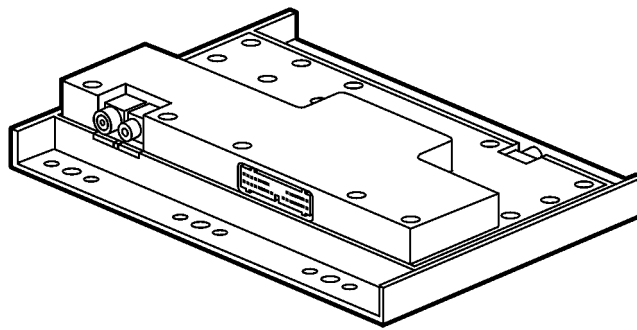


Satellite Communication System Service Procedures



W3004840

Volvo Link ECU

The Volvo Link System provides satellite communications. It includes the Volvo Link ECU, GPS antenna, wiring harnesses and dash switch. This system allows communications between the fleet, via Volvo's Web based software, and the vehicle.

This information covers repair procedures of the vehicle portion of the Volvo Link system. For design and troubleshooting information, see service information in group 397.

This information contains:

- ["Volvo Action Service Switch, Replacement" page 2](#)
- ["ECU, Replacement" page 2](#)
- ["GPS Antenna, Replacement" page 4](#)
- ["GPS Antenna Cable, Replacement" page 5](#)
- ["Radio Adapter Cables, Replacement" page 9](#)
- ["Wiring Harness, Replacement" page 10](#)
- ["Kit, Installation" page 12](#)

Service Procedures

3646-03-02-44 Volvo Action Service Switch, Replacement

NOTE: The Volvo Action Service Switch may not be provided with all Volvo Link systems.

1



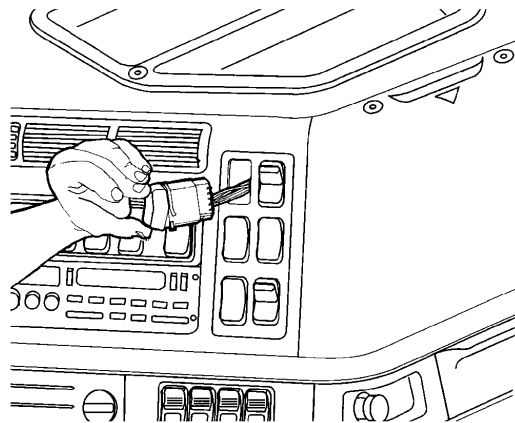
Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

Make certain the vehicle ignition is OFF.

2

Insert a small slotted screwdriver into the bottom of the switch to release the locking tab.

3



W3004860

Pull the switch out of the dash by “rocking” out at the bottom, then pulling out at the top. Disconnect the electrical connector and remove the switch.

4

Connect the electrical connector to the new switch. Install by pushing into the panel until it locks into position.

3970-03-02-01 ECU, Replacement Volvo Link ECU

NOTE: Replacing a Volvo Link ECU with another ECU from a different vehicle will not work. There are system checks within the ECU that will not allow it to work if it has been changed from the VIN that it was originally installed or configured for.

NOTE: When replacing early model Volvo Link ECUs, the ECU should be ordered from Volvo per the vehicle’s engine type. Early model ECUs will be programmed before delivery. Later model ECUs may be programmed in the field using the VCADS Pro tool.

1



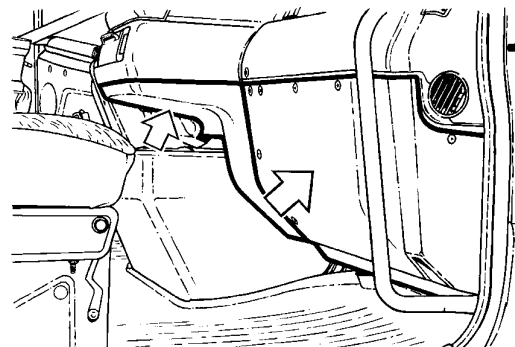
Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

Make certain the vehicle ignition is OFF.

2

Remove the right upper grab handle mounting bolt.

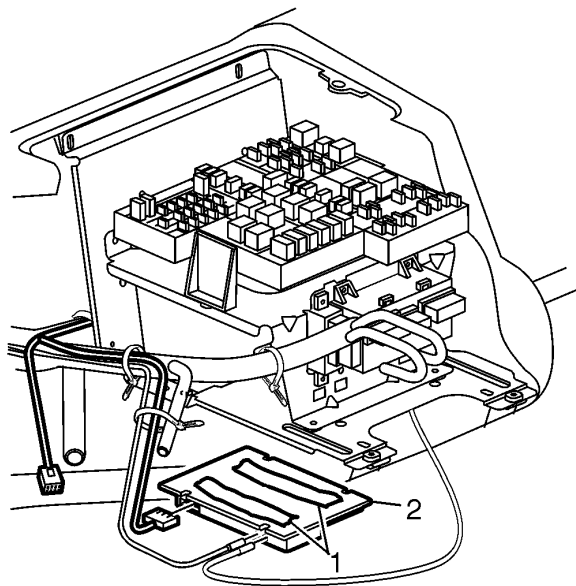
3



W8001131

Remove the center and right lower dash panels.

4



W3004853

- 1 2-sided tape
- 2 Volvo Link ECU

Note all connections to the ECU to aid in assembly. Remove all cable and wiring connections. Remove the fasteners and remove the ECU from the vehicle. Note: Early ECUs may be secured with 2-sided tape.

5

Replace all removed panels.

6

Install the upper right grab handle mounting bolt. Torque tighten to 24 ± 4 Nm (18 ± 2 ft-lb).

7

If necessary, program the Volvo Link ECU with the VCADS Pro tool.

NOTE: This step is not included in the Volvo Standard Time (VST) calculations.

8

In-warranty ECUs that are defective must be returned to Volvo's TMAC following parts return procedures.

3970-03-02-03 GPS Antenna, Replacement Volvo Link System

1

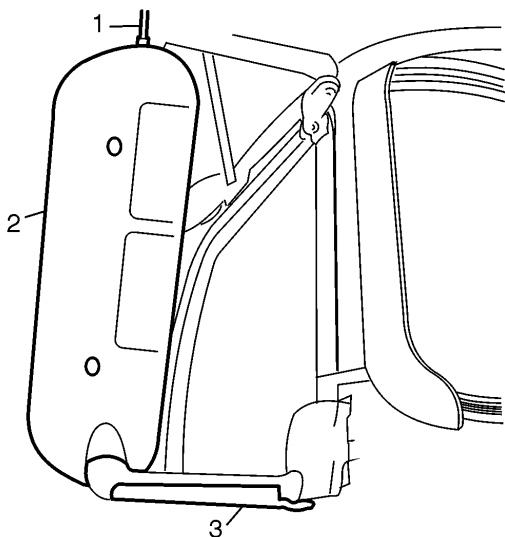


DANGER

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

Make certain the vehicle ignition is OFF.

2



W3004855

Remove the right antenna whip (1) and right mirror backing (2).

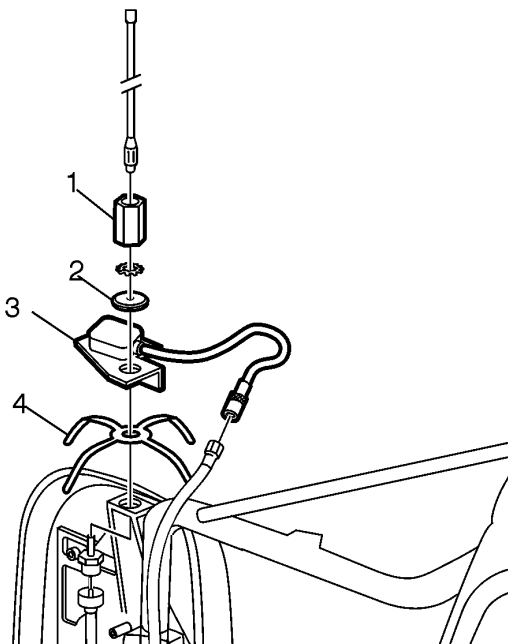
3

Disconnect the GPS antenna from the GPS antenna cable. Remove tie straps as needed.

4

Remove the GPS antenna and bracket assembly from underneath the multiplex antenna mounting nut and seal. Note the stack-up of components for installation.

5



W3004846

- 1 Antenna mounting nut
- 2 Spacer
- 3 GPS antenna and bracket
- 4 Cell phone antenna

Install the replacement GPS antenna and bracket assembly under the multiplex antenna mounting nut and seal. See the figure for proper installation.

6

Connect the GPS antenna to the GPS cable. Secure as needed.

7

Install the mirror backing and multiplex antenna whip.

3970-03-02-04 GPS Antenna Cable, Replace- ment Volvo Link System

1



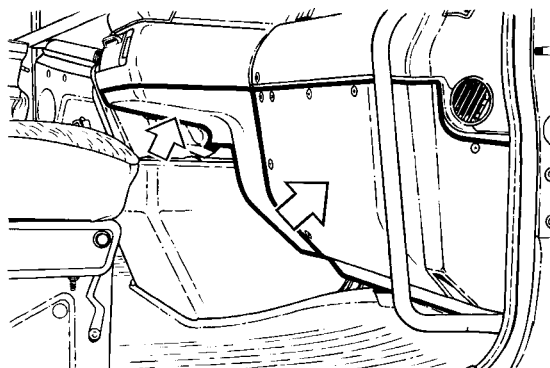
DANGER

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

Make certain the vehicle ignition is OFF.

2
Remove the right upper grab handle mounting bolt.

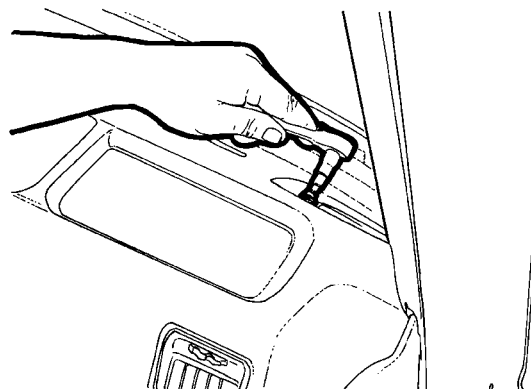
3



W8001131

Remove the center and right lower dash panels.

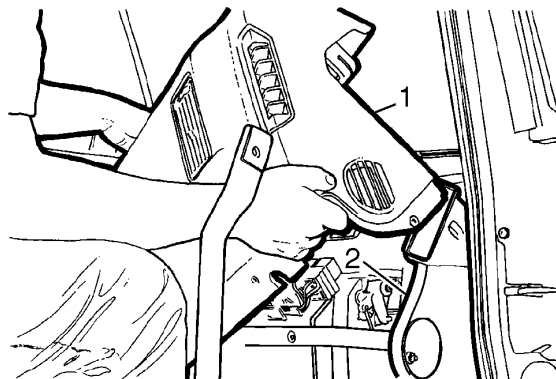
4



W8001178

Remove the right dash speaker grille, and the speaker.

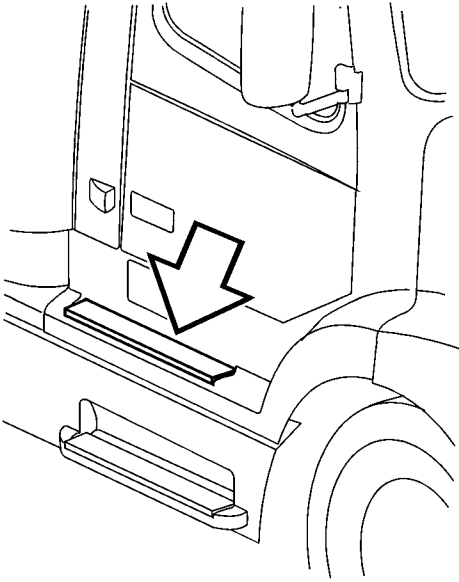
5



W3004847

Remove the right upper dash panel (1) and lower right plenum (2).

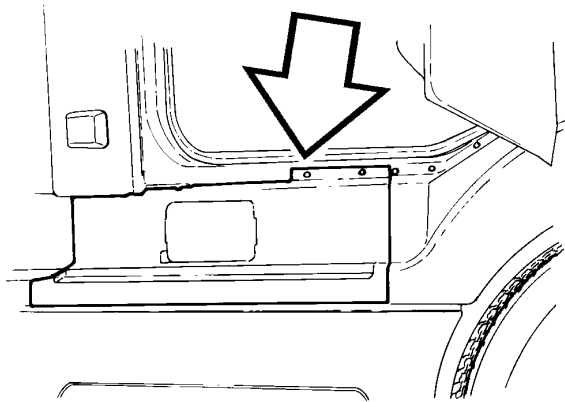
6



W3000667

Remove the right side cab step.

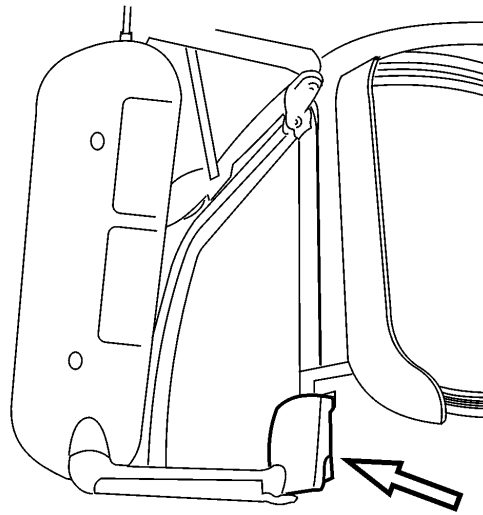
7



W3000662

Remove the upper tank fairing.

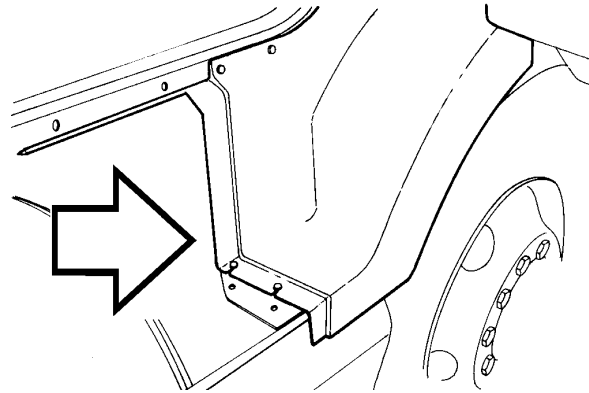
8



W3004854

Remove the bolts securing the lower right mirror mounting arm.

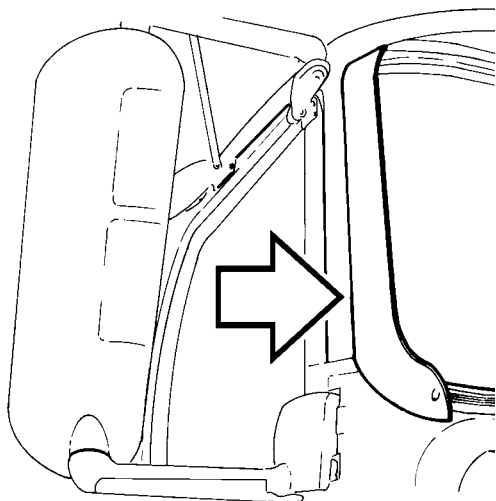
9



W3000661

Remove the right quarter fender.

10



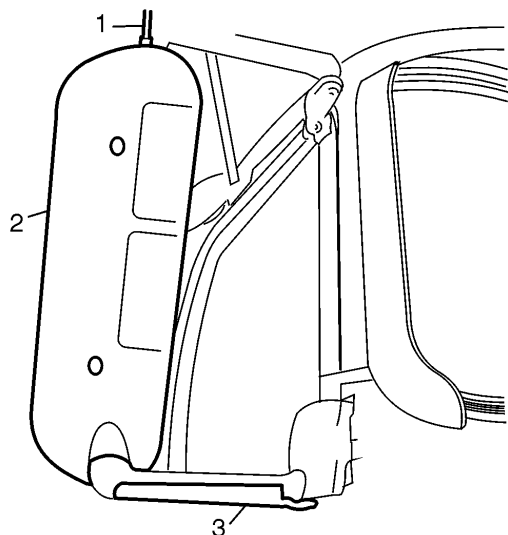
W3000663

Remove the right drip molding.

11

Remove the right side cowl panel mounting bolts. Then carefully work the cowl around the lower mirror arm mount and remove from the vehicle. Note the position of the lower fresh air seal to aid in installation.

12



W3004855

Remove the right antenna whip (1), right mirror backing (2), and lower arm cover (3).

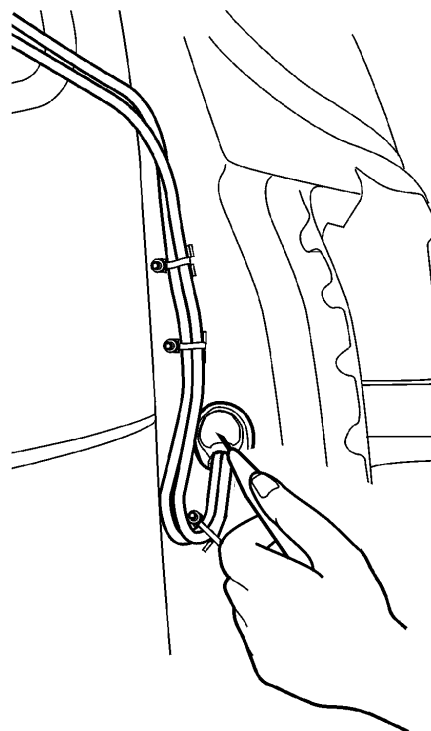
13

Note the routing of the existing GPS antenna cable from the Volvo Link ECU to the antenna whip in the mirror head. Cut the tie straps securing the antenna cable. Disconnect the GPS cable from the GPS antenna and the Volvo Link ECU. Remove the GPS cable.

14

Disconnect all mirror connectors to allow installation of a new cowl pass-through seal.

15



W3004845

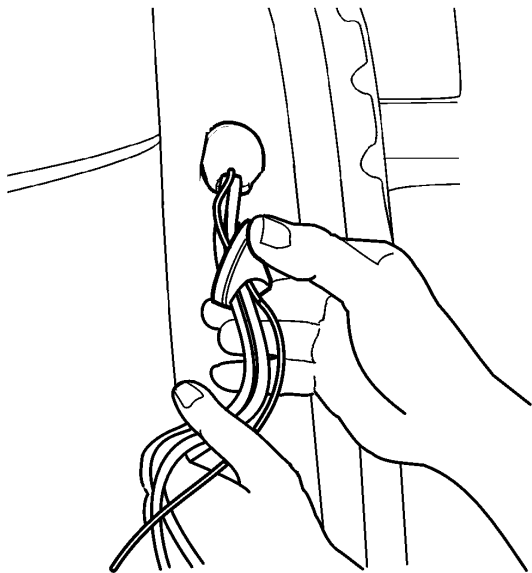


CAUTION

Do not cut or nick wiring. Doing so could cause an electrical short-circuit.

Carefully cut away the old pass-through seal.

16



W3004843



CAUTION

It is important to route the cable exactly as instructed. Failure to do so can damage to the cable, resulting in poor communication.

Route the new GPS antenna cable through the cowl pass-through opening. Install the new cowl pass-through seal over all the wiring and into its mounting position. Do not heat shrink to the cowl at the same time. Note: Be sure that the threaded cable end goes to the mirror assembly.

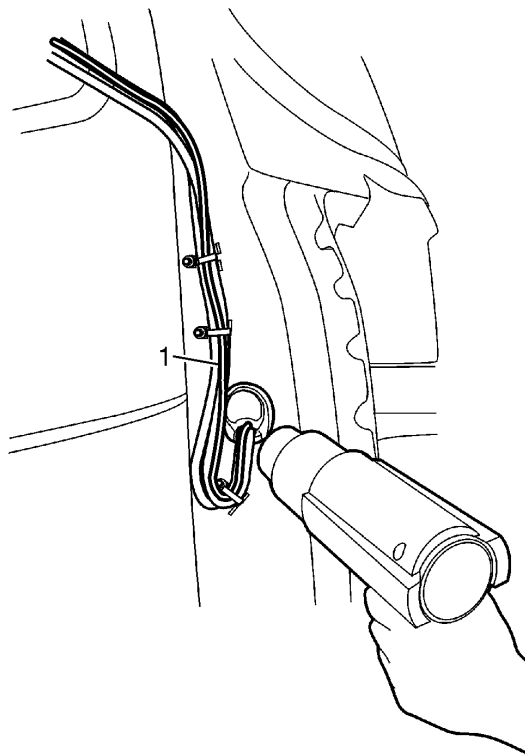
17

Connect the replacement cable to the GPS antenna. Connect all mirror wiring connectors.

18

Pull the excess cable into the cab. Route the Volvo Link antenna cable and mirror wiring along the same route where the mirror wiring was previously. Secure with tie straps as needed.

19



W3004844

Secure the cowl seal to the cowl. Use a heat gun to shrink the seal.

20

Install the right mirror backing, lower arm cover and antenna whip.

21

Position the lower fresh air seal and install the right cowl panel.

22

Install the bolts securing the lower right mirror mounting arm. Torque tighten to 24 ± 4 Nm (18 ± 2.9 ft-lb).

24 ± 4 Nm (18 \pm 2.9 ft-lb)

23

Install the right drip molding. Torque tighten the top 2 screws to 1.2 ± 0.2 Nm (10.6 ± 2 in-lb), and the lower screw to 3 Nm \pm 0.5 (26 ± 5 in-lb).

1.2 ± 0.2 Nm (10.6 \pm 2 in-lb)
 3 Nm \pm 0.5 (26 \pm 5 in-lb)

- 24**
Install the right quarter fender. Torque tighten to 24 ± 4 Nm (18 ± 2.9 ft-lb).
- 25**
Install the upper tank fairing. Start all bolts, then tighten after aligning fairing. Torque tighten to 24 ± 4 Nm (18 ± 2.9 ft-lb).
- 26**
Install the right cab step. Start all 4 bolts, then tighten after aligning the step. Torque tighten to 12 ± 1 Nm (106 ± 8 in-lb).
- 27**
Starting inside the right cowl, route the replacement GPS antenna cable along the route the old cable followed to the Volvo Link ECU. Connect the cable to the ECU and secure as needed.
- 28**
Replace all removed panels.
- 29**
Install the upper right grab handle mounting bolt. Torque tighten to 24 ± 4 Nm (18 ± 2 ft-lb).

3970-03-02-05 Radio Adapter Cables, Re- placement Volvo Link System

1

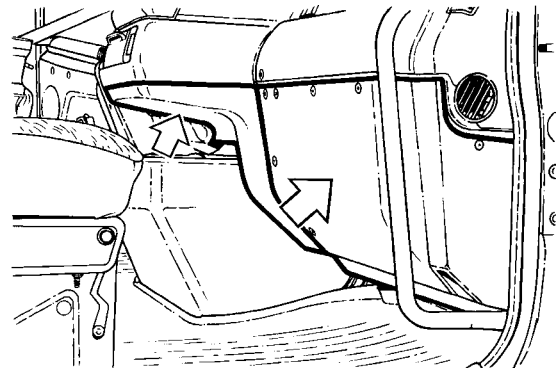
DANGER

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

Make certain the vehicle ignition is OFF.

2
Remove the right upper grab handle mounting bolt.

3



W8001131

Remove the center and right lower dash panels.

4
Note the routing of the existing radio antenna adapter cables to aid in installation. Cut the tie straps securing the adapter cables. Disconnect the cables and remove.

5
Install the new adapter cables, routing the same way as the old cables. Connect all connectors and secure as needed.

6
Replace all removed panels.

7
Install the upper right grab handle mounting bolt. Torque tighten to 24 ± 4 Nm (18 ± 2 ft-lb).

3970-03-02-02 Wiring Harness, Replacement Volvo Link System

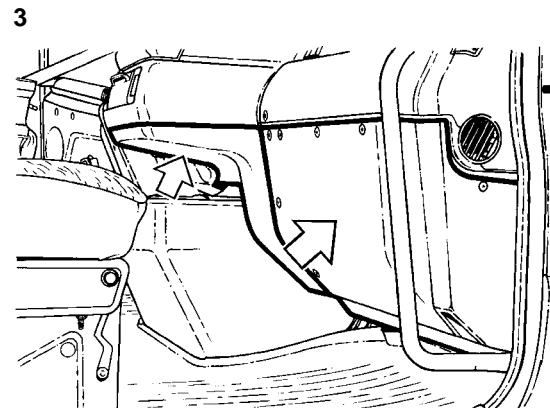
1



Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

Make certain the vehicle ignition is OFF.

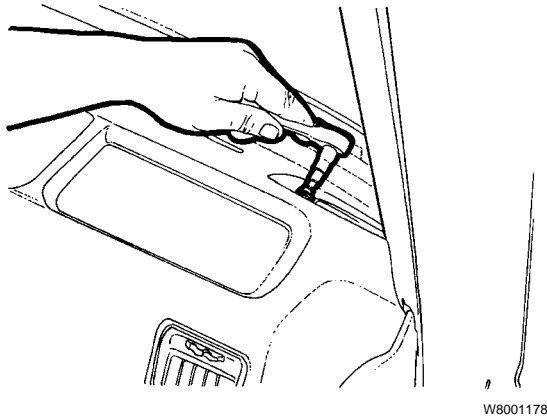
2
Remove the right upper grab handle mounting bolt.



W8001131

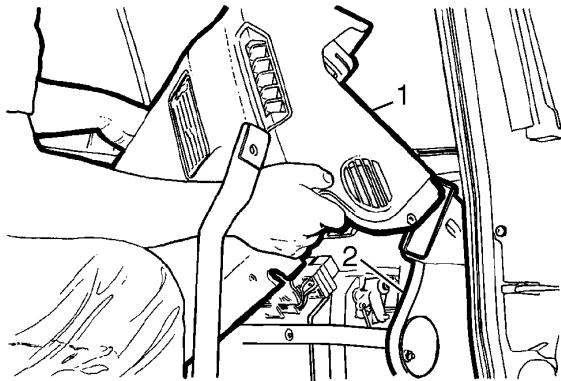
3
Remove the center and right lower dash panels.

4



Remove the right dash speaker grille, and the speaker.

5



Remove the right upper dash panel (1).

6

Remove top TEC cover.

7

Remove the Volvo Action Service Switch (see "Volvo Action Service Switch, Replacement" page 2).

8

Observe the routing of the existing Volvo Link wiring harness to aid in installation. Cut tie straps as needed. Disconnect all connectors and remove the harness.

9

Install the replacement harness along the same route as the old harness. Connect all connectors and secure as needed.

10

Install the Volvo Action Service switch.

11

Replace all removed panels.

12

Install the upper right grab handle mounting bolt. Torque tighten to 24 ± 4 Nm (18 ± 2 ft-lb).

3970-18-02-01 Kit, Installation Volvo Link System, Complete

The following instructions are for installation of kits 20469220 and 20469221.

NOTE: Prerequisites for this kit are at least a '98 instrument cluster (from 1999 and forward), RAMI Multiplexer antenna system with dual whips and Lang Mekra mirrors.

NOTE: Volvo Link kits should be ordered from Volvo per the engine type in the vehicle. Early model ECUs will be programmed before delivery. Later model ECUs may be programmed in the field using the VCADS Pro tool.

NOTE: The instrument cluster must be programmed to interface with the Volvo Link ECU. It is assumed that all retrofits will be done at dealer locations with the ability to reprogram the instrument cluster.

1



DANGER

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

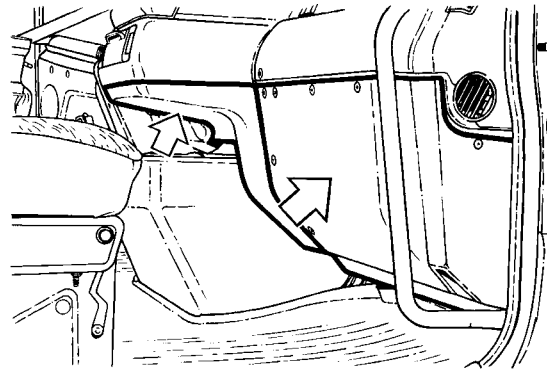
Make certain the vehicle ignition is OFF.

GPS Antenna and Cable Installation

2

Remove the right upper grab handle mounting bolt.

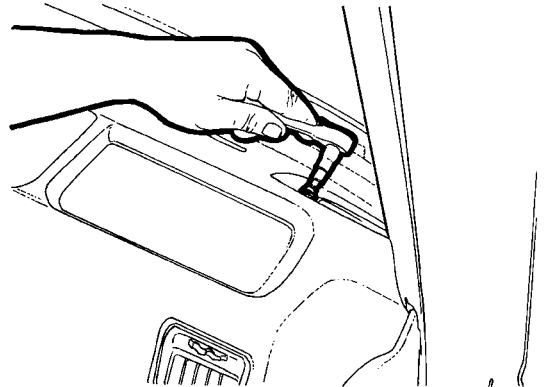
3



W8001131

Remove the center and right lower dash panels.

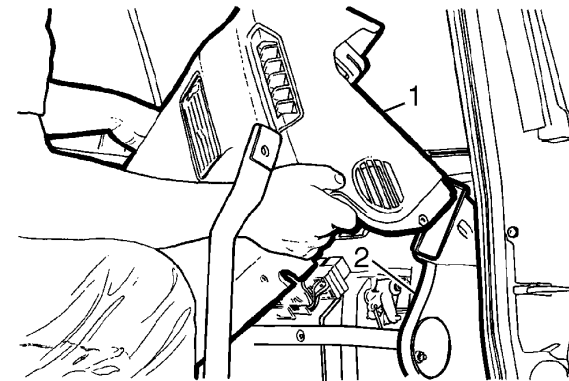
4



W8001178

Remove the right dash speaker grille, and the speaker.

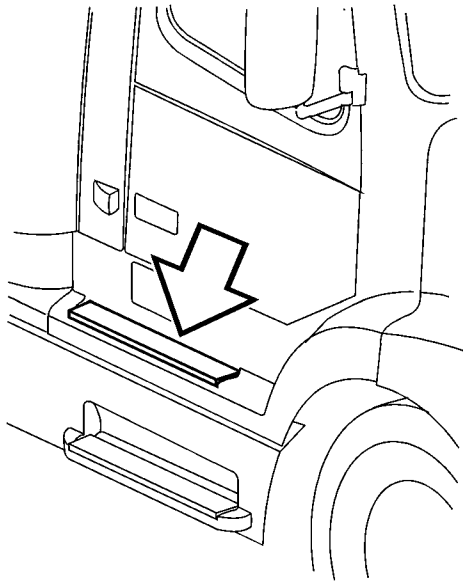
5



W3004847

Remove the right upper dash panel (1) and lower right plenum (2).

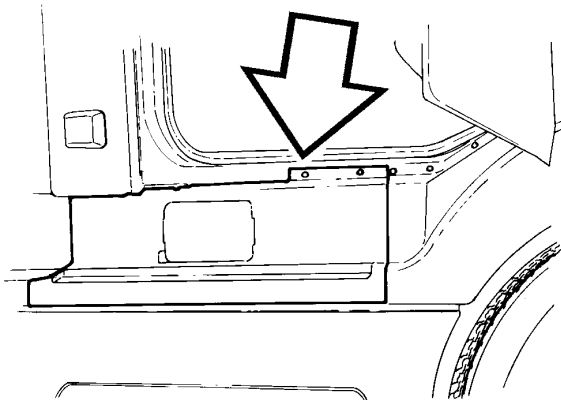
6



W3000667

Remove the right side cab step.

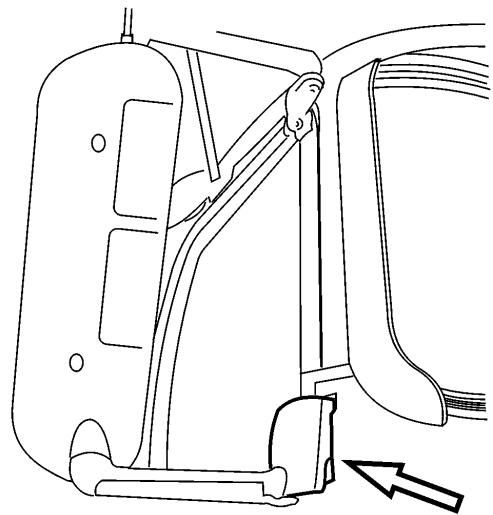
7



W3000662

Remove the upper tank fairing.

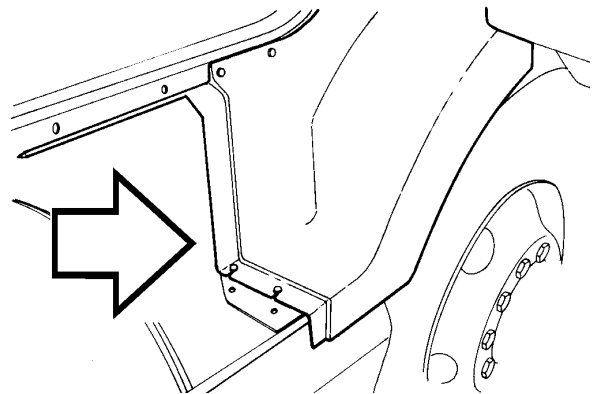
8



W3004854

Remove the bolts securing the lower right mirror mounting arm.

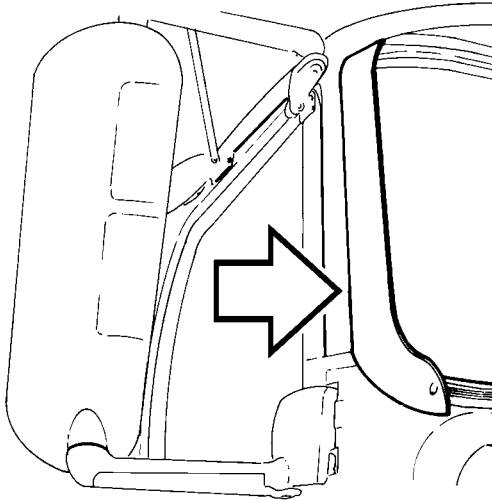
9



W3000661

Remove the right quarter fender.

10



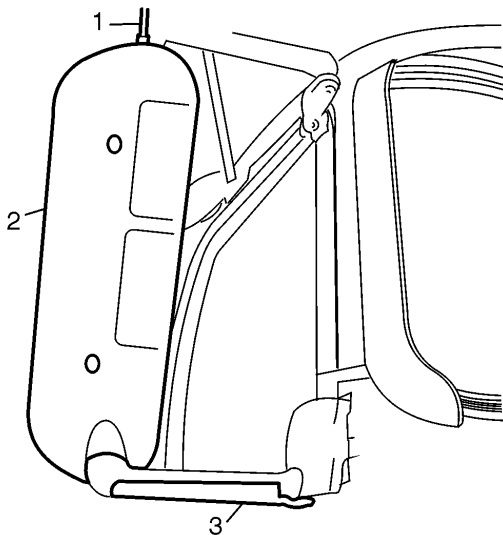
W3000663

Remove the right drip molding.

11

Remove the right side cowl panel mounting bolts. Then carefully work the cowl around the lower mirror arm mount and remove from the vehicle. Note the position of the lower fresh air seal to aid in installation.

12



W3004855

Remove the right antenna whip (1), right mirror backing (2), and lower arm cover (3).

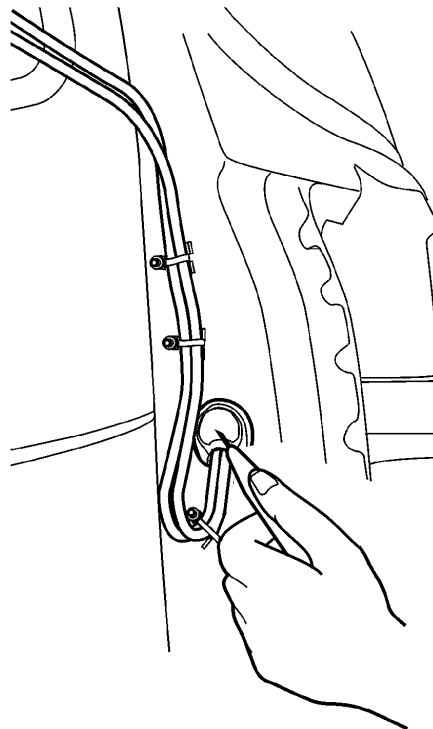
13

Note the routing of the existing right antenna cable from the RAMI multiplexer box to the antenna whip in the mirror head. Cut the tie straps securing the cables from the cowl seal to the mirror assembly.

14

Disconnect all mirror connectors to allow installation of a new cowl pass-through seal.

15



W3004845

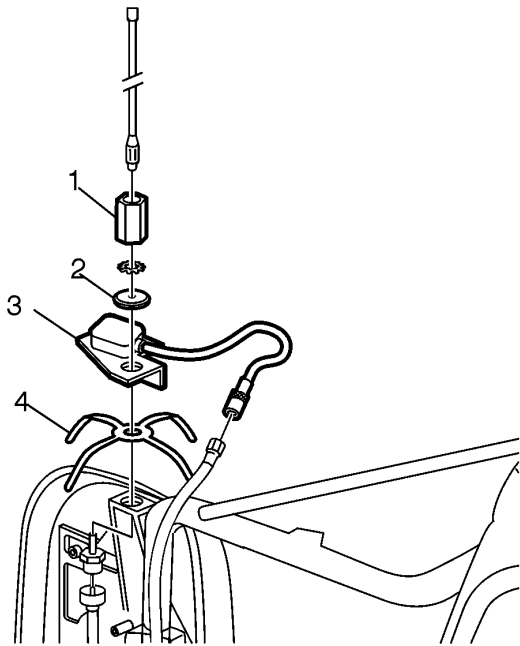


CAUTION

Do not cut or nick wiring. Doing so could cause an electrical short-circuit.

Carefully cut away the old pass-through seal.

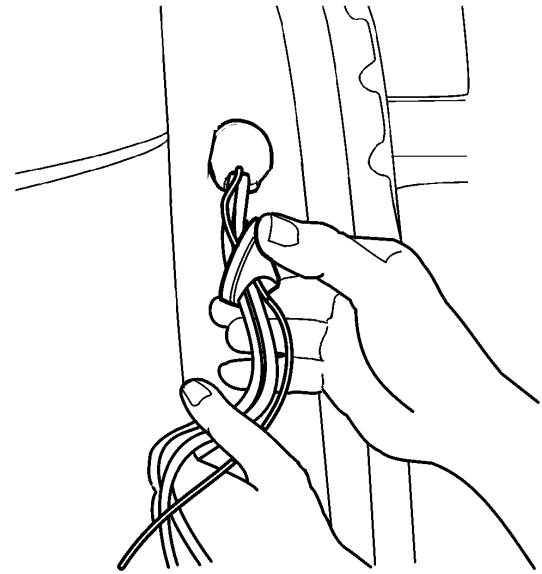
16



- 1 Antenna mounting nut
- 2 Spacer
- 3 GPS antenna and bracket
- 4 Cell phone antenna

Install the GPS antenna and bracket assembly under the multiplex antenna mounting nut and seal.

17



W3004843



CAUTION

It is important to route the cable exactly as instructed. Failure to do so can damage to the cable, resulting in poor communication.

Route the GPS antenna cable through the cowl pass-through opening. Install the new cowl pass-through seal over all the wiring and into its mounting position. Do not heat shrink to the cowl at the same time. Note: Be sure that the threaded cable end goes to the mirror assembly.

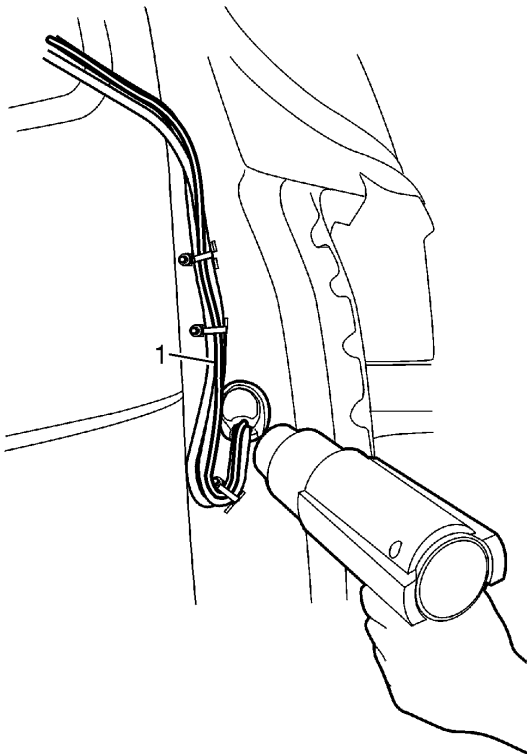
18

Connect the Volvo Link cable to the GPS antenna. Connect all mirror wiring connectors.

19

Pull the excess cable into the cab. Route the Volvo Link antenna cable and mirror wiring along the same route where the mirror wiring was previously. Secure with tie straps as needed.

20



W3004844

Secure the cowl seal to the cowl. Use a heat gun to shrink the seal.

21

Install the right mirror backing, lower arm cover and antenna whip.

22

Position the lower fresh air seal and install the right cowl panel.

23

Install the bolts securing the lower right mirror mounting arm. Torque tighten to 24 ± 4 Nm (18 ± 2.9 ft-lb).

24

Install the right drip molding. Torque tighten the top 2 screws to 1.2 ± 0.2 Nm (10.6 ± 2 in-lb), and the lower screw to 3 Nm ± 0.5 (26 ± 5 in-lb).

25

Install the right quarter fender. Torque tighten to 24 ± 4 Nm (18 ± 2.9 ft-lb).

26

Install the upper tank fairing. Start all bolts, then tighten after aligning fairing. Torque tighten to 24 ± 4 Nm (18 ± 2.9 ft-lb).

27

Install the right cab step. Start all 4 bolts, then tighten after aligning the step. Torque tighten to 12 ± 1 Nm (106 ± 8 in-lb).

28

Starting inside the right cowl, overlay the GPS antenna cable along the route of the multiplex antenna cable to the RAMI box. Secure as needed.

ECU and Wiring Harness Installation

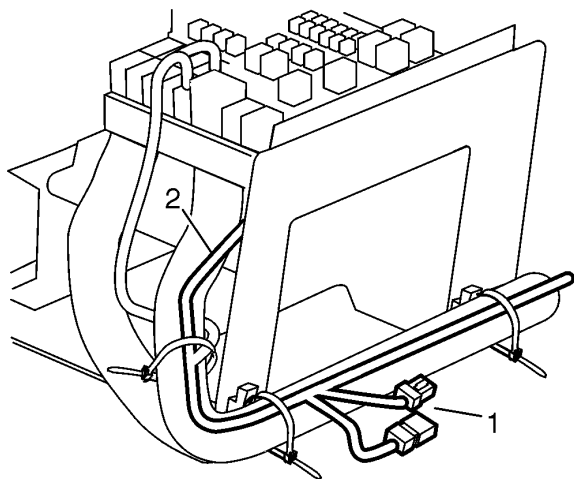
29

Remove the top TEC cover.

30

Before routing the Volvo Link wiring harness, locate the 2-pin connector for the data link (wires 400 and 401) located at the back of the TEC panel. Also locate the 3-pin connector (wires 490, 141 and OD-G) for switch illumination under the TEC panel.

31



W3004852

- 1 Switch illumination connector
- 2 To Data Link connector

Route the wiring harness per the illustration.

32

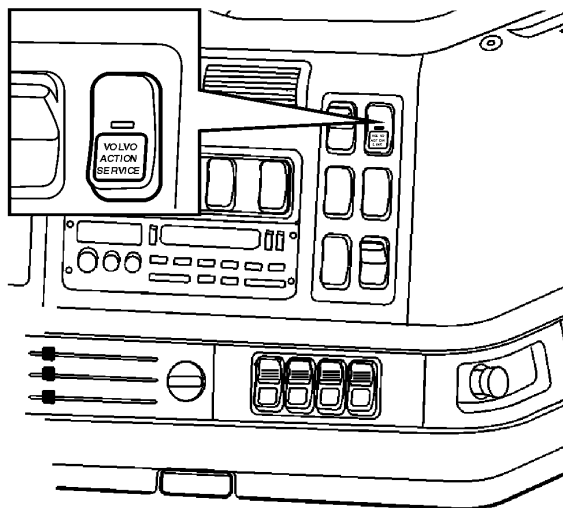
Install the power point connectors to expansion block positions B1-1 and B2-1 in the TEC panel.

NOTE: If the designated positions are already in use, connect B1-1 to an available ignition connector, and B2-1 to an available battery connector. Expansion block and fuse location information is on a decal under the top and front TEC covers.

33

Connect the 2-pin data link connector and 3-pin illumination connector.

34

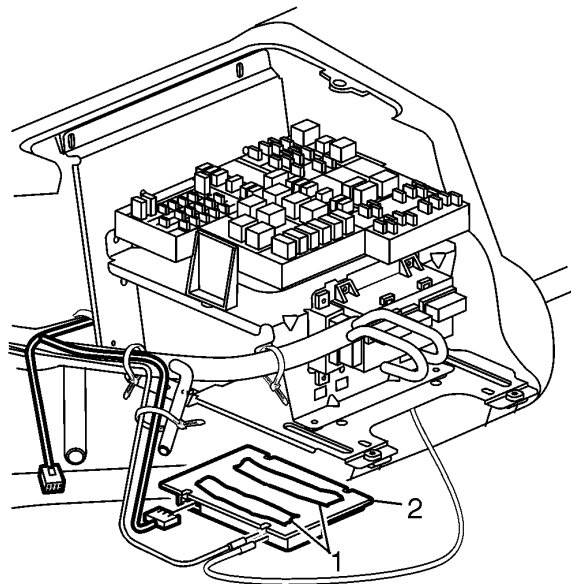


W3004842

Install the "Volvo Action Service" switch and connect the connector.

NOTE: This switch may not be available with all kits.

35

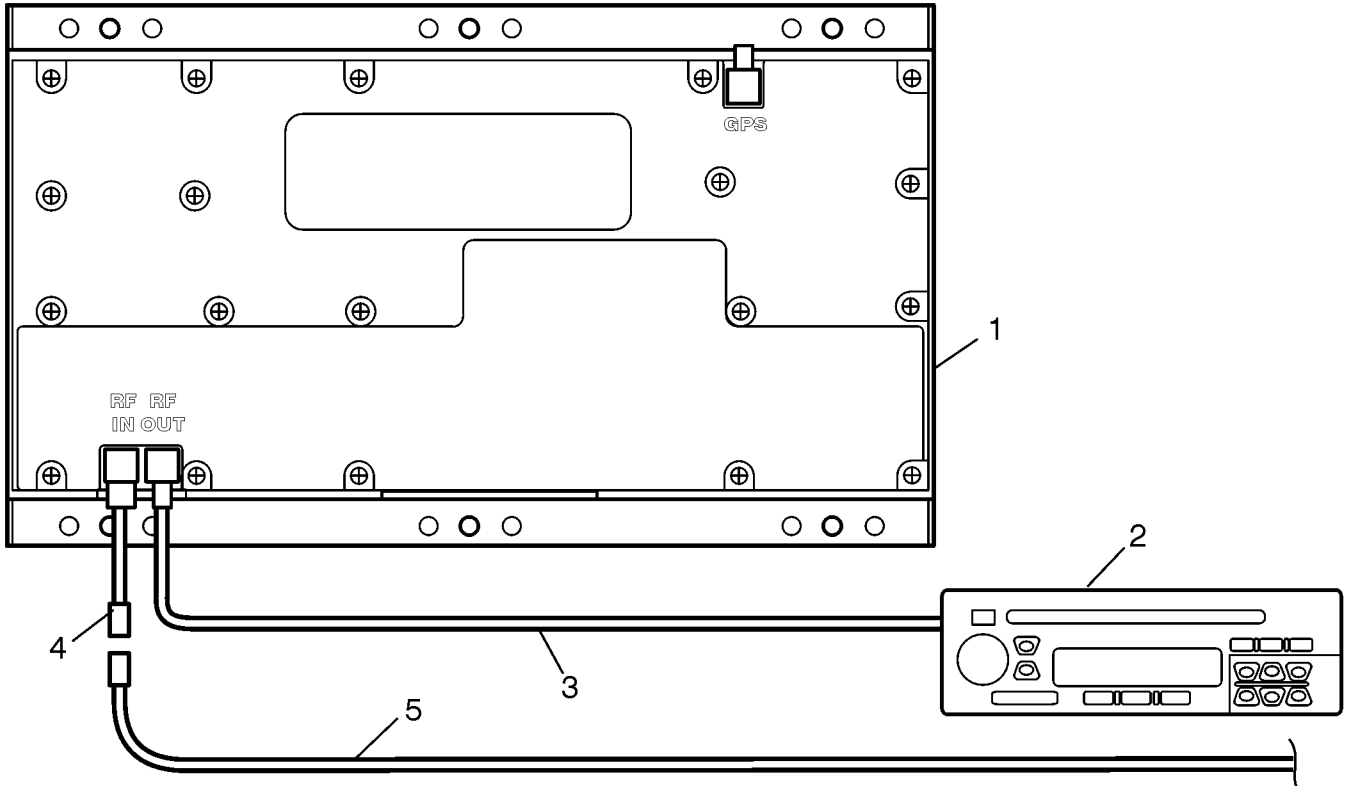


W3004853

- 1 Two-sided tape
- 2 Volvo Link ECU

Mount the ECU to the underside of the TEC tray with two-sided tape. Be sure to orient the ECU properly so the wiring harness and antenna connections can be easily made.

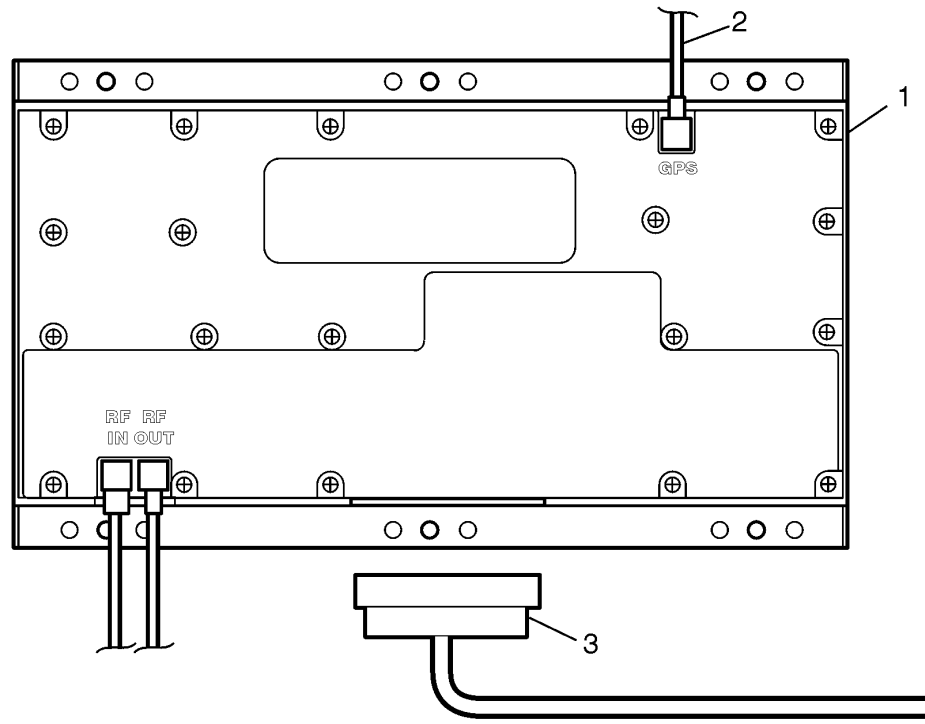
36



W3004849

- 1 Volvo Link ECU
- 2 Radio
- 3 "RF OUT" Cable to Radio
- 4 "RF IN" Short Jumper Cable
- 5 "RF IN" Cable from RAMI box (previously to the back of the radio)

Disconnect the radio antenna cable from the radio. Plug the antenna cable into the short antenna adapter cable. Plug the other end of the short antenna adapter cable into the ECU "RF IN" connector. Plug the long antenna adapter cable into the ECU "RF OUT" connector, and the opposite end into the radio antenna receptacle.



W3004848

- 1 Volvo Link ECU
- 2 GPS Antenna Cable
- 3 Electrical Connector

37
Connect the wiring harness and GPS antenna cable to the ECU.

38
Secure all wiring and connectors as needed.

39
Install 5-amp fuses in positions 46 and 52 in the TEC panel.

NOTE: If an alternative expansion block was selected in step 31, add the corresponding 5-amp fuses. Expansion block and fuse location information is on a decal under the top and front TEC covers.

40
Replace all removed panels.

41
Install the upper right grab handle mounting bolt. Torque tighten to 24 ± 4 Nm (18 ± 2 ft-lb).

42
If necessary, program the Volvo Link ECU with the VCADS Pro tool (applies to late model ECUs only). See the VCADS Pro user manual for programming instructions.

NOTE: This step is not included in the Volvo Standard Time (VST) calculations.

43
Program the instrument cluster to interface with the Volvo Link ECU. New main software for the instrument cluster may need to be downloaded, also. This step must be performed by a dealer with the proper tools and access to the Volvo database.

NOTE: This step is not included in the Volvo Standard Time (VST) calculations.

3970-18-02-01 Kit, Installation Volvo Link System, with Prep Kit

The following instructions are for installation of kits 20470229 and 20470230, for vehicles with the Volvo Link prep kit already installed.

NOTE: Volvo Link kits should be ordered from Volvo per the engine type in the vehicle. Early model ECUs will be programmed before delivery. Later model ECUs may be programmed in the field using the VCADS Pro tool.

NOTE: The instrument cluster must be programmed to interface with the Volvo Link ECU. It is assumed that all retrofits will be done at dealer locations with the ability to reprogram the instrument cluster.

1



DANGER

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

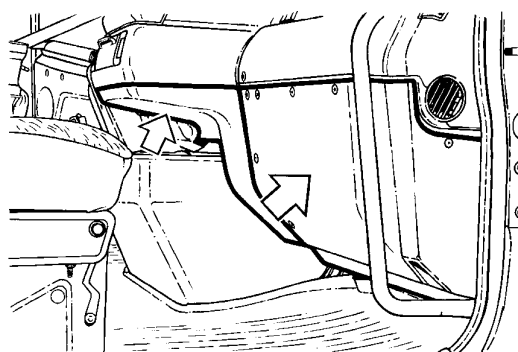
Make certain the vehicle ignition is OFF.

ECU and Wiring Harness Installation

2

Remove the right upper grab handle mounting bolt.

3



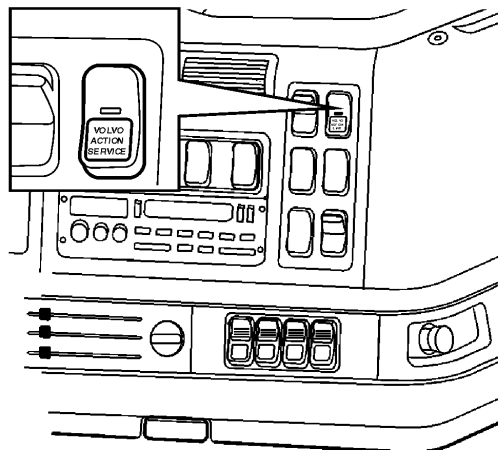
W8001131

Remove the center and right lower dash panels.

4

Remove the top TEC cover.

5

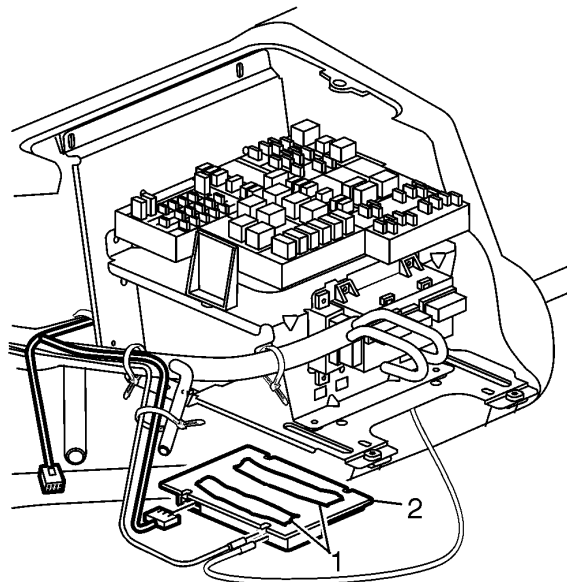


W3004842

If switch is provided, install the "Volvo Action Service" switch in a blank switch location and connect the connector.

NOTE: This switch may not be available with all kits.

6

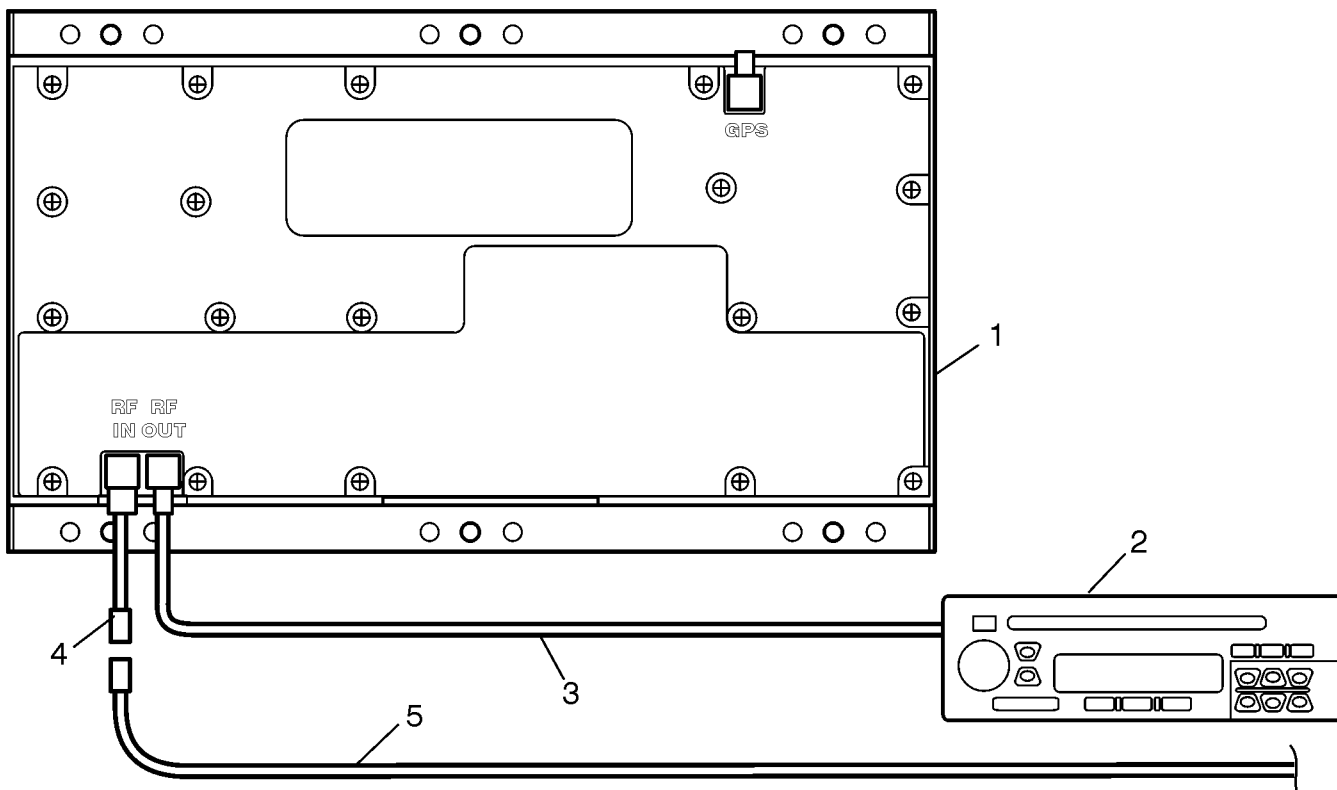


W3004853

- 1 Two-sided tape
- 2 Volvo Link ECU

Mount the ECU to the underside of the TEC tray with two-sided tape. Be sure to orient the ECU properly so the wiring harness and antenna connections can be easily made.

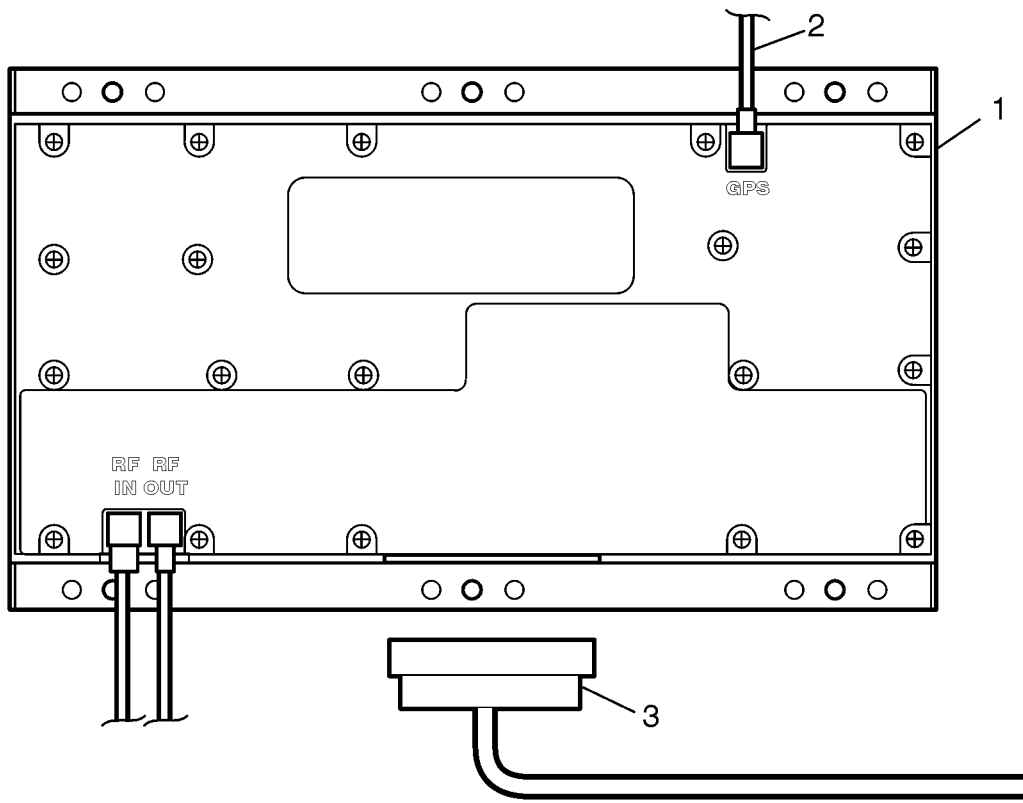
7



W3004849

- 1 Volvo Link ECU
- 2 Radio
- 3 "RF OUT" Cable to Radio
- 4 "RF IN" Short Jumper Cable
- 5 "RF IN" Cable from RAMI box (previously to the back of the radio)

Disconnect the radio antenna cable from the radio. Plug the antenna cable into the short antenna adapter cable. Plug the other end of the short antenna adapter cable into the ECU "RF IN" connector. Plug the long antenna adapter cable into the ECU "RF OUT" connector, and the opposite end into the radio antenna receptacle.



- 1 Volvo Link ECU
- 2 GPS Antenna Cable
- 3 Electrical Connector

W3004848

8
Connect the wiring harness and GPS antenna cable to the ECU.

9
Secure all wiring and connectors as needed.

10
Replace all removed panels.

11
Install the upper right grab handle mounting bolt. Torque tighten to 24 ± 4 Nm (18 ± 2 ft-lb).

12
If necessary, program the Volvo Link ECU with the VCADS Pro tool (applies to later model ECUs only). See the VCADS Pro user manual for programming instructions.

NOTE: This step is not included in the Volvo Standard Time (VST) calculations.

13
Program the instrument cluster to interface with the Volvo Link ECU. New main software for the instrument cluster may need to be downloaded, also. This step must be performed by a dealer with the proper tools and access to the Volvo database.

NOTE: This step is not included in the Volvo Standard Time (VST) calculations.