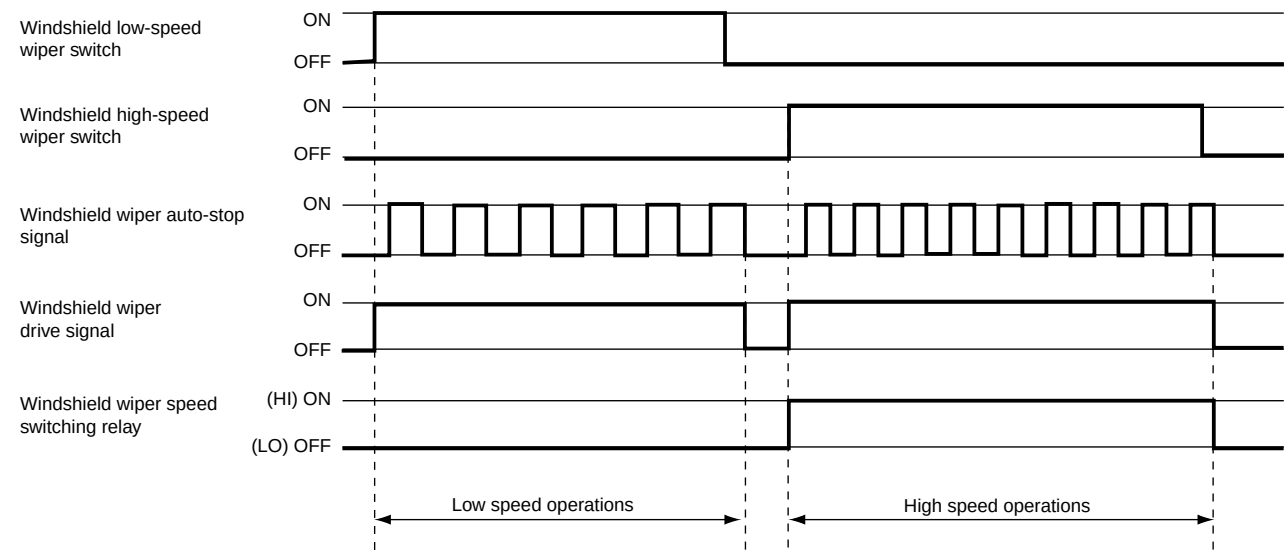
2. When ETACS receives the ON signal of the windshield intermittent wiper switch, it turns the windshield wiper drive signal ON. When the wiper reaches the stop position, the windshield wiper auto-stop signal turns OFF, and the windshield wiper drive signal turns OFF. When the intermittent time T1 calculated by step 1 has elapsed after the windshield wiper drive signal ON, the windshield wiper drive signal turns ON again, and the above-mentioned operation is repeated.



Mist wiper control

When the windshield wiper mist switch on the column switch is turned ON while the ignition switch is in ACC or ON position, the column switch turns the windshield wiper drive signal ON. At the same time, the wiper speed switching relay turns ON (HI). When the windshield mist wiper switch is ON, the windshield wiper operates at high speed.

Low speed wiper and high speed wiper control

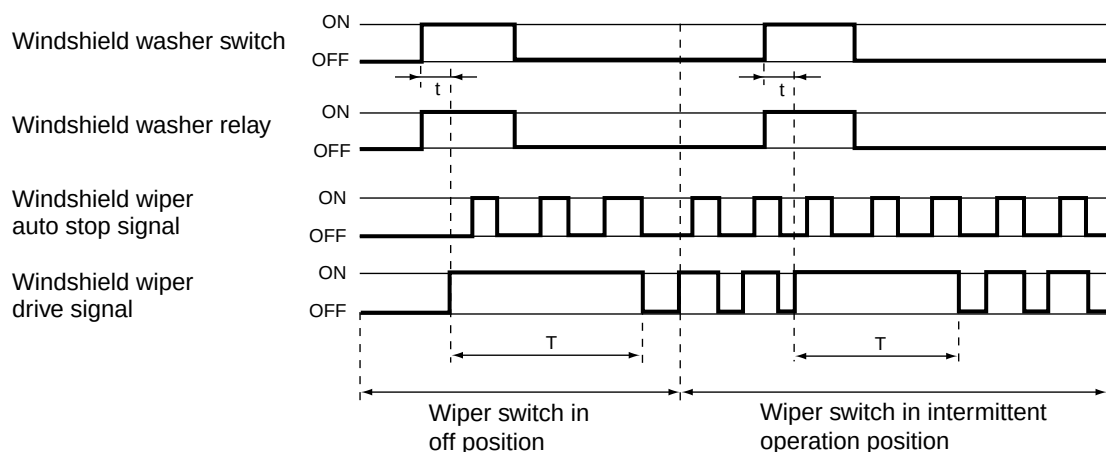


ZC5012800000

When the windshield low speed wiper switch on the column switch is turned ON while the ignition switch is in ACC or ON position, the column switch turns the windshield wiper drive signal ON. Also, the wiper speed switching relay turns OFF (LO), and the windshield wiper operates at low speed.

When the windshield high speed wiper switch is turned ON, the windshield wiper drive signal turns ON. Also, the wiper speed switching relay turns ON (HI), and the windshield wiper operates at high speed.

Windshield wiper linked with washer function Initial condition: with function, with windshield washer check valve



ZC5012810000

Wiper switch	OFF position			Intermittent operation position				Low-speed or high-speed operation position
Washer switch ON time(t)	0.3 second or less	0.3 to 0.5 second	0.5 second or more	0.2 second or less	0.2 to 0.4 second	0.4 to 0.6 second	0.6 second or more	-
T	0 second	2 seconds	3 seconds	0 second	1 second	2 seconds	3 seconds	3 seconds

When the windshield washer switch on the column switch is turned ON while the ignition switch is in ACC or ON position, ETACS turns the windshield washer relay ON.

When the windshield washer switch is kept ON for 0.3 seconds or longer, the windshield wiper drive signal (the wiper drive signal output time varies depending on the conditions. For details, see the table.) is turned ON, and the windshield wiper operates at high speed. The windshield wiper is turned OFF with 3 seconds delay after the windshield washer switch is turned OFF.

Even when the windshield washer switch is turned ON while the windshield wiper is operating intermittently, the intermittent action starts again after the linked operation is finished.

If the ignition switch is turned to ACC position while the windshield washer switch is ON, the windshield washer relay turns ON, but the windshield wiper does not perform the linked operation. When the windshield washer switch is turned OFF and then ON, the windshield wiper starts the linked operation.

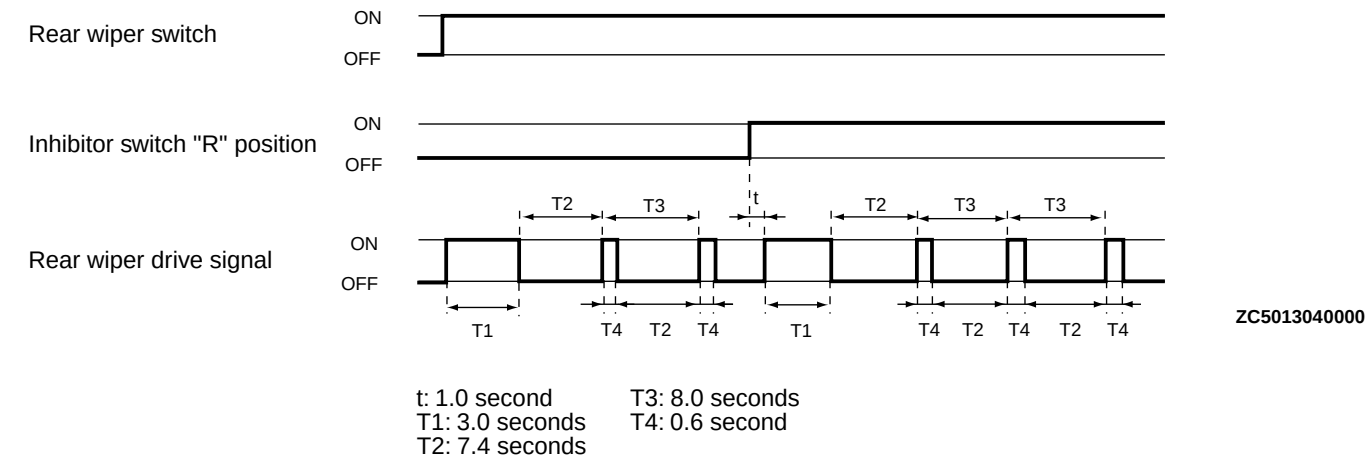
NOTE:

**Using the customization function, the washer linked windshield wiper function can be invalidated. (Refer to P.51B-48.)*

**Using the customization function, when the washer linked windshield wiper function is invalidated, only the washer operates. It is useful to melt ice on a frozen windshield.*

REAR WIPER AND WASHER: DESCRIPTION OF CONSTRUCTION AND OPERATION

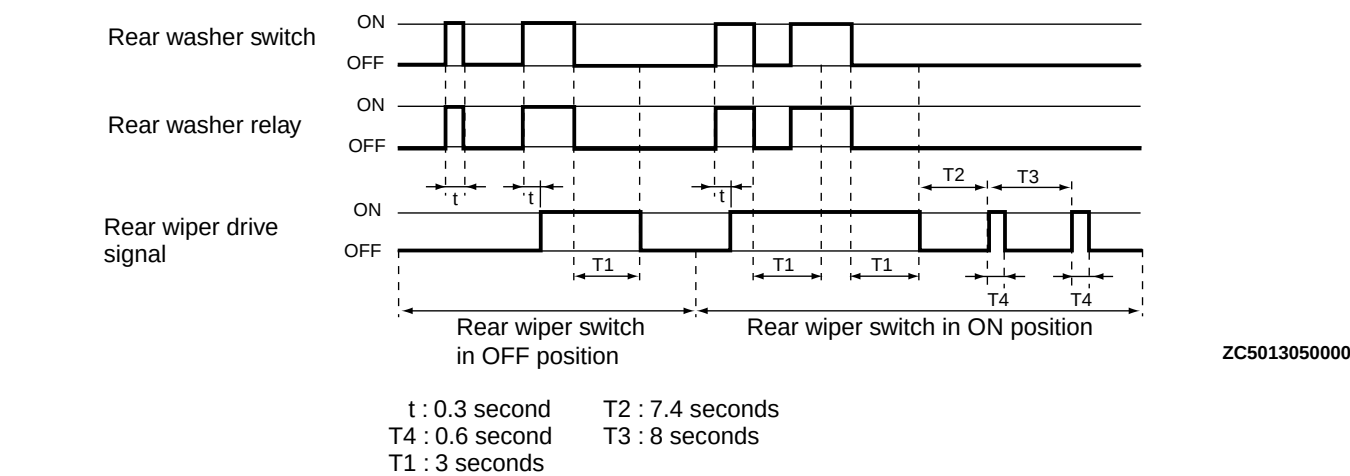
Rear wiper control [Initial condition: 8 seconds (without successive operations)]



- 1. When the rear wiper switch on the column switch is turned ON while the ignition switch is in ACC or ON position, ETACS turns the rear wiper drive signal ON for 3 seconds (for approximately 2 cycles) and operates the intermittent action in 8 seconds interval.
- 2. By the special operation of the rear wiper switch on the column switch (2 consecutive operations), the rear wiper can operate continuously regardless on the set intermittent time.

NOTE: Using the customization function, the rear wiper intermittent time can be adjusted. (Refer to P. 51B-48.)

Rear wiper linked with washer function Initial condition: with function



When the rear washer switch on the column switch is turned ON while the ignition switch is in ACC or ON position, ETACS turns the rear washer relay ON.

The rear washer relay turns ON after the rear washer switch has been ON for 0.3 seconds, then turns the rear wiper drive signal ON to operate the rear wiper simultaneously. When the rear washer switch is turned OFF, after 3 seconds the rear wiper is turned OFF.

If the rear washer switch is turned ON during the rear wiper operation, 7.4 seconds after turning OFF the

rear wiper drive signal turns OFF, the intermittent action is resumed in 8 seconds interval.

NOTE: Using the customization function, the washer linked rear wiper function can be invalidated. (Refer to P. 51B-48.)

SPECIFICATION(S)

SERVICE SPECIFICATION

M15102100001USA0000010000

Item	Standard value
Stop position of the windshield wiper arm/blade assembly mm(in)	Φ 2(0.08) marking ± 5(0.20)
Stop position of rear wiper arm/blade assembly (Distance from the edge of the wiper blade to the edge of the ceramic line on the liftgate glass) mm (in)	0 to 20(0.79) from edge of the ceramic line

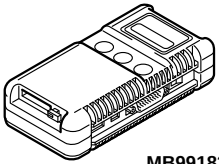
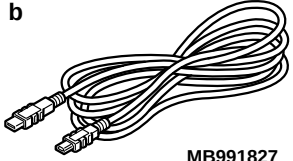
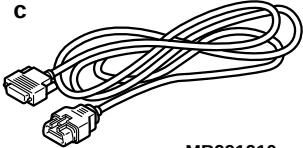
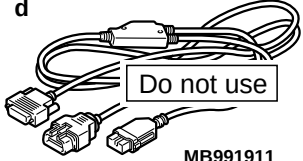
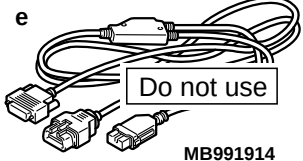
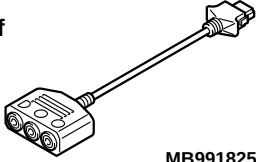
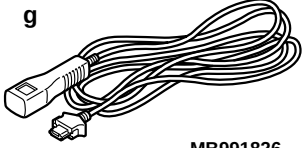
LUBRICANT

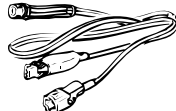
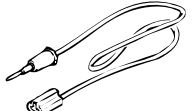
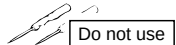
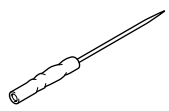
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Item	Specified lubricant	Quantity
Wiper motor link rod	Contact joint between link rod and wiper motor link plate	Multipurpose grease SAE J310, NLGI No.1(mineral oil + Li) or equivalent
		As required

SPECIAL TOOL

M15102100003USA0000010000

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 g  MB991826 YB9919580000	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 Daimler 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. Windshield wiper intermittent time check

Tool	Tool number and name	Supersession	Application
a  b  c  d  YB9912230000	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222 Harness set a. Test harness b. LED harness c. LED harness adaptor d. Probe	General service tools	Continuity check and voltage measurement at harness wire or connector for loose, corroded or damaged terminals, or terminals pushed back in the connector. a. Connector pin contact pressure inspection b. Power circuit inspection c. Power circuit inspection d. Commercial tester connection
 MB992006	MB992006 Extra fine probe	-	Making voltage and resistance measurement during troubleshooting

DIAGNOSIS

TROUBLESHOOTING STRATEGY

1. Gather the information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by the following Symptom Chart.
4. Verify the malfunction is eliminated.

M15102100077USA0000010000

TROUBLE SYMPTOM CHART

M15102100006USA0000010000

TROUBLE SYMPTOM	Inspection procedure No.	Reference page
Windshield wiper does not operate at all	1	P.51B-13
Windshield wiper does not operate at "INT", "Washer" or "Mist", but operate at "Lo" regardless of position "Hi" or "Lo"	2	P.51B-18
Windshield wiper does not stop at predetermined park position	3	P.51B-20
Windshield wiper does not operate correctly	4	P.51B-23
Intermittent wiper interval cannot be adjusted by operating intermittent wiper volume control	5	P.51B-26
Intermittent wiper interval does not depend on vehicle speed	6	P.51B-28
Windshield washer does not work normally	7	P.51B-30

WIPER AND WASHER DIAGNOSIS

TROUBLE SYMPTOM	Inspection procedure No.	Reference page
Rear wiper does not operate at all	8	P.51B-34
Rear wiper does not stop at predetermined park position	9	P.51B-39
When selector lever is moved to "R" position during rear wiper operation, rear wiper does not operate at continuous mode	10	P.51B-42
Rear washer does not work normally.	11	P.51B-44

NOTE: If the ETACS-ECU failed, the windshield wiper will operate only at low speed as a fail-safe measure. (Normally, the windshield wipers operate with the ignition switch at the "ACC"

position. However, during the fail-safe mode, they can operate with the ignition switch at the ON position only.)

SYMPTOM PROCEDURES

GENERAL DESCRIPTION CONCERNING THE WIPER AND WASHER

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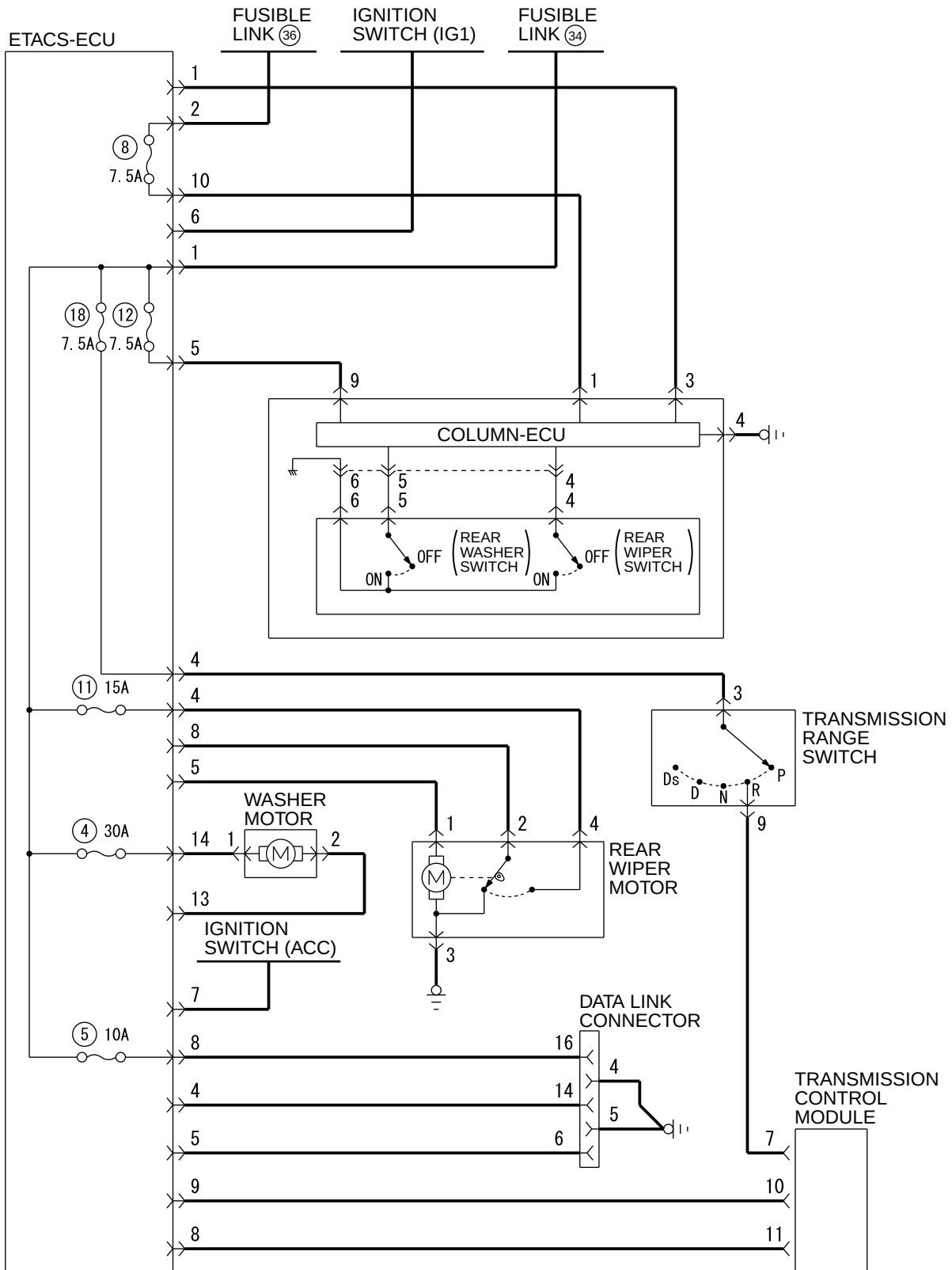
The following ECUs affect the functions and control of the wiper and washer.

FUNCTION		CONTROL ECU
Windshield wiper and washer control function	Intermittent control (Vehicle speed-dependent variable type)	ETACS-ECU, column switch
	Mist wiper control	ETACS-ECU, column switch
	Low-speed wiper, high-speed wiper control	ETACS-ECU, column switch
	Washer control	ETACS-ECU, column switch
Rear wiper control		ETACS-ECU, column switch
Rear washer control		ETACS-ECU, column switch

<Windshield wiper and washer>



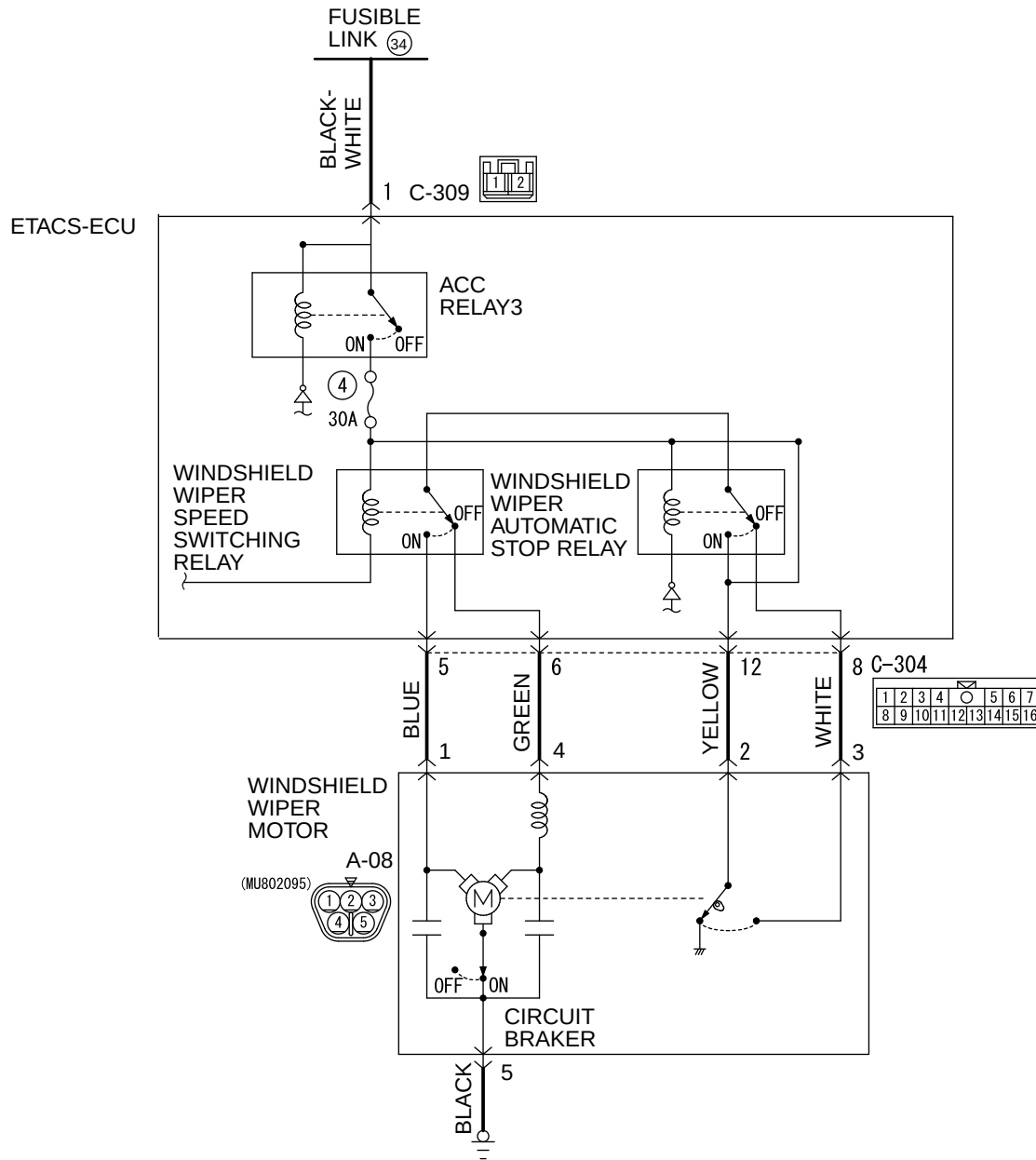
<Rear wiper and washer>



INSPECTION PROCEDURE 1: The windshield wipers do not work at all.

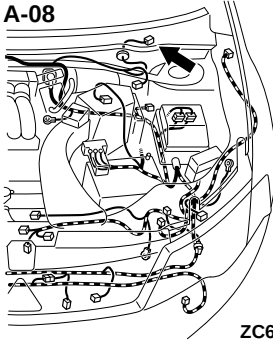
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Windshield Wiper Power Supply Circuit



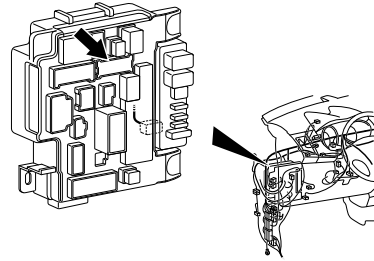
ZC6033060000

Connector: A-08



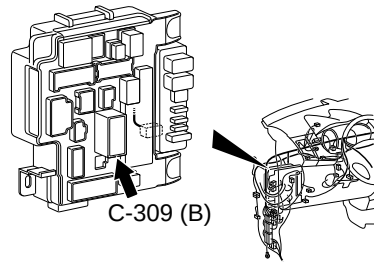
ZC6008720003

Connector: C-304



ZC6008780022

Connector: C-309



ZC6008780009

CIRCUIT OPERATION

- The windshield wiper and washer switch sends a signal through the column-ECU (incorporated in the column switch) to the ETACS-ECU. If the column-ECU sends a windshield wiper and washer switch "ON" signal to the ETACS-ECU, the ETACS-ECU turns on the relay (incorporated in the ETACS-ECU), thus causing the windshield wiper and washer motor to be turned on.
- If the LIN communication line is defective, the ETACS-ECU operates windshield wiper motor by using the other communication lines (wiper backup circuit) instead of that line. In this case, the windshield wiper works at low speed regardless of the windshield wiper and washer switch positions ("LO" or "HIGH").

TECHNICAL DESCRIPTION (COMMENT)

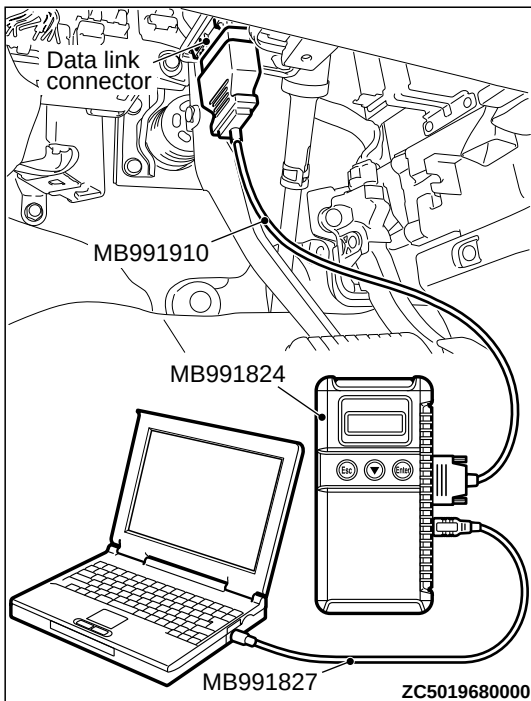
If the windshield wiper does not work at all, the windshield wiper motor, column switch (windshield wiper and washer switch) or the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The wiper motor may be defective
- The column switch may be defective
- The ETACS-ECU may be defective

DIAGNOSIS**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A



STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.

Connect the scan tool. Refer to GROUP 54Ad ETACS, "Diagnostic function P.54Ad-5."

Q:Is the diagnostic trouble code set?

YES: Diagnose the ETACS-ECU. Refer to GROUP 54Ad ETACS, "Diagnostic trouble code chart P.54Ad-8."

NO: Go to Step 2.

STEP 2. Check the input signal related to the windshield wiper operation.

*Ignition switch: ACC

Item No.	Item name	Normal condition
Item 288	ACC switch	ON
Item 235	Front wiper ACT	ON

OK: Normal condition is displayed.

Q:Is the check result normal?

NO: Go to Step 3.

YES: Refer to GROUP 54Ad – ETACS, Input signal procedures P.54Ad-61.

STEP 3. Check windshield wiper motor connector A-08 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

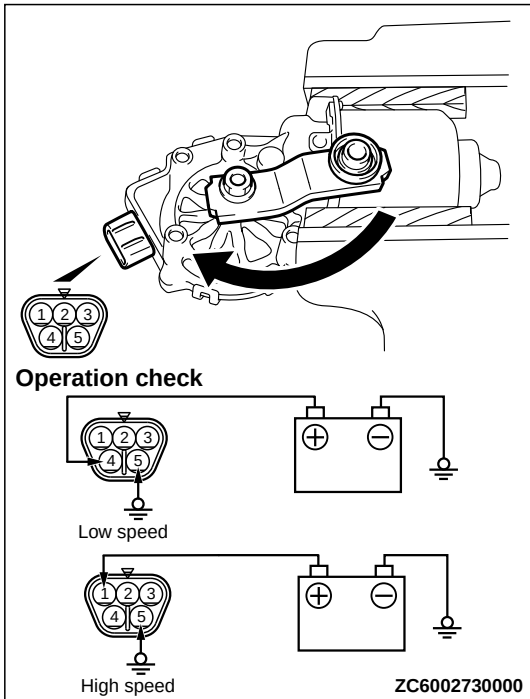
Q:Is windshield wiper motor connector A-08 in good condition?

YES: Go to Step 4.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper works normally.

STEP 4. Check the windshield wiper motor.

(1) Disconnect windshield wiper motor connector A-08.



- (2) Connect a battery to the windshield wiper motor as shown. Then check that the windshield wiper motor operates normally at high and low speeds.

Q: Does the windshield wiper motor operate normally?

YES: Go to Step 5.

NO: Replace the windshield wiper motor. Verify that the windshield wiper works normally.

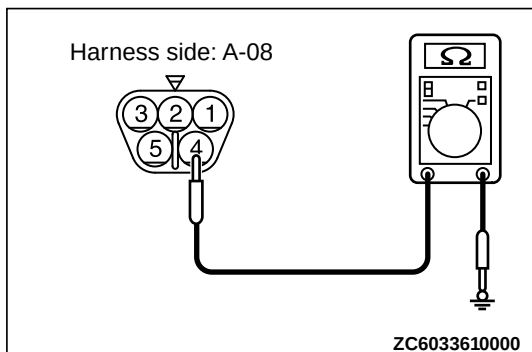
STEP 5. Check the ground circuit to the windshield wiper motor. Measure the resistance at the windshield wiper motor connector A-08.

- (1) Disconnect windshield wiper motor connector A-08 and measure the resistance available at the wiring harness side of the connector.
- (2) Measure the resistance value between terminal 5 and ground.
 - *The resistance should be 2 Ω or less.

Q: Is the measured resistance 2 Ω or less?

YES: Go to Step 7.

NO: Go to Step 6.



STEP 6. Check the wiring harness between windshield wiper motor connector A-08 (terminal 5) and ground.

Q: Is the wiring harness between windshield wiper motor connector A-08 (terminal 5) and ground in good condition?

YES: No action is necessary and testing is complete.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify the windshield wiper works normally.

STEP 7. Check ETACS-ECU connector C-304 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ETACS-ECU connector C-304 in good condition?

YES: Go to Step 8.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper works normally.

STEP 8. Measure the voltage at ETACS-ECU connector C-304.

(1) Disconnect ETACS-ECU connector C-304 and measure the resistance available at the wiring harness side of the connector.

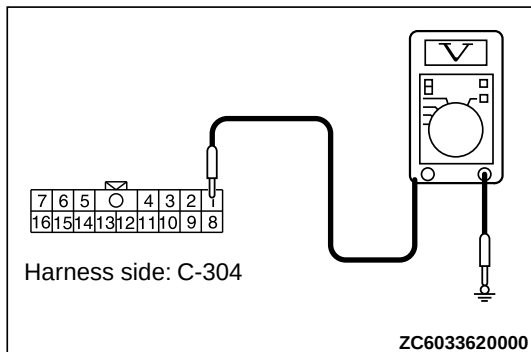
(2) Measure the voltage between terminal 1 and ground.

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

Q: Is the measured voltage approximately 12 volts (battery positive voltage)?

YES: Go to Step 10.

NO: Go to Step 9.



STEP 9. Check the wiring harness between ETACS-ECU connector C-309 (terminal 1) and the fusible link (34).

*Check the power supply line for open circuits.

Q: Is the wiring harness between ETACS-ECU connector C-309 (terminal 1) and the fusible link (34) in good condition?

YES: Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and wire check P.00E-13.

STEP 10. Check the wiring harness between ETACS-ECU connector C-304 (terminals 5, 6) and windshield wiper motor connector A-308 (terminals 1, 4).

*Check the input and output lines for open or short circuit.

Q: Is the wiring harness between ETACS-ECU connector C-304 (terminals 5, 6) and windshield wiper motor connector A-308 (terminals 1, 4) in good condition?

YES: Go to Step 11.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and wire check P.00E-13.

STEP 11. Retest the system.

Check that the windshield wipers work normally.

Q: Is the check result normal?

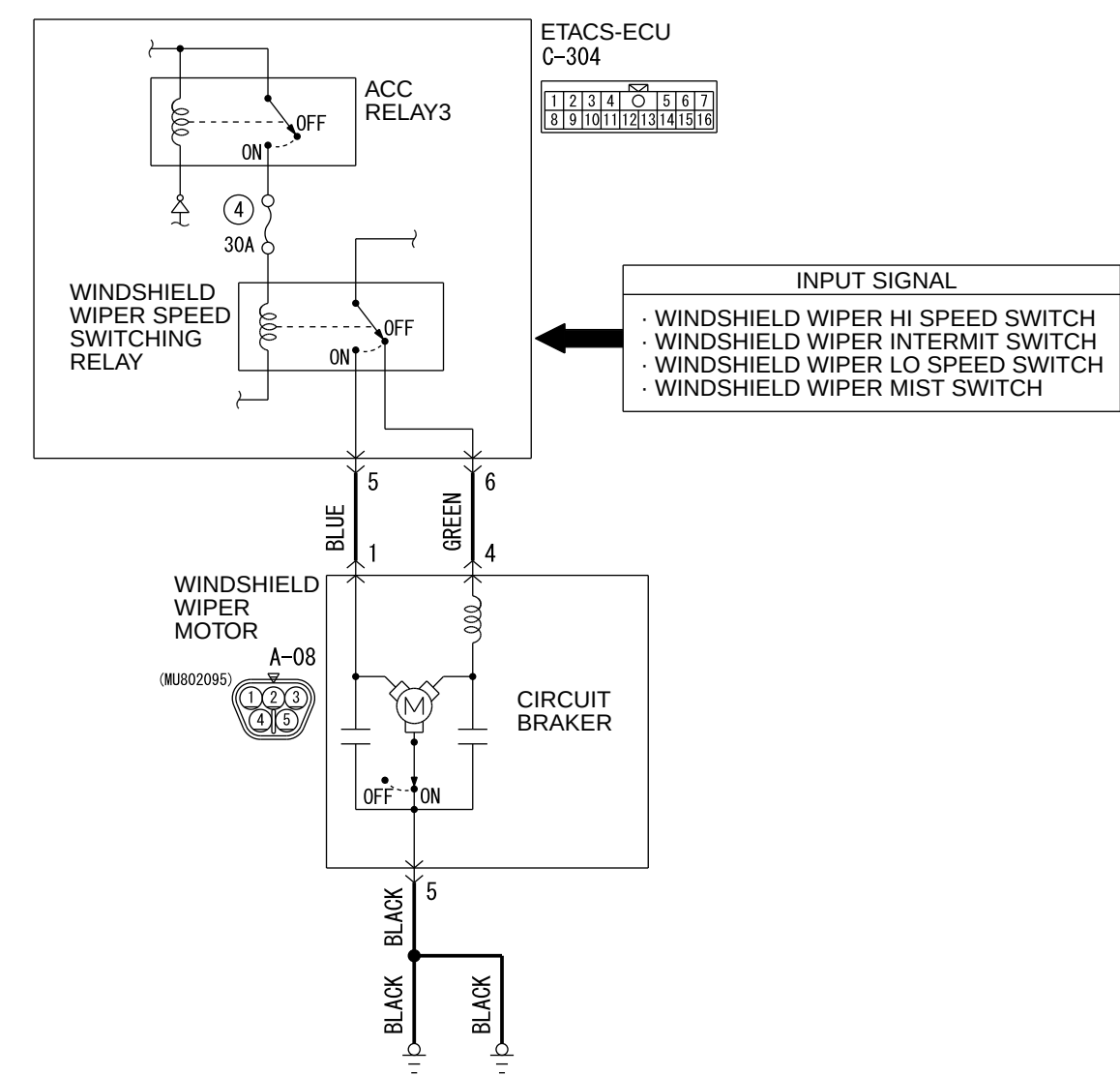
YES: Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

NO: Replace the ETACS-ECU.

INSPECTION PROCEDURE 2: The windshield wipers do not work when the wiper switch is at the "INT", "Washer" or "Mist" position. However, the wipers work at low speed when the switch is at the "Lo" and "Hi" position.

M15102100009USA0000010001

Windshield Wiper Motor Circuit



D7G51M002000

TECHNICAL DESCRIPTION (COMMENT)

This system may be at fail-safe mode if the LIN communication line is defective.

If the system cannot receive any signal from the column switch (windshield wiper and washer switch)

due to a open circuit in the LIN communication line or other reasons, the system will enter the fail-safe mode when the ignition switch is at the "ACC" position.

TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A

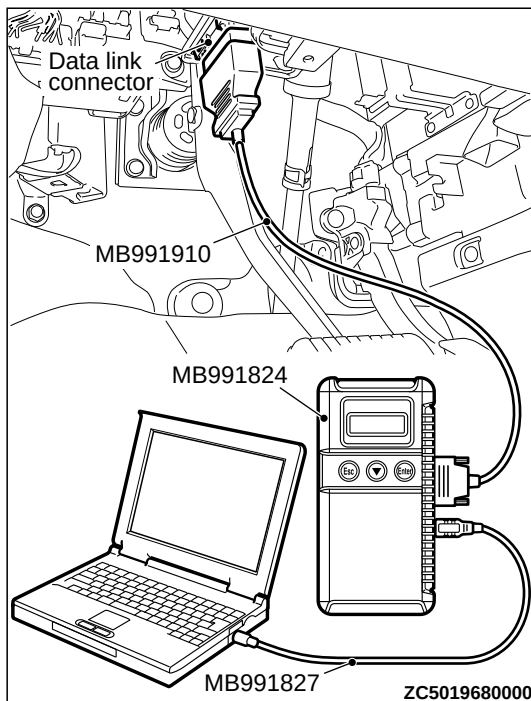
STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.

Connect the scan tool. Refer to GROUP 54Ad ETACS, "Diagnostic function P.54Ad-5."

Q:Is the diagnostic trouble code set?

YES: Diagnose the ETACS-ECU. Refer to GROUP 54Ad ETACS, "Diagnostic trouble code chart P.54Ad-8."

NO: Go to Step 2.



STEP 2. Retest the system.

Check that the windshield wipers work normally.

Q:Is the check result normal?

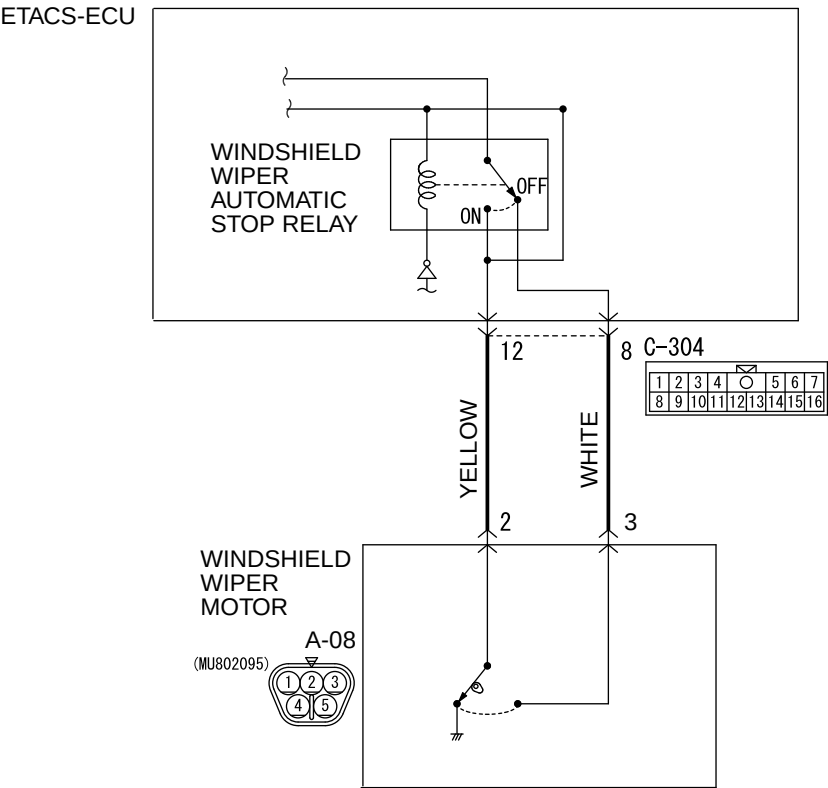
YES: Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

NO: Replace the ETACS-ECU.

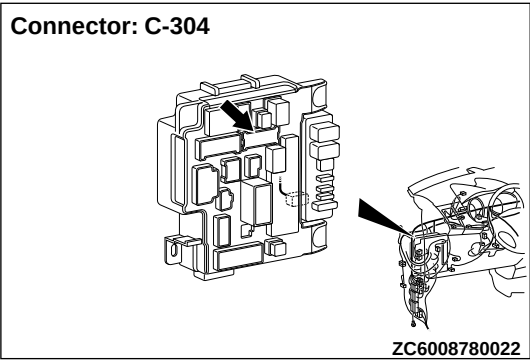
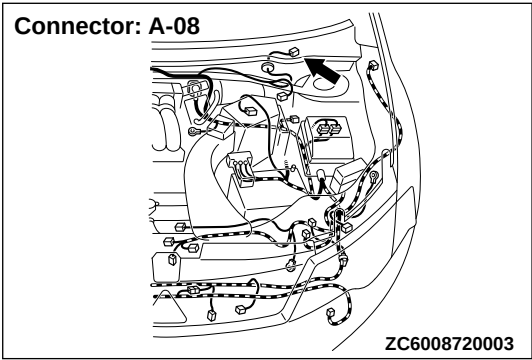
INSPECTION PROCEDURE 3: Windshield wipers do not stop at the specified park position.

M15102100010USA0000010001

Windshield Wiper Automatic Stop Relay Circuit



ZC6033070000



TECHNICAL DESCRIPTION (COMMENT)

If the windshield wipers do not stop at predetermined park position, the windshield wiper motor or the ETACS-ECU may be defective.

- The windshield wiper motor may be defective
- The ETACS-ECU may be defective

TROUBLESHOOTING HINTS

- 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

STEP1. Check windshield wiper motor connector A-08 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is windshield wiper motor connector A-08 in good condition?

YES: Go to Step 2.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper works normally.

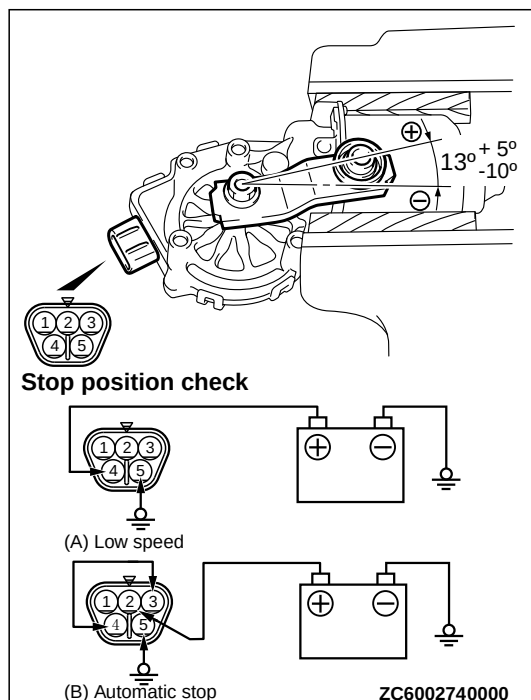
STEP 2. Check the windshield wiper motor.

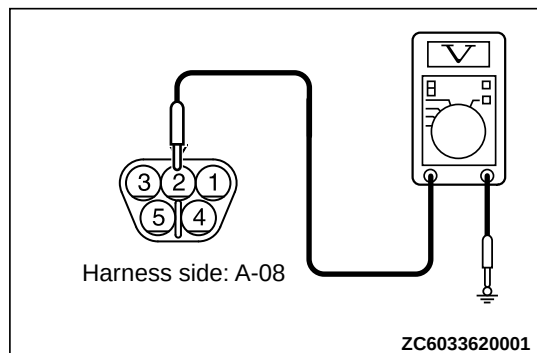
- (1) Disconnect windshield wiper motor connector A-08.
- (2) Connect the vehicle battery to the windshield wiper motor connector as shown, and operate the windshield wiper at low speed. While the windshield wiper is working, disconnect the battery at positions other than the specified park position to stop the windshield wiper motor.
- (3) When the battery is connected as shown, the motor should run at low speed, and then stop at the specified park position.

Q: Does the windshield wiper motor operate normally?

YES: Go to Step 3.

NO: Replace the windshield wiper motor. The windshield wiper should now stop at the specified park position.





STEP 3. Check the fusible link (34) circuit to the windshield wiper motor. Measure the voltage at windshield wiper motor connector A-08.

- (1) Disconnect windshield wiper motor connector A-08 and measure the voltage available at the wiring harness side of the connector.
- (2) Turn the ignition switch to the "ACC" position.
- (3) Measure the voltage between terminal 2 and ground.
 - *The voltage should measure approximately 12 volts (battery positive voltage).

Q: Is the measured voltage approximately 12 volts (battery positive voltage)?

YES: Go to Step 5.

NO: Go to Step 4.

STEP 4. Check the wiring harness between windshield wiper motor connector A-08 (terminal 2) and the fusible link (34).

- *Check the power supply line for open circuits.

Q: Is the wiring harness between windshield wiper motor connector A-08 (terminal 2) and the fusible link (34) in good condition?

YES: Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and wire check P.00E-13.

STEP 5. Check ETACS-ECU connector C-304 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ETACS-ECU connector C-304 in good condition?

YES: Go to Step 6.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 6. Check the wiring harness between ETACS-ECU connector C-304 (terminals 8, 12) and windshield wiper motor connector A-08 (terminals 2, 3).

- *Check the output lines for open or short circuits.

Q: Is the wiring harness between ETACS-ECU connector C-304 (terminals 8, 12) and windshield wiper motor connector A-08 (terminals 2, 3) in good condition?

YES: Go to Step 7.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and wire check P.00E-13.

STEP 7. Retest the system.

Check that the windshield wipers stops at the specified park position.

Q: Is the check result normal?

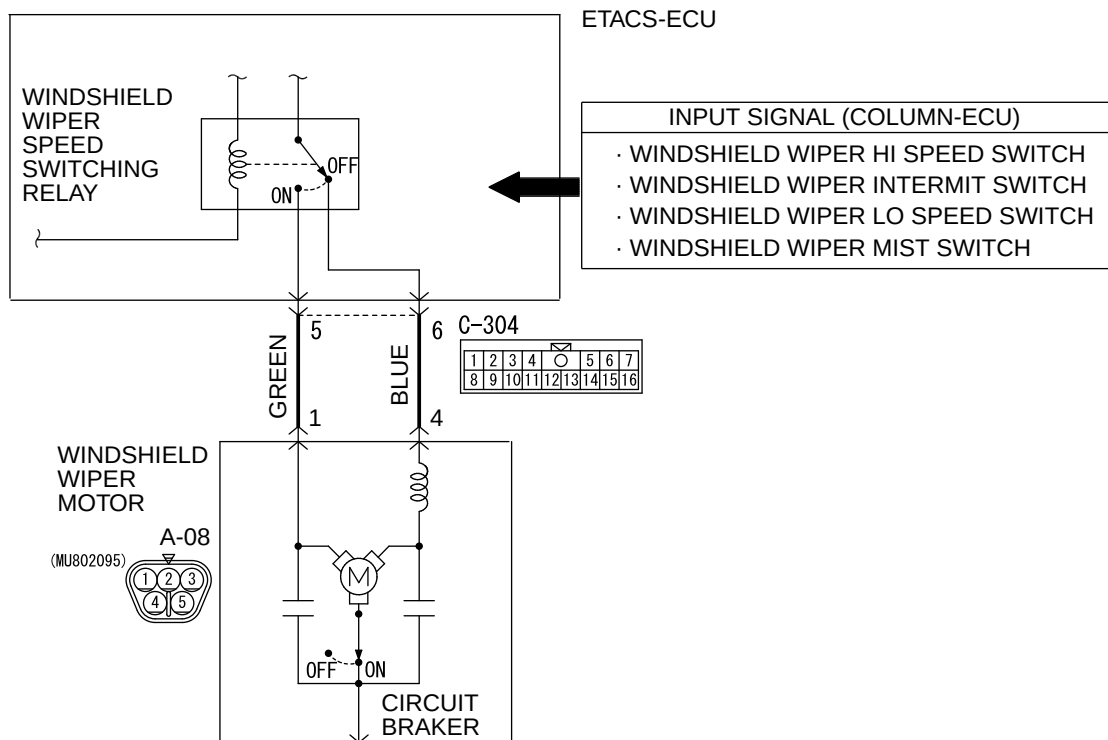
YES: Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

NO: Replace the ETACS-ECU.

INSPECTION PROCEDURE 4: Windshield Wipers do not work normally.

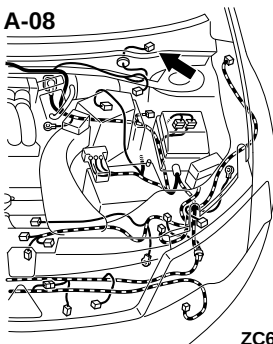
M15102100011USA0000010001

Windshield Wiper Motor Drive Circuit



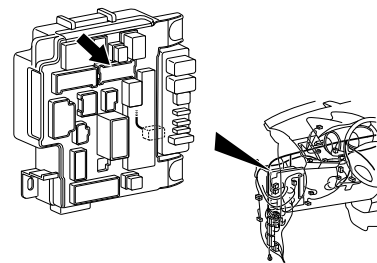
ZC6033080000

Connector: A-08



ZC6008720003

Connector: C-304



ZC6008780022

TECHNICAL DESCRIPTION (COMMENT)

If either of the windshield wiper switch positions is defective, the windshield wiper motor, column switch

(windshield wiper and washer switch) or the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

- The wiper motor may be defective
- The ETACS-ECU may be defective

DIAGNOSIS**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A

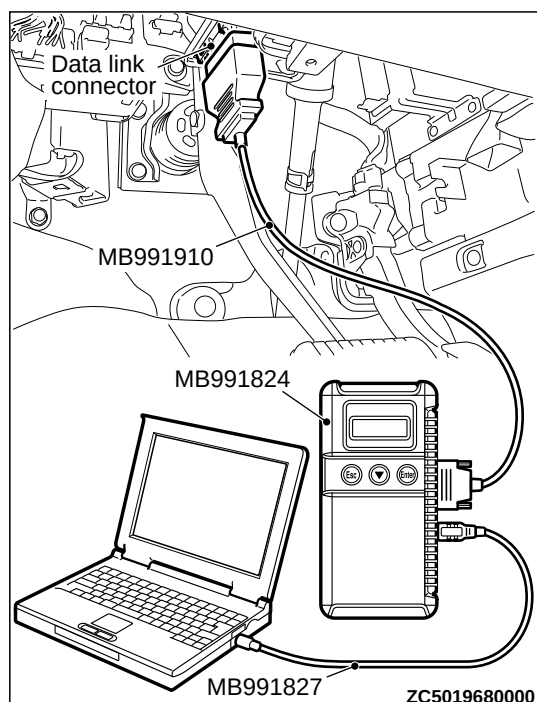
STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.

Connect the scan tool. Refer to "How to connect the scan tool (M.U.T.-III) P.54Ad-5."

Q:Is the diagnostic trouble code set?

YES: Diagnose the ETACS-ECU. Refer to Diagnostic trouble code chart P. 54Ad-8. "

NO: Go to Step 2.

**STEP 2. Check the input signal related to the windshield wiper operation.**

- Ignition switch: ACC

Item No.	Item name	Normal condition
Item 235	Front wiper ACT	ON
Item 236	Front wiper Lo/Hi	ON

OK: Normal condition is displayed.

Q:Is the check result normal?

NO: Go to Step 3.

YES: Refer to GROUP 54Ad - ETACS, Input signal procedures P. 54Ad-61.

STEP 3. Check windshield wiper motor connector A-08 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is windshield wiper motor connector A-08 in good condition?

YES: Go to Step 4.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.

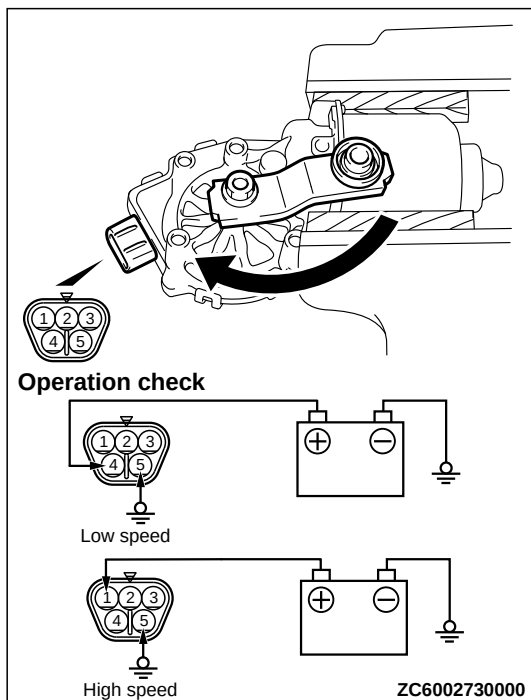
STEP 4. Check the windshield wiper motor.

- (1) Disconnect windshield wiper motor connector A-08.
- (2) Connect a battery to the windshield wiper motor as shown. Then check if the windshield wiper motor operates normally at high and low speeds.

Q: Does the windshield wiper motor operate normally?

YES: Go to Step 5.

NO: Replace the windshield wiper motor. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.



STEP 5. Check ETACS-ECU connector C-304 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ETACS-ECU connector C-304 in good condition?

YES: Go to Step 6.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.

STEP 6. Check the wiring harness between windshield wiper motor connector A-08 (terminals 1 and 4) and ETACS-ECU connector C-304 (terminals 5 and 6).

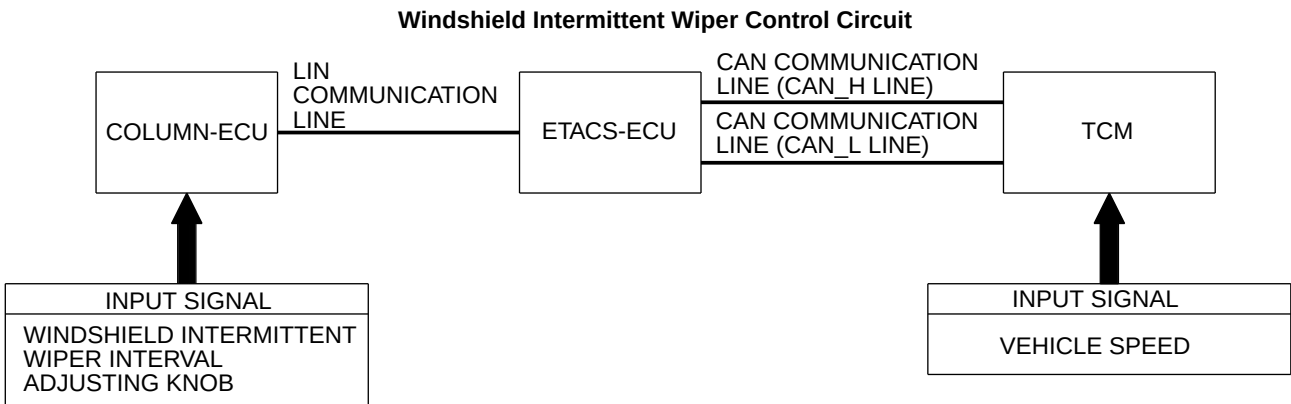
Q: Is the wiring harness between windshield wiper motor connector A-08 (terminals 1 and 4) and ETACS-ECU connector C-304 (terminals 5 and 6) in good condition?

YES: No action is necessary and testing is complete.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.

INSPECTION PROCEDURE 5: The windshield intermittent wiper interval cannot be adjusted by operating the windshield intermittent wiper volume control switch.

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ZC6033090000

TECHNICAL DESCRIPTION (COMMENT)

If the windshield intermittent wiper interval is not changed by operating the windshield intermittent wiper interval adjusting knob or according to the vehicle speed, the column switch or the ETACS-ECU may be defective.

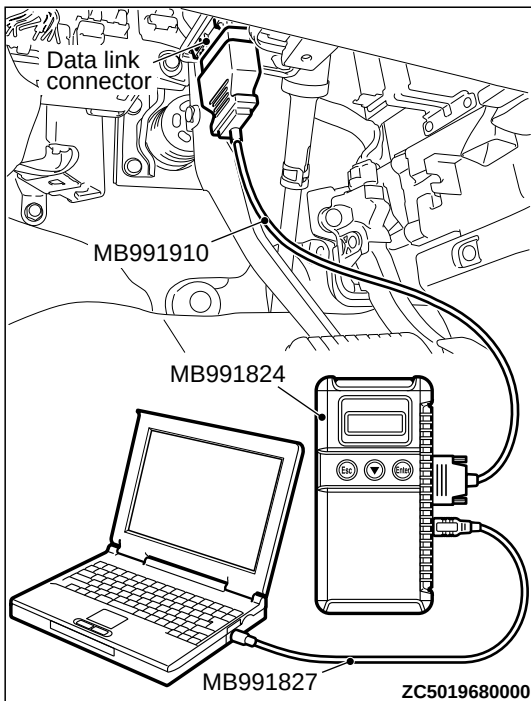
TROUBLESHOOTING HINTS

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The ETACS-ECU may be defective

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A



STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.

Connect the scan tool. Refer to GROUP 54Ad ETACS, "Diagnostic function P.54Ad-5."

Q:Is the diagnostic trouble code set?

YES: Diagnose the ETACS-ECU. Refer to GROUP 54Ad ETACS, "Diagnostic trouble code chart P.54Ad-8."

NO: Go to Step 2.

STEP 2. Check the ETACS configuration function.

Use the ETACS configuration function to check that "Front wiper operation" is set to "variable INT" or "vehicle speed dependent".

Q:Is the check result normal?

YES: Go to Step 3.

NO: Use the ETACS configuration function to set "Front wiper operation" to "variable INT" or "vehicle speed dependent". Refer to P.51B-48.

STEP 3. Retest the system.

Check that the windshield wiper interval changes when the windshield wiper volume control is rotated.

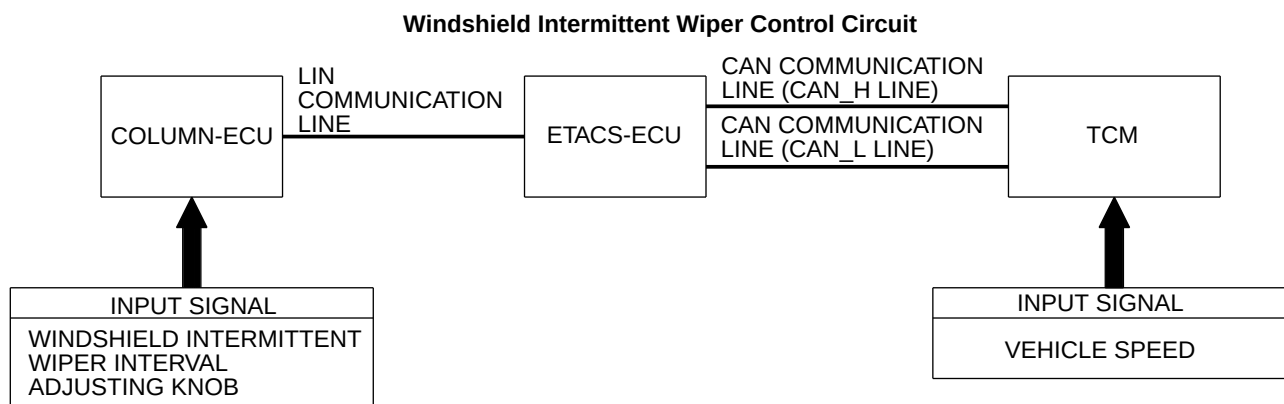
Q:Is the check result normal?

YES: Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

NO: Replace the ETACS-ECU.

INSPECTION PROCEDURE 6: The windshield intermittent wiper interval is not changed according to the vehicle speed.

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ZC6033090000

TECHNICAL DESCRIPTION (COMMENT)

If the intermittent wiper interval does not depend on the vehicle speed, the input circuit of the vehicle speed signal and the ETACS-ECU may be defective. Alternatively, the vehicle speed-dependent wiper may be set to "disabled" by using the configuration function.

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The CAN bus line may be defective
- The ETACS-ECU may be defective

DIAGNOSIS**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A

STEP 1. Retest the system.

Check that the windshield intermittent wiper interval can be adjusted by operating the windshield intermittent wiper volume control switch.

Q:Is the check result normal?

YES: Go to Step 2.

NO: Refer to Inspection Procedure 5 "The windshield intermittent wiper interval cannot be adjusted by operating the windshield intermittent wiper volume control switch" P. 51B-26.

STEP 2. Check the ETACS configuration function.

Use the ETACS configuration function to confirm that "FRONT WIPER OPERATION" is set to "VEHICLE SPEED DEPENDENT".

Q:Is the check result normal?

YES: Go to Step 3.

NO: Use the ETACS configuration function to set "FRONT WIPER OPERATION" to "VEHICLE SPEED DEPENDENT" (Refer to P.51B-48).

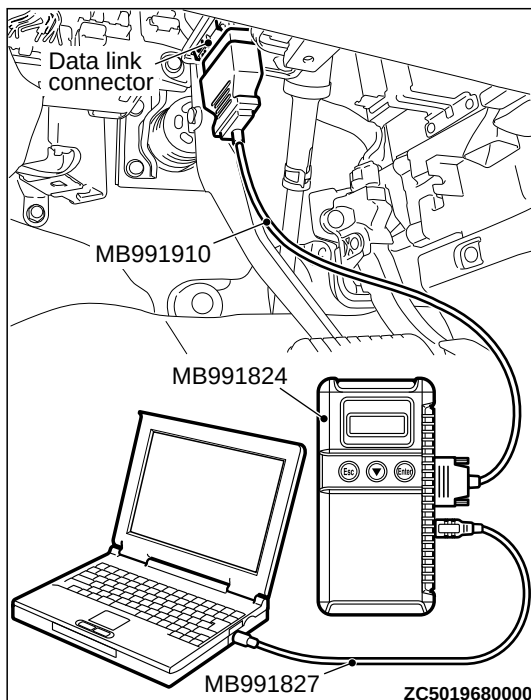
STEP 3. Use the scan tool MB991958 to diagnose the CAN bus lines.

Connect the scan tool. Refer to GROUP 54Ad ETACS, "Diagnostic function P.54Ad-5."

Q:Is the check result normal?

YES: Go to Step 4.

NO: Repair the CAN bus line (Refer to GROUP 54D - CAN bus diagnosis chart P.54D-17).



STEP 4. Use the scan tool MB991958 to diagnose other system diagnostic trouble code

Connect the scan tool. Refer to GROUP 54Ad ETACS, "Diagnostic function P.54Ad-5."

Check that the TCM sets a diagnostic trouble code.

Q:Is the diagnostic trouble code set?

YES: Diagnose the TCM (Refer to GROUP 23 - Diagnostic trouble code chart P.23A-22).

NO: Go to Step 5.

STEP 5. Retest the system.

Check that the intermittent wiper interval depends on the vehicle speed.

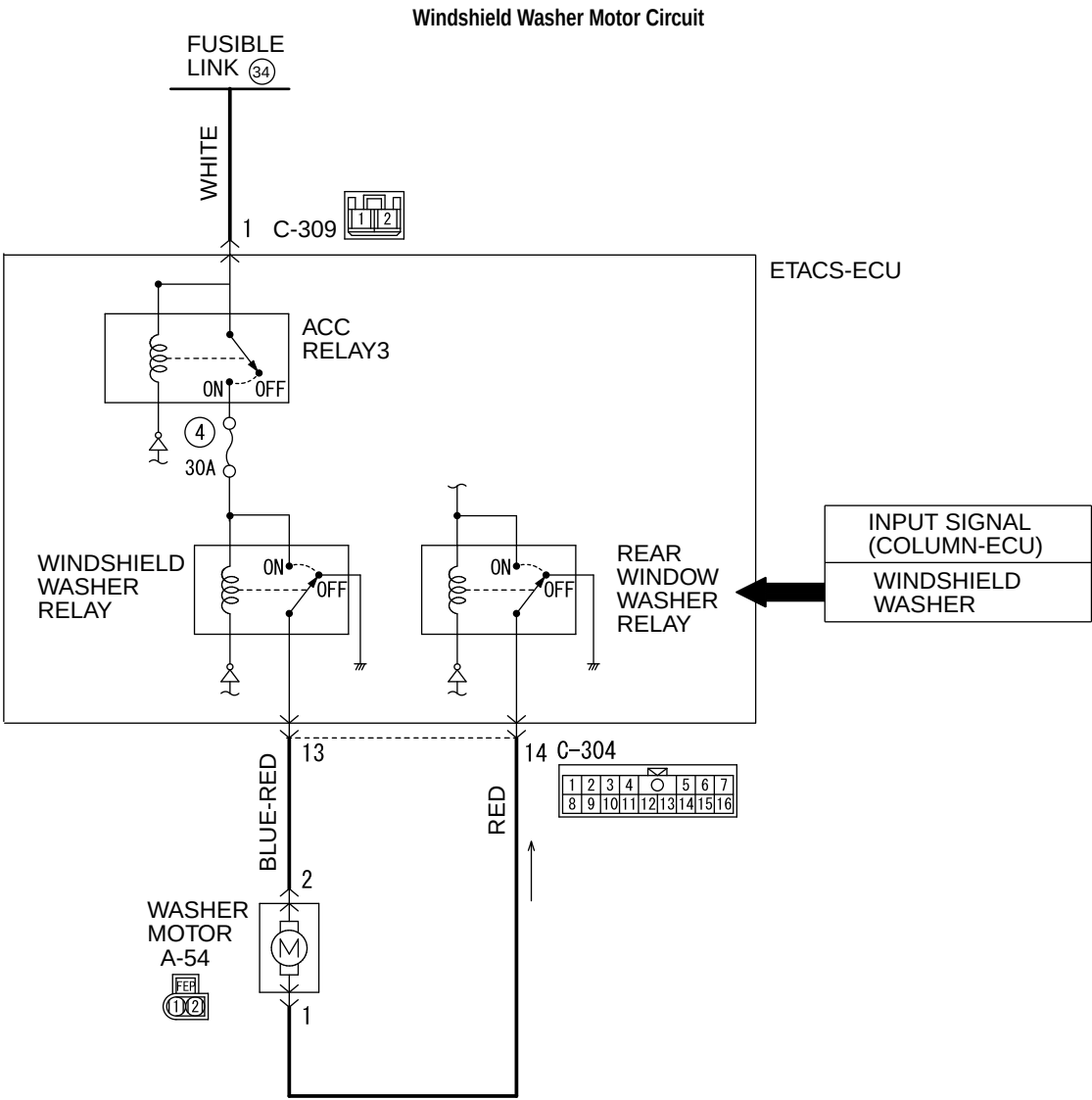
Q:Is the check result normal?

YES: Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

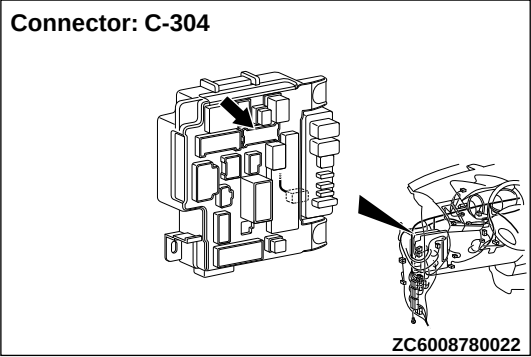
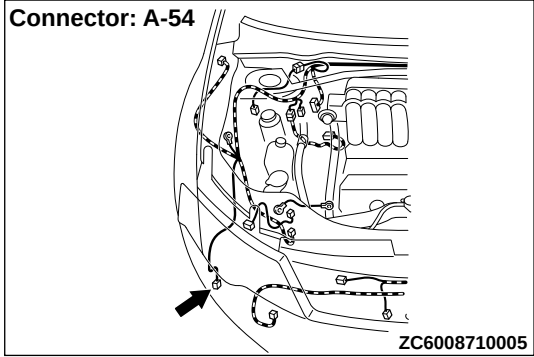
NO: Replace the ETACS-ECU.

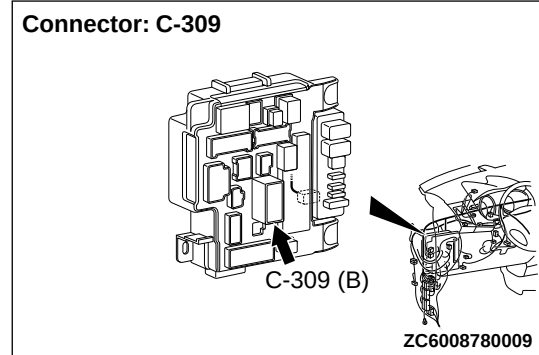
INSPECTION PROCEDURE 7: The windshield washer does not work.

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ZC6033100000





CIRCUIT OPERATION

The windshield washer switch sends a signal through the column-ECU (incorporated in the column switch) to the ETACS-ECU. If the column-ECU sends a windshield washer switch "ON" signal to the ETACS-ECU, the ETACS-ECU turns on the relay (incorporated in the ETACS-ECU), thus causing the washer motor to be turned on.

TECHNICAL DESCRIPTION (COMMENT)

If the windshield washer does not work normally, the washer motor, the column switch (windshield wiper

and washer switch) or the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tools:

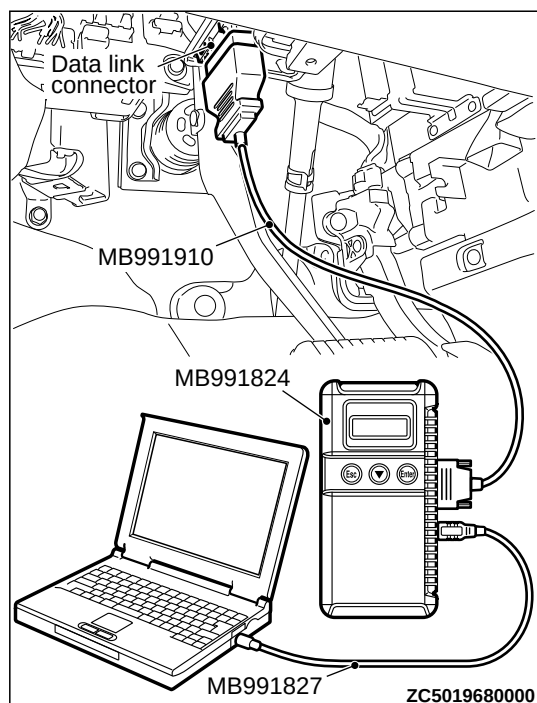
- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A

STEP 1. Verify the windshield wiper operation.

Q:Does the windshield wiper operate normally?

YES: Go to Step 2.

NO: Refer to Inspection Procedure 1 "The windshield wipers do not work at all P.51B-13."


STEP 2. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.

Connect the scan tool. Refer to GROUP 54Ad ETACS, "Diagnostic function P.54Ad-5."

Q:Is the diagnostic trouble code set?

YES: Diagnose the ETACS-ECU. Refer to GROUP 54Ad ETACS, "Diagnostic trouble code chart P.54Ad-8."

NO: Go to Step 3.

STEP 3. Check the input signal related to the windshield washer operation.

- Ignition switch: ACC
- Windshield washer switch: ON

Item No.	Item name	Normal condition
Item 237	Front washer	ON

OK: Normal condition is displayed.

Q:Is the check result normal?

NO: Go to Step 4.

YES: Refer to GROUP 54Ad - ETACS, Input signal procedures P.54Ad-61.

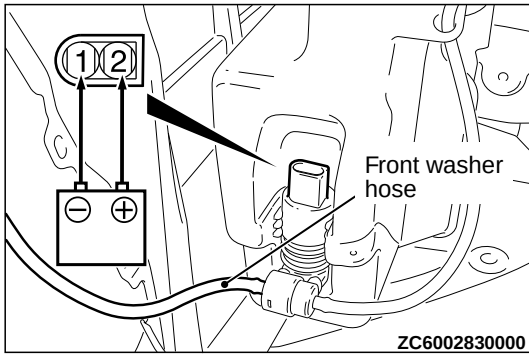
STEP 4. Check windshield washer motor connector A-54 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q:Is windshield washer motor connector A-54 in good condition?

YES: Go to Step 5.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper works normally.

STEP 5. Check the operation of windshield washer motor.

- (1) Disconnect windshield washer motor connector A-54 and check at windshield washer motor connector side.
- (2) Fill the windshield washer tank with washer fluid.



(3) When battery voltage is applied between terminals 1 and 2, washer fluid should spray out.

Q: Does the washer motor operate normally?

YES: Go to Step 6.

NO: Replace the washer motor. Verify that the windshield washer works normally.

STEP 6. Check the operation of rear washer.

Check that rear washer works.

Q: Does the rear washer operate normally?

YES: Go to Step 7.

NO: Replace the ETACS-ECU.

STEP 7. Check ETACS-ECU connector C-304 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ETACS-ECU connector C-304 in good condition?

YES: Go to Step 8.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield washer works normally.

STEP 8. Check the wiring harness between windshield washer motor connector A-54 (terminal 2) and ETACS-ECU connector C-304 (terminal 13).

*Check the input lines for open or short circuit.

Q: Is the wiring harness between windshield washer motor connector A-54 (terminal 2) and ETACS-ECU connector C-304 (terminal 13) in good condition?

YES: Go to Step 9.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and wire check P.00E-13.

STEP 9. Check the wiring harness between windshield washer motor connector A-54 (terminal 1) and ETACS-ECU connector C-304 (terminal 14).

*Check the input lines for open or short circuit.

Q: Is the wiring harness between windshield washer motor connector A-54 (terminal 1) and ETACS-ECU connector C-304 (terminal 14) in good condition?

YES: Go to Step 10.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and wire check P.00E-13.

STEP 10. Retest the system.

Check that the windshield washers work normally.

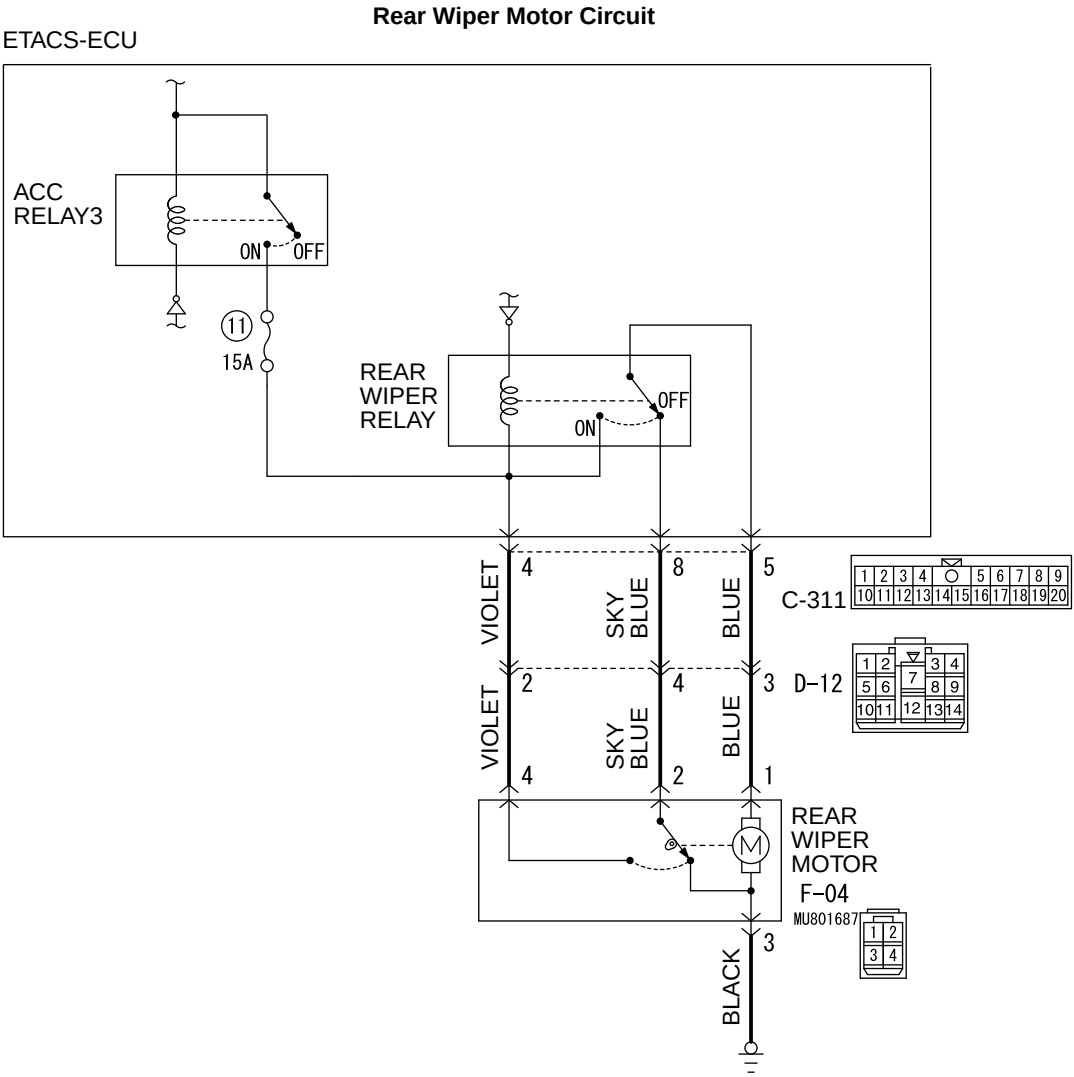
Q: Is the check result normal?

YES: Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

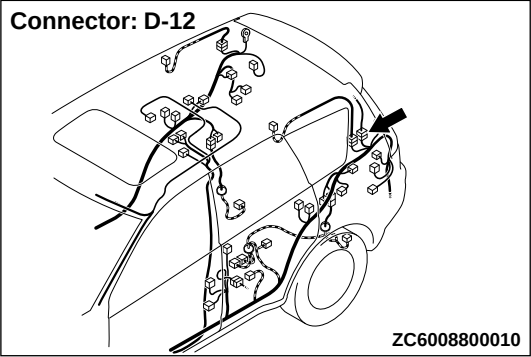
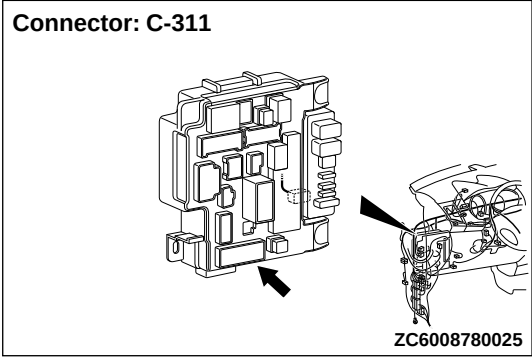
NO: Replace the ETACS-ECU.

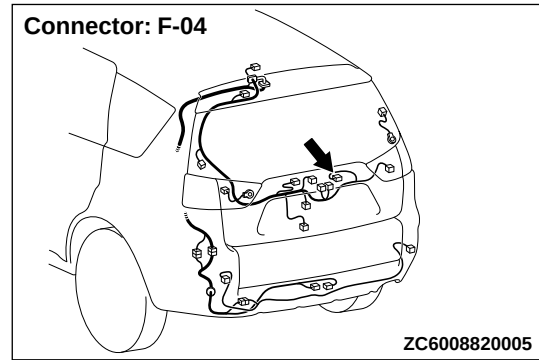
INSPECTION PROCEDURE 8: Rear wiper does not work at all.

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ZC6033110000





CIRCUIT OPERATION

- The rear wiper switch sends a signal through the column-ECU (incorporated in the column switch) to the ETACS-ECU. If the column-ECU sends a rear wiper switch "ON" signal to the ETACS-ECU, the ETACS-ECU turns on the relay (incorporated in the ETACS-ECU), thus causing the rear wiper motor to be turned on.
- The ETACS-ECU operates the rear wiper according to the following switches:
 - Ignition switch (ACC)
 - Rear wiper switch

the column switch (windshield wiper and windshield washer switch) or the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

- The rear wiper motor may be defective
- The column switch (windshield wiper and washer switch) may be defective
- The ETACS-ECU may be defective
- The wiring harness may be damaged or the connectors may have loose, corroded or damaged terminals, pushed back in the connector

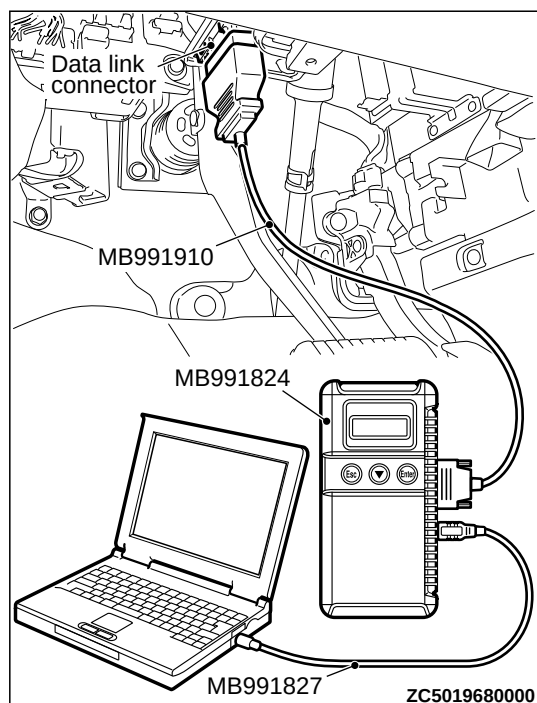
TECHNICAL DESCRIPTION (COMMENT)

If the rear wiper does not work normally, the input circuit system from the switches, the rear wiper motor,

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles communication interface (V.C.I.)
 - MB991827: M.U.T.-III USB cable
 - MB991911: M.U.T.-III Main harness B


STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.

Connect the scan tool. Refer to GROUP 54Ad ETACS, "Diagnostic function P.54Ad-5."

Q:Is the diagnostic trouble code set?

YES: Diagnose the ETACS-ECU. Refer to GROUP 54Ad ETACS, "Diagnostic trouble code chart P.54Ad-8."

NO: Go to Step 2.

STEP 2. Check the input signal related to the rear wiper operation.

*Ignition switch: ACC

Item No.	Item name	Normal condition
Item 239	Rear wiper	ON
Item 288	ACC switch	ON

OK: Normal condition is displayed.

Q:Is the check result normal?

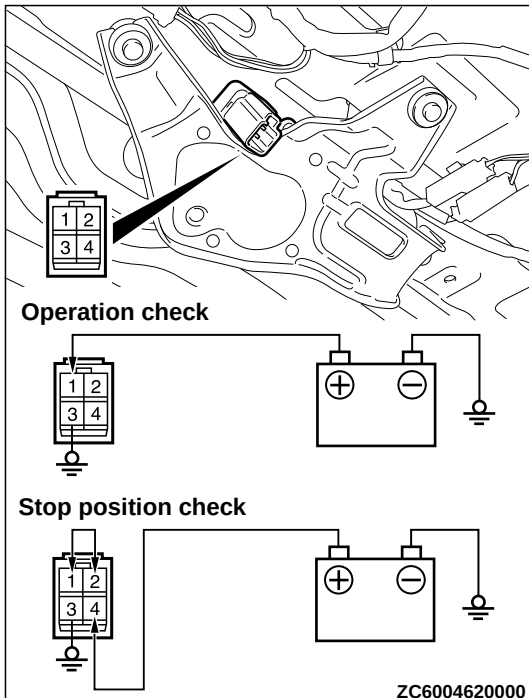
NO: Go to Step 3.

YES: Refer to GROUP 54Ad - ETACS, Input signal procedures P.54Ad-61.

STEP 3. Check the rear wiper motor connector F-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q:Is rear wiper motor connector F-04 in good condition?

YES: Go to Step 4.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the rear wiper works normally.



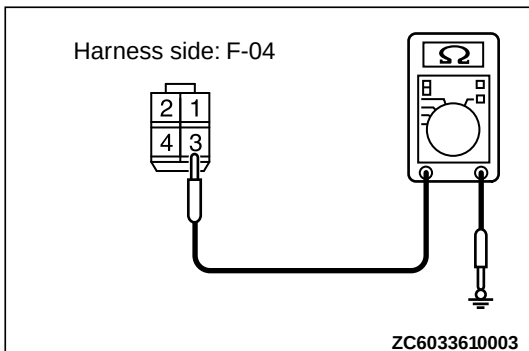
STEP 4. Check the rear wiper motor.

- (1) Disconnect rear wiper motor connector F-04.
- (2) Connect a battery to the wiper motor as shown in the illustration and inspect the motor operation.

Q:Is the rear wiper motor in good condition?

YES: Go to Step 5.

NO: Replace the rear wiper motor. Verify that the rear wiper works normally.



**STEP 5. Check the ground circuit to the rear wiper motor.
Measure the resistance at the rear wiper motor connector F-04.**

- (1) Disconnect rear wiper motor connector F-04 and measure the resistance available at the wiring harness side of the connector.
- (2) Measure the resistance value between terminal 3 and ground.
 - *The resistance should be 2 Ω or less.

Q:Is the measured resistance 2 Ω or less?

YES: Go to Step 7.

NO: Go to Step 6.

STEP 6. Check the wiring harness between rear wiper motor connector F-04 (terminal 3) and ground.

Q:Is the wiring harness between rear wiper motor connector F-04 (terminal 3) and ground in good condition?

YES: No action is necessary and testing is complete.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the rear wiper works normally.

STEP 7. Check ETACS-ECU connector C-311 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ETACS-ECU connector C-311 in good condition?

YES: Go to Step 8.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the rear wiper works normally.

STEP 8. Check the wiring harness between rear wiper motor connector F-04 (terminal 1) and ETACS-ECU connector C-311 (terminal 5).

NOTE: Also check junction block connector D-12 for loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

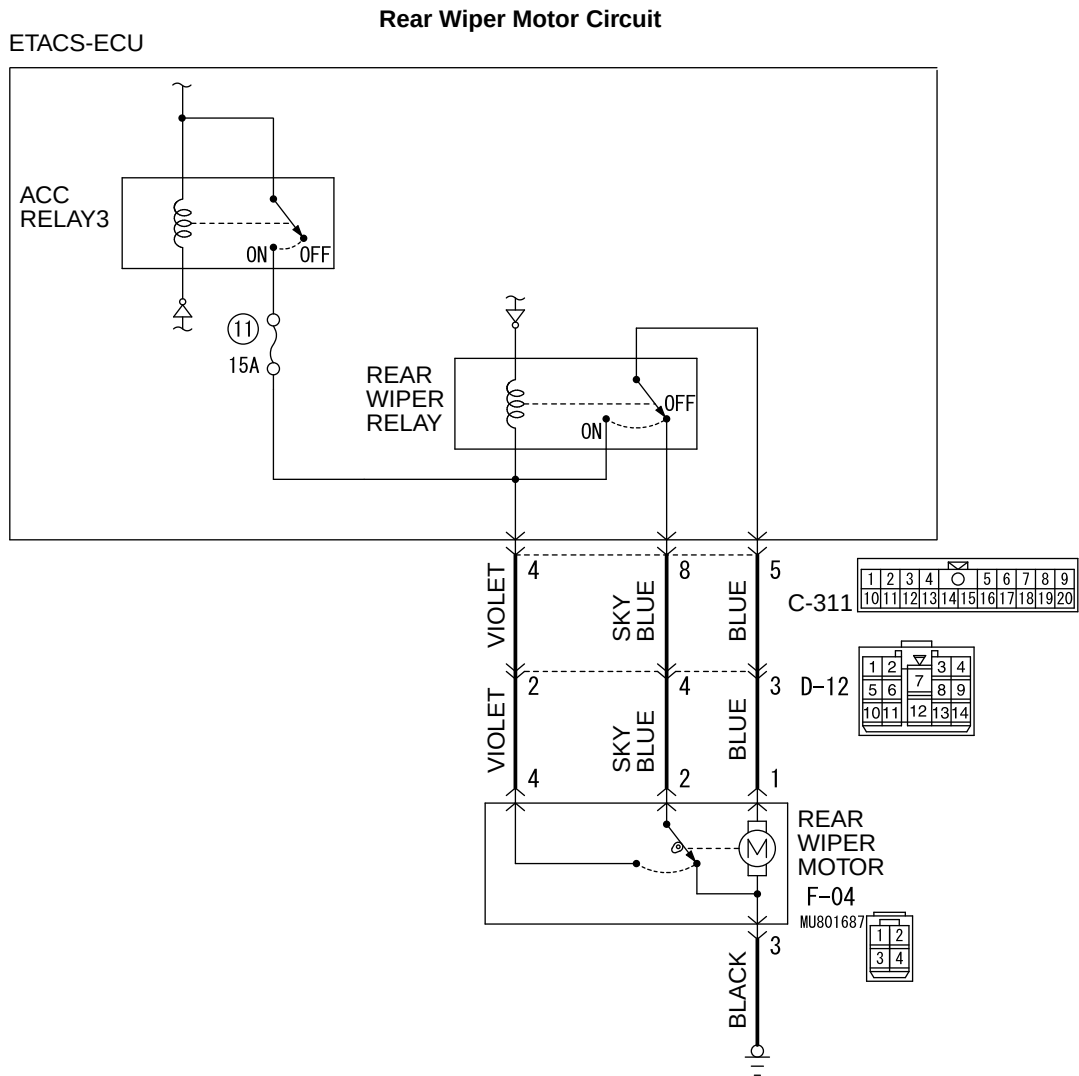
Q: Is the wiring harness between rear wiper motor connector F-04 (terminal 1) and ETACS-ECU connector C-311 (terminal 5) in good condition?

YES: Replace the ETACS-ECU. Verify that the rear wiper should work normally.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the rear wiper works normally.

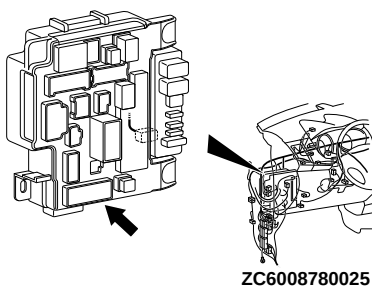
INSPECTION PROCEDURE 9: Rear wiper does not stop at the specified park position.

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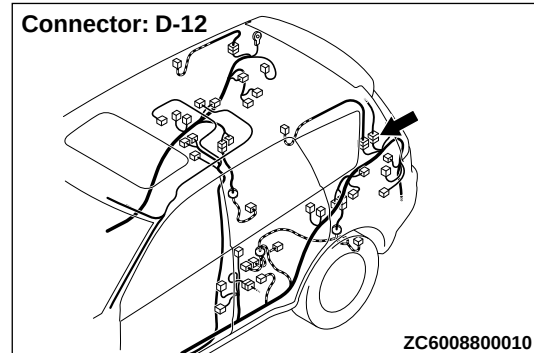


ZC6033110000

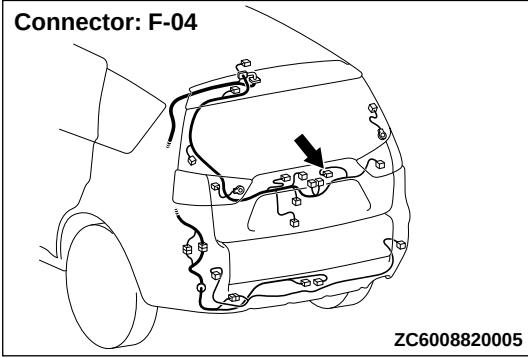
Connector: C-311



Connector: D-12



Connector: F-04

**TECHNICAL DESCRIPTION (COMMENT)**

If the rear wipers do not stop at predetermined park position, the rear wiper motor or the ETACS-ECU may be defective.

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

TROUBLESHOOTING HINTS

- The rear wiper motor may be defective

DIAGNOSIS**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe

STEP1. Check rear wiper motor connector F-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

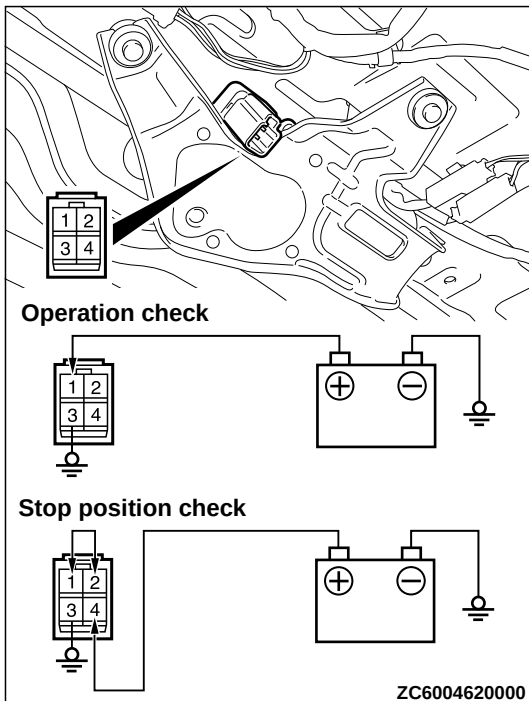
Q: Is rear wiper motor connector F-04 in good condition?

YES: Go to Step 2.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper works normally.

STEP 2. Check the rear wiper motor.

- (1) Disconnect rear wiper motor connector F-04.



- (2) Connect the vehicle battery to the rear wiper motor connector as shown, and operate the rear wiper. While the rear wiper is working, disconnect the battery at positions other than the specified park position to stop the rear wiper motor.
- (3) When the battery is connected as shown, the motor should run and then stop at the specified park position.

Q: Does the rear wiper motor operate normally?

YES: Go to Step 3.

NO: Replace the rear wiper motor. The rear wiper should now stop at the specified park position.

STEP 3. Check rear wiper motor connector F-04 and ETACS-ECU connector C-311 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is rear wiper motor connector F-04 and ETACS-ECU connector C-311 in good condition?

YES: Go to Step 4.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P. 00E-2.

STEP 4. Check the wiring harness between rear wiper motor connector F-04 (terminals 2,4) and ETACS-ECU connector C-311 (terminals 4, 8).

NOTE: Also check intermediate connector D-12 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is the wiring harness between rear wiper motor connector F-04 (terminals 2,4) and ETACS-ECU connector C-311 (terminals 4, 8) in good condition?

YES: Go to Step 5.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and wire check P. 00E-13.

STEP 5. Check the input signal related to the rear wiper operation.

• Ignition switch: ACC or ON

• Rear wiper: In operation

Item No.	Item name	Normal condition
Item 292	Rear wiper auto-stop switch	ON

NOTE: Confirm that the scan tool displays ON to OFF when rear wiper stops at the specified park position.

OK: Normal condition is displayed.

Q: Is the check result normal?

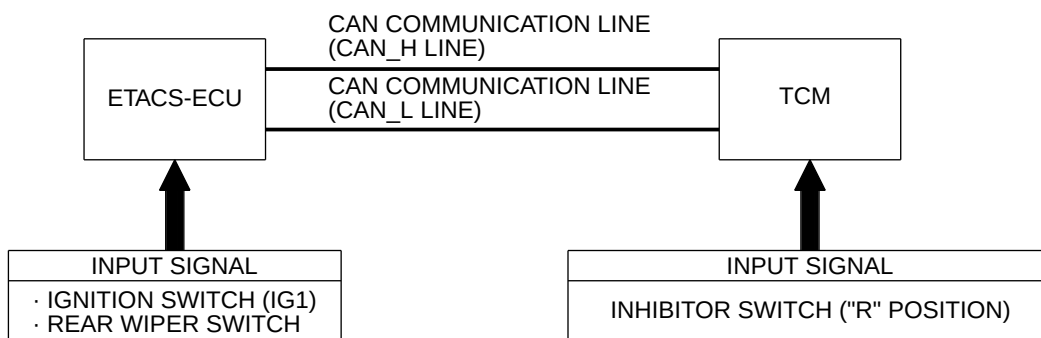
YES: Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P. 00-15.

NO: Replace the ETACS-ECU.

INSPECTION PROCEDURE 10: When the selector lever is moved to "R" position during the rear wiper operation, the rear wiper does not operate at the continuous mode.

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"R" Position During Wiper Operation Circuit



ZC6033120000

CIRCUIT OPERATION

The ETACS-ECU operates the rear wiper consecutively when the selector lever is moved to "R" position while the rear wiper is turned on.

TECHNICAL DESCRIPTION (COMMENT)

If the rear wiper does not work consecutively, the transmission range switch ("R" position) or the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles communication interface (V.C.I.)
 - MB991827: M.U.T.-III USB cable
 - MB991911: M.U.T.-III Main harness B

STEP 1. Verify the rear wiper.

Check that the rear wiper system works normally by operating the rear wiper switch.

Q:Does the rear wiper operate?

YES: Go to Step 2.

NO <Rear wiper does not work.>: Refer to Inspection Procedure 1 "Rear wiper does not work at all P.51B-34."

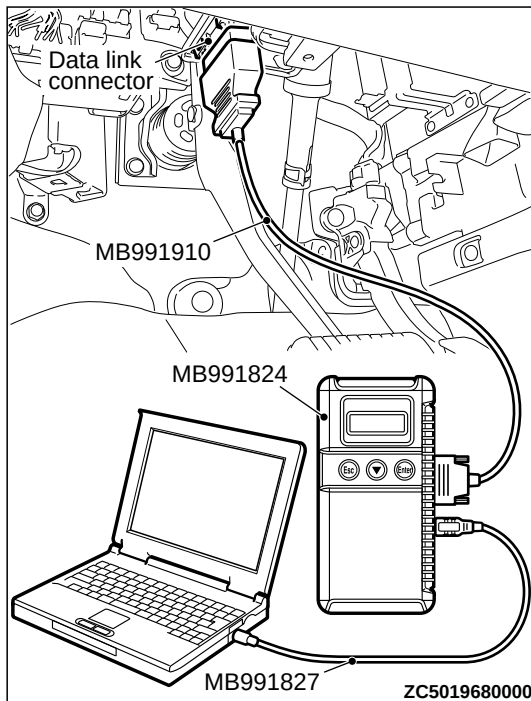
STEP 2. Use the scan tool MB991958 to diagnose the CAN bus lines.

Connect the scan tool. Refer to GROUP 54Ad ETACS, "Diagnostic function P.54Ad-5."

Q:Is the check result normal?

YES: Go to Step 3.

NO: Repair the CAN bus line (Refer to GROUP 54D - CAN bus diagnosis chart P.54D-17).



STEP 3. Use the scan tool MB991958 to diagnose other system diagnostic trouble code

Connect the scan tool. Refer to GROUP 54Ad ETACS, "Diagnostic function P.54Ad-5."

Check that the TCM sets a bus-off diagnostic trouble code.

Q:Is the diagnostic trouble code set?

YES: A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the TCM and the ETACS-ECU (Refer to GROUP 00, How to cope with intermittent malfunction P.00-15).

NO: Go to Step 4.

STEP 4. Retest the system.

Check that the rear wiper operates continuously when the selector lever is moved to the R position during the rear wiper operation.

Q:Is the check result normal?

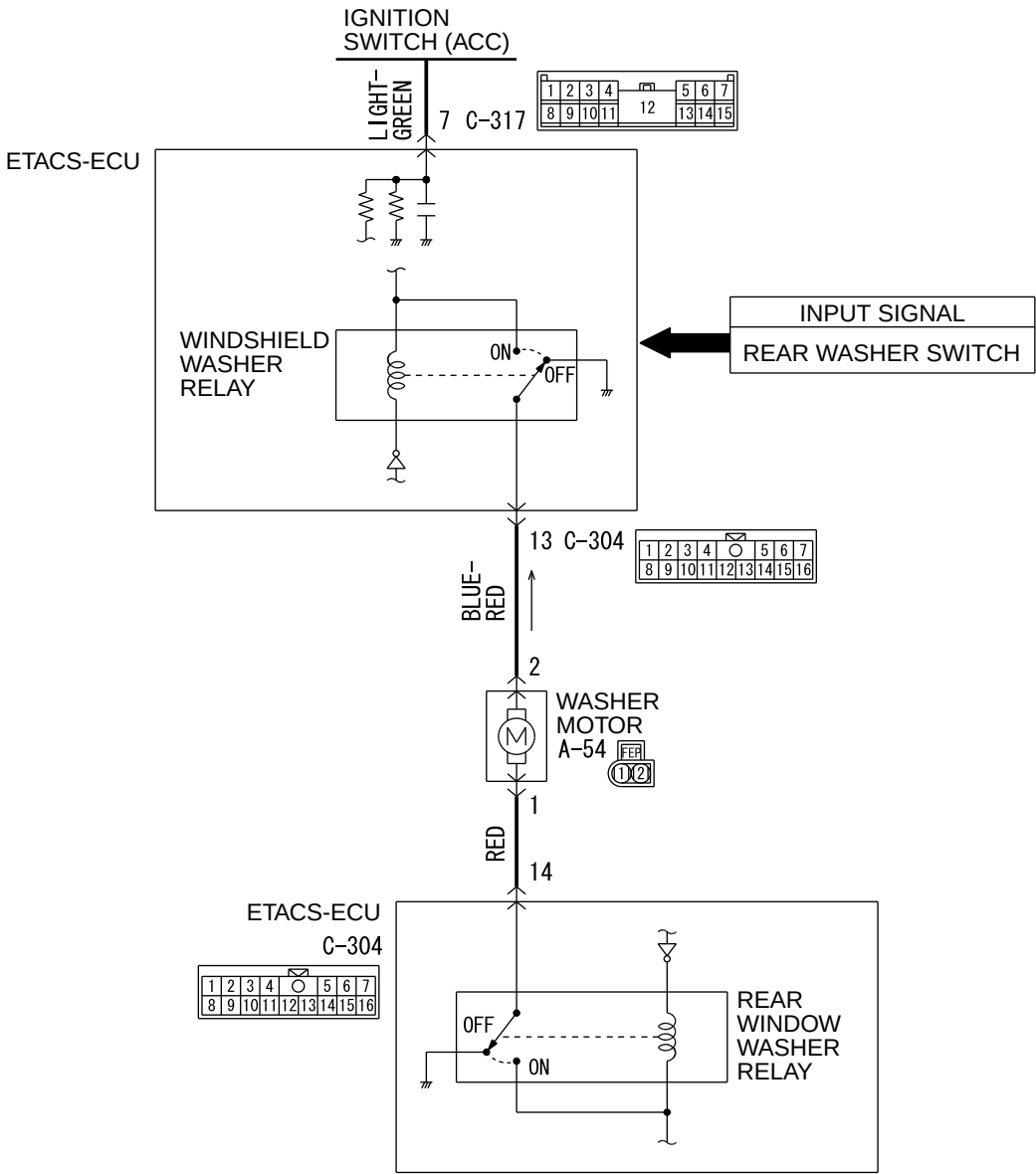
YES: Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

NO: Replace the ETACS-ECU.

INSPECTION PROCEDURE 11: Rear washer does not operate.

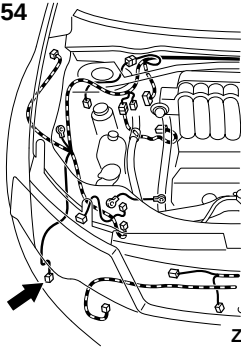
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Rear Washer Motor Power Supply Circuit

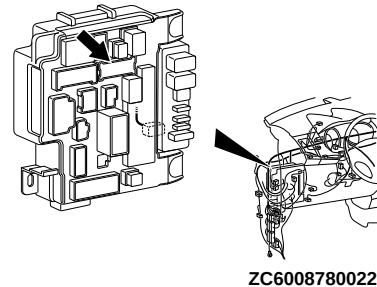


D7G51M003A00

Connector: A-54



Connector: C-304



CIRCUIT OPERATION

The rear washer switch sends a signal through the column-ECU (incorporated in the column switch) to the ETACS-ECU. If the column-ECU sends a rear washer switch "ON" signal to the ETACS-ECU, the ETACS-ECU turns on the relay (incorporated in the ETACS-ECU), thus causing the windshield and rear washer motor to be turned on.

TECHNICAL DESCRIPTION (COMMENT)

If the rear washer does not work normally, the windshield and rear washer motor, the column switch

(windshield wiper and washer switch) or the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

- The windshield and rear washer motor may be defective
- The column switch (windshield wiper, washer switch) may be defective
- The ETACS-ECU may be defective

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles communication interface (V.C.I.)
 - MB991827: M.U.T.-III USB cable
 - MB991911: M.U.T.-III Main harness B

STEP 1. Verify the windshield washers.

Q:Does the windshield washers operate?

YES: Go to Step 2.

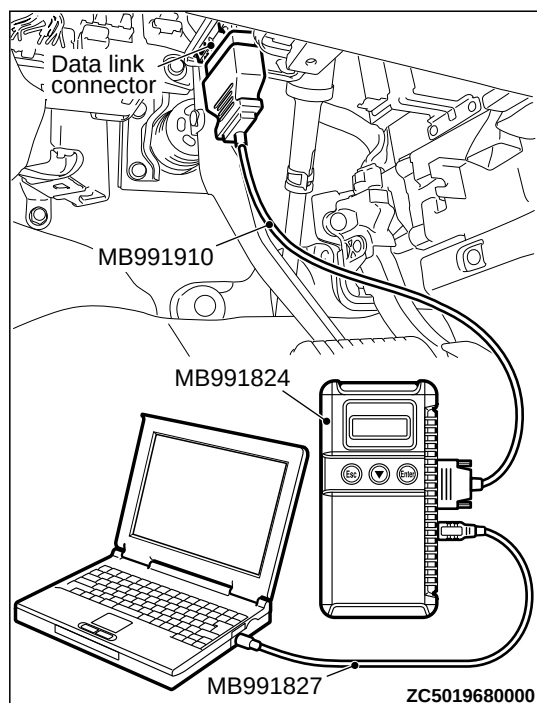
NO: Refer to Inspection Procedure 7 "Windshield washer does not work. P. 51B-30."

STEP 2. Verify the rear wiper.

Q:Does the rear wiper operate?

YES: Go to Step 3.

NO: Refer to Inspection Procedure 8 "Rear wiper does not work. P. 51B-34."



STEP 3. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.

Connect the scan tool. Refer to GROUP 54Ad ETACS, "Diagnostic function P.54Ad-5."

Q:Is the diagnostic trouble code set?

YES: Diagnose the ETACS-ECU. Refer to GROUP 54Ad ETACS, "Diagnostic trouble code chart P.54Ad-8."

NO: Go to Step 4.

STEP 4. Check the input signal related to the rear washer operation.

- Ignition switch: ACC
- Rear washer switch: ON

Item No.	Item name	Normal condition
Item 238	Rear washer	ON

OK: Normal condition is displayed.

Q:Is the check result normal?

NO: Go to Step 5.

YES: Refer to GROUP 54Ad - ETACS, Input signal procedures P.54Ad-61.

STEP 5. Check the washer motor connector A-54 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

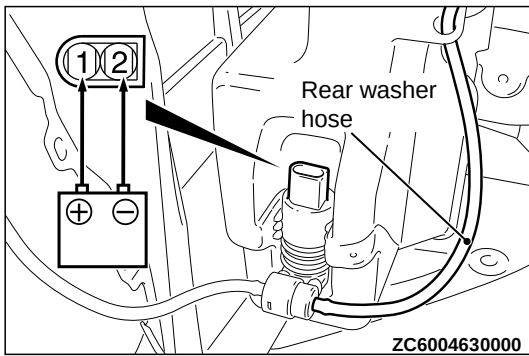
Q:Is washer motor connector A-54 in good condition?

YES: Go to Step 6.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the rear washer works normally.

STEP 6. Check the washer motor.

- (1) Disconnect the washer motor connector A-54.
- (2) Fill the washer tank with washer fluid.



(3) When battery voltage is applied between terminals 1 and 2, washer fluid should spray out.

Q: Does the washer motor operate normally?

YES: Go to Step 7.

NO: Replace the washer motor. Verify that the rear washer works normally.

STEP 7. Check the ETACS-ECU connector C-304.

Q: Is the check result normal?

YES: Go to Step 8.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the rear washer works normally.

STEP 8. Check the wiring harness between washer motor connector A-54 (terminal 1,2) and ETACS-ECU connector C-304 (terminal 13,14).

• Check the lines for open or short circuit.

Q: Is the check result normal?

YES: Go to Step 9.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and wire check P.00E-13.

STEP 9. Replace the ETACS-ECU, and then check its operation.

Replace the ETACS-ECU, and then check that the rear washer works normally.

(1) Replace the ETACS-ECU.

(2) Ignition switch: ON

(3) The rear washer should now work normally.

Q: Is the check result satisfactory?

YES: Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

NO: Replace the front-ECU.

ON-VEHICLE SERVICE

WINDSHIELD INTERMITTENT WIPER INSPECTION

1. Check that the intermittent wiper interval is changed as the windshield intermittent wiper volume is operated.
2. Turn the windshield intermittent wiper switch to the intermittent operation position. Use the scan tool to set a simulated vehicle speed with the wiper

volume held. The intermittent wiper interval should be changed as the simulated vehicle speed is changed.

3. If either of above is defective, carry out the troubleshooting. (Refer to P.51B-26)

OPERATION CHECK OF REVERSE GEAR-LINKED OPERATION OF REAR WIPER

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1. When the selector lever is moved to the "R" position with the rear wiper switch at the "INT" position, the wiper should operate twice or three times at low speed after approximately one second.
2. If not, carry out the troubleshooting. (Refer to P. 51B-42)

CONFIGURATION FUNCTION

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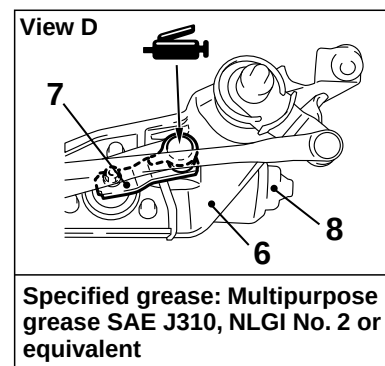
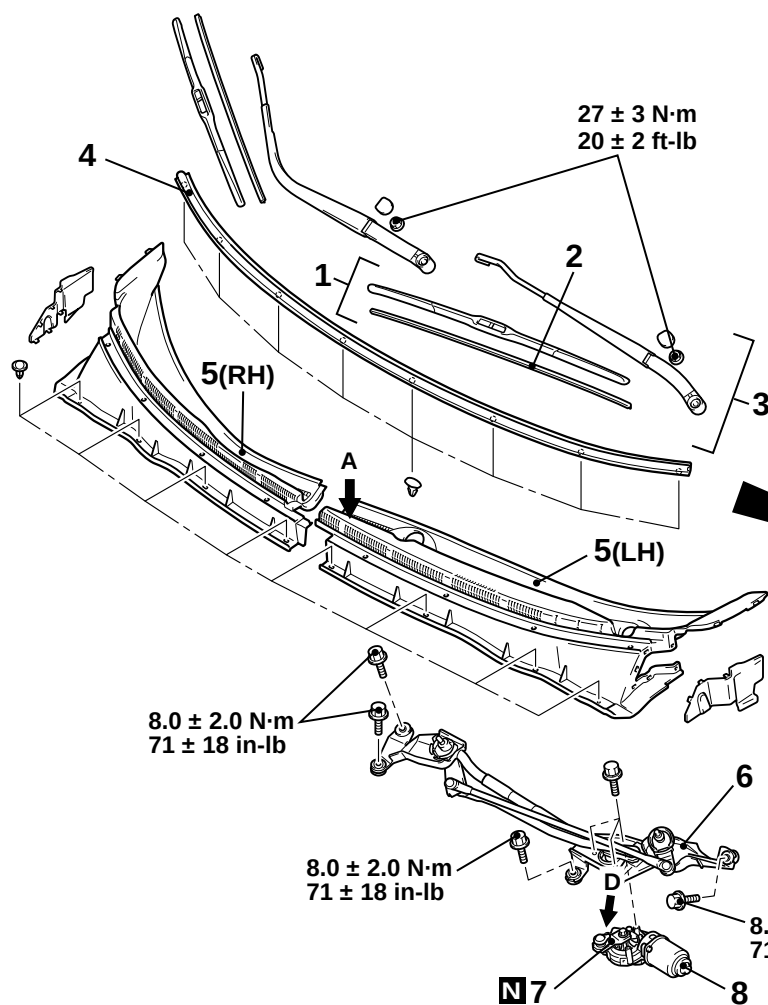
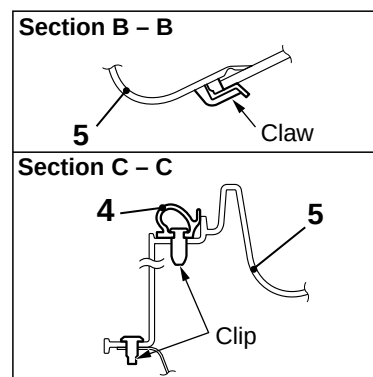
With the scan tool MB991958 operation, the following information is held even when the battery is disconnected. The programmed functions can be programmed.

Adjustment item (scan tool MB991958 display)	Adjustment item	Adjusting contents (scan tool MB991958 display)	Adjusting contents
Front wiper operation	Adjustment of the intermittent windshield wiper operation	Normal INT	Intermittent wiper interval is fixed to 4 seconds.
		Variable INT	Intermittent wiper interval is calculated only by the wiper volume control.
		Vehicle speed dependent	Intermittent wiper interval is calculated according to the intermittent wiper volume control and vehicle speed (default).
Front wiper washer	Disabling or enabling washer-linked wiper function	Washer only	Without function
		Washer-linked wiper	With function (default)
Rear wiper intermittent duration	Adjustment of rear wiper interval	0 seconds	No wiper interval
		4 seconds	4 seconds
		8 seconds	8 seconds (default)
		16 seconds	16 seconds
Rear wiper low speed mode	Disabling or enabling rear wiper continuous operation	Disabled	Without function (default)
		Enabled	With function

REMOVAL AND INSTALLATION

View A

Diagram of View A showing the bottom of the hull. The diagram illustrates the arrangement of clips and claws along the hull's length. Labels include 5(RH), 5(LH), B, and C. Arrows indicate the positions of clips (black arrows) and claws (white arrows). A note at the bottom states: NOTE: Black arrow: Clip positions, White arrow: Claw positions.



- Wiper blade removal steps**
- >>C<<
1. Wiper blade assembly
 2. Wiper blade

- ### Windshield wiper motor and link assembly removal steps
- >>B<<
3. Wiper arm and blade assembly
 4. Hood weatherstrip rear

ZC5018660000

Windshield wiper motor and link
assembly removal steps

- 5. Front deck garnish
- 6. Windshield wiper link
- 7. Wiper motor link plate

Windshield wiper motor and link
assembly removal steps

- <<A>> >>A<< 8. Windshield wiper motor

Required Special Tool:

•MB991955: M.U.T.-III sub-assembly

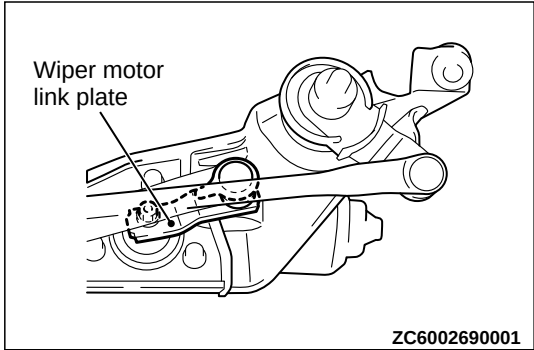
•MB991223: Harness set

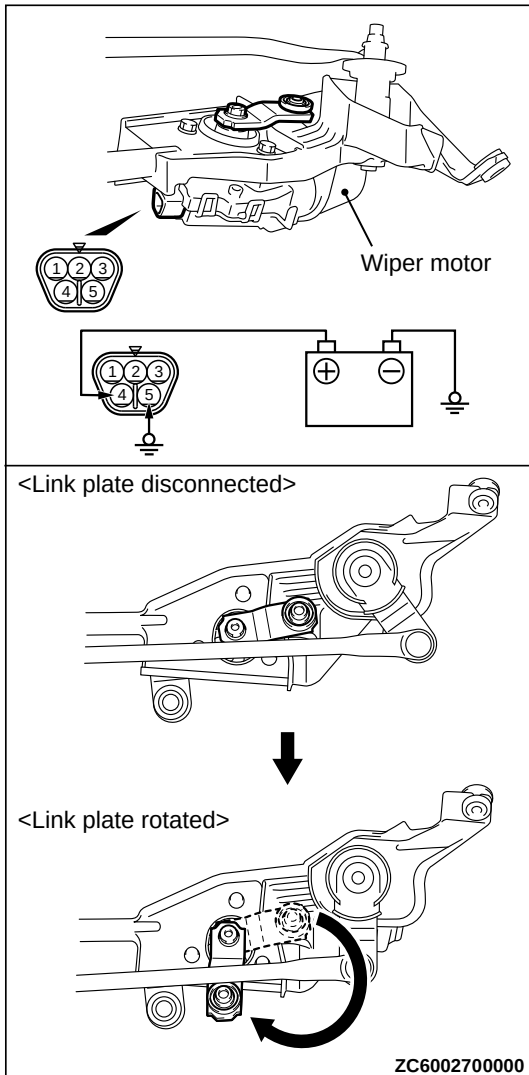
NOTE: For removal and installation of the wiper and washer switch, refer to GROUP 54Ah, Column switch P. 54Ah-8.

REMOVAL SERVICE POINT

<<A>> WINDSHIELD WIPER MOTOR REMOVAL

- 1. Remove the wiper link rod joint from the wiper motor link plate.





2. Connect the wiper motor to a battery, and rotate the link plate as shown.
3. In this position, withdraw the link plate from the wiper link assembly.

INSTALLATION SERVICE POINT

>>A<< WINDSHIELD WIPER MOTOR INSTALLATION

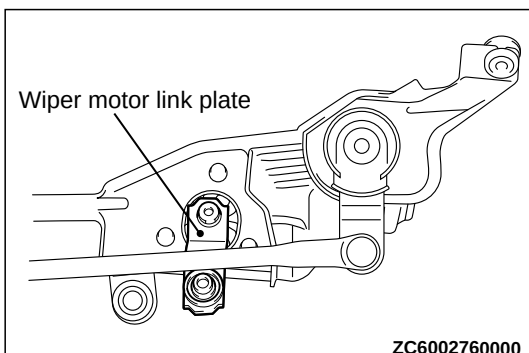
1. Position the wiper motor link plate as shown, and assemble it to the wiper link assembly.

NOTE:

*The link plate can be assembled to the wiper link assembly only at this position. If not, rotate the link plate to this position (Refer to Stop Position Check, P.51B-53).

*Wiper motor replacement parts are supplied with the link plate positioned as shown.

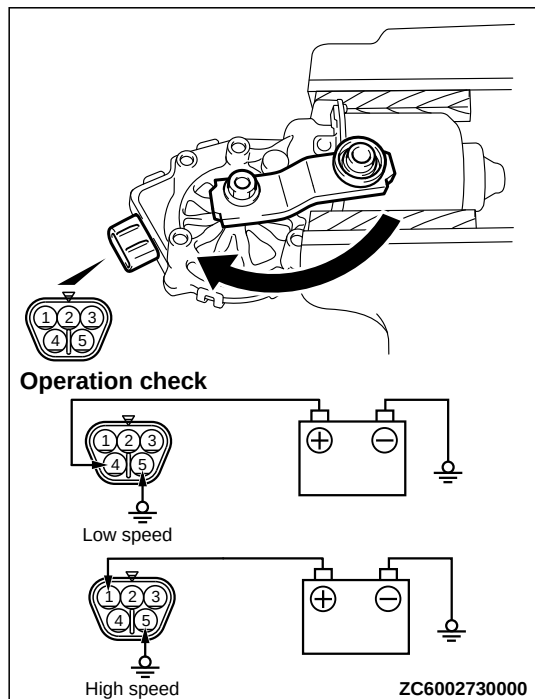
2. Connect the assembled wiper motor to a battery, and set it to the automatic stop position (Refer to Stop Position Check, P. 51B-53).
3. Apply grease to the inside of link rod joint (as required) and connect the link rod to wiper motor link plate.



INSPECTION

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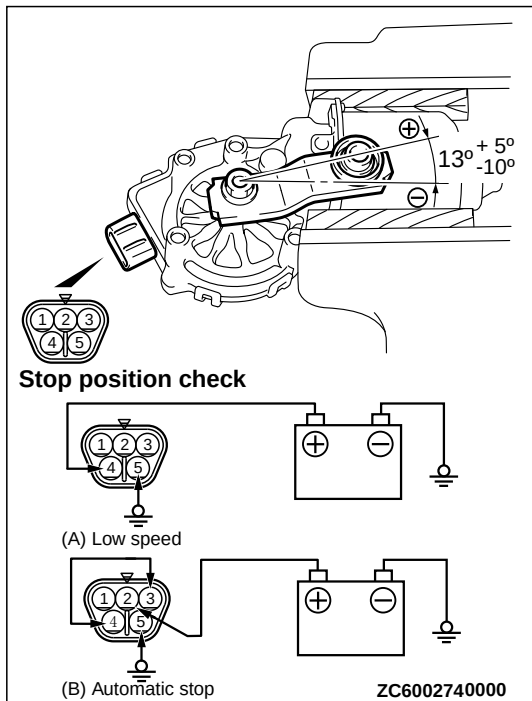
WINDSHIELD WIPER MOTOR CHECK



Remove the windshield wiper motor and inspect it at the harness connector.

WINDSHIELD WIPER MOTOR AT LOW OR HIGH SPEED OPERATION

Connect the battery to the windshield wiper motor to inspect the operation of motor rotation at low or high speed.



WINDSHIELD WIPER MOTOR AT STOP POSITION OPERATION

1. Connect the battery to the windshield wiper motor as shown in the illustration (A).
2. Run the windshield wiper motor at low speed, then disconnect the battery in the middle of the motor rotation and check to see that the motor stops.
3. Connect the battery to the windshield wiper motor as shown in the illustration (B).
4. Connect the terminals of the windshield wiper motor connector as shown in the illustration (B).
5. Check to see that the windshield wiper motor runs at low speed and then stops at the automatic stop position.

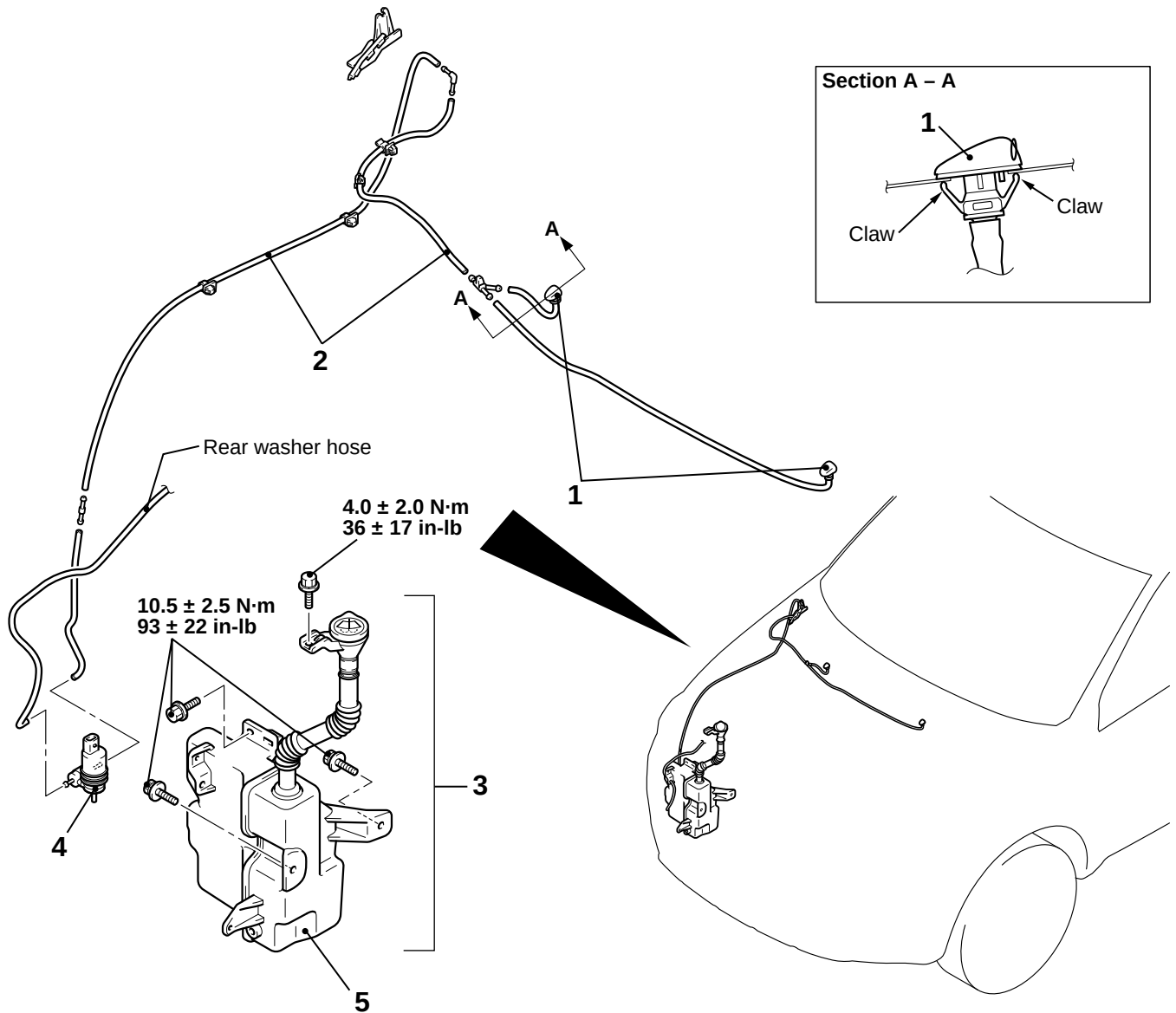
WINDSHIELD WIPER SWITCH CHECK

Check the windshield wiper switch (mist, intermittent, low speed and high speed) from the ETACS diagnosis codes for proper operations. (Refer to GROUP 54Ad, DIAGNOSTIC TROUBLE CODE CHART P.54Ad-8.)

WINDSHIELD WASHER

REMOVAL AND INSTALLATION

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ZC6002820000

Windshield washer nozzle removal steps

- Connection of windshield washer hose
- 1. Windshield washer nozzle

Washer hose removal steps

- Splash shield (RH) mounting clips
- Connection of washer nozzle/washer motor
- 2. Windshield washer hose

Washer tank removal steps

- Engine room under cover front (Refer to P.51A-18)
- Splash shield (RH) mounting clips
- Connection of front/rear washer hose
- 3. Windshield washer tank assembly
- 4. Windshield washer motor
- 5. Windshield washer tank

Washer motor removal steps

- Engine room under cover front (Refer to P.51A-18)
- Connection of front/rear washer hose

Washer motor removal steps

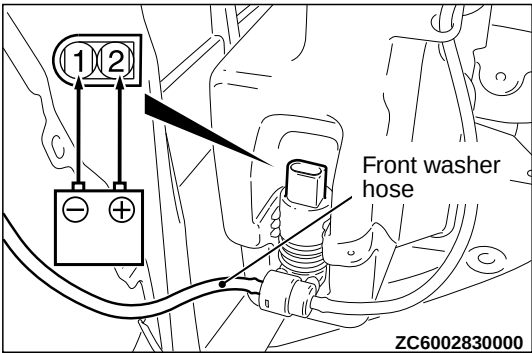
- 4. Windshield washer motor

INSPECTION

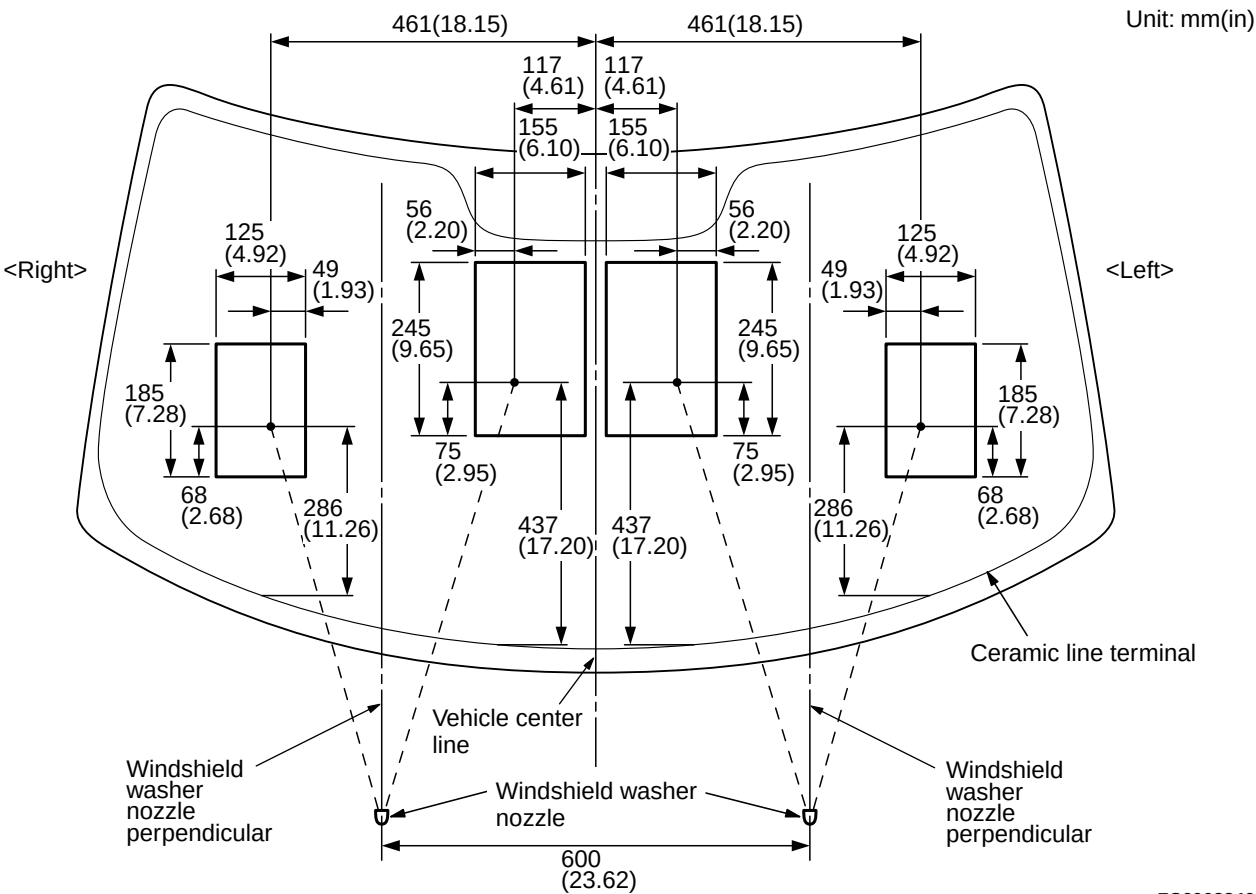
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FRONT WASHER MOTOR INSPECTION

1. The front washer motor must be checked with the washer tank installed and the washer fluid filled.
2. Connect the battery to the washer motor connector as shown. Check that the washer motor delivers washer strongly to the front washer hose side.



WINDSHIELD WASHER FLUID EJECTION CHECK



ZC6002840000

Move the nozzle to adjust the position so that the spray is in the area shown in the illustration.

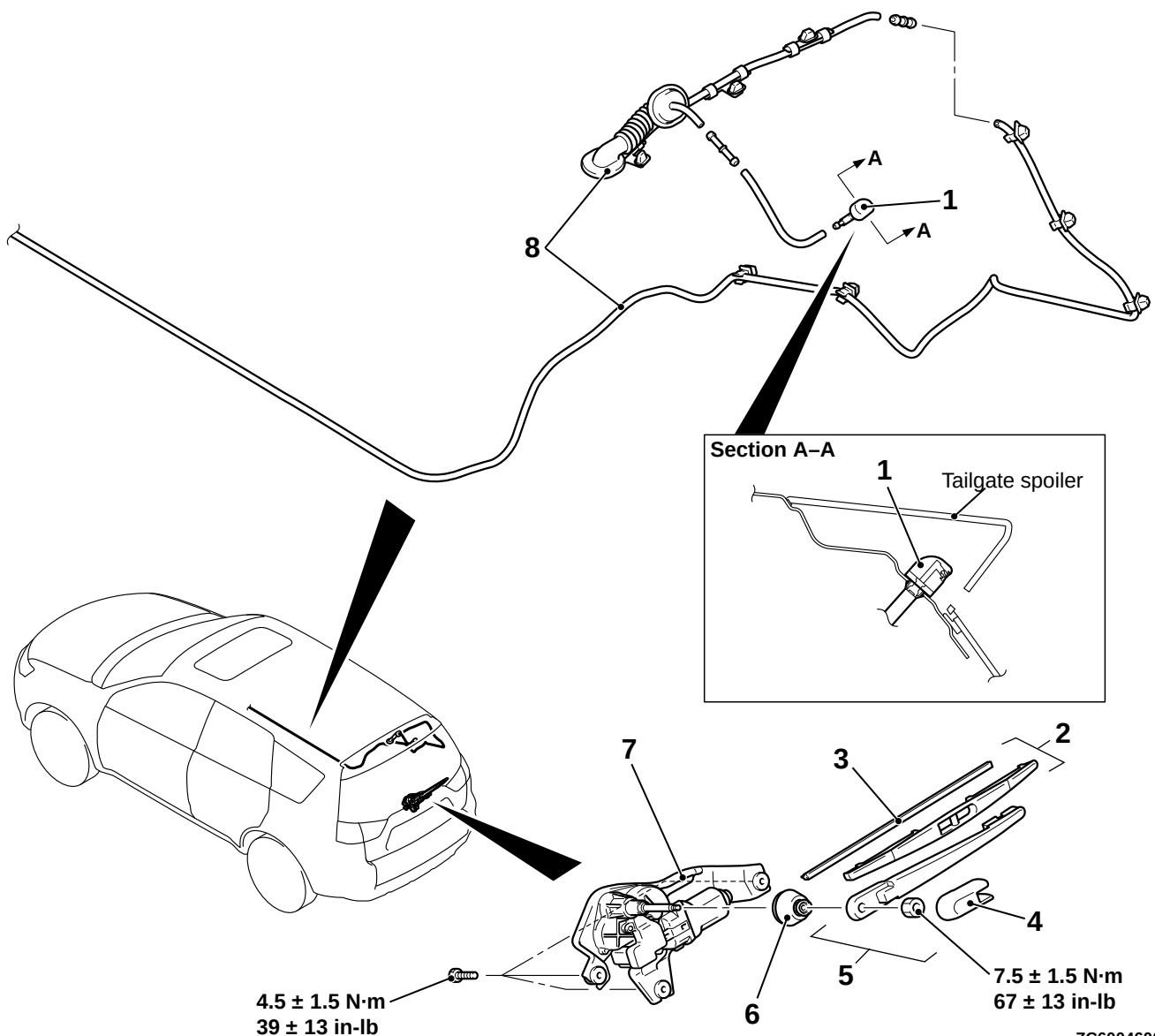
WINDSHIELD WASHER SWITCH CHECK

Check the windshield washer switch from the ETACS diagnosis codes for proper operation.(Refer to GROUP 54Ad, DIAGNOSTIC TROUBLE CODE CHART P.54Ad-8.)

REAR WIPER AND WASHER

REMOVAL AND INSTALLATION

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ZC6004600000

- Washer tank (Refer to P.51B-55)
- Washer motor (Refer to P.51B-55)

- Rear washer nozzle removal steps
- Liftgate spoiler (Refer to P.51A-20)

Rear washer nozzle removal steps

- High-mounted stop light assembly (Refer to P.51A-20)

1. Rear washer nozzle assembly

Rear wiper blade removal steps

2. Rear wiper blade assembly

>>A<< 3. Rear wiper blade

Rear wiper motor removal steps

4. Cover

>>B<< 5. Rear wiper arm assembly

- Liftgate trim (Refer to GROUP 52A, Liftgate Trim P.52A-14)

Rear wiper motor removal steps

6. Grommet
7. Rear wiper motor assembly

Rear washer hose removal steps

- Front/rear scuff plate, cowl side trim, quarter trim (Refer to GROUP 52A, Interior Trim P.52A-10)
- Liftgate trim (Refer to GROUP 52A, Liftgate Trim P.52A-14)
- 8. Rear washer hose

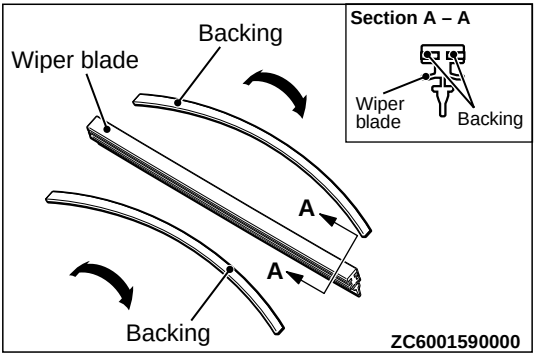
NOTE: For removal and installation of the wiper and washer switch, refer to GROUP 54Ah, Column Switch P. 54Ah-8.

INSTALLATION SERVICE POINTS

>>A<< REAR WIPER BLADE INSTALLATION

⚠ CAUTION

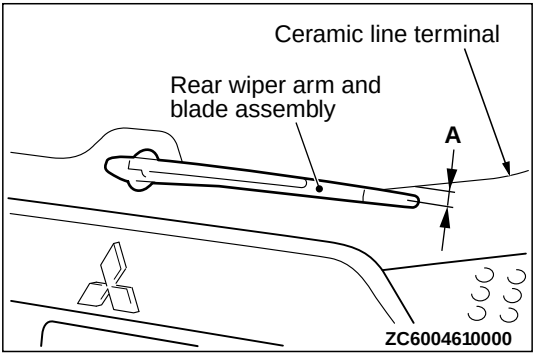
Use a curved backing like that shown for the backing of a wiper blade to ensure sustained wiper wiping performance.



>>B<< REAR WIPER ARM AND BLADE ASSEMBLY INSTALLATION

Assemble the wiper arm so that their edge stops at the specified position.

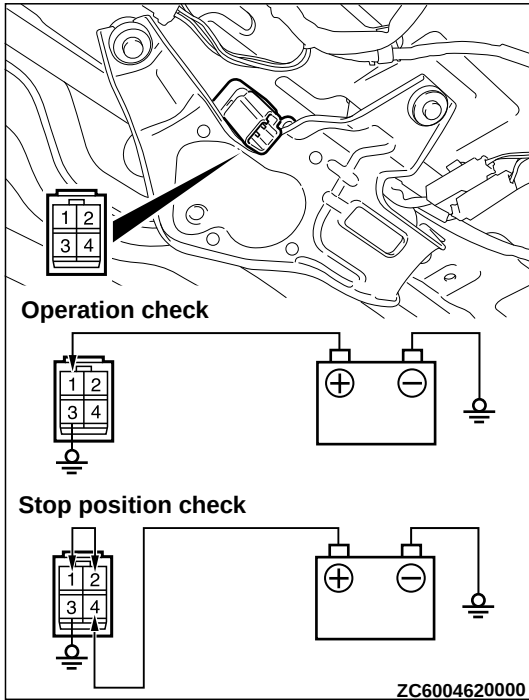
(A): 0 to 20 mm(0 to 0.79 in) from edge of the ceramic line



INSPECTION

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REAR WIPER MOTOR CHECK



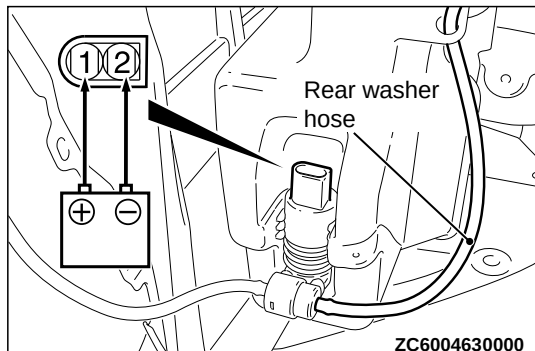
Inspect the rear wiper motor by disconnecting the harness connector with the motor attached to the vehicle.

REAR WIPER MOTOR OPERATION CHECK

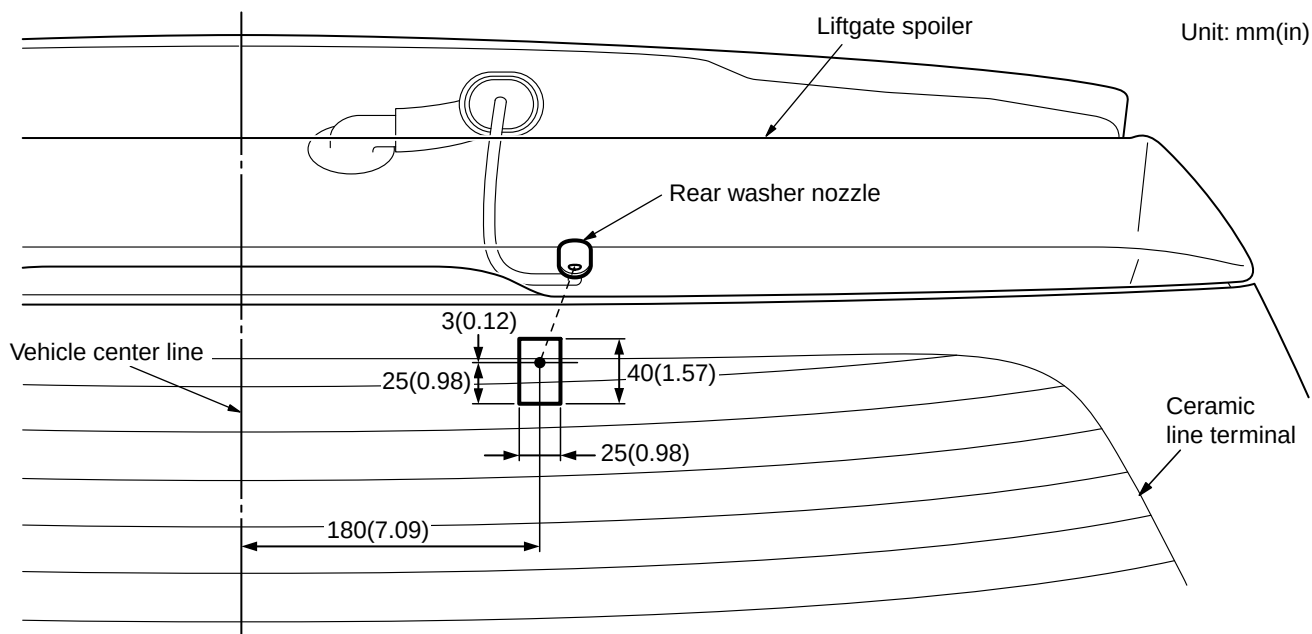
Connect the battery to the rear wiper motor to inspect the motor operation as shown in the illustration.

REAR WIPER MOTOR STOP POSITION CHECK

1. Connect the battery to the rear wiper motor as shown in the illustration.
2. Disconnect the battery in the middle of the motor rotation and check to see that the motor stops.
3. Reconnect the battery.
4. Check to see that the rear wiper motor runs and then stops at the automatic stop position.

REAR WASHER MOTOR INSPECTION

1. The rear washer motor must be checked with the washer tank installed and the washer fluid filled.
2. Connect the battery to the washer motor connector as shown. Check that the washer motor delivers washer strongly to the rear washer hose side.

CHECKING THE REAR WASHER NOZZLE INJECTION DIRECTION

Adjust the nozzle so that it injects washer fluid to the range shown.

CHECKING THE REAR WIPER AND WASHER SWITCH

The rear wiper and washer switch can be checked for proper operation by confirming ETACS diagnostic trouble code.(Refer to GROUP 54Ad, DIAGNOSTIC TROUBLE CODE CHART P. 54Ad-8.)