

Harness repair manual

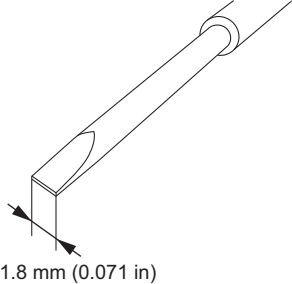
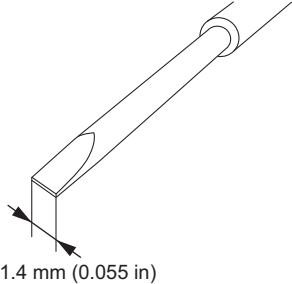
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1. Precautions before starting work


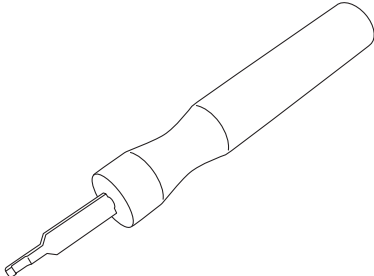
- When conducting harness repair work, do not make changes or improvements to the circuitry. Doing so may lead to a malfunction or fire due to harness wear.
- Before starting work, please refer to the "General Description", "Repair Contents", "NOTE", and "TROUBLESHOOTING OF ELECTRICAL SYSTEM" sections in the service manual.

2. Preparation items

A: General tools

Illustration	Description	Remarks
 <p>1.8 mm (0.071 in)</p> <p>WI-78764</p>	Precision screwdriver (general purpose) Tip width of 1.8 mm (0.071 in) or less.	Removing retainers.
 <p>1.4 mm (0.055 in)</p> <p>WI-78765</p>	Precision screwdriver (general purpose) Tip width of 1.4 mm (0.055 in) or less.	Removing terminals.
-	Hexagonal wrench: 2 mm (0.08 in) or less.	Removing waterproof plugs.
-	Harness tape (general purpose)	Protecting or securing the harness.

B: Special tools

Illustration	Tool number	Description	Remarks
 <p>STSSM4</p>	-	SUBARU SELECT MONITOR 4	<p>Used for setting various functions and troubleshooting issues in the electrical system.</p> <p>NOTE: For detailed operation procedures of the Subaru Select Monitor 4, please refer to "Application help".</p>
 <p>WI-85571</p>	99804AA0000	RETAINER REMOVER	<p>Used for removing retainers from the front oxygen (A/F) sensor (99801AA140) and rear oxygen sensor (99801AA150).</p> <p>NOTE: The tip of the special tool is very small and not very durable, since it was designed to fit the shape of the connector retainer. Thus, the tip may deform (bend or warp) if the tool is used repeatedly. If the tip is deformed, be sure to straighten it before using the tool again. However, Subaru will not be responsible for any damage caused by repeated deformations (bending or warping) during use and its repairs.</p>

3. Replacement parts

Connectors that can be replaced

If any of the following connectors fail, it is possible to obtain replacement parts.

Connector name	Replacement part number	Replacement part name	Connector manufacturer	Connector manufacturer part number			Poles
				Housing	Retainer	Housing & retainer	
Headlight	99801AA020	Repair harness connector	Yazaki Corporation	-	-	7283-1407-40	10
	99801AA000	Repair harness connector	Yazaki Corporation	-	-	7283-1289-40	8
	99801AA010	Repair harness connector	Yazaki Corporation	-	-	7283-7062-30	6
	99801AA100	Repair harness connector	Sumitomo Wiring Systems	-	-	6189-0715	16
	99801AA110	Repair harness connector	Yazaki Corporation	-	-	7283-1289-30	8
Front fog light	99801AA040	Repair harness connector	Sumitomo Wiring Systems	6189-0935	6918-1922	-	2
Daytime running light	99801AA050	Repair harness connector	Delphi	-	-	F487000	2
Main fan motor	99801AA060	Repair harness connector	Sumitomo Wiring Systems	6185-0867	6918-1774	-	2
	99801AA120	Repair harness connector	Yazaki Corporation	7123-6423-30	7157-6720	-	2
Sub fan motor	99801AA060	Repair harness connector	Sumitomo Wiring Systems	6185-0867	6918-1774	-	2
	99801AA130	Repair harness connector	Sumitomo Wiring Systems	-	-	6189-0482	2
Front oxygen (A/F) sensor	99801AA070	Repair harness connector	Sumitomo Wiring Systems	-	-	6189-0509	4
	99801AA140	Repair harness connector	Sumitomo Wiring Systems	6181-0664	6918-1600	-	6
Rear oxygen sensor	99801AA080	Repair harness connector	Sumitomo Wiring Systems	-	-	6189-0581	4
	99801AA150	Repair harness connector	Sumitomo Wiring Systems	6181-0513	6918-1598	-	4
Ignition coil	99801AA090	Repair harness connector	JST	-	-	03NFG-B-1A	3

For more information regarding harness repair connectors for each vehicle model, please refer to the "Body & Electrical/WIRING SYSTEM", "WIRING SYSTEM", "Harness Repair Kit", "SPECIFICATION", and "APPLICATION CHART" sections in the service manual.

4. Connector replacement

Precautions for connector replacement work

- Be sure to turn the ignition switch to the OFF position, and disconnect the negative terminal of the battery before starting work.
- If the connector is damaged, perform a visual inspection of the harness to confirm that it is not damaged.
- Make sure that the fuse is not blown.
- If there are any abnormalities such as deformation or damage to the terminal or waterproof plug, repair by replacing the entire harness assembly without replacing the connector.
- Do not cut the harness as the terminal parts are not included with the repair harness connector.
- When peeling off the harness protective tape to make it easier to work, ensure that the repair and waterproofing work is appropriately carried out.

A: Detaching the connector

NOTE:

Thoroughly wipe any dirt or oil off the harness to be repaired.

- 1) Remove all of the parts attached to the connector to be replaced.
- 2) Disconnect the connector.
- 3) Undo all fasteners such as clips, and pull out the connector.

B: Releasing the terminal retainer

- 1) Remove (release) the retainer from the housing (connector).

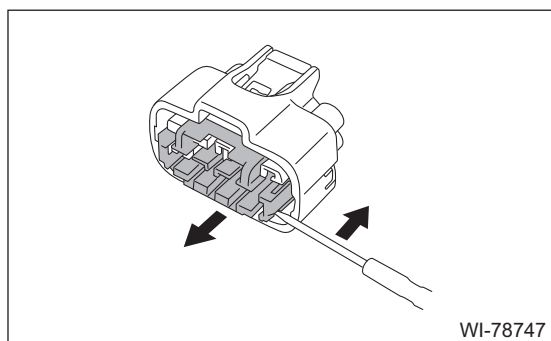
NOTE:

Before removing the retainer, make a note of the connector terminal arrangement and wire colors.

- 2) Removal method for each connector.

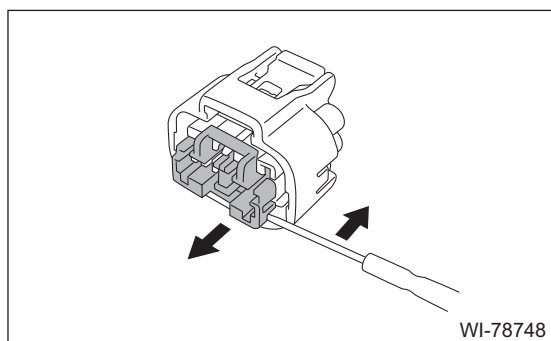
(1) Headlight (99801AA020)

- Pry out the left and right sides of the retainer.



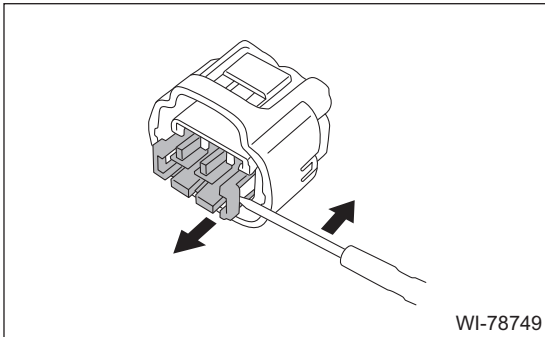
(2) Headlight (99801AA000)

- Pry out the left and right sides of the retainer.



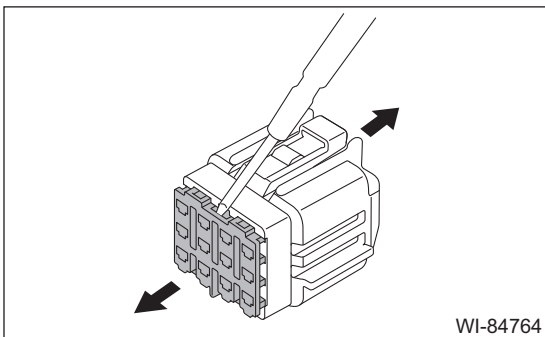
(3) Headlight (99801AA010)

- Pry out the left and right sides of the retainer.



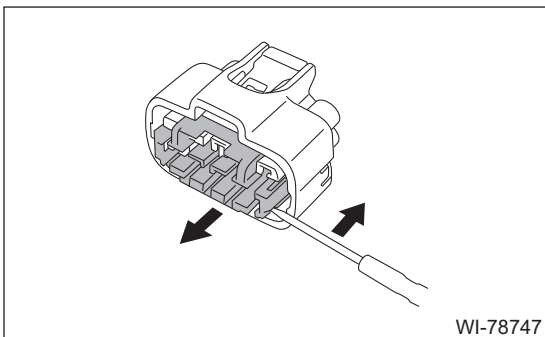
(4) Headlight (99801AA100)

- Pry out the top side of the retainer.



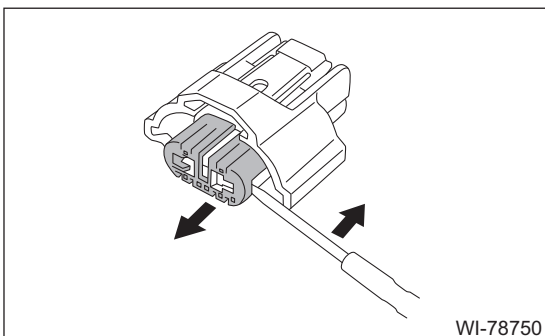
(5) Headlight (99801AA110)

- Pry out the left and right sides of the retainer.



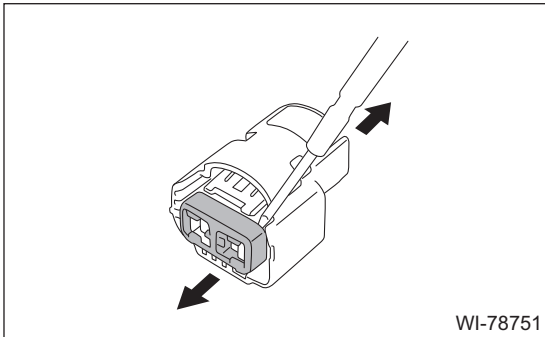
(6) Front fog light (99801AA040)

- Pry out the left and right sides of the retainer.



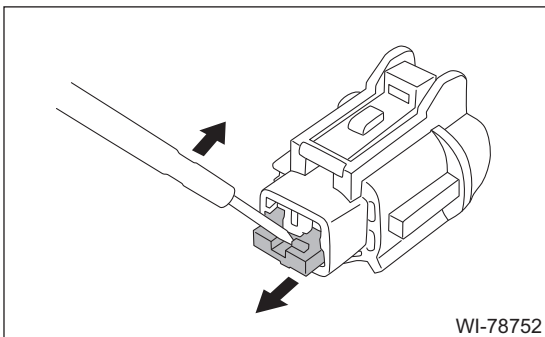
(7) Daytime running light (99801AA050)

- Pry out the left and right diagonal corners of the retainer.



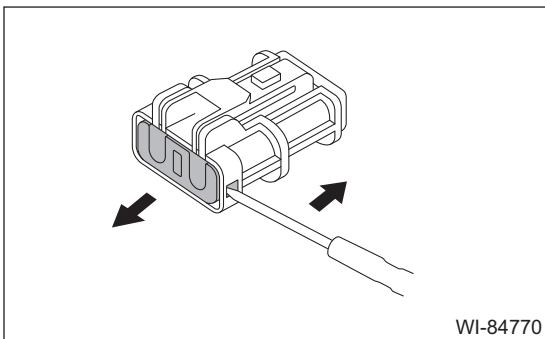
(8) Main fan motor (99801AA060)

- Pry out the top side of the retainer.



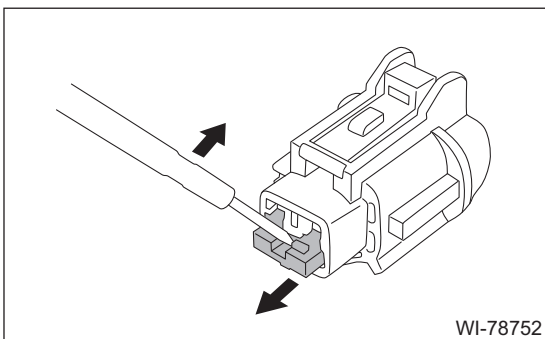
(9) Main fan motor (99801AA120)

- Pry out the left and right sides of the retainer.



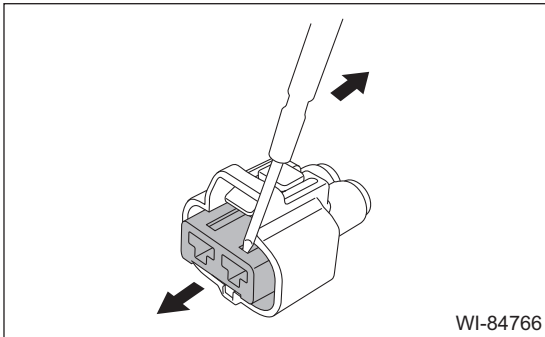
(10) Sub fan motor (99801AA060)

- Pry out the top side of the retainer.



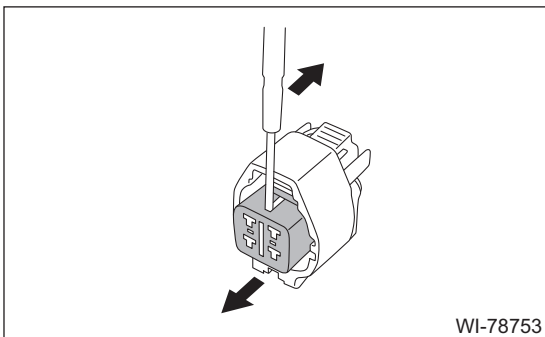
(11) Sub fan motor (99801AA130)

- Pry out the top side of the retainer.



(12) Front oxygen (A/F) sensor (99801AA070)

- Pry out the top and bottom sides of the retainer.

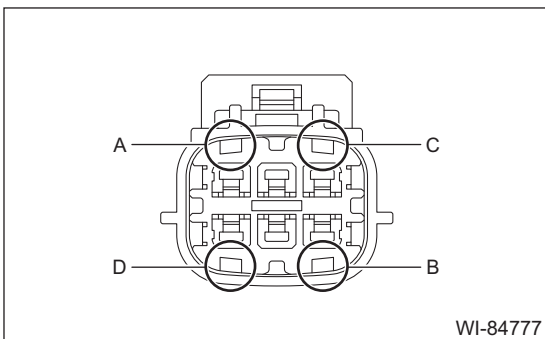


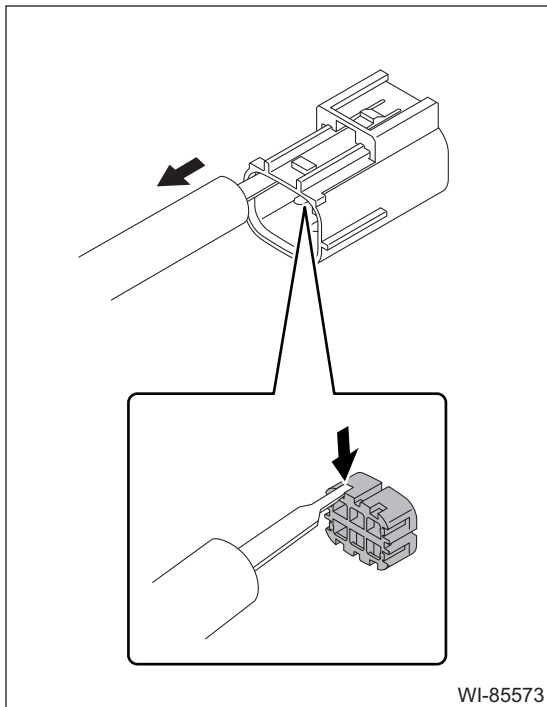
(13) Front oxygen (A/F) sensor (99801AA140)

- Insert the special tool into the retainer release hole A or B. Make sure the special tool is firmly attached to the retainer, and then slowly pull the retainer out.

CAUTION:

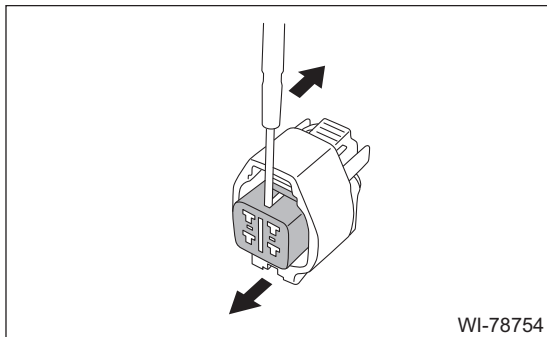
If you pull the retainer with the special tool inserted into hole C or D, you can damage the retainer. Do not use holes C and D.





(14) Rear oxygen sensor (99801AA080)

- Pry out the top and bottom sides of the retainer.

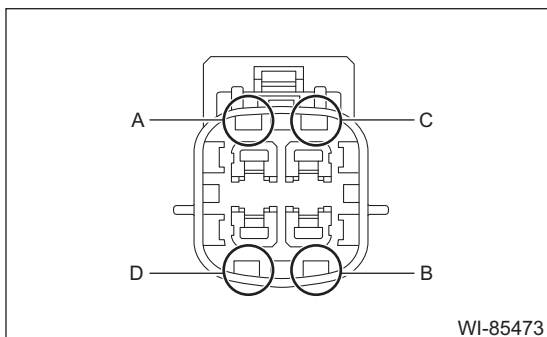


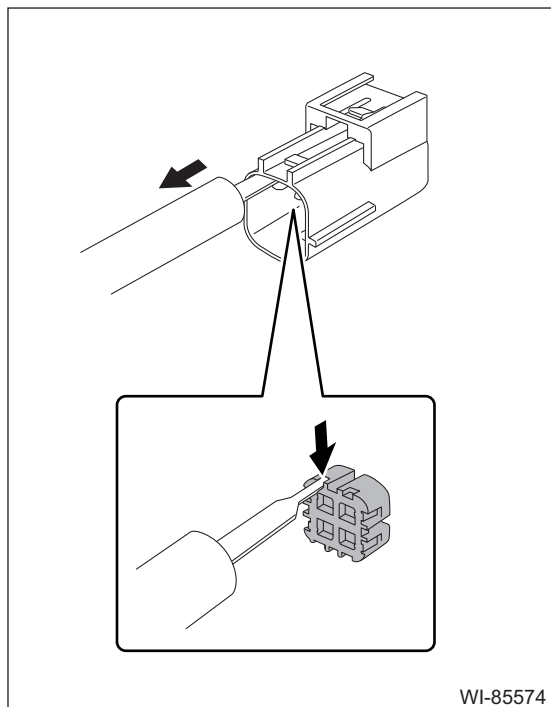
(15) Rear oxygen sensor (99801AA150)

- Insert the special tool into the retainer release hole A or B. Make sure the special tool is firmly attached to the retainer, and then slowly pull the retainer out.

CAUTION:

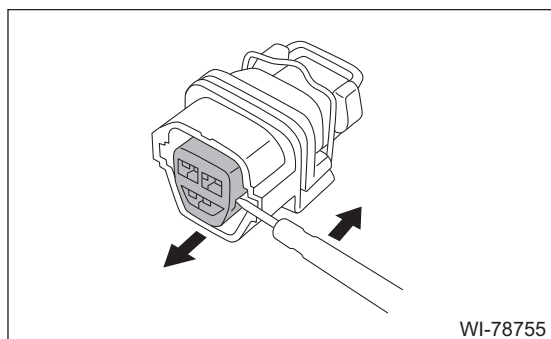
If you pull the retainer with the special tool inserted into hole C or D, you can damage the retainer. Do not use holes C and D.





(16) Ignition coil (99801AA090)

- Pry out the left and right sides of the retainer.



C: Removing terminals

CAUTION:

If the terminal is deformed, replace the entire harness assembly.

- 1) Ensure that the terminal remains pressed against the housing.
- 2) Check the cross section of each connector, and release the terminal locking mechanism using a precision screwdriver.
- 3) Once the terminal locking mechanism is released, pull out the terminal from the housing.
- 4) If it is not possible to pull out the terminal, repeat the procedure from the start.

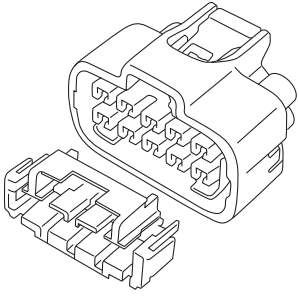
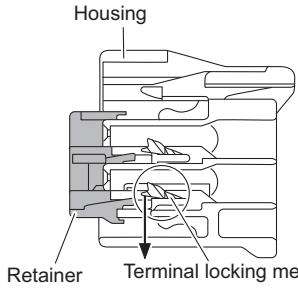
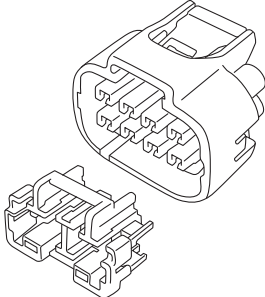
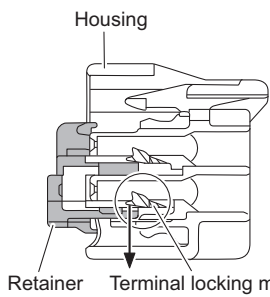
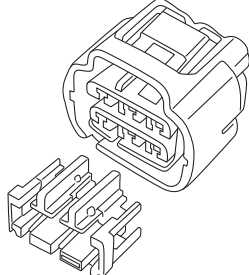
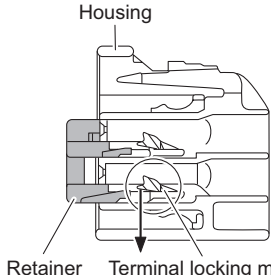
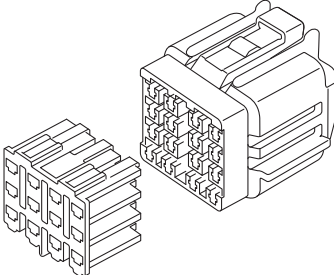
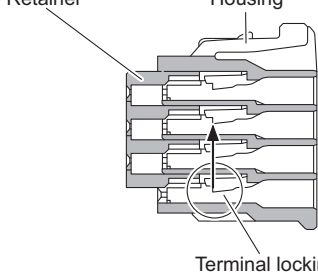
CAUTION:

- Do not forcefully pry out or strongly pull on the terminal.
- Ensure that tools such as the precision screwdriver used to pull out the terminal do not come into contact with the terminal contacts.

NOTE:

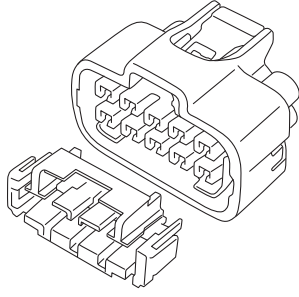
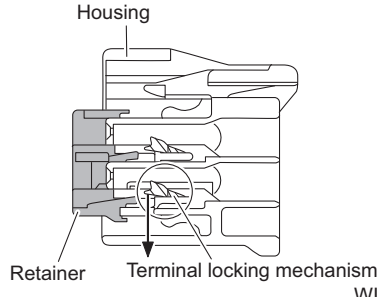
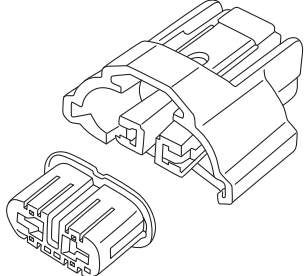
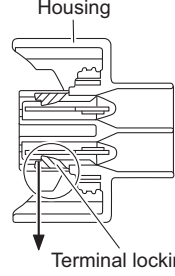
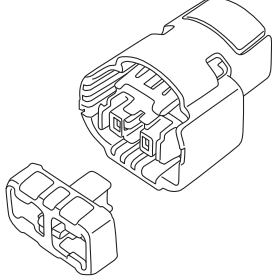
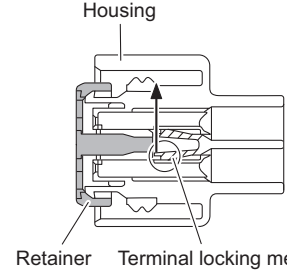
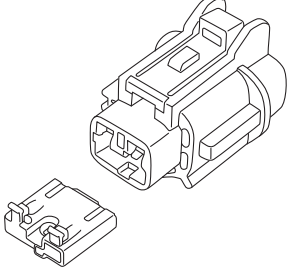
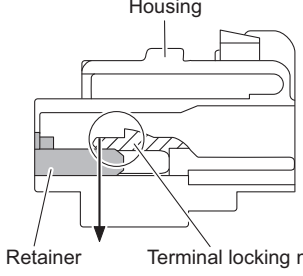
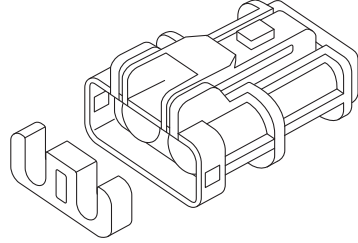
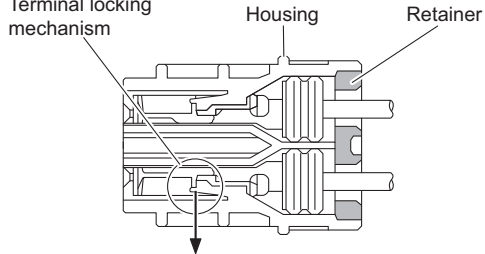
If the distance from the connector to the end of the harness protective tape is too short causing it to become difficult to remove the terminal, peel off some of the harness protective tape to make it easier to pull out the terminal.

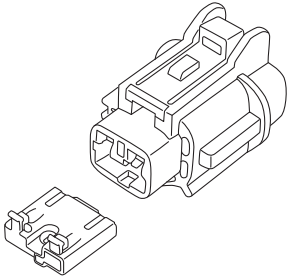
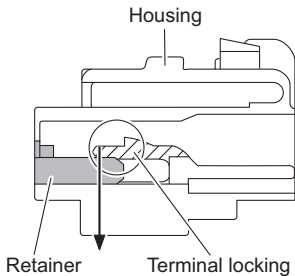
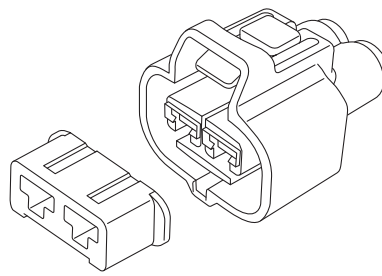
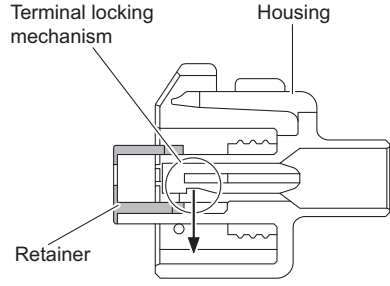
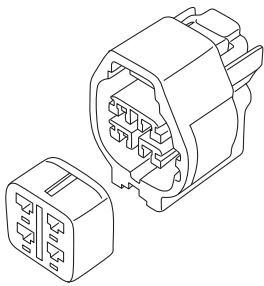
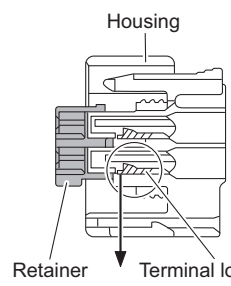
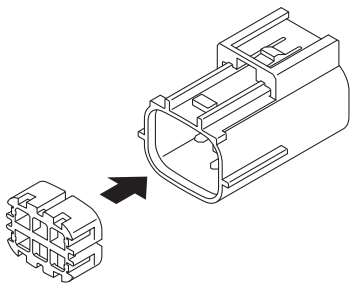
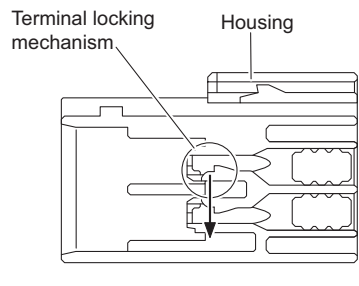
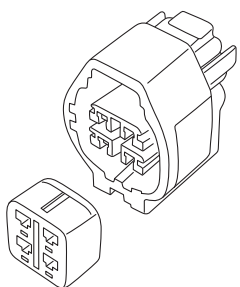
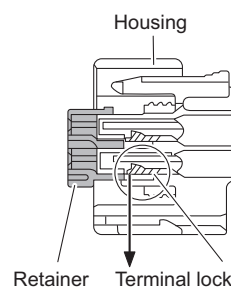
5) Shape and cross section of each connector

Connector type	Connector shape	Cross section
1) Headlight (99801AA020)	 WI-78766	 Housing Retainer Terminal locking mechanism WI-78775
2) Headlight (99801AA000)	 WI-78767	 Housing Retainer Terminal locking mechanism WI-78776
3) Headlight (99801AA010)	 WI-78768	 Housing Retainer Terminal locking mechanism WI-78777
4) Headlight (99801AA100)	 WI-84765	 Retainer Housing Terminal locking mechanism WI-84779

Connector replacement

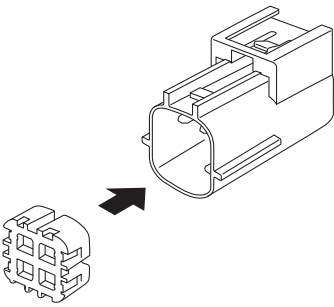
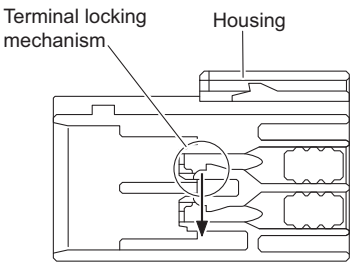
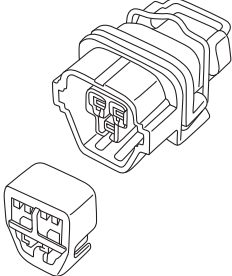
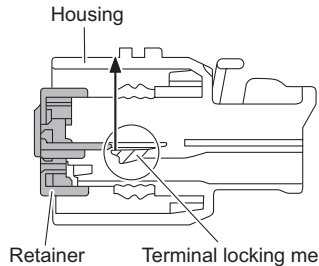
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Connector type	Connector shape	Cross section
5) Headlight (99801AA110)	 WI-78766	 WI-78775
6) Front fog light (99801AA040)	 WI-78769	 WI-78778
7) Daytime running light (99801AA050)	 WI-78770	 WI-78779
8) Main fan motor (99801AA060)	 WI-78771	 WI-78780
9) Main fan motor (99801AA120)	 WI-84771	 WI-84780

Connector type	Connector shape	Cross section
10) Sub fan motor (99801AA060)	 WI-78771	 WI-78780
11) Sub fan motor (99801AA130)	 WI-84767	 WI-84781
12) Front oxygen (A/F) sensor (99801AA070)	 WI-78772	 WI-78781
13) Front oxygen (A/F) sensor (99801AA140)	 WI-84773	 WI-84782
14) Rear oxygen sensor (99801AA080)	 WI-78773	 WI-78782

Connector replacement

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Connector type	Connector shape	Cross section
15) Rear oxygen sensor (99801AA150)	 WI-85474	 WI-84782
16) Ignition coil (99801AA090)	 WI-78774	 WI-78783

D: Installing and removing the waterproof plug

- 1) Use a tool such as a hexagonal wrench to pull out and remove the waterproof plug from the front of the connector.

CAUTION:

- Remove any dust or dirt from the waterproof plug.
- Be careful not to damage or break the waterproof plug.

- 2) Push in the waterproof plug straight from the back of the connector to install.

NOTE:

There is no specified waterproof plug installation orientation.

E: Checking the terminals

- 1) Connect the female terminal directly to the corresponding male terminal, and check the terminal contact pressure, the degree of mating, and the weight of sliding movement. Replace the harness assembly if faulty.
- 2) Replace the connecting parts if the male terminal has any deformation or is faulty.

F: Installing terminals

- 1) Before removing the retainer, insert the terminal straight from the rear of the housing while referring to the record of the connector terminal arrangement and wire colors.

CAUTION:

Pay attention to the vertical orientation when inserting the terminal.

- 2) Push until you hear a click to indicate that it is locked in place.
- 3) Pull on the harness lightly to confirm that it is appropriately locked in place.
- 4) If the terminal is not properly locked, check for any terminal deformation or damage to the terminal locking mechanism, and do the following:
 - Terminal deformation: Replace the harness assembly.
 - Damage to the terminal locking mechanism: Replace the repair harness connector.

G: Installing the retainer

Install the retainer to the housing. To install the retainer to a male housing, use a slotted screwdriver or a similar tool.

NOTE:

If you cannot install it to its original position, ensure that you are pressing the terminal against the housing.

CAUTION:

Confirm that the retainer is properly installed.

H: Connecting the connector

- 1) Connect the replaced connector.
- 2) Secure the harness by using a tool such as a clamp. Make sure the harness is not too slack or too taut.

CAUTION:

- Secure it so that it does not interfere with the body end parts, edges, bolts or screws.
- When installing a harness or another part, make sure that nothing is caught on the harness.

- 3) Install the removed parts.

NOTE:

If you peel off any harness tape, do not reuse it. Replace it with new tape.

I: Checking operation

- 1) Check the operation of the replaced connector.
 - (1) Check the headlight connector.
 1. Turn the ignition and headlight switches to the ON position, and gently move the harness and connector in the up, down, left, and right directions. Confirm that the lights do not turn off or flash.
 - (2) Check the front fog light connector.
 1. Turn the ignition and front fog light switches to the ON position, and gently move the harness and connector in the up, down, left, and right directions. Confirm that the lights do not turn off or flash.
 - (3) Check the radiator fan connector.
 1. Turn the ignition switch to the ON position, connect the Subaru Select Monitor, and run the radiator fan through an active test.
 2. Gently move the harness and connector in the up, down, left, and right directions, and confirm that the fan does not stop running.
 - (4) Check the daytime running light connector.
 1. Turn the ignition switch and daytime running light to the ON position. Gently move the harness and connector in the up, down, left, and right directions, and confirm that the light does not turn off or flash.
 - (5) Check the front oxygen (A/F) sensor and rear oxygen sensor connector.
 1. Start the engine, and wait until it is warmed up.
 2. Connect the Subaru Select Monitor, and bring up the graphs for the corresponding monitor values of the "A/F Sensor #1" and "Bank 1 - Sensor 2 present at that location" items in the engine data monitor function.
 3. Gently move the harness and connector in the up, down, left, and right directions, and confirm that there are no abnormalities in the monitored values.
 - (6) Check the ignition coil connector.
 1. Start the engine, and wait until it is warmed up.

Connector replacement

2. Connect the Subaru Select Monitor, and bring up the graphs for the corresponding values of the "Cylinder Monitor #1", "Cylinder Monitor #2", "Cylinder Monitor #3", and "Cylinder Monitor #4" items in the engine data monitor function.
3. Gently move the harness and connector in the up, down, left, and right directions, and confirm that there is no variation in the monitored values. In addition, check for noise or vibration that indicates engine misfiring.