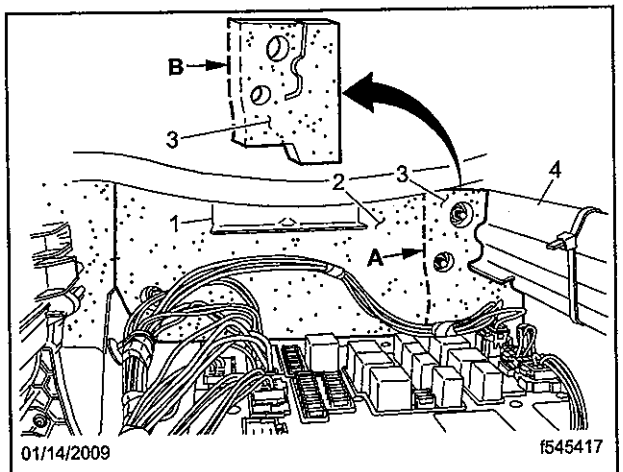
Work Instructions

Subject: Cascasdia Cab and Chassis SAMs

Models Affected: Specific Freightliner Cascadia vehicles manufactured with signal-detect and activation modules (SAMs) between February 20, 2006, and December 15, 2008

1. Check the base label (Form WAR259) for a completion sticker (Form WAR260) for FL545 indicating this work has been done. The base label is usually located on the passenger-side door about 12 inches (30 cm) below the door latch. If a sticker is present, no further work is needed. If there is no sticker, go to the next step.
2. Shut down the engine, set the parking brake, and chock the tires. Open the hood.
3. Disconnect the batteries at the negative terminals.
4. From inside the cab, access the SAM Cab by removing the four fasteners that hold the glove box in place, then removing the glove box.
5. Remove the rectangular plastic shield from the SAM Cab.
6. Make a vertical cut into the foam rubber insulation that lines the inside of the frontwall, forward of the SAM Cab. See **Fig. 1**.
7. Remove all of the insulation to the right of the cut previously made, including the section that is outboard of the dash support bracket. See **Fig. 1**.



A. Mark and cut here.
B. This section extends outboard of the dash-support bracket.

1. Z-Bracket (not present on all vehicles)
2. Foam Rubber Insulation
3. Insulation Section to be Removed

Fig. 1, Frontwall Insulation (view from inside the cab)

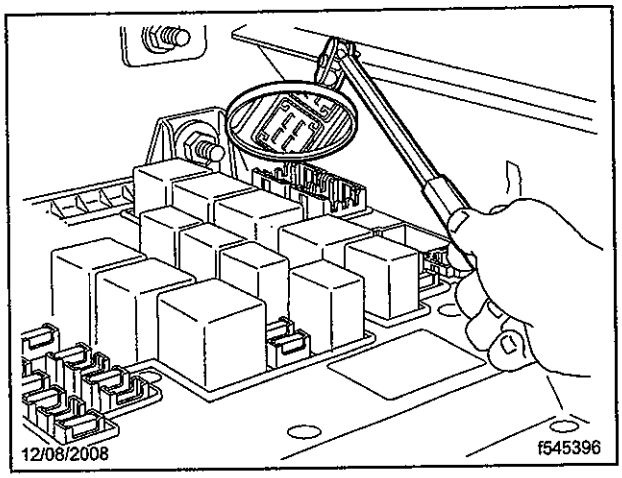


Fig. 2, Corrosion Inspection

8. Disconnect the four large, multi-pin connectors from the right side of the SAM Cab. Using an inspection mirror, check for extensive corrosion or evidence of excessive moisture in the connection insertion points on the SAM Cab. See **Fig. 2**. Check all the connections in the SAM Cab for extensive corrosion or evidence of moisture (whitish deposits). If extensive corrosion is found, or the module is not functioning correctly, replace the SAM Cab, following the instructions in step 9, below. To determine if the SAM Cab is functioning correctly, refer to section **G02.04** in the *Cascadia Troubleshooting Manual*.

   NOTE: If you suspect the cab may be leaking, please reference Service Solution 3495 by going to AccessFreightliner.com / ServicePro / Service Solutions / Symptoms Search (at the bottom of the page, enter the Service Solution number) to determine the source for the leaks. If leaks are found, please reference Service Solutions 3497, 3498, and 3499 for leak repairs, as necessary.

   If the connector terminals on the four wiring harnesses are damaged by extensive corrosion, replace the affected wiring ends, terminals, and connectors. If replacing the terminals, use the standard splicing technique and the butt splice connectors from Kit ESY ES 66 404. Refer to **Parts Bulletin 54-075** to identify the part numbers for the replacement connectors and terminals.

   If replacing the SAM Cab, go to the next step; otherwise, go to step 10.

9. If applicable, replace the SAM Cab as follows.

   9.1 From inside the cab, mark and disconnect all the wiring from the SAM Cab.

   9.2 Remove the three fasteners that secure the SAM Cab.

   9.3 From the engine compartment and on the right side of the frontwall, mark and disconnect the two battery cables and the four lever-lock connectors from the SAM Cab. See **Fig. 3**.

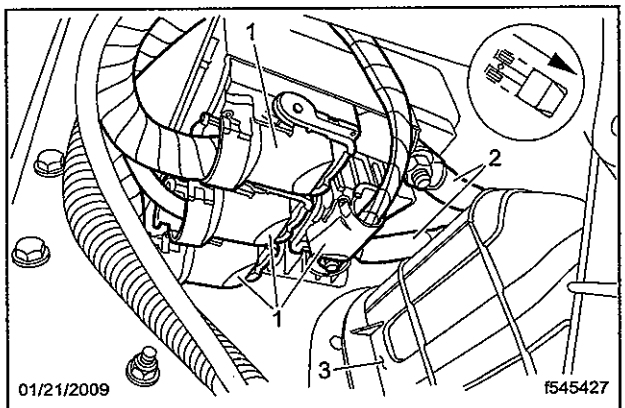
   9.4 Lift the SAM Cab up and out of the vehicle.

   9.5 Transfer any necessary relays and fuses from the old SAM to the new SAM.

   9.6 Position the new SAM Cab on the mounting plate, and fit the forward mounting hole over the stud.

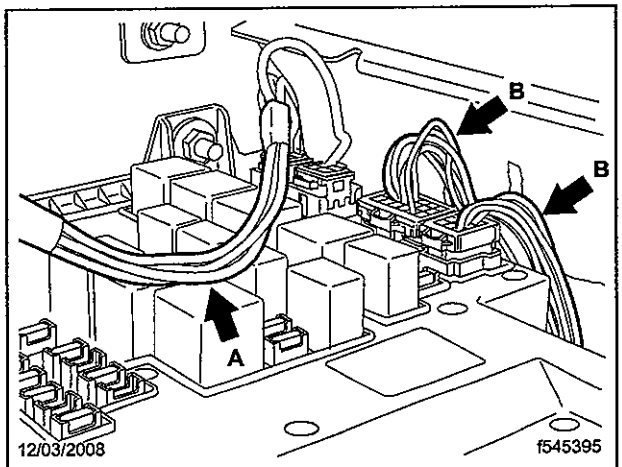
   9.7 Install and securely tighten the three SAM Cab mounting fasteners.

   9.8 In the engine compartment, connect the two battery cables and the four lever-lock connectors to the SAM Cab.



1. Lever-Lock Connectors (4 qty.)
2. Battery Cables (2 qty.)

Fig. 3, SAM Cab Exterior Frontwall Connections



A. This wiring to be secured to the wiring on the left, and away from the frontwall.
B. Route this wiring down and away from the SAM Cab to form drip loops.

Fig. 4, SAM Cab Wiring

10. Connect all the interior wiring to the SAM Cab. Route the wiring from connectors X14 and X15 away from the frontwall. Use a tie strap to secure it to the harness at connector X8. Route the wiring harnesses from connectors X16 and X17 so they are situated downward through the opening to the right of the SAM Cab. See **Fig. 4**.
11. Install the new plastic drip shield behind the SAM Cab, between it and the frontwall. See **Fig. 5** and **Fig. 6**. Make sure the bottom edge of the shield clears the forward edge of the SAM Cab. Bend the shield to fit the area. It is to fit behind the defroster duct and (if present) the Z-bracket.

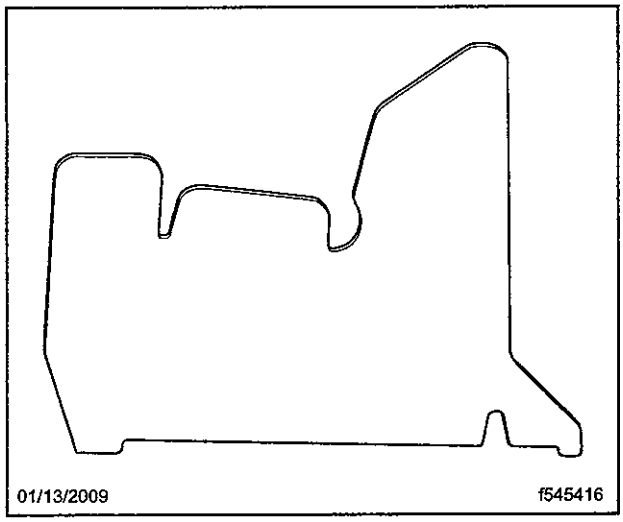
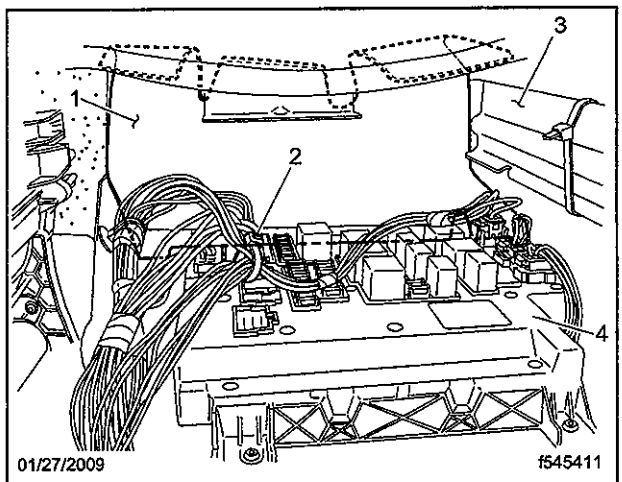


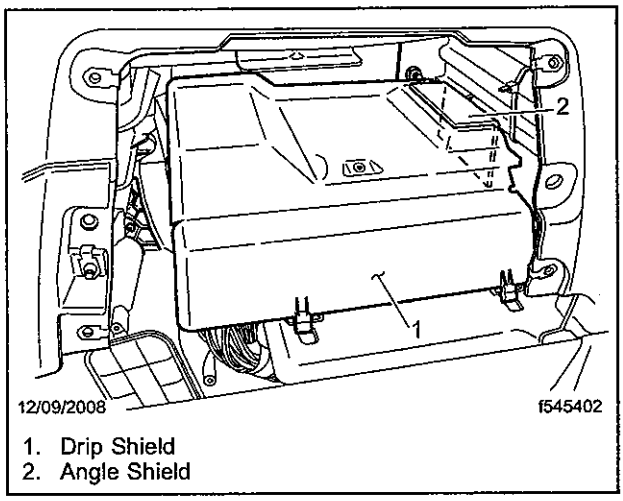
Fig. 5, New Drip Shield



1. Plastic Drip Shield
2. Tie Strap
3. Dash Support Bracket
4. SAM Cab

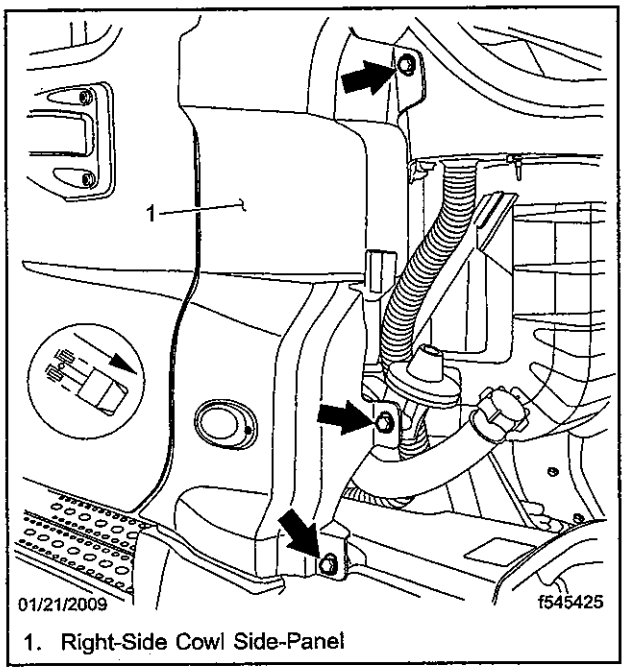
Fig. 6, Drip Shield Installed and Wiring Tie-Strapped

12. Install the rectangular plastic shield previously removed.
13. Make sure the raised area on the right-side top of the drip shield is clean and dry, then remove the paper backing from the Velcro strip on the secondary, angle drip shield and attach it to the raised area on the drip shield on the right side of the SAM Cab. See **Fig. 7**.
14. Install the glove box.
15. From outside the vehicle, remove the cowl side-panels as follows.
    - 15.1 On one side of the vehicle, disconnect the wiring from the side marker light.
    - 15.2 Remove the three fasteners that hold the forward edge of the side panel in place. See **Fig. 8**.



1. Drip Shield
2. Angle Shield

Fig. 7, Drip Shield Installed



1. Right-Side Cowl Side-Panel

Fig. 8, Forward Cowl Side-Panel Fasteners

- 15.3 Open the door to access the four fasteners that hold the rear edge of the side-panel in place. See **Fig. 9**.
- 15.4 Remove the fasteners, then remove the cowl side-panel from the vehicle.
- 15.5 Repeat the procedure on the other side of the vehicle.

16. From inside the cab, access the SAM Chassis as follows.
    - 16.1 On the driver's side, remove the tread plate from the doorway.
    - 16.2 Pull back the door seal as needed to gain access to the outboard edge of the driver-side kick panel.
    - 16.3 Remove the driver-side kick panel to access the SAM chassis wiring.
17. Mark and disconnect all the SAM chassis wiring, including the large ground wire.

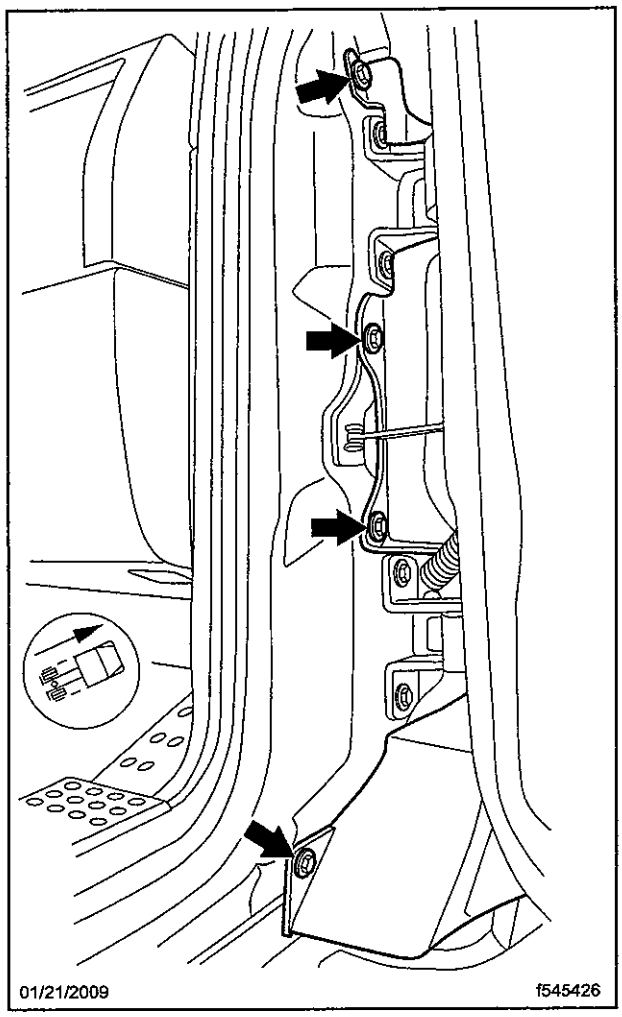


Fig. 9, Rear Cowl Side-Panel Fasteners

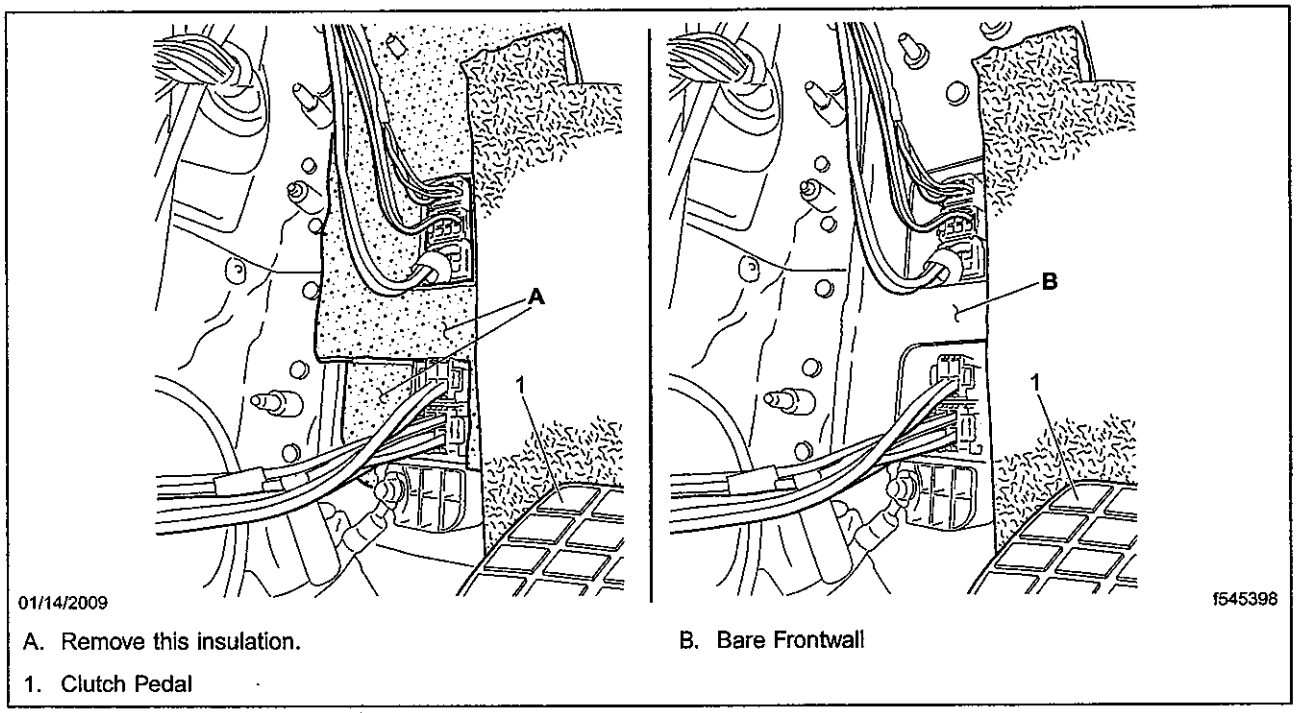
18. Make a vertical cut 3-1/2 inches (9 cm) from the left edge of the frontwall foam rubber insulation. This cut should line up with the junction of the kick panel and the insulation. The upper cut will be above that area where the carpeting on the insulation stops. Remove the insulation from around the SAM chassis connections. See **Fig. 10**.

19. From the engine compartment, remove the fasteners that hold the clutch assembly to the frontwall. If you decide to remove the clutch pedal assembly from the frontwall, be sure to disconnect the wiring from it; otherwise, let the assembly hang loose. In either case, do not disconnect the hydraulic line. **NOTE:** It is possible to improperly reconnect the following connectors X4, X5, X8, X14, and X15. Please mark these connectors to insure proper reinstallation.

20. Disconnect the two battery cables and the four lever-lock connectors from the SAM Chassis. See **Fig. 11**.

21. Check the sockets of the lever-lock connectors for evidence of moisture and corrosion. If extensive corrosion is present or the module is not functioning correctly, replace the SAM Chassis. To determine if the SAM Chassis is functioning correctly, refer to section **G02.05** in the *Cascadia Troubleshooting Manual*.

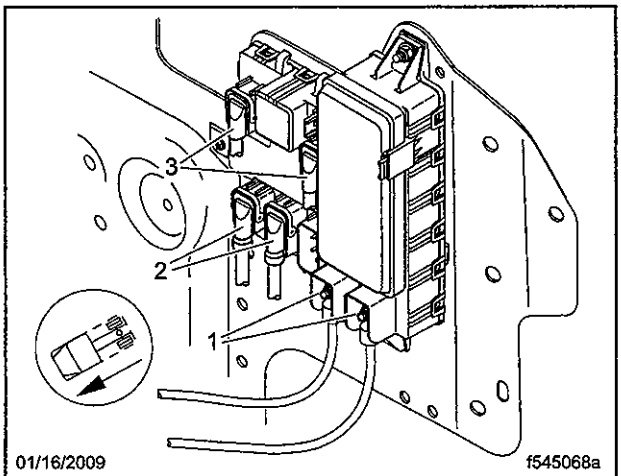
    If the terminals on the lever-lock connectors are damaged by corrosion, replace the affected wiring ends, terminals, and connectors. If replacing the terminals, use the standard splicing technique and the butt splice connectors from Kit ESY ES 66 404. Refer to **Parts Bulletin 54-075** to identify the part numbers for the replacement connectors and terminals.



A. Remove this insulation.
B. Bare Frontwall
1. Clutch Pedal

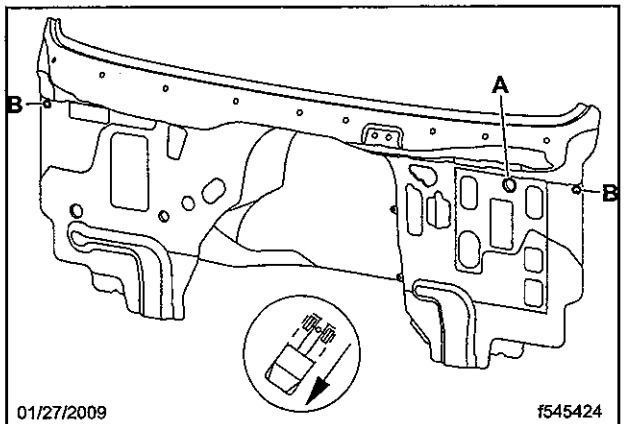
Fig. 10, Removing the Insulation

22. Remove the three nuts that secure the SAM chassis to the studs on the frontwall. Remove the SAM chassis and put it on a work bench, unless you are replacing it.
23. At the vehicle, find the two tooling holes on the upper edge of the exterior frontwall that were covered by the cowl side-panels, and the one larger electrical pass-through hole, above the clutch, as shown in **Fig. 12**.
24. Remove the existing sealant tape, if present, from all three holes in the frontwall.



1. Battery Cables
2. Lower Lever-Lock Connectors
3. Upper Lever-Lock Connectors

Fig. 11, SAM Chassis Frontwall Connections



A. Electrical Pass-Through Hole
B. Tooling Hole

Fig. 12, Frontwall Holes

25. Using a solvent such as a brake parts cleaner, clean the area around each hole.

26. Use new, foil-faced, waterproof tape (such as Polyken 360-35 heavy duty, waterproofing repair tape) to create new sealing patches. Cut two 1-1/2-inch x 2-inch (38-mm x 50-mm) pieces of this tape for the tooling holes. Cut one 3-1/2-inches (90-mm) square piece for the electrical pass-through hole above the clutch. Seal the holes, making sure the tape is flat and smooth against the surface of the frontwall. Frontwall sealing patch (p/n 18-46891-000) may also be used to reseal the hole above the clutch assembly.

IMPORTANT: Remove any adhesive residue and oils are before applying this patch.

27. For vehicles in FL545**B**, replace the gaskets on both the 76-pin bulkhead pass-through connectors on the exterior frontwall, using the new gaskets from the kit, as follows. See **Fig. 13**.

    27.1 Remove the center screw from each bulkhead connector to detach the wiring harness from it.

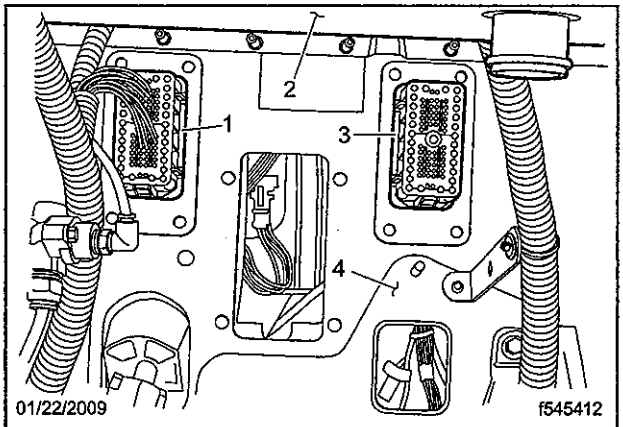
    27.2 Remove the four hexbolts that hold each bulkhead connector to the frontwall, remove the connector, then remove the old gaskets.

    27.3 Peel off the paper from the adhesive backing of each new gasket, and install the gaskets on the bulkhead-connector plates.

    27.4 Using the four existing hexbolts for each bulkhead connector, install them on the frontwall.

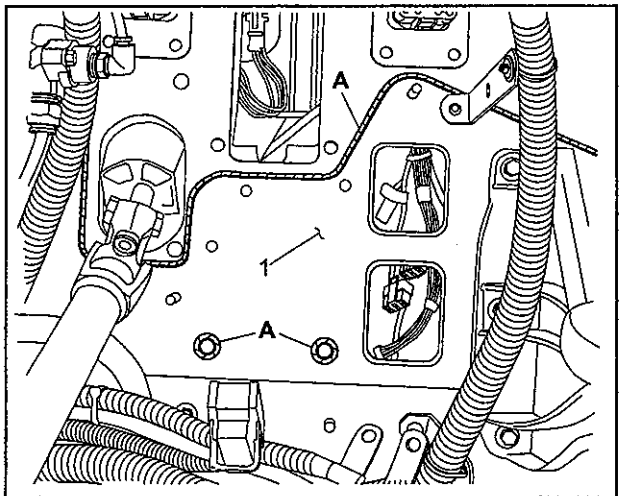
    27.5 Connect the wiring harnesses to the bulkhead connectors and install the center screw on each connector.

28. If the vehicle was built before March 10, 2008, clean the edges of the frontwall doubler plate (see **Fig. 14**), then apply a bead of RTV silicone around the edges, extending the silicone bead all the way to the outboard edge of the frontwall. Also, apply a bead around the two lower holes in the doubler plate. The RTV bead should be 1/8 inch diameter and should be forced into the seam between the doubler plate and the frontwall. See **Fig. 14**.



1. Left Bulkhead Pass-Through Connector (76-Pin)
2. Rain Tray
3. Right Bulkhead Pass-Through Connector (harness detached)
4. Frontwall Doubler Plate

Fig. 13, Left-Side Frontwall



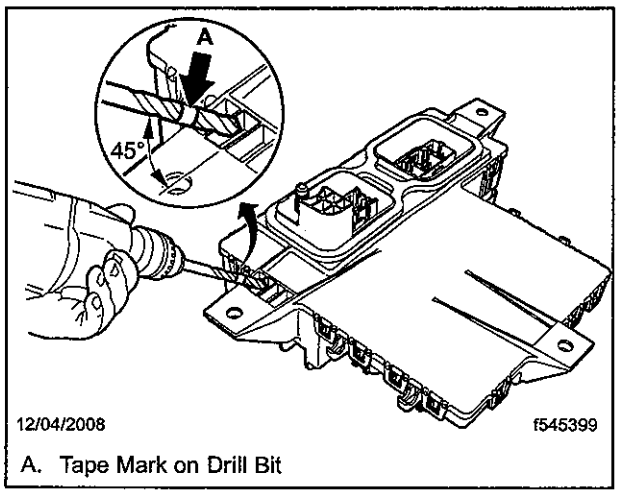
A. Silicone Bead

1. Frontwall Doubler Plate

Fig. 14, Applying Silicone

IMPORTANT: If you replace the SAM Chassis, you will need to drill a drain hole in the new one.

29. With the SAM Chassis on a workbench, mark a 1/4-inch (6-mm) drill bit with tape at 1 inch (25 mm) from the end, then drill a drain hole in the lower mounting flange of the SAM chassis, as shown in **Fig. 15**. Drill the hole at a 45-degree angle. Drill only to a depth of 1 inch (25 mm). **Don't drill any further.**



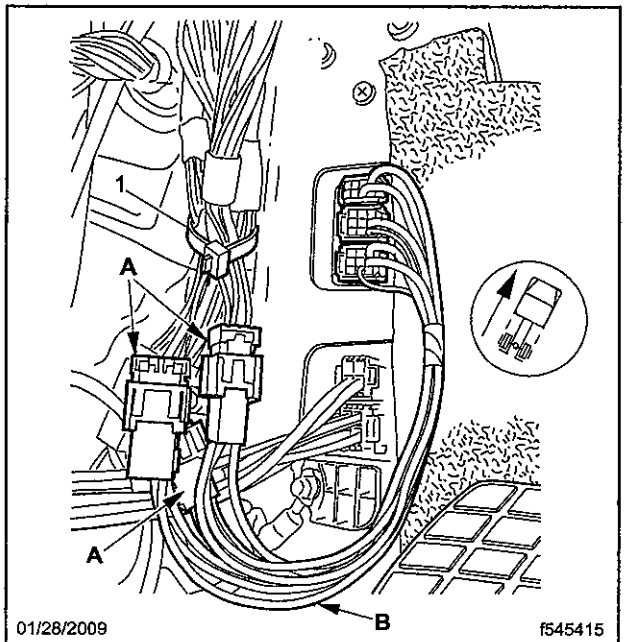
A. Tape Mark on Drill Bit

Fig. 15, Drilling the Drain Hole

30. Install the SAM Chassis on the frontwall. Tighten the mounting hexnuts firmly.
31. Insure the fuse cover on the SAM chassis is completely latched. Press firmly on the bottom and then the top of the cover to insure it has snapped closed.
32. Connect the two battery cables and the four lever-lock connectors to the SAM chassis. Replace any tie straps that were previously removed.
33. If applicable, install the clutch pedal assembly and connect the wiring to it.
34. Install the cowl side-panels .
35. From inside the cab, do the following.

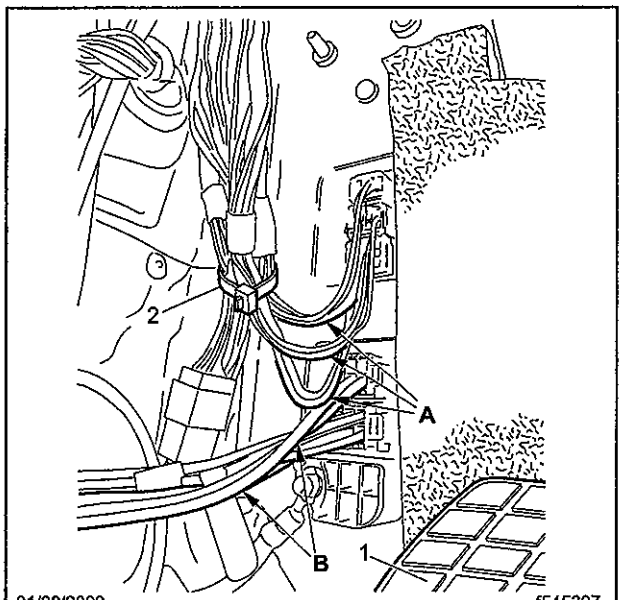
    For vehicles in FL545**A and** FL545**B:** Attach the jumper harnesses to the three upper SAM Chassis wiring harnesses. This will increase their lengths so that you can shape each harness into a "U" to form a drip loop. Using a tie strap, secure the new harnesses just above the point where they connect to the vehicle harnesses. See **Fig. 16**.

    On vehicles in FL545**C**: Form drip loops on the three upper SAM Chassis wiring harnesses. The wiring on these vehicles is long enough that extra harnesses are not required for forming drip loops. Using a tie strap, secure the three harnesses. See **Fig. 17**.



A. New Harnesses
B. Drip Loops
1. Tie Strap

Fig. 16, SAM Chassis Wiring, Vehicles in FL545A-B



A. Drip Loops
B. Wiring Routed Down and Away from SAM Chassis
1. Clutch Pedal
2. Tie Strap

Fig. 17, SAM Chassis Wiring, Vehicles in FL545C

36. As previously marked, connect the cab wiring to the SAM Chassis. Make sure all the wiring is at a downward angle, away from the SAM Chassis, to prevent the entrance of moisture.
37. Install the driver-side kick panel.
38. Install the door seal section that was previously pulled away.
39. Install the tread plate.
40. Connect the batteries.
41. Using ServiceLink, flash any new SAM with the correct parameters for the vehicle. Make sure that both the SAM Cab and SAM Chassis have the same level of software and that you've cleared any fault codes associated with removing the SAMs. Refer to the *ServiceLink User Guide* for more information. Also refer to Service Bulletin **54-231**, *Replacing SAM Cab and SAM Chassis Hardware Assemblies*.
42. Close the hood.
43. Clean a spot on the base label (Form WAR259), and attach a completion sticker (Form WAR260) for Recall FL545 to the base label.