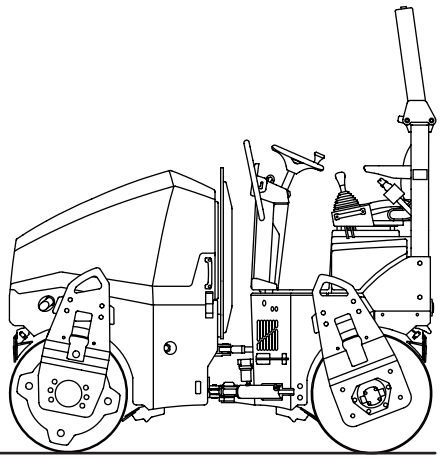
ARX 23-2
ARX 26-2

TANDEM ROLLER
KUBOTA D1803-CR-E5
EU Stage V, U.S. EPA Tier 4f



OPERATING MANUAL

EDITION 01/2020 EN
ARX 23-2 KU St V / T4f From Serial No. 5883043
ARX 26-2 KU St V / T4f From Serial No. 5893104

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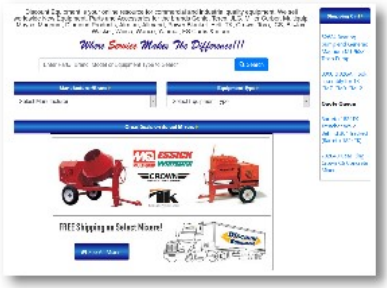

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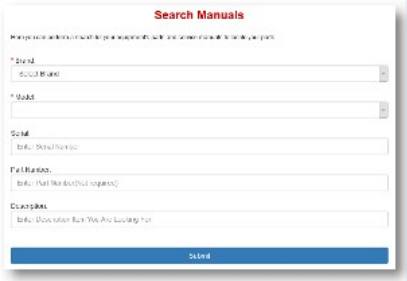

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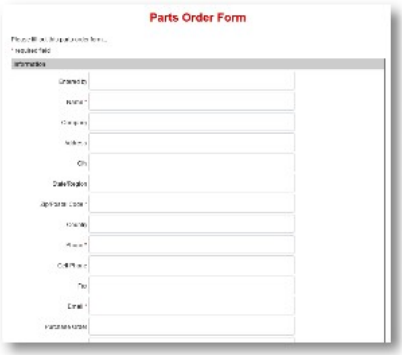

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Označení / *Designation / Bezeichnung:*	Tandemový válec / *Tandem roller / Tandemwalze*
Typ / *Type / Typ:*	ARX 23-2
Verze / *Version / Version:*	
Výrobní číslo / *Serial number / Maschinennummer:*	
Motor / *Engine / Motor:*	Kubota D1803-CR-E5, vznětový, jmenovitý výkon (SAE J1995): 25 kW, jmenovité otáčky: 2400 min-1. / Kubota D1803-CR-E5, Diesel, nominal power (SAE J1995): 25 kW, rated speed: 2400 RPM. / Kubota D1803-CR-E5/, Dieselmotor, Nennleistung (SAE J1995): 25 kW, Nenndrehzahl: 2400 min-1.
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Jméno / *Name / Name:* Olga Francová
Funkce / *Grade / Stelle:* Export Manager
Podpis / *Signature / Unterschrift:*

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Označení / *Designation / Bezeichnung:*	Tandemový válec / *Tandem roller / Tandemwalze*
Typ / *Type / Typ:*	ARX 26-2
Verze / *Version / Version:*	
Výrobní číslo / *Serial number / Maschinennummer:*	
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Jméno / *Name / Name:* Olga Francová
Funkce / *Grade / Stelle:* Export Manager
Podpis / *Signature / Unterschrift:*

Congratulations on your purchase of an AMMANN road roller. This modern compaction device is characterised by simple operation and maintenance and is the product of many years of AMMANN experience in the field of road roller engineering. In order to avoid faults due to improper operation and maintenance we request that you read this operating manual with great care and keep it for later reference.

With kind regards,

Ammann Czech Republic a.s. | Náchodská 145 | CZ-549 01 Nové Město nad Metují

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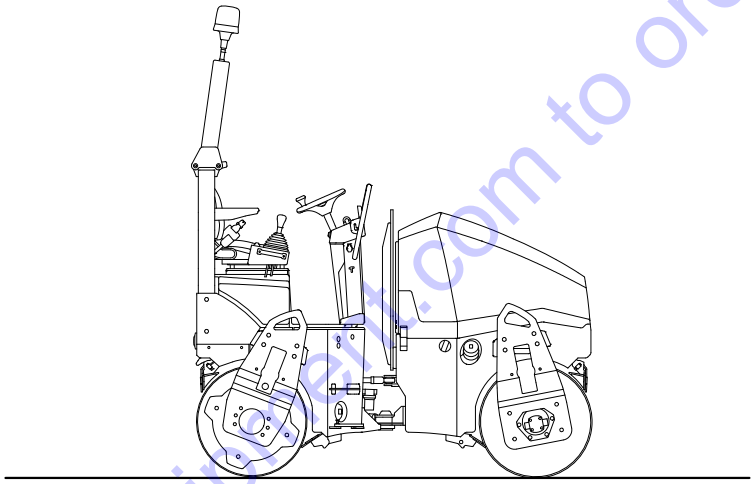

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This instruction manual is a "translation of the original instruction manual" within the meaning of the paragraph 1.7.4.1 of the Directive of the European parliament and of the Council 2006/42/EC of 17 Mai 2006.

This manual consists of:

I. Specification manual II. Operating instructions III. Maintenance manual

The following explanations serve to familiarise the machinist (operator) with the roller and to support him during handling and maintenance. It is therefore absolutely necessary to provide the operator with these instructions and to ensure that he reads them carefully before using the road roller. This aids training comprehension during the first use of the road roller.

Subsequent faults due to improper operating are avoided.

Adherence to maintenance instructions increases the reliability and lifetime of the machinery. It reduces repair costs and down time.

AMMANN accepts no liability for continued safe functioning of the road roller if it is incorrectly operated and / or operating modes are employed which represent improper use.

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

These instructions must always be kept available on the equipment.

Preface

Information, specifications, and recommended operation and maintenance instructions contained in this publication are basic and final information at the time of the printing of this publication. Printer's errors, technical modifications, and modifications of figures are reserved. All dimensions and weights are approximate and, therefore, not binding.

Ammann Czech Republic a.s. reserves the right to perform modifications without obligation to inform the machine user. If you identify any differences between the machine operated by you and the information contained in this publication, contact your local dealer.

SYMBOLS OF THE SAFETY NOTICES:

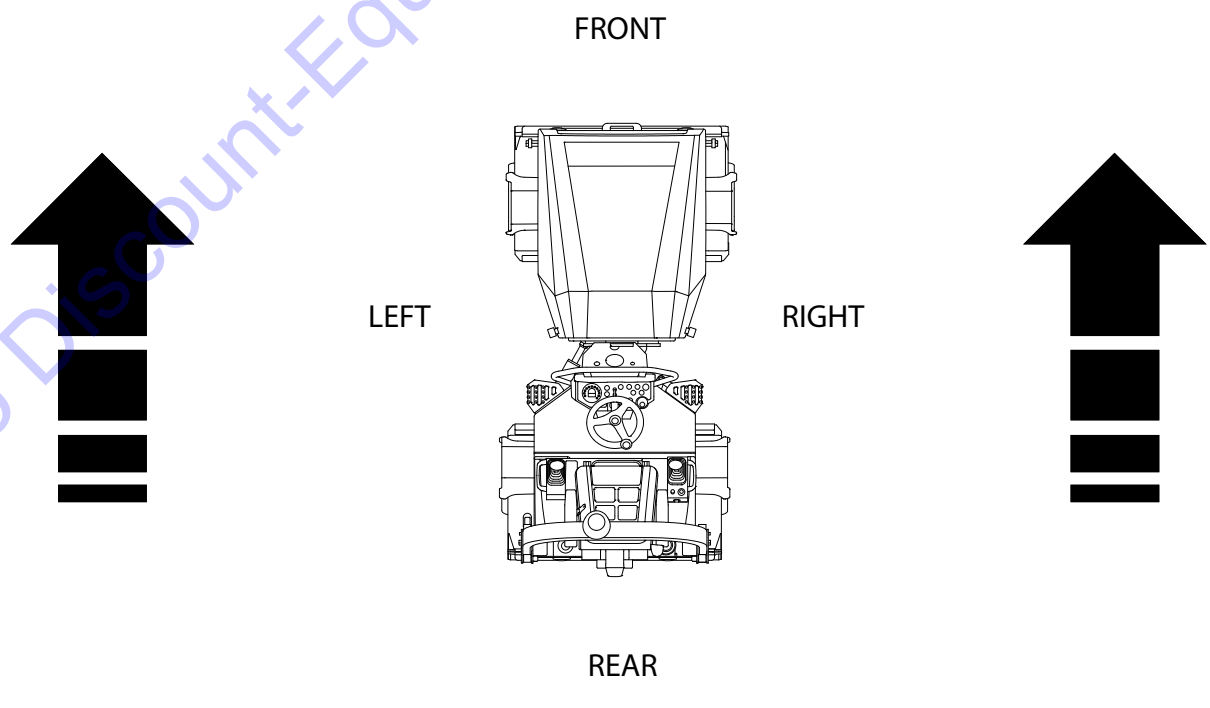
The notice warns of a serious risk of personal injury or other personal hazards.

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

The notice warns of the necessity of environmental protection.

! WARNING !

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



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1 SPECIFICATION MANUAL

ARX 23-2
ARX 26-2
(Kubota Tier 4 final)

1.1 Basic specification

Machine description

ATandem machine with an articulated frame and two smooth drums. Both drums are hydrostatic-driven and vibrating. The rear drum vibration is switchable. The concept of the frame allows compacting close to the walls and elevated kerbs on both sides of the machine. It is convenient for works within constrained areas due to its small dimensions and short turning radius. The operator's post provides perfect control of both edges of the drums.

Combined machines have only a front smooth vibrating drum. The rear axle consists of tyres with smooth shoes (compactor).

Machine application

The machine is designed for small compaction works in road construction (building local roads, cycle paths, pavements, parking areas and garage driveways) and in building construction (small industrial areas).

The machine is suitable for compacting asphalt mixtures up to the (compacted) layer thickness of 120 mm (4,7 in), hydraulically consolidated mixtures up to the layer thickness of 150 mm (5,9 in), mixed soils up to the layer thickness of 200 mm (7,9 in) or sandy and gritty materials up to the layer thickness of 300 mm (11,8 in).

The machine is not suitable for compacting rockfill, loam and clay materials.

The machine is designed for operation under conditions according to EN 60721-2-1:2014: WT, WDr, MWDr (i.e. mild climate zone, warm dry zone or hot dry zone with a limited ambient temperature range from -15 °C (5 °F) to 45 °C (113 °F). Storage temperature from -25 °C (-12 °F) to 45 °C (113 °F).

The standard version of the machine is not designed for operation on roads. For more information, please contact your dealer.

The machine that complies with the requirements as to health protection and safety is identified with a name plate with CE marking.

1 - Name - always mentioned only in the English version
2 - Type
3 - Serial number
4 - Operating weight
5 - Maximum weight
6 - Rated power
7 - Version
8 - Transport weight
9 - Front axle load
10- Rear axle load
11- Year of manufacture

Please fill in the following data:

(see Pin label, Label of the Kubota engine)

Type of machine

.....

ICV/PIN (Serial number of the machine)

.....

Production year

.....

Type of engine

.....

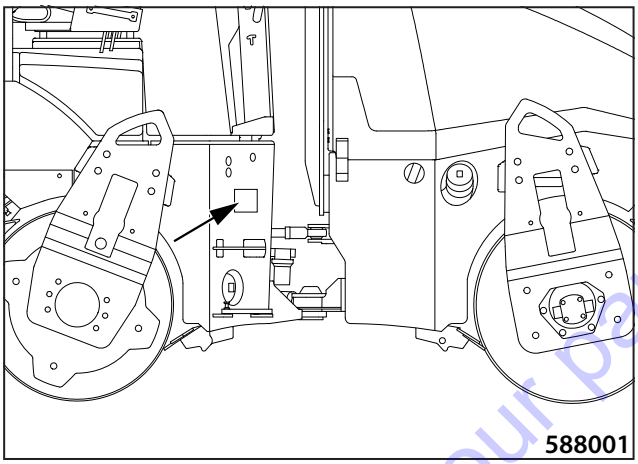
Serial number of the engine

.....

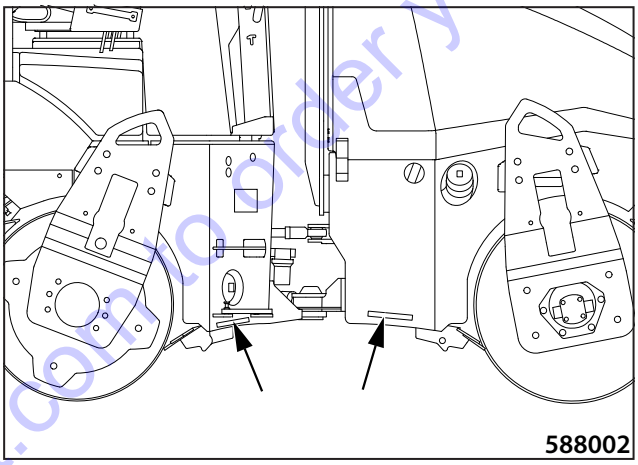
The data mentioned in the table refer always when you contact the dealer or manufacturer.

Nameplate position

Nameplate

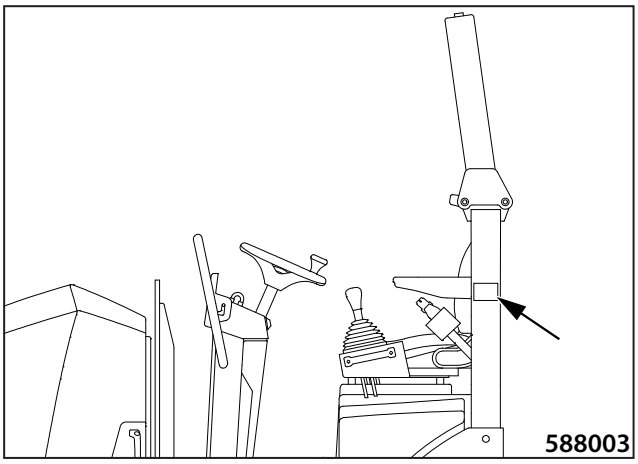


Serial number of the machine frame



Position of the ROPS nameplate

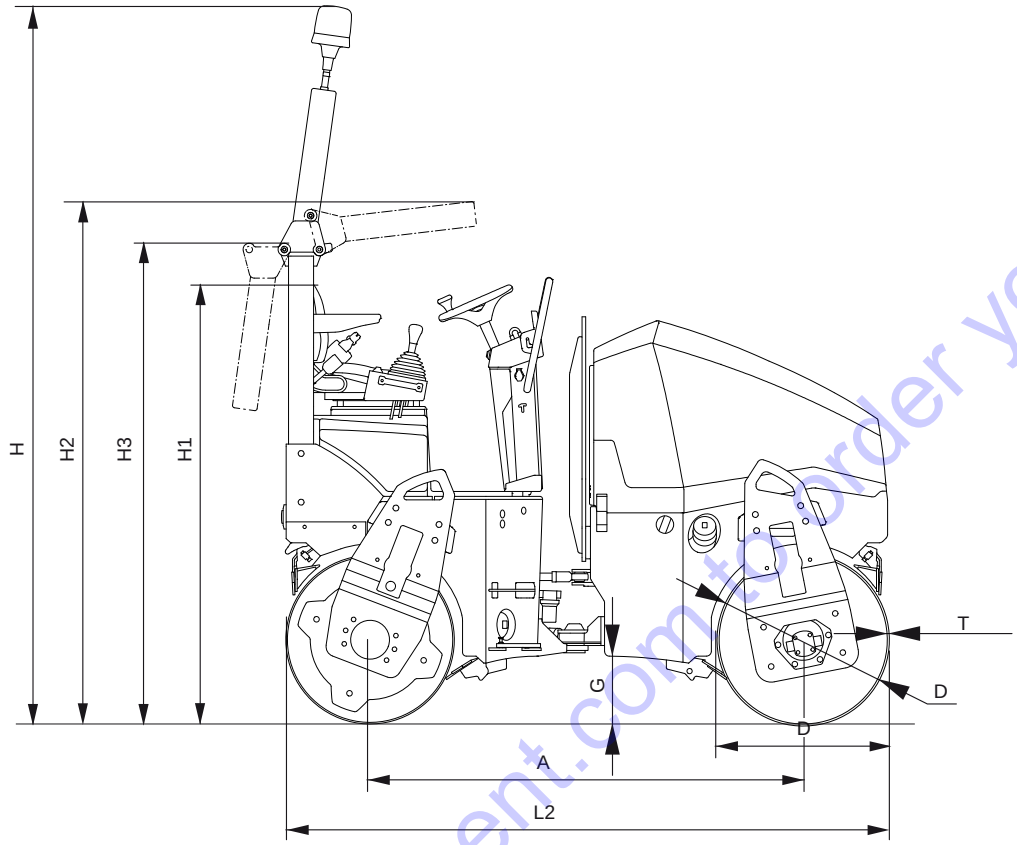
ROPS nameplate

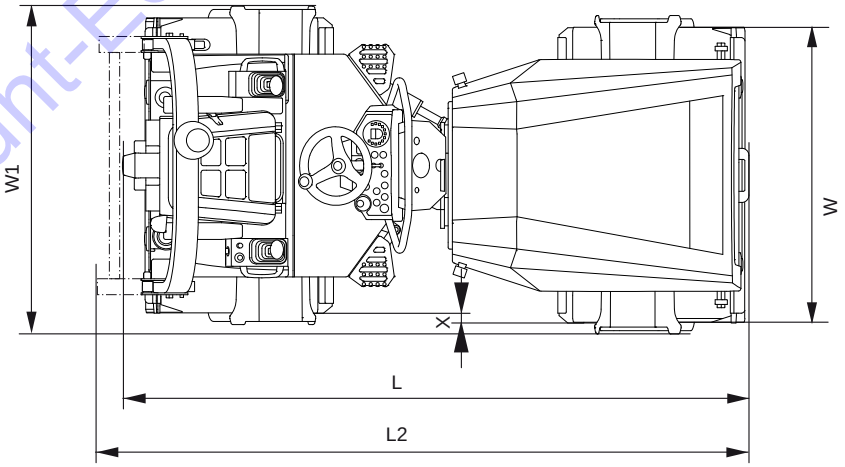


Engine nameplate position

Serial number of the Kubota engine

1.2 Machine dimension scheme





588004A

mm (in)	ARX 23-2	ARX 23-2C	ARX 26-2	ARX 26-2C
	EU Stage V / U.S. EPA Tier 4f			
A	1740 (68,5)	1755 (69,1)	1740 (68,5)	1755 (69,1)
D	695 (27,4)	695 / 635 (27,7 / 25,0)	695 (27,4)	695 / 635 (27,7 / 25,0)
G	280 (11)	280 (11)	280 (11)	280 (11)
H	2550 (100,4)	2550 (100,4)	2550 (100,4)	2550 (100,4)
H1	1815 (71,5)	1815 (71,5)	1815 (71,5)	1815 (71,5)
H2	2140 (84,3)	2140 (84,3)	2140 (84,3)	2140 (84,3)
H3	1935 (76,2)	1935 (76,2)	1935 (76,2)	1935 (76,2)
L	2500 (98,4)	2500 (98,4)	2500 (98,4)	2500 (98,4)
L1	2585 (101,8)	2585 (101,8)	2585 (101,8)	2585 (101,8)
L2	2430 (95,7)	2420 (95,3)	2430 (95,7)	2420 (95,3)
W	1000 (39,4)	1000 (39,4)	1200 (47,2)	1200 (47,2)
W1	1130 (44,5)	1120 (44,1)	1350 (53,1)	1295 (51)
X	40 (1,6)	-	40 (1,6)	-
T	13 (0,5)	13 (0,5)	13 (0,5)	13 (0,5)

1.3 Technical data

		ARX 23-2	ARX 23-2C	ARX 26-2	ARX 26-2C
		EU Stage V / U.S. EPA Tier 4f			
Weight					
Operating weight of EN 500-1+A1 (CECE)	kg (lb)	2230 (4920)	2085 (4600)	2515 (5540)	2350 (5180)
Operating load of EN 500-1+A1 (CECE) on front axis	kg (lb)	1075 (2370)	1090 (2400)	1240 (2730)	1220 (2690)
Operating load of EN 500-1+A1 (CECE) on rear axis	kg (lb)	1155 (2550)	995 (2190)	1275 (2810)	1130 (2490)
Weight of half fluid capacities	kg (lb)	110 (240)	115 (250)	110 (240)	115 (250)
Operating weight of ISO 6016	kg (lb)	2245 (4950)	2100 (4630)	2530 (5580)	2365 (5210)
Maximum weight with accessories	kg (lb)	2425 (5350)	2285 (5040)	2710 (5970)	2550 (5620)
Maximum permitted weight according to ROPS	kg (lb)	2850 (6280)	2850 (6280)	2850 (6280)	2850 (6280)
Static linear load of front drum	kg/cm (lb/in)	10,8 (20)	10,9 (20)	10,3 (20)	10,2 (20)
Static linear load of rear drum	kg/cm (lb/in)	11,6 (30)	-	11 (20)	-
Weight of Canopy	kg (lb)	35 (80)	35 (80)	35 (80)	35 (80)
Weight of Ammann edge cutter	kg (lb)	50 (110)	50 (110)	50 (110)	50 (110)
Deduction for the transport weight to the EN 500-1+A1 (CECE) operating weight.	kg (lb)	180 (400)	185 (410)	180 (400)	185 (410)
Driving characteristics					
Maximum transport speed	km/h (MPH)	11 (6,8)	11 (6,8)	11 (6,8)	11 (6,8)
Climbing ability without vibration	%	35	35	35	35
Climbing ability with vibration	%	30	35	30	35
Lateral static stability	%	55	46	62	53
Lateral stability during driving without vibration	%	25	20	25	20
Lateral stability during driving with vibration	%	15	10	15	10
Turning radius inner (edge)	mm (in)	2630 (103,5)	2630 (103,5)	2540 (100)	2540 (100)
Turning radius outer (contour)	mm (in)	3750 (147,6)	3750 (147,6)	3910 (153,9)	3910 (153,9)
Type of drive	-	Hydrostatic	Hydrostatic	Hydrostatic	Hydrostatic
Number of driving axles	-	2	2	2	2
Oscillation angle	°	6,5	6,5	6,5	6,5
Angle of steering	°	30	30	30	30
Steering					
Type of steering	-	Joint	Joint	Joint	Joint
Steering control	-	Hydraulic	Hydraulic	Hydraulic	Hydraulic
Linear hydraulic motors	-	1	2	1	1

		ARX 23-2	ARX 23-2C	ARX 26-2	ARX 26-2C
		EU Stage V / U.S. EPA Tier 4f			
Engine					
Manufacturer	-	Kubota	Kubota	Kubota	Kubota
Type	-	D1803-CR-E5	D1803-CR-E5	D1803-CR-E5	D1803-CR-E5
Power according to SAE J1995	kW	25	25	25	25
Number of cylinders	-	3	3	3	3
Cylinder capacity	cm^3 (cu in)	1826 (111)	1826 (111)	1826 (111)	1826 (111)
Nominal speed	min^{-1} (RPM)	2100 / 2400	2100 / 2400	2100 / 2400	2100 / 2400
Maximum torque	Nm (ft lb)/rpm	115,8 / 1500	115,8 / 1500	115,8 / 1500	115,8 / 1500
Average fuel consumption	l/h (gal US/h)	4,1 (1,1)	4,1 (1,1)	4,1 (1,1)	4,1 (1,1)
Engines complies with emission regulations	-	EU Stage V, U.S. EPA Tier 4 Final	EU Stage V, U.S. EPA Tier 4 Final	EU Stage V, U.S. EPA Tier 4 Final	EU Stage V, U.S. EPA Tier 4 Final
Cooling system of engine	-	Liquid	Liquid	Liquid	Liquid
Brakes					
Operating	-	Hydrostatic	Hydrostatic	Hydrostatic	Hydrostatic
Parking	-	Mechanical multiple-disc	Mechanical multiple-disc	Mechanical multiple-disc	Mechanical multiple-disc
Emergency	-	Mechanical multiple-disc	Mechanical multiple-disc	Mechanical multiple-disc	Mechanical multiple-disc
Vibration					
Frequency I	Hz (VPM)	58 (3480)	58 (3480)	58 (3480)	58 (3480)
Frequency II	Hz (VPM)	66 (3960)	66 (3960)	66 (3960)	66 (3960)
Amplitude I	mm (in)	0,5 (0,02)	0,5 (0,02)	0,5 (0,02)	0,5 (0,02)
Amplitude II	mm (in)	0,5 (0,02)	0,5 (0,02)	0,5 (0,02)	0,5 (0,02)
Centrifugal force I	kN	33,4	33,4	38,8	38,8
Centrifugal force II	kN	39,9	39,9	46,5	46,5
Type of drive	-	Hydrostatic	Hydrostatic	Hydrostatic	Hydrostatic
Watering					
Type of watering	-	Pressure	Pressure	Pressure	Pressure
Number of pumps	-	1	1	1	1
Number of filtrations	-	2	2	2	2
Fluid capacities					
Fuel	l (gal US)	35 (9,2)	35 (9,2)	35 (9,2)	35 (9,2)
Water for drum watering	l (gal US)	190 (50,2)	190 (50,2)	190 (50,2)	190 (50,2)
Engine (oil filling)	l (gal US)	7 (1,8)	7 (1,8)	7 (1,8)	7 (1,8)
Cooling system	l (gal US)	6,7 (1,8)	6,7 (1,8)	6,7 (1,8)	6,7 (1,8)
Hydraulic system	l (gal US)	28,5 (7,5)	28,5 (7,5)	28,5 (7,5)	28,5 (7,5)
Spraying emulsion	l (gal US)	-	12 (3,2)	-	12 (3,2)

1.3 Technical data

		ARX 23-2	ARX 23-2C	ARX 26-2	ARX 26-2C
		EU Stage V / U.S. EPA Tier 4f			
Wiring					
Voltage	V	12	12	12	12
Battery capacity	Ah	77	77	77	77
Noise and vibration emissions					
Measured sound pressure level A, LpA at the operator's position (platform) *	dB	85	85	85	85
Uncertainty KpA *	dB	2	2	2	2
Guaranteed sound power level A, LWA **	dB	104	104	104	104
Highest weighted effective value of acceleration of vibrations transmitted to the whole body (platform) ***	m/s^2 (ft/s^2)	<0,5 (<1,6)	<0,5 (<1,6)	<0,5 (<1,6)	<0,5 (<1,6)
Total value of acceleration of vibrations transmitted to hands (platform) ***	m/s^2 (ft/s^2)	<2,5 (<8,2)	<2,5 (<8,2)	<2,5 (<8,2)	<2,5 (<8,2)
Optional					
Additional lights					
Turn signal lights					
Working lights					
Beacon					
Reversing alarm					
Licence plate holder					
One-point lifting lug					
Battery disconnecter					
2nd travel control lever					
Arm rest					
Water tank lock					
Infra thermometer					
ACE Force					
ATC inter-axle lock					
Edge cutter					
Fixed scrapers					
Hinged scrapers					
Set of filters, 500 h					
FOPS roof (mounted on the ROPS)					
Canopy					
Seat heating					
Special colour design					
Additional documentation set					
Certificate of Origin					
Audible brake warning					
Rear-view mirrors					
Telematic					
Green LED beacon					

* measured according the EN 500-4

** measured according the DIRECTIVE 2000/14/EC

*** measured according the EN 1032+A1 on the gravel base under the vibration travel)

Note

2 OPERATING MANUAL

ARX 23-2
ARX 26-2
(Kubota Tier 4 final)

2.1.1 Safety measures during machine operation

Safety measures given in the individual chapters of the technical documentation supplied with the machine must be supplemented with safety precautions applicable in the workplace within the respective country where the machine is used with respect to organization of work, working process and personnel involved.

2.1.1.1 Before compaction works are started

- The building contractor (machine user) is liable to issue instructions for operators and maintenance workers that include requirements to provide for safe operation of the machine.
- Before the compacting works are started, he must verify:
  - utility lines
  - underground areas (direction, depth)
  - seepage or sudden escape of harmful substances
  - ground-bearing capacity, travel plane slope
  - other obstacles and specify work safety measures.

  He must make the machine operator carrying out the earth works familiar with the above items.
- He must specify a technological procedure including a working process for the specific job that specifies among others:
  - measures for works under extraordinary conditions (works within protection zones, extreme slopes, etc.)
  - precautions for any natural disaster hazards
  - work performance requirements and observance of principles of health and safety at work
  - technical and organizational measures to provide for safety of employees, workplaces and surroundings.

  He must make the machine operators provably familiar with the technological procedure.

2.1.1.2 Work in the dangerous area

Any damage to the utility lines must be immediately reported to their provider, and at the same time measures must be taken to prevent unauthorized persons from entering the danger area.

The worker is not allowed to work alone in a workplace where another worker is not in sight and within an ear shot who in case of an accident will help or call for help unless another effective form of supervision or communication is provided.

2.1.1.3 Ensurance of safety measures by the owner

- He must ensure that the machine is operated only under conditions and only for purposes it is technically capable of according to conditions specified by the manufacturer and respective standards.
- He must ensure that the machine is used only in such a way and in such a workplace where there is no risk of transmission of dangerous vibrations and damage to nearby facilities, etc.
- He must ensure regular inspection of operation, technical condition, and regular machine maintenance in intervals according to the lubrication and maintenance instructions. If the technical condition of the machine does not meet requirements to such an extent that the machine endangers safety of operation, persons and property, or damages and impairs the environment, it must be put out of service until the defects are removed.
- He must specify who is allowed to carry out operation, maintenance and repairs of the machine as well as what activities can be carried out in such cases.
- Every person who drives the machine or performs maintenance and repairs of the machine must be familiarised with instructions stipulated in the operating manual of the machine.
- He must ensure that the fire extinguisher is checked on regular basis.
- The operator must ensure that the "Operation manual" is available at the designated place in the machine.
- He must ensure continuous supervision by an appointed person during machine operation on public roads, and he will be liable in particular for releasing instructions to ensure the health and safety at work.
- He must ensure that dangerous substances (fuel, oils, coolant, etc.) must be removed from places of leakage according to their nature to avoid their adverse impact on the environment, safety of operation and human health.

2.1.1.4. Protective frame ROPS

When the protection frame ROPS is used:

- the machine frame must not be damaged (broken, bent, etc.) in the connection point
- the protective ROPS frame itself must not show corrosion, cracks or breaks
- the protective ROPS frame must not be loose during operation of the machine
- all bolted connections must meet requirements of the specification and must be tightened to the specified torque
- bolts must not be damaged, distorted and must not show rust marks.
- Additional modifications must not be carried out on the protective ROPS frame without the approval of the manufacturer because they can result in decrease of its strength (e.g. holes, welding, etc.).
- The machine weight must not exceed the maximum permissible weight according to the protective ROPS frame.

2.1.2 Requirements for the qualification of machine operators

Only a person having been trained according to ISO 7130 and other local and national instructions and standards specified for operators of this group of machines, is allowed to operate the machine.

2.1.3 Driver's obligations

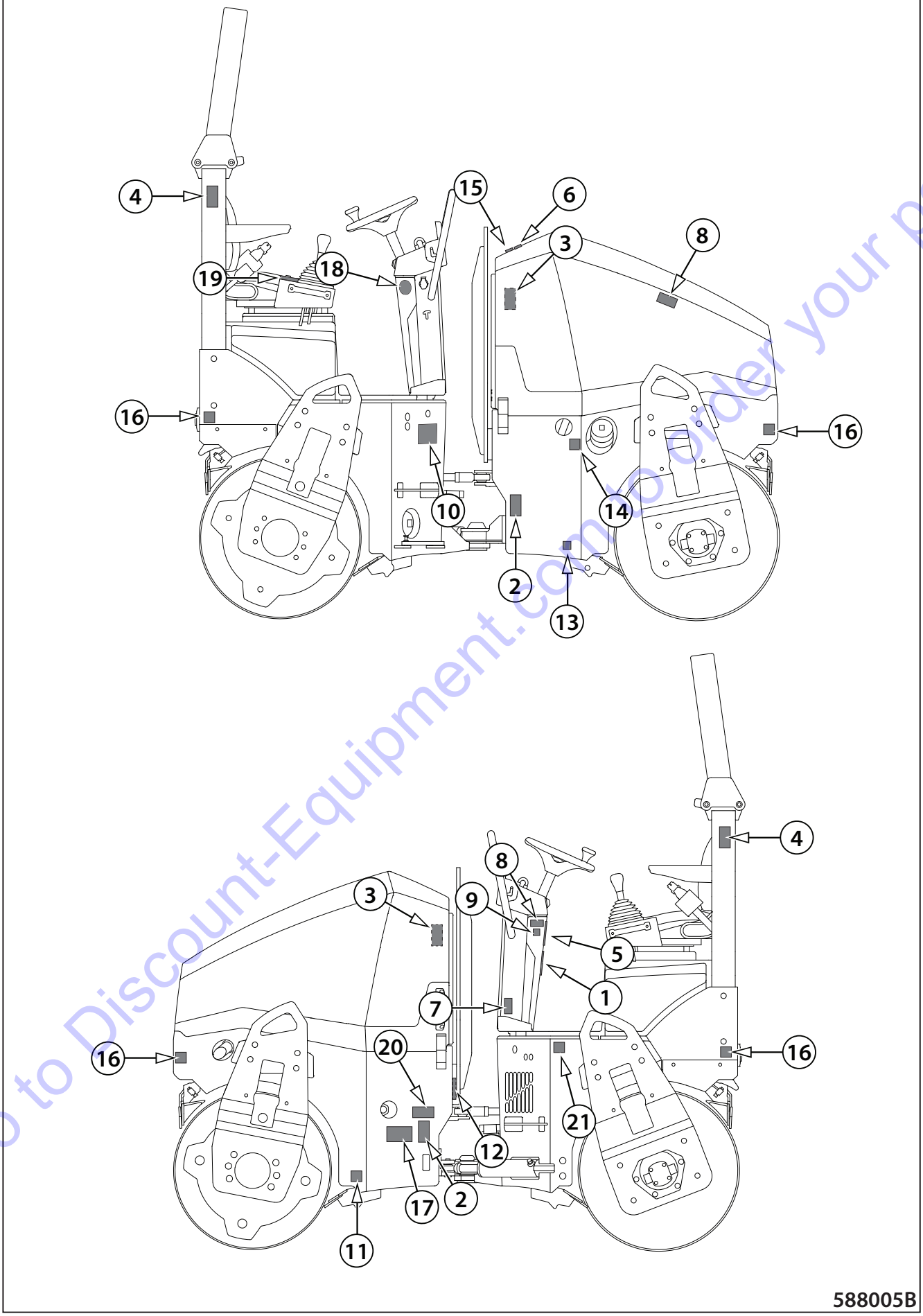
- Before starting operation of the machine, the machine operator is obliged to get familiar with instructions stated in the documentation supplied together with the machine, especially with safety precautions, and strictly observe the instructions. This also applies to the personnel in charge of maintenance, adjustments and repairs of the machine. (In case you do not understand some parts of the manuals, contact the nearest dealer or the manufacturer.)
- He may drive the machine only if he is fully familiarized with all functions of the machine and working and operating elements and knows precisely how to operate the machine.
- He is obliged to follow the safety symbols placed on the machine and keep them legible.
- Before starting the work, the operator must get familiar with the workplace environment, i.e. with obstructions, slopes, utility line system and with necessary types of workplace protections with respect to the surroundings (noise, vibration, etc.).
- The operator while working with the machine must be fastened with the safety belt.
- The safety belt and its brackets must not be damaged.
- When there is a risk to health, human life, property, failures, during hardware accidents, or there are symptoms of such risks during operation, the operator must stop his work and secure the machine against undesired starting, communicate this to a responsible worker and to a possible extent notify all the persons exposed to such hazard.
- Before starting operation of the machine, the operator is obliged to get familiar with the records and operating deviations found out during the previous work shift.
- Before starting the work, he must inspect the machine, accessories, check up control elements, communication and safety devices, whether they are operable according to the manual. When he finds out a malfunction that might endanger the safety of work and is not able to repair it, he must not put the machine into operation and must report such a failure to the responsible worker.
- If the operator finds a defect during operation, he must immediately stop the machine and secure it safely against undesirable starting.
- During operation the operator must watch the machine run and record any detected defects into the operation logbook.
- The operator must maintain an operation logbook which is meant for records of machine acceptances and take-overs carried out between operators, of defects and repairs done during operation and keeping files of serious events during the work shift.
- The operator checks the brake and steering for function before putting the machine into operation.
- Before the engine is put into operation, both travel controls must be in the parking position (P); no persons are allowed to stay within dangerous reach of the machine.
- The operator indicates each machine start-up with an acoustic or light signal and also before starting the engine of the machine.
- After a warning alarm, the operator may start the machine only when all workers have left the endangered area. During operation of the machine it is necessary to follow safety instructions and not to carry out any activity that might endanger the work safety; the operator must be fully engaged in driving the machine. He must always sit on the seat while driving the machine.
- The driver must comply with technological procedures of works or instructions of a responsible worker.
- When rolling (traversing) the machine within the workplace he must adapt the driving speed to terrain conditions, the work performed and weather conditions. He must watch continuously the clearance to avoid collision with any obstruction.
- If the operator finishes or interrupts operation of the machine and leaves the machine, he must carry out safety measures against unauthorized use of the machine and undesired start up. The operator must remove the key from the ignition box, lock the cab and disconnect the electrical installation using the disconnector.
- When the operation is completed, he must park the machine at a suitable parking place (flat, bearing surface) so as not to endanger stability of the machine; the machine must not interfere with traffic roads, must not be exposed to falling objects (rocks), and must be protected against any natural disaster of another kind (floods, landslides, etc.).
- When shutting down the machine on roads, the measures according to road traffic regulations shall be taken. The machine must be marked properly.
- After finishing the work with the machine, all of the defects, damages to the machine and any repairs made must be recorded in the operation logbook. When the operators take turns, one operator is obliged to report any identified facts to the other operator.
- The operator must use personal protective equipment – work clothes, work shoes, protective helmet and protective goggles.
- He must equip the machine with accessories and equipment as prescribed.
- He must keep the operator's stand, foot rests and walkways clean.
- He must keep the machine free of oil contaminants and inflammable materials.
- When the machine comes into contact with high voltage, observe the following principles:
  - try to leave the hazardous zone with the machine
  - do not leave the operator's stand
  - warn the others to keep off and not touch the machine.
- When operating the machine, make sure the regeneration switch is in the AUTO position. Do not operate the machine with the regeneration switch in the OFF position. The diesel particulate filter (DPF) can be destroyed.

2.1.4 Forbidden activities – safety and guarantee

The following is forbidden

- Using the machine in case of an evident defect of the machine.
- Using the machine when any of operating fluid levels is low.
- Repairing the engine without authorization – except common changes of operating fluids and filters; only an authorized service organization is allowed to intervene in the engine, including peripheral components of the engine (e.g. alternator, starter, thermostat, electrical installation of the engine).
- Increasing and decreasing the engine speed rapidly; you could damage the engine.
- Using the emergency brake for turning off the engine during normal operation of the machine.
- Operating the machine in an explosive environment and underground.
- Using the machine after ingestion of alcoholic beverages or drugs.
- Using the machine if its operation might endanger its technical condition, safety (life, health) of persons, facilities or objects, or road traffic and its continuity.
- Putting the machine into operation and using the machine when other persons are within its danger zone – the exception is a training of a driver by an instructor.
- Putting the machine into operation and using the machine when a safety device (emergency brake, hydraulic locks, etc.) has been removed or damaged.
- Travelling and compacting in such slopes where the machine stability would be broken (overturning). The stated machine static stability is reduced by dynamic effects of the drive.
- Travelling and compacting in such gradients of slopes where there is a risk of soil breaking off (dropping) under the machine or of loss of adhesion and of uncontrolled slip.
- Controlling the machine in some other way than stated in the operation manual.
- Travelling and compacting with vibration according to the bearing capacity of the subsoil in such a distance from the slope edge or trenches where there is a risk of landslide or shoulder breaking off (dropping) together with the machine.
- Travelling and compacting with vibration in such a distance from walls, cuts and slopes where there is a risk of landslide and the machine could be covered up with soil.
- Compacting with vibration in such a distance from buildings or facilities and equipment within which there is a risk of damage due to transmission of vibration.
- Moving and transporting persons on the machine.
- Working with the machine if the operator´s stand is not properly attached.
- Working with the machine when the bonnet, cab or platform is lifted off.
- Working with the machine if there are other machines or means of transport in its danger zone, except those that operate in mutual cooperation with the machine.
- Working with the machine at a place that is not seen from the operator's stand and where hazard to people or property could occur unless the occupational safety is ensured through some other way, e.g. by a duly instructed signalling person.
- Working with the machine in a protected zone of electric lines or substations.
- Crossing electric cables if they are not properly protected against mechanical damage.
- Working with the machine in reduced visibility or at night unless the machine working area and the workplace are illuminated sufficiently.
- Leaving the seat of the machine operator when the machine is running.
- Getting in or off on the run, jumping down from the machine.
- Sitting on the railing or external parts of the machine during a drive.
- Leaving the machine unattended – moving away from the machine without having prevented its misuse.
- Disabling safety, protective or locking systems or altering their parameters.
- Using a machine from which oil, fuel, coolant or other operating fluid is leaking.
- Starting the engine in a different way than given in the operation manual.
- Placing other items (tools, accessories) than items for personal use on the operator's stand.
- Placing materials or other items on the machine.
- Removing dirt while the machine is running.
- Performing maintenance, cleaning or repairs with the machine not secured against spontaneous movement or accidental start, and if a person can come in contact with moving parts of the machine.
- Touching moving parts of the machine with the human body or items and tools held in hands.
- Smoking or handling an open flame when checking or pumping fuels, replacing and refilling oils, lubricating the machine, and inspecting and refilling the battery.
- Conveying rags saturated with inflammable materials and inflammable liquids in loose vessels on the machine (in the engine compartment).
- Running the engine in contained areas. Exhaust fumes are dangerous to life.
- Making modifications on the machine without the prior consent of the manufacturer.
- Travelling with the seat belt not fastened.
- Moving electrical conductors.
- Using other than original spare parts.
- Intervening in electrical and electronic units in any manner.
- Using the pressure washing near the control unit of the machine.
- Filling the hydraulic circuit during the guarantee period in a different way than using the hydraulic unit.
- Working long-term in the vibro stroke mode!
- Operating the machine with the regeneration switch in the OFF position. The diesel particulate filter (DPF) can be destroyed.

Non-observance of the above provisions can impact on the assessment of a complaint and effectiveness of the engine guarantee period.



2.1.5 Safety notices and signs applied on the machine

1 Read the operating instructions

2946bz

Get perfectly familiar with the machine operation and maintenance according to the operation manual!

2 Risk of squeezing

3865

Keep a safe distance from the machine; there is a danger of squeezing by the machine between the front and rear frame.

3 Risk of injury

3866

There is a risk of injury. Do not touch rotating parts while the engine is running. There is a risk of burns. Do not touch hot parts of the machine unless you make sure that they are sufficiently cold.

4 Risk of injury

3864bz

There is a risk of fatal injury. Do not operate the machine when the protective ROPS frame is lowered.

5 Using the parking and emergency brakes

3867bz

Use the parking brake only when the machine is stopped. Use the emergency brake only for stopping the machine in emergency.

6 Safety belt


3863bz

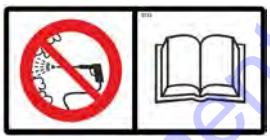
Lock the safety belt before starting the machine.

7. Keep calm and adjust


2584bz

Turn off the engine and remove the key from the ignition box before performing maintenance or repairs.

8 Washing the machine with water


3733

Hazardous situation. Prevent the water from entering electrical and electronic parts of the machine; the equipment could get damaged and persons injured. Read the operation manual!

9 Hearing protection


2408bz

Dangerous noise level! Use hearing protection.

10 Guaranteed sound power level

3567

11 Hydraulic oil drain plug

12 Engine oil drain plug

13 Fuel drain plug

14 Refuelling

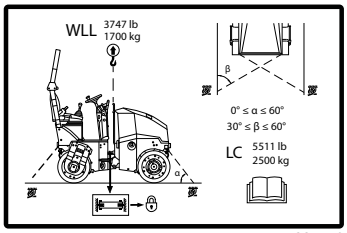
15 Lifting hole

Use only these holes to lift the machine.

16 Tie-down attachment point

Tie-down the machine for transport in these holes only.

17 Lifting diagram



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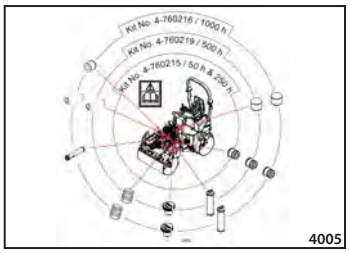
To lift the machine, use binding means of a sufficient loading capacity; refer to the chapter Machine loading. Before hanging, lock the articulation of the machine.

18 Set of filters



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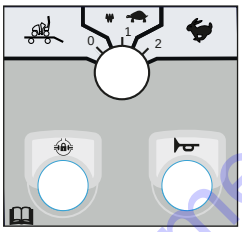
19 Travel mode switch



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20. California Proposition 65

4055bz

Exhaust gases and their components, operating fluids, batteries and other machine accessories contain chemicals known in the state of California to be substances which may cause cancer, congenial defects and other reproduction problems.

When handling these substances, abide by relevant safety precautions.

Further information see www.p65warnings.ca.gov

21. Emulsion sprinkling tank

3518

2.1.6 Hand signals

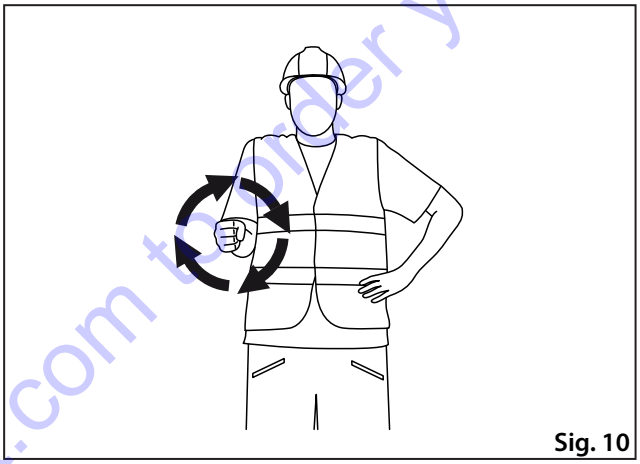
Signals given by an assistant operator if the operator cannot see the travelling or working area or work devices of the machine.

The following principles must be observed:

- For communication purposes, only a limited number of signals must be used.
- The signals must be clearly distinguishable to prevent any misunderstanding.
- Hand signals can only be used when ambient conditions allow clear communication between persons.
- Hand signals must be as similar as possible to intuitive movements.
- Single-handed signals can be done with any hand.

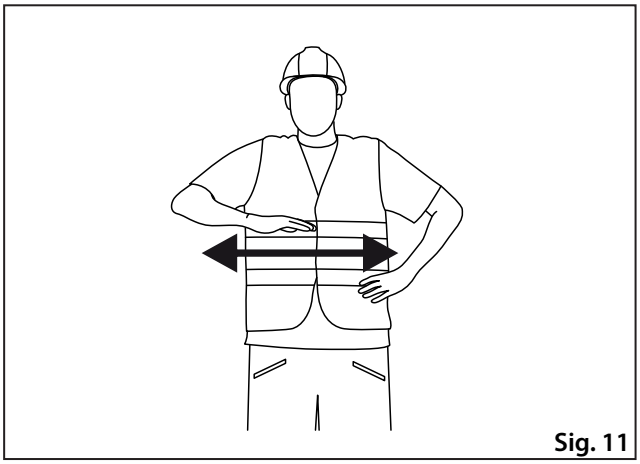
SIGNALS FOR GENERAL COMMANDS

Engine start



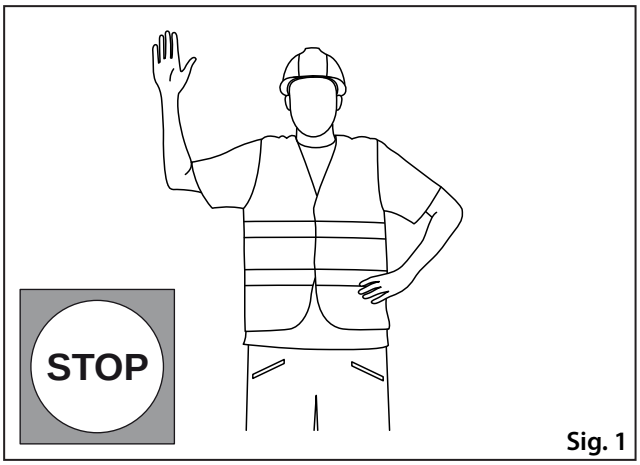
Sig. 10

Engine OFF



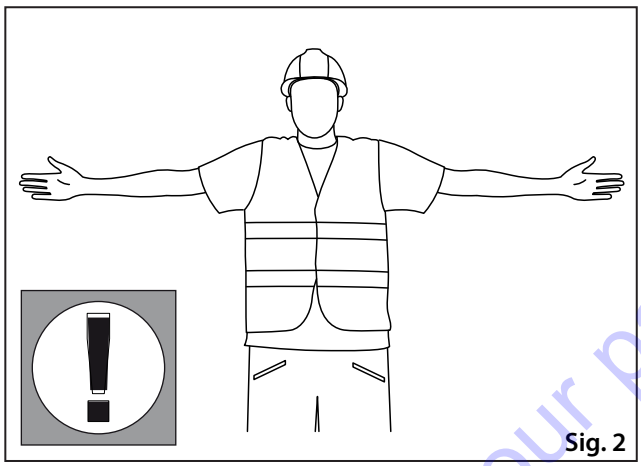
Sig. 11

Stop



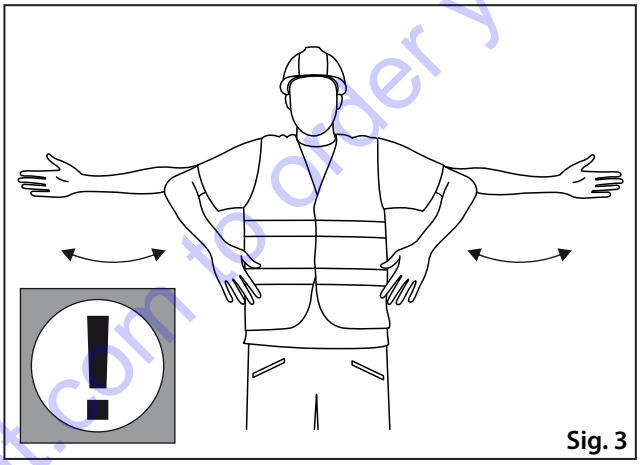
Sig. 1

Watch out!



Sig. 2

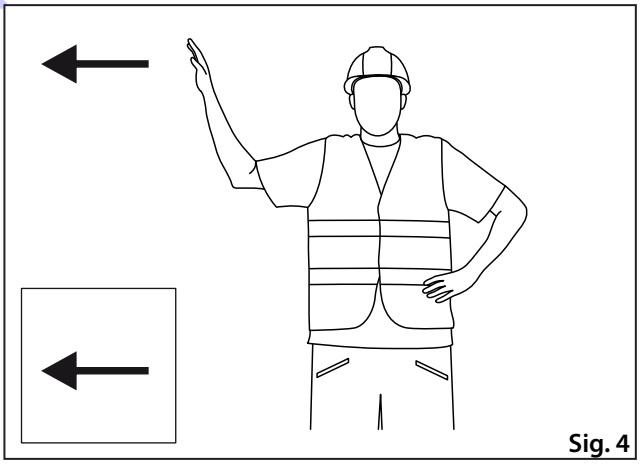
Watch out, danger!



Sig. 3

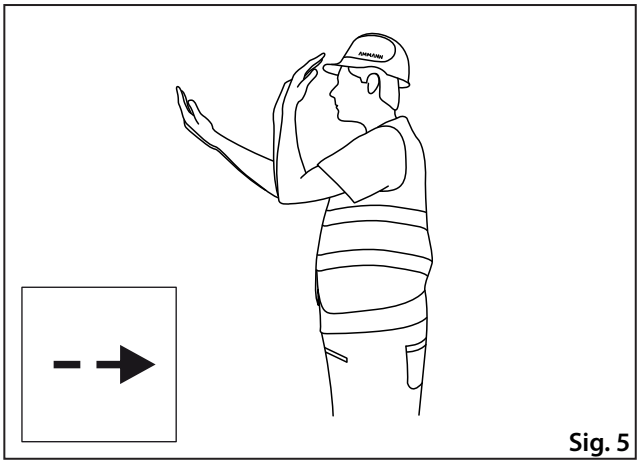
SIGNALS FOR DRIVE

Travel



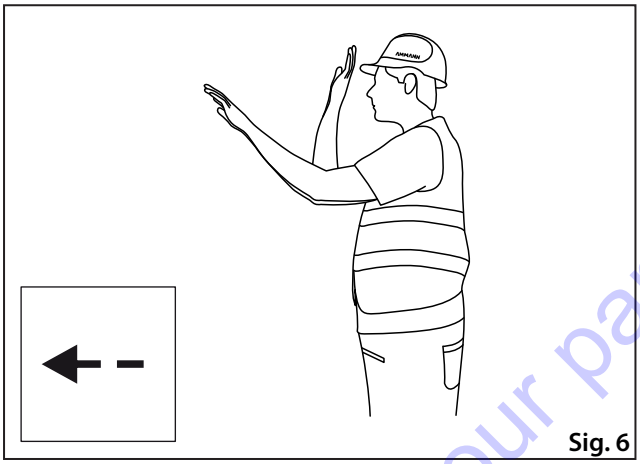
Sig. 4

Slow forward drive – towards me



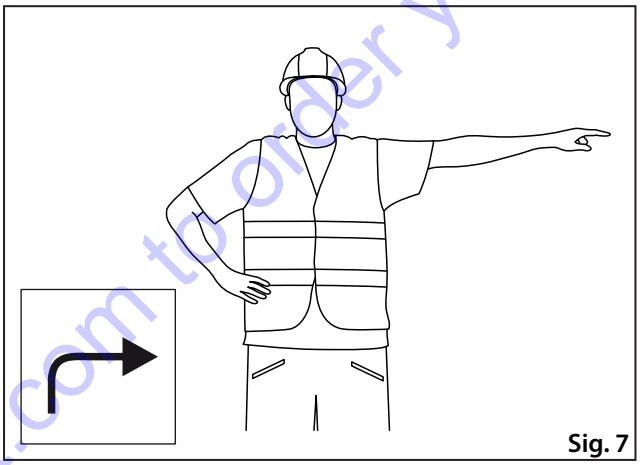
Sig. 5

Slow backward drive – away from me



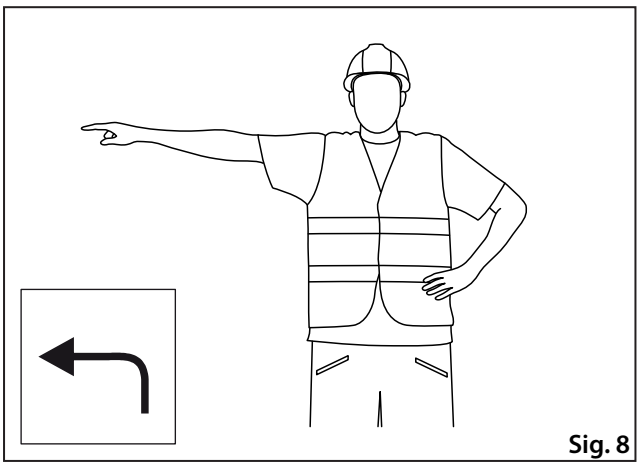
Sig. 6

Drive to the right



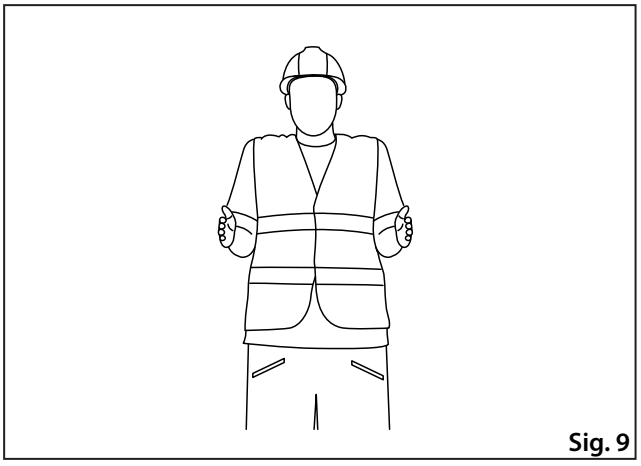
Sig. 7

Drive to the left



Sig. 8

Short distance travel



Sig. 9

2.2 Ecological and hygienic principles

2.2.1 Hygienic principles

When operating and storing the machines, the user is obliged to observe general principles of health and environmental protection, and laws and regulations relating to the given points at issue within the territory where the machine is used.

- Petroleum products, coolants, battery cartridges and paints including thinners are harmful to health. Workers coming into contact with the above products during operation or maintenance of the machine are obliged to follow general principles of their own health protection and comply with safety and hygienic manuals by 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 treat your hands with a suitable reparation cream before eating.
  - when handling cooling systems, follow instructions given in the manuals supplied with the machine.
- Always store petroleum products, coolants, battery cartridges and paints including organic thinners, and also 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 likelihood of confusion. Possible confusion with foodstuffs or beverages is very dangerous.
- In case of accidental contact with skin, mucosa, eyes or inhalation of vapour, immediately apply the first aid principles. In case of accidental ingestion of these products, immediately seek medical help.
- When working with a machine that is not provided with a cab or when the cab windows are open, always use ear protectors of suitable type and version.

2.2.2 Ecological principles

- 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, oil or fuels
  - coolants
  - battery media and batteries
  - cleaning and preservative agents
  - all dismounted filters and filter cartridges
  - 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 applicable to environmental and health protection.

2.3 Preservation and storage

2.3.1 Short-term preservation and storage for 1–2 months

Wash and clean the entire machine carefully. Before shutting down the machine for preservation and storage, run the engine to warm it up to its operating temperature. Shut down the machine on a solid and flat surface at a safe place with no risk of natural disaster (floods, landslides, fire, etc.) for the machine.

In addition:

- repair paints where damaged.
- lubricate all lubrication points
- confirm that water fillings are drained
- check that the coolant has the required antifreeze properties
- check that the batteries are charged and/or recharge them if necessary
- lubricate chromed surfaces of piston rods with preservative grease
- we recommend you to protect the machine against corrosion with a chemical preservative (applied by spraying), particularly in areas where corrosion can occur.

2.3.2 Preservation and storage of the machine for more than 2 months

For machine shut-down, the same principles are applicable as for the short-term preservation.

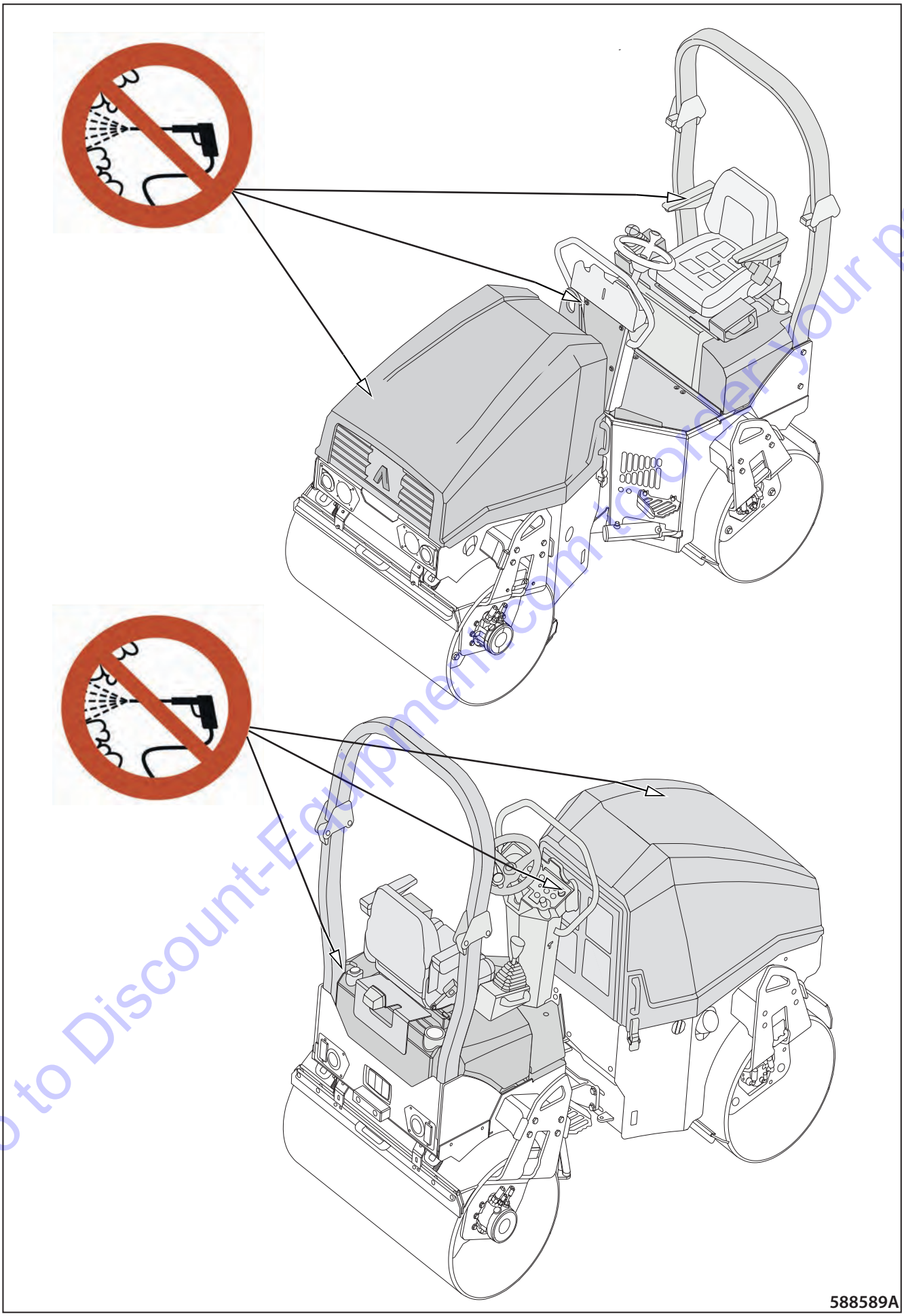
In addition it is recommended to:

- remove the batteries, check for condition and store them in a cool and dry room (charge the batteries regularly)
- support the drum frame so that the shock-absorbing system shows minimal sag
- protect the rubber elements by coating with special preservative agent
- cover the suction and exhaust pipe of the engine with double PE foil and tighten it carefully with sealing tape
- spray a special liquid on the headlights, external rear-view mirrors and other elements of the external electrical installation and wrap in PE foil to protect them
- preserve the engine according to the manufacturer's manual – mark visibly that the engine is preserved.

After 6 months we recommend you to inspect the condition of preservation and renew if required.

Never start the engine during storage!

When the machine is stored under field conditions, check that the parking place is not exposed to danger of flooding due to floods and that there is no other type of danger in this area (landslip etc.)!



2.3.3 Removal of preservation of the machine

- Check all parts of the machine for damage during storage and for missing parts.

If the machine has been preserved, remove the preservative agents as follows:

Wash off the preservative agents using a high-pressure stream of hot water with common degreasers:

- **Wash the machine while observing environmental principles.**
- **Caution! Do not use a high-pressure stream to wash the edge cutter and the highlighted parts of the machine as shown in Fig. 588589, as this could seriously damage the machine.**
- **Prevent water from entering the air filter, electrical and electronic parts of the machine.**
- **Do not use a high-pressure stream near the control unit!**
- **Use a high-pressure stream at a maximum angle of 90 degrees downwards.**

Remove the preservation and wash the machine in places with intercepting sumps to catch the water and de-preservation agents.

Remove the preservation according to the manufacturer's manual.

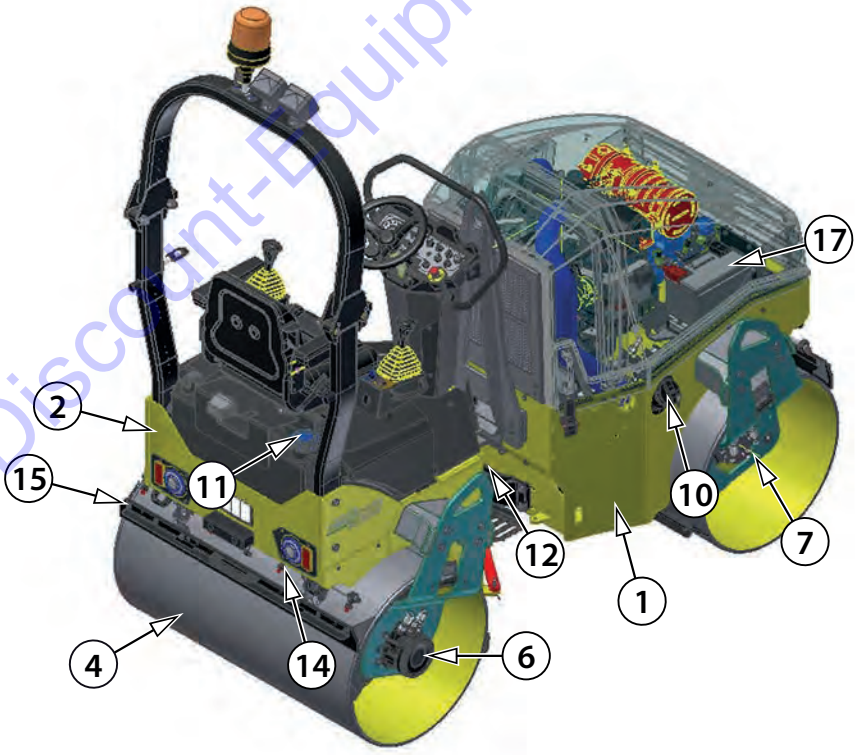
Before putting the machine into operation, check the operating fluids.

2.4 Machine disposal after its service life

When disposing the machine following its service life, the user is obliged to follow national waste and environmental regulations and acts. In the above cases, we recommend you to always contact:

- specialized companies with a respective authorization for these operations
- the machine manufacturer or manufacturer-appointed accredited contracting service organizations put in charge by the manufacturer.

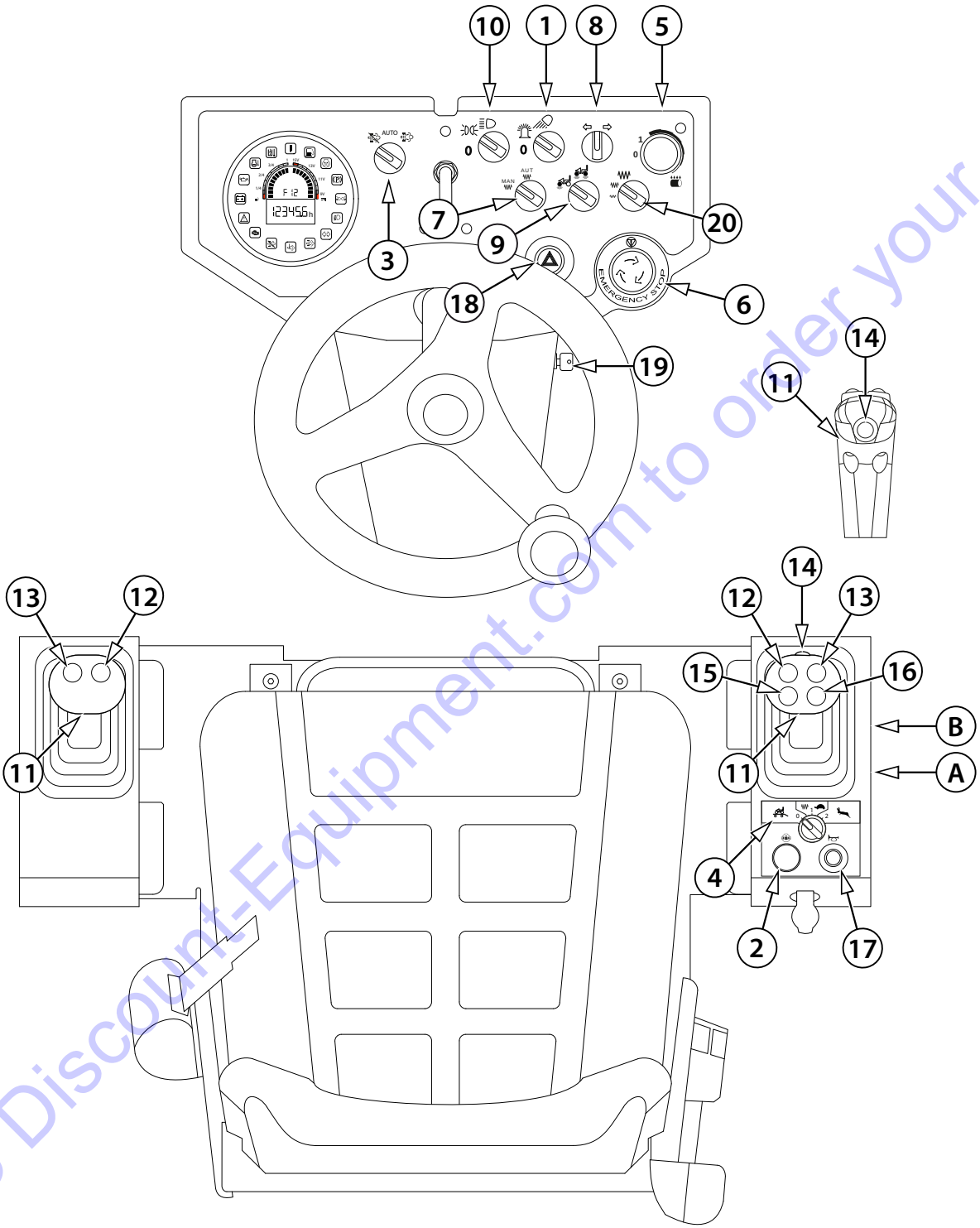
The machine manufacturer Ammann shall not be liable for damage to the health of users or environmental damage caused by non-compliance with the above mentioned rules.



588010A

Legend:

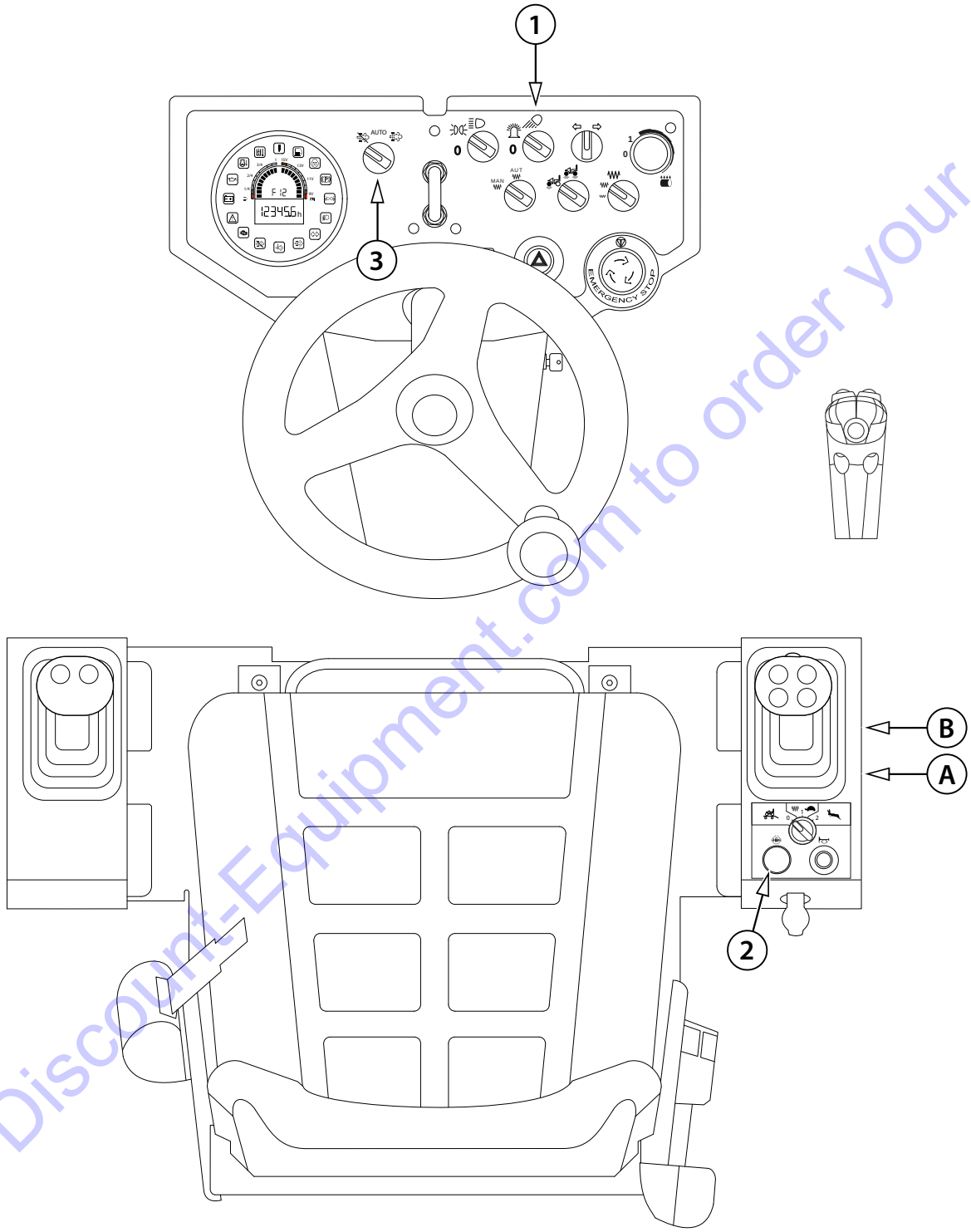
1 - Front frame
2 - Rear frame
3 - Front drum
4 - Rear drum
5 - Engine
6 - Travel hydraulic motor
7 - Vibration hydraulic motor
8 - Steering joint
9 - Hydraulic oil level indicator
10 - Fuel tank
11 - Sprinkling tank
12 - Sprinkling filter
13 - Operator's stand
14 - Drum sprinkling
15 - Drum scraper
16 - Exhaust pipe
17 - Battery
18 - Hydraulic oil cooler
19 - Air filter



2.6.1 Dashboard and control panels

Legend:

A - Brake test button
B - Calibration button
1 - Beacon and rear light change-over switch
2 - Differential lock button
3 - Regeneration switch
4 - Travel mode switch
5 - Sprinkling potentiometer
6 - Emergency brake button
7 - Vibration mode selector switch (manual mode / automatic mode)
8 - Turn indicators switch
9 - Vibrating drum selector switch
10 - Lights switch (outline lights / front lights)
11 - Travel control
12 - Vibration switch
13 - Sprinkling switch
14 - Edge cutter sprinkling switch
15 - Edge cutter button – up
16 - Edge cutter button – down
17 - Horn switch
18 - Warning lights
19 - Ignition box
20 - Vibration amplitude selector switch



588012G

Brake test button (A)

Used to check the correct brake function.

Calibration button (B)

Used to calibrate functions:

- start ramp HARD / SOFT
- activation of the left travel lever
- infra thermometer setting °C / °F


AMN138

Beacon and rear light change-over switch (1)

- To the gear 1: The beacon is ON.

It is possible that the machine is equipped with a beacon but the corresponding change-over switch is missing. In such a case, the beacon will start in continuous operation as soon as the ignition key is set to the position I.

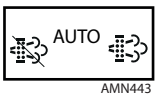

AMN45

Differential lock button (2)

It is used for turning on the differential lock.

The differential lock prevents the drum from slipping when crossing a difficult terrain.

Turn the differential lock off after the difficult ground has been overcome!



AMN443

Regeneration switch (3)

It is used to activate DPF regeneration.

Left position – regeneration OFF

- It is used to interrupt regeneration in emergency situations only, such as machine operation in an explosive or flammable environment.
- Do not suppress regeneration unless is it absolutely necessary.

Repeated suppression of regeneration results in DPF damage. Prolonged operation of the machine with suppressed regeneration will destroy the diesel particulate filter (DPF).

Centre position – AUTO

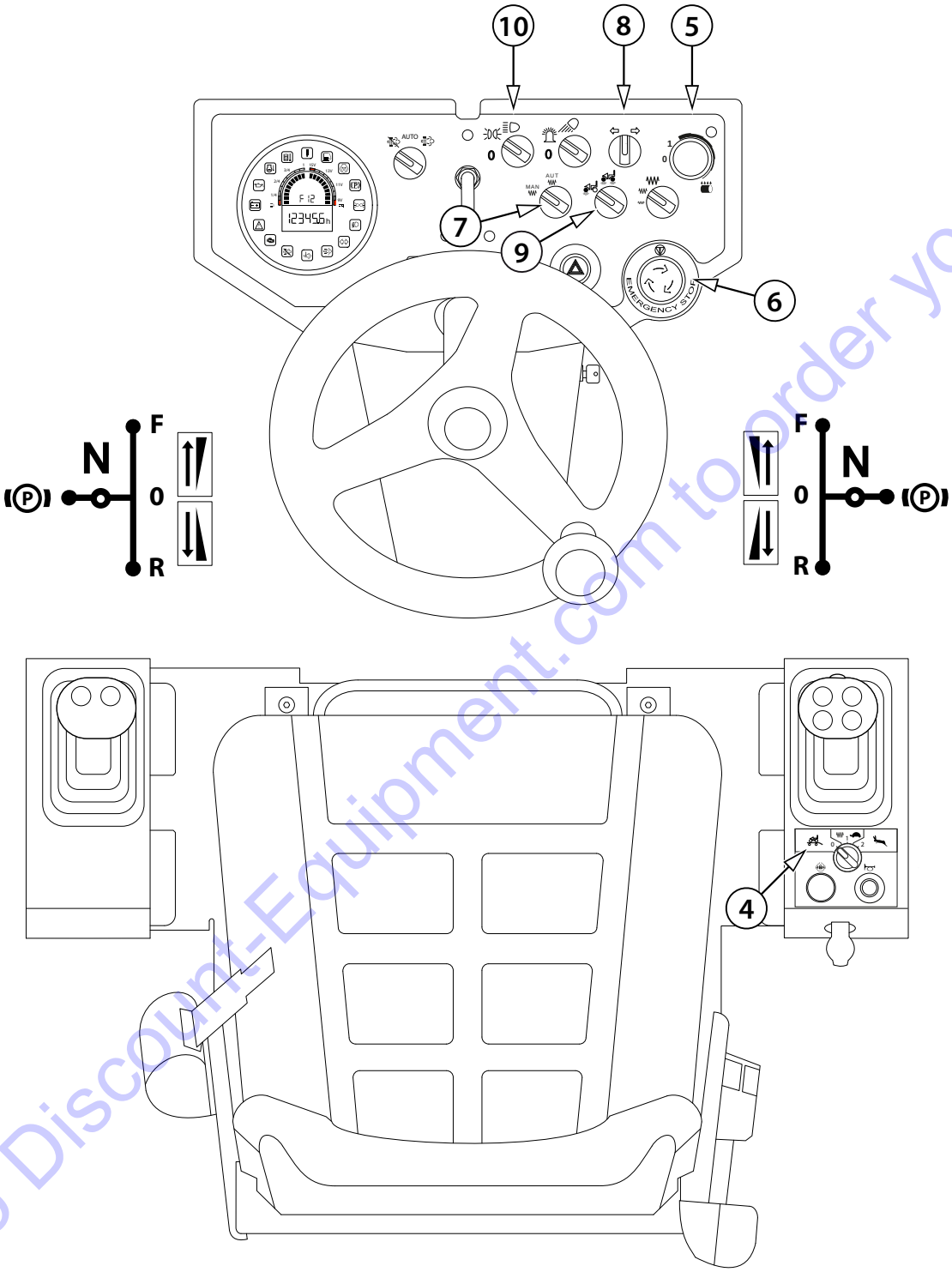
- Active regeneration is automatic without operator input (according to Chapter 2.7.14.2.2).

Leave the AUTO position set for the whole duration of machine operation. This will prevent diesel particulate filter (DPF) damage.

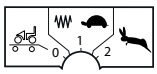
Right position – parking active regeneration ON

- It is used to activate parking active regeneration.

Perform DPF regeneration according to Chapter 2.7.14 Principles of use of the machine with a diesel particulate filter (DPF).



588013G



AMN010D

Travel mode switch (4)

Loading mode (0)

- Limited travel speed.
- Activated differential lock.
- Blocked working functions of the machine (vibration).

Working mode (1)

- Machine working speed (7 km/h).
- Option to activate the differential lock for the time necessary.
- Option to activate the working functions of the machine (vibration).

Transport mode (2)

- Machine transport speed (10 km/h).
- Deactivated differential lock.
- Blocked working functions of the machine (vibration).


AMN83

Sprinkling potentiometer (5)

OFF in the position "0". Turn the sprinkling potentiometer from the position "1" to the position "MIN" to smoothly control the sprinkling intensity of the drums.

AMN142

Emergency brake button (6)

Pressing the button activates the emergency brake of the machine. The machine stops, the engine shuts down. After activating the emergency brake button the indicator lamps for battery charging (22), engine lubrication (23), parking brake (29) and emergency stop (26) are shown on the display.

3726G

Vibration mode selector switch (manual mode / automatic mode) (7)

- Manual vibration mode – vibration can be switched on when the machine is stationary or moving. Drum sprinkling – vibration can be switched on when the machine is stationary or moving.
- Automatic vibration mode – vibration is automatically switched on when the machine starts moving and automatically switched off when the machine stops. Automatic activation of drum sprinkling when the machine starts moving and automatic deactivation of drum sprinkling when the machine stops.

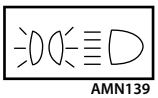

3726CH

Turn signals switch (8)


AMN441

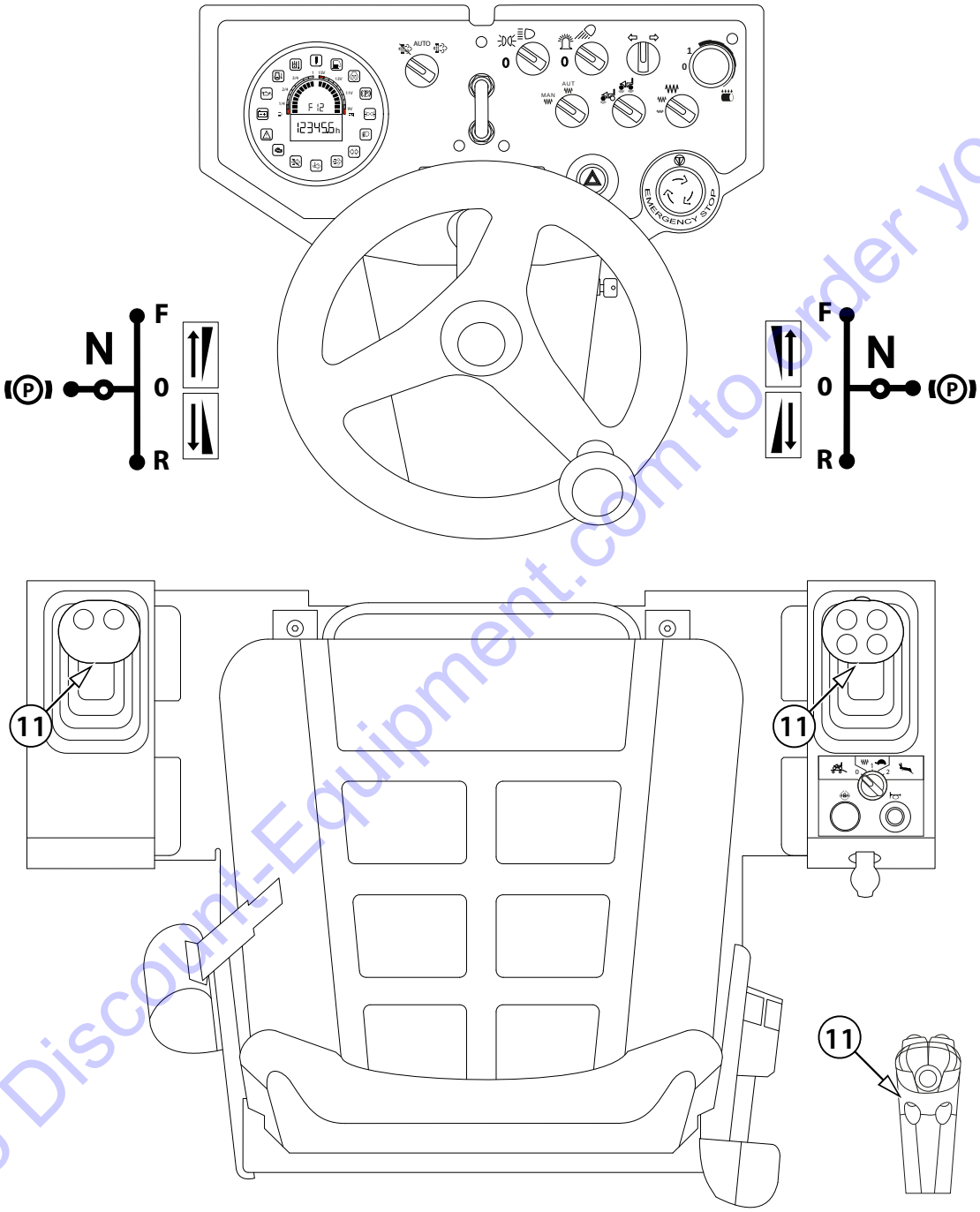
Vibrating drum selector switch (9)

- front drum
- front and rear drum


AMN139

Lights switch (outline lights / front lights) (10)

- outline lights
- front lights



588014F

Travel control – right (standard) (11)

The travel control is used to set the engine speed, the parking brake, forward/reverse direction and the travel speed of the machine. Direction and speed of machine travel is controlled by shifting the control from zero position (0) forward or backward. The travel speed corresponds to the displacement of the travel control at the set speed gear. The travel control is fixed in the set position except for the zero position (0).

The travel control can activate the so-called panic response (Chapter 2.7.2).

Shifting the control to the neutral position (N) stops the machine – the parking brake is not engaged!

If you leave the travel lever in the neutral position (N), it is possible that the machine will move from the slope due to leakages of the hydraulic system.

The parking brake position (P) is indicated by lighting up of the parking brake indicator lamp.

The travel control is fitted with vibration, drum sprinkling, edge cutter (up/down) and edge cutter sprinkling switches.

P – parking brake – activated parking brake, idle engine speed

N – neutral – the machine is not braked, idle engine speed

0 – zero position – working engine speed

F – forward travel – working engine speed

R – reverse travel – working engine speed

Travel control – left (optional)

The travel control is used to set the engine speed, the parking brake, forward/reverse direction and the travel speed of the machine. Direction and speed of machine travel is controlled by shifting the control from zero position (0) forward or backward. The travel speed corresponds to the displacement of the travel control at the set speed gear. The travel control is fixed in the set position except for the zero position (0).

The travel control can activate the so-called panic response (Chapter 2.7.2).

Shifting the control to the neutral position (N) stops the machine – the parking brake is not engaged!

If you leave the travel lever in the neutral position (N), it is possible that the machine will move from the slope due to leakages of the hydraulic system.

The parking brake position (P) is indicated by lighting up of the parking brake indicator lamp.

The travel control is fitted with vibration and drum sprinkling.

P – parking brake – activated parking brake, idle engine speed

N – neutral – the machine is not braked, idle engine speed

0 – zero position – working engine speed

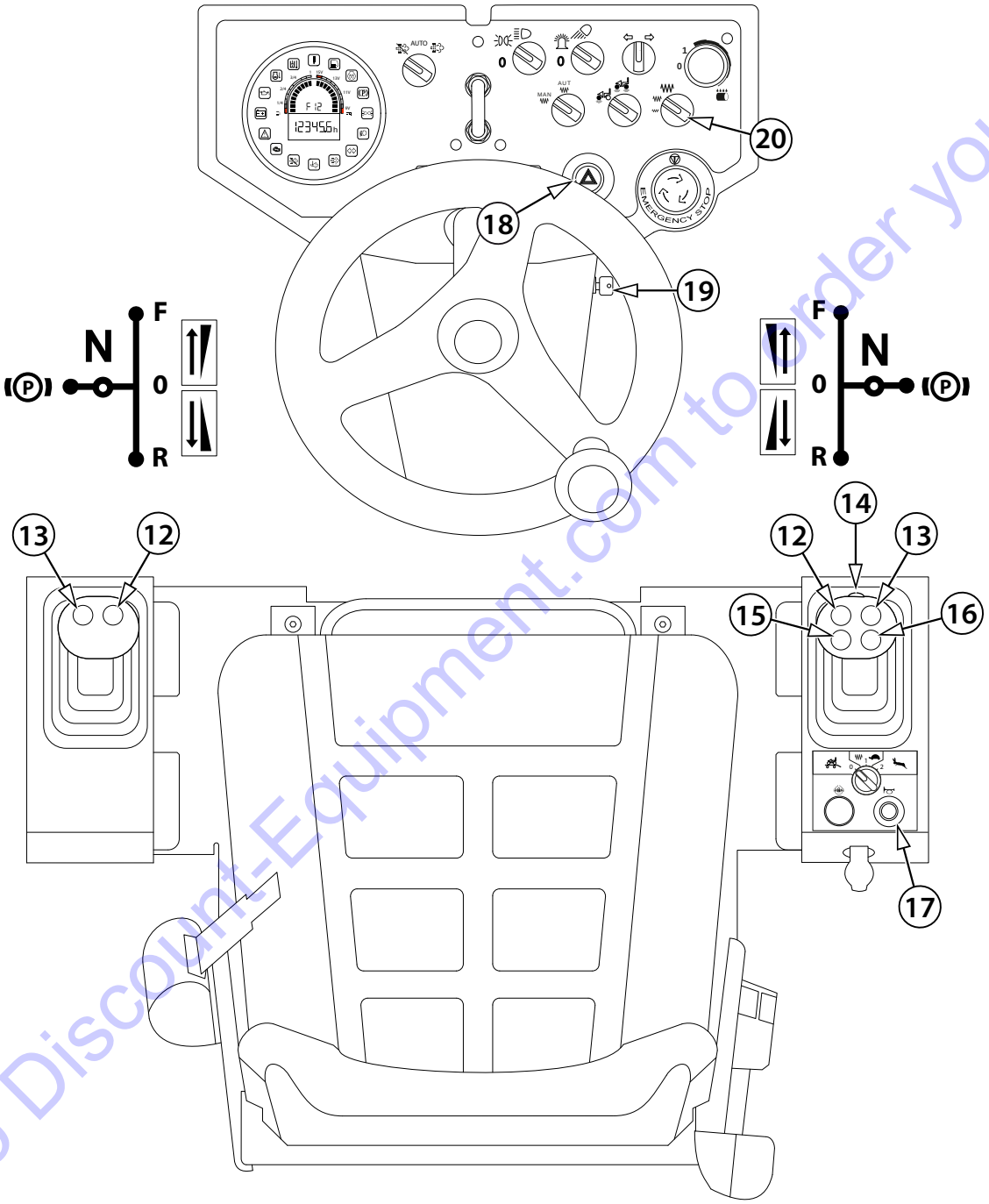
F – forward travel – working engine speed

R – reverse travel – working engine speed

Note

If requested by the customer, the machine can be equipped with the second travel control (11) placed on the left armrest. However, only one of travel controls (11) may remain active.

For the machine travel using one of the controls (the active one), the inactive travel control must be set to the parking brake position (P). If the inactive control is deflected from the parking brake position (P), the machine will stop. When the machine is stopped, move both of the travel controls (11) to the parking brake position (P) and then select the driving direction on the active travel control (11).



588888A

Vibration switch (12)

Press the switch to turn on/off the vibration function.

Sprinkling switch (13)

Press the switch to turn on/off the drum sprinkling function.

Edge cutter sprinkling switch (14)

Press the switch to turn on/off the edge cutter sprinkling function.

Edge cutter button – up (15)

Pressing the button sets the edge cutter to the transport position.

Edge cutter button – down (16)

Pressing the button sets the edge cutter to the transport position.

Warning horn button (17)

Warning lights switch (18)

Ignition box (19)

0 - OFF

I - ON / Engine heating

II - Not assigned

III - Engine starting

Vibration amplitude switch (20)

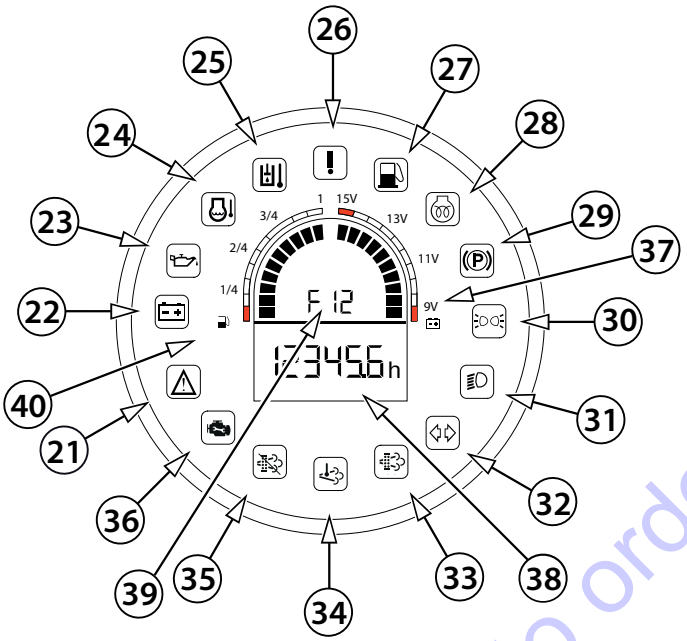
low frequency

high frequency

Before changing vibration parameters (frequency), stop the vibration.

It is forbidden to vibrate on the spot.

It is prohibited to change vibration parameters which the machine is vibrating.



588015A

Indicator lamps

21 - Error message indicator lamp
22 - Battery charging indicator lamp
23 - Engine oil pressure indicator lamp
24 - Coolant temperature indicator lamp
25 - Hydraulic oil temperature indicator lamp
26 - Emergency stop indicator lamp
27 - Fuel reserve indicator lamp
28 - Engine heating indicator lamp
29 - Brake indicator lamp
30 - Outline lights indicator lamp
31 - Dipped lights indicator lamp
32 - Turn signals indicator lamp
33 - DPF clogging indicator lamp
34 - Indicator lamp of high temperature of exhaust gases
35 - Suppression of DPF regeneration indicator lamp
36 - Engine failure indicator lamp
37 - Battery voltage indicator
38 - Counter of worked engine hours
39 - Error message indicator
40 - Fuel tank indicator

The warning indicator lamps for engine oil pressure, battery charging and brakes must light up when the ignition is ON. As soon as you start the engine, the indicator lamps must go off.


AMN58

Error message indicator lamp (21)

The error message indicator lamp lights up when the control system detects an error. At the same time, the error code appears on the display.

- Check the machine according to the table of error message codes.

If the indicator lamp remains lighting, call the service!

See Annex 3.8 – Error codes.


2777

Battery charging indicator lamp (22)

When the battery charging indicator lamp lights up during operation or it does not go off after the engine is started, carry out the undermentioned steps:

- Stop the engine.
- Check the V-belt of the engine for damage and loosening. If the indicator lamp is still lit up when the engine is started, contact the service centre.


AMN49

Engine lubrication indicator lamp (23)

When the engine lubrication indicator lamp lights up during operation or does not go off after the engine is started up, you must stop the machine immediately and turn off the engine!

- Check the engine for oil leaks and for correct oil level.
- If the oil level in the engine is correct, call the service!


AMN76

Engine overheating indicator lamp (24)

When the engine overheating indicator lamp lights up during operation, turn off the engine and fill up the coolant! Check the cooling circuit for leaks! Check the hoses for damage and missing hose clips.


2635

Hydraulic oil temperature indicator lamp (25)

The hydraulic oil temperature indicator lamp lights up when the oil temperature exceeds 85 °C.

If the oil temperature exceeds 95 °C, the error F32 will appear.


592520

Emergency stop indicator lamp (26)

The emergency stop indicator lamp lights if the emergency brake button (6) is enabled.

If the indicator lamp does not go off when the emergency brake button is disabled, look for the cause!

The engine can be started only after the fault has been repaired!


595425

Fuel indicator lamp (27)

When the fuel indicator lamp lights up, the tank capacity is sufficient for half-hour operation of the machine.

Refill the fuel!


3518

Engine heating indicator lamp (28)

It indicates the engine warming up before the cold start.


2703

Parking brake indicator lamp (29)

The lighting indicator lamp indicates that the parking brake was enabled.


AMN146

Outline lights indicator lamp (30)

The indicator lamp indicates that the outline lights are ON.


596303

Front lights indicator lamp (31)

The indicator lamp indicates that the front lights are ON.


595200

Turn signal indicator lamp (32)

The indicator lamp indicates that the turn signals are ON.


AMN118

Indicator lamp of DPF (Diesel Particulate Filter) clogging (33)

The indicator lamp signals blocked start of regeneration.

If the indicator lamp is on, proceed according to Chapter 2.7.14 Principles of use of the machine with a diesel particulate filter (DPF).


AMN120

Indicator lamp of high temperature of exhaust gases (34)

The indicator lamp signals ongoing DPF (diesel particulate filter) regeneration.

If the indicator lamp is on, proceed according to Chapter 2.7.14 Principles of use of the machine with a diesel particulate filter (DPF).


AMN442

Indicator lamp of DPF (diesel particulate filter) regeneration suppression (35)

The indicator lamp signals blocked start of DPF regeneration.

Prolonged operation of the machine with suppressed regeneration is prohibited. Check that the DPF regeneration switch is in the left position. Set the regeneration switch to the AUTO position – the DPF regeneration indicator lamp goes off.

Repeated suppression of regeneration results in diesel particulate filter (DPF) damage. Prolonged operation of the machine with suppressed regeneration will destroy the diesel particulate filter (DPF).


AMN47

Engine failure indicator lamp (36)

The indicator lamp indicates an engine failure.

The lighting indicator lamp during operation of the engine indicates a failure.

The engine will stall – the machine will stop and parking brake will be enabled.

The engine can be started only after the defect is repaired!


2777

Battery voltage indicator (37)


AMN26

Worked hours indicator (38)

Error message code indicator (39)


595425

Fuel level indicator (40)

Seat

Seat adjustment

1 Backrest inclination adjustment

2 Seat springing stiffness

3 Seat longitudinal travel

4 Seat cross travel

Seat springing stiffness

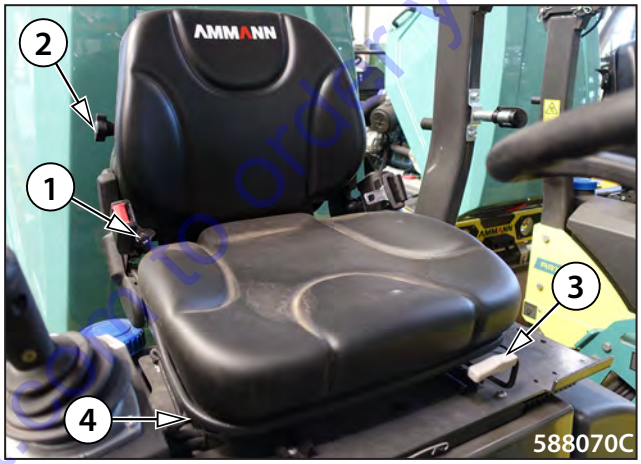
Turn the switch (2) to set stiffness according to driver's weight between 50 and 120 kg (110 - 265 lb).

Adjust the seat before driving the machine.

The driver must be fastened with the safety belt while driving.

Non-observance of this instruction can lead to death or serious injury.

During travel of the machine, the driver must have his legs on the machine platform; there is a risk of injury when the machine turns.



Seat longitudinal travel

- After raising on the lever (3), it is possible to move the seat in the longitudinal direction forward - rearward.

Seat cross travel

- After raising on the lever (4), it is possible to move the seat in the cross direction to the left and right.

Seat switch

The seat switch is located in the seat cushion.

It is used for locking the engine starting and for stopping the engine if the operator does not sit on the seat.

If the driver gets up from the seat when driving, the speed starts to decrease to a complete stop and the machine brakes to stop, which takes about 5 sec. The engine will stall after another 5 sec.

For the next start of the engine, the driver must sit down again, move the travel control to the parking position (P) – braked, change over the key to position "0" and then he can start the engine.

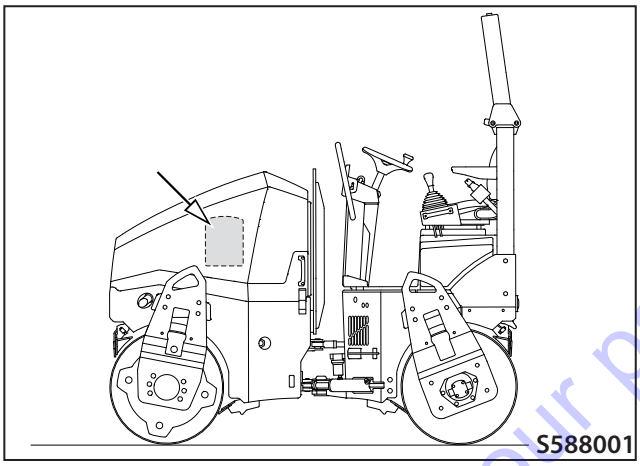
If the driver sits down again within 5 seconds, the machine keeps moving at the selected speed.

If the driver sits down within 5 seconds after the machine stops, the engine does not turn off and the driver can set the machine in motion again. Before that, the travel control must be moved to the neutral position (N).

It is forbidden to load the seat switch with other items!

Document box

The storage box situated on the inner left side of the bonnet is used to store the Operating Manual and other documents related to the operation of the machine.



The Operating Manual must always be kept in the machine in an appropriate place to be always available for the driver of the machine for viewing.

Fuse box (37)

F1 – 7.5 A .....parking lights

F2 – 7.5 A .....tail lights, licence plate light

F3 – 15 A .....headlamps

F4 – 15 A .....rear light, ROPS lights, beacon, green beacon, monitoring device

F5 – 5 A.....direction indicators

F6 – 5 A.....control unit – electronics

F7 – 40 A .....control unit – power part

F8 – 5 A.....display, alternator excitation

F9 – 25 A .....hydraulic oil cooler

F10 – 10 A.....service socket, seat heating

F11 – 11 A.....water sprinkling pump, emulsion sprinkling pump at the axle

F12 – 7.5 A.....right travel lever, left travel lever, differential lock switch, working mode selector, horn switch, brake tester, calibration button

F13 – 7.5 A.....horn

F14 – 5 A .....seat switch

F15 – 5 A .....infra thermometer, monitoring device

F16 .....reserve

Battery disconnector fuses

F20 – 70 A.....main fuse

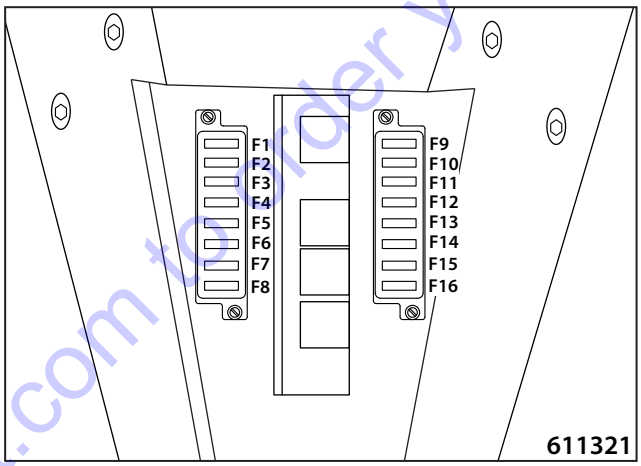
F30 – 50 A.....glowing

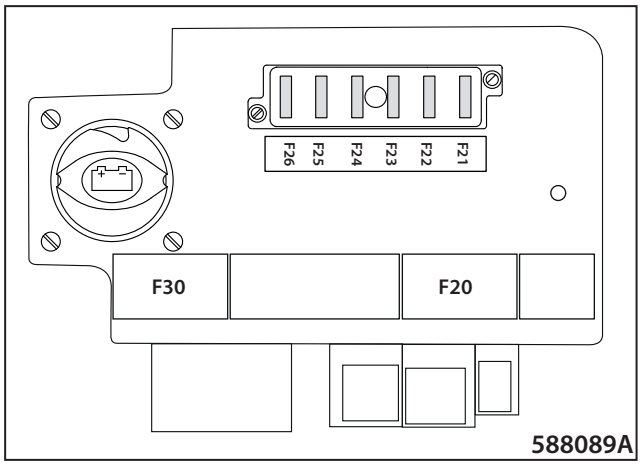
F21 – 25 A.....ECU main fuse

F22 – 5 A .....ECU

F23 – 7.5 A.....fuel pump

F24 – 5 A compaction module





Dashboard cover

The cover protects the dashboard from:

- weather effects
- vandalism
- handling by others

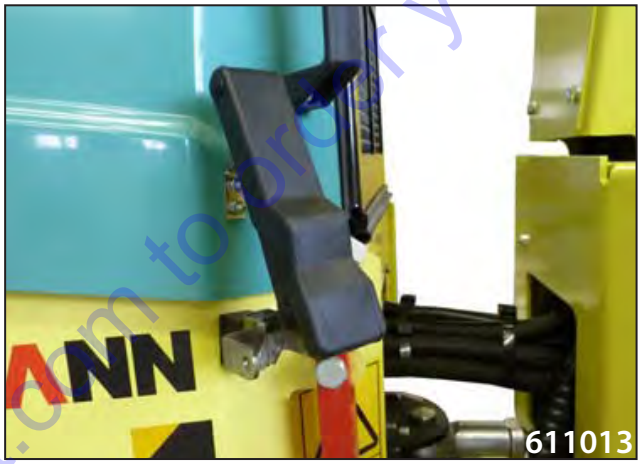
The cover of the dashboard can be locked with a padlock; the padlock is not delivered in the machine equipment.

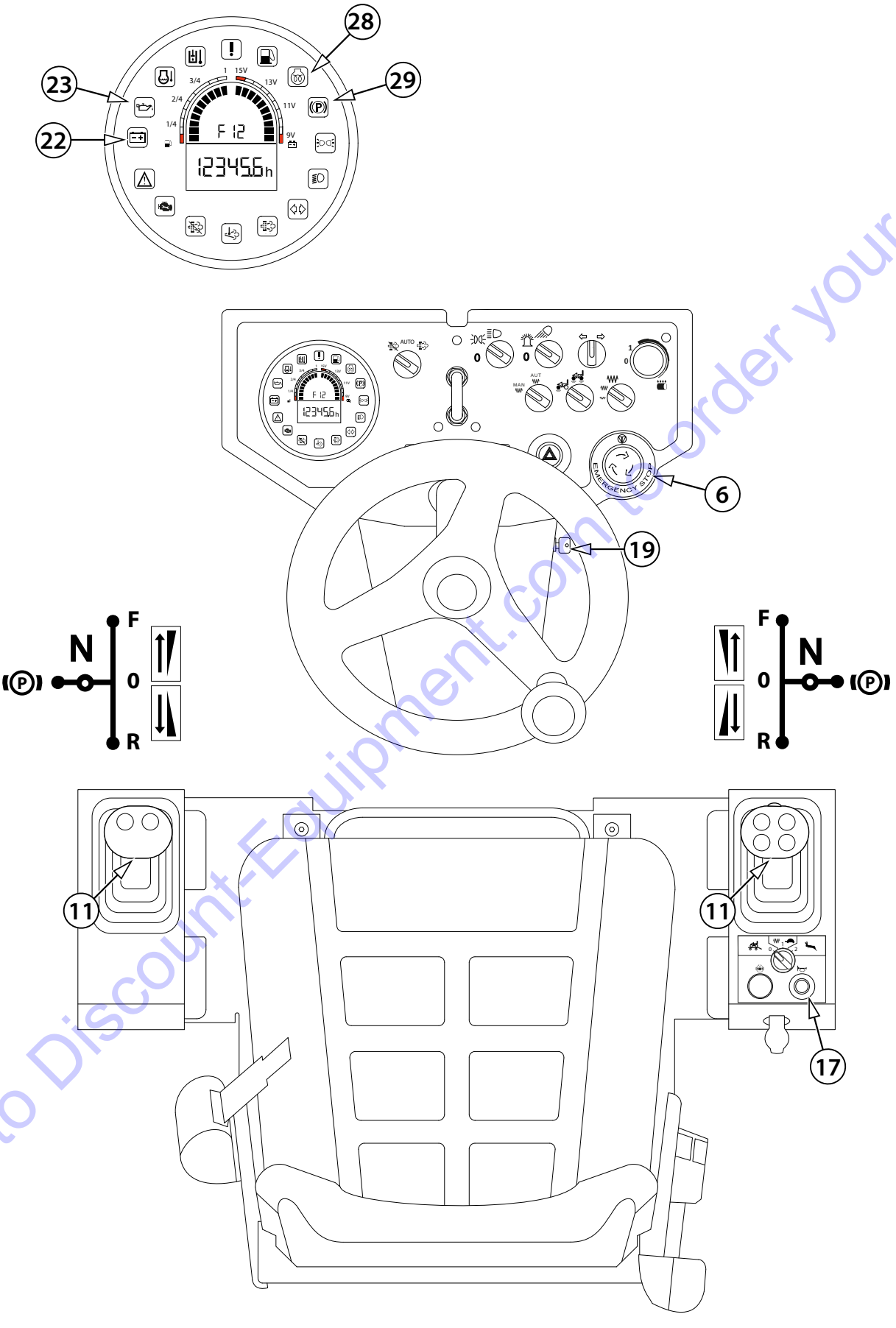
Engine bonnet

The bonnet protects the engine from:

- weather effects
- vandalism
- handling by others

The bonnet of the engine can be locked with a padlock; the padlock is not delivered in the machine equipment.





2.7.1 Starting the engine

Daily before starting the engine, check the oil level in the engine and in the hydraulic tank, fuel level in the fuel tank and water level in the water tank. Check that there are no loosened, worn or missing parts on the machine.

Start the engine only from the driver's stand! Use the alarm horn to signal the engine starting and check that nobody is endangered by starting the engine!

Starting the engine:

Turn on the battery disconnector.

Sit down on the seat.

Set the travel control (11) to the brake position (P). When the machine is equipped with two travel controls, set both travel controls to the parking brake position (P).

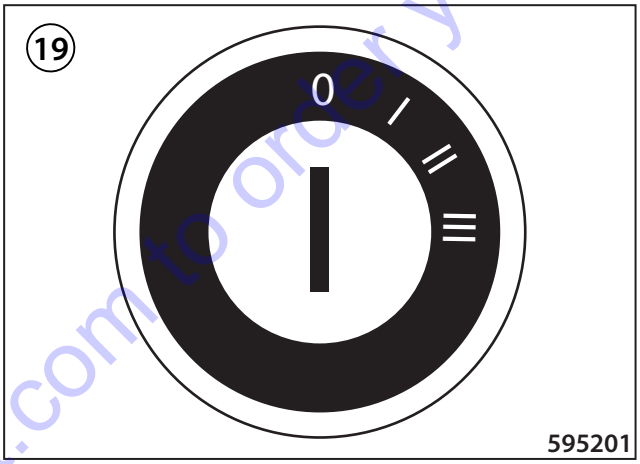
Check that the emergency brake (6) is not activated.

Insert the key into the ignition box (19) in the position "0" and switch over to the position "I".

The indicator lamps for battery charging (22), engine lubrication (23), engine glowing (28) and parking brake (29) will light up.

The glowing indicator lamp (28) lights for 2–10 s according to the ambient temperature. Leave the key in the position "I" until the indicator lamp goes out. After the indicator lamp for glowing (28) goes out, use the warning horn (17) to signal that the engine is starting and start the engine by turning the key to the position "III".

After the start, the indicator lamps for battery charging (22) and engine lubrication (23) must go out on the display.



Do not start the engine by turning the key to the position "III" before the indicator lamp for engine glowing (28) goes out.

When driving with a cold engine and cold hydraulic oil, the braking distances are longer than when the oil has reached its operating temperature.

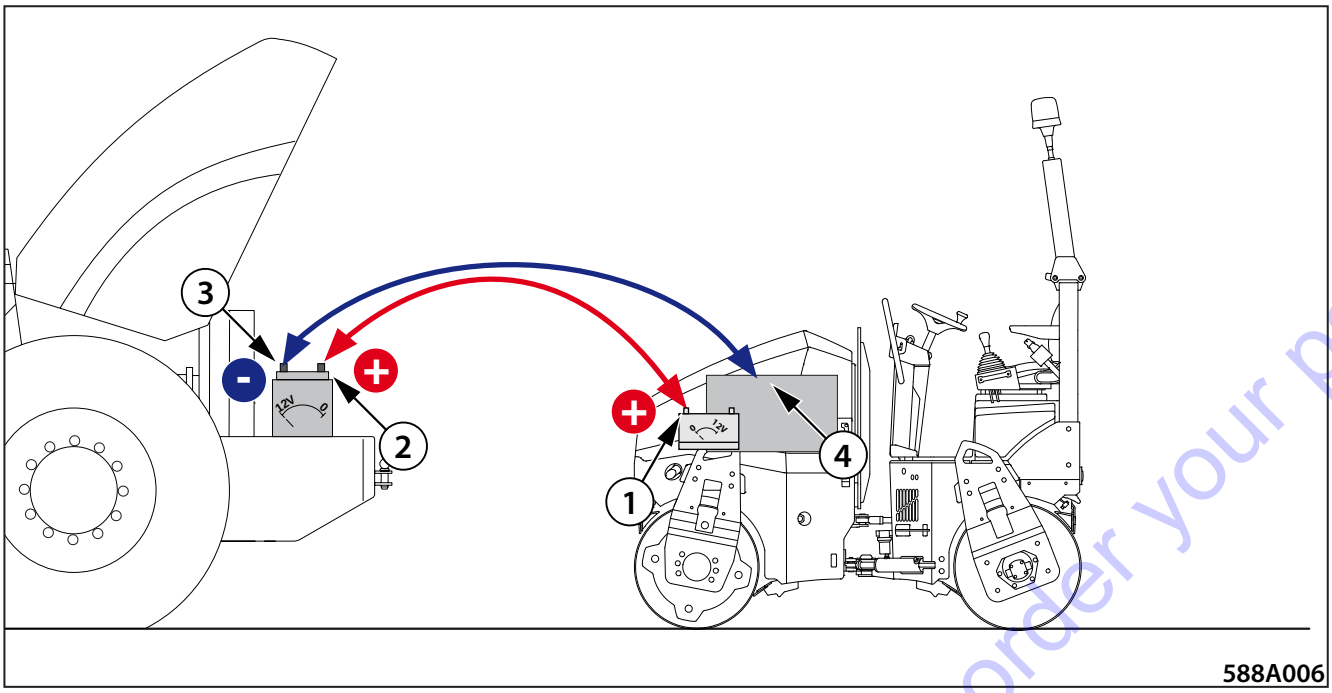
Do not start the engine for more than 30 seconds. Wait for 2 minutes before starting again.

Following the engine start let the engine idle at increased speed for 3–5 min.

If the coolant temperature does not reach at least 40 °C (104 °F), do not load the engine at full power!

Note

If the engine cannot be started or stops after a while, bleed the fuel system according to Chapter 3.6.46.



Start-up procedure using leads from an external power supply:

The starting supply from the external power supply must be 12 V.

Always follow the undermentioned operation sequence.

1/ Connect one end of the (+) pole of the cable to the (+) pole of the discharged battery.

2/ Connect the other end of the (+) pole of the cable to the (+) pole.

3/ Connect one end of the (-) pole of the cable to the (-) pole of the external battery.

4/ Connect the other end of the (-) pole of the cable to any part of the started machine which is attached to the engine (or to the engine block itself).

After starting, disconnect the jump leads in reverse order.

Do not connect (-) pole cable to the (-) pole of the discharged battery of the machine being started! During the starting, heavy sparking may occur and gases of the charged battery may explode.

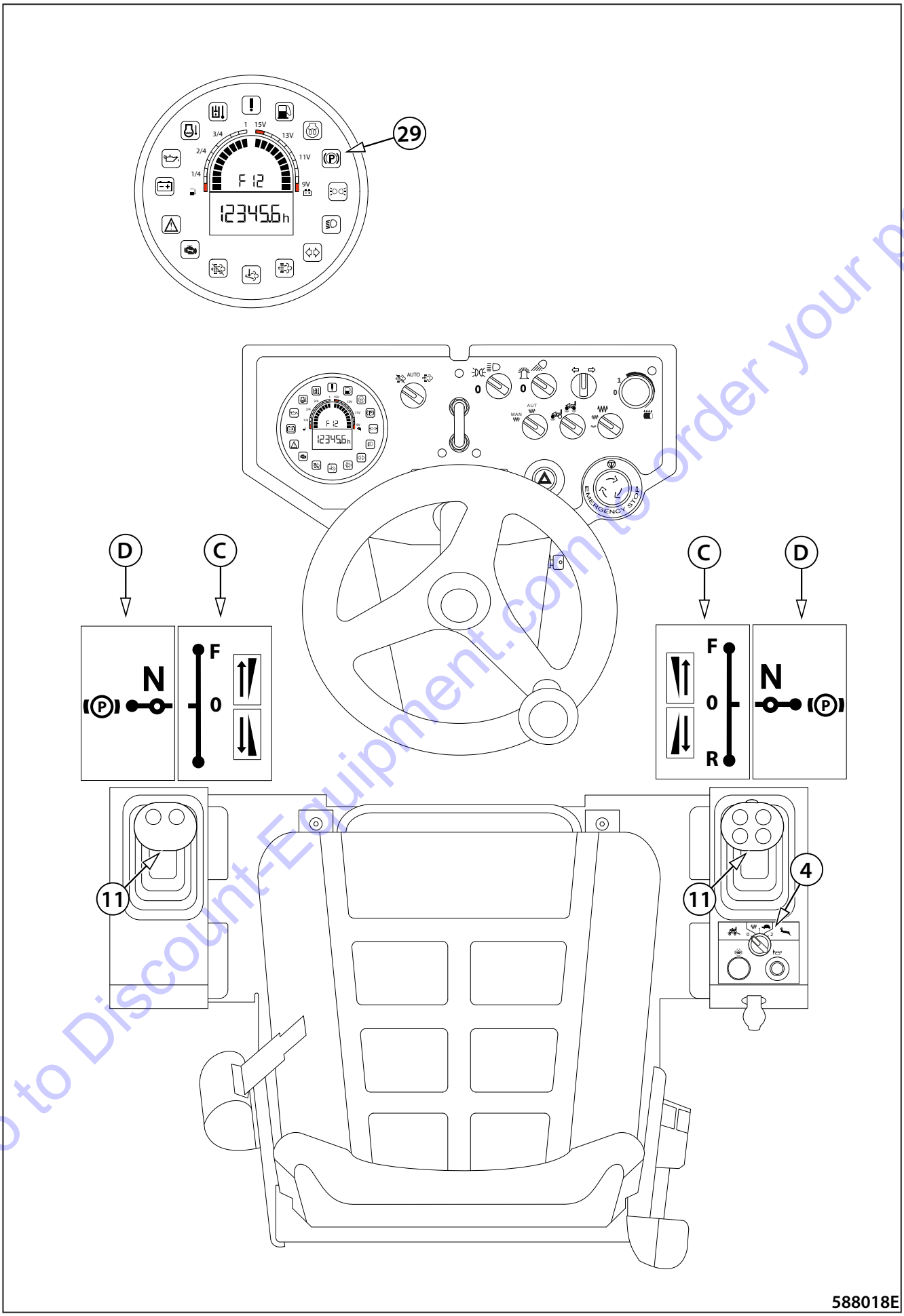
Uninsulated parts of clamps of the jump leads must not touch each other!

The jump lead connected to the (+) pole of the batteries must not come into contact with electrically conductive parts of the machine – danger of a short circuit!

Do not lean over the batteries – possibility of electrolyte burns!

Remove flammable sources (open flame, burning cigarettes, etc.)

Do not check that the wire is live by sparking to the machine frame!



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2.7.2 Travel and reversing

Before moving off, check that the articulation joint of the machine is locked.

Use the warning horn to signal that the engine is starting and wait long enough so that all persons could leave the area around the machine or under the machine in time!

Before moving off, check that the area in front of and behind the machine is empty and that there are no persons or obstructions there!

The operator must not control the machine from the ground. If he did so anyway and is not sitting on the seat when the travel control is moved from the parking brake position (P), the machine does not disengage the brake and will not move, and after 5 seconds the engine will be stopped.

The operator must not leave the operator seat when operating the machine. If he does so anyway and leaves the seat when the travel control is in deflected form the parking brake position (P), the machine behaves according to the seat switch description (Chapter 2.6).

Engine speed

The engine speed is set automatically by moving the travel control (11).

- Idle engine speed (D)
  - Parking brake position (P)
  - Neutral position (N)
- Increased engine speed (C)
  - Zero position (0)
  - Forward travel (F)
  - Reverse travel (R)

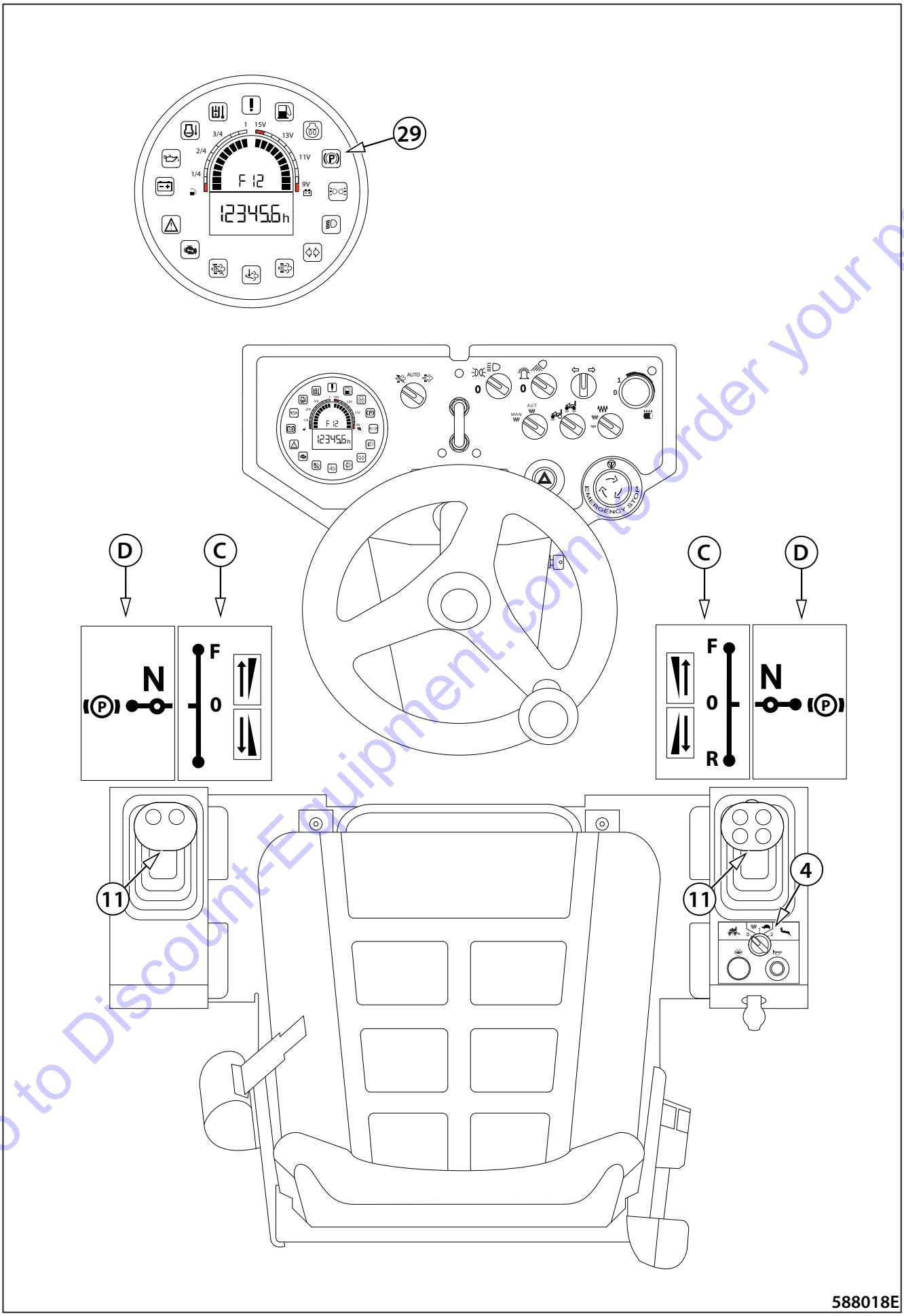
Selection of the travel direction

- Selection of the travel direction is set on the active travel control. Set and leave the inactive travel control in the parking brake position (P).
- Start the engine.
- Move the travel control (11) from the parking brake (P) to the neutral position (N) – releasing of the brakes, the parking brake indicator lamp (29) goes out. The engine idle speed is set.
- Move the travel control (11) to the position (0) and select a travel direction (F/R). The engine working speed is set.

When the driver releases the travel control (11), it does not return to the zero position automatically. The travel control remains in the selected position.

When the driver quickly moves the travel control (11) through the zero position (0) from the selected direction of the machine travel, e.g. due to a dangerous situation, the machine stops and the parking brake is engaged (panic response).

When the driver moves travel control (11) from the selected direction of machine travel to the neutral position, e.g. due to a dangerous situation, the machine stops but the parking brake is not engaged. This may cause counting movement of the machine when driving down the slope, due to leakages form the hydraulic system.



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Travel speed selection

- The travel speed is set on the active travel control. Set and leave the inactive travel control in the parking brake position (P).
- The travel speed corresponds to the deflection of the travel control (11) forward or rearward from the zero position (0) at the given operating mode (4).
- The travel speed can be changed with the travel mode switch (4).

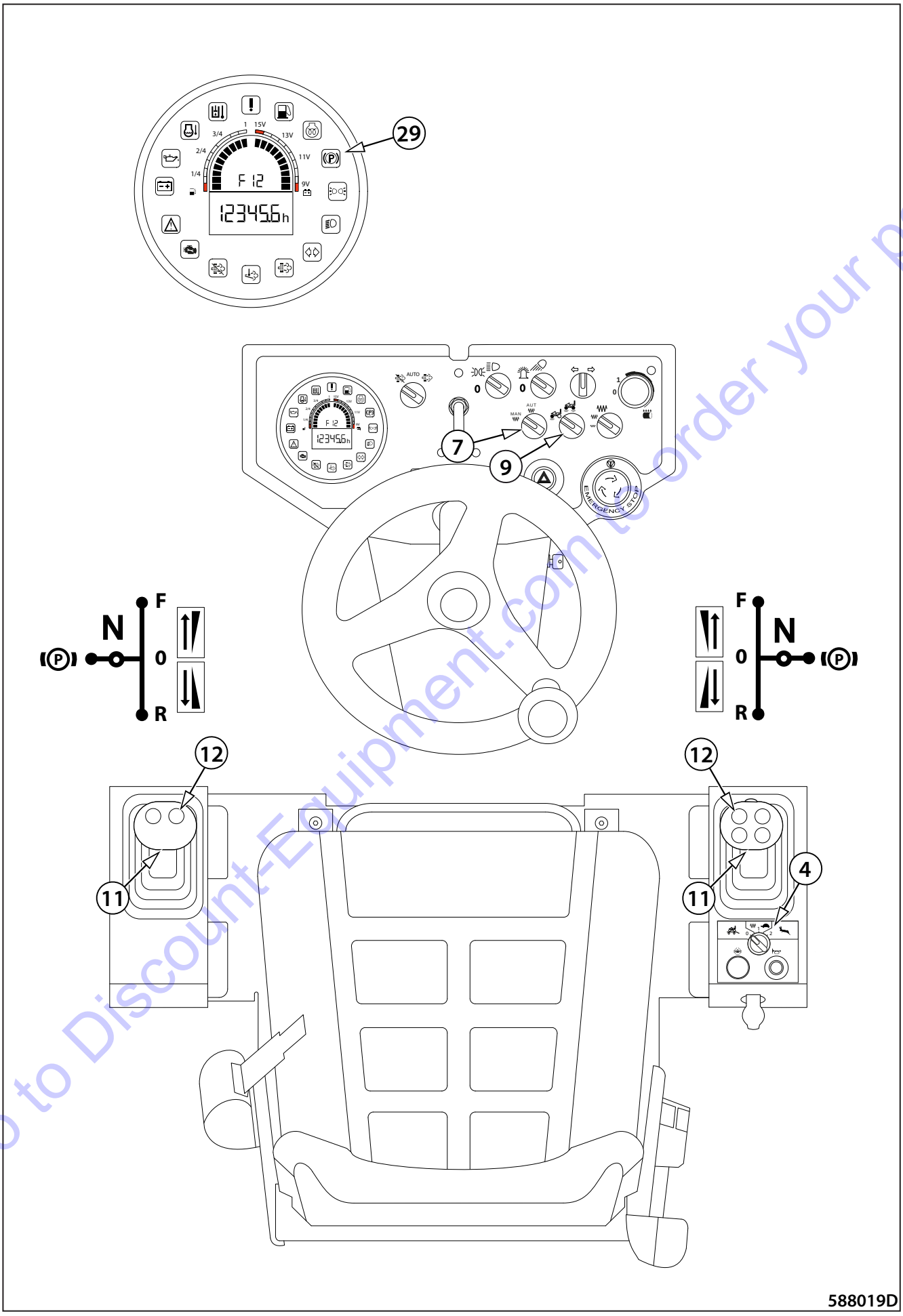
Panic response

The immediate stop of the machine using the travel control (11) applies to all of the travel modes of the machine. When the travel control (11) is changed to the opposite position through (0) within 1 second, the machine will stop – the parking brake will be engaged and the engine will keep running, i.e. panic response. When the machine vibration is on, the vibration will stop also when the manual vibration mode is selected. The machine can start moving again after the travel control (11) is changed to the parking brake position (P) and the travel direction (F/R) is selected.

Note

If the driver leaves the driver's seat while the travel control is not in the brake position (P), the machine behaves according to the seat switch description (Chapter 2.6).

When the driver moves travel control from the brake position (P) without sitting on the seat at that time, the engine will be stopped after 5 seconds.



Machine travel and reversing with vibration

It is forbidden to enable the vibration when the machine is standing.

If the parking brake indicator lamp (29) is on, move the travel control (11) from the parking brake (P) position to the (0) position.

Manual mode

- Use the vibration mode selector (7) to set the manual mode.
- Use the vibrating drum selector (9) to select the front drum vibration or front and rear drum vibration.

Use the travel mode switch (4) to set mode "1" – the working mode of the machine.

- Using the travel control (11) select the forward (F) or reverse (R) travel direction.

Turning on

- Turn on the vibration with the switch (12).

Turning off

- Turn off the vibration with the switch (12).

Note

When the travel control (11) is in the zero position (0), vibration of the machine is still active. Vibration is automatically turned off in the parking brake position (P).

Automatic mode

- Use the vibration mode selector (7) to set the automatic mode.
- Use the vibrating drum selector (9) to select the front drum vibration or front and rear drum vibration.

Use the travel mode switch (4) to set mode "1" – the working mode of the machine.

- Using the travel control (11) select the forward (F) or reverse (R) travel direction.

Turning on

- Press the vibration switch (12).
- Vibration and sprinkling will automatically activate when the travel speed is more than 1–2 km/h (0.6–1.2 MPH).
- Vibration and sprinkling will automatically deactivate when the travel speed is less than 1–2 km/h (0.6–1.2 MPH).
- Vibration and sprinkling remains enabled even after the travel control (11) has been smoothly shifted through the zero position (0).

Turning off

- Press the vibration switch (12).

Note

When the travel control (11) is kept in the zero position (0) or set to the parking brake position (P), vibration and sprinkling is automatically turned off.

Panic response

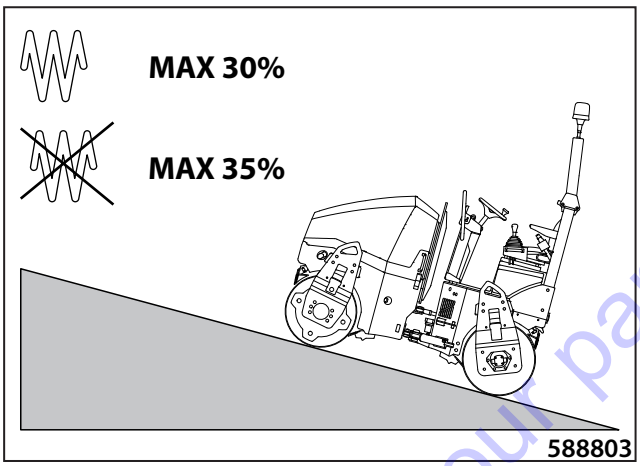
The immediate stop of the machine using the travel control (11) applies to all of the travel modes of the machine. When the travel control (11) is changed to the opposite position through (0) within 1 second, the machine will stop – the parking brake will be engaged and the engine will keep running, i.e. panic response. When the machine vibration is on, the vibration will stop also when the manual vibration mode is selected. The machine can start moving again after the travel control (11) is changed to the parking brake position (P) and the travel direction (F/R) is selected.

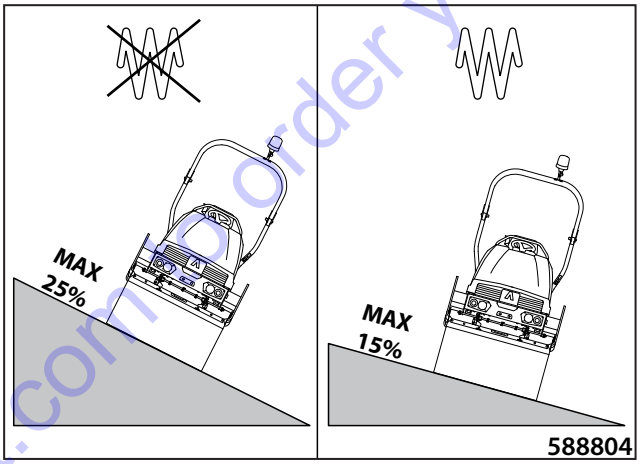
For the maximum permissible slope gradient when driving uphill and across the slope gradient, see figures.

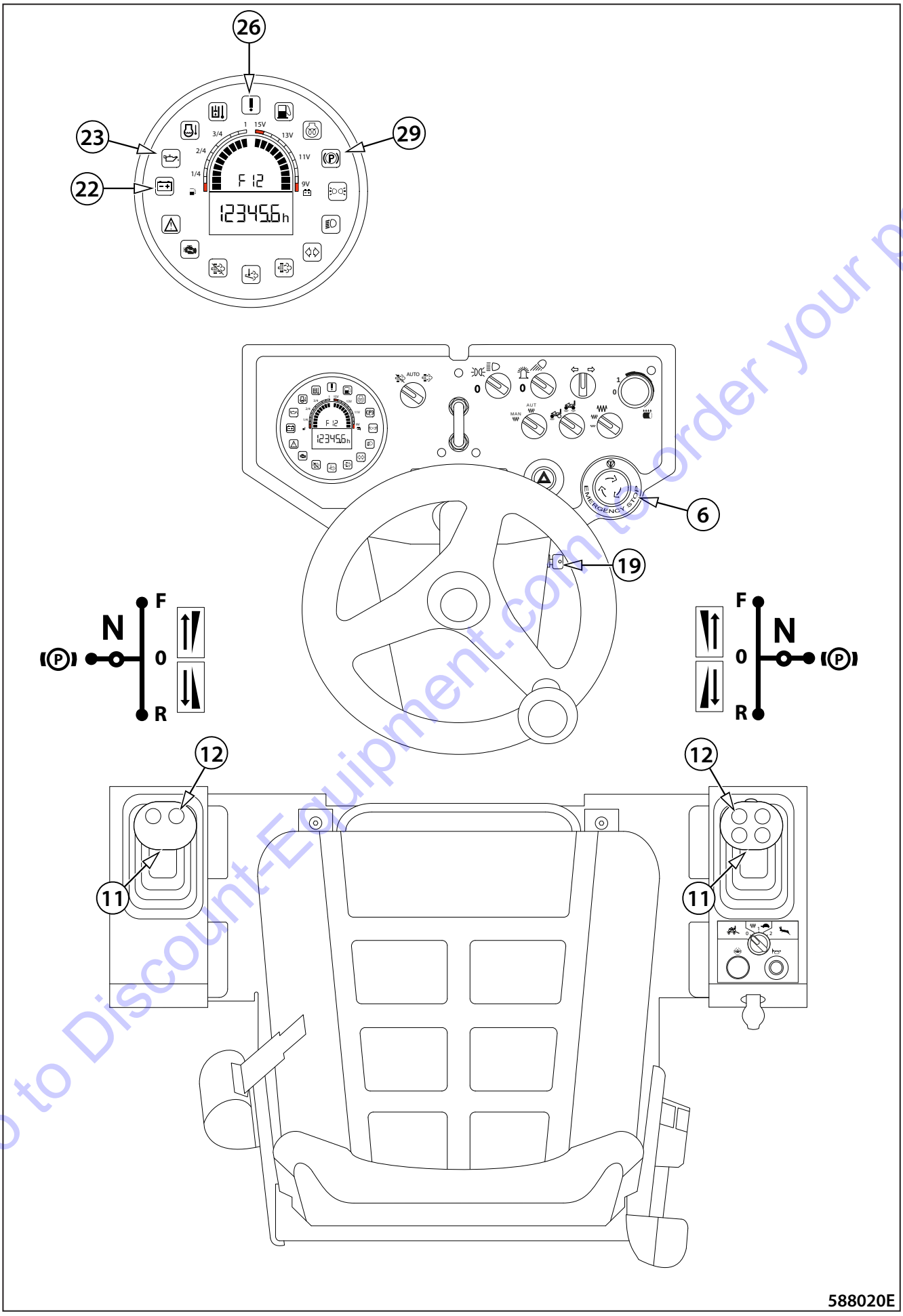
The given values will be lower depending on adhesive conditions and the instantaneous weight of the machine!

Prevent potential danger and pay extra attention to the adherence to permitted slope gradients.

Observe safety precautions. The machine operator must always be fastened with the safety belt.







2.7.3 Stopping the machine and turning off the engine

Turn off the vibration with the vibration switch (12).

Stop the machine by changing the travel control (11) to the neutral position (N).

Brake the machine by changing the travel control (11) to the brake position (P).

Switch over the key in the ignition box (19) to the position "0", take out the key from the ignition box and close the lid.

Turn off the battery disconnector when shutting down the machine.

2.7.4 Machine emergency stop

In a dangerous situation requiring the machine to immediately stop, press the emergency brake button (6).
The machine immediately stops, the engine shuts down.

Turning on:

Press the emergency brake button (6). The machine immediately stops, the engine shuts down.

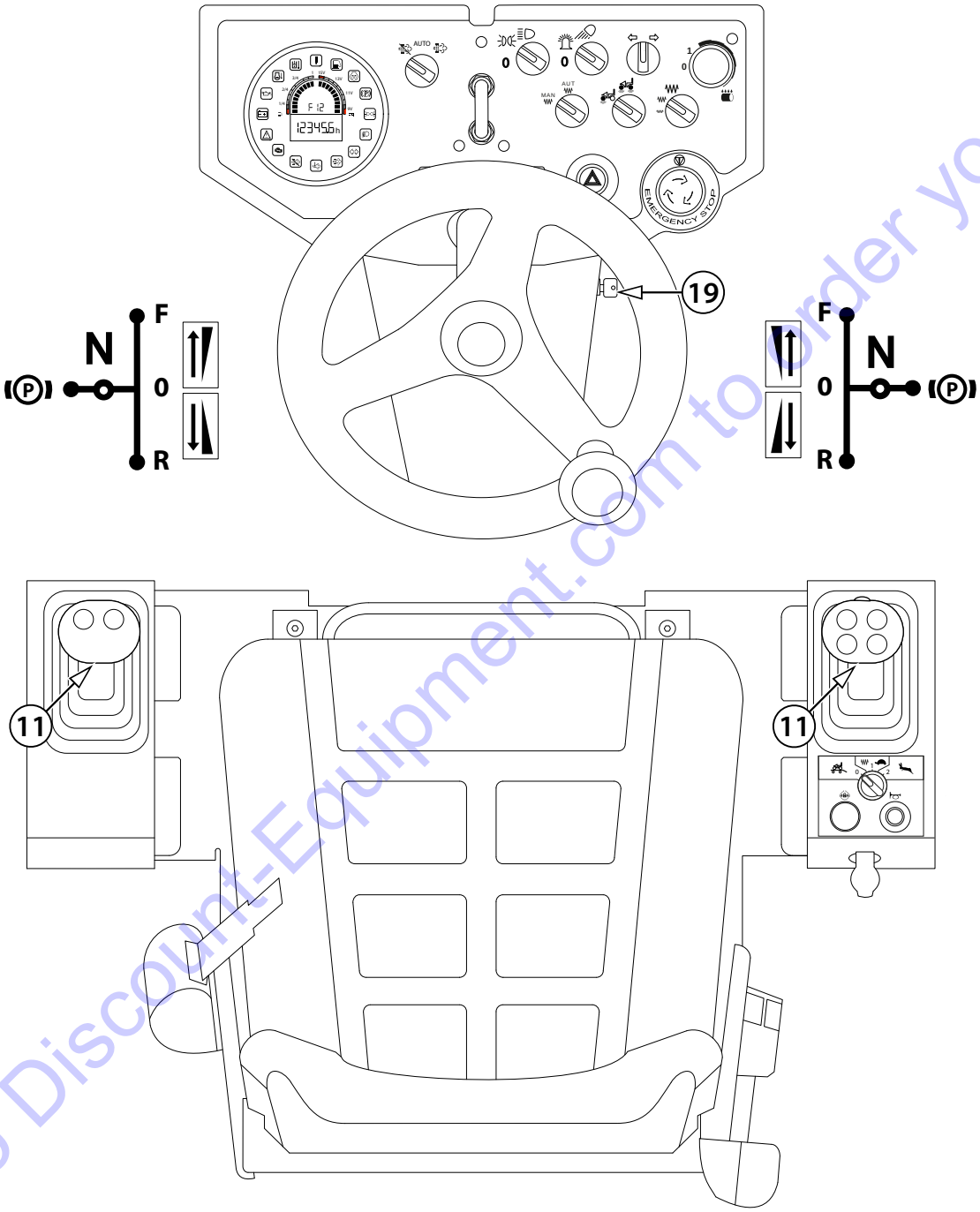
The indicator lamps for battery charging (22), engine lubrication (23), parking brake (29) and emergency stop (26) will light up on the display.

Turning off:

Turn the emergency brake button (6) in the direction of arrows.

The indicator lamps for battery charging (22), engine lubrication (23) and parking brake (29) will remain light up on the display.

Move the travel control (11) to the brake position (P) and then start the engine.



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2.7.5 Machine parking

Shut down the machine on a flat and solid surface where there is no potential natural hazard (e.g. landslides, flooding).

Change the travel control (11) to the brake position (P).

Switch over the key in the ignition box (19) to the position "0", take out the key from the ignition box and close the lid.

Turn off the battery disconnector if it is installed in the machine.

Clean the machine from dirt.

Check the whole machine and repair defects that occurred during operation.

Lock the cover of the dashboard and the engine bonnet with a padlock.

Note

The padlock is not delivered in the machine equipment.

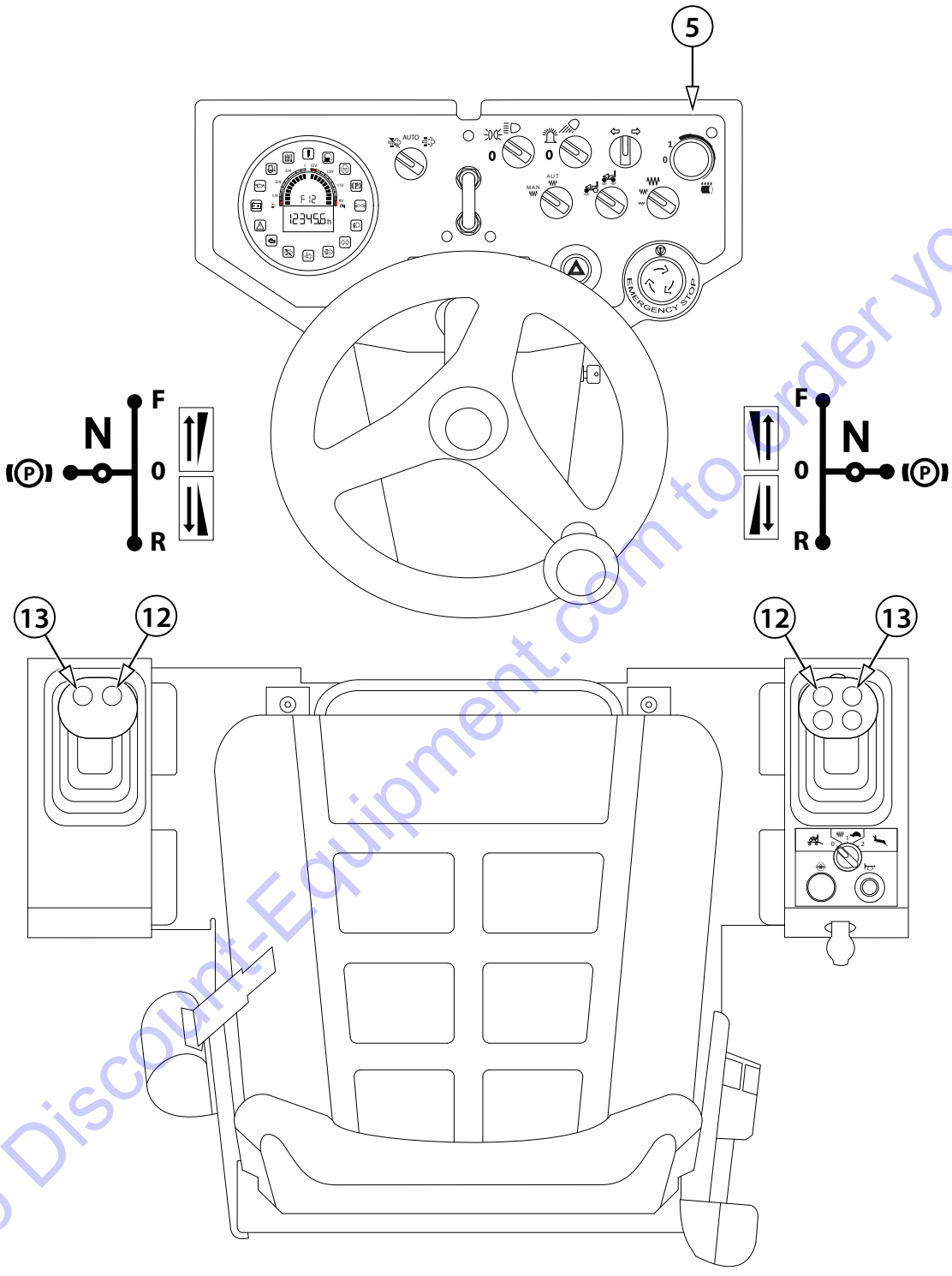
Protect the dashboard and the engine compartment from unauthorized access of others by locking the dashboard cover and the engine bonnet.

It is forbidden to use the parking brake for bringing the machine to a stop.

2.7.6 Panic response

The immediate stop of the machine using the travel control (11) applies to all of the travel modes of the machine. When the travel control (11) is changed to the opposite position through (0) within 1 second, the machine will stop – the parking brake will be engaged and the engine will keep running, i.e. panic response. When the machine vibration is on, the vibration will stop also when the manual vibration mode is selected. The machine can start moving again after the travel control (11) is changed to the parking brake position (P) and the travel direction (F/R) is selected.

It is forbidden to use the panic response for common stopping the machine. Enable the panic response only in emergency when the machine must be stopped immediately.



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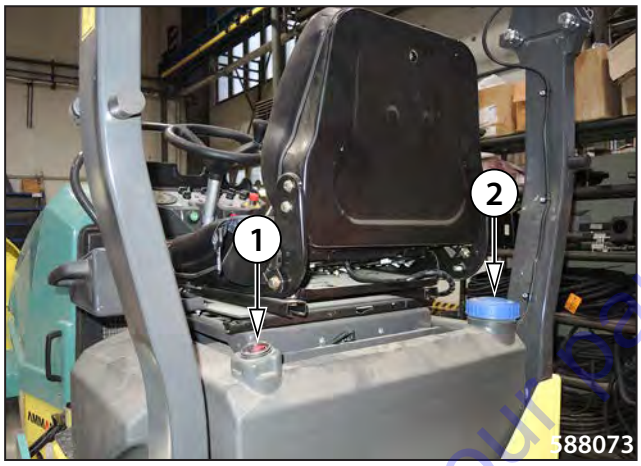
2.7.7 Sprinkling



The water level in the tank is shown on the indicator (1).

Hole to fill the water tank (2).

Check the water level in the tank before putting the machine into operation.

Turn on the sprinkling with the sprinkling potentiometer (5).

Position 0 – sprinkling OFF

Position 1 – sprinkling ON

Turning from the position 1 to the right to turn on the interval sprinkling.

In the interval sprinkling mode you can continuously control the sprinkling break interval.

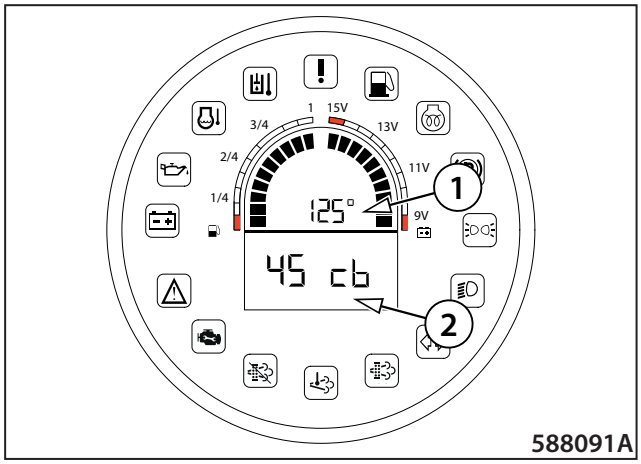
Using the sprinkling switch (13), it is possible to turn on the sprinkling at any time, e.g. before driving on a compacted bitumen surface.

Note

At a combined machine, the sprinkling switch (13) is used for sprinkling the tyres and the sprinkling potentiometer (5) is used for sprinkling the drum.

Sprinkling automatically deactivates if the machine is not moving and automatic vibration is set.

2.7.8 ACE Force (Optional)



The ACE Force system measures current surface compaction at the first drum and shows the value of compaction in the unit of cb (MN/m) on the multifunctional display.

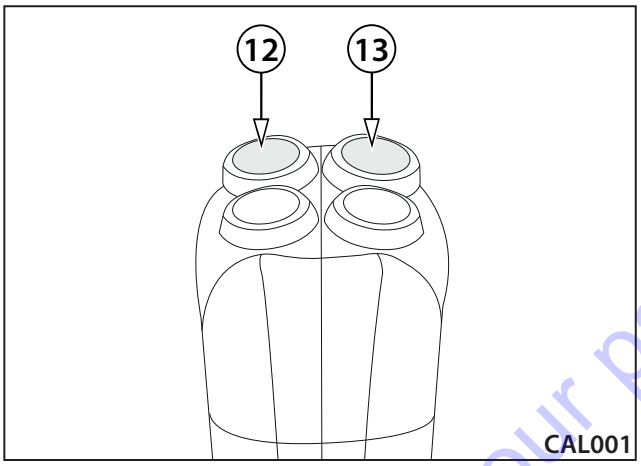
1 - surface temperature

2 - compaction value

ACE Force is switched on and off by pressing the vibration switch (12). Values are not saved or printed.

2.7.9 Infrathermometer (optional)

It is activated by turning on the key in the switch box (19) and it displays the temperature of the bitumen surface being rolled. The measured temperature in °C is indicated on the display.



Control

In the following text, the “OK button” means the vibration button (12). The “select button” means the sprinkling button (13). These buttons only work on the right travel control.

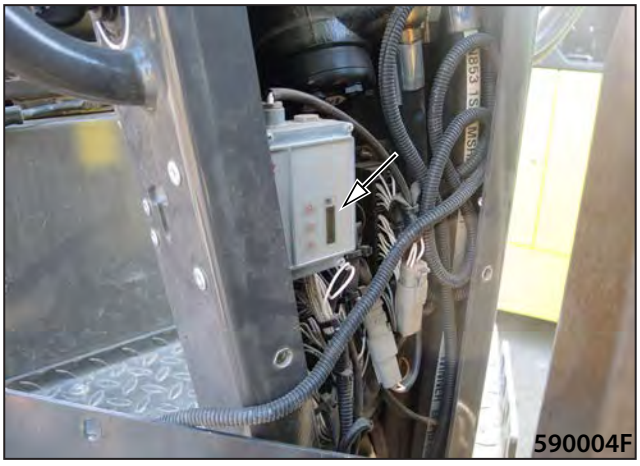
Procedure to set the units of measure °C or °F

After setting the required parameters on the display of the infra thermometer, the values are saved automatically.

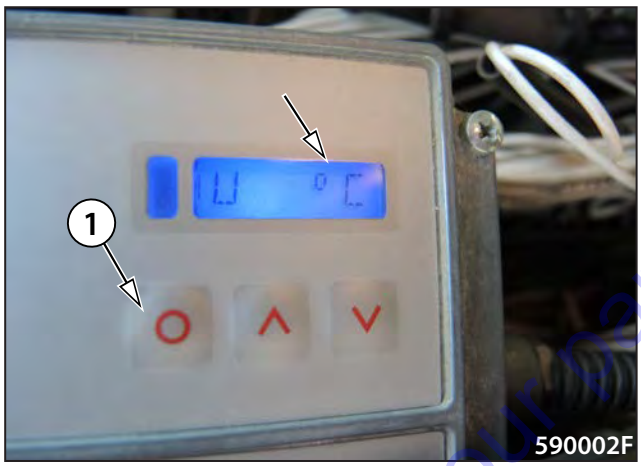
Remove the cover.

Turn the key in the ignition box to the "I" position.

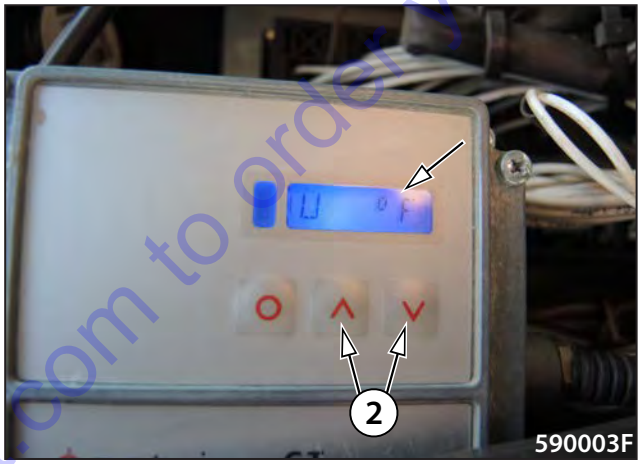
The infra thermometer display will light up.



Switch over with the MODE button (1) until °C appears on the display.

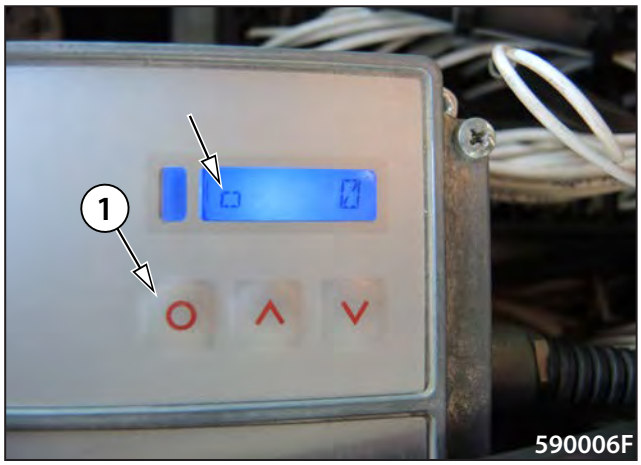


Switch over with the UP and DOWN arrows (2) until °F appears on the display.

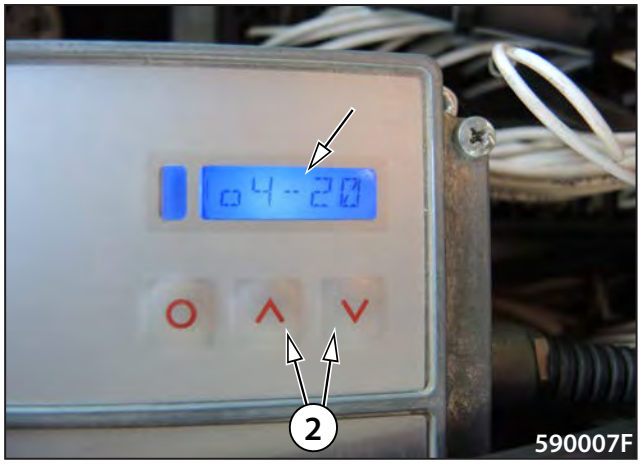


Set the current output of the infra thermometer.

- Switch over with the MODE button (1) until the "o" symbol appears on the display.

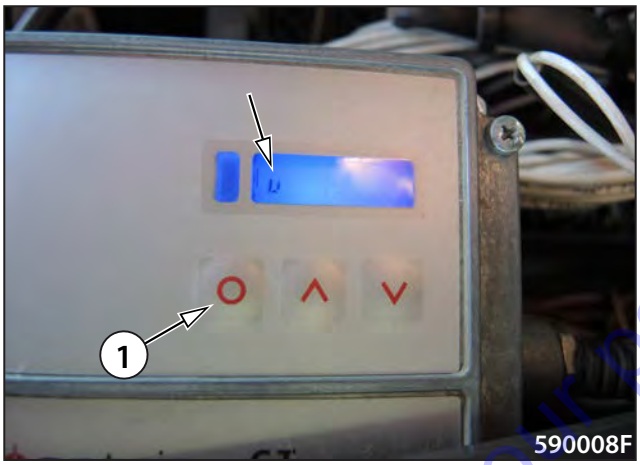


- Switch over with the UP and DOWN arrows (2) until 4–20 mA appears on the display.

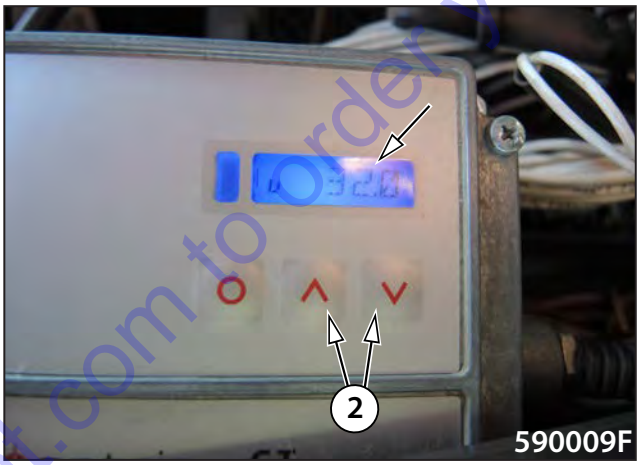


Set the minimum temperature.

- Switch over with the MODE button (1) until the “u” symbol appears on the display.

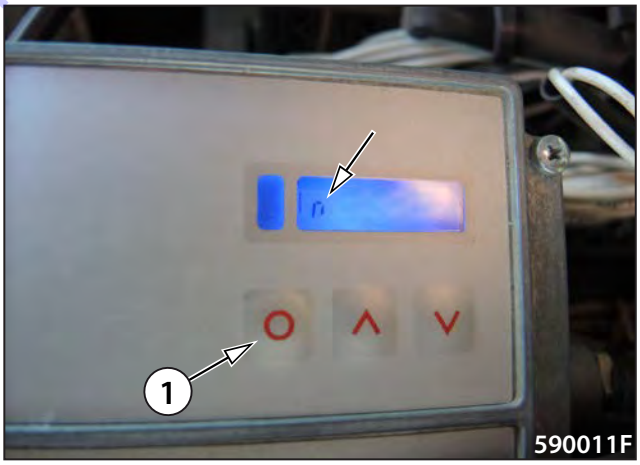


- Switch over with the UP and DOWN arrows (2) until the value of 32.0 °F appears on the display.

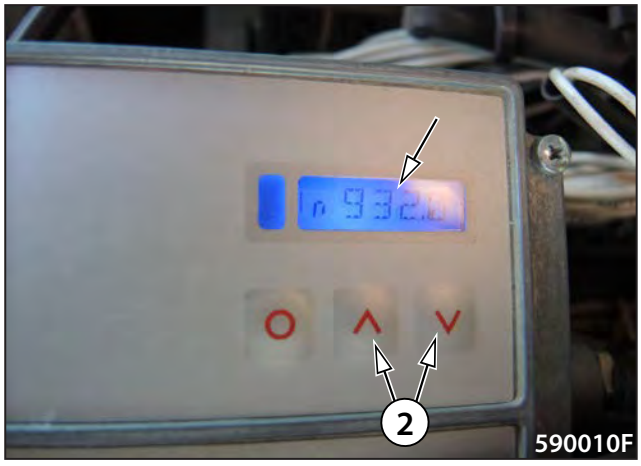


Set the maximum temperature.

- Switch over with the MODE button (1) until the “n” symbol appears on the display.

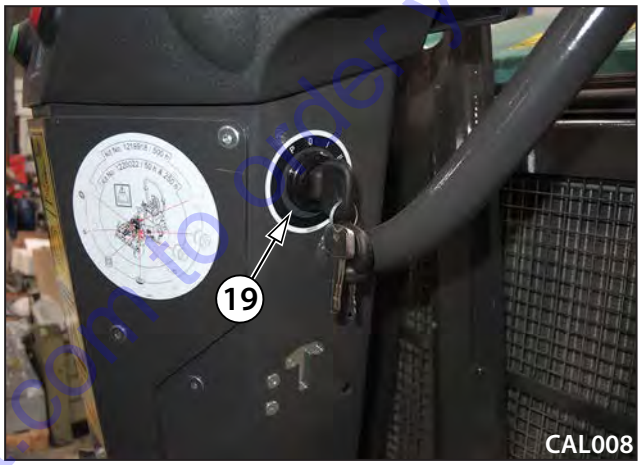


- Switch over with the UP and DOWN arrows (2) until the value of 932.0 °F appears on the display.



- Mount the cover.

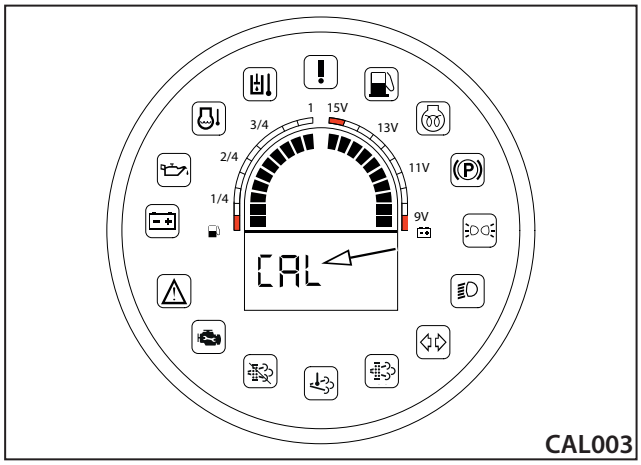
Turn the key in the ignition box to the "I" position.

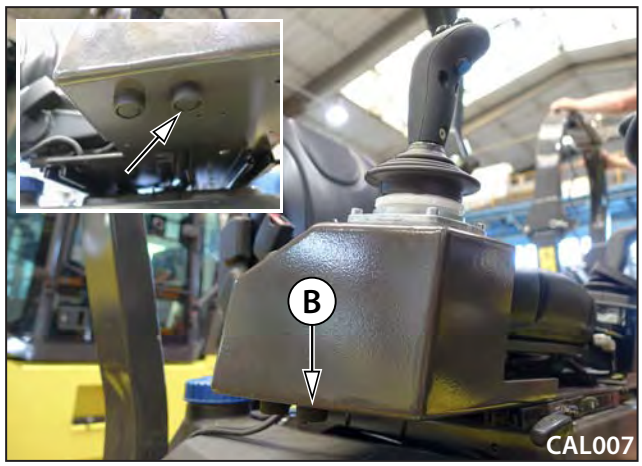


Sit in the driver's seat (activation of the seat switch).

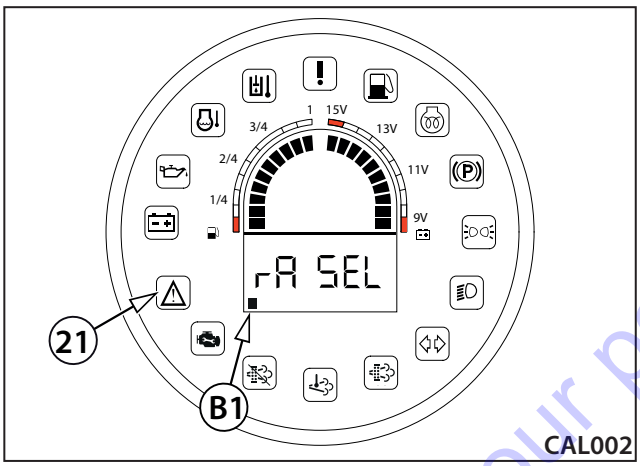
Set the travel control to the parking brake position "P".

Press the calibration button (B) for 5 seconds. While the button is held down, the display shows the "CAL" status.

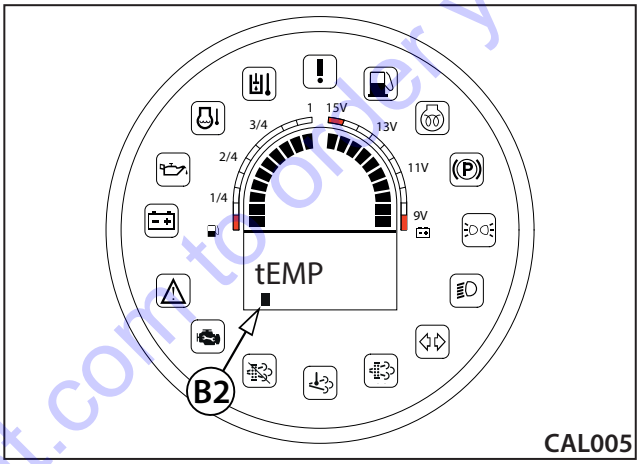




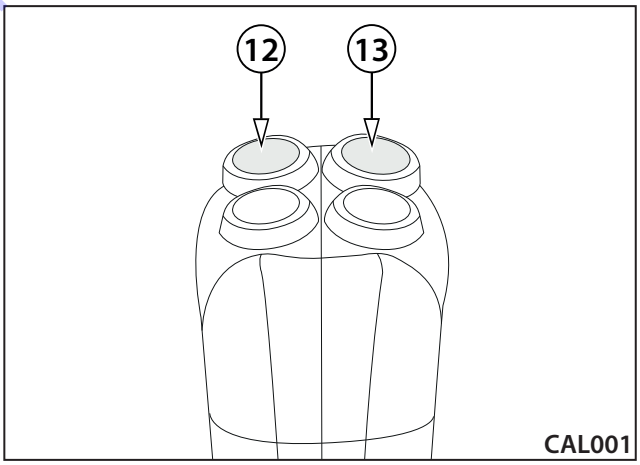
After 5 seconds, the display shows B1 and, at the same time, the error message indicator lamp (21) starts flashing.



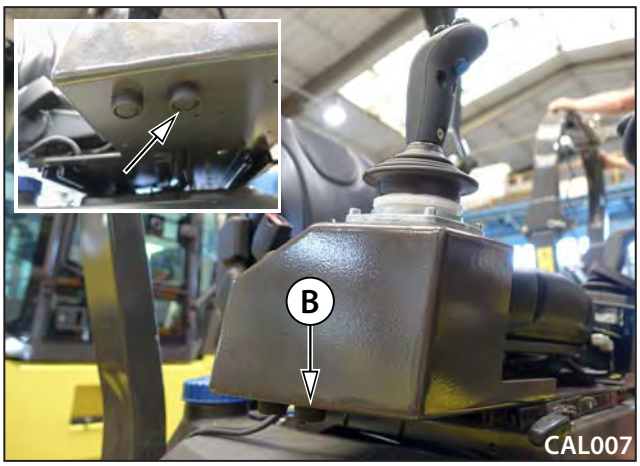
Using the Select button (13), scroll to the B2 tab (Fahrenheit/ Celsius temperature unit selection) and press OK (12) to confirm.



Use the Select button (13) to set the desired unit and press OK (12) to confirm.



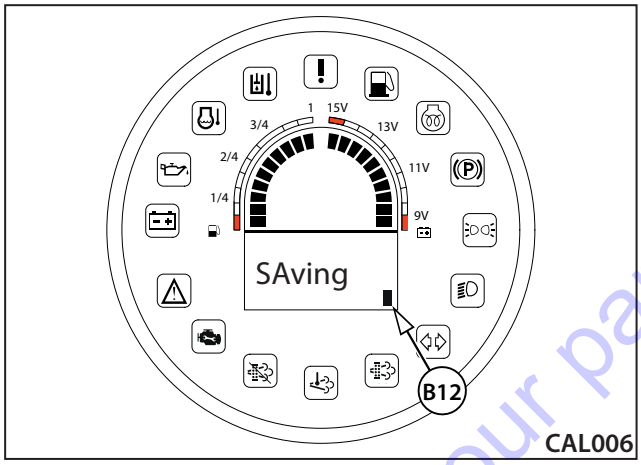
Use the Select button (13) to scroll to the B12 tab and press the calibration button (B) for 5 seconds.



While the button is held down, the display shows the “Saving” status.

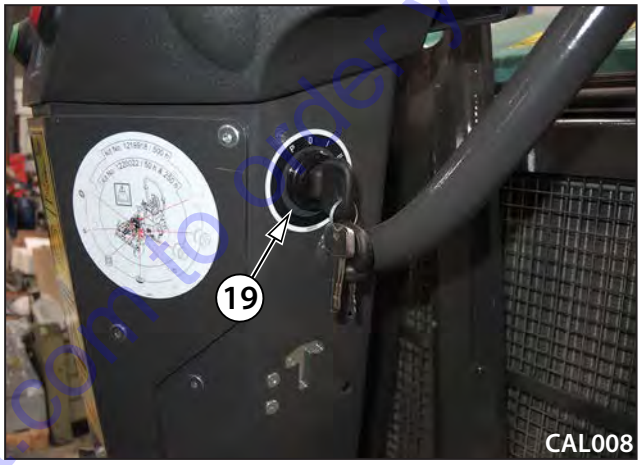
If the parameters are OK, they are saved and the display shows the “Saved” status.

If the set parameters are not OK, the display shows the “Error” status. The set parameters are not saved and the whole process must be repeated.



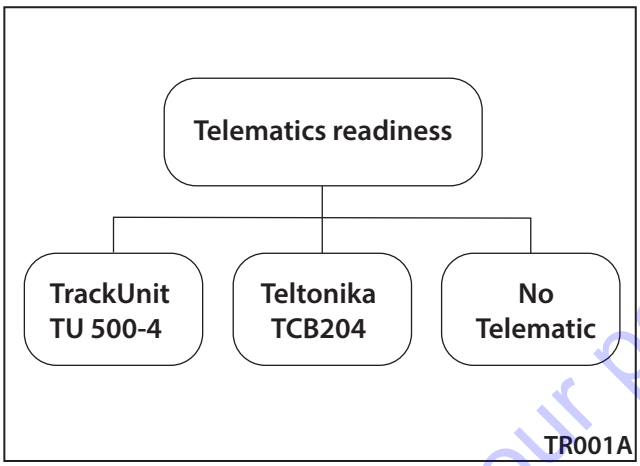
To complete the setting, switch off ignition by turning the key in the ignition box (19) to the “0” position.

To exit the calibration mode without saving, switch off ignition or press the calibration button for 5 seconds when the tab is not set to B12.



Start the engine. The display will show the measured value in degrees Fahrenheit or Celsius.

2.7.10 Telematics readiness



Global positioning system with telemetry that monitors operating systems of the machine (machine start, engine speed, fuel consumption, number of engine hours, etc.) and its current position.

The GPS system allows the geofencing function (machine operation limited to a defined area) and remote machine monitoring, which helps finding a stolen machine.

Note

The availability and content of the given data depends on the selected manufacturer of the telematics system.

Turn off the battery disconnector before installation or maintenance.

Installation shall only be carried out by trained personnel according to the wiring diagram.

In case of a failure, contact your dealer or Ammann Technical Support.

2.7.11 Edge cutter (optional equipment)

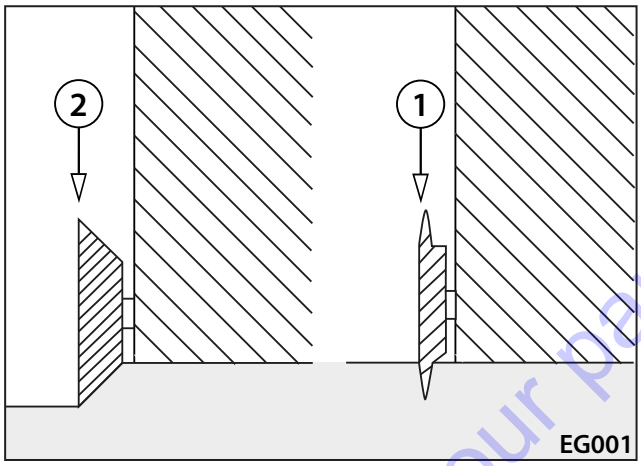
The edge cutter set contains a cutting and compaction disc.

The cutting disc (1) is used to cut the road at the desired location and align the road edges.

The compaction disc (2) is used to finish the compaction of road edges.

Note

If one of the discs is not in use, attach it to the holder provided.

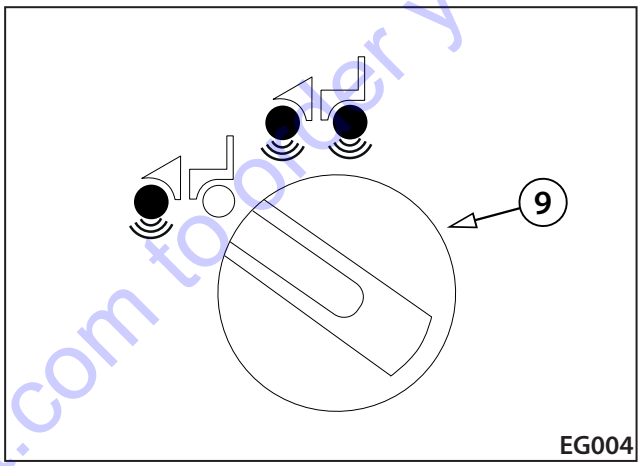


Edge cutter pre-adjustment

Before working with the edge cutter, set the vibrating drum selector (9) to the left (front drum).

Note

The edge cutter only works flawlessly with a pre-adjusted edge cutter.



Control procedure

Set the desired height of the edge cutter using its up (15) and down (16) button.

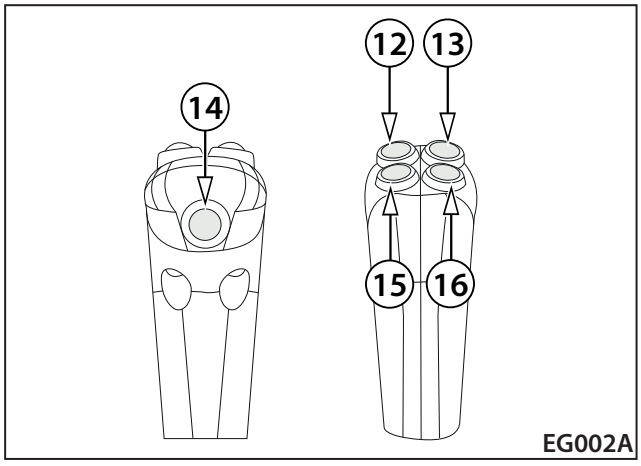
Make sure nobody is endangered when the edge cutter is started.

Turn on drum sprinkling using the sprinkling button (13).

Turn on edge cutter sprinkling using the edge cutter sprinkling button (14).

Note

The water inlet of edge cutter sprinkling only works when continuous drum sprinkling is on.



Turn on vibration with the vibration switch (12).

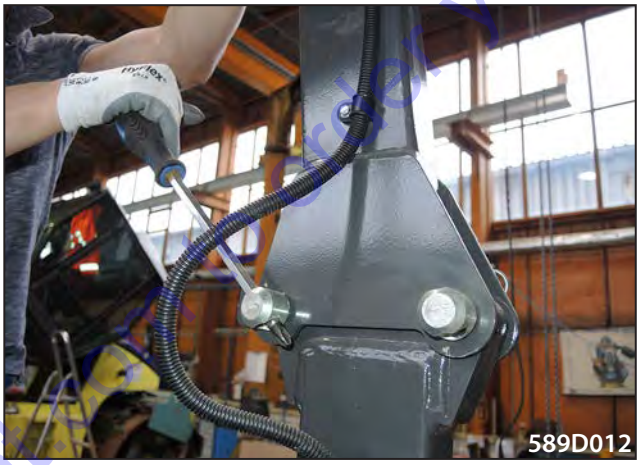
Note

After turning on vibration, the edge cutter automatically rises and is inoperative.

2.7.12 ROPS lifting and lowering

ROPS lifting

Lift the ROPS to the vertical position and mount the front screws of the ROPS on the left and right side.



Mount the cotter pins.

ROPS lowering

Remove the split pins.

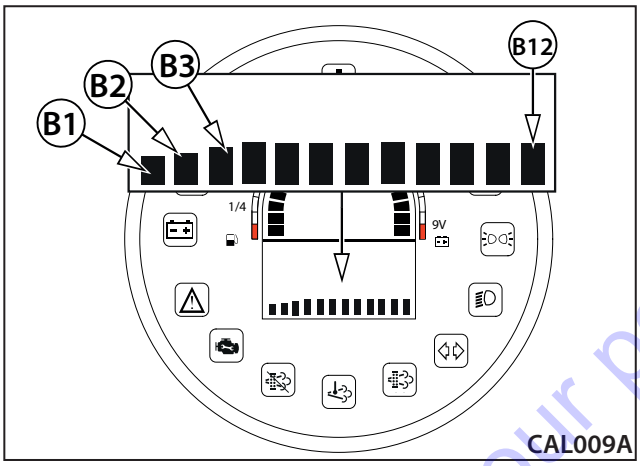
Dismount the front frame screws on the left and right sides.

Tilt the ROPS safety frame to the back and secure it in a suitable way.

Tilt and lift the ROPS with the help of another person.
There is a risk of injury from the falling ROPS.
Do not operate the machine when the ROPS is lowered. There is a risk of fatal injury.
Lower the ROPS only during the transport.

The tightening torque of the ROPS screws is 147 Nm.

2.7.13 Calibration mode



Tabs

B1 Ramp selection (rA SEL)

- selection of the Hard value
- selection of the Soft value
- return one level

B2 Fahrenheit/Celsius temperature unit selection (tEMP)

- selection of the Fahrenheit value
- selection of the Celsius value
- return one level

B3 Left lever selection (LEFtLu)

- selection of active lever
- selection of inactive lever
- return one level

B12 Save and exit (SAvE)

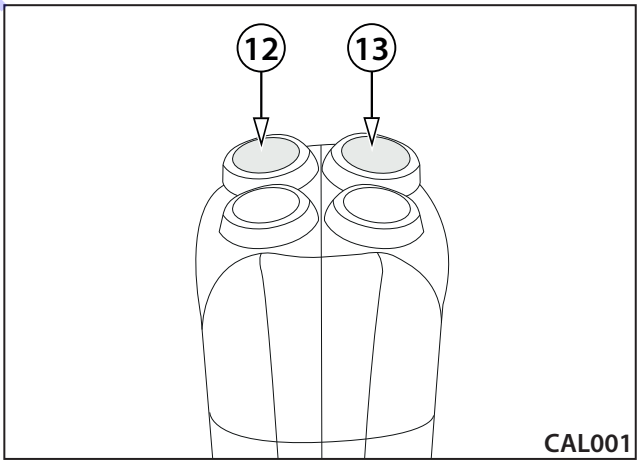
- Values saved
- Error saving values

Control

In the following text, the “OK button” means the vibration button (12). The “select button” means the sprinkling button (13). These buttons only work on the right travel control.

Press the select button (13) to scroll through tabs B1 to B12 and parameters of the given folders.

Use the OK button (12) to confirm your selection.



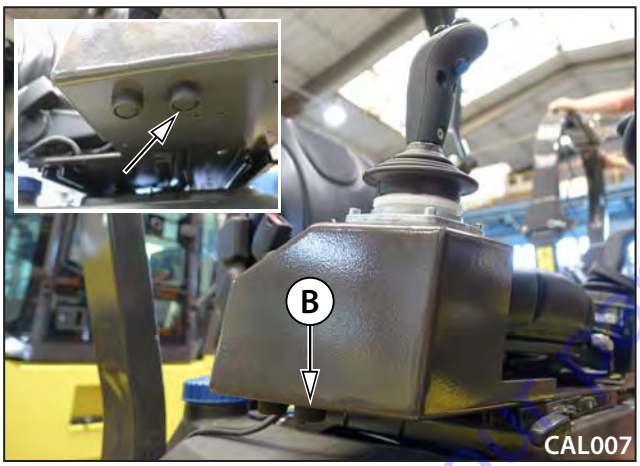
Calibration procedure:

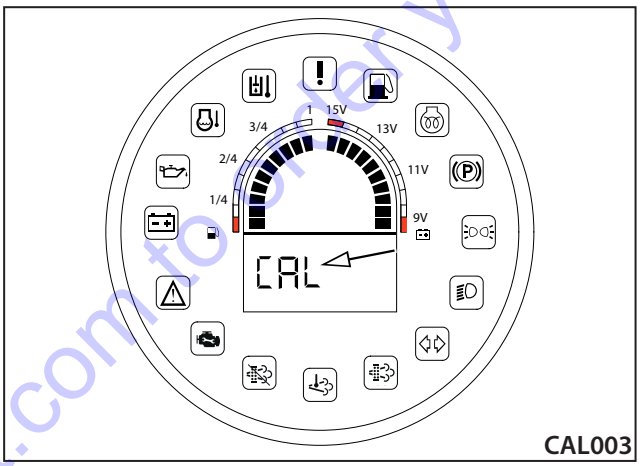
Turn the key in the ignition box to the "I" position.

Sit in the driver's seat (activation of the seat switch).

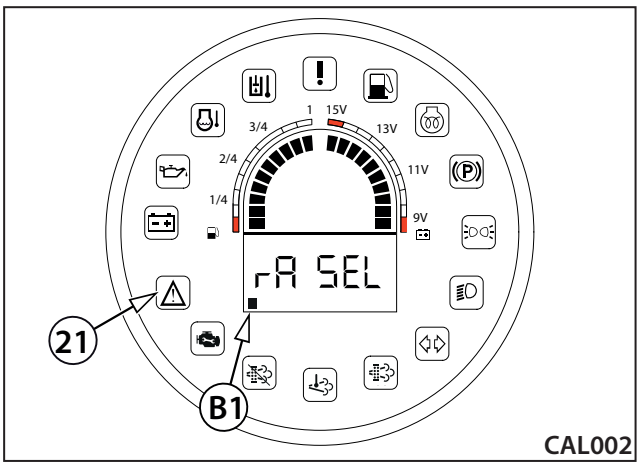
Set the travel control to the parking brake position "P".

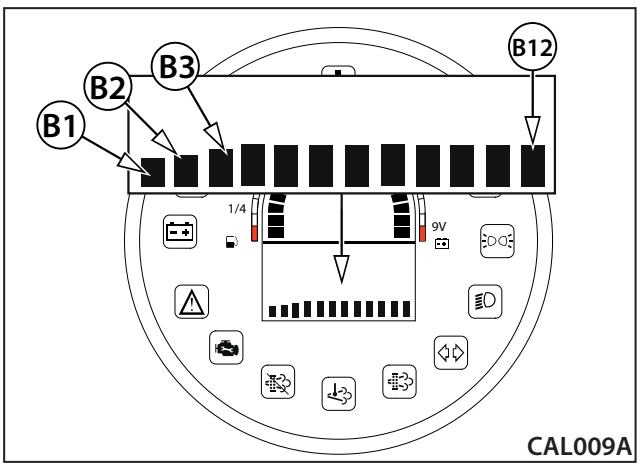
Press the calibration button (B) for 5 seconds. While the button is held down, the display shows the "CAL" status.





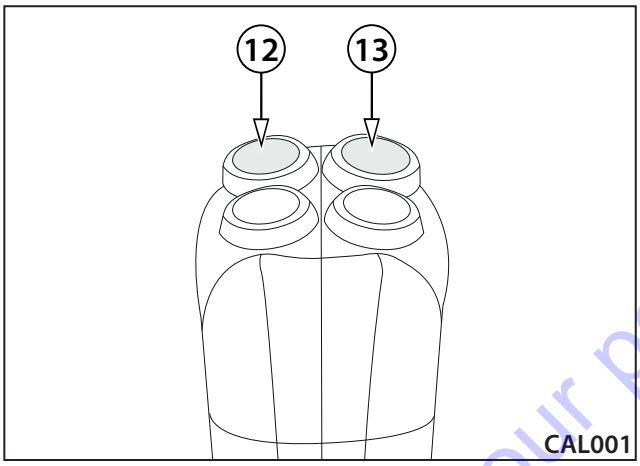
After 5 seconds, the display shows B1 and, at the same time, the error message indicator lamp (21) starts flashing. The error message indicator lamp (21) flashes for the duration of the calibration mode.



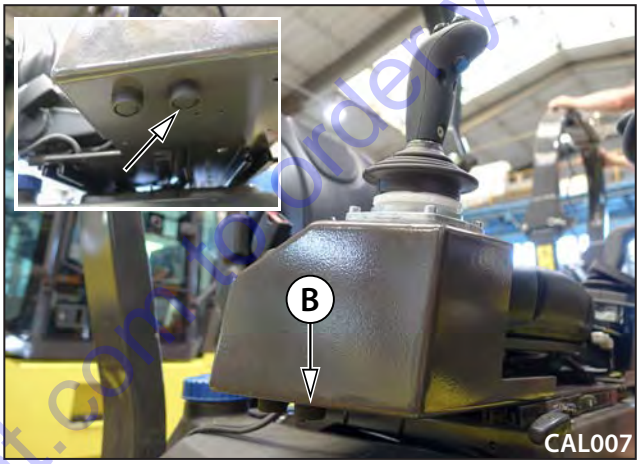


Use the select button (13) to select the tab and press OK (12) to confirm. The display will show the current state of the set parameter (e.g. SOFT when choosing the ramp – B1).

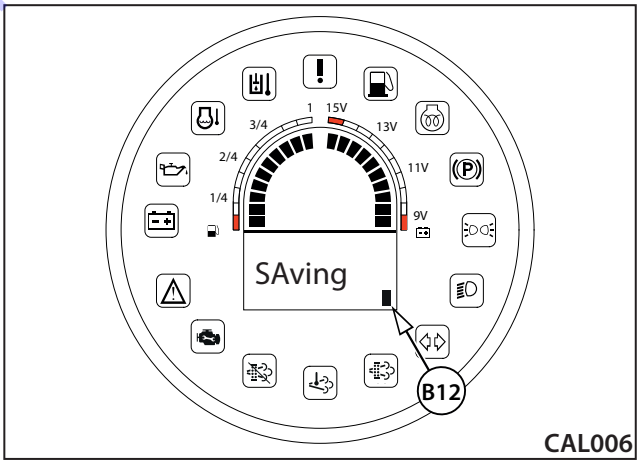
Select the parameter and press OK to confirm (12).



After all required parameters are set, set the B12 tab and press the calibration button (B) for 5 seconds.



While the button is held down, the display shows the "Saving" status.



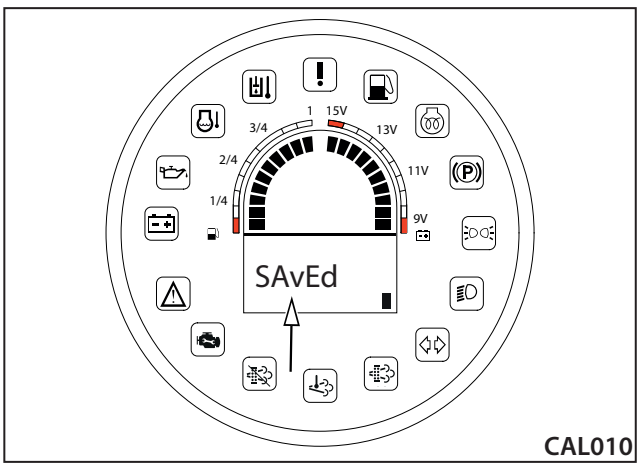
If the parameters are OK, the data saved and the display shows the "Saved" status.

If the set parameters are not OK, the display shows the "Err" status. The set parameters are not saved and the whole calibration must be repeated.

To complete the calibration, switch off ignition by turning the key in the ignition box to the "0" position.

To exit the calibration mode without saving, switch off ignition or press the calibration button for 5 seconds when the tab is not set to B12.

In caseof an error, the display shows the B12.c "Error" message. The ignition then must be switched to the "0" position.



Possible errors:

Error saving new values (the value is out of the permitted range).

Engine start/stop in calibration mode.

2.7.14 Principles of use of the machine with a diesel particulate filter (DPF)

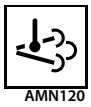
2.7.14.1 Diesel particulate filter (DPF)

- It absorbs solid particles contained in exhaust gases and reduces fine dust in the emissions produced by diesel engines.
- Conditions for maintaining the DPF in a fully functional state.
  - Use fuels with low sulphur content (according to Chapter 3.2.2).
  - Use only the oil recommended by the engine manufacturer (according to Chapter 3.2.1).
  - Do not interfere with the DPF, do not tamper with it.
  - When operating the machine, do not leave the switch in the DPF regeneration suppression position. Operate the machine only when the switch is in the AUTO position.
  - Replace the DPF after 6000 hours or after 5 years at the latest.
  - Avoid short engine operating times and low engine load (long engine idling times).

2.7.14.2 Diesel particulate filter (DPF) regeneration

- A process in which accumulated solid particles burn in the diesel particulate filter.
- During regeneration, keep away from flammable or explosive materials and do not touch any part of the particulate filter system.
- The diesel particulate filter regeneration can be done in three ways:
  - passive regeneration
  - active automatic regeneration
  - active parking regeneration
- The following table explains the indicator lamps displayed on the screen with the regeneration switch set to the AUTO position. If the indicator lamps are different, set the regeneration switch to the AUTO position and follow the table.

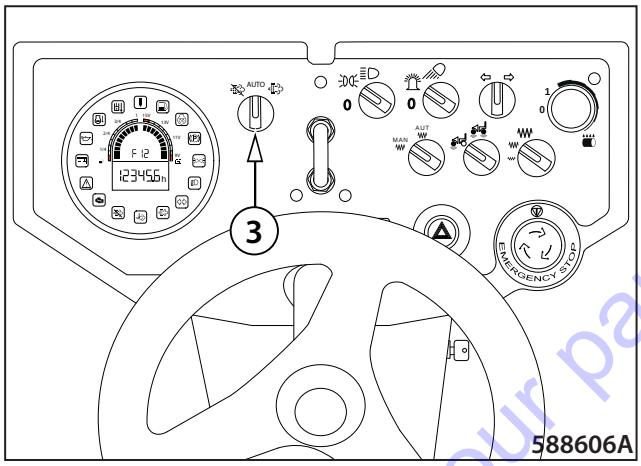
Before the start of regeneration			
 AMN120 **Indicator lamp of high exhaust gas temperature**	 AMN118 **DPF clogging indicator lamp**	**Description**	**Procedure**
Off	Off	DPF does not require regeneration	
Lighting	Lighting/flashing	Active automatic regeneration in progress	According to Chapter 2.7.14.2.2
Off	Lighting/flashing	Active parking regeneration required	According to Chapter 2.7.14.2.3

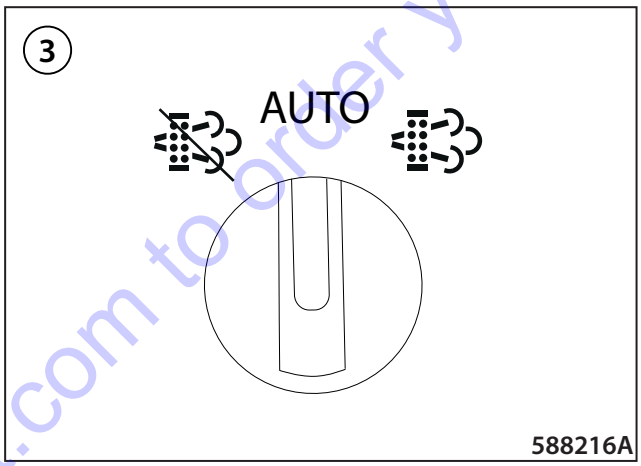
Regeneration progress			
 AMN120 **Indicator lamp of high exhaust gas temperature**	 AMN118 **DPF clogging indicator lamp**	**Description**	**Procedure**
Lighting	Lighting/flashing	"Active automatic regeneration in progress Active parking regeneration in progress"	According to Chapter 2.7.14.2.2 According to Chapter 2.7.14.2.3

End of regeneration			
 AMN120 **Indicator lamp of high exhaust gas temperature**	 AMN118 **DPF clogging indicator lamp**	**Description**	**Procedure**
Off	Off	Correct diesel particulate filter (DPF) cleaning performed	
Off	Lighting/flashing	Correct diesel particulate filter (DPF) cleaning not performed	Contact AMMANN / KUBOTA service

2.7.14.2.1 Passive regeneration

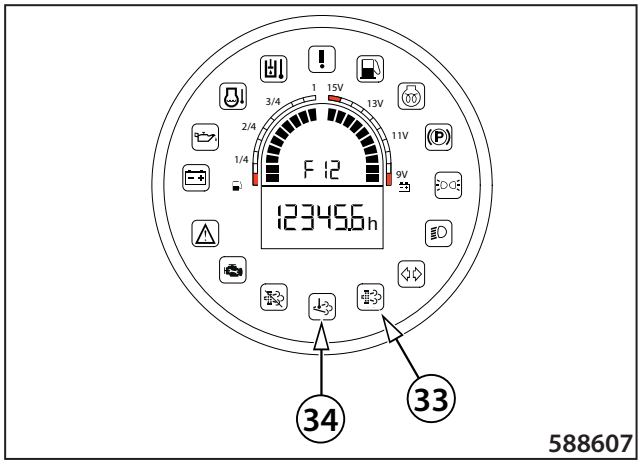
- Occurs due to high exhaust gas temperature independently of the degree of DPF clogging.
- To enable the start of regeneration, the switch (3) must be in the AUTO position.
- The regeneration starts and stops without any interaction between the operator and the machine.





2.7.14.2.2 Automatic active regeneration

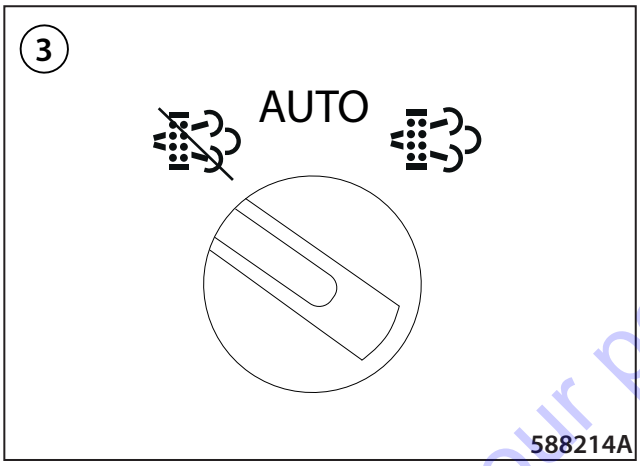
- It is a controlled regeneration, during which higher temperatures are reached in the exhaust system using additional fuel injection into the exhaust gases to achieve smooth active regeneration process.
- To start the regeneration, the switch (3) must be in the AUTO position.
- Work with the machine is not interrupted.
- Do not suppress regeneration, do not reduce engine power and do not turn off the engine. Suppression of the regeneration can result in DPF damage.
- Once the DPF is cleaned, the process automatically stops.



The duration of automatic regeneration depends on the conditions of use and the engine temperature.

When the regeneration is suppressed, the diesel particulate filter (DPF) may get damaged.

2.7.14.2.2.1 Suppression of DPF regeneration



Active automatic DPF regeneration can be suppressed by switching over the regeneration switch (3) to the left position – regeneration switched off. Suppress regeneration only when absolutely necessary (e.g. when working indoors).

After interrupting the regeneration process, make sure that the regeneration switch (3) is returned to the AUTO position.

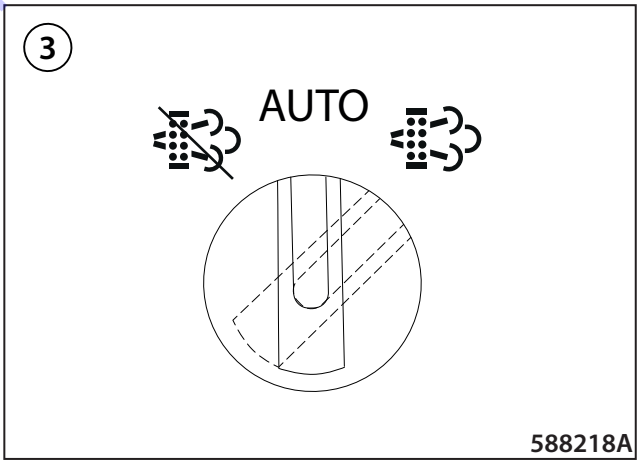
Do not suppress regeneration unless is it absolutely necessary.

Long-term and/or repeated suppression of regeneration results in DPF damage.

After the regeneration has been completed, let the machine run for at least 10 minutes at idle speed to remove excessive heat generated during the process from the engine compartment.

Ignoring a request of the machine for regeneration results in DPF damage.

2.7.14.2.3 Active parking regeneration



Regeneration is required if the filter clogging exceeds a limit when it is not possible to clean the filter in the above ways.

Before starting regeneration, follow these steps:

- Place the machine on a level and firm surface in an open and well-ventilated area.
- Keep away from flammable or explosive materials.
- Warm up the machine to the operating temperature. The coolant temperature must be around 50 °C.
- Set the travel control to the parking brake position "P" – engine idle speed.
- The fuel tank must be filled to at least ¼ of the maximum capacity.

Note

Interfering with any of the above controls during active regeneration will automatically stop the regeneration process.

After starting the regeneration, hold the switch (3) in the right position for 2 seconds. After regeneration starts, the engine speed increases.

Do not turn off the engine or suppress the regeneration during regeneration.

Once the DPF is cleaned, the process automatically stops and the engine speed decreases.

Regeneration takes approximately 25–45 minutes depending on ambient conditions and the degree of filter clogging.

Note

If the indicator lamps do not turn off at the end of regeneration, contact KUBOTA / AMMANN service.

After the regeneration has been completed, let the machine run for at least 10 minutes at idle speed to remove excessive heat generated during the process from the engine compartment.

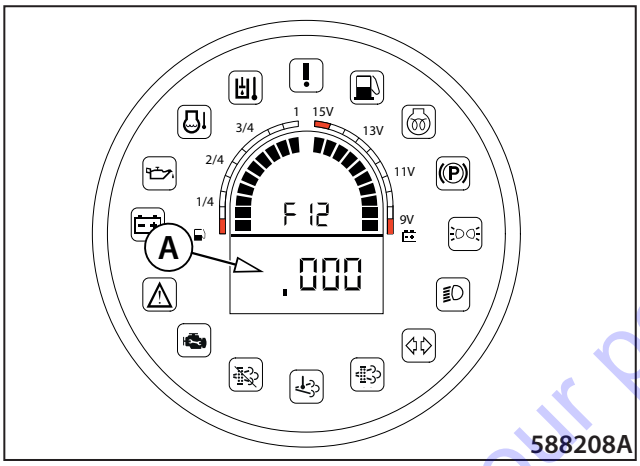
Do not suppress the regeneration and do not turn off the engine during regeneration. The diesel particulate filter (DPF) may get damaged.

Risk of burns. Keep away from flammable or explosive materials.

2.7.14.3 Diesel particulate filter (DPF) clogging

Switching the key in the ignition box (20) to the "I" position displays DPF clogging.

First, a soot clogging value – SOOT (A) – is displayed for a period of 3–5 sec. DPF clogging is reduced after regeneration depending on the previous DPF degree.



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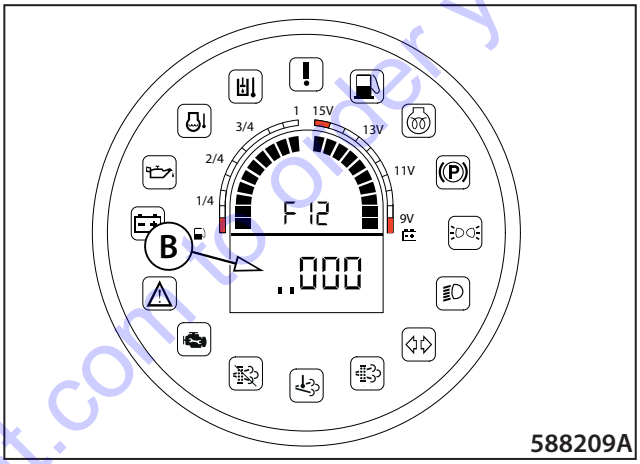
Subsequently, an ash clogging value – ASH (B) – is displayed for a period of 3–5 sec.

The soot clogging value (SOOT) and ash clogging value (ASH) displays are only for checking that the active parking regeneration is correctly performed.

When the diesel particulate filter is properly cleaned, the SOOT value decreases and the ASH value increases.



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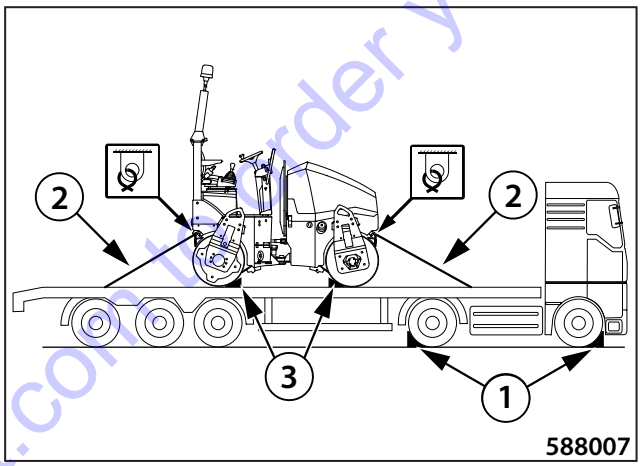
- The machine can move on its own within the work site.

When driving, observe the safety measures applicable to the working site.

- The machine should be transported on a vehicle on public roads.



When transporting the machine on a vehicle, observe regulations applicable to the given territory.

Use the loading mode to load the machine. Switch over the travel mode selector (4) to position "0".

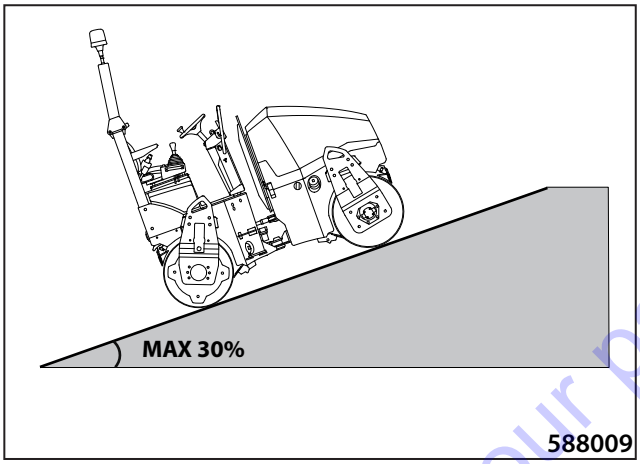
When loading and unloading, the vehicle transporting the machine must be braked and mechanically protected against accidental movement using wedges (1).

The articulation joint of the machine must be secured with a strut against tilting on the vehicle.

The machine on the vehicle must be properly anchored and mechanically secured with the slings (2) in tie-down holes against longitudinal and lateral displacement as well as against overturning. The machine drums must be secured against accidental movement using wedges (3).

2.8.1 Loading the machine

Use a loading ramp or a crane to load the machine onto the transport vehicle.



2.8.1.1 Loading the machine using a ramp

When loading the machine using a ramp, all safety regulations related to loading of the machine valid in the place of loading must be adhered to. The ramp must have appropriate loading capacity, slip-resistant surface and must be stored on a flat surface. We recommend that you adhere to the BGR 233 regulation.

The maximum allowable inclination of the access ramp is 30%.

Use the loading mode to load the machine. Switch over the travel mode selector (4) to position "0".

When loading the machine, another person must be present to give hand signals for the driving onto the ramp. See the list of hand signals in chapter 2.1.6.

Pay increased attention when loading the machine. Improper handling can cause serious injury or death.

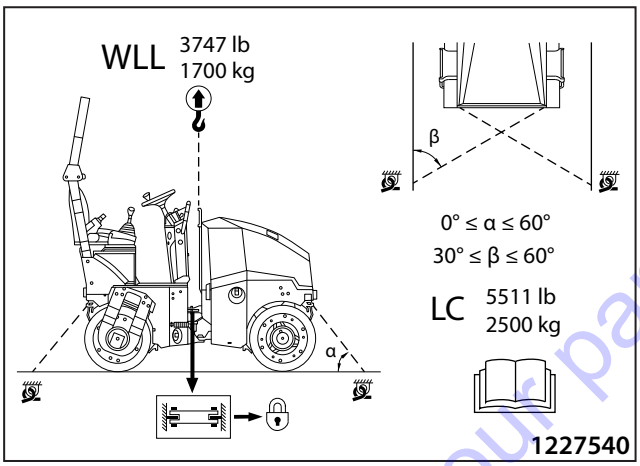
Non-adherence to the prescribed parameters of the access ramp may result in damage to the machine.

2.8.1.2 Loading the machine with a crane

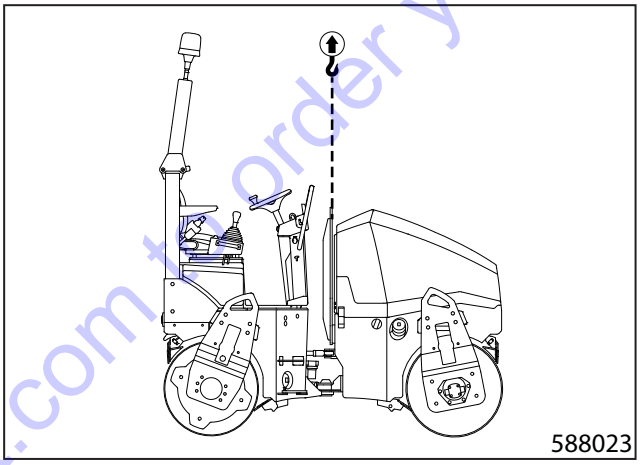
For loading with a crane, the machine is provided with a 1-point or 4-point suspension.

Use a crane with a sufficient load capacity.

Observe the relevant national safety measures when loading th emachine with a crane.



Before lifting, the articulation joint of the machine must be secured with the strut 1 against tilting and secured with the pin 2 and the lock 3.



Observe safety regulations while loading and unloading!

Use a crane with a sufficient load capacity!

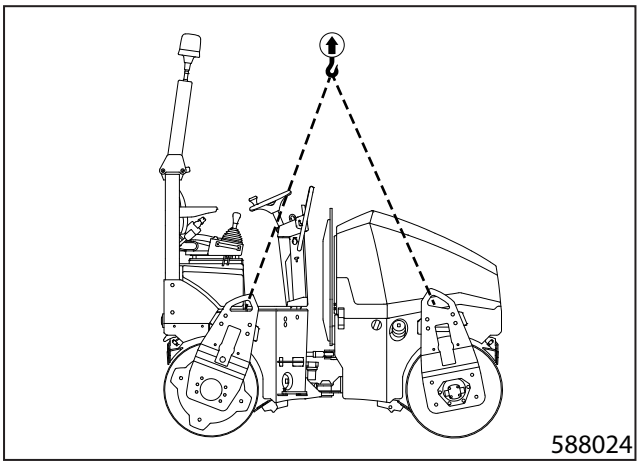
Use corresponding and unbroken hoisting slings with a sufficient load capacity!

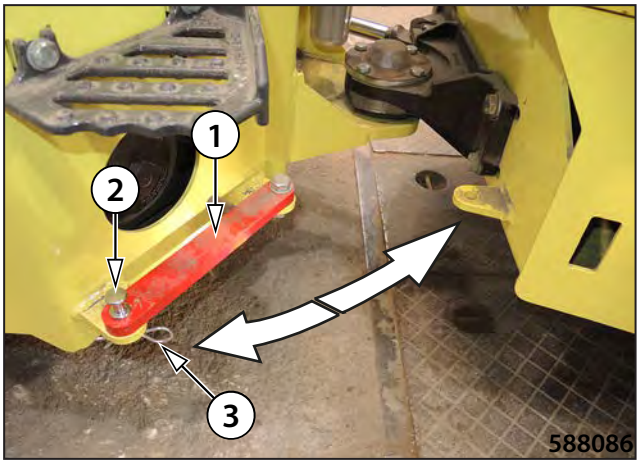
The machine must be tied to the 4-point or 1-point suspension!

The maximum permissible working load for the one-point suspension is 2.7 tons.

Only a trained person (slinger) may carry out the tying of the machine!

Do not enter under the lifted load!

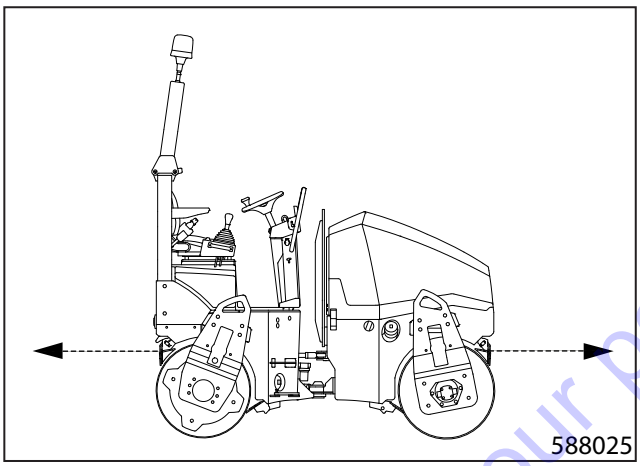




2.9 Special conditions to use the machine

2.9.1 Towing the machine

The machine is provided with two towing lugs on the front frame and with two towing lugs on the rear frame.

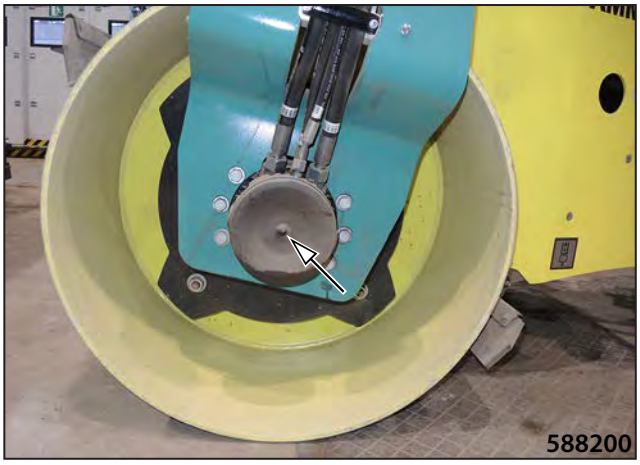


Releasing the machine brake

Secure the articulation joint of the machine against tilting.

Remove the brake discs.

Dismount protective lids on the front and rear travel hydraulic motor.



Mount a brake disc on the front drum travel hydraulic motor.

Tighten the screw by half a turn.

Note

Repeat the same procedure for the hydraulic motor of the rear drum travel.

When the towing is completed, return the machine into its original shape using the reverse procedure.

Towing procedure

- Secure the articulation joint of the machine against tilting.
- Attach the tow ropes or tow bars.
- Pull out the machine from the danger area.

The towed machine must be attached to both tow lugs.

For towing, use undamaged tow ropes or tow bars of a sufficient capacity 1.5 × higher than the weight of the towed vehicle. Do not use a chain for the towing.

It is necessary to maintain the minimal deviation from the direct towing angle. The maximum deviation is possible within 30°.

The towing movement must be smooth. Do not exceed the towing speed by more than 1 km/hour (0.6 mph).

Tow the roller at the shortest distance possible – to rescue when it gets stuck or to remove when it is broken and obstructing. Do not tow for a distance exceeding 10 m (11 yd).

The towing machine should correspond with its size to the damaged machine. It must have a sufficient traction force (power), weight, and brake effect.

While towing downhill using a rope, another towing machine must be connected to the rear part of the damaged machine. In this way you can prevent an uncontrolled motion of the damaged machine.

No person may stay on the towed machine!

Do not touch hot parts of the machine, there is a burn hazard!

2.9.2 Drum offset

In-line position (Y)

In the in-line position, the machine drums are aligned in the same plane.

To adjust the drum from the offset position to the in-line position:

- Lock the strut (5) using the pin (6) and safety pin (7).
- Loosen the screws (3) and move the suspension of the connecting rod (1) to the left and then tighten the screws (3).
- Loosen the screws (4) and move the joint part (2) to the right and then tighten the screws (4).
- Unlock the strut (5) using the pin (6) and safety pin (7).

Offset position (X)

In the offset position, the front drum of the machine is offset to the right side from the rear drum. The drum offset is 40 mm.

To adjust the drums from the in-line position to the offset position:

- Lock the strut (5) using the pin (6) and safety pin (7).
- Loosen the screws (3) and move the suspension of the connecting rod (1) to the right and then tighten the screws (3).
- Loosen the screws (4) and move the joint part (2) to the left and then tighten the screws (4).
- Unlock the strut (5) using the pin (6) and safety pin (7).

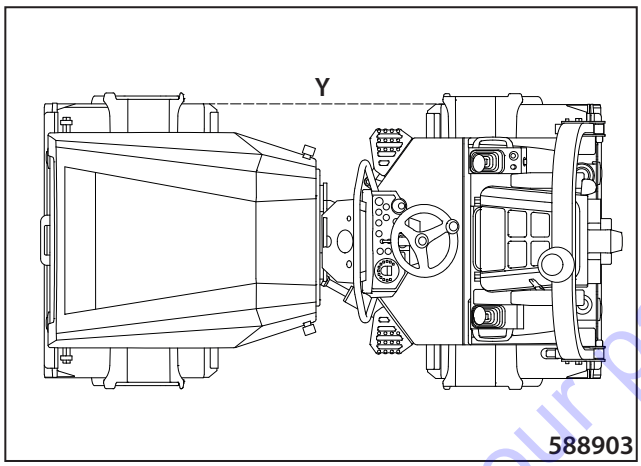
Danger of injury!

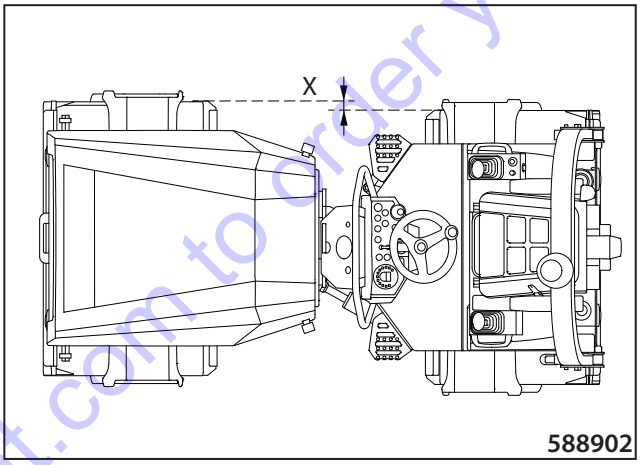
Carry out the drum offset when the engine is not running!

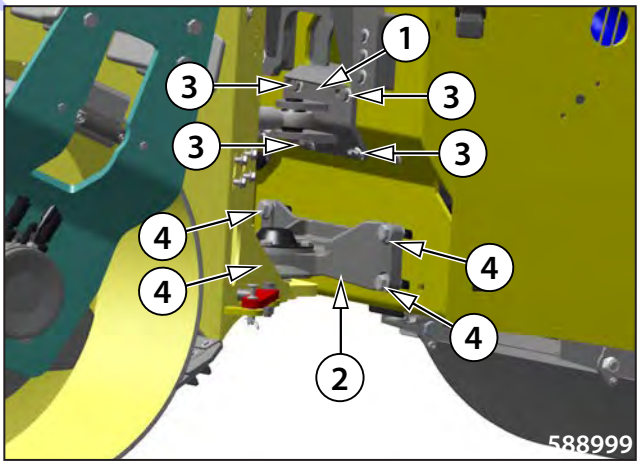
Lock the front and rear frame with the strut (5) in the joint area to prevent squeezing.

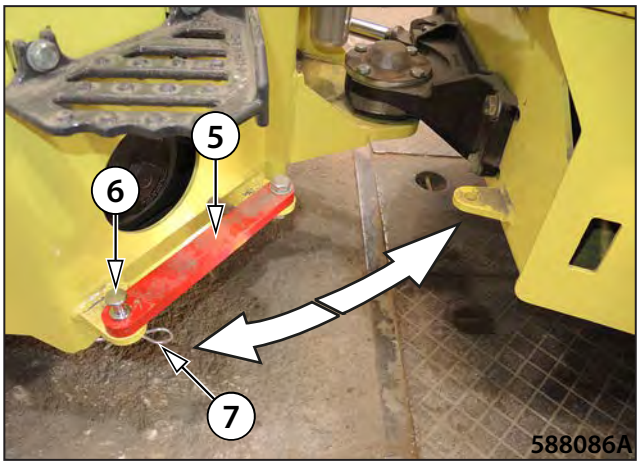
After the drum offset is completed, unlock the front and rear frame using the strut (5) in the joint area.

Make sure there are no persons in the dangerous area of the machine.









2.9.3 Operation of the machine during the running-in period

When putting a new machine into operation or during the first 30 hours after a complete overhaul, do not run the machine at full power!

2.9.4 Machine operation at low temperatures

The compaction in the winter season depends on the content of fine particles and water in the soil being compacted. With the temperature dropping below the freezing point the soil becomes more solid and harder to compact.

At the temperatures below 0 °C (32 °F) it is possible to compact only dry soils (and loose stony materials), or carry out rapid compaction of non-frozen materials (before the soil gets frozen).

Prepare the machine for operation at low temperatures:

- Check concentration of the engine coolant.
- Replace the engine oil with the oil recommended for the range of ambient temperatures.
- Use a hydraulic oil of the corresponding cinematic viscosity.
- Use a winter diesel.
- Check the battery for charging.

The good condition of the battery is a precondition for good starting under low temperatures. The machine can be used at full power only after the operating fluids have been heated to their operating temperatures.

2.9.5 Machine operation under high temperatures and humidity

The engine power output decreases with the increasing temperature and air humidity. Considering that both of the factors reducing the engine power are independent on each other, it is possible to describe their impact as follows:

- every 10 °C (18 °F) of the temperature rise means a power drop by up to 4 % (at a constant humidity).
- every 10 % of the relative humidity rise means a power drop by up to 2 % (at a constant temperature).

At outdoor temperatures when the hydraulic oil temperature is constantly about 90 °C (194 °F), we recommend you to replace the oil with the oil ISO VG 100 having the cinematic viscosity of 100 mm^2/s at 40 °C (104 °F).

2.9.6 Machine operation at high altitudes

With the increasing altitude, the engine power output decreases as a result of the lower atmospheric pressure and specific density of the incoming air.

The engine power depends on the environment, in which the machine is working.

2.9.7 Machine operation in a very dusty environment

While operating in a very dusty environment, shorten cleaning and replacement intervals of air filter cartridges and shorten cleaning intervals of coolers.

The recommended cleaning interval is once a week.

2.9.8 Driving with vibration on compacted and hard materials

When the machine works with vibration on hard materials (e.g. loose stony materials) or materials with a high degree of compaction, the drum can lose its contact with the compacted material (so-called vibro stroke). Due to this condition, the transfer of vibrations to the machine frame and to the operator's stand increases. It can be partly removed by increasing the travel speed or by changing the vibration parameters of the machine (using a smaller amplitude).

If it is necessary to work with the machine in conditions when the operator can be exposed to higher vibrations, the machine user must modify working procedures to protect the driver's health.

Note

When driving with vibration on a different background material than specified in the Specification manual, the emission values of the vibration acceleration will be different – Noise and vibration emissions.

3 MAINTENANCE MANUAL

ARX 23-2
ARX 26-2
(Kubota Tier 4 final)

3.1 Safety and other measures during maintenance of the machine

3.1.1 Safety during maintenance of the machine

Lubrication, maintenance and adjustment works are to be carried out:

by professionally trained personnel

according to safety instructions given in the operating manual

in the intervals specified in the maintenance table. If the table contains two intervals of mandatory maintenance, e.g. every 1000 hours of operation or 1 year, always use the interval that occurs first.

on the machine standing on a flat solid surface and secured against motion (by scotch blocks), always with the engine off, the key removed from the ignition box and the wiring disconnected

on cold machine parts

after the machine, lubrication points and maintenance places have been cleaned

using suitable, undamaged tools

by replacing parts with new original parts according to the spare parts catalogue

by providing sufficient lighting of the entire machine in case of poor visibility and at night

by reinstalling all removed covers and safety elements after the work is completed

by retightening screw connections – with the specified tightening torque, and by checking the connections for tightness

after heating the operating fluids – beware of burns – use only recommended filling charges.

After the adjustment or maintenance is completed, check all safety devices for proper operation!

3.1.2 Fire protection when operating fluids are changed

- Considering the fire danger, the flammable liquids used on the machine are divided into the following hazard classes:

  II hazard class – diesel oil

  IV hazard class – mineral oils, lubricating greases
- The oil change point must be located so that it cannot interfere in the explosion or fire hazard area.
- It must be identified with “No smoking” and “No open fire” signs and signs.
- The handling area must be dimensioned so that it can catch a volume of the flammable liquid equal to the capacity of the biggest vessel, transport container.
- It must be equipped with portable fire extinguishers.
- For handling oils and diesel fuel, use vessels such as metal barrels, jerrycans and sheet-metal cans.
- The transport containers must be properly closed during storage.
- The containers must be provided with one hole, always stored with the hole up and secured so that their content cannot flow out and drip off.
- Containers must be marked by non-removable texts stating the contents and flammability classes.

3.1.3 Ecological and hygienic principles

When operating or maintaining the machines, the user is obliged to follow general principles of health and environmental protection according to laws, ordinances and regulations in individual territories when the machine is used.

Hygienic principles

- Petroleum products, coolants, battery cartridges and paints including thinners are harmful to health. Workers coming into contact with the above products during operation or maintenance of the machine are obliged to follow general principles of their own health protection and comply with safety and hygienic manuals by 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 treat your hands with a suitable reparation cream before eating.
  - follow instructions given in this manual.

- Always store petroleum products, coolants, battery cartridges and paints including organic thinners, and also 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 likelihood of confusion. Possible confusion with foodstuffs or beverages is very dangerous.
- In case of accidental contact with skin, mucosa, eyes or inhalation of vapour, immediately apply the first aid principles. In case of accidental ingestion of these products, immediately seek medical help.
- While working with the machine when it is provided with a platform or the cab windows are open, always use ear protectors of suitable type and version.

Ecological principles

The discarded (dismounted, replaced) operating fluids of the individual machine systems 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 media and batteries
  - cooling system media
  - cleaning and preservative agents
  - all dismounted filters and filter cartridges
- 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 applicable to environmental and health protection.

3.2.1 Engine oil

Engine oil has been specified as per its performance classification and viscosity classification.

Performance classification according to

API (AMERICAN PETROLEUM INSTITUTE)

ACEA (ASSOCIATION DES CONSTRUCTEURS EUROPÉENS D'AUTOMOBILE)

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.

Use of permissible oils according to API: CJ-4

SAE 15W-40 year-round

Note

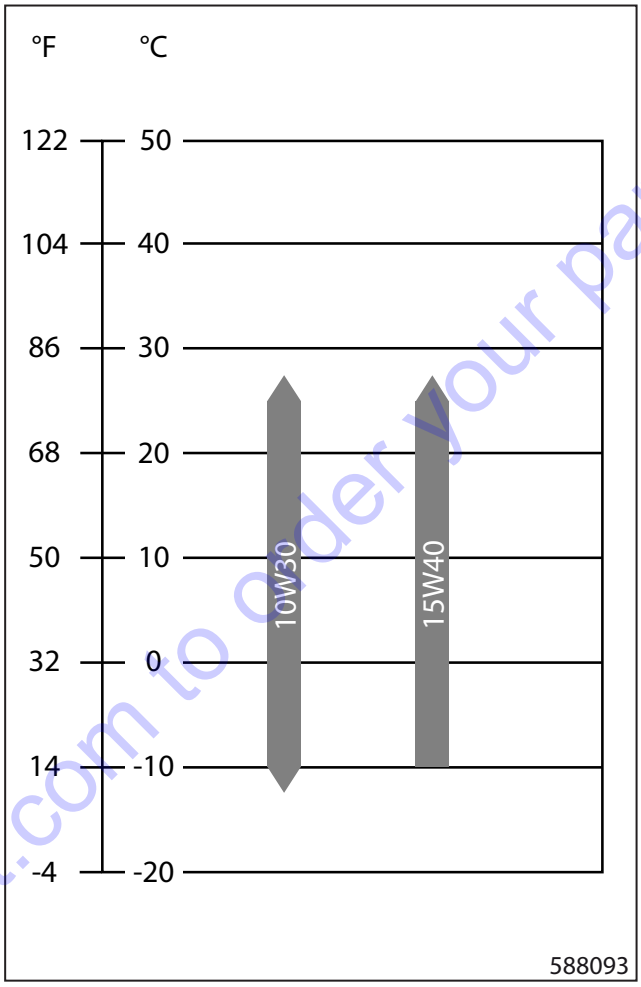
The exceeding of the lower temperature limit does not result in damage to the engine; however, it can cause some difficulties with starting.

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

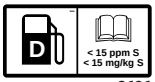
For easy starts at the temperatures below 0 °C (32 °F), the engine manufacturer recommends the SAE 10W-30 oil.

Exceeding the upper temperature limit, considering the reduced lubricating capabilities of the oil must not last for long.

Viscosity diagram



3.2.2 Fuel



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Diesel oil is used as fuel for the engine:

- EN590
- ASTM D975: 1D S15, 2D S15

Note

Do not use fuels with a sulphur content exceeding 0.0015 percent by weight.

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

Mixing diesel with special additives is forbidden.

3.2.3 Coolant

The coolant specification must meet requirements of:

- SAE J1034
- SAE J814c

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 2 years at the latest.

Note

The machines are filled with a cooling solution with the Bantleon Avia Antifreeze NG coolant, specification SAE J 1034 at the manufacturer's during the production.

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

There is an Avia NG label placed at the point to fill the coolant 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.

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

Do not use hard water with a higher content of calcium and magnesium, which brings calculus formation, and with a higher content of chlorides and sulphates, which causes corrosion.

The maximum content of compounds of calcium and magnesium is 170 milligrams – hardness of water.

The maximum content of compounds of chlorine is 40 milligrams.

The maximum content of compounds of sulphur is 100 milligrams.

Safety instructions:

1) Protect your hands with protective gloves.
2) In case of ingestion immediately seek medical treatment.
3) In case of 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.

3.2.4 Hydraulic oil

For the hydraulic system of the machine, it is necessary to use only high-quality hydraulic oil grades according to ISO 6743/HV (equal to DIN 51524 part 3 HVLP).

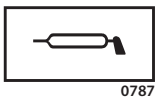
Fill the machines standardly with the hydraulic oil ISO VG 46 with a kinematic viscosity of 46 mm2/s at 40 °C (104 °F). This oil is the most suitable for use in the widest range of ambient temperatures.

Synthetic hydraulic oil

The hydraulic system can be filled with synthetic oil, which, if leakages occur, will be degraded completely by microorganisms living in water and soil.

Always consult any switching from mineral oil to synthetic or mixing oils of various brands with the oil manufacturer or dealer!

3.2.5 Lubricating grease



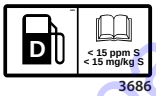
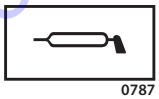
The machine must be lubricated with plastic grease containing lithium according to:

ISO 6743/9 CCEB 2

DIN 51 502 KP2K-30

3.2.6 Emulsion

For sprinkling the tyres, use anti-adhesive emulsion of RHODOSIL EMULSION E1P with water in the mixing ratio of 1.5:100.

Part	Fluid type	Fluid quantity l (gal US)	Brand
Engine	Engine oil according to the chapter 3.2.1.	7 (1,8)	 2412
Fuel tank	Fuel according to the chapter 3.2.2.	35 (9,3)	 3686
Hydraulic system	Hydraulic oil according to the chapter 3.2.4.	28,5 (7,5)	 2158
Steering joint bearings, stirrup bearings, steering swivel pins, suspensions	Lubricating grease according to the chapter 3.2.5.	as required	 0787
Cooling system	Coolant according to the chapter 3.2.3.	6,7 (1,8)	 2152
Sprinkling tank	Water	190 (50,2)	 AMN59
Emulsion sprinkling tank	Emulsion according to the chapter 3.2.6	12 (3,2)	 AMN242

3.4 Lubrication and maintenance chart

Every 20 hours of operation (daily)	
3.6.1	Fuel check
3.6.2	Engine oil check
3.6.3	Engine coolant check
3.6.4	Hydraulic oil check
3.6.5	Hydraulic oil cooler cleaning
3.6.6	Air filter check
3.6.7	Sprinkling emulsion level check
3.6.8	Check of hoses and clips
3.6.9	Sprinkling tank refilling
3.6.10	Scraper adjustment
3.6.11	Inspection of warning and checking devices
3.6.12	Engine tightness check
3.6.13	Check of the fan and engine belt for condition
3.6.14	Brake test
Every 50 hours of operation	
3.6.15	Battery check
3.6.16	Cleaning of the water separator on the fuel filter
After 50 hours of operation	
3.6.21	Engine oil change *
Every 100 hours of operation (weekly)	
3.6.17	Machine lubrication
3.6.18	Tyre pressure check
Every 250 hours of operation (3 months)	
3.6.19	Check of hose and clip fixation
3.6.20	Sprinkling filter cleaning
3.6.21	Engine oil change
3.6.22	Check of hoses of the engine cooler for wear and mounting
3.6.23	Air filter cleaning
Every 500 hours of operation (every 6 months)	
3.6.24	Fuel filter replacement
3.6.25	Electrical installation check

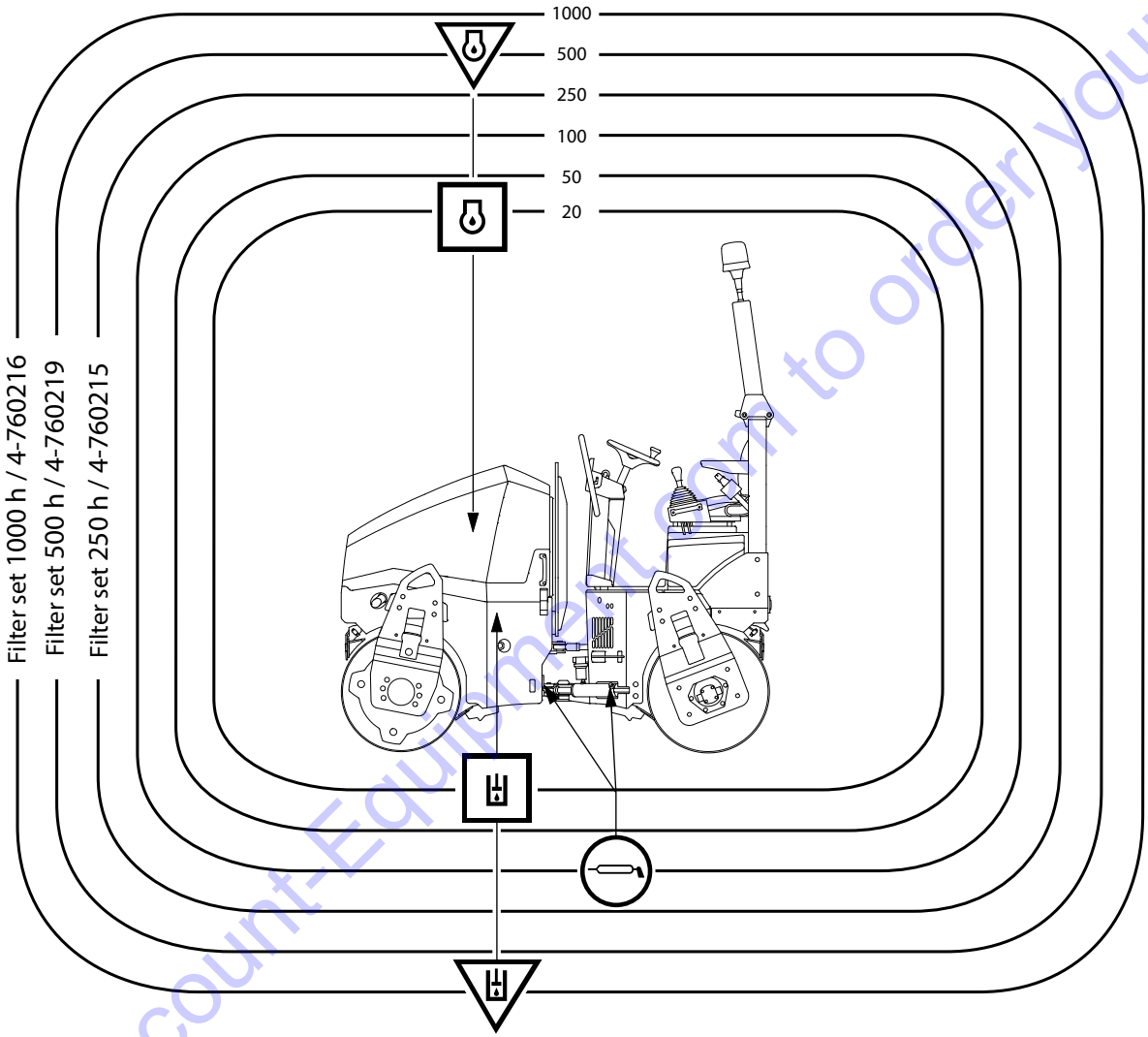
3.6.26	Air filter main cartridge replacement
3.6.27	Oil separator filter replacement
3.6.28	Engine cooler rubber-metals inspection
After 500 hours of operation	
3.6.29	Replace hydraulic oil and filters **
Every 1000 hours of operation (yearly)	
3.6.29	Replace hydraulic oil and filters
3.6.30	Air filter cartridges replacement
3.6.31	Damping system check
3.6.32	Swinging support check
3.6.33	Articulation joint check
3.6.34	Oil separator cartridge replacement
3.6.35	Fuel tank cleaning
3.6.36	Valve clearance check and adjustment
Every 2000 hours of operation (2 years)	
3.6.37	Engine coolant change
3.6.38	Engine belt replacement
Every 3000 hours of operation (3 years)	
3.6.39	DPF cleaning
3.6.40	EGR valve inspection
Maintenance as required	
3.6.41	Gas strut replacement
3.6.42	Cleaning water separator
3.6.43	Water tank cleaning
3.6.44	Machine cleaning
3.6.45	Draining water from the sprinkling circuit before the winter season
3.6.46	Fuel system venting
3.6.47	DPF (Diesel Particulate Filter) clogging regeneration
3.6.48	Charging of the battery
3.6.49	Tightening torques

*** First after 50 engine hours.**

**** First after 500 engine hours.**

LUBRICATION AND SERVICE PLAN

□	CONTROL
○	LUBRICATE
▽	EXCHANGE

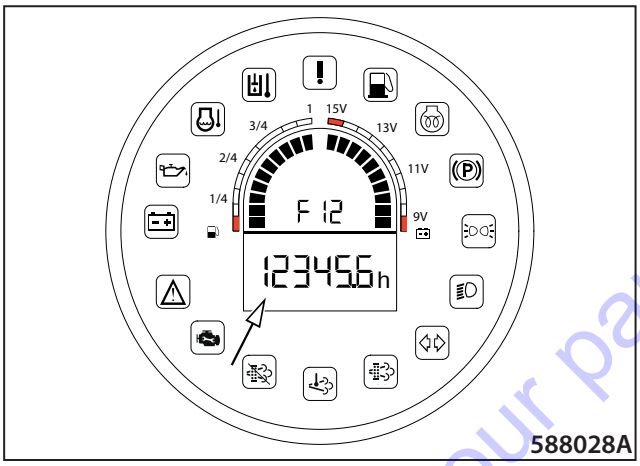


	Engine oil:	**SAE 15W/40**	**API CJ-4**
	Hydraulic oil:	**ISO VG 46 HVLP**	
	Grease:	**ISO 6743/9**	**DIN 51 502**

588036en

The lubrication and maintenance chart contains tasks and instructions that must be followed at certain intervals. If the table contains two intervals of mandatory maintenance, e.g. every 1000 hours of operation or 1 year, always use the interval that occurs first.

The worked hours can be determined by daily reading of the data on the worked hours counter.



This manual includes only basic information about the engine; the other data are given in the operation and maintenance manual, which is a part of documentation supplied together with the machine.

Follow also the instructions given in the engine operation and maintenance manual!

Retighten removed or loosened bolts, plugs, threaded joints in the hydraulic system, etc. with the tightening torque specified in tables in the chapter 3.6.49 unless a different value is given for the respective operation.

Carry out maintenance works with the machine placed on a flat, solid surface and secured against any spontaneous movement, always with the engine off, and the key removed from the ignition box and with the disconnected electrical installation (unless required otherwise).

After the first 50 hours of operation of the new machine (or after a general overhaul), carry out the following operations:

3.6.21 Engine oil change

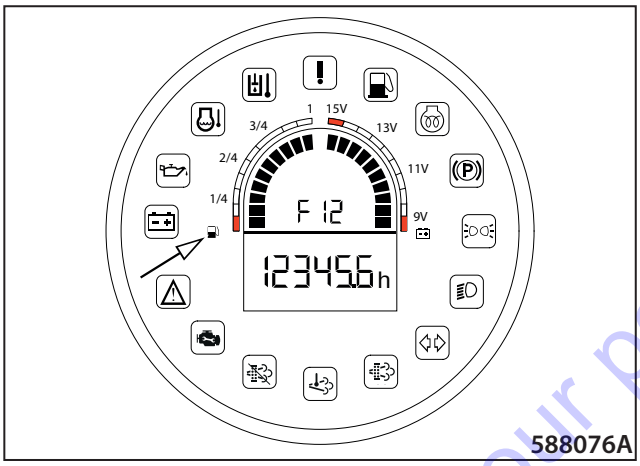
After the first 500 hours of operation of the new machine (or after a general overhaul), carry out the following operations:

3.6.29 Filter hydraulic oil change

Every 20 hours of operation (daily)

3.6.1 Fuel check

Check the fuel level on the dashboard and refill if necessary.



588076A

Clean the tank cap and the filler neck.

Unlock the lock and remove the cap.

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

588038

Note

The fuel tank volume is 35 l (9,3 gal US).

Refill the same oil grade; see the chapter 3.2.2.

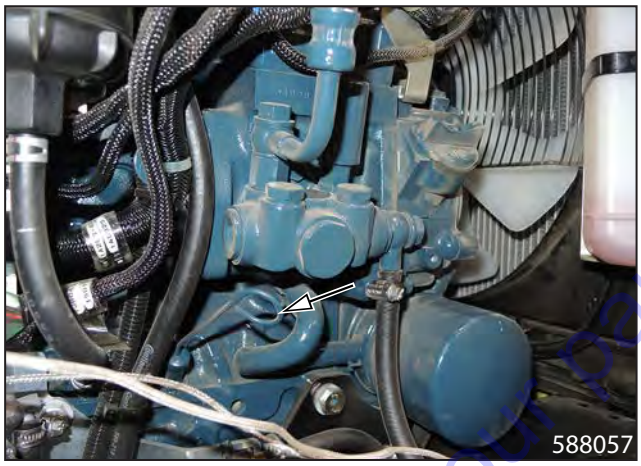
Check the fuel tank and the fuel circuit for leaks.

Do not smoke and do not use an open flame while working.

Do not refill the fuel when the engine is running.

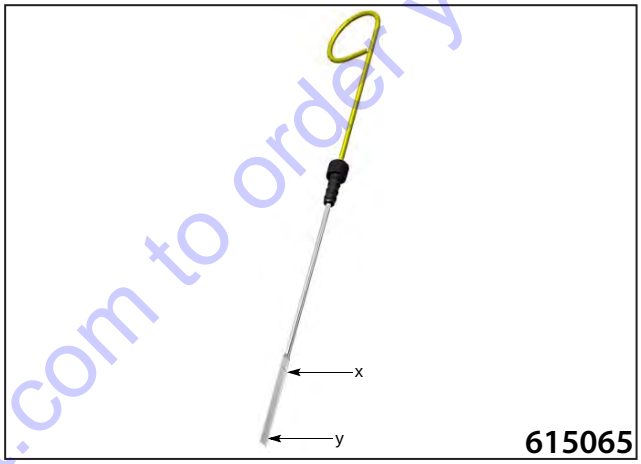
Stop the fuel soaking into the ground.

3.6.2 Engine oil check



Wait for about 5 min. until the oil flows down into the engine sump.

Take out the oil dipstick, wipe it, insert fully back and take it out again to read out the oil level.



Keep the level within the range of gauge marks imprinted in the dipstick. The lower mark shows the lowest possible oil level, the upper mark indicates the highest.

Refill the oil as required.

Refill the engine oil into one of the two filler necks:

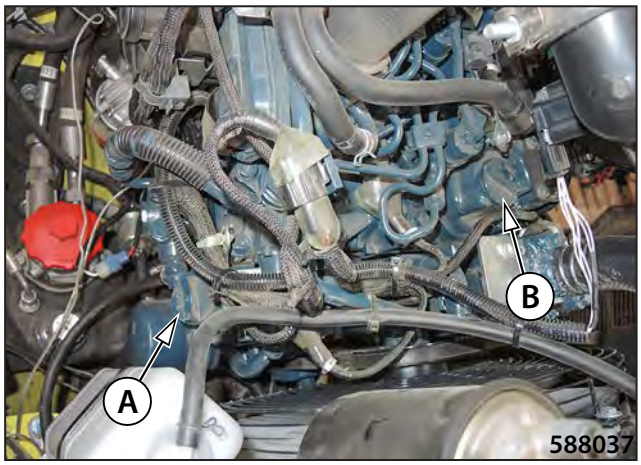
- filler neck on the left side of the engine (A),
- filler neck on the engine (B).

Check the engine for leaks and remove the cause.

Check the engine for damaged and missing parts and for changes in appearance.

Note

The total volume of the oil in the engine is 7 l (1,85 gal US).



Do not use the engine unless the oil level in the engine is correct.

Carry out the check after the oil has been cooled.

Refill only oil of the same grade according to the chapter 3.2.1.

Stop the oil soaking into the ground.

3.6.3 Engine coolant check

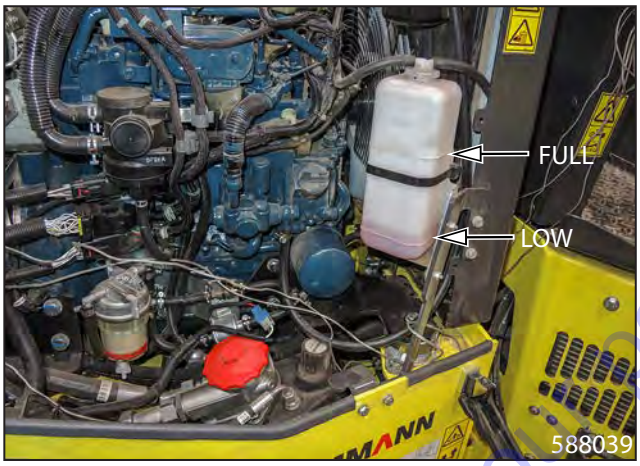
Let the coolant cool below 50 °C (120 °F).

Do visual inspection of the level on the expansion tank. The fluid level must be between the upper (MAX) and the lower (MIN) mark.

Refill the coolant as required. Carry out the refilling through the filler neck.

Note

The total volume of the coolant in the engine is 6,7 l (1,8 gal US).



Remove the filling plug only after the temperature of the engine coolant drops below 50 °C (120 °F). If you remove the plug at a higher temperature, there is a risk of steam or coolant scalding due to an internal overpressure.

The level must not drop below the lower mark.

Only refill the coolant consisting of antifreeze agents on the same basis according to the chapter 3.2.3.

Do not add additives to the engine coolant to remove leaks of the cooling system!

Do not refill a cold coolant into a hot engine. There is a danger of damage to the engine castings.

In case of large losses, find out where the cooling system leaks and repair the cause.

3.6.4 Hydraulic oil check

Check the hydraulic oil level always when the engine is cold but running.

Put the machine on a flat terrain.

Let the engine run at idle.

Check the oil level in the inspection hole.

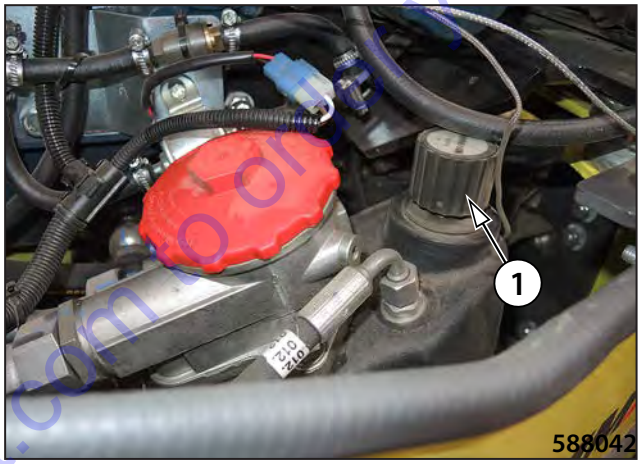
The ideal oil level is when the gauge is half-full.

Hydraulic oil refilling

Take off the ventilation filter (1) from the filler neck.

Refill the required quantity of hydraulic oil.

Screw in the ventilation filter (1) back in place.



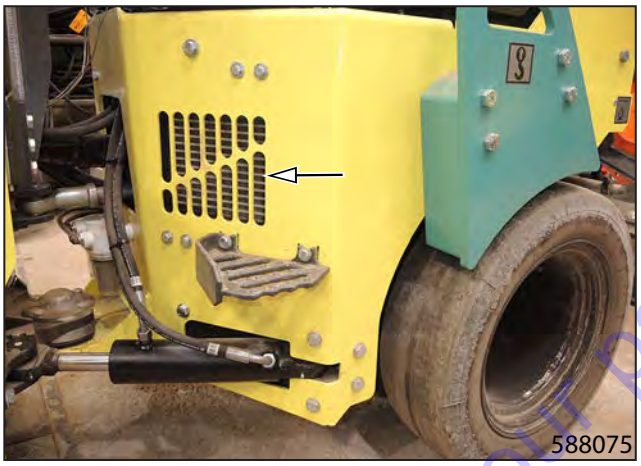
Always lubricate the O-ring before screwing it in place.

Check the oil when it is cooled.

Refill only oil of the same grade according to the chapter 3.2.4

Stop the oil soaking into the ground.

3.6.5 Hydraulic oil cooler cleaning



Check the cooling fins that they are not dirty or clogged.

Clean the fins with water or blow through with compressed air.

When working in a very dusty environment, carry out the cleaning daily. The cooler clogging results in reduced cooling effect and increased temperatures of the engine coolant and hydraulic oil.

Never clean the cooler with high pressure (e.g. with strong water jets).

When the cooler is contaminated by petroleum products, use a cleaning agent and proceed according to the manufacturer's instructions! Find out the cause of contamination!

Do not smoke while working!

Check the hydraulic circuit for leakage.

Follow environmental standards and regulations when cleaning the machine!

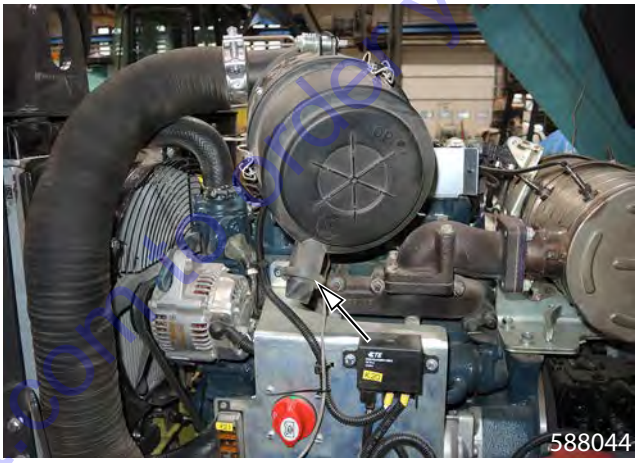
Clean the machine in a workplace equipped with a collection system for cleaning agents to avoid contamination of soil and water!

Do not use forbidden cleaning agents!

3.6.6 Air filter check

Check that the suction hole is not dirty.

Clean the exit slit and squeeze to remove any dust trapped.



Note

Any dust trapped in the dust valve is automatically emptied during operation of the machine.

Replace the dust valve immediately if it is damaged!

3.6.7 Sprinkling emulsion level check

Open the lid.

Remove the tank cap.

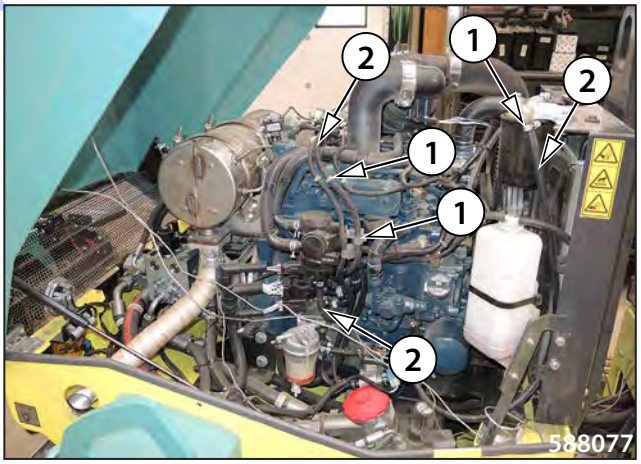
Refill the emulsion.

Refill only emulsion of the same grade according to the chapter 3.2.6.

Stop the emulsion soaking into the ground.

3.6.8 Check of hoses and clips

Check visually clips (1) and fuel hoses (2). If clips are loosened or hoses worn out, ensure remedy.



3.6.9 Sprinkling tank refilling

Check the water level in the tank in the inspection hole.

Open the tank cap and refill with clean water.

Before the winter period, drain the water from the water tank and from the sprinkling system!

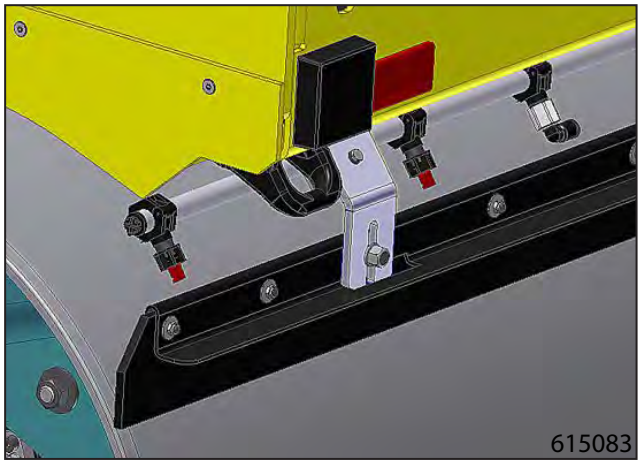
3.6.10 Scraper adjustment

Fixed scrapers (optional equipment)

Loosen the screws and move the scraper so that it is in contact with the drum.

Hinged scrapers (optional equipment)

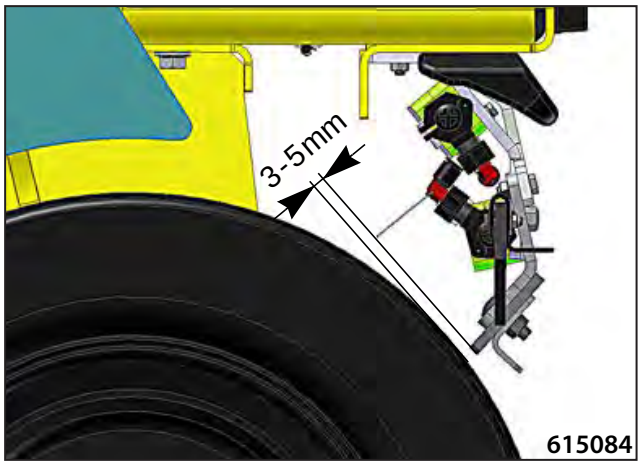
The hinged scrapers can be lifted and lowered manually. Before driving adjust the drum scrapers and move the scraper so that it is in contact with the drum.



Scrapers for the wheel axle

Adjust the tyre scrapers so that there is a gap of 3–5 mm between the scraper and the tyre.

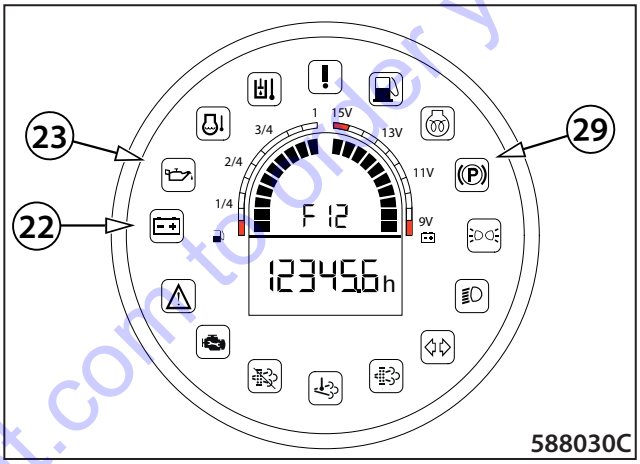
Never wipe off the emulsion.



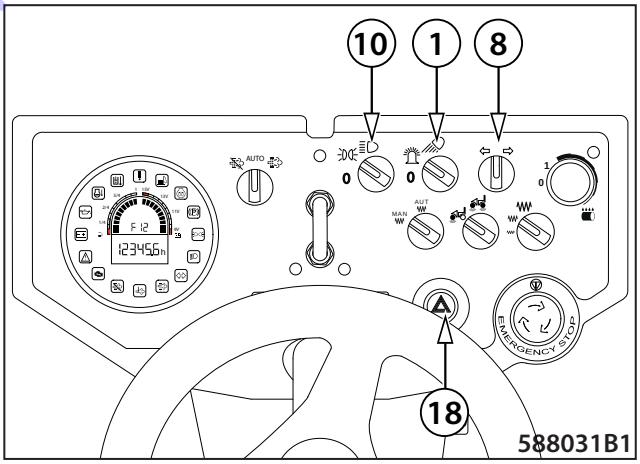
3.6.11 Inspection of warning and checking devices

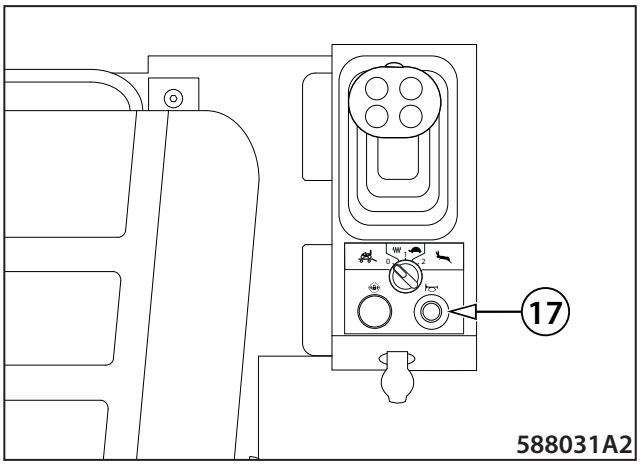
Turn the key in the ignition box to the position I.

The indicator lamps for battery charging (22), engine lubrication (23) and parking brake (29) will light up.



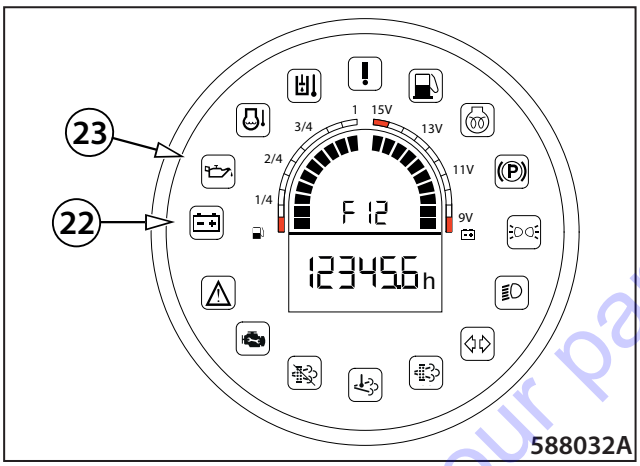
Then test functions of the switches (1, 8, 10, 17, 18).





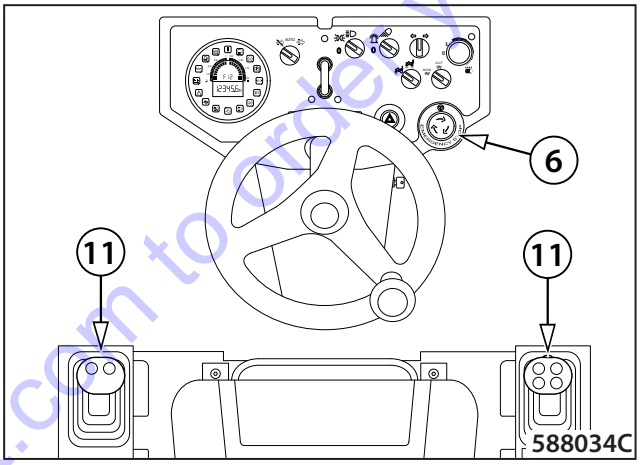
Start the engine according to Chapter 2.7.1.

After the start, the indicator lamps for battery charging (22) and engine lubrication (23) must go off.



Move off the machine:

After the travel control (11) is moved through the neutral position "N", the brake indicator lamp (29) goes out.



Emergency brake button function:

Let the machine stay on the spot and set the travel control to the neutral position (N).

Press the emergency brake button (6).

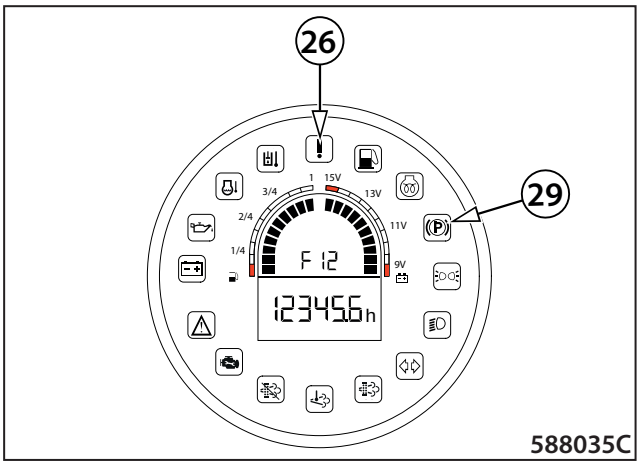
The brake is enabled and the engine stalls.

The emergency stop indicator lamp (26) and the parking brake indicator lamp (29) light up.

Turn the emergency brake button (6) in the direction of arrows.

Set the travel control (11) to the brake position (P). Move the key in the ignition box to the "0" position.

Now you can start the engine again.



Use the audible alarm to announce the engine start!

Before starting the engine, check that nobody is endangered by the engine start!

Use the alarm horn to signal the engine starting and check that nobody is endangered by starting the engine!

Make sure that the area in front of and behind the machine is free and no persons are present there!

During operation, check the instruments and indicator lamps continuously.

Promptly repair any failures!

3.6.12 Engine tightness check

Visually check the engine and the engine compartment for oil leakage.

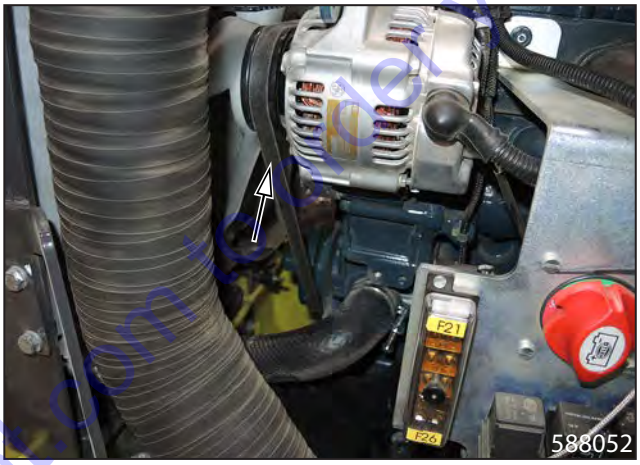
Remove the identified defects.

3.6.13 Check of the fan and engine belt for condition

Fan wear check

Check the fan visually. Replace the fan if damaged (e.g. missing parts of materials, cracks, shape changes, etc.).

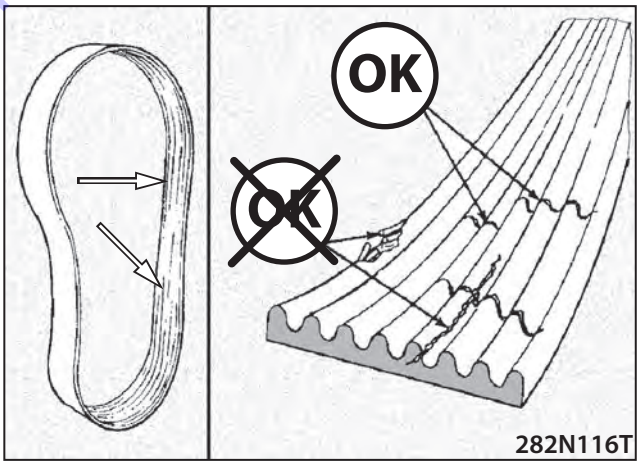
Fan
Order number: 1448212



Belt wear check

Visually inspect the belt.

Cracks perpendicular to the belt width are not considered to be a fault. If longitudinal cracks appear on the belt, or the belt edges are ragged, or some material parts are pulled off, then the belt must be replaced.

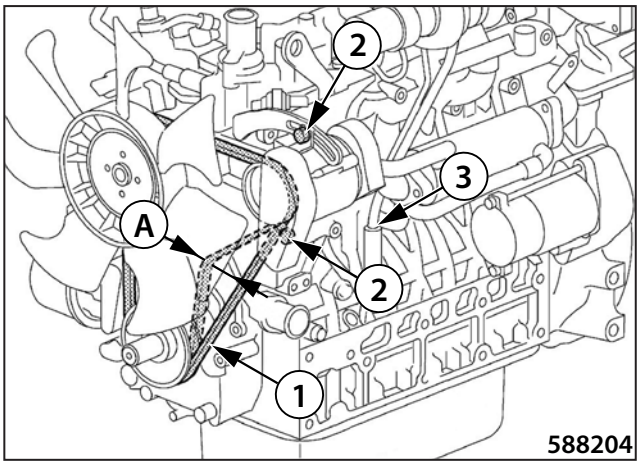


Belt tension check

Press with your thumb at the spot where belt length between pulleys is the longest, using 110 N (25 lb) strength. The max. slack (A) is 7–9 mm (0.28 – 0.35 in).

Tighten the belt (1) by loosening the screws (2) and shifting the alternator (3) if required.

Check the belt for correct tension.



3.6.14 Brake test

To test the functionality of the parking brake, the forward tractive force of the vehicle can also be applied with the parking brake activated. This option can be activated using the brake test button (A).

This activation will cause a high mechanical and hydraulic load of the machine. Ensure a suitable safe distance in front of the machine, behind the machine as well as on its sides.

Procedure

Sit in the driver's position and start the engine.

Set the travel control (11) to the parking brake position "P".

Switch to the "Brake test" mode by pressing the brake test button (A) for 5 seconds. While the button is held down, the display shows the "btn br" status.

After 5 seconds, the display shows the "br tSt" status.

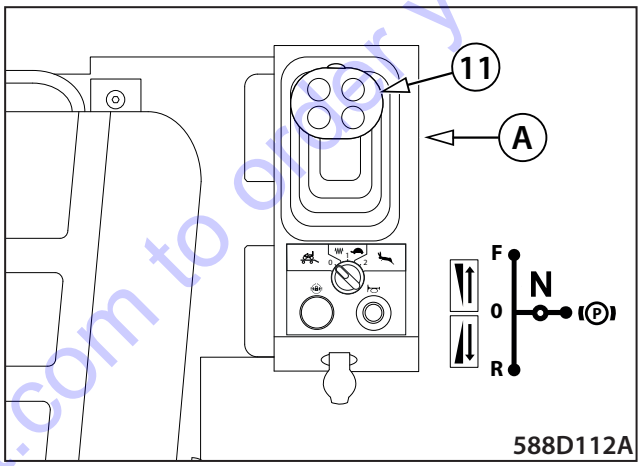
Start the test by setting the travel control to the forward travel position.

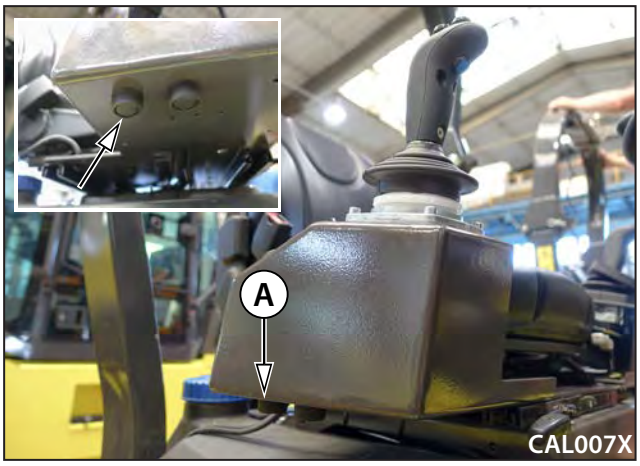
- If the machine starts moving forward against the brake, the test was failed. The machine moves for 3 seconds and only reacts to the travel control forward movement.
- If the machine does not start moving against the brake, the test was passed and after moving the travel control (11) forward, the machine does not start to move.

The test can be terminated prematurely by moving the lever anywhere out of the forward position.

To end the test, move the travel control back to the parking brake position (P). You can then resume normal operation.

After an unsuccessful brake test, secure the machine against spontaneous movement by wedges and contact service.





Every 50 hours of operation

3.6.15 Battery check

Stop the engine.

Clean the surface of batteries.

Check the condition of the terminals and clamps. Clean the terminals and clamps. Apply a thin layer of grease on the clamps.

MAINTENANCE-FREE BATTERY

In case of a maintenance-free battery version (the battery has no accessible plugs), check only the rest voltage on the terminals. The batteries cannot be refilled. If the rest voltage is 12.6 V and more, the battery is fully charged. If the rest voltage is below 12.4 V, the battery should be charged immediately. After the battery is charged, leave it to stand for 2–3 hours and then measure the voltage again. The mounting is recommended 24 hours after the charging.

Note

The rest voltage is the voltage measured at the terminals of the battery, which was at rest for at least 12 hours – it was not either charged or discharged.

Do not turn the battery upside down; the electrolyte may pour down from the degassing plugs.

If the electrolyte is spilled, flush the affected area with water and neutralize with lime.

Hand over the aged battery that does not work, for its disposal.

Keep the battery dry and clean.

Do not disconnect the battery when the engine is running.

Always follow the instructions of the manufacturer, when working with the battery.

Disconnect the battery for repair or while handling wires and electrical components in the wiring circuit to prevent short-circuit.

First disconnect the minus pole cable when disconnecting the battery. First connect the plus pole cable when connecting the battery.

Use rubber gloves and eye protection devices when handling the battery.

Use suitable clothing to protect your skin against contact with the electrolyte.

In case of eye contact with the battery electrolyte, immediately flush the affected eye thoroughly with running water for several minutes. Then seek medical advice.

Upon ingestion of the electrolyte drink large quantities of milk, water or suspension of magnesium hydroxide in water.

In case of skin contact with electrolyte, remove the clothing and shoes, wash the affected skin immediately with soap and water or with solution of water and soda. Then seek medical advice.

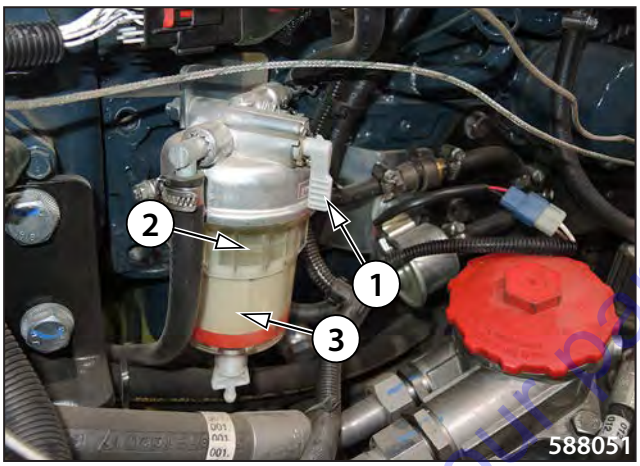
Do not eat, drink, smoke while working!

After completing the work, wash your hands and face thoroughly with water and soap!

Do not check that the wire is live by touching the machine frame.

Never make direct conductive connection between the battery poles, short circuit will occur with the risk of battery explosion.

3.6.16 Cleaning of the water separator on the fuel filter



If the red ring goes up from the bottom, drain the water from the separator.

Close the stop cock (1).

Unscrew the filter housing (2).

Clean the filter element (3).

Screw in the filter housing back (2)

Open the stop cock (1).

Turn the ignition on. The fuel pump will vent the system automatically.

Fuel filter cartridge
Order number: 1448216

Do not smoke while working!

Check the water separator for leaks.

Stop the fluid soaking into the ground.

Every 100 hours of operation (weekly)

3.6.17 Machine lubrication

Remove the caps on the grease nipples.

Before lubricating, clean the grease nipple.

Connect the grease gun to the grease nipple.

Lubricate the bearing sufficiently until the lubricant starts to flow out.

Install the protective cover in place.

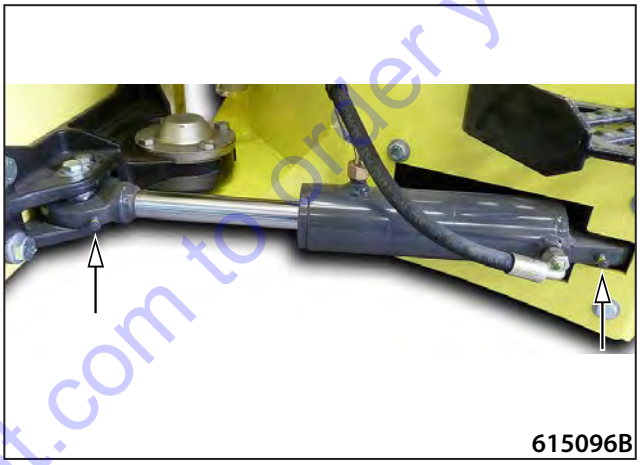
Note

After every machine cleaning or steam cleaning, lubricate the bearing again.

Steering linear hydraulic motor

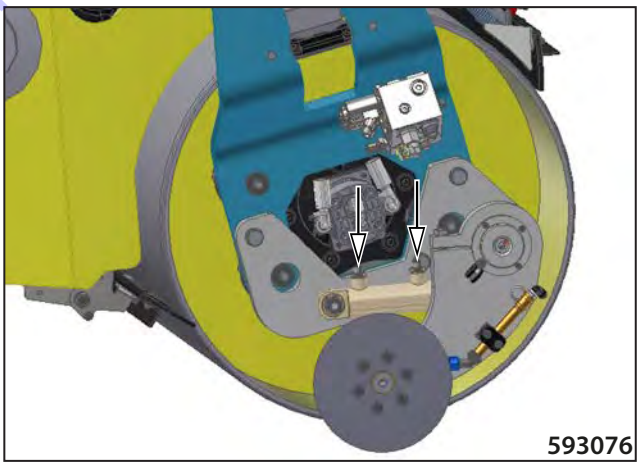
Turn the steering mechanism up to the stop to lubricate the hydraulic cylinder.

Turn the machine slightly to the right and to the left. This will loosen the bearings.



Edge cutter

Pins 2×



3.6.18 Tyre pressure check

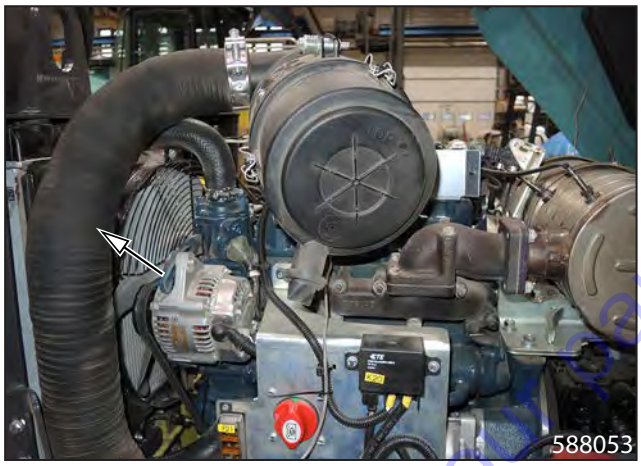
Check the air pressure with a pressure gauge on the tyre valve; 100 kPa (14.5 PSI).

Pay attention to the equal pressure in all of the tyres.

Every 250 hours of operation (3 months)

3.6.19 Check of hose and clip fixation

Check the engine inlet piping for leakage. Check the hose for damage and missing hose clips.



Check the cooling circuit for leakage. Check the hoses for damage and missing hose clips. When hoses are cracked or hardened, replace them for new ones.

3.6.20 Sprinkling filter cleaning

Remove the sprinkling filter vessel, remove the sieve, clean it and mount back.

Check the seal.

Replace if damaged.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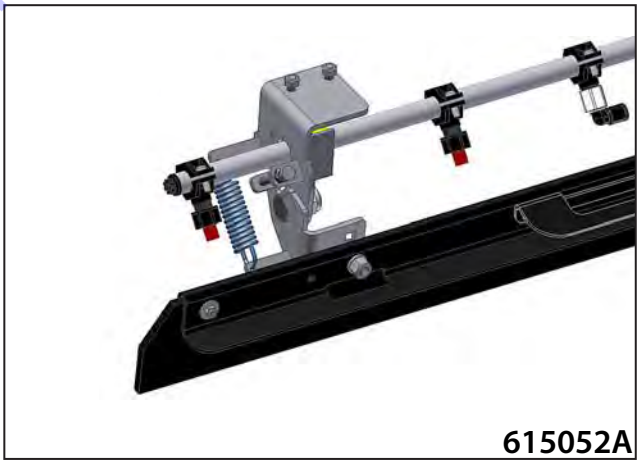
Remove and clean the sprinkler sieves.


611303

Remove and clean the sprinkler sieves.


615052A

3.6.21 Engine oil change

Carry out for the first time after 50 hours.

Drain the oil after the operation is finished immediately after the coolant has been cold down to 60 °C (140 °F), or warm up the engine during operation until the coolant temperature reaches 60 °C (140 °F).

The engine oil drain plug is on the left side in front between the front and rear frame of the machine.

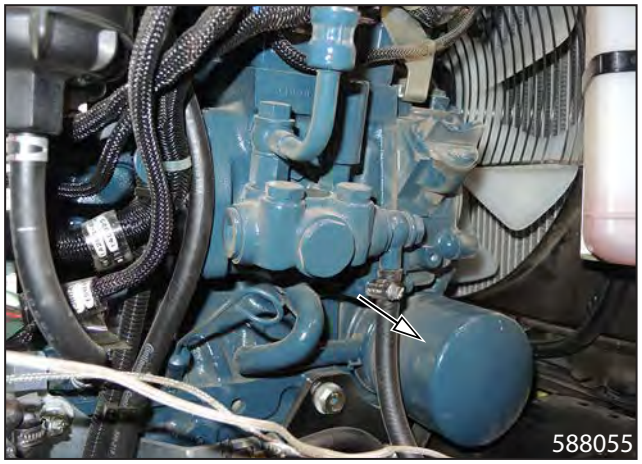
Turn the machine to the right to get better access to the drain plug.

The total volume of oil in the engine is 7 litres (1.85 US gal).

Remove the drain plug and let the oil drain out.

Remount the plug.

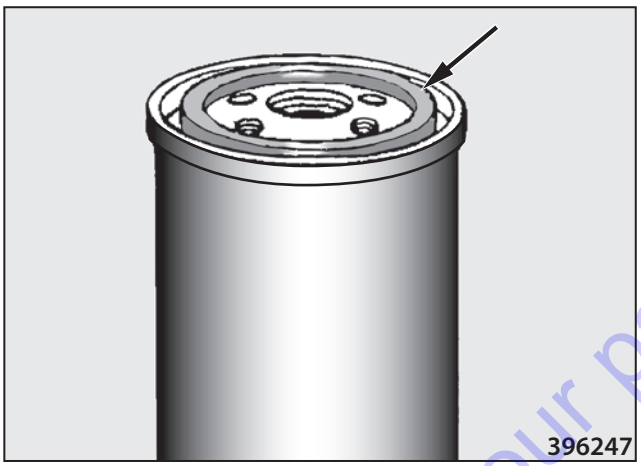
Clean the surface around the head of the oil filter. Remove the filter. Clean the seating surface for the filter gasket.



Lubricate the gasket with oil.

Mount the new filter.

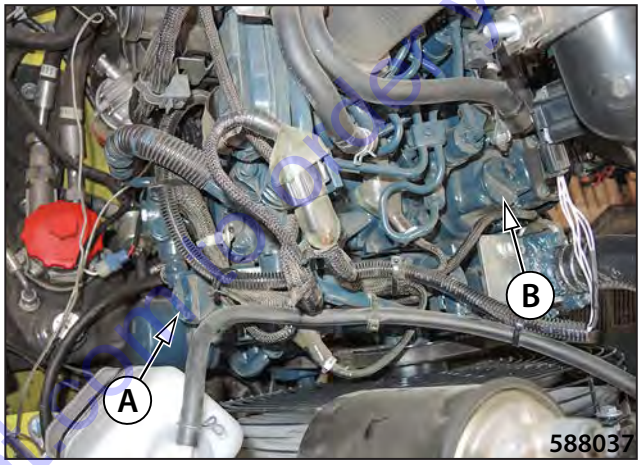
Do not overtighten the filters to prevent damage to the thread and gasket.



Engine oil filter
Order number: 1504183

Refill the engine oil into one of the two filler necks.

- Filler neck on the left side of the engine (A)
- Filler neck on the engine (B)



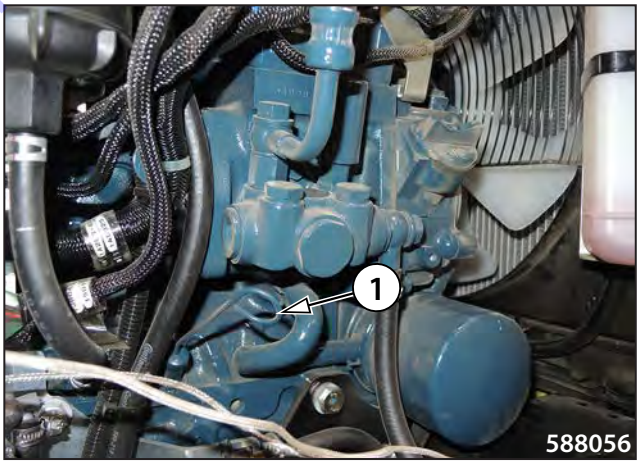
Keep the level within the range of gauge marks imprinted in the dipstick (1). The lower mark shows the lowest possible oil level, the upper mark indicates the highest.

Refill the oil to the upper oil level mark (1). The oil volume is 7 l (1.85 gal US) including the oil filter volume.

Note

After the replacement, start the engine for 2–3 min. Check tightness of drain plug and filter.

Stop the engine, wait for 5 minutes until the oil runs down to the engine sump. Then check the level with the oil dipstick.



When changing oil, check that the old oil has been drained from the tank completely. Do not mix different types of oils.

During the regeneration process, the engine oil can be diluted by the fuel. It can cause that the engine oil quantity will increase. If the engine oil level is above the upper level mark, change the oil.

If the DPF regeneration interval is shorter than 5 hours, replace the oil.

Beware of the risk of scalding when draining hot oil.

Let the oil cool down to less than 50 °C (122 °F).

Follow the firefighting measures.

Change the oil after 6 months at the latest even if 500 hours have not been worked. Exchange oil in the interval that comes first.

Use recommended filters only; refer to the spare parts catalogue. Use recommended oil – see chap. 3.2.1

Catch the drained oil and do not let it soak into the ground.

Used oil and filters are environmentally hazardous waste – hand it over for disposal.

3.6.22 Check of hoses of the engine cooler for wear and mounting

Check the cooling system for defective hoses and missing hose clips. Check the cooler for damage and leaks and the cooling fins for clogging. Clean and repair the cooler if required.

3.6.23 Air filter cleaning

Remove the main cartridge of the air filter and clean with compressed air.

Clean the internal area of the filter and of the contact surface to avoid contamination of the safety cartridge.

Never use compressed air to clean the filter interior.

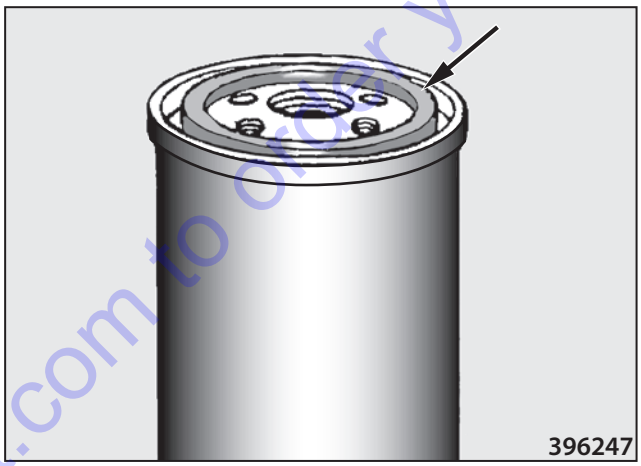
Every 500 hours of operation (every 6 months)

3.6.24 Fuel filter replacement

Clean the fuel filter head.

Remove the filter.

Lubricate the seal rings of the new filters with oil.

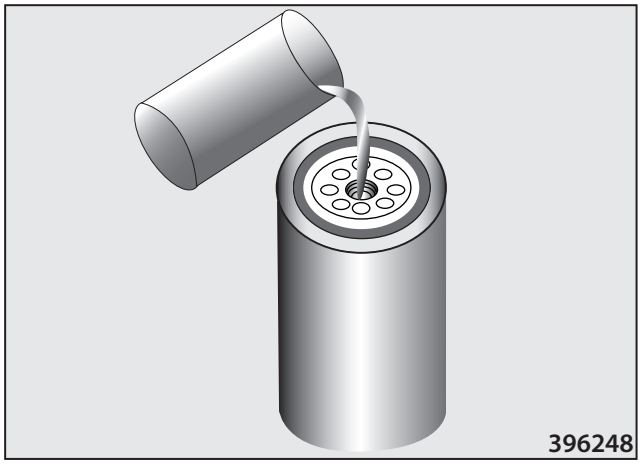


Fill up the filter with new fuel. Mount the new filter in the machine. Tighten manually!

Fuel filter
Order number: 1448257

Use original specified filters.

Do NOT tighten the filters with force!



Follow safety regulations!

Do not smoke and do not use an open flame while working on the fuel system!

Catch the drained fuel.

Store used filters in a separate container and hand them over for disposal.

3.6.25 Electrical installation check

Check cables, connectors, protective hoses and their attachments for damage, in particular if they are near hot surfaces and moving parts of the machine including the engine. Replace damaged parts. Use only original spare parts.

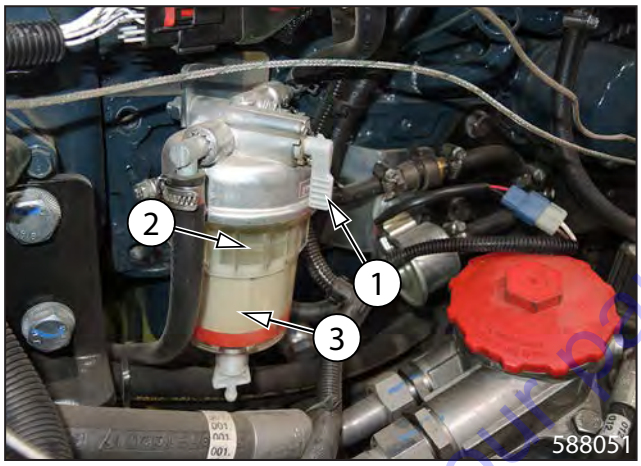
3.6.26 Air filter main cartridge replacement

Remove the filter cap.

Take out the main cartridge.

Air filter cartridge
Order number: 1503941

3.6.27 Oil separator filter replacement



If the red ring goes up from the bottom, drain the water from the separator.

- Close the stop valve (1).
- Unscrew the filter housing (2).
- Replace the filter element (3).
- Refit the filter housing (2).
- Open the stop valve (1).
- Turn the ignition on. The fuel pump will deaerate the system automatically.

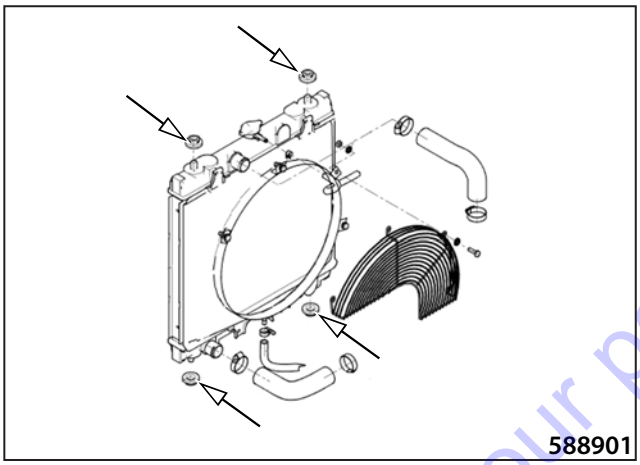
Fuel filter cartridge
Order number: 1448216

! Do not smoke while working!
Check the water separator for leaks.

Stop the fluid soaking into the ground.

3.6.28 Engine cooler rubber-metals inspection

Recheck the rubber-metals for condition and for rubber-to-metal bond strength.



Replace if damaged.

Recheck screws and nuts for tightening.

Cooler rubber-metal element
Order number 1448304

Every 1000 hours of operation (yearly)

3.6.29 Replace hydraulic oil and filters

Perform the check for the first time after 500 hours.

Hydraulic oil filter replacement

Take off the filter cap.

Unlock the filter cartridge.

Pull out the filter cartridge from the filter housing.

Dispose of the filter cartridge environmentally.

Insert the new filter cartridge in the correct place. Keep the position of the safety cam.

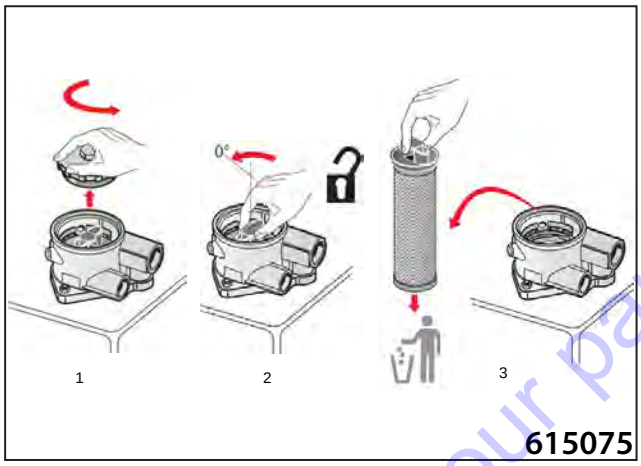
Turn the filter cartridge clockwise up to the stop.

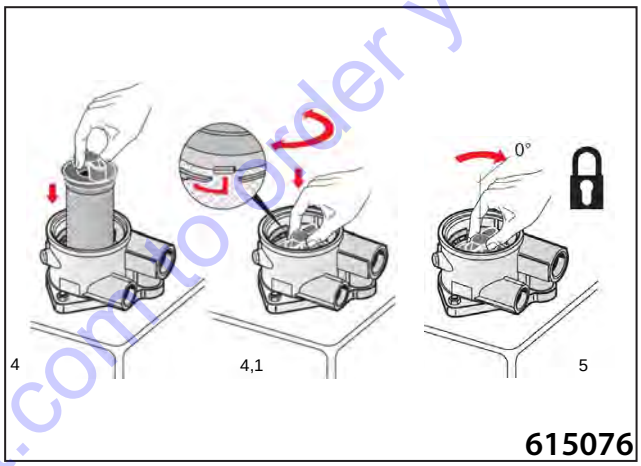
Oil the sealing ring on the filter cap slightly.

Put the filter cap in place.

Tighten the cap with the torque spanner (max. torque 20 Nm).

Set of hydraulic oil filters
Order number: 1182946





Hydraulic oil draining

Note

Drain hydraulic oil only at operating temperature. Residues in the tank are drained with the oil.

Place a vessel under the hydraulic oil drain plug. Oil charge is 28.5 l (7.5 gal US).

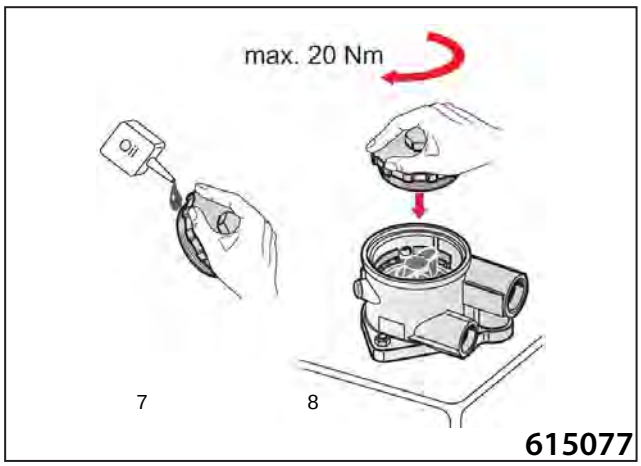
Take out the ventilation filter.

Remove the plug from the hydraulic tank.

Let the oil flow out into the vessel.

Mount the plug. Tighten the screw connection with hand.

Tighten the screw connections in the hydraulic tank with hand.



Hydraulic circuit filling

Take out the ventilation filter.

Fill the hydraulic oil through the hole into the tank.

Replace the ventilation filter with a new one.

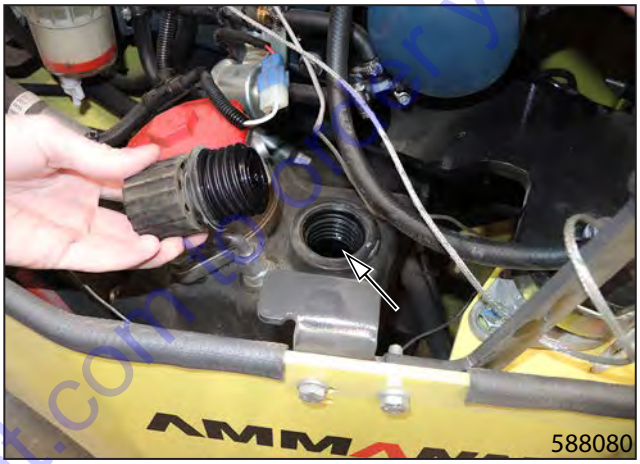
Lubricate the seal ring of the new filter cap with oil.

Mount a new filter (1).

Carry out the oil change when the oil is warm, preferably after operation of the machine.

Let the drained oil cool down below 50 °C (122 °F).

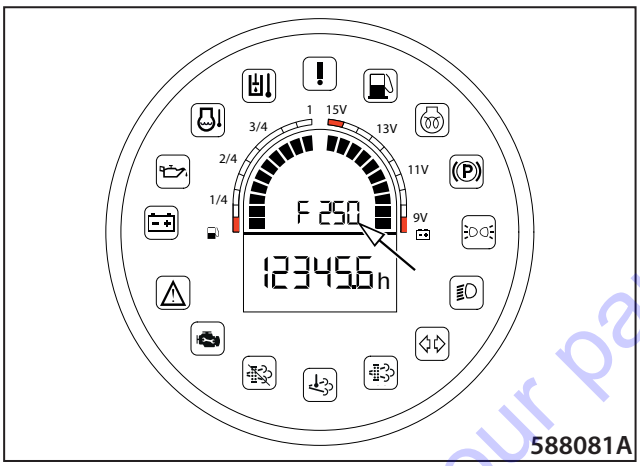
Refill the same type of oil.



Stop the oil soaking into the ground.

3.6.30 Air filter cartridges replacement

If the F250 error code appears on the display during operation of the machine, the cartridge must be replaced, however after 500 operation hours at the latest.



588081A

The manufacturer does not recommend you to clean the cartridges because there is a possibility of reducing the capacity by up to 40% and damaging the cartridge during the cleaning.

Remove the filter cap.


588060

Take out the main cartridge.

Air filter cartridge
Order number: 1503941


588061

Take out the safety cartridge.

Replace the safety cartridge after every third replacement of the main cartridge.

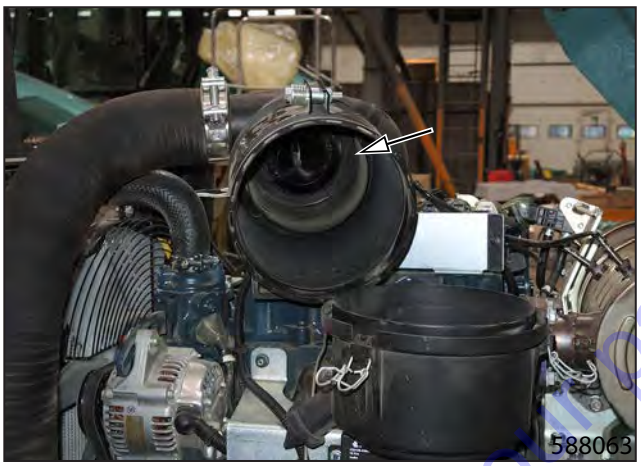
Air filter cartridge
Order number: 1503942


588062

Clean the internal area of the filter and of the contact surface so that no dust is taken into the inner supply piping towards the engine.

Insert the new safety cartridge.

Insert the new main cartridge. Check that both cartridges are mounted correctly and are sealing.



Remove the dust valve of the air filter, clean and remount.

Check connections and the piping for leakage and the engine inlet opening on the bonnet for clogging (e.g. by leaves).

Do NOT clean filter's inner space with pressure air so no dust is taken into the engine induction manifold.

Use original cartridges, only.

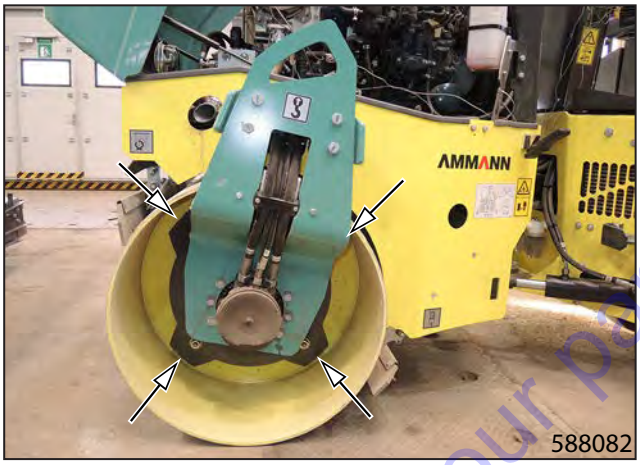
Take care not to splash water into the air filter.

Replace the dust valve immediately if it is damaged!

NEVER operate the Machine with filter body or lid damaged.

3.6.31 Damping system check

Check the condition of the rubber-metals, the strength of the bond between metal and rubber.



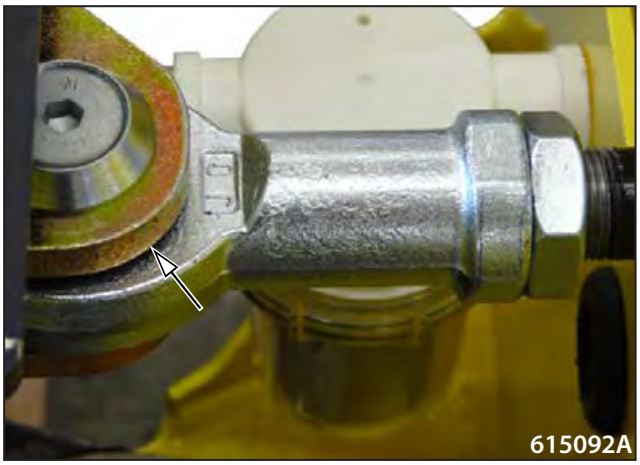
Replace if damaged.

Check the tightness of screws and nuts.

Drum rubber-metal
Order number: 1175152

3.6.32 Swinging support check

Once a year check the swinging support for excessive clearance.



Machine equipped with a one-point lifting lug

Lift the machine with a crane while using the one-point lifting lug.

Visually check the clearance of the swinging support by applying pressure on the machine alternatively upwards and downwards.

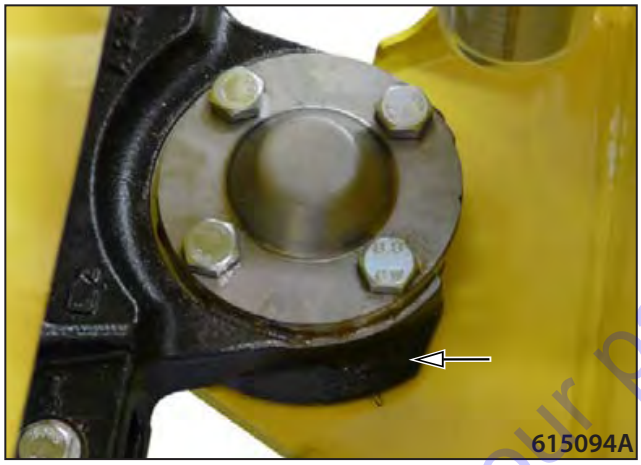
The machine is not equipped with a one-point lifting lug

Lift the machine slightly with a suitable hydraulic jack.

Visually check the clearance of the swinging support by applying pressure on the machine alternatively upwards and downwards.

3.6.33 Articulation joint check

Once a year check the articulation joint for excessive clearance.



Machine equipped with a one-point lifting lug

Lift the machine with a crane while using the one-point lifting lug.

Visually check the clearance of the articulated joint by applying pressure on the machine alternatively upwards and downwards.

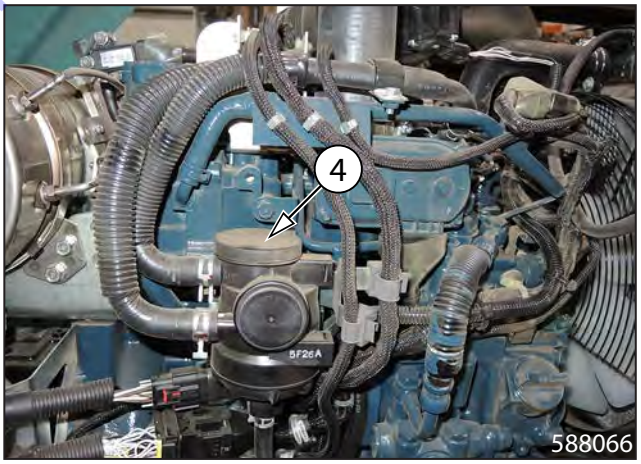
The machine is not equipped with a one-point lifting lug

Lift the machine slightly with a suitable hydraulic jack.

Visually check the clearance of the articulated joint by applying pressure on the machine alternatively upwards and downwards.

3.6.34 Oil separator cartridge replacement

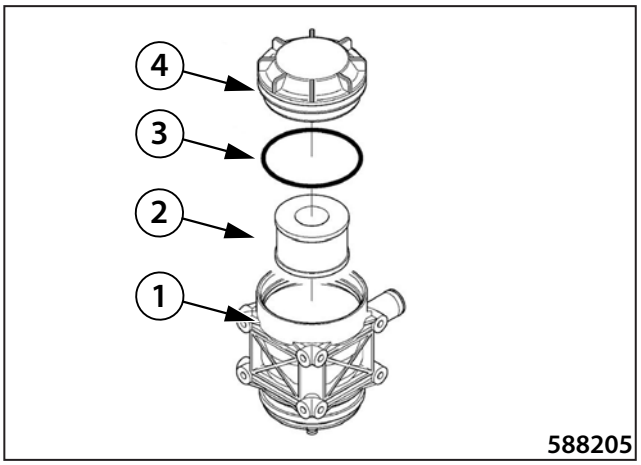
Remove the cap (4).



Replace the filter cartridge (2) and the seal ring (3).

Clean the internal area of the filter (1).

Insert a new filter cartridge (2) and a seal ring (3).



3.6.35 Fuel tank cleaning

Over time, condensed water accumulates in the fuel tank. It should be drained once a year.

Remove the plug from the fuel tank.

Place a vessel under the drain plug.

Drain the engine diesel fuel.

Check and clean the interior of the tank.

Put on the screw plug.

Tighten the screw connection with hand.

Fill the fuel tank with diesel fuel up to the lower edge of the filler neck.

Do not smoke while working!

Catch the drained fuel.

3.6.36 Valve clearance check and adjustment

Contact the service for adjusting the engine valves.

Every 2000 hours of operation (2 years)

3.6.37 Engine coolant change

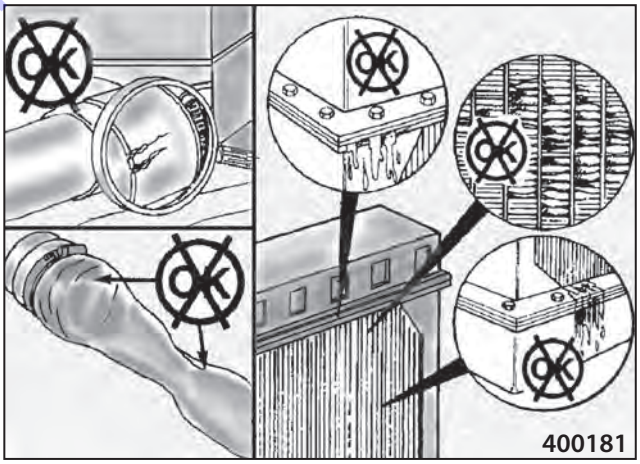
Open the cooling system by removing the overpressure plug on the expansion tank.

Remove the drain plug and drain the coolant.

Note

The total volume of the coolant in the engine is 6,7 l (1,8 gal US).

Check the cooling system for defective hoses and missing hose clips. Check the cooler for damage and leaks and the cooling fins for clogging. Clean and repair the cooler if required.



Fill the cooling system through the hole in the expansion tank.

Remove the filling plug only after the temperature of the engine coolant has dropped below 50 °C (120 °F). If you remove the plug at a higher temperature, there is a risk of steam or coolant scalding due to an internal overpressure.

The level must not drop below the lower mark.

Only refill the coolant consisting of antifreeze agents on the same basis according to the chapter 3.2.3

Do not add additives to the engine coolant to remove leaks of the cooling system!

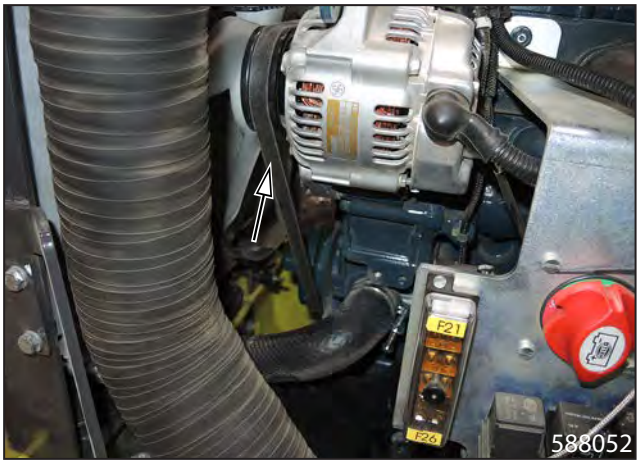
Do not refill a cold coolant into a hot engine. There is a danger of damage to the engine castings.

In case of large losses, find out where the cooling system leaks and repair the cause.

Stop the oil soaking into the ground.

3.6.38 Engine belt replacement

Contact the Kubota service for engine belt replacement.



Every 3000 hours of operation (3 years)

3.6.39 DPF replacement

Contact the Kubota service for DPF replacement.

3.6.40 EGR valve inspection

Contact the Kubota service for EGR valve inspection

Maintenance as required

3.6.41 Gas strut replacement

The gas struts are maintenance-free. They do not require any maintenance, such as e.g. lubrication. They are designed according to given requirements and work trouble-free for years. As soon as the struts stop performing their function, replace them with new ones.

Gas strut
Order number: 1448823

Before beginning to replace the gas strut, secure the engine bonnet against free fall.

There is a risk of injury!

Disassembly

Use a screwdriver to pull out the clamps and release the struts.

Pull out the gas strut away from the ball stud.

Installation

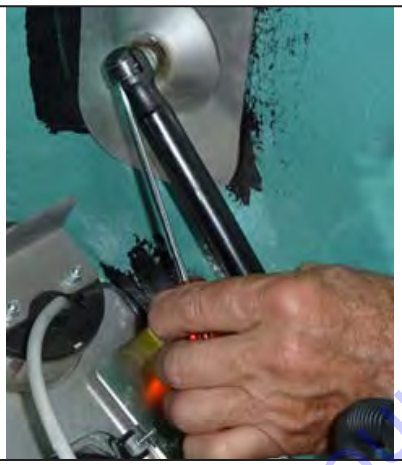
Push the new gas strut on the ball stud.

The clamp then needs to be safely seated.

Do not install the gas strut if it is damaged due to mechanical handling.

Use genuine parts only!

If you do not need the gas struts any more, dispose of them environmentally.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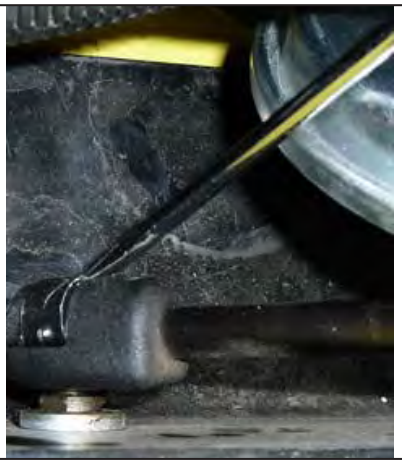
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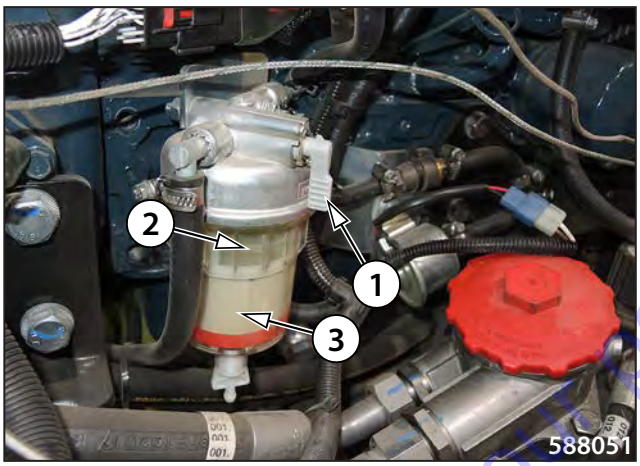
3.6.42 Cleaning water separator



If the red ring goes up from the bottom, drain the water from the separator.

Close the stop valve (1).

Unscrew the filter housing (2).

Clean the filter element (3).

Refit the filter housing (2).

Open the stop valve (1).

Turn the ignition on. The fuel pump will vent the system automatically.

3.6.43 Water tank cleaning

Remove the cap of the filler neck of the tank.

Clean the strainer in the filler neck.

Remove the drain plug of the water tank.

Rinse the tank with running water.

3.6.44 Machine cleaning

Clean the machine from big impurities after completing the work.

Clean the whole machine completely on regular basis, at least once a week.

Before pressure water or steam cleaning, cover all holes into which the cleaning agent could get (e.g. engine intake hole). After completing the cleaning, remove the end caps.

Do not direct the running water or steam at the electric parts or insulation materials. Always cover such materials (interior of the alternator, etc.).

Clean with the engine stopped.

Do not use aggressive or easily ignitable cleaning agents (e.g. petrol and/or easily flammable substances).

Follow environmental standards and regulations when cleaning the machine!

Clean the machine in a workplace equipped with a collection system for cleaning agents to avoid contamination of soil and water!

Do not use forbidden cleaning agents!

3.6.45 Draining water from the sprinkling circuit before the winter season

Water must be drained from the sprinkling circuit before the winter season because the individual parts may get damaged due to frost.

Procedure for draining water from the sprinkling circuit

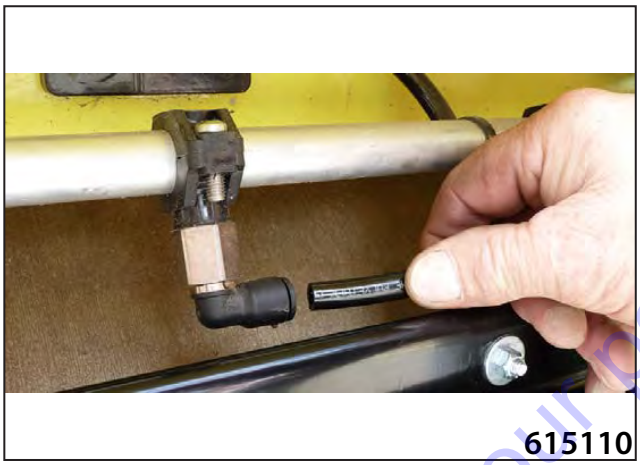
Release the quick coupler of the sprinkling hose.

Push the ring against the screw joint.

Remove the hose from the coupler.

The water will flow out automatically.

Turn on the sprinkling and let the pump run briefly. The remaining water will flow out.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Removal of the sprinkling filter

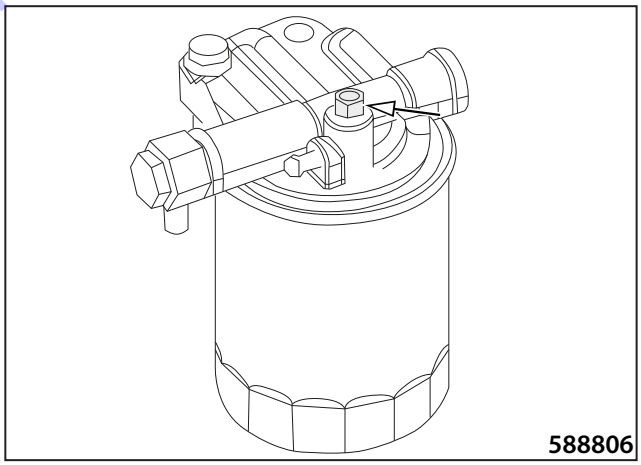
Remove and clean the vessel with the sprinkling filter. Keep the vessel with the filter in a safe place.


615111B

3.6.46 Fuel system venting

Vent the fuel system before the first start in the following cases:

- Unless fuel filters have been filled with fuel - upon filter replacement
- Upon fuel pump replacement
- Following fuel system repair
- Long-term shut-down of the machine
- When the tank is empty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Low-pressure piping and filter venting:

Prepare a suitable vessel.

Connect the fuel filter bleeding hose and insert the other end into the catch pan.


593407

Turn the key in the ignition box to position I.

The fuel pump starts working (it is audible).

Loosen the bleeding screw on the fuel filter.

Bleed the system – no air bubbles appear in the hose.

Tighten the screw.

Press the valve about 15 times.

Start the engine.

Note:

If the engine does not start or stops immediately after starting, bleed the fuel system again.

Do not bleed when the engine is hot, the leaking fuel can cause a fire.

Follow safety regulations!

Do not smoke and do not use an open flame while working on the fuel system!

Stop the fuel soaking into the ground!

3.6.47 Regeneration of clogged DPF (diesel particulate filter)

Perform DPF regeneration according to Chapter 2.7.14 Principles of use of the machine with a diesel particulate filter (DPF).

3.6.48 Charging of the battery

- Only use chargers with an appropriate rated voltage. Check that the charger is strong enough to charge the battery not too strong to charge with excessive current.
- Read and observe the operating manual of the charger manufacturer.

- Check that the ventilation holes in the battery cover are not dirty or clogged and that gases can escape freely.
- Connect the positive terminal (+) of the battery to the positive terminal of the charger.
- Connect the negative terminal (-) of the battery to the negative terminal of the charger.
- Turn on the charger only after connecting the battery.
- Charge the battery with current corresponding to one tenth of the battery capacity.
- After charging, first turn off the charger and then disconnect the cables from the battery.

- The battery is fully charged, if:
  - electric current and voltage remain constant in the case of voltage-controlled chargers,
  - the charging voltage in the case of current-controlled chargers does not increase within two hours, the automatic charger turns off or switches to maintaining charge.

Use rubber gloves and eye protection devices when handling the battery.

Use suitable clothing to protect your skin against contact with the electrolyte.

After eye contact with the battery electrolyte, immediately flush the affected eye thoroughly with running water for several minutes. Then seek medical advice.

After ingestion of the electrolyte drink large quantities of milk, water or suspension of magnesium hydroxide in water.

In case of skin contact with electrolyte, remove your clothing and shoes, wash the affected skin immediately with soap and water or with solution of water and soda. Then seek medical advice.

Do not eat, drink and smoke while working!

After completing the work, wash your hands and face thoroughly with water and soap!

Do not check that a wire is live by touching the machine frame.

When working with the battery always follow instructions of the battery manufacturer!

Never charge a frozen battery or battery with a temperature above 45 °C.

Stop charging if the battery is hot or leaking acid.

Check that the ventilation holes in the battery cover are not dirty or clogged and that gases can escape freely. If the ventilation holes are clogged, gases can accumulate inside the battery and irreversibly damage it.

Never make direct conductive connection between both poles of the battery to avoid a short circuit and a risk of explosion of the battery.

Do not turn the battery upside down, the electrolyte can flow out.

If the electrolyte is spilled, wash the affected area with water and neutralize with lime.

Hand over the old inoperative battery for disposal.

3.6.49 Tightening torques

- Confirm regularly that no loosening of bolted connections has occurred.
- Use the torque spanners to do the tightening.

	TIGHTENING MOMENT					TIGHTENING MOMENT			
	For the screws 8,8 (8G)		For the screws 10,9 (10K)			For the screws 8,8 (8G)		For the screws 10,9 (10K)	
Worm	**Nm**	**lb ft**	**Nm**	**lb ft**	**Závit**	**Nm**	**lb ft**	**Nm**	**lb ft**
M6	10	7,4	14	10,3	M18x1,5	220	162,2	312	230,1
M8	24	25,0	34	25,0	M20	390	287,6	550	405,6
M8x1	19	14,0	27	19,9	M20x1,5	312	230,1	440	324,5
M10	48	35,4	67	49,4	M22	530	390,9	745	549,4
M10x1,25	38	28,0	54	39,8	M22x1,5	425	313,4	590	435,1
M12	83	61,2	117	86,2	M24	675	497,8	950	700,6
M12x1,25	66	48,7	94	69,3	M24x2	540	398,2	760	560,5
M14	132	97,3	185	136,4	M27	995	733,8	1400	1032,5
M14x1,5	106	78,2	148	109,1	M27x2	795	586,3	1120	826,0
M16	200	147,5	285	210,2	M30	1350	995,7	1900	1401,3
M16x1,5	160	118,0	228	168,1	M30x2	1080	796,5	1520	1121,0
M18	275	202,8	390	287,6					

The figures given in the chart are torques at dry thread (with coefficient of friction = 0,14). These figures do not apply to a lubricated thread.

Chart showing the torques for cap nuts with sealing "O" ring – hoses

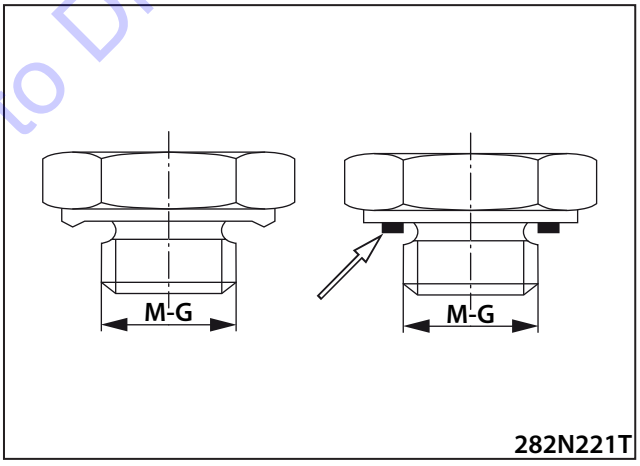
			Tightening moments for the sliding nuts with the tightening circle „O“ - hoses					
			Nm			lb ft		
Size spanner	Worm	Hose	Nominal	Min	Max	Nominal	Min	Max
14	12x1,5	6	20	15	25	15	11	18
17	14x1,5	8	38	30	45	28	22	33
19	16x1,5	8	45	38	52	33	28	38
		10						
22	18x1,5	10	51	43	58	38	32	43
		12						
24	20x1,5	12	58	50	65	43	37	48
27	22x1,5	14	74	60	88	55	44	65
		15						
30	24x1,5	16	74	60	88	55	44	65
32	26x1,5	18	105	85	125	77	63	92
36	30x2	20	135	115	155	100	85	114
		22						
41	36x2	25	166	140	192	122	103	142
46		28						
50	42x2	30	240	210	270	177	155	199
50	45x2	35	290	255	325	214	188	240
	52x2	38	330	280	380	243	207	280
		42						

Chart showing the torques for necks with sealing edge, or with flat gasket

	Tightening moments for the necks	
G -M	**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 11/4	600	443
G 11/2	800	590
10 x 1	25	18
12 x 1,5	30	22
14 x 1,5	50	37
16 x 1,5	60	44
18 x 1,5	60	44
20 x 1,5	140	103
22 x 1,5	140	103
26 x1,5	220	162
27 x 1,5	250	184
33 x 1,5	400	295
42 x 1,5	600	443
48 x 1,5	800	590

Chart showing the torques for plugs with flat gasket

	Tightening moments for the plugs	
G -M	**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 11/4	600	443
G 11/2	800	590
10 x 1	13	10
12 x 1,5	30	22
14 x 1,5	40	30
16 x 1,5	60	44
18 x 1,5	70	52
20 x 1,5	90	66
22 x 1,5	100	74
26 x1,5	120	89
27 x 1,5	150	111
33 x 1,5	250	184
42 x 1,5	400	295
48 x 1,5	500	369



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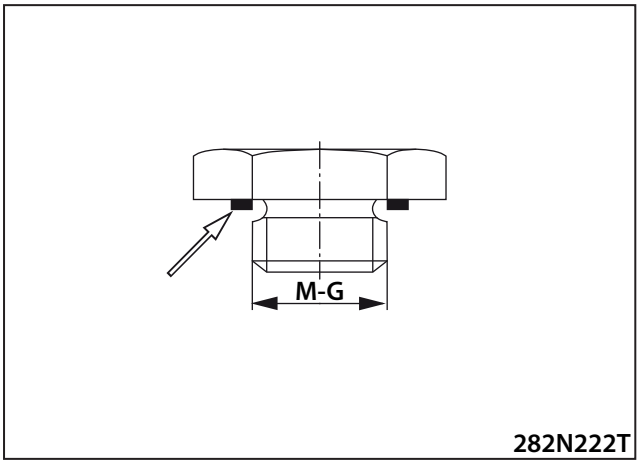

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The defects are usually caused by incorrect operation of the machine. Therefore in case of any defect read carefully instructions given in the operation and maintenance manual for your machine and engine. If you cannot identify a cause of the defect, contact the service department of the authorised dealer or the manufacturer.

The troubleshooting in hydraulic and electric systems requires knowledge of hydraulic systems and electrical installations; therefore contact the service department of an authorised dealer or the manufacturer for troubleshooting.

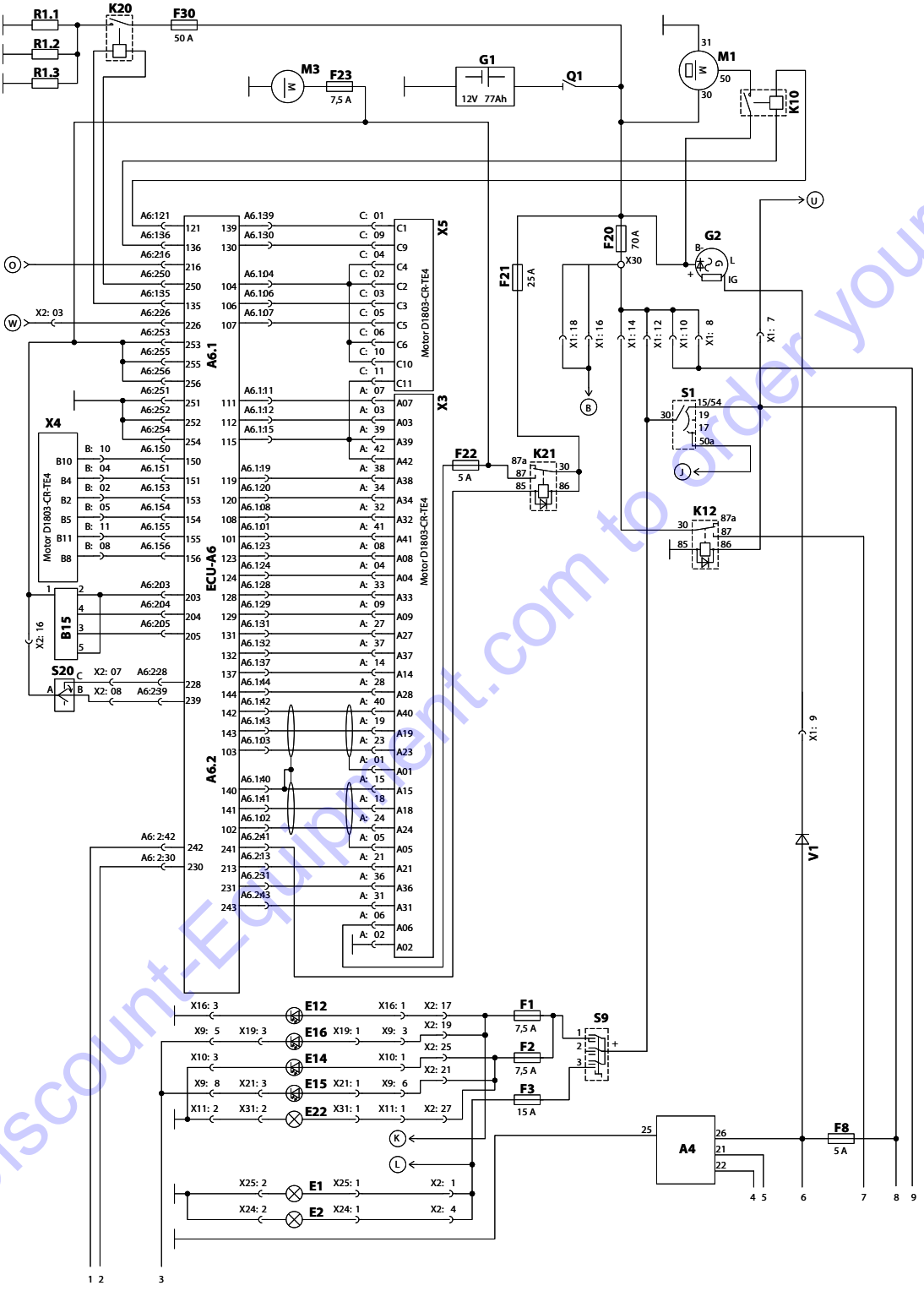
Wiring diagram

Legend:

A7	**Gessmann right travel lever**
S27	Vibration switch
S28	Sprinkling switch
S29	Edge cutter sprinkling switch
S30	Edge cutter selector
A9	**Gessmann left travel lever**
S31	Vibration switch
S32	Sprinkling switch
S33	Edge cutter sprinkling switch
S34	Edge cutter selector
A4	**Bauser display**
A1	Fuel gauge indicator (CAN)
A2	Voltage indicator
H1	ERROR indicator lamp (CAN)
H2	Charging indicator lamp (CAN)
H3	Engine oil pressure indicator lamp (CAN)
H4	Coolant temperature indicator lamp (CAN)
H5	Indicator lamp for hydraulic oil temperature (CAN)
H6	Emergency stop indicator lamp (CAN)
H7	Diesel fuel reserve indicator lamp (CAN)
H8	Engine glowing indicator lamp (CAN)
H9	Brake indicator lamp (CAN)
H10	Parking lights indicator lamp (CAN)
H11	Headlamps indicator lamp (CAN)
H12	Indicator lamp for direction indicators (CAN)
A3	Computer HY-TTC 510
A4	Bauser multifunctional display
A5	Infra thermometer
A6	ECU engine
A7	Travel lever – right
A8	Monitoring device
A9	Travel lever – left
A10	Compaction module
A11	Frequency sensor
B3	Hydraulic oil temperature sensor
B4	Fuel level float
B15	Air weight
C1	Noise suppressing filter
E1, 2	Front headlamps
E3	Rear light
E12, 14	Front parking lights
E15, 16	Tail lights
E17, 19	Right direction indicators
E18, 20	Left direction indicators
E21	Warning beacon
E22	Licence plate lighting
E23, 24	Working lights, ROPS
E25, 26	Brake lights
E27	Green beacon
F1-16	Fuses
F21-25	Fuses
F30	Main fuses
F30	Glowing fuse
G1	Battery
G2	Alternator
H13	Horn
H14	Reversing horn
H16	Seat contact delay horn
K1–6	Auxiliary relay
K10	Starter relay
K11	Interrupter
K12, 211	Auxiliary relay
K20	Glowing contactor
M1	Engine starter
M2	Hydraulic oil cooler
M3	Fuel pump
M4	Sprinkling pump
M11	Emulsion sprinkling pump
Q1	Battery disconnector
R1.1–1.3	Engine glowing
R11	Seat heating
S1	Ignition box
S2	Emergency brake button
S4	Sprinkling potentiometer
S5	Drive mode switch
S6	Automatic vibration switch
S7	Vibration switch, rear
S9	Headlamps switch
S10	Rear lights switch
S11	Warning lights switch
S12	Direction indicators switch
S15	Differential lock switch
S18	Seat switch
S20	Regeneration switch
S22	Brake pressure switch
S24	Horn switch
S25	Brake test switch
S26	Calibration switch
S40	Vibration mode switch
S41	Seatbelt switch
V1	Diode
X3, X4, X5	Engine connectors
X17	Machine diagnostics socket
X30	Auxiliary power supply point
X35	Machine diagnostics socket
X36	Engine diagnostic socket
Y2	Brake valve electromagnet
Y3	Valve electromagnet, forward travel
Y4	Valve electromagnet, reverse travel
Y5	Vibration valve electromagnet, front
Y6	Vibration valve electromagnet, rear
Y7	Vibration valve electromagnet – big (ARX4)
Y8	Vibration valve electromagnet – small (ARX4)
Y9	Sprinkling pump valve electromagnet
Y11	Quantity divider valve electromagnet
Y12	Valve electromagnet of the edge cutter – up
Y13	Valve electromagnet of the edge cutter – down
Y14	Valve electromagnet of the edge cutter – sprinkling

(*) Optional equipment

(**) not available



38152A_1en

Wiring diagram

Legend:

A7	**Gessmann right travel lever**
S27	Vibration switch
S28	Sprinkling switch
S29	Edge cutter sprinkling switch
S30	Edge cutter selector
A9	**Gessmann left travel lever**
S31	Vibration switch
S32	Sprinkling switch
S33	Edge cutter sprinkling switch
S34	Edge cutter selector
A4	**Bauser display**
A1	Fuel gauge indicator (CAN)
A2	Voltage indicator
H1	ERROR indicator lamp (CAN)
H2	Charging indicator lamp (CAN)
H3	Engine oil pressure indicator lamp (CAN)
H4	Coolant temperature indicator lamp (CAN)
H5	Indicator lamp for hydraulic oil temperature (CAN)
H6	Emergency stop indicator lamp (CAN)
H7	Diesel fuel reserve indicator lamp (CAN)
H8	Engine glowing indicator lamp (CAN)
H9	Brake indicator lamp (CAN)
H10	Parking lights indicator lamp (CAN)
H11	Headlamps indicator lamp (CAN)
H12	Indicator lamp for direction indicators (CAN)
A3	Computer HY-TTC 510
A4	Bauser multifunctional display
A5	Infra thermometer
A6	ECU engine
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A8	Monitoring device
A9	Travel lever – left
A10	Compaction module
A11	Frequency sensor
B3	Hydraulic oil temperature sensor
B4	Fuel level float
B15	Air weight
C1	Noise suppressing filter
E1, 2	Front headlamps
E3	Rear light
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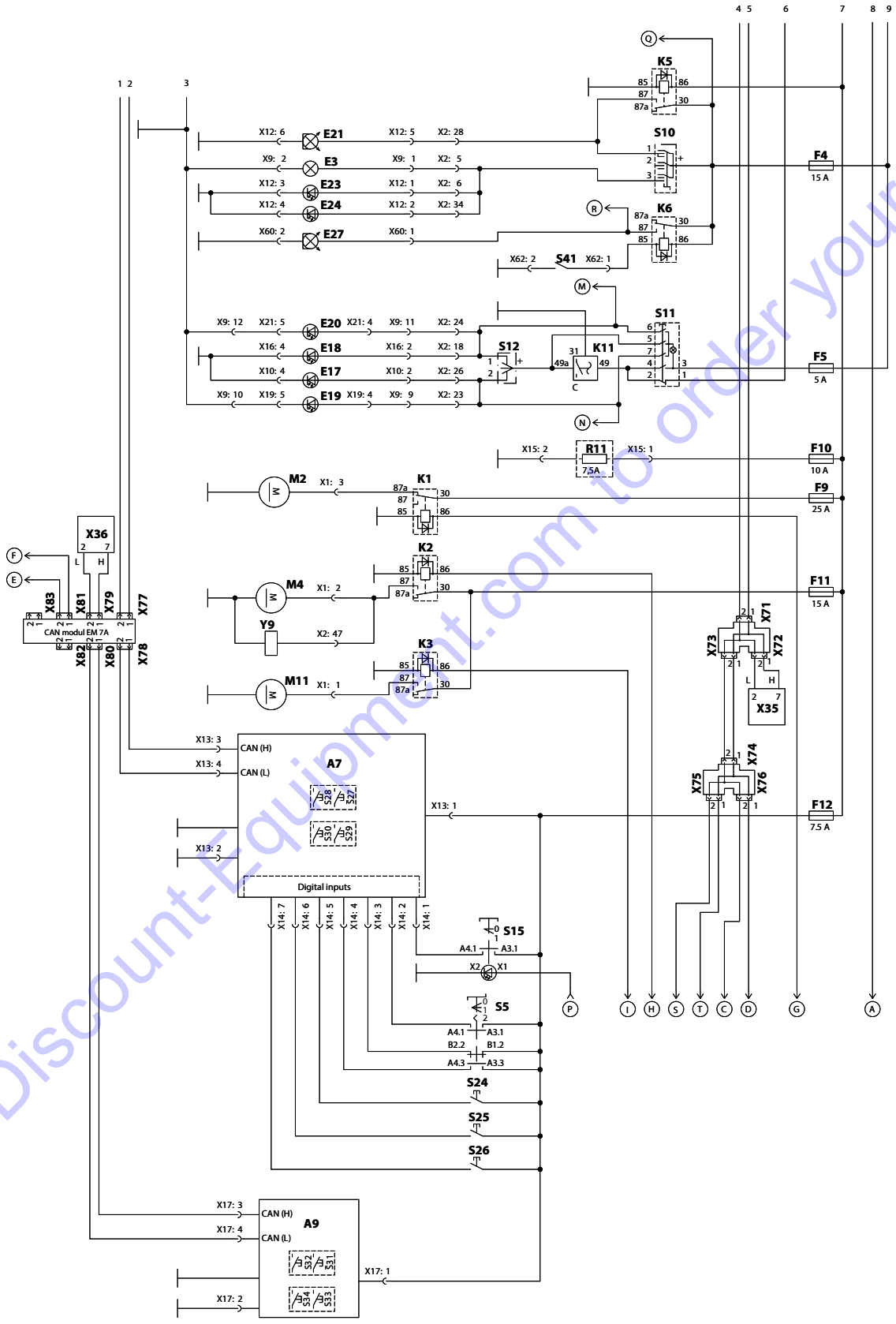
E15, 16	Tail lights
E17, 19	Right direction indicators
E18, 20	Left direction indicators
E21	Warning beacon
E22	Licence plate lighting
E23, 24	Working lights, ROPS
E25, 26	Brake lights
E27	Green beacon
F1-16	Fuses
F21-25	Fuses
F30	Main fuses
F30	Glowing fuse
G1	Battery
G2	Alternator
H13	Horn
H14	Reversing horn
H16	Seat contact delay horn
K1–6	Auxiliary relay
K10	Starter relay
K11	Interrupter
K12, 211	Auxiliary relay
K20	Glowing contactor
M1	Engine starter
M2	Hydraulic oil cooler
M3	Fuel pump
M4	Sprinkling pump
M11	Emulsion sprinkling pump
Q1	Battery disconnector
R1.1–1.3	Engine glowing
R11	Seat heating
S1	Ignition box
S2	Emergency brake button
S4	Sprinkling potentiometer
S5	Drive mode switch
S6	Automatic vibration switch
S7	Vibration switch, rear
S9	Headlamps switch
S10	Rear lights switch
S11	Warning lights switch
S12	Direction indicators switch
S15	Differential lock switch
S18	Seat switch
S20	Regeneration switch
S22	Brake pressure switch
S24	Horn switch
S25	Brake test switch
S26	Calibration switch
S40	Vibration mode switch
S41	Seatbelt switch
V1	Diode
X3, X4, X5	Engine connectors
X17	Machine diagnostics socket
X30	Auxiliary power supply point
X35	Machine diagnostics socket
X36	Engine diagnostic socket
Y2	Brake valve electromagnet
Y3	Valve electromagnet, forward travel
Y4	Valve electromagnet, reverse travel
Y5	Vibration valve electromagnet, front
Y6	Vibration valve electromagnet, rear
Y7	Vibration valve electromagnet – big (ARX4)
Y8	Vibration valve electromagnet – small (ARX4)
Y9	Sprinkling pump valve electromagnet
Y11	Quantity divider valve electromagnet
Y12	Valve electromagnet of the edge cutter – up
Y13	Valve electromagnet of the edge cutter – down
Y14	Valve electromagnet of the edge cutter – sprinkling

(*) Optional equipment

(**) not available



38152A_2en

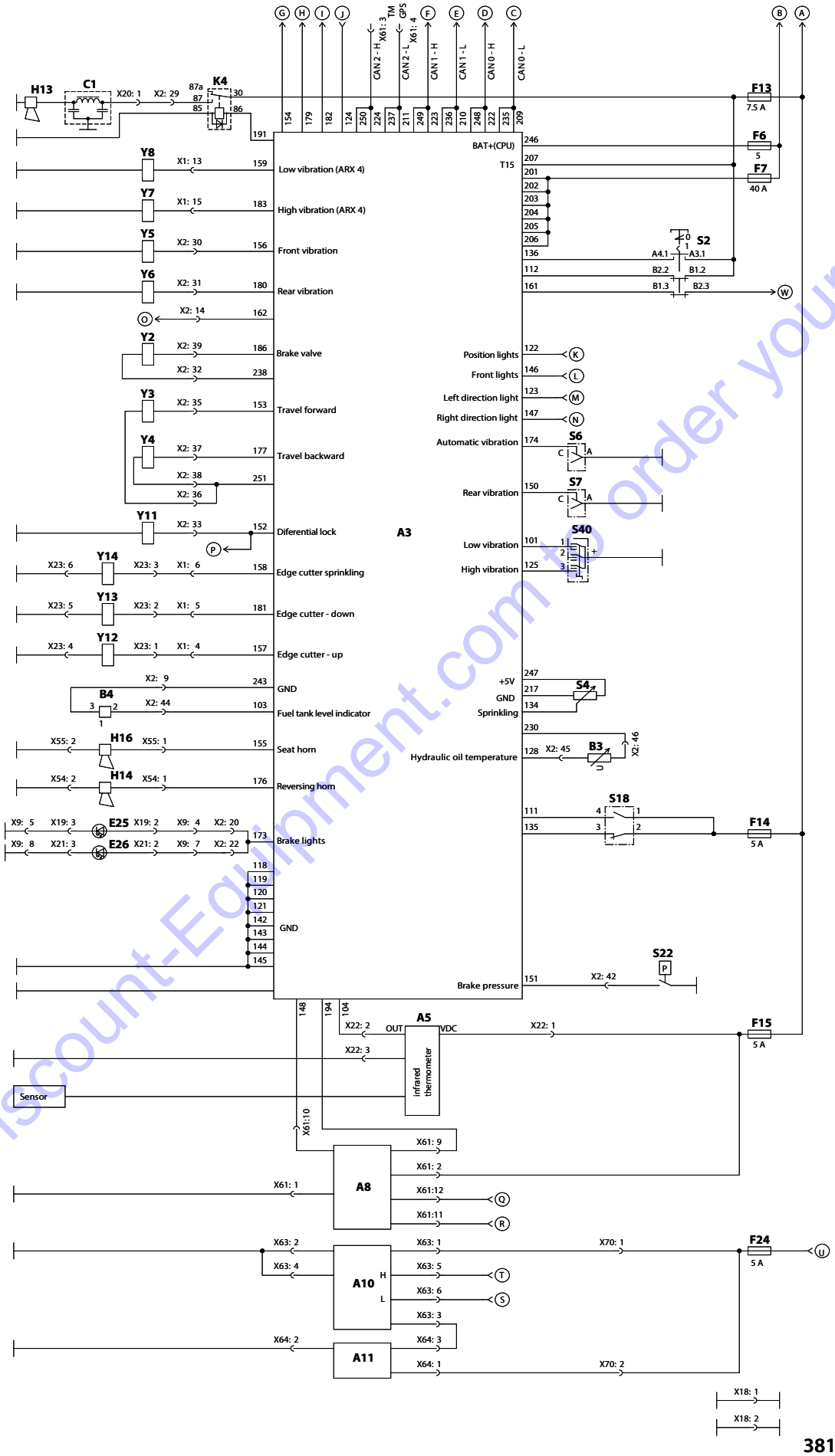
Wiring diagram

Legend:

A7	**Gessmann right travel lever**
S27	Vibration switch
S28	Sprinkling switch
S29	Edge cutter sprinkling switch
S30	Edge cutter selector
A9	**Gessmann left travel lever**
S31	Vibration switch
S32	Sprinkling switch
S33	Edge cutter sprinkling switch
S34	Edge cutter selector
A4	**Bauser display**
A1	Fuel gauge indicator (CAN)
A2	Voltage indicator
H1	ERROR indicator lamp (CAN)
H2	Charging indicator lamp (CAN)
H3	Engine oil pressure indicator lamp (CAN)
H4	Coolant temperature indicator lamp (CAN)
H5	Indicator lamp for hydraulic oil temperature (CAN)
H6	Emergency stop indicator lamp (CAN)
H7	Diesel fuel reserve indicator lamp (CAN)
H8	Engine glowing indicator lamp (CAN)
H9	Brake indicator lamp (CAN)
H10	Parking lights indicator lamp (CAN)
H11	Headlamps indicator lamp (CAN)
H12	Indicator lamp for direction indicators (CAN)
A3	Computer HY-TTC 510
A4	Bauser multifunctional display
A5	Infra thermometer
A6	ECU engine
A7	Travel lever – right
A8	Monitoring device
A9	Travel lever – left
A10	Compaction module
A11	Frequency sensor
B3	Hydraulic oil temperature sensor
B4	Fuel level float
B15	Air weight
C1	Noise suppressing filter
E1, 2	Front headlamps
E3	Rear light
E12, 14	Front parking lights
E15, 16	Tail lights
E17, 19	Right direction indicators
E18, 20	Left direction indicators
E21	Warning beacon
E22	Licence plate lighting
E23, 24	Working lights, ROPS
E25, 26	Brake lights
E27	Green beacon
F1-16	Fuses
F21-25	Fuses
F30	Main fuses
F30	Glowing fuse
G1	Battery
G2	Alternator
H13	Horn
H14	Reversing horn
H16	Seat contact delay horn
K1–6	Auxiliary relay
K10	Starter relay
K11	Interrupter
K12, 211	Auxiliary relay
K20	Glowing contactor
M1	Engine starter
M2	Hydraulic oil cooler
M3	Fuel pump
M4	Sprinkling pump
M11	Emulsion sprinkling pump
Q1	Battery disconnector
R1.1–1.3	Engine glowing
R11	Seat heating
S1	Ignition box
S2	Emergency brake button
S4	Sprinkling potentiometer
S5	Drive mode switch
S6	Automatic vibration switch
S7	Vibration switch, rear
S9	Headlamps switch
S10	Rear lights switch
S11	Warning lights switch
S12	Direction indicators switch
S15	Differential lock switch
S18	Seat switch
S20	Regeneration switch
S22	Brake pressure switch
S24	Horn switch
S25	Brake test switch
S26	Calibration switch
S40	Vibration mode switch
S41	Seatbelt switch
V1	Diode
X3, X4, X5	Engine connectors
X17	Machine diagnostics socket
X30	Auxiliary power supply point
X35	Machine diagnostics socket
X36	Engine diagnostic socket
Y2	Brake valve electromagnet
Y3	Valve electromagnet, forward travel
Y4	Valve electromagnet, reverse travel
Y5	Vibration valve electromagnet, front
Y6	Vibration valve electromagnet, rear
Y7	Vibration valve electromagnet – big (ARX4)
Y8	Vibration valve electromagnet – small (ARX4)
Y9	Sprinkling pump valve electromagnet
Y11	Quantity divider valve electromagnet
Y12	Valve electromagnet of the edge cutter – up
Y13	Valve electromagnet of the edge cutter – down
Y14	Valve electromagnet of the edge cutter – sprinkling

(*) Optional equipment

(**) not available

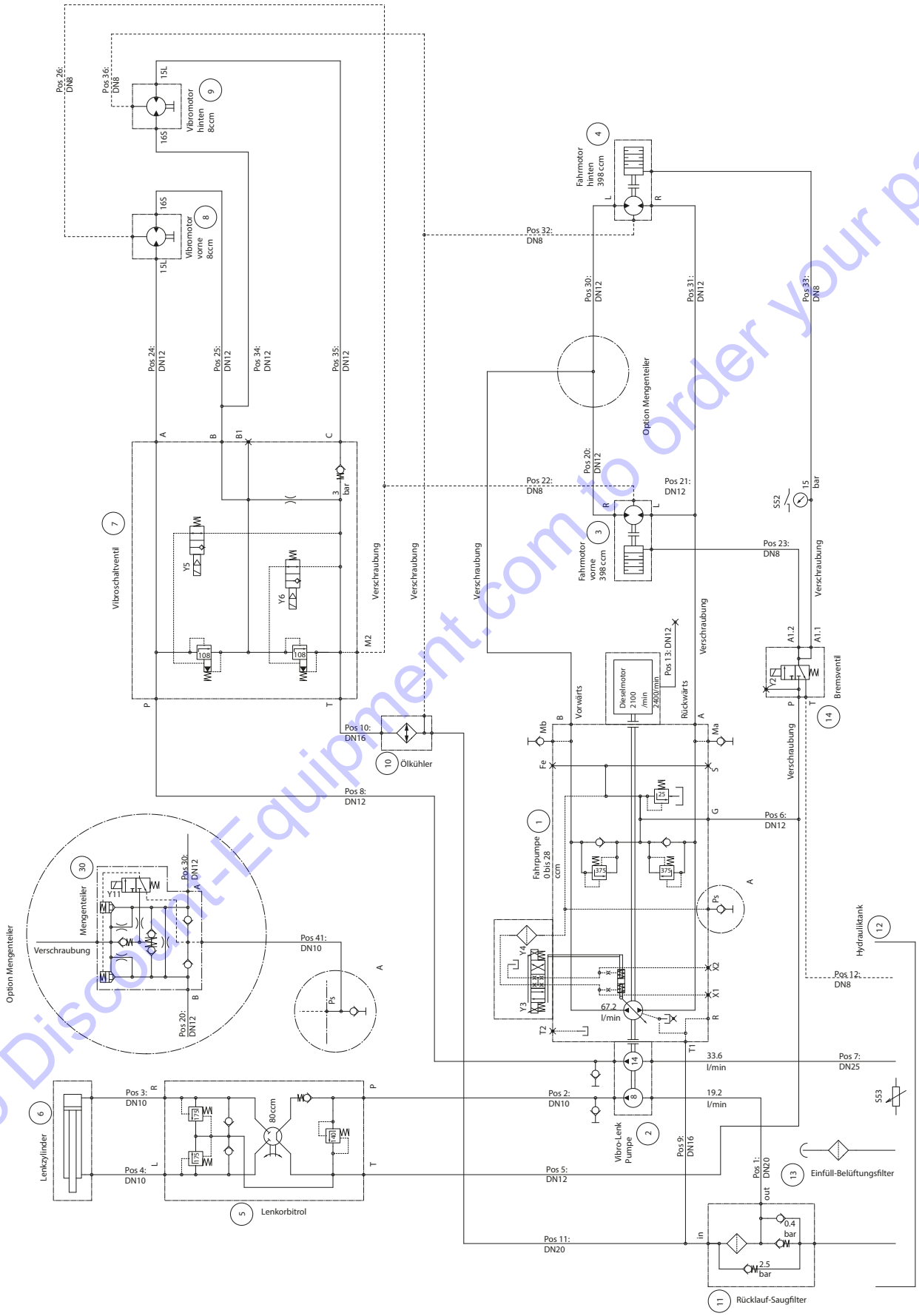


38152A_3en

Hydraulic system diagram ARX 23-2, ARX 26-2

Legend:

1 Travel pump
2 Pump, vibration, steering
3 Travel engine, front
4 Travel engine, rear
5 Steering unit (Orbitrol)
6 Steering cylinder
7 Vibration switching valve
8 Vibro motor, front
9 Vibro motor, rear
10 Oil cooler
11 Suction return filter
12 Hydraulic oil tank
13 Input ventilation filter
14 Brake valve
15 Travel engine, rear, left
16 Travel engine, rear, right



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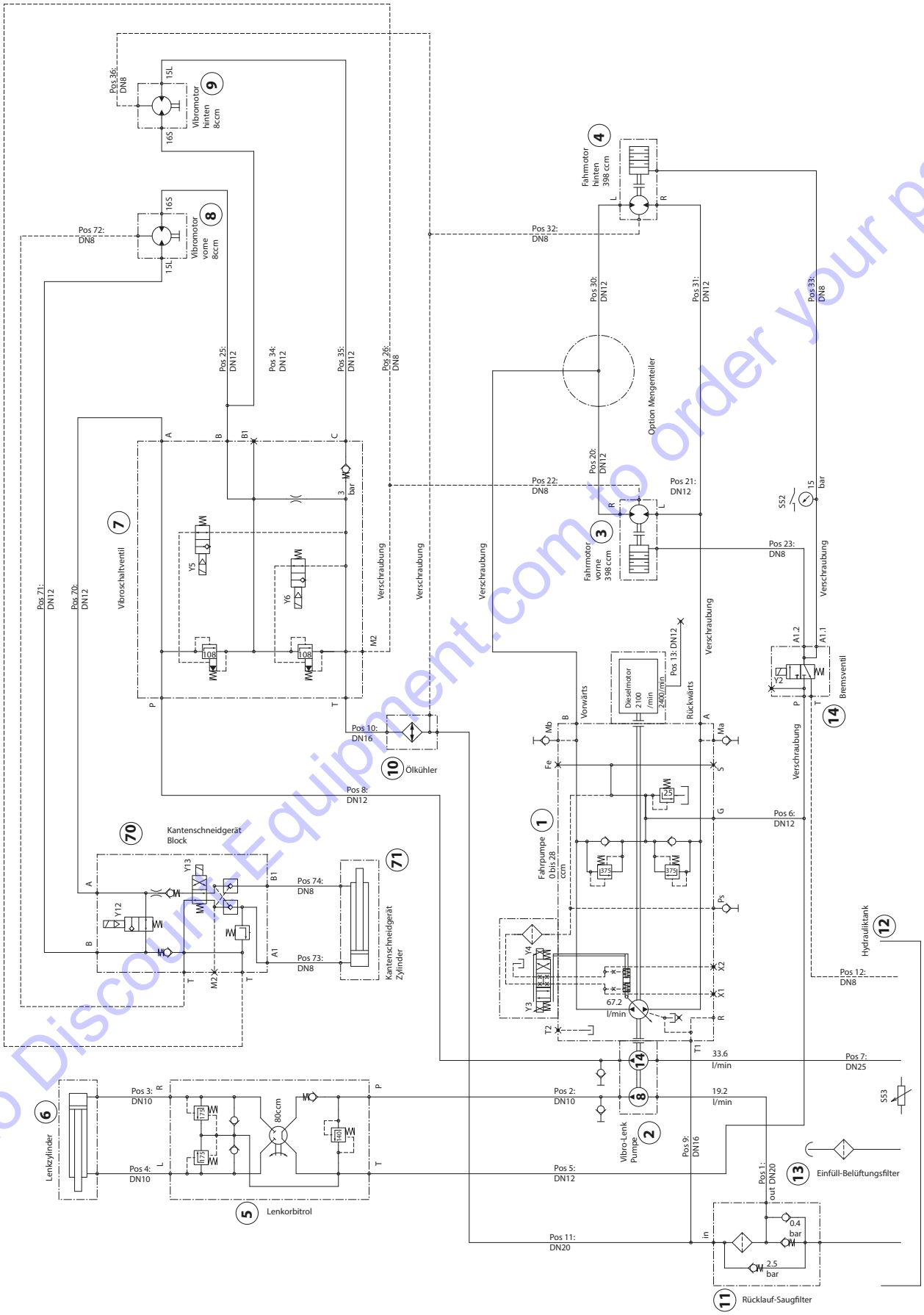
Hydraulic diagram – Edge cutter

Legend:

1 Travel pump
2 Pump, vibration, steering
3 Travel engine, front
4 Travel engine, rear
5 Steering unit (Orbitrol)
6 Steering cylinder
7 Vibration switching valve
8 Vibro motor, front
9 Vibro motor, rear
10 Oil cooler
11 Suction return filter
12 Hydraulic oil tank
13 Input ventilation filter
14 Brake valve
30 Quantity divider
70 Edge cutter – unit
71 Edge cutter – cylinder



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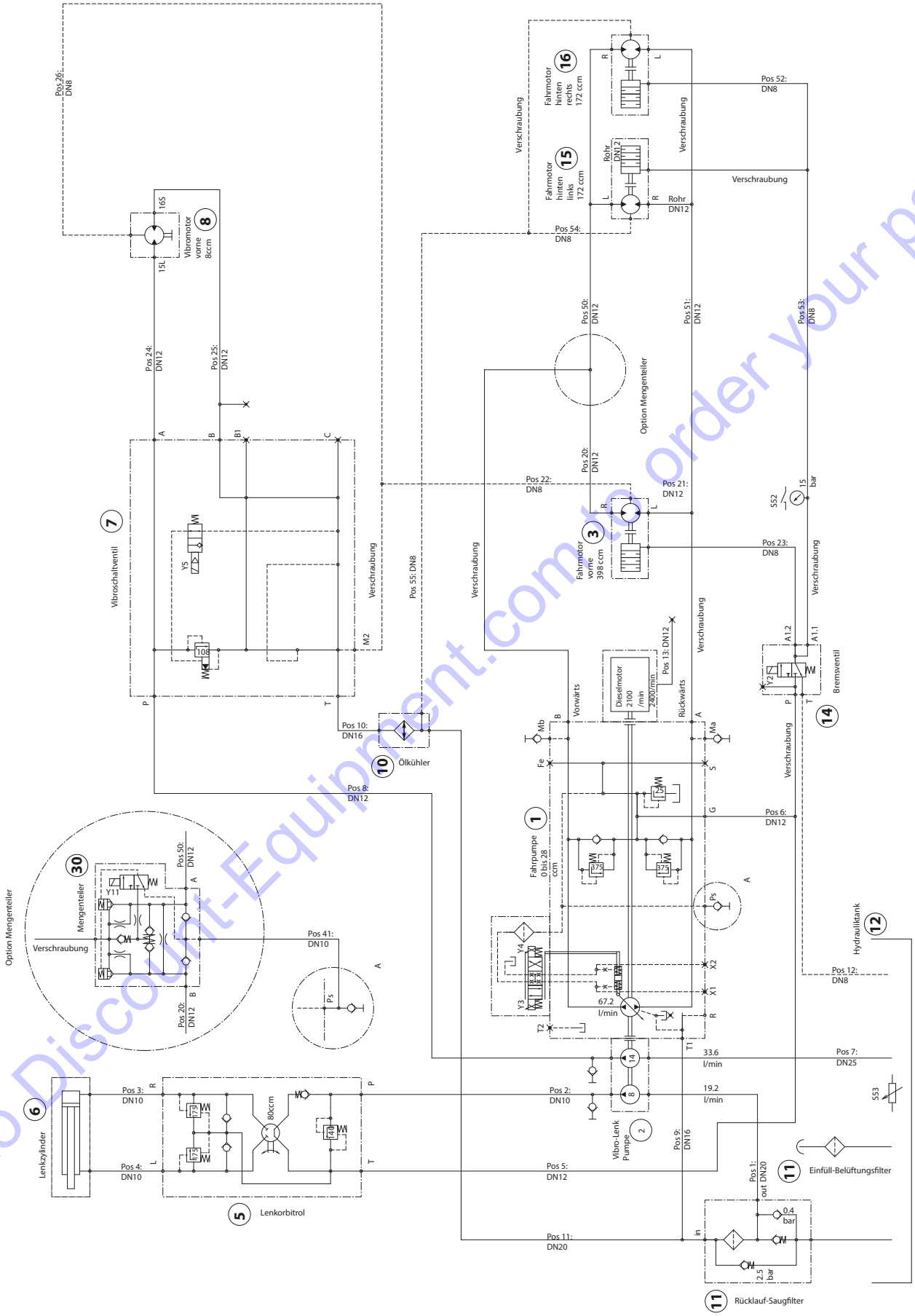
Hydraulic system diagram ARX 23-2C, ARX 26-2C

Legend:

1 Travel pump
2 Pump, vibration, steering
3 Travel engine, front
4 Travel engine, rear
5 Steering unit (Orbitrol)
6 Steering cylinder
7 Vibration switching valve
8 Vibro motor, front
9 Vibro motor, rear
10 Oil cooler
11 Suction return filter
12 Hydraulic oil tank
13 Input ventilation filter
14 Brake valve
15 Travel engine, rear, left
16 Travel engine, rear, right



1193807

Table of spare parts for regular maintenance

Chapter	Spare part	Order number
3.6.16	Fuel filter cartridge	1448216
3.6.19	Fan	1448212
3.6.21	Engine oil filter	1504183
3.6.24	Fuel filter	1448257
3.6.26	Air filter cartridge	1503941
3.6.26	Air filter cartridge	1503942
3.6.27	Fuel filter cartridge	1448216
3.6.28	Cooler rubber-metal element	1175152
3.6.29	Set of hydraulic oil filters	1182946
3.6.29	Ventilation filter	1242184
3.6.30	Air filter cartridge	1503941
3.6.41	Gas strut	1448823

Content of the filter set after 250 hours (4-760215)

Chapter	Spare part	Number of parts	Order number
3.6.21	Engine oil filter	1	1504183

Content of the filter set after 500 hours (4-760219)

Chapter	Spare part	Number of parts	Order number
3.6.16	Fuel filter cartridge	1	1448216
3.6.21	Engine oil filter	1	1504183
3.6.24	Fuel filter	1	1448257
3.6.26	Air filter cartridge, external	1	1503942
3.6.29	Hydraulic tank set of filters	1	1182946

Content of the filter set after 1000 hours (4-760216)

Chapter	Spare part	Number of parts	Order number
3.6.16	Fuel filter cartridge	1	1448216
3.6.21	Engine oil filter	1	1504183
3.6.24	Fuel filter	1	1448257
3.6.29	Hydraulic tank set of filters	1	1182946
3.6.30	Air filter cartridge, internal	1	1503941
3.6.30	Air filter cartridge, external	1	1503942

Error codes

Machine error codes		
F code	**Description**	**Troubleshooting**
-11	Seat Contact Open	Sit Down
-12	One or both levers are out of Parking brake position	Put the operating levers in the Parking brake position
-16	Immobiliser is active	Deactivate immobiliser
F021	Drive Joystick Right failure	Check the cable assembly and connectors
F023	Drive Joystick Left failure (if present)	
F025	Sprinkling Potentiometer - voltage out of range	Check the cable assembly and connectors
F026	Hydraulic oil temperature sensor failure	Check the cable assembly and connectors
F032	Hydraulic oil temperature too high (>95°C)	Wait untill oil temperature falls down
F029	Vibro Relays failure	Check the magnet, cable assembly and connectors
F030	Brake valve failure	Check the magnet, cable assembly and connectors
F031	Battery voltage lower than 7 V	Charge the battery, check the supply voltage
F036	Current PWM pump forward - the requested and measured currents of the pump forward magnet are too different from each other	Check the magnets of the hydraulic pump, cable assembly, and RC plugs
F037	Current PWM pump backward - the requested and measured currents of the pump forward magnet are too different from each other	Check the magnets of the hydraulic pump, cable assembly, and RC plugs
F038	Wrong drive direction	Check the cable assembly and connectors
F042	Asphalt Temperature sensor failure	Check the sensor, cable assembly, and connectors
EBUS	CAN bus err (Machine - Engine)	Check the cable assembly and connectors
F045	ACE frequency out of range	
F046	ACE amplitude low	
F047	ACE timeout on CAN	
F050	Brake valve and brake pressure sensor crosscheck failure	Check the cable assembly, connectors, brake pressure valve and brake pressure sensor.
F051	CAN_BUS0 error	Check the cable assembly and connectors
F052	CAN_BUS1 error	Check the cable assembly and connectors
F053	CAN_BUS2 error	Check the cable assembly and connectors
F054	SW failure	Disconnect battery (via central switch) for at least 3s
F055	Machine ECU failure	Disconnect battery (via central switch) for at least 3s
F056	ECU sensor supply failure	Check the cable assembly and connectors
F057	Machine ECU temperature out of range	Ensure the ECU temperature is within range
F058	Error list failure	Disconnect battery (via central switch) for at least 3s
F059	Some of machine ECU pins failed (short to ground or short to power or open circuit or other error).	Check the cable assembly and connectors

Engine error codes		
F code	**Description**	**Troubleshooting**
F100	Pressure limiter emergency open	Contact service Kubota / Ammann
F101	SCV(MPROP) stuck	Contact service Kubota / Ammann
F102	Fuel leak (in high pressured fuel system)	Contact service Kubota / Ammann
F103	Rail pressure sensor: Low	Contact service Kubota / Ammann
F104	Rail pressure sensor: High	Contact service Kubota / Ammann
F105	Injector charge voltage: High	Contact service Kubota / Ammann
F106	Open circuit of harness/coil in 1st cylinder injector	Contact service Kubota / Ammann
F107	Open circuit of harness/coil in 3rd cylinder injector	Contact service Kubota / Ammann
F108	Open circuit of harness/coil in 4th cylinder injector	Contact service Kubota / Ammann
F109	Open circuit of harness/coil in 2nd cylinder injector	Contact service Kubota / Ammann
F110	Engine overheat	Contact service Kubota / Ammann
F111	Engine overrun	Contact service Kubota / Ammann
F112	Oil pressure error	Contact service Kubota / Ammann
F113	ECU FLASH ROM error	Contact service Kubota / Ammann
F114	ECU CPU (Main IC) error	Contact service Kubota / Ammann
F115	ECU CPU (Monitoring IC) error	Contact service Kubota / Ammann
F116	Injector charge voltage: Low	Contact service Kubota / Ammann
F117	Open circuit of SCV (MPROP)	Contact service Kubota / Ammann
F118	SCV (MPROP) drive system error	Contact service Kubota / Ammann
F119	Injector drive IC error or Open circuit	Contact service Kubota / Ammann
F120	Internal injector drive circuit short	Contact service Kubota / Ammann
F121	Sensor supply voltage 1: Low	Contact service Kubota / Ammann
F122	Sensor supply voltage 1: High	Contact service Kubota / Ammann
F123	No.1 & 4 cylinder injector short to +B or GND	Contact service Kubota / Ammann
F124	No. 2 & 3cylinder injector short to +B or GND	Contact service Kubota / Ammann
F125	Pressure limiter not open	Contact service Kubota / Ammann
F126	Rail pressure failure after pressure limiter open	Contact service Kubota / Ammann
F127	CAN2 Bus off	Contact service Kubota / Ammann
F128	CAN1 Bus off	Contact service Kubota / Ammann
F129	CAN-KBT Frame error	Contact service Kubota / Ammann
F150	MAF sensor: Low	Contact service Kubota / Ammann
F151	MAF sensor: High	Contact service Kubota / Ammann
F152	Emission deterioration	Contact service Kubota / Ammann
F153	"Emergency Exhaust gas temperature sensor 0: High"	Contact service Kubota / Ammann
F154	"Emergency Exhaust gas temperature sensor 1: High"	Contact service Kubota / Ammann
F155	"Emergency Exhaust gas temperature sensor 2: High"	Contact service Kubota / Ammann
F156	Excessive PM5	Contact service Kubota / Ammann
F157	High exhaust gas temp. after emergency high temp. DTC.	Contact service Kubota / Ammann
F200	"NE-G phase shift NE: Crankshaft position sensor G : Camshaft position sensor"	Contact service Kubota / Ammann
F201	High rail pressure	Contact service Kubota / Ammann
F202	Coolant temperature sensor: Low	Contact service Kubota / Ammann
F203	Coolant temperature sensor: High	Contact service Kubota / Ammann
F204	No input of NE sensor (Crank position sensor) pulse	Contact service Kubota / Ammann

Engine error codes		
F code	**Description**	**Troubleshooting**
F205	NE sensor (Crank position sensor) pulse number error	Contact service Kubota / Ammann
F206	+B short of glow relay driving circuit	Contact service Kubota / Ammann
F207	Battery voltage: Low	Contact service Kubota / Ammann
F208	Battery voltage: High	Contact service Kubota / Ammann
F209	+B short circuit of SCV (MPROP)	Contact service Kubota / Ammann
F210	Sensor supply voltage 2: Low	Contact service Kubota / Ammann
F211	Sensor supply voltage 2: High	Contact service Kubota / Ammann
F212	Sensor supply voltage 3: Low	Contact service Kubota / Ammann
F213	Sensor supply voltage 3: High	Contact service Kubota / Ammann
F214	Accelerator position sensor 1: Low	Contact service Kubota / Ammann
F215	Accelerator position sensor 1: High	Contact service Kubota / Ammann
F216	Accelerator position sensor 2: Low	Contact service Kubota / Ammann
F217	Accelerator position sensor 2: High	Contact service Kubota / Ammann
F218	Accelerator position sensor error (CAN)	Contact service Kubota / Ammann
F250	Intake air volume: Low	Contact service Kubota / Ammann
F251	EGR actuator open circuit	Contact service Kubota / Ammann
F252	EGR actuator coil short	Contact service Kubota / Ammann
F253	EGR position sensor failure	Contact service Kubota / Ammann
F254	Exhaust gas temperature sensor 1: Low	Contact service Kubota / Ammann
F255	Exhaust gas temperature sensor 1: High	Contact service Kubota / Ammann
F256	Exhaust gas temperature sensor 0: Low	Contact service Kubota / Ammann
F257	Exhaust gas temperature sensor 0: High	Contact service Kubota / Ammann
F258	Intake throttle feedback error	Contact service Kubota / Ammann
F259	Accelerator position sensor correlation error	Contact service Kubota / Ammann
F260	EGR actuator valve stuck	Contact service Kubota / Ammann
F261	EGR (DC motor) overheat	Contact service Kubota / Ammann
F262	EGR (DC motor) temp. sensor failure	Contact service Kubota / Ammann
F263	Exhaust gas temperature sensor 2: Low	Contact service Kubota / Ammann
F264	Exhaust gas temperature sensor 2: High	Contact service Kubota / Ammann
F265	Differential pressure sensor 1: Low	Contact service Kubota / Ammann
F266	Differential pressure sensor 1: High	Contact service Kubota / Ammann
F267	Intake throttle lift sensor: Low	Contact service Kubota / Ammann
F268	Intake throttle lift sensor: High	Contact service Kubota / Ammann
F269	Excessive PM3	Contact service Kubota / Ammann
F270	Excessive PM4	Contact service Kubota / Ammann
F271	Boost pressure low	Contact service Kubota / Ammann
F272	All exhaust temp. sensor failure	Contact service Kubota / Ammann
F273	High frequency of regeneration	Contact service Kubota / Ammann
F274	No communication with EGR	Contact service Kubota / Ammann
F300	Intake air temp. error: Low	Contact service Kubota / Ammann
F301	Intake air temp. error: High	Contact service Kubota / Ammann
F302	Boost pressure sensor: Low	Contact service Kubota / Ammann
F303	Boost pressure sensor: High	Contact service Kubota / Ammann
F304	No input of G sensor (Camshaft position sensor) pulse	Contact service Kubota / Ammann
F305	G-sensor (Camshaft position sensor) pulse number error	Contact service Kubota / Ammann
F306	Open circuit of glow relay driving circuit	Contact service Kubota / Ammann
F307	Ground short of glow relay driving circuit	Contact service Kubota / Ammann

Engine error codes		
F code	**Description**	**Troubleshooting**
F308	Glow heater relay driving circuit overheat	Contact service Kubota / Ammann
F309	QR(IQA) data error	Contact service Kubota / Ammann
F310	No QRIQA) data	Contact service Kubota / Ammann
F311	Main relay is locked in closed position	Contact service Kubota / Ammann
F312	Ground short of Starter relay driving circuit	Contact service Kubota / Ammann
F313	Barometric pressure sensor error (Low side)	Contact service Kubota / Ammann
F314	Barometric pressure sensor error (High side)	Contact service Kubota / Ammann
F350	Intake air temp. built-in MAF sensor: Low	Contact service Kubota / Ammann
F351	Intake air temp. built-in MAF sensor: High	Contact service Kubota / Ammann
F352	EEPROM check sum error	Contact service Kubota / Ammann
F353	Low coolant temp. in parked regeneration	Contact service Kubota / Ammann
F354	Parked regeneration time out	Contact service Kubota / Ammann
F355	Over heat pre-caution	Contact service Kubota / Ammann
F356	CAN CCVS (Parking SW and Vehicle speed) frame error	Contact service Kubota / Ammann
F357	CAN CM1 (Regen SW) frame error	Contact service Kubota / Ammann
F358	CAN DDC1 (Transmission) frame error	Contact service Kubota / Ammann
F359	CAN ETC2 (Neutral SW) frame error	Contact service Kubota / Ammann
F360	CAN ETC5 (Neutral SW) frame error	Contact service Kubota / Ammann
F361	CAN TSC1 frame error	Contact service Kubota / Ammann
F362	CAN EBC1 frame error	Contact service Kubota / Ammann

Messages displayed on the display

Displayed message	Description of the displayed message	Note
btnCAL	Calibration button pressed	
btn br	Brake test button pressed	
br tSt	Brake test active	
rA SEL	Ramp selection	
HArd	Hard ramp	
SoFt	Soft ramp	
tEMP	Temperature unit selection	
C	Celsius	
F	Fahrenheit	
LEFtLu	Left lever presence selection	
OFF	Off - left lever not present	
On	On - left lever present	
tc SEL	Rear drum type (tandem/combi) selection	
tAndEM	Tandem	
CoMbI	Combi	
Saue	Save (menu item)	
SAuIn9	Saving	
SAuEd	Saved	
btnOFF	Off button pressed	
Error	Error when saving new parameters values	
PUMP	Pump calibration (menu item)	
CUrr	Current in mA	Current (to the forward/reverse travel coil) during calibration, the value in [mA] is shown in the upper display
SUCC	Success	The calibration of minimum currents to travel coils successfully completed
FAIL	Failure	Error in the calibration of minimum currents to travel coils – values have not been changed
bAC	Back	One step back in the menu structure
UndEF	Undefined	Unspecified error (contact the service centre)
dPFErr	DPF error	No message about the DPF filter status received from the engine.

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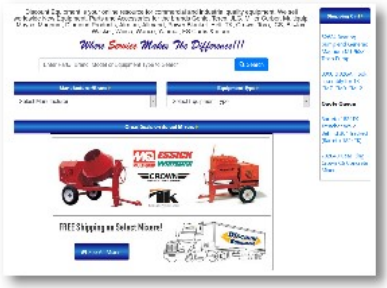

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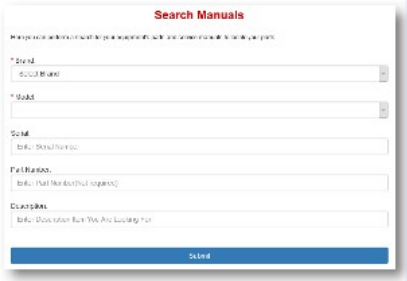

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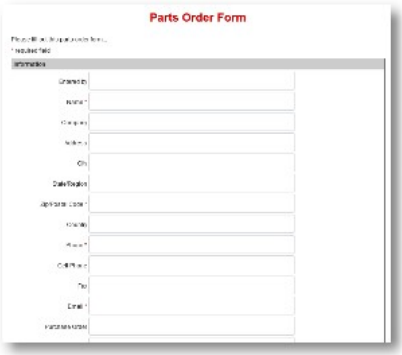

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