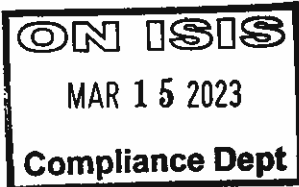


# ***SERVICE PROCEDURE***

22523  
MARCH 2023

**SUBJECT: SAFETY RECALL**

High-Voltage positive cables on certain IC Bus® Electric CE Series school bus models built 10/13/2020 thru 10/18/2022 with feature codes 0008TLC (210 kWh Total Battery Capacity) or 0008TLD (315 kWh Total Battery Capacity)



**CUSTOMER LETTER**

Print ready (PDF file) copy of the [Customer Letter](#)

**DEFECT DESCRIPTION**

The high-voltage positive cables from the battery packs to the Manual Service Disconnects (MSDs) may have incorrect identification marking tape that indicates a lower level 2 isolation (MSD removal) instead of indicating a level 3 isolation (battery fuse removal). An incorrectly identified cable may indicate to a first responder, technician, or customer that the cable is de-energized, when it may not be, possibly increasing the risk of electrical shock resulting in personal injury or death.

**MODELS INVOLVED**

This safety recall involves certain IC Bus® Electric CE Series school bus models built 10/13/2020 thru 10/18/2022 with feature codes 0008TLC (210 kWh Total Battery Capacity) or 0008TLD (315 kWh Total Battery Capacity).

**ELIGIBILITY**

This procedure applies ONLY to vehicles marked in the International® Service Portal<sup>SM</sup> with safety recall 22523. Also complete any other open campaigns listed on the Service Portal at this time.

## TOOLS REQUIRED

Description	Tool Number
Lift Assembly	08-529-01
Plastic Bag	Source Locally
Plastic Blade (Boxcutter, Pick)	Source Locally

## PARTS INFORMATION

Part Number	Part Description	Quantity
4309053C1	Tape, High-Voltage Wrap White	1
4309732C1	Label, High-Voltage Black	3 Per Cable
306132C1	Strap, Cable Lock	As Needed

## SERVICE PROCEDURE

**WARNING!** To prevent personal injury and / or death, or damage to property, NEVER service a high-voltage vehicle without completing high-voltage safety training. Before working on vehicle, read and obey High-Voltage Safety, and Lock-Out Tag-Out safety procedures and information.

**WARNING!** To prevent personal injury and / or death, wear and use approved high-voltage Personal Protective Equipment (PPE) when near a high-voltage electric vehicle. Inspect PPE before use. Do not use gloves or other PPE with expired dates, holes, cracks, or damage. NEVER touch energized orange high voltage cables or high-voltage components without wearing approved high voltage PPE.

**WARNING!** To prevent personal injury and / or death, or damage to property, park vehicle on hard flat surface, key OFF, set the parking brake, and install wheel chocks to prevent the vehicle from moving in both directions.

**WARNING!** To prevent personal injury and / or death, or damage to property, ALWAYS follow existing cable-routing for all replacement cables. Kit-supplied replacement cables are designed to be installed with no slack present. NEVER deviate from existing routing when replacing a high-voltage cable.

**WARNING!** To prevent personal injury and / or death, always wear safe eye protection when performing vehicle maintenance.

**WARNING!** To prevent personal injury and / or death, or damage to property, keep flames or sparks away from vehicle and do not smoke while servicing the vehicle's batteries. Batteries expel explosive gases.

**WARNING!** To prevent personal injury and / or death, or damage to property, if the vehicle must be raised, do not work under the vehicle supported only by jacks. Jacks can slip or fall over.

**WARNING!** To prevent personal injury and / or death, read all information in the Safety Information and High-Voltage Safety sections of the service manual.

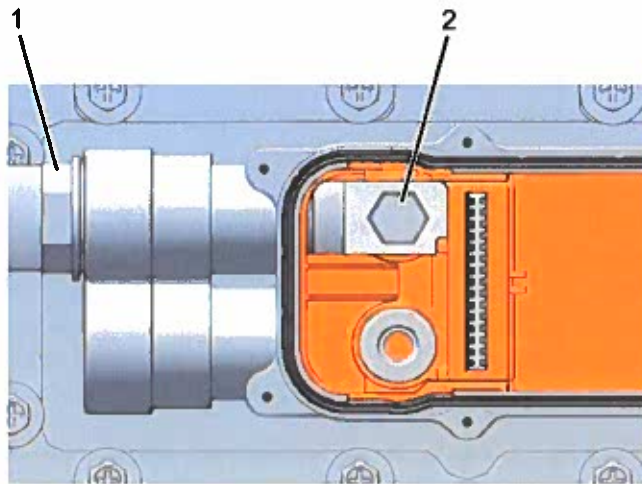
1. Bring vehicle into shop area and park vehicle on a dry level surface.
2. Set drive mode selector to Neutral, turn ignition to Key OFF position, and set parking brake.
3. Install wheel chocks.

**NOTE:** This procedure is also required if the vehicle is equipped with a three-string system, as high-voltage positive battery to MSD cables are also affected.

4. Turn OFF 12V and high-voltage disconnect switches and perform lock out / tag out procedure.
5. Lift vehicle.
6. Perform High-Voltage Isolation Level 3. Refer to technician manual for detailed instructions.

**NOTE:** If the vehicle is equipped with a three-string system, record positive cable connections as well.

7. Record and label high-voltage positive cable connections at high-voltage batteries and at MSD inlet connections.
8. Remove rubber cap covering high-voltage positive cable connection bolt inside of lower high-voltage battery fuse connection port. Place on clean work surface and save for reinstallation.



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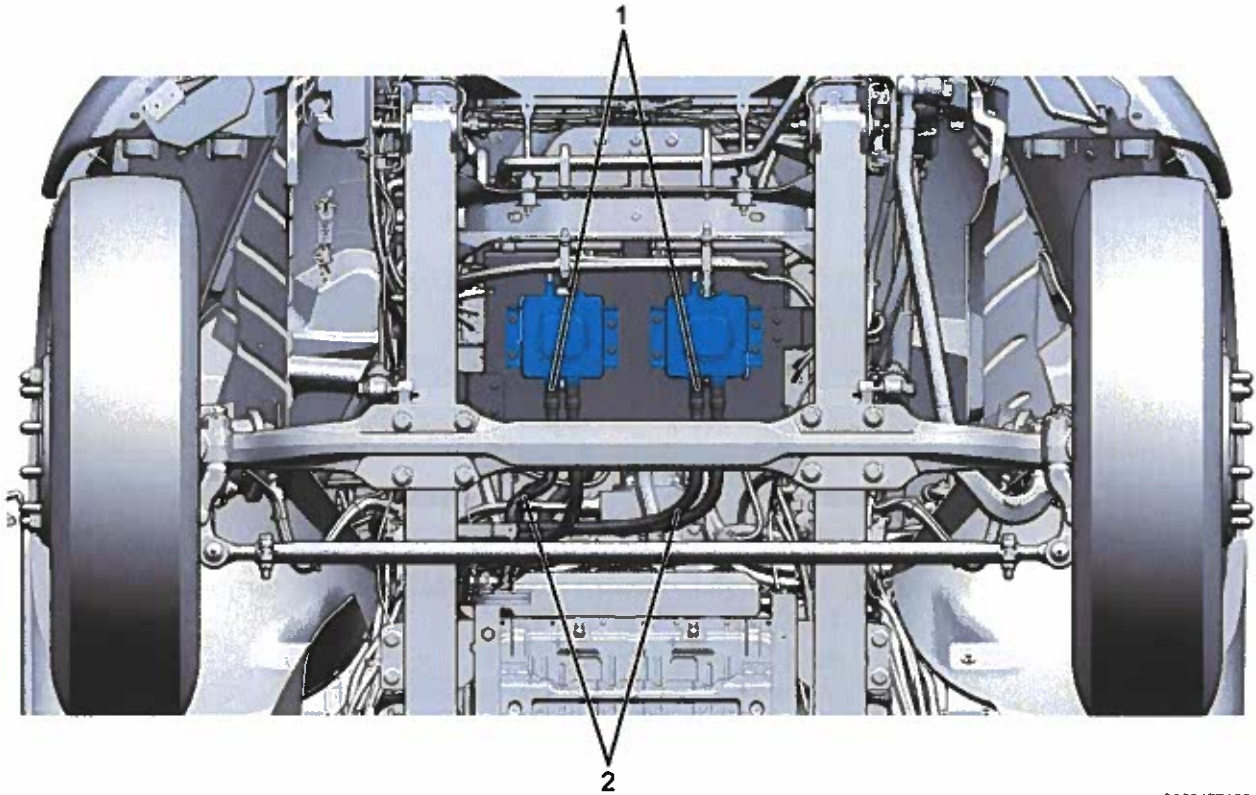
**Figure 1. Battery Fuse Positive Cable Connection**

1. High-voltage positive cable retaining nut
2. High-voltage positive cable end bolt

9. Remove high-voltage positive cable end bolt (Figure 1, Item 2) from lower battery fuse connection port and loosen high-voltage positive cable retaining nut (Figure 1, Item 1) to remove cable.

10. Repeat Steps 8 and 9 for upper positive cable fuse connection.

**NOTE: If the vehicle you are working on is equipped with a three-string system, repeat Steps 8 and 9 for this positive cable fuse connection.**

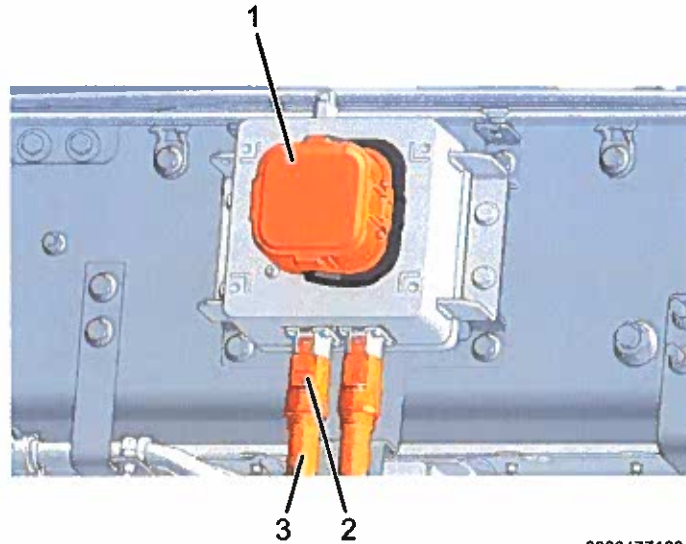


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**Figure 2. High-Voltage MSD Cables and Connections**

1. MSD inlet connector (2)
2. High-voltage positive cable (2)

11. Disconnect high-voltage positive cables (Figure 2, Item 2) from MSD inlet connectors (Figure 2, Item 1) located under front of the vehicle.



**Figure 3. Three-string High-Voltage MSD and Connections**

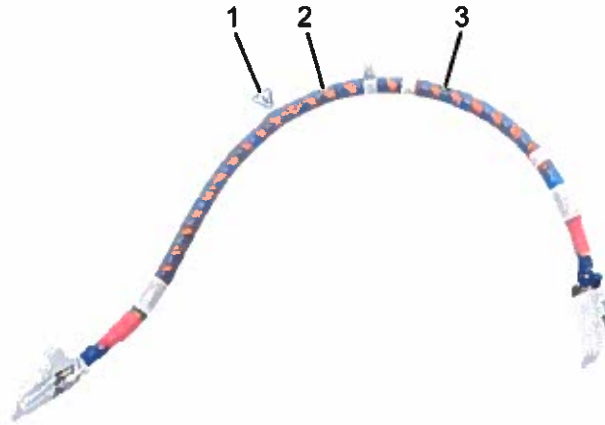
1. MSD
2. MSD inlet connector
3. High-voltage positive cable

**CAUTION!** To prevent damage to property, store disconnected or removed components on clean surface and properly cover exposed connections. Failure to do so can lead to contamination and damage to component.

**NOTE:** If the vehicle is equipped with a three-string system, refer to Step 12. For two-string systems, proceed to Step 13.

12. If the vehicle is equipped with a three-string system, locate the three-string MSD (Figure 3, Item 1) on the frame rail and disconnect the high-voltage positive cable (Figure 3, Item 3) from the MSD inlet connector (Figure 3, Item 2).
13. Record location of the routing of all high-voltage positive cables. Remove all cable tie straps securing the high-voltage positive cables to their saddles and remove them from the vehicle.
14. Once positive cables have been removed from the vehicle, wrap both ends of each cable in a plastic bag and secure with tape / rubber band.

**CAUTION!** To prevent damage to property, utilize only plastic tools (i.e., plastic razor or plastic pick) to remove tape from high-voltage positive cables. Failure to do so can result in damage to the cable.



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**Figure 4. Blue Identification Tape and Blue Warning Label**

1. Blue warning label
2. High-voltage positive cable
3. Blue identification tape

15. Using a plastic blade, remove the BLUE identification tape (Figure 4, Item 3) and all BLUE high-voltage warning labels (Figure 4, Item 1) from removed high-voltage positive cable (Figure 4, Item 2).

**CAUTION!** To prevent damage to property, NEVER allow soap and water to come into contact with high-voltage cable connector ends. Confirm high-voltage cables are dry before reinstallation. Failure to do so can result in property damage.

16. Clean cables using ONLY mild soap and water and dry with shop air.



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**Figure 5. White Identification Tape**

1. White identification tape
2. High-voltage positive cable

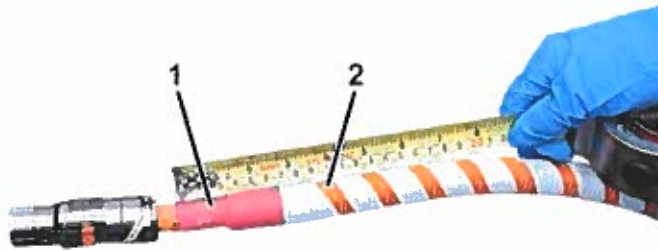


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**Figure 6. White Identification Striping**

17. Overlap WHITE identification tape (Figure 5, Item 1) three times at one end. Continue to spiral wrap around high-voltage positive cable (Figure 5, Item 2). Conclude wrapping with three overlapping wraps on opposite end. Reference Figure 6 for proper tape pattern.



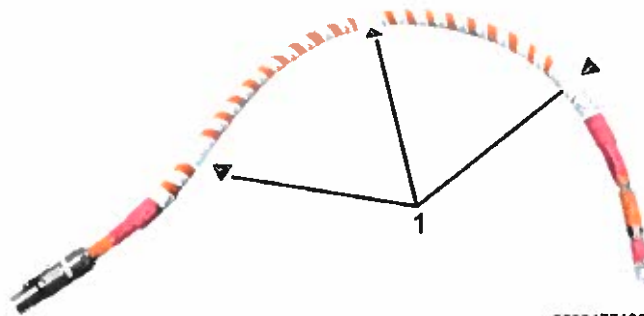


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### Figure 7. Black Warning Label Placement

1. Heat shrink insulation
2. High-voltage positive cable

18. Measure six inches from beginning of heat shrink (Figure 7, Item 1) on both ends of high-voltage positive cable (Figure 7, Item 2) and mark. Mark a center point for the middle label in between both previously marked label locations.

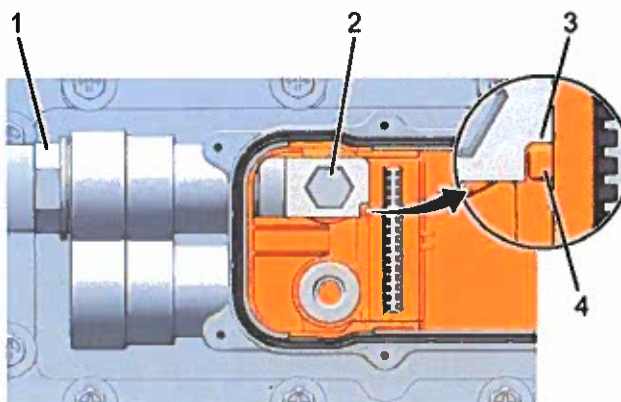


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### Figure 8. Black Warning Label Placement

1. Black warning label (3)

19. Install high-voltage black warning labels on marks made during Step 18. Reference Figure 8 for final placement.
20. Repeat Steps 17–19 for remaining high-voltage cable.
21. Remove and discard protective bags from each high-voltage positive cable.



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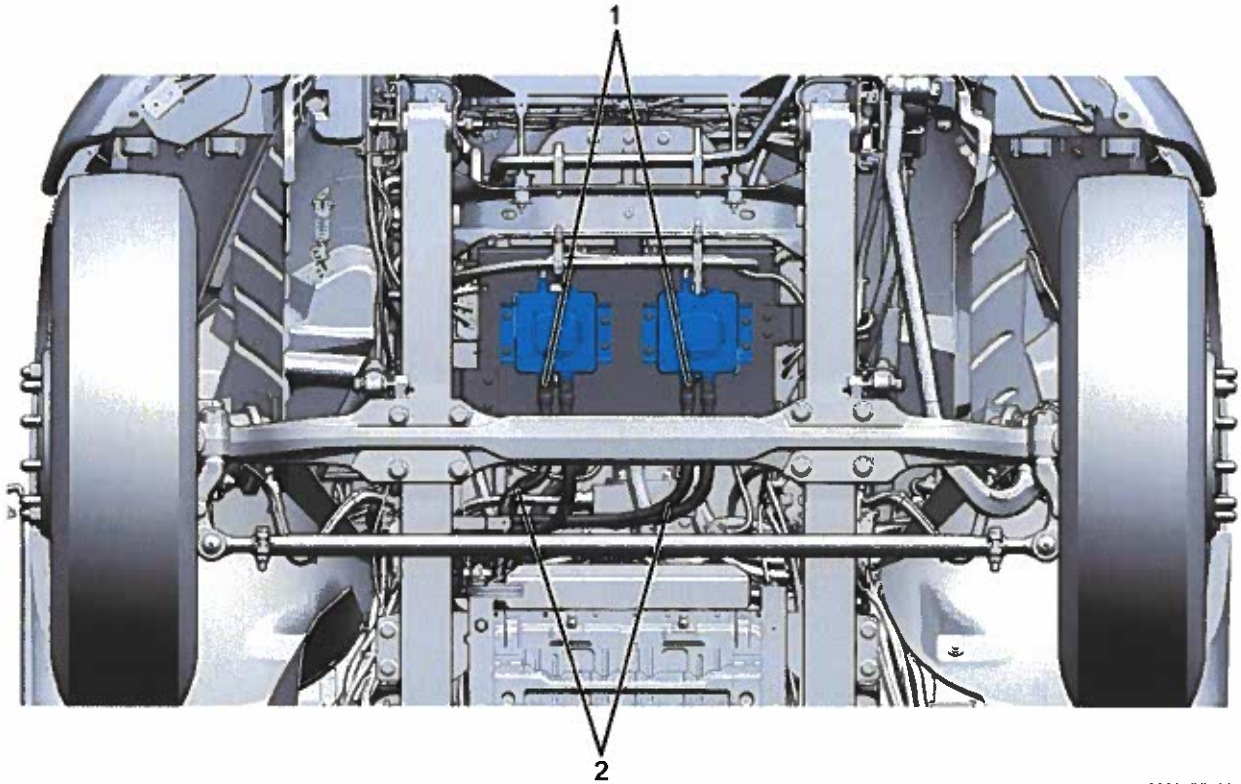
**Figure 9. Battery Fuse Positive Cable Connection**

1. High-voltage positive cable retaining nut
2. High-voltage positive cable end bolt
3. High-voltage positive cable terminal keyway
4. High-voltage positive cable connector seat key

**CAUTION!** To prevent damage to property, confirm high-voltage positive cable terminal keyway aligns with high-voltage positive cable connector seat key. Failure to do so can result in property damage.

**CAUTION!** To prevent damage to property, ensure no dirt / debris is present between high-voltage cable terminal and battery fuse connector seat. Failure to do so can lead to contamination and damage to component.

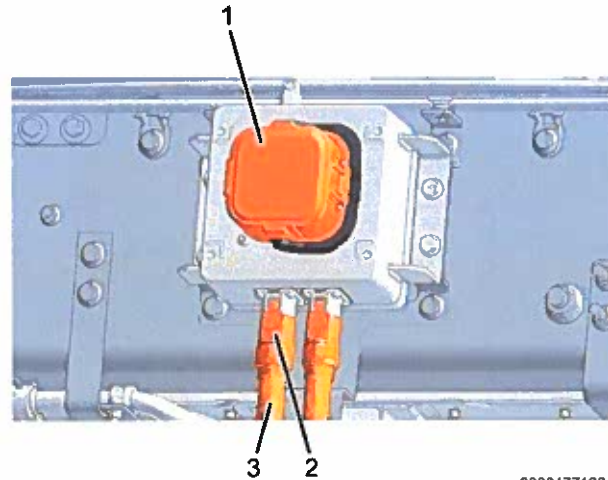
22. Align high-voltage positive cable terminal keyway (Figure 9, Item 3) with high-voltage positive cable connector seat key (Figure 9, Item 4) and install high-voltage positive cable end into upper battery fuse connection port.
23. Using torque wrench, tighten high-voltage positive cable end bolt (Figure 9, Item 2) to 22 lb-ft (30 N·m). Using torque wrench, tighten high-voltage positive cable retaining nut (Figure 9, Item 1) to 70 lb-ft (8 N·m) and confirm no screw thread is exposed.



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**Figure 10. High-Voltage MSD Cables and Connections**

1. MSD inlet connectors
  2. High-voltage positive cables
- 
24. Connect high-voltage positive cables (Figure 10, Item 2) to respective MSD inlet connectors (Figure 10, Item 1) located under the front of the vehicle.
  25. Using previously recorded clipping areas, position high-voltage positive cable to its respective original clipping points as noted in Step 13 and secure with cable-tie wrap.
  26. Repeat Steps 22-25 for lower high-voltage positive cable.



**Figure 11. High-Voltage MSD Cables and Connections**

1. MSD
2. MSD inlet connector
3. High-voltage positive cables

**NOTE: If the vehicle is equipped with a three-string system, refer to Step 27. For two-string systems, proceed to Step 30.**

27. Align high-voltage positive cable terminal keyway (Figure 9, Item 3) with high-voltage positive cable connector seat key (Figure 9, Item 4) and install high-voltage positive cable end into third-string battery fuse connection port.
28. Using a torque wrench, tighten high-voltage positive cable end bolt (Figure 9, Item 2) to 22 lb-ft (30 N·m). Using torque wrench, tighten high-voltage positive cable retaining nut (Figure 9, Item 1) to 70 lb-in (8 N·m) and confirm it is screwed in until no screw thread is exposed.
29. If the vehicle you are working on is a three-string vehicle, connect the high-voltage positive cable to the MSD inlet connector on the frame rail MSD.
30. If the vehicle you are working on is a three-string vehicle, clip high-voltage positive cable to its respective original clipping points as noted in Step 13.
31. Install removed rubber caps to cover high-voltage positive cable connection bolt inside of upper and lower high-voltage battery fuse connection port.
32. If the vehicle you are working on is equipped with a three-string system, repeat Step 31 for this fuse connection port.

33. Install battery fuses for each battery pack, including third battery pack if the vehicle has a three-string system.
34. Install all MSDs, including third battery pack MSD if the vehicle you are working on is a three-string system.
35. Lower vehicle.
36. Turn ON 12V and high-voltage disconnect switches.
37. Remove wheel chocks.

## **END OF SERVICE PROCEDURE**

### **LABOR INFORMATION**

<b>Operation Number</b>	<b>Description</b>	<b>Time</b>
A40-22523-1	High-voltage Isolation Level 3, Zone 3	1.3 Hrs.
A40-22523-2	Replace High-voltage Cable ID tape; 2 String	1.0 Hrs.
A40-22523-3	Replace High-voltage Cable ID tape, Add-on For 3 String	1.0 Hrs.

### **CAMPAIGN IDENTIFICATION LABEL**

Each vehicle corrected in accordance with this campaign must be marked with a CTS-1075 Campaign Identification Label.

Complete the label and attach on a clean surface next to the vehicle identification number (VIN) plate.

**DO NOT REMOVE**

**INTERNATIONAL**

Campaign No. \_\_\_\_\_

VIN \_\_\_\_\_

Eng.# \_\_\_\_\_

**COMPLETED**

Service Location Code # \_\_\_\_\_

**DO NOT REMOVE**

### **ADMINISTRATIVE / DEALER RESPONSIBILITIES**

#### **WARRANTY CLAIMS**

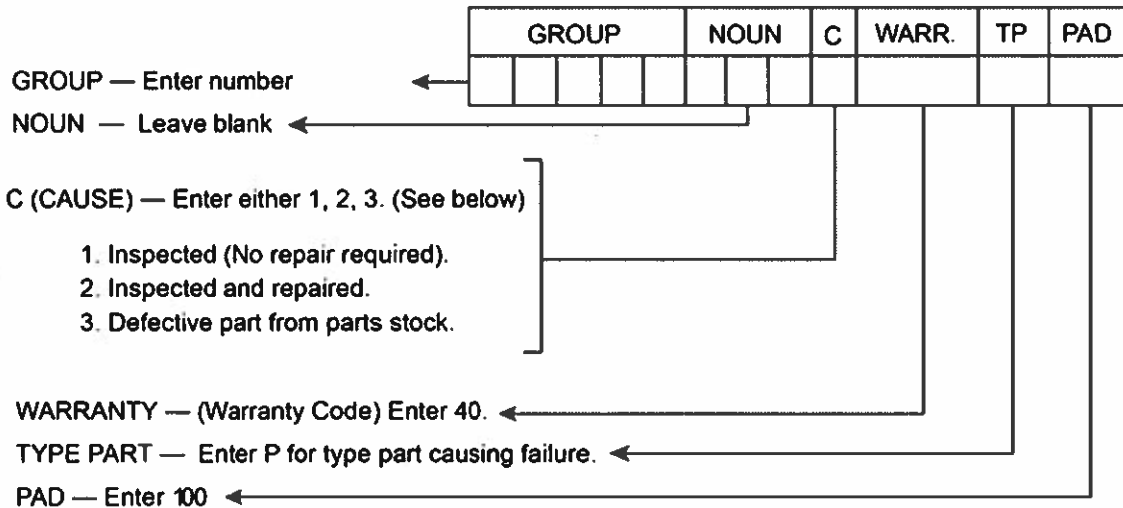
Warranty claim expense is to be charged to Warranty. Claims are to be submitted in the normal manner, making reference to Safety Recall 22523.

Section 7 of the Warranty Policy and Procedures Manual contains further information related to the submission and processing of AFC / Recall claims.

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#### **VEHICLE RECALL 22523**

As with all claim submissions, items acquired locally must be submitted in the "Other Charges" tab. The cost of any bulk items (such as a bag of cable tie straps, roll of wire, barrel of oil, or tube of silicone) should be prorated for the cost of the individual pieces / amount used during each repair.



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## UNITED STATES AND POSSESSIONS

The National Traffic and Motor Vehicle Safety Act, as amended, provides that each vehicle that is subject to a vehicle recall campaign must be adequately repaired within a reasonable time after the owner has tendered it for repair. A failure to adequately repair within 60 days after a tender of a vehicle is prima facie evidence of failure to repair within a reasonable time. If the condition is not adequately repaired within 60 days, the owner may be entitled to replacement with an identical or reasonable equivalent vehicle at no charge, or to a refund of the purchase price less a reasonable allowance for depreciation.

Dealers must correct all vehicles subject to this campaign at no charge to the owner, regardless of mileage, age of vehicle, or ownership, from this time forward.

Dealers should proceed immediately to make necessary correction to units in inventory. All inventory vehicles subject to this recall campaign must be corrected prior to sale, transfer or delivery. If vehicles have been sold or transferred and you are in receipt of Customer Notification Letters and Authorization for Recall Service cards for those vehicles, the transfer location or customer must be notified immediately from your dealer location.

Dealers must make every effort to promptly schedule an appointment with each owner to repair his or her vehicle as soon as possible. However, consistent with the customer notification, dealers are expected to complete the repairs on the mutually agreed upon service date.

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### VEHICLE RECALL 22523

Dealers involved in the recall process will be furnished a listing of owner names and addresses to enable them to follow up with owners and have the vehicles corrected. Use of this listing must be limited to this campaign because the list may contain information obtained from state motor vehicle registration records, and the use of such motor vehicle registration data for purposes other than this campaign is a violation of law in several states.

## **CANADA**

Dealers must correct all vehicles subject to this campaign at no charge to the owner, regardless of mileage, age of vehicle, or ownership, from this time forward.

Dealers should proceed immediately to make necessary correction to units in inventory. All inventory vehicles subject to this recall campaign must be corrected prior to sale, transfer or delivery. If vehicles have been sold or transferred and you are in receipt of Customer Notification Letters and Authorization for Recall Service cards for those vehicles, the transfer location or customer must be notified immediately from your dealer location.

Dealers must make every effort to promptly schedule an appointment with each owner to repair his or her vehicle as soon as possible. However, consistent with the customer notification, dealers are expected to complete the repairs on the mutually agreed upon service date.

Dealers involved in the recall process will be furnished a listing of owner names and addresses to enable them to follow up with owners and have the vehicles corrected. Use of this listing must be limited to this campaign because the list may contain information obtained from state motor vehicle registration records, and the use of such motor vehicle registration data for purposes other than this campaign is a violation of law in several states.

## **EXPORT**

Export Distributors should proceed immediately to make necessary correction to units in inventory. All inventory vehicles subject to this recall campaign must be corrected prior to sale, transfer or delivery. If vehicles have been sold or transferred and you are in receipt of Customer Notification Letters and Authorization for Recall Service cards for those vehicles, the transfer location or customer must be notified immediately from your distributor location.

Export Distributors are to submit warranty claims in the usual manner making reference to this recall number.

Export Distributors are expected to provide full cooperation and follow-up with respect to this important subject matter. If you have any questions or need further assistance, please contact the Regional Service Manager at your regional office.

## **NAVISTAR, INC.**