

General

This document describes the handling and dimensioning of electrical cables and cable harnesses.

To facilitate work with the bodywork there are a number of electrical cables and cable harnesses that can be ordered as options from the factory. These are described in this document and in other documents under Preparations and options from the factory.



IMPORTANT!

All cables must be protected against overload by fuses or electronic current limitation.

Electrical cables

Dimensioning electrical cables

When dimensioning electrical cables, it is the rating of the fuse that determines the cable cross section. The following table shows the relationship between the fuse and the cable cross section.

Fuse (A)	Minimum cable cross section (mm ²)	Maximum cable length (m)
5	0.75	3.9
7.5	1.0	2.6
10	1.5	3.9
20	2.5	3.2
30	6.0	5

Note:

The table must only be regarded as a reference value; each individual cable must be assessed on the basis of the relevant conditions.

Cables outside the cab must, with consideration to mechanical stress, have a cross section of minimum 1.5 mm².

If the cables are longer than the maximum cable length, it may be necessary to choose cables with a larger cross section than indicated in the table in order to prevent a large voltage drop. A voltage drop of 5% (1.2 V) is normally permitted.

Voltage drop

Calculate the voltage drop for copper conductors that have a resistivity of 0.0175 ohm/mm² at a temperature of 20°C:

$$U = \frac{I \cdot 0,0175 \cdot L}{A}$$

Explanation of parameters:

U = voltage drop in volts (V).

I = current in amperes (A)

L = cable length in metres

A = cable cross-section in mm²

Note:

Include the entire length from supply to electrical ground point in the calculation.

Routing the cables

Bear the following in mind when planning the routing of cables:

- Fit chafing covers on the cables if there is a risk of chafing.
- The cables must not touch sharp edges (radius < 0.5 mm), e.g. cutting edges or ends of threaded screws.
- Cables that are clamped to a rubber hose must not hinder hose movement.
- Make the cables long enough so that they are not stretched.
- The distance between the cable clamps, such as cable ties, should be maximum:
 - 150 mm in cab
 - 400 mm on chassis

Install the cables as far as possible from hot surfaces (> 90°C). The following minimum distances apply to cables that can withstand at least 105°C if no type of heat protection is used.

- 200 mm from exhaust pipe, turbocharger and silencer
- 100 mm from exhaust pipe for engine and cab heater
- 100 mm from coolant pipe for engine and retarder

In and around the instrument panel near the air ducts, the temperature may be as high as 90°C. Therefore, always use cables that can withstand at least 105°C both in the cab and on the chassis. A higher heat resistance may be required in the engine compartment, depending on position.

More information on hot components is found in the document Risk of fire and damage in connection with hot components

Action with damaged cables

Renew the entire cable, if possible.

Splice the cable if you cannot renew the entire cable. Preferably, splice using water-tight connectors: Cannon Sure Seal, Deutsch serie DT or the equivalent. As a last alternative, splice the cable using jointing sleeves, glue and shrinking tubing.

Connectors and jointing sleeves with glue can be ordered from Scania dealers.

Position the splice in a well protected location so that it is not subjected to mechanical loading.

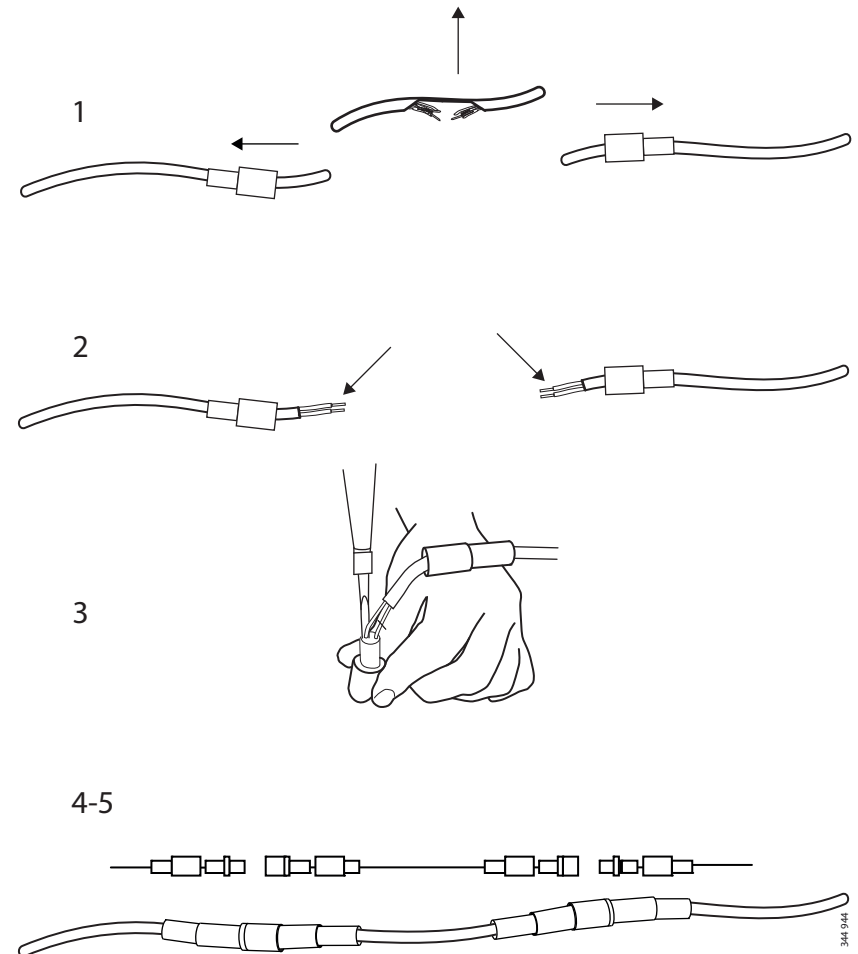
Splicing using connectors:

Splice the cable directly if the cable ends are intact and long enough to enable splicing without stretching the cable. Make an intermediate piece if the intact cable ends are too short for splicing directly. Complete the contact housings in the same way in both cases. Contact housings are available in 1-pin to 10-pin versions.

The parts are available from Scania dealers.

Description of cable splicing using an intermediate piece:

1. Remove the damaged part of the cable. Choose splicing points so that bending of the splices is avoided. Thread the connectors' protection sleeves on both the intact cable ends. The protection sleeve must be adapted to the cable's dimensions.
2. Strip approx. 35 mm of the outer cable insulation and then 7-8 mm of the inner insulation at both ends.
3. Use a press tool to clamp the associated pins and sleeves on the cables. The pin and sleeve must be appropriate for the cable cross section. Push in the pin and sleeve from the rear of each connector by pressing it in using a tool, see illustration.
4. Push the protection sleeve over the contact housing.
5. Make an intermediate piece according to steps 1-4 with a corresponding contact housing at both ends.



Fitting the jointing sleeve with glue

1. Remove the damaged part of the cable. Choose splicing points so that bending of the splices is avoided. Strip the insulation 7-8 mm at both the intact cable ends.
2. Strip 7-8 mm at each end of the intermediate piece, if required.
3. Shrinking tubing must protect the splicing point if the splice is located outside the cab. The length of the shrinking tubing should be at least 3 times the length of the jointing sleeve. Cut a length of shrinking tubing and slide it onto the cable.
4. Fit the jointing sleeve so that the cable ends reach the bottom of the sleeve. Use a sleeve that is appropriate for the cable cross section.
5. Use a press tool to clamp the sleeve over the stripped parts of the cable ends.
6. Apply heat from the centre of the sleeve and outwards using a hot air gun, fitted with a reflector, until the ends of the sleeve shrink and glue seeps out.



IMPORTANT!

Do not overheat.

7. Thread the shrinking tubing over the jointing sleeve, and heat the tube until the joint is tight and strong.
8. Test the joint.

Cable grommet in cab floor

All vehicles have a cable grommet to the cab on the passenger side at the transition point between the floor and firewall.

The cable grommet is designed for a wide range of cable dimensions and is big enough to feed through a connector with a diameter of approx. 70 mm.

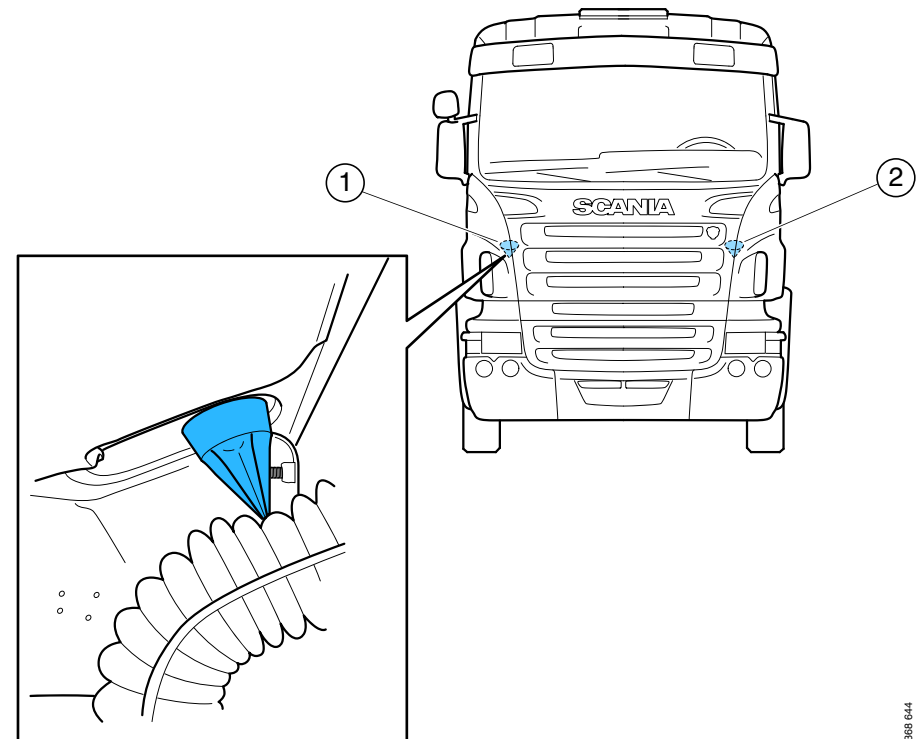
Using the cable grommet

The cable grommet is accessible from the inside and the outside of the cab.

From the outside of the cab, the cable grommet is accessible behind the upper front grille panel and cab corner on the passenger side. There, the cable grommet looks like a cone-shaped rubber bellows that protrudes from the underside of the cab floor, see illustration.

From the inside of the cab:

1. Remove the panel in front of the footwell on the passenger side.
2. Remove the side strip for the floor mat and pull the mat back.
3. Remove the rubber bellows.
4. Remove the foam plastic insert.
5. Cut the rubber bellows so that the hole is slightly smaller than the connector to be fed in.
6. Use a pipe, in which the connector can be fed, and push the pipe through the hole in the rubber bellows.
7. Pass the connector through the pipe and remove the pipe.
8. Refit the foam plastic insert to the rubber bellows so that the bellows fit tightly against the cables.
9. Refit the rubber bellows in the hole in the cab floor and make sure that the entire upper rubber ring lays tightly against the cab floor.
10. Secure the cable using a cable tie around the rubber bellows and pull tight.
11. Refit the floor mat, the side strip and the panel.



The cable grommet is located on the passenger side behind the front grille panel and cab corner:

- 1. Left-hand drive vehicles.*
- 2. Right-hand drive vehicles.*

Cable harnesses

The cable harnesses described below are options. Cable harnesses are described in more detail under Preparations and options from the factory. A description of how these can be used at installation is provided below.



IMPORTANT!

All cables must be protected against overload by fuses or electronic current limitation.

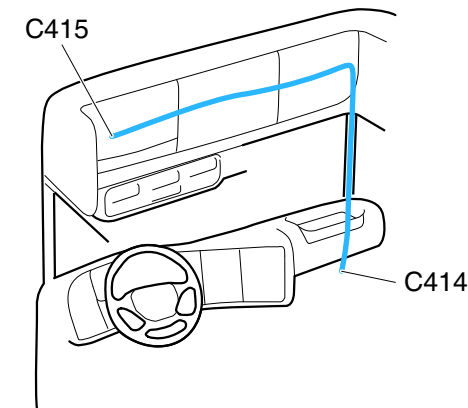
Cable harness in roofshelf

The cable harness is pre-routed from the central electric unit via the A-pillar up to the roofshelf on the driver side and is intended to be used for connecting different components in the roofshelf and on the roof.

The cables are included as a separate harness, of which the last half in the roofshelf is secured with tape so it can be easily removed for changing its routing and laying. For vehicles produced before 20 January 2006, the conductors are incorporated into the roofshelf cable harness.

Vehicle production period

Production site	Chassis serial number
	2006-01-20 -
Södertälje	2 014 272 -
Zwolle	5 139 836 -
Angers	9 106 788 -



368 504

More information on cable harnesses in the roofshelf is found in the document *Cable harness in roofshelf*.

Bodywork cable harness from cab to frame

The cable harness is needed to connect equipment outside the cab.

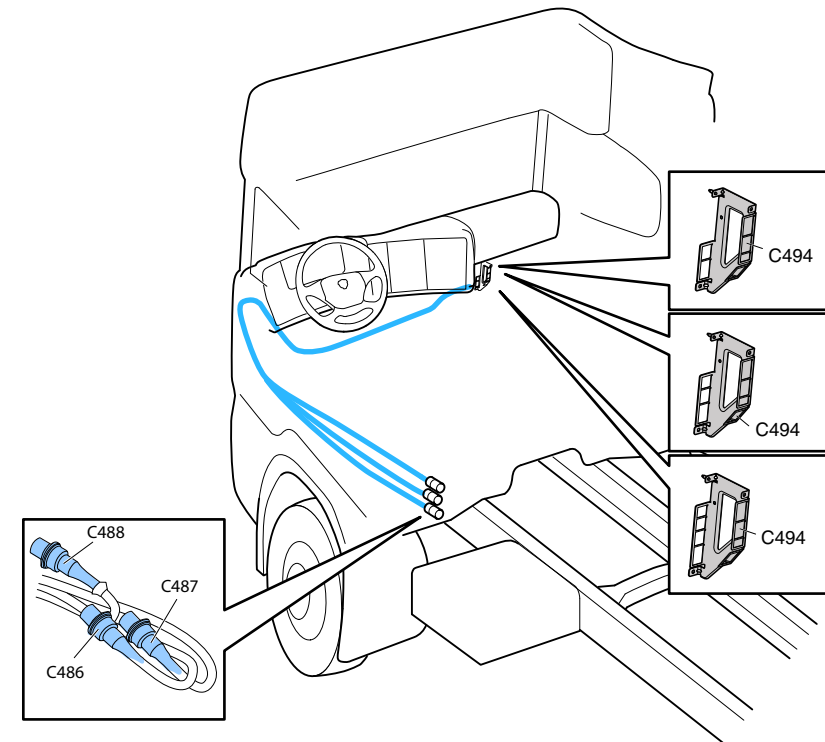
All vehicles can be ordered with this cable harness which runs from connector C494, in the bodywork console out to the frame. The cable harness ends with one, two or three 7-pin DIN connectors located as illustrated.

Each DIN connector is marked with a C number: C486, C487 or C488. C486 is 4-pin on early P, G, R and T series vehicles.

Note:

For vehicles produced up to and including 8 March 2011, the connectors are located on the upper part of the left-hand wheel housing, see illustration.

For vehicles produced from 9 March 2011, the connectors are located in front of the left-hand wheel housing.



More information on cable harnesses for bodywork from cab to frame is found in the document Cable harness cab and frame.

More information on cable cross-section area, pin numbering and colour marking is found in the documents under Connections.

Bridging between contacts in the bodywork console

Depending on how the vehicle is equipped from the factory, there is a number of connectors in the bodywork console that contain the available electrical signals.

Bridging is used to connect signals to C494 from, for example the central electric unit, switches or the other connectors. In this way, the bodybuilder can choose which signals should be available on the frame.

Make all connections on the sleeve section of the bodywork console connectors. The sleeve section is the outer, removable part of the connector. For certain customer choices, some bridging may already have been done at the factory and are then included in the outer part of the connector. The outer part is not included in connectors without bridging.

Note:

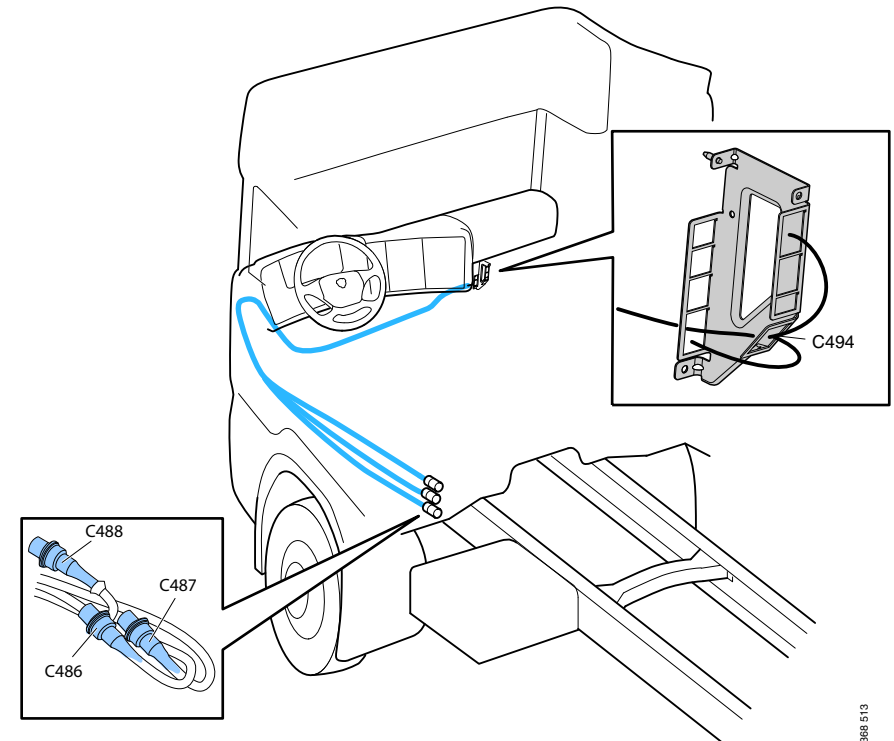
Connector C489 is dimensioned for a total, continuous current of maximum 25 A .

The following material for bridging can be ordered from a Scania dealer:

- Cable terminals and contact housings for making cable harnesses
- Complete cables with cable terminals, 10 pcs, 400 mm long without contact housing
 - 3 pcs 0.75 mm²
 - 3 pcs 1.0 mm²
 - 2 pcs 1.5 mm²
 - 2 pcs 2.5 mm²

Bodybuilders can assemble contact housings with prepared bridges and store them if the same electrical functions are commonly used for different types of bodywork.

To reduce the lead time, the bodywork may be prepared with a complete electrical installation designed for connection to DIN connectors when docking with the chassis.



More information on connectors and on how the connection of bridges affects the signals in the connectors is found in the documents under Connections.

More information on contact housings and flat pin sleeves is found in the document General information about the bodywork console and connectors.

More information on electrical installations from the factory is found in the documents under Factory-fitted option packages.

Bodywork cable harness in frame including junction box

The cable harness in the frame is an extension to provide connection to the bodywork where it best suits. The cable harness is ADR-classed, available in 2, 8 and 12 metre lengths and is terminated without connector. The cable harness has the same marking, colours and cable cross-section area as Cable harness for bodywork from cab to frame, and is terminated without a contact housing. They must be connected to the correct DIN connector in order for the colour marking and the twisted conductors to correspond.

More information on extension cable harnesses is found in the documents under Connections.



IMPORTANT!

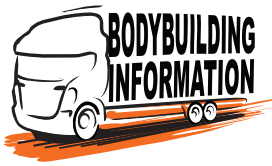
On vehicles with V8 engines a silver heat shield is fitted to protect cables and hoses routed out onto the chassis. Protect any extra cable harness fitted in parallel to these in the same way with an equivalent heat shield. The part number for the heat shield is 1 783 099.

On earlier P, G, R and T series vehicles the extension cable harnesses are 2, 7 and 12 metres and the colour marking between the 2 cable harnesses do not fully correspond.



IMPORTANT!

- The cables to and from the junction box in such an installation must also be ADR type cables.
 - The ground connection in the junction box (ground plate in retaining screw) should only be used as a junction point.
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Cabling and cable harnesses

SCANIA

Cable harnesses

The cable harness and junction box are supplied in the cab and are not connected. For short cabs, they are on the floor in front of the passenger seat and for sleeper cabs they are in the space under the rear bed.

Pins and cable markings

This is how the extension cable harness is connected to the bodywork cable harness from cab to frame:

- C424 to C486 (to C494)
- C413 to C487 (to C494)
- C413 to C488 (to C494)

The cable marking below applies to vehicles with the following chassis serial numbers:

Vehicle production period

Production site	Chassis serial number
	2007-03-30 - 2014-11-01
Södertälje	2 025 622 - 2 105 298
Zwolle	5 172 541 - 5 369 814
Angers	9 119 557 - 9 191 854

Pin	Connected to	Cable marking in the extension cable harness	
C494/1	C487/1	BWS83.GN-1.5	Green
C494/2	C487/2	BWS84.VT-1.5	Violet
C494/3	C487/3	BWS85.GY-1.5	Grey
C494/4	C487/4	BWS86.OG-1.5	Orange
C494/5	C487/5	BWS87.BN-1.5	Brown
C494/6	C487/6	BWS88.BU-1.5	Blue
C494/7	C487/7	BWS89.RD-1.5	Red
C494/8	C488/1	BWS90.VT-1.5	Violet
C494/9	C488/2	BWS91.BU-1.5	Blue
C494/10	C488/3	BWS92.GY-1.5	Grey

Pin	Connected to	Cable marking in the extension cable harness	
C494/11	C488/4	BWS93.GN-1.5	Green
C494/12	C488/5	BWS94.BN-1.5	Brown
C494/13	C488/6	BWS95.RD-1.5	Red
C494/14	C488/7	BWS96.OG-1.5	Orange
C494/15	C486/1	BWS97.YE-2.5	Yellow
C494/16	C486/2	BWS98.BK-2.5	Black
C494/17	C486/3	BWS99.GY-2.5	Grey
C494/18	C486/4	BWS100.BN-2.5	Brown
C494/19	C486/5	BWS263.OG-2.5	Orange
C494/20	C486/6	BWS264.BU-2.5	Blue
C494/21	C486/7	BWS265.VT-2.5	Violet

The cable marking below applies to vehicles with the following part numbers:

Vehicle production period

Production site	Chassis serial number
	2014-11-01 -
Södertälje	2 105 298 -
Zwolle	5 369 814 -
Angers	9 191 854 -
São Bernardo do Campo	3 868 309 -

Preparations from the factory

Option	Alternative	Variant code
Bodywork control unit BWE	With	5837A

If required

Bodywork cable harness from cab to frame	7+7+7-pin	2411F
Bodywork cable harness in frame	2 m	3023A
	8 m	3023D
	12 m	3023C

Pin	Connected to	Cable marking in the extension cable harness	
C494/1	C487/1	BWE56.GN-1.5	Green

Pin	Connected to	Cable marking in the extension cable harness	
C494/2	C487/2	BWE57.VT-1.5	Violet
C494/3	C487/3	BWE58.GY-1.5	Grey
C494/4	C487/4	BWE59.OG-1.5	Orange
C494/5	C487/5	BWE60.BN-1.5	Brown
C494/6	C487/6	BWE61.BU-1.5	Blue
C494/7	C487/7	BWE62.RD-1.5	Red
C494/8	C488/1	BWE63.VT-1.5	Violet
C494/9	C488/2	BWE64.BU-1.5	Blue
C494/10	C488/3	BWE65.GY-1.5	Grey
C494/11	C488/4	BWE66.GN-1.5	Green
C494/12	C488/5	BWE67.BN-1.5	Brown
C494/13	C488/6	BWE68.RD-1.5	Red
C494/14	C488/7	BWE69.OG-1.5	Orange
C494/15	C486/1	BWE70.YE-2.5	Yellow
C494/16	C486/2	BWE71.BK-2.5	Black
C494/17	C486/3	BWE72.GY-2.5	Grey
C494/18	C486/4	BWE73.BN-2.5	Brown
C494/19	C486/5	BWE74.OG-2.5	Orange
C494/20	C486/6	BWE75.BU-2.5	Blue
C494/21	C486/7	BWE76.VT-2.5	Violet

Cable harness for tail lift

The tail lift cable harness is an option package designed for vehicles with a tail lift.

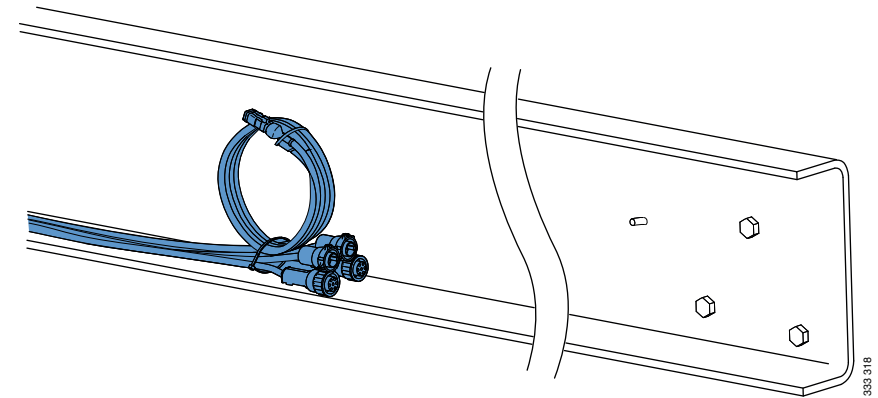
Preparations include the following:

- Cable harness for switches
- 2 connected switches to activate the tail lift and load compartment lighting. Both switches are bridged through C494 to the DIN connectors on the frame.
- Signals for side marker lamps
- Signal for work light
- Warning signal when the tail lift platform is not in the parking position

The connectors, including C158 and C159, are collected in the right-hand frame side member just in front of the rear end of the frame.

Vehicle production period

Production site	Chassis serial number
	2007-03-30 - 2014-11-01
Södertälje	2 025 622 - 2 105 298
Zwolle	5 172 541 - 5 369 814
Angers	9 119 557 - 9 191 854



More information on cable harnesses for tail lifts is found in the document *Cable harness for tail lift*.

Cable harness for high-mounted headlamps

The cable harness provides electric power supply to the auxiliary lamps, direction indicator lamps and position lamps, and is equipped with two connectors: C364 and C365.

The option package also includes a switch in the cab to alternate between the standard and high-mounted headlamps. The changeover only applies to the main beam and dipped beam functions.

On vehicles with the following chassis serial numbers, connectors C364 and C365 are located on the right-hand side behind the front grille panel.

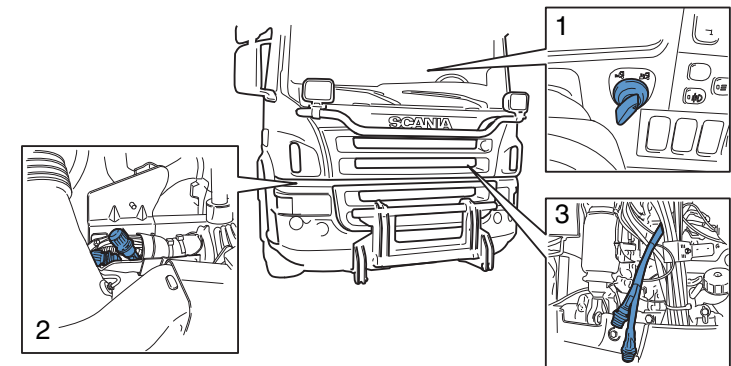
Vehicle production period

Production site	Chassis serial number
	2007-06-08 - 2014-11-01
Södertälje	2 027 765 - 2 105 298
Zwolle	5 178 472 - 5 369 814
Angers	9 121 843 - 9 191 854

On vehicles with the following chassis serial numbers, connectors C364 and C365 are located on the left-hand side behind the front grille panel.

Vehicle production period

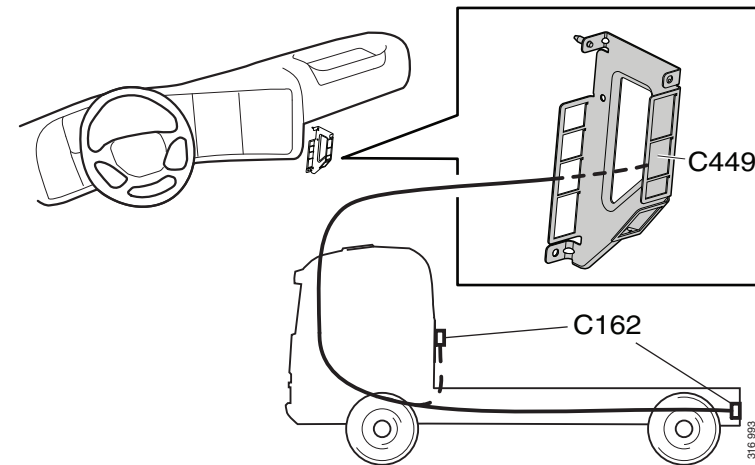
Production site	Chassis serial number
	2005-01-21 - 2007-06-07
Södertälje	2 006 429 - 2 027 764
Zwolle	5 117 958 - 5 178 471
Angers	9 097 244 - 9 121 843



1. Switch in cab.
2. Connector on right-hand side behind the front grille panel.
3. Connector on left-hand side behind the front grille panel.

Cable harness for trailer socket

Pins 12 to 18 in the trailer's 15-pin cable harness are not used from the factory, but the cables are routed to connector C449. The pins can be used for optional functions and signals. By bridging signals to C449, they then become accessible in trailer socket C162 on the vehicle.



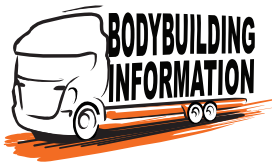
Cable harnesses for power take-off preparation

The cable harnesses in this option package have complete connectors for switches behind the instrument panel and for solenoid valves on the frame. All necessary parameters in affected control units are factory preset based on which power take-off preparations are selected.

Note:

The cable harness that runs from the cab to the frame is not bridged through connector C494 in this case. Alternative cable paths are instead used which must only be used for factory-fitted equipment.

More information on the alternatives is found in the document Power take-off and engine speed control.



Cable harness for crew cab

The option package is standard on vehicles with a crew cab. It includes a cable harness for connecting signals from the instrument panel to the floor and roof in the rear part of the cab. The cable harness is not connected. It has a C328 connector at one end, located in the instrument panel. There are 3 connectors at the other end: C327 is located in the roof and C184 and C185 are located on the floor.

More information on the crew cab cable harness is found in the documents under Instructions.

Bodywork packages for older vehicles

Earlier P, G, R and T-series vehicles can be equipped with factory-fitted bodywork packages. The packages consist of different types of preparations for connections in the electrical bodywork interface.

- Electrical preparation
- Tail lift preparation
- Power take-off preparation

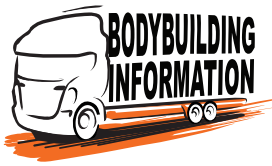
Electrical preparation

This package consists of the bodywork control unit which provides access to the additional functions which are available in connectors C493 and C259. In addition, there is an optional Cable harness for bodywork from cab to frame.

More information on the electrical preparation, tail lift preparation and bridges to C494 is found in the documents under Instructions.

Tail lift preparation

This package is designed for trucks with a tail lift and is prepared with electrical functions adapted to this. The package contains switches, status and warning lamps, and bridges to C494 from other connectors in the bodywork console. In addition, there are the optional Cable harness for bodywork from cab to frame, Cable harness for status and warning lamps and Cable harness for bodywork in frame. The package also consists of the bodywork control unit which provides access to the additional functions which are available in connectors C493 and C259.



Power take-off preparation

This package is designed for trucks with a power take-off and is prepared with electrical functions adapted to this. The package contains switches, status and warning lamps, and bridges to C494 from other connectors in the bodywork console. In addition, there is a cable harness for bodywork from cab to frame, cable harness for status and warning lamps and cable harness for bodywork in frame. The package also consists of the bodywork control unit which provides access to the additional functions which are available in connectors C493 and C259.

This package is required on older vehicles in order to use the Remote engine start function.

More information on the power take-off option package and bridges to C494 is found in the documents under Instructions.