Operating manual

E

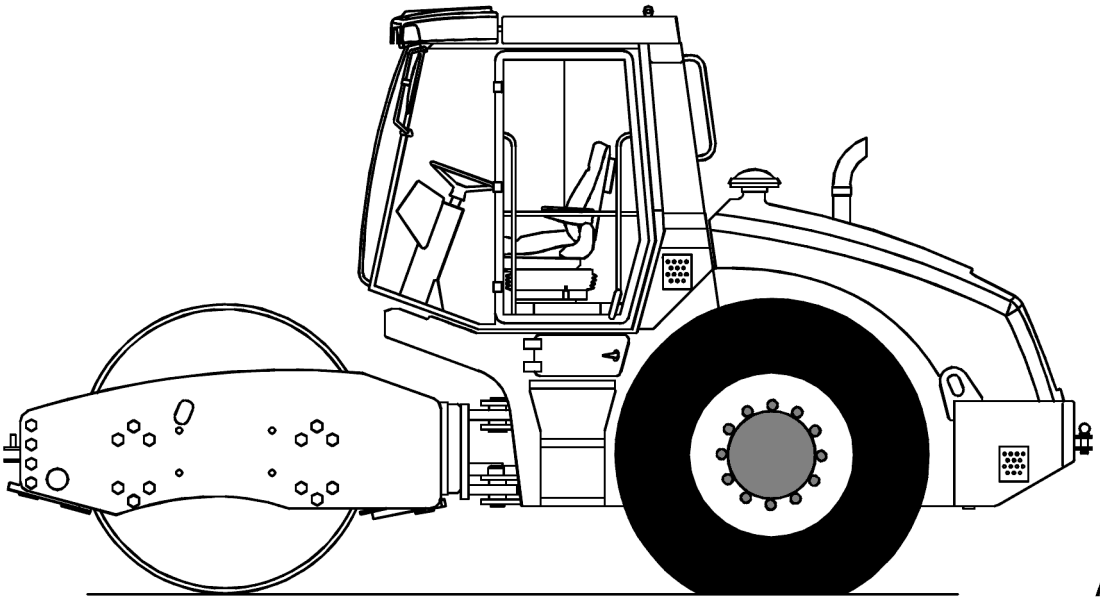
AMMANN

ASC 110 / ASC 150
Cummins Tier II

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
☎ + 420 491 476 111 | Fax + 420 491 470 215 | info@ammann-group.cz | www.ammann-group.cz



ASC001

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.

Spare parts must meet AMMANN technical specifications. These requirements are fulfilled if only original AMMANN spare parts are used.

These instructions must always be kept available on the equipment.

EC DECLARATION OF CONFORMITY

EG – KONFORMITÄTSERKLÄRUNG / DECLARATION DE CONFORMITE CE
DICHIARAZIONE CE DI CONFORMITA / DECLARACION CE DE CONFORMIDAD
DECLARAÇÃO CE DE CONFORMIDADE/ ES PROHLÁŠENÍ O SHODĚ

in accordance with EC Directives 98/37/EC and 2000/14/EC

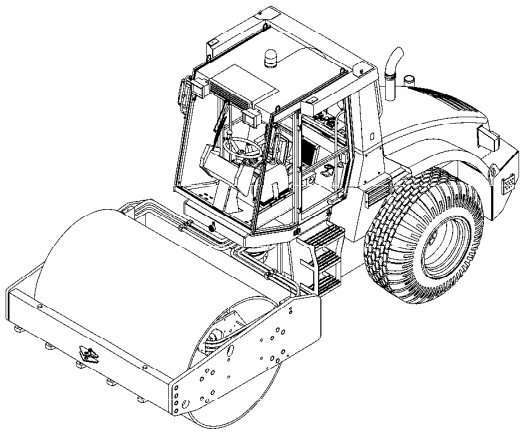
I	**Category /** Art / Catégorie / Categoria / Tipo / Categoria / Název	**Single drum roller**
II	**Make (Type)** / Hersteller (Typ) / Marque (Type) / Marca (Tipo) / Marca (Codice) / Marca (Tipo) / Značka (Typ)	**AMMANN** **ASC 110 / ASC 150** **S/N:**
III	**Measured sound power level** / gemessener Schalleistungspegel / niveau de puissance acoustiyue mesure / livello di potenza sonora rilevato / nivel de potencia acústica medido / Nivel de potência sonora midido / naměřená hladina akustického výkonu	**L_{WA} = 107 dB (A)**
IV	**Guaranteed sound power level** /garantierter Schalleistungspegel / niveau de puisance acoustique garanti / livello di potenza sonora garantito / nivel de potencia acustica garantizado / Nivel sonoro garantido/ garantovaná hladina akustického výkonu	**L_{WA} = 108 dB (A)**
V	**Notified body involved** / beteiligte Zertifizierungsstelle / de l´organisme notifié / dell`organismo notificato che l´ha effettuata / dirección del organismo notificado que haya intervenido / organismo notificado envolvido/ zúčastněná notifikovaná osoba	**SZZPLS, a.s.** **Třanovského 622/11** **163 04 Praha 6** **Czech Republic** **Notified body 1016**
VI	**Conformity assessment procedure followed** / Konformitäts-Bewertungsverfahren / la procédure appliquée pour l`éevaluation de la conformté et / procedura di valutazione della conformità / procedimiento de evaluación de la conformidad / procedimento de avaliação de conformidade/ použitý postup posuzování shody	**internal control of production according to Annex VI Directive 2000/14/EC**

has been produced in accordance with following standards / ist in Übereinstimmung mit folgenden Richtlinien hergestellt worden / est produit conforme aux dispositions des directives europeenes ci-apres / ha sido fabricado en conformidad con las siguienter normas / é stato fabbricato in conformità alle sequenti norme / é fabricado conforme as seguintes normas / byl vyroben v souladu s následujícími směrnicemi a normami

98/37/EC	Machinery Directive of the European Parliament and of the Council of 22 June 1998
89/336/EEC	EMC Directive of the Council of 3 May 1989
2000/14/EC	Noise emission Directive of the European Parliament and of the Council of 8 May 2000
97/68/EC	Emissions Directive of the European Parliament and of the Council of 16 December 1997
EN 500-1	Mobile road construction machinery - Safety Part 1: Common requirements
EN 500-4	Mobile road construction machinery - Safety Part 4: Specific requirements for compaction machines

File certificate carefully / Bescheinigung bitte sorgfältig aufbewahren / Conserver certificat soigneusement / Conservar certificado cuidadosamente / Pregasi conservare accuratamente certificato / Conservar o certificado com cuidado / Prohlášení o shodě pečlivě uschovejte.

Nové Město nad Metují, 02.05.2006.



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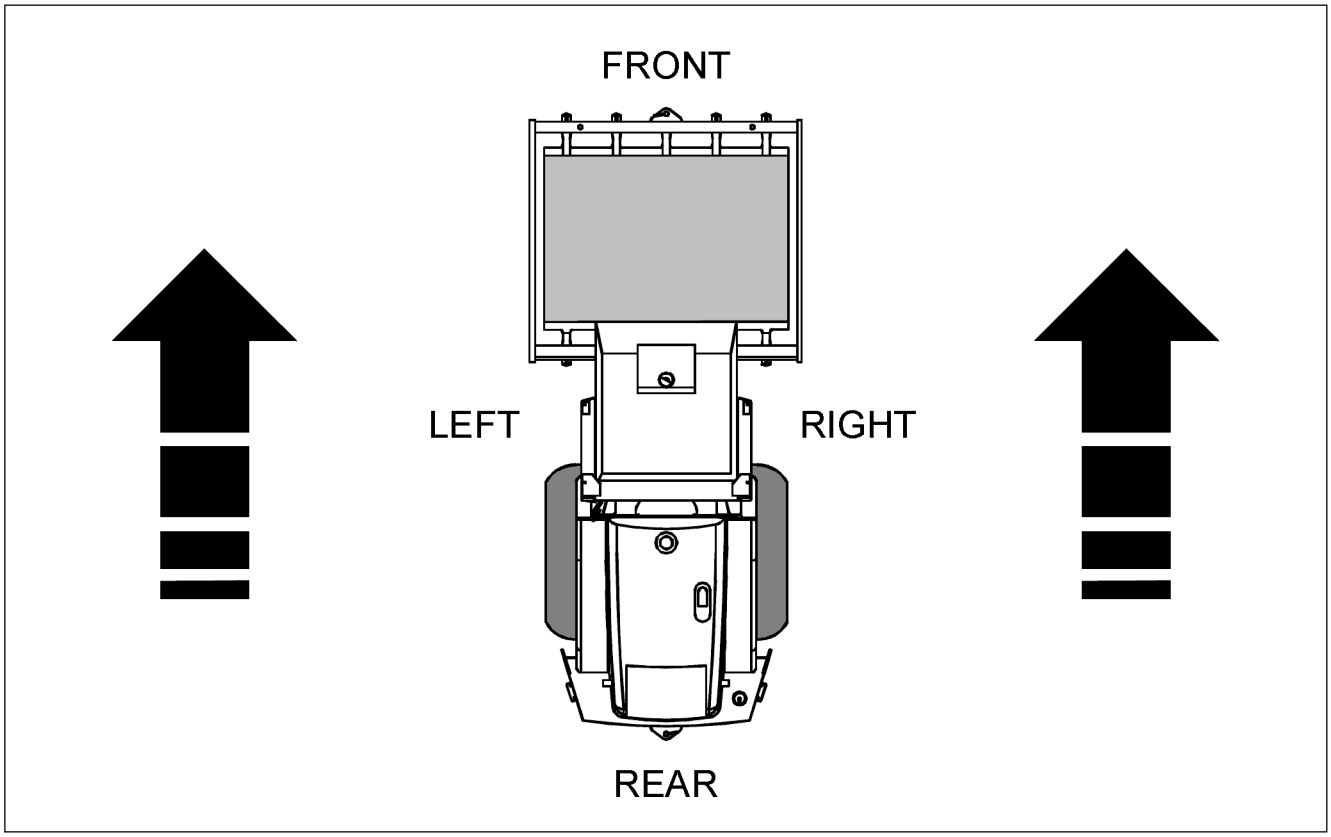
Quality Control Manager

Ammann Czech Republic a.s.
Náchodská 145
549 01 Nové Město nad Metují
Czech Republic
phone: +420 491 476 111, fax: +420 491 470 215
E-mail:. info@ammann-group.cz
internet: http:// www.ammann-group.cz

! NOTICE !

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



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CONTENT:

CONTENT:

1. SPECIFICATION MANUAL

ASC 110
ASC 150

Introduction

Single drum vibratory rollers of line ASC 110, ASC 150 are outstanding by their up-to-date design, adopted technologies, as well as modern styling. These machines offer maximal comfort to the operator, are easy to operate, extremely reliable and require minimal maintenance. The utilized frequency, amplitude and centrifugal force of vibration were optimized by means of compaction tests to reach extra high compaction effect on various materials.

Application Range

The vibratory rollers of ASC 110, ASC 150 line are especially suitable for use at mid- and large compaction jobs of highway construction (construction of highways, railways, airports), hydraulic construction (earth dams) and civil engineering (industrial areas, ports etc.).
The rollers are designated for operation under conditions as according to IEC 721-2-1 (038900): WT, WDr, MWDr (i.e. moderate, warm dry, hot dry) with temperature limits from -15°C (5°F) to +45°C (113°F).

Modifications

The single drum vibratory roller ASC 110 D with the smooth drum is suitable for compaction of all kinds of soil. It can be employed at compaction of clayey soils up to the layer thickness (compacted) of 25 cm (9,8 in), loam soils up to the layer thickness of 40 cm (15,7 in), mixed soils up to the layer thickness of 50 cm (19,7 in), sandy soils and rockfills up to the layer thickness of 80 cm (31,4 in), gravels up to the layer thickness of 60 cm (23,6 in). Maximal allowed grain size is up to 2/3 of total layer thickness. The roller is suitable for compaction of stabilized soils as well.

The padfoot roller ASC 110 PD (where the vibratory and masticating effect act simultaneously) is suitable mainly for compaction of clayey soils up to the layer thickness (compacted) of 30 cm (11,8 in), loam soils up to the layer thickness of 40 cm (15,7 in), and mixed soils up to the layer thickness of 50 cm (19,7 in).

The single drum vibratory roller ASC 150 D with the smooth drum is suitable for compaction of all kinds of soil. It can be employed at compaction of clayey soils up to the layer thickness (compacted) of 30 cm (11,8 in), loam soils up to the layer thickness of 50 cm (19,7 in), mixed soils up to the layer thickness of 70 cm (27,5 in), sandy soils and rockfills up to the layer thickness of 120 cm (47,2 in), gravels up to the layer thickness of 80 cm (31,4 in). Maximal allowed grain size is up to 2/3 of total layer thickness. The roller is suitable for compaction of stabilized soils as well.

The padfoot roller ASC 150 PD (where the vibratory and masticating effect act simultaneously) is suitable mainly for compaction of clayey soils up to the layer thickness (compacted) of 35 cm (13,7 in), loam soils up to the layer thickness of 50 cm (19,7 in), and mixed soils up to the layer thickness of 70 cm (27,5 in).

Vibratory roller ASC 110/150 HD with increased traction force - smooth drum.

Vibratory roller ASC 110/150 HDPD with increased traction force – padded drum.

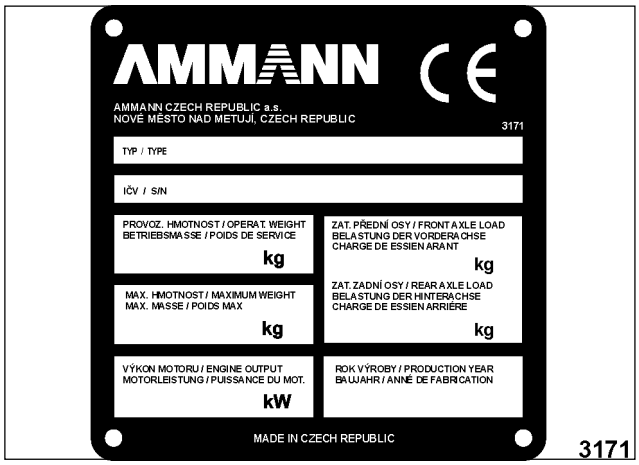
Vibratory roller ASC 110/150 HT for permanently hard conditions and on slopes above 30% - smooth drum.

Vibratory roller ASC 110/150 HTPD for permanently hard conditions and on slopes above 30% - padded drum.

Vibratory roller ASC 110/150 PDB with padded drum and a blade for material spread. Blade is optional per order.

The machine meets the requirements for “CE” mark and the requirements due to the law no. 22/1997 Sb. (i.e. CSN EN 500-1,4 and next) for the Czech Republic and Directive 2000/14/EC (EN ISO 3744).
In the course of proposal has been respected requierements of international norms for hygiene, ergonomi and safety. The machine fulfil conditions for „CE“ mark.

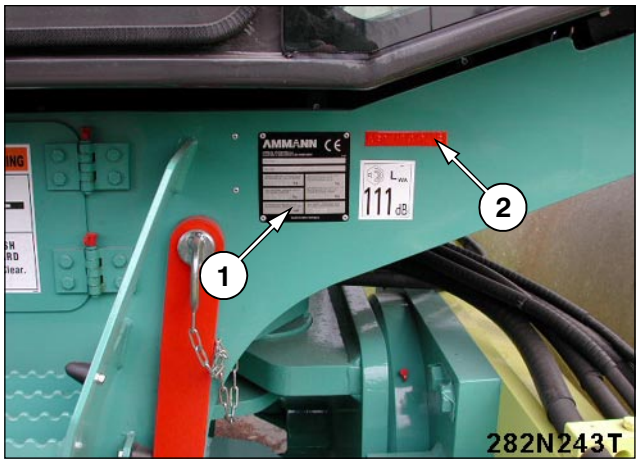
Pin label - CE

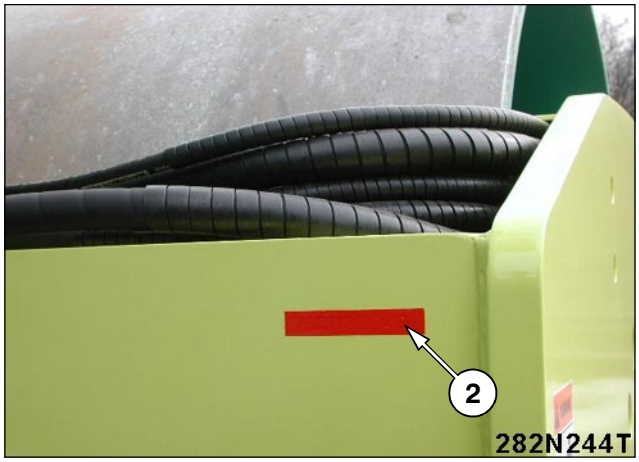


The machine which does not meet requirements according to „CE“ specification there is not „CE“ mark.

Pin label

Location of the decal at the machine





1 - Decal
2 - Frame number

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

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

.....

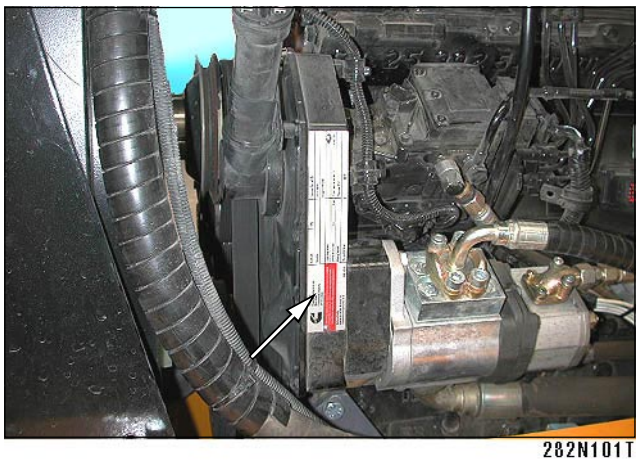
Type of engine

.....

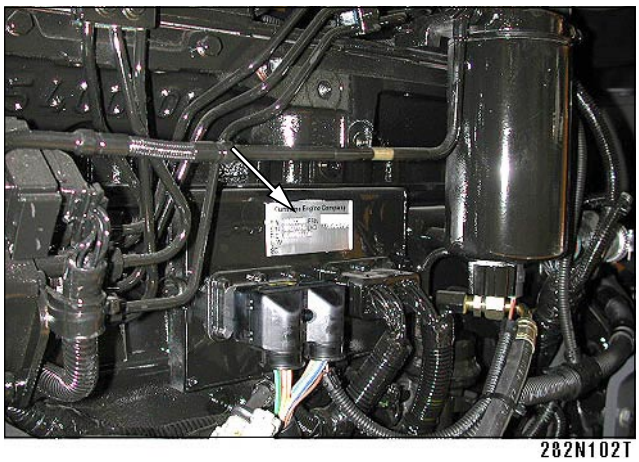
Serial number of the engine

.....

Serial number of the CUMMINS engine

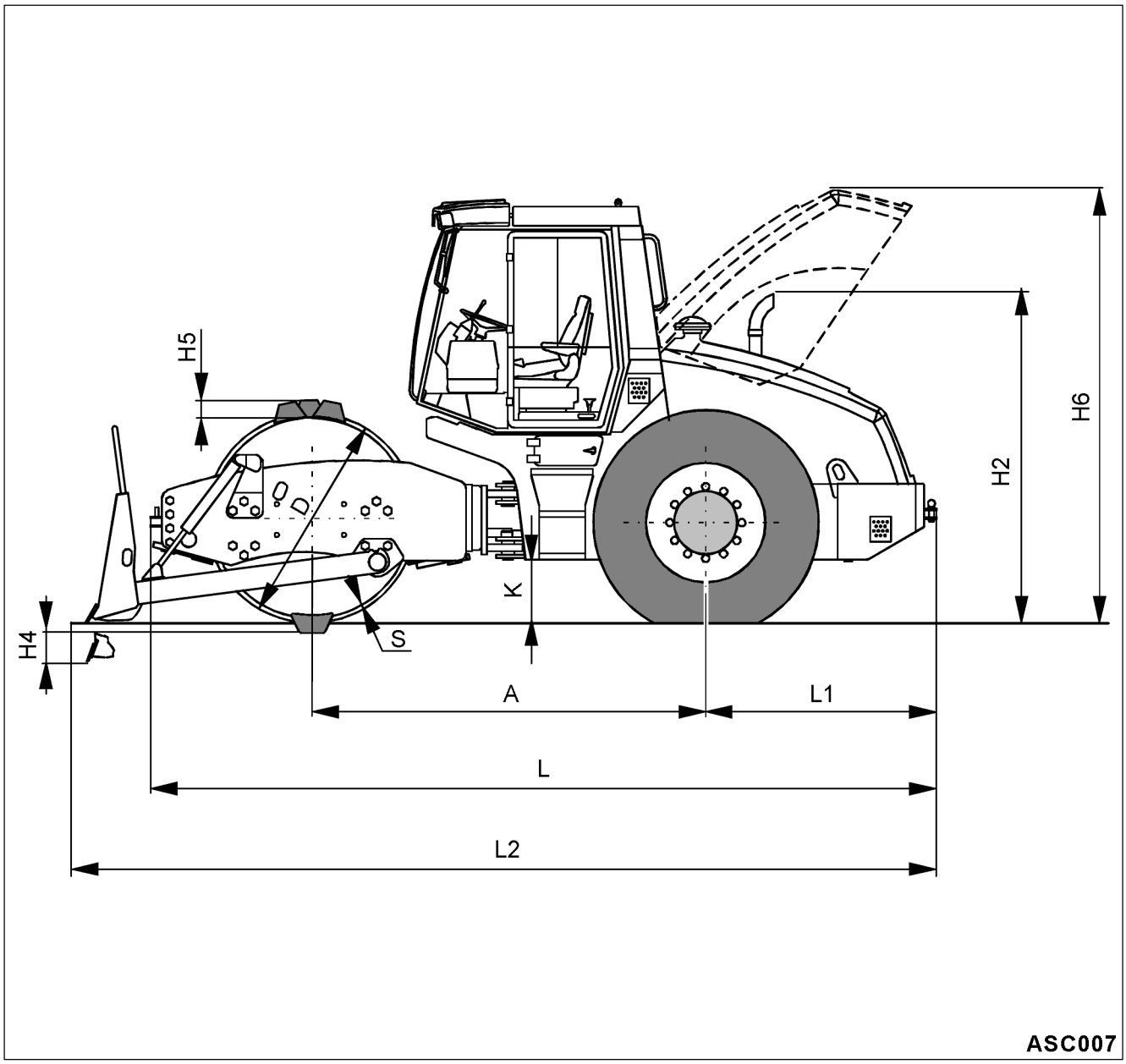


Serial number of the CUMMINS engine



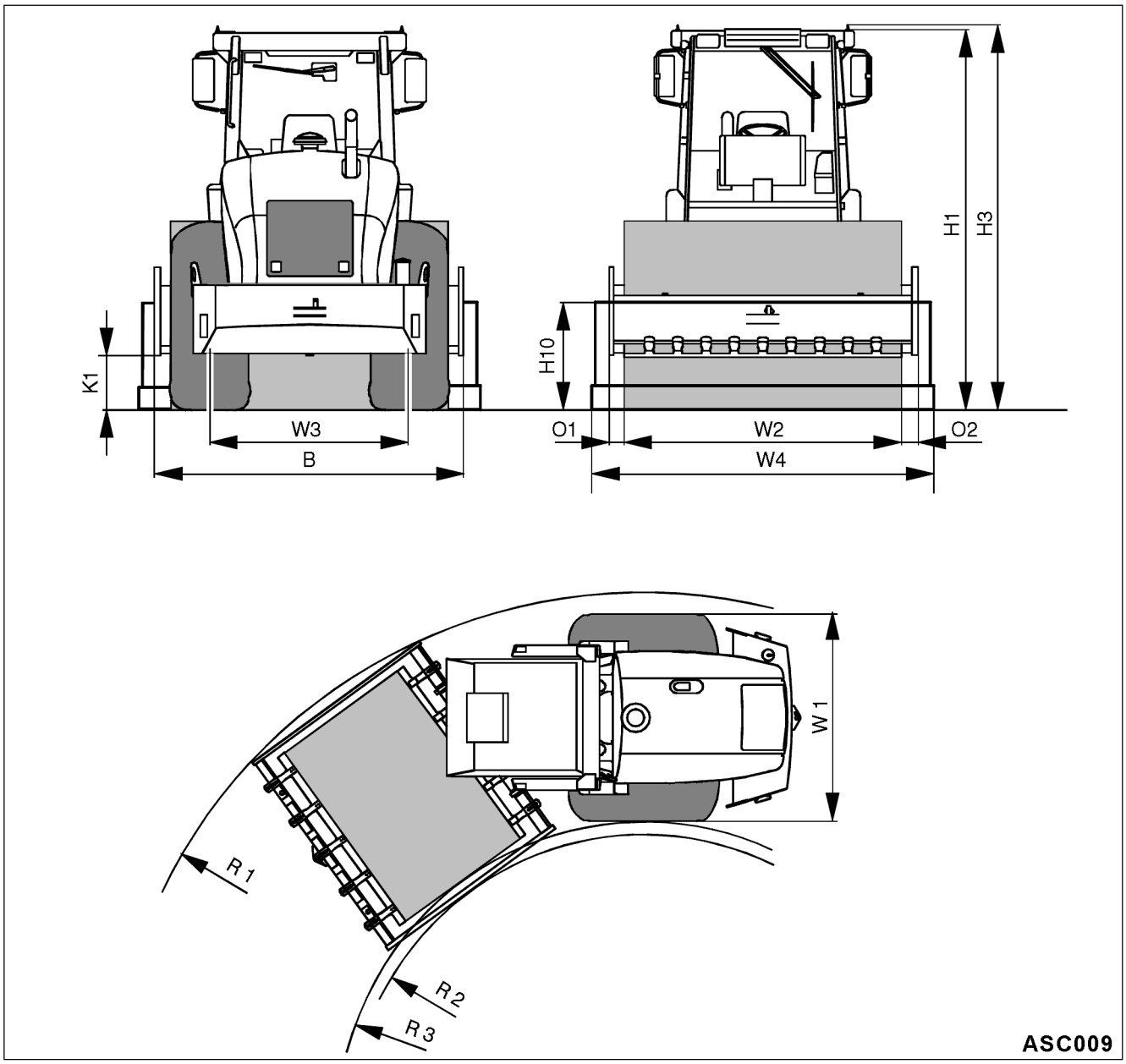
1.2. Dimension Chart

Dimension Chart of the Machine ASC 110 (with cab and ROPS frame)



mm (in)	A	B	D	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	K
ASC 110 D	2820	2436	1500	3000	2375	3150	-	-	3540	2400	2265	3050	-	420
	(111,0)	(95,9)	(59,0)	(118,1)	(93,5)	(124)	(-)	(-)	(139,4)	(94,5)	(89,2)	(120,1)	(-)	(16,5)
ASC 110 PD	2820	2436	1440	3000	2375	3150	-	100	3540	2400	2265	3050	-	420
	(111,0)	(95,9)	(56,7)	(118,1)	(93,5)	(124)	(-)	(3,9)	(139,4)	(94,5)	(89,2)	(120,1)	(-)	(16,5)
ASC 110 PDB	2820	2436	1440	3000	2375	3150	277	100	3540	2400	2265	3050	916	420
	(111,0)	(95,9)	(56,7)	(118,1)	(93,5)	(124)	(10,9)	(3,9)	(139,4)	(94,5)	(89,2)	(120,1)	(36,1)	(16,5)

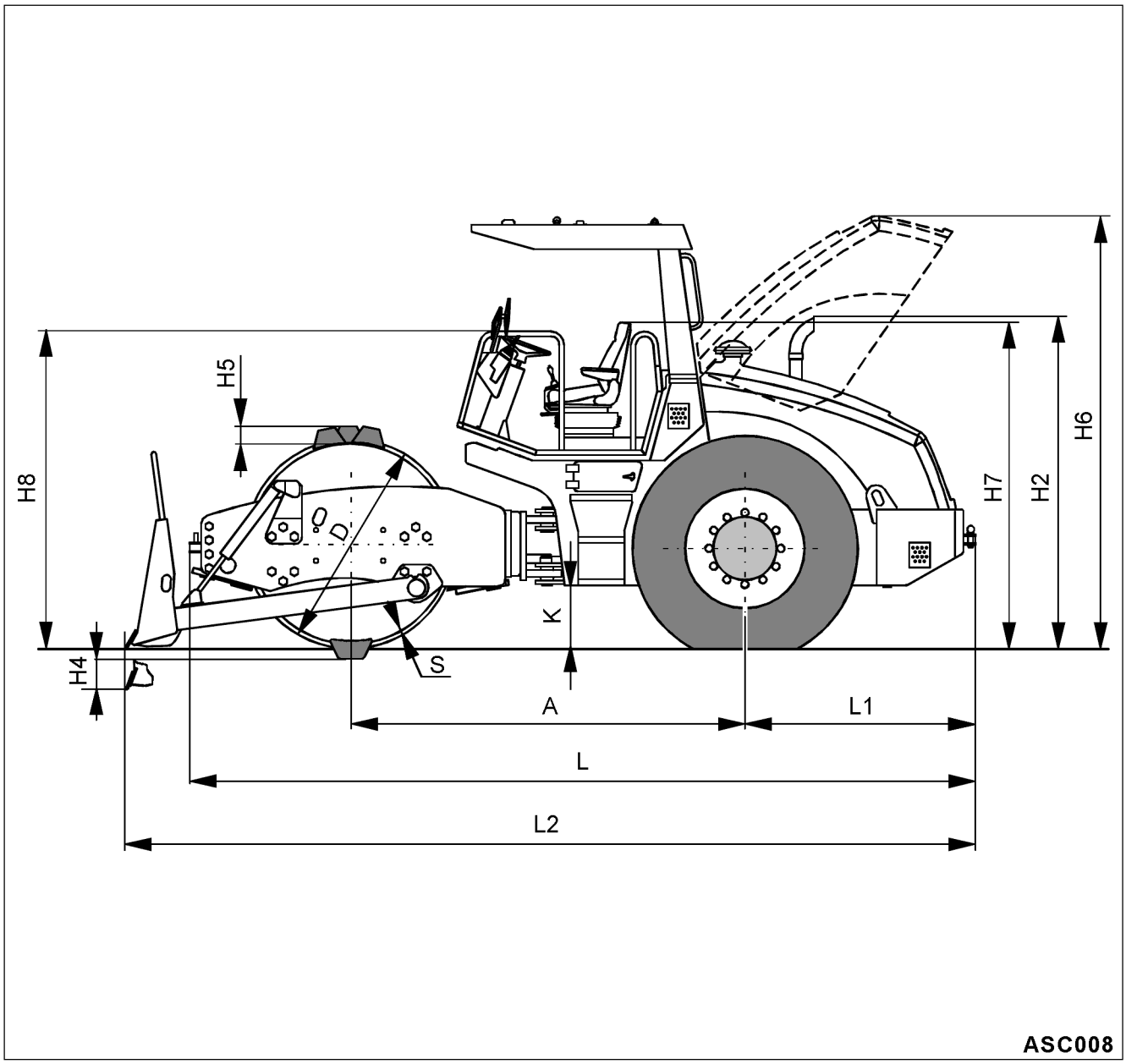
Dimension Chart of the Machine ASC 110 (with cab and ROPS frame)



mm (in)	K1	L	L1	L2	O1	O2	R1	R2	R3	S	W1	W2	W3	W4
ASC 110 D	430	5686	1690	-	118	132	5370	2920	3050	25	2186	2200	1580	-
	(16,9)	(223,8)	(66,5)	(-)	(4,65)	(5,20)	(211,4)	(115,0)	(120,0)	(0,98)	(86,1)	(86,6)	(62,2)	(-)
ASC 110 PD	430	5686	1690	-	118	132	5370	2920	3050	20	2186	2200	1580	-
	(16,9)	(223,8)	(66,5)	(-)	(4,65)	(5,20)	(211,4)	(115,0)	(120,0)	(0,79)	(86,1)	(86,6)	(62,2)	(-)
ASC 110 PDB	430	5686	1690	6094	118	132	5738	2920	3050	20	2186	2200	1580	2950
	(16,9)	(223,8)	(66,5)	(240,0)	(4,65)	(5,20)	(225,9)	(115,0)	(120,0)	(0,79)	(86,1)	(86,6)	(62,2)	(116,1)

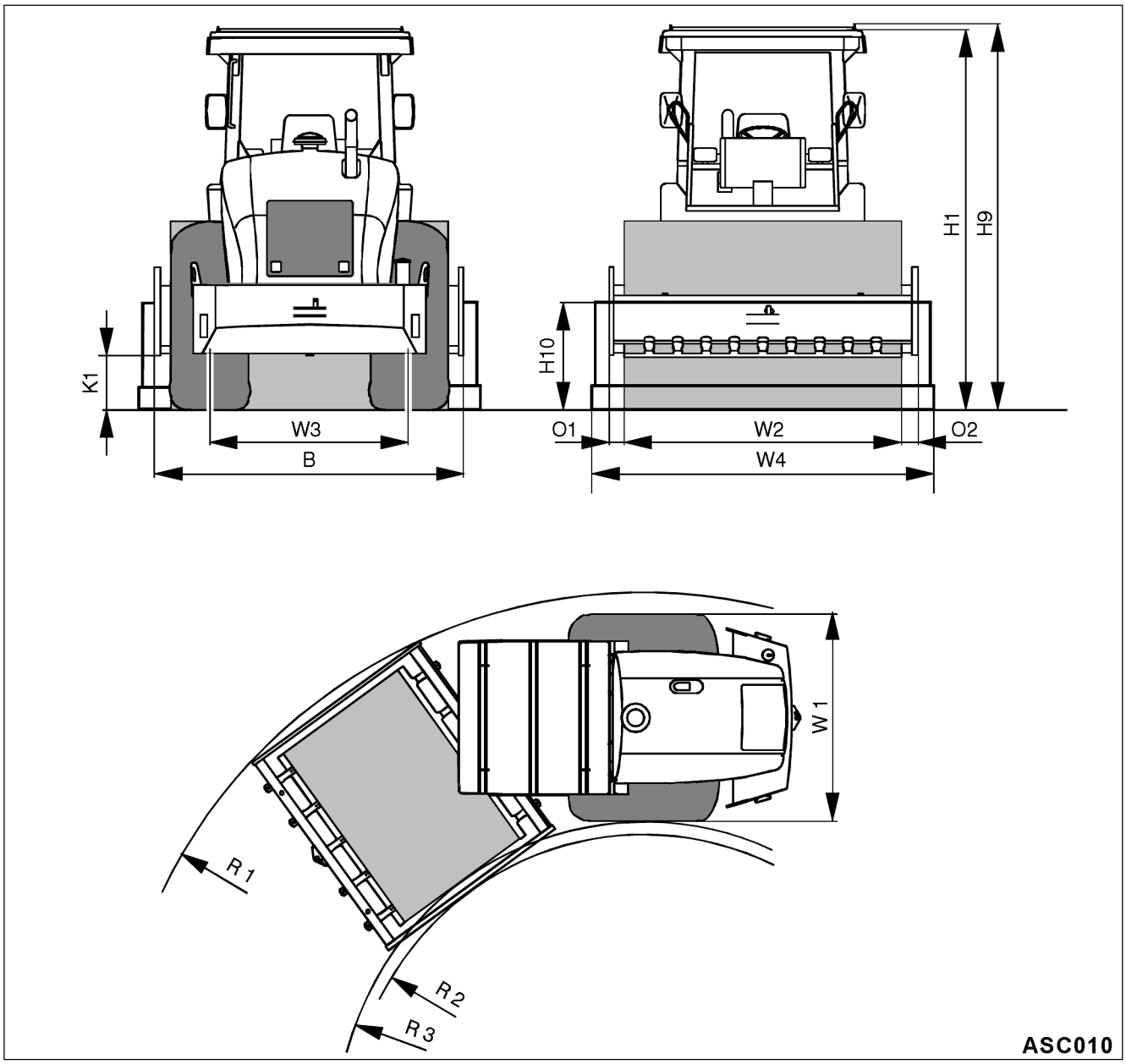
1.2. Dimension Chart

Dimension Chart of the Machine ASC 110 (without cab, with ROPS frame)



mm (in)	A	B	D	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	K
ASC 110 D	2820	2436	1500	3000	2375	3150	-	-	3540	2400	2265	3050	-	420
	(111,0)	(95,9)	(59,0)	(118,1)	(93,5)	(124)	(-)	(-)	(139,4)	(94,5)	(89,2)	(120,1)	(-)	(16,5)
ASC 110 PD	2820	2436	1440	3000	2375	3150	-	100	3540	2400	2265	3050	-	420
	(111,0)	(95,9)	(56,7)	(118,1)	(93,5)	(124)	(-)	(3,9)	(139,4)	(94,5)	(89,2)	(120,1)	(-)	(16,5)
ASC 110 PDB	2820	2436	1440	3000	2375	3150	277	100	3540	2400	2265	3050	916	420
	(111,0)	(95,9)	(56,7)	(118,1)	(93,5)	(124)	(10,9)	(3,9)	(139,4)	(94,5)	(89,2)	(120,1)	(36,1)	(16,5)

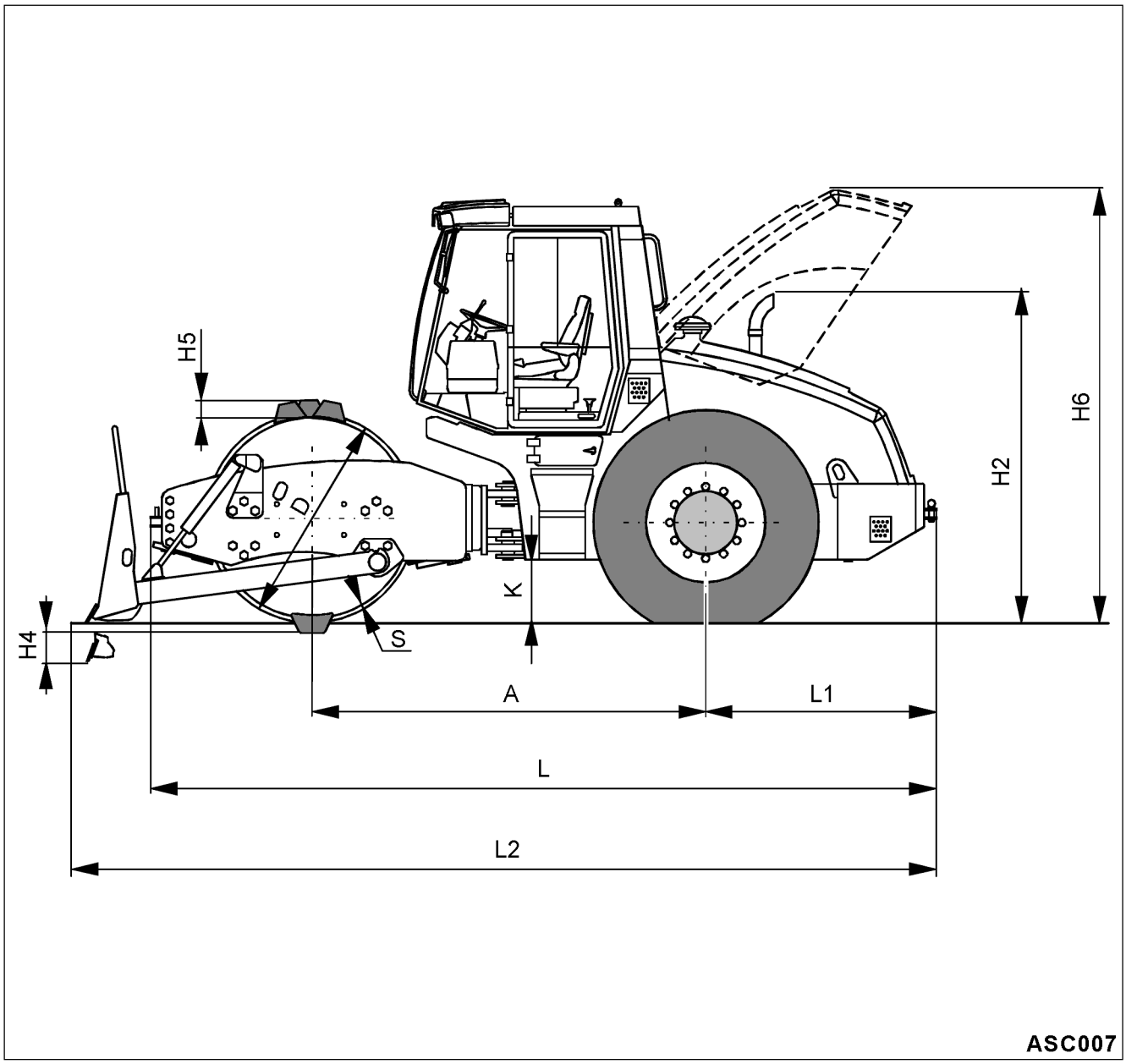
Dimension Chart of the Machine ASC 110 (without cab, with ROPS frame)



mm (in)	K1	L	L1	L2	O1	O2	R1	R2	R3	S	W1	W2	W3	W4
ASC 110 D	430	5686	1690	-	118	132	5370	2920	3050	25	2186	2200	1580	-
	(16,9)	(223,8)	(66,5)	(-)	(4,65)	(5,20)	(211,4)	(115,0)	(120,0)	(0,98)	(86,1)	(86,6)	(62,2)	(-)
ASC 110 PD	430	5686	1690	-	118	132	5370	2920	3050	20	2186	2200	1580	-
	(16,9)	(223,8)	(66,5)	(-)	(4,65)	(5,20)	(211,4)	(115,0)	(120,0)	(0,79)	(86,1)	(86,6)	(62,2)	(-)
ASC 110 PDB	430	5686	1690	6094	118	132	5738	2920	3050	20	2186	2200	1580	2950
	(16,9)	(223,8)	(66,5)	(240,0)	(4,65)	(5,20)	(225,9)	(115,0)	(120,0)	(0,79)	(86,1)	(86,6)	(62,2)	(116,1)

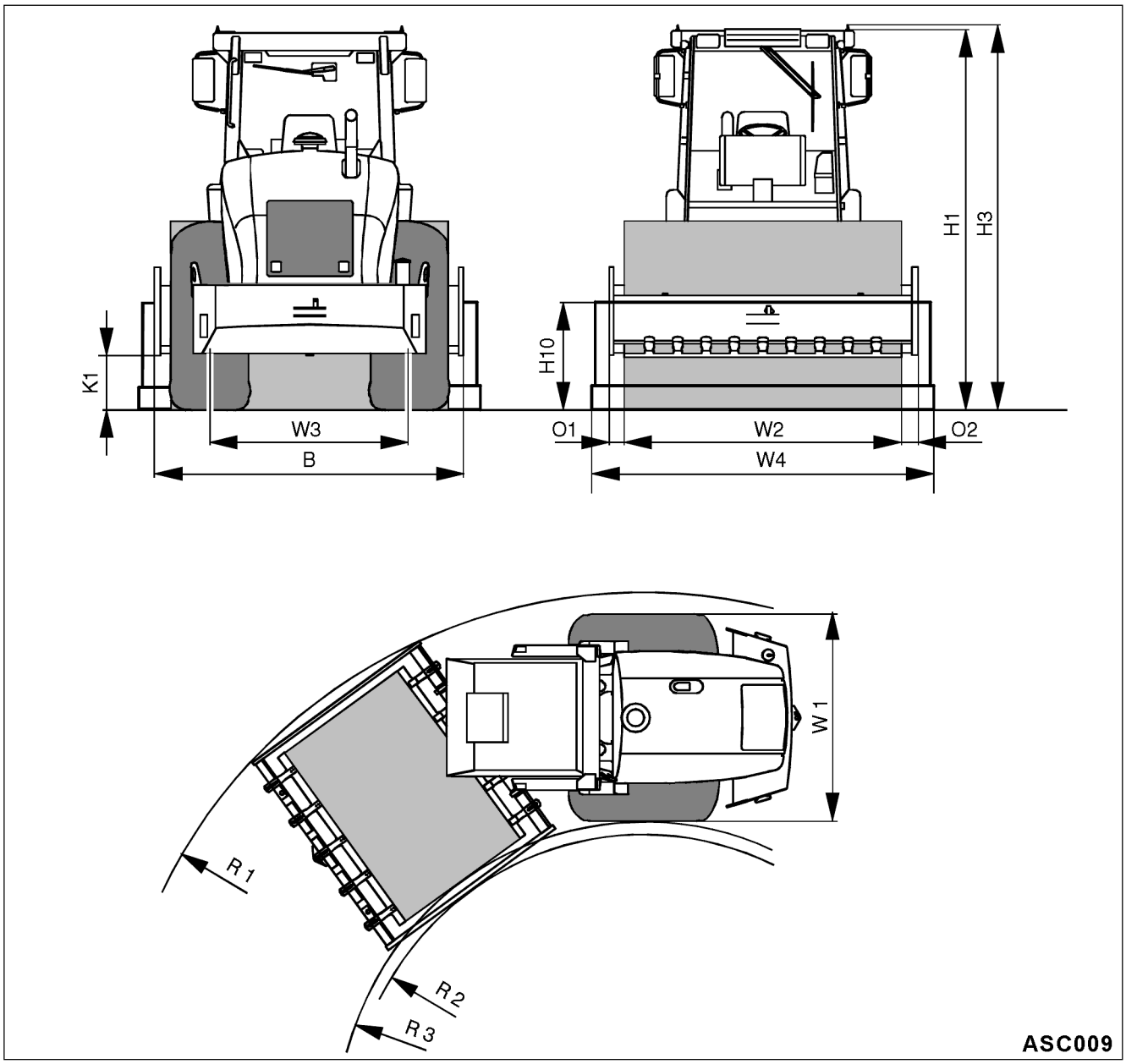
1.2. Dimension Chart

Dimension Chart of the Machine ASC 150 (with cab and ROPS frame)



mm (in)	A	B	D	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	K
ASC 150 D	2820	2500	1500	3000	2375	3150	-	-	3540	2400	2265	3050	-	420
	(111,0)	(98,4)	(59,0)	(118,1)	(93,5)	(124)	(-)	(-)	(139,4)	(94,5)	(89,2)	(120,1)	(-)	(16,5)
ASC 150 PD	2820	2500	1440	3000	2375	3150	-	100	3540	2400	2265	3050	-	420
	(111,0)	(98,4)	(56,7)	(118,1)	(93,5)	(124)	(-)	(3,9)	(139,4)	(94,5)	(89,2)	(120,1)	(-)	(16,5)
ASC 150 PDB	2820	2500	1440	3000	2375	3150	277	100	3540	2400	2265	3050	916	420
	(111,0)	(98,4)	(56,7)	(118,1)	(93,5)	(124)	(10,9)	(3,9)	(139,4)	(94,5)	(89,2)	(120,1)	(36,1)	(16,5)

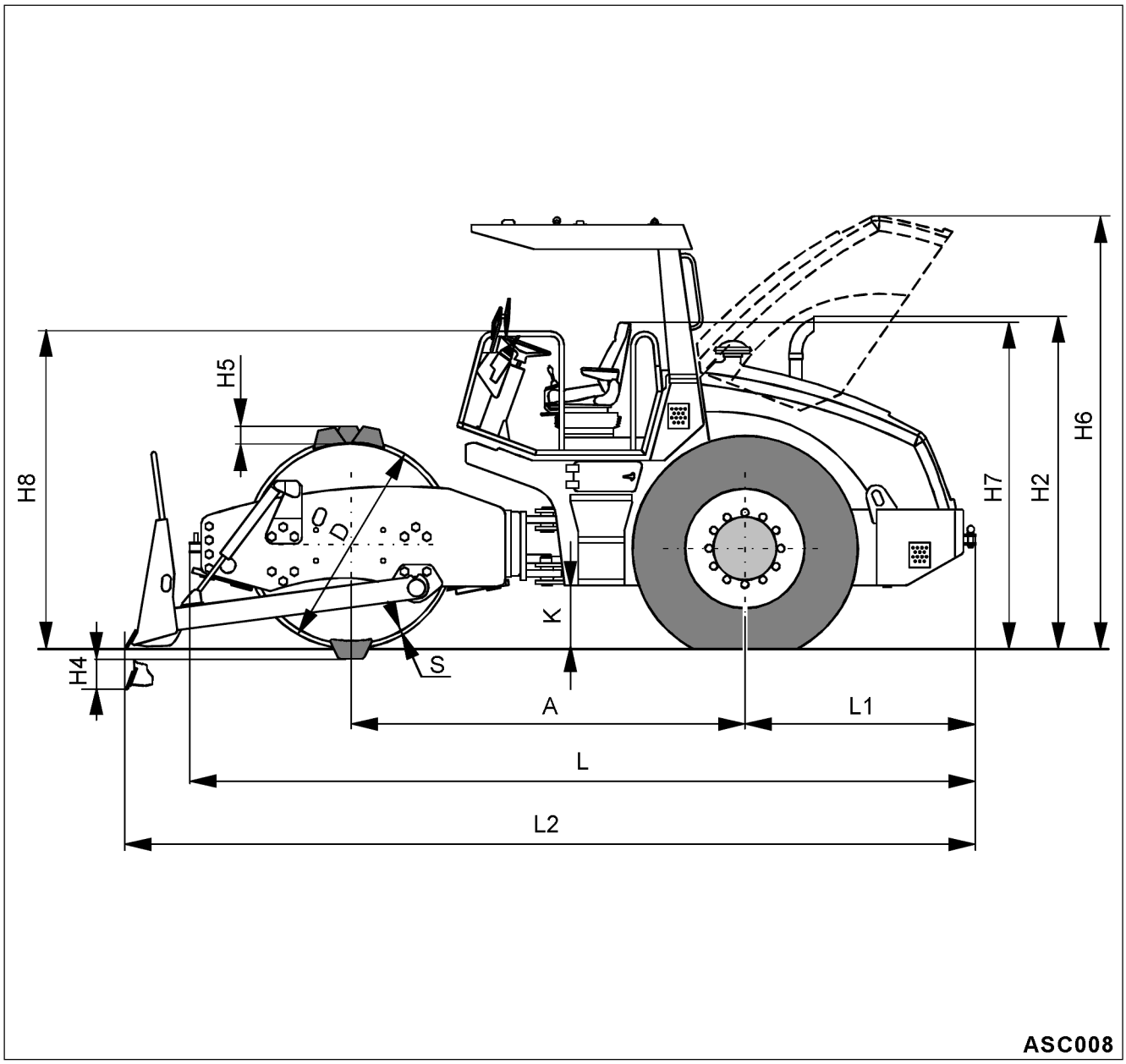
Dimension Chart of the Machine ASC 150 (with cab and ROPS frame)



mm (in)	K1	L	L1	L2	O1	O2	R1	R2	R3	S	W1	W2	W3	W4
ASC 150 D	430	5686	1690	-	142	162	5395	2920	3050	40	2186	2200	1580	-
	(16,9)	(223,8)	(66,5)	(-)	(5,6)	(6,4)	(212,4)	(115,0)	(120,0)	(1,57)	(86,1)	(86,6)	(62,2)	(-)
ASC 150 PD	430	5686	1690	-	142	162	5395	2920	3050	28	2186	2200	1580	-
	(16,9)	(223,8)	(66,5)	(-)	(5,6)	(6,4)	(212,4)	(115,0)	(120,0)	(1,1)	(86,1)	(86,6)	(62,2)	(-)
ASC 150 PDB	430	5686	1690	6094	142	162	5738	2920	3050	28	2186	2200	1580	2950
	(16,9)	(223,8)	(66,5)	(240,0)	(5,6)	(6,4)	(225,9)	(115,0)	(120,0)	(1,1)	(86,1)	(86,6)	(62,2)	(116,1)

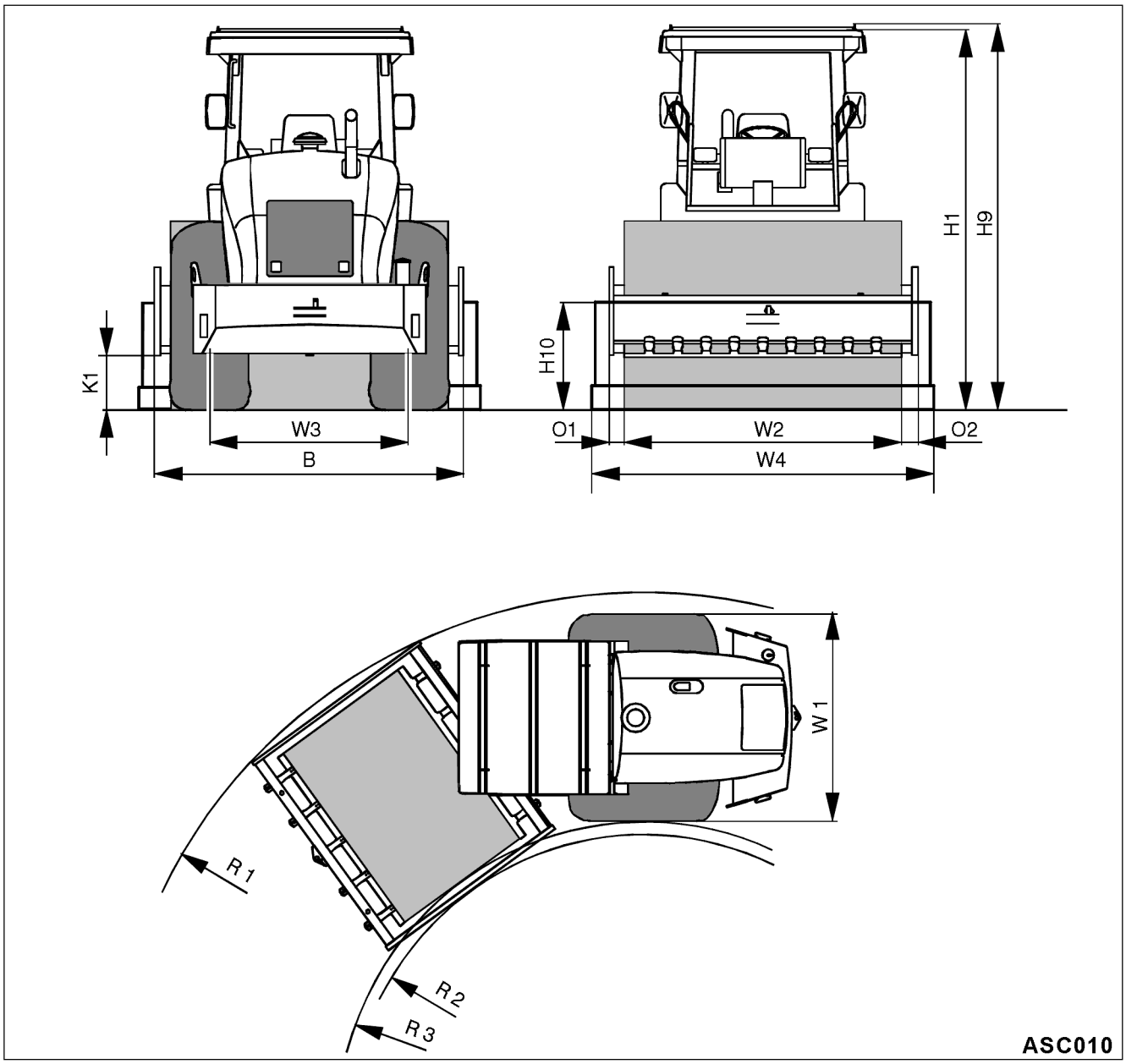
1.2. Dimension Chart

Dimension Chart of the Machine ASC 150 (without cab, with ROPS frame)



mm (in)	A	B	D	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	K
ASC 150 D	2820	2500	1500	3000	2375	3150	-	-	3540	2400	2265	3050	-	420
	(111,0)	(98,4)	(59,0)	(118,1)	(93,5)	(124)	(-)	(-)	(139,4)	(94,5)	(89,2)	(120,1)	(-)	(16,5)
ASC 150 PD	2820	2500	1440	3000	2375	3150	-	100	3540	2400	2265	3050	-	420
	(111,0)	(98,4)	(56,7)	(118,1)	(93,5)	(124)	(-)	(3,9)	(139,4)	(94,5)	(89,2)	(120,1)	(-)	(16,5)
ASC 150 PDB	2820	2500	1440	3000	2375	3150	277	100	3540	2400	2265	3050	916	420
	(111,0)	(98,4)	(56,7)	(118,1)	(93,5)	(124)	(10,9)	(3,9)	(139,4)	(94,5)	(89,2)	(120,1)	(36,1)	(16,5)

Dimension Chart of the Machine ASC 150 (without cab, with ROPS frame)



mm (in)	K1	L	L1	L2	O1	O2	R1	R2	R3	S	W1	W2	W3	W4
ASC 150 D	430	5686	1690	-	142	162	5395	2920	3050	40	2186	2200	1580	-
	(16,9)	(223,8)	(66,5)	(-)	(5,6)	(6,4)	(212,4)	(115,0)	(120,0)	(1,57)	(86,1)	(86,6)	(62,2)	(-)
ASC 150 PD	430	5686	1690	-	142	162	5395	2920	3050	28	2186	2200	1580	-
	(16,9)	(223,8)	(66,5)	(-)	(5,6)	(6,4)	(212,4)	(115,0)	(120,0)	(1,1)	(86,1)	(86,6)	(62,2)	(-)
ASC 150 PDB	430	5686	1690	6094	142	162	5738	2920	3050	28	2186	2200	1580	2950
	(16,9)	(223,8)	(66,5)	(240,0)	(5,6)	(6,4)	(225,9)	(115,0)	(120,0)	(1,1)	(86,1)	(86,6)	(62,2)	(116,1)

1.3.1. Weights

		ASC 110 D	ASC 110 PD
Operation weight with cab EN500-1	kg (lb)	11265 (24834)	11695 (25782)
Operation weight EN500-1			
to drum	kg (lb)	7090 (15630)	7520 (16578)
to axle	kg (lb)	4175 (9204)	4175 (9204)
Static linear load	kg/cm (lb/in)	32,2 (180,5)	(-)
Operation weight EN500-1 with cab and protective frame ROPS	kg (lb)	11495 (25341)	11925 (26290)
to drum	kg (lb)	7130 (15718)	7560 (16667)
to axle	kg (lb)	4365 (9623)	4365 (9623)
Static linear load	kg/cm (lb/in)	32,4 (181,5)	(-)
Operation weight with cab according to ISO 6016	kg (lb)	11435 (25209)	11865 (26157)
to drum	kg (lb)	7015 (15465)	7445 (16413)
to axle	kg (lb)	4420 (9744)	4420 (9744)
Static linear load	kg/cm (lb/in)	31,9 (178,5)	(-)
Operation weight with cab and protective frame ROPS according to ISO 6016	kg (lb)	11665 (25716)	12095 (26664)
to drum	kg (lb)	7055 (15553)	7485 (16501)
to axle	kg (lb)	4610 (10163)	4610 (10163)
Static linear load	kg/cm (lb/in)	32,1 (179,5)	(-)
Operation weight with cab, protective frame ROPS and padfoot segments according to ISO 6016	kg (lb)	13345 (29420)	(-)
to drum	kg (lb)	8735 (19257)	(-)
to axle	kg (lb)	4610 (10163)	(-)
Operation weight with cab and tires filled with liquid (to -25°C/-13°F) according to ISO 6016	kg (lb)	12635 (27855)	13065 (28803)
to drum	kg (lb)	7015 (15465)	7445 (16413)
to axle	kg (lb)	5620 (12390)	5620 (12390)
Static linear load	kg/cm (lb/in)	31,9 (178,5)	(-)
Operation weight with cab, protective frame ROPS and tires filled with liquid (to -25°C/-13°F) according to ISO 6016	kg (lb)	12865 (28362)	13295 (29310)
to drum	kg (lb)	7055 (15553)	7485 (16501)
to axle	kg (lb)	5810 (12809)	5810 (12809)
Static linear load	kg/cm (lb/in)	32,1 (179,5)	(-)

		ASC 110 HD ASC 110 HT	ASC 110 HDPD ASC 110 HTPD
Operation weight with cab EN500-1	kg (lb)	12500 (27558)	12930 (28506)
Operation weight EN500-1			
to drum	kg (lb)	7125 (15708)	7555 (16656)
to axle	kg (lb)	5375 (11850)	5375 (11850)
Static linear load	kg/cm (lb/in)	32,4 (181,4)	(-)
Operation weight EN500-1 with cab and protective frame ROPS	kg (lb)	12730 (28065)	13160 (29013)
to drum	kg (lb)	7165 (15796)	7595 (16744)
to axle	kg (lb)	5565 (12269)	5565 (12269)
Static linear load	kg/cm (lb/in)	32,6 (182,6)	(-)
Operation weight with cab according to ISO 6016	kg (lb)	12670 (27933)	13100 (28881)
to drum	kg (lb)	7050 (15543)	7480 (16491)
to axle	kg (lb)	5620 (12390)	5620 (12390)
Static linear load	kg/cm (lb/in)	32,0 (179,2)	(-)
Operation weight with cab and protective frame ROPS according to ISO 6016	kg (lb)	12900 (28440)	13330 (29388)
to drum	kg (lb)	7090 (15631)	7520 (16579)
to axle	kg (lb)	5810 (12809)	5810 (12809)
Static linear load	kg/cm (lb/in)	32,2 (180,3)	(-)
Operation weight with cab, protective frame ROPS and padfoot segments according to ISO 6016	kg (lb)	14580 (32143)	(-)
to drum	kg (lb)	8770 (19334)	(-)
to axle	kg (lb)	5810 (12809)	(-)

1.3. Technical Data

		ASC 150 D	ASC 150 PD
Operation weight with cab EN500-1	kg (lb)	14150 (31195)	14060 (30996)
Operation weight EN500-1			
to drum	kg (lb)	10160 (22399)	10070 (22200)
to axle	kg (lb)	3990 (8796)	3990 (8796)
Static linear load	kg/cm (lb/in)	46,2 (258,6)	(-)
Operation weight EN500-1 with cab			
and protective frame ROPS	kg (lb)	14380 (31702)	14290 (31503)
to drum	kg (lb)	10200 (22487)	10110 (22288)
to axle	kg (lb)	4180 (9215)	4180 (9215)
Static linear load	kg/cm (lb/in)	46,4 (259,6)	(-)
Operation weight with cab according to ISO 6016	kg (lb)	14320 (31569)	14230 (31371)
to drum	kg (lb)	10090 (22244)	10000 (22046)
to axle	kg (lb)	4230 (9325)	4230 (9325)
Static linear load	kg/cm (lb/in)	45,9 (256,8)	(-)
Operation weight with cab and protective			
frame ROPS according to ISO 6016	kg (lb)	14550 (32076)	14460 (31878)
to drum	kg (lb)	10130 (22332)	10040 (22134)
to axle	kg (lb)	4420 (9744)	4420 (9744)
Static linear load	kg/cm (lb/in)	46,0 (257,8)	(-)
Operation weight with cab, protective frame ROPS			
and padfoot segments according to ISO 6016	kg (lb)	16230 (35780)	(-)
to drum	kg (lb)	11810 (26036)	(-)
to axle	kg (lb)	4420 (9744)	(-)
Operation weight with cab and tires filled with			
liquid (to -25°C/-13°F) according to ISO 6016	kg (lb)	15520 (34215)	15430 (34017)
to drum	kg (lb)	10090 (22244)	10000 (22046)
to axle	kg (lb)	5430 (11971)	5430 (11971)
Static linear load	kg/cm (lb/in)	45,9 (256,8)	(-)
Operation weight with cab, protective frame ROPS			
and tires filled with liquid (to -25°C/-13°F)			
according to ISO 6016	kg (lb)	15750 (34722)	15660 (34524)
to drum	kg (lb)	10130 (22332)	10040 (22134)
to axle	kg (lb)	5620 (12390)	5620 (12390)
Static linear load	kg/cm (lb/in)	46,0 (257,3)	(-)

		ASC 150 HD ASC 150 HT	ASC150HDPD ASC150HTPD
Operation weight with cab EN500-1	kg (lb)	15385 (33918)	15295 (33720)
Operation weight EN500-1			
to drum	kg (lb)	10195 (22476)	10105 (22278)
to axle	kg (lb)	5190 (11442)	5190 (11442)
Static linear load	kg/cm (lb/in)	46,3 (242,5)	(-)
Operation weight EN500-1 with cab and protective frame ROPS	kg (lb)	15615 (34425)	15525 (34227)
to drum	kg (lb)	10235 (22564)	10145 (22366)
to axle	kg (lb)	5380 (11861)	5380 (11861)
Static linear load	kg/cm (lb/in)	46,5 (260,4)	(-)
Operation weight with cab according to ISO 6016	kg (lb)	15555 (34293)	15465 (34094)
to drum	kg (lb)	10125 (22322)	10035 (22123)
to axle	kg (lb)	5430 (11971)	5430 (11971)
Static linear load	kg/cm (lb/in)	46,0 (257,5)	(-)
Operation weight with cab and protective frame ROPS according to ISO 6016	kg (lb)	15785 (34800)	15695 (34602)
to drum	kg (lb)	10165 (22410)	10075 (22212)
to axle	kg (lb)	5620 (12390)	5620 (12390)
Static linear load	kg/cm (lb/in)	46,2 (258,7)	(-)
Operation weight with cab, protective frame ROPS and padfoot segments according to ISO 6016	kg (lb)	17465 (38504)	(-)
to drum	kg (lb)	11845 (26114)	(-)
to axle	kg (lb)	5620 (12390)	(-)

Operating weight according to EN 500 is weight of the machine with full operating liquid, half filling of fuel, water tank of sprinkling and operator's weight 75 kg (165 lb).

Operating weight according to ISO 6016 is weight of the machine with maximum operating liquid, of fuel, water tank of sprinkling and operator's weight 75 kg (165 lb).

The weights may differ depending on additional modifications of the machine made on special request of the customer or if additional options and/or accessories are used.

Weights of machine without cabin can be calculated from all the above weights by deducting

Operation weight	kg (lb)	-220 (485)	-220 (485)
to drum	kg (lb)	-105 (231)	-105 (231)
to axle	kg (lb)	-115 (254)	-115 (254)
Static linear load	kg/cm (lb/in)	-0,48 (2,7)	(-)

The weight of the machine with the cover roof is calculated on all models by deducting the weight of the cab and adding the following weights:

Operation weight	kg (lb)	+140 (308)	+140 (308)
to drum	kg (lb)	+60 (132)	+60 (132)
to axle	kg (lb)	+80 (176)	+80 (176)
Static linear load	kg/cm (lb/in)	+0,27 (1,5)	(-)

For all machine variants, the weight of machine including blade is calculated by adding the weights below:

Operation weight			
to drum	kg (lb)	+1240 (2734)	+1240 (2734)
to axle	kg (lb)	-330 (728)	-330 (728)

1.3.2. Travel Parameters

			ASC 110 D	ASC 110 PD
Travel speed infinitely adjustable in both directions				
1st speed range (work)	km/h	1.	0 - 2,5	0 - 2,5
	(MPH)		(0 - 1,55)	(0 - 1,55)
		2.	0 - 3,5	0 - 3,5
			(0 - 2,17)	(0 - 2,17)
		3.	0 - 5,3	0 - 5,4
			(0 - 3,29)	(0 - 3,35)
2nd speed range (transport)	km/h		0 - 10,6	0 - 10,7
	(MPH)		(0 - 6,58)	(0 - 6,64)
Theoretical gradability *				
1st speed range (work)	%		68	64
2nd speed range (transport)	%		27	26
Practical gradability by forward run *				
- without vibration	%		45	45
- with vibration	%		45	45

			ASC 110 HD	ASC 110 HDPD
Travel speed infinitely adjustable in both directions				
1st speed range (work)	km/h	1.	0 - 2,5	0 - 2,5
	(MPH)		(0 - 1,55)	(0 - 1,55)
		2.	0 - 3,3	0 - 3,3
			(0 - 2,05)	(0 - 2,05)
		3.	0 - 4,1	0 - 4,2
			(0 - 3,29)	(0 - 3,35)
2nd speed range (transport)	km/h		0 - 8,7	0 - 8,7
	(MPH)		(0 - 5,4)	(0 - 5,4)
Theoretical gradability *				
1st speed range (work)	%		80	76
2nd speed range (transport)	%		33	32
Practical gradability by forward run *				
- without vibration	%		55	55
- with vibration	%		55	55

			ASC 110 HT	ASC 110 HTPD
Travel speed infinitely adjustable in both directions				
1st speed range (work)	km/h	1.	0 - 2,4	0 - 2,4
	(MPH)		(0 - 1,49)	(0 - 1,49)
		2.	0 - 3,1	0 - 3,1
			(0 - 1,93)	(0 - 1,93)
		3.	0 - 3,8	0 - 3,8
			(0 - 2,36)	(0 - 2,36)
2nd speed range (transport)	km/h		0 - 8,0	0 - 8,0
	(MPH)		(0 - 4,97)	(0 - 4,97)
Theoretical gradability *				
1st speed range (work)	%		113	105
2nd speed range (transport)	%		34	33
Practical gradability by forward run *				
- without vibration	%		60	60
- with vibration	%		60	60

			ASC 110 D; HD; HT	ASC 110 PD; HDPD; HTPD
Approach angle				
- front	(°)		30	30
- rear	(°)		28	28
Transversal stability with cabin and ROPS frame				
- straight frame (static)	(°)		36	36
- full turn (static)	(°)		33	33
Max. allowed transversal inclination				
- without vibration	(°)		23	23
- with vibration	(°)		5	9

			ASC 150 D	ASC 150 PD
Travel speed				
1st speed range (work)	km/h	1.	0 - 2,5	0 - 2,5
	(MPH)		(0 - 1,55)	(0 - 1,55)
		2.	0 - 3,5	0 - 3,5
			(0 - 2,17)	(0 - 2,17)
		3.	0 - 4,5	0 - 4,6
			(0 - 2,8)	(0 - 2,86)
2nd speed range (transport)	km/h		0 - 10,0	0 - 10,1
	(MPH)		(0 - 6,2)	(0 - 6,27)
Theoretical gradability *				
1st speed range (work)	%		69	70
2nd speed range (transport)	%		21	21
Practical gradability by forward run *				
- without vibration	%		45	45
- with vibration	%		45	45

			ASC 150 HD	ASC 150 HDPD
Travel speed				
1st speed range (work)	km/h	1.	0 - 2,5	0 - 2,5
	(MPH)		(0 - 1,55)	(0 - 1,55)
		2.	0 - 3,0	0 - 3,0
			(0 - 1,86)	(0 - 1,86)
		3.	0 - 3,6	0 - 3,7
			(0 - 2,23)	(0 - 2,3)
2nd speed range (transport)	km/h		0 - 8,1	0 - 8,2
	(MPH)		(0 - 5,0)	(0 - 5,1)
Theoretical gradability *				
1st speed range (work)	%		80	81
2nd speed range (transport)	%		25	25
Practical gradability by forward run *				
- without vibration	%		55	55
- with vibration	%		55	55

1.3. Technical Data

			ASC 150 HT	ASC 150 HTPD
Travel speed				
1st speed range (work)	km/h	1.	0 - 2,4	0 - 2,4
	(MPH)		(0 - 1,49)	(0 - 1,49)
		2.	0 - 2,8	0 - 2,8
			(0 - 1,74)	(0 - 1,74)
		3.	0 - 3,15	0 - 3,15
			(0 - 1,96)	(0 - 1,96)
2nd speed range (transport)	km/h		0 - 7,0	0 - 7,0
	(MPH)		(0 - 4,35)	(0 - 4,35)
Theoretical gradability *				
1st speed range (work)	%		96	97
2nd speed range (transport)	%		30	30
Practical gradability by forward run *				
- without vibration	%		60	60
- with vibration	%		60	60

		ASC 150 D;HD;HT	ASC150 PD;HDPD;HTPD
Approach angle			
- front	(°)	30	30
- rear	(°)	28	28
Transversal stability with cabin and ROPS frame			
- straight frame (static)	(°)	37	37
- full turn (static)	(°)	33	33
Max. allowed transversal inclination			
- without vibration	(°)	23	23
- with vibration	(°)	5	9

* Weight according to ISO 6016 with cab and ROPS frame

1.3.3. Vibration

ASC 110

Drive hydrostatic. Vibration exciter two-stage, circular non-directed vibration.

Frequency	Hz	32/35
	(VPM)	(1920/2100)
Rated amplitude	mm	1,85/1,15
	(in)	(0,073/0,045)
Centrifugal force	kN	277/206
	(lb)	(62250/46294)

ASC 150

Drive hydrostatic. Vibration exciter two-stage, circular non-directed vibration.

Frequency	Hz	29/35
	(VPM)	(1740/2100)
Rated amplitude	mm	2,0/1,0
	(in)	(0,079/0,039)
Centrifugal force	kN	325/237
	(lb)	(73037/53261)

1.3.4. Engine

Make		Cummins Diesel
Type		QSB5.9-C155
Serial number		.....
Number of cylinders		6
Bore	mm (in)	102 (4,02)
Stroke	mm (in)	120 (4,72)
Total displacement	cm^3 (cu in)	5880 (359)
Output according to ISO 3046/1 (DIN 6271)	kW (HP)	116 (155)
Rated speed	min^{-1} (RPM)	2200
Maximal torque	Nm (ft lb)	597 (440) /1500 min^{-1} (RPM)
Specific fuel consumption at rated speed	g/kWh	234
Fuel speed at normal operation	l/h (gal US/h)	ASC 110 - 11,8 (3,12)
		ASC 150 - 12,5 (3,3)
Fuel cleaners - Fleetguard		1x FF 1280 (3925274)* a 1x FF 5052 (3903640)*
Oil cleaner - Fleetguard		LF 3345*
Air cleaner		Donaldson FLG 10-0220
Air filter element		Donaldson P77-2555
Air filter safety element		Donaldson P13-3138
Cooling system		liquid cooled engine with cooler 34299
Coupling		CENTA CF-H-030-1 Sa 03
Engine fulfills requirements of:		Dir. 97/68/EU Stage 2 EPA/CARB 40 CFR Part 89 Tier 2

* Exact denomination of these parts is dependent on modification of the engine. For spare parts ordering always refer to the serial number of your engine.

1.3.5. Axle

The front axle consists of the drum, the rear axle of the axle housing with two drive gearboxes with the wheels.

Tire size		23,1x26“ thread UK-5 (10 PR) MITAS
Average contact pressure on soil	kPa (PSI)	304 (44,1)
Tire inflation	kPa (PSI)	160 (23,2)
Tire size		23,1x26“ thread TR1 (TD-01) (10 PR) MITAS
Average contact pressure on soil	kPa (PSI)	860 (124,7)
Tire inflation	kPa(PSI)	160 (23,2)

1.3.6. Brakes

Service brake		hydrostatic system of travel
Parking emergency brake		three band brakes installed in the gearboxes of the wheels and the drum, governed by springs with hydraulic release
Releasing pressure	MPa (PSI)	1,7 (246)

1.3.7. Steering

Hydraulic power steering with two hydraulic cylinders		
Hydraulic pump of steering		REXROTH PN-11-028RDC
Power steering unit		Mannesmann Rexroth Servostat 8477955593
Safety pressure	MPa (PSI)	15 (2175)
Hydraulic cylinders		2x HV 90/45/400
Steering angle	(±)	36
Oscillation angle	(±)	10

1.3.8. Vibratory Drum

		ASC 110 D	**ASC 110 PD**
Drum dia	mm (in)	1500 (59,0)	1440 (56,7)
Drum dia over pads	mm (in)	-	1640 (64,6)
Drum width	mm (in)	2200 (86,6)	2200 (86,6)
Drum shell thickness	mm (in)	25 (0,98)	20 (0,79)
Number of pads		-	140
Height of a pad	mm (in)	-	100 (3,93)
Area of a pad	cm^2 (sq in)	-	120 (18,6)

		ASC 150 D	**ASC 150 PD**
Drum dia	mm (in)	1500 (59,0)	1440 (56,7)
Drum dia over pads	mm (in)	-	1640 (64,6)
Drum width	mm (in)	2200 (86,6)	2200 (86,6)
Drum shell thickness	mm (in)	40 (1,57)	28 (1,1)
Number of pads		-	140
Height of a pad	mm (in)	-	100 (3,93)
Area of a pad	cm^2 (sq in)	-	120 (18,6)

1.3.9. Hydrostatic Drive of Travel

Hydraulic pump of travel variable output with skew plate, electrohydraulically controlled		Sauer 90 R 075
Delivery per revolution	cm^3(cu in/rev)	75 (4,57)
Safety pressure	MPa (PSI)	42 (6090)
Kontroller		Sauer MCH
Drum drive gear-box **ASC 110**		Trasmital 709C3B75,5 H1 (D; PD; HD; HDPD) Trasmital 710C3B75,5 H2 (HT; HTPD)
Drum drive gear-box **ASC 150**		Trasmital 710C3B75,5 H2 (D; PD; PDB) Trasmital 713C3B97,2 H2 (DH; HDPD; PDBH)
Filtration block		Donaldson HMK 045796
Filter element		Donaldson P165332
Drum drive hydromotor		Sauer 51 C 060
Wheel gears		Trasmital 707C2B33,3 H1 (D; PD; HD; HDPD) Trasmital 707C3B53,3 H1 (HT; HTPD)
Hydraulic motors of wheel drives		Sauer 51C060
The distributor block		Hytos 880-0303

1.3.10. Hydrostatic Drive of Vibration

		ASC 110
Hydraulic pump of vibration variable-output, with skew plate, electrohydraulically controlled		Rexroth A10VG45
Delivery per revolution	cm^3(cu in/rev)	45 (2,74)
Safety pressure	MPa (PSI)	34 (4930)
Hydromotor of vibration		Rexroth A10FM45

		ASC 150
Hydraulic pump of vibration variable-output, with skew plate, electrohydraulically controlled		Rexroth A10VG63
Delivery per revolution	cm^3(cu in/rev)	63 (3,84)
Safety pressure	MPa (PSI)	34 (4930)
Hydromotor of vibration		Rexroth A10FM63

Options:

		ASC 110
Hydraulic pump of vibration variable-output, with skew plate, electrohydraulically controlled		Sauer 90 R 042
Delivery per revolution	cm^3(cu in/rev)	42 (2,56)
Safety pressure	MPa (PSI)	40 (5800)
Hydromotor of vibration		Sauer 90 M 042

		ASC 150
Hydraulic pump of vibration variable-output, with skew plate, electrohydraulically controlled		Sauer 90 R 055
Delivery per revolution	cm^3(cu in/rev)	55 (3,36)
Safety pressure	MPa (PSI)	40 (5800)
Hydromotor of vibration		Sauer 90 M 055

1.3.11. Hydraulic Oil Tank

Suction basket	Argo AS 080-1

1.3.12. Lifting and lowering of the Hood and the Cabin

Hydraulic set	Hytos SMA 03 731-0433
Filter	SF 56/48
Block of lifting	Hytos 729-0030
Hydraulic cylinders of hood lifting	2x HM 25/18-320
Hydraulic cylinder of cab lifting	HM 40/22-300
Hand pump	Technometra RC 16
Hydraulic locks	
- for hood lifting and lowering	2x Hytos RJV1-05 Typ 535-0118
- for cab lifting and lowering	Hytos RJV1-05 Typ 535-0118

1.3.13. Cooling System of Hydraulic Oil

Oil cooler	Emmegi 34299

1.3.14. Fluids

Engine oil	l (gal US)	16,3 (4,3)
Cooling system	l (gal US)	25,0 (6,6)
Fuel	l (gal US)	410 (108,3)
Hydraulic system	l (gal US)	90 (23,8)
Drum drive gear-box(ASC 110 HD, HDPD)	l (gal US)	4,2 (1,11)
(ASC 110 HT, HTPD; ASC 150 HD, HDPD)	l (gal US)	4,8 (1,27)
(ASC 150 HT, HTPD)	l (gal US)	5,1 (1,35)
Wheel gears	l (gal US)	2x2,8 (2x0,74)
Vibratory drum	l (gal US)	8,0 (2,1)
Tank of windscreen washer	l (gal US)	2,75 (0,72)
Liquid-filled tyres up to - 25 °C (-13 °F)	kg (lb)	2 x 600 (2 x 1323)
to 0 °C (32 °F)	kg (lb)	2 x 500 (2 x 1102)

They represent additional weight for ASC 110/150 HD, HT, HDPD, HTPD

1.3.15. Electrical Installation

Rated voltage	V	24
Capacity of battery	Ah	2 x 100

1.3.16. Safety Devices

Emergency brake	stoppage of all functions and braking
Hydraulic locks	protective device preventing fall of the hood or cabin at failure of the lifting system
Oil leak protection	automatically stops the machine and optically signals in a case of oil leak
Battery disconnector	disconnects electrical installation

1.3.17. Hygienical Data

ASC 110/150

The machine with cab and closed windows:

Noise:

The acoustic pressure level affecting the driver:
(measured according the EN 11 204 and prEN 500-4:2001
on the elastic material, stopped machine with vibration) L_{pA} = 78 dB (A)

Guaranteed sound power level (CE)
(measured due to the Directive 2000/14/EC, EN ISO 3744
on the elastic material, stopped machine with vibration) L_{WA} = 108 dB(A)

Sound power level
(measured due to the Directive 2000/14/EC, EN ISO 3744
on the elastic material, stopped machine with vibration) L_{WA} = 111 dB(A)

The vibrations:

The mean effective value of the vibrations acceleration:

- transfered to the body
  (measured according the EN 1032
  on the sand base under the vibration travel) $a_w < 0{,}5\ m/s^2$ (vectorial sum)
- transfered to the hands
  (measured according the ISO 5349
  on the sand base under the vibration travel) $a_w < 2{,}5\ m/s^2$ (vectorial sum)

The machine with the cab with opened windows:

Noise:

The acoustic pressure level affecting the driver:
(measured according the EN 11204 and prEN 500-4:2001
on the elastic material, stopped machine with vibration) L_{pA} = 84 dB(A)

The machine without cab:

Noise:

The acoustic pressure level affecting the driver:
(measured according the EN 11204 and prEN 500-4:2001
on the elastic material, stopped machine with vibration) L_{pA} = 91 dB(A)

1.3.18. Requirements of Traffic Regulations

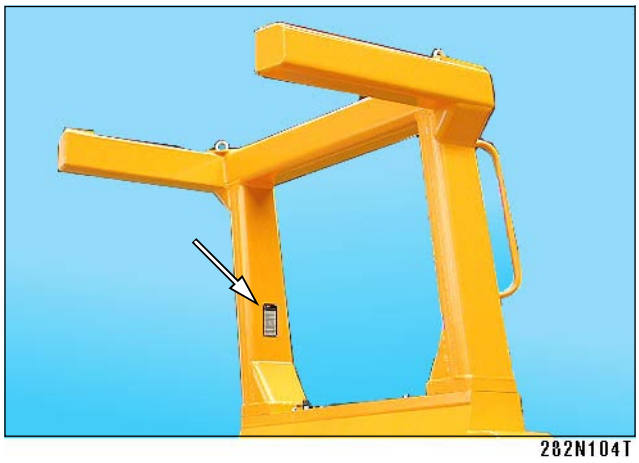
The basic machine model is not intended to be moved under own power on public roads, since its appointment is not in compliance with the regulation for public roads.

1.3.19. Accessories

A) Rolling Over Protective Structure (ROPS)

Compliant with international standards EN 13510:2000; ISO 3471:1994; SAE J ISO 3471:2003; AS 2294:2003 for maximum machine weight 18500 kg (40785 lb).

Weight of the ROPS frame	kg (lb)	230 (507)
Fastened to the machine flame with		16bolts M 24 x 80 CSN 02 1143.55 (8G)
Tightening torque	Nm (in lb)	549 (4854)



B) Dozing Blade

Blade width	mm (in)	2950 (116,1)
Blade height	mm (in)	916 (36,1)
Ground clearance at transport position	mm (in)	576 (22,6)
Cutting depth	mm (in)	277 (10,9)
Weight of blade (total)	kg (lb)	910 (2006,2)
Fastened to the machine frame with		2 bolts M 20 x 100 (8G) 2 bolts M 20 x 110 (8G) 5 bolts M 20 x 140 (8G) 5 bolts M 20 x 160 (8G)
Tightening torque	Nm (in lb)	314 (2776)
Distributor		HP8-1-STA
Safety pressure	MPa (PSI)	20 (2900)
Hydraulic cylinders		2x HM 63/32/500 111131

C) Padfoot Segments

These are mounted onto the smooth drum and partially substitute for the padfoot modification. The padfoot segments are used for compaction of soils up to the layer thickness according to following table:

	ASC 110	ASC 150
cohesive soils	50 cm (19,7 in)	50 cm (19,7 in)
mixed soils	60 cm (23,6 in)	70 cm (27,5 in)

The segments are also suitable for pulverization and compaction of plate-shaped rock (shales).

Number of segments		3
Drum dia over pads	mm (in)	1712 (67,4)
Total number of pads		150
Height of a pad	mm (in)	100 (3,9)
Area of a pad	cm^2 (sq in)	120 (18,6)
Weight of one segment	kg (lb)	560 (1235)
Total weight of segments	kg (lb)	1680 (3703)
Fastened to the drum with		18 bolts M 20 x 150 (8G)
Tightening torque	Nm (in lb)	314 (2776)

D) FOPS roof cover

The cover complies with international standards ISO 3449:1992; SAE J 231:JAN81; AS 2294:1990 and approval level II. It is mounted on the ROPS protective frame, and protects the driver from falling objects, such as trees, boulders, etc.,

Cover weight	kg (lb)	140 (309)
Attached to ROPS by		4 bolts M16x30(8G)
Tightening torque	Nm (in lb)	165 (1457)

Details are listed on label on the cover.

E) ATC - interaxle differential

Control unit	Sauer Susmic S1X-26G2 511982
Proportional valve	Sauer 507832 24V
Slope sensor	Sauer MCX 106A 1005X 742361

F) FOPS cab

This is a standard cab with a reinforced roof protecting against falling objects. The cab complies with international standards ISO 3449:1992; SAE J 231:JAN81; AS 2294:1990 and approval level II.

Notes:

Notes:

2. OPERATING INSTRUCTIONS

ASC 110, ASC 130, ASC 150
ASC 200 and ASC 250

2.1.1. Safety Regulations and Instruction for Operation of the Machine

The safety regulations stated in the individual chapters of the documentation delivered with the machine are to be complemented with safety regulations valid for the respective country of use and on the respective jobsite with regards to organization of work, work processes and personnel.

2.1.1.1. Beginning of Compaction Works

- The contractor (the company which operates the machine) is obliged to issue regulations for operation and maintenance of the machine, which must contain also the requirements for safety of work.
- Before the work is started, it is necessary to check:
  - location of engineering networks
  - underground spaces (direction, depth)
  - suction and/or escape of dangerous agents
  - bearing power of soil, inclination of the work area

  These facts must be communicated to the machine's operator designated to carry out the work.

- It is necessary to issue a technological procedures for the actual work activity, which would set up:
  - measurements for operation under exceptional conditions (work in protective zones, at extreme slopes, etc.);
  - measurements for protection from the forces of nature;
  - requirements for operational safety;
  - technical and organizational measurements for securing safety of personnel, jobsite and the surrounding area.

  The technological procedures must be communicated to the machine's operator.

2.1.1.2. Operation in an imperiled area

Whatever damage to service networks must be reported immediately to the operating company, simultaneously, access by unauthorized persons to the imperiled area must be limited.

No worker must be left alone whenever there is no other worker in sight that could provide or call for help, unless another effective method of control and contact has been installed.

2.1.1.3. Work safety precepts on behalf of the operator

The operator

- must make sure that the machine is operated only under conditions and for the purpose to which the machine has been designed as defined by the manufacturer and applicable standards,
- must make sure that the vibration roller is used only under such conditions and in such locations where there is no danger of transmitting vibrations and causing damage to nearby structures, etc.,
- must provide for regular inspection of operations, technical conditions, for regular maintenance at intervals specified in the Instructions for Maintenance and Lubrication. In cases of noncompliance to such degree that would endanger safe operation, personnel, property, and the environment, the machine must be removed from operations until the defects have been corrected,
- must define who may perform specific functions during operations, maintenance, and repairs of the machine,
- everybody who drives, maintains, and repairs the machine must be acquainted with the rules listed in the Operation Manual for the machine
- must provide for the fire extinguisher to be checked regularly,
- must store the Operations Manual and the Operations Diary in the defined location, the seat box, to be available to the driver at all times
- must provide a steady supervision by a defined worker during operations on public roads, and in particular must issue work safety regulations,
- must provide for the removal of dangerous matters (fuel, oil, cooling fluid, etc.) from spots of leakage in line with their nature to prevent any adverse effect on the environment, work safety and health of personnel.

When using ROPS frame

- the machine frame in the spot of connection must not be damaged (broken bent, etc.)
- the ROPS frame itself must not be corroded, damaged, or show any hair fractures or breaks,
- the ROPS frame must not be loose during operation,
- all screw connections must be as specified and tightened to the specified torque,
- the bolts must not be damaged, deformed, and/or corroded,
- the ROPS frame must not be modified without the manufacturer’s approval, since its firmness could be affected (such as holes, welds, etc.),
- the weight of the machine with the protective frame may not exceed approved weight for which the ROPS has been approved.

2.1.2. Requirements for the competence of the driver

- The roller may be operated by a driver, who has been trained to ISO 7130 and other local and national regulations and standards for drivers of this category
- Only such person may drive the machine without proper certification that is being instructed with the owner's permission in operating the machine under a direct supervision of a special instructor for the purpose of gaining preliminary skills.
- The roller may be operated without the proper certificate momentarily without supervision by a worker who is mentally and physically fit, older than 18 years, and who has been
  a) entrusted by the machine manufacturer for the assembly, testing and demonstration of the machine, and/or instructing drivers, while having been instructed himself in work safety regulations applicable to the site
  b) designated by the builder for the operation (maintenance), evidently trained and instructed, and/or having professional training in operating and driving according to special regulations (machinist certificate, etc.)

2.1.3. The driver's duties

- Before the start of operations, the driver must become acquainted with instructions published in the machine documentation, particularly with safety rules, and adhere to them. This applies also to personnel entrusted with maintenance, adjustments and repairs. If some sections of the manuals are not clear enough, contact the nearest dealer or the manufacturer.
- The driver may not drive the machine unless fully cognizant of all functions of the machine, its working and controlling elements, and unless he knows exactly how to operate the machine.
- The driver must comply with all safety signs placed on the machine, and keep them in legible state.
- Before the start of operations the driver must become acquainted with the site, its obstacles, slopes, service network, and required types of working site protection regarding noise, vibration, etc.
- When a situation arises endangering health, lives, property, during defects of technical nature, and/or when signs are present indicating such possibilities during operations, unless the driver can remove the danger by himself, he must cease his work and secure the machine against involuntary start, report to his supervisor, and advise all persons imperiled by the situation.
- The driver must become acquainted before the start of the machine with records of operating deviations made by the preceding shift.
- The driver must inspect the machine before starting work, accessories, control elements, information and safety equipment, whether functional as instructed. Should he not be able to correct by himself a defect affecting work safety, he may not start the machine, and must report the defect to his supervisor.
- The driver must wear safety belts.
- The safety belt and its anchors must not be defective.
- Should the driver discover a defect during work, he must stop the machine immediately, and secure it against involuntary start
- During operations the driver must monitor the machine and record defects in the operation diary.
- The driver must keep up to date the operation diary, which serves the purpose of recording transfers of the machine between drivers, defects and repairs during operation, and important events during the shift.
- Prior to starting the engine, the control levers must be in neutral, nobody may be present in the vicinity of the machine.
- The driver informs of the startup by audible or visual signals always before the start of the engine.
- The driver must check brakes and steering before operations.

- Following the warning signal the operator may start the machine first after all personnel have left the vicinity of the machine. On a difficult to oversee site the machine may be started after a certain time allowed for vacating it.
- The driver must follow safety regulations, not perform actions affecting work safety, and fully attend work on hand.
- He must have regard for the work process and/or instructions given by the supervisor.
- The speed of the machine must be adjusted to the condition of the grounds, the operation, and the weather, and the site must be observed to avoid meeting an obstacle.
- When the operator leaves the machine unattended at the end of an operation or its interruption, he must secure the machine against unauthorized use and incidental startup by removing ignition key, locking the cabin door, and switching off electrical circuits.
- After the operation has been finished, the machine must be parked on a flat and firm ground in a stable position off public roads and out of reach of falling objects (soil) and natural dangers like floods, landslides, etc.
- When the machine is parked on public roads, it must be done according to regulations applicable to public roads. The machine must be provided with proper signs.
- Following operations the machine's defects and repairs must be recorded in the operations diary. The driver of the next shift must be made aware of existing situation.
- The driver must use personal protective means – dress and shoes. The dress may not be too loose and torn; hair must be protected by a suitable head covering. Hands must be protected by suitable gloves for maintenance (lubrication, handling fluids).
- The driver must wear headsets effective against noise levels of 90 dB on a machine without cabin.
- He must keep accessories as prescribed.
- He must keep his station, steps and stepping points clean.
- Before lifting the cabin or hood, he must check for free space and electrical wiring in the area, and make sure that nobody is in danger when refolding the cabin and closing the hood.
- Should the machine touch high voltage lines,
  - try to leave the area of danger with the machine
  - do not leave the station
  - warn others not to approach and touch the machine
- Maintain the machine free of oil and inflammable materials.

To follow safety messages under all circumstances to avoid risk of serious injury or death.

To follow safety messages under all circumstances to avoid risk of injury.

To follow environmental regulations to protect environment (contamination of water sources or soil).

! NOTE ! **Pay attention to signs to avoid damage of the machine.**

NOTE: **Additional information for operators.**

2.1.4. Forbidden actions

It is not permitted to

- operate the machine under the influence of alcohol or drugs
- use the machine while its technical condition, personal safety (lives or health), property, or public roads traffic would be endangered,
- operate the machine while other people would be in the vicinity, except during instructions by a teacher,
- operate the machine, if some of its safety equipment has been removed or damaged, like emergency brake, hydraulic locks, etc.
- travel and compact on slopes that could lead to the instability of the machine (tipping over). The stated static stability is lowered by the dynamic effect of travel.
- travel and compact on slopes where the ground could slide with the machine, or the lack of adhesion could initiate an uncontrolled skid.
- operate the machine contrary to Operating instructions.
- travel and compact with vibration adjusted to ground firmness near edges of slopes and excavations to cause danger of slides with the machine,
- travel and compact with vibration on at a distance from walls, cuts, and slopes that could cause danger of landslides over the machine,
- compact with vibration on at a distance from buildings and constructions that could cause damage through vibration effects
- transport people on the machine,
- operate the machine unless the driver's station is firmly anchored
- operate the machine with open hood
- operate the machine with other machinery or vehicles near by, except those that are participating in the operation,
- operate the machine at a site, which cannot be surveyed by the driver and where people or property could be endangered, unless work safety is secured by other means, such as signalization by another properly instructed person,
- operate the machine near electrical wires or transformer stations,
- travel over electrical cables, unless properly protected against mechanical damage,
- operate the machine in deteriorated visibility and at night, unless the site and the machine are sufficiently illuminated,
- leave the seat with the machine running
- leave the machine unsecured, unless secured against misuse
- eliminate safety and protection devices, fusing, or change their settings,
- use the machine with oil, fuel, cooling or other fluids leaking
- start the engine contrary to the Operating instructions
- place other things on the driver's platform except for personal belongings,
- deposit material and other items on the machine,
- remove dirt while the machine is running,
- maintain, clean, or repair unless the machine is secured against involuntary movement or starting, and the worker's contact with moving parts is not prevented,
- touch moving parts of the machine bodily or by hand holding tools,
- smoke and handle open flame during inspection and tanking fuel, changing or adding oil, lubrication, checking and topping battery,
- carry on the machine – in the cabin or under the hood –rags soaked in flammable fluids and flammable fluids in open cans,
- leave the engine running in closed rooms. Exhaust fumes are deadly.

Applicable standards and regulations

ISO 6749

ISO 4510

ISO 8152

2.1.5. Safety signs and symbols marked on the machine

1. Risk of grasp


2941bz

Dangerous space with risk of grasp. (Symbols located on the left and right side of the rear crossbar of the front frame)

2. Risk of burn


2586bz

Risk of burn. Do not touch the hot parts of the machine until you've checked they are cold enough. (Symbol located on the internal side of the side door)

3. Risk of injury


2409bz

Risk of injury and reeling. Do not touch the rotating parts while the motor is still running. (Symbol located on the left side of the cooler)

4. Coolant


3227bz

Risk of scald. Do not open the lid of the expansion tank until the liquid gets cooled down bellow 50 °C (122 °F). (Symbol located on the equalizing tank)

5. Adjust machine while switched off


2584bz

There is a risk of injury and hand capture in the rotating parts of the machine. Do not make adjustment and maintenance while the motor is still running. (Symbol located on the internal side of the side door)

6. Read instruction manual


2702bz

Read the instruction manual before start up of the machine. (Symbol located on the left side of the control board.)

7. Safety belt


2687bz

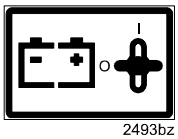
Fasten your safety belt before machine start. (Symbol located on the left side of the control board)

8. Machine maximum height

2212_bz

Attention to be paid when driving through places with a height limit. (Symbol located on the left side, on the frame under the cab)

9. Battery disconnector



2493bz

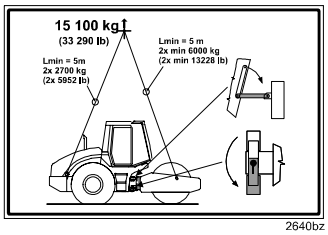
Switch the battery disconnector into „O“ position in the case of a failure and after end of work. (Symbol located on the panel under the left side door)

10. Handbook


2428bz

Indication of a box containing the machine handbook (Symbol located at the back of the seat)

11. Hanging figure



2640bz

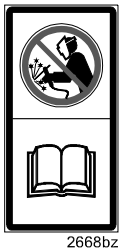
To lift machine, binding means of sufficient capacity to be used. Lock the machine joint before hanging it. (Symbol located on the left side door)

12. Hanging spots


2153bz

Suspend the machine in these spots only. (Symbols located on the both sides of the frames)

13. Disconnect the alternator


2668bz

Prior to welding on the machine disconnect the alternator, ATC, control unit of engine (Symbol located on the internal side of the side door)

14. First-aid kit


2427bz

Indication of the first-aid kit box. (Symbol located in the top left corner of the cab)

15. Ear protection


2408bz

If there is no cab at the machine or if working with the windows open, be sure to wear an ear protection. (Symbol located on the central post of the control)

16. Noise emission

2901bz

Symbol located on the right side of frame under cabine.

17. Danger of injury


2601bz

Danger of being wound by the belt. (symbol placed on the left side of the cooler)

18. Electrical equipment

2225bz

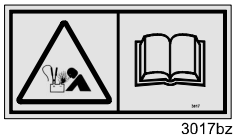
Cover the electrical equipment when washing the machine. (symbol placed on the left side of the cooler)

19. Dangerous area


2942bz

Keep safety distance from the machine. (symbol placed on the left side of the runner and on the back of the machine frame)

20. Danger of explosion


3017bz

Pay attention when servicing the battery – read the maintenance manual. (symbol placed on the fuel tank)

21. Emergency exit


2884bz

(symbol placed on the right window of the cabin)

22. Sling Points


3048bz

The machine is to be rigged in these points. (Symbols located on the both sides of the frames)

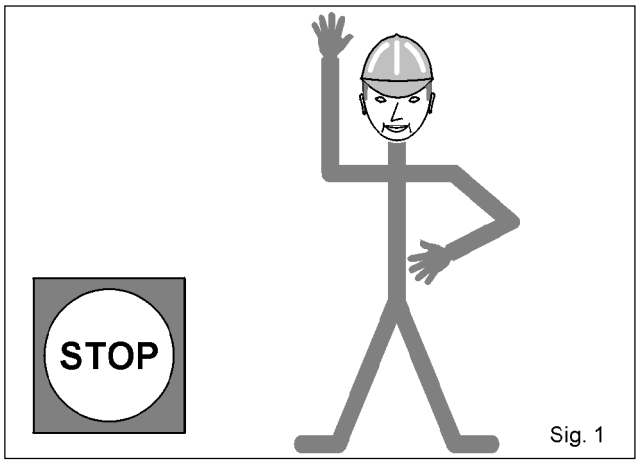
2.1.6. Hand Signals

Signals given by Machine assistant operator unless driver visually contains the rolling space or working space or working equipment, tool.

Signals for general commands

Stop

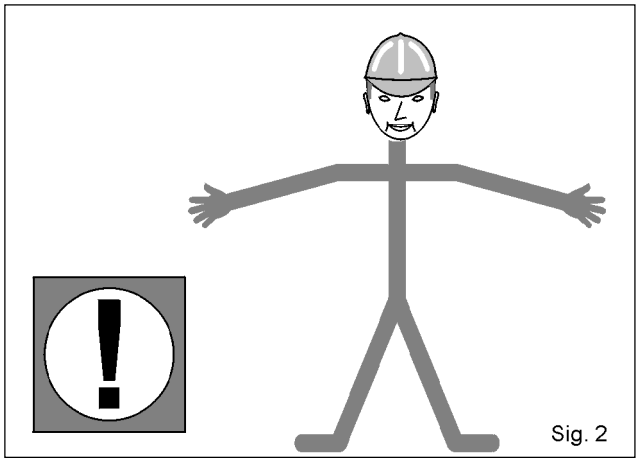
One arm erected with open palm in the direction of the driver, second arm akimbo.



Sig. 1

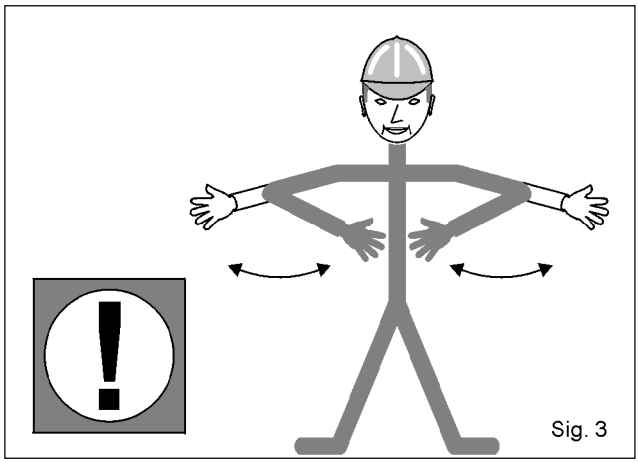
Attention

Both arms sideways raised horizontally – palms forward.


Sig. 2

Attention, Danger

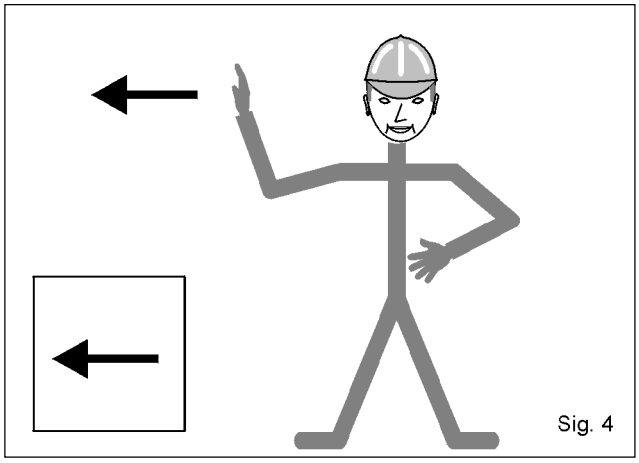
Swinging motion of both of the arms with antebrachium from the position of arms sideways raised horizontally to the position of arms sideways raised – arms bending across and back.


Sig. 3

SIGNALS FOR DRIVE

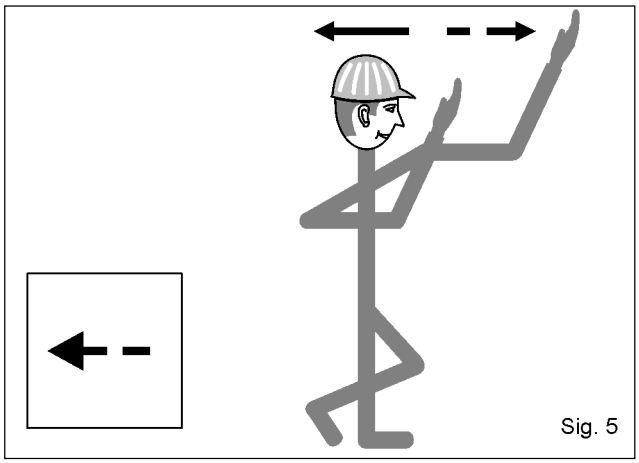
Departure with the Machine

One arm erected – bent with open palm, long motion of antebrachium in the direction of required motion, second arm akimbo.


Sig. 4

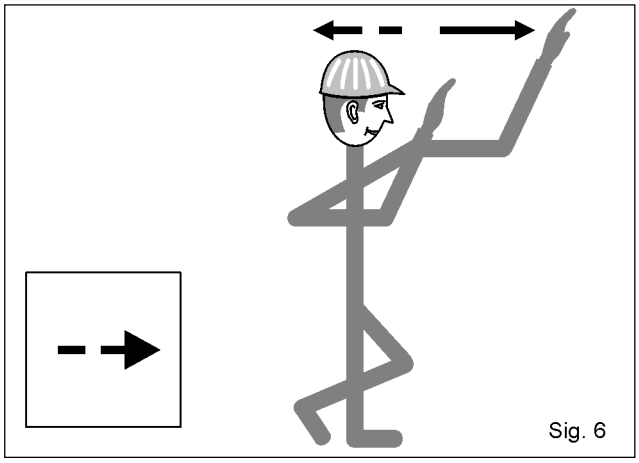
Low-speed cruising forward – towards me

Both arms erected abreast bending across, with palms towards the body – short swinging movements of antebrachium towards the body and backward.


Sig. 5

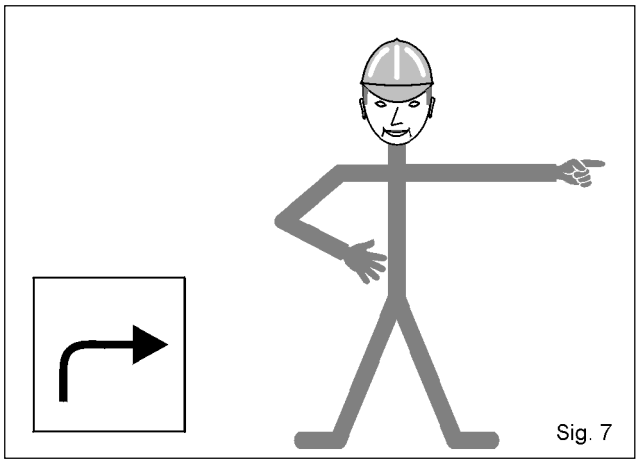
Low-speed cruising backward – away from me

Both arms erected abreast bending across, with palms away from the body - short swinging movements of antebrachium away from the body and back.


Sig. 6

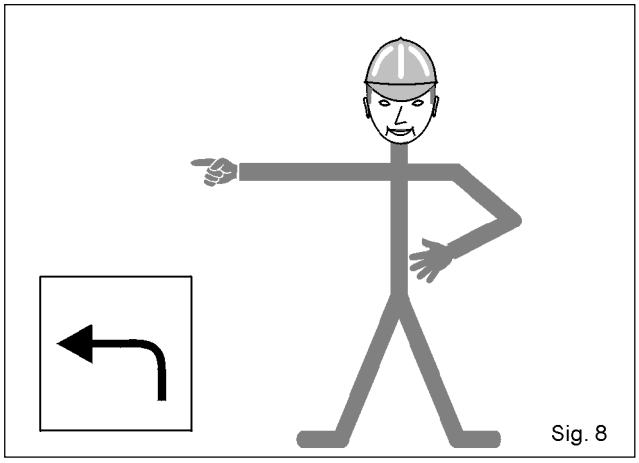
Driving to the right

Left arm sideways raised, right arm akimbo.


Sig. 7

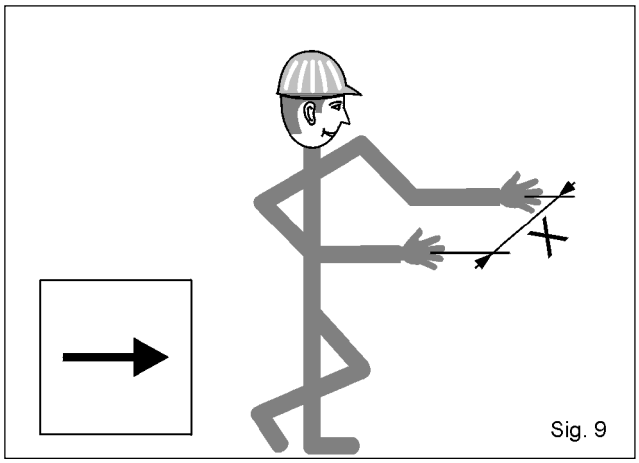
Driving to the left

Right arm sideways raised, left arm akimbo.


Sig. 8

Short motion

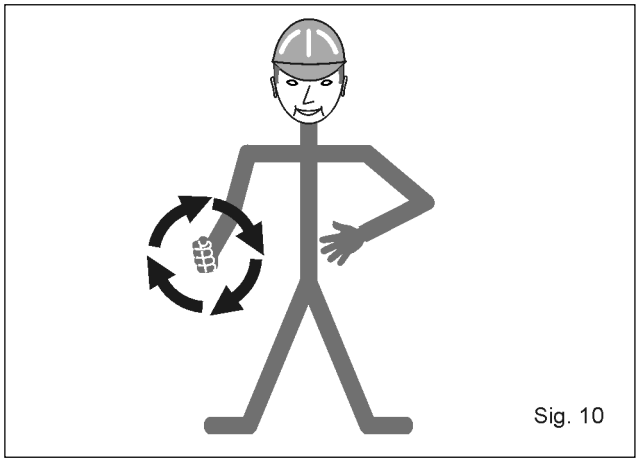
Both arms lifted forward bending across. Mark the „**X**“ distance between palms, then the motion signal follows.



Sig. 9

Engine start

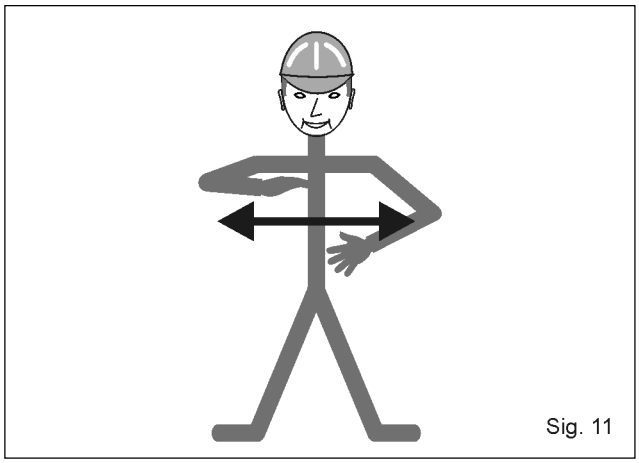
Circular motion of right hand's antebrachium, with the fist closed.



Sig. 10

Engine cut off

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



Sig. 11

The user must observe general rules of health and environment protection, and all applicable laws, notices and regulations in the country of use, when operating or parking the machine.

2.2.1. Health rules

- Oils, refrigerants, battery acids, and lacquers with their thinners are injurious to health. Workers that come in contact with such products during operation and maintenance must observe general health protection rules and safety and health instructions issued by the manufacturers of such products.

  Observe primarily rules

  - for the protection of eyes and skin when working with batteries
  - for the protection of skin when working with oils, lacquers and refrigerants
  - for washing hands after work and before meals, apply suitable hand cream,
  - for work with refrigerants as instructed by the manufacturer of the machine.
- Store oils, refrigerants, battery acids, lacquers, organic thinners, cleaning and conservation products always in original containers correctly marked on the outside. Do not allow storage in unmarked bottles and other containers to prevent confusion. Particularly confusing food and drink is dangerous.
- Should skin, mucous membranes, or eyes be affected, or fumes breathed in, apply first aid immediately. Seek medical aid immediately in case of swallowing any of the listed products.
- Use hearing protectors of the correct type and shape when working with machines without a cabin or with open windows.

2.2.2. Ecological rules

- The fills of specific systems and some components become waste with risk factors to the environment when discharged.

  This category of products includes mainly

  - organic and synthetic lubricants, oils and fuels
  - refrigerants
  - battery acids and batteries
  - fill tires
  - cleaning and conservations means
  - all discarded filters and cartridges
  - some used and discarded hydraulic and air hoses, rubberized metals and other components soiled by above-listed products.

Producer and contractual service organizations accredited by him, or dealers take back the following materials or parts free of charge:

- oils
- batteries
- tyres

The above-listed products and parts when discarded must be handled according to applicable national regulations for the protection of environment and health.

2.3.1. Short-term storage of 1 to 2 months

Wash and clean the machine thoroughly. Warm up the engine to operating temperature before starting conservation for storage. Place the machine on a firm and flat surface in a secure location where there is no danger of damaging the machine by forces of nature like floods, landslides, fire, etc.

then

- repair any defective lacquer
- grease all lubrication places, cables, lever elbows, etc.
- check that water tanks are drained
- check whether the refrigerant is frost resistant
- check the charge of batteries and recharge if necessary
- cover chrome plated surface of pistons with conservation grease
- we recommend to protect the machine against corrosion by spraying it with conservation means, mainly in spots endangered by corrosion.

A machine that has been treated in this manner doesn't require any special processing before next use.

2.3.2. Conservation and storage for more than 2 months

Same rules for short-term storage apply here as well,

moreover,

- remove batteries, check condition and store in a dry, cool room – recharge battery regularly,
- support the drum frame so that the shock absorbing system is not loaded,
- protect rubber components with a layer of special conservation preparation
- inflate tires to prescribed pressure and protect them against direct sunshine
- cover chrome plated surface of pistons with conservation grease
- for conservation spray the machine with a special preparation particularly in places subject to possible corrosion
- cover exhaust and intake of the engine with double PE foil and sticky tape over it
- protect headlights, outside rearview mirrors and other electrical components outside by spraying over them special preparation and covering with PE foil,
- conserve the engine as instructed by manufacturer and leave a sign that the engine has been conserved.

! NOTE !

We recommend that you inspect the conservation condition. After 6 months inspect and renew if necessary.

Do not start the engine while stored!

If the machine is stored outside, check whether the site is not in danger of being flooded in case of bad weather or endangered in any other way.

Before starting operations again, wash off conservation with high-pressured hot water with ordinary degreasing means added as directed, while observing environmental rules.

Remove conservation and wash the machine in places with catch basins available to collect rinse water and chemicals.

2.3.3. De-conservation and inspection of brand new machines

Check the machine against delivery documentation.

Check whether any parts were damaged during transport or are missing. Inform the shipper of any discrepancies.

Before starting operations again, wash off conservation with high-pressured hot water with ordinary degreasing means added as directed, while observing environmental rules.

Remove conservation and wash the machine in places with catch basins available to collect rinse water and chemicals.

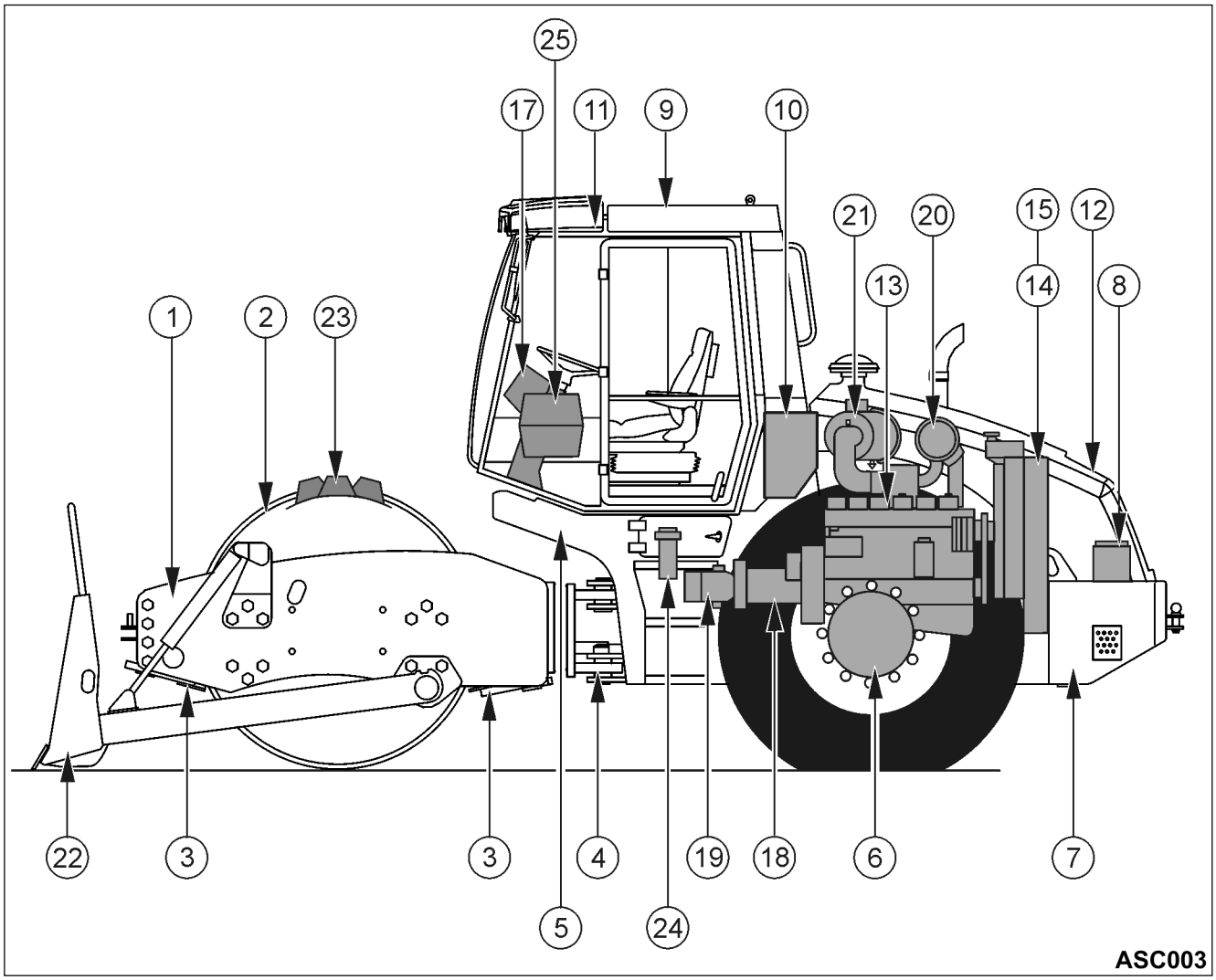
2.4. Liquidation of the Machine After Termination of Its Service Life

In disposing of the machine at the end of its life, the user must observe national regulations and laws on waste disposal and protection of environment. We recommend that you refer always to

- specialized companies authorized to deal with such cases
- the machine manufacturer or authorized service establishments.

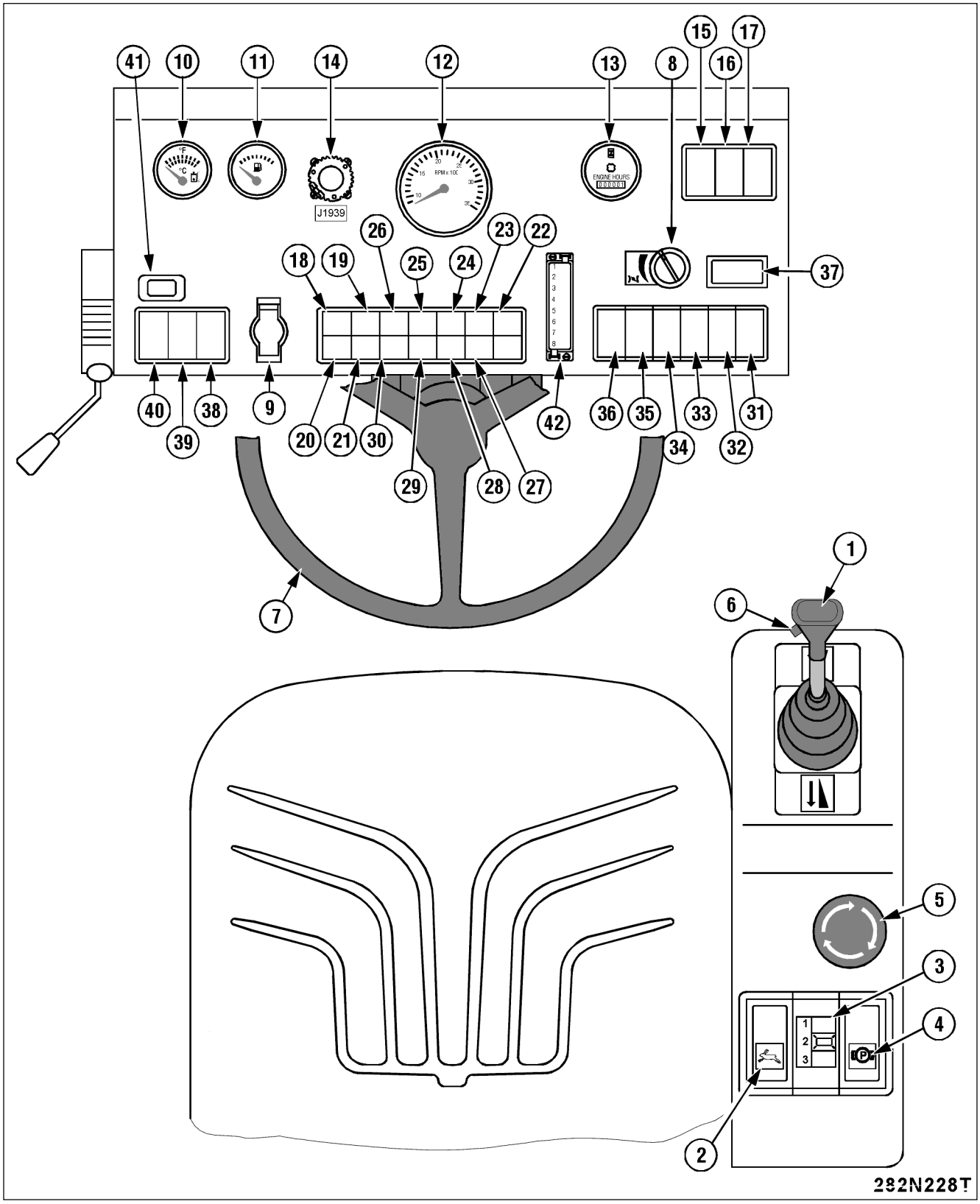
The manufacturer is not responsible for injuries to health and damages to the environment caused by disobeying this notice.

Main Components of the Machine



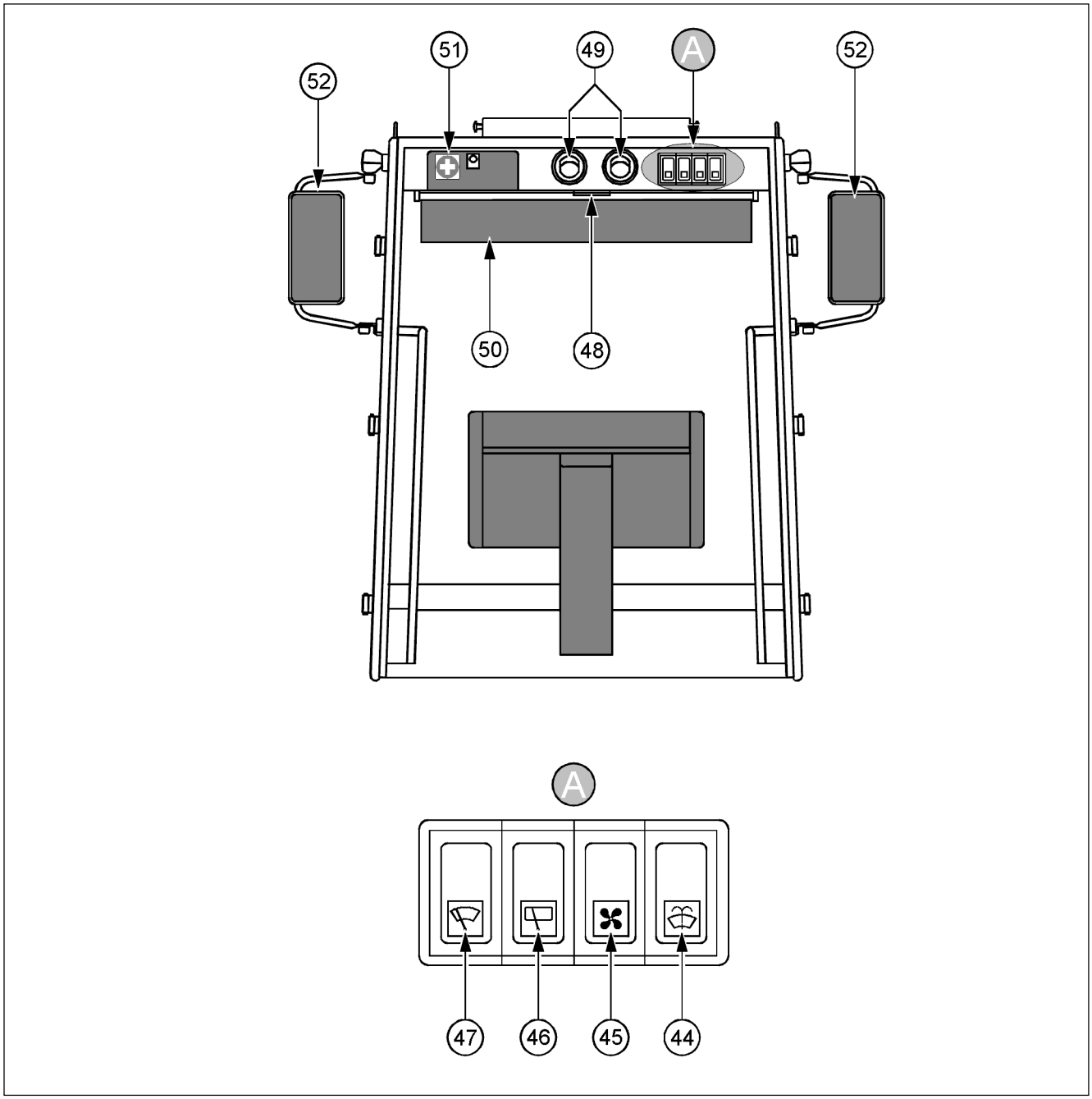
1 - Drum frame
2 - Vibratory drum
3 - Scraper
4 - Articulated joint
5 - Tractor frame
6 - Axle
7 - Fuel tank
8 - Batteries
9 - ROPS frame
10 - Hydraulic oil tank
11 - Cabin
12 - Hood
13 - Engine
14 - Hydraulic oil cooler
15 - Liquid radiator
17 - Driver's workplace
18 - Pump of travel
19 - Pump of vibration
20 - Exhaust silencer
21 - Air cleaner
22 - Dozing blade
23 - Padfoot segments
24 - Hydraulic oil pressure filter
25 - Air condition system

Controls and control devices



1 - Travel control
2 - Transport gear selector
3 - Working gear pre-selector
4 - Parking brake switch
5 - Emergency brake push-button
6 - Vibration switch
7 - Steering wheel
8 - Engine speed selector
9 - Switchbox
10 - Hydraulic oil thermometer
11 - Fuel gauge
12 - Revolution counter
13 - Hourmeter
14 - Engine diagnostics
15 - Engine idling switch
16 - Engine diagnostics switch
17 - Troubleshooting switch
18 - Stop engine - signal lamp
19 - Engine warning - signal lamp
20 - Water in fuel - signal lamp
21 - Maintenance signal lamp
22 - Battery charging - signal lamp
23 - Brake - signal lamp
24 - Idle (neutral) position - signal lamp
25 - Air filter - signal lamp
26 - ATC - interaxle differential - signal lamp
27 - Oil level in hydraulic tank - signal lamp
28 - Vibration on - signal lamp
29 - Clogging of the pressure filter of hydraulic oil - signal lamp
30 - Indicators - signal lamp
31 - Horn push-button
32 - Rear lights - switch + signal lamp
33 - Front lights - switch + signal lamp
34 - Auxiliary lights - switch + signal lamp
35 - Warning lights - switch + signal lamp
36 - Warning beacon - switch + signal lamp
37 - Indicators switch
38 - Drum traction slip control - switch + signal lamp
39 - Heating fan - switch + signal lamp
40 - Vibration pre-selector
41 - ATC connector
42 - Fuse box

Layout of controls and cabin accessories



282N005T

44 - Windshield washer switch

45 - Fan switch

46 - Rear wiper switch

47 - Front wiper switch

48 - Cabin illumination

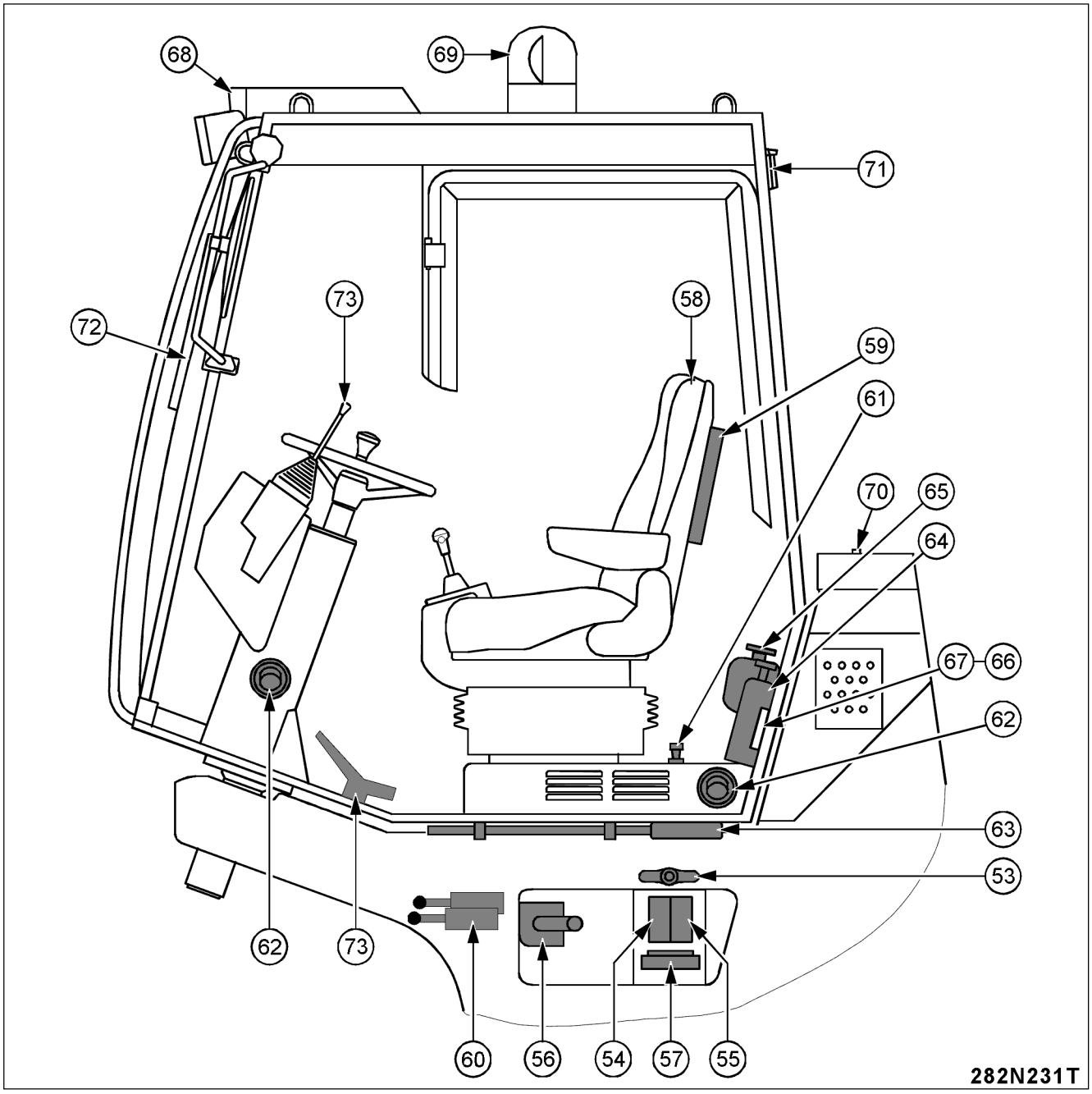
49 - Vent jets

50 - Sun shield

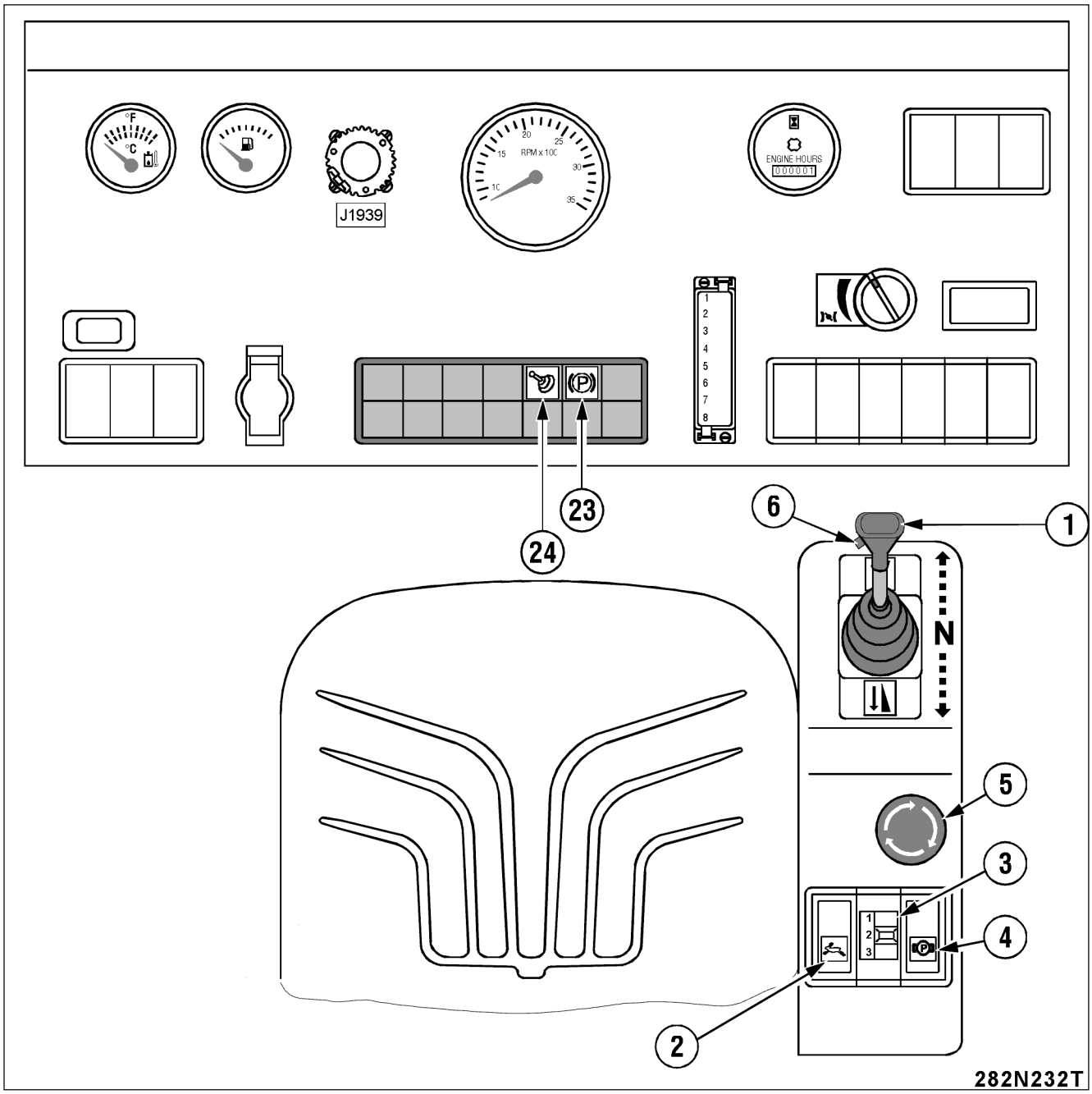
51 - Glove box

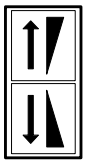
52 - Rear mirrors

Cabin



53 - Battery disconnector
54 - Cabin lifting and lowering switch
55 - Bonnet lifting and lowering switch
56 - Manual hydro-generator for lifting and lowering of driver's stand and bonnet
57 - (50A) fuse
58 - Driver's seat
59 - Box
60 - Levers of lifting and lowering of cab and hood
61 - Heat control
62 - Heating vents
63 - Manual hydro-generator operating lever
64 - Fire extinguisher
65 - Washer tank
66 - Bottle holder
67 - Storage compartment
68 - Cabin ventilation filter
69 - Beacon
70 - Beacon connector
71 - Rear wiper
72 - Front wiper
73 - Blade control - hand pedal





Travel control 1

Use this control to adjust the travel direction and speed. The travel speed depends on degree of the control movement from the neutral position. At the same time, it is only used as a operating brake of the machine. The control is locked in the set position. Signal lamp 24 will light up to indicate neutral position of the control (N). Vibration switch 6 is located in the control grip.

! NOTE !

The engine can only be started when in neutral.

Vibration cannot be activated in neutral (vibrator bearings are not lubricated during vibration on the spot).

Transport gear selector 2

When the gear selector is on, the transport gear is engaged (”rabbit” signal lamp of the selector is on). The machine can reach the maximum speed at reduced towing power and reduced climbing capacity.

NOTE:

When the selector is off, the working gear mode is selected. The machine can reach the maximum towing power and climbing capacity - see pre-selector 3.

! NOTE !

Selector 2 - transport gear - can be activated when driving on finished surface.

It is possible to activate the selector while loaded.

Should towing power be insufficient, turn the transport gear selector off.

Do not activate the selector while working with the machine!

Do not turn the selector off at higher speeds - this will cause rapid deceleration and impact in the hydraulic system. Turn the selector off at low speeds or when the machine is stopped!

Working gear pre-selector 3

Use the pre-selector to choose one of three working gears in both directions obr. 20. Maximum speeds reached in pre-selector ”1” to ”3” positions correspond to common working speeds used for compacting and are factory-preset. The machine can reach the maximum towing power (climbing capacity) in position ”3”.

! NOTE !

Pre-selector 3 can only be operated if selector 2 is off.

Use positions 1 and 2 of the pre-selector on even surface only.

Use position 3 of the pre-selector when climbing.

Parking brake push-button 4

Use the brake of the machine when the engine is running. The brake pilot lamp is shining. Then the operator can leave the seat.

NOTE:

In this case the seat switch is not activated.

Emergency brake push-button 5

In case of failure when it is not possible to stop the machine by moving the travel control 1, emergency brake controlled by push-button 5 must be used. Activate the emergency brake by pressing the button; the roller will brake, engine will stop and the signal lamp 23 will light up. Turn the button in the direction of the arrow to release the brake.

! NOTE !

If the emergency brake is pushed, it is not possible to start the engine.

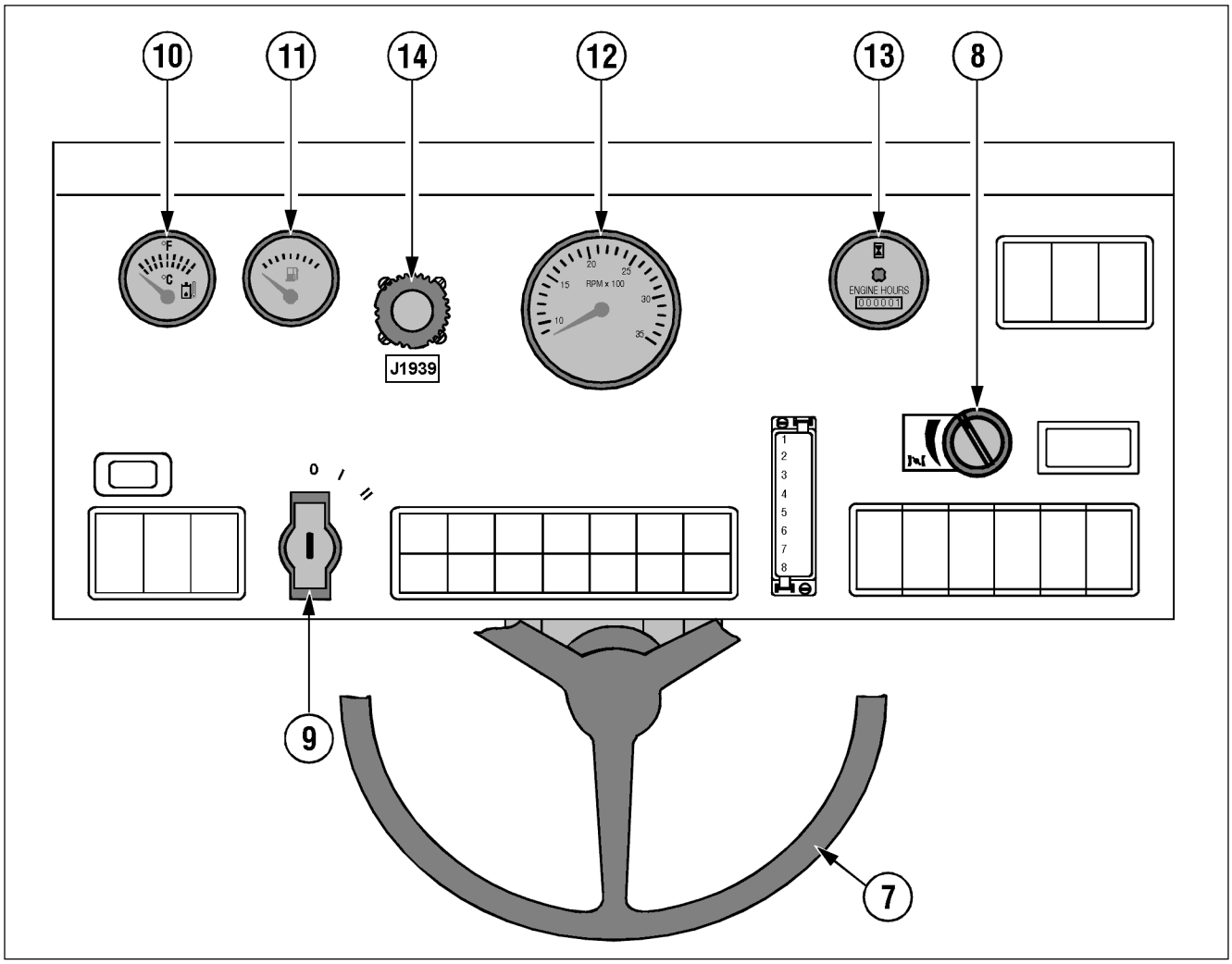
Vibration switch 6

Press the switch to turn on vibration. Press it again to turn vibration off.

! NOTE !

The signal lamp will indicate ”on” status.

Vibration can only be turned on if selector 2 is off.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282N008t

Steering wheel 7

Use the steering wheel to steer the machine.

! NOTE !

When driving without vibration, set optimum speed (1800 rpm) to ensure safe steering.

Engine speed selector 8

Use this control to decrease combustion engine speed.

Note

The switch 8 decrease from max to min engine speed.

Switch box 9

There are three positions: ”0”, ”I” and ”II”. In ”0” position, all appliances of fuses F1, F2 and F7 are connected; in ”I” position, remaining appliances are connected; ”II” spring position is used for starting the machine. Stop the machine by turning the key to ”0” position; the key can then be removed.

Note

The key of switch box is used for door of cabine and servis door under cabine and tools box.

! NOTE !

Remove the key from the switch box when leaving the machine!

In cabinless machines, protect the ignition box from water and dirt by folding the box cover after having removed the key.

Hydraulic oil thermometer 10

Indicates the hydraulic oil temperature during operation.

! NOTE !

Top limit is 90 °C for oils of viscosity grades HV 68 and HV 100. 50 - 60 °C (122 - 140 °F) is the optimum working temperature.

Using other viscosity grade oils:

Oil viscosity	Max. allowed oil temperature
HV 46	80°C
HV32	70°C

Fuel gauge 11

Indicates the level of fuel in fuel tank.

! NOTE !

Check the gauge regularly during operation.

Revolution counter 12

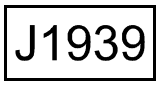
Indicates engine revolutions per minute.

Hourmeter 13

Indicates hours of running engine. The counter starts counting (adding) at starting the engine.

Note

Counting hours does not depend on engine speed.



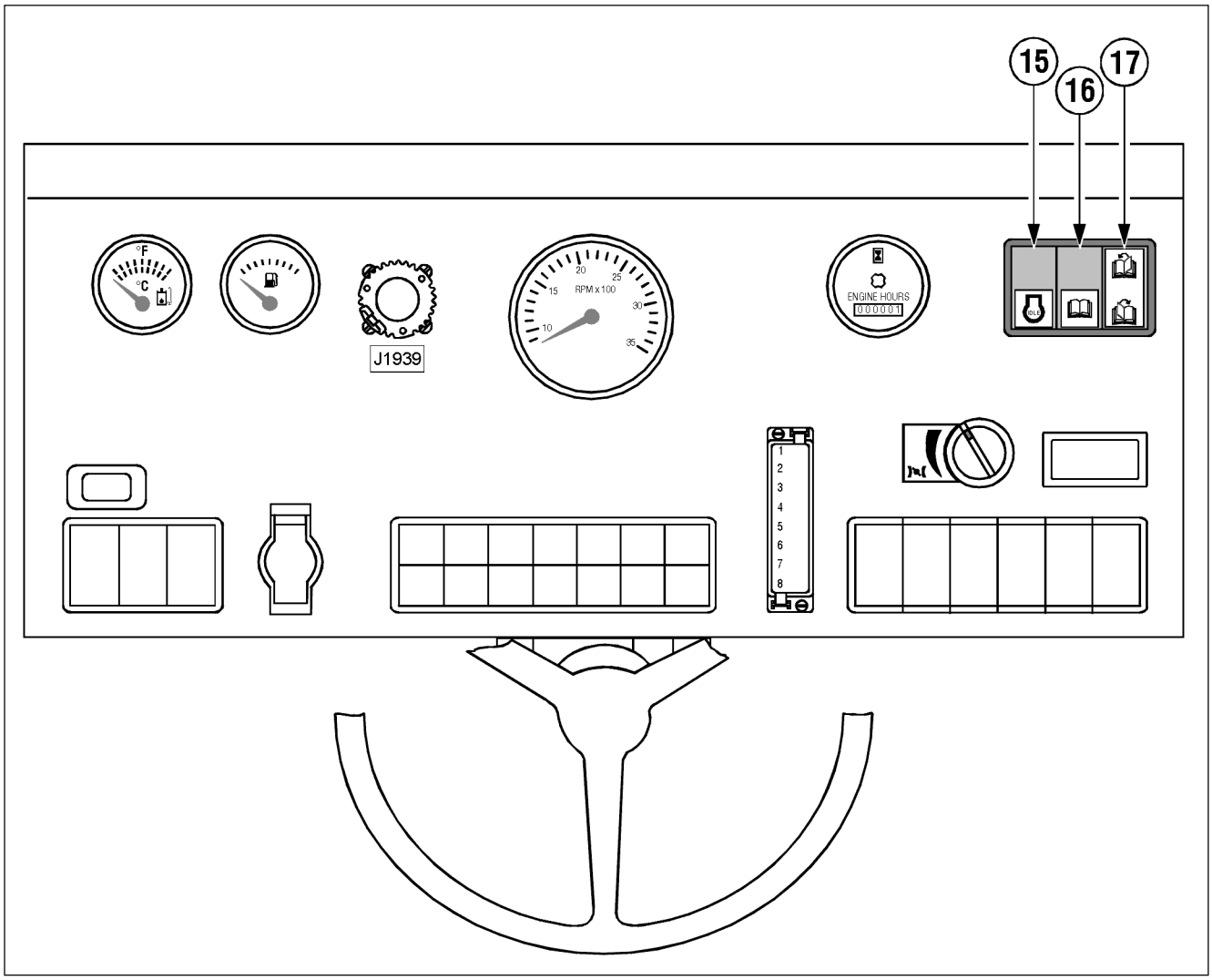
Connector 14

Use the connector to connect ECM (Electronic Control Module) and diagnostics trouble.

Note

ECM processes engine function data and controls the engine. Sensors pick up information on engine function and malfunctions and transfer it to ECM. The control module analyses input and returns commands for the engine to function properly.

Malfunctions and other data is identified and stored in ECM memory. This data will be transferred after connecting a service device (notebook) to connector 14.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282N009T

Engine idling switch 15

Use the switch to turn on engine idling with an engine start. Signal lamp in the switch will light up upon activating.

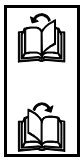
Engine diagnostics switch 16

In case of a malfunction of the engine, clutch the diagnostics switch 16 to identify the defect on the basis of flashing code on signal lamp 18.

Note

Signal lamp 18 or 19 will go on in case of an engine malfunction, depending on severity of the defect. After activating switch 16, the will start flashing the code of the first defect see chapter 2.7.7.

If both pilot lamps indicating defects (yellow – 19 and red – 18) go on after pressing the switch when the ignition box is on that means no defects have been identified by engine ECM.



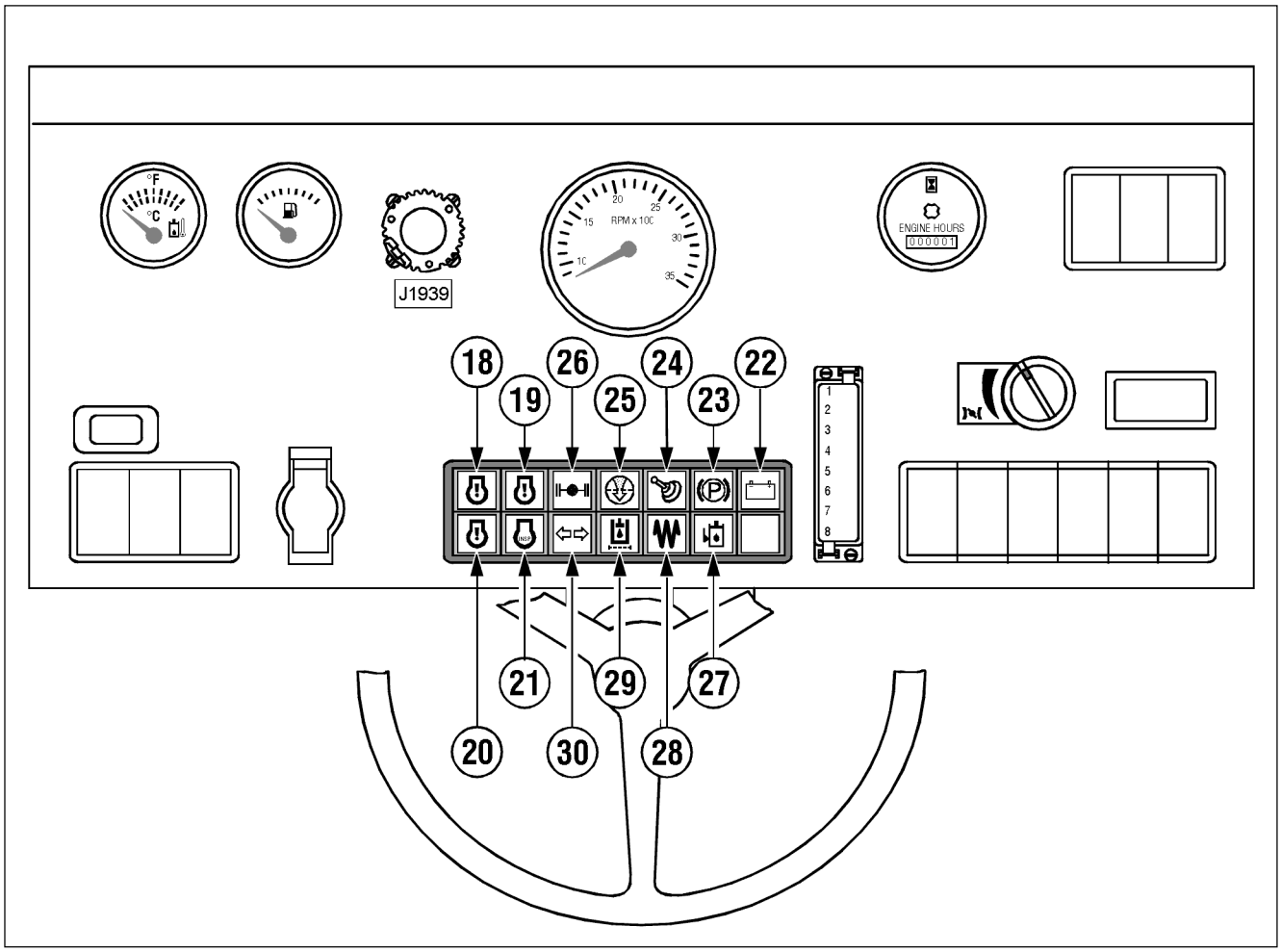
Troubleshooting switch 17

The switch is in the middle position.

Turn it continuously any direction (+ forward or - backward) to find defects according to flashing codes of signal lamps 18 or 19.

! NOTE !

Use the switch for trouble shooting only.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282N010T

Stop engine - signal lamp 18

Stop the engine as soon as possible if this red lamp goes on.

After the signal lamp goes on, stop operation and engine while keeping safety at work!

Do not start the engine before the defect has been repaired!

Engine warning - signal lamp 19

This yellow lamp indicates a defect - the engine must be checked.

Note

The searching fault engine see chap. 2.7.7.

! NOTE !

Repair the defect as soon as possible!

Water in fuel - signal lamp 20

This lamp indicates water or other deposits detected in the fuel filter separator.

! NOTE !

Blow of water from fuel filter see. chap. 3.6.8.

Maintenance signal lamp 21

It is connect. It possibile to connect after agreement with engine producer.

Battery charging - signal lamp 22

Indicates proper function of battery charging. The lamp must go on at turning the ignition key 7 to "I" position and go off after the engine has been started.

! NOTE !

If it does not go off, detect the cause!

Brake signal lamp 23

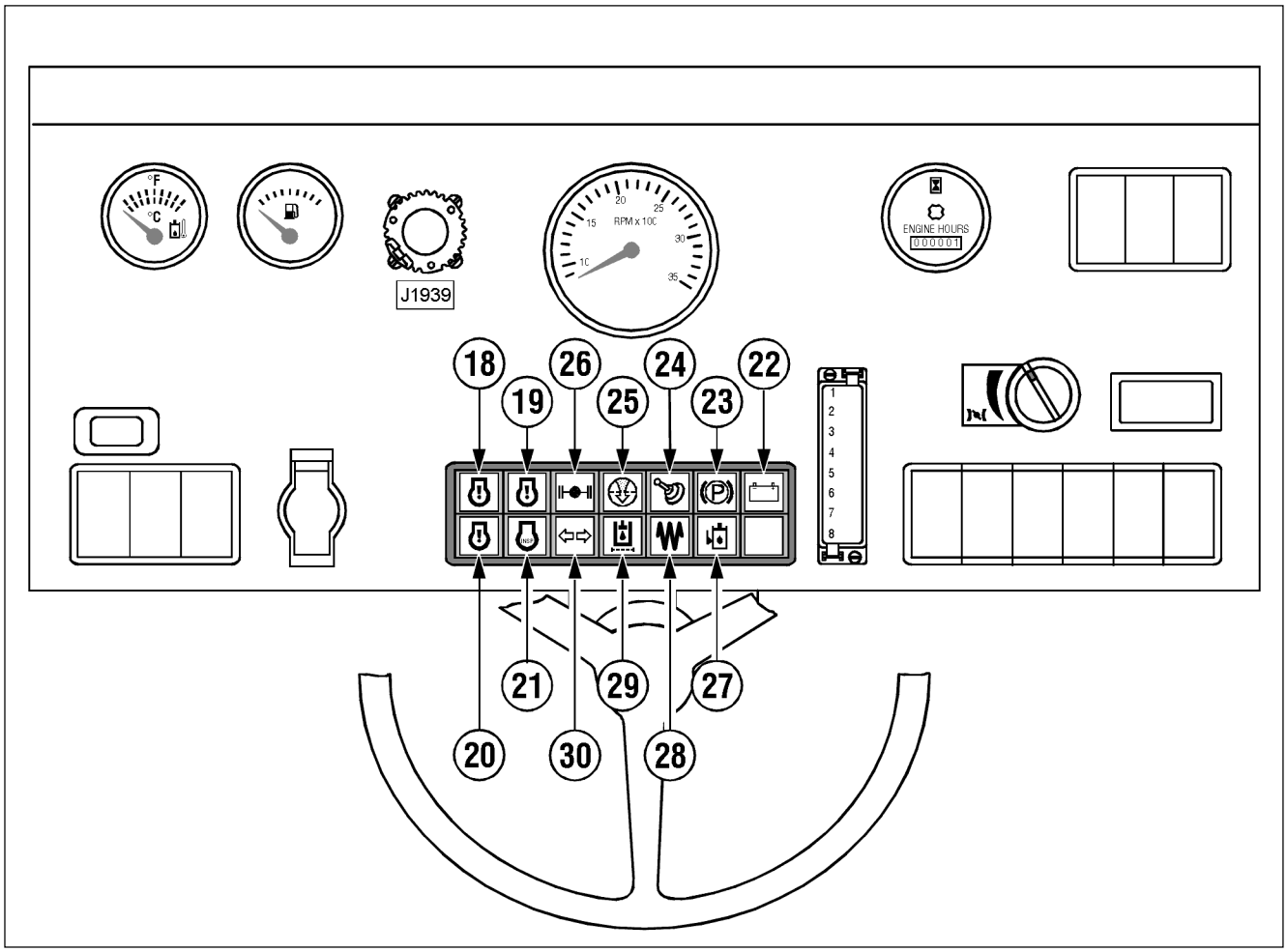
This lamp (on) indicates that the machine is braked.

Zero position of neutral - signal lamp 24

This lamp indicates neutral position of the travel control; the engine can be started in this position.

! NOTE !

Check the neutral position before starting the engine!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282N010T

Clogged air cleaner - signal lamp 25

This lamp (on) indicates excessively clogged air filter.

! NOTE !

Replace filters immediately!

ATC - interaxle differential - signal lamp 26

Flashing lamp indicates a defect on ATC.

Note

For function description ATC, see chapter 2.7.8.

Hydraulic oil level - signal lamp 27

This lamp (on) indicates oil level in the tank under the lower limit. The machine and engine will automatically stop (environmental protection).

! NOTE !

It is possible to start engine only after repairing the defect and refilling oil in the hydraulic tank to proper level!

Vibration on - signal lamp 28

This lamp (on) indicates vibration is on.

Clogging of the pressure filter of hydraulic oil - signal lamp 29

At oil temperature of 50 - 60°C, this lamp (on) indicates clogging of the filter.

! NOTE !

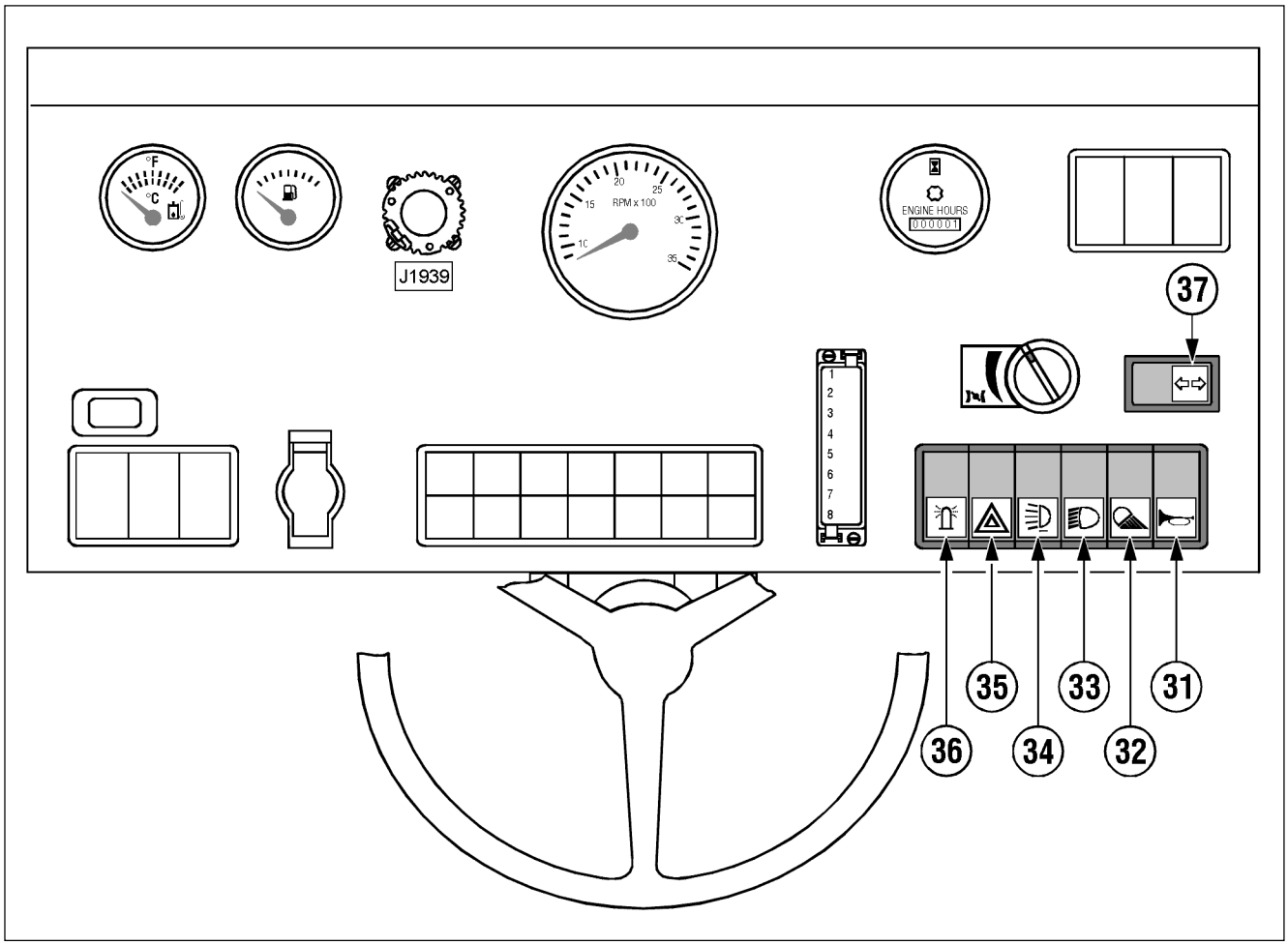
Replace the filter immediately!

Indicators - signal lamp 30

The lamp is flashing when direction indicators are on.

! NOTE !

Check function of indicators.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282N011T

Horn push-button 31

Press the button to horn.

Rear lights switch 32

Use the switch to turn on rear lights. The lamp in the switch indicates lights lit up.

Parking + front working lights switch 33

position - off

position - parking lights and dashboard illumination on

position - main headlights on

The lamp in the switch indicates lights lit up.

Auxiliary lights switch 34

Use the switch to turn on auxiliary lights.

The lamp in the switch indicates lights lit up.

Warning lights switch 35

Use the switch to turn on warning lights.

The flashing lamp in the switch indicates lights on.

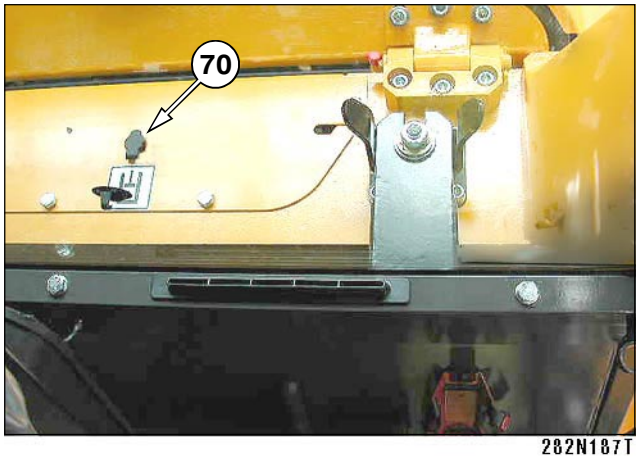
Beacon switch 36

Use the switch to turn on warning beacon.

The lamp in the switch indicates beacon on.

! NOTE !

The beacon must be connected to connector 70.



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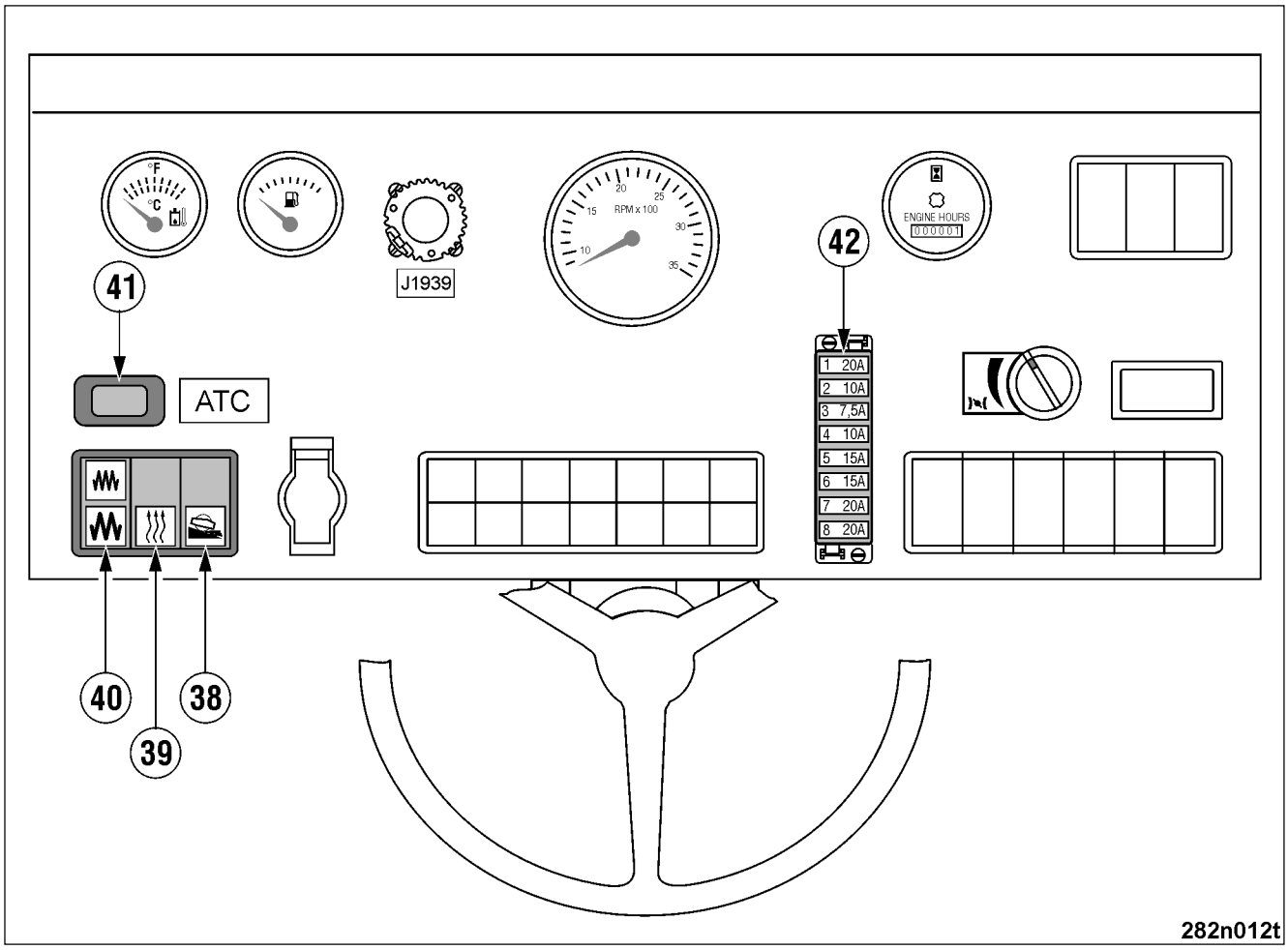
Indicators - position switch 37

Move the position switch to the right to turn on right indicators and to the left to turn on left indicators.

Flashing indicators signal lamp indicates the direction indicators are on 30.



Drum traction slip control switch 38

Located on the control panel if the machine is not equipped with ATC function.

The lamp in the switch indicates the function on.

! WARNING!

Apply traction slip control only for driving up to platforms of transporting vehicles.

Selector 2 must be off while switch 38 is on. At the same time, vibration is locked.

Heating fan switch 39

position - off

position - high speed of fan motor

position - low speed of fan motor

Fan ensures air circulation inside the cabin only.

Vibration pre-selector 40

Position - low amplitude and high frequency is on

Position - high amplitude and low frequency is on

ATC connector 41

Use this connector to connect a service device (notebook) in order to communicate with the control module (susmic) and to troubleshoot.

Fuse box 42

Fuse	(F1) -20 A	(upper fuse) front + rear lights, front parking + rear lights, auxiliary headlights, dashboard illumination, lifting and lowering of bonnet and driver's stand, license plate illumination.
Fuse	(F2) -10 A	portable lamp connector, cabin illumination, horn, direction indicators, beacon.
Fuse	(F3) -7.5 A	brake, brake signal lamp, brake lights, magnets - transporting speed of wheels, travel servo valve, vibration magnets, vibration-on signal lamp, back horn, hydraulic oil level signal lamp, travel control neutral position signal lamp
Fuse	(F4) -10 A	ATC (interaxle differential)
Fuse	(F5) -15 A	fuel gauge, revolution counter, hourmeter, hydraulic oil thermometer, charging signal lamp, air filter signal lamp, hydraulic oil level signal lamp, water in fuel signal lamp, maintenance signal lamp, stop engine signal lamp, engine warning signal lamp.
Fuse	(F6) -15 A	ventilation fan, heating fan, front and rear washers, front and rear wipers.
Fuse	(F7) -20 A	reserve (air conditioning)
Fuse	(F8) -20 A	reserve

! NOTE !

Replace fuse with fuse of the same rate only!!!

Windshield washer switch 44

Use the switch to turn on front and rear washers at the same time.

Roof fan switch 45

Use this switch to turn on the roof fan.

NOTE

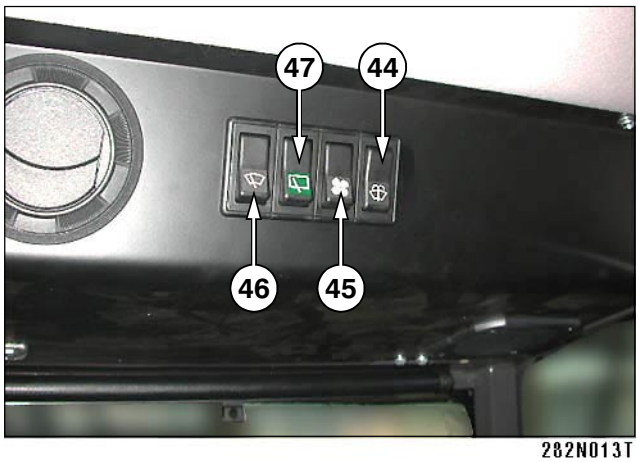
The fan draws outside air, through a filter.

Front wiper switch 46

Use the switch to turn on the front wiper.

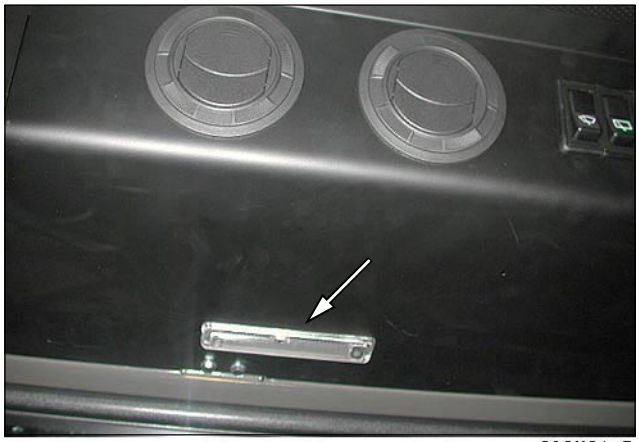
Rear wiper switch 47

Use the switch to turn on the rear wiper.



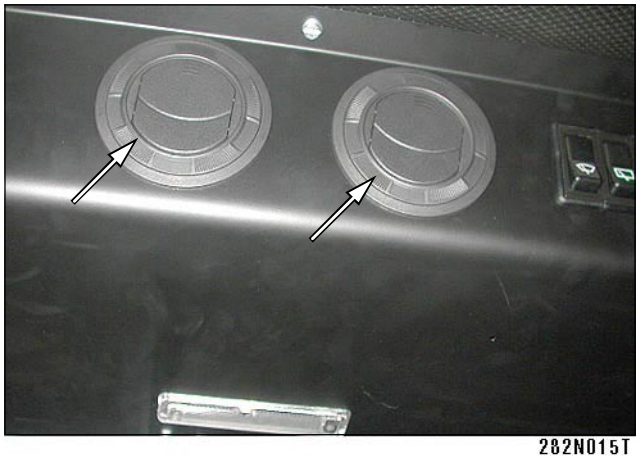
282N013T

Roof light 48



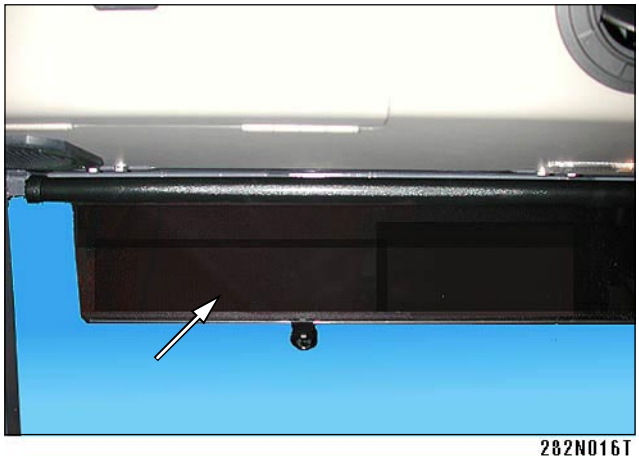
Vent jets 49

Tilt the vents to adjust amount of fresh air, swivel to adjust direction.



Sun shield 50

Move the shield vertically to adjust it.

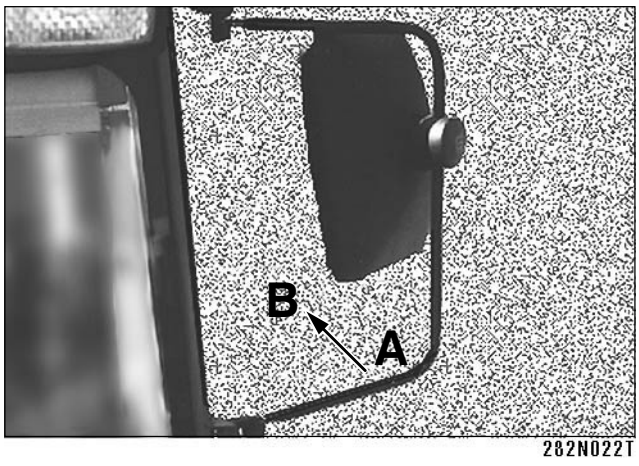


Glove box 51

Use this box to store first aid kit.

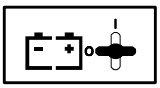
Rear mirrors 52

When working in congested environment or when transporting the machine, rear mirrors can be folded 90 degrees from A working position to B transporting position.



! NOTE !

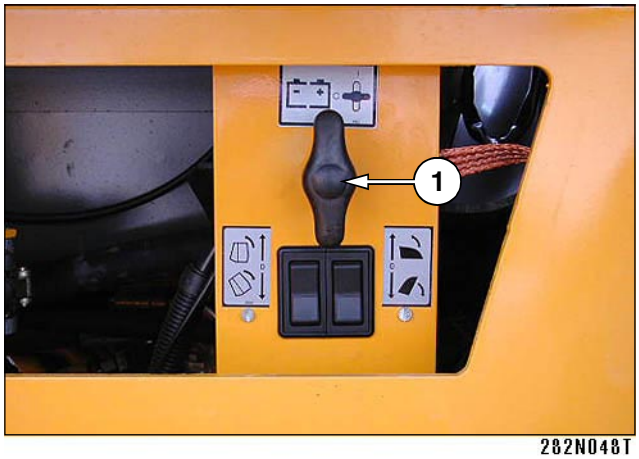
Keep rear mirrors clean and properly adjusted!!!



Battery disconnector 53

Use the disconnector 1 to disconnect battery.

O position - electric system of the machine is disconnected
I position - electric system of the machine is connected



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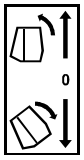
! NOTE !

After stopping the machine, disconnect battery using the disconnector!

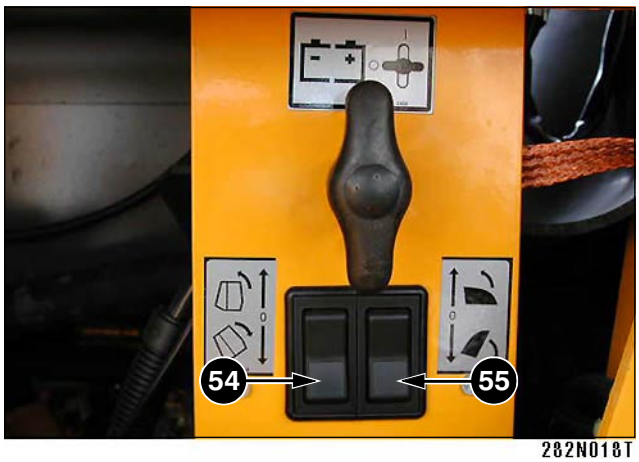
Always disconnect battery when washing the machine!



Lifting and lowering driver's stand switch 54,

Lifting and lowering bonnet switch 55

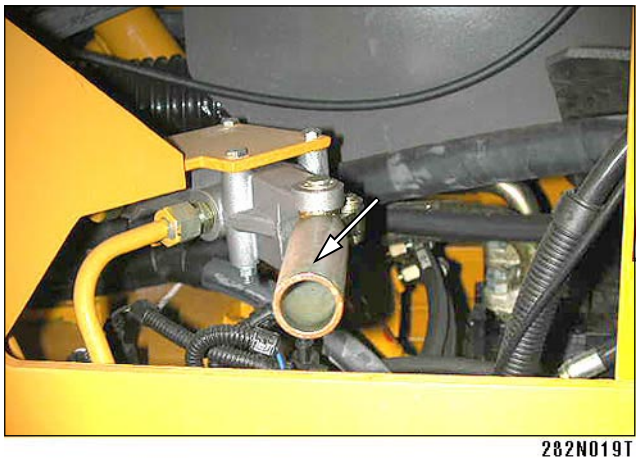
Press buttons 54 or 55 to turn on lifting or lowering.



282N018T

Manual hydro-generator 56

Use this device to manually lift or lower bonnet or driver's stand in case of electric-hydraulic unit failure or low battery.



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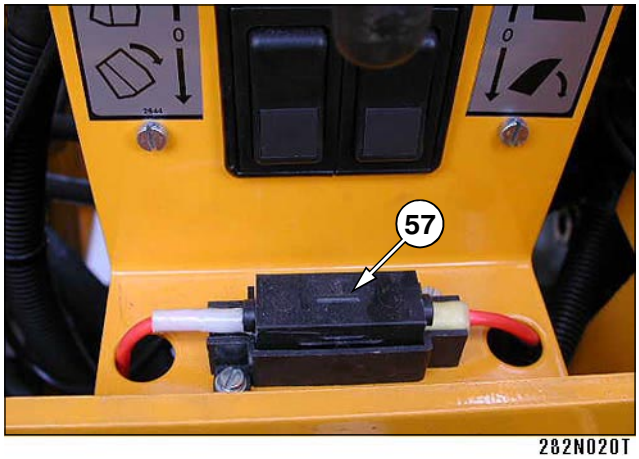
Fuse 57

Secures protection of electric pump used for lifting and lowering of bonnet and driver's stand.



282N020T

! NOTE !

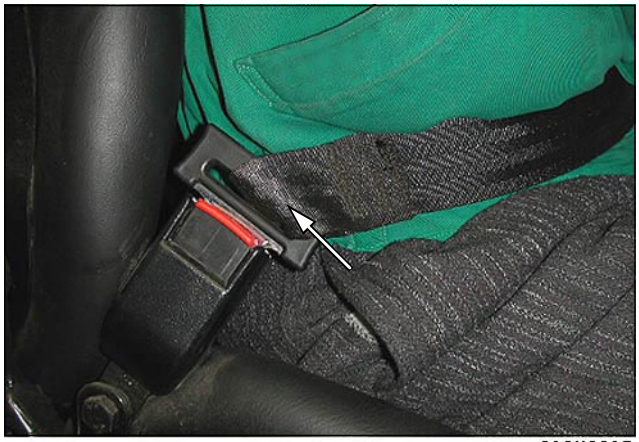
Replace the fuse with a genuine one of the same rate 50 A.

Driver's seat 58

Adjustable, sprung, equipped with two-point retractor belt 1.

282N021T

Driver must fasten the seat-belt during drive!



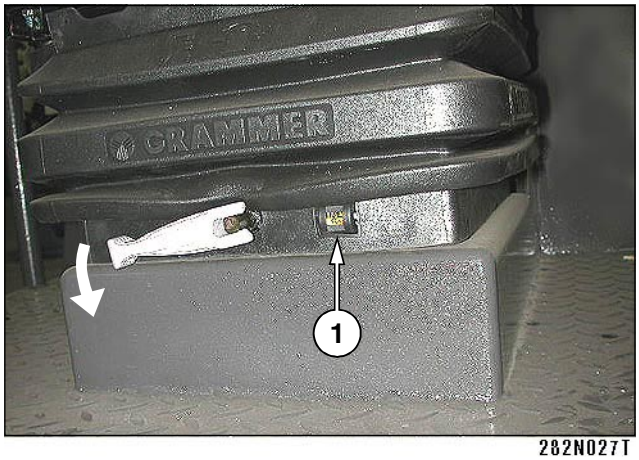
282N023T

SEAT ADJUSTING ELEMENTS:

Backrest inclination adjustment - raise the lever to tilt the backrest infinitely as necessary.

282N025T

Seat spring stiffness adjustment - turn the catch to adjust stiffness according to driver's weight indicator 1 between 50 and 130 kg (110 - 266 lb) in 10kg (22 lb) increments.



282N027T

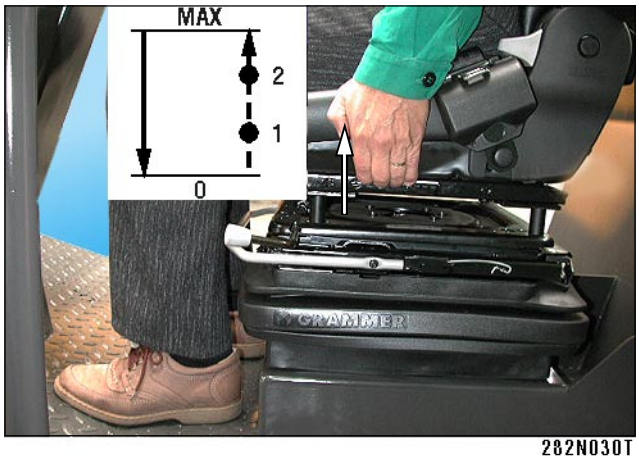
Horizontal seat squab adjustment - raise the lever to move the seat single handedly forward or backward.

282N028T

Horizontal seat adjustment - raise the handle to move the seat with control panel forward or backward.

282N028T

Vertical seat adjustment - grasp the seat at the bottom and lift it to gradually adjust height of the seat. The seat must click into the position. You have to lift it to the top position first to be able to put it back to its lowest position.



282N030T

Seat slight turning - raise the lever to slight turning to the right.

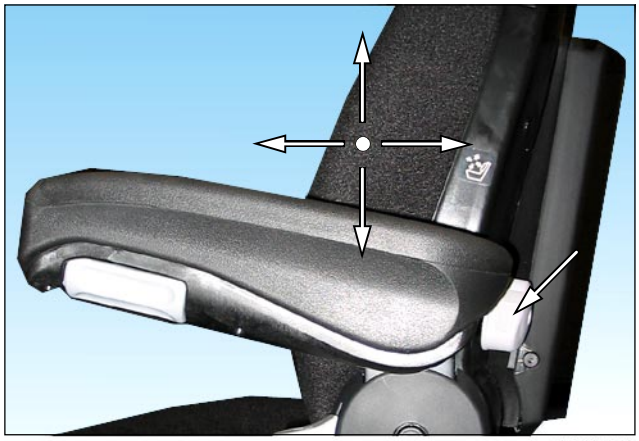
282N029T

Do not swivel the seat while driving!

Arm rest adjustment - raise and turn the screw to cast down a raise the rest.

282N031T

Lumbac support adjustment - Turning of driver is regulated lumbar support.



388N034

Adjust the seat before driving the machine!

Box 59

Fold out the back wall of the seat to use the box to store operation manual.

282N032T

Seat switch

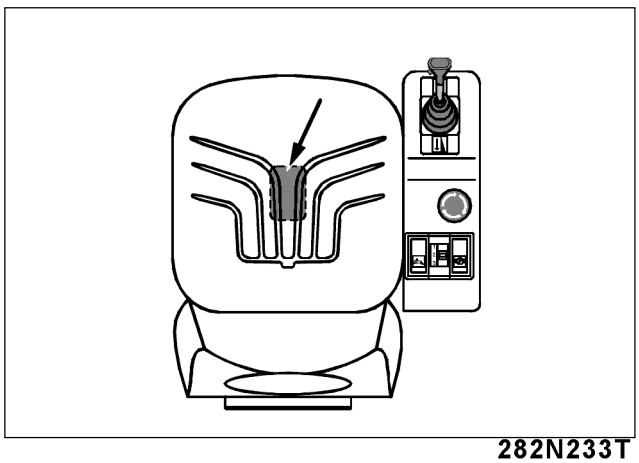
The seat switch is located in the seat squab.

The function of the seat switch is activated when the driver leaves its seat during the ride. Afterwards, speed will decrease until the dead stop, which takes for 3 seconds. After another 5 seconds, the roller brakes to a stop and the engine stalls.

For subsequent engine start, the driver must sit down, move the travel control device to the neutral position, and switch on the brake switch. Before starting, it is necessary to turn off the key to ”0” position and then it is possible to start up the engine. Before run-up, release the brake by switching-off of the switch.

If the driver sits down before 3 seconds pass, the roller keeps on going in selected speed.

If the driver sits down after the roller stopping until 5 seconds pass, the engine does not stall and it does not brake to a stop and the driver can again drive off. Before that, the driver must move the control device to the neutral position and again select the original driving direction.



282N233T

Heating control 61

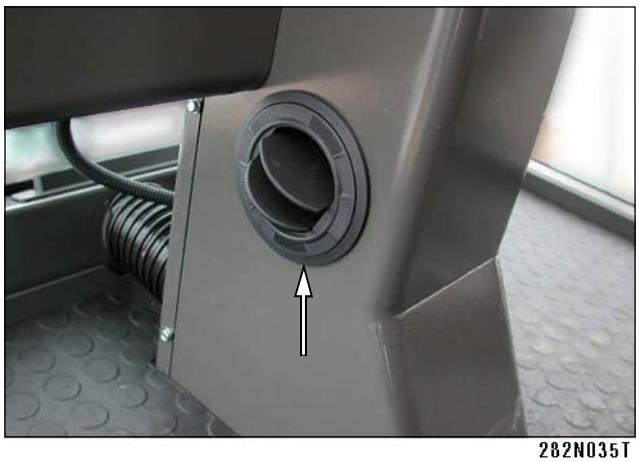
Amount of liquid flowing to the heating radiator can be infinitely controlled from fully closed (valve closed) to fully open valve.

282N034T

Adjust the heating valve before driving!

Heating vents 62

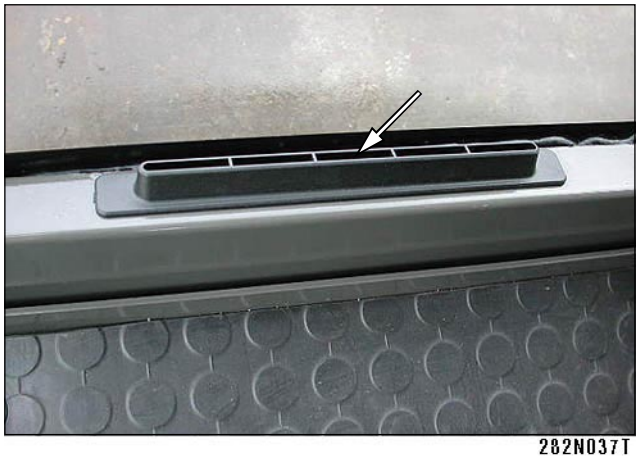
Tilt the vents to adjust amount of fresh air, swivel to adjust direction.



282N035T

282N036T

Front and rear windshields are blown with hot air to avoid dewing.



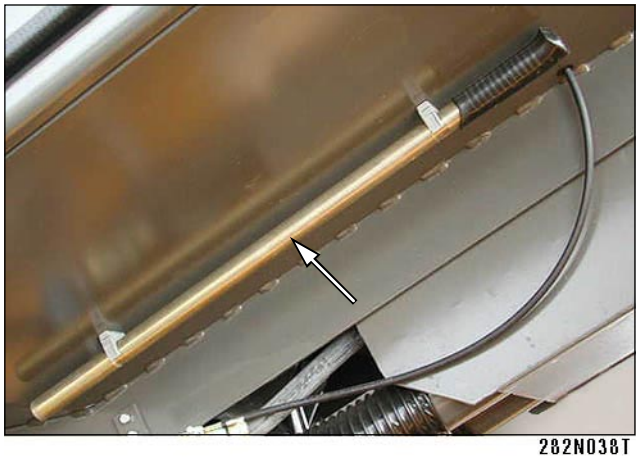
282N037T

! NOTE !

Ensure proper ventilation while heating!

Hydro-generator control lever 63

Use the lever to control manual hydro-generator of lifting and lowering the cabin and bonnet.



282N038T

Fire extinguisher 64

For instructions how to use the fire extinguisher, see the label.

282N039T

Get familiar with using the fire extinguisher!

Inspect the fire extinguisher regularly!

Washer tank 65

The tank is used for supplying solution to two pumps of windshield washers - for front and rear washer jets.

282N040T

Bottle holder 66

Fold out the holder to keep standard bottle.

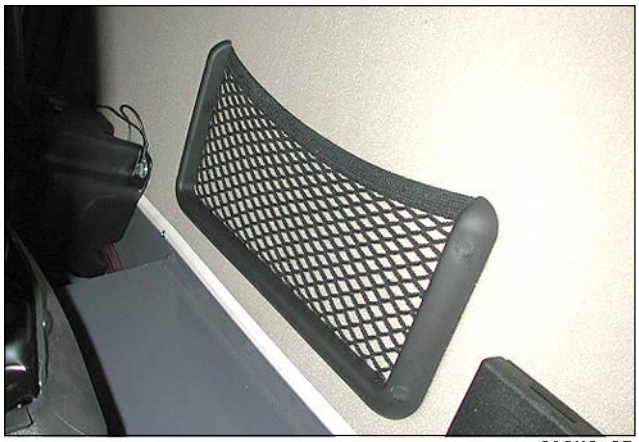
282N041T

! NOTE !

Fill the tank with anti-freeze solution before winter!

Storage compartment 67

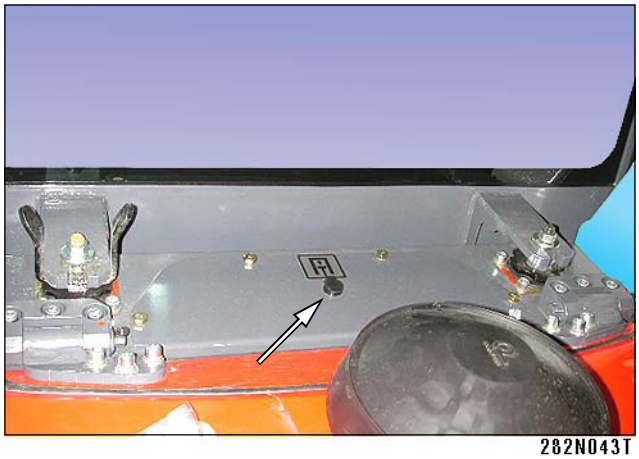
Compartment for driver's personal belongings.



282N042T

Connector 70

Use this connector for warning beacon.



282N043T

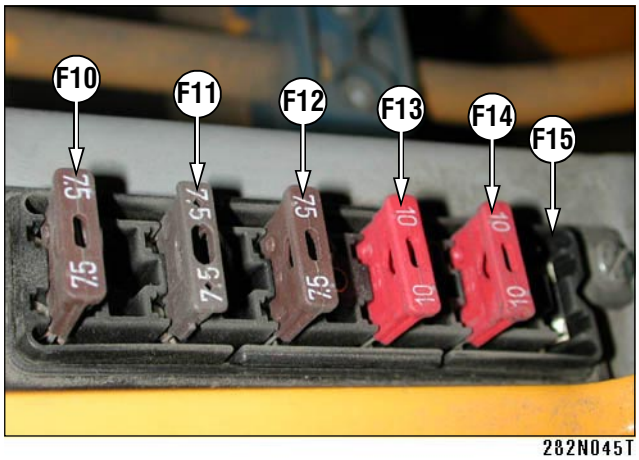
Engine fuses 74

Fuses F10 – F12 –7.5 A ... power supply engine electronics

Fuses F13 – F14 -10 A ..... power supply injection pump

Fuse F15 - reserve

282N044T



282N045T

2.7.1. Starting the engine

Blow horn before starting the engine to check that nobody is endangered by starting the engine!

Start-up procedure:

- Turn on battery disconnecter.

- Put the key to the ignition box 9 and move it to "I" position - brakes 23, charging 22 and neutral 24 signal lamps will light up.
- Engine diagnostics signal lamps 18, 19, 20 and 21 will light up and go off after 4 seconds.
- Turn on engine idling switch 15.
- Check whether the emergency brake STOP button 5 is not pressed.
- Turn the ignition key to "II" position to start the engine (hold the key in the position until the engine starts up only).
- The charging signal lamp must go off after starting up the engine.

WARNING!

Do not start longer than 30 seconds. Wait for 2 minutes before next starting.

Repeat starting procedure 3 times at most; then detect the cause in fuel system. Missing smoke in the exhaust pipe indicates failure in fuel supply to the engine.

After starting up, check correct engine operation by indicators.

Do not run up the engine rapidly; let the engine run at idle speed for 3 to 5 minutes to stabilize pressure in the engine and to have bearings lubricate.

Do not let the engine run at idle speed for longer then 10 minutes to avoid engine damage.

Do not load the engine with full power until the temperature of cooling liquid reaches 60 °C (140 °F).

Starting will be blocked at the following instances:

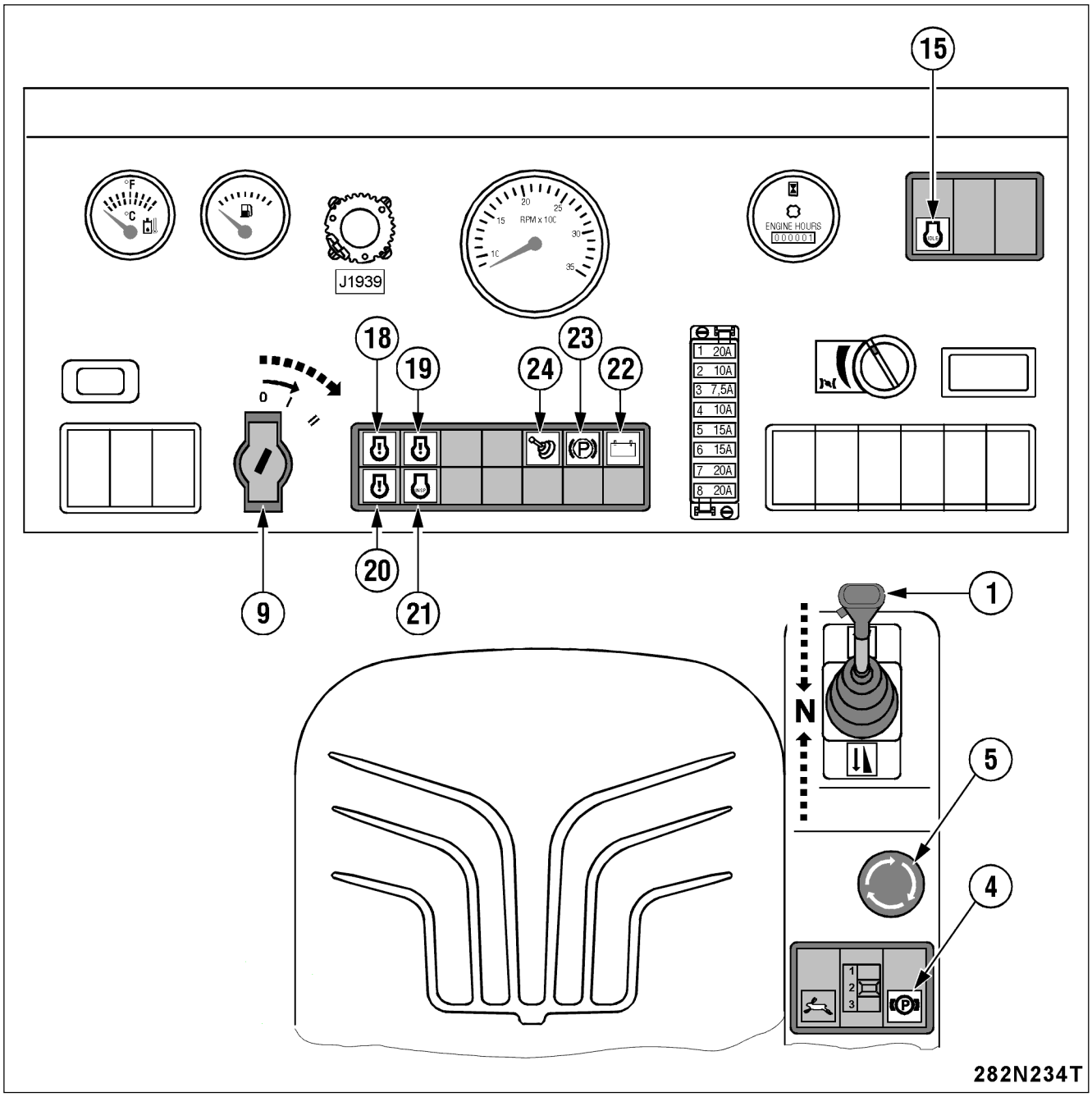
If the engine iddle switch 15 is switched off.

If the brake switch 4 is not switched on.

STOP button 5 is pressed

Control 1 is not in neutral.

If the operator is not siting on the seat.


15
J1939
RPM x 100
ENGINE HOURS
18
19
24
23
22
1 20A
2 10A
3 7,5A
4 10A
5 15A
6 15A
7 20A
8 20A
0
I
II
9
20
21
1
N
5
4
1
2
3
282N234T

! NOTE !

Starting voltage of the external starting source must be 24 V.

Keep the specified order of operations under all conditions!

1. Connect one terminal of the (+) cable pole to the (+) pole of the flat battery.
2. Connect the other terminal of the (+) cable pole to the (+) pole of the battery in the supporting machine.
3. Connect one terminal of the (-) cable pole to the (-) pole of the battery in the supporting machine.
4. Connect the other terminal of the (-) cable pole to the part of the started machine that is securely connected to the engine (or connect the terminal to the proper engine block).

- After starting up, disconnect starting cables in reverse order.
- If using a starting power unit without connected batteries, do not disconnect the power unit before a battery will be connected in the machine.

Do not connect the (-) pole cable to the (-) pole of the flat battery in the started machine! When starting, extensive sparkling may occur that might ignite fumes generated by the battery.

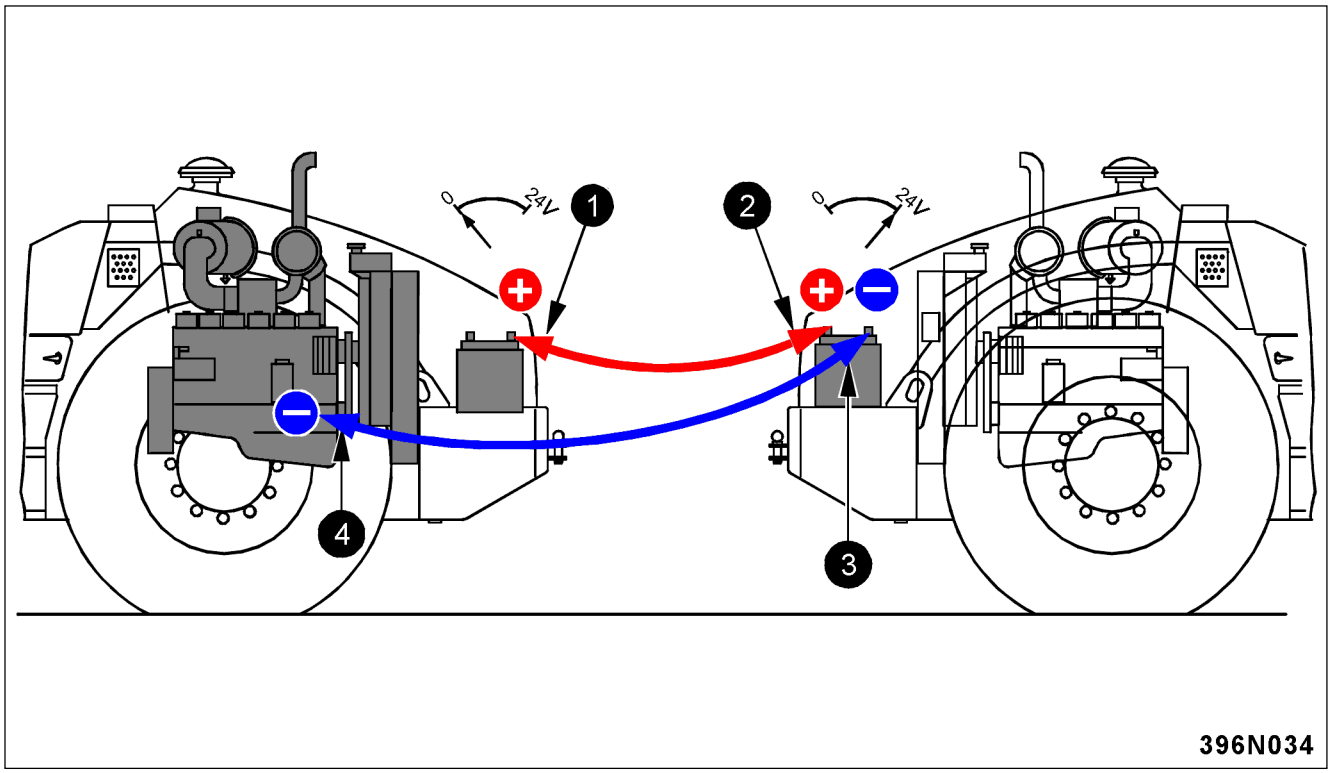
Prevent bare parts of starting cable clips from mutual contact!

The starting cable connected to the (+) pole of the battery must not come into contact with electrically conducting parts of the machine - risk of short circuit.

Do not lean over batteries - beware of electrolyte burns!

Keep away sources of fire (open flames, lit cigarettes etc.)

Do not test whether wires are live by touching the frame of the machine!

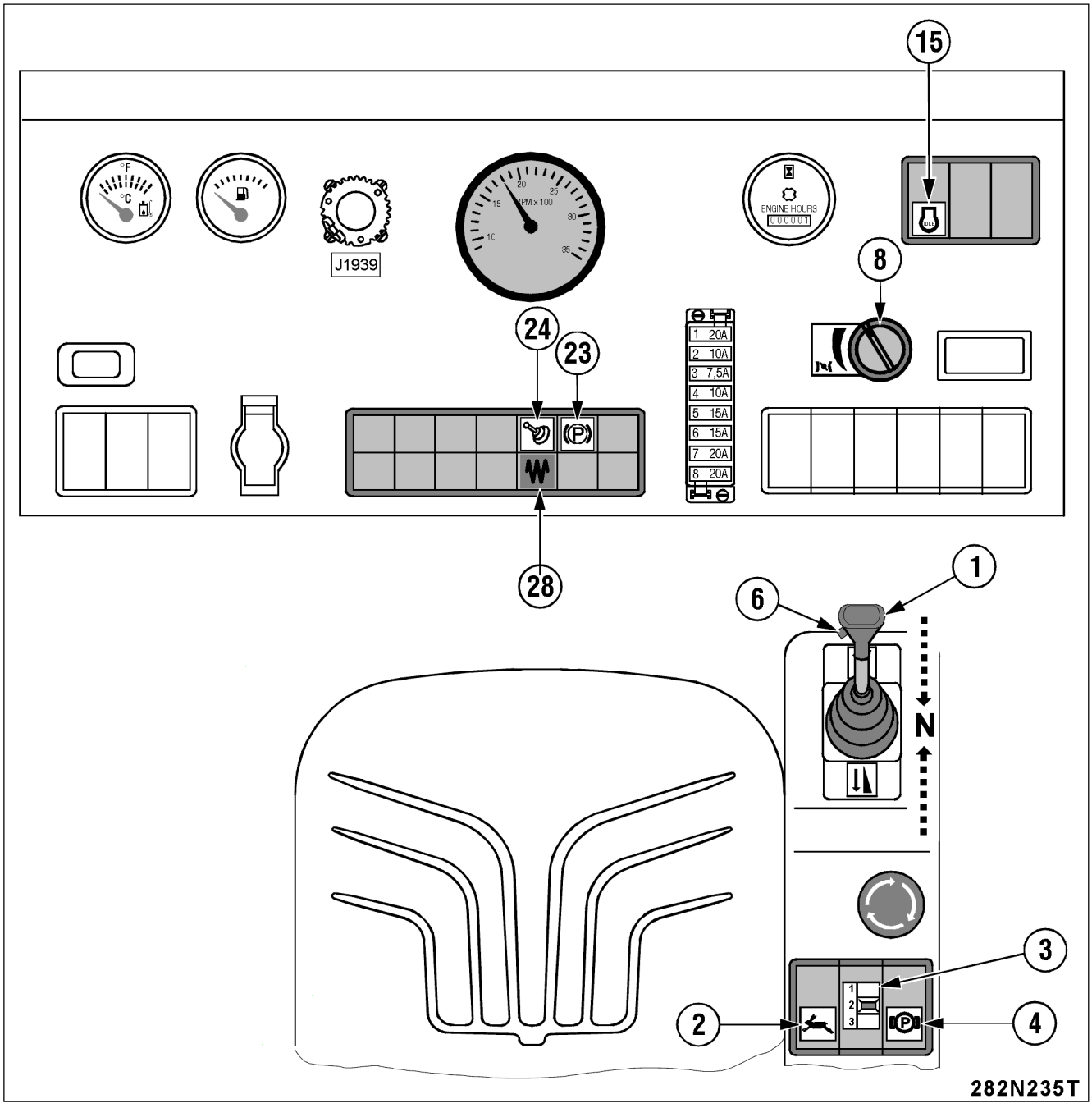


2.7.2. Travel and reversing without vibrations

Give the acoustic signal before starting driving the machine and wait for period sufficiently long for all persons being able to leave the area around the machine (area under the machine) in time!

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

- Turn off gear selector 2 to set the working gear mode.
- Select appropriate range of working gear on the working gear pre-selector 3.
- Turn off the IDLE switch 15. Use selector 8 to adjust appropriate engine speed - approx. 1800 rpm.
- Check whether vibration is not on - the signal lamp 28 must not be on; use switch 6 to turn it off.
- Release brakes of the machine with a switch 4. Signal lamp will go off.



Selecting driving direction and speed

- Move the travel control 1 from neutral to the required direction - little movement = low speed and vice versa. Upon moving the travel control 1, the neutral 24 signal lamp will go off.

Reversing - move the control 1 to the opposite direction via neutral.

Note:

Using the selector 8 can be set engine speed between 1800 RPM to max.

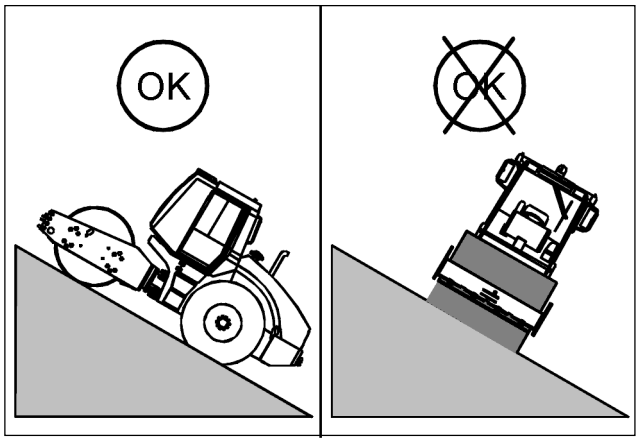
! NOTE !

Selector 2 - transport gear - can be activated when driving on finished surface.

It is possible to activate selector 2 while the machine is under load; rabbit symbol will light up.

Should towing power be insufficient, turn the transport gear selector off 2.

Do not drive across (traverse) slopes with high inclination! Drive directly up the slope!



282N049T

Prior to driving down a steep slope, engage working gear by deactivating selector 2!

Deactivate selector 2 while the machine is stopped or moving in a low speed! Do not turn selector off at higher speeds - this will cause rapid deceleration and impact in the hydraulic system.

Do not use engine speed selector 8 to control the machine speed.

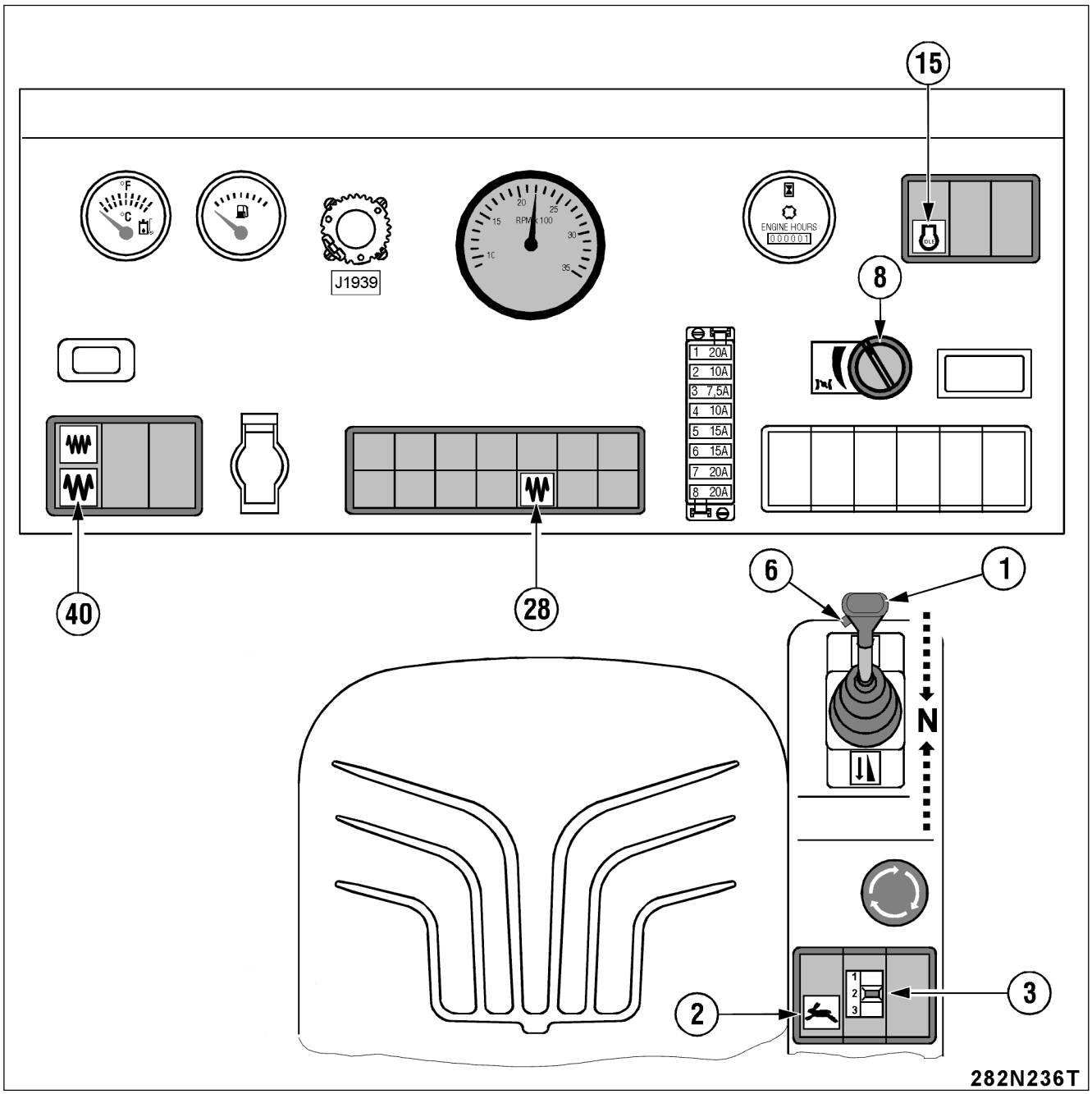
If you have to stop the machine in a slope, first move travel control 1 to neutral and then press parking brake button 4.

2.7.3. Travel with vibration

- Turn off gear selector 2 to set the working gear mode.
- Switch pre-selector 3 to appropriate working gear range.
- Use pre-selector 40 to turn on vibration amplitude.
- Use selector 8 to adjust maximum engine speed. The switch 15 must be switched off.
- Start moving and use switch 6 to turn on vibration. Signal lamp 28 will light up; the drum will start vibrating.
- Press and release switch 6 to stop vibration.

Note:

The machine should reach speed of 1800 rpm before activating vibration.

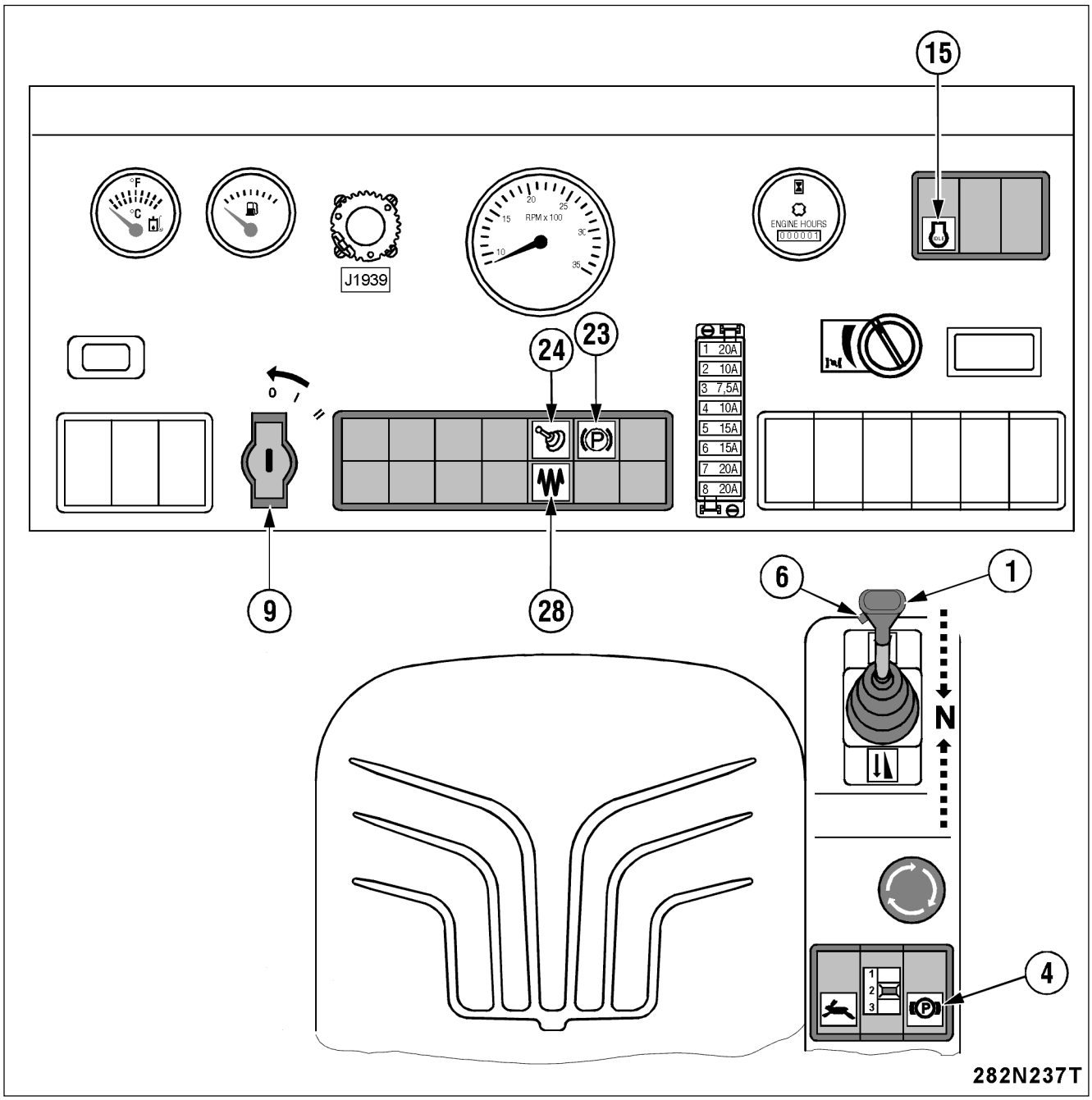


2.7.4. Stopping the machine and engine

- Use switch 6 to deactivate vibration - signal lamp 28 will go off.
- Use control 1 to stop the machine - signal lamps 23 and 24 will light up. Brake the machine with a switch 4.
- **Press button 15 to adjust idling speed.**
- Turn the ignition key to ”0” position and take it out. Close the ignition box cover.

! NOTE !

Do not stop the engine immediately; let it idle for 3 minutes to cool it down and turbocharger.



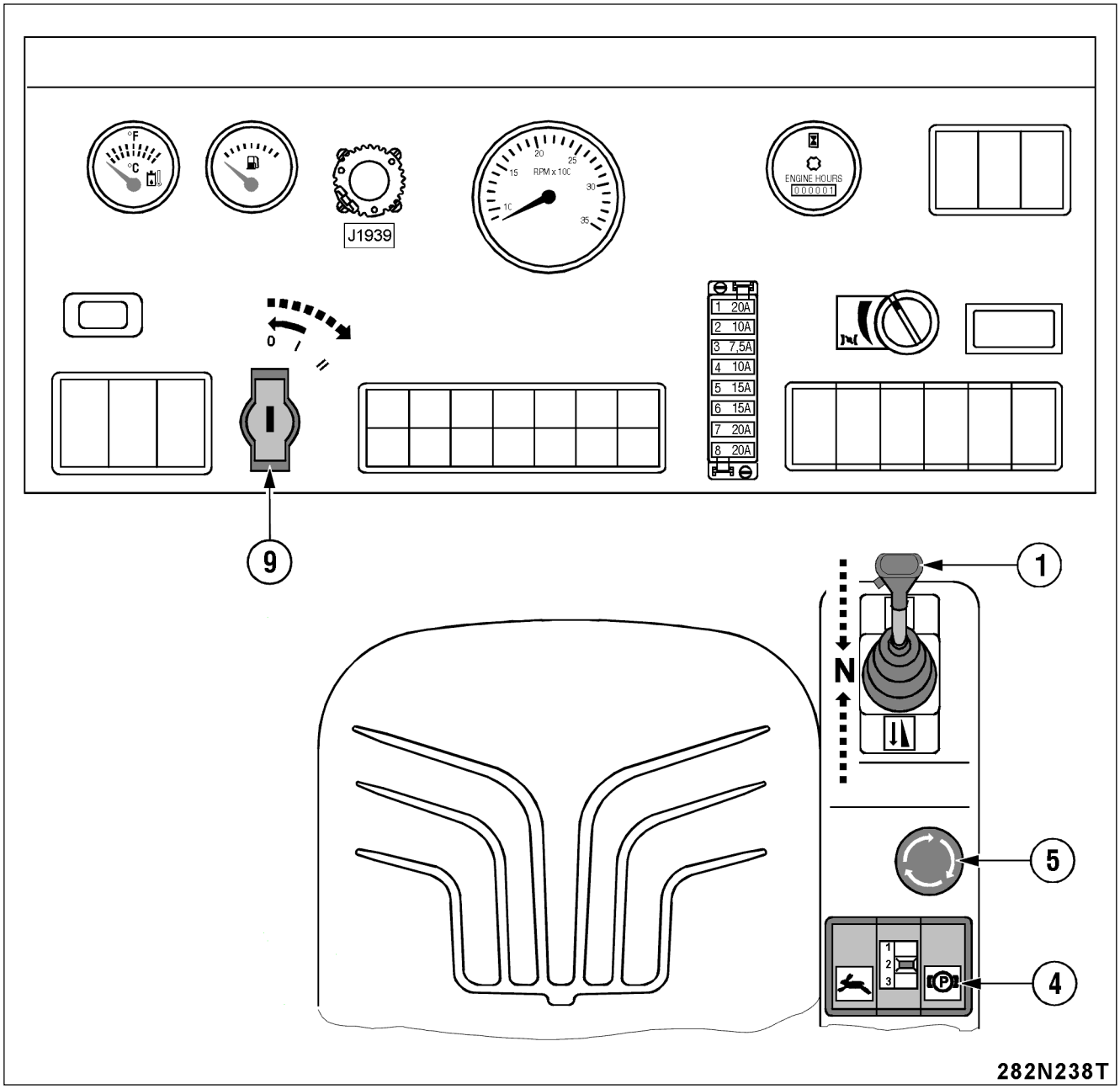
2.7.5. Emergency stopping

Use this way of stopping in case of defect, when the machine cannot be stopped by moving travel control 1 to neutral position, or is it impossible to shut down the engine by starter switch key.

- Press button 5 - the engine will stop and the machine as well.

! NOTE ! Before restarting the engine, turn the button 5 in the direction of the arrow, move the travel lever 1 in to ”N” position. Brake the machine with switch 4 and turn off the key 9 to „0“ position.

Never use it during normal operation to shut down the engine.



2.7.6. Dead parking of the machine

- Stop the machine - see chapter 2.7.4.
- Turn off the battery disconnector.
- Clean the machine from dirt (scraper and tyres).
- Check the whole machine and repair defects arisen during the operation.
- Check the tyre pressure.
- Secure wheels and drum with scotch blocks.
- Lock covers of instruments or the cabin and door under the driver's stand.

Stop the machine on even and firm surface.

Check the place of parking for risk of natural dangers (landslides, floods etc.)

2.7.7. Troubleshooting according to flashing codes

- In case of engine fault, either stop engine red signal lamp 18 or engine warning yellow lamp 19 will light up.
- **Before troubleshooting stop the engine and turn the ignition key 9 to "I" position.**
- Press button 16 to activate error code. The lighting signal lamp will start flashing in the code corresponding to the defect and it repeat twice in the same sequence.
- Press button 17 to move to the next error. You can search for error codes stored in ECM index using symbols of switch 17: upper symbol forward or bottom symbol backward.

Example of flashing error code

Flashing code consists of three digits.

Example: code 123 signal lamp

Yellow lamp 19 will flash, red lamp 18 will flash the code after 1-2 sec.

Number 1: red will flash once, then pauses for 1-2 sec.

Number 2: red will flash twice, then pauses for 1-2 sec.

Number 3: red will flash thrice.

When the number has finished flashing in red, a yellow lamp will appear again. The three – digit code will repeat in the same sequence. Press button 17 to move to the next error.

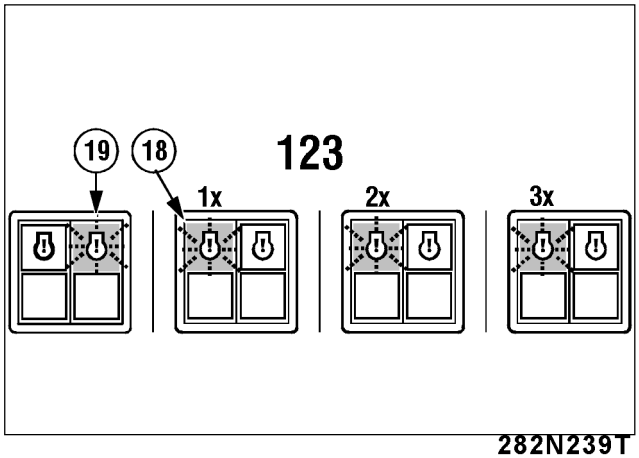
NOTE: If only one defect is identified, its error code will be signalled repeatedly even if you press switch 17 in either direction.

After the signal lamp 18 goes on, stop operation and engine while keeping safety at work!

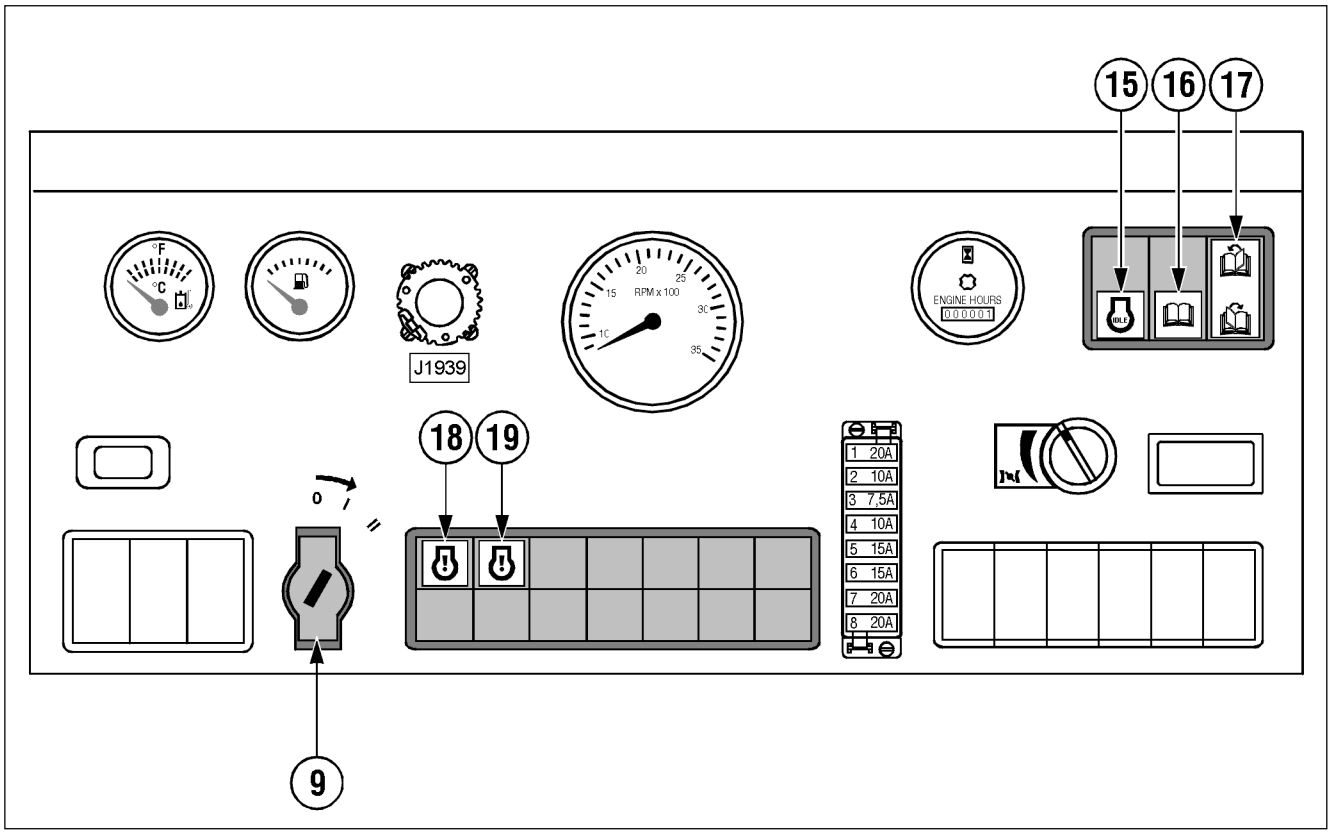
Do not start the engine before the defect has been repaired!

! NOTE !

If signal lamp 19 lights up, repair the defect as soon as possible!



282N239T



282N053T

2.7.8. ATC function

- ATC (Ammann Traction Control) - interaxle differential - prevents slipping of wheels and drum in case of exceeding adhesion limit when driving in heavy conditions or on slopes.
- Activate ATC by turning ignition key to ”I” position. It is working in the whole range of working and transport gears.
- Flashing signal lamp 26 indicates an ATC defect.

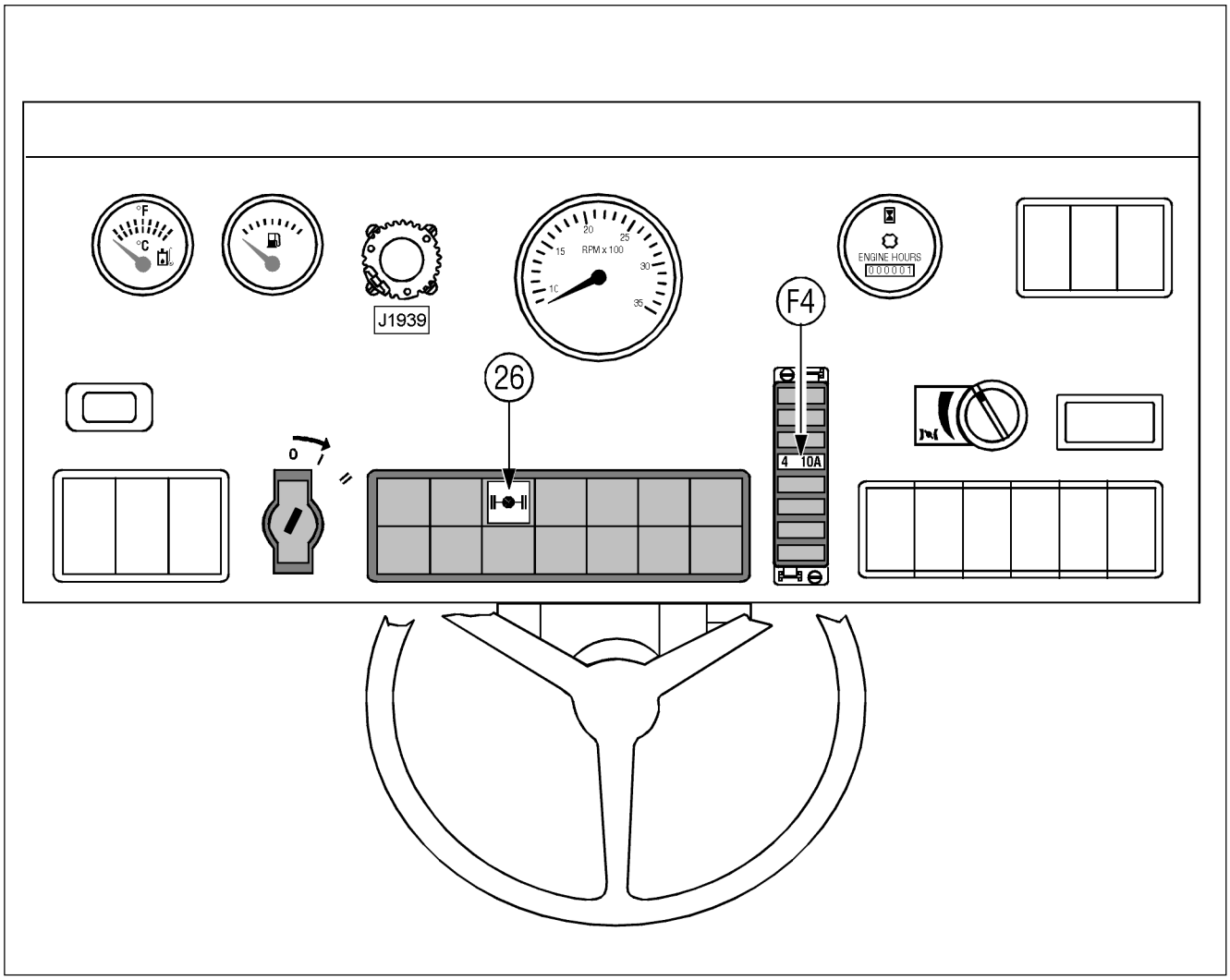
NOTE

In case of ATC defect, transport gear cannot be engaged or, if adhesion limit is exceeded, drum or one of wheels will start slipping.

- **In case a wheel locks up while driving** (the cell of drum rotations sensor fails or the contact to the cell is broken), the wheel will be unlocked automatically (while driving) after 5 seconds and will start turning. The wheel will lock up again for five seconds after stopping the machine and engine and subsequent starting and driving away. The machine may work in this condition.
- **In case the drum locks up while driving** (the cell of one-of-wheels rotations sensor fails or the contact to the cell is broken), the drum will be unlocked automatically (while driving) after 5 seconds and will start turning. The drum will lock up again for five seconds after stopping the machine and engine and subsequent starting and driving away. The machine may work in this condition.

Disabling ATC

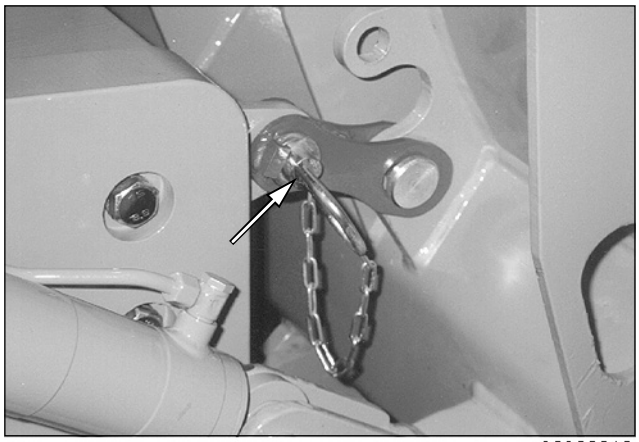
To avoid wheel or drum lock-up during repeated engine starts, disable ATC by removing fuse F4 - 10 A in the dashboard.



282N054T

2.7.9. Blade

- Unlock the blade on both sides.
- For locked (secured) blade.

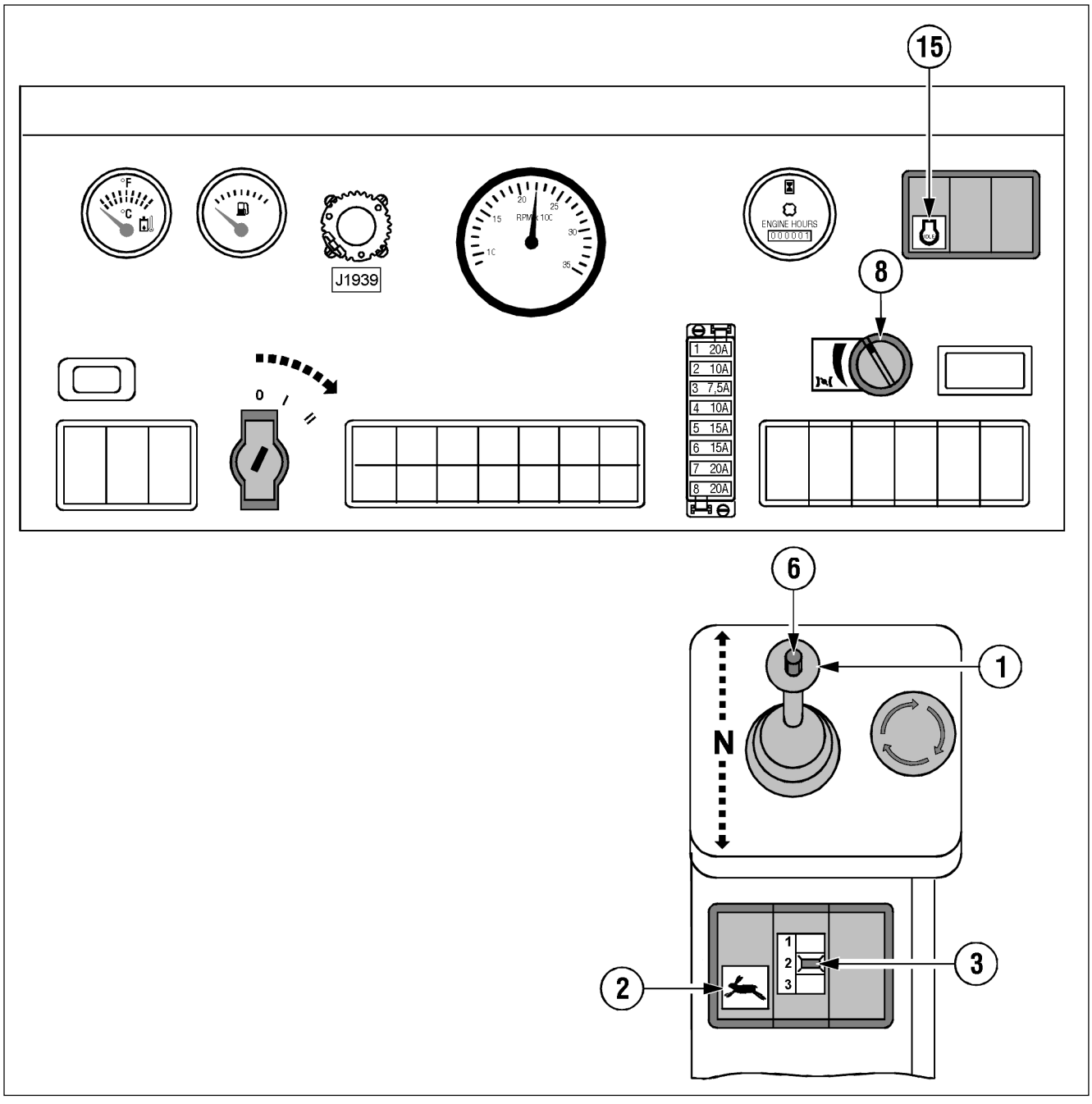


396S0019

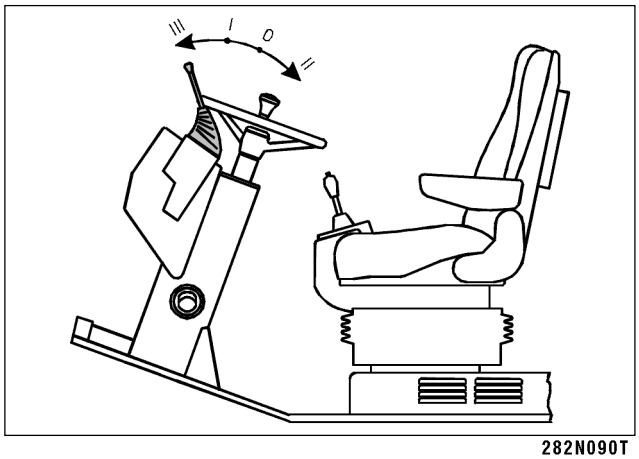
- For unlocked blade.

396S0020

- Start the engine. Switch off the ”Idle” switch 15, set maximum RPM 8 (or those proportional to the subsequent output). Switch off the gear selector 2 and choose a suitable range of speed of operation on the appropriate preselector 3.

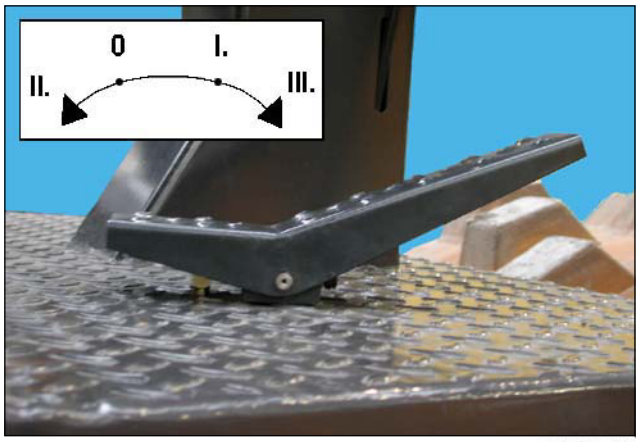


- Lower the blade down to the earth by shifting the blade controller forwards from ”0” position to ”III” (floating position).



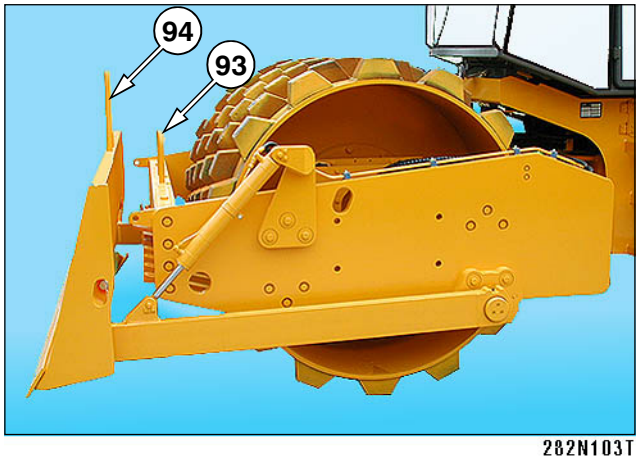
282N090T

or pedal.



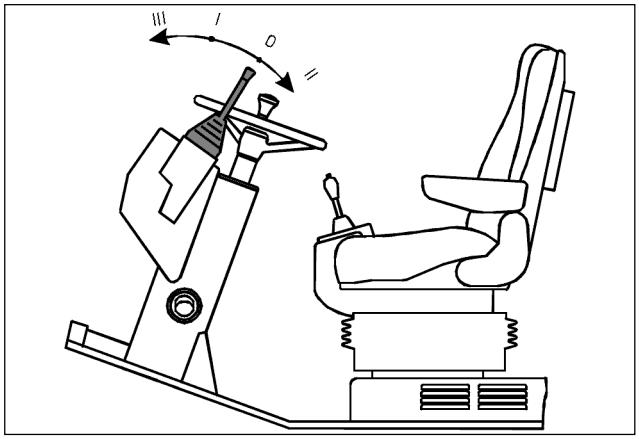
208M0053

- Find the position of the of the fixed indicator 93 on the drum frame beam as related to the movable indicator with the blade 94 and remember this information. This is then the basic position of the blade.



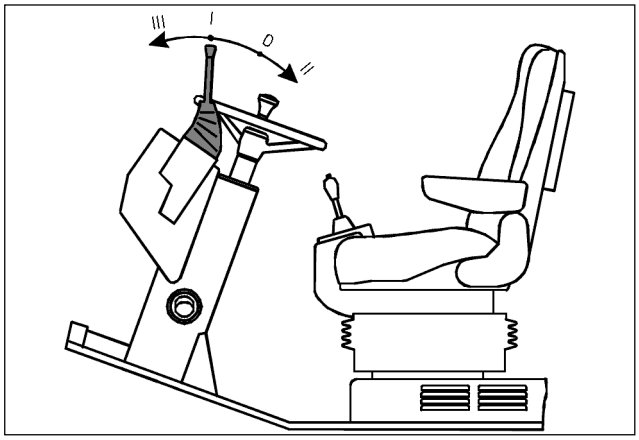
282N103T

- Return the controller (pedal) to ”0” position and start driving.



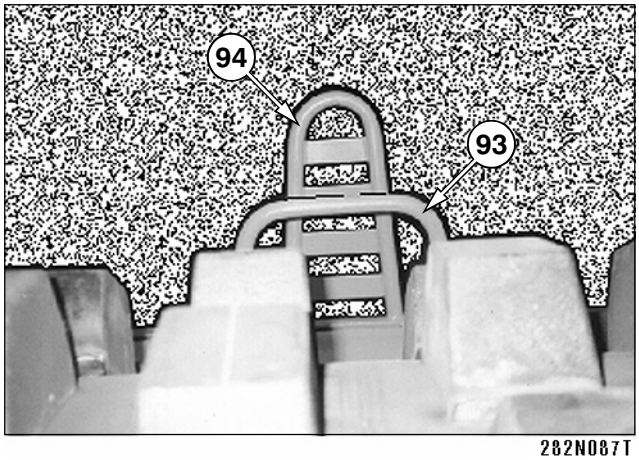
282N091T

- The blade then starts digging after shifting the controller (pedal) to ”I” position.



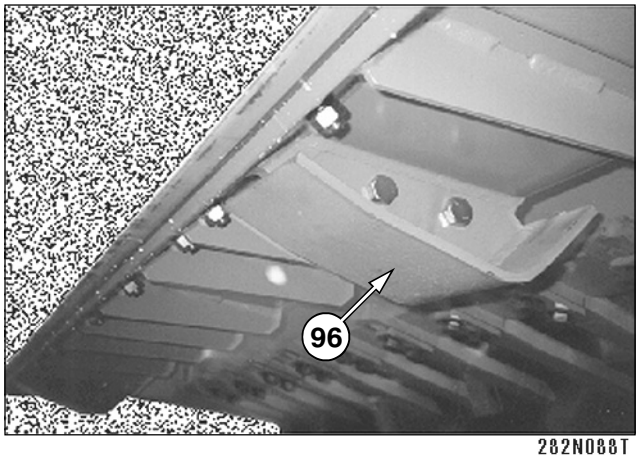
282N092T

- The size of the digging can be read on the basis of the relative position of both the fixed 93 and movable 94 indicators. (Each shift by one increment means the blade will move by 50 mm).



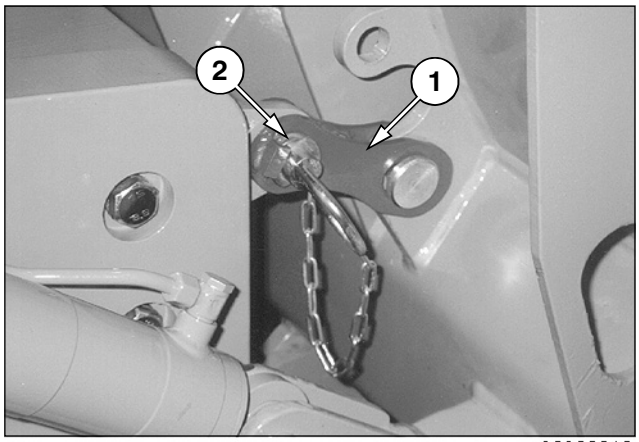
282N087T

- Floating position can be used for shovelling the material. The blade slides over removable skids 96. It can be also used for the regressive spreading and evening of the material.



282N088T

- After finishing work with the blade secure it in the upper position using both safety pull rods 1 and pins 2.



396S0019

NOTE:

- The functions in 4 positions

  position 0 (initial position of the pedal)

  position I.(blade moves down)

  position II. (blade moves up)

  position III. (blade is in floating position)

- Volume of the shovelled material can be corrected by lowering the blade (blade lever in "I" position) or by lifting it up (the lever is in "II" position) dependently on traction power of the machine.
- Blade edges are removable and they can be turned by 180° after their wear.

! NOTE !

Do not adjust the scrapers, do not carry out any maintenance at the blade unless it is lowered to the ground and the engine stopped, or unless the blade is secured by both safety links.

Do not work with the blade when it is secured.

In case that only one link is secured, the blade can be damaged.

2.7.10. Lifting driver's stand and bonnet

! NOTE ! Fold the seat and rest before lifting drivers stand. Just the machine with integrated roof in ROPS.

282N225T

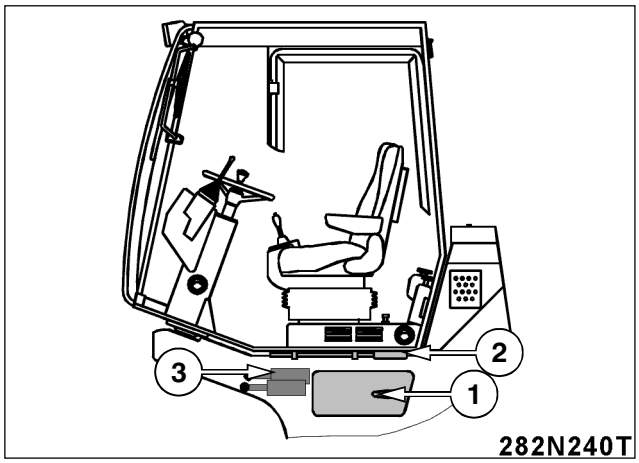
Lifting driver's stand

- Remove nuts of the driver's stand.

282N056T

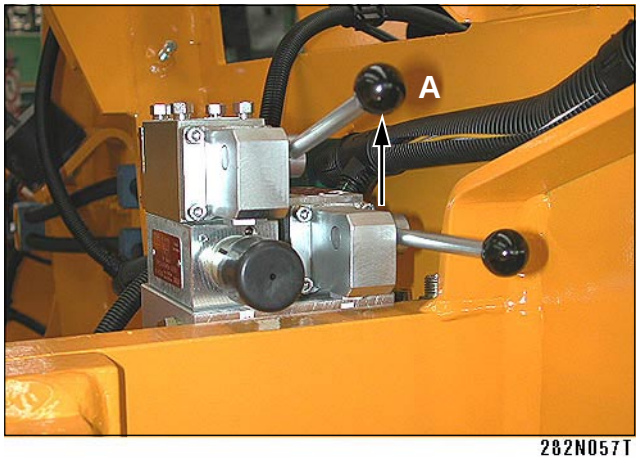
- Open the cover 1 on the left side under the driver's stand. Take out the pump lever 2.

  Levers of lifting and lowering 3



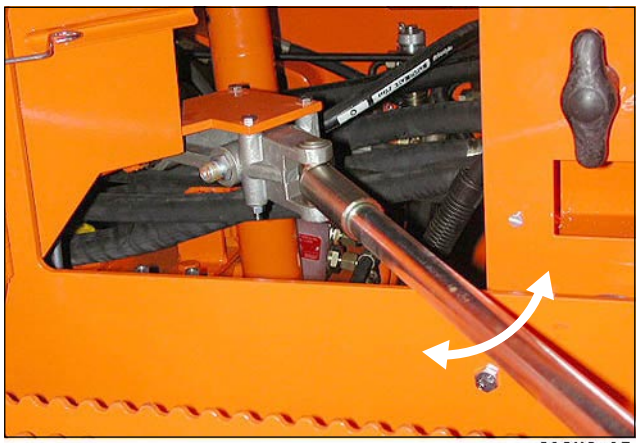
282N240T

- Move the lever to A position (**lifting**).



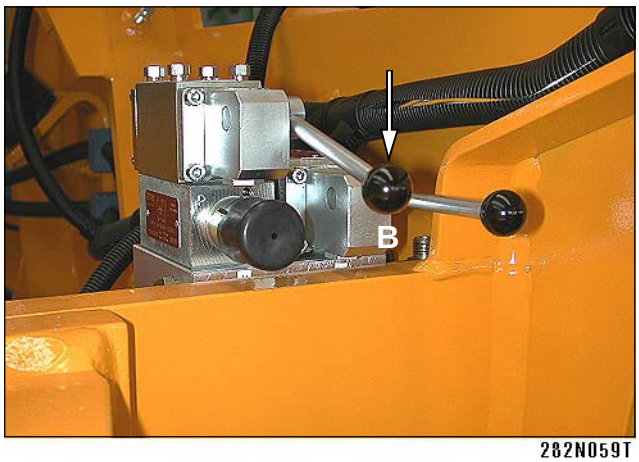
282N057T

- Insert the lever to the pump and lift the driver's stand.



282N058T

- Move the lever to B position (**lowering**) and pump.

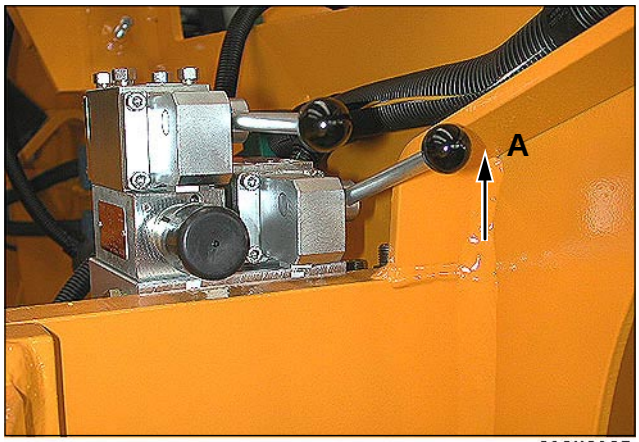


282N059T

Screw the driver's stand in after lowering. If the driver's stand is not screwed in properly, the machine may overturn and cause lethal injuries.

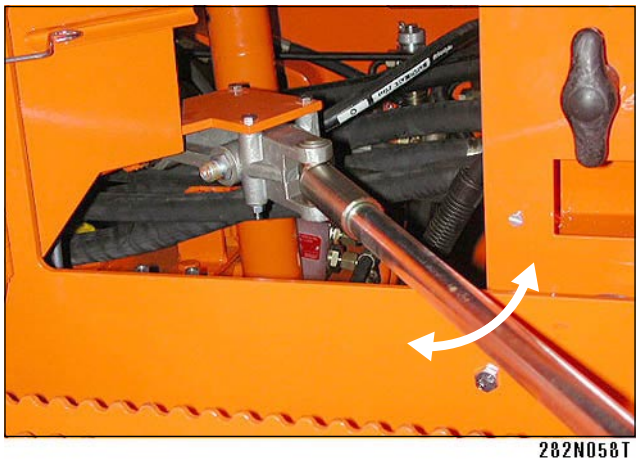
Lifting bonnet

- Move the lever to A position - (**lifting**).



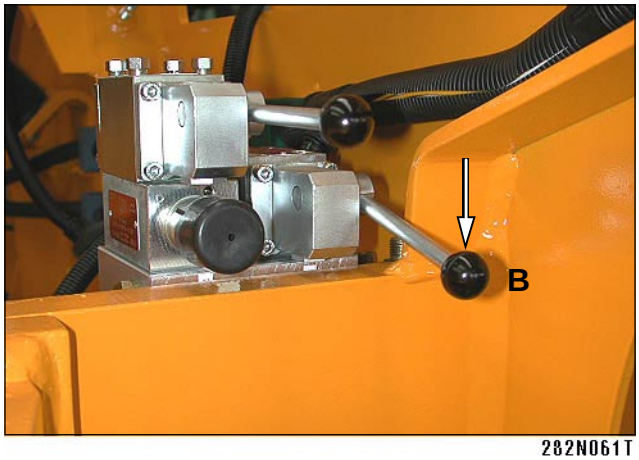
282N060T

- Insert the lever to the pump and lift the driver's stand.



282N058T

- Move the lever to B position (**lowering**) and pump with the manual hydro-generator.



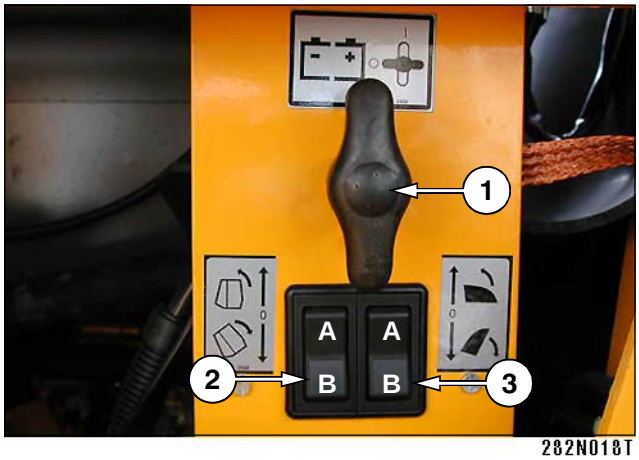
282N061T

Lifting and lowering using electric-hydraulic pump (optional)

- Remove nuts of the driver's stand.

282N056T

- Connect electric system by turning the battery disconnector 1.
- Press and hold button 2 (lifting driver's stand) or button 3 (lifting bonnet) in "A" position. Press and hold appropriate button in "B" position to perform lowering.

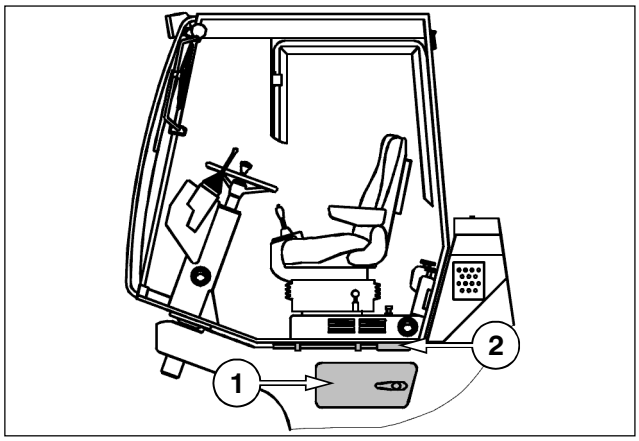


282N018T

Screw the driver's stand in after lowering. If the driver's stand is not screwed in properly, the machine may overturn and cause lethal injuries.

Manual lifting and lowering

- In case of el-hydraulic unit or flat battery, use the manual hydro-generator to perform lifting and lowering.
- Open the cover 1 on the left side under the driver's stand. Take out the pump lever 2.



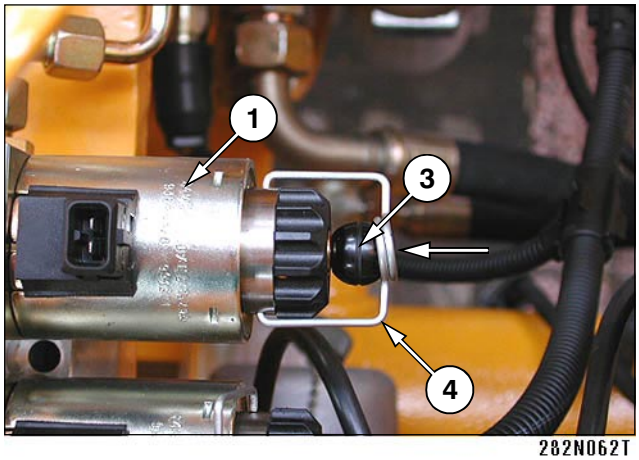
282N055T

Driver's stand

- Remove nuts of the driver's stand.

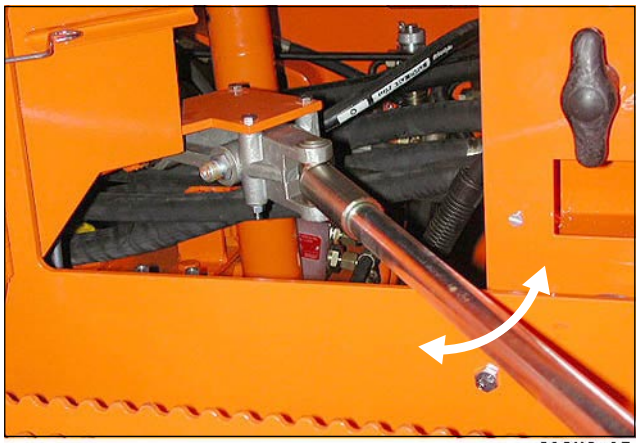

282N056T

- Push the sliding valve 3 on the switchboard 1 and secure it in the position with safety pin 4.

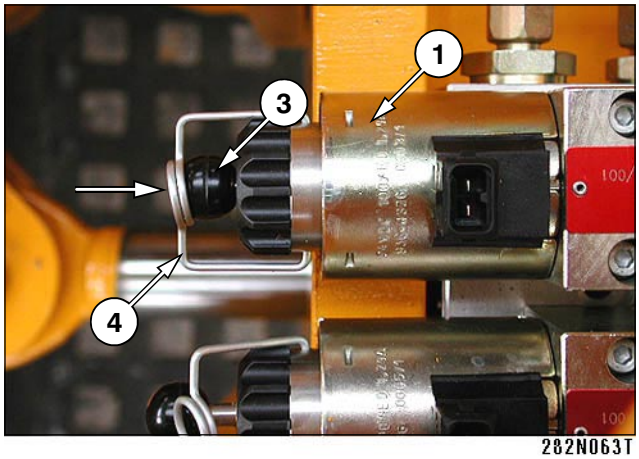


282N062T

- Insert the lever to the pump and lift the driver's stand.


282N058T

- Unlock the safety pin of lifting before starting lowering.
- Push the sliding valve 3 on the other side of the switchboard 1, secure it with safety pin 4 and pump to lower the driver's stand.

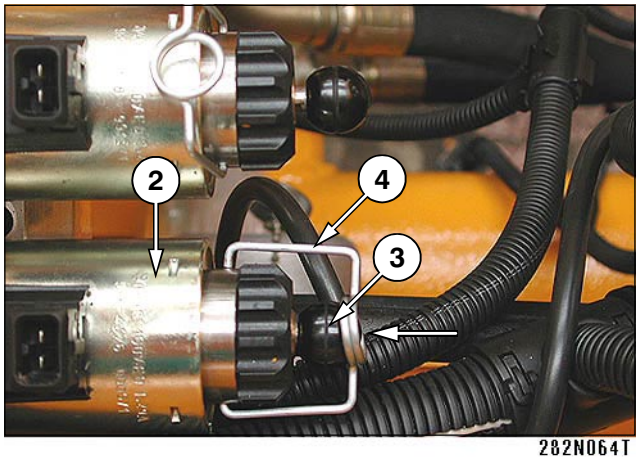


282N063T

Screw the driver's stand in after lowering. If the driver's stand is not screwed in properly, the machine may overturn and cause lethal injuries.

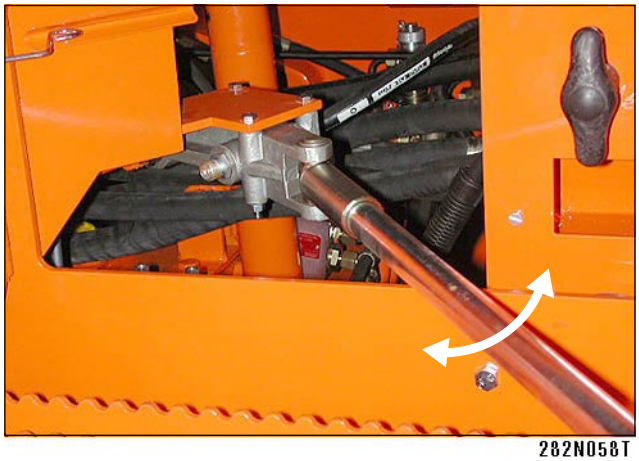
Bonnet

- Push the sliding valve 3 on the switchboard 2 and secure it in the position with safety pin 4.

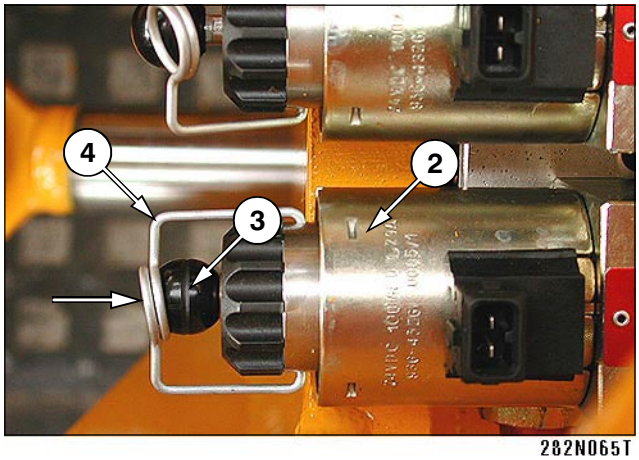


282N064T

- Pump to lift the bonnet.


282N058T

- Unlock the safety pin of lifting before starting lowering.
- Push the sliding valve 3 on the other side of the switchboard 2, secure it with safety pin 4 and pump to lower the bonnet.



282N065T

2.8.1. Transporting the machine on its own

The machine may drive on its own between worksites if not using public roads.

! NOTE !

When transporting the machine on finished roads, use transport gear - activate selector 2.

In case of long distance transport, make an hour cooling break after three hours of drive. Make another hour break after next 2 hours of drive. This will help prevent overheating and damaging gearboxes.

Safety rules of the site must be followed.

2.8.2. Transporting the machine on public roads

! NOTE !

The standard version of the machine is not equipped with facilities to travel on public roads - traveling on public roads is forbidden!

- The roller can be transported on public roads on a vehicle of appropriate load capacity and the platform height so as not to exceed the total height of 4 m (with the roller loaded). Should the height be higher, it is necessary to dismantle cabin and safety frame - see chapter 2.8.4.

Use switch 38 to turn on drum traction slip control when driving up the transporting vehicle. It is recommended to underlay drum with rubber strips or wooden planks etc.

The vehicle transporting the roller must be braked for loading and unloading and mechanically secured against undesirable movements by scotch blocks.

The person guiding the machine must communicate with the driver by prescribed communication signals, he/she must stand all the time on the same location, away from the machine and the transporting vehicle. He/she must be within the field of driver's vision (visual contact) for all the time of driving up and down.

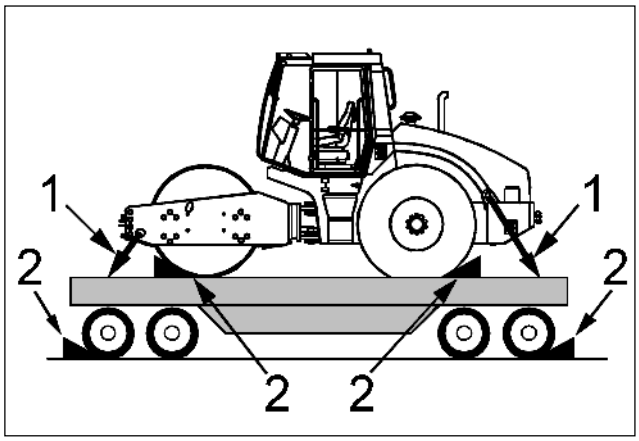
During driving up and down the transporting vehicle, all persons but the driver must be away from the machine in such a distance that they cannot be injured in case of an accident (fall of the machine).

The machine must be attached to the transporting vehicle by tying ropes on tying spots. Tying spots: rear lifting eyes and slings in side plates of the drum frame.

When transporting the machine on public roads, the regulations governing public road traffic must be followed.

During the actual transport, no persons may stay on the driver's stand, on the machine or on the transporting vehicle platform.

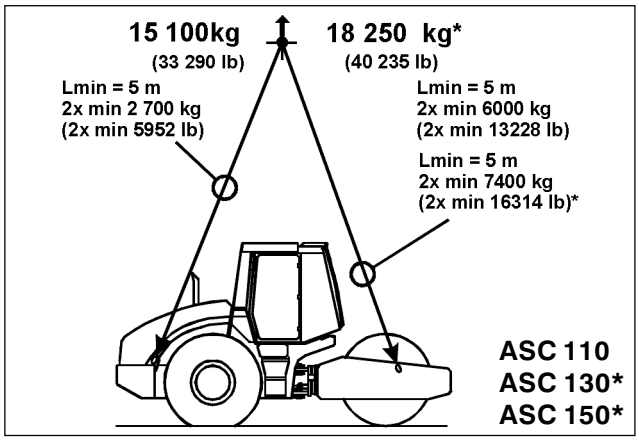
Hooking at a Carrier Vehicle



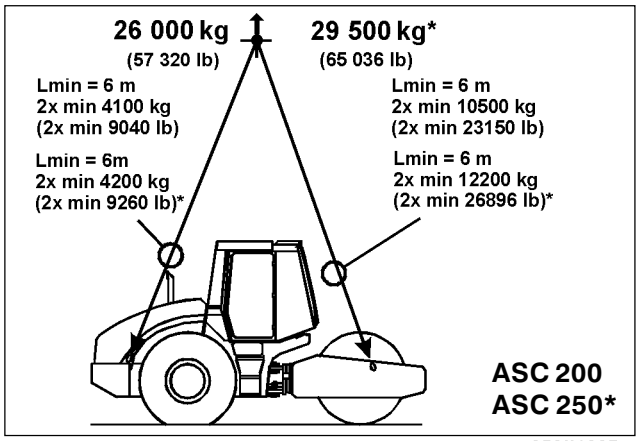
282N066T

2.8.3. Loading the machine

- Use drive-up ramps or crane to load the machine to a transporting vehicle.
- The roller is equipped with lifting eyes for loading by crane:



282N068T

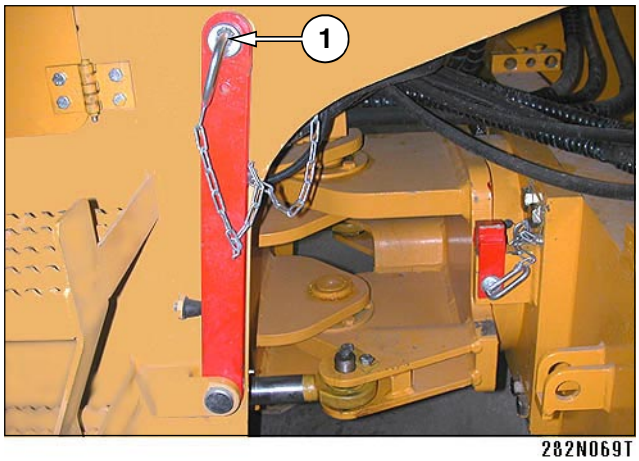


278N138T

- Lock the joint against movements prior to lifting the roller.

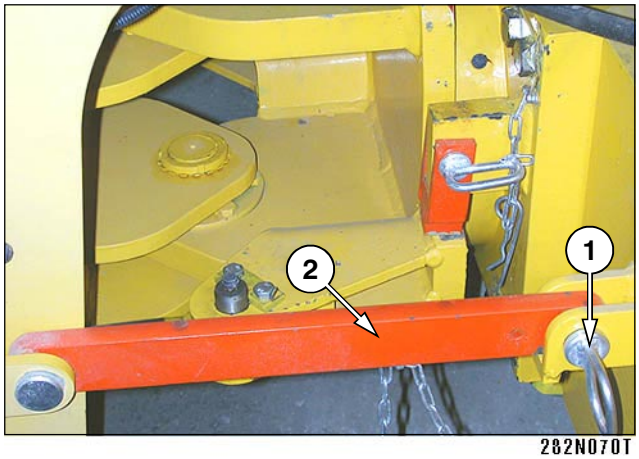
Joint locking:

- Unlock and pull pin 1.



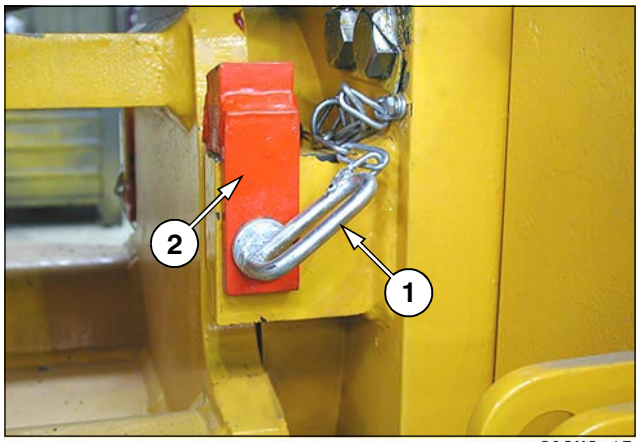
282N069T

- Fold arm 2 and secure it with pin 1 and locking pin.



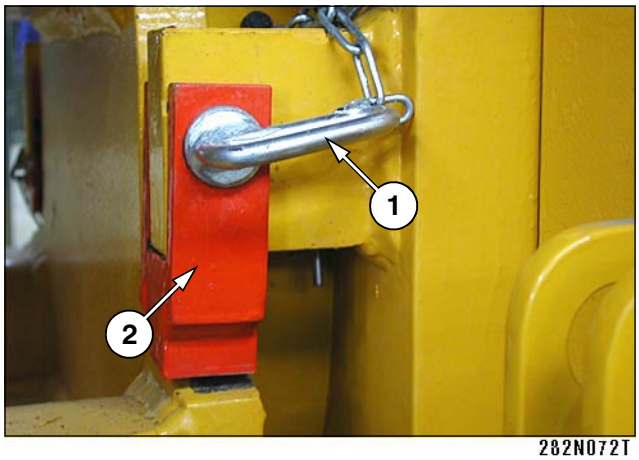
282N070T

- Unlock and pull pins 1 of two blocks 2 on both sides from the joint. (options)



282N071T

- Turn blocks 2 and secure with pin 1 and locking pin.



282N072T

Do not step under the hanging load!

Return the safety arm and blocks to default positions after loading is complete.

Observe appropriate regulations while loading and unloading the machine.

Use appropriate unimpaired tying means of sufficient capacity.

Use appropriate crane of sufficient capacity.

To tie the machine, use only lifting eyes designed for the purpose.

Only a qualified slinger may attach slings.

2.8.4. Dismantling cabin and ROPS frame

- If the machine height on the transporting vehicle is higher than allowed for transport, dismantle cabin and ROPS frame.

Dismantling ROPS

- Hang the frame by lifting eyes.

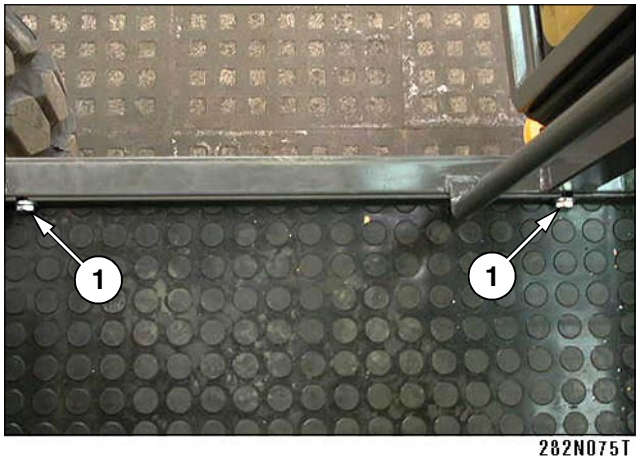
282N073T

- Dismantle bolts and remove the frame.

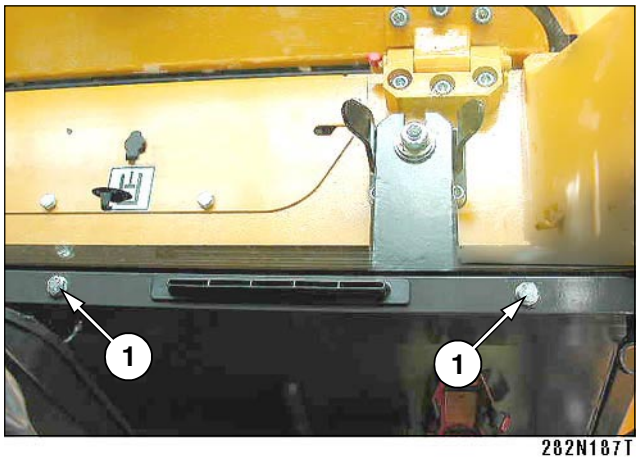
282N074T

Dismantling cabin

- Remove bolts 1 fastening the cabin to the platform.

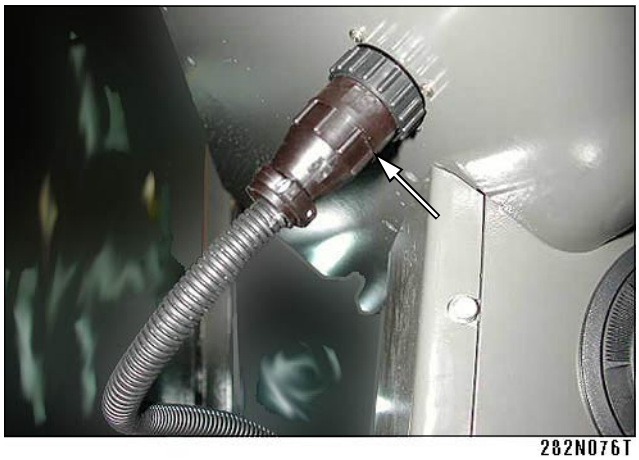


282N075T



282N187T

- Disconnect electric system by disconnecting connector between steering column and front windshield.



282N076T

- Disconnect electric system of washer and lines to windshield washing jets. Hang the cabin by eyes and remove.

282N077T

2.9. Using the machine under special conditions

2.9.1. Towing

- In case of failure the Machine can be towed to a distance necessarily needed. For this reason the Machine has been fitted with two eyes on the frame of drum.

Make sure the Machine is attached to both of the eyes when being towed!

- Rear towing lug on the fuel tank is equipped with a pin locked with a locking catch against jumping out. It is possible to remove the pin after raising the locking pin.

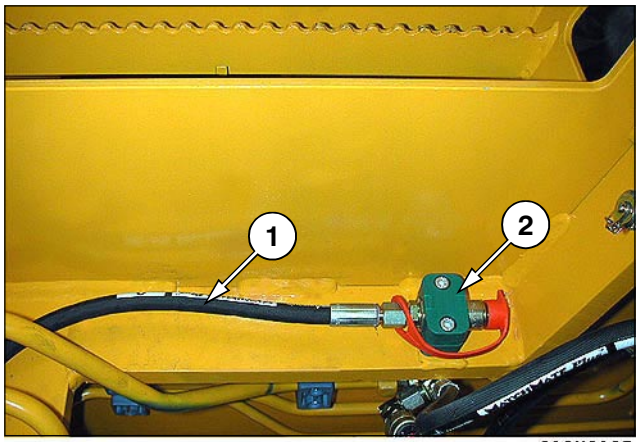
Options:

- Pin is also used for front towing lug on the crossbar of the front frame.

It is forbidden to use the machine for towing towed vehicles (e.g. tanks, compressors, house trailers etc.).

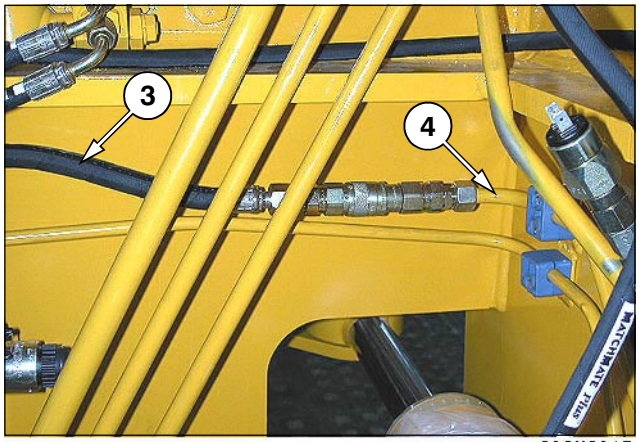
Releasing drum and wheels for ASC 110 - ASC 130 - ASC 150:

- Release all multi-plate brakes to avoid slipping of drum and wheels.
- Release hose 1 in clip 2.



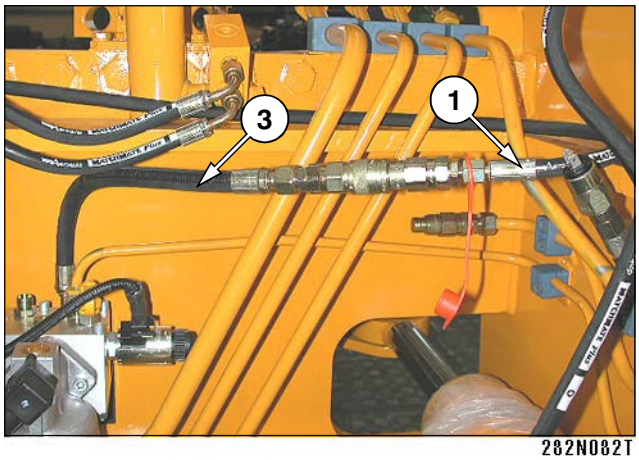
282N080T

- Disconnect hose 3 from tube 4.



282N081T

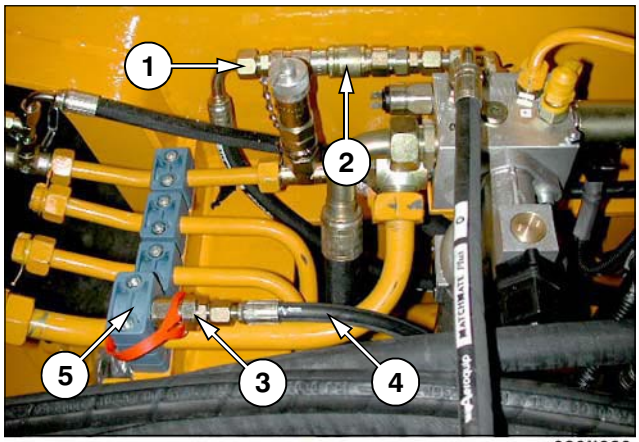
- Connect hose 1 of the manual hydro-generator with hose 3 of pressure filter.



282N082T

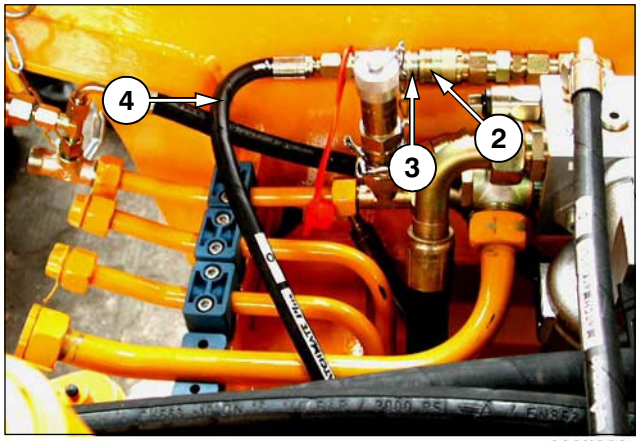
Releasing brakes of the drum and the wheels for ASC 200÷250

- Release hose 4 by quick coupler 3 in clamp 5.
- Disconnect hose 1 from pressure filter to hydraulic tank in quick coupler 2.



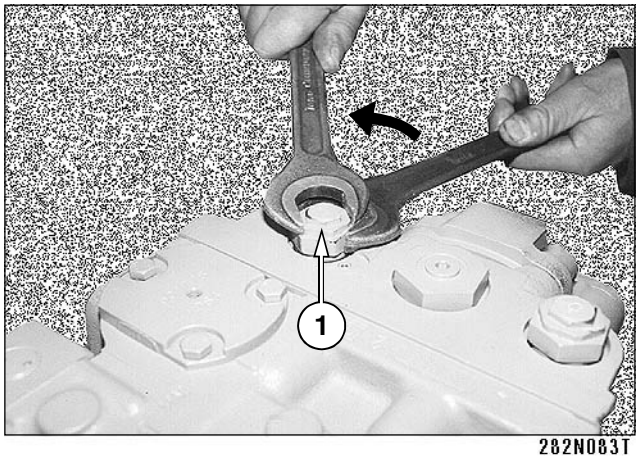
396N028

- Connect quick coupler 3 on hose 4 to manual hydraulic generator with quick coupler 2 in hose 1.



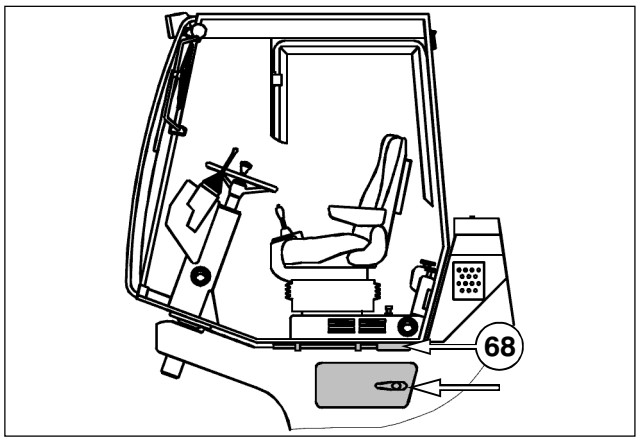
396N029

- Unscrew central parts 1 (haxagonal 27 mm (11/16")) by three turns anti-clockwise on two multi-purpose safety valves of the hydro-generator of travel.



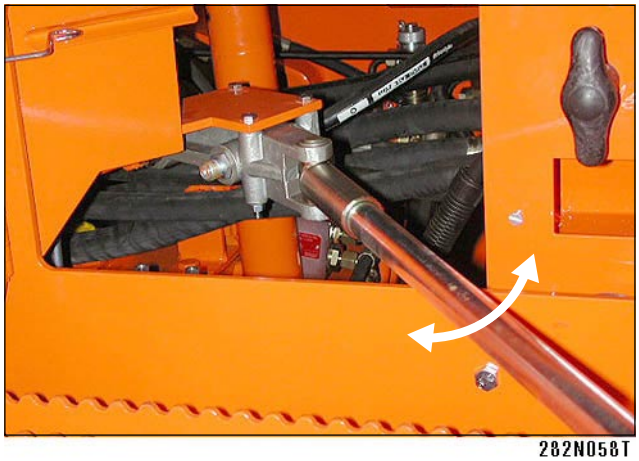
282N083T

- Open the cover on the left side under cabin. Take out the lever 68 under the driver's stand.

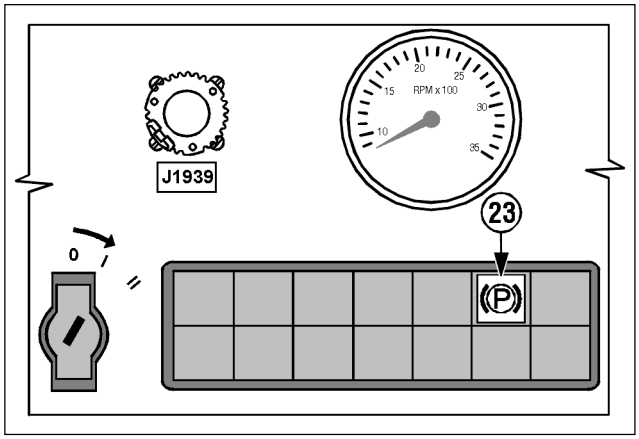


282N055T

- Insert the lever 68 into the manual hydro-generator and pump until the machine is unbraked for towing now.


282N058T

- Turn the ignition key to I position and check signal lamp of brake 23 switched off.



282N084T

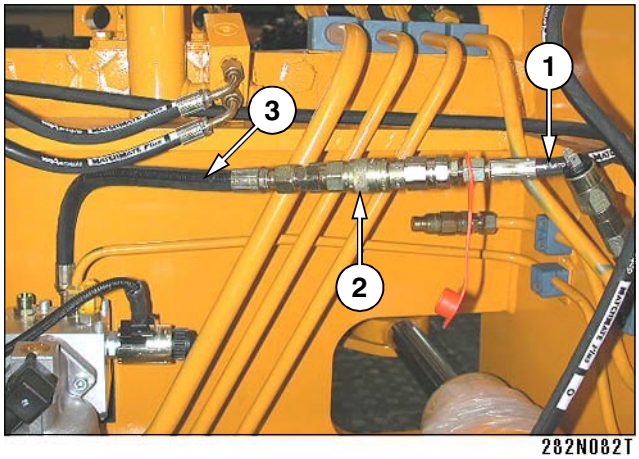
! NOTE !

During towing, leakage may cause pressure in brakes decrease. If brake signal lamp 23 lights up during towing, pump more.

After towing, put the machine into its original condition.

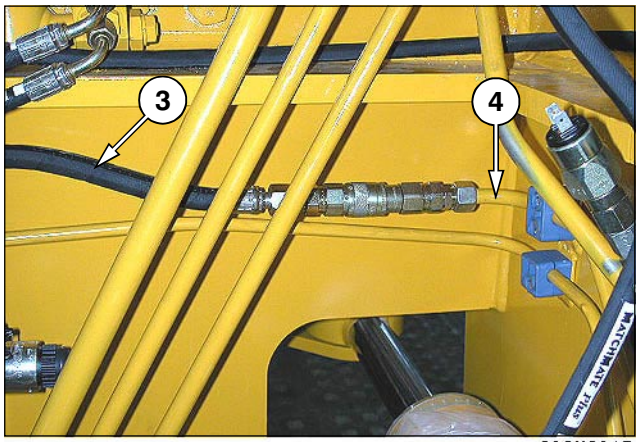
To put the machine into the original condition for ASC 110 - ASC 130 - ASC 150:

- Disconnect hose 1 from hose 3 in the quick coupling 2.



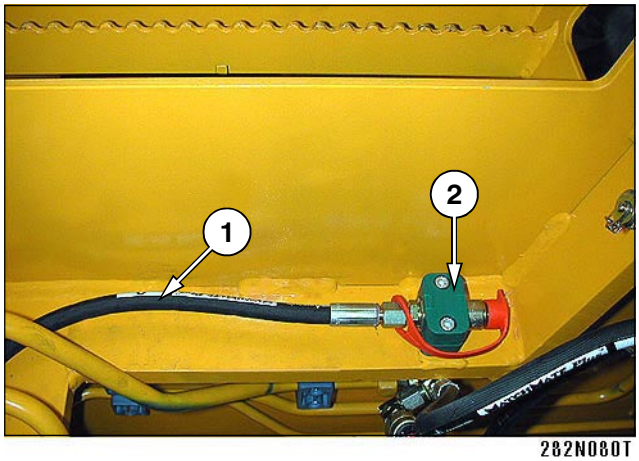
282N082T

- Connect hose 3 back to tube 4.



282N081T

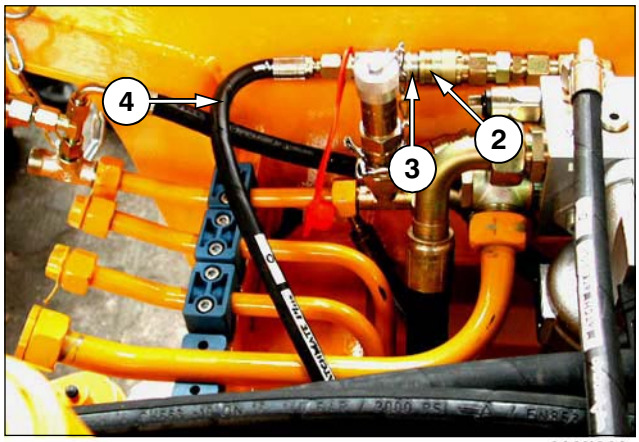
- Fix hose 1 in clip 2.



282N080T

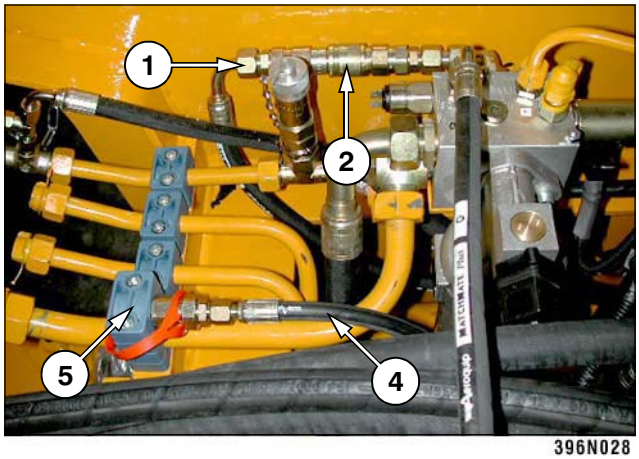
To put the machine into the original condition for ASC 200÷250

- Disconnect hoses 4.



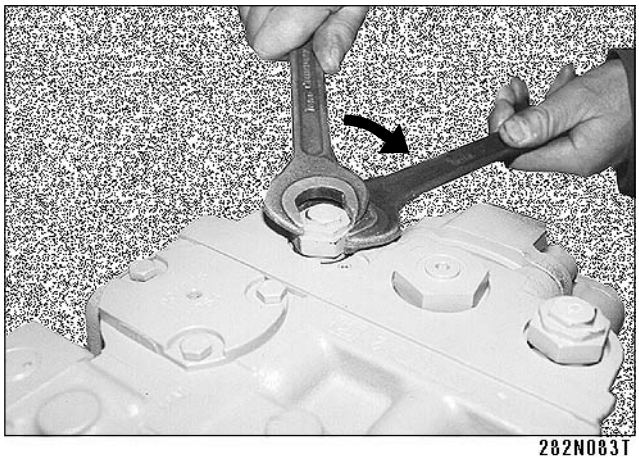
396N029

- Reconnect hose 1 into the pressure filter and hydraulic travel generator loop.
- Fix hose 4 in clamp 5.



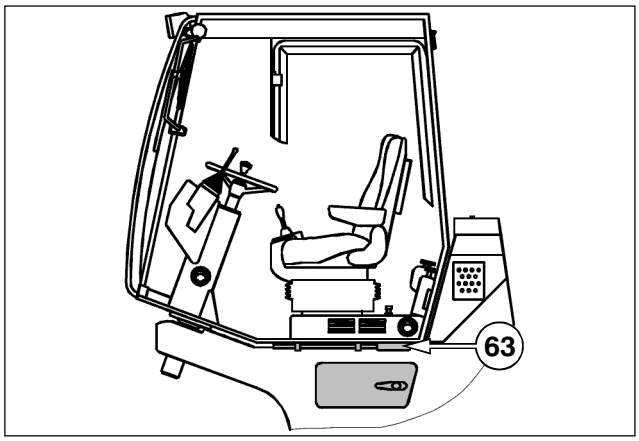
396N028

- Screw back multi-purpose valves on the hydro-generator.



282N083T

- Put the manual hydro-generator lever 63 to the holder under the driver's stand.



282N055T

! WARNING!

During towing, leakage may cause pressure in brakes decrease. When towing, check brakes for heating due to insufficient brake release.

After releasing brakes and short-circuiting the travel hydraulic circuit, all brakes are out of operation!

Use unimpaired towing cables or towing bars of sufficient capacity - dimensioned to weight 1.5 times higher than weight of the towed machine. It is not permitted to use chains for towing.

No persons can be present on the machine with non-working engine.

It is necessary to keep the deviation from the straight towing angle as little as possible. Maximum deviation is 30 degrees.

The movement during towing must be smooth. Do not exceed towing speed of 2 kmph (1.2 mph). Do not tow the machine for distances longer than 300 m (0.19 miles).

The towing machine should be equal by size to the damaged machine. It must be sufficiently powerful (towing power), heavy and have sufficient brake effect.

When towing downhill using a cable, it is necessary to connect another towing machine to the rear part of the damaged machine. This will prevent uncontrolled movement of the damaged machine.

Do not start the engine during towing.

The bogged roller may be pulled out for short distance, if the engine is running and the driving unit and steering are functional. The drive on the towed roller must steer the roller in the dragging direction.

If the engine is stopped. Avoid damaging inoperable power train, steering and brake system.

NOTE

These are general requirements for safe towing of the damaged machine under standard conditions. Any specific conditions that may occur during towing must be consulted with a machine distributor.

2.9.2. Driving with vibrations on compacted and hard material

When driving with vibration on more compacted subgrade material, so called vibro-strike may occur.

The same applies when driving with vibration on hard materials (such as stone aggregate). This situation results in increased transmission of vibrations to the machine frame and the driver's stand. It can be partially reduced by increasing travel speed or by changing vibration parameters (using smaller amplitude).

Note:

Emission data of vibration acceleration will be different during driving with vibration on subgrade material other than the one specified in "Specification manual" - Sanitary data.

! NOTE !

If working with the machine under conditions exposing the operator to increased vibrations cannot be avoided, the keeper of the machine must modify working procedures so that it is not harmful to the driver's health.

2.9.3. Using the machine under heavy weather conditions

2.9.3.1. Operating the machine under low temperature

Compacting in winter depends on content of fine particles and water in compacted soil. The lower temperature below zero, the firmer soil and more difficult compacting.

If it is necessary to compact at temperatures below 0 °C (32 °F), dry soil can be compacted (and stone aggregates) or non-frozen material must be compacted quickly before it will freeze.

Prepare the machine for operation under low temperature:

- Check concentration of engine cooling liquid.
- Exchange engine oil for oil recommended for the specific range of low ambient temperatures.
- Use hydraulic oil of appropriate kinematic viscosity.
- Exchange oil in drum and wheel gearbox for recommended oil for the specific gearbox operating temperature range.
- Use winter fuel.
- Check battery charge.

Good battery condition is essential for good starting under low temperature. You can lower the threshold starting temperature to 4 to 5 °C (39.2 to 41 °F) by warming batteries to approx. 20 °C (68 °F) (take them out and store them in a heated room).

Minimum temperature of engine cooling liquid is 60 °C (140 °F).

Use the machine at full power only after warming of service fluids to the operating temperature (you can help it by partially covering the radiator).

! NOTE !

If oil HV 100 is filled in the hydraulic system, the machine must not be started at ambient temperature lower than +2 °C (36 °F).

If it is necessary to start the machine for a month or longer at ambient temperature lower than -8 °C (18 °F), exchange oil in hydraulic system for oil of HV 46 viscosity grade.

At temperatures below -13 °C (9 °F), use HV 32 oil (e.g. BP BARTRAN HV 32, ESSO UNIVIS N 32, etc.).

The machine cannot be started at temperatures below -23 °C (-9 °F) without pre-heating service fluids.

2.9.3.2. Operating the machine at higher temperature and humidity

Engine power output decreases with increasing temperature and air humidity. With regards to the fact that the two factors are independent of each other, their influence can be described as follows:

- every 10 °C (18 °F) of temperature rise results in power output decrease of up to 4 % (at a constant humidity)
- every 10 % of relative humidity rise results in power output decrease of up to 2 % (at a constant temperature).

At high ambient temperatures when hydraulic oil temperature reaches permanently around 90 °C (194 °F), it is recommended to exchange hydraulic oil for oil a grade higher - of kinematic viscosity 100 mm^2/s (e.g. BP BARTRAN HV 100, ESSO UNIVIS N100, etc.).

Output class on ISO 6743/HV	HV (HVLP)
Viscosity class on ISO 6743/4, DIN 51519	VG 100
Viscosity class on CETOP RP 91H	HV 100

! NOTE !

When working under extreme conditions, when cooling liquid or hydraulic oil temperatures reach maximum allowed limits, it is possible to increase cooling capacity of the cooling system by removing bonnet lower shields resulting in better withdrawal of hot air from the engine compartment.

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- If the hydraulic system is filled with oil of grade HV 46, the maximum allowed oil temperature is 80 °C (144 °F);

  HV 32, the maximum allowed oil temperature is 70 °C (158 °F).

2.9.3.3. Operating the machine in higher altitude

In higher altitude, engine power output decreases as a result of lower atmospheric pressure and specific density of incoming air.

Altitude in m	(ft)	Power output decrease (%)
0	0	0
500	(1640)	3
1000	(3281)	6
1500	(4921)	10
2000	(6562)	15
2500	(8202)	21
3000	(9843)	28

If the engine produces black exhaust fumes in higher altitude, contact a service organisation of the engine manufacturer that will set up the injection pump for the required operating conditions.

2.9.3.4. Operating the machine in extremely dusty conditions

! NOTE !

Shorten intervals of cleaning air filters, engine cooler, hydraulics and cabin dust filters in extremely dusty conditions.

It is recommended to clean these elements every week.

2.9.4. Filling tyres with water

This is useful to increase weight allocated to axle and to lower gravity center when working in extreme conditions. Fill the inside of tyres with a solution of water, hydrated lime (calcium hydroxide) and anhydrous calcium chloride ($CaCl_2$) or magnesium chloride ($MgCl_2$). See the table for mixing ratios for individual temperatures, for one tyre:

Freezing point	Water	Calcium chloride $CaCl_2$	Calcium hydroxide	Added weight
°C [°F]	l [gal US]	kg [lb]	kg [lb]	kg [lb]
-18 [0]	458 [121]	120 [265]	2 [4.4]	580 (1280)
-25 [-13]	458 [121]	141 [312]	2,2 [4.9]	600 (1323)
-30 [-22]	458 [121]	155,5 [343]	2,5 [5.5]	617 (1360)

Preparing the solution:

! NOTE !

Wash any spills with fresh water.

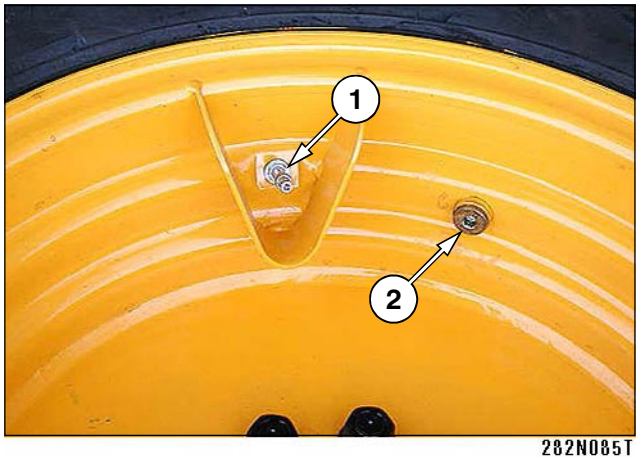
Protect metal parts and electric system from contact with the solution.

The solution must not be filled in the engine cooling system.

Always add anhydrous calcium chloride $CaCl_2$ to water, never vice versa!!

Filling procedure:

- Secure the drum by scotch blocks from both sides, lift the rear part of the roller and release brake of wheel hydromotors, see chapter 2.9.1.
- Rotate tyres so that valves 1 are at top positions. Blow off both tyres and screw out inflation valves 1 and caps 2.



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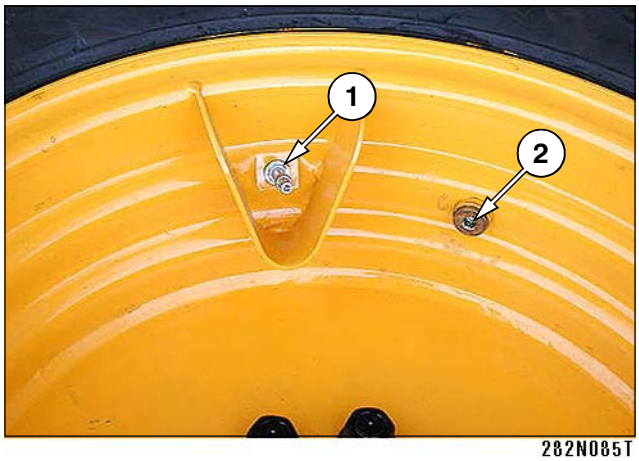
- Screw the filler (gr. 635 - spare parts list) to the cap opening 2 and insert the hose of filling device (higher-positioned container, pump etc.). Start filling tyres with prepared solution.
- Repeat the procedure for the other tyre.
- Unscrew the filler and screw in inflation valves and caps again.
- Inflate tyres to the prescribed pressure and screw in valve caps.
- Activate brakes - see chapter 2.9.1.
- In regions where temperatures do not fall below zero (i.e. down to 0°C (32°F)), add extra weight in the form of solution of water and copper sulphate $CuSO_4$ $5H_2O$ (bluestone).
- For one tyre, mix 500 l (132 US gal) of water and 0.17 kg (0.4 lb) of copper sulphate $CuSO_4$ $5H_2O$.
- Fill tyres with the solution.

Use safety goggles (safety shield) and rubber gloves.

Draining:

- Secure the drum by scotch blocks from both sides, lift the rear part of the roller and release brake of wheel hydromotors, see chapter 2.9.1.
- Rotate tyres so that valves 1 are at top positions. Unscrew valves. **Warning! The solution will squirt out at unscrewing.** Unscrew caps 2.



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- Screw the filler into the opening see gr. 635 Parts katalogue.
- Rotate tyres so that fillers are at bottom positions.
- Apply a hose with pressured air to inflation valve and inflate until the solution stops draining.
- After draining tyres, unscrew fillers and screw in valves and caps again.
- Inflate tyres to the prescribed pressure.
- Activate brakes - see chapter 2.9.1.

! NOTE !

Use safety goggles (safety shield) and rubber gloves.

2.9.5. Installing air conditioner

When retrofitting air condition unit, it is necessary to keep sufficient distance between the oil cooler and air conditioner condenser in order that air flow the machine cooling system is not affected. (This would reduce cooling capacity of radiators.) Minimum distance is 50 mm (2 in).

Notes:

Notes:

3. MAINTENANCE MANUAL

ASC 110, ASC 130 and ASC 150

(Cummins tier 2)

3.1. Safety Standards at Lubrication and Maintenance

3.1.1. Safety during maintenance

Lubrication, maintenance and adjustment process:

- use qualified personnel.
- according to safety instructions in the Operating manual for the vibration roller.
- according to intervals in the lubrication table according to working hours.
- on machine placed on a flat, firm surface, secured against spontaneous movement (with blocks) and with steering locked.
- with disconnected electric wires and with the starting key taken out.
- with the machine parts cooled off.
- after cleaning the machine, the lubricating and maintenance points, and spots to be repaired.
- with proper undamaged tools.
- by replacing parts with new original ones. The manufacturer cannot be responsible for damages caused by using different units or parts.
- under proper illumination of the machine when working at reduced visibility or at night
- in case the work involves removing covers and safety cartridges, reassemble them after completing the work
- retighten bolts with applicable torque and check tightness of the joints.
- pay attention not to get burnt after heating up fluids - use recommended fills.

Operations performed while the engine is running (adjusting) must be performed with another person present. This person must have immediate access to the emergency stop and must be in permanent communication contact with the adjusting person so that the engine can be stopped immediately, if necessary.

3.1.2. Fire safety during changing contents

- From fire safety point of view, inflammable liquids used in the machine are classified into following classes:

  II class of fire danger - Diesel

  IV. class of fire danger - mineral oils, lubrication greases
- The location of oil change operation must not conflict with places subject to explosion or fire hazard.
- It must be marked by tables and signs prohibiting smoking and open flame.
- The manipulation area must be of such design and dimensions so that it can contain the amount of inflammable liquid equal to the content of the largest tank or transport package.
- The site must be equipped with portable fire extinguishers.
- Metal barrels, canisters or tin cans should be used for handling oils or Diesel fuel.
- Transport containers must be duly closed while being stored.
- The containers must have one opening, they must always be stored with the opening upside and secured against leaks.
- The containers must be marked by permanent signs showing the content and the class of fire danger.

3.1.3. Environmental and health regulations

During operation and maintenance of the machines the user must follow general principles of health and environment protection, and laws, notices and regulations relating to this subject, applicable in the territory.

3.1.3.1. Health regulations

- Oil products, contents of cooling systems and batteries, and paints including thinners are materials injurious to health. The workers coming into contact with these products when operating and maintaining the machine must follow general principles of health protection and safety and health instructions by manufacturers of these products.

  We especially draw attention to:

  - eyes and skin protection when working with batteries
  - skin protection when working with oil products, painting compounds and coolants
  - proper washing of hands after work and before meals. Treat your hands with proper skin cream
  - follow instructions in the operator's manual when working with cooling systems.

- Store oil products, coolants and battery acids, painting compounds including organic thinners and cleaning and preservation agents always in their original, properly marked containers. Avoid storing these materials in unmarked bottles or other containers because of risk of possible substitutions. Possible substitution of food and beverages is particularly dangerous.

- In case of accidental staining skin, mucous membranes, eyes, or in case of inhaling fumes, immediately apply first aid . In case of accidental ingestion of these products seek out medical help immediately.

- Always use proper type and design of ear-protectors when working with the machine without cabin or with open windows.

3.1.3.2. Environmental principles

Contents of specific machine systems and some of its parts are wastes dangerous to the environment after when discarded (disassembly, changing contents).

Especially the following items belong to this category of waste products:

- organic and synthetic grease, oils and fuel
- hydraulic brake fluids
- coolants
- battery contents and batteries as such
- contents of air-conditioning systems
- cleaning and preservatives
- fill tires
- all removed filters and filter cartridges
- all used and discarded hydraulic and fuel hoses, rubberized metal pieces, and other machine elements contaminated by the above-mentioned products.

After discarding, these materials must be treated in compliance with applicable national regulations for the protection of specific segments of the environment, and in compliance with health protection regulations.

3.2.1. Engine oil

Engine oil is specified by its performance and viscosity classifications.

Performance classification according to

API (AMERICAN PETROLEUM INSTITUTE)

CCMC (COMMITE of COMMON MARKET AUTOMOBILE CONSTRUCTORS).

ACEA (ASSOTIATION DES CONSTRUCTEURS EUROPÉENS DE AUTOMOBILE)

Viscosity classification

To determine SAE (Society of Automotive Engineers) viscosity class, the ambient temperature and type of operation in place of usage of the machine are decisive.

Permitted oil according to API: CH-4/SJ; CI-4

All season - SAE 15W-40 (e.g. Valvoline, Premium Blue,).

NOTE

Exceeding of the lower temperature limit does not damage the engine, it may only cause starting problems.

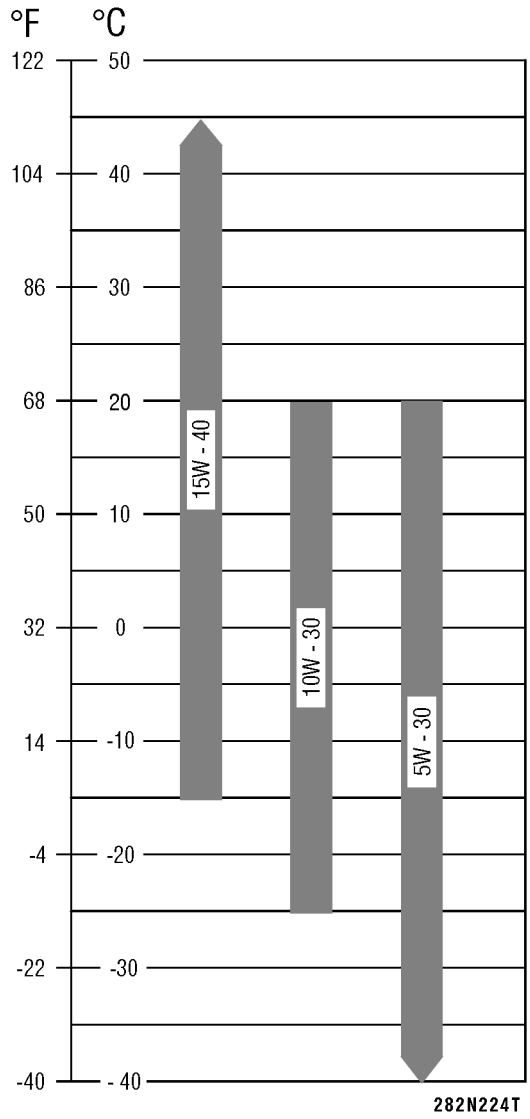
It is suitable to use general-purpose multi-grade oil in order that oil need not be exchanged because of ambient temperature changes.

For easier start at temperatures below 0 °C (32 °F), SAE 10W-30 oil is recommended by the engine manufacturer.

! WARNING !

Exceeding the upper temperature limit must not last for long, taking into consideration reduced lubricating properties of oil.

When using oil according to API CF-4/SH, the exchange interval should be cut to one half, i.e. 125 hours or 3 months.



3.2.2. Fuel

Diesel is used as fuel:

- CEN EN 590 or DIN/EN 590 (draft)
- DIN 51 601 (February, 1986)
- BS 2869 (1988): A1 and A2
- ASTM D 975-88: 2-D
- VV-F-800C: DF-A, DF-1 and DF-2
- NATO code F-54 and F-75

NOTE

Engine producer recommends to use fuel with sulphur content less than 0.05 weight percent.

! NOTE !

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”).

3.2.3. Coolant

Use coolant consisting of 50% of frost-resistant ethyl glycol agent and water according to Table all year-round for the cooling system of the engine. Use the coolant with antifreeze even in zones where temperatures do not fall below -36 °C (-34 °F). The coolant is not only protecting the cooling system against frost but increases also the boiling point. Inhibitors contained in the antifreeze protect parts of the engine cooling system and extend their life. Propylene antifreeze may also be used as coolants.

Prepare coolant by mixing the antifreeze with water.

Use water in compliance with the criteria given in the table for preparing the coolant:

The antifreeze must contain anticorrosive agents protecting all materials (including rubber and head seals) of the cooling system. They must be low siliceous and must comply with testing criteria of ASTM 4985. The following antifreeze may be used:

SUNOCO - PERMANENT ANTIFREEZE

SHELL - Glycoshell AF 511 S

TEXACO - HAVOLINE Antifreeze Coolant/AFC

CASTROL - ANTIFREEZE MB

! NOTE !

Do not use more than 50% of antifreeze in the coolant, unless absolutely necessary.

Never use a ratio higher than 68%.

Antifreeze is manufactured in different bases.

Their mutual mixing is not recommended. Anticorrosive properties may be lost when mixing different types of coolants.

Nitric amines dangerous to health are formed when mixing the nitride-base antifreeze and the amine-base agent.

Check the ratio of antifreeze in the coolant before wintertime using a refract meter (hydrometer).

Do not use antifreeze aggressive to aluminum - it may cause corrosion of the radiator.

3.2.4. Hydraulic oil

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

The machines are filled with hydraulic oil of kinetic viscosity 68 mm²/s at 40 °C (104 °F) ISO VG 68 by the manufacturer. This particular oil is suited for applications in the widest range of ambient temperatures.

Manufactured by	Sort of oil
Output class on ISO 6743/HV	HV (HVLP)
Viscosity class on ISO 6743/4, DIN 51519	VG 68
Viscosity class on CETOP RP 91H	HV 68
AGIP	AGIP ARNICA 68
AVIA	AVILUB HVI 68
BP	BARTRAN HV 68
CASTROL	HYSPIN AWH 68
CHEVRON	EP 68 HV
ELF	HYDRELF 68
ESSO	UNIVIS N 68
FINA	HYDRAN HV 68
FUCHS	RENOLIN MR 68 HV
MOBIL	MOBIL DTE 16
ÖMV	HLP - M 68
SHELL	TELLUS T 68
TEXACO	RANDO OIL HD CZ 68
TOTAL	EQUIVIS ZS 68

! NOTE !

At high ambient temperatures, when the oil temperature reaches continual 90 °C (194 °F), we recommend replacing the oil with one of kinetic viscosity 100 mm²/s - HV 100 (BP BARTRAN HV 100; ESSO UNIVIS N 100, etc.)

Should it be required to start the machine at temperatures below –8 °C (18 °F) lasting more than one month, replace oil in the hydraulic system with one of kinetic viscosity 46 mm²/s - viscosity class HV 46.

At temperatures below –13 °C (9 °F), replace oil with one of kinetic viscosity 32 mm²/s - viscosity class HV 32, such as BP BARTRAN HV 32, ESSO UNIVIS N 32, etc.) see Operating Instructions chapt. 2.9.3.

Synthetic hydraulic oil

Hydraulic system can be filled with synthetic oil, such as PANOLIN - HLP Synth. 15/22/32/68 that is completely degradable by microorganisms found in water and soil in case of leak.

! NOTE !

Water content (condensation water) in oil must not exceed the limit of 0,1%.

Operating fluid must be checked by taking samples in regular intervals - see the chart.

When filling older machines with synthetic oil, the residual limit of mineral oils must not exceed 8% of the total fill.

When filling biologically degradable oils, mixing with up to 2% of the total tank content is allowed.

When changing over from mineral oil to synthetic or when mixing oils of different brands, always consult the procedure with the oil manufacturer or dealer!

Interval of taking samples	Common operation	Extreme conditions
1. check	500 h	250 h
2. check	1000 h	500 h
subsequent checks	1000 h or once a year	500 h or once a year

3.2.5. Gearbox oil

Use high quality oils complying with API GL-5 or EP or MIL-L-2105 C for lubricating the drum gearbox and axle (wheels) drive gearboxes.

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

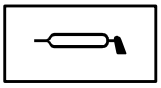
Viscosity SAE 80W/140 for outdoor temperature range +20 °C ÷+45 °C (68 °F ÷ +113 °F).

Manufactured by	Sort of oil	
Outdoor temperatures	–10°C÷ +30°C (14°F ÷ 86°F)	+20°C ÷+45°C (68°F ÷ +113°F)
SHELL	SPIRAX HD	SPIRAX HD
AGIP	ROTRA MP	ROTRA MP
ARAL	GETRIEBEOL HYP	GETRIEBEOL HYP
BP - MACH	HYPOGEAR EP	HYPOGEAR EP
CASTROL	HYPOY	HYPOY
CHEVRON	UNIVERSAL GEAR LUBRICANTE	UNIVERSAL GEAR LUBRICANTE
ELF	TRANSELF8	TRANSELF8
ESSO	GEAR OIL GX PONTONIC MP	GEAR OIL GX PONTONIC MP
I.P.	PONTIAX HD	PONTIAX HD
MOBIL	MOBILUBE HD	MOBILUBE HD
TOTAL	TRASMISSION TM	TRASMISSION TM

! NOTE !

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

3.2.6. Lubricating grease



Plastic grease containing lithium in compliance with NLGI-2 regulation (Mobilplex EP-1, Retinax A, Alvania, Grease No 3 etc.) must be used to grease the machine.

ISO 6743/9 CCEB 2

DIN 51 502 KP2K-30

(Mogul LA 2, Mobilplex EP-1, Retinax A, Alvania, Grease No 3 etc.).

3.2.7. Windshield washer liquid

Water (at temperatures down to 0°C) and windshield washer agent are used as fills in the washer can.

! NOTE !

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

Fills of...	Type of fill	Quantity l (gal US)	Brand
Engine	Engine oil according to chapter 3.2.1.	16,3 (4,3)	
Fuel tank	Diesel according to chapter 3.2.2.	410 (108,3)	
Hydrostatic system	Hydraulic oil according to chapter 3.2.4.	90 (23,8)	
Drum gearbox	Gearbox oil according to chapter 3.2.5.	4,2 (1,11)	
Axle gearbox	Gearbox oil according to chapter 3.2.5.	2x2,8 (2x0,7)	
Joint bearings - joint and steering cylinder	Plastic grease according to chapter 3.2.6.	as required	
Engine cooling system - coolant	All year round - anti-freeze liquid according to chapter 3.2.3. for temperatures down to -25°C (-13°F)	25 (6,6)	
Vibrating drum	Engine oil, see the engine	8 (2,1)	
Battery	Distilled water	as required	
Windshield washers	Water and antifreeze - ratio according to outdoor temperature	2,75 (0,72)	
Tires	Air or liquid see Operating Instructions chapter 2.9.4.		

To be caried out regularly, every (hours)							□ INSPECTION, CHECKING, REPLENISHING, ADJUSTMENT ◇ CLEANING ○ LUBRICATION ▽ EXCHANGE				The place	CHAPTER
20 daily	100 weekly	250 3 monts	500 6 monts	1000 1 year	2000 2 years	Maintenan. as needed						
●							●				Engine oil	3.6.1.
●							●				Engine cooling liquid	3.6.2.
●							●				Oil in hydraulic tank	3.6.3.
●							●				Engine belt	3.6.4.
●							●				Engine ventilator	3.6.5.
●							●				Engine inlet piping	3.6.6.
●							●				Air cleaner vacuum valve	3.6.7.
●							●				Fuel level in fuel tank	3.6.8.
●							●				Fuel filter water separator	3.6.9.
●							●				Safety and monitoring devices	3.6.10.
	●						●				Tyre inflating pressure	3.6.11.
		●								●	Engine oil and filter	3.6.12.
		●					●				Injection pump	3.6.13.
		●					●				Tightness of engine cooling circuit	3.6.14.
		●					●				Battery	3.6.15.
		●					●				Air cleaner vacuum switch	3.6.16.
		●							●		Articulation joint bearings, pins	3.6.17.

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20 daily	100 weekly	250 3 monts	500 6 monts	1000 1 year	2000 2 years	Maintenan. as needed	□	◇	○	▽	The place	
		●					●				Oil charge - vibrators	3.6.18.
		●					●				Oil charge - gearboxes	3.6.19.
			●							●	Fuel filter	3.6.20.
			●				●				Cooling liquid concentration	3.6.21.
			●				●				Wheel bolts tightening	3.6.22.
				●			●				Valve clearance	3.6.23.
				●			●				Engine belt	3.6.24.
				● *						●	Gearbox oil	3.6.25.
				●			●				Damping system - drum and cabin	3.6.26.
				●				●			Fuel tank	3.6.27.
					●					●	Oil in vibrator	3.6.28.
					●					●	Hydraulic oil and filter	3.6.29.
					●			●			Suction strainer of the lifting and lowering unit	3.6.30.
					●					●	Engine cooling liquid	3.6.31.
					●		●				Engine torsion vibration damper	3.6.32.
						●				●	Filter elements - engine suction filter	3.6.33.
						●		●			Engine and hydraulic oil cooler	3.6.34.
						●		●			Cabin ventilation filter	3.6.35.
						●		●			Cleaning the machine	3.6.36.
						●	●				Bleeding of the fuel system	3.6.37.
						●	●				Scrapers	3.6.38.
						●	●				Threaded joints	3.6.39.

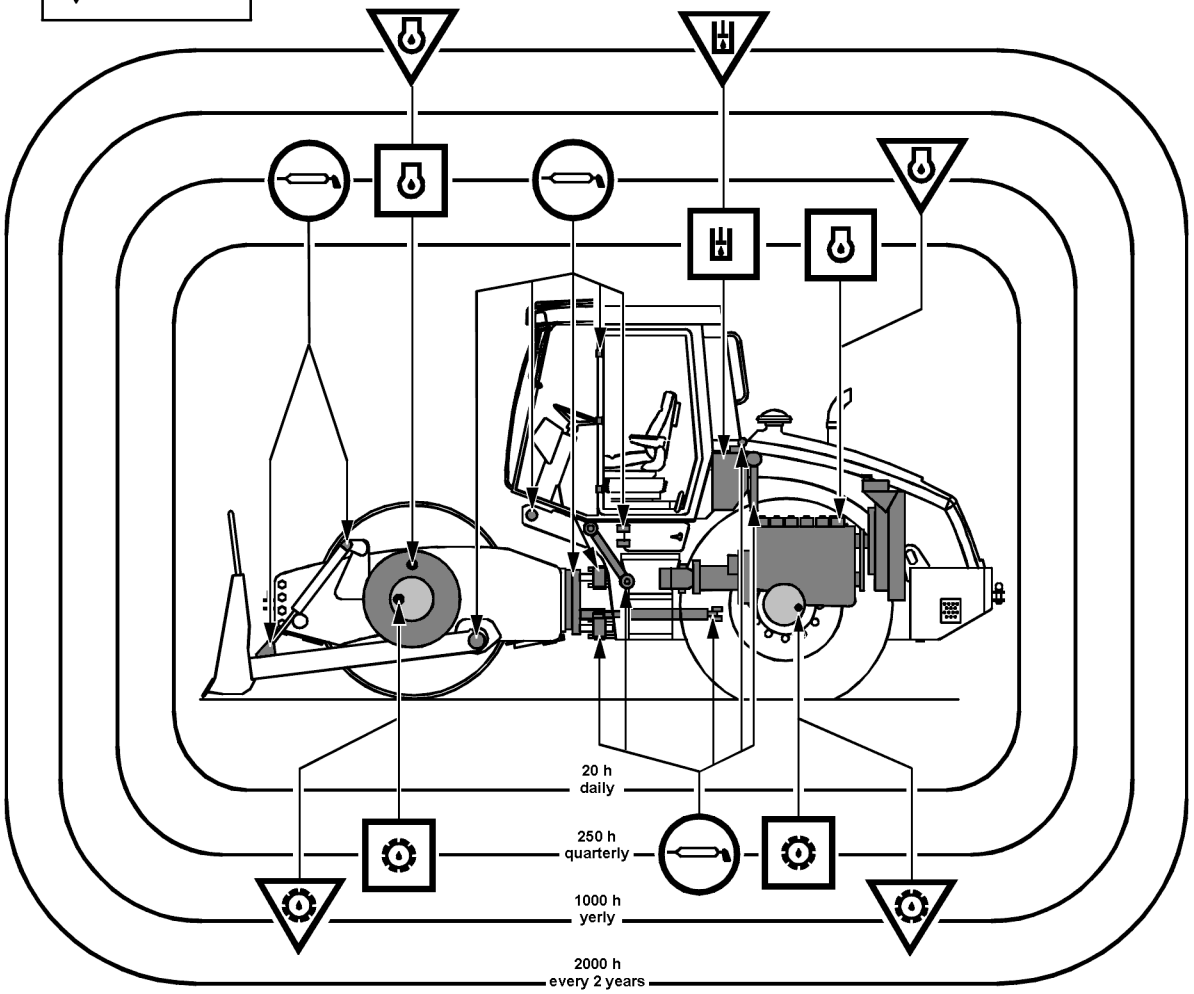
*First after 100 hours

282N242TA

LUBRICATION PLAN

LEGEND

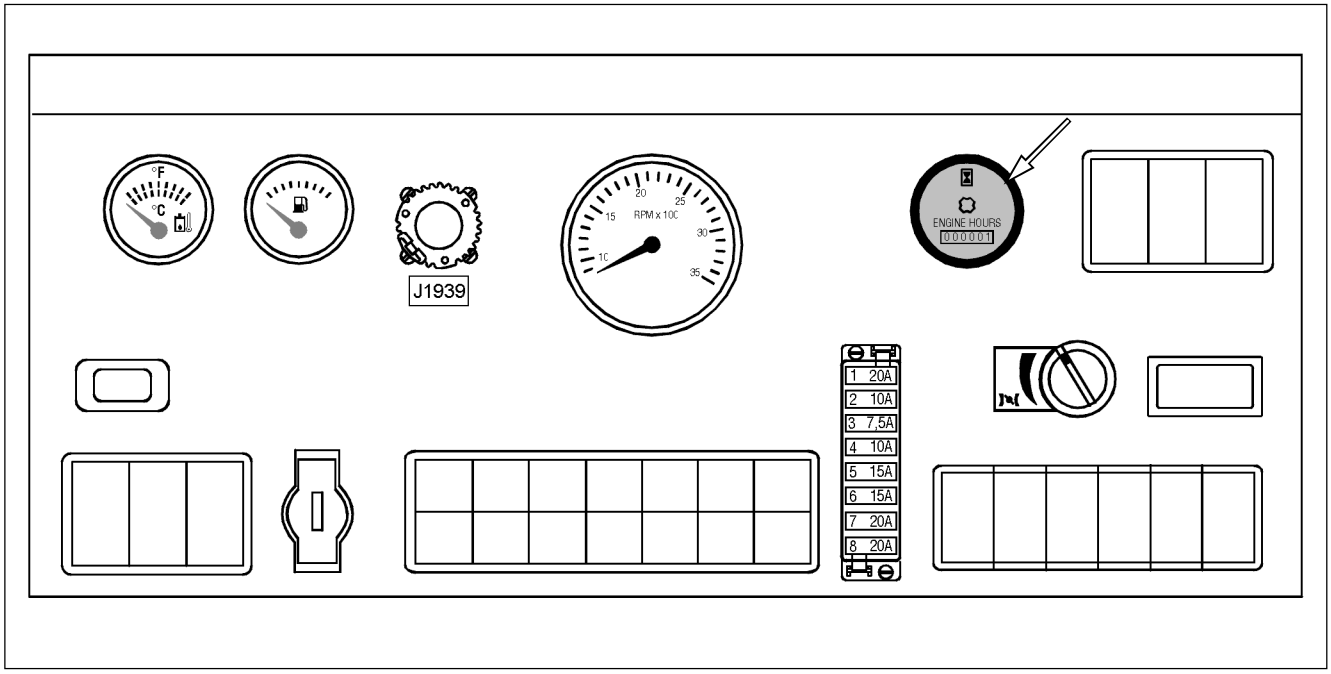
CONTROL
LUBRICATE
EXCHANGE



	Engine oil:	SAE 15W/40, API CH-4
	Hydraulic oil:	ISO VG 68 ISO 6743/HV
	Grease:	ISO 6743/9 CCEB 2
	Transmission oil:	SAE 80W/90; API GL-5; MIL-L2105 C SAE 80W/140; API GL-5; MIL-L-2105 C

ASC004A

Ensure regular and repetitive lubrication and maintenance at intervals according to daily reading of the working hours counter.



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This manual includes only basic information on the engine; the rest is provided in the operation and maintenance manual of the engine, which is a part of documentation supplied with the machine.

Disassembled or loose bolts, plugs, threaded connections of hydraulics etc. should be tightened with torque according to tables in chapter 3.6.39., unless a different value is listed for the particular operation.

! NOTE !

Follow the instructions given in the manual for operation and maintenance of the engine!

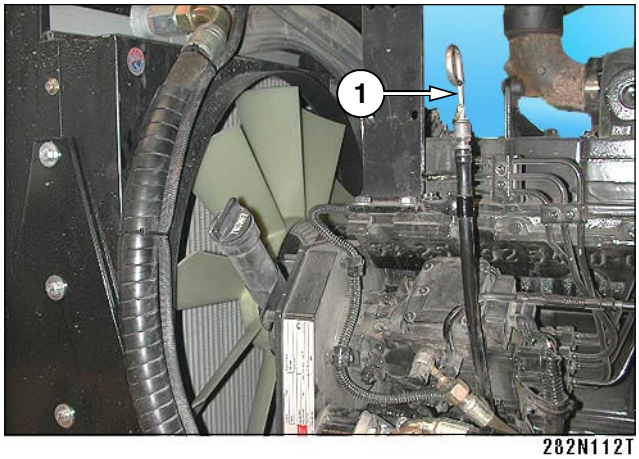
After the first 100 hours of working with a new machine (or after machine general overhaul), make the following operations:

3.6.25. The first oil exchange in drum and axle gearboxes

Every 20 Hours or Daily

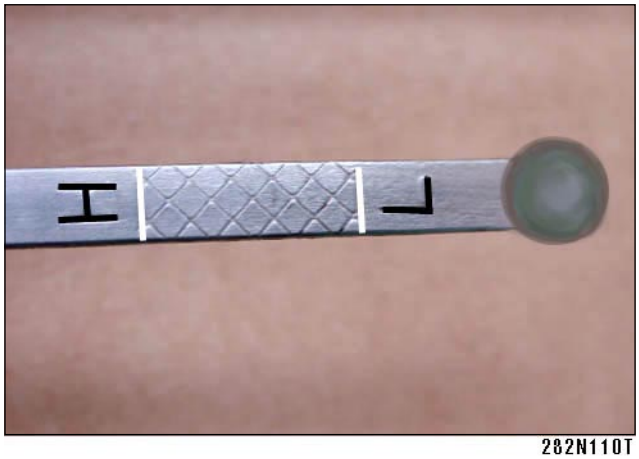
3.6.1. Checking the amount of oil in the engine

- Place the roller onto a flat, firm surface and stop the engine.
- Wait approx. 5 min. until oil runs down to the engine sump.
- Take out the oil dipstick (1), wipe it, insert fully back and take it out again to read out the oil level.



282N112T

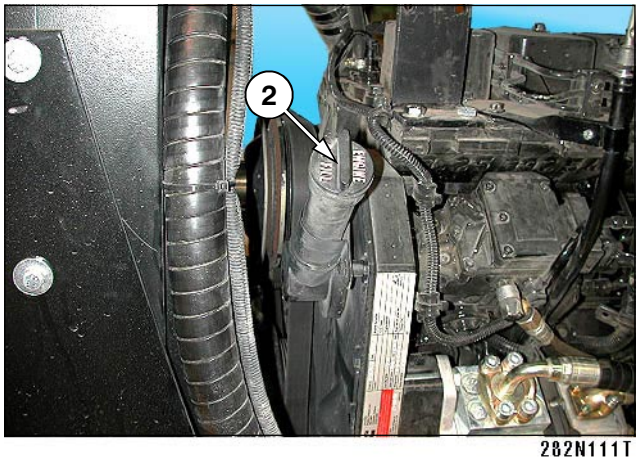
- Keep the level within the range of gauge marks pressed in the dipstick. The lower mark L (Low) marks the lowest possible oil level, the upper mark H (High) the highest one.



282N110T

Every 20 Hours or Daily

- Refill oil after removing the filler plug (2) through the oil filler. Wait approx. 1 min until the level is stable and check again.



282N111T

! NOTE !

The amount of oil between the dipstick marks is 0.95 litre (1.0 US Quart).

- Refill the identical type of oil. Use oils according to chapter 3.2.1.
- Check the engine for leakage, repair possible causes.
- Check the engine for damaged and missing parts and for changes in appearance.

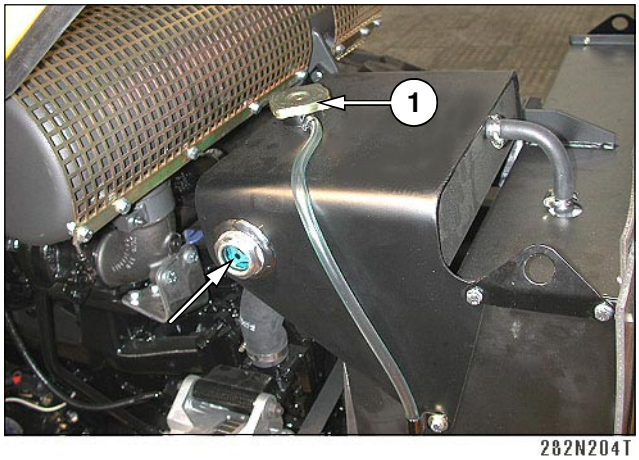
! NOTE !

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

Every 20 Hours or Daily

3.6.2. Checking cooling liquid of the engine

- Place the roller onto flat, firm surface and stop the engine.
- Let cooling liquid cool down to less than 50 °C (120 °F).
- Check visually the level.
- Refill coolant through the filler (1).



282N204T

Every 20 Hours or Daily

! NOTE !

The level must not fall below the level indicator eyesight.

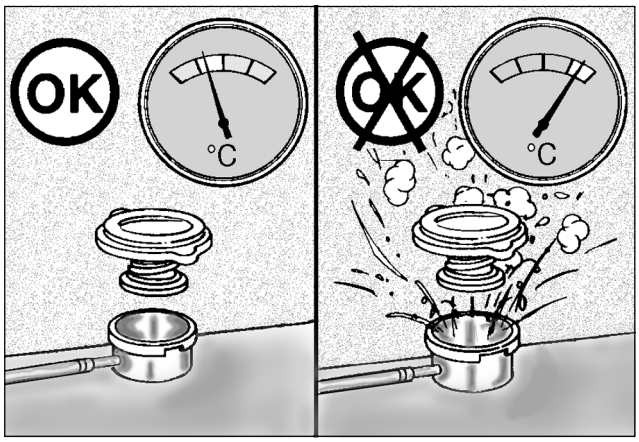
Refill only cooling liquids containing the frost-resistant agents on the identical basis, according to chapter 3.2.3.

Do not add additives eliminating untightness of the cooling system to the engine cooling liquid!

Do not refill cold cooling liquid into hot engine. Engine castings might get damaged.

In case of larger losses, find the location of cooling system leaks and repair the cause.

Dismantle the filling plug only when the temperature of engine cooling liquid falls to less than 50 °C (120 °F). If you open it at higher temperatures, you risk scalding by steam or by cooling liquid due to the inner overpressure.

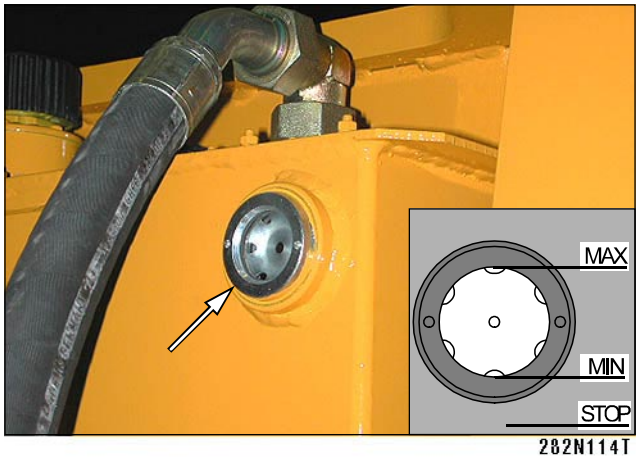


282N205T

Every 20 Hours or Daily

3.6.3. Checking oil in the hydraulic tank

- Place the roller onto flat, firm surface and stop the engine.
- Check the oil level. (oil gauge).



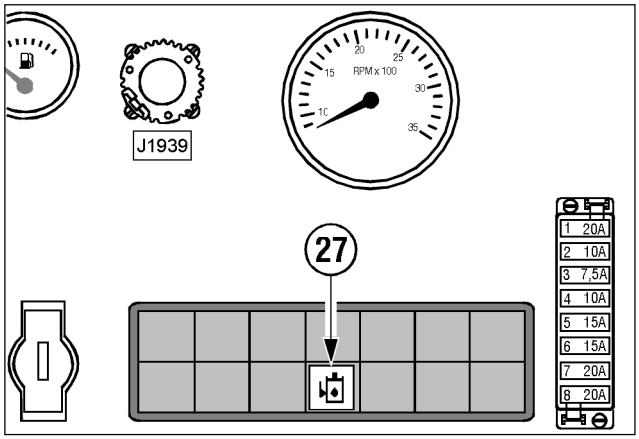
282N114T

Every 20 Hours or Daily

- Refill oil using filling device by means of filling quick coupling according to chapter 3.6.29.

! NOTE !

If the oil level falls below the lower edge of the "MIN" oil-level indicator, the engine will automatically stop and signal lamp (27) will light up.



282N115T

NOTE

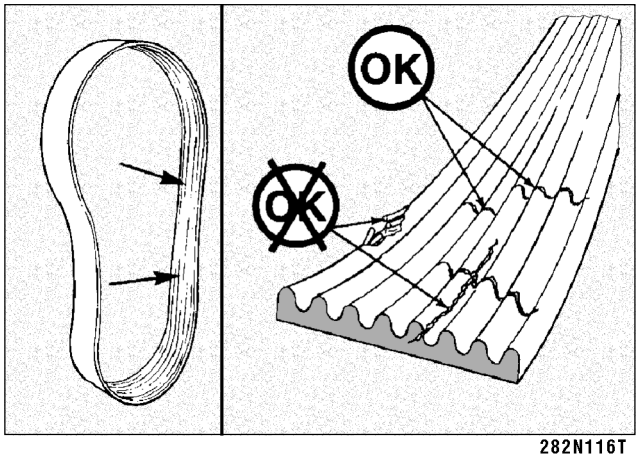
In case of more extensive losses find the location of hydraulic system leaks and repair the cause.

By stopping the engine in case of oil leakage, the hydraulic system of the machine is protected and operation is environment-friendly, since in case of hydraulic hose damage not all the content of the hydraulic tank but only limited amount would leak out. The engine can only be started after refilling oil.

Every 20 Hours or Daily

3.6.4. Checking the engine belt

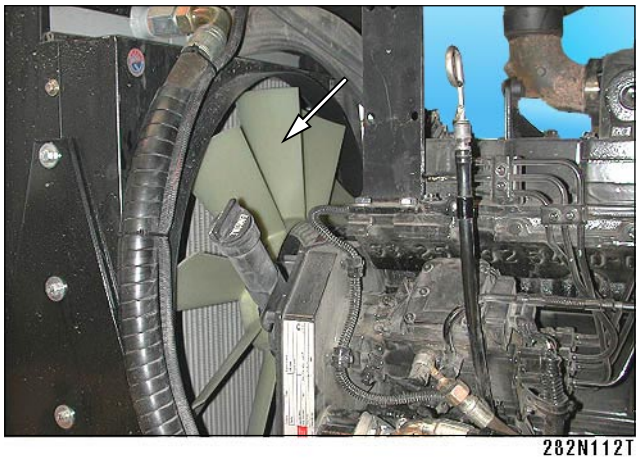
- Check visually the belt, search for its damage. Cracks perpendicular to the belt are not defects. In case any lengthwise cracks appear on the belt or its edges are frayed or its parts torn out, it is necessary to exchange the belt.



282N116T

3.6.5. Checking the condition of the ventilator

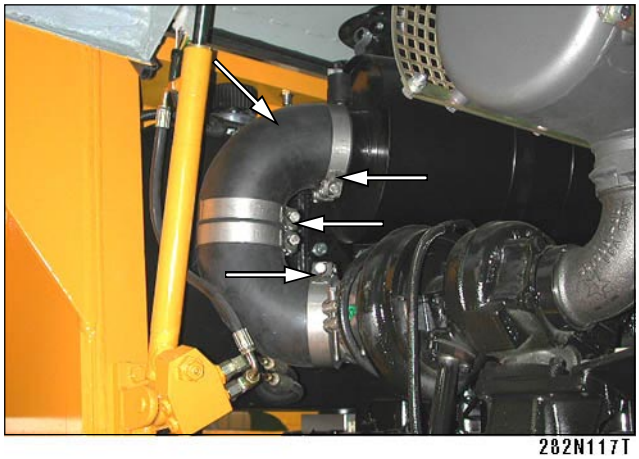
- Check the ventilator visually. In case of any damage (e.g. missing parts of the material, cracks, changes in shape etc.) replace the ventilator.


282N112T

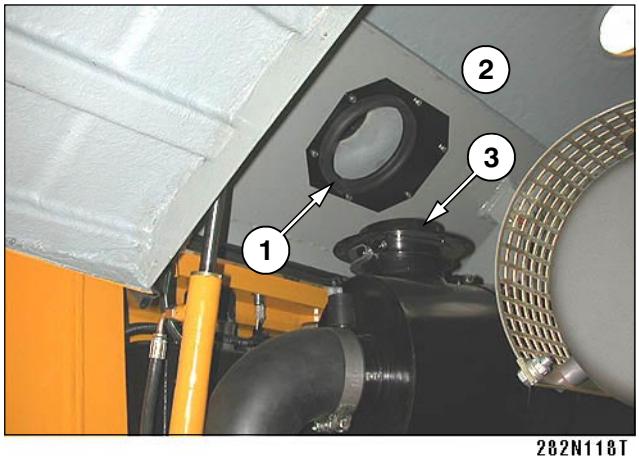
Every 20 Hours or Daily

3.6.6. Checking the engine inlet piping

- Check the tightness of engine inlet piping.
- Check for any damage of the rubber hose of the inlet piping leading from the filter, and for missing clamping clips.


282N117T

- Check again tightness between the bonnet (2) and the air cleaner (3).



282N118T

- Replace damaged sealing (1) with a new one.

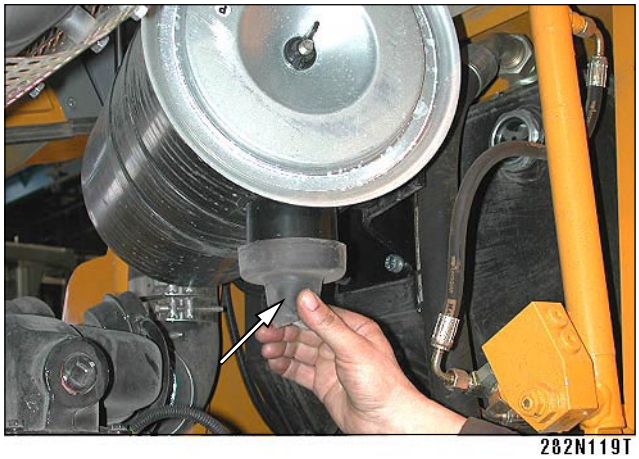
! NOTE !

Do not operate the machine if the sealing between the bonnet and the air cleaner is damaged or not tight.

Every 20 Hours or Daily

3.6.7. Checking the vacuum valve of the air cleaner

- Clean the exit slit and remove the trapped dust by pushing.



282N119T

Every 20 Hours or Daily

NOTE

- Collected dust is stored in the dust valve and automatically emptied during the machine operation.
- If the machine is equipped with air pre-filter (optional), clean it daily.

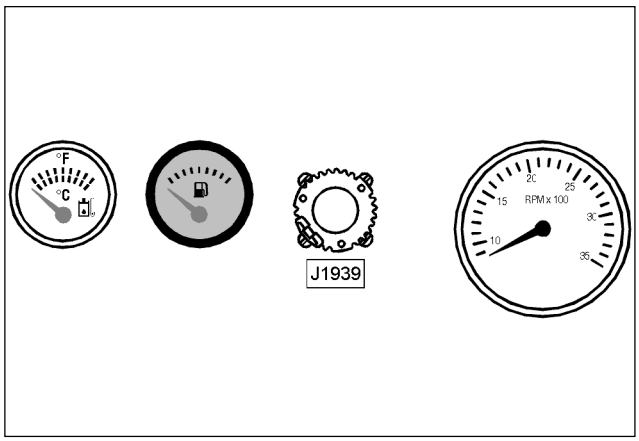
! NOTE !

Do not operate the machine if the dust valve is damaged.

Every 20 Hours or Daily

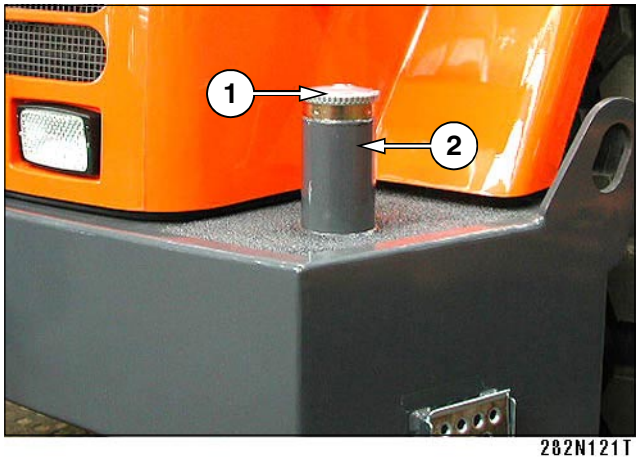
3.6.8. Checking fuel level

- Check the amount of fuel on fuel gauge; in case of insufficient amount refill fuel.



282N120T

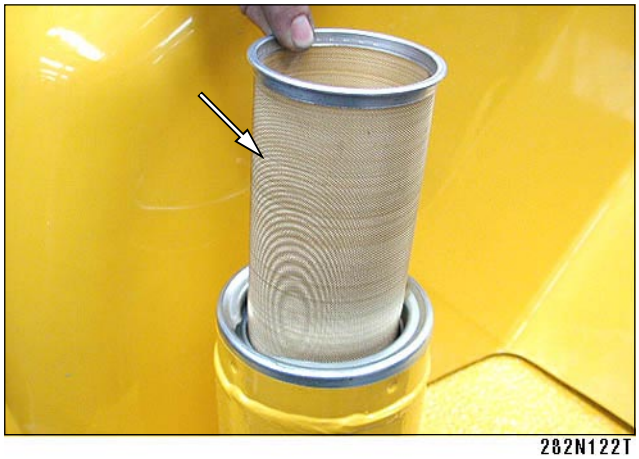
- Clean the fuel tank cap (1) and fuel filler (2).
- Unlock the tank cap lock, turn the cap and remove it.



282N121T

Every 20 Hours or Daily

- Refill the fuel tank up to the lower edge of the tank filler through the strainer.



282N122T

NOTE

The capacity of the fuel tank is 410 l (108 US gallons). The capacity of full fuel tank is approximately 34 hours of operation of the machine.

Do not smoke nor use open fire when working.

! NOTE !

Do not use up the fuel tank. In such case the whole fuel system must be de-aerated, which is rather tedious operation.

Use clean and recommended fuel only, according to chapter 3.2.2.

Do not refill fuel under running engine.

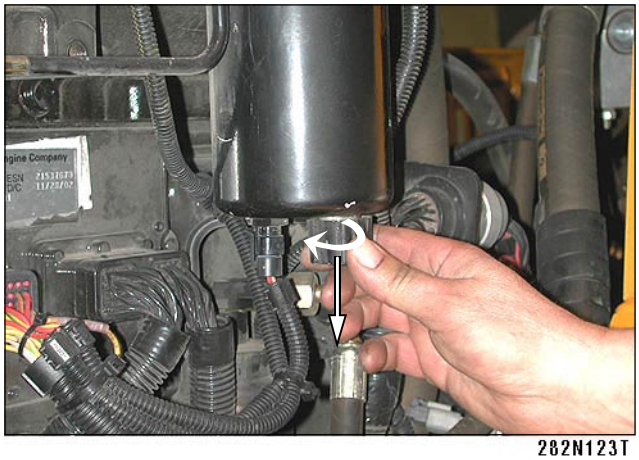
Do not refill fuel in closed room.

Do not spill fuel.

Every 20 Hours or Daily

3.6.9. Cleaning the water separator

- Prepare a vessel for draining the settling.
- Turn the separator valve (1) clockwise by 4 rotations until it shifts down by approx. 25 mm (1”). Let fuel drain until clean fuel starts to drain.



282N123T

Every 20 Hours or Daily

- Then push the valve up and screw it in.

! NOTE !

If you drained more than 6 cl (2 ozs) of fuel, refill fuel into the fuel filter according to chapter 3.6.20. or deaerate the system according to chapter 3.6.37. This will prevent problems with starting.

Do not smoke nor use open fire when working.

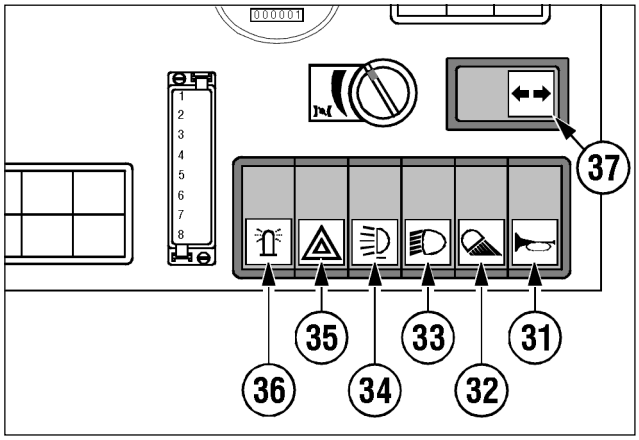
Do not drain the separator under running engine.

Catch the drained fuel with sediments to a suitable container.

Every 20 Hours or Daily

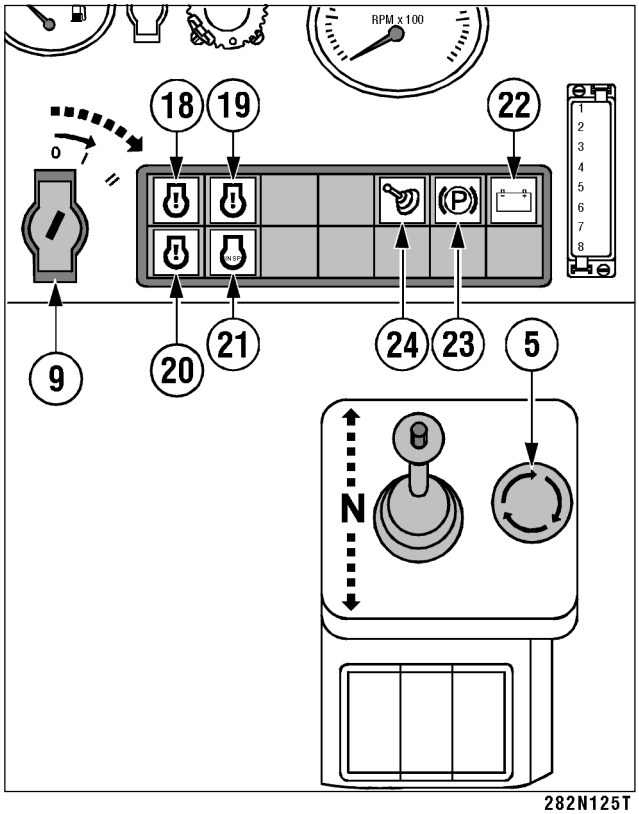
3.6.10. Checking warning and control devices

- Turn on switches (31, 32, 33, 34, 35, 36, 37), test the horn, beacon and lights.



282N124T

- Turn the ignition key to I position. Signal lamps (18, 19, 20, 21, 22, 23, 24) will light up.
- ECM signal lamps (18, 19, 20, 21) go off after 3 seconds.
- Start the engine - signal lamp (22) must go off.
- Start driving the machine and test the emergency brake (5) and signal lights (23).



282N125T

Every 20 Hours or Daily

Continuously check devices and signal lights during operation

Repair any indicated defects immediately!

Announce starting the engine by the acoustic signal!

Check before starting of the engine that nobody is endangered!

Give the acoustic signal before starting driving the machine and wait for period sufficiently long for all persons being able to leave the area around the machine (area under the machine) in time!

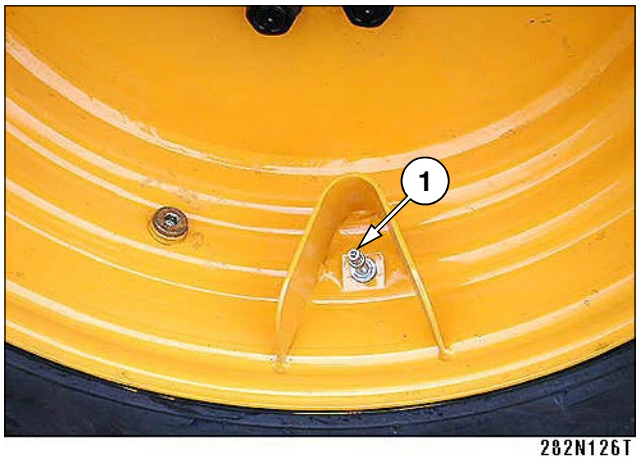
Make sure that the area in front and in the back of the machine is free and that no persons are present in this area!

Every 100 Hours

Every 100 Hours

3.6.11. Checking the tyre pressure

- Inflate the tyres (1) by pressured air through tyre valves (2).



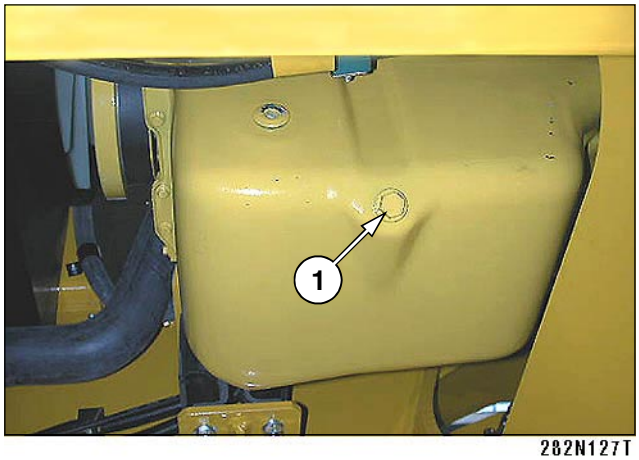
282N126T

- Check the pressure in cold tyres, by air pressure meter.
- Keep the tyre pressure at 160 kPa (23.2 PSI).

Every 250 Hours or Once in 3 Months

3.6.12. Engine oil exchange

- Place the roller onto flat, firm surface.
- Stop the engine.
- Prepare a suitable container with the capacity of approximately 20 l.
- Dismantle the drain plug (1) and let oil drain.

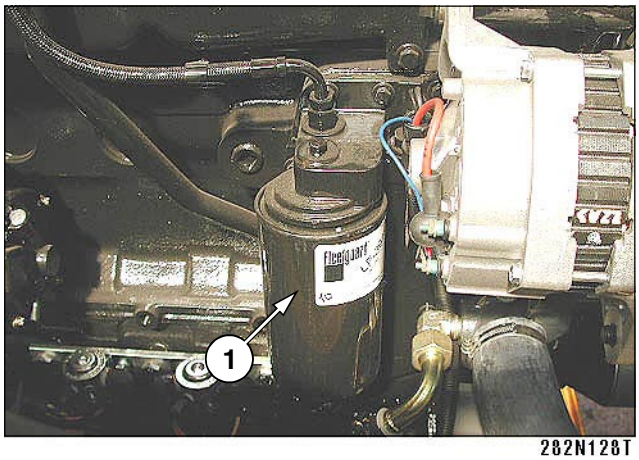


282N127T

- Dismantle the drain plug (1) and let oil drain (CE).

Every 250 Hours or Once in 3 Months

- Clean the area around the oil filter head. Dismantle the filter (1).

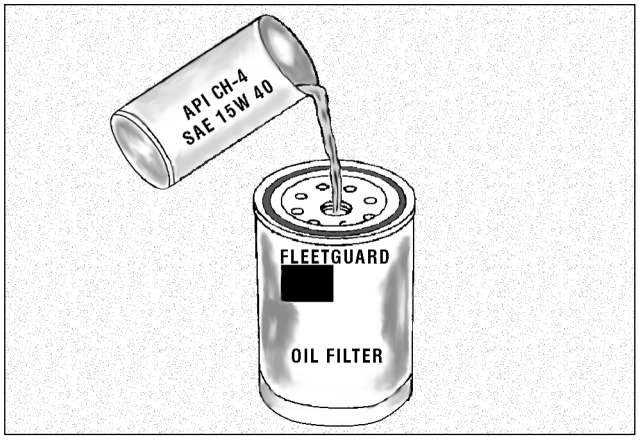


282N128T

- Clean the contact area of the filter sealing.


282N129T

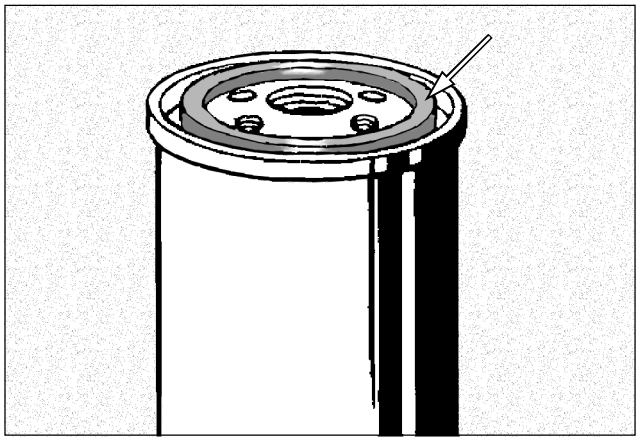
- Take a new filter and fill it with clean engine oil.



282N130T

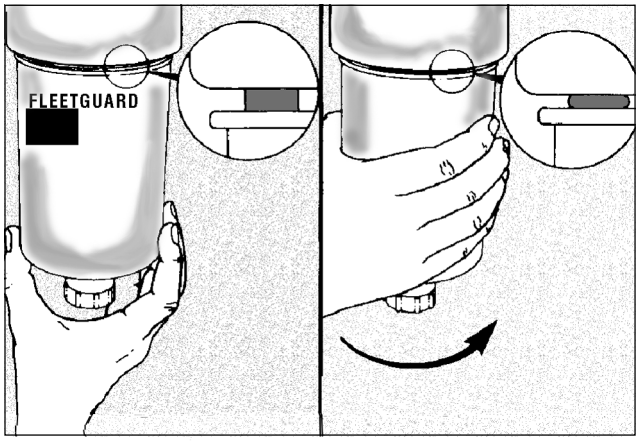
Every 250 Hours or Once in 3 Months

- Wipe the sealing with oil.



282N131T

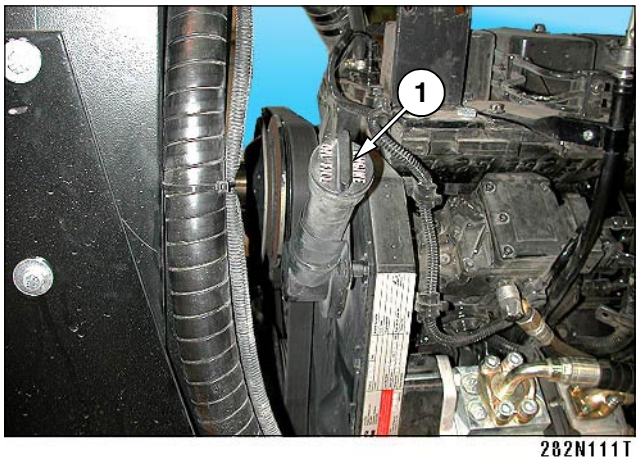
- Mount the filter and tighten firmly with hand.



282N132T

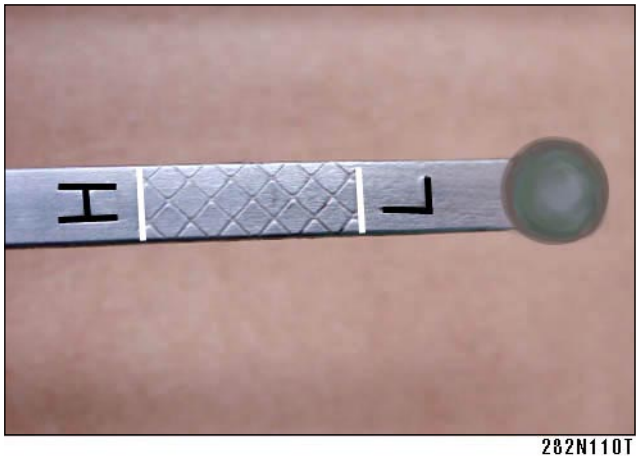
Every 250 Hours or Once in 3 Months

- Check the drain plug sealing replace it, if damaged.
- Check the engine sump thread and clean the contact area of the sealing.
- Mount the plug back. Tightening torque is 60 Nm (44 ft-lb).
- Fill the engine through the filler (1).



282N111T

- Refill oil to the upper oil level mark (H). Oil charge is 16.3 l (15.4 qt).



282N110T

Every 250 Hours or Once in 3 Months

NOTE

- After refilling, start the engine for 2 - 3 min. Check tightness of drain plug and filter.
- Stop the engine, wait for approx. 5 min. until oil runs down to the engine sump. Then check the level with oil dipstick.

! NOTE !

Drain oil after stopping the operation, when it is warm. Alternatively, warm engine up until the temperature of cooling liquid reaches 60 °C (140 °F).

Exchange oil after 6 months at the latest, if 250 hours of operation have not been reached by that time.

Exchange oil in the interval that comes first.

Use recommended filters - see the specifications manual or Spare parts catalogue.

Use recommended oil - see chapter 3.2.1.

Do not tighten the filter too tight, the thread and sealing might get damaged.

Beware of scalding when draining hot oil. Let oil cool down to less than 50 °C (122 °F).

Follow the fire safety measures!

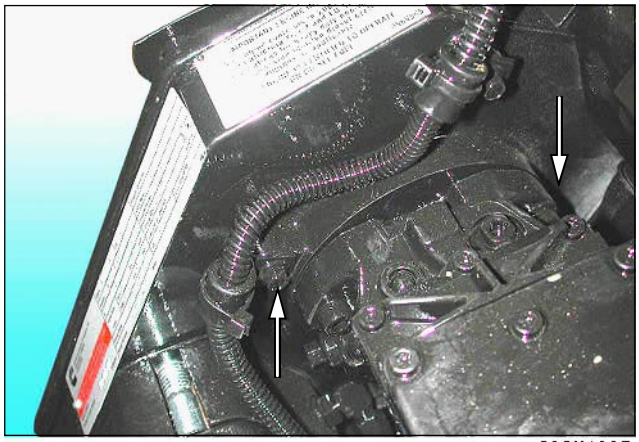
Collect drained oil; do not let it soak into the ground.

Used oil and filters are environmentally dangerous waste - have them liquidated.

Every 250 Hours or Once in 3 Months

3.6.13. Checking the injection pump

- Check tightness of the injection pump nuts.



282N133T

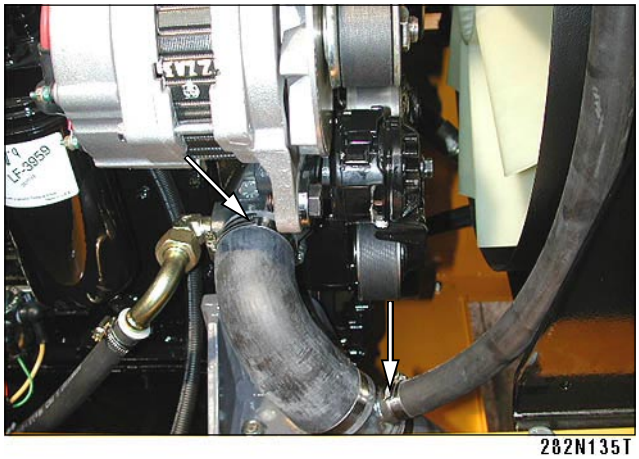
Every 250 Hours or Once in 3 Months

3.6.14. Checking the cooling circuit of the engine

- Check tightness of the cooling circuit. Check the circuit for damaged hoses and for missing hose clips.

282N134T

- Check whether the oil cooler gills and the engine radiator gills are not clogged. In case of clogged gills clean them for instance by blowing the radiators through with pressure air (steam or warm water) according to chapter 3.6.36.

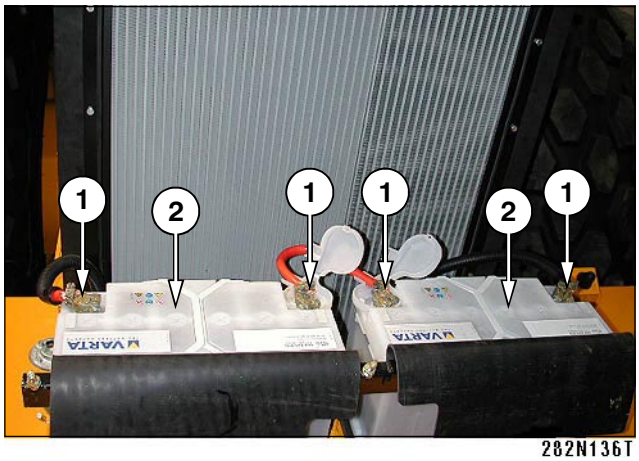


282N135T

Every 250 Hours or Once in 3 Months

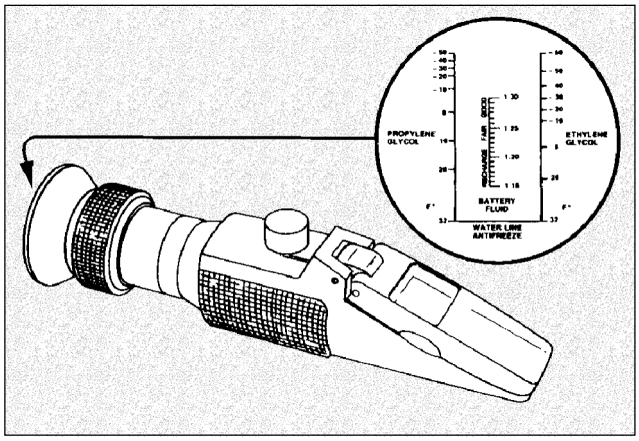
3.6.15. Checking batteries

- Place the roller onto flat, firm surface.
- 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.
- Check the level of electrolyte after opening plugs of the battery cells (2) - the level of electrolyte in all cells should be 5 - 15 mm (0.2-0.6 in) above the plates, or to the lower edge of the gauge in the battery cells. Refill the cells whose electrolyte level is lower, than 5 mm (0.2 in) above the plates, with distilled water.



282N136T

- Measure electrolyte density in the individual cells using a refractometer



282N137T

Every 250 Hours or Once in 3 Months

or hydrometer.

282N138T

- Compare measured values with the chart.

	Density			
	in g/cm³		in °Be (Beume)	
	20 °C 68 °F	Tropics	20 °C 68 °F	Tropics
fully charged	1,28	1,23	32°	27°
semi charged	1,2	1,12	24°	16°
exhausted - charge immediately!	1,12	1,08	16°	11°

NOTE

- Check the level using a glass tube.
- Should the machine not be used during winter period - for couple of weeks, dismantle the batteries and store them away from frosts. Check batteries and charge level before and during storage.

! NOTE !

Keep the batteries dry and clean.

Close batteries after checking.

Refill battery with distilled water only - never with acid.

Refill distilled water immediately before working with the machine or before recharging the battery.

Recharge insufficiently charged battery.

Recharge batteries dismantled from the machine.

Open the plugs before recharging.

Do not disconnect the battery under running engine.

Every 250 Hours or Once in 3 Months

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

Use protective gloves and eye protection equipment when working with the battery.

Wear suitable dress to protect your skin against staining with electrolyte.

In case of an eye injured by electrolyte immediately wash the eye with flowing water for couple of minutes. Then seek medical advice.

In case of ingestion of electrolyte drink maximum possible amount of milk, water or mixture of magnesium oxide with water.

In case of staining your skin with electrolyte take off your clothes and shoes, wash injured spots with soap water or with solution of soda and water as soon as possible. Then seek medical advice.

Do not eat, drink and smoke during operation!

Wash your hands and face carefully with soap and water after finishing you work!

Do not test whether wires are alive by touching the frame of the machine.

Disconnect the battery to avoid short-circuit when repairing it or manipulating with wires and electric equipment in the circuit of electric system.

Disconnect the minus pole wire first when disconnecting the battery. Connect the plus pole wire first when connecting the battery.

In case of contact of both poles of the battery the short-circuit may cause explosion of the battery.

Do not turn batteries upside down to avoid draining of electrolyte from venting of the battery.

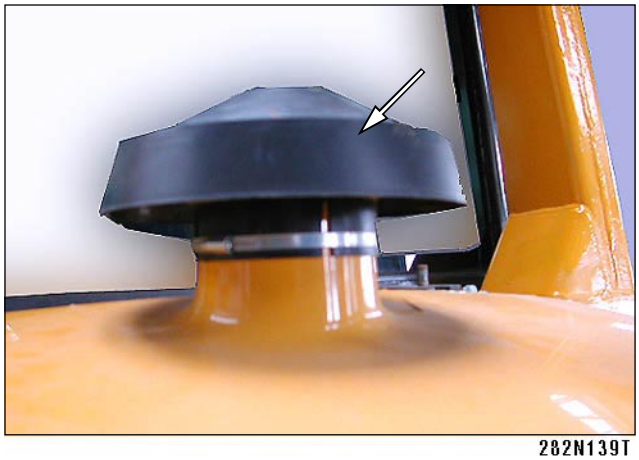
In case of spilling electrolyte wash such a place with water and neutralise with lime.

Dispose of old damaged batteries.

Every 250 Hours or Once in 3 Months

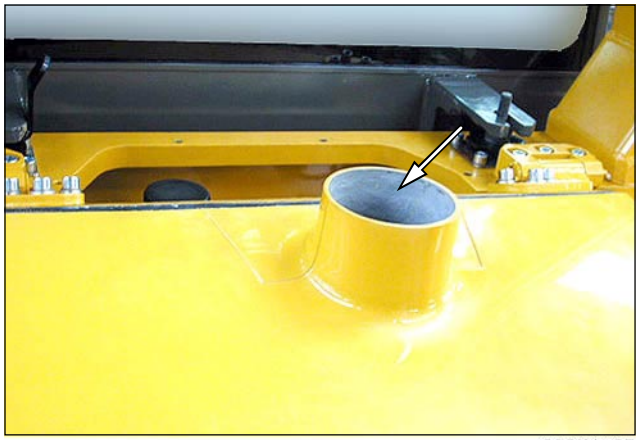
3.6.16. Checking the function of vacuum switch of the air cleaner

- Set engine speed to increased speed of approx. 1500 rpm.
- Dismantle the engine suction cover.



282N139T

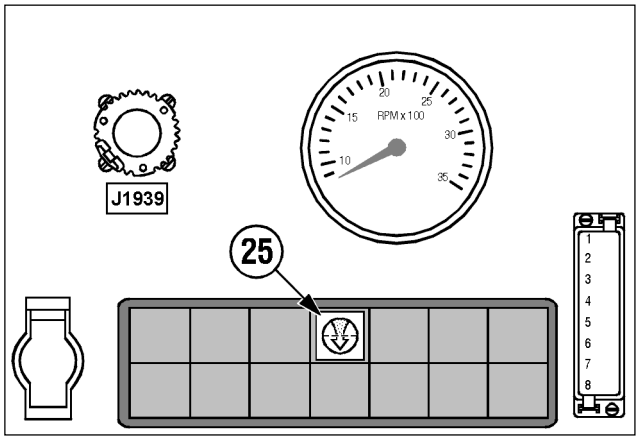
- Shortly cover the inlet opening of the air cleaner on the engine bonnet.



282N140T

Every 250 Hours or Once in 3 Months

- After such covering the signal lamp (25) of the air cleaner clogging must light up.

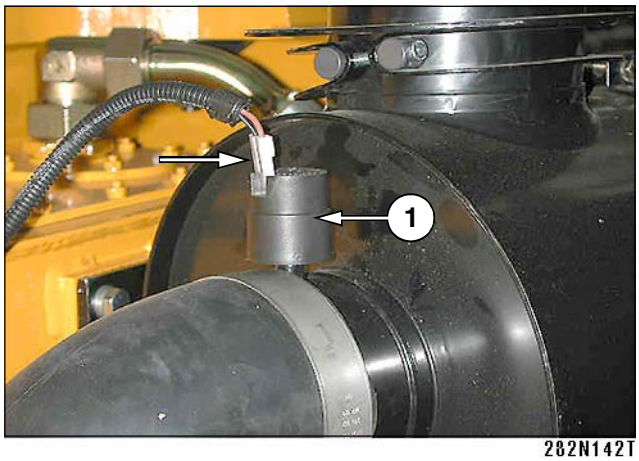


282N141T

- If it does not light up, check the following:

  vacuum switch (1)

  bulb in the signal lamp (25), contacts, supply wire.



282N142T

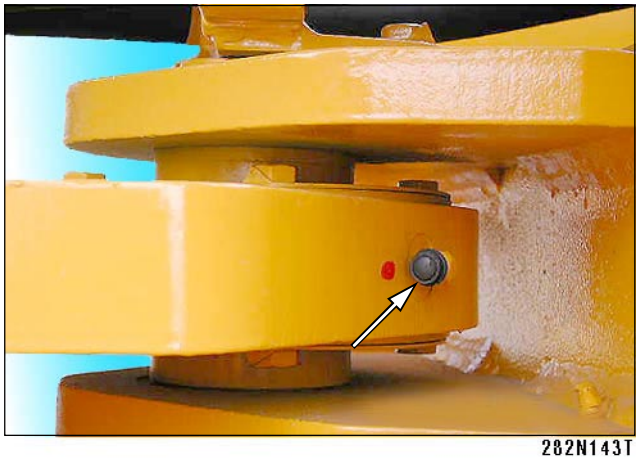
3.6.17. Lubrication of the machine

- Place the roller onto flat, firm surface.
- Stop the engine and disconnect electric system using the isolating master switch.
- Remove the caps on the grease nipples.
- Successively mount the grease nipple of pressure lubricator and continue greasing until the old grease starts to drain out.
- Return the grease nipple caps.

Every 250 Hours or Once in 3 Months

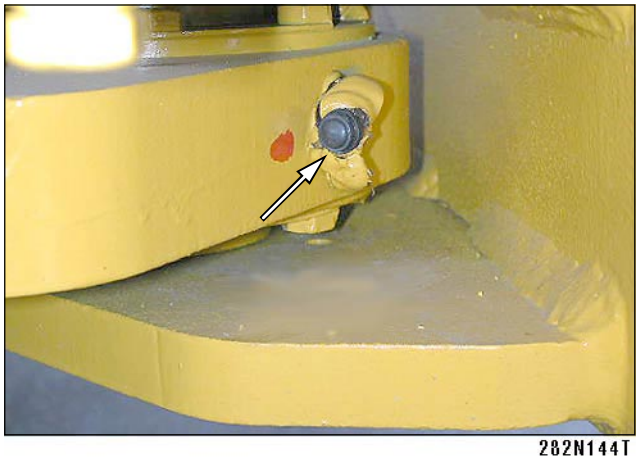
Steering

upper bearing



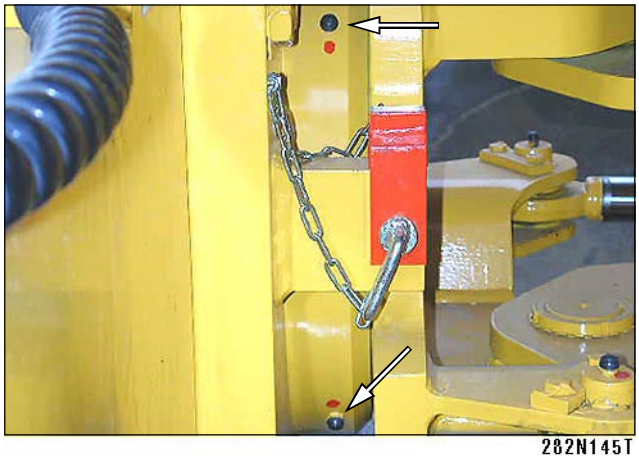
282N143T

lower bearing



282N144T

bearing 4x



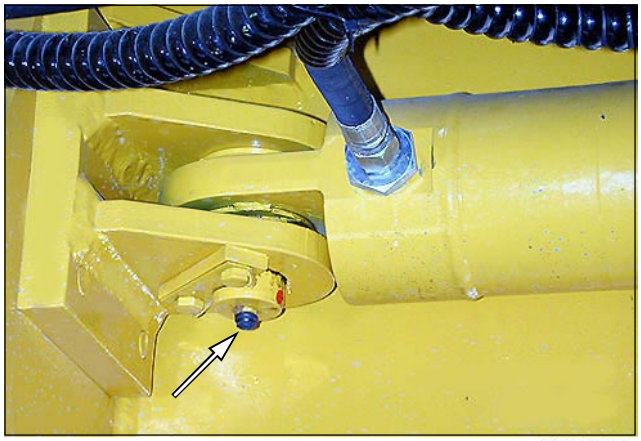
282N145T

Every 250 Hours or Once in 3 Months

Steering hydraulic cylinders

front pins 2x

rear pins 2x

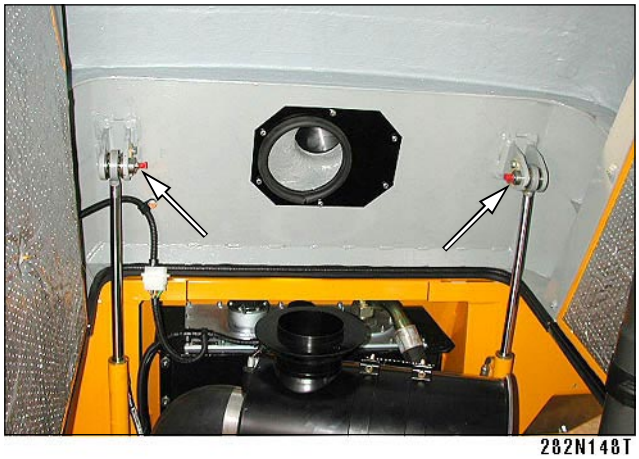


rear pins 2x (CE)

Every 250 Hours or Once in 3 Months

Hydraulic cylinders of bonnet lifting

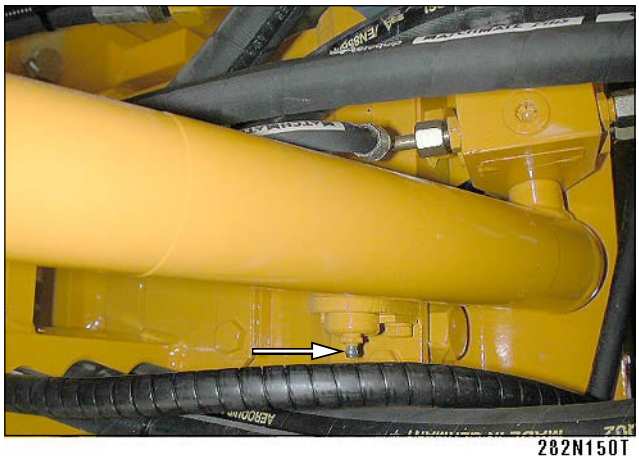
upper pins 2x



lower pins 2x

Hydraulic cylinder of driver's post lifting

lower pins 2x



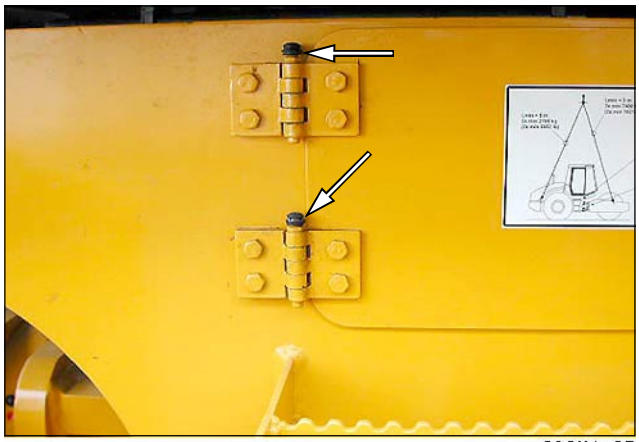
Every 250 Hours or Once in 3 Months

Door hinges pins

pins 6 x

282N151T

Door hinges pins, left, right side

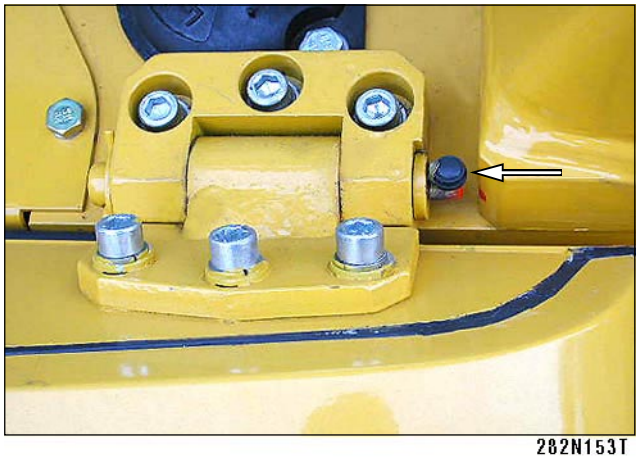


282N152T

Every 250 Hours or Once in 3 Months

Bonnet hinges pins

pins 2 x



282N153T

Front pins of cabin attachment

pins 2 x

282N154T

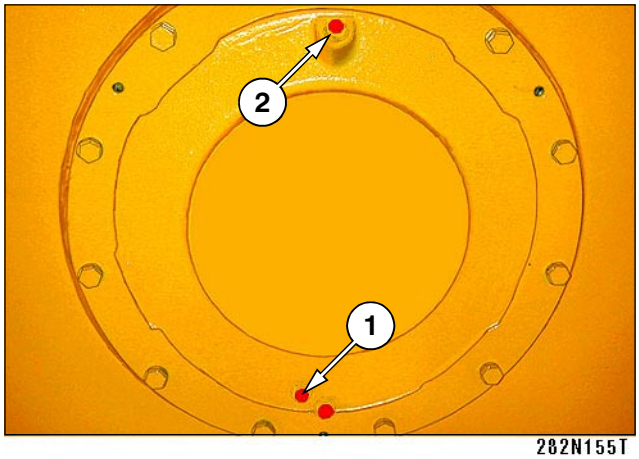
! NOTE !

Use only recommended lubricating greases, see chapter 3.2.6.

Every 250 Hours or Once in 3 Months

3.6.18. Checking oil in the vibrator

- Stop the machine on an even firm surface in order that the plugs on the left side of the drum are in the position according to fig.



282N155T

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

Every 250 Hours or Once in 3 Months

! NOTE !

Refill the identical type of oil.

Check oil when it is cooled down.

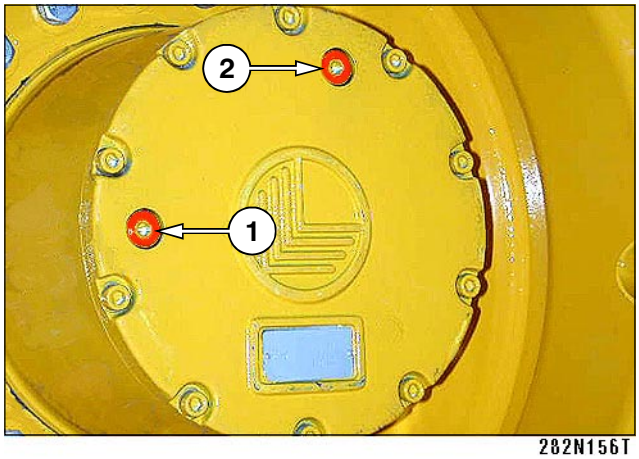
Avoid leakage of oil to the soil.

Every 250 Hours or Once in 3 Months

3.6.19. Checking oil in gearboxes

Axle gearbox

- Stop the machine on even, firm surface in order that the gearbox plugs of both wheels are in the position according to fig.

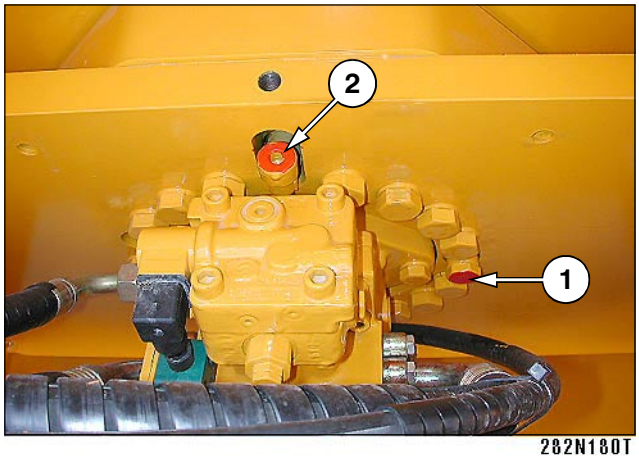


282N156T

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

Drum gearbox

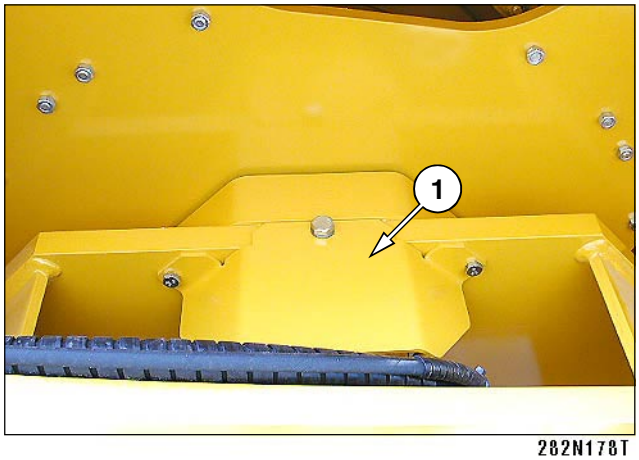
- Clean the area around the checking plug (1).
- Unscrew the plug (1) and check the oil level. The oil level must reach the checking opening or slightly flow out.



282N180T

Every 250 Hours or Once in 3 Months

- After disassembly the cover (1).
- Refill oil through the filling plug (2), if necessary.



282N178T

- Clean the plugs and mount again.
- Check tightness of the gearboxes.

! NOTE !

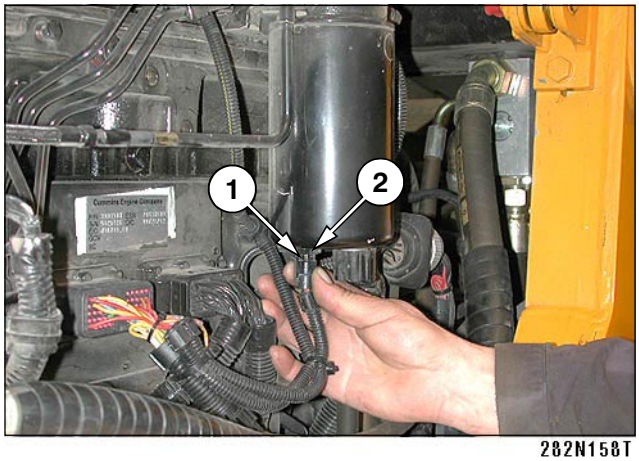
The plugs are located on the static part of the gearbox - they do not rotate during driving.

Do not touch the gearbox and adjacent parts if they are hot.

Every 500 Hours or Once in 6 Month

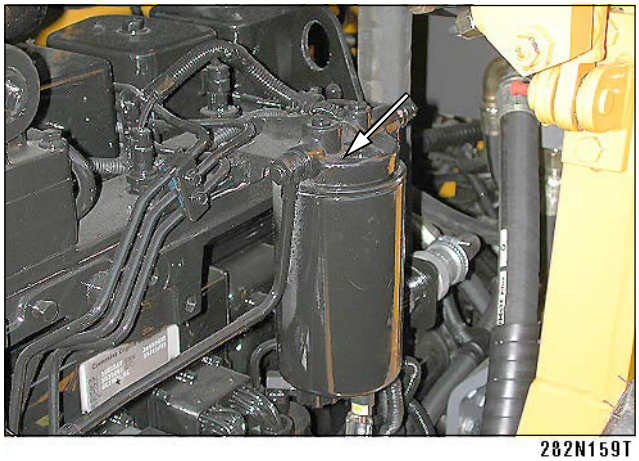
3.6.20. Engine fuel filter exchange

- Stop the engine.
- Disconnect water separator sensor connector (1), dismantle water separator sensor (2) from the filter and assembly it on new filter.



282N158T

- Clean the head of fuel filter and dismantle the filter.



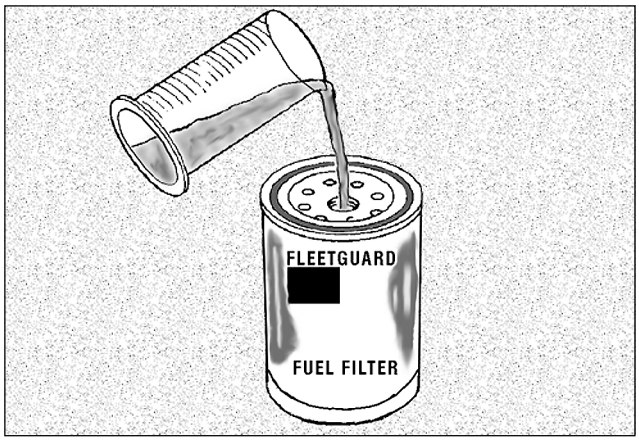
282N159T

Every 500 Hours or Once in 6 Month

- Clean the contact area of the filter.

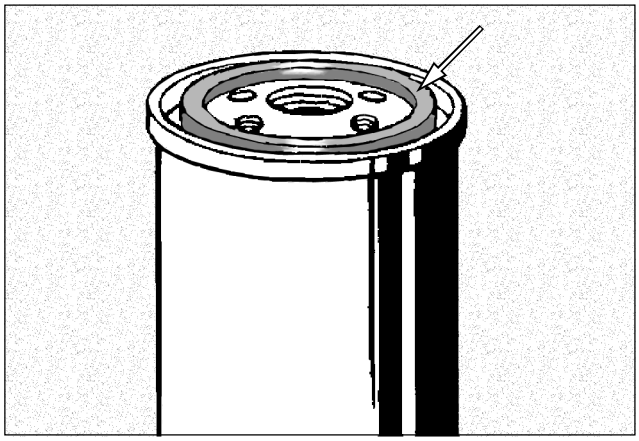
282N129T

- Fill the filter with clean fuel.



282N160T

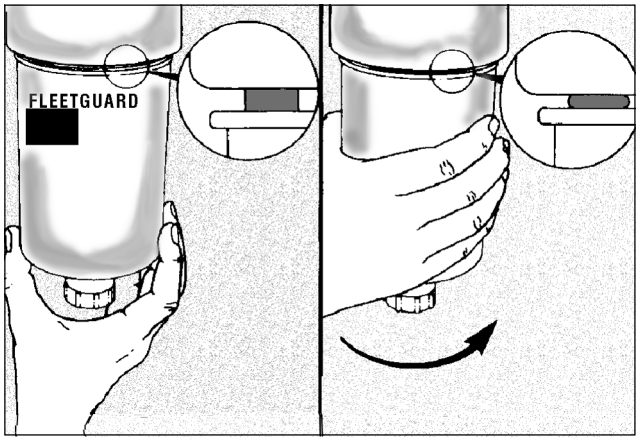
- Wipe the sealing ring with oil.



282N131T

Every 500 Hours or Once in 6 Month

- Mount the filter and tighten firmly with hand.



282N132T

Note:

Remove water separator after dismantling of filter from engine.

! NOTE !

Use original specified filters.

Do not tighten by force.

Do not smoke nor use open fire when working!

Collect leaking fuel.

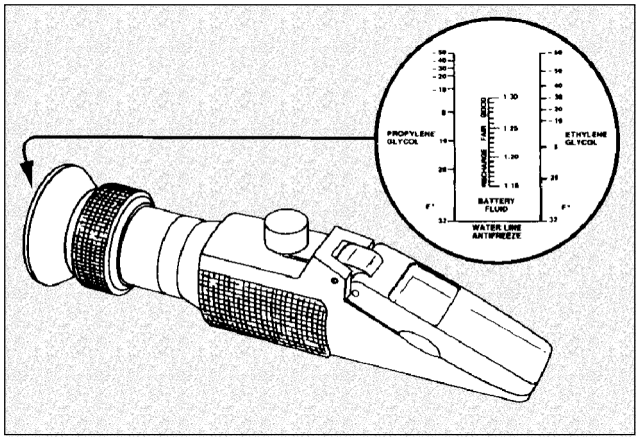
Store used filters in a separate container and dispose of them.

Every 500 Hours or Once in 6 Month

3.6.21. Checking cooling liquid

- Check the concentration of anti-freeze agent in cooling liquid using a refractometer.

282N161T



282N137T

! NOTE !

Check the cooling liquid always before winter season. In case the concentration measured is not sufficient for -36 °C (-34 °F), adjust it by adding frost-resistant agent into cooling liquid or exchange cooling liquid.

- Add anti-freeze agent according to chapter 3.2.3.

Every 500 Hours or Once in 6 Month

Every 500 Hours or Once in 6 Month

3.6.22. Checking tightening bolts of wheel

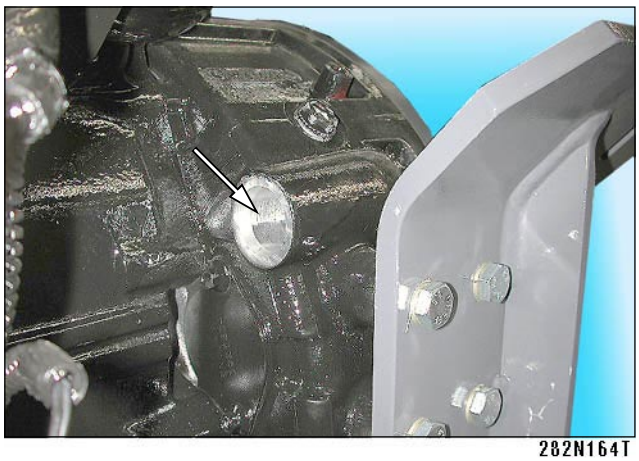
- Check tightening bolts of wheel using a torque wrench.
- Tightening torque is 165 Nm (122 lb ft).

282N162T

Every 1000 Hours or Once a Year

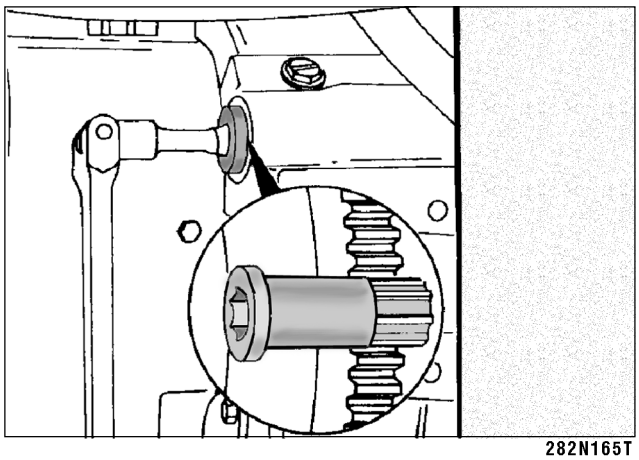
3.6.23. Checking and adjusting the valve clearance

- Dismantle the inlet air piping leading to the turbo charger and valve covers.
- Dismantle the blinding plug on the opening of the flywheel casing, which serves for inserting the grooved pin.



282N164T

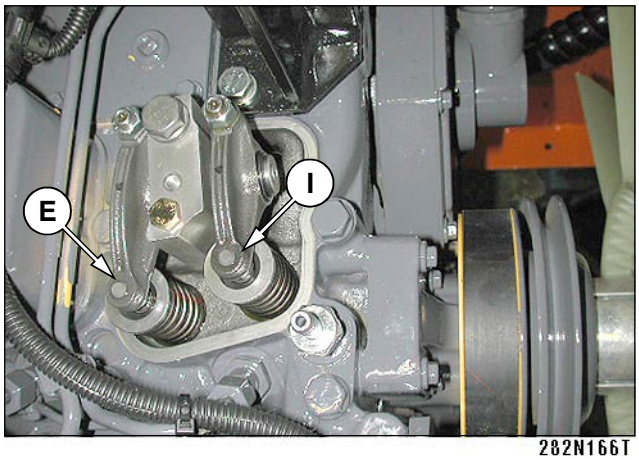
- Insert the grooved pin Cummins no. 3824591 with 1/2” recess for hex key. Using the key, you can manually turn the engine.



282N165T

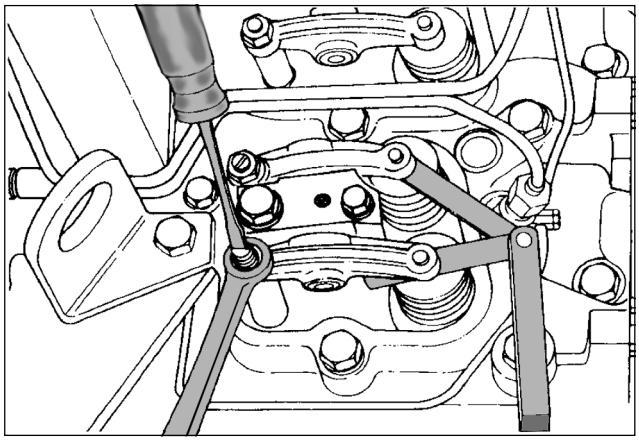
Every 1000 Hours or Once a Year

- By slow turning the engine find the top (top dead centre) of stroke of no.1 cylinder. In this position valve rocker arms of both valves (E, I) are free.



282N166T

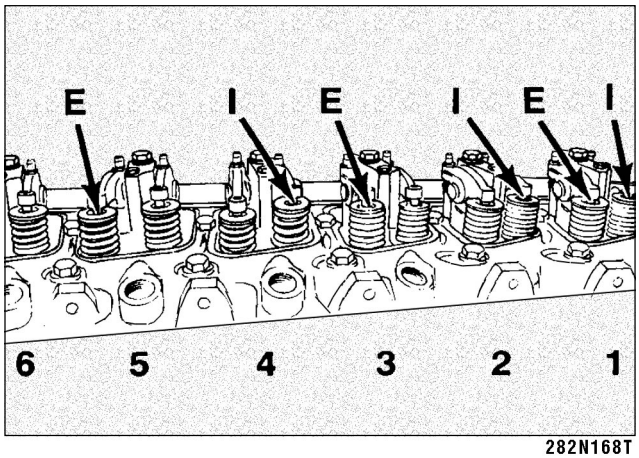
- Measure the clearance of the inlet and exhaust valves of the 1st cylinder using the feeler gauges. To adjust clearance, loosen the locking nut and turn the adjusting screw using a screwdriver.



282N167T

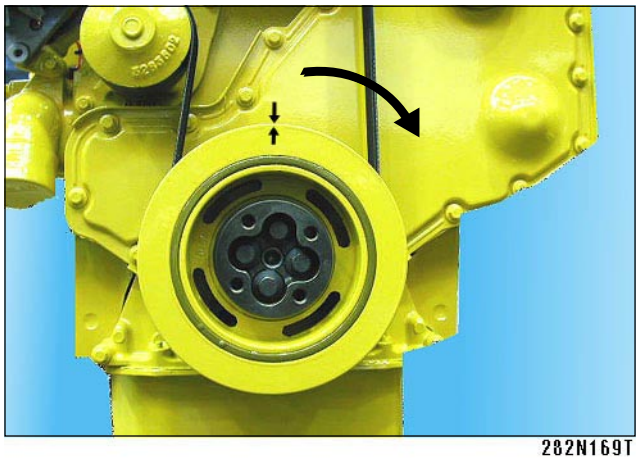
Every 1000 Hours or Once a Year

- Check and adjust clearances of remaining valves according to the figure. After tightening the locking nut check again the clearance.



282N168T

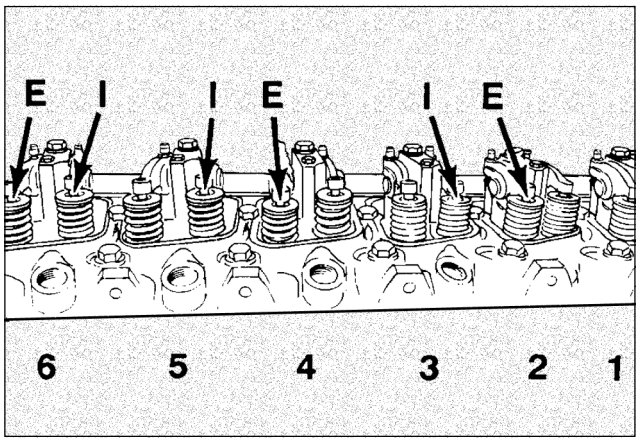
- Make a mark on the torsion vibration damper and turn the crank shaft by 360°.



282N169T

Every 1000 Hours or Once a Year

- Check and adjust clearances of the remaining valves according to the figure.



282N170T

- Mount again the valve covers. Mount the inlet air piping.

! WARNING!

Check and adjust the valves when the engine is cooled down to below 60 °C.

The order of cylinders is 1 - 4 from the ventilator belt pulley; valve clearances:

- Inlet valves: 0.254 mm (0.010 in).

- Exhaust valves: 0.508 mm (0.020 in).

The clearance is adjusted correctly, when one can feel resistance when moving the feeler gauge.

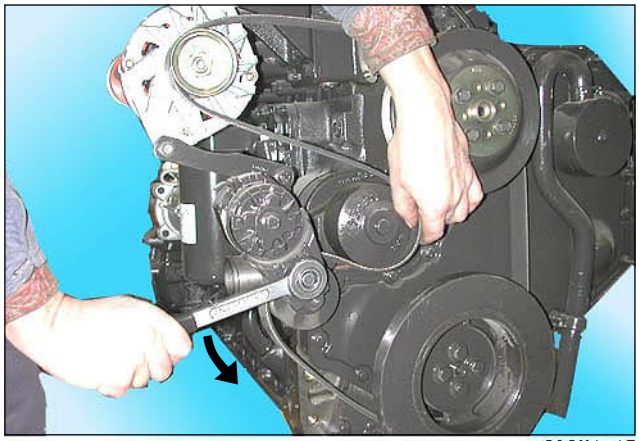
(I) sign applies for the inlet valves, (E) for the exhaust valves.

After adjustment tighten the locking nuts and the cover bolts with torque of 24 Nm (18 ftlb).

Every 1000 Hours or Once a Year

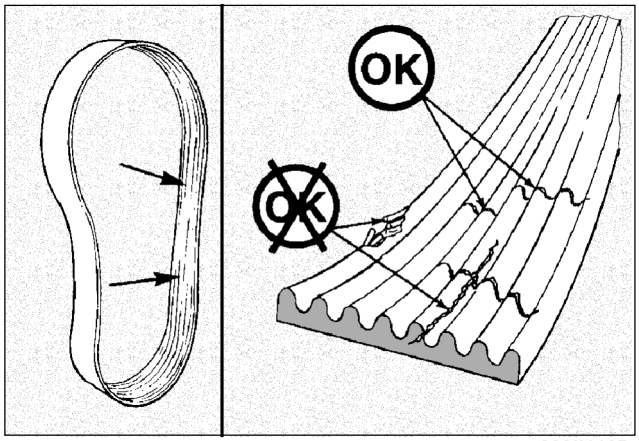
3.6.24. Checking the engine belt

- With the engine running, visually check the ventilator belt pulley - whether it is not vibrating and whether the belt runs with its all surface on the tensioning pulley.
- Stop the engine!
- Lift the belt-tensioning pulley using the lever and remove the belt.



282N171T

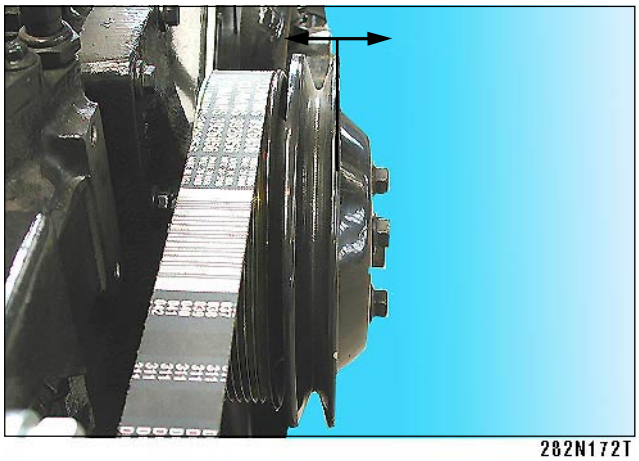
- Check visually the belt, search for its damage. Cracks perpendicular to the belt are not defects. In case any lengthwise cracks appear on the belt or its edges are frayed or its parts torn out, it is necessary to exchange the belt.



282N116T

Every 1000 Hours or Once a Year

- Check the axial clearance of the ventilator belt pulley - it must not exceed 0.15 mm (0.006 in).

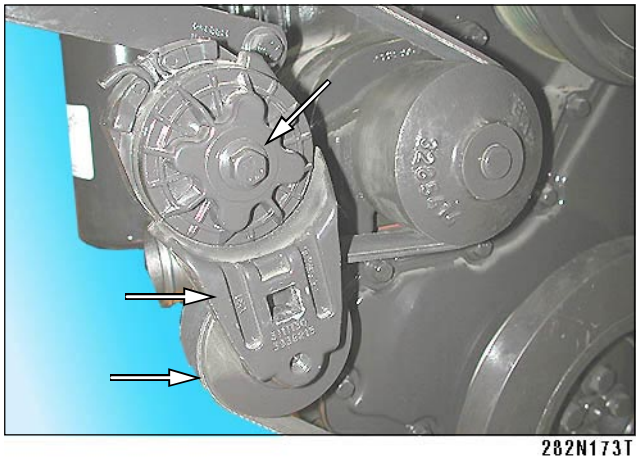


282N172T

- Mount the belt back.

Checking the tensioner:

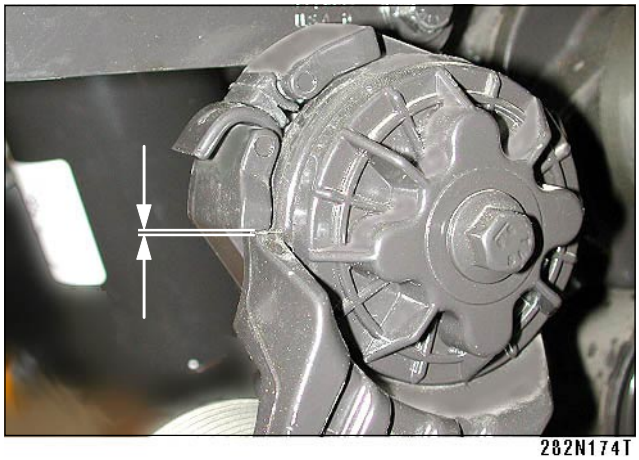
- Check the tensioner belt pulley and arm for cracks.



282N173T

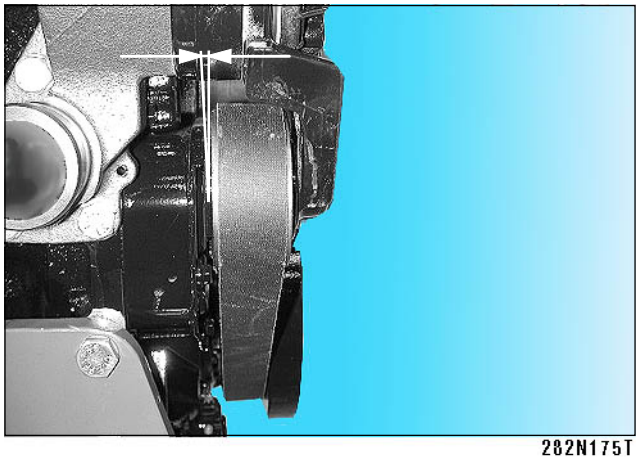
Every 1000 Hours or Once a Year

- Check the tensioner for clearance.



282N174T

- Check the belt tensioner for clearances and for deviation of the pulley from the vertical axis. Maximum deviation is 3 degrees.



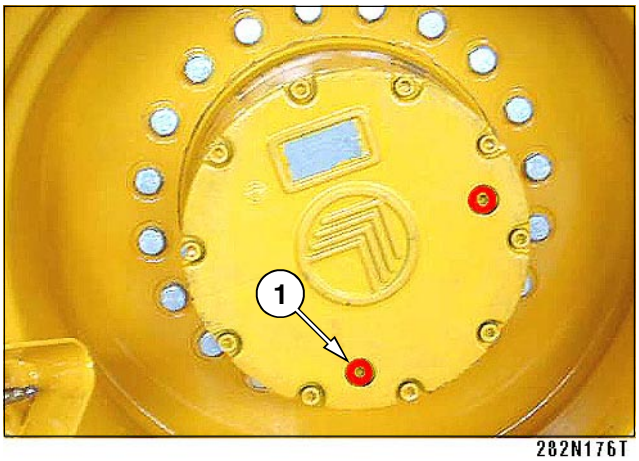
282N175T

Every 1000 Hours or Once a Year

3.6.25. Exchanging oil in gearboxes

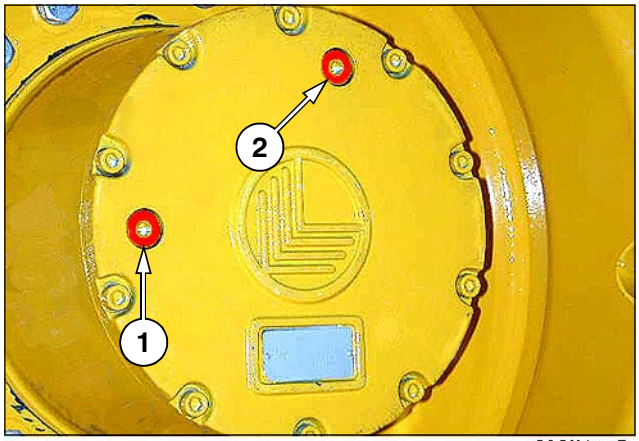
Axle (wheel) gearboxes

- Place the roller onto a flat, firm surface so that the axle gearbox plugs are in the position according to Fig. Clean the area around plugs. Put appropriate vessel under the drain plug (1). Unscrew both plugs and clean them and drain oil.



282N176T

- Àfter draining drive away with the roller so that the plugs turn to the position.



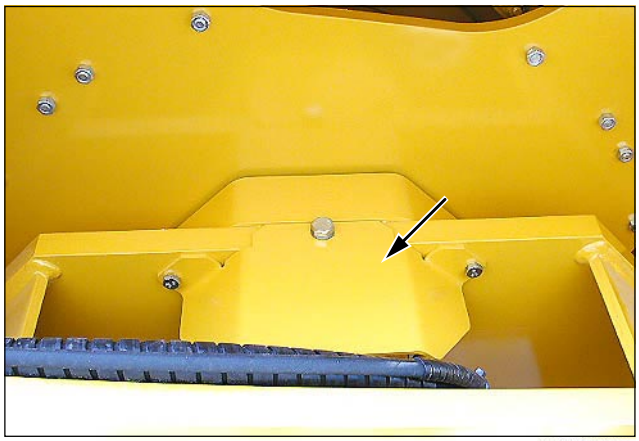
282N177T

- Fill oil through the upper plug (2) until the level reaches the checking opening (1) or until it starts flowing out.
- Mount the plugs, replace damaged plug sealings.

Every 1000 Hours or Once a Year

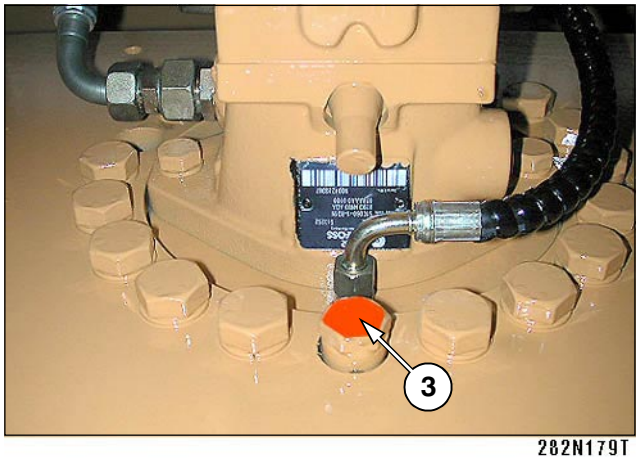
Drum gearbox - right side

- Place the roller onto a flat, firm surface.
- Unscrew cover.



282N178T

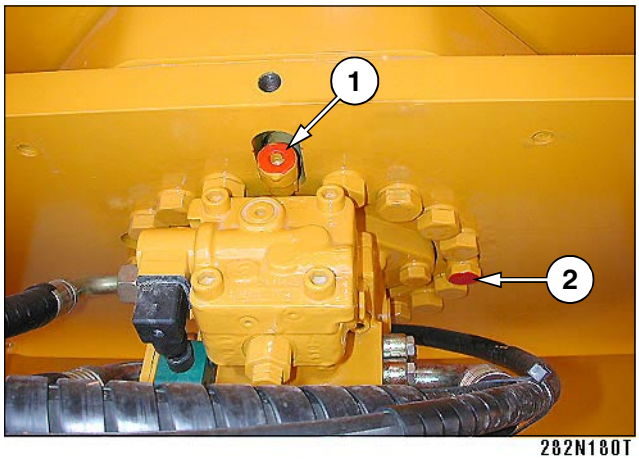
- Clean the area around plugs.
- Put appropriate vessel under the drain plug (3).



282N179T

Every 1000 Hours or Once a Year

- Unscrew all plugs (1), (2), (3) and let oil drain.



282N180T

- 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.

! NOTE !

Perform the first oil exchange after reaching 100 operation hours.

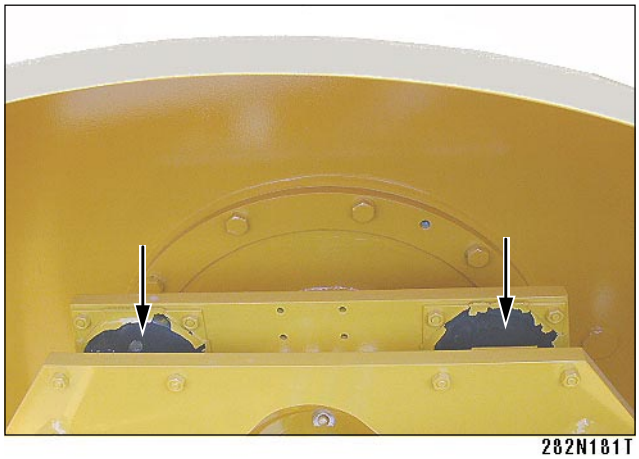
Do not touch the gearbox and adjacent parts if they are hot.

Every 1000 Hours or Once a Year

3.6.26. Checking the damping system

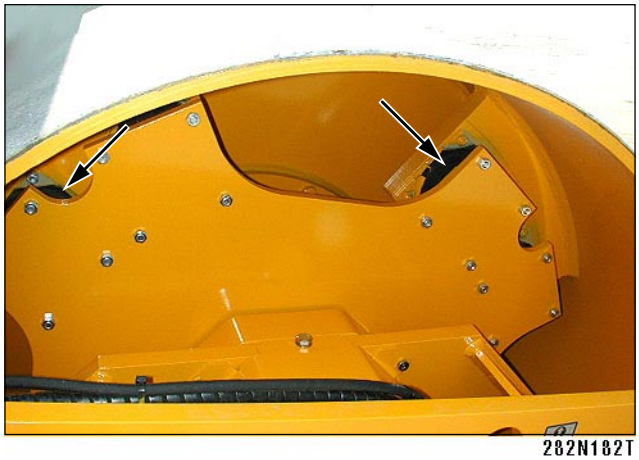
- Check the condition of metal-rubber mountings and bonding of metal with rubber.

Drum damping system - left side;



282N181T

Drum damping system - right side;



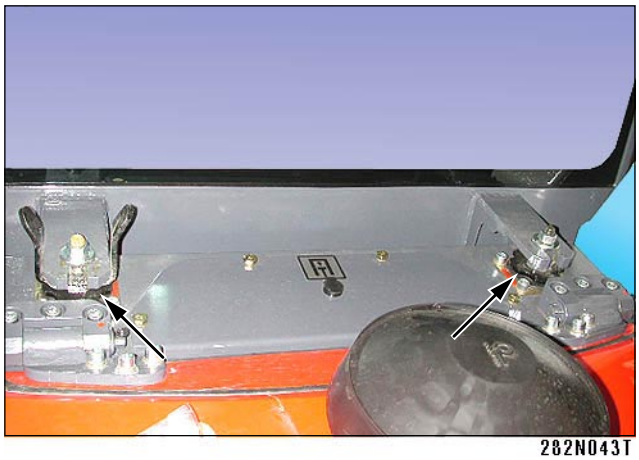
282N182T

Front metal-rubber mountings - driver's post

282N154T

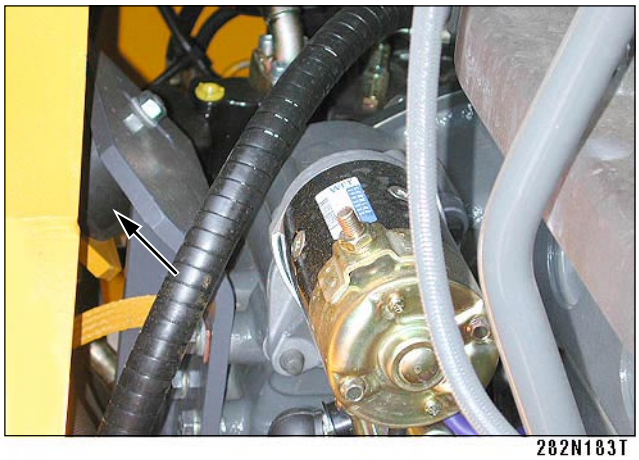
Every 1000 Hours or Once a Year

Rear metal-rubber mountings - driver's post



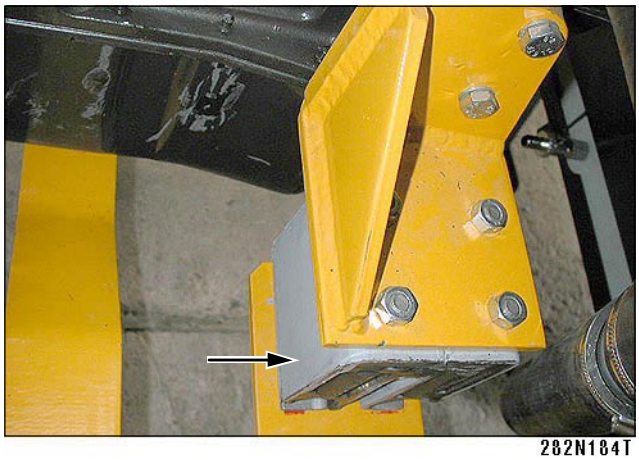
282N043T

Front metal-rubber mountings of the engine



282N183T

Rear metal-rubber mountings of the engine



282N184T

- Replace damaged mountings.
- Check again tightening of bolts and nuts.

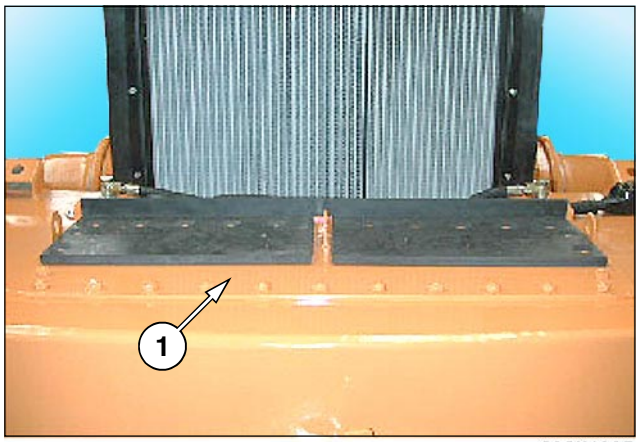
Every 1000 Hours or Once a Year

3.6.27. Cleaning the fuel tank

- Stop the engine and disconnect electric system of the machine.
- Unscrew the drain plug (1) and let fuel drain into a vessel.

282N185T

- Flush the tank with clean fuel.
- Screw the plug (1) in.
- In case of more serious fouling dismantle the batteries and the tank cover (1). Check and clean the inside of the tank. Insert a new sealing teflon strip between the cover and the tank and screw in the cover. Mount the batteries.



282N186T

Every 1000 Hours or Once a Year

NOTE

In case of aerating of fuel system of the engine deaerate it according to chapter 3.6.37.

Clean the tank when minimum of fuel is inside.

Approximately 45 l (12 US gal) of fuel remains in the tank after using up the tank capacity.

Do not smoke nor use open fire when working!!!

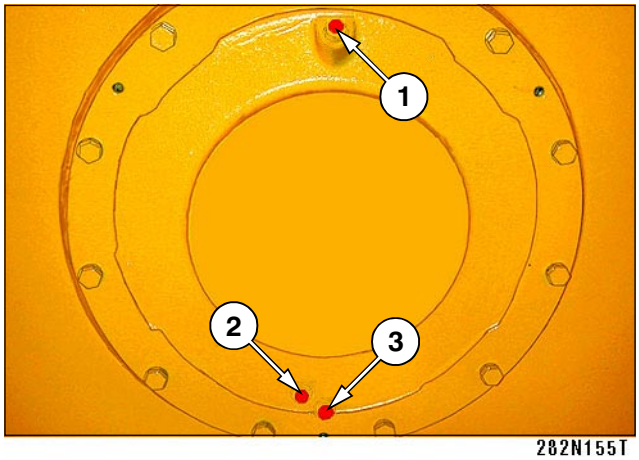
Follow environmental regulations when cleaning the tank.

Avoid fuel spills.

Every 2000 Hours or Every 2 Years

3.6.28. Oil exchange in the vibrator

- Place the roller onto a flat, firm surface so that the drain plug on the left side of the drum (3) is in the lowest position and the opposite filling plug (1) in the highest position.



282N155T

- Put appropriate vessel under the drain plug.
- Unscrew all plugs and let oil drain.
- Mount the drain plug after draining is finished.
- Refill recommended oil to the edge of the checking opening (2) through the filler (1).
- Mount remaining plugs.

! NOTE !

Change oil when it is warm.

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

Avoid leakage of oil to the soil.

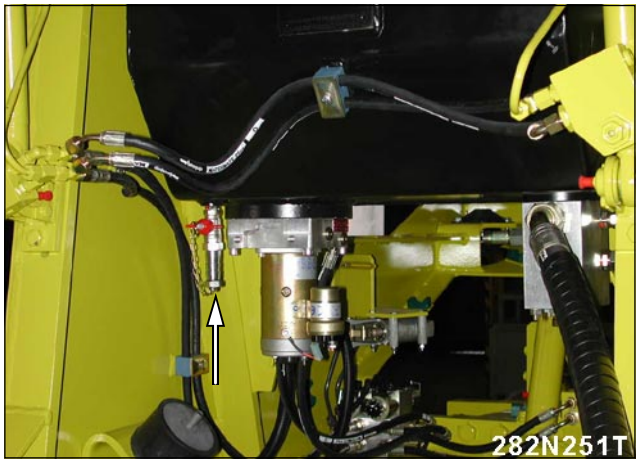
Every 2000 Hours or Every 2 Years

3.6.29. Exchanging hydraulic oil and filter

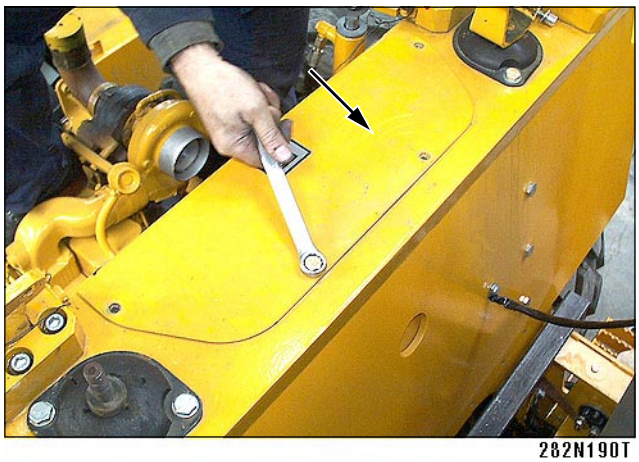
! NOTE !

Exchange oil before the season or after longer downtime of the machine. Clean together a suction basket see chapter 3.6.30.

- Place the roller onto a flat, firm surface.
- Stop the engine and disconnect electric system.
- Fit the hose to the drain cock.

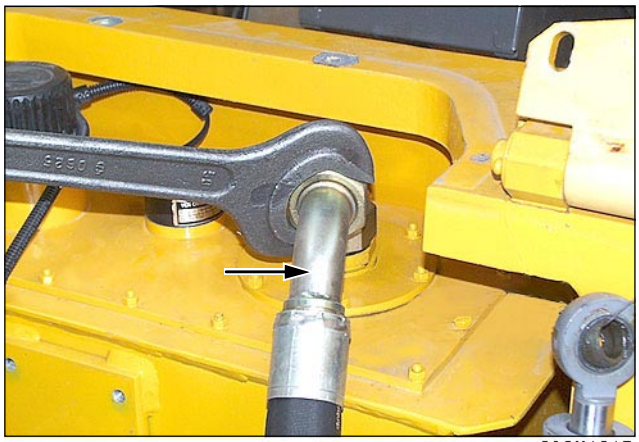

282N251T

- Let oil drain into a prepared vessel - the total amount of oil is approximately 73 l (19.3 US gal).
- Dismantle the cover.


282N190T

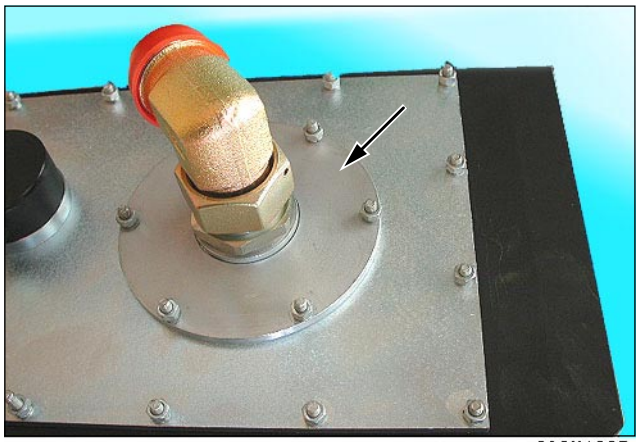
Every 2000 Hours or Every 2 Years

- Dismantle suction hose.



282N191T

- Dismantle cover with suction strainer.



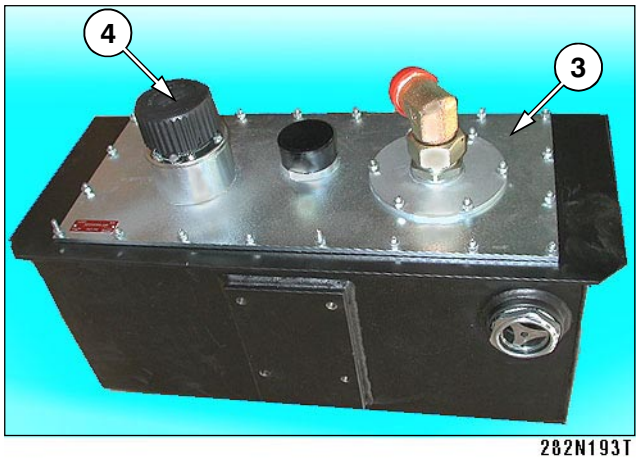
282N192T

Every 2000 Hours or Every 2 Years

- Dismantle the suction strainer from the suction pipe. Wash the suction strainer and blow the strainer with pressure air from inside.
- Check the condition of the suction strainer; replace the strainer in case of damaged filter part.
- Check the inside of the tank. Carefully clean the bottom and flush it with new oil if there are any impurities on the bottom.
- Reassemble and wipe the ”O” ring with clean oil.

NOTE

For easier cleaning it is possible to dismantle the whole upper cover (3) with the filler (4). If you dismantled the whole upper cover (3), use a new teflon sealing strip.



282N193T

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.

Every 2000 Hours or Every 2 Years

Checking the oil thermometer sensor

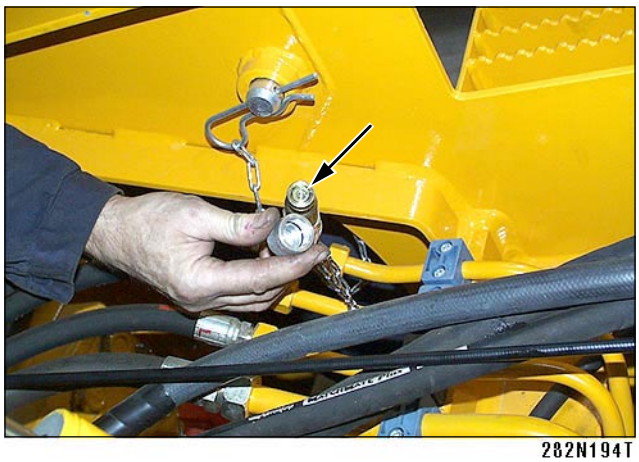
- Dismantle the sensor and clean the contact.

212UM022

- 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.

Filling the hydraulic circuit:

- Use a filling device with the following parameters:
  min. pressure 6 MPa (870 PSI)
  filtering property 3 to 10 μm
- Open the cover on the right side under the cabin and remove the cap of filling terminal.



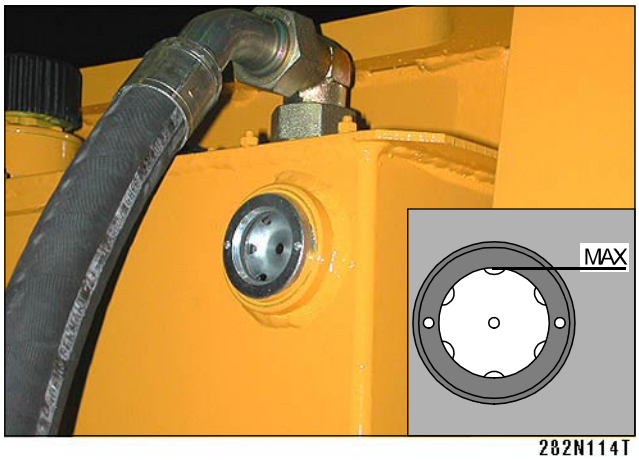
282N194T

Every 2000 Hours or Every 2 Years

- Mount the quick coupling of the filling device to the quick coupling.

282N195T

- 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.



282N114T

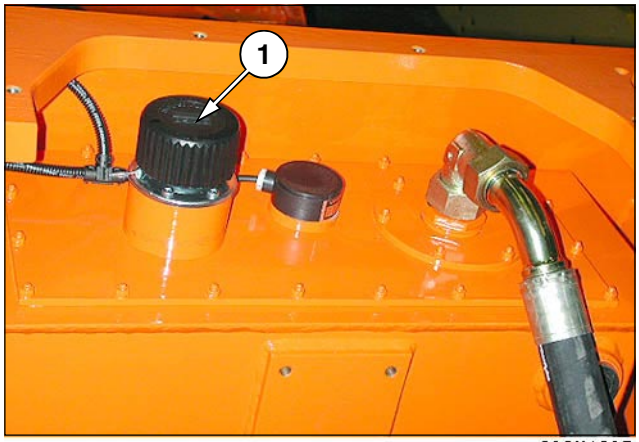
Every 2000 Hours or Every 2 Years

Alternative filling through the tank filler

! NOTE !

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 (1) the filler with specified type of oil up to the bottom of the strainer in the filler.



282N196T

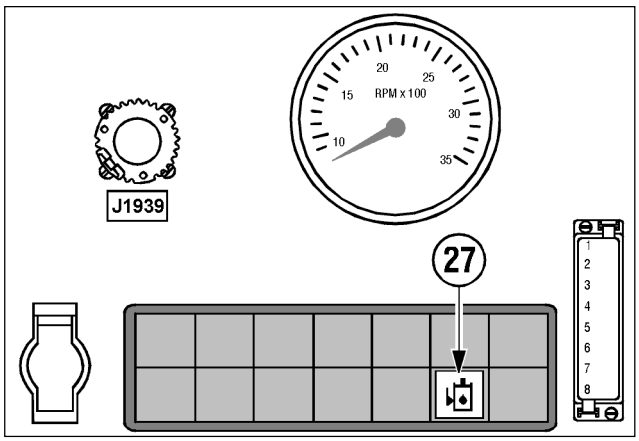
NOTE

- When filling through the tank filler, large amount of old dirty oil remains in the circuit, which reduces lifetime of hydraulic units.
- You can order a filling device at the manufacturer of the machine or your dealer.

Every 2000 Hours or Every 2 Years

! NOTE !

After filling the circuit, check whether signal lamp doesn‘t shine.



282N197T

! NOTE !

Start the engine and run functions of the machine at increased engine speed to let circuits fill.

Check tightness of filter, temperature sensor, suction hose and cover.

Keep the machine clean. Avoid polluting the system with materials that may damage important units!

Follow the fire safety measures!

Do not open the hydraulic tank unnecessarily!

Exchange oil and filter always, when inner part of a unit (hydromotors, hydro-generators) were destroyed or after a considerable repair of hydraulic system. Clean and rinse the hydraulic tank before assembling a new unit. Exchange filter.

Do not use chemical detergents to clean the tank.

Use clothes not loosing staples to clean it.

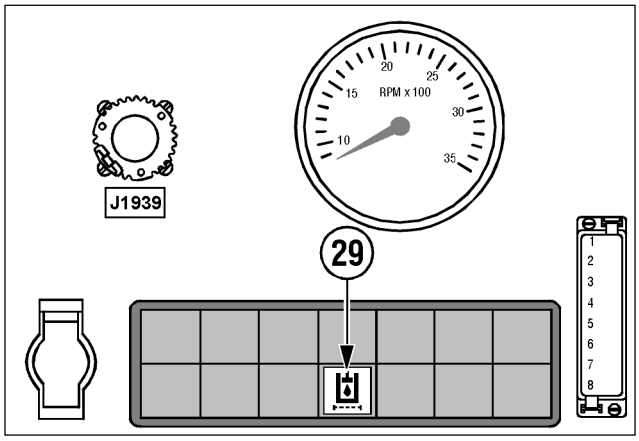
Use oils in accordance with chapter 3.2.4.

Every 2000 Hours or Every 2 Years

Exchanging the filter element of pressure filter

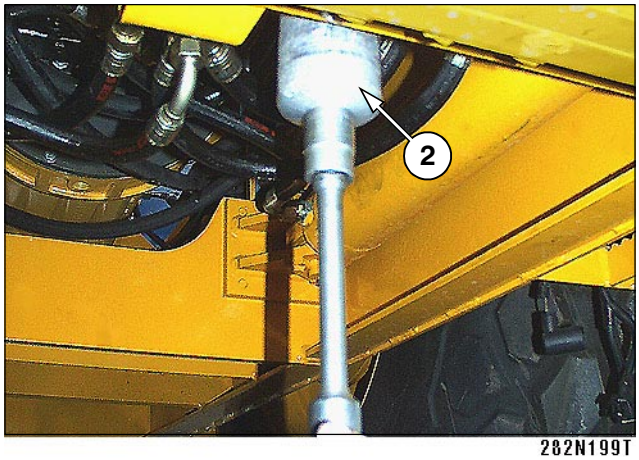
Exchange the filter element always in the following occasions:

- **when changing oil**
- **if the signal lamp of pressure filter (29) lights up after the working temperature reached 50 through 60 °C (122 - 140 °F).**



282N198T

- Dismantle the filter container (2) using wrench 27.



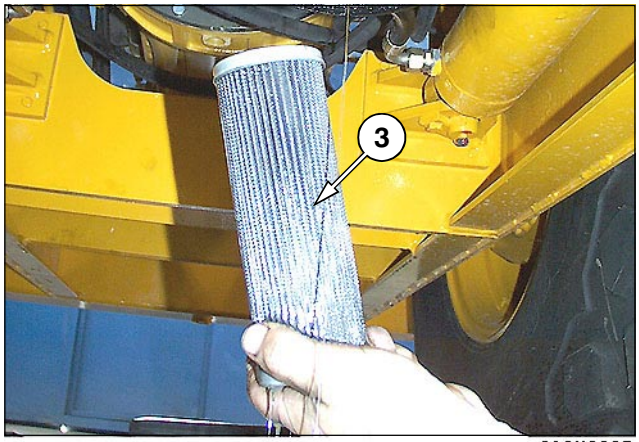
282N199T

Every 2000 Hours or Every 2 Years

- Dismantle the filter container (2) /CE/.

282N244T

- Take out the filter element (3).



282N200T

- Carefully clean the filter container.
- Clean the contact surface of the filtration block from the lower side.
- Check the condition of sealing rings and lubricate them with clean oil.
- Insert a new element into the filter container - tighten with torque of 40 + 10 Nm (30 + 7 lb ft).

! NOTE !

Use original filter elements according to spare parts catalogue only.

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

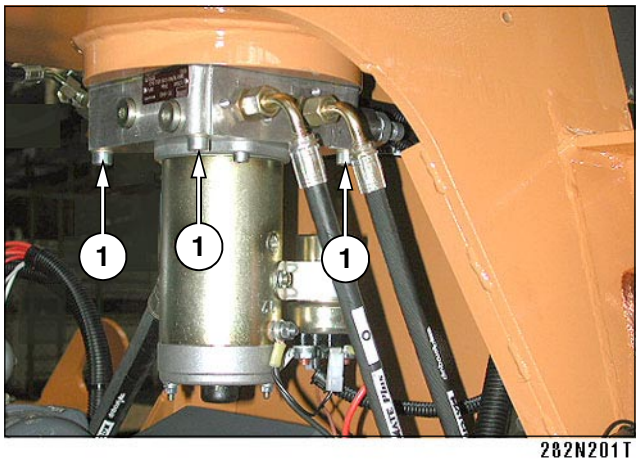
Every 2000 Hours or Every 2 Years

3.6.30. Cleaning of the suction strainer of lifting and lowering of the bonnet and the driver's post

! NOTE !

Clean the strainer when exchanging hydraulic oil.

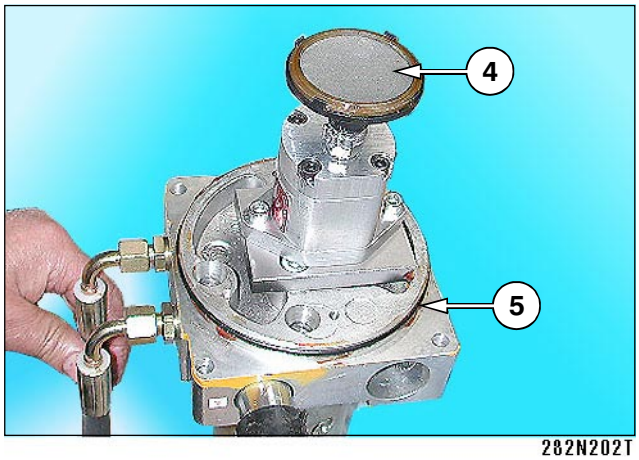
- Unscrew bolts (1), take out the unit from the bottom of the tank.



282N201T

Every 2000 Hours or Every 2 Years

- Remove the suction strainer (4). Wash the suction strainer in petrol and blow through the strainer with pressure air. Check the sealing ring (5).



282N202T

Avoid leakage of oil to the soil!

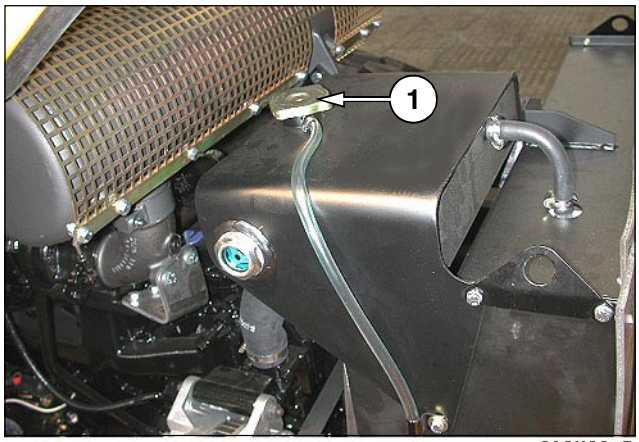
Every 2000 Hours or Every 2 Years

3.6.31. Exchanging the engine cooling liquid

! NOTE !

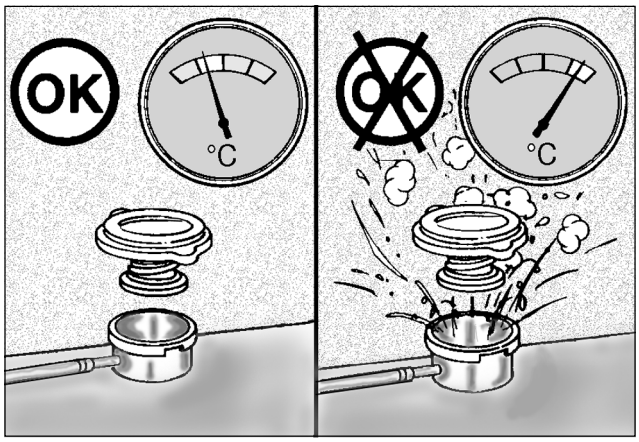
Exchange the coolant after operation of the machine or after warming the coolant (by running the engine) to 80 °C (176 °C).

- Place the roller onto a flat, firm surface.
- Stop the engine.
- Open cooling system by removing pressure plug (1) on the equaliser reservoir.



282N204T

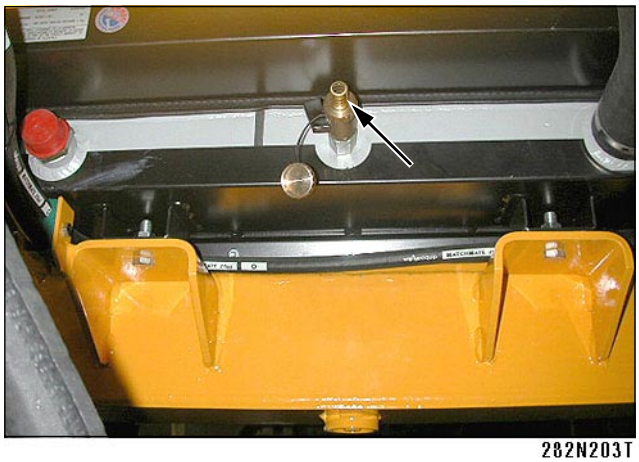
Do not dismantle the pressure plug before the temperature of cooling liquid falls lower than to 50 °C (122 °C). Beware of gushing of the coolant and scalding when opening the pressure plug.



282N205T

Every 2000 Hours or Every 2 Years

- Open the drain cock in the cooler lower chamber. Let liquid drain into prepared vessels. The quantity drained is approximately 19 l (5 US gal).

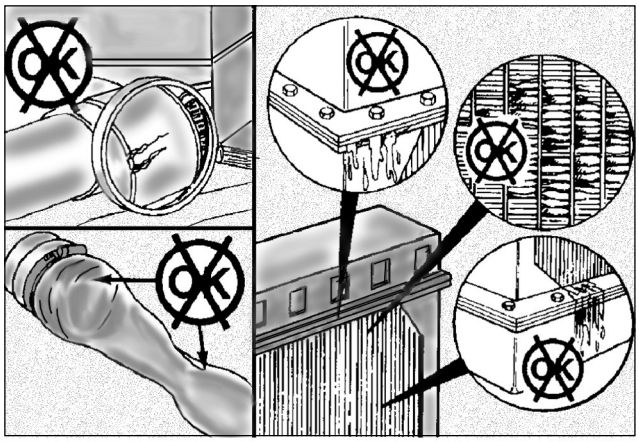


282N203T

- Dismantle the drain plug (CE).

NOTE

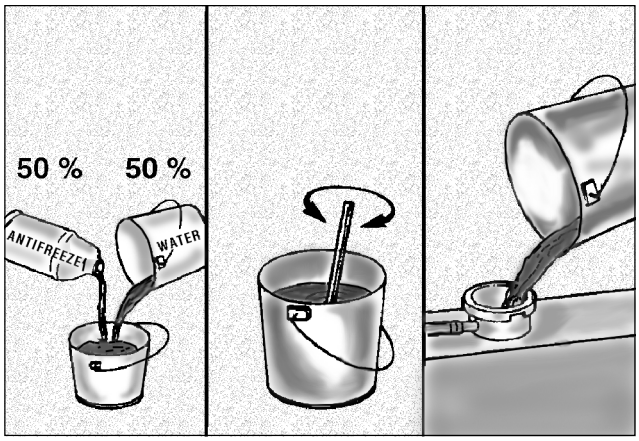
- Check cooling system for defective hoses and missing hose clips. Check the condition of the cooler - search for defects, leaks and cooling gills blocked with impurities.



282N206T

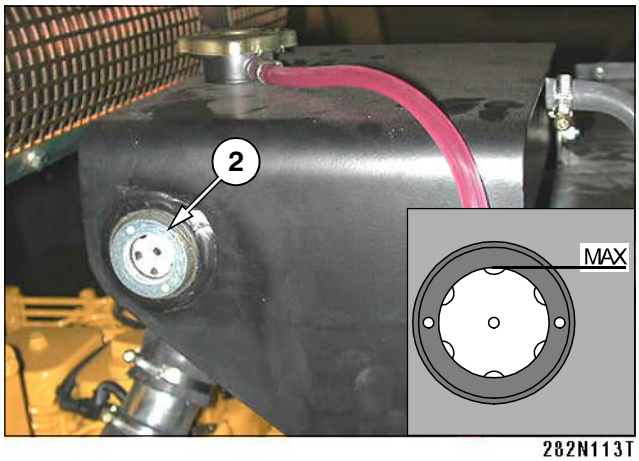
Every 2000 Hours or Every 2 Years

- After closing the drain cock, fill cooling system with new cooling liquid with ratio of 50% of water + 50% of anti-freeze agent.



282N207T

- Fill it up to the upper edge of the level indicator. After filling, wait for approx. 2-3 minutes until air goes off and the circuit is filled. The maximum filling rate is 19 l/min (5 US gal/min). Close the equaliser reservoir with the pressure plug.

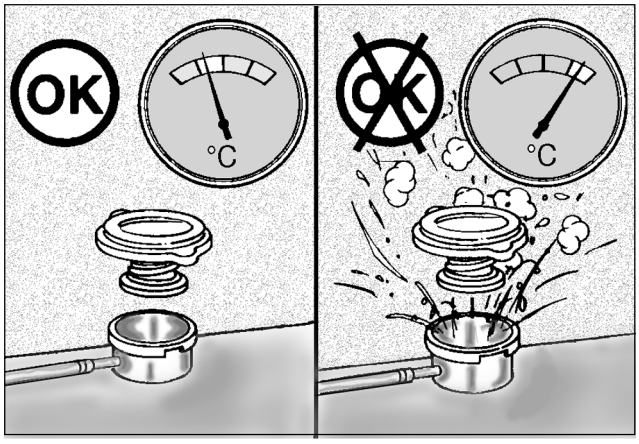


282N113T

- Start the engine and wait until the temperature reaches 80 °C (175 °F). Check during your waiting for any leakage of cooling liquid.
- Stop the engine.
- Check the level on the indicator (2). If the level is low, refill cooling liquid to maximum.

Every 2000 Hours or Every 2 Years

Do not dismantle the pressure plug before the temperature of cooling liquid falls lower than to 50°C (122°C). Beware of gushing of the coolant and scalding when opening the pressure plug.



282N205T

! NOTE !

Use cooling liquid according to chapter 3.2.3!

Follow the instructions of the manufacturer of anti-freeze fluid when changing coolant!

Protect your hands with gloves!

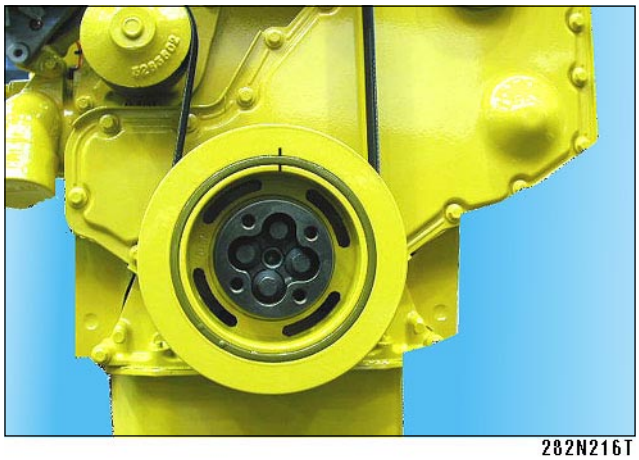
Use safety glasses or safety shield!

Collect used liquid and have it safely disposed according to valid regulations!

Every 2000 Hours or Every 2 Years

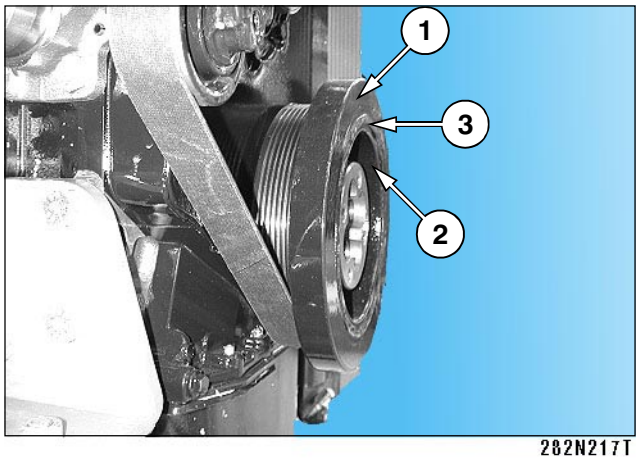
3.6.32. Checking torsion vibration damper of the engine

- Check the position of pressed marks on the face of both parts of torsion vibration damper. If the marks are shifted from each other by more than 1.59 mm (1/16 in), it is necessary to exchange the damper.



282N216T

- Check whether the rubber component (3) is not higher or lower above the level of metal parts (1) and (2) by more than 3.18 mm (1/8 in). If the limit is exceeded, exchange torsion vibration damper.



282N217T

Every 2000 Hours or Every 2 Years

- Check visually whether the torsion vibration damper is not moving forward. Check th vibration damper for evidence of fluids loss, dents and wobble.

! NOTE !

With time, the flexible silicone filling of the damper gets rigid and no longer works properly. Non-working damper may cause considerable damage to the engine.

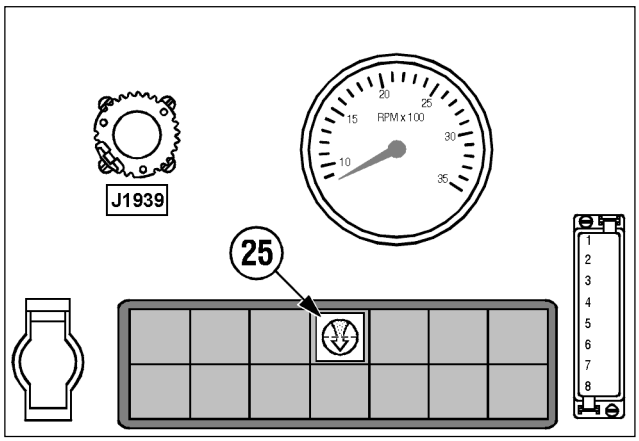
3.6.33. Exchanging cleaner elements of air cleaner

NOTE

The air cleaner contains the main and safety elements.

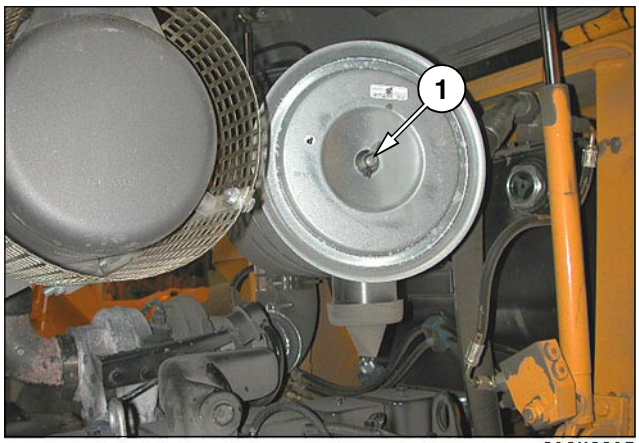
! NOTE !

If signal lamp (25) lights up, the both elements must be exchanged.



282N141T

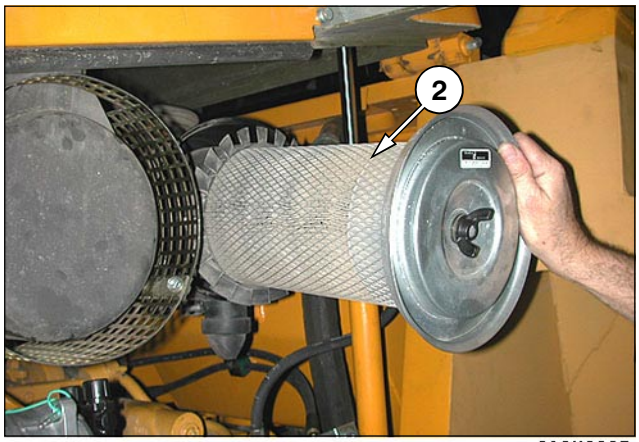
- Place the roller onto flat, firm surface.
- Stop the engine and disconnect electric system.
- Lift the bonnet to the limit position. (See Operating instructions, chapter 2.7.10.)
- Unscrew the wing nut (1).



282N208T

Maintenance - As Needed

- Carefully remove the cover with the main element (2).



282N209T

- After unscrewing nut (2), remove the safety element.

282N213T

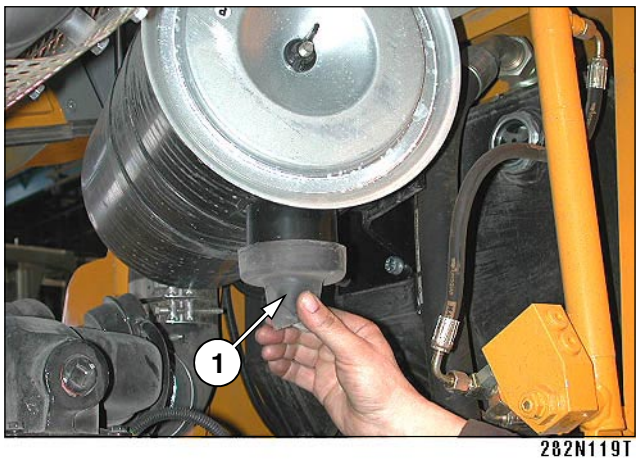
- Clean the inside of the cleaner and contact surface in order that the engine inlet pipe does not get blocked. Check connections and piping for any untightness and clogging of the engine inlet opening on the bonnet (e.g. by leaves).

Maintenance - As Needed

- Replace the safety element.

282N213T

- Mount new main element. Check whether it fits correctly and whether it is tight.
- Remove the dust valve (1), clean it and mount it back.



282N119T

Maintenance - As Needed

! NOTE !

Do not clean the inside of the cleaner by pressure air; dust might get into the engine inlet piping.

Replace both elements after 1 year of service at the leatest.

Replace the sealing nut with a new one when replacing the element.

Use original elements only.

When washing the machine, make sure water cannot pour into the air cleaner.

In case of absorbing water, exchange main element. Dry the cleaner body.

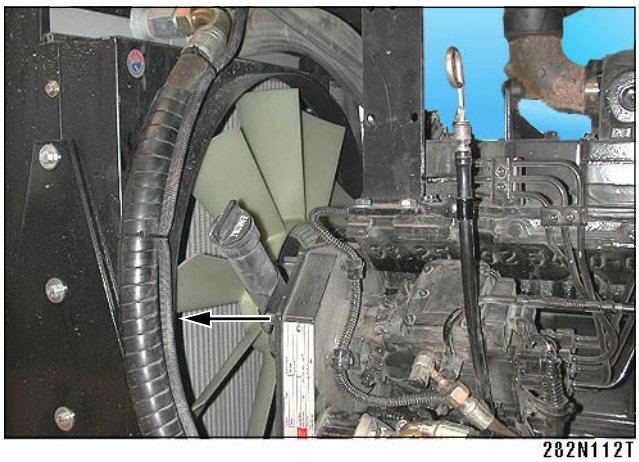
Replace defective vacuum valve immediately!

Do not operate the machine with damaged cleaner body or cover.

Maintenance - As Needed

3.6.34. Cleaning the engine radiator and hydraulic oil

- Due to variable working conditions it is not possible to determine any fixed interval of cleaning.
- In case of work in very dusty conditions clean the radiator daily. Clogged radiators will result in lower cooling capacity and increasing temperatures of engine cooling liquid and hydraulic oil.
- Clean it using pressure air or pressure water (steam). Cleaning direction is from the ventilator side.



282N112T

! NOTE !

Do not use cleaner with too high pressure so as not to damage radiator honeycombs.

In case of contamination of the radiator by oil products, use a cleaning agent and proceed according to the manufacturer's instructions! Find the cause of contamination!

Follow environmental standards and regulations when cleaning the machine!

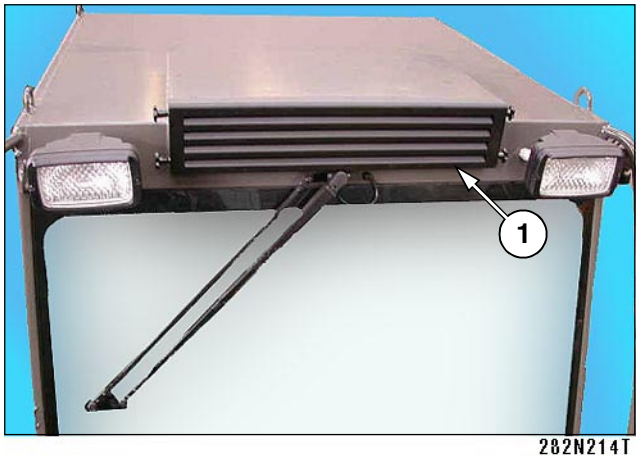
Clean the machine in a site equipped with an intercepting system for cleaning agents so that the soil and water sources are not contaminated!

Do not use forbidden cleaning agents!

Maintenance - As Needed

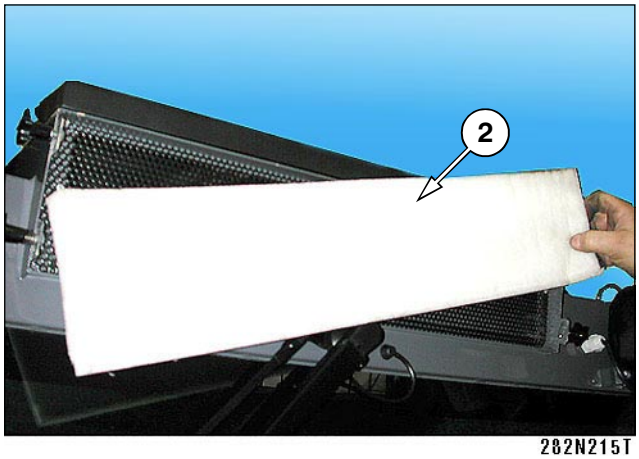
3.6.35. Cleaning the air cleaner of cabin ventilation

- Dismantle the cover grill (1).



282N214T

- Take out the cleaner with cleaning element (2).



282N215T

- Carefully beat out the element and wash it in a detergent solution. If you damage the cleaning element or you are not able to clean it properly, replace it with a new one.

! NOTE !

Clean it once in a month. In case you work in very dusty conditions, make the interval shorter.

Maintenance - As Needed

3.6.36. Cleaning the machine

- Clean the machine from major impurities after finishing your work.
- Perform overall cleaning regularly at least once in a week. When working in cohesive soils, cement and lime stabilisation's, the overall cleaning must be performed daily.

! NOTE !

Blind all openings into which the cleaning agent might penetrate (e.g. engine inlet opening) prior to pressure water washing. Remove these blinders after washing the machine.

Do not expose electric parts or insulation material to direct water or steam flow. Always cover such materials (inside of the alternator etc.).

Disconnect batteries using the isolating master switch.

Work with stopped engine.

Do not use aggressive and highly inflammable cleaning agents (e.g. petrol or highly inflammable materials).

Follow environmental standards and regulations when cleaning the machine!

Clean the machine in a site equipped with an intercepting system for cleaning agents so that the soil and water sources are not contaminated!

Do not use forbidden cleaning agents!

Maintenance - As Needed

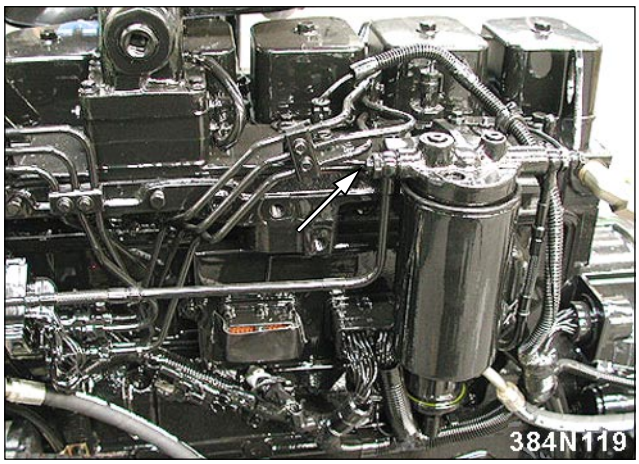
3.6.37. Fuel system venting

NOTE

Check the joints and sealing on the fuel feed piping from the fuel tank to the feed pump. Check if fuel does not leak in loose joints and defective sealing on the piping from the feed pump to the injection pump.

Low-pressure manifold and filters venting:

- Loosen the vent screw on the fuel filters.

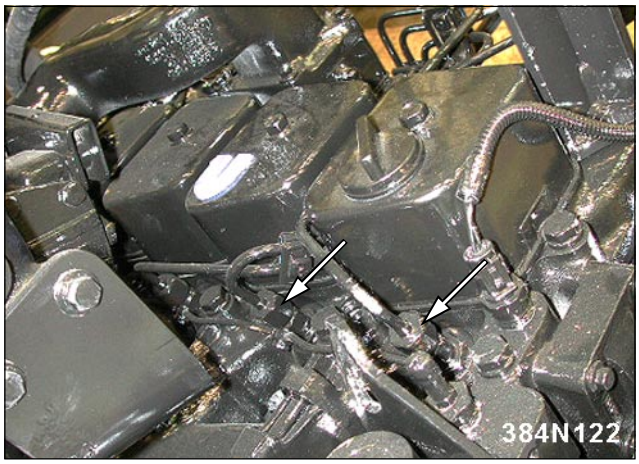


- Pump fuel with the feed pump until pure and without air bubbles fuel flows out. Tighten the vent screw applying the tightening torque of 9 Nm (7 ft lb).

Maintenance - As Needed

High-pressure manifold and injectors venting:

- In the event that you performed the above-mentioned operations and the engine did not start up, vent the high-pressure manifold. Loosen the nuts on the injectors and turn the engine with starter. Perform venting until the engine running is regular. Tighten the loosened joints applying the tightening torque of 38 Nm (28 ft-lb).



! NOTE !

If you are performing venting by turning the motor with starter, do not turn it longer than 30 s. Between starting-up wait 2 minutes. During the venting, the engine could start-up, therefore, observe the safety precautions.

Fuel pressure in the high-pressure manifold is high and may cause skin and other serious injury.

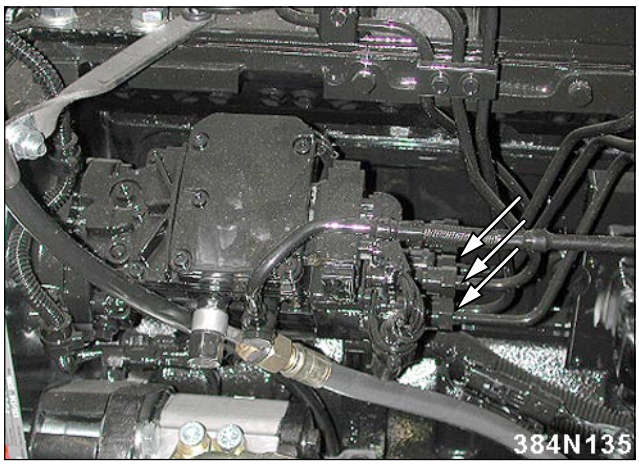
Venting must not be performed on the hot engine as fuel may flow on the hot exhaust manifold and cause fire.

Do not smoke when working on the fuel feed system.

Contain leaking fuel.

Maintenance - As Needed

- Irregular running of the engine may be caused by suspended opened injector causing blowing exhaust fumes back to the pump. Loosen the high-pressure mains to the injectors on the injection pumps, turn the motor, and monitor the manifold. If the exhaust fumes are blown through the manifold back, the injector hangs and it is opened. In this case, contact dealer or Cummins service department for the injector replacement.



! NOTE !

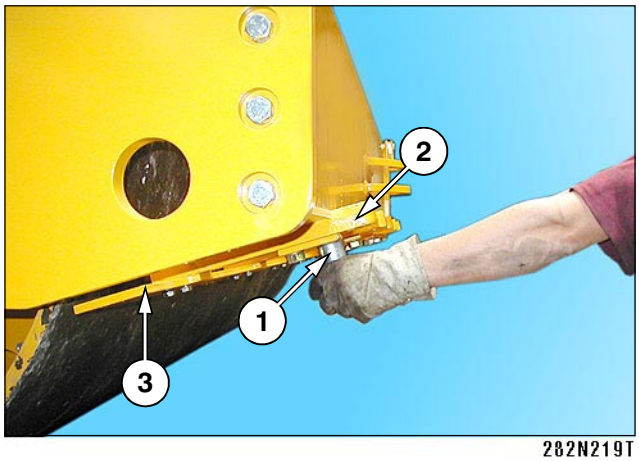
For the high-pressure manifold loosening on the injection pump, use two spanners. Hold the discharge valve with one and loosen the manifold with the other.

Maintenance - As Needed

3.6.38. Adjusting scrapers

Scrapers for the smooth drum

- Loosen bolts (1), see fig., and move holders (2) towards the drum to the distance of 15 mm (0.6 in) between the scraper and the drum.



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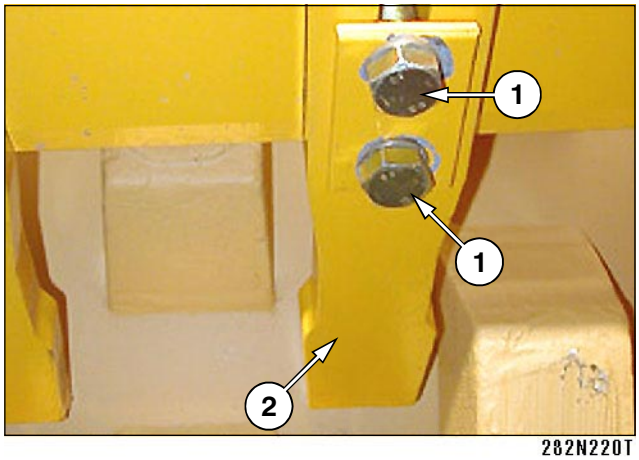
! NOTE !

If you can not move scrapers any more within the range of oval openings of the holders (2) due to the wear of the scrapers, dismantle the scraper (3) and move it closer to the drum by one hole.

Maintenance - As Needed

Scrapers for the taper foot drum

- Loosen bolts (1) and move individual scrapers (2) towards the drum to the distance of 25 mm (1 in).



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! NOTE !

Rear scrapers of the taper foot drum are longer. When replacing worn scrapers, replace the front scrapers with rear ones and the rear scrapers with new ones.

If you set too short distance between the scraper and drum, they may get into contact when cornering with the machine.

Maintenance - As Needed

3.6.39. Checking and tightening bolted joints

- Check regularly for loosened bolted joints.
- Use torque wrenches to tighten them.

	TIGHTENING MOMENT					
	For the screws 5.8 (5 S)		For the screws 8.8 (8 G)		For the screws 10.9 (10 K)	
Worm	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft
M4	2	1	3	2	4	3
M5	4	3	6	4	8	6
M6	7	5	10	7	14	10
M8	16	12	22,5	17	32,5	24
M10	31,5	23	44	32	62	46
M12	53	39	75	55	105	77
M14	79	58	118	87	165	122
M16	113	83	165	122	226	167
M18	172	127	245	181	343	253
M20	226	167	314	232	441	325
M22	284	209	392	289	559	412
M24	392	289	549	405	755	557

The values given in the chart are torques used for dry threads (friction factor 0.14). These values are not applicable for lubricated threads.

Maintenance - As Needed

Table of insert nuts tightening moments of the hoses with sealing “O” ring

			Tightening moments for the nuts with sealing "O"ring					
			Nm			lb-ft		
Size spanner	Worm	Hose	Nominal	Min	Max	Nominal	Min	Max
14	M12x1.5	6	20	15	25	15	11	18
17	M14x1.5	8	38	30	45	28	22	33
19	M16x1.5	8	45	38	52	33	28	38
		10						
22	M18x1.5	10	51	43	58	38	32	43
		12						
24	M20x1.5	12	58	50	65	43	37	48
27	M22x1.5	14	74	60	88	55	44	65
		15						
30	M24x1.5	16	74	60	88	55	44	65
32	M26x1.5	18	105	85	125	77	63	92
36	M30x2	20	135	115	155	100	85	114
		22						
41	M36x2	25	166	140	192	122	103	142
46		28						
50	M42x2	30	240	210	270	177	155	199
50	M45x2	35	290	255	325	214	188	240
	M52x2	38	330	280	380	243	207	280
		42						

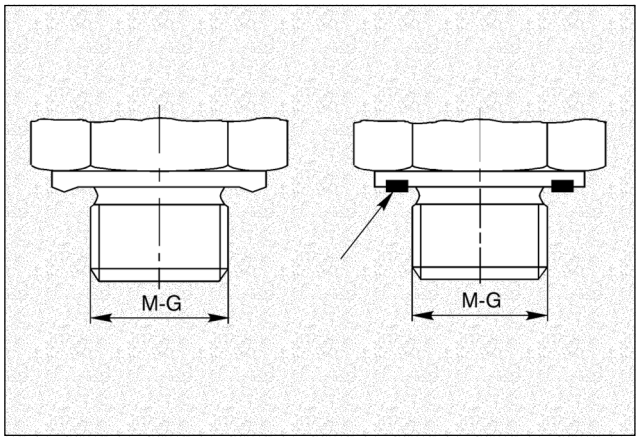
Maintenance - As Needed

Table of tightening moments for necks with tightening edge, or with flat packing

	Tightening moments for the necks	
G - M	Nm	lb -ft
G 1/8"	25	18
G 1/4"	40	30
G 3/8"	95	70
G 1/2"	130	96
G 3/4"	250	184
G 1"	400	295
G 11/4"	600	443
G 11/2"	800	590
M 10 x 1	25	18
M 12 x 1,5	30	22
M 14 x 1,5	50	37
M 16 x 1,5	60	44
M 18 x 1,5	60	44
M 20 x 1,5	140	103
M 22 x 1,5	140	103
M 26 x 1,5	220	162
M 27 x 1,5	250	184
M 33 x 1,5	400	295
M 42 x 1,5	600	443
M 48 x 1,5	800	590

Table of tightening moments for plugs with flat packing

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



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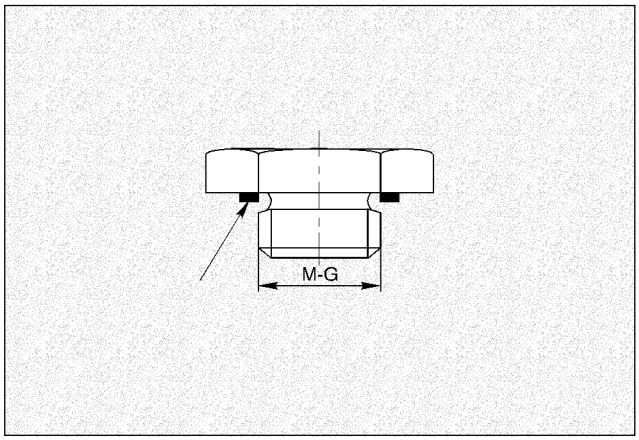

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! NOTE !

Usually, defects are caused by incorrect operation of the machine. Therefore, in case of any troubles read again properly through the instructions given in the operation and maintenance manual for the machine and engine. If you cannot identify the cause, contact a service department of an authorised dealer or the manufacturer.

! NOTE !

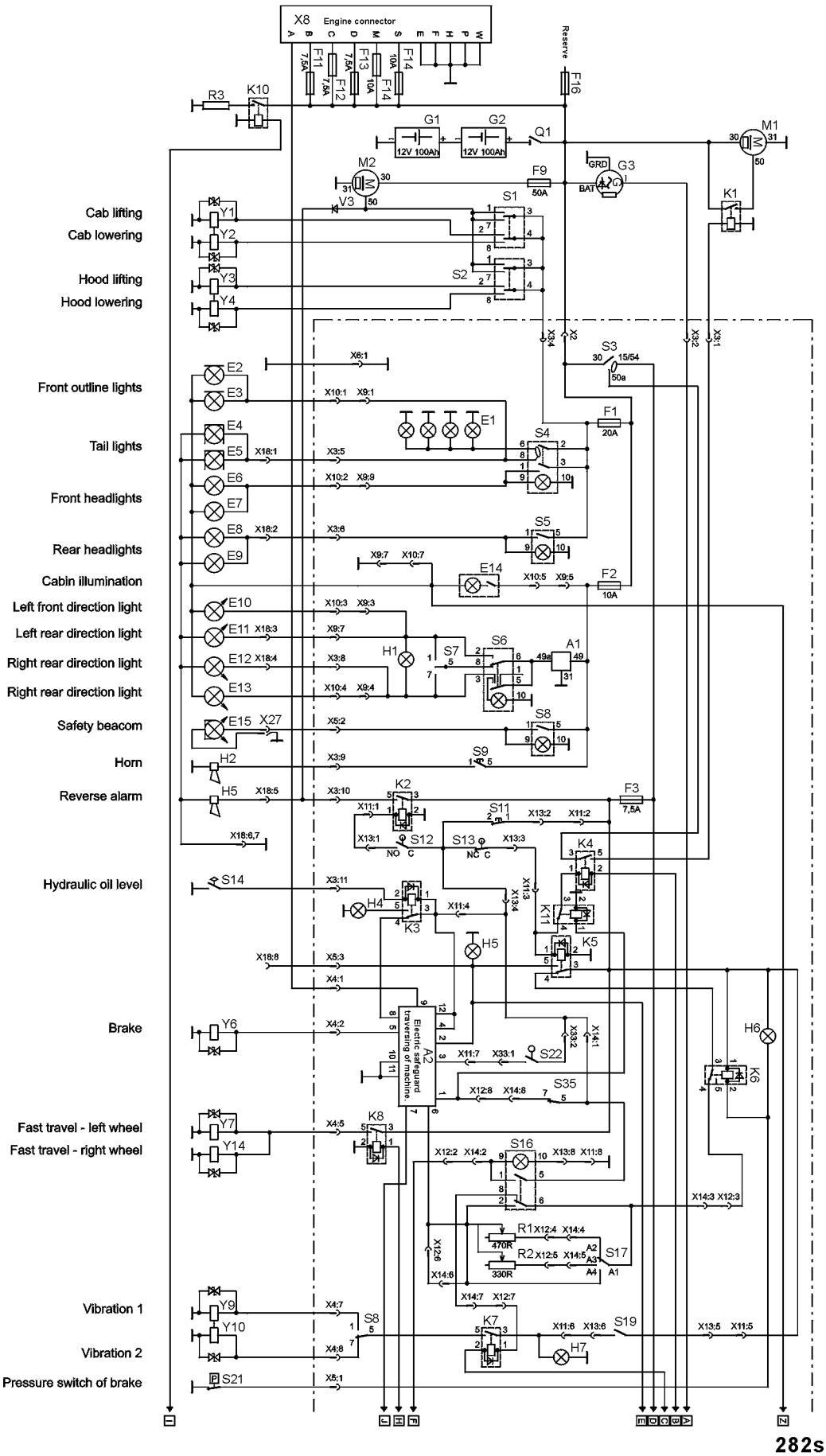
Troubleshooting in hydraulic and electric systems requires knowledge of these systems; therefore a service department of an authorised dealer or the manufacturer should be called to solve these problems.

Wiring scheme

Wiring scheme - Chair switch - with engine QSB according to TIER II (4 x ASC)

Legend: (the schematic reflects machine version that includes all controlling elements and accessories)

A1 - Interrupter of direction lights (optional)
A2 - Electronics safeguard traversing
A3 - Travel control
A4 - Controlling unit of differential lock (optional)
A5 - Sensor of longitudinal inclination (optional)
B1 - Sensor of cooling liquid level
B2 - Sensor of hydraulic oil thermometer
B3 - Fuel level sensor
E1 - Instruments illumination
E2, 3 - Front outline lights (optional)
E4, 5 - Tail lights (optional)
E6, 7 - Front headlights
E8, 9 - Rear headlights
E10,11 - Left direction lights (optional)
E12,13 - Right direction lights (optional)
E14 - Cabin illumination
E15 - Safety beacon (optional)
F1-9 - Fuses
F11-16 - Fuses of engine
G1,2 - Batteries
G3 - Alternator
H1 - Indicator of direction lights (optional)
H2 - Horn
H3 - Back-up alarm (optional)
H4 - Indicator of hydraulic oil level
H5 - Indicator of neutral position of the travel control
H6 - Indicator of brake
H7 - Indicator of vibration preselection
H10 - Indicator of charging
H11 - Indicator of air filter clogging
H12 - Indicator of hydraulic filter clogging
H13 - Indicator of differential lock (ASC)
H14 - Stop engine warning lamp - red
H15 - Water in fuel warning lamp
H16 - Engine defect warning lamp - yellow
H17 - Maintenance indicator lamp
K1 - Start relay
K2-9 - Auxiliary relay
K10 - Preheating relay
K11 - Auxiliaries relay
M1 - Starter
M2 - Electric motor of hood & cabin lifting system
M3 - Fan of cabin ventilation
M4 - Front windscreen wiper
M5 - Rear windscreen wiper
M6 - Front windscreen washer
M7 - Rear windscreen washer
M8 - Fan of heating
P2 - Hydraulic oil thermometer
P3 - Fuel gauge
P4 - Speedometer
P5 - Hour counter
Q1 - Battery disconnector
R1,2 - Resistors
R3 - Engine preheating
R4 - Engine speed control
S1 - Push button of cabin lifting system
S2 - Push button of hood lifting system
S3 - Switch box
S4 - Switch of front headlights
S5 - Switch of rear headlights
S6 - Switch of warning lights (optional)
S7 - Change-over switch of direction lights (optional)
S8 - Switch of safety beacon (optional)
S9 - Push button of horn
S11 - Push button of emergency brake
S12 - Switch of back-up alarm (at the travel control)
S13 - Switch of neutral (at the travel control)
S14 - Float of the hydraulic oil tank
S15 - Pressure switch of steering
S16 - Switch - fast travel
S17 - Switch - speed preselector
S18 - Change-over switch of vibration
S19 - Switch of vibration (at the travel control)
S20 - Terminal switch of the gas lever
S21 - Pressure switch of brake
S22 - Chair switch
S23 - Sensor of drum speed (optional)
S24 - Sensor of left wheel speed (optional)
S25 - Sensor of right wheel speed (optional)
S27 - Underpressure switch of air filter clogging
S28 - Underpressure switch of hydraulic filter clogging
S29 - Change-over of cabin ventilation
S30 - Switch of front windscreen wiper
S31 - Switch of rear windscreen wiper
S32 - Push button of windscreen washer
S33 - Change-over switch of fan of heating
S35 - Parking brake push button
S36 - Limit switch of traction spin of the drum
S37 - Engine idle speed switch
S38 - Engine diagnostic switch
S39 - Trouble shooting switch
S40 - Water in fuel sensor
V3 - Blocking diode (only machine with signalling of sound lift cabin)
V4-7 - Blocking diode
X2-24 - Connectors
X25 - Diagnostic socket (optional)
X27 - Socket of safety beacon
X28-33 - Connectors
X34 - Engine diagnostic
X35-40 - Connectors J1939
X41-42 - Connectors
Y1 - Electromagnetic valve cab lifting
Y2 - Electromagnetic valve cab lowering
Y3 - Electromagnetic valve hood lifting
Y4 - Electromagnetic valve hood lowering
Y6 - Electromagnetic valve of brake
Y7 - Electromagnetic valve of fast travel speed (left wheel)
Y8 - Electromagnetic valve of fast travel speed (drum)
Y9 - Electromagnetic valve of vibration I.
Y10 - Electromagnetic valve of vibration II.
Y11 - Electromagnetic valve of differential lock - LH wheel backward(opt.)
Y12 - Electromagnetic valve of differential lock - LH wheel forward (opt.)
Y13 - Servovalve of the pump of travel
Y14 - Electromagnetic valve of fast travel speed (right wheel)
Y15 - Electromagnetic valve of differential lock - RH wheel forward (opt.)
Y16 - Electromagnetic valve of differential lock - RH wheel backward (opt.)


X8 Engine connector
A B C D M S E F H P W
F11 7,5A
F12 7,5A
F13 7,5A
F14 10A
F16 Reserve
R3
K10
G1 12V 100Ah
G2 12V 100Ah
Q1
M1
M2
F9 50A
G3
K1
V3
S1
S2
Cab lifting
Cab lowering
Hood lifting
Hood lowering
Y1
Y2
Y3
Y4
S3
F1 20A
F2 10A
E1
E2
E3
E4
E5
E6
E7
E8
E9
E10
E11
E12
E13
E14
E15
Front outline lights
Tail lights
Front headlights
Rear headlights
Cabin illumination
Left front direction light
Left rear direction light
Right rear direction light
Right rear direction light
Safety beacom
S4
S5
S6
S7
S8
S9
A1
H1
H2
H5
Horn
Reverse alarm
K2
F3 7,5A
S11
S12
S13
K4
S14
Hydraulic oil level
H4
K3
K11
K5
H6
K6
Brake
Y6
A2 Electric safeguard traversing of machine
S22
S35
Fast travel - left wheel
Fast travel - right wheel
Y7
Y14
K8
S16
R1 470R
R2 330R
S17
Vibration 1
Vibration 2
Y9
Y10
S8
K7
S19
H7
Pressure switch of brake
S21
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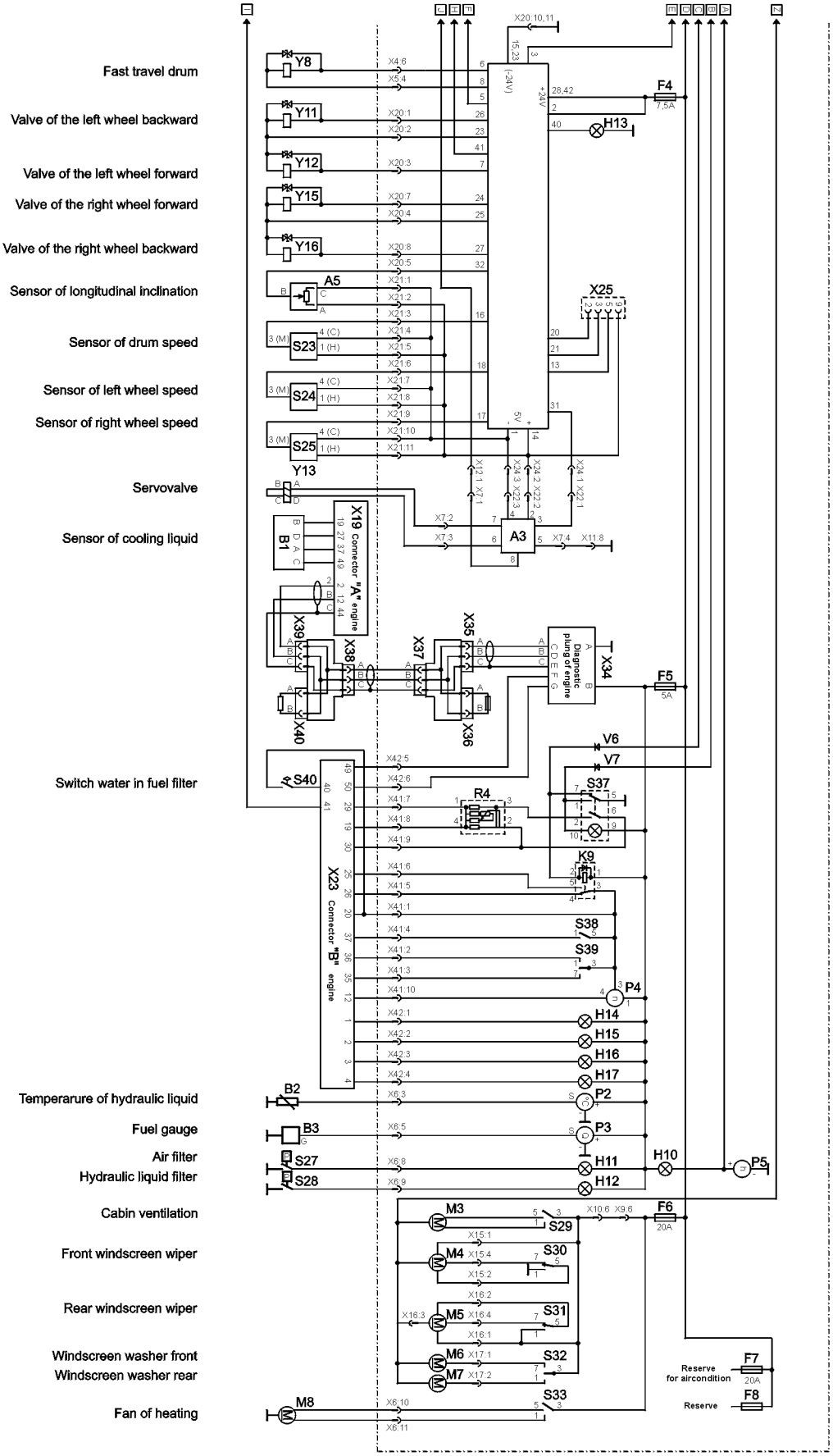
Fast travel drum
Valve of the left wheel backward
Valve of the left wheel forward
Valve of the right wheel forward
Valve of the right wheel backward
Sensor of longitudinal inclination
Sensor of drum speed
Sensor of left wheel speed
Sensor of right wheel speed
Servovalve
Sensor of cooling liquid
Switch water in fuel filter
Temperarure of hydraulic liquid
Fuel gauge
Air filter
Hydraulic liquid filter
Cabin ventilation
Front windscreen wiper
Rear windscreen wiper
Windscreen washer front
Windscreen washer rear
Fan of heating
Y8
Y11
Y12
Y15
Y16
A5
S23
S24
S25
Y13
B1
X19 Connector "A" engine
A3
X25
X34
X35
X36
X37
X38
X39
X40
Diagnostic plung of engine
F4 7,5A
F5 5A
F6 20A
F7 20A
F8
H13
V6
V7
S37
S40
R4
K9
X23 Connector "B" engine
S38
S39
P4
H14
H15
H16
H17
P2
P3
H10
H11
H12
P5
B2
B3
S27
S28
M3
S29
M4
S30
M5
S31
M6
M7
S32
S33
M8
Reserve for aircondition
Reserve

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Hydraulic circuit – ASC110/130/150 – INTER - Wheel differential lock

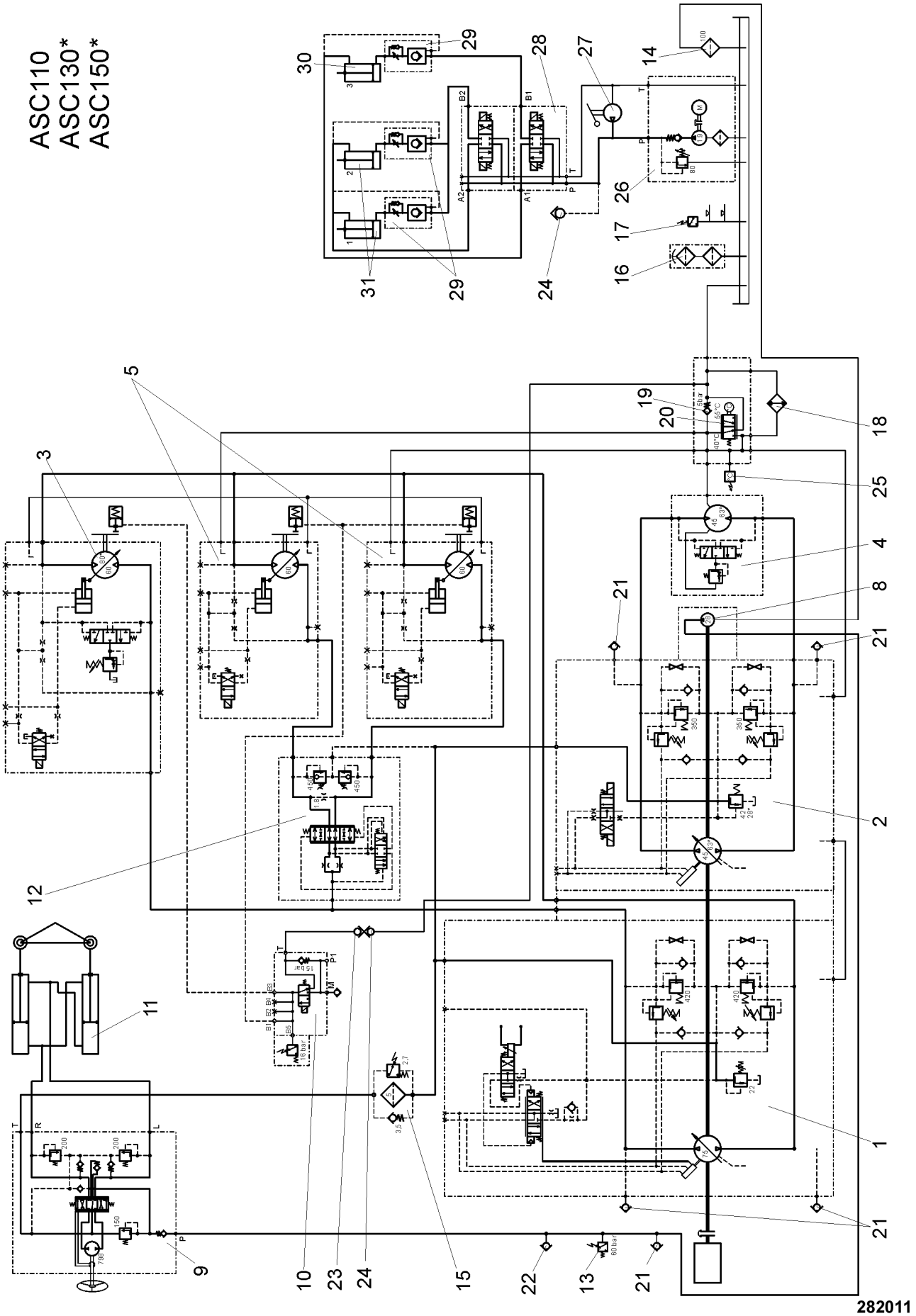
Diagram:

1	- Travel pump	SAUER
2	- Vibration pump*	REXROTH
3	- Drive drum hydromotor	SAUER
4	- Vibration hydromotor**	REXROTH
5	- Wheel hydromotors	SAUER
8	- Steering pump	REXROTH
9	- Power steering unit	REXROTH
10	- Brake block	HYTOS
11	- Steering hydraulic cylinder	AXL SEMILY
12	- Divider lock	HYTOS
13	- Switch 60 bar	HYTOS
14	- Suction strainer	HYTOS
15	- Filter	DONALDSON
16	- Filler	ARGO
17	- Hydraulic tank float	
18	- Combined cooler	EMMEGI
18	- One-way valve	HYTOS
20	- Thermoregulator	
21	- Check point	STAUFF
22	- Quick-release coupling - male	FASTER
23	- Quick-release coupling - female	FASTER
24	- Quick-release coupling - male	FASTER
25	- Temperature sensor	
26	- Lifting electro-hydraulic generator SMA03	HYTOS
27	- Lifting hand hydraulic generator RC16	SAUER
28	- Lifting block	HYTOS
29	- Hydraulic lock	HYTOS
30	- Cabin lifting hydraulic cylinder	AXL SEMILY
31	- Bonnet lifting hydraulic cylinder	AXL SEMILY

* Rexroth A10VG 45 for ASC 110
Rexroth A10VG 63 for ASC 130/150
Sauer 90R042 for ASC 110 option
Sauer 90R055 for ASC 130/150 option

** Rexroth A10FM 45 for ASC 110
Rexroth A10FM 63 for ASC 130/150
Sauer 90M042 for ASC 110 option
Sauer 90M055 for ASC 130/150 option

ASC110
ASC130*
ASC150*



Hydraulic circuit – ASC110/130/150 - Interaxle differential lock ATC

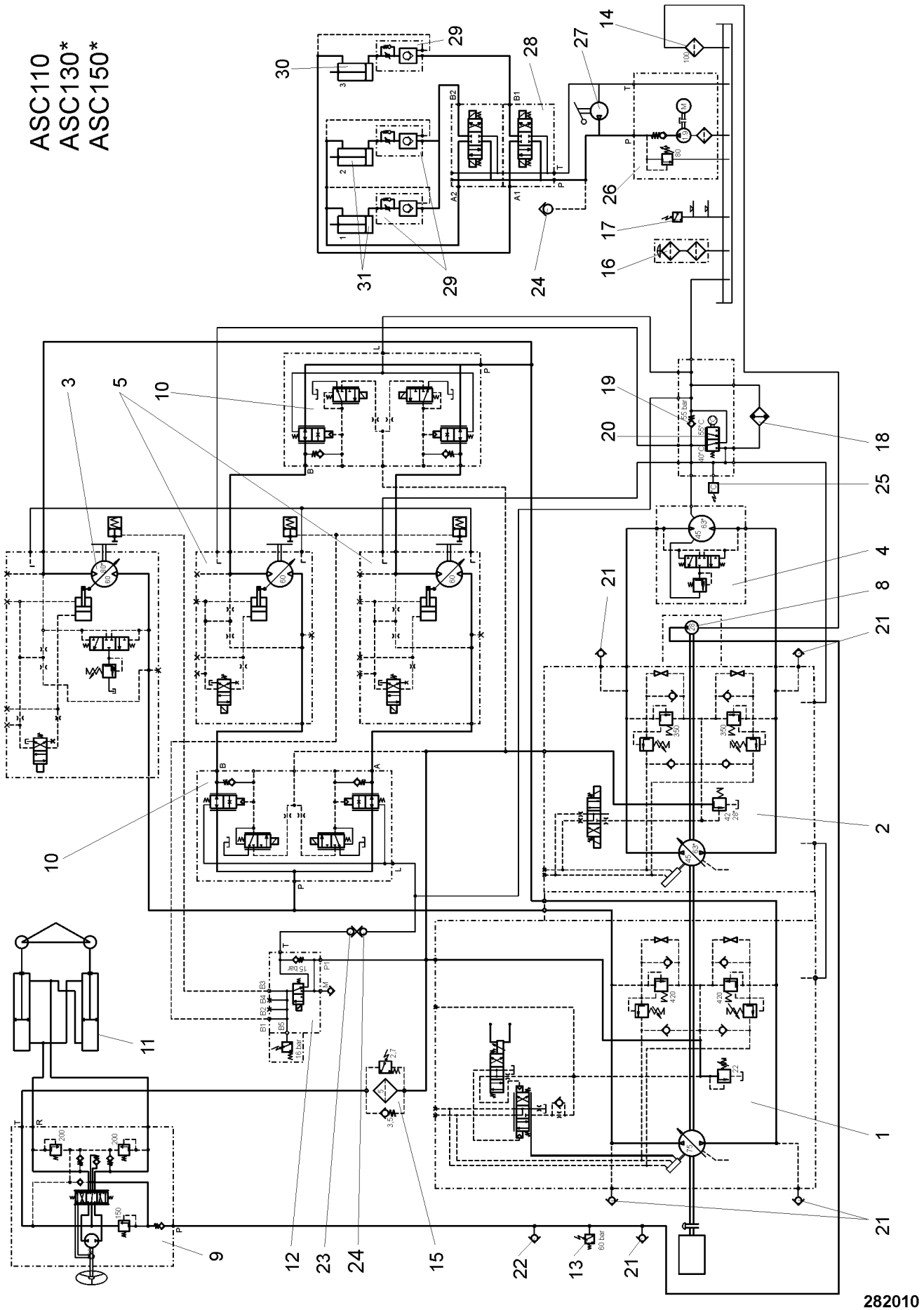
Diagram:

1	- Travel pump	SAUER
2	- Vibration pump*	
3	- Drive drum hydromotor	SAUER
4	- Vibration hydromotor**	
5	- Wheel hydromotors	SAUER
8	- Steering pump	REXROTH
9	- Power steering unit	REXROTH
10	- Valve AST	SAUER
11	- Steering hydraulic cylinder	AXL SEMILY
12	-Brake block	
13	- Switch 60 bar	HYTOS
14	- Suction strainer	HYTOS
15	- Filter	DONALDSON
16	- Filler	ARGO
17	- Hydraulic tank float	
18	- Combined cooler	EMMEGI
18	- One-way valve	HYTOS
20	- Thermoregulator	
21	- Check point	STAUFF
22	- Quick-release coupling - male	FASTER
23	- Quick-release coupling - female	FASTER
24	- Quick-release coupling - male	FASTER
25	- Temperature sensor	
26	- Lifting electro-hydraulic generator SMA03	HYTOS
27	- Lifting hand hydraulic generator RC16	SAUER
28	- Lifting block	HYTOS
29	- Hydraulic lock	HYTOS
30	- Cabin lifting hydraulic cylinder	AXL SEMILY
31	- Bonnet lifting hydraulic cylinder	AXL SEMILY

* Rexroth A10VG 45 for ASC 110
Rexroth A10VG 63 for ASC 130/150
Sauer 90R042 for ASC 110 option
Sauer 90R055 for ASC 130/150 option

** Rexroth A10FM45 for ASC 110
Rexroth A10FM 63 for ASC 130/150
Sauer 90M042 for ASC 110 option
Sauer 90M055 for ASC 130/150 option

ASC110
ASC130*
ASC150*



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