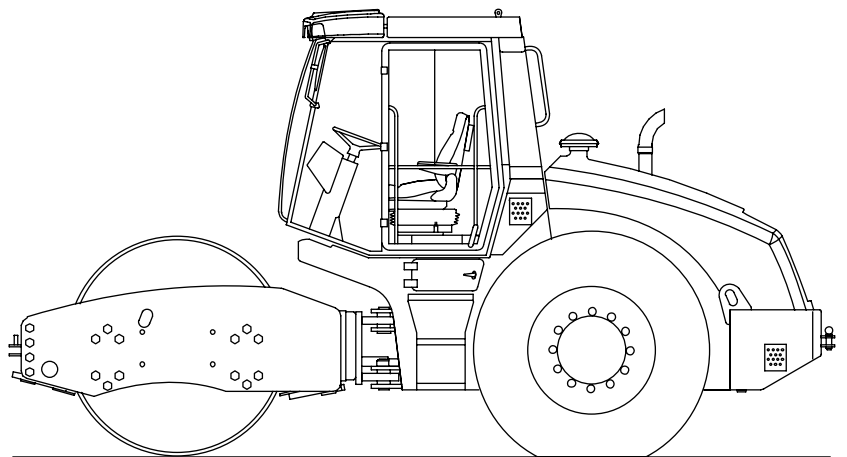


ASC 70

SINGLE DRUM ROLLER
CUMMINS Tier 3



OPERATING MANUAL

EDITION 10/2018 EN
From Serial No. 2742519

AMMANN

ES / EU Prohlášení o shodě

(Původní ES/EU prohlášení o shodě / Original EC/EU Declaration of conformity / Ursprüngliche EG-/EU-Konformitätserklärung)

EC / EU Declaration of conformity / EG-/EU-Konformitätserklärung

(Překlad původního ES/EU prohlášení o shodě / Translation original EC/EU Declaration of conformity / Übersetzung der ursprünglichen EG-/EU-Konformitätserklärung)

Originální ES/EU prohlášení o shodě je dodané s dokumenty během expedice stroje. / The original EC/EU Declaration of Conformity is supplied with documents during expedition of machine. / Das Original der EG-/EU-Konformitätserklärung wird mit den Unterlagen während des Versands der Maschine mitgeliefert.

Výrobce / Manufacturer / Hersteller:	Ammann Czech Republic a.s.
Adresa / Address / Adresse:	Náchodská 145, CZ-549 01 Nové Město nad Metují, Czech Republic
IČ / Identification Number / Ident.-Nr:	000 08 753
Jméno a adresa osoby pověřené sestavením technické dokumentace podle 2006/42/ES a jméno a adresa osoby, která uchovává technickou dokumentaci podle 2000/14/ES / Name and address of the person authorised to compile the technical file according to 2006/42/EC and name and address of the person, who keeps the technical documentation according to 2000/14/EC / Name und Adresse der mit der Zusammenstellung der technischen Dokumentation beauftragten Person gemäß 2006/42/EG und Name und Adresse der mit der Aufbewahrung der technischen Dokumentation beauftragten Person gemäß 2000/14/EG:	Ing. Radek Ostrý Ammann Czech Republic a.s. Náchodská 145, CZ-549 01 Nové Město nad Metují, Czech Republic
Popis strojího zařízení / Description of the machinery / Beschreibung der Maschineneinrichtung:	
Označení / Designation / Bezeichnung:	Tahačový válec / Single drum roller / Walzenzug
Typ / Type / Typ:	ASC 70
Verze / Version / Version:	
Výrobní číslo / Serial number / Maschinenummer:	
Motor / Engine / Motor:	Cummins QSB 3.3-C99, vznětový, jmenovitý výkon (ISO 3046-1): 74,0 kW, jmenovitě otáčky: 2200 min ⁻¹ . / Cummins QSB 3.3-C99, Diesel, nominal power (ISO 3046-1): 74,0 kW, rated speed: 2200 RPM. / Cummins QSB 3.3-C99, Dieselmotor, Nennleistung (ISO 3046-1): 74,0 kW, Nenndrehzahl: 2200 min ⁻¹ .
Prohlašujeme, že strojní zařízení splňuje všechna příslušná ustanovení uvedených směrnic / We declare, that the machinery fulfils all the relevant provisions mentioned Directives / Wir erklären, dass die Maschineneinrichtung sämtliche entsprechenden Bestimmungen aufgeführter Richtlinien erfüllt:	Strojní zařízení – směrnice 2006/42/ES / Machinery Directive 2006/42/EC / Maschineneinrichtung – Richtlinie 2006/42/EG Elektromagnetická kompatibilita – směrnice 2014/30/EU / Electromagnetic Compatibility Directive 2014/30/EU / Elektromagnetische Kompatibilität – Richtlinie 2014/30/EU Emise hluku – směrnice 2000/14/ES / Noise Emission Directive 2000/14/EC / Lärmemissionen – Richtlinie 2000/14/EG
Harmonizované technické normy a technické normy použité k posouzení shody / The harmonized technical standards and the technical standards applied to the conformity assessment / Harmonisierte technische Normen und für die Beurteilung der Konformität verwendete Normen:	ČSN EN ISO 12100, ČSN EN 500-1+A1, ČSN EN 500-4, ČSN EN ISO 4413, ČSN EN 13309
Osoby zúčastněné na posouzení shody / Bodies engaged in the conformity assessment / An der Konformitätsbeurteilung beteiligte Personen:	Notifikovaná osoba č. 1016 / Notified Body No.: 1016 / Notifizierte Stelle Nr.: 1016 Státní zkušebna strojů a.s., Třanovského 622/11, 163 04 Praha 6-Řepy, ČR. / The Government Testing Laboratory of Machines J.S.C., Třanovského 622/11, 163 04 Praha 6-Řepy, Czech Republic / Staatliche Prüfstelle für Maschinen AG, Třanovského 622/11, 163 04 Praha 6-Řepy, Tschechische Republik.
Použitý postup posouzení shody / To the conformity assessment applied procedure / Verwendetes Vorgehen der Konformitätsbeurteilung:	Na základě směrnice 2000/14/ES příloha VI / Pursuant to the Noise Emission Directive 2000/14/EC, Annex VI / Aufgrund der Richtlinie 2000/14/EG, Anlage VI
Naměřená hladina akustického výkonu / Measured sound power level / Gemessener Schalleistungspegel:	L _{WA} = 105 dB
Garantovaná hladina akustického výkonu / Guaranteed sound power level / Garantierter Schalleistungspegel:	L _{WA} = 106 dB

Místo a datum vydání / Place and date of issue / Ort und Datum der Ausgabe: Nové Město nad Metují,

Osoba zmocněná k podpisu za výrobce / Signed by the person entitled to deal in the name of manufacturer / Zeichnungsberechtigter für den Hersteller:

Jméno / Name / Name: Bc. Martin Čeřovský
Funkce / Grade / Stelle: Quality Control Manager
Podpis / Signature / Unterschrift:

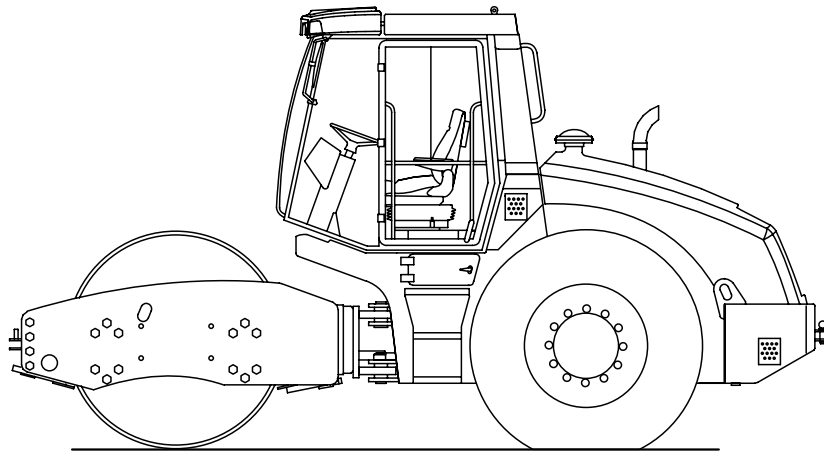
Congratulations on your purchase of an AMMANN road roller. This modern compaction device is characterised by simple operation and maintenance and is the product of many years of AMMANN experience in the field of road roller engineering. In order to avoid faults due to improper operation and maintenance 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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ASC001

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.

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SYMBOLS OF THE SAFETY NOTICES:



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



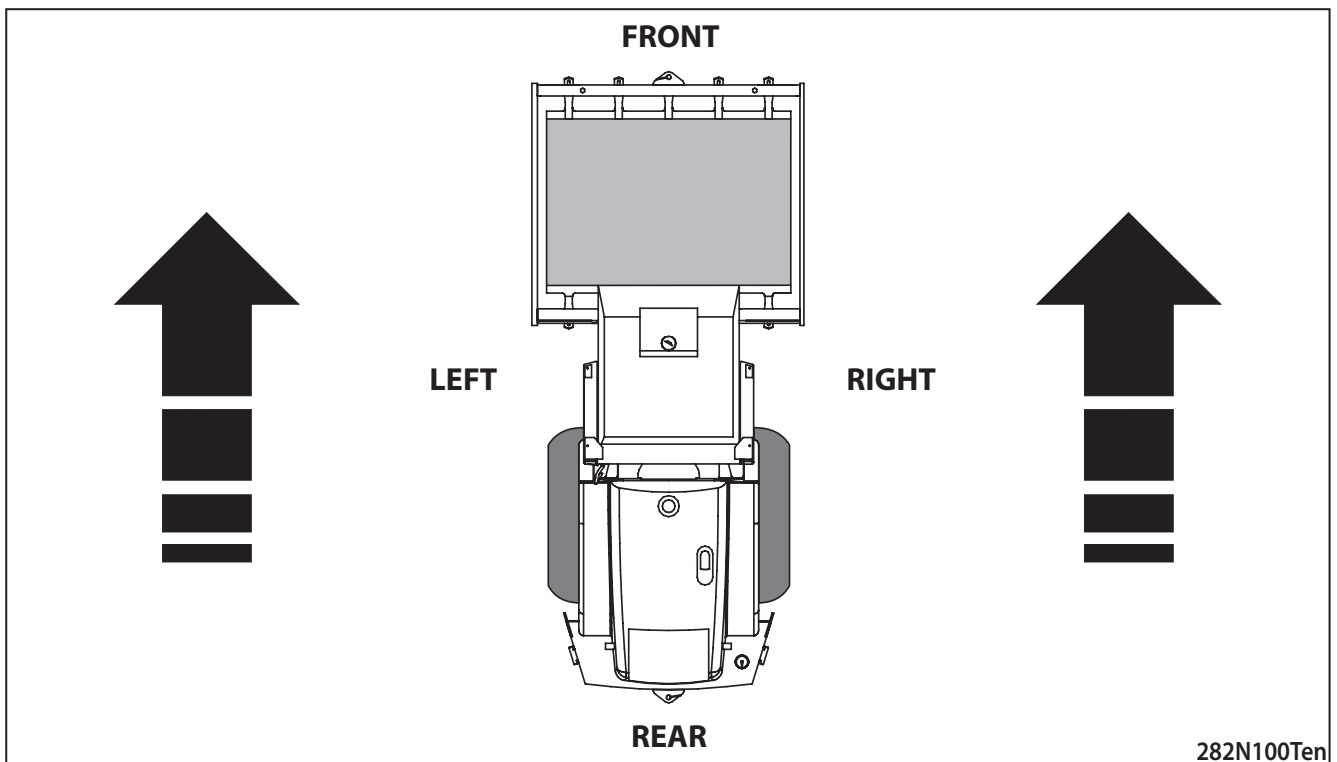
The notice warns of possible damages to the machine or its parts.



The notice warns of the necessity of environmental protection.

! NOTICE !

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



Content

Content.....	4
1. SPECIFICATION MANUAL.....	9
1.1. Basic specification	10
1.2. Dimensional diagram of the Machine.....	12
1.3. Specifications.....	14

2. OPERATION MANUAL	19
2.1. Major Safety Precautions	21
2.1.1. Safety Measures during Machine Operation	21
2.1.1.1. Compaction Work Commencement	21
2.1.1.2. Work Safety Secured by User	21
2.1.1.3. Ensurance of safety measures by the owner	22
2.1.1.4. ROPS	22
2.1.2. Requirements on Driver's Qualification	23
2.1.3. Driver's Liabilities	24
2.1.4. Forbidden activities – safety and guarantee	25
2.1.5. Safety inscriptions and signs used on the Machine	26
2.1.6. Hand signals	31
2.2. Ecological and hygienic principles	34
2.2.1. Hygienic principles	34
2.2.2. Ecological principles	34
2.3. Machine preservation and storage	35
2.3.1. Short-term preservation and storage for a period of 1 – 2 months	35
2.3.2. Preservation and storage for the period over 2 months long	35
2.3.3. Dewaxing and inspection of a supplied machine	36
2.4. Machine disposal following its life cycle end	37
2.5. Machine description	38
2.6. Actuators and dashboard instruments	39
2.6.1. Power View control	54
2.7. Machine control and use	64
2.7.1. Starting the engine	64
2.7.2. Travel and reversing	67
2.7.3. Emergency stop of the Machine	70
2.7.4. How to stop the Machine and its engine	71
2.7.5. Machine parking	72
2.7.6. Cab and bonnet raising and lowering	73
2.7.7. Blade	76
2.7.8. Ballasting of tyres with liquid	79
2.8. How to transport the Machine	81
2.8.1. Loading the machine	82
2.8.1.1. Loading the machine using a ramp	82
2.8.1.2. Loading the machine using a crane	83
2.9. Special conditions of the Machine use	84
2.9.1. Machine towing	84
2.9.2. Machine operation during running-in	90
2.9.3. Machine operation at low temperatures	90
2.9.4. Operating the Machine at high temperatures and humidity	91
2.9.5. Operating the Machine at high altitudes	92
2.9.6. Work of the machine in the dusty environment	92
2.9.7. Driving with vibrations on compacted and hard materials	92

Content

3. MAINTENANCE MANUAL	95
3.1. Safety and other measures for machine maintenance.....	97
3.1.1. Safety of machine maintenance.....	97
3.1.2. Fire precautions during operation media exchanges.....	97
3.1.3. Ecological and hygienic principles	98
3.2. Media specifications.....	99
3.2.1. Engine oil	99
3.2.2. Fuel.....	100
3.2.3. Coolant	101
3.2.4. Hydraulic oil.....	102
3.2.5. Gearbox oil.....	102
3.2.6. Lube grease.....	102
3.2.7. Glass washer fluid	102
3.2.8. Air-conditioning filling.....	102
3.3. Filling media	103
3.4. Lubrication and Maintenance Chart	104
3.5. Lubrication and service plan	106
3.6. Lubrication and Maintenance.....	107
Every 20 hours of operation (daily).....	108
3.6.1. Engine oil level check.....	108
3.6.2. Engine cooling liquid level check	109
3.6.3. Hydraulic oil level check.....	109
3.6.4. Crankcase breather tube.....	110
3.6.5. Fan and engine belt condition check.....	110
3.6.6. Air filter dust valve check.....	111
3.6.7. Warning and control devices check.....	112
Every 100 hours of operation (weekly).....	113
3.6.8. Tyre pressure check.....	113
Every 250 hours of operation (3 months)	114
3.6.9. Engine oil change	114
3.6.10. Engine inlet piping check.....	117
3.6.11. Battery check.....	119
3.6.12. Machine lubrication	120
3.6.13. Oil in the vibrator check	123
3.6.14. Oil in the travel gearboxes check.....	124
3.6.15. Pad foot segments inspection	125

Every 500 hours of operation (6 months)	126
3.6.16. Fuel filter replacement.....	126
3.6.17. Air filter elements replacement.....	128
3.6.18. Filters of the cab ventilation and heating replacement.....	130
3.6.19. Engine cooling liquid check.....	131
3.6.20. Wiring check	131
3.6.21. Air filter of the air conditioning system replacement.....	132
3.6.22. Wheel bolts tightening check	132
Every 1000 hours of operation (1 year).....	133
3.6.23. Engine belt check.....	133
3.6.24. Oil in the travel gearboxes change.....	134
3.6.25. Air conditioning compressor mounting check.....	135
3.6.26. Damping system check	136
Every 2000 hours of operation (2 years)	138
3.6.27. Valve clearance adjustment	138
3.6.28. Oil in the vibrator change	138
3.6.29. Air conditioning system cleaning	139
3.6.30. Hydraulic oil and filter change	140
3.6.31. Suction strainer unit cleaning	144
3.6.32. Engine cooling liquid change.....	145
Maintenance as required	147
3.6.33. Water separator cleaning.....	147
3.6.34. Coolers cleaning.....	148
3.6.35. Fuel system venting	149
3.6.36. Machine cleaning.....	150
3.6.37. Scrapers adjustment.....	151
3.6.38. Screw connection tightening check	152
3.7. Failures	155
3.8. Annexes	156
3.8.1. Wiring diagram	156
3.8.2. Wiring diagram - road lights	162
3.8.3. Hydraulic system diagram - INTER - Wheel differential lock.....	166
3.8.4. Hydraulic system diagram - Interaxle differential lock ATC	168
3.8.5. Hydraulic system diagram - electro-hydraulic cab and bonnet lifting.....	170
3.8.6. Hydraulic system diagram - manual cab and bonnet lifting.....	171
3.8.7. Table of spare parts	172

1. SPECIFICATION MANUAL

ASC 70 (Cummins Tier 3)

1.1. Basic specification

Machine description

Single drum roller with an articulated frame with a front smooth or padfoot steel driven vibrating drum and driven rear axle with two treaded tyres. Steering using the articulated frame.

Machine application

The **ASC 70** rollers are suitable for medium and small-sized compaction works in transport construction (construction of roads, railways, cart roads, and forest roads) and building construction (industrial zones, embankments), etc.

ASC 70 D roller with a smooth drum is suitable for the compaction of all kinds of soils. It is possible to be used for the compaction of clay soils up to a layer thickness (after compaction) of 15 cm (5,9 in), loam soils up to a layer thickness of 25 cm (9,8 in), mixed soils up to a layer thickness of 35 cm (13,8 in), sandy and gravel materials up to a layer thickness of 45 cm (17,7 in). The roller can also be used for compaction by means of stabilisation.

ASC 70 PD roller with a padfoot drum (synchronous kneading and vibrating effect) is suitable for the compaction of clay soils up to a layer thickness (after compaction) of 20 cm (7,9 in), loam soils up to a layer thickness of 25 cm (9,8 in), and mixed soils up to a layer thickness of 35 cm (13,8 in).

The roller **ASC 70 HX** for continuous use in severe conditions requiring the continuous application of a high tractive power, or for continuous compaction on a slope above 30 % – smooth drum.

The roller **ASC 70 HXP**D for continuous use in severe conditions requiring the continuous application of a high tractive power, or for continuous compaction on a slope above 30 % – padfoot drum.

ASC 70 PDB roller with a padfoot drum and blade for spreading materials. The blade is the optional equipment supplied per order.

The machines are intended for operation in conditions of the following types according to ČSN IEC 721-2-1 (038900): WT, WDr, MWDr (i.e. mild, warm dry, hot dry with a limited temperature range of from -15 °C (5 °F) to +45 °C (113 °F).

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

Please fill in the following data:

(see Pin label, Label of the CUMMINS engine)

Type of machine

.....

ICV/PIN (Serial number of the machine)

.....

Production year

.....

Type of engine

.....

Serial number of the engine

.....

Please refer to the data in the table below always when approaching the dealer or the manufacturer.

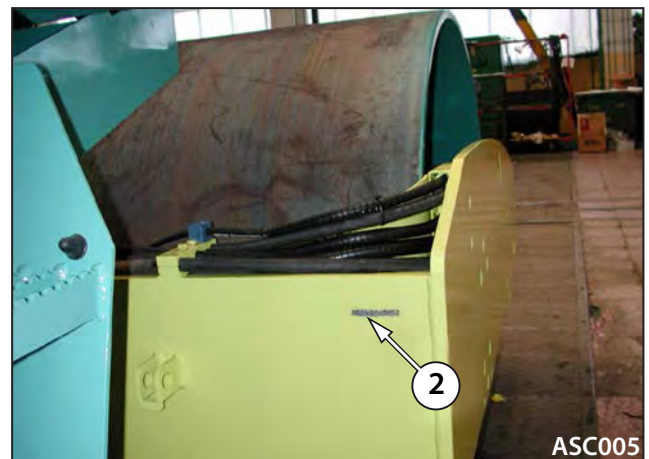
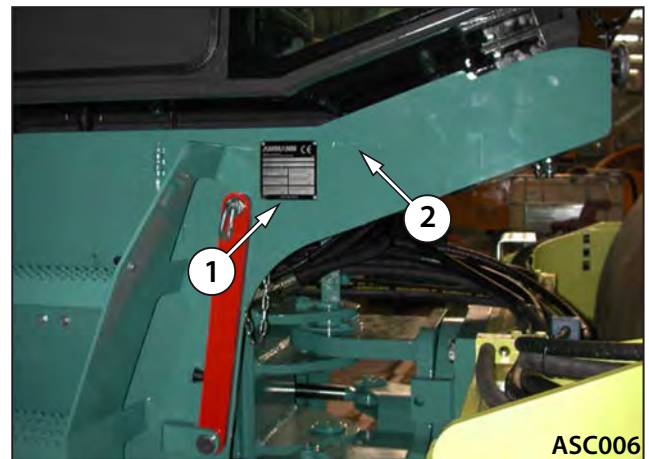
The machine that complies with the requirements as to health protection and safety is identified with a name plate with CE marking.

- 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 - Shipping weight
- 9 - Front axle load
- 10 - Rear axle load
- 11 - Year of manufacture



Name plate location

- 1 - Name plate
- 2 - Machine frame number

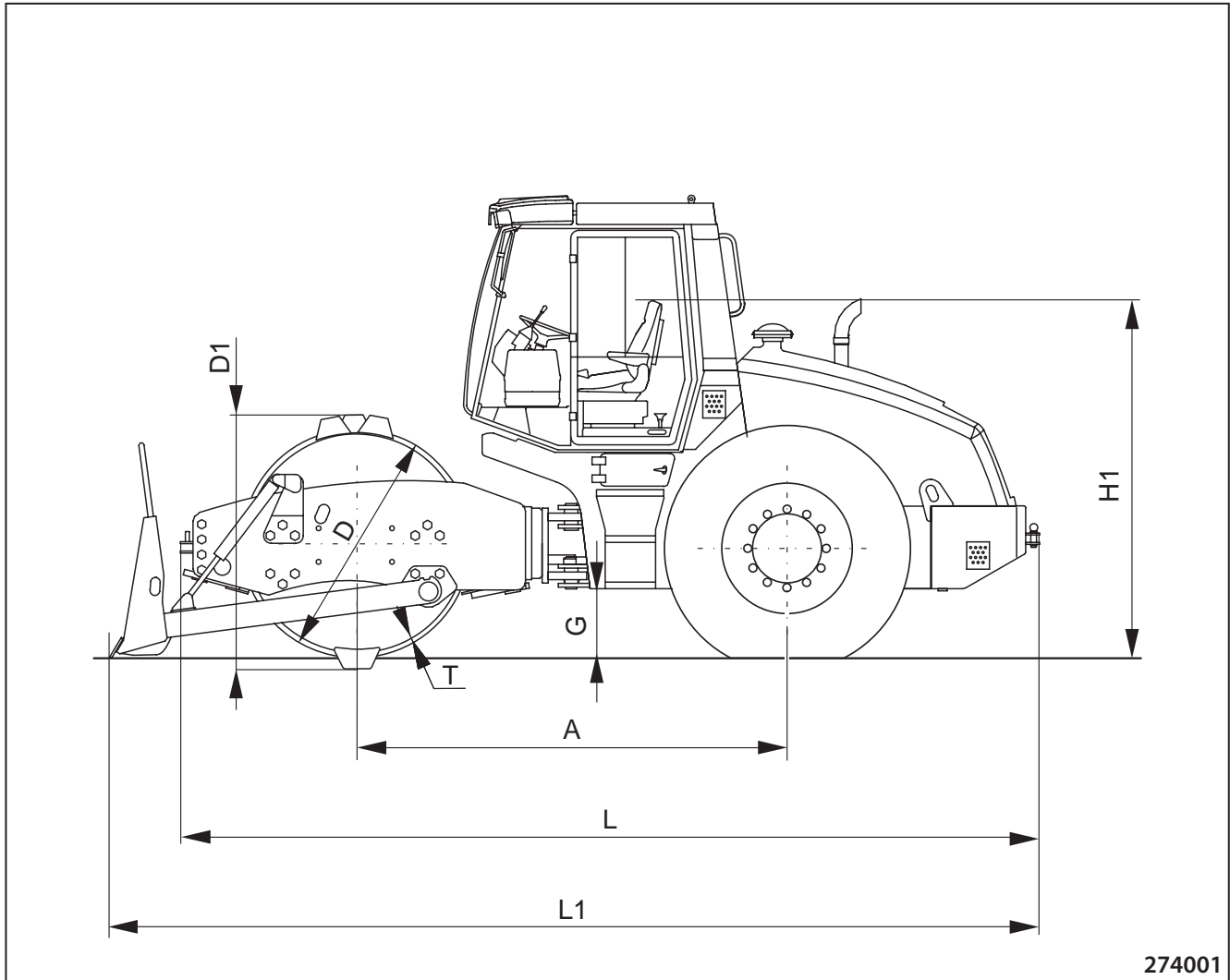


Engine name plate location



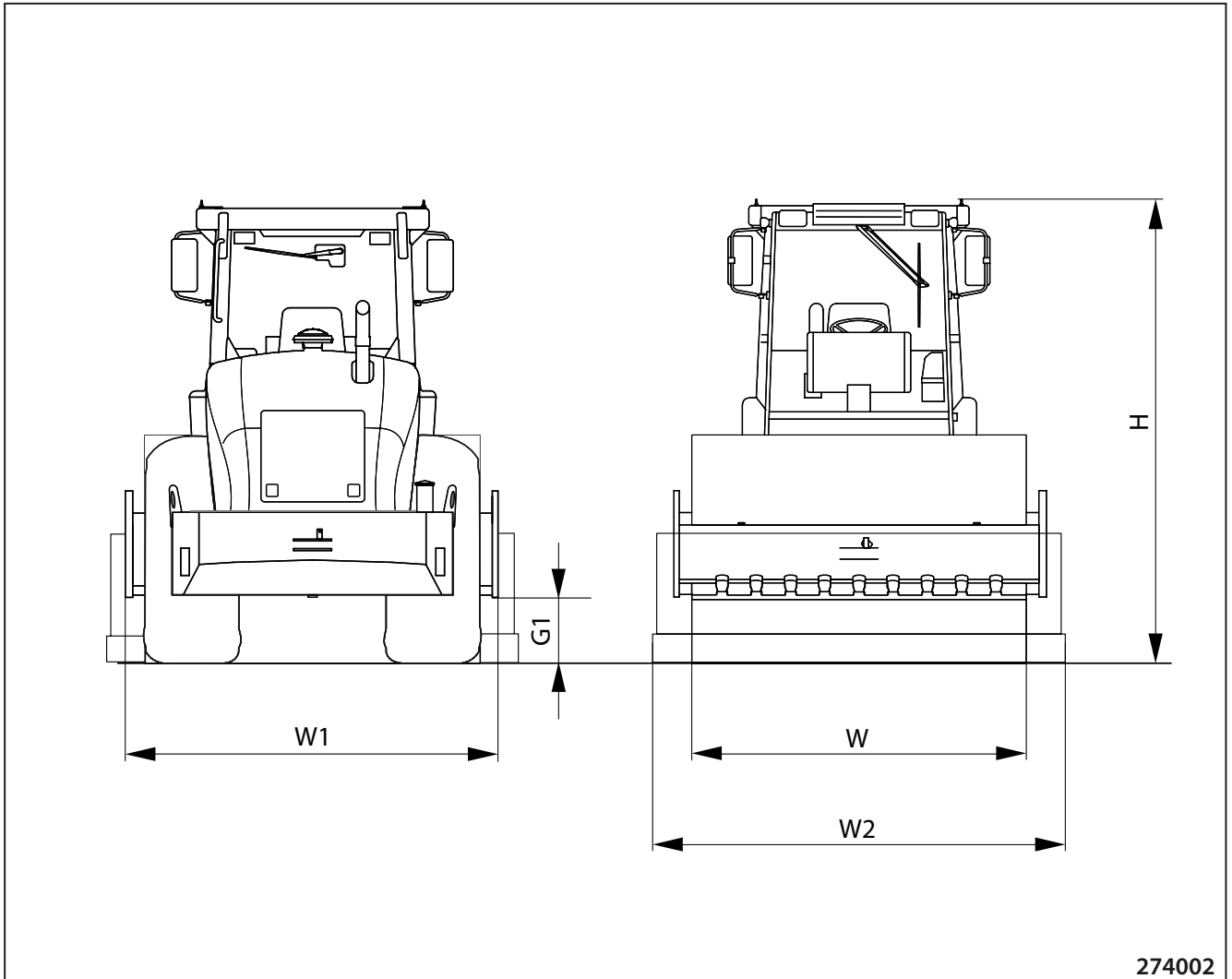
1.2. Dimensional diagram of the Machine

Dimensional diagram for ASC 70 Machine (with cab and protective frame, and incl. blade)



274001

mm (in)	A	D	D1	G	G1	H	H1	L	L1	T	W	W1	W2
ASC 70 D	2560	1300	-	385	350	2870	2280	5195	-	25	1680	1875	-
	(100,8)	(51,2)	(-)	(15,2)	(13,8)	(113,0)	(89,8)	(204,5)	(-)	(1,0)	(66,1)	(73,8)	(-)
ASC 70 PD	2560	1240	1400	385	350	2870	2280	5195	-	15	1680	1875	-
	(100,8)	(48,8)	(55,1)	(15,2)	(13,8)	(113,0)	(89,8)	(204,5)	(-)	(0,6)	(66,1)	(73,8)	(-)
ASC 70 PDB	2560	1240	1400	385	350	2870	2280	5195	5555	15	1680	1875	2215
	(100,8)	(48,8)	(55,1)	(15,2)	(13,8)	(113,0)	(89,8)	(204,5)	(218,7)	(0,6)	(66,1)	(73,8)	(87,2)



274002

mm (in)	A	D	D1	G	G1	H	H1	L	L1	T	W	W1	W2
ASC 70 D	2560	1300	-	385	350	2870	2280	5195	-	25	1680	1875	-
	(100,8)	(51,2)	(-)	(15,2)	(13,8)	(113,0)	(89,8)	(204,5)	(-)	(1,0)	(66,1)	(73,8)	(-)
ASC 70 PD	2560	1240	1400	385	350	2870	2280	5195	-	15	1680	1875	-
	(100,8)	(48,8)	(55,1)	(15,2)	(13,8)	(113,0)	(89,8)	(204,5)	(-)	(0,6)	(66,1)	(73,8)	(-)
ASC 70 PDB	2560	1240	1400	385	350	2870	2280	5195	5555	15	1680	1875	2215
	(100,8)	(48,8)	(55,1)	(15,2)	(13,8)	(113,0)	(89,8)	(204,5)	(218,7)	(0,6)	(66,1)	(73,8)	(87,2)

1.3. Specifications

		ASC 70 Cummins Tier 3			
		D	HX	PD	HXPD
Weight					
Operating weight of EN 500-1+A1 (CECE) with cab, ROPS	kg (lb)	7140 (15740)	7620 (16800)	7090 (15630)	7570 (16690)
Operating weight of EN 500-1+A1 (CECE) with cab	kg (lb)	6990 (15410)	7470 (16470)	6940 (15300)	7420 (16360)
Operating weight of EN 500-1+A1 (CECE) with platform, rail	kg (lb)	6840 (15080)	7320 (16140)	6790 (14970)	7260 (16010)
Operating load of EN 500-1+A1 (CECE) with cab, ROPS on front axis	kg (lb)	4020 (8860)	4080 (8990)	3970 (8750)	4030 (8880)
Operating load of EN 500-1+A1 (CECE) with cab, ROPS on rear axis	kg (lb)	3120 (6880)	3540 (7800)	3120 (6880)	3540 (7800)
Weight of half fluid capacities	kg (lb)	110 (240)	110 (240)	110 (240)	110 (240)
Operating weight of ISO 6016 with cab, ROPS	kg (lb)	7250 (15980)	7730 (17040)	7200 (15870)	7680 (16930)
Maximum weight with the cab, ROPS, accessories, weighing	kg (lb)	9260 (20410)	9740 (21470)	8120 (17900)	8600 (18960)
Maximum permitted weight according to ROPS	kg (lb)	13200 (29100)	13200 (29100)	13200 (29100)	13200 (29100)
Static linear load of front drum	kg/cm (lb/in)	23,9 (133,8)	24,3 (136,1)	-	-
Cab weight	kg (lb)	220 (490)	220 (490)	220 (490)	220 (490)
Weight of ROPS	kg (lb)	210 (460)	210 (460)	210 (460)	210 (460)
Weight of ROPS/FOPS (CNH design)	kg (lb)	290 (640)	290 (640)	290 (640)	290 (640)
Weight of sheet roof on ROPS	kg (lb)	140 (310)	140 (310)	140 (310)	140 (310)
Weight of canopy	kg (lb)	60 (130)	60 (130)	60 (130)	60 (130)
Weight of canopy posts (version without ROPS)	kg (lb)	60 (130)	60 (130)	60 (130)	60 (130)
Weight of blade	kg (lb)	500 (1100)	500 (1100)	500 (1100)	500 (1100)
Weight of 3 padfoot segments	kg (lb)	1090 (2400)	1090 (2400)	-	-
Weight of tyre filling 0°C	kg (lb)	367 (810)	367 (810)	367 (810)	367 (810)
Weight of tyre filling -25°C	kg (lb)	420 (930)	420 (930)	420 (930)	420 (930)
Driving characteristics					
Number of speeds	-	3+1	3+1	3+1	3+1
Maximum transport speed	km/h (MPH)	11 (6,8)	8,4 (5,2)	11,1 (6,9)	8,5 (5,3)
Working speed 1	km/h (MPH)	2,5 (1,6)	2,5 (1,6)	2,5 (1,6)	2,5 (1,6)
Working speed 2	km/h (MPH)	3,5 (2,2)	3 (1,9)	3,5 (2,2)	3 (1,9)
Working speed 3	km/h (MPH)	4,7 (2,9)	3,6 (2,2)	4,8 (3)	3,7 (2,3)
Climbing ability	%	45	60	45	60
Climbing ability with vibration	%	40	40	40	40
Lateral static stability	%	48,8	48,8	48,8	48,8
Lateral stability during driving without vibration	%	25	25	25	25
Lateral stability during driving with vibration	%	15	15	15	15
Maximum gradient when towing machine on slope	%	60	60	60	60
Turning radius inner (edge)	mm (in)	3090 (121,7)	3090 (121,7)	3090 (121,7)	3090 (121,7)
Turning radius outer (contour)	mm (in)	4685 (184,4)	4685 (184,4)	4685 (184,4)	4685 (184,4)
Front approach slope	%	65	65	65	65
Rear approach slope	%	51	51	51	51
Type of drive	-	Hydrostatic	Hydrostatic	Hydrostatic	Hydrostatic
Number of driving axles	-	2	2	2	2
Oscillation angle	°	±12	±12	±12	±12
Angle of steering	°	±36	±36	±36	±36

		ASC 70 Cummins Tier 3			
		D	HX	PD	HXPD
Steering					
Type of steering	-	Joint	Joint	Joint	Joint
Steering control	-	Hydraulic	Hydraulic	Hydraulic	Hydraulic
Linear hydraulic motors	-	2	2	2	2
Engine					
Manufacturer	-	Cummins	Cummins	Cummins	Cummins
Type	-	QSB3.3-C99	QSB3.3-C99	QSB3.3-C99	QSB3.3-C99
Power according to ISO 3046-1	kW (HP)	74 (99)	74 (99)	74 (99)	74 (99)
Number of cylinders	-	4	4	4	4
Cylinder capacity	cm ³ (cu in)	3300 (201)	3300 (201)	3300 (201)	3300 (201)
Nominal speed	min ⁻¹ (RPM)	2200	2200	2200	2200
Maximum torque	Nm/rpm	412/1600	412/1600	412/1600	412/1600
Average fuel consumption	l/h (gal US/h)	8,8 (2,3)	8,8 (2,3)	8,8 (2,3)	8,8 (2,3)
Engines complies with emission regulations	-	EU Stage IIIA, U.S. EPA Tier 3	EU Stage IIIA, U.S. EPA Tier 3	EU Stage IIIA, U.S. EPA Tier 3	EU Stage IIIA, U.S. EPA Tier 3
Cooling system of engine	-	Liquid	Liquid	Liquid	Liquid
Axle					
Maximum tyre pressure	MPa (PSI)	0,15 (21,8)	0,15 (21,8)	0,15 (21,8)	0,15 (21,8)
Pattern of tyres	-	UK 5 Diamond	UK 5 Diamond	TD-02 Tractor	TD-02 Tractor
Number of tyres	-	2	2	2	2
Number of rear wheels	-	2	2	2	2
Size of tyres	-	14,9x24''	14,9x24''	14,9x24''	14,9x24''
Type of tyres	-	Tubeless	Tubeless	Tubeless	Tubeless
Number of pads (only PD version)	-	-	-	104	104
Pad contact surface (only PD version)	cm ² (sq in)	-	-	114 (17,7)	114 (17,7)
Pad height (only PD version)	mm (in)	-	-	80 (3,1)	80 (3,1)
Brakes					
Operating	-	Hydrostatic	Hydrostatic	Hydrostatic	Hydrostatic
Parking	-	Multiple-disc spring brake	Multiple-disc spring brake	Multiple-disc spring brake	Multiple-disc spring brake
Emergency	-	Multiple-disc spring brake	Multiple-disc spring brake	Multiple-disc spring brake	Multiple-disc spring brake
Vibration					
Frequency I	Hz (VPM)	30 (1800)	30 (1800)	30 (1800)	30 (1800)
Frequency II	Hz (VPM)	41 (2460)	41 (2460)	41 (2460)	41 (2460)
Amplitude I	mm (in)	1,7 (0,067)	1,7 (0,067)	1,7 (0,067)	1,7 (0,067)
Amplitude II	mm (in)	0,86 (0,034)	0,86 (0,034)	0,86 (0,034)	0,86 (0,034)
Centrifugal force I	kN	145	145	145	145
Centrifugal force II	kN	130	130	130	130
Type of drive	-	Hydrostatic	Hydrostatic	Hydrostatic	Hydrostatic

1.3. Specifications

		ASC 70 Cummins Tier 3			
		D	HX	PD	HXPD
Fluid capacities					
Fuel	l (gal US)	275 (72,65)	275 (72,65)	275 (72,65)	275 (72,65)
Engine (oil filling)	l (gal US)	7 (1,85)	7 (1,85)	7 (1,85)	7 (1,85)
Cooling system	l (gal US)	24 (6,34)	24 (6,34)	24 (6,34)	24 (6,34)
Hydraulic system	l (gal US)	73 (19,28)	73 (19,28)	73 (19,28)	73 (19,28)
Drum vibrator	l (gal US)	6,7 (1,77)	6,7 (1,77)	6,7 (1,77)	6,7 (1,77)
Wheel gearbox	l (gal US)	2x0,8 (2x0,21)	2x0,8 (2x0,21)	2x0,8 (2x0,21)	2x0,8 (2x0,21)
Drum gearbox	l (gal US)	1,8 (0,48)	1,5 (0,4)	1,8 (0,48)	1,5 (0,4)
Washer tank	l (gal US)	2,75 (0,73)	2,75 (0,73)	2,75 (0,73)	2,75 (0,73)
Wiring					
Voltage	V	24	24	24	24
Battery capacity	Ah	2x61	2x61	2x61	2x61
Noise and vibration emissions					
Measured sound power level A, L_{pA} at the operator's position (cab) *	dB	79	79	79	79
Uncertainty K_{pA} *	dB	2	2	2	2
Guaranteed sound power level A, L_{WA} **	dB	106	106	106	106
Declared highest weighted effective value of vibration acceleration transmitted to the whole body (cab) ***	m/s ² (ft/s ²)	<0,5 (<1,6)	<0,5 (<1,6)	<0,5 (<1,6)	<0,5 (<1,6)
Declared total value of vibration acceleration transmitted to hands (cab) ***	m/s ² (ft/s ²)	<2,5 (<8,2)	<2,5 (<8,2)	<2,5 (<8,2)	<2,5 (<8,2)
* 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					

	ASC 70 Cummins Tier 3			
	D	HX	PD	HXPD
Optional equipment				
Air-conditioning				
Installation for radio with antenna and loudspeakers				
Radio with CD				
Electro-hydraulic cab and bonnet lifting				
ROPS 2D				
Warning beacon				
Reversing alarm				
Alternator and fan cover				
Head and rear lights (including direction indicator lights)				
Inter-axle electronic differential lock ATC				
Additional padfoot segments (recommended with ATC and tractor tyre)				
Blade				
Plates made of Hardox on PD segments				
Tractor tyre (as standard with HX and PD versions)				
Ballasting of tyres with liquid of up to 0 °C				
Ballasting of tyres with liquid of up to -25 °C (as standard with HX versions)				
Contact scrapers made of Polytan				
Engine air pre-filter (Syclone)				
Panel with testing points under the platform				
Padlock staple above the fuel tank cover				
ACE FORCE				
ACE FORCE printer				
ADS software				
Biologically degradable hydraulic oil (Panolin)				
Additional documentation				
Ammann set of tools				
First servicing set (engine and air filters)				
Fire extinguisher				
Different colour design (Ammann scheme), 1 colour				
Special colour design (others)				

2. OPERATION MANUAL

ASC 70

(Cummins Tier 3)

2.1.1. Safety Measures during Machine Operation

Safety measures given in the individual chapters of Engineering Documentation supplied with the Machine shall be added with Safety Precautions in force within a respective country that uses the Machine at workplace with regard to work organization, work process and personnel involved.

2.1.1.1. Compaction Work Commencement

- Constructional Supplier (Machine User) is liable to issue instructions for driver and maintenance before compaction work is started, that will include requirements on work safety provision during Machine operation.

- He must verify and mark:
 - utility lines
 - underground areas (direction, depth)
 - seepage or escape of hazardous materials
 - soil bearing capacity, slope of travelling plane
 - other obstructions incl. their removal.

He must make Machine driver, who will carry out earth work, familiar with these conditions.

- He must specify Code of Practice (C.O.P.) part of which is work procedure for a given work operation and this work procedure will specify inter alia:
 - measures when working under extraordinary conditions (work within protective zones, within extreme slopes, etc.)
 - precautions for any natural disaster hazards
 - requirements on work performance while observing job safety principles
 - technical and organizational measures to secure safety of personnel, workplace and environment.

He must make Machine driver evidently familiar with the Code of Practice.

2.1.1.2. Work Safety Secured by User

- User shall promptly communicate any damage to the utility lines to their operator, and at same time he make measures to prevent unauthorized persons from entering endangered area.
- He must ensure an employee does not work alone at a workplace. Another worker must always be in sight and within an ear-shot, who in case of accident will provide or call for help unless another effective form of monitoring or communication exists.

2.1. Major Safety Precautions

2.1.1.3 Ensurance of safety measures by the owner

- The owner must ensure that the machine is operated only in such conditions and only for such purposes to which the machine is technically capable according to conditions specified by the manufacturer and relevant standards.
- He must ensure that the roller is used only in such manner and on such working places without a danger to damage the close structures, sections, etc.
- He must ensure a regular inspection of operation and technical conditions, regular maintenance of the machine in intervals specified in the manuals for greasing and maintenance work. In case the technical condition of the machine does not meet the requirements to such extent it endangers safety of operation, people and property or it causes a damage and impairment to the environment, the machine 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 during the operation, maintenance and repair of the machine.
- The person (driver) who drives the machine and each person carrying out maintenance and repair of the machine must be acquainted with instructions specified in the operation manual of the machine.
- He must ensure that "Operation manual of the machine" and operational book are kept on specified place to be at disposal for the driver all the time.
- He must assign a workman for permanent supervision over the machine work during its operation on public roads and especially he is obliged to issue instructions to ensure safety of works.
- He must ensure that dangerous substances (such as fuel, oils, coolant, break fluid, etc. must be removed from places of leakage according to their nature to prevent from their adverse impact to the environment, safety of operation and health of people.

2.1.1.4.ROPS

The following precautions shall be observed while the protection frame ROPS is used:

- The machine frame must not be damaged (broken, bent, etc.) in the place of connection.
- The ROPS frame itself must not show the marks from corrosion, damage through cracks or splits.
- ROPS frame must not be loose during the machine operation.
- All bolted connections must meet the specifications requirements and must be tightened to the moment specified.
- Bolts and nuts must not be damaged, distorted and they must not show the marks from corrosion.
- None additional modifications can be carried out on the ROPS frame without the approval of the manufacturer because they can result in decrease of its strength (e.g. openings, welding, etc.).
- Weight of the machine with the protective frame must not exceed the permitted weight for which ROPS was approved.

2.1.2. Requirements on Driver's Qualification

- Only a driver trained under ISO 7130 and other local and national regulations designed for drivers of this group of machines may operate the Roller (Compacter).
- With no licence only the one who learns driving the Machine for the purpose of getting preliminary practice with the approval of User may drive the Machine, and such person has to be under direct and continuous surveillance of professional teacher or trainer.
- Licence holder is liable to take due care of the licence, and when requested, put it forward to the control authorities.
- Licence holder can make no registrations, changes or corrections in the licence card.
- He/she is liable to promptly report his/her licence loss to the authority that issued this licence.
- Driving the Roller alone may be performed by an employee mentally and physically fit, over 18 years old, who is:
 - a) assigned by machine manufacturer for the assembly, testing and presentation of the Machine, for training the drivers, whereas he/she must be made familiar with safety work regulations in force at the workplace
 - or
 - b) assigned by Constructional Supplier to operate (carry out maintenance) and is evidently trained and acquainted with, or owns professional competence to operate and drive under special regulations (machinist licence, etc.).
- Machine driver must undergo training and examination concerning work safety regulations at least 1x every 2 years.

2.1. Major Safety Precautions

2.1.3. Driver's Liabilities

- Before starting to operate the Machine the driver will be liable to get familiar with the guidelines given in the documentation delivered with the Machine, with safety precautions in particular, and observe these thoroughly. This applies as well to the personnel in charge of maintenance, adjustments and repairs of the Machine.
- Do not drive the Roller unless made familiar with all the Machine functions, working and operating elements, and unless knowing exactly how to control the Machine.
- Follow safety signs located on the Machine, and keep them in legible condition. Replace or add those impaired or missing ones.
- Before work commencement the driver must get familiar with the workplace environment, i.e. with the slopes, utility line system, with necessary types of workplace protections with regard to the environment (noise, etc.).
- When you find out any hazard to health or life of persons, property hazard, failure, or upon technology equipment accident, or when finding any symptoms of such hazards in course of operation, then the driver, unless able to eliminate such hazard by himself/herself, must stop the work and secure the machine against any undesirable start; please attach "MACHINE REPAIR" warning sign onto steering wheel as depicted in Section called "Safety signs used on the machine", report this to the person in charge, and if possible, notify all persons exposed to such danger.
- Before Machine operation startup the driver will be liable to get familiar with the records and operation deviations found out in course of the previous work shift.
- Before work is started he/she must inspect the Machine, its accessories, check up control elements, communication and safety devices, whether these are operable in line with the Manual. When finding out a malfunction that might be hazardous to job safety, and he/she is not able to repair it, then he/she must not start running the machine and instead report such failure to the person accountable.
- During work with the Machine the driver must be fastened with the seat belt. The seat belt and its mounting shall not be damaged!
- When driver finds any defect during operation he/she must immediately stop the Machine, secure it safely against undesired ignition.
- During operation the driver shall follow the Machine run and record any defects found in the Operation Logbook.
- Driver shall keep his/her Operation Logbook designed to maintain records about Machine handover between the drivers, about the defects or repairs in course of operation, to write down major events during work shift.
- Prior turning on the engine the controls have to be in their zero position, no persons may stay within dangerous reach of the Machine.
- Indicate each Machine startup via an acoustic or light signal and this always before igniting the Machine engine.
- Confirm brake function and steering function before starting to run the Machine.
- Following the alarm an operator may start the Machine only when all the workers have left the danger area. At close (blind) workplaces it will be possible to start the operation only after a time necessary to leave danger area has elapsed.
- During Machine operation observe safety regulations, make no action that might endanger work safety, give full attention to Machine steering.
- Respect Code of Practice or instructions of a person responsible.
- When rolling (traversing) the Machine within a workplace adapt your speed to a terrain condition, to a work performed and weather conditions. Watch permanently the clearance so to avoid collision with any obstruction.
- Upon completion or stop of the Machine operation during which driver leaves the Machine, he/she must make measures against unauthorized use of the Machine or against spontaneous starting of the engine. Remove key from the ignition box, disconnect the wiring via disconnecter, lock the cabin, engine bonnet.
- When shutting down the Machine on roads the measures under regulations effective on roads shall be taken.
- When operation is completed, park the Machine at a proper parking place (flat, bearing area) so as not to endanger Machine stability, not to make the Machine interfere with traffic roads, not to expose the Machine to falling objects (rock), and where the Machine is safe against any natural disaster of other kind (floods, landslides, etc.).
- When working with the Machine is ended all the defects, damage to the Machine and any repairs made shall be written down in the Operation Logbook. Upon immediate changing of drivers the driver will be liable to call attention of changing driver to any facts identified.
- Driver shall use personal protective equipment (PPE) - work clothing, safety shoes, the clothing shall not be too loose, impaired, hair protected with proper head piece. During maintenance (lubrication, refilling, replacement of working media) your hands must be protected with proper gloves.
- In the event that the machine has no cab or when the windows are open, the operator must wear ear protectors.
- Driver shall maintain the Machine equipped with fittings and outfit required.
- Maintain the Machine free of oil dirt or flammable materials. Keep the drive's stand, foot rests and runner areas clean.
- When the Machine comes into contact with high voltage observe the following principles:
 - try to leave with the Machine a hazardous zone
 - do not leave driver's stand
 - give warning to others to keep off and not touch the Machine.

2.1.4. Forbidden activities – safety and guarantee

Banned are the following

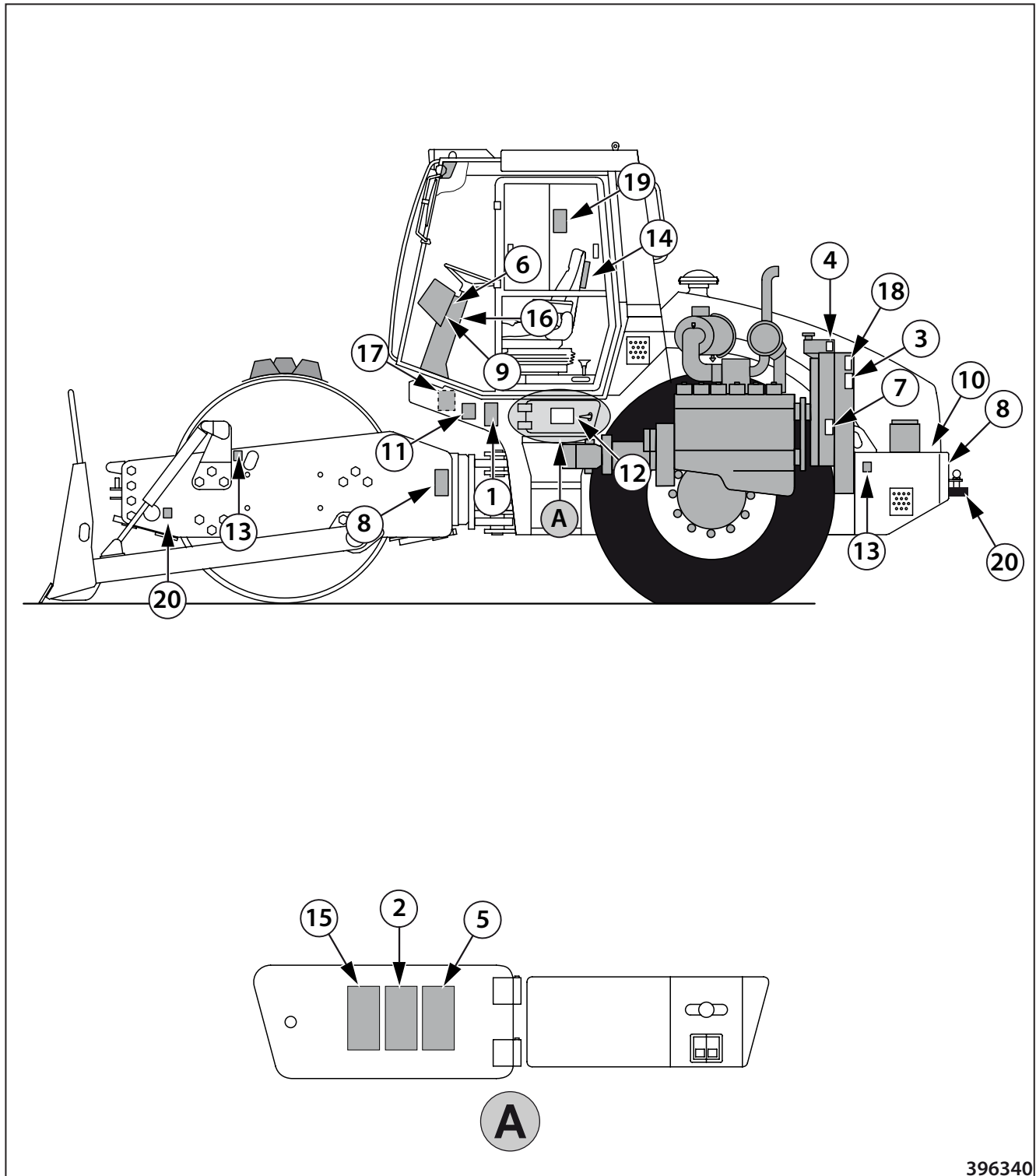
- Vibrating on the spot. When it is vibrated on the spot, bearings of the vibrator are not lubricated.
- Filling the hydraulic circuit during the guarantee period in a different way than using the hydraulic unit.
- Changing the vibration amplitude when driving – It is always necessary to stop and only then set a different amplitude.
- Using the machine in case of an evident defect of the machine.
- Using the machine when any operating fluid level is low.
- Wilful repair of the engine – Except common changes of operating fluids and filters, only the Cummins service department can intervene in the engine, in particular in peripheral components of the engine – alternator, starter, thermostat, electrical installation of the engine.
- Controlling the heating valve control rod while driving.
- Quickly increase and decrease engine speed. It can damage the engine.
- Use the emergency brake for turning off the engine during normal operation of the machine.
- Operate the machine in the explosive environment and underground.
- To use the Machine following ingestion of alcoholic beverages or dopes.
- To use the Machine if its operation might put its technical condition, safety (life, health) of persons, facilities or objects, or road traffic and its continuity, at risk.
- Put into operation and use the Machine when other persons are within its hazardous reach - exception is training a driver by lecturer.
- Put into operation and use the Machine when some of its safeguarding device (emergency brake, driving brake, horn, etc.) has been dismantled or damaged.
- To roll and compact at such slopes where Machine stability would be disrupted (turning over). Machine's static stability stated will lower by drive's dynamic effects.
- To roll and compact at such angles of slopes where hazard of soil breaking off (dropping) under the Machine exists, or loss of adhesion followed by uncontrolled slip might occur.
- To control the Machine in some other way than stated in Driving Manual.
- To roll and compact per bearing capacity of subsoil at such a distance from the edge of slope or trenches, where hazard of landslide or shoulder breaking off (dropping) together with the Machine would occur
- To roll and compact with vibration at such a distance from the walls, cuts, slopes, where their slip (slide) would happen and the Machine covered in.
- Driving with vibration on hard (frozen, concrete, overcompacted) surface or on bedrock. There is a danger of damage to the machine.
- To compact with vibration at such a distance from buildings or facilities and equipment within which the risk of them being damaged due to vibration transfer impact, would occur.
- To operate the Machine unless driver control stand fixed properly.
- To operate the Machine when engine bay cover is open.
- To move and transport persons on the Machine.
- To operate the Machine when within hazardous reach thereof are other machines or transportation means aside from those that operate in mutual concert with the Machine.
- To operate the Machine at places impossible to see from driver's stand, and where hazard to people or property could occur unless work safety has been secured through some other way like for instance via signalling by duly instructed person.
- To work with the Machine at a protected zone of electric lines or substations.
- To cross electric cables if these are not properly protected against mechanical damage.
- To operate the Machine under lowered visibility or at night, unless Machine's working area and workplace are illuminated sufficiently.
- To leave driver's cockpit of the Machine when the Machine is running.
- Boarding or getting off while on the run, jumping off the Machine.
- Sit or stand on the outside parts of the Machine when driving, or stand on the steps.
- Leave unsecured Machine - move away from the Machine without having prevented its misuse.
- Disable safeguarding, protective or locking systems or alter their parameters.
- Use the Machine with oil, fuel, cooling liquid or other fillings leaking.
- Start the engine through some other way than given in the Driving Manual.
- Locate some other items (tools, accessories) aside from personal needs at driver's stand.
- Lay away material or other objects on the Machine.
- Remove dirt while the Machine is running.
- Perform maintenance, cleaning or repairs with the Machine not secured against spontaneous move or accidental start, and when contact of a person with moving parts of the Machine is not excluded.
- Contact of moving parts of the Machine with human body or objects and tools held in hands.
- Smoke or handle open fire when checking or pumping fuels, refilling oils, lubricating the Machine, or inspecting the accumulator or making up the accumulator.
- Carry rags soaked with flammable materials, or carry flammable liquids in free vessels on the Machine (in engine bay).
- Let the engine run inside confined spaces.
- Drive with open doors.
- Perform any adjustments on the machine without the prior consent of the manufacturer.
- Drive without the seat belt fastened.
- Shift electrical conductors.
- Use other than original spare parts.
- Interfere in the electrical and electronic units in any manner.

! NOTICE !

Breaching these provisions can influence the judgement of a possible complaint and effectiveness of the engine guarantee period.

2.1. Major Safety Precautions

2.1.5. Safety inscriptions and signs used on the Machine



396340

1 Clamping hazard



2941bz

imminent danger of being pressed. (Symbols located left and right on the frame)

2 Burn hazard



2586bz

imminent risk of burn. Do NOT touch hot parts of the Machine unless you make certain these have cooled out sufficiently. (Symbol located from within on the LH door)

3 Risk of injury



2409bz

imminent risk of cutting oneself and/or chipping off. Do NOT touch rotating parts if the engine is running. (Symbol located on LH side of the cooler).

4 Cooling liquid



3227bz

imminent risk of scald. Do NOT open expansion tank lid until liquid cools down below 50 °C (122 °F). (Symbol located on expansion tank)

5 Adjust while at rest



2584bz

Switch OFF the engine and remove the key from ignition box before carrying out any maintenance or repair. (Symbol located from within on LH door)

6 Read Operation Manual



2702bz

Read Operation Manual before starting the Machine. (Symbol located on LH side of the actuator panel)

2.1. Major Safety Precautions

7 Risk of injury



2601bz

Imminent risk of hand caught by belt. (Symbol located on LH side of cooler)

8. Danger zone



2942bz

Keep a safe distance from the machine! (Symbol located on both sides of the drum frame and on the rear of the machine frame)

9 Safety belt



2687bz

Fasten the seat belt before starting to move the Machine. (Symbol located on LH side of actuator panel)

10 Danger of explosion



3017bz

Imminent danger of explosion while handling the battery - read Operation Manual. (Symbol located on fuel tank)

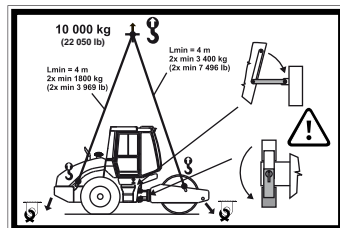
11 Machine max height



3155

Attention when passing through places with height limits. (Symbol located on LH side under the cab on frame)

12 Suspension scheme



2783bz

For lifting the machine, use slings with a sufficient capacity, see the Machine loading section. Before suspending, secure the machine joint. (Symbol located on the left door)

13 Lifting points



Sling (hang) the Machine only in these points. (Symbols located along both sides of the frames)

14 Manual



Identification of stowage box to put Machine documentation in. (Symbol located on the back rest of the seat, from the rear)

15 Disconnect alternator



Before welding, please disconnect alternator and electronics of the Machine, engine actuator unit. (Symbol located from within on lateral LH door)

16 Ear protectors



Use ear muffs when the Machine has no cab or you work with open windows. (Symbol located on centre steering column)

17 Emitted noise level



Plate located on the right side of the frame under the cab (for the noise level, see the Noise and vibration emissions section)

18 Electric instruments



Cover electric instruments when washing Machine. (Symbol located on LH side of cooler)

2.1. Major Safety Precautions

19 Emergency exit



Unless possible to exit the Machine via LH door, please use emergency exit. (Symbol located on cab's RH window)

20 Rigging points



Sling the Machine in these points only. The maximum permitted force for fastening the machine to a vehicle using rear slings is 5 t. (Symbols located along both sides of the frames).

21 Machine repair



Do NOT start the engine! Hang the sign onto steering wheel. The sign is supplied together with machine accessories and should be kept in documentation locker.

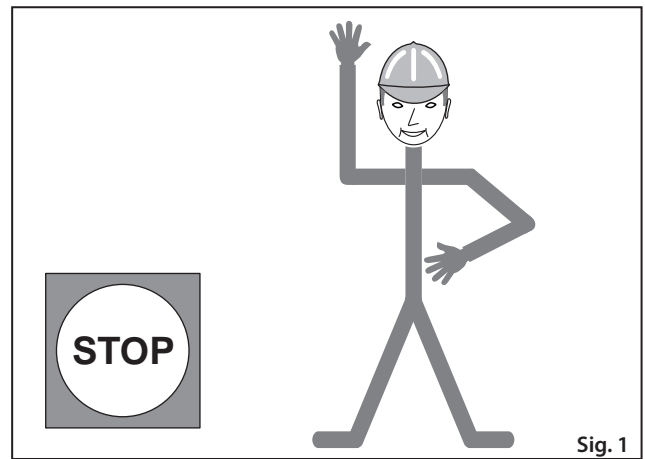
2.1.6. Hand signals

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

SIGNALS USED FOR ALL THE COMMANDS

Stop

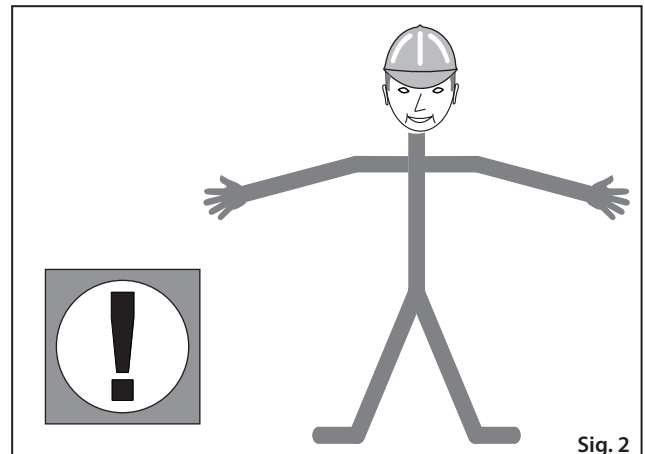
One arm stretched upward with open palm in the Operator direction, second arm akimbo.



Sig. 1

Attention!

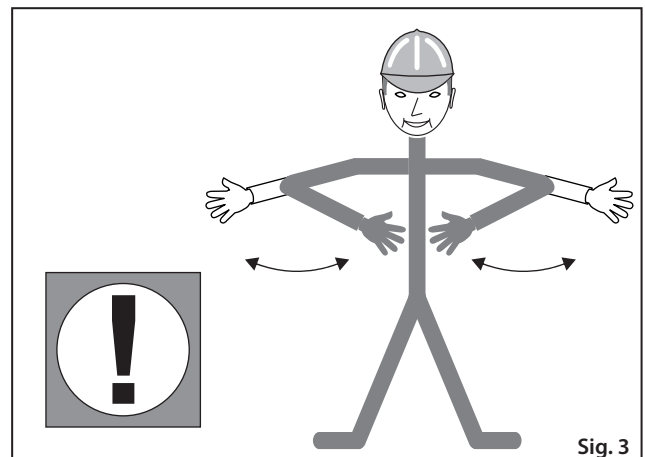
Both arms horizontally sideways raised - palms facing forward.



Sig. 2

Attention, Danger!

Oscillating motion of both arms with antebrahium from the position of arms horizontally sideways raised to the position or arms sideways raised - bent and back.

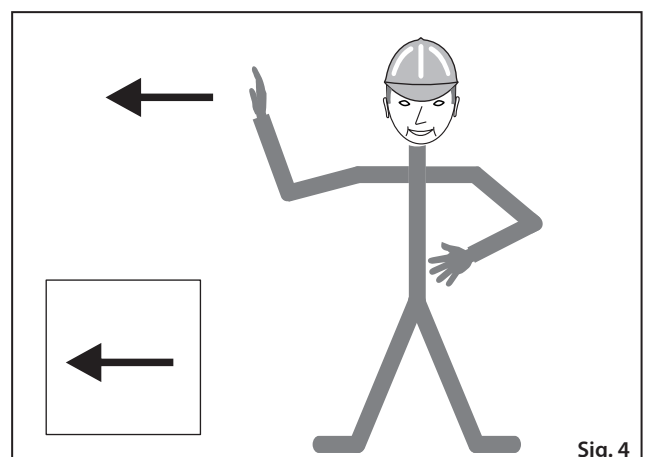


Sig. 3

SIGNALS FOR DRIVING

Drive away with the Machine

One arm stretched upward - bent with open palm, long motion of antebrahium in the direction of the movement required, second arm akimbo.

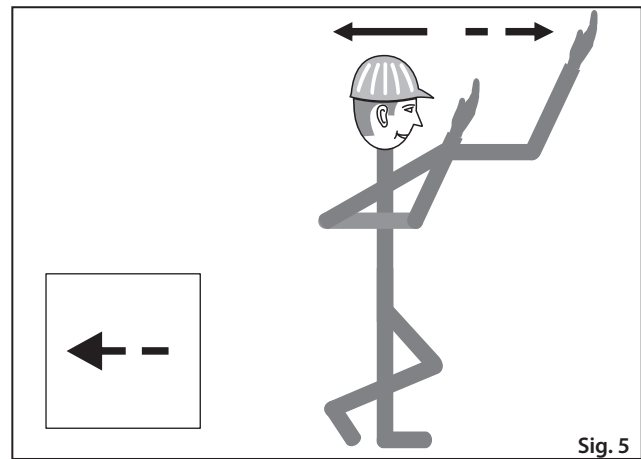


Sig. 4

2.1. Major Safety Precautions

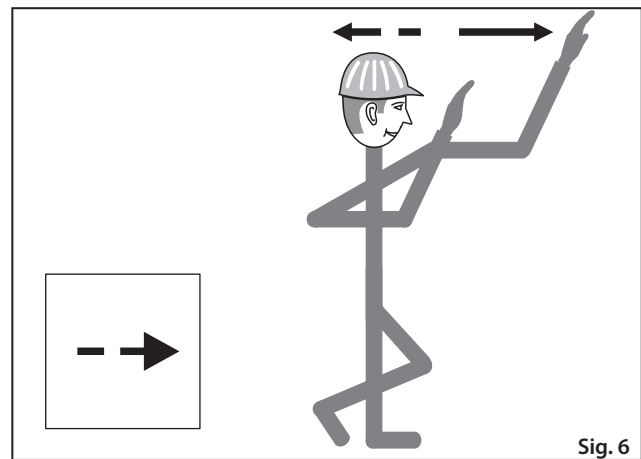
Slow driving forward - towards me

Both arms stretched upward, abreast, bent, with palms facing the body - short oscillating motions of antebrachium, towards the body, and back.



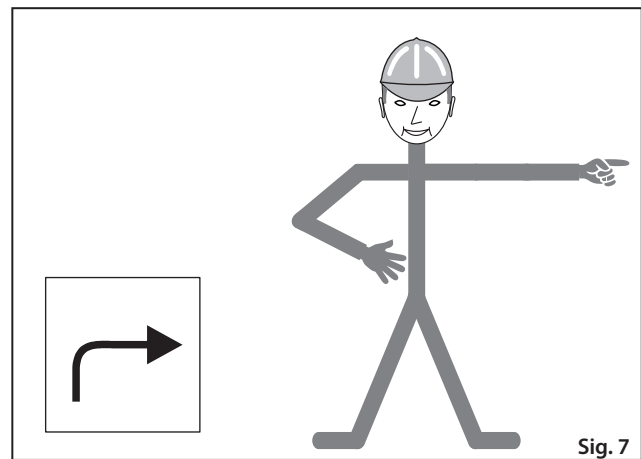
Slow driving backward - away from me

Both arms stretched upward, abreast, bent, with palms away from the body - short oscillating motions of antebrachium away from the body, and back.



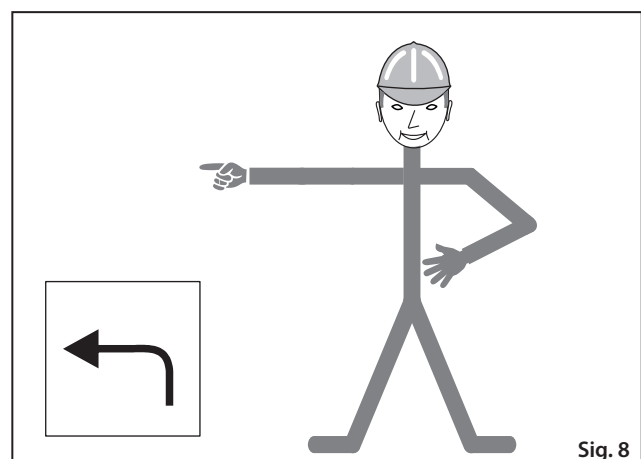
Driving on the right

Left arm sideways raised, right arm akimbo.



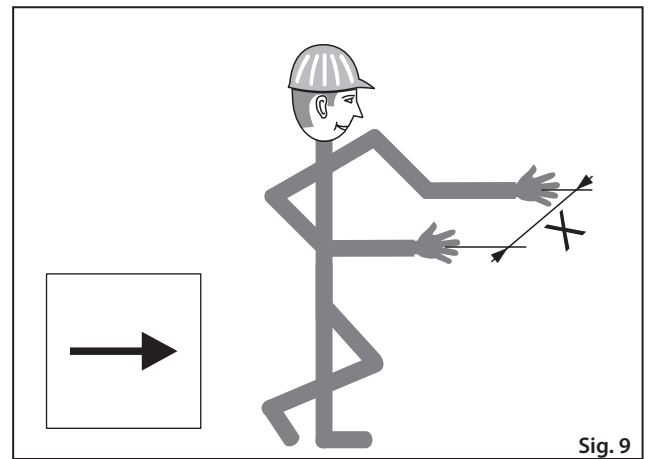
Driving on the left

Right arm sideways raised, left arm akimbo.



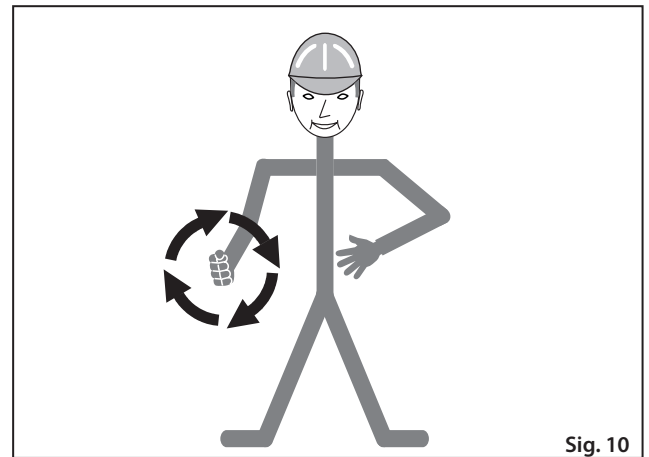
Short motion

Both arms lifted forward, bent. Mark distance "X" between palms, then follows the motion signal.



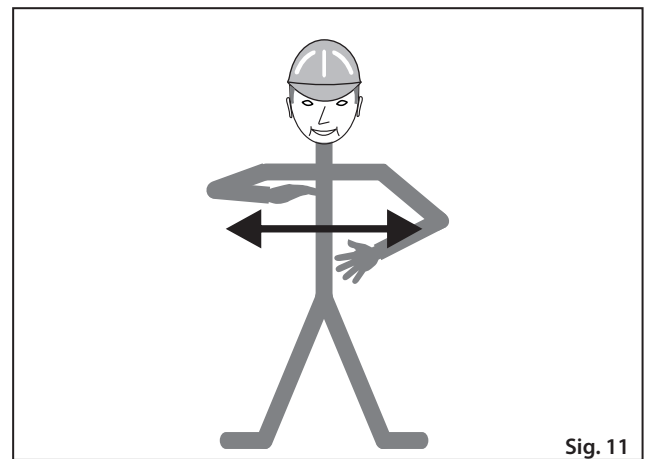
Engine start

Circular motion of antebrachium of right hand, with tight fist.



Engine cut off

Oscillating motion of right hand sideways raised in front of the body, to the sides.



2.2. Ecological and hygienic principles



When operating and storing the Machine the User shall be liable to adhere to the general principles of health and environment protection, as well as the laws, regulations, and rules related to this issue, and effective within the territory where the Machine will be used.

2.2.1. Hygienic principles

- Oil products, cooling system media, battery media, and coating compositions incl. thinners are deleterious materials. Persons that come into contact with these products during Machine operation and maintenance shall be liable to follow general principles of own health protection and conform to the safety and hygienic directions from manufacturers of these products.

Observe the following in particular:

- Eye and skin protection when handling the batteries
 - Skin protection when handling oil products, coating compositions and cooling liquids
 - Wash your hands thoroughly upon work completion and before meal, treat your hands with proper tissue cream
 - When handling the cooling systems, please observe instructions given in the Operation Manual supplied with the Machine.
-
- Always store oil products, cooling system media, battery media and coating compositions incl. organic thinners, and the cleaning and preservation agents as well, in their original properly marked packages. Admit no storage of these materials in unidentified bottles or other vessels with regard to the risk of being interchanged. Especially hazardous is the potential of interchanging for eatables or drinks.
 - If skin, mucosa or eyes are stained accidentally, or vapours inhaled, promptly apply the first aid principles. Get prompt medical attention upon accidental ingestion of these products.
 - When operating the Machine in cases of no cab mounted, or cab windows opened, always use ear muffs of proper type and version.

2.2.2. Ecological principles

- When discarded, the media for Machine's individual systems and some of the Machine's parts will become waste of hazardous properties against the environment.

This waste product category includes the following in particular:

- Organic and synthetic lubrication materials, oil and fuels,
 - Cooling liquids,
 - Battery media and the batteries themselves,
 - Tyre media
 - Cleaning and preservation agents,
 - All filters and filter elements removed,
 - All used and discarded hydraulic and fuel hoses, metal rubbers or other Machine's elements contaminated by the abovementioned products.
-
- Manufacturer and Manufacturer-accredited contracting service organizations or dealers take back these used materials or parts without cost:
 - oils
 - batteries
 - tyres



The mentioned materials and parts, when discarded, shall be handled in line with relevant national regulations to protect individual components of environment, and in conformity with the health protection regulations.

2.3. Machine preservation and storage

2.3.1. Short-term preservation and storage for a period of 1 – 2 months

Wash and clean thoroughly the entire Machine. Before shutting down the Machine for preservation and storage, please heat the engine to its operating temperature while running. Park the Machine on paved, flat surface, in safe location with no danger of damage to the Machine due to natural disasters (floods, landslides, fire origination, etc.).

In addition:

- Repair spots where paint has been impaired,
- Lubricate all lubricating points, actuator cables (cable assemblies), joints of the actuators, etc.,
- Check water media have been drained,
- Confirm cooling liquid has the antifreezing properties required,
- Check condition of the battery charges; let them be recharged if required,
- Spread chromated surfaces of piston rods with preservation fat,
- We recommend to protect your Machine against corrosion through spraying the preservation agent (spray-applied), and this especially in places of corrosion hazard.

The Machine treated like that needs no special preparation (set-up) before its subsequent putting into operation.

2.3.2. Preservation and storage for the period over 2 months long

To shut down the Machine the same principles apply like with short time preservation.

In addition, we recommend the following:

- Remove the batteries, check their condition and store in cold, dry room (recharge the batteries on regular basis),
- Bottom the drum frame up so the damping system has minimal sag,
- Protect rubber elements with paint using special preservation agent,
- Inflate tyres to their required pressure, and protect against sun radiation effects,
- Spread preservation fat over piston rods' chromated surfaces,
- Preserve the Machine through spraying with special agent, and this particularly in places of possible corrosion,
- Blind the induction manifold and exhaust of the engine with double PE foil, attach thoroughly with adhesive tape,
- Protect headlamps, external back mirrors and other elements of external wiring through spraying with special agent and wrapping in PE foil,
- Preserve engine according to the Manufacturer's Directions - mark visibly the engine has been preserved.



Following 6 months we recommend to inspect the condition of preservation and renew it if required.

If storing the Machine under field conditions, please check the parking place is not exposed to any flooding hazard due to deluges, or whether any other type of risk occurs within such area!

NEVER start the engine in course of storage!



Before restoration of the Machine service, please dewax and wash the preservation agents away with high pressure stream of hot water added with normal degreasers while observing Directions for Use along with ecological principles.

Carry out dewaxing and washing of the Machine at places equipped with collection sumps to catch rinsing water and dewaxing agents.

2.3. Machine preservation and storage

2.3.3. Dewaxing and inspection of a supplied machine

Check the Machine according to the shipping documents.

Check no parts of the Machine have been damaged during transportation, and that no parts are missing. Inform shipper about any deficiencies.



Before restoration of the Machine service, please dewax and wash the preservation agents away with high pressure stream of hot water added with normal degreasers while observing Directions for Use along with ecological principles.

Carry out dewaxing and washing of the Machine at places equipped with collection sumps to catch rinsing water and dewaxing agents.

2.4. Machine disposal following its life cycle end

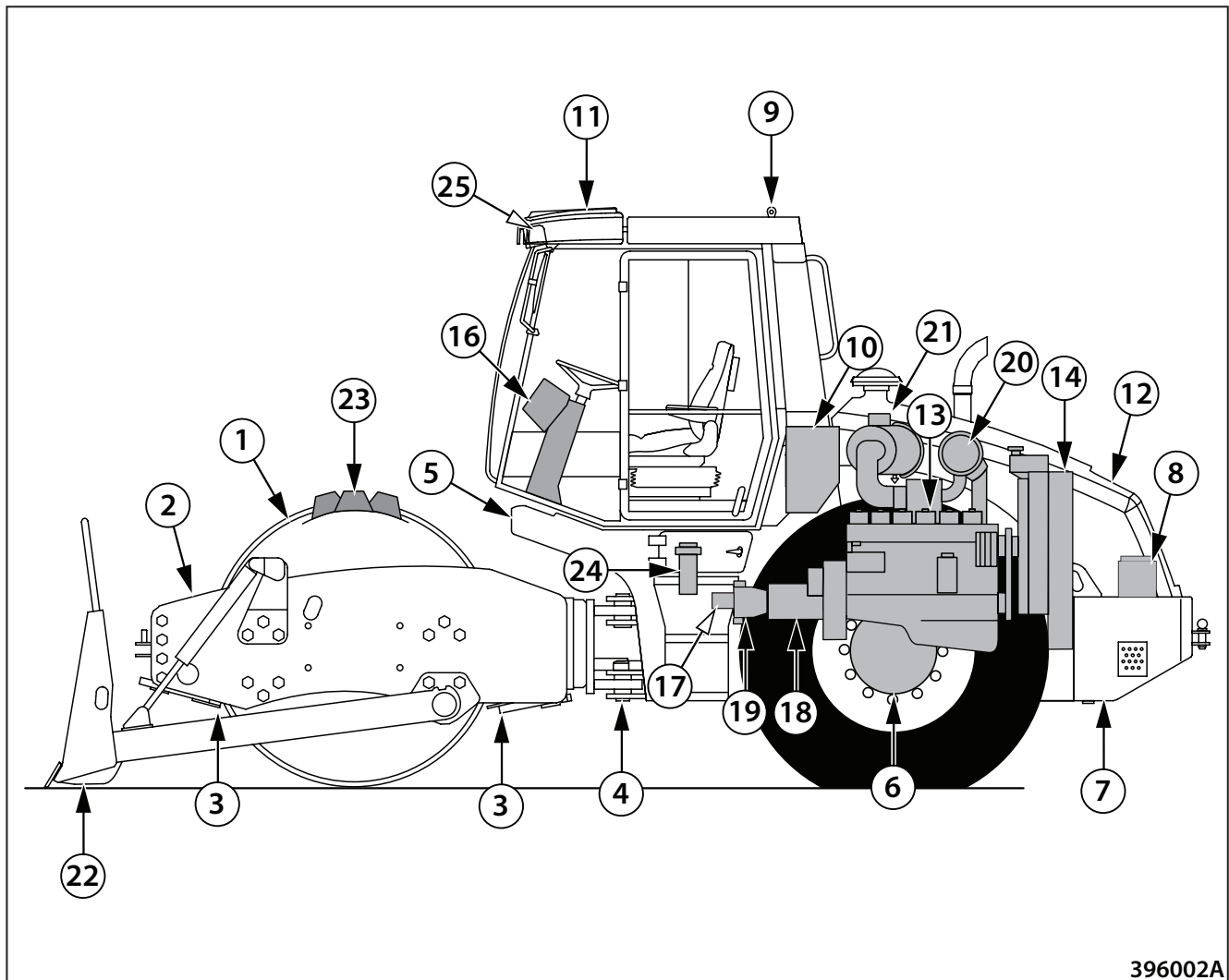
Upon Machine disposal following its life cycle end the User shall be liable to follow the national regulations, waste acts and environmental policy acts. We therefore recommend to always contact:

- Specialized companies with relevant authorization to deal with these operations,
- Machine Manufacturer or Manufacturer-appointed accredited contracting service organization.



Manufacturer bears no responsibility for any damage caused to Users' health or for any damage to environment due to non-adherence to the aforementioned warning.

2.5. Machine description



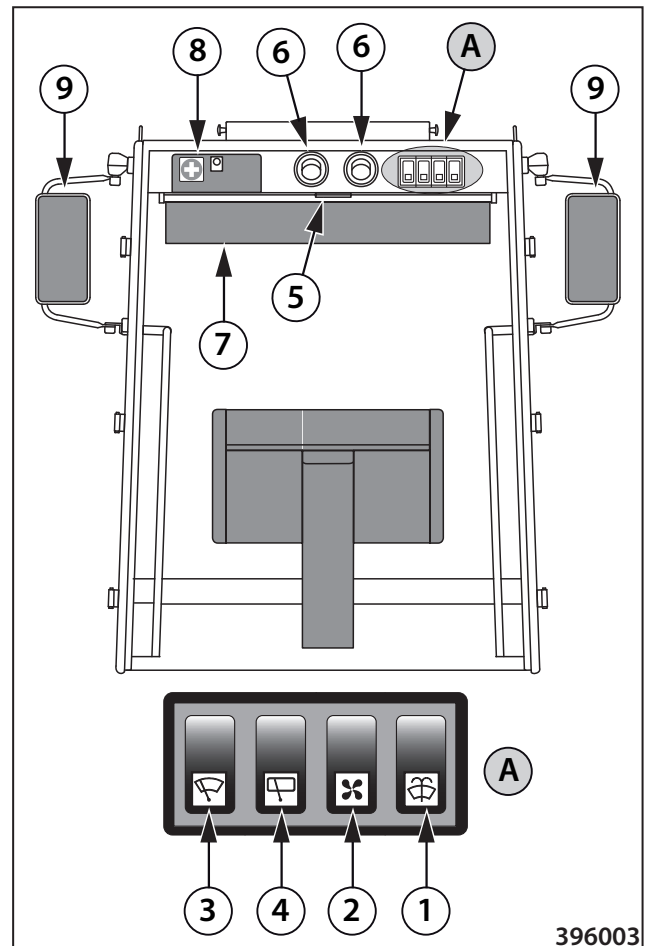
396002A

- | | |
|---------------------------|--|
| 1 - Vibratory drum | 14 - Engine cooler |
| 2 - Drum frame | - Cooler for engine air induction manifold |
| 3 - Scraper | - Hydraulics cooler |
| 4 - Joint | 16 - Driver's actuator stand |
| 5 - Machine frame | 17 - Steering hydrogenerator |
| 6 - Axle | 18 - Travel hydrogenerator |
| 7 - Fuel tank | 19 - Vibration hydrogenerator |
| 8 - Batteries | 20 - Exhaust muffler |
| 9 - ROPS protection frame | 21 - Air filter |
| 10 - Hydraulic tank | 22 - Plough blade |
| 11 - Cab | 23 - Padfoot segments |
| 12 - Bonnet | 24 - Hydraulic oil pressure filter |
| 13 - Engine | 25 - Air Conditioner |

2.6. Actuators and dashboard instruments

Layout of actuator elements and cab accessories

- 1 - Windshield washer switch
- 2 - Fan switch - fan induces ambient air
- 3 - Front wiper switch
- 4 - Rear wiper switch
- 5 - Cab light
- 6 - Ventilation nozzles
- 7 - Sun visor
- 8 - Stowage box for first aid kit, operation logbook, etc.
- 9 - Back mirrors - able to fold for transport position by 90° towards cabwards cab



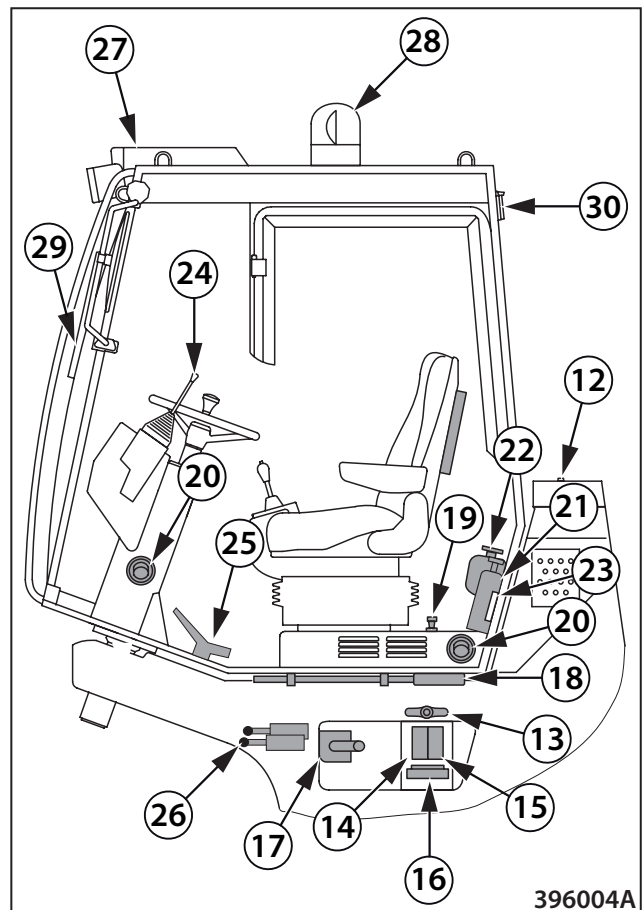
- 10 - Air-conditioning switch (OPTION)
- 11 - Air blowing intensity selector (OPTION)
- 2A - Air recirculation switch



2.6. Actuators and dashboard instruments

- 12 - Socket for beacon, for hand lamp
- 13 - Battery disconnecter
- 14 - Cab lifting / lowering switch (OPTION)
- 15 - Bonnet lifting / lowering switch (OPTION)
- 16 - Fuse for lifting actuator - cab/bonnet lowering 50 A (OPTION)
- 17 - Manual hydrogenerator for lifting / lowering
- 18 - Manual hydrogenerator joy stick
- 19 - Heater valve tie rod
- 20 - Heater breaths
- 21 - Fire extinguisher (OPTION)*
- 22 - Washer tank
- 23 - Drink holder
- 24 - Blade actuator hand-type (OPTION)
- 25 - Blade actuator foot-type (OPTION)
- 26 - Lifting levers - cab and bonnet lowering
- 27 - Cab ventilation filter
- 28 - Beacon
- 29 - Front wiper incl. screen washer
- 30 - Rear washer incl. screen washer

* Place for the installation of a fire extinguisher holder.



! ATTENTION !

It is prohibited to operate the heating valve control rod (19) while driving.

! ATTENTION !

The manufacturer recommends that the machine be equipped with a fire extinguisher.

Driver's seat

Seat adjustment:

- 1 Backrest position
- 2 Arm rest position and folding
- 3 Seat swivel
- 4 Seat sliding (shift)
- 5 Seat squab sliding (shift)
- 6 Seat cushion stiffness as per Driver weight indicator
- 7 Seat height - please, grasp underneath seat squab and lift slowly to adjust seat height to next higher position, 0 ÷ MAX, which will be locked (it clicks). When lifted to highest position the seat will drop again to lowest position.

- 8 Lumbar bolster



Adjust your seat and fasten your seat belt before driving off!

! CAUTION !

If Driver stands up from the seat while driving the speed will slow down until Roller is fully stopped and braked, this will last 4 seconds. Following next 4 sec. the engine shuts down.

To start the engine again the Driver must sit down again, shift the travel actuator to neutral, turn ON brake switch, turn ignition key to "0" position and then start the engine. Driver must brake off before starting to move.

If Driver sits down again before 4 sec. have elapsed, then the Roller will continue driving at a speed selected.

If Driver sits down after 4 sec. have elapsed, then the engine will shut down, the Driver may start moving it again. Before that the Drives must shift the controller to neutral, and select again the original driving direction.

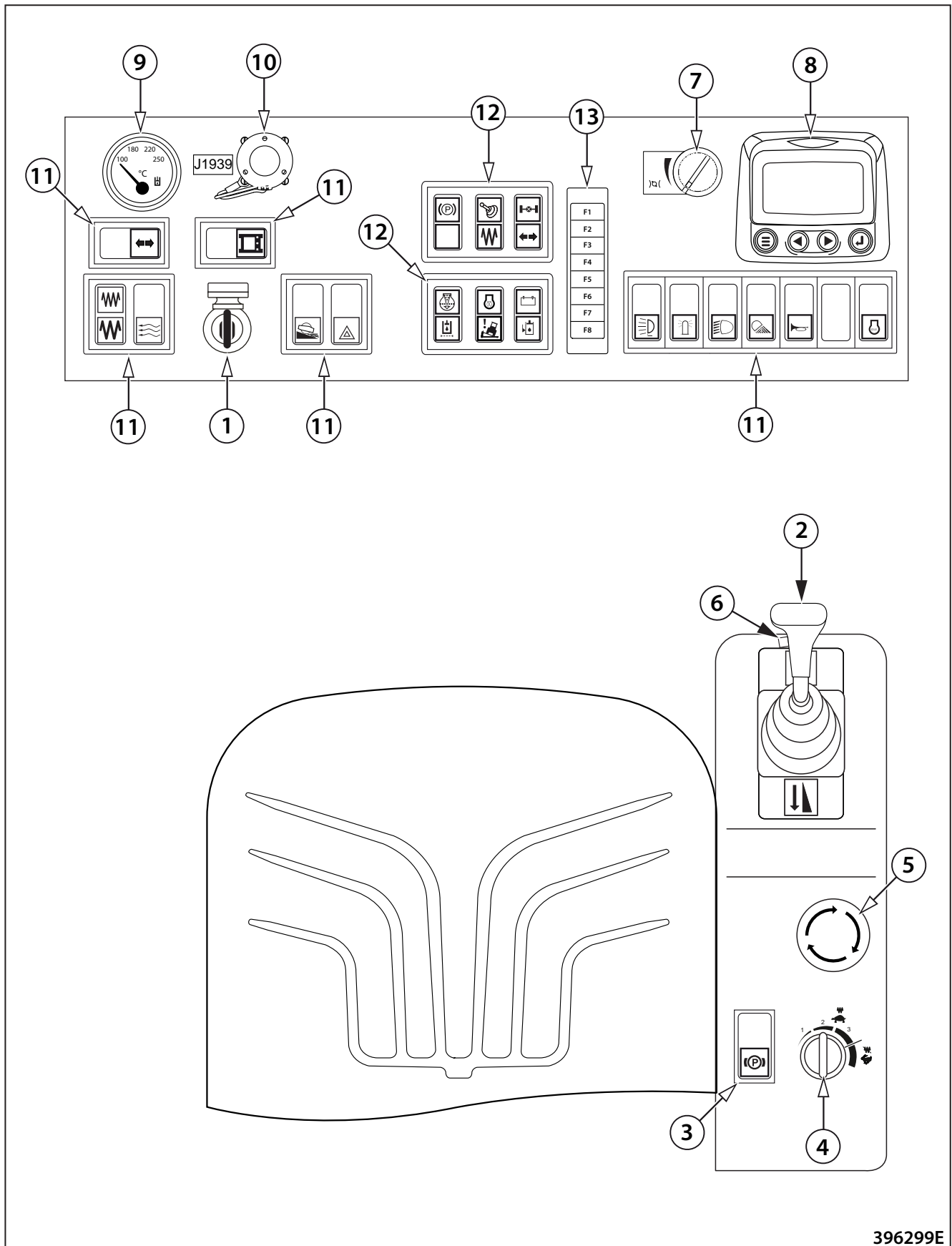


Document compartment

A document compartment is located on the rear side of the seat back.



2.6. Actuators and dashboard instruments



396299E

Dashboard & Actuator Panel

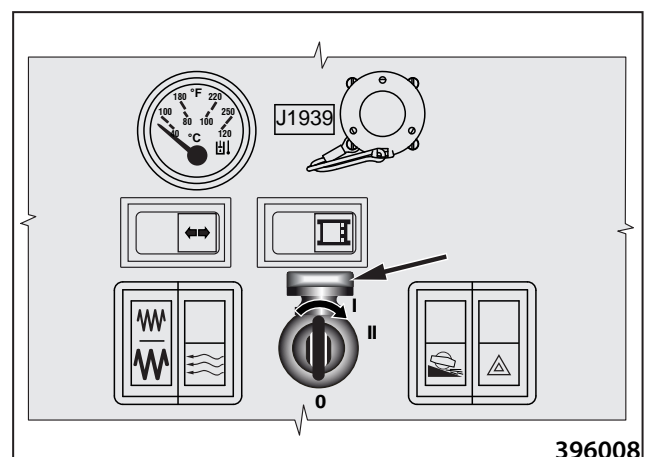
- 1 - Ignition box
- 2 - Travel joy stick
- 3 - Parking brake
- 4 - Working/transport speed switch
- 5 - TOTAL STOP pushbutton (for emergency brake)
- 6 - Vibration switch
- 7 - Engine speed selector
- 8 - Power View Display
- 9 - Hydraulic oil thermometer
- 10 - ECM engine socket
- 11 - Switches
- 12 - Pilot lamps
- 13 - Fuses

Ignition box (1)

While in "0" position the lights, cab/bonnet lifting and AC are connected. While in "I" position the dashboard instruments are connected. Position "II" is used to start the Machine.

Note

Ignition key is common for cab door, service door underneath cab, and for tool kit.



2.6. Actuators and dashboard instruments

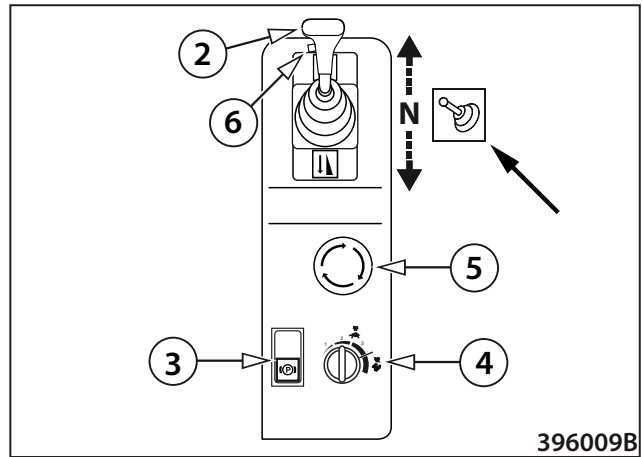


Travel joy stick (2)

Use this joy stick to adjust driving direction and speed. Driving speed corresponds to the size of joy stick deflection from neutral position. This joy stick becomes locked in the position adjusted. Joy stick neutral position (N) will be signalled through indicator lamp going on. In the actuator handle there is vibration switch (6) located to turn ON/OFF vibrations.

! CAUTION !

Adjust joy stick to neutral before engine start.



396009B

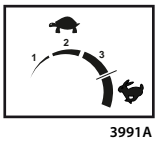


Parking brake (3)

Use this brake to stop the Roller if the engine is to keep running. In this case Driver may stand up from the seat and leave the Roller.

Note

Unless standing Roller is braked and Driver stands up from the seat, the Roller will brake and engine will shut off after 8 seconds.



Working/transport speed switch (4)

Three operating speeds and transport speed can be selected using the switch while driving.

Position "I" – working speed 1 ON

Position "II" – working speed 2 ON

Position "III" – working speed 3 ON

Position "IV" – transport speed ON



TOTAL STOP pushbutton (5)

Press this button to stop and brake the Roller, and to shut off the engine.

! CAUTION !

Brake off in arrow direction before starting the engine.

Vibration switch (6)

Vibration is able to be switched ON while driving.



It is forbidden to vibrate on the spot!



It is forbidden to use the emergency brake for turning off the engine during normal operation of the machine!

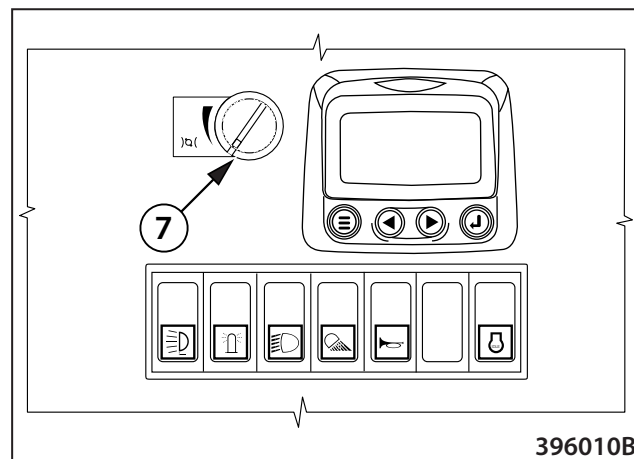


Engine speed selector (7)

It is used to adjust the combustion engine speed from max to min.

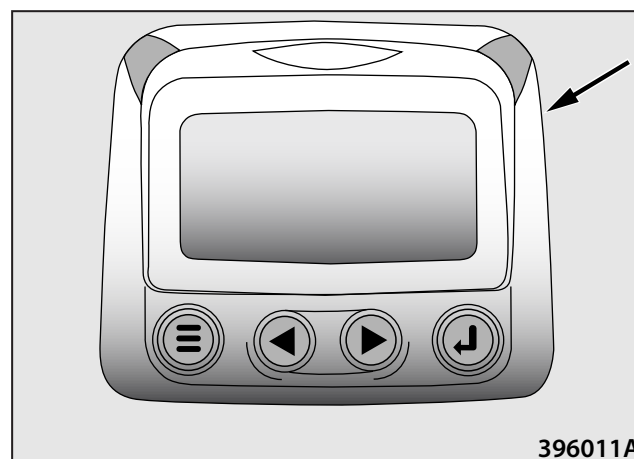


It is forbidden to quickly increase and decrease engine speed. It can damage the engine!



Power View Display (8)

Multifunctional instrument to display parameters of the engine function and fuel level.



2.6. Actuators and dashboard instruments

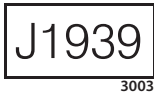


Hydraulic oil thermometer (9)

It indicates hydraulic oil temperature during operation. Highest admissible temperature is 90 °C (194 °F) for oil of viscosity class of HV 68 and HV 100. Optimal operating temperature is 50 - 60 °C (122 - 140 °F).

The use of oil of other viscosity

Oil viscosity	Max admissible oil temperature
HV 46	80 °C (176 °F)
HV 32	70 °C (158 °F)

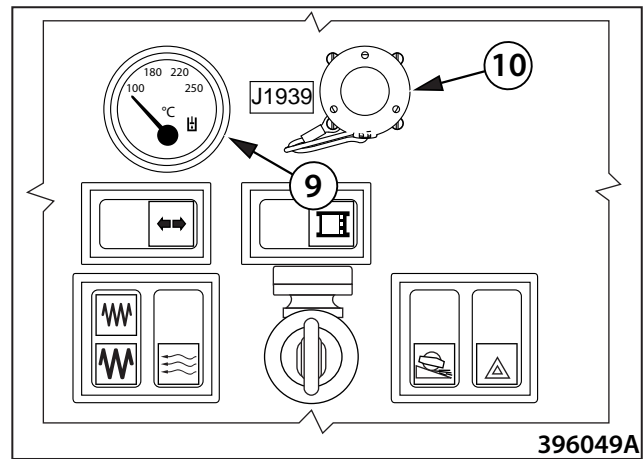


Socket (10)

Connection to ECM (Electronic Actuator Module) - actuator units of the engine and diagnosing of defects or parameter adjustments

Note

ECM is designed to process data about engine function, and to actuator its operation.



SWITCHES (11)



596473

Additional lights



596303

Fender lights + working headlamps - 3-position one

- switched OFF
- 1. Front fender lights ON + rear lights ON, dashboard instrument lighting
- 2. Front lamps ON



591668R

Rear lights



2246

Loud horn

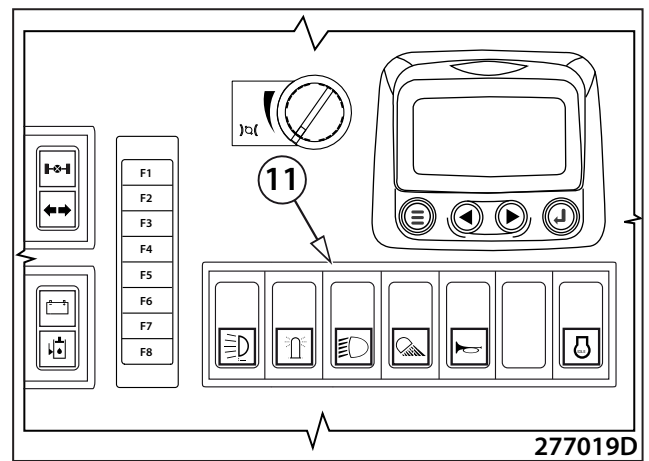


3006

Engine idling

It must be switched ON when starting the engine.

Flashing beacon - connect to the socket.



2.6. Actuators and dashboard instruments



Warning lights



Limitation for drum slip

It is used only for Roller to move onto the loading area of a transport vehicle.

Note

If the Roller is equipped with the drum slip limitation system then ATC will not be used.

! CAUTION !

Transport speed controller must be switched OFF when drum slip limitation is enabled. At the same time the vibration is interlocked.



Vibration preselector - 2 positions

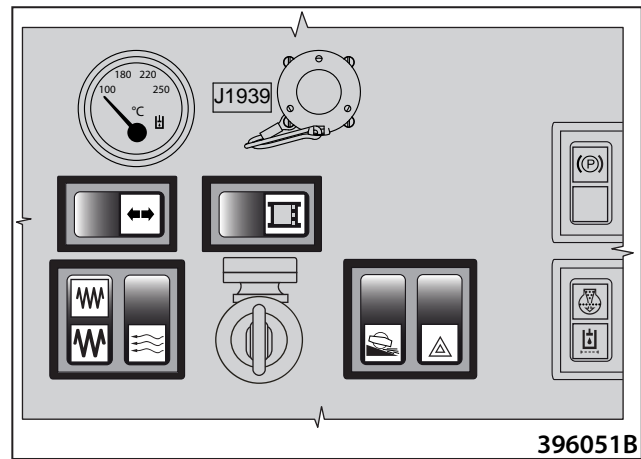
High frequency - low amplitude

Low frequency - high amplitude

Before the machine starts moving, use the switch to set the required amplitude. Before changing the amplitude, first stop the machine, use the switch to change the amplitude and then start moving the machine again.



**It is forbidden to vibrate on the spot!
It is forbidden to change the vibration amplitude while driving.**





Heater fan switch - 3-position one

2487

- OFF
- high fan motor rpm
- low fan motor rpm

! CAUTION !

The fan will provide for air circulation inside cab only.



Change-over switch for direction indicator lights

2489

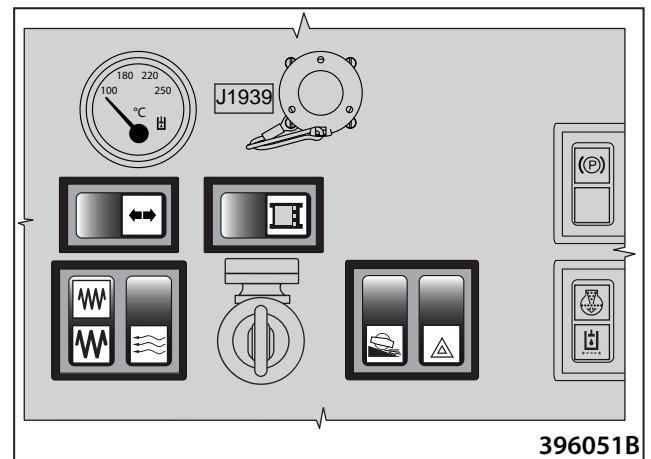


Compaction meter switch

AMN39

Note

Compaction Meter Operation Manual has been supplied separately.



396051B

2.6. Actuators and dashboard instruments

PILOT LAMPS (12)



Brake - pilot lamp ON, signals the Machine is braked.

2703



Vibration - signals the vibration is ON via switch (6)

2612



Direction lights

2489

! CAUTION !

**Rapid flashing signals a failure (defective bulb).
Check function of direction lights.**



Zero position of travel actuator - neutral (idle)

596653

! CAUTION !

Check travel actuator in neutral before starting the engine!



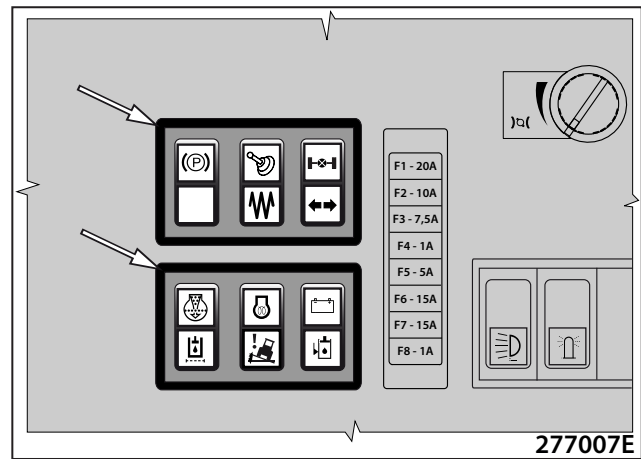
ROPS 2D (Roll Over Preventative System)

3400

Flickering indicator lamp incl. acoustic alarm will signal any hazardous bank of the Machine during cross travel of Roller on the slope, and vibration will stop simultaneously – lateral slip hazard.

! CAUTION !

Vibration is unable to switch ON until Machine returns to its safe bank.



The ATC centre differential - Ammann Traction Actuator

596116

ATC pilot lamp is ON - the system is enabled with transport speed controller switched OFF (switch identified with "hare" symbol). ATC will work automatically when adhesion conditions alter.

Note

If Roller is equipped with ATC system (inter-axle lock) the drum slip limitation will not be used.

! CAUTION !

The ATC locker block can be enabled only at the operation speed.



Engine glowing

It signals glowing before engine start at low ambient temperature.



Hydraulic oil filter fouled

It signals filter element is clogged.

 **Promptly replace the filter element!**



Hydraulic oil level

Hydraulic oil level indicator lamp ON will signal the level in the tank has dropped below set limit. Roller will stop - engine stalling.

! CAUTION !
Engine can be started once defect is repaired and oil in hydraulic tank filled up to its set limit!



Air filter fouled

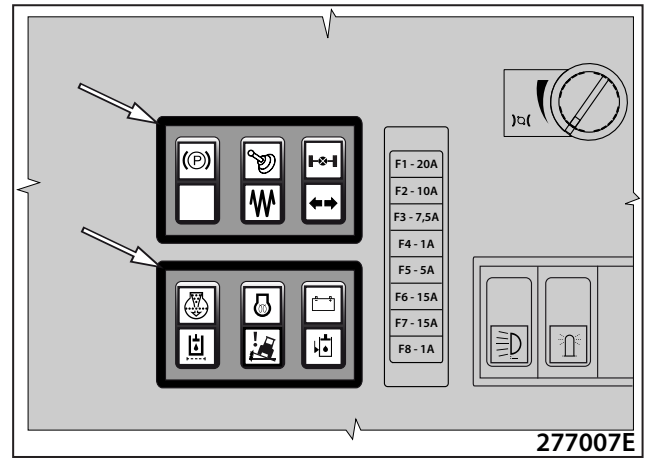
It signals filter elements are fouled.

 **Promptly replace the filter element!**



Recharging indicator lamp

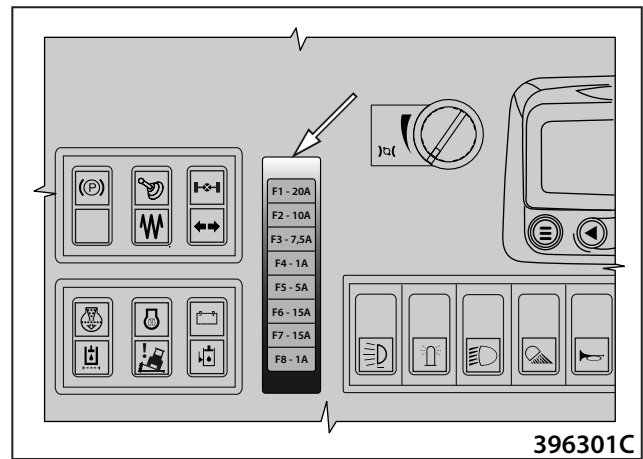
Goes off when started.



2.6. Actuators and dashboard instruments

Fuse block (13)

- Fuse (F1) - 20 A (upper fuse) front + rear lamps, front fender lights + rear lights, auxiliary headlamps, dashboard instrument illumination, bonnet lifting - lowering and Driver's control stand,
- Fuse (F2) - 10 A cab light, loud horn, direction indicator lights, beacon.
- Fuse (F3) - 7,5 A brake, engine STOP, travel, vibration, brake lights, return horn, hydraulic oil level indicator lamp, vibration contact indicator lamp, brake indicator lamp, indicator lamp for zero position of travel actuator
- Fuse (F4) - 1 A POWER VIEW, J1939 socket power supply
- Fuse (F5) - 5 A hydraulic oil thermometer, indicator lamp for vacuum in engine suction filter, regarding indicator lamp, indicator lamp for hydraulic oil filter fouled, glowing indicator lamp, engine rpm switches
- Fuse (F6) - 15 A ventilation and heater fan, front wiper and rear wiper, front washer and rear washer
- Fuse (F7) - 15 A reserve (air conditioner / ROPS 2D)
- Fuse (F8) reserve



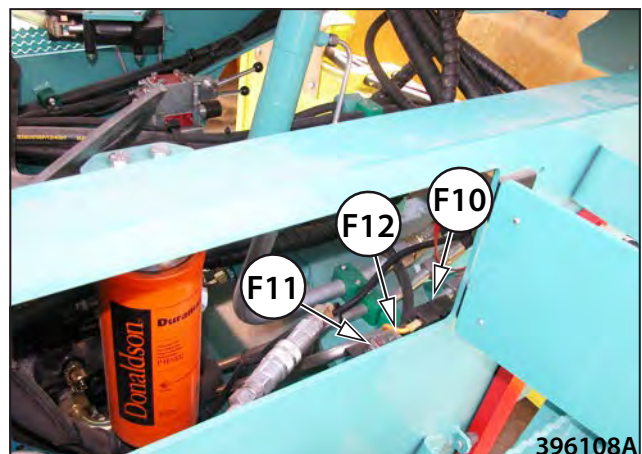
Fuse (F9) - 50 A

Electrohydraulic unit (aggregate) for bonnet lifting/lowering and Driver's control stand.



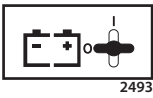
Engine fuses

- Fuses (F10) - 125 A engine glowing
- Fuse (F11) - 30 A engine electronics
- Fuse (F12) car radio

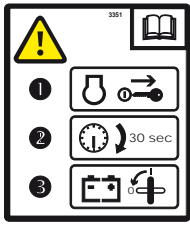


! CAUTION !

Replace fuses only with fuses of identical value!!!



Master switch



When driving is ended, please use master switch to disconnect battery!

Cut OFF master switch only after 30 sec. following ignition key removed from switch box.

Time limits must be observed for ECM engine data to be stored.

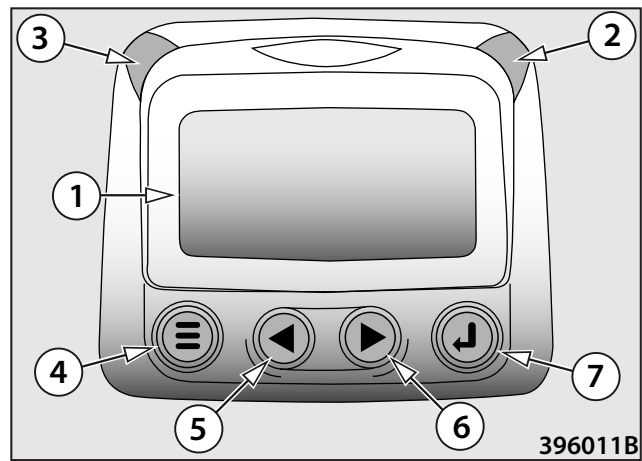
When washing the Machine ALWAYS cut OFF master switch!



2.6. Actuators and dashboard instruments

2.6.1. Power View control

- 1 Display
- 2 Red LED lights – **ENGINE SHUTOFF** – engine substantial defect alarm
- 3 Yellow LED lights - **WARNING** – engine failure alarm, or minimal fuel level in tank alarm
- 4 Menu selection pushbutton – to enter or exit menu
- 5 Pushbutton – to move cursor UP – illuminates data on display or moves parameter option to the left or up
- 6 Pushbutton – to move cursor DOWN – illuminates data on display or moves parameter option to the right or down
- 7 ENTER pushbutton – selects menu or parameter, or conceals/displays active error code



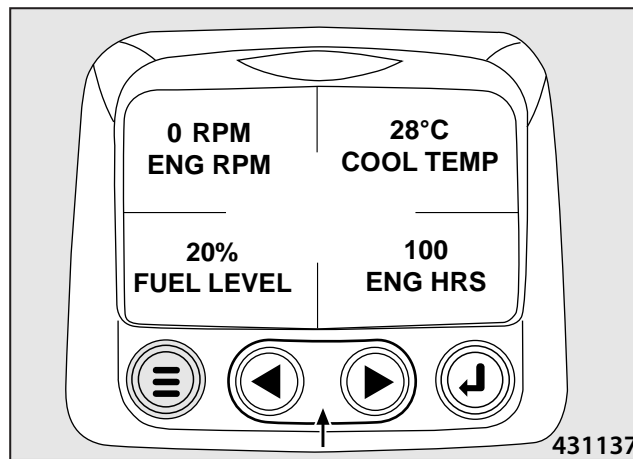
The red LED is lighting – reduce the engine power, park the machine immediately at a safe place and turn off the engine! Contact your dealer. Do not operate the machine until the failure is removed!

The yellow LED is lighting – warning – engine failure alarm, or minimal fuel level in the tank alarm. Reduce the engine power, park the machine immediately at a safe place and turn off the engine! Remove the failure or contact your dealer. Do not operate the machine until the failure is removed!

If a failure code is displayed, contact your dealer.

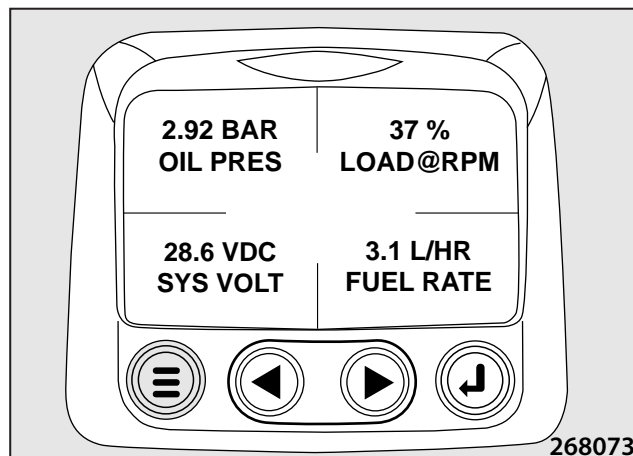
NAVIGATION BASIS

After the start-up, a four-parameter screen is displayed (engine speed, coolant temperature, fuel level, number of engine operating hours). By pressing the left or right arrow, you display four additional parameters.



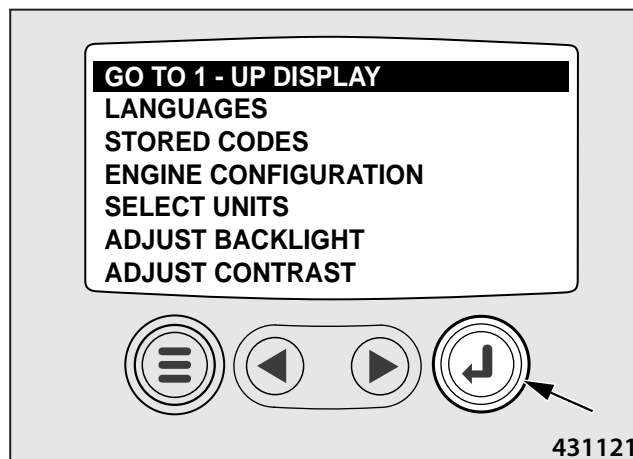
(engine oil pressure, engine load, el. system voltage, fuel consumption rate)

Press the button MENU to display the main menu.



GO TO 1-UP DISPLAY – one-parameter display

Move the cursor (1) in the main menu onto the item and use the button ENTER (2) to enter the submenu.

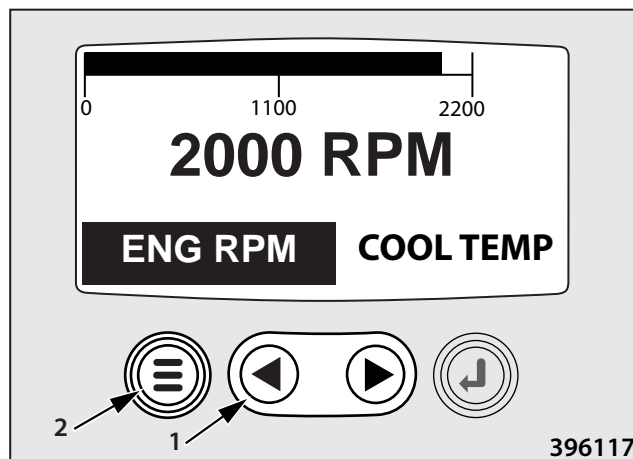


Using the cursor (1) you can gradually display 8 pre-set parameters (engine speed, coolant temperature, engine oil pressure, engine load in % at actual engine speed, el. system voltage, number of engine operating hours, fuel consumption rate, fuel level).

Press the button MENU (2) to return to the main menu.

Note:

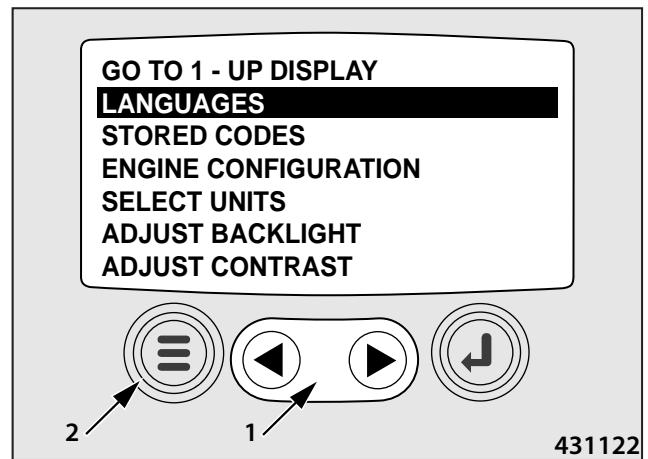
If the engine is at rest, the battery voltage is indicated. If the engine is running, then roller's el. system voltage is indicated.



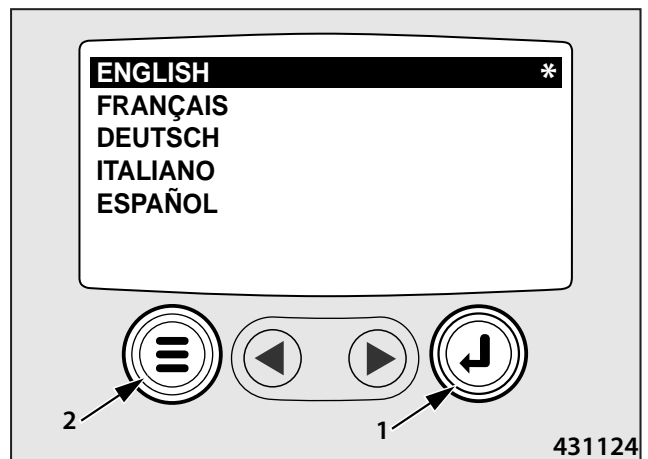
2.6. Actuators and dashboard instruments

LANGUAGES – menu to select a language

Move the cursor (1) in the main menu onto the item and use the button ENTER (2) to enter the submenu.



Use the cursor and select a language, then confirm your selection using the button ENTER (1) and return to the main menu by pressing the button MENU (2).

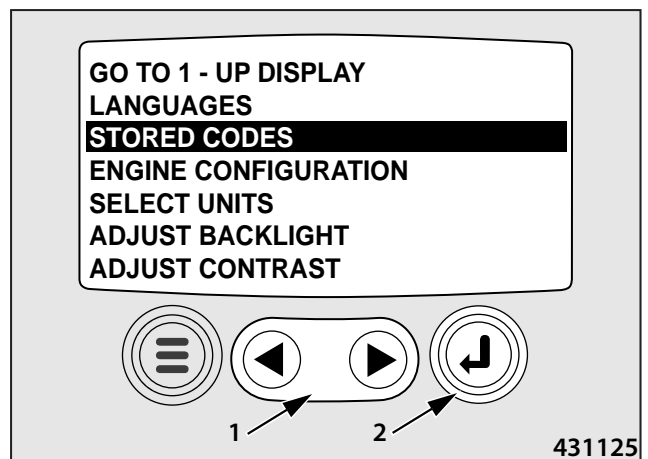


STORED CODES – saved defects, which are not enabled.

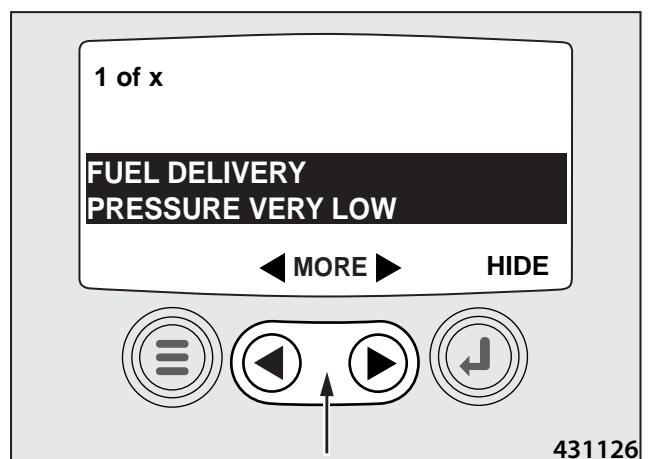
Move the cursor (1) in the main menu onto the item and use the button ENTER (2) to enter the submenu.

Note:

The following message will appear on the display: "Requesting fault codes". Wait until it disappears.

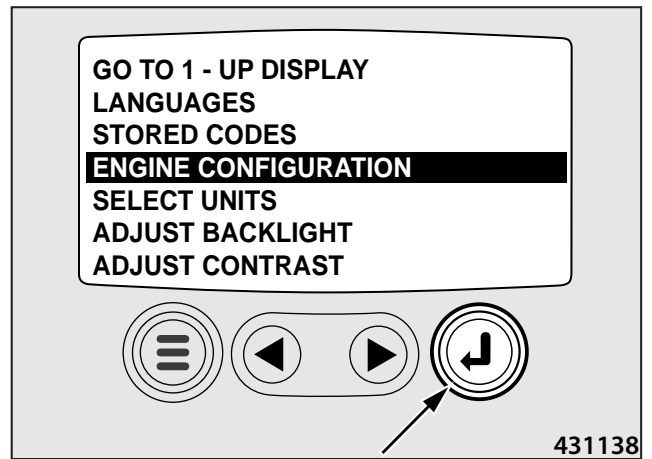


If the word MORE appears, use the cursor to move to other saved positions. By pressing the button ENTER, return to the main menu.

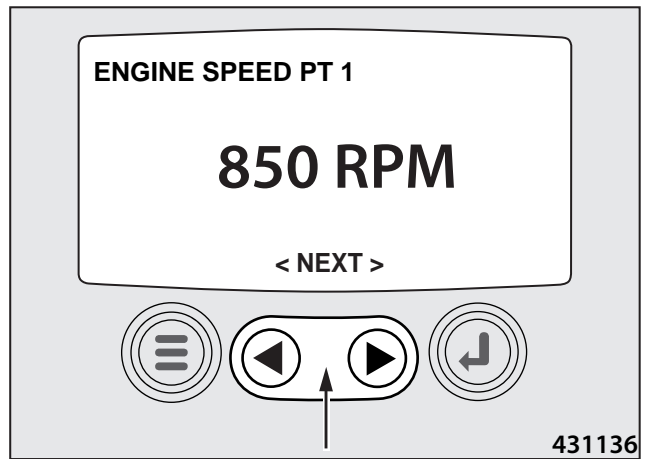


ENGINE CONFIGURATION – menu to browse engine parameters

Move the cursor (1) in the main menu onto the item and use the button ENTER (2) to enter the submenu.

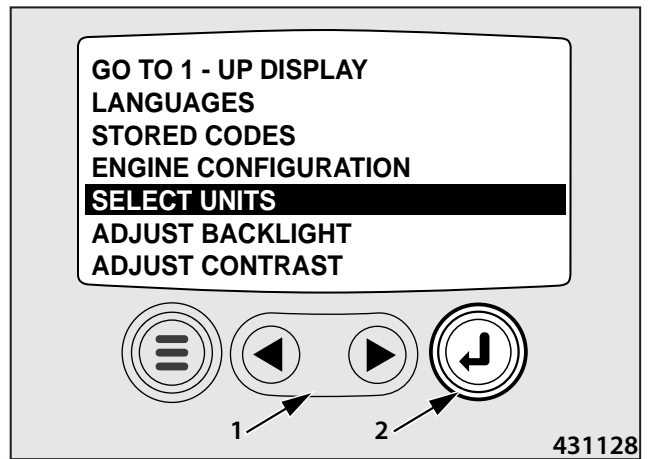


Using the cursor you can move among the parameters.



SELECT UNITS – selection of units of measure

Move the cursor (1) in the main menu onto the item and use the button ENTER (2) to enter the submenu.

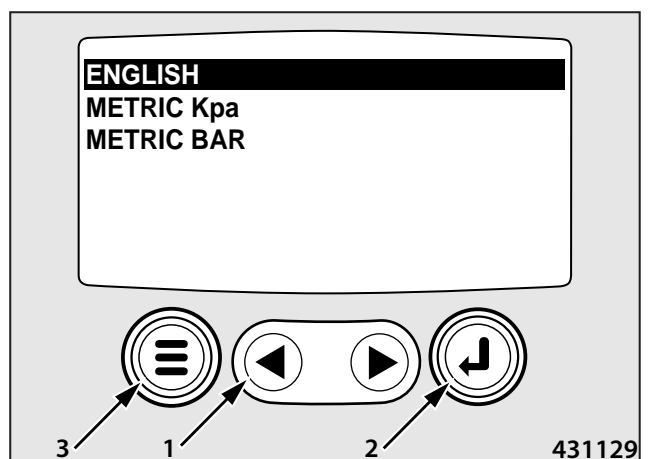


Use the cursor to set (1) ENGLISH and the indicated variables appear in PSI units (pressure), °F (temperature).

After you set METRIC KPA, the displayed variables are in kPA, °C units.

After you set METRIC BAR, the displayed variables are in bar, °C units.

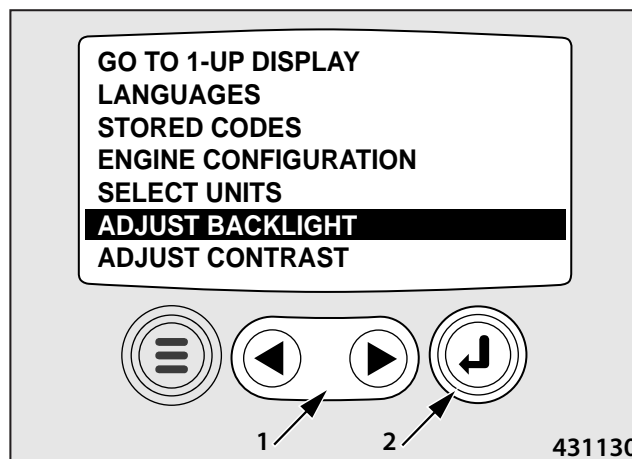
Using the button ENTER (2) confirm the variables and using the button MENU (3) return to the main menu.



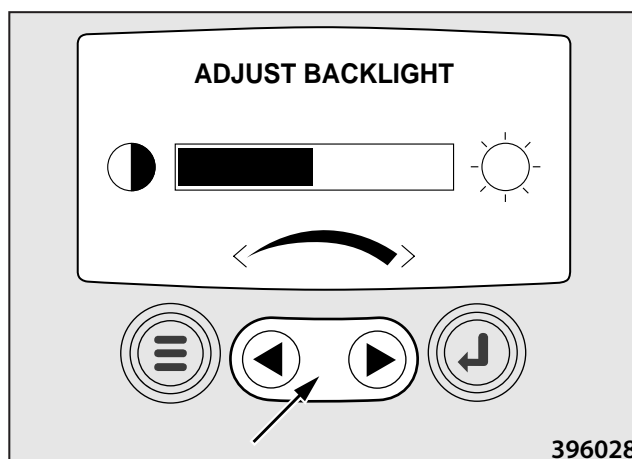
2.6. Actuators and dashboard instruments

ADJUST BACKLIGHT – adjustment of the display backlight intensity

Move the cursor (1) in the main menu onto the item and use the button ENTER (2) to enter the submenu.

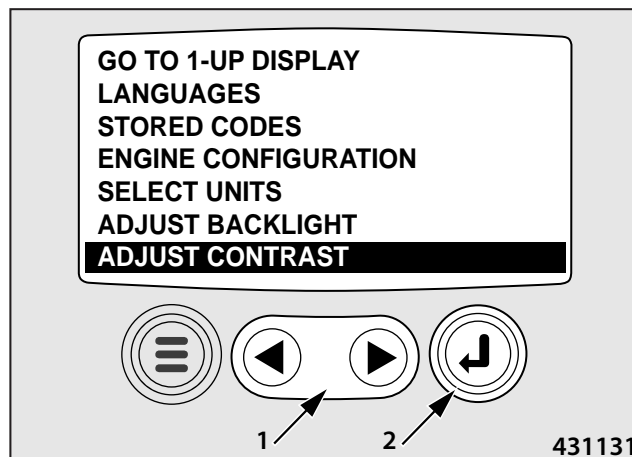


Set the backlight intensity using the cursor. By pressing the button MENU, return to the main menu.

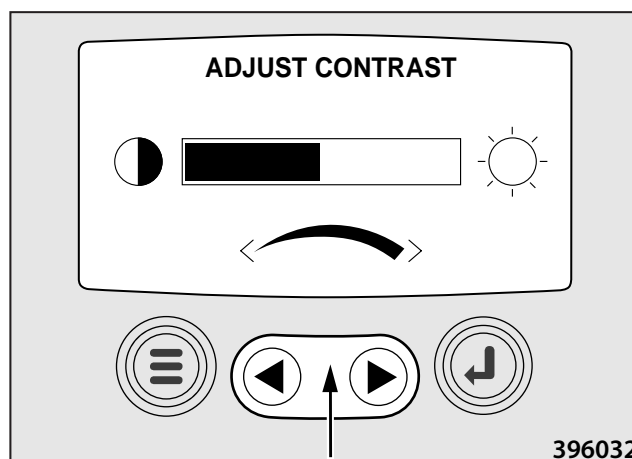


ADJUST CONTRAST – adjustment of the display contrast

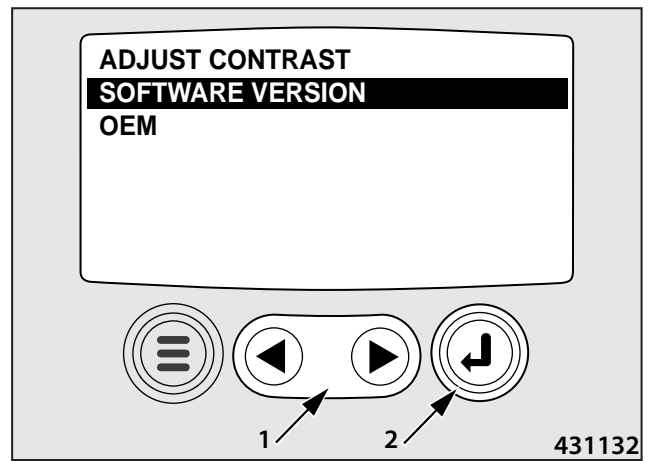
Move the cursor (1) in the main menu onto the item and use the button ENTER (2) to enter the submenu.



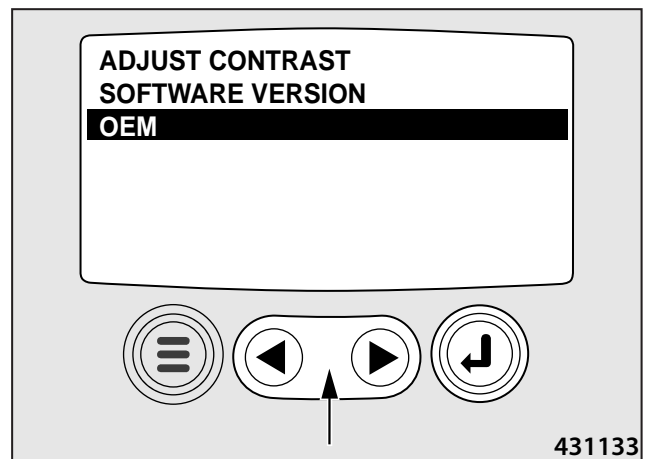
Set the display contrast using the cursor. By pressing the button MENU, return to the main menu.



SOFTWARE VERSION – informs about the software version



OEM – service access




2.6. Actuators and dashboard instruments

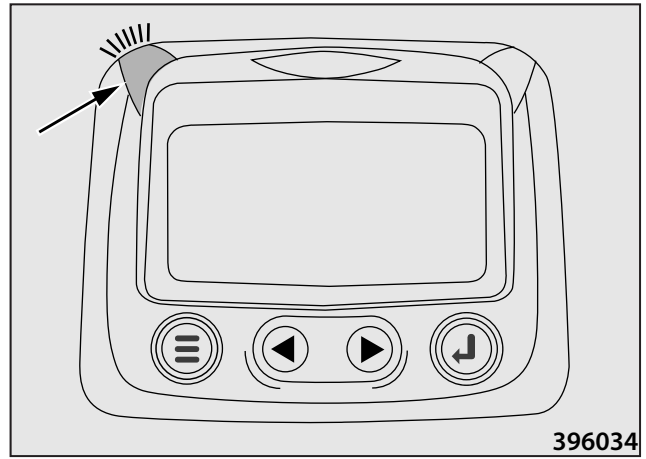
ENGINE FAULT SIGNALLING

ALARM SIGNALLING

The alarm signal indicated with the lighting yellow LED informs about an engine malfunction – **warning**.

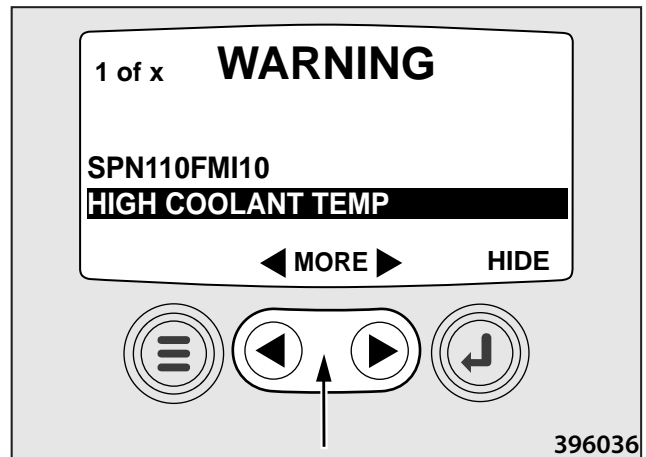


Engine failure alarm, or min fuel level in tank alarm. Reduce the engine power, park the machine immediately at a safe place and turn off the engine! Remove the failure or contact your dealer. Do not operate the machine until the failure is removed!

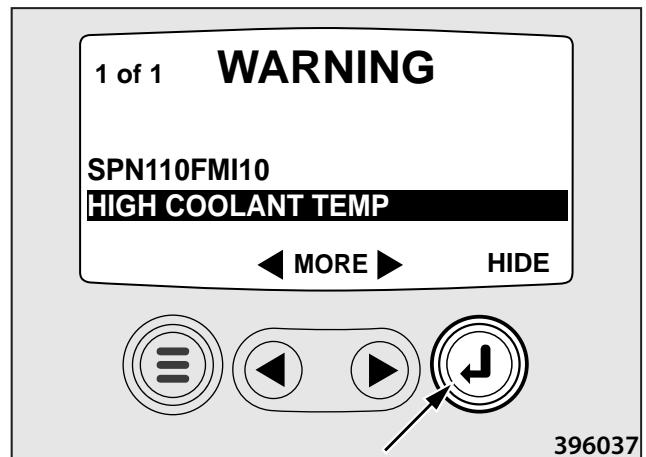


A registered failure is indicated on the display through an error code and a description of the failure.

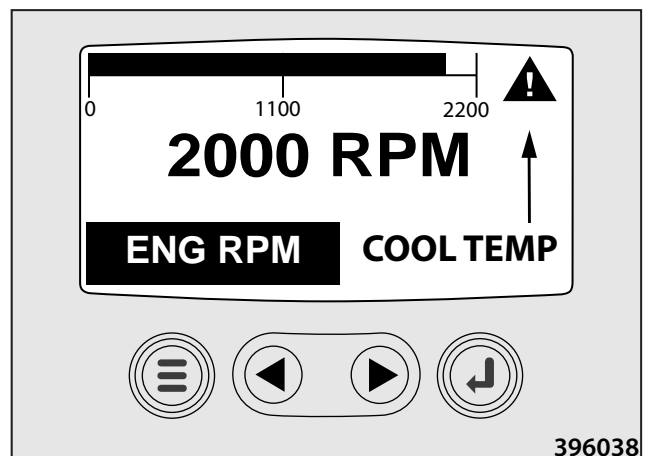
When more errors are registered, please use the cursor to display the registered failures step by step.



Press ENTER to confirm and hide the display.



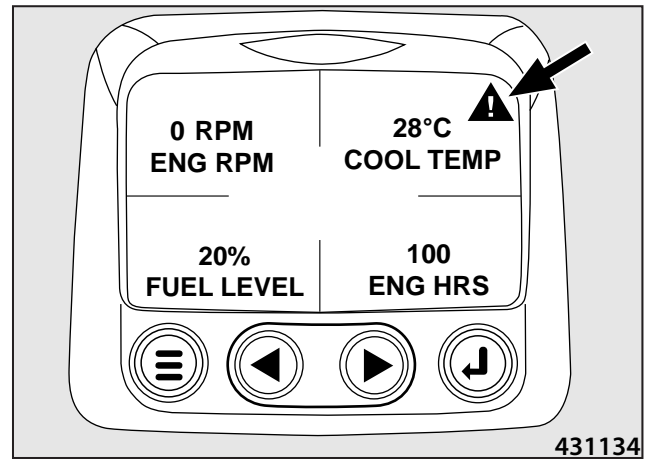
Return to the 1-parameter screen with the warning icon for the active failure in the RH corner.



Return to the 4-parameter screen with the warning icon for the active failure in the RH corner.



If a failure description and a code appear on the display of the instrument board, contact your dealer if it is impossible to remove the failure.



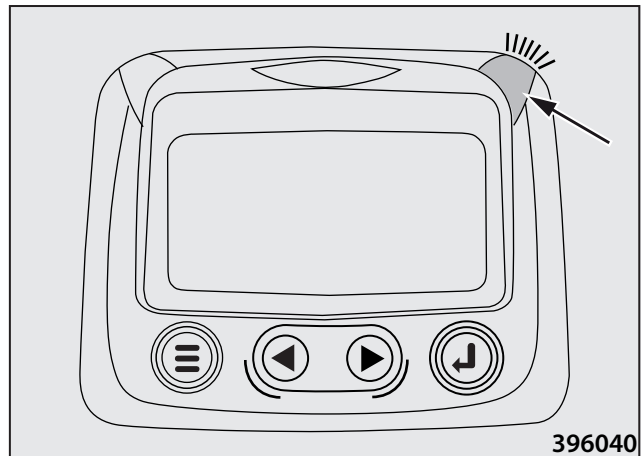
2.6. Actuators and dashboard instruments

ENGINE CUT OFF ALARM

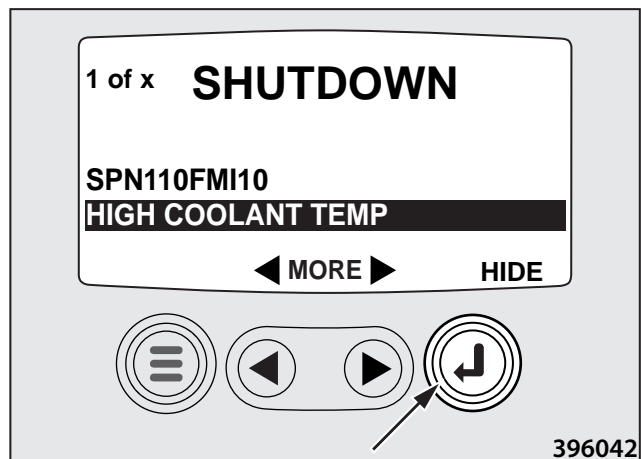
The alarm signal indicated by the red lighting LED informs about a serious failure of the engine – **Turn off the engine.**



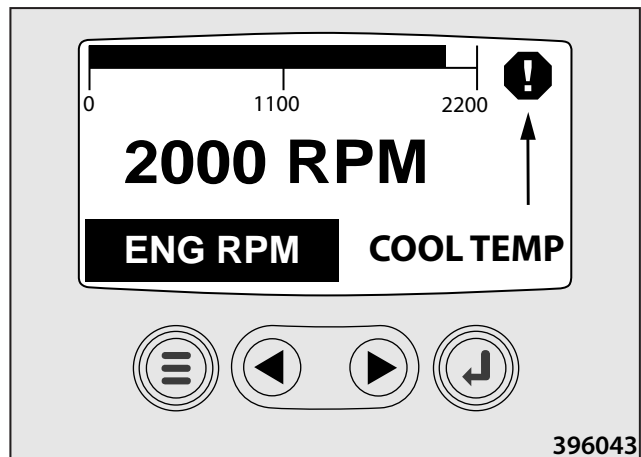
Reduce the engine power, park the machine immediately at a safe place and turn off the engine! Contact your dealer. Do not operate the machine until the failure is removed!



A registered serious failure of the engine is indicated by an error code and a description of the failure on the display with the warning message "SHUT DOWN". Confirm and hide the display using the button ENTER.



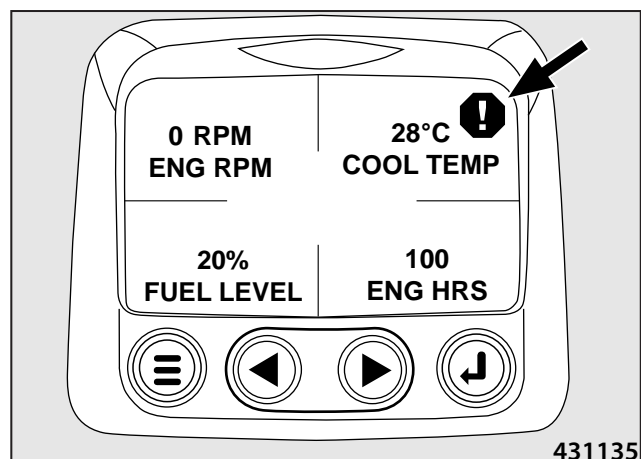
1-parameter display with the warning icon "SHUT DOWN" in the upper right corner.



4-parameter display with the warning icon "SHUT DOWN" in the upper right corner.

Note

Press ENTER to display again the hidden error code for failure. Press ENTER once again to display either 1 parameter or 4 parameters. The warning icon is displayed until the failure is removed.



ERROR MESSAGES	
Error message	Signature
" WAIT TO START PREHEATING " is displayed	The ECU is broadcasting a 'Wait To Start' message. Engine manufacturers typically recommend against starting the engine while the ECU is broadcasting this message. Once the ECU stops broadcasting this message, this screen will no longer be displayed on the Power View.
" CANBUS FAILURE " is displayed	The Power View has not received any valid J1939 CAN messages for at least 30 seconds.
" TIMEOUT ECU NOT RESPONDING " is displayed	The Power View sent a request to the ECU for Stored Fault Code (DM2) information, and the ECU did not respond to the request. This message on the PowerView indicates the ECU may not support Stored Fault Code (DM2) functionality over J1939.
" NO STORED CODES " is displayed	The Power View sent a request to the ECU for Stored Fault Code (DM2) information, and the ECU responded. There are zero stored codes.
" NO GAGE DATA " is displayed	The Power View has no record of gages connected to the RS485 bus.
" NO DATA " is displayed in place of a parameter value	The Power View has not received data for the selected parameter for at least 5 seconds.
" NOT SUPPORTED " is displayed in place of a parameter value	The ECU is sending a message that it does not support this parameter.
" DATA ERROR " is displayed in place of a parameter value	The ECU is sending a message that there is a data error with this parameter. Or (PV101 only) FUEL LEVEL has been selected for display, ANALOG INPUT has been set to FUEL LEVEL, but no Murphy Fuel Sender has been connected to the analog input.
One of the 4-UP quadrants is empty	No parameter has been selected for display in this quadrant.
Display is not readable, either very dim or very dark	The LCD contrast may have been over or under adjusted. Press and hold the MENU key for approximately 5 seconds. This will reset the LCD contrast setting to factory default.

2.7. Machine control and use

2.7.1. Starting the engine



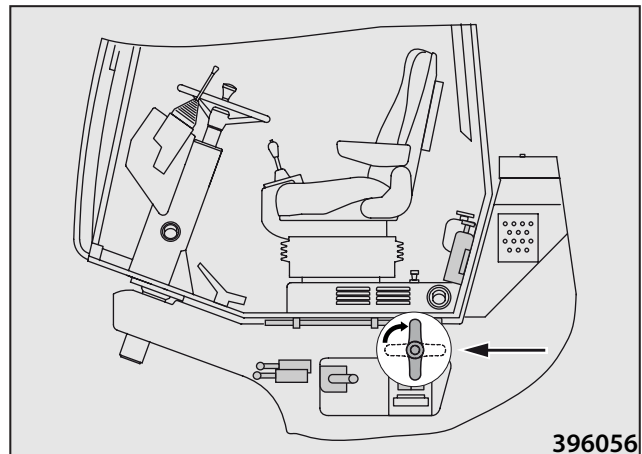
Before starting the engine, please confirm nobody gets endangered when engine is started!

How to start:

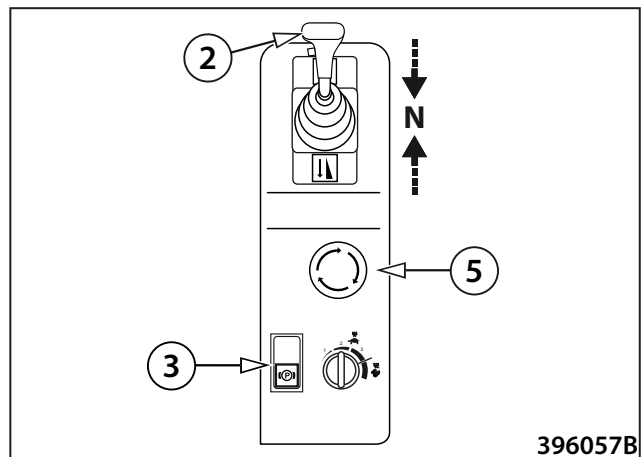
- Pump fuel via feed hand pump on the engine (upon long term shutdown of the Machine).



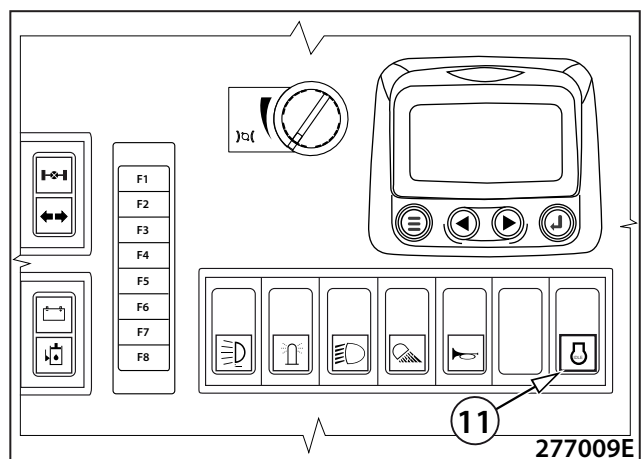
- Cut in battery disconnecter.



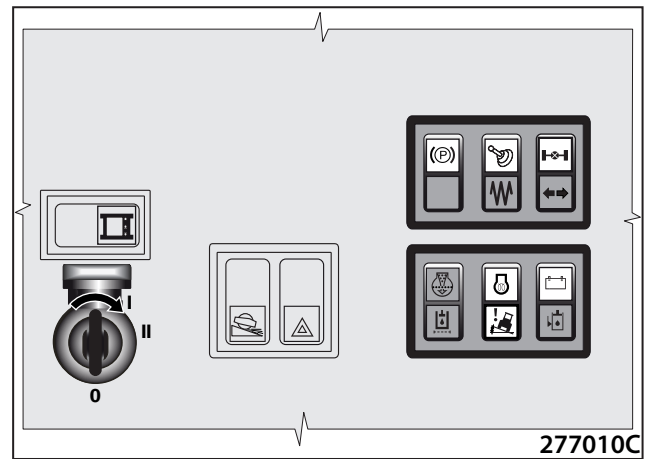
- Check "TOTAL STOP" (5) is off, and brake (3) is on, and actuator (2) in neutral.



- Turn on IDLE (11) engine idling switch.



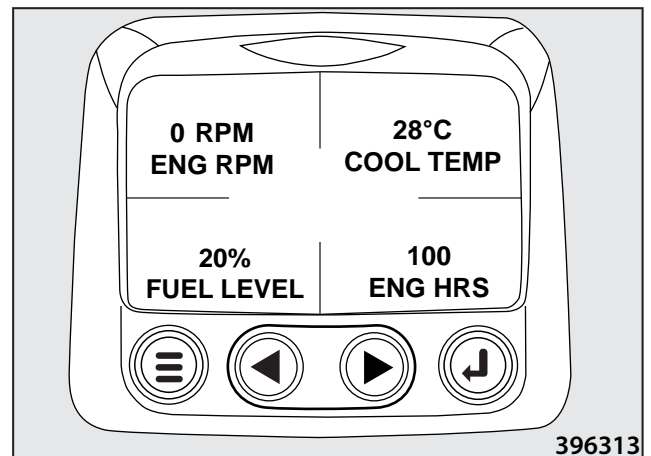
- Turn key in ignition box (1) to position "I" - the pilot lamps for brake, recharging, neutral, engine glowing (as per ambient temperature) will light. ROPS 2D indicator lamp will light up shortly along with acoustic alarm.



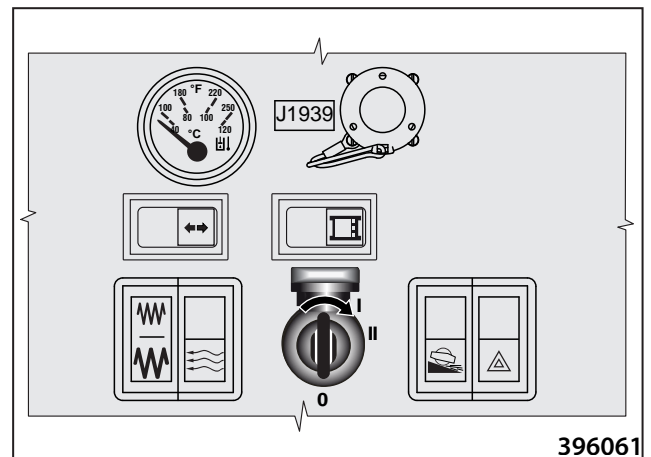
- The display will show logo and then 4 quadrants with parameters set.

Note

The display has been set by Manufacturer, it is possible to change it to a single parameter display, refer to par. 2.6.1.



- Glowing indicator lamp goes off, please switch to position "II" to start the engine and (hold key in "II" position only until engine is started).



Do NOT start for no longer than 30 sec. Repeat starting only after 2 minutes.

Repeat starting max 3x, then track a failure within fuel system. Absence of smoke in exhaust will signal a defect within fuel supply to the engine.

When started, please check recharging function - indicator lamp must go off.

Do NOT increase RPM abruptly, let engine run for 3 to 5 minutes in idle speed so to stabilize pressure in the engine, and bearings to lubricate. Do not let engine run idle longer than 10 minutes, engine may get damaged.

Starting will be interlocked if:

Roller is not braked.

Actuator (2) not in neutral.

STOP button pressed.

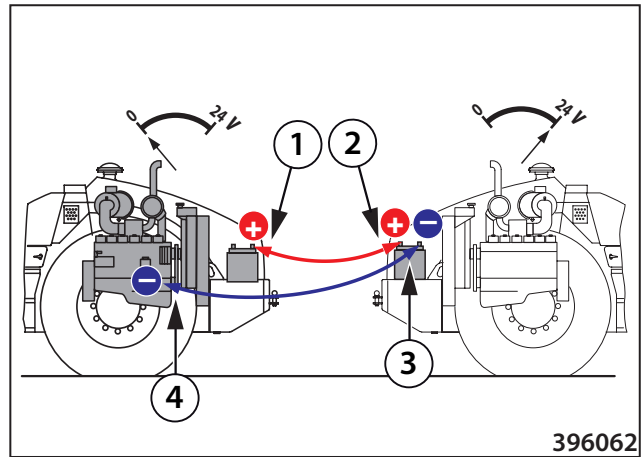
Driver not sitting on the seat.

2.7. Machine control and use

When using auxiliary starting source this power supply shall have starting voltage of 24 V.

How to start via starting cables from different machine

1. Connect one end (+) of cable pole to (+) pole of discharged battery.
2. Connect second end of (+) cable pole to (+) pole of the Machine battery from which starting will be made.
3. Connect one end of (-) pole to (-) pole of vehicle battery with the help of which starting will be made.
4. Connect second end of (-) cable pole to such part of the Machine being started which is wired in the engine (or eventually in the engine block itself).



Observe unconditionally the sequence of operations given below!

Once started, disconnect the starting cables in reverse sequence.

When having used starting unit with no batteries connected do not disconnect this unit before Machine's battery is connected.



Do NOT connect cable of (-) pole to (-) pole of discharged battery of started Machine! Strong sparking followed by explosion of gas generated by the battery may occur when starting.

Non-insulated parts of starting cable collets may not touch each other!

Starting cable connected to battery (+) pole may not come into contact with electrically conductive parts of the Machine - short-circuit possible.

Do NOT bend over the battery - hazard of acid burn!

Eliminate presence of flammable sources (open fire, burning cigarettes, etc.).

Do NOT check presence of voltage in wires with the use of sparking via Machine frame!

2.7.2. Travel and reversing



Give acoustic signal for Machine started to move, and wait long enough so any persons present could leave the area within Machine vicinity (under the Machine) in time!

Before starting to move, please confirm the area in front and behind the Machine is free and that no persons are found therewithin!

- Switch ON vibration amplitude (1), indicator lamp (2) will light.
- Switch OFF IDLE (11) and engine rpm to max. 2200 min⁻¹ via gas actuator (7).
- Fasten the seat belt.
- Change the working/transport speed switch (4) to an appropriate range of the working speeds "1"–"3" – this activates the working speed.
- Use the switch (3) to disengage the brakes. The parking brake indicator lamp (A) goes off.
- Start moving the Machine and turn ON the vibration via switch (6) - you can stop the vibration by pressing and releasing the pressbutton.

Note

The working speed "1"–"3" can be selected with the switch (4) while driving.



When driving uphill, set the switch (4) to "3" to achieve the maximum tractive force (gradeability) of the machine.

- By switching the transport speed "4" with the switch (4), you turn on the working speed – vibration is disabled.

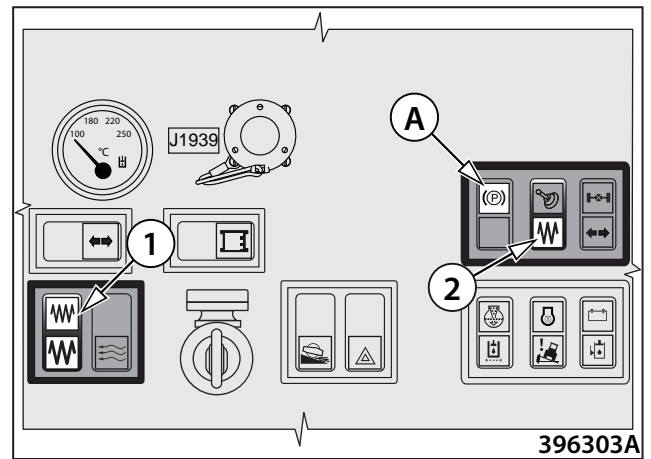
Note

The transport speed "4" can be enabled and disabled while driving.

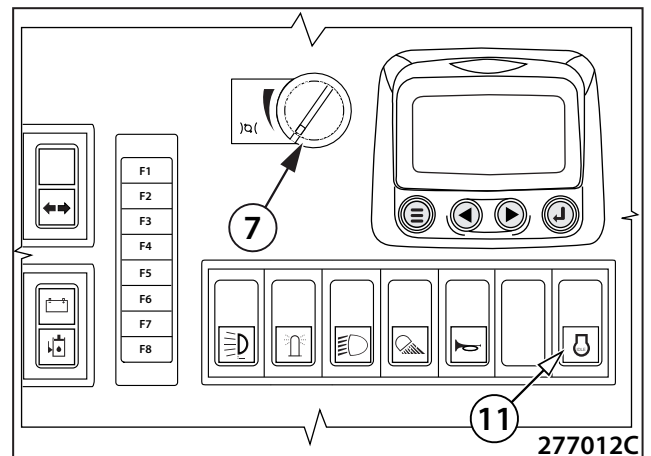
If the tractive force is insufficient while going uphill, change the switch to the working speed "3".



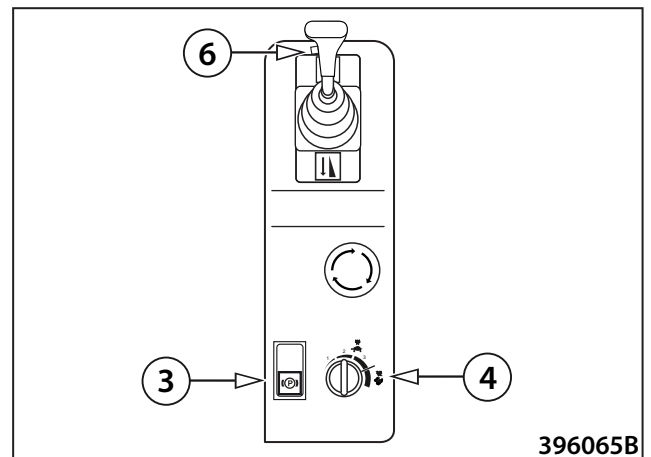
Before driving downhill, turn off the transport speed "4".



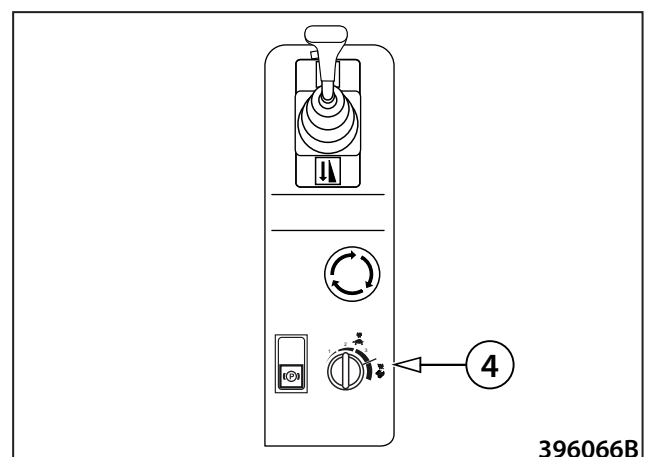
396303A



277012C



396065B



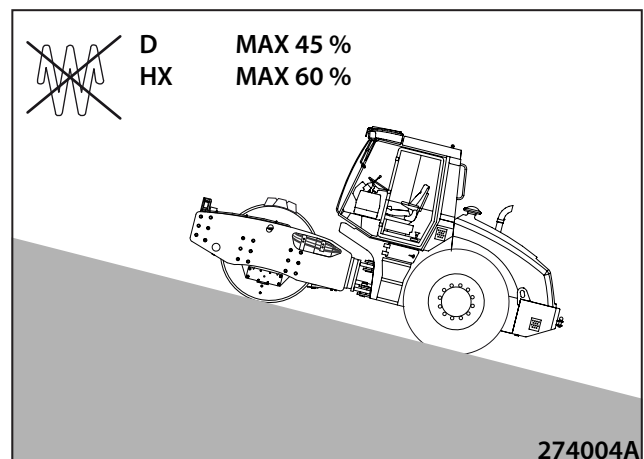
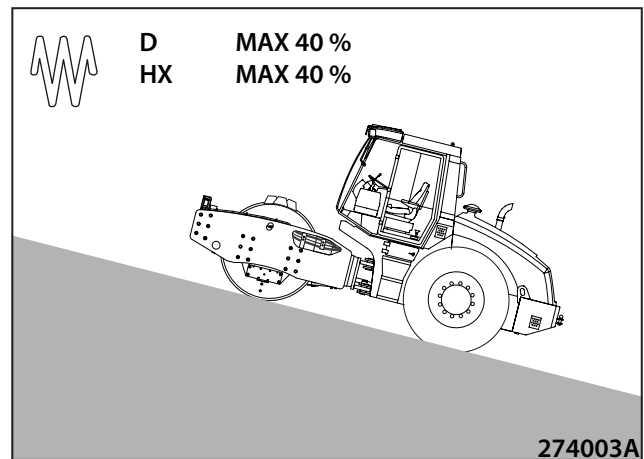
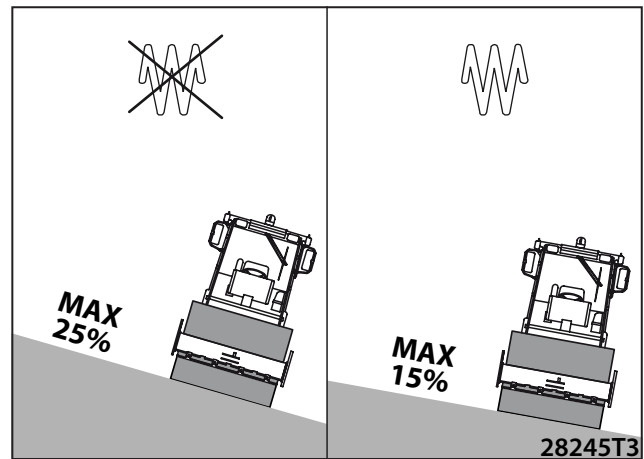
396066B

2.7. Machine control and use



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

The values given are lower depending on adhesive conditions and the machine instantaneous weight!



Do NOT load engine at full capacity until it reaches 60 °C (140 °F) temperature.

Do not turn off the transport speed at a high speed – it will cause sudden slowing down and an impact in the hydraulic system. Switch off the transport speed at a low speed or when the machine is at a standstill!

! CAUTION !

If Driver stands up from the seat while driving the speed will slow down until Roller is fully stopped and braked, this will last 4 seconds. Following next 4 sec. the engine shuts down.

To start the engine again the Driver must sit down again, shift the travel actuator to neutral, turn ON brake switch, turn ignition key to "0" position and then start the engine. Driver must brake off before starting to move.

If Driver sits down again before 4 sec. have elapsed, then the Roller will continue driving at a speed selected.

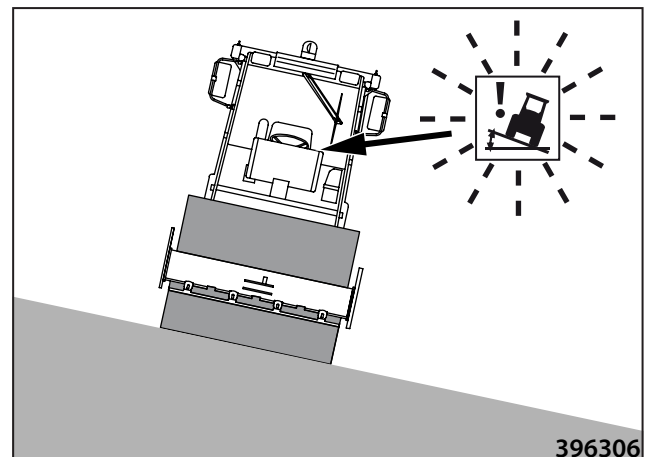
If Driver sits down after 4 sec. have elapsed, then the engine will shut down, the Driver may start moving it again. Before that the Drives must shift the controller to neutral, and select again the original driving direction.



If there is a loss of traction, a decrease of tractive force or a significant decrease of the engine speed, engage the lower gear using the transport and working speed change-over switch (4)! If the machine is equipped with an ATC differential lock function, enable this function using the switch!

! CAUTION !

Indicator lamp will light up and acoustic signal will be heard with Rollers equipped with ROPS 2D and driving across a slope with gradient over 12°. Vibration will cut off if Roller bank increases to 15°.



2.7. Machine control and use

2.7.3. Emergency stop of the Machine

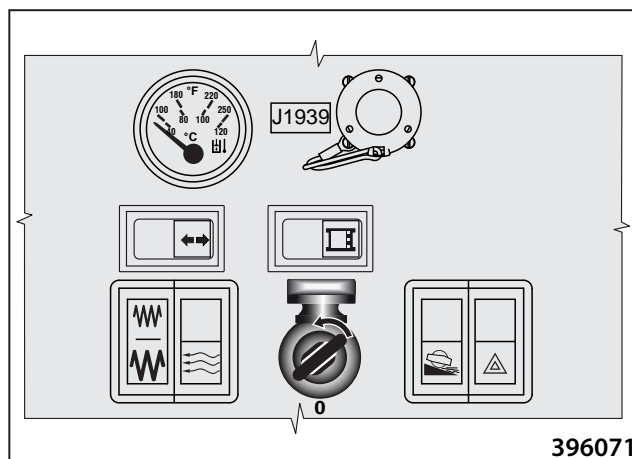
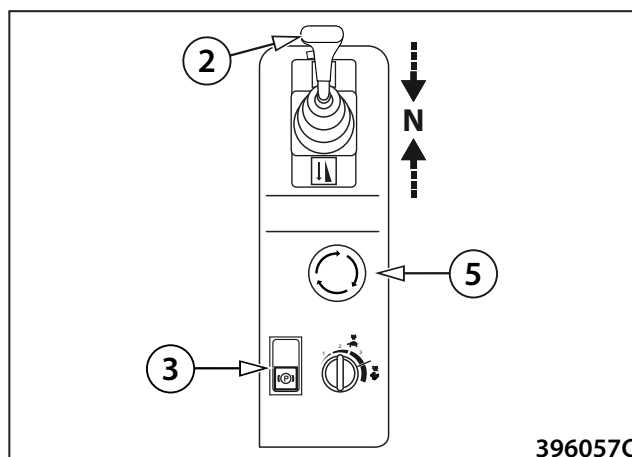
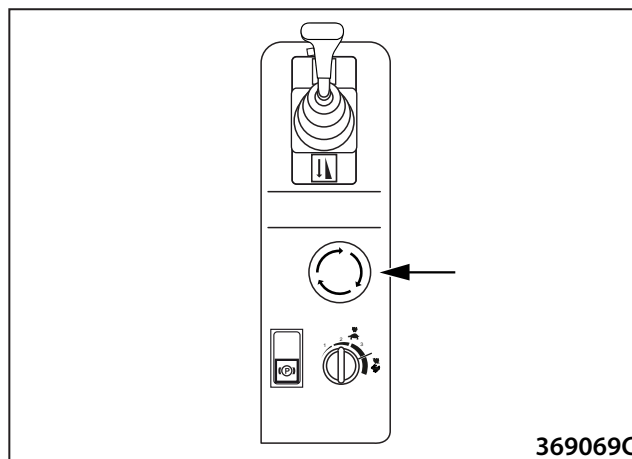


Apply in the event when engine is unable to stop via ignition key or when Machine is unable to stop via switching the travel controller to neutral.

- Press TOTAL STOP (emergency brake) - the engine stops and the Machine stops moving.

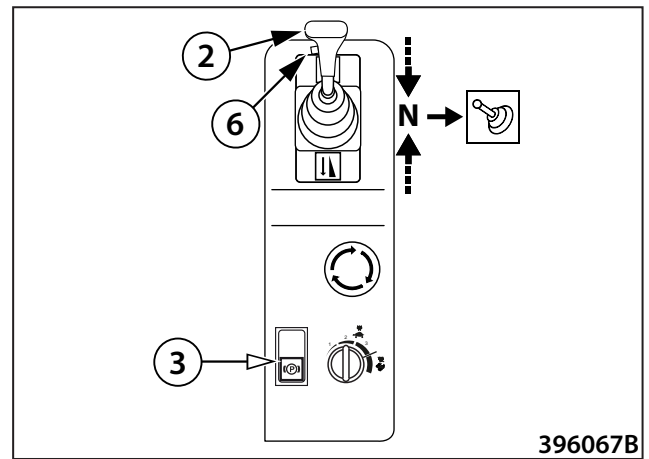
- Before new engine start, please shift controller (2) to "N" position and turn pressbutton (5) according to arrow direction. Brake via parking brake switch (3).

- Switch key (1) to "0" position and then start.

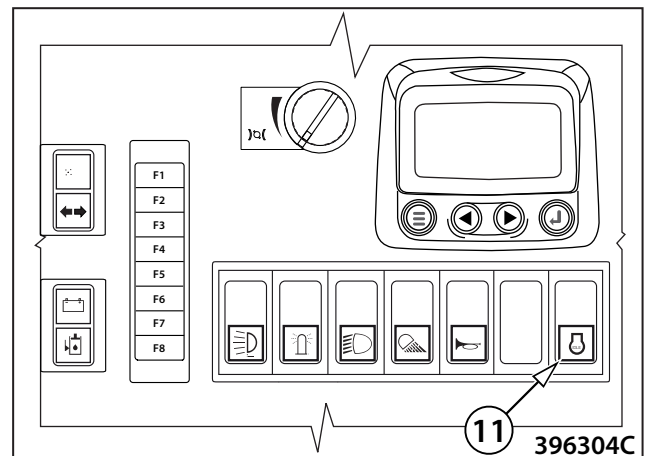


2.7.4. How to stop the Machine and its engine

- Turn OFF the vibration via switch (6), if turned ON. Stop the Machine via actuator (2), and brake with parking brake (3).



- Turn ON the IDLE (11) switch. Turn OFF the engine via key (1) to "0" position, and pull it out - close the ignition box lid.



! CAUTION !

If you wish to stand up from the seat, leave the engine and let the engine run, please switch ON the parking brake.



Do NOT stop hot engine instantly but let it idle for 3 minutes for turbocharger to cool down.

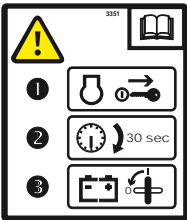
2.7. Machine control and use

2.7.5. Machine parking

- Stop the Machine, switch OFF battery disconnecter
- Clean the Machine to get rid of any coarse dirt.
- Carry out overall inspection of the Machine and repair any defects that occurred during operation.
- Check sufficient pressure in tyres.
- Use scotch blocks to secure the wheels and drum.
- Lock the covers of instruments or cab and door underneath the Driver's control stand.



Shut down the Machine on flat and paved surface. Confirm there is no potential of natural hazard (landslide, potential flooding due to any deluges, etc.) at the location.



3351

Switch off the battery disconnecter no sooner than 30 seconds after removing the key from the ignition switch.

Keeping of the time limit is necessary for saving the data of the ECM motor.

2.7.6. Cab and bonnet raising and lowering

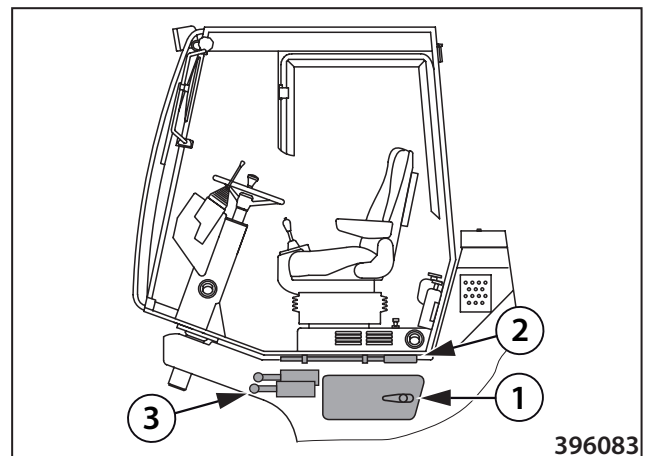


Lifting, lowering and keeping the cabin or platform in the raised position must only be performed with an empty cabin or platform.

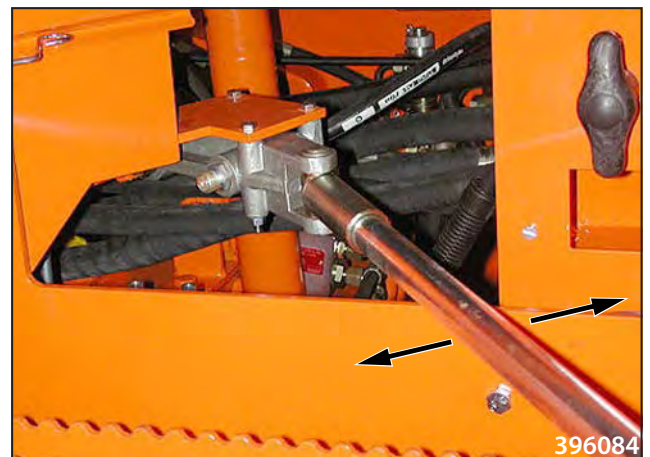


Before lifting Driver's control stand with the Machines that have a canopy with ROPS, please fold down the backrest and arms.

- Open door (1), remove pump lever (2). Levers for lifting - dropping (3).



- Do pumping on hand hydrogenerator to lift - drop the cab or bonnet.



- Before lifting, please unlock the cab.

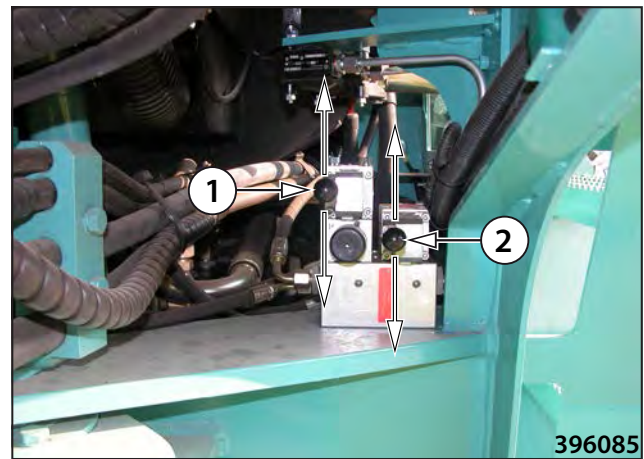


2.7. Machine control and use

Cab - (1)

Bonnet - (2)

- Lever up - lifting
- Lever down - dropping

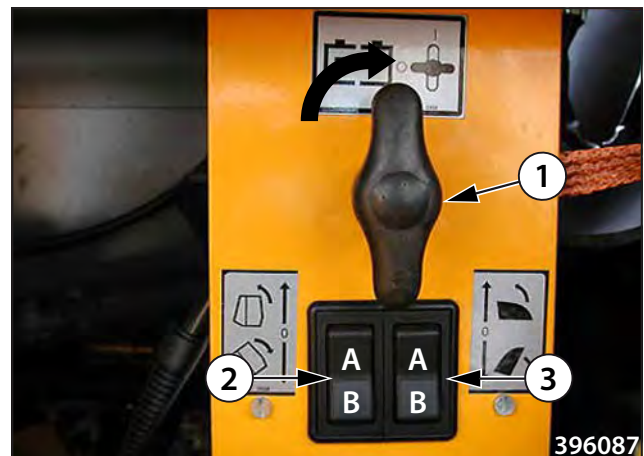


Electric-hydraulic control (optional)

- Connect wiring by turning battery disconnecter (1). Press pushbutton (2) to position "A" to lift the cab, or pushbutton (3) to lift the bonnet. To drop you must press pushbuttons to position "B".

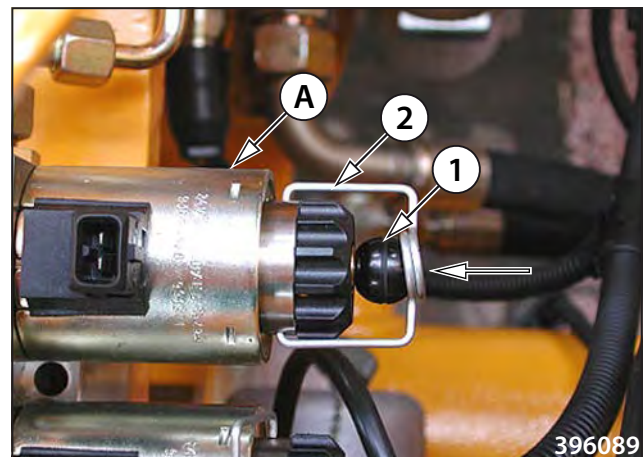
Note

When unit (aggregate) is broken, or battery discharged, please lift - drop the cab or bonnet by pumping on hand hydrogenerator with the distributors adjusted as seen hereinafter. The distributors are located underneath the cab, inside the frame, on LH side.

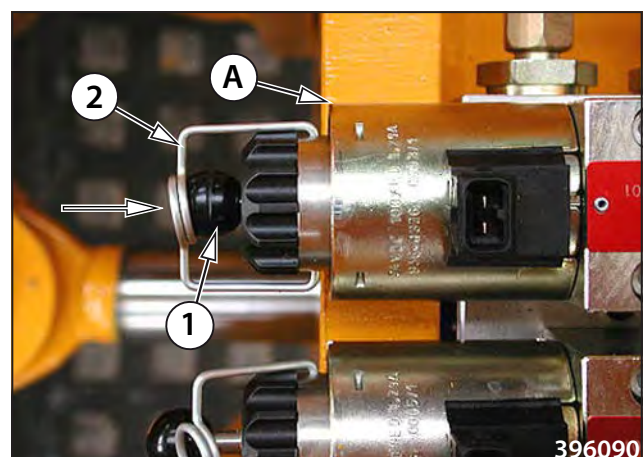


Cab

- To lift manually you must plug in the slide (1) on distributor (A), secure with safety pin (2). Before dropping, please unlock the safety pin.

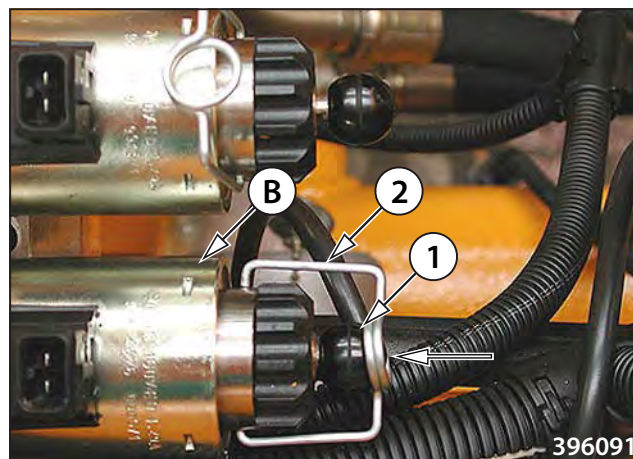


- To drop you must plug in the slide (1) on the second side of distributor (A), secure with safety pin (2).



Bonnet

- To lift manually, please plug in slide (1) on distributor (B) and secure with safety pin (2). Before dropping, please unlock the safety pin.



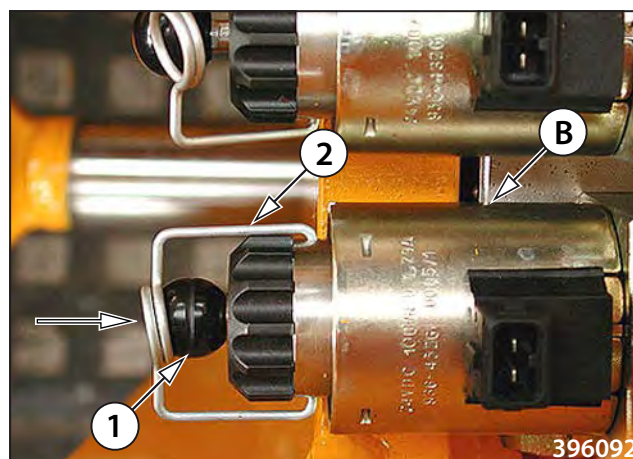
- To drop you must plug in the slide (1) on the second side of distributor (B) and secure with safety pin (2).

Note

Remember to unlock the safety pin before dropping.



Once dropped, please bolt the Driver's control stand (cab)!



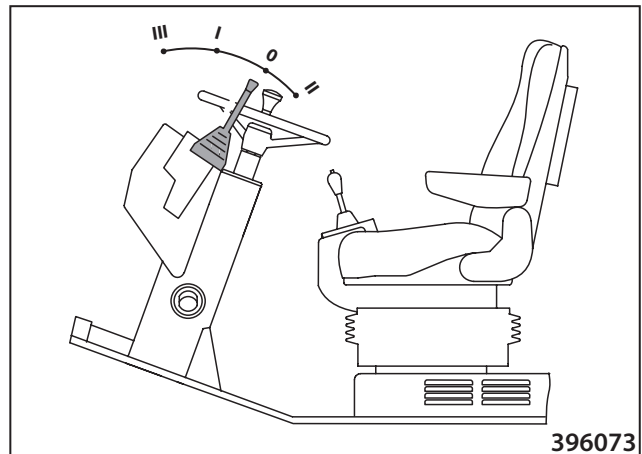
2.7. Machine control and use

2.7.7. Blade

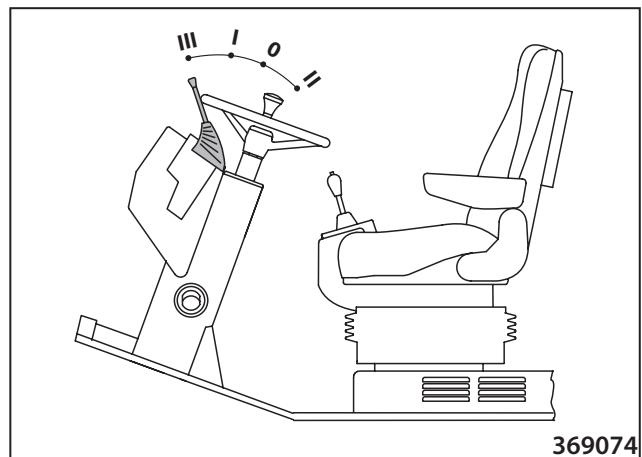
- Unlock the blade on both sides. Unlocked blade



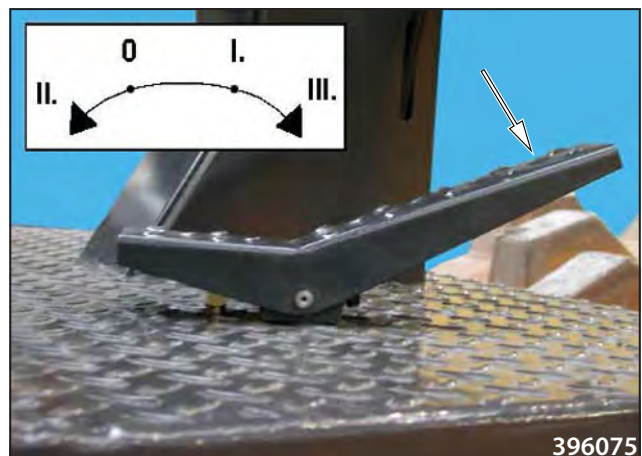
- Control function is given by four positions:
0 position basic position
Position I blade going down
Position II blade ascending
Position III blade is in floating positions



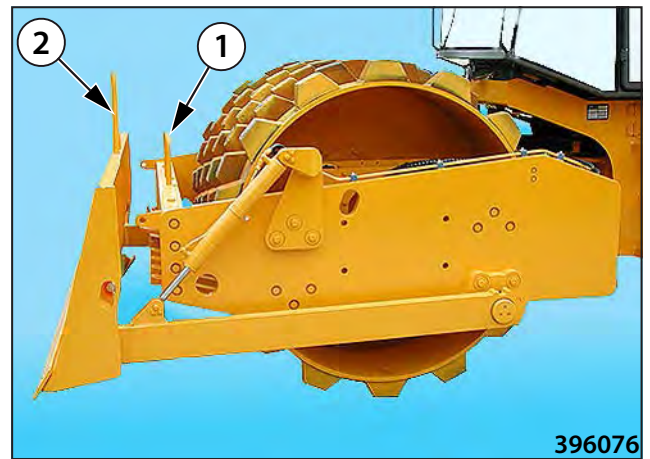
- Drop the blade to the ground via shifting the actuator to "III" position (floating position)



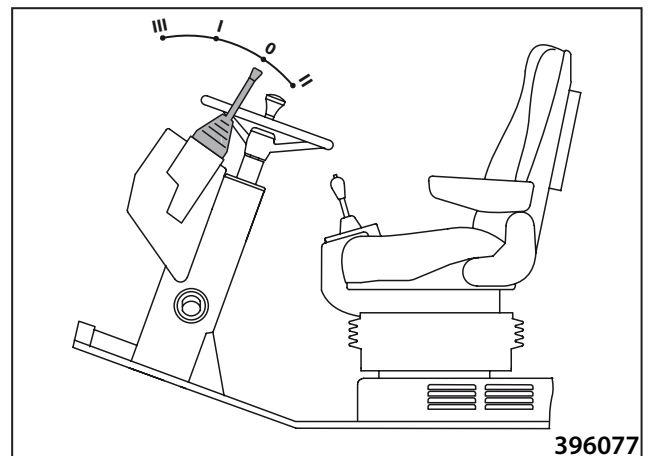
or via the pedal.



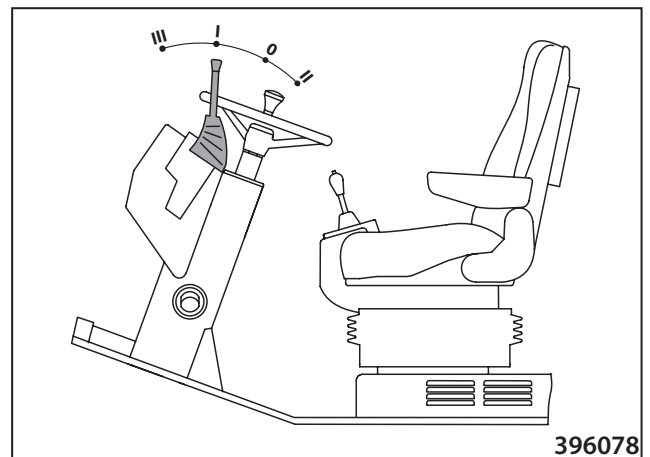
- Find out mutual position of fixed indicator (1) against mobile indicator (2). This is the basic position of the blade.



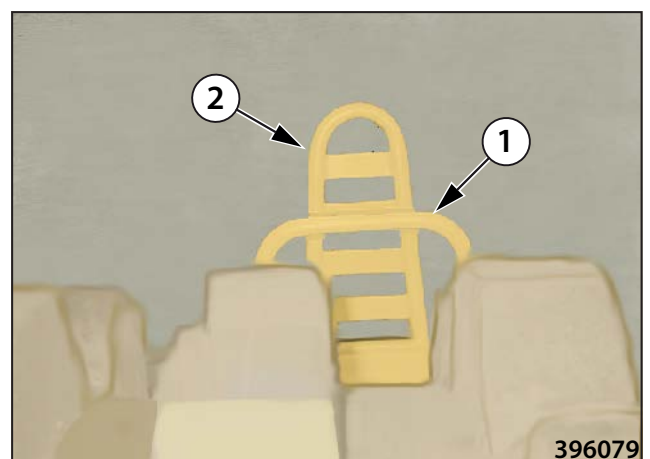
- Return controller (pedal) to "0" position and start moving the Machine.



- You may sink the blade through shifting the controller (pedal) to "I".

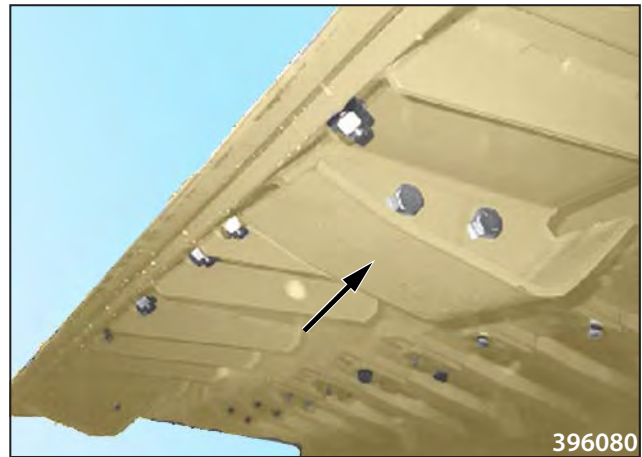


- Read the size of sinking from mutual position of fixed and mobile indicators (1), (2). Shifting by one gap (from one diagonal to the second one) the blade will shift by 50 mm.



2.7. Machine control and use

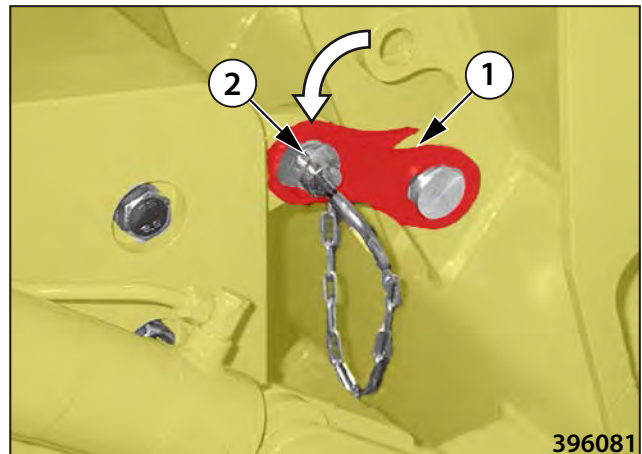
- Floating blade can be used when bulldozing a material on a paved area. Floating position may also be applied when spreading and levelling again the material being spread. The blade will skim on removable skids.



- When work with blade is completed, please secure it in its upper position with the help securing tie rods (1) and pivots (2) on both sides.

Note

The blade edges are able to dismount, and when worn out you may turn them round by 180°.



Do NOT perform any adjusting of scrapers or any work on the blade unless blade is descended on the ground and engine stopped, or unless blade is secured with both locking tie rods.



Do not operate the blade if it is locked. If attached to one securing tie rod, there is hazard of blade damaged.

2.7.8. Ballasting of tyres with liquid

It is used for lowering the machine gravity centre. The mixing ratios for individual temperature per one tyre are given in the table.

Ballasting of tyres with liquid of up to 0 °C

The inner space of the tyre is filled with the solution of water and 34% calcium chloride CaCl_2 .

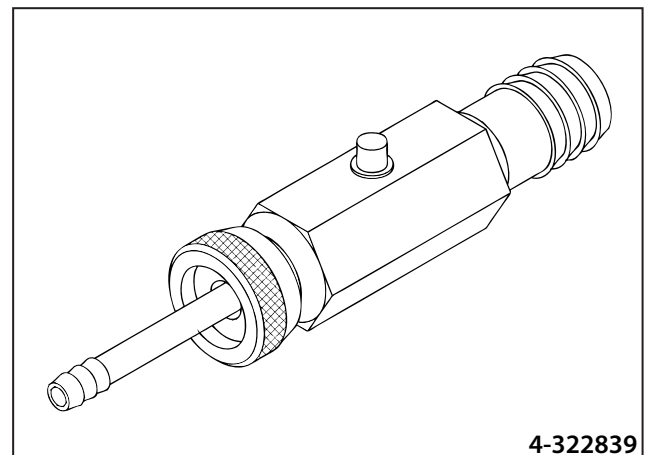
Water	Calcium chloride CaCl_2	Added weight
(l) [gal US]	(kg) [lb]	(kg) [lb]
130 [34.3]	53,5 [118]	183,5 [404.5]

Ballasting of tyres with liquid of up to -25 °C

The inner space of the tyre is filled with the solution of water and 34% calcium chloride CaCl_2 .

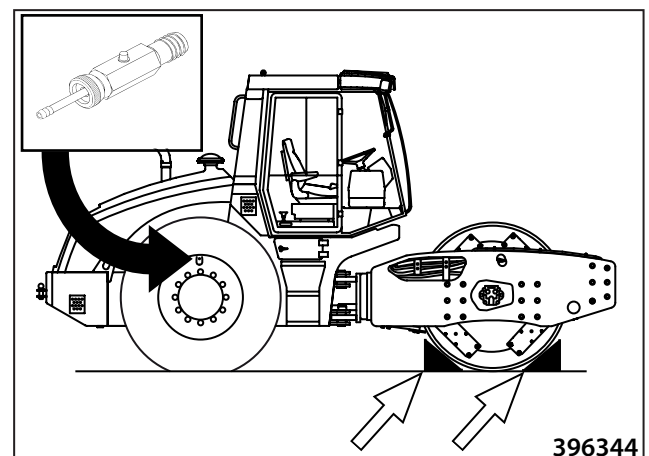
Water	Calcium chloride CaCl_2	Added weight
(l) [gal US]	(kg) [lb]	(kg) [lb]
65 [17,2]	145 [320]	210 [463]

A filler neck can be ordered as a replacement part under number 4-5325190009.



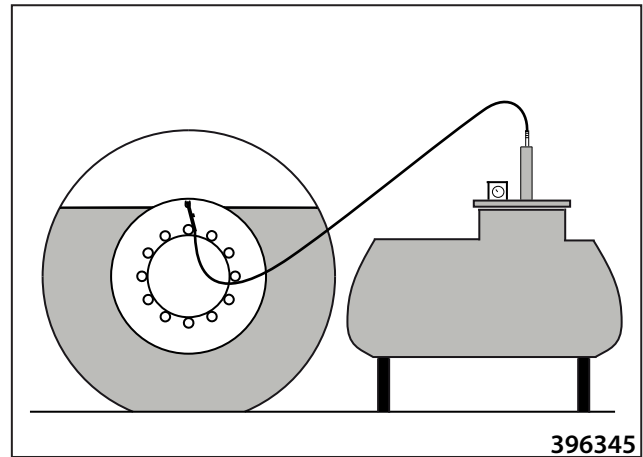
Filling procedure:

- Move the machine to a firm base. The filling valves should be in the extreme upper position. Secure the drum with blocks on both sides.
- Unscrew the removable valve insert and screw on the filler neck.



2.7. Machine control and use

- Mount the hose from the filling equipment (a tank located above, pump, etc.) on the filler neck and fill the tyres with the solution.
- During the filling, air escapes from the tyre through the side opening from the filler neck. The tyre is sufficiently filled (at 75%) when the solution starts flowing out through the opening.
- Unscrew the filler neck, screw the valve insert back on, and inflate the tyre to a pressure of 150 kPa (21,8 PSI).



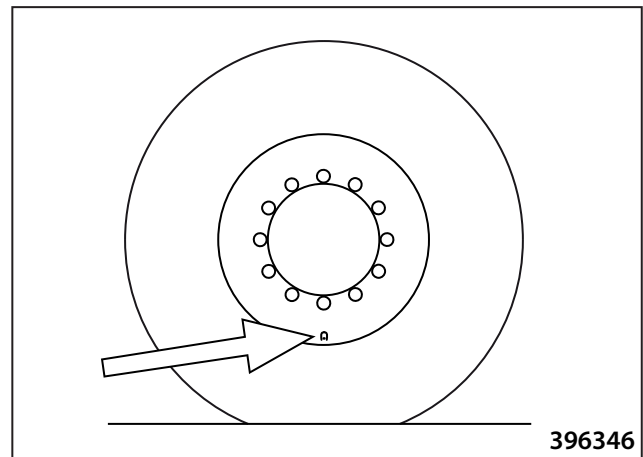
Draining procedure:

- Move the machine to a firm base. The filling valves should be in the extreme lower position. Secure the drum with blocks on both sides.
- Unscrew the removable valve insert and let the solution flow out.



The solution can spurt out after unscrewing the valve insert.

- As soon as the solution does not flow out due to a decrease in pressure, screw on the filler neck and inflate the tyre to a pressure of 150 kPa (21,8 PSI).
- After the tyre has been inflated, remove the filler neck and screw the valve insert back on.



Protect your eyes with glasses (face shield) and your hands with rubber gloves!
Add calcium chloride CaCl_2 to water, never vice versa!



Wash away spilled solution with clean water.
Solution may never come into contact with metal parts and wiring.

- The machine can move on its own between working sites.



When moving on the working site, observe the safety measures applicable to the working site.

When driving for long distances, 1-hour cooling breaks after 3 hours of driving should be taken. Failing that, you are exposed to the risk of damage to the machine for which the manufacturer is not responsible.

- When on the road, the machine should be transported on a vehicle.



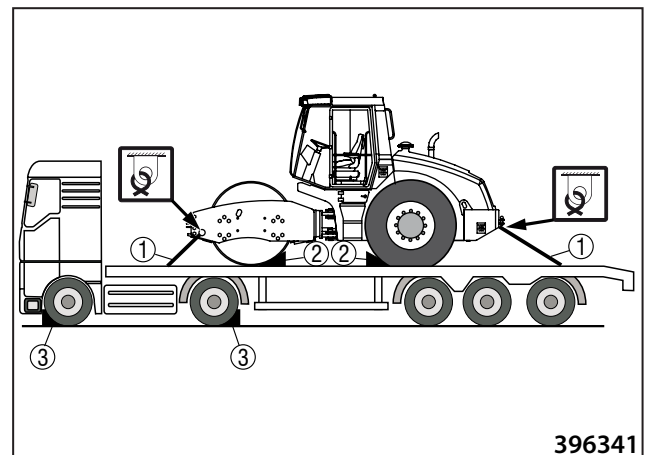
When transporting the machine on a vehicle, observe the regulations in force in the given territory.



Make sure the transport carrier is braked and mechanically secured against undesired motion with scotch blocks (3) when loading or unloading.

When moving onto the transport carrier you must switch ON the function of Drum Slip Limitation. At the same time we recommend to put rubber bands or wooden planks, etc. underneath the drum.

The machine on the vehicle must be properly tied and mechanically secured against longitudinal and lateral displacement as well as against tipping (1). The drums must be secured using scotch blocks (2). The maximum permitted force for fastening the machine to a vehicle using rear slings is 5 t.



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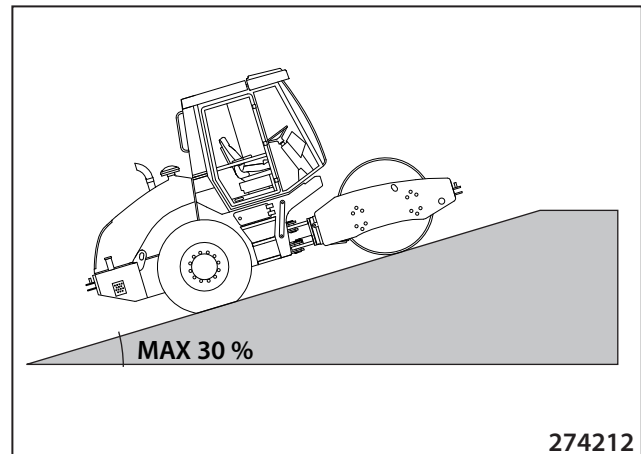
2.8. How to transport the Machine

2.8.1. Loading the machine

- Use a loading ramp or 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, antislip surface and must be stored on a flat surface. We recommend that you adhere to regulation BGR 233.
- Maximum permissible incline of the ramp is 30 %.



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

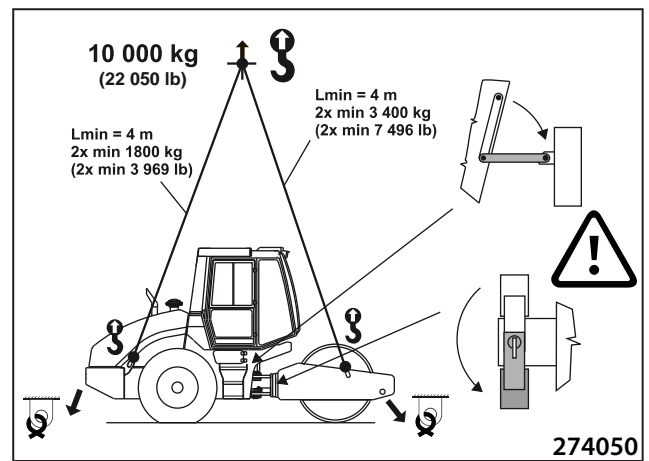
When loading the machine, a second person must be present to signal approach onto the ramp. See the list of hand signals in chapter 2.1.6.



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

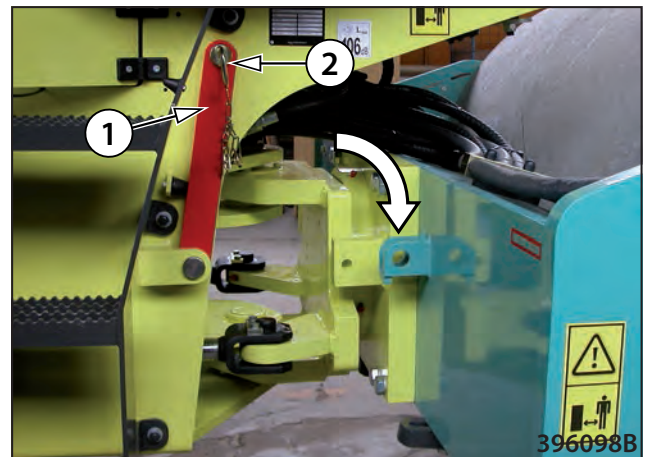
2.8.1.2. Loading the machine using a crane

- When loading with crane the Roller is fitted with lifting lugs.
- When lifting the Roller the Machine's joint shall be secured against turning.



How to secure the joint:

- Fold down the arm (1), lock with safety pin (2)..



Do NOT enter the area under the lifted load!



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

Upon loading completion, please return the safety arm to its initial position.

Use corresponding, undamaged riggings of sufficient loading capacity.

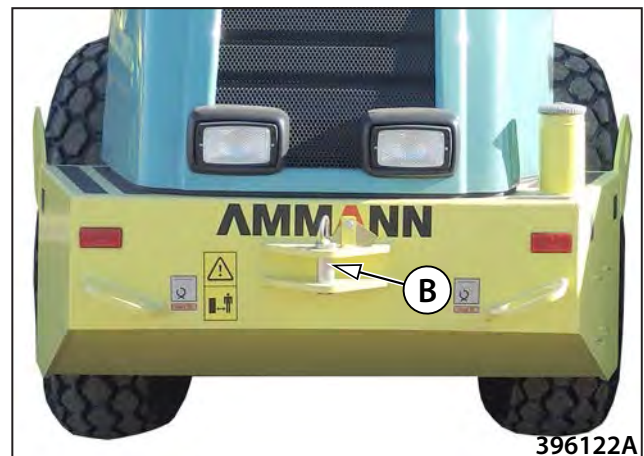
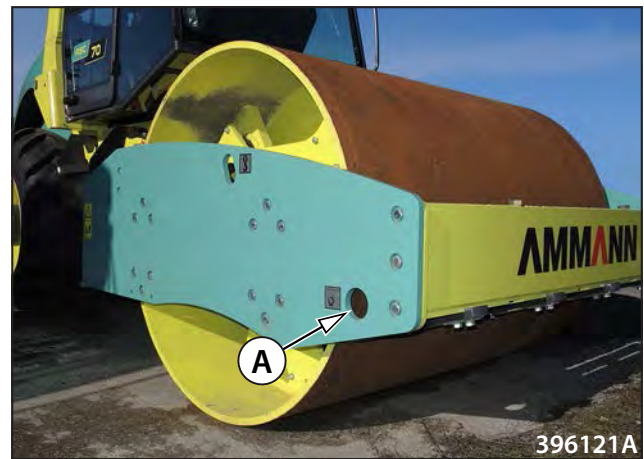
To sling, please use only the lifting lugs on the Machine designed for that purpose.

Only a trained slinger may carry out the slinging.

2.9. Special conditions of the Machine use

2.9.1. Machine towing

- For towing, the machine is provided with two lugs (A) on the drum frame and the rear row (B).
- A sunken machine can be towed for a short distance if the engine is running and the travel drive and steering are working.



When towed the Machine shall be attached with both lugs !

When towing, please use undamaged towing cable or pull rod of sufficient loading capacity 1,5 higher than the weight of hauled Machine. It is forbidden to use a chain for hauling.

It will be necessary to maintain minimal deflection from direct angle of hauling. Max deflection will be possible within angle of up to 30°.

Smooth and constant movement must be maintained when towing. Do not exceed the towing speed by more than 1 km/hour (0.62 mph).

The machine should only be towed for the shortest possible distance – to extricate the machine if it gets stuck or is blocking traffic in case of breakdown. Do not tow the machine for a longer distance than 300 m (0.19 mi).

The hauling machine shall fit with its size the Machine broken. It shall have sufficient hauling force (performance), weight and brake effect.

When hauling downhill with the help of cable it will be necessary to attach next hauling machine to the rear part of the Machine broken. In this way it will be possible to avoid uncontrolled motion of the Machine damaged.

- If the engine does not work, or there is a defect in the hydraulic system, you must short-circuit the hydraulic circuit and release the brake of the machine. Then the machine can be towed.



No person may stay on the towed machine!

After the hydraulic circuit of the machine is short-circuited and the machine brake is released, all of the brakes are disabled!

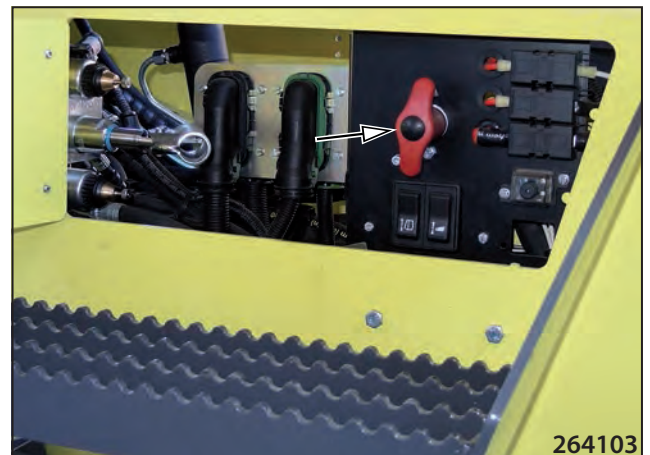
Before releasing the brake, secure the machine with wooden scotch blocks against motion!

The cab (platform) and bonnet must be moved down before the brakes are released.

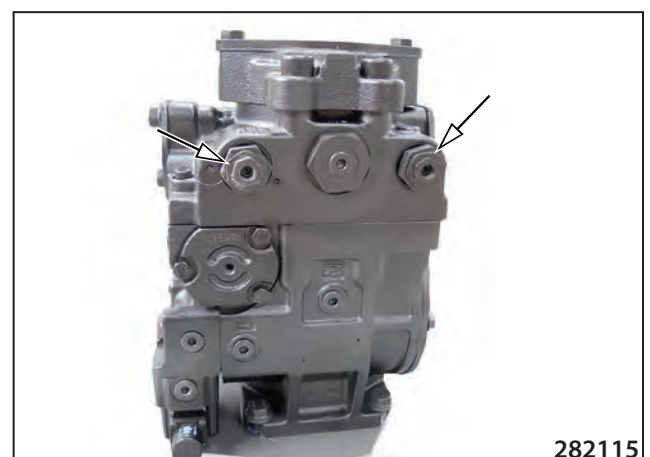
Do not touch hot parts of the machine, burn hazard!

Short-circuiting the travel pump:

- Disconnect the battery using the disconnecter.



- Cut short the hydraulic circuit of the travel through loosening the centre parts of both multifunctional valves by 3 turns in CCW direction.



2.9. Special conditions of the Machine use

How to brake off:



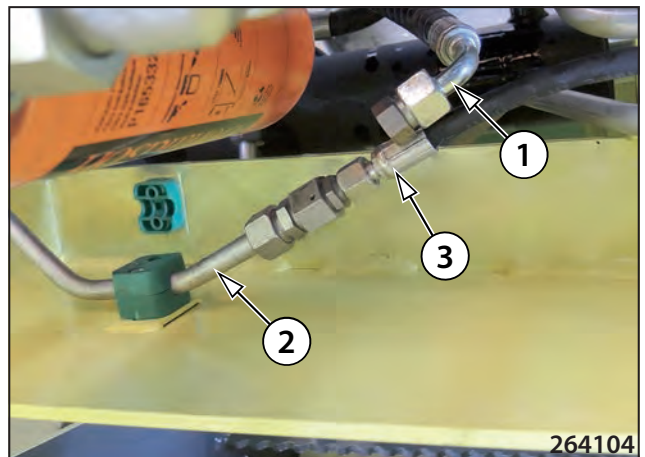
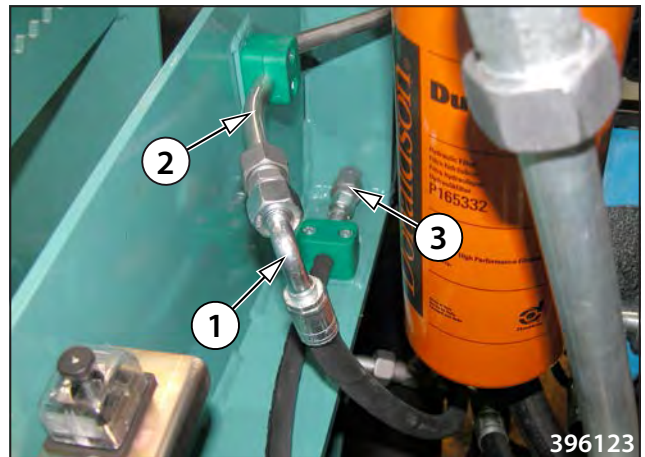
Before releasing the brake, secure the machine with wooden scotch blocks against motion!

- Put a vessel under the machine to collect the leaking fluids.

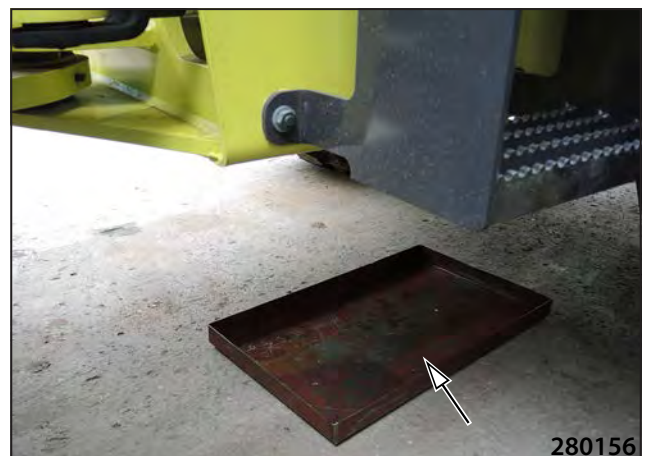


Avoid leakage of oil to the soil.

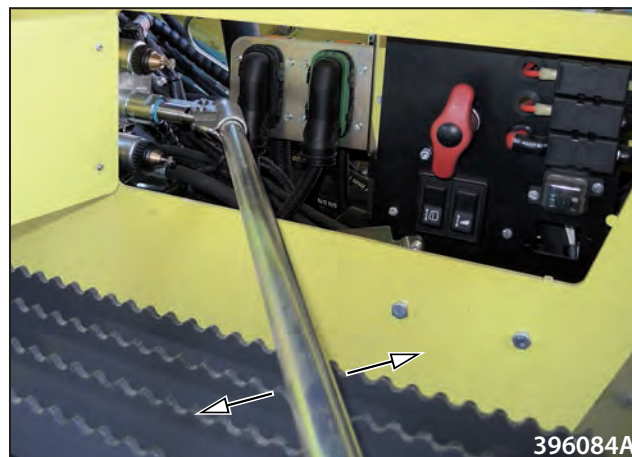
- Disconnect hose (1).
- Remove the plug from hose (3).
- Loosen hose (3) in the clamp and connect it with hose (2).
- Mount the plug to the hose (1).



- Take away the vessel collecting the leaking fluids from under the machine.



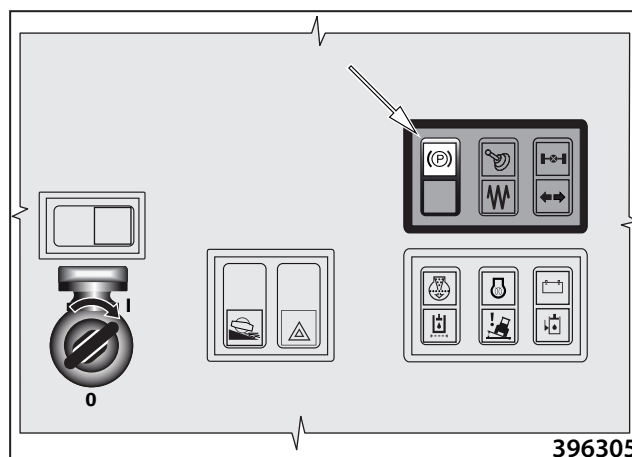
- Turn on the battery disconnecter.
- Switch over the key to the position "I".
- Pump using the lever in the manual hydrogenerator.
- Watch, until the brake indicator lamp goes out when the key is on. The cylinder brake is released and the machine can be towed.
- When the electrical installation is not operating, pump using the lever in the manual hydrogenerator with 30 full strokes at least (one stroke = lever movement to the left and to the right).



Due to leakages, the pressure in the brakes can drop during the towing.

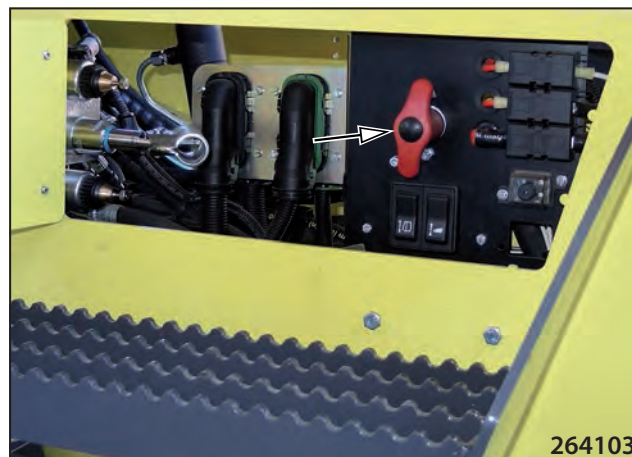
Check the drum or tyres of the towed machine for the occurrence of braking or skidding. In such a case interrupt the towing and pump again using the lever in the manual hydrogenerator.

When towing is completed, please secure the wheels and drum with scotch blocks (cotters), and put into initial state.

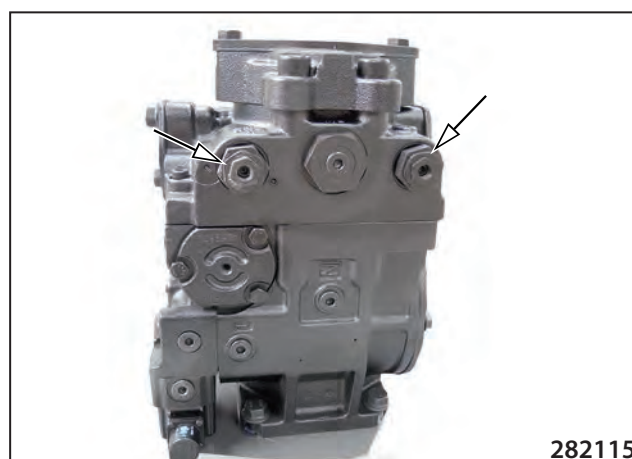


How to put into initial state

- Disconnect the battery using the disconnecter.



- Screw back the multi-purpose valves on the travel hydrogenerator.



2.9. Special conditions of the Machine use

- Put a vessel under the machine to collect the leaking fluids.



Avoid leakage of oil to the soil.

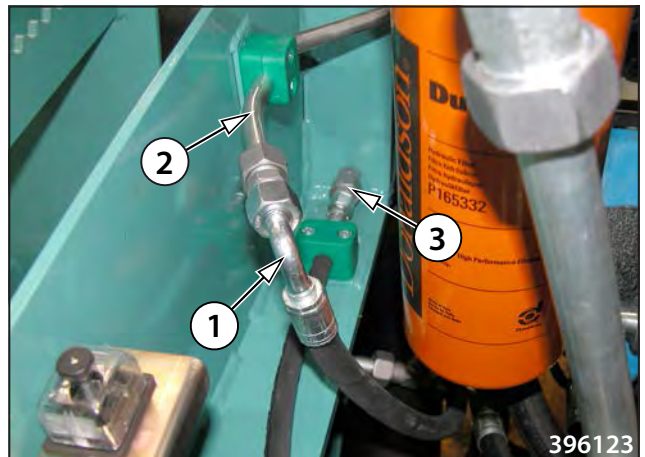
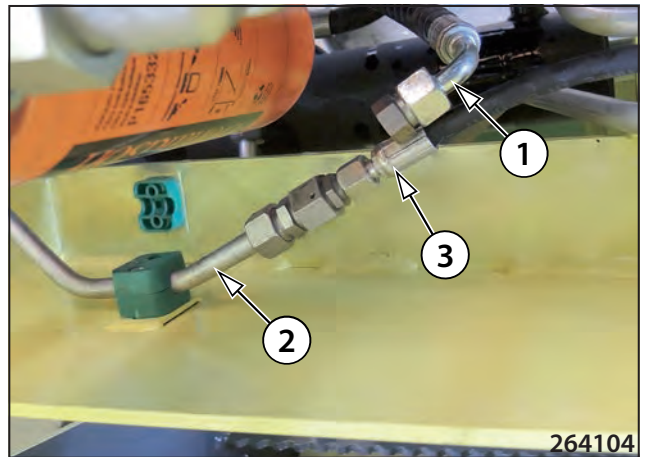


- Disconnect hose (3).

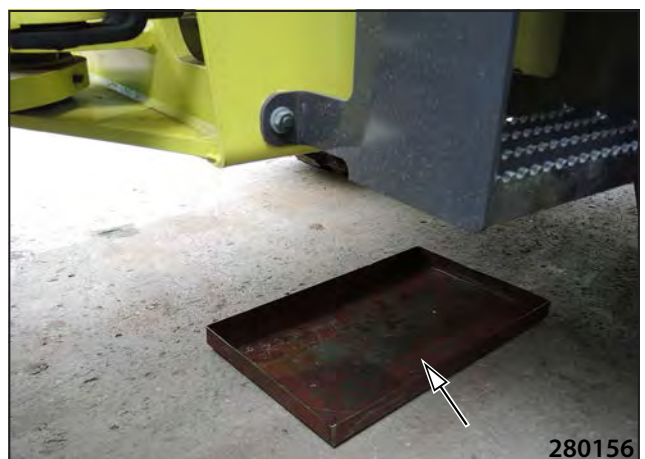
! CAUTION !

The hose can be under pressure. Collect the outgoing oil in the prepared vessel.

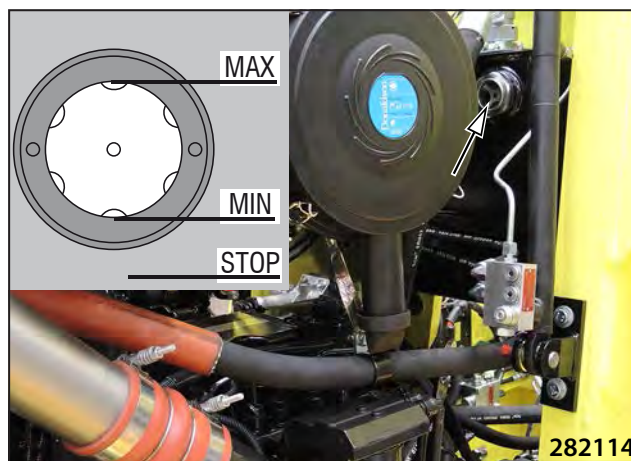
- Remove the plug from hose (1).
- Connect hose (1) to the hose (2).
- Mount the plug to the hose (3), mount the hose to the clamp.
- Put hand hydrogenerator lever into the holder underneath the Driver's control stand.



- Take away the vessel collecting the leaking fluids from under the machine.



- Check the hydraulic oil level in the tank. Refill the oil according to chapter 3.6.3. if required.



2.9. Special conditions of the Machine use

2.9.2. Machine operation during running-in

When putting a new machine into operation, the machine should not be run at full power for the first 50 hours (driving uphill with vibration).

2.9.3. Machine operation at low temperatures

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

It necessary to compact at the temperatures below 0 °C (32 °F) then it is possible to compact dry soil (and stony loose materials) or make swift compaction of non-frozen materials (before earth freezes through).

Preparation for work under low temperatures:

- Check concentration of engine cooling liquid.
- Exchange oil in the engine with the recommended one for given range of low ambient temperatures.
- Use hydraulic oil of corresponding cinematic viscosity.
- Oil in drum gearbox, replace with recommended one for given operating temperature range of the gearbox.
- Use winter fuel.
- Check the batteries are recharged.

Note

Warm the batteries to ca 20 °C (68 °F) (removing the batteries and storing them in a warn room) to lower the limit temperature for starting by 4 to 5 °C (39,2 to 41 °F).



Min temperature of engine cooling liquid is 60 °C (140 °F). Max temperature of 100 °C (212 °F).



You may use the Machine at its full capacity only after heating the media to their operating temperature (cooler possible to be partially covered).

! CAUTION !

When using HV 100 oil in the hydraulic system NEVER start the Machine at ambient temperatures below +2 °C (36 °F).

If required to start the Machine for the period of one month or longer at ambient temperatures below -8 °C (18 °F), replace oil in hydraulic system with the oil of HV 46 viscosity class.

At temperatures below -13 °C (9 °F) with oil of HV 32 class.

It is impossible to start the Machine below -23 °C (-9 °C) with no preheating of filling media.

2.9.4. Operating the Machine at high temperatures and humidity

The higher the air temperature and humidity the lower the engine performance is. Both factors reducing the performance are dependent on each other:

- Each 10 °C (18 °F) increase of temperature means capacity drop of up to 4 % (at constant humidity)
- Each 10 % increase of relative humidity means capacity drop of up to 2 % (at constant temperature).

Machine cooling will improve through hot air removal away from engine compartment when you remove the fender shields of the bonnet.

Note

For oil of HV 46 class the max admissible oil temperature will be 80 °C (176 °F), for HV 32 oil the max admissible oil temperature will be 70 °C (158 °F).

In the environment where hydraulic oil temperature stays constantly round 90 °C (194 °F) we recommend to exchange hydraulic oil for oil denser by one class, with HV 100 cinematic viscosity.



2.9. Special conditions of the Machine use

2.9.5. Operating the Machine at high altitudes

With higher altitudes the engine capacity will drop due to reduced atmospheric pressure and specific weight of air induced. If the engine has black smoke at high altitudes (over 1500 m), please contact engine Manufacturer's service centre who will make adjustment to your fuel injection pump for these operating conditions.



The engine power is affected by the environment in which the machine is working. The machine may be used up to a maximum altitude of 3,658 m (12,000 ft).

2.9.6. Work of the machine in the dusty environment

When operating in very dusty environment, you must cut short the intervals for cleaning and replacement. Cut the intervals of cleaning the engine cooler, hydraulics, and also of the replacement of cab's dust filter.

2.9.7. Driving with vibrations on compacted and hard materials

When operating the Machine with vibration on hard materials (e.g. stony loose material), or with high level of compacting the base material, there can be even loss of contact between the drum and the material compacted (so called vibro-hit). This state will show in the increased vibration transfer into the Machine frame and onto the Driver's control stand. Its partial elimination is possible via increasing the travel speed or changing the Machine vibration parameters (with the use of lower amplitude).

When it is necessary to operate the Machine under conditions where the Operator might be exposed to higher vibrations, then the Machine Operator will be liable to adjust the work procedures so as to prevent any injury to Driver's health.

Note

When driving the Machine with vibrations on a different base material than stated in "Specification Manual", the emission figures for vibration acceleration will be different - "Noise and vibration emissions".



The driving with vibration on hard (frozen, concrete, overcompacted) surface or on bedrock is forbidden. There is a danger of damage to the machine.

3. MAINTENANCE MANUAL

ASC 70 (Cummins Tier 3)

3.1. Safety and other measures for machine maintenance

3.1.1. Safety of machine maintenance

Carry out lubrication, maintenance and adjustments:

- By professionally trained personnel
- In line with safety instructions given in the Operation Manual
- According to schedule given in the Lubrication Chart following the hours actually worked
- On the machine located on flat solid surface, secured against self-motion (scotch blocks), and this always with the engine OFF, key removed from ignition box, and the wiring cut off
- Only after **Machine Repair** sign is attached onto steering wheel (the sign is supplied together with machine accessories)
- On machine parts cooled out
- After having cleaned the machine, lubrication points and maintenance locations
- Using proper, undamaged tools
- Through replacement with new original parts as per the Spare Parts Catalogue
- With sufficient lighting of the entire machine in the event of lowered visibility and at night
- so the guards and safety elements are reinstalled again upon work completion
- through retightening bolted connections - with torque specified, and through checking the connection tightness
- with the operation media heated - beware of burns - use recommended media, only

3.1.2. Fire precautions during operation media exchanges

- In terms of fire hazard the flammable liquids used on the Machine have been divided into three hazard classes:
 - IInd Hazard class - Diesel oil
 - IVth Hazard class - mineral oils, lube greases
- Oil exchange point shall be located so it does not interfere with the explosion or fire hazard area.
- It shall be identified with notice boards and signs of no smoking and no use of open flame.
- Handling area shall be sized so the capture the amount to flammable liquid equal to the capacity of biggest vessel, transport container.
- It must be equipped with portable fire extinguishers.
- To handle the oil, Diesel oil, please use such vessels like metal barrels, canisters or sheet-metal cans.
- Transport containers shall be properly closed when stored.
- Vessels shall have one opening, be stored with the opening on top, and secured against any flowing out or dripping of their content.
- Vessels shall be designated with indelible inscription indicating the content and flammability class.



Upon completion of the adjustment or maintenance, please examine the function of all safeguard equipment!

3.1. Safety and other measures for machine maintenance

3.1.3. Ecological and hygienic principles

When operating or maintaining the Machines the user shall be liable to follow the general principles of health and environment protection according to the laws, ordinances and regulations in individual territories of the Machine use.

Hygienic principles

- Crude oil products, cooling system media, battery media and coating compositions incl. thinners are materials harmful to health. Workers coming into contact with these products during machine operation or maintenance shall be liable to follow the general principles of their own health protection and conform to the safety and hygienic manuals of these products' manufacturers.
- We call your attention to the following in particular:
 - Eye protection and skin protection during work with the batteries
 - Skin protection during work with crude oil products, coating compositions or cooling liquids
 - Proper hand washing upon work completion and before any meal; use adequate reparation cream to treat your hands
 - Adherence to the instructions given in this Manual
- Always store the crude oil products, cooling system media and battery media, and coating compositions incl. organic thinners, and also the cleaners and preserving agents, in the genuine, original and properly labelled packages. Do not admit any storage of these materials in unlabelled bottles or in any other vessels with regard to the hazard of mistaken identification (faulty change).
- When skin, mucosa, eyes are accidentally stained, or vapours inhaled, immediately apply the first aid principles. In the event of accidental use of these products get prompt medical attention.
- When working with the Machine in cases where the Machine has platform fitted, cabin windows are left opened, always use ear protectors of adequate type and version.

Ecological principles



The media of Machine's individual systems, and some of its parts after having been discarded (dismantled, media exchanged) become waste with hazardous properties against the environment.

- This category of waste products includes the following in particular
 - Organic and synthetic lubricating materials, oils and fuels
 - Brake fluids
 - Cooling liquids
 - Battery media and the batteries themselves
 - Cooling system media
 - Cleaners & preserving agents
 - All dismantled filters and filter elements
 - All used and discarded hydraulic or fuel hoses, rubber-metal and Machine's other elements, made dirty due to the abovementioned products.



The given materials and parts, when scrapped, shall be handled compliant to the respective national regulations on environmental protection, and in line with the health protection regulations, as well.

3.2.1. Engine oil



2412

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

Performance classification under

API (AMERICAN PETROLEUM INSTITUTE)

CCMC (COMITE OF COMMON MARKET AUTOMOBILE CONSTRUCTORS)

ACEA (ASSOCIATION DES CONSTRUCTEURS EUROPEENS DE AUTOMOBILE)

Viscosity classification

To determine SAE (SOCIETY OF AUTOMOTIVE ENGINEERS) viscosity class the ambient temperature and type of operations at the place where the Machine will be used are decisive.

The use of admissible oil under API: CH-4/SJ; CI-4

CCMC DHD1

ACEA: E-5

API CI-4 oil is recommended as especially appropriate.

All the year round: SAE 15W-40, refer to Fig.

Note

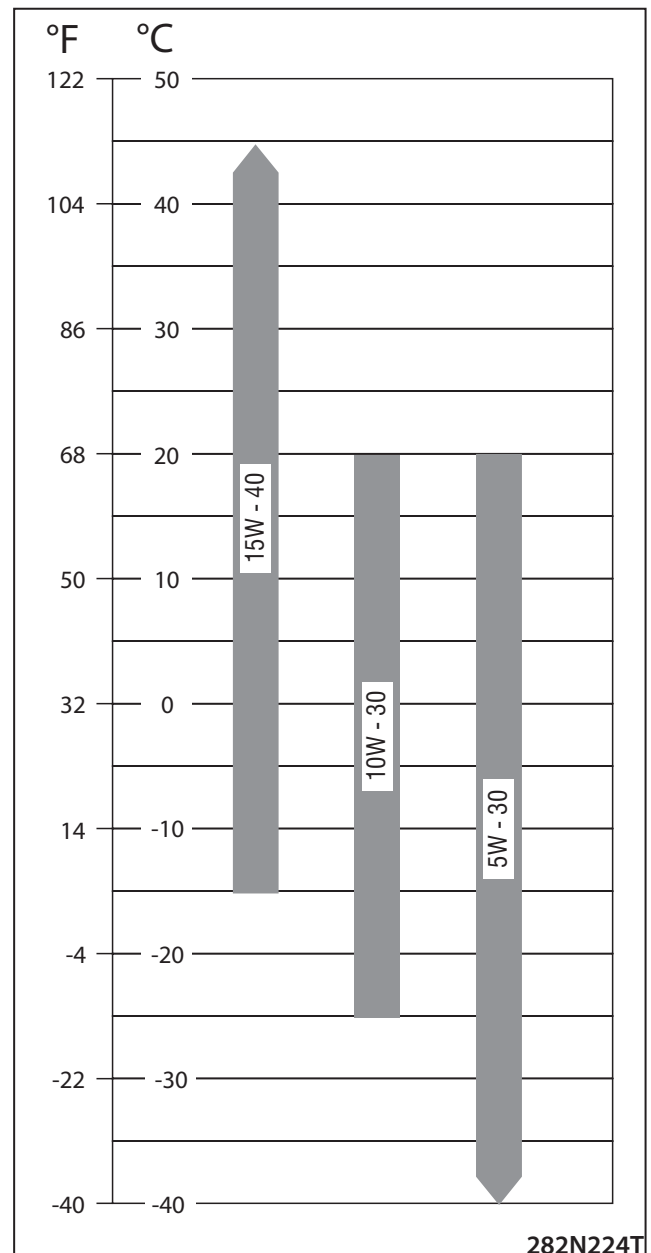
Exceeding low temperature limit leads to no engine damage; it may only cause some starting difficulties.

It is convenient to use universal multi-range oils so to avoid any necessity to exchange oil due to ambient temperature.

It is possible to use synthetic engine oils when oils' performance and viscosity classifications correspond to the recommended mineral oils.

Exchange periods shall be observed at the same intervals like when mineral oils are used.

To perform starting at the temperatures below 0 °C (32 °F) easier the engine manufacturer recommends SAE 10W-30 oil.



Exceeding upper temperature limit, with regard to oil's reduced capabilities, must not last for some long period.

When using oil under API CG-4/SH the exchange interval must be reduced to half, i.e. 125 hours.

3.2. Media specifications

3.2.2. Fuel



Diesel oil is used as the engine fuel:

- EN 590
- ASTM D6078-78: 1-D and 2-D*

The ASTM 2D is recommended to use as optimal one.

Fuel viscosity shall be over 1,3 cST at 40 °C (104 °F) to provide for fair characteristics of the liquidity and lubricating of the fuel system components.



Therefore use winter Diesel fuel at outdoor temperatures below 0 °C (32 °F). Special Diesel fuel with additives intended for very low temperatures must be used at outdoor temperatures below -15 °C (5 °F) ("super Diesel").

Use of biofuel (Diesel fuel)

Using the fuel mixture under the trade name of Bionafta is in principle approved by the engine manufacturer for the engine on the machine if it conforms to the specifications under EN 14214 or ASTM D6751.

Before using Bionafta on the machine, make sure that it is supplied by a reputable supplier who supplies fuels corresponding to the above-mentioned standards.

Always ask the supplier of Bionafta for information concerning the condition under which it can be used.



Guarantee for the engine will be rejected when using Bionafta not conforming to the above-mentioned standards and if the fuel system or engine is damaged as a result of using improper Bionafta!

! CAUTION !

When using Bionafta, power can be reduced by up to 12% depending on the used mixture of Bionafta. Therefore, do not adjust the engine or the setting of the injection pump for increasing the power in any case. Never mix the fuel mixture at the place of use.

Bionafta has a higher cloud point at a low ambient temperature, which leads to the creation of wax crystals in the fuel resulting in the fuel filter clogging.

When using Bionafta, it is necessary to shorten the intervals of the engine oil exchange and replacement of an oil filter and fuel filter.

When changing over to Bionafta, the action of Bionafta releases corrosion and impurities created on the fuel tank internal walls. Impurities are brought by the fuel to the filter catching them and the filter must be replaced afterwards.

Bionafta has a higher ability to absorb atmospheric moisture, which results in the condensation of atmospheric moisture on the internal walls of the tank and a higher content of water in the fuel and the need for more frequent discharging of water from the fuel filter separators. The possibility of the occurrence of the problem increases in cold weather.

If Bionafta (Biodiesel) is used all the year round, it is necessary to clean the fuel system under the engine operation with a clean diesel fuel for at least 30 minutes before parking the machine for longer than 3 months. Further, it is necessary to drain off the fuel tank, clean it, and either fill it with diesel fuel or minimise the occurrence of moisture and limit the microbiological growth inside the tank. Consult the measures with the fuel supplier.

3.2.3. Coolant



The coolant specification must meet requirements of:
CES 14603



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).

The maximum admissible concentration of the coolant is 60% (thermal protection up to -54 °C).

Change the coolant every 2,000 hours of operation, after 2 years at the latest.

Note:

The machines are filled with a cooling solution with the Bantleon Avia Antifreeze NG coolant, specification CES 14603, ASTM D 4985, ASTM D 6210 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; refer to CUMMINS Engine Operation and Maintenance Manual.

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. Media specifications

3.2.4. Hydraulic oil



2158

Only the quality hydraulic oil of performance class under ISO 6743/ HV (corresponds to DIN 51524 part 3 HVL; CETOP RP 91 H) shall be used for the Machine's hydraulic system.

Fill the Machines normally with hydraulic oil that has cinematic viscosity of 68 mm²/s at 40 °C (104 °F) ISO VG 68. This oil is most appropriate for its use within the widest range of ambient temperatures.

Note

Hydraulic system is able to be filled with synthetic oil which, if any leaks occur, will be degraded with no residues, via the microorganisms found in water and in soil.



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

3.2.5. Gearbox oil



sta04

To lubricate drum's gearbox and gearboxes for axle drive (wheels), please use quality oil corresponding to API GL-5 or EP or MIL-L-2105 C

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

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



Operating temperature of oil shall not exceed 85 °C ÷ 90 °C (185 °F ÷ 194 °F).

3.2.6. Lube grease



0787

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

- ISO 6743/9 CCEB 2
- DIN 51 502 KP2K-30

3.2.7. Glass washer fluid



2260

The medium used in the glass washer tank will water (up to 0 °C temperature) plus glass washer agent for motor vehicles.



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

3.2.8. Air-conditioning filling













2441

0.8 kg of coolant Halocarbon 134a

0.2 l of oil PAG 150

0.005 l of contrast medium

Part	Medium Type	Medium Amount l (gal US)	Brand
Engine	Engine Oil as per par. 3.2.1.	7,0 (1.85)	 2412
Fuel Tank	Diesel Oil as per par. 3.2.2.	275 (72.5)	 595425
Hydrostatic System	Hydraulic Oil as per par. 3.2.4.	73 (19.3)	 2158
Drum's Gearbox	Gearbox Oils as per par. 3.2.5.	1,8 (0,48) (D; PD) 1,5 (0,4) (HX; HXPD)	 sta04
Axle Gearboxes	Gearbox oil as per par. 3.2.5.	2x0,8 (2x0,21)	 sta04
Hinge Bearings - steering joint & steering cylinders	Plastic grease, refer to par. 3.2.6.	As required	 0787
Engine Cooling System	Year round anti-freeze as per par. 3.2.3.	24 (6.3)	 2152
Vibratory Drum	Engine oil the same like engine	6,7 (1.77)	 2412
Air-conditioning	Mixture according to chapter 3.2.8.	-	 2441
Washers	Water and anti-freeze agent - their ratio as per outdoor temperature	2,75 (0,72)	 2260
Tyres	Air or liquid, refer to Operation Manual, par. 2.7.8.		

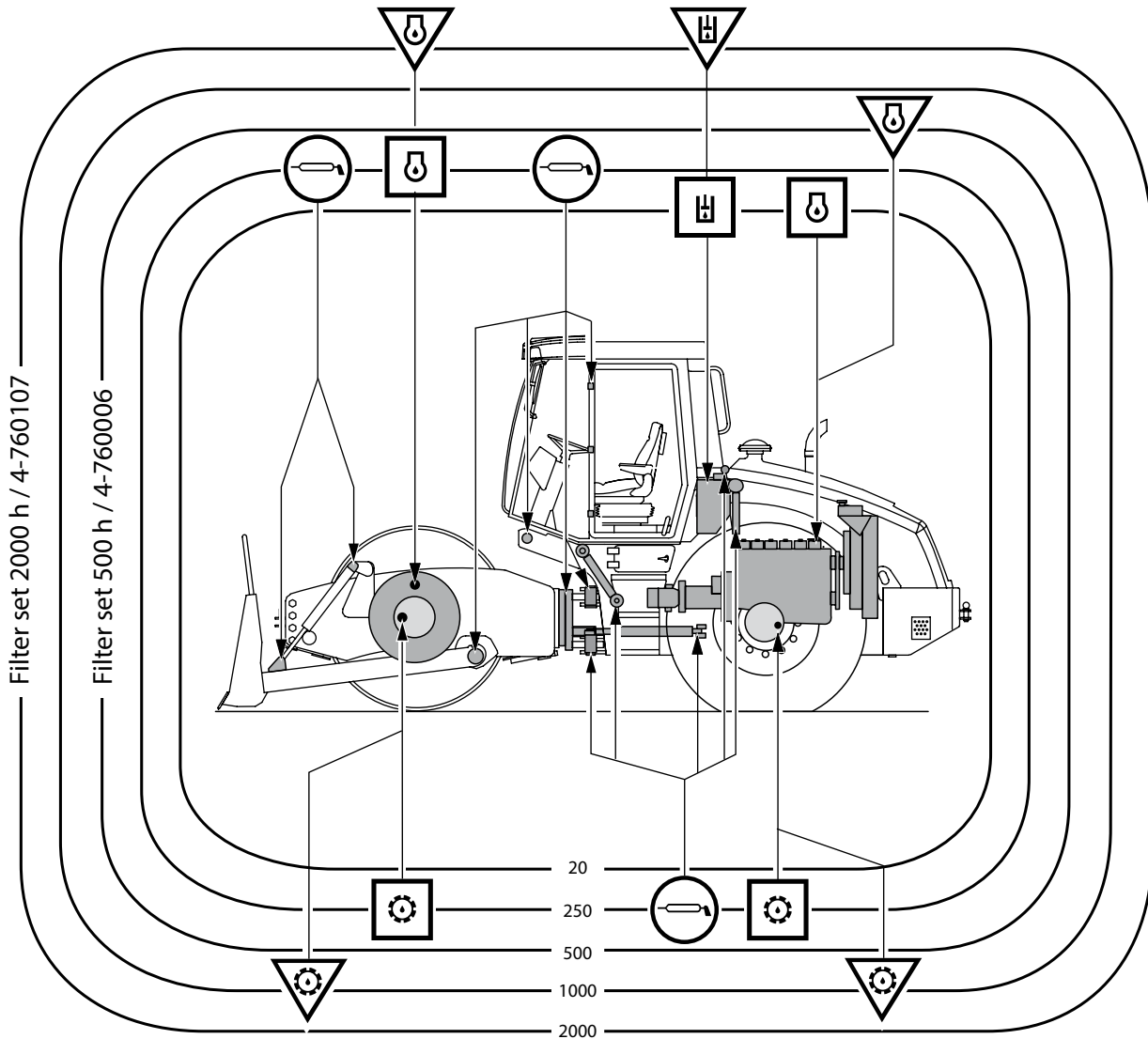
3.4. Lubrication and Maintenance Chart

Every 20 hours of operation (daily)	
3.6.1.	Engine oil level check
3.6.2.	Engine cooling liquid level check
3.6.3.	Hydraulic oil level check
3.6.4.	Crankcase breather tube
3.6.5.	Fan and engine belt condition check
3.6.6.	Air filter dust valve check
3.6.7.	Warning and control devices check
Every 100 hours of operation (weekly)	
3.6.8.	Tyre pressure check
After 100 hours of operation	
3.6.22.	Wheel bolts tightening check *
3.6.24.	Oil in the travel gearboxes change *
Every 250 hours of operation (3 months)	
3.6.9.	Engine oil change
3.6.10.	Engine inlet piping check
3.6.11.	Battery check
3.6.12.	Machine lubrication
3.6.13.	Oil in the vibrator check
3.6.14.	Oil in the travel gearboxes check
3.6.15.	Pad foot segments inspection
Every 500 hours of operation (6 months)	
3.6.16.	Fuel filter replacement
3.6.17.	Air filter elements replacement
3.6.18.	Filters of the cab ventilation and heating replacement
3.6.19.	Engine cooling liquid check
3.6.20.	Wiring check
3.6.21.	Air filter of the air conditioning system replacement
3.6.22.	Wheel bolts tightening check

After 500 hours of operation	
3.6.28.	Oil in the vibrator change **
Every 1000 hours of operation (1 year)	
3.6.23.	Engine belt check
3.6.24.	Oil in the travel gearboxes change
3.6.25.	Air conditioning compressor mounting check
3.6.26.	Damping system check
Every 2000 hours of operation (2 years)	
3.6.27.	Valve clearance adjustment
3.6.28.	Oil in the vibrator change
3.6.29.	Air conditioning system cleaning
3.6.30.	Hydraulic oil and filter change
3.6.31.	Suction strainer unit cleaning
3.6.32.	Engine cooling liquid change
Maintenance as required	
3.6.33.	Water separator cleaning
3.6.34.	Coolers cleaning
3.6.35.	Fuel system venting
3.6.36.	Machine cleaning
3.6.37.	Scrapers adjustment
3.6.38.	Screw connection tightening check
<p>* First after 100 hours ** First after 500 hours</p>	

LUBRICATION AND SERVICE PLAN

□	CONTROL
○	LUBRICATE
▽	EXCHANGE

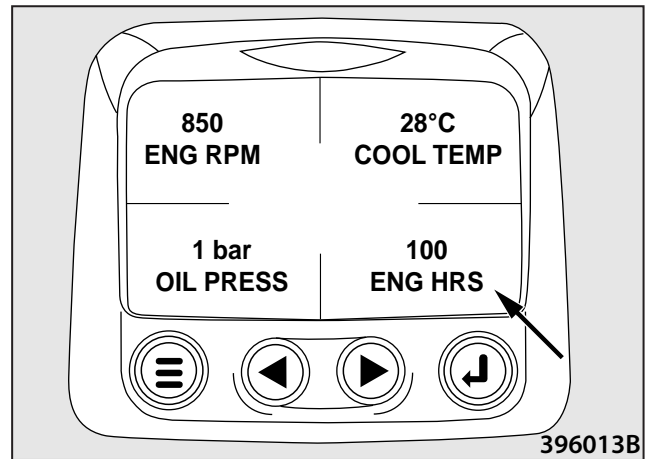


	Engine oil:	SAE 15W/40	API CH-4/SJ; CI-4/SK
	Hydraulic oil:	ISO VG 68	ISO 6743/HV
	Grease:	ISO 6743/9	CCEB 2
	Transmission oil:	SAE 80W/90 SAE 80W/140	API GL-5 API GL-5

396072en

3.6. Lubrication and Maintenance

Carry out lubrication and maintenance on regular basis and repeatedly in the intervals as per daily reading on the counter of hours actually worked.



This Manual states only the basic information about the engine, other data are given in the Engine Operation and Maintenance Manual which is part of the Documentation supplied with the Machine.



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

Tighten the removed or loosened bolts, plugs, threaded joints of the hydraulics, etc. with tightening torque according to the Chart in par. 3.6.38. unless another value is provided with the respective operation.



Carry out maintenance with the Machine placed on flat, paved surface, and secured against any self-motion, always with the engine off, and key removed from the ignition box and with the wiring cut off (unless otherwise required).

Following the first 100 hours of operation of the new Machine (following a major overhaul) carry out as per:

- 3.6.22. Wheel bolts tightening check
- 3.6.24. Oil in the travel gearboxes change

Following the first 500 hours of operation of the new Machine (following a major overhaul) carry out as per:

- 3.6.28. Oil in the vibrator change

3.6. Lubrication and Maintenance

Every 20 hours of operation (daily)

3.6.1. Engine oil level check

- Shut off the engine and wait ca 5 minutes until oil flows off into the engine sump.
- Pull out oil dipstick, wipe it, put it back, take it out and check the level.



- Keep the level within the division lines stamped on the dipstick. The bottom L (Low) division line indicates possible oil level, the upper division line H (High) indicates the highest level.



- Use filler neck to refill oil.

! CAUTION !

Amount of oil in between the marks on the dipstick makes 1,5 litres (1.6 U.S Quart).

Replenish oil of the identical type as per par. 3.2.1.



NEVER use engine unless there is correct oil level in the engine.



3.6.2. Engine cooling liquid level check

With the engine at standstill, cooled down below 50 °C (120 °F), check the cooling liquid level. Use filler neck (1) to refill.



The level must not drop below level indicator eyesight.

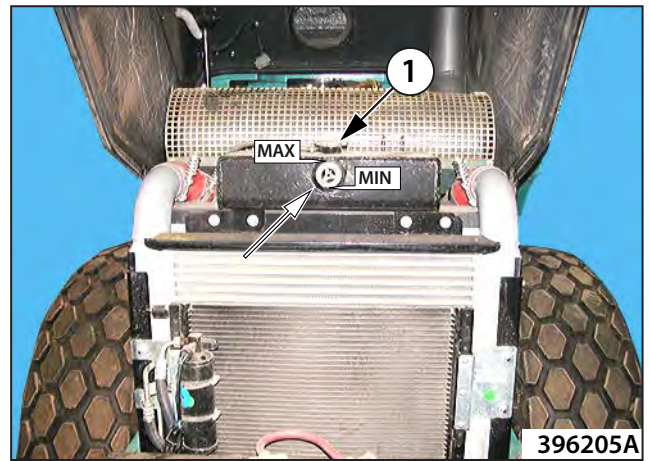
Top up cooling liquid consisting of water and antifreeze agents of the identical base.

Do NOT use additives to remove any cooling system leakages into the engine cooling liquid!

Do NOT refill cold cooling liquid while the engine is hot. Let the cooling liquid temperature drop below 50 °C (120 °F). Otherwise there is risk of engine casting damaged.



Open the pressure cap only after engine cooling liquid temperature drops below 50 °C (120 °F). When plug is removed at high temperature there is risk of vapour scald cooling liquid scald due to internal overpressure.

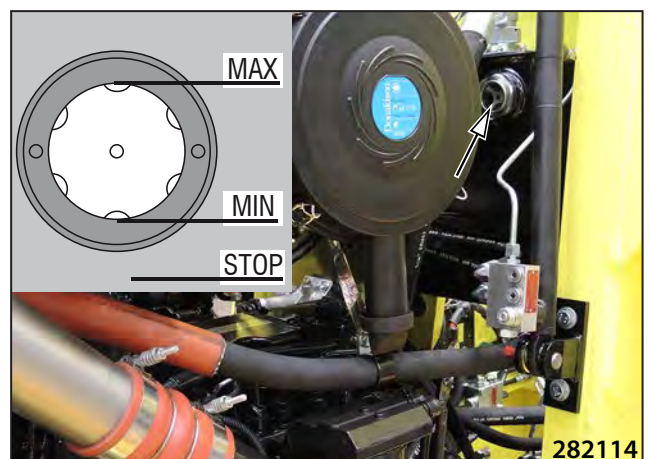


3.6.3. Hydraulic oil level check

- Check and maintain the level. Indicator lamp will signal oil loss below „STOP“ (engine stops).

Note

You can restart the engine only after oil is replenished. Refill the same type of oil via filling device, refer to par. called “Oil Exchange”.



3.6. Lubrication and Maintenance

3.6.4. Crankcase breather tube

- Check ventilation of the crankcase whether it is not contaminated with deposits, or, during winter season, frozen with ice.

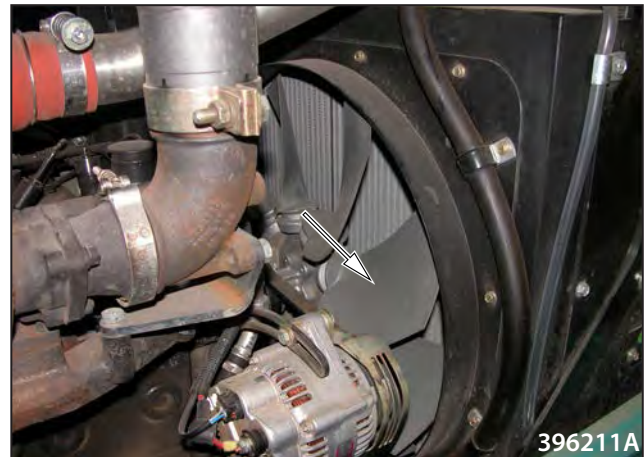
Note

When operating the Machine at the temperatures below 0 °C (32 °F), please check at shorter intervals.



3.6.5. Fan and engine belt condition check

- Check visually the fan. If you find for instance any missing parts of the material, cracks, shape changes, etc. - replace the fan.



- Check visually the belt. Small cracks are not a defect. If any smooth, bright flats (faces, small surfaces) occur on the belt, or belt's edges are frayed (shattered), or parts of the material are torn away, then it will be necessary to make the adjustment of its replacement.

Cog belt

Order number: 4-9501000306



3.6.6. Air filter dust valve check

Note

- Any dust caught in the dust filter will automatically get emptied during Machine operation. We recommend to clean the outlet slot (slit) from time to time. Please press to remove any dust caught.

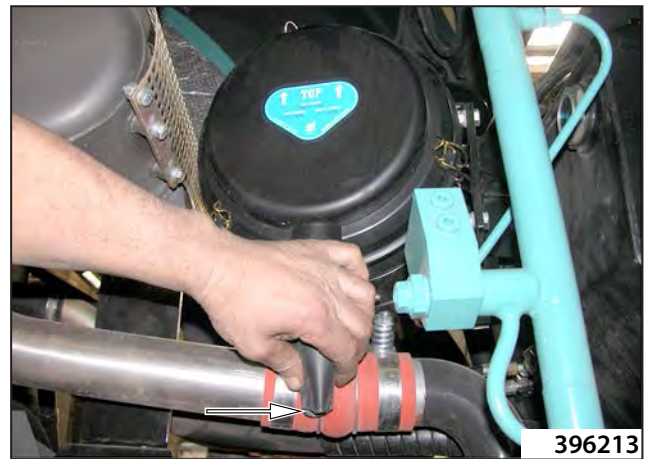


Replace the dust valve immediately if it is damaged!

Dust valve

Order number: 1-952454

- Should the Machine be equipped with air precleaner (optional), please check. Clean the bowl of precleaner (1) if the dirt deposited reaches up to the mark, following nut (2) removal and lid (3) detached (taken off).



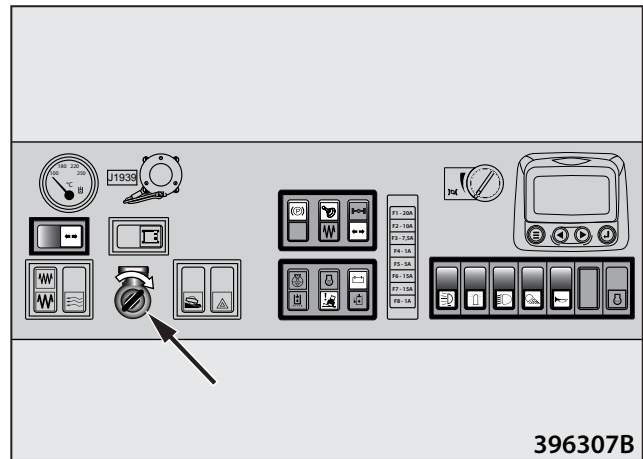
3.6. Lubrication and Maintenance

3.6.7. Warning and control devices check

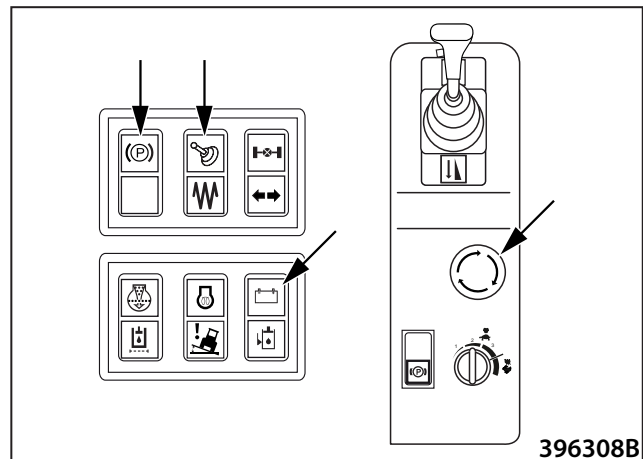
- Turn ON the switches, test if horn, lights and direction indicators lights work. Turn ON the ignition key to position I, check brake pilot lamps for brake, neutral, and for recharging. ROPS 2D indicator lamp will light up shortly along with warning alarm heard.



If ROPS 2D indicator lamp continues to flicker, carry out troubleshooting.



- Start the engine, press TOTAL STOP - engine stalling must occur, pilot lamps go ON.



Every 100 hours of operation (weekly)

3.6.8. Tyre pressure check

! NOTE!

Rotate tyres so that valves are at top positions.

- Check the pressure in cold tyres, by air pressure meter.
- Maintain the pressure in tyres at 150 kPa (21,8 PSI).



3.6. Lubrication and Maintenance

Every 250 hours of operation (3 months)

3.6.9. Engine oil change



Drain oil while it is hot right after operation is finished, or warm up the engine while in operation until cooling liquid temperature reaches 60 °C (140 °F).

Observe fire precautions!

In case of work in a very dusty environment, shorten the engine oil replacement intervals.



Pay max attention when draining hot oil, danger of scald. Let the oil cool down below 50 °C (122 °F).

- Remove drain plug and let oil pour out into the vessel of 8 l (10 qt) capacity - reinstall the plug.



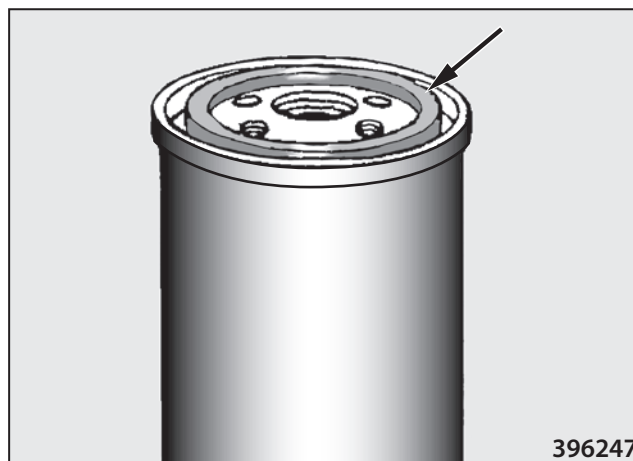
- Clean the oil filter and its vicinity. Remove the filter.



- Spread oil over the gasket of new filter.

Engine oil filter

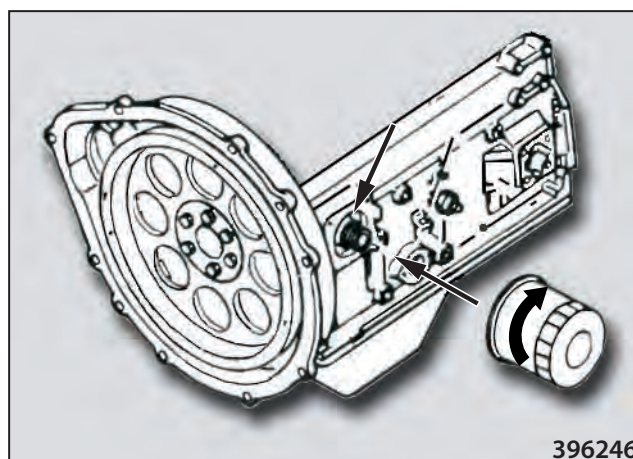
Order number: 4-9501000307



- Clean the contact surface for filter gasket. Install the filter and tighten properly with your hand.



Do NOT overtighten the filter, its thread and gasket may get damaged.



- Use filler neck to fill the engine.



- Fill oil to the upper division line of H dipstick. The oil filling is of 7 l (7.4 qt). The amount between division lines L and H is 1,5 l (1.6 qt).



3.6. Lubrication and Maintenance

- When oil is replaced start the engine for 2 - 3 minutes. Check regularly the tightness of drain plug and filter. Following engine stop you must wait 5 minutes until oil flows down to the engine sump. Then check oil level with dipstick.



! CAUTION !

Replace oil after 3 months at the latest, even though 250 hours have not been actually worked. Exchange oil at the interval that comes first.

Use recommended filters only, refer to the Spare Parts Catalogue. Use recommended oils, refer to par. (3.2.1.).

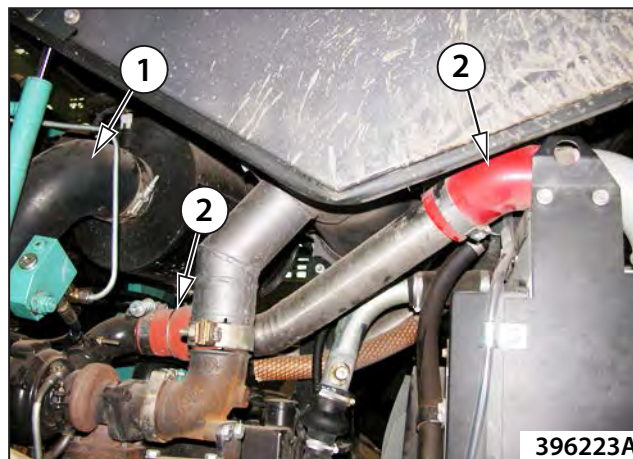


Retain the oil drained, and do not let it seep into ground.

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

3.6.10. Engine inlet piping check

- Check hoses (1), (2) and if clamps are tightened.



- Check hoses and if clamps are tightened.



- Check tightness of the connection between bonnet and air filter. Replace damaged gasket with new one.

! CAUTION !
Do not operate the Machine with damaged gasket between bonnet and air filter or if the connection is not tight.



- Remove engine induction cover.

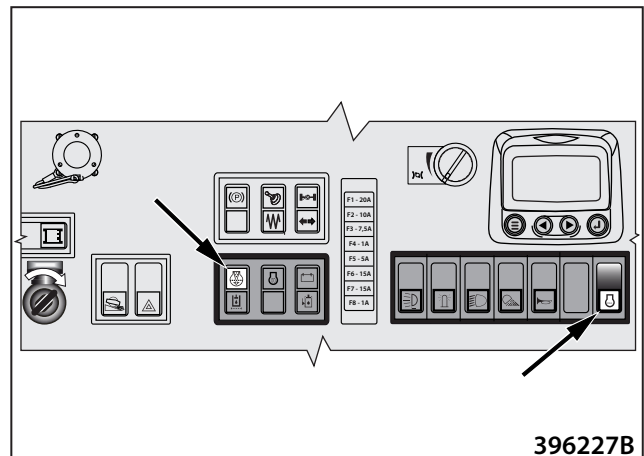


3.6. Lubrication and Maintenance

- Cover the air filter suction hole on the engine bonnet.



- Start the engine and increase its speed by turning OFF the IDLE switch. Check the filter-fouled indicator lamp goes ON.

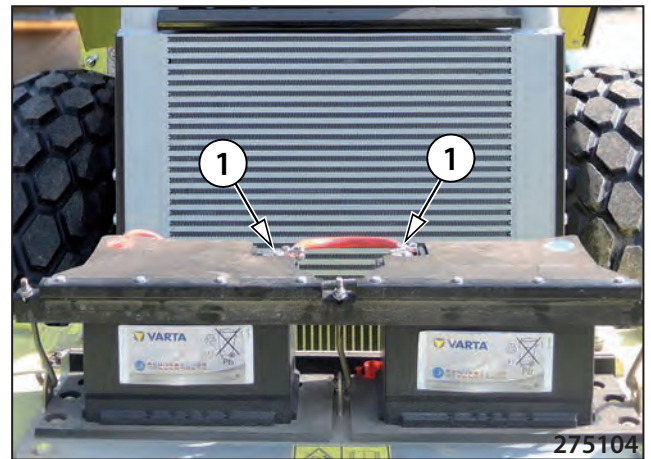


- Unless it lights, check the following: vacuum switch, bulb inside indicator lamp, contact, feeder cable.



3.6.11. Battery check

- Stop the engine and disconnect the electric system using the isolating master switch.
- Clean the surface of batteries.
- Check the condition of poles and terminals (1) and clean them. Slightly wipe terminals with grease.



MAINTENANCE-FREE BATTERY

- In case of a maintenance-free battery (the battery has no freely accessible plugs), only the no-load voltage on terminals is checked. The batteries cannot be replenished. If the no-load voltage is 12.6 V and more, the battery is fully charged. If the no-load 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. It is recommended to be mounted 24 hours after charging.

Note:

The no-load voltage is the voltage measured at the terminals of the battery which was at rest for at least 12 hours – was neither charged nor discharged.



Do NOT turn over the batteries, electrolyte may pour out from degassing batteries.

When there is electrolyte spillage, rinse the affected place with water, and neutralize with lime.

Hand over old batteries that do not work for their disposal.



Keep the batteries dry and clean.

Do NOT disconnect battery while the engine runs.

When handling with the battery, always follow battery Manufacturer's Manual!

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

Use proper clothing to protect your skin against any electrolyte stain.

When there is eye contact with electrolyte immediately flush affected eye with large amounts of water for a few minutes. Get prompt medical attention.

When there is electrolyte ingestion, drink max amount of milk, water, or solution of calcined magnesia in water.

During skin contact with electrolyte, remove clothing, including shoes, flush affected points as soon as possible with soap water or solution of soda and water. Get prompt medical attention.

Do NOT eat, drink or smoke while at work!

After work is completed, wash your hands and face thoroughly with water and soap!

Do NOT check a wire is energized by touching Machine frame.

Disconnect the battery before its repair, or when about to handle the wires and electric devices within the wiring circuit so to avoid a short circuit.

When disconnecting the battery, please disconnect cable with (-) pole first. When connecting, you must connect (+) pole first.

Making direct conductive connection between battery's both poles you will cause a short circuit with battery explosion hazard.

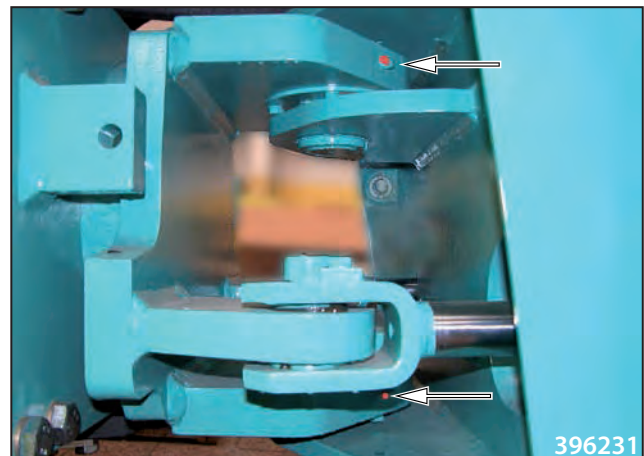
3.6. Lubrication and Maintenance

3.6.12. Machine lubrication

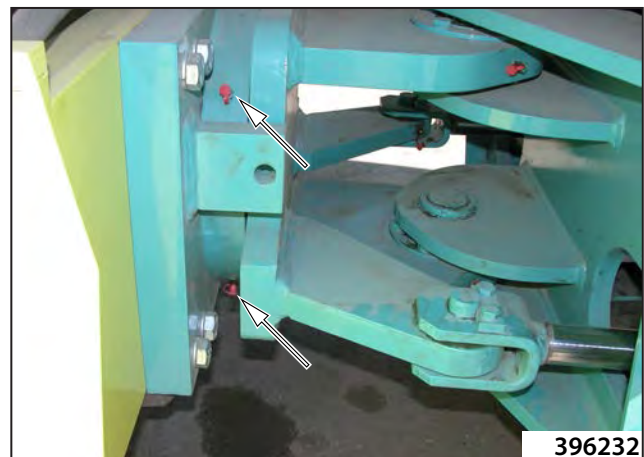
Remove the caps on greasing nipples. Lubricate until old grease starts pouring out. Fit back the grease nipple caps again.

Steering joint

upper, lower bearing

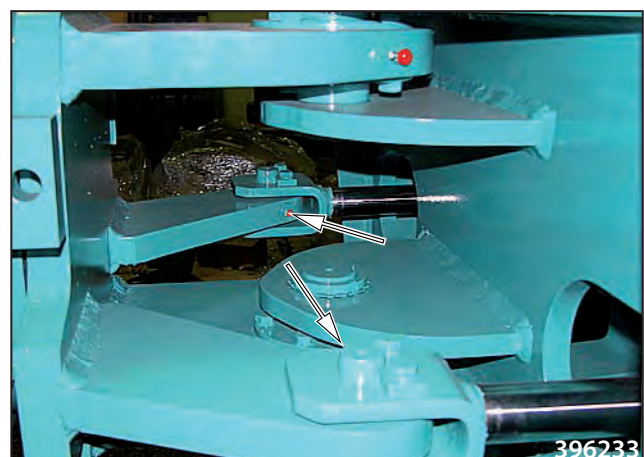


bearing 4x



Linear hydromotors for steering

front pin 2 x



rear pin 2x



Linear hydromotors for bonnet lifting

upper pins 2 x



lower pins 2 x



Linear hydromotor for lifting Driver's control stand
pin



3.6. Lubrication and Maintenance

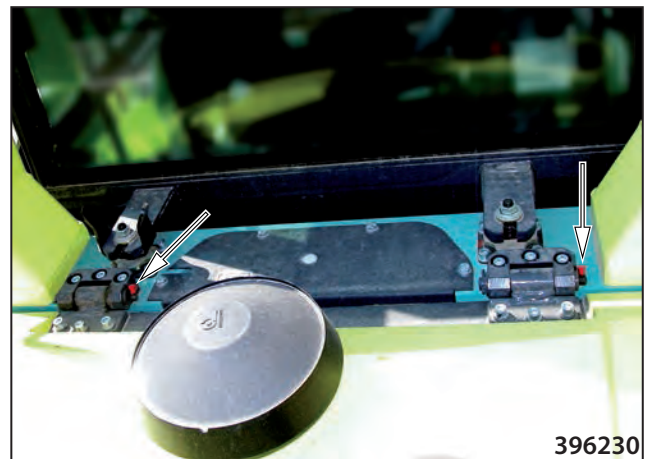
Door hinge pins

pins 6 x



Bonnet hinge pins

pins 2 x



Front pins for cab fitting

pins 2 x



! CAUTION !

Use only the recommended lube greases, refer to par. 3.2.6.

3.6.13. Oil in the vibrator check

- Stop the Machine on flat paved surface so the drum plugs on LH side are in the position as per the Fig. Clean the spot round the plug (1), unscrew plug (1) and check oil level. The level has to be up to the hole or flow out slightly. Replenish oil via the hole of plug (2). Clean the plugs and reinstall.



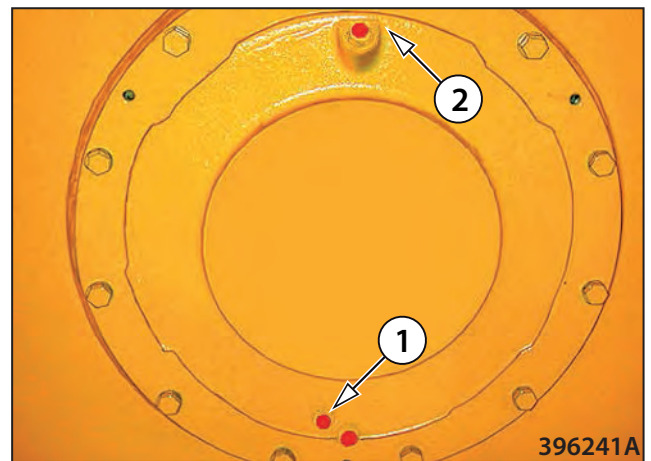
Fill in with the same type of oil.



Check oil only after oil cools down.



Avoid any oil leakage into the ground.



3.6. Lubrication and Maintenance

3.6.14. Oil in the travel gearboxes check

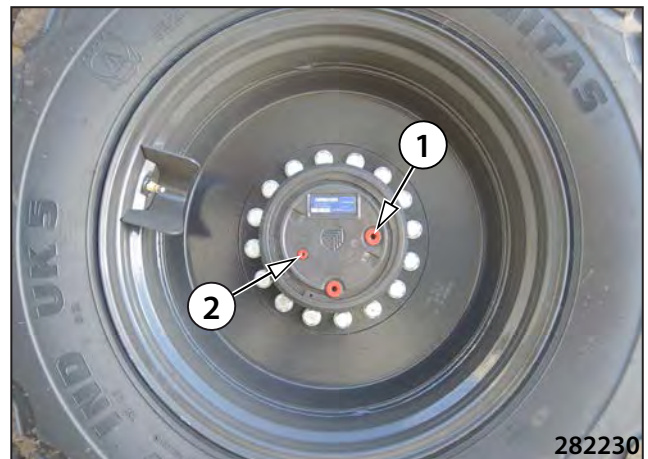
Gearbox of wheels with two plugs

- Stop the Machine on flat paved surface so that the plugs of both wheels' gearboxes are in the position as per the Fig. Clean the spot round the plugs and unscrew them. Check oil level. The level has to be up to the hole or flow out slightly. Replenish and then clean the plug and reinstall.

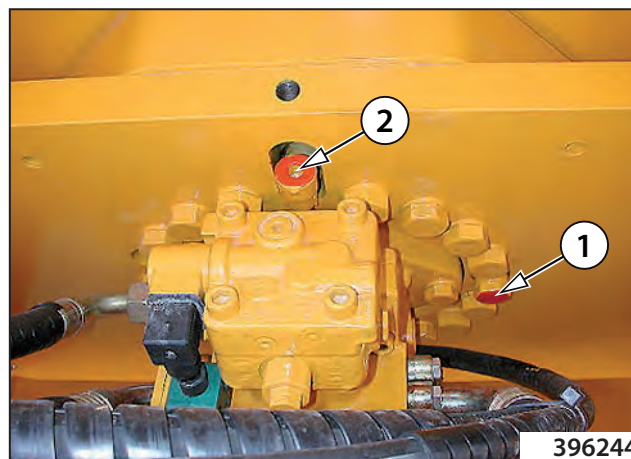


Gearbox of the axle with three plugs

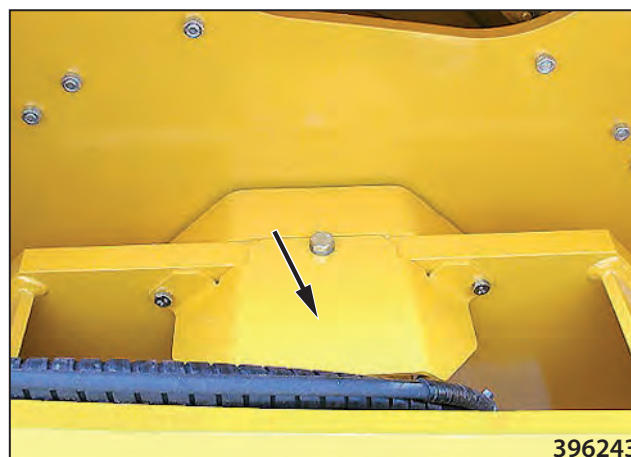
- Clean the area around the checking plug (2).
- Unscrew the plug (2) and check the oil level. The oil level must reach the checking opening or slightly flow out.
- Refill oil through the filling plug (1), if necessary.
- Clean the plugs and mount again.



- **Drum gearbox**
- Clean the spot round the plug (1), unscrew and check oil level. The level must be up to the hole or flow out slightly. Fill in oil via the hole of plug (2). Clean the plugs and reinstall.



- Remove the cover before oil is filled in.



Replenish with the same type of oil.



Check oil only when oil gets cooled down.



Avoid any oil leakage into the ground.

3.6.15. Pad foot segments inspection

- Before inspection is made, clean the segment surface, and mainly round bolted connections. Check overall condition of the segments (any fissures, deformations) and whether M16 8G bolts are tightened with 200 Nm (147,5 lb ft) torque.



3.6. Lubrication and Maintenance

Every 500 hours of operation (6 months)

The set of filters after 500 operating hours can be ordered under the order number 4-760006. For the list of all spare parts, see the table in the end of this publication.

3.6.16. Fuel filter replacement

- Clean and remove fuel filter.



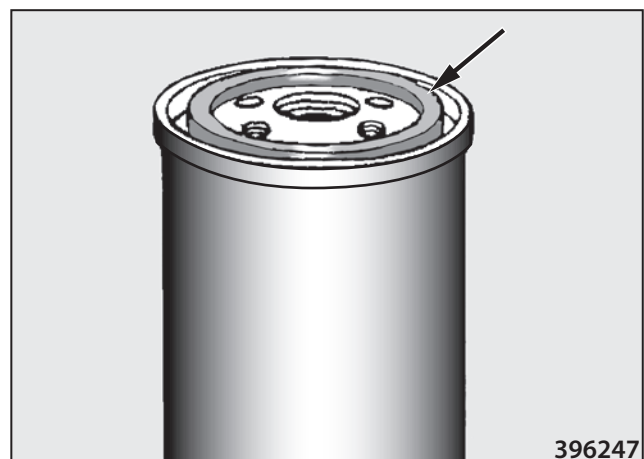
- Clean contact surface for the filter.



- Apply oil over the sealing ring at the new filter.

Fuel filter

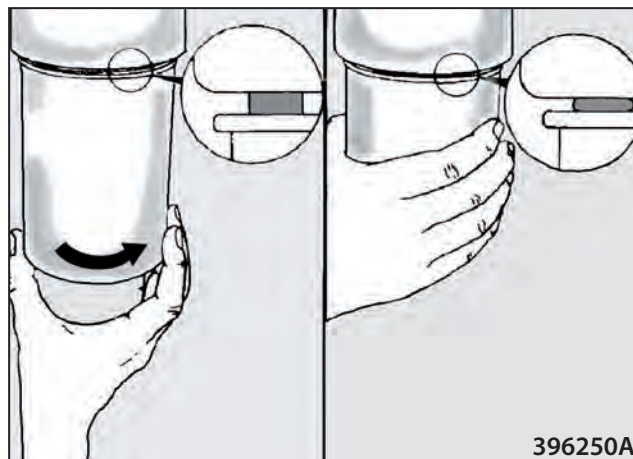
Order number: 4-9501000308



- Fill the filter with pure fuel.



- Install the filter and tighten with your hand - as per filter manufacturer's data (by 2/3 turn once the filter bears on).



Fuel pre-filter

- Disconnect the connector of water separator sensor and proceed in the same way like in the previous text. Connect the sensor connector.

Fuel filter

Order number: 1194061

Note

Unless filters are filled with fuels when exchanging them, please replenish fuel in both filters, refer to the Chapter named "Fuel System Deaerating".



Use original filters required.
No smoking at work!
Do NOT tighten the filters with force.



Retain any fuel flowing out.
Store used filters inside separate container, and hand over for their disposal.

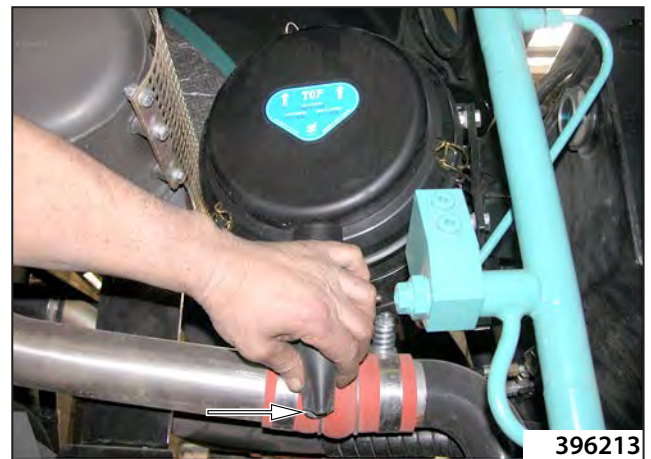
- Clean the inside of the cleaner and contact surface in order that the engine inlet pipe does not get blocked.
- Check connections and piping for any untightness and clogging of the engine inlet opening on the bonnet (e.g. by leaves).



- Insert the safety element.
- Mount the new main element. Check whether the both cartridges fits correctly and whether are sealing.
- Remove the dust valve, clean it and mount it back.

Dust valve

Order number: 1-952454



! CAUTION !

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

Use original elements, only.

Check after installation whether it seals.

When washing the Machine be careful not to spray water into the air filter.

Replace the dust valve immediately if it is damaged!

NEVER operate the Machine with filter body or lid damaged.

In case of work in a very dusty environment, shorten the cleaning intervals.

3.6. Lubrication and Maintenance

3.6.18. Filters of the cab ventilation and heating replacement

Cab

- Remove the top grate.



- Replace the filter.

Filter cartridge

Order number: 4-613780



Heating:

- Remove the top grate on either side.
- Replace the filters.

Filter cartridge

Order number: 4-612044



3.6.19. Engine cooling liquid check

- Check the concentration of antifreeze agent in cooling liquid via refractometer. Top up antifreeze agent as per par. 3.2.3.



! CAUTION !

Check always before winter season starts. Unless concentration for -36 °C (-33 °F) temperature is measured, you must replenish antifreeze agent in the cooling liquid, or replace the cooling liquid.

3.6.20. Wiring check

- Check for any damage to cables, connectors, protective hoses, and their fastening, especially if in the vicinity of hot surfaces and moving parts of the machine including the engine. Replace damaged parts. Use only original spare parts.

3.6. Lubrication and Maintenance

3.6.21. Air filter of the air conditioning system replacement

- Remove the top grate.
- Replace the filter.

Air-conditioning filter

Order number: 4-8300750677



3.6.22. Wheel bolts tightening check



First carry out after 100 hours.

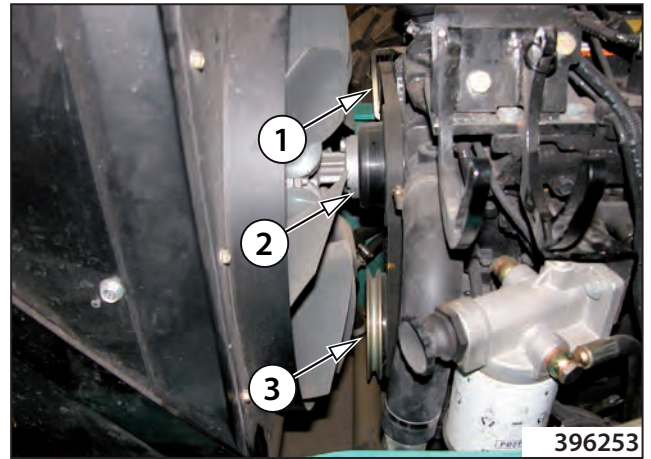
- Check the wheel bolts are tightened with 165 Nm (122 lb ft) torque.



Every 1000 hours of operation (1 year)

3.6.23. Engine belt check

- With the engine running, check visually the pulley of alternator (1), fan (2) and crank shaft (3), whether this does not oscillate.



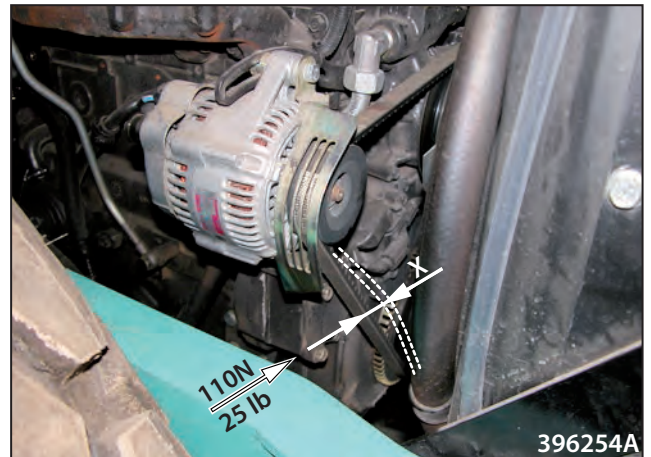
- **Shut off the engine!**
- Check the belt tension with 110 N (25 lb) pressure. If the sagging is higher than belt X thickness, replace the belt.

Cog belt

Order number: 4-9501000306

Note

Measure exactly the belt sagging with the use of gauge. Refer to Engine Operation Manual, section V-15.



- Tighten the belt once you slacken the bolts and via moving a bit the alternator.



3.6. Lubrication and Maintenance

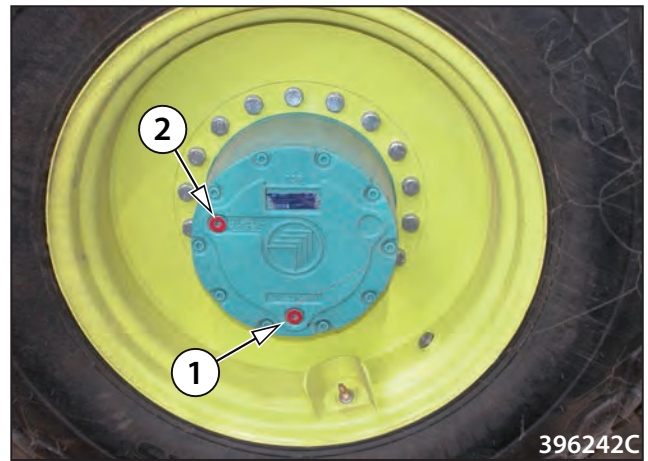
3.6.24. Oil in the travel gearboxes change



First carry out after 100 hours.

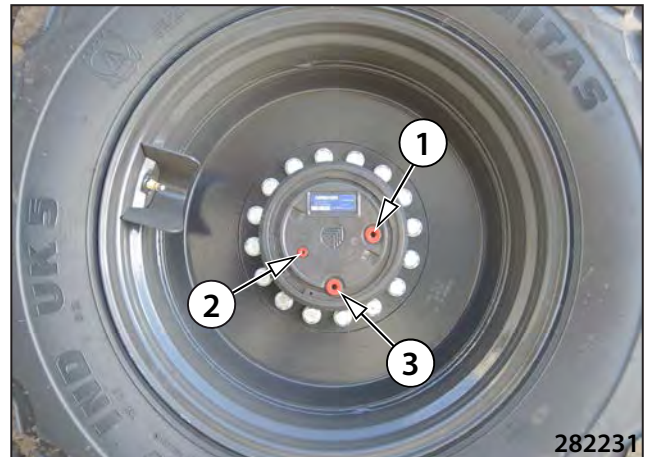
Gearboxes of the axle (wheels) with two plugs

- Place the Roller on flat surface so that the plugs of axle gearboxes are in the position as per the Fig. Clean the spots round the plugs. Install a proper vessel underneath the plug! Remove plugs (1) and (2) and let the oil pour out then reinstall plug (1). Use hole (2) to replenish oil until its level reaches the hole edge, or starts flowing out. Reinstall plug (2).



Gearboxes of the axle (wheels) with three plugs

- Clean the area around plugs.
- Put appropriate vessel under the drain plug (3).
- Remove the plugs, clean them and let the oil drain out.
- Refill the oil through the filler plug (1) until the level reaches the check hole (2) or the oil starts to flow out.
- Mount the plugs, replace damaged plug sealings.

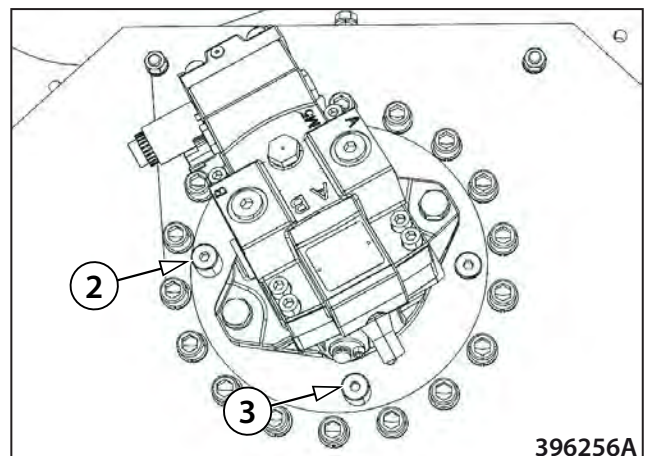


Drum gearbox - RH side

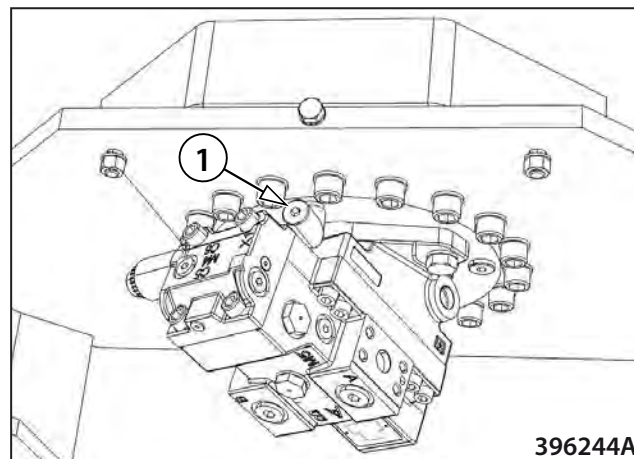
- Place the roller onto a flat, firm surface.
- Remove the cover. Clean the spot round the plugs.



- Put appropriate vessel under the drain plug (3).



- Unscrew all plugs (1), (2), (3) and let oil drain.
- Mount the drain plug (3) after draining is finished.
- Refill recommended oil through the filling plug (1).
- Check oil level in the checking opening (2). The oil level must reach the lower edge of the opening or slightly flow out.
- Mount the plugs (1) and (2), replace damaged plug sealings.



Drain oil once it gets cooled down below 50 °C (122 °F).

3.6.25. Air conditioning compressor mounting check

- Check the strength of the compressor attachment and the compressor bracket. Make sure that the belt does not spin. If necessary, tighten the screws.

Belt

Order number: 1230933



3.6. Lubrication and Maintenance

3.6.26. Damping system check

- Check the condition of metal rubbers, coherence between metal and rubber. Replace any damaged ones. Check the bolts and nuts are tightened.
- Drum damping system, LH side.

Rubber metal

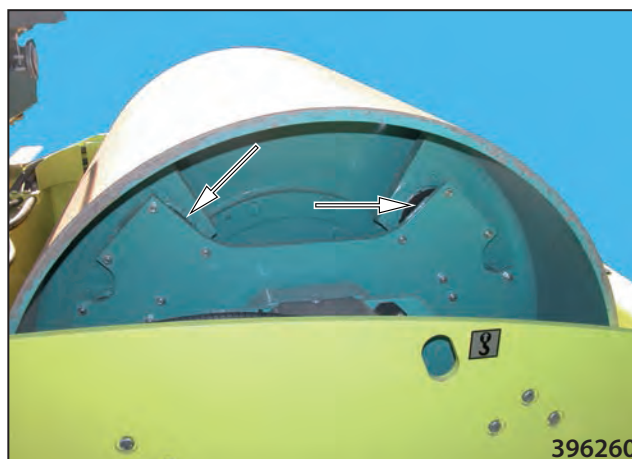
Order number: 4-9200000030



- Drum damping system, RH side.

Rubber metal

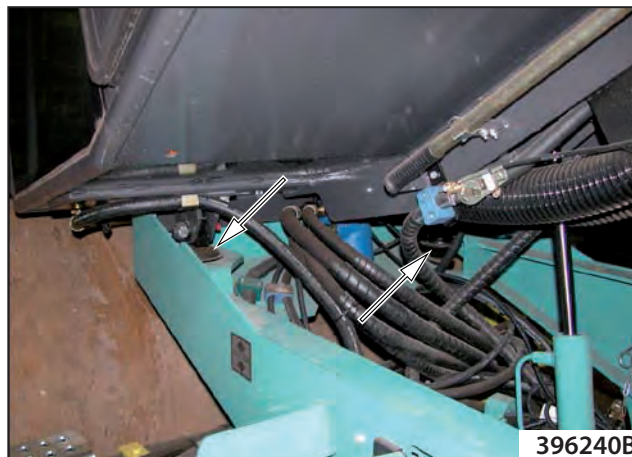
Order number: 4-9200000030



- Front metal rubbers for the Driver's control stand.

Rubber metal

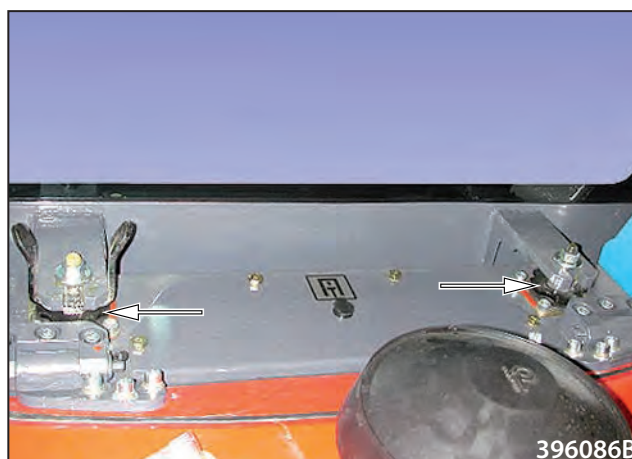
Order number: 4-6120080016



- Rear metal rubbers for the Driver's control stand.

Rubber metal

Order number: 1160052



- Front metal rubbers for the engine.

Rubber metal

Order number: 4-444436



- Rear metal rubbers for the engine.

Rubber metal

Order number: 4-9200000062



3.6. Lubrication and Maintenance

Every 2000 hours of operation (2 years)

The set of filters after 2000 operating hours can be ordered under the order number 4-760107. For the list of all spare parts, see the table in the end of this publication.

3.6.27. Valve clearance adjustment

- Call CUMMINS service department to adjust the engine valves. Next valve adjustment will follow periodically after 2000 hours or after two years - for contact points, please refer to Engine Operation and Maintenance Manual.

3.6.28. Oil in the vibrator change



First carry out after 500 hours.

- Place the Roller on flat, paved area so that the drain plug on drum's LH side is in its lowest position, put an appropriate vessel underneath this plug. Unscrew all the plugs and let the oil run out. Once drained, reinstall the drain plug. Use filler hole (2) to replenish oil recommended up to the edge of inspection hole (3). Reinstall the remaining plugs.



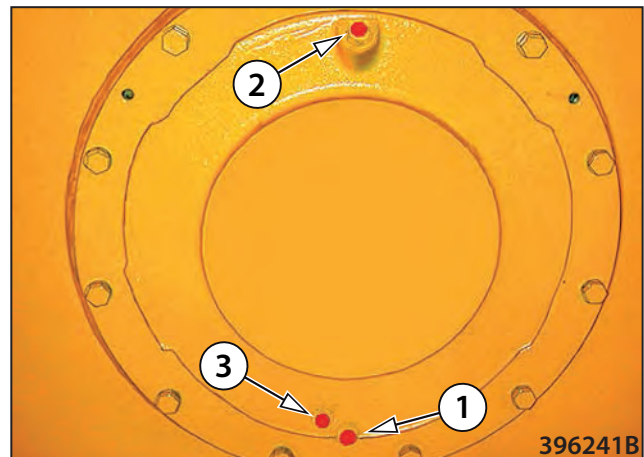
Exchange oil best after Roller operation when the impurities are diffused within the medium.

Do NOT touch the gearbox and its adjacent parts if these are hot.

Drain oil when it gets cooled down below 50 °C (122 °F).



Avoid oil leakage into ground.



3.6.29. Air conditioning system cleaning

- Replace the filter-dryer.

Water separator

Order number: 1230555

- Have the functional check of individual components, wiring checking, and air conditioning system cleaning (removal of mould and bacteria) performed by an authorised company.
- In case of work in a highly dusty environment, have the check performed in shorter intervals.



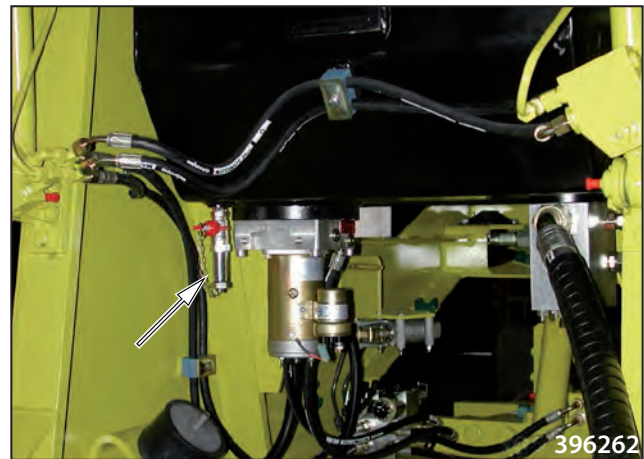
3.6. Lubrication and Maintenance

3.6.30. Hydraulic oil and filter change



Exchange oil before winter season starts or following a long term shutdown of the Machine. Clean the suction strainer at the same time, refer to par. 3.6.31.

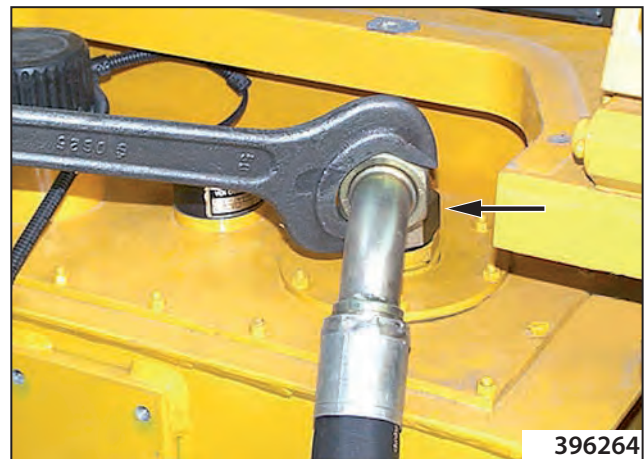
- Attach hose to the drain valve. Let oil flow out into the vessel set up - the total amount of oil flowing out is round 60 l (15,8 gal US).



- Remove the cover.



- Remove the suction hose.



- Remove the lid. Remove the suction basket from the suction pipe. Replace the suction basket.

Suction strainer

Order number: 4-5451050018

- Inspect the interior of the tank. When the bottom is dirty, clean and rinse the tank with the new oil. Mount the lid back. Use the new sealing tape.

Sealing tape

Order number: 4-690219





Drain oil after it has cooled down below 50 °C (122 °F).

Follow the fire safety measures!



After disconnecting the hydraulic circuits blind all holes with plugs.

Collect drained oil; do not leave it soak into the soil.

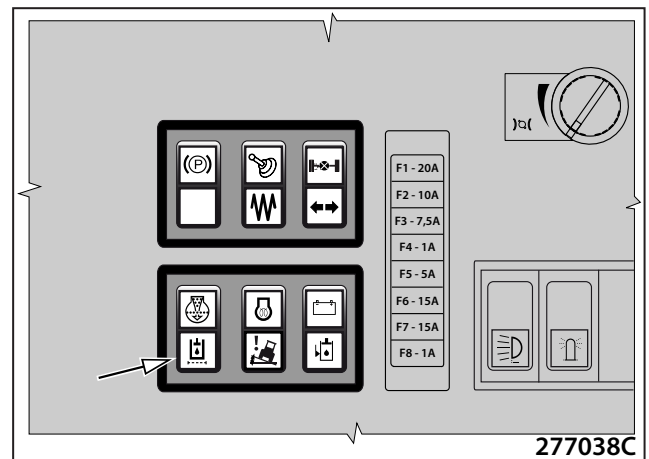
Used oil is environmentally dangerous waste - have them liquidated.

Exchanging the filter element of pressure filter

! NOTE!

Exchange the filter element always in the following occasions:

- when changing oil
- if the signal lamp of pressure filter lights up after the working temperature reached 50 through 60 °C (122 - 140 °F).



277038C

- Remove the filter. Clean from below the following: contact surface of the filtration block, spread pure oil over the new filter's ring, screw down, tighten.

Filter cartridge

Order number: 4-5358520121



282N144T



Use original filter elements according to spare parts catalogue only.

Exchange oil and filter always when a destruction of internal parts of the units occurs (of hydromotors, of hydrogenerators), or during a major overhaul of the hydraulic system. Clean and rinse out the hydraulic tank before installing new unit, and fill it with oil. With the engine running at increased speed, please test the functions of the Machine. Check the tightness.



Used filter elements are environmentally dangerous waste - have them liquidated.

3.6. Lubrication and Maintenance

Filling the hydraulic circuit:

- Fill using the hydraulic unit.
- You can order the hydraulic unit from the machine manufacturer.

Hydraulic unit 230 V

Order number: 1251998

Hydraulic unit 110 V

Order number: 1255297

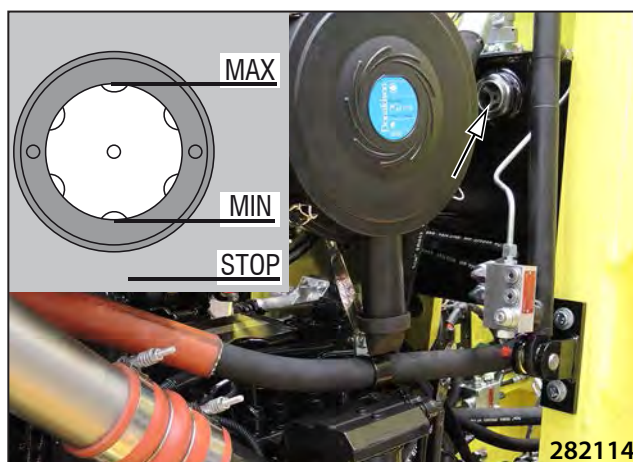
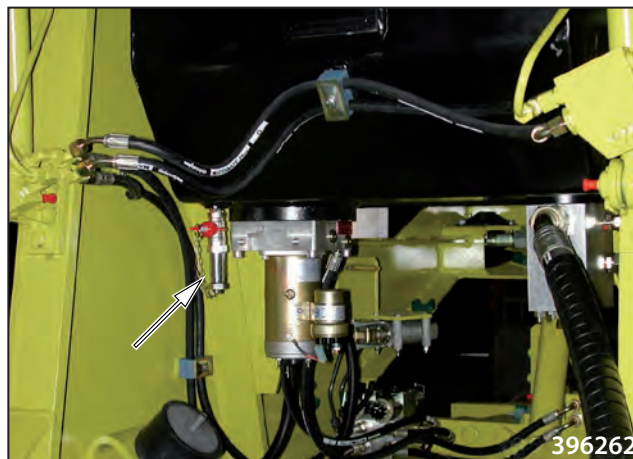
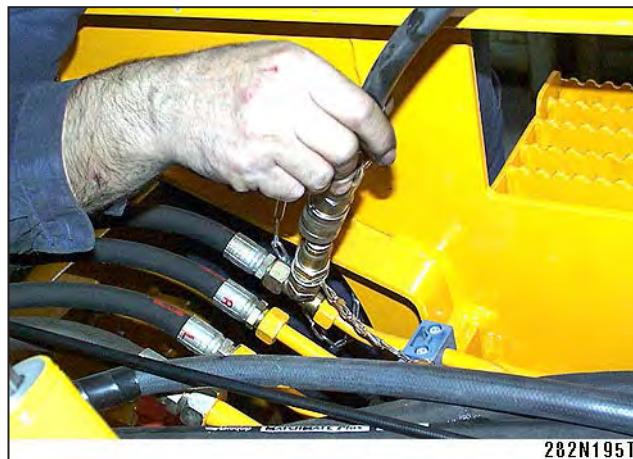
Note:

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

- Put the quick-release coupling of the hydraulic unit on the quick-release coupling. Fill the hydraulic circuit until clean oil starts to flow out of the hose. Collect it to a clean vessel.

- After flowing out of approximately 15 l (4 US gal), close the drain cock.

- Refill oil in the tank to maximum and disconnect the filling device.



Checking the oil thermometer sensor

- Dismantle the sensor and clean the contact.
- Dip the sensor into warm oil of known temperature and read out the oil temperature on the thermometer. Replace the sensor if not working properly.

Temperature sensor

Order number: 4-5503580072



212UM022

Alternative filling through the tank filler



The alternative way of filling the hydraulic circuit is only emergency solution!

In this way of filling it is necessary to cut the next exchange interval to one half, i.e. 1000 h or 1 year.

The cap of the tank filler is sealed. In case of breaking the seal during warranty period, the warranty expires.

- Refill the tank through the filler with specified type of oil up to the bottom of the strainer in the filler.

NOTE

When filling via tank filler neck a large portion of used oil incl. dirt will remain within the vicinity, and hydraulic units' life cycle will lower.

Breather filter

Order number: 1405919



396265C



Observe cleanliness at work. Avoid contamination of the system with materials that may cause damage to crucial units!

Do NOT open hydraulic tank uselessly!

When cleaning the tank, use cleaners with no fibre-slip, do not use chemical detergents.

Refill oil according to par. 3.2.4.

3.6. Lubrication and Maintenance

3.6.31. Suction strainer unit cleaning



Clean when replacing the hydraulic oil.

- Remove the bolts and take the unit out from the tank bottom.
- Replace the suction filter (2) and the sealing O-ring (3).

Suction filter

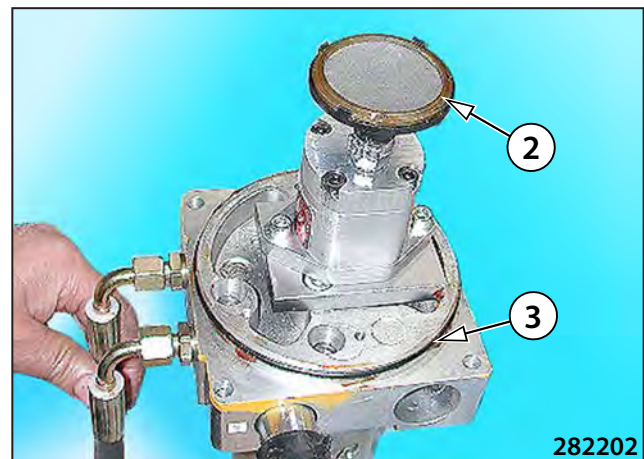
Order number: 1270762

O-ring

Order number: 1258804



396272



282202



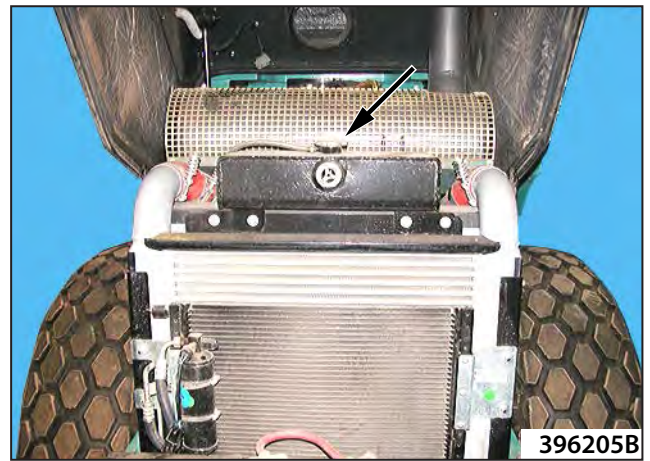
Avoid any oil leakage into ground!

3.6.32. Engine cooling liquid change

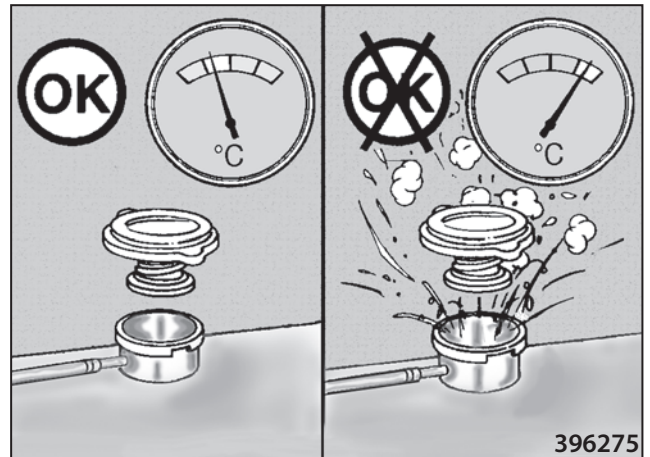
! CAUTION !

Carry it out when engine operation has ended or on heating the liquid during engine operation to 80 °C (176 °F).

- Open pressure seal at the expansion tank.



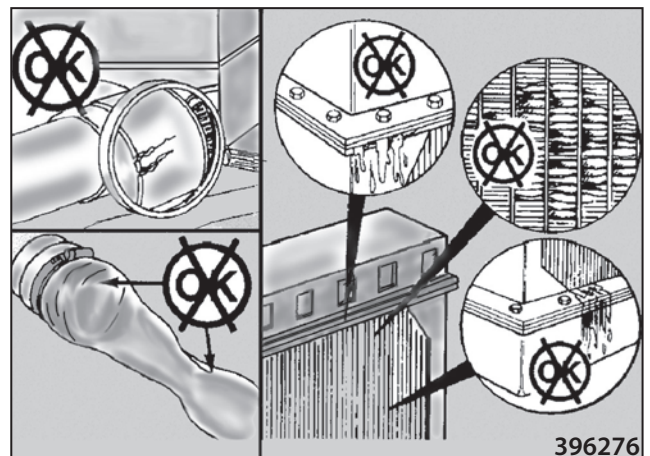
Do NOT open the seal before cooling liquid temperature drops below 50 °C (122 °F). On opening the seal there is risk of liquid splashing out with possible scald.



- Remove drain plug. Let the liquid flow out into a vessel set up. Drained amount is ca 24 l (6.3 gal U.S.).

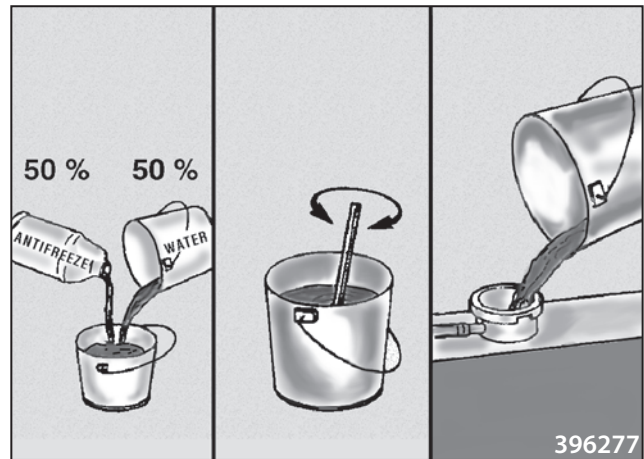


- Check no hoses in the engine cooling system are damaged and no hose clips are missing. Check the condition of cooler whether it is not damaged, leaking and whether the cooler fins (cooling gills) are not fouled with impurities. Clean and repair if required.



3.6. Lubrication and Maintenance

- Install drain plug and fill the cooling system with new cooling liquid at the ratio of 50 % of water + 50 % of antifreeze agent.



- Top up to the upper edge of water gauge. When filled, please wait ca 2-3 minutes until air escapes and the circuits gets filled. Max filling rate is 10 l/min (2,6 gal US/min). Close the expansion tank.
- Start the engine and wait until temperature gets to 80 °C (175 °F). While waiting, check whether the cooling liquid is not leaking. Following the engine stop, check the level on water gauge (2). Should it be low, replenish cooling liquid to max level.

Note

Flush, according to the Engine Operation and Maintenance Manual, when replacing the system, with the mixture of water and soda (soda carbonate) at the ratio of 0,5 kg (1.1 lb) of soda per 23 l (6.0 gal) of water. Fill the system with this mixture and heat up to 80 °C (176 °F) with the engine running - do not install pressure seal of the expansion tank. After shutting off the engine, please drain water and replenish with clean water and heat up the engine again, and then drain the water again. Repeat this until water is clean.



Use cooling liquid as per par. 3.2.3 to do the filling!

When replacing, proceed according to the antifreeze liquid Manufacturer's Manual!

Wear gloves to protect your hands!

Wear glasses or shield to protect your eyes!

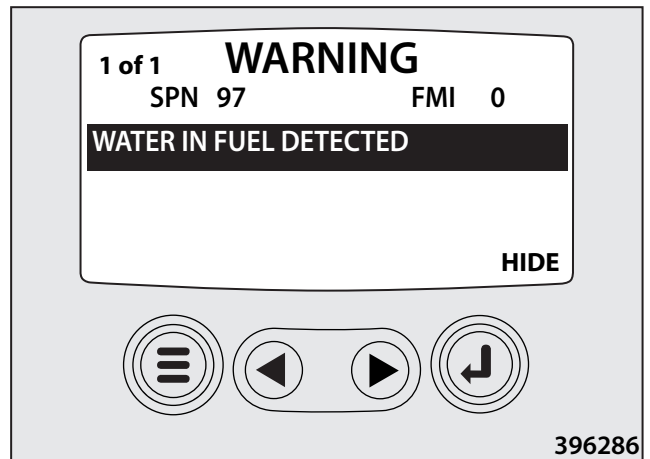
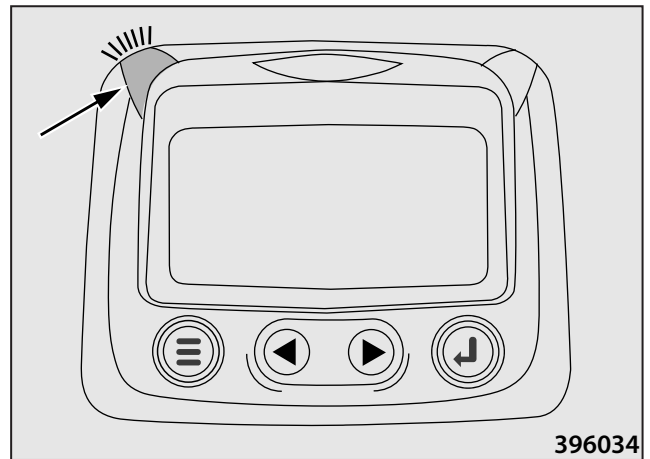


Hand over used liquid for its safe disposal under the regulations!

Maintenance as required

3.6.33. Water separator cleaning

- Yellow indicator lamp signal.
- Code No. 97 VODA V PALIVU (WATER IN FUEL) will be displayed.
- Turn the separator's valve when water starts flowing out.



! CAUTION !

If you drained over 60 cm³ (0,63 quarts) of fuel, replenish fuel into the fuel filter as per the Chapter named "Deaerating". In this way you will avoid problems concerning difficult starting.



No smoking at work.
NEVER drain separator during engine run.



Retain drained fuel incl. its deposit (sediments) in a suitable vessel.

3.6. Lubrication and Maintenance

3.6.34. Coolers cleaning

Considering various working conditions a regular interval of cleaning is unable to be determined. When working under very dusty environment, please clean on daily basis. Clogging of coolers will show in a reduced cooling capacity, and the temperatures of engine cooling liquid, and of hydraulic oil, increasing. Clean with pressure air or pressure water (steam) from the fan's side only.

! CAUTION !

Do NOT use cleaners with too high pressure in order to avoid any damage to the coolers' honeycombs.

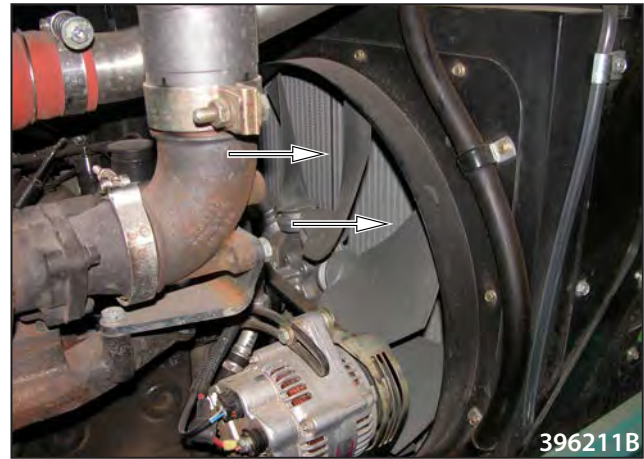
If coolers get contaminated with crude oil products, use a cleaning agent and proceed according to the Manufacturer's instructions! Find out the cause of contamination!



When cleaning, please proceed under the environmental standards and regulations!

Carry out Machine cleaning at a workplace equipped with the cleaning agent retention system so to avoid any contamination of soil and water resources!

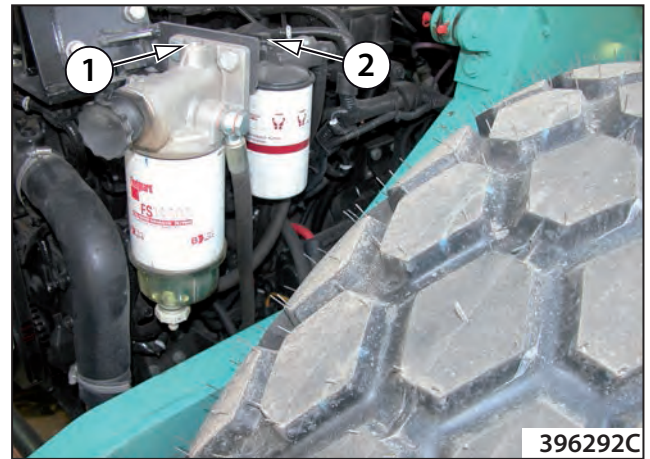
Do NOT use any cleaning agents banned!



3.6.35. Fuel system venting

Deaerate (vent) the fuel system before the first start:

- Unless fuel filters have been filled with fuel - upon filter replacement
- Upon fuel pump replacement
- Following fuel system repair
- Upon long term shutdown of the Machine
- When having run out of fuel from the tank
- Slacken air relief screw (1) on fuel pre-filter. Pump fuel via the feed pump until clean fuel starts flowing out, with no air bubbles. Retighten the screw, and bleed the second filter via the air relief screw (2).



**Do NOT bleed with the hot engine, leaking fuel may cause fire.
No smoking at work on fuel system!**



Retain any leaking fuel!

3.6. Lubrication and Maintenance

3.6.36. Machine cleaning

- When work has ended, please clean the Machine to remove any major dirt. Carry out overall cleaning on regular basis at least once a week. When working on coherent soils, soil cements or lime stabilizations you must make overall cleaning on daily basis.



Before pressure cleaning with the use of water or steam, blind all the holes where a cleaner might penetrate (e.g. via engine suction holes). Remove these blinds once the Machine is cleaned,.

Do NOT expose electric parts or insulation material to direct stream of water or steam. Always cover these materials (alternator's internal space, etc.).

Disconnect battery disconnecter.

Execute the work with the engine shut off.

When using the cleaners, please proceed in line with the Manufacturer's Directions for Use.

Do NOT use aggressive or easily ignitable cleaners (for instance gasoline or easily ignitable materials).



When cleaning, please proceed according to the ecological standards and regulations!

Clean the Machine at workplaces equipped with cleaner retention (containment) system so to avoid contamination of soil and water resources!

NEVER use forbidden cleaners!

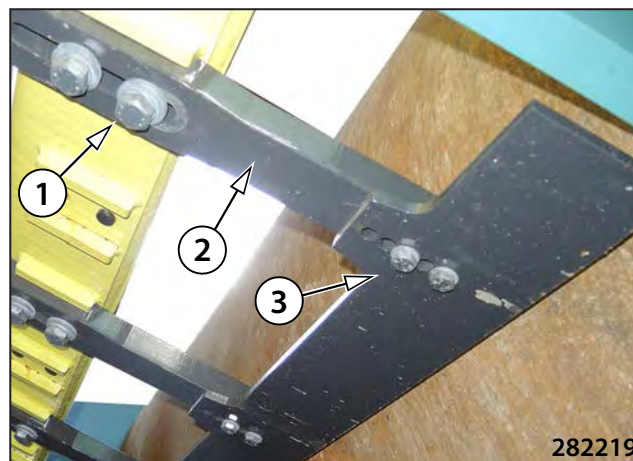
3.6.37. Scrapers adjustment

Scrapers designed for smooth drum

- Slacken bolts (1) and shift holders (2) towards the drum for 15 mm (0,6 in) distance between the scraper and the drum.

! CAUTION !

Unless possible to shift the scrapers in oval-shaped holes of holders (2) when scraper (3) gets worn, remove the scraper (3) and move it by one hole towards the drum.



282219

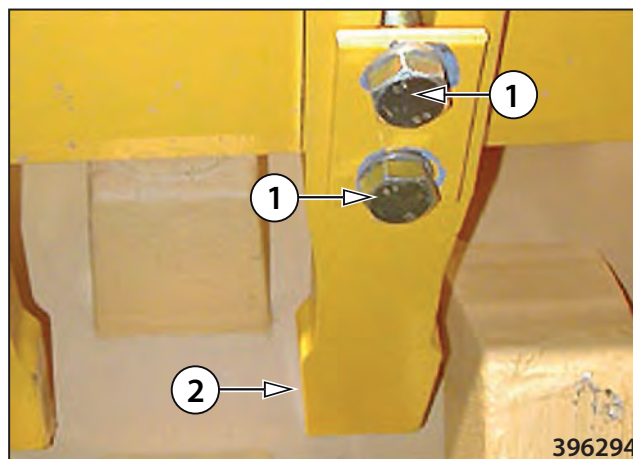
Scrapers for padfoot drum

- Slacken bolts (1) and shift individual scrapers (2) towards the drum at 25 mm (1 in) distance.

! CAUTION !

Rear scrapers at padfoot drum are longer. When replacing worn scrapers use rear ones instead of front ones, and replace the rear scrapers with new ones.

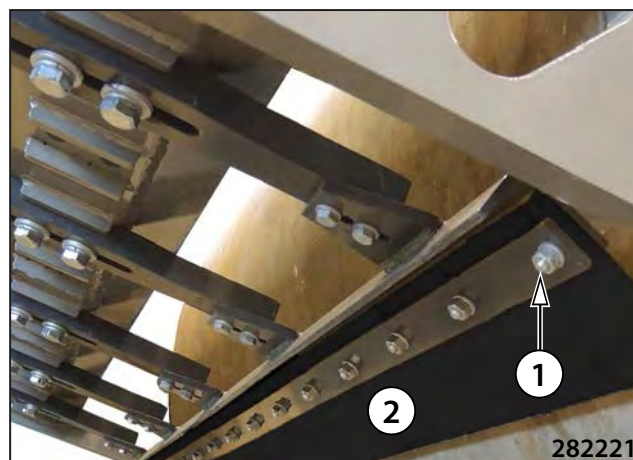
If only small gap has been adjusted between scraper and drum then it may happen that there will be a contact between scraper and drum when the Machine turns.



396294

Contact scrapers made of Polytan (OPTION)

- Loosen bolts (1) and move scraper (2) towards the drum.



282221

3.6. Lubrication and Maintenance

3.6.38. Screw connection tightening check

- Check regularly whether no bolt connection has become loosened. Use torque spanners to tighten the bolt connections.

Thread	Torque				Thread	Torque			
	For 8,8 Bolts (8G)		For 10,9 Bolts (10K)			For 8,8 Bolts (8G)		For 10,9 Bolts (10K)	
	Nm	lb ft	Nm	lb ft		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					

Values given in the Table are the torques at dry tread (at coefficient of friction = 0,14). Such values do NOT apply to a greased thread.

Table of torques used for cap nuts with sealing "O" ring - hoses

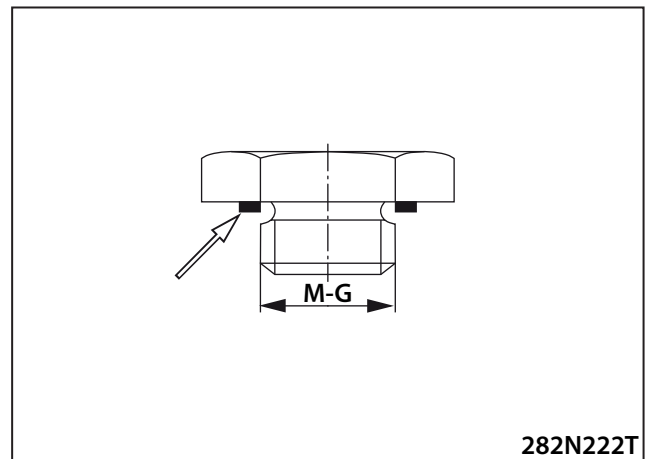
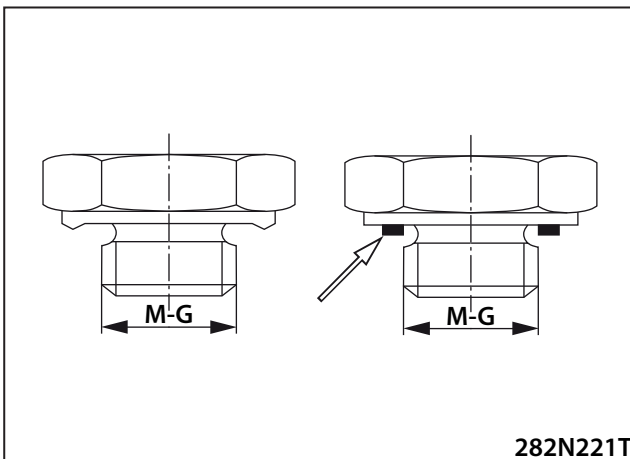
			Torques for cap nuts incl. "O" ring - hoses					
			Nm			lb ft		
Spanner Size	Thread	Pipe	Nominal	Min	Max	Nominal	Min	Max
14	12x1,5	6	20	15	25	15	11	18
17	14x1,5	8	38	30	45	28	22	33
19	16x1,5	8	45	38	52	33	28	38
		10						
22	18x1,5	10	51	43	58	38	32	43
		12						
24	20x1,5	12	58	50	65	43	37	48
27	22x1,5	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	52x2	35	290	255	325	214	188	240
		38						
		42						

Chart for torques of necks with sealing edge or with flat gasket

G -M	Neck Torques	
	Nm	lb ft
G 1/8	25	18
G 1/4	40	30
G 3/8	95	70
G 1/2	130	96
G 3/4	250	184
G 1	400	295
G 1 1/4	600	443
G 1 1/2	800	590
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 x 1,5	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 for torques of plugs with flat gasket

G -M	Plug Torques	
	Nm	lb ft
G 1/8	15	11
G 1/4	33	24
G 3/8	70	52
G 1/2	90	66
G 3/4	150	111
G 1	220	162
G 1 1/4	600	443
G 1 1/2	800	590
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 x 1,5	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





Any failures will in most cases happen due to incorrect Machine operation. Therefore with each defect, please read the instructions in this Machine and Engine Operation and Maintenance Manual thoroughly once more. Unless you are able to determine the cause of a failure, please contact the service assistance of an authorized dealer or manufacturer.

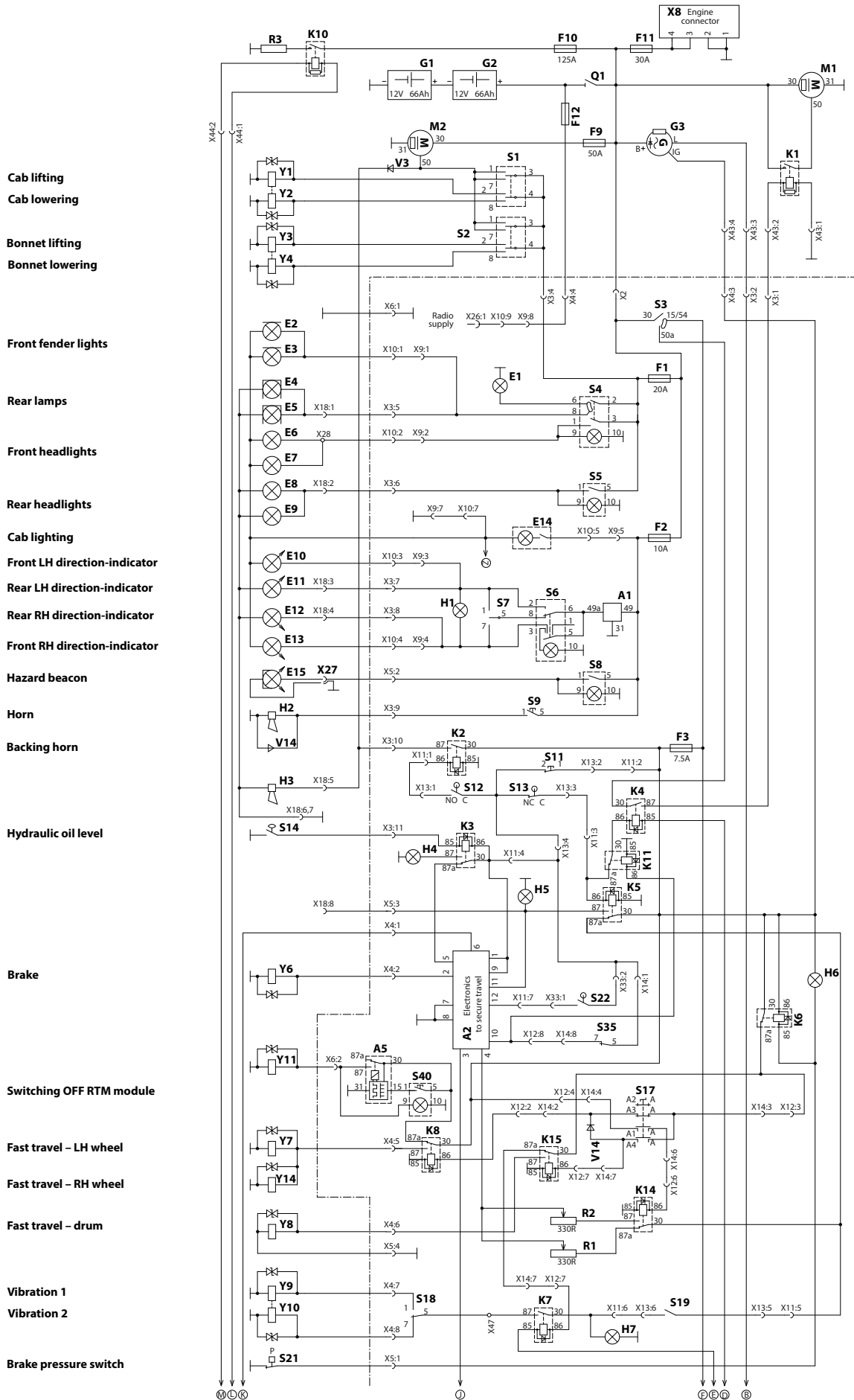


Troubleshooting of the hydraulics and wiring will require knowledge in the field of hydraulics and electric field, and therefore trust a service assistance of an authorized dealer or manufacturer with the troubleshooting.

3.8. Annexes

3.8.1. Wiring diagram

- A1 - Clicker for direction-indicator lights
- A2 - Electronics to secure travel
- A3 - Travel actuator
- A4 - Multifunctional display Murphy PV - 101
- A5 - Step relay
- B2 - Hydraulic oil thermometer sensor
- B3 - Float (displacer) in fuel tank
- E1 - Hydraulics thermometer lighting
- E2,3 - Front fender lights
- E4,5 - Rear lamps
- E6,7 - Front headlights
- E8,9 - Rear headlights
- E10,11 - LH direction-indicator lights
- E12,13 - RH direction-indicator lights
- E14 - Cab lighting
- E15 - Hazard beacon
- F1-12 - Drop-out fuses
- G1,2 - Batteries
- G3 - Alternator
- H1 - Pilot lamp for direction-indicator lights
- H2 - Horn
- H3 - Backing horn
- H4 - Pilot lamp for hydraulic oil level
- H5 - Pilot lamp for neutral
- H6 - Pilot lamp for brake
- H7 - Pilot lamp for vibration preset
- H10 - Pilot lamp for battery recharging
- H11 - Pilot lamp for air filter clogged
- H12 - Pilot lamp for hydraulic oil filter clogged
- H17 - Pilot lamp for glowing (white)
- K1 - Starting contactor
- K2-9 - Auxiliary relays
- K10 - Glowing contactor
- K11,14,15 - Auxiliary relay
- M1 - Engine starter
- M2 - Motor for cab lifting pump
- M3 - Cab ventilation fan
- M4 - Front wiper
- M5 - Rear wiper
- M6 - Windscreen washer
- M7 - Rear glass washer
- M8 - Heater fan
- P2 - Hydraulic oil thermometer
- Q1 - Battery disconnecter
- R1,2,5 - Resistors
- R3 - Engine preheating
- R4 - Engine revolution control potentiometer
- S1 - Cab lifting double pushbutton
- S2 - Bonnet lifting double pushbutton
- S3 - Ignition box
- S4 - Front headlight switch
- S5 - Rear headlight switch
- S6 - Warning light switch
- S7 - Direction-indicator light change-over switch
- S8 - Hazard beacon switch
- S9 - Horn pushbutton
- S11 - Emergency brake pushbutton
- S12 - Backing horn switch (in travel actuator)
- S13 - Neutral switch (in travel actuator)
- S14 - Float (displacer) inside hydraulic oil tank
- S17 - Selector switch for operating speed preset
- S18 - Vibration selector switch
- S19 - Vibration switch (in travel actuator)
- S21 - Brake pressure switch
- S22 - Seat switch
- S27 - Vacuum switch for air filter clogged
- S28 - Vacuum switch for hydraulic oil filter clogged
- S29 - Cab fan selector switch
- S30 - Front wiper switch
- S31 - Rear wiper switch
- S32 - Washers double pushbutton
- S33 - Heater fan selector switch
- S35 - Parking brake switch
- S36 - Switch to reduce drum slip
- S37 - Engine idling switch
- S40 - RTM module switch
- V3 - Interlocking LED (only with Machines having cab lifting alarm)
- V4-7,14 - Interlocking LEDs
- V8-14 - Interference suppression diodes
- X2-24 - Interface connectors
- X27 - Socket for hazard beacon
- X28-33 - Interface connectors
- X34 - Socket for engine diagnostics
- X35-40 - J1939 Connectors
- X41,45 - Interface connectors
- Y1 - Solenoid valve for cab lifting
- Y2 - Solenoid valve for cab lowering
- Y3 - Solenoid valve for bonnet lifting
- Y4 - Solenoid valve for bonnet lowering
- Y6 - Solenoid valve for brake
- Y7 - Solenoid valve for fast travel - LH wheel
- Y8 - Solenoid valve for fast travel - drum
- Y9 - Solenoid valve vibrations 1
- Y10 - Solenoid valve for vibrations 2
- Y11 - Solenoid valve to disengage RTM differential interlock
- Y13 - Servo valve for travel pump
- Y14 - Solenoid valve for fast travel - RH wheel

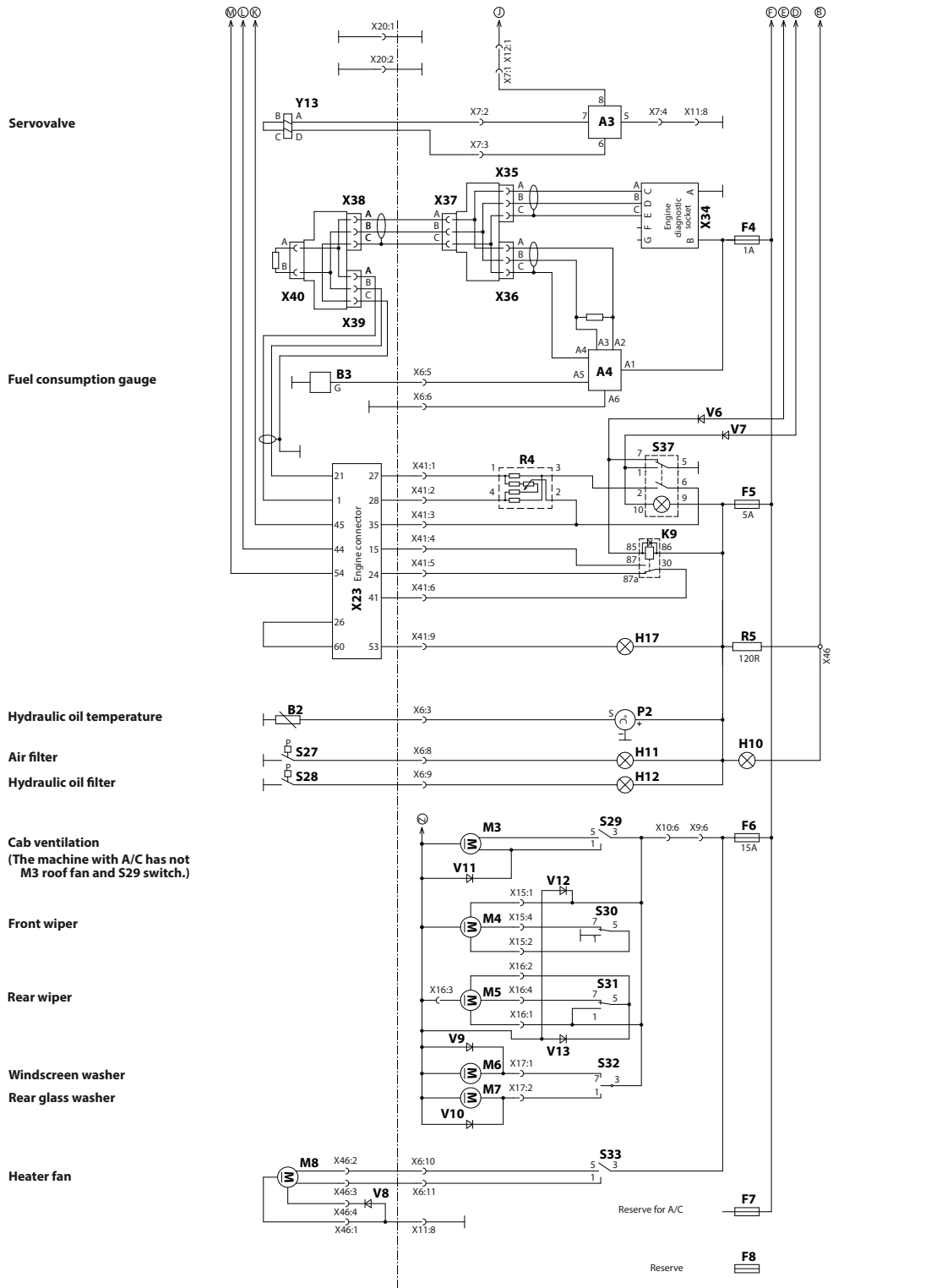


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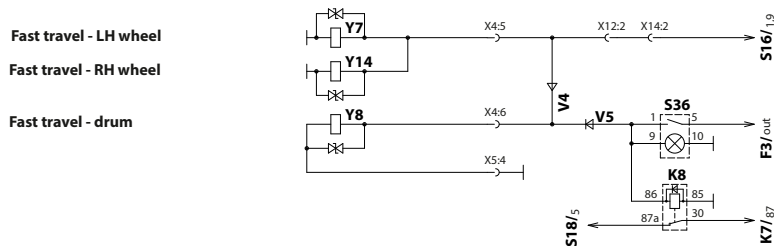
3.8. Annexes

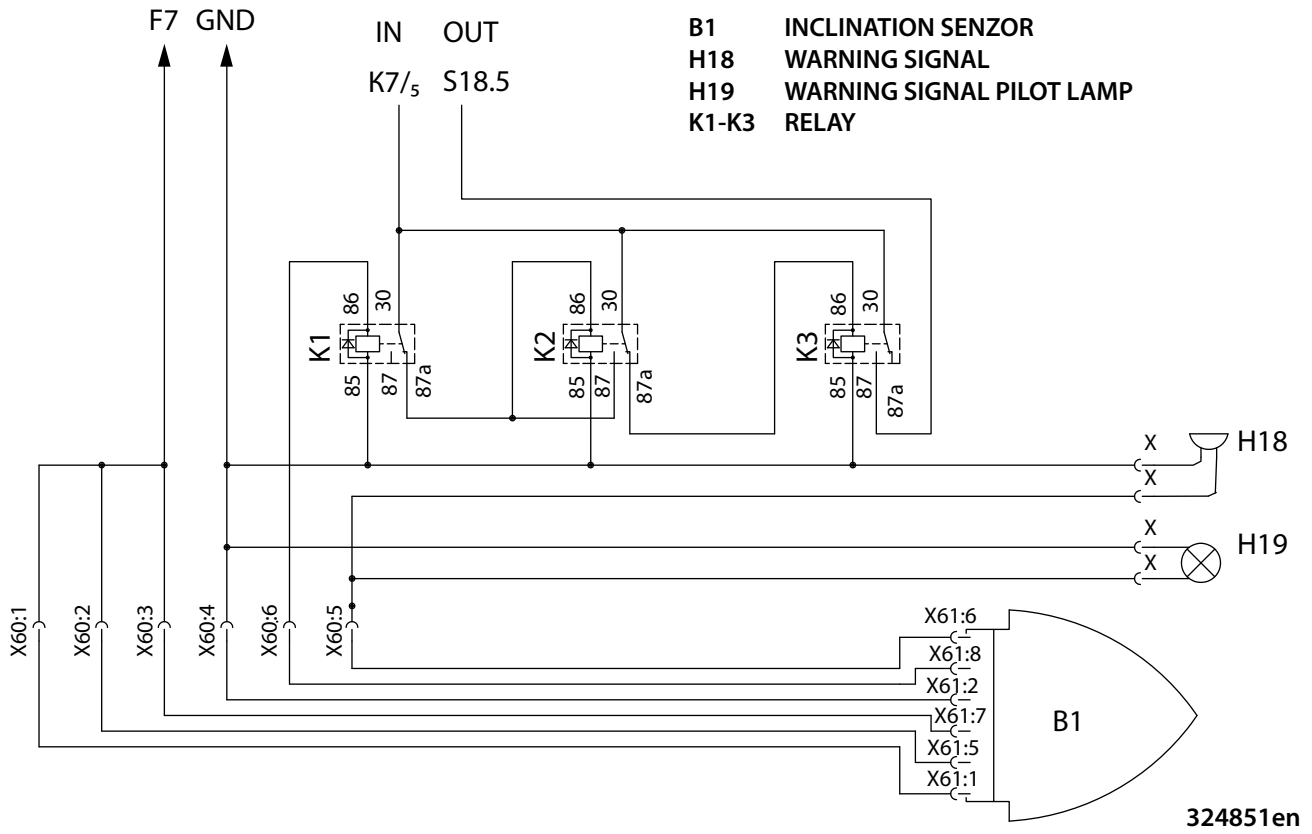
Wiring diagram

A1 - Clicker for direction-indicator lights	S3 - Ignition box
A2 - Electronics to secure travel	S4 - Front headlight switch
A3 - Travel actuator	S5 - Rear headlight switch
A4 - Multifunctional display Murphy PV - 101	S6 - Warning light switch
A5 - Step relay	S7 - Direction-indicator light change-over switch
B2 - Hydraulic oil thermometer sensor	S8 - Hazard beacon switch
B3 - Float (displacer) in fuel tank	S9 - Horn pushbutton
E1 - Hydraulics thermometer lighting	S11 - Emergency brake pushbutton
E2,3 - Front fender lights	S12 - Backing horn switch (in travel actuator)
E4,5 - Rear lamps	S13 - Neutral switch (in travel actuator)
E6,7 - Front headlights	S14 - Float (displacer) inside hydraulic oil tank
E8,9 - Rear headlights	S17 - Selector switch for operating speed preset
E10,11 - LH direction-indicator lights	S18 - Vibration selector switch
E12,13 - RH direction-indicator lights	S19 - Vibration switch (in travel actuator)
E14 - Cab lighting	S21 - Brake pressure switch
E15 - Hazard beacon	S22 - Seat switch
F1-12 - Drop-out fuses	S27 - Vacuum switch for air filter clogged
G1,2 - Batteries	S28 - Vacuum switch for hydraulic oil filter clogged
G3 - Alternator	S29 - Cab fan selector switch
H1 - Pilot lamp for direction-indicator lights	S30 - Front wiper switch
H2 - Horn	S31 - Rear wiper switch
H3 - Backing horn	S32 - Washers double pushbutton
H4 - Pilot lamp for hydraulic oil level	S33 - Heater fan selector switch
H5 - Pilot lamp for neutral	S35 - Parking brake switch
H6 - Pilot lamp for brake	S36 - Switch to reduce drum slip
H7 - Pilot lamp for vibration preset	S37 - Engine idling switch
H10 - Pilot lamp for battery recharging	S40 - RTM module switch
H11 - Pilot lamp for air filter clogged	V3 - Interlocking LED (only with Machines having cab lifting alarm)
H12 - Pilot lamp for hydraulic oil filter clogged	V4-7,14 - Interlocking LEDs
H17 - Pilot lamp for glowing (white)	V8-14 - Interference suppression diodes
K1 - Starting contactor	X2-24 - Interface connectors
K2-9 - Auxiliary relays	X27 - Socket for hazard beacon
K10 - Glowing contactor	X28-33 - Interface connectors
K11,14,15 - Auxiliary relay	X34 - Socket for engine diagnostics
M1 - Engine starter	X35-40 - J1939 Connectors
M2 - Motor for cab lifting pump	X41,45 - Interface connectors
M3 - Cab ventilation fan	Y1 - Solenoid valve for cab lifting
M4 - Front wiper	Y2 - Solenoid valve for cab lowering
M5 - Rear wiper	Y3 - Solenoid valve for bonnet lifting
M6 - Windscreen washer	Y4 - Solenoid valve for bonnet lowering
M7 - Rear glass washer	Y6 - Solenoid valve for brake
M8 - Heater fan	Y7 - Solenoid valve for fast travel - LH wheel
P2 - Hydraulic oil thermometer	Y8 - Solenoid valve for fast travel - drum
Q1 - Battery disconnecter	Y9 - Solenoid valve vibrations 1
R1,2,5 - Resistors	Y10 - Solenoid valve for vibrations 2
R3 - Engine preheating	Y11 - Solenoid valve to disengage RTM differential interlock
R4 - Engine revolution control potentiometer	Y13 - Servo valve for travel pump
S1 - Cab lifting double pushbutton	Y14 - Solenoid valve for fast travel - RH wheel
S2 - Bonnet lifting double pushbutton	



Connection of valves Y7, Y8 and Y14 for machines with wheel interlock (without RTM):

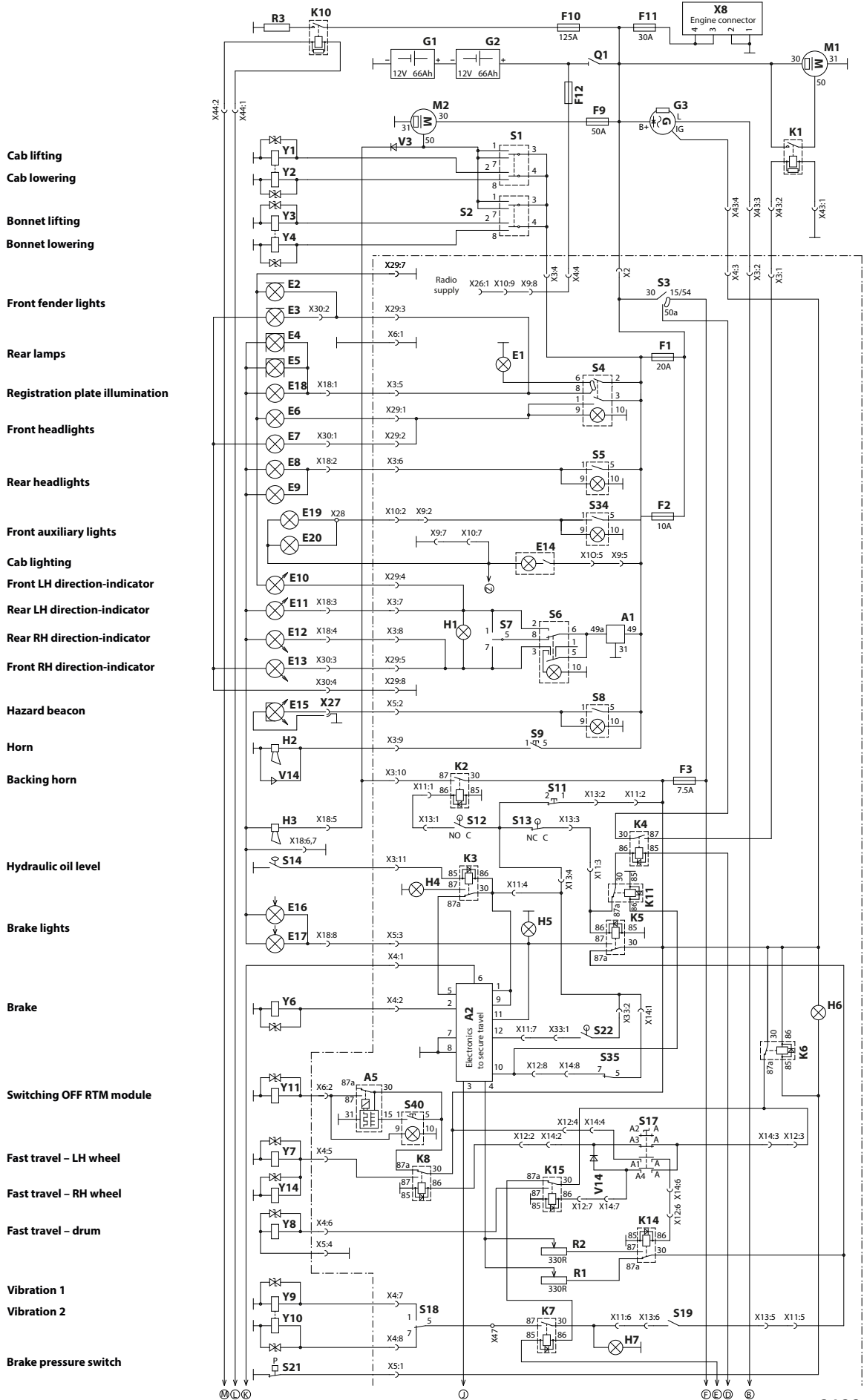




3.8. Annexes

3.8.2. Wiring diagram - road lights

- A1 - Clicker for direction-indicator lights
- A2 - Electronics to secure travel
- A3 - Travel actuator
- A4 - Multifunctional display Murphy PV - 101
- A5 - Step relay
- B2 - Hydraulic oil thermometer sensor
- B3 - Float (displacer) in fuel tank
- E1 - Hydraulics thermometer lighting
- E2,3 - Front fender lights
- E4,5 - Rear lamps
- E6,7 - Front headlights
- E8,9 - Rear headlights
- E10,11 - LH direction-indicator lights
- E12,13 - RH direction-indicator lights
- E14 - Cab lighting
- E15 - Hazard beacon
- E16,17 - Brake lights
- E18 - Registration plate lighting
- E19,20 - Front auxiliary headlights
- F1-12 - Drop-out fuses
- G1,2 - Batteries
- G3 - Alternator
- H1 - Pilot lamp for direction-indicator lights
- H2 - Horn
- H3 - Backing horn
- H4 - Pilot lamp for hydraulic oil level
- H5 - Pilot lamp for neutral
- H6 - Pilot lamp for brake
- H7 - Pilot lamp for vibration preset
- H10 - Pilot lamp for battery recharging
- H11 - Pilot lamp for air filter clogged
- H12 - Pilot lamp for hydraulic oil filter clogged
- H17 - Pilot lamp for glowing (white)
- K1 - Starting contactor
- K2-9 - Auxiliary relays
- K10 - Glowing contactor
- K11,14,15 - Auxiliary relay
- M1 - Engine starter
- M2 - Motor for cab lifting pump
- M3 - Cab ventilation fan
- M4 - Front wiper
- M5 - Rear wiper
- M6 - Windscreen washer
- M7 - Rear glass washer
- M8 - Heater fan
- P2 - Hydraulic oil thermometer
- Q1 - Battery disconnecter
- R1,2,5 - Resistors
- R3 - Engine preheating
- R4 - Engine revolution control potentiometer
- S1 - Cab lifting double pushbutton
- S2 - Bonnet lifting double pushbutton
- S3 - Ignition box
- S4 - Front headlight switch
- S5 - Rear headlight switch
- S6 - Warning light switch
- S7 - Direction-indicator light change-over switch
- S8 - Hazard beacon switch
- S9 - Horn pushbutton
- S11 - Emergency brake pushbutton
- S12 - Backing horn switch (in travel actuator)
- S13 - Neutral switch (in travel actuator)
- S14 - Float (displacer) inside hydraulic oil tank
- S17 - Selector switch for operating speed preset
- S18 - Vibration selector switch
- S19 - Vibration switch (in travel actuator)
- S21 - Brake pressure switch
- S22 - Seat switch
- S27 - Vacuum switch for air filter clogged
- S28 - Vacuum switch for hydraulic oil filter clogged
- S29 - Cab fan selector switch
- S30 - Front wiper switch
- S31 - Rear wiper switch
- S32 - Washers double pushbutton
- S33 - Heater fan selector switch
- S35 - Parking brake switch
- S34 - Auxiliary headlights switch
- S36 - Switch to reduce drum slip
- S37 - Engine idling switch
- S40 - RTM module switch
- V3 - Interlocking LED (only with Machines having cab lifting alarm)
- V4-7 - Interlocking LEDs
- V8-11 - Interference suppression diodes
- V14 - Interference suppression diodes
- X2-24 - Interface connectors
- X27 - Socket for hazard beacon
- X28-33 - Interface connectors
- X34 - Socket for engine diagnostics
- X35-40 - J1939 Connectors
- X41,45 - Interface connectors
- Y1 - Solenoid valve for cab lifting
- Y2 - Solenoid valve for cab lowering
- Y3 - Solenoid valve for bonnet lifting
- Y4 - Solenoid valve for bonnet lowering
- Y6 - Solenoid valve for brake
- Y7 - Solenoid valve for fast travel - LH wheel
- Y8 - Solenoid valve for fast travel - drum
- Y9 - Solenoid valve vibrations 1
- Y10 - Solenoid valve for vibrations 2
- Y11 - Solenoid valve to disengage RTM differential interlock
- Y13 - Servo valve for travel pump
- Y14 - Solenoid valve for fast travel - RH wheel

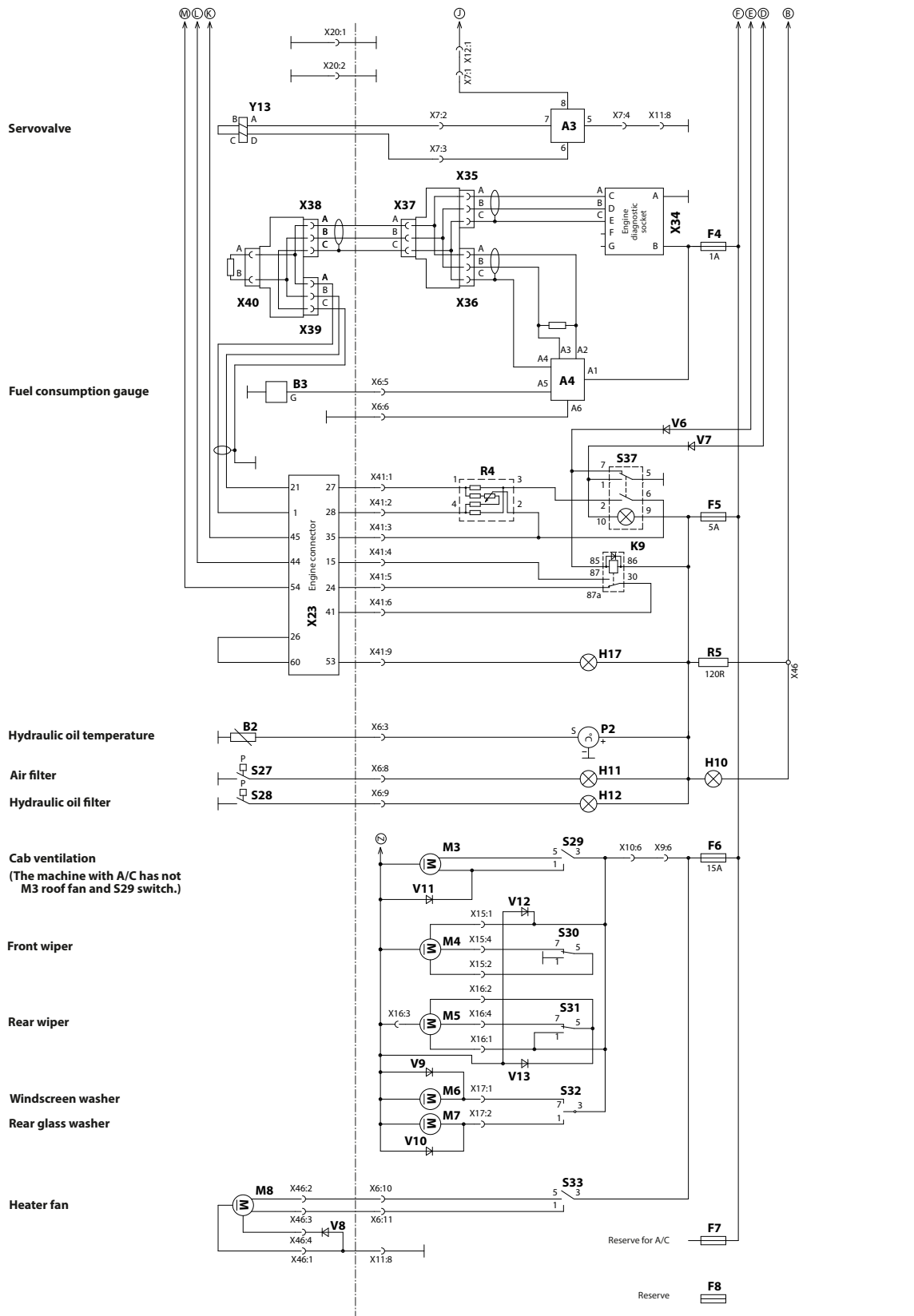


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3.8. Annexes

Wiring diagram - road lights

- A1 - Clicker for direction-indicator lights
- A2 - Electronics to secure travel
- A3 - Travel actuator
- A4 - Multifunctional display Murphy PV - 101
- A5 - Step relay
- B2 - Hydraulic oil thermometer sensor
- B3 - Float (displacer) in fuel tank
- E1 - Hydraulics thermometer lighting
- E2,3 - Front fender lights
- E4,5 - Rear lamps
- E6,7 - Front headlights
- E8,9 - Rear headlights
- E10,11 - LH direction-indicator lights
- E12,13 - RH direction-indicator lights
- E14 - Cab lighting
- E15 - Hazard beacon
- E16,17 - Brake lights
- E18 - Registration plate lighting
- E19,20 - Front auxiliary headlights
- F1-12 - Drop-out fuses
- G1,2 - Batteries
- G3 - Alternator
- H1 - Pilot lamp for direction-indicator lights
- H2 - Horn
- H3 - Backing horn
- H4 - Pilot lamp for hydraulic oil level
- H5 - Pilot lamp for neutral
- H6 - Pilot lamp for brake
- H7 - Pilot lamp for vibration preset
- H10 - Pilot lamp for battery recharging
- H11 - Pilot lamp for air filter clogged
- H12 - Pilot lamp for hydraulic oil filter clogged
- H17 - Pilot lamp for glowing (white)
- K1 - Starting contactor
- K2-9 - Auxiliary relays
- K10 - Glowing contactor
- K11,14,15 - Auxiliary relay
- M1 - Engine starter
- M2 - Motor for cab lifting pump
- M3 - Cab ventilation fan
- M4 - Front wiper
- M5 - Rear wiper
- M6 - Windscreen washer
- M7 - Rear glass washer
- M8 - Heater fan
- P2 - Hydraulic oil thermometer
- Q1 - Battery disconnecter
- R1,2,5 - Resistors
- R3 - Engine preheating
- R4 - Engine revolution control potentiometer
- S1 - Cab lifting double pushbutton
- S2 - Bonnet lifting double pushbutton
- S3 - Ignition box
- S4 - Front headlight switch
- S5 - Rear headlight switch
- S6 - Warning light switch
- S7 - Direction-indicator light change-over switch
- S8 - Hazard beacon switch
- S9 - Horn pushbutton
- S11 - Emergency brake pushbutton
- S12 - Backing horn switch (in travel actuator)
- S13 - Neutral switch (in travel actuator)
- S14 - Float (displacer) inside hydraulic oil tank
- S17 - Selector switch for operating speed preset
- S18 - Vibration selector switch
- S19 - Vibration switch (in travel actuator)
- S21 - Brake pressure switch
- S22 - Seat switch
- S27 - Vacuum switch for air filter clogged
- S28 - Vacuum switch for hydraulic oil filter clogged
- S29 - Cab fan selector switch
- S30 - Front wiper switch
- S31 - Rear wiper switch
- S32 - Washers double pushbutton
- S33 - Heater fan selector switch
- S35 - Parking brake switch
- S34 - Auxiliary headlights switch
- S36 - Switch to reduce drum slip
- S37 - Engine idling switch
- S40 - RTM module switch
- V3 - Interlocking LED (only with Machines having cab lifting alarm)
- V4-7 - Interlocking LEDs
- V8-11 - Interference suppression diodes
- V14 - Interference suppression diodes
- X2-24 - Interface connectors
- X27 - Socket for hazard beacon
- X28-33 - Interface connectors
- X34 - Socket for engine diagnostics
- X35-40 - J1939 Connectors
- X41,45 - Interface connectors
- Y1 - Solenoid valve for cab lifting
- Y2 - Solenoid valve for cab lowering
- Y3 - Solenoid valve for bonnet lifting
- Y4 - Solenoid valve for bonnet lowering
- Y6 - Solenoid valve for brake
- Y7 - Solenoid valve for fast travel - LH wheel
- Y8 - Solenoid valve for fast travel - drum
- Y9 - Solenoid valve vibrations 1
- Y10 - Solenoid valve for vibrations 2
- Y11 - Solenoid valve to disengage RTM differential interlock
- Y13 - Servo valve for travel pump
- Y14 - Solenoid valve for fast travel - RH wheel

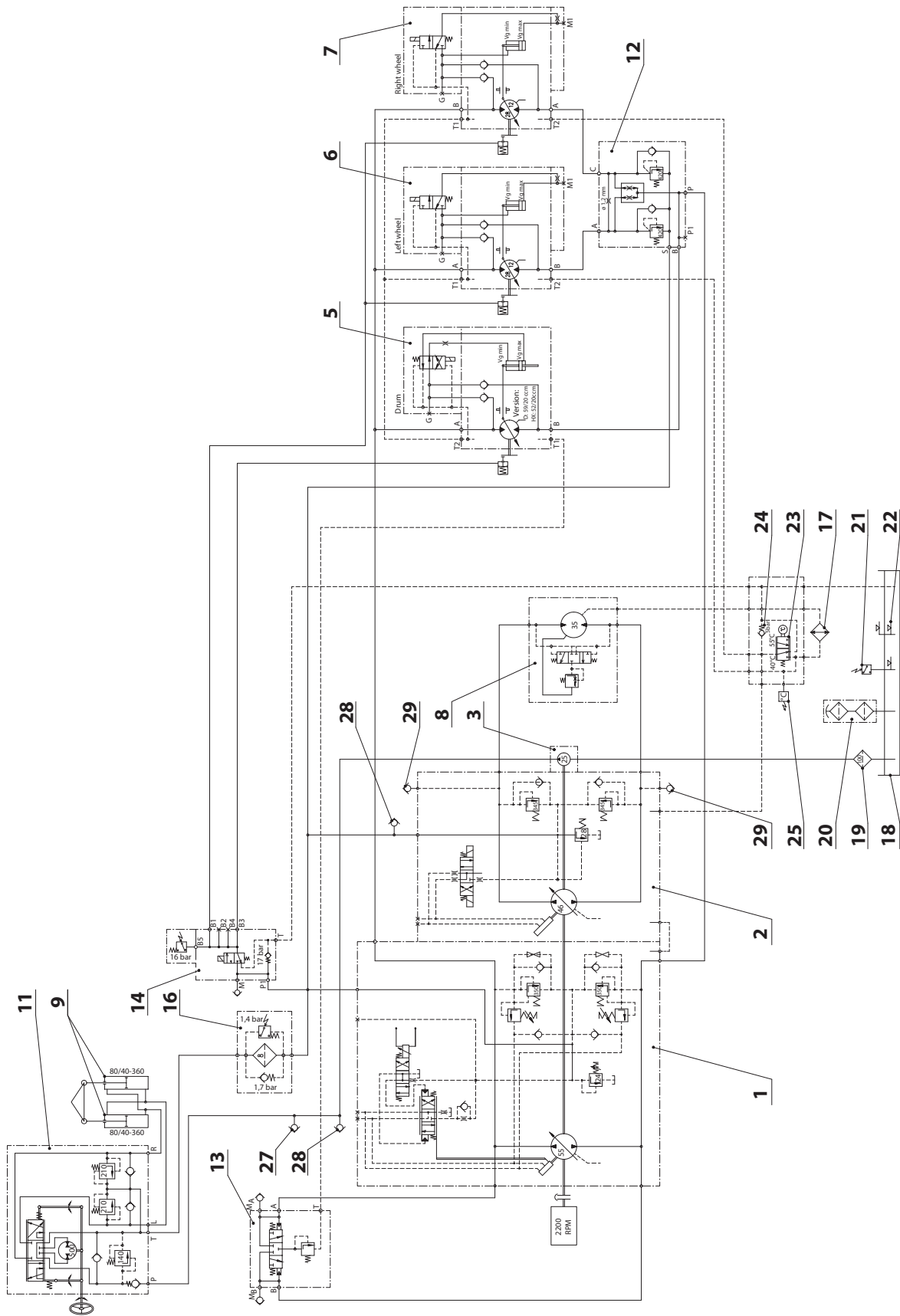


3.8. Annexes

3.8.3. Hydraulic system diagram - INTER - Wheel differential lock

Legend:

- 1 - Travel pump
- 2 - Vibration pump
- 3 - Steering pump
- 5 - Drum travel hydraulic motor
- 6 - Wheel travel hydraulic motor
- 7 - Wheel travel hydraulic motor
- 8 - Vibration hydraulic motor
- 9 - Steering hydraulic motor
- 11 - Power steering
- 12 - Flow divider block
- 13 - Flushing block
- 14 - Brake block
- 16 - Hydraulic filter
- 17 - Cooler
- 18 - Hydraulic tank
- 19 - Suction strainer
- 20 - Filling neck
- 21 - Level indicator
- 22 - Oil level indicator
- 23 - Thermoregulator
- 24 - One-way valve (check valve)
- 25 - Hydraulic oil temperature sensor
- 27 - Filling quick coupler
- 28 - Measuring quick coupler
- 29 - Measuring quick coupler



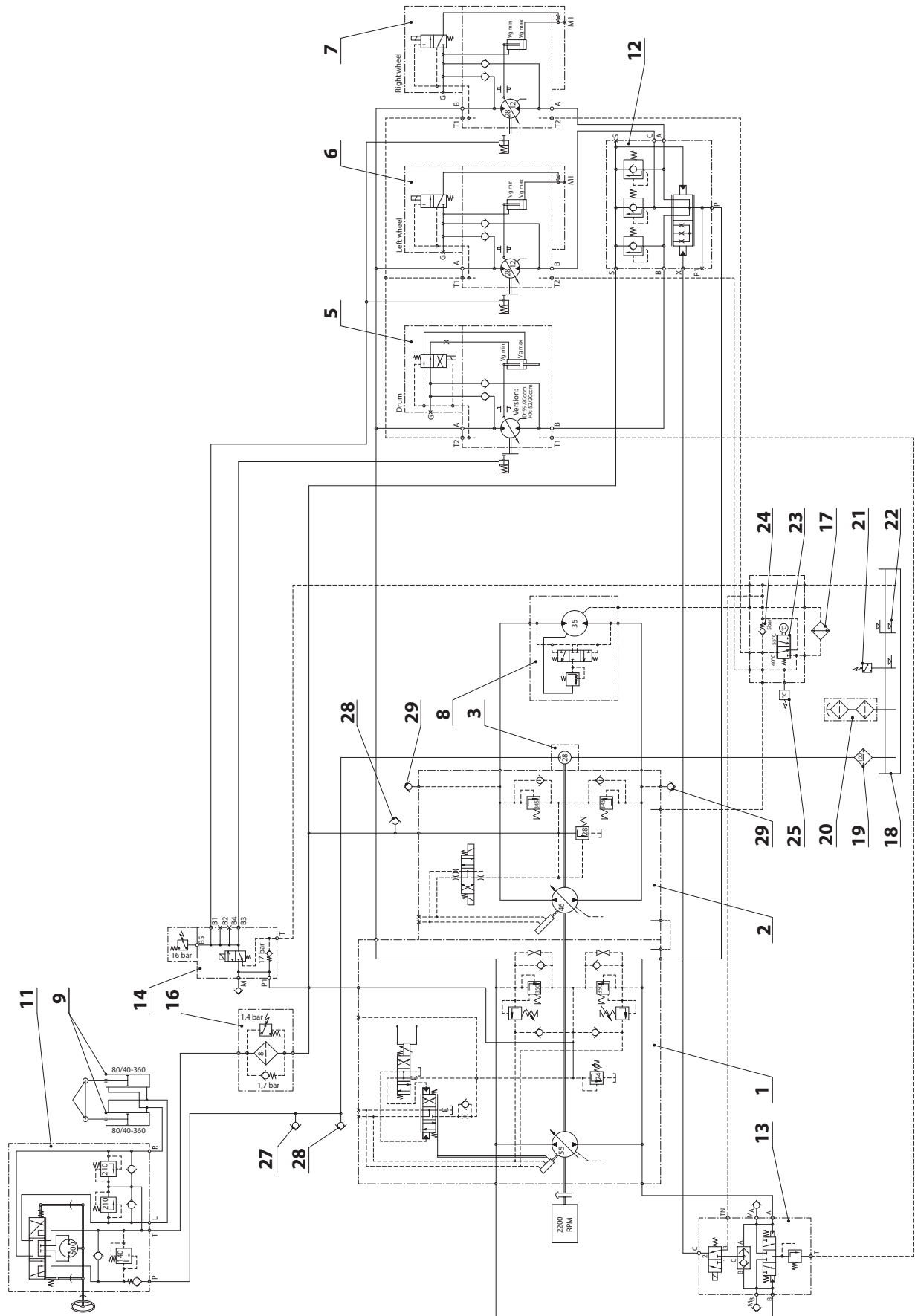
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3.8. Annexes

3.8.4. Hydraulic system diagram - Interaxle differential lock ATC

Legend:

- 1 - Travel pump
- 2 - Vibration pump
- 3 - Steering pump
- 5 - Drum travel hydraulic motor
- 6 - Wheel travel hydraulic motor
- 7 - Wheel travel hydraulic motor
- 8 - Vibration hydraulic motor
- 9 - Steering hydraulic motor
- 11 - Power steering
- 12 - Flow divider block
- 13 - Flushing block and RTM control
- 14 - Brake block
- 16 - Hydraulic filter
- 17 - Cooler
- 18 - Hydraulic tank
- 19 - Suction strainer
- 20 - Filling neck
- 21 - Level indicator
- 22 - Oil level indicator
- 23 - Thermoregulator
- 24 - One-way valve (check valve)
- 25 - Hydraulic oil temperature sensor
- 27 - Filling quick coupler
- 28 - Measuring quick coupler
- 29 - Measuring quick coupler



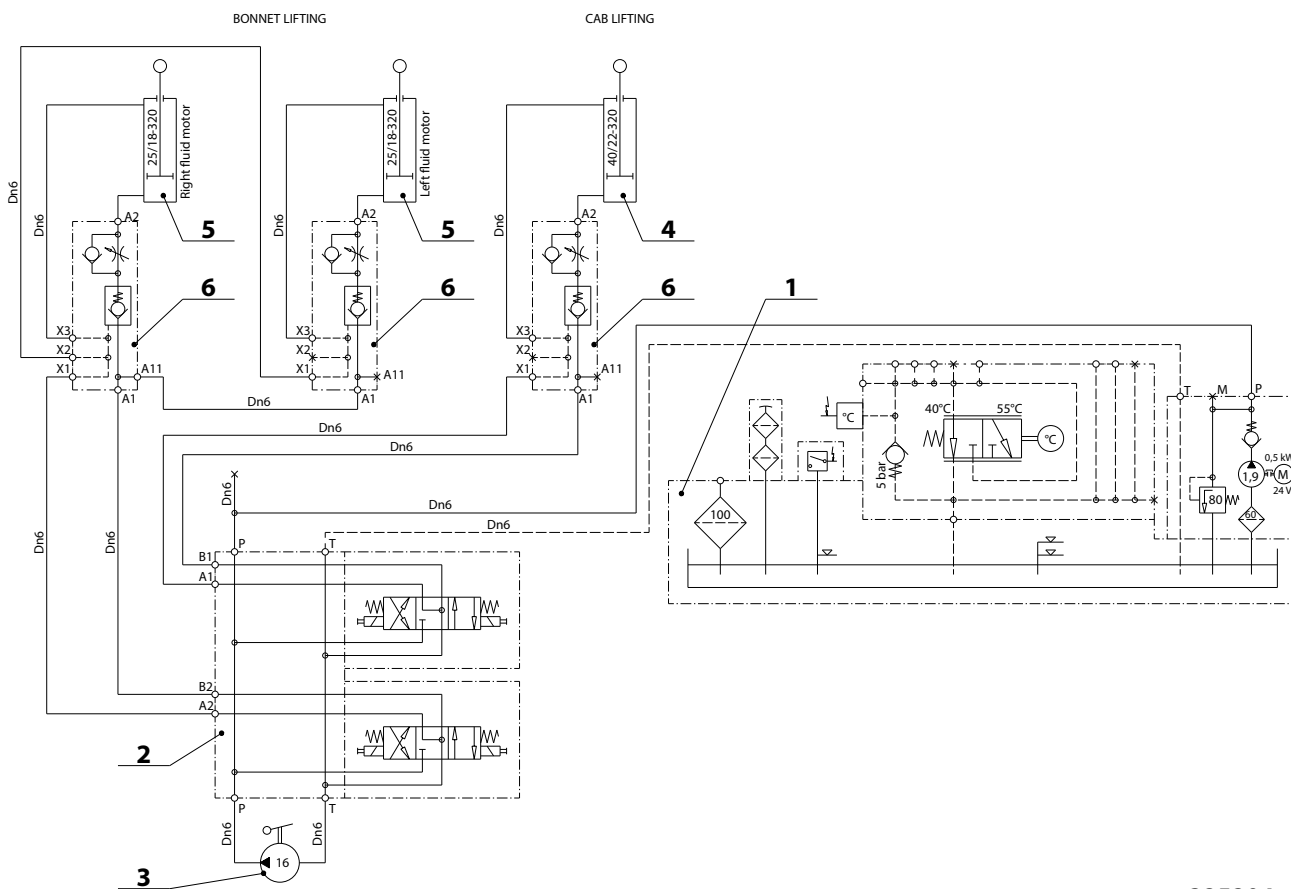
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3.8. Annexes

3.8.5. Hydraulic system diagram - electro-hydraulic cab and bonnet lifting

Legend:

- 1 - Hydraulic tank
- 2 - Lifting block
- 3 - Hand pump
- 4 - Fluid motor for cab lifting
- 5 - Fluid motor for bonnet lifting
- 6 - Hydraulic lock

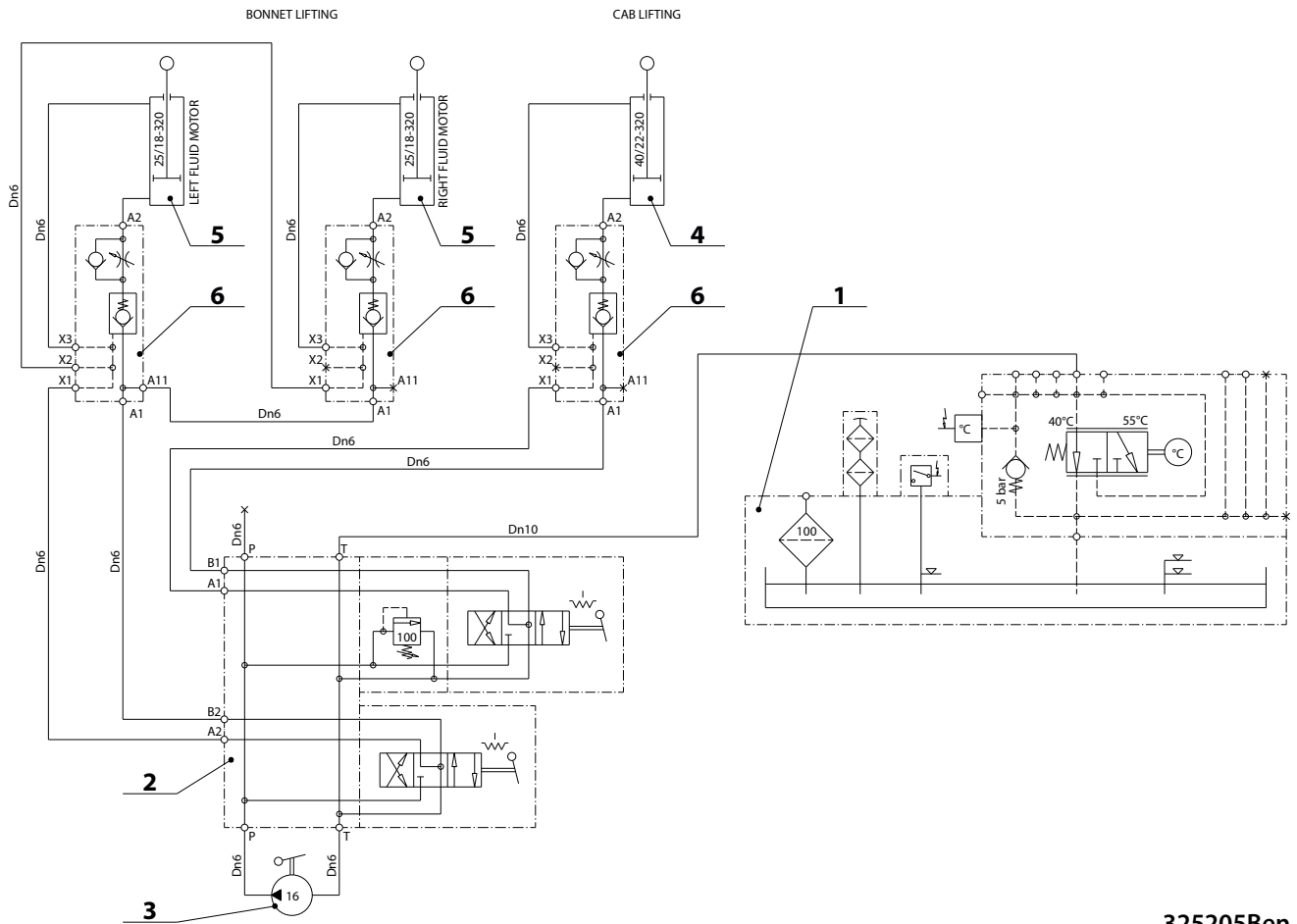


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3.8.6. Hydraulic system diagram - manual cab and bonnet lifting

Legend:

- 1 - Hydraulic tank
- 2 - Lifting block
- 3 - Hand pump
- 4 - Fluid motor for cab lifting
- 5 - Fluid motor for bonnet lifting
- 6 - Hydraulic lock



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3.8. Annexes

3.8.7. Table of spare parts

Chapter	Spare part	Order No.
Every 20 hours of operation (daily)		
3.6.5.	Cog belt	4-9501000306
3.6.6.	Dust valve	1-952454
Every 250 hours of operation (3 months)		
3.6.9.	Engine oil filter	4-9501000307
Every 500 hours of operation (6 months)		
3.6.16.	Fuel filter	4-9501000308
3.6.16.	Fuel filter	1194061
3.6.17.	Air filter element	4-5358520127
3.6.17.	Air filter element	4-5358520128
3.6.17.	Dust valve	1-952454
3.6.18.	Filter element	4-613780
3.6.18.	Filter element	4-612044
3.6.21.	Air-conditioning filter	4-8300750677
Every 1000 hours of operation (1 year)		
3.6.23.	Cog belt	4-9501000306
3.6.25.	Belt	1230933
3.6.26.	Rubber metal	4-9200000030
3.6.26.	Rubber metal	4-6120080016
3.6.26.	Rubber metal	1160052
3.6.26.	Rubber metal	4-444436
3.6.26.	Rubber metal	4-9200000062

Every 2000 hours of operation (2 years)		
3.6.29.	Water separator	1230555
3.6.30.	Suction strainer	4-5451050018
3.6.30.	Sealing tape	4-690219
3.6.30.	Temperature sensor	4-5503580072
3.6.30.	Filter cartridge	4-5358520121
3.6.30.	Hydraulic unit 230 V	1251998
3.6.30.	Hydraulic unit 110 V	1255297
3.6.30.	Breather filter	1405919
3.6.31.	Suction filter	1270762
3.6.31.	O-ring	1258804

Content of the set of filters after 500 operating hours (4-760006)

Chapter	Spare part	Number of parts	Order No.
3.6.9.	Engine oil filter	1	4-9501000307
3.6.16.	Fuel filter	1	4-9501000308
3.6.16.	Fuel filter	1	1194061
3.6.17.	Air filter element	1	4-5358520127
3.6.17.	Air filter element	1	4-5358520128
3.6.18.	Filter element	1	4-613780
3.6.18.	Filter element	2	4-612044

3.8. Annexes

Content of the set of filters after 2000 operating hours (4-760107)

Chapter	Spare part	Number of parts	Order No.
3.6.9.	Engine oil filter	1	4-9501000307
3.6.16.	Fuel filter	1	4-9501000308
3.6.16.	Fuel filter	1	1194061
3.6.17.	Air filter element	1	4-5358520127
3.6.17.	Air filter element	1	4-5358520128
3.6.18.	Filter element	1	4-613780
3.6.18.	Filter element	2	4-612044
3.6.30.	Filter element	1	4-5358520121
3.6.30.	Breather filter	1	1405919

Notes

For additional product information
and services please visit:
www.ammann.com