

TRAILER REMOTE CONTROL 446 122 080 0

INSTALLATION AND CONNECTION INSTRUCTION



WABCO

Trailer Remote Control

446 122 080 0

Installation and connection instructions

Edition 1

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Purpose of publication

This publication applies to employees of a workshop for repairing utility vehicles with a knowledge of vehicle electronics. It details the installation and commissioning of the Trailer Remote Control 446 122 080 0 in the towing vehicle.

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1 Symbols used

CAUTION

Potential hazard situations that can cause minor or moderate personal injury if the safety instruction is not observed.



Important instructions, information, or tips that you should always observe.



Reference to information on the Internet

- List
- Step
- Consequence of an action

2 Safety information

Compliance of regulations / instructions

Read this publication thoroughly. Adhere to all instructions, information and safety information to prevent injury to persons and damage to property. WABCO will only guarantee the security, reliability and performance of their products and systems if all information in this publication is adhered to.

Make sure to follow the specifications and instructions of the vehicle manufacturer.

Maintain all accident regulations of the business as well as regional and national regulations.

Provisions for a safe work environment

Only trained and qualified technicians are to perform any work on the vehicle.

Use protective outfit if required (protective goggles, respiratory protection, ear defenders, etc.).

Pedal actuations can lead to severe injuries if persons are in the vicinity of the vehicle. Make sure that pedals cannot be actuated as follows:

- Switch the transmission to "neutral" and actuate the park brake.
- Secure the vehicle against rolling with chocks.
- Fasten a visible note to the steering wheel indicating the work is being performed on the vehicle and that the pedals are not to be actuated.

Do not wear a tie, loose clothing, open hair, arm bands, etc. when working on the vehicle, especially with the engine running. Keep your hands and hair away from the moving parts.

Your workspace must be dry as well as sufficiently illuminated and ventilated.

Keep flammable material (cloths, paper, etc.) away from the exhaust system.

Do not smoke in the workplace.

Use only devices that have proper electrical equipment.

3 Introduction

These instructions describe the connection and commissioning of the Trailer Remote Control 446 122 080 0 in the towing vehicle.

Trailer Remote Control makes it possible for the driver to control trailer functions from the driver's cab.

Trailer Remote Control is functional on a connected trailer with installed Trailer EBS E Premium Modulator as of version 2.0 and the Electronic Extension Module. The ignition must be switched on.



Trailer CAN-Router/Repeater requires communication on terminal 15 (Pin 2).

Recommended public

More information on TEBS E, Electronic Extension Module and Trailer Remote Control can be found in the following publications:

Publications	Brochure Number XX = Language Code*
Trailer Remote Control - Operating Manual	815 990 193 3
TEBS E system description	815 XX0 093 3

***Language Code:** 01 = English, 02 = German, 03 = French, 04 = Spanish, 05 = Italian, 06 = Dutch, 07 = Swedish, 08 = Russian, 09 = Polish, 10 = Croatian, 11 = Romanian, 12 = Hungarian, 14 = Turkish, 15 = Czech, 16 = Chinese, 17 = Korean, 18 = Japanese, 21 = Arabic, 24 = Danish, 28 = Finnish, 34 = Portuguese (Brazil), 98 = multilingual, 99 = nonverbal

4 Function

Trailer Remote Control is a display and control device for TEBS E functions and a distance display for TailGUARD functions in the trailer (more precise descriptions for the functions can be found in the TEBS E System Description).

Using a Trailer Remote Control is possible in any towing vehicle. The function only exists in combination with the Electronic Extension Module and a TEBS E2 Premium Modulator.

Trailer Remote Control enables the operation of trailer functions from the towing vehicle. The Trailer Remote Control communicates with the Electronic Extension Module on the trailer via Power Line Communication (PLC). PLC is the generic term for the transfer of data via cables that are primarily used for the supply of power.

PLC enables the sending of information over long distances without the use of extra cables and plug-in connections. A direction for the transmitted signals cannot be predetermined. This means that the signal is distributed to all connected components in a vehicle, i.e. to every part of the power circuit that can be used to receive your communication. The signal is attenuated by other components in the circuit and it is sufficient for just a single component, because of its electrical characteristic, to affect the signal.

As a result, the signal can not be evaluated and the communication is interrupted.

If the dampening caused by components in the towing vehicle is too great, a decoupling between the Trailer Remote Control and the interrupting components can ensure sufficient signal quality in the direction of the trailer.

Electronic Extension Module supports the communication via terminal 15 and terminal 30 of the 7-pin ISO 7638 trailer socket and automatically select the better of the two for communicating with Trailer Remote Control.

5 Assembly

CAUTION**Traffic safety, functionality of the safety equipment**

- Install the Trailer Remote Control so that the driver's view is not obstructed and access to all important controls is not hindered.
- Make sure that the airbag functionality is not decreased in any way and that there is no danger in triggering the airbag from the Trailer Remote Control while performing the installation.
- While installing, make sure that no important parts in the towing vehicle are damaged by the screws.

- Plan an install location for the Trailer Remote Control.
- Check whether the fuse panel can be reached with the 4 m cable provided when routed sensibly. Measure the distance from the planned installation location for the Trailer Remote Control (A-pillar or instrument panel) to the fuse panel.
- Install the Trailer Remote Control within the driver's view.
A holder and four screws are provided with the delivery. As an alternative, other standard holders can also be used (e.g. suction cup mounts as used with standard navigation devices).
- Run the cable to the base of the windshield and then under the rubber seal to the fuse panel for example.
More precise information on connection to the power supply see chapter 6 "Connection to the power supply", page 11.

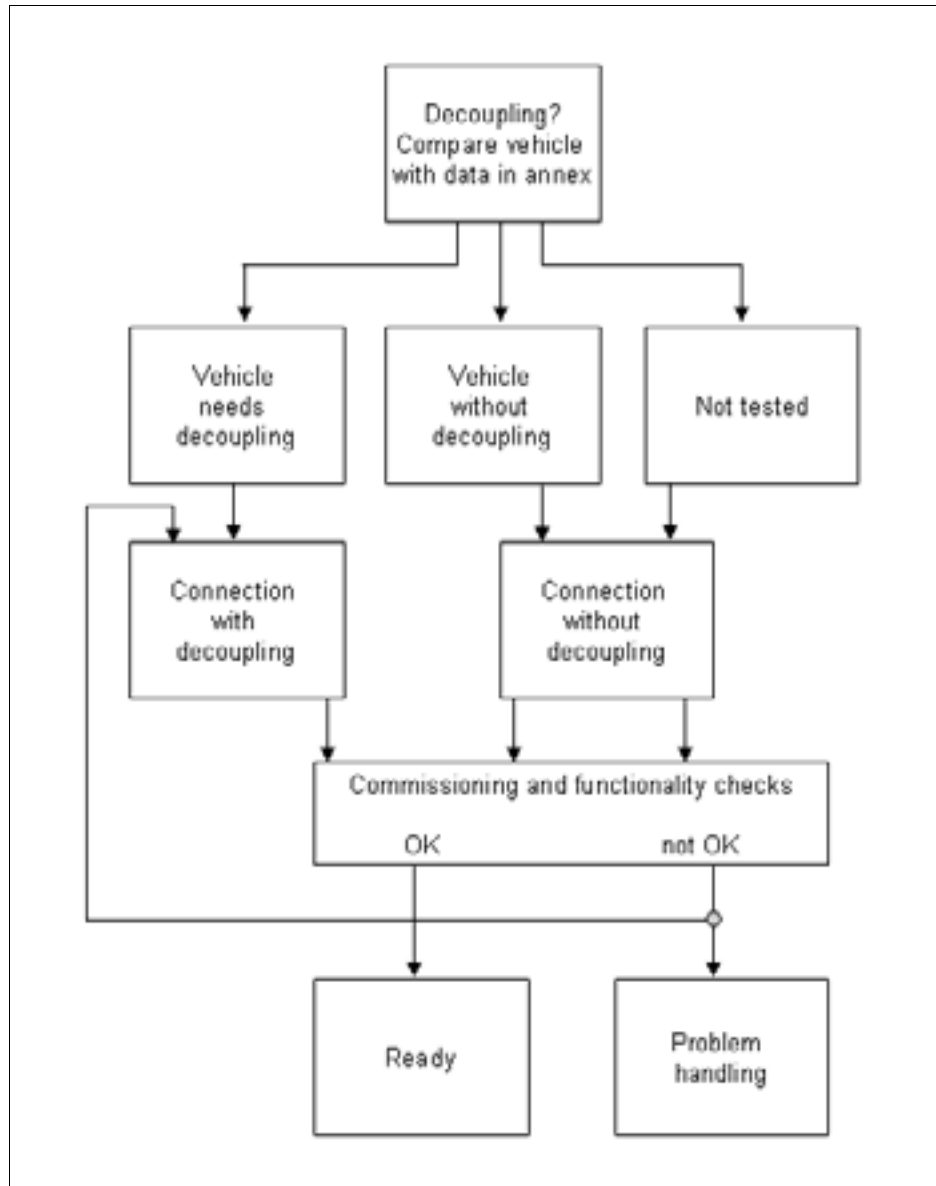
6 Connection to the power supply

WABCO tested the connection of Trailer Remote Control in many different towing vehicle models (see appendix). Whether or not a decoupling coil should be used for the respective model is shown there.

If your towing vehicle is not listed in the appendix, install a Trailer Remote Control first without a decoupling coil.

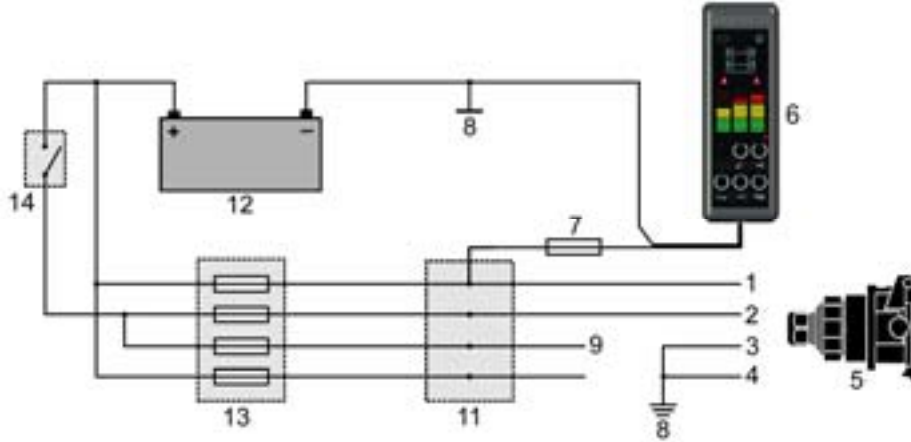
The functionality check will show whether a decoupling coil must be installed. An exact description of the process can be found in the following diagram.

Process diagram for determining the decoupling

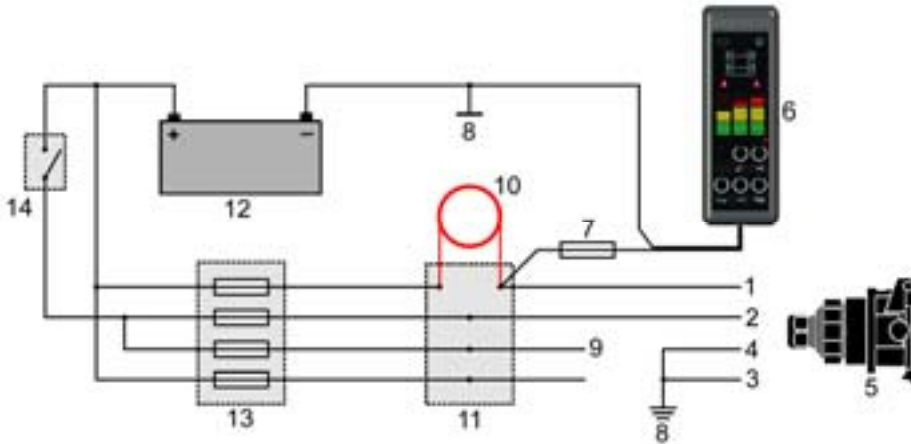


Procedure

Connection without decoupling



Connection with decoupling



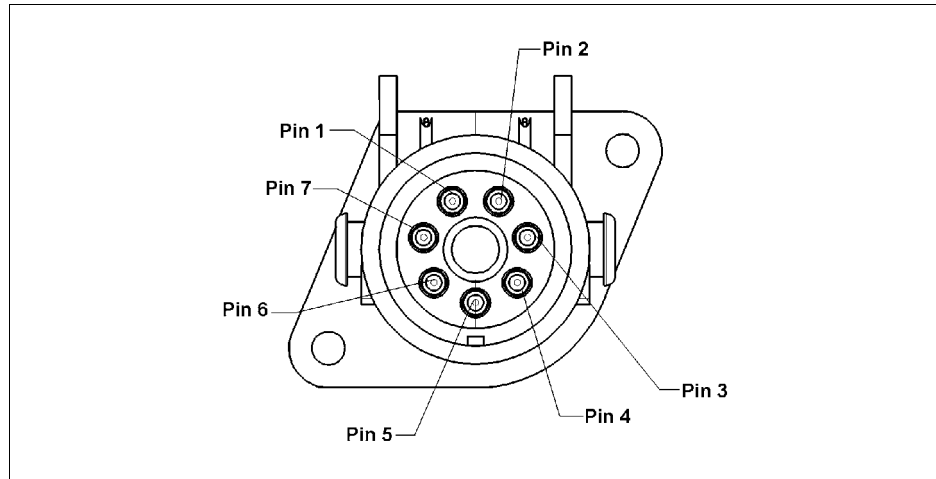
Legend

1	ISO 7638 – Pin 1 Terminal 30	2	ISO 7638 – Pin 2 Terminal 15
3	ISO 7638 – Pin 3 Ground ECU	4	ISO 7638 – Pin 4 Ground Valve
5	ISO 7638 trailer socket	6	Trailer Remote Control
7	5 A fuse	8	Ground/Chassis
9	Supply lines terminal 15 and terminal 30 from other electronics that can weaken the PLC signal.	10	Decoupling coil
11	Power transfer point under the engine cowl	12	Battery of the towing vehicle
13	Fuse box in driver's cab	14	Ignition switch

1. Preparations

- Get the circuit diagrams for the towing vehicle.
- Check for whether a decoupling coil has to be installed (see vehicle list in the appendix).

2. Determine the line for terminal 30 of the ISO 7638 trailer socket



Pin	Colour	Assignments	Cable
1	red	Terminal 30	4 mm ²
2	Black	Terminal 15	1,5 mm ²
3	yellow	GND 15	1,5 mm ²
4	brown	GND 30	4 mm ²
5	white	Warning lamp	1,5 mm ²
6	white/green	CAN High	1 mm ²
7	white/brown	CAN Low	1 mm ²

- Open the engine cowl and remove the cover for the power transfer point.
- Look at the vehicle list in the appendix. The cabling for different models is similar with individual vehicle manufacturers, so that the respective cable of the ISO 7638 trailer socket often fit in the same socket. If your model is not listed but another model from the same manufacturer is listed, you can find the respective cable for you model using this model.
The cable for terminal 30 (continuous positive) normally has a greater cross-section than standard cable, which can limit the search further.
- Connect a temporary test light between vehicle ground and pin 1 of the ISO 7638 trailer socket.
- Monitor the test light.
- Disconnect the cable in question from the connector on the power transfer point or pull out the fuse of the respective cable.
If the light goes out, you have found the right line to connect to the Trailer Remote Control - possibly with attached decoupling coil.

Determine another suitable cable for connecting the Trailer Remote Control

! The trailer must be equipped with Electronic Extension Module and TEBS E as of version 2.0 and must be connected to the towing vehicle via the 7-pin ISO 7638 trailer socket. The ignition must be switched on so that the Trailer Remote Control can receive a PLC signal of the Electronic Extension Module."

- Connect the ground line (black) of the Trailer Remote Control cable to a good ground contact on the chassis.

- Connect the power line of the Trailer Remote Control (red) with various cables at the power transfer point and observe the Trailer Remote Control:
If the Trailer Remote Control performs an activation check (see chapter 9 "Operating states", page 18), power is being supplied. This is guaranteed with many cables; otherwise check the ground connection.
If the Trailer Remote Control switches to operating mode after the activation check (illumination of all or individual pushbuttons), this line is suitable for a permanent connection. The signal quality can be improved in cases by inserting a decoupling coil.

3. Shut down the power circuit

CAUTION



Danger of injury by electricity, heat

- To avoid shorts, pull out the fuse for the respective power circuit.
- Disconnect the battery if necessary. However, the downstream theft-protection systems may have to be reprogrammed.
- Make sure the lines do not carry power before working on them.

4. Connection to the power transfer point

- Run the cable for the Trailer Remote Control through a suitable opening to the power transfer point.
- Connect the ground line (black) of the Trailer Remote Control with a good ground point on the vehicle (e.g. bolt on the steel frame, ground cable in the fuse panel).



If a decoupling coil has to be used, continue with chapter "7. Installing a Decoupling Coil".

5. Connecting the Trailer Remote Control

- Protect the positive line of the Trailer Remote Control (red) with a 5A fuse. Use a free fuse block or an inline fuse holder.
- Connect the fused positive line with terminal 30 of the connecting line between the fuse panel and ISO 7638 trailer interface.
As an alternative, the connection behind the fuse (in the fuse panel in the driver's cab) can be made at the line of the fuse on terminal 30 of the trailer, but not on all vehicles - depends on the electronics installed in the vehicle.
After connecting the Trailer Remote Control to terminal 30, all LEDs of the Trailer Remote Control illuminate briefly and a short beep tone sounds (activation check of the Trailer Remote Control with power supply) see chapter 9 "Operating states", page 18.

6. Final checks

- Make sure that all cables are connected properly and are insulated properly.
- Check the Trailer Remote Control functionality see chapter 7 "Commissioning and functionality checks", page 16.
If the installation was successful, close up the power transfer point again.
If the installation was not successful, check more points see chapter 8 "Problem handling", page 17.

7. Installing a Decoupling Coil

If no communication is possible with the Electronic Extension Module in the coupled trailer, the attenuation of the PLC signal by the electronics installed in the towing vehicle is too great. The attenuation at the connection point of the Electronic Extension Module or the Trailer Remote Control must be reduced with inductance.

An additional line (decoupling coil) serves for inductance and is inserted between the line for terminal 30 of the trailer socket and the power supply line of the towing vehicle.

- Find the line for terminal 30 of the trailer power supply (pin 1 of ISO 7638 socket).
- Disconnect this line from the supply of the towing vehicle by pulling the pin of the cable out of the plug-in connector or by cutting the cable.
- Make the decoupling coil. Make sure that the cross-section of the decoupling line is at least as great as the cross-section of the cable that the decoupling coil will be used in.
- Insert the decoupling coil between the plug-in connector and the line of the trailer socket (length: 1,5 m - 4 m, cross-section: 2,5 mm²).

Mark the decoupling coil with the following text "Do not remove - Decoupling coil required for the WABCO Trailer Remote Control", so that other workshops will not mistake the cable as an extra extension cable and remove it.

- Connect the Trailer Remote Control to the cable end that comes from the trailer socket because it will worsen communication otherwise.
- Continue with chapter "5. Connecting the Trailer Remote Control".

7 Commissioning and functionality checks

- Connect a trailer (with Electronic Extension Module and TEBS E2 Premium Modulator) with to the towing vehicle.
- Switch on the ignition.
 - ➔ Activation check from Trailer Remote Control: All LEDs are illuminated for 1 second and a brief signal tone sounds (power is supplied).
If there is communication with Electronic Extension Module, the operating and display area is illuminated (operating mode). Check for whether you can operate the defined functions for the trailer with Trailer Remote Control.
Trailer Remote Control is connected correctly if operation is possible.
Trailer Remote Control waits for an Electronic Extension Module response for 1 minute. If the re-sponse is not received, the operating and display area is not illuminated and no operation is possible. Trailer Remote Control switches to sleep-mode. Perform more checks to rectify the problem see chapter 8 "Problem han-dling", page 17

8 Problem handling

The following points must be completed so the Electronic Extension Module and Trailer Remote Control can communicate:

- A trailer with Electronic Extension Module and TEBS E2 (or higher) is connected to the towing vehicle with Trailer Remote Control via the trailer connector ISO 7638.
- The ignition in the towing vehicle is switched on (used for switching on Electronic Extension Module).
- The communication to the Trailer Remote Control is activated in the TEBS E Diagnostics software (Page *Electronic Extension Module - Parameter => Communication to Trailer Remote Control active*).
- The power supply of TEBS and Electronic Extension Module is confirmed.
- The power supply of Trailer Remote Control is confirmed. Check for whether the activation check has been performed by Trailer Remote Control see chapter 9 "Operating states", page 18. If no activation check was performed, Trailer Remote Control is not supplied with power. Check the connection point and the ground connection of Trailer Remote Control for correct power.
- Check for whether a CAN router or CAN repeater is installed in the trailer. The PLC signal is weakened greatly by the CAN router or CAN repeater. Stable communication is normally no longer possible, but may be if Trailer Remote Control is connected directly to the trailer socket ISO 7638 of the towing vehicle and to terminal 15 (Pin 2 of ISO 7638) and not to terminal 30.

If these points are completed but there is still no communication between Trailer Remote Control and Electronic Extension Module, another connecting point (another line in the fuse box or at the power transfer point) must be selected for Trailer Remote Control with less damping on the PLC signal or the connection must be made with a decoupling coil see chapter 6 "Connection to the power supply", page 11. If communication is still not possible, connect the line to the Trailer Remote Control directly to the ISO 7638 trailer socket (Pin 1 and 4).

9 Operating states

The following is a description of the operating states of the Trailer Remote Control when connecting the towing vehicle.

Activation check

All Trailer Remote Control LEDs are illuminated for 1 second and a brief signal tone sounds.

Operating mode

The operating and display area of the Trailer Remote Control is illuminated. Trailer functions can be controlled via pushbuttons. If a TailGUARD function is activated (reverse gear engaged), the distance indicators are also illuminated (LED rows).

Waiting for communication

The middle yellow and the middle red LED rows flash briefly every 5 seconds for the duration of one minute.

Sleep mode

If no communication is established, Trailer Remote Control is inactive. In this case, all functions are switched off and the operating and display area of Trailer Remote Control is not illuminated.

Trailer Remote Control can be awoken from sleep-mode as follows:

- Press a button on the control.
- Remove the plug-in connector from the Trailer Remote Control and connected again.

After awaking from sleep-mode, Trailer Remote Control restarts and goes back into operating mode after the activation check.

Error mode

Active error (e.g. Error in TailGUARD system while the TailGUARD function is activated):

- Signal tone of 3 seconds
- Continuous illumination of the middle yellow and middle red LED rows.

Passive error (e.g. Error in TailGUARD system while the TailGUARD function is not activated)

- Illumination of the middle yellow and middle red LED rows once per second for the duration of one minute.

There is then no longer shown on the display (status the same as in operating mode).

10 Annex

10.1 Vehicle list

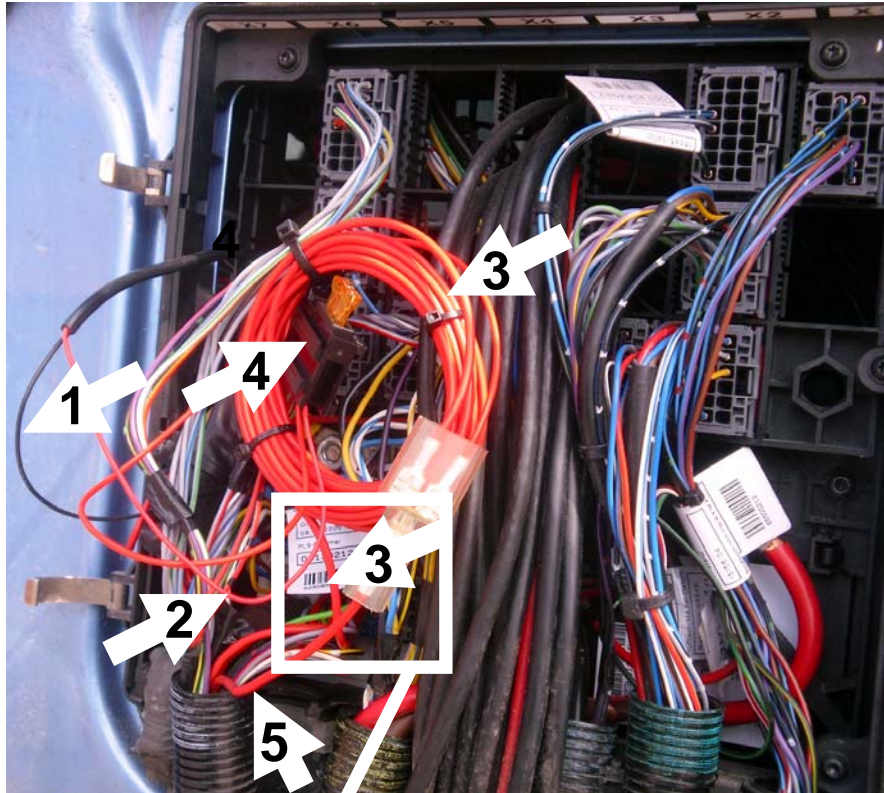
Cabling examples

see following pages

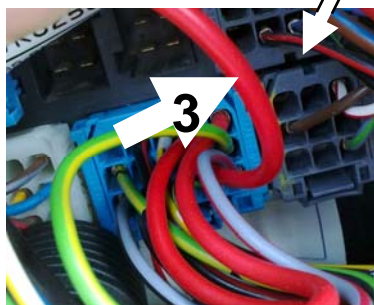
Vehicle	Decoupling coil
Daimler – Mercedes Actros 4148	4 m
Daimler – Mercedes Actros 1850	4 m
Daimler – Mercedes Atego 2528, V21	4 m
Daimler – Mercedes Actros 1841	2 m
Daimler – Mercedes Actros 1845 (MP4)	-
DAF XF 85.460	4 m
IVECO Stralis 420	2 m
MAN TGA 26.480	–
MAN TGX 26.400	–
Renault – RVI Premium	4 m

Daimler – Mercedes Actros 4148

Example of how to connect the Trailer Remote Control



- (1) Ground line (black) of the Trailer Remote Control (negative pole), connected with chassis
- (2) Terminal 30 (steady positive voltage-) line (red) to Trailer Remote Control (positive pin)
- (3) Decoupling coil
- (4) Fuse for Trailer Remote Control
- (5) ISO 7638 trailer terminal 30 – before installation of the decoupling coil, this cable is connected on pin 5 of plug A725 (small picture), where the decoupling coil (3) is connected now.



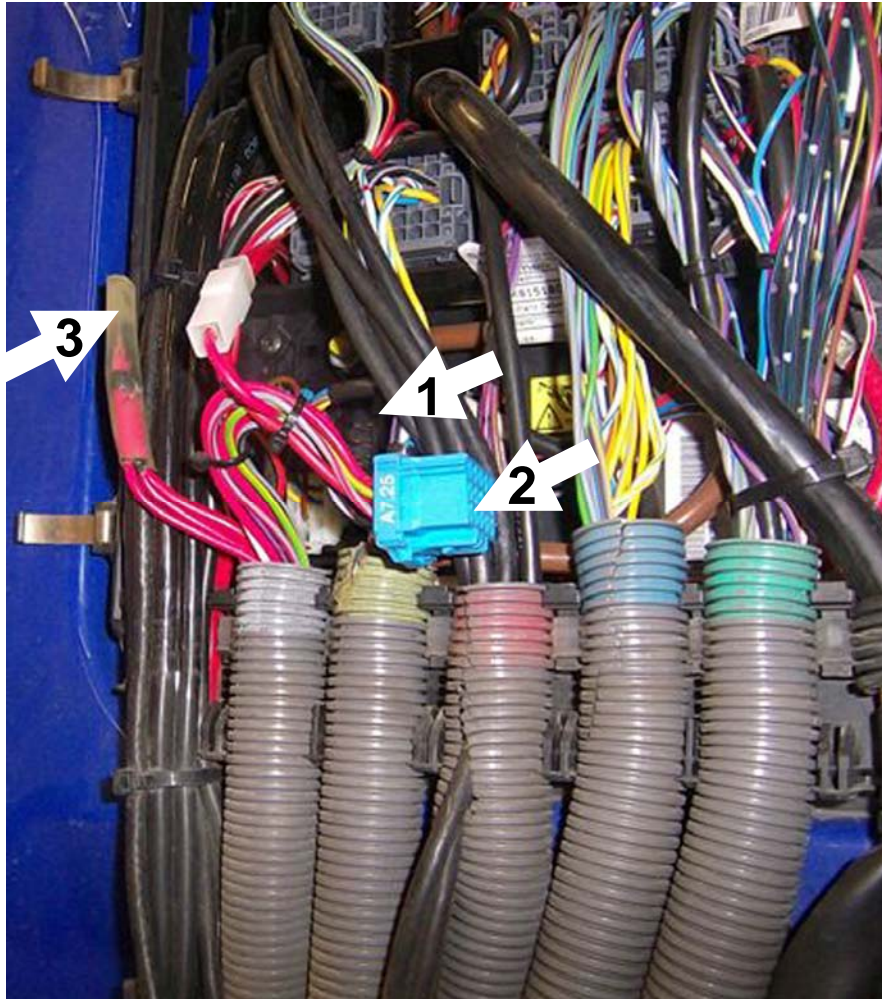
Power transfer point towing vehicle trailer: Passenger side under the engine cover

The red cable on pin 5 of plug A725 (6) must be pulled out of/disconnected from the plug and expanded with a 4 m damping cable.

The Trailer Remote Control is connected - secured with a 5A fuse - to the trailer-side cable end.

Daimler – Mercedes Actros 1850

Example of how to connect the Trailer Remote Control



- (1) Slot of plug A725
- (2) Plug A725
- (3) Combination of lines from pin 5 and pin 6

Power transfer point towing vehicle trailer: Passenger side under the engine cover

The plug A725 must be pulled out of its slot (1). The trailer terminal 30 cable is on plug A725 (2) on pin 5 and 6.

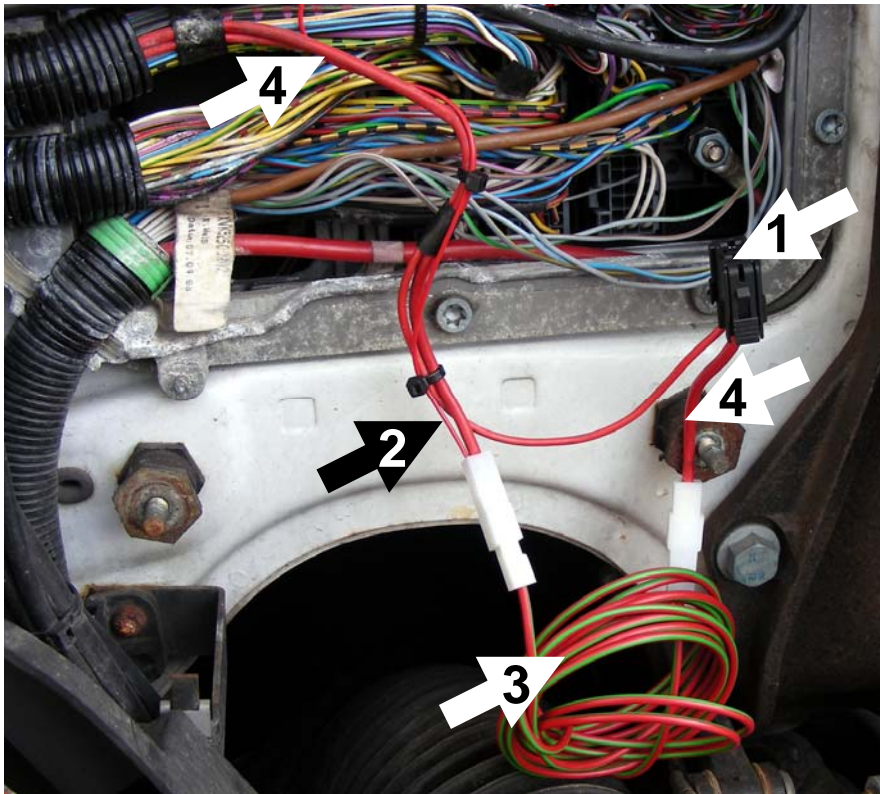
The lines from pin 5 and pin 6 are connected in this vehicle, just behind the connector (in the left-hand cable guide duct with the white marking) (3) and run together to pin 1 of the trailer socket ISO 7638.

The lines on pin 5 and pin 6 of plug A725 have to be pulled out/disconnected or the combined cable must be disconnected behind the joint of the two lines and then extended with a 4 m decoupling coil.

The Trailer Remote Control is connected - secured with a 5A fuse - to the trailer-side cable end.

Mercedes Atego 2528, V21

Example of how to connect the Trailer Remote Control



- (1) Fuse for terminal 30 (pin 1) on the towing vehicle trailer connection socket
- (2) Terminal 30 (steady positive voltage-) line to Trailer Remote Control (positive pin), shown without fuse
- (3) Decoupling coil
- (4) Terminal 30 line from the trailer socket ISO 7638

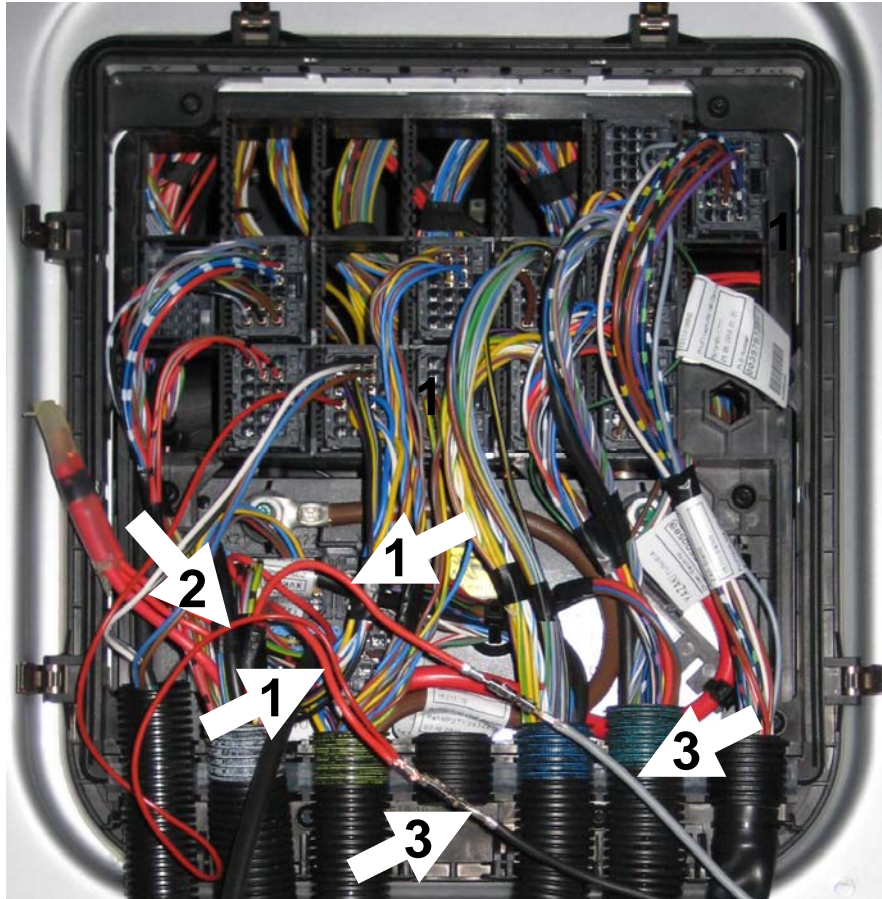
Power transfer point towing vehicle trailer: Passenger side under the engine cover

The red thick cable from fuse No. 12 on the towing vehicle must be disconnected and extended with a 4 m decoupling coil.

The Trailer Remote Control is connected - secured with a 5A fuse (Trailer Remote Control fuse not shown here) - to the trailer-side cable end.

Daimler – Mercedes Actros 1841

Example of how to connect the Trailer Remote Control



- (1) Line from the trailer socket ISO 7638 to the towing vehicle (plug-in connector X25)
- (2) Terminal 30 (steady positive voltage-) line to Trailer Remote Control (positive pin), shown without fuse
- (3) Decoupling coil (additional piece of cable that is put between the open ends of the trailer socket line (1) to decouple faults from the towing vehicle.)

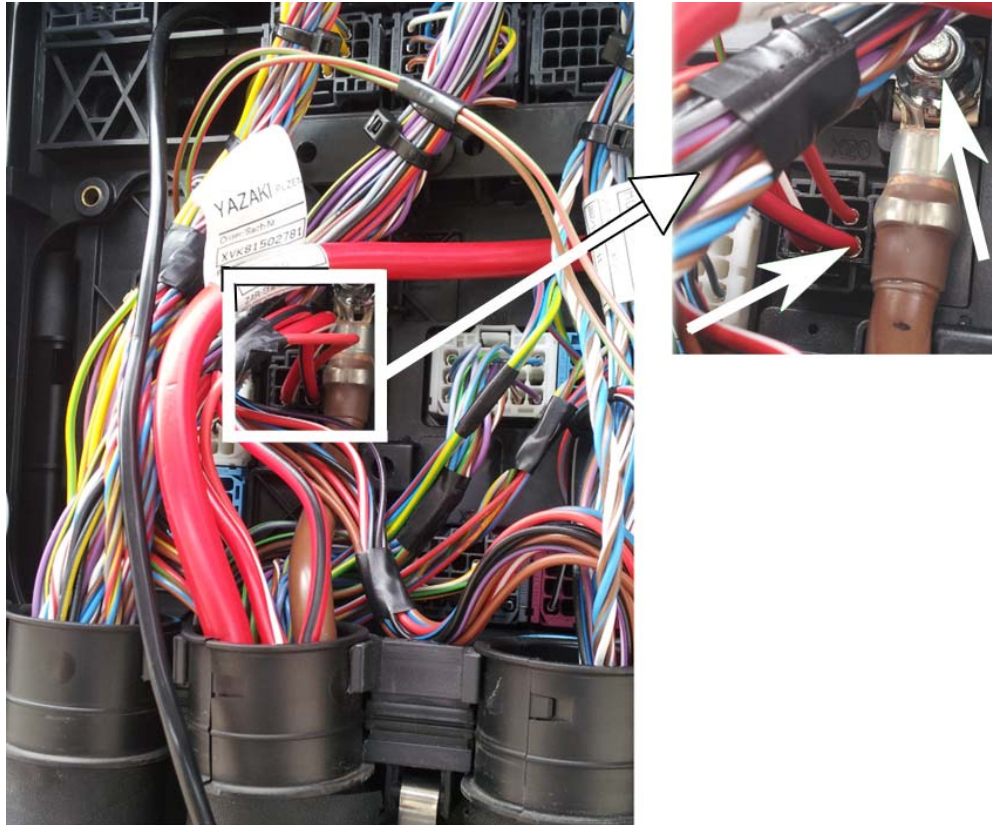
Power transfer point towing vehicle trailer: Passenger side under the engine cover

The red cable (1) from the trailer socket on plug-in connector X25 of the towing vehicle must be disconnected and extended with a 2 m decoupling coil (3).

The Trailer Remote Control is connected - secured with a 5A fuse (Trailer Remote Control fuse not shown here) - to the trailer-side cable end.

Mercedes Actros 1845 (MP4)

Cabling example for connecting the Trailer Remote Control



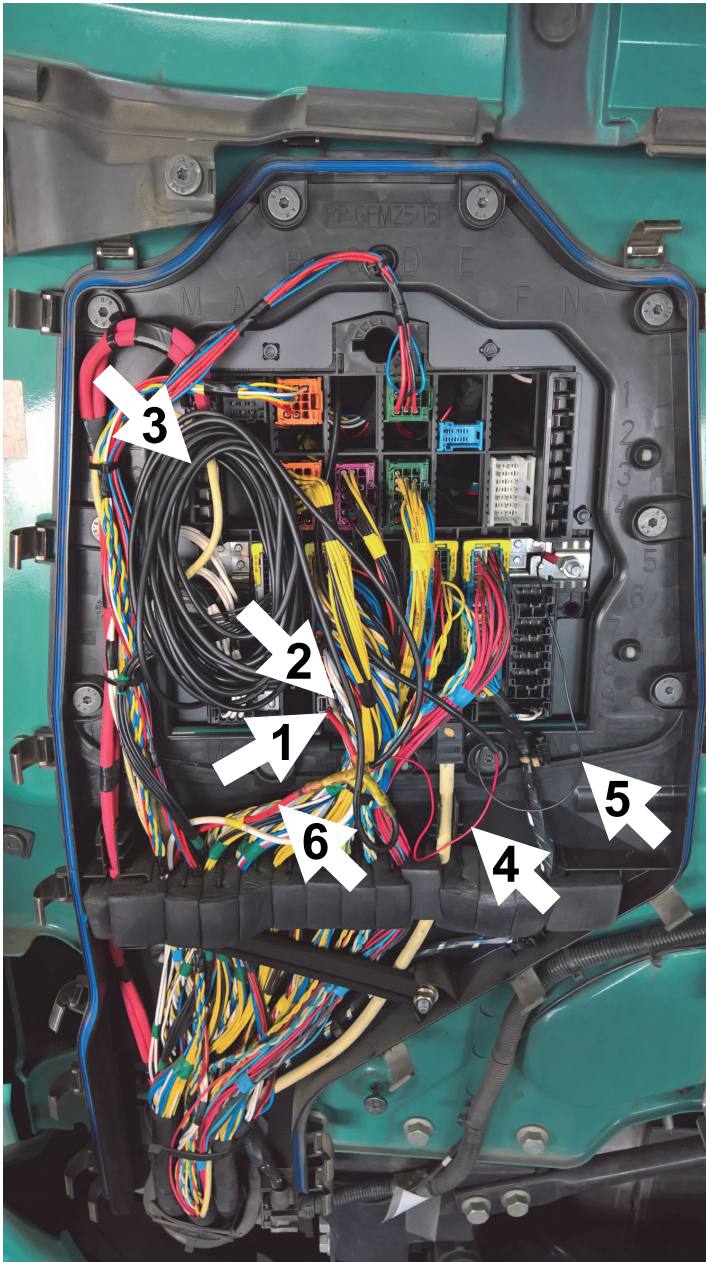
Power transfer point towing vehicle to trailer: Passenger side under the engine cowl

The red Trailer Remote Control cable is protected by a 5A fuse and connected to the red-black cable on the X20 connector.

Insertion of an attenuator is not absolutely necessary with this model. The black Trailer Remote Control cable is connected to the ground cable (brown cable).

Vehicle types DAF XF.460 (Euro 6) and DAF XF.510 (Euro 6)

Example of how to connect the Trailer Remote Control



- (1) Red cable (Terminal 30 from truck)
- (2) Plug 9H
- (3) Damping Performance
- (4) Trailer Remote Control Plus
- (5) Trailer Remote Control Ground
- (6) Terminal 30 to trailer

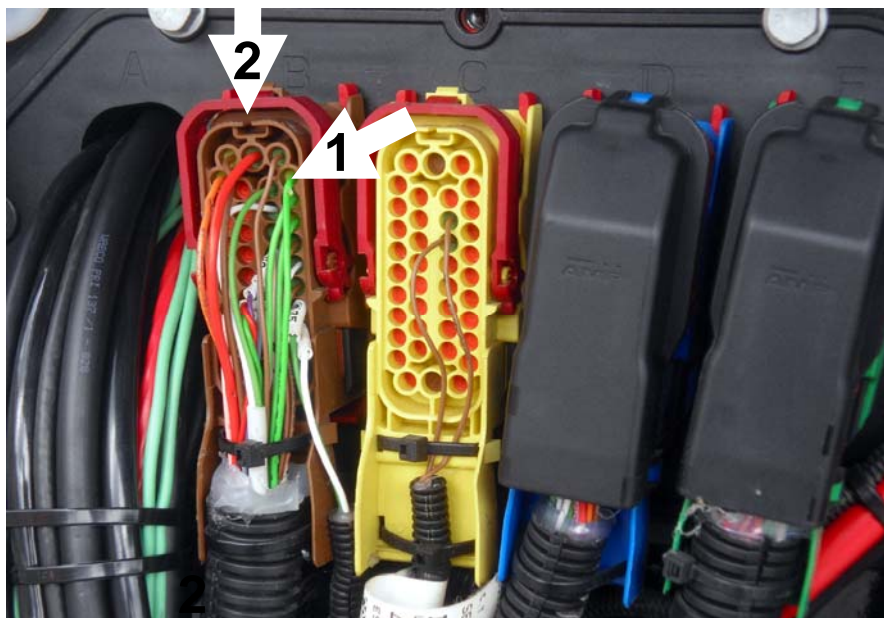
Power transfer point towing vehicle trailer: Passenger side under the engine cover

The red cable (1) on plug-in connector 9H (2) must be pulled out of/disconnected from the plug and expanded with a 4 m decoupling coil.

The Trailer Remote Control is connected - secured with a 5A fuse - to the trailer-side cable end.

IVECO Stralis 420

Example of how to connect the Trailer Remote Control



(1) Green cable

(2) Slot B

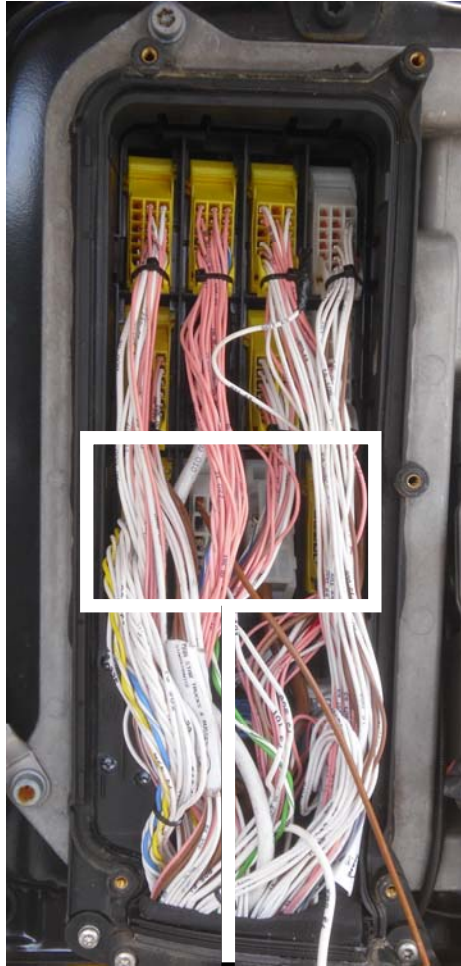
Power transfer point towing vehicle trailer: Passenger side under the engine cover

The green cable (terminal 15, number 800076) at the top right in slot B must be pulled out of/disconnected from the plug and expanded with a 2 m decoupling coil.

The Trailer Remote Control is connected - secured with a 5A fuse - to the trailer-side cable end.

MAN TGA 26.480

Example of how to connect the Trailer Remote Control



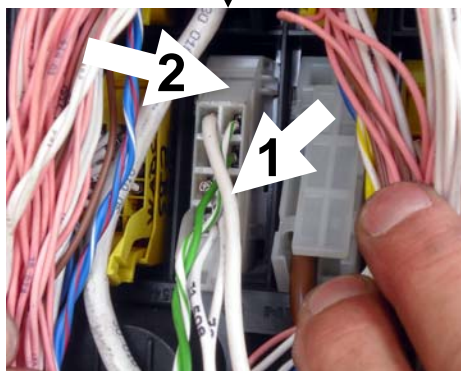
(1) White cable

(2) Plug X1542

Power transfer point towing vehicle trailer: Driver's side under the engine cover

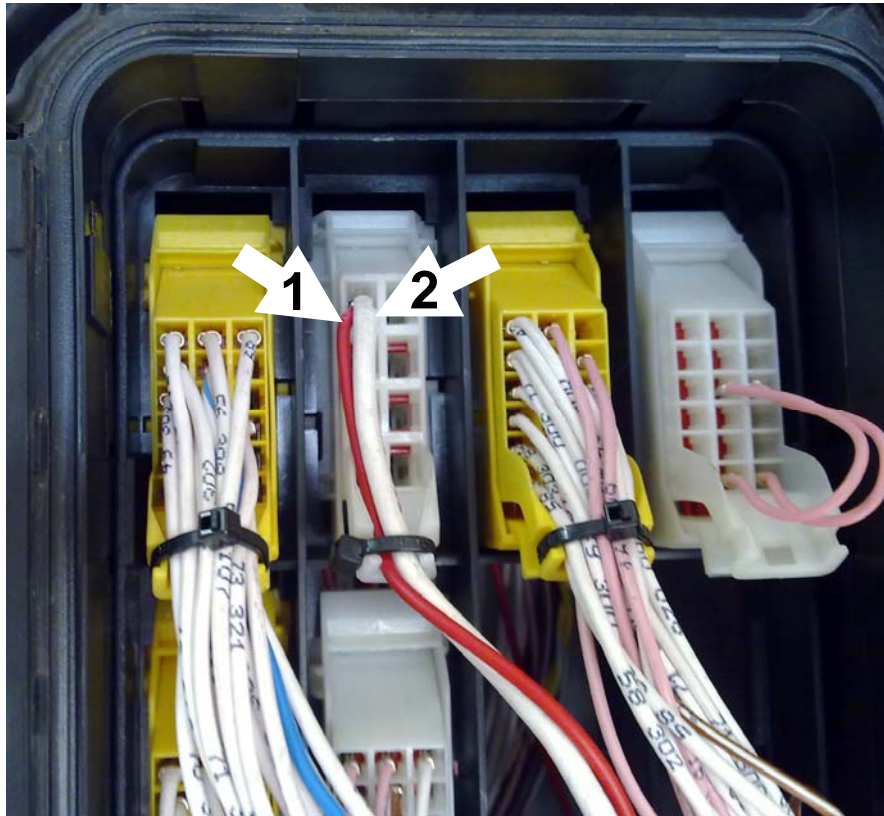
The Trailer Remote Control is connected - secured with a 5A fuse - to the white cable (terminal 30, number 73002) (1) to plug-in connector X1542 (2).

Insertion of a decoupling coil is not absolutely necessary with this model.



MAN TGX 26.400

Example of how to connect the Trailer Remote Control



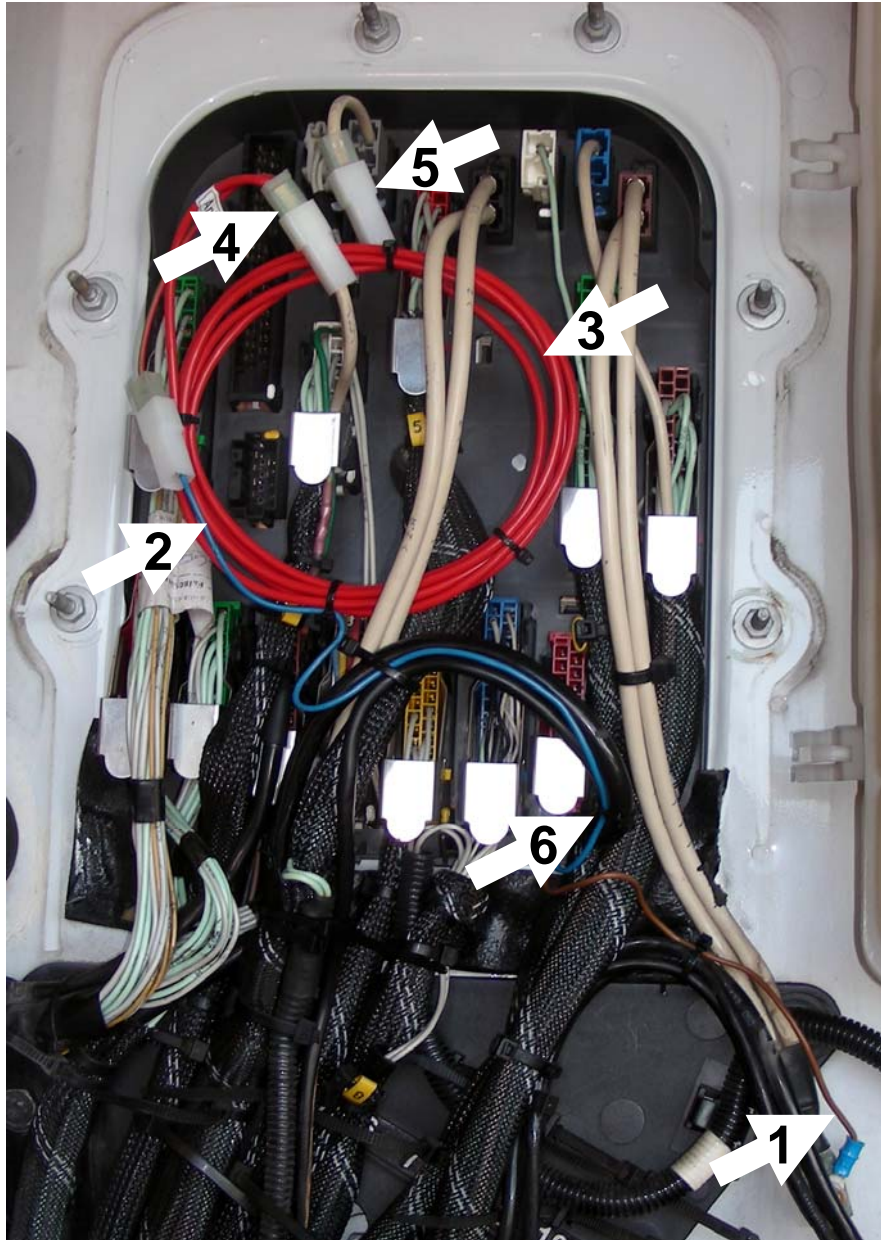
- (1) Supply cable for the Trailer Remote Control
- (2) Trailer terminal 30 Cable for MAN

Power transfer point towing vehicle trailer: Passenger side under the engine cover

The Trailer Remote Control is connected - secured with a 5A fuse - to the white cable (terminal 30, number 73002). Insertion of a decoupling coil is not absolutely necessary with this model.

Renault – RVI Premium

Example of how to connect the Trailer Remote Control



- (1) Ground line (brown) of the Trailer Remote Control (negative pole), connected with chassis
- (2) Terminal 30 (steady positive voltage) line (blue) to Trailer Remote Control (positive pin), shown without fuse
- (3) Decoupling coil
- (4) Terminal 30 line from the trailer socket ISO 7638
- (5) Terminal 30 Trailer power supply for the engine towing vehicle
- (6) Opening for lines 1 and 2 for the Trailer Remote Control into the driver's cab

Power transfer point towing vehicle trailer: Passenger side under the engine cover

The grey cable (4 and 5) must be pulled out of/disconnected from the plug and expanded with a 4 m decoupling coil.

The Trailer Remote Control is connected - secured with a 5A fuse - to the trailer-side cable end.



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