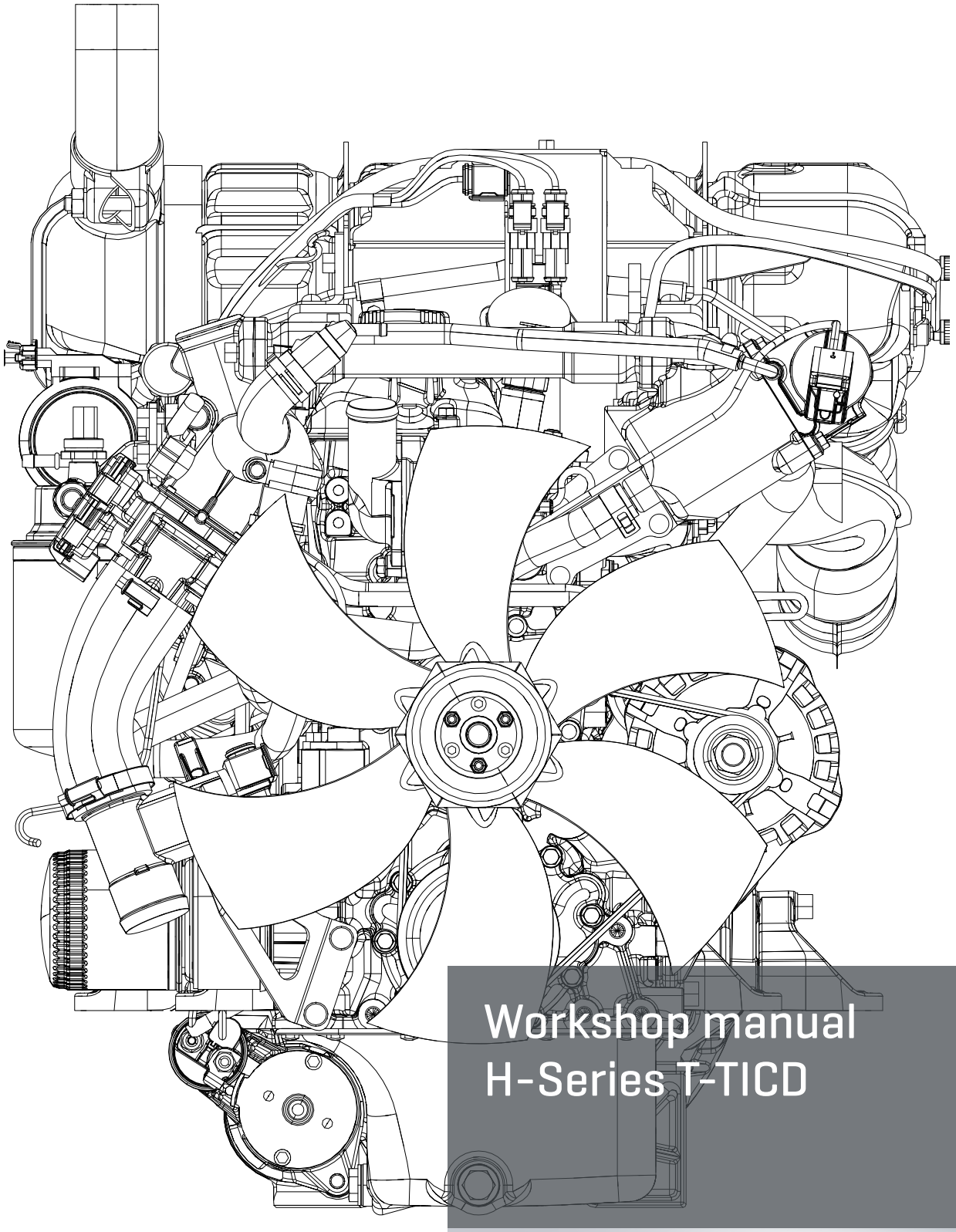
SERVICE

CREATING
POWER
SOLUTIONS

HATZ



Workshop manual
H-Series T-TICD

Hatz Service Solutions

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01
General

We can accept no liability of any kind for any consequential damage caused by improper repair (especially on emission-related components such as the injection system, crankcase ventilation, piston, etc.). For this reason, we recommend:

Have service work performed by qualified technicians only. We recommend that you work with one of the more than 500 HATZ service centers [network.hatz.com]. There, regularly trained personnel will repair your machine using Hatz original spare parts and HATZ tools.

01.1 Legal notices

Contact data

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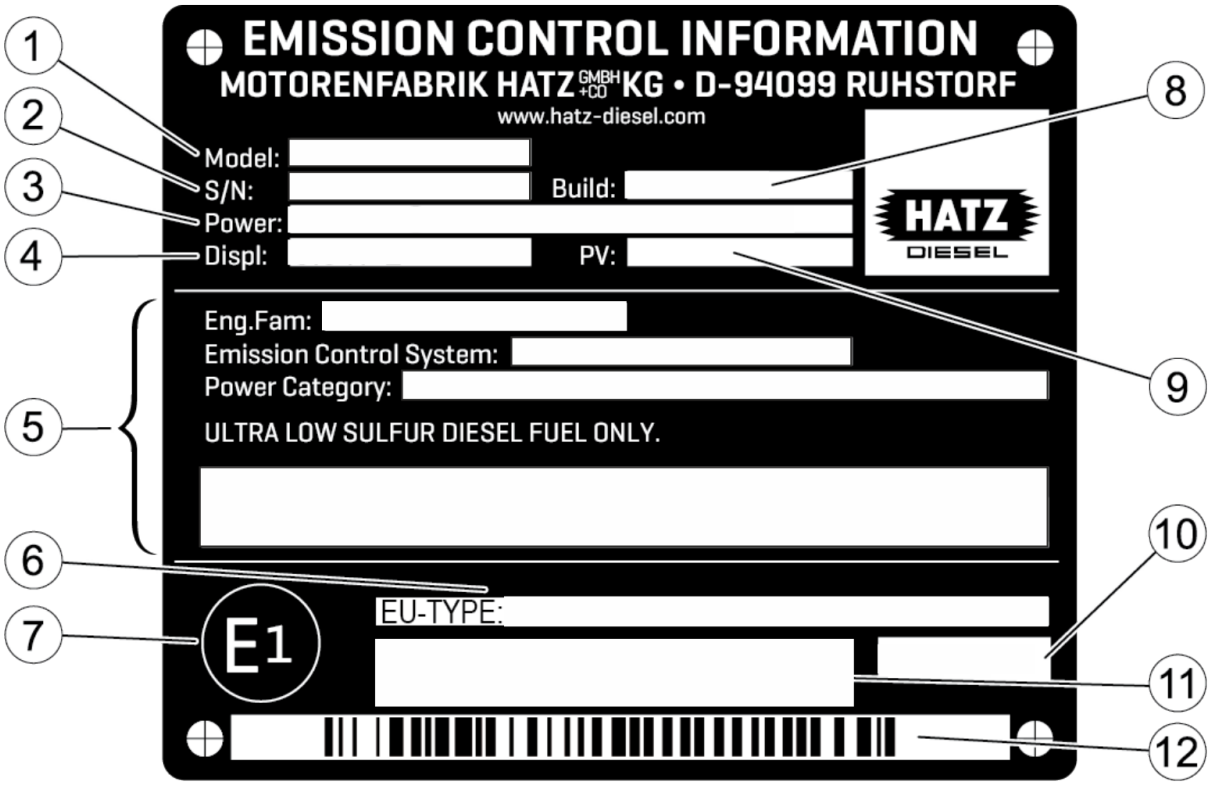
Original manual

This manual has been translated into multiple languages. The German version is the original manual.

All other language versions are translations of the original manual.

01.2 Engine type plate



Pos.	Designation
1	Model designation of the engine
2	Engine serial number
3	Engine power [kW] and rated speed [rpm]
4	Displacement [liters]
5	Information for emission certification [EPA/CARP]
6	EU type approval number
7	EU country of origin [Germany]
8	Model year [month/year]
9	Test specification for special setting
10	Code for type plate variant
11	Additional data [incl. "Seperate Shipment Information"]
12	Barcode [engine serial number]

01.3 General information

This Workshop Manual corresponds to the technical status as stated on each page (month/year). It has been written in such a way that only a trained mechanic (instructed yearly) can perform all repairs trouble-free.

Notes on how to clean parts, etc., have been omitted, as it is taken for granted that this is known and will be accomplished.

Repairs on the engine should always be performed without tension.

All work may only be performed with the specified Hatz special tools or absolutely equivalent tools. Standard "manual tools" are assumed to be available.

With regard to service work, operating materials, etc., we advise you to consult the Diesel Engine Operator's Manual. For troubleshooting, the Diesel Engine Operator's Manual and the HDS² is recommended. Only use Hatz original spare parts for repairs! Only these parts guarantee problem-free functioning and quality.

In addition, the general statutory regulations and those of the responsible professional trade associations apply.

Potential discrepancies due to special equipment are possible and can neither be accounted for in the Repair Manual nor in the Spare Parts list.

If any problems come up, please contact your nearest HATZ service center [network.hatz.com].

Torques and screw classification

To ensure correct screw connections, the "Torques + classification 056758XX_H50" list must be abided by every time installation work or repairs are performed.

For a category A screw connection, there are additional requirements that need to be adhered to.

The newest list can be found at www.hatz.com/docu.

01.4 Symbols used

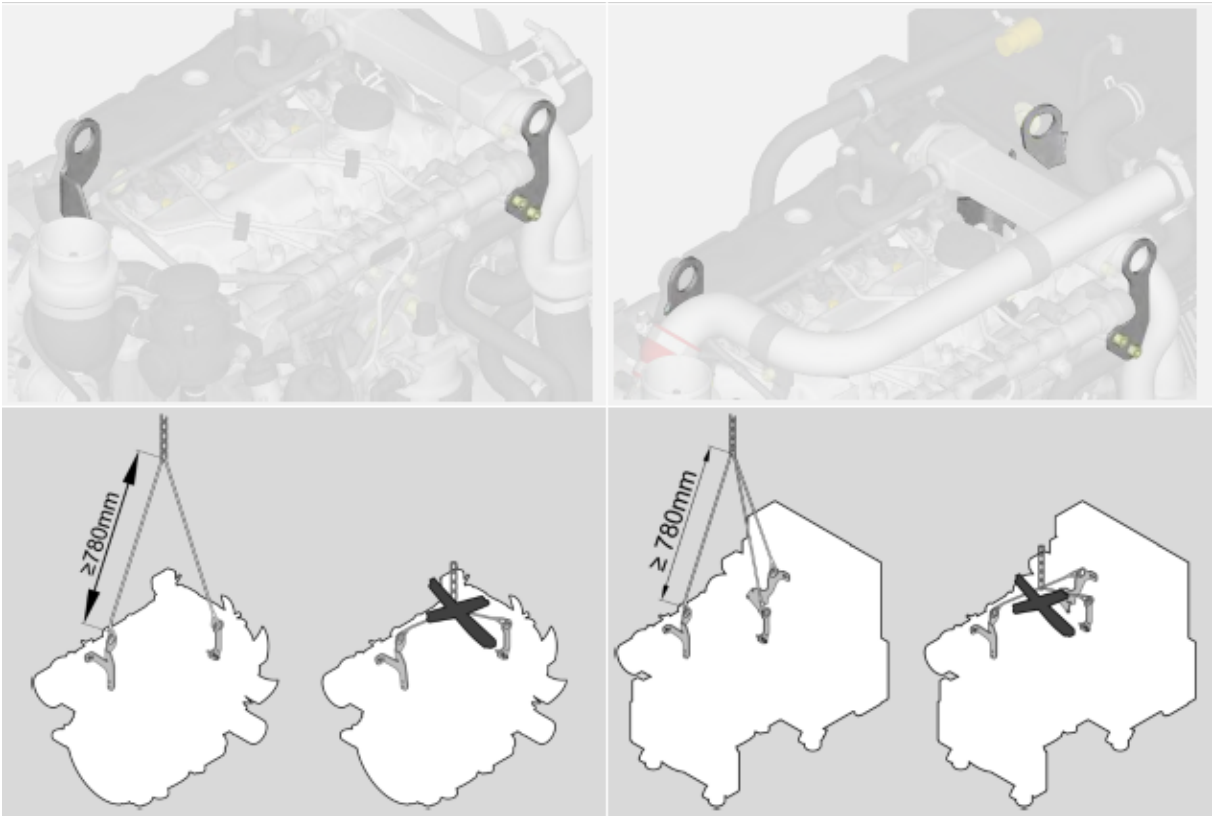
	Warning Used to indicate a potentially hazardous situation which, if not avoided, could result in serious injury or death.
	Note the installation sequence. Indicates that the marked components must be installed in the specified installation sequence.
	Note Indicates additional information that is important to the user.
	Screw connection category A Indicates that the affected screw connection is a category A screw connection. Please abide by the requirements in the "Torque + classification 056758XX_H50" list.

01.5 Lifting specifications

Warning

Danger of injury from improper lifting and transport.

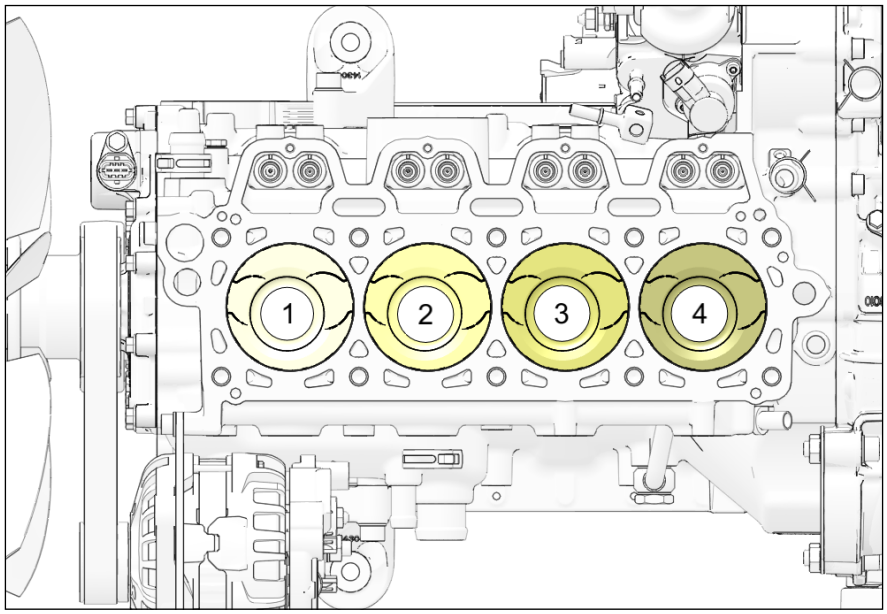
- The machine may only be lifted using the lifting points.
- Before lifting the engine, check the lifting eyes for deformation and damage.
- Lifting with deformed or damaged lifting eyes is not permitted. Replace deformed or damaged lifting eyes before using them for lifting.
- Before lifting the engine, ensure that the fixing screws of the lifting eyes are tight.
- Only use a suitable hoist with a sufficient carrying capacity.
- Always use all lifting eyes for lifting.
- Do not remain under suspended loads.

Lifting eyes F2F	Lifting eyes OPU
	

Note

- Disconnect the engine from the power supply and the fuel and coolant supply before it is lifted.
- Please observe the minimum length of your lifting device shown in the illustration.
- Only lift the appliance when it is switched off and has cooled down.
- If you have any questions about transporting the appliance, please contact your nearest Hatz service station [network.hatz.com].

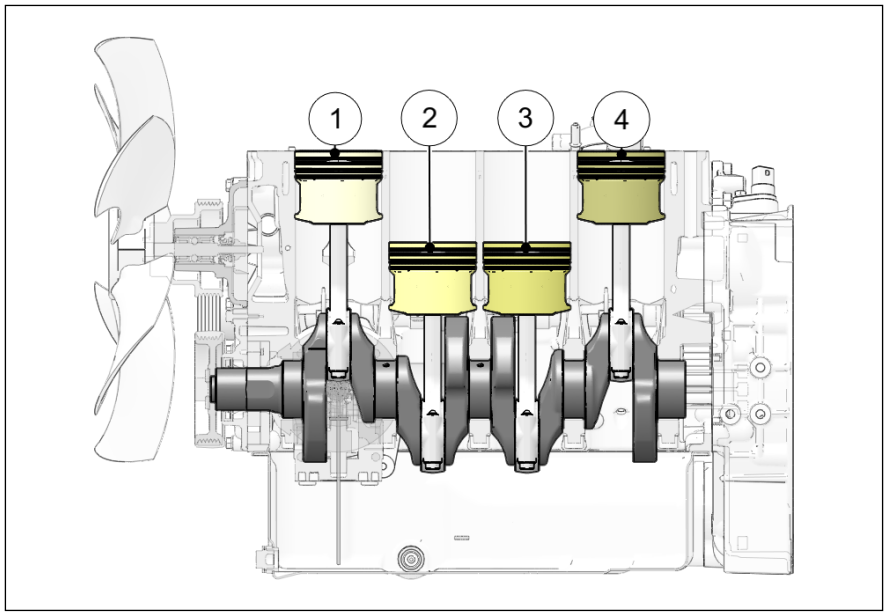
01.6 Cylinder numbering/ignition sequence



Cylinder numbering:

Cylinder 1 is located opposite the power output side (flywheel).

The cylinders are numbered consecutively (1 – 4) from there.



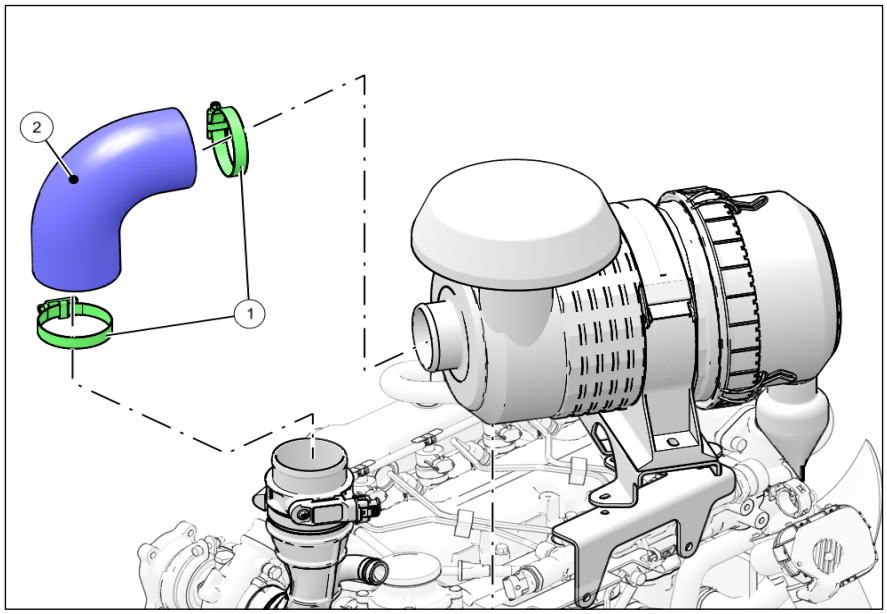
Ignition sequence:

The ignition sequence is as follows:

1 - 3 - 4 - 2

02
Air intake

02.1 Inlet pipe 90°



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hose clamp 70 mm	M8x35	Hand-tight	
2	Inlet pipe 90° elbow	8.4		

Preparatory work

- -

Disassembly

- Release clamps [1].
- Remove inlet pipe [2].

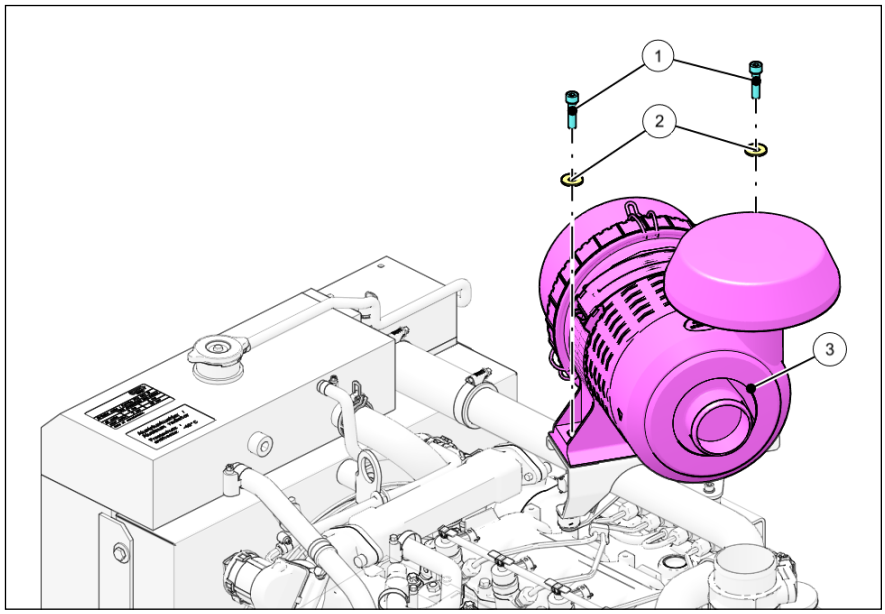
Inspection/maintenance

- Check the inlet pipe for cracks/abrasion/aging.

Assembly

- Attach the inlet pipe [2] using the clamp [1].

02.2 Air filter



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M8x35	5 Nm	
2	Washer	8.4		
3	Air filter			

Preparatory work

- Disassemble the inlet pipe 90° [section 02.1].

Disassembly

- Remove the screws [1] and washers [2].
- Remove the air filter [3].

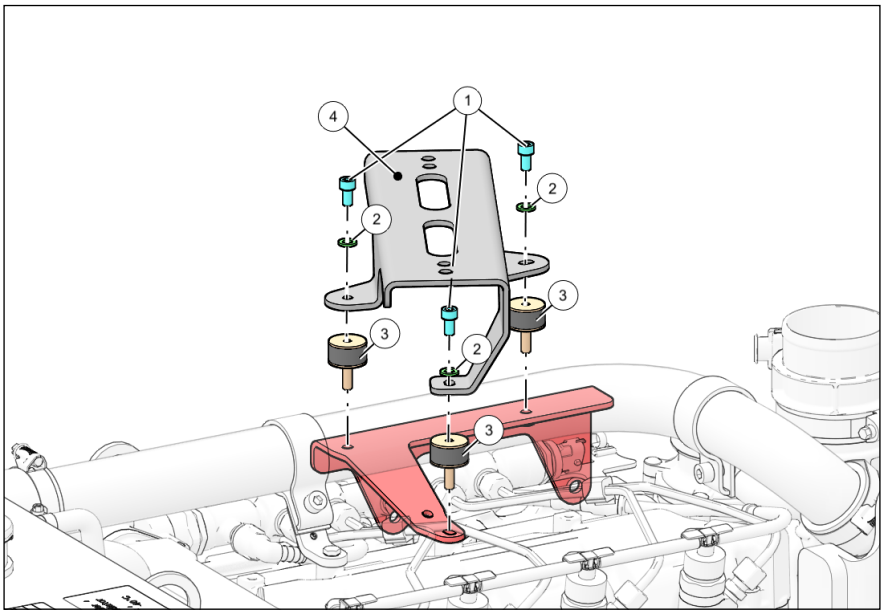
Inspection/maintenance

- Change the air filter as per the maintenance plan (see Diesel Engine Operator's Manual).

Assembly

- Attach the air filter [3] with screws [1] and washers [2].
- Mount the inlet pipe 90° [section 02.1].

02.3 Air filter bracket



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M6x12	9.5 Nm	
2	Washer	6.4		
3	Rubber buffer	M6	9.5 Nm	
4	Air filter bracket			

Preparatory work

- Disassemble the air filter [section 02.2].

Disassembly

- Remove the cylinder screw [1] and washers [2].
- Remove the bracket [4].
- Remove the rubber buffer [3].

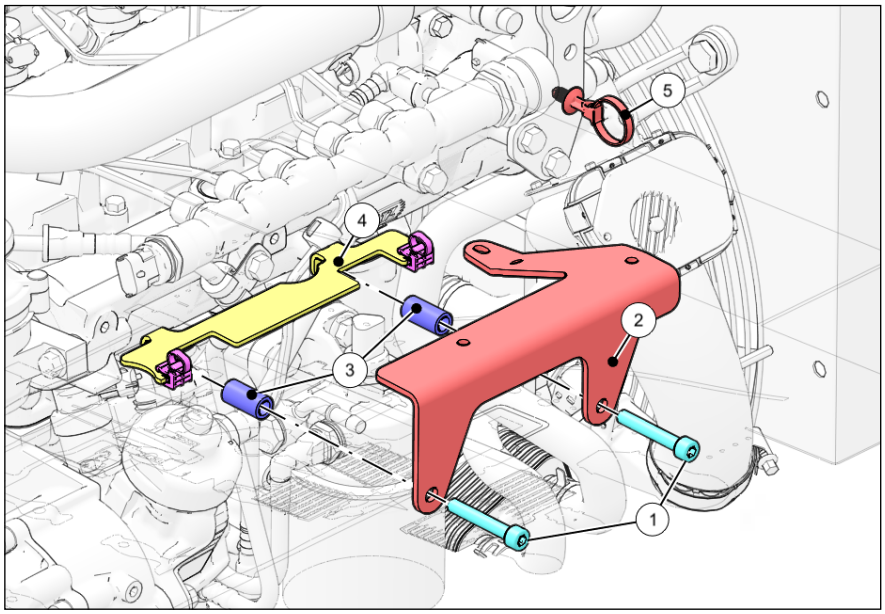
Inspection/maintenance

- Check the rubber buffer [3] for cracks/aging.
- Replace if necessary.

Assembly

- Screw in the rubber buffer [3].
- Attach the bracket [4] with screws [1] and washers [2].
- Mount the air filter [section 02.2].

02.4 Console for air filter bracket



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M8x50	23 Nm	
2	Console for air filter bracket			
3	Bush	9x14x28		
4	Engine wiring harness bracket			
5	Wiring harness bracket			

Preparatory work

- Disassemble the air filter [section 02.2].
- Disassemble the air filter bracket [section 02.3].

Disassembly

- Remove the screws [1].
- Remove the parts [2], [3], [4].

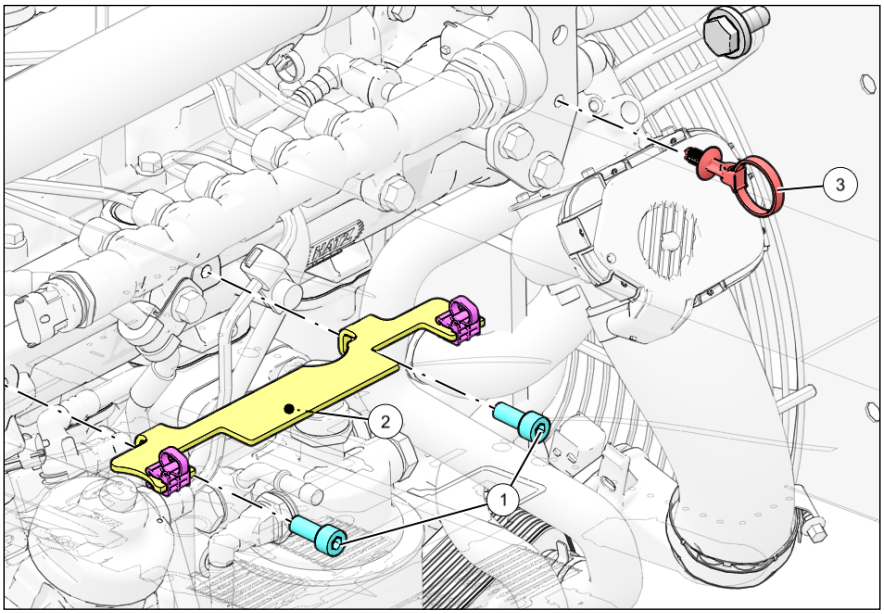
Inspection/maintenance

- Replace the engine wiring harness bracket [5].
- Replace the cable ties, if necessary.

Assembly

- Attach the parts [2], [3], [4] using the screws [1].
- Mount the air filter bracket [section 02.3].
- Mount the air filter [section 02.2].

02.5 Wiring harness bracket



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M8x20	23 Nm	
2	Engine wiring harness bracket			
3	Wiring harness bracket			

Preparatory work

- Remove the wiring harness.

Disassembly

- Remove the screws [1].
- Remove the bracket [2].

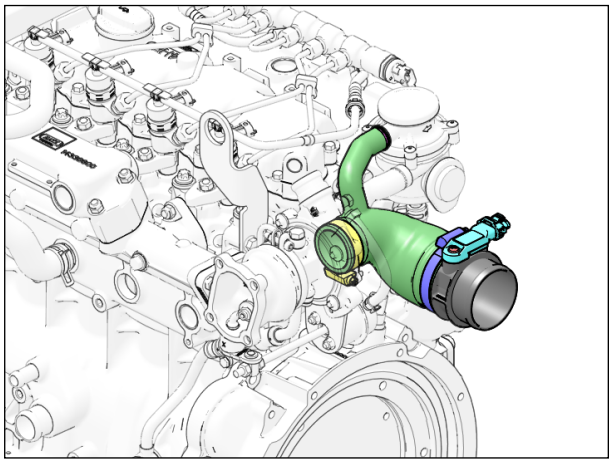
Inspection/maintenance

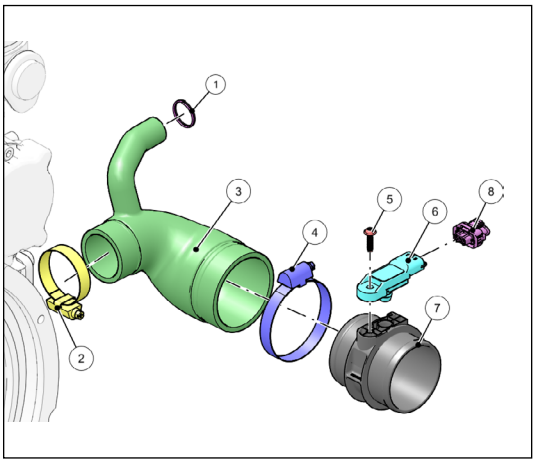
- Replace the cable ties.
- Replace the wiring harness bracket [3].

Assembly

- Attach the bracket [2] with the cylinder screws [1].
- Mount the wiring harness.

02.6 Horizontal intake





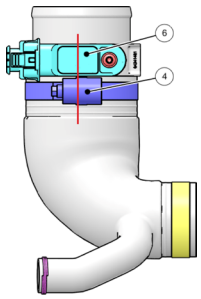
Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Wire hose clip			
2	Hose clamp	40/60	Hand-tight	
3	Horizontal intake			
4	Hose clamp	70–90x13	Hand-tight	
5	Torx screw	5x20	5,5 Nm	
6	Pressure sensor			
7	Sensor mount, intake			
8	Electrical connection			

Preparatory work

- Disassemble the intake path from the sensor mount [7].

Disassembly

- Remove the electrical connection [8] from the pressure sensor [6].
- Release the screw [5] and remove the pressure sensor [6].
- Release the clamp [1] and hose clamp [2].
- Remove the intake [3].
- Release the hose clamp [4] and disconnect the sensor mount [7].



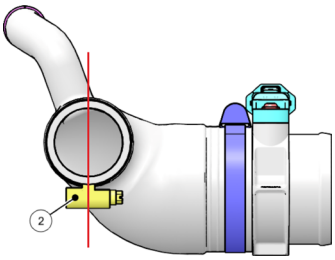
Recommended orientation of pressure sensor [6] and hose clamp [4].

Inspection/maintenance

- Check the intake [3] for cracks/abrasion/aging.

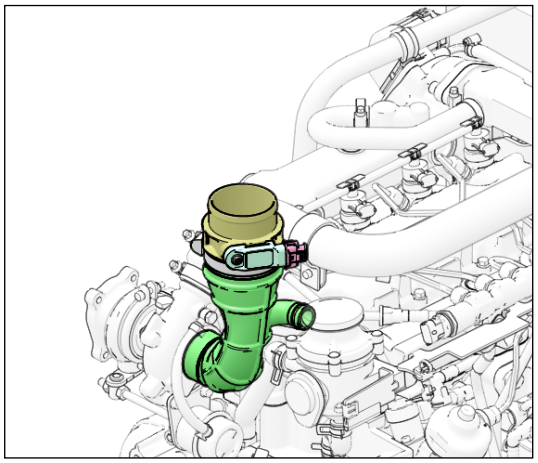
Assembly

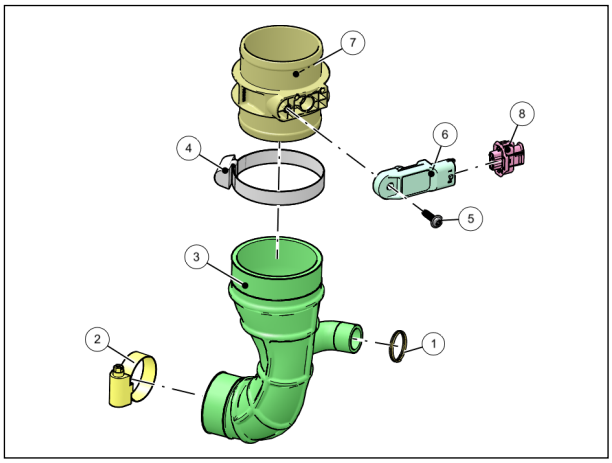
- Attach the sensor mount [7] to the intake [3] using the hose clamp [4]. Note the recommended orientation; see the figures on the right.
- Mount the intake [3] to the engine using the clamp [1] and hose clamp [2].
- Attach the pressure sensor [6] using the screw [5].
- Attach the electrical connection [8].
- Attach the intake path to the sensor mount [7].



Recommended orientation of hose clamp [2].

02.7 Vertical intake





Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Wire hose clip			
2	Hose clamp	40/60	Hand-tight	
3	Vertical intake			
4	Hose clamp	70–90x13	Hand-tight	
5	Torx screw	5x20	5,5 Nm	
6	Pressure sensor			
7	Sensor mount, intake			
8	Electrical connection			

Preparatory work

- Disassemble the intake path from the sensor mount [7].

Disassembly

- Remove the electrical connection [8] from the pressure sensor [6].
- Release the screw [5] and remove the pressure sensor [6].
- Release the clamp [1] and hose clamp [2].
- Remove the intake [3].
- Release the hose clamp [4] and remove the sensor mount [7].

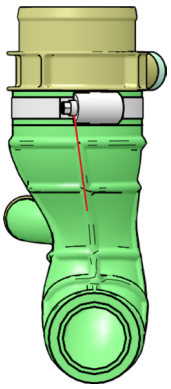
Recommended orientation of sensor mount [7].

Inspection/maintenance

- Check the intake [3] for cracks/abrasion/aging.

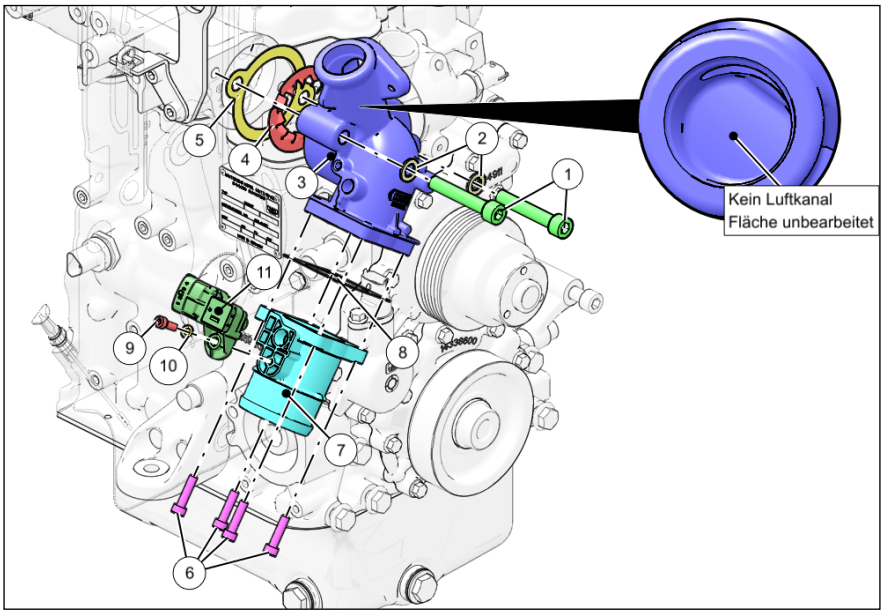
Assembly

- If necessary, mount the sensor mount [7] on the intake [3] using the hose clamp [4]. Note the recommended orientation; see the figures on the right.
- Attach the intake [3] to the engine using the hose clamp [2] and clamp [1].
- Attach the pressure sensor [6] using the screw [5].
- Attach the electrical connection [8].
- Attach the intake path to the sensor mount [7].



Recommended orientation of hose clamp [4].

02.8 Charge air intake (TI)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M10x60	46 Nm	
2	Washer	10.5		
3	Charge air guide TI			
4	Diffusion disk			
5	Gasket for air intake pipe			
6	Cylinder screw	M6x25	9.5 Nm	
7	Adapter			
8	Gasket for throttle valve			
9	Cylinder screw	M5x16	5.5 Nm	
10	Washer	5.3		
11	Pressure and temperature sensor			

Preparatory work

- Disassemble the shaped hose of the charge air cooler [section 14.7].

Disassembly

- Remove the electrical connections.
- Remove the screws [1] and washers [2].
- Disassemble the parts [3], [4], [5].

Inspection/maintenance

- Replace the gasket [5].
- If the adapter [7] is disassembled from the charge air guide [3], the gasket [8] must be replaced.

Assembly

- Mount the parts in the sequence [5 – 3] using the washers [2] and screws [1].
- Attach the electrical connections.
- Mount the shaped hose of the charge air cooler [section 14.7].

03
Injection equipment

Note

All work on the injection system may only be done in the voltage and pressure-free state (disconnect battery). During all work on the injection system, cleanliness must be heeded in order to avoid the entry of particles into the injection system or the engine. Every time a pressure pipe is released, it must be replaced by a new one!

Mounting of injectors on the engine

Remove the protective caps only right before mounting. Make sure that the nozzle cap and thus the injection holes are not damaged. Moisten exterior gaskets (O-rings) with installation oil, engine oil or diesel. Lubricants and glide agents that contain water are not permissible.

Before mounting, it may be necessary to check the correct position of the copper sealing disk on the nozzle clamping nut. Attention must be paid that the injector is inserted into the cylinder head bore without damage. A transmission of force to the return connection or the plastic overmold must be avoided.

All plug connectors must be snapped in securely and locked during mounting.

The cap nut of the high-pressure line must be fastened properly before start-up.

If necessary, injector-specific data such as the IMA code must be transferred to the control unit. These serve the correct activation of the injectors and thus the intended operation. The injector does not have to be ventilated before initial start-up.

Dismounting of injectors on the engine

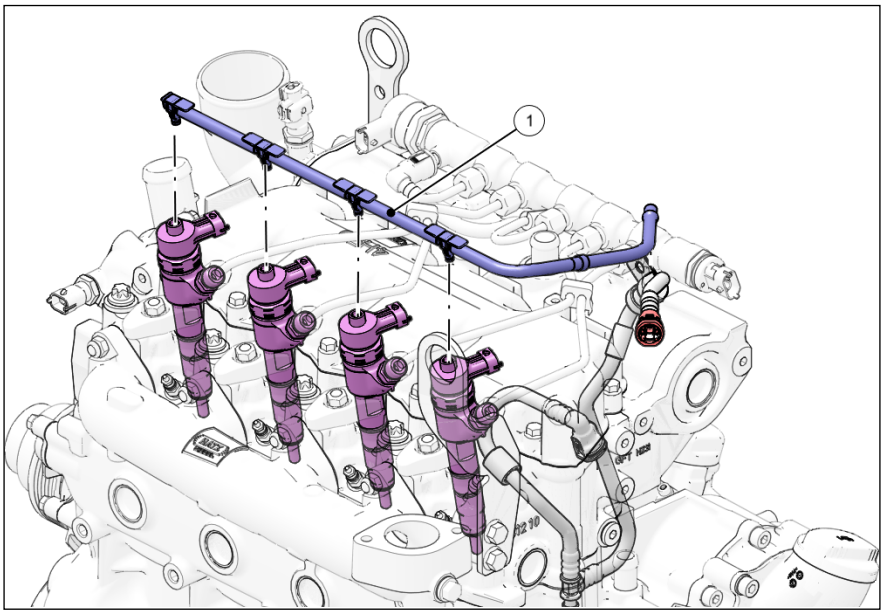
The dismounting of the injectors must be done analogously to the mounting. Open connections must be sealed with protective caps. To loosen the high-pressure screw connection, hold the hexagon of the inlet connector tight. If the inlet connector is released, the operation of the injector is no longer guaranteed. Once the inlet connector has been released, the injector must always if replaced.

Remounting of injectors on the engine

After each loosening of an injector, the old copper sealing ring must be removed and a new one used. In order to get cylinder-specific correction data for the engine controller, the injectors should be inserted on the original cylinder when re-using. In principle, the installation on other cylinders is also possible, however only if the IMA correction values are read into the control unit again.

Injectors can be cleaned before re-installation below the high-pressure connection in vertical position in the ultrasound bath. Mechanical cleaning of the nozzle shaft with brushes is impermissible in order to prevent damage to the injection holes.

03.1 Fuel return line



Note

- The fuel return line [1] may only be assembled/disassembled manually.
- Using tools for assembly/disassembly can cause damage.
- If during the removal of the plug connectors the O-ring on them is damaged, then the entire return line must be replaced.
- Before re-mounting of the plug connectors, it must be ensured that the counter pieces are not soiled or corroded.
- Hose-nozzle connections may not be loosened. The mounting of the fuel return line on the vehicle low-pressure circuit and on the injector must be done dry (without mounting aids).

Assembly:

Insert the return plug all the way into the injector return connection (figure 3). Then push down the latch. The latch must be flush with the mounting surfaces (figure 4). Fuel can escape if not installed properly!

Disassembly:

Lift the latch all the way. Press the mounting surfaces down while lifting the latch all the way (figure 1). Then pull the return plug out of the injector return connection (figure 2).

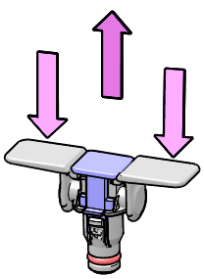


Image 1

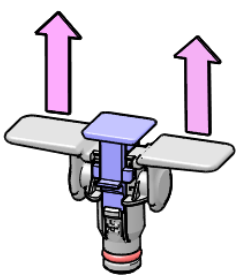


Image 2

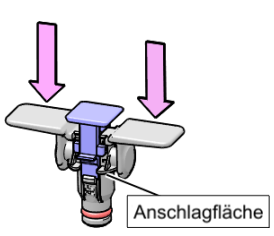


Image 3

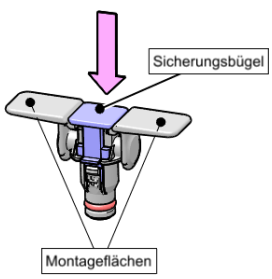
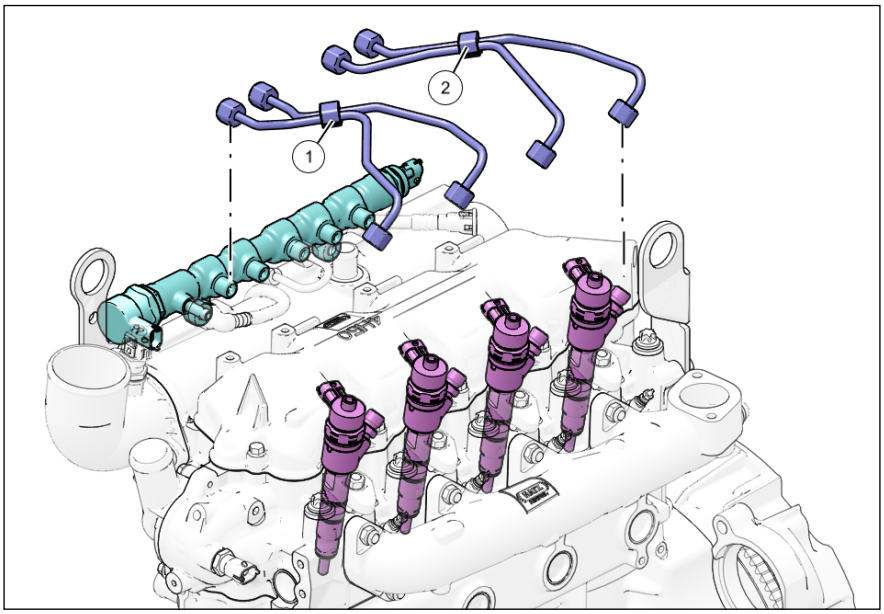


Image 4

03.2 Fuel pressure tube of rail injector



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Fuel pressure tube rail injector	M14x1.5	10 Nm + 60° + 5°	
2	Fuel pressure tube rail injector	M14x1.5	10 Nm + 60° + 5°	

Note

Every disassembled fuel pressure pipe must be replaced.

Preparatory work

- Disassemble the charge air pipe, if necessary.
- Disassemble the fuel return line [section 03.1].

Disassembly

- Release the cap nuts of the fuel pressure tubes [1], [2].
- Remove the fuel pressure tubes [1], [2].

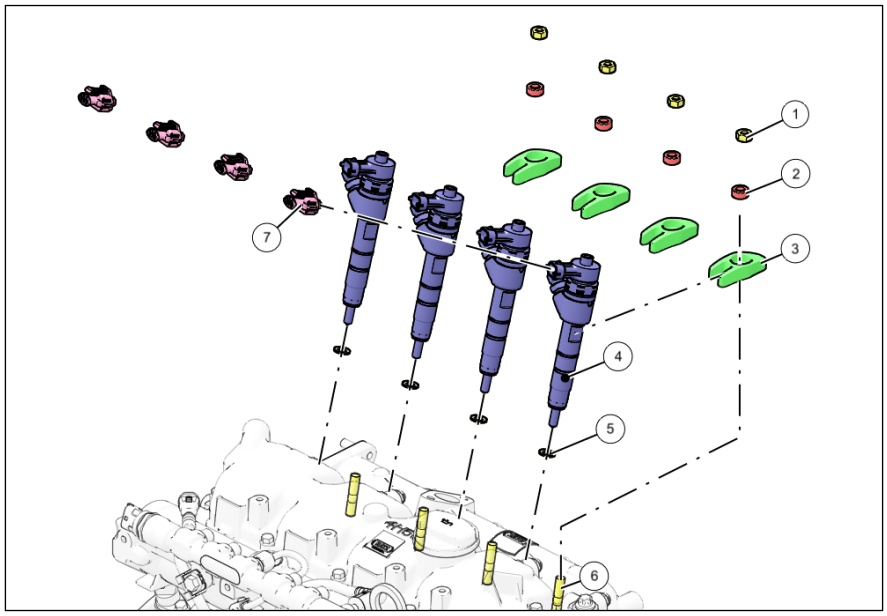
Inspection/maintenance

- Replace the fuel pressure tubes [1], [2].

Assembly

- Attach the fuel pressure tubes [1], [2] to the rail and injectors.
- Mount the fuel return line [section 03.1].
- Mount the charge air pipe if necessary.

03.3 Injectors



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon nut	M8	23 Nm	
2	Bush for injector			
3	Clamping claw for injector			
4	CR injector			
5	Injector sealing ring			
6	Stud bolt	M8x25		
7	Electrical connection			

Preparatory work

- Disassemble the fuel pressure tube from the rail injector [section 03.2].

Disassembly

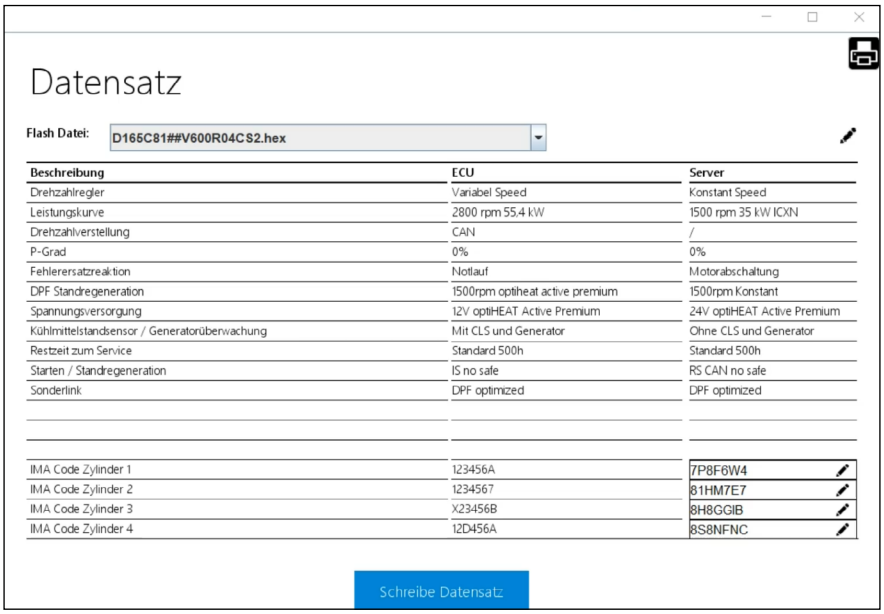
- Remove the electrical connection [7].
- Remove the nut [1], bush [2] and clamping claw [3].
- Pull out the injector [4] with the sealing ring [5].

Inspection/maintenance

- Replace the sealing ring [5] by clamping with pliers on the outside diameter and removing from the injector by turning gently.
- If stud bolts [6] came loose, tighten again all the way.

Assembly

- Mount the sealing ring [5] on the injector [4] with grease.
- Wet the injector [4] lightly with assembly paste (e.g. Castrol® Molub-Alloy Paste White T™) and insert in the cylinder head.
- Attach the clamping claw [3] and bush [2] using nut [1] (not curvature).
- Connect the electrical connection [7] with the corresponding electrical line.
- Mount the fuel pressure tube on the rail injector [section 03.2].

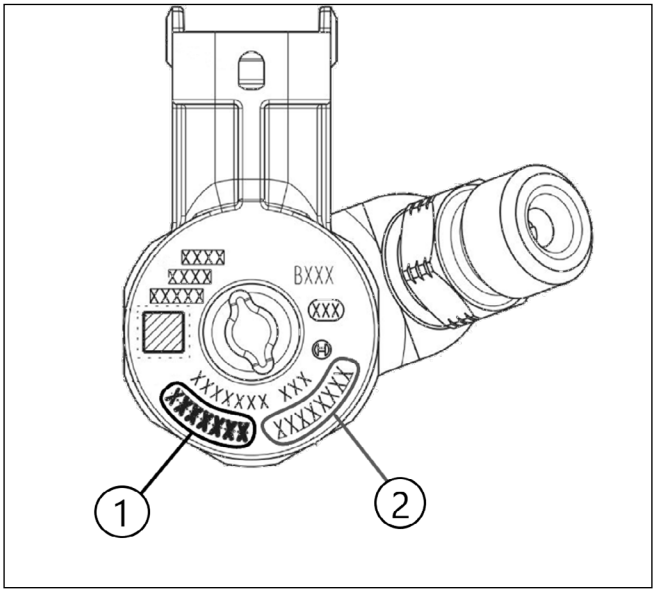


Datensatz

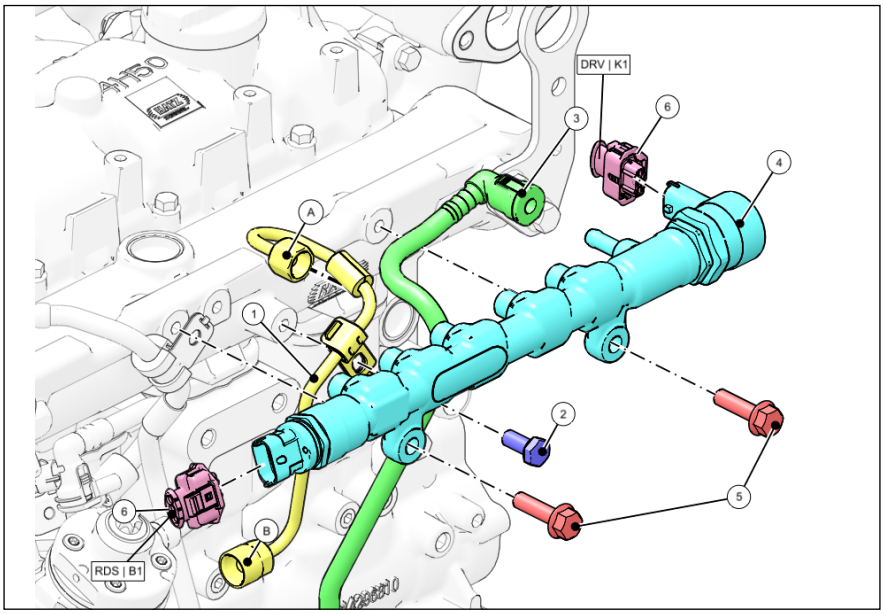
Flash Datei: D166C81##V600R04CS2.hex

Beschreibung	ECU	Server
Drehzahlregler	Variabel Speed	Konstant Speed
Leistungskurve	2800 rpm 55,4 kW	1500 rpm 35 kW ICXN
Drehzahlverstellung	CAN	/
P-Grad	0%	0%
Fehlerersatzreaktion	Notlauf	Motorabschaltung
DPF Standregeneration	1500rpm optiheat active premium	1500rpm Konstant
Spannungsversorgung	12V optiHEAT Active Premium	24V optiHEAT Active Premium
Kühlmittelstandsensor / Generatorüberwachung	Mit CLS und Generator	Ohne CLS und Generator
Restzeit zum Service	Standard 500h	Standard 500h
Starten / Standregeneration	IS no safe	RS CAN no safe
Sonderlink	DPF optimized	DPF optimized
IMA Code Zylinder 1	123456A	7P8F6W4
IMA Code Zylinder 2	1234567	81HM7E7
IMA Code Zylinder 3	X23456B	8H8GGIB
IMA Code Zylinder 4	12D456A	8S8NFNC

Schreibe Datensatz



03.4 High pressure rail



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Fuel pressure tube - pump rail			
2	Hexagon head screw	M8x18	23 Nm	
3	Fuel return line			
4	High-pressure rail			
5	Hexagon head screw	M8x30	23 Nm	
6	Electrical connection			
A	Cap nut	M14x1.5	10 Nm + 60° + 5°	
B	Cap nut	M16x1	15 Nm + 60° + 5°	

Note

Every disassembled pressure pipe must be replaced.

Preparatory work

- Disassemble the fuel pressure tube from the rail injector [section 03.2].
- Disassemble the injectors if necessary [section 03.3].

Disassembly

- Remove the electrical connections [6].
- Release the cap nut [A].
- Remove the fuel return line [3] form the high-pressure rail [4].
- Remove the screws [5].
- Remove the high-pressure rail [4].
- Remove the screw [2].
- Release the cap nut [B] and remove the fuel pressure tube [1].

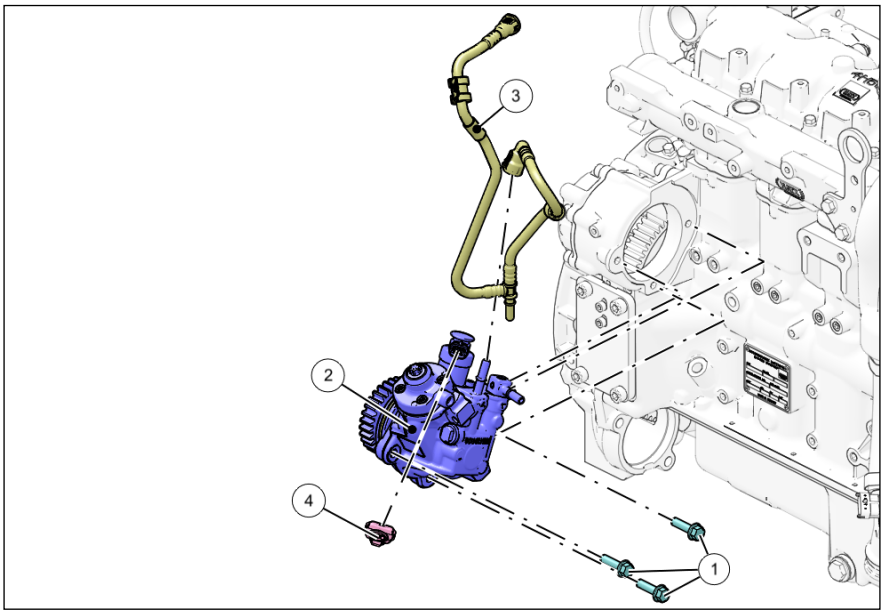
Inspection/maintenance

- Replace the fuel pressure tube [1].
- Check the fuel return line [3] for cracks/abrasion/aging.

Assembly

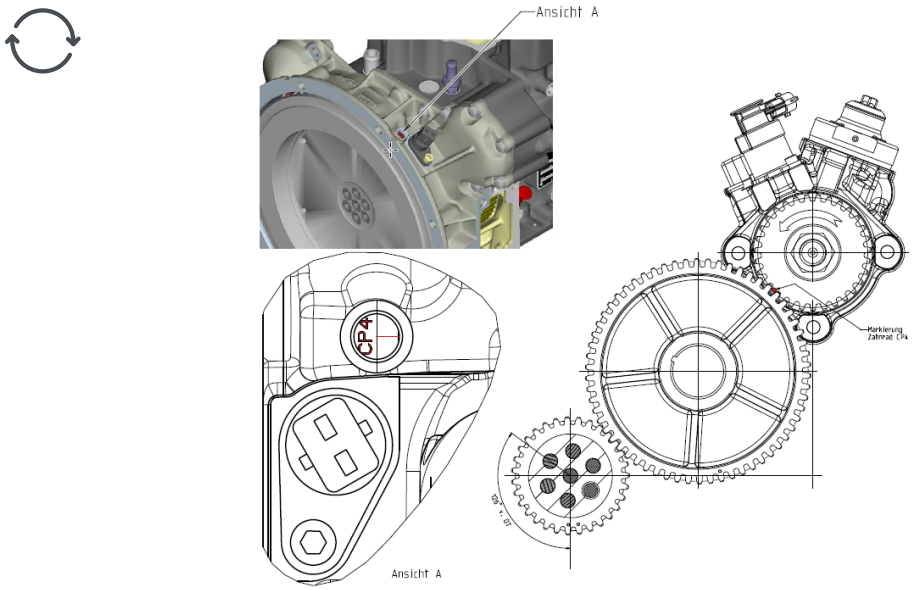
- Tighten the cap nut [A] lightly on the high-pressure rail [4].
- Attach the fuel return line [3] to the rail [4].
- Attach the rail [4] to the cylinder head using the screws [5].
- Tighten the cap nut [B] lightly on the high-pressure pump.
- Attach the hose clamp for the fuel pressure tube [1] to the cylinder head using the screw [2].
- Tighten the cap nuts [A] and [B].
- Attach the electrical connections [6].
- Mount the injectors if necessary [section 03.3].
- Mount the fuel pressure tube on the rail injector [section 03.2].

03.5 High-pressure pump



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw with flange	M8x30	23 Nm	
2	High-pressure pump CP4			↻
3	Fuel return line			
4	Electrical connection			

Installation note



Before the installation or removal of the high-pressure pump, the crankshaft must be turned into the position "CP4" (marking visible through inspection hole in the connection housing).

The marking on the high-pressure pump is now in the position shown. This is the basic position for the mounting of the high-pressure pump.

Mounting precision: ± 1 tooth. For mounting, grease the o-ring lightly (LIQUI MOLY® Silikonfett™).

Preparatory work

- Disassemble the high-pressure rail [section 03.4].
- Disconnect the fuel line from the high-pressure pump [section 03.6].

Disassembly

- Disconnect the electrical connection [4] from the metering unit.
- Remove the screws [1].
- Pull out the high-pressure pump [2].
- Disconnect the fuel return line [3] from the high-pressure pump.

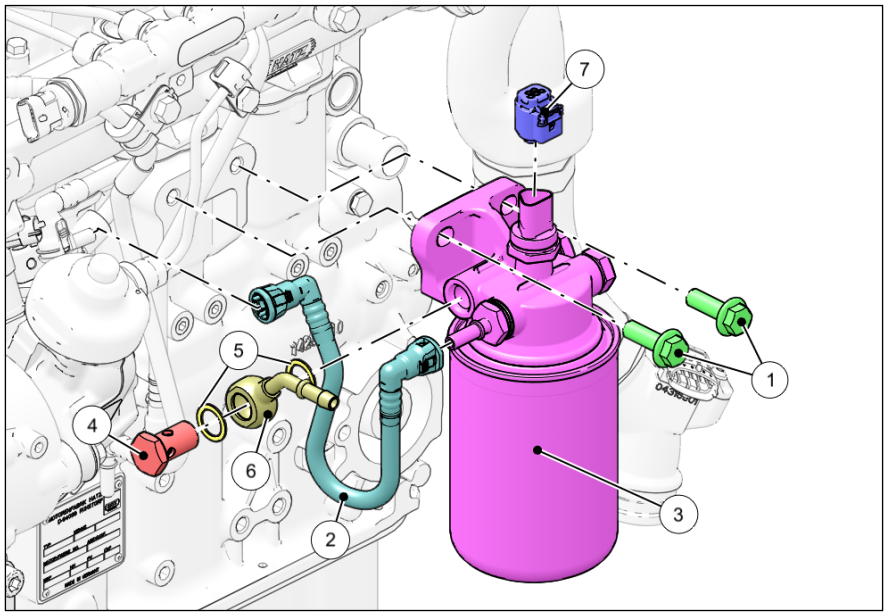
Inspection/maintenance

- Check the fuel return line [3] for cracks/abrasion/aging.

Assembly

- Attach the high-pressure pump [2] with the screws [1].
- Attach the fuel return line [3] to the high-pressure pump.
- Attach the electrical connection [4] to the metering unit.
- Mount the fuel line on the high-pressure pump [section 03.6].
- Mount the high-pressure rail [section 03.4].

03.6 Fuel main filter (two-filter system)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw	M10x30	46 Nm	
2	Fuel line			
3	Fuel main filter			
4	Hollow bolt	M16x1.5	55 Nm	
5	Sealing ring	D16x22x1.5		
6	Ring nipple			
7	Electrical connection			

Preparatory work

- –

Disassembly

- Remove the electrical connection [7].
- Remove the fuel line [2].
- Unscrew the screws [1].
- Remove the fuel main filter [3].

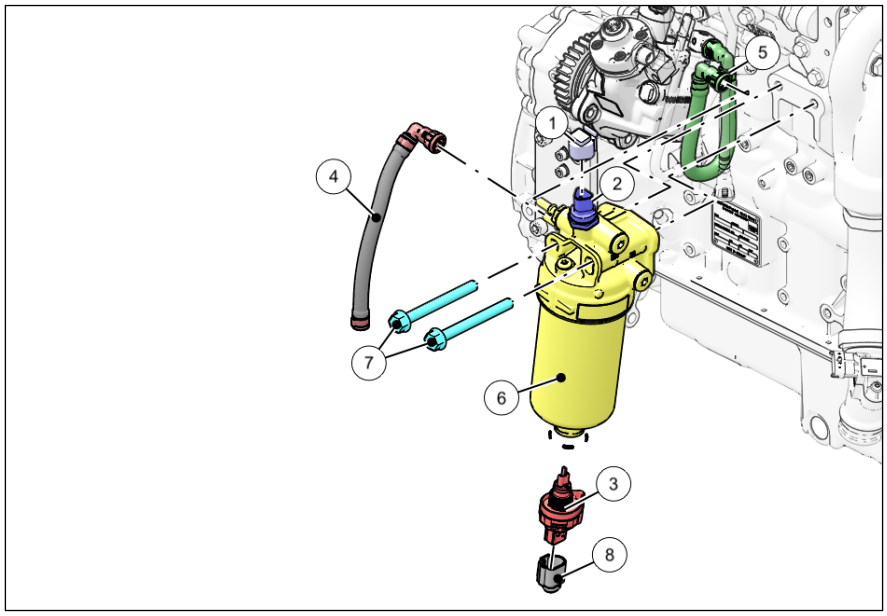
Inspection/maintenance

- Change the filter cartridge as per the maintenance plan (see Diesel Engine Operator's Manual).
- If the ring nipple [6] is disassembled, replace the sealing rings [5].

Assembly

- Attach the fuel main filter using the screws [1].
- Attach the fuel line [2].
- When installing the nipple [6], ensure that it is oriented at 90° from the fuel filter.

03.7 Fuel main filter (one-filter system)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Electrical connection of pressure/temperature sensor			
2	Pressure/temperature sensor	-		
3	Fill level sensor WFS			
4	Fuel line			
5	Fuel line	8x270		
6	Fuel filter H50			⟳
7	Hexagon head screw with flange	M10x100	46 Nm	
8	Electrical connection of fill level sensor WFS			

Preparatory work

- -

Disassembly

- Remove the electrical connection [1] from the sensor [2].
- Remove the electrical connection [8] from the fill level sensor [3].
- Remove the fuel lines [4] and [5].
- Remove the hexagon head screw [7].
- Remove the fuel filter [6].

Inspection/maintenance

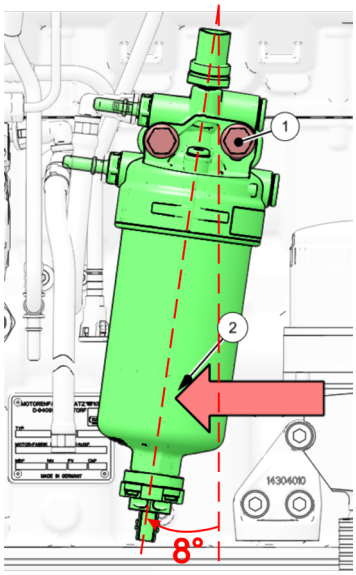
- Change the filter cartridge as per the maintenance plan (see Diesel Engine Operator's Manual).

Assembly

- Mount the fuel filter [6] using the screws [7] (see the figure below).
- Attach the electrical connection [8] to the fill level sensor [3].
- Attach the electrical connection [1] to the sensor [2].
- Attach the fuel lines [4] and [5].

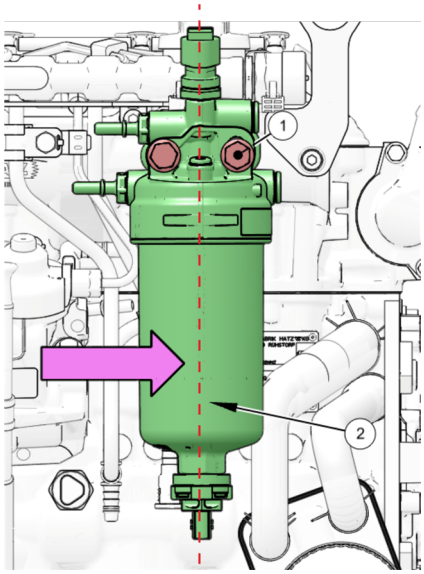
Installation note

4H50



Mounting of filter 4H50 (inclination 8°):
Use the upper fastening hole.

3H50



Mounting of filter 3H50:
Use the lower fastening hole.

04

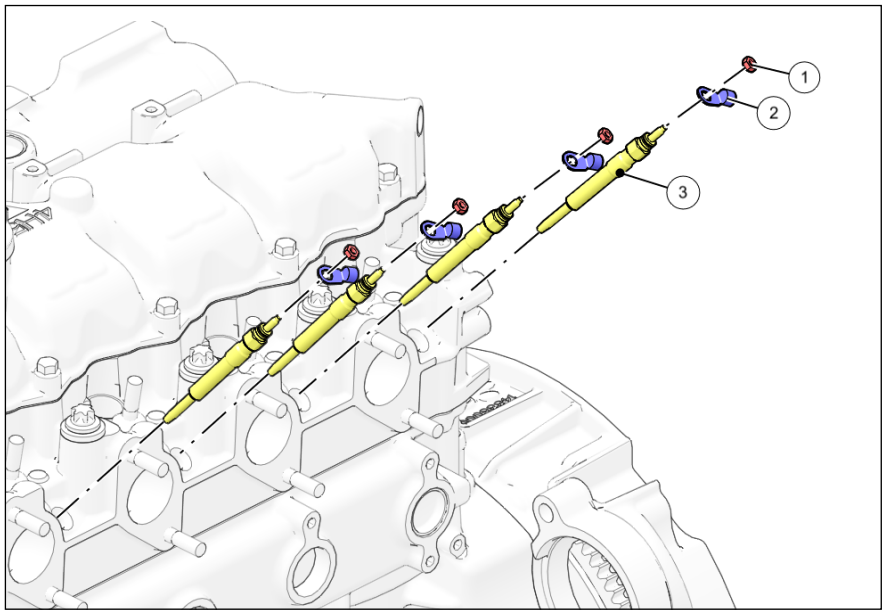
Engine electrical system/ electrical add-on parts

04.1 General installation notes

Warning

- Always disconnect the battery before working on electrical components.
- When removing the battery, first disconnect the negative cable and then the positive cable.
- Do not disconnect the battery while the machine is running. Resulting voltage peaks could destroy the electronic components.

04.2 Pencil glow plug



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon nut	M4	2.5 Nm	
2	Electrical connection			
3	Pencil glow plug	M10x1	12.5 Nm	Castrol® Molub-Alloy Paste TA™

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).

Disassembly

- Release the nut (1).
- Remove the electrical connections (2).
- Remove the pencil glow plug (3).

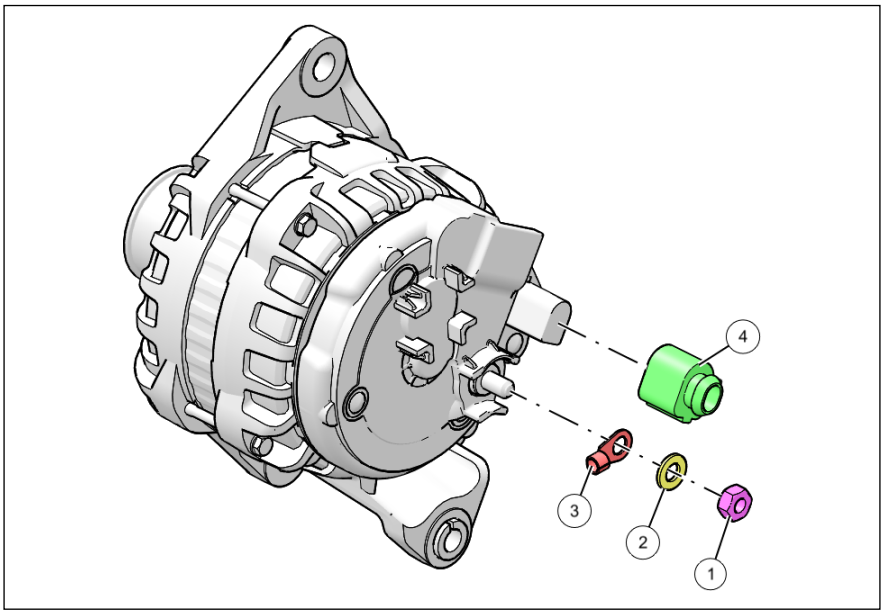
Inspection/maintenance

- Check the electrical connections for oxidation/damage.

Assembly

- Coat the thread of the pencil glow plugs (3) with Castrol® Molub-Alloy Paste TA™ and mount it.
- Attach the electrical connections (2) using nuts (1).
- Connect the battery (see the Diesel Engine Operator's Manual).

04.3 Electrical connection of alternator 12V



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon nut	M8	10 Nm	
2	Washer	8.4		
3	Electrical connection	8.4		
4	Electrical connection D+			

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).

Disassembly

- Remove the nut (1).
- Remove the washer (2) and electrical connection (3).
- Detach the electrical connection (4).

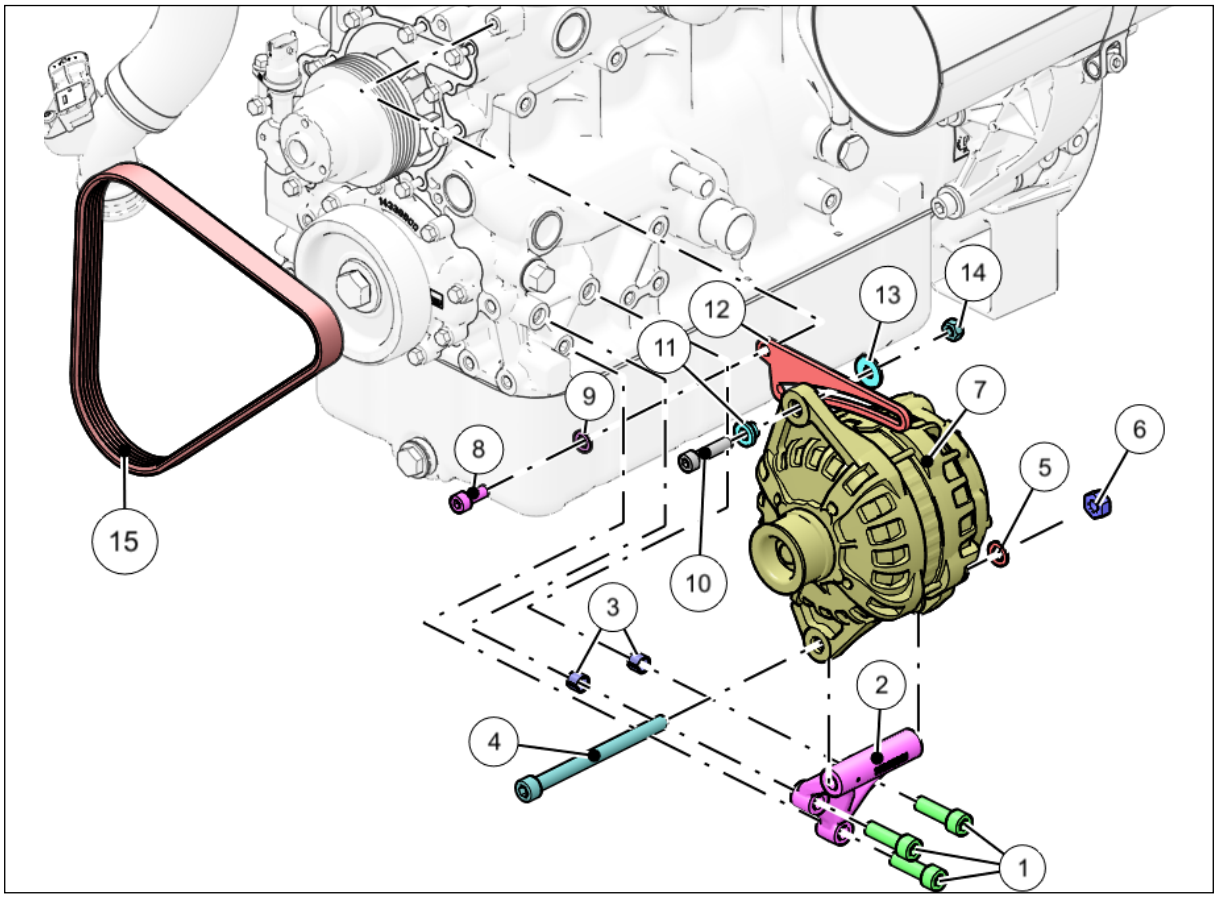
Inspection/maintenance

- Check the electrical connections for oxidation/damage.

Assembly

- Attach the electrical connection (3) and washer (2) using the nut (1).
- Attach the electrical connection (4).
- Connect the battery (see the Diesel Engine Operator's Manual).

04.4 Alternator 12 V



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M10x35	23 Nm	
2	Console for alternator			
3	Spring pins	12x10		
4	Cylinder screw	M10x130	46 Nm	
5	Washer	10.5		
6	Hexagon nut	M10	46 Nm	
7	Alternator 12 V			
8	Cylinder screw	M8x20	23 Nm	
9	Washer	8.4		
10	Cylinder screw	M8x35	23 Nm	
11	Flange sleeve			
12	Tensioning arm			
13	Washer	8.4		
14	Hexagon nut	M8		

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).
- Disassemble the electrical connections from the alternator [section 04.3].
- Disassemble the poly v belt [section 07.2].

Disassembly

- Remove the screws [10] and parts [11], [13], [14].
- Remove the screw [4] and parts [5], [6], [7].
- Remove the screw [8] and parts [9], [12].
- Remove the screws [1] and console [2].

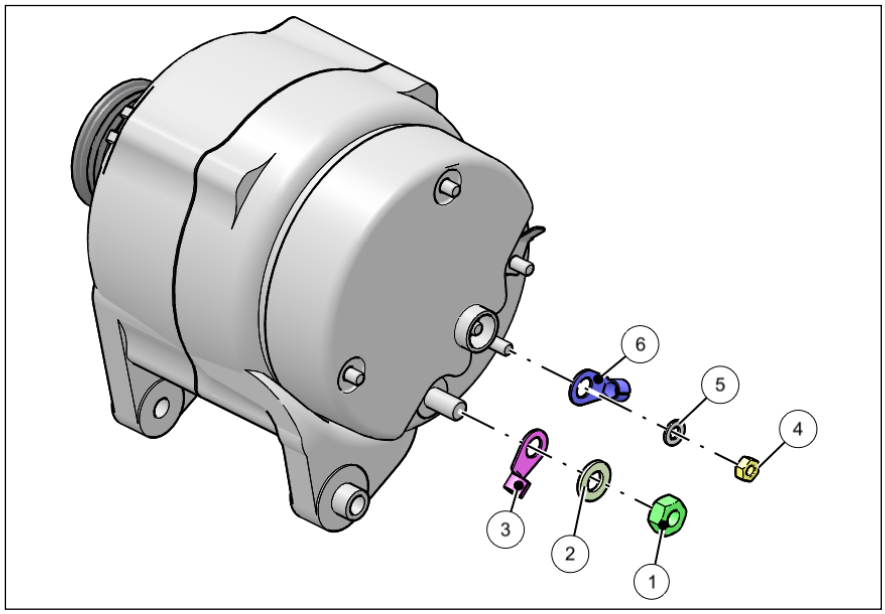
Inspection/maintenance

- Change the poly v belt as per the maintenance plan (see Diesel Engine Operator's Manual).
- If necessary, push the spring pins [3] all the way in.

Assembly

- Mount the console [2] using the screws [1].
- Attach the tension arm [12] to the housing using the screw [8] and washer [9].
- Attach the alternator [7] to the console with parts [4], [5] and [6].
- Attach the alternator [7] loosely to the tension arm [12] with parts [10], [11] [13] and [14].
- The screw [10] is tightened when the poly v belt is tensioned.
- Mount the poly v belt [section 07.2].
- Mount the electrical connections to the alternator [section 04.3].
- Connect the battery (see the Diesel Engine Operator's Manual).

04.5 Electrical connection of alternator 24 V



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon nut	M8	10 Nm	
2	Washer	8.4		
3	Electrical connection B+	M5		
4	Hexagon nut	M5	5,5 Nm	
5	Washer	5.4		
6	Electrical connection D+			

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).

Disassembly

- Remove the nut (1).
- Remove the washer (2) and electrical connection (3).
- Remove the nut (4).
- Remove the washer (5) and electrical connection (6).

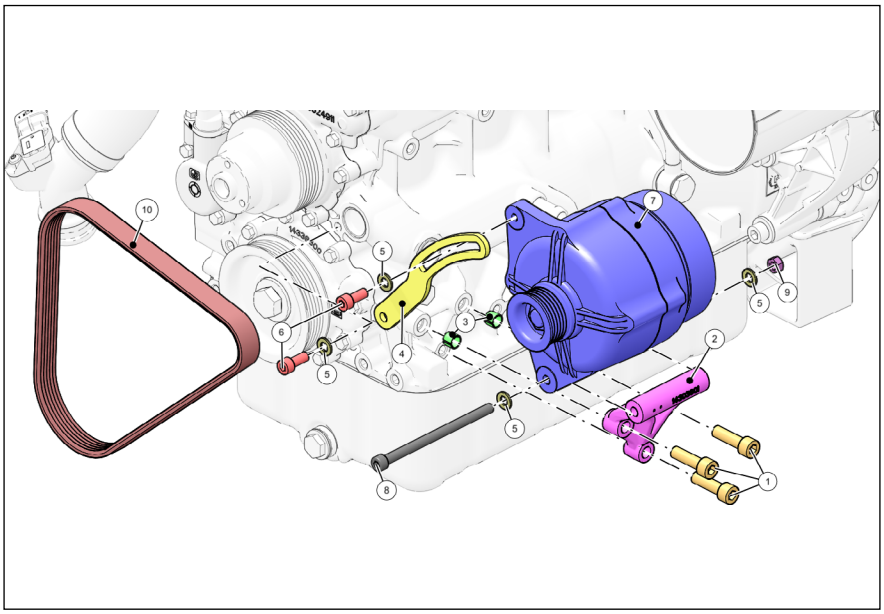
Inspection/maintenance

- Check the electrical connections for oxidation/damage.

Assembly

- Attach the electric connection (6) using the washer (5) and nut (4).
- Attach the electric connection (3) using the washer (2) and nut (1).
- Connect the battery (see the Diesel Engine Operator's Manual).

04.6 Alternator 24 V



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M10x35	46 Nm	
2	Console for alternator			
3	Spring pins	12x10		
4	Tensioning arm			
5	Washer	8.4		
6	Cylinder screw	M8x20	23 Nm	
7	Alternator 24 V			
8	Cylinder screw	M8x130	23 Nm	
9	Nut	M8	23 Nm	
10	Poly v belt			

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).
- Disassemble the electrical connection from the alternator [section 04.5].
- Disassemble the poly v belt [section 07.2].

Disassembly

- Remove the screws [6] and associated washers [5].
- Release the screw [8] and remove the parts [5], [7], [9].
- Remove the screws [1] and console [2].

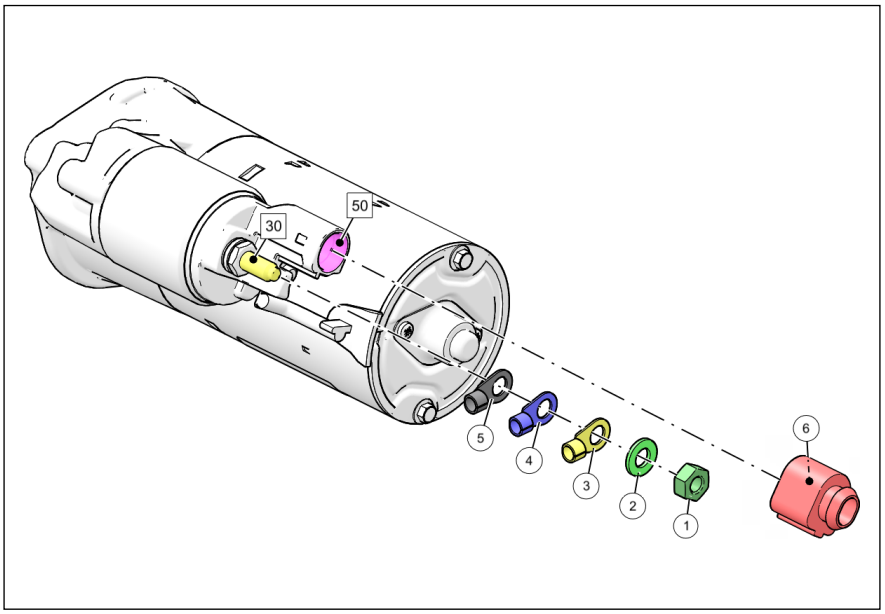
Inspection/maintenance

- Change the poly v belt as per the maintenance plan (see Diesel Engine Operator's Manual).
- If necessary, push the spring pins [3] all the way in.

Assembly

- Mount the console [2] using the screws [1].
- Attach the tension arm [4] to the housing using a screw [6] and a washer [5].
- Attach the alternator [7] to the console with parts [8], [5] and nut [9].
- Attach the alternator [7] to the tension arm using a screw [6] and a washer [5].
- The screw [6] is tightened when the poly v belt is tensioned.
- Mount the poly v belt [section 07.2].
- Mount the electrical connection on the alternator [section 04.5].
- Connect the battery [see the Diesel Engine Operator's Manual].

04.7 Electrical connection of starter (12 V/24 V)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon nut	M8	12V = 22Nm 24V = 8,5 ± 1,5Nm	
2	Washer	8.4		
3	Electrical connection 1			
4	Electrical connection 1			
5	Electrical connection B+			
6	Electrical connection 50			

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).

Disassembly

- Remove the nut [1] and washer [2].
- Remove the electrical connections [3], [4], [5].
- Detach the electrical connection [6].

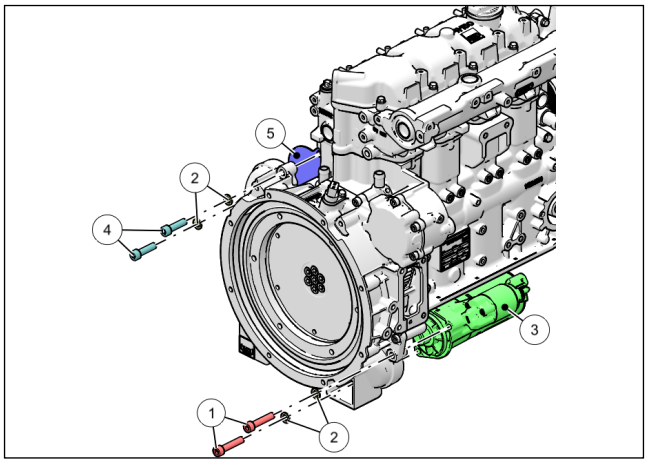
Inspection/maintenance

- Check the electrical connections for oxidation/damage.

Assembly

- Mount the electrical connection [6].
- Mount the electrical connections [5], [4], [3] with a washer [2] and nut [1].
- Connect the battery (see the Diesel Engine Operator's Manual).

04.8 Starter, low position



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M10x50	46 Nm	
2	Washer	10.5		
3	Starter - installation "low"			
4	Cylinder screw	M10x40	46 Nm	
5	Cover plate			

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).
- Disassemble the electrical connection from the starter [section 04.7].

Disassembly

- Remove the screws [1].
- Remove the washers [2] and starter [3].

Inspection/maintenance

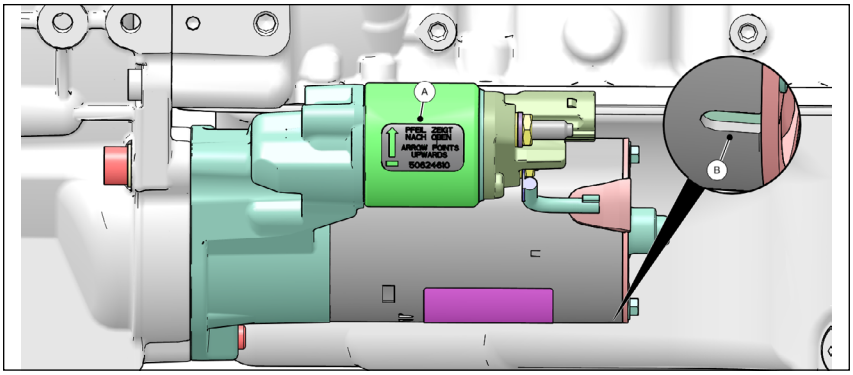
- Check the pinion (starter) for damage.
- Check the sprocket (flywheel) for damage.

Assembly

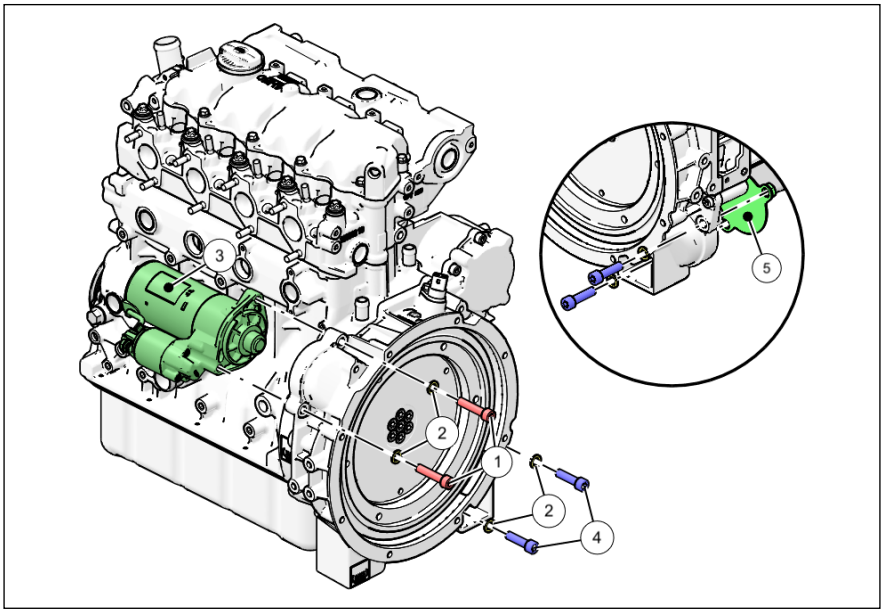
- Attach the starter [3] using the washers [2] and screws [1].
- If the cover plate [5] is disassembled, mount it using the screws [4] and washers [2].
- Mount the electrical connection on the starter [section 04.7].
- Connect the battery (see the Diesel Engine Operator's Manual).

Starter installation position:

- [A] The arrow on the adhesive label on the starter solenoid must face up.
- [B] The water drain hole must be positioned vertically downward.



04.9 Starter, high position



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M10x50	46 Nm	
2	Washer	10.5		
3	Starter - installation "high"			
4	Cylinder screw	M10x40	46 Nm	
5	Cover plate			

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).
- Disassemble the electrical connection from the starter [section 04.7].

Disassembly

- Remove the screw [1].
- Remove the washers [2] and starter [3].

Inspection/maintenance

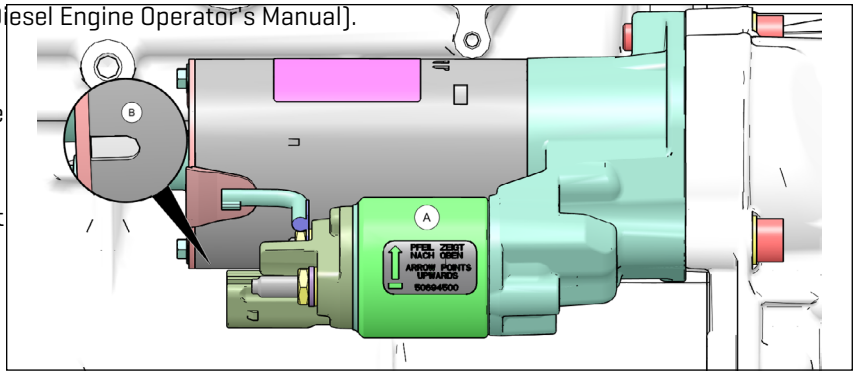
- Check the pinion (starter) for damage.
- Check the sprocket (flywheel) for damage.

Assembly

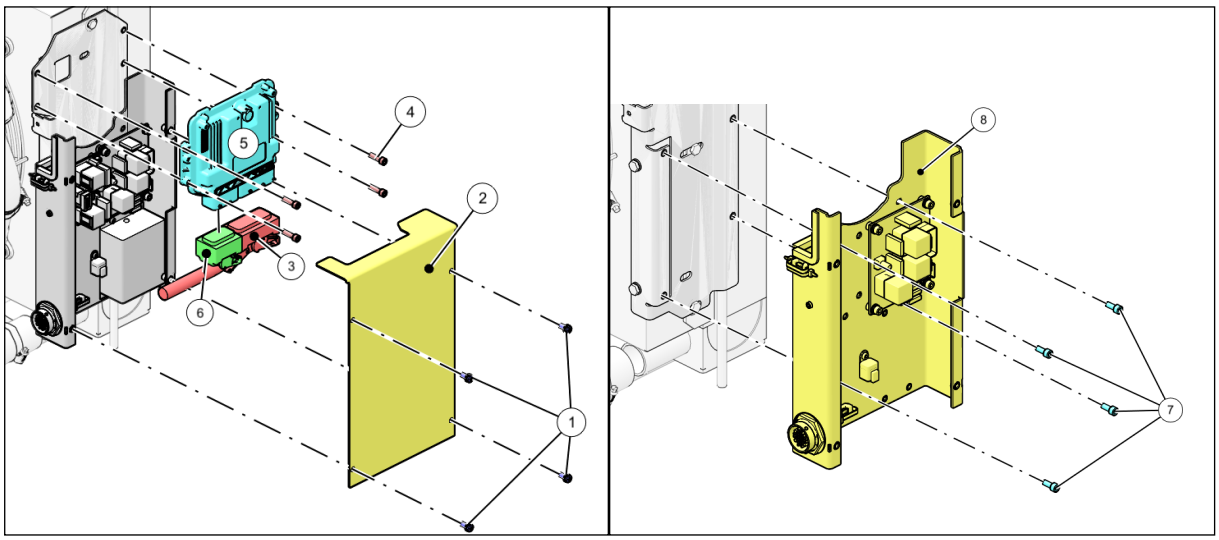
- Mount the starter [3] using the washers [2] and screws [1].
- If the cover plate [5] is disassembled, mount it using the washers [2] and screws [4].
- Mount the electrical connection on the starter [section 04.7].
- Connect the battery (see the Diesel Engine Operator's Manual).

Starter installation position:

- [A] The arrow on the adhesive label on the starter solenoid must face up.
- [B] The water drain hole must be positioned vertically downward.



04.10 Control unit and connector holding plate (Open Power Unit version)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Combi screw	M6x16	9.5 Nm	
2	Plug retaining plate			
3	K connector C81			
4	Cylinder screw	M6x25	9.5 Nm	
5	Engine control unit C81			
6	A connector C81			
7	Cylinder screw	M6x16	9.5 Nm	
8	Plug retaining plate			

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).

Disassembly

- Release the screws [1] and remove the cover [2].
- Remove the connectors [3] and [6] from the control unit [5].
- Release the screws [4] and remove the control unit [5].
- Remove the screws [7].
- Carefully fold the connector holding plate [8] away from the cooler. Ensure that the cable is not kinked or taut.

Inspection/maintenance

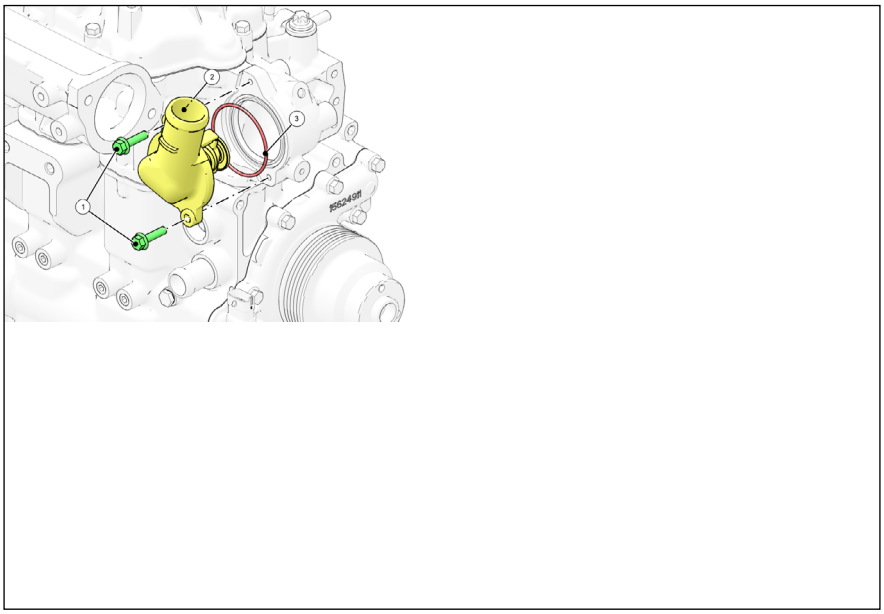
- Check the cable for cracks/abrasion/oxidation.

Assembly

- Attach the connector holding plate [8] to the cooler using the screws [7].
- Attach the control unit [5] to the cooler using the screws [4].
- Attach the connectors [3] and [6] to the control unit [5].
- Attach the cover [2] using the screws [1].
- Connect the battery (see the Diesel Engine Operator's Manual).

05
Engine cooling

05.1 Thermostat



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw with flange	6x25	11 Nm	
2	Thermostat			
3	O-ring	58x2		

Preparatory work

- Drain the coolant (see Diesel Engine Operator's Manual).
- Remove the coolant hose from the thermostat (2).

Disassembly

- Remove the screws (1).
- Remove the thermostat (2) and o-ring (3).

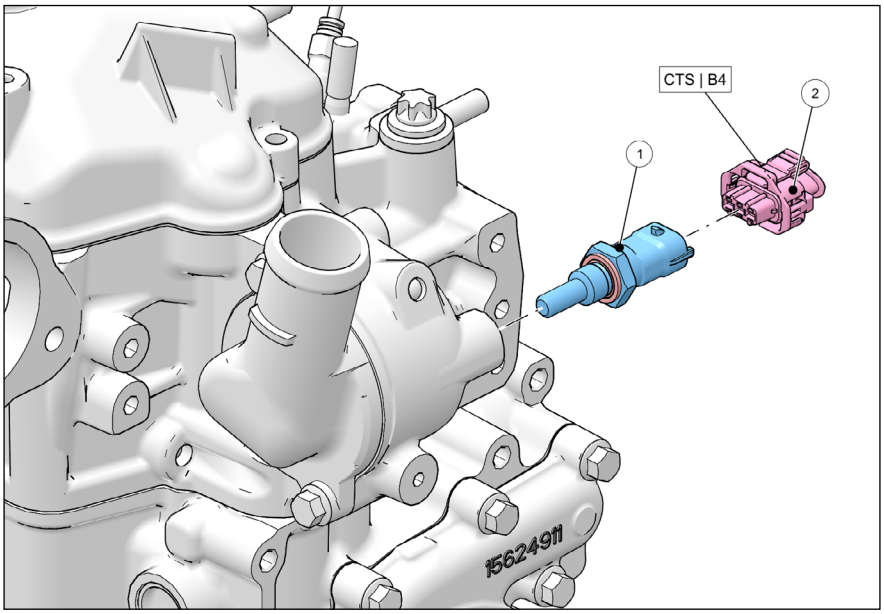
Inspection/maintenance

- Replace the o-ring (3).

Assembly

- Lightly grease the o-ring (3) and position it in the groove.
- Attach the thermostat (2) using the screws (1).
- Attach the coolant hose to the thermostat (2).
- Fill up with coolant (see the Diesel Engine Operator's Manual).

05.2 Temperature transmitter



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Temperature transmitter		11 Nm	
2	Electrical connection			

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).
- Remove the cable ties, if necessary.

Disassembly

- Remove the electrical connection [2] from the temperature transmitter [1].
- Remove the temperature transmitter [1].

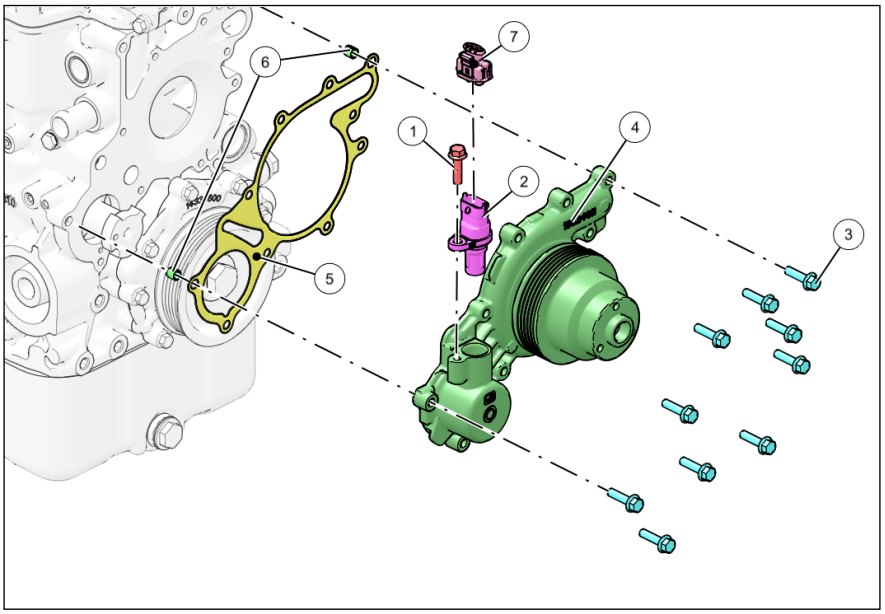
Inspection/maintenance

- Replace the cable ties, if necessary.

Assembly

- Mount the temperature transmitter [1].
- Connect the electrical connection [2].
- Attach the cable ties, if necessary.
- Connect the battery (see the Diesel Engine Operator's Manual).

05.3 Water pump



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw with flange	M6x25	9.5 Nm	
2	Phase encoder for camshaft			Optisil FM
3	Hexagon head screw with flange	M6x25	9.5 Nm	↻
4	Water pump			
5	Gasket for water pump			
6	Spring pin	8x8		
7	Electrical connection			

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).
- Drain the coolant (see Diesel Engine Operator's Manual).
- Disassemble the fan [section 05.4].
- Disassemble the poly v belt [section 07.2].

Disassembly

- Remove the electrical connection [7] from the phase encoder [2].
- Remove the screw [1].
- Remove the phase encoder [2].
- Remove the screws [3].
- Remove the water pump [4] and gasket [5].

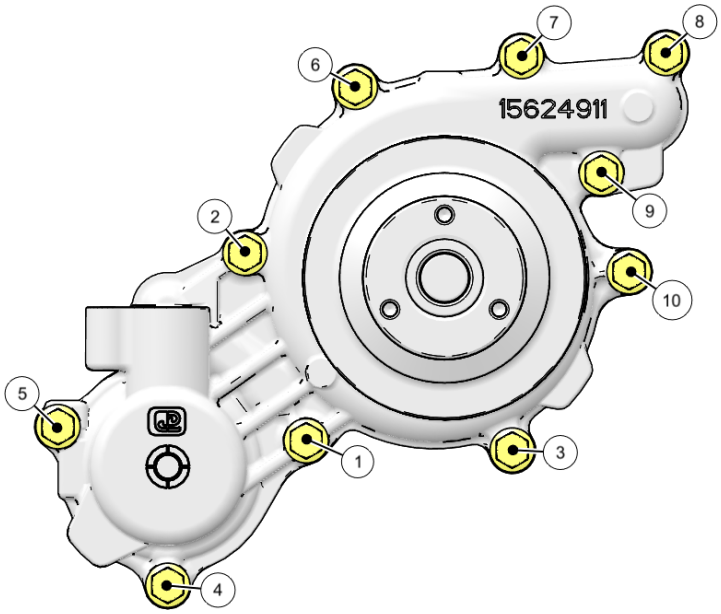
Inspection/maintenance

- Replace the gasket [5].
- If necessary, push the spring pins [6] all the way in.

Assembly

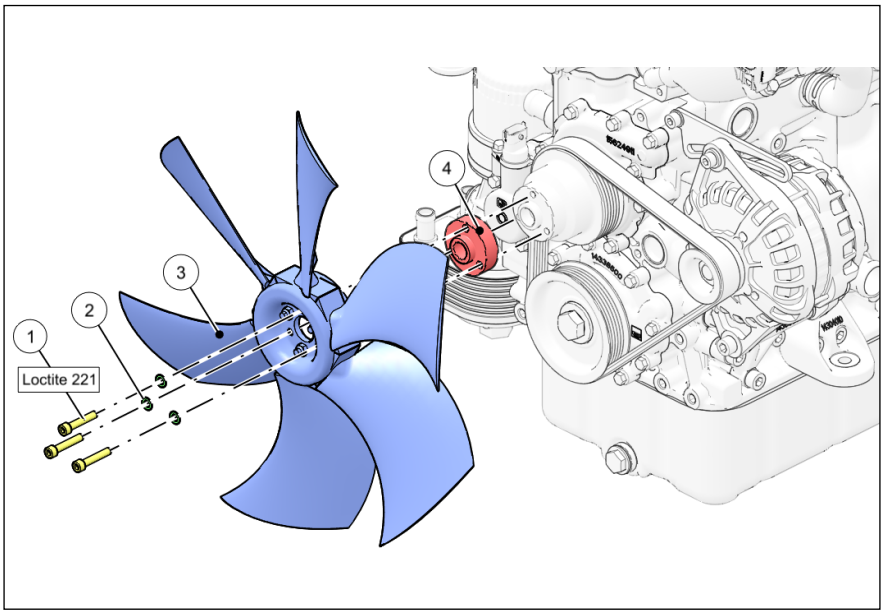
- Position the water pump [4] with the gasket [5] on the spring pins [6].
- Mount the screws [3]; see installation note.
- Attach the phase encoder [2] using the screw [1] (coat the o-ring thinly with OPTISIL FM).
- Mount the electrical connection [7].
- Mount the poly v belt [section 07.2].
- Mount the fan [section 05.4].
- Fill up with coolant (see the Diesel Engine Operator's Manual).
- Connect the battery (see the Diesel Engine Operator's Manual).

Installation note



1. Tighten the cylinder screws in the specified sequence.
2. Tighten all screws again in the same sequence as in step 1.

05.4 Fan



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M6x35	9.5 Nm	Loctite® 221™
2	Spring washer	A6		
3	Fan			
4	Intermediate piece for pulley			

Preparatory work

- Disassemble the cooler, if necessary.

Disassembly

- Remove the screws [1] and washers [2].
- Remove the fan [3].
- Remove the intermediate piece [4].

Inspection/maintenance

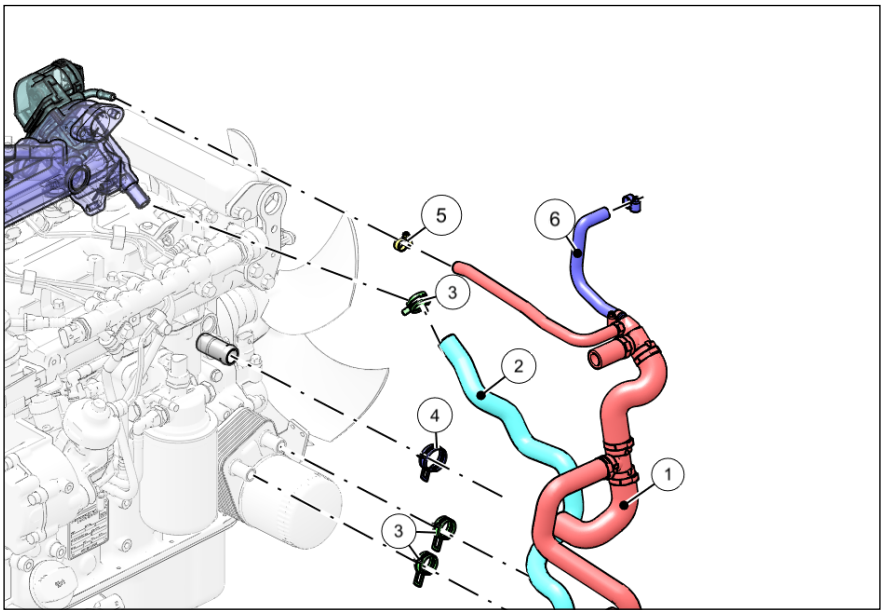
- Check the fan blades for cracks/pitting.

Assembly

- Attach the intermediate piece [4] and fan [3] using the spring washer [2] and cylinder screw [1].
- Install the cooler, if necessary.

06
Engine lubrication

06.1 Hose for oil cooler/filter, horizontal



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Shaped hose piece, multiple parts			
2	Shaped hose piece	D16x4.5		
3	Spring band clamp	24–26		
4	Spring band clamp	30–32.5		
5	Hose clamp	7.5		
6	Coolant hose	8x3x198		

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).
- Drain the coolant (see Diesel Engine Operator's Manual).
- Disassemble the coolant hose [6] from the cooler [section 14.5].

Disassembly

- Release the spring band clamps [3] and [4].
- Release the hose clamp [5].
- Remove the shaped hose pieces [1] and [2].

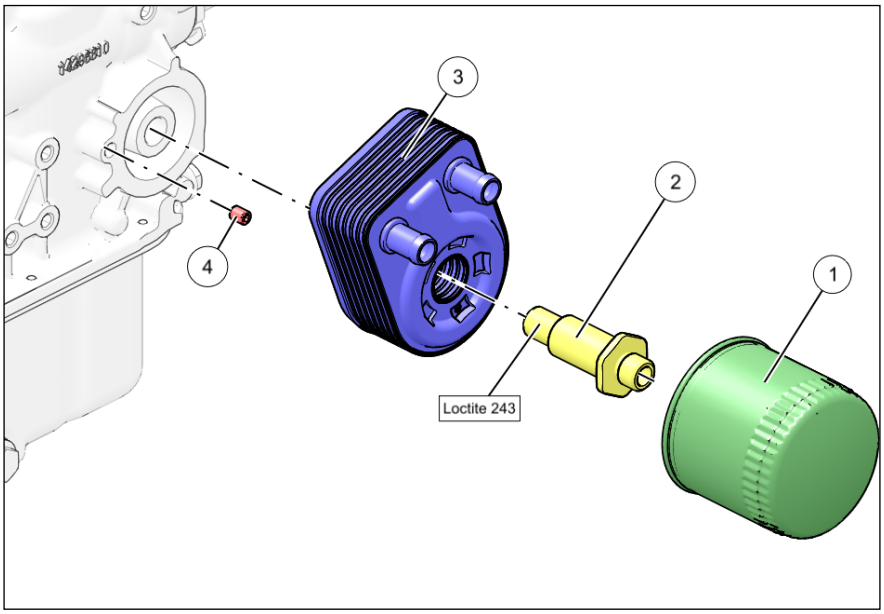
Inspection/maintenance

- Check the shaped hose pieces [1] and [2] for cracks/abrasion/aging.
- Replace the shaped hose pieces if necessary.

Assembly

- Attach the shaped hose pieces [1] and [2] using hose clamps [3], [4], [5].
- Mount the coolant hose [6] on the cooler [section 14.5].
- Fill up with coolant (see the Diesel Engine Operator's Manual).
- Connect the battery (see the Diesel Engine Operator's Manual).

06.2 Oil cooler/filter, horizontal



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Oil filter, short			
2	Double nipple for oil cooler	M18x1.5	40 Nm	Loctite® 243™
3	Oil cooler, horizontal			
4	Set screw	M8x10		do not disassemble

Note

Set screw [4] is only installed horizontally with the oil cooler/filter and must not be disassembled.

Preparatory work

- Disassemble the horizontal oil cooler hose [section 06.1].

Disassembly

- Remove the oil filter [1].
- Remove the double nipple [2].
- Remove the oil cooler [3].

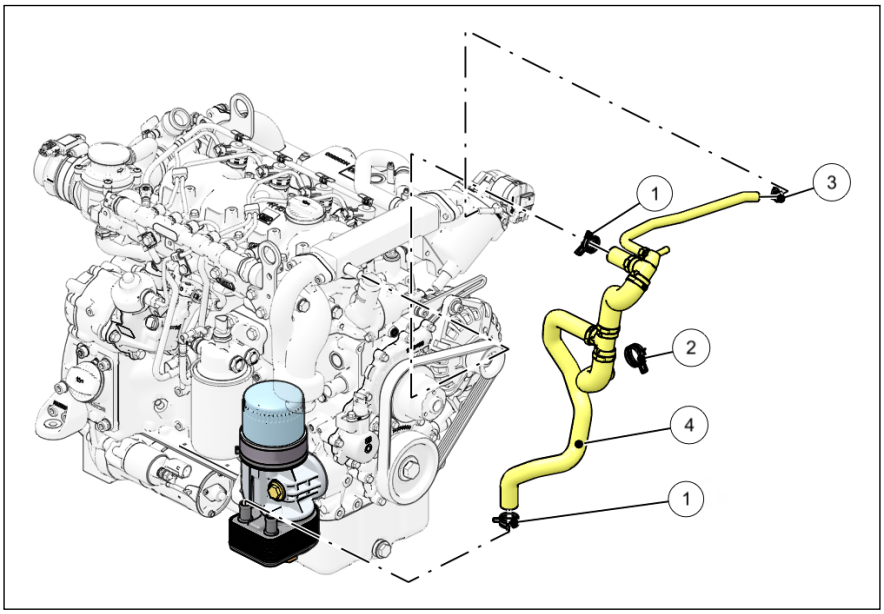
Inspection/maintenance

- Change the oil filter as per the maintenance plan.

Assembly

- Attach the oil cooler [3] using the double nipple [2].
- Attach the oil filter [1] to the double nipple [2] and fasten it hand-tight.
- Mount the horizontal oil cooler hose [section 06.1].
- Fill up with coolant (see the Diesel Engine Operator's Manual).

06.3 Oil cooler/filter hose, vertical



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Spring band clamp	24–26		
2	Spring band clamp	30–32.5		
3	Hose clamp	7.5	Hand-tight	
4	Shaped hose piece, multiple parts			

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).
- Drain the coolant (see Diesel Engine Operator's Manual).
- Disconnect the shaped hose piece [4] from the cooler.

Disassembly

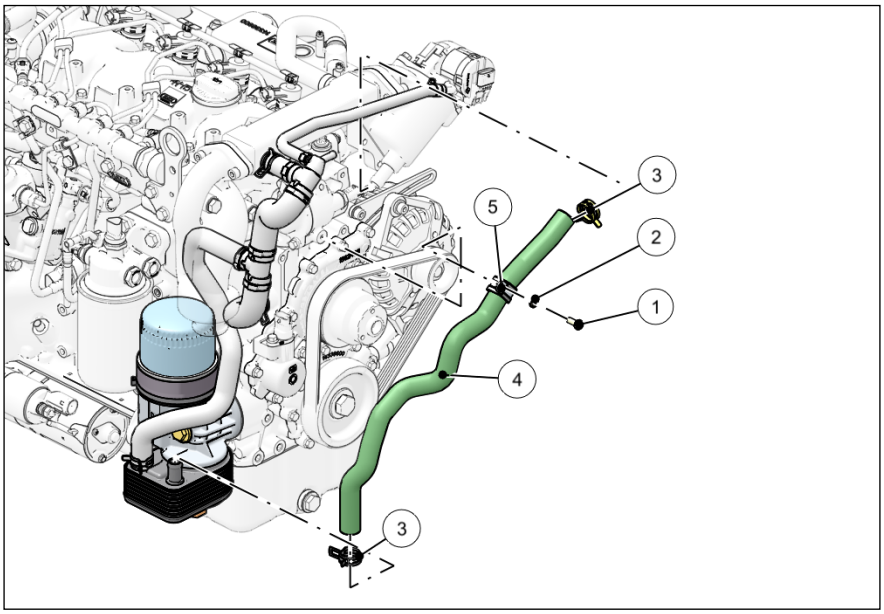
- Release the hose clamps [1], [2], [3].
- Remove the shaped hose piece [4].

Inspection/maintenance

- Check the shaped hose piece [4] for cracks/abrasion/aging.
- Replace the hose clamps [1], [2], [3] if necessary.

Assembly

- Attach the shaped hose piece [4] using hose clamps [1], [2], [3].
- Fill up with coolant (see the Diesel Engine Operator's Manual).
- Connect the battery (see the Diesel Engine Operator's Manual).



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw	M6x16	9.5 Nm	
2	Washer	6.4		
3	Spring band clamp	24–26		
4	Shaped hose piece	D16x4.5		
5	Pipe clamp RSGU	1.25/15		

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).
- Drain the coolant (see Diesel Engine Operator's Manual).

Disassembly

- Remove the screw (1) and washer (2).
- Release the clamps (3).
- Remove the shaped hose piece (4).

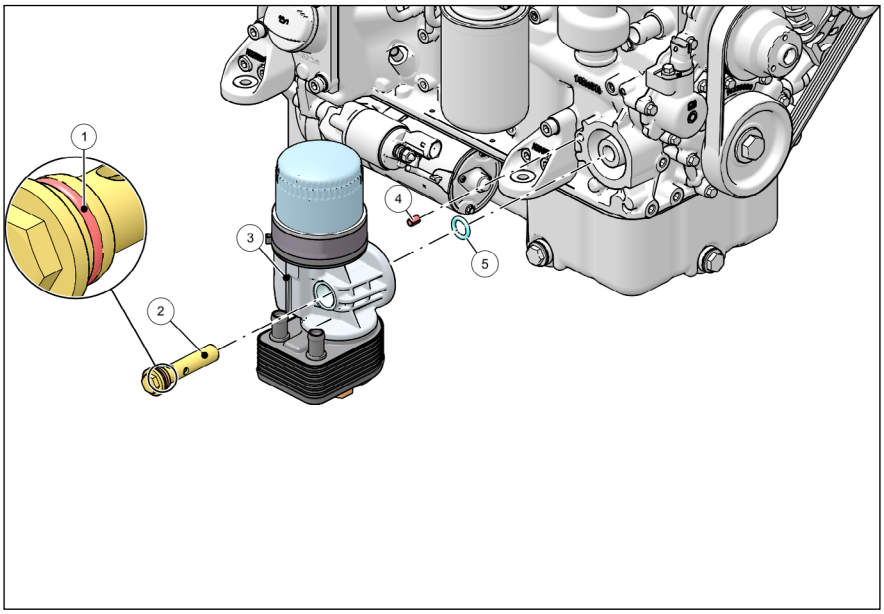
Inspection/maintenance

- Check the shaped hose piece (4) for cracks/abrasion/aging.

Assembly

- Attach the shaped hose piece (4) using the clamps (3).
- Attach the pipe clamp (5) using the washer (2) and screw (1).
- Fill up with coolant (see the Diesel Engine Operator's Manual).
- Connect the battery (see the Diesel Engine Operator's Manual).

06.4 Oil cooler/filter, vertical



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	O-ring	22x2		
2	Hollow bolt	M18x1.5	50 Nm	
3	Oil cooler/filter, vertical			Loctite® 5910™
4	Spring pin	8x12		
5	O-ring	18x4		

Preparatory work

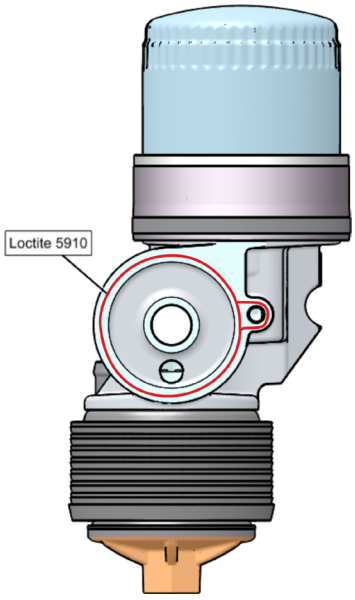
- Drain the coolant (see Diesel Engine Operator's Manual).
- Disassemble the horizontal oil cooler/filter hose [section 06.3].

Disassembly

- Remove the hollow bolt [2].
- Remove the oil cooler [3] and O-ring [5].

Inspection/maintenance

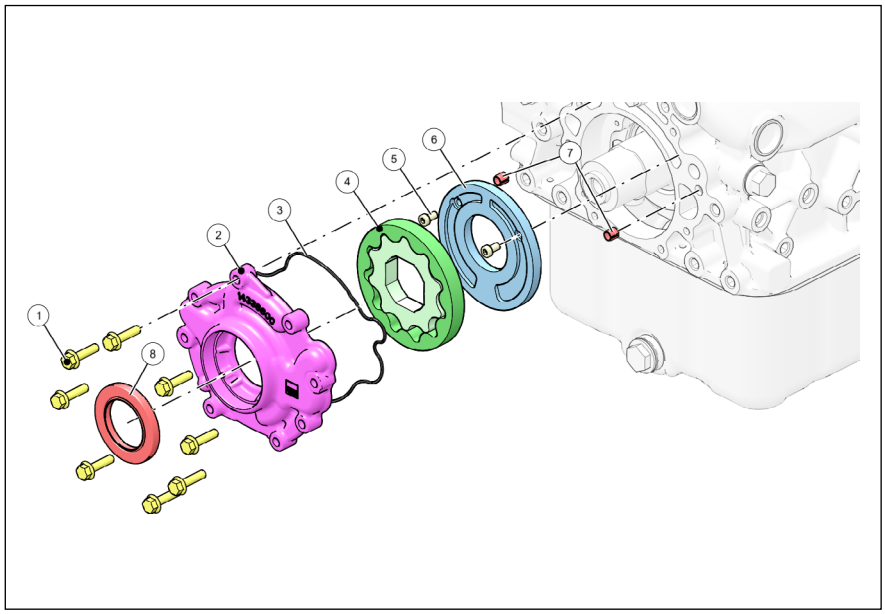
- Change the oil filter as per the maintenance plan (see Diesel Engine Operator's Manual).
- Clean the sealing surfaces of the oil cooler to remove oil and grease.
- Apply sealing agent Loctite® 5910™ on the sealing surfaces as shown in the figure.
- Replace the o-rings [1] and [5].
- Press the spring pin all the way in.



Assembly

- Coat the o-ring [1] lightly with oil.
- Insert the hollow bolt [2] through the oil cooler [3].
- Position the o-ring [5] on the hollow bolt.
- Attach the cooler [3] to the engine.
- Mount the vertical oil cooler/filter hose [section 06.3].
- Fill up with coolant (see the Diesel Engine Operator's Manual).

06.5 Oil pump



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M6x25	11 Nm	↻
2	Cover for oil pump			
3	Sealing cord			
4	Rotor set			
5	Cylinder screw	M5x10	5.5 Nm	
6	Bulkhead			
7	Spring pin	8x8		
8	Shaft sealing ring	40x62x7		

Preparatory work

- Drain the coolant if necessary (see Diesel Engine Operator's Manual).
- Disassemble the cooler, if necessary.
- Drain the oil (see Diesel Engine Operator's Manual).
- Disassemble the pulley [section 07.4].

Disassembly

- Remove the screws [1].
- Remove the parts [2 – 4].
- Remove the screws [5].
- Remove the bulkhead [6].

Inspection/maintenance

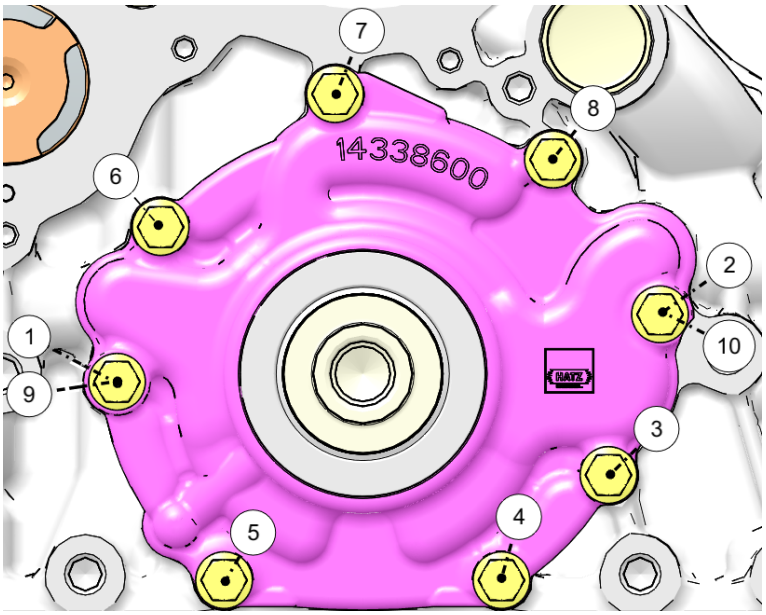
- Replace the gasket [3].
- Check the rotor set [4] for damage/wear.
- Replace the shaft sealing ring [8], if necessary. To do so, lightly grease the shaft sealing ring and press it all the way into the cover of the oil pump.
- If necessary, push the spring pins [7] all the way in.

Assembly

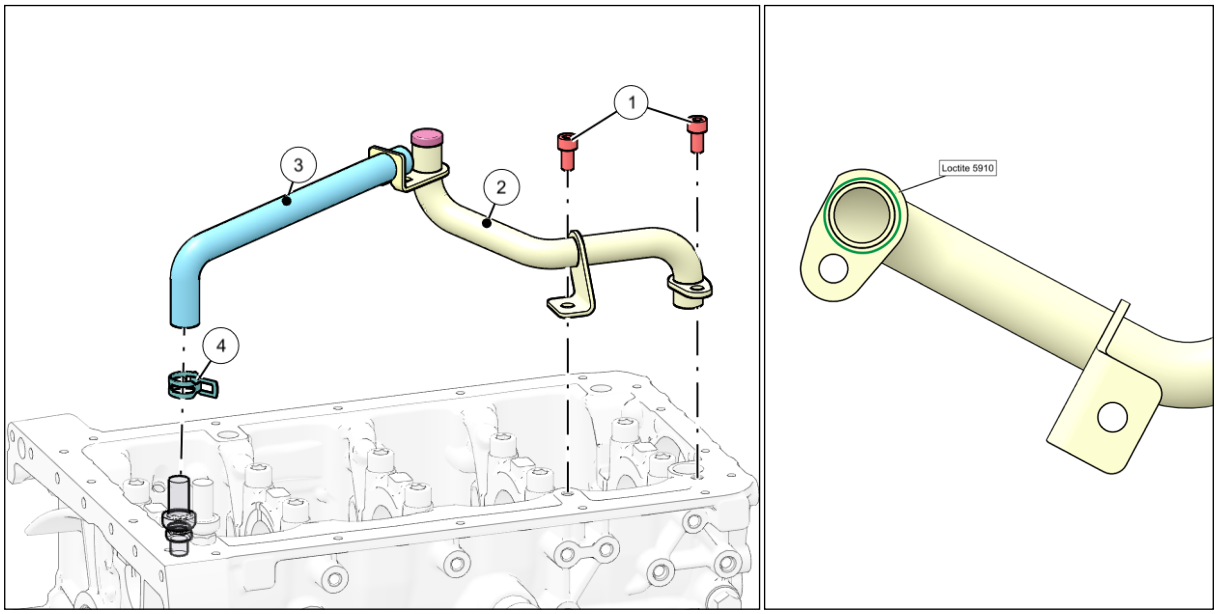
- Attach the bulkhead [6] using the screws [5].
- Position the rotor set [4] on the crankshaft.
- Place the cover of the oil pump [2] with the sealing cord [3] on the spring pins.
- Mount the screws [1]; see installation note.
- Mount the pulley [section 07.4].
- Fill up the oil (see Diesel Engine Operator's Manual).
- Install the cooler, if necessary.
- Fill up with coolant (see the Diesel Engine Operator's Manual).

Installation note

Tighten the cylinder screws in the following sequence:



06.6 Oil intake pipe



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M8x16	23 Nm	Loctite® 243™
2	Oil suction pipe			Loctite® 5910™
3	Shaped hose piece	D14x3		
4	Spring band clamp	20–21.6		

Preparatory work

- Disassemble the oil sump [section 06.7].

Disassembly

- Release the clamp [4] and remove the shaped hose piece [3].
- Remove the screws [1].
- Remove the oil intake pipe [2].

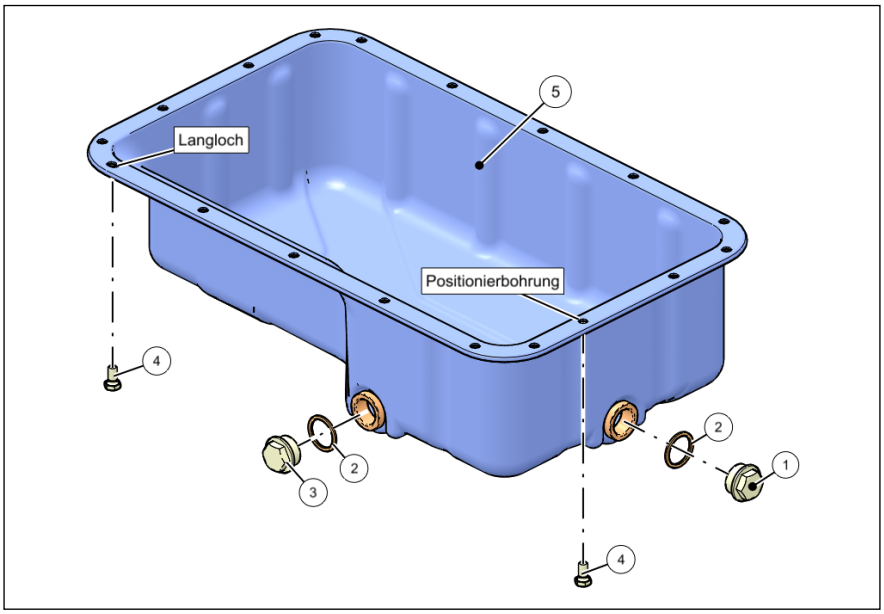
Inspection/maintenance

- Clean the sealing surface to remove oil and grease.
- Apply sealing agent Loctite® 5910™ as shown in the figure above.

Assembly

- Attach the oil intake pipe [2] using the screws [1].
- Attach the shaped hose piece [3] using the clamp [4].
- Mount the oil sump [section 06.7].

06.7 Oil sump



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Screw plug	M22x1.5	58 Nm	
2	Sealing ring			
3	Screw plug	M22x1.5	58 Nm	
4	Combi screw	M6x13	9.5 Nm	
5	Oil sump			Loctite® 5910™

Preparatory work

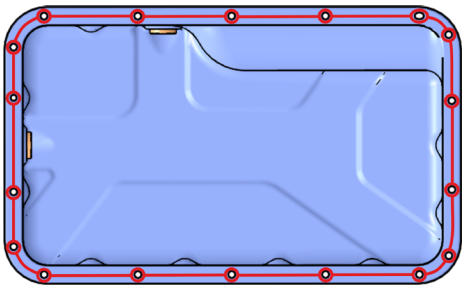
- Drain the oil (see Diesel Engine Operator's Manual).
- If necessary, disassemble the starter, low [section 04.8].

Disassembly

- Remove all combi screws [4].
- Take off the oil sump [5].

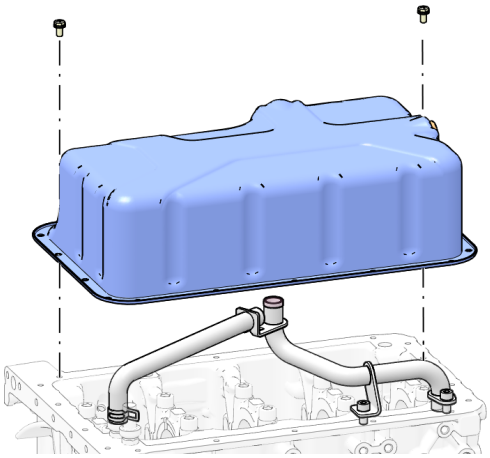
Inspection/maintenance

- Clean the sealing surfaces of the oil sump to remove grease and oil.
- Apply sealing agent Loctite® 5910™ on the sealing surfaces as shown in the figure on the right.



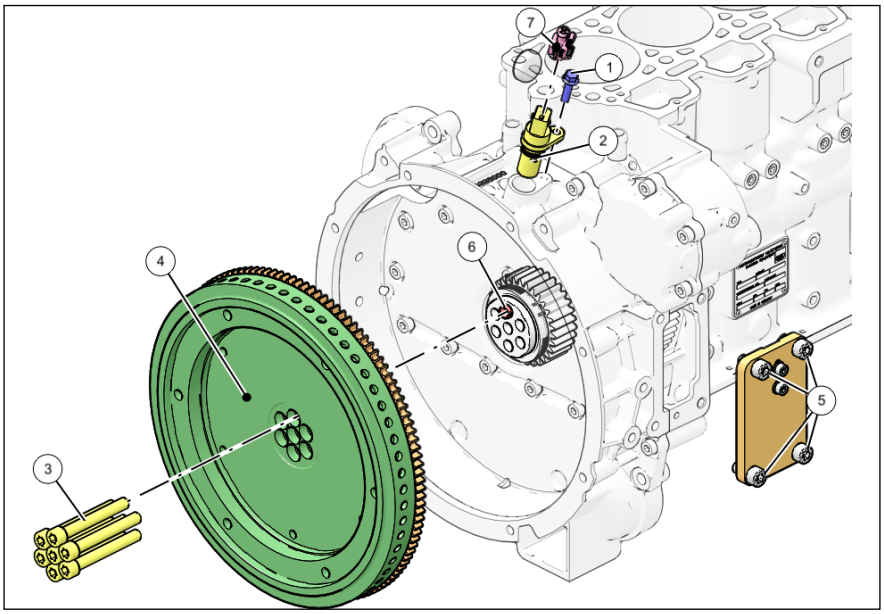
Assembly

- Secure the oil sump [5] on the positioning hole and oblong hole using the screws [4]. Only screw in the screws lightly.
- Align the oil sump [5].
- Tighten the screws [4] in the oblong hole and positioning hole.
- Attach the oil sump using the remaining screws [4].
- Fill with oil (see Diesel Engine Operator's Manual).
- If necessary, mount the starter, low [section 04.8].



07
Add-on parts

07.1 Flywheel



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw with flange	M6x25	9.5 Nm	
2	Speed sensor			
3	Cylinder screw	M10x1x80		Ⓐ ⟳
4	Flywheel			
5	Special tool	65348000	23 Nm	
6	Centering bush			
7	Electrical connection			

Screw connection category A

Ⓐ Please abide by the requirements in the "Torque + classification 056758XX_H50" list.

Note

- Remove speed sensor before dismounting the flywheel and only install after mounting the flywheel; otherwise it can be damaged by the sprocket.
- Avoid contamination! The face is magnetic - avoid contact with iron particles!
- The flywheel screw fittings must be disassembled manually. Use of an impact screw driver is prohibited.
- It is prohibited to heavily oil/grease the screw thread when mounting the flywheel screw fitting. If necessary, only oil the screw thread "lightly".

Preparatory work

- Disassemble the oil filler engine bracket, if necessary [section 10.4].
- Disassemble the auxiliary drive (PTO bottom), if necessary [section 07.7].

Disassembly

- Remove the electrical connection [7].
- Remove the screw [1].
- Remove the speed sensor [2].
- Secure the crankshaft using the special tool [5]. To do so, insert the special tool into the opening until it engages in the sprocket of the flywheel.
- Tighten the cylinder screws [5]
- Remove the cylinder screws [3].
- Remove the flywheel [4].
- Remove the centering bush [6].

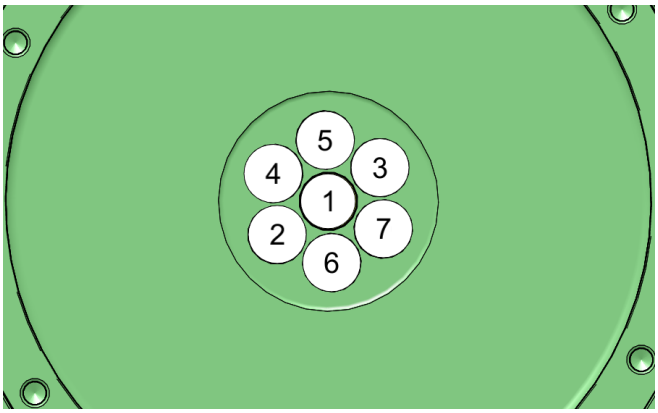
Inspection/maintenance

- Replace the screws [3].
- Check the sprocket of the flywheel for damage.

Assembly

- Insert the centering bush [6] in the crankshaft.
- Mount the flywheel [4]; see installation note.
- Release the cylinder screws of the special tool [5] and remove the special tool.
- Mount the speed sensor [2] using the screw [1].
- Attach the electrical connection [7].
- Mount the oil filler engine bracket/auxiliary drive, if necessary [section 10.4].
- Mount the auxiliary drive (PTO bottom), if necessary [section 07.7].

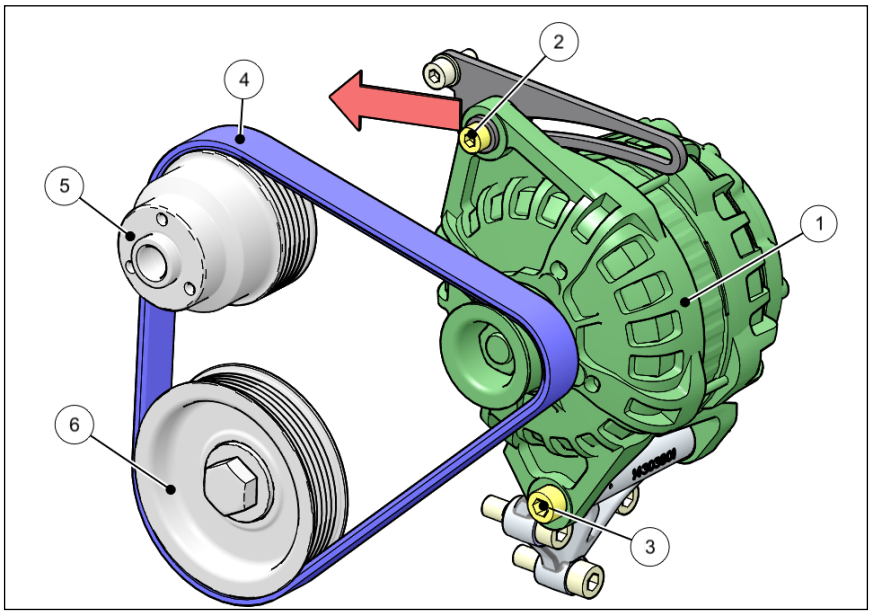
Installation note



Tighten the cylinder screws [3] in the following sequence:

- Screw 1 = 45 Nm
- Screws 2–7 = 95 Nm
- Screw 1 = 95 Nm

07.2 Poly v belt (without A/C compressor)



Pos.	Designation
1	Alternator
2	Upper fixing screw on the alternator
3	Lower fixing screw on the alternator
4	Poly v belt
5	Pulley Water pump
6	Pulley Crankshaft

Note

- The cause of running noises of the poly v belt is mostly likely that the pretension on the belt is too low.
- Belt pretension that is too low causes premature wear of the poly v belt. Regularly check the belt tension, retension the poly v belt if required.

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).
- Disassemble the fan [section 05.4].

Disassembly

- Loosen the fixing screws [2] and [3].
- Turn the alternator [1] in the direction of the arrow all the way.
- Remove the loose poly v belt [4] from the pulleys [5], [6].

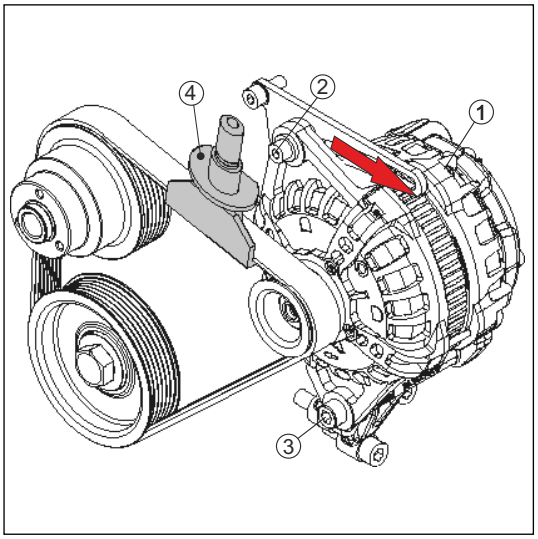
Inspection/maintenance

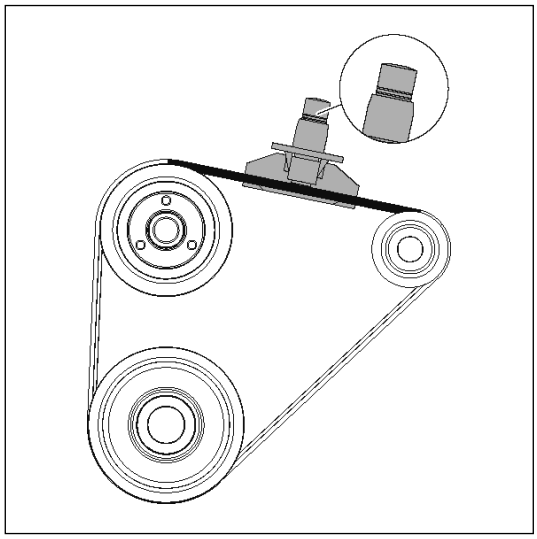
- Check the pulley for perfect condition. If the grooves are broken off or bent, renew the damaged belt pulley.
- Replace the poly v belt as per the maintenance plan.

Assembly

- Place the poly v belt [4] on the pulleys [5], [6].
- Now push the alternator [1] in direction opposite to the arrow.
- Tighten the upper fixing screw [2] on the alternator.
- Then tighten the lower fixing screw [3] on the alternator.
- Mount the fan [section 05.4].
- Check the belt tension [section 07.3].
- Connect the battery (see the Diesel Engine Operator's Manual).

07.3 Checking and adjusting the poly v belt





Checking the belt tension

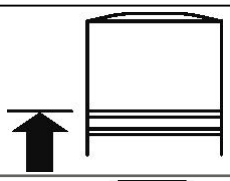
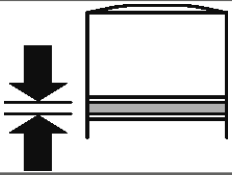
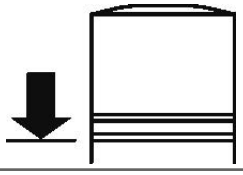
- Check the belt tension at the measuring point in accordance with the manual of the measuring device manufacturer and compare with the setting values for the belt tension. Adjust the belt tension if required.

Setting the belt tension

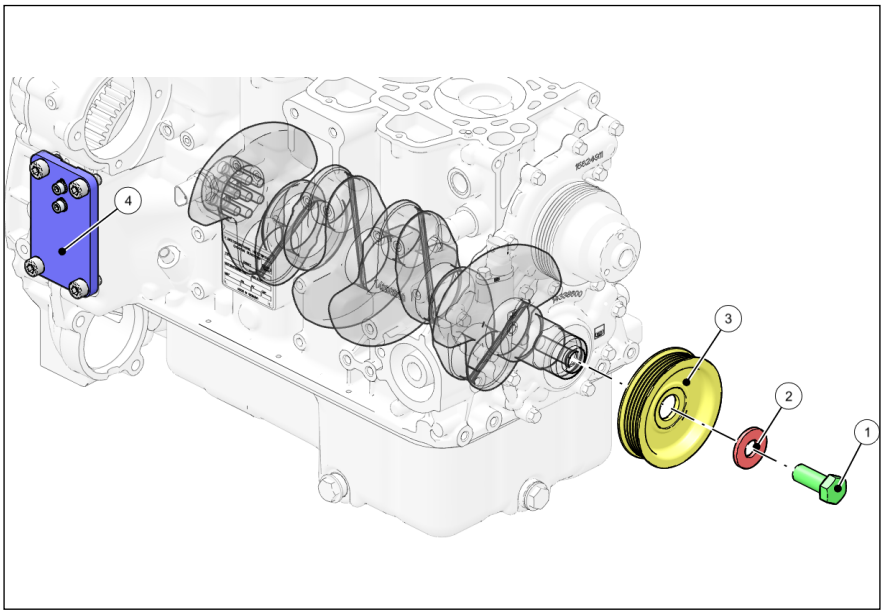
- Loosen the fixing screws [2] and [3].
- Turn the alternator [1] in the direction of the arrow, hold it and simultaneously tighten the fixing screws [2], [3] of the alternator in this position.
- Check the belt tension again.
- If necessary, correct the belt tension.

Setting values for the belt tension

The pretensioning force or the vibration frequency of the belt is decisive for adjustment of the belt tension. For this, we recommend the use of the DM.16 belt tension meter from Facom or a frequency meter. If neither of these meters are available, please contact your nearest **HATZ Service**.

Belt tension		
	Display (4) on the "Facom" belt tension meter	**Vibration frequency (frequency meter)**
New belt		210 Hz (+10 Hz)
Belt after maintenance interval		150 Hz (+ 10 Hz)
Minimum tension		125 Hz

07.4 Pulley



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M16x1.5x40 LH	200 Nm	
2	Curved washer	16		
3	Pulley crankshaft	Ø 103 PK6		
4	Special tool	65348000	23 Nm	

Preparatory work

- Disassemble the oil filler engine bracket, if necessary [section 10.4].
- Disassemble the auxiliary drive (PTO bottom), if necessary [section 07.7].
- Disassemble the fan [section 05.4].
- Disassemble the poly v belt [section 07.2].

Disassembly

- Mount the special tool (4) to secure the crankshaft.
- Remove the screw (1) and curved washer (2).
- Remove the pulley (3).

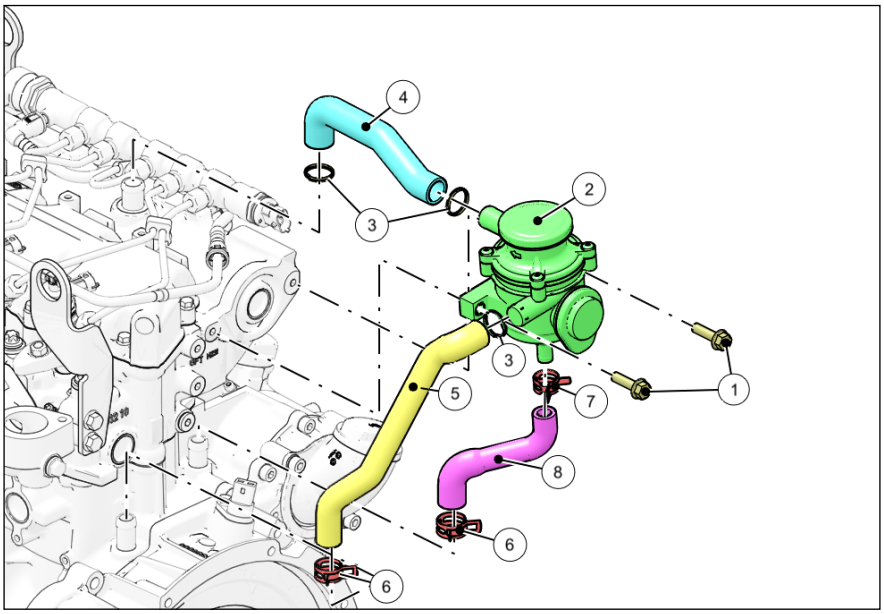
Inspection/maintenance

- Replace the curved washer (2).

Assembly

- Mount the pulley (3) using the screw (1) and curved washer (2).
- The curvature of the curved washer (2) must face the screw head.
- Remove the special tool (4).
- Mount the poly v belt [section 07.2].
- Mount the fan [section 05.4].
- Mount the auxiliary drive (PTO bottom), if necessary [section 07.7].
- Mount the oil filler engine bracket, if necessary [section 10.4].

07.5 Provent



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw with flange	M8x30	23 Nm	
2	Provent			
3	Wire hose clip			
4	Shaped hose piece			
5	Shaped hose piece			
6	Spring band clamp	22–24.5		
7	Spring band clamp	20–21.6		
8	Shaped hose piece			

Preparatory work

- -

Disassembly

- Release the hose clamps [6], [7] and clamps [3].
- Remove the shaped hose pieces [4], [5], [8].
- Remove the screws [1] and provent [2].

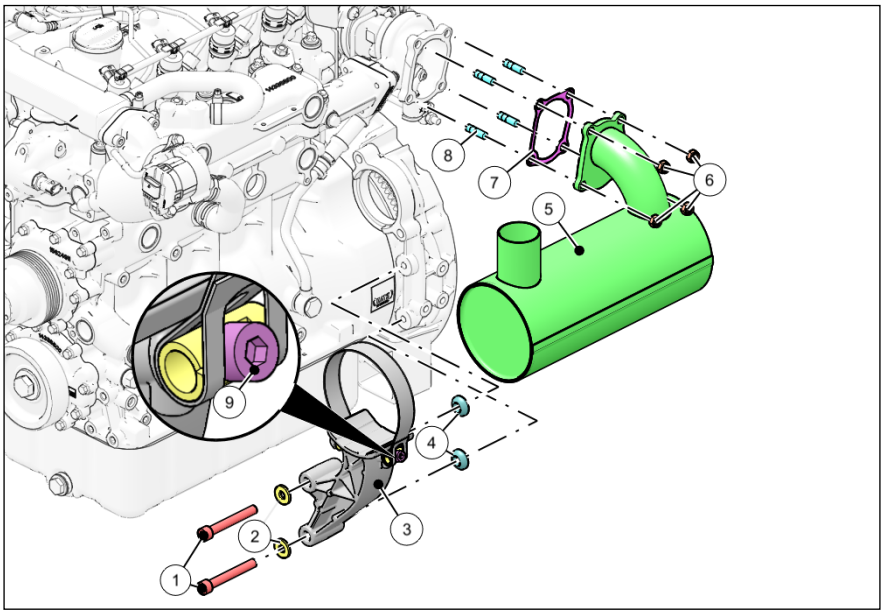
Inspection/maintenance

- Check the shaped hose pieces [4], [5], [8] for cracks/abrasion/aging.

Assembly

- Mount the provent [2] with screws [1].
- Mount the shaped hose pieces [4], [5], [8] with chips [3] and hose clamps [6], [7].

07.6 Exhaust silencer/oxidation catalytic converter



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M10x80	46 Nm	↻
2	Washer	10x24x3		
3	Retaining strap + bracket to DOC			
4	ball head			
5	Exhaust silencer/oxidation catalytic converter			
6	Hexagon nut	VM8	23 Nm	↻
7	Gasket for the turbocharger			
8	Stud bolt	M8x22		
9	Cylinder screw	M8x35	15 Nm	↻

Preparatory work

- -

Disassembly

- Release the nuts [6].
- Release the screw [9].
- Remove the exhaust silencer/oxidation catalytic converter [5] and gasket [7].
- Release the screws [1].
- Remove the parts [2], [3], [4].

Inspection/maintenance

- Replace the gasket [7].
- Replace the nuts [6].
- If necessary, screw the stud bolts [8] all the way in.

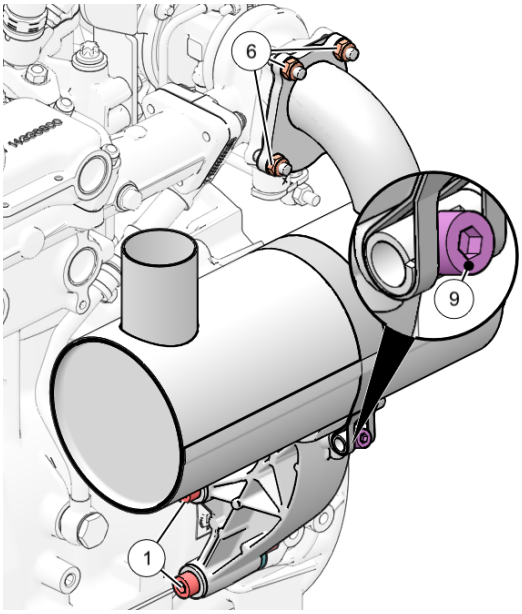
Assembly

- Attach all parts without tension. Ensure that the retaining strap runs straight over the exhaust silencer/oxidation catalytic converter.
- Tighten the screws; see installation note.

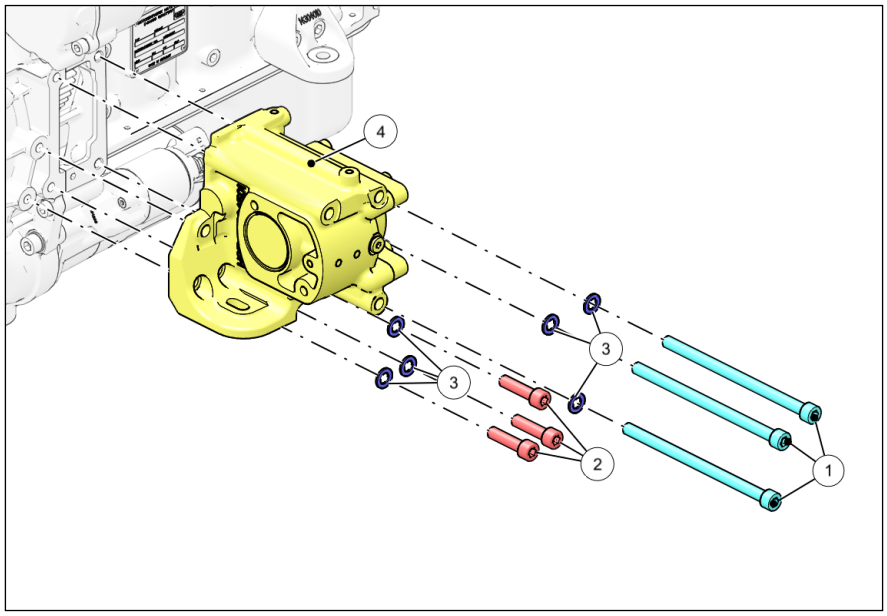
Installation note

Tighten the screws in the following sequence:

- Tighten the nuts [6] to torque 23 Nm.
- Tighten the screw [9] to torque 15 Nm.
- Tighten screws [1] to torque 46 Nm.



07.7 Auxiliary drive (PTO bottom)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M10x170	46 Nm	
2	Cylinder screw	M10x40	46 Nm	
3	Washer	10.5		
4	Auxiliary drive (PTO bottom)			
8	O-ring	7.3x2.4		

Preparatory work

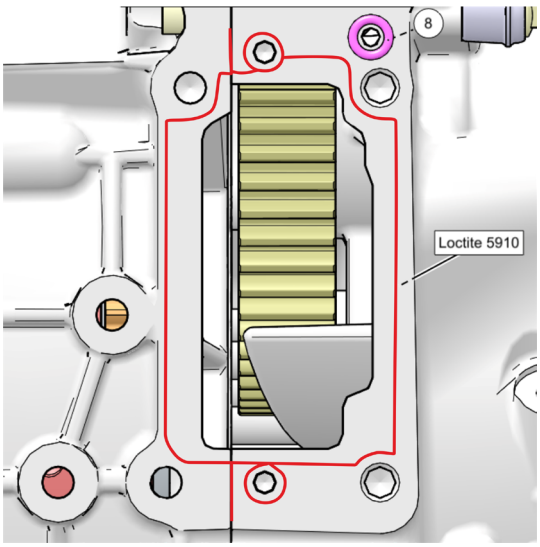
- -

Disassembly

- Remove the screws [2] and washers [3].
- Remove the screws [1] and washers [3].
- Remove the auxiliary drive [4].

Inspection/maintenance

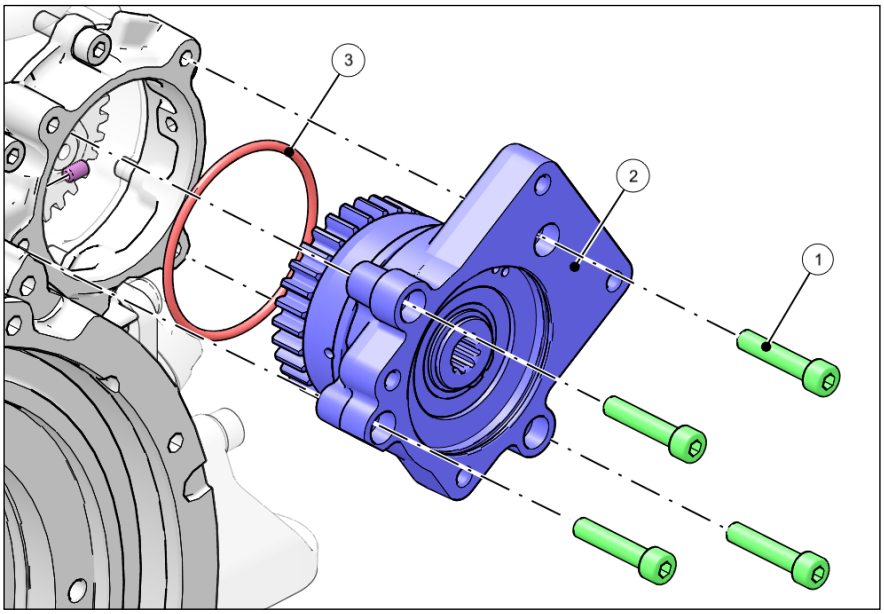
- Clean the sealing surfaces to remove grease and oil.
- Apply sealing agent Loctite® 5910™ on the sealing surfaces as shown in the figure on the right.
- Replace the o-ring [8].



Assembly

- Attach auxiliary drive [4] using the screws [1], [2] and washers [3].

07.8 Auxiliary drive (PTO top)



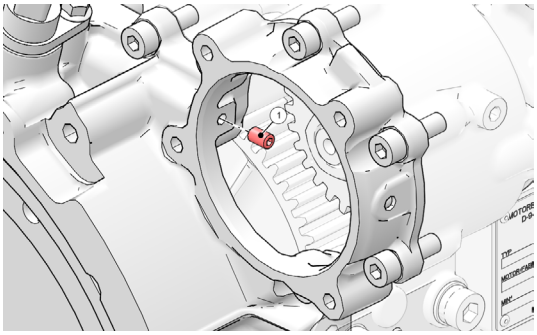
Note

- When mounting the auxiliary drive (PTO top) later, it must be ensured that the set screw M6x10 is removed first (see figure below).
- The top auxiliary drive (PTO top) may only be mounted when the pressure oil hole is open.

Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M8x40	23 Nm	
2	Auxiliary drive (PTO top)	Ø 80		
3	O-ring	77x3.5		

Preparatory work

- Disassemble the hydraulic pump, if necessary [section 07.9].
- Disassemble the cover of the hydraulic pump, if necessary [section 07.10].



Disassembly

- Remove the cylinder screws [1].
- Remove the auxiliary drive [2].

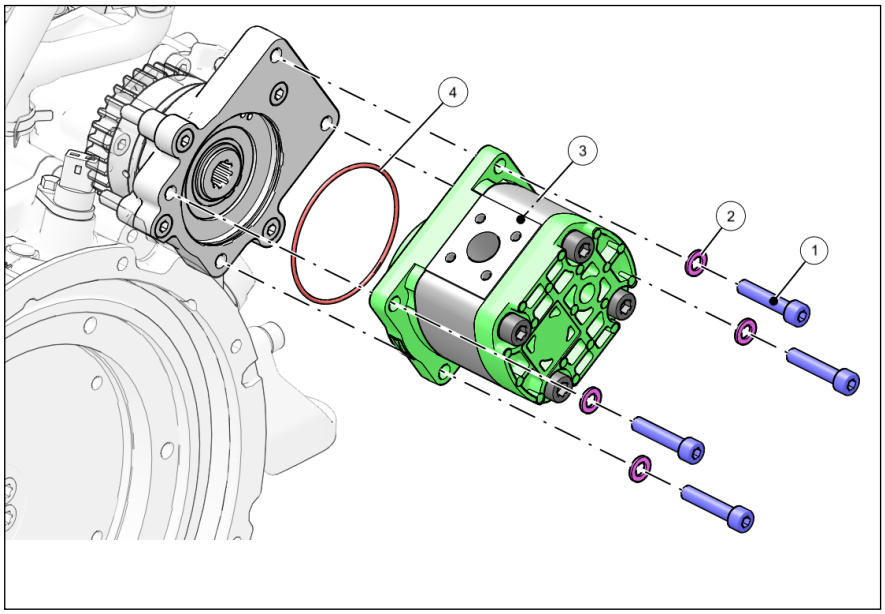
Inspection/maintenance

- Replace the o-ring [3].

Assembly

- Grease the o-ring [3] lightly and position it in the groove.
- Attach the auxiliary drive [2] using the screws [1].
- Mount the hydraulic pump, if necessary [section 07.9].
- Mount the cover of the hydraulic pump, if necessary [section 07.10].

07.9 Hydraulic pump (PTO top)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M8x40	23 Nm	
2	Washer	8.4		
3	Hydraulic pump (PTO top)	Ø 80		
4	O-ring	80x2		

Preparatory work

- Drain the oil (see Diesel Engine Operator's Manual).

Disassembly

- Remove the cylinder screws [1] and washers [2].
- Remove the hydraulic pump [3].

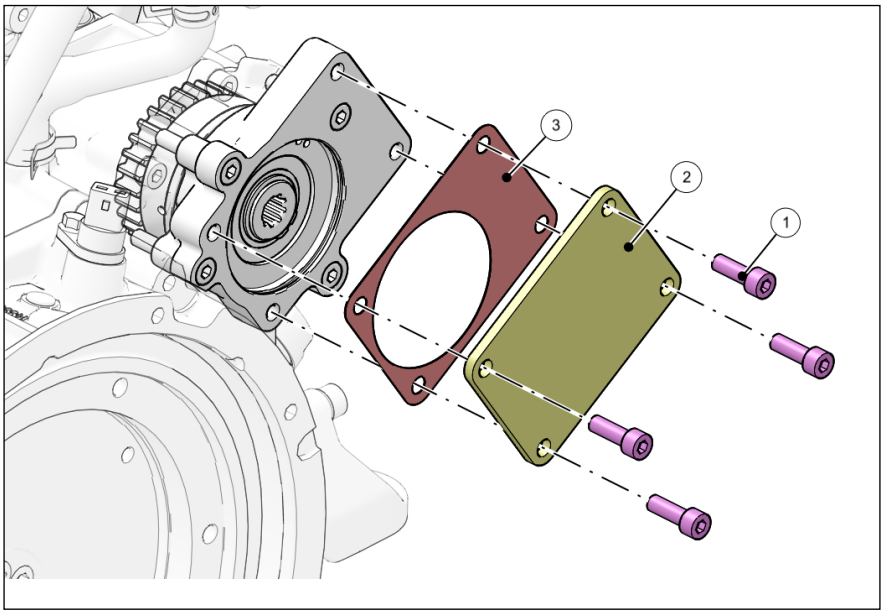
Inspection/maintenance

- Replace the o-ring [4].

Assembly

- Grease the o-ring [4] and position it in the groove.
- Attach the hydraulic pump [3] using the washers [2] and screws [1].
- Fill up the oil (see Diesel Engine Operator's Manual).

07.10 Cover for hydraulic pump (PTO top)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M8x25	23 Nm	
2	Cover for hydraulic pump (PTO top)	8.4		
3	Gasket	Ø 80		

Preparatory work

- Drain the oil (see Diesel Engine Operator's Manual).

Disassembly

- Remove the cylinder screws [1].
- Remove the cover [2] and gasket [3].

Inspection/maintenance

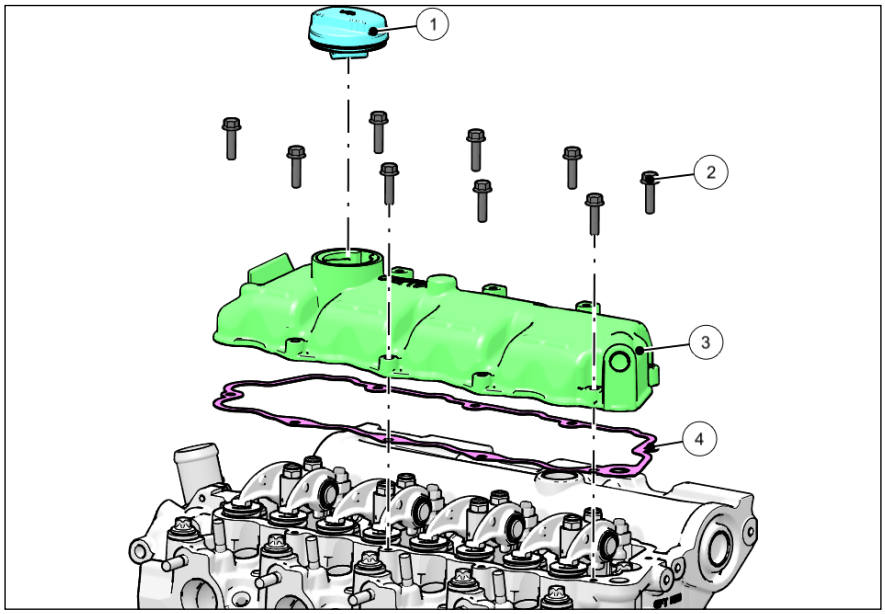
- Replace the gasket [3].

Assembly

- Attach the gasket [3] and cover [2] using the screws [1].
- Fill up the oil (see Diesel Engine Operator's Manual).

08
Cylinder head

08.1 Cylinder head cover



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cap		Hand-tight	
2	Hexagon head screw with flange	M6x25	13 Nm	
3	Cylinder head cover			
4	Gasket for cylinder head			

Preparatory work

- Disassemble the electrical lines from the injectors [section 03.3].
- Disassemble the fuel pressure tube from the rail injector [section 03.2].

Disassembly

- Remove the screws [2].
- Remove the cover [3] and gasket [4].

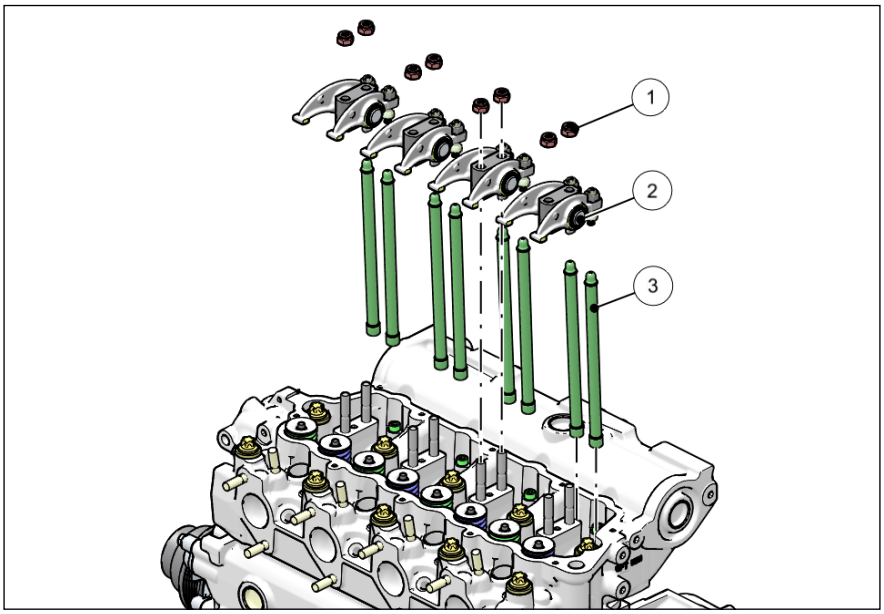
Inspection/maintenance

- Replace the gasket [4].
- Check that the cover is level using a straightedge and rework or replace if necessary.

Assembly

- Attach the gasket [4] and cover [3] using the screws [2].
- Tighten the cap [1], if necessary.
- Mount the fuel pressure tube on the rail injector [section 03.2].
- Mount the electrical lines on the injectors [section 03.3].

08.2 Rocker arm and push rod



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Nut	VM8	23 Nm	
2	Rocker arm bracket, complete			⟳
3	Push rod			

Preparatory work

- Disassemble the cylinder head cover [section 08.1].

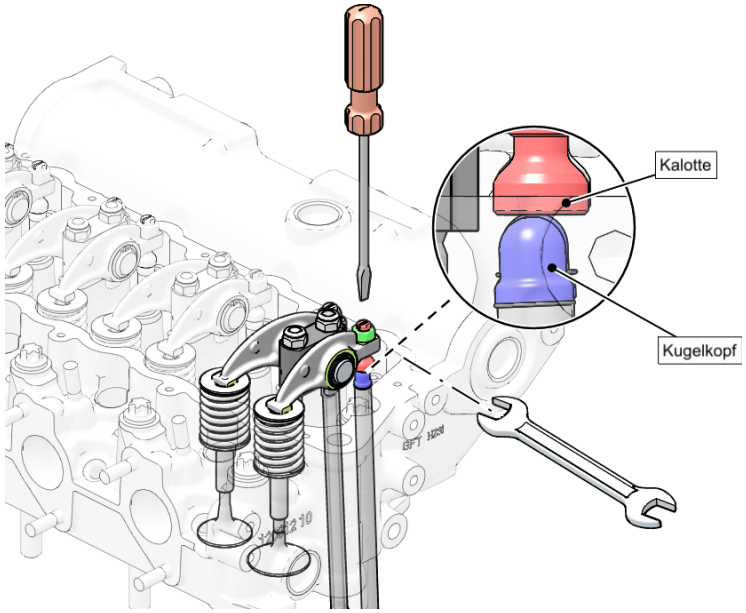
Disassembly

- Mark the rocker arm bracket. They must not be swapped during installation.
- Remove the nuts [1].
- Remove the rocker arm bracket [2].
- Remove the push rod [3].

Assembly

- Insert the push rods [3].
- Mount the previously marked rocker arm brackets onto the cylinder head in the correct sequence.
- Attach the rocker arm brackets [2] using the nuts [1].
- Mount the cylinder head cover [section 08.1].

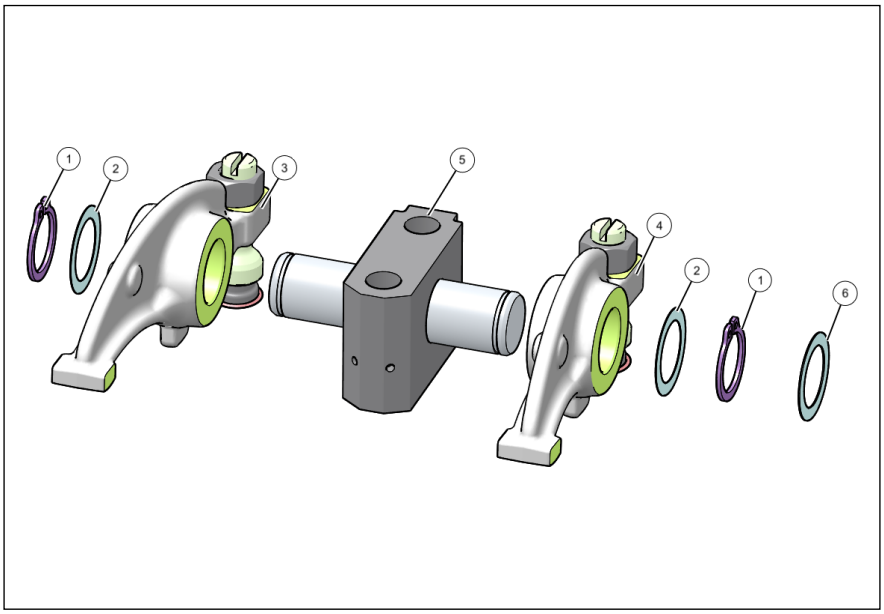
Installation note



Basic setting of tappet clearance:

- Turn the cylinder being set to ignition TDC (inlet and outlet valves are closed).
- Ensuring ignition TDC: Turn the crankshaft by approx. 20° (clockwise and counterclockwise), during which the rocker arm of the respective cylinder must not move.
- Loosen the lock nut and turn adjusting screw in until the calotte of the adjusting screw lies against the ball head of the push rod.
- From this position, turn the adjusting screw 1 1/4 turns in and secure with lock nut.

08.3 Disassembled rocker arm



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Retaining ring	A18x1		
2	Shim washer	15x21x0.2		
3	Rocker arm, outlet			
4	Rocker arm, inlet			
5	Rocker arm bracket			
6	Shim washer	15x21x0.3		

Preparatory work

- Disassemble the rocker arm [section 08.2].

Disassembly

- Remove the retaining ring [1].
- Remove the shim washers [2].
- Pull off the outlet rocker arm [3] and inlet rocker arm [4].

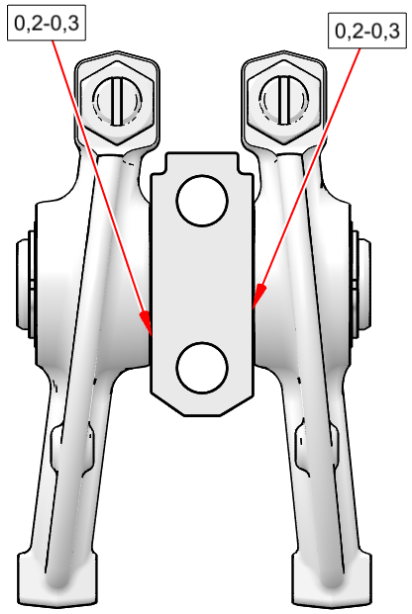
Inspection/maintenance

- Check the rocker arm for wear.

Assembly

- Mount the outlet rocker arm [3] and inlet rocker arm [4] on the rocker arm bearing block [5].
- Mount the washers [2].
- Mount the retaining rings [1].
- Check the axial clearance; see installation note.
- Mount the rocker arm [section 08.2].

Installation note

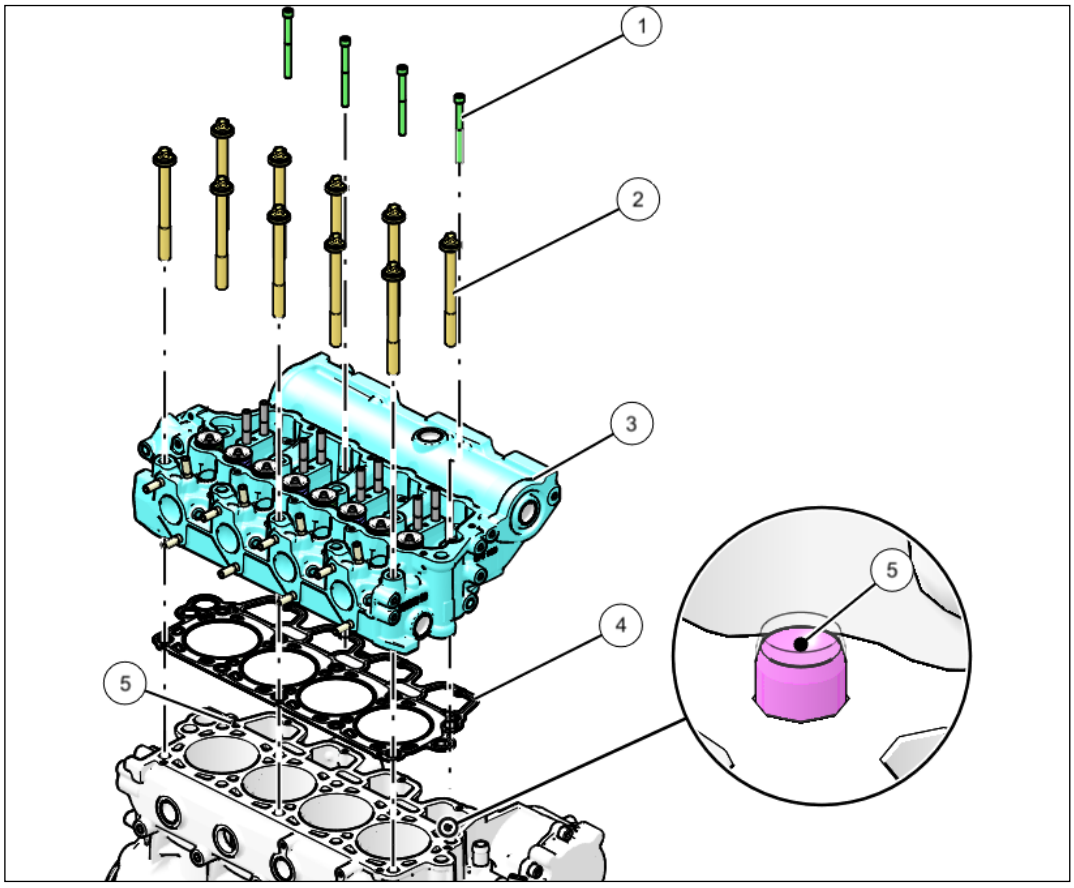


Check the axial clearance:

(shim washer [2] and retaining ring [1] mounted on rocker arm bearing block).

- Check the clearance using the feeler gage.
- Permitted axial clearance: 0.2 – 0.3 mm
- If clearance > 0.3 mm: replace the shim washer [2] by shim washer [6].

08.4 Cylinder head



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M6x80		↻
2	External Torx combi screw	M12x130		Castrol® Molub-Alloy Paste White T™ ↻
3	Cylinder head			
4	Gasket for cylinder head			
5	Cylindrical pin	6M6x12		

Preparatory work

- Disassemble the injectors [section 03.3].
- Disassemble the rocker arms/push rods [section 08.2].
- Disassemble the high-pressure rail [section 03.4].
- Disassemble the exhaust manifold [section 08.6].
- If necessary, disassemble the EGR system.

Disassembly

- Remove the screws [1], [2].
- Remove the cylinder head [3] and gasket [4].

Inspection/maintenance

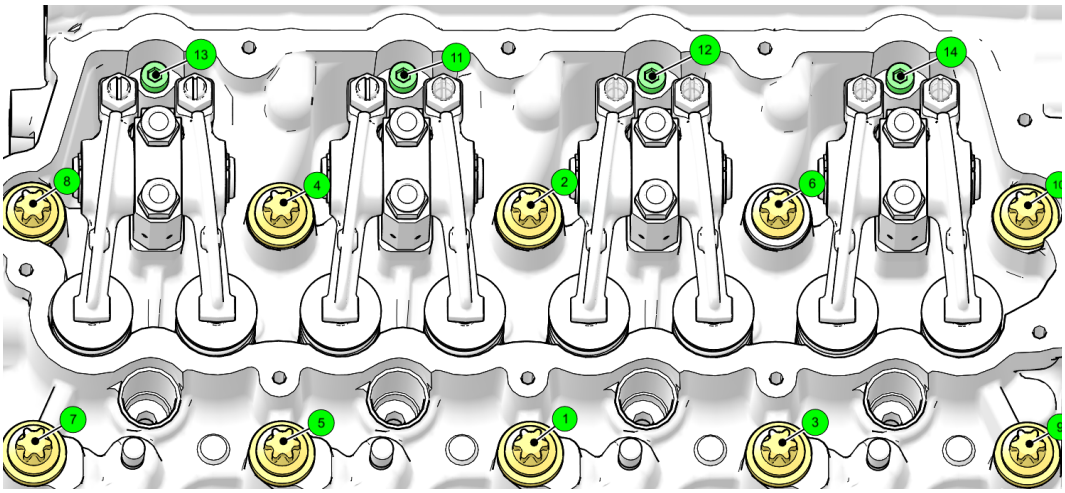
- Check the cylinder head [3] for wear.
- Clean the sealing surfaces to remove grease and oil.
- Replace the gasket [4].

- If necessary, push the cylindrical pins [5] all the way in.

Assembly

- Place the gasket [4] and cylinder head [3] on the housing. Note both cylindrical pins [5] for alignment.
- Mount the screws [1], [2]; see installation note.
- Mount the EGR path.
- Mount the high-pressure rail [section 03.4].
- Mount the injectors [section 03.3].
- Mount the rocker arms/push rods [section 08.2].
- Mount the exhaust manifold [section 08.6].

Installation note



Tightening torque:

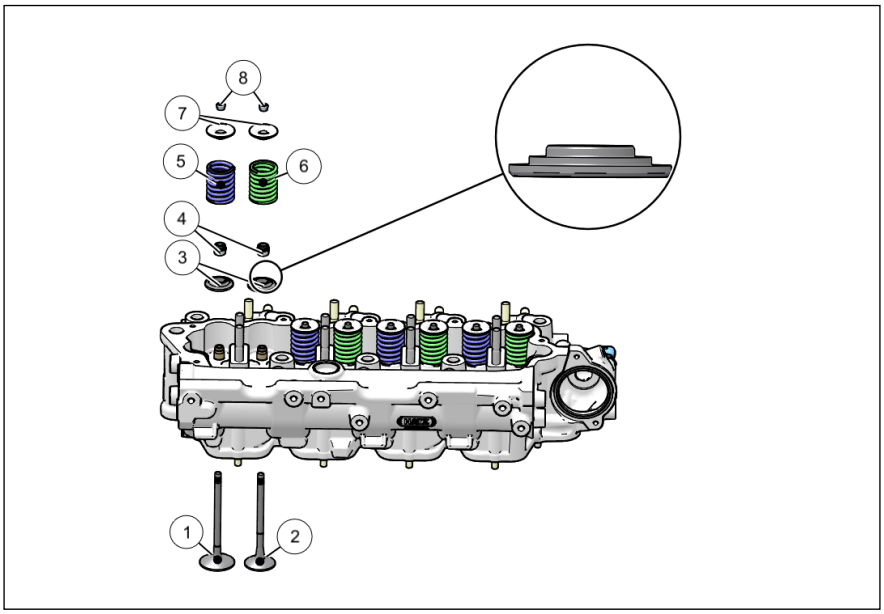
Screws 1 – 10

- 1st level: 21 Nm
- 2nd level: 79°
- 3rd level: 79°

Screws 11 – 14

- 9.5 Nm

08.5 Valves for cylinder head



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Inlet valve			
2	Outlet valve			
3	Washer for valve spring			
4	Valve shaft seal			
5	Valve spring, inlet			
6	Valve spring, outlet			
7	Plate spring			
8	Valve cone	MK6		

Preparatory work

- Disassemble the cylinder head [section 08.4].

Disassembly

- Push down the respective valve spring using special tool 62922301.
- Remove the valve cone [8].
- Relax the spring.
- Remove the parts [7], [6], [5], [3].
- Pull out the valve.

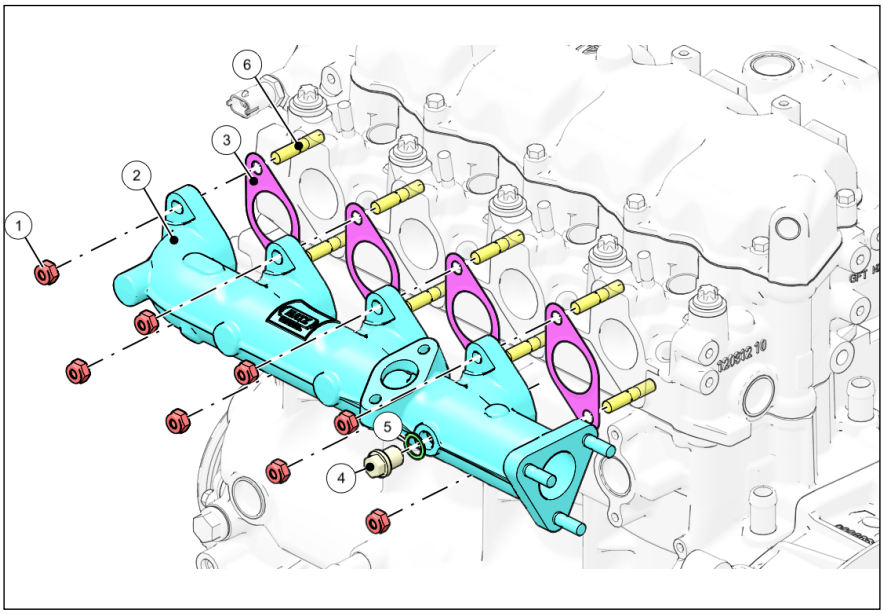
Inspection/maintenance

- Check the valves [1], [2] and valve springs [5], [6] for wear.
- Replace the valve shaft seal [4] if necessary.
- The new valves must be ground in.

Assembly

- Insert the valves [1], [2].
- Insert the parts in the sequence [3], [5], [6], [7].
- Push down the spring using special tool 62922301.
- Mount the valve cone [8].
- Relax the spring.
- Check that the valve cone is correctly seated.
- Mount the cylinder head [section 08.4].

08.6 Exhaust manifold (TIC, TICD)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon nut	VM8	25 Nm	
2	Exhaust manifold			
3	Gasket for exhaust manifold			
4	Screw plug	G1/4	30 Nm	
5	Sealing ring	1.0		
6	Stud bolt	M8x25		

Preparatory work

- Disassemble the exhaust gas turbocharger [section 11.7].
- Disassemble the EGR precooler, EGR cooler [section 12.6].

Disassembly

- Remove the nuts [1].
- Remove the exhaust manifold [2].
- Remove the gaskets [3].

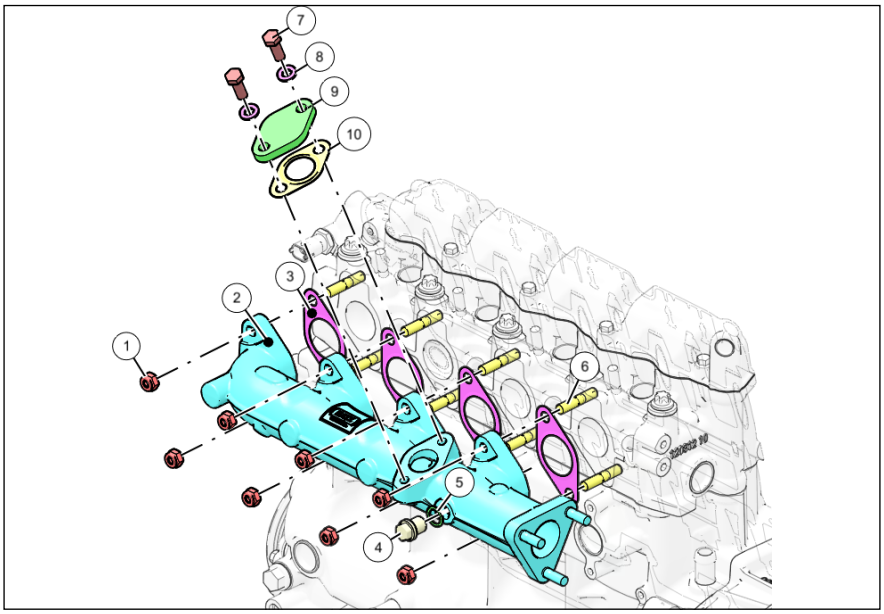
Inspection/maintenance

- Replace the gaskets [3].
- Replace the nuts [1].
- If necessary, screw the stud bolt [6] all the way in.
- When disassembling the screw plug [4], the sealing ring [5] must be replaced.

Assembly

- Position the gaskets [3] on the stud bolts [6]. The raised side of the swage must face the exhaust manifold.
- Mount the exhaust manifold [2] using nuts [1].
- Disassemble the EGR precooler, EGR cooler [section 12.6].
- Mount the exhaust gas turbocharger [section 11.7].

08.6 Exhaust manifold (T, TI)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon nut	VM8	25 Nm	
2	Exhaust manifold			
3	Gasket for exhaust manifold			
4	Screw plug	G1/4	30 Nm	
5	Sealing ring	1.0		
6	Stud bolt	M8x25		
7	Hexagon head screw	M8x22	23 Nm	
8	Washer	8.4		
9	Exhaust manifold cap			
10	Gasket for exhaust manifold			

Preparatory work

- Disassemble the exhaust gas turbocharger [section 11.7].

Disassembly

- Remove the nuts [1].
- Remove the exhaust manifold [2].
- Remove the gaskets [3].
- If necessary, remove the screws [7], washers [8], cap [9] and the gasket [10].

Inspection/maintenance

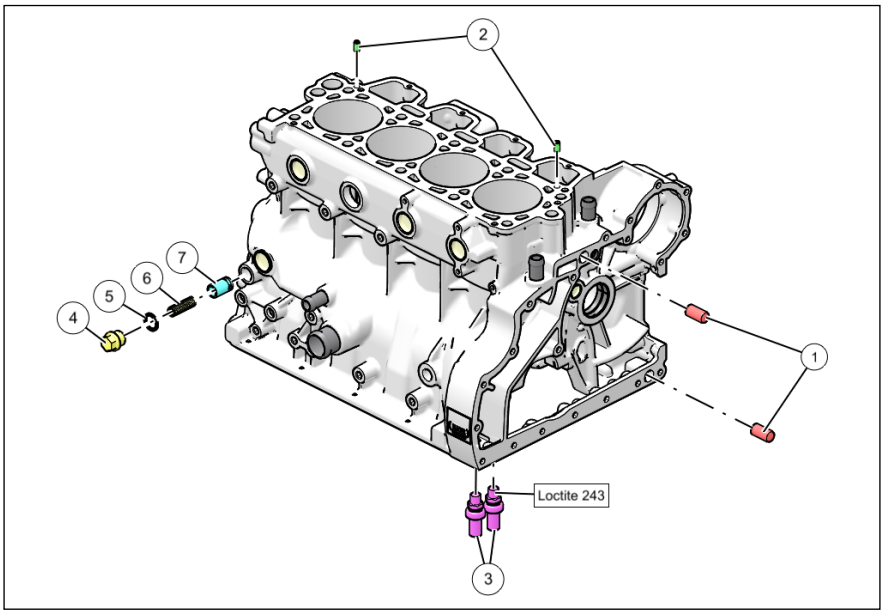
- Replace the gaskets [3].
- Replace the nuts [1].
- When disassembling the screw plug [4], the gasket [5] must be replaced.
- When disassembling the cap [9], the gasket [10] must be replaced.

Assembly

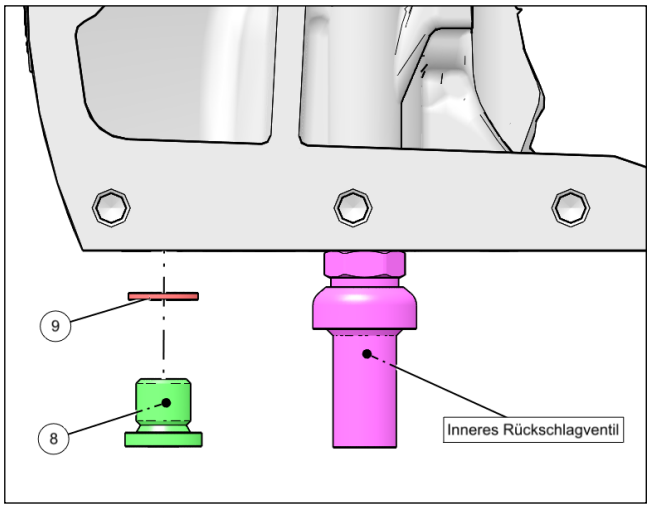
- Position the gaskets [3] on the stud bolts [6]. The raised side of the swage must face the exhaust manifold.
- Mount the exhaust manifold [2] using nuts [1].
- If necessary, attach the gasket [10] and cap [9] using the screws [7] and washers [8].
- Mount the exhaust gas turbocharger [section 11.7].

09
Crankcase

09.1 Crankcase

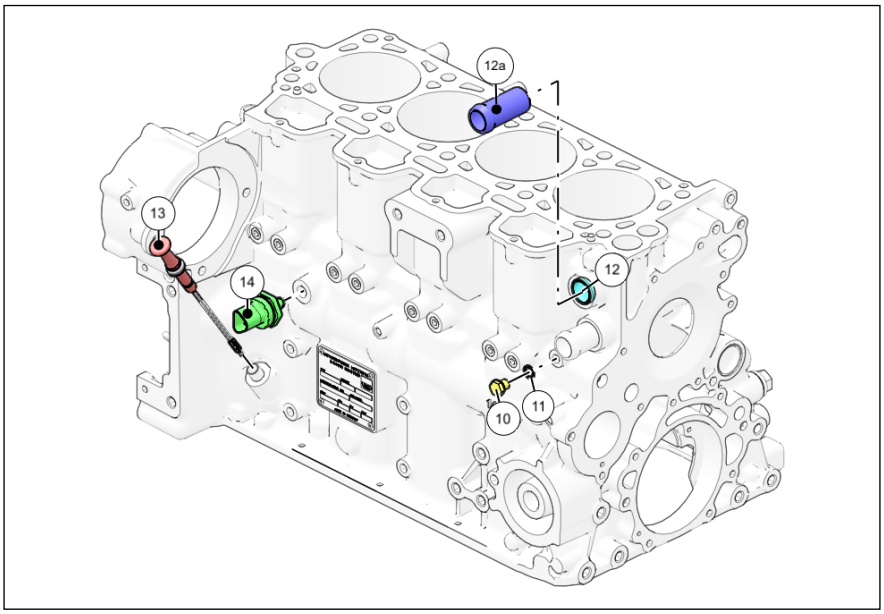


Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylindrical pin	14 M6x28		
2	Cylindrical pin	6 M6x12		
3	Check valve of oil precleaner	M12x1.5	12.5 Nm	Loctite® 243™
4	Screw plug	M18x1.5	50 Nm	
5	Sealing ring	A18x22		
6	Valve spring	1.5		
7	Piston for oil overpressure valve			
8	Screw plug	M12x1.5	26 Nm	
9	Sealing ring	A12x1.5		



Note

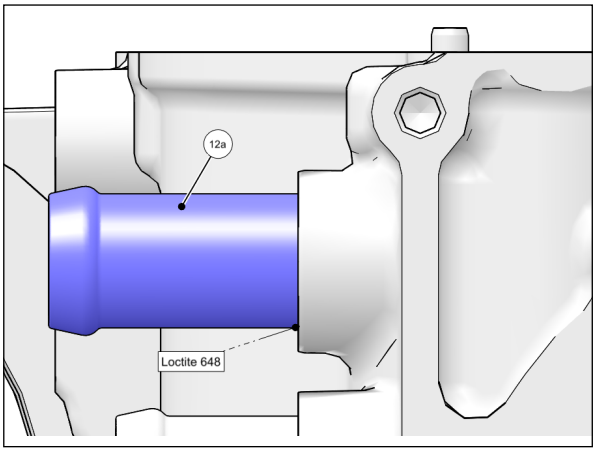
In engines with inclination package (F2F), the screw plug [8] with the sealing ring [9] is mounted instead of the check valve.



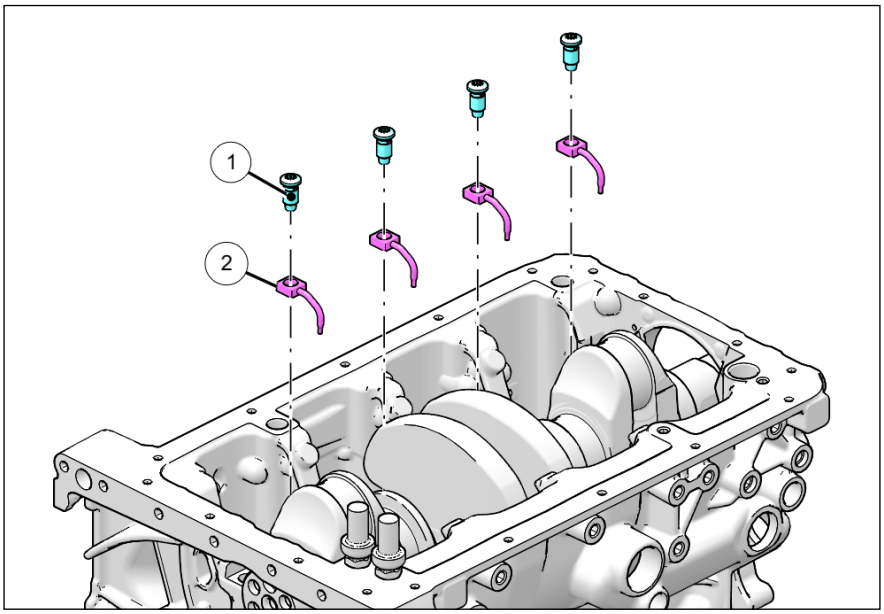
Pos.	Designation	Size	Tightening torque	Miscellaneous
10	Screw plug	M8x1	23 Nm	
11	Sealing ring	A8x11.5		
12	Cap	22		
12a	Tube connector	22		Loctite® 648™
13	Dipstick			
14	Oil pressure sensor		37.5 Nm	

Note

Regarding [12a]:
If a cab heater is later connected to the cooling circuit, the cap [12] is replaced by the tube connector [12a].
The assembly is performed with Loctite® 648™.
Press-in distance = 30 mm



09.2 Oil injection nozzle



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Valve screw for oil injection nozzle	M8x1	27 Nm	
2	Oil spray nozzle	A8x11.5		

Preparatory work

- Disassemble the oil sump [section 06.7].

Disassembly

- Unscrew the valve screw [1].
- Remove the oil injection nozzles [2].

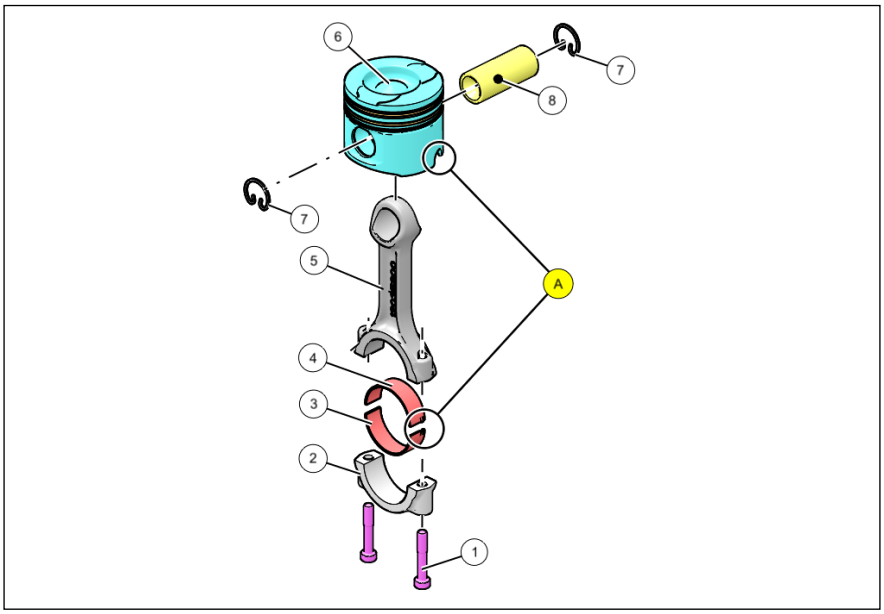
Inspection/maintenance

- Check the spray nozzles with compressed air for passage.

Assembly

- Mount the oil injection nozzle [2] with the valve screw [1].
- Mount the oil sump [section 06.7].

09.3 Piston and conrod



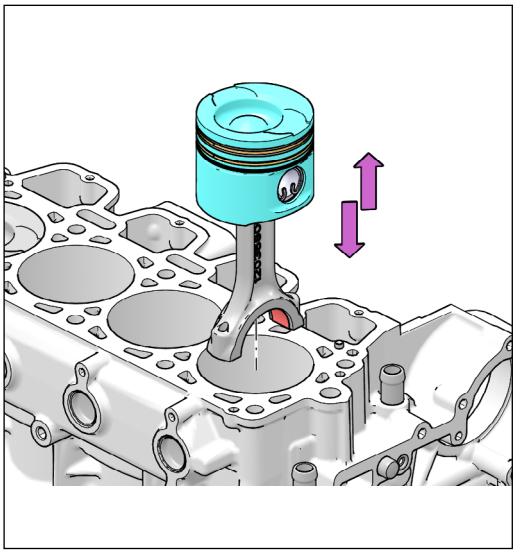
Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M8x1	20 Nm + 65°	
2	Conrod cover			
3	Bearing shell, bottom			
4	Bearing shell, top			
5	Connecting rod			
6	Piston			
7	Retaining ring	Ø 28x1.2		
8	Piston pin			

Preparatory work

- Disassemble the oil intake pipe [section 06.6].
- Disassemble the exhaust manifold [section 08.6].
- Disassemble the cylinder head [section 08.4].

Disassembly

- Remove the screws [1].
- Disassemble the conrod cover [2] and bottom bearing shell [3].
- Pull the piston [6] with the connecting rod [5] and bearing shell [4] up and out of the housing.
- Disconnect the bearing shell [4] from the connecting rod [5].
- Remove the retaining rings [7] from the piston.
- Pull the piston pin [8] out of the piston.



Inspection/maintenance

- Check the piston rings for wear and replace if necessary; see installation note
- Check connecting rod [5] and conrod cover [2] for wear

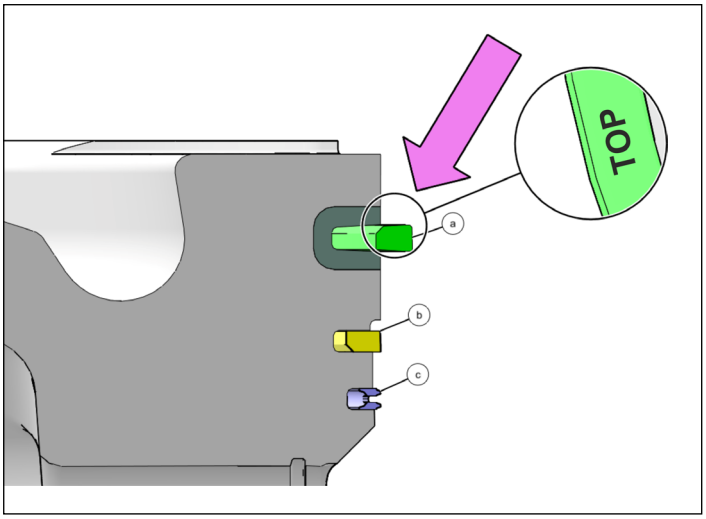
- and replace if necessary.
- Replace the bearing shells [3], [4].
- Replace the screws [1].

Assembly

- Lightly coat the piston pin [8] with oil.
- Connect the connecting rod [5] and piston [6] with the piston pin [8]. Ensure the correct position!
  A = bearing grooves of the connecting rod bearing and the recess for the oil injection nozzle on the piston are on the same side!
- Secure the piston pin [8] using retaining rings [7].
- Insert the upper bearing shell [4] into the connecting rod [5] and coat lightly with oil.
- Align the piston rings: the piston ring joints are offset by 120 degrees from each other.
- Coat the cylinder wall with oil.
- Insert the piston with the conrod into the cylinder.
- Insert the lower bearing shell [3] into the connecting rod cover [2] and coat lightly with oil.
- Mount the connecting rod cover [2] with the connecting rod [5] on the crankshaft together with the screws [1].
- Mount the cylinder head [section 08.4].
- Mount the exhaust manifold [section 08.6].
- Mount the oil intake pipe [section 06.6].

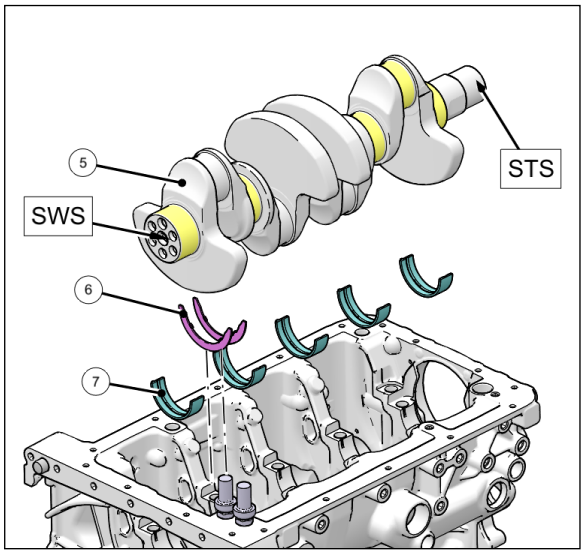
Installation note

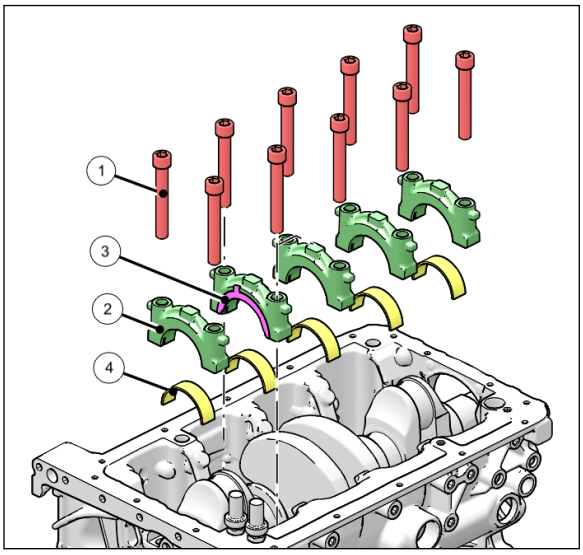
- Always use piston ring pliers to assemble/disassemble the piston rings. Spread piston rings only as far as necessary.
- Install piston rings with the “TOP” marking pointing to the piston crown.
- Piston rings must not be interchanged.



Pos.	Designation	Size
a	TBA ring [compression ring]	Ø 84x2,5
b	M ring [compression ring]	Ø 84x2,0
c	DSF ring [oil scraper ring]	Ø 84x2,0

09.4 Crankshaft

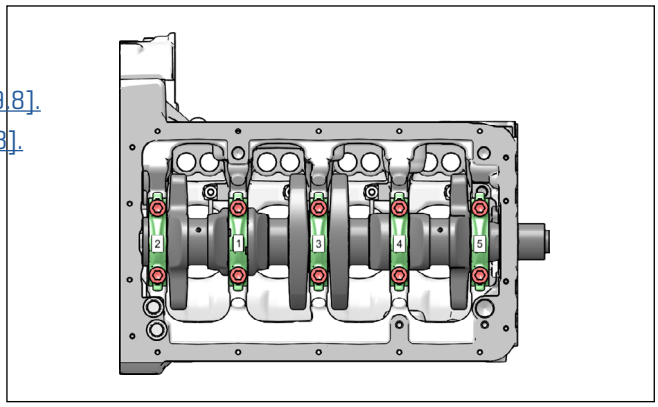




Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Screws	M12x85		↻
2	Main bearing bracket			
3	Thrust washer, bottom			
4	Bearing shell, bottom			
5	Crankshaft			
6	Thrust washer, top			
7	Bearing shell, top			
STS	Timing cover side			
SWS	Flywheel side			

Preparatory work

- Disassemble the oil pump [section 06.5].
- Disassemble the connection housing [section 09.8].
- Disassemble the piston and conrod [section 09.3].



Note

Mark the main bearing bracket (no. 1–5), see figure. They must not be swapped during installation.

Disassembly

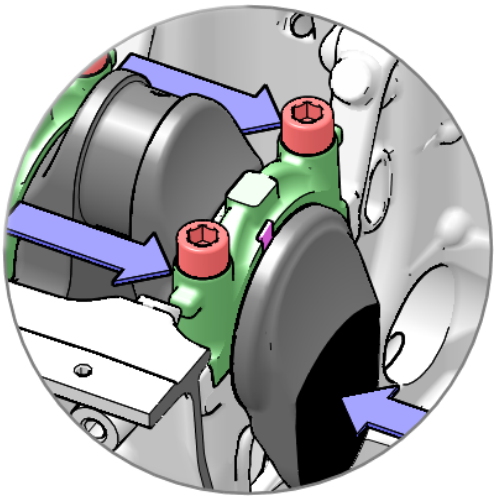
- Unscrew the screws [1].
- Remove the main bearing bracket [2] together with the thrust washers [3] and bearing shells [4].
- Take out the crankshaft [5] with SWS first.
- Remove the thrust washers [6] and bearing shells [7].

Inspection/maintenance

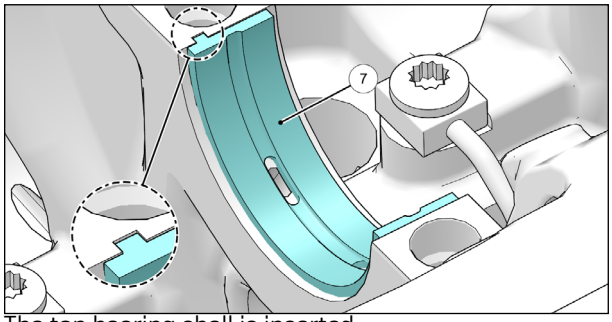
- Check the crankshaft [5] for wear.
- Replace the bearing shells [4], [7] and thrust washers [3], [6].

Assembly

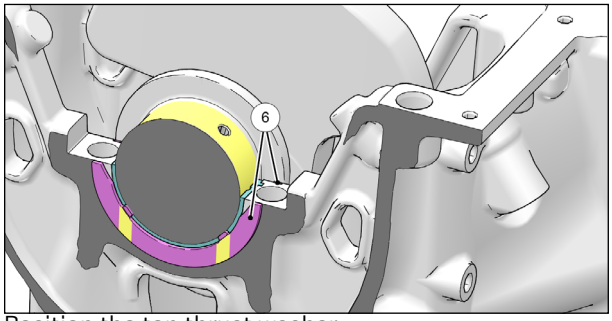
- Insert the top bearing shells [7] into the crankcase, watching out for the holding groove and lubricating oil hole. Then moisten with graphite paste.
- Insert the crankshaft [5] with STS first.
- Position the top thrust washers [6] laterally at bearing positions (oil pockets face outward).
- Insert the bottom bearing shells [4] in the main bearing bracket [2].
- Insert the bottom thrust washers [3] in the main bearing bracket [2].
- Position the main bearing bracket in the right sequence on the crankshaft.
- Ensure the crankshaft has sufficient axial clearance:
  Press the main bearing bracket with the thrust washers axially outward all the way while at the same time pressing the crankshaft axially in the opposite direction.
- Tighten main bearing bracket in the specified sequence; see installation note. The main bearing brackets of the 3H50 are tightened in the same sequence, but screws 9 and 10 are omitted.
- After assembly is finished, check the crankshaft for ease of movement and axial clearance.
- Mount the piston and conrod [section 09.3].
- Mount the connection housing [section 09.8].
- Mount the oil pump [section 06.5].



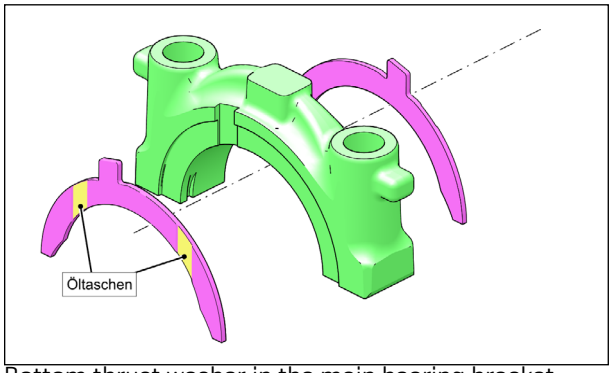
Ensure adequate axial clearance of the crankshaft



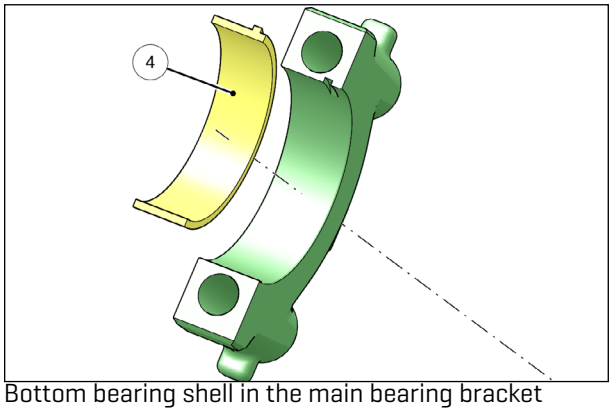
The top bearing shell is inserted



Position the top thrust washer

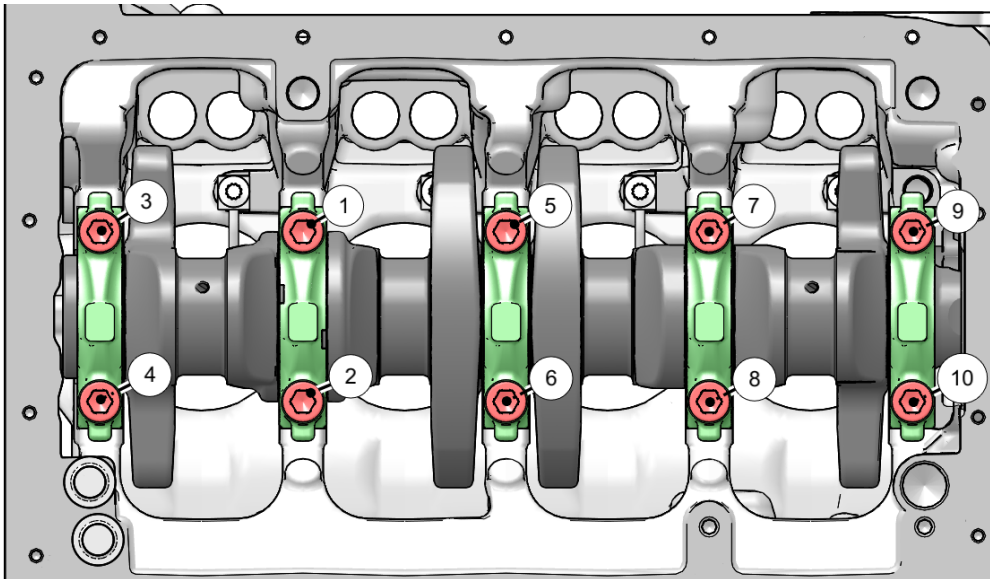


Bottom thrust washer in the main bearing bracket



Bottom bearing shell in the main bearing bracket

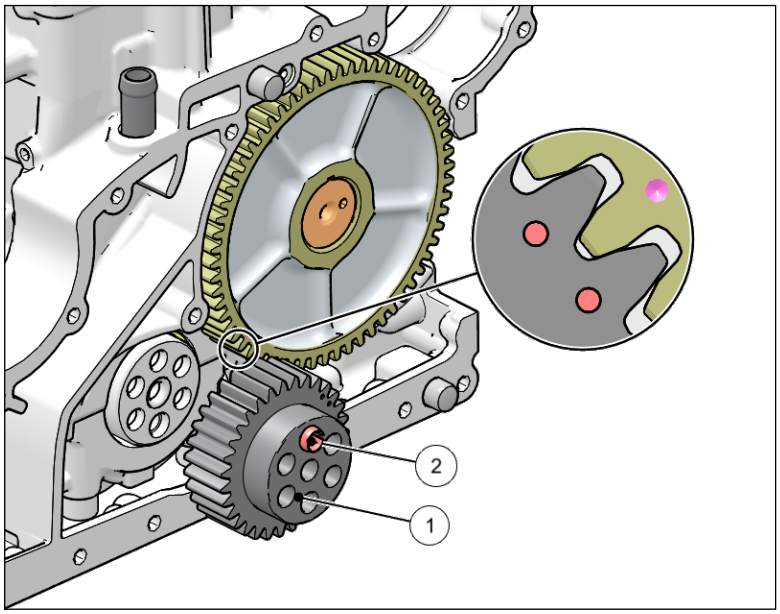
Installation note

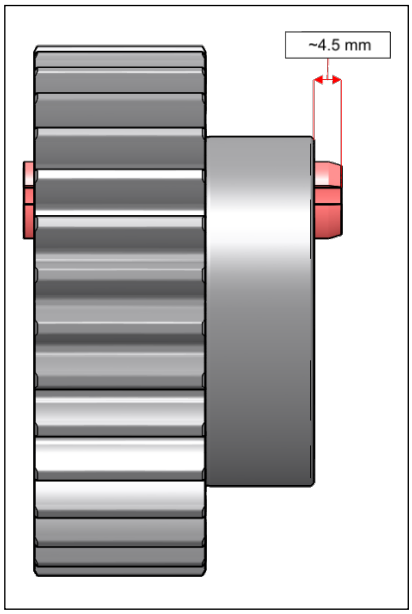


Tightening torque:

- 1st stage = 10 ± 2 Nm
- 2nd stage = 45 ± 5 Nm
- 3rd stage = 90 ± 5 Nm

09.5 Crankshaft sprocket





Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Crankshaft sprocket			
2	Spring pin	12x50		

Preparatory work

- Disassemble the connection housing [section 09.8].

Disassembly

- Disassemble the crankshaft sprocket [1].

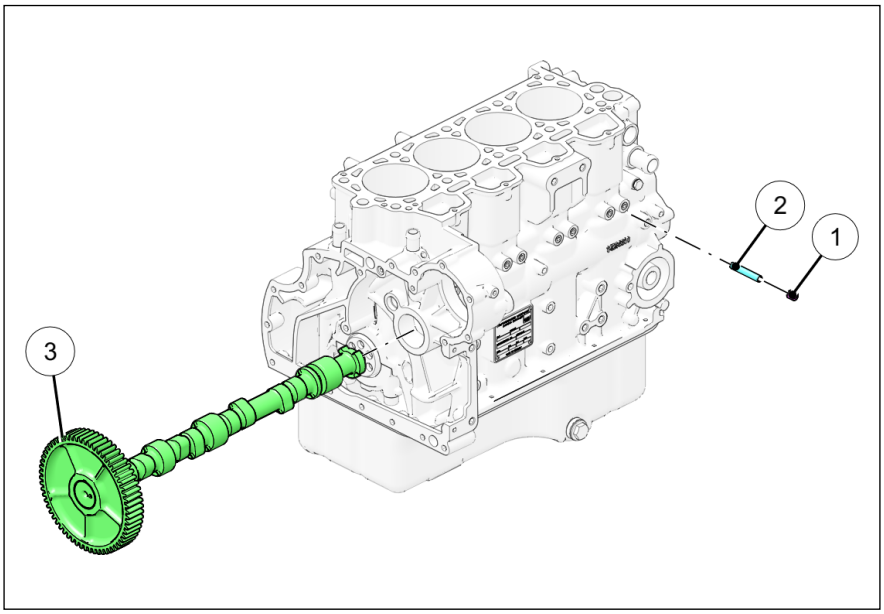
Inspection/maintenance

- Press in the spring pin until only 4.5 mm remain protruding. This is used to center the flywheel.

Assembly

- Position the crankshaft sprocket [1] on the crankshaft. Watch for the correct position of the marking.
- Mount the connection housing [section 09.8].

09.6 Camshaft



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Set screw	M10x10	Max. 5 Nm	
2	Cylindrical pin	M8x50		
3	Camshaft with gear wheel			

Preparatory work

- Disassemble the connection housing [section 09.8].
- Disassemble the cylinder head [section 08.4].
- Disassemble the roller plunger (hydraulic) [section 09.7].

Disassembly

- Unscrew the set screw [1].
- Pull out the cylindrical pin [2] (as an aid, screw an M3 screw into the inside thread of the cylindrical pin).
- Pull out the camshaft [3].

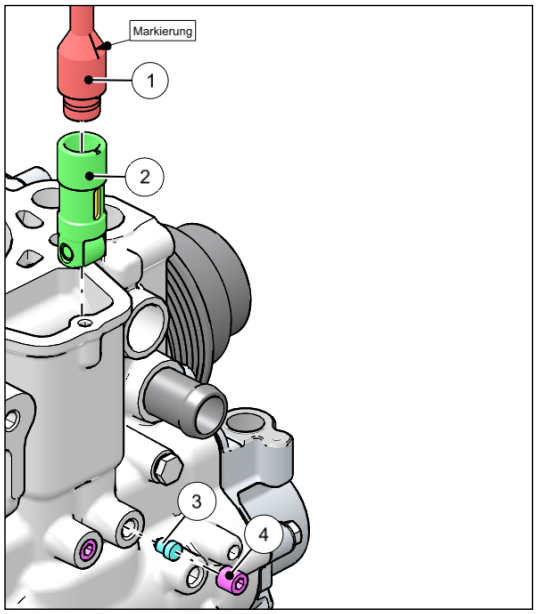
Inspection/maintenance

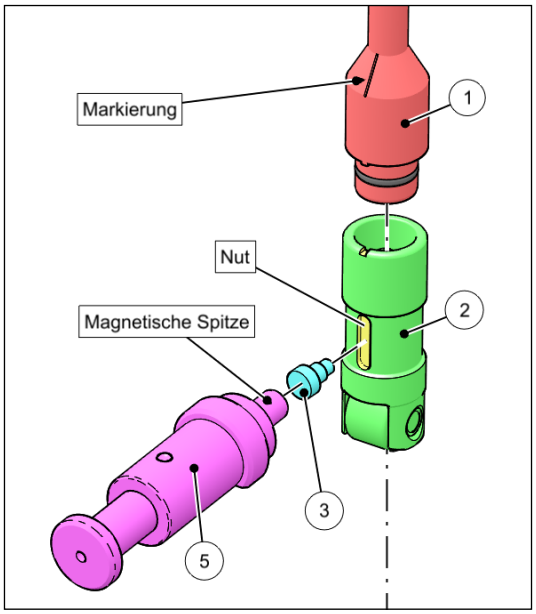
- Replace the set screw [1].
- Check the camshaft [3] for wear.

Assembly

- Insert the camshaft [3].
- Insert the cylindrical pin [2].
- Screw in the set screw [1].
- Mount the roller plunger (hydraulic) [section 09.7].
- Mount the cylinder head [section 08.4].
- Mount the connection housing [section 09.8].

09.7 Roller plunger (hydraulic)





Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Special tool	65346600		
2	Roller plunger			
3	Guide pin			
4	Set screw	M10x10	max. 5 Nm	
5	Special tool	65346410		

Ensure that the roller plungers are positioned vertically with the roller facing down. A horizontal bearing can lead to faults.

Preparatory work

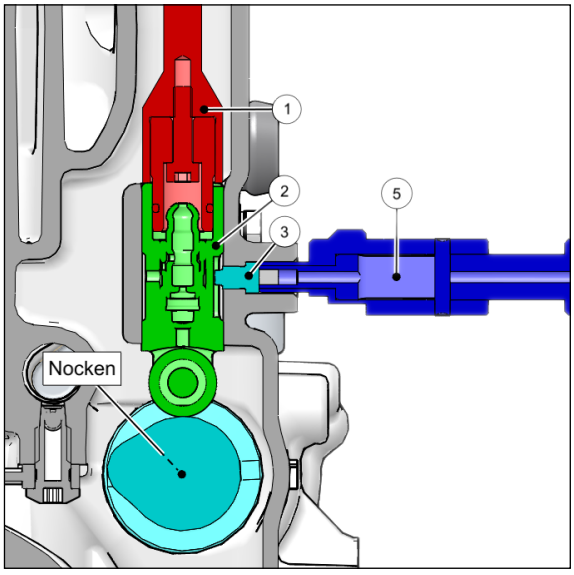
- Disassemble the cylinder head [section 08.4].

Disassembly

- Remove the set screw [4] (warm up if necessary).
- Using special tool [5], remove the guide pin [3].
- Insert the special tool [1] into the roller plunger [2] from above and pull it out.

Inspection/maintenance

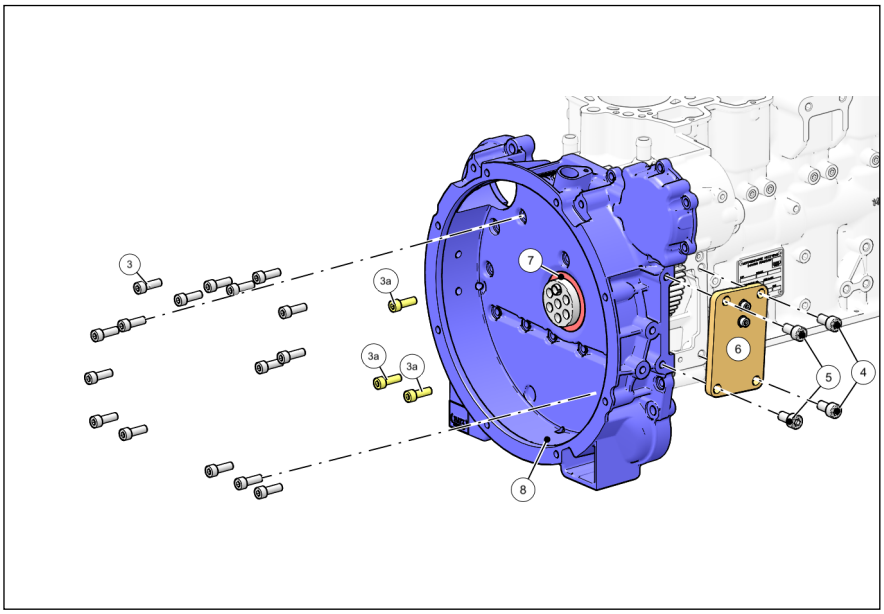
- Replace the set screw [4] and guide pin [3].
- Mount the cylinder head [section 08.4].



Assembly

- Insert the roller plunger [2] onto the special tool [1] and insert them into the drilled hole together. Insert to the point where the roller plunger [2] is in contact with the camshaft. The marking on the special tool [1] faces outward.
- Insert the guide pin [3] into the drilled hole using the special tool [5].
- Ensure that the guide pin [3] is inserted in the groove of the roller plunger [2].
- Remove the special tool [5].
- Screw in the set screw [4].
- Pull out the special tool [1].

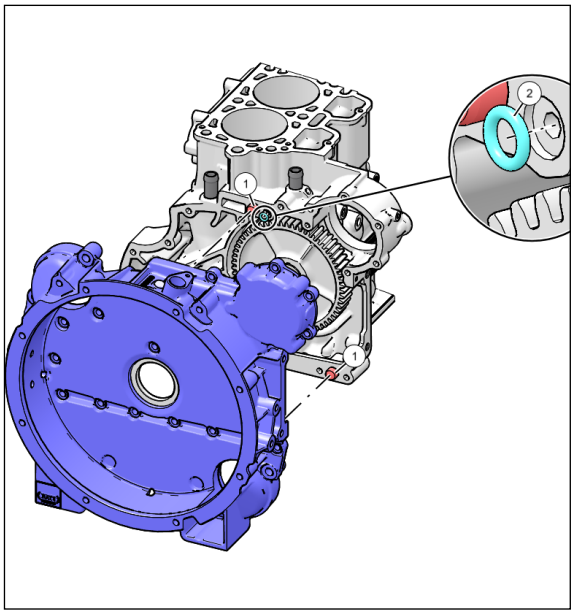
09.8 Connection housing



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylindrical pin	14 M6x28		
2	Sealing ring	7.3x2.4		
3/3a	Cylinder screw	8x25	23 Nm	
4	Screw, special tool		23 Nm	
5	Screw, special tool		23 Nm	
6	Special tool	65348000		
7	Shaft sealing ring	55x70x8		↻
8	Connection housing			↻

Preparatory work

- Drain the oil (see Diesel Engine Operator's Manual).
- Disassemble the oil filler engine bracket, if necessary [section 10.4].
- Disassemble the auxiliary drive (PTO bottom), if necessary [section 07.7].
- Disassemble the flywheel [section 07.1].



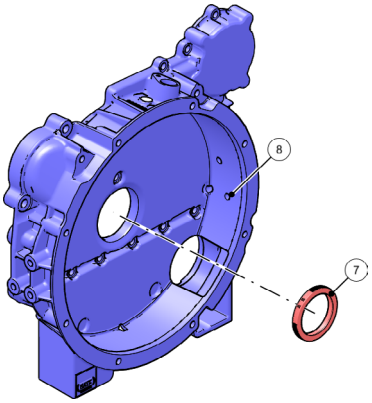
Disassembly

- Unscrew all screws (3), (3a).
- Remove the connection housing.

Inspection/maintenance

- Replace the sealing ring (2).
- Press the released cylindrical pins (1) back in all the way.
- Replace the shaft sealing ring (7) (see installation note).

Installation note



Pos.	Designation	Size	Tightening torque	Miscellaneous
7	Shaft sealing ring	55x70x8		
8	Connection housing			Loctite® 5910™

Preparatory work

- Disassemble the connection housing.

Disassembly

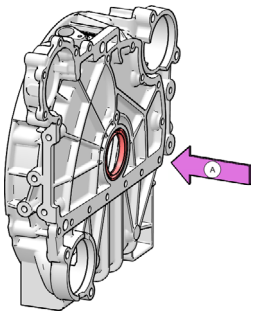
- Press out the shaft sealing ring [7].

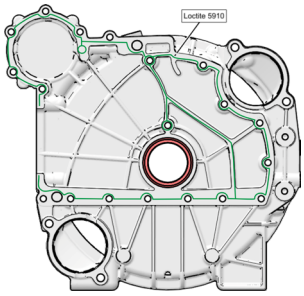
Inspection/maintenance

- Replace the shaft sealing ring [7].
- Clean the sealing surfaces on the connection housing to remove grease and oil.
- Apply sealing agent Loctite® 5910™ (see figure).

Assembly

- Oil the shaft sealing ring [7 and press it in.
- Press-in depth: 1.2 ± 0.3 mm of flange surface [A].



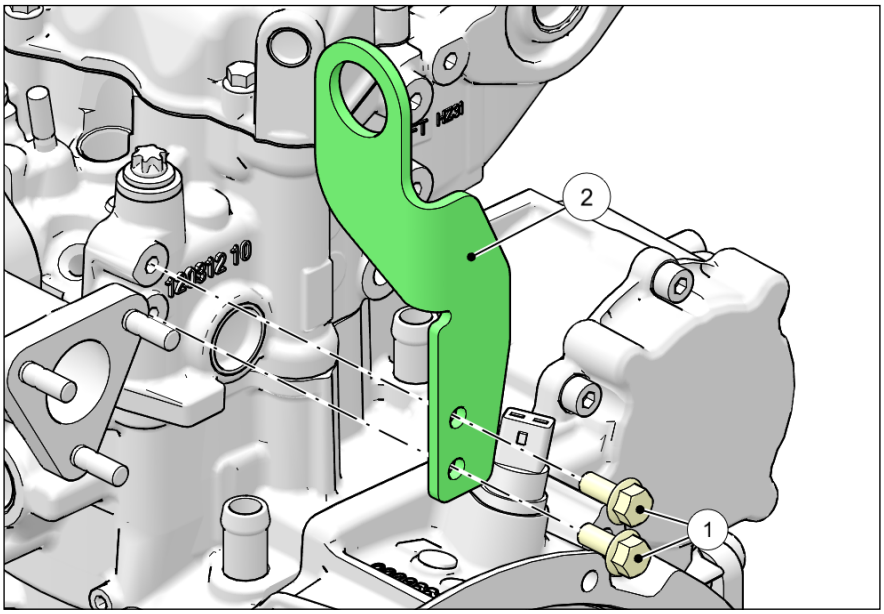


Assembly

- Insert the sealing ring [2].
- Place connection housing on crankcase and tighten slightly by hand using the three screws [3a].
- Screw the special tool [6] onto the crankcase using the screws [4].
- Screw the special tool [6] onto the crankcase using the screws [5]. In doing so, the flange surface is aligned.
- Now tighten the screws [3a] (10–12 Nm).
- Loosen the screws [5] again to avoid strain.
- Tighten all screws [3], [3a].
- Release the screws [4] and remove special tool [6].
- Mount the flywheel [section 07.1].
- Mount the oil filler engine bracket, if necessary [section 10.4].
- Mount the auxiliary drive (PTO bottom), if necessary [section 07.7].
- Fill up the oil (see Diesel Engine Operator's Manual).

10
Engine suspension

10.1 Lifting eyelet, timing cover side



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw with flange	M8x20	23 Nm	
2	Lifting eyelet, exhaust gas side			

Preparatory work

- Disassemble the exhaust gas turbocharger, if necessary [section 11.7].

Disassembly

- Release the screws [1].
- Remove the lifting eyelet [2].

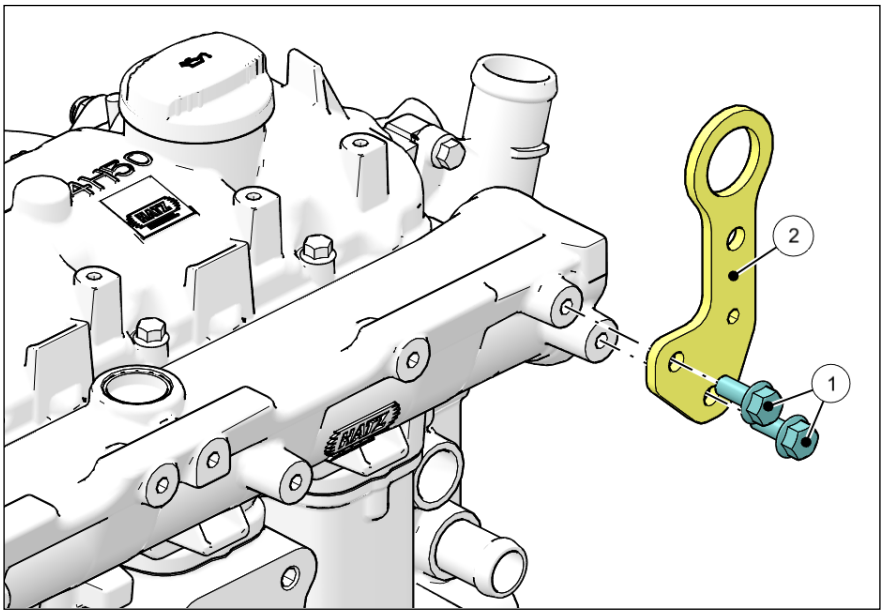
Inspection/maintenance

- -

Assembly

- Mount the lifting eyelet [2] with screws [1].
- Mount the exhaust gas turbocharger, if necessary [section 11.7].

10.2 Lifting eyelet, operation side



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw with flange	M8x20	23 Nm	
2	Lifting eyelet, operation side			

Preparatory work

- -

Disassembly

- Remove the screws [1] and lifting eyelet [2].

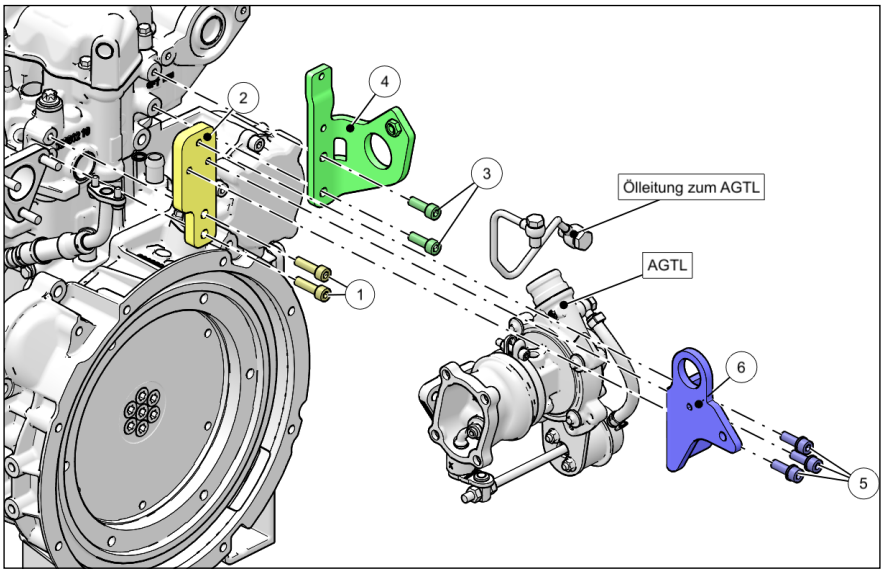
Inspection/maintenance

- -

Assembly

- Attach the lifting eyelet [2] using the screws [1].

10.3 Lifting eyelet/DPF bracket



Pos.	Designation	Size	Tightening torque	Miscellaneous
5	Cylinder screw	M8x35	23 Nm	
6	Bracket for console, exhaust gas side			

Note

The bracket for the console on the exhaust gas side [5] is attached after the exhaust gas turbocharger is installed. The installation of the DPF is described in the DPF section.

Preparatory work

- Disassemble the diesel particulate filter [section 13.4].

Disassembly

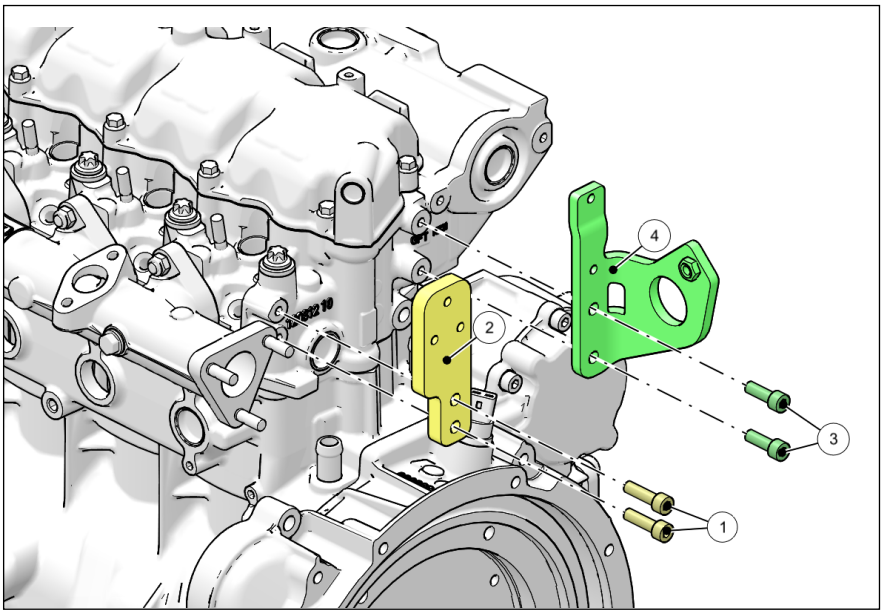
- Remove the screws [5].
- Disassemble the bracket [6].

Inspection/maintenance

- -

Assembly

- Mount the bracket [6] with the screws [5].
- Mount the diesel particulate filter [section 13.4].



1	Cylinder screw	M8x30	23 Nm	
2	Fastening plate for DPF			
3	Cylinder screw	M8x25	23 Nm	
4	Bracket for the console, DPF			

Preparatory work

- Disassemble the bracket for console [6] on the exhaust gas side.
- Disassemble the exhaust gas turbocharger [section 11.7].

Disassembly

- Remove the screws [1] and fastening plate [2].
- Remove the screws [3] and bracket [4].

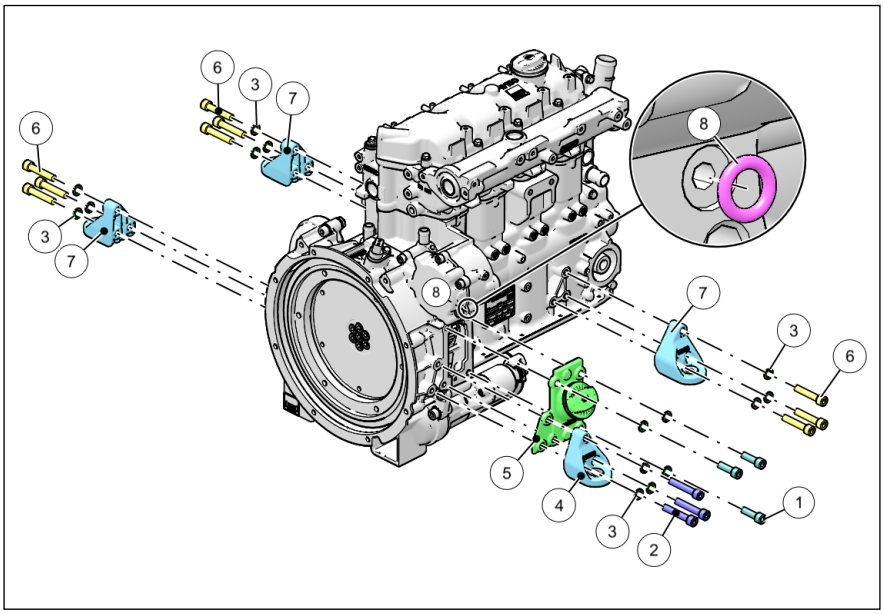
Inspection/maintenance

- -

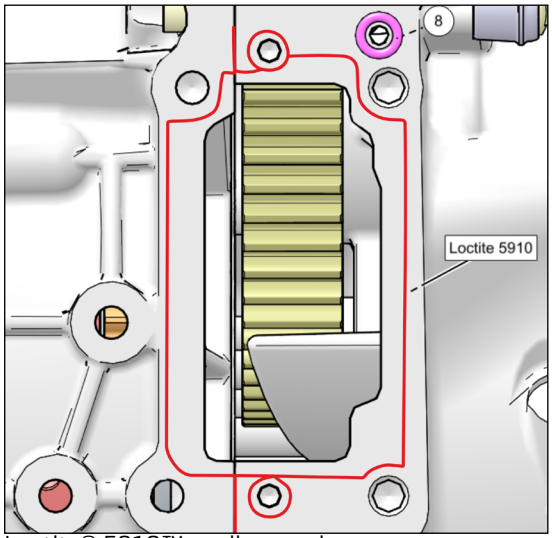
Assembly

- Attach the fastening plate [2] using the screws [1].
- Attach the bracket [4] using the screws [3].
- Mount the exhaust gas turbocharger [section 11.7].
- Mount the bracket for console [6] on the exhaust gas side.

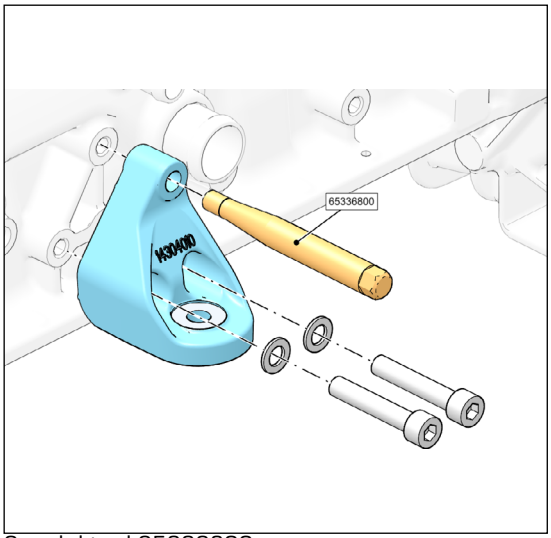
10.4 Engine brackets



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M10x35	46 Nm	
2	Cylinder screw	M10x60	46 Nm	
3	Washer	10.5		
4	Oil filler engine bracket			
5	Oil filler cover plate			
6	Cylinder screw	M10x60	46 Nm	
7	Engine bracket			
8	O-ring	7.3x2.4		



Loctite® 5910™ sealing cord



Special tool 65336800

Preparatory work

- -

Disassembly

- Remove the screws and washers of the respective engine bracket.
- Remove the engine bracket.

Inspection/maintenance

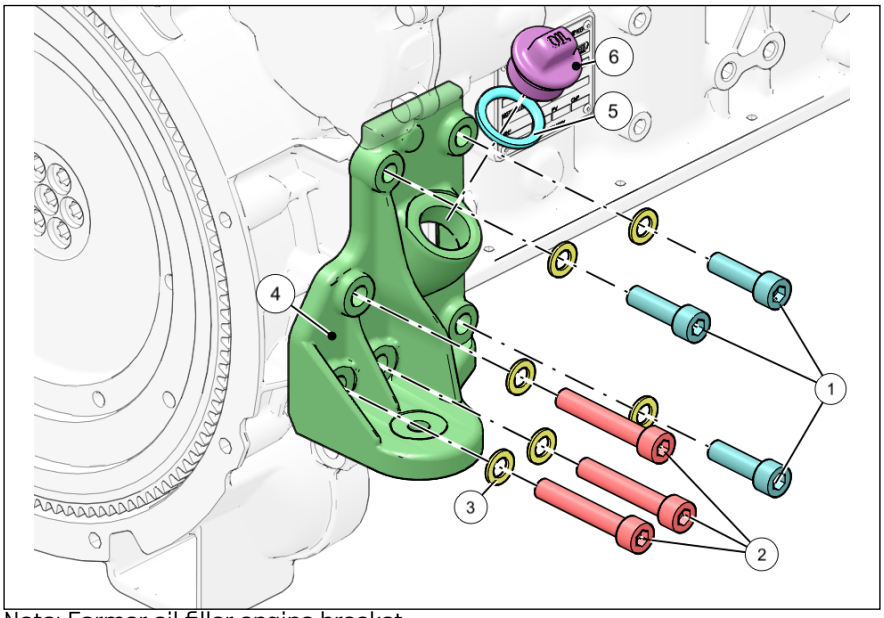
- When disassembling the cover plate [5], replace the o-ring [8].
- Clean the sealing surfaces to remove grease and oil.
- Apply sealing agent Loctite® 5910™ as shown in the figure.

Standard assembly of engine brackets

- Fasten the respective engine bracket [7] using special tool 65336800.
- Mount the screws [6] with washers [3].
- Unscrew special tool 65336800 and replace using the screw [6] and washer [3].

Assembly of oil filler engine bracket

- Apply sealing agent Loctite® 5910™ as shown in the figure.
- Insert the o-ring [8].
- Mount the cover plate [5] using the screws [1] and washers [3].
- Mount the oil filler engine bracket [4] using the screws [2] and washers [3].



Note: Former oil filler engine bracket

Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M10x35	46 Nm	
2	Cylinder screw	M10x40	46 Nm	
3	Washer	10.5		
4	Oil filler cover plate (former)			Loctite® 5910™
5	Sealing ring	26x35x3		
6	Oil filler screw plug		Hand-tight	
8	O-ring	7.3x2.4		

Disassembly

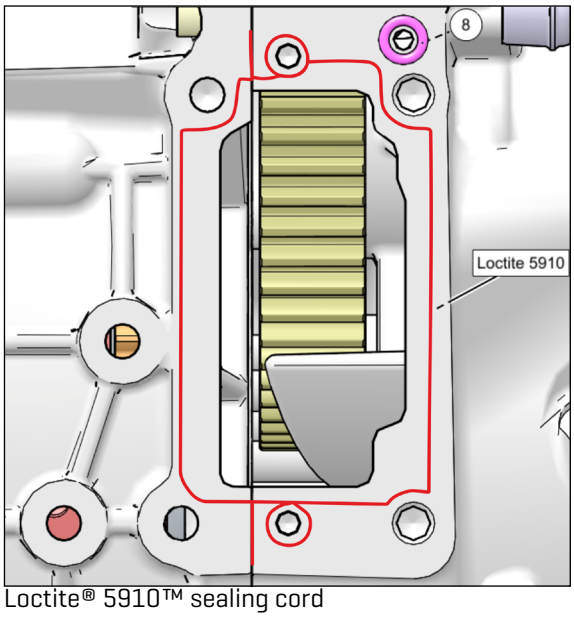
- Remove the screws [1], [2] and washers [3].
- Remove the cover plate [4].

Inspection/maintenance

- Clean the sealing surface to remove oil and grease.
- Apply sealing agent Loctite® 5910™ as shown in the figure.
- Replace the o-ring [8].
- Replace the sealing ring [5], if necessary.

Assembly

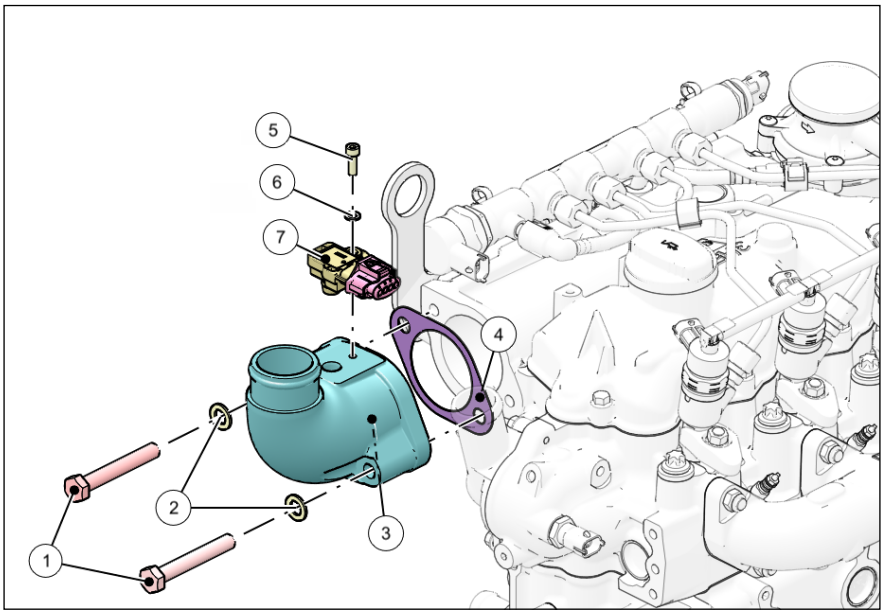
- Mount the cover plate [4] using the screws [1], [2] and washers [3].
- Hand-tighten the screw plug [6], if necessary.



Loctite® 5910™ sealing cord

11
Exhaust gas turbocharger

11.1 Charge air guide (T)



Pos.	Designation	Size	Tightening torque	Miscellaneous

Preparatory work

- Disassemble the charge air pipe [section 11.2].

Disassembly

- Remove electrical connection.
- Remove the screw [5] and washer [6].
- Remove the pressure and temperature sensor [7].
- Remove the screws [1] and washers [2].
- Remove the air guide [3] and gasket [4].

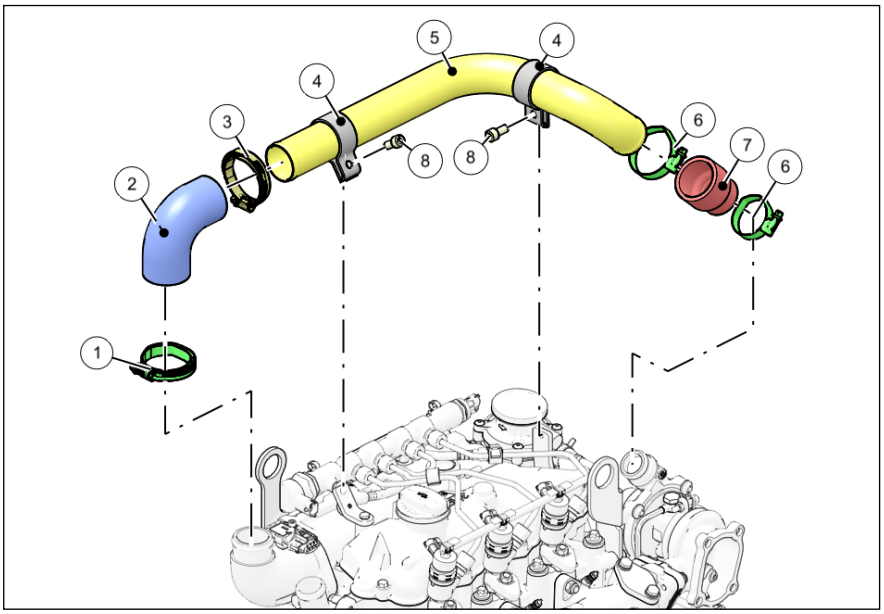
Inspection/maintenance

- Replace the gasket [4].

Assembly

- Attach the gasket [4] and air guide [3] using the washers [2] and screws [1].
- Attach the pressure and temperature sensor [7] using the screw [5] and washer [6].
- Attach electrical connection.
- Mount the charge air pipe [section 11.2].

11.2 Charge air pipe



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hose clip	40–60	Hand-tight	
2	Shaped hose	90°		
3	Hose clip	40–60	Hand-tight	
4	Pipe clamp	45.5		
5	Charge air pipe			
6	Hose clip	40–60	Hand-tight	
7	Charge air adapter, exhaust gas turbocharger			
8	Cylinder screw	M8x18	23 Nm	

Preparatory work

- -

Disassembly

- Remove the screws [8] from the pipe clamps [4].
- Release the clamps [1] and [6].
- Remove the complete charge air pipe.

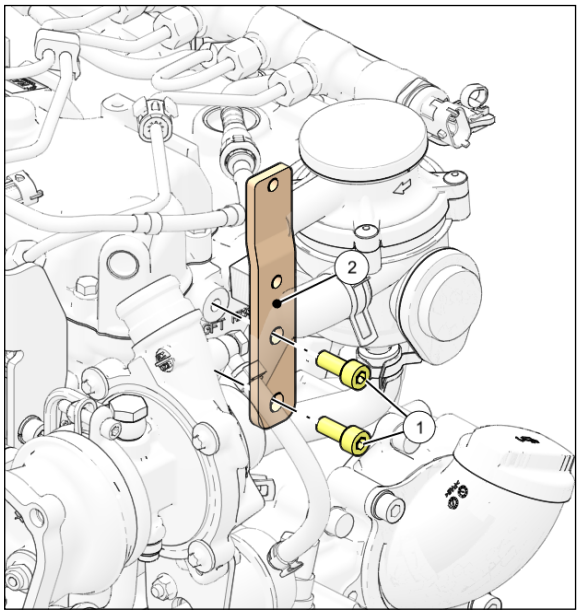
Inspection/maintenance

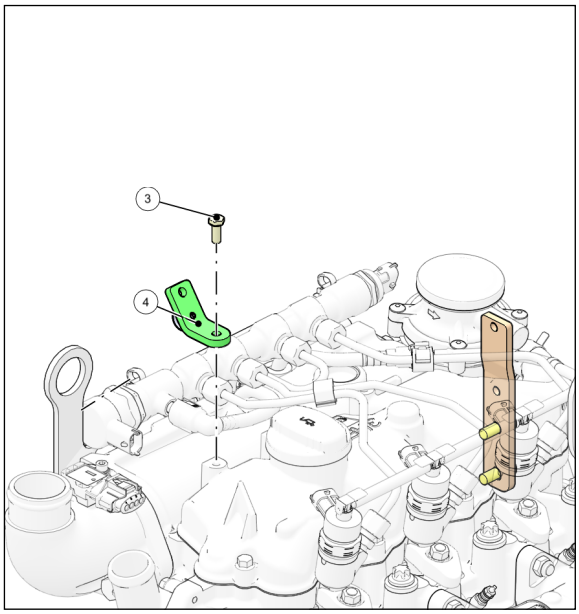
- Check the shaped hose [2] and adapter [7] for cracks/abrasion/aging.

Assembly

- Attach the complete charge air pipe with clamps [1] and [6].
- Attach the pipe clamp [4] to the brackets using the screws [8].

11.3 Charge air pipe bracket





Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M8x20	23 Nm	
2	Power pipe bracket			
3	Hexagon head screw	M6x16	9.5 Nm	
4	Power pipe retaining plate			

Preparatory work

- Disassemble the charge air pipe [section 11.2].

Disassembly

- Remove the screws [1] and bracket [2].
- Remove the screws [3] and bracket [4].

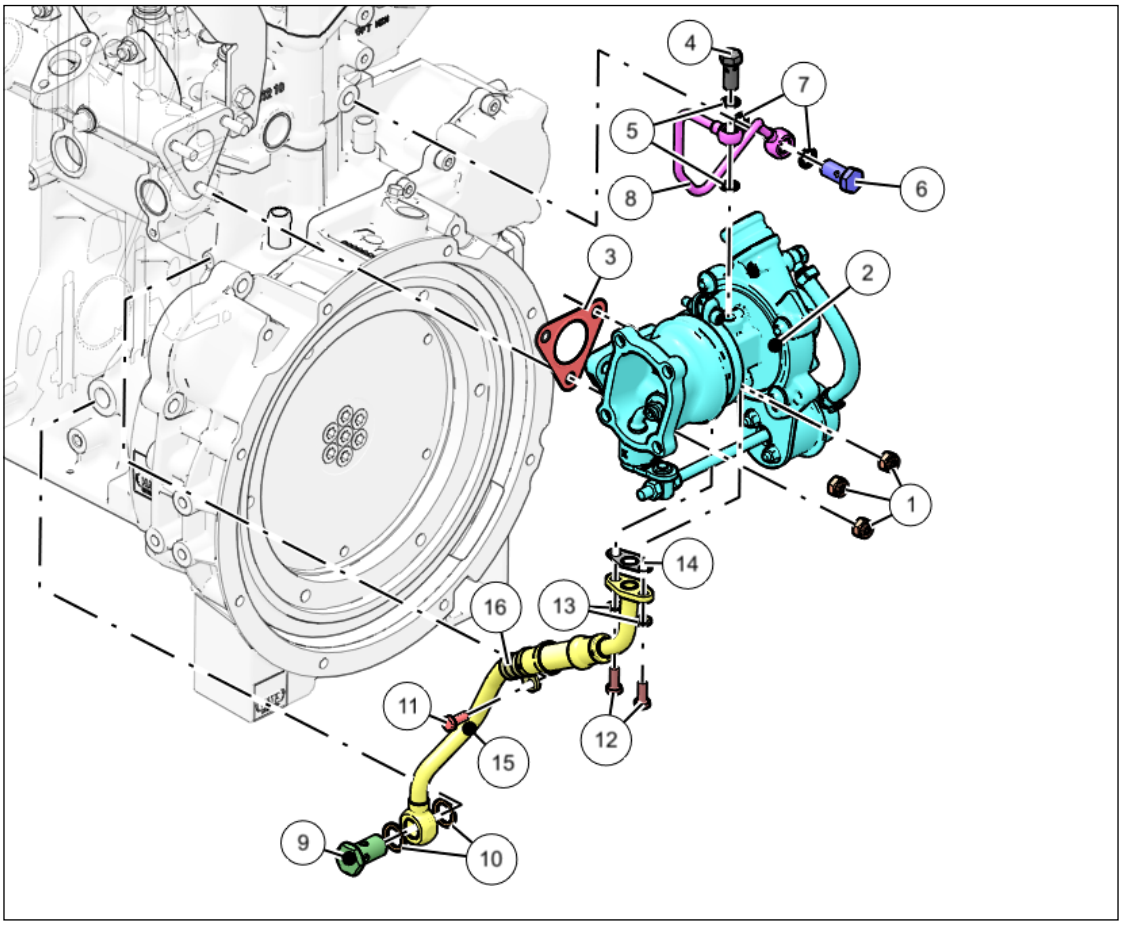
Inspection/maintenance

- -

Assembly

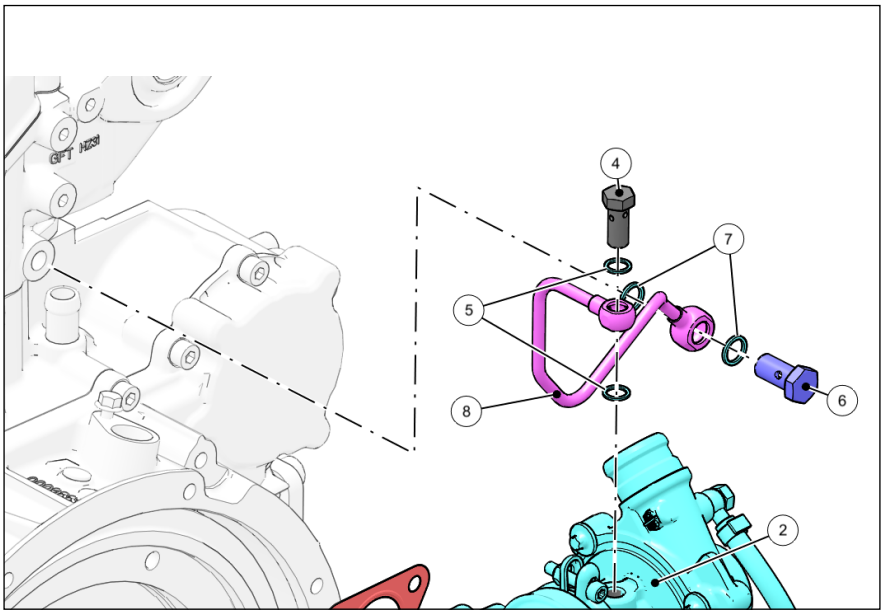
- Attach the bracket [2] using the screws [1].
- Attach the bracket [4] using the screw [3].
- Mount the charge air pipe [section 11.2].

11.4 Components



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon nut	VM8		
2	Turbocharger			
3	Gasket for the turbocharger			
4	Hollow bolt	M10x1	20 Nm	
5	Sealing ring	A10x13.5		
6	Hollow bolt	M12x1.5	30 Nm	
7	Sealing ring	A12x15.5		
8	Oil pressure line to turbocharger			
9	Hollow bolt	M16x1.5	55 Nm	
10	Sealing ring	A16x22		
11	Hexagon head screw	M6x16	9,5 Nm	
12	Hexagon head screw	M6x16	9,5 Nm	
13	Washer	6.4		
14	Gasket, oil return line			
15	Oil return line from turbocharger			
16	Pipe clamp			

11.5 Oil pressure line



Pos.	Designation	Size	Tightening torque	Miscellaneous
2	Turbocharger			
4	Hollow bolt	M10x1	20 Nm	
5	Sealing ring	A10x13.5		
6	Hollow bolt	M12x1.5	30 Nm	
7	Sealing ring	A12x15.5		
8	Oil pressure line to turbocharger			

Preparatory work

- Disassemble the console for the diesel particulate filter, if necessary.

Disassembly

- Remove the hollow bolts [4] and [6].
- Remove the oil pressure line [8] together with the sealing rings [5] and [7].

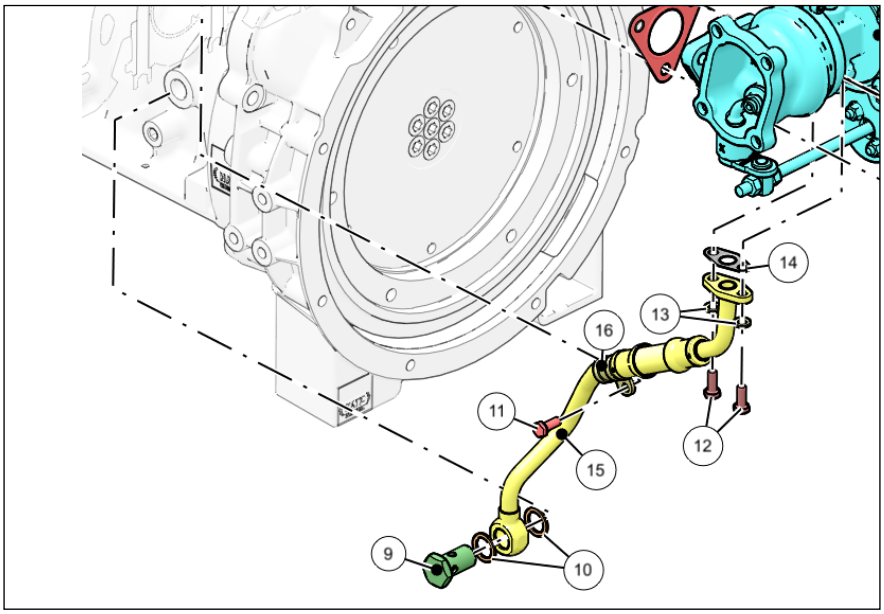
Inspection/maintenance

- Replace the sealing rings [5] and [7].

Assembly

- Attach the oil pressure line[8] using the hollow bolt [4] and sealing rings [5].
- Attach the oil pressure line[8] using the hollow bolt [6] and sealing rings [7].
- Mount the console for the diesel particulate filter, if necessary.

11.6 Oil return line



Pos.	Designation	Size	Tightening torque	Miscellaneous
9	Hollow bolt	M16x1.5	55 Nm	
10	Sealing ring	A16x22		
11	Hexagon head screw	M6x16	9.5 Nm	
12	Hexagon head screw	M6x16	9.5 Nm	
13	Washer	6.4		
14	Gasket, oil return line			
15	Oil return line from turbocharger			
16	Pipe clamp			

Preparatory work

- Disassemble the console for the diesel particulate filter if necessary [section 13.10].

Disassembly

- Remove the screw [11].
- Remove the hollow bolt [9] and sealing rings [10].
- Remove the screws [12].
- Remove the oil pressure line [15], washers [13] and gasket [14].

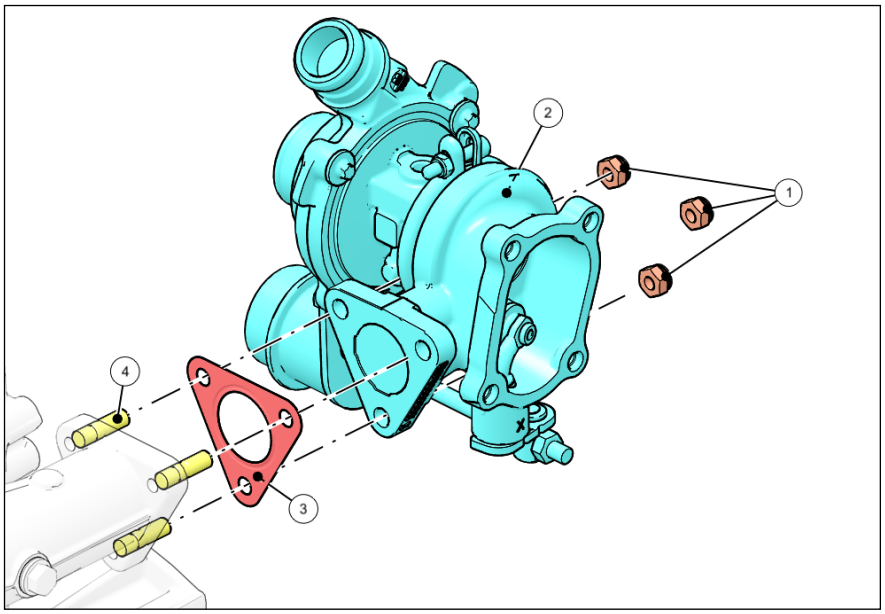
Inspection/maintenance

- Replace the gasket [14], sealing rings [10] and washers [13].

Assembly

- Lightly attach the oil return line [15] with washers [10] and hollow bolt [9].
- Attach the oil return line [15] using the screws [12], washers [13] and gasket [14].
- Tighten the screw [9].
- Attach the oil return line[15] with the screw [11].
- Mount the console for the diesel particulate filter if necessary [section 13.10].

11.7 Exhaust gas turbocharger



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon nut	VM8	25 Nm	
2	Turbocharger			
3	Gasket for exhaust gas turbocharger			
4	Stud bolt	M8x20		

Preparatory work

- Disassemble the intake [section 02.7].
- Disassemble the charge air pipe [section 11.2].
- Disassemble the exhaust silencer/oxidation catalytic converter [section 07.6].
- Disassemble the oil pressure pipe [section 11.5].
- Disassemble the oil return pipe [section 11.6].

Disassembly

- Remove the nuts [1].
- Remove the exhaust gas turbocharger [2] and gasket [3].

Inspection/maintenance

- Replace the gasket [3].
- Replace the nuts [1].
- If necessary, screw the stud bolt [4] all the way in.

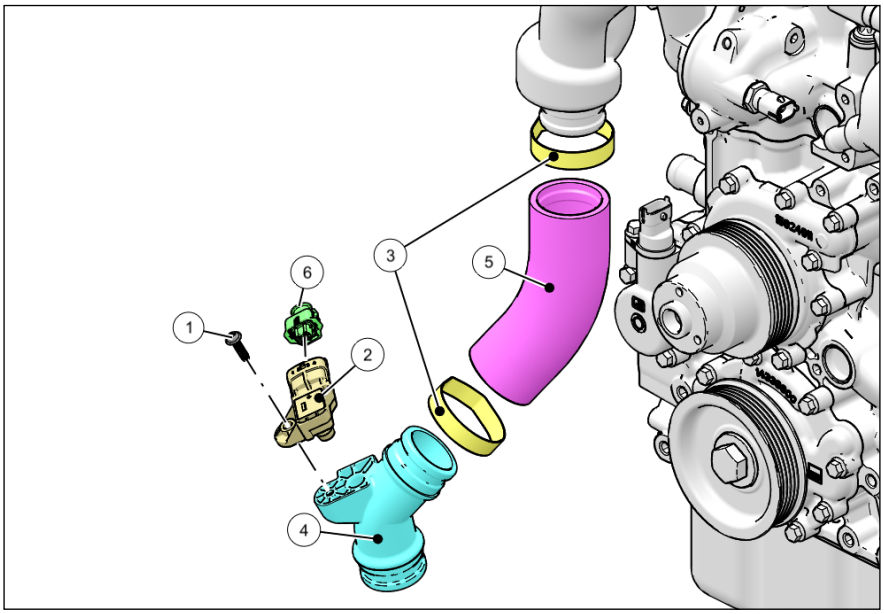
Assembly

- Position the gasket [3] on the stud bolts [4].
- Installation position: The raised side of the swage must face the exhaust gas turbocharger.
- Attach the exhaust gas turbocharger [2] using the nuts [1].
- Mount the oil return pipe [section 11.6].
- Mount the oil pressure pipe [section 11.5].
- Mount the exhaust silencer/oxidation catalytic converter [section 07.6].
- Mount the charge air pipe [section 11.2].
- Mount the intake [section 02.7].

12

Exhaust gas return (TIC,TICD)

12.1 Charge air intake TIC - (outdated)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Torx screw	5x20	5.5 Nm	
2	Pressure/temperature sensor			
3	Hose clip	40–60/13		
4	Sensor mount			
5	Shaped hose piece	Ø 45x5		
6	Electrical connection			

Preparatory work

- Disassemble the shaped hose for the charge air cooler from the sensor mount [4].

Disassembly

- Detach the electrical connection [6].
- Remove the screw [1] and pressure/temperature sensor [2].
- Release hose clips [3] and disconnect the intake from the mixing nozzle.

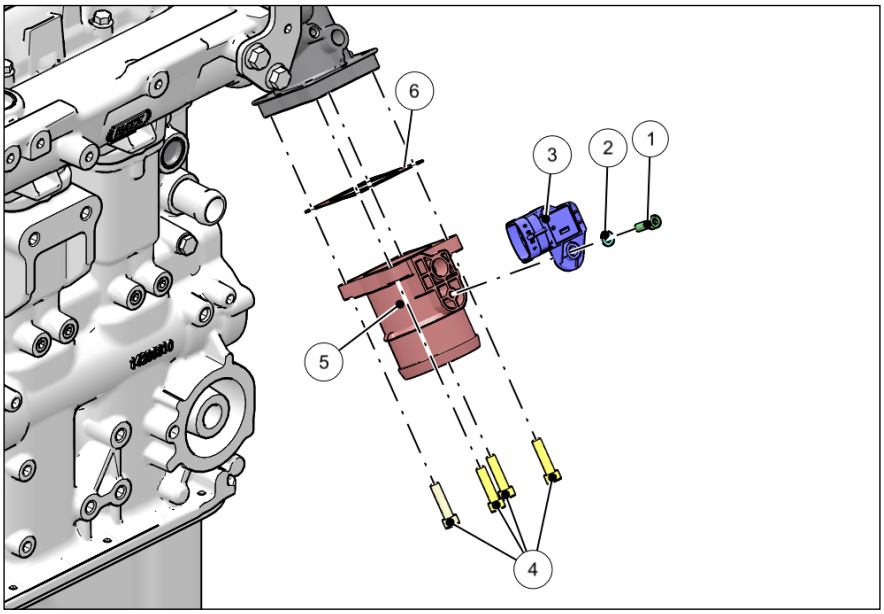
Inspection/maintenance

- Replace the hose clips [3].
- Check the shaped hose piece [5] for cracks/abrasion/aging, replace if necessary.
- To do so, release the hose clip [3] and disconnect the shaped hose piece [5] from the sensor mount [4].
- Attach the new shaped hose piece [5] to the sensor mount [4] using the hose clip [3].

Assembly

- Attach the intake to the mixing nozzle using the hose clip [3].
- Attach the sensor [2] to the sensor mount [4] using the screw [1].
- Attach the electrical connection [6].
- Mount the shaped hose for the charge air cooler on the sensor mount [4].

12.1 Charge air intake TIC



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M5x16	5.5 Nm	
2	Washer	5.3		
3	Pressure/temperature sensor			
4	Cylinder screw	M6x25	9.5 Nm	
5	Pressure/temperature sensor bracket			
6	Gasket			

Preparatory work

- Disassemble the shaped hose for charge air cooler [section 14.7].

Disassembly

- Remove electrical connection.
- Remove the screw [1] and washer [2].
- Remove the pressure/temperature sensor [3].
- Remove the screws [4].
- Disassemble the bracket [5] and gasket [6].

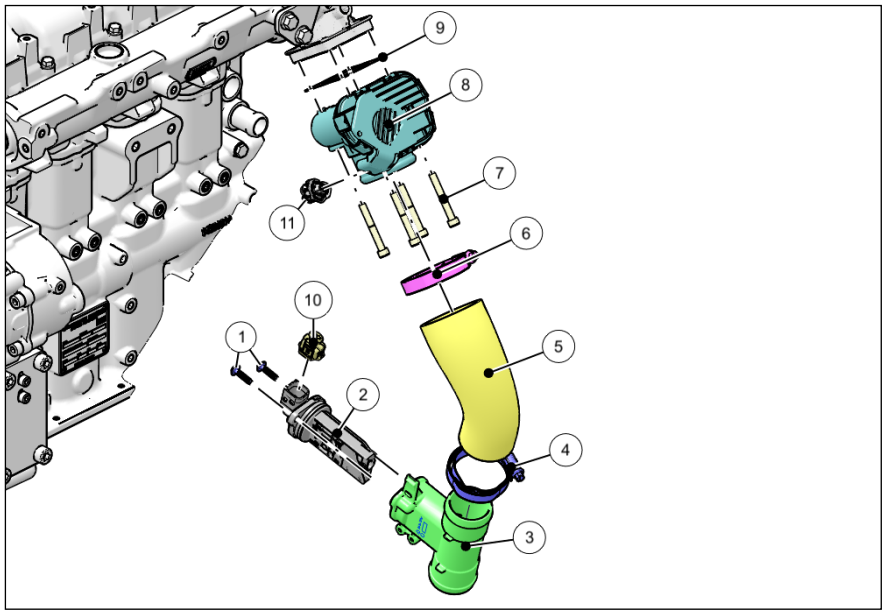
Inspection/maintenance

- Replace the gasket [6].

Assembly

- Attach the gasket [6] and bracket [5] using the screws [4].
- Attach the pressure/temperature sensor [3] and washer [2] using the screw [1].
- Attach electrical connection.
- Mount the shaped hose for charge air cooler [section 14.7].

12.1 Charge air intake TICD



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Torx screw	M5x20	5.5 Nm	
2	PFM sensor			
3	PFM sensor housing			
4	Hose clamp	46–60/13	Hand-tight	
5	Shaped hose, charge air cooler	Ø 45x5		
6	Hose clamp	50–70	Hand-tight	
7	Cylinder screw	M6x50	9.5 Nm	
8	Throttle valve			
9	Gasket for throttle valve			
10	Electrical connection			
11	Electrical connection			

Preparatory work

- Disassemble the PFM housing bracket [section 12.3].
- Disassemble the shaped hose for the charge air cooler from the PFM sensor housing [3] [section 14.7].

Disassembly

- Remove the electrical connections [10], [11].
- Remove the screws [1] and sensor [2].
- Remove the screws [7] and take off the intake.

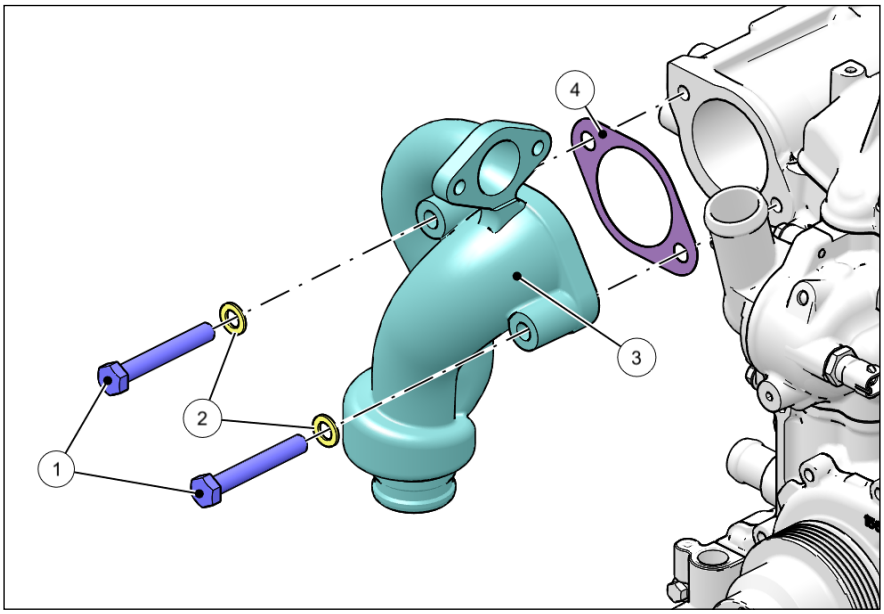
Inspection/maintenance

- Replace the gasket [9].
- Check the shaped hose [5] for cracks/abrasion/aging, replace if necessary. To do so, release the clamps [4] and [6] and disconnect the parts [8] and [3] from the shaped hose [5]. Reattach the new shaped hose using the clamps [4] and [6].

Assembly

- Attach the gasket [9] and complete intake to the mixing nozzle using the screws [7].
- Attach the sensor [2] using the screw [1].
- Attach the electrical connections [10], [11].
- Mount the shaped hose for the charge air cooler on the PFM sensor housing [3] [section 14.7].
- Mount the PFM housing bracket [section 12.3].

12.2 Mixing nozzle TIC - outdated



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw	M10x70	46 Nm	
2	Washer	10.5		
3	Mixing nozzle for EGR path			
4	Gasket for air intake pipe			

Preparatory work

- Disassemble the intake from the mixing nozzle [3].

Disassembly

- Remove the screws [1] and washers [2].
- Remove the mixing nozzle [3] and gasket [4].

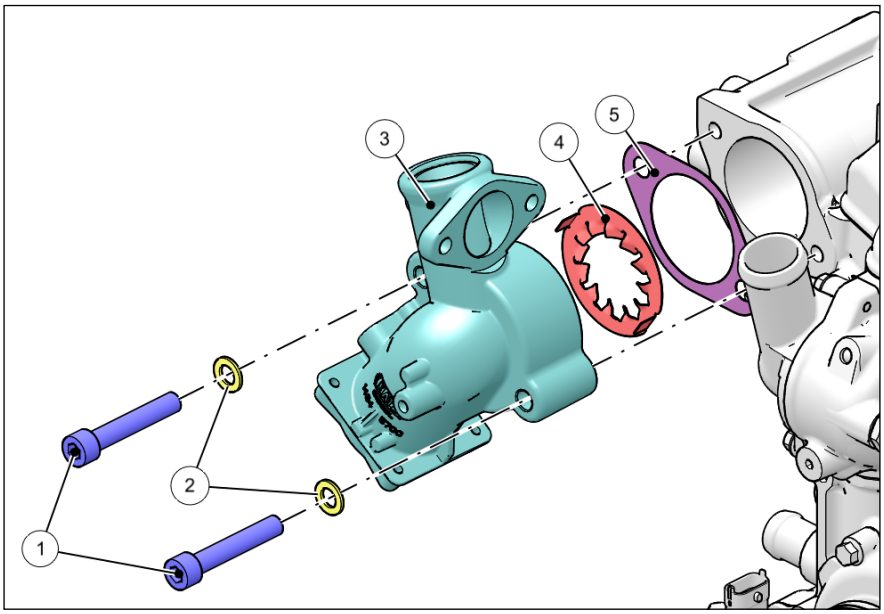
Inspection/maintenance

- Replace the gasket [4].

Assembly

- Attach the gasket [4] and mixing nozzle [3] using the washers [2] and screws [1].
- Mount the intake on the mixing nozzle [3].

12.2 Mixing nozzle for EGR path



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M10x60	46 Nm	
2	Washer	10.5		
3	Mixing nozzle for EGR path			
4	Diffusion disk			
5	Gasket for air intake pipe			

Preparatory work

- Disassemble the air intake from the mixing nozzle [3].

Disassembly

- Remove the screws [1] and washers [2].
- Remove the mixing nozzle [3], diffusion disk [4] and gasket [5].

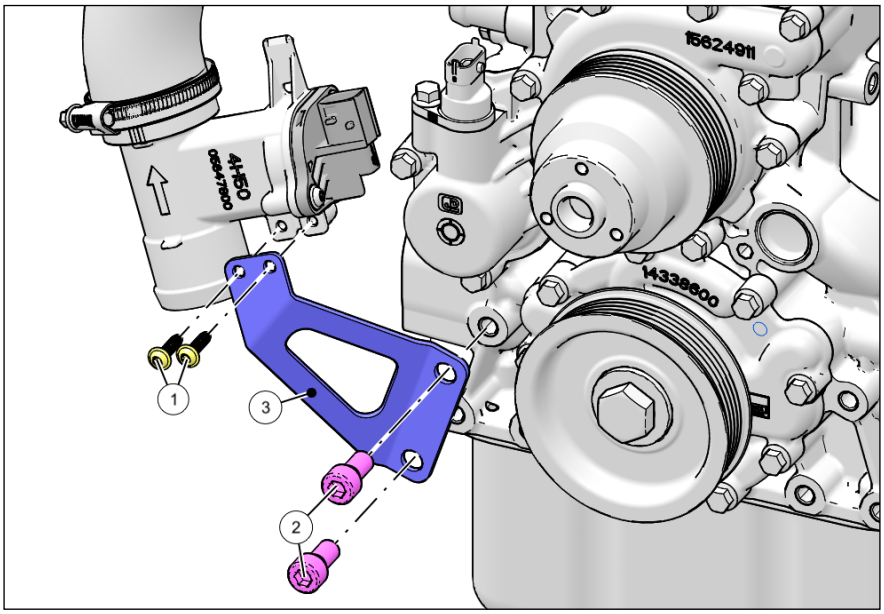
Inspection/maintenance

- Replace the gasket [5].

Assembly

- Insert the diffusion disk [4] into the mixing nozzle [3].
- Attach the parts [5], [4], [3] using the washers [2] and screws [1].
- Mount the air intake on the mixing nozzle [3].

12.3 PFM housing bracket



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Torx screw	M5x20	5.5 Nm	
2	Cylinder screw	M10x20	46 Nm	
3	PFM sensor bracket			

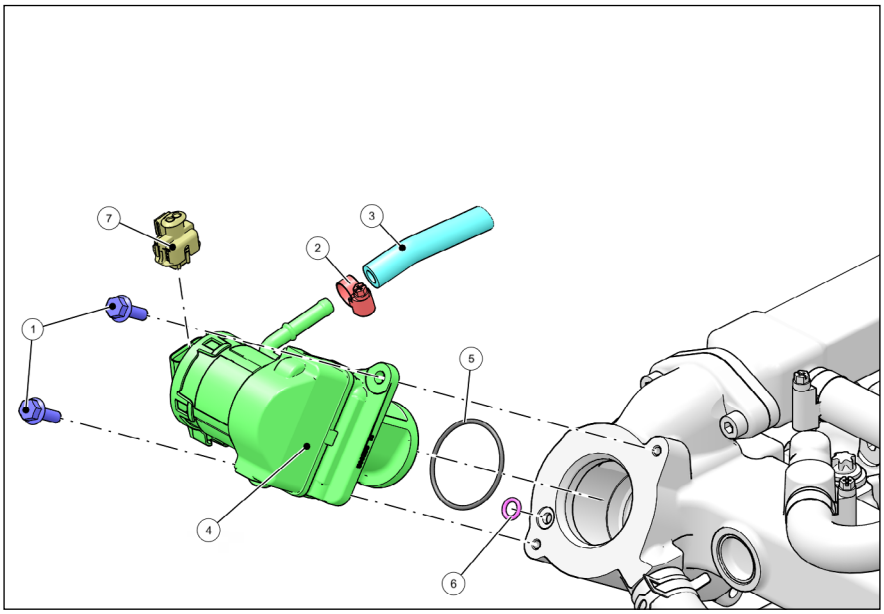
Disassembly

- Remove the screws [1], [2].
- Remove the bracket [3].

Assembly

- Attach the bracket [3] using the screws [2].
- Attach the screws [1].

12.4 EGR Valve



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw with flange	M6x20	9.5 Nm	
2	Hose clamp	7.5	Hand-tight	
3	Shaped hose piece			
4	EGR valve			
5	O-ring	45x2		
6	O-ring	8x2		
7	Electrical connection			

Preparatory work

- Drain the coolant (see Diesel Engine Operator's Manual).

Disassembly

- Disassemble the electrical connection [7].
- Release the hose clamp [2] and remove the shaped hose piece [3].
- Remove the screws [1].
- Pull out the EGR valve [4].
- Remove the o-ring [6].

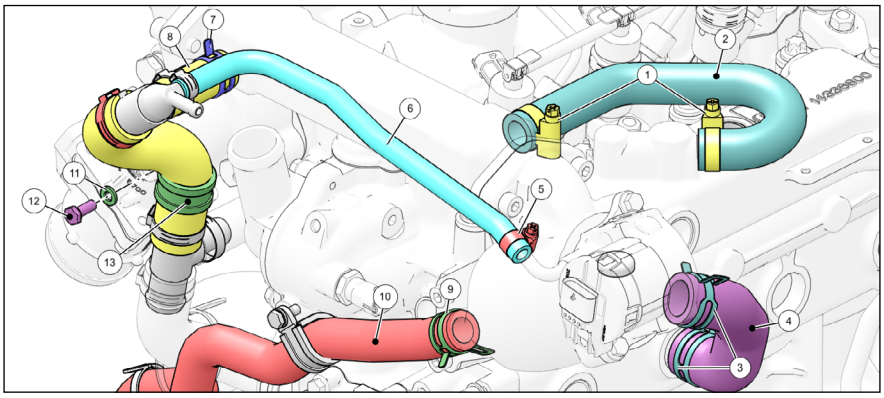
Inspection/maintenance

- Check the shaped hose piece [3] for cracks/abrasion/aging.
- Replace the o-rings [5], [6].

Assembly

- Grease the o-ring [6] and position it in the groove.
- Position the o-ring [5] on the EGR valve [4] and grease it.
- Attach the EGR valve [4] using the screws [1].
- Attach the shaped hose piece [3] using the hose clamp [2].
- Attach the electrical connection [7].
- Fill up with coolant (see the Diesel Engine Operator's Manual).

12.5 EGR coolant hosing



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hose clamp		Hand-tight	
2	Shaped hose piece	D16x45		
3	Spring band clamp	28–30.5		
4	Shaped hose piece	D22x4.5		
5	Hose clamp	7.5	Hand-tight	
6	Shaped hose piece			
7	Spring band clamp	24–26		
8	Shaped hose piece			
9	Spring band clamp	24–26		
10	Shaped hose piece	D16x4.5		
11	Washer	6.4		
12	Hexagon head screw	M6x16	9.5 Nm	
13	Pipe clamp	28/15		

Preparatory work

- Drain the coolant (see Diesel Engine Operator's Manual).

Disassembly

- Release the hose clamps [1] and remove the shaped hose piece [2].
- Release the spring band clamp [3] and remove the shaped hose piece [4].
- Release the hose clamp [5] and pull off the shaped hose piece [6] from the nipple.
- Release the spring band clamp [7] and pull off the shaped hose piece [8] from the tube connector.
- Release the spring band clamp [9] and pull off the shaped hose piece [10] from the tube connector.
- Remove the screw [12] and washer [11] from the pipe clamp [13] to loosen the shaped hose piece.

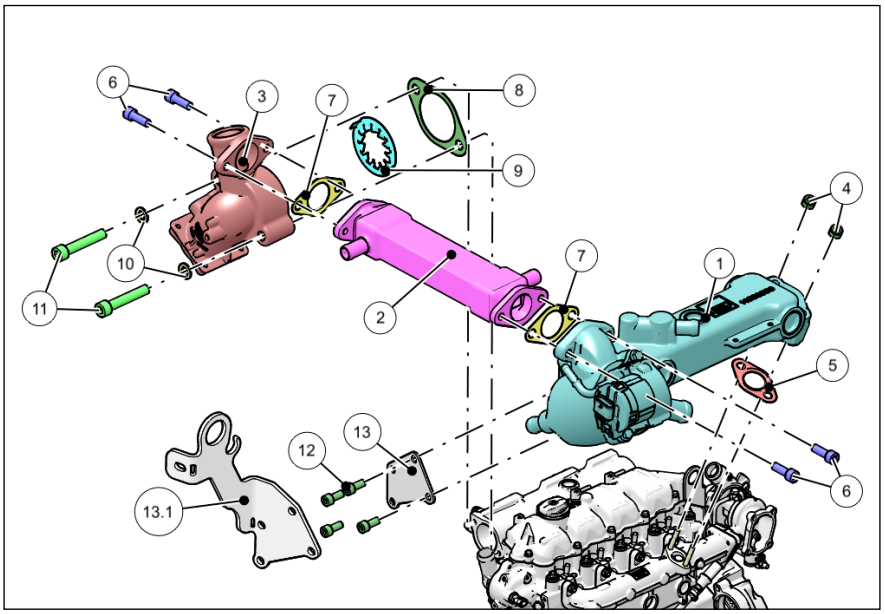
Inspection/maintenance

- Check all shaped hose pieces for cracks/abrasion/aging.

Assembly

- Attach all shaped hose pieces with the respective spring band clamps or hose clamps.
- Attach the pipe clamp [13] using the screw [12] and washer [11].
- Fill up with coolant (see the Diesel Engine Operator's Manual).

12.6 EGR precooler, EGR cooler (TIC, TICD)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Precooler			
2	EGR cooler			
3	Mixing nozzle for EGR			
4	Nut	VM8	23 Nm	↻
5	Precooler gasket			
6	Cylinder screw	M8x25	23 Nm	↻
7	EGR cooler gasket			
8	Gasket for air intake pipe			
9	Diffusion disk			
10	Washer	10.5		
11	Cylinder screw	M16x60	46 Nm	↻
12	Cylinder screw	M8x20	9.5 Nm	↻
13	Bracket			
13.1	Lifting eyelet replaced [13] during OPU			

Preparatory work

Drain the coolant (see Diesel Engine Operator's Manual).

- Disassemble the charge air intake [section 12.1].
- Disassemble the electrical connection of the EGR valve [section 12.4].
- Disassemble the EGR coolant hosing [section 12.8].
- Disassemble the lifting eyelet on the operation side [section 10.2].

Disassembly

- Remove the screws [12] and brackets [13 / 13.1].
- Remove the screws [6], [11] and nut [4].
- Remove the EGR system.

Inspection/maintenance

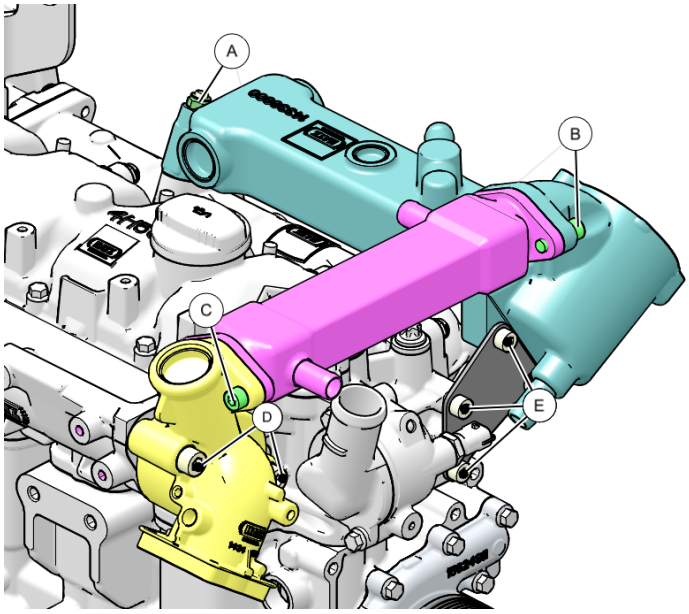
- Replace the gaskets [5], [7], [8].
- Clean the EGR cooler if necessary (if you have any question, please contact Customer Service).

Assembly

- Note the installation note.
- Mount the EGR coolant hosing [section 12.8].
- Mount the electrical connection of the EGR valve [section 12.4].
- Mount the lifting eyelet on the operation side [section 10.2].
- Mount the charge air intake [section 12.1].

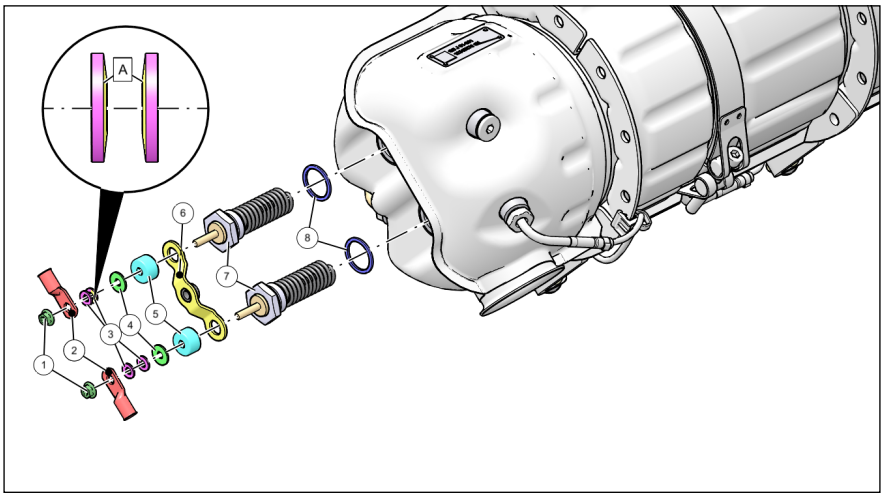
Installation note

- Initially, loosely (hand-tight) screw together or mount the components successively, starting with [A] and continuing through [E] to ensure strain-free installation.
- Then tighten [A – E] as per the tightening torque specifications.



13
Diesel particulate filter (TICD)

13.1 DPF glow plugs (DPF Premium)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Flange nut	M5	4 Nm	
2	Cable lug (electrical connection)			
3	curved washer	M5		
4	Washer	M5		
5	Ceramic sleeve			
6	Ground connection plate			
7	Glow plug 13 V	M22x1.5	35 Nm	Castrol Optimol Paste TA
8	Sealing ring	A22x27		

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).

Disassembly

- Remove the protective cap.
- Remove the nuts (1).
- Remove the parts in the sequence (2 – 6).
- Unscrew the glow plugs (7).
- Remove the sealing rings (8).

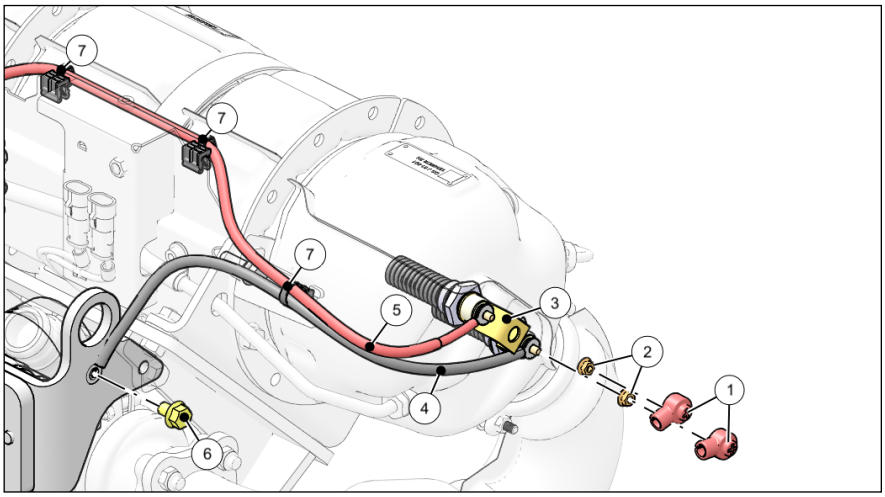
Inspection/maintenance

- Replace the sealing rings (8).
- Replace the glow plugs (7) if necessary.

Assembly

- Attach the glow plug (7) with the sealing ring (8).
- Attach the parts in reverse sequence (6 – 2) using the nuts (1). Mount the curved washers (3) with the outwardly curved sides (A) facing each other.
- Attach the protective caps.
- Connect the battery (see the Diesel Engine Operator's Manual).

13.2 Electrical connection of DPF glow plug 24 V



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Protective cap			outdated
2	Nut with flange	M5	4 Nm	
3	Connection plate			
4	Ground line EXH-/GND	10 mm²		
5	Plus line EXH+/GK1	6 mm²		
6	Hexagon head screw with flange	M8x12	23 Nm	
7	Cable ties			

Note

The lines must be fastened after no more than 250 mm to protect them against pulling, pushing and vibration forces (strain relief).

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).

Disassembly

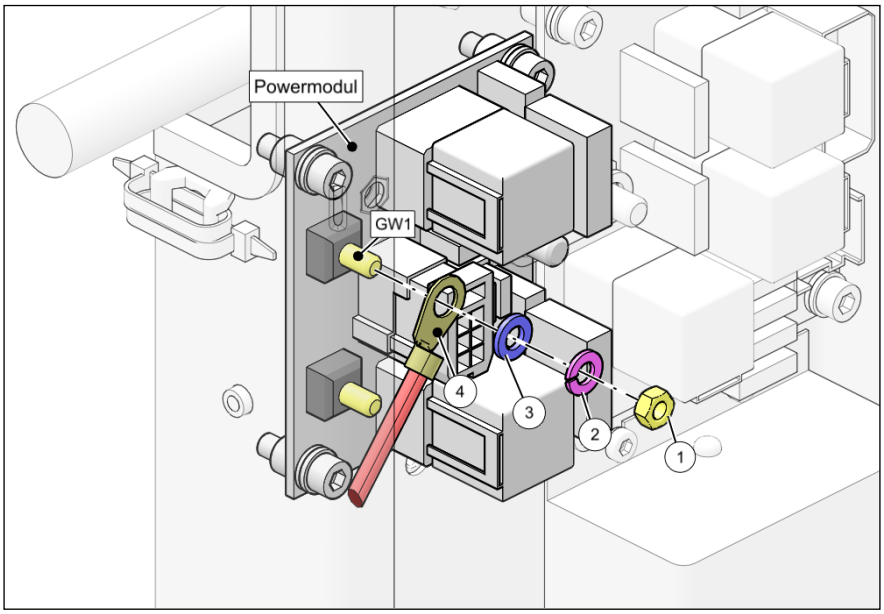
- Remove the protective cap (1), if present.
- Release the nuts (2).
- Remove the ground line GND (4) and plus line GK1 (5) from the glow plugs.
- Remove the screw (6) and remove the ground line GND (4) from the DPF bracket.

Inspection/maintenance

- Replace the cable ties (7), if necessary.
- Check the electrical lines (4), (5) and connections for damage.

Assembly

- Attach the ground line GND (4) to the glow plug using the nut (2).
- Attach the plus line GK1 (5) to the glow plug using the nut (2).
- Attach the ground line GND (4) to the DPF bracket using the screw (6).
- Attach the lines to the DPF using cable ties (7).
- Connect the battery (see the Diesel Engine Operator's Manual).



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Nut	M6	3.9 Nm	
2	Spring washer	6		
3	Washer	6		
4	Plus line EXH+/GK1	Ø 6 mm²		

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).

Disassembly

- Remove the nut [1], spring ring [2] and washer [3].
- Remove the plus line GK1 [4].

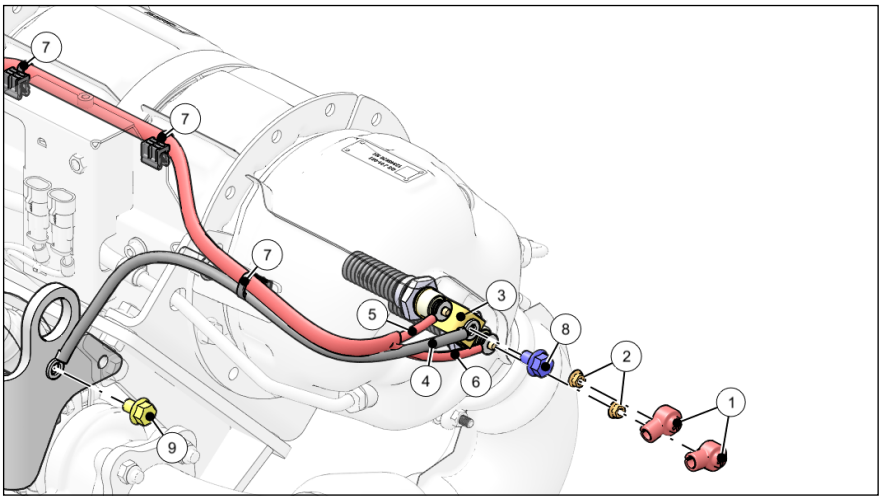
Inspection/maintenance

- Check the electrical line [4] and connections for damage.

Assembly

- Attach the plus line GK1 [4] to connection GW1 of the power module using the washer [3], spring ring [2] and nut [1].
- Connect the battery (see the Diesel Engine Operator's Manual).

13.3 Electrical connection of DPF glow plug 12 V



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Protective cap			outdated
2	Nut with flange	M5	4 Nm	
3	connection plate			
4	Ground line EXH-/GND	10 mm²		
5	Plus line EXH+/GK1	6 mm²		
6	Plus line EXH+/GK2	6 mm²		
7	Cable ties			
8	Hexagon head screw with flange	M8x12	23 Nm	
9	Hexagon head screw with flange	M8x12	23 Nm	

Note

The lines must be fastened after no more than 250 mm to protect them against pulling, pushing and vibration forces (strain relief).

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).

Disassembly

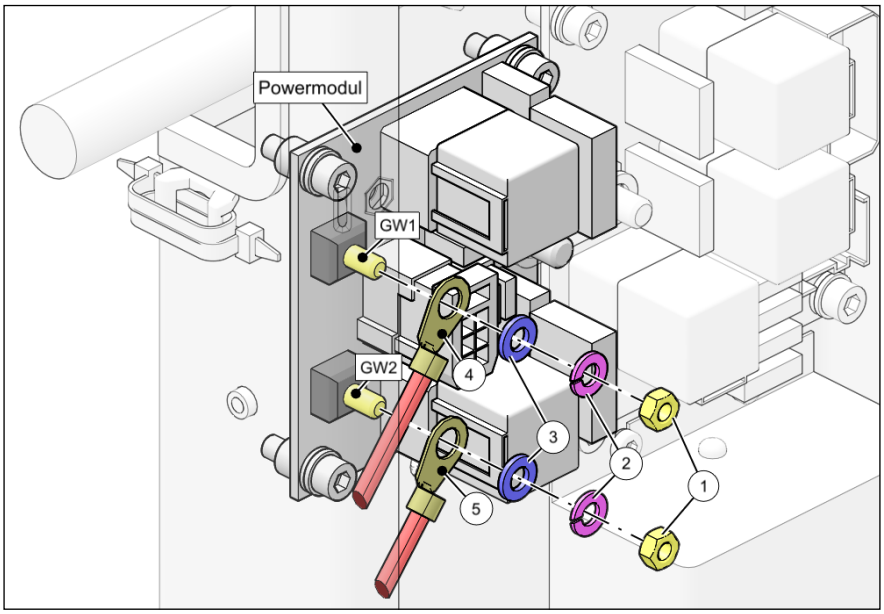
- Remove the protective cap [1], if present.
- Remove the nuts [2] and disconnect the plus lines GK1 [5] and GK2 [6] from the glow plugs.
- Remove the screw [8] and disconnect the ground line GND [4] from the connection plate [3].
- Remove the screw [9] and ground line GND [4] from the DPF bracket.

Inspection/maintenance

- Replace the cable ties [7], if necessary.
- Check the electrical lines [4], [5], [6] and connections for damage.

Assembly

- Attach the plus lines [5], [6] to the glow plugs using the nuts [2].
- Attach the ground line GND [4] to the connection plate [3] using the screw [8].
- Attach the ground line GND [4] to the DPF bracket using the screw [9].



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Nut	M6	3.9 Nm	
2	Spring washer	6		
3	Washer	6		
4	Plus line EXH+/GK1	Ø 6 mm²		
5	Plus line EXH+/GK2	Ø 6 mm²		

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).

Disassembly

- Remove the nuts[1], spring rings [2] and washers [3].
- Remove the plus lines GK1 [4] and GK 2 [5].

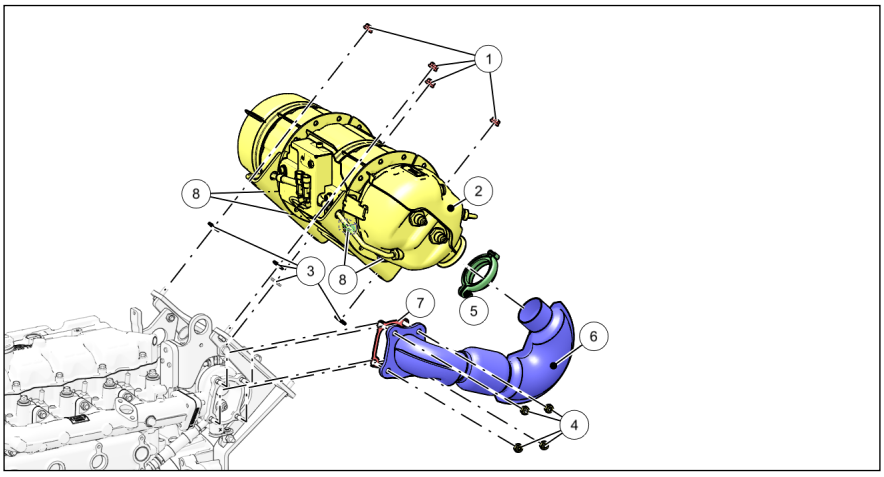
Inspection/maintenance

- Check the electrical line [4] and connections for damage.

Assembly

- Attach the plus line GK1 [4] to connection GW1 of the power module using the washer [3], spring ring [2] and nut [1].
- Attach the plus line GK2 [5] to connection GW2 of the power module using the washer [3], spring ring [2] and nut [1].
- Connect the battery (see the Diesel Engine Operator's Manual).

13.4 Diesel particulate filter (engine-mounted)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Nut with flange	M8	23 Nm	
2	Complete diesel particulate filter			
3	Washer	8.4		
4	Hexagon nut	VM8	23 Nm	
5	V-band clamp		9 Nm	
6	Inlet pipe			
7	Gasket for exhaust gas turbocharger			
8	Hexagon head screw with flange	M8x25	23 Nm	

Note

When installing a new, unused diesel particulate filter, the screws [8] must be retightened.

Preparatory work

- Disconnect the battery.
- Disassemble the electrical connection of the DPF glow plugs [section 13.2].
- Disassemble the electrical connection of the DPF temperature sensor [section 13.7].

Disassembly

- Remove the nuts [1], clamp [5].
- Pull the inlet pipe [6] out of the diesel particulate filter.
- Lift the diesel particulate filter [2] off of the console.

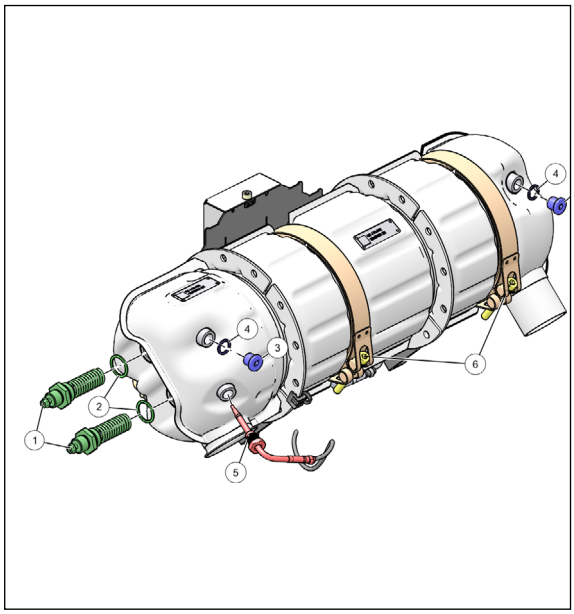
Inspection/maintenance

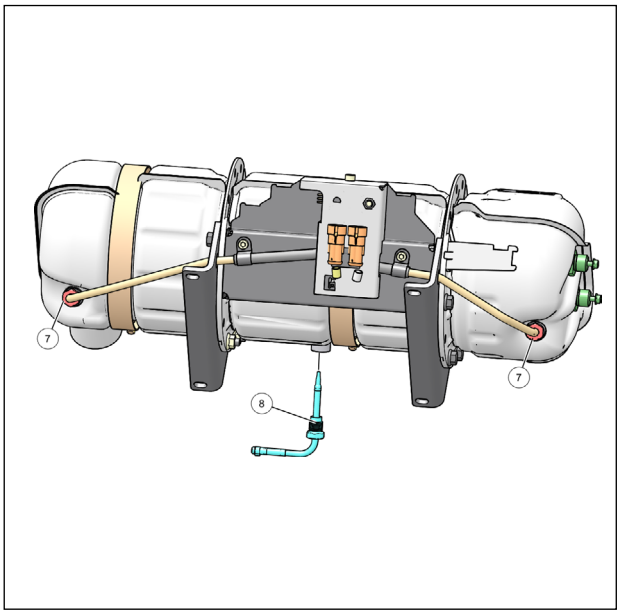
- If necessary, renew the gasket [7], nuts [4], clamp [5].
- Clean the DPF, if necessary. See the Diesel Engine Operator's Manual.

Assembly

- Attach washers [3] and diesel particulate filter [2] to the console using the nuts [1].
- Attach the inlet pipe [6] to the diesel particulate filter [2] using the clamp [5].
- Mount the electrical connection of the DPF temperature sensor [section 13.7].
- Mount the electrical connection of the DPF glow plugs [section 13.2].

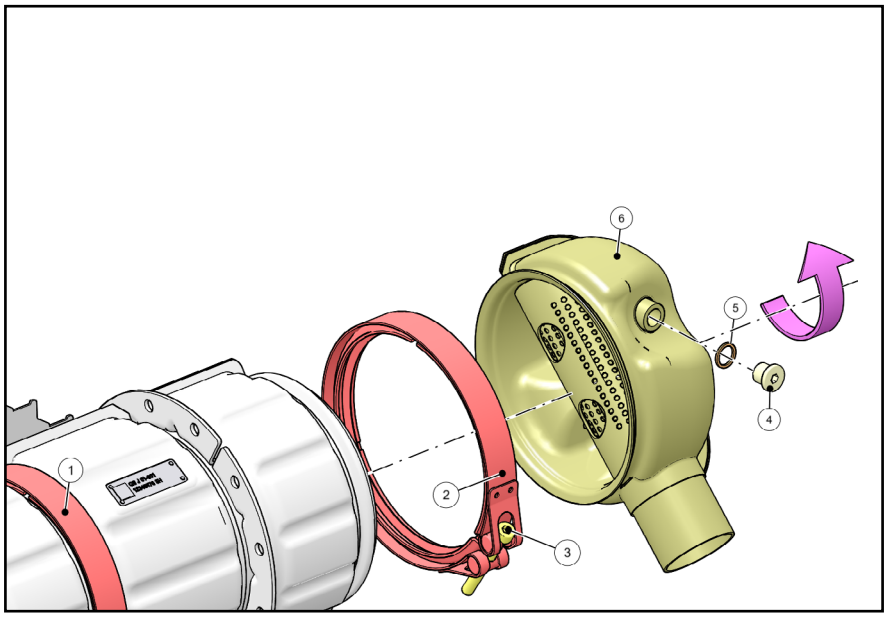
13.5 Diesel particulate filter components





Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Glow plug 13 V (DPF Premium) Alternatively, screw plug	M22x1.5	35 Nm	Castrol Optimol TA
2	Sealing ring	A22x27		
3	Screw plug	M14x1.5	45 Nm	Castrol Optimol TA
4	Sealing ring	A14x18		
5	Temperature sensor	M14x1.5	45 Nm	Castrol Optimol TA
6	V-band clamp with gasket	Ø 5.66"	12 Nm	Power screw-driver speed max. 350 rpm
7	Clamping screw	M14x1.5	45 Nm	Castrol Optimol TA
8	Temperature sensor	M14x1.5	45 Nm	Castrol Optimol TA

13.6 DPF Radial outlet module position correction



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	V-band clamp, inlet	Ø 5.66"		
2	V-band clamp, outlet	Ø 5.66"		
3	Cylinder screw	M8x70	12 Nm	
4	Screw plug	M14x1.5	45 Nm	Power screw-driver speed max. 350 rpm
5	Sealing ring	A14x18		Castrol Optimol TA
6	Radial outlet module			

Note

V-band clamp, inlet

Because the leak tightness of the system is no longer ensured after the position of the inlet is corrected, it is prohibited to perform a position correction here.

Note

V-band clamp, outlet

If further standards and regulations apply to the overall machine (e.g. permissible exhaust gas volume in the engine compartment), the machinery manufacturer is responsible for a leak tightness test where necessary.

Note

- Tighten the V-band clamp with 12 Nm.
- Max. speed 350 rpm (when using a power screwdriver).
- Do not use lubricants on screws, bolts, studs and pins!
- Use a recoil-free, soft-faced hammer.

Preparatory work

- Disassemble the DPF pressure pipe [section 13.9].

Disassembly

- Remove the screw plug [4] with the sealing ring [5].
- Loosen the cylinder screw [3] and remove the clamp [2].
- Take off the outlet module [6].
- Attention: The gasket must not be damaged/bent.

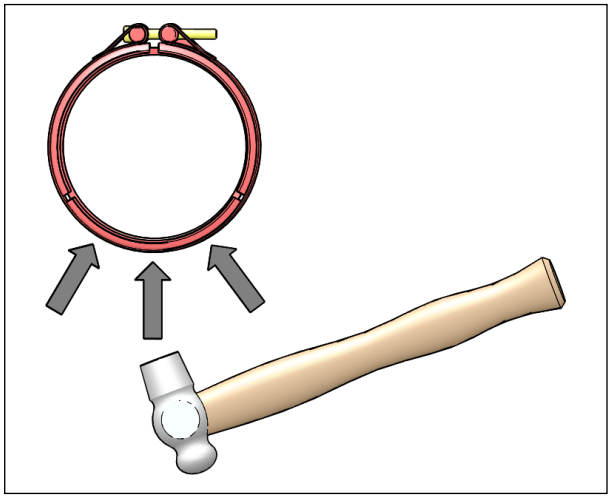
Inspection/maintenance

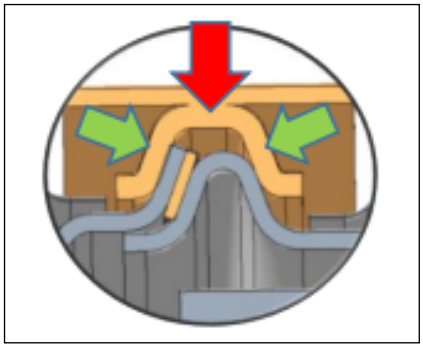
- Replace the sealing ring [5].
- Replace the V-band clamp [2] (incl. DPF gaskets).

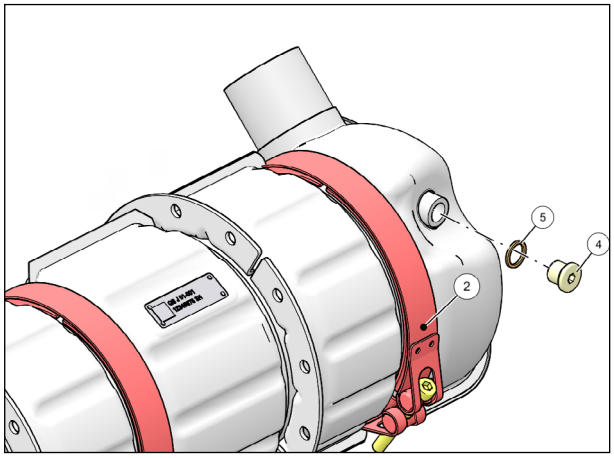
Assembly

- Position the outlet module [6] in the desired position and attach using the clamp [2] and screw [3].

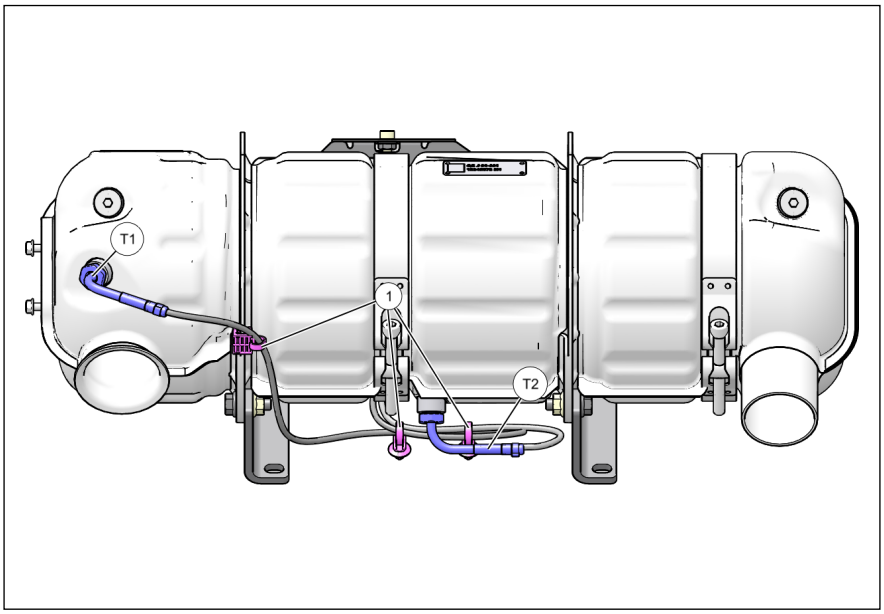
  Attention:
- Strike the points on the clamp [2] indicated in the figure below using a recoil-free soft-faced hammer. The compresses the gasket into the V contour all around.
- Tighten the screw [3] again using the rated torque.
- Attach the screw plug [4] with the sealing ring [5] at the new position (see figure below).
- Mount the DPF pressure pipe [section 13.9].
- Perform a leak tightness test after correcting the position, if necessary.







13.7 DPF temperature sensor



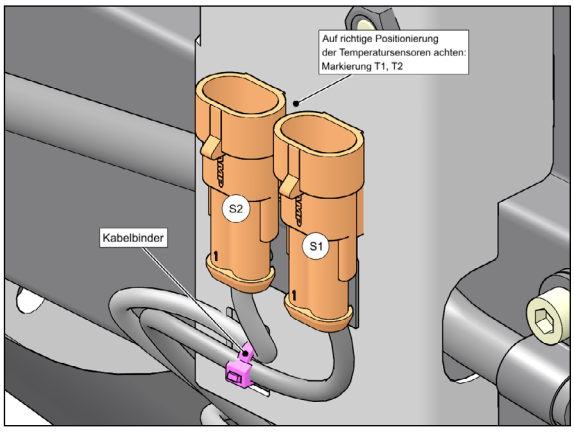
Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cable ties			
T1	Temperature sensor	M14x1.5	45 Nm	Castrol Optimol TA
T2	Temperature sensor	M14x1.5	45 Nm	Castrol Optimol TA

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).
- Disassemble the diesel particulate filter [section 13.4].

Disassembly

- Release all cable ties.
- Remove the temperature sensors (T1), (T2).
- Remove the plugs of the temperature sensors (S1), (S2) (pull out toward the top).



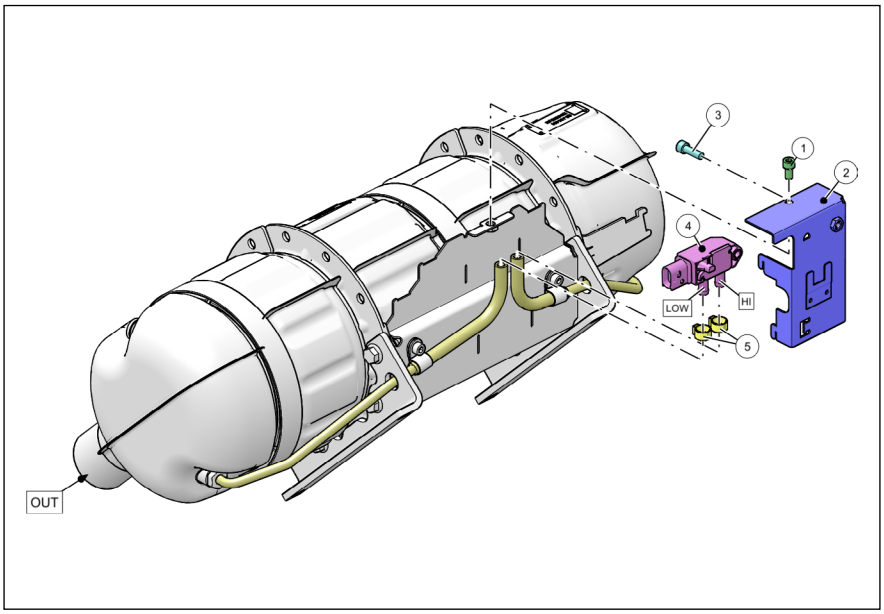
Inspection/maintenance

- Replace the cable ties.

Assembly

- Screw in the temperature sensors (T1), (T2).
- The sensor (T2) is positioned parallel to the center axis of the diesel particulate filter (horizontal).
- Position the connectors (S1), (S2) on the holder (note the arrangement).
- Coil the excess cable length and secure with cable ties.
- Mount the diesel particulate filter [section 13.4].
- Connect the battery (see the Diesel Engine Operator's Manual).

13.8 DPF differential pressure sensor



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M6x12	9.5 Nm	
2	Differential pressure sensor cover			
3	Cylinder screw	M6x20	9.5 Nm	
4	Differential pressure sensor			
5	Hose clip	13.8		

Preparatory work

- Disassemble the diesel particulate filter [section 13.4].

Disassembly

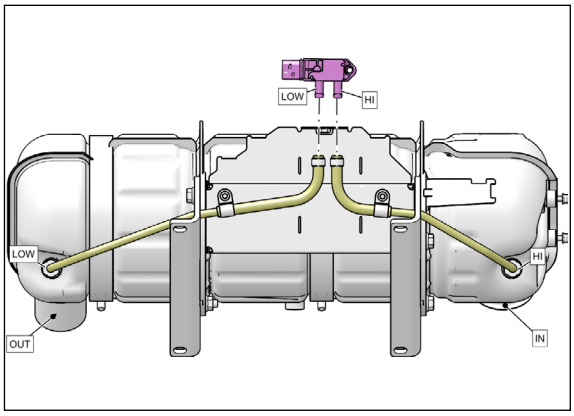
- Remove the screw [1].
- Remove the screw [3] and disconnect the differential pressure sensor [4] from the cover [2].
- Remove the hose clips [5].
- Pull the differential pressure sensor [4] off of the hoses.

Inspection/maintenance

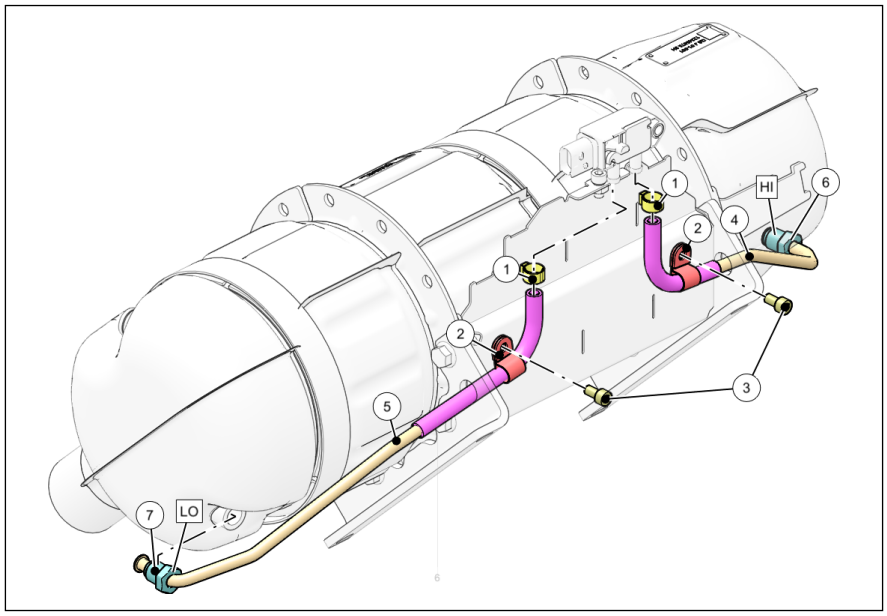
- Replace the hose clips [5].
- Check the hoses for cracks/abrasion/aging.

Assembly

- Attach the differential pressure sensor [4] to the hoses using hose clips [5].
- Input HI (high) is connected to the DPF inlet using the pressure pipe.
- Input LOW is connected to the DPF outlet using the pressure pipe.
- Attach the differential pressure sensor [4] to the cover [2] using the screw [3].
- Attach the cover [2] to the diesel particulate filter using the screw [1].
- Mount the diesel particulate filter [section 13.4].



13.9 DPF pressure pipe



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hose clip	13.8		
2	Pipe clamp	12/15		
3	Cylinder screw	M6x12	9.5 Nm	
4	Pipe 1 for differential pressure sensor			
5	Pipe 2 for differential pressure sensor			
6	Clamping screw HI	M14x1.5	45 Nm	Castrol Optimol TA
7	Clamping screw LO	M14x1.5	45 Nm	Castrol Optimol TA

Preparatory work

- Disassemble the differential pressure sensor [section 13.8].

Disassembly

- Remove the hose clip [1].
- Remove the screws [3].
- Release the clamping screws [6] and pull out the pipe [4].
- Release the clamping screw [7] and pull out the pipe [5].

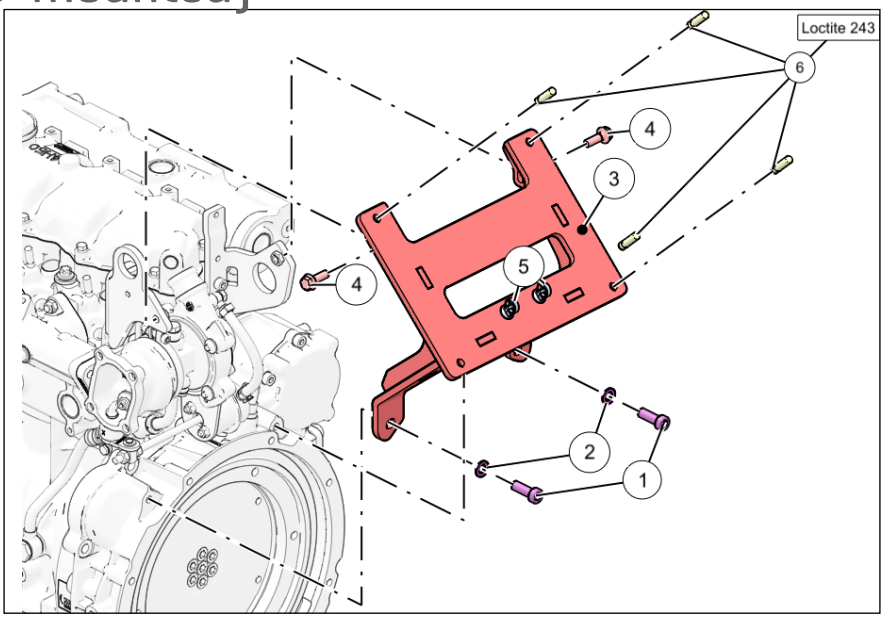
Inspection/maintenance

- Check the pipes [4] and [5] for cracks/abrasion/aging.

Assembly

- Pass the pipes [4] and [5] through the dilled holes in the bracket to the console.
- Attach the pipe [4] to inlet HI using the clamping screw [6].
- Attach the pipe [5] to inlet LO using the clamping screw [7].
- Attach the pipes [4] and [5] to the DPF using the screw [3] and pipe clamp [2].
- Mount the differential pressure sensor [section 13.8].

13.10 Console for diesel particulate filter (engine-mounted)



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Cylinder screw	M10x30	46 Nm	
2	Washer	10.5		
3	Console for DPF			
4	Hexagon head screw with flange	M8x25	23 Nm	
5	Cable ties with slat foot	6.5–7.0		
6	Stud bolt	M8x25		Loctite® 243™

Preparatory work

- Disassemble the diesel particulate filter [section 13.4].

Disassembly

- Remove the screws [1] and washers [2].
- Remove the screws [4].
- Remove the console [3].

Inspection/maintenance

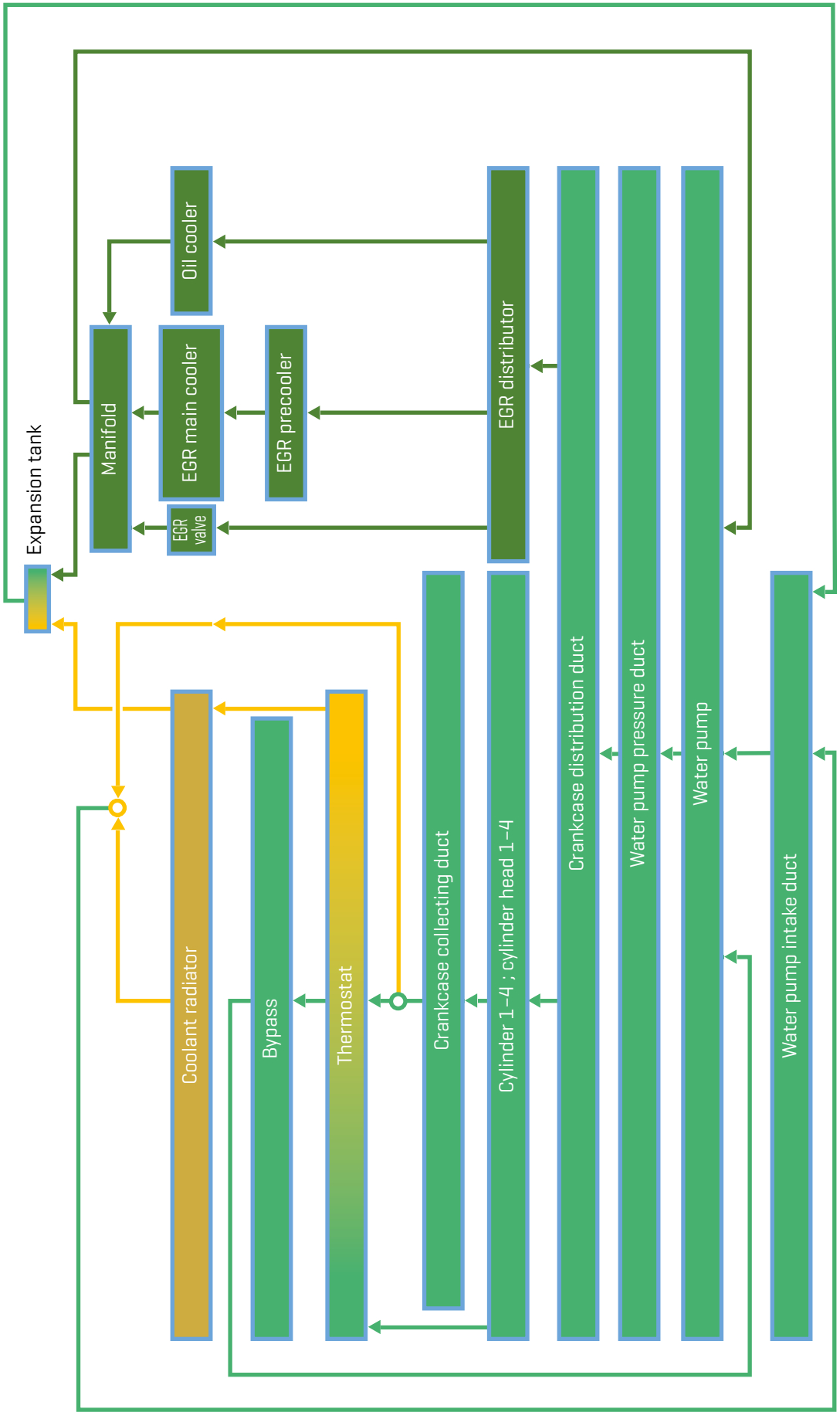
- Replace the cable ties [5].
- If necessary, screw the stud bolt [6] all the way in.

Assembly

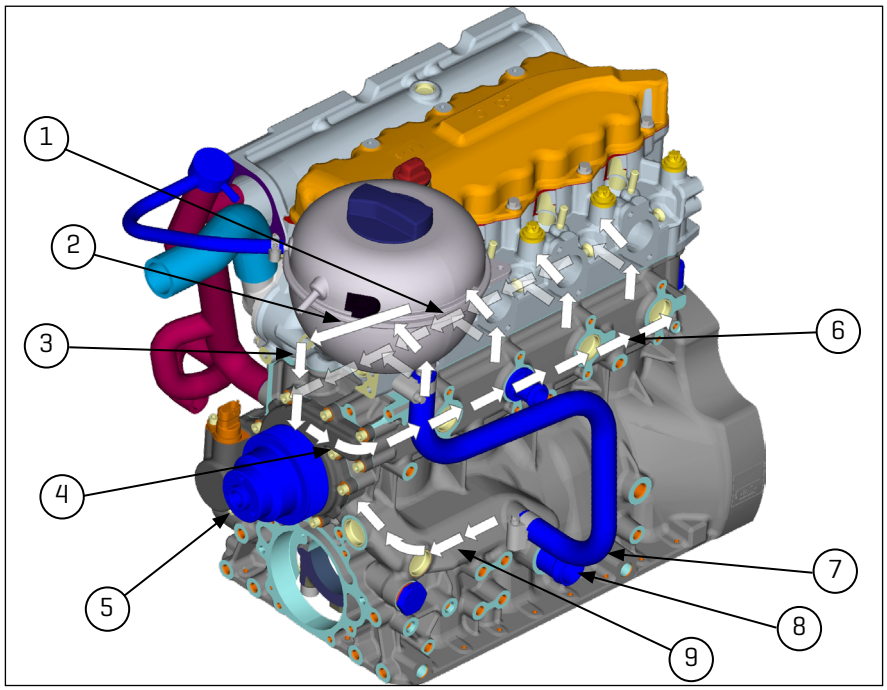
- Attach the console [3] to the housing using the washers [2] and screws [1] and screws [4].
- Mount the diesel particulate filter [section 13.4].

14
Cooling system

14.1 Cooling schematic H50 - schematic

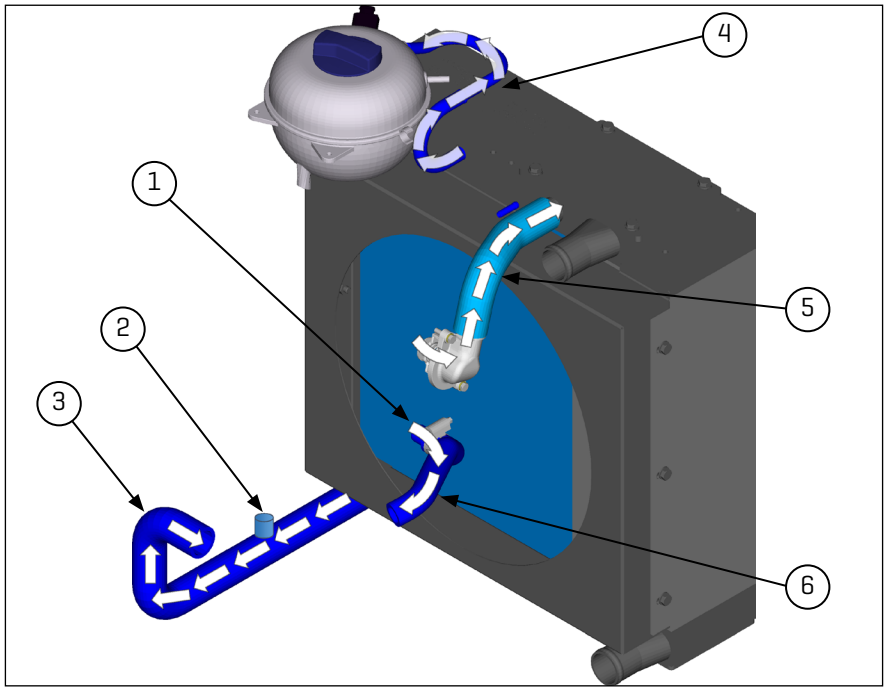


14.2 Cooling schematic H50 - inside engine



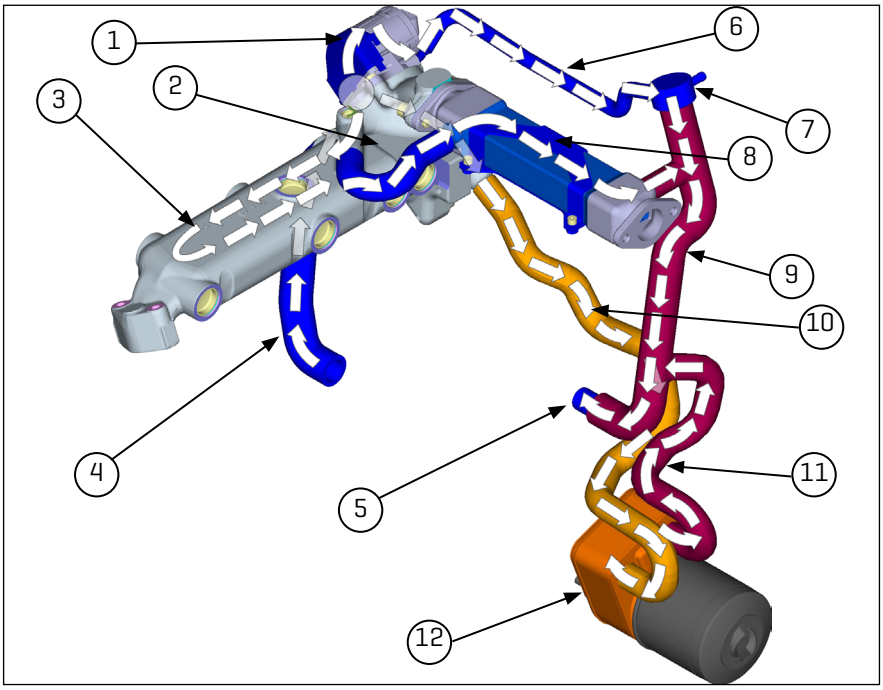
Pos.	Designation
1	Crankcase collecting duct
2	Cylinder head relief
3	Thermostat bypass
4	Water pump pressure duct
5	Water pump
6	Crankcase distribution duct
7	Expansion tank return
8	Coolant radiator return
9	Water pump intake duct

14.3 Cooling schematic H50 - coolant radiator and cab heating



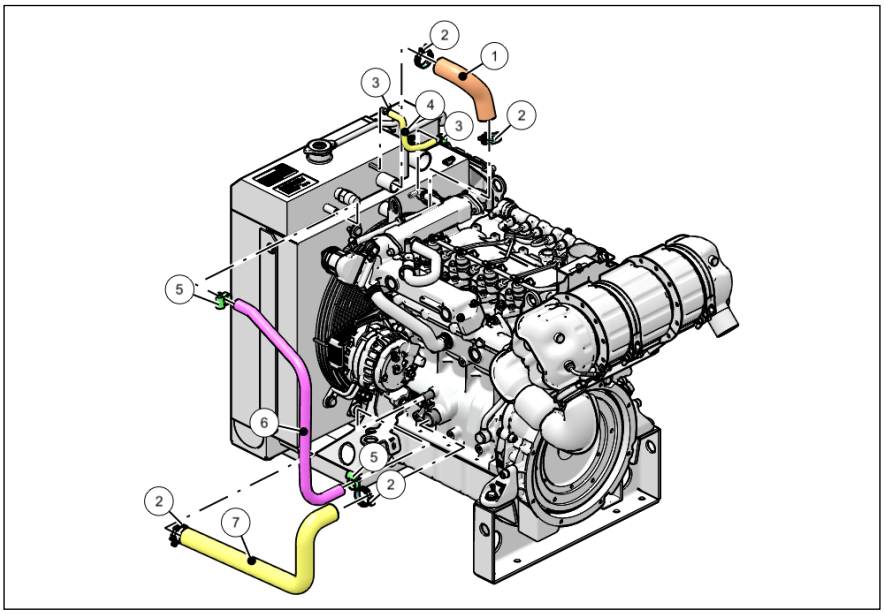
Pos.	Designation
1	Supply from crankcase collecting duct
2	Cabin heating return
3	Supply line from coolant radiator to water pump intake duct
4	Coolant radiator relief
5	Coolant radiator supply
6	Cabin heating supply

14.4 Coolant circuit schematic H50 - exhaust gas return and oil cooler



Pos.	Designation
1	EGR valve
2	EGR distributor
3	EGR precooler
4	Supply to EGR distributor from crankcase distribution duct
5	Return from manifold to water pump
6	Return from EGR to manifold
7	Relief to expansion tank
8	EGR main cooler
9	Cooling water manifold
10	Supply from EGR distributor to oil cooler
11	Return from oil cooler to manifold
12	Oil cooler

14.5 Coolant hosing of cooler



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Shaped hose	Ø32x4		
2	Spring band clamp	40/12		
3	Hose clamp	7.5	Hand-tight	
4	Coolant hose	8x3x198		
5	Hose clamp	16–27x12	Hand-tight	
6	Coolant hose	16x4x690		
7	Standard hose	Ø32x4		

Preparatory work

- Drain the coolant (see Diesel Engine Operator's Manual).

Disassembly

- Release the clamps (2) and remove the hoses (1) and (7).
- Release the clamps (5) and remove the hose (6).
- Release the clamps (3) and remove the hose (4).

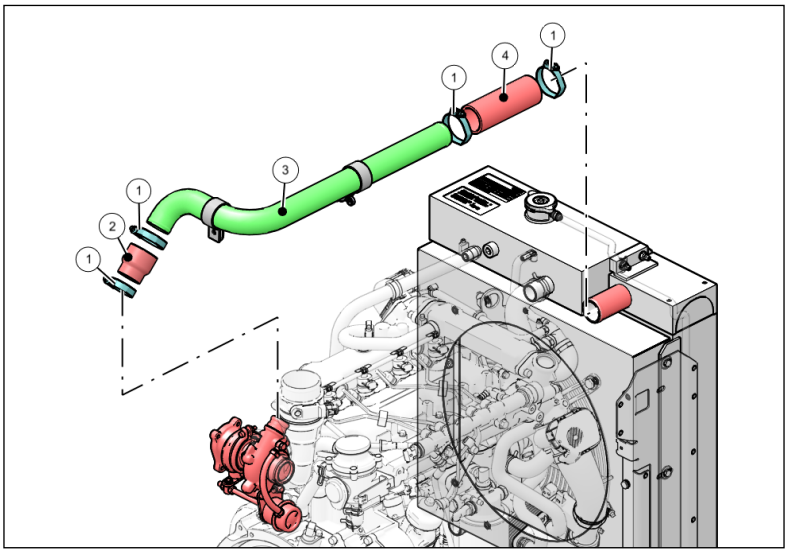
Inspection/maintenance

- Check the hoses for cracks/abrasion/aging.
- Replace the clamps if necessary.

Assembly

- Attach the hose (4) using the clamps (3).
- Attach the hose (6) using the clamps (5).
- Attach the hoses (1) and (7) using the clamps (2).
- Fill up with coolant (see the Diesel Engine Operator's Manual).

14.6 Charge air cooler TIC/TICD (Open Power Unit) - inlet



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hose clamp	Ø40–60	Hand-tight	
2	Charge air adapter			
3	Charge air pipe			↻
4	Cooler hose	45x5x13		

Disassembly

- Release the hose clamps [1] from the turbocharger and cooler. Remove the complete charge air pipe [1, 2, 3, 4].

Inspection/maintenance

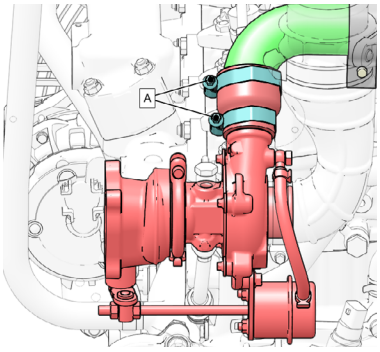
- Check the hose [4] and adapter [2] for cracks/abrasion/aging. Replace if necessary.
- Check the charge air pipe [3] for damage.
- Replace the hose clamp [1], if necessary.

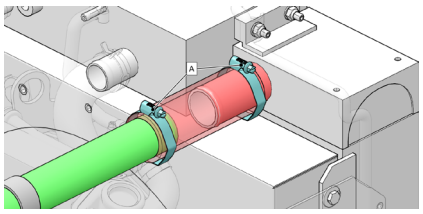
Assembly

- Attach the complete charge air pipe [1, 2, 3, 4] to the turbocharger and cooler using hose clamps [1].
- Check the charge air system for leak tightness.

Installation note

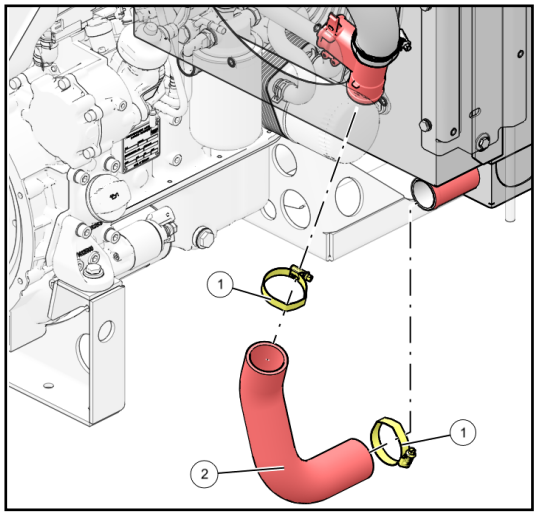
↻





[A] Recommended alignment of hose clamps [1].

14.7 Charge air cooler TICD (Open Power Unit) - outlet



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hose clamp	Ø 40–60	Hand-tight	↻
2	Shaped hose for cooler	45x5		

Disassembly

- Remove the hose clamps [1] from the cooler and intake, and remove the hose [2].

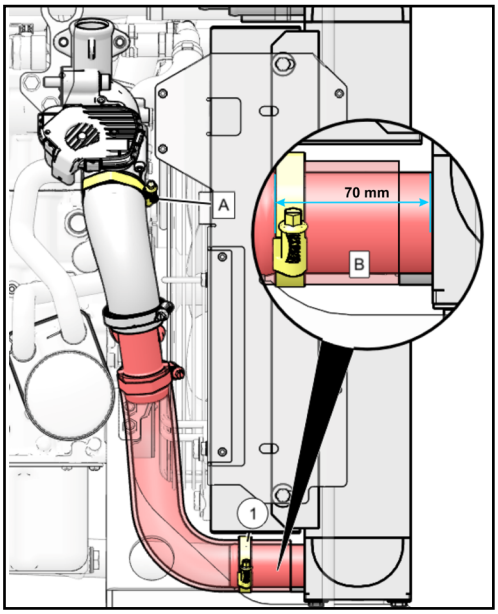
Inspection/maintenance

- Check the hose [2] for cracks/abrasion/aging and replace if necessary.
- Replace the hose clamps [1], if necessary.

Assembly

- Attach the hose [2] to the cooler and intake using the hose clamps [1].
- Check the charge air system for leak tightness.

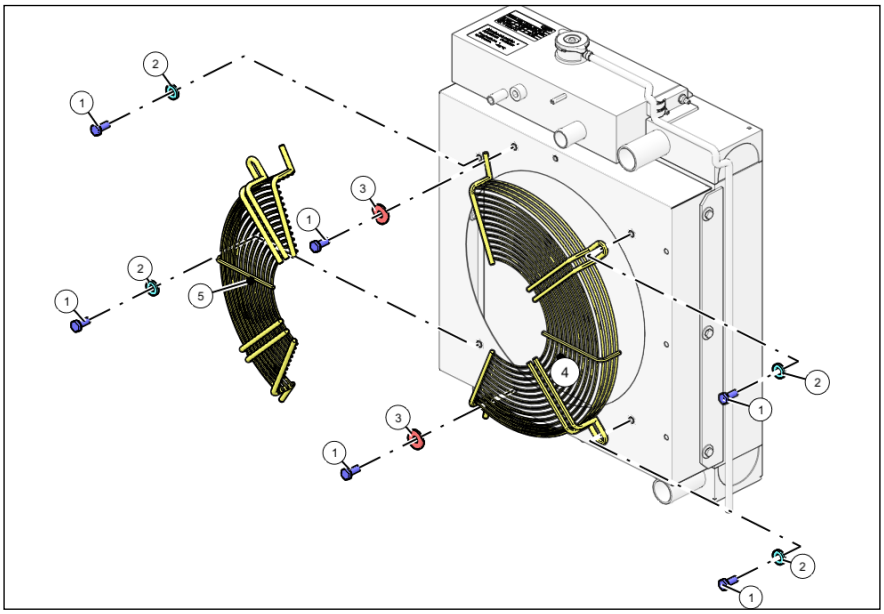
Installation note



[A]
Recommendation for hose clamp orientation: clamp screw fitting faces the cooler.

[B]
Mount the hose clamp a distance of 70 mm from the cooler.

14.8 Safety guard of cooler



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw	M10x25	30 Nm	
2	Washer	10.5		
3	Washer	11x34x3		
4	Safety guard for air filter (left)			
5	Safety guard for air filter (right)			

Disassembly

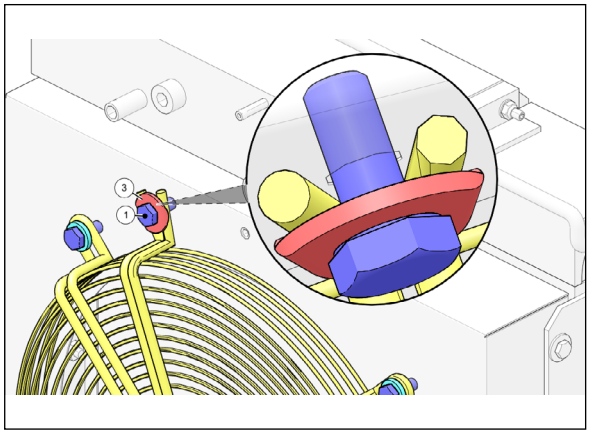
- Disassemble the screws [1] and washers [2], [3].
- Remove the safety guard [4], [5] outward.

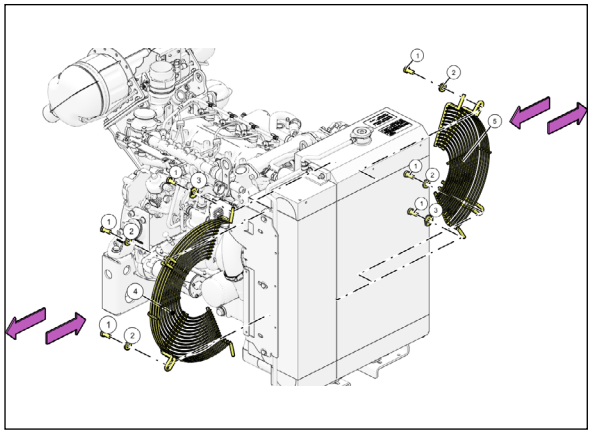
Inspection/maintenance

- -

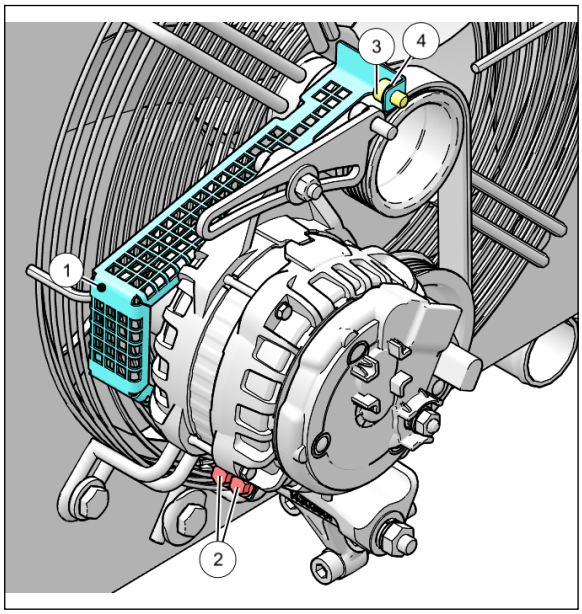
Assembly

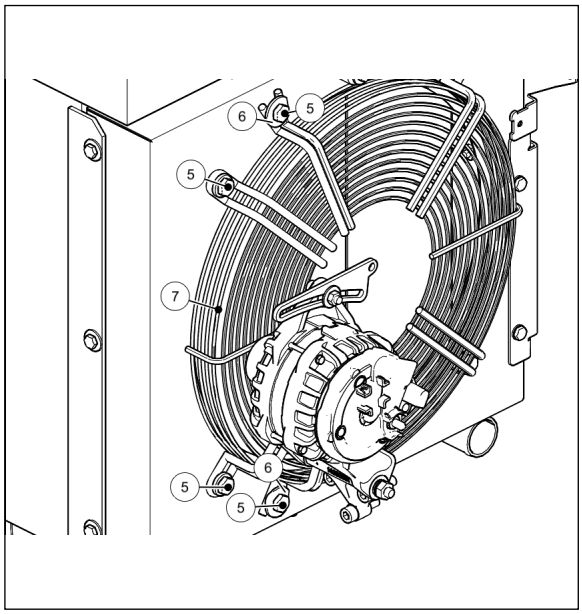
- Join the safety guard [4] and [5] between the engine and combination cooler.
- Attach the safety guard [4], [5] to the combination cooler using the screws [1] and washers [2], [3]. Ensure that the washers [3] cover both bars of the guard (see figure below).





14.9 OPU - Changing the poly v belt (step 1)





Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Belt protection for alternator			
2	Hexagon head screw with flange	M6x8	9.5 Nm	
3	Cylinder screw	M8x10	23 Nm	
4	Spring washer	8		
5	Hexagon head screw	M10x25	30 Nm	
6	Washer	11x34x3		
7	Safety guard (left half)			

Preparatory work

- Disconnect the battery (see the Diesel Engine Operator's Manual).

Disassembly

- Remove the screws [2], [3] and spring ring [4].
- Remove the belt protection [1].
- Remove the screws [5] and washers [6].
- Remove the safety guard [7].

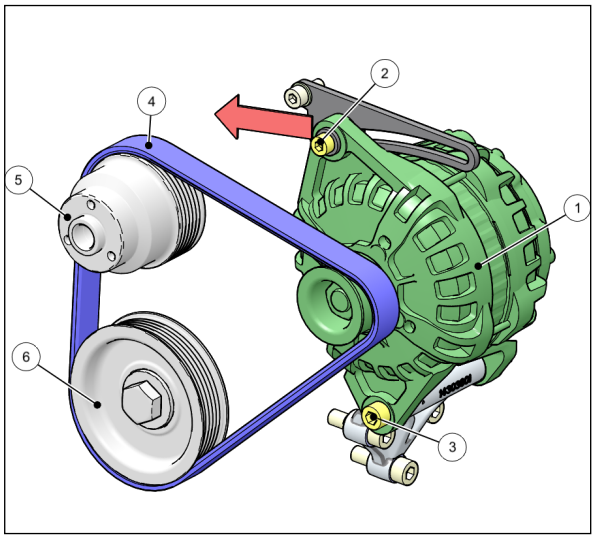
Inspection/maintenance

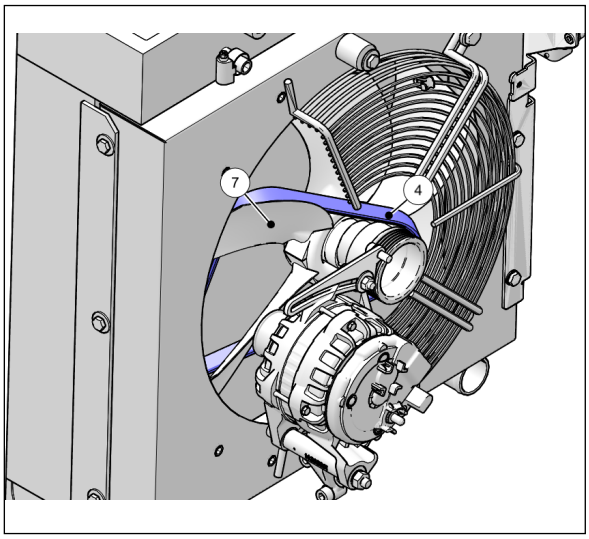
- -

Assembly

- Attach the safety guard [7] using the screws [5] and washers [6].
- Mount the belt protection [1] with the screws [2], [3] and spring ring [4].
- Connect the battery (see the Diesel Engine Operator's Manual).

14.10 OPU - Changing the poly v belt [step 2)





Pos.	Designation
1	Alternator
2	Upper fixing screw on the alternator
3	Lower fixing screw on the alternator
4	Poly v belt
5	Pulley Water pump
6	Pulley Crankshaft
7	Fan

Preparatory work

- OPU - Change the poly v belt [step 1] [section 14.9].

Disassembly

- Loosen the fixing screws [2] and [3].
- Turn the alternator [1] in the direction of the arrow all the way.
- Remove the loose poly v belt [4] from the pulleys [5], [6].
- Carefully lift the poly v belt over a fan blade [7]. Turn the fan further in the counterclockwise direction and lift the belt over the remaining fan blades until it is completely free.

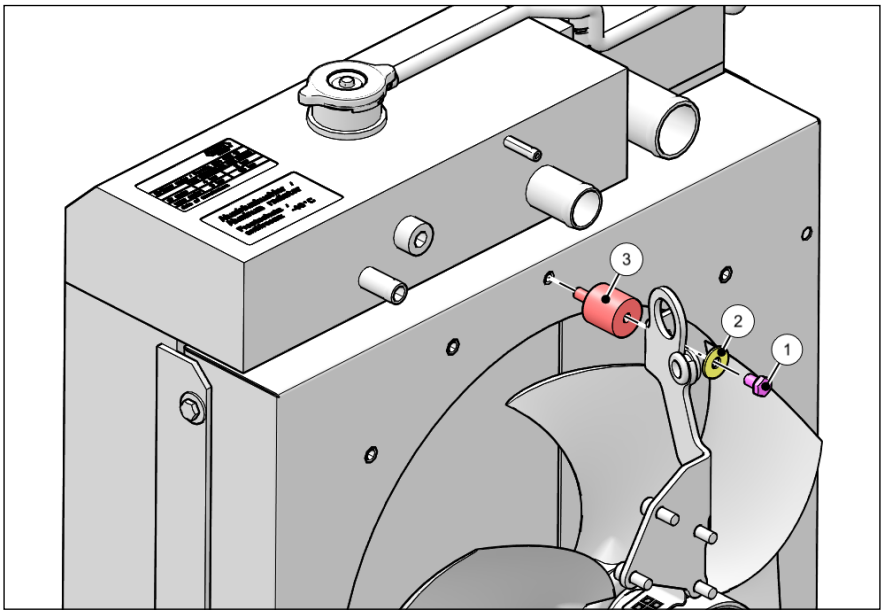
Inspection/maintenance

- Check the pulley for perfect condition. If the grooves are broken off or bent, renew the damaged belt pulley.
- Change the poly v belt [4] as per the maintenance plan (see Diesel Engine Operator's Manual).

Assembly

- Feed a new poly v belt over the fan blade in the same way from the radiator side.
- Place the poly v belt [4] on the pulleys [5], [6].
- Now push the alternator [1] in direction opposite to the arrow.
- Tighten the upper fixing screw [2] on the alternator.
- Tighten the lower fixing screw [3] on the alternator.
- Check the belt tension [section 07.3].
- OPU - Change the poly v belt [step 1] [section 14.9].

14.11 Cooler



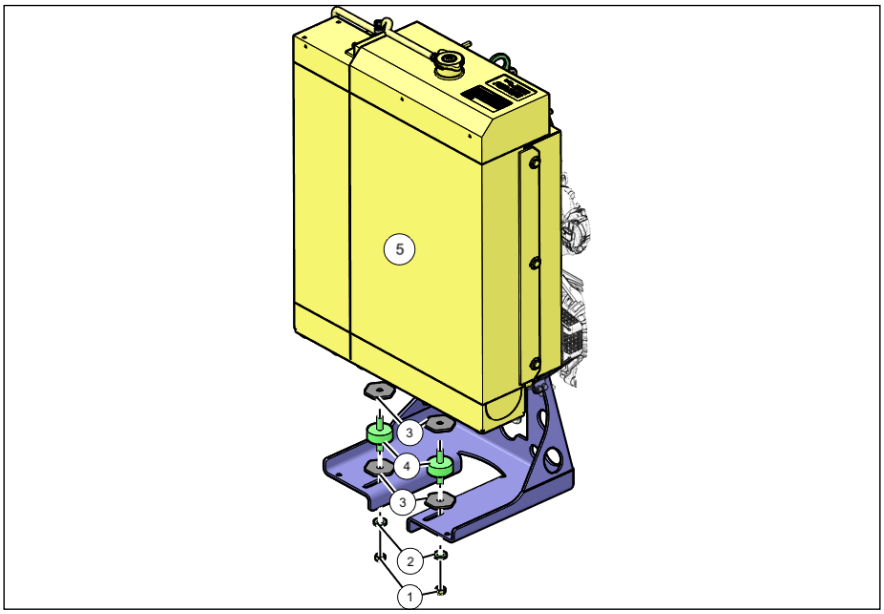
Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw	M8x12	46 Nm	
2	Washer	8.4		
3	Rubber buffer		23 Nm	

- Disassemble the control unit and connector holding plate [section 04.10].
- Disassemble the cooler from the coolant hose of the cooler [section 14.5].
- Disassemble the cooler from the air guide of the cooler [section 14.6].
- Disassemble the safety guard of the cooler [section 14.8].

- Remove the screw [1] and washer [2] to separate the cooler from the bracket.

- -

- Attach the cooler to the bracket using the washer [2] and screw [1].
- Mount the safety guard of the cooler [section 14.8].
- Mount the cooler on the air guide of the cooler [section 14.6].
- Mount the cooler on the coolant hose of the cooler [section 14.5].
- Mount the control unit and connector holding plate [section 04.10].



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon nut	M10	46 Nm	
2	Washer	10.5		
3	Washer	10.5x55x5		
4	Rubber buffer		46 Nm	
5	Cooler			

Disassembly

- Remove the nut [1] and washers [2].
- Lift the combination cooler out from above.

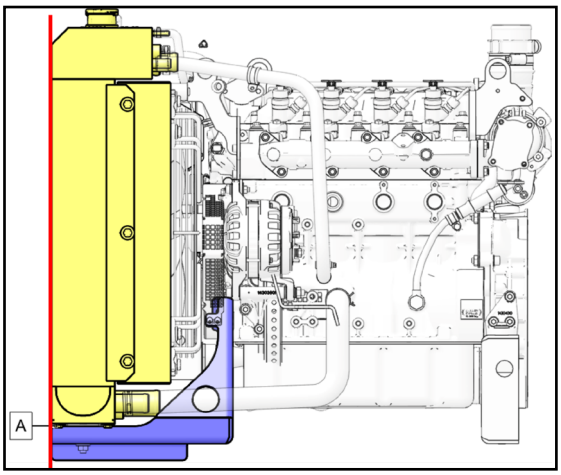
Inspection/maintenance

- Check the rubber buffer [4] for cracks and damage and replace if necessary.

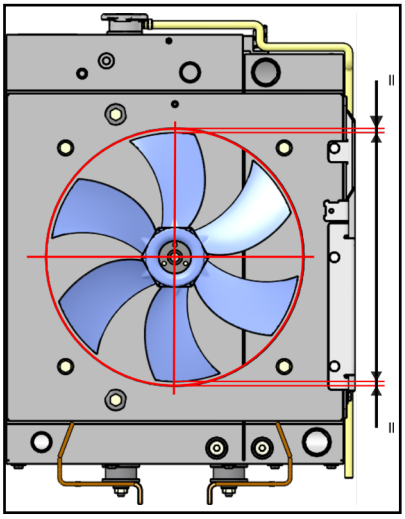
Assembly

- Position the cooler with the rubber buffer [4] in the cutout on the engine bracket STS.
- Align the cooler. Adhere to the installation note.
- Attach the cooler using the washers [3], [2] and nuts [1].

Installation note

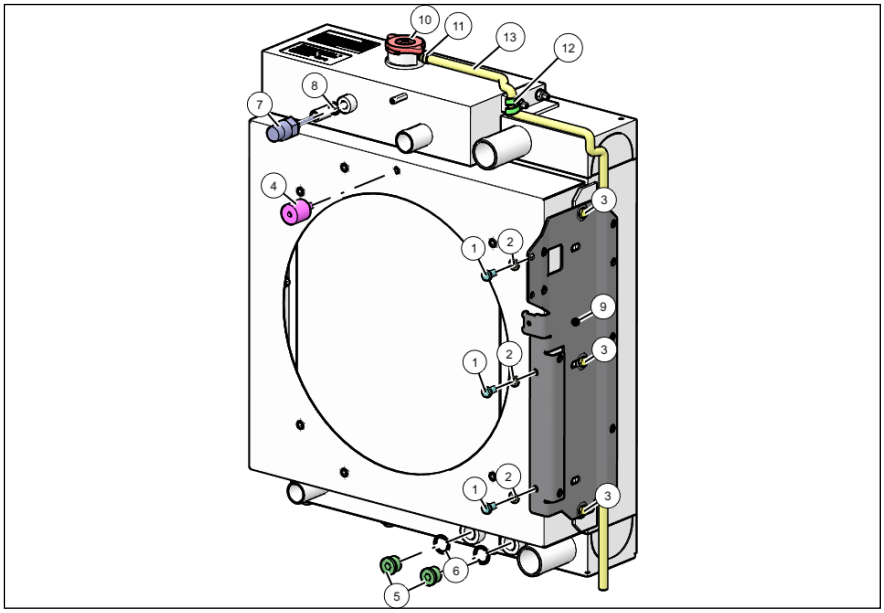


The cooler must be flush with the end of the OPU engine bracket [A].



The cooler must be centered on the fan. If necessary, add a washer [3].

14.12 Cooler components

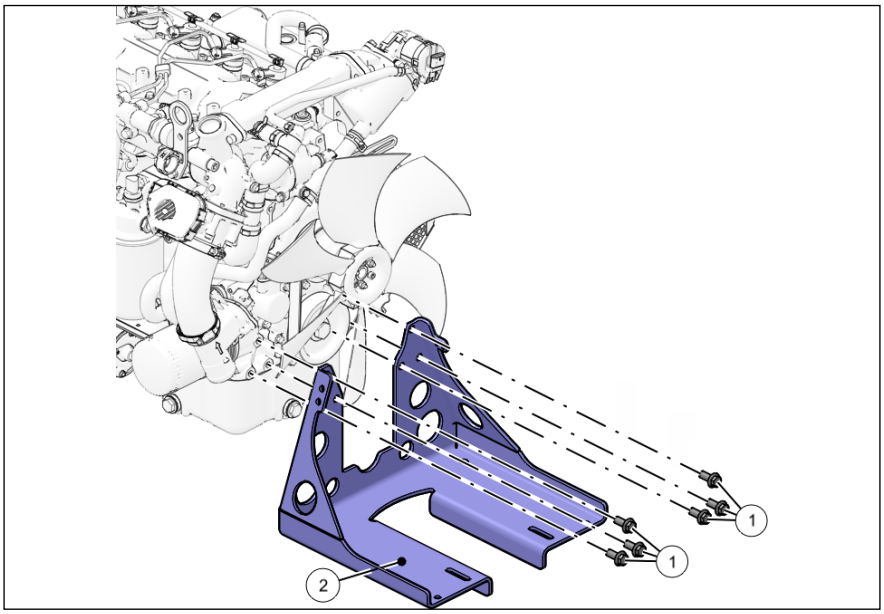


Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw	M8x16	23 Nm	
2	Washer	8.4		
3	Hexagon head screw/washer	M8x20/8.4	23 Nm	
4	Rubber buffer		23 Nm	
5	Screw plug	M22x1.5	50 Nm	
6	Sealing ring	A22x27		
7	Coolant level switch		25 Nm	
8	Sealing ring	A14x18		
9	Bracket for control unit OPU			
10	Cap			
11	Hose clip	12.3		
12	Cable clamp			
13	Hose for coolant overflow			

Note

When disassembling the screw plug [5], the sealing ring [6] must be replaced.
When disassembling the coolant level switch [7], the sealing ring [8] must be replaced.

14.13 Engine bracket STS



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw with flange	M10x25	46 Nm	
2	Engine bracket on timing cover side, OPU			

Preparatory work

- Disassemble the cooler [section 14.11].

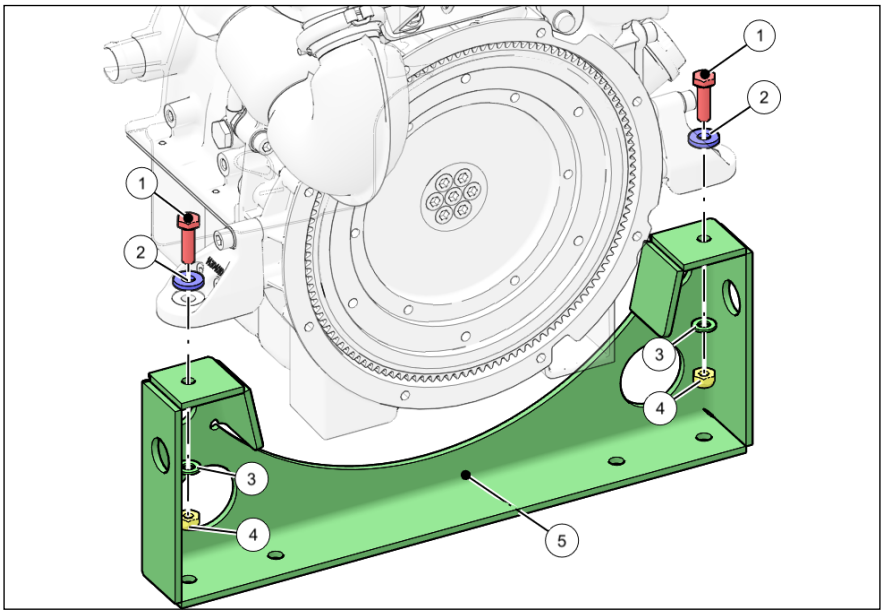
Disassembly

- Remove the screws [1].
- Remove the engine bracket [2].

Assembly

- Attach the engine bracket [2] using the screws [1].
- Mount the cooler [section 14.11].

14.14 Engine bracket SWS



Pos.	Designation	Size	Tightening torque	Miscellaneous
1	Hexagon head screw	M10x35	46 Nm	
2	Washer	10.5		
3	Washer	10.5		
4	Hexagon nut	M10	46 Nm	
5	Engine bracket on flywheel side, OPU			

Preparatory work

- -

Disassembly

- Remove the screws [1], washers [2], [3] and nuts [4].
- Remove the engine bracket [5].

Inspection/maintenance

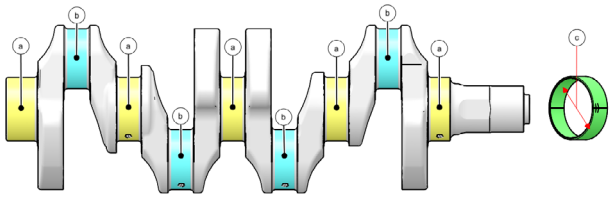
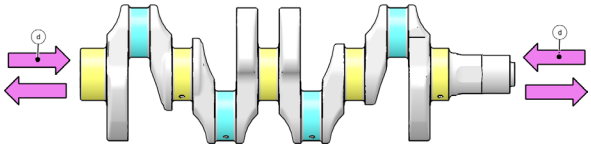
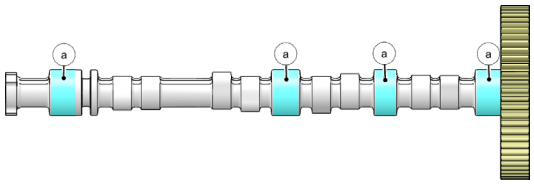
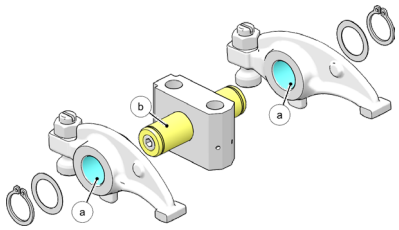
- -

Assembly

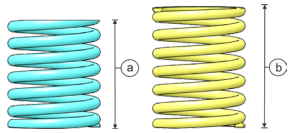
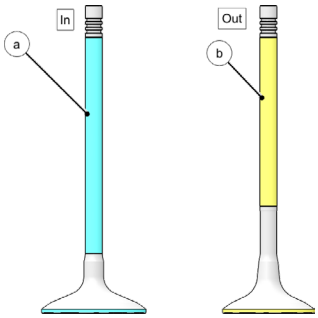
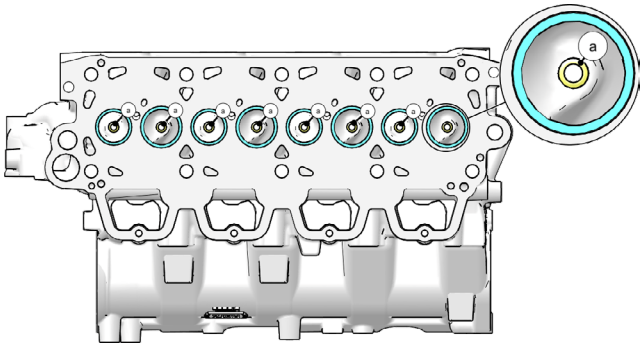
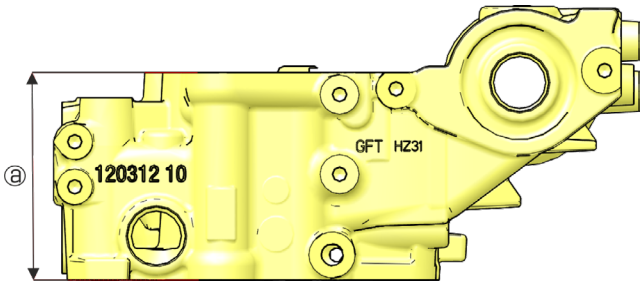
- Attach the engine bracket [5] using the screws [1], washers [2], [3] and nut [4].

15
Wear dimensions

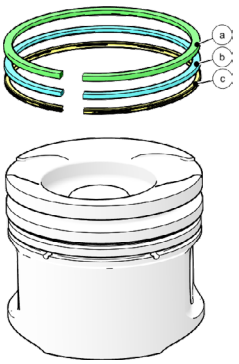
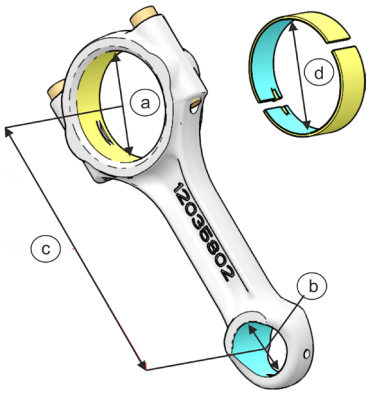
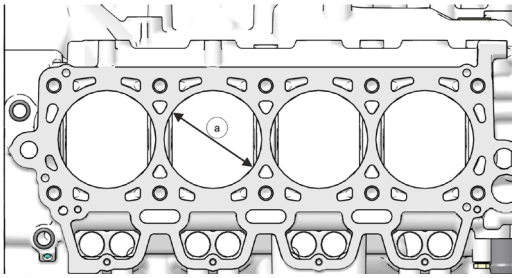
15.1 Crankshaft, camshaft, rocker arm

	Target dimension	Wear dimension
Crankshaft		
	a = 55 g6 ($^{-0,010}_{-0,029}$) mm	54,90 mm
	b = 52 g6 ($^{-0,010}_{-0,029}$) mm	51,90 mm
	c = 55 ($^{+0,024}_{-0,009}$) mm	55,15 mm
Crankshaft - axial clearance		
	0,1 - 0,2 mm	0,5 mm
Camshaft		
	a = 42 ($^{}_{-0,060}$) mm	41,90 mm
Rocker arm		
	a = 15 H7 ($^{0,018}_{0,000}$) mm	15,05 mm
	b = 15 f6 ($^{-0,016}_{-0,027}$) mm	14,90 mm

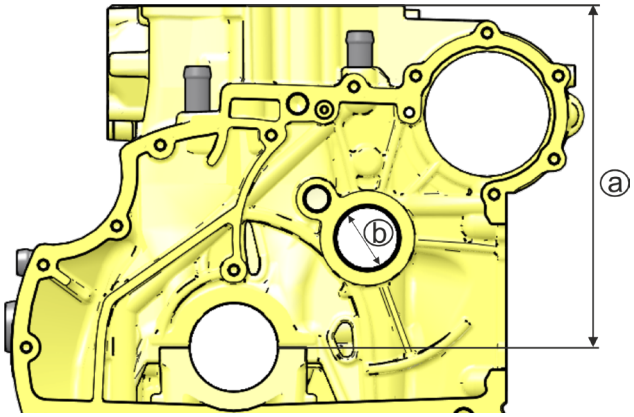
15.2 Valve springs, valves, cylinder head

	Target dimension	Wear dimension
Valve springs		
	a = 66,22 mm b = 70 mm	- -
Valves		
	a = 5,952 [+0,007 - 0,007] mm b = 5,962 [+0,007 - 0,007] mm c = 110°0´ [+0°20 - 0°20] d = 110°0´ [+0°20 - 0°20]	Ø 5,94 mm Ø 5,95 mm
Cylinder head - valve shaft guide		
	a = 6 [+0,012 0,000] mm	-
Cylinder head		
	a = 99 [+0,20 - 0,20] mm Valve protrusion	0.05 At b > 0.5, the valve seats must be repositioned.

15.3 Piston, connecting rod, cylinder bore

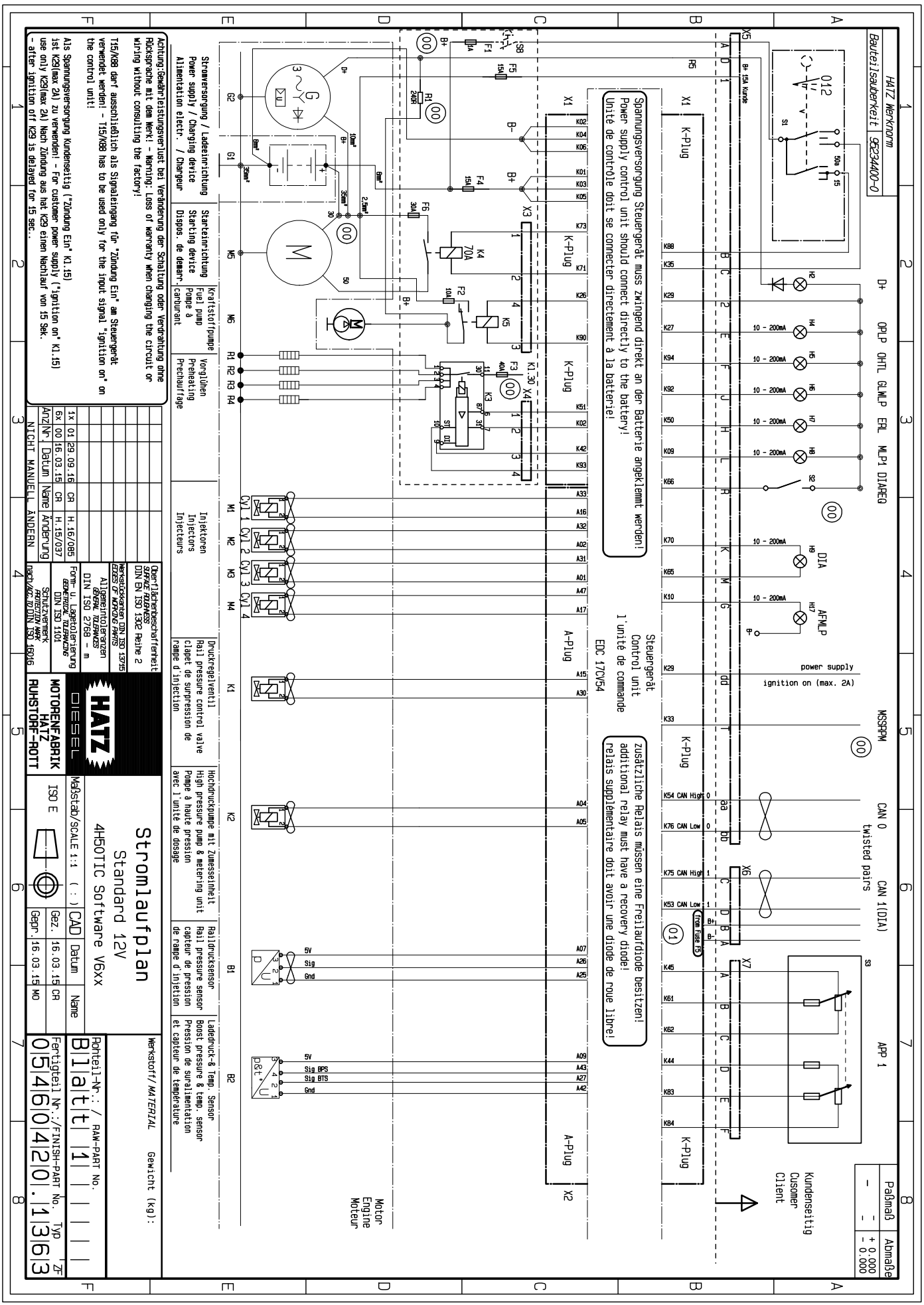
		Target dimension	Wear dimension
Piston			
		a = 0,20-0,35 mm	0,6 mm
	X	b = 0,60-0,80 mm	1,0 mm
		c = 0,25-0,50 mm	1,0 mm
Connecting rod			
		a = 55 H6 $\left[{}^{+0,019}_{0,000} \right]$	
		b = 28 F6 $\left[{}^{+0,033}_{+0,020} \right]$	28,04 mm
		c =	max. ⊥ 0,15 mm
		d = 52 $\left[{}^{+0,038}_{0,000} \right]$	52,05 mm
Cylinder bore			
		a = 84 $\left[{}^{+0,015}_{+0,005} \right]$	Ø 84,03 mm

15.4 Housing

	Target dimension	Wear dimension
Housing (levelness)		
	a = 230 [$^{+0,030}_{-0,030}$]	Depending on the gasket use, max. 0.2 mm
	b = 42 H6	42.1 mm

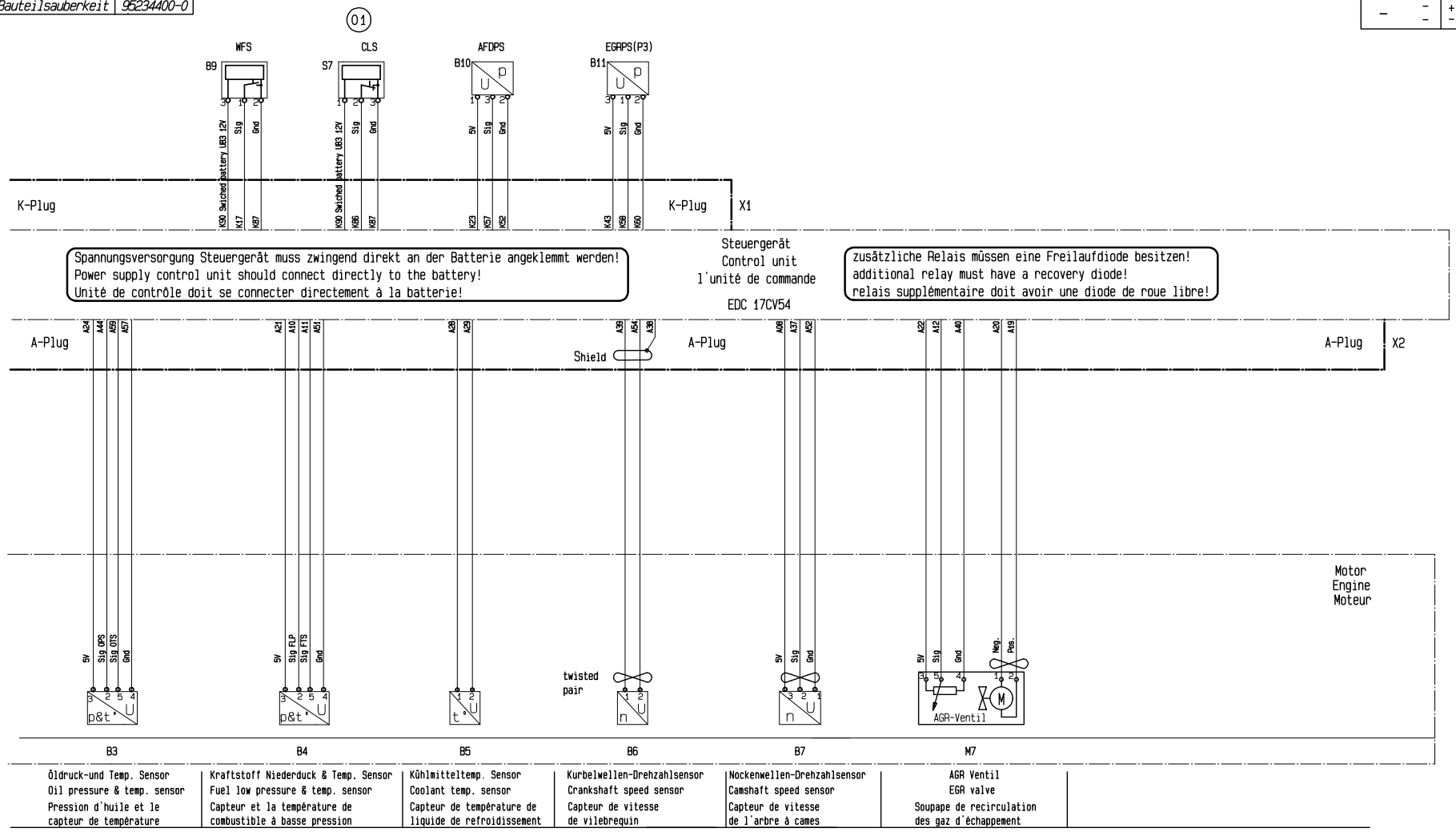
16
Circuit diagrams CV54

16.1 Circuit diagram CV54: TIC 12V V6xx



HATZ Werknorm	
Bauteilsauberkeit	95234400-0

Paßmaß	Abmaße
– –	+ 0.000 - 0.000



Öldruck-und Temp. Sensor Oil pressure & temp. sensor Pression d'huile et le capteur de température	Kraftstoff Niederduck & Temp. Sensor Fuel low pressure & temp. sensor Capteur et la température de combustible à basse pression	Kühlmitteltemp. Sensor Coolant temp. sensor Capteur de température de liquide de refroidissement	Kurbelwellen-Drehzahlsensor Crankshaft speed sensor Capteur de vitesse de vilebrequin	Nockenwellen-Drehzahlsensor Camshaft speed sensor Capteur de vitesse de l'arbre à cames	AGR Ventil EGR valve Soupape de recirculation des gaz d'échappement

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! - Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!

T15/K88 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden! - T15/K88 has to be used only for the input signal "ignition on" on the control unit!

Als Spannungsversorgung Kundenseitig ("Zündung Ein" Kl.15) ist K29(max 2A) zu verwenden! - For customer power supply ("ignition on" Kl.15) use only K29(max 2A) Nach Zündung aus hat K29 einen Nachlauf von 15 Sek. - after ignition off K29 is delayed for 15 sec..

Anz	Nr.	Datum	Name	Änderung
1x	01	29.09.16	CR	H.16/085
4x	00	16.03.15	CR	H.15/037

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach/ACC.TO DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
Standard 12V
4H50TIC Software V6xx

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		16.03.15	CR
Gepr.		16.03.15	MO

Werkstoff/MATERIAL Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 2

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0546042O.1363

B1	Raildrucksensor Railpressuresensor
B2	Ladedruck-& Temperatursensor Boostpressure & temp. sensor
B3	Öldruck-& Temperatursensor Oil pressure & temp. sensor
B4	Kraftstoff Niederdruck & Temperatursensor Fuel low pressure & temp. sensor
B5	Kühlmitteltemperatursensor Coolant temperature sensor
B6	Kurbelwellendrehzahlsensor Crankshaft speed sensor
B7	Nockenwellendrehzahlsensor Camshaft speed sensor
B8	Umgebungstemperatursensor Ambient temperature sensor
B9	Wasser in Kraftstoffsensor Water in fuel sensor
B10	Luftfilter Differenzdruck Sensor Air cleaner differential pressure sensor
B11	AGR Drucksensor P3 EGR pressure sensor
F1	Sicherung T15/T50 Fuse T15/50
F2	Sicherung Kraftstoffpumpe Fuse fuelpump
F3	Sicherung Glühkerzen Fuse glow plugs
F4	Sicherung Steuergerät B+ Fuse control unit B+
F5	Sicherung B+ Spannungsversorgung Kunde Fuse B+ power supply customer
F6	Sicherung Starter 50 Fuse starter 50
G1	Starterbatterie Starter battery
G2	Drehstromgenerator Battery charger
H2	Ladekontrolllampe Charge control fault lamp
H4	Öldrucklampe Oil pressure fault lamp
H5	Übertemperaturlampe Engine overtemperature fault lamp
H6	Vorglühanzeigelampe Pre glow lamp
H7	Motor läuft Anzeigelampe Engine running lamp
H8	Wartungs Anzeigelampe Maintenance lamp
H9	Diagnoselampe Diagnostic lamp
H17	Luftfilterwartungsanzeigelampe Air cleaner maintenance lamp
K1	Druckregelventil Rail pressure control valve
K2	Hochdruckpumpe mit Zumesseinheit High pressure pump & metering unit
K3	Glühzeitsteuergerät Glow control unit
K4	Starter Relais Starter relais
K5	Relais für Kraftstoffförderpumpe Fuelpump relais
M1	Injektor Zyl. 1
M2	Injektor Zyl. 2
M3	Injektor Zyl. 3
M4	Injektor Zyl. 4
M5	Anlasser Starter motor
M6	Kraftstoffförderpumpe Fuel pump
M7	AGR-Ventil EGR valve
P1	Drehzahlmesser speed counter
R1	Widerstand zur Generatorerregung Resistor for battery charger excitation
S1	Zündstartschalter Ignition - start -switch
S2	Diagnose Request Schalter diagnostic request switch
S3	Gaspedal-Drehzahlverstellung 1 acceleration pedal 1
S4	Startschalter (optional) Start switch (optional)
S5	Stopschalter (optional) Stop switch (optional)
S6	Schalter für Mehrfachdrehzahl (optional) multi state switch(optional)
S7	Kühlmittelstand Schalter coolant level switch
S8	Not-Aus - Verdrahtung Kundenseits Emergency stop - wiring customer side
X1	Steuergerätestecker Kundenseitig Control unit plug customer side
X2	Steuergerätestecker Motorseitig Control unit plug engine side
X3	Stecker for Starterrelais u. Kraftstoffförderpumpenrelais Plug for starter relay & fuel pump relay
X4	Stecker zu Glühzeitsteuergerät Plug for glow control unit
X5	Stecker für Kundensignale plug for customer signals
X6	CAN-Bus Diagnosestecker Can bus diagnostic plug
X7	Stecker zu Gaspedal - Drehzahlverstellung acceleration pedal 1

Sicherungen - Fuses

Steckplatz Place	Ampere Ampere	Bez. Term	Verwendung Application
A	15A	F4	Versorgungsspannung Steuergerät Power supply control unit
B	1A	F1	Eingang T15/50 Steuergerät Input T15/50 control unit
C	40A	F3	Glühkerzen Glow plugs
D	15A	F5	Spannungsversorgung Kunde Power supply customer
E	10A	F2	Kraftstoffpumpe Fuel pump
F	30A	F6	Anlasser Starter motor

X4

Pin	Belegung	Steuergerät
1	Spannungsversorgung GCU power supply GCU	K51
2	Masse GCU ground GCU	K02
3	Diagnose Ausgang GCU diagnostic output GCU	K42
4	Steuereingang GCU control input GCU	K93

→ Bosch 1 928 A00 325 94 Pin Codierung C Rechts

→ Bosch 1 928 A00 325 60 Pin Codierung C Links

→ Deutsch DTM 06-4S

→ Deutsch DTM 04-4P

→ ITT Canon Trident 4-28

→ Deutsch HD10-9-1939PE

→ ITT Canon Trident 0-12

X3

Pin	Assignment	Control Unit EDC
1	Starter Relais Kl. 86 starter relais highside - 86	K73
2	Starter Relais Kl. 85 starter relais lowside - 85	K71
3	Kraftstoffförderpumper Relais Kl. 86 fuelpump relais lowside - 86	K90
4	Kraftstoffförderpumper Relais Kl. 85 fuelpump relais highside - 85	K26

01

X6

Pin	Belegung	Steuergerät
A	Ground	K02
B	B+ (15A)	K01
C	CAN1 High (DIA)	K75
D	CAN1 Low (DIA)	K53

X7

Pin	Belegung	Steuergerät
A	O_V_5V_APP1 - supply +5V	K45
B	I_A_APP1 - signal 0,5V - 4,5V	K61
C	G_R_APP1 - ground	K62
D	O_V_5V_APP2 - supply +5V	K44
E	I_A_APP2 - signal 0,25V - 2,25V	K83
F	G_R_APP2 - ground	K84

X5

Nr.	Bezeichnung	Bosch-Hatz-Kennung	Leitungske.
1	B+ 15A Spannungsversorgung Kunde B+ 15A power supply customer	1 - vom Sicherungsblock 1 - from fuse	1
2	UB2 2A geschaltetes B+ switched battery B+	K29 - V8	24
3	B-	0 - vom Massepunkt 0 - fom ground	0
4			
A	B+ 1A Spannungsversorgung T15/50 B+ 1A power suppy T15/50	vom Sicherungsblock from fuse	1
B	Zündung Ein Klemme 15 Ignition on clamp 15	I_S_T15 - K88	15
C	Startsignal Klemme 50 Startsignal clamp 50	I_S_T50 - K35	50
D	Ladekontrolle Charge control fault	Nr.2	2
E	Öldruckmangel Oil pressure fault	O_S_OPLP - K27	4
F	Übertemperatur Motor Engine overtemperature fault	O_S_OHTL - K94	5
G	Luftfilterwartungsschalter Air cleaner maintenance switch	O_S_AFLMP - K10 (Highsider)	17
H	Motor läuft Lampe Engine running lamp	O_S_ERL - K50	ML
J	Vorglühanzeige Pre glowing lamp	O_S_GLWLP - K92	13
K	Diagnoselampe Highside Diagnistic lamp highside	O_V_DIA - K70	DIA+
L	Wartungsintervall Maintenance lamp	O_S_MLP1 - K09	IV
M	Diagnoselampe Lowside Diagnostic lamp lowside	G_R_DIA - K65	DIA-
N	Motor Start-Schalter Engine start switch	I_S_ENGSA - K67	9
P	Motor Stop-Schalter Engine stop switch	I_S_STP - K31	11
R	Diagnose Request-Schalter Diagnostic request switch	I_S_DIAREQ - K66	DR
S	Drehzahlsignal Engine speed signal	O_F_ENGN - K49	22
T	Drehzahlwahlschalter Multi state switch	I_A_MSSRPM - K33	14
U	Masse Digital Inputs Ground digital inputs	G_R_DIG K87	0
V			
W			
aa	CAN 0 High	B_D_CANH0 - K54	CAN+
bb	CAN 0 LOW	B_D_CANL0 - K76	CAN-
cc	B-	0 - vom Massepunkt 0 - fom ground	0
dd	UB2 2A geschaltetes B+ Switched battery B+	K29 - V8	24

Paßmaß	Abmaße
– –	+ 0.000 – 0.000

HATZ Werknorm

Bauteilsauberkeit 95234400-0

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! - Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!

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Anz	Nr.	Datum	Name	Änderung
1x	01	29.09.16	CR	H.16/085
4x	00	16.03.15	CR	H.15/037

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach/ACC. TO DIN ISO 16016

HATZ DIESEL

MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan

Standard 12V

4H50TIC Software V6xx

Maßstab/SCALE 1:1 (:)

ISO E

CAD	Datum	Name	
Gez.	16.03.15	CR	
Gepr.	16.03.15	MO	

Werkstoff/MATERIAL Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.

Blatt 3

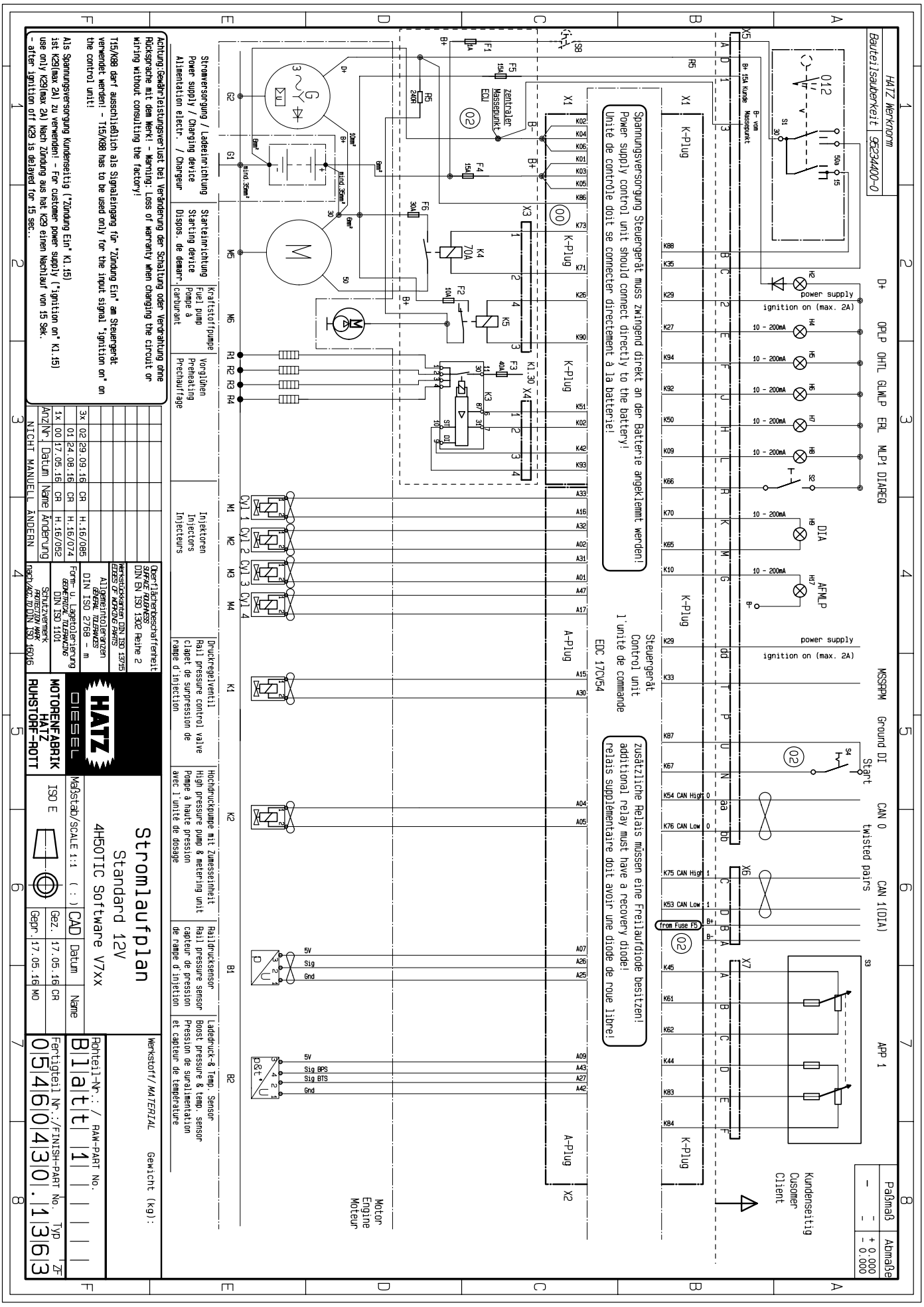
Fertigteil Nr.:/FINISH-PART No. Typ ZF

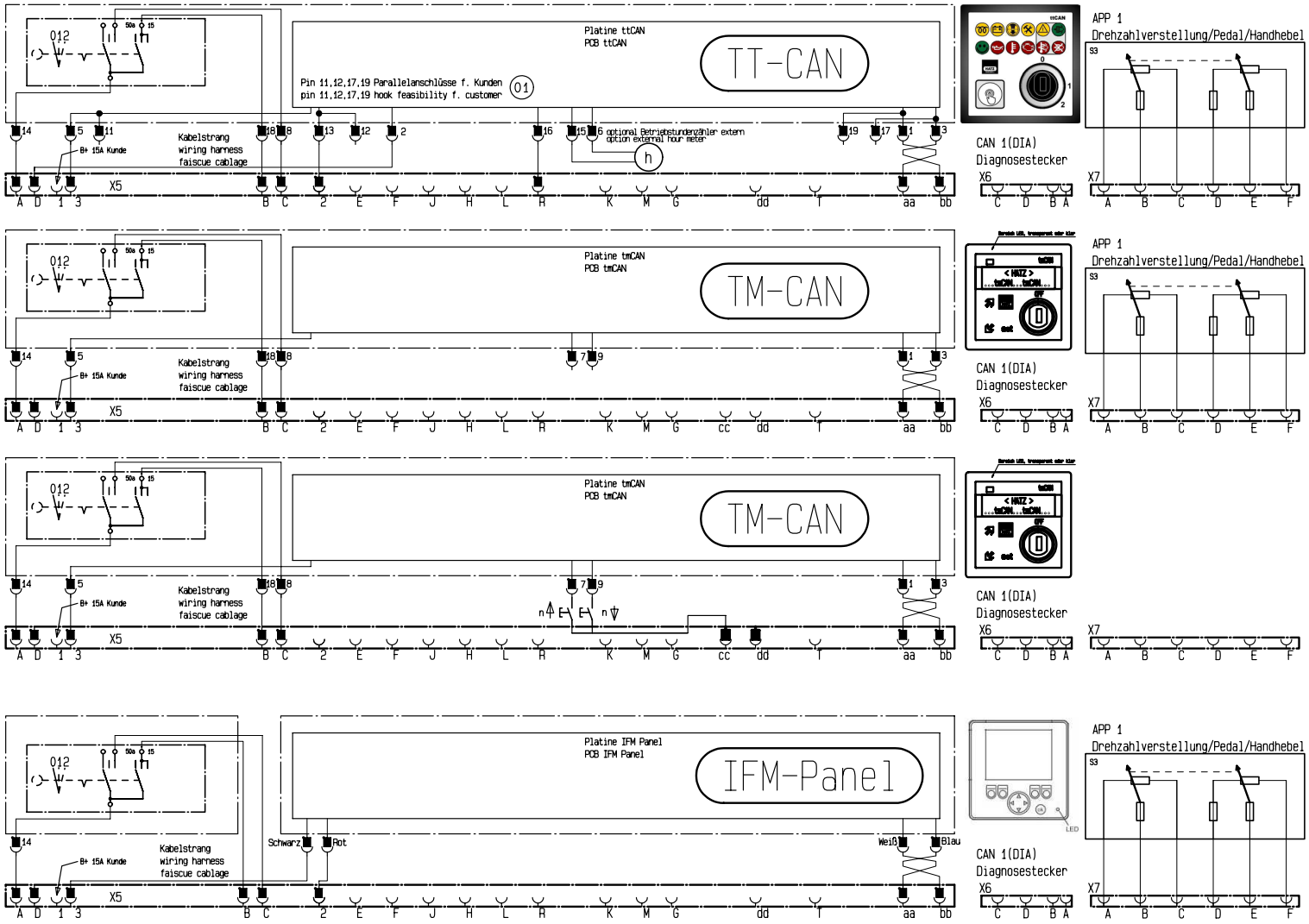
05460420 . 1363

02-H50T-TICD | 10.2024

180

16.2 Circuit diagram CV54: TIC 12V V7xx





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Anz	Nr.	Datum	Name	Änderung
	01	24.08.16	CR	H.16/074
	00	17.05.16	CR	H.16/052

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715 *EDGES OF WORKING PARTS*

Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m

Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101

Schutzvermerk *PROTECTION MARK* nach/*ACC.TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
Standard 12V
4H50TIC Software V7xx

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		17.05.16	CR
Gepr.		17.05.16	MO

HATZ Werknorm
Bauteilsauberkeit

Werkstoff/ *MATERIAL* Gewicht (kg):

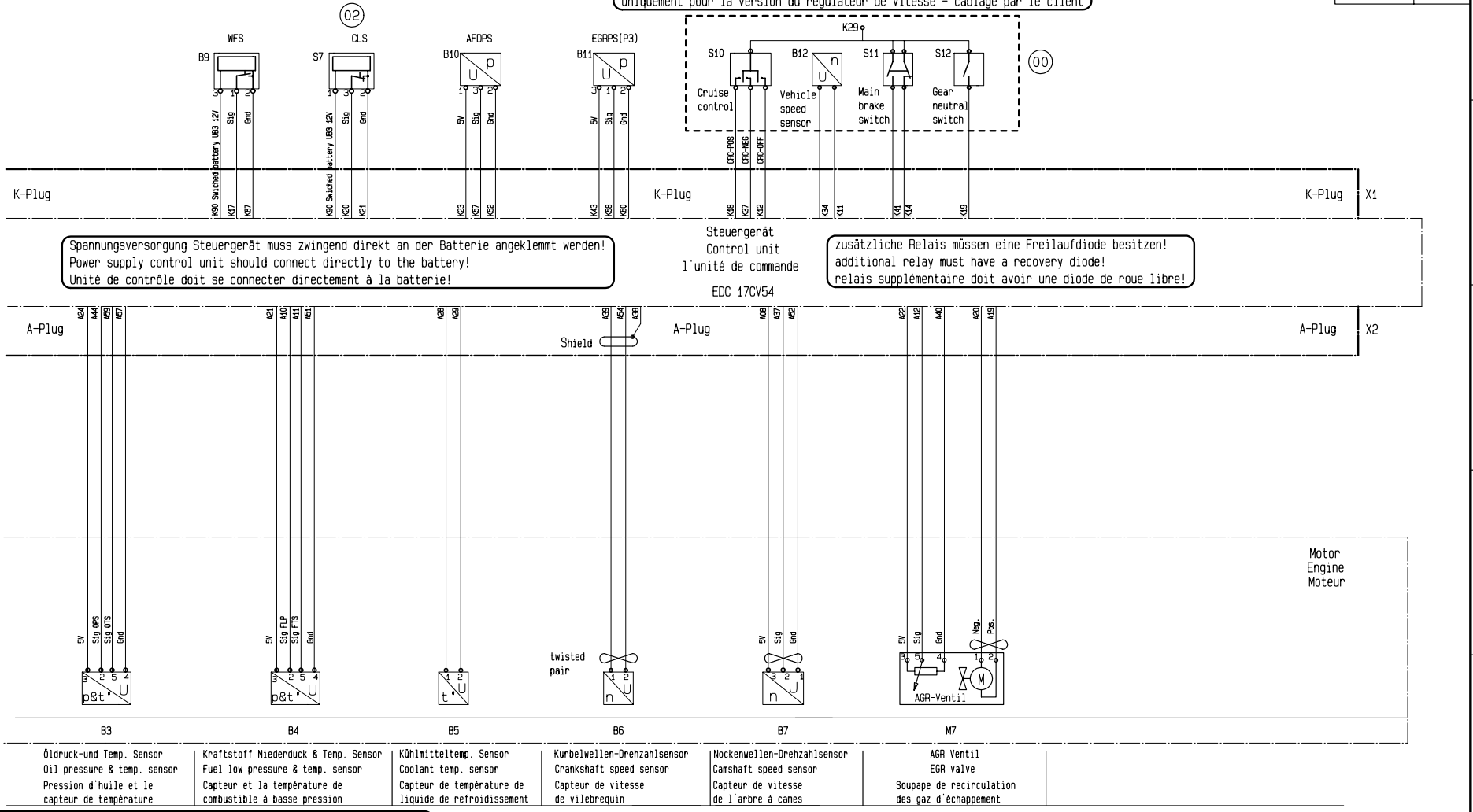
Rohteil-Nr.: / RAW-PART No.
B|L|A|T|T| |1|A| | | | |

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0|5|4|6|0|4|3|0|.|1|3|6|3

HATZ Werknorm	
Bauteilsauberkeit	95234400-0

Paßmaß	Abmaße
– –	– + 0.000 – - 0.000

nur für Cruise control Version - Verdrahtung Kundenseits
only for cruise control version - wiring by customer
uniquement pour la version du régulateur de vitesse - câblage par le client



Öldruck-und Temp. Sensor Oil pressure & temp. sensor Pression d'huile et le capteur de température	Kraftstoff Niederduck & Temp. Sensor Fuel low pressure & temp. sensor Capteur et la température de combustible à basse pression	Kühlmitteltemp. Sensor Coolant temp. sensor Capteur de température de liquide de refroidissement	Kurbelwellen-Drehzahlsensor Crankshaft speed sensor Capteur de vitesse de vilebrequin	Nockenwellen-Drehzahlsensor Camshaft speed sensor Capteur de vitesse de l'arbre à cames	AGR Ventil EGR valve Soupape de recirculation des gaz d'échappement

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! - Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!

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Anz	Nr.	Datum	Name	Änderung
1x	02	29.09.16	CR	H.16/085
	01	24.08.16	CR	H.16/074
1x	00	17.05.16	CR	H.16/052

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit SURFACE ROUGHNESS DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 EDGES OF WORKING PARTS
Allgemeintoleranzen GENERAL TOLERANCES DIN ISO 2768 - m
Form- u. Lagetolerierung GEOMETRICAL TOLERANCING DIN ISO 1101
Schutzvermerk PROTECTION MARK nach/ACC.TO DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
Standard 12V
4H50TIC Software V7xx

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		17.05.16	CR
Gepr.		17.05.16	MO

Werkstoff/MATERIAL Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
B|l|a|t|t| |2| | | | |

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0|5|4|6|0|4|3|0|.|1|3|6|3

B1 Raildrucksensor
Railpressuresensor
Capteur pression rail
B2 Ladedruck-& Temperatursensor
Boostpressure & temp. sensor
Capteur température et pression air de suralimentation
B3 Öldruck-& Temperatursensor
Oil pressure & temp. sensor
Capteur température et pression d'huile
B4 Kraftstoff Niederdruck & Temperatursensor
Fuel lowpressure & temp. sensor
Capteur température et basse pression carburant
B5 Kühlmitteltemperatursensor
Coolant temperature sensor
Capteur température liquide de refroidissement
B6 Kurbelwellendrehzahlsensor
Crankshaft speed sensor
Capteur régime vilebrequin
B7 Nockenwellendrehzahlsensor
Camshaft speed sensor
Capteur régime arbre à cames
B8 Umgebungstemperatursensor
Ambient temperature sensor
Capteur température ambiante
B9 Wasser in Kraftstoffsensor
Water in fuel sensor
Capteur d'eau dans carburant
B10 Luftfilter Differenzdruck Sensor
Air cleaner differential pressure sensor
Capteur pression différence du filtre à air
B11 AGR Drucksensor P3
EGR pressure sensor
Capteur pression EGR P3
B12 Fahrzeug-Geschwindigkeitssensor (nur für Cruise control)
Vehicle speed sensor (only for cruise control)
Capteur vitesse du véhicule (seulement pour Cruise Control)
F1 Sicherung T15 /T50
Fuse T15/50
Fusible T15/50
F2 Sicherung Kraftstoffpumpe
Fuse fuelpump
Fusible pompe d'alimentation carburant
F3 Sicherung Glühkerzen
Fuse glow plugs
Fusible bougies de préchauffage
F4 Sicherung Steuergerät B+
Fuse control unit B+
Fusible calculateur EDC17 B+
F5 Sicherung B+ Spannungsversorgung Kunde
Fuse B+ power supply customer
Fusible B+ alimentation courant client
F6 Sicherung Starter 50
Fuse starter 50
Fusible démarreur 50
G1 Starterbatterie
Starter battery
Batterie
G2 Drehstromgenerator
Battery charger
Alternateur triphasé

H2 Ladekontrolllampe
Charge control fault lamp
Lampe témoin de charge batterie
H4 Öldrucklampe
Oil pressure fault lamp
Lampe témoin de pression d'huile
H5 Übertemperaturlampe
Engine overtemperature fault lamp
Lampe témoin de surchauffe
H6 Vorglühanzeigelampe
Pre glow lamp
Lampe témoin préchauffage
H7 Motor läuft Anzeigelampe
Engine running lamp
Lampe témoin moteur en route
H8 Wartungs Anzeigelampe
Maintenance lamp
Lampe témoin d'entretien
H9 Diagnoselampe
Diagnistic lamp
Lampe témoin de diagnostique
H17 Luftfilterwartungsanzeigelampe
Air cleaner maintenance lamp
Lampe témoin d'entretien filtre à air
K1 Druckregelventil
Rail pressure control valve
Clapet de surpression de rampe
K2 Hochdruckpumpe mit Zumesseinheit
High pressure pump & metering unit
Pompe à haute pression avec l'unité de dosage
K3 Glühzeitsteuergerät
Glow control unit
Unité de contrôle systéme de préchauffage
K4 Starter Relais
Starter relais
Relais démarreur
K5 Relais für Kraftstoffförderpumpe
Fuelpump relais
Relais pompe d'alimentation carburant
M1 Injektor Zyl. 1
Injector Cyl. 1
Injecteur Cyl. 1
M2 Injektor Zyl. 2
Injector Cyl. 2
Injecteur Cyl. 2
M3 Injektor Zyl. 3
Injector Cyl. 3
Injecteur Cyl. 3
M4 Injektor Zyl. 4
Injector Cyl. 4
Injecteur Cyl. 4

M5 Anlasser
Starter motor
Démarreur
M6 Kraftstoffförderpumpe
Fuel pump
Pompe d'alimetation carburant
M7 AGR-Ventil
EGR valve
Vanne EGR
P1 Drehzahlmesser
Speed counter
Compte tours
R1 Glühkerze Zylinder 1
Glowplug cylinder 1
Bougie de préchauffage cylindre 1
R2 Glühkerze Zylinder 2
Glowplug cylinder 2
Bougie de préchauffage cylindre 2
R3 Glühkerze Zylinder 3
Glowplug cylinder 3
Bougie de préchauffage cylindre 3
R4 Glühkerze Zylinder 4
Glowplug cylinder 4
Bougie de préchauffage cylindre 4
R5 Widerstand zur Generatorerregung
Resistor for battery charger excitation
Résistance pour excitation alternateur
S1 Zündstartschalter
Ignition - start -switch
Clé de contact
S2 Diagnose Anforderungstaster
Diagnostic request switch
Interrupteur de demande de diagnostic
S3 Gaspedal-Drehzahlverstellung 1 (analog)
Acceleration pedal 1 (analog)
Réglage régime 1 (analogue)
S4 Startschalter (optional) zu B- (K87 / X5 - U)
Start switch (optional) to B- (K87 / X5 - U)
Bouton Start (option) sur B- (K87 / X5-U)
S5 Stopschalter (optional) zu B- (K87 / X5 - U)
Stop switch (optional) to B- (K87 / X5 - U)
Bouton Stop (option) sur B- (K87 / X5-U)
S6 Schalter für Mehrfachdrehzahl (optional)
Multi state switch(optional)
Commutateur pour plusieurs vitesses (MSS)
S7 Kühlmittelstand Schalter
Coolant level switch
Capteur niveau liquide de refroidissement
S8 Not-Aus - Verdrahtung Kundenseits
Emergency stop - wiring customer side
Arrêt d'urgence - Câblage par le client

S9 Ladekontrolle (nur CAN-Botschaft)
Alternator monitoring (only Can-message)
Surveillance alternteur (seulement signal CAN-Bus)
S10 Drehzahlregler
Cruise control
Régulateur de vitesse
S11 Handbremsschalter (nur für cruise control)
Main break switch (only for cruise control)
Interrupteur frein à main (seulement pour Cruise Control)
S12 Neutral-Gang-Schalter (nur für cruise control)
Gear neutral switch (only for cruise control)
Interrupteur de vitesse neutre (seulement pout Cruise Control)

X1 Steuergerätestecker Kundenseitig
Control unit plug customer side
Connecteur calculateur côté client
X2 Steuergerätestecker Motorseitig
Control unit plug engine side
Connecteur calculateur côté moteur
X3 Stecker for Starterrelais
u. Kraftstoffförderpumpenrelais
Plug for starter relay & fuel pump relay
Connecteur relais de démarrage et relais
pompe d'alimentation carburant
X4 Stecker zu Glühzeitsteuergerät
Plug for glow control unit
Connecteur unité de contrôle
système de préchauffage"
X5 Stecker für Kundensignale
Plug for customer signals
Connecteur signaux client
X6 CAN-Bus Diagnosestecker
Can bus diagnostic plug
Connecteur CAN-Bus diagnostique
X7 Stecker zu Gaspedal
Drehzahlverstellung (analog)
Acceleration pedal 1 (analog)
Connecteur réglage régime 1 (analogue)

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K88 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K88 has to be used only for the input signal "ignition on" on the control unit!
T15 / K88 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Als Spannungsversorgung Kundenseitig ("Zündung Ein" K1.15) ist K29(max 2A) zu verwenden!
For customer power supply ("ignition on" K1.15) use only K29(max 2A)
Pour l'alimentation électrique du client (« Contact allumer » borne 15) utiliser uniquement K29 (max 2A).

Nach Zündung aus hat K29 einen Nachlauf von 15 Sek..
After ignition off K29 is delayed for 15 sec..
Après coupure du contact, K29 est retardée pendant 15 secondes.

Anz	Nr.	Datum	Name	Änderung
	01	24.08.16	CR	H.16/074
1x	00	17.05.16	CR	H.16/052

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach/*ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
Standard 12V
4H50TIC Software V7xx

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		17.05.16	CR
Gepr.		17.05.16	MO

Werkstoff/*MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
B|l|a|t|t| |3| | | | |

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0|5|4|6|0|4|3|0|.|1|3|6|3

185

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X5

Nr.	Description	Assignment	Label
1	B+ 15A Spannungsversorgung Kunde B+ 15A Power supply customer B+ 15A alimentation courant client	1 - vom Sicherungsblock 1 - from fuse 1 - du fusible	1K
2	geschaltetes B+ max 2A switched battery B+ max 2A B+ commandé 15 max 2A	K29 - V8	24
3	B- - Masse Ground B- - masse	vom Massepunkt from Ground de la masse	0
4			
A	B+ 1A Spannungsversorgung T15/50 B+ 1A power supply T15/50 B+ alimentation courant T15/50	vom Sicherungsblock from fuse du fusible	1ST
B	Zündung Ein Klemme 15 ignition on clamp 15 Contact allumé borne 15	T15 - K88	15
C	Startsignal Klemme 50 startsignal clamp 50 Signal de démarrage borne 50	T50 - K35	50
D	Ladekontrolle alternator monitoring Contrôle de charge	Nr. 2 - K86	2
E	Öldruckmangel oil pressure fault Manque de pression d'huile	OPLP - K27(Lowside)	4
F	Übertemperatur Motor engine overtemperature fault Surchauffe moteur	OHTL - K94(Lowside)	5
G	Luftfilterwartungsschalter air cleaner maintenance switch commutateur de filtre à air	AFLMP - K10(Highside)	17
H	Motor läuft Lampe engine running lamp Lampe témoin moteur en route	ERL - K50(Lowside)	ML
J	Vorglüanzeige pre glow lamp Lampe témoin de préchauffage	GLWLP - K92(Lowside)	13
K	Diagnoselampe Highside diagnostic lamp highside Lampe témoin de diagnostic Highside	Dia - K70	Dia+
L	Wartungsintervall maintenance lamp Lampe témoin d'entretien	MLP1 - K09	MLP
M	Diagnoselampe Lowside diagnostic lamp lowside Lampe témoin de diagnistic lowside	Dia - K65	DIA-

Nr.	Description	Assignment	Label
N	Motor Start Schalter engine start switch Interrupteur démarrage moteur	ENGSA - K67	9
P	Motor Stop Schalter engine stop switch Interrupteur arrêt moteur	STP - K31	11
R	Diagnose Anforderungsschalter diagnostic request switc Interrupteur diagnostic request	DIAREQ - K66	DR
S	Drehzahlsignal engine speed signal Signal régime	ENGN - K49	22
T	Drehzahlwahlschalter multi state switch Commutateur pour plusieurs vitesse (MSS)	MSSRPM - K33	14
U	Masse Digital Inputs ground digital inputs Masse entrée digitale	GR-DI - K87	0
V	AGR/DPF Fehler Lowside EGR/DPF failure lowside Erreur EGR Lowside	AGR-ECU 55	
W	Regenerations Temp. zu niedrig (Lowside) regenerations temp. to low (lowside) Température regénération trop basse (Lowside)	AGR-ECU 57(RTN)	
aa	CAN 0 High (Kunden-CAN) CAN 0 high (customer-CAN) CAN 0 High (CAN-client)	CAN H 0 - K54	CAN +
bb	CAN 0 Low (Kunden-CAN) CAN 0 low (customer-CAN) CAN 0 Low (CAN-client)	CAN L 0 - K76	CAN-
cc	B-	0 vom Massepunkt 0 from ground 0 de la masse	0
dd	geschaltetes B+ max 2A switched battery B+ max 2A B+ commandé 15 max 2A	K29 - V8	24

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K88 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K88 has to be used only for the input signal "ignition on" on the control unit!
T15 / K88 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

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Pour l'alimentation électrique du client (« Contact allumer » borne 15) utiliser uniquement K29 (max 2A).

Nach Zündung aus hat K29 einen Nachlauf von 15 Sek..
After ignition off K29 is delayed for 15 sec..
Après coupure du contact, K29 est retardée pendant 15 secondes.

X3

Pin	Assignment	Control Unit EDC
1	Starter Relais Kl. 86 starter relais highside - 86 Relais démarreur borne 86	K73
2	Starter Relais Kl. 85 starter relais lowside - 85 Relais démarreur borne 85	K71
3	Kraftstoffförderpumpen Relais Kl. 86 fuelpump relais highside - 86 Relais pompe d'alimentation carburant borne 86	K90
4	Kraftstoffförderpumpen Relais Kl. 85 fuelpump relais lowside - 85 Relais pompe d'alimentation carburant borne 85	K26

(02)

X4

Pin	Assignment	Control Unit EDC
1	Spannungsversorgung GCU power supply GCU Alimentation courant GCU	K51
2	Masse GCU ground GCU Masse GCU	K02
3	Diagnose Ausgang GCU diagnostic output GCU Sortie diagnostique GCU	K42
4	Steuereingang GCU control input GCU Entrée de commande GCU	K93

X1	Bosch 1 928 A00 325 94 Pin Codierung C Rechts
X2	Bosch 1 928 A00 325 60 Pin Codierung C Links
X3	Deutsch DTM 06-4S
X4	Deutsch DTM 04-4P
X5	ITT Canon Trident 4-28
X6	Deutsch HD10-9-1939PE
X7	ITT Canon Trident 0-12

Anz	Nr.	Datum	Name	Änderung
1x	02	29.09.16	CR	H.16/085
	01	24.08.16	CR	H.16/074
	00	17.05.16	CR	H.16/052

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach/ACC.TO DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
Standard 12V
4H50TIC Software V7xx

Maßstab/SCALE 1:1 (:)
ISO E

	CAD	Datum	Name
Gez.		17.05.16	CR
Gepr.		17.05.16	MO

HATZ Werknorm
Bauteilsauberkeit

Werkstoff/MATERIAL Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 4

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05460430.1363

02-H50T-TICD | 10.2024

HATZ Werknorm
Bauteilsauberkeit	

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

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T15 / K88 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Als Spannungsversorgung Kundenseitig ("Zündung Ein" Kl.15) ist K29(max 2A) zu verwenden!
For customer power supply ("ignition on" Kl.15) use only K29(max 2A)
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Nach Zündung aus hat K29 einen Nachlauf von 15 Sek..
After ignition off K29 is delayed for 15 sec..
Après coupure du contact, K29 est retardée pendant 15 secondes.

Sicherungen - Fuses - Fusibles

Steckplatz Place	Ampere	Bezeichnung Term Désignation	Verwendung Application Utilisation
A	15A	F4	Versorgungsspannung Steuergerät Power supply control unit Alimentation courant calculateur
B	1A	F1 - 1ST	Eingang T15/50 Steuergerät Input T15/50 control unit Entrée T15/T50 calculateur
C	40A	F3	Glühkerzen Glow plugs Bougies de préchauffage
D	15A	F5 - 1K & 1C1	Spannungsversorgung Kunde Power supply customer Alimentation courant client
E	10A	F2	Kraftstoffpumpe Fuel pump Pompe d'alimentation carburant
F	30A	F6	Anlasser Starter motor Démarreur

X6

Pin	Assignment	Control Unit EDC
A	Ground	K02
B	B+ (15A) 1C1	K01
C	CAN1 High (DIA)	K75
D	CAN1 Low (DIA)	K53

X7

Pin	Assignment	Control Unit EDC
A	O_V_5V_APP1 - supply +5V	K45
B	I_A_APP1 - signal 0,5V - 4,5V	K61
C	G_R_APP1 - ground	K62
D	O_V_5V_APP2 - supply +5V	K44
E	I_A_APP2 - signal 0,25V - 2,25V	K83
F	G_R_APP2 - ground	K84

Anz	Nr.	Datum	Name	Änderung
	01	24.08.16	CR	H.16/074
	00	17.05.16	CR	H.16/052

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach/*ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
Standard 12V
4H50TIC Software V7xx

Maßstab/SCALE 1:1 (:) ISO E

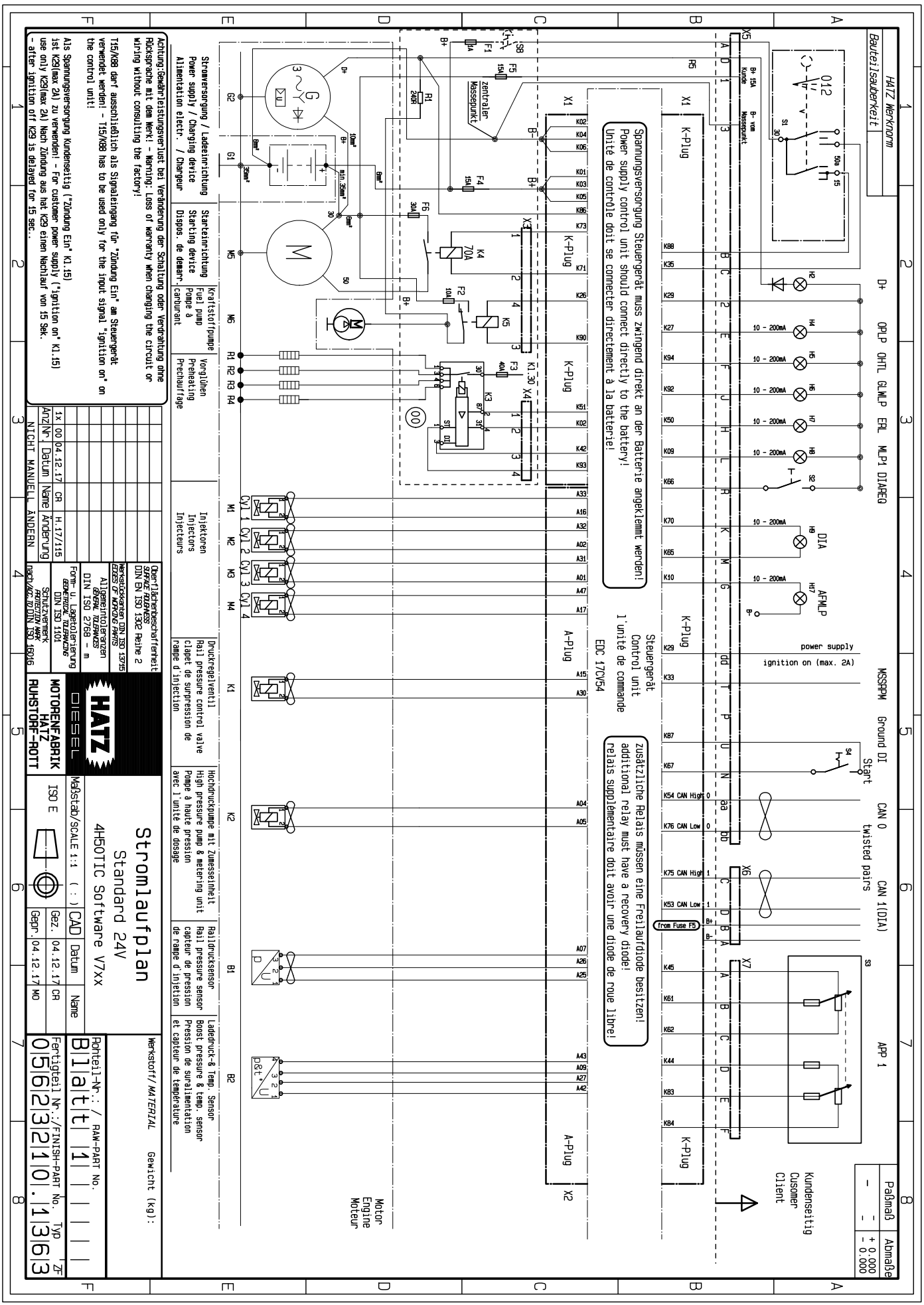
	CAD	Datum	Name
Gez.		17.05.16	CR
Gepr.		17.05.16	MO

Werkstoff/*MATERIAL* Gewicht (kg):

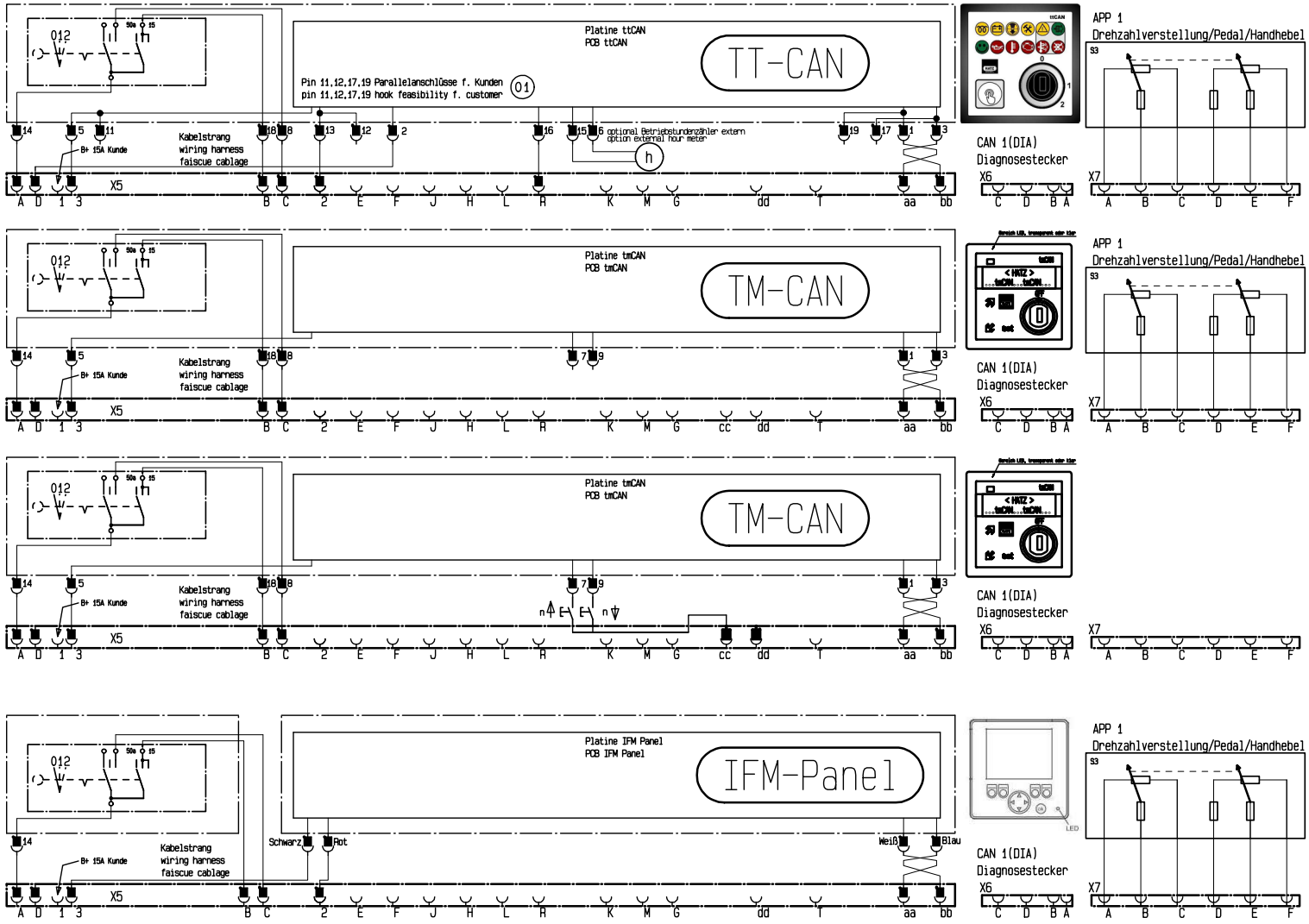
Rohteil-Nr.: / RAW-PART No.
Blatt 5

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05460430.1363

16.3 Circuit diagram CV54: TIC 24V V7xx



HATZ Werknorm
Bauteilsauberkeit



Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! - Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!

T15/K88 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden! - T15/K88 has to be used only for the input signal "ignition on" on the control unit!

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Anz	Nr.	Datum	Name	Änderung
	00	04.12.17	CR	H.17/115

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 *EDGES OF WORKING PARTS*
Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m
Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101
Schutzvermerk *PROTECTION MARK* nach/*ACC.TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan

Standard 24V

4H50TIC Software V7xx

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		04.12.17	CR
Gepr.		04.12.17	MO

Werkstoff/*MATERIAL* Gewicht (kg):

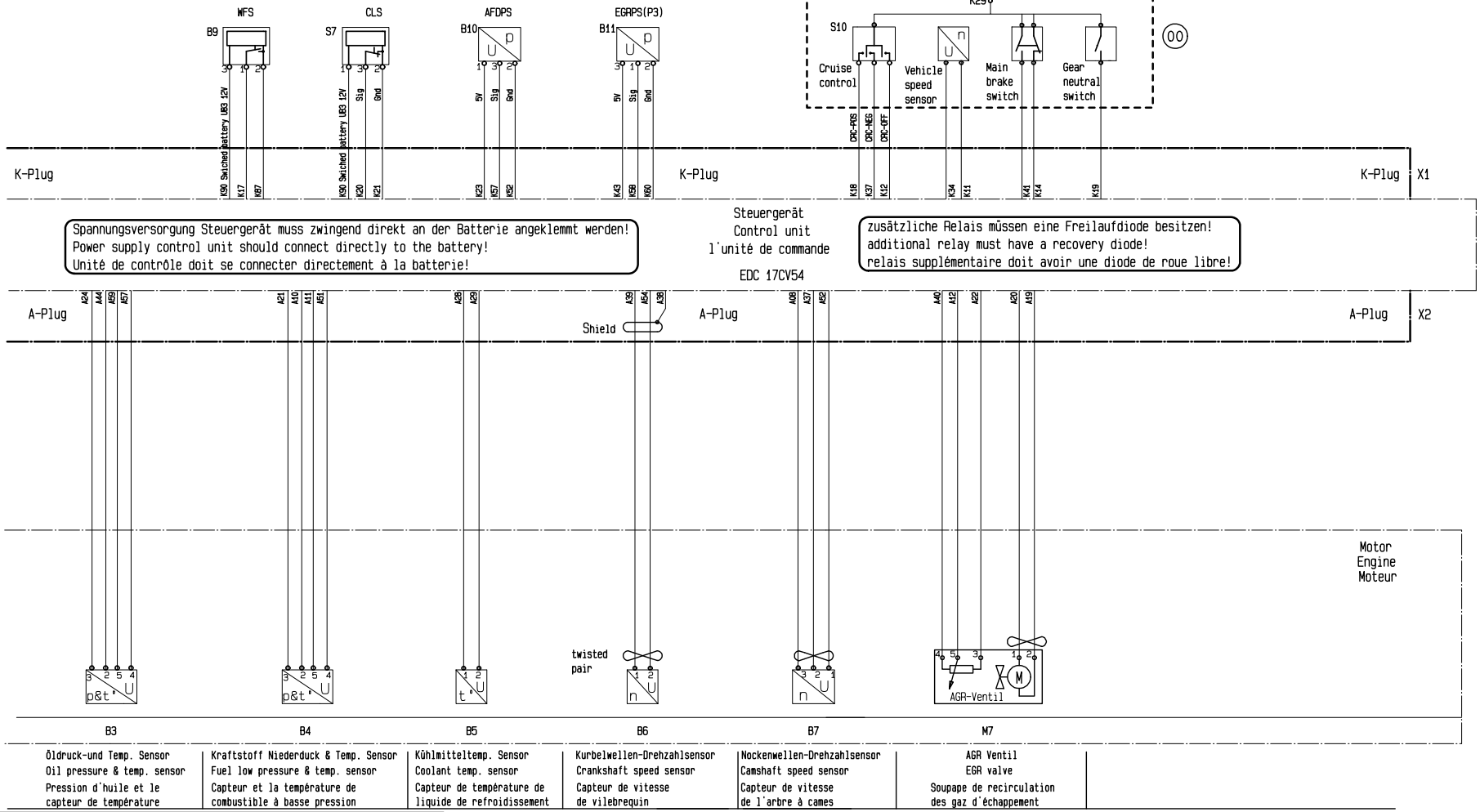
Rohteil-Nr.: / RAW-PART No.
B L A T T 1 A

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0 5 6 2 3 2 1 0 . 1 3 6 3

HATZ Werknorm
Bauteilsauberkeit | 95234400-0

Paßmaß	Abmaße
– –	+ 0.000 - 0.000

nur für Cruise control Version - Verdrahtung Kundenseits
only for cruise control version - wiring by customer
uniquement pour la version du régulateur de vitesse - câblage par le client



B3	B4	B5	B6	B7	M7
Öldruck-und Temp. Sensor Oil pressure & temp. sensor Pression d'huile et le capteur de température	Kraftstoff Niederduck & Temp. Sensor Fuel low pressure & temp. sensor Capteur et la température de combustible à basse pression	Kühlmitteltemp. Sensor Coolant temp. sensor Capteur de température de liquide de refroidissement	Kurbelwellen-Drehzahlsensor Crankshaft speed sensor Capteur de vitesse de vilebrequin	Nockenwellen-Drehzahlsensor Camshaft speed sensor Capteur de vitesse de l'arbre à cames	AGR Ventil EGR valve Soupape de recirculation des gaz d'échappement

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! - Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!

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Anz	Nr.	Datum	Name	Änderung
	00	04.12.17	CR	H.17/115

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach/ACC.TO DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
Standard 24V
4H50TIC Software V7xx

Maßstab/SCALE 1:1 (:) ISO E

CAD	Datum	Name
Gez.	04.12.17	CR
Gepr.	04.12.17	MO

Werkstoff/MATERIAL Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
B|l|a|t|t| |2| | | | |

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0|5|6|2|3|2|1|0|.|1|3|6|3

B1 Raildrucksensor
Railpressuresensor
Capteur pression rail
B2 Ladedruck-& Temperatursensor
Boostpressure & temp. sensor
Capteur température et pression air de suralimentation
B3 Öldruck-& Temperatursensor
Oil pressure & temp. sensor
Capteur température et pression d´huile
B4 Kraftstoff Niederdruck & Temperatursensor
Fuel lowpressure & temp. sensor
Capteur température et basse pression carburant
B5 Kühlmitteltemperatursensor
Coolant temperature sensor
Capteur température liquide de refroidissement
B6 Kurbelwellendrehzahlsensor
Crankshaft speed sensor
Capteur régime vilebrequin
B7 Nockenwellendrehzahlsensor
Camshaft speed sensor
Capteur régime arbre à cames
B8 Umgebungstemperatursensor
Ambient temperature sensor
Capteur température ambiante
B9 Wasser in Kraftstoffsensor
Water in fuel sensor
Capteur d´eau dans carburant
B10 Luftfilter Differenzdruck Sensor
Air cleaner differential pressure sensor
Capteur pression différence du filtre à air
B11 AGR Drucksensor P3
EGR pressure sensor
Capteur pression EGR P3
B12 Fahrzeug-Geschwindigkeitssensor (nur für Cruise control)
Vehicle speed sensor (only for cruise control)
Capteur vitesse du véhicule (seulement pour Cruise Control)
F1 Sicherung T15 /T50
Fuse T15/50
Fusible T15/50
F2 Sicherung Kraftstoffpumpe
Fuse fuelpump
Fusible pompe d´alimentation carburant
F3 Sicherung Glühkerzen
Fuse glow plugs
Fusible bougies de préchauffage
F4 Sicherung Steuergerät B+
Fuse control unit B+
Fusible calculateur EDC17 B+
F5 Sicherung B+ Spannungsversorgung Kunde
Fuse B+ power supply customer
Fusible B+ alimentation courant client
F6 Sicherung Starter 50
Fuse starter 50
Fusible démarreur 50
G1 Starterbatterie
Starter battery
Batterie
G2 Drehstromgenerator
Battery charger
Alternateur triphasé

H2 Ladekontrolllampe
Charge control fault lamp
Lampe témoin de charge batterie
H4 Öldrucklampe
Oil pressure fault lamp
Lampe témoin de pression d´huile
H5 Übertemperaturlampe
Engine overtemperature fault lamp
Lampe témoin de surchauffe
H6 Vorglühanzeigelampe
Pre glow lamp
Lampe témoin préchauffage
H7 Motor läuft Anzeigelampe
Engine running lamp
Lampe témoin moteur en route
H8 Wartungs Anzeigelampe
Maintenance lamp
Lampe témoin d´entretien
H9 Diagnoselampe
Diagnistic lamp
Lampe témoin de diagnostique
H17 Luftfilterwartungsanzeigelampe
Air cleaner maintenance lamp
Lampe témoin d´entretien filtre à air
K1 Druckregelventil
Rail pressure control valve
Clapet de surpression de rampe
K2 Hochdruckpumpe mit Zumesseinheit
High pressure pump & metering unit
Pompe à haute pression avec l´unité de dosage
K3 Glühzeitsteuergerät
Glow control unit
Unité de contrôle systéme de préchauffage
K4 Starter Relais
Starter relais
Relais démarreur
K5 Relais für Kraftstoffförderpumpe
Fuelpump relais
(00) Relais pompe d´alimentation carburant
M1 Injektor Zyl. 1
Injector Cyl. 1
Injecteur Cyl. 1
M2 Injektor Zyl. 2
Injector Cyl. 2
Injecteur Cyl. 2
M3 Injektor Zyl. 3
Injector Cyl. 3
Injecteur Cyl. 3

M4 Injektor Zyl. 4
Injector Cyl. 4
Injecteur Cyl. 4
M5 Anlasser
Starter motor
Démarreur
M6 Kraftstofförderpumpe
Fuel pump
Pompe d´alimetation carburant
M7 AGR-Ventil
EGR valve
Vanne EGR
P1 Drehzahlmesser
Speed counter
Compte tours
R1 Widerstand zur Generatorerregung
Resistor for battery charger excitation
Résistance pour excitation alternateur
S1 Zündstartschalter
Ignition - start -switch
Clé de contact
S2 Diagnose Anforderungstaster
Diagnostic request switch
Interrupteur de demande de diagnostic
S3 Gaspedal-Drehzahlverstellung 1 (analog)
Acceleration pedal 1 (analog)
Réglage régime 1 (analogue)
S4 Startschalter (optional) zu B- (K87 / X5 - U)
Start switch (optional) to B- (K87 / X5 - U)
Bouton Start (option) sur B- (K87 / X5-U)
S5 Stopschalter (optional) zu B- (K87 / X5 - U)
Stop switch (optional) to B- (K87 / X5 - U)
Bouton Stop (option) sur B- (K87 / X5-U)
S6 Schalter für Mehrfachdrehzahl (optional)
Multi state switch(optional)
Commutateur pour plusieurs vitesses (MSS)
S7 Kühlmittelstand Schalter
Coolant level switch
Capteur niveau liquide de refroidissement
S8 Not-Aus - Verdrahtung Kundenseits
Emergency stop - Wiring customer side
Arrêt d´urgence - Câblage par le client
S9 Ladekontrolle (nur CAN-Botschaft)
Alternator monitoring (only Can-message)
Surveillance alternteur (seulement signal CAN-Bus)
S10 Drehzahlregler
Cruise control
Régulateur de vitesse
S11 Handbremsschalter (nur für cruise control)
Main break switch (only for cruise control)
Interrupteur frein à main (seulement pour Cruise Control)

S12 Neutral-Gang-Schalter (nur für cruise control)
Gear neutral switch (only for cruise control)
Interrupteur de vitesse neutre
(seulement pout Cruise Control)

X1 Steuergerätestecker Kundenseitig
Control unit plug customer side
Connecteur calculateur côté client
X2 Steuergerätestecker Motorseitig
Control unit plug engine side
Connecteur calculateur côté moteur
X3 Stecker for Starterrelais
u. Kraftstofförderpumpenrelais
Plug for starter relay & fuel pump relay
Connecteur relais de démarrage et relais
pompe d´alimentation carburant
X4 Stecker zu Glühzeitsteuergerät
Plug for glow control unit
Connecteur unité de contrôle
système de préchauffage"
X5 Stecker für Kundensignale
Plug for customer signals
Connecteur signaux client
X6 CAN-Bus Diagnosestecker
Can bus diagnostic plug
Connecteur CAN-Bus diagnostique
X7 Stecker zu Gaspedal
Drehzahlverstellung (analog)
Acceleration pedal 1 (analog)
Connecteur réglage régime 1 (analogue)

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l´usine!

T15/K88 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K88 has to be used only for the input signal "ignition on" on the control unit!
T15 / K88 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l´unité de commande!

Als Spannungsversorgung Kundenseitig ("Zündung Ein" K1.15) ist K29(max 2A) zu verwenden!
For customer power supply ("ignition on" K1.15) use only K29(max 2A)
Pour l´alimentation électrique du client (« Contact allumer » borne 15) utiliser uniquement K29 (max 2A).

Nach Zündung aus hat K29 einen Nachlauf von 15 Sek..
After ignition off K29 is delayed for 15 sec..
Après coupure du contact, K29 est retardée pendant 15 secondes.

Anz	Nr.	Datum	Name	Änderung
1x	00	04.12.17	CR	H.17/115

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach/*ACC.TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
Standard 24V
4H50TIC Software V7xx

Maßstab/SCALE 1:1 (:)	CAD	Datum	Name
ISO E	Gez.	04.12.17	CR
	Gepr.	04.12.17	MO

Werkstoff/*MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 3

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0562321 0.1363

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X5

Nr.	Description	Assignment	Label
1	B+ 15A Spannungsversorgung Kunde B+ Power supply customer B+ alimentation courant client	1 - vom Sicherungsblock 1 - from fuse 1 - du fusible	1K
2	geschaltetes B+ switched battery B+ B+ commandé 15	K29 - V8	24
3	B- - Masse Ground B- - masse	vom Massepunkt from Ground de la masse	0
4			
A	B+ 1A Spannungsversorgung T15/50 B+ 1A power supply T15/50 B+ alimentation courant T15/50	vom Sicherungsblock from fuse du fusible	1ST
B	Zündung Ein Klemme 15 ignition on clamp 15 Contact allumé borne 15	T15 - K88	15
C	Startsignal Klemme 50 startsignal clamp 50 Signal de démarrage borne 50	T50 - K35	50
D	Ladekontrolle alternator monitoring Contrôle de charge	Nr. 2 - K86	2
E	Öldruckmangel oil pressure fault Manque de pression d'huile	OPLP - K27(Lowside)	4
F	Übertemperatur Motor engine overtemperature fault Surchauffe moteur	OHTL - K94(Lowside)	5
G	Luftfilterwartungsschalter air cleaner maintenance switch commutateur de filtre à air	AFLMP - K10(Highside)	17
H	Motor läuft Lampe engine running lamp Lampe témoin moteur en route	ERL - K50(Lowside)	ML
J	Vorglüanzeige pre glow lamp Lampe témoin de préchauffage	GLWLP - K92(Lowside)	13
K	Diagnoselampe Highside diagnostic lamp highside Lampe témoin de diagnostic Highside	Dia - K70	Dia+
L	Wartungsintervall maintenance lamp Lampe témoin d'entretien	MLP1 - K09	MLP
M	Diagnoselampe Lowside diagnostic lamp lowside Lampe témoin de diagnistic lowside	Dia - K65	DIA-

Nr.	Description	Assignment	Label
N	Motor Start Schalter engine start switch Interrupteur démarrage moteur	ENGSA - K67	9
P	Motor Stop Schalter engine stop switch Interrupteur arrét moteur	STP - K31	11
R	Diagnose Request Schalter diagnostic request switc Interrupteur diagnostic request	DIAREQ - K66	DR
S	Drehzahlsignal engine speed signal Signal régime	ENGN - K49	22
T	Drehzahlwahlschalter multi state switch Commutateur pour plusieurs vitesse (MSS)	MSSRPM - K33	14
U	Masse Digital Inputs ground digital inputs Masse entrée digitale	GR-DIG - K87	0
V	AGR/DPF Fehler Lowside EGR/DPF failure lowside Erreur EGR Lowside	AGR-ECU 55	
W	Regenerations Temp. zu niedrig (Lowside) regenerations temp. to low (lowside) Température regénération trop basse (Lowside)	AGR-ECU 57(RTN)	
aa	CAN 0 High (Kunden-CAN) CAN 0 high (customer-CAN) CAN 0 High (CAN-client)	CAN H 0 - K54	CAN +
bb	CAN 0 Low (Kunden-CAN) CAN 0 low (customer-CAN) CAN 0 Low (CAN-client)	CAN L 0 - K76	CAN-
cc	B-	0 vom Massepunkt 0 from ground 0 de la masse	0
dd	geschaltetes B+ switched battery B+ B+ commandé 15	K29 - V8	24

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K88 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K88 has to be used only for the input signal "ignition on" on the control unit!
T15 / K88 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Als Spannungsversorgung Kundenseitig ("Zündung Ein" Kl.15) ist K29(max 2A) zu verwenden!
For customer power supply ("ignition on" Kl.15) use only K29(max 2A)
Pour l'alimentation électrique du client (« Contact allumer » borne 15) utiliser uniquement K29 (max 2A).

Nach Zündung aus hat K29 einen Nachlauf von 15 Sek..
After ignition off K29 is delayed for 15 sec..
Après coupure du contact, K29 est retardée pendant 15 secondes.

X3

Pin	Assignment	Control Unit EDC
1	Starter Relais Kl. 86 starter relais highside - 86 Relais démarreur borne 86	K73
2	Starter Relais Kl. 85 starter relais lowside - 85 Relais démarreur borne 85	K71
3	Kraftstofförderpumpen Relais Kl. 86 fuelpump relais highside - 86 Relais pompe d'alimentation carburant borne 86	K90
4	Kraftstofförderpumpen Relais Kl. 85 fuelpump relais lowside - 85 Relais pompe d'alimentation carburant borne 85	K26

X4

Pin	Assignment	Control Unit EDC
1	Spannungsversorgung GCU power supply GCU Alimentation courant GCU	K51
2	Masse GCU ground GCU Masse GCU	K02
3	Diagnose Ausgang GCU diagnostic output GCU Sortie diagnostique GCU	K42
4	Steuereingang GCU control input GCU Entrée de commande GCU	K93

HATZ Werknorm
Bauteilsauberkeit

X1 Bosch 1 928 A00 325 94 Pin Codierung C Rechts
X2 Bosch 1 928 A00 325 60 Pin Codierung C Links
X3 Deutsch DTM 06-4S
X4 Deutsch DTM 04-4P
X5 ITT Canon Trident 4-28
X6 Deutsch HD10-9-1939PE
X7 ITT Canon Trident 0-12

Anz	Nr.	Datum	Name	Änderung
	00	04.12.17	CR	H.17/115

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach/ACC.TO DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
Standard 24V
4H50TIC Software V7xx

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		04.12.17	CR
Gepr.		04.12.17	MO

Werkstoff/MATERIAL Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 4

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05623210.1363

02-H50T-TICD | 10.2024

HATZ Werknorm
Bauteilsauberkeit

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K88 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K88 has to be used only for the input signal "ignition on" on the control unit!
T15 / K88 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Als Spannungsversorgung Kundenseitig ("Zündung Ein" Kl.15) ist K29(max 2A) zu verwenden!
For customer power supply ("ignition on" Kl.15) use only K29(max 2A)
Pour l'alimentation électrique du client (« Contact allumer » borne 15) utiliser uniquement K29 (max 2A).

Nach Zündung aus hat K29 einen Nachlauf von 15 Sek..
After ignition off K29 is delayed for 15 sec..
Après coupure du contact, K29 est retardée pendant 15 secondes.

Sicherungen - Fuses - Fusibles

Steckplatz Place	Ampere	Bezeichnung Term Désignation	Verwendung Application Utilisation
A	15A	F4	Versorgungsspannung Steuergerät Power supply control unit Alimentation courant calculateur
B	1A	F1 - 1ST	Eingang T15/50 Steuergerät Input T15/50 control unit Entrée T15/T50 calculateur
C	40A	F3	Glühkerzen Glow plugs Bougies de préchauffage
D	15A	F5 - 1K & 1C1	Spannungsversorgung Kunde Power supply customer Alimentation courant client
E	10A	F2	Kraftstoffpumpe Fuel pump Pompe d'alimentation carburant
F	30A	F6	Anlasser Starter motor Démarreur

X6

Pin	Assignment	Control Unit EDC
A	Ground	K02
B	B+ (15A) 1C1	K01
C	CAN1 High (DIA)	K75
D	CAN1 Low (DIA)	K53

X7

Pin	Assignment	Control Unit EDC
A	O_V_5V_APP1 - supply +5V	K45
B	I_A_APP1 - signal 0,5V - 4,5V	K61
C	G_R_APP1 - ground	K62
D	O_V_5V_APP2 - supply +5V	K44
E	I_A_APP2 - signal 0,25V - 2,25V	K83
F	G_R_APP2 - ground	K84

Anz	Nr.	Datum	Name	Änderung
	00	04.12.17	CR	H.17/115

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach/ACC.TO DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
Standard 24V
4H50TIC Software V7xx

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		04.12.17	CR
Gepr.		04.12.17	MO

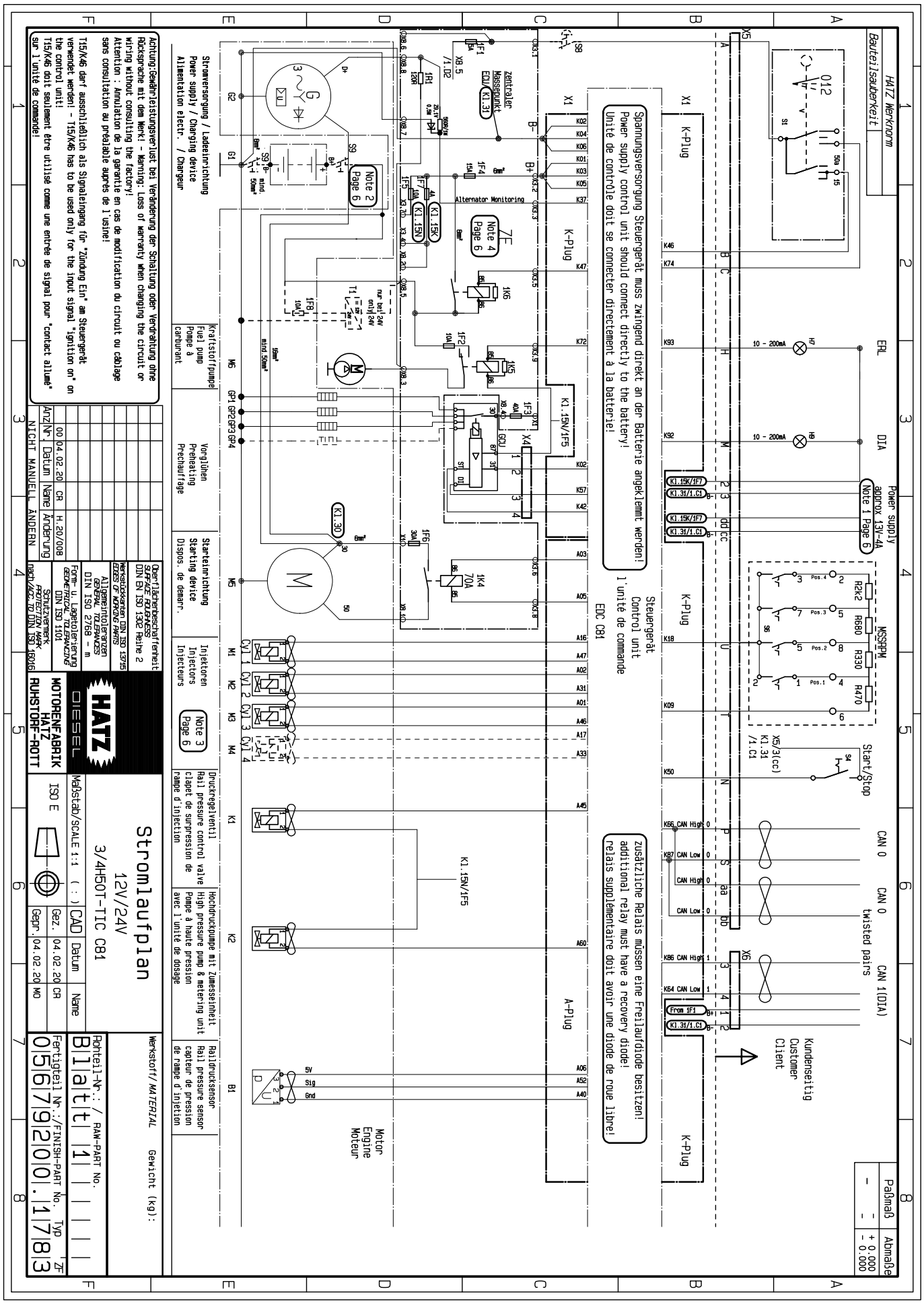
Werkstoff/MATERIAL Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 5

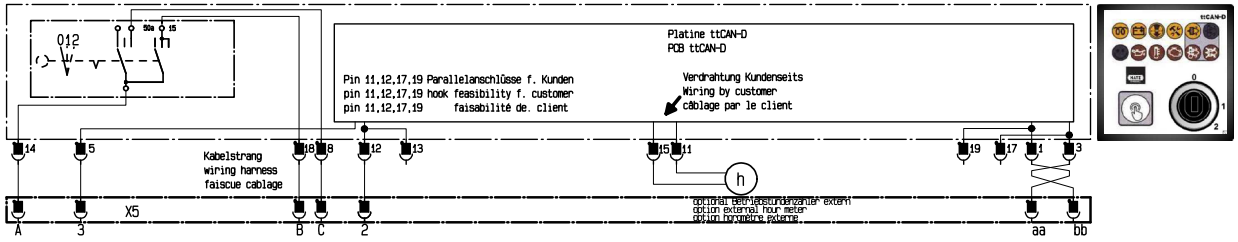
Fertigteil Nr.:/FINISH-PART No. Typ ZF
05623210.1363

17
Circuit diagrams C81

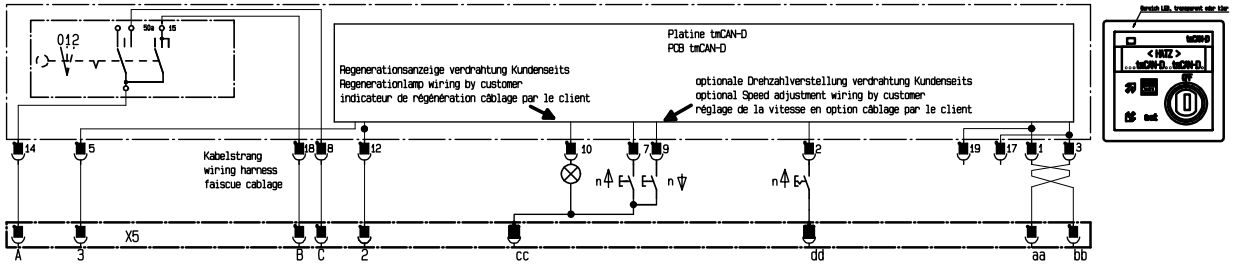
17.1 Circuit diagram C81: T-TIC 12V/24V double filter system



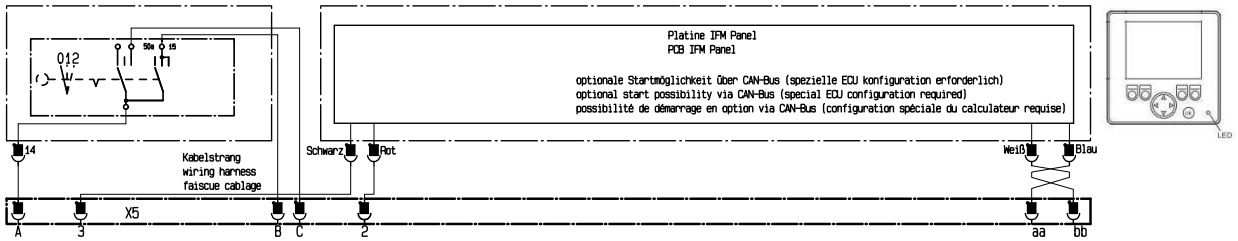
HATZ Werknorm
Bauteilsauberkeit



TT-CAN-D



TM-CAN-D



IFM-Panel

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! - Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Annulation de la garantie en cas de modification du circuit ou câblage sans consultation au préalable auprès de l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden! - T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15/K46 doit seulement être utilisé comme une entrée de signal pour "contact allumé" sur l'unité de commande!

Anz	Nr.	Datum	Name	Änderung
	00	04.02.20	CR	H.20/008

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach/*ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan

12V/24V

3/4H50T-TIC C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		04.02.20	CR
Gepr.		04.02.20	MO

Werkstoff/*MATERIAL* Gewicht (kg):

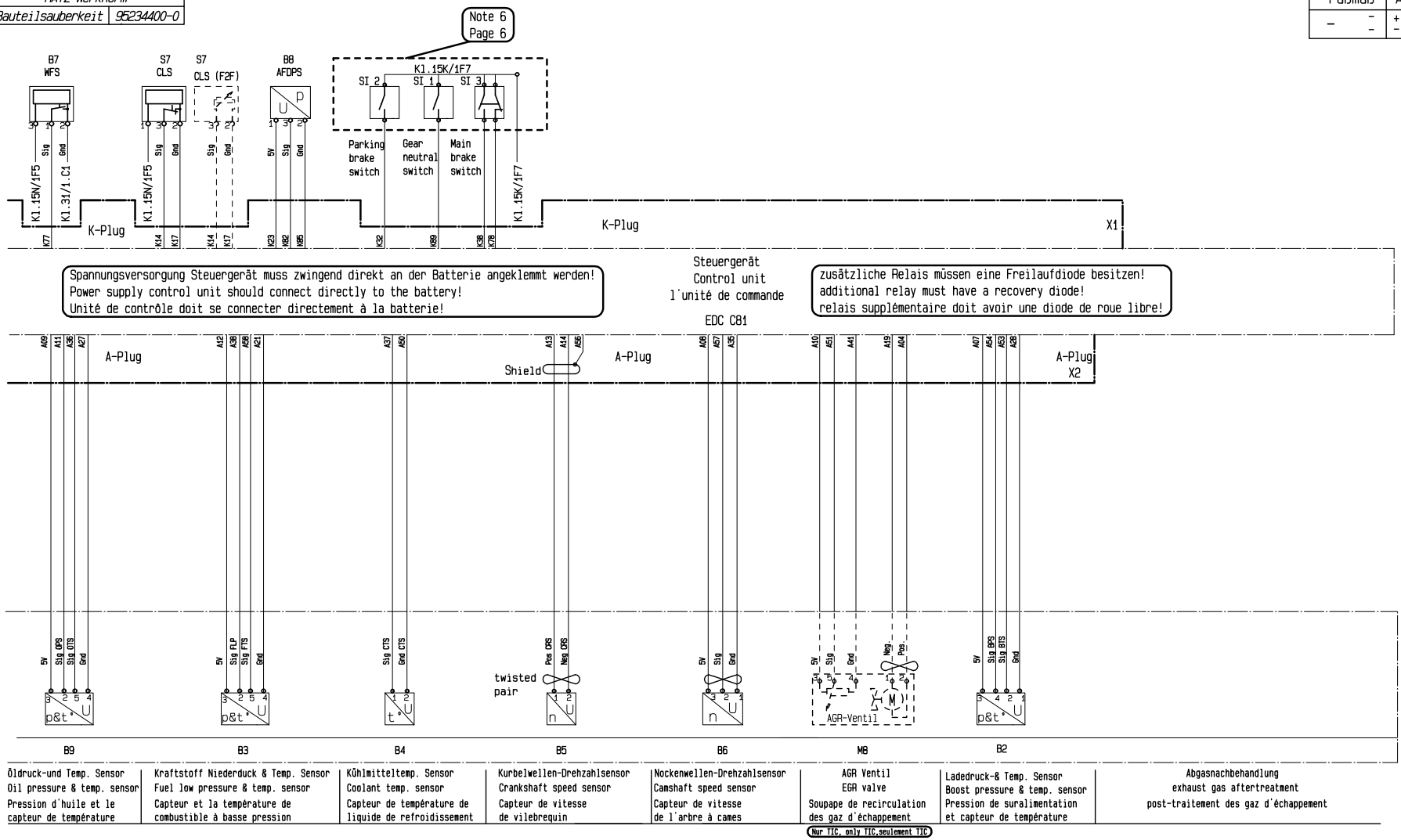
Rohteil-Nr.: / RAW-PART No.
B|L|A|T|T| |2| | | | |

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0|5|6|7|9|2|0|0|.|1|7|8|3

HATZ Werknorm

Bauteilsauberkeit	95234400-0

Paßmaß	Abmaße
– –	+ 0.000 - 0.000



Nur TIC, only TIC, seulement TIC

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! - Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Annulation de la garantie en cas de modification du circuit ou câblage sans consultation au préalable auprès de l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden! - T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15/K46 doit seulement être utilisé comme une entrée de signal pour "contact allumé" sur l'unité de commande!

Anz	Nr.	Datum	Name	Änderung
	00	04.02.20	CR	H.20/008

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach *ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan

12V/24V

3/4H50T-TIC C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		04.02.20	CR
Gepr.		04.02.20	MO

Werkstoff/ *MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 3

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0567920 0.1783

Klemme 15N und Kl.15K sind nach Zündung aus noch für ca. 20Sek. aktiv. (Nachlauf)
Terminal 15N and Kl.15K are still on for approx. 20 seconds after ignition off.(after run)
Les terminaux 15N et Kl.15K sont toujours allumés pendant env. 20 secondes après la coupure du contact. (après course)

B1 Raildrucksensor
Railpressuresensor
Capteur pression rail
B2 Ladedruck-& Temperatur Sensor
Boost pressure & temperature sensor
Pression de suralimentation et capteur de température
B3 Kraftstoff Niederdruck & Temperatursensor
Fuel lowpressure & temp. sensor
Capteur température et basse pression carburant
B4 Kühlmitteltemperatursensor
Coolant temperature sensor
Capteur température liquide de refroidissement
B5 Kurbelwellendrehzahlsensor
Crankshaft speed sensor
Capteur régime vilebrequin
B6 Nockenwellendrehzahlsensor
Camshaft speed sensor
Capteur régime arbre à cames
B7 Wasser in Kraftstoffsensor
Water in fuel sensor
Capteur d´eau dans carburant
B8 Luftfilter Differenzdruck Sensor
Air cleaner differential pressure sensor
Capteur pression différence du filtre à air
B9 Öldruck-& Temperatursensor
Oil pressure & temp. sensor
Capteur température et pression d´huile

1F1 Sicherung T15 /T50 - ZE
Fuse T15/50 - ZE
Fusible T15/50 - ZE
1F2 Sicherung Kraftstoffpumpe - ZE
Fuse fuelpump - ZE
Fusible pompe d´alimentation carburant - ZE
1F3 Sicherung Glühkerzen - ZE
Fuse glow plugs - ZE
Fusible bougies de préchauffage - ZE
1F4 Sicherung Steuergerät B+ - ZE
Fuse control unit B+ - ZE
Fusible calculateur EDC17 B+ - ZE
1F5 Sicherung Zündung ein Klemme 15N - ZE
Fuse ignition on Pin 15N - ZE
Fusible pour Contact Borne 15N - ZE
1F6 Sicherung Starter 50 - ZE
Fuse starter 50 - ZE
Fusible démarreur 50 - ZE

1F7 Sicherung Zündung ein Klemme 15K Kunde - ZE
Fuse ignition on Pin 15K customer - ZE
Fusible pour Contact Borne 15K client - ZE
1F8 Sicherung Spannungswandler - ZE
Fuse DC/DC converter - ZE
Fusible pour les transformateurs de tension - ZE
G1 Starterbatterie
Starter battery
Batterie
G2 Drehstromgenerator
Battery charger
Alternateur triphasé
GCU Glühzeitsteuergerät
Glow control unit
Unité de contrôle systéme de préchauffage
GP1 Glühkerze 1
Glow plug 1
bougie de préchauffage 1
GP2 Glühkerze 2
Glow plug 2
bougie de préchauffage 2
GP3 Glühkerze 3
Glow plug 3
bougie de préchauffage 3
GP4 Glühkerze 4
Glow plug 4
bougie de préchauffage 4
H7 Motor läuft Anzeigelampe
Engine running lamp
Lampe témoin moteur en route
H9 Diagnoselampe
Diagnistic lamp
Lampe témoin de diagnostique
K1 Druckregelventil
Rail pressure control valve
Clapet de surpression de rampe
K2 Hochdruckpumpe mit Zumesseinheit
High pressure pump & metering unit
Pompe à haute pression avec l´unité de dosage
1K4 Starter Relais
Starter relay
Relais démarreur

1K5 Relais für Kraftstofförderpumpe - ZE
Fuelpump relay - ZE
Relais pompe d´alimentation carburant - ZE
1K6 Hauptrelais Steuergerät Ein - ZE
Mainrelay ECU On - ZE
Relais principal calculateur - ZE

M1 Injektor Zyl. 1
Injector Cyl. 1
Injecteur Cyl. 1
M2 Injektor Zyl. 2
Injector Cyl. 2
Injecteur Cyl. 2
M3 Injektor Zyl. 3
Injector Cyl. 3
Injecteur Cyl. 3
M4 Injektor Zyl. 4
Injector Cyl. 4
Injecteur Cyl. 4
M5 Anlasser
Starter motor
Démarreur
M6 Kraftstofförderpumpe
Fuel pump
Pompe d´alimetation carburant
M8 AGR-Ventil
EGR-Valve
Vanne EGR
M9 Drosselklappe
Throttle Valve
Vanne d´étranglement
PM DPF Zusatzheizung Platine
DPF Power modul board
DPF Carte du module d'alimentation
R1 Widerstand zur Generatorerregung
Resistor for battery charger excitation
Résistance pour excitation alternateur
R6 Abgasheizung 1
Exhaust heater 1
chauffage des gaz d'échappement 1
R7 Abgasheizung 2
Exhaust heater 2
chauffage des gaz d'échappement 2

S1 Zündstartschalter
Ignition - start -switch
Clé de contact
S2 Diagnose Anforderungstaster
Diagnostic request switch
Interrupteur de demande de diagnostic
S4 Startschalter (optional) zu B-
Start switch (optional) to B-
Bouton Start (option) sur B-
S6 Schalter für Mehrfachdrehzahl (optional)
Multi state switch(optional)
Commutateur pour plusieurs vitesses (MSS)
S7 Kühlmittelstand Schalter
Coolant level switch
Capteur niveau liquide de refroidissement
S8 Not-Aus - Verdrahtung Kundenseits
Emergency stop - wiring customer side
Arrêt d´urgence - Câblage par le client
S9 Batteriehauptschalter
Battery Main Switch
Interrupteur principal de batterie
SI1 Sicherheitseingang - Neutral-Gang-Schalter
Safety input - Gear neutral switch
entrée de sécurité - Interrupteur de vitesse neutre
SI2 Sicherheitseingang - Park-bremsen-schalter
Safety input - Parking brake switch
entrée de sécurité - Commutateur de frein de stationnement
SI3 Sicherheitseingang - Fussbremse (Redundant)
Safety input - Footbrake (Redundant)
entrée de sécurité - frein à pied (Redundant)
T1 Gleichspannungswandler 24V/12V 20A
DC/DC Converter 24V/12V 20A
Convertisseur DC/DC 24V/12V 20A
ZE Zentralelektrik Platine
Central electric board
Tableau électrique central

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15 / K46 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Nach Zündung aus hat Kl.15 einen Nachlauf von 15 Sek..
After ignition off Kl.15 is delayed for 15 sec..
Après coupure du contact, Kl.15 est retardée pendant 15 secondes.

HATZ Werknorm
Bauteilsauberkeit

Anz	Nr.	Datum	Name	Änderung
	00	04.02.20	CR	H.20/008

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 *EDGES OF WORKING PARTS*
Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m
Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101
Schutzvermerk *PROTECTION MARK* nach *ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
12V/24V
3/4H50T-TIC C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		04.02.20	CR
Gepr.		04.02.20	MO

Werkstoff/*MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 4

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0567920 0.1783

HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Hatz-Standard - Wiring harness	953253xx

X5

Nr.	Description	Assignment	Label
1			
2	Zündung Ein Kl. 15 mit Nachlauf ignition on clamp 15 with after run Contact allumé borne 15 dépassement du temps	(KL.15N) (KL.15N) (KL.15N)	
3	B- - Masse Ground B- - masse	vom Massepunkt from Ground de la masse	0
4			
A	B+ 5A Spannungsversorgung T15/50 B+ 5A power supply T15/50 B+ alimentation courant T15/50	von der Zentralelektrik from centralelectric du électrique central	1
B	Zündung Ein Klemme 15 ignition on clamp 15 Contact allumé borne 15	T15 - K46	15
C	Startsignal Klemme 50 startsignal clamp 50 Signal de démarrage borne 50	T50 - K74	50
H	Motor läuft Lampe engine running lamp Lampe témoin moteur en route	ERL - K93(Lowside)	ML
M	Diagnoselampe Lowside diagnostic lamp lowside Lampe témoin de diagnistic lowside	Dia - K90	DIA-

Nr.	Description	Assignment		
N	Motor Start Schalter engine start switch Interrupteur démarrage moteur	ENGSA - K50		
R				
T	Drehzahlwahlschalter multi state switch Commutateur pour plusieurs vitesse (MSS)	MSSRPM - K09		14
U	Masse MSSRPM ground MSSRPM Masse MSSRPM	GR-DIG - K18		0
P	CAN 0 High (Kunden-CAN) CAN 0 high (customer-CAN) CAN 0 High (CAN-client)	CAN H 0 - K66 - V11		CAN +
S	CAN 0 Low (Kunden-CAN) CAN 0 low (customer-CAN) CAN 0 Low (CAN-client)	CAN L 0 - K87 - V12		CAN-
aa	CAN 0 High (Kunden-CAN) CAN 0 high (customer-CAN) CAN 0 High (CAN-client)	CAN H 0 - K66 - V11		CAN +
bb	CAN 0 Low (Kunden-CAN) CAN 0 low (customer-CAN) CAN 0 Low (CAN-client)	CAN L 0 - K87 - V12		CAN-
cc	B-	0 vom Massepunkt 0 from ground 0 de la masse		0
dd	Kl. 15 mit Nachlauf (KL.15N) clamp 15 with after run (KL.15N) Contact allumé borne 15 dépassement du temps (KL.15N)			24
ee				
hh				

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
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T15 /K46 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Nach Zündung aus hat Kl.15 einen Nachlauf von 15 Sek..
After ignition off Kl.15 is delayed for 15 sec..
Après coupure du contact, Kl.15 est retardée pendant 15 secondes.

GCU 24V (K3) Pin assignment

6-pol connector
1 - Glowplug 1
2 - not connect
3 - Glowplug 2
4 - Glowplug 3
5 - not connect
6 - Glowplug 4

4-pol connector
1 - ST(Control signal)
2 - 86(ignition on)
3 - DI(Diagnosis signal)
4 - 31(Ground)

Screw M6
B+ powersupply glow plugs

GCU 12V (K3) Pin assignment

1 - Glowplug 1
2 - Glowplug 2
3 - Glowplug 3
4 - Glowplug 4
5 - not connect
6 - 87(ignition on)
7 - 31(Ground)
8 - not connect
9 - DI(Diagnosis signal)
10 - ST(Control signal)
11 - power supply glow plugs

X6-Can Bus 1 diagnostic plug
1 - B+ 5A
2 - B- (Ground)
3 - Can 1 high
4 - Can 1 low

X1 Steuergerätestecker Kundenseitig
Control unit plug customer side
Connecteur calculateur côté client
X2 Steuergerätestecker Motorseitig
Control unit plug engine side
Connecteur calculateur côté moteur
X3 Stecker für Kraftstoffförderpumpenrelais und Hauptrelais
Plug for fuel pump relay and mainrelay
Connecteur pour pompe d'alimentation carburant et relais principal
X4 Stecker zu Glühzeitsteuergerät
Plug for glow control unit
Connecteur unité de contrôle système de préchauffage"
X5 Stecker für Kundensignale
Plug for customer signals
Connecteur signaux client
X6 CAN-Bus Diagnosestecker
Can bus diagnostic plug
Connecteur CAN-Bus diagnostique
X7 Stecker für Starterrelais
Plug for starterrelay
Connecteur pour relais de démarrage

Anz	Nr.	Datum	Name	Änderung
	00	04.02.20	CR	H.20/008

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 *EDGES OF WORKING PARTS*
Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m
Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101
Schutzvermerk *PROTECTION MARK* nach *ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan

12V/24V

3/4H50T-TIC C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		04.02.20	CR
Gepr.		04.02.20	MO

Werkstoff/*MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 5

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05679200.1783

02-H50T-TICD | 10.2024

200

HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Hatz-Standard - Wiring harness	953253xx

Note 1:
Spannungsversorgung für Kundensteuerung ca. 13V- 4A auch bei 24V Motoren.
Power supply for customer control approx 13V-4A also by 24V-Engines.
Alimentation pour commande client env. 13V-4A également avec moteurs 24V

Note 2:
Batterietrennschalter möglichst nah an der Batterie installieren.
Zuleitung Steuergerät muss auch durch den Trennschalter von der Batterie getrennt werden.
Der Trennschalter darf frühestens 1 Minute (Nachlauf) nach Motorstillstand betätigt werden.Sonst können elektrische Komponenten des Motors zerstört werden.
Der Motor kann und darf unter keinen Umständen durch den Batterietrennschalter abgestellt werden.
Battery disconnector install as close as possible to the battery.
The control unit supply line must be also disconnected from the battery.
The circuit breaker must not be opened until at least 1 minute (after-run) after the motor has stopped, otherwise electrical components of the motor can be destroyed.
The engine must not be switched off by the battery isolating switch during operation.
Installez l'interrupteur de batterie aussi près que possible de la batterie.
La ligne d'alimentation de l'unité de commande doit également être déconnectée de la batterie à l'aide du l'interrupteur de batterie.
L'interrupteur de batterie doit être actionné au moins 1 minute (dépassement) après l'arrêt du moteur, sinon les composants électriques du moteur peuvent être détruits.
En aucun cas, le moteur ne doit être arrêté à l'aide du coupe-batterie

Note 3:
M4 und GP4 nur bei 4H50TICD
M4 and GP4 only by 4H50TICD
M4 et GP4 seulement à 4H50TICD
T1 nur bei 3/4H50TICD 24V
T1 only by 3/4H50TICD 24V
T1 seulement à 3/4H50TICD 24V

Note 4:
ZE-X8.2 & X8.6 frei verfügbar
ZE-X8.2 & X8.6 freely available
ZE-X8.2 & X8.6 disponible gratuitement

Note 6:
erforderlich für Anwendung mobile Maschine für Start und Regeneration
und für Stationärmotoren für Regeneration - Verdrahtung Kundenseits
required for application mobile machine for starting and regeneration
and for stationary engines for regeneration - wiring by customer
requis pour l'application machine mobile pour le démarrage et la régénération
et pour moteurs à l'arrêt pour la régénération - câblage par le client

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15 /K46 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Klemme 15N und Kl.15K sind nach Zündung aus noch für ca. 20Sek. aktiv. (Nachlauf)
Terminal 15N and Kl.15K are still on for approx. 20 seconds after ignition off.(after run)
Les terminaux 15N et Kl.15K sont toujours allumés pendant env. 20 secondes après la coupure du contact. (après course)

Anz	Nr.	Datum	Name	Änderung
	00	04.02.20	CR	H.20/008

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 *EDGES OF WORKING PARTS*
Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m
Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101
Schutzvermerk *PROTECTION MARK* nach *ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
12V/24V
3/4H50T-TIC C81

Maßstab/SCALE 1:1 (:) ISO E

	Datum	Name
CAD		
Gez.	04.02.20	CR
Gepr.	04.02.20	MO

Werkstoff/*MATERIAL* Gewicht (kg):

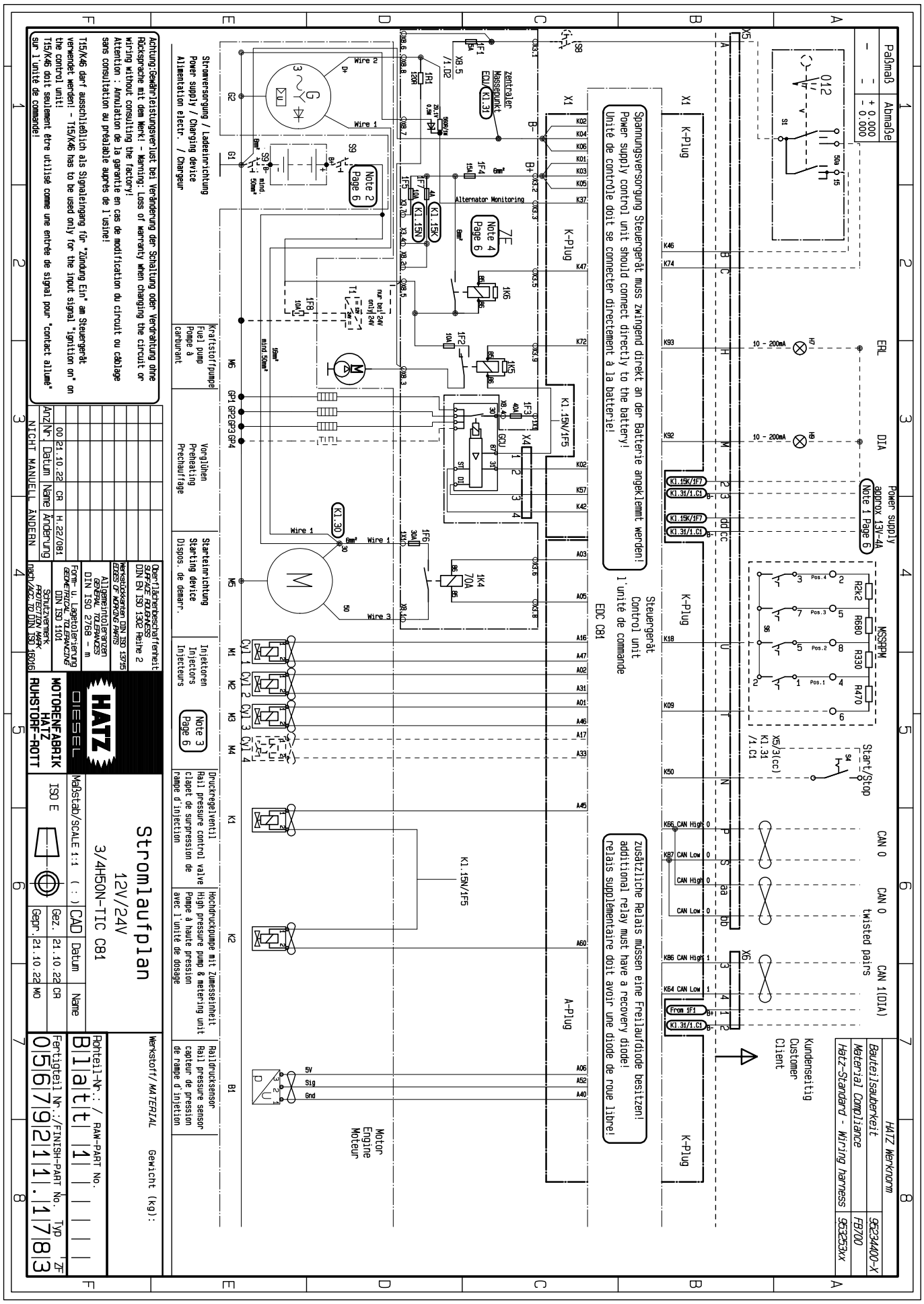
Rohteil-Nr.: / RAW-PART No.
Blatt 6

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05679200.1783

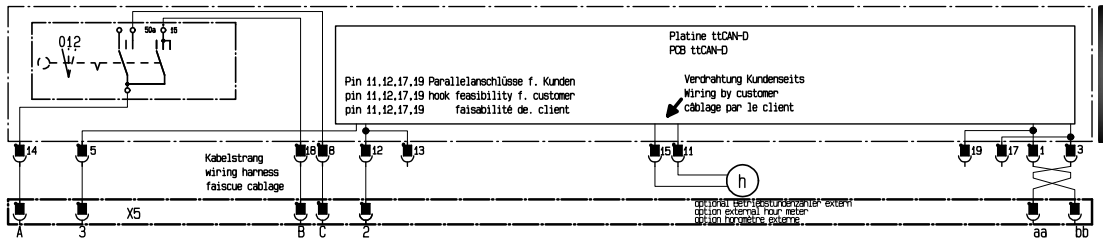
201

02-H50T-TICD | 10.2024

17.2 Circuit diagram C81: T-TIC 12V/24V single filter system



HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Material Compliance	FB700
Hatz-Standard - Wiring harness	953253xx



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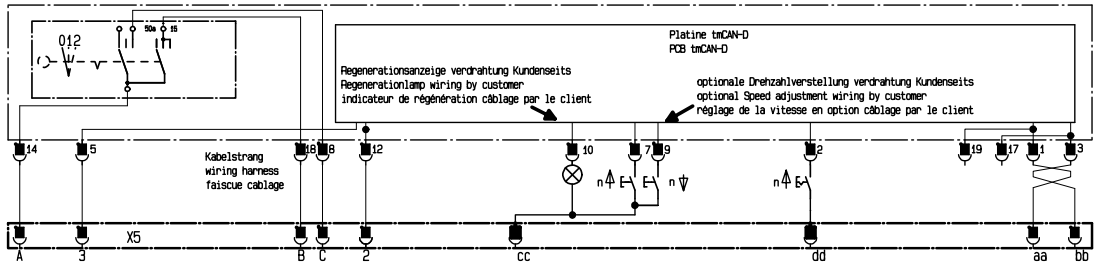
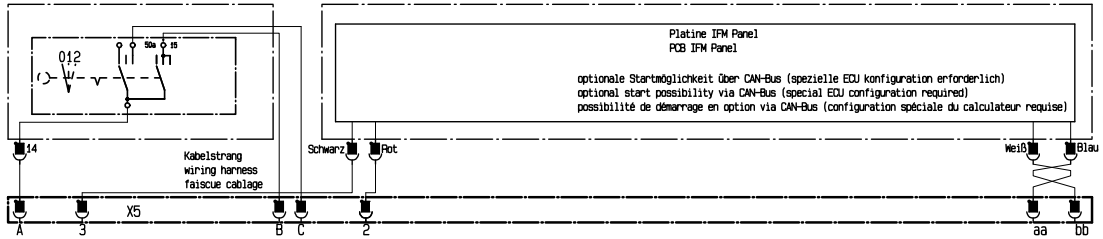
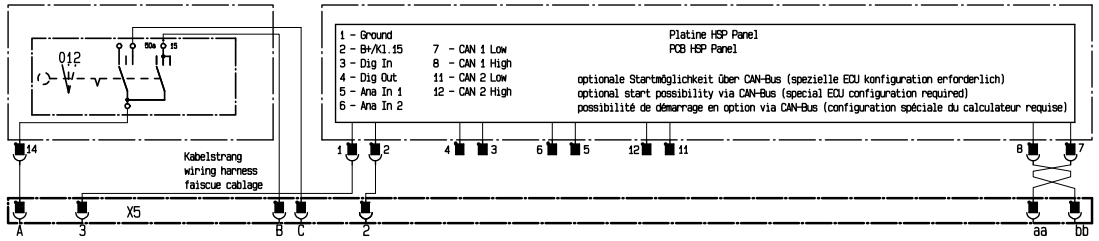
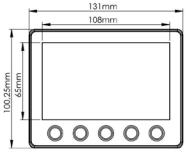


TM-CAN-D



IFM-Panel





HSP-Panel

00

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! - Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Annulation de la garantie en cas de modification du circuit ou câblage sans consultation au préalable auprès de l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden! - T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15/K46 doit seulement être utilisé comme une entrée de signal pour "contact allumé" sur l'unité de commande!

Anz	Nr.	Datum	Name	Änderung
1x	00	21.10.22	CR	H.22/081

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach/*ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHRSTORF-ROTT

Stromlaufplan

12V/24V

3/4H50N-TIC C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		21.10.22	CR
Gepr.		21.10.22	MO

Werkstoff/*MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
BLATT 2

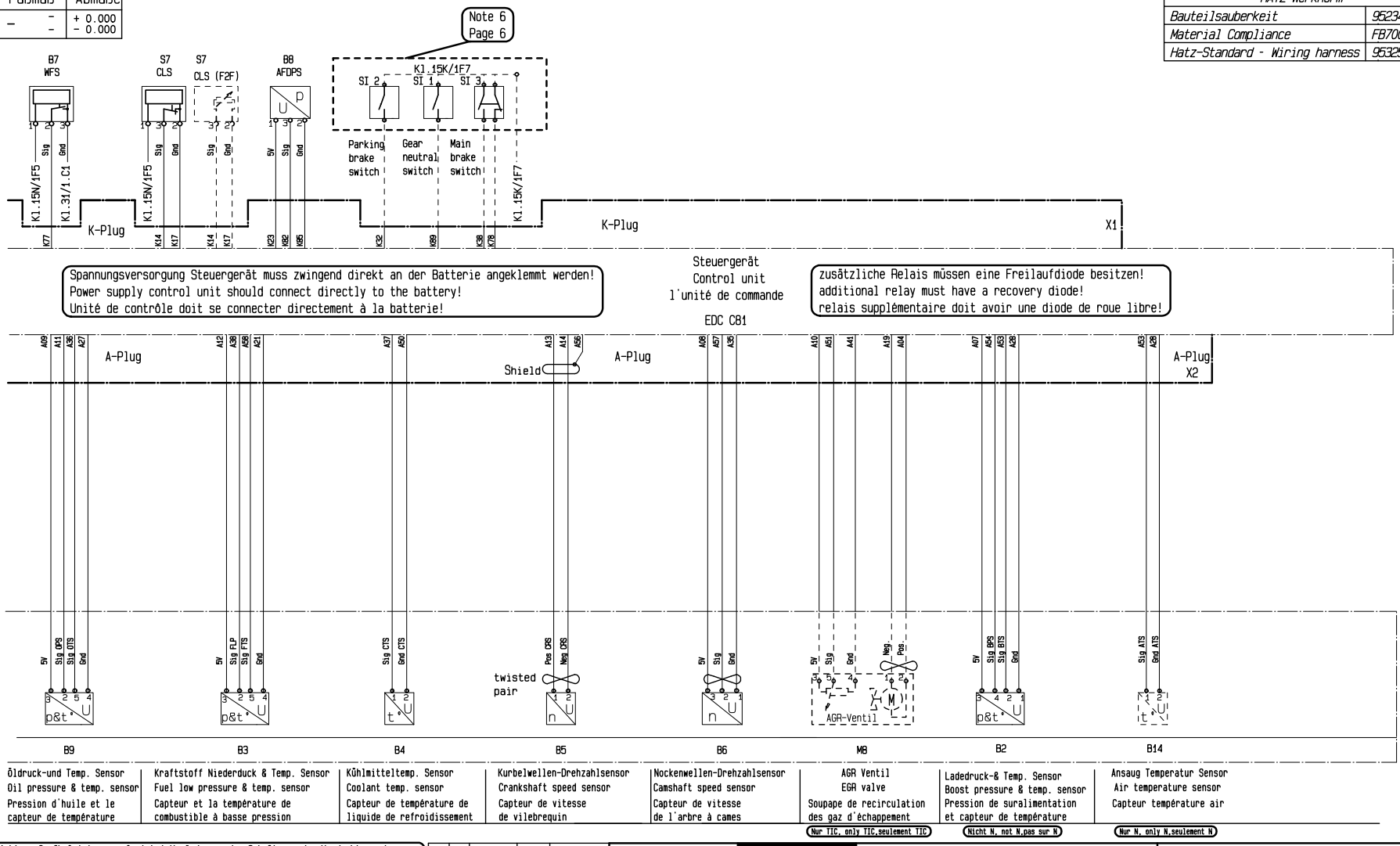
Fertigteil Nr.:/FINISH-PART No. Typ ZF
05679211.1783

203

02-H50T-TICD | 10.2024

Paßmaß	Abmaße
– –	+ 0.000
– –	– 0.000

HATZ Werknorm	
Bauteilsauberkeit	95234400-0
Material Compliance	FB700
Hatz-Standard - Wiring harness	953253xx



Öldruck-und Temp. Sensor	Kraftstoff Niederduck & Temp. Sensor	Kühlmitteltemp. Sensor	Kurbelwellen-Drehzahlsensor	Nockenwellen-Drehzahlsensor	AGR Ventil	Ladedruck-& Temp. Sensor	Ansaug Temperatur Sensor
Oil pressure & temp. sensor	Fuel low pressure & temp. sensor	Coolant temp. sensor	Crankshaft speed sensor	Camshaft speed sensor	EGR valve	Boost pressure & temp. sensor	Air temperature sensor
Pression d'huile et le capteur de température	Capteur et la température de combustible à basse pression	Capteur de température de liquide de refroidissement	Capteur de vitesse de vilebrequin	Capteur de vitesse de l'arbre à cames	Soupape de recirculation des gaz d'échappement	Pression de suralimentation et capteur de température	Capteur température air
					Nur TIC, only TIC, seulement TIC	Nicht N, not N, pas sur N	Nur N, only N, seulement N

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! - Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
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Anz	Nr.	Datum	Name	Änderung
	00	21.10.22	CR	H.22/081

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 *EDGES OF WORKING PARTS*
Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m
Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101
Schutzvermerk *PROTECTION MARK* nach *ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan

12V/24V

3/4H50N-TIC C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		21.10.22	CR
Gepr.		21.10.22	MO

Werkstoff/ *MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
B|l|a|t|t| |3| | | | |

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0|5|6|7|9|2|1|1|.|1|7|8|3

HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Material Compliance	FB700
Hatz-Standard - Wiring harness	953253xx

Klemme 15N und Kl.15K sind nach Zündung aus noch für ca. 20Sek. aktiv. (Nachlauf)
Terminal 15N and Kl.15K are still on for approx. 20 seconds after ignition off.(after run)
Les terminaux 15N et Kl.15K sont toujours allumés pendant env. 20 secondes après la coupure du contact. (après course)

B1 Raildrucksensor
Railpressuresensor
Capteur pression rail
B2 Ladedruck-& Temperatur Sensor
Boost pressure & temperature sensor
Pression de suralimentation et capteur de température
B3 Kraftstoff Niederdruck & Temperatursensor
Fuel lowpressure & temp. sensor
Capteur température et basse pression carburant
B4 Kühlmitteltemperatursensor
Coolant temperature sensor
Capteur température liquide de refroidissement
B5 Kurbelwellendrehzahlsensor
Crankshaft speed sensor
Capteur régime vilebrequin
B6 Nockenwellendrehzahlsensor
Camshaft speed sensor
Capteur régime arbre à cames
B7 Wasser in Kraftstoffsensor
Water in fuel sensor
Capteur d´eau dans carburant
B8 Luftfilter Differenzdruck Sensor
Air cleaner differential pressure sensor
Capteur pression différence du filtre à air
B9 Öldruck-& Temperatursensor
Oil pressure & temp. sensor
Capteur température et pression d´huile
B14 Ansaug Temperatur Sensor
Air temperature sensor
Capteur température air
1F1 Sicherung T15 /T50 - ZE
Fuse T15/50 - ZE
Fusible T15/50 - ZE
1F2 Sicherung Kraftstoffpumpe - ZE
Fuse fuelpump - ZE
Fusible pompe d´alimentation carburant - ZE
1F3 Sicherung Glühkerzen - ZE
Fuse glow plugs - ZE
Fusible bougies de préchauffage - ZE
1F4 Sicherung Steuergerät B+ - ZE
Fuse control unit B+ - ZE
Fusible calculateur EDC17 B+ - ZE
1F5 Sicherung Zündung ein Klemme 15N - ZE
Fuse ignition on Pin 15N - ZE
Fusible pour Contact Borne 15N - ZE
1F6 Sicherung Starter 50 - ZE
Fuse starter 50 - ZE
Fusible démarreur 50 - ZE

1F7 Sicherung Zündung ein Klemme 15K Kunde - ZE
Fuse ignition on Pin 15K customer - ZE
Fusible pour Contact Borne 15K client - ZE
1F8 Sicherung Spannungswandler - ZE
Fuse DC/DC converter - ZE
Fusible pour les transformateurs de tension - ZE
G1 Starterbatterie
Starter battery
Batterie
G2 Drehstromgenerator
Battery charger
Alternateur triphasé
GCU Glühzeitsteuergerät
Glow control unit
Unité de contrôle systéme de préchauffage
GP1 Glühkerze 1
Glow plug 1
bougie de préchauffage 1
GP2 Glühkerze 2
Glow plug 2
bougie de préchauffage 2
GP3 Glühkerze 3
Glow plug 3
bougie de préchauffage 3
GP4 Glühkerze 4
Glow plug 4
bougie de préchauffage 4
H7 Motor läuft Anzeigelampe
Engine running lamp
Lampe témoin moteur en route
H9 Diagnoselampe
Diagnistic lamp
Lampe témoin de diagnostique
K1 Druckregelventil
Rail pressure control valve
Clapet de surpression de rampe
K2 Hochdruckpumpe mit Zumesseinheit
High pressure pump & metering unit
Pompe à haute pression avec l´unité de dosage
1K4 Starter Relais
Starter relay
Relais démarreur

1K5 Relais für Kraftstoffförderpumpe - ZE
Fuelpump relay - ZE
Relais pompe d´alimentation carburant - ZE
1K6 Hauptrelais Steuergerät Ein - ZE
Mainrelay ECU On - ZE
Relais principal calculateur - ZE

M1 Injektor Zyl. 1
Injector Cyl. 1
Injecteur Cyl. 1
M2 Injektor Zyl. 2
Injector Cyl. 2
Injecteur Cyl. 2
M3 Injektor Zyl. 3
Injector Cyl. 3
Injecteur Cyl. 3
M4 Injektor Zyl. 4
Injector Cyl. 4
Injecteur Cyl. 4
M5 Anlasser
Starter motor
Démarreur
M6 Kraftstofförderpumpe
Fuel pump
Pompe d´alimetation carburant
M8 AGR-Ventil
EGR-Valve
Vanne EGR
M9 Drosselklappe
Throttle Valve
Vanne d´étranglement

R1 Widerstand zur Generatorerregung
Resistor for battery charger excitation
Résistance pour excitation alternateur
R6 Abgasheizung 1
Exhaust heater 1
chauffage des gaz d´échappement 1
R7 Abgasheizung 2
Exhaust heater 2
chauffage des gaz d´échappement 2

S1 Zündstartschalter
Ignition - start -switch
Clé de contact
S2 Diagnose Anforderungstaster
Diagnostic request switch
Interrupteur de demande de diagnostic
S4 Startschalter (optional) zu B-
Start switch (optional) to B-
Bouton Start (option) sur B-
S6 Schalter für Mehrfachdrehzahl (optional)
Multi state switch(optional)
Commutateur pour plusieurs vitesses (MSS)
S7 Kühlmittelstand Schalter
Coolant level switch
Capteur niveau liquide de refroidissement
S8 Not-Aus - Verdrahtung Kundenseits
Emergency stop - wiring customer side
Arrêt d´urgence - Câblage par le client
S9 Batteriehauptschalter
Battery Main Switch
Interrupteur principal de batterie
SI1 Sicherheitseingang - Neutral-Gang-Schalter
Safety input - Gear neutral switch
entrée de sécurité - Interrupteur de vitesse neutre
SI2 Sicherheitseingang - Park-bremsen-schalter
Safety input - Parking brake switch
entrée de sécurité - Commutateur de frein de stationnement
SI3 Sicherheitseingang - Fussbremse (Redundant)
Safety input - Footbrake (Redundant)
entrée de sécurité - frein à pied (Redundant)
T1 Gleichspannungswandler 24V/12V 20A
DC/DC Converter 24V/12V 20A
Convertisseur DC/DC 24V/12V 20A
ZE Zentralelektrik Platine
Central electric board
Tableau électrique central

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15 / K46 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Nach Zündung aus hat Kl.15 einen Nachlauf von 15 Sek..
After ignition off Kl.15 is delayed for 15 sec..
Après coupure du contact, Kl.15 est retardée pendant 15 secondes.

Anz	Nr.	Datum	Name	Änderung
	00	21.10.22	CR	H.22/081

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 *EDGES OF WORKING PARTS*
Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m
Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101
Schutzvermerk *PROTECTION MARK* nach *ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan

12V/24V

3/4H50N-TIC C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		21.10.22	CR
Gepr.		21.10.22	MO

Werkstoff/ *MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 4

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05679211.1783

HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Material Compliance	FB700
Hatz-Standard - Wiring harness	953253xx

X5

Nr.	Description	Assignment	Label
1			
2	Zündung Ein Kl. 15 mit Nachlauf ignition on clamp 15 with after run Contact allumé borne 15 dépassement du temps (KL.15N)	(KL.15N) (KL.15N)	
3	B- - Masse Ground B- - masse	vom Massepunkt from Ground de la masse	0
4			
A	B+ 5A Spannungsversorgung T15/50 B+ 5A power supply T15/50 B+ alimentation courant T15/50	von der Zentralelektrik from centralelectric du électrique central	1
B	Zündung Ein Klemme 15 ignition on clamp 15 Contact allumé borne 15	T15 - K46	15
C	Startsignal Klemme 50 startsignal clamp 50 Signal de démarrage borne 50	T50 - K74	50
H	Motor läuft Lampe engine running lamp Lampe témoin moteur en route	ERL - K93(Lowside)	ML
M	Diagnoselampe Lowside diagnostic lamp lowside Lampe témoin de diagnistic lowside	Dia - K90	DIA-

Nr.	Description	Assignment	
N	Motor Start Schalter engine start switch Interrupteur démarrage moteur	ENGSA - K50	
R			
T	Drehzahlwahlschalter multi state switch Commutateur pour plusieurs vitesse (MSS)	MSSRPM - K09	14
U	Masse MSSRPM ground MSSRPM Masse MSSRPM	GR-DIG - K18	0
P	CAN 0 High (Kunden-CAN) CAN 0 high (customer-CAN) CAN 0 High (CAN-client)	CAN H 0 - K66 - V11	CAN +
S	CAN 0 Low (Kunden-CAN) CAN 0 low (customer-CAN) CAN 0 Low (CAN-client)	CAN L 0 - K87 - V12	CAN-
aa	CAN 0 High (Kunden-CAN) CAN 0 high (customer-CAN) CAN 0 High (CAN-client)	CAN H 0 - K66 - V11	CAN +
bb	CAN 0 Low (Kunden-CAN) CAN 0 low (customer-CAN) CAN 0 Low (CAN-client)	CAN L 0 - K87 - V12	CAN-
cc	B-	0 vom Massepunkt 0 from ground 0 de la masse	0
dd	Kl. 15 mit Nachlauf (KL.15N) clamp 15 with after run (KL.15N) Contact allumé borne 15 dépassement du temps (KL.15N)		24
ee			
hh			

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15 /K46 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Nach Zündung aus hat Kl.15 einen Nachlauf von 15 Sek..
After ignition off Kl.15 is delayed for 15 sec..
Après coupure du contact, Kl.15 est retardée pendant 15 secondes.

X1 Steuergerätestecker Kundenseitig
Control unit plug customer side
Connecteur calculateur côté client
X2 Steuergerätestecker Motorseitig
Control unit plug engine side
Connecteur calculateur côté moteur
X3 Stecker für Kraftstofffförderpumpenrelais und Hauptrelais
Plug for fuel pump relay and mainrelay
Connecteur pour pompe d'alimentation carburant et relais principal
X4 Stecker zu Glühzeitsteuergerät
Plug for glow control unit
Connecteur unité de contrôle système de préchauffage"
X5 Stecker für Kundensignale
Plug for customer signals
Connecteur signaux client
X6 CAN-Bus Diagnosestecker
Can bus diagnostic plug
Connecteur CAN-Bus diagnostique
X7 Stecker für Starterrelais
Plug for starterrelay
Connecteur pour relais de démarrage
1X1 B+ Anschluss an der Zentralelektrik
B+ connection on the central electric board
B+ connexion Tableau électrique central

GCU 24V (K3) Pin assignment

6-pol connector
1 - Glowplug 1
2 - not connect
3 - Glowplug 2
4 - Glowplug 3
5 - not connect
6 - Glowplug 4

4-pol connector
1 - ST(Control signal)
2 - 86(ignition on)
3 - DI(Diagnosis signal)
4 - 31(Ground)

Screw M6
B+ powersupply glow plugs

GCU 12V (K3) Pin assignment

1 - Glowplug 1
2 - Glowplug 2
3 - Glowplug 3
4 - Glowplug 4
5 - not connect
6 - 87(ignition on)
7 - 31(Ground)
8 - not connect
9 - DI(Diagnosis signal)
10 - ST(Control signal)
11 - power supply glow plugs

X6-Can Bus 1 diagnostic plug
1 - B+ 5A
2 - B- (Ground)
3 - Can 1 high
4 - Can 1 low

Anz	Nr.	Datum	Name	Änderung
	00	21.10.22	CR	H.22/081

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit SURFACE ROUGHNESS DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 EDGES OF WORKING PARTS
Allgemeintoleranzen GENERAL TOLERANCES DIN ISO 2768 - m
Form- u. Lagetolerierung GEOMETRICAL TOLERANCING DIN ISO 1101
Schutzvermerk PROTECTION MARK nach/ACC. TO DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan

12V/24V

3/4H50N-TIC C81

Maßstab/SCALE 1:1 (:) ISO E

	Name	Datum	Name
CAD			
Gez.	21.10.22	CR	
Gepr.	21.10.22	MO	

Werkstoff/MATERIAL Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 5

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05679211.1783

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HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Material Compliance	FB700
Hatz-Standard - Wiring harness	953253xx

Note 1:
Spannungsversorgung für Kundensteuerung ca. 13V- 4A auch bei 24V Motoren.
Power supply for customer control approx 13V-4A also by 24V-Engines.
Alimentation pour commande client env. 13V-4A également avec moteurs 24V

Note 2:
Batterietrennschalter möglichst nah an der Batterie installieren.
Zuleitung Steuergerät muss auch durch den Trennschalter von der Batterie getrennt werden.
Der Trennschalter darf frühestens 1 Minute (Nachlauf) nach Motorstillstand betätigt werden.Sonst können elektrische Komponenten des Motors zerstört werden.
Der Motor kann und darf unter keinen Umständen durch den Batterietrennschalter abgestellt werden.
Battery disconnector install as close as possible to the battery.
The control unit supply line must be also disconnected from the battery.
The circuit breaker must not be opened until at least 1 minute (after-run) after the motor has stopped, otherwise electrical components of the motor can be destroyed.
The engine must not be switched off by the battery isolating switch during operation.
Installez l'interrupteur de batterie aussi près que possible de la batterie.
La ligne d'alimentation de l'unité de commande doit également être déconnectée de la batterie à l'aide du l'interrupteur de batterie.
L'interrupteur de batterie doit être actionné au moins 1 minute (dépassement) après l'arrêt du moteur, sinon les composants électriques du moteur peuvent être détruits.
En aucun cas, le moteur ne doit être arrêté à l'aide du coupe-batterie

Note 3:
M4 und GP4 nur bei 4H50TICD
M4 and GP4 only by 4H50TICD
M4 et GP4 seulement à 4H50TICD
T1 nur bei 3/4H50TICD 24V
T1 only by 3/4H50TICD 24V
T1 seulement à 3/4H50TICD 24V

Note 4:
ZE-X8.2 & X8.6 frei verfügbar
ZE-X8.2 & X8.6 freely available
ZE-X8.2 & X8.6 disponible gratuitement

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15 /K46 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Note 6:
erforderlich für Anwendung mobile Maschine für Start und Regeneration
und für Stationärmotoren für Regeneration - Verdrahtung Kundenseits
required for application mobile machine for starting and regeneration
and for stationary engines for regeneration - wiring by customer
requis pour l'application machine mobile pour le démarrage et la régénération
et pour moteurs à l'arrêt pour la régénération - câblage par le client

Klemme 15N und Kl.15K sind nach Zündung aus noch für ca. 20Sek. aktiv. (Nachlauf)
Terminal 15N and Kl.15K are still on for approx. 20 seconds after ignition off.(after run)
Les terminaux 15N et Kl.15K sont toujours allumés pendant env. 20 secondes après la coupure du contact. (après course)

Anz	Nr.	Datum	Name	Änderung
	00	21.10.22	CR	H.22/081

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 *EDGES OF WORKING PARTS*
Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m
Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101
Schutzvermerk *PROTECTION MARK* nach *ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
12V/24V
3/4H50N-TIC C81

Maßstab/SCALE 1:1 (:) ISO E

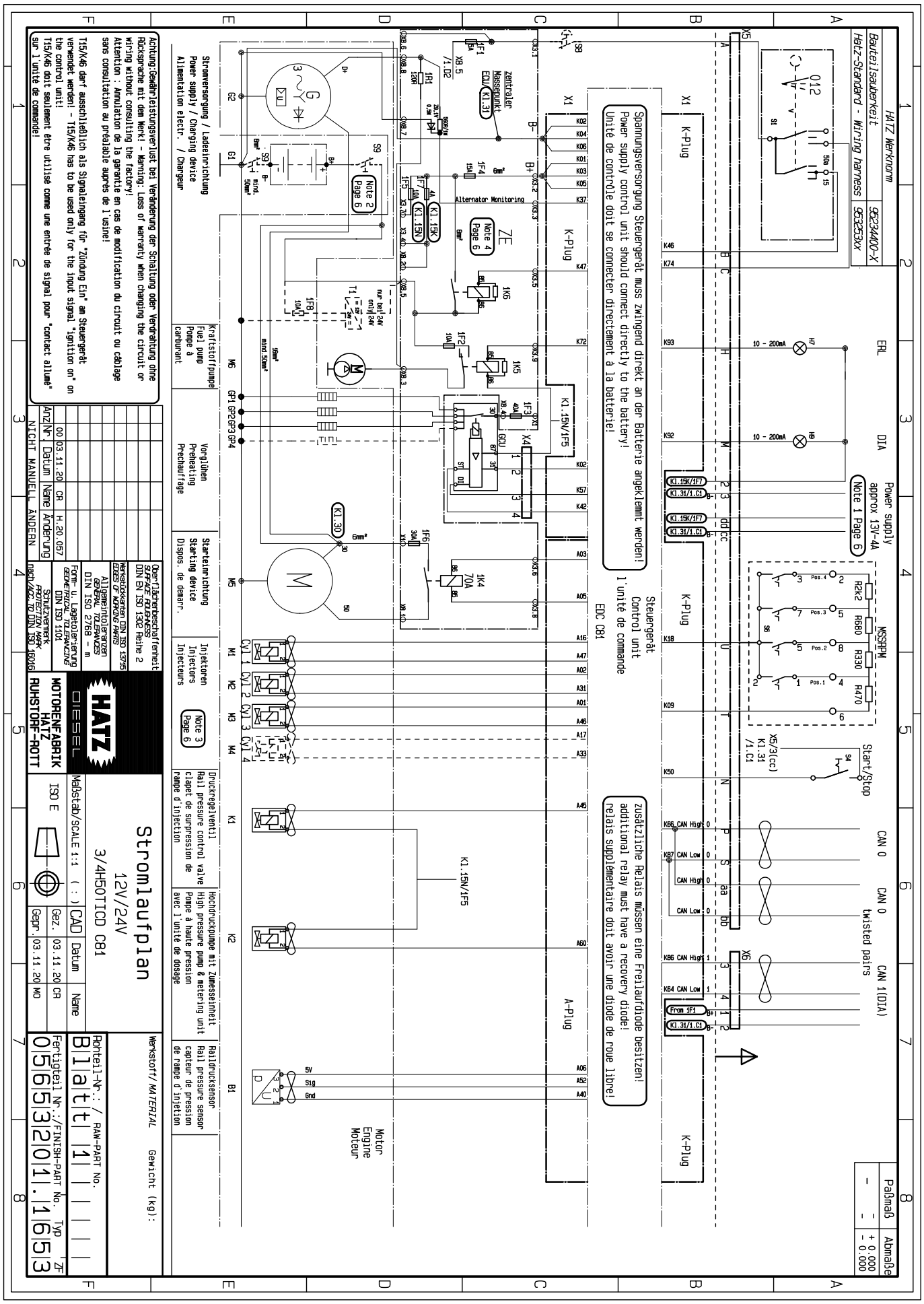
	Datum	Name
CAD		
Gez.	21.10.22	CR
Gepr.	21.10.22	MO

Werkstoff/ *MATERIAL* Gewicht (kg):

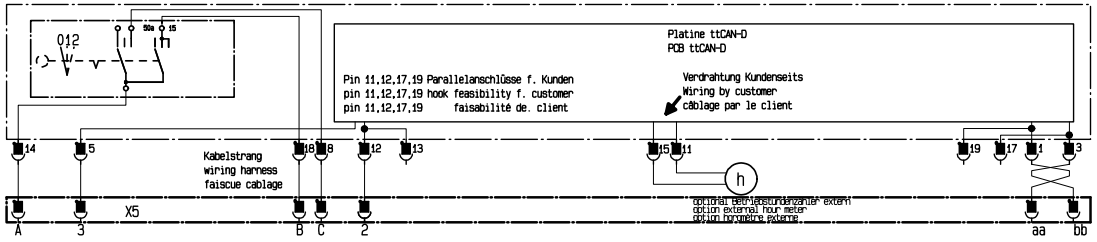
Rohteil-Nr.: / RAW-PART No.
Blatt 6

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05679211.1783

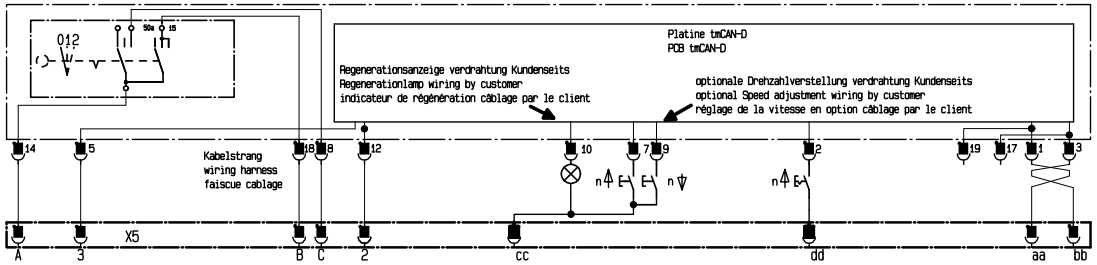
17.3 Circuit diagram C81: TICD 12V/24V double filter system



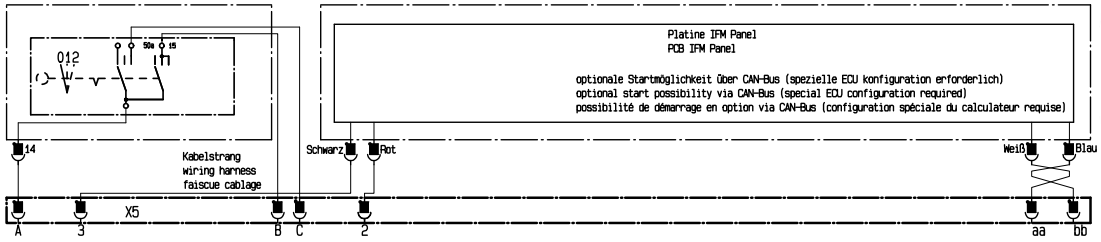
HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Hatz-Standard - Wiring harness	953253xx



TT-CAN-D



TM-CAN-D



IFM-Panel

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! - Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Annulation de la garantie en cas de modification du circuit ou câblage sans consultation au préalable auprès de l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden! - T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15/K46 doit seulement être utilisé comme une entrée de signal pour "contact allumé" sur l'unité de commande!

Anz	Nr.	Datum	Name	Änderung
	00	03.11.20	CR	H.20/057

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach/*ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan

12V/24V

3/4H50TICD C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		03.11.20	CR
Gepr.		03.11.20	MO

Werkstoff/*MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
B|L|A|T|T| |2| | | | |

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0|5|6|5|3|2|0|1|.|1|6|5|3

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HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Hatz-Standard - Wiring harness	953253xx

Paßmaß	Abmaße
– –	+ 0.000
– –	- 0.000

Note 6
Page 6

B7 WFS
S7 (00) CLS (OPU) CLS (F2F)
B8 AFDPS
SI 2 Parking brake switch
SI 1 Gear neutral switch
B11 DPF
B12 DPF T1
B13 DPF T2
B15 PFM
K1.15N/1F5
K1.31/1.C1
K1.15K/1F7
K-Plug
X1

Spannungsversorgung Steuergerät muss zwingend direkt an der Batterie angeklemmt werden!
Power supply control unit should connect directly to the battery!
Unité de contrôle doit se connecter directement à la batterie!

Steuergerät
Control unit
l'unité de commande
EDC C81

zusätzliche Relais müssen eine Freilaufdiode besitzen!
additional relay must have a recovery diode!
relais supplémentaire doit avoir une diode de roue libre!

A-Plug
Shield
A-Plug X2
PM
2K7 70A
2K8 70A
2F8 50A
2F7 50A
B+
Motor
Engine
Moteur
twisted pair
AGR-Ventil
Throttle Valve
Note 5
Page 6

B9 Öldruck-und Temp. Sensor
Oil pressure & temp. sensor
Pression d'huile et le capteur de température

B3 Kraftstoff Niederduck & Temp. Sensor
Fuel low pressure & temp. sensor
Capteur et la température de combustible à basse pression

B4 Kühlmitteltemp. Sensor
Coolant temp. sensor
Capteur de température de liquide de refroidissement

B5 Kurbelwellen-Drehzahlsensor
Crankshaft speed sensor
Capteur de vitesse de vilebrequin

B6 Nockenwellen-Drehzahlsensor
Camshaft speed sensor
Capteur de vitesse de l'arbre à cames

M8 AGR Ventil
EGR valve
Soupape de recirculation des gaz d'échappement

M9 Drosselklappe
Throttle Valve
Vanne d'étranglement

R6 R7 Abgasnachbehandlung
exhaust gas aftertreatment
post-traitement des gaz d'échappement

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! - Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Annulation de la garantie en cas de modification du circuit ou câblage sans consultation au préalable auprès de l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden! - T15/K46 has to be used only for the input signal "ignition on" on the control unit!
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Anz	Nr.	Datum	Name	Änderung
1x	00	03.11.20	CR	H.20/057

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit SURFACE ROUGHNESS DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 EDGES OF WORKING PARTS
Allgemeintoleranzen GENERAL TOLERANCES DIN ISO 2768 - m
Form- u. Lagetolerierung GEOMETRICAL TOLERANCING DIN ISO 1101
Schutzvermerk PROTECTION MARK nach/ACC. TO DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
12V/24V
3/4H50TICD C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		03.11.20	CR
Gepr.		03.11.20	MO

Werkstoff/MATERIAL Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
B|l|a|t|t| |3| | | | |

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0|5|6|5|3|2|0|1|.|1|6|5|3

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HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Hatz-Standard - Wiring harness	953253xx

B1 Raildrucksensor
Railpressuresensor
Capteur pression rail
B2
B3 Kraftstoff Niederdruck & Temperatursensor
Fuel lowpressure & temp. sensor
Capteur température et basse pression carburant
B4 Kühlmitteltemperatursensor
Coolant temperature sensor
Capteur température liquide de refroidissement
B5 Kurbelwellendrehzahlsensor
Crankshaft speed sensor
Capteur régime vilebrequin
B6 Nockenwellendrehzahlsensor
Camshaft speed sensor
Capteur régime arbre à cames
B7 Wasser in Kraftstoffsensor
Water in fuel sensor
Capteur d'eau dans carburant
B8 Luftfilter Differenzdruck Sensor
Air cleaner differential pressure sensor
Capteur pression différence du filtre à air
B9 Öldruck-& Temperatursensor
Oil pressure & temp. sensor
Capteur température et pression d'huile
B10 Fahrzeug-Geschwindigkeitssensor (nur für Cruise control)
Vehicle speed sensor (only for cruise control)
Capteur vitesse du véhicule (seulement pour Cruise Control)
B11 Differenz Druck Sensor Dieselpartikelfilter
Differential pressure sensor Diesel particle filter
Capteur pression différence FAP
B12 DPF Abgastemperatursensor T1 Oxi-Cat Upstream
DPF Exhaust gas temperature sensor T1
FAP capteur température T1
B13 DPF Abgastemperatursensor T2 DPF Upstream
DPF Exhaust gas temperature sensor T2
FAP capteur température T2
B15 PFM Luftmassenstrommesser druckbasierend
PFM Pressure based air mass flow meter
PFM Débitmètre de masse d'air basé sur la pression
1F1 Sicherung T15 /T50 - ZE
Fuse T15/50 - ZE
Fusible T15/50 - ZE
1F2 Sicherung Kraftstoffpumpe - ZE
Fuse fuelpump - ZE
Fusible pompe d'alimentation carburant - ZE
1F3 Sicherung Glühkerzen - ZE
Fuse glow plugs - ZE
Fusible bougies de préchauffage - ZE
1F4 Sicherung Steuergerät B+ - ZE
Fuse control unit B+ - ZE
Fusible calculateur EDC17 B+ - ZE
1F5 Sicherung Zündung ein Klemme 15N - ZE
Fuse ignition on Pin 15N - ZE
Fusible pour Contact Borne 15N - ZE
1F6 Sicherung Starter 50 - ZE
Fuse starter 50 - ZE
Fusible démarreur 50 - ZE

1F7 Sicherung Zündung ein Klemme 15K Kunde - ZE
Fuse ignition on Pin 15K customer - ZE
Fusible pour Contact Borne 15K client - ZE
1F8 Sicherung Spannungswandler - ZE
Fuse DC/DC converter - ZE
Fusible pour les transformateurs de tension - ZE
2F7 Sicherung Abgasheizung 1 - PM
Fuse exhaust heater 1 - PM
Fusible d'échappement 1 - PM
2F8 Sicherung Abgasheizung 2 - PM
Fuse exhaust heater 2 - PM
Fusible d'échappement 2 - PM
G1 Starterbatterie
Starter battery
Batterie
G2 Drehstromgenerator
Battery charger
Alternateur triphasé
GCU Glühzeitsteuergerät
Glow control unit
Unité de contrôle systéme de préchauffage
GP1 Glühkerze 1
Glow plug 1
bougie de préchauffage 1
GP2 Glühkerze 2
Glow plug 2
bougie de préchauffage 2
GP3 Glühkerze 3
Glow plug 3
bougie de préchauffage 3
GP4 Glühkerze 4
Glow plug 4
bougie de préchauffage 4
H7 Motor läuft Anzeigelampe
Engine running lamp
Lampe témoin moteur en route
H9 Diagnoselampe
Diagnistic lamp
Lampe témoin de diagnostique
K1 Druckregelventil
Rail pressure control valve
Clapet de surpression de rampe
K2 Hochdruckpumpe mit Zumesseinheit
High pressure pump & metering unit
Pompe à haute pression avec l'unité de dosage
1K4 Starter Relais
Starter relay
Relais démarreur

1K5 Relais für Kraftstofförderpumpe - ZE
Fuelpump relay - ZE
Relais pompe d'alimentation carburant - ZE
1K6 Hauptrelais Steuergerät Ein - ZE
Mainrelay ECU On - ZE
Relais principal calculateur - ZE
2K7 Relais 1 zur Abgasheizung - PM
Relay 1 for exhaustheater - PM
Relais 2 pour chauffage par gaz d'échappement - PM
2K8 Relais 2 zur Abgasheizung - PM
Relay 2 for exhaustheater - PM
Relais 2 pour chauffage par gaz d'échappement - PM
M1 Injektor Zyl. 1
Injector Cyl. 1
Injecteur Cyl. 1
M2 Injektor Zyl. 2
Injector Cyl. 2
Injecteur Cyl. 2
M3 Injektor Zyl. 3
Injector Cyl. 3
Injecteur Cyl. 3
M4 Injektor Zyl. 4
Injector Cyl. 4
Injecteur Cyl. 4
M5 Anlasser
Starter motor
Démarreur
M6 Kraftstofförderpumpe
Fuel pump
Pompe d'alimetation carburant
M8 AGR-Ventil
EGR-Valve
Vanne EGR
M9 Drosselklappe
Throttle Valve
Vanne d'étranglement
PM DPF Zusatzheizung Platine
DPF Power modul board
DPF Carte du module d'alimentation
R1 Widerstand zur Generatorerregung
Resistor for battery charger excitation
Résistance pour excitation alternateur
R6 Abgasheizung 1
Exhaust heater 1
chauffage des gaz d'échappement 1
R7 Abgasheizung 2
Exhaust heater 2
chauffage des gaz d'échappement 2

S1 Zündstartschalter
Ignition - start -switch
Clé de contact
S2 Diagnose Anforderungstaster
Diagnostic request switch
Interrupteur de demande de diagnostic
S4 Startschalter (optional) zu B-
Start switch (optional) to B-
Bouton Start (option) sur B-
S6 Schalter für Mehrfachdrehzahl (optional)
Multi state switch(optional)
Commutateur pour plusieurs vitesses (MSS)
S7 Kühlmittelstand Schalter
Coolant level switch
Capteur niveau liquide de refroidissement
S8 Not-Aus - Verdrahtung Kundenseits
Emergency stop - wiring customer side
Arrêt d'urgence - Câblage par le client
S9 Batteriehauptschalter
Battery Main Switch
Interrupteur principal de batterie
S10 Geschwindigkeitsregler
Cruise control
Régulateur de vitesse
S11 Bremsen Schalter (nur für cruise control)
Main break switch (only for cruise control)
Interrupteur frein à main (seulement pour Cruise Control)
SI1 Sicherheitseingang - Neutral-Gang-Schalter
Safety input - Gear neutral switch
entrée de sécurité - Interrupteur de vitesse neutre
SI2 Sicherheitseingang - Park-bremsen-schalter
Safety input - Parking brake switch
entrée de sécurité - Commutateur de frein de stationnement
T1 Gleichspannungswandler 24V/12V 20A
DC/DC Converter 24V/12V 20A
Convertisseur DC/DC 24V/12V 20A
ZE Zentralelektrik Platine
Central electric board
Tableau électrique central

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15 / K46 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Nach Zündung aus hat K1.15 einen Nachlauf von 20 Sek..
After ignition off K1.15 is delayed for 20 sec..
Après coupure du contact, K1.15 est retardée pendant 20 secondes.

Anz	Nr.	Datum	Name	Änderung
	00	03.11.20	CR	H.20/057

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit
SURFACE ROUGHNESS
DIN EN ISO 1302 Reihe 2

Werkstückkanten DIN ISO 13715
EDGES OF WORKING PARTS

Allgemeintoleranzen
GENERAL TOLERANCES
DIN ISO 2768 - m

Form- u. Lagetolerierung
GEOMETRICAL TOLERANCING
DIN ISO 1101

Schutzvermerk
PROTECTION MARK
nach *ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
12V/24V
3/4H50TICD C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		03.11.20	CR
Gepr.		03.11.20	MO

Werkstoff/*MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 4

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05653201.1653

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HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Hatz-Standard - Wiring harness	953253xx

X5

Nr.	Description	Assignment	Label
1			
2	Zündung Ein Kl. 15 mit Nachlauf (KL.15K) ignition on clamp 15 with after run (KL.15K) Contact allumé borne 15 dépassement du temps (KL.15K)		
3	B- - Masse Ground B- - masse	vom Massepunkt from Ground de la masse	0
4			
A	B+ 5A Spannungsversorgung T15/50 B+ 5A power supply T15/50 B+ alimentation courant T15/50	von der Zentralelektrik from centralelectric du électrique central	1
B	Zündung Ein Klemme 15 ignition on clamp 15 Contact allumé borne 15	T15 - K46	15
C	Startsignal Klemme 50 startsignal clamp 50 Signal de démarrage borne 50	T50 - K74	50
H	Motor läuft Lampe engine running lamp Lampe témoin moteur en route	ERL - K93(Lowside)	ML
M	Diagnoselampe Lowside diagnostic lamp lowside Lampe témoin de diagnistic lowside	Dia - K90	DIA-

Nr.	Description	Assignment		
N	Motor Start Schalter engine start switch Interrupteur démarrage moteur	ENGSA - K50		
R				
T	Drehzahlwahlschalter multi state switch Commutateur pour plusieurs vitesse (MSS)	MSSRPM - K09		14
U	Masse MSSRPM ground MSSRPM Masse MSSRPM	GR-DIG - K18		0
P	CAN 0 High (Kunden-CAN) CAN 0 high (customer-CAN) CAN 0 High (CAN-client)	CAN H 0 - K66 - V11		CAN +
S	CAN 0 Low (Kunden-CAN) CAN 0 low (customer-CAN) CAN 0 Low (CAN-client)	CAN L 0 - K87 - V12		CAN-
aa	CAN 0 High (Kunden-CAN) CAN 0 high (customer-CAN) CAN 0 High (CAN-client)	CAN H 0 - K66 - V11		CAN +
bb	CAN 0 Low (Kunden-CAN) CAN 0 low (customer-CAN) CAN 0 Low (CAN-client)	CAN L 0 - K87 - V12		CAN-
cc	B-	0 vom Massepunkt 0 from ground 0 de la masse		0
dd	Kl. 15 mit Nachlauf (KL.15K) clamp 15 with after run (KL.15K) Contact allumé borne 15 dépassement du temps (KL.15K)			24
ee				
hh				

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15 /K46 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

X1 Steuergerätestecker Kundenseitig
Control unit plug customer side
Connecteur calculateur côté client
X2 Steuergerätestecker Motorseitig
Control unit plug engine side
Connecteur calculateur côté moteur
X3 Stecker für Kraftstoffförderpumpenrelais und Hauptrelais
Plug for fuel pump relay and mainrelay
Connecteur pour pompe d'alimentation carburant et relais principal
X4 Stecker zu Glühzeitsteuergerät
Plug for glow control unit
Connecteur unité de contrôle système de préchauffage"
X5 Stecker für Kundensignale
Plug for customer signals
Connecteur signaux client
X6 CAN-Bus Diagnosestecker
Can bus diagnostic plug
Connecteur CAN-Bus diagnostique
X7 Stecker für Starterrelais
Plug for starterrelay
Connecteur pour relais de démarrage

GCU 24V (K3) Pin assignment

6-pol connector
1 - Glowplug 1
2 - not connect
3 - Glowplug 2
4 - Glowplug 3
5 - not connect
6 - Glowplug 4

4-pol connector
1 - ST(Control signal)
2 - 86(ignition on)
3 - DI(Diagnosis signal)
4 - 31(Ground)

Screw M6
B+ powersupply glow plugs

GCU 12V (K3) Pin assignment

1 - Glowplug 1
2 - Glowplug 2
3 - Glowplug 3
4 - Glowplug 4
5 - not connect
6 - 87(ignition on)
7 - 31(Ground)
8 - not connect
9 - DI(Diagnosis signal)
10 - ST(Control signal)
11 - power supply glow plugs

Klemme 15N und Kl.15K sind nach Zündung aus noch für ca. 20Sek. aktiv. (Nachlauf)
Terminal 15N and Kl.15K are still on for approx. 20 seconds after ignition off.(after run)
Les terminaux 15N et Kl.15K sont toujours allumés pendant env. 20 secondes après la coupure du contact. (après course)

X6-Can Bus 1 diagnostic plug
1 - B+ 5A
2 - B- (Ground)
3 - Can 1 high
4 - Can 1 low

Anz	Nr.	Datum	Name	Änderung
	00	03.11.20	CR	H.20/057

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit SURFACE ROUGHNESS DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 EDGES OF WORKING PARTS
Allgemeintoleranzen GENERAL TOLERANCES DIN ISO 2768 - m
Form- u. Lagetolerierung GEOMETRICAL TOLERANCING DIN ISO 1101
Schutzvermerk PROTECTION MARK nach/ACC. TO DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan

12V/24V

3/4H50TICD C81

Maßstab/SCALE 1:1 (:) ISO E

	Datum	Name
CAD		
Gez.	03.11.20	CR
Gepr.	03.11.20	MO

Werkstoff/MATERIAL Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 5

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05653201.1653

02-H50T-TICD | 10.2024

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HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Hatz-Standard - Wiring harness	953253xx

Note 1:
Spannungsversorgung für Kundensteuerung ca. 13V- 4A auch bei 24V Motoren.
Power supply for customer control approx 13V-4A also by 24V-Engines.
Alimentation pour commande client env. 13V-4A également avec moteurs 24V

Note 2:
Batterietrennschalter möglichst nah an der Batterie installieren.
Zuleitung Steuergerät muss auch durch den Trennschalter von der Batterie getrennt werden.
Der Trennschalter darf frühestens 1 Minute (Nachlauf) nach Motorstillstand betätigt werden.Sonst können elektrische Komponenten des Motors zerstört werden.
Der Motor kann und darf unter keinen Umständen durch den Batterietrennschalter abgestellt werden.
Battery disconnector install as close as possible to the battery.
The control unit supply line must be also disconnected from the battery.
The circuit breaker must not be opened until at least 1 minute (after-run) after the motor has stopped, otherwise electrical components of the motor can be destroyed.
The engine must not be switched off by the battery isolating switch during operation.
Installez l'interrupteur de batterie aussi près que possible de la batterie.
La ligne d'alimentation de l'unité de commande doit également être déconnectée de la batterie à l'aide du l'interrupteur de batterie.
L'interrupteur de batterie doit être actionné au moins 1 minute (dépassement) après l'arrêt du moteur, sinon les composants électriques du moteur peuvent être détruits.
En aucun cas, le moteur ne doit être arrêté à l'aide du coupe-batterie

Note 3:
M4 und GP4 nur bei 4H50TICD
M4 and GP4 only by 4H50TICD
M4 et GP4 seulement à 4H50TICD
T1 nur bei 3/4H50TICD 24V
T1 only by 3/4H50TICD 24V
T1 seulement à 3/4H50TICD 24V

Note 4:
ZE-X8.2 & X8.6 frei verfügbar
ZE-X8.2 & X8.6 freely available
ZE-X8.2 & X8.6 disponible gratuitement

Note 5
Bei 24V System Glühkerzen in Reihe und nur Relais 2K7 und Rückmeldung K56 aktiv.
By 24V system Glowplugs in serial and Relay 2K7 and feedback K56 activ.
à 24V système bougies de préchauffage connectées en série et seulement relais 2K7 et Commentaires K56 actif

Note 6:
erforderlich für Anwendung mobile Maschine für Start und Regeneration
und für Stationärmotoren für Regeneration - Verdrahtung Kundenseits
required for application mobile machine for starting and regeneration
and for stationary engines for regeneration - wiring by customer
requis pour l'application machine mobile pour le démarrage et la régénération
et pour moteurs à l'arrêt pour la régénération - câblage par le client

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15 /K46 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Klemme 15N und Kl.15K sind nach Zündung aus noch für ca. 20Sek. aktiv. (Nachlauf)
Terminal 15N and Kl.15K are still on for approx. 20 seconds after ignition off.(after run)
Les terminaux 15N et Kl.15K sont toujours allumés pendant env. 20 secondes après la coupure du contact. (après course)

Anz	Nr.	Datum	Name	Änderung
	00	03.11.20	CR	H.20/057

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 *EDGES OF WORKING PARTS*
Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m
Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101
Schutzvermerk *PROTECTION MARK* nach *ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
12V/24V
3/4H50TICD C81

Maßstab/SCALE 1:1 (:) ISO E

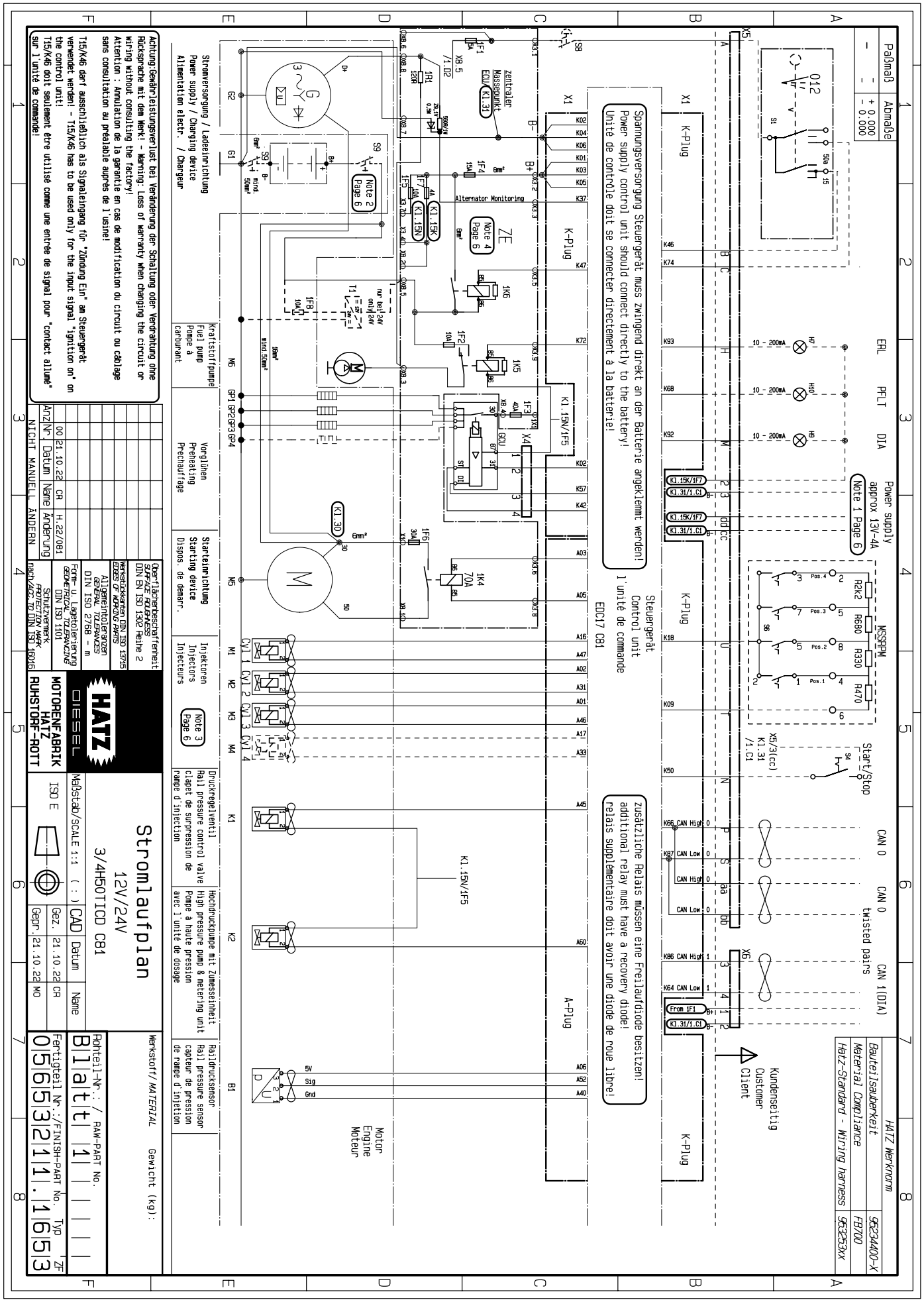
	CAD	Datum	Name
Gez.		03.11.20	CR
Gepr.		03.11.20	MO

Werkstoff/ *MATERIAL* Gewicht (kg):

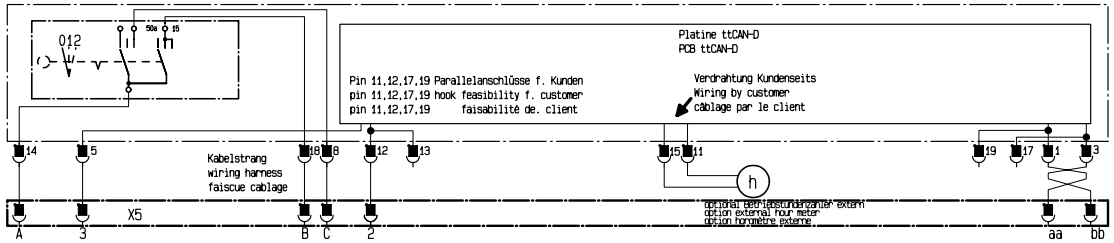
Rohteil-Nr.: / RAW-PART No.
Blatt 6

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05653201.1653

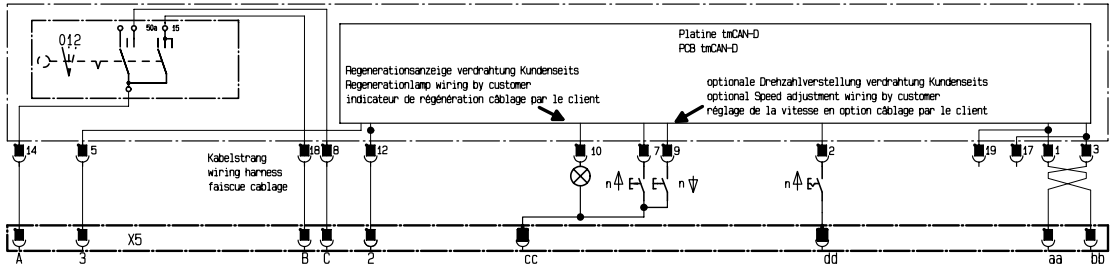
17.4 Circuit diagram C81: TICD 12V/24V single filter system



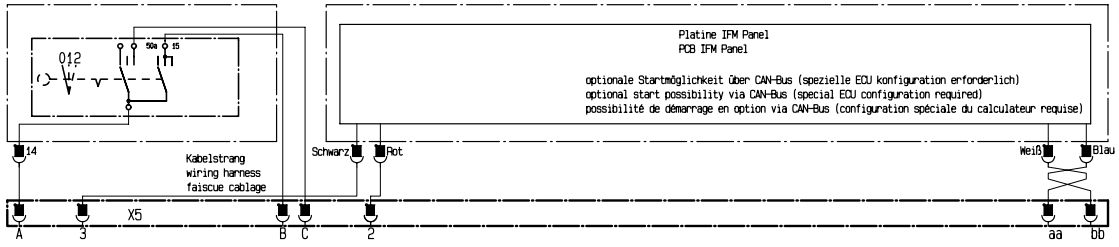
HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Material Compliance	FB700
Hatz-Standard - Wiring harness	953253xx



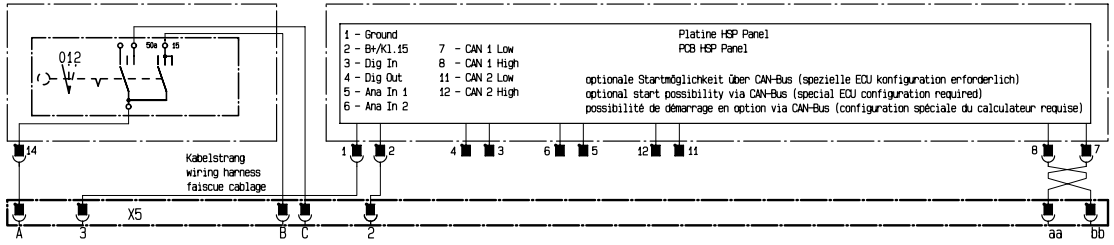
TT-CAN-D

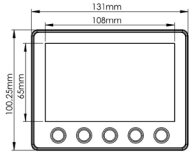


TM-CAN-D



IFM-Panel





HSP-Panel

(00)

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! - Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Annulation de la garantie en cas de modification du circuit ou câblage sans consultation au préalable auprès de l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden! - T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15/K46 doit seulement être utilisé comme une entrée de signal pour "contact allumé" sur l'unité de commande!

Anz	Nr.	Datum	Name	Änderung
1x	00	21.10.22	CR	H.22/081

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 *EDGES OF WORKING PARTS*
Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m
Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101
Schutzvermerk *PROTECTION MARK* nach/*ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
12V/24V
3/4H50TICD C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		21.10.22	CR
Gepr.		21.10.22	MO

Werkstoff/*MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
BLATT 2

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05653211.1653

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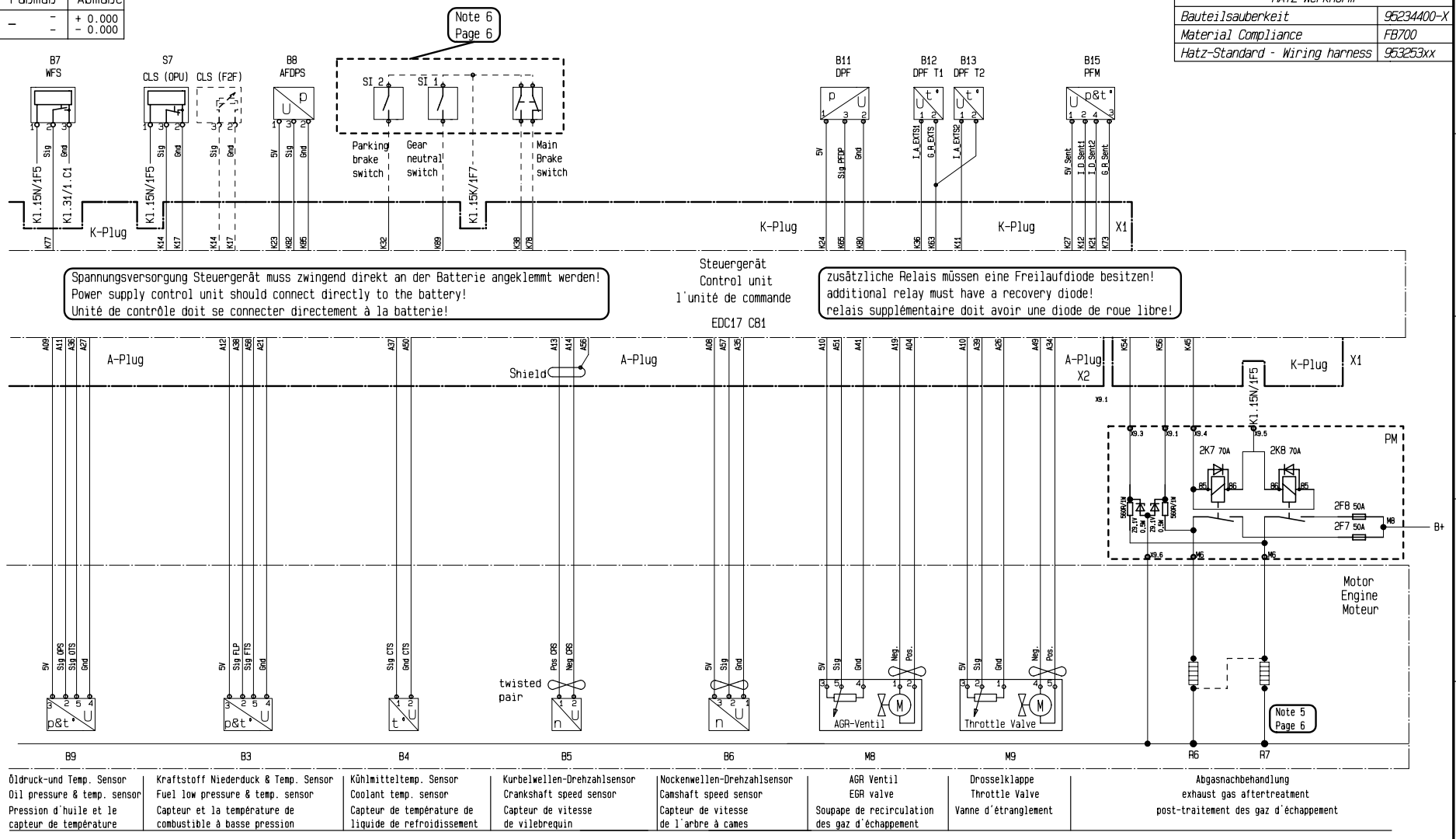
Paßmaß	Abmaße
– –	+ 0.000 – 0.000

HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Material Compliance	FB700
Hatz-Standard - Wiring harness	953253xx



Öldruck-und Temp. Sensor Oil pressure & temp. sensor Pression d'huile et le capteur de température	Kraftstoff Niederduck & Temp. Sensor Fuel low pressure & temp. sensor Capteur et la température de combustible à basse pression	Kühlmitteltemp. Sensor Coolant temp. sensor Capteur de température de liquide de refroidissement	Kurbelwellen-Drehzahlsensor Crankshaft speed sensor Capteur de vitesse de vilebrequin	Nockenwellen-Drehzahlsensor Camshaft speed sensor Capteur de vitesse de l'arbre à cames	AGR Ventil EGR valve Soupape de recirculation des gaz d'échappement	Drosselklappe Throttle Valve Vanne d'étranglement	Abgasnachbehandlung exhaust gas aftertreatment post-traitement des gaz d'échappement

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk! – Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Annulation de la garantie en cas de modification du circuit ou câblage sans consultation au préalable auprès de l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden! – T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15/K46 doit seulement être utilisé comme une entrée de signal pour "contact allumé" sur l'unité de commande!

Anz	Nr.	Datum	Name	Änderung
	00	21.10.22	CR	H.22/081

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit SURFACE ROUGHNESS DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 EDGES OF WORKING PARTS
Allgemeintoleranzen GENERAL TOLERANCES DIN ISO 2768 – m
Form- u. Lagetolerierung GEOMETRICAL TOLERANCING DIN ISO 1101
Schutzvermerk PROTECTION MARK nach/ACC. TO DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
12V/24V
3/4H50TICD C81

Maßstab/SCALE 1:1 (:) ISO E

CAD	Datum	Name
Gez.	21.10.22	CR
Gepr.	21.10.22	MO

Werkstoff/MATERIAL Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
B|l|a|t|t| |3| | | | |

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0|5|6|5|3|2|1|1|.|1|6|5|3

B1 Raildrucksensor
Railpressuresensor
Capteur pression rail
B2
B3 Kraftstoff Niederdruck & Temperatursensor
Fuel lowpressure & temp. sensor
Capteur température et basse pression carburant
B4 Kühlmitteltemperatursensor
Coolant temperature sensor
Capteur température liquide de refroidissement
B5 Kurbelwellendrehzahlsensor
Crankshaft speed sensor
Capteur régime vilebrequin
B6 Nockenwellendrehzahlsensor
Camshaft speed sensor
Capteur régime arbre à cames
B7 Wasser in Kraftstoffsensor
Water in fuel sensor
Capteur d'eau dans carburant
B8 Luftfilter Differenzdruck Sensor
Air cleaner differential pressure sensor
Capteur pression différence du filtre à air
B9 Ôldruck-& Temperatursensor
Oil pressure & temp. sensor
Capteur température et pression d'huile
B10 Fahrzeug-Geschwindigkeitssensor (nur für Cruise control)
Vehicle speed sensor (only for cruise control)
Capteur vitesse du véhicule (seulement pour Cruise Control)
B11 Differenz Druck Sensor Dieselpartikelfilter
Differential pressure sensor Diesel particle filter
Capteur pression différence FAP
B12 DPF Abgastemperatursensor T1 Oxi-Cat Upstream
DPF Exhaust gas temperature sensor T1
FAP capteur température T1
B13 DPF Abgastemperatursensor T2 DPF Upstream
DPF Exhaust gas temperature sensor T2
FAP capteur température T2
B15 PFM Luftmassenstrommesser druckbasierend
PFM Pressure based air mass flow meter
PFM Débitmètre de masse d'air basé sur la pression
1F1 Sicherung T15 /T50 - ZE
Fuse T15/50 - ZE
Fusible T15/50 - ZE
1F2 Sicherung Kraftstoffpumpe - ZE
Fuse fuelpump - ZE
Fusible pompe d'alimentation carburant - ZE
1F3 Sicherung Glühkerzen - ZE
Fuse glow plugs - ZE
Fusible bougies de préchauffage - ZE
1F4 Sicherung Steuergerät B+ - ZE
Fuse control unit B+ - ZE
Fusible calculateur EDC17 B+ - ZE
1F5 Sicherung Zündung ein Klemme 15N - ZE
Fuse ignition on Pin 15N - ZE
Fusible pour Contact Borne 15N - ZE
1F6 Sicherung Starter 50 - ZE
Fuse starter 50 - ZE
Fusible démarreur 50 - ZE

1F7 Sicherung Zündung ein Klemme 15K Kunde - ZE
Fuse ignition on Pin 15K customer - ZE
Fusible pour Contact Borne 15K client - ZE
1F8 Sicherung Spannungswandler - ZE
Fuse DC/DC converter - ZE
Fusible pour les transformateurs de tension - ZE
2F7 Sicherung Abgasheizung 1 - PM
Fuse exhaust heater 1 - PM
Fusible d'échappement 1 - PM
2F8 Sicherung Abgasheizung 2 - PM
Fuse exhaust heater 2 - PM
Fusible d'échappement 2 - PM
G1 Starterbatterie
Starter battery
Batterie
G2 Drehstromgenerator
Battery charger
Alternateur triphasé
GCU Glühzeitsteuergerät
Glow control unit
Unité de contrôle systéme de préchauffage
GP1 Glühkerze 1
Glow plug 1
bougie de préchauffage 1
GP2 Glühkerze 2
Glow plug 2
bougie de préchauffage 2
GP3 Glühkerze 3
Glow plug 3
bougie de préchauffage 3
GP4 Glühkerze 4
Glow plug 4
bougie de préchauffage 4
H7 Motor läuft Anzeigelampe
Engine running lamp
Lampe témoin moteur en route
H9 Diagnoselampe
Diagnistic lamp
Lampe témoin de diagnostique
H10 Partikelfilterlampe
Particle filter lamp
Lampe à filtre à particules
K1 Druckregelventil
Rail pressure control valve
Clapet de surpression de rampe
K2 Hochdruckpumpe mit Zumesseinheit
High pressure pump & metering unit
Pompe à haute pression avec l'unité de dosage
1K4 Starter Relais
Starter relay
Relais démarreur

1K5 Relais für Kraftstoffförderpumpe - ZE
Fuelpump relay - ZE
Relais pompe d'alimentation carburant - ZE
1K6 Hauptrelais Steuergerät Ein - ZE
Mainrelay ECU On - ZE
Relais principal calculateur - ZE
2K7 Relais 1 zur Abgasheizung - PM
Relay 1 for exhaustheater - PM
Relais 2 pour chauffage par gaz d'échappement - PM
2K8 Relais 2 zur Abgasheizung - PM
Relay 2 for exhaustheater - PM
Relais 2 pour chauffage par gaz d'échappement - PM
M1 Injektor Zyl. 1
Injector Cyl. 1
Injecteur Cyl. 1
M2 Injektor Zyl. 2
Injector Cyl. 2
Injecteur Cyl. 2
M3 Injektor Zyl. 3
Injector Cyl. 3
Injecteur Cyl. 3
M4 Injektor Zyl. 4
Injector Cyl. 4
Injecteur Cyl. 4
M5 Anlasser
Starter motor
Démarreur
M6 Kraftstofförderpumpe
Fuel pump
Pompe d'alimetation carburant
M8 AGR-Ventil
EGR-Valve
Vanne EGR
M9 Drosselklappe
Throttle Valve
Vanne d'étranglement
PM DPF Zusatzheizung Platine
DPF Power modul board
DPF Carte du module d'alimentation
R1 Widerstand zur Generatorerregung
Resistor for battery charger excitation
Résistance pour excitation alternateur
R6 Abgasheizung 1
Exhaust heater 1
chauffage des gaz d'échappement 1
R7 Abgasheizung 2
Exhaust heater 2
chauffage des gaz d'échappement 2

HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Material Compliance	FB700
Hatz-Standard - Wiring harness	953253xx

S1 Zündstartschalter
Ignition - start -switch
Clé de contact
S2 Diagnose Anforderungstaster
Diagnostic request switch
Interrupteur de demande de diagnostic
S4 Startschalter (optional) zu B-
Start switch (optional) to B-
Bouton Start (option) sur B-
S6 Schalter für Mehrfachdrehzahl (optional)
Multi state switch(optional)
Commutateur pour plusieurs vitesses (MSS)
S7 Kühlmittelstand Schalter
Coolant level switch
Capteur niveau liquide de refroidissement
S8 Not-Aus - Verdrahtung Kundenseits
Emergency stop - wiring customer side
Arrêt d'urgence - Câblage par le client
S9 Batteriehauptschalter
Battery Main Switch
Interrupteur principal de batterie
S10 Geschwindigkeitsregler
Cruise control
Régulateur de vitesse
S11 Bremsen Schalter (nur für cruise control)
Main break switch (only for cruise control)
Interrupteur frein à main (seulement pour Cruise Control)
SI1 Sicherheitseingang - Neutral-Gang-Schalter
Safety input - Gear neutral switch
entrée de sécurité - Interrupteur de vitesse neutre
SI2 Sicherheitseingang - Park-bremsen-schalter
Safety input - Parking brake switch
entrée de sécurité - Commutateur de frein de stationnement
T1 Gleichspannungswandler 24V/12V 20A
DC/DC Converter 24V/12V 20A
Convertisseur DC/DC 24V/12V 20A
ZE Zentralelektrik Platine
Central electric board
Tableau électrique central

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne RÜcksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15 / K46 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Nach Zündung aus hat K1.15 einen Nachlauf von 20 Sek..
After ignition off K1.15 is delayed for 20 sec..
Après coupure du contact, K1.15 est retardée pendant 20 secondes.

Anz	Nr.	Datum	Name	Änderung
	00	21.10.22	CR	H.22/081

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 *EDGES OF WORKING PARTS*
Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m
Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101
Schutzvermerk *PROTECTION MARK* nach/*ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
12V/24V
3/4H50TICD C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		21.10.22	CR
Gepr.		21.10.22	MO

Werkstoff/*MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
B l a t t 4

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0 5 6 5 3 2 1 1 . 1 6 5 3

HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Material Compliance	FB700
Hatz-Standard - Wiring harness	953253xx

X5

Nr.	Description	Assignment	Label
1			
2	Zündung Ein Kl. 15 mit Nachlauf (KL.15K) ignition on clamp 15 with after run (KL.15K) Contact allumé borne 15 dépassement du temps (KL.15K)		
3	B- - Masse Ground B- - masse	vom Massepunkt from Ground de la masse	0
4			
A	B+ 5A Spannungsversorgung T15/50 B+ 5A power supply T15/50 B+ alimentation courant T15/50	von der Zentralelektrik from centralelectric du électrique central	1
B	Zündung Ein Klemme 15 ignition on clamp 15 Contact allumé borne 15	T15 - K46	15
C	Startsignal Klemme 50 startsignal clamp 50 Signal de démarrage borne 50	T50 - K74	50
H	Motor läuft Lampe engine running lamp Lampe témoin moteur en route	ERL - K93(Lowside)	ML
M	Diagnoselampe Lowside diagnostic lamp lowside Lampe témoin de diagnistic lowside	Dia - K90	DIA-

Nr.	Description	Assignment	
N	Motor Start Schalter engine start switch Interrupteur démarrage moteur	ENGSA - K50	
R			
T	Drehzahlwahlschalter multi state switch Commutateur pour plusieurs vitesse (MSS)	MSSRPM - K09	14
U	Masse MSSRPM ground MSSRPM Masse MSSRPM	GR-DIG - K18	0
P	CAN 0 High (Kunden-CAN) CAN 0 high (customer-CAN) CAN 0 High (CAN-client)	CAN H 0 - K66 - V11	CAN +
S	CAN 0 Low (Kunden-CAN) CAN 0 low (customer-CAN) CAN 0 Low (CAN-client)	CAN L 0 - K87 - V12	CAN-
aa	CAN 0 High (Kunden-CAN) CAN 0 high (customer-CAN) CAN 0 High (CAN-client)	CAN H 0 - K66 - V11	CAN +
bb	CAN 0 Low (Kunden-CAN) CAN 0 low (customer-CAN) CAN 0 Low (CAN-client)	CAN L 0 - K87 - V12	CAN-
cc	B-	0 vom Massepunkt 0 from ground 0 de la masse	0
dd	Kl. 15 mit Nachlauf (KL.15K) clamp 15 with after run (KL.15K) Contact allumé borne 15 dépassement du temps (KL.15K)		24
ee			
hh			

GCU 24V (K3) Pin assignment

6-pol connector
1 - Glowplug 1
2 - not connect
3 - Glowplug 2
4 - Glowplug 3
5 - not connect
6 - Glowplug 4

4-pol connector
1 - ST(Control signal)
2 - 86(ignition on)
3 - DI(Diagnosis signal)
4 - 31(Ground)

Screw M6
B+ powersupply glow plugs

GCU 12V (K3) Pin assignment

1 - Glowplug 1
2 - Glowplug 2
3 - Glowplug 3
4 - Glowplug 4
5 - not connect
6 - 87(ignition on)
7 - 31(Ground)
8 - not connect
9 - DI(Diagnosis signal)
10 - ST(Control signal)
11 - power supply glow plugs

X6-Can Bus 1 diagnostic plug
1 - B+ 5A
2 - B- (Ground)
3 - Can 1 high
4 - Can 1 low

Klemme 15N und Kl.15K sind nach Zündung aus noch für ca. 20Sek. aktiv. (Nachlauf)
Terminal 15N and Kl.15K are still on for approx. 20 seconds after ignition off.(after run)
Les terminaux 15N et Kl.15K sont toujours allumés pendant env. 20 secondes après la coupure du contact. (après course)

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15 /K46 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

X1 Steuergerätestecker Kundenseitig
Control unit plug customer side
Connecteur calculateur côté client
X2 Steuergerätestecker Motorseitig
Control unit plug engine side
Connecteur calculateur côté moteur
X3 Stecker für Kraftstoffförderpumpenrelais und Hauptrelais
Plug for fuel pump relay and mainrelay
Connecteur pour pompe d'alimentation carburant et relais principal
X4 Stecker zu Glühzeitsteuergerät
Plug for glow control unit
Connecteur unité de contrôle système de préchauffage"
X5 Stecker für Kundensignale
Plug for customer signals
Connecteur signaux client
X6 CAN-Bus Diagnosestecker
Can bus diagnostic plug
Connecteur CAN-Bus diagnostique
X7 Stecker für Starterrelais
Plug for starterrelay
Connecteur pour relais de démarrage
1X1 B+ Anschluss an der Zentralelektrik
B+ connection on the central electric board
B+ connexion Tableau électrique central

Anz	Nr.	Datum	Name	Änderung
	00	21.10.22	CR	H.22/081

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2
Werkstückkanten DIN ISO 13715 *EDGES OF WORKING PARTS*
Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m
Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101
Schutzvermerk *PROTECTION MARK* nach/*ACC. TO* DIN ISO 16016

HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
12V/24V
3/4H50TICD C81

Maßstab/SCALE 1:1 (:) ISO E

	CAD	Datum	Name
Gez.		21.10.22	CR
Gepr.		21.10.22	MO

Werkstoff/*MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 5

Fertigteil Nr.:/FINISH-PART No. Typ ZF
05653211.1653

02-H50T-TICD | 10.2024

HATZ Werknorm	
Bauteilsauberkeit	95234400-X
Material Compliance	FB700
Hatz-Standard - Wiring harness	953253xx

Note 1:
Spannungsversorgung für Kundensteuerung ca. 13V- 4A auch bei 24V Motoren.
Power supply for customer control approx 13V-4A also by 24V-Engines.
Alimentation pour commande client env. 13V-4A également avec moteurs 24V

Note 2:
Batterietrennschalter möglichst nah an der Batterie installieren.
Zuleitung Steuergerät muss auch durch den Trennschalter von der Batterie getrennt werden.
Der Trennschalter darf frühestens 1 Minute (Nachlauf) nach Motorstillstand betätigt werden.Sonst können elektrische Komponenten des Motors zerstört werden.
Der Motor kann und darf unter keinen Umständen durch den Batterietrennschalter abgestellt werden.
Battery disconnector install as close as possible to the battery.
The control unit supply line must be also disconnected from the battery.
The circuit breaker must not be opened until at least 1 minute (after-run) after the motor has stopped, otherwise electrical components of the motor can be destroyed.
The engine must not be switched off by the battery isolating switch during operation.
Installez l'interrupteur de batterie aussi près que possible de la batterie.
La ligne d'alimentation de l'unité de commande doit également être déconnectée de la batterie à l'aide du l'interrupteur de batterie.
L'interrupteur de batterie doit être actionné au moins 1 minute (dépassement) après l'arrêt du moteur, sinon les composants électriques du moteur peuvent être détruits.
En aucun cas, le moteur ne doit être arrêté à l'aide du coupe-batterie

Note 3:
M4 und GP4 nur bei 4H50TICD
M4 and GP4 only by 4H50TICD
M4 et GP4 seulement à 4H50TICD
T1 nur bei 3/4H50TICD 24V
T1 only by 3/4H50TICD 24V
T1 seulement à 3/4H50TICD 24V

Note 4:
ZE-X8.2 & X8.6 frei verfügbar
ZE-X8.2 & X8.6 freely available
ZE-X8.2 & X8.6 libre disposition

Note 5
Bei 24V System Glühkerzen in Reihe und nur Relais 2K7 und Rückmeldung K56 aktiv.
By 24V system Glowplugs in serial and Relay 2K7 and feedback K56 activ.
à 24V système bougies de préchauffage connectées en série et seulement relais 2K7 et Commentaires K56 actif

Note 6:
erforderlich für Anwendung mobile Maschine für Start und Regeneration
und für Stationärmotoren für Regeneration - Verdrahtung Kundenseits
required for application mobile machine for starting and regeneration
and for stationary engines for regeneration - wiring by customer
requis pour l'application machine mobile pour le démarrage et la régénération
et pour moteurs à l'arrêt pour la régénération - câblage par le client

Achtung:Gewährleistungsverlust bei Veränderung der Schaltung oder Verdrahtung ohne Rücksprache mit dem Werk!
Warning: Loss of warranty when changing the circuit or wiring without consulting the factory!
Attention : Perte de garantie en cas de changement du circuit ou câblage sans consulter l'usine!

T15/K46 darf ausschließlich als Signaleingang für "Zündung Ein" am Steuergerät verwendet werden!
T15/K46 has to be used only for the input signal "ignition on" on the control unit!
T15 /K46 doit être utilisé uniquement pour le signal d'entrée « Contact allumer » sur l'unité de commande!

Klemme 15N und K1.15K sind nach Zündung aus noch für ca. 20Sek. aktiv. (Nachlauf)
Terminal 15N and K1.15K are still on for approx. 20 seconds after ignition off.(after run)
Les terminaux 15N et K1.15K sont toujours allumés pendant env. 20 secondes après la coupure du contact. (après course)

Anz	Nr.	Datum	Name	Änderung
	00	21.10.22	CR	H.22/081

NICHT MANUELL ÄNDERN

Oberflächenbeschaffenheit *SURFACE ROUGHNESS* DIN EN ISO 1302 Reihe 2
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Allgemeintoleranzen *GENERAL TOLERANCES* DIN ISO 2768 - m
Form- u. Lagetolerierung *GEOMETRICAL TOLERANCING* DIN ISO 1101
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HATZ DIESEL
MOTORENFABRIK HATZ RUHSTORF-ROTT

Stromlaufplan
12V/24V
3/4H50TICD C81

Maßstab/SCALE 1:1 (:) ISO E

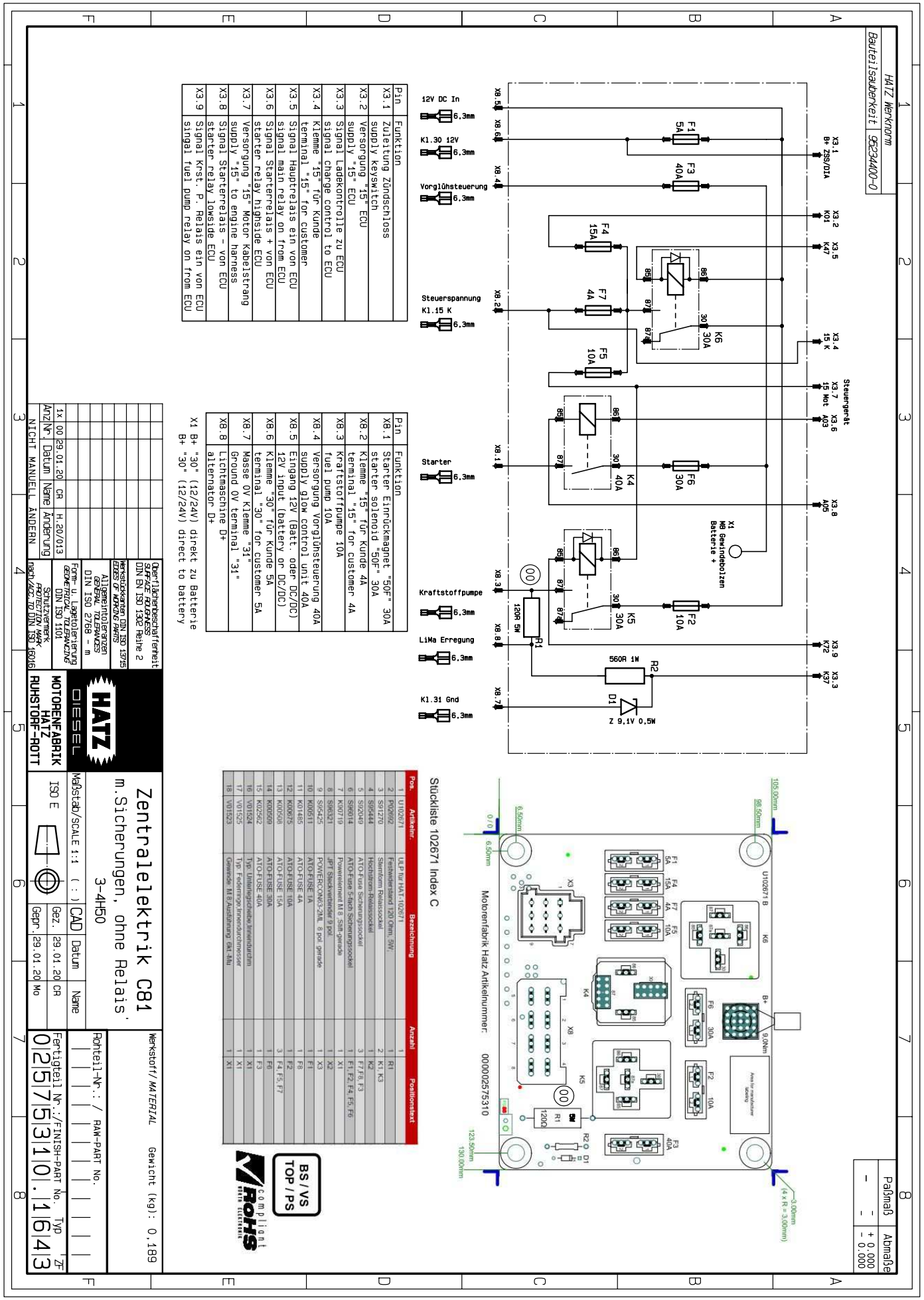
	CAD	Datum	Name
Gez.		21.10.22	CR
Gepr.		21.10.22	MO

Werkstoff/ *MATERIAL* Gewicht (kg):

Rohteil-Nr.: / RAW-PART No.
Blatt 6

Fertigteil Nr.:/FINISH-PART No. Typ ZF
0565321 11.1653

17.5 Circuit diagram C81: Central electric module



Pin	Funktion
X3.1	Zuleitung Zündschloss
	supply keyswitch
X3.2	Versorgung "15" ECU
	supply "15" ECU
X3.3	Signal Ladekontrolle zu ECU
	signal charge control to ECU
X3.4	Klemme "15" für Kunde
	terminal "15" for customer
X3.5	Signal Hauptrelais ein von ECU
	signal main relay on from ECU
X3.6	Signal Starterrelais + von ECU
	starter relay highside ECU
X3.7	Versorgung "15" Motor Kabelstrang
	supply "15" to engine harness
X3.8	Signal Starterrelais - von ECU
	starter relay lowside ECU
X3.9	Signal Krst. P. Relais ein von ECU
	singal fuel pump relay on from ECU

Pin	Funktion
X8.1	Starter Einrückmagnet "50F" 30A
	starter solenoid "50F" 30A
X8.2	Klemme "15" für Kunde 4A
	terminal "15" for customer 4A
X8.3	Kraftstoffpumpe 10A
	fuel pump 10A
X8.4	Versorgung Vorglühsteuerung 40A
	supply glow control unit 40A
X8.5	Eingang 12V (Batt. oder DC/DC)
	12V input (battery or DC/DC)
X8.6	Klemme "30" für Kunde 5A
	terminal "30" for customer 5A
X8.7	Masse 0V Klemme "31"
	Ground 0V terminal "31"
X8.8	Lichtmaschine D+
	alternator D+

Pos.	Artikelnr.	Bezeichnung	Anzahl	Positionstext
1	U102671	LLP for HAT-102671	1	
2	P03692	Freilaufdiode/ 1200hm, 5W	1	R1
3	S91270	Sterntorm Relaissockel	2	K1, K3
4	S95444	Hochstrom-Relaissockel	1	K2
5	S92049	ATO-Fuse Sicherungssockel	3	F7,F6, F3
6	S96014	ATO-Fuse 5-fach Sicherungssockel	1	F1, F2, F4, F5, F6
7	K00719	Powerelement M 8 , Stift gerade	1	X1
8	S96321	JPT Steckverbinder 6 pol.	1	X2
9	S95425	POWERCON63-2M, 8 pol. gerade	1	X3
10	K00511	ATO-FUSE 1A	1	F1
11	K01485	ATO-FUSE 4A	1	F8
12	K00635	ATO-FUSE 10A	1	F2
13	K00508	ATO-FUSE 15A	3	F4, F5, F7
14	K00509	ATO-FUSE 30A	1	F6
15	K02562	ATO-FUSE 40A	1	F3
16	V01524	Typ: Unterlegscheibe, Innendurchm	1	X1
17	V01525	Typ: Federringe, Innendurchmesser	1	X1
18	V01523	Gewinde: M 8,Ausführung: 6kt.-Mu	1	X1

17.6 Circuit diagram C81: TICD Power module