

October 2020
FL858A-C
NHTSA #20V-466
Transport Canada #2020-365

Subject: Freightliner Business Class M2 Engine Harness Clearance

Models Affected: Specific Model Year 2017-2021 Freightliner Business Class M2 vehicles manufactured February 18, 2016, through July 31, 2020, and equipped with a Detroit Diesel DD5 engine.

General Information

Daimler Trucks North America LLC (DTNA), on behalf of its Freightliner Trucks Division, has decided that a defect that relates to motor vehicle safety exists on the vehicles mentioned above.

On certain vehicles, the engine harness may contact and chafe at various locations around the air compressor and the frame rail. If the wires are damaged and short, under certain circumstances, the engine may stall without any prior warning, with no ability to restart, which may increase the risk of a crash.

Engine harnesses will be inspected for damage, and adequate clearance, and repaired as required. (Less than 1% of vehicles are expected to need the harness replaced.)

There are approximately 6,010 vehicles involved in this campaign.

Additional Repairs

Dealers must complete all outstanding Recall and Field Service campaigns prior to the sale or delivery of a vehicle. A Dealer will be liable for any progressive damage that results from its failure to complete campaigns before sale or delivery of a vehicle.

Owners may be liable for any progressive damage that results from failure to complete campaigns within a reasonable time after receiving notification.

Work Instructions

Please refer to the attached work instructions. Prior to performing the campaign, check the vehicle for a completion sticker (Form WAR260).

Replacement Parts

Replacement parts are now available and can be obtained by ordering the kit listed below from your facing Parts Distribution Center.

If our records show your dealership has ordered any vehicle(s) involved in campaign number FL858, a list of the customers and vehicle identification numbers will be available on DTNAConnect. Please refer to this list when ordering parts for this recall.

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Table 1 - Replacement Parts for FL858

Campaign Number	Kit Number	Part Description	Part Number	Qty. per Kit
FL858A-C	25-FL858-000	BRKT-STANDOFF, .433X.433,TWIST	23-09130-042	1 ea
		SCREW-CAP,HEX,1/4-20	23-09432-075	2 ea
		WASHER-FLAT,SST,1/4"	23-10900-025	4 ea
		CLAMP-HOSE,SGL,CUSH,1.00,SLOT	23-11357-016	2 ea
		SCRW HEX FLNG,M8X1.25X20,	23-13345-020	1 ea
		BRKT-STANDOFF, .354X.354,OFFSET	23-13514-020	1 ea
		NUT-HEX,FLG,1/4-20,LOCK,ZN/AL	23-13861-104	2 ea
		MOUNT-TIE,CABLE,DUAL,SWIVEL FOR TIE STRPS:T50-T250; SIZE 4	23-12886-001	1 ea
		TUBE-TWIST TUBE,PES,BK,DIA25	BEN 2421002503SCM	5 ft.
		MSC-3/4 TAPE,.007THK,YEL,ELEC 3M 35 VINYL	48-00126-018	1 ea
		CABLE TIE-FIR TREE MOUNT,TYC 1.0-6.5 MM THK	23-14137-001	7 ea
BLANK COMPLETION STICKER	WAR260	1 ea		

Table 1

Removed Parts

U.S. and Canadian Dealers, please follow Warranty Failed Parts Tracking shipping instructions for the disposition of all removed parts. Export distributors, please destroy removed parts unless otherwise advised.

Labor Allowance

Table 2 - Labor Allowance

Campaign Number	Procedure	Time Allowed (hours)	SRT Code	Corrective Action
FL858A-C	Inspect, wrap, and secure engine harness	1.9	996-R110A	12-Repair Recall/Campaign
	Inspect, repair wiring, wrap, and secure engine harness	2.8	996-R110B	12-Repair Recall/Campaign
	Inspect, replace engine harness, wrap, and secure engine harness (Less than 1% of vehicles are expected to need the harness replaced)	3.3	996-R110C	12-Repair Recall/Campaign

Table 2

IMPORTANT: When the Recall has been completed, locate the base completion label in the appropriate location on the vehicle, and attach the red completion sticker provided in the recall kit (Form WAR260). If the vehicle does not have a base completion label, clean a spot on the appropriate location of the vehicle and first attach the base completion label (Form WAR259). If a recall kit is not required or there is no completion sticker in the kit, write the recall number on a blank sticker and attach it to the base completion label.

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Claims for Credit

You will be reimbursed for your parts, labor, and handling (landed cost for Export Distributors) by submitting your claim through the Warranty system within 30 days of completing this campaign. Please reference the following information in OWL:

- Claim type is **Recall Campaign**.
- In the Campaign field, enter the campaign number and appropriate condition code (**e.g. FL858-A, FL858-B etc.**).
- In the Primary Failed Part Number field, enter **25-FL858-000**.
- In the Parts field, enter the appropriate kit as shown in the Replacement Parts Table.
- In the Labor field, first enter the appropriate SRT from the Labor Allowance Table. Administrative time will be included automatically as SRT 939-6010A for 0.3 hours.
- The VMRS Component Code is **F99-999-005** and the Cause Code is **A1 - Campaign**.
- **U.S. and Canada -- Reimbursement for Prior Repairs.** When a customer asks about reimbursement, please do the following:
 - Accept the documentation of the previous repair.
 - Make a brief check of the customer's paperwork to see if the repair may be eligible for reimbursement. (See the "Copy of Owner Letter" section of this bulletin for reimbursement guidelines.)
 - Submit an OWL Recall Pre-Approval Request for a decision.
 - Include the approved amount on your claim in the Other Charges section.
 - Attach the documentation to the pre-approval request.
 - If approved, submit a based on claim for the pre-approval.
 - Reimburse the customer the appropriate amount.

IMPORTANT: OWL must be viewed prior to performing the recall to ensure the vehicle is involved and the campaign has not been previously completed. Also, check for a completion sticker prior to beginning work.

U.S. and Canadian dealers, contact the Warranty Campaigns Department via Web inquiry at DTNAConnect.com / WSC, if you have any questions or need additional information. Export distributors, submit a Web inquiry or contact your International Service Manager.

U.S. and Canadian Dealers: To return excess kit inventory related to this campaign, U.S. dealers must submit a Parts Authorization Return (PAR) to the Memphis PDC. Canadian dealers must submit a PAR to their facing PDC. All kits must be in resalable condition. PAR requests must include the original purchase invoice number. Export Distributors: Excess inventory is not returnable.

The letter notifying U.S. and Canadian vehicle owners is included for your reference.

Please note that the National Traffic and Motor Vehicle Safety Act, as amended (Title 49, United States Code, Chapter 301), requires the owner's vehicle(s) be corrected within a reasonable time after parts are available to you. The Act states that failure to repair a vehicle within 60 days after tender for repair shall be prima facie evidence of an unreasonable time. However, circumstances of a particular situation may reduce the 60 day period. Failure to repair a vehicle within a reasonable time can result in either the obligation to (a) replace the vehicle with an identical or reasonably equivalent vehicle, without charge, or (b) refund the purchase price in full, less a reasonable allowance for depreciation. The Act further prohibits dealers from selling a vehicle unless all outstanding recalls are performed. Any lessor is required to send a copy of the recall notification to the lessee within 10 days. Any subsequent stage manufacturer is required to forward this notice to its distributors and retail outlets within five working days.

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Copy of Notice to Owners

Subject: Freightliner Business Class M2 Engine Harness Clearance

For the Notice to U.S. Customers: This notice is sent to you in accordance with the National Traffic and Motor Vehicle Safety Act. **For the Notice to Canadian Customers:** This notice is sent to you in accordance with the requirements of the Motor Vehicle Safety Act. This is to inform you that your vehicle may contain a defect that could affect the safety of a person.

Daimler Trucks North America LLC (DTNA), on behalf of its Freightliner Trucks Division, has decided that a defect that relates to motor vehicle safety exists on specific Model Year 2017-2021 Freightliner Business Class M2 vehicles manufactured February 18, 2016, through July 31, 2020, and equipped with a Detroit Diesel DD5 engine.

On certain vehicles, the engine harness may contact and chafe at various locations around the air compressor and the frame rail. If the wires are damaged and short, under certain circumstances, the engine may stall without any prior warning, with no ability to restart, which may increase the risk of a crash.

Engine harnesses will be inspected for damage, and adequate clearance, and repaired as required.

Please contact an authorized Daimler Trucks North America dealer to arrange to have the Recall performed and to ensure that parts are available at the dealership. To locate an authorized dealer, search online at www.Daimler-TrucksNorthAmerica.com. On the menu tab, select "Contact," scroll down to "Find a Dealer," and select the appropriate brand. The Recall will take approximately two to three hours and will be performed at no charge to you. You may also confirm your vehicle's involvement in this recall at this URL: <https://dtna-dlrinfo.prd.freightliner.com:48518/VinLookup/vin-module/getVinLookupPage>

You may be liable for any progressive damage that results from your failure to complete the Recall within a reasonable time after receiving notification.

If you do not own the vehicle that corresponds to the identification number(s) which appears on the Recall Notification, please return the notification to the Warranty Campaigns Department with any information you can furnish that will assist us in locating the present owner. If you have leased this vehicle, Federal law requires that you forward this notice to the lessee within 10 days. If you are a subsequent stage manufacturer, Federal law requires that you forward this notice to your distributors and retail outlets within five working days. If you have paid to have this recall condition corrected prior to this notice, you may be eligible to receive reimbursement. Please see the reverse side of this notice for details.

If you have questions about this Recall, please contact the Warranty Campaigns Department at (800) 547-0712, 7:00 a.m. to 4:00 p.m. Pacific Time, Monday through Friday, e-mail address DTNA.Warranty.Campaigns@Daimler.com. **For the Notice to U.S. Customers:** If you are not able to have the defect remedied without charge and within a reasonable time, you may wish to submit a complaint to the Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590; or call the Vehicle Safety Hotline at (888) 327-4236 (TTY: 800-424-9153); or to <http://www.safercar.gov>. **For the Notice to Canadian Customers:** If you wish to submit a complaint about this recall, you can contact Transport Canada road safety, 80 rue Noel, Gatineau, Quebec J8Z 0A1 or call (800) 333-0510.

We regret any inconvenience this action may cause but feel certain you understand our interest in motor vehicle safety.

WARRANTY CAMPAIGNS DEPARTMENT

Enclosure

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Reimbursement to Customers for Repairs Performed Prior to Recall

If you have already **paid** to have this recall condition corrected you may be eligible to receive reimbursement.

Requests for reimbursement may include parts and labor. Reimbursement may be limited to the amount the repair would have cost if completed by an authorized Daimler Trucks North America LLC dealer. The following documentation must be presented to your dealer for consideration for reimbursement.

Please provide original or clear copies of all receipts, invoices, and repair orders that show:

- The name and address of the person who paid for the repair
- The Vehicle Identification Number (VIN) of the vehicle that was repaired
- What problem occurred, what repair was done, when the repair was done
- Who repaired the vehicle
- The total cost of the repair expense that is being claimed
- Proof of payment for the repair (such as the front and back of a cancelled check or a credit card receipt)

Reimbursement will be made by check from your Daimler Trucks North America LLC dealer.

Please speak with your Daimler Trucks North America LLC authorized dealer concerning this matter.

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Work Instructions

Subject: Freightliner Business Class M2 Engine Harness Clearance

Models Affected: Specific Model Year 2017-2021 Freightliner Business Class M2 vehicles manufactured February 18, 2016, through July 31, 2020, and equipped with a Detroit Diesel DD5 engine.

DD5 Engine Harness Repair - FL858A and FL858C

1. Check the base label (Form WAR259) for a completion sticker for FL858 (Form WAR260) 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 completion sticker is present, no work is needed. If a completion sticker is not present, continue with the next step.
2. Park the vehicle on a level surface, shut down the engine, and set the parking brake. Chock the tires.
3. Open the hood.
4. Disconnect the battery negative cable.
5. Remove the left bumper end cap by removing the fasteners.
6. Remove the left front quarter fender. Using a suitable tether (rope, bungee, tie strap, etc.), support the Power Train Power Distribution Module (PTPDM) and main Power Distribution Module (PDM) bracket to the front wall hood support in order to prevent damage to harness or connectors.
7. Cut open the tie straps that secure the DD5 engine harness to access the complete harness for inspection of the key chaffing points. The key chaffing points include air compressor-mounted bracket and discharge line, fuel lines, transmission dip stick tube, and at the cab frontwall-mounted bracket on the innermost edge of the left frontwall. See [Fig. 1](#).



Fig. 1, Harness Tie Strap Removal

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8. At the key chaffing points, inspect the engine harness for damage. Pull the harness away from the brackets, using a mirror as needed. See [Fig. 2](#).



Fig. 2, Inspection by Mirror

NOTE: Wiring harnesses are considered damaged when chaffing has worn through the harness fiber wrap and the wire insulation resulting in exposed strands of copper wire.

9. If damage to the wiring is found, cut and unwrap the harness wrap in the damaged area to determine the extent of damage.
- If five or fewer wires (approximately 30% or less) in the harness are damaged, the harness can be repaired.
 - If more than five wires in the harness are damaged, the harness must be replaced. (Less than 1% of vehicles are expected to need the harness replaced.)

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IMPORTANT: It is expected that there will be a low occurrence of harness replacements. When needed, use PartsPro® (Module 487) or EZWiring™ (found under “Vehicle Information”/“Location search”/ and once the S/N is entered, select “Commodity Harness” under the “System Options”) to locate the correct VIN specific engine harness. For assistance in engine harness replacement, submit a WSC ticket to Warranty Campaigns.

10. Repair damaged wiring as follows.

NOTE: Additional harness clipping points and harness connectors may need to be removed to provide access to the harness for repair.

- 10.1 Locate the damaged area and carefully cut open the fiber wrap using a sewing seam ripper tool. See [Fig. 3](#).



Fig. 3, Cutting an Opening into the Fiber Wrap

- 10.2 Flip the seam ripper tool over so that the blunt end is facing wiring, then cut enough length to allow the fiber to be unwrapped. See [Fig. 4](#).



Fig. 4, Cutting the Fiber Using the Blunt End of the Seam Ripper

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- 10.3 Unwrap the fiber until a sufficient area is exposed to make the repair, then cut out the damaged section of the wire. See [Fig. 5](#).



Fig. 5, Unwrapping the Harness

- 10.4 Inspect the harness and ensure there is enough wire slack to install the Phillips STA-DRY® connector. See [Table 3](#) for correct size of Phillips STA-DRY®.

Phillips STA-DRY Crimp and Solder Connectors Parts		
Wire Size: Gauge (mm)	Connector Part Number*	Shrinkable Tubing (Daimler Part Number)
20 to 18 (0.5 to 0.8)	PHM 1 1863	1/4 inch with internal adhesive coating (48 02461 025)
16 to 14 (1 to 2)	PHM 1 1862	1/4 inch with internal adhesive coating (48-02461-025)
12 to 10 (3 to 5)	PHM 1 1861	3/8 inch with internal adhesive coating—4 foot length (48-02461-038)
8 or larger (5 or larger)	Replace the terminal or the entire cable	Use adhesive lined red for positive cables and black for negative cables.

* Twenty-five connectors per pack.

Table 3, Phillips STA-DRY Crimp and Solder Connectors Parts

- 10.5 If the wire does not have enough slack to install the Phillips STA-DRY® connector, add a new section of overlay wire using two Phillips STA-DRY® connectors. If an overlay wire is necessary, remove the fiber to allow for a splice into the damaged wire and make sure the wire is the same gauge and quality as the wire being repaired. See [Fig. 6](#).



Fig. 6, Overlay Added to the Damaged Area of the Harness

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- 10.6 Crimp the Phillips STA-DRY® connector on the repaired wires as required using tool DKIOCHA17003-2 or similar. Use a heat gun to apply the solder and heat shrink the Phillips STA-DRY® connectors. See [Fig. 7](#).

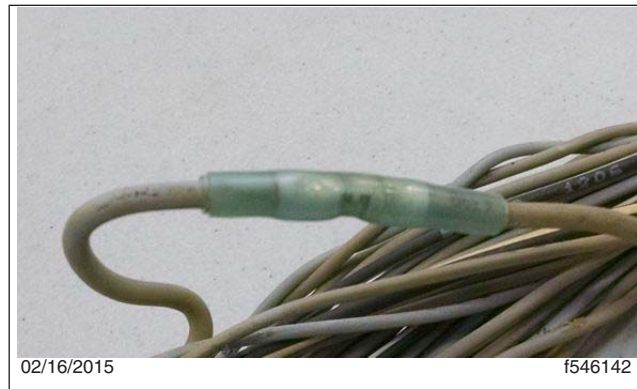


Fig. 7, Wire Repaired with Shrink Tubing

IMPORTANT: No more than five wires on the engine harness should be repaired. This includes up to five sections of overlay wires. Multiple wire repairs should be staggered using varying length overlay wires in order to maintain the overall engine harness size.

- 10.7 Wrap the entire length of the repaired area with new fiber wrap tape (48-25910-000). Make sure enough tape is used to overlap the starting point.
- 10.8 Secure both ends of the fiber wrap with electrical tape. Install the clipping points and connectors removed for the repair.
11. Wrap the harness at the key chaff points with severe duty harness wrap (TwistTube®) for added protection.
12. Add the TwistTube® to the engine harness at the air compressor bracket area following the measurements shown in [Fig. 8](#). The horizontal section of the harness must be 3.5 inches (90 mm) ahead of the vertical section, and 4.3 inches (110 mm) behind the vertical section (total of 7.8 inches (200 mm) TwistTube for horizontal section). The vertical section must be at 11.8 inches (300 mm) from horizontal section. See [Fig. 9](#). Secure the loose ends of the TwistTube with electrical tape or tie straps.

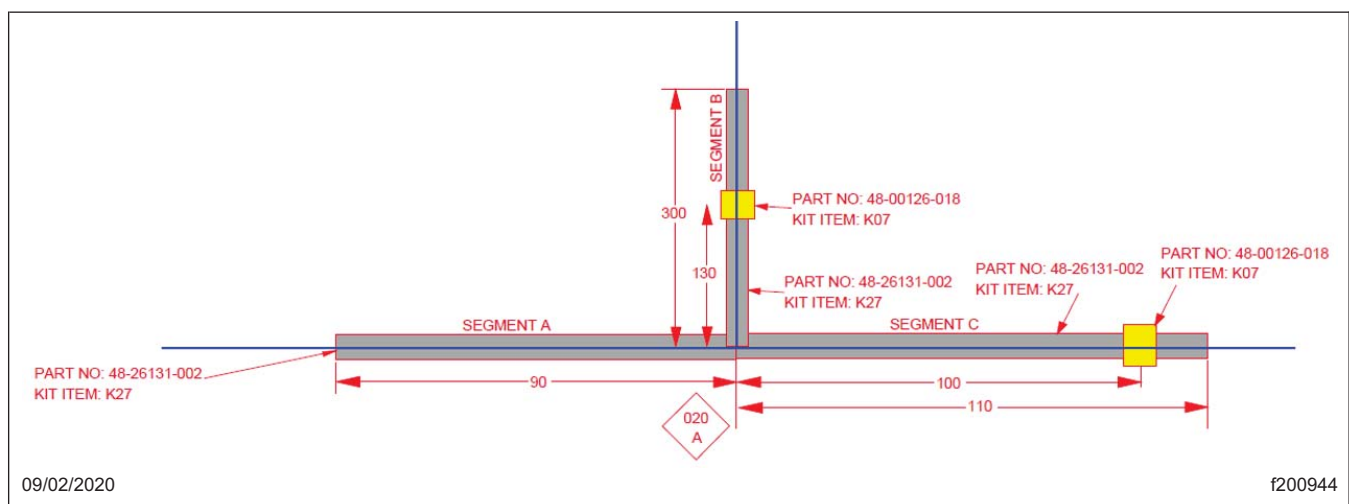


Fig. 8, TwistTube and Clamp Location Measurements

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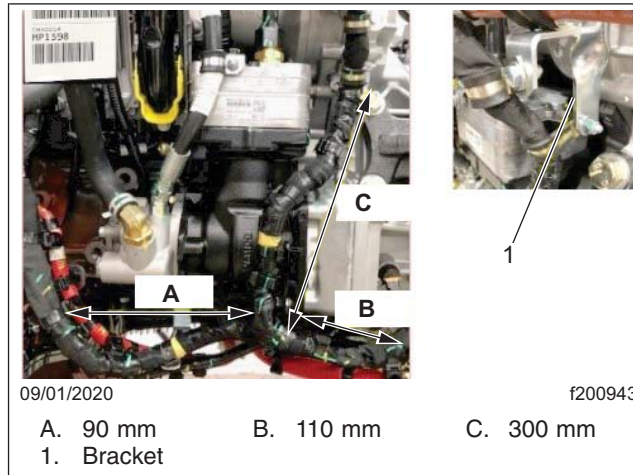


Fig. 9, TwistTube Length

13. Add yellow marking tape at the two key spots (3.9 inches (100 mm) on the horizontal and 5.1 inches (130 mm) on the vertical section) to identify the clipping point so the harness will be properly secured to prevent further chaffing. See [Fig. 8](#) and [Fig. 10](#).

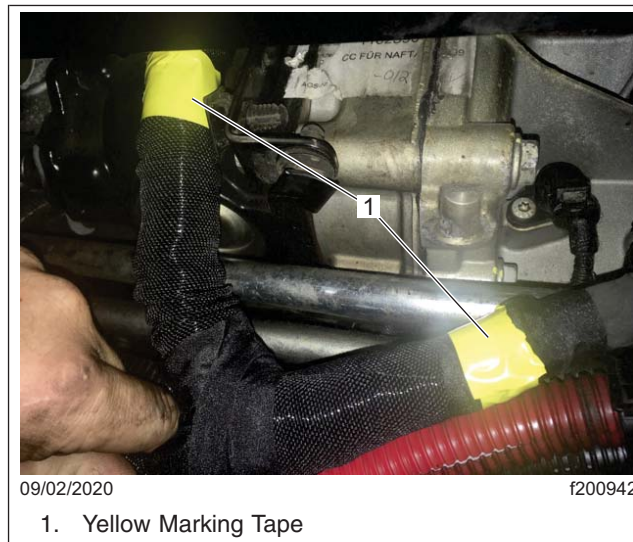


Fig. 10, Yellow Marking Tape and Locations

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14. Install two new standoff brackets at the left rear of the engine, replacing the existing fuel line standoff bracket with 23-13514-020 and adding bracket (23-09130-042). Use screw (23-13345-020) to mount both the brackets on the engine housing. See **Fig. 11** for correct location and orientation of the bracket.

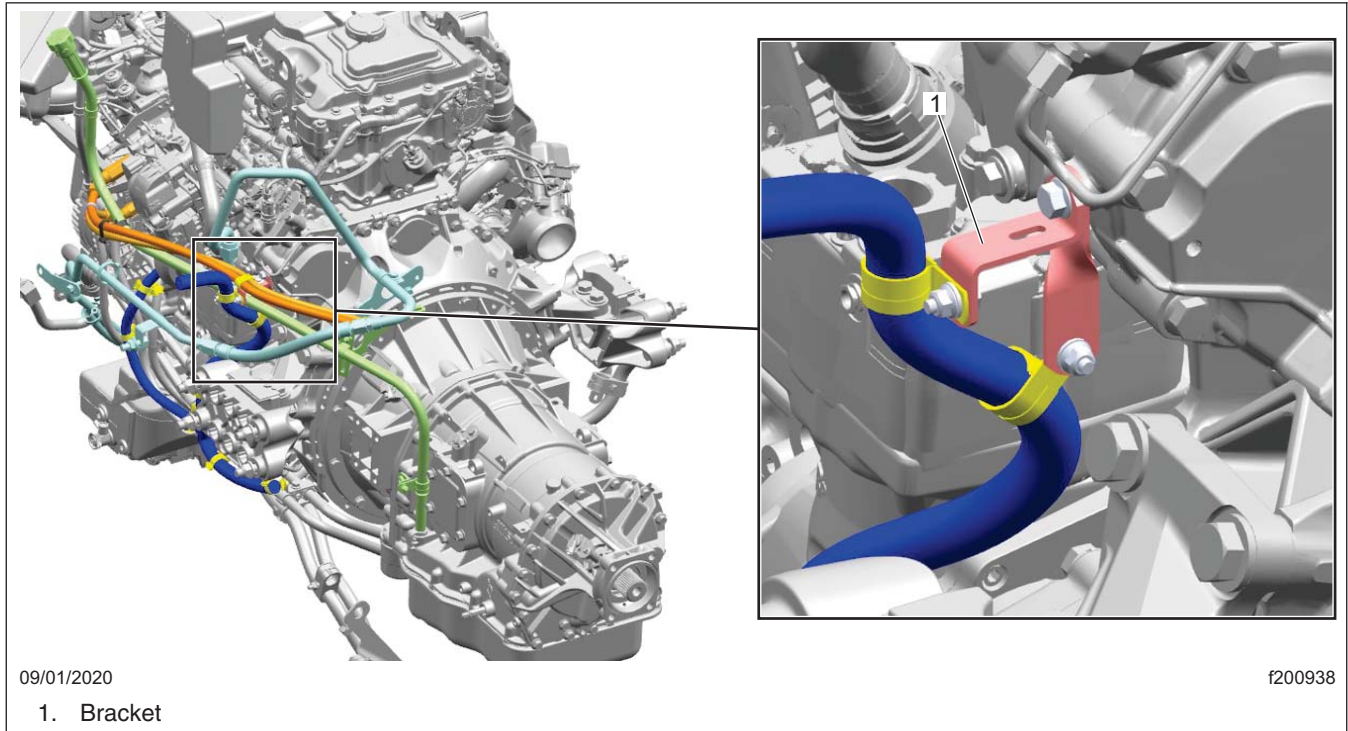


Fig. 11, Bracket Location

15. Using the tiestraps, secure the harness at the clipping points on the air compressor-mounted bracket, starting at the marked positions on the harness identified with the yellow tape. Add additional TwistTube® at any potential chaff points and use additional tie straps as needed to secure the harness.
16. Install the clamps (23-11357-016) to secure the engine harness to both of the new standoff brackets at the rear of the engine, and mount the clamps using the nut (23-13861-104), screw (23-09432-075), and two washers (23-10900-025). See **Fig. 12**.



Fig. 12, Clamp Installation

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17. Install and secure the 5.9 inches (150 mm) of TwistTube to the engine harness at the clipping point of the cab frontwall mounted bracket and on the innermost edge of the left frontwall and secure the harness to the bracket using tie straps. See [Fig. 13](#).



Fig. 13, Securing the Harness using Tie Strap

18. Install the fuel lines on the bracket at the rear of the engine using the original clamp and fasteners. Install the front fuel line clamp and the transmission dip stick tube clamp using the original clamps and fasteners. See [Fig. 14](#).

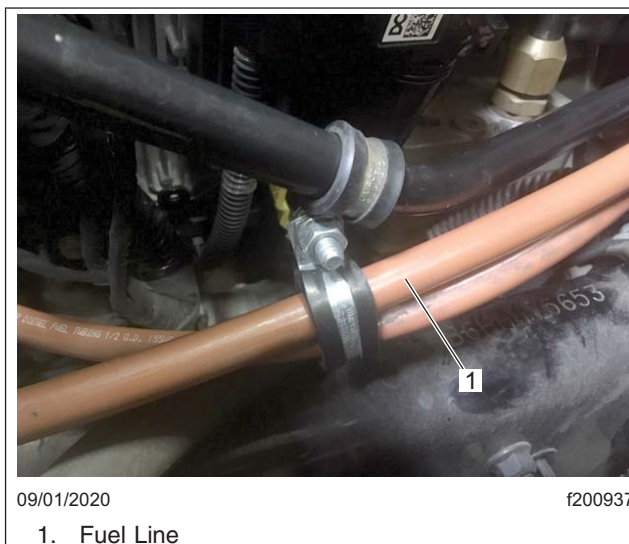


Fig. 14, Securing the Fuel Line

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19. Install the left bumper end cap and install the fasteners.
20. Install the left quarter fender and attach the bracket for the main PDM and PTPDM.
21. Connect the battery negative cable.
22. Start and run the vehicle for a minute to verify the repair.
23. Close the hood.
24. Clean a spot on the base label (Form WAR259), write the recall number, FL858, on a red completion sticker (Form WAR260), and attach it to the base label, indicating this work has been completed.

DD5 Engine Harness Repair - FL858B Only

1. Check the base label (Form WAR259) for a completion sticker for FL858 (Form WAR260) 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 completion sticker is present, no work is needed. If a completion sticker is not present, continue with the next step.
2. Park the vehicle on a level surface, shut down the engine, and set the parking brake. Chock the tires.
3. Open the hood.
4. Disconnect the battery negative cable.
5. Remove the left bumper end cap by removing the fasteners.
6. Remove the left front quarter fender. Using a suitable tether (rope, bungee, tie strap, etc.), support the Power Train Power Distribution Module (PTPDM) and main Power Distribution Module (PDM) bracket to the front wall hood support in order to prevent damage to harness or connectors.
7. Cut open the tie straps that secure the DD5 engine harness to access the complete harness for inspection of the key chaffing points. The key chaffing points include air compressor-mounted bracket and discharge line, fuel lines, transmission dip stick tube, and at the cab frontwall-mounted bracket on the innermost edge of the left frontwall. See [Fig. 15](#).

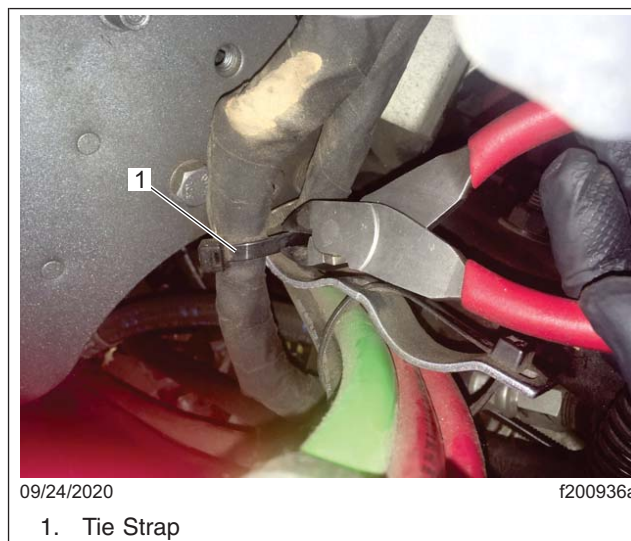


Fig. 15, Harness Tie Strap Removal

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- At the key chaffing points, inspect the engine harness for damage. Pull the harness away from the brackets, using a mirror as needed. See [Fig. 16](#).

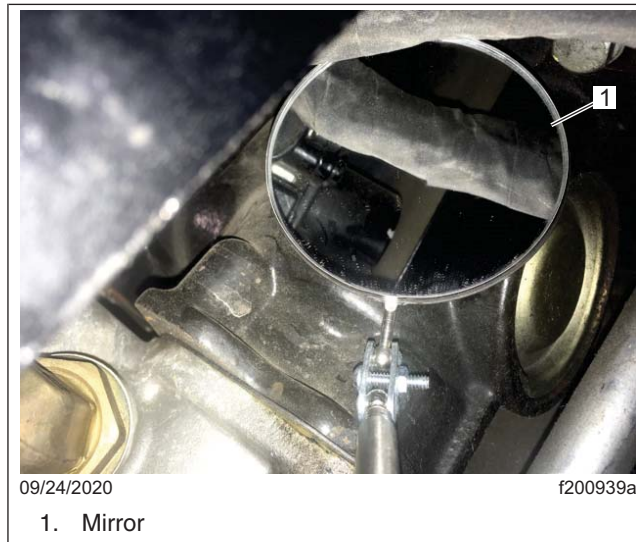


Fig. 16, Inspection by Mirror

NOTE: Wiring harnesses are considered damaged when chaffing has worn through the harness fiber wrap and the wire insulation resulting in exposed strands of copper wire.

- If damage to the wiring is found, cut and unwrap the harness wrap in the damaged area to determine the extent of damage.
 - If five or fewer wires (approximately 30% or less) in the harness are damaged, the harness can be repaired.
 - If more than five wires in the harness are damaged, the harness must be replaced. (Less than 1% of vehicles are expected to need the harness replaced.)

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IMPORTANT: It is expected that there will be a low occurrence of harness replacements. When needed, use PartsPro® (Module 487) or EZWiring™ (found under “Vehicle Information”/“Location search”/ and once the S/N is entered, select “Commodity Harness” under the “System Options”) to locate the correct VIN specific engine harness. For assistance in engine harness replacement, submit a WSC ticket to Warranty Campaigns.

10. Repair damaged wiring as follows.

NOTE: Additional harness clipping points and harness connectors may need to be removed to provide access to the harness for repair.

- 10.1 Locate the damaged area and carefully cut open the fiber wrap using a sewing seam ripper tool. See [Fig. 17](#).



Fig. 17, Cutting an Opening into the Fiber Wrap

- 10.2 Flip the seam ripper tool over so that the blunt end is facing wiring, then cut enough length to allow the fiber to be unwrapped. See [Fig. 18](#).



Fig. 18, Cutting the Fiber Using the Blunt End of the Seam Ripper

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- 10.3 Unwrap the fiber until a sufficient area is exposed to make the repair, then cut out the damaged section of the wire. See [Fig. 19](#).



Fig. 19, Unwrapping the Harness

- 10.4 Inspect the harness and ensure there is enough wire slack to install the Phillips STA-DRY® connector. See [Table 4](#) for correct size of Phillips STA-DRY®.

Phillips STA-DRY Crimp and Solder Connectors Parts		
Wire Size: Gauge (mm)	Connector Part Number*	Shrinkable Tubing (Daimler Part Number)
20 to 18 (0.5 to 0.8)	PHM 1 1863	1/4 inch with internal adhesive coating (48-02461-025)
16 to 14 (1 to 2)	PHM 1 1862	1/4 inch with internal adhesive coating (48-02461-025)
12 to 10 (3 to 5)	PHM 1 1861	3/8 inch with internal adhesive coating—4 foot length (48-02461-038)
8 or larger (5 or larger)	Replace the terminal or the entire cable	Use adhesive lined red for positive cables and black for negative cables.

* Twenty-five connectors per pack.

Table 4, Phillips STA-DRY Crimp and Solder Connectors Parts

- 10.5 If the wire does not have enough slack to install the Phillips STA-DRY® connector, add a new section of overlay wire using two Phillips STA-DRY® connectors. If an overlay wire is necessary, remove the fiber to allow for a splice into the damaged wire and make sure the wire is the same gauge and quality as the wire being repaired. See [Fig. 20](#).



Fig. 20, Overlay Added to the Damaged Area of the Harness

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- 10.6 Crimp the Phillips STA-DRY® connector on the repaired wires as required using tool DKIOCHA17003-2 or similar. Use a heat gun to apply the solder and heat shrink the Phillips STA-DRY® connectors. See [Fig. 21](#).

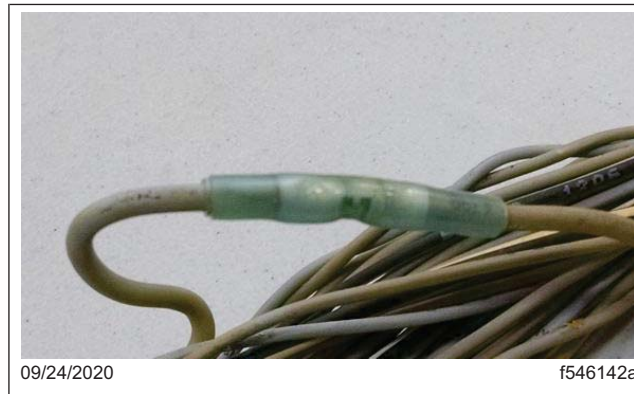


Fig. 21, Wire Repaired with Shrink Tubing

IMPORTANT: No more than five wires on the engine harness should be repaired. This includes up to five sections of overlay wires. Multiple wire repairs should be staggered using varying length overlay wires in order to maintain the overall engine harness size.

- 10.7 Wrap the entire length of the repaired area with new fiber wrap tape (48-25910-000). Make sure enough tape is used to overlap the starting point.
- 10.8 Secure both ends of the fiber wrap with electrical tape. Install the clipping points and connectors removed for the repair.
11. Wrap the harness at the key chaff points with severe duty harness wrap (TwistTube®) for added protection.
12. Add the TwistTube® to the engine harness at the air compressor bracket area following the measurements shown in [Fig. 22](#) and [Fig. 23](#). The horizontal section of the harness must be 3.5 inches (90 mm) ahead of the vertical section, and 4.3 inches (110 mm) behind the vertical section (total of 7.8 inches (200 mm) TwistTube for horizontal section). The vertical section must be at 11.8 inches (300 mm) from horizontal section. Secure the loose ends of the TwistTube with electrical tape or tie straps.

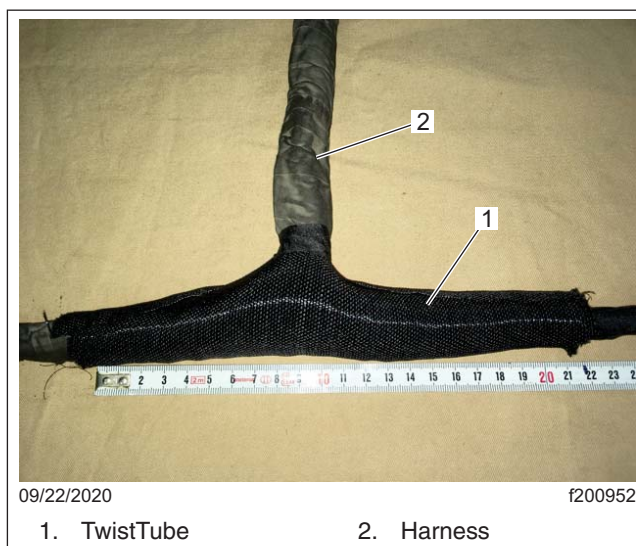


Fig. 22, TwistTube Horizontal Measurement



Fig. 23, TwistTube Vertical Measurement

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13. Add yellow marking tape at the two key spots (2.5 inches (65 mm) on the horizontal and 7.1 inches (180 mm) on the vertical section) to identify the clipping point so the harness will be properly secured to prevent further chaffing. See [Fig. 24](#) and [Fig. 25](#).

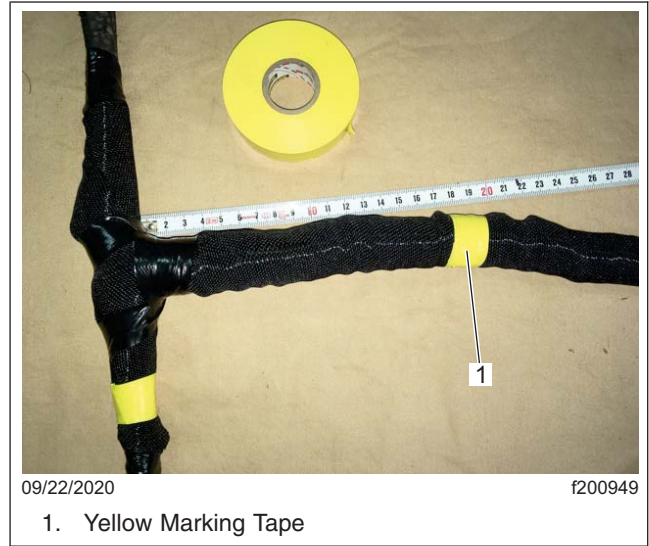
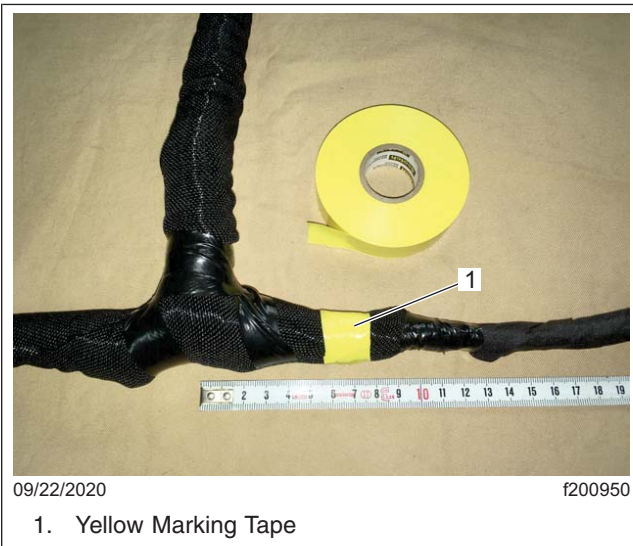


Fig. 24, Yellow Marking Tapes for Horizontal Section

Fig. 25, Yellow Marking Tapes for Vertical Section

14. Install two new standoff brackets at the left rear of the engine, replacing the existing fuel line standoff bracket with 23-13514-020 and adding bracket (23-09130-042). Use screw (23-13345-020) to mount both the brackets on the engine housing. See [Fig. 26](#) for correct location and orientation of the bracket.

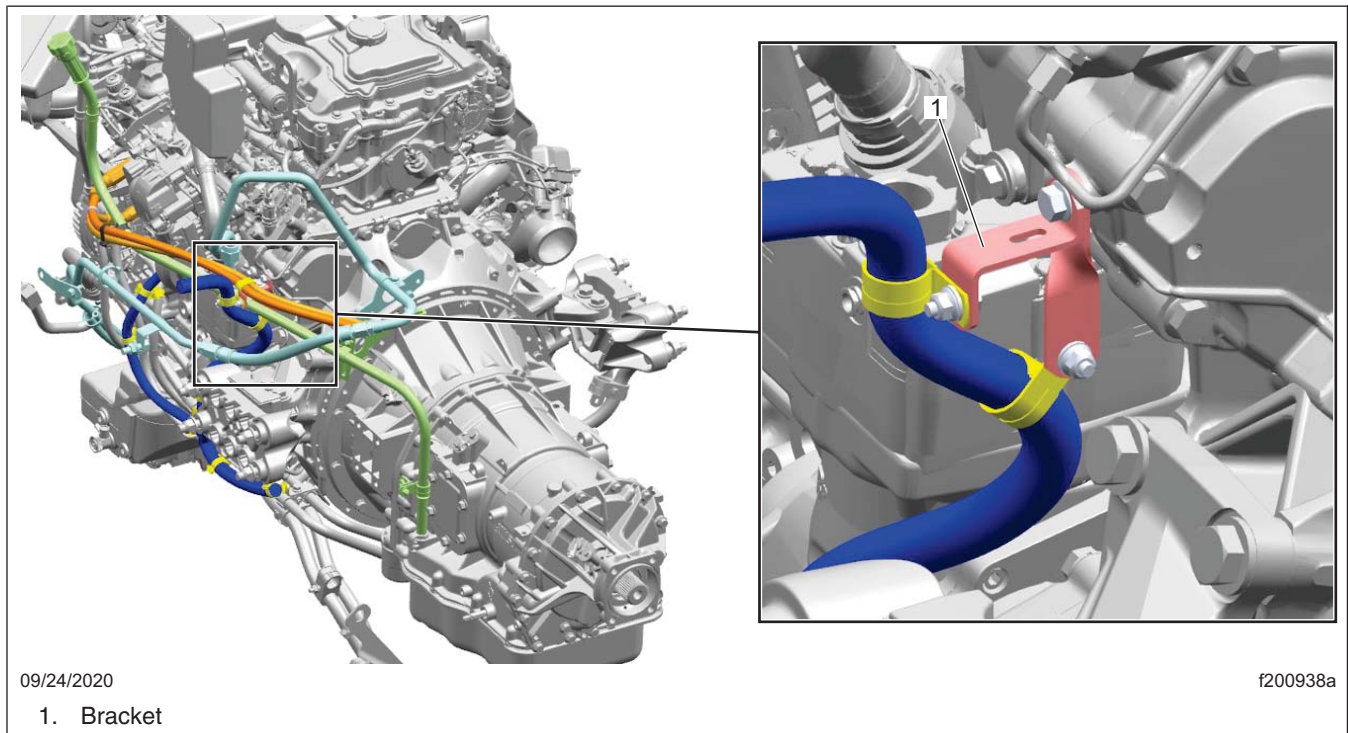


Fig. 26, Bracket Location

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- Using the tiestraps, secure the harness at the clipping points on the air compressor-mounted bracket, starting at the marked positions on the harness identified with the yellow tape. Add additional TwistTube® at any potential chaff points and use additional tie straps as needed to secure the harness.
- Install the clamps (23-11357-016) to secure the engine harness to both of the new standoff brackets at the rear of the engine, and mount the clamps using the nut (23-13861-104), screw (23-09432-075), and two washers (23-10900-025). See **Fig. 27**.

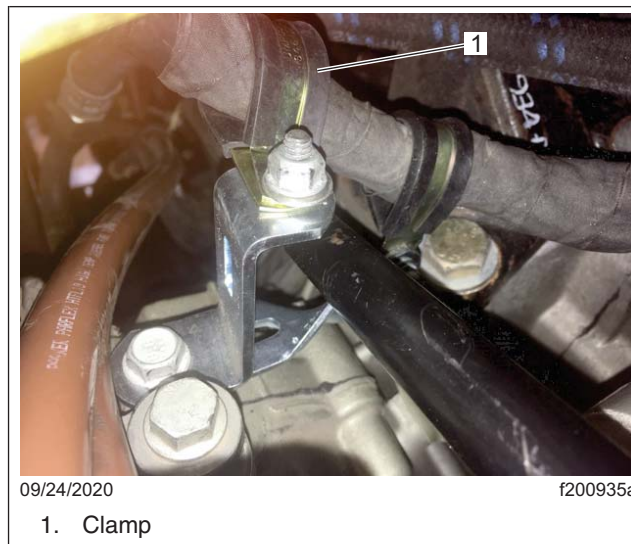


Fig. 27, Clamp Installation

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17. Install and secure the 5.9 inches (150 mm) of TwistTube to the engine harness at the clipping point of the cab frontwall mounted bracket and on the innermost edge of the left frontwall and secure the harness to the bracket using tie straps. See [Fig. 28](#).

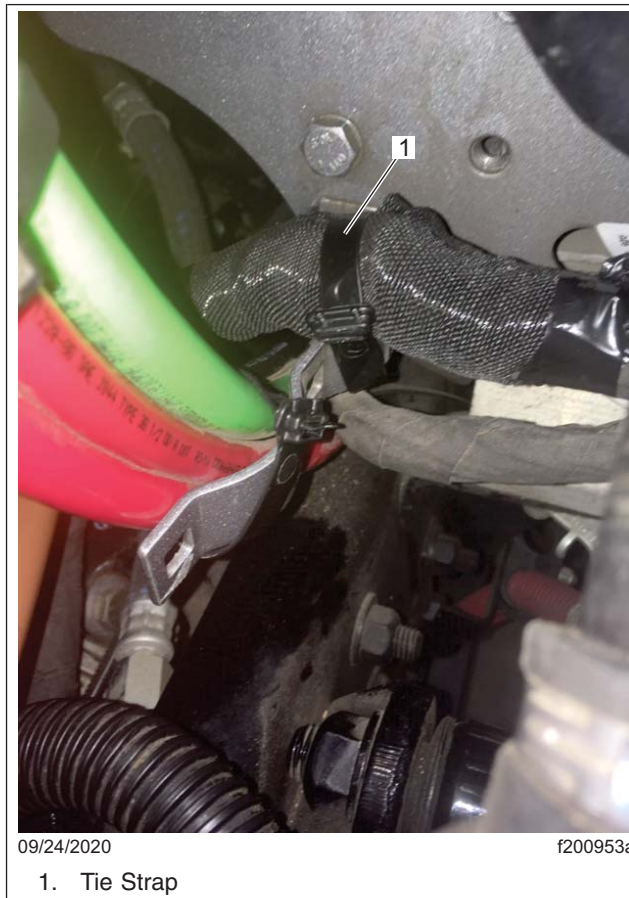


Fig. 28, Securing the Harness using Tie Strap

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18. Install the fuel lines on the bracket at the rear of the engine using the original clamp and fasteners. Install the front fuel line clamp and the transmission dip stick tube clamp using the original clamps and fasteners. See [Fig. 29](#).

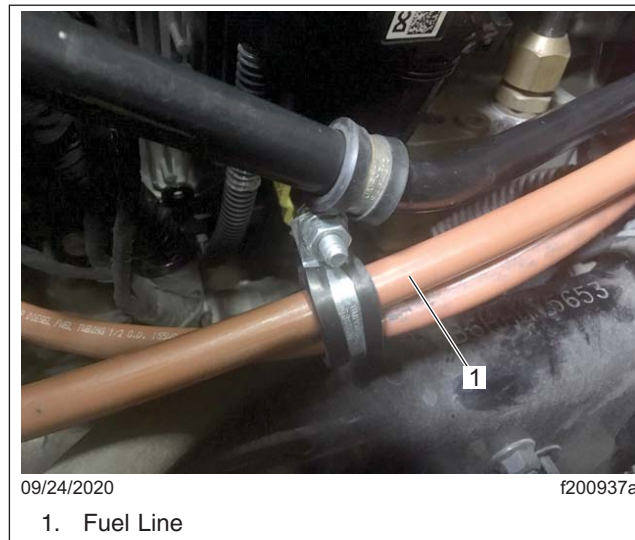


Fig. 29, Securing the Fuel Line

19. Install the left bumper end cap and install the fasteners.
20. Install the left quarter fender and attach the bracket for the main PDM and PTPDM.
21. Connect the battery negative cable.
22. Start and run the vehicle for a minute to verify the repair.
23. Close the hood.
24. Clean a spot on the base label (Form WAR259), write the recall number, FL858, on a red completion sticker (Form WAR260), and attach it to the base label, indicating this work has been completed.