TRACTIONBATTERY :LIFTING

Note, one or more warnings are present in this procedure

Special tooling required	
Mobile crane	Ms. 1977
Insulating blanket	Ms. 1978
Safety lockout plug padlock of the traction battery	Ele. 1980
Traction battery lifting kit	Ms. 1975
Voltage detector	Ele. 1993
Safety lockout plug of the traction battery	Ele. 2005

Equipment required
Class 00 or 0 electrical insulating gloves
Face shield
Electrical class 00 or 0 safety footwear
Protective overalls (Mainly coton)

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Vehicle: Precautions for the repair ,
- Wiring: Precautions for the repair .

WARNING

The procedures described below must be performed by qualified personnel authorized to work on a high voltage onboard network.

Any work performed on the vehicle's high voltage network entails a risk of death by electrocution. An operator is authorized by the company that employs him/her, subject to certain mandatory training and skills.

WARNING

Operators must never work alone in the workshop. There must always be someone else in the vicinity to help the person in danger in the event of a problem.

WARNING

To prevent any risk of an accident, do not move the lift table in the up position with a traction battery. Always strap traction batteries on the lift table when moving.

WARNING

To prevent any risk of an accident, when lifting a battery, do not move the crane with the jib in the raised position.

CAUTION

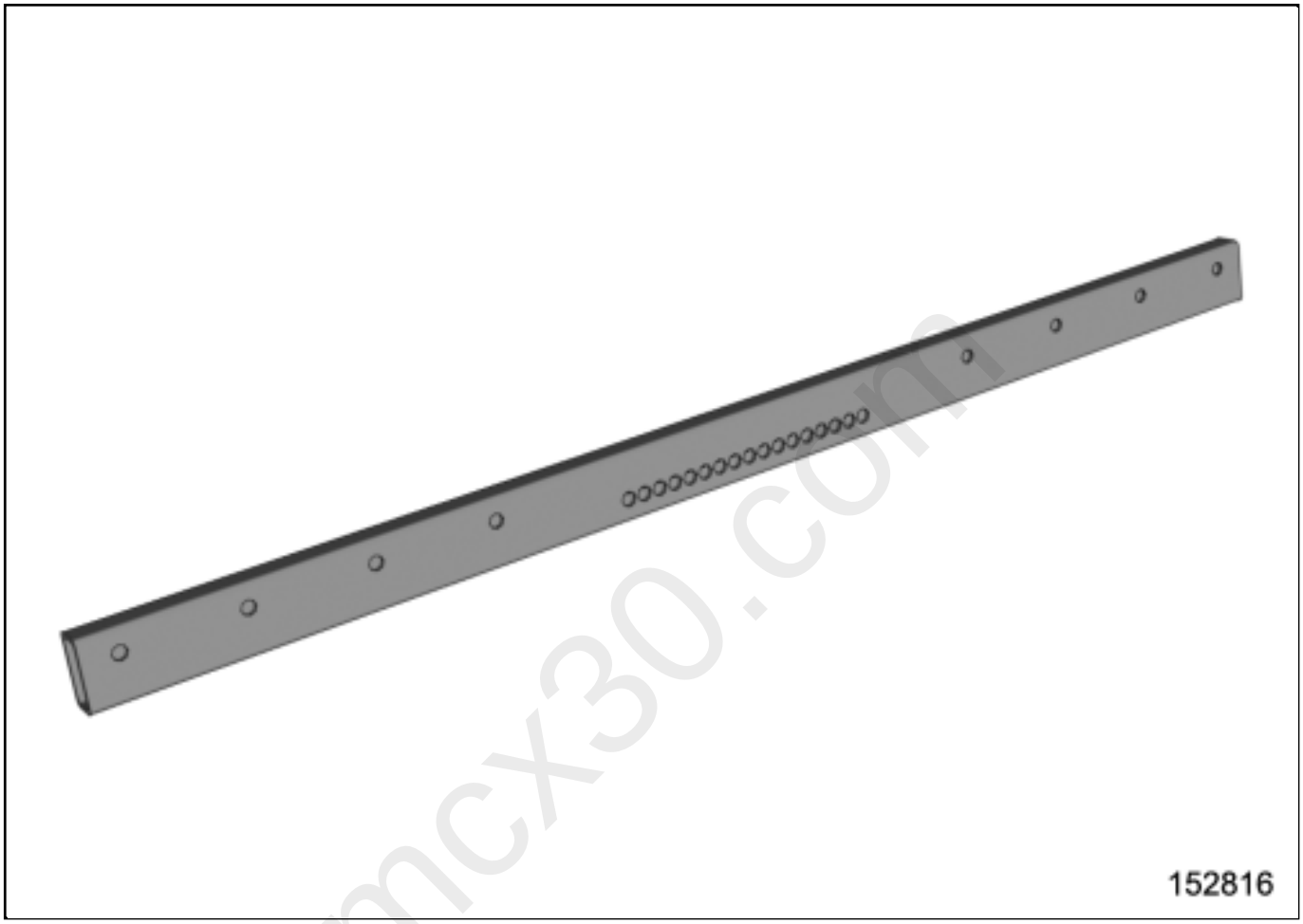
To prevent contamination of disconnected connectors and sockets, hermetically seal the connectors and sockets using a plastic bag and a securing clip. For traction battery sockets, use traction battery caps**Vehicle: Parts and consumables for the repair** .

Required equipment:

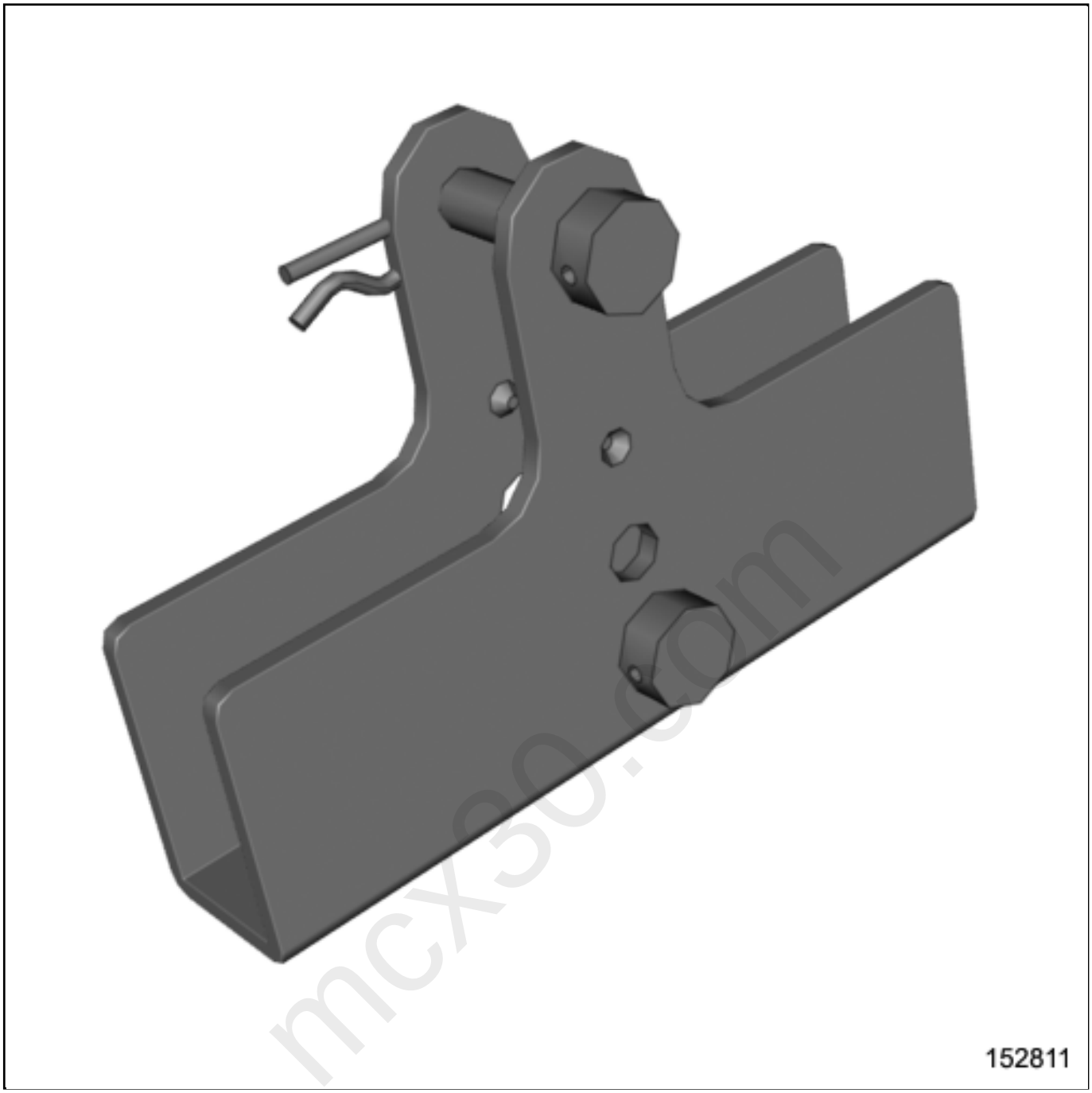
- Class 00 or 0 electrical insulating gloves,
- Electrical class 00 or 0 safety footwear,
- Protective overalls (Mainly coton),
- Face shield,
- Mobile crane (**Ms. 1977**) ,

- Traction battery lifting kit(**Ms. 1975**) ,
- Safety lockout plug padlock of the traction battery(**Ele. 1980**) ,
- Safety lockout plug of the traction battery(**Ele. 2005**)
- Insulating blanket (**Ms. 1978**) ,
- Voltage detector(**Ele. 1993**) .

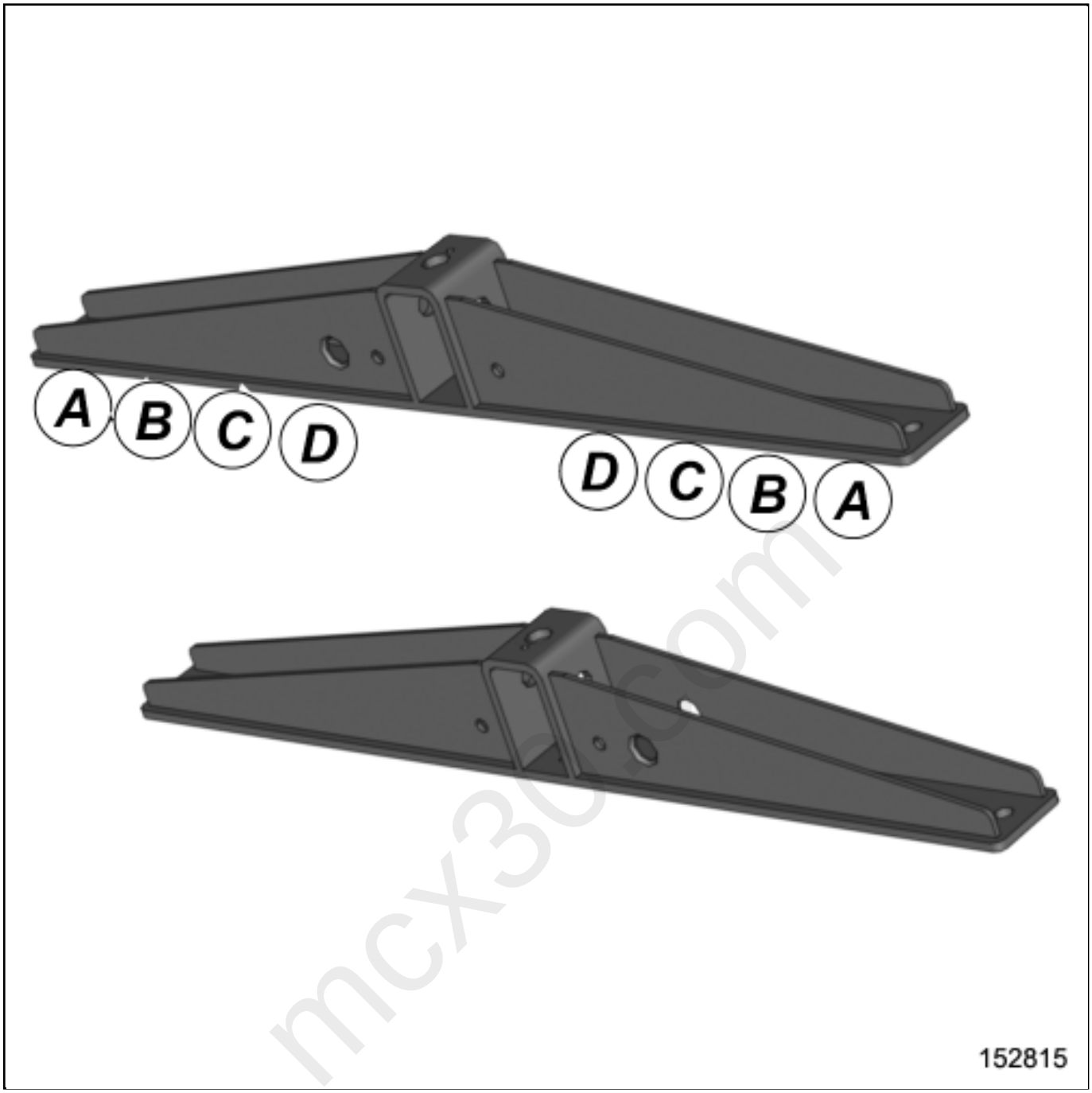
1. MS.1975 DESCRIPTION



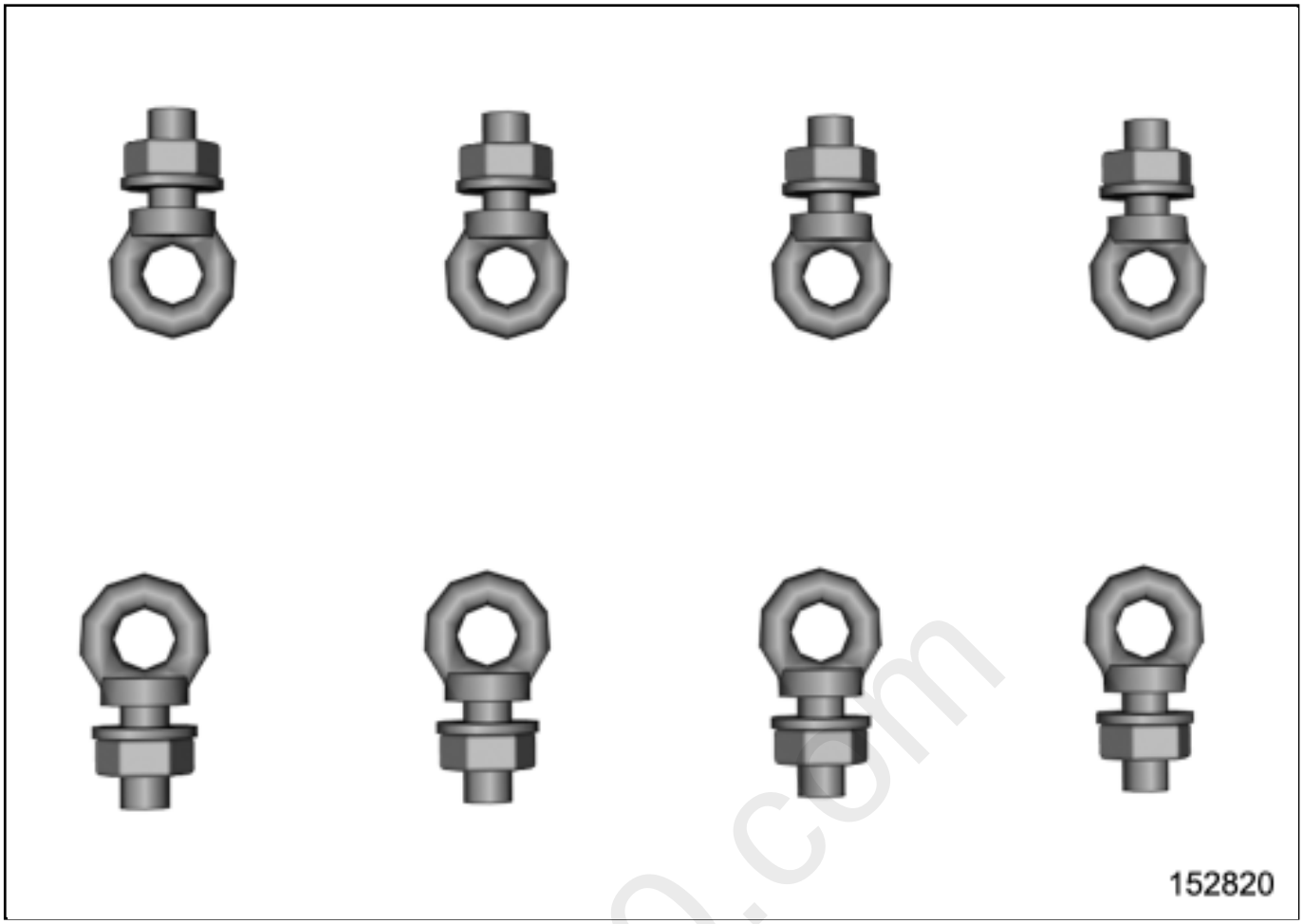
One central bar.



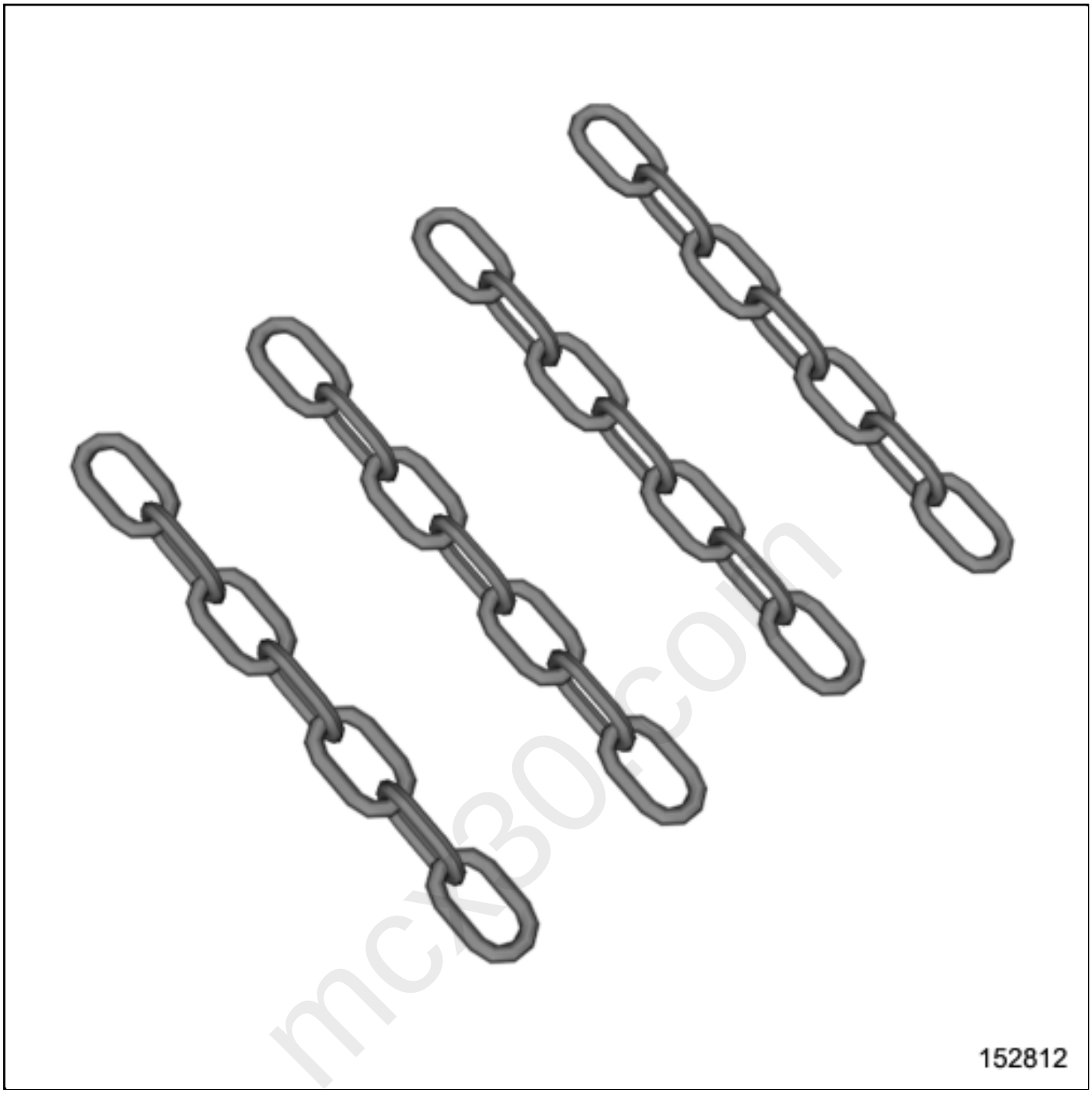
- One central slide.



- Two transversal bars.



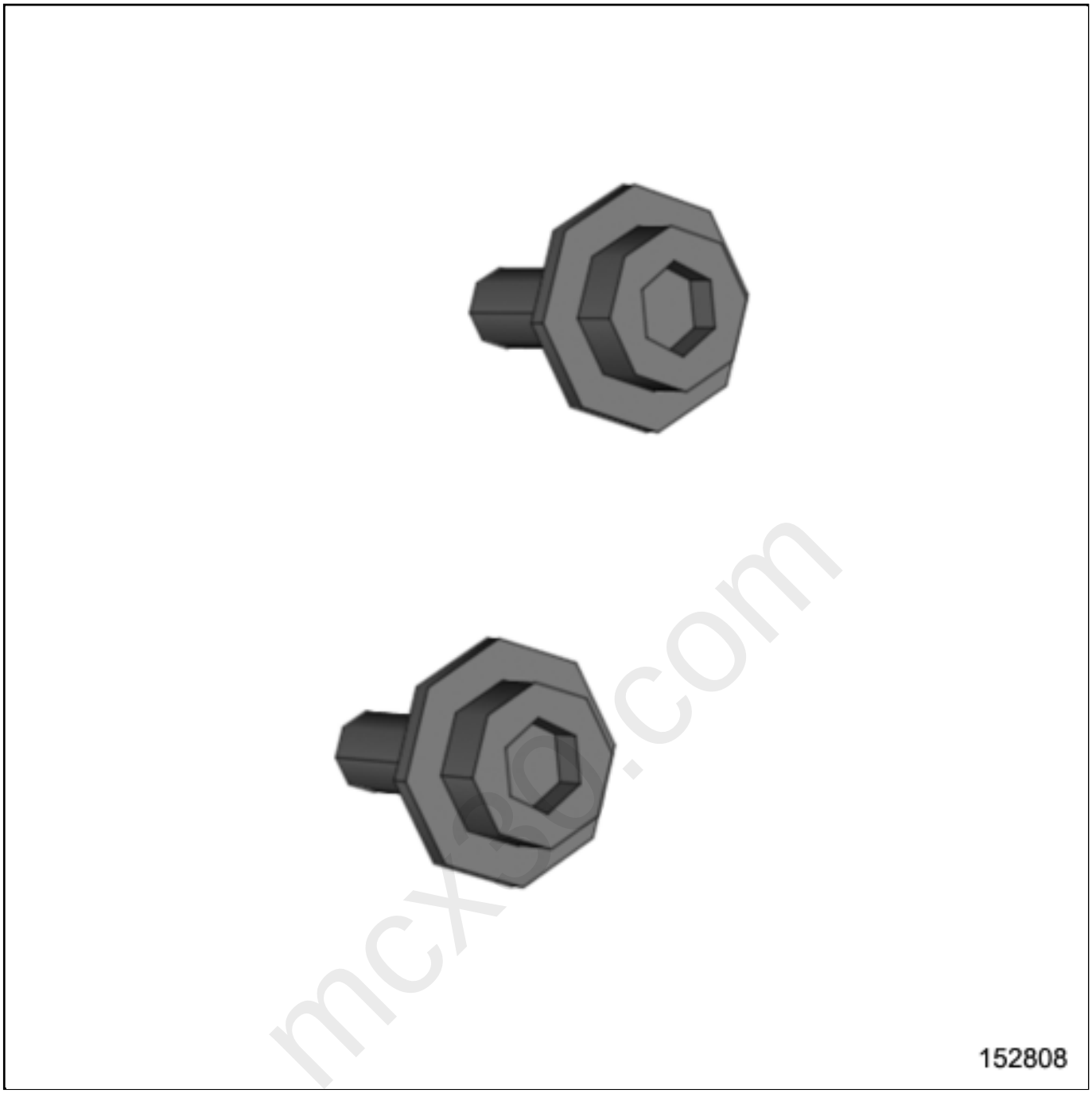
- Eight lifting rings (M10 C15).



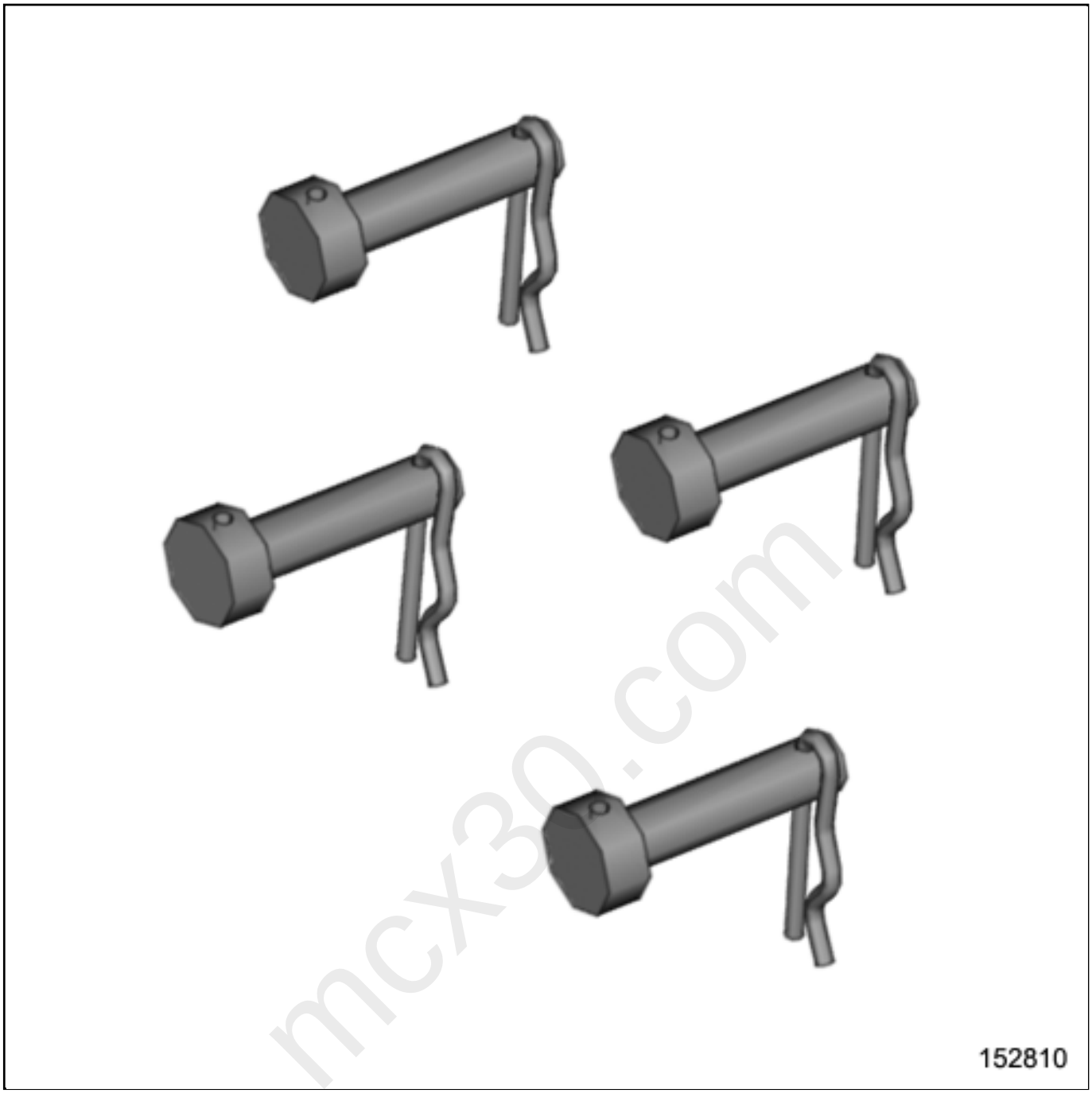
- Four lifting chains.

- Eight fast links Ø 10.

- One lifting ring (M14*90).



- Two bolts (M8*25).

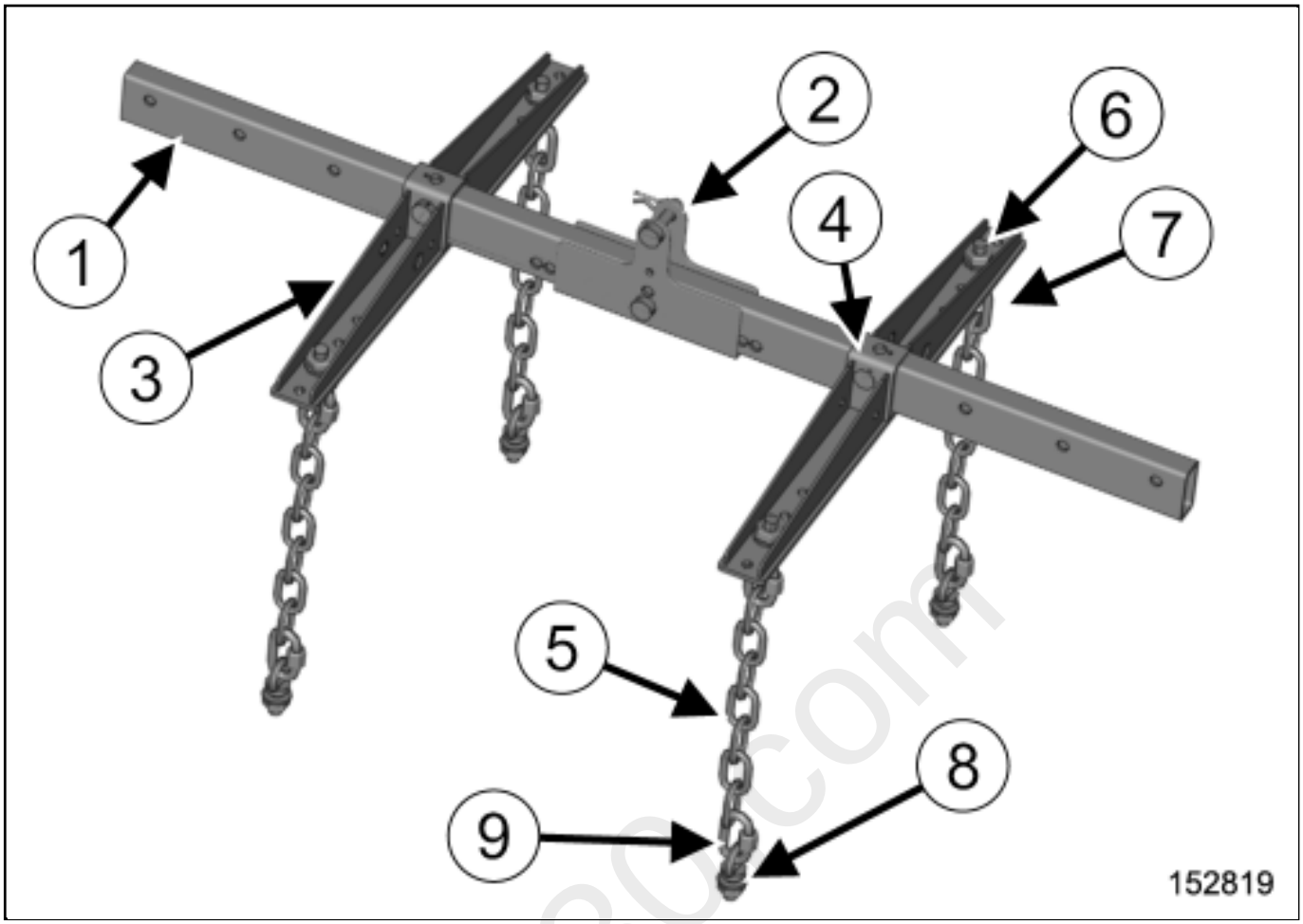


- Four shafts Ø 12with pins.

2. TRACTION BATTERY LIFTING

- Check:
  - the presence of the toolsSafety lockout plug of the traction battery(**Ele. 2005**) and Safety lockout plug padlock of the traction battery(**Ele. 1980**) on the traction battery,
  - the presence of the protective covers on the traction battery connector**Vehicle: Parts and consumables for the repair** ,
  - the presence of theInsulating blanket (**Ms. 1978**) .

1- TOOL ASSEMBLY



- The central bar(1) with the central slide(2) at the center (mark 0).
- Two transversal bars(3) locked with the pins(4) at the mark 1 of the central bar(1) .
- The four lifting chains(5) using the lifting rings (M10 C15)(6) and the fast links(7) at the 4 marks(A) of the transversal bars(3) .
- The four lifting rings (M10 C15)(8) using the four fast links(9) .

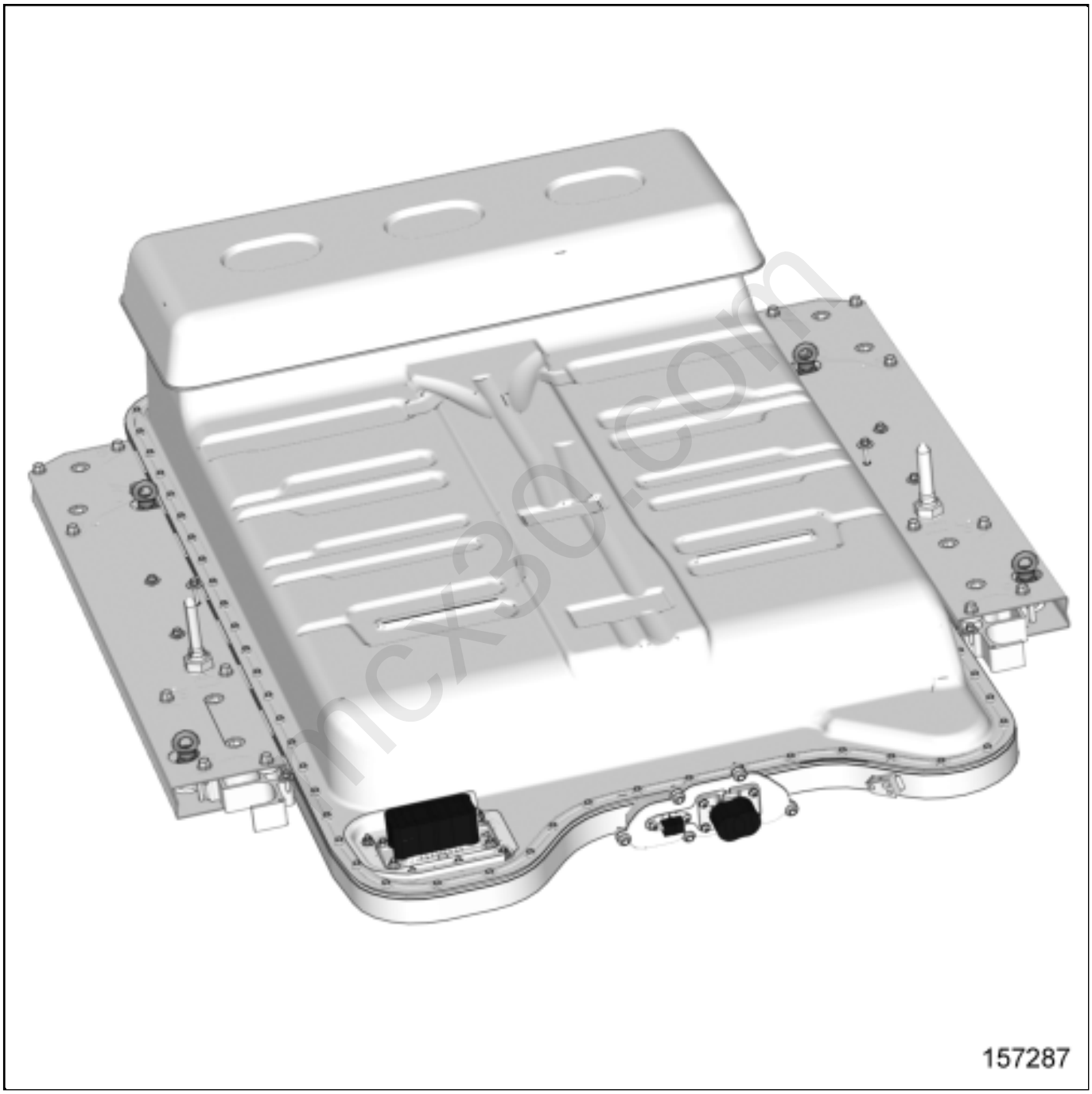
2- TRACTION BATTERY LIFTING

- Wear personal protective equipment:
  - Protective overalls (Mainly coton),
  - Electrical class 00 or 0 safety footwear,
  - Face shield,
  - Class 00 or 0 electrical insulating gloves.

Note:

Check the gloves tightness.

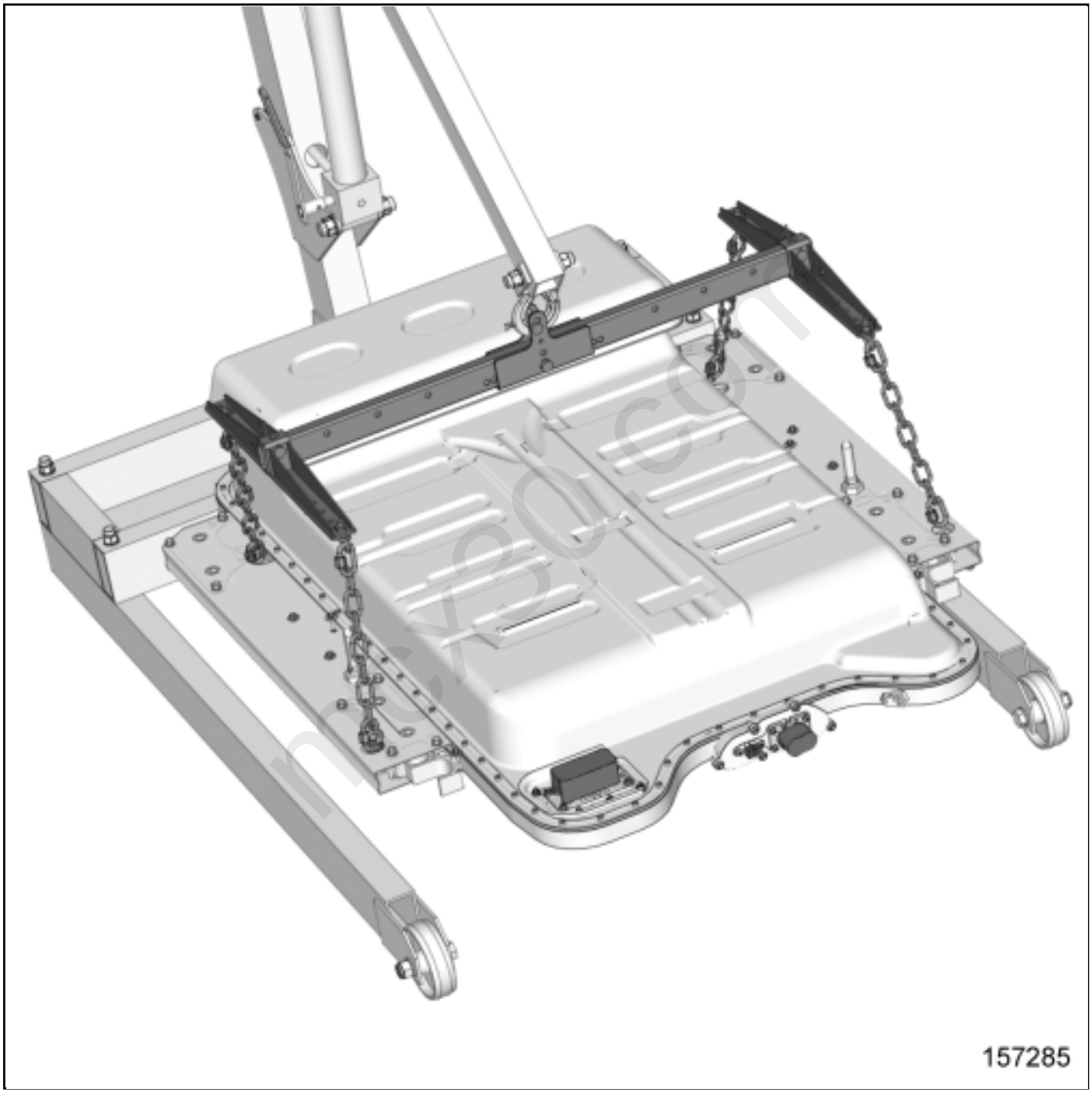
- Make sure the insulating blanketInsulating blanket (Ms. 1978) covers the traction battery air inlets.



- Put the four lifting rings (M10 C15)(8) on the traction battery at the mark and four fast links(9) .

Note:

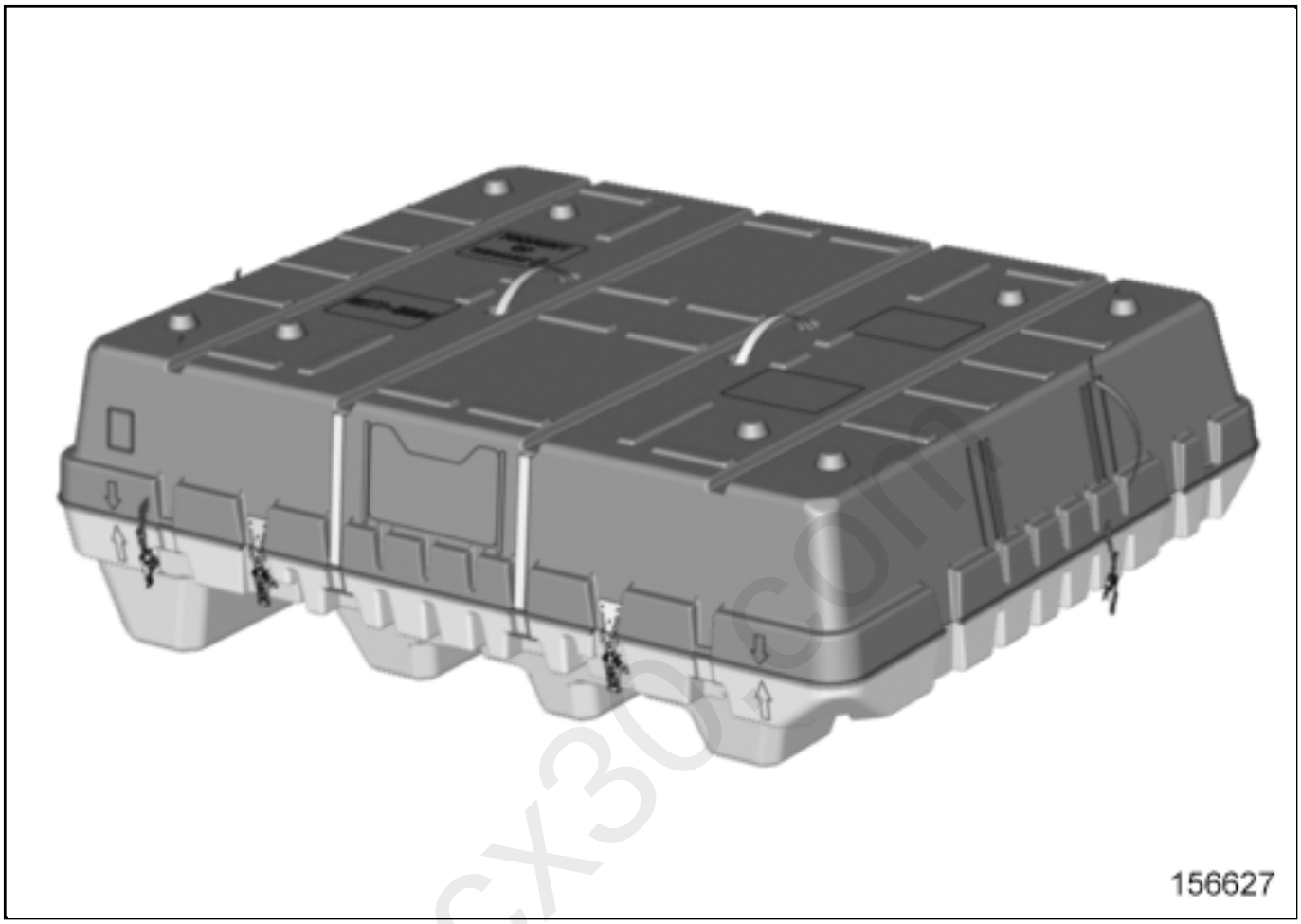
The two lifting chains fixed on the 2 marks(A) of the transversal bar(3) are in front of the traction battery.



- Lift the traction battery using the toolMobile crane (Ms. 1977) .

3. TRACTION BATTERY UNPACKING

- Prepare the toolTraction battery lifting kit(Ms. 1975) .
- Position the tool Mobile crane (Ms. 1977) .



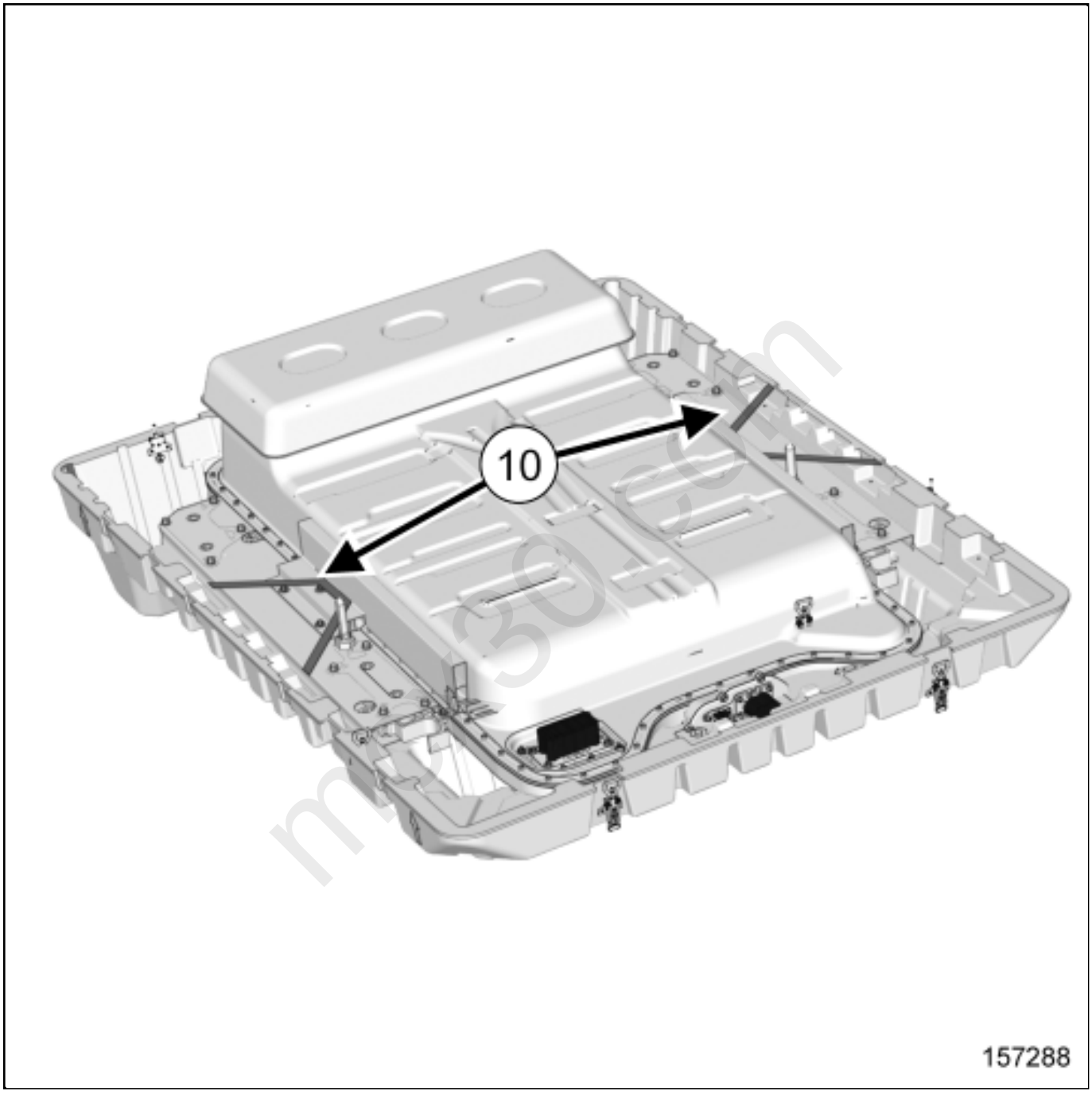
- Remove the traction battery packaging cover.

> Note:
>
> This operation requires two people.

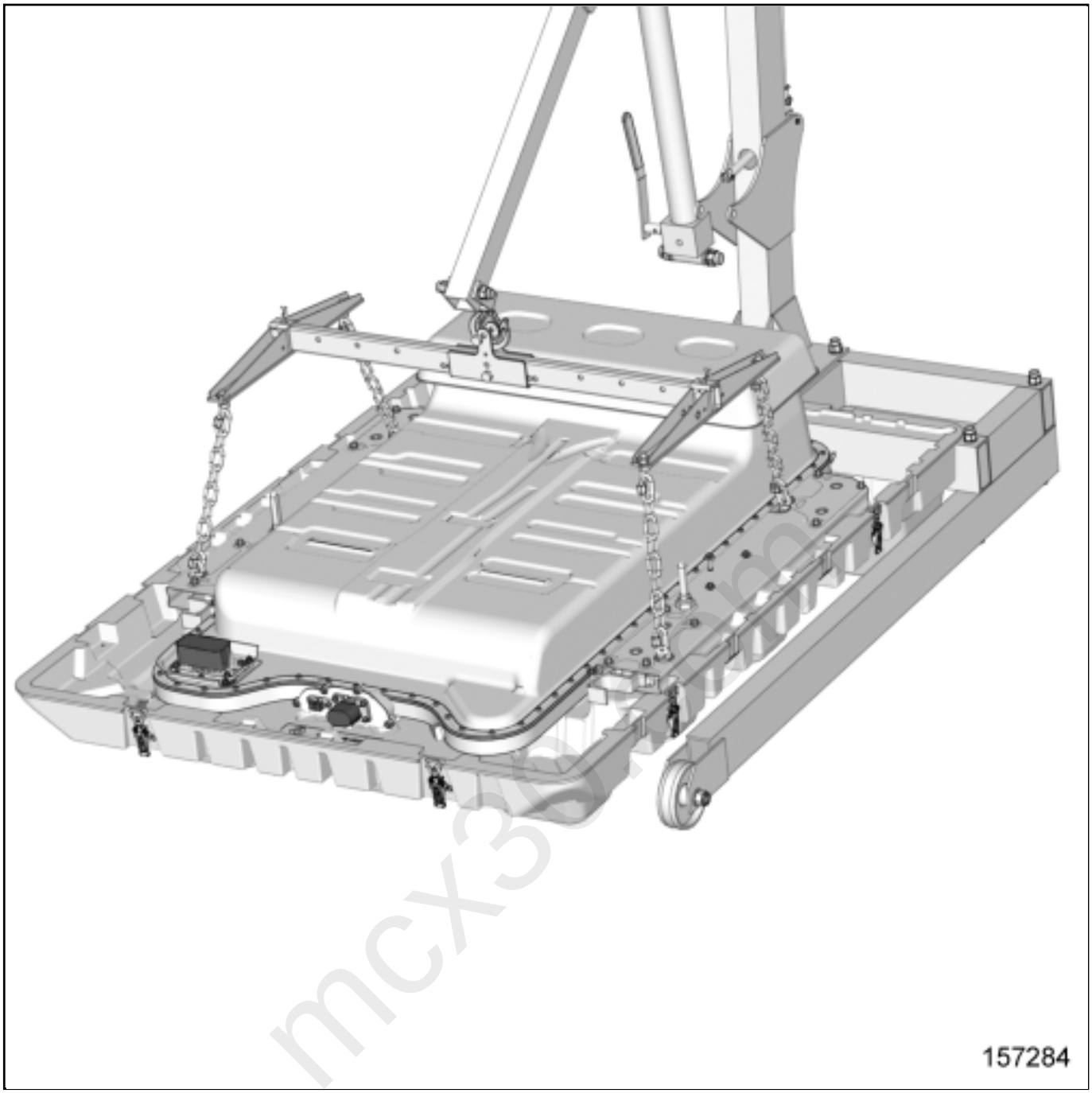
- Wear personal protective equipment:
  - Protective overalls (Mainly coton),
  - Electrical class 00 or 0 safety footwear,
  - Face shield,
  - Class 00 or 0 electrical insulating gloves.

Note:

Check the gloves tightness.



- Unstrap the traction battery at(10) .



- Put the toolTraction battery lifting kit(Ms. 1975) on the traction battery.

- Lift the traction battery over the lower part of the packaging.

- Place the traction battery on the work bench (equipped with an insulated cover).

- Remove the toolTraction battery lifting kit(Ms. 1975) from the traction battery.

- Check for the presence of the protection on the traction battery connectorVehicle: Parts and consumables for the repair .

Note:

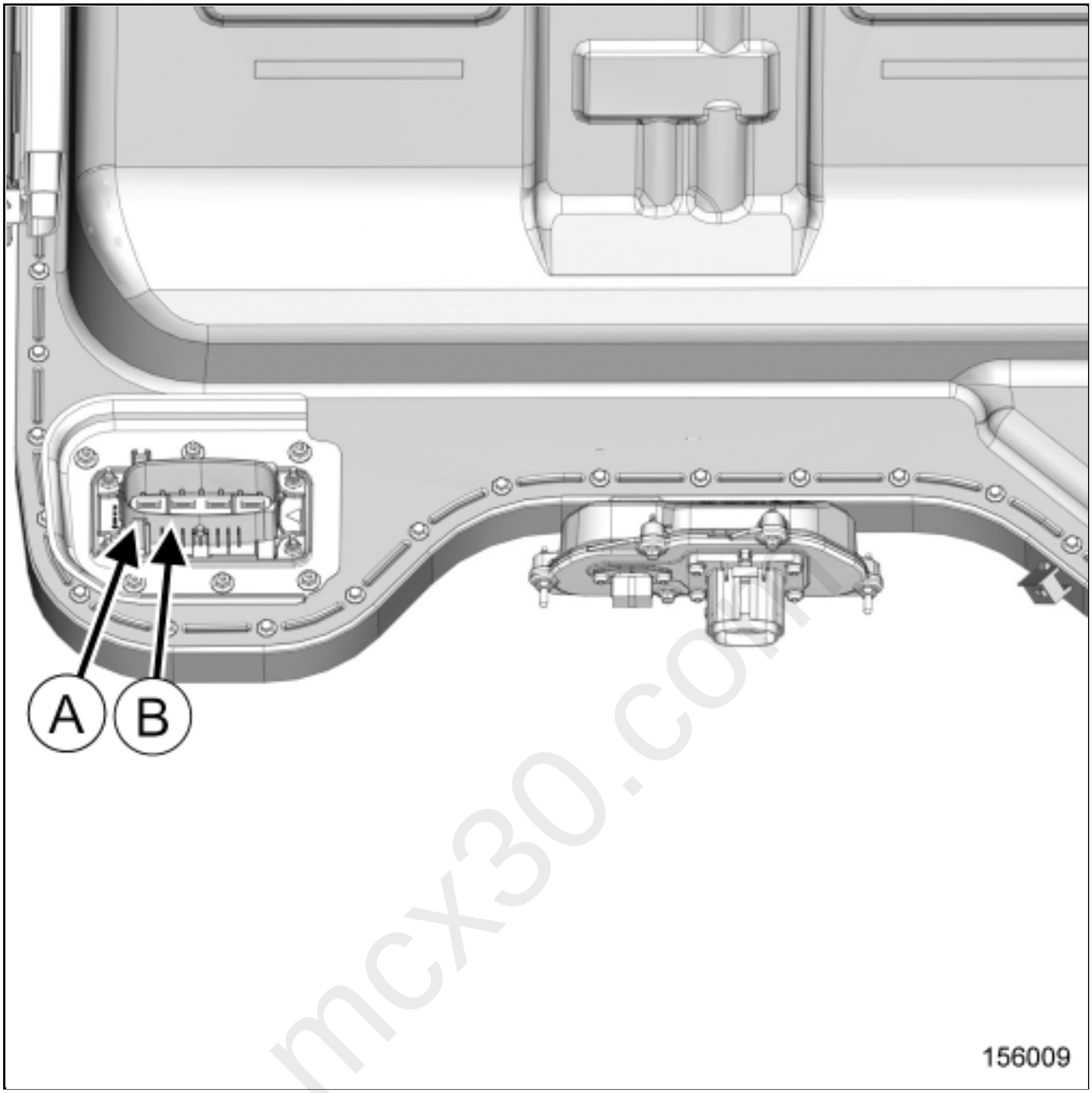
The following electrical measurements are done to verify the conformity of the traction battery after the transport logistics.

- Remove:
  - the protective cover from the safety device switch socket,
  - the protective cover from the high voltage connector.

- Check the working order of the toolVoltage detector(**Ele. 1993**) before measuring.

WARNING

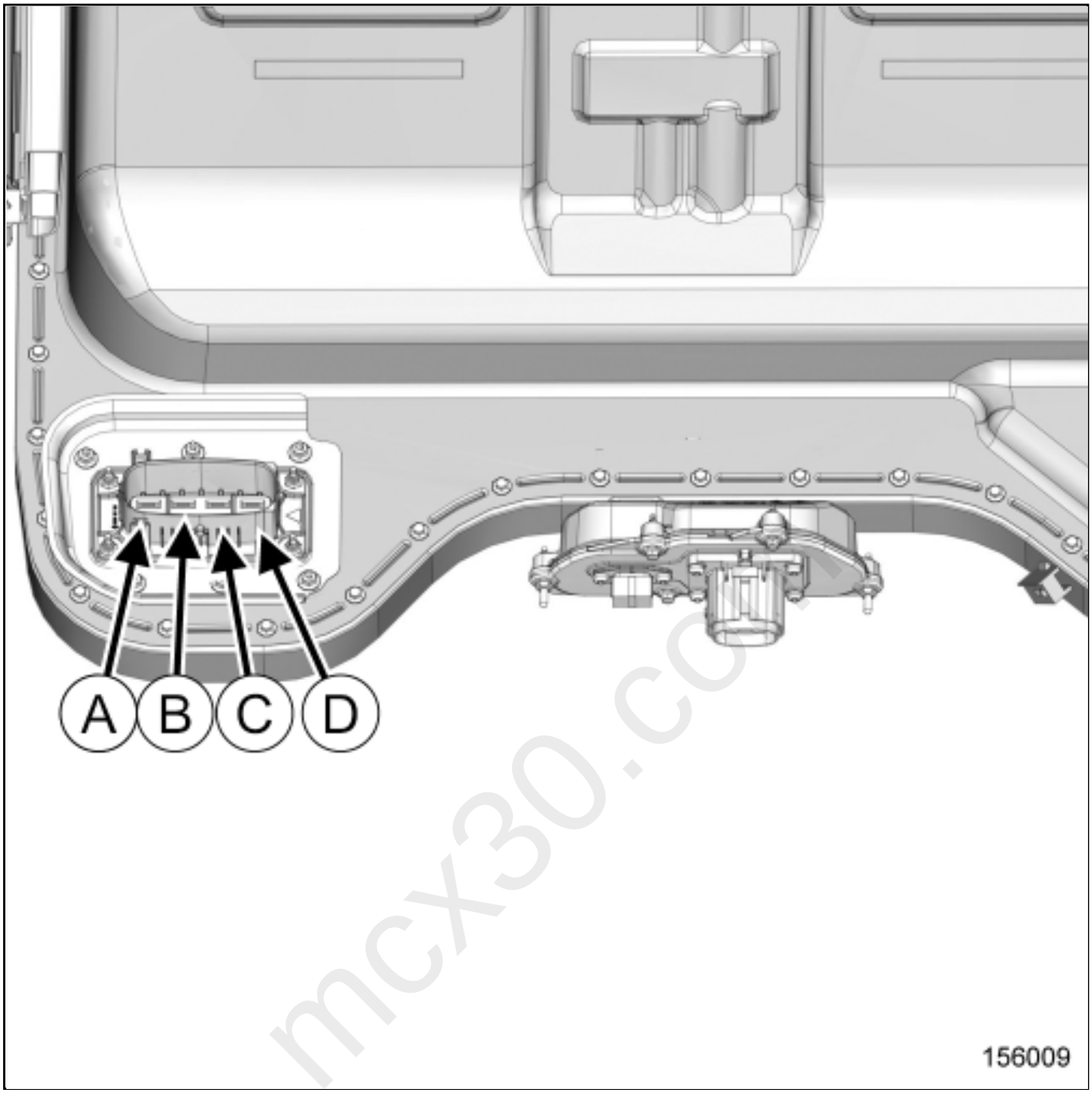
Never use a voltage detector if its self-test is incorrect as it could provide erroneous data that could place you in danger.



❑ Check the presence of voltage using a voltage detectorVoltage detector(Ele. 1993) between the terminals 1 (A) and 2 (B) of the traction battery safety device switch socket (1 measurement).

Note:

Measure between the terminals 1(A) and 2 (B) , the voltage could reach 408V.

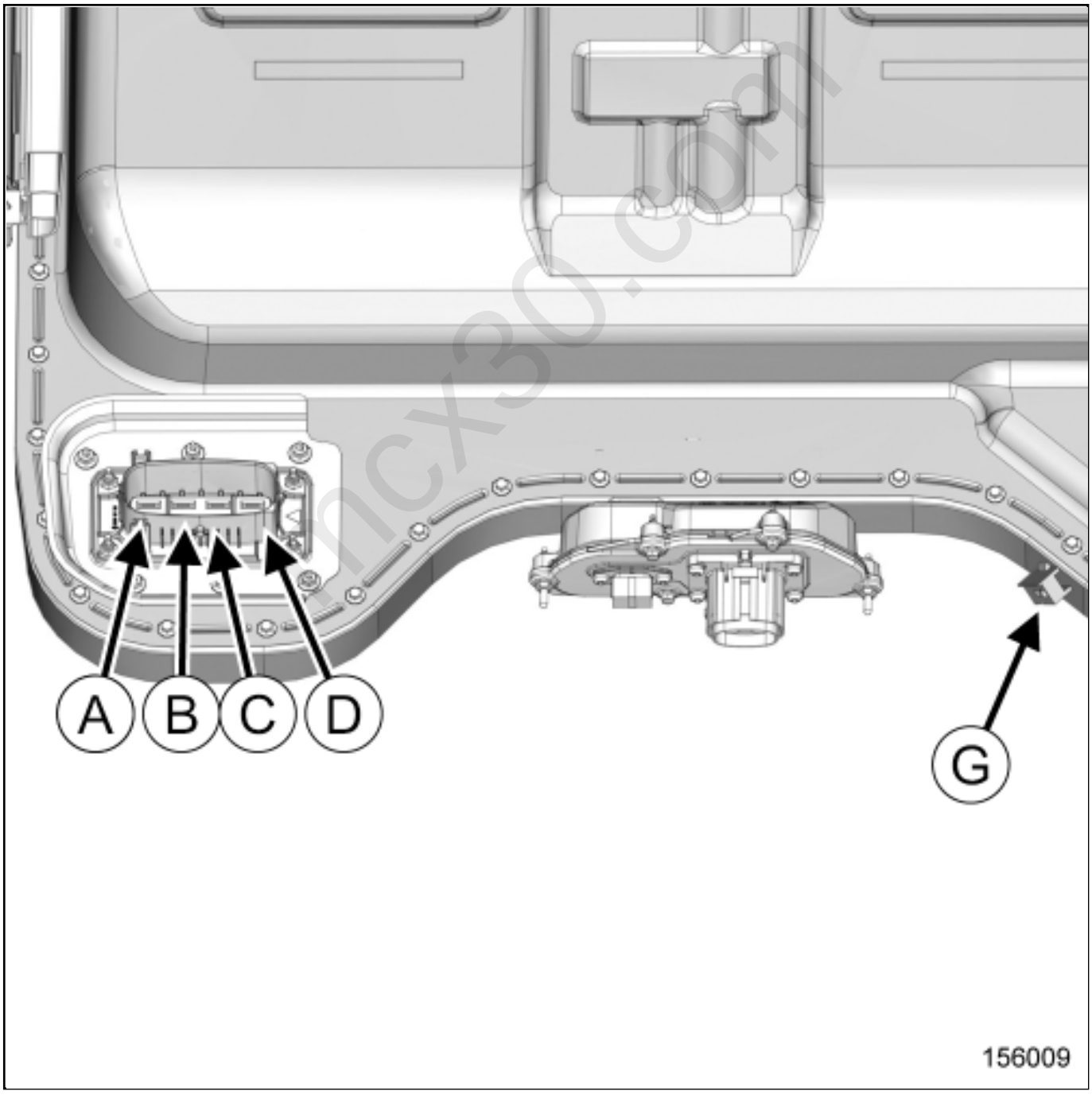


❏ Check that there is no voltage using a voltage detectorVoltage detector(Ele. 1993) between the 4 terminals of the traction battery safety device switch socket (5 measurements).

Note:

- Measure between the terminals:
  - 1 (A) and 3 (C) ,
  - 1 (A) and 4 (D) ,
  - 2 (B) and 3 (C) ,
  - 2 (B) and 4 (D) .
  - 3 (C) and 4 (D) .

These 5 measurements must provide zero-voltage values or capacitive values (non-permanent voltage).



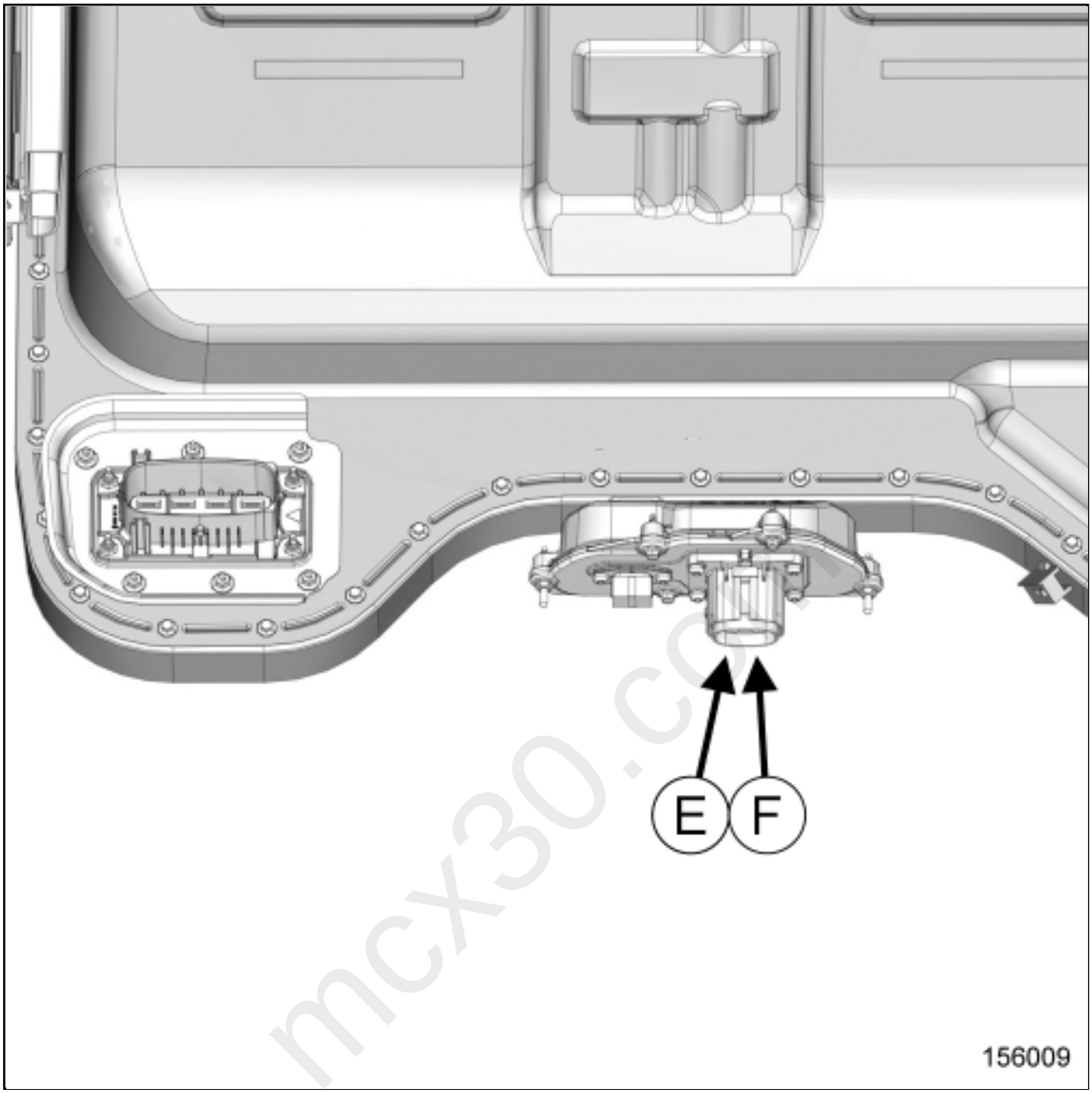
Check that there is no voltage using a voltage detectorVoltage detector(Ele. 1993) between the 4 terminals of the traction battery safety device switch socket and the traction battery lower cover earth (4 measurements).

Note:

Measure between the terminals:

- 1 (A) and 7 (G) ,
- 2 (B) and 7 (G) ,
- 3 (C) and 7 (G) ,
- 4 (D) and 7 (G) .

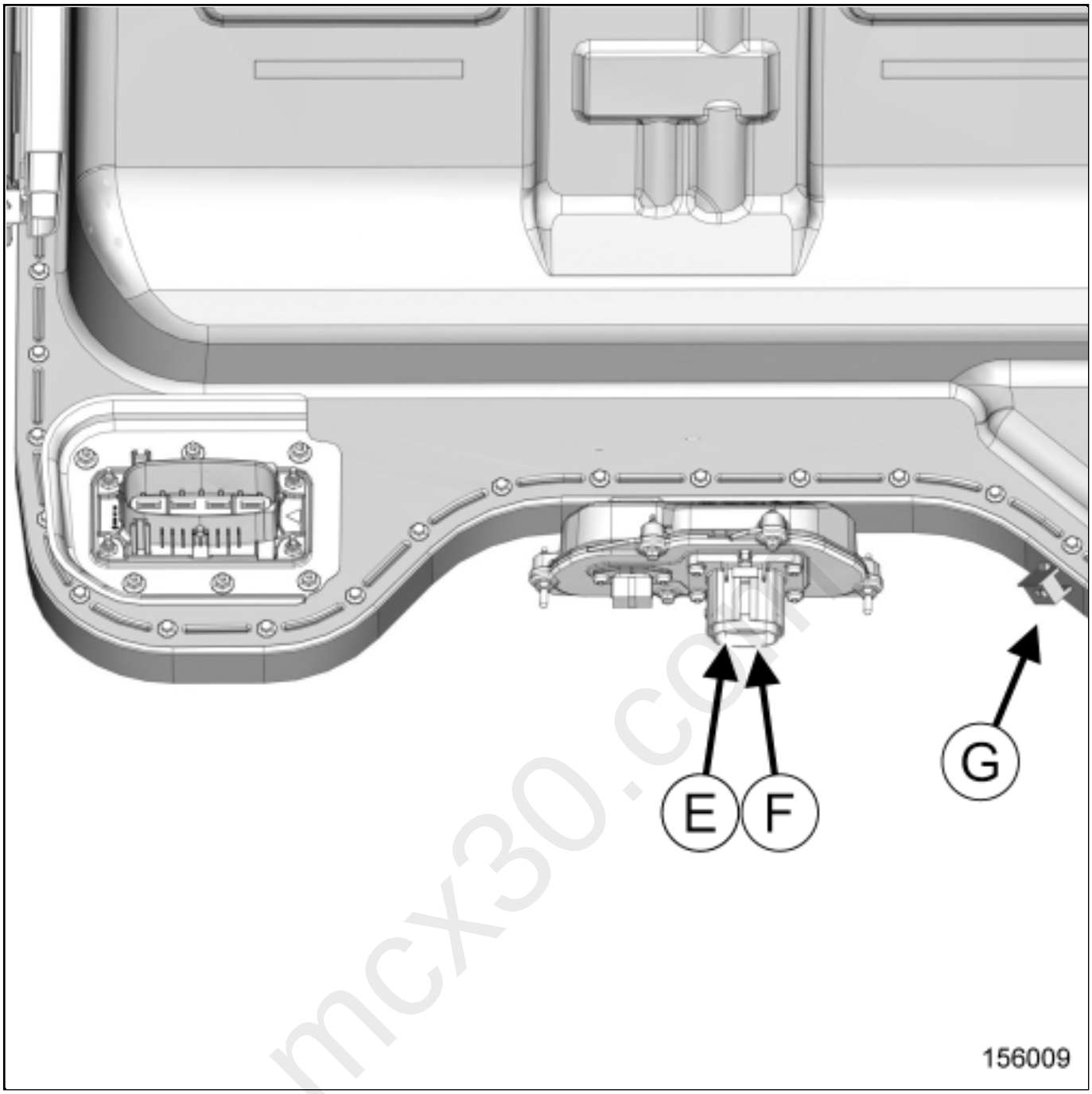
These 4 measurements must provide zero-voltage values or capacitive values (non-permanent voltage).



Check that there is no voltage using a voltage detectorVoltage detector(Ele. 1993) between the 2 terminals of the traction battery high voltage connector (1 measurement).

Note:

Measure between the terminals 5(E) and 6 (F) . This measure must provide zero-voltage value or capacitive value (non-permanent voltage).

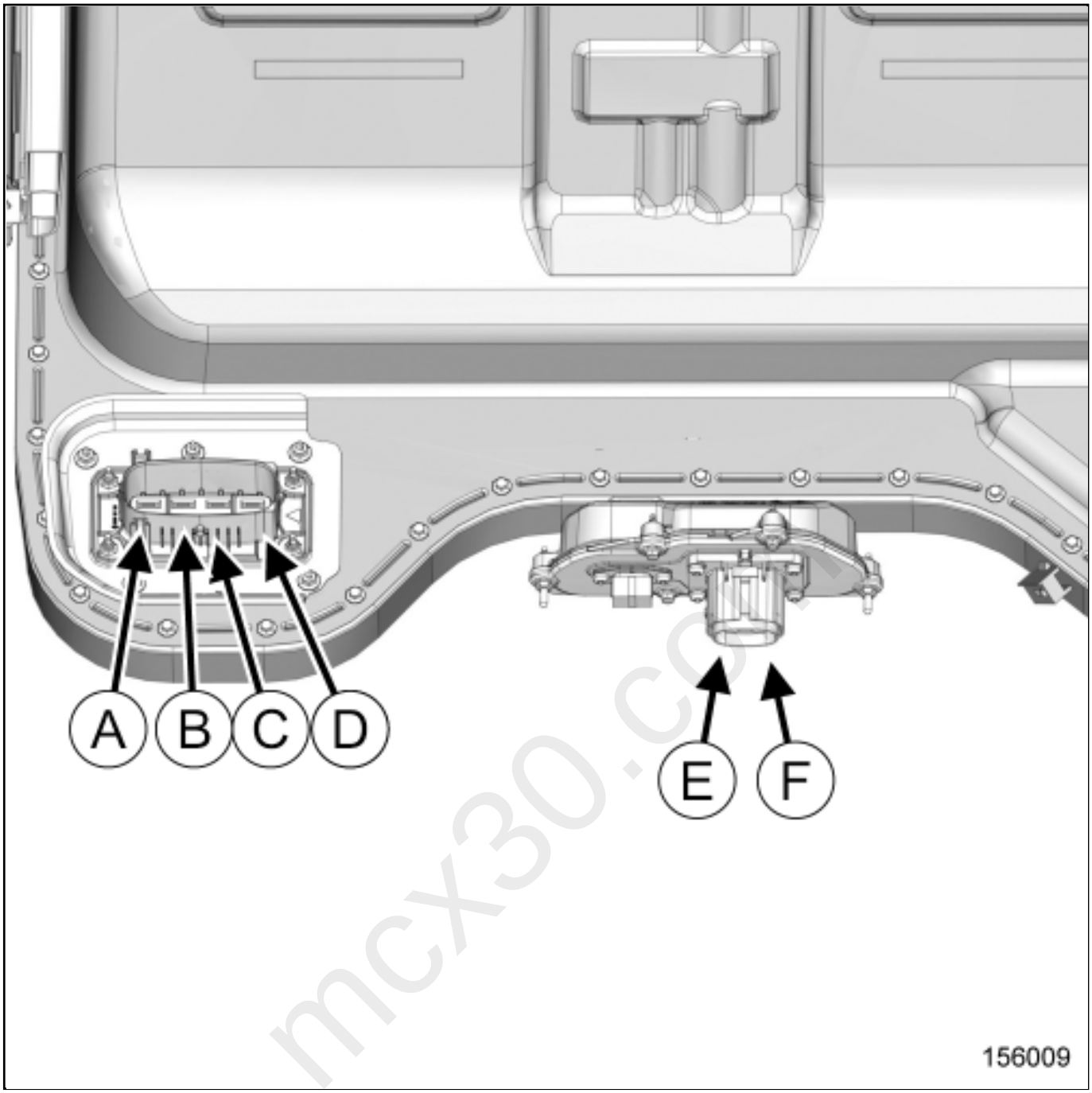


Check that there is no voltage using a voltage detectorVoltage detector(Ele. 1993) between the 2 terminals of the traction battery high voltage connector and the traction battery lower cover earth (2 measurements).

Note:

- Measure between the terminals:
  - 5 (**E**) and 7 (**G**) ,
  - 6 (**F**) and 7 (**G**) .

These 2 measurements must provide zero-voltage value or capacitive value (non-permanent voltage).



Check that there is no voltage using a voltage detectorVoltage detector(Ele. 1993) between the 4 terminals of the traction battery safety device switch socket and the 2 terminals of the traction battery high voltage connectors (8 measurements).

Note:

- Measure between the terminals:
  - 1 (A) and 5 (E) ,
  - 2 (B) and 5 (E) ,
  - 3 (C) and 5 (E) ,
  - 4 (D) and 5 (E) ,
  - 1 (A) and 6 (F) ,
  - 2 (B) and 6 (F) ,
  - 3 (C) and 6 (F) ,
  - 4 (D) and 6 (F) .

This 8 measurements must provide zero-voltage value or capacitive value (non-permanent voltage).

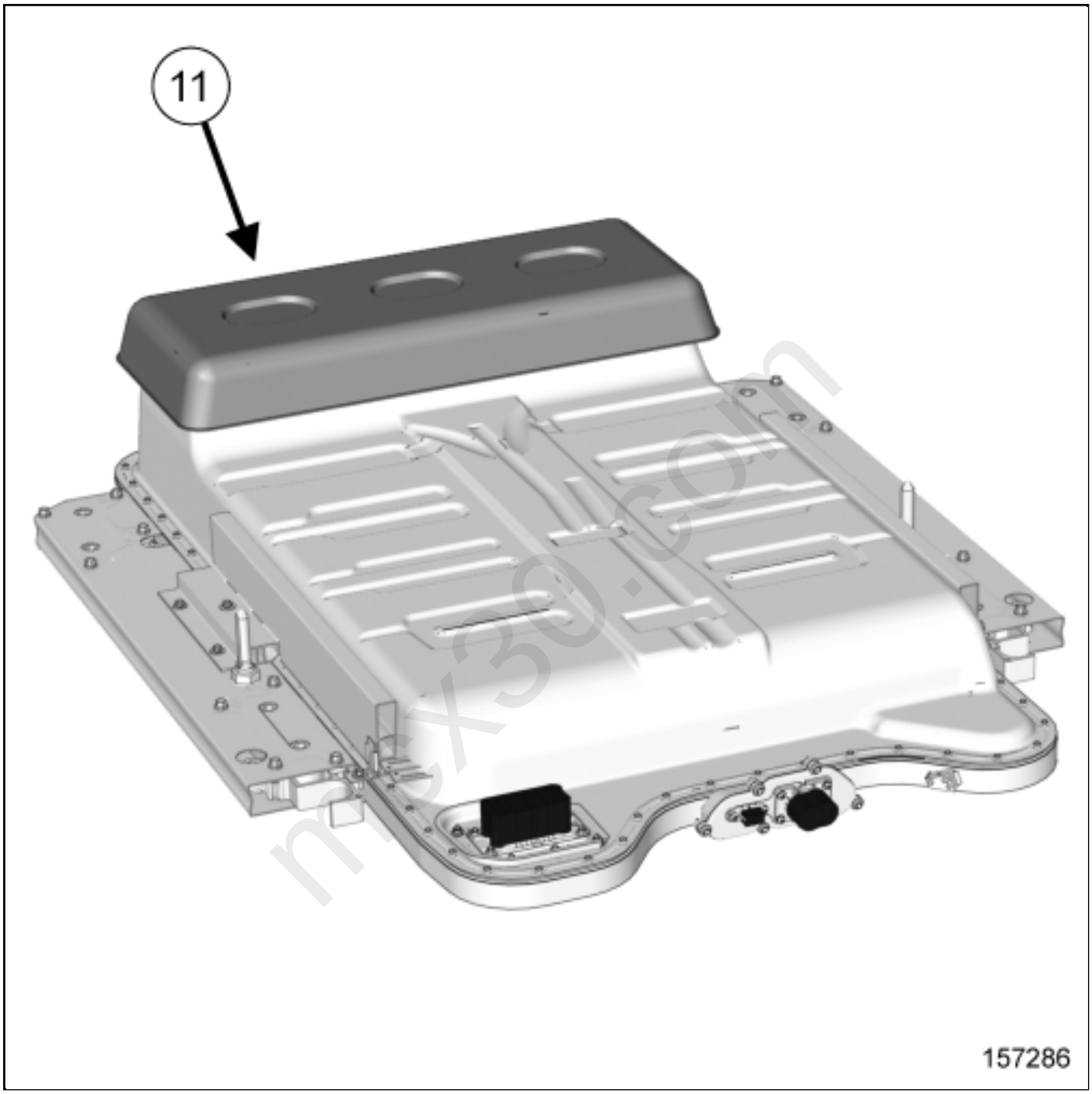
WARNING

An electrical hazard occurs if the voltage is not 0V. Carry out a troubleshooting procedure and only proceed to the next step once the problem has been rectified.

Check that the voltage detectorVoltage detector(Ele. 1993) is working correctly after measurement.

Refit:

- the protective cover on the safety device switch socket,
- the protective cover on the hight voltage connector.



Remove the protective cover of the inlet air(11) .

Fit the protective cover of the inlet air in the packing.

Fit a Insulating blanket (Ms. 1978) on the traction battery.

4. TRACTION BATTERY PACKING

Prepare the toolTraction battery lifting kit(Ms. 1975) .

Position the tool Mobile crane (Ms. 1977) .

Remove the traction battery packaging cover.

> Note:
>
> This operation requires two people.

Fill in the traction battery check-listTraction battery check-list : Description .

Wear personal protective equipment:

- Protective overalls (Mainly coton),
- Electrical class 00 or 0 safety footwear,
- Face shield,
- Class 00 or 0 electrical insulating gloves.

> Note:
>
> Check the gloves tightness.

Remove the Insulating blanket (Ms. 1978) from the traction battery.

Put the protective cover on the inlet air.

Put the toolTraction battery lifting kit(Ms. 1975) on the traction battery.

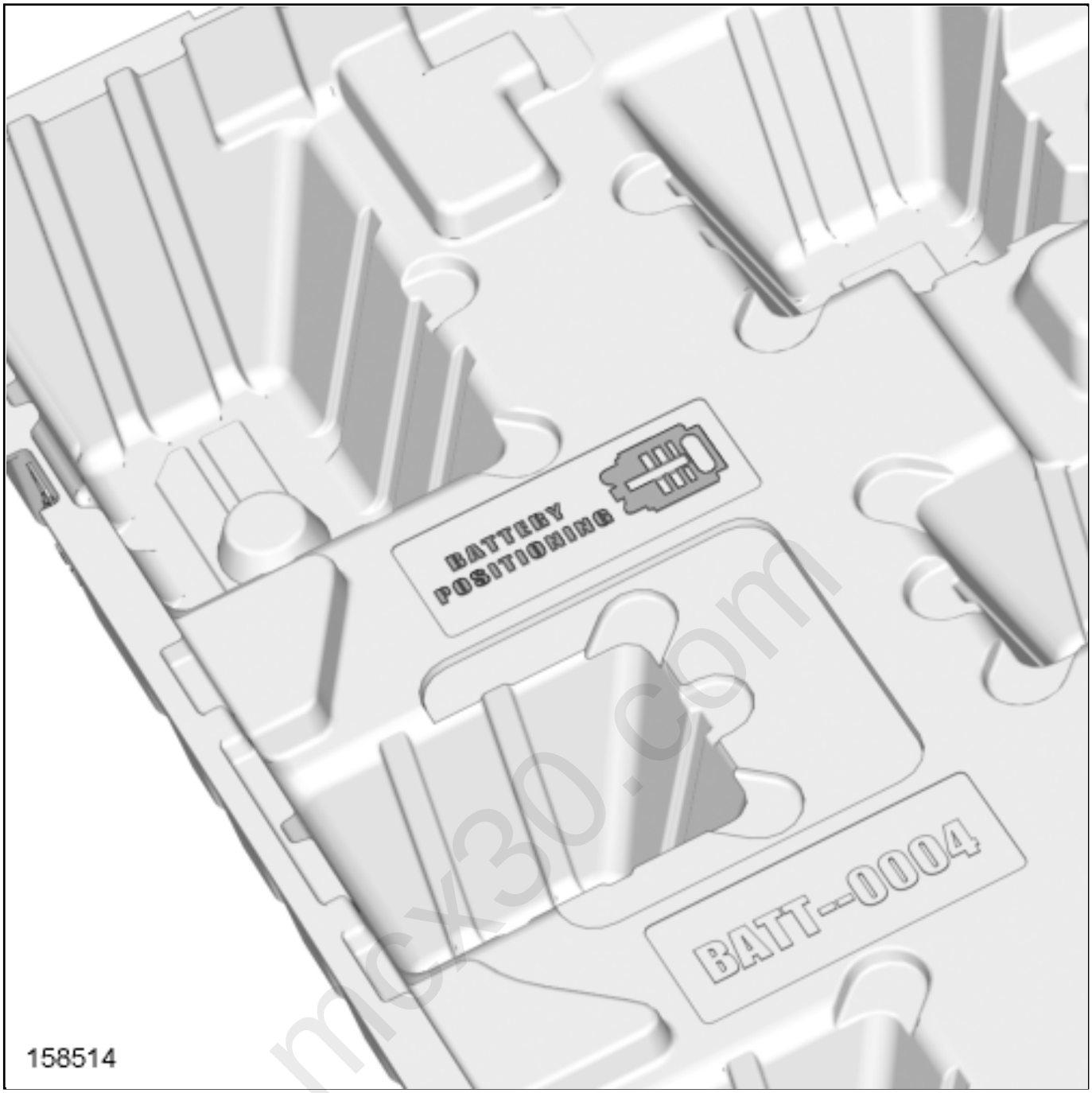
Lift the traction battery over the lower part of the packaging.

Remove:

- the toolSafety lockout plug padlock of the traction battery(Ele. 1980) ,
- the toolSafety lockout plug of the traction battery(Ele. 2005) .

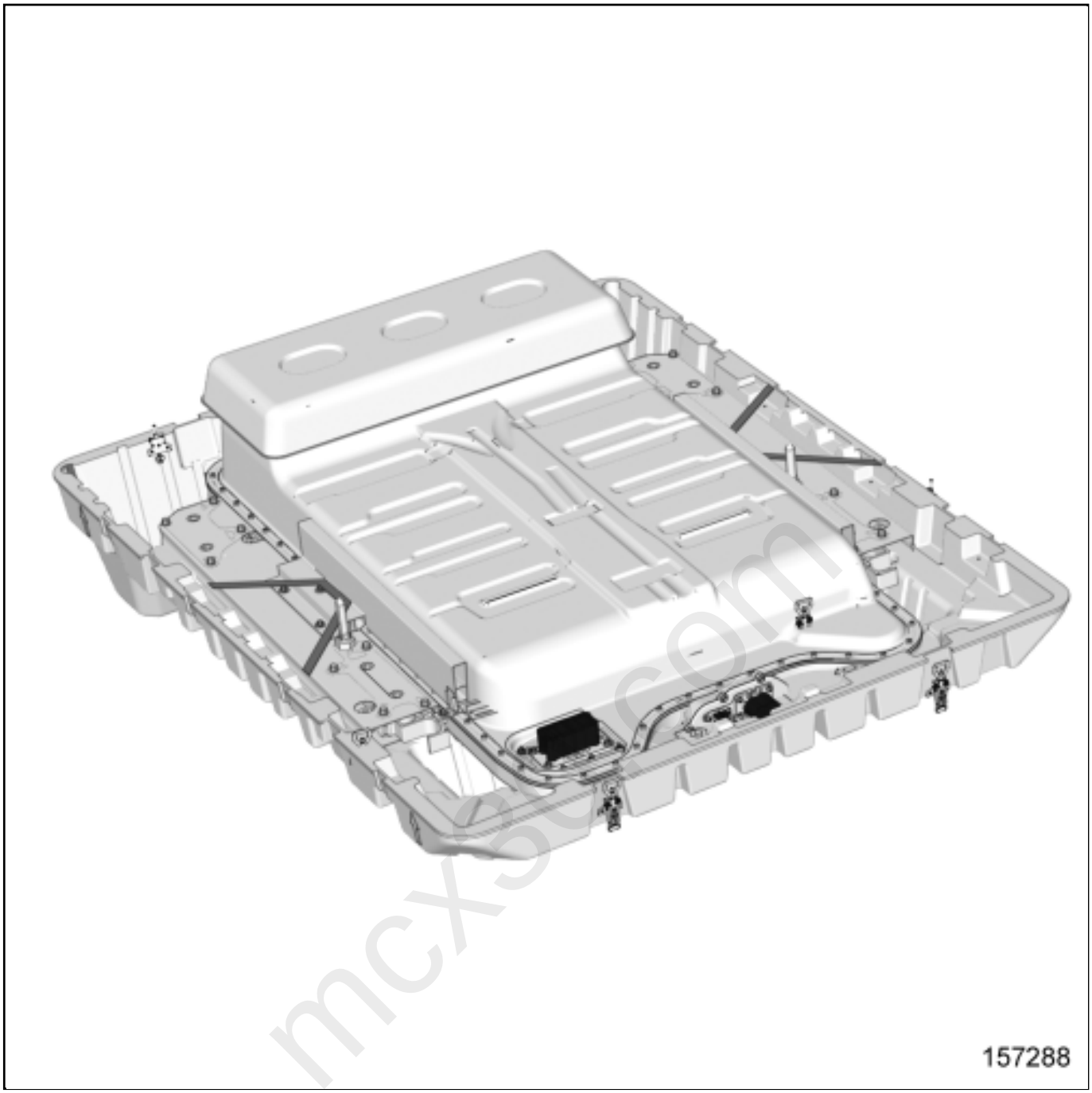
Put the protective covers on the traction batteryVehicle: Parts and consumables for the repair .

Fit the traction battery into the traction battery packaging.



Note:

Pay attention to the position of the traction battery.



- Strap the traction battery.
- Insert in the packaging the traction battery check-list[Traction battery check-list : Description] .
- Refit the traction battery packaging cover.

Note:

Pay attention to the position of the packaging cover.

5. TRACTION BATTERY STORAGE

Traction battery must be stored:

- on a wooden palett or in a traction battery packaging,
- in a clean area protected from sun and rain.

Check the presence of:

- the toolSafety lockout plug of the traction battery(**Ele. 2005**) ,
- the toolSafety lockout plug padlock of the traction battery(**Ele. 1980**) ,
- the protective covers on the traction battery**Vehicle: Parts and consumables for the repair** .

Put:

- a Insulating blanket (**Ms. 1978**) on the traction battery,
- a placard on theInsulating blanket (**Ms. 1978**) **Warning placard for electric vehicle : Description** .