Webasto
Feel the drive

Applicationdocumentation

Commercial Vehicles

Manufacturer:

Daimler AG

Vehiclebrand(s) / Vehiclemodel(s):

Mercedes Benz Actros II / III	***S-Cabin***
Mercedes Benz Actros II / III	***M-Cabin***
Mercedes Benz Actros II / III	***L-Cabin***
Mercedes Benz Actros II / III	***Megaspace***

Year of Production / Model Series:

10/2005 -

Installed Product:

AirTop 2000ST

Referenz Id. No:

9010542

List of Modifications (part 1)

Version	Modifications	Datum	Created	Approved
1.0	*First Release*	*01.12.2008*	*A.Ludwig*	*A.Ludwig*

Table of Contents

General and Vehicle Data

Product Referenz Id. No.:	*9010542*		
Productcategorie:	*Airheater*		
Basic Unit / Product:	*AirTop 2000ST*		
Type of Application	*OE-Application designed by Webasto*		
Vehicle Type:	*Heavy Duty Truck*		
Manufacturer:	*Daimler AG*		
Land of Production:	*Germany*		

Mercedes-Benz

* only for single aftermarket applications, customer OE-applications, prototype applications or other single applications

Installation by*:			
Contact person for vehicle*:			
Datum of vehicle assessment*:		Location*:	
Application release by*:			
Serial production No of the product*:			
Vehicle model/ Vehicle brand:	*Mercedes Benz Actros II / III*	Type:	*S-Cabin*
	Mercedes Benz Actros II / III	Type:	*M-Cabin*
	Mercedes Benz Actros II / III	Type:	*L-Cabin*
	Mercedes Benz Actros II / III	Type:	*Megaspace*
		Type:	
Vehicle serial number*:		Year of Production / Series:	*10/2005 -*
Vehicle voltage:	*24 Volts*	Fuel type:	*Diesel*
Hazardous-material transportation vehicle*:		Hazardous-material vehicle version:	*yes*
Steering type:	*lefthanddrive*		

Picture of Vehicle

remarks acc. to vehicle (specials, vehicle usage, prototype, vehicle condition …..):

Vehicle production since 01/2003, Webasto heater facelift in 10/2005. For vehicles production series from 01/2003 - 10/2005 see other document

Vehicle Equipment (electrical)

Vehicle batterie					
Vehicle voltage:	*24 Volts*		2nd battery on board:	*optional*	
Capacity of 1st battery:	*unknown*	Ah	Capacity of 2nd Battery:	*unknown*	Ah
Battery cutoff switch:			Cutoff:		
Emergency cutoff switch:			Cutoff:		
Remarks:	*installation of cutoff swiches is dependent onti vehicle equipment*				

Electrical databus-system			
Databus System existing:	*CAN-Bus*	*Low-Speed Can Bus*	
Webasto product is integrated into databus-system:	*yes*		
Remarks:			

Diagnosis system			
Onboard diagnosis system existing:	*yes*	Webasto product onboard diagnosable:	*yes*
Offboard customer diagnosis existing:	*yes*	Webasto product offboard diagnosable:	*yes*
Naming of customer diagnosis:	*Star Diagnosis*		
Remarks:	*heater onboard diagnosable by central operation unit*		

Operating system	
Webasto product is operated by customer- or vehicle specific operating element:	*yes*
Remarks:	*by central operation unit, push buttons at steering wheel, dashboard and bunk units*

Vehicle Equipment (Heating / Air Conditioning)

Vehicle integrated heating/ventilation/air conditioning unit				
Integrated heater on board:	*yes*	Type of cabine heating:	*by coolant (motor heat)*	
Integrated air conditioning on board:	*optional*	Regulation:	manually or automatic	
Regulation type of air temperature :	*air-blending*	Lock valve installed:	*yes*	
A/C compressor used:	*uncontrolled*	A/C compressor drive:	*belt drive*	
Name and manufacturer of compressor:				
Remarks:				

Electrical- , storage- , evaporative parking cooler or other A/C - unit			
A/C unit or parking cooler on board (bevor installation of Webasto product) :			*yes*
Type of installation:	*Original equipment*	Type of product:	*Storage (OE)*
Name and manufacturer of product:	*Webasto Accusphere I*		
Remarks:	*see separat description of parking cooler product*		

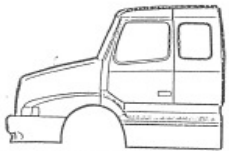
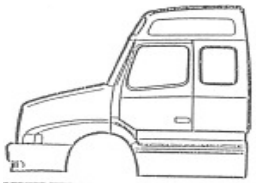
Parking heater			
Parking heater on board (bevor installation of Webasto product) :			no
Type of installation:		Type of product:	
Name and manufacturer of heater:			
Remarks:			

Auxiliary heater			
Auxiliary heater on board (bevor installation of Webasto product) :			no
Type of installation:		Type of product:	
Name and manufacturer of heater:			
Remarks:			

Other products oder specials on board (relatet to the Webasto productportfolio or competitors)	
Type of product:	
Type of installation:	
Name and manufacturer of product:	
Description and pictures:	

Vehicle Equipment (Type of Cabine)

Type of Cabine

			
X	X	X	X
			
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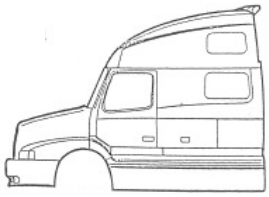
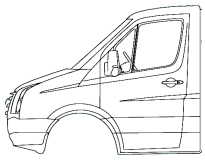
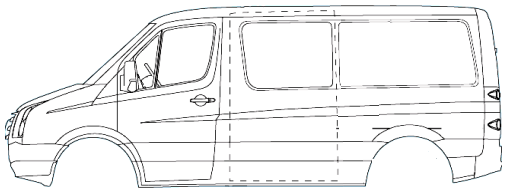
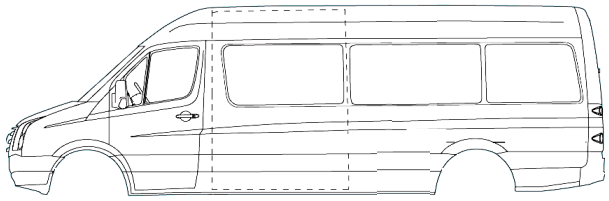
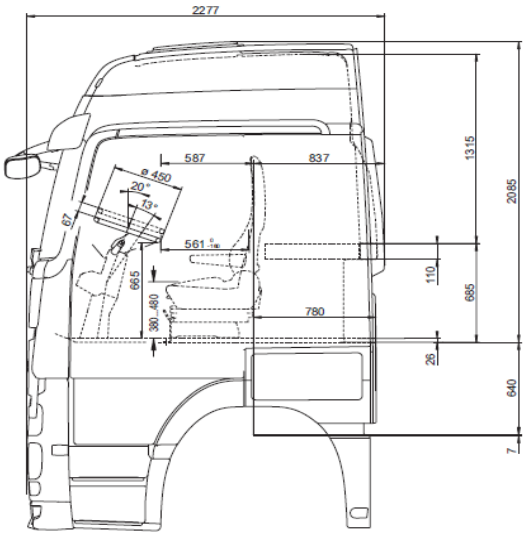
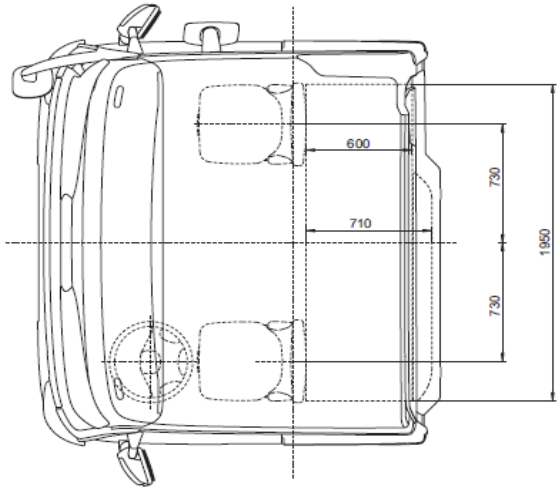
			
			

Megaspace-Cabin:





description for other type of cabine:

Vehicle Equipment (Interieur)

Cabine equipment

Number of seats:	2	Number of sleeping places / bunks:	max. 2		
Estimated air volume inside cabine (m³):	unknown	min. (m³):		max. (m³):	
Estimated outside surface area (m²):	unknown	min. (m²):		max. (m²):	
Estimated window surface area (m²):	unknown	min. (m²):		max. (m²):	
Insulation of cabine:	optional				
Type and material of the insulation (if known):		unknown			
Thickness of the insulation (in mm, if known):		unknown			
For sandwich constructions (from outside to inside):		material1:		thick.1(mm):	
material2:		thick.2(mm):		material3:	thick.3(mm):
Remarks for insulation:					
Window curtains:	existing	Bunk curtains:	existing		
Roof hatch, sunroof:	optional	Type of roof hatch/sunroof:	glas, with roller blind		
Estimated glass area of sunroof (m²):					
General remarks for cabine equipment:					

Pictures or sketches of the interior, geometrie of interior:

Vehicle Equipment (Engine)

Engine equipment (coolant circuit, masses)

Cylinder:	min. :	*6*	max. :	*8*	Design: *V-form*
Capacity:	min. :	*11,95*	max. :	*15,95*	
Material cylinder head:			Material engine block:		
Dry mass of cylinder head (kg):			min. :		max. :
Dry mass of engine block (kg):			min. :		max. :
Dry mass (engine block + cyl. head)(kg):			min. :		max. :
Total cooling system capacity (l):			min. :		max. :
Cooling system capac. heating circuit (l)			min. :		max. :
Nominal cooling water temparature (°C):			nominal cooling system prssure (bar):		
Opening temperature of radiator thermostat (starts to open) (°C):					
Opening pressure of pressure release valve of cooling system (bar):					
Cooling system retarder on board:					

Cooling system circuit scheme (bevor installation of Webasto product):

Remarks for engine equipment:

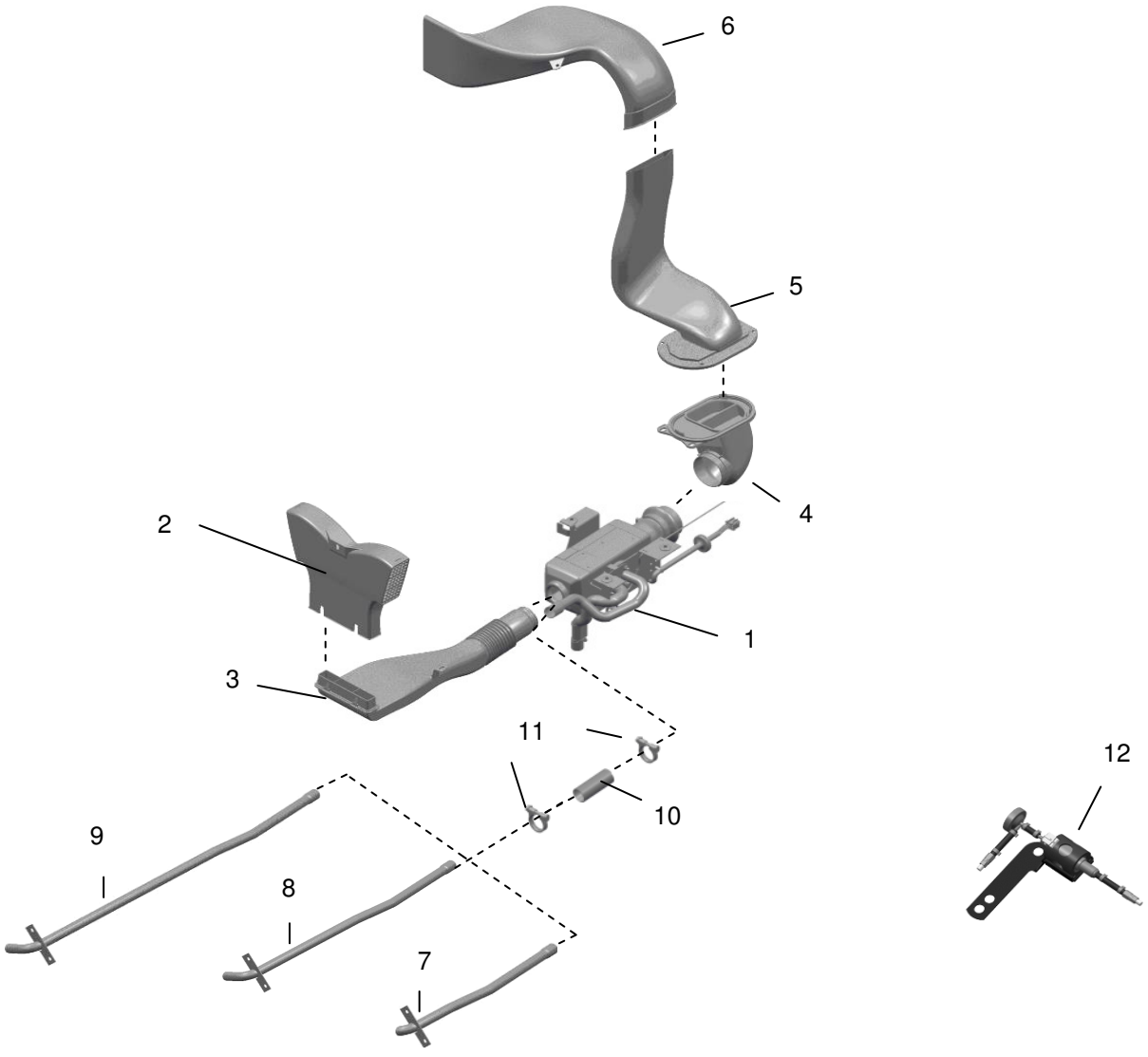
Scope of Delivery / Part Numbers

Productcategory:	*Airheater*	*Daimler AG / Mercedes Benz Actros II/III Lefthanddrive*
Basic Unit / Product:	*AirTop 2000ST*	

Scopes of Delivery (Art. No. and Customer Numbers of used Webasto Parts):

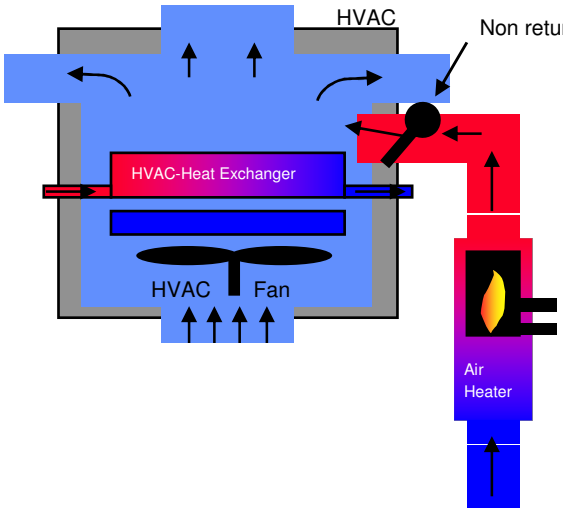
No.:	Part No.:	Part Name Webasto	Cust. No.	Remarks
1	*9010542*	*Assembly AT2000ST LH*	*A9438300961*	
2	*9000329*	*Inside Air Duct LH/RH*	*A9438320045*	
3	*9000333*	*Outside Air Duct AT2000 LH*	*A9438320145*	
4	*9000327*	*Air Duct Outside*	*A9438320345*	
5	*72138*	*Air Duct Lower Side LH*	*A9438300644*	
6	*72137*	*Air Duct Upper Side LH*	*A9438310945*	
7	*9007261*	*Exhaust Pipe S LH*	*A9438350815*	*for S-Cabin*
8	*9007263*	*Exhaust Pipe M LH*	*A9438351015*	*for M-Cabin*
9	*9007265*	*Exhaust Pipe L/LH LH*	*A9438351215*	*for L- and Megaspace Cabin*
10	*9003120*	*Flex. Pipe D30-100*	*A9439870027*	
11	*9003206*	*Exhaust Clamp D33-36*	*A0089975990*	
12	*9002300*	*Ass.Dosing Pump DP30*	*A0014705594*	*(new assembly and part no. in progress)*

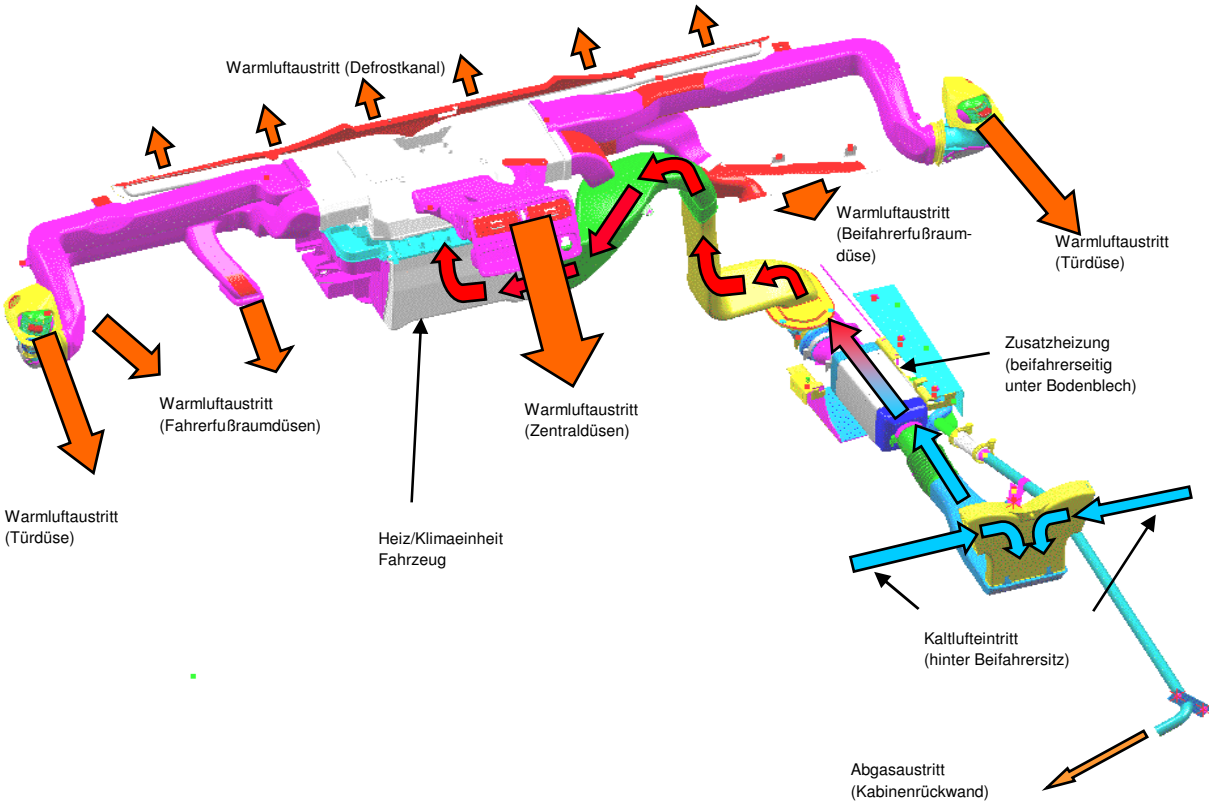
Parts Overview (Diagram incl.Breakdown into upper shown Art.No.):



System Scheme

schematic diagramm or description of parts, which are used for operation and parts, which are in direct interaction (pipes, air ducts, pumps, compressors, fans, heat exchangers, Evaporators...) incl. the most important connections and connecting elements:

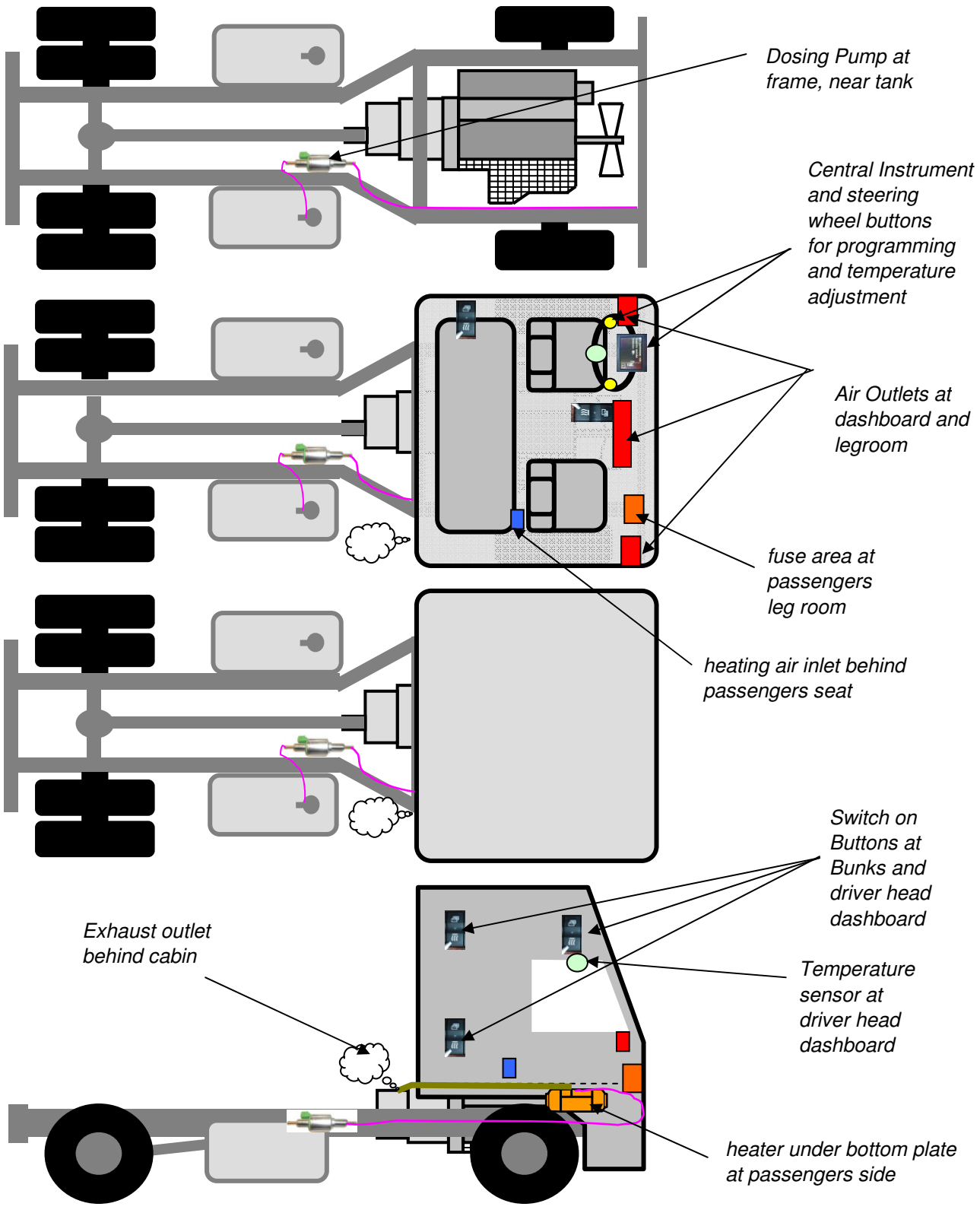




Air heater is blowing into vehicle HVAC. The warm air is distributed to the vehicle cabin by the vehicles own air ducts.

Installation Areas of Basic Components

Type of Vehicle:	platform or tractor truck without engine hood; tall and flat , long and short cabins



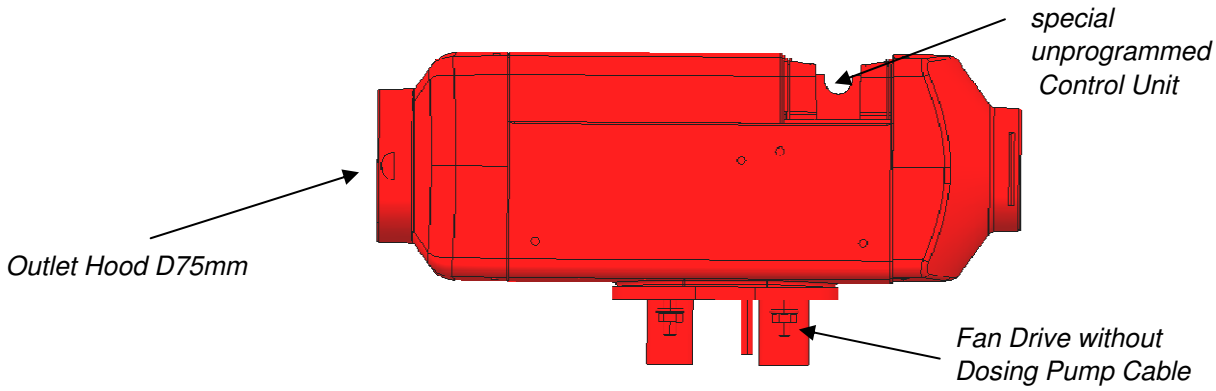
symbol description:			
Air Heater	Switch on Buttons	Exhaust Line	Fuel Line
Dosing Pump	Vehicle Fuses	Heating Air Inlet	Heating Air Outlets
Central Screen	Steering Wheel Buttons	Temperatur Sensor	

Description of the Main Component(s)

Heater / AC-Unit / Main Component

Productcategory:	*Airheater*
mechanical form of unprogrammed basic unit:	*special OE*
Part. No. of the unprogrammed basic unit:	*1302598*

Picture, sketch or description of the unprogrammed basic unit:

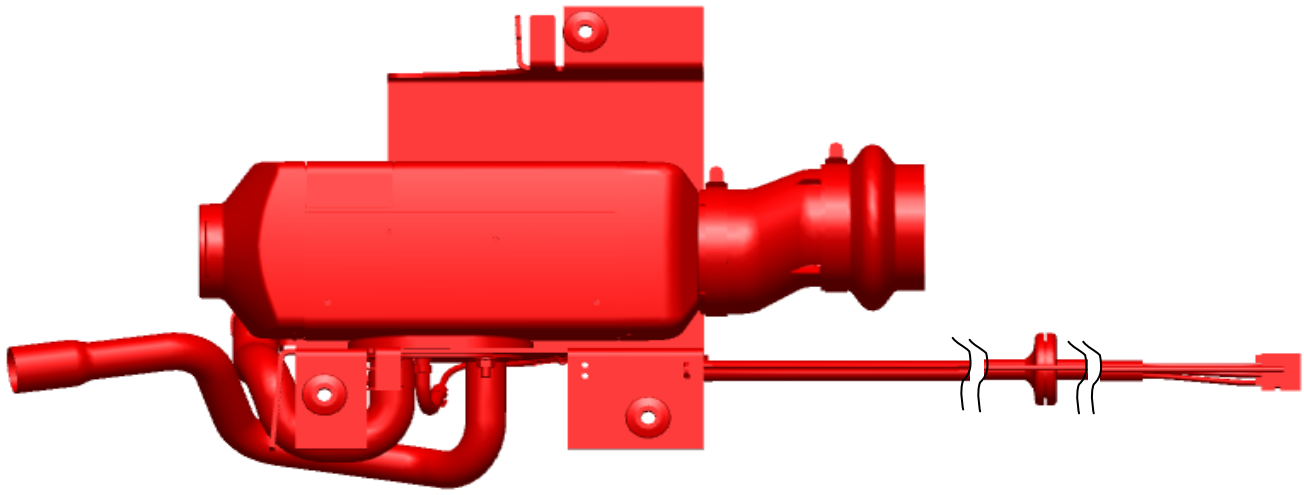


Description of the special model of the unprogrammed basic unit (differences to the standard):

The unprogrammed basic heater is different to the standard heater by using:
- the 75mm diameter outlet hood
- fan drive without dosing pump cable through combustion air port
- special unprogrammed control unit with CAN-Bus Interface

form of the programmed basic unit (basic unit version):	*special OE*
Part. No. of the programmed basic unit (basic unit version):	*9010542*

picture, sketch or description of the programmed basic unit (basic unit version):



Description of the special model of the programmed basic unit (differences to the standard):

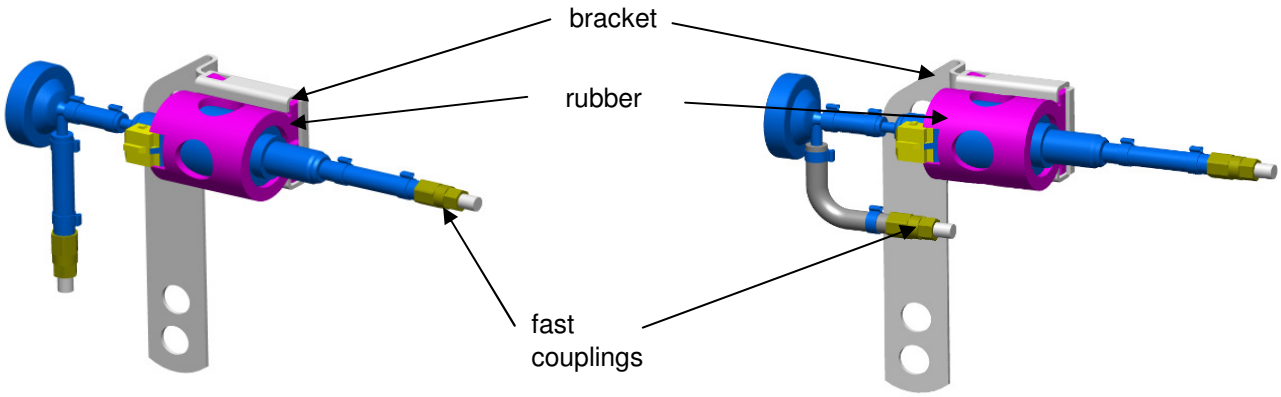
The "programmed basic unit" is the final application assembly unit. This unit is shipped to the customers production line.The unit contains:
- bracket, decoupling elements, combustion air routing, fix exhaust line pipe, some air ducts, fuel line and special cable harness
- labels
- to standard different datasets

Description of Additional Components

Dosing Pump

Part. No. of basic pump	*9012869*	Type of dosing pump:	*DP30.2*	Voltage:	*24V*
mechanical design of the dosing pump incl. bracket or mounting:		*OE - version*			
Part. No. of the dosing pump assembly or the dosing pump kit:				*9002300 / 9019832*	

picture, sketch or description of the dosing pump assembly or the dosing pump kit:



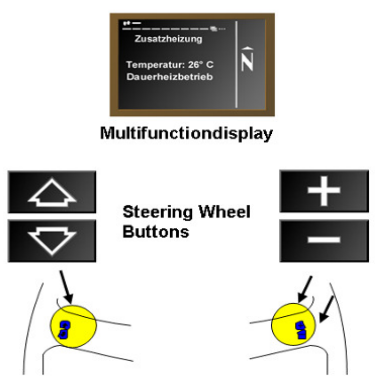
9002300
(01/2003 - 12/2008)

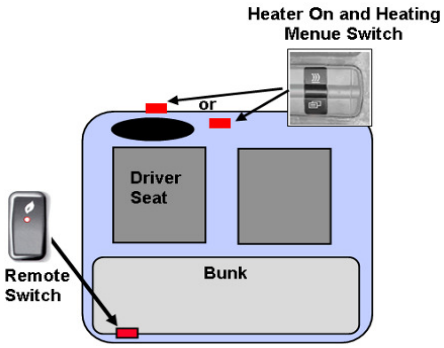
9019832
(12/2008 -)

Control Element(s)

Type of control element(s):	*OE- control unit*	Prt. No. control element:	
name of control elements:	*Central Instrument and Push Buttons*	Volt:	*24V*

picture, sketch or description of the control elements:



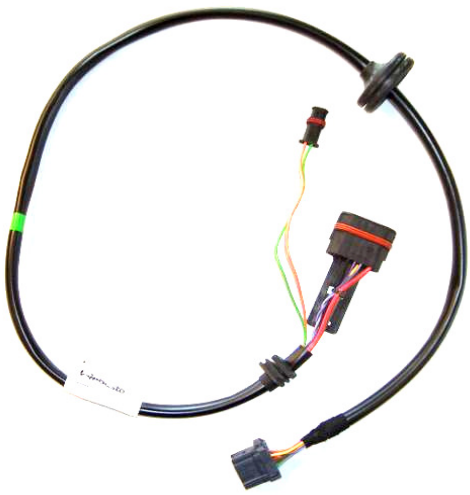


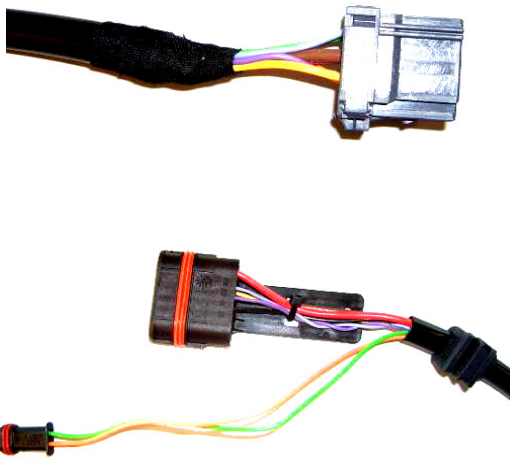
Central Instrument **Remote Switches**

Main Cable Harness

Type of cable harness:	*special OE version*	Part No. of cable harness:	*9006046*

Picture, sketch or description of main cable harness:



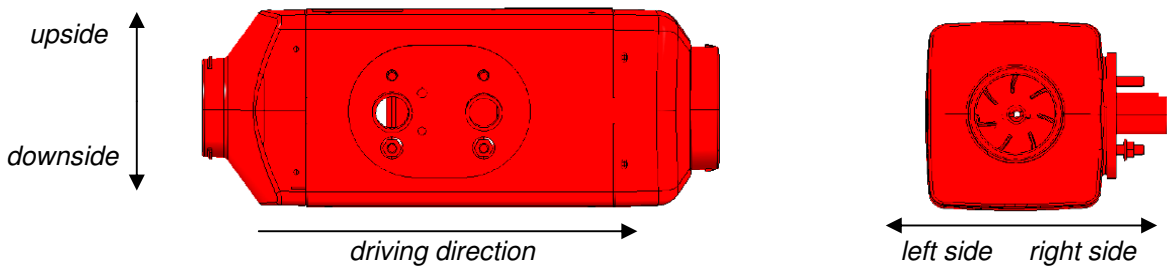


Mechanical Integration

Productcategory:	*Airheater*	

Installation position of heater / A/C - unit / main component

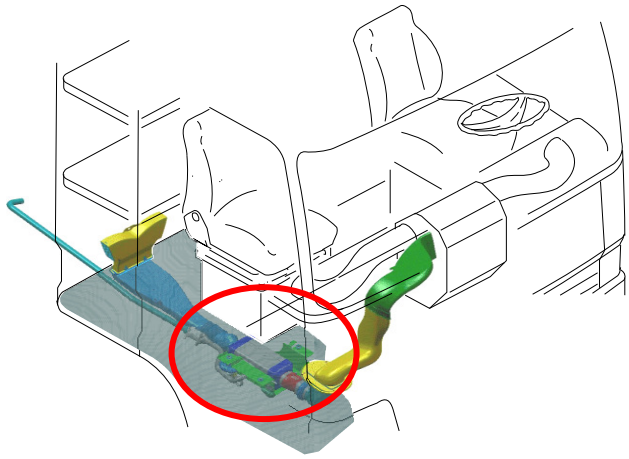
Picture, foto, sketch and/or description of the installation position; if necessary description of the deviation:



heater position is:
- horizontal: standard position, not rotated
- rotation around heater axis, 90 ° to the left side

Installation area of heater / A/C - unit / main component

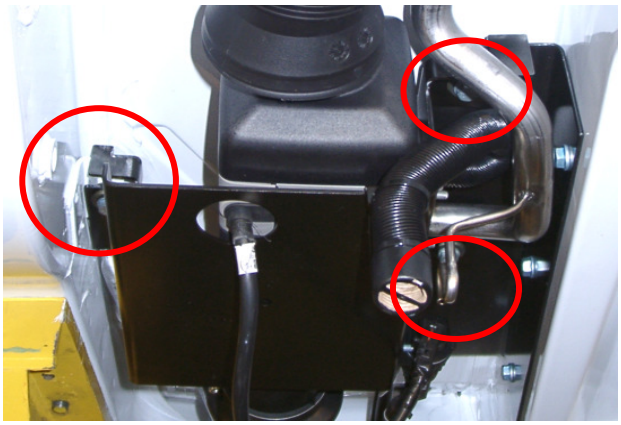
Picture, foto, sketch and/or description of the installation area:

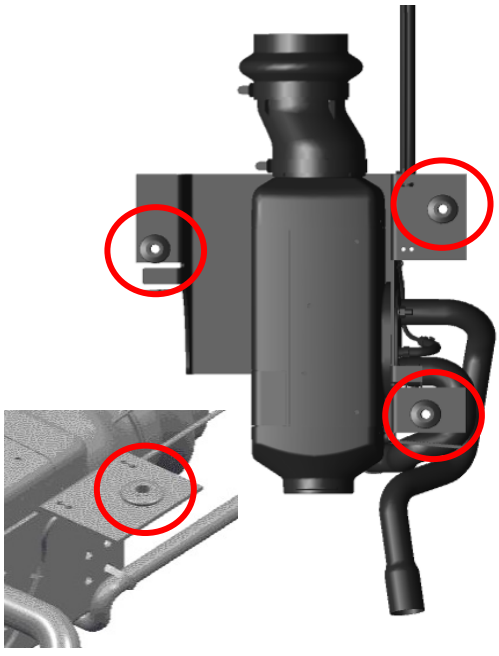


mounted at the passengers side, under bottom plate, outside cabine

Fixation / mounting of heater / A/C - unit / main component

Picture, foto, sketch and/or description of the fixation / mounting:





Heater is mounted to cabin consoles by 3 fixation points. Heater bracket and consoles are designed, to hang in heater assembly bevore screwing. Screwing points contain a 3 parts vibration decoupling element

Mechanical Integration

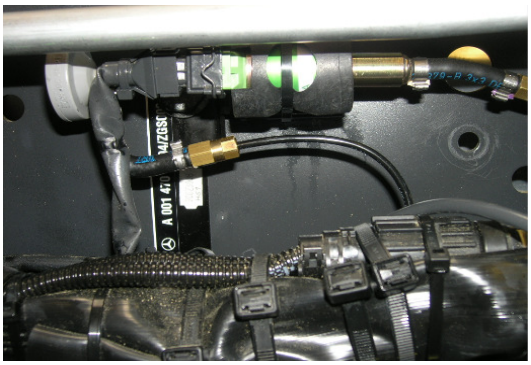
Installation position dosing pump

Picture, foto, sketch and/or description of the installation position; if necessary description of the deviation:

Dosing pump is installed in correct standard position, without any deviations, the fuel damper is installed in a not recommended position (fuel outlet to downside)

Installation area dosing pump

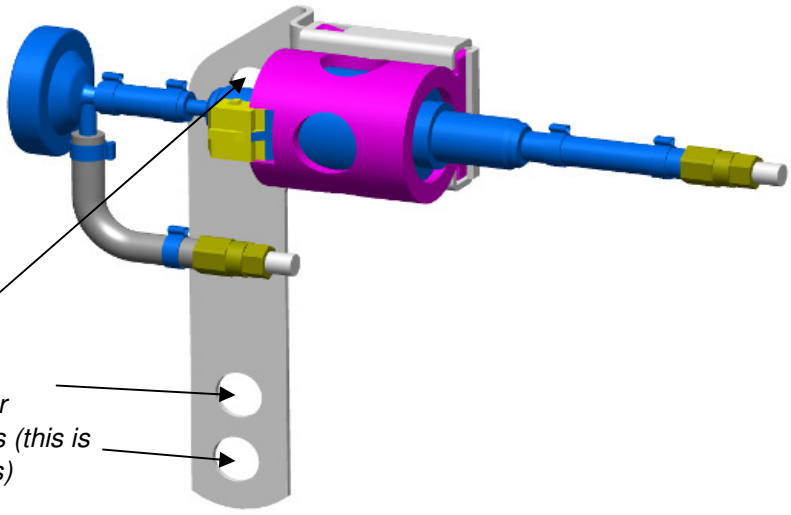
Picture, foto, sketch and/or description of the installation area:



The dosing pump is mounted near tank at the codrivers side at the inner side of the frame

Fixation / mounting of dosing pump

Picture, foto, sketch and/or description of the fixation / mounting:



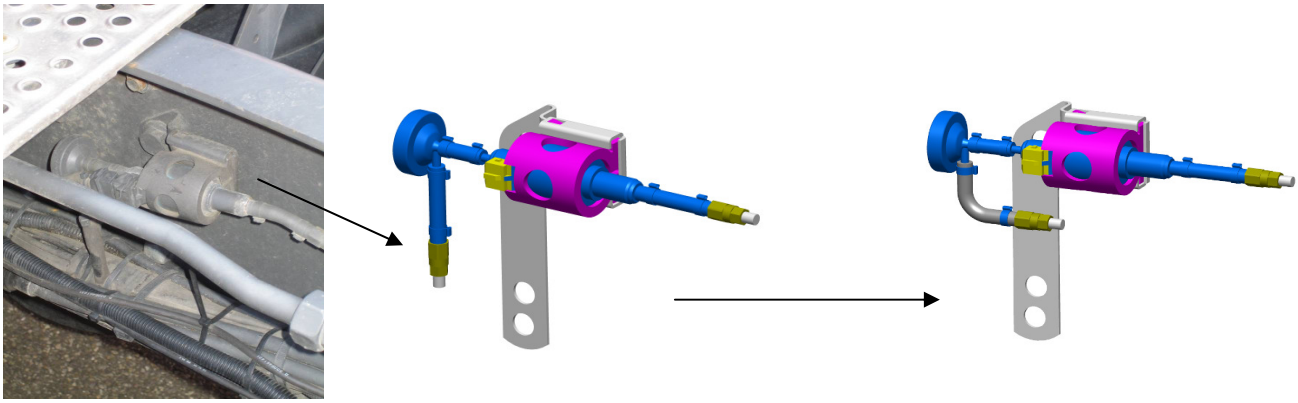
dosing pump bracket is mounted onto vehicle frame with 3 srewing points, together with other, heavy vehicle parts (this is the reason for 3 fixation points)

Mechanical Integration

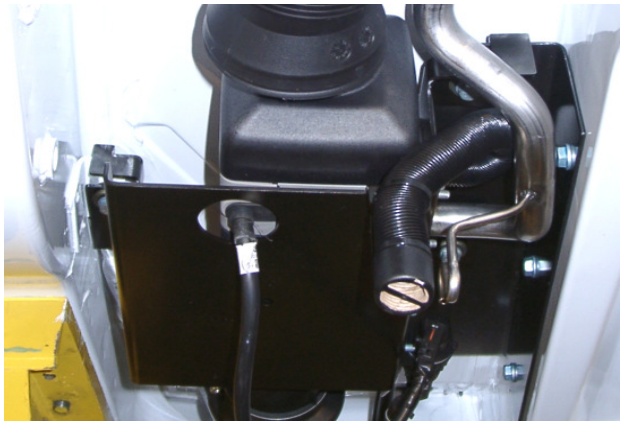
possible problems, known troubles and other remarks

picture, foto, sketch and / or description:

1. Dosing pump position isn't correct, pump slips out of rubber bracket because of getting force onto fuel pressure line while production line mounting. (fuel lines and vehicles cable harness is put together with cable bearings while vehicle frame is produced turned onto top, after returning chassis, the cable harness pulls down dosing pump by pulling the pressure fuel line.
-> a modification has been done by changing fuel hose at the pressure side outlet of dosing pump assembly.



2. In case of maintenance or repair of the heater unit, it is difficult to demount the heater unit while coverings and vehicle side step unit is mounted. Cabin has to be tilt.

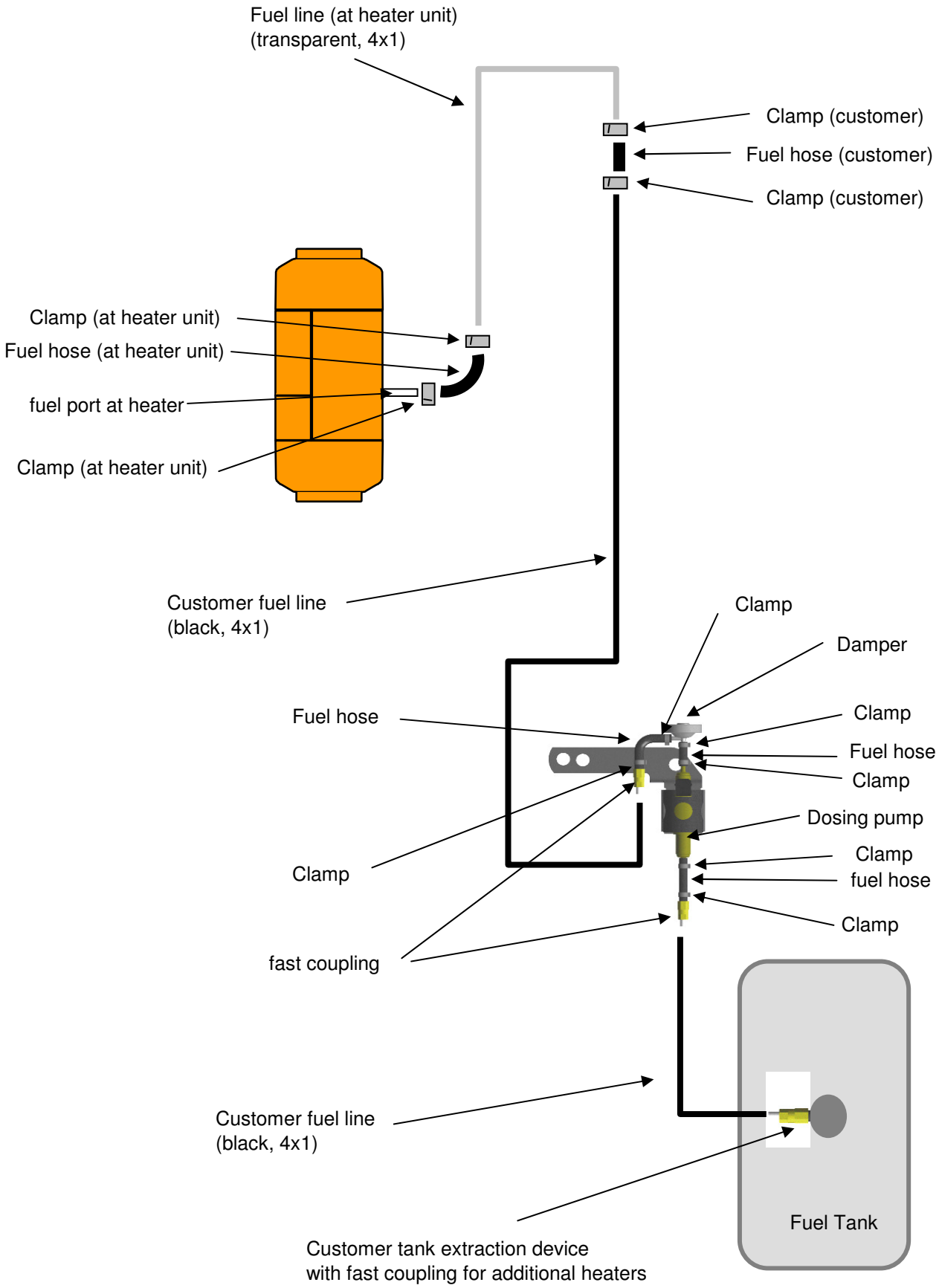


Fuel Supply System

Productcategory	Airheater	

Fuel supply system

Diagram, sketch, CAD-picture or description of the complete fuel supply system:



Fuel Supply System

Fuel line length, diameter, material and connections

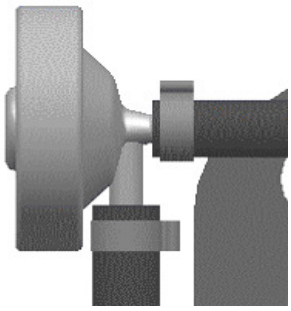
Number of fuel line connections:		*13*	Number of fuel routing parts	*14*
Number of bendings:		*unknown*	Sum of bending angles:	*unknown*
Fuel routing contains zinc parts or parts with zinc alloy:		yes		
effective fuel line length and inner diameter of the whole fuel line routing:				
Part:	Inner-Ø(mm):	length (mm):	Material:	Part. No.
Tank extraction device	*ca. 4*	*ca. 550*	*multiple , unknown*	
fuel pipe	*2*	*unknown*	*PA12, black*	
fast coupling	*2*	*ca.30*	*unknown*	
fuel hose	*4 - 4,5*	*ca. 40*	*rubber, PME resistant,*	
dosing pump	*different*	*ca. 100*	*multiple , unknown*	
fuel hose	*4,5*	*ca.10*	*rubber, PME resistant,*	
fast coupling	*2*	*ca.30*	*unknown*	
fuel pipe	*2*	*unknown*	*PA12, black*	
fuel hose	*unknown*	*unkonwn*	*unknown*	
fuel pipe	*2*	*ca. 950*	*PA12, transparent*	
fuel hose	*4 -4,5*	*ca. 50*	*rubber, PME resistant,*	
Total line length, suction side (mm):		*< 3000*	Total line length, pressure side (mm):	*< 8000*
only for OE- series with different line length: fuel line routing with minimum line length:				
Part:	Inner-Ø(mm):	length (mm):	Material:	Part. No.
Total line length, suction side (mm):			Total line length, pressure side (mm):	
only for OE- series with different line length: fuel line routing with maximum line length:				
Part:	Inner-Ø(mm):	length (mm):	Material:	Part. No.
Total line length, suction side (mm):			Total line length, pressure side (mm):	

Fuel Supply System

Dosing pump					
Part. No. of basic pump	*9012869*	Type of dosing pump:	*DP30.2*	Voltage:	*24V*

Fuel Damper			
Fuel damper used:	*yes*	Fuel damper inside permitted installation position:	*no*

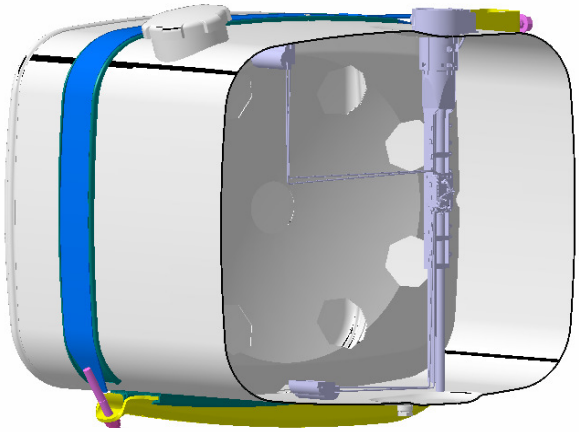
Picture, foto, sketch of fuel damper mounting position:

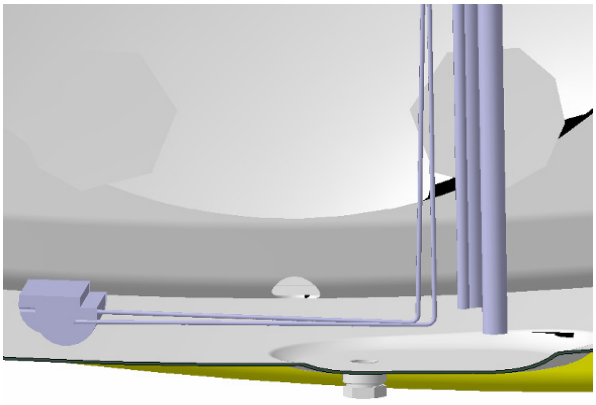


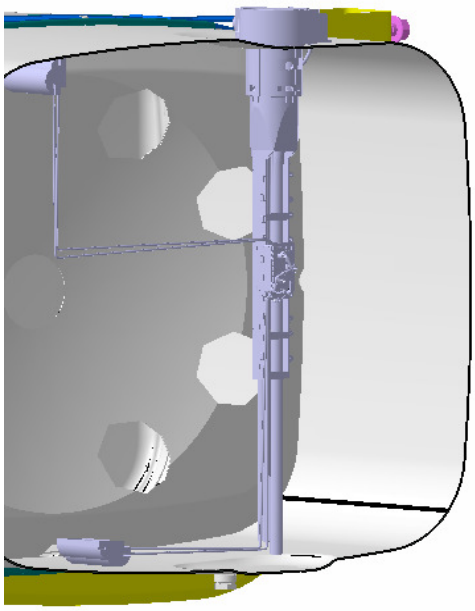
Fuel extraction					
Fuel extraction from:	*main vehicle tank*		Type:	*extraction unit integrated (in OE armature)*	
Part. No. of additional tank:		Volume (l) :		Part.No. extraction device:	
Material of Tank:	*metal*		Material extraction device:	*mix of plastik/metal*	
OE customer number of vehicle tank extraction unit:					

for fuel extraction from main vehicle tank:

Picture, foto, sketch, section view and/or description of the fuel extraction, extraction devices ...:

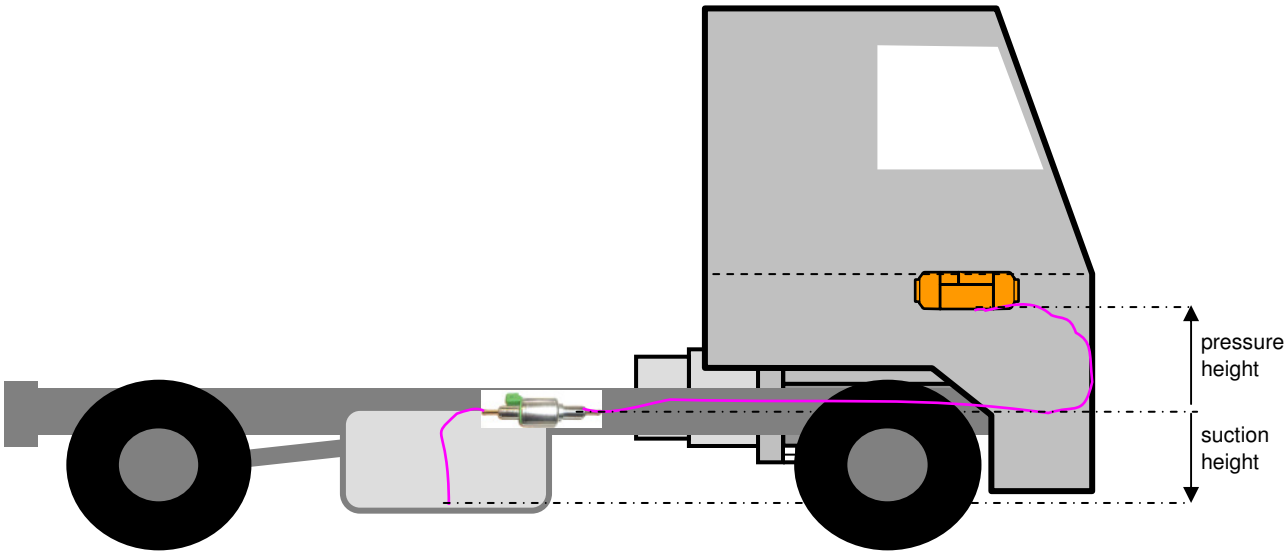






Fuel Supply System

Pump lifts			
Suction height (in mm) :	ca. 600	Pressure height (in mm) :	ca. 500
only for OE- series with different pump lifts: fuel line routing with minimum pump lift:			
Suction height (in mm) :		Pressure height (in mm) :	
only for OE- series with different pump lifts: fuel line routing with maximum pump lift:			
Suction height (in mm) :		Pressure height (in mm) :	
Sketch and/or description of the pump lifts:			



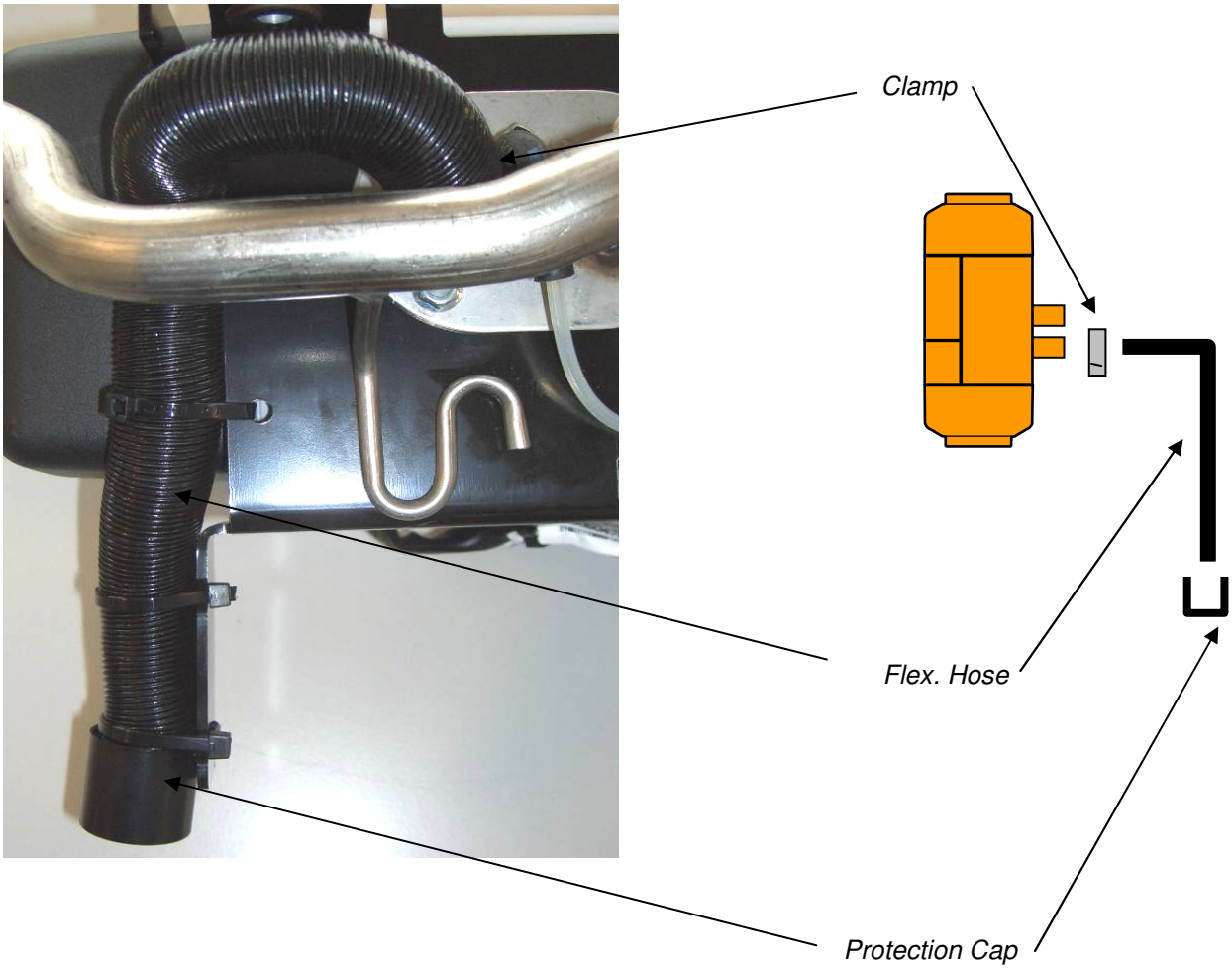
Fuel filter			
Type of fuel filter:	no one	Customer No.:	
Part. No. fuel filter:			
Installation position, installation area and fixing/mounting of fuel filter			
Picture, foto, sketch and/or description :			

Combustion Air System

Productcategory	*Airheater*	

Combustion Air System

Sketch, description or CAD-picture of the mounted combustion air system :



Combustion air routing

Number of connections:	*1*	Number of combustion air routing parts:	*1*
Number of bendings:	*3*	Sum of bending angles:	*ca. 270 °*

Pipe length and inner diameter of combustion air routing:

Part:	Inner-Ø(mm):	length (mm):	Material:	Part. No.
Flexible hose	*22*	*ca. 300*	*PAK*	

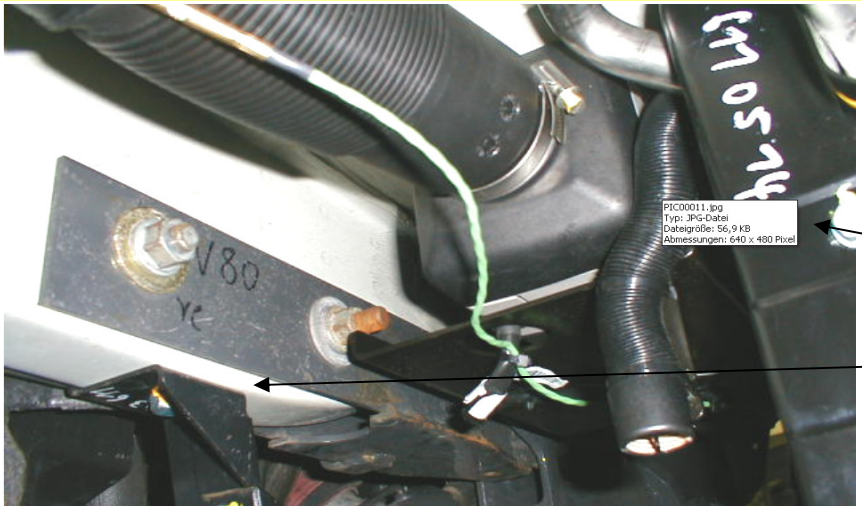
Total pipe length (mm):	*310*	Protection cap at air inlet:	*yes*
air inlet at heater is highest position:	*no ->*	Syphon with drainage hole installed:	*no*
Combustion air routing continous falling:	*no ->*	Drainage hole at lowest position:	*no*
Height of comb. air inlet in heater (mm):	*unknown*	Height of air inlet into comb. air pipe (mm):	*unknown*
Height of drainage hole (mm):		Diameter of drainage hole / - pipe (mm):	
Angle of air inlet acc. to driving direction:	*90 °*	Comb. air inlet higher than wading line:	*yes*

Combustion Air System

Take-off area of combustion air

Take-off area dust- / water protected:	*yes*	Take-off from cool ambient conditions:	*yes*
Short circuit with exhaust gas possible:	*no*	Pressure fluctuation at air inlet possible:	*no*
unintended plugging possible:	*no*	buckling or damaging of pipe possible:	*no*

picture, foto, sketch and / or description of combustion air inlet area:



Passengers side steps

Cabine chassis frame

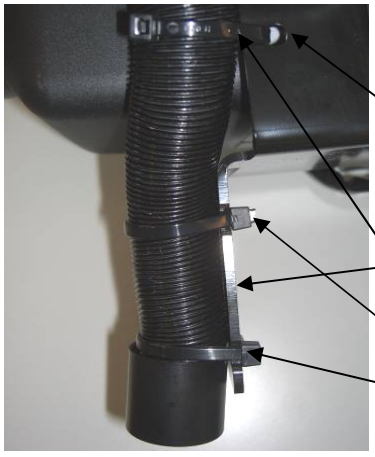
Intake silencer

Air intake silencer installed:	*no*	Part . No. of the air intake silencer:	
Type of air intake silencer:			

picture, foto, sketch and / or description of mounting direction, mounting place and mounting place:

Fixing of combustion air routing

picture, foto, sketch and / or description of combustion air fixations:



special designed bracket with cutouts or holes for cable bearings

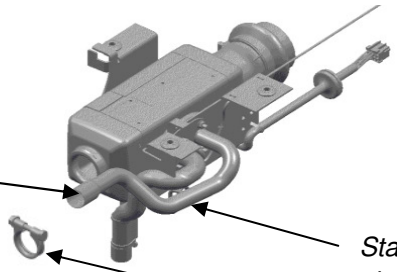
cable bearings

Exhaust System Installation

Productcategory	Airheater	

Exhaust System

sketch, description or CAD-picture of mounted exhaust system:



1 *Stainless steel pipe (premounted at heater assembly)*

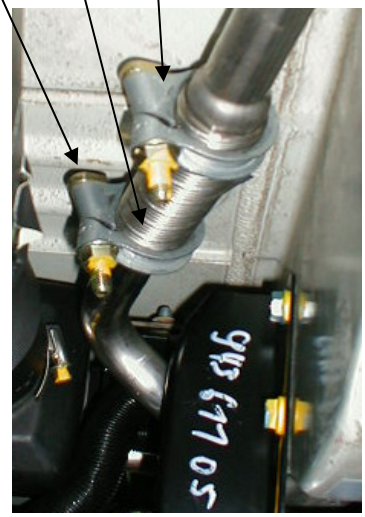
Clamp

2 *Flexible pipe*

Clamp

Exhaust outlet behind cabin (at the rear wall, behind engine suction channel bellows)

3 *Steel pipe*



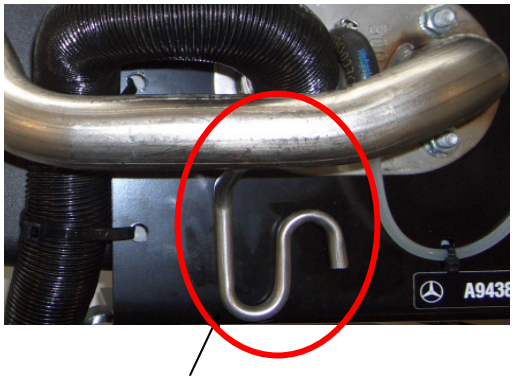
Exhaust Routing

number of connections:		3	number of exhaust routing parts:	3
number of bendings:		6	sum of bending angles:	ca. 320 °
line lenght and inner diameters of exhaust line routing				
Part:	inner-Ø(mm):	length (mm):	Material:	Part. No.
1 , stainless steel pipe	*22 - 28*	*ca. 400*	*stainless steel*	
2, Flex-Pipe D30	*30*	*100*	*stainless steel, inox*	
3, steel pipe (for S cabin)	*28 - 24*	*ca. 600*	*aluminated steel*	
3, steel pipe (for M cabin)	*28 - 24*	*ca. 800*	*aluminated steel*	
3, steel pipe (for L cabin)	*28 - 24*	*ca. 1000*	*aluminated steel*	
total line length (mm):		*1100 - 1600*	protection cap at end of exhaust line:	*no*
exhaust outlet of heater at highest position:		*no ->*	syphon with drainage hole provided:	*yes*
exhaust line permanent falling:		*no ->*	drainage hole at lowest routing point:	*yes*
height of heaters exhaust outlet (mm):		*unknown*	height of exhaust outlet routing line (mm):	*unknown*
heigth of drainage hole (mm):		*unknown*	minimal Ø of drainage hole / pipe (mm):	*4*
angle of outlet to vertical axis(°):		*ca. 45*	exhaust outlet is higher than wading line:	
exhaust outlet not in driving direction:		*yes*	protection against air flow pressure :	*yes*
exhaust line routing injury protectet:		*yes*	protection shield installed :	*no*
flamable or temp. sensitive materials near (<200 mm) exhaust line or exhaust routing parts:				*no*

Exhaust System Installation

Exhaust Outlet Area / drainage			
outlet protected against water/dirt/snow:	*yes*	blows onto temp. sensitive material:	*no*
combustion air inlet shortcircuit possible:	*no*	air flow pressure fluctuation possible:	*no*
unintended plugging possible:	*no*	buckling or damaging of pipe possible:	*no*
waste gas blown out near HVAC inlet:	*no*	waste gas blown out under cabine floor:	*no*
picture, foto, sketch and / or description of exhaust outlet area and the drainage:			

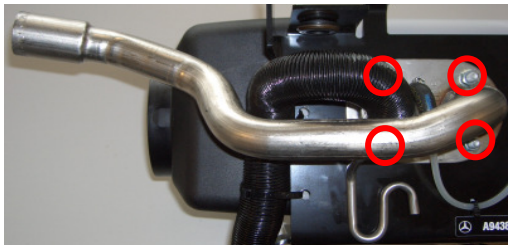
Exhaust outlet behind cabin (at the rear wall, behind engine suction channel bellows



drainage hole with separat pipe "pig tail", to route drainage water behind coverings

Exhaust Muffler			
exhaust muffler used:	no	Part . No. of exhaust muffler:	
kind of exhaust muffler:			
picture, foto, sketch and / or description of	mounting direction, mounting place and mounting place:		

Fixing of Exhaust Line			
mounting parts heat resist >300°C:	yes	heat insulation provided:	no
vibration reduction provided:	no	Art. No. of heat insulation:	
picture, foto, sketch and / or description of	exhaust line fixations and heat insulation:		



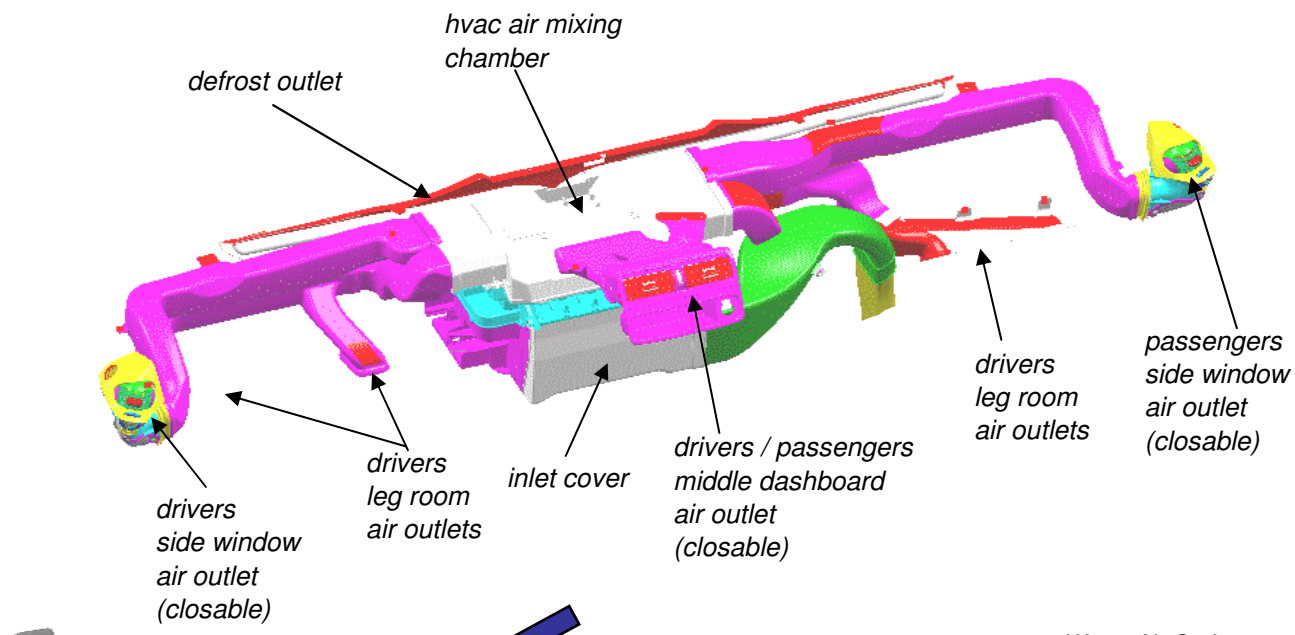
The exhaust line is generally designed with fix steel pipes and a short flex pipe for tolerance equation. Fixation points are at the heater assembly, at the vehicles back wall an the bottom plate.

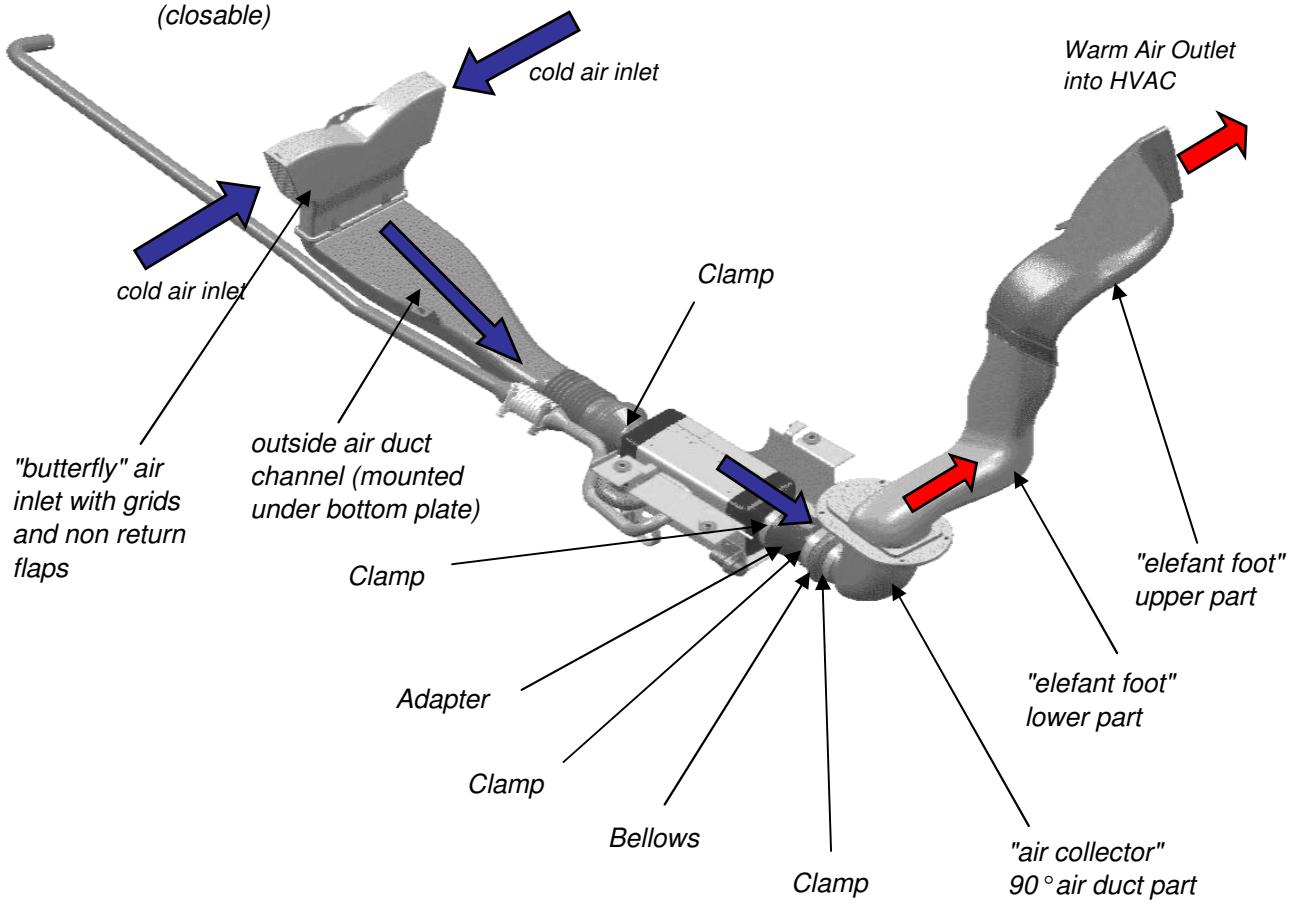
Air Duct System

Productcategory	Airheater	

Air duct system

Sketch, description or CAD-picture of the mounted air duct system :





Air duct design of installed product

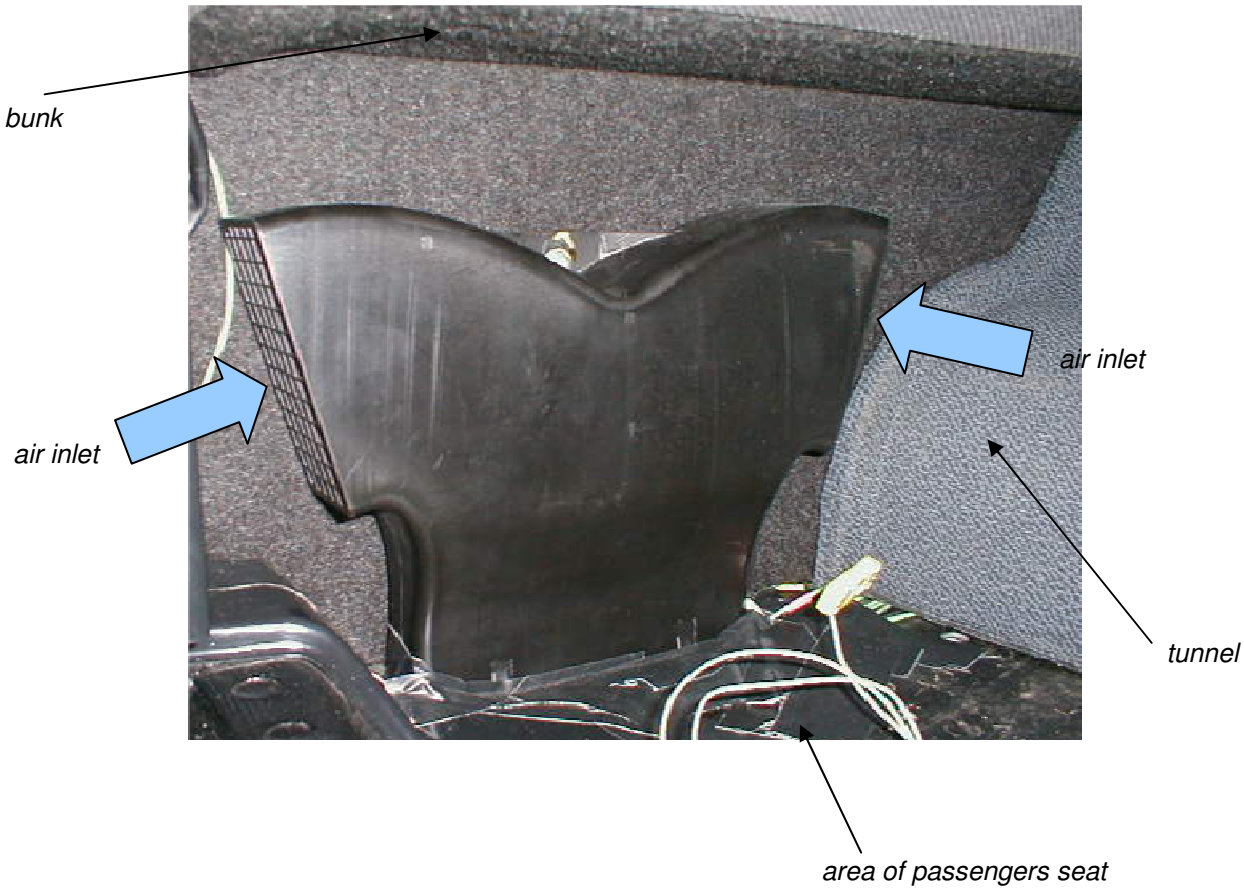
Type of air ducting:	*additional air ducts*	Air inlets and outlets protected by grids:	*both*
Standard Webasto parts used:	*no*	Special Webasto customer parts used:	*yes*
Customer parts used:	*yes*	Air outlets can be closed manually:	*yes*
Air duct parts installation area:	*inside and outside of cab.*	Air mode:	*circulation air*
Design of additional air duct:	*main line with branches*	Number of branches:	*6*
Sum of resistance points:	*unknown*	Permitted sum of points for product:	

Air Duct System

Suction side of air duct system

number of connections at suction side:		2	number of parts at suction side:			4
Part:	Inner-Ø(mm):	length (mm):	Material	Bend. angle	Resist. point	Part. No.
Inside air duct "butterfly"	min. 75	undefined	pp-h	no	undefined	
Outside air duct	min. 75	ca. 600	pp-h/ppepdm	1x90°	undefined	

picture, foto, sketch and / or description of suction side air inlet area:



Take-off area dust- / water protected:	yes	Take-off from cool ambient conditions:	yes
Short circuit with air outlet possible:	no	Pressure fluctuation at air inlet possible:	no
unintended plugging possible:	no	buckling or damaging of duct possible:	no

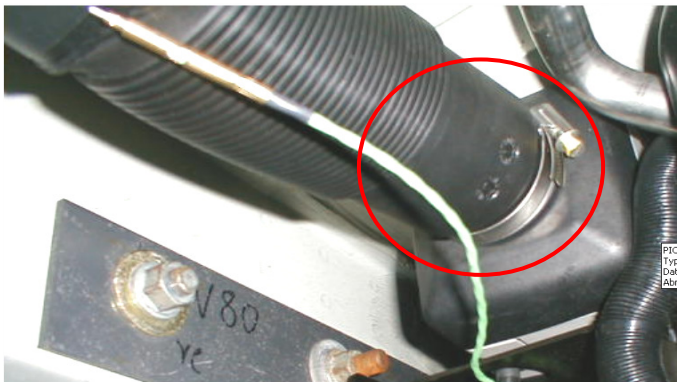
For full, particular or switched fresh air suction

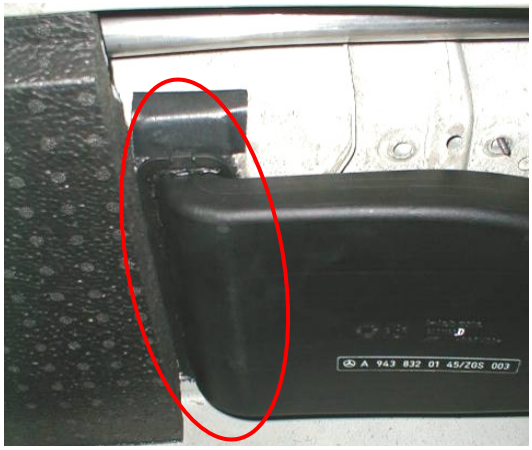
air inlet not in areas with possible exhaust gases (from heater or vehicle or other vehicles):			yes
Test done for exhaust gas concentration in cabine:	no	if yes: test report number	
protection of air inlet against damage, vandalism and intended manipulation :			yes

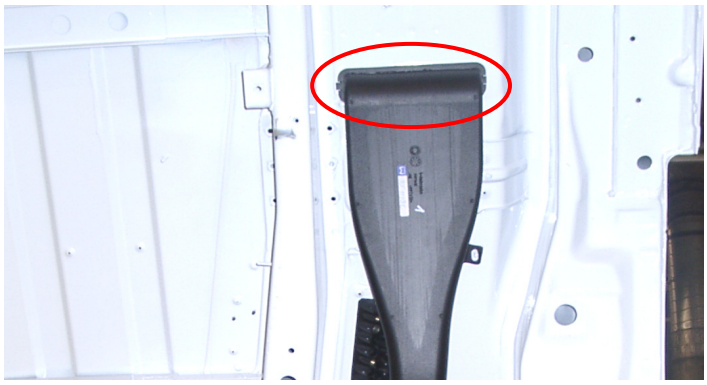
Air Duct System

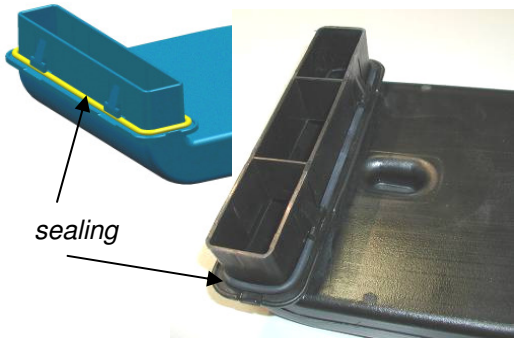
Tightness of suction side air duct system outside of cabine (without fresh air mode)		
number of connections outside of the cabine:	2	

picture, foto, sketch and / or description of critical connections:









Connections are near exhaust routing:	*yes*	Connections are near exhaust outlet:	*no*
protection of air duct against damage:	*yes*	approved parts acc. environment used:	*yes*
sealings acc. environment used:	*yes*	suitable clamps or fixations used:	*yes*
Environmental test done for suction side:	*no*	if yes: test report number	
shaker test done for suction side:	*no*	if yes: test report number	

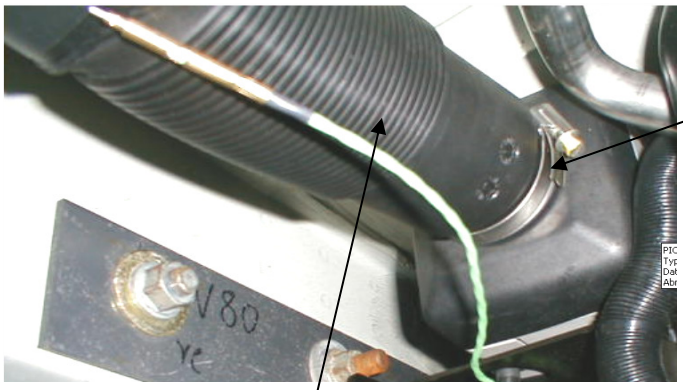
Suction side air inlet filter			
suction side air inlet filter used:	*no*	filter is changable:	
indicating label near filter installed:		service instruction for filter in manual:	

picture, foto, sketch and / or description of filter:

Air Duct System

Fixings and protection of suction side air duct system

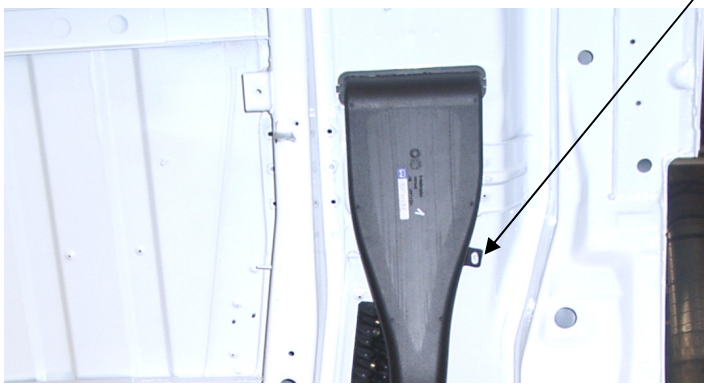
picture, foto, sketch and / or description of suction side air duct system fixations:

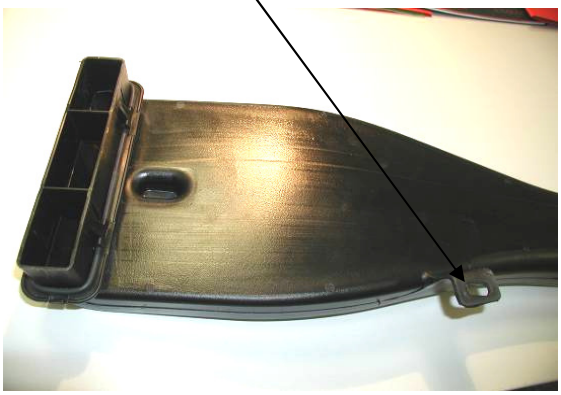


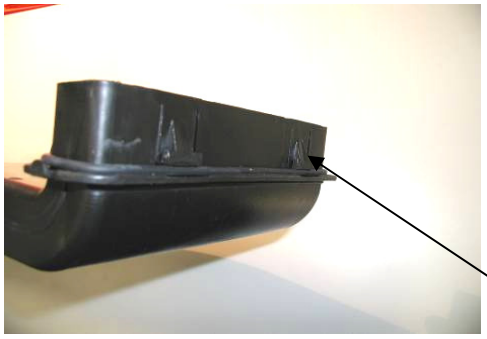
clamp

pretensioned bellows,

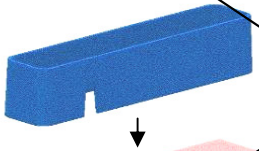
screwing point



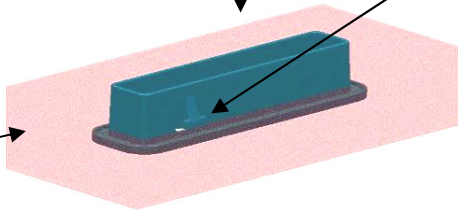




inside air duct (secondary locking the "noses")



"noses" are clipsing into bottom plate



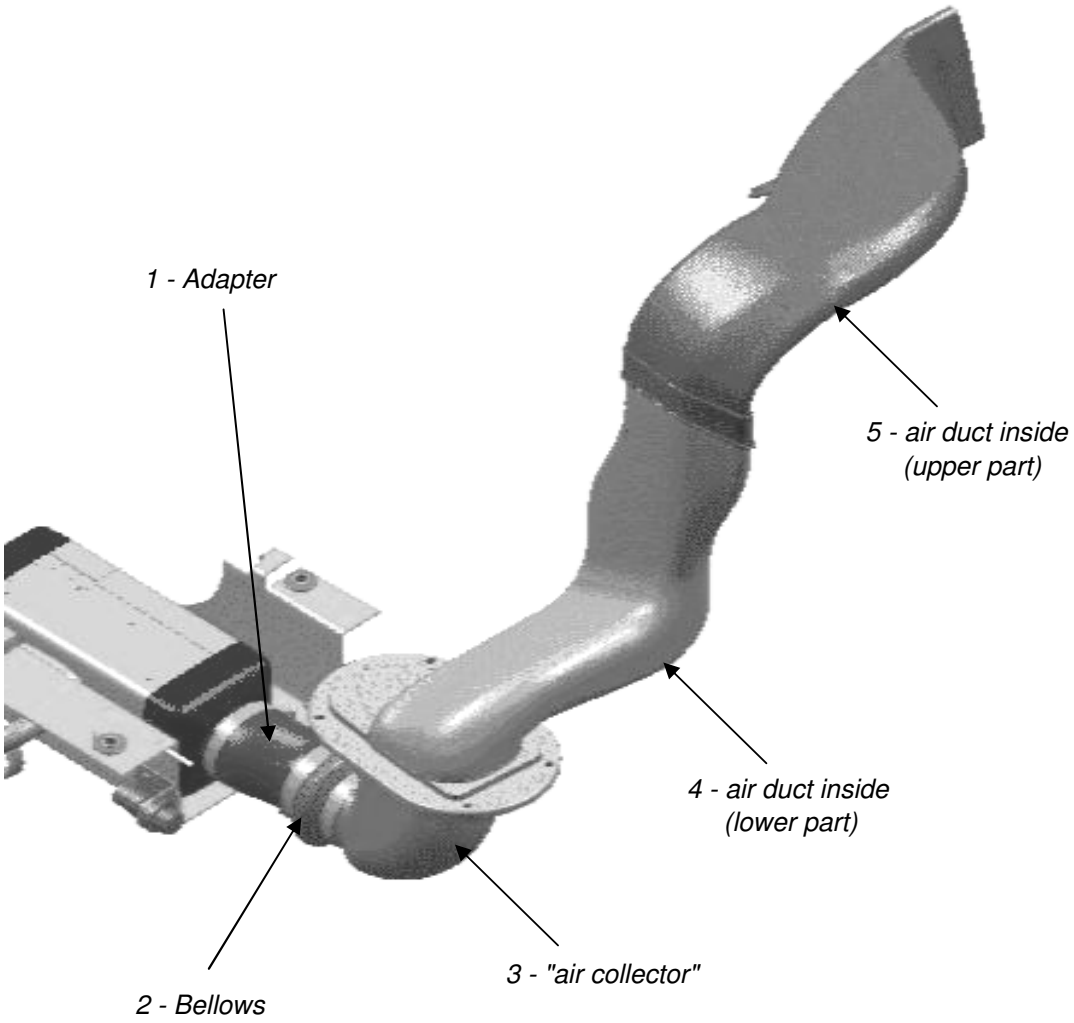
bottom plate

Air Duct System

Pressure side of air duct system

number of connections at pressure side:		6 (to HVAC)	number of parts at pressure side:			5
Part:	Inner-Ø(mm):	length (mm):	Material	Bend. angle	Resist. point	Part. No.
1 - Adapter	*ca. 75*	*ca. 90*	*PA 6.6 GF30*	*unknown*	*unknown*	
2 - Bellows	*ca. 75*	*ca. 50*	*EPDM*	*30 °*	*unknown*	
3 - "Air collector"	*min. 75*	*ca. 150*	*PP-TV20*	*90 °*	*unknown*	
4 - air duct inside (lower)	*min. 75*	*ca. 400*	*PP-TV20*	*90 °*	*unknown*	
5 - air duct inside (upper)	*min. 75*	*ca. 400*	*PP-TV20*	*180 °*	*unknown*	

picture, foto, sketch and / or description of pressure side air outlet area(s):

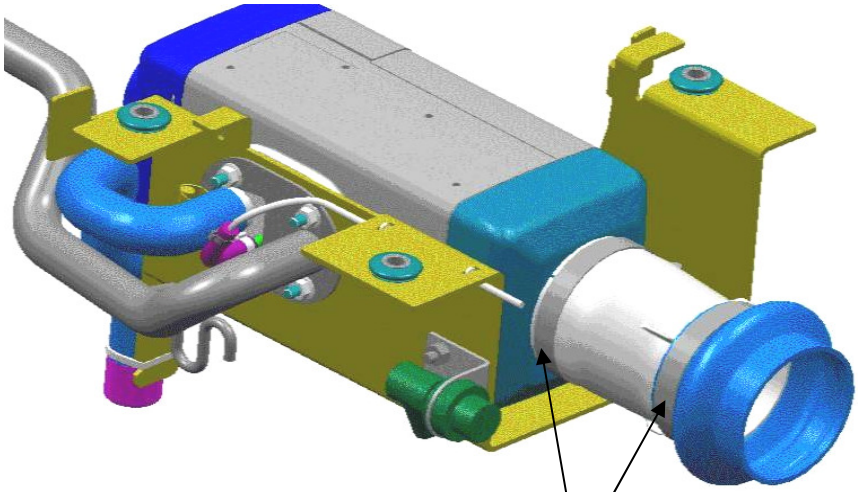


vehicle components or parts near outlets are dimensioned for high outlet temperatures:			*yes*
all air ducts temp. resist >150℃ :	*no*		
outlet positions prevent injuring:	*yes*	outlet grid(s) material non metal:	*yes*
due to one of the upper points heaters outlet temp. is reduced:	*yes*	to (℃)	*103*
unintended plugging possible:	*no*	buckling or damaging of duct possible:	*no*
outlet air duct is routed throug or near temperature sensitive areas, parts or components:			*no*

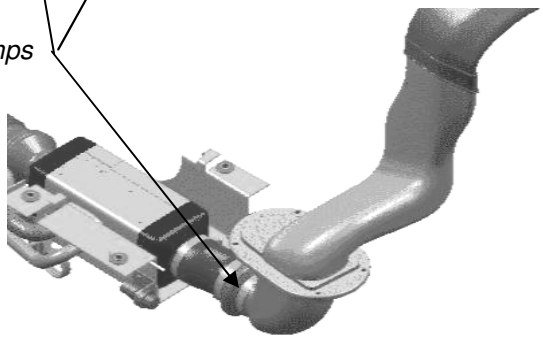
Air Duct System

Fixings of pressure side air duct system

picture, foto, sketch and / or description of pressure side air duct system fixations and gaskets:

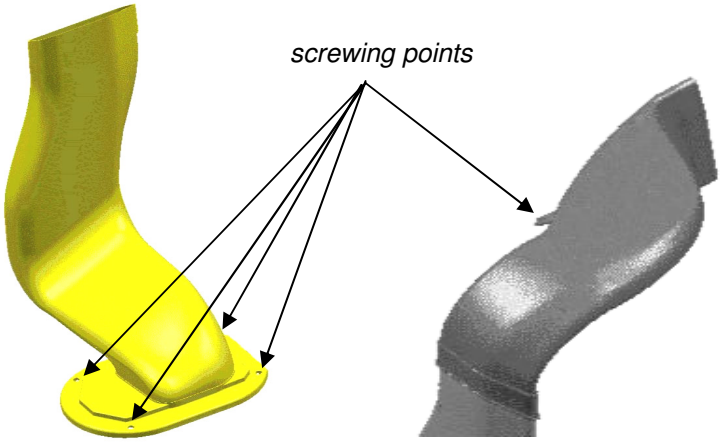


clamps



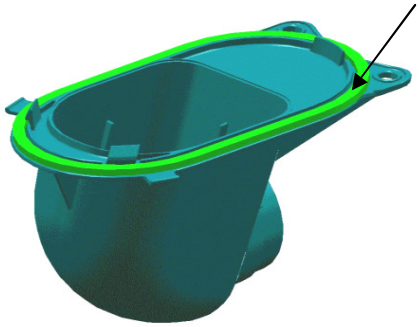
clipses into bottom plate

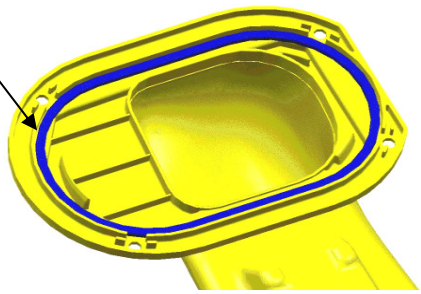
screwing points



screwing points

flat gaskets



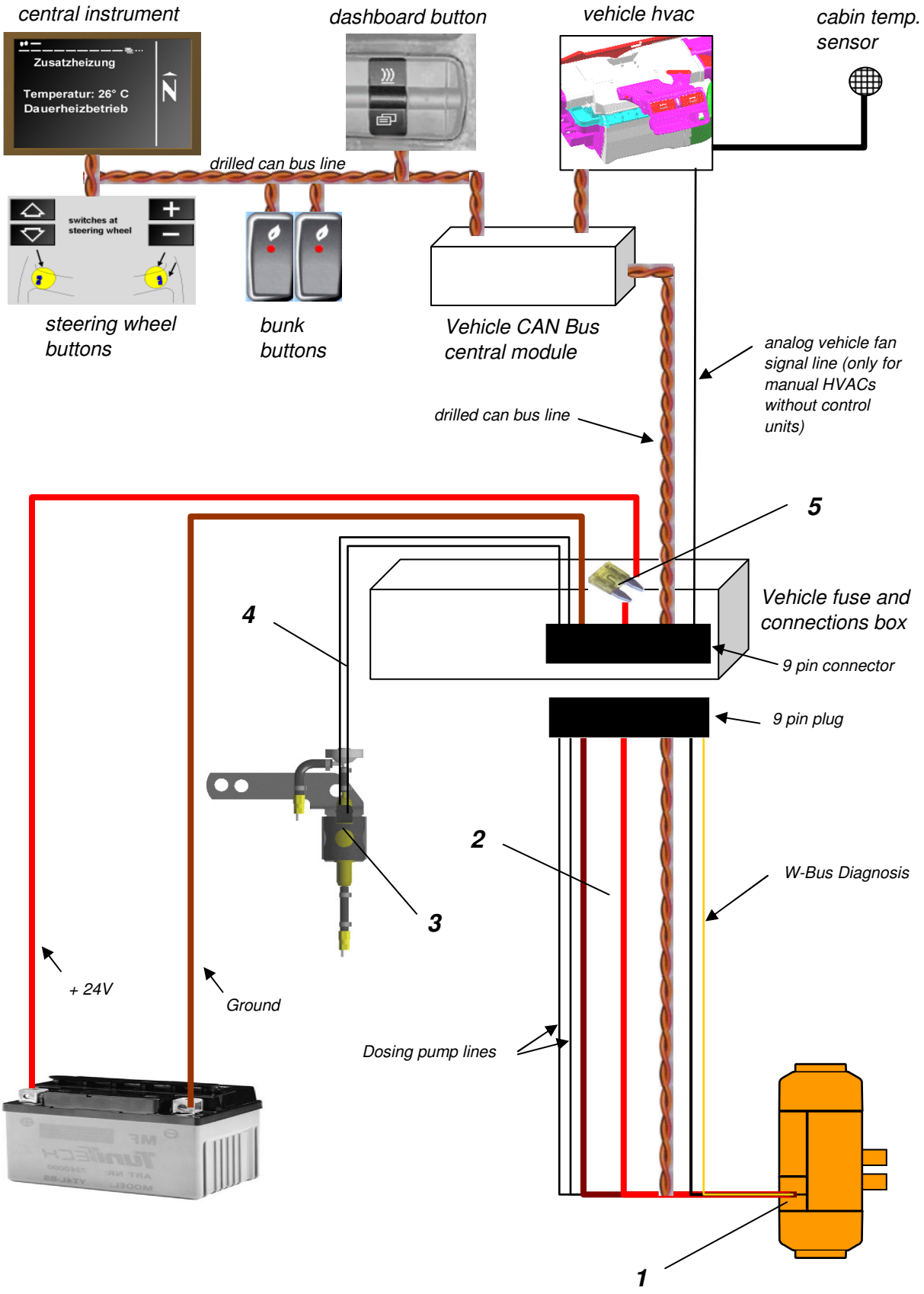


Electrical System

Productcategory	*Airheater*	

Electrical Scheme

Diagram, sketch, CAD-picture or description of the complete electrical system with parts:

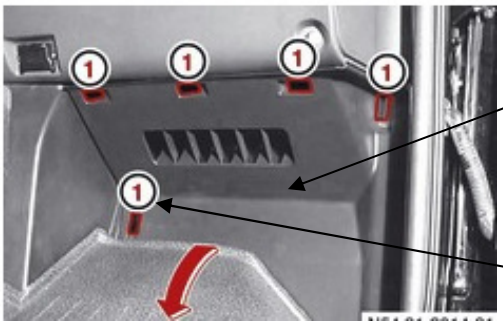


Electrical System

Part:	Remarks:	Part. No.
1 AT2000ST Heater Control Unit (CAN Bus)	*special programmed DAG CU*	
2 Cable harness	*from heater to vehicle fuse module*	
3 Dosing Pump DP30.2		
4 Dosing pump cable harness	*integrated into vehicles cable harness*	
5 Fuse20A	*integrated into vehicles fuse module*	
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

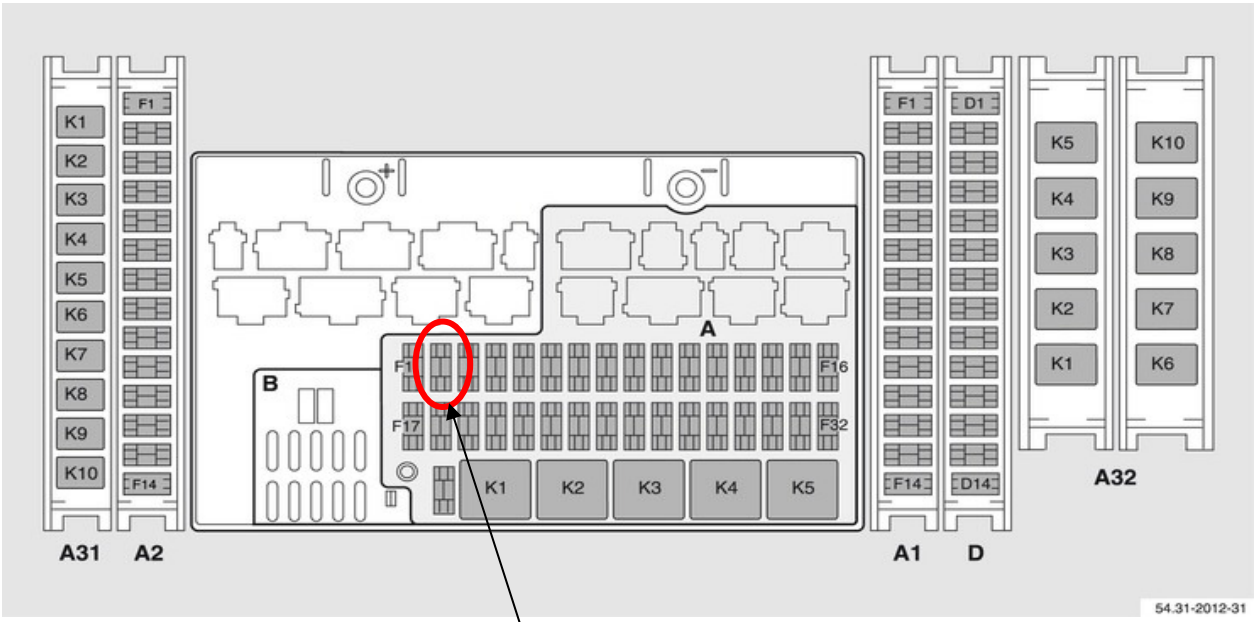
Fuses

Picture or description of the mounting areas of the Fuses:



Fuse area behind coverings at codrivers legroom

lockings for coverings



Vehicle Fuse Box

Fuse "F2" = parking heater = 20A

Electrical System

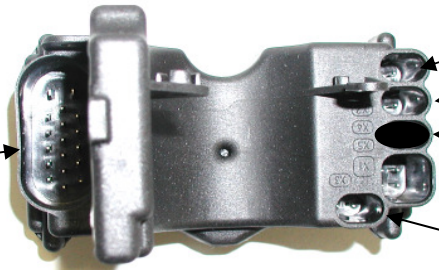
Fuse values

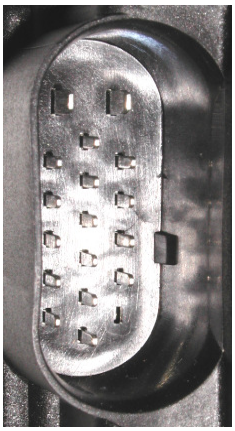
Fuse No.:	Value (A):	Fuse used for:	Remarks:
1 "F2"	*20 A*	*Heater*	*Fuse integrated into vehicle fuse box*
2			
3			
4			
5			
6			

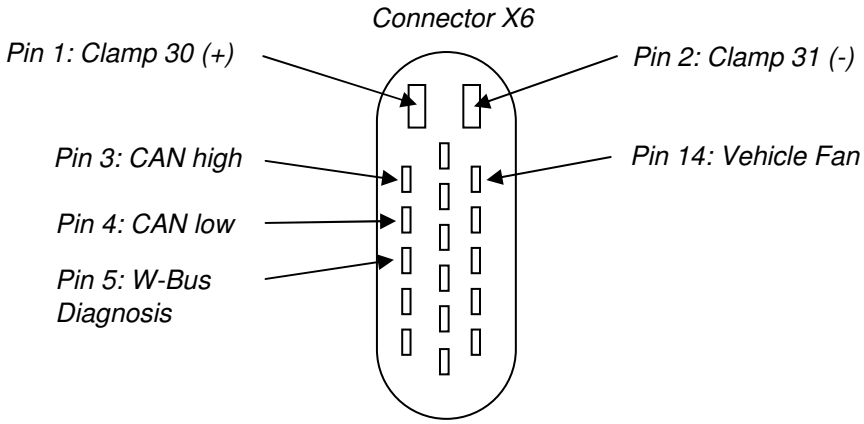
Heater / Cooler / Component Control Unit

Part No. of programmed control unit:	*9010860*	Type of CU:	*electronical (with CPU)*

Pinning scheme or picture and description of the programmed control unit:

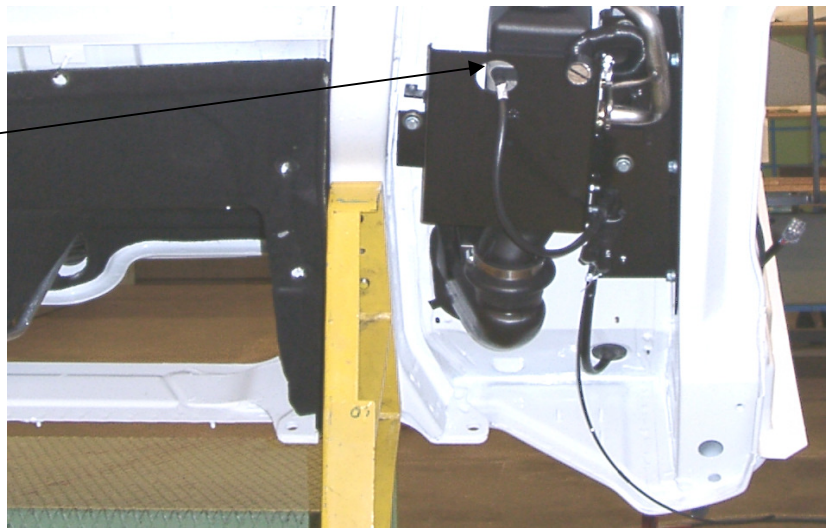






Picture, sketch or description of the heater connection / connection area (at vehicle):

while mounted heater, the connection of the cable harness at the control unit cannot be reached, heater and assembly has to be dismounted

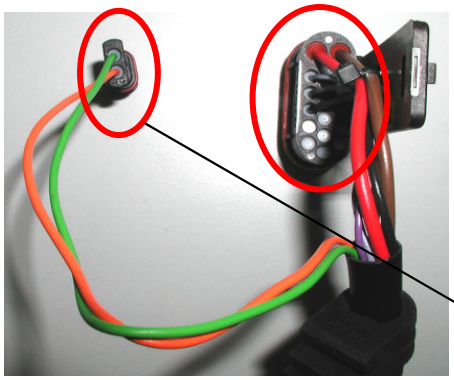


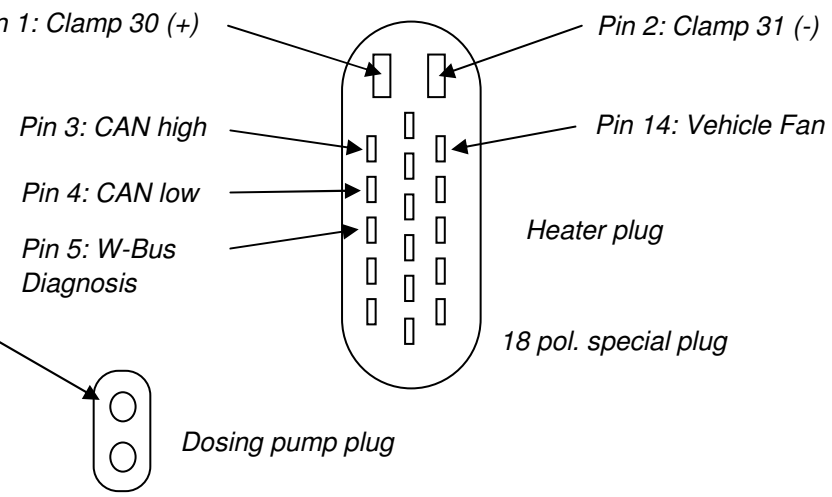
Electrical System

Connection of Heater / Cooler / Component to Vehicle

Connection to vehicle by: *special created adapter cable harness*

Pinning and plug(s) from special created adapter cable harness to heater (plug direction shown):

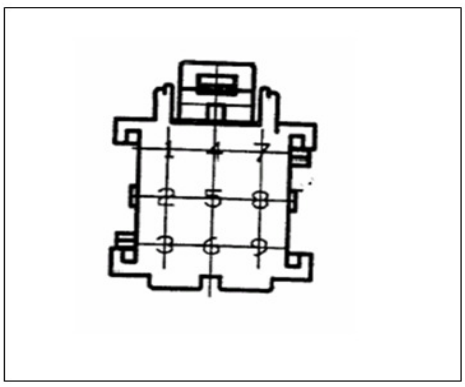




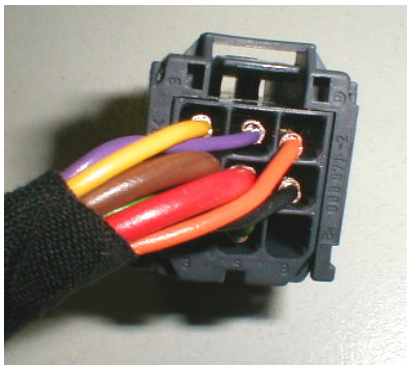
Cable Cross Sections and Colors of Heater Connection

from Pin	of	to Pin	of	mm²	Color
1	*18 pol. special plug*	*5*	*9 pol. AMP Plug*	*2,50*	*red*
2	*18 pol. special plug*	*2*	*9 pol. AMP Plug*	*2,50*	*brown*
3	*18 pol. special plug*	*3*	*9 pol. AMP Plug*	*0,75*	*grey*
4	*18 pol. special plug*	*4*	*9 pol. AMP Plug*	*0,75*	*violet*
5	*18 pol. special plug*	*8*	*9 pol. AMP Plug*	*0,75*	*black*
14	*18 pol. special plug*	*1*	*9 pol. AMP Plug*	*0,75*	*yellow*
1	*2 pol. special plug*	*6*	*9 pol. AMP Plug*	*0,75*	*green*
2	*2 pol. special plug*	*7*	*9 pol. AMP Plug*	*0,75*	*orange*

Pinning and plug of adapter cable harness to vehicle or vehicle cable harness:



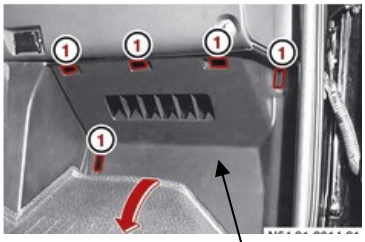
1 Fahrzeuggebläse
2 Klemme 31
3 CAN-High
4 CAN-Low
5 Klemme 30
6 Dosierpumpe Plus
7 Dosierpumpe Minus
8 W-Bus - Diagnose
9

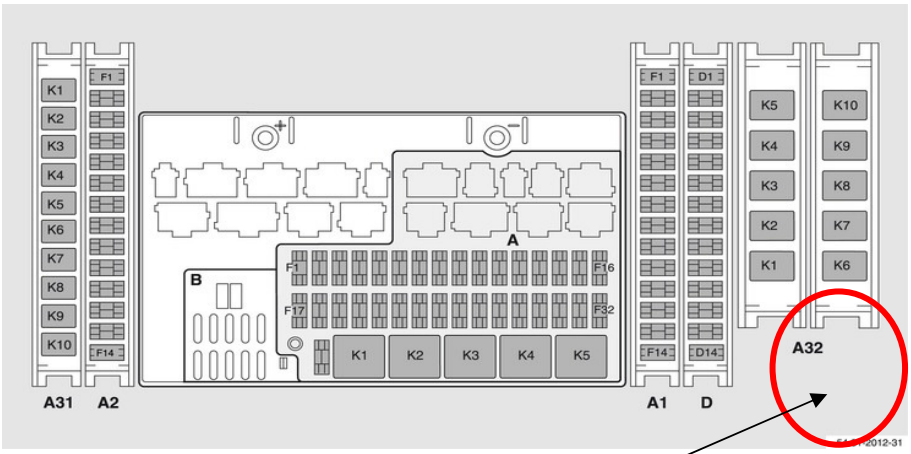


Electrical System

Connection of Heater / Cooler / Component to Vehicle

Picture, sketch or description of the connection / connection area from adapter cable to vehicle:





heater connection area is at the fuse box inside of the vehicle

Connection of Dosing Pump

minimum line length of dosing pump cable harness (mm):	*unknown*
maximum line length of dosing pump cable harness (mm):	*unknown*

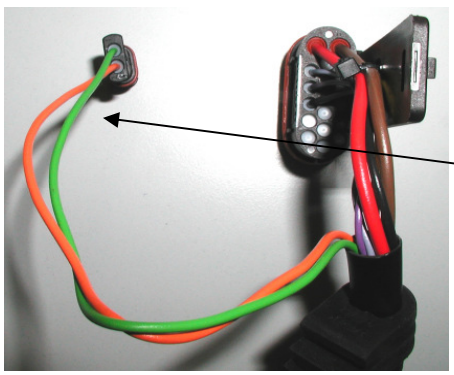
Picture, sketch or description of the connection / connection area of dosing pump cable harness:

cable harness of the dosing pump is integrated by the customer into customers vehicle cable harness

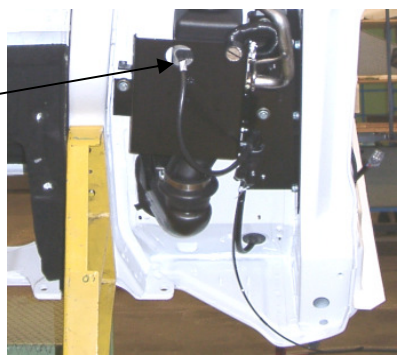
Cable Cross Sections and Colors of Dosing Pump Connection

from Pin	of	to Pin	of	mm²	Color
7	*Fuse box heater connector*	*1*	*dosing pump connector*	*unknown*	*unknown*
6	*Fuse box heater connector*	*2*	*dosing pump connector*	*unknown*	*unknown*

Picture, sketch or description of the connection / connection area of dosing pump cable to heater:



dosing pump connection is integrated into the special cable harness (and not routed through combustion air port of the heater).



Electrical System

Battery Main and Cut-Off Switches

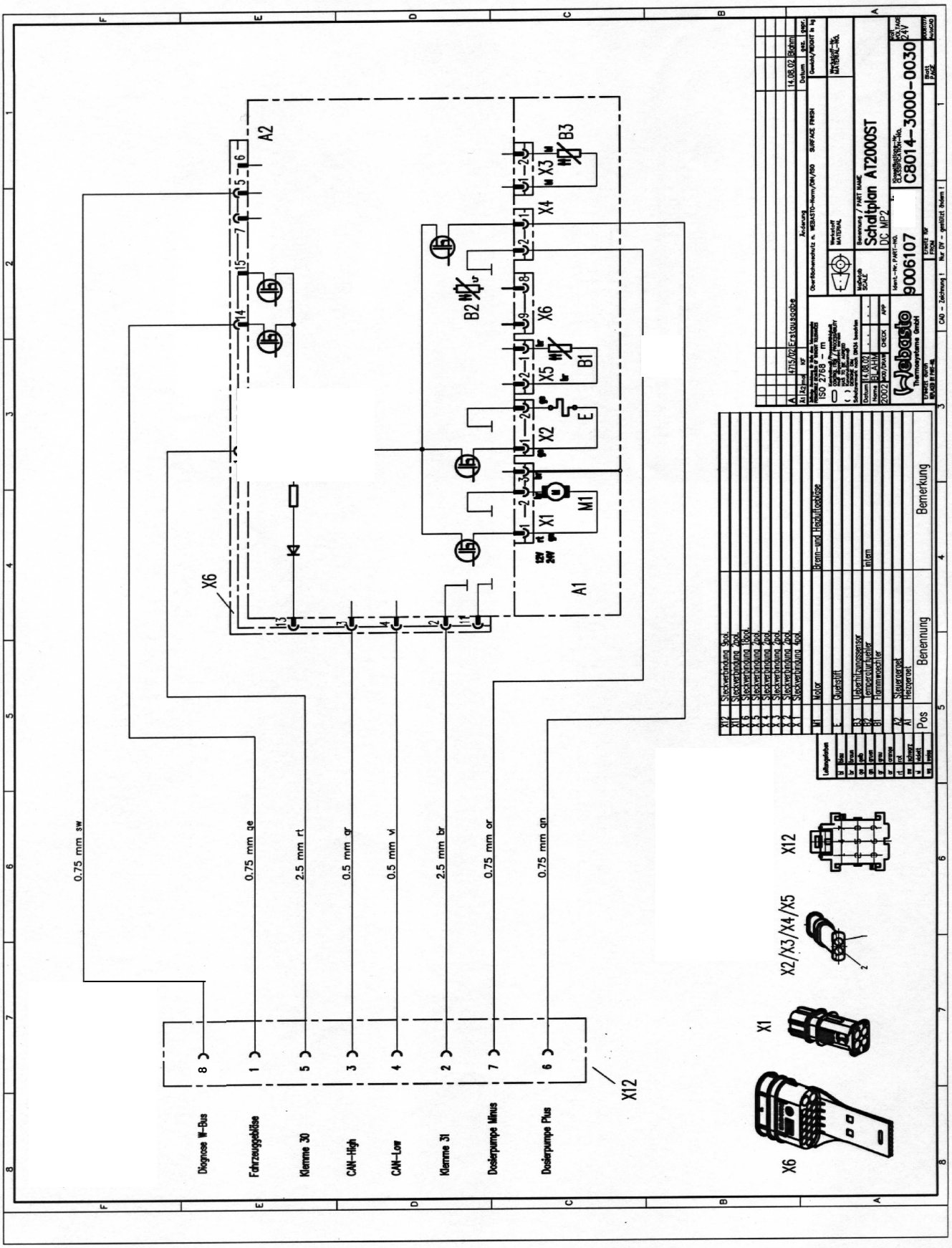
Description, scheme or sketch of handling switches to prevent heater cut off while heater operation:

Logical switch off is done by vehicle control unit. While heater running and cut off switch is used, cut off switch is hold closed, as long as heater finished his shutdown mode

Electrical System

electrical circuit drawings

Electrical circuit drawing for:	*Heater with cable harness*



Software, Parameters, Function

Productcategory	Airheater		

Part No. and Versions

Part No. of the unprogrammed Control Unit:	*1302425*	Part No. of Software:	*1302643*
Part No. of the programmed Control Unit:	*9010860*	Software Version:	*5.60*
Part. No. EOL -Dataset:	*9010324*	Part. Nr. Test Bench Dataset:	*9010660*
Part. No. PPD (Test Dataset):		Part. Nr. APPD (Applic. Test Dataset):	
Software is different to standard aftermarket heater/cooler/component version:	*yes*		
Differences to standard aftermarket datasets:	*application and basic heater param.*		

Application Parameters

Applikationsspezifische Parameter

1. Codierung allgemein

Benzin		Diesel	X
12V		24V	X
Halbhup DP		Blinkcode deaktiviert	
HS vor UB		BA abhängig HS	

2. Codierung ADR / Zusatzfunktionen

Automatische ADR Erkennung	X	Lüften	
Feste ADR - Initialisierung		Zwangsboost	
NA - Pegel HIGH		Multifunktionseingang	

3. Codierung Fahrzeuggebläse-Ansteuerung

Ansteuerung:		**Ansteuerart:**	
2-stufig	X	Leistungsabhängig	
3-stufig		Zeitabhängig	X
stufenlos		Temperaturabhängig	
Ansteuerung über:		**Verzögerungszeit RP:**	
CAN	X	Zeit (Min.)	2,5
PIN	X		
Schwellen:			
EIN-Schwelle (Min.)	0,5	AUS-Schwelle (Min.)	5
Delta Temp. EIN (°C)	110	Delta Temp. AUS (°C)	120

4.Codierung Steuergeräteausgang 1 / 2

Steuergeräteausgang 1:		**Steuergeräteausgang 2:**	
Batterietrennschalter		Batterietrennschalter	
Fahrzeuggebläse	X	Fahrzeuggebläse	
Betriebsanzeige		Betriebsanzeige	
		Master-Slave-Betrieb	

5. Codierung Temperatursensor / Drucksensor

Temperatursensor über CAN	X
automatische Erkennung ext. Sensor	
Brennermotor AUS in RP (nur mit ext. Sensor)	
Höhentauglichkeit (Drucksensor)	

6. Temperaturschwellen für Raumtemperatur-/Ausblastemperaturregelung

Hysterese Raumtemperaturregler:	
obere Regeltemp. RTO [°C]	2,5
untere Regeltemp. RTU [°C]	0,5
Ausblastemperaturregler:	
obere Grenze Ausblastemp. ATO [°C]	110
Sollwert Ausblastemp. ATR_MAX [°C]	100
untere Grenze Ausblastemp. ATU [°C]	45
Temperaturschwellen:	
Schwelle Warmstart (LPT), TWS [°C]	10
Schwelle Warmstart (UEHT), TUEWS [°C]	45
Schwelle Abkühlen, UEHT [°C]	100

7. Unter / Überspannungsschwelle

Unterspannungsschwelle [V]	21	Überspannungsschwelle [V]	31
Zeit für Unterspannung [s]	20	Zeit für Überspannung [s]	6

8. Überhitzungsschutz

Gradiententenschwelle UEHS [K/s]	1	Überhitzungsschwelle [°C]	152
Gradiententenschwelle Applikation [K/s]	0,9	max. Temp. LPT [°C]	42

9. Fehlerhandling

max. Anzahl Flammabbrüche	6	Anzahl Fehlstarts	7
max. Anzahl Störungen	3	Zykluswiederholzähler	3
max. Anzahl Überhitzungen	99	Zeit für ZWZ	2

Red = differences to standard parameter set (AT2000ST 24V D Standard)
Comparison: 9010324H12 <-> 9012660D03

Software, Parameters, Function

Additional Functions

Automatic ADR Initialisation:

- dependent onto vehicle type (ADR or not) CAN data is sent to heater. Heater is initialized as ADR heater or not.

Automatic Start (only for automatic HVACs):

- heater starts automatic for additional heating, when several environment and signal conditions are valid:
** Running engine (D+ signal on)*
** Automatic HVAC on Position "Auto"*
** Cabin temperature < Set temperature*
** Ambient temperature < 5°C*
** Coolant temperature < 60°C*
** all conditions are valid > 120s*

Defrost Function:

- additional heating with running engine and with high fan levels:
** Coolant temperature < 30°C*
** Ambient temperature < 10°C*
** Cabin temperature < 20°C*
** Running engine (D+ signal on)*

Powermode:

- at cool cabin temperature and cabin heat up, heater trys to reach a predefined set temperature (which is higher than user set temperature) to get a better heat up performance
-> set temperature while powermode: 25 °C
-> maximum powermode time: 120 min
** difference between cabin- and users set temperature: 5 Kelvin*
** engine not running*
- including a standby suppression (at the end of the powermode, when the set temperature is lower than the actual temperature

Set temperature offset:

- there is a 3 K offset onto the users set temperature, to get better subjective heating performance

Standby suppression while and after vehicle fan operation:

- while heater is operating and vehicle fan is operated by heater, the heater standby of the cabin temperature regulation is suppressed

Software, Parameters, Function

possible problems, known troubles and other remarks

picture, foto, sketch and / or description:

Limitation of the heater outlet temperature to at the beginning 85° caused a lot of end customers trouble.
In some steps, outlet temperature was rised to actual 100°.

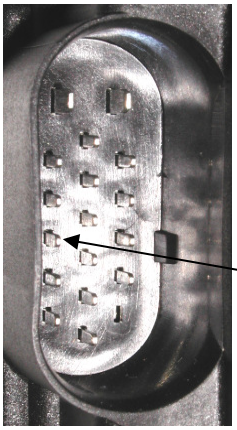
A update of older heaters (until Oktober 2005) can be done by Daimler AG workshops.

Diagnosis

Productcategory	Airheater		
Error Code Output by indicator :	*no*	Error code output "F….." by timer:	*no*
Heater / cooler / component diagnosable by Webasto diagnosis:	*yes*	Type:	*W-Bus*
special Customer diagnosis integrated:	*yes*	Cust. diagnosis protocol:	*special customer CAN*

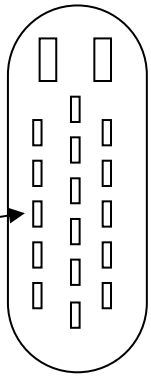
Access points to diagnosis

1. At control unit

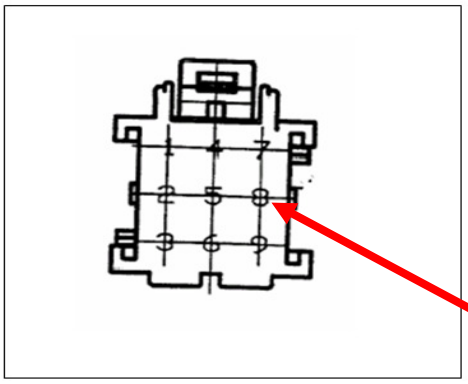


Pin 5: W-Bus Diagnosis

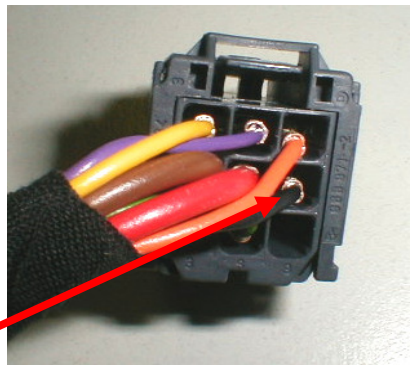
Connector X6



2. At cable harnesses



1 Fahrzeuggebläse
2 Klemme 31
3 CAN-High
4 CAN-Low
5 Klemme 30
6 Dosierpumpe Plus
7 Dosierpumpe Minus
8 W-Bus - Diagnose
9



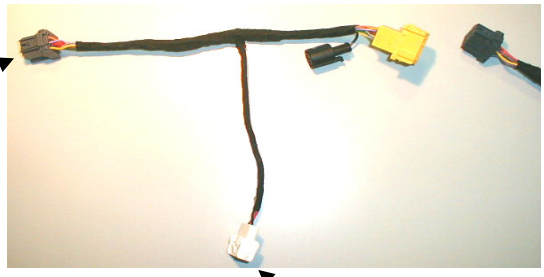
W-Bus Diagnosis pin

Diagnosis Adapter Cable Harness

special Webasto adapter cable harness for diagnosis available:	*yes*	Part. No.:	*9006911*

Picture, description or sketch of adapter cable harness and how to use it:

plug into vehicle fuse box connection



heater cable harness

connection to Webasto diagnosis box (power supply for diagnisis box is already included!)

Diagnosis

Diagnosis Procedure

Description of diagnosis procedure if different from standard:

heater diagnosis is running, when heater gets power; it is not necessary to switch heater on to get a diagnosis and data connection

Error Codes

additionally to the standard error codes, (codes will be shown in clear text at the diagnosis) there are some more codes, which are shown at diagnosis with "customer specific error No. xx (german: Kundenspezifischer Fehler Nr. xx). Following shown are the total possible error codes:

Nr.	Fehler	Bedingungen, unter denen der Fehler auftritt
1	Steuergerätefehler / falscher Parametersatz	SG mit falschem Parametersatz programmiert.
2	Kein Start	Kein Kraftstoff vorhanden
3	Brennermotor Blockierschutz	Brennermotor läuft aufgrund einer Blockade nicht.
4	Flammabbruch (wiederholt)	Der Verdampfer, der Brenner oder die Brennstoffzufuhr arbeitet nicht korrekt.
5	Überspannung (Warnung)	Batterie ist nicht in Ordnung.
6	Unterspannung (Warnung)	Batterie ist nicht in Ordnung.
7	Vorzeitige Flammerkennung	Der Verdampfer, der Brenner oder die Brennstoffzufuhr arbeitet nicht korrekt.
8	Wasserpumpe Unterbrechung Kurzschluss nach Ub (nur Wasser-HG)	Versorgungsleitung der Wasserpumpe ist unterbrochen oder gegen Batterie-Pluspol kurzgeschlossen.
9	Wasserpumpe Kurzschluss nach Masse (nur Wasser-HG)	Versorgungsleitung der Wasserpumpe ist nach Batterie-Minuspol kurzgeschlossen.
12	Dosierpumpe Unterbrechung	Die Versorgungsleitung der Dosierpumpe ist unterbrochen.
13	Dosierpumpe Kurzschluss nach Masse	Die Versorgungsleitung der Dosierpumpe ist gegen Batteriepluspol kurzgeschlossen.
14	Brennermotor Unterbrechung Kurzschluss nach Ub	Versorgungsleitung des Brennermotors ist unterbrochen oder gegen Batterie-Pluspol kurzgeschlossen.
15	Brennermotor Kurzschluss nach Masse, Überlastung	Versorgungsleitung des Brennermotors ist nach Batterie-Minuspol kurzgeschlossen.
16	Glühstift oder Flammwächter Kurzschluss nach Masse	Versorgungsleitung des Glühstifts oder Flammwächters ist nach Batterie-Minuspol kurzgeschlossen.
17	Glühstift oder Flammwächter Unterbrechung nach Ub	Versorgungsleitung des Glühstifts oder Flammwächters ist unterbrochen oder gegen Batterie-Pluspol kurzgeschlossen.
18	Überhitzung	Die Kühlmittelzufuhr in ausreichendem Maße ist nicht gewährleistet oder HG ist verdämmt.
21	Fahrzeuggebläserelais Kurzschluss	Das Fahrzeuggebläserelais arbeitet nicht mehr korrekt.
22	W-Bus Kommunikationsfehler	W-Bus Kommunikationsleitung ist unterbrochen oder ein elektronischer Baustein für die W-Bus Kommunikation arbeitet nicht korrekt.
23	Nicht belegt	
24	Kundenbus Kommunikation fehlerhaft	CAN-Bus Kommunikationsleitungen sind unterbrochen oder ein elektronischer Baustein für die CAN-Bus Kommunikation arbeitet nicht korrekt.
25	Nicht belegt	
26	Nicht belegt	
27	EEPROM-Checksummenfehler	Datensatz im EEPROM ist falsch programmiert oder EEPROM ist defekt.
28	Flammabbruch 2	
29	Heizgeräteverriegelung	Aufgrund eines Fehlers ist die Funktion des HGs nicht mehr gewährleistet.
30	Heizgeräteverriegelung permanent	Aufgrund eines schwerwiegenden Fehlers ist die Funktion des HGs nicht mehr gewährleistet.
31	CAN Kommunikation IST_ALFTTEMP_GM nicht verfügbar	CAN-Bus Signal IST_ALFTTEMP_GM nicht verfügbar
32	CAN Kommunikation STA_KL_D_PLUS nicht verfügbar	CAN-Bus Signal STA_KL_D_PLUS nicht verfügbar
33	CAN Kommunikation SOLL_IRAUMTEMP_INS nicht verfügbar	CAN-Bus Signal SOLL_IRAUMTEMP_INS nicht verfügbar
34	CAN Kommunikation ANF_ZHE_INS nicht verfügbar	CAN-Bus Signal ANF_ZHE_INS nicht verfügbar
35	CAN Kommunikation IST_KÜHLWASSERTEMP nicht verfügbar	CAN-Bus Signal IST_KÜHLWASSERTEMP nicht verfügbar
36	CAN Kommunikation IST_IRAUMTEMP nicht verfügbar	CAN-Bus Signal IST_IRAUMTEMP nicht verfügbar
37	CAN Kommunikation SOLL_IRAUMTEMP nicht verfügbar	CAN-Bus Signal SOLL_IRAUMTEMP nicht verfügbar
38	falsch codiertes Steuergerät	Das SG ist falsch programmiert.
39	Neutral oder gesperrt codiert	Das SG ist falsch programmiert.
41	Temperatursensor Kurzschluß	1) Die beiden Anschlußdrähte des Temperatursensors sind durch Feuchte oder Dreck kurzgeschlossen. 2) Der Temperatursensor ist defekt.
42	Temperatursensor Unterbrechung	1) Mindestens einer der beiden Anschlußdrähte des Temperatursensors ist z.B. durch einen Riß auf dem PCB unterbrochen. 2) Der Temperatursensor ist defekt.
43	LP-Temperatursensor Kurzschluß	Die beiden Anschlußdrähte des LP-Temperatursensors sind kurzgeschlossen.
44	LP-Temperatursensor Unterbrechung	Mindestens einer der beiden Anschlußdrähte des LP-Temperatursensors ist unterbrochen.
45	Brennluftgebläse schwergängig (nur Luft HG)	Der Motor des Brennluftgebläses wird blockiert oder ist defekt.
46	Batterietrennschalter Kurzschluß	Der Batterietrennschalter ist defekt oder die Zuleitung ist kurzgeschlossen.
47	üHS-Gradient zu groß	HG ist verdämmt.
48	üHS-Gradient zu klein	Temperatursensor ist falsch montiert.
49	Sollwertpoti Unterbrechung	
50	Überhitzungssensor Kurzschluß	Die beiden Anschlußdrähte des Überhitzungssensors sind kurzgeschlossen.
51	Überhitzungssensor Unterbrechung	Mindestens einer der beiden Anschlußdrähte des Überhitzungssensors ist unterbrochen.
52	Definitionsfehler Ablauf	SG ist defekt.

Text is only available in German

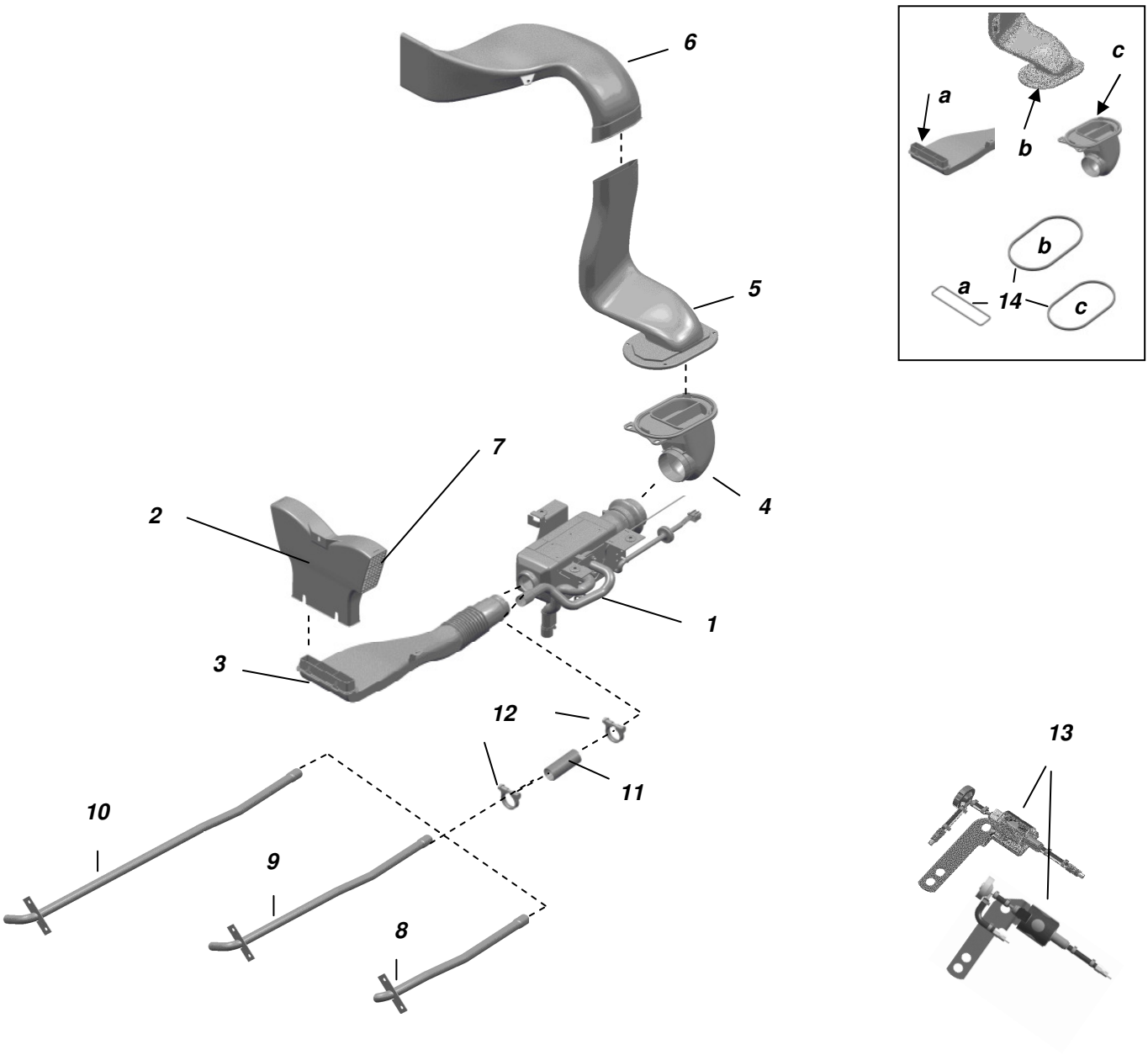
Note: you can also isert a screenshot or picture for error codes

Spare Parts List

Productcategory	Airheater	

Special created customer spare parts (1)

Spare parts for: ***Assemblies and delivery kits***

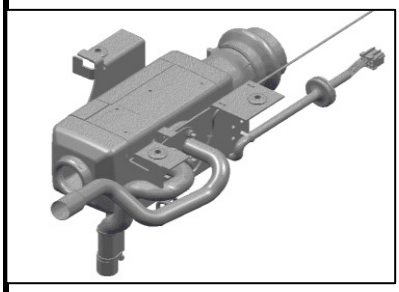


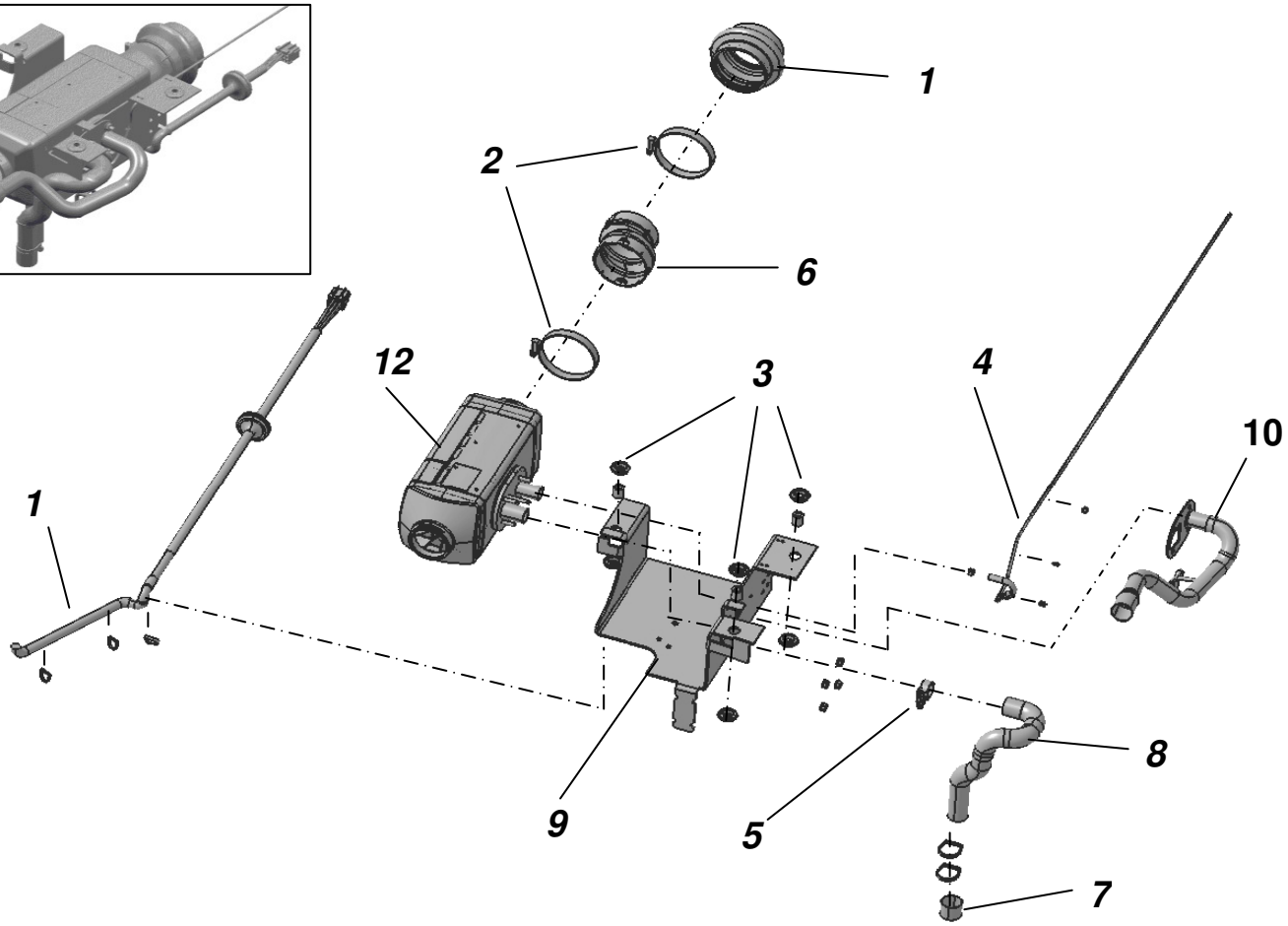
No.	Part No.	Part Name	Customer No.	altern.Webasto spare part	only OE
1	9010542	Assembly AT2000ST LH	A 943 830 09 61	no	yes
2	9000329	Inside Suction Air Duct	A 943 832 00 45	no	yes
3	9000333	Outside Suction Air Duct	A 943 832 01 45	no	yes
4	9000327	Air Collector	A 943 832 03 45	no	yes
5	72138	Inside Air Duct Lower Part	A 943 830 06 44	no	yes
6	72137	Inside Air Duct Upper Part	A 943 831 09 45	no	yes
7	9010367	Air Inlet Grid (with Filter)	A 000 835 43 18	no	yes
8	9007261	Exhaust Pipe S LH	A 943 835 08 15	no	yes
9	9007263	Exhaust Pipe M LH	A 943 835 10 15	no	yes
10	9007265	Exhaust Pipe L/LH LH	A 943 835 12 15	no	yes
11	9003120	Flexible Pipe Di 30 - 100	A 943 987 00 27	no	yes
12	9003206	Exhaust Clamp Di 33..36	A 008 997 59 90	no	no
13	9002300	Dosing Pump Assembly	A 001 470 55 94	no, Info: - Dez. 2008	yes
13	9019832	Dosing Pump Assembly	A 002 470 32 94	no, Info: Dez. 2008 -	yes
14	9005885	Air Duct Gaskets	A 000 830 14 98	no	yes

Spare Parts List

Special created customer spare parts (2)

Spare parts for: ***Heater Assembly***



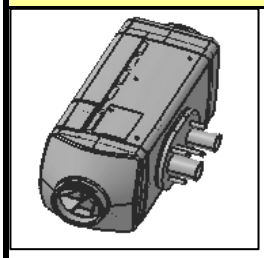


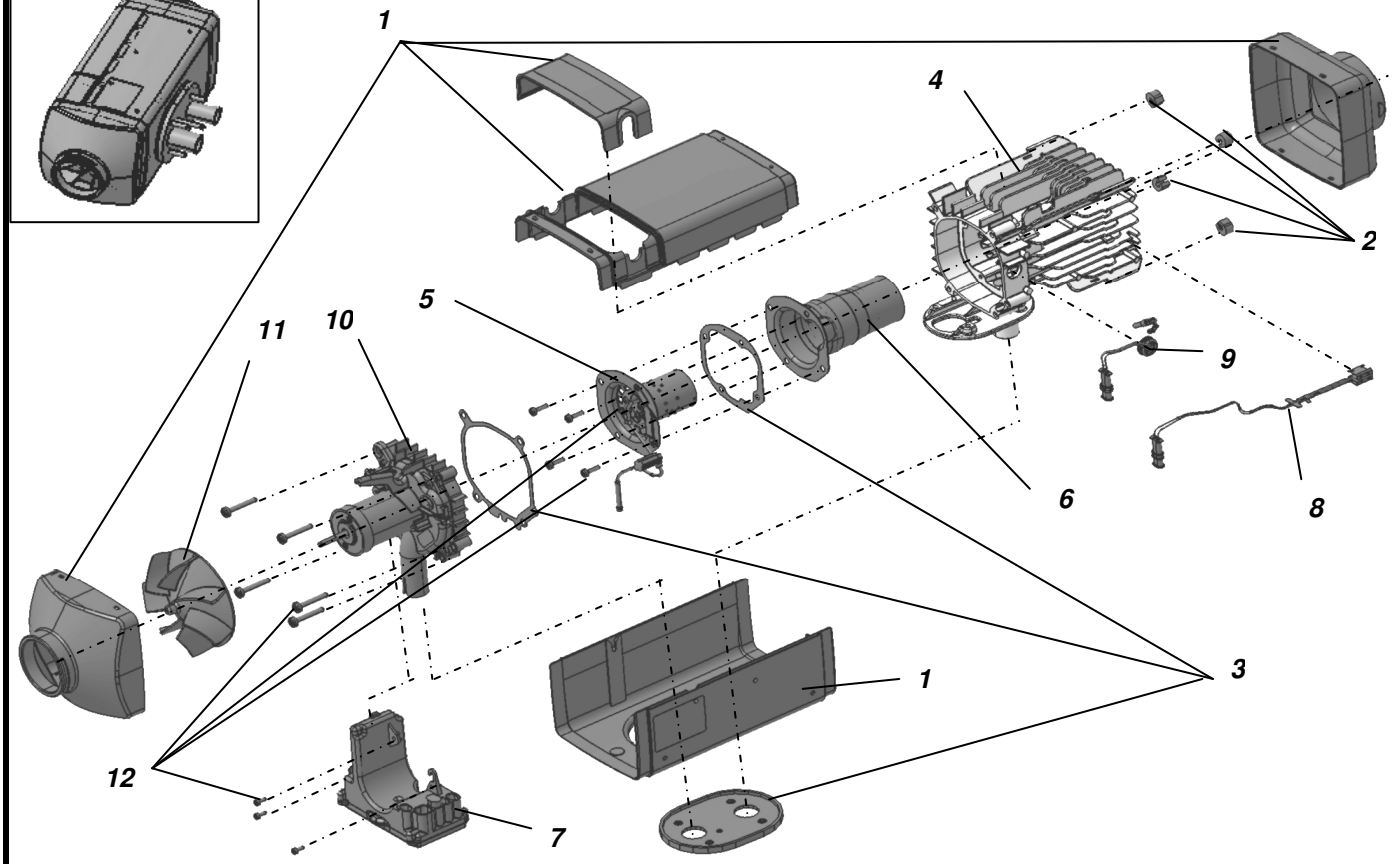
No.	Part No.	Part Name	Customer No.	altern.Webasto spare part	only OE
1	9005863	Bellows	A 000 975 02 47	no	yes
2	9007547	Hose Clamp Di 70 - 90	A 000 995 46 10	see Webasto Access. List	no
3	9005864	Bag Decoupling Elements	A 000 832 03 54	no	yes
4	9005865	Bag Fuel Supply Parts	A 000 830 52 96	see Webasto Access. List	no
5	9005870	Clamp for comb. air duct	A 000 995 47 10	see Webasto Access. List	no
6	9005866	Air Duct Connector	A 000 997 09 76	no	yes
7	9005867	Protection Cap D27	A 000 831 10 29	see Webasto Access. List	no
8	9005868	Flex Pipe PAK 22 -380	A 000 832 05 16	see Webasto Access. List	no
9	9005872	Bracket	A 000 830 01 10	no	yes
10	9005873	Exhaust Pipe	A 000 835 53 15	no	yes
11	9005874	Cable Harness	A 000 540 22 35	no	yes
12	9011676	Spare Part Heater	A 007 830 06 61	no	yes

Spare Parts List

Special created customer spare parts (3)

Spare parts for: ***Heater***





No.	Part No.	Part Name	Customer No.	altern. Webasto spare part	only OE
1	9014258	Housing cpl.	A 000 831 08 44	see Webasto SP List	no
2	9011686	Spacers	A 000 830 59 14	see Webasto SP List	no
3	9014259	Bag Heater Gaskets	A 000 830 30 98	see Webasto SP List	no
4	9011688	Heat Exchanger	A 003 835 91 01	see Webasto SP List	no
5	9011689	Burner (without Glow Plug)	A 000 830 17 59	see Webasto SP List	no
6	9005922	Combustion Tube	A 000 835 13 69	see Webasto SP List	no
7	9011677	Control Unit 24V CAN	A 001 446 11 29	no	yes
8	9005924	Overheating Sensor	A 001 830 32 72	see Webasto SP List	no
9	9005925	Glowplug	A 000 835 42 26	see Webasto SP List	no
10	9011690	Drive (general OE Version)	A 003 830 14 08	see Webasto SP List	no
11	9011691	Fan	A 000 835 82 04	see Webasto SP List	no
12	9015888	Bag Screws	A 000 990 65 99	see Webasto SP List	no