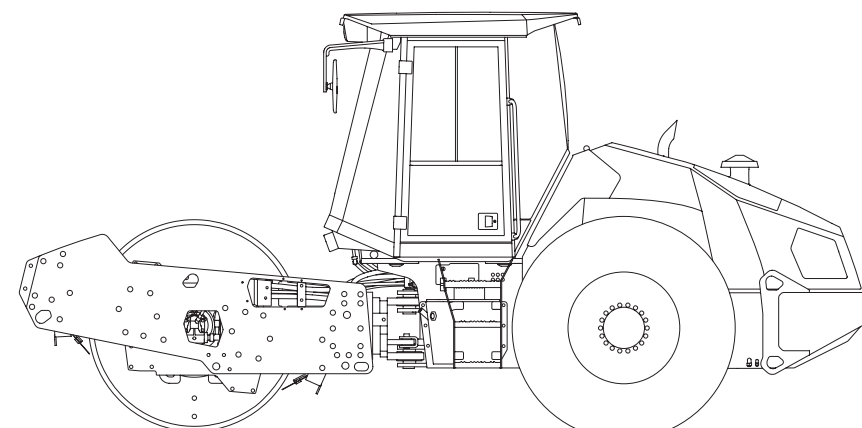


# ARS 150

SINGLE DRUM ROLLER

DEUTZ TCD4.1 L4

EU Stage V / U.S. EPA Tier 4f



## WORKSHOP MANUAL

EDITION 10/2023 EN  
Product Identification Number 3074599 -

**AMMANN**



## **Preface**


Information, specifications, and recommended instructions for the assembly and disassembly of individual machine components or parts contained in this publication represent basic and final information at the time of the printing of this publication. Print errors, technical modifications and modifications of images are reserved. All dimensions and weights are approximate and, therefore, not binding.

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# **AMMANN**

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# **1 Introduction**

# 1 Introduction

---

The workshop manual is divided into separate chapters and contains technical and maintenance data, instructions for adjustment and instructions for the use of special tools, jigs and aids.

The main purpose of this manual is to provide basic information for disassembly, assembly and service repairs of the main subassemblies of the machine.

Labelling of machine subassemblies in this manual corresponds to the spare parts catalogue.

**In order to ensure smooth operation of the AMMANN compaction equipment, use only original spare parts supplied by AMMANN for repairs.**

The manufacturer constantly improves its products on the basis of operational experience and the latest findings. Due to development, the manufacturer reserves the right to change the images, descriptions, procedures and designs presented in this manual.



**Before disassembly, it is recommended to always mark the removed parts for their reassembly and blank off all holes of individual parts of the hydraulic system in order to prevent contamination of the hydraulic circuits.**

**When mounting individual parts on the machine, tighten individual screws or nuts according to the table of tightening torques (see the appendix), unless specified otherwise in the text.**

**When handling the parts, use a crane and slings with adequate load capacity. Weights of individual parts are listed in the electronic spare parts catalogue.**

**During work, always follow the safety instructions and measures given in Chapter 2.**

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## SAFETY NOTICES AND SIGNS:



The notice warns of a serious risk of personal injury or other personal hazards.



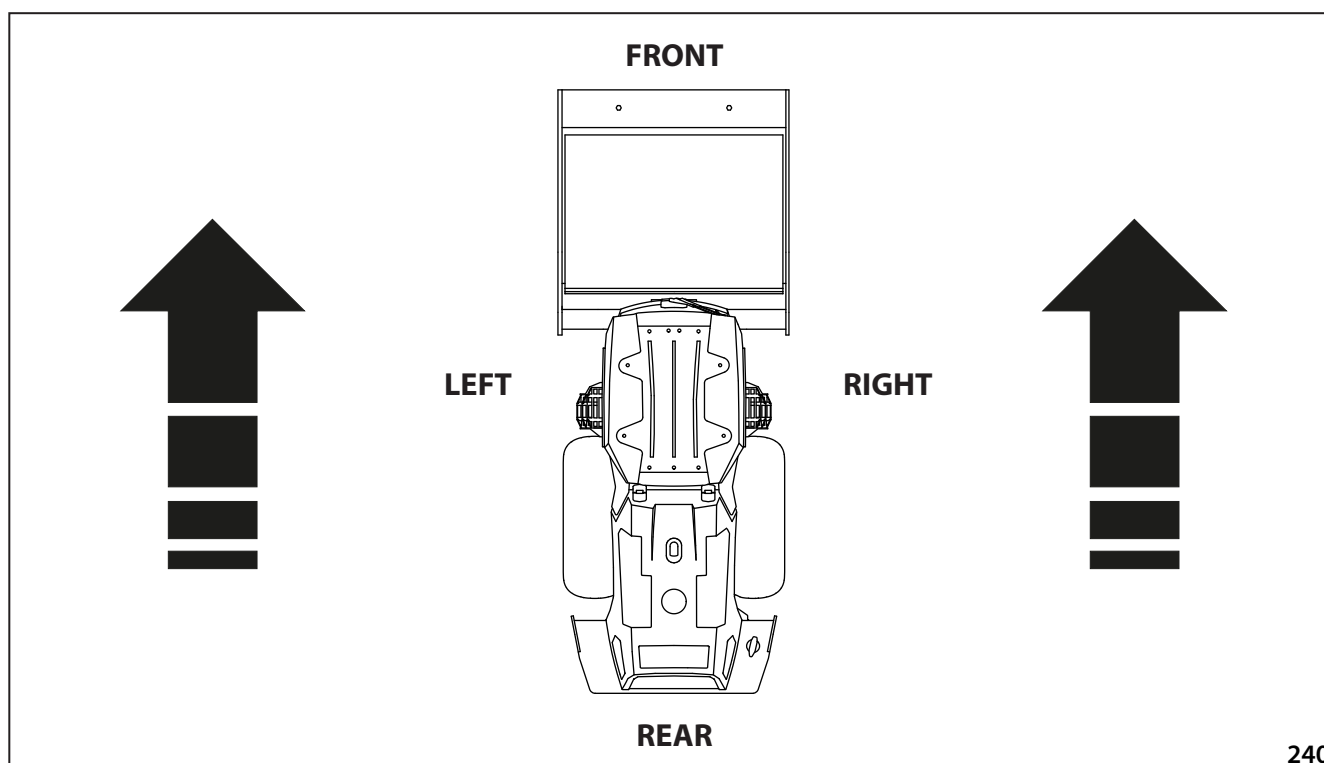
The notice warns of possible damage to the machine or its parts.



The notice warns of the necessity of environmental protection.

### ! CAUTION !

As used in this operating manual, the terms right, left, front and rear indicate sides of the machine moving forward.





## **1.1 About this workshop manual**

This workshop manual is a supplementary document for dealers of ARS vibration rollers. It is a document of Ammann and its subsidiaries in other countries.

### **1.1.1 Who is the workshop manual intended for**

This workshop manual is intended for service technicians in the field and a workshop who are authorised by the user to perform servicing and maintenance.

### **1.1.2 Purpose**

The purpose of this workshop manual is to provide instructions for optimal use and safe operation of the roller, while ensuring the following processes:

- Maintenance
- Repairs

### **1.1.3 Applicability of the workshop manual**

This workshop manual applies to the following rollers:

ARS 150

The roller has a variety of optional equipment, which we can install according to your needs. For this reason, some pictures or descriptions in this workshop manual may differ from your roller.

### **1.1.4 Validity of the workshop manual**

Never remove any chapters from this manual. Missing pages – especially the Safety chapter – must be immediately replaced in case of a loss.

---

## **2 Safety measures and instructions**

## 2 Safety measures and instructions

---

### 2.1 Safety rules

#### **These safety rules must be followed by all persons involved in machine repairs!**

- Repairs of this machine may be carried out only by qualified, professionally trained and experienced workers or by the Service personnel of our dealers.
- Always use our workshop manual when performing repairs. Individual chapters contain special instructions regarding assembly work.
- Before putting the machine into operation, familiarize yourself with the machine controls according to the Operating Manual and make sure you have well understood all the equipment of your machine.
- Do not use the machine if you do not fully understand all operating and control elements and if you do not know exactly how the machine works.
- Familiarize yourself with the area where you work.
- Do not carry out any alterations or modifications to the machine, as this may affect the safety of the machine.
- Original parts and accessories have been designed specifically for this machine.
- Installation and use of spare parts that are not supplied or authorized by the machine manufacturer may have a negative impact on the operational characteristics and safe operation of the machine.
- It is forbidden to remove components of individual parts during the warranty period. If you fail to comply with this prohibition, the warranty of the damaged component will not be recognized.

#### **Safety measures for machine repairs and inspection**

- Wear work clothes and footwear.
- Use gloves when handling oil, fuel and coolant.
- When handling the battery, protect your eyes with goggles or a shield.
- Place the machine on a level and firm surface before performing repairs. Secure the machine against rolling.
- Secure the machine and drum frame against relative rotation with a lock pin and rod.
- Before starting work, remove the key from the ignition, disconnect the batteries and allow hot parts to cool.
- Attach a "machine out of order" sign to the steering wheel and leave it there for the duration of the work.
- Properly wash the entire machine. In the case of steam cleaning, avoid aiming the steam flow directly at electrical components and insulating material or cover them beforehand.
- When removing, installing and repairing individual groups, maintain absolute cleanliness of all parts. Protect removed parts against dirt.
- Clean the surface of removed parts and create a corresponding dust-free work environment with the necessary storage area.
- Handle cleaning agents with caution. Do not use petrol or other flammable substances for cleaning!
- Dry the cleaned parts and immediately coat them with anti-corrosion oil – never install corroded parts!
- Tools, lifting equipment, securing elements, supports and other auxiliary equipment must be in a good, working condition.
- Lifting equipment and slings (ropes, chains) must have adequate load capacity and be intact.
- Ensure sufficient air supply when starting the machine indoors.
- Before putting the machine into operation, make sure there are no persons on the machine or in its dangerous proximity. Use the audible warning signal when putting the machine into operation, always before starting the engine and after each break, before the machine starts moving. Persons located on the machine and in its dangerous proximity must leave the machine and the area after the audible warning signal.
- Do not adjust the machine in operation.
- When performing necessary work on a running engine (adjustment), avoid contact with hot and rotating parts of the machine. Work performed when the engine is running (adjustment) must be carried out in the presence of another person who has immediate access to emergency shut-down and who is continuously in contact with the person performing the adjustment, so that the engine can be immediately switched off if necessary.
- Only use prescribed kinds of engine, transmission and hydraulic oil and coolant.

### **Safety measures for work on hydraulic circuits**

- Before disassembly, make sure the hydraulic circuits are depressurized. Hydraulic oil leaking under pressure may damage your skin and cause serious injury.
- Before disassembly, mark the parts, hoses and pipes.
- Do not put hydraulic pumps and motors into operation without oil.
- Work with hot oil may result in scalding.
- Do not heat the oil to temperatures above 160 °C – the oil or its vapours may ignite.
- When removing hydraulic components, always blank off the hose ends and outlets of the components.
- Use lint-free cloth when wiping and cleaning hydraulic parts.
- When assembling parts, use hydraulic oil as a slip agent – not grease.
- Before installation, carefully clean the fittings and flush and blow compressed air through hoses and pipes.
- Only use new seals.
- Fill new aggregates with hydraulic oil before installation.
- After a hydraulic aggregate replacement, flush the hydraulic circuit and clean the hydraulic tank.
- Replace the oil filter element.
- Fill the hydraulic circuit with clean oil of prescribed viscosity, only when the engine is off!
- Wipe any overflowed oil.
- Check the connections for any leaks before the system pressurizes.
- Check all connections after finishing all work.
- Do not adjust safety valves.
- After finishing work, reinstall all protective elements.

### **Check after putting into operation**

- Oil level in the hydraulic tank.
- Check the charge pressure of replaced hydraulic pumps and the pressure of safety valves.
- Perform the measurement at 40 °C (104 °F).

### **Safety measures for work on the fuel system**

Petrol and diesel mixtures (winter fuel) are as flammable as petrol.

- do not refuel in enclosed spaces,
- wipe any overflowed fuel,
- do not smoke and do not use an open flame while working on the fuel system! There is a risk of fire!

## 2 Safety measures and instructions

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### Safety measures for work on the electrical system

- Disconnect the battery when repairing the charging circuit to prevent accidental short circuits.
- Before removal, disconnect the cable from the negative terminal (-) and then from the positive terminal (+).
- Do not disconnect the batteries when the engine is running.
- Connect the negative battery terminal to the ground and the positive terminal to the "B+" alternator output. The opposite connection would destroy the whole semiconductor equipment.
- When starting using an auxiliary external power supply, do not disconnect this power supply until the machine battery is connected. Pay attention to the starting voltage of the auxiliary external power supply (for 24 V).
- Do not put the alternator into idle operation, i.e. with a disconnected wire from the "B+" terminal and connected "D+" terminal.
- Do not check the presence of voltage in the wire by sparking against the machine frame.
- Do not perform any activities generating sparks.
- Use protective rubber gloves and eye protection when handling batteries.
- Protect your skin and clothes against being splashed by the electrolyte or lead particles.
- In case of eye contact with the electrolyte, immediately flush the affected eye thoroughly with running water for several minutes. Then, seek medical treatment as soon as possible.
- If the electrolyte comes in contact with skin or clothing, remove the clothes, immediately wash the affected areas with soapy water or a solution of baking soda and water and seek medical treatment.
- In case of ingestion of electrolyte, drink the maximum possible amount of milk, magnesium oxide dissolved in water or at least water and immediately seek medical treatment.
- Never fill the cells with distilled water, unless it is followed by work with the machine or recharging outside the machine. It would otherwise cause excessive battery self-discharge.
- Never add acid ( $H_2SO_4$ )!
- Do not turn over the batteries to avoid electrolyte flowing out of the degassing vents.
- In case of acid (electrolyte) spillage, wash the affected area with water and neutralize with lime.
- The charging process releases hydrogen, which forms an explosive, easily combustible mixture with air. Do not smoke or use open flame or lights in the vicinity.

### Welding work on the machine

- Before performing welding work on the machine using an electric arc, disconnect all elements containing semiconductors from the electrical system, including the machine electronics:
  - ground the power supply as well as the repaired machine,
  - protect the power supply against moisture,
  - place the ground terminal in close proximity to the weld joint,
  - When performing welding work on suspended parts or machine, it is necessary to prevent current from reaching the lifting equipment by insulating the point of current transition or using non-conductive slings (hemp rope).

### Sealing

- Use new seals for all installation.
- Seal kits are obtained as spare parts.

### Tightening torques

- In order to apply the correct tightening torque, use a torque spanner.
- Fastening screws and nuts of used quality shall be tightened according to the respective tables.
- The screw quality is indicated on the screw head.
- Different tightening torques are specified in the respective chapters.
- Threaded joints of hydraulic circuits shall be tightened according to the tables.
- The presented tightening torques apply to non-lubricated threads.
- Only use new self-locking nuts.

## **2.2 Environmental and hygiene principles**

When repairing the machines, observe general principles of health and environmental protection as well as laws and regulations related to this issue and being in force within the territory where the machine is used.

### **Hygienic principles**

- Petroleum products, fillings of cooling systems, battery fillings and paints, including thinners, are harmful substances that can cause severe injuries when in contact with body organs.
- It is therefore necessary to strictly follow safety and hygiene instructions of products and use personal protective equipment when handling these substances.
- Workers coming into contact with the above products when repairing the machine are obliged to follow general principles of their own health protection and comply with safety and hygiene manuals of the manufacturers of the products.

In particular we draw your attention to the following:

- protect your eyes and skin while working with the batteries,
  - protect your skin while handling petroleum products, paints and coolants,
  - wash your hands properly after finishing the work and before eating, treat your hands with a suitable reparation cream,
  - when handling the cooling system, follow the instructions given in the manuals supplied with the machine.
- Always store petroleum products, refrigerants, batteries and paints including organic thinners as well as cleaners and preserving agents in original and properly labelled containers. These materials are not allowed to be stored in unlabelled bottles or in any other containers considering the possible risk of confusion. Possible confusion with foodstuffs or beverages is very dangerous.
  - If by accident the skin, eyes or mucous membrane is stained or if you breathe in the vapours of such products, apply immediately the principles of the first aid. In case of accidental ingestion of these products, immediately seek medical help.

### **Environmental measures**

- Discarded operating fluids of individual systems of the machine and also some of its parts become hazardous wastes with dangerous properties for the environment.

This category of waste products includes in particular:

- organic and synthetic lubricating materials, oils and fuels,
  - coolants,
  - battery cartridges and batteries,
  - cleaning and preservative agents,
  - all dismantled filters and filter elements,
  - all used and discarded hydraulic or fuel hoses, rubber-metals and other parts of the machine contaminated by the above mentioned products.
- It is necessary to treat the above mentioned materials and parts after they have been discarded in accordance with relevant national regulations valid for protection of individual parts of the environment and in compliance with health protection regulations.
  - When disassembling hydraulic, fuel and cooling systems and their units. Escape of fluids into the ground has to be prevented by using suitable vessels placed underneath and by plugging of the holes.
  - In case of leakage, the affected area must be immediately dried with the use of sawdust, Vapex, etc.
  - The affected soil must be removed to prevent further leakage. The contaminated soil and absorbent should then be handed over for further safe disposal.

## 2 Safety measures and instructions

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### 2.3 Fire prevention

- The oil change point must be located so that it cannot interfere in the explosion or fire hazard area.
- It must be identified by the tables and signs with "No smoking" signs and signs prohibiting the use of naked fire.
- The handling area must be dimensioned so that it can capture a volume of the flammable liquid equal to the capacity of the biggest transport container.
- It must be equipped with portable fire extinguishers.
- For handling the oil and diesel fuel, use such vessels as metal barrels, jerry cans, sheet-metal cans.
- The transport containers must be properly closed during storage.
- Vessels must be with only one outlet, stored always with the outlet up and secured against the outflow and drains.
- Vessels must be marked by non-removable writing showing the contents and the flammable liquid class.

### Special tools, jigs – see relevant chapters of the manual

### 2.4 Claim conditions and disclaimer of liability

#### 1. Warranty rules

- Regular inspections and correct operation of the equipment
- Products have been registered at the service portal
- The equipment is operated by a trained operator
- Following parts are excluded from warranty: part subject to wear and tear, including, without limitation, rubber washers/wheels, belts, scrapers, sweepers, filters, grease, fluids, conveyor parts, chains, foundation boards, compacting rods, auger elements, bearings, fuel and consumables.
- A warranty for 12 months / 1,000 hours is provided to batteries. Then batteries are included in parts subject to wear and tear and are excluded from the warranty.
- Hydraulic hoses can be purchased from local dealers and charged as an expense to Ammann.

#### 2. Procedure for raising a claim

- In case of raising a warranty claim, the owner/user shall immediately submit the manufacturer a completed warranty claim and images of the fault. The owner/user shall also send a proof of regular maintenance before sending the warranty claim or together with it at the latest.
- Ammann recommends that you send a proof of regular maintenance regularly.
- The document can be sent in various ways (e.g. via the service portal, service application). The document shall contain a machine serial number and a serial number of the original maintenance kit of Ammann. This information can be provided either typed, or scanned according to the selected manner of handover.

#### 3. Breach

- If a dealer breaches obligations stated in points 1) and 2), any warranty claims will be rejected.

## **3 Specification manual**

# 3 Specification manual

## 3.1 Basic data

### Machine description

Single drum roller with an articulated frame with a front smooth drum or a pad-foot steel driven vibratory drum and a rear driven axle with two tyres with tread pattern. Steering using the articulated frame.

### Machine application

**ARS 150** rollers are suitable for medium and large-sized compaction works in transport construction (motorways, railways, airfields), water resources construction (rockfill dams), and building construction (industrial zones, harbours), etc.

**ARS 150 D** roller with a smooth drum is suitable for the compaction of all kinds of soils. It is possible to be used for the compaction of clay soils up to a layer thickness (after compaction) of 30 cm (11.8 in), loam soils up to a layer thickness of 50 cm (19.7 in), mixed soils up to a layer thickness of 70 cm (27.6 in), sandy and gravel materials up to a layer thickness of 80 cm (31.5 in), and rockfill up to a layer thickness of 120 cm (47.2 in). The maximum permissible grain size in a loose layer is 2/3 of the layer thickness. The roller can also be used for compaction by means of stabilisation.

**ARS 150 PD** roller with a padfoot drum (synchronous kneading and vibrating effect) is suitable for the compaction of clay soils up to a layer thickness (after compaction) of 35 cm (13.8 in), loam soils up to a layer thickness of 50 cm (19.7 in), and mixed soils up to a layer thickness of 70 cm (27.6 in).

**ARS 150 HX** for continuous use in severe conditions requiring the continuous application of a high tractive power, or for continuous compaction on a slope above 30 % – smooth drum.

**ARS 150 HXPD** for continuous use in severe conditions requiring the continuous application of a high tractive power, or for continuous compaction on a slope above 30 % – padfoot drum.

The machines are designed for operation in arid, temperate and cold climates according to EN 60721-2-1:2014 with a limited temperature range from -15 °C (5 °F) to +45 °C (113 °F) and a maximum absolute humidity of 25 g.m<sup>-3</sup>.

The standard type of the machine is not intended for road traffic. For more information, please contact your dealer.

**Please fill in the following data:**  
(see nameplate and Deutz engine nameplate)

Machine type  
.....

Product Identification Number  
.....

Year of manufacture  
.....

Engine type  
.....

Serial number of the engine  
.....

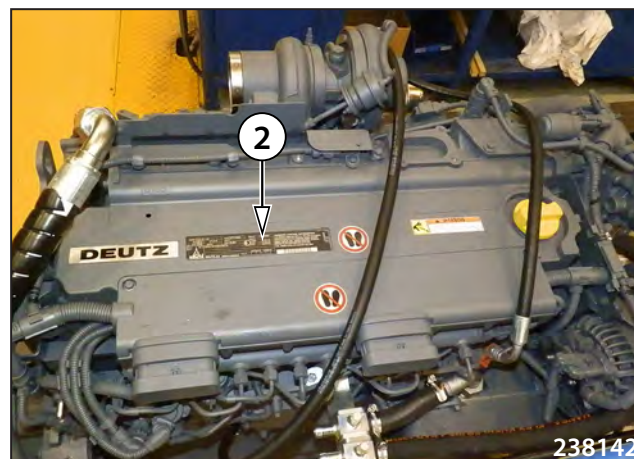
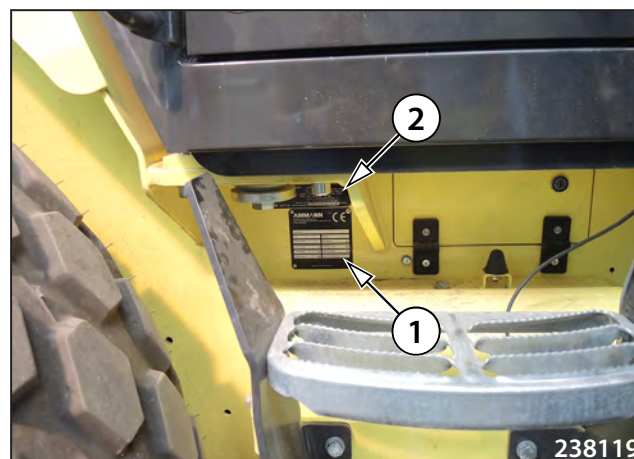
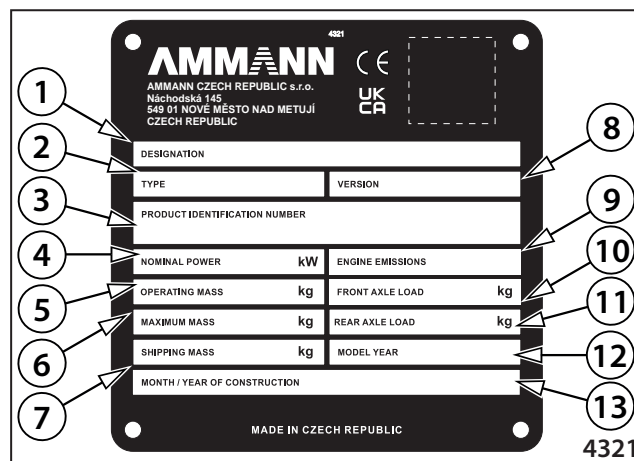
The data mentioned in the table refer always when you contact the dealer or manufacturer.

The machine that complies with the health and safety requirements is provided with a nameplate with CE marking.

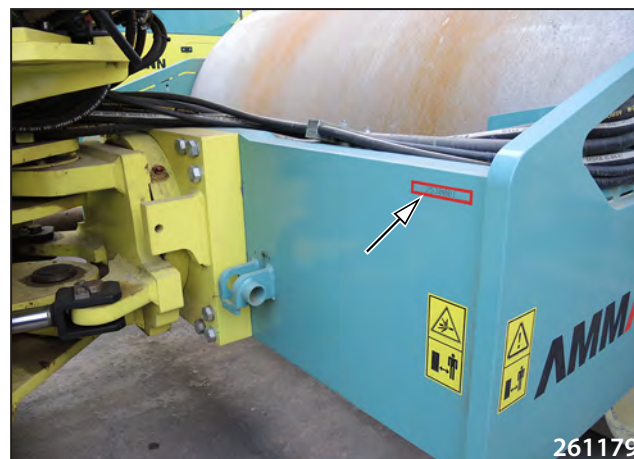
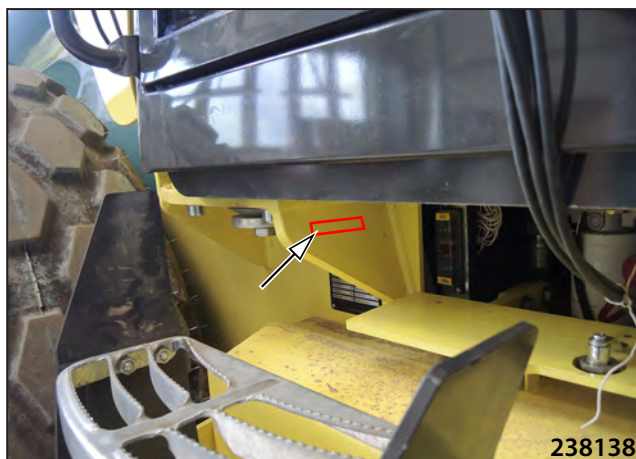
1. Name – always mentioned only in the English version
2. Type
3. Product identification number
4. Rated power
5. Operating weight
6. Maximum weight
7. Shipping weight
8. Version
9. Engine emissions
10. Front axle load
11. Rear axle load
12. Model year
13. Month/year of manufacture

Nameplate position (1)

Engine nameplate position (2)



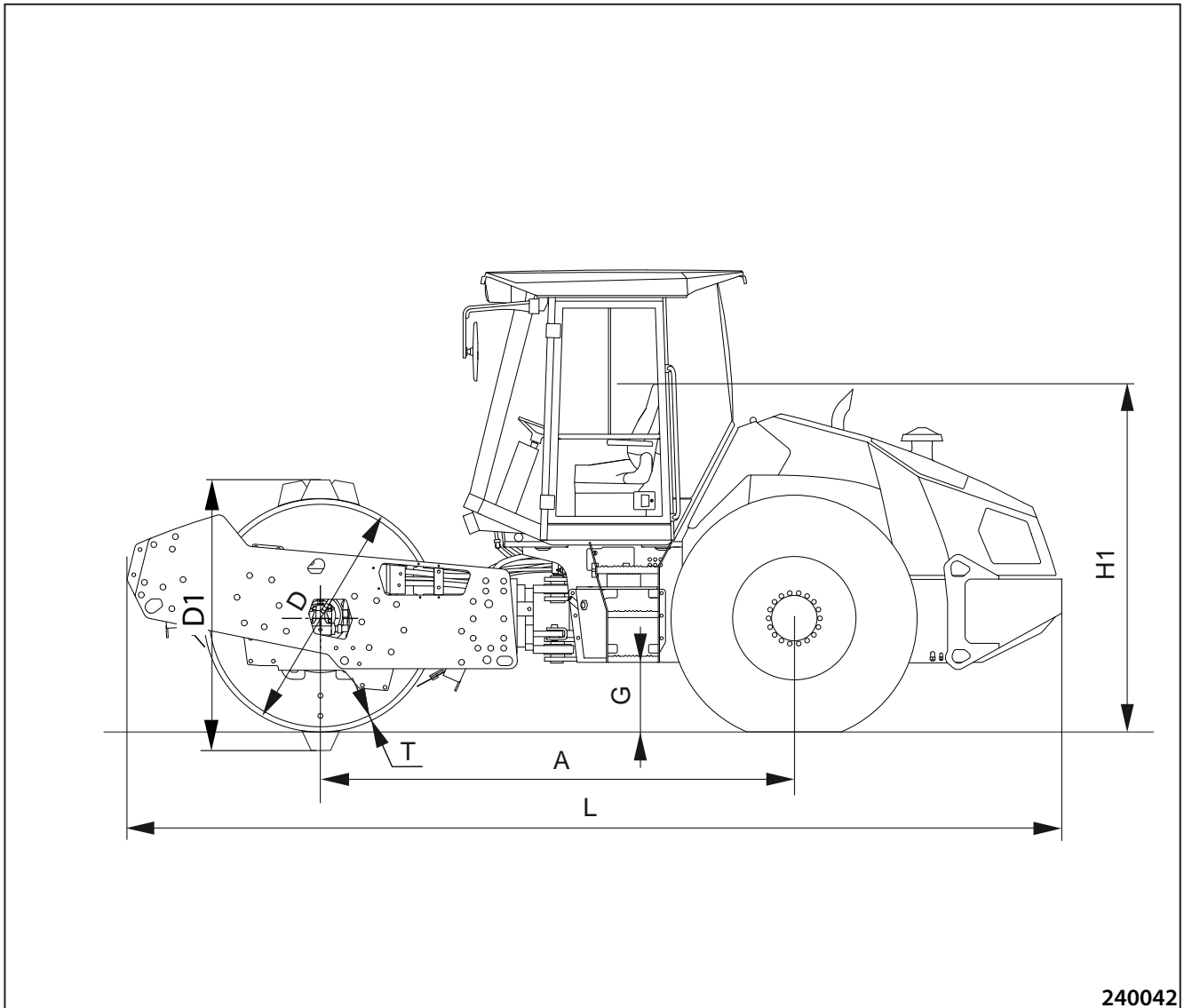
Machine frame number



### 3 Specification manual

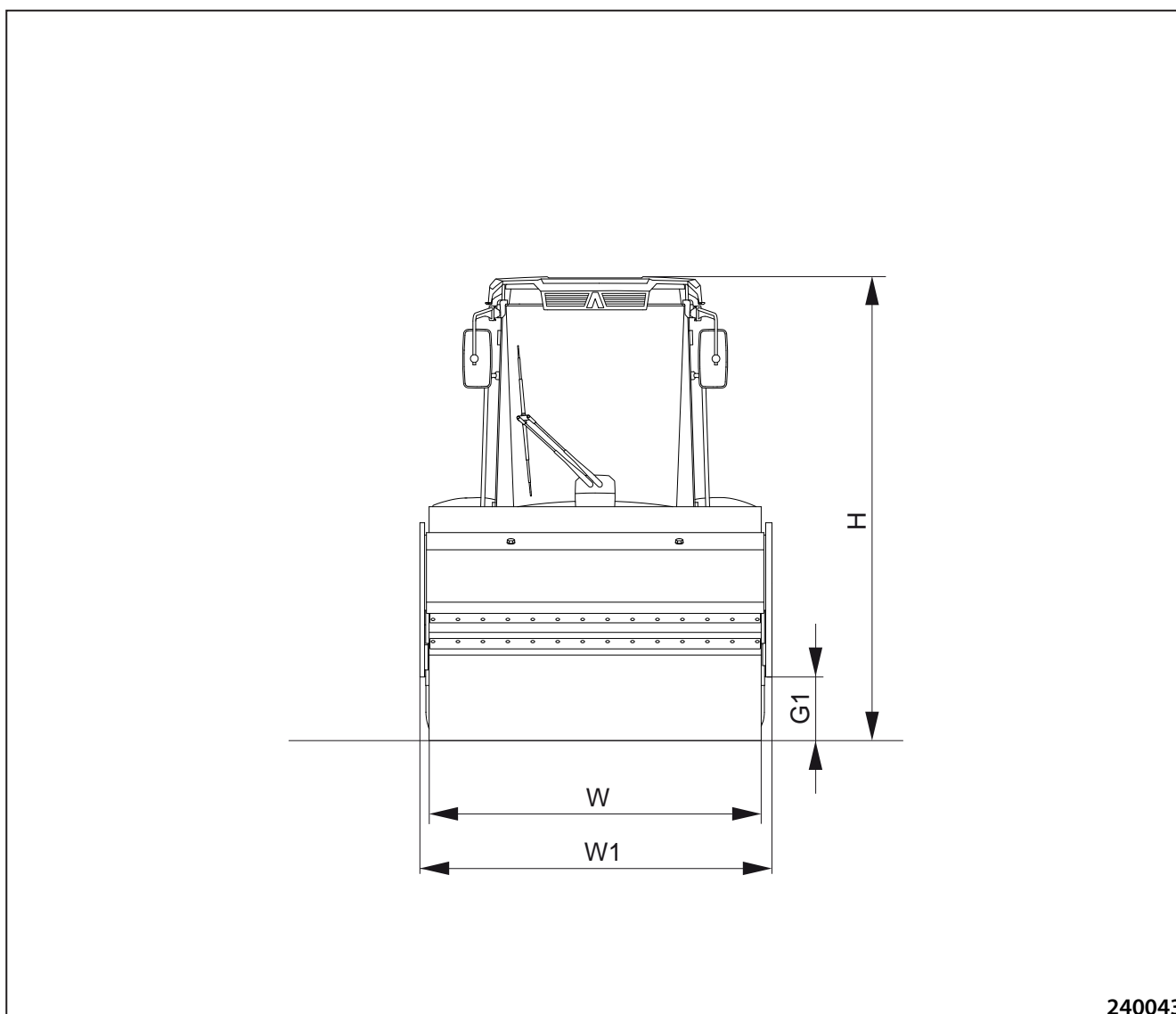
#### 3.2 Dimensioned drawing of the machine

##### Dimensioned drawing of the ARS 150 machine



mm (in)	A	D	D1	G	G1	H	H1	L	T	W	W1
<b>ARS 150 D</b>	3040	1500	1716	430	400	2970	2200	5950	35	2130	2260
	(119.7)	(59.1)	(67.6)	(16.9)	(15.7)	(116.9)	(86.6)	(234.3)	(1.4)	(83.9)	(89.0)
<b>ARS 150 PD</b>	3040	1480	1685	430	400	2970	2200	5950	25	2130	2260
	(119.7)	(58.3)	(66.3)	(16.9)	(15.7)	(116.9)	(86.6)	(234.3)	(1.0)	(83.9)	(89.0)

**Dimensioned drawing of the ARS 150 machine**



**240043**

mm (in)	A	D	D1	G	G1	H	H1	L	T	W	W1
<b>ARS 150 D</b>	3040	1500	1716	430	400	2970	2200	5950	35	2130	2260
	(119.7)	(59.1)	(67.6)	(16.9)	(15.7)	(116.9)	(86.6)	(234.3)	(1.4)	(83.9)	(89.0)
<b>ARS 150 PD</b>	3040	1480	1685	430	400	2970	2200	5950	25	2130	2260
	(119.7)	(58.3)	(66.3)	(16.9)	(15.7)	(116.9)	(86.6)	(234.3)	(1.0)	(83.9)	(89.0)

## 3 Specification manual

### 3.3 Technical data

		ARS 150			
		EU Stage V / U.S. EPA Tier 4f			
		D	HX	PD	HXPD
<b>Weight</b>					
Operating weight of EN 500-1+A1 (CECE) with cab, ROPS	kg (lb)	14510 (31990)	14530 (32030)	14830 (32690)	14850 (32740)
Operating weight of EN 500-1+A1 (CECE) with platform, rail	kg (lb)	14445 (31850)	14465 (31890)	14765 (32550)	14785 (32600)
Operating load of EN 500-1+A1 (CECE) with cab, ROPS on front axis	kg (lb)	8845 (19500)	8865 (19540)	9165 (20210)	9185 (20250)
Operating load of EN 500-1+A1 (CECE) with cab, ROPS on rear axis	kg (lb)	5600 (12350)	5600 (12350)	5600 (12350)	5600 (12350)
Weight of half fluid capacities	kg (lb)	160 (350)	160 (350)	160 (350)	160 (350)
Operating weight of ISO 6016 with cab, ROPS	kg (lb)	14670 (32340)	14690 (32390)	14990 (33050)	15010 (33090)
Maximum weight with the cab, ROPS, accessories, weighing	kg (lb)	17570 (38740)	17590 (38780)	16375 (36100)	16395 (36140)
Maximum permitted weight according to ROPS	kg (lb)	19900 (43870)	19900 (43870)	19900 (43870)	19900 (43870)
Static linear load of front drum	kg/cm (lb/in)	43,4 (243)	43,5 (243,6)	-	-
Cab weight	kg (lb)	825 (1820)	825 (1820)	825 (1820)	825 (1820)
Weight of the platform with railing and canopy (ROPS/FOPS)	kg (lb)	760 (1680)	760 (1680)	760 (1680)	760 (1680)
Weight of blade	kg (lb)	895 (1970)	895 (1970)	895 (1970)	895 (1970)
Ballast weight	kg (lb)	490 (1080)	490 (1080)	490 (1080)	490 (1080)
Weight of 2 padfoot segments	kg (lb)	1515 (3340)	1515 (3340)	-	-
Deduction for the transport weight to the EN 500-1+A1 (CECE) operating weight.	kg (lb)	155 (340)	155 (340)	155 (340)	155 (340)
<b>Driving characteristics</b>					
Number of speeds	-	5+1	4+1	5+1	4+1
Maximum transport speed	km/h (MPH)	12,7 (7,9)	10 (6,2)	12,7 (7,9)	10 (6,2)
Working speed 1	km/h (MPH)	2,2 (1,4)	2,2 (1,4)	2,2 (1,4)	2,2 (1,4)
Working speed 2	km/h (MPH)	3,2 (2)	3,4 (2,1)	3,2 (2)	3,4 (2,1)
Working speed 3	km/h (MPH)	4,3 (2,7)	5,2 (3,2)	4,3 (2,7)	5,2 (3,2)
Working speed 4	km/h (MPH)	6,5 (4)	-	6,5 (4)	-
Loading mode 0	km/h (MPH)	2,2 (1,4)	2,5 (1,6)	2,2 (1,4)	2,5 (1,6)
Climbing ability	%	53	67	54	67
Climbing ability with vibration	%	50	55	50	55
Lateral static stability	%	78	78	78	78
Lateral stability during driving without vibr.	%	20	20	20	20
Lateral stability during driving with vibration	%	15	15	15	15
Maximum gradient when towing machine on slope	%	60	60	60	60
Turning radius inner (edge)	mm (in)	3570 (140,6)	3570 (140,6)	3570 (140,6)	3570 (140,6)
Turning radius outer (contour)	mm (in)	5930 (233,5)	5930 (233,5)	5930 (233,5)	5930 (233,5)
Front approach slope	%	88	88	119	119
Rear approach slope	%	47	47	44	44
Type of drive	-	Hydrostatic	Hydrostatic	Hydrostatic	Hydrostatic
Number of driving axles	-	2	2	2	2
Oscillation angle	°	±10	±10	±10	±10
Angle of steering	°	±36	±36	±36	±36

		<b>ARS 150</b>			
		<b>EU Stage V / U.S. EPA Tier 4f</b>			
		<b>D</b>	<b>HX</b>	<b>PD</b>	<b>HXPD</b>
<b>Steering</b>					
Type of steering	-	Joint	Joint	Joint	Joint
Steering control	-	Hydraulic	Hydraulic	Hydraulic	Hydraulic
Linear hydraulic motors	-	2	2	2	2
<b>Engine</b>					
Manufacturer	-	Deutz	Deutz	Deutz	Deutz
Type	-	TCD4.1 L4	TCD4.1 L4	TCD4.1 L4	TCD4.1 L4
Power according to ISO 14396	kW (HP)	115 (154)	115 (154)	115 (154)	115 (154)
Number of cylinders	-	4	4	4	4
Cylinder capacity	cm <sup>3</sup> (cu in)	4038 (246)	4038 (246)	4038 (246)	4038 (246)
Nominal speed	min <sup>-1</sup> (RPM)	2200	2200	2200	2200
Maximum torque	Nm/rpm	609/1600	609/1600	609/1600	609/1600
Average fuel consumption	l/h (gal US/h)	14,2 (3,8)	14,2 (3,8)	14,2 (3,8)	14,2 (3,8)
DEF (AdBlue) consumption	l/h (gal US/h)	0,24 (0,1)	0,24 (0,1)	0,24 (0,1)	0,24 (0,1)
Engines complies with emission regulations	-	EU Stage V, US EPA Tier 4 Final	EU Stage V, US EPA Tier 4 Final	EU Stage V, US EPA Tier 4 Final	EU Stage V, US EPA Tier 4 Final
Cooling system of engine	-	Liquid	Liquid	Liquid	Liquid
Maximum permitted speed during engine braking	min <sup>-1</sup> (RPM)	2900	2900	2900	2900
<b>Axle</b>					
Maximum tyre pressure	MPa (PSI)	0,16 (23,2)	0,16 (23,2)	0,16 (23,2)	0,16 (23,2)
Pattern of tyres	-	UK 5 Diamond	UK 5 Diamond	TD-01 Tractor	TD-01 Tractor
Number of tyres	-	2	2	2	2
Number of rear wheels	-	2	2	2	2
Size of tyres	-	23,1x26''	23,1x26''	23,1x26''	23,1x26''
Type of tyres	-	Tubeless	Tubeless	Tubeless	Tubeless
Number of pads (only PD version)	-	-	-	140	140
Pad contact surface (only PD version)	cm <sup>2</sup> (sq in)	-	-	120 (18,6)	120 (18,6)
Pad height (only PD version)	mm (in)	-	-	100 (3,9)	100 (3,9)
<b>Brakes</b>					
Operating	-	Hydrostatic	Hydrostatic	Hydrostatic	Hydrostatic
Parking	-	Multiple-disc spring brake	Multiple-disc spring brake	Multiple-disc spring brake	Multiple-disc spring brake
Emergency	-	Multiple-disc spring brake	Multiple-disc spring brake	Multiple-disc spring brake	Multiple-disc spring brake
<b>Vibration</b>					
Frequency I	Hz (VPM)	25-29 (1500-1740)	25-29 (1500-1740)	25-29 (1500-1740)	25-29 (1500-1740)
Frequency II	Hz (VPM)	25-35 ( 1500-2100)	25-35 ( 1500-2100)	25-35 ( 1500-2100)	25-35 ( 1500-2100)
Amplitude I	mm (in)	2,06 (0,081)	2,06 (0,081)	1,93 (0,076)	1,93 (0,076)
Amplitude II	mm (in)	0,96 (0,038)	0,96 (0,038)	0,88 (0,035)	0,88 (0,035)
Centrifugal force I	kN	325	325	325	325
Centrifugal force II	kN	110-215	110-215	110-215	110-215
Type of drive	-	Hydrostatic	Hydrostatic	Hydrostatic	Hydrostatic

### 3 Specification manual

		ARS 150			
		EU Stage V / U.S. EPA Tier 4f			
		D	HX	PD	HXPD
<b>Fluid capacities</b>					
Fuel	l (gal US)	345 (91,1)	345 (91,1)	345 (91,1)	345 (91,1)
Engine (oil filling)	l (gal US)	13,5 (3,6)	13,5 (3,6)	13,5 (3,6)	13,5 (3,6)
Cooling system	l (gal US)	29 (7,7)	29 (7,7)	29 (7,7)	29 (7,7)
Hydraulic system	l (gal US)	90 (23,8)	90 (23,8)	90 (23,8)	90 (23,8)
Drum vibrator	l (gal US)	8,2 (2,2)	8,2 (2,2)	8,2 (2,2)	8,2 (2,2)
Drum cooling liquid (up to -25°C)	l (gal US)	107 (28,3)	107 (28,3)	107 (28,3)	107 (28,3)
Wheel gearbox	l (gal US)	2x1,5 (2x0,4)	2x1,7 (2x0,45)	2x1,5 (2x0,4)	2x1,7 (2x0,45)
Drum gearbox	l (gal US)	2,9 (0,8)	2,6 (0,7)	2,9 (0,8)	2,6 (0,7)
Washer tank	l (gal US)	2,75 (0,7)	2,75 (0,7)	2,75 (0,7)	2,75 (0,7)
DEF (AdBlue) Tank	l (gal US)	22 (5,8)	22 (5,8)	22 (5,8)	22 (5,8)
<b>Wiring</b>					
Voltage	V	24	24	24	24
Battery capacity	Ah	2x90	2x90	2x90	2x90
<b>Noise and vibration emissions</b>					
Measured sound power level A, $L_{pA}$ at the operator's position (cab) *	dB	76	76	76	76
Uncertainty $K_{pA}$ *	dB	2	2	2	2
Guaranteed sound power level A, $L_{WA}$ **	dB	108	108	108	108
Declared highest weighted effective value of vibration acceleration transmitted to the whole body (cab) ***	$m/s^2$ (ft/s <sup>2</sup> )	<0,5 (<1,6)	<0,5 (<1,6)	<0,5 (<1,6)	<0,5 (<1,6)
Declared total value of vibration acceleration transmitted to hands (cab) ***	$m/s^2$ (ft/s <sup>2</sup> )	<3,9 (<12,8)	<3,9 (<12,8)	<3,9 (<12,8)	<3,9 (<12,8)
* measured according to EN 500-4					
** measured according to DIRECTIVE 2000/14/EC and EN 500-4					
*** measured according to EN 1032+A1 while driving with vibration on gravel foundation					

## **4 Specification of operating fluids**

## 4 Specification of operating fluids

### 4.1 Engine oil



The engine oil is specified according to the performance and viscosity classification.

#### Performance classification

With respect to the emission requirements of Tier 4 final, the engine manufacturer requires the use of only such oils that are certified by Deutz.

Permissible oils according to DEUTZ QUALITY CONTROL (DQC):

DQC III LA

DQC IV LA

The current list of oils corresponding to the classification can be found on the engine manufacturer's (Deutz) website ([www.deutz.com](http://www.deutz.com)).

The machine manufacturer uses oil filling according to classification DQC IV LA, type Valar Egida FNA104 10W-40.



**If a failure occurs due to the use of incorrect oil, the warranty shall become void.**

#### Viscosity classification

To determine the SAE (Society of Automotive Engineers) viscosity class, the ambient temperature and type of operation where the machine is used are decisive.

#### Note

Exceeding the lower temperature limit does not result in damage to the engine; it can only cause some starting difficulties.

It is recommended that universal multi-range oils are used to avoid the necessity of oil changes due to changes of ambient temperature.



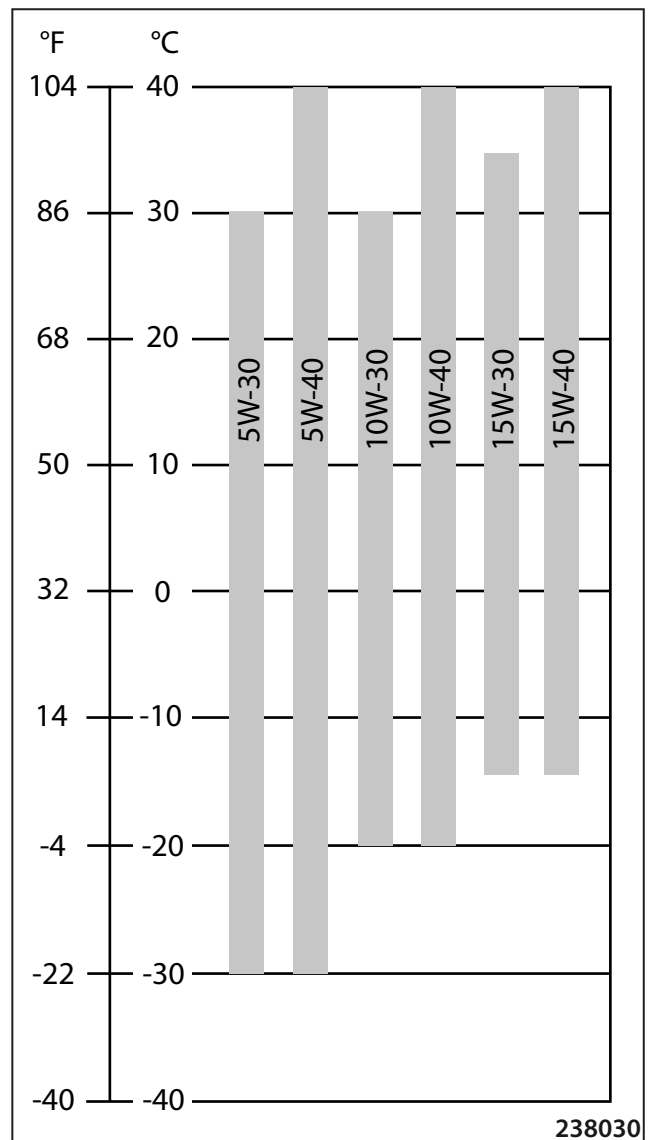
**Exceeding the upper temperature limit can result in decreased lubricating abilities of the oil and cause high oil degradation.**

**When temperatures are below -40 °C, pre-heat the oil before starting the engine.**

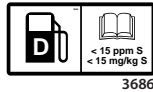


**Reduce the oil change interval by half if at least one of the following applies:**

- The ambient temperature is constantly below -10 °C
- The oil temperature during operation of the machine is below 60 °C.



4.2 Fuel



Diesel fuel is used as fuel for the engine:

- CEN EN 590
- ASTM D975 Grade 1-D S15
- ASTM D975 Grade 2-D S15



The engine manufacturer allows the use of fuel with a sulphur content not exceeding 0.0015 percent by weight (0.0010 percent by weight for the use of the machine in EU).

The use of fuel with a higher sulphur content will result in void of the engine warranty.

At ambient temperatures below 0 °C (32 °F), use winter diesel fuel.

Mixing diesel with special additives is forbidden.

**Use of HVO fuel:**

The EN15940 standard approves the use of hydrotreated vegetable oil (HVO) with no guarantee on the performance level due to the characteristics of the fuel (lower density and calorific value).

4.3 Coolant



The coolant specification must meet requirements of:

DQC CB-14

DQC CC-14



To fill the cooling circuit, use the coolant in the mixing ratio of 50%/50% with high-quality water (thermal protection up to -37 °C).

Change the coolant every 6,000 hours of operation, after 4 years at the latest.

When the thermal protection is required under -37 °C, contact Deutz partners.

**Note:**

The machines are filled with a cooling solution with the Bantleon Avia Antifreeze NG coolant, specification DQC CC-14 at the manufacturer's during the production.

It is a coolant based on monoethylene glycol containing silicates. It does not contain phosphates, nitrates, amines and borates.

There is an Avia NG label placed where the coolant is to be filled into the machine.



Refill the cooling circuit with the same or a completely miscible coolant of the required specification.



If the use of a different, immiscible coolant is necessary, the cooling circuit must be completely drained and cleaned with clean water repeatedly, at least 3 times. However, it is not allowed to use a coolant of a different specification than stated by the engine manufacturer.

## 4 Specification of operating fluids



The coolant protects the cooling system from freezing, corrosion, cavitation, overheating etc.

**It is forbidden to operate the machine without coolant even for a short time.**

**It is forbidden to use a coolant of a different than prescribed specification and base. The engine and the cooling system can get damaged and the warranty lost.**

**Always check the ratio of antifreeze cooling agent in the coolant with a refractometer before the winter season starts.**

### Water quality

Use only water whose properties correspond to values in the table:

	min	max
pH value	6.5	8.5
Chlorine content in mg/l		100
Sulphate content in mg/l		100
Water hardness in mmol/l		3.56

If the water properties do not correspond to the values in the table, the water must be treated.

- Too low pH value:
  - Add dilute sodium hydroxide or caustic potash.
- Too high total hardness:
  - Mix with softened, distilled or desalinated water.
- Too high chloride and/or sulphate value:
  - Mix with softened, distilled or desalinated water.



### Safety instructions:

1. **Protect your hands with protective gloves.**
2. **In case of ingestion immediately seek medical treatment.**
3. **On contact with skin or clothing, immediately wash the affected area with clean water.**
4. **Do not mix different types of coolants. The mixture can cause a chemical reaction with formation of harmful substances.**

## 4.4 Hydraulic oil



For the hydraulic system of the machine, it is necessary to use only high-quality hydraulic oils of class according to ISO 6743/HV (equal to DIN 51524 part 3 HVLV; CETOP RP 91 H).

Fill the machines standardly with a hydraulic oil that has cinematic viscosity of 68 mm<sup>2</sup>/s at 40 °C (104 °F) ISO VG 68. This oil is the most suitable to be used in the widest range of ambient temperatures.



**At high external temperatures when the oil temperature is constantly 90 °C (194 °F), we recommend you to replace the oil with an oil with the kinematic viscosity 100 mm<sup>2</sup>/s – HV 100.**

**If it is necessary to start the machine at temperatures below -8 °C (18 °F) for one month or longer, replace the oil in the hydraulic system with an oil with the kinematic viscosity 46 mm<sup>2</sup>/s – viscosity class HV 46.**

**At temperatures below -13 °C (9 °F), replace it with an oil with the kinematic viscosity of 32 mm<sup>2</sup>/s – class of viscosity HV 32; see Operating manual, chapter 2.9.4.**

### Synthetic hydraulic oil

The hydraulic system can be filled with synthetic oil, which if leakages occur will be degraded completely by micro-organisms present in water and soil.



**Please consult always with oil manufacturer or dealer any switching from mineral oil to synthetic one or mixing the oils of various brands!**

4.5 Gear oil



Use high-quality oils corresponding to API GL-5, or EP or MIL-L-2105 C to lubricate the drum gearbox and the wheel axle drive gearboxes.

Viscosity SAE 80W/90 for ambient temperature range -10 °C ÷ +30 °C (14 °F ÷ 86 °F).

Viscosity SAE 80W/140 for ambient temperature range +20 °C ÷ +45 °C (68 °F ÷ +113 °F).



**The operating temperature of the oil must not exceed 85 °C ÷ 90 °C (185 °F ÷ 194 °F).**

4.6 DEF (AdBlue)



Liquid additive used for the treatment of exhaust gases from SCR diesel engines.

Specification: DIN 70070, ISO 22241-1, ATSTM D 7821.

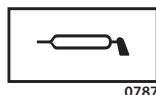
Trade name in Europe: AdBlue

Trade name in the U.S.: DEF



**Use only DEF (AdBlue) according to the recommended specification!**

4.7 Lubricating grease



To lubricate the machine you must use plastic grease containing lithium according to:

ISO 6743/9 CCEB 2

DIN 51 502 KP2K-30

4.8 Screen washer fluid



When filling the windscreen washer tank, use water (for temperatures above 0°C) and windscreen washer fluid for motor vehicles.



**Replace the water with an antifreeze agent at temperatures below 0 °C (32 °F).**

4.9 Drum coolant



**Mixture:**

40 litres of water

91 kg of 34% calcium chloride – CaCl<sub>2</sub>

4.10 Air-conditioning filling




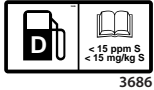










**Mixture:**

1.2 kg coolant Halocarbon 134a

0.2 l of oil PAG 150

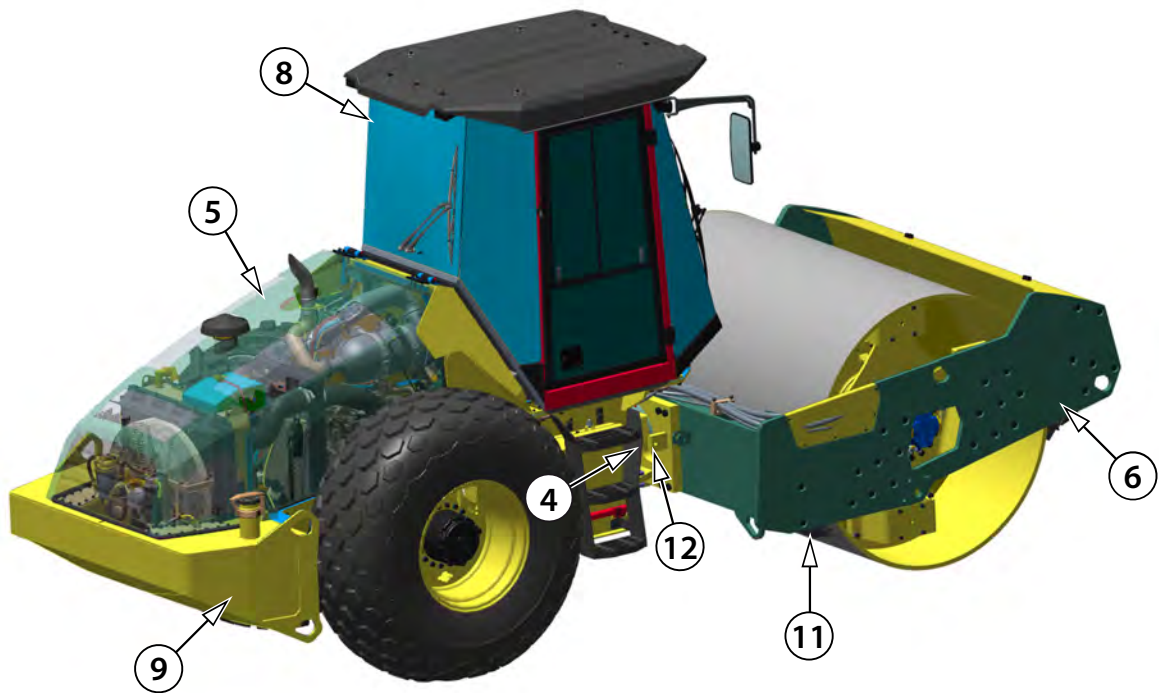
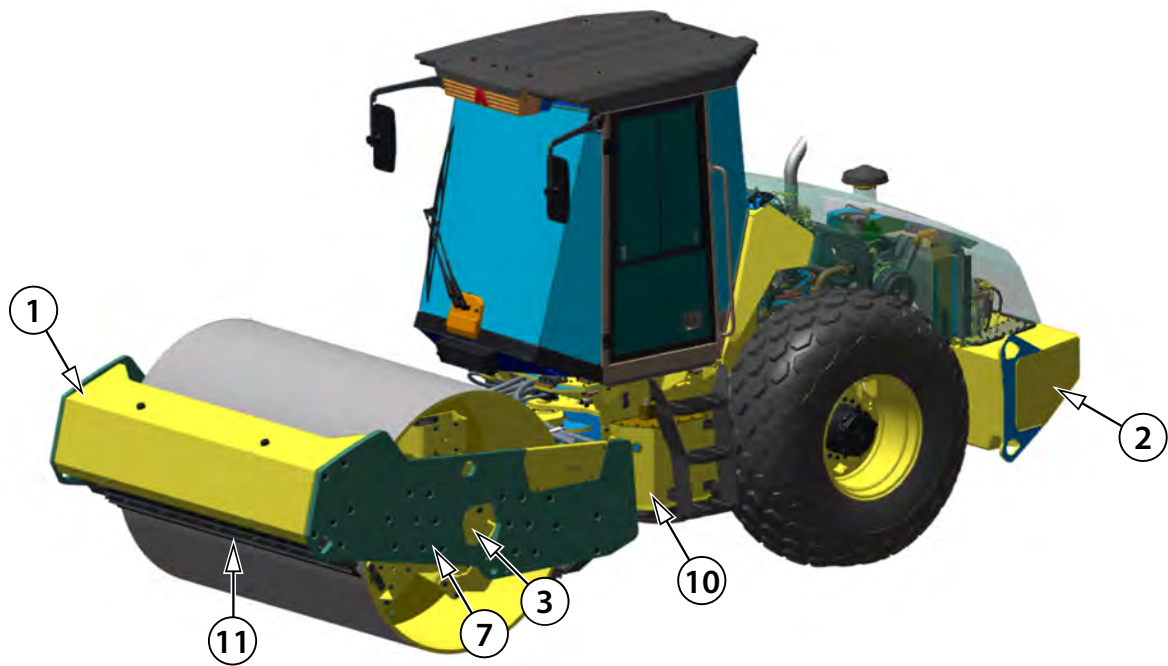
## 4 Specification of operating fluids

### 4.11 Fluids

Part	Fluid type	Fluid quantity l (gal US)	Brand
Engine	Engine oil according to chapter 4.1	13.5 (3.6)	 2412
Fuel tank	Diesel fuel according to chapter 4.2	345 (91.1)	 3686 < 15 ppm S < 15 mg/kg S
Hydrostatic system	Hydraulic oil according to chapter 4.4	90 (23.8)	 2158
Drum gearbox	Gear oil according to chapter 4.5	2.9 (0.8) - D, PD 2.6 (0.7) - HX, HXPD	 2186
Axle gearboxes	Gear oil according to chapter 4.5	2x1.5 (2x0.4) - D, PD 2x1.7 (2x0.45) - HX, HXPD	 2186
DEF tank (AdBlue)	Mixture according to Chapter 4.6	22 (5.8)	 595426
Articulation joint bearings – steering joint & steering cylinders	Plastic grease according to chapter 4.7	as required	 0787
Engine cooling system	Year-round anti-freeze according to Chapter 4.3 – for temperatures up to -25 °C (-13 °F)	29 (7.7)	 2152
Drum coolant	Mixture according to Chapter 4.9	107 (28.3)	 2152
Vibratory drum	Engine oil according to chapter 4.1	7.3 (1.9)	 2412
Air-conditioning	Mixture according to Chapter 4.10	-	 2441
Windscreen washers	Water and anti-freeze agent – ratio according to outdoor temperature	2.75 (0.7)	 2260
Tyres	For air or fluid see Operating instructions, Chap. 2.7.9		

## **5 Frame**

# 5 Frame



240D001

**5.1 Description of basic elements**

1. Front frame
2. Rear frame
3. Vibration hydraulic motor
4. Machine locking
5. Bonnet
6. Right side wall
7. Left side wall
8. Integrated ROPS frame
9. Fuel tank
10. Hydraulic tank, hydraulic oil level indicator
11. Drum scraper
12. Steering joint

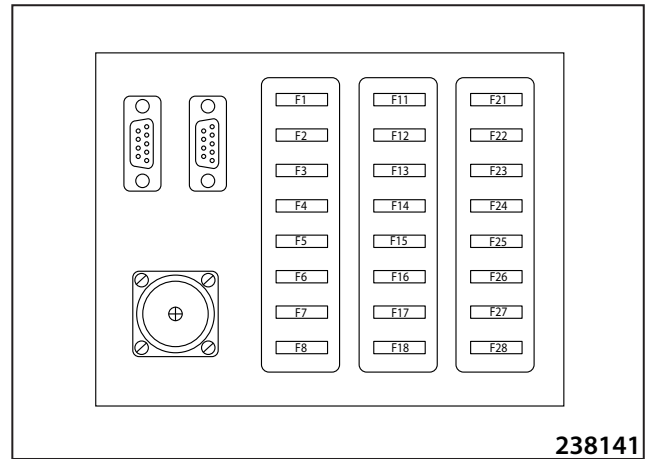
## 5 Frame

### 5.3 Electrical installation

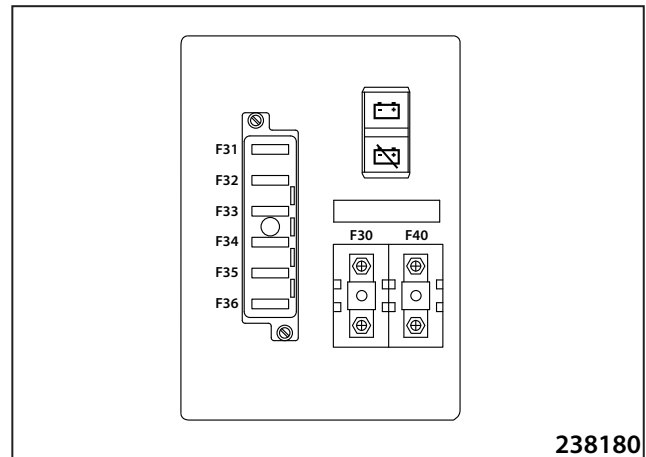
#### 5.3.1 Fuses

##### Fuse box

Fuse (F1)	10 A	Sockets 12 V
Fuse (F2)	15 A	Parking lights, Rear lights, License plate lighting, Road lighting, Cab and bonnet lifting valves
Fuse (F3)	7.5 A	Front headlights, Rear headlights
Fuse (F4)		Reserve
Fuse (F5)	10 A	Cooling fan, RC
Fuse (F6)	7.5 A	Horn, Cab lighting, Directional lights, Beacon, Brake lights
Fuse (F7)	30 A	RC control unit
Fuse (F8)		Reserve
Fuse (F11)	15 A	Engine control unit
Fuse (F12)	5 A	Engine control unit
Fuse (F13)	5 A	Back signal horn, Alternator excitation
Fuse (F14)	10 A	Exciter frequency sensor, Left wheel speed sensor, Fan speed sensor, Low vibration, High vibration
Fuse (F15)	10 A	RC, Brake light, Engine control unit
Fuse (F16)	1 A	RC control unit
Fuse (F17)	7.5 A	Gessmann lever, Engine diagnosis socket, Display
Fuse (F18)	15 A	SCR – NOx sensors
Fuse (F21)	15 A	Converter 24 V/12 V
Fuse (F22)	10 A	Heating fan, Heating servo valve
Fuse (F23)		Reserve
Fuse (F24)	10 A	Wipers, Screen washers
Fuse (F25)	20 A	Rear window heating
Fuse (F26)	2 A	Green beacon
	5 A	Telematic, ACE, Green beacon
Fuse (F27)	5 A	Tachograph, GPS
Fuse (F28)	5 A	Compaction modul
Fuse (F30)	80 A	Main fuse
Fuse (F31)	20 A	Main fuse of cabin
Fuse (F32)	15 A	Engine computer
Fuse (F33)	25 A	SCR
Fuse (F34)		Reserve
Fuse (F35)	5 A	SCR – urea sensor
Fuse (F36)	15 A	Power supply of electronic memories (Telematic, radio, ACE Force)
Fuse (F40)		Reserve



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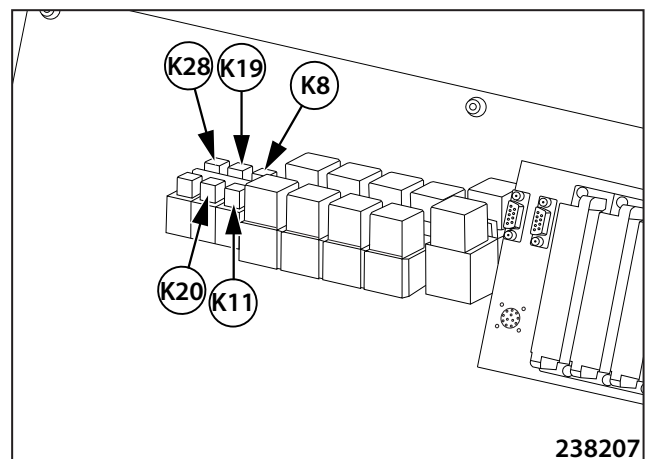
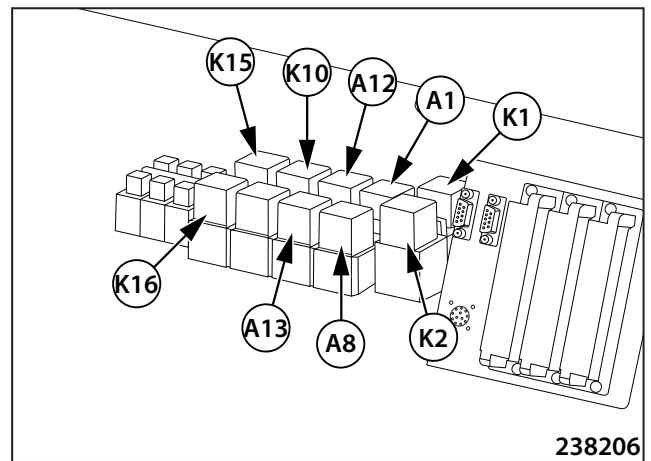
**Always replace the fuses with the fuses of the same value!**

**5.3.2 Relays**

Relays are located under a plastic cover behind the seat.

- K1, K2 – Power circuit 15/54
- K8 – Reversing horn relay
- K10 – Air-conditioning relay
- K11 – Engine blocking relay
- K15 – Rear window heating relay
- K16 – Road lights relay
- K19 – Brake lights relay
- K21 – Engine start contactor – a part of the engine
- K22 – Glowing contactor – a part of the engine
- K28 – Blade valve control relay – floating position

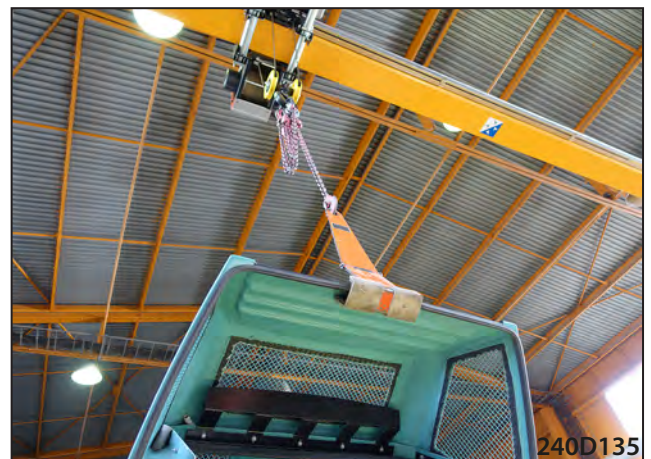
- A1 – Direction indicator signal breaker
- A8 – Rear window heating timer – 5 min
- A12 – Front wiper intermittent
- A13 – Rear wiper intermittent



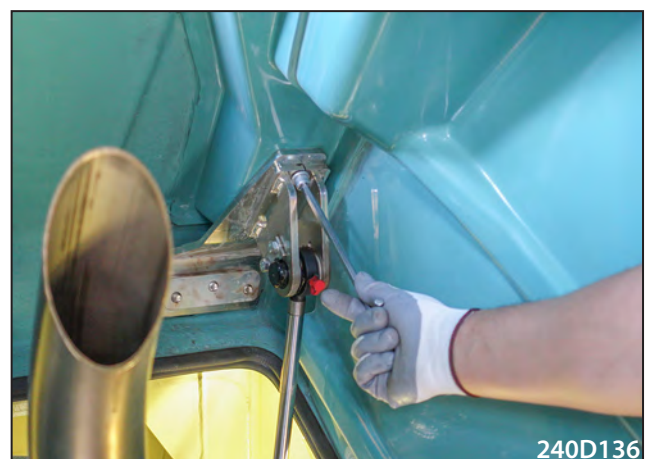
**5.4 Mechanical parts**

**5.4.1 Removal of the bonnet**

Hang the bonnet on the crane of sufficient load capacity. Bonnet weight ca. 50 kg (110 lb).



Remove the screws of the gas struts attachment.



## 5 Frame

Remove the central screws and mount the lifting lugs.



Remove the bonnet hinge screws.



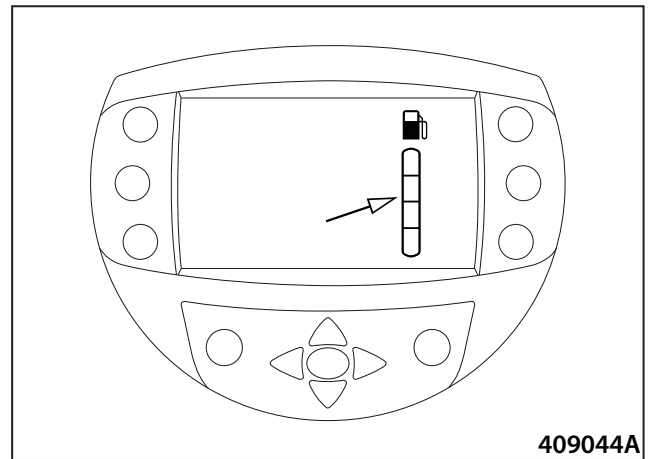
Hang the bonnet on the crane and move it aside.



## 5.5 Fuel tank

### 5.5.1 Fuel level check

Check the fuel volume on the display and refill if necessary.

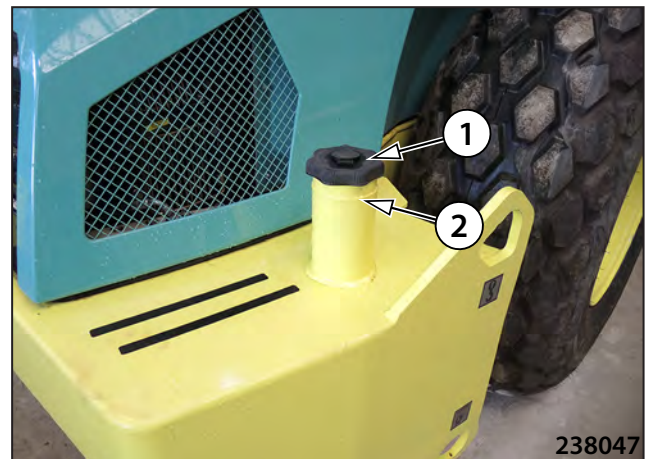


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### 5.5.2 Fuel replenishment

Clean the tank filler cap (1) and the filler neck (2).  
Unlock the lock and remove the cap.

Refill the tank up to the bottom line of the filler neck through the strainer.



238047

#### Note

The fuel tank volume is 345 l (91.1 gal US).



**Do not smoke and do not use open flame while working.**  
**Do not refill the fuel when the engine is running.**



**Do not pump out the tank completely. After the tank is completely pumped out, the whole fuel system must be vented, which is demanding.**

**Use only recommended clean fuel according to Chapter 4.1.2.**

**Do not refill the fuel in closed spaces.**



**Do not spill the fuel.**

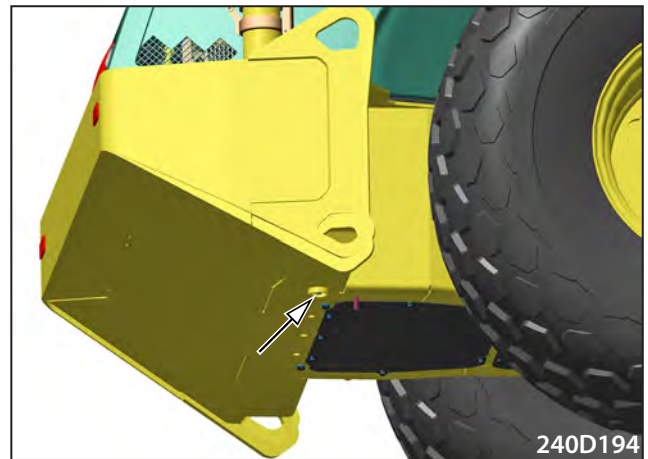
## 5 Frame

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### 5.5.3 Fuel drainage

Unscrew the drain plug and let the oil flow out into the prepared pan.

Remount the plug.



**When cleaning, follow the environment protection regulations.**

**Stop the fuel leakage.**

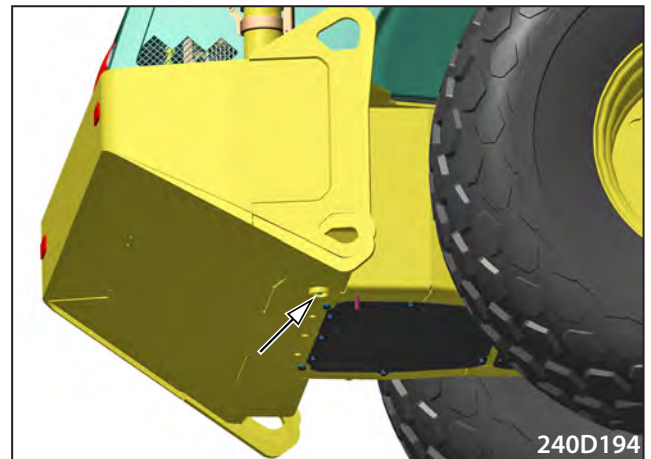
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**5.5.4 Fuel tank cleaning**

Unscrew the drain plug and let the oil flow out into the prepared pan.

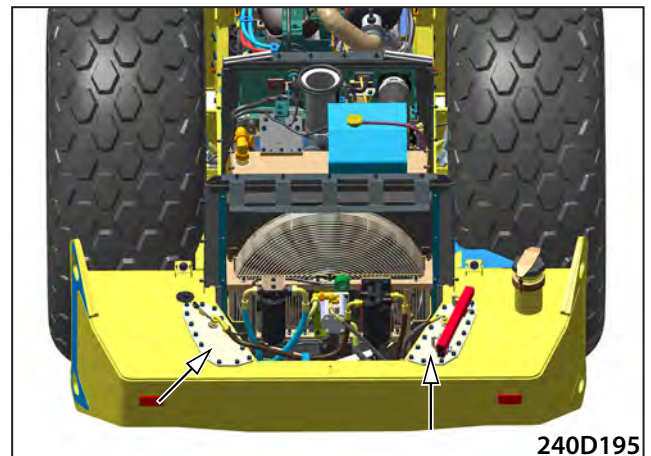
Wash out the tank with clean fuel.

Remount the plug.



If the contamination is heavy, remount the tank cap.

Check and clean the interior of the tank.



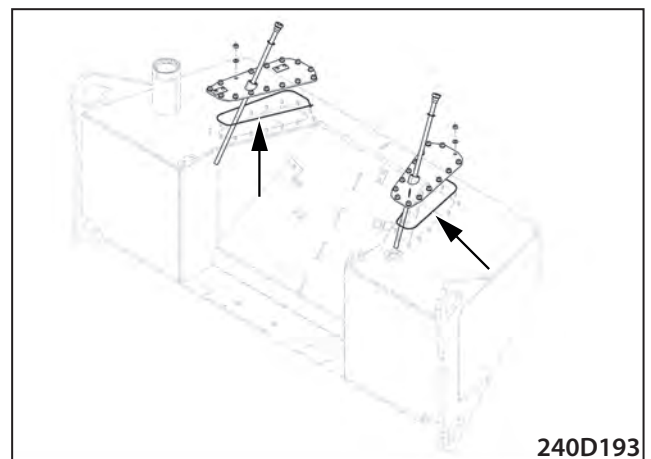
Insert new sealing strips between the cap and the tank.

Remount the caps.

**Note**

Clean the tank when there is a minimum fuel volume there.

After the tank is run out, there is about 20 l [5.3 US gal] in the tank.



**Do not smoke while working!**



**When cleaning, follow the environment protection regulations.**

**Stop the fuel leakage.**

## 5 Frame

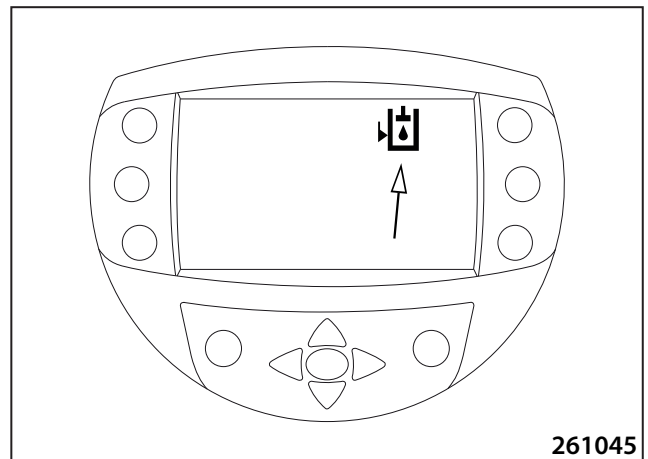
### 5.6 Hydraulic tank

#### 5.6.1 Hydraulic oil level check

Check the oil level in the oil gauge.



When the level is below the bottom edge of the oil gauge "MIN", the indicator lamp lights up and the engine stops.



**5.6.2 Hydraulic oil replenishment**

Fill using the hydraulic unit.

You can order the hydraulic unit from the machine manufacturer.

---

**Hydraulic unit 230 V**

Order number: 1251998

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**Hydraulic unit 110 V**

Order number: 1255297

**Note:**

The hydraulic unit 230 V is intended for operation in 230 Volt networks (Europe), the hydraulic unit 110 V is intended for operation in 110 Volt networks (North America).

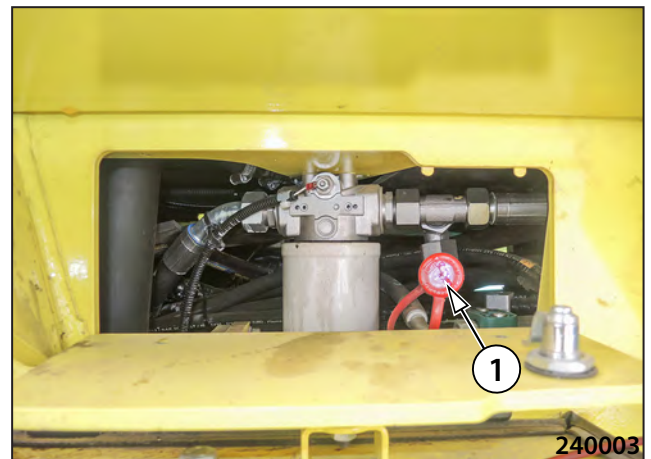
Put on the quick coupling (1) of the hydraulic unit on the quick coupling. Fill the hydraulic circuit until the clean oil starts flowing out from the tank. Catch the oil in a clean pan.

Let drain about 15 l (4 gal US) and mount the plug.

Fill up the tank with the oil to the maximum level and disconnect the filling device.



1251998



240003



238098



238044

## 5 Frame

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### 5.6.3 Hydraulic oil drainage

Remove the plug. Let the hydraulic oil drain out into the prepared pan. The drained volume is 90 l (23.8 gal US).



**Drain the oil when cooled down below 50 °C (122 °F).  
Follow the fire fighting measures!**

---



**Catch the drained oil and do not let it soak into the ground.  
The used oil is ecologically hazardous waste – hand it over for disposal.**

---

### 5.6.4 Hydraulic oil filter replacement

Remove the filter.



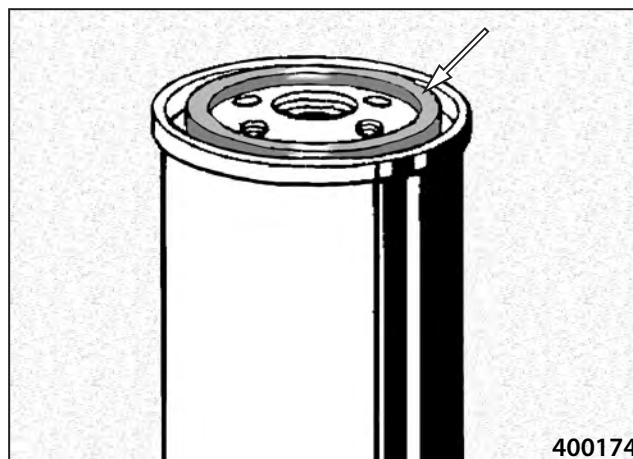
Clean the seating surface underneath.



Check the seal ring for condition.

Lubricate the ring with clean oil.

Mount the new filter.



**Always change the oil and replace the filter when inner parts of the units (hydraulic motors, hydraulic generators) were destroyed, or after a major repair of the hydraulic system. Clean and rinse out the hydraulic tank before mounting the new unit and refill with oil. When the engine is running at a higher speed, test functions of the machine. Check for leakage.**

**Use only original filter cartridges according to the spare parts catalogue.**



**Used filter cartridges are ecologically hazardous waste – hand them over for disposal.**

## 5 Frame

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### 5.6.5 Ventilation filter replacement

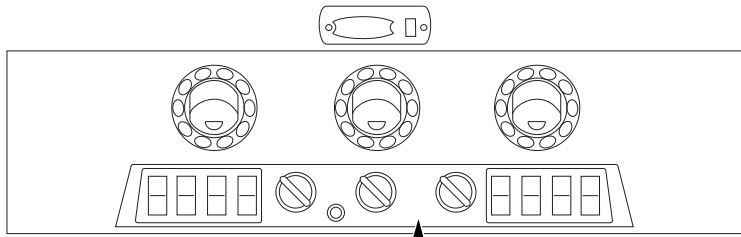
Remove the vent filter. Mount the new vent filter.



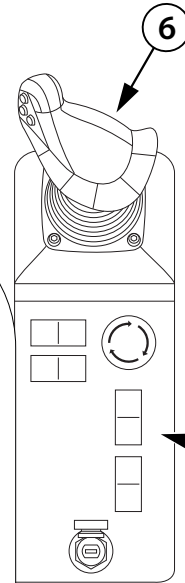
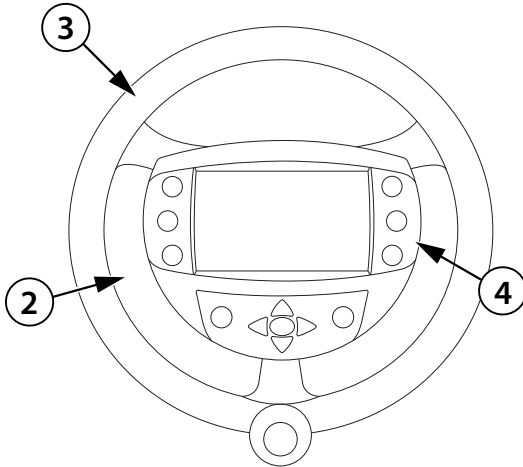
## 6 Cab and platform

# 6 Cab and platform

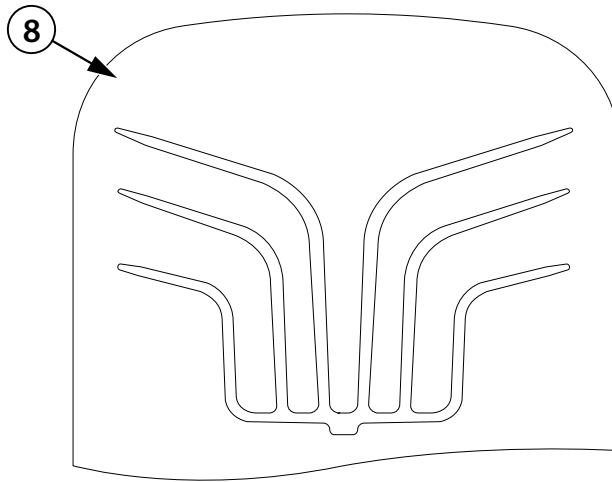
1



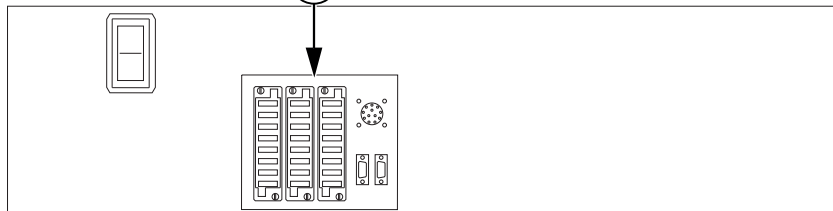
5



7



9



240D190

## 6.1 Description of basic elements

1. Operator's stand
2. Steering pillar
3. Steering wheel
4. Display
5. Controls in the cab ceiling
6. Travel control
7. Armrest controls
8. Seat
9. Fuse box

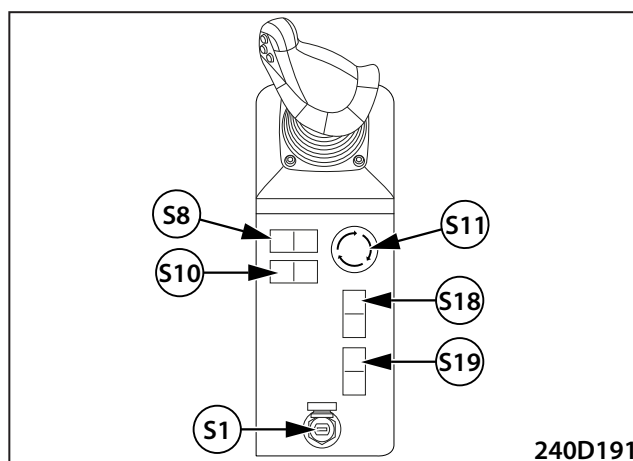
## 6 Cab and platform

### 6.3 Electrical installation

Fuse box (Chap. 5.3.1).

#### 6.3.6 Control lever panel

- S1 - Ignition box
- S8 - Warning horn button
- S10 - Direction indicators switch
- S11 - Emergency brake button
- S18 - Vibration amplitude selector switch
- S19 - Vibration mode switch (MAN/AUT)



## 6.3.7 Other components

### 6.3.7.1 Control unit of the machine A2

The control unit is located in the distributor box behind the operator seat.



## 6.4 Mechanical parts

### 6.4.1 Setting of the control force of the travel control

Adjust the force of the travel control using the Bodas software.

## 6 Cab and platform

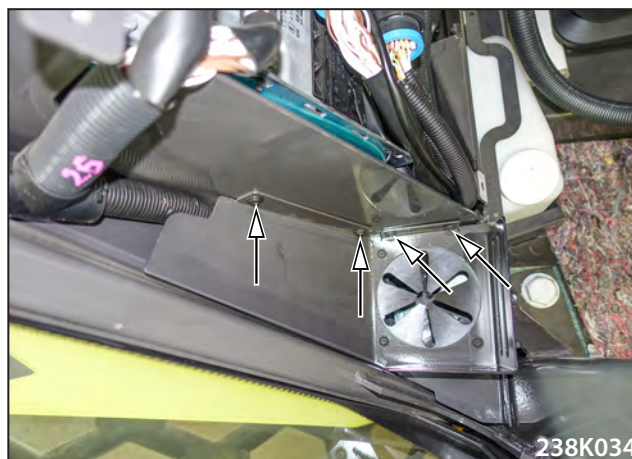
### 6.5 Cab

#### 6.5.1 Cab removal

Remove the air-conditioning hose covers.



Remove the beverage holder.



**Applicable only for machines with air-conditioning system**

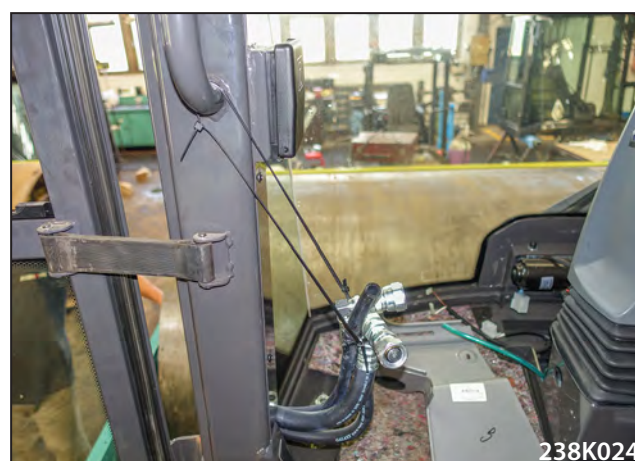
Remove quick-couplings of the air-conditioning hoses. Plug the hoses.



Remove the hoses of the air-conditioning overflow from the opening in the floor.



Fix the air-conditioning hoses to the handle on the cab frame.



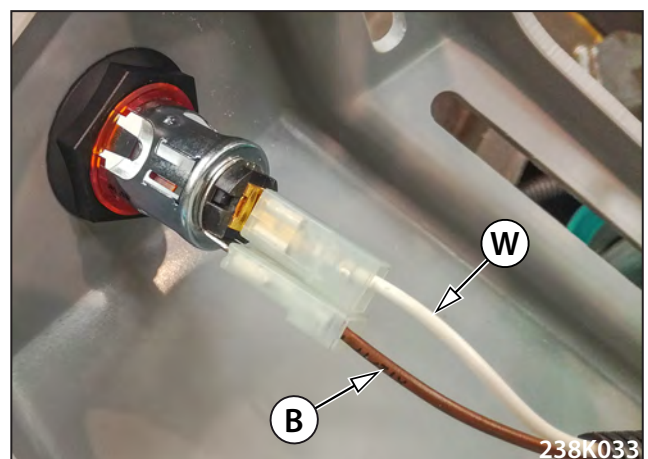
## 6 Cab and platform

### Applicable to all machines

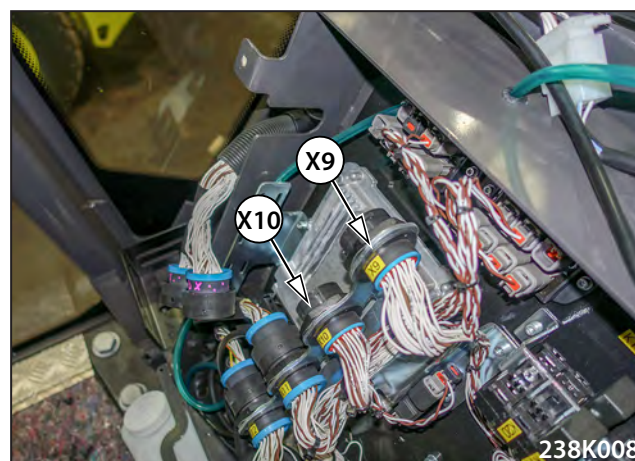
Remove the distributor cover and take off carefully.



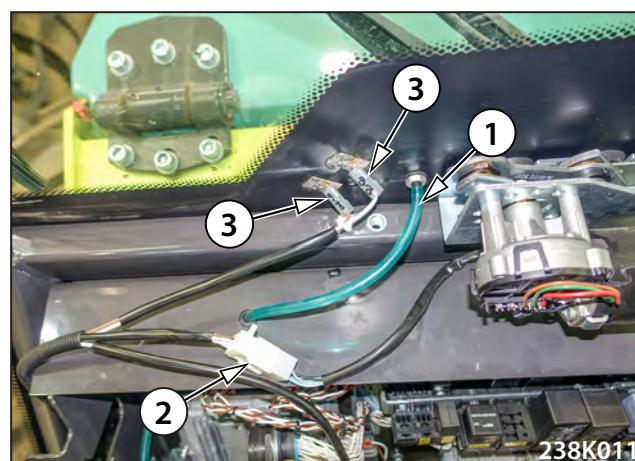
Carefully disconnect the brown wire (B) and the white wire (W) of the connector of the service socket on the distributor cover.



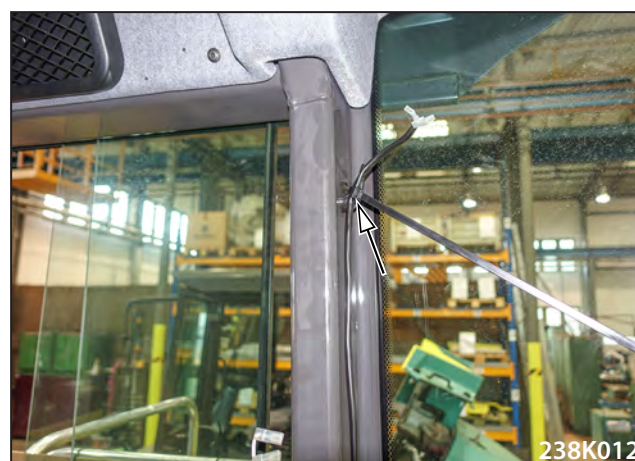
Disconnect the connectors X9 and X10.



Disconnect the washer tube (1), the wiper connector (2) and the rear window heating connectors (3).



Attach the disconnected electrical installation to the cab frame using cable ties.

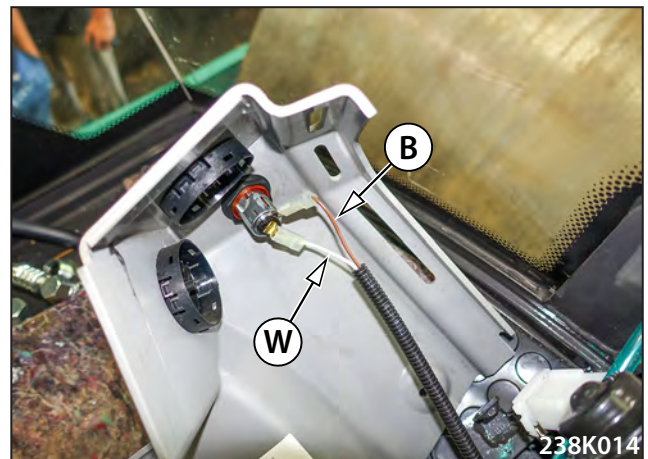


## 6 Cab and platform

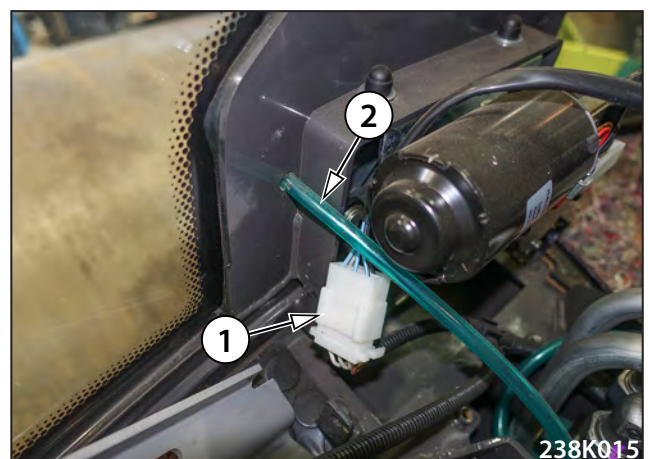
Remove the heating covers and take off carefully.



Carefully disconnect the brown wire (B) and the white wire (W) of the service socket connector on the heating cover.



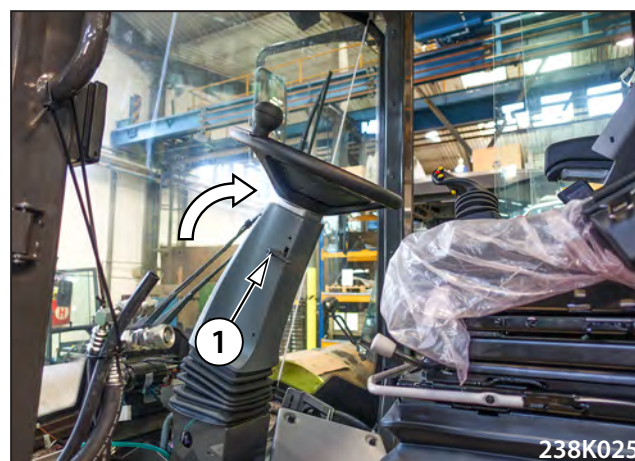
Disconnect the wiper connector (1) and the washer tube (2) in the front part of the cab.



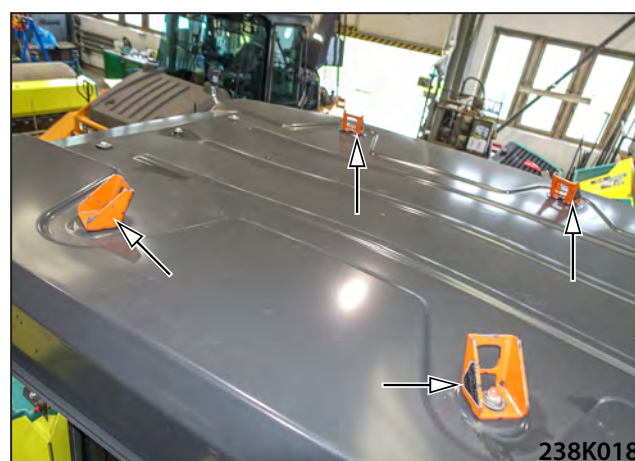
Remove the thresholds.



Set the steering column in its extreme position to the seat using the lever (1).



Loosen the 4 screws on the roof and mount the lifting lugs.

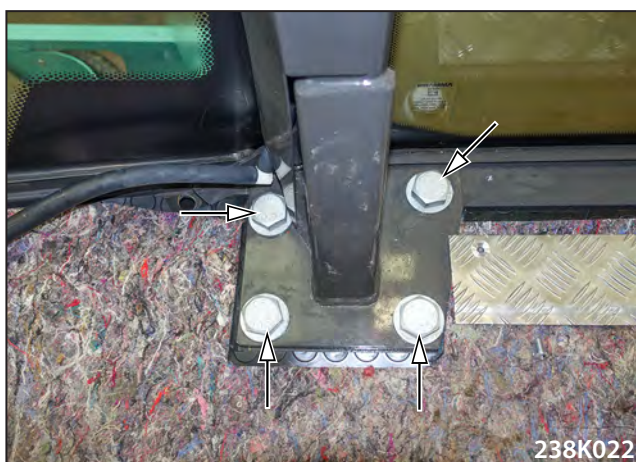
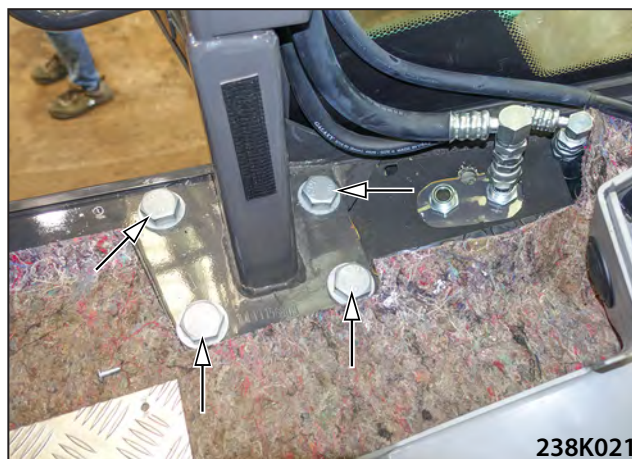
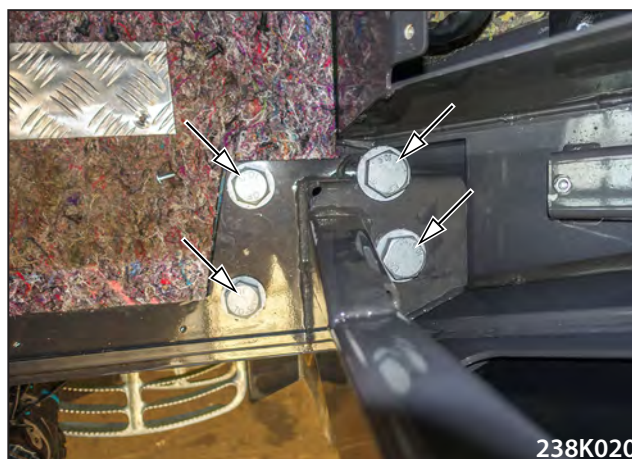


## 6 Cab and platform

Hang the cab on a crane with sufficient load capacity.  
Cab weight about 480 kg (1058 lb).



Remove the screws fixing the cab.



Lift the cab and move it aside carefully.



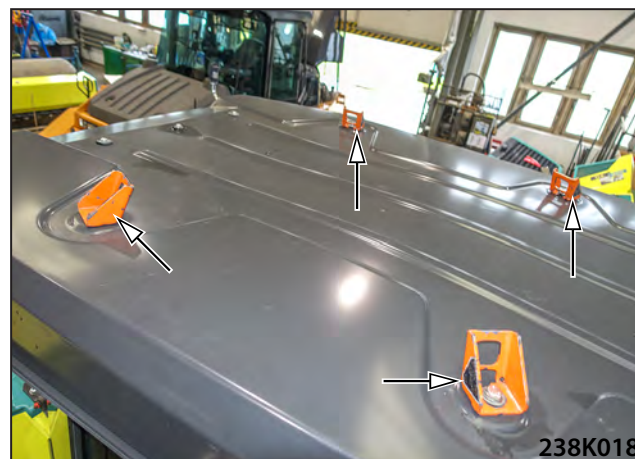
## Installation

Remove the old gasket.

Glue the new gasket along the edges of the platform.



Loosen the 4 screws on the roof and mount the lifting lugs.



Hang the cab on a crane with sufficient load capacity.

Cab weight 480 kg (1058 lb).

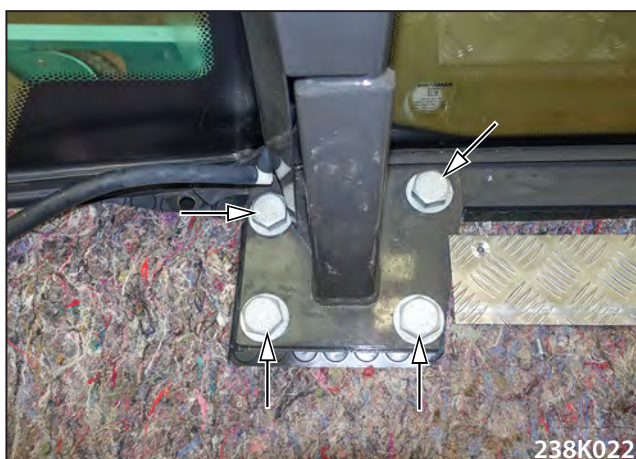
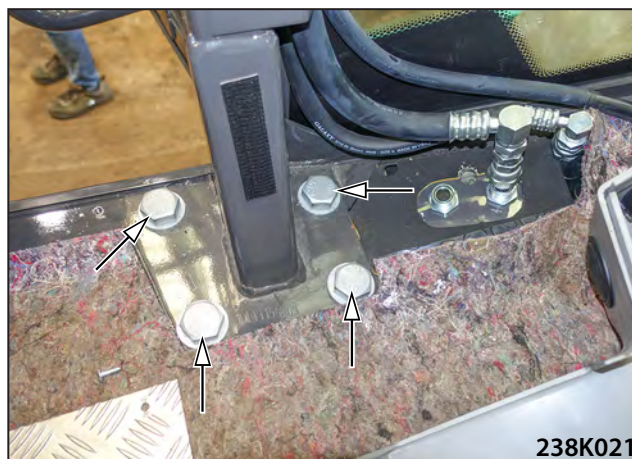
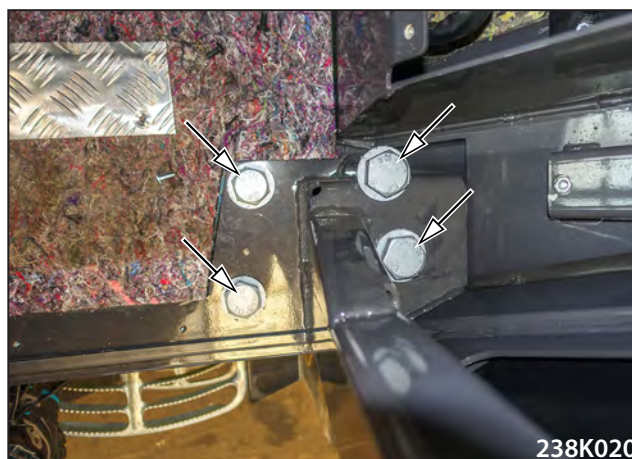


## 6 Cab and platform

Take special care when positioning the cab on the platform.  
Make sure the cab is seated properly.



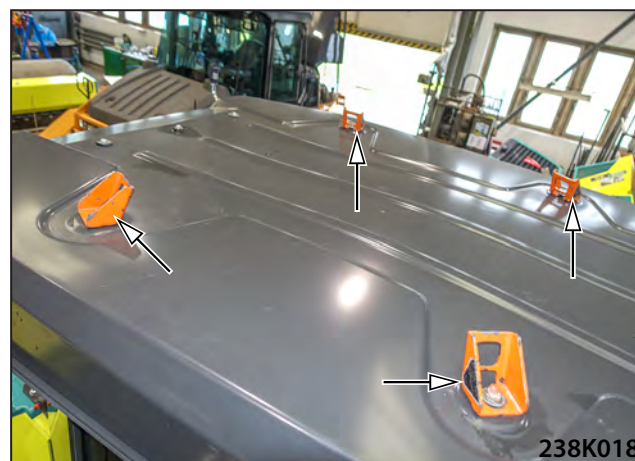
Mount the screws fixing the cab.  
Tightening torque of the screws 350 Nm (258 lb ft).  
Tighten all screws and check the tightening torque again.



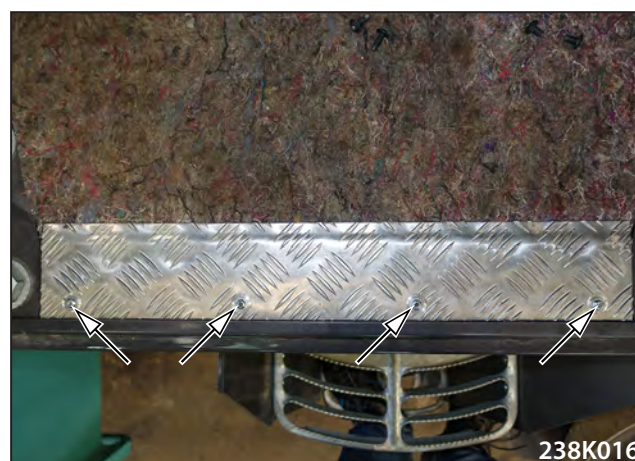
Remove the lifting lugs.

Use new sealing under the roof-fixing screws. Tighten the screws.

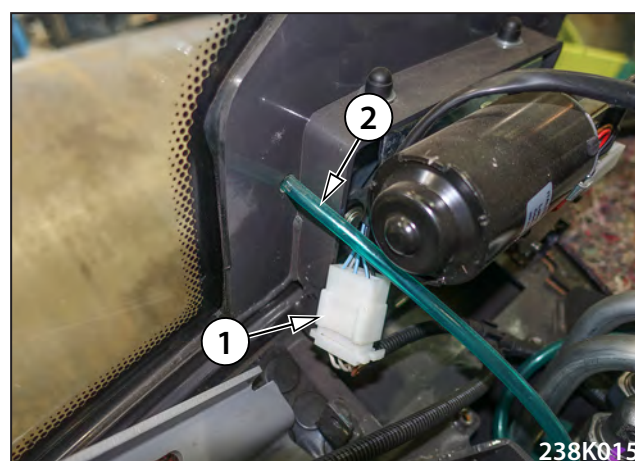
Tightening torque of the screws 10 Nm (7.4 lb ft).



Mount the thresholds.

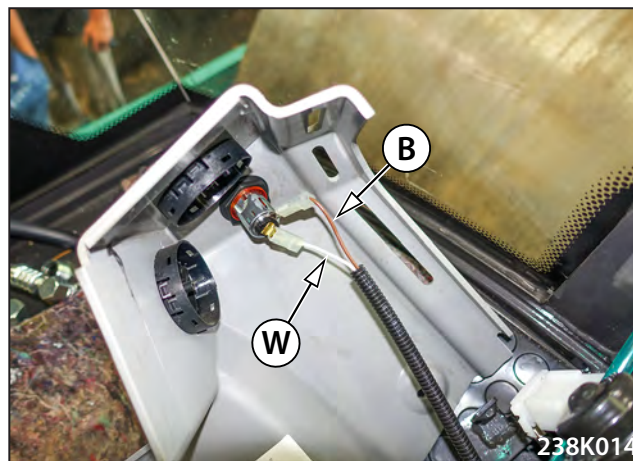


Connect the wiper connector (1) and the washer tube (2).



## 6 Cab and platform

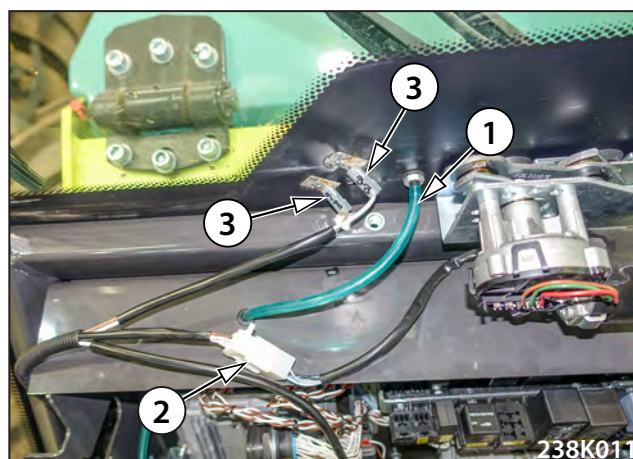
Connect the brown wire (B) and the white wire (W) of the connector of the service socket on the heating cover in the front part of the cab.



Mount the heater cover.



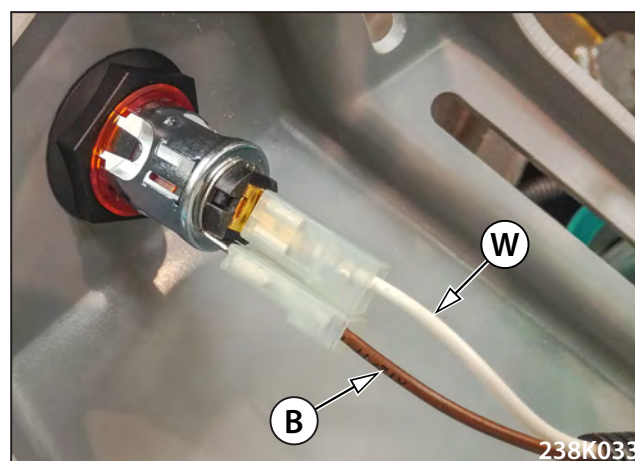
Connect the washer tube (1), the wiper connector (2) and the rear window heating connectors (3).



Connect the connectors X9 and X10.



Connect the brown wire (B) and the white wire (W) of the connector of the service socket on the distributor cover.

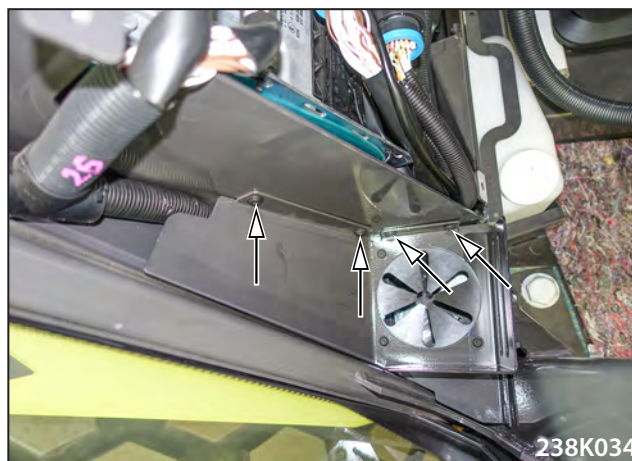


## 6 Cab and platform

Mount the distributor cover.

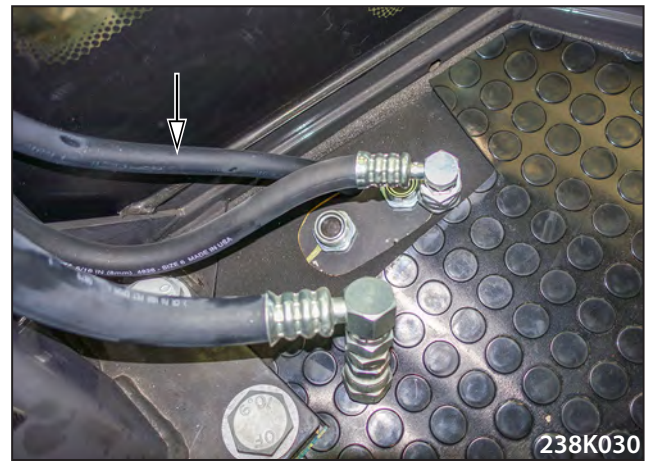


Mount the beverage holder.

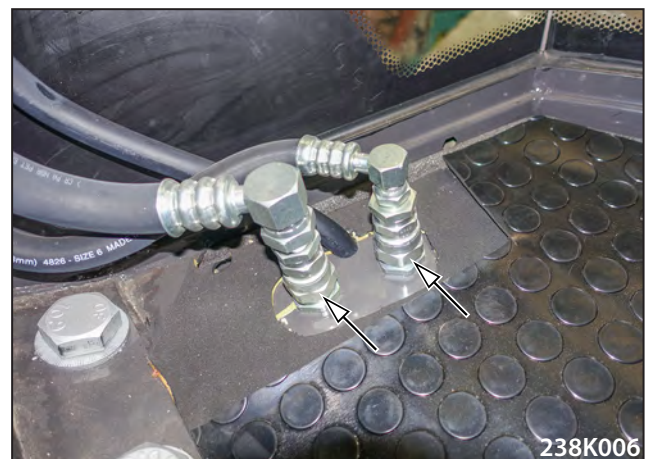


## Applicable only for machines with air-conditioning system

Insert the hoses of air-conditioning overflow into the opening in the floor.



Mount the air-conditioning hoses using quick-couplings.



## 6 Cab and platform

### Applicable to all machines

Mount the air-conditioning hose covers.



6.7 Driver's stand

6.7.4 Display replacement

Remove the display screws.



Mark and disconnect the display wiring.



Remove the display holder..



**When replacing the display, make sure that the new display contains the same software version as the old one.**

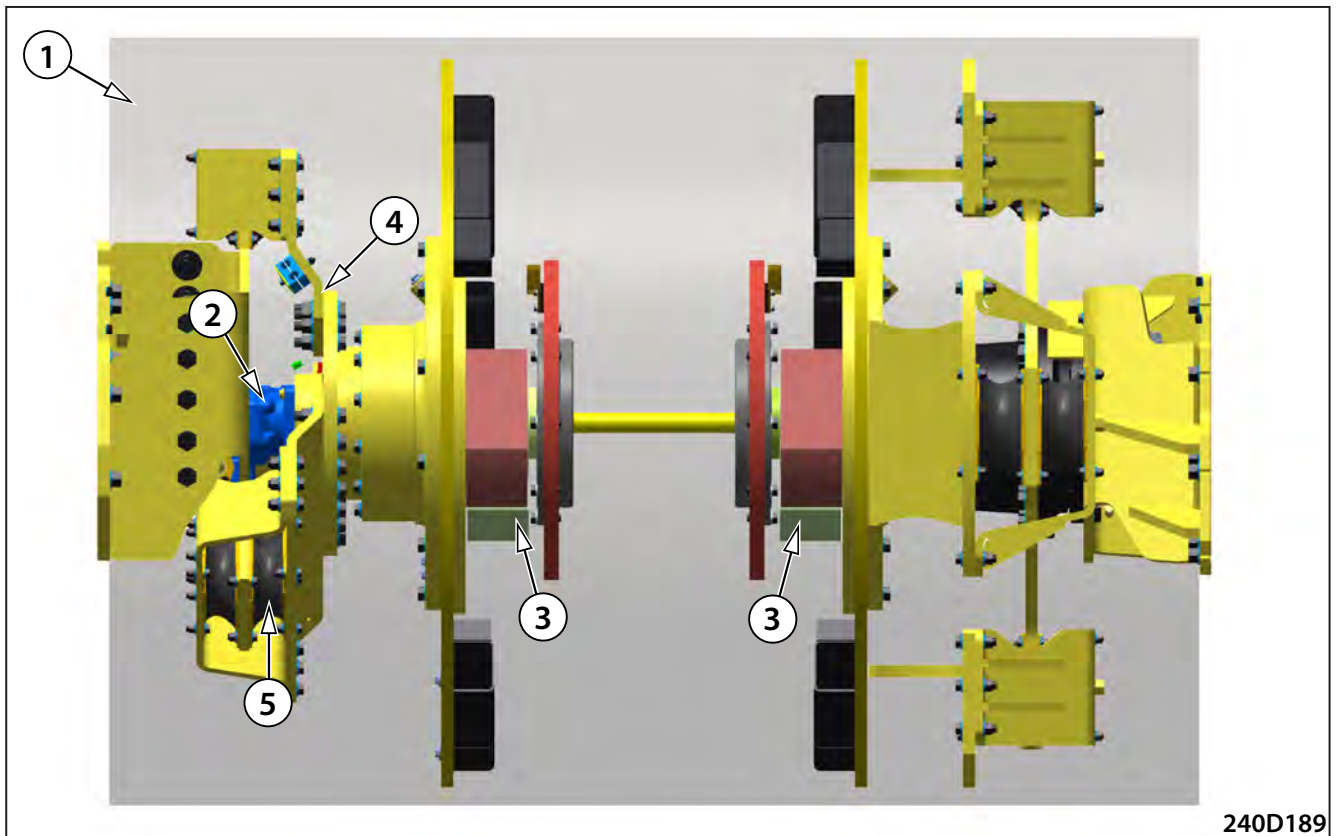




## 7 Front drum



7.1 Description of basic elements



1. Drum
2. Vibration hydraulic motor
3. Vibrator
4. Damper plate
5. Rubber metal element

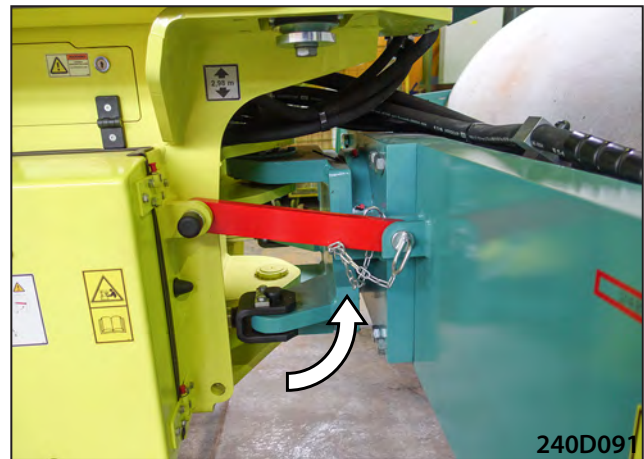
## 7 Front drum

### 7.4 Mechanical parts

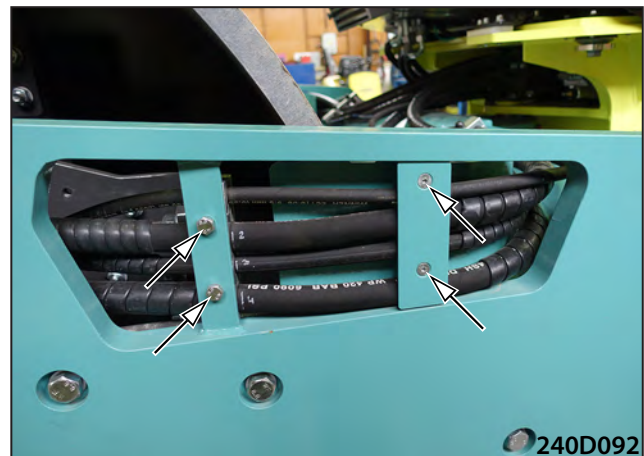
#### 7.4.1 Replacement of vibration unit bearings

##### 7.4.1.1 Drum disassembly from the frame

Secure the articulation joint of the machine against turning using a mechanical strut.



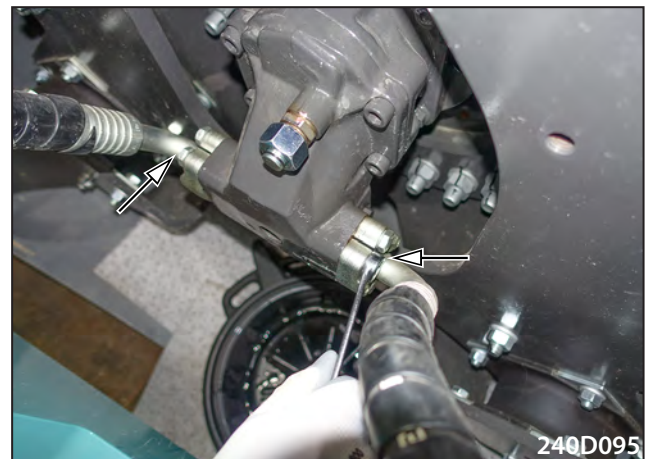
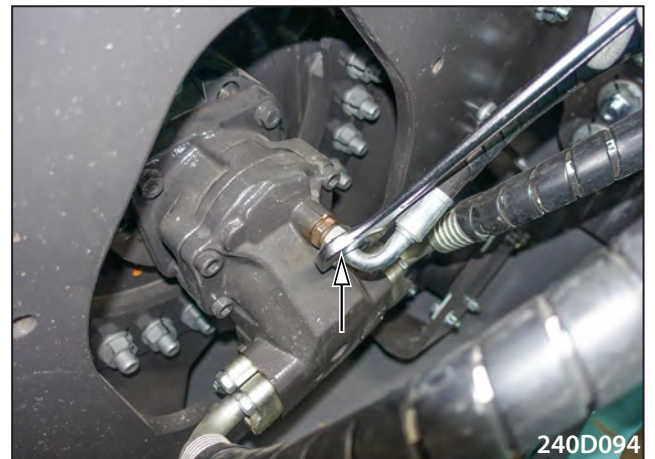
Remove the hose clips on both sides of the drum frame.



Disconnect the connector.



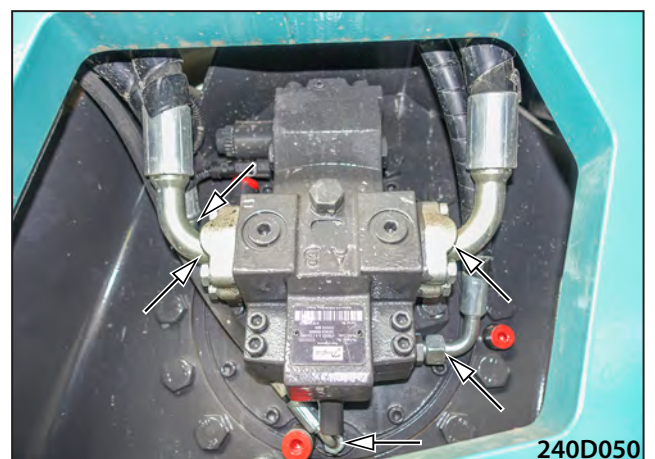
Disconnect the hoses from the vibration hydraulic motor.



Disconnect the connector of the drum travel hydraulic motor coil.



Disconnect the hoses from the travel hydraulic motor.

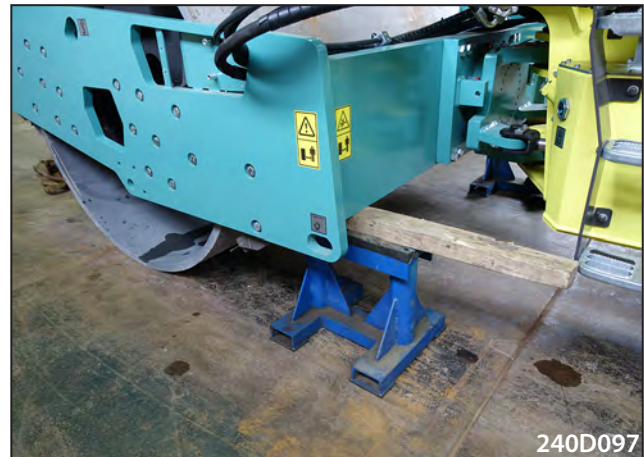


## 7 Front drum

Take out the hoses from the frame and tie it to the cab stairs.



Lift the drum frame so that the drum can slightly touch the ground – or lift it using hydraulic jacks. Support it with solid supports from both sides.



Hang the drum on a crane with sufficient load capacity.

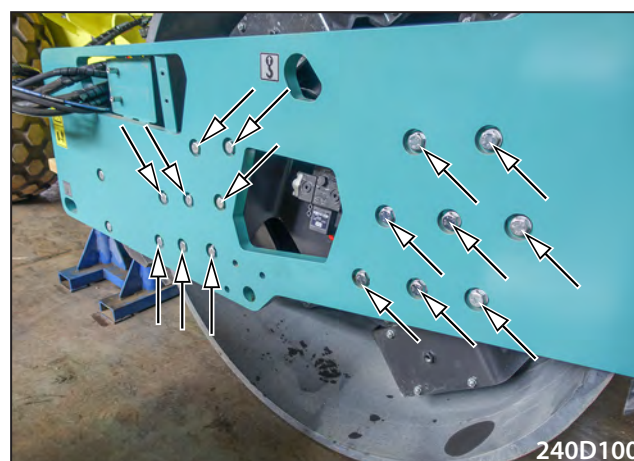
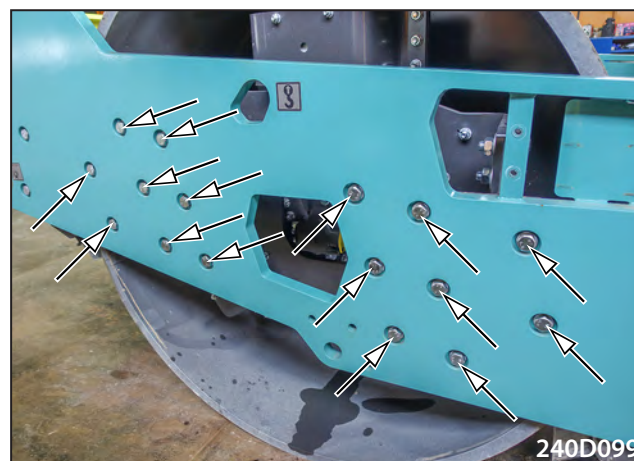
Drum weight:

Smooth drum about 5550 kg (12236 lb)

Pad-foot drum about 5750 kg (12677 lb)



Remove the bracket screws on both sides of the machine.



Loosen the screws on the left side of the drum and insert the bracket towards the drum.

Hang the drum on the crane, and take it slowly out of the frame.



## 7 Front drum

### 7.4.1.3 Drum assembly

Heat the eccentric to the temperature of 400°C (752°F) and put it on a jig stand. Insert the shaft with the key into it.



Press the housing to the eccentric using the jig.



Grease the housing with oil and press it using the jig.



Press the eccentric of the vibrator on the shaft.



Mount halves of rings.



The other assembly operations are identical for both parts of the drum.

Place a washer under the vibrator cover.



Lubricate the vibrator cover with grease.



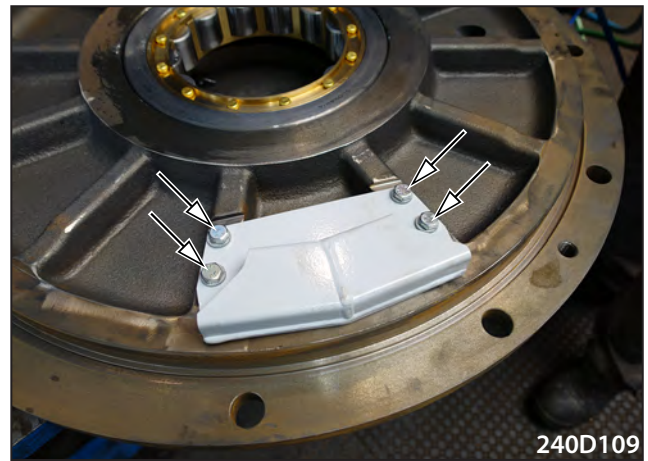
Press the bearing to the vibrator cover.

When assembling the outer bearing ring, you have to pair them with the inner bearing rings!



## 7 Front drum

Mount the oil ladles.



Heat the ring to the temperature of 110°C (230°F) and mount it on the shaft.



Apply grease on the seal groove.  
Mount the sealing.



Mount the plugs. Secure the plugs with the Loxeal 58-11 adhesive.



Put on the lock ring.



Apply grease on the ring.



Press the bearing.



## 7 Front drum

Put the lock rings on the shaft.



Mount the oil ladles.



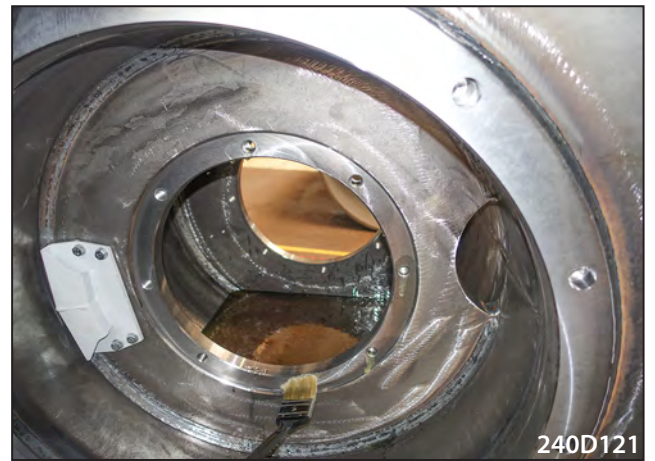
Fill in oil having the prescribed specification to the drum.



Fill the drum with the coolant.



Apply grease on the flange.



Mount the cover with the bearing using the jig.



## 7 Front drum

Mount the vibrator using the jig.



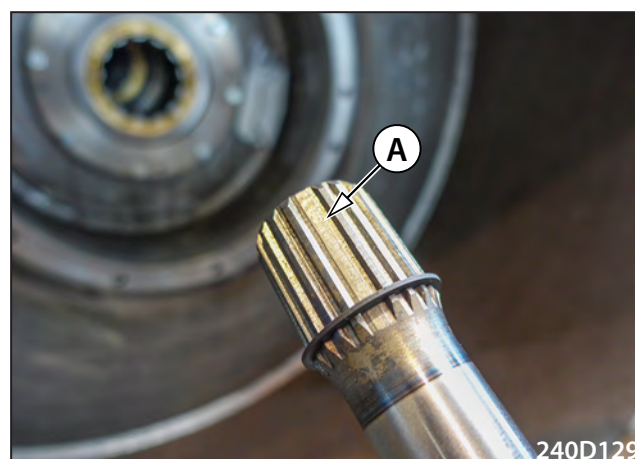
Mount the vibrator cover using the jig.



Mount the vibrator cover.



When putting on the connecting shaft, take care to ensure the correct mutual position of the vibrators. It is provided by groove „A“ on both ends of the shaft that fits against the pins.

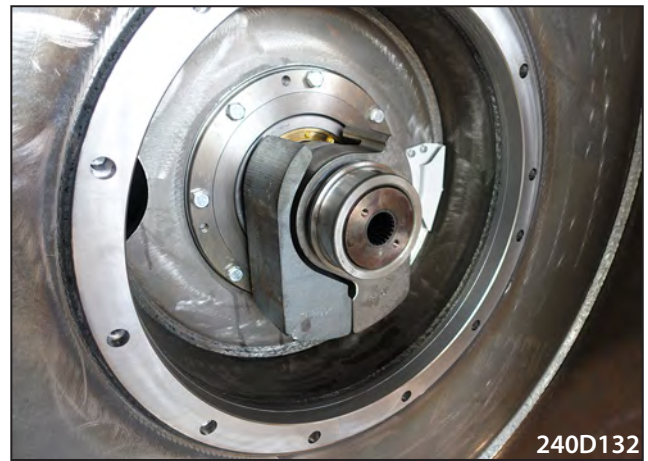


Mount the connecting shaft.

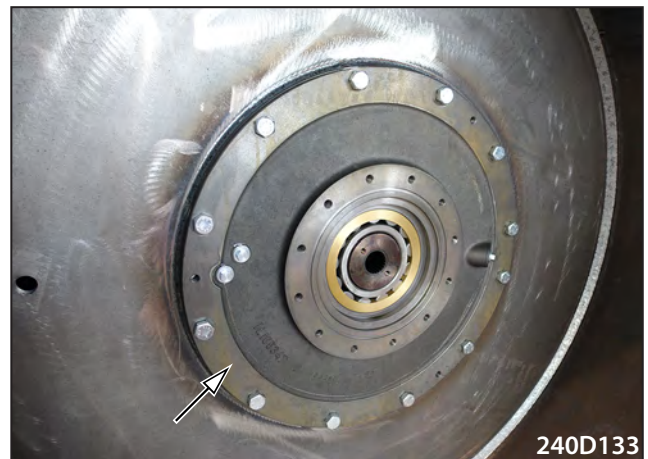


## 7 Front drum

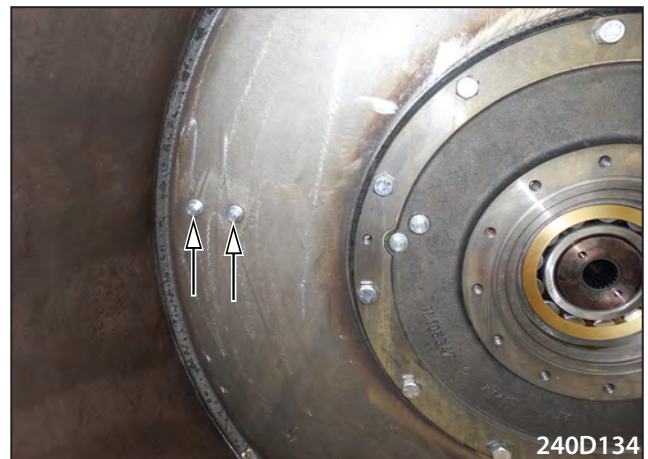
Mount the vibrator on the shaft.



Mount the vibrator cover.



Mount the plugs. Secure the plugs with the Loxeal 58-11 adhesive.



## **8 Rear drum (not included in the machine equipment)**

---

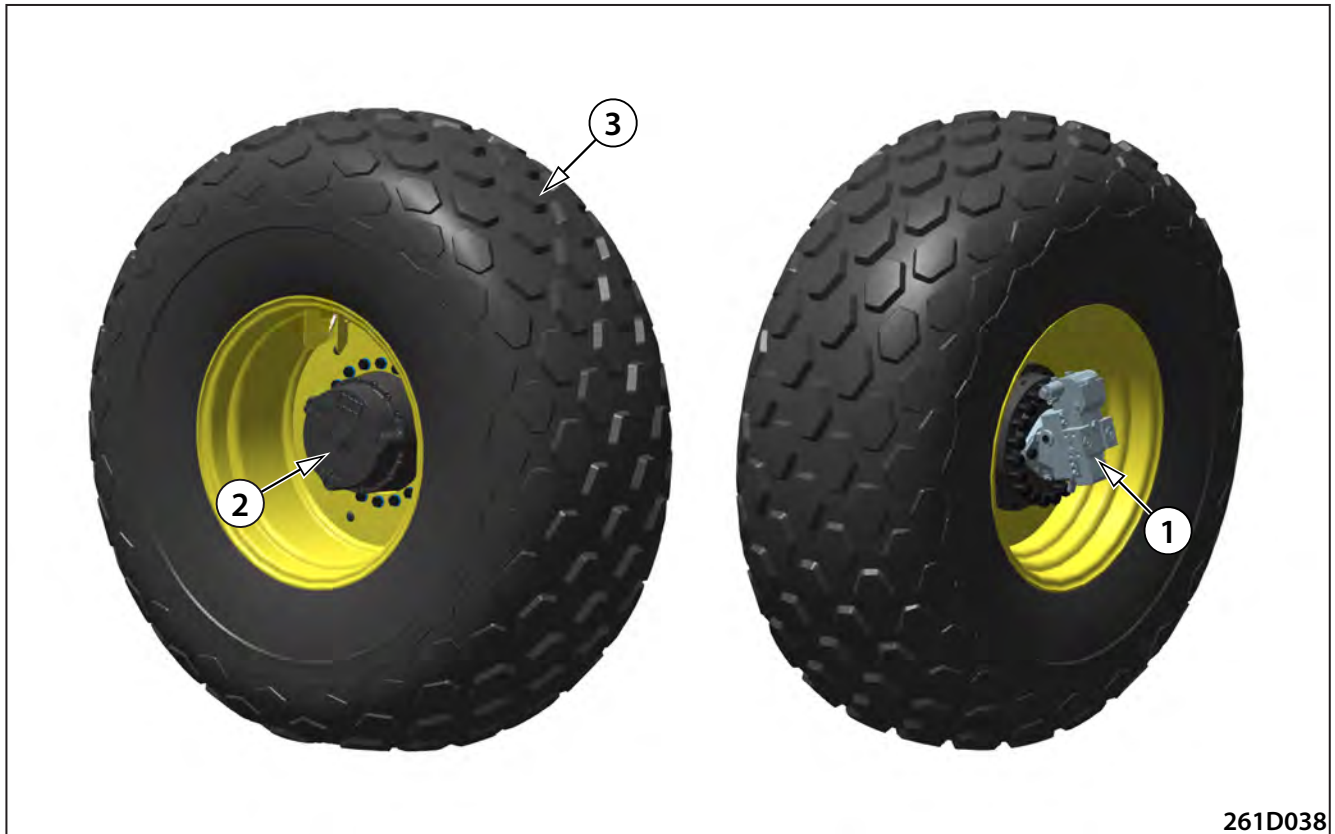
## **9 Front axle (not included in the machine equipment)**

---

## **10 Rear axle**

## 10 Rear axle

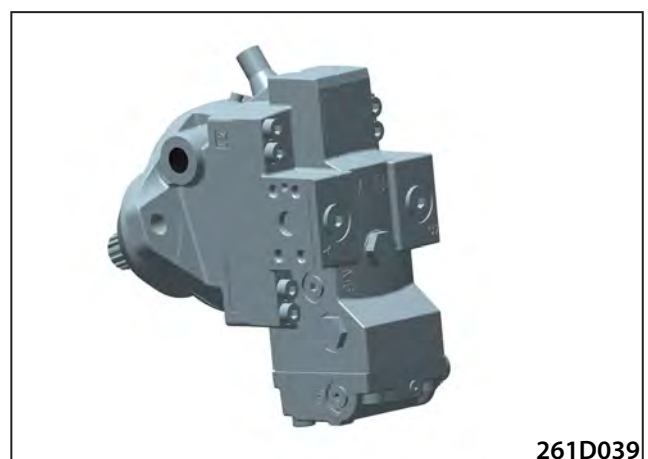
### 10.1 Description of the basic elements



1. Travel hydraulic motor
2. Gearbox
3. Tyre

### 10.2 Hydraulic parts

#### 10.2.1 Travel hydraulic motor

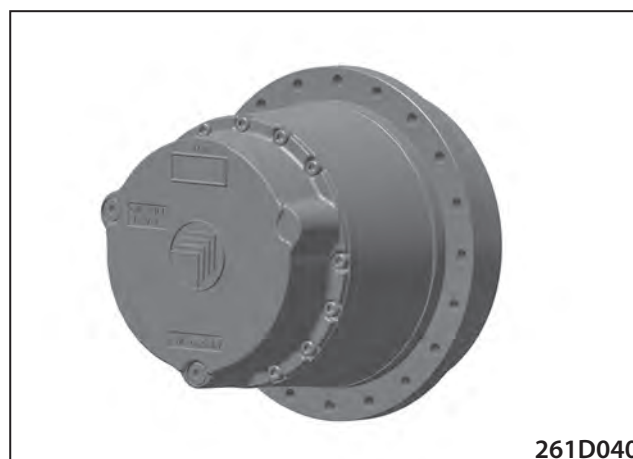


## 10.2.2 Travel hydraulic motor replacement

Travel hydraulic motor replacement (Chap. 11.2.3.2).

## 10.4 Mechanical parts

### 10.4.1 Gearbox



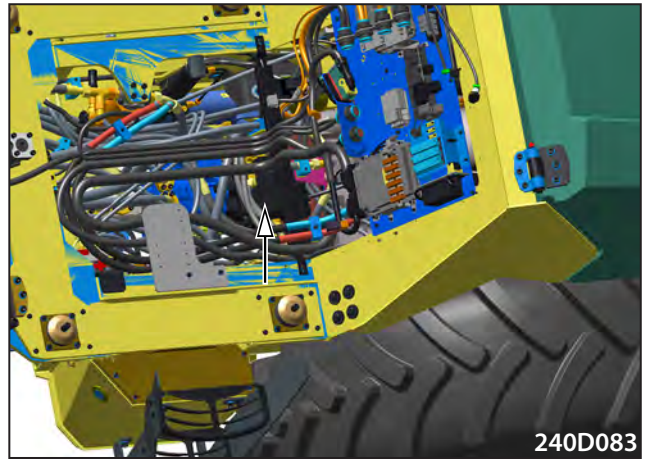


# 11 Travel

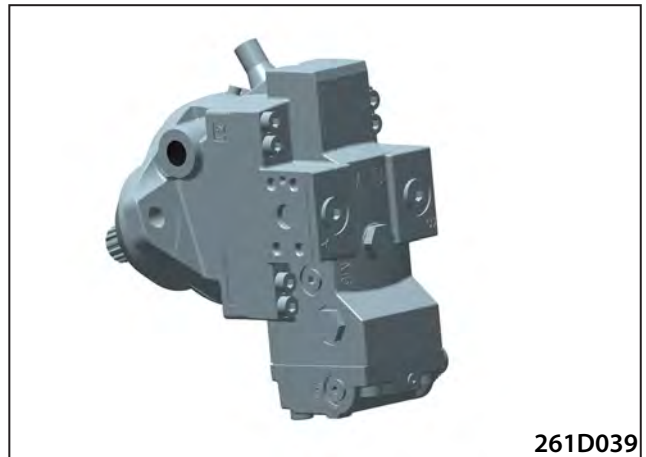
# 11 Travel

## 11.1 Description of the basic elements

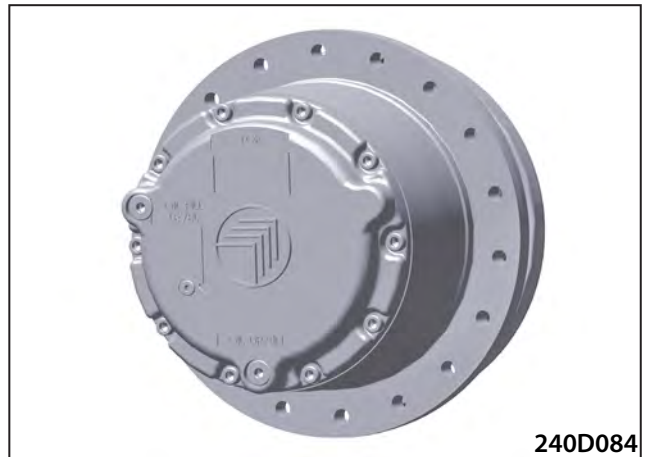
Travel pump



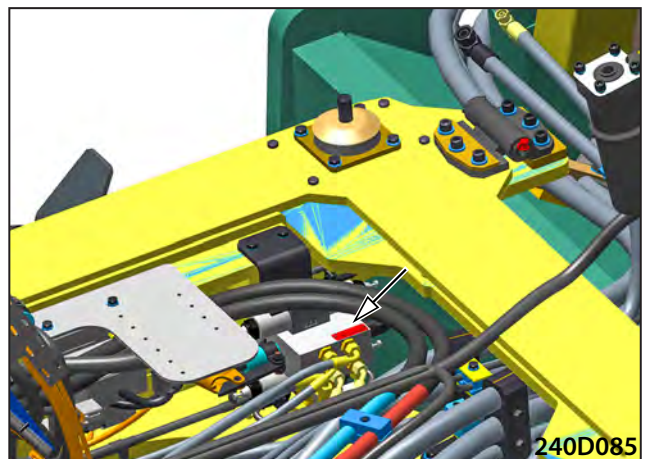
Travel hydraulic motor



Gearbox



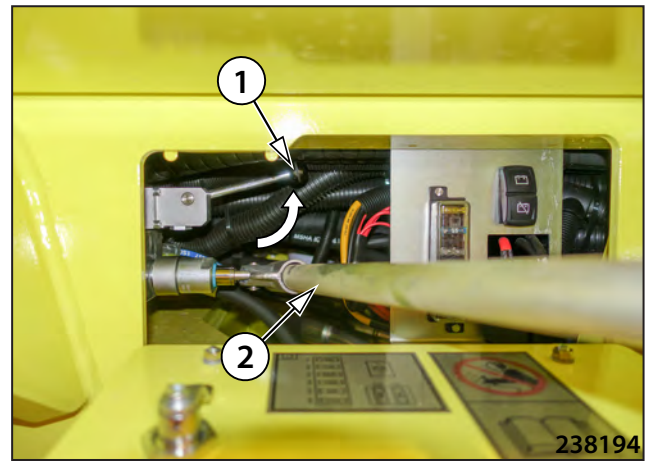
Brake block



**11.2 Hydraulic parts**

**11.2.1 Travel pump replacement**

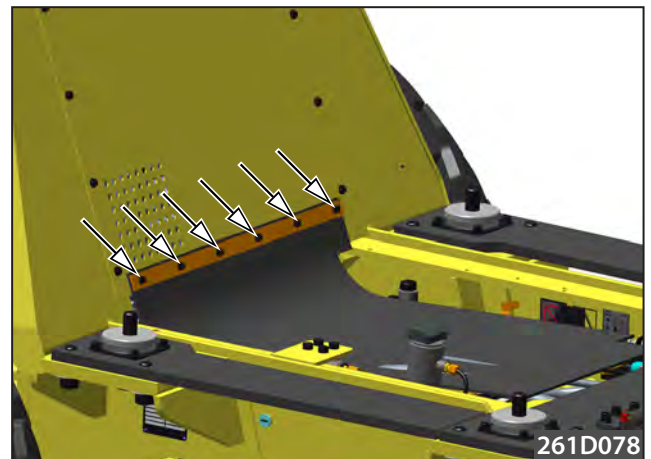
Move the brake block lever (1) to the upper position.  
Insert the lever (2) into the pump and lift the cab by pumping.



Disconnect the electrical installation using the disconnecter.

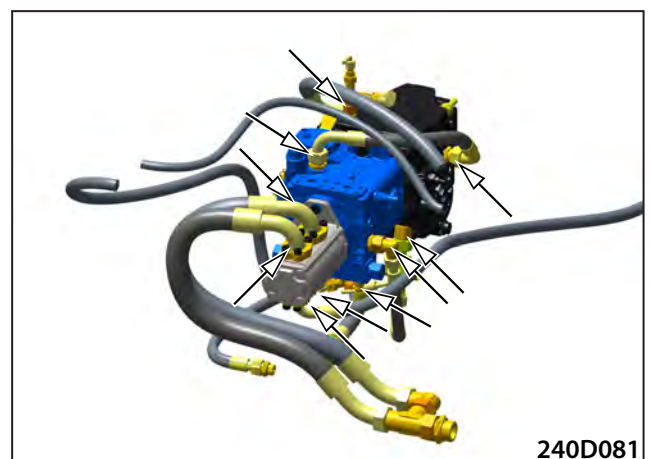


Remove the rubber gasket.



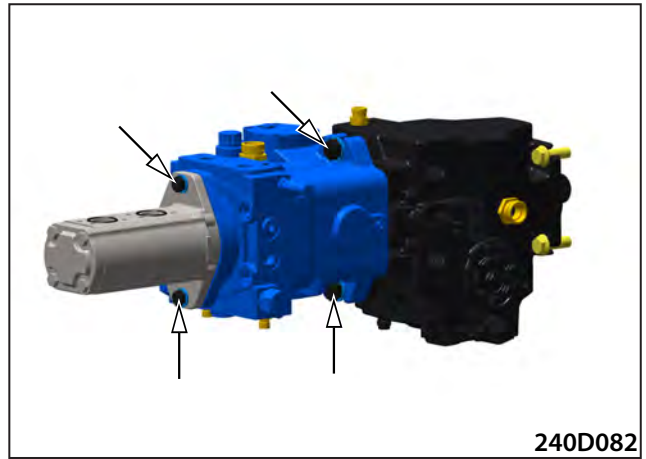
Remove the hoses from the pumps. Blank off the pump outlets and hose ends.

Disconnect the electrical installation from the pumps.



# 11 Travel

Remove the steering pump.



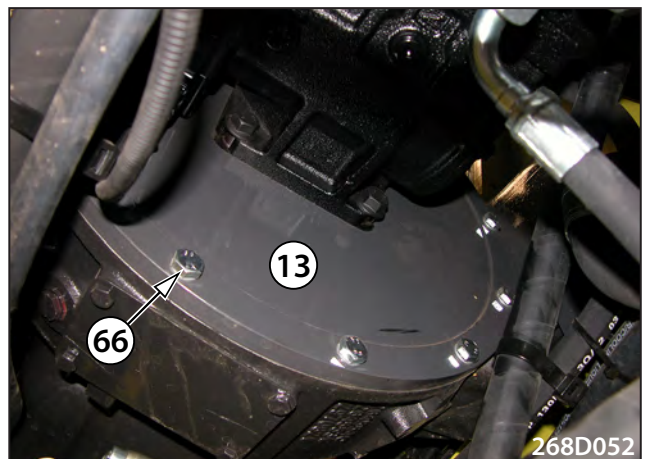
Hang the vibration pump on the crane.  
Remove the screws connecting the vibration and travel pumps.  
Take out the pump and put aside.



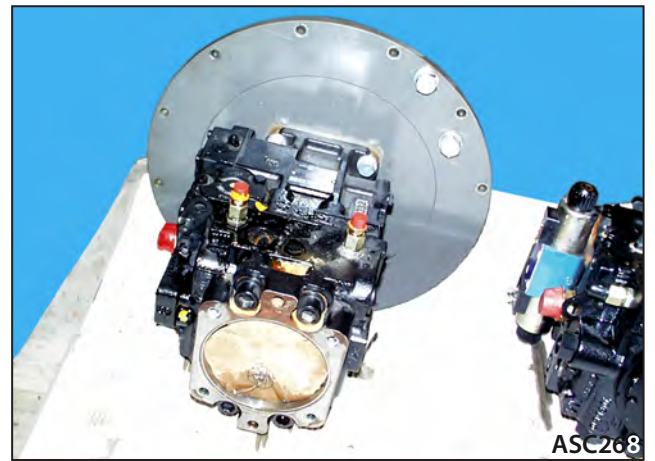
Hang the travel pump on the crane.



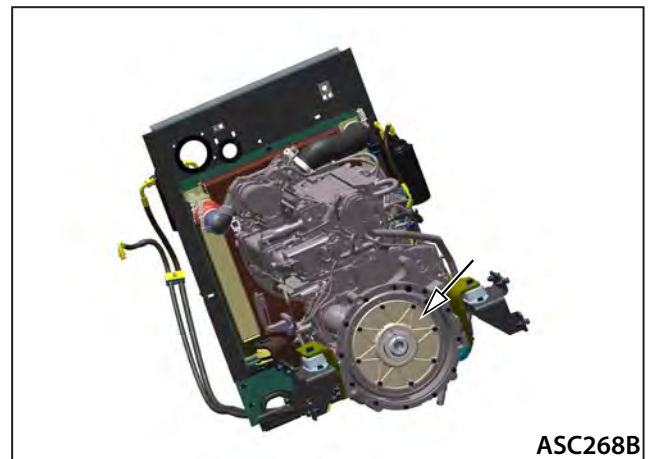
Remove the screws (66) from the flange (13).



Take out the pump from the connecting piece and put aside.



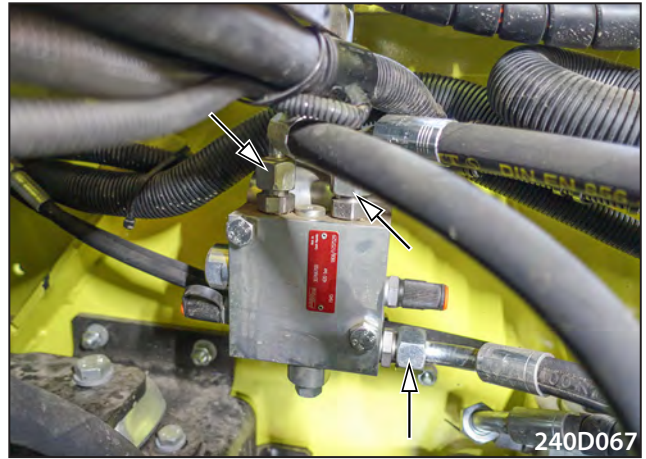
Remove the connecting piece.



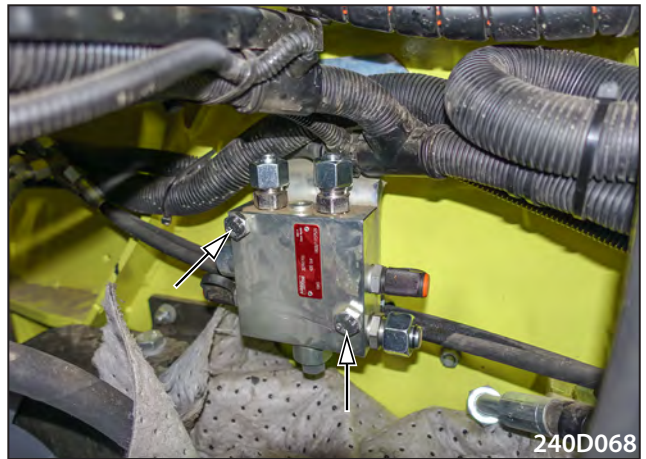
# 11 Travel

## 11.2.2 Flushing block replacement

Remove the hoses.



Remove the flushing block attachment screws. Remove the flushing block and put it aside.



**11.2.3 Travel hydraulic motor replacement**

**11.2.3.1 Drum hydraulic motor replacement**

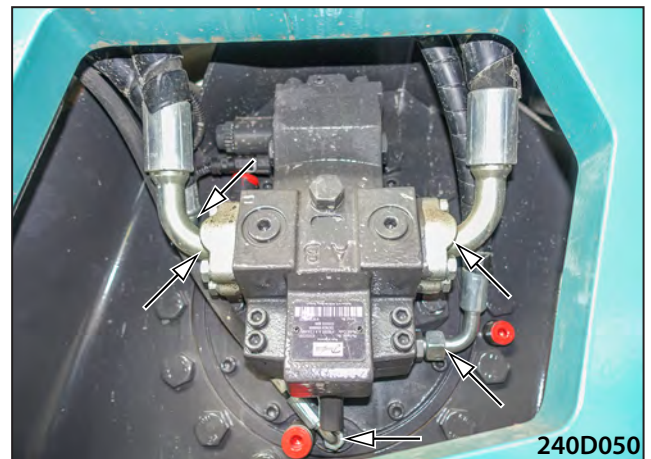
Put the catch tank under the travel hydraulic motor.



Remove the cover of the travel hydraulic motor.



Remove the hoses of the travel hydraulic motor. Blank off the hose ends.



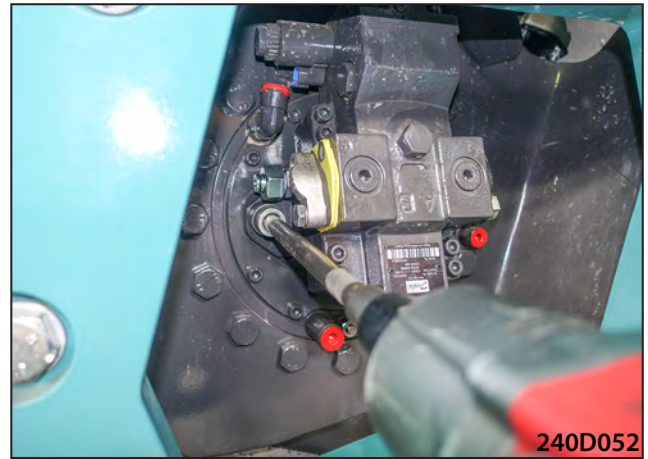
Disconnect the electrical installation from the travel hydraulic motor. Blank off the outlets.



## 11 Travel

---

Remove the screws of the travel hydraulic motor attachment.  
Hang the hydraulic motor on the crane and put aside.



### 11.2.3.2 Rear axle travel hydraulic motor replacement

Raise the rear frame of the machine and support on the side of the disassembled wheel so that the wheel is free.

Secure the wheel on the other side with scotch blocks.

Remove the free wheel screws.



Remove the wheel.



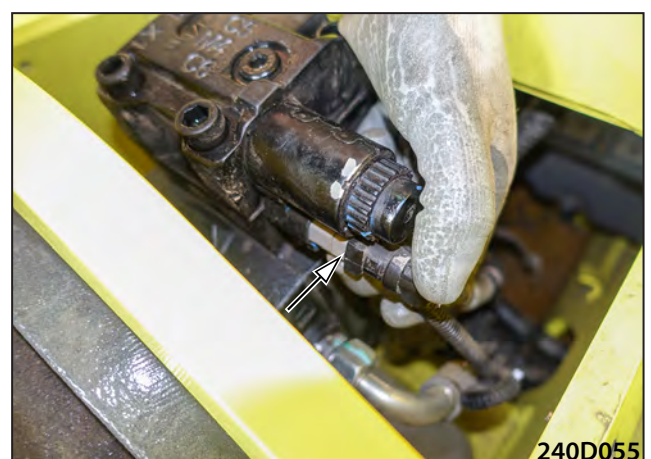
**Do not enter under the suspended load. During assembly prevent the wheel from falling down and injuring persons.**



Remove the cover.

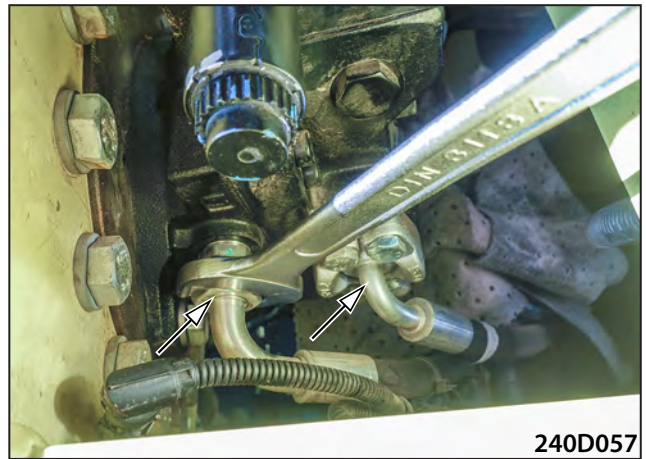
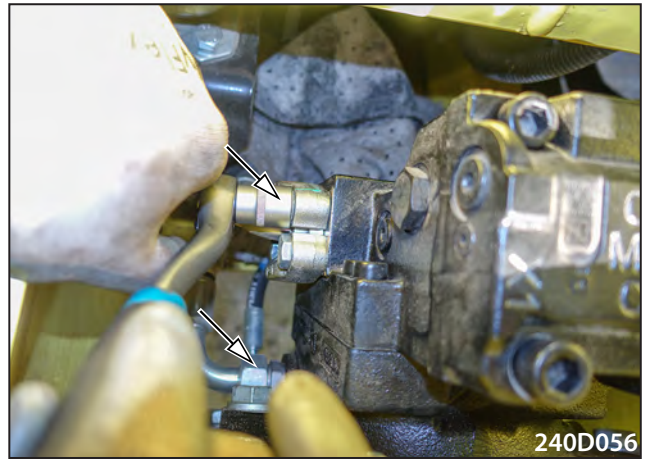


Disconnect the wiring from the hydraulic motor.

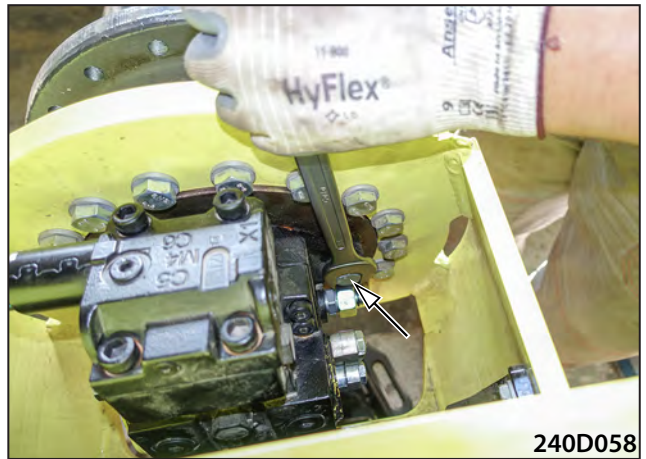


# 11 Travel

Remove the hoses, blank off the outlets.



Remove the screws of the hydraulic motor attachment.  
Take out the hydraulic motor and put it aside.

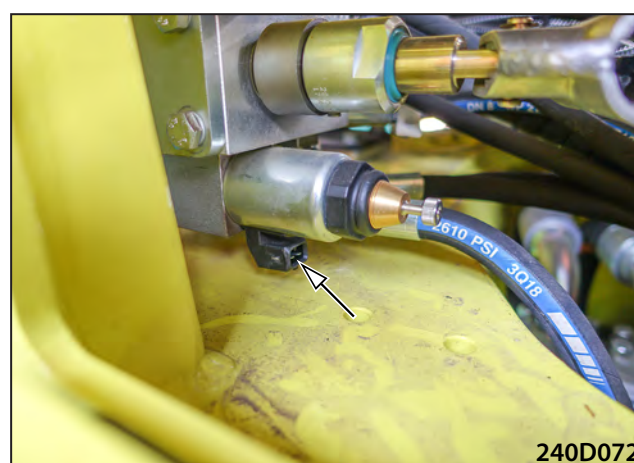


### 11.2.4 Replacement of the brake block

Remove the metal plate.

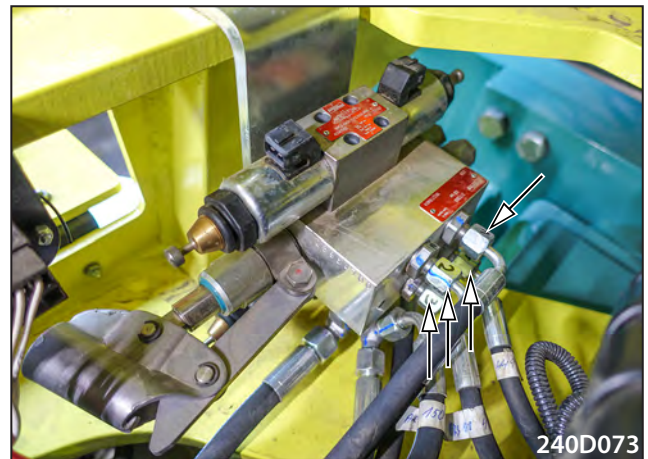


Disconnect the brake block connectors.



## 11 Travel

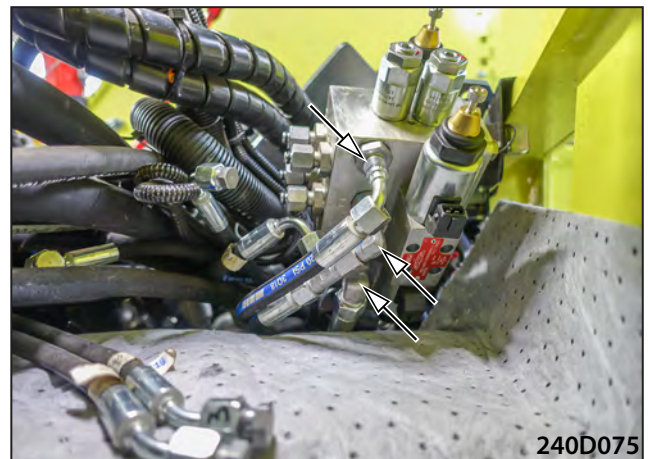
Mark and remove the hoses.



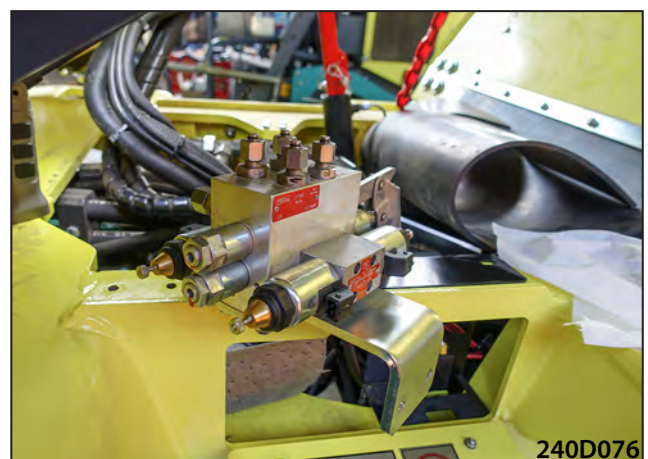
Remove the holder of the brake block.



Remove the hoses.



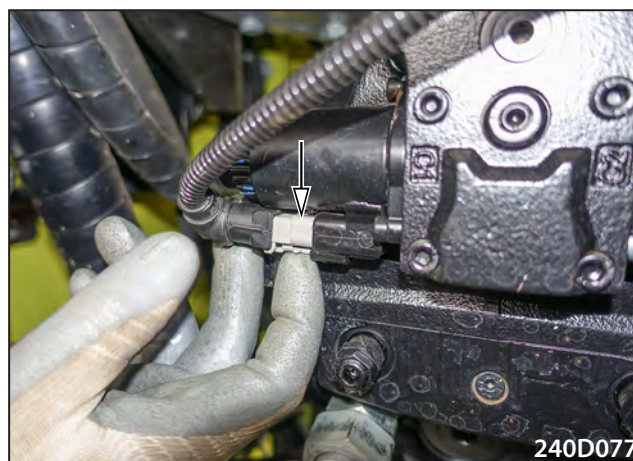
Remove the brake block and put it aside.



**11.3 Electrical installation**

**11.3.1 Travel pump coils replacement**

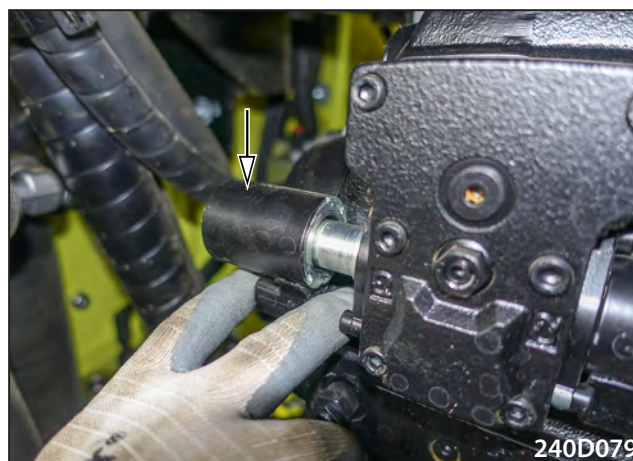
Disconnect the coil connector.



Remove the nut and the sealing O-ring..



Take out the coil.



Remove the electromagnet.



# 11 Travel

## 11.3.2 Travel hydraulic motor coils replacement

### Axle

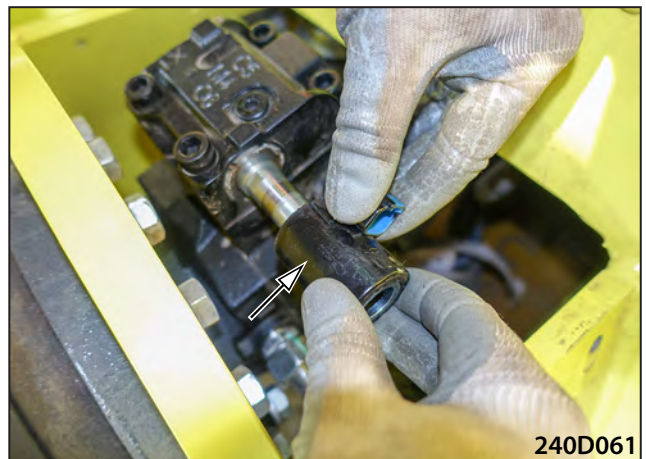
Disconnect the connector.



Remove the nut.



Take out the coil.

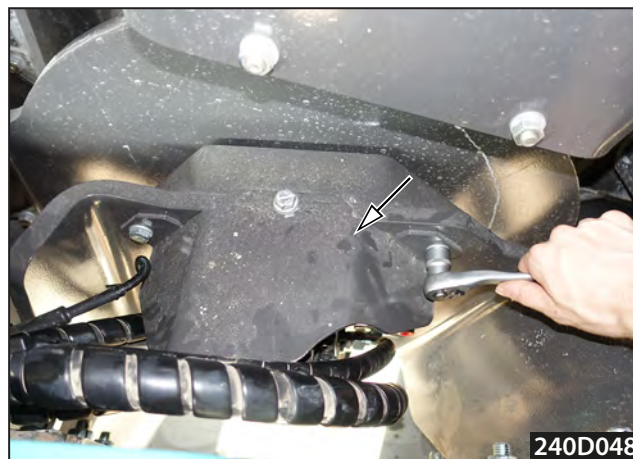


Remove the electromagnet.

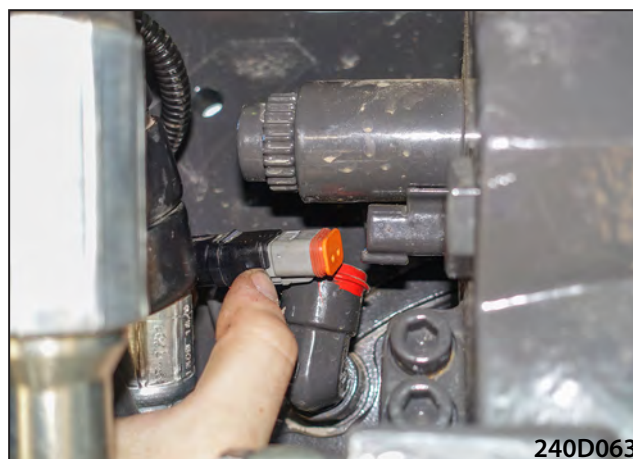


**Drum**

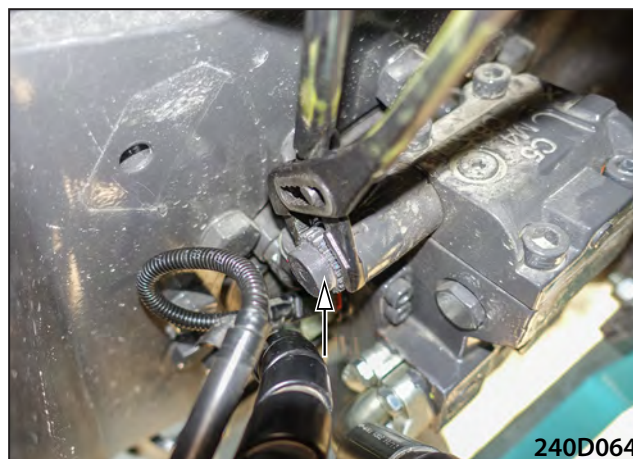
Remove the cover of the travel hydraulic motor.



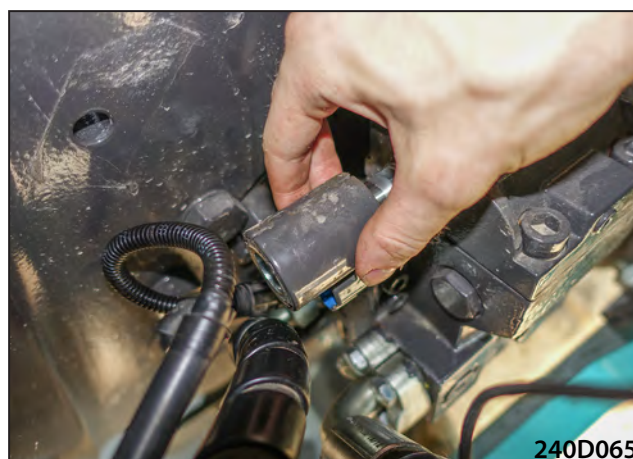
Disconnect the connector.



Remove the nut.



Take out the coil.



## 11 Travel

---

Remove the electromagnet.

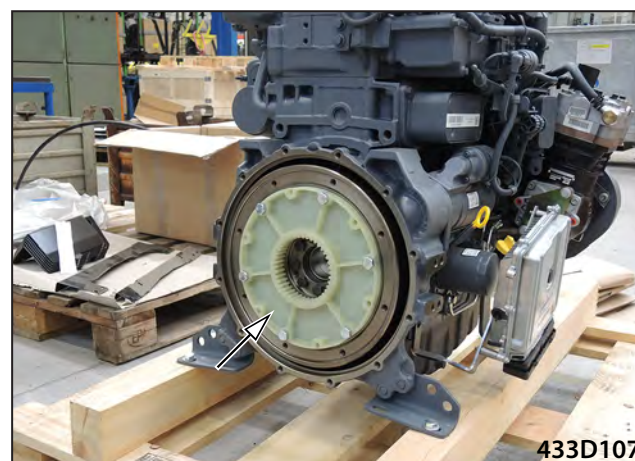


## 11.4 Mechanical parts

### 11.4.1 BOVEX coupling replacement

#### Installation

- Mount the coupling carrier.



433D107

- Hang the pump on a crane.



433D111

- Mount the coupling on the pump according to the figure.
- The front side of the coupling must be aligned with the front side of the pump shaft.



433D108

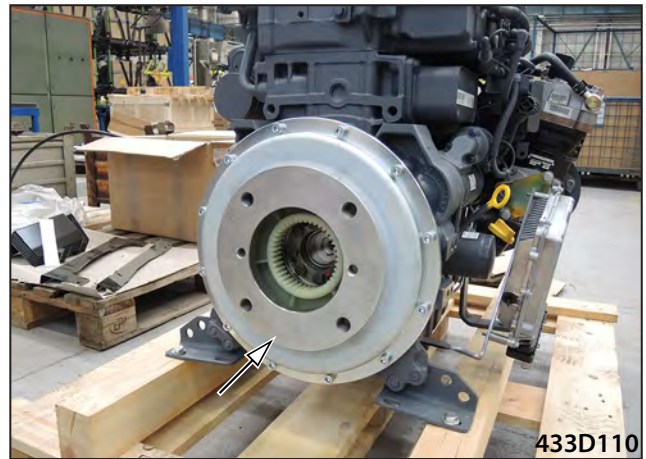
- Tighten the coupling using the screw.



433D109

## 11 Travel

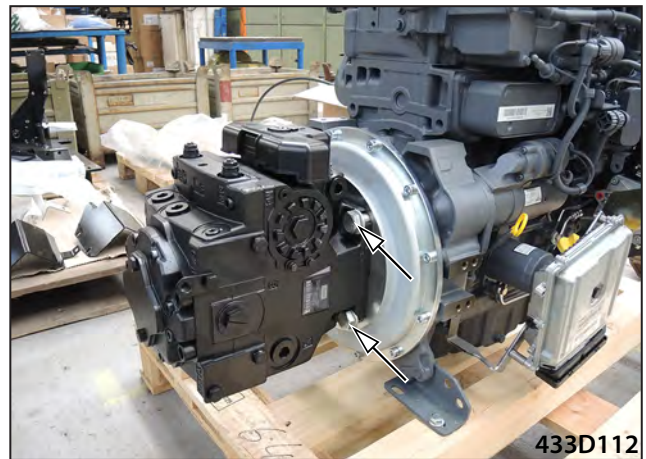
- Mount the flange according to the figure.



- Mount the pump on the flange.

**Note**

While mounting, secure the screws.



## Disassembly

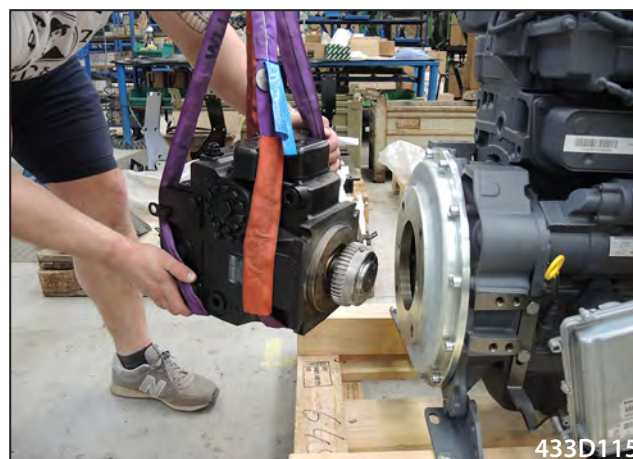
- Hang the pump on a crane.



- Remove the pump from the flange.



- Take out the pump with the coupling from the coupling carrier.

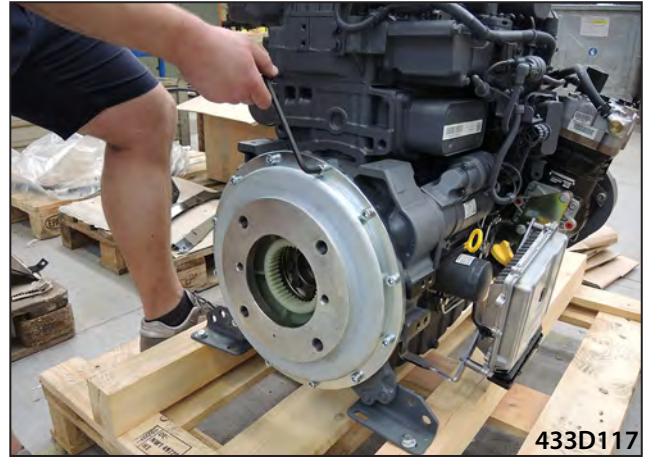


- Loosen the coupling screw and move out the coupling.

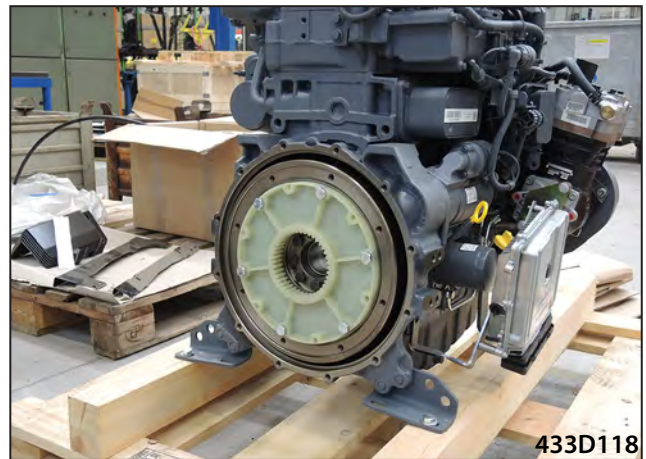


## 11 Travel

- Remove the flange.



- Remove the coupling carrier.

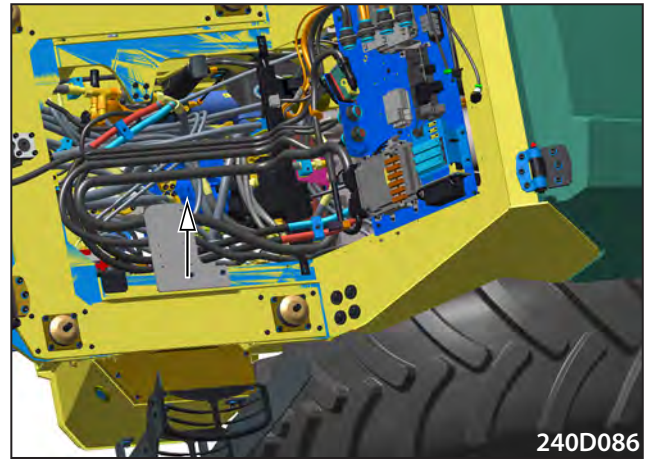


## 12 Vibration

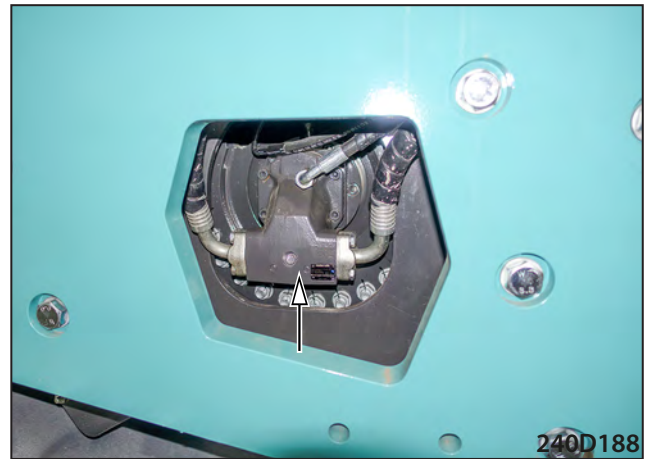
## 12 Vibration

### 12.1 Description of basic elements

Vibration pump



Vibration hydraulic motor



## 12.3 Electrical installation

### 12.3.1 Vibration pump coil replacement

Disconnect the coil connector.



Remove the nut.



Take out the coil.



Remove the electromagnet.



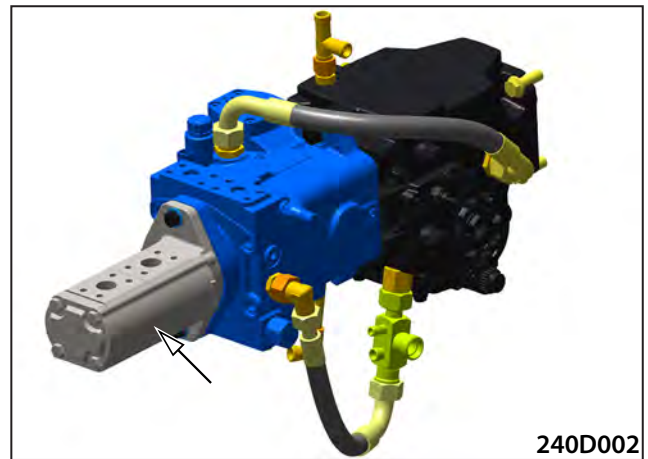


# 13 Steering

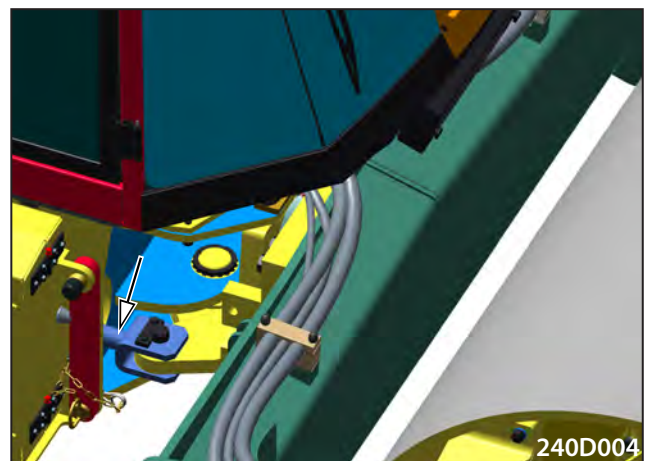
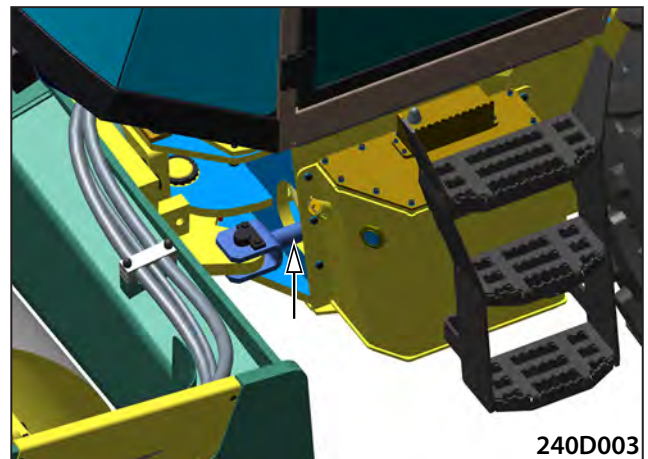
# 13 Steering

## 13.1 Description of basic elements

Steering pump



Linear hydraulic motor



Hydraulic filter



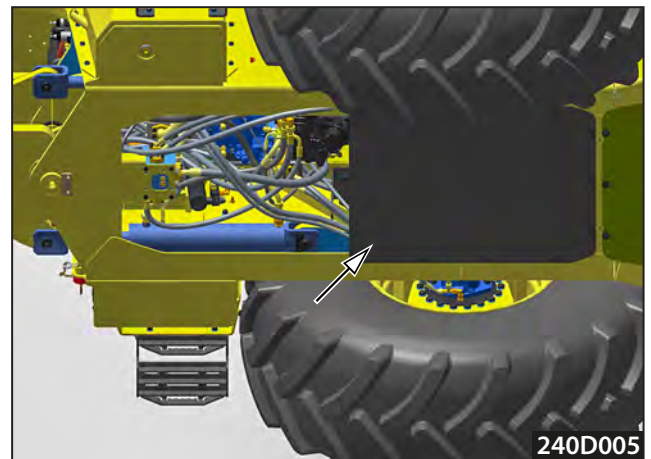
Control unit



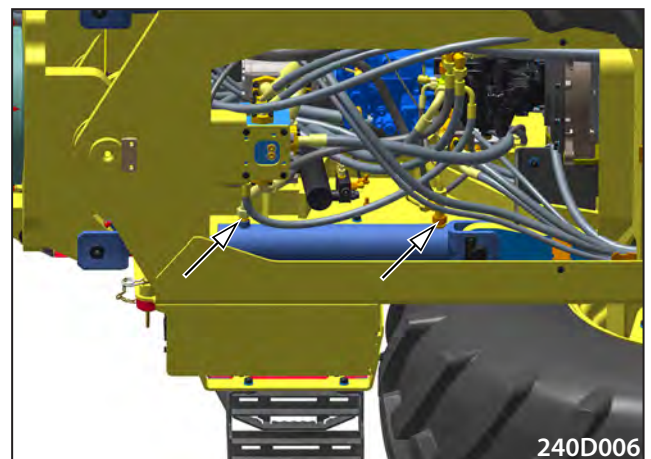
## 13.2 Hydraulic parts

### 13.2.1 Linear hydraulic motor replacement

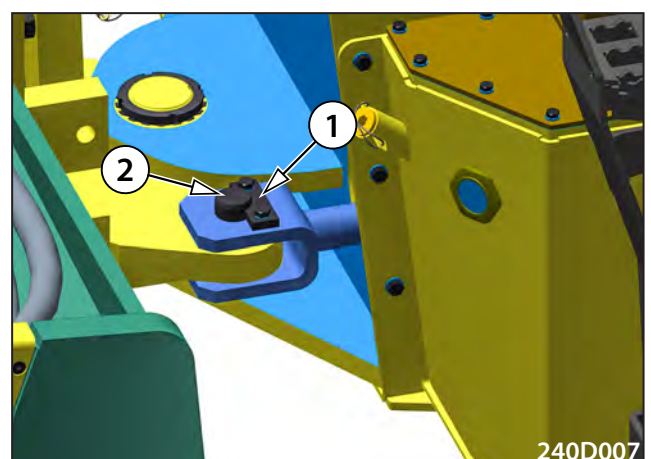
Align the machine on a level and solid surface.  
Remove the cover.



To provide better access, set the steering in the max. steering wheel lock.  
Put the catch tank under the removed hydraulic motor.  
Disconnect the hoses, blank off the ends.



Remove the plates (1) and press out the pins (2) from the eyes.  
Remove the hydraulic motor from the machine..

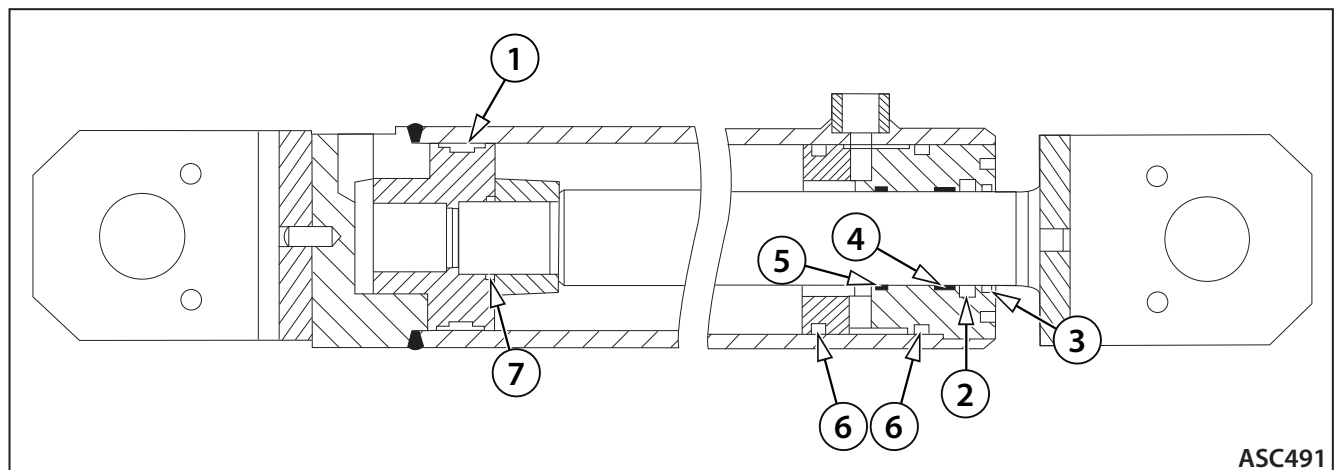


## 13 Steering

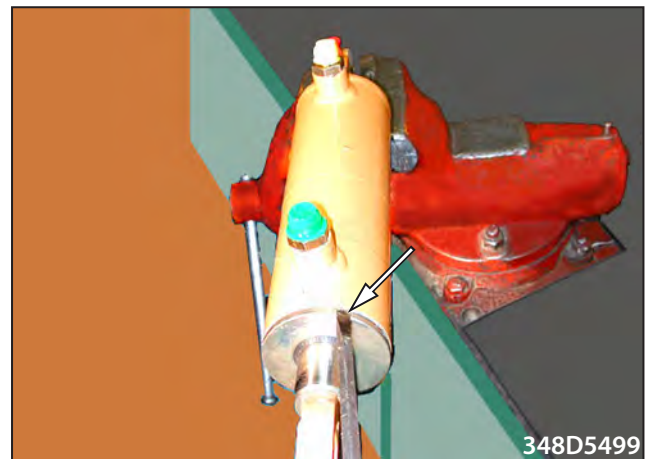
### 13.2.2 Replacement of the gasket of the linear hydraulic motor for steering

Seal set - order number: 4-8300750355

Pos.	Name
1	Seal
2	Collar
3	Scraper ring
4	Guide band
5	Guide band
6	Ring
7	Ring



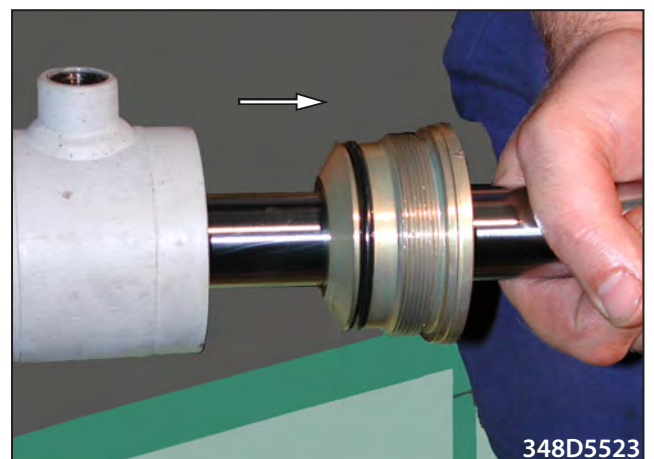
Unlock the hydraulic motor cover.



Dismount the hydraulic motor cover using a hook spanner.

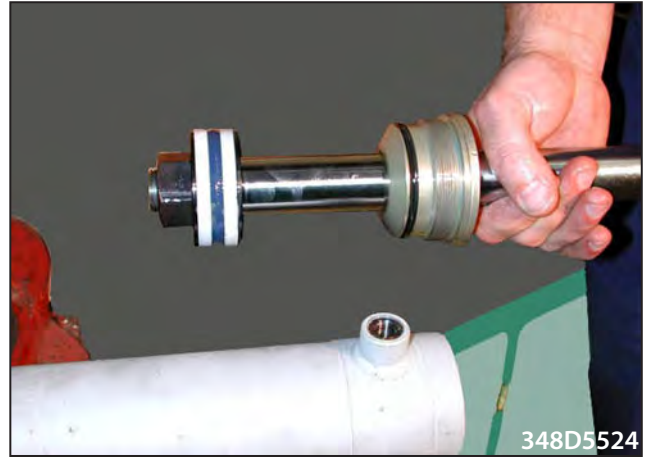


Remove it.



## 13 Steering

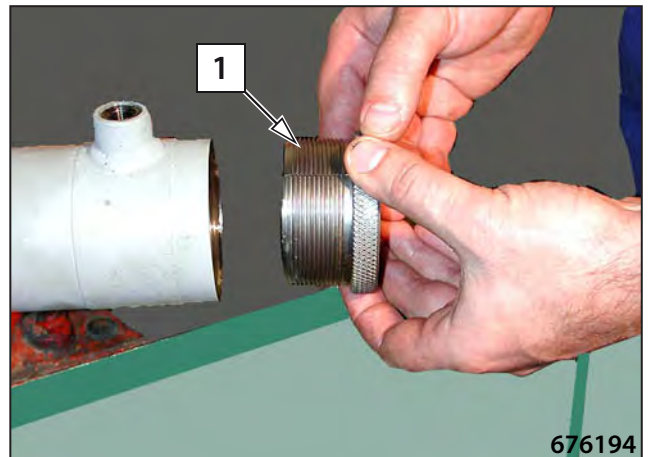
Remove the hydraulic motor piston.



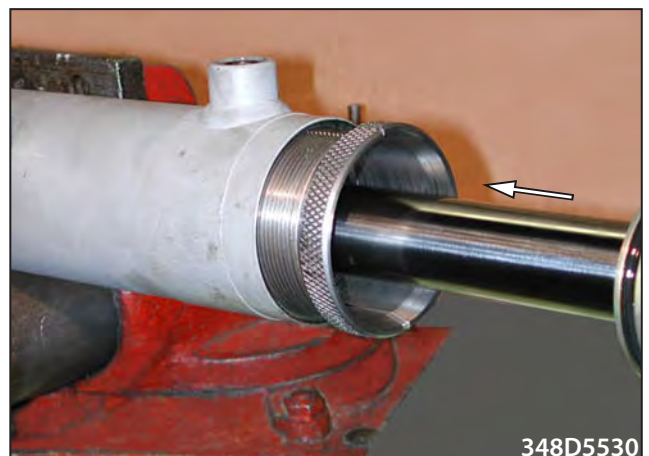
Dismount the piston nut and reseal the piston at the same time with the cover.



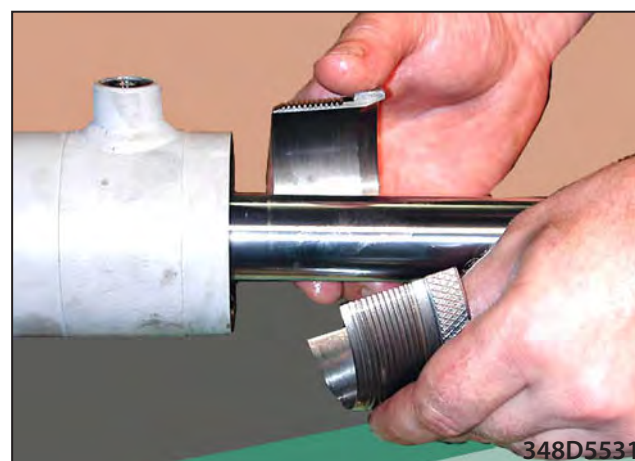
Mount fixture (1) into hydraulic motor body.



Put on the piston.



Dismount the fixture from the hydraulic motor.



Mount the hydraulic motor cover.



Secure the cover.



Tightening torque table for linear hydraulic motor 90/45-400

Connection of piston rod		Connection of cylinder body, cover	
Thread	Tightening torque	Thread	Tightening torque
M 32x2	140 Nm	M 95x1,5	200 Nm

## 13 Steering

### 13.2.3 Replacement of the steering hydraulic unit

#### Removal

Remove the heater covers.



Disconnect the connectors of the socket on the heater cover.



Remove the holder of the steering column tilting lever.



Remove the cover of the steering column.



Remove the rubber seal of the steering column.



Disconnect the connector of the steering column.



Remove the screws of the steering column attachment.  
Put the column aside.



Dismount the protective cover of the cab.



## 13 Steering

Disconnect the washer tube.



Remove the hose covers.



Remove the screws of the steering unit attachment.



Mark the hoses of the steering unit, remove them and blank off.  
Put the steering unit aside.



## Installation

Connect the steering unit hoses.



240D018

Mount the steering unit using screws.



240D017

Mount the hose covers.



240D016

Connect the washer hose.



240D015

## 13 Steering

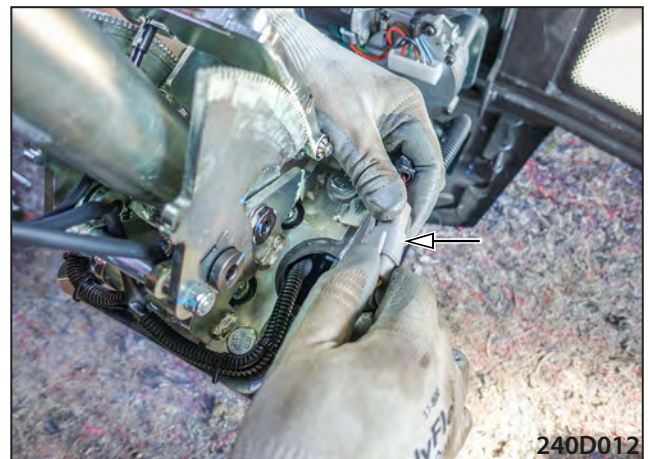
Mount the protective cover of the cab.



Mount the steering column using screws.



Connect the connector of the steering column.



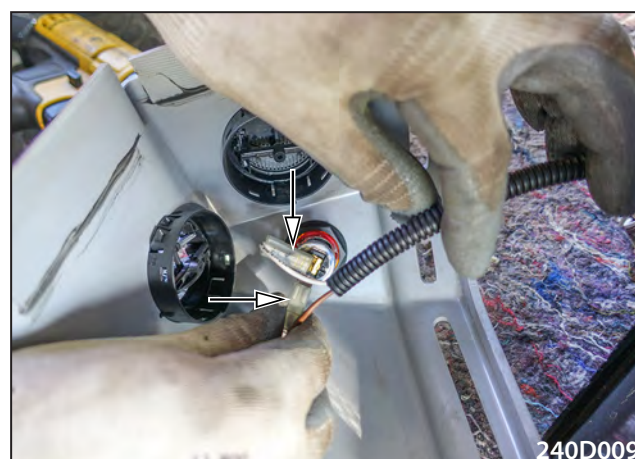
Mount the rubber seal of the steering column.



Mount the cover of the steering column.



Connect the connectors of the socket on the heater cover.



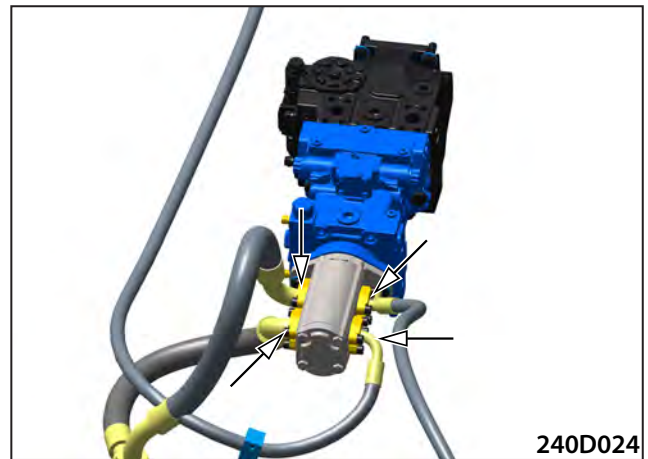
Attach the heater covers.



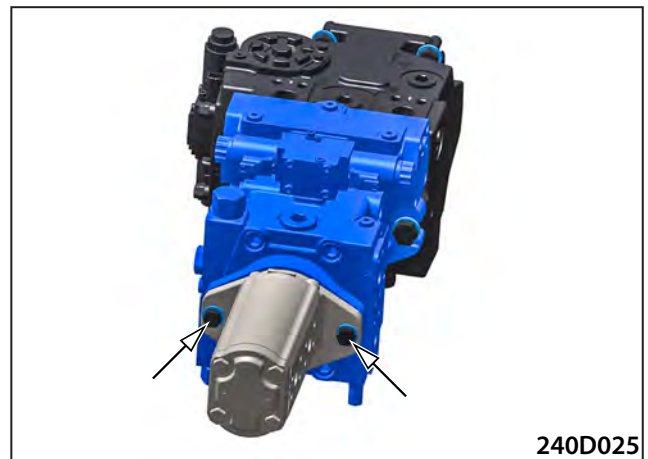
## 13 Steering

### 13.2.4 Steering pump

Remove the hoses from the steering pump.



Remove the steering pump.



## 13.3 Electrical installation

### 13.3.1 Display replacement

Display replacement (Chap. 6.7.4).

**13.3.2 Travel control replacement**

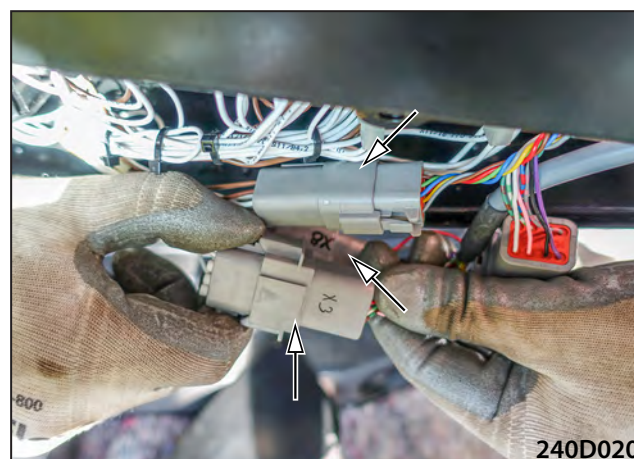
Disconnect the electrical installation using the battery disconnecter.



Remove the armrest cover.



Disconnect the connectors X8 and X3.



Remove cover of the travel controller screws



## 13 Steering

Remove screws of the travel control.



Take out the travel control.



### 13.4 Mechanical parts

#### 13.4.2 Steering wheel removal

Complete the following tasks before the removing the steering wheel:

##### 13.3.1 Display replacement

Remove the nut. Pull off the steering wheel.

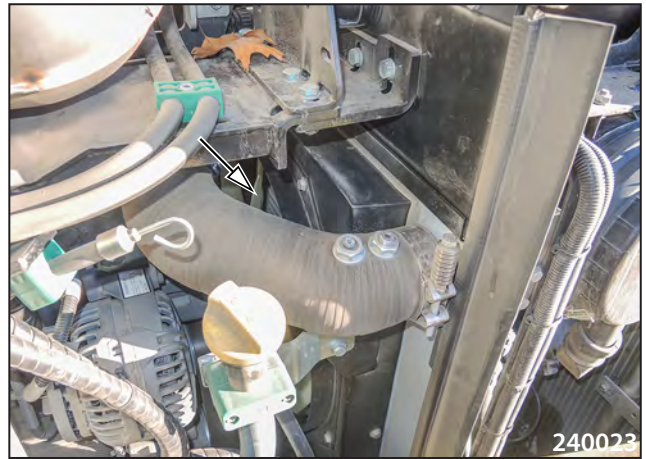


# 14 Cooling

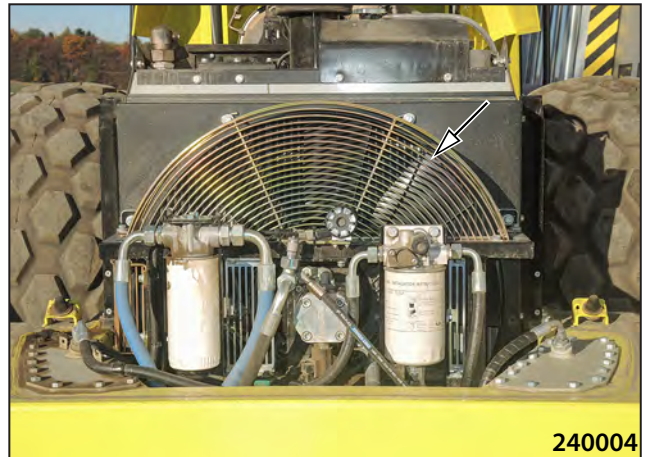
# 14 Cooling

## 14.1 Description of basic elements

Air cooler

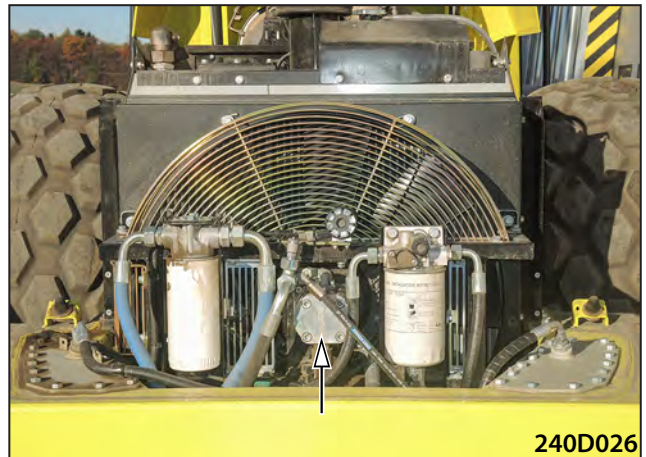


Combined cooler



## 14.2 Hydraulic parts

Cooling hydraulic motor



Hydraulic filter



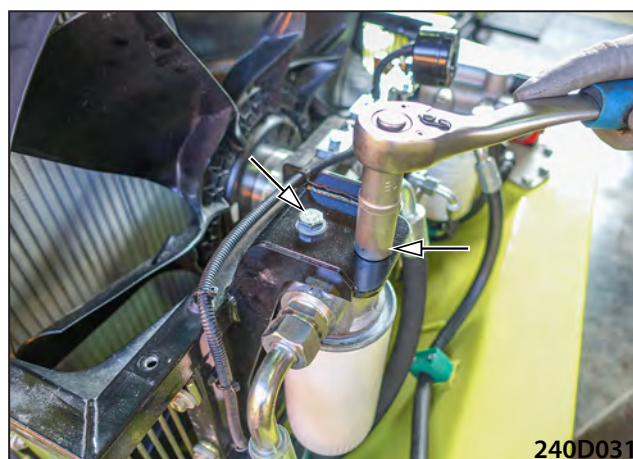
**14.2.1 Cooling hydraulic motor replacement**

**Removal**

Remove the fan cover.



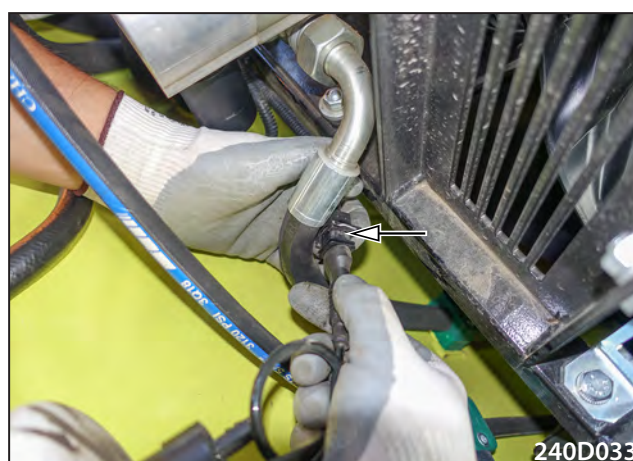
Remove the engine oil filter.



Remove the fuel pre-filter.



Disconnect the pre-filter connector.



## 14 Cooling

Disconnect the connector on the cooling hydraulic motor coil.



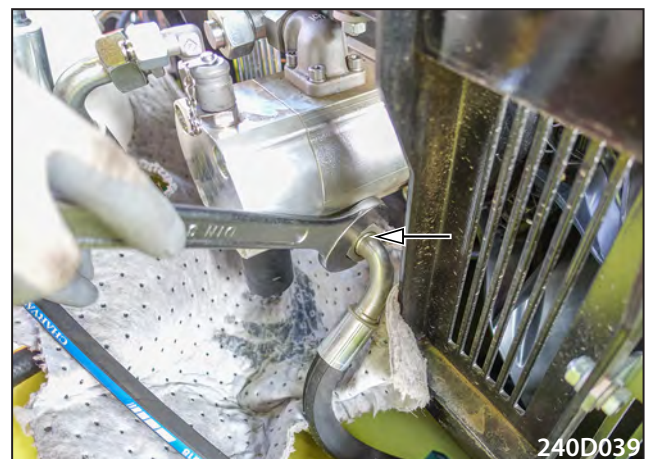
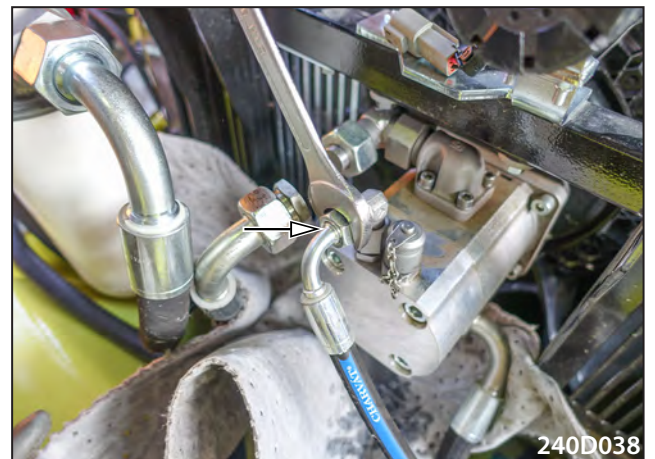
Disconnect the reversing horn connector.



Remove the wiring mount band clamps.



Remove the cooling hydraulic motor hoses.

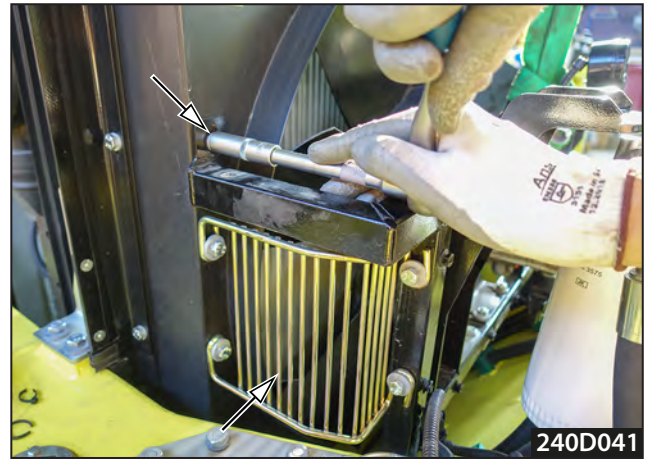


Hang the propeller frame on a crane with sufficient load capacity. Frame weight about 25 kg (55 lb).

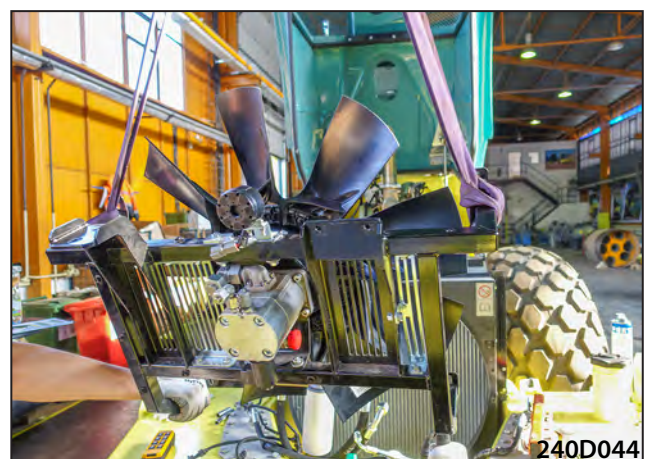


## 14 Cooling

Remove the fan covers and propeller frame mounting bolts.



Remove the frame with the propeller and put it aside.



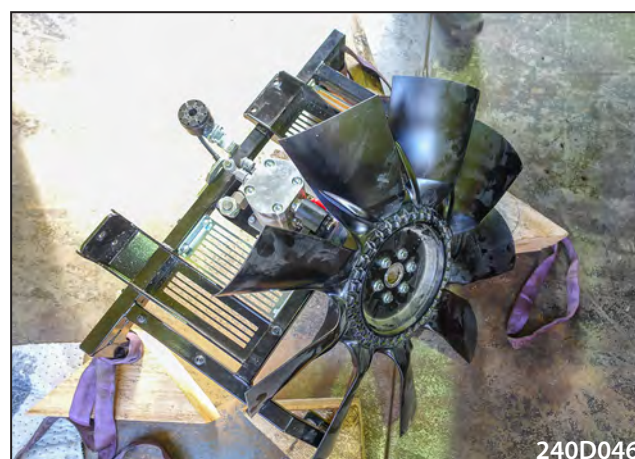
Remove the fan nut.



**It is forbidden to adjust the propeller in any way. The propeller is adjusted by the manufacturer and it may become unbalanced.**



Pull the propeller down from the cooling hydraulic motor shaft.  
Put the propeller aside.



Remove the cooling hydraulic motor mounting bolts.  
Remove the hydraulic motor and put it aside.



## 14 Cooling

### Installation

Insert the hydraulic motor.

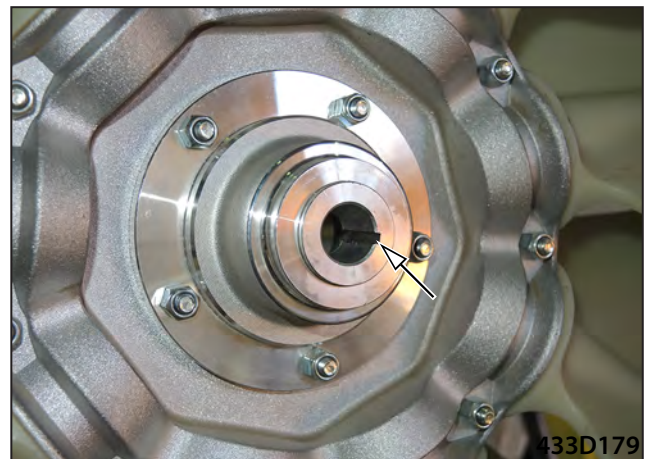
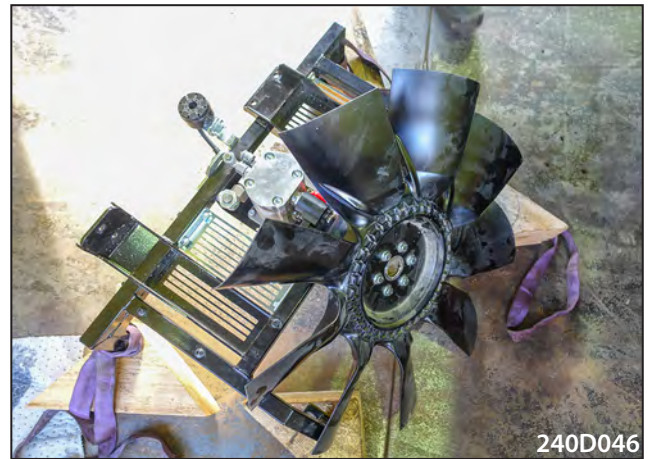
Mount the cooling hydraulic motor mounting bolts.



Slide the propeller onto the cooling hydraulic motor shaft.

### Note

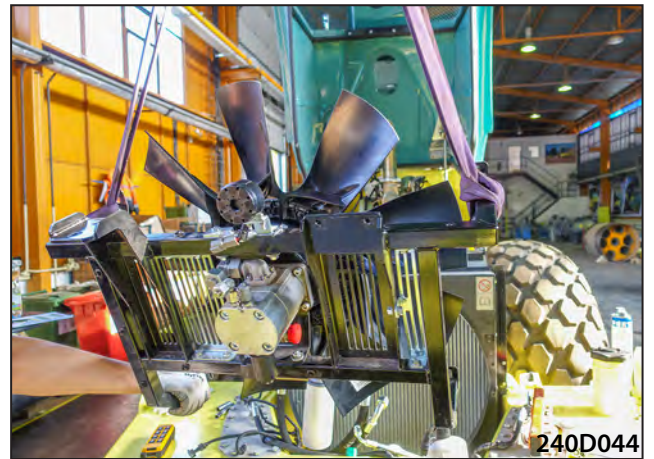
When reassembling, observe the correct fan rotation.



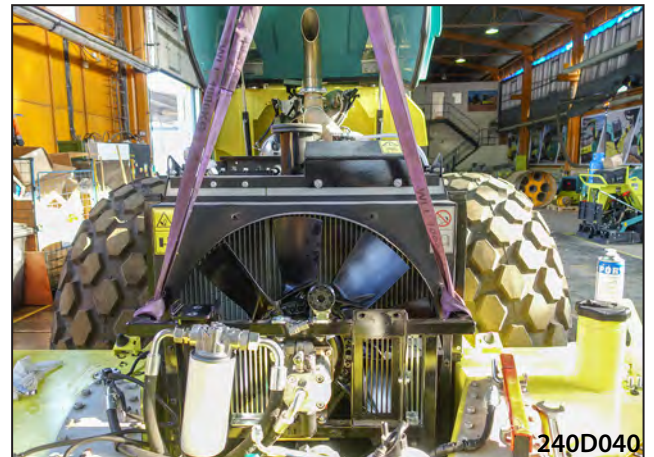
Propeller nut.



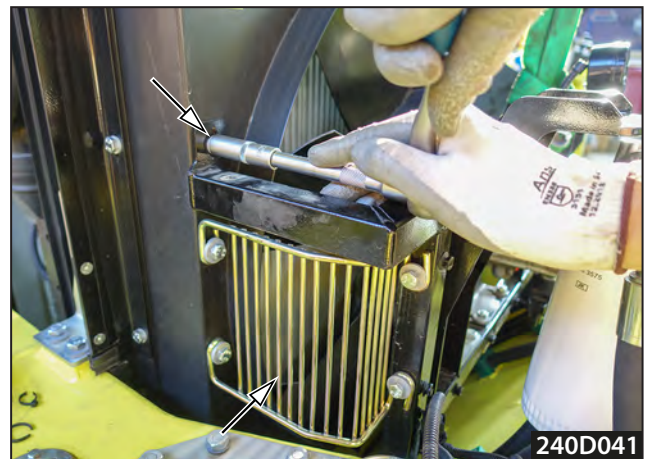
Hang the propeller frame on a crane with sufficient load capacity. Frame weight about 25 kg (55 lb).



Fit the frame with the propeller into the machine.

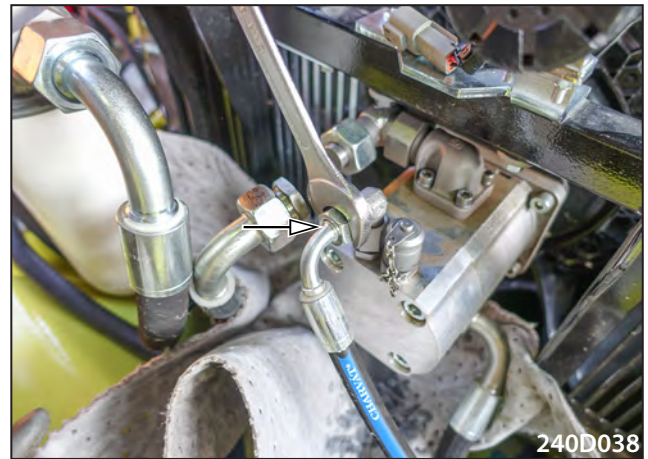
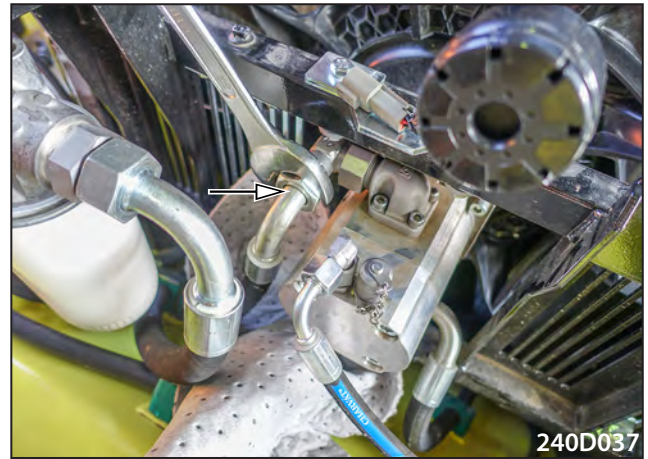


Mount the propeller frame fitting bolts and fan covers.



## 14 Cooling

Mount the cooling hydraulic motor hoses.



Connect the reversing horn connector.



Connect the connector on the cooling hydraulic motor coil.



Connect the pre-filter connector.



Mount the fuel pre-filter.



Mount the engine oil filter.



## 14 Cooling

Mount the fan cover.



### 14.3 Electrical installation

Connector

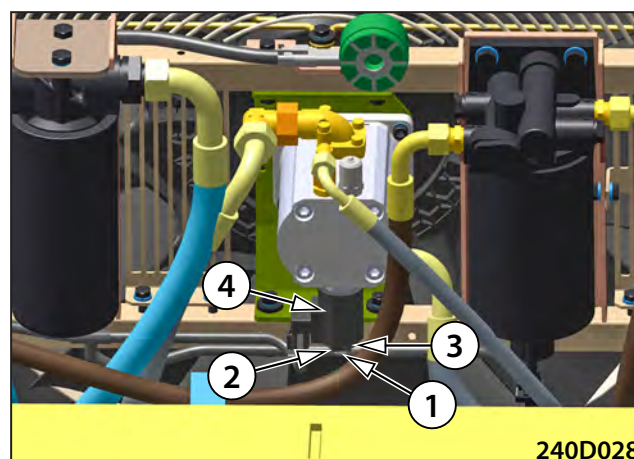


#### 14.3.1 Replacement of the electromagnet coil of the cooling hydraulic motor

Remove the nut (1).

Remove the cover (2) and the sealing (3).

Remove the coil of the hydraulic motor (4).



## 14 Cooling

### 14.4 Mechanical parts

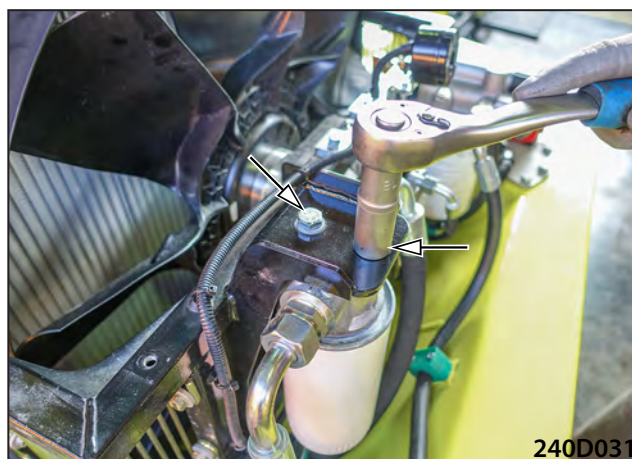
#### 14.4.1 Replacement of the cooling fan, cooling fan spacer

##### Removal

Remove the fan cover.



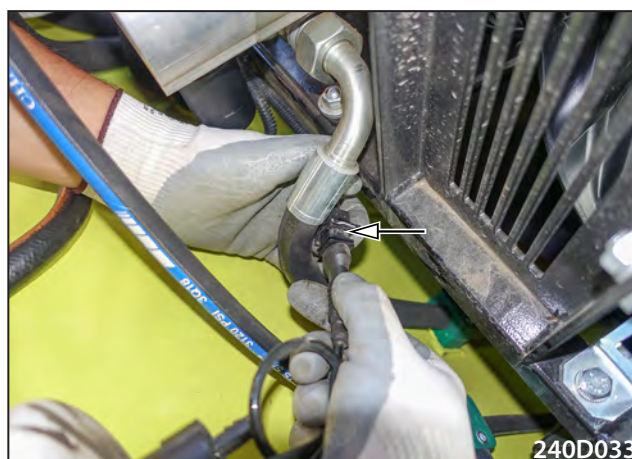
Remove the engine oil filter.



Remove the fuel pre-filter.



Disconnect the pre-filter connector.



Disconnect the connector on the cooling hydraulic motor coil.



Disconnect the reversing horn connector.

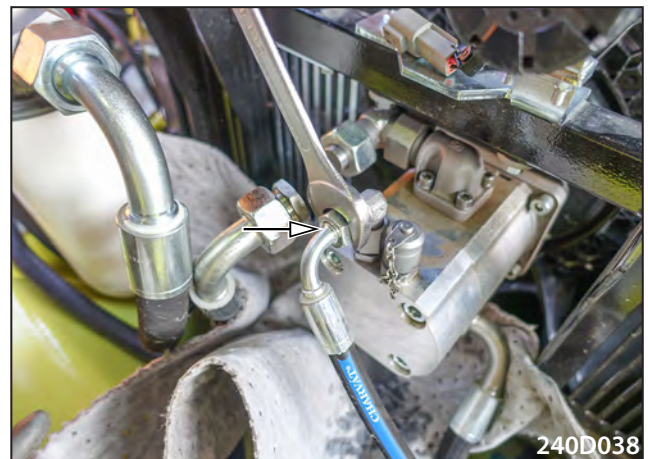
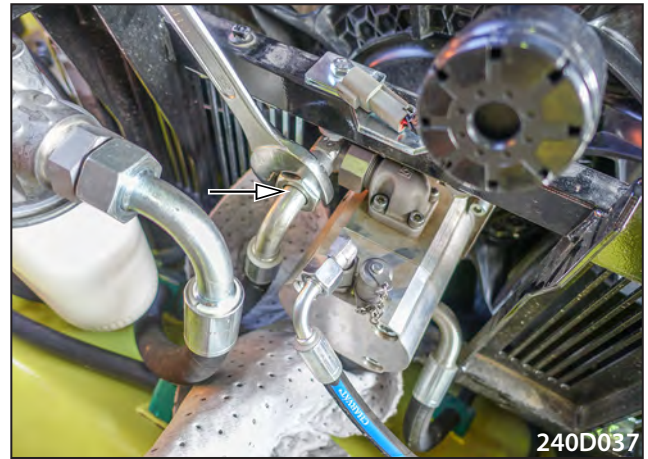


Remove the wiring mount band clamps.



## 14 Cooling

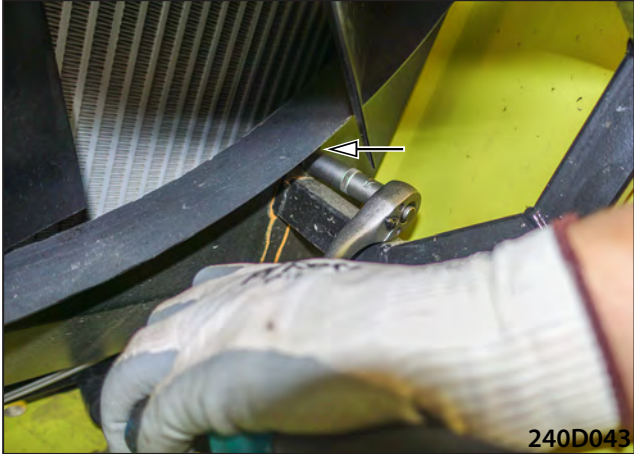
Remove the cooling hydraulic motor hoses.



Hang the propeller frame on a crane with sufficient load capacity. Frame weight about 25 kg (55 lb).



Remove the fan covers and propeller frame mounting bolts.



Remove the frame with the propeller and put it aside.

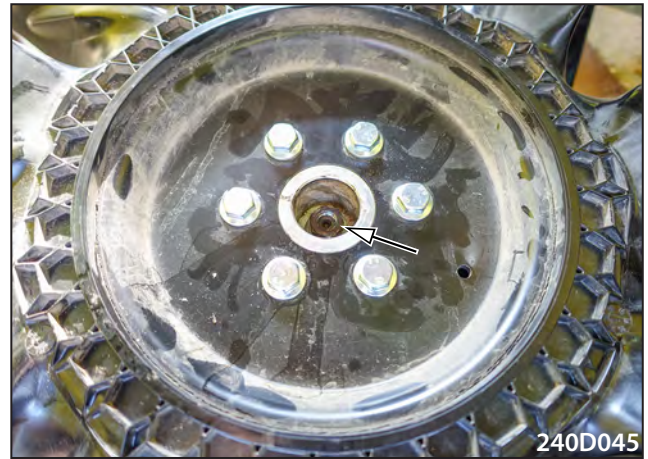


## 14 Cooling

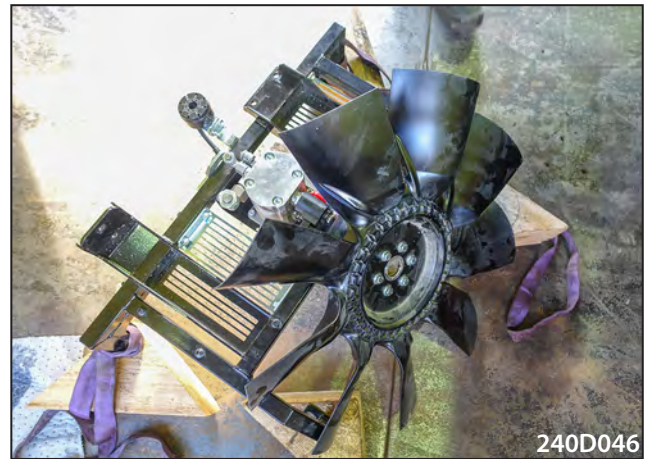
Remove the fan nut.



It is forbidden to adjust the propeller in any way. The propeller is adjusted by the manufacturer and it may become unbalanced.



Pull the propeller down from the cooling hydraulic motor shaft.  
Put the propeller aside.

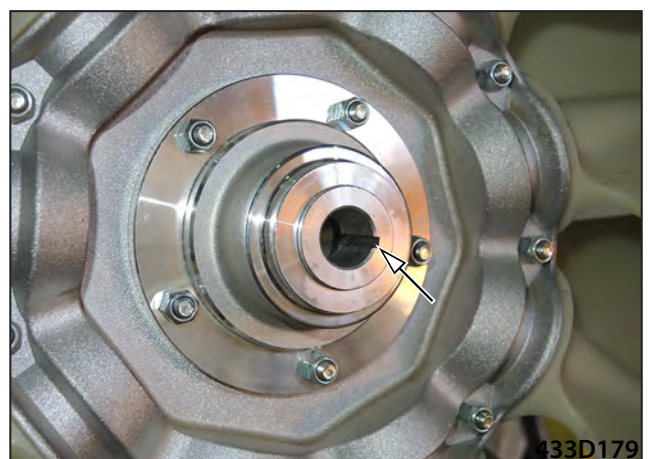
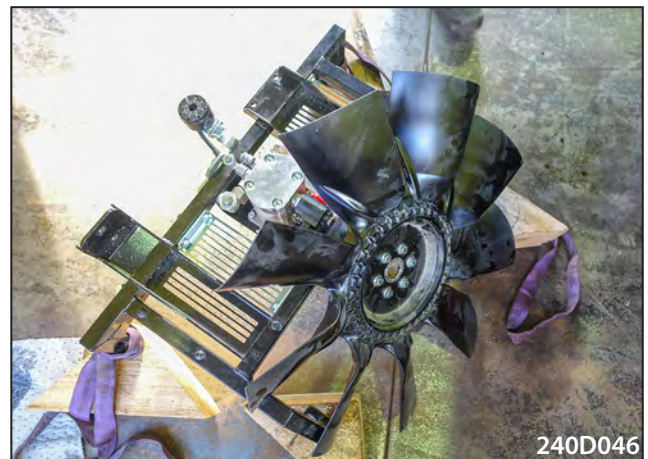


### Installation

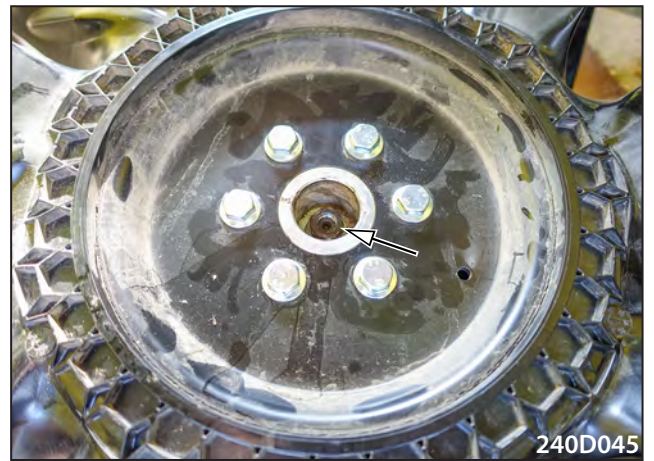
Slide the propeller onto the cooling hydraulic motor shaft.

### Note

When reassembling, observe the correct fan rotation.



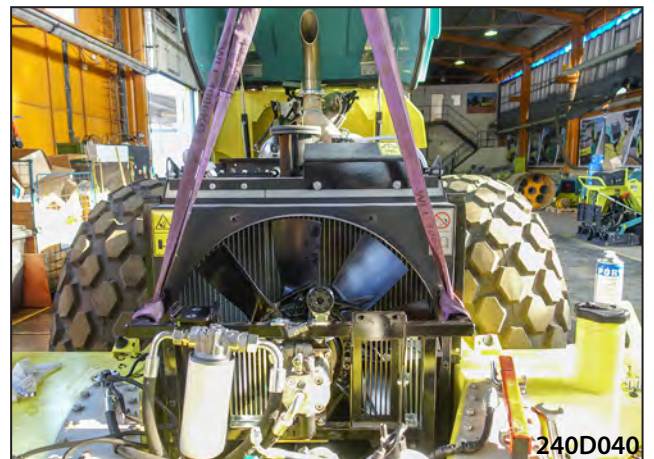
Mount the fan nut.



Hang the propeller frame on a crane with sufficient load capacity. Frame weight about 25 kg (55 lb).

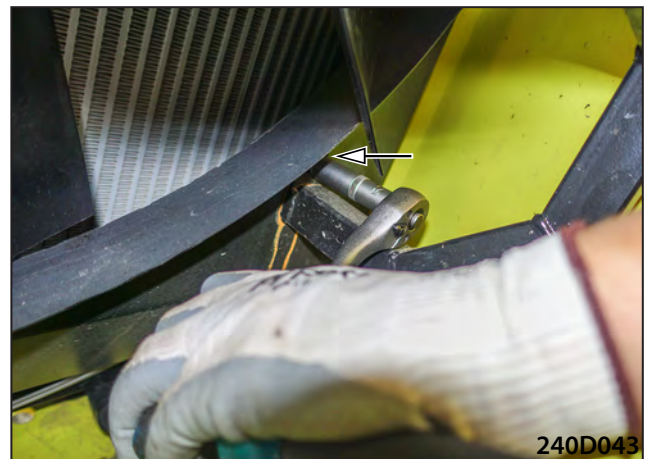
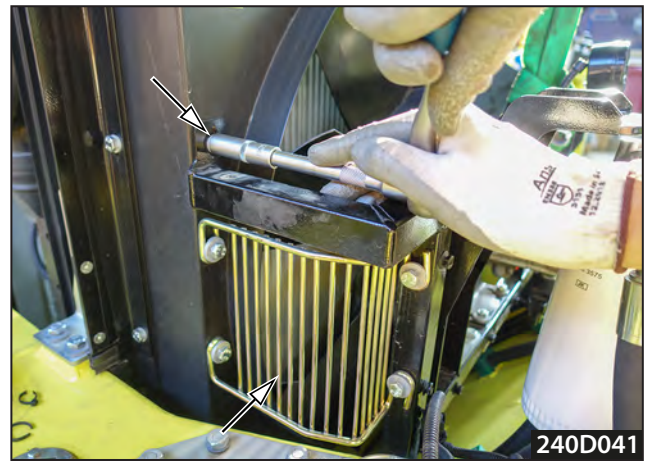


Fit the frame with the propeller into the machine.

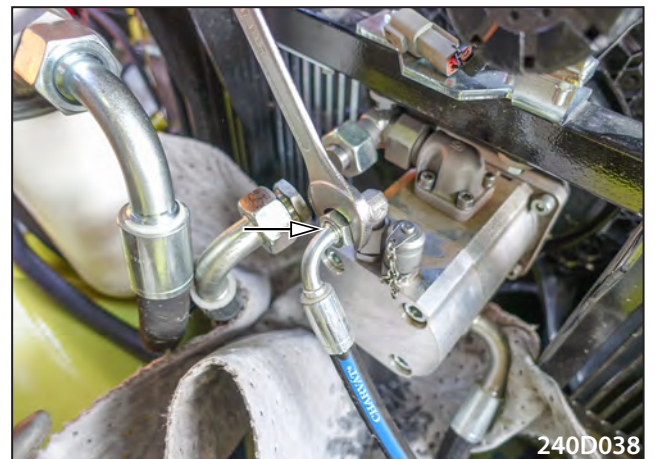
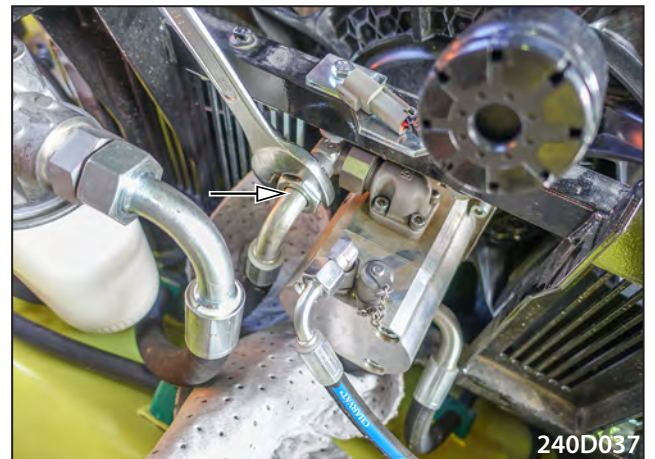


## 14 Cooling

Mount the propeller frame fitting bolts and fan covers.



Mount the cooling hydraulic motor hoses.



Connect the reversing horn connector.



## 14 Cooling

Connect the connector on the cooling hydraulic motor coil.



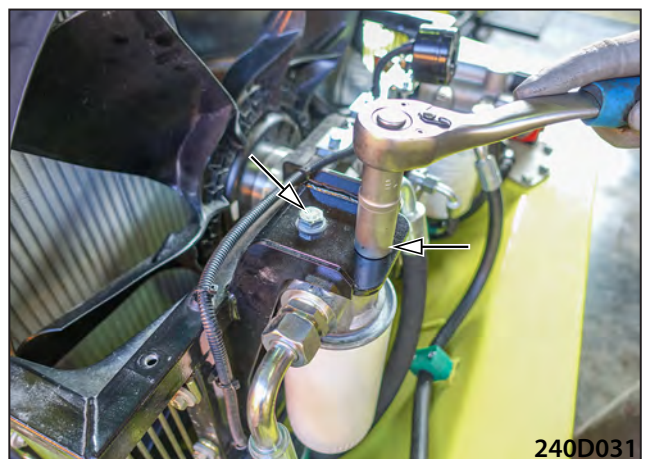
Connect the pre-filter connector.



Mount the fuel pre-filter.



Mount the engine oil filter.



Mount the fan cover.

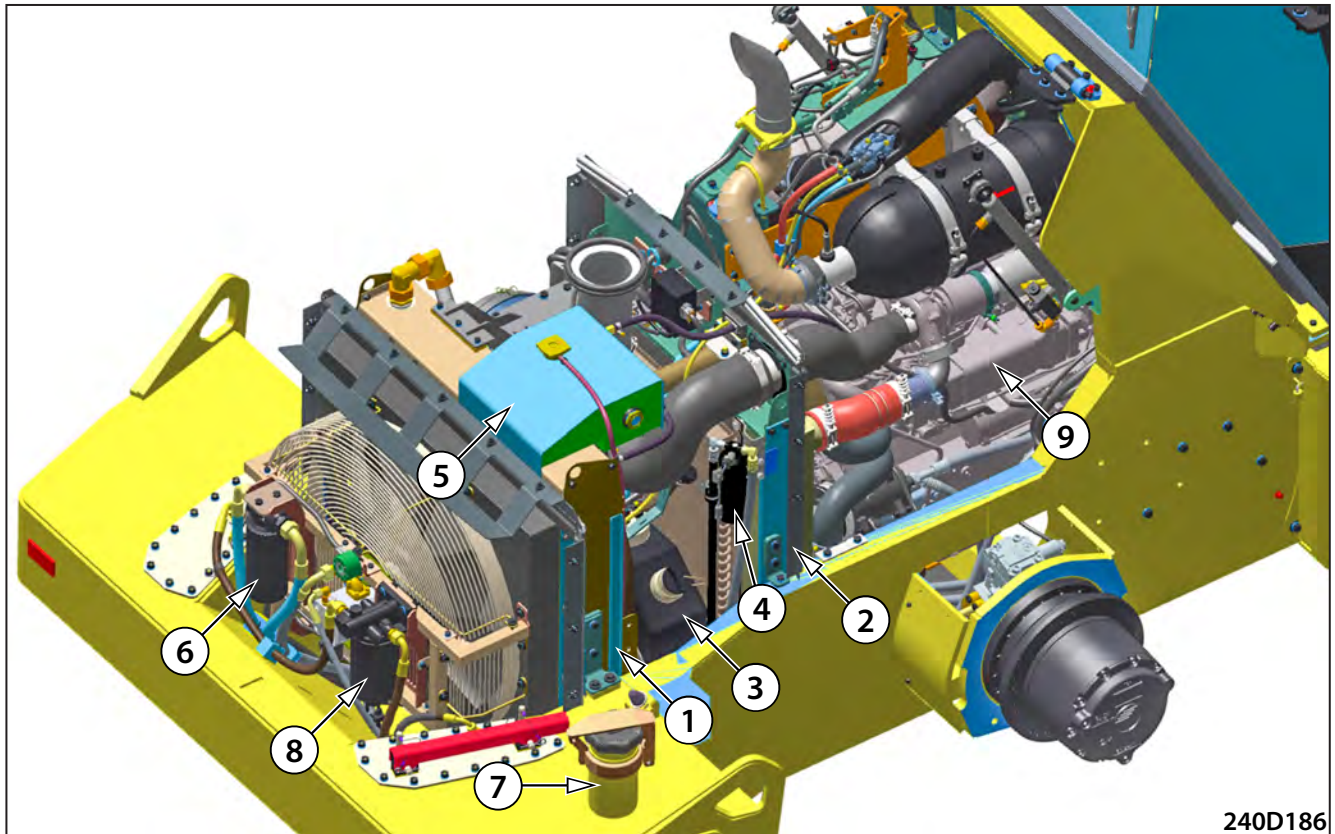


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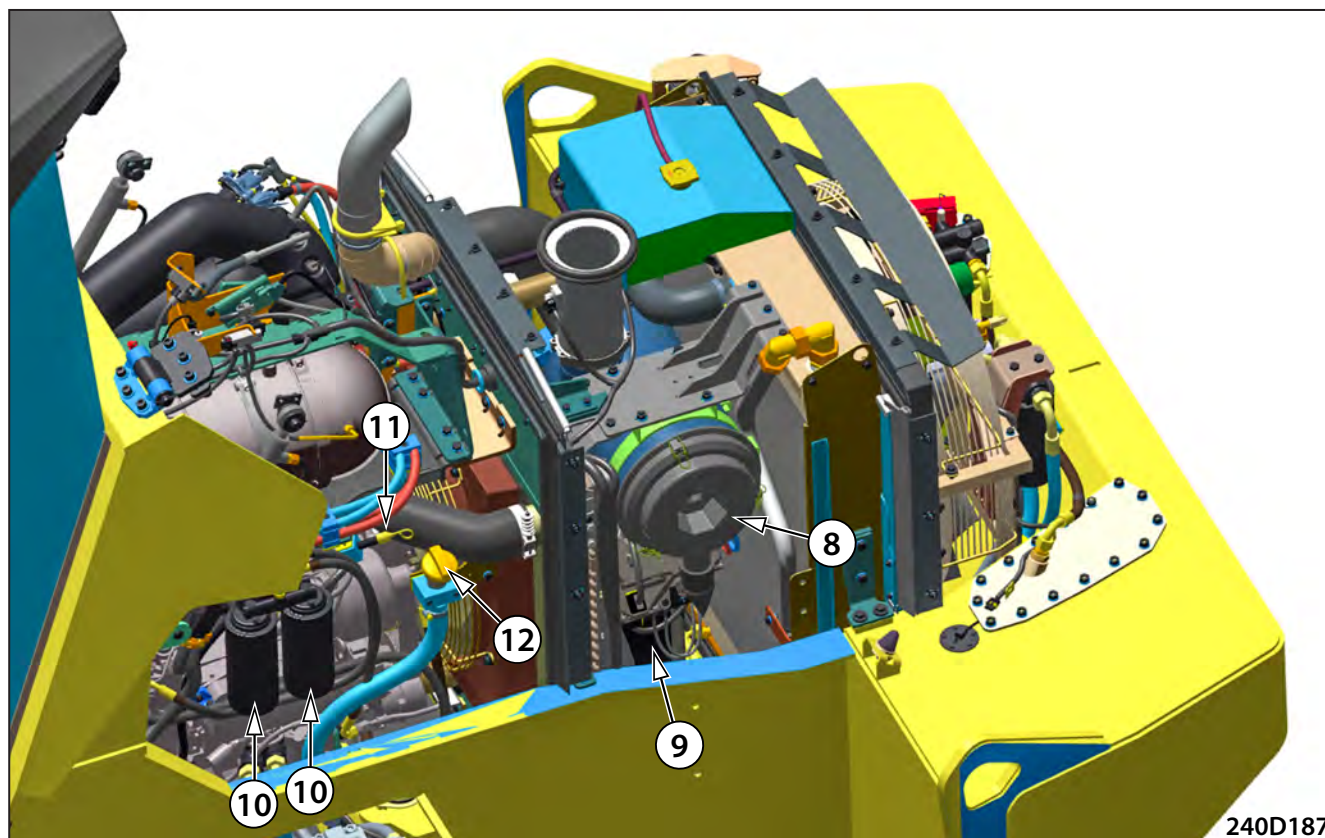
# **15 Engine**

## 15 Engine

### 15.1 Description of basic elements



1. Combined cooler
2. Air cooler
3. DEF tank (AdBlue)
4. Filter dehydrator
5. Coolant overpressure tank
6. Engine oil filter
7. Filler neck of the fuel tank
8. Fuel pre-filter
9. Engine



- 8. Air filter
- 9. DEF (AdBlue) pump
- 10. Fuel filters
- 11. Engine oil dipstick
- 12. Engine oil filler neck

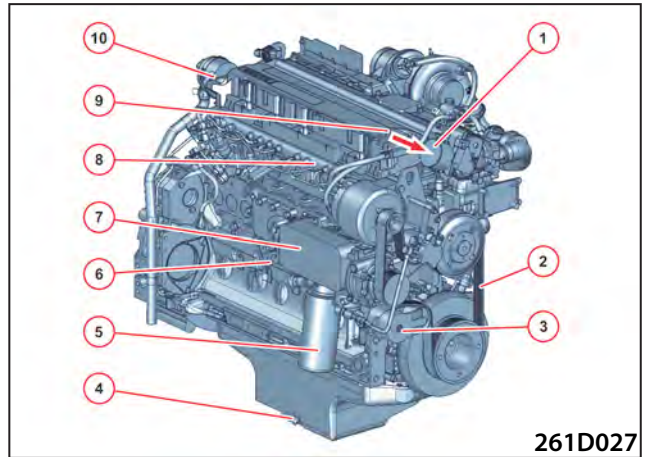
# 15 Engine

Engine nameplate



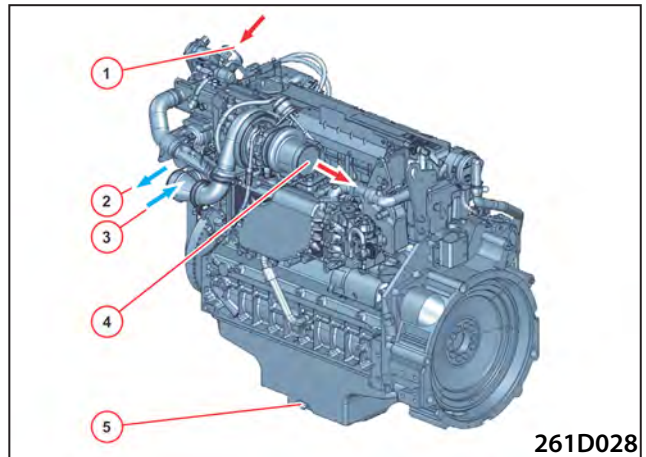
### Right side view

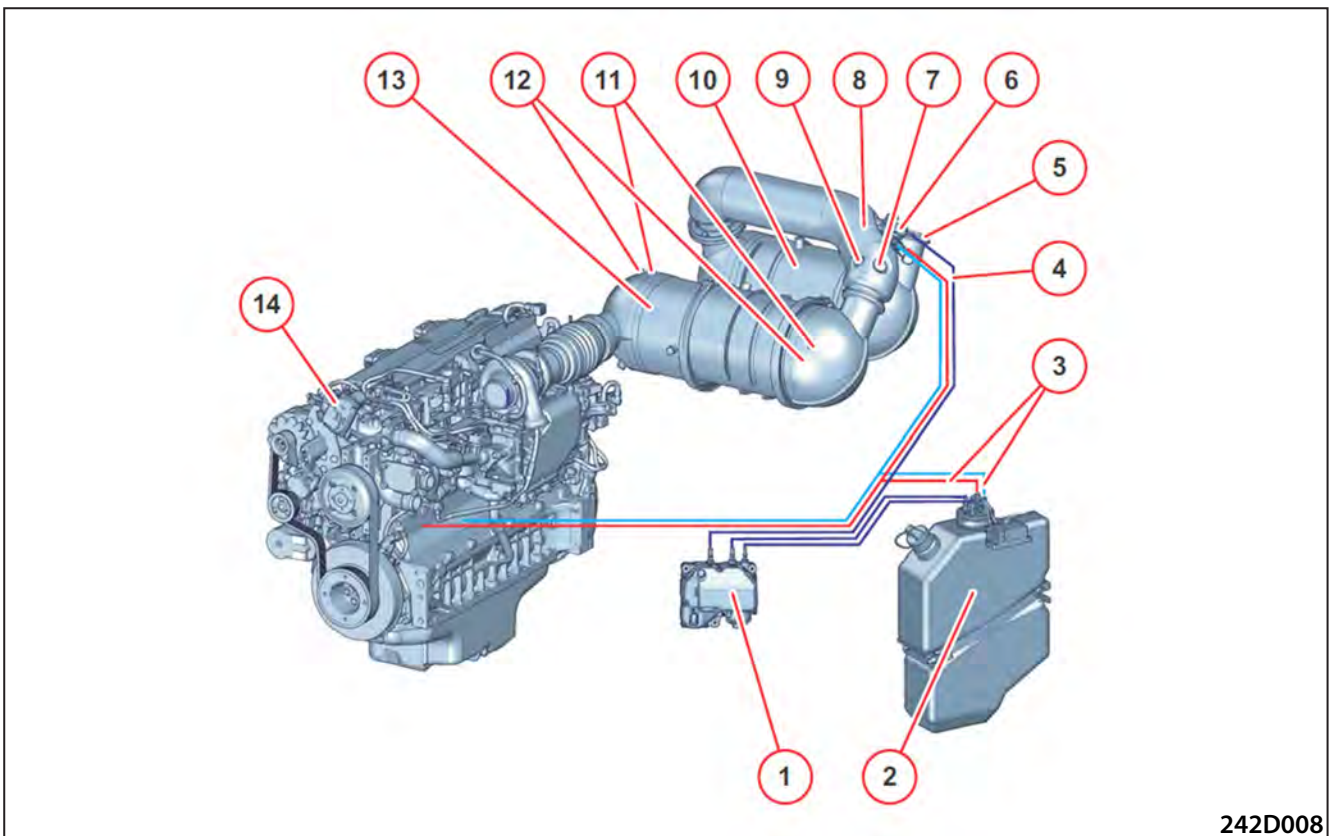
- 1. Combustion air inlet
- 2. Grooved V-belt
- 3. Idler pulley
- 4. Lubricating oil drain plug
- 5. Engine oil filter
- 6. Engine oil dipstick
- 7. Engine oil cooler
- 8. Injection distribution system
- 9. Engine oil filling
- 10. Crankcase ventilation



### Left side view

- 1. Combustion air inlet
- 2. Coolant drain
- 3. Coolant inlet
- 4. Exhaust outlet
- 5. Engine oil drain plug





242D008

**Exhaust aftertreatment system**

1. Feed pump
2. AdBlue tank
3. AdBlue line for AdBlue tank pre-heating and for feeding unit cooling
4. AdBlue line
5. NOx sensor
6. Feeding unit
7. NOx sensor
8. Exhaust temperature sensor
9. Pressure sensor
10. SCR catalytic converter
11. Differential pressure sensor
12. Exhaust temperature sensor
13. Diesel particulate filter
14. Throttle

# 15 Engine

## Technical data

General technical data		
Engine type	Dimensions	TCD 4.1 L4
Working principle		Four-stroke diesel engine
Charging		Turbocharger with charge air cooling
Cooling type		Water cooling
Preferred arrangement		Serial
Number of cylinders		4
Bore/stroke	mm	101/126
Total volume of cylinders	cm <sup>3</sup>	4038
Combustion process		Direct injection
Injection system		Deutz Common Rail (DCR)
Exhaust gas recirculation		External cooling
Exhaust gas aftertreatment		Selective catalytic reduction (SCR) and Diesel particle filter (DPF)
Valves per cylinder		4
Valve clearance: suction/exhaust	mm	0.3/0.5
Torque protractor adjustment	°	75°±15°/120°±15°
Engine firing order		1-3-4-2
Direction of rotation when looking at the flywheel		left
Rated engine power according to ISO 3046	kW	See the engine nameplate
Rated speed	min <sup>-1</sup>	See the engine nameplate
Coolant volume (only engine without cooler / hoses and tubes)	l	5.9
Permissible continuous coolant temperature	°C	max. 110
Temperature difference between the coolant inlet/outlet	°C	4-8
Beginning of thermostat opening	°C	87
Thermostat fully open	°C	102
Lubricating oil replacement volume (including filter), industrial engines/agricultural technology	l	11.5*
Temperature of lubricating oil in oil sump, maximum	°C	125
Minimum lubricating oil pressure (low idle, warm engine)	kPa/bar	80/0.8
Permissible maximum temperature of combustion air downstream of the charge air cooler	°C	50
V-belt tension		Pre-tensioning/Re-tensioning
AVX V-belts (width: 13 mm)	N	650±50/400±50
Grooved V-belt tensioning		Automatic tensioning of the spring clamping cylinder
Weight without cooling system according to DIN 70020-A, industrial engines/agricultural technology	kg	400 / 450
* The stated lubricating oil volumes apply to the standard version. Engines that deviate from the standard, e.g. different lubricating oil sumps/dipstick variants and/or special tilted versions, may have different lubricating oil volumes. The lubricating oil dipstick is always decisive.		

## **15.2 Hydraulic parts**

### **15.2.1 Steering pump replacement**

Steering pump replacement (Chap. 13.2.4).

## 15 Engine

---

### 15.3 Electrical installation

#### 15.3.1 Batteries

The batteries are filled with an acid at a density of 1.28 g/ml by the manufacturer and charged sufficiently for immediate use. When the starting power is insufficient, the recharging is required.

##### Charging

- The battery must be recharged if the rest voltage due to a longer storage time is below 12.5 V. The rest voltage shall be checked after 2–4 quarters from the production date. If the rest voltage is below 12.5 V, the battery must be recharged before a longer storage time to a level from 12.7 to 12.8 V. The rest voltage shall be measured with a digital multimeter. The measurement should be made at about 20 °C.
- Ensure good ventilation of working areas.
- Use only suitable DC chargers.
- Connect the plus pole of the battery with the plus output of the charger; connect the minus pole in a similar way.
- Turn on the charger after the battery is connected and turn it off after it is recharged.
- Recommended charging current: 1/10 battery capacity in Amperes (Ah).
- If the acid temperature exceeds 55 °C, interrupt the charging.
- The battery is fully charged when the charging voltage does not increase further in the course of two hours.
- When the charging is completed, always measure the rest voltage (do it at the earliest 1 hour after the charging).

##### Removal

- While disassembling, first disconnect the cable of the negative (-) pole and then of the positive (+) pole. Never disconnect the battery when the engine is running.

##### Installation

- Remove the protective cover of the plus pole only in the machine while connecting the pole terminal and put it on the pole of the removed battery to prevent short-circuits.
- Clean the poles and terminals and apply a thin layer of grease on the poles.
- First, attach the plus poles and make sure the clamps are firmly attached.
- Leave at least one degassing vent free.

#### 15.3.2 Alternator replacement

The alternator is a part of the engine. In the event of a fault, contact the Deutz engine manufacturer.

#### 15.3.3 Starter replacement

The starter is a part of the engine. In the event of a fault, contact the Deutz engine manufacturer.

**15.4 Mechanical parts**

**Removal of the cooler**

Remove the bonnet (Chapter 5.4.1).

Disconnect the electrical installation using the disconnecter.



238182

Drain the coolant from the engine into a prepared vessel. The drained coolant volume is approximately 29 l (7.7 US gal).



240D162

Remove the pressure plug of the coolant tank.



240D163

Drain the hydraulic oil into a prepared vessel. The drained oil volume is about 90 l (23.8 gal US).

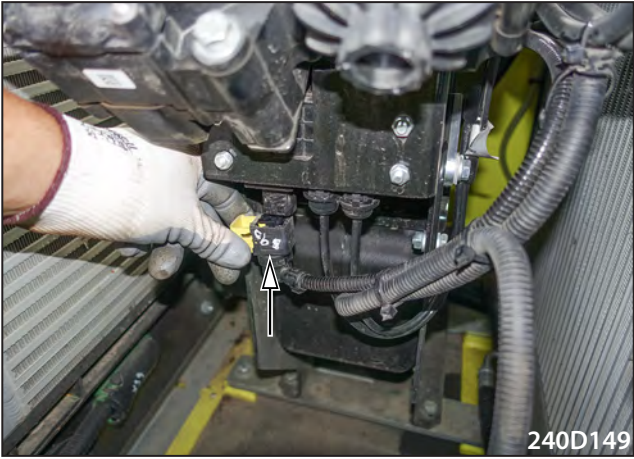
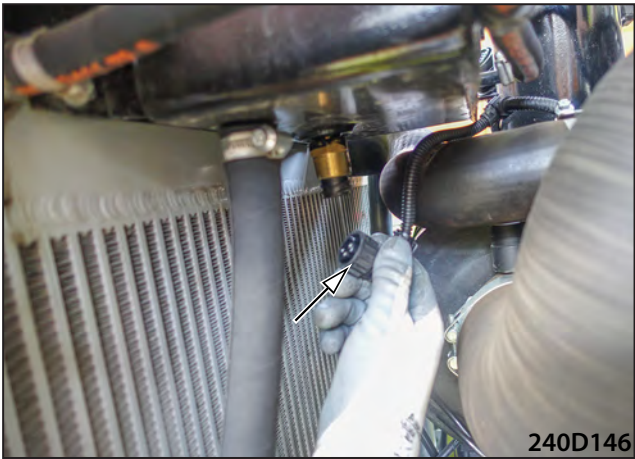


240D164

# 15 Engine

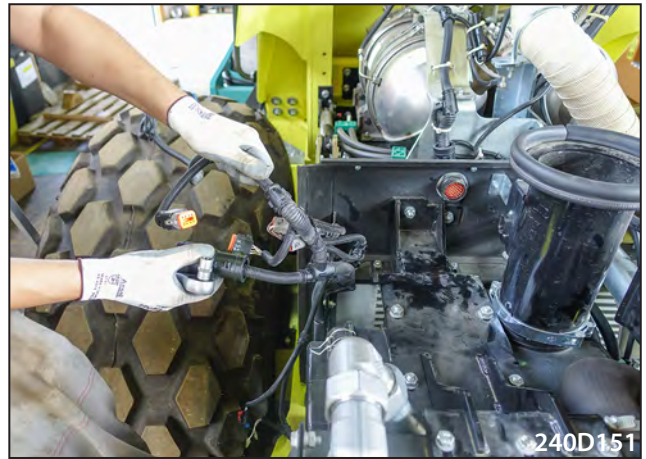
Disconnect the wiring connectors in the engine compartment.





## 15 Engine

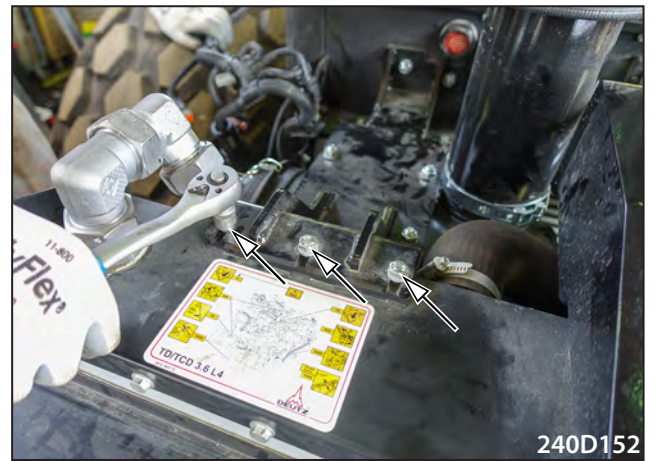
Move the bundle out of the frame.



Remove the air suction hose.



Remove the air filter bracket.



Disconnect the horn connector.



Disconnect the cooling hydraulic motor connector.



# 15 Engine

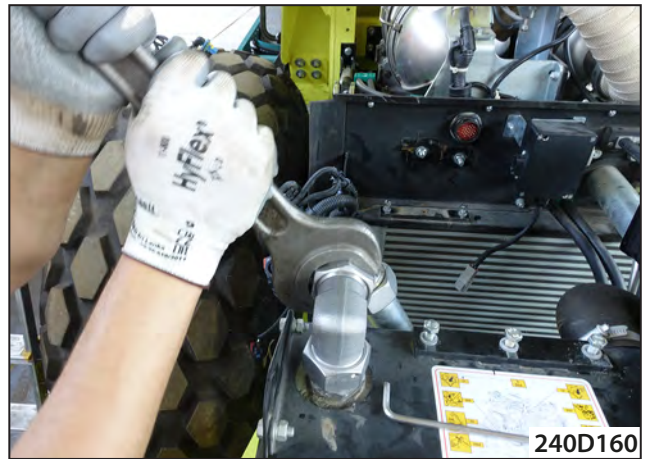
Disconnect the fuel pre-filter connector.



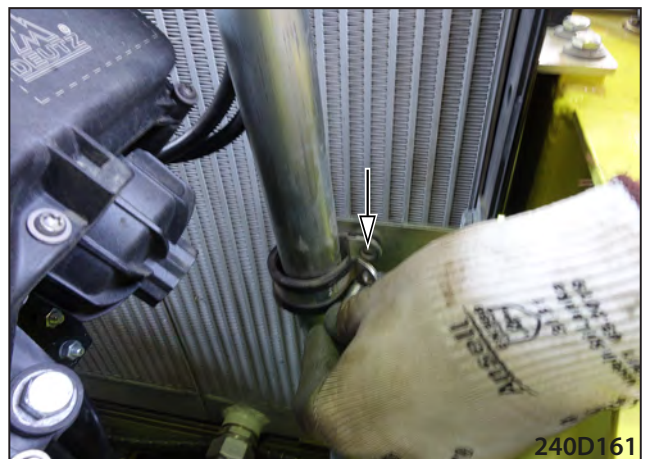
Remove the hoses from the cooling hydraulic motor connector, oil filter and fuel pre-filter. Blank off the outlets.



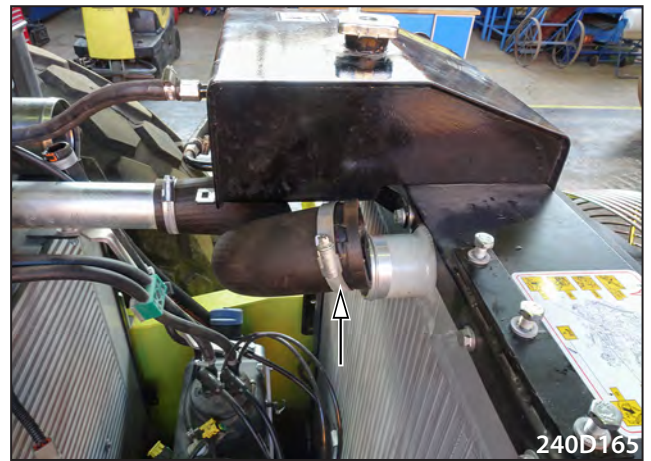
Loosen the cap nut.



Remove the hose clip.



Remove the cooling hose.



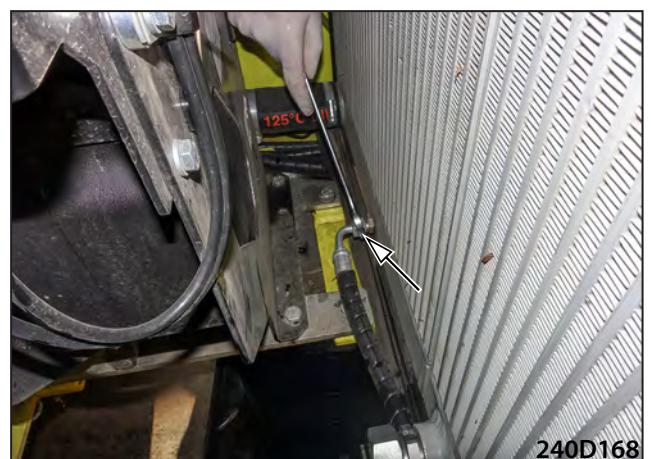
Remove the lower engine cover.



Remove the hydraulic hose from the cooler.



Remove the coolant draining hose.



## 15 Engine

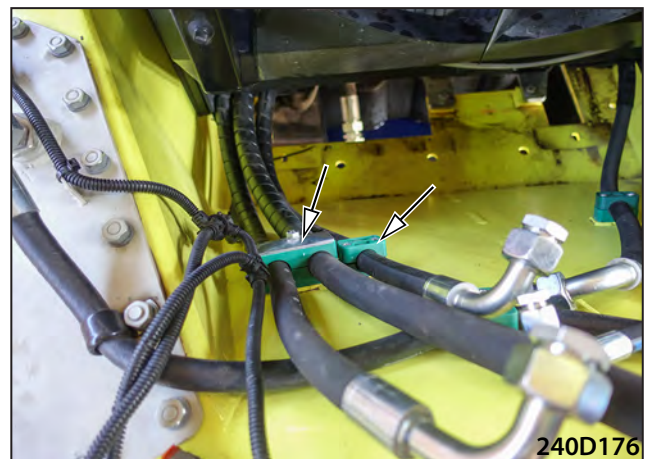
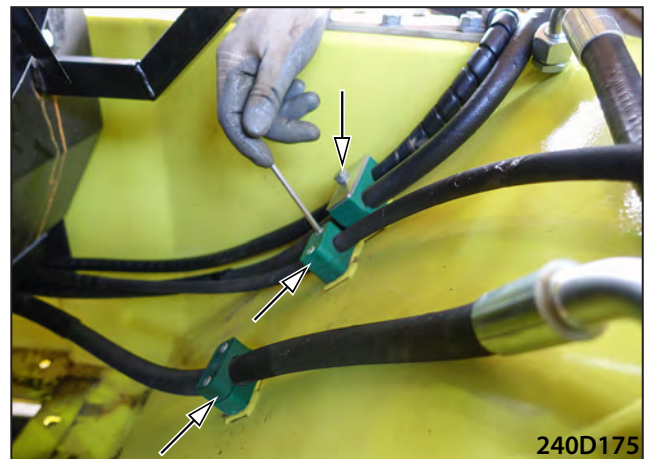
Remove the coolant hose.



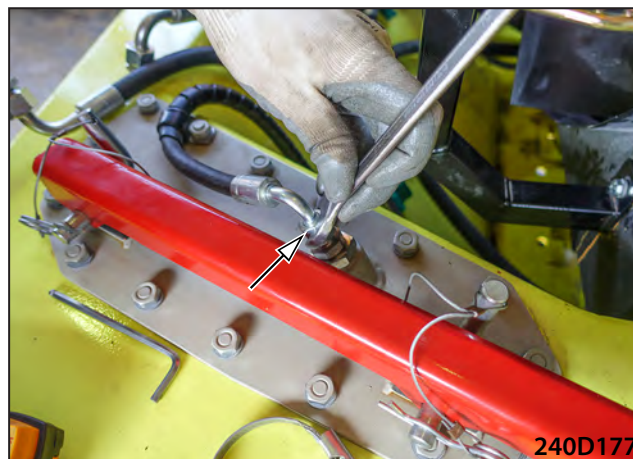
Remove the cooling hose.



Remove the hose clips.



Remove the fuel hose.



Remove the hose from the clip.



Disconnect the fuel gauge connector.

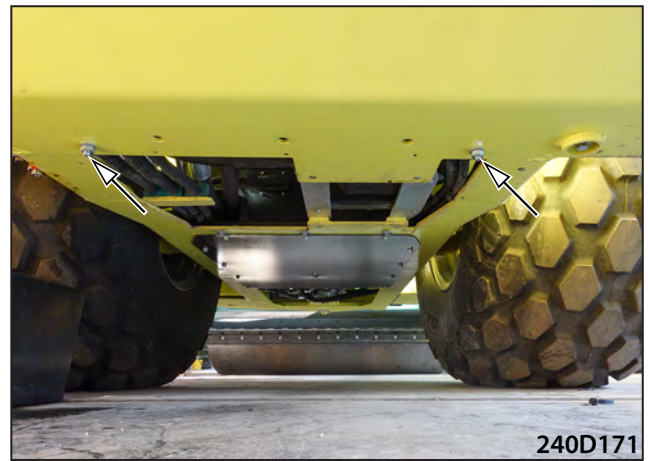


Hang the cooler on a crane with sufficient load capacity. Cooler weight ca. 175 kg (386 lb).



## 15 Engine

Remove screws fixing the cooler.



**Removal of the DEF tank and pump**

Remove the hose from the DEF pump.



Remove the hose from the DEF tank.

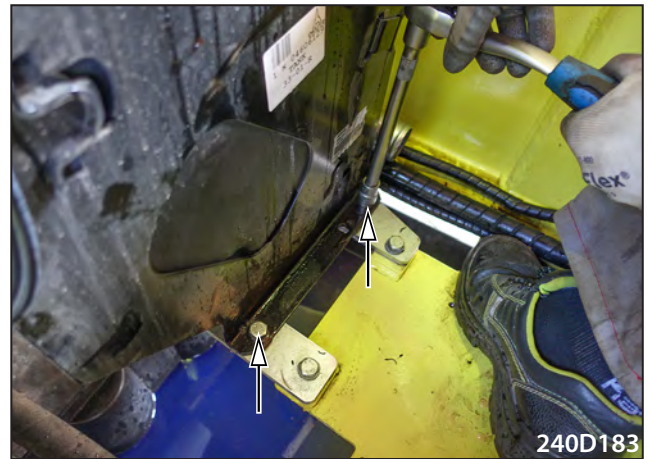


Remove the DEF tank holder.



## 15 Engine

Remove the screws of the DEF tank mount.



Hang the DEF tank and pump on the crane and remove them from the machine.



## 16 Optional equipment

## 16 Optional equipment

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### 16.1 Optional equipment list

Air-conditioning  
Preparation for antenna radio and loudspeakers  
Radio  
Reverse alarm  
Warning beacon  
Licence plate holder  
Road traffic lighting (including direction lights)  
Night operation lighting  
ATC inter-axle lock  
Additional padfoot segments (recommended with ATC and tractor tyres)  
Blade  
Tyre ballasting with liquid up to -25 °C  
Air pre-filter  
Padlock latch over the fuel tank  
ACEecon  
ACE Force  
Printer ACE systems  
Telematic preparation  
Telematic  
Tachograph preparation  
Tachograph  
Tractor tyres  
Triangle for slow-moving vehicles  
Fire extinguisher  
Set of filters, 500 h  
Set of filters, 2000 h  
Biodegradable hydraulic oil  
Amman tool kit  
Special colour design  
Certificate of Origin  
Additional documentation set

# 17 General procedures

## **17 General procedures**

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### **17 General procedures**

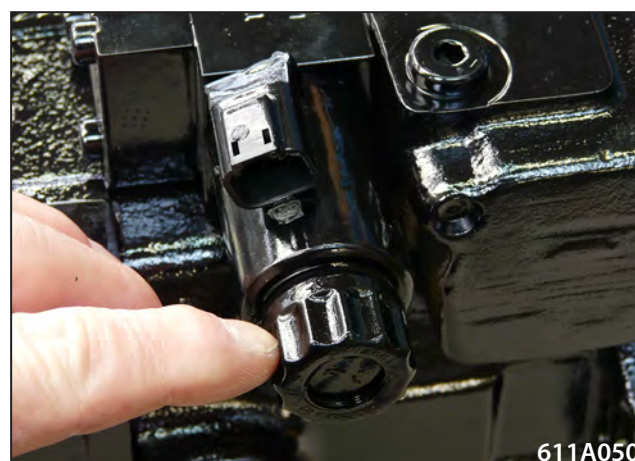
**17.2 Electrical installation**

**17.2.1 Travel pump magnetic coil check**

The travel pump magnetic coil cannot be controlled mechanically.



Loosen the coil nut.



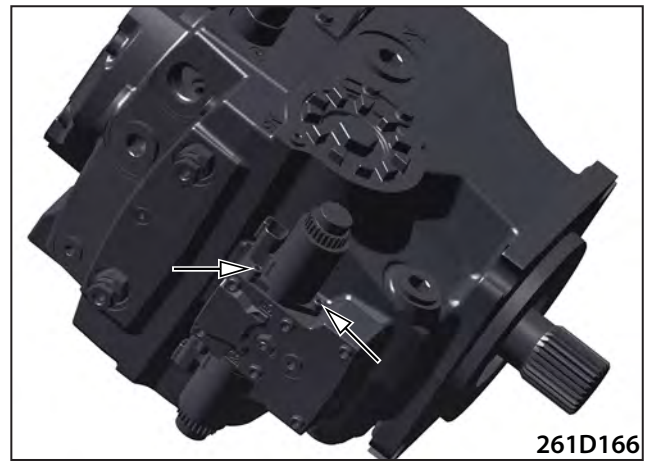
Remove the magnetic coil.



## 17 General procedures

Remove the magnetic valve.

Replace the sealing (1) if damaged.



### Change of the position of the magnetic coil connector

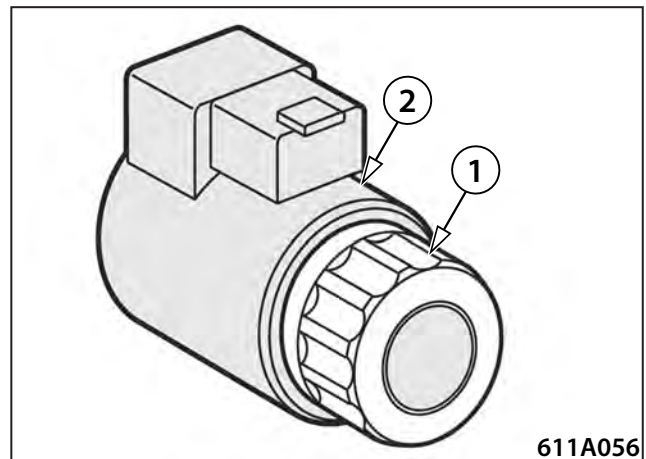
The position of the connector can be changed by turning the magnet body as needed.

Release the lock nut (1) of the magnet.

Turn the lock nut (1) by one turn to the left.

Turn the body of the magnet (2) to the required position.

Tighten the lock nut. Tightening torque of the lock nut: 5+1 Nm.



### 17.2.2 Preparation for welding works



**Electrical installations may be damaged during welding works on a roller with the installed battery!**

**Completely remove the battery before welding works on the roller.**

**Place grounding cables of the welding equipment as near to the point of welding as possible. The grounding point must be free of paint.**

---



**Danger of injury!**

**Incorrectly welded cast pieces may result in material cracks.**

**Welding of cast pieces is prohibited!**

---

### 17.2.3 Starting the battery by means of another battery (jumping)

Attach the red cable to the (+) clamps of both batteries.

Connect one end of the green or black cable to the (-) clamps of both batteries.

Press the starter. Let the engine run.

Wait until the engine evenly rotates at idle speed and disconnect the cables from the clamps.

Start with the (-) clamp.



**Battery poles and clamps must be clean. If they show a coat of sulphate (whitish or greenish), they must be loosened and cleaned.**

---

## 17 General procedures

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### 17.2.4 Charging the battery with a charger

Disconnect the battery from the clamps.

Connect the charger.

Observe the operating manual of the charger manufacturer.

When re-connecting the battery, start with the (+) clamp.



---

**Battery poles and clamps must be clean. If they show a coat of sulphate (whitish or greenish), they must be loosened and cleaned.**

---

### 17.2.5 Long-term storage

If the roller is not operated for more than two days, the battery disconnecter must be switched off. This will prevent fast discharge of the battery.

If your roller is not equipped with a battery disconnecter, disconnect the battery cable from the negative pole of the battery before an idle period longer than two weeks.

### 17.2.6 Battery replacement

Loosen the (-) clamp and remove it.

Loosen the (+) clamp and remove it.

Loosen the holding angle piece and remove it.

Lift the battery from the machine area.

Insert a new battery.

Connect the battery.

Start with the (+) clamp.



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**Battery poles and clamps must be clean. If they are covered with a (whitish or greenish) sulphur layer, they must be cleaned.**

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## 17.4 Calibration and setting

### 17.4.1 Pump current calibration

Pump current calibration may help in the following problems:

The machine jerkily stops/starts

When changing a direction, the machine stops for a longer time.



**Calibrate the pump current only if really necessary.**

**If the calibration is performed incorrectly, it may result in significant worsening of machine behaviour while driving.**

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#### 17.4.1.1 Required material

Bodas software



# 18 Troubleshooting

## 18 Troubleshooting

### 18.1 SW error diagnostics

Use appropriate software tools for diagnostics.

#### 18.1.1 Machine errors

Error number BODAS/HEX	Error number SPN/DEC/Display	Name	Description	Saved	Only the active are displayed
8000	32768	CAN1	Communication error at CAN 1.	Yes	Yes
8001	32769	VB_High	Supply voltage is too high. For 12V systems >18 V, for 24V systems >32 V.	Yes	Yes
8002	32770	VB_Low	Supply voltage is too low. For 12V systems <5 V, for 24V systems <9V.	Yes	Yes
8003	32771	Engine shut down	The engine stopped. The error is activated if the motor runs at < 200 rpm and has already been started.	No	Yes
8004		-			
8005		-			
8006	32774	VSS1	The voltage Vss1 out of the range from 4.5 V to 5.5 V.	Yes	Yes
8007	32775	VSS2	The voltage Vss2 out of the range from 9.5 V to 10.5 V.	Yes	Yes
8008	32776	VSS3	The voltage Vss3 out of the range from 4.5 V to 5.5 V.	Yes	Yes
8009	32777	VP1	The voltage VP out of the range from 8 V to 33 V	Yes	Yes
800A	32778	Emergency stop	The emergency button is activated.	Yes	Yes
800B	32779	VP2	VP2 voltage status (power supply to outputs). It is displayed if VP2 is off.	Yes	Yes
800C	32780	Engine high rpm	The maximum speed of the Diesel engine exceeded. The error is activated if the speed is higher than 120 % of the maximum speed defined by the parameter 4.1.3	No	Yes
8011	32785	No CAN message from Engine	One or more messages from the motor (EFLP1, EEC1, EEC2) not received at the CAN2 bus.	No	Yes
8012	32786	No CAN message from Lever	Messages from the lever not received at the CAN2 bus.	Yes	No
8013	32787	No CAN message from Coolant temp	Message on motor temperature (ET1) from the motor not received at the CAN2 bus.	No	Yes
8014	32788	No CAN message from Lever 2nd Ch	Messages from the lever not received at the CAN1 bus.	Yes	No
8015	32789	No CAN message from display	Messages from the display not received at the CAN2 bus.	Yes	No
8016	32790	Inhibit is activated	The Inhibit input (one of the inputs of the emergency button – PIN 224) is active.	Yes	Yes
8019	32793	Redundant lever position unmatched	The position of the lever from the primary and secondary channel differ by more than the value stated in the parameter 7.1.2	Yes	No
801A	32794	Lever direction and movement unmatch	The desired direction of the movement from the lever and the actual direction of the machine movement do not agree. The error is activated after 3 s at the actual speed higher than 0.1 km/h.	Yes	Yes
801B	32795	Hydraulic oil level is low	Low hydraulic oil level.	Yes	Yes
801C	32796	Brake status and switch unmatched	Conflict between the brake valve status and brake pressure sensor status.	Yes	Yes

<b>Error number BODAS/HEX</b>	<b>Error number SPN/DEC/Display</b>	<b>Name</b>	<b>Description</b>	<b>Saved</b>	<b>Only the active are displayed</b>
801D	32797	Level is in N posit but it moves	The machine is in neutral but moving. The error occurs if the number of pulses from the speed sensor is higher than 5 per second for longer than stated in the parameter 7.1.3.	No	Yes
801E	32798	Drive currents uncalibrated	The spacing current of the drive pump is calibrated incorrectly. It lies outside the range from 150 to 330 mA on 24V systems or 350 to 500 mA on 12V systems.	No	Yes
801F	32799	Machine speed unmatch	The required and actual speed values differ by more than the value stated in the parameter 7.1.1	Yes	Yes
8023	32803	CAN2	Communication error at CAN 2.	Yes	Yes
8024	32804	CAN3	Communication error at CAN 3.	Yes	Yes
8025	32805	SW-Inhibit is activated	The SW_Inhibit input (one of the inputs of the emergency button – PIN114) is active.	Yes	Yes
8027	32807	RC unit ovetemper- ature	The RC unit is overheated. The temperature of the RC unit is higher than 85 °C.	Yes	Yes
8028	32808	RC unit undertem- perate	The RC unit is insufficiently heated. The temperature of the RC unit is lower than -40 °C.	Yes	Yes
8029	32809	Service button is activated	The service button is active.	No	Yes
802A	32810	Wrong speed sensor	Incorrect signal from the speed sensor. The required speed of the machine is higher than 2 km/h and one or both channels of the speed sensor display zero frequency.	Yes	No
802B	32811	Wrong Fuel tank calib parameter	Incorrect parametrization of the fuel level metering. The parameters 4.4.3 to 4.4.8 are arranged in the ascending or descending order.	Yes	Yes
802E	32814	Passive errors erased	It indicates that passive errors have been deleted.	Yes	Yes
802F	32815	NV memory writing error	Error writing in NV memory.	Yes	Yes
8030	32816	Lever data incon- sistent	The position in the X direction does not comply with the N and PB signals, or the non-zero position Y and X is not - 1000 (full tilting to the left).	Yes	No
8031	32817	Hydraulic oil temp. is low	The hydraulic oil is insufficiently heated. The hydraulic oil temperature is lower than the parameter 4.8.1. The error is activated if the temperature is higher and the lever is in the parking position.	No	No
8032	32818	Engine coolant temp. is low	The engine is insufficiently heated. The Diesel engine temperature is lower than the parameter 4.2.3. The error is activated if the temperature is higher and the lever is in the parking position.	No	No
8049	32841	No Telematic	Communication error at CAN 4.	Yes	Yes
804A	32842	Vibration frequency unmatch	Incorrect signal from the vibration frequency sensor. The required vibration frequency is higher than 10 Hz and the sensor shows the zero frequency.	Yes	No
804B	32843	Engine coolant level low	In the case of engines with an external sensor, it informs of low coolant level in the engine	Yes	Yes
804C	32844	Water in fuel	In the case of engines with an external sensor it informs of the presence of water in fuel	Yes	Yes
804D	32845	Air Filter Clogged	In the case of engines with an external sensor it informs of the clogged air filter	Yes	Yes

## 18 Troubleshooting

### 18.1.2 Errors due to safety functions

Error number BODAS/HEX	Error number SPN/DEC/Display	Name	Description	Saved	Only the active are displayed
8310	33552	SF1-Starting Conditions	Starting conditions not met.		
8311	33553	SF1.1-Engine Start	Starting conditions not met. The lever is not in the parking position.	No	Yes
8312	33554	SF1.2-Lever Auto-detection	No data from the lever found.	Yes	No
8320	33568	SF2 - EMCY Brake, Engine Stop	Danger. Engine off.		
8321	33569	SF2.1-Pump coil diag.	Error of the diagnostics of the coils at the travel pump.	Yes	Yes
8322	33570	SF2.2-Operator Detection	The operator is not in the seat. It is activated if the engine is running, the operator is not on the seat and the lever leaves the PB position, or if the machine is moving and the operator leaves his seat for longer than 10 s.	No	Yes
8323	33571	SF2.3-EMCY Stop	The emergency button has been activated.	Yes	Yes
8325	33573	SF2.5-Lever Pos Validation	The position in the X direction does not comply with the N and PB signals, or the non-zero position Y and X is not - 1000 (full tilting to the left).	Yes	No
8326	33574	SF2.6-ParkBrake Coil diag.	Error of the diagnostics of the parking brake coil.	Yes	No
8328	33576	SF2.8-Decel monitor	The machine does not decelerate as expected. The function is activated if the lever is in the neutral position and the machine speed is higher than 0.6 m/s (2.16 km/h), the panic reaction on the lever is active or there is a requirement for braking from the safety functions (soft and hard braking) and the machine does not decelerate at least by 1.0 m/s <sup>2</sup> .	Yes	Yes
8330	33584	SF3-Soft Brake, Engine runs			
8332	33586	SF3.2-Operator Detection	The operator is not in the seat. It is activated if the machine is moving and the operator leaves his seat for longer than 5 s.	No	Yes
8334	33588	SF3.4-Hydraulic oil Overtemp	The hydraulic oil temperature has exceeded 105 °C.	Yes	Yes
8335	33589	SF3.5-HOil Temp Sensor diag.	Error of the diagnostics of the hydraulic oil temperature sensor.	Yes	No
8340	33600	SF4-EMCY Brake, Engine runs			
8341	33601	SF4.1-Lever CAN validation	Data from channel 1 or 2 are either missing, or their difference is outside the tolerance permitted by the parameter 7.1.2.	Yes	Yes
8342	33602	SF4.2-ParkBrake monitor	The requirement on brake status does not agree with the actual status of the brake.	Yes	Yes
8343	33603	SF4.3-PASD movement monitor	The machine has been moving on the neutral. The error occurs if the number of pulses from the speed sensor is higher than 5 per second for longer than stated in the parameter 7.1.3.	No	Yes
8344	33604	SF4.4-Direction monitor	The desired direction of the movement from the lever and the actual direction of the machine movement do not agree. The error is activated after 3 s at the actual speed higher than 0.1 km/h.	Yes	No

<b>Error number BODAS/HEX</b>	<b>Error number SPN/DEC/Display</b>	<b>Name</b>	<b>Description</b>	<b>Saved</b>	<b>Only the active are displayed</b>
8345	33605	SF4.5-RPM Sensor diag.	Incorrect signal from the speed sensor. The required speed of the machine is higher than 2 km/h and one or both channels of the speed sensor display zero frequency.	Yes	No
8346	33606	SF4.6-Panic on lever	Panic reaction on the lever has been activated.	No	Yes
8350	33616	SF5-Speed Reduction			
8351	33617	SF5.1-Hydraulic oil temp monitor	The hydraulic oil temperature has exceeded 85 °C.	No	Yes
8360	33632	SF6-PASD activation			
8361	33633	SF6.1-ParkBrake movement monitor	A movement has been recorded on the parking brake, and the PASD function has been activated.	Yes	Yes

### 18.1.3 Errors at the inputs

<b>Error number BODAS/HEX</b>	<b>Error number SPN/DEC/Display</b>	<b>Name</b>	<b>Description</b>	<b>Saved</b>	<b>Only the active are displayed</b>
8404	33796	NTC H oil temp. out of range	An input value outside of the range, an input error.	No	Yes
8405	33797	Speed sensor out of range	An input value outside of the range, an input error.	Yes	No
8406	33798	Direction sensor out of range	An input value outside of the range, an input error.	Yes	No
8407	33799	H oil filter1 out of range	An input value outside of the range, an input error.	Yes	No
8408	33800	H oil level input out of range	An input value outside of the range, an input error.	Yes	No
8409	33801	Park brake input out of range	An input value outside of the range, an input error.	Yes	No
840A	33802	Fuel level sensor out of range	An input value outside of the range, an input error.	Yes	No
840D	33805	Service switch out of range	An input value outside of the range, an input error.	Yes	No
840E	33806	Left blinker input out of range	An input value outside of the range, an input error.	Yes	No
840F	33807	Right blinker input out of range	An input value outside of the range, an input error.	Yes	No
8412	33810	Speed diag input out of range	An input value outside of the range, an input error.	Yes	Yes
8414	33812	Air condition input out of range	An input value outside of the range, an input error.	Yes	No
8415	33813	Air filter input out of range	An input value outside of the range, an input error.	Yes	No
8416	33814	Water in fuel input out of range	An input value outside of the range, an input error.	Yes	No
8417	33815	Coolant level input out range	An input value outside of the range, an input error.	Yes	No

## 18 Troubleshooting

### 18.1.4 Errors at the outputs

Error number BODAS/HEX	Error number SPN/DEC/Display	Name	Description	Saved	Only the active are displayed
8600	34304	Forward pump highside error	Pump output error. Connection error...	Yes	No
8601	34305	Reverse pump highside error	Pump output error. Connection error...	Yes	No
8602	34306	Lowside to pump output error	Pump output error. Connection error...	Yes	No
8604	34308	Brake valve output error	Error at the parking brake valve output.	Yes	No
8605	34309	Brake lights output error	Error at the brake light output.	Yes	No
8606	34310	DifLock valve output error	Error at the RTM module output.	Yes	No
8607	34311	Reverze Signal output error	Error at the reversing horn horn output.	Yes	No
8608	34312	Pump currents unmatched	Incorrect difference in the current values between the HS and LS outputs.	Yes	No
8609	34313	Pump safout error	Error in the safety connection of the pump.	Yes	No
860A	34314	Front H motor safout unmatched	Incorrect difference in the current values between the HS and LS outputs.	Yes	No
860B	34315	Rear L H motor safout unmatched	Incorrect difference in the current values between the HS and LS outputs.	Yes	No
860C	34316	Rear R H motor safout unmatched	Incorrect difference in the current values between the HS and LS outputs.	Yes	No
860D	34317	Front Hydromotor output	Error at the hydraulic motor output. Connection error...	Yes	No
860E	34318	Left Hydromotor output	Error at the hydraulic motor output. Connection error...	Yes	No
860F	34319	Right Hydromotor output	Error at the hydraulic motor output. Connection error...	Yes	No
8610	34320	Front Hydromotor SF output	Error at the hydraulic motor safety connection.	Yes	No
8611	34321	Left Hydromotor SF output	Error at the hydraulic motor safety connection.	Yes	No
8612	34322	Right Hydromotor SF output	Error at the hydraulic motor safety connection.	Yes	No
8613	34323	Front Hydromotor LS output	Error at the hydraulic motor output. Connection error...	Yes	No
8614	34324	Left Hydromotor LS output	Error at the hydraulic motor output. Connection error...	Yes	No
8615	34325	Right Hydromotor LS output	Error at the hydraulic motor output. Connection error...	Yes	No
8640	34368	Engine relay output error	Error at the Neutral output for the Diesel engine.	Yes	No
8641	34369	Fan valve output error	Error at the fan bypass output.	Yes	No
8642	34370	Fine front vibr valve output	Error at the fine vibration output	Yes	No
8643	34371	Rough front vibr valve output	Error at the coarse vibration output	Yes	No
8644	34372	Fine tacho output	Error at the tachograph output, fine vibration	Yes	No
8645	34373	Rough tacho output	Error at the tachograph output, coarse vibration	Yes	No

<b>Error number BODAS/HEX</b>	<b>Error number SPN/DEC/Dis- play</b>	<b>Name</b>	<b>Description</b>	<b>Saved</b>	<b>Only the active are displayed</b>
8646	34374	Blade up valve output	Error at the blade lifting output.	Yes	No
8647	34375	Blade down valve output	Error at the blade lowering output.	Yes	No
8648	34376	Blade floating valve output	Error at the blade floating position output.	Yes	No

## 18.1.5 ACE errors

<b>Error number BODAS/HEX</b>	<b>Error number SPN/DEC/Dis- play</b>	<b>Name</b>	<b>Description</b>	<b>Saved</b>	<b>Only the active are displayed</b>
8700	34560	ACE system fault	General ACE error. CM, parameters...	Yes	No
8701	34561	ACE compaction module	Error of communication with CM	Yes	No
8702	34562	ACE parameters	Incorrect ACE parameters	Yes	No

## 18 Troubleshooting

### 18.1.6 System errors

Error number BODAS/HEX	Error number SPN/DEC/Display	Name	Description	Saved	Only the active are displayed
9000	36864	pwrn supply VB low	Low voltage value at the unit power supply.	Yes	Yes
9001	36865	pwrn supply VSS	Low level of input power supply	Yes	Yes
9002	36866	pwrn hwmonitor 1	HW error during self-test.	Yes	Yes
9003	36867	pwrn sequence - startcondition	General error during self-test.	Yes	Yes
9005	36869	pwrn engine speed	Low Diesel engine speed.	Yes	Yes
9006	36870	pwrn hwmonitor 2	HW error during self-test.	Yes	Yes
9007	36871	pwrn sequence - Immobilizer	Active immobilizer.	Yes	Yes
900A	36874	pwrn safout cable brake	Error at the safety outputs, disconnecting.	Yes	Yes
900B	36875	pwrn safout short circuit	Error at the safety outputs, short-circuit.	Yes	Yes
9010	36880	pwrn powerswitch 1	Error in switching the output stage 1.	Yes	Yes
9011	36881	pwrn powersupply	Power supply error.	Yes	Yes
9012	36882	pwrn powerswitch 2	Error in switching the output stage 2.	Yes	Yes
9013	36883	pwrn reverse power	Error in connection of the power supply or the sensors.	Yes	Yes
9014	36884	pwrn emergency stop	Emergency pushbutton.	Yes	Yes
9015	36885	pwrn Safety input error	Error in the power supply of the safety outputs.	Yes	Yes
9016	36886	pwrn safout unavailable	The safety outputs are out of order.	Yes	Yes

**18.1.7 Engine errors**

Error codes	SPN	FMI	Error description
8	132	1	„The air mass flow AFS_dm is greater than or equal to AFS_PhysRng.Min_C. Physical range check is low for air mass flow sensor.“
9	172	2	Air inlet filter temperature, plausibility error.
26	523891	14	„When AirHt_ctDefSRCLoOn_mp is lower than AirHt_ctMaxDef_C. DFC to SRC Low error when heater is on.“
28	523953	2	„Healing takes place if the condition for error detection is not present. Air temprature monitoring plausibility check array.“
30	523955	2	„Healing takes place if the condition for error detection is not present. Air temperature monitoring plausibility check array.“
36	523923	3	
37	523924	3	Short circuit to battery error of actuator relay 2.
38	523925	3	Short circuit to battery of actuator relay 3.
40	523927	3	Short circuit to battery of actuator relay 6.
41	523923	4	„Short circuit to ground error. Detailinformation not available.“
42	523924	4	Short circuit to ground of actuator relay 2.
43	523925	4	Short circuit to ground of actuator relay 3.
44	523926	4	Short circuit to ground of actuator relay 4.
45	168	3	Sensor battery voltage error; signal range check is high.
46	168	4	Sensor battery voltage error; signal range check is low.
47	168	2	High battery voltage; warning threshold is exceeded.
48	168	2	High battery voltage; Shot off threshold exceeded.
55	523910	14	„Air pump doesn't achieve air mass flow setpoint. Burner Control - burner air pump“
56	524013	7	„Burner does not start after several trials (burner flame lost detection). Burner flame unintentional deleted.“
57	524020	14	„Burner Control: Power reduction due to low lambda. Engine power: Not enough oxygen for regeneration.“
58	523911	0	„Burner dosing valve (DV2); Overcurrent at the end of the injection phase.“
59	523911	12	Burner dosing valve (DV2); Powerstage over temperature.
60	523911	3	Burner dosing valve (DV2); Short circuit to battery.
62	523911	4	Burner dosing valve (DV2); Short circuit to ground.
63	523911	11	„Burner dosing valve (DV2); Short circuit high side powerstage.“
64	523912	2	„Burner dosing valve (DV2) downstream pressure sensor; plausibility error.“
66	523912	0	„Physical range check high for burner dosing valve (DV2) downstream pressure; Shut off regeneration.“
69	523912	1	„Physical range check low for burner dosing valve (DV2) downstream pressure; Shut off regeneration. When burner injector is actuated, the measured pressure does not rise above 1250mbar abs (expected: about 2400mbar).“

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Error codes	SPN	FMI	Error description
72	523912	3	„Sensor error burner dosing valve (DV2) downstream pressure sensor; Signal range check high.“
73	523912	4	„For engines < 4l: Throttle valve error, Open load or short cut to battery, blocked valve or wrong control signal for valve. For engines with Burner T4i: Pressure Sensor error after valve (DV2), lower limit reached.“
74	523913	3	„Sensor error glow plug control diagnostic line voltage; Signal range check high.“
75	523913	4	„Sensor error glow plug control diagnostic line voltage; Signal range check low.“
76	523914	5	„Glow plug control; Open load. Water pump control (PWM) only TTCD 6.1/7.8.“
77	523914	12	Glow plug control; Powerstage over temperature.
78	523914	3	„Glow plug control; Short circuit to battery. Water pump control (PWM).“
79	523914	4	„Glow plug control; Short circuit to ground. Water pump control (PWM).“
82	1235	14	„CAN-Bus 2 = CAN_C reports Bus-error (for engines <8L and CV52 it is the engine-CAN@250kbaud). CAN Bus error passive; warning CAN C - engine CAN.“
83	16	0	No detail information.
84	639	14	CAN-Bus 0; „BusOff-Status“
85	1231	14	CAN-Bus 1; „BusOff-Status“
86	1235	14	CAN-Bus 2 = engine bus „BusOff-Status“
87	16	0	BusOff error CAN.
88	102	2	Charged air pressure above warning threshold.
89	102	2	Charged air pressure above shut off threshold.
90	110	2	Defect fault check for absolute plausibility test.
92	110	0	Physical range check high for coolant temperature.
93	110	1	Physical range check low for coolant temperature.
96	110	3	Sensor error coolant temperature; Signal range check high.
97	110	4	Sensor error coolant temperature; Signal range check low.
98	110	0	High coolant temperature; Warning threshold exceeded.
99	110	0	Coolant temperature; System reaction initiated.
101	111	1	Coolant level too low.
106	598	2	Plausibility check for clutch.
121	1109	2	Engine shut off demand ignored.
122	523698	11	Shut off request from supervisory monitoring function.
124	523969	11	Fault entry for override control mode.
125	523717	12	„Timeout error of CAN-transmit-frame AmbCon; Weather environments.“
126	523603	9	„Timeout Error of CAN-receive-frame AMB; Ambient temperature sensor.“
128	3224	9	„Timeout error of CAN-receive-frame AT1IG1; NOX sensor upstream.“
129	3224	2	DLC error of CAN-receive-frame AT1IG1Vol NOX sensor.
130	3224	9	„Timeout error of CAN-receive-frame AT1IG1Vol; NOX sensor.“

<b>Error codes</b>	<b>SPN</b>	<b>FMI</b>	<b>Error description</b>
133	523938	9	„Timeout error (BAM to packet) for CAN-receive-frame AT1IGCVol1.“
134	523939	9	„Broadcast announce message of the calibration message of the upstream catalytic NOx sensor has failed.“
135	523940	9	„Timeout error (PCK2PCK) for CAN-Receive-Frame AT1IGCVol1.“
136	3234	2	DLC error of CAN-Receive-Frame AT1O1.
137	3234	9	„Timeout error of CAN-Receive-Frame AT1OG1. NOx sensor (SCR-system downstream cat; DPF-system downstream cat).“
138	3234	2	DLC error of CAN-Receive-Frame AT1O1Vol.
139	3234	9	Timeout error of CAN-Receive-Frame AT1OG1Vol.
140	523941	9	„Timeout error (BAM to packet) for CAN-Receive-Frame AT1OGCVol2.“
141	523942	9	„Calibration message 1 of the after catalyst Nox sensor has failed.“
142	523943	9	„Timeout error (PCK2PCK) for CAN-Receive-Frame AT1OGCVol2.“
153	523992	9	Not used.
155	0	0	Not used.
164	523211	9	Timeout error of CAN-Receive-Frame EBC1.
167	523704	12	Timeout error of CAN-Transmit-Frame EEC3.
168	523935	12	„Timeout error of CAN-Transmit-Frame EEC3VOL1. Engine send messages.“
169	523936	12	„Timeout error of CAN-Transmit-Frame EEC3VOL2. Engine send messages.“
171	523212	9	„Timeout error of CAN-Receive-Frame ComEngPrt. Engine Protection.“
172	523741	14	Engine shut off request through CAN.
174	523213	12	Timeout error of CAN-Transmit-Frame ERC1.
178	523706	12	Timeout error of CAN-Transmit-Frame FIEco.
179	523240	9	„Timeout CAN-message FunModCtl. Function Mode Control.“
193	523937	9	Timeout DFC for NOxSensGlbReqTx.
196	3227	2	DFC SAE J1939 error.
198	523216	9	„Timeout error of CAN-Receive-Frame PrHtEnCmd. Pre-heat command, engine command.“
202	523793	9	„Timeout error of CAN-Receive-Frame UAA10. AGS sensor service message.“
203	523794	9	„Timeout error of CAN-Receive-Frame UAA11. AGS sensor data.“
212	523803	9	„Timeout error of CAN-Receive-Message RxEngPres. Status Burner Air Pump.“
273	3219	2	DFC SAE J1939 error.
281	523766	9	Timeout error of CAN-Receive-Frame Active TSC1AE.
282	523767	9	Timeout error of CAN-Receive-Frame Passive TSC1AE.
283	523768	9	Timeout error of CAN-Receive-Frame Active TSC1AR.
284	523769	9	Timeout error of CAN-Receive-Frame Passive TSC1AR.
291	523776	9	Timeout error of CAN-Receive-Frame TSC1TE - active.
292	523777	9	„Passive timeout error of CAN-Receive-Frame TSC1TE. Setpoint.“
293	523778	9	Timeout error of CAN-Receive-Frame TSC1TR.

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Error codes	SPN	FMI	Error description
294	523779	9	Passive timeout error of CAN-Receive-Frame TSC1TR.
299	523788	12	„Timeout error of CAN-Transmit-Frame TrbCH. Status Wastegate.“
300	523605	9	„Timeout error of CAN-Receive-Frame TSC1AE. Traction Control.“
301	523606	9	„Timeout error of CAN-Receive-Frame TSC1AR. Retarder.“
305	898	9	„Timeout error of CAN-Receive-Frame TSC1TE. Setpoint.“
306	520	9	„Timeout Error of CAN-Receive-Frame TSC1TR; control signal“
313	523858	12	Timeout error of CAN-Transmit-Frame UAA11.
322	523867	12	„Timeout error of CAN-Transmit-Frame UAA1 on CAN 2. Control burner air pump.“
360	523982	0	„Powerstage diagnosis disabled. High battery voltage.“
361	523982	1	„Powerstage diagnosis disabled. Low battery voltage.“
362	523090	2	„Engine brake Pre-Selection switch. Plausibility error.“
376	630	12	Access error EEPROM memory (delete).
377	630	12	Access error EEPROM memory (read).
378	630	12	Access error EEPROM memory (write).
381	411	4	Physical range check low for EGR differential pressure.
384	2791	12	„Actuator EGR valve. Powerstage over temperature.“
387	523612	12	„Internal software error ECU. Injection cut off.“
388	190	0	„Engine speed above warning threshold. Overspeed detection in component engine protection.“
389	190	0	Engine speed above warning threshold (FOC-Level 1).
390	190	11	Engine speed above warning threshold (FOC-Level 2).
391	190	14	Engine speed above warning threshold (Overrun Mode).
411	108	11	„Ambient air pressure received from a CAN-bus is reported as defective.“
412	108	3	Sensor error ambient air pressure. Signal range check high.
413	108	4	Sensor error ambient air pressure. Signal range check low.
415	171	0	„Environment temperature sensor, temperature above upper physical threshold.“
416	171	1	Environment temperature physical range check low.
417	171	3	„Sensor error SCR-System environment temperature. DPF-System air inlet temperature, signal range check high.“
418	171	4	„Sensor error SCR-System environment temperature. DPF-System air inlet temperature, signal range check low.“
419	190	8	Sensor camshaft speed, disturbed signal.
420	190	12	„Sensor camshaft detection. Out of range, signal disrupted, no signal.“
421	190	2	„Offset angle between crank- and camshaft-sensor is too large.“
422	190	8	„Sensor crankshaft detection. Out of range, signal disrupted or no signal.“
423	190	12	Speed detection, out of range, signal disrupted or no signal.
455	975	5	PWM-Signal fan, open load or short-circuit ground.
457	975	3	PWM-Signal fan, short-circuit to battery.

<b>Error codes</b>	<b>SPN</b>	<b>FMI</b>	<b>Error description</b>
458	975	4	PWM-Signal fan, open load or short circuit to ground
459	1639	12	„Fan speed sensor, electrical error, signal disturbed or very low fan speed.“
460	1639	0	„Sensor error fan speed. Signal range check high or engine speed resp. fan speed too big.“
461	1639	1	„Sensor error fan speed, signal range check low or fan speed too low.“
462	523602	0	High fan speed, warning threshold exceeded.
463	523602	0	High fan speed, shut off threshold exceeded.
464	97	3	Sensor error water in fuel, signal range check high.
465	97	4	Sensor error water in fuel, signal range check low.
472	94	3	Sensor error low fuel pressure, signal range check high.
473	94	4	Sensor error low fuel pressure, signal range check low.
474	94	1	Low fuel pressure, warning threshold exceeded.
475	94	1	Low fuel pressure, shut off threshold exceeded.
483	174	11	Fuel temperature not plausible.
486	523618	3	„Sensor error gearbox oil temperature, signal range check high.“
487	523618	4	„Sensor error gearbox oil temperature, signal range check low.“
488	523619	2	„Physical range check high for exhaust gas temperature upstream (SCR-CAT).“
489	523619	2	„Shutoff condition No detail information!“
500	523915	0	„HCl dosing valve (DV1); overcurrent at the end of the injection phase“
501	523915	12	HCl dosing valve (DV1): Powerstage overtemperature.
502	523915	3	HCl dosing valve (DV1): Short circuit to battery.
503	523915	3	Short circuit to battery high side, HCl dosing valve (DV1).
504	523915	4	HCl dosing valve (DV1): Short circuit to ground.
505	523915	11	HCl dosing valve (DV1): Short circuit high side powerstage.
506	523916	2	„Sensor HCl dosing valve (DV1) downstream pressure: Plausibility error.“
508	523916	0	„HCl dosing valve (DV1) downstream pressure: Physical range check high. Shut off regeneration.“
511	523916	1	„HCl dosing valve (DV1) downstream pressure: Physical range check low. Shut off regeneration.“
514	523916	3	„Sensor error HCl dosing valve (DV1) downstream pressure: Signal range check high.“
515	523916	4	„Sensor error HCl dosing valve (DV1) downstream pressure: Signal range check low.“
525	523917	4	„Sensor error DV1 & DV2 upstream pressure: Signal range check low.“
534	523918	3	„Sensor error DV1 & DV2 upstream temperature: Signal range check high.“
535	523918	4	„Sensor error DV1 & DV2 upstream temperature: Signal range check low.“
542	1638	2	Hydraulic oil temperature check for Shut off condition.
543	676	11	Cold start aid relay error.
544	676	11	Cold start aid relay: Open load.
545	729	5	Cold start aid relay open load.
547	729	12	Cold start aid relay: Over temperature error.

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Error codes	SPN	FMI	Error description
549	729	3	Intake Air Heater Device: Short circuit to battery.
551	729	4	
559	523895	13	„Check of missing injector adjustment value programming (IMA) injector 1.“
560	523896	13	„Check of missing injector adjustment value programming (IMA) injector 2.“
561	523897	13	„Check of missing injector adjustment value programming (IMA) injector 3.“
562	523898	13	„Check of missing injector adjustment value programming (IMA) injector 4.“
563	523899	13	„Check of missing injector adjustment value programming (IMA) injector 5.“
564	523900	13	„Check of missing injector adjustment value programming (IMA) injector 6.“
565	523350	4	Injector cylinder-bank 1: Short circuit.
566	523352	4	Injector cylinder-bank 2: Short circuit.
567	523354	12	Injector powerstage output defect.
568	651	5	Injector 1 (in firing order): Interruption of electric connection.
569	652	5	Injector 2 (in firing order): Interruption of electric connection.
570	653	5	Injector 3 (in firing order): Interruption of electric connection.
571	654	5	Injector 4 (in firing order): Interruption of electric connection.
572	655	5	Injector 5 (in firing order): Interruption of electric connection.
573	656	5	Injector 6 (in firing order): Interruption of electric connection.
575	523756	14	„special pattern for special cases No detail informationen!“
576	523757	14	„special pattern for special cases No detail informationen!“
577	523758	14	„special pattern for special cases No detail informationen!“
578	523759	14	„special pattern for special cases No detail informationen!“
579	523760	14	„special pattern for special cases No detail informationen!“
580	651	3	Injector 1 (in firing order): Short circuit.
581	652	3	Injector 2 (in firing order): Short circuit.
582	653	3	Injector 3 (in firing order): Short circuit.
583	654	3	Injector 4 (in firing order): Short circuit.
584	655	3	Injector 5 (in firing order): Short circuit.
585	656	3	Injector 6 (in firing order): Short circuit.
590	655	4	„High side to low side short circuit in the injector 5 (in firing order)“
591	656	4	„High side to low side short circuit in the injector 6 (in firing order)“
592	523615	5	Metering unit (Fuel-System): Open load.
593	523615	12	Metering unit (Fuel-System): Powerstage over temperature.
594	523615	3	Metering unit (Fuel-System): Short circuit to battery, highside.
595	523615	4	„Metering unit (Fuel-System): Short circuit to ground, high side.“

<b>Error codes</b>	<b>SPN</b>	<b>FMI</b>	<b>Error description</b>
596	523615	3	Metering unit (Fuel-System): Short circuit to battery, low side.
597	523615	4	Metering Unit (Fuel-System): Short circuit to ground, low side.
598	523615	3	Metering unit, short circuit to battery
599	523615	4	Metering unit, short circuit to ground
605	1323	12	Too many recognized misfires in cylinder 2 (in firing order)
607	1323	12	Too many recognized misfires in cylinder 4 (in firing order)
608	1323	12	Too many recognized misfires in cylinder 5 (in firing order)
609	1323	12	Too many recognized misfires in cylinder 6 (in firing order)
610	1322	12	
611	1346	0	„Misfire detection monitoring No detail informationen!“
612	523612	12	Internal ECU monitoring detection reported error
613	523612	12	„ECU reported internal software error Internal ECU monitoring detection reported error“
614	523612	12	ECU reported internal software error
615	523612	12	ECU reported internal software error.
616	523612	12	ECU reported internal software error
617	523612	12	ECU reported internal software error
618	523612	12	ECU reported internal software error
619	523612	12	Injection system,electrical error injectors
620	523612	12	ECU reported internal software error
621	523612	12	ECU reported internal software error
623	523612	12	ECU reported internal software error
624	523612	12	ECU reported internal software error
625	523612	12	ECU reported internal software error
627	523612	12	ECU reported internal software error
628	523612	12	ECU reported internal software error
629	523612	12	„Diagnostic fault check to report the accelerator pedal position error“
630	523612	12	Diagnostic fault check to report the engine speed error
631	523612	12	Error in the plausibility of the injection energizing time
632	523612	12	Error in the plausibility of the start of energising angles
633	523612	12	„Diagnostic fault check to report the error due to non plausibility in ZFC“
634	523612	12	„Diagnosis fault check to report the demand for normal mode due to an error in the Pol2 quantity“
635	523612	12	„Diagnosis fault check to report the error to demand for an ICO due to an error in the Pol2 shut-off“
636	523612	12	„Diagnosis fault check to report the error to demand for an ICO due to an error in the Pol3 efficiency factor“
637	523612	12	Internal ECU monitoring detection reported error
638	523612	12	Monitoring of Fuel Quantity Correction

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Error codes	SPN	FMI	Error description
639	523612	12	„Diagnostic fault check to report the plausibility error in rail pressure monitoring“
640	523612	12	„Diagnostic fault check to report the error due to torque comparison“
641	523612	12	„Diagnosis of curr path limitation forced by ECU monitoring level 2“
642	523612	12	„Diagnosis of lead path limitation forced by ECU monitoring level 2“
643	523612	12	„Diagnosis of set path limitation forced by ECU monitoring level 2.“
644	523612	3	Reported Over Voltage of Supply
646	523612	4	Reported UnderVoltage of Supply
648	523008	1	Manipulation control was triggered
649	523008	2	Timeout error in Manipulation control
654	2634	12	„Early opening defect of main relay No detail informationen!“
656	2634	12	„DFC for stuck main relay error No detail informationen!“
659	3226	2	„Nox feed back fault detection No detail informationen!“
692	523752	0	„Plausibiliti error during Rich to Lean switch over No detail informationen!“
693	523752	0	„Monitoring of Nox signal readiness No detail informationen!“
714	523612	12	„Diagnostic fault check to report WDA active due to errors in query-/response communication“
715	523612	12	„Diagnostic fault check to report ABE active due to undervoltage detection“
716	523612	12	„Diagnostic fault check to report ABE active due to overvoltage detection“
717	523612	12	„Diagnostic fault check to report WDA/ABE active due to unknown reason“
720	98	2	„Plausibility Check No detail informationen!“
732	100	3	Sensor error oil pressure; signal range check high
733	100	4	Sensor error oil pressure sensor; signal range check low
734	100	0	High oil pressure; warning threshold exceeded.
735	100	0	High oil pressure; shut off threshold exceeded
736	100	1	Low oil pressure; warning threshold exceeded
737	100	1	Low oil pressure; shut off threshold exceeded
743	175	3	Sensor error oil temperature; signal range check high
744	175	4	Sensor error oil temperature; signal range check low
745	175	0	High oil temperature; warning threshold exceeded
746	175	0	High oil temperature; shut off threshold exceeded
747	1237	2	Override switch; plausibility error.
750	107	3	„Sensor error airfilter differential pressure; short circuit to battery“
751	107	0	„Sensor error airfilter differential pressure; short circuit to ground“
752	107	0	Air filter differential pressure; air filter cologged.

<b>Error codes</b>	<b>SPN</b>	<b>FMI</b>	<b>Error description</b>
753	523919	2	DPF burner air pump pressure sensor, plausibility error
755	523919	0	„DPF burner air pump pressure sensor, pressure above upper shutoff threshold“
758	523919	1	„DPF burner air pump pressure sensor, pressure below lower shutoff threshold“
761	523919	3	„DPF burner air pump pressure sensor, short circuit to battery or open load“
762	523919	4	DPF burner air pump pressure sensor, short circuit to ground
763	523920	2	Exhaustgaspressure upstream burner, plausibility error
765	523920	0	„Exhaustgaspressure upstream burner, pressure above upper shutoff threshold“
770	523920	3	„Exhaustgaspressure upstream burner, short circuit to battery or open load“
771	523920	4	Exhaustgaspressure upstream burner, short circuit to ground
772	102	2	Pressure downstream charge air cooler, plausibility error
774	102	1	„Pressure downstream charge air cooler, pressure below lower physical threshold“
776	102	3	„Pressure downstream charge air cooler, short circuit to battery or open load“
777	102	4	„Pressure downstream charge air cooler, short circuit to ground“
780	523699	3	„Boost pressure control; negative governor deviation below limit“
781	523699	4	„learning valu too high No detail informationen!“
785	523889	3	„over teperature of device driver of pressure control valve No detail informationen!“
791	411	0	„signal range check low error of pressure control valve AD-channel delta pressure across venturi in EGR line above physical high limit“
793	411	0	„Plausibility Check fault for deviation of desired and actual EGR-mass flow, where the latter is calculated out of EGR Delta Pressure Sensor“
795	411	3	„Sensor error differential pressure Venturiunit (EGR), signal range check low.“
796	411	4	„Sensor error differential pressure Venturiunit (EGR), signal range check high.“
805	524025	14	„Particulate filter regeneration. Regeneration after time X is not successful (The error occurs when the regeneration times (3x) over the max. has been aborted allowed recovery time).“
806	524058	2	Particulate filter; regeneration not succesful
807	3253	2	Differential pressure DPF, plausibility error
809	3251	0	Differential pressure DPF maximum value is exceeded
810	3251	0	„Differential pressure sensor across DPF exceeds warning high limit“
812	3251	1	„Differential pressure DPF, pressure below lower shutoff threshold.“
813	3251	1	„Differential pressure DPF, pressure below lower warning threshold.“
814	3253	3	„Electrical error differential pressure B58 (DPF). (signal range check high)“
815	3253	4	„Electrical error differential pressure (DPF). signal range check low.“
825	523009	9	„The pressure relief valve (PRV) has reached the number of allowed activations.“
826	523470	2	„Pressure relief valve is forced to open, perform pressure increase.“
827	523470	2	„Pressure Relief Valve (PRV) forced to open. Performed by pressure increase.“
828	523470	12	„Pressure Relief Valve (PRV) forced to open. Shutoff conditions.“
829	523470	12	„Pressure Relief Valve (PRV) forced to open. Warning conditions.“

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Error codes	SPN	FMI	Error description
830	523470	14	Open Pressure Relief Valve (PRV)
831	523470	11	„Pressure Relief Valve (PRV) error; Rail pressure out of tolerance range.“
832	523470	11	„Rail pressure out of tolerance range. The PRV can not be opened at this operating point with a pressure shock.“
833	523009	10	„Open time of Pressure Relief Valve (PRV) for wear out monitoring had exceeded“
834	523906	5	Electrical fuel pre - supply pump; open load
835	523906	12	„Electrical fuel pre - supply pump. ECU powerstage over temperature.“
836	523906	3	Electrical fuel pre - supply pump; short circuit to battery
837	523906	4	„Electrical fuel pre - supply pump. Short circuit to ground.“
847	1176	0	„Pressure sensor upstream turbine, Physical Range Check high.“
848	1176	1	„Pressure sensor upstream turbine, Physical Range Check low.“
849	1176	3	„Pressure sensor upstream turbine, signal range check (SRC) high.“
850	1176	4	„Pressure sensor upstream turbine, signal range check (SRC) low.“
856	523613	0	Rail pressure metering unit, Positive governor deviation.
857	523613	0	„Rail pressure metering unit, Rail pressure disrupted. Maximum positive deviation of rail pressure exceeded.“
858	523613	0	„Rail pressure metering unit, Rail pressure disrupted. Maximum positive deviation of rail pressure in metering unit exceeded (RailMeUn1).“
859	523613	0	„Rail pressure metering unit, Rail pressure below the target range .(RailMeUn2) Railsystem leakage detected.(RailMeUn10)“
861	523613	1	„Rail pressure metering unit, Minimum rail pressure exceeded (RailMeUn3) Negative deviation of rail pressure second stage (RailMeUn22)“
862	523613	0	„Rail pressure metering unit, Maximum rail pressure exceeded.“
864	523613	2	„Rail pressure metering unit, Setpoint of metering unit in overrun mode not plausible.“
865	523613	0	Setpoint of metering unit in overrun mode not plausible
874	157	0	„Rail pressure raw value is intermittent No detail informationen!“
875	157	1	„rail pressure raw value is above maximum offset No detail informationen!“
876	523470	7	Maximum rail pressure exceeded (PRV).
877	157	3	„Sensor error rail pressure. Sensor voltage above upper limit.“
878	157	4	„Sensor error rail pressure. Sensor voltage below lower limit.“
881	523633	11	Longterm adaption factor below threshold
882	523633	11	„Nox conversion rate insufficient (SCR-Cat defect, bad DEF quality)“
883	523633	11	„Nox conversion rate insufficient (SCR-Cat defect, bad DEF quality); temperature range 1“
887	3234	11	„DFC for plausibility error Min for NOx sensor downstream of SCR Cat.“
889	3224	1	„DFC for plausibility error Max for NOx sensor upstream of SCR Cat“
892	4345	11	Sensor backflow line pressure (SCR); plausibility error
893	4343	11	„SCR Monitoring; Pressure stabilisation error, general pressure check error (SCR)“

<b>Error codes</b>	<b>SPN</b>	<b>FMI</b>	<b>Error description</b>
894	4374	13	Pressure stabilisation error dosing valve (SCR)
897	523632	16	Pump pressure SCR metering unit too high.
898	523632	18	Pump pressure SCR metering unit too low
899	523632	0	Pressure overload of SCR-System.
900	523632	1	Pressure build-up error SCR-System.
903	4365	0	DEF tank temperature too high.
905	3241	0	„Sensor SCR catalyst upstream temperature too high; plausibility error.“
908	3361	7	DEF dosing valve blocked (SCR)
914	523720	2	„DEF supply module heater temperature; plausibility error (normal condition).“
915	523720	2	„Sensor DEF supply module heater temperature; plausibility error (cold start condition)“
916	523721	2	„Sensor DEF supply module temperature; plausibility error (normal condition)“
917	523721	2	„Sensor DEF supply module temperature; plausibility error (cold start condition)“
918	523981	11	„SCR plausibility, OBD and diagnosis; Stuck in range check of DEF tank temperature sensor DEF-tank without heating function (heating phase)“
919	523330	14	Immobilizer status; fuel blocked
920	523330	14	„DFC to block the fuel by Sia No detail informationen!“
921	523330	14	„DFC to indicate that TEN-code or UC-code received if ECU is learned. No detail informationen!“
922	523330	14	„DFC to indicate that no code is received via CAN. No detail informationen!“
923	523330	14	„DFC to indicate that wrong code is received. No detail informationen!“
925	523720	8	„DEF supply module heater temperature; duty cycle in failure range.“
926	523720	8	„DEF supply module heater temperature; duty cycle in invalid range.“
927	523721	11	Urea supply module temperature measurement not available.
928	523722	8	DEF supply module PWM signal; period outside valid range.
929	523722	8	Detect faulty PWM signal from Supply Modul.
930	523721	8	DEF supply module temperature; duty cycle in failure range.
931	523721	8	Urea supply module temperature; duty cycle in invalid range.
932	29	3	Handthrottle idle validation switch; short circuit to battery
935	91	3	„Sensor error accelerator pedal. Signal range check high.“
937	29	4	Handthrottle; short circuit to ground
940	91	4	„Sensor error accelerator pedal. Signal is below the range.“
942	523921	3	Sensor error burner temperature; signal range check high
943	3532	3	ensor error DEF tank level; signal range check high
944	523921	4	Sensor error burner temperature; signal range check low
945	3532	4	Sensor error DEF tank level; signal range check low
946	1079	13	Failure of sensor supply voltage 1.
947	1080	13	Failure of sensor supply voltage 2.

## 18 Troubleshooting

Error codes	SPN	FMI	Error description
948	523601	13	Failure of sensor supply voltage 3.
956	677	3	„Starter relay high side. Short circuit to battery.“
957	677	4	Starter relay high side short circuit to ground.
958	677	5	Starter relay low side no load error.
959	677	12	Starter relay powerstage over temperature.
960	677	3	Starter relay low side short circuit to battery.
961	677	4	Starter relay low side short circuit to ground.
965	523922	3	Burner shut of valve; short circuit to battery
969	624	5	SVS lamp; open load
970	624	12	SVS lamp: powerstage over temperature
971	624	3	SVS lamp; short circuit to battery
972	624	4	SVS lamp; short circuit to ground
973	523612	14	Softwarereset CPU SWReset_0
974	523612	14	Softwarereset CPU SWReset_1
975	523612	14	Softwarereset CPU SWReset_2
976	91	11	„Plausibility error between APP1 and APP2 or APP1 and idle switch.“
978	29	2	„Plausibility error between sensor and idle switch, Acceleration Pedal Detection. In case of Hand Throttle with Low Idle Switch, it is the plausibility check between hand throttle and idle switch.“
980	523550	12	Terminal 50 was operated too long
981	172	3	„Air flow temperature sensor; short circuit to battery or open load.“
982	172	4	„Sensor Luftmengentemperatur; Massekurzschluss Air flow temperature sensor; short circuit to ground“
986	523921	0	„Burner temperature, temperature above upper shutoff threshold“
989	523921	1	„Burner temperature, temperature below lower shutoff threshold“
992	105	1	„Charged Air cooler down stream temperature. Temperature below lower physical threshold.“
994	105	3	„Electrical error charged air temperature. Signal range check high.(SRC)“
995	105	4	„Electrical error charged air temperature. Signal range check low.“
996	105	0	„Charged air cooler temperature. System reaction initiated. High charged air cooler temperature. Warning threshold exceeded.“
997	105	0	„High charged air cooler temperature. Shut off threshold exceeded.“
998	105	11	„Diagnostic fault check for charged air cooler downstream temperature sensor No detail informationen!“
1007	412	3	„Electrical error EGR cooler downstream temperature. Signal range check high.“
1008	412	4	„electrical error EGR cooler downstream temperature. Signal range check low.“

<b>Error codes</b>	<b>SPN</b>	<b>FMI</b>	<b>Error description</b>
1011	523960	0	„Physical range check high for EGR cooler downstream temperature.“
1012	523960	1	„Physical range check low for EGR cooler downstream temperature.“
1014	51	6	„Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8). Signal range check high.“
1015	520521	5	„Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); signal range check low.“
1016	51	7	„Actuator position for EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8) not plausible.“
1022	51	6	„Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); signal range check high“
1023	51	5	„Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); signal range check low“
1024	51	3	„Position sensor error of actuator EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8). Signal range check high.“
1025	51	4	„Position sensor error actuator EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8). Signal range check low.“
1026	4769	2	Temperature downstream DOC, plausibility error
1029	4766	0	„Temperature downstream DOC, temperature above upper shutoff threshold“
1030	4766	0	„Temperature downstream DOC, temperature above upper warning threshold“
1034	4769	3	„Sensor error exhaust gas temperature downstream (DOC); signal range check high“
1035	4769	4	„Sensor error exhaust gas temperature downstream (DOC); signal range check low“
1036	4768	2	Temperature upstream DOC, plausibility error
1039	4765	0	„Temperature upstream DOC, temperature above upper shutoff threshold“
1040	4765	0	„Temperature upstream DOC, temperature above upper warning threshold“
1044	4768	3	„Electrical error exhaust gas temperature upstream (DOC); signal range check high“
1045	4768	4	„Electrical error exhaust gas temperature upstream (DOC); signal range check low“
1047	3248	4	„Sensor error particle filter downstream temperature; signal range check low“
1067	1180	3	„Sensor error exhaust gas temperature upstream turbine; signal range check high“
1069	4360	0	„Exhaust temperature upstream SCR-Cat, temperature above upper physical threshold“
1070	4360	1	„Sensed exhaust temperature before SCR-Cat is < physical low limit“
1071	4361	2	„Signal error for CAN message Detailinformationen fehlen! Signal error for CAN message No detail informationen!“
1072	4361	3	„Sensor error DEF catalyst exhaust gas temperature upstream; signal range check high“
1073	4361	4	„Sensor error DEF catalyst exhaust gas temperature upstream; signal range check low“
1074	1761	14	DEF tank level; warning threshold exceeded
1075	3361	6	DEF dosing valve; power at the end of injection too high
1077	3361	3	DEF dosing valve; short circuit to battery on low side
1078	3361	3	„DEF dosing valve; short circuit to battery or open load on high side“
1079	3361	4	„Urea dosing valve; short circuit to ground or open load on low side“
1080	3361	4	DEF dosing valve; short circuit on high side
1081	4345	5	SCR heater relay DEF returnline secondary side; open load
1082	4366	5	SCR main relay (secondary side): open load

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Error codes	SPN	FMI	Error description
1083	4343	5	„SCR heater relay DEF pressureline secondary side; open load“
1084	4366	5	SCR main relay (secondary side); Shortcut to battery
1085	4366	5	„SCR main relay (secondary side), heat relay (secondary side), heating elements or heating valve short to ground.“
1086	4341	5	SCR heater relay DEF supplyline secondary side; open load
1087	523719	5	„SCR heater relay DEF supply modul secondary side; open load“
1088	4366	5	SCR Tank heating valve secondary side: open load
1089	4243	11	„SCR system heater diagnostic reports error; shut off SCR-system“
1090	4345	5	SCR heater relay DEF returnline primary side; open load
1092	4345	3	SCR heater DEF returnline; short circuit to battery
1093	4345	4	SCR heater DEF returnline; short circuit to ground
1094	4343	5	SCR heater relay DEF pressureline primary side; open load
1096	4343	3	SCR heater DEF pressureline; short circuit to battery
1097	4343	4	SCR heater DEF pressureline; short circuit to ground
1098	523718	5	tank heating valve; open load
1099	523718	12	SCR main relay (primary side); powerstage over temperature
1100	523718	3	SCR main relay (primary side); short circuit to battery
1101	523718	4	SCR main relay (primary side); short circuit to ground
1102	4341	5	SCR heater relay DEF supply line primary side; open load
1104	4341	3	SCR-heater DEF supplyline; short circuit to battery
1105	4341	4	SCR-heater DEF supply line; short circuit to ground
1106	523719	5	SCR heater relay DEF supplymodule primary side; open load
1108	523719	3	SCR heater DEF supplymodule; short circuit to battery
1109	523719	4	SCR heater DEF supplymodule; short circuit to ground
1110	4366	5	SCR tank heating valve primary side; open load
1112	4366	3	SCR Tank heating valve; short circuit to battery
1113	4366	4	SCR Tank heating valve; short circuit to ground
1117	523632	11	Pump motor not available for actuation
1118	4375	5	Urea pump motor; open load
1120	4375	3	Urea pump motor; short circuit to battery
1121	4375	4	Urea pump motor; short circuit to ground
1122	4334	0	„Supply module DEF, DEF pressure above upper physical threshold“
1123	4334	1	„Urea supply module pressure sensor; physical range check low (defect pressure sensor)“
1124	4334	0	Urea pump pressure sensor; high signal not plausible
1125	4334	1	Urea pump pressure sensor; low signal not plausible
1126	523632	2	„Signal error for CAN message No detail informationen!“
1127	523632	3	Sensor error urea pump pressure; signal range check high

<b>Error codes</b>	<b>SPN</b>	<b>FMI</b>	<b>Error description</b>
1128	523632	4	Sensor error urea pump pressure; signal range check low
1129	4376	5	SCR reversal valve; open load
1130	4376	12	SCR reversing valve; over temperature
1131	4376	3	SCR reversal valve; short circuit to battery
1132	4376	4	SCR reversing valve; short circuit to ground
1135	3031	0	DEF tank, DEF temperature in DEF tank is to high.
1136	3031	1	DEF tank, DEF temperature below lower physical threshold
1137	4365	2	Tank temperature signal error for CAN message
1138	4365	3	Sensor error urea tank temperature: short circuit to battery
1139	4365	4	Sensor error urea tank temperature; short circuit to ground.
1157	97	12	Water in fuel level prefilter; maximum value exceeded
1158	523946	0	„Zerofuel calibration injector 1 (in firing order); maximum value exceeded“
1159	523947	0	„Zerofuel calibration injector 2 (in firing order); maximum value exceeded“
1160	523948	0	„Zerofuel calibration injector 3 (in firing order); maximum value exceeded“
1163	523951	0	„Zerofuel calibration injector 6 (in firing order); maximum value exceeded“
1164	523946	1	„Zerofuel calibration injector 1 (in firing order); minimum value exceeded“
1165	523947	1	„Zerofuel calibration injector 2 (in firing order); minimum value exceeded“
1166	523948	1	„Zerofuel calibration injector 3 (in firing order); minimum value exceeded“
1167	523949	1	„Zerofuel calibration injector 4 (in firing order); minimum value exceeded“
1168	523950	1	„Zerofuel calibration injector 5 (in firing order); minimum value exceeded“
1170	523612	12	Internal software error ECU
1180	168	0	Physical range check high for battery voltage
1181	168	1	Physical range check low for battery voltage
1183	172	1	Air inlet filter sensor out of physical range check
1187	523980	14	Bad quality of reduction agent detected
1193	1180	0	„Physical range check high for exhaust gas temperature upstream turbine“
1194	1180	1	„Physical range check low for exhaust gas temperature upstream turbine“
1219	524018	14	„HMI engine derate service state DPF wasn't regenerated, power reduction phase 1 (manuell regeneration request)“
1220	524022	14	„HMI engine derate stop state DPF wasn't regenerated, power reduction phase 2 (manuell regeneration request)“
1222	190	14	„Camshaft- and Crankshaft speed sensor signal not available on CAN“
1223	51	5	„Actuator EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); open load“
1224	51	6	„Actuator EGR-Valve (2.9;3.6) or Throttle-Valve (6.1,7.8); over current“
1226	51	3	„EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); short circuit to battery“
1227	51	3	„EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); short circuit to battery“
1228	51	4	„EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); short circuit to ground“
1229	51	4	„EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); short circuit to ground“

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Error codes	SPN	FMI	Error description
1230	51	6	„Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); Overload by short-circuit“
1231	51	11	Power stage overtemperature due to high current.
1232	51	4	„actuator AGR valve (2.9;3.6) throttle valve (4.1;6.1;7.8); Voltage below threshold.“
1239	523984	3	UB7; Short circuit to battery error of actuator relay 7
1241	523986	4	UB6; Short circuit to ground actuator relais 6
1242	523987	4	UB7; Short circuit to ground actuator relay 7
1247	524019	11	„Burner Control; Air Line - Blocked Air Pump; air lines blocked“
1248	523910	9	„Burner Control; Air Pump - CAN Lost Air Pump; CAN communication lost“
1249	523910	7	„Air pump;CAN communication interrupted no purge function available“
1250	523910	12	Air Pump; internal error
1252	523910	0	Air Pump; operating voltage error
1254	524014	1	„Air inlet EPV - pressure too low Air pressure glow plug flush line; below limit“
1255	524013	7	„Burner Control; Flame lost max Burner operation is interrupted too often“
1257	523915	7	HCI dosing valve (DV1); blocked open
1258	524016	11	„Burner Control; HFM - Electrical Fault HFM sensor; electrical fault“
1259	524016	2	„Burner Control; HFM - Plausibilitätsfehler 1 Amount of air is not plausible to pump speed“
1261	523910	6	„Burner Control Air Pump; over current Air pump electrically overloaded“
1262	523922	7	„Burner Control; Shut-off Valve - Blocked closed Burner Shut Off Valve; blocked closed“
1263	524021	11	„Burner Control; Fuel line ShutOff downstream - broken Burner fuel line pipe leak behind Shut Off Valve“
1264	523922	7	Burner Shut Off Valve; blocked open
1285	524038	9	„Timeout error of CAN-Receive-Frame ComMS_Sys1TO (error memory Slave); Master-Slave internal CAN message“
1286	524039	9	„Timeout error of CAN-Receive-Frame ComMS_Sys2TO (error memory Slave); Master-Slave internal CAN message“
1287	524040	9	„Timeout error of CAN-Receive-Frame ComMS_Sys3TO (error memory Slave); Master-Slave internal CAN message“
1288	524041	9	„Timeout error of CAN-Receive-Frame ComMS_Sys4TO (error memory Slave); Master-Slave internal CAN message“
1289	524042	9	„Timeout error of CAN-Receive-Frame ComMS_Sys5TO (error memory Slave); Master-Slave internal CAN message“
1290	524043	9	„Timeout error of CAN-Receive-Frame ComMS_Sys6TO (error memory Slave); Master-Slave internal CAN message“
1291	524045	9	„Master Slave, Error of message counter CAN receive message ComMSMoFOvR; Com- MSMoFOvR1CNT“
1292	524046	9	„Master-Slave CAN; Error Checksum of CAN-Receive Message“
1293	524047	9	„Master-Slave CAN; Error of message length of CAN receive message ComMSMoFOvR;_ ComMSMoFOvR1DLC“
1294	524048	9	„Timeout error CAN message ComMSMoFOvR1TO error memory Slave“
1299	523788	0	Wastegate plausibility error off CAN transmit message.
1300	523788	0	„Timeout Error of CAN-Receive-Frame ComTrbChActr; Wastegate“

<b>Error codes</b>	<b>SPN</b>	<b>FMI</b>	<b>Error description</b>
1302	524024	11	„Deviation of the exhaust gas temperature setpoint to actual value downstream (DOC) too high“
1324	523995	13	„Check of missing injector adjustment value programming (IMA) injector 7 (in firing order)“
1325	523996	13	„check of missing injector adjustment value programming (IMA) injector 8 (in firing order)“
1326	523997	4	Injector cylinder bank 1 slave; short circuit
1327	523998	4	Injector cylinder bank 2 slave; short circuit
1328	523999	12	Injector powerstage output Slave defect
1329	524000	5	Injector 7 (in firing order); interruption of electric connection
1330	524001	5	Injector 8 (in firing order); interruption of electric connection
1333	524000	3	Injector 7 (in firing order); short circuit
1334	524001	3	Injector 8 (in firing order); short circuit
1337	2797	4	„Timeout of Short-Circuit Ground Diagnosis Cyl. Bank 0;_IVDiaShCirGndToutBnk_0“
1338	2798	4	„Timeout of Short-Circuit Ground Diagnosis Cyl. Bank 1;_IVDiaShCirGndToutBnk_1“
1339	2797	4	Injector diagnostic; Short circuit to ground cylinder bank 0
1340	2798	4	Injector diagnostic; Short circuit to ground cylinder bank 1
1341	524035	12	Injector diagnostics; time out error in the SPI communication
1342	524036	12	„Injector diagnostics Slave; time out error in the SPI communication“
1345	524069	9	„Timeout Error of CAN-Receive-Frame MSMon_FidFCCTO; Master-Slave CAN communication faulty“
1357	524052	11	Error memory Slave reports FID MSMonFC2 (collective error)
1368	524052	11	Error memory Slave reports FID MSMonFC3 (collective error)
1378	523919	2	Sensor air pump airpressure; plausibility error
1379	523920	2	Sensor exhaust gas back pressure burner; plausibility error
1380	3253	2	Sensor differential pressure (DPF); plausibility error
1381	164	2	Rail pressure safety function is not executed correctly ()
1389	523922	5	Burner Shut Off Valve; open load
1390	523922	12	Burner Shut Off Valve; powerstage over temperature
1392	523922	4	Burner Shut Off Valve; short circuit to ground
1395	523921	2	„Burner temperature sensor; Plausibility Check for burner temperature sensor Sensor burner temperature; plausibility error“
1398	1136	0	Physical range check high for ECU temperature
1402	4769	2	„Sensor exhaust gas temperature OxiCat downstream (normal operation); plausibility error“
1403	4769	2	„Sensor exhaust gas temperature OxiCat downstream (regeneration); plausibility error“
1411	1188	11	Wastegate actuator; internal error
1412	1188	11	Wastegate actuator; EOL calibration not performed correctly
1413	1188	13	„Wastegate actuator calibration deviation too large, recalibration required“
1414	1188	2	Wastegate; status message from ECU missing
1415	1188	7	Wastegate actuator; blocked

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Error codes	SPN	FMI	Error description
1417	1188	11	Wastegate actuator; over temperature (> 135°C)
1418	1188	11	Wastegate actuator; operating voltage error
1423	51	0	„Warning threshold for an internal actuator error exceeded, <4L EGR.actuator und >4L Air Intake Flap“
1424	51	1	„Shut off threshold for an internal actuator error exceeded, <4L EGR.actuator und >4L Air Intake Flap“
1425	172	0	„air temperature within air filter box above maximum physical value“
1431	524028	2	CAN message PROEGRActr; plausibility error
1432	524029	2	„Timeout Error of CAN-Receive-Frame ComEGRActr - exhaust gas recirculation positioner“
1436	524034	5	Disc Separator; open load
1437	524034	12	Disc Separator; powerstage over temperature
1438	524034	3	Disc separator; short circuit to battery
1439	524034	4	Disc separator; short circuit to ground
1440	524030	7	EGR actuator; internal error
1441	524031	13	EGR actuator, calibration error
1442	524032	2	EGR actuator; status message „EGRCust“ is missing
1443	524033	7	EGR actuator; due to overload in Save Mode
1455	3711	12	Temperature during stand-still main phase too low or too high
1458	523960	0	„High exhaust gas temperature EGR cooler downstream; warning threshold exceeded.“
1464	0	0	
1466	0	0	
1467	0	0	
1469	0	0	
1470	0	0	
1471	0	0	
1472	0	0	
1481	524025	5	DPF system; operating voltage error
1482	524044	9	CAN message ComMS_Sys7 not received from slave
1484	524068	2	„Master ECU and Slave ECU have been identified as the same types“
1485	524052	11	„Master ECU and Slave ECU data sets or software are not identical“
1486	523718	5	SCR mainrelay; open load (only CV56B)
1488	523718	3	SCR mainrelay; short circuit to battery (only CV56B)
1489	523718	4	SCR mainrelay; short circuit to ground (only CV56B)
1490	4376	5	SCR reverting valve; open load
1491	4376	12	SCR reverting valve; over temperature
1493	4376	4	SCR reverting valve; short circuit to ground
1505	524057	2	Fuel low pressure pump; error pressure build up
1523	2659	2	Exhaust Gas Recirculation AGS Sensor; signal not plausible

<b>Error codes</b>	<b>SPN</b>	<b>FMI</b>	<b>Error description</b>
1524	2659	0	„Exhaust Gas Recirculation AGS Sensor; Sensed exhaust mass value above maximum physical value“
1525	2659	1	„Exhaust Gas Recirculation AGS Sensor; Sensed exhaust mass value below minimum physical value“
1526	2659	12	„Exhaust Gas Recirculation AGS Sensor; plausibility error, AGS sensor has not passed the burn off process“
1527	2659	2	„Exhaust Gas Recirculation AGS Sensor; Temperature of EGR mass not plausible“
1529	524070	2	„(Upstream NOx-Sensor) Diagnostic Fault Check for invalid upstream NOx value (Sensor self diagnostic DFC set by Deutz-SW) NOx-Sensor before SCR-Cat: Invalid upstream NOx value“
1530	524071	2	„(Downstream NOx-Sensor) Diagnostic Fault Check for invalid downstream lambda value (Sensor self diagnostic DFC set by Deutz-SW)“
1531	524072	2	„(Upstream NOx-Sensor) Diagnostic Fault Check for invalid upstream lambda value (Sensor self diagnostic DFC set by Deutz-SW)“
1532	524073	2	„(Downstream NOx-Sensor) Diagnostic Fault Check for invalid downstream NOx value (Sensor self diagnostic DFC set by Deutz-SW)“
1533	524074	9	„NOx sensor downstream SCR-CAT, sensor internally open load“
1534	524075	11	„NOx sensor downstream SCR-CAT, sensor internally short circuit“
1535	524076	9	NOx sensor upstream SCR-CAT, sensor internally open line
1536	524077	11	„NOx sensor upstream SCR-CAT, sensor internally short circuit“
1537	524078	9	„NOx sensor downstream SCR-CAT, lambda value above upper physical threshold“
1538	524079	9	„NOx sensor downstream SCR-CAT, lambda value below lower physical threshold“
1539	524080	9	„NOx sensor upstream SCR-CAT, lambda value above upper physical threshold“
1540	524081	9	„NOx sensor upstream SCR-CAT, lambda value below lower physical threshold“
1541	524082	9	„(Downstream NOx-Sensor) Diagnostic Fault Check for downstream NOx value over maximum limit (DFC set by Deutz-SW)“
1542	524083	9	„NOx-Sensor downstream SCR-CAT, NOx value below minimum value.“
1543	524084	9	„NOx-Sensor upstream SCR-CAT, NOx value above maximum value.“
1544	524085	9	„NOx sensor upstream SCR-CAT, NOx value below lower physical threshold“
1545	524149	2	„Plausibility error between pressure downstream turbine (PTrbnDs) and ambient air pressure (EnvP)“
1555	524063	5	„Relay Urea backflow line heater: broken wiring detected (open load) in-line engine: SCR-backflow line (K29) V-engine: Master: SCR-suction / backflow line (K32.1) Slave: SCR-suction / backflow line (K32.2)“
1556	524063	5	SCR main relay not connected
1557	524063	5	SCR heater pressureline; open load
1558	524063	3	SCR heater mainrelay; short circuit to battery
1559	524063	4	„SCR heater main relay load side (K31) on heating valve (Y31), Short cut to ground.“
1560	524063	5	„Relay Urea suction line: broken wiring detected (open load) Row engine: SCR suction line (K28) V-engine: Master: common SCR-suction line (K28) Slave: common SCR backflow line (K29)“
1561	524063	5	SCR heater supply module; open load

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Error codes	SPN	FMI	Error description
1562	524063	5	SCR heater tank; open load
1565	524065	0	„Pressure sensor upstream SCR-CAT, pressure above upper physical threshold“
1566	524065	1	„Pressure sensor upstream SCR-CAT, pressure below lower physical threshold“
1569	524065	3	„Pressure sensor upstream SCR-CAT; short circuit battery or open load“
1570	524065	4	Pressure sensor upstream SCR-CAT; short circuit ground
1579	524066	3	„SCR measurement heater output stage; short circuit battery or open load“
1581	524067	0	„DEF supply module, heater temperature above upper physical threshold“
1582	524067	1	„DEF supply module, heater temperature below lower physical threshold“
1585	524067	0	„DEF supply module, temperature above upper physical threshold“
1586	524067	1	„DEF supply module, temperature below lower physical threshold“
1593	1761	0	DEF tank, DEF level above upper physical threshold
1594	1761	1	DEF tank, DEF level below lower physical threshold
1597	524149	2	Pressure downstream turbine, plausibility error
1598	524065	2	Pressure sensor upstream SCR-CAT, plausibility error
1617	3699	2	„Passive regeneration of DPF; DOC error Temperature sensor us. and ds. DOC simultaneously defect“
1619	524087	5	Urea Error Lamp; open load
1620	524087	12	Urea Error Lamp; temperatur over limit
1621	524087	3	Urea Error Lamp; short circuit battery
1622	524087	4	Urea Error Lamp; short circuit ground
1630	524132	2	„Fuel low pressure upstream fuel low pressure pump not plausible“
1631	524132	0	„Fuel low pressure upstream fuel low pressure pump, pressure above maximum warning threshold“
1632	524132	0	„Fuel low pressure upstream fuel low pressure pump, pressure above maximum shut off threshold“
1633	524132	1	„Fuel low pressure upstream fuel low pressure pump, pressure below minimum shut off threshold“
1634	524132	1	„Fuel low pressure upstream fuel low pressure pump, pressure below minimum warning threshold“
1635	3699	0	„Maximum standstill time reached; oil exchange request ignored“
1639	524147	13	SCR System,pressure build up not possible
1646	524063	12	DEF supply modul, time for defrosting too long
1647	524063	12	DEF tank, time for defrosting too long
1654	1761	14	„Urea Tank Signal to HMI for indicating the Urea Tank-Level (Urea tank volume ratio low threshold 1)“
1655	1761	14	DEF tank, DEF level below first warning threshold
1656	1761	14	DEF tank, DEF level below second warning threshold
1658	524096	14	„Control of the SCR system; If the start stop counter (EPA-Counter) exceeds the threshold SCRctl_ctEngStrtStopThresh_C. This counter will increment only once in each driving cycle in case of an SCR error. If the counter reaches the threshold, the DFC will be set to inhibit the engine start Engine will not be started, because of EPA-Counter“

<b>Error codes</b>	<b>SPN</b>	<b>FMI</b>	<b>Error description</b>
1659	524114	9	Timeout error of CAN-Transmit-Frame A1DOC
1660	524115	9	Timeout error of CAN-Transmit-Frame AT1S
1661	524116	9	Timeout error of CAN-Transmit-Frame SCR2"
1662	524117	9	Timeout error of CAN-Transmit-Frame SCR3"
1663	524097	9	Timeout error of CAN-Transmit-Frame DPFBrnAirPmpCtl
1664	524098	9	Timeout error of CAN-Transmit-Frame ComDPFBrnPT
1665	524099	9	Timeout error of CAN-Transmit-Frame ComDPFC1
1666	524100	9	Timeout error of CAN-Transmit-Frame ComDPFHisDat.
1667	524101	9	Timeout error of CAN-Transmit-Frame ComDPFtstMon
1668	524105	9	„Timeout error of CAN-Transmit-Frame ComEGRMsFlw (EGR Steller)“
1669	524108	9	„Timeout error of CAN-Transmit-Frame ComEGRTVActr (EGR actuator)“
1670	524110	9	Timeout error of CAN-Transmit-Frame ComETVActrTO.
1671	524112	9	Timeout ComIntake Throttle Valve Actr.
1672	524118	9	Timeout error of CAN-Receive-Frame ComRxCM1
1675	524103	9	Timeout error of CAN-Receive-Frame ComRxDPFBrnAirPmp
1676	524104	9	Timeout error of CAN-Receive-Frame ComRxDPFCtl.
1677	524106	9	„Timeout error of CAN-Receive-Frame ComRxEGRMsFlw1 (EGR actuator)“
1678	524107	9	„Timeout error of CAN-Receive-Frame ComRxEGRMsFlw2 (EGR actuator)“
1679	524109	9	„Timeout error of CAN-Receive-Frame ComRxEGRTVActr (EGR actuator)“
1680	524111	9	Timeout error of CAN-Receive-Frame ComRxETVActr
1681	524113	9	Timeout error of CAN-Receive-Frame ComRxITVActr
1682	524120	9	Timeout error of CAN-Receive-Frame ComRxSCRHtDiag“
1683	524121	9	„Timeout error of CAN-Receive-Frame ComRxTrbChActr (wastegate actuator)“
1684	524122	9	„Timeout error of CAN-Receive-Frame ComRxUQSens (Urea quality)“
1685	524123	9	Timeout error of CAN-Receive-Frame ComSCRHtCtl“
1686	524124	9	Timeout error of CAN-Receive-Frame ComTxAT1IMG“
1687	524125	9	„Timeout error of CAN-Receive-Frame ComTxTrbChActr (Wastegate actuator)“
1698	524133	2	HMI system; set if restore button blocked
1699	524134	0	DPF, ash load exceeds the shutoff threshold
1700	524134	0	DPF, ash load exceeds the warning threshold
1701	524135	0	DPF, soot load exceeds the shutoff threshold
1702	524135	14	DPF, soot load exceeds the service request threshold
1703	524135	0	DPF, soot load exceeds the warning threshold
1705	524156	9	Timeout error of CAN-Receive-Frame ComRxEBC2.
1706	524157	9	Fancontrol; time out for fan governing
1708	524159	0	Fan; short circuit battery or open load
1709	524159	1	Fan; short circuit ground

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Error codes	SPN	FMI	Error description
1710	524160	5	Fan; in/outlet valve 1; open load
1712	524160	3	Fan; in/outlet valve 1; short circuit battery
1713	524160	4	Fan; in/outlet valve 1; open load ground
1714	524161	5	Fan; in/outlet valve 2; open load
1716	524161	3	Fan; in/outlet valve 2; short circuit battery
1717	524161	4	Fan; in/outlet valve 2; open load ground
1718	524162	12	Fan; fancontrol; angle sensor defect
1719	524163	12	Fan; fancontrol; fan or valve defect
1752	2791	7	EGR actuator, actuator blocked
1753	2791	2	EGR actuator, CAN error
1754	2791	13	EGR actuator, EOL calibration error
1755	2791	12	EGR Actuator, internal electrical fault
1756	2791	13	EGR actuator, learning process aborted
1757	2791	6	EGR actuator current is above maximum threshold
1758	2791	3	„EGR actuator supply voltage is above the maximum threshold“
1759	2791	4	EGR actuator supply voltage is below minimum threshold.
1760	2791	13	EGR actuator, learning process out of range
1761	2791	7	EGR actuator, broken spring detected.
1762	2791	16	EGR actuator, temperature high.
1763	2791	0	EGR actuator, temperature critical high
1788	1188	7	Turbocharger wastegate, mechanical blocking detected.
1789	1188	2	Turbocharger wastegate, CAN Error
1790	1188	13	Turbocharger wastegate, EOL calibration error.
1791	1188	12	Turbocharger wastegate, internal electrical error
1792	1188	13	Turbocharger wastegate, learning process aborted.
1793	1188	6	Turbocharger wastegate, current above maximum threshold.
1794	1188	3	„Turbocharger wastegate, supply voltage above maximum threshold.“
1795	1188	4	„Turbocharger wastegate, supply voltage below minimum threshold.“
1796	1188	13	Turbocharger wastegate, learning process out of range.
1797	1188	7	Turbocharger wastegate, broken spring detected.
1799	1188	0	Turbocharger wastegate, temperature critical high.
1827	524141	7	DEF dosing valve, dosing valve blocked
1857	523612	12	Engine starter, plausibility error of starter release condition
1858	524147	7	SCR-System, reverting valve blocked
1859	524175	0	SCR-CAT, Nox emissions above maximum threshold
1860	524074	2	„NOx-Sensor after SCR-Cat: Nox-Sensor dew point problem or plausibility problem“
1861	524076	2	„NOx-Sensor before SCR-Cat: Nox-Sensor dew point problem or plausibility problem“

<b>Error codes</b>	<b>SPN</b>	<b>FMI</b>	<b>Error description</b>
1863	524177	7	SCR System, DEF suction line blocked
1864	524178	7	SCR System, DEF pressure out of range
1865	4360	2	Exhaust temperature sensor upstream SCR, plausibility error
1866	4334	2	DEF supply module pressure, plausibility error
1867	524067	2	Supply module heater temperature, plausibility error
1868	524067	2	Supply module temperature, plausibility error
1869	1761	2	DEF tank level, plausibility error
1870	3031	2	Urea tank temperature outside of plausible thresholds
1874	524152	2	Urea Quality Sensor; Timeout CAN message
1875	524153	2	„Urea tank level & urea tank temperature via CAN bus, timeout of CAN message“
1880	1761	14	DEF tank, DEF level below third warning threshold
1881	4768	2	„exhaust gas temperature sensors up- and downstream DOC are physically swapped“
1882	524025	14	„The standstill-regeneration mode time exceeds the long-limit. Vehicle was too long or too often in standstill mode. Make oil change and reset counter.“
1883	524025	14	„The standstill-regeneration mode time exceeds the short-limit. Vehicle was too long or too often within a short time in standstill mode. Make oil change and reset counter.“
1884	524184	9	
1889	524189	9	Master / Slave Can disturbed.
1891	524190	14	1 Inducement level 1 activ
1892	524191	14	2 Inducement level 2 activ
1893	524193	8	„The standstill-regeneration mode time exceeds the long limit threshold. Vehicle was too long or too often in standstill mode. Change oil and reset counter.“
1894	524194	8	„The standstill-regeneration mode time exceeds the short-limit. Vehicle was too long or too often within a short time in standstill mode. Change oil and reset counter.“
1895	3519	12	DEF tank temperature, temperature too high
1896	3520	3	DEF quality sensor, short circuit to battery or open load
1897	3520	4	DEF quality sensor, short circuit to ground
1898	3519	3	„DEF quality sensor, internal temperature sensor short circuit to battery or open load“
1899	3519	4	„DEF quality sensor, internal temperature sensor short circuit to ground“
1900	524195	14	Standstill request due to crystallisation ignored too long
1901	524196	13	Variant handling, address error
1902	524196	2	Variant handling, Synchronisation error
1904	3520	2	„DEF quality sensor, Significantly diluted DEF or another liquid than DEF in the tank.“
1905	3520	8	„DEF quality sensor, DEF quality cannot be measured within a certain time frame.“
1907	3520	13	Urea quality at UQS invalid
1908	3519	13	Temperature at UQS invalid
1909	4365	12	Urea Tank Temperature is above the warning threshold

## 18 Troubleshooting

Error codes	SPN	FMI	Error description
1910	3532	13	„DEF qualitysensor, tank level; DEF level out of physial range“
1911	3532	3	The DEF Level at UQS out of max. physical range
1912	3532	4	Quality at UQS out of min. physical range
1913	4365	13	„DEF qualitysensor, tank temperatur; Temperature out of physial range“
1914	4365	3	„DEF qualitysensor, tank temperatur; Short circuit to battery or open load“
1915	4365	4	DEF qualitysensor, tank temperatur; Short circuit to ground
1917	3936	14	Standstill request ignored too long.
1918	3936	14	Standstill time based escalation requests Inducement step 2
1921	51	5	„Intake Throttle Flap, H-Bridge, wiring harness broken at connected actuator“
1922	51	6	„Intake Throttle Flap, H-Bridge, current above maximum threshold“
1924	51	3	Intake Throttle Flap, H-Bridge, short circuit to battery (A02)
1925	51	3	Intake Throttle Flap, H-Bridge, short circuit to battery (A67)
1926	51	4	Intake Throttle Flap, H-Bridge, short circuit to ground (A02)
1927	51	4	Intake Throttle Flap, H-Bridge, short circuit to ground (A67)
1931	51	7	„Intake Throttle Flap, H-Bridge, position of actuator not plausible (deviation from setpoint more than 7%)“
1935	51	3	„Intake Throttle Flap, H-Bridge, short circuit to battery oder broken wiring harness“
1936	51	4	Intake Throttle Flap, H-Bridge, short circuit to ground
1943	524202	11	SCR error code in master ECU active.
1944	524203	11	DEF tank level failure is in master ECU active.
1945	524204	11	SCR afterrun failure is in master ECU active.
1946	524205	11	SCR Co2Off failure is in master ECU active.
1947	524206	11	SCR disable DEF dosing failure is in master ECU active.
1971	524230	11	Inducement HW Failure Slave.
1972	524231	11	Inducement SCR Tamp. Slave
1973	524232	11	Inducement DEF Quality in Slave ECU
1974	524233	11	Urea Level Error Slave
1975	524234	11	Urea Temp. Error Slave
1976	524235	11	Urea Level Replace Slave
1977	524236	11	SCR System Afterrun Slave
1978	524237	11	NSwitch Off SCR System Slave
1979	524238	11	Disable SCR Dosing Slave
1980	524239	11	SCR regeneration failure is in slave ECU active.
1983	524242	11	Urea CONC Replace Slave
1984	524243	11	Urea Quality Error Slave
1989	524248	11	NOX sensor downstream error in slave ECU
1990	524249	11	DEF dosing valve error in slave ECU
1992	524251	11	DEF pressure problems in slave ECU

<b>Error codes</b>	<b>SPN</b>	<b>FMI</b>	<b>Error description</b>
1993	524252	11	Reverting valve error in slave ECU
1994	524253	11	DEF back flow line heater error on slave ECU
1995	524254	11	Error NOx-Tailpipe emissions exceeded on Slave ECU
1996	524255	11	DEF suction line heater error on slave ECU
1997	524256	11	DEF supply module heater error on slave ECU
1998	524257	11	Error Exhaust pressure upstream SCR on Slave ECU.
1999	524258	11	Error Exhaust temperature upstream SCR on Slave ECU
2000	524259	11	DEF pressure line heater error on slave ECU
2001	524260	11	Error Urea pump temperature on Slave ECU
2002	524261	11	Error DEF heater relais on Slave ECU.
2003	524262	8	
2007	524267	14	Announcement triggers the Inducement Level 2
2008	524025	8	Max. launch time for stand still exceeded (60min).
2011	4171	2	Dynamic temperatur check of temp before SCR
2013	524147	13	„Set together with DFC_SCRCoBldUpLoPres. DFC_SCRCoBldUpLoPresRst is only used for inducement purposes. It ensures that legal inducement is working correctly.“
2014	3520	1	„Diluted DEF in the tank.

## **18 Troubleshooting**

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### **18.2.3 Travel control check**

Travel control replacement (Chap. 13.3.2)

### **18.2.14 Travel control**

#### **18.2.14.1 Travel control replacement**

Travel control replacement (Chap. 13.3.2).

#### **18.2.14.2 Travel lever switch check and replacement**

Travel control replacement (Chap. 13.3.2).

# 19 Appendices



### **19.1 Hydraulic system**

#### **19.1.1 Travel pump zero position adjustment**

##### **19.1.1.1 Travel pump magnetic coil check**

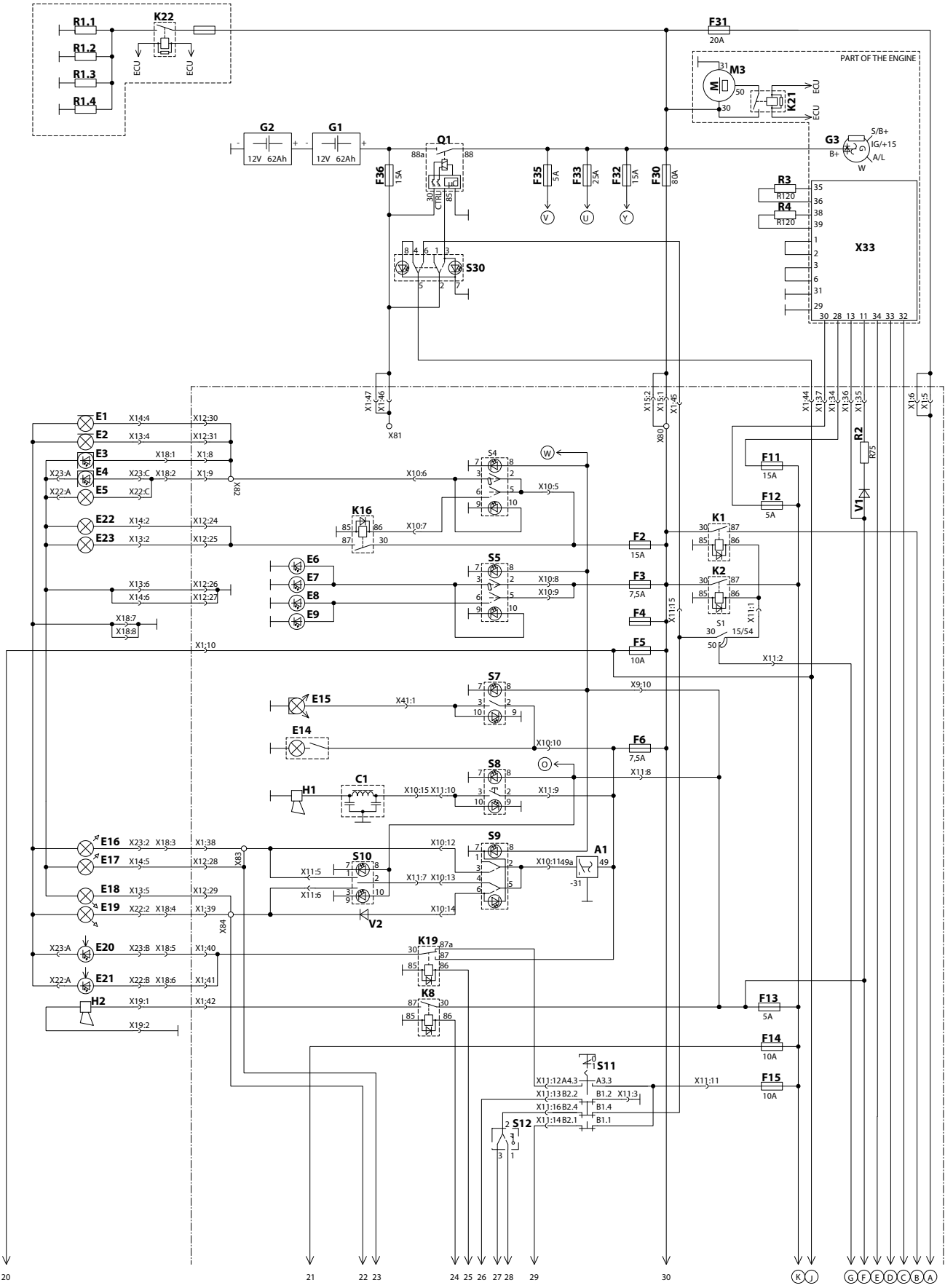
Check of the travel pump magnetic coil (chap. 17.2.1)

# 19 Appendices

## 19.2 Wiring diagram

### Legend:

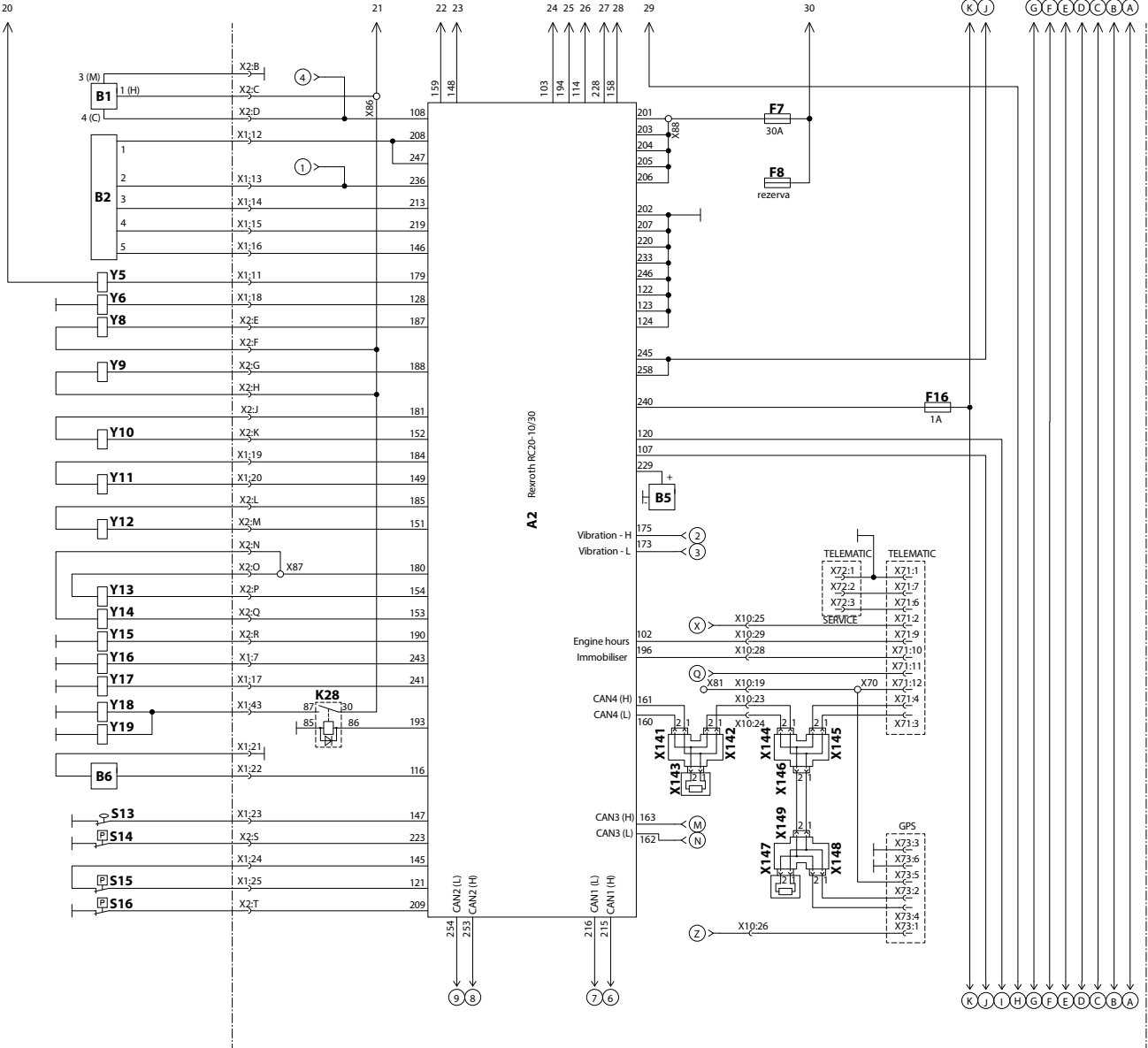
A1 - Direction light interrupter	F1 - 12V fuse for sockets	S17 - Seat switch
A2 - Control unit Rexroth RC20-10/30	F2-8 - Fuses – switchboard (in front of the key)	S18 - Vibration switch Small/Big
A4 - Travel control lever	F11-28 - Fuses – switchboard (after the key)	S19 - Vibration switch Manual/Automatic
A5 - Display	F30 - Main fuse	S30 - Electronic disconnecter switch
A6 - Deusch engine control unit	F31-35 - Fuses – on the machine (in front of the key)	S35 - Air suction temperature
A7 - Air-conditioning	F36 - Memory power supply fuse	S36 - Coolant level switch
A8 - Time relay of rear window heating	F40 - Pre-heating fuse	S37 - Air filter clogging pressure switch
A9 - Voltage transformer 24 V / 12 V	F50 - Cab lifting fuse	S38 - Water in fuel switch
A10 - Autoradio 12 V	G1-2 - 62 Ah battery	S40 - Heater fan switch
A11 - Heating	G3 - Alternator 100	S41 - Front wiper switch
A12 - Front wiper intermittent	H1 - Horn	S42 - Rear wiper switch
A13 - Rear wiper intermittent	H2 - Back signal horn	S43 - Screen washer switch
A15 - Relaybox	H3 - Right loudspeaker	S44 - Rear window heating switch
A16 - Tachograph	H4 - Left loudspeaker	S47 - Air-condition overpressure safety element
A17 - Adapter N1/M1	K1,2 - POWER relay	S49 - Fuel level sensor
A18 - Compaction modul	K10,16 - Relay	S51 - Seat belt sensor
A21 - Pulse changer	K8,11,19,28 - MICRO relay	X34-35 - Mounting 12V sockets
A22 - Voltage transformer 24V / 12V	M3 - Starter	X36 - Engine diagnostic socket
B1 - Vibrator frequency sensor	M6 - Front windscreen wiper	X64 - Diagnostic socket CAN1
B2 - Left wheel speed sensor	M7 - Rear windscreen wiper	X65 - Diagnostic socket CAN2
B5 - Inclinometer	M8 - Front windscreen washer	X68 - Diagnostic socket of display
B6 - Fuel level indicator	M9 - Rear windscreen washer	V - Rectifier diodes
B54 - NOx sensor in front of SCR catalytic converter	Q1 - Electronic disconnecter	Y5 - Cooling fan electromagnet
B56 - NOx sensor after SCR catalytic converter	R1 - Pre-heating	Y6 - Differential lock electromagnet RTM
B58 - DPF differential pressure sensor	R2 - Resistor 75 Ω	Y8 - Vibration electromagnet – small
B65 - Temperature of exhaust gases in front of OXY catalytic converter	R5,7,8 - Resistor 120 Ω	Y9 - Vibration electromagnet – big
B66 - Temperature of exhaust gases after OXY catalytic converter	R6 - Rear window heating	Y10 - Fast travel electromagnet – drum
B78 - Temperature of exhaust gases in front of SCR catalytic converter	R9 - Heating flap valve 22 kΩ	Y11 - Fast travel electromagnet – left wheel
B88 - Pressure sensor after DPF module	R15 - Suction circuit heating	Y12 - Fast travel electromagnet – right wheel
B90 - Urea sensor	R16 - Return circuit heating	Y13 - Travel electromagnet – reverse
C1 - Noise suppressing filter	R17 - Pressure circuit heating	Y14 - Travel electromagnet – forward
E1,2 - Front outline lights	S1 - Ignition box	Y15 - Parking brake electromagnet
E3,4 - Tail lights	S2 - Cab lifting switch	Y16 - Blade electromagnet - up
E5 - Number plate lighting	S3 - Bonnet lifting switch	Y17 - Blade electromagnet - down
E6,7 - Front headlights (on the cabin)	S4 - Road lighting switch	Y18-19 - Blade electromagnet - floating position
E8,9 - Rear headlights (on the cabin)	S5 - Headlights switch on the cabin	Y23 - Air-conditioning compressor coupling electromagnet
E14 - Lighting in the cab	S7 - Beacon switch	Y24 - Urea dosing valve electromagnet
E15 - Beacon	S8 - Horn button	Y31 - Urea tank heating
E16,17 - Left direction lights	S9 - Warning lights switch	
E18,19 - Right direction lights	S10 - Turn indicators switch	
E20,21 - Brake lights	S11 - Emergency brake	
E22,23 - Road lighting	S12 - Service switch	
	S13 - Hydraulic oil fuel level	
	S14 - Pressure parking brake switch	
	S15 - Hydraulic oil temperature switch	
	S16 - Hydraulic oil filter pressure switch	



## Wiring diagram

### Legend:

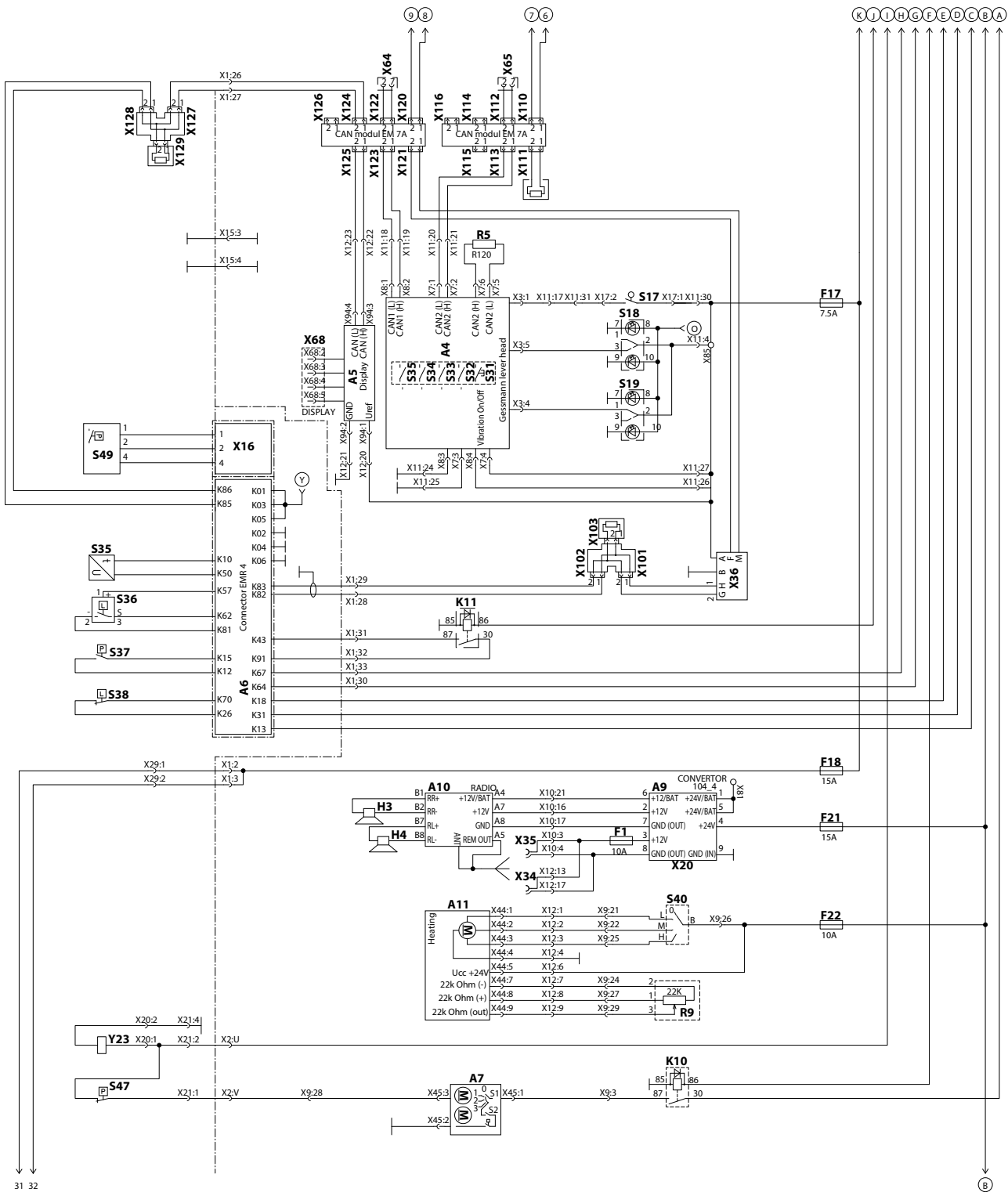
A1 - Direction light interrupter	F1 - 12V fuse for sockets	S17 - Seat switch
A2 - Control unit Rexroth RC20-10/30	F2-8 - Fuses – switchboard (in front of the key)	S18 - Vibration switch Small/Big
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A5 - Display	F30 - Main fuse	S30 - Electronic disconnecter switch
A6 - Deutsch engine control unit	F31-35 - Fuses – on the machine (in front of the key)	S35 - Air suction temperature
A7 - Air-conditioning	F36 - Memory power supply fuse	S36 - Coolant level switch
A8 - Time relay of rear window heating	F40 - Pre-heating fuse	S37 - Air filter clogging pressure switch
A9 - Voltage transformer 24 V / 12 V	F50 - Cab lifting fuse	S38 - Water in fuel switch
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A11 - Heating	G3 - Alternator 100	S41 - Front wiper switch
A12 - Front wiper intermittent	H1 - Horn	S42 - Rear wiper switch
A13 - Rear wiper intermittent	H2 - Back signal horn	S43 - Screen washer switch
A15 - Relaybox	H3 - Right loudspeaker	S44 - Rear window heating switch
A16 - Tachograph	H4 - Left loudspeaker	S47 - Air-condition overpressure safety element
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B5 - Inclinometer	M8 - Front windscreen washer	X68 - Diagnostic socket of display
B6 - Fuel level indicator	M9 - Rear windscreen washer	V - Rectifier diodes
B54 - NOx sensor in front of SCR catalytic converter	Q1 - Electronic disconnecter	Y5 - Cooling fan electromagnet
B56 - NOx sensor after SCR catalytic converter	R1 - Pre-heating	Y6 - Differential lock electromagnet RTM
B58 - DPF differential pressure sensor	R2 - Resistor 75 Ω	Y8 - Vibration electromagnet – small
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B88 - Pressure sensor after DPF module	R15 - Suction circuit heating	Y12 - Fast travel electromagnet – right wheel
B90 - Urea sensor	R16 - Return circuit heating	Y13 - Travel electromagnet – reverse
C1 - Noise suppressing filter	R17 - Pressure circuit heating	Y14 - Travel electromagnet – forward
E1,2 - Front outline lights	S1 - Ignition box	Y15 - Parking brake electromagnet
E3,4 - Tail lights	S2 - Cab lifting switch	Y16 - Blade electromagnet - up
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E6,7 - Front headlights (on the cabin)	S4 - Road lighting switch	Y18-19 - Blade electromagnet - floating position
E8,9 - Rear headlights (on the cabin)	S5 - Headlights switch on the cabin	Y23 - Air-conditioning compressor coupling electromagnet
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E15 - Beacon	S8 - Horn button	Y31 - Urea tank heating
E16,17 - Left direction lights	S9 - Warning lights switch	
E18,19 - Right direction lights	S10 - Turn indicators switch	
E20,21 - Brake lights	S11 - Emergency brake	
E22,23 - Road lighting	S12 - Service switch	
	S13 - Hydraulic oil fuel level	
	S14 - Pressure parking brake switch	
	S15 - Hydraulic oil temperature switch	
	S16 - Hydraulic oil filter pressure switch	



## Wiring diagram

### Legend:

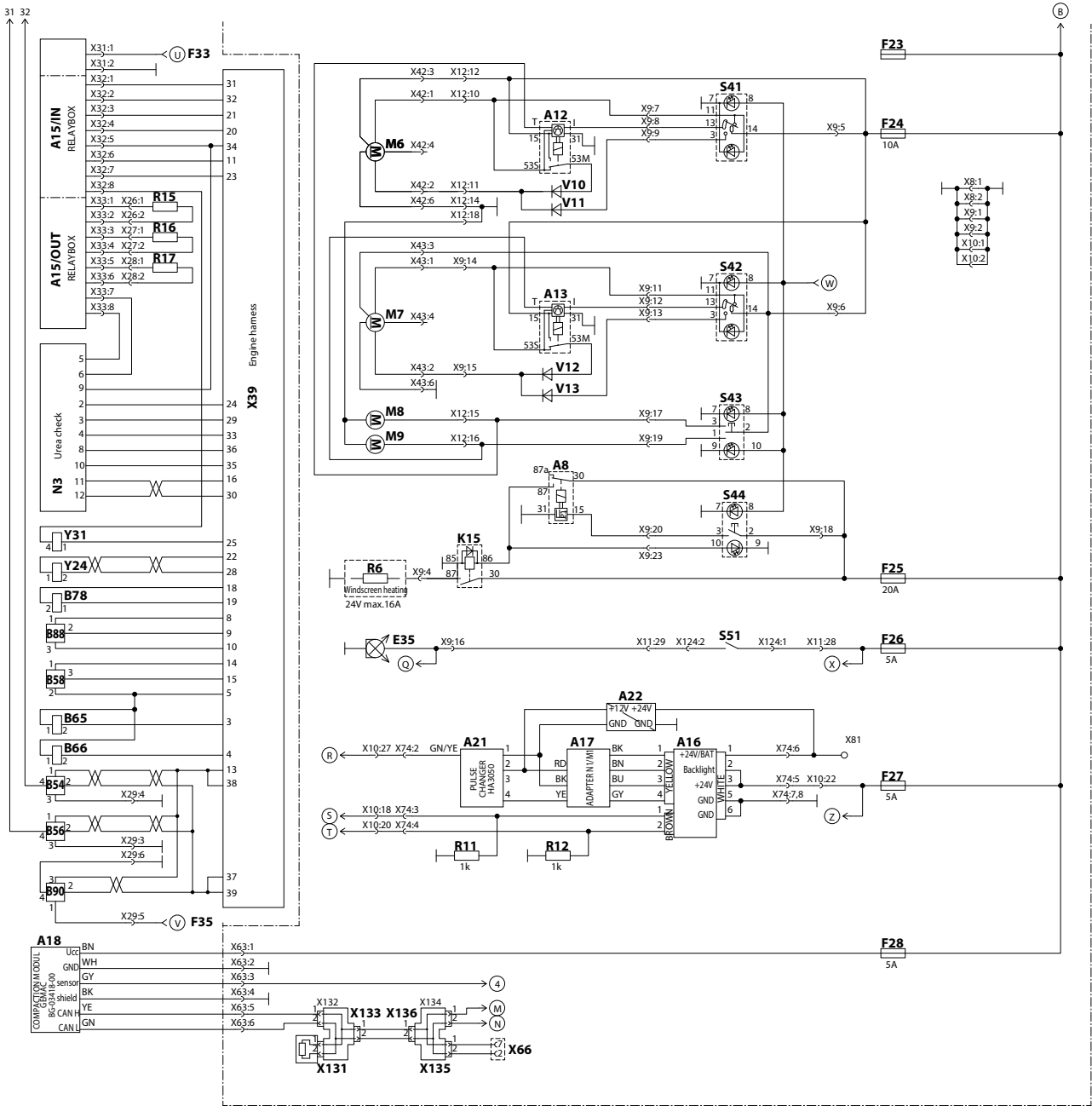
A1 - Direction light interrupter	F1 - 12V fuse for sockets	S17 - Seat switch
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A5 - Display	F30 - Main fuse	S30 - Electronic disconnecter switch
A6 - Deutsch engine control unit	F31-35 - Fuses – on the machine (in front of the key)	S35 - Air suction temperature
A7 - Air-conditioning	F36 - Memory power supply fuse	S36 - Coolant level switch
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A10 - Autoradio 12 V	G1-2 - 62 Ah battery	S40 - Heater fan switch
A11 - Heating	G3 - Alternator 100	S41 - Front wiper switch
A12 - Front wiper intermittent	H1 - Horn	S42 - Rear wiper switch
A13 - Rear wiper intermittent	H2 - Back signal horn	S43 - Screen washer switch
A15 - Relaybox	H3 - Right loudspeaker	S44 - Rear window heating switch
A16 - Tachograph	H4 - Left loudspeaker	S47 - Air-condition overpressure safety element
A17 - Adapter N1/M1	K1,2 - POWER relay	S49 - Fuel level sensor
A18 - Compaction modul	K10,16 - Relay	S51 - Seat belt sensor
A21 - Pulse changer	K8,11,19,28 - MICRO relay	X34-35 - Mounting 12V sockets
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B1 - Vibrator frequency sensor	M6 - Front windscreen wiper	X64 - Diagnostic socket CAN1
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B5 - Inclinometer	M8 - Front windscreen washer	X68 - Diagnostic socket of display
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B54 - NOx sensor in front of SCR catalytic converter	Q1 - Electronic disconnecter	Y5 - Cooling fan electromagnet
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B90 - Urea sensor	R16 - Return circuit heating	Y13 - Travel electromagnet – reverse
C1 - Noise suppressing filter	R17 - Pressure circuit heating	Y14 - Travel electromagnet – forward
E1,2 - Front outline lights	S1 - Ignition box	Y15 - Parking brake electromagnet
E3,4 - Tail lights	S2 - Cab lifting switch	Y16 - Blade electromagnet - up
E5 - Number plate lighting	S3 - Bonnet lifting switch	Y17 - Blade electromagnet - down
E6,7 - Front headlights (on the cabin)	S4 - Road lighting switch	Y18-19 - Blade electromagnet - floating position
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E14 - Lighting in the cab	S7 - Beacon switch	Y24 - Urea dosing valve electromagnet
E15 - Beacon	S8 - Horn button	Y31 - Urea tank heating
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E18,19 - Right direction lights	S10 - Turn indicators switch	
E20,21 - Brake lights	S11 - Emergency brake	
E22,23 - Road lighting	S12 - Service switch	
	S13 - Hydraulic oil fuel level	
	S14 - Pressure parking brake switch	
	S15 - Hydraulic oil temperature switch	
	S16 - Hydraulic oil filter pressure switch	



## Wiring diagram

### Legend:

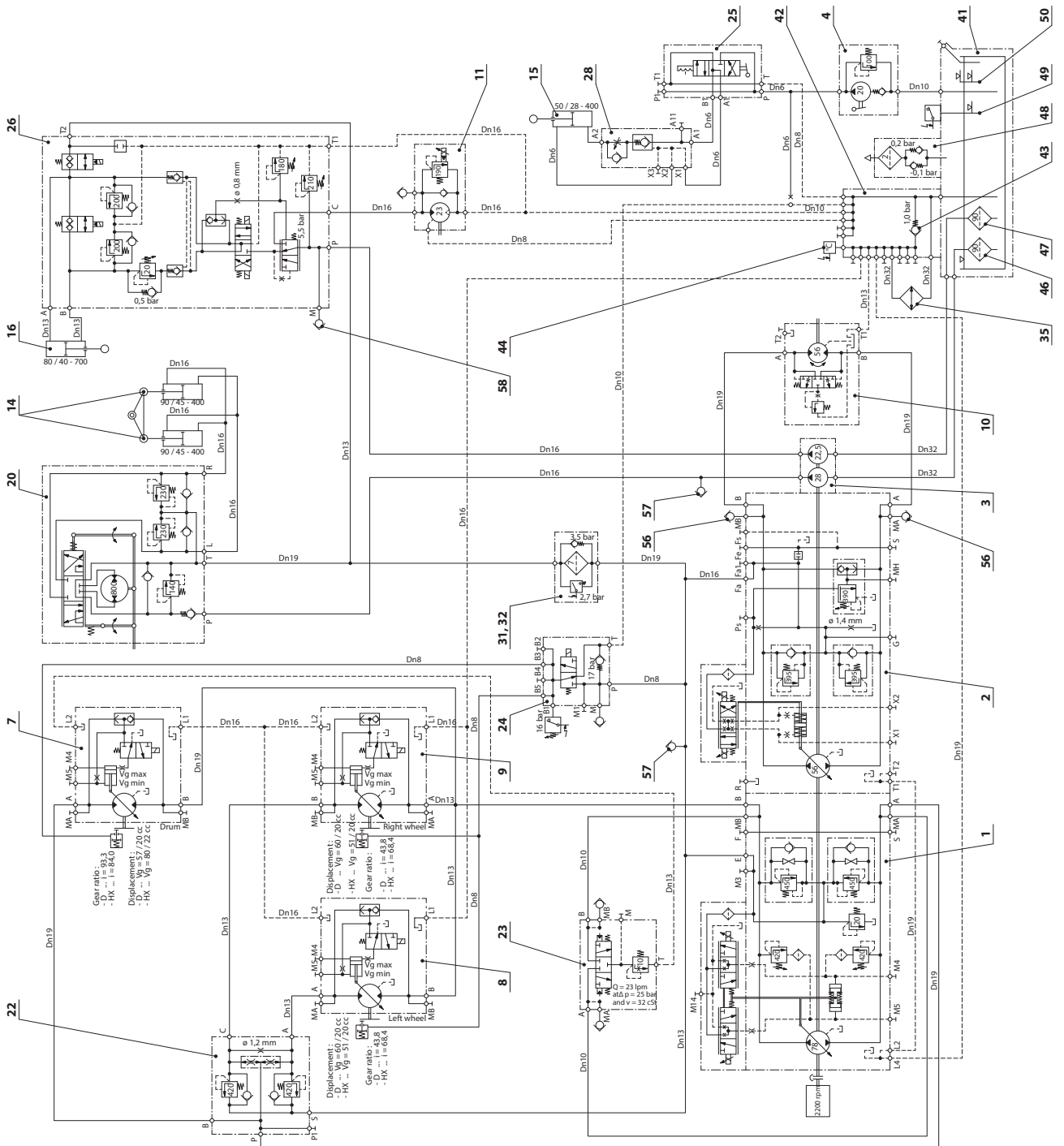
A1 - Direction light interrupter	F1 - 12V fuse for sockets	S17 - Seat switch
A2 - Control unit Rexroth RC20-10/30	F2-8 - Fuses – switchboard (in front of the key)	S18 - Vibration switch Small/Big
A4 - Travel control lever	F11-28 - Fuses – switchboard (after the key)	S19 - Vibration switch Manual/Auto-matic
A5 - Display	F30 - Main fuse	S30 - Electronic disconnecter switch
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A7 - Air-conditioning	F36 - Memory power supply fuse	S36 - Coolant level switch
A8 - Time relay of rear window heating	F40 - Pre-heating fuse	S37 - Air filter clogging pressure switch
A9 - Voltage transformer 24 V / 12 V	F50 - Cab lifting fuse	S38 - Water in fuel switch
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B5 - Inclinometer	M8 - Front windscreen washer	X68 - Diagnostic socket of display
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B56 - NOx sensor after SCR catalytic converter	R1 - Pre-heating	Y6 - Differential lock electromagnet RTM
B58 - DPF differential pressure sensor	R2 - Resistor 75 Ω	Y8 - Vibration electromagnet – small
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B66 - Temperature of exhaust gases after OXY catalytic converter	R6 - Rear window heating	Y10 - Fast travel electromagnet – drum
B78 - Temperature of exhaust gases in front of SCR catalytic converter	R9 - Heating flap valve 22 kΩ	Y11 - Fast travel electromagnet – left wheel
B88 - Pressure sensor after DPF module	R15 - Suction circuit heating	Y12 - Fast travel electromagnet – right wheel
B90 - Urea sensor	R16 - Return circuit heating	Y13 - Travel electromagnet – reverse
C1 - Noise suppressing filter	R17 - Pressure circuit heating	Y14 - Travel electromagnet – forward
E1,2 - Front outline lights	S1 - Ignition box	Y15 - Parking brake electromagnet
E3,4 - Tail lights	S2 - Cab lifting switch	Y16 - Blade electromagnet - up
E5 - Number plate lighting	S3 - Bonnet lifting switch	Y17 - Blade electromagnet - down
E6,7 - Front headlights (on the cabin)	S4 - Road lighting switch	Y18-19 - Blade electromagnet - floating position
E8,9 - Rear headlights (on the cabin)	S5 - Headlights switch on the cabin	Y23 - Air-conditioning compressor coupling electromagnet
E14 - Lighting in the cab	S7 - Beacon switch	Y24 - Urea dosing valve electromagnet
E15 - Beacon	S8 - Horn button	Y31 - Urea tank heating
E16,17 - Left direction lights	S9 - Warning lights switch	
E18,19 - Right direction lights	S10 - Turn indicators switch	
E20,21 - Brake lights	S11 - Emergency brake	
E22,23 - Road lighting	S12 - Service switch	
	S13 - Hydraulic oil fuel level	
	S14 - Pressure parking brake switch	
	S15 - Hydraulic oil temperature switch	
	S16 - Hydraulic oil filter pressure switch	



### 19.3 Hydraulic diagram – wheel lock

**Legend:**

1. Travel pump
2. Vibration pump
3. Steering and cooling pump
4. Hand pump
7. Travel hydraulic motor - drum
8. Travel hydraulic motor – left wheel
9. Travel hydraulic motor – right wheel
10. Vibration hydraulic motor
11. Fan drive motor
14. Steering hydraulic cylinder
15. Cab lifting hydraulic cylinder
16. Dozer blade hydraulic cylinder
20. Steering unit
22. Flow divider
23. Flushing valve
24. Brake hydraulic block
25. Cab lifting hydraulic block
26. Dozer blade hydraulic block
28. Throttle check valve
31. Hydraulic filter - head
32. Hydraulic filter - filter element
35. Combined cooler
41. Hydraulic tank
42. Return line manifold
43. Check valve
44. Temperature sensor
46. Strainer
47. Strainer
48. Ventilating filter
49. Float switch
50. Oil level indicator
54. Filling quick coupling
56. Test coupling
57. Test coupling
58. Test coupling

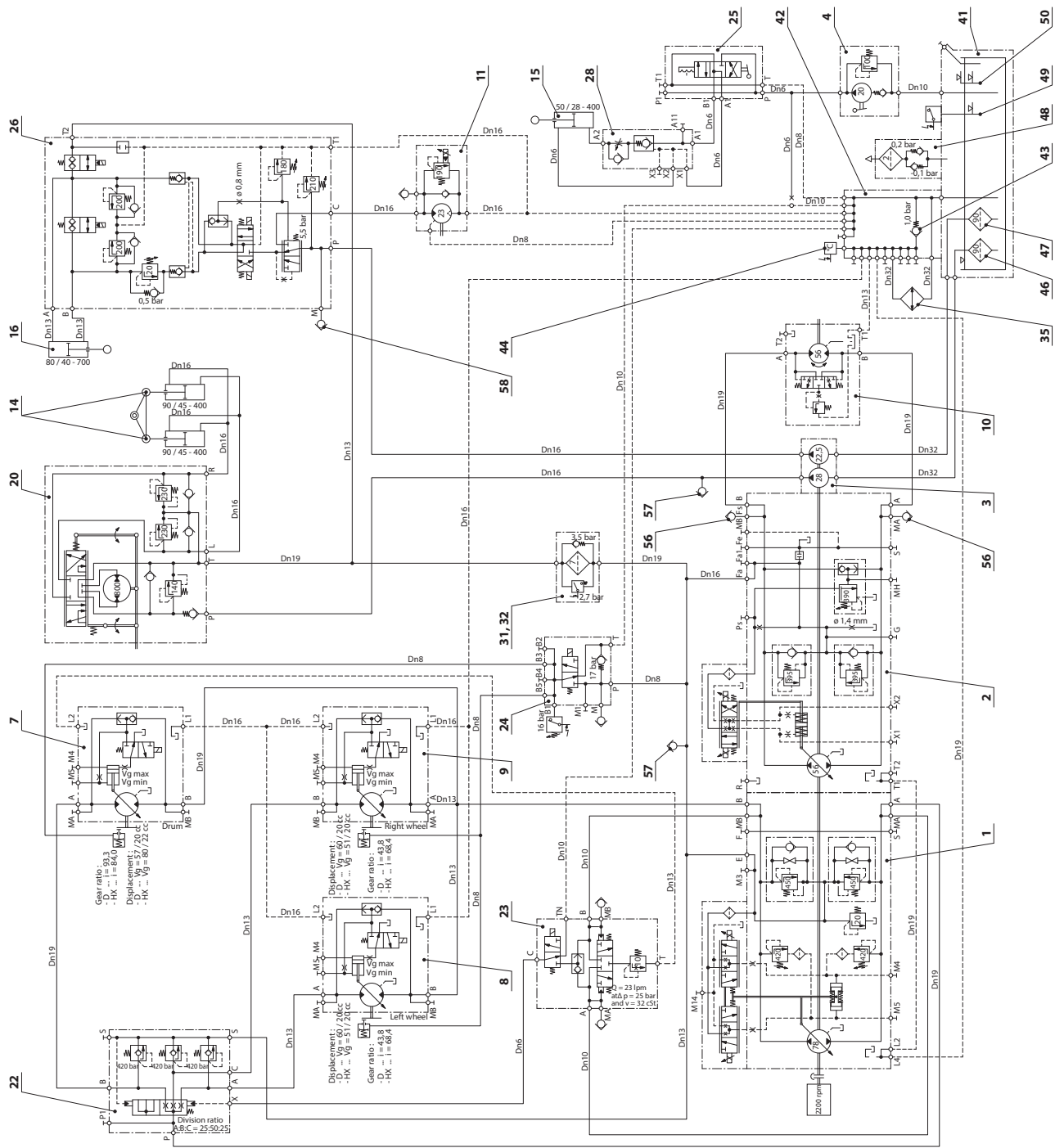


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### 19.4 Hydraulic diagram – complete ATC

**Legend:**

1. Travel pump
2. Vibration pump
3. Steering and cooling pump
4. Hand pump
7. Travel hydraulic motor - drum
8. Travel hydraulic motor – left wheel
9. Travel hydraulic motor – right wheel
10. Vibration hydraulic motor
11. Fan drive motor
14. Steering hydraulic cylinder
15. Cab lifting hydraulic cylinder
16. Dozer blade hydraulic cylinder
20. Steering unit
22. Flow divider
23. Flushing valve and control of RTM
24. Brake hydraulic block
25. Cab lifting hydraulic block
26. Dozer blade hydraulic block
28. Throttle check valve
31. Hydraulic filter - head
32. Hydraulic filter - filter element
35. Combined cooler
41. Hydraulic tank
42. Return line manifold
43. Check valve
44. Temperature sensor
46. Strainer
47. Strainer
48. Ventilating filter
49. Float switch
50. Oil level indicator
54. Filling quick coupling
56. Test coupling
57. Test coupling
58. Test coupling



43676Ben

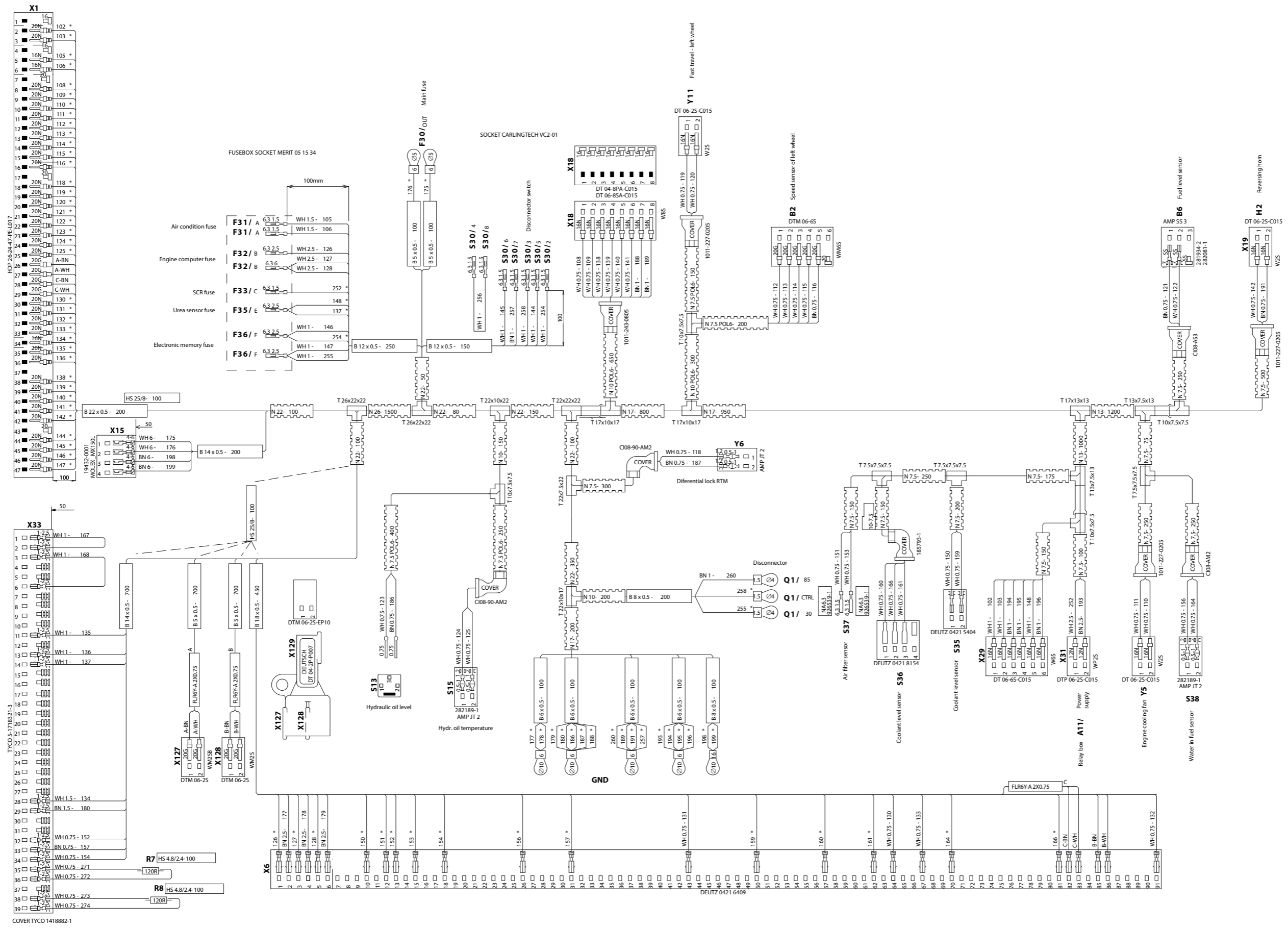
## 19 Appendices

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### 19.5 Harnesses

1	Cable harness #1 .....	4-39457_D
2	Cable harness #2 .....	4-38342
3	Cable harness #3 .....	4-39223
4	Power conductors.....	4-38343
5	Vibration RPM sensor .....	37637_D
6	Fast travel - drum .....	4-37638
7	Cab .....	4-36119
8	Washers .....	4-37704
9	Armrest.....	4-35277_E
10.1	Distribution box, part 1 .....	4-39462_B
10.2	Distribution box, part 2 .....	4-39462_B
11	Wipers, washers and lights switches.....	4-35080
12	Aftertreatment.....	4-35567_C
13	Beacon .....	4-444445
14	Speaker.....	4-38637
15	Air conditioning .....	4-38237
16	ROPS .....	4-36771_A
17	Display .....	4-39703A

# ARS150 Tier 4 final Cable harness #1 Part Number 4-39457\_D



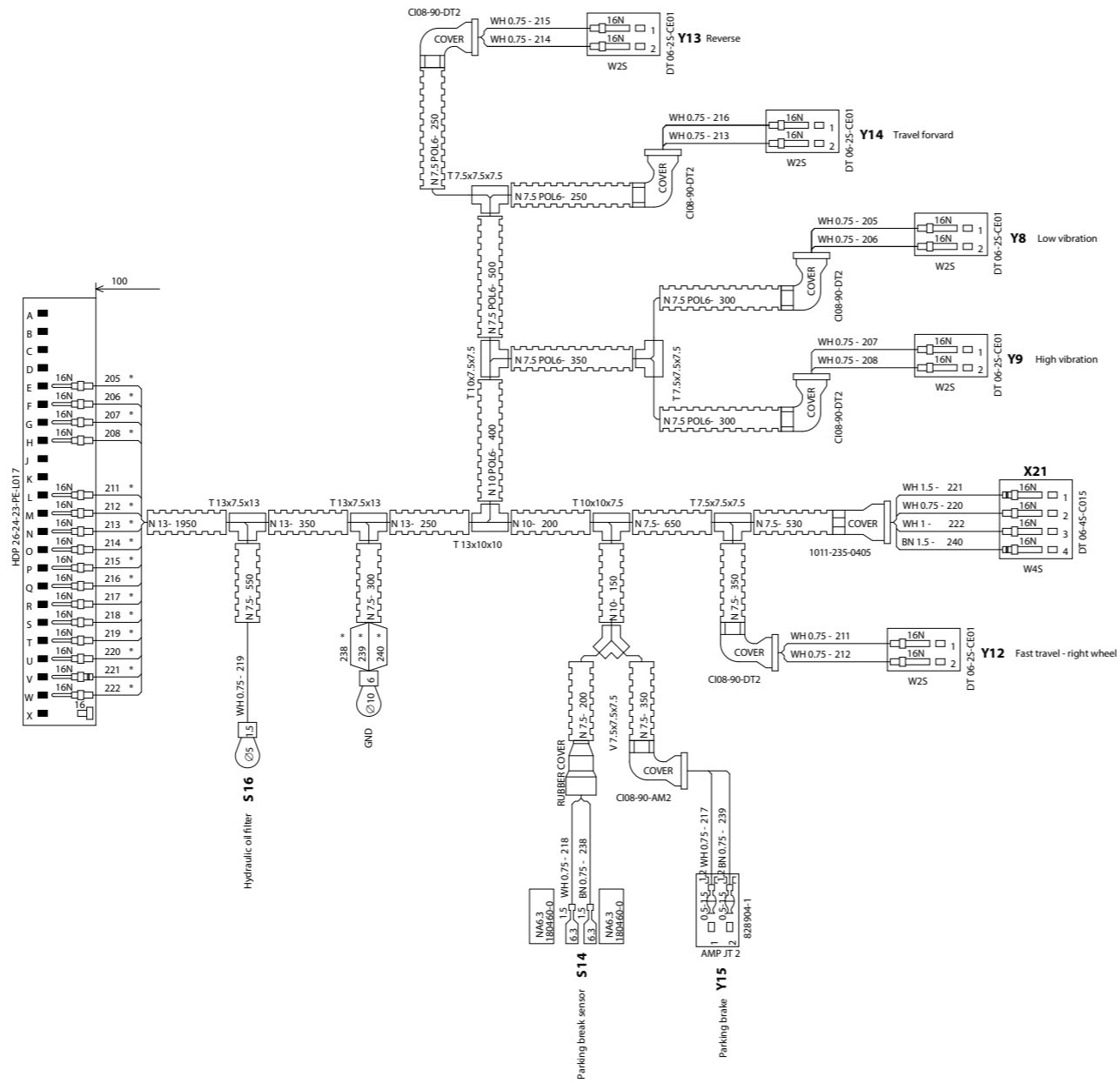
### CABLE HARNESS LEGEND:

- Faston
  - Ring tongue
  - Wire ferrule
  - Butt splice
  - Contact
  - Sealing plug
  - Single wire seal
  - Lock nut
  - Insulation sleeve
  - Clip
  - Reducer
  - Clamp
  - T-Manifold
  - Conduit gland SEM straight
  - Faston connector
  - DIN connector
  - DIN connector
  - Receptacle connector
  - Plug connector
- Wire color: R - 1 - 1200 (100)
- Wire: Square mm, Length, Wire number
- Cable: H03W-F2X0.75 - 2500
- Cable: Type, Length
- Corrugated tube: NW13 - 700
- Corrugated tube: Type, Length

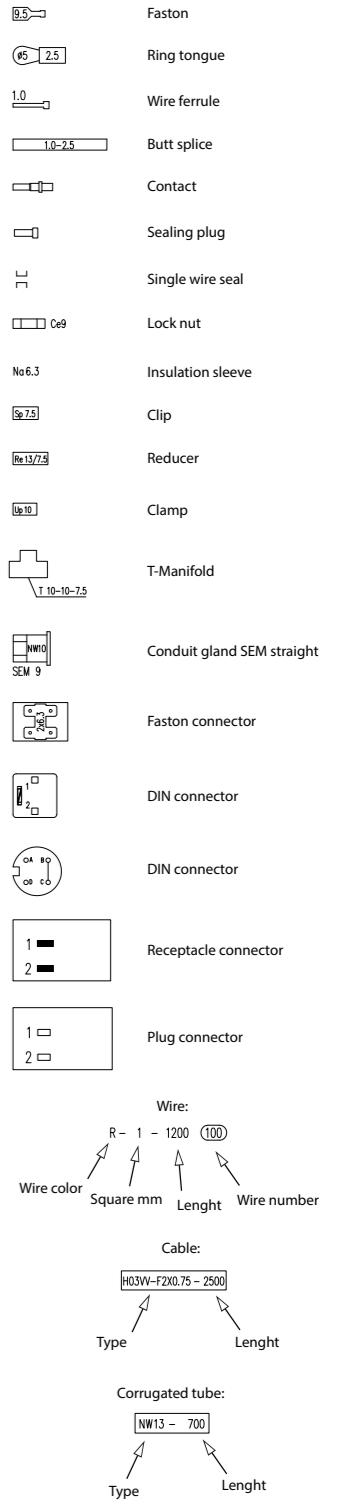
### TABLE OF COLOR SYMBOLS:

WH	B	White
BK	C	Black
BN	H	Brown
BU	M	Blue
RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange

**ARS150 Tier 4 Final  
Cable harness #2  
Part Number 4-38342**



**CABLE HARNESS LEGEND:**






















**TABLE OF COLOR SYMBOLS:**

WH	B	White
BK	C	Black
BN	H	Brown
BU	M	Blue
RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange

ARS150 Tier 4 Final  
Cable harness #3  
Part Number 4-39223

CABLE HARNESS LEGEND:

-  Faston
  -  Ring tongue
  -  Wire ferrule
  -  Butt splice
  -  Contact
  -  Sealing plug
  -  Single wire seal
  -  Lock nut
  -  Insulation sleeve
  -  Clip
  -  Reducer
  -  Clamp
  -  T-Manifold
  -  Conduit gland SEM straight
  -  Faston connector
  -  DIN connector
  -  DIN connector
  -  Receptacle connector
  -  Plug connector
- Wire:  
R - 1 - 1200 (100)  
Wire color    Square mm    Length    Wire number
- Cable:  
H03VV-F2X0.75 - 2500  
Type    Length
- Corrugated tube:  
NW13 - 700  
Type    Length

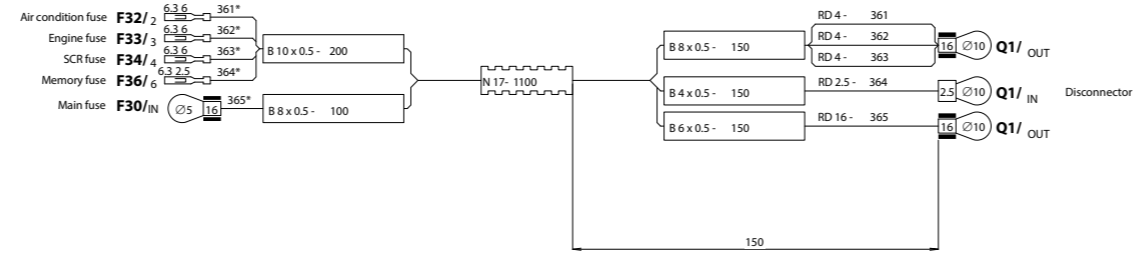



















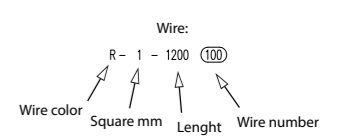
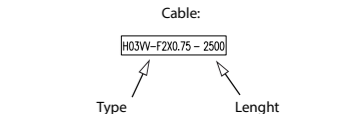
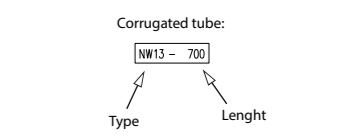


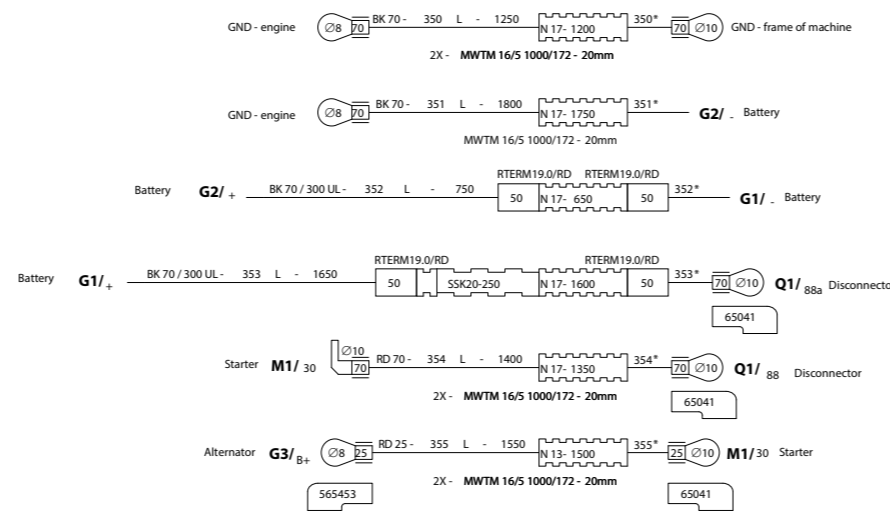
TABLE OF COLOR SYMBOLS:

WH	B	White
BK	C	Black
BN	H	Brown
BU	M	Blue
RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange

**ARS150 Tier 4 Final  
Power conductors  
Part Number 4-38343**

**CABLE HARNESS LEGEND:**

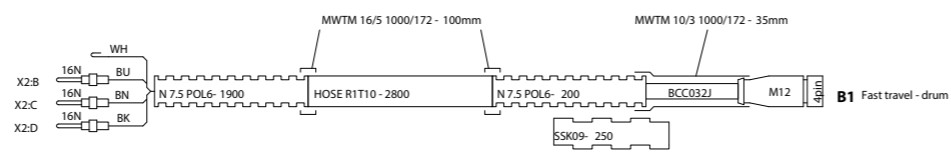
-  Faston
  -  Ring tongue
  -  Wire ferrule
  -  Butt splice
  -  Contact
  -  Sealing plug
  -  Single wire seal
  -  Lock nut
  -  Insulation sleeve
  -  Clip
  -  Reducer
  -  Clamp
  -  T-Manifold
  -  Conduit gland SEM straight
  -  Faston connector
  -  DIN connector
  -  DIN connector
  -  Receptacle connector
  -  Plug connector
- Wire:  
 Wire color, Square mm, Length, Wire number
- Cable:  
 Type, Length
- Corrugated tube:  
 Type, Length



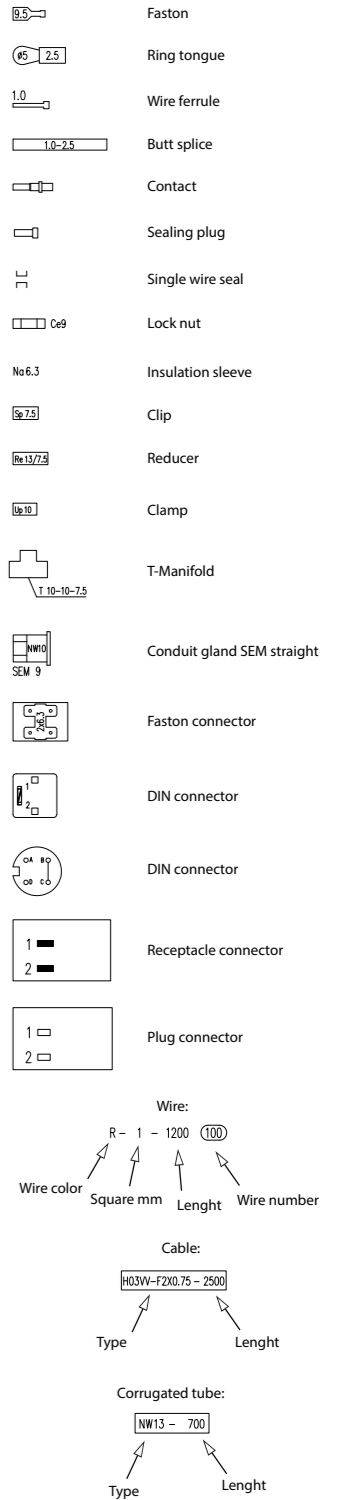
**TABLE OF COLOR SYMBOLS:**

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BN	H	Brown
BU	M	Blue
RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange

**ARS150 Tier 4 final  
Vibrator RPM sensor  
Part Number 4-37637\_D**

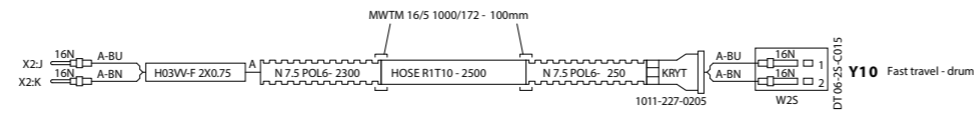


**CABLE HARNESS LEGEND:**

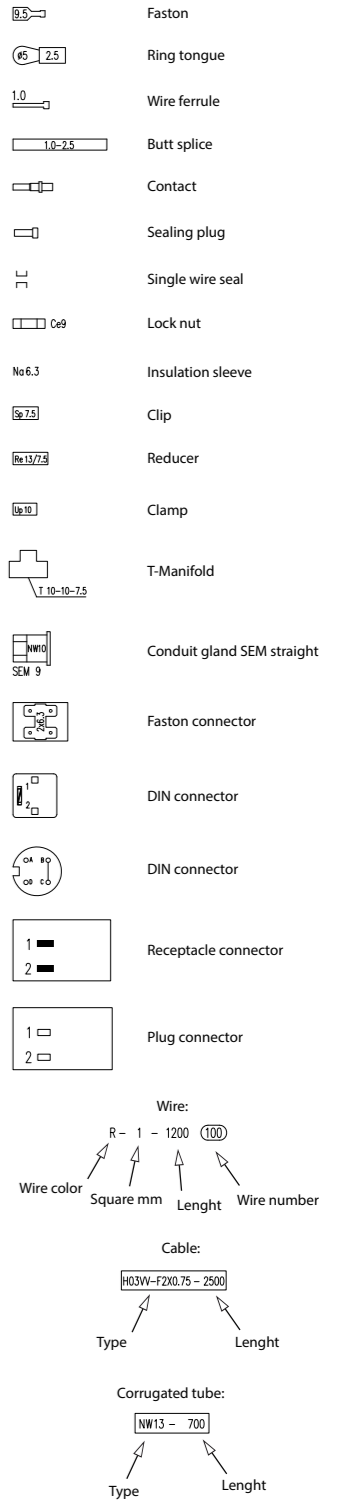


**TABLE OF COLOR SYMBOLS:**

WH	B	White
BK	C	Black
BN	H	Brown
BU	M	Blue
RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange



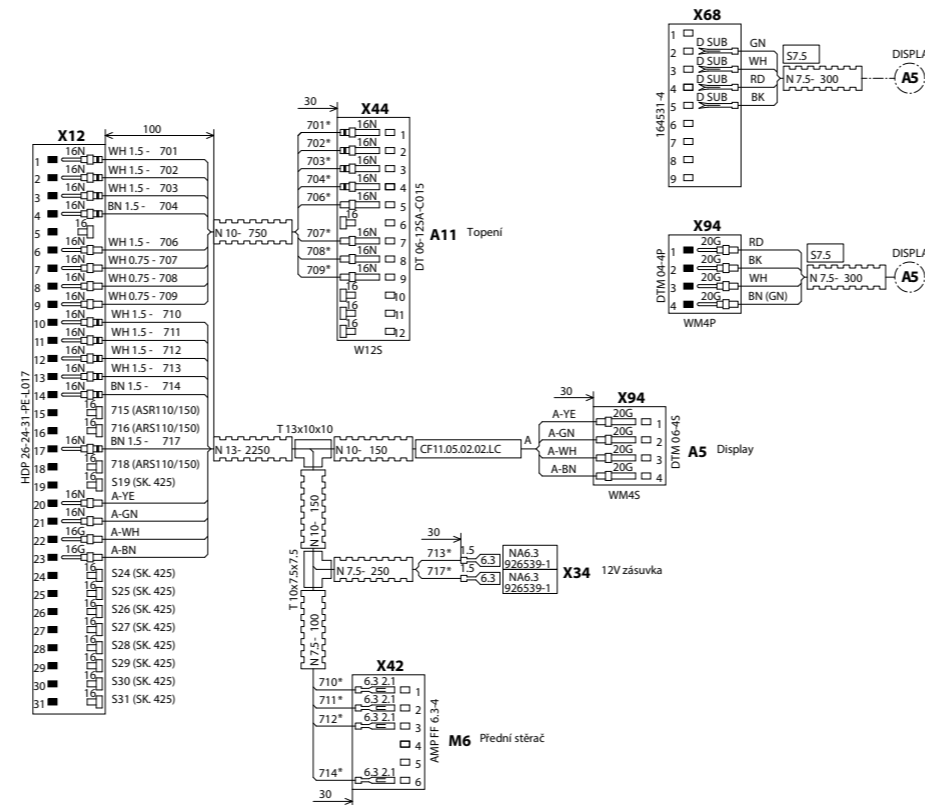
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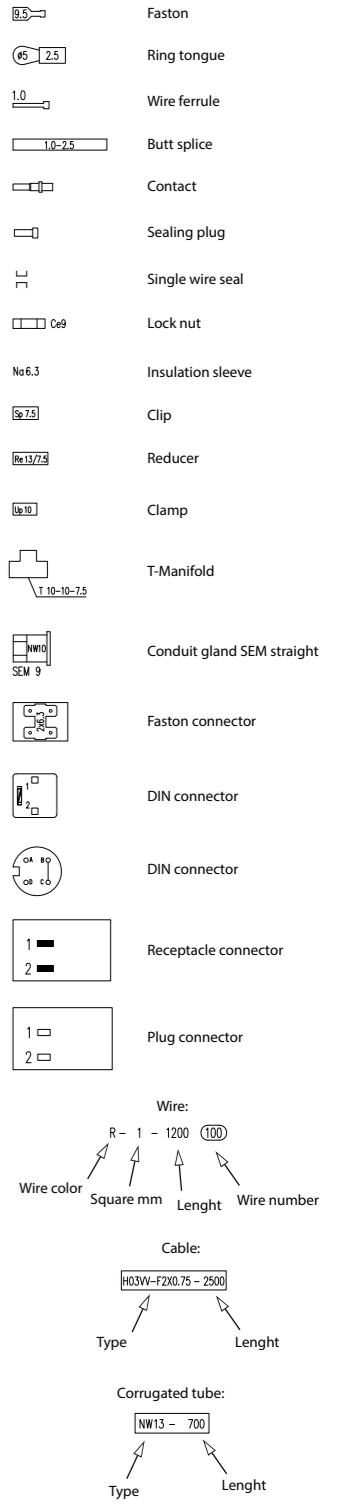
**TABLE OF COLOR SYMBOLS:**

WH	B	White
BK	C	Black
BN	H	Brown
BU	M	Blue
RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange

**ARS150 Tier 4 Final  
Cab  
Part Number 4-36119**



**CABLE HARNESS LEGEND:**



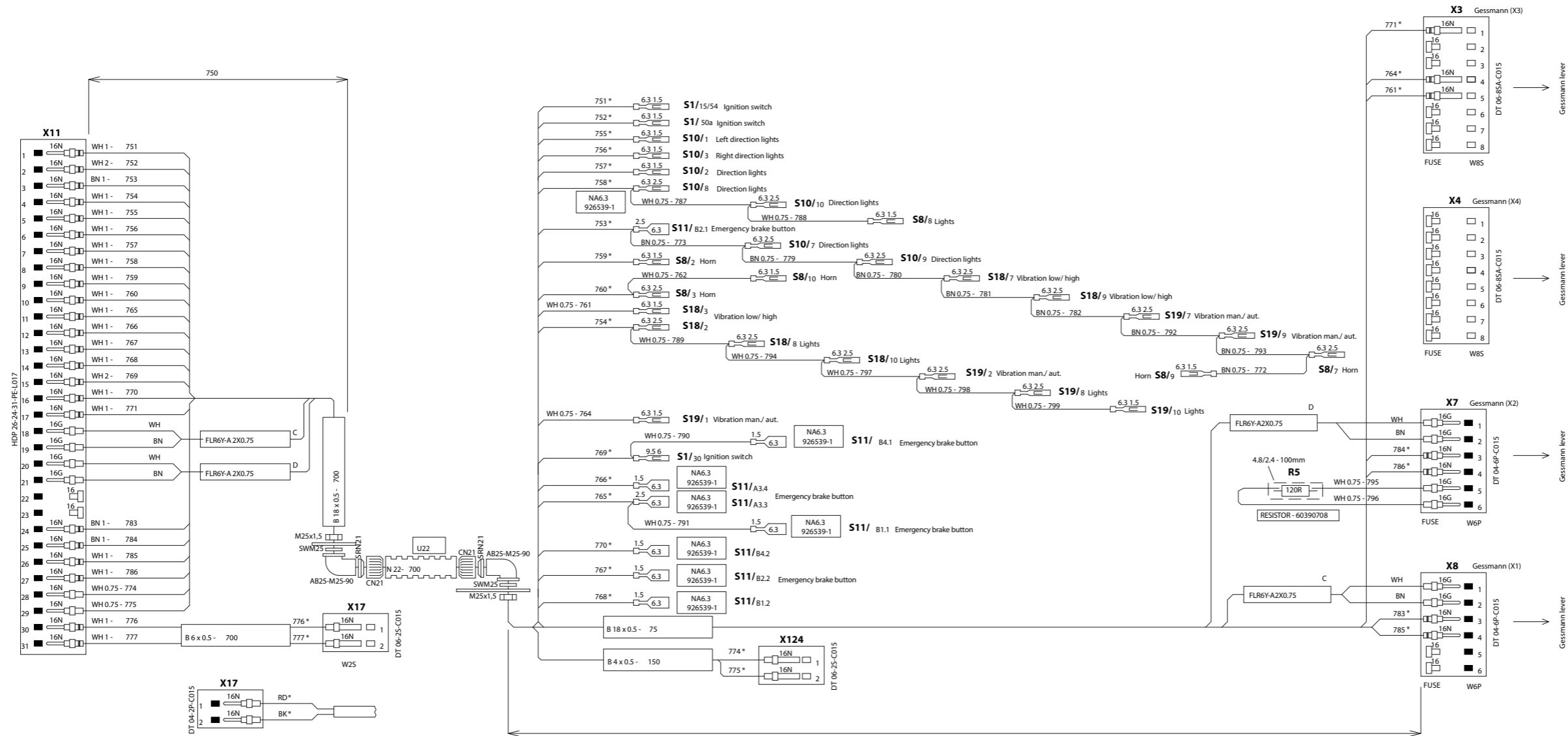
**TABLE OF COLOR SYMBOLS:**

WH	B	White
BK	C	Black
BN	H	Brown
BU	M	Blue
RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange

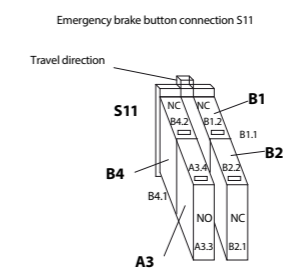
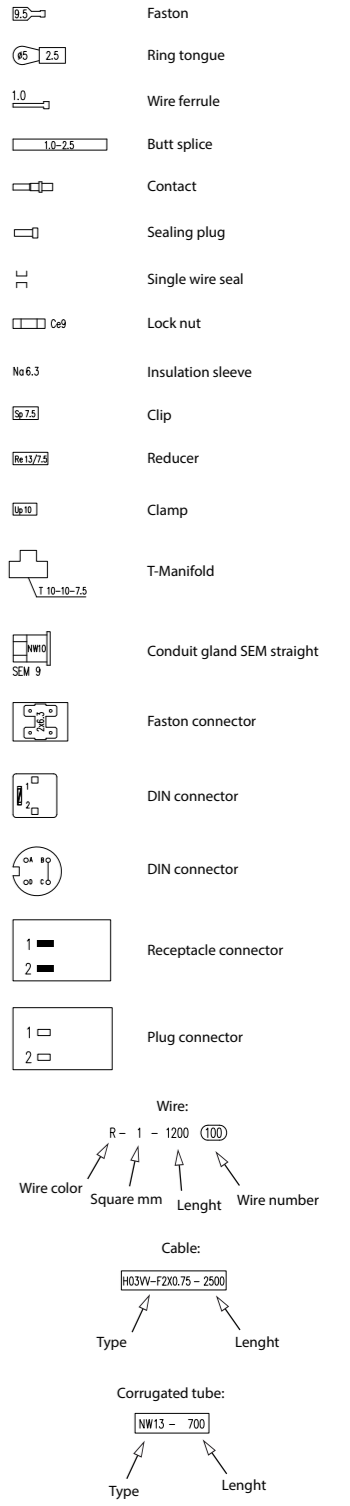


**ARS150 Tier 4 final  
Armrest  
Part Number 4-35277\_E**

**9**



**CABLE HARNESS LEGEND:**






















**TABLE OF COLOR SYMBOLS:**

WH	B	White
BK	C	Black
BN	H	Brown
BU	M	Blue
RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange

ARS150 Tier 4 final  
Distribution box, part 1  
Part Number 4-39462\_B

CABLE HARNESS LEGEND:

-  Faston
-  Ring tongue
-  Wire ferrule
-  Butt splice
-  Contact
-  Sealing plug
-  Single wire seal
-  Lock nut
-  Insulation sleeve
-  Clip
-  Reducer
-  Clamp
-  T-Manifold
-  Conduit gland SEM straight
-  Faston connector
-  DIN connector
-  DIN connector
-  Receptacle connector
-  Plug connector

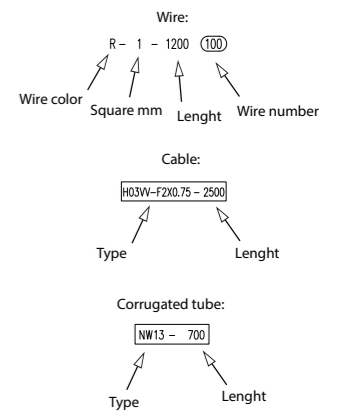
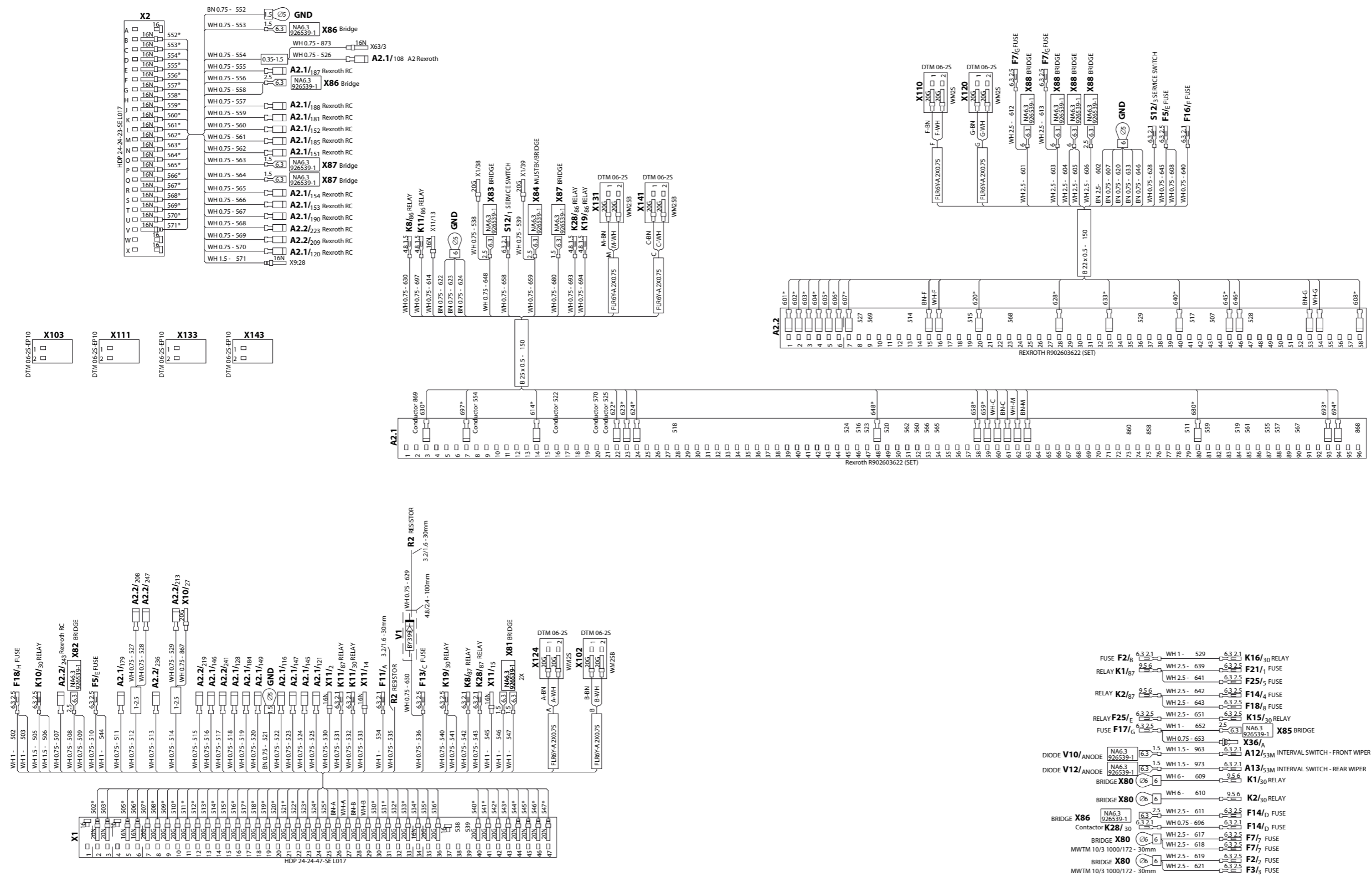


TABLE OF COLOR SYMBOLS:

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BK	C	Black
BN	H	Brown
BU	M	Blue
RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange



HDP 24-24-41-SE-LE017

1	20H	503*
2	20H	503*
3	20H	503*
4	20H	505*
5	20H	505*
6	20H	505*
7	20H	507*
8	20H	507*
9	20H	509*
10	20H	509*
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46	20H	529*
47	20H	530*

ARS150 Tier 4 final  
Distribution box, part 2  
Part Number 4-39462\_B

10.2

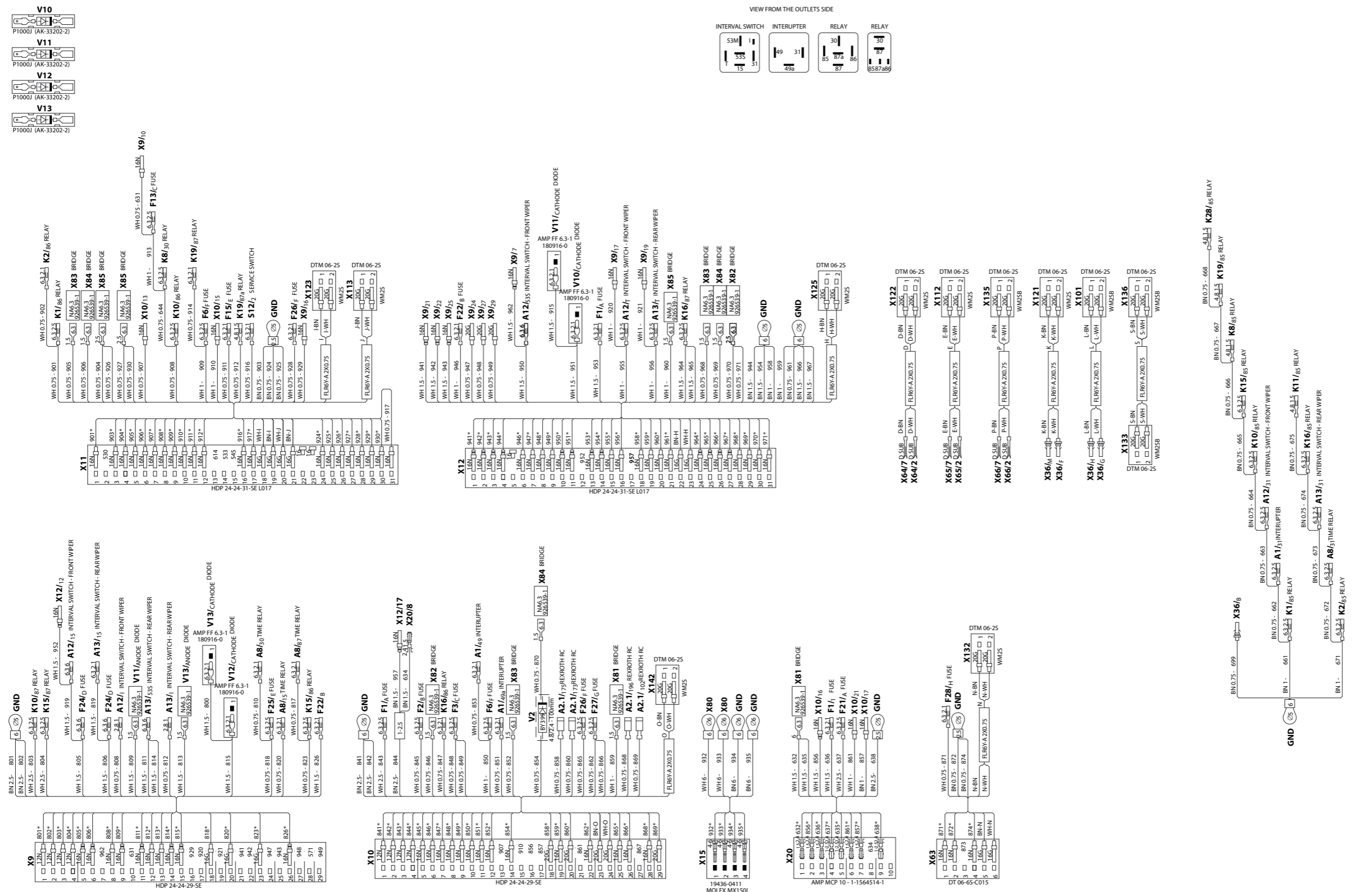
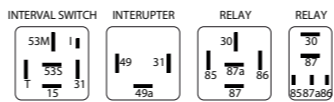
CABLE HARNESS LEGEND:

- Faston
  - Ring tongue
  - Wire ferrule
  - Butt splice
  - Contact
  - Sealing plug
  - Single wire seal
  - Lock nut
  - Insulation sleeve
  - Clip
  - Reducer
  - Clamp
  - T-Manifold
  - Conduit gland SEM straight
  - Faston connector
  - DIN connector
  - DIN connector
  - Receptacle connector
  - Plug connector
- Wire:  
Wire color → R - 1 - 1200 (100) → Length → Wire number
- Cable:  
Type → H03VV-F2X0.75 - 2500 → Length
- Corrugated tube:  
Type → NW13 - 700 → Length

TABLE OF COLOR SYMBOLS:

WH	B	White
BK	C	Black
BN	H	Brown
BU	M	Blue
RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange

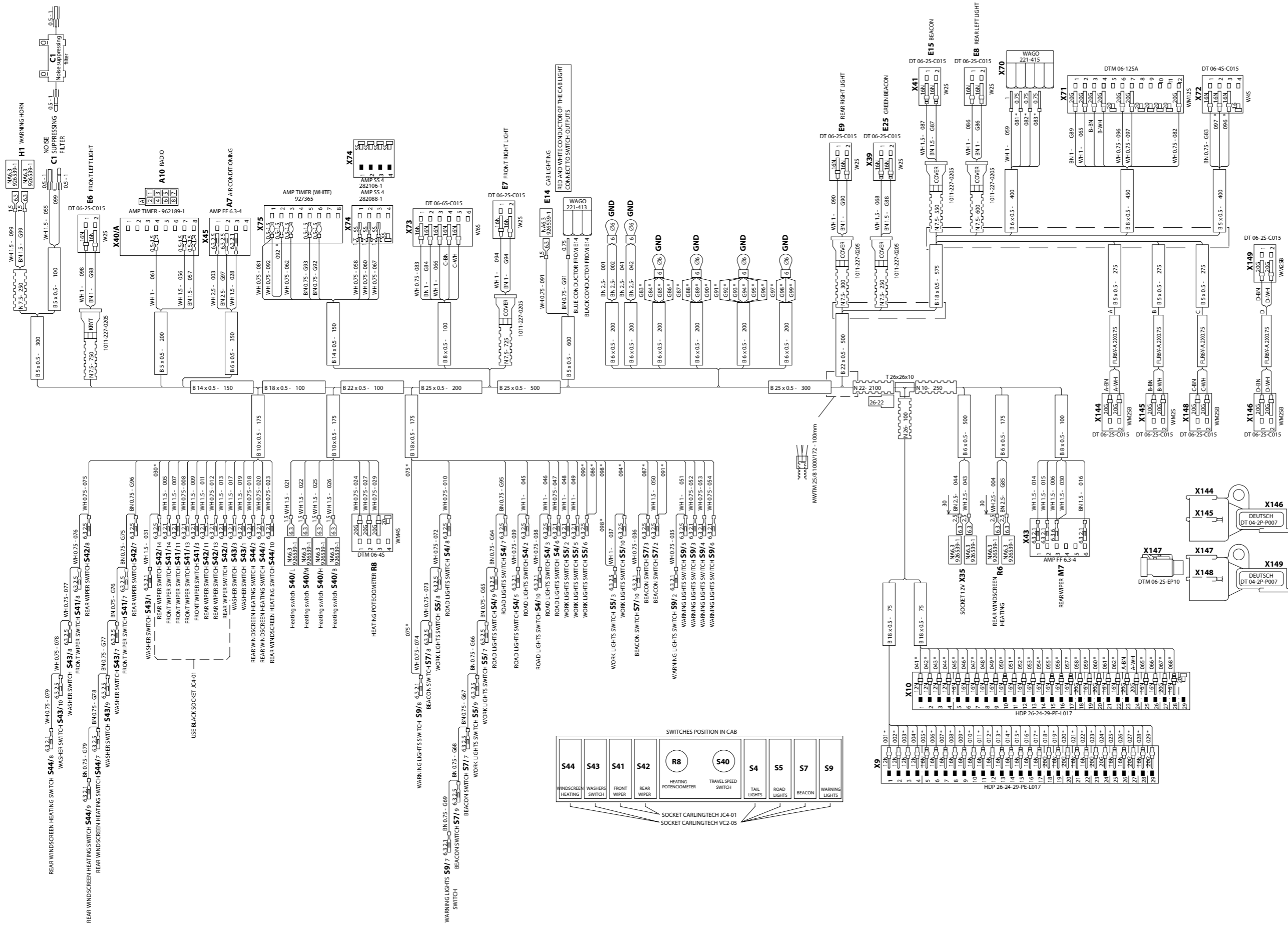
VIEW FROM THE OUTLETS SIDE



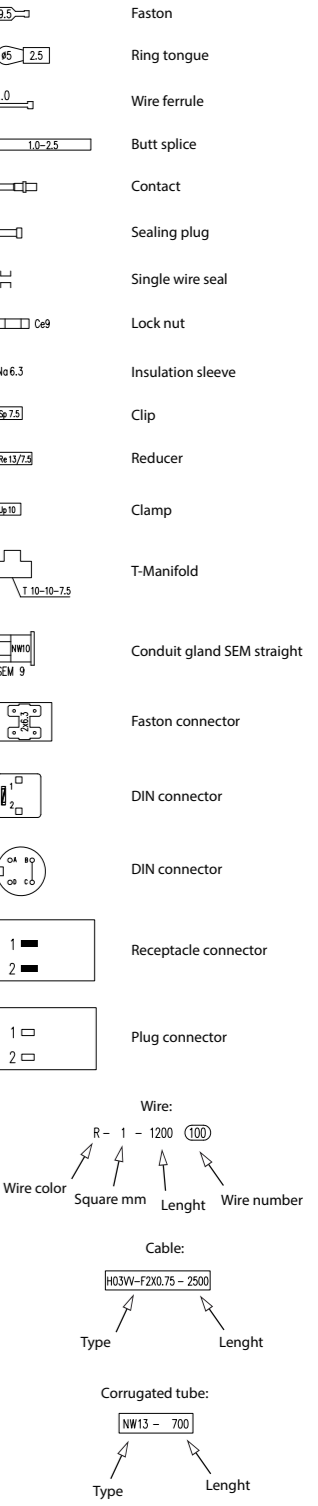
# ARS150 Tier 4 Final

## Wipers, washers and lights switches

### Part Number 4-35080



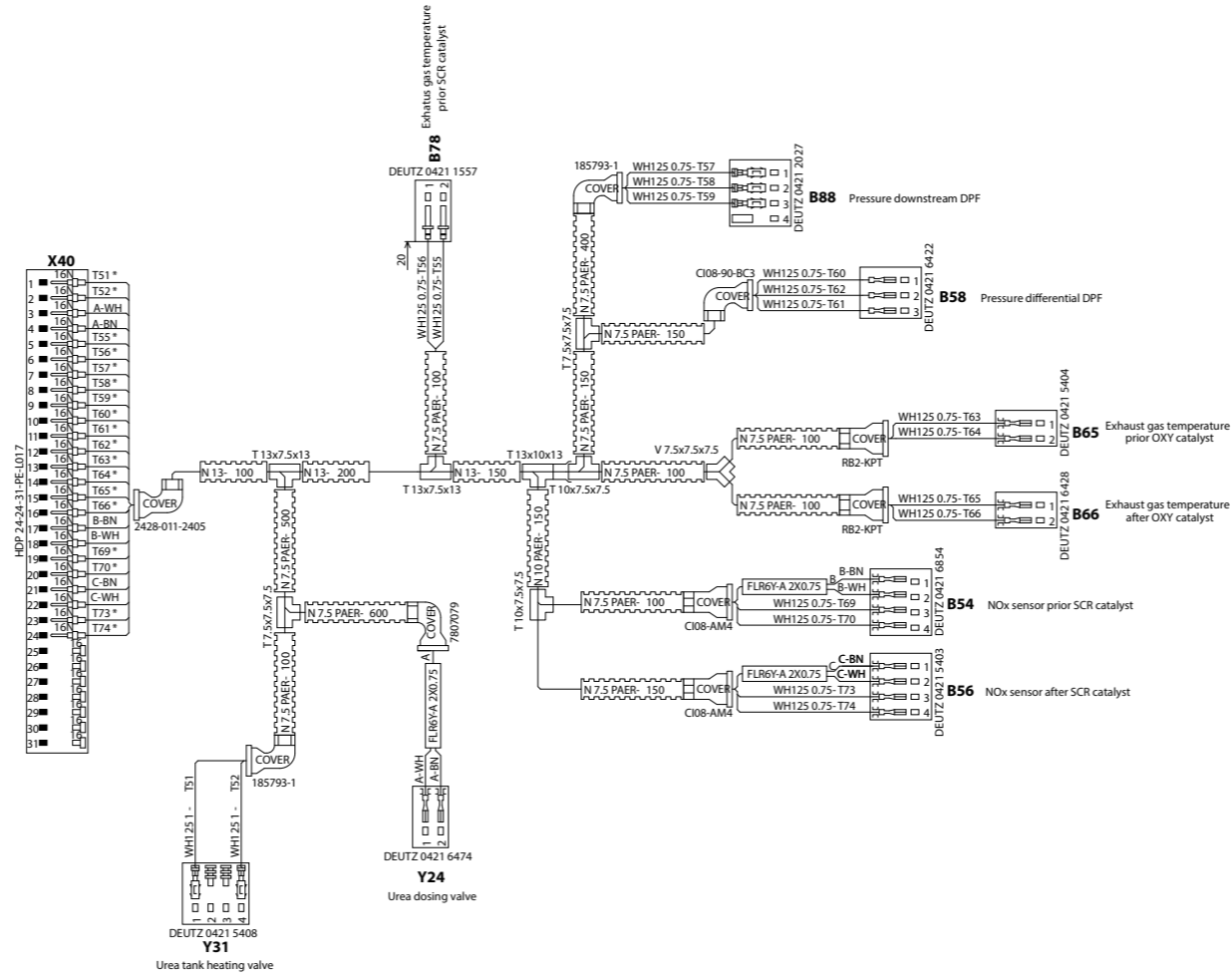
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


















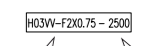
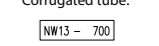
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RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange

**ARS150 Tier 4 final  
Aftertreatment  
Part Number 4-35567\_C**




















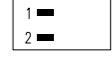
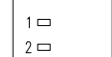

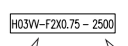
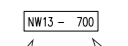
**CABLE HARNESS LEGEND:**

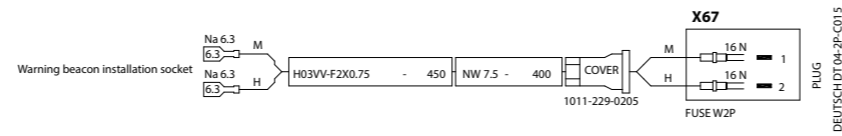
-  Faston
  -  Ring tongue
  -  Wire ferrule
  -  Butt splice
  -  Contact
  -  Sealing plug
  -  Single wire seal
  -  Lock nut
  -  Insulation sleeve
  -  Clip
  -  Reducer
  -  Clamp
  -  T-Manifold
  -  Conduit gland SEM straight
  -  Faston connector
  -  DIN connector
  -  DIN connector
  -  Receptacle connector
  -  Plug connector
- Wire:  
 Wire color    R - 1 - 1200    100  
 Square mm    Length    Wire number
- Cable:  
  
 Type    Length
- Corrugated tube:  
  
 Type    Length

**TABLE OF COLOR SYMBOLS:**

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BU	M	Blue
RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange

**CABLE HARNESS LEGEND:**

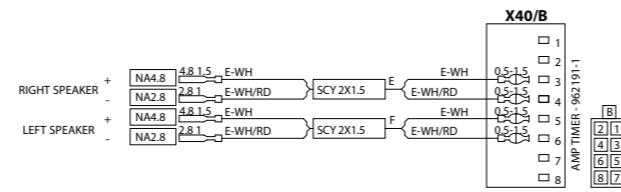
-  Faston
  -  Ring tongue
  -  Wire ferrule
  -  Butt splice
  -  Contact
  -  Sealing plug
  -  Single wire seal
  -  Lock nut
  -  Insulation sleeve
  -  Clip
  -  Reducer
  -  Clamp
  -  T-Manifold
  -  Conduit gland SEM straight
  -  Faston connector
  -  DIN connector
  -  DIN connector
  -  Receptacle connector
  -  Plug connector
- Wire:  
 R - 1 - 1200 (100)  
 Wire color    Square mm    Length    Wire number
- Cable:  
 H03VV-F2X0.75 - 2500  
 Type    Length
- Corrugated tube:  
 NW13 - 700  
 Type    Length



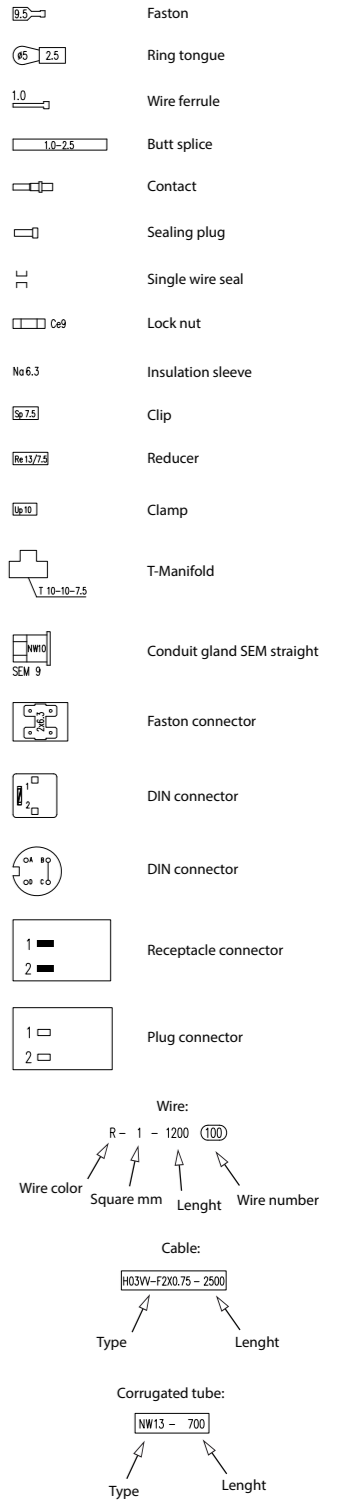
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**ARS150 Tier 4 Final  
Speaker  
Part Number 4-38637**

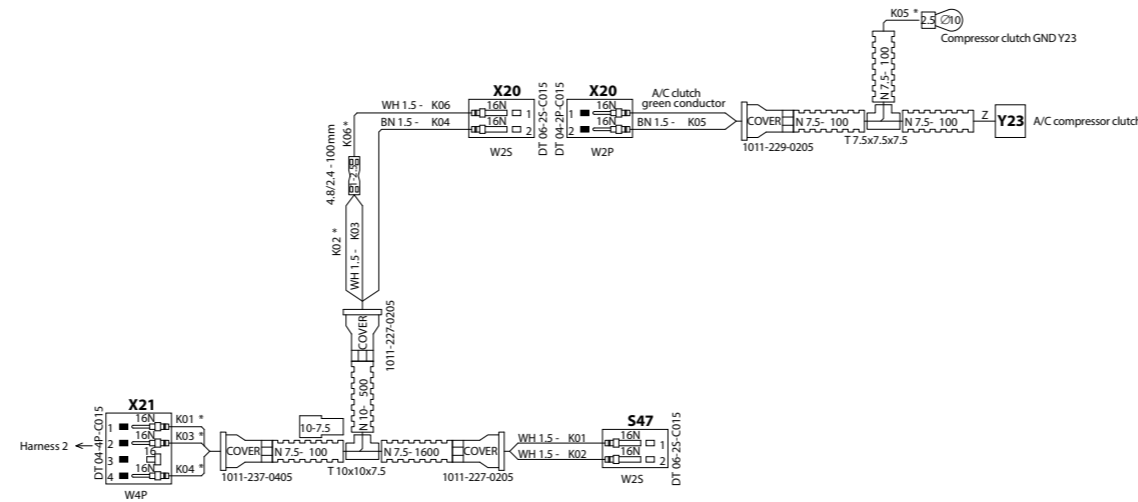


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

















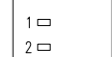




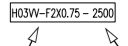
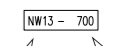


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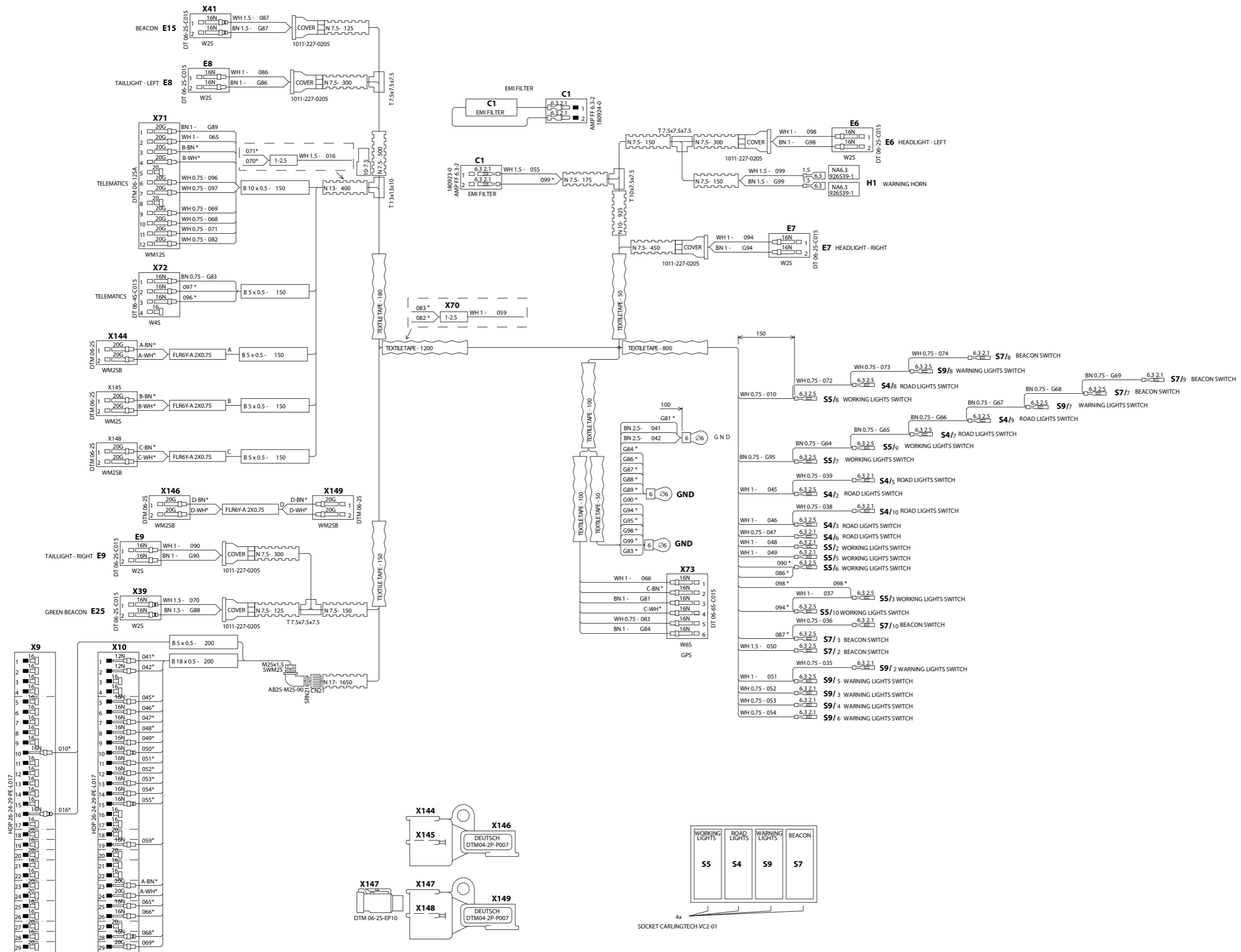
**CABLE HARNESS LEGEND:**

-  Faston
  -  Ring tongue
  -  Wire ferrule
  -  Butt splice
  -  Contact
  -  Sealing plug
  -  Single wire seal
  -  Lock nut
  -  Insulation sleeve
  -  Clip
  -  Reducer
  -  Clamp
  -  T-Manifold
  -  Conduit gland SEM straight
  -  Faston connector
  -  DIN connector
  -  DIN connector
  -  Receptacle connector
  -  Plug connector
- Wire:  
 Wire color     Square mm     Length     Wire number
- Cable:  
 Type    Length
- Corrugated tube:  
 Type    Length

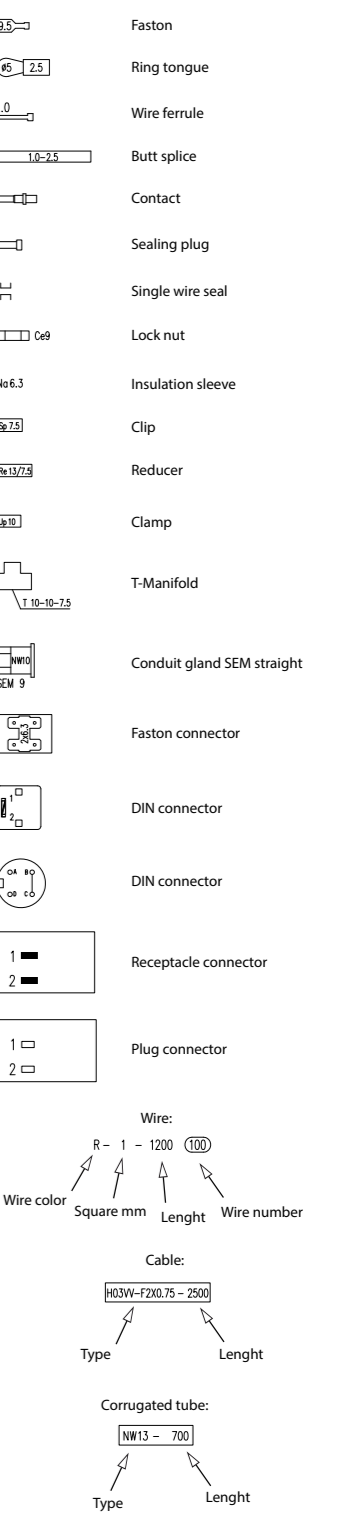
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**ARS150 Tier 4 final  
ROPS  
Part Number 4-36771\_A**

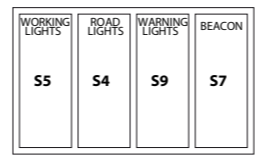


**CABLE HARNESS LEGEND:**



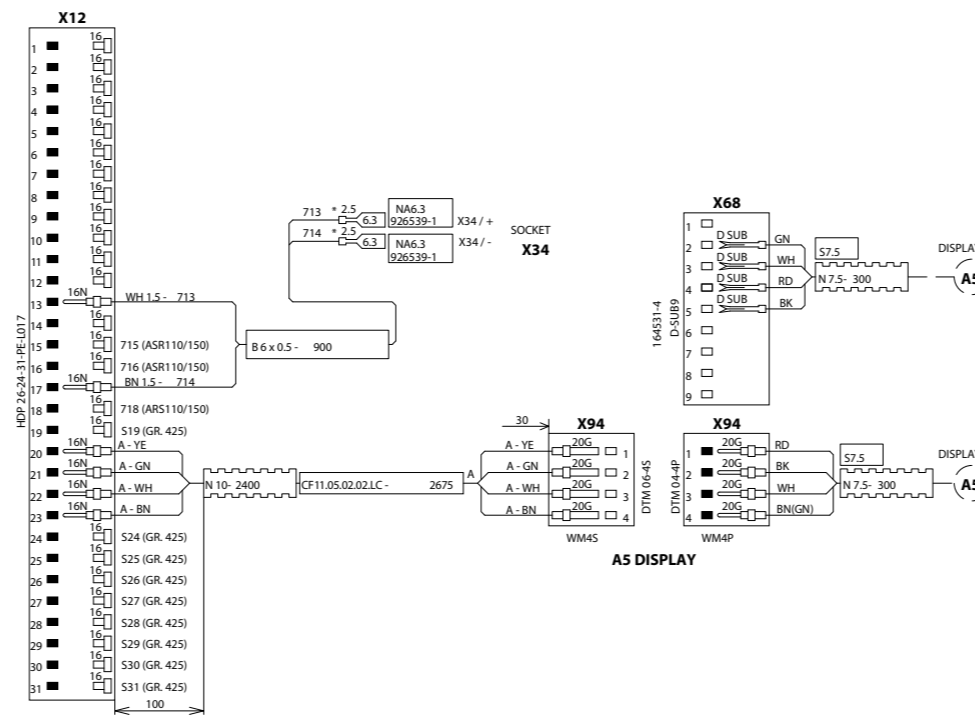
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VT	-	Violet
OG	-	Orange



SOCKET CARLINGTECH VC2-01

**ARS150 Tier 4 final  
Display  
Part Number 4-39703\_A**



**CABLE HARNESS LEGEND:**

- Faston
  - Ring tongue
  - Wire ferrule
  - Butt splice
  - Contact
  - Sealing plug
  - Single wire seal
  - Lock nut
  - Insulation sleeve
  - Clip
  - Reducer
  - Clamp
  - T-Manifold
  - Conduit gland SEM straight
  - Faston connector
  - DIN connector
  - DIN connector
  - Receptacle connector
  - Plug connector
- Wire:  
 Wire color    R - 1 - 1200 (100)    Square mm    Length    Wire number
- Cable:  
 H03VV-F2X0.75-2500    Type    Length
- Corrugated tube:  
 NW13-700    Type    Length

**TABLE OF COLOR SYMBOLS:**

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BN	H	Brown
BU	M	Blue
RD	R	Red
GY	S	Grey
YE	Y	Yellow
GN	Z	Green
VT	-	Violet
OG	-	Orange

**19.6 Check of the screw connections for tightening**

- Check that the main screw connections are not loose (wheel nuts, attachment of axles, hydraulic connections of the engine and attached units). Use torque spanners for tightening.

Thread	Tightening torque				Thread	Tightening torque			
	For screws 8.8 (8G)		For screws 10.9 (10K)			For screws 8.8 (8G)		For screws 10.9 (10K)	
	Nm	lb ft	Nm	lb ft		Nm	lb ft	Nm	lb ft
M6	10	7.4	14	10.3	M18×1.5	220	162.2	312	230.1
M8	24	25.0	34	25.0	M20	390	287.6	550	405.6
M8×1	19	14.0	27	19.9	M20×1.5	312	230.1	440	324.5
M10	48	35.4	67	49.4	M22	530	390.9	745	549.4
M10×1.25	38	28.0	54	39.8	M22×1.5	425	313.4	590	435.1
M12	83	61.2	117	86.2	M24	675	497.8	950	700.6
M12×1.25	66	48.7	94	69.3	M24×2	540	398.2	760	560.5
M14	132	97.3	185	136.4	M27	995	733.8	1400	1032.5
M14×1.5	106	78.2	148	109.1	M27×2	795	586.3	1120	826.0
M16	200	147.5	285	210.2	M30	1,350	995.7	1,900	1,401.3
M16×1.5	160	118.0	228	168.1	M30×2	1,080	796.5	1,520	1,121.0
M18	275	202.8	390	287.6					

Values given in the table are tightening torques for dry threads (friction coefficient = 0.14). The values are not applicable to lubricated threads.

**Table of tightening torques of cap nuts with sealing O-rings – hoses**

Spanner size	Thread	Pipe	Tightening torque values of cap nuts with O-rings – hoses					
			Nm			lb ft		
			Nominal	Min	Max	Nominal	Min	Max
14	12×1.5	6	20	15	25	15	11	18
17	14×1.5	8	38	30	45	28	22	33
19	16×1.5	8	45	38	52	33	28	38
		10						
22	18×1.5	10	51	43	58	38	32	43
		12						
24	20×1.5	12	58	50	65	43	37	48
27	22×1.5	14	74	60	88	55	44	65
		15						
30	24×1.5	16	74	60	88	55	44	65
32	26×1.5	18	105	85	125	77	63	92
36	30×2	20	135	115	155	100	85	114
		22						
41	36×2	25	166	140	192	122	103	142
46		28						
50	42×2	30	240	210	270	177	155	199
50	45×2	35	290	255	325	214	188	240
		38						
		42						
	52×2		330	280	380	243	207	280

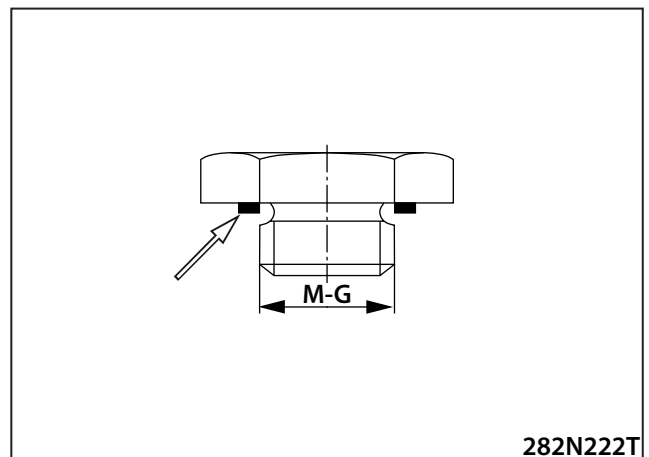
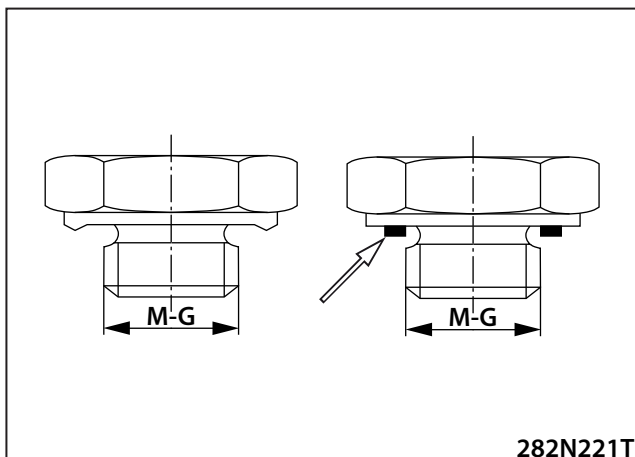
# 19 Appendices

**Table of tightening torque values for necks with tightening edges or with flat gaskets**

G-M	Neck tightening torques	
	Nm	lb ft
G 1/8	25	18
G 1/4	40	30
G 3/8	95	70
G 1/2	130	96
G 3/4	250	184
G 1	400	295
G 1 1/4	600	443
G 1 1/2	800	590
10x1	25	18
12x1.5	30	22
14x1.5	50	37
16x1.5	60	44
18x1.5	60	44
20x1.5	140	103
22x1.5	140	103
26x1.5	220	162
27x1.5	250	184
33x1.5	400	295
42x1.5	600	443
48x1.5	800	590

**Table of tightening torques for plugs with flat gaskets**

G-M	Plug tightening torques	
	Nm	lb ft
G 1/8	15	11
G 1/4	33	24
G 3/8	70	52
G 1/2	90	66
G 3/4	150	111
G 1	220	162
G 1 1/4	600	443
G 1 1/2	800	590
10x1	13	10
12x1.5	30	22
14x1.5	40	30
16x1.5	60	44
18x1.5	70	52
20x1.5	90	66
22x1.5	100	74
26x1.5	120	89
27x1.5	150	111
33x1.5	250	184
42x1.5	400	295
48x1.5	500	369



**19.7 List of spare parts specified in the publication**

<b>Chapter</b>	<b>Spare part</b>	<b>Order number</b>
5.6.2	Hydraulic unit 230 V	1251998
5.6.2	Hydraulic unit 110 V	1255297
13.2.2	Sealing kit	4-8300750355









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