Instruction manual

RHINO CA50 / CA55 / CA65 / CA70

4812311840_EN.pdf

Engine

Cummins QSB5.9-C210-III

Cummins QSB3.9-C150-31

Serial number

CA55D (T3) 10000204TPC013180 -

CA50D (T3) 10000222LRC014015 -

Original instruction

Reservation for changes
Printed in China

CONTENT

Introduction

The machine

Dynapac CA50D / CA55D / CA65D / CA70D is a single drum roller in the 15/18 / 20 / 22 tons class respectively, with a useful drum width of 2130 mm. They are available in D (Smooth drum) and PD (padfoot) version.

Intended use

CA50D / CA55D / CA65D / CA70D is commonly for compaction during work on road construction, airports, ports, and industrial areas, etc. It is available with a smooth drum or padfoot shell assembled on Drum or padfoot drum.

The cab and safety-related accessories are described in this manual.

Training

The purpose of operator training is to impart the operator the knowledge and skills necessary for proper operation and routine maintenance of the roller according to this manual.
Note to trainer: Further information on operator training can be found in ISO 7130.

Warning symbol.

WARNING! Identifies a dangerous or risky procedure that could lead to danger to life or serious damage, if ignored.

CAUTION! Identifies a risky procedure that could lead to damage to machine or property, if ignored.

Safety information

The Safety Manual supplied with the machine must be read by all roller operators. Always follow the safety instructions and do not remove the manual from the roller.

We recommended that the operator carefully reads the safety instructions in this manual and follows these instructions. Make sure that the manual is always available.

Read the entire manual before starting the machine and before carrying out any maintenance.

Only the operator is allowed to be on the roller.

Make sure there is good ventilation when the engine is on in closed spaces.

CALIFORNIA

Proposition 65

Decal and location of decal shown in section Machine description.

> ⚠ **WARNING**: Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
>
> - Always start and operate the engine in a well-ventilated area.
> - If in an enclosed area, vent the exhaust to the outside.
> - Do not modify or tamper with the exhaust system.
> - Do not idle the engine except as necessary.
>
> For more information go to www.P65warnings.ca.gov/diesel.

General

This manual contains instructions for machine operation and maintenance.

Machine maintenance should be performed correctly to achieve maximum performance.

The machine should be kept clean, so that leakages, loose screws or connections can be identified as quickly as possible.

Inspect the machine every day before starting it, so that possible leakages or other problems can be detected.

Check the ground under the machine. Leakages can be detected more easily on the ground under the machine.

THINK ABOUT THE ENVIRONMENT: Do not discard lubricating oil or fuel in places where it can contaminate soil or the environment. Always discard used filters, oil, and fuel residue correctly.

This manual contains instructions for periodic maintenance, where maintenance after every 10 and 50 hours of operation can be performed by the machine operator. Other maintenance intervals must be carried out by accredited (Dynapac) service personnel.

Other instructions for the engine may be found in the manufacturer's manual.

Specific maintenance and checks on diesel engines must be performed by engine supplier authorized personnel.

CE marking and Declaration of conformity

(Applies to machines marketed in EU/EEC)

This machine is CE marked. This shows that on delivery it complies with the basic health and safety directives applicable for the machine in accordance with machinery directive 2006/42/EC and that it also complies with other regulations and directives applicable for this machine.

A "Declaration of conformity" is supplied with this machine, which specifies the applicable regulations and directives with supplements, as well as the harmonized standards and other regulations that are applied and according to the regulations must be declared in writing.

Safety - General instructions

(Also read the safety manual)

1. ***The Operator must be familiar with the contents of the OPERATION section before starting the roller .***

2. ***Ensure that all instructions in the MAINTENANCE section are followed.***

3. ***Only the operator is allowed to be on the roller. Remain seated at all times when operating the roller.***

4. ***Never use the roller if it is in need of adjustment or repair.***

5. ***Only ascend and descend the roller when it is stationary. Use the intended footsteps, grips and rails. Always use the three point grip (both feet and one hand, or one foot and both hands) when ascending and descending the machine. Never jump down from the machine.***

6. ***Dynapac always recommends mounted ROPS (Roll Over Protective Structure), or a ROPS- approved cab and seat belt usage.***

7. ***Drive slowly in sharp bends.***

8. ***Avoid driving across slopes. Drive Straight up or straight down the slope.***

9. ***Never operate with the drum outside the edge, the substrate might not have full bearing strength, or the edge is close to a slope. Avoid operating close to edges and ditches and the like as well as on poor ground conditions that jeopardizes the bearing strength and capacity to support the roller.***

10. ***Make sure that there are no obstacles in the direction of travel, on the ground, and in front of or behind the roller or overhead.***

11. ***Drive particularly carefully on uneven ground.***

12. ***Keep the roller clean. Clean any dirt or grease that accumulates on the footsteps or operator platform to avoid slipping risk. Keep al signs and decals clean and legible.***

13. ***Safety measures before refuelling:***
    - ***Stop the engine;***
    - ***Do not smoke;***
    - ***No naked flames in the vicinity of the roller***
    - ***Earth the filling equipment nozzle by keeping it in contact to the tank opening to avoid sparks.***

14. ***Before repair or service:***
    - ***Chock the drums/wheels.***
    - ***Lock the articulation if necessary.***
    - ***Please block under overhanging equipment, such as strike-off blade, edge cutter/compactor or chip spreader***

15. ***Hearing protection is recommended if the noise level exceeds 80 dB(A). The noise level can vary depending on the equipment on the machine and the surface the machine is being used on.***

16. ***Modifications to the roller, including the use of any attachment/equipment, not approved by Dynapac that might compromise safety (including visibility) are not allowed. Any modifications are only to be made after written approval has been given by Dynapac.***

17. ***Avoid using the roller before the hydraulic fluid has reached its normal working temperature. Braking distance can be longer than normal when the fluid is cold.***

18. ***If the machine seems to be responding abnormally during travel, stop and check it.***

19. ***For the operator's protection, use:***
    - ***A helmet;***
    - ***Working boots with steel toecaps;***
    - ***Hearing protection;***
    - ***Reflective clothing/reflective vest;***
    - ***Working gloves.***

Safety – When operating

Prevent persons from entering or remaining in the risk zone, i.e. a distance of at least 7 m (23 ft) in all directions from operating machines. The operator may allow a person to remain in the risk zone, however he/she must be attentive and operate the machine only when the person is fully visible or has given a clear indication of where he or she is.

Avoid driving across a slope. Drive straight up and down sloping ground.

Operation near edges

Never operate with the drum outside the edge, the substrate might not have full bearing strength or the edge is close to a slope.

Keep in mind that the machine's center of gravity moves outwards when steering. For example, the center of gravity moves to the right when you steer to the left.

Work driving

To exit the cab in an emergency, release the hammer on the rear right post and break the rear window.

Dynapac always recommends mounted ROPS (Roll Over Protective Structure), or a ROPS-approved cab and seat belt usage.

Avoid operating close to edges and ditches and the like as well as on poor ground conditions that jeopardizes the bearing strength and capacity to support the roller. Pay attention to potential obstacles above the machine, such as overhead cables and the branches of trees etc.
Pay particular attention to the stability of the substrate when compacting close to edges and holes. Do not compact with a large overlap from the previous track in order to maintain roller stability. Consider other compaction methods such as remote-control or a walk-behind roller close to steep slopes or where the bearing strength of the substrate is unknown.

Safety (Optional)

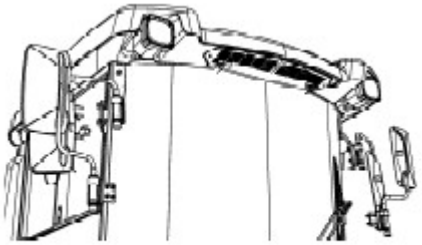

Fig. Cab

Air conditioning

The system described in this manual is an AC/ACC type (Automatic climate control)

The system contains pressurized refrigerant. It is forbidden to release refrigerants into the atmosphere.

The cooling system is pressurized. Incorrect handling can result in serious personal injury. Do not disconnect or undo the hose couplings.

The refrigerant contains a tracing agent, enabling leak-tracing to be performed using UV light.
The condenser is located together with other radiators, and the drying filter is located on the right-hand side of the radiator stand.

Special instructions

Standard lubricants and other recommended oils and fluids

Before leaving the factory, the systems and components are filled with the oils and fluids specified in the lubricant specification. These are suitable for ambient temperatures in the range -15°C to +40°C (5°F -104°F).

Higher ambient temperatures, above +40°C (104°F)

For operation of the machine at higher ambient temperatures, but not exceeding +50°C (122°F), the following recommendations apply:

The diesel engine works at this temperature with standard oil, but the following oils must be used in the other components:

Hydraulic system – Shell Tellus S2V100mineral oil or equivalent.

Lower ambient temperature – Risk of freezing

Make sure that the cooling system is empty/drained (sprinkler, hoses, tanks) or that anti-freeze has been added, to prevent system freezing.

Temperatures

The temperature limits apply to standard versions of the machine.

Machines with additional equipment, such as noise suppression equipment, may require special care when operating at higher temperatures.

High pressure cleaning

Do not spray directly into electrical components.

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Do not use a high-pressure water jet on the instrument panel/display.

Detergent that can destroy electrical parts, or which is conductive, must not be used.

In certain cases there is an electrical control lever and associated electronic control unit (ECU) in the engine compartment, which must not be washed with a high-pressure jet or with any water at all. It is sufficient to wipe these off.
The same applies to the engine electronic control unit (engine ECU).

Place a plastic bag over the fuel filler cap and secure with a rubber band. This is to avoid high pressure water entering the vent hole in the filler cap. This could cause malfunctions, such as the blocking of filters.

Place a plastic bag over the exhaust pipe and secure with a rubber band to avoid water in the muffler.

Never aim the water jet directly at the fuel tank cap, or into exhaust pipe. This is particularly important when using a high-pressure cleaner.

Fire extinguisher

If the machine catches fire, use a ABC-class powder fire extinguisher.

A BE-class carbon dioxide fire extinguisher can also be used.

Roll Over Protection Structure (ROPS), ROPS-approved cab.

If the machine is fitted with a Roll Over Protective Structure (ROPS, or ROPS-approved cab), never carry out any welding or drilling in the structure or cab.

Never attempt to repair a damaged ROPS structure or cab. These must be replaced with a new structure or cabs.

Precaution during Welding

When carrying out welding on the machine, the battery must be disconnected and the electronics disconnected from the electrical system.

If possible, remove the part(s) to be welded from the machine.

Battery handling

When removing batteries, always disconnect the negative cable first.

When fitting batteries, always connect the positive cable first.

Dispose of used batteries in an environmentally friendly manner. Batteries contain toxic lead.

Never use fast charge to charge the battery. This may shorten battery life.

Ignition key & Battery Dis-connector key removal in transit

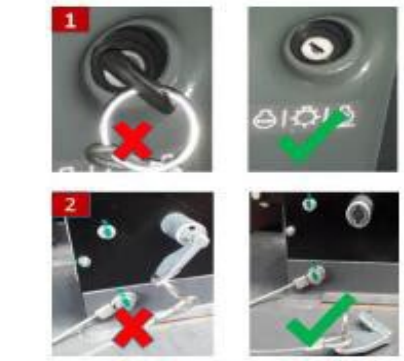


Fig. Ignition key & Battery dis-connector
1. Ignition key
2. Battery Dis-connector

While transporting the machine on the trailer or container or in long term parking always ensure that

1. Ignition key should be removed from the ignition switch.
2.Battery dis-connector key should be removed.

This will avoid static parasitic current consumption & saves the battery life & potential battery drain issue.

Jump starting

Do not connect the negative cable to the negative terminal on a dead battery. A spark can ignite the oxy-hydrogen gas formed around the battery.

Check that the battery used for jump starting has the same voltage, AH &CCA rating as dead battery.

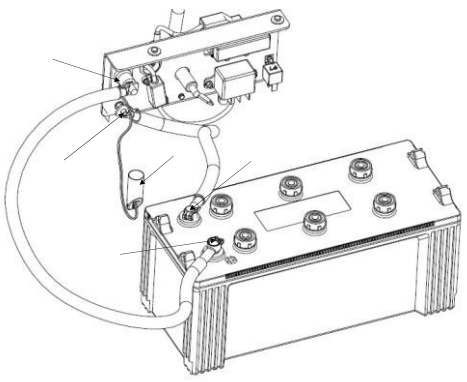


Fig. Jump starting

Turn the ignition and all power consuming equipment off. Switch off the engine on the machine which is providing jump start power.

First Remove the cap (5) from jump start connector. Connect the jump start battery's positive terminal (1) to the Jump start connector positive terminal (2). Then connect the jump start battery's negative terminal (3) to, on the bracket, a bolt (4).

Start the engine on the machine providing the power. Let the engine run a little. Now try to start the other machine. Disconnect the cables in reverse order.

Once the jump start done, ensure to fit the rubber cap (5) Firmly on the jump start positive terminal.

Orientation of Rotating beacon on the Machine

Fig. Orientation of Rotating Beacon

The beacon should be fitted with then lens (amber coloured) mounted at uppermost (sky direction) i.e. never bend the beacon towards the down

This will avoid rainwater entry & its accumulated through its drain holes if beacon bended at bottom.

However, wherever heights constraints observed (like machine in container) – the same beacon light to be removed, packed safety & send along with machine.

Technical specifications

Noise/Vibrations

Vibrations - Operator station

(ISO 2631)

The vibration levels are measured in accordance with the operational cycle described in EU Directive 2000/14/EC on machines equipped for the EU market, with vibration switched on, on soft polymer material and with the operator's seat in the transport position.
Measured whole-body vibrations are below the action value of 0.5 m/s^2, as specified in Directive 2002/44/EC. (Limit is 1.15 m/s^2)
Measured hand/arm vibrations were also below the action level of 2.5m/s^2 specified in the same directive. (Limit is 5 m/s^2)

Noise level

The noise level is measured in accordance with the operational cycle described in EU directive 2000/14/EC on machines equipped for the EU market, on soft polymer material with vibration switched on and the operator's seat in the transport position.

Guaranteed sound power level, L_{wA}	107 dB (A)
Sound pressure level at the operator's ear (ROPS), L_{pA}	90 ±3 dB (A)
Sound pressure level at the operator's place (cab), L_{pA}	85 ±3 dB (A)

During operation the above values may differ because of the actual operational conditions.

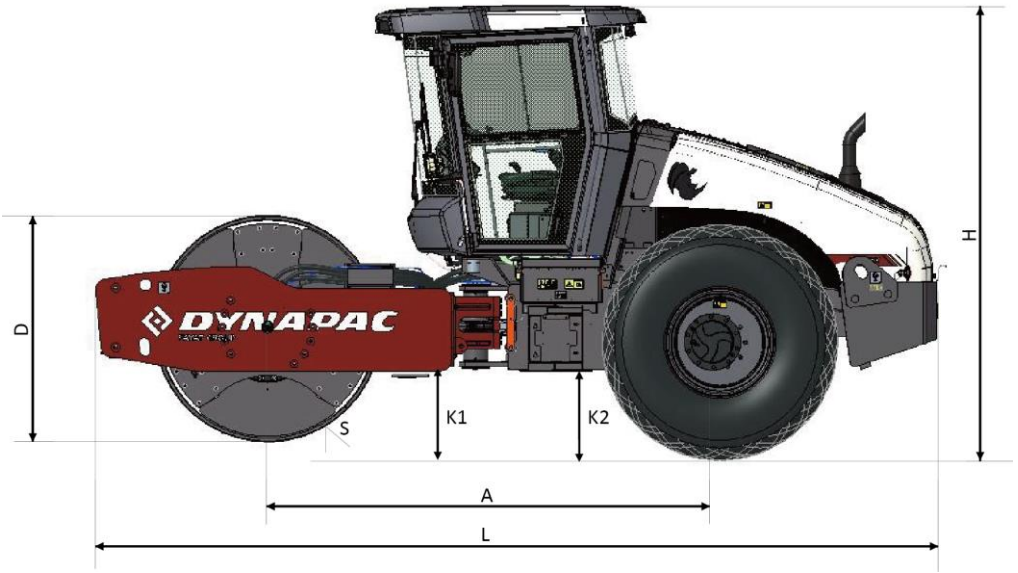
Slopes

Max 20° or 36%

The recommended max slope angle is for a machine that runs straight on hard, flat surface.

Unstable ground, vibration on, speed and steering the machine can all cause the machine to topple at smaller angles than specified here.

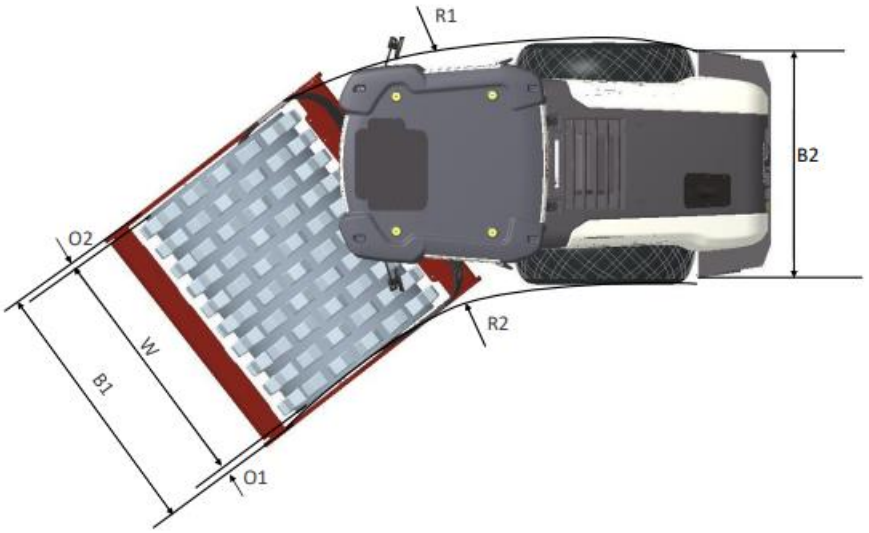
Technical specifications – Dimensions



Dimensions – Side view

	Dimensions	mm
A	Wheelbase, drum and wheel	3100
L	Length, roller with standard equipment	6236
H	Height, with ROPS/cab (D)	2900(D)/2950(PD)
H	Height, with ROPS/cab (PD, Pad shell)	2950
D	Diameter, drum	1573
S	Thickness, drum amplitude, Nominal	50
K1	Clearance, machine frame	470
K2	Height clearance, drum frame (D, PD, Pad Shell)	500

Dimensions – Top view



	Dimensions	mm
B1	Front width	2360(CA50/CA55/CA65), 2440(CA70)
B2	Back width	2130
O1	Overhang, left frame side	115(CA50/CA55/CA65), 155(CA70)
O2	Overhang, right frame side	115(CA50/CA55/CA65), 155(CA70)
R1	Turning radius, outside	5638
R2	Turning radius, inside	3508
W	Width, drum	2130

Technical specifications – Weights and Volumes

Weight

Model	CA70D		CA65D		CA55D		CA50D	
Operation Type	CAB	ROPS	CAB	ROPS	CAB	ROPS	CAB	ROPS
Operation weight (Kg）	22300	22160	20300	20160	18300	18160	15450	15310
Front axle load (Kg）	14800	14800	13800	13800	12100	12100	10560	10560
Rear axle load (Kg）	7500	7360	6500	6360	6200	6060	4890	4750
Max. weight	23800	23800	21800	21800	19800	19800	16950	16950
Max.Front axle load	16250	16250	15250	15250	13550	13550	12010	12010

Model	CA70PD		CA65PD		CA55PD		CA50PD	
Operation Type	CAB	ROPS	CAB	ROPS	CAB	ROPS	CAB	ROPS
Operation weight (Kg）	22120	21980	20120	19980	18120	17980	15270	15130
Front axle load (Kg）	14620	14620	13620	13620	11920	11920	10380	10380
Rear axle load (Kg）	7500	7360	6500	6360	6200	6060	4890	4750
Max. weight	22170	22170	20170	20170	18170	18170	15320	15320
Max.Front axle load	14620	14620	13620	13620	11920	11920	10380	10380

Fluid capacities

Fluid capacities	D/PD			
Rear axle	CA55/CA65/CA70		CA50	
- Differential	14	litres	14	litres
- Planetary gear (standard axle)	3.5	litre/side	3.5	litre/side
Drum				
- Gearbox (D/PD)	3.5	litres	2.5	litres
- Cartridge	2.3	litres/side	2.3	litres/side
Hydraulic reservoir	52	litres	52	litres
Oil in hydraulic system	38	litres	38	litres
Diesel engine				
- Lubrication oil	17	litres	9	litres
- Coolant Without cab	36	litres	36	litres
Fuel tank	320	litres	320	litres

Technical specifications – Working capacity

Compaction data and machine Speed

Mode	CA70D		CA65		CA55		CA50	
Operation type	CAB	ROPS	CAB	ROPS	CAB	ROPS	CAB	ROPS
Static linear load (Kg/cm）	69.5		65		57		50	
Amplitude, high (mm)	1.8	1.1	1.8	1.1	1.8	1.1	1.8	1.1
Vibration frequency, high/low amplitude	29	31	29	31	29	31	30	31
Centrifugal force, high amplitude (KN)	317	231	317	231	317	231	302	200
4 gear speed range	0-4,0-5,0-6,0-11						0-4,0-5,0-6,0-9.5	
Max. slop	38%		41%		46%		40%	

Machine speeds adjustment

Keypad Button 6 pressing status	LED position on keypad button 5(-)	LED position on Keypad button 6(+)	Display Tell-tale condition in working page	Display Tell-tale condition in transport page	Condition
Normal condition	LED OFF	LED OFF			Turtle/Turtle= Working order
Pressing of button no.6 once	LED OFF	LED will blink			Rabbit/Turtle= Hare mode on the Drum
Pressing of button no.6 twice	LED OFF	LED will blink			Turtle/ Rabbit = Hare mode on the Tyre
Pressing of button no.6 at 3 times	LED OFF	LED will blink			Rabbit/Rabbit= Transport mode

Technical specifications – General

Engine

Manufacturer/Model	Cummins QSB5.9 Turbo diesel engine, water-cooled	Cummins QSB3.9 Turbo diesel engine, water-cooled
Power (SAE J1995)	154 kW / 210 hp	103 kW / 150 hp
Engine speed, idling	900 rpm	900 rpm
Engine speed, working/transport	2200 rpm	2200 rpm

Electrical system

Battery	12V	950Ah
Alternator	12V	70A
Fuses	See section “Electrical system” – fuses.	

Tire	Tire dimensions:	Tire pressure
Std type	23.1 x 26.0 8 ply	180 kPa (1.8 kp/cm^2) (26psi)
Tractor type	23.1 x 26.0 12 ply	180 kPa (1.8 kp/cm^2) (26psi)

The tires filled with fluid (up to 575 kg/tire). When doing tire maintenance, pay attention to their condition.

Tire Water Blasting procedure

Jack the Roller and turn the tire to bring the valve to the top position.

Remove the valve core housing and make connection with tire blasting pump and fill the water with Cacl2 solution 575 lits per tire.

Set the final working press (180kpa-26psi) after unjack the roller in valve position in bottom side.

Tyre blasting must in bead seating with control pressure & valve position in up position.

Hydraulic System

Opening pressure	Bar
Drive system	400
Supply system	20
Vibration system	400
Steering systems	175
Release the brakes	20

Air conditioning

The System Described in this manual is an AC type.

The System contains fluorinated greenhouse gases.

Coolant designation: HFC-134a

Coolant weight when full: 1.5kg

ROPS bolts

Bolt dimensions:	Front mount M20x150 (PN 903633) Back mount M20x130 (PN 902282)
Strength class:	10.9
Tightening torque:	585 N/m (Dacromet treated)

ROPS bolts that are tightened should be dry.

Torque

Tightening torque in Nm (lbf.ft) for oiled or dry bolts tightened with a torque wrench.

Metric coarse screw thread, bright galvanised (fzb):

STRENGTH CLASS:

M – thread	8.8 – oiled	8.8 – dry	10.9 – oiled	10.9 – dry	12.9 – oiled	12.9 – dry
M6	8.4	9.4	12	13.4	14.6	16.3
M8	21	23	28	32	34	38
M10	40	45	56	62	68	76
M12	70	78	98	110	117	131
M14	110	123	156	174	187	208
M16	169	190	240	270	290	320
M20	330	370	470	520	560	620
M22	446	497	626	699	752	839
M24	570	640	800	900	960	1080
M30	1130	1260	1580	1770	1900	2100

Metric coarse thread, zinc-treated (Dacromet/GEOMET):

STRENGTH CLASS:

M – thread	10.9 – oiled	10.9 – dry	12.9 – oiled	12.9 – dry
M6	12	15	14.6	18.3
M8	28	36	34	43
M10	56	70	68	86
M12	98	124	117	147
M14	156	196	187	234
M16	240	304	290	360
M20	470	585	560	698
M22	626	786	752	944
M24	800	1010	960	1215
M30	1580	1990	1900	2360

Machine description

Diesel engine

The machine is equipped with a water-cooled, straight four cylinder, four-stroke, turbocharged diesel engine with direct injection and a charge air cooler.

The engine is also equipped with Cummins® Diesel oxidation catalyst, a diesel particulate filter and a selective catalytic reduction (DOC/DPF and SCR) System for exhaust gas after-treatment.

Electrical system

The machine has the following control units.

- Electronic Control Unit (ECU)
- Engine control module (ECM)

Propulsion/Transmission system

The propulsion system is a hydrostatic system with a hydraulic pump supplying two motors connected in parallel, one for the rear axle and one for the drum.

The speed of the machine is proportional to the angle of the control lever (the deflection of the forward/reverse lever regulates the speed). A speed selector system is available.

Brake system

The brake system comprises a service brake, secondary brake and parking brake. The service brake system produces retardation of the propulsion system, i.e. hydrostatic braking.

Secondary and parking brake

The secondary and parking brake system comprises spring disc brakes on the rear axle and the drum gear which are disengaged by hydraulic pressure.

Steering system

The steering system is a hydrostatic system. The control valve on the steering column distributes the flow to the steering cylinders at the articulated joint. The steering angle is proportional to the amount the steering wheel is turned.

Vibration system

The vibration system is a hydrostatic system in which a hydraulic motor drives the eccentric shaft, which generates the drum's vibrations.
High amplitude or low amplitude are determined by the hydraulic motor's direction of rotation. Optional systems for variable amplitude are available.

Cab

The cab has a heating and ventilation system, with defrosters for windows. Air conditioning is available as an accessory.

Emergency exit

The cab has two emergency exits: the door and back window of the cab, which can be broken with an emergency hammer located in the cab.

FOPS and ROPS

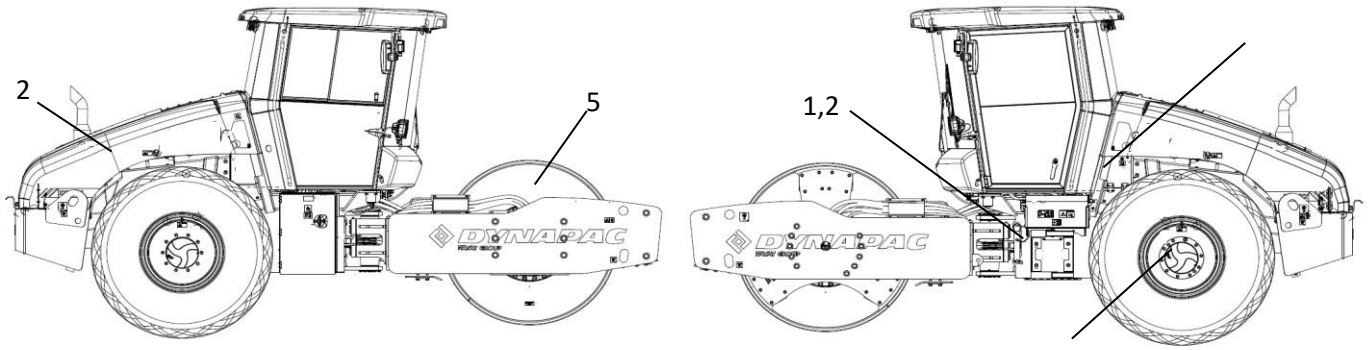
FOPS stand for Falling Object Protective Structure and ROPS is the acronym for Rollover Protection Structure.

The cab is approved as a protection cab in accordance with the FOPS and ROPS standards.

If any part of the cab or FOPS/ROPS structure has plastic deformation or cracks, the FOPS/ROPS structure should be replaced immediately.

Never perform unauthorised modifications to the cab or FOPS/ROPS structure without first having discussed the modification with Dynapac production unit. Dynapac will determine whether the modification would result in approval in line with the FOPS/ROPS standards.

Machine plate – Identification



1. Product plate - Product Identification Number (PIN), model/type designation
2. Engine plate - Type description, product and serial numbers
3. Cab/ROPS plate - Certification, product and serial numbers
4. Component plate, rear axle - Product and serial numbers
5. Component plate, drum - Product and serial numbers

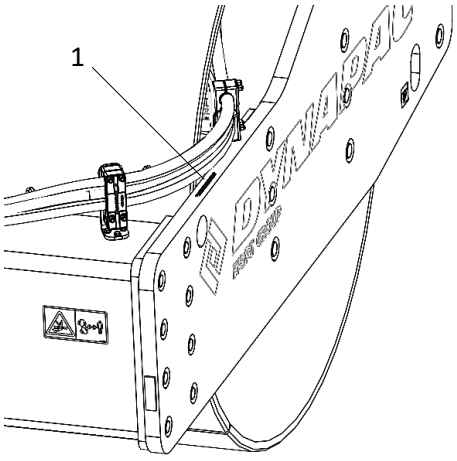


Fig. Front frame
1. PIN

Product identification number on frame

The machine's product identification number (1) is punched on the right side of the front frame.

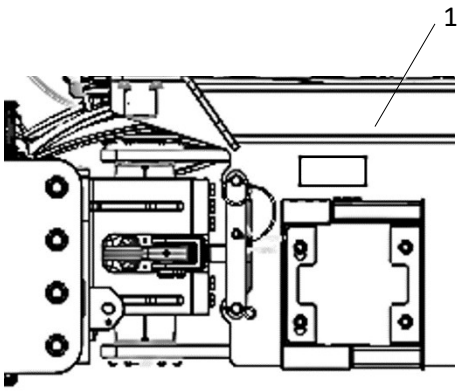


Fig. Back frame
1. Machine type plate

Machine type plate

The machine type plate (1) is attached to the front left of the back frame, beside the articulated joint.

The plate shows the manufacturer's name and address, type of machine, PIN (serial number), working weight, engine power and year of manufacturing.

DYNAPAC
FAYAT GROUP

optional QR code

Dynapac (China) Compaction & Paving Equipment Co., Ltd.
38, Quanwang Rd, Wuqing High Tech Ind. Park,
Tianjin, China 301700

Product Identification Number	>XXXXXXXXXXXXXXXXX<		
Designation	Type	Rated Power	Max axle load front / rear
XXXXXX	XXXXXX	XXX kW	XXXX/XXXX kg

Gross machinery mass	Operating mass	Max ballast	Date of Mfg
XXXX kg	XXXX kg	XXXX kg	XX/XXXX

Designed by Dynapac in Germany, assembled in China
4812126993

Please state the machine's PIN (serial number) when ordering spare parts.

Explanation of serial number (17PIN)

103	00123	V	E	B	123456
A	**B**	**C**	**D**	**E**	**F**

A= Manufacturer
B= Family/Model
C= Check Letter
D= Year of manufacturing
E= Production unit
F= Serial number

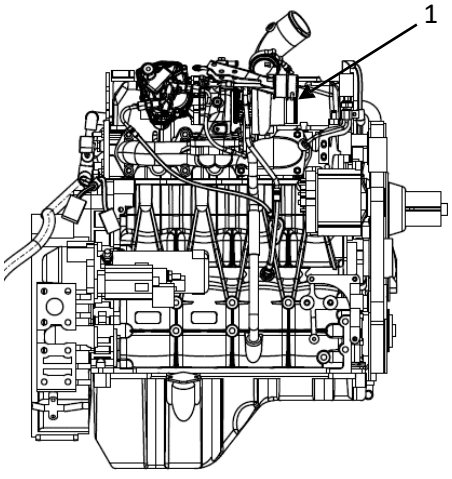


Fig. Engine
1. Engine identification plate

Engine identification plate

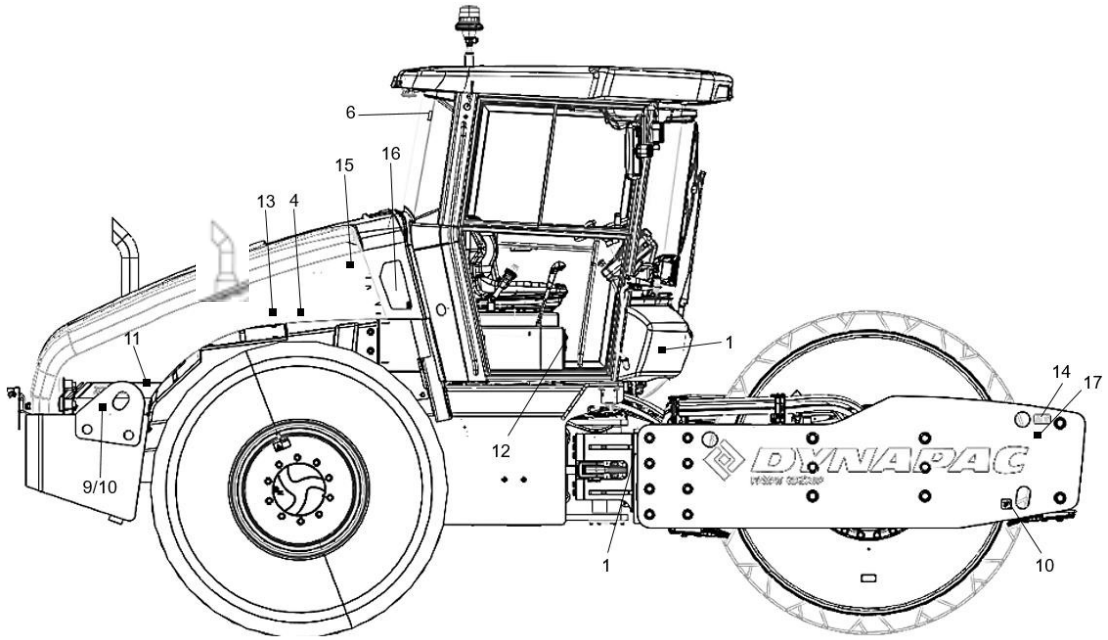
The plate (1) is affixed to the top of the engine.

It indicates the engine type, serial number and specifications.

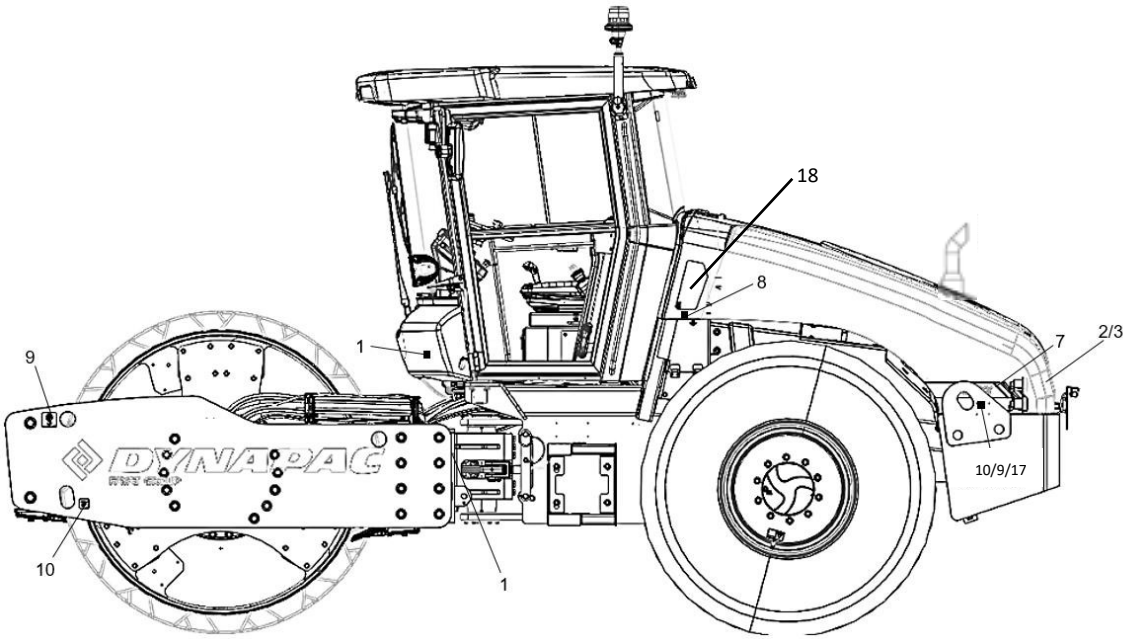
Please specify the engine serial number when ordering spare parts.
See also the engine manual.

Machine description – Decals

Location – Decals



1. Warning - Crush zone
2. Warning, rotating engine components
3. Warning, very hot surfaces
4. Warning, ballasted tire
6. Emergency exit – cab
7. Fuelling
8. Hydraulic fluid
9. Lift point
10. Fixing point
11. Main switch
12. Safety manual compartment
13. Tire pressure
15. Coolant
16. Hydraulic fluid level
17. Locking the articulation



1. Warning - Crush zone
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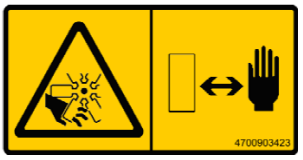
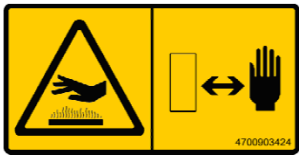
9. Lift point
10. Fixing point
11. Main switch
12. Safety manual compartment
13. Tire pressure
15. Coolant
16. Hydraulic fluid level
17. Locking the articulation
18. Hydraulic oil level

Safety decals

4700903422
Warning – Crush zone, articulation/drum.
Keep a safe distance from the crush zone.



4700903423
Warning – Rotating engine components.
Keep your hands at a safe distance from the danger zone.



4700903424
Warning – Hot surfaces in the engine compartment.
Keep your hands at a safe distance from the danger zone.

4700903985
Warning, ballasted tire.
Read the instruction manual.

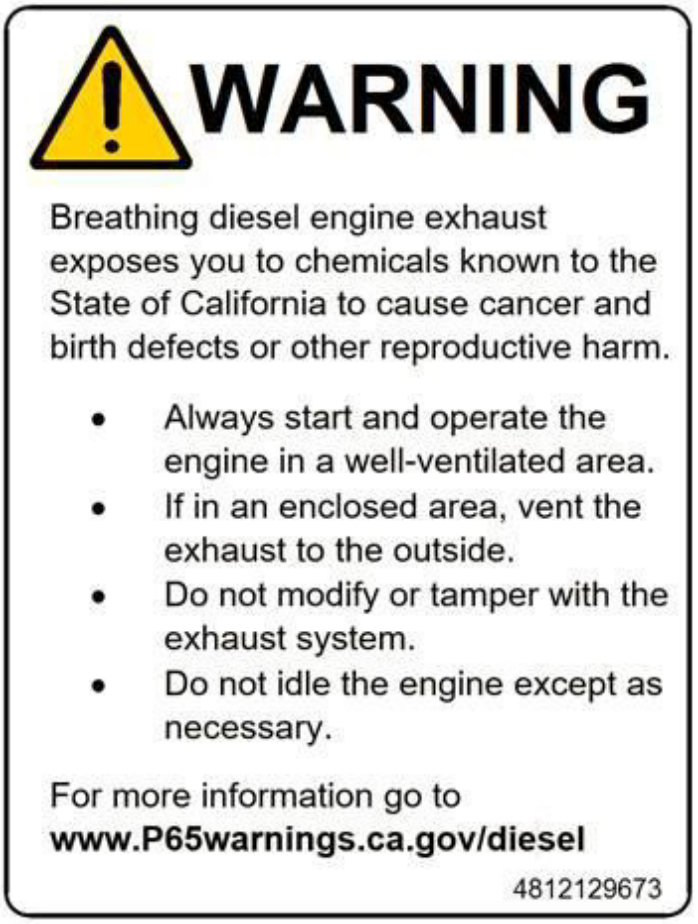
4700903459
Warning – Instruction manual
The operator must read the safety, operation and maintenance instructions before operating the machine.

4700791642
Attention – Use of gas to start the engine is prohibited.

4700908229
Attention – Locking the articulation.
During elevation, the central articulation should be locked.
Read the instruction manual.

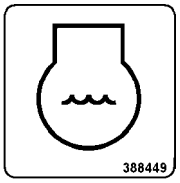
4700903590
Emergency exit (Cab).

Warning
CALIFORNIA - Proposition 65



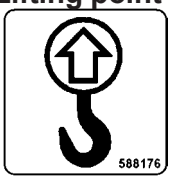
Info decals

Coolant



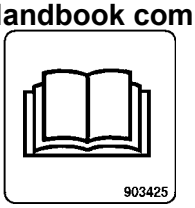
Diesel fuel

Lifting point

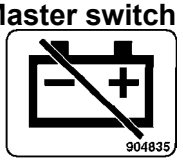


Hoisting plate

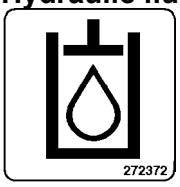
Handbook compartment



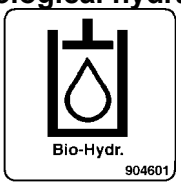
Master switch



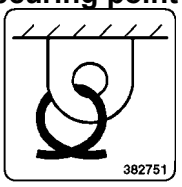
Hydraulic fluid



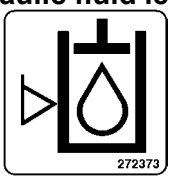
Biological hydraulic fluid



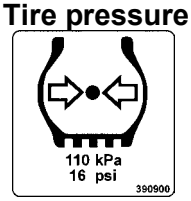
Securing point



Hydraulic fluid level



Tire pressure



Machine Description – Instruments/Controls

Locations – Instruments and controls

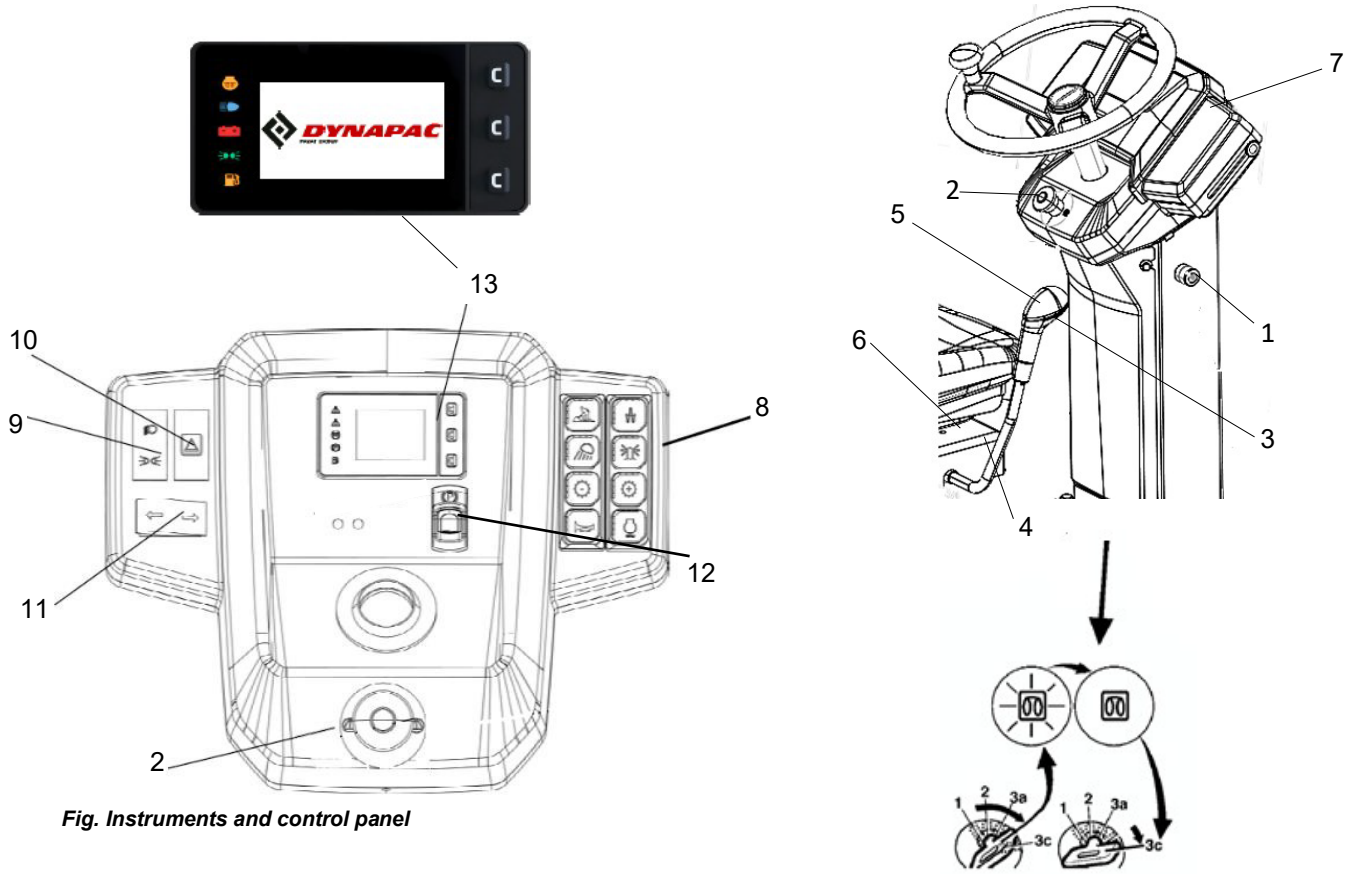
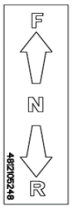
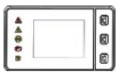


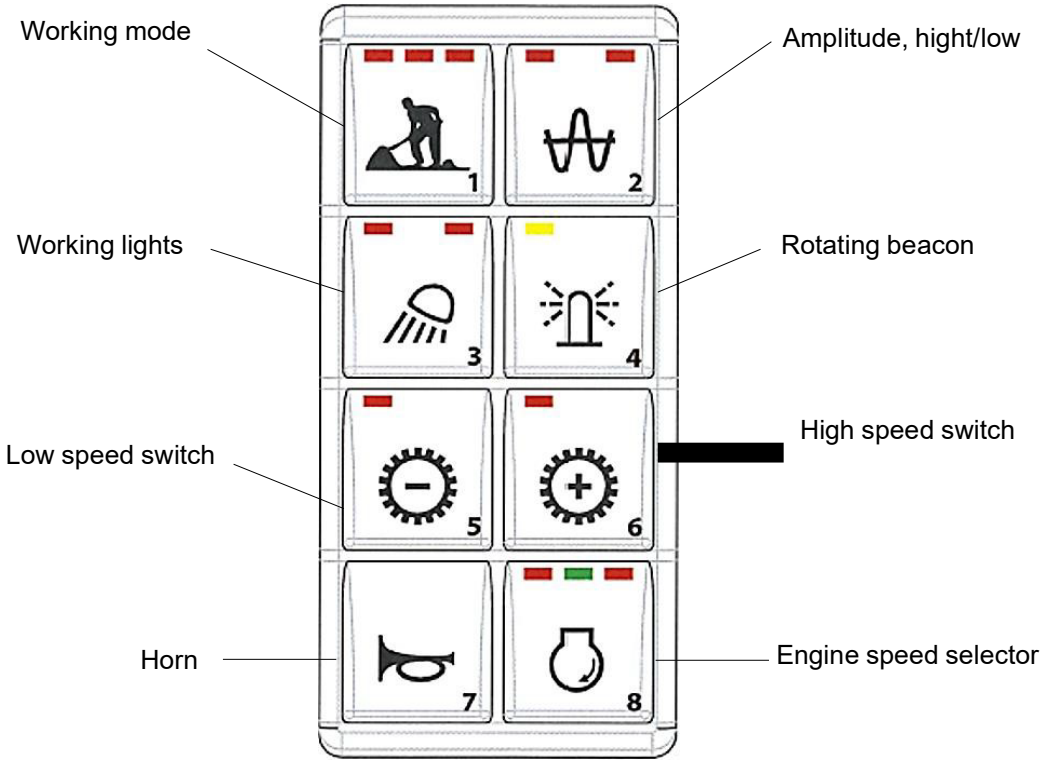
Fig. Instruments and control panel

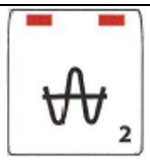
1. Ignition key
2. Emergency Stop
3. Vibration Switch
4. Handbook compartment
5. Forward/reverse control
6. Seat switch
7. Instrument guard
8. Keypad
9. Traffic lights
10. Hazard lights
11. Direction indicators
12. Switch Parking brake
13. Display

No.	Designation	Symbol	Function
1.	Ignition key	 	Positions 1-2: Shut off position, key can be removed. Position 3a: All instruments and electric controls are supplied with power. The machine is equipped with automatic glowing which occurs in this position. Position 3c: Actuation of starter motor.
2.	Emergency Stop	 	When pressed, the emergency stop is activated. The brake is applied and the engine stops. Brace yourself for a sudden stop.
3.	Vibration computer Switch		To activate vibration, select work mode (1) button from keypad panel, and press the button (2) in keypad panel. Press again to deactivate vibration. High or low amplitude must be chosen on the keypad panel (2).
4.	Handbook compartment		Pull up and open the top of the compartment for access to handbooks.
5.	Forward/reverse lever		Position in neutral to start the diesel engine. In any other position, it will not start. The forward/reverse lever controls the driving direction and speed of the roller. Move the lever forward to moves the roller forward, etc. The roller's speed is proportional to the distance between the lever and neutral. The further from neutral, the higher the speed.
6.	Seat switch		Stay seated whenever you are operating the roller. When the operator gets up during operation, the alarm is activated. After 4 seconds the brakes are activated and the engine stops.
7.	Instrument cover		The instrument cover is to protect control panel from weather condition & any tempering, It is lockable
8.	keypad panel		Detailed information about how it works is provided further down.
9.	Drive lights, switch (optional)		When pressed up, the drive lights will be switched 'ON" with amber illumination in switch. When pressed down, the parking lights will be switched 'ON" with amber illumination in switch.
10.	Hazard warning lights, switch (optional)		When pressed, the front & rear lamps will be switched 'ON" with blinking illumination in the switch.

No.	Designation	Symbol	Function
10.	Turn indicators, switch (optional)		When pressed in one of the two directions, the respective light will blink with green illumination. In central position, the function is switched off.
11.	Parking brake switch		Push the button to activate the parking brake; the machine stops with the engine running. Always use the parking brake when the machine is stationary on a sloping surface.
12.	Display		Detailed information about how it works is provided further down.
13.	Service socket		Diagnostic socket available in circuit board. Gateway is connected here to read the CAN-Open system.

Functional Description – Keypad panel



Symbol	Designation	Function	LED	LED colour
	Working mode Vibration	Activates working mode, which makes it possible to use vibration and edge cutter (optional).		
		LED OFF → Transport mode		-
		LED LEFT → Working mode, vibration		Red
	Amplitude selector	**LED LEFT** → Low amplitude		Red
		LED RIGHT → High amplitude		
	Working lights	Turns on the working lights of canopy/ROPS/cab		
		LED OFF		-
		LED LEFT → Working lights, ON		Red

Symbol	Designation	Function	LED	LED colour
	Rotating beacon (Option)	Press to activate the rotating beacon		
		LED OFF →		-
		LED LEFT → On		Yellow
	Low speed switch	**LED OFF** → Working mode		-
		LED LEFT → Tortoise mode on the drum		Red
	Hi speed switch	Activate the change function of the machines		
		LED OFF		-
		LED LEFT → Rabbit mode on the drum		Red
	Horn	Press the button to activate the Horn.		
	Engine speed selector	**LED LEFT** → Low speed		Red
		LED CENTRE → Mid mode		Green
		LED RIGHT → High speed		Red

Functional Description – Display

Fig. Start screen

When the ignition key is activated to position 1, the start screen appears on the display (Fig. 1). This is shown for a two seconds and then switches over to the status screen.

Transport mode

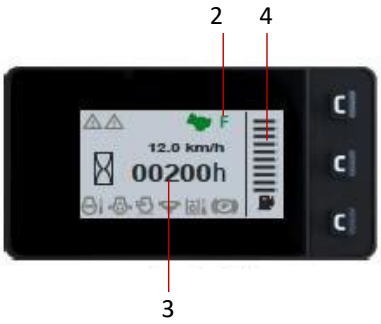


Fig. Transport mode

The transport mode menu is shown when one of the three function keys to the right on the display is activated.

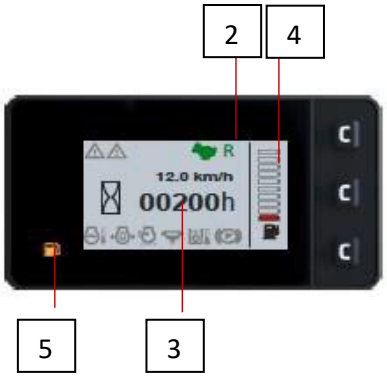
The status screening provides information about travel direction (2), Hour meter (3) and fuel level (4).

Direction of work

The icon has three options (F, N, R) and is located in the top left corner of the Display (2).

- ➔ **N** (Neutral) – Indicates that the lever is in Neutral position.
- ➔ **F** (Forwards) – A left arrow is shown in front of "F" on the display.
- ➔ **R** (Reverse) – A right arrow is shown after "R" on the display.

Hour meter



An icon (hour-glass) is shown on the left-hand side of the display for machine hours. The number of hours is shown to the right of the icon (3).

Fuel level

The fuel level is indicated as a no of lines of on the bar to the right of the display.

Once the first fuel bar is reached (bottom to top), it means the system has 10% of its total capacity, and the warning LED lights glow, indicating that you should refuel (5).

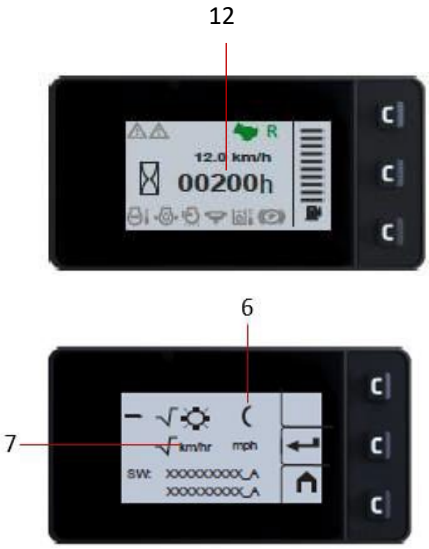


Fig. User settings

Transport with machine speed (Applicable to DCM)

User can see the machine speed (12) in travel and working mode. It's applicable in DCM machine.

User settings

Users can change the lighting configurations (6), Brightness & contrast. Machine speed (7) Applicable in Compaction meter.

SW: - 4812133751– Display
4812133750– ECU software

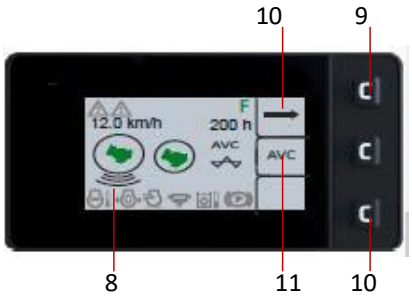


Fig. Working mode – Vibration

Vibration status

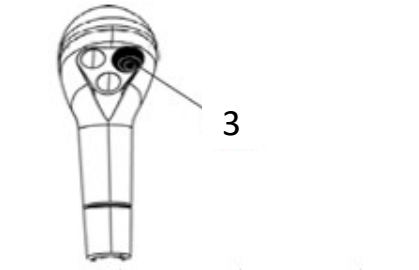
Vibration status activated on the drum (8).

Automatic Vibration Control – AVC

Press bottom buttons (9) on the far edge of the Display. An arrow will appear on the right (10).

Press the bottom button (9) and the submenu is displayed.

Press the bottom button (9) to activate AVC (11), and after it is activated, the icon will appear on the bottom right of the display. To activate the vibration, click on the button (3).



Machine with standard equipment
Fig. Vibritaion switch

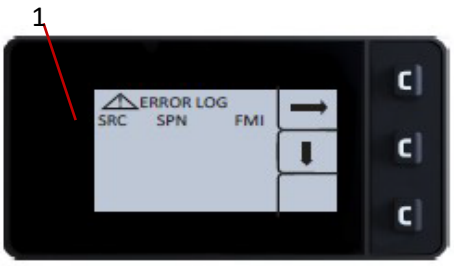


Fig. Submenu – Error codes

Sub menu – Error codes

1. The alarm symbols are shown on the left hand side of the display. At the top is the red warning symbol and at the bottom the yellow (1).
2. The side menu is displayed, when the sub-menu is selected.

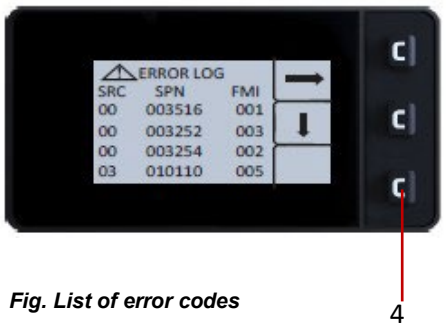
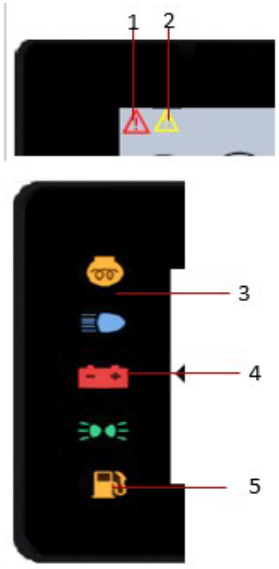


Fig. List of error codes

3. Now go to the submenu of user configurations.
4. The middle button (4) on the side menu shows a downward arrow. When this is selected, an error code list appears. When the last error code is shown, scroll the list up to the first error code again.
5. The active Home mode is shown when the travel direction is changed.
6. If the sub-menu is inactive for more than 20 seconds, the menu will switch back to the active home menu.

7. When "OK" is shown in the box to the bottom right, the screen should be cleared.
8. When "OK" is selected, the active Home mode is shown.
9. A Red or Yellow control lamp gives a reminder until the error is rectified.

Function description



		Designation and function
1		Warning lamp (Red) **Serious failures** : STOP the engine immediately. Light 'ON' a long with message on the screen. Below functions affected. ▪ High Engine Temperature ▪ High Hydraulic Oil Temperature ▪ Low Oil Pressure ▪ Air Filter Clogging ▪ Check Engine
2		Warning lamp (Yellow) Less serious failures: Correct as soon as possible Light 'ON' a long with Message on the screen. Below functions affected. ▪ Water in fuel ▪ Malfunction Indication (MIL) ▪ No Battery Charging ▪ Glow Plug ▪ Low AdBlue level when display in transport or working page
3		Heating (Yellow) When glow plug is active ;immediately the glow plug LED should be on.
4		Battery indicator (Red) The symbol light glow when the battery voltage below 13.5V
5		Fuel level (Yellow) The Symbol lights glows only 10% of fuel is left in the tank.

Functional Description – Tell- Tales & Alarms

Symbol	Warning	Designation	Function
	NA	Warning symbol, hydraulic fluid filter	When Hydraulic fluid filter clogged; immediately symbol will come & the hydraulic fluid filter must be changed.
		Warning symbol, clogged air filter	If this symbol is shown when the engine is running at full speed, the air filter must be checked/replaced.
		Warning symbol, battery charging	If the symbol is shown when the engine is running, then the alternator is not charging. Switch off the engine and locate the fault.
		Warning symbol, engine temperature	If this symbol is shown, the engine is too hot. Stop the engine immediately and locate the fault. Refer also to the engine manual.
		Warning symbol, hydraulic fluid temperature	This symbol is shown when the hydraulic fluid is too hot. Do not drive the roller; allow the fluid to cool by running the engine on idle, and then locate the fault.
		Warning symbol, low fuel level	If this symbol is shown, there is less/upto 10% of the fuel left. Bottom line of fuel is also showing in 'R ' .

Symbol	Warning	Designation	Function
		Warning symbol, low oil pressure, diesel engine	If this symbol is shown, the engine's oil pressure is too low. Switch off the engine immediately & fix it.
		Warning symbol, water in the fuel	If this symbol is shown, the engine must be stopped and the fuel pre-filter drained of water.
		Warning symbol, Malfunction Indicator Lamp	During malfunction indicator error from engine: Immediately symbol should come with yellow color alert.
		Warning symbol, Check Engine Lamp	During check engine error from engine: Immediately symbol should come & its in "RED" so its critical warning which needs to be attend immediately

Symbol	Warning	Designation	Function
	**NA**	Warning symbol, HEST (High Exhaust System Temperature)	The High Exhaust System Temperature (HEST) Lamp will illuminate during manual (non-mission) exhaust system cleaning. In addition, the HEST Lamp will also illuminate if the exhaust temperature exceeds the calibrated temperature threshold.
	**NA**	Warning Symbol, Regeneration Needed	The Exhaust System Cleaning/Regeneration Lamp notifies the operator that the aftertreatment system has not auto regenerated at the required time limit and requires an exhaust system cleaning. See “MACHINE SETTINGS” (EAT Cleaning) **If ignored. Engine power might be reduced & Immediately contact Service.**
	**NA**	Warning Symbol, Regeneration Inhibit	The Exhaust System Cleaning/Regeneration Disabled (Inhibit) Lamp indicates that Exhaust System Cleaning/Regeneration Disabled (Inhibit) Switch is active (see machine settings (EAT Cleaning), therefore automatic and manual (non-emission) exhaust system cleaning cannot occur. This may be used by operator to prevent exhaust system cleaning when the machine is operating in a hazardous environment
		Warning Symbol, Glow Plug	While preheating of diesel engine is running the symbol ‘Glow plug’ is shown in the top LH side of display with ‘Yellow’ triangle. Turn the ignition key ‘ON’ to right position I and wait for the Glow plug symbol to disappear from the display & then only start the engine.

Symbol	Warning	Designation	Function
	NA	Parking brake	When the parking brake applied symbol should come red tell- tale
	NA	Parking Brake	When the parking brake released and try to start the machine, symbol should appear to indicate the Parking switch need to applied in machine starting
	NA	FNR in neutral	When the FNR lever away from neutral and try to start the machine, Machine, Symbol will appear to indicate the FNR need to In neutral switch when machine starting.
	NA	Work Mode	In working condition work mode need to select before vibration mode activation, Symbol will appear when work mode switch not activated.
	NA	Driver seat switch reminder	When the driver away from seat in machine starting and also in running condition symbol will appear **o** indicate operator need to seat.
	NA	Driver seat belt reminder	When the driver away from seat in machine starting and also in running condition symbol will appear o indicate operator need to seat

Symbol	Warning	Designation	Function
	NA	Symbolic representation of working mode	Switched ‘ON’ Low speed button and check symbol as per beside with tortoise curve inside the drum (this will appear when low speed activated)
	NA	Symbolic representation of Travel mode	Switched ‘ON’ Low speed button and check symbol as per beside with tortoise curve inside the drum (this will appear when low speed activated)
	NA	Symbolic representation of Vibration 'ON' in low amplitude	Switched 'ON' vibration in low amplitude & check symbol as per beside snap with single curve below drum (this will appear whenever machine running in Vibration low mode only)
	NA	Symbolic representation of Vibration 'ON' in high amplitude	Switched 'ON' vibration in high amplitude & check symbol as per beside snap with dual curves below drum (this will appear whenever machine running in Vibration high mode only)
	NA	Water In Fuel	When water detected in fuel; immediately symbol should come with yellow colour alert.
	NA	Malfunctioning indicator	During malfunction indicator error from engine: Immediately symbol should come with yellow colour alert

Instruments and control, Cab

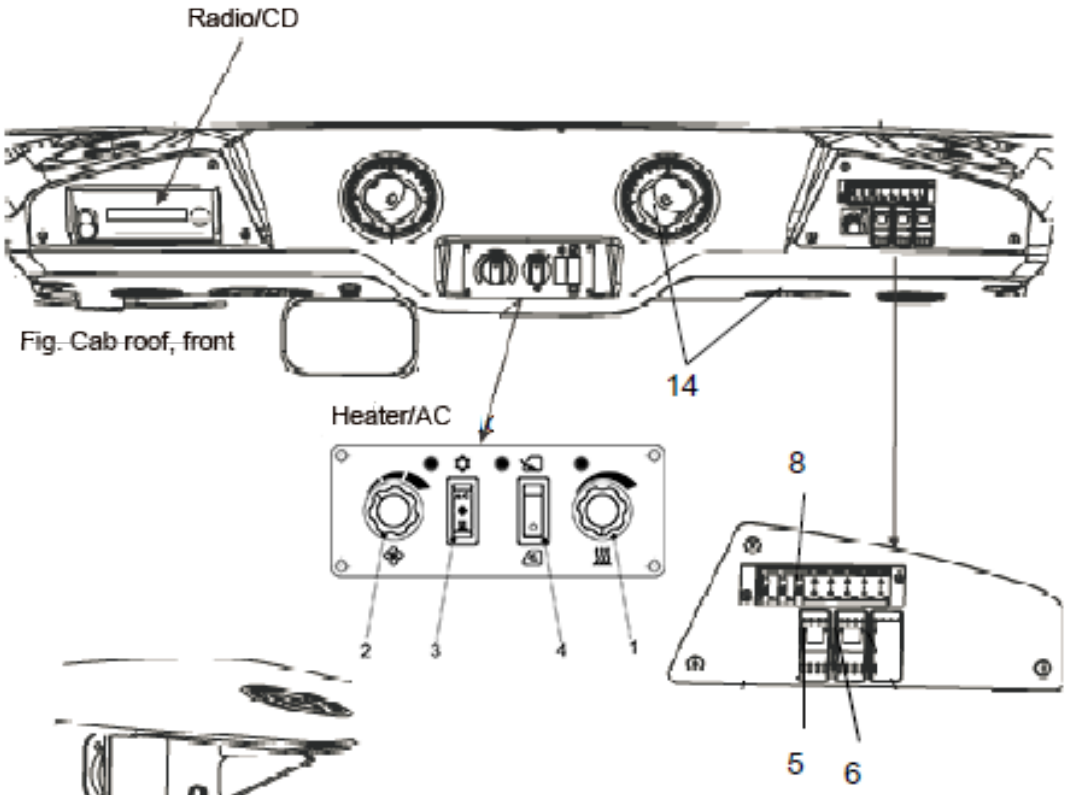


Fig. Cab roof, front

Fig. Right rear cab post

15. Hammer for emerency exit

No.	Designation	Symbol	Function
1.	AC/Heater control		Turn to right increase heating. Turn to centre reduce heating. Turn to left Increase the cooling.
2.	Ventilation fan, Switch		In the left position, the fan is off. Turning the knob to the right increases the volume of air entering the cab
3.	Air conditioning switch		Starts and stops the air conditioning
4.	Cabin air circulation system, switch		Press the button above to open the air damper and allow air to enter the cab. Press the button below to close the damper, which allows air to circulate inside the cab.
5.	Front wiper switch		Press to operate the front screen wiper.

6.	Front and rear windshield washers switch		Press the button on top to activate the front windshield washers.
8.	Fuse box		Contains fuses for the electrical system in the cab.
14.	Air vents		Position the air vents in the best way for you.
15.	Hammer for emergency exit		To escape from the cab in an emergency, release the hammer and break the REAR window.

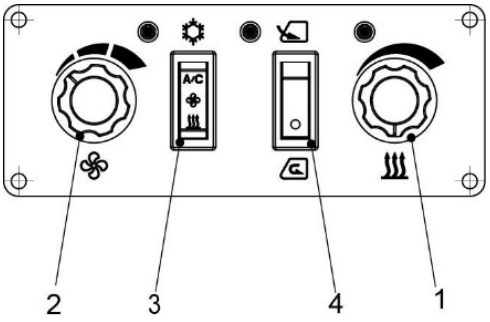


Fig. AC
1. Heat controller
2. Fan
3. AC
4. Cab air circulation system, switch

A/C – System operation

Introduction

This air conditioning system was designed to provide safety and comfort for the equipment operator while working, consequently improving productivity.

Using the cab Controls

Defroster

To Quickly remove ice or mist, make sure that only the front and rear air nozzle are open.

Turn the heater and fan dial (1 and 2) to max.

Adjust the nozzle so that it blows on the window to be de - iced, or to remove mist.

Heat

If the cab is cold, open the lower nozzle on the front columns and the middle nozzle just over the controls for the heater and fan.
Turn the max speed & max fan speed.
When the required temperature has been reached, open the other nozzle and if necessary, turn down the heat and fan speed.

AC

Note :- When using AC all the window must be closed for the system to work efficiently.

To quickly reduce the temperature in the cab, Adjust the following setting on the control panel.

Set the heater control (1) to minimum and turn up the fan speed (2). Keep only the front middle nozzle in the ceiling open.

When the temperature has dropped to a comfortable level, adjust the required temperature on the heater control (1) and reduce the fan speed (2).

Now open the remaining nozzles in the roof to achieve a comfortable temperature in the cab.

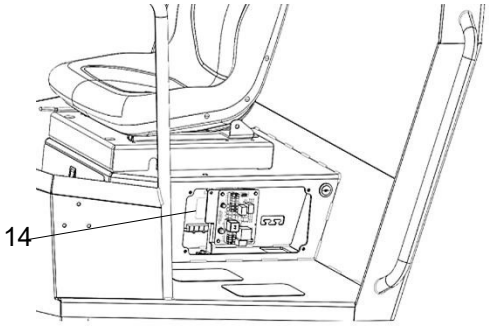


Fig. Driving compartment
14. Control unit (ECU)

Electronic control unit

The electronic control unit (ECU) (14) is place behind Left side the operator's seat.
The ECU controls, Vibration, Engine, start-stops & machine safety interlocks.

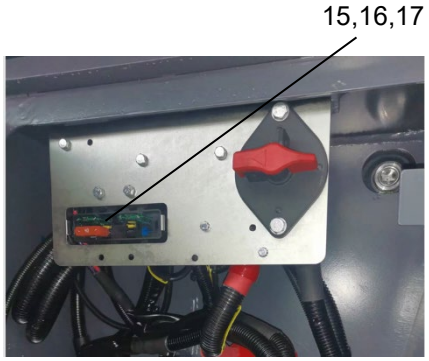


Fig. Engine compartment
15. Main fuse
16. Engine fuse
17. Cab fuse

Main fuses

There are three main fuses. These are on the battery disconnecting switch.
The fuse is of the flat pin type.

Main power (15)	40A (Orange, high).
ECM of the engine (16)	30A (Green)
Cab power (17)	30A (Green)

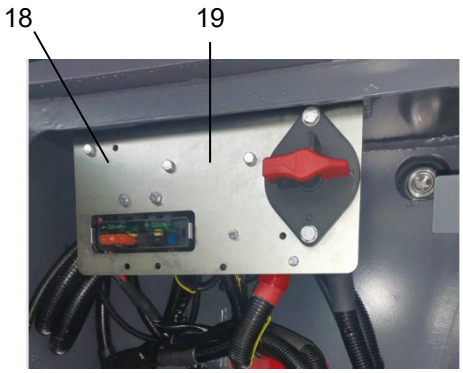


Fig. Engine compartment
18. Start relay
19. Pre heating relay

The Power relays are located in the backside of the bracket, beside the battery switch and are the starting relay (18) and the Pre heating relay (19).

Relays

The table below shows fuse amperage and function.

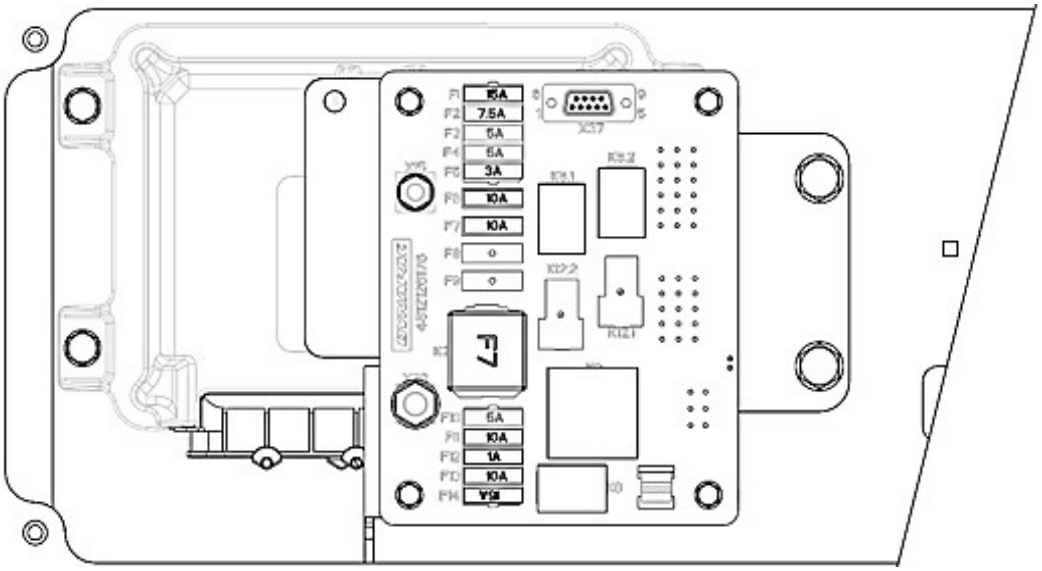


Fig. Relays and fuse board

Fuse	Amperage	Function
F1	Spare	-
F2	Spare	-
F3	5A	Display, Keypad, Dyn@link, P-Brake Switch
F4	5A	Neutral switch, Seat switch, alternator, vibration switch (joystick)
F5	3A	Compaction Meter (Option)
F6	10A	Front Working Lights Relay
F7	15A	Rear Working Lights Relay
F8	15A	Line heater relay
F9	15A	DEF tank power supply
F10	5A	Ignition switch
F11	15A	Power socket outlet (Platform and Rear) Master ECU, Dynalink Power supply
F12	20A	Master ECU
F13	10A	Direction Indicators
F14	20A	Headlights, Position Lights
A6		Circuit board
K1		Starter relay
K30		Cab main relay
K31		Windshield wiper interval time relay
K36		Line heater relay
K37		DEF Supply line relay

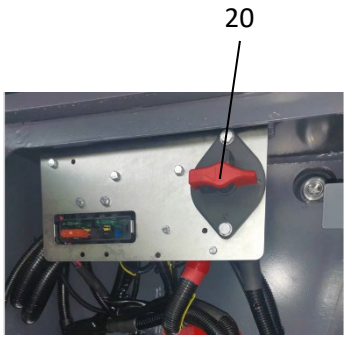


Fig. Engine compartment
20. Master switch

Operation – Start-up

Before starting

Master switch – Activation

Always perform daily maintenance. See the maintenance instructions.

The battery master switch is located in the engine compartment. Open the engine cover and set the key (20) to the ON position. The whole circuit of the machine gets electric power.

The engine hood must be unlocked when required, so that the battery can be quickly disconnected.

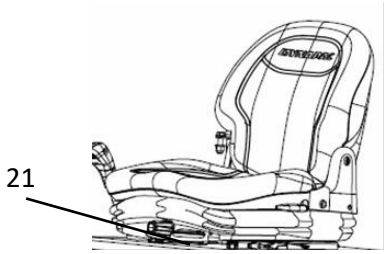


Fig. Operator's seat
21. Length adjustment

Operator seat – Adjustment

Adjust the operator's seat in a comfortable position within easy reach of the controls.

The seat can be adjusted lengthways (21).

Always make sure that the seat is secure before beginning operation.

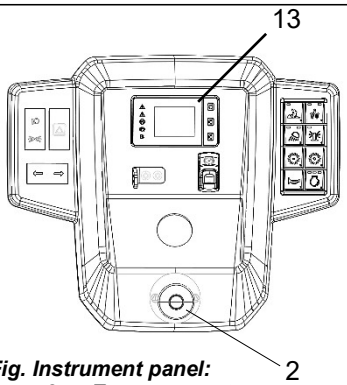


Fig. Instrument panel:
2. Emergency stop;
13. Display;

Before starting

Make sure that the emergency stop (2) is pulled out.

When the roller is in neutral or there is no load on the operator's seat, the automatic brake function is engaged.

Pull out the emergency stop (2).
Turn key to ignition 3rd position.
Check that the warning lamps one the Display (13) are on.

Operator position

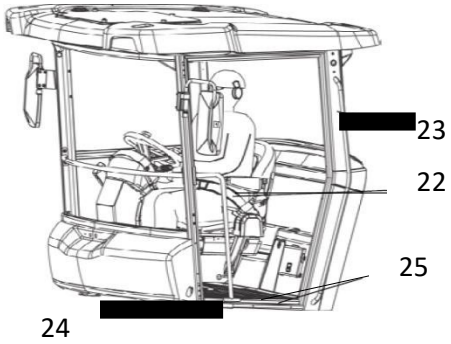


Fig. Operator's position:
22. Safety belt;
23. ROPS;
24. Rubber element;
25. Anti-slip protection.

If a ROPS (23) (Roll Over Protective Structure) or a cab is mounted on the drum, always wear the seat belt (22) provided and wear a protective helmet.

Replace the seatbelt (22) if it is worn out or has been subjected to high levels of force.

Check that rubber elements (24) on the platform are in good condition. Worn elements will impair comfort.

Ensure that the anti-slip protection (25) on the platform is in good condition. Replace if it does not provide good anti-slip friction.

If the machine is fitted with a cab, make sure that the door is closed.

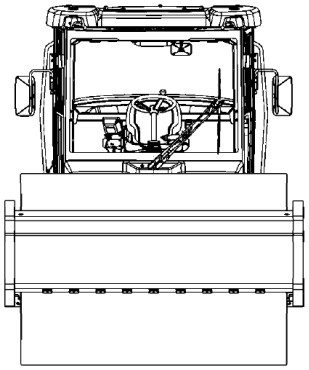


Fig. View

View

Before starting, make sure that the view forwards and backwards is unobstructed.
All cab windows must be clean and rear-view mirrors properly adjusted.

Interlock

The machine is equipped with a locking system.
The engine switches off 4 seconds after the operator rises from the seat at the same time as the forward/reverse lever is in drive position (not neutral).
The engine does not stop if the parking brake is activated.

Sit down for all operations!

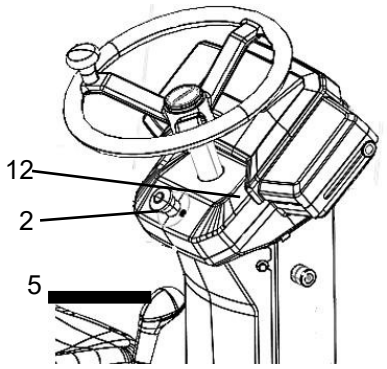


Fig. Control panel:
2. Emergency stop;
12. Parking brake;
5. Forward/reverse lever;

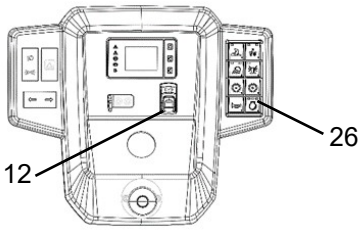


Fig. Control panel:
12. Parking brake
26. Speed selector.

Operation – Start-up

Start of diesel engine

Make sure that the emergency stop (2) is pulled out.

Make sure that the parking brake switch (12) is activated.

Set the forward/reverse lever (5) in neutral. The engine can only be started when the lever is in neutral.

Set Speed selector (26) at the position for idle running, low.

Warmup: turn key to position II. When the heating symbol on the display turns off, turn the starting switch to position 3c. As soon as the engine has started, let the starting switch go.

Do not run the starter motor for too long. If the engine does not start, wait a minute or so before trying again.

Idle the engine for few minutes until it is warm longer if the ambient temperature is less than +10°C (50°F).

At temperatures below 0°C (32°F) the diesel engine and hydraulic system should be warmed up for at least 15 minutes.

When activating and driving the machine in low temperature, remember that the oil has the same temperature and the breaking distances are longer than after it reaches its normal working temperature.

Ensure good ventilation (air extraction) if the diesel engine is run indoors. Risk of carbon monoxide poisoning.

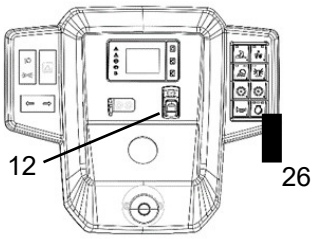
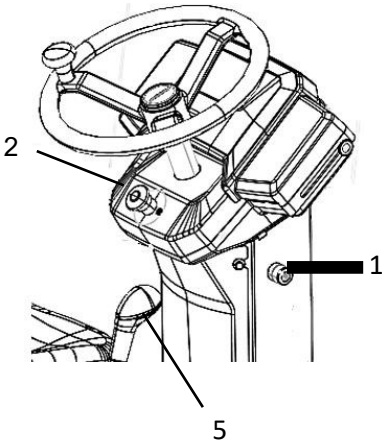


Fig. Control panel:
1. Ignition key;
12. Parking brake switch
2. Emergency stop;
26. Speed selector;
5. Forward/reverse lever;



Operation – Driving

Operating the roller

The machine should never be controlled from the ground. The operator should remain seated at all times.

Set speed selector (26) in high operation position.

Release the parking brake (12).

Check that the steering is working properly by turning the steering wheel once to the right and once to the left while the machine is stationary.

Make sure that the area in front of and behind the machine is clear.

Carefully move the forward/reverse lever (5) forward or backward. Depending on the desired direction of travel.

The speed increases as the lever is moved away from the neutral position.

The speed should always be controlled by using the forward/reverse lever, and never by changing the engine speed.

Test the emergency stop by pressing the emergency stop button (2) while the machine is moving at slow speed. Brace yourself for a sudden stop. The engine will be switched off and the brakes activated.

Check while driving if the warning lights are on.

Operation – Vibration

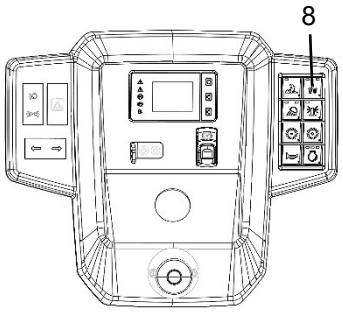


Fig. Control panel:
8. Amplitude switch.

Vibration switch

To activate or deactivate the vibration, activate the high or low amplitude selector (8).

The operator should activate it using the vibration switch, located under the forward/reverse lever (5).

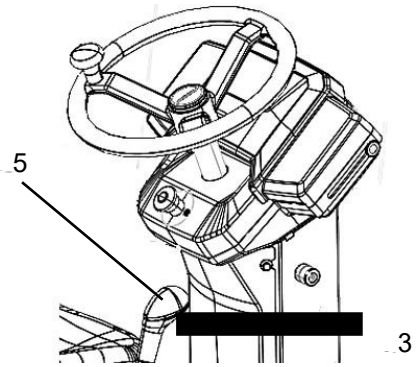


Fig. Forward/reverse lever;
3. Vibration switch.
5. Forward/reverse lever.

Vibration – Activation

Never activate vibration when the machine is stationary. This can damage both the surface and the machine.

Engage and disengage vibration using the switch (3) on the underside of the forward/reverse lever (5).

The vibration should be activated only at high or low speed.

Always switch off vibration before the machine comes to a standstill.

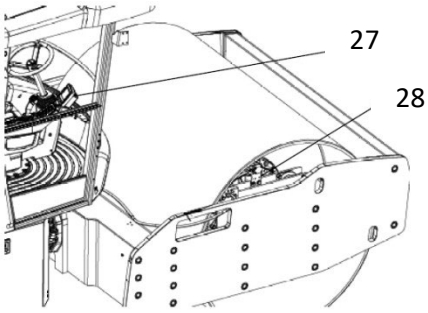


Fig. Main components:
27. CMV display
28. Sensor and processing unit.

Dynapac Compaction Meter (DCM) including Dynapac Bouncing Indication (DBI) – Optional

The Compaction Meter is an accessory used to improve compaction efficiency and efficacy. Its system allows to choose different types of materials as a parameter, adapting the system to the material being compacted. If the machine is equipped with the meter, an extra display indicates the stiffness of the surface as CMV (compaction meter value).

DBI is integrated in the compaction meter and warns the operator about the bouncing effect. This resource serves to preserve both the compacted material and the machine.

The compaction meter is available for all versions, but since contact with the ground varies a lot in version P and PD, the readings may not be conclusive and DBI will remain active. It is possible to deactivate active bouncing control via the Options menu.

Setting the CMV limits

The CMV display (compaction value) will inform the operator about the frequency and tilt together with the current CMV level and the limits defined by the operator. Use the buttons on the left of the display to set the limits. The scale will switch automatically between 0-75 and 0-150 depending on the current reading.

If bouncing occurs, the operator will receive an alert signal (!) on the display.

The sensor is mounted on the side plate on the right over the main bearing and detects vibration movements of the drum. The information is transmitted to the processor unit, where it is analysed.

The analysed information is presented in the display as a digital value expressed in CMV (Compaction Meter Value). The high or low interval is automatically selected and shown on the display. The resulting numerical value is a relative measure of identified ground stiffness.

Operation CMV

The Compaction Meter is measuring the dynamic stiffness of the ground. CMV is affected by bearing speed, direction (forward or backward), amplitude and vibration frequency. DCM is less sensitive to small variation in vibration frequency.

Some reference CMV for some compacted materials:

Material	CMV
Rockfill	40 - 200
Rock fill	25 - 100
Sand	20 - 60
Silt	5 -30
Clay	0 - 80

The water content in the compacted soil, except for rockfill, has a large influence on stiffness; wet soil will result in low CMV and dry soil will result in higher CMV.

When bouncing occurs, CMV will be reduced and this lower CMV should not be used for determine if compaction is ready or not.

NOTE: The operator should always focus on the direction of driving and not too much on the CMV display for safety reasons.

Operation – Stopping

Braking

Service brake

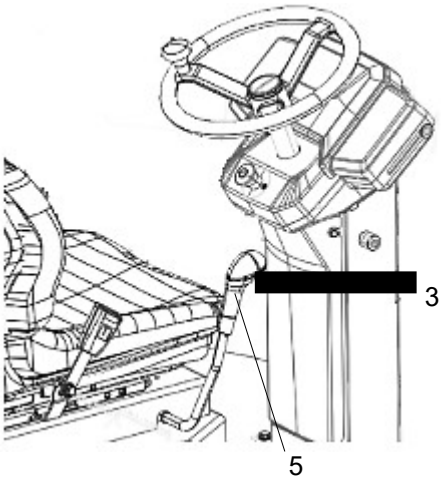


Fig. Control panel:
3. Vibration switch;
5. Forward/reverse lever;

Press the switch (3) to switch off the vibration.

Place the forward/reverse lever (5) to neutral position to stop the machine.

Set Throttle control to idle running position.

Set the parking brake switch in the 'ON' position.

Always use the parking brake when the machine is stationary on a sloping surface.

When starting and driving a machine that is cold, remember that the hydraulic fluid is also cold and that braking distances can be longer than normal until the machine reaches the working temperature.

Reserve brake

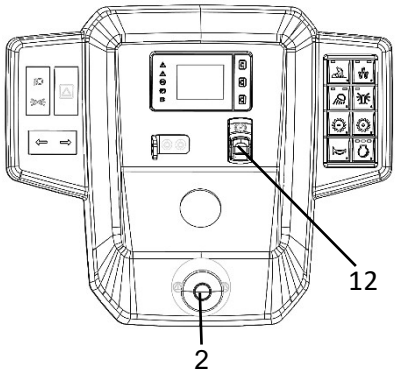


Fig. Control panel:
2. Emergency stop;
12. Parking brake

Braking is normally activated using the forward/reverse lever. The hydrostatic transmission retards and slows the roller when the lever is moved towards the neutral position.

There is also a brake in the Drum motor, gear box and rear axle of the machine that acts as an emergency brake during operation.

For reserve braking, press the parking bake button (12), hold the steering wheel firmly and be prepared for a sudden stop. The brakes are applied and the engine stops.

Emergency stop

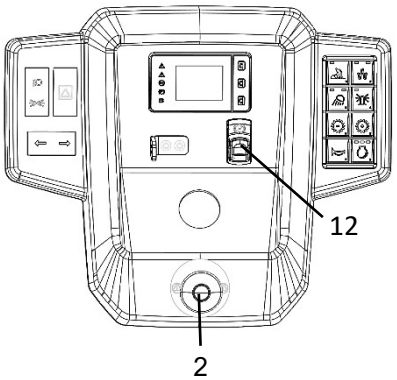


Fig. Control panel:
3. Emergency stop;
12. Parking brake

The emergency stop is activated by pressing the button (2).
.
Hold the steering wheel firmly and brace yourself for sudden stop.

The brake is applied and the engine stops.
After an emergency stop, return the forward/reverse lever to neutral and deactivate the emergency stop by pulling up the button (2).

Activate the parking brake (12) and the engine can be restarted.

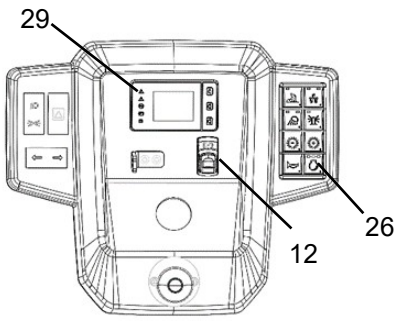


Fig. Control panel:
29. Warning lights panel;
26. Throttle lever;
12. Parking brake;

Switching off

Check the controls and warning lights to see if any faults are indicated (29). Switch off all lights and other electrical functions.

Set Speed selector (26) in low idle position and let the engine run for about one minute.

Activate the parking brake (12).

Turn the ignition key to the left to the switched off position (1). At the end of the shift. Lower down and lock the control panel cover.

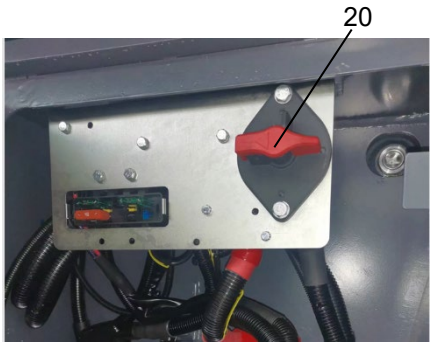


Fig. Engine compartment:
20. Master switch.

Parking of the machine

Master switch

Switch the master switch (20) into disconnected mode and remove the key at the end of the shift. This will prevent battery discharging and will also make it difficult for unauthorised persons to start and operate the machine. Also lock the engine hood with the key.

Chocking the drums

Never leave the machine when the is engine running, without pressing the emergency or parking brake button first.

Make sure that the machine is parked in a safe place with respect to other people who pass through the place. Chock the drums if the roller is parked on sloping ground.

Remember the risk of freezing during the winter. Fill the engine cooling system and the screen wash bottle of the cab windshields, tyres with suitable anti- freeze mixtures. See maintenance instructions as well.

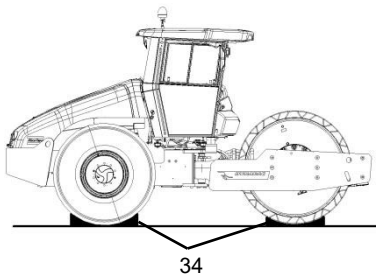


Fig. Machine:
34. Chocks.

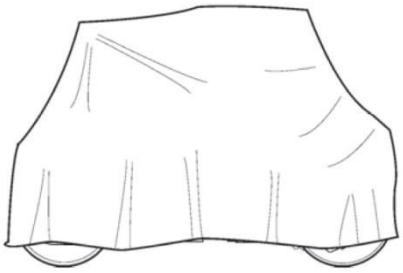


Fig. Drum protection against bad weather

Long-term Parking

The following instructions should be followed for long-term parking (more than one month).

These measures apply when parking for a period of up to 6 months.

Wash the machine and touch up the paint finish to avoid rusting.

Treat exposed parts with anti-rust agent, lubricate the machine thoroughly and apply grease to unpainted surfaces.

Engine

See manufacturer's instructions in the engine manual that accompanies with the roller.

Battery

Remove the battery from the machine. Clean the battery, check that the electrolyte level is correct and trickle-charge the battery once a month.

Air cleaner, exhaust pipe

Cover the air cleaner or its opening with plastic or tape. Also cover the exhaust pipe opening. This is necessary to prevent moisture from entering the engine.

Fuel tank

Fill the fuel tank completely to prevent condensation.

Hydraulic reservoir

Fill the hydraulic reservoir to the uppermost level mark.

Steering Cylinder, hinges, etc.

Lubricate the articulation bearings with grease

Grease the steering cylinder piston with conservation grease.

Grease the hinges on the doors to the engine compartment and the cab. Lubricate both ends of the forward/reverse control (chrome-plated parts)

Hoods, tarpaulin

Place the control cover over the control panel.

Cover the whole machine with protective tarpaulin. A gap must be left between the tarpaulin and the ground.

If possible, store the machine indoors and ideally in a building where the temperature is constant.

Tires (all-weather)

Check that the tire pressure is 16 Psi.

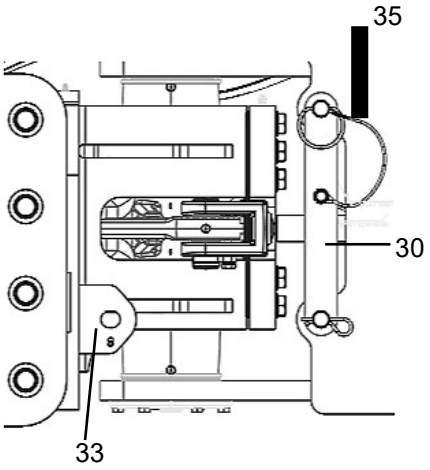


Fig. Articulation in locked position
35. Pin with wire
30. Locking arm
33. Locking the articulation

Miscellaneous

Lifting

Locking the steering articulation

Steering articulation must be locked to prevent inadvertent turning before lifting the machine.

Turn the steering wheel so the direction is straight forward. Press the emergency/parking brake button.

Pull out the lowermost safety pin with a wire (35).

Fold out the locking arm (30) and secure it to the articulation lock (33) on the steering joint.

Fit the locking pin (35) in the holes through the arm (30) and attach the locking pin with the safety pin (33).

Lifting the Roller

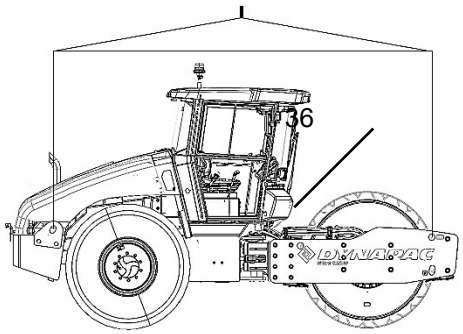


Fig. Roller prepared for hoisting
36. Product identification plate

The machine's gross weight is specified on the Product identification plate (36). Refer to the technical specifications as well.

Lifting equipment such as chains, steel wires, straps and lifting hooks must be dimensioned in accordance with the relevant safety regulations for the lifting equipment.

Stand clear when the machine is Lifted! Make sure that lifting hooks are securely anchored.

Unlocking the articulation

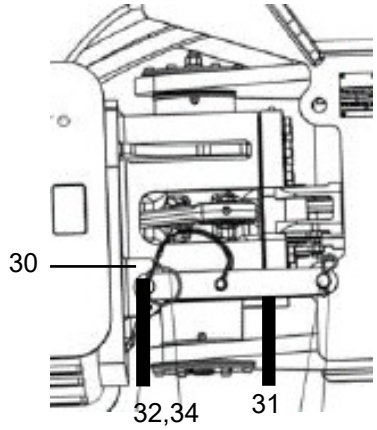


Fig. Articulation in open position
30. Locking arm
31. Safety lock
32. Locking pin
33. Locking the articulation

Remember to unlock the articulation before the start of operation.

Fold the locking arm (31) back and secure it in the locking articulation (33) with the locking pin (30). Install the safety pin with the cable (31) to attach the locking pin (32). The locking articulation (33) is located on the frame of the machine.

Towing

The machine can be moved up to 300 metres in accordance with the following instructions.

Alternative 1

Short distance towing with the engine running.

Press the emergency/parking brake button and temporarily stop the engine. As a safety measure to prevent the drum from rolling, chock the rollers.

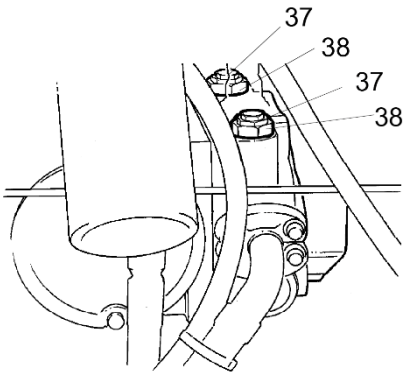
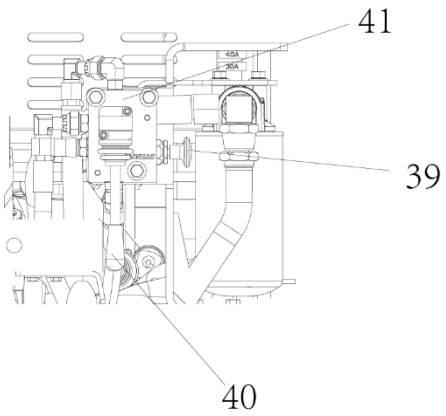


Fig. Propulsion pump
37. Setting screw
38. Safety nut
39. Knob
40. Lever
41. Brake release valve

Turn both safety nut (38) one turn anti clockwise, then to loosen (rotate anti clockwise) the setting screw (37) completely. The Setting screw are place on the up & downside of drive pump.

Alternative 2

Towing short distances when the engine is in-operative



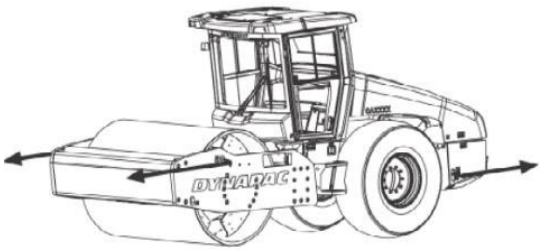
First release both towing valves as per alternative 1.

Press the knob (39) fully and pump the lever (40) forward/ reverse up to 20 to 25 time, up to get resistance in lever.

Start the engine in low idle. The machine can now tow and can also be steered if the steering system is working.

Towing the Roller

When the roller is towed/recovered, the towing vehicle will have to break it. If necessary, use a towing bar, since the machine will have no breaks.



The machine has to be towed slowly at a max. speed of 3 km/h (2 mph), and only for short distances, of max. 300 m (330 yards).

When towing/retrieving a machine, the towing device must be connected to both lifting holes. The pulling force shall act longitudinally on the machine as shown in the figure. Maximum gross pulling force 185 kN (41590 lbf).

Restore the items for towing according to alternative 1 on the preceding pages.

Preparation of the Roller for transport

Lock the steering articulation before lifting and transporting. Follow the instructions in the corresponding sections.

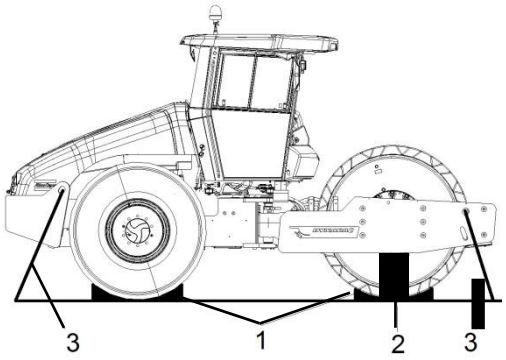


Fig. Transport
42. Chocks
43. Support
44. Tensioning belt

Apply the chocks to the drums (1) and then attach them to the transport vehicle.

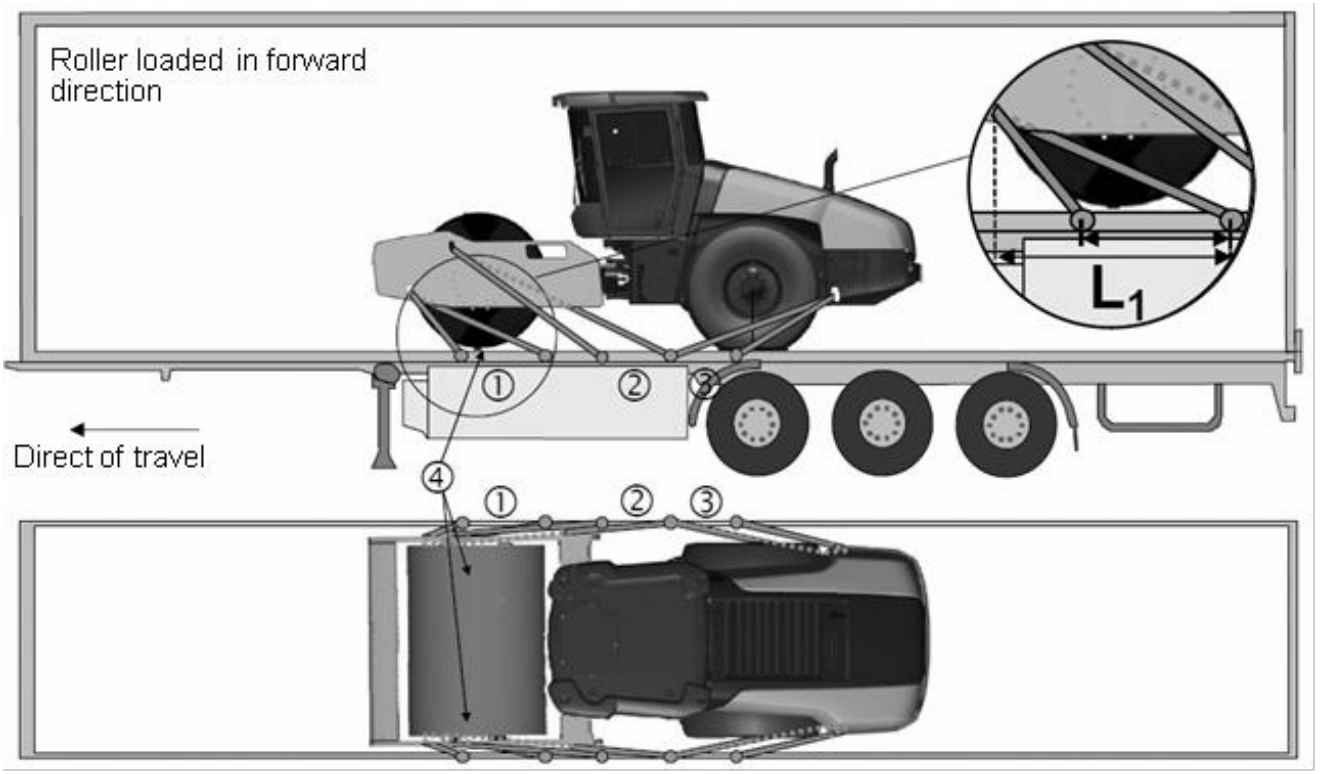
Place support under the drum frame (2) to avoid overloading on the roller suspension when it is stuck in the tensioning belts.

Secure down the machine with tensioning belts (3) at all four corners. The decals indicate the points of attachment.

Remember to deactivate the steering articulation before starting the roller.

Securing in closed Container for loading

Securing the CA50D / CA55D / CA65D / CA70D/PD
Vibratory roller from Dynapac for transport.



1 – 3= Double lashing, i.e one lashing with two parts secured to two different lashing mounts, symmetrically located on the right and left sides.

4 – Rubber.

The lashings' permitted distance interval in meters		
(1 - 3: Double lashings, LC at least 1.7 tonnes (1700 daN), S_{TF} 300 kg (300daN))		
Double L_1	Double L_2	Double L_3
0,9 - 2,5	0,9 - 2,5	0,1 - 2,5

*For lashing 1 is **L_1** the distance between the lashing point on the edge of the platform and the point directly sideways from the lashing point on the roller perpendicular to the platform edge. The relationship for lashings **L_2 and L_3** is the same.*

Note - "Shown Pictorial view may not be the same as actual machine view ".

Operating instructions – Summary

1. **Follow the SAFETY INSTRUCTIONS specified in the safety manual;**
2. Make sure that all instructions in the MAINTENANCE section are followed;
3. Activate the battery switch;
4. Set the forward/reverse lever in neutral;
5. Set the switch for manual/static vibration to the 0 position;
6. Set rotation starter switch in the position for idle running (950 rpm);
7. Start the engine and allow it to warm up;
8. Set the engine speed control to the operating position (2300 rpm);
9. Set Throttle lever to maximum start position;
10. **Move the roller, carefully moving the forward/reverse lever;**
11. **Test the brakes. Remember that the braking distance will be longer if the roller is cold;**
12. Use vibration only when the roller is in motion;
13. **In case of emergency:**
    - **Press the emergency/parking brake button;**
    - **Hold the steering wheel firmly;**
    - **Brace yourself for a sudden stop**.
14. When parked
    - Press the reserve/parking brake button;
    - Stop the engine and chock the drum and wheels.
15. To lift the machine:
    - Refer to the relevant section in the Instruction Manual.
16. To tow:
    - Refer to the relevant section in the Instruction Manual.
17. When transporting:
    - Refer to the relevant section in the Instruction Manual.
18. To recover:
    - Refer to the relevant section in the Instruction Manual.

Preventive maintenance

Complete maintenance is necessary for the machine to function satisfactorily and at the lowest possible cost.

The Maintenance section includes periodic maintenance that must be carried out on the machine.

The recommended maintenance intervals assume that the machine is used in a normal environment and working conditions.

Acceptance and delivery inspection

The machine is tested and adjusted before it leaves the factory.

On arrival, before delivery to the customer, a delivery inspection must be conducted as per the check list in the warranty document.

Any transport damage must be immediately reported to the transport company.

Warranty

The warranty is only valid if the stipulated delivery inspections and the service inspections have been completed as per the warranty document, and when the machine has been registered at the start of the warranty.

The warranty is not valid if damage has been caused by inadequate service, incorrect use of the machine, use of lubricants and hydraulic fluids other than those specified in the manual, or if any other adjustments have been made without the requisite authorisation.

Maintenance – Lubricants and symbols

Always use high-quality lubricants in the recommended amounts. Too much grease or oil can cause overheating, resulting in premature wear.

	**ENGINE OIL**	PN DYNAPAC550– 4 lits (API CI-4)
	**HYDRAULIC FLUID**	PN 4812313760 – 18 lits
	**Axle OIL**	PN DYNAPAC100 – 4 lits
	**Drum gear Oil**	PN DYNAPAC100 – 4 lits
	**Drum OIL**	PN 4812270282 – 4 lits
	**GREASE**	PN 4812161897 Dynapac Grease or equivalent for articulated joint.
	**FUEL**	See the instruction manual for the engine.
	**COOLANT**	Anti-freeze protection effective down to -37°C. PN 4812161854 – 20 lit Dynapac coolant 100

Other fuel and lubricants are required when operating in areas with extremely high or extremely low ambient temperature. See the “Special instructions” section or contact Dynapac.

Maintenance symbols

	Engine, oil level		Tire pressure
	Engine, oil filter		Air cleaner
	Hydraulic reservoir		Battery
	Hydraulic fluid, filter		Recycling
	Transmission, oil level		Fuel filter
	Drum, oil level		Coolant
	Oil for lubrication		

Maintenance Schedule: CA55/CA65/CA70

CA55/CA65/CA70 T3 1st year (1000 h) service kit				1st year			
Item	P/N	QTY	fluid volume	50	500	1000	1st year
Oil filter	4812310250	5		1	1	1	3
Fuel filter	4812310252	5		1	1	1	3
Fuel pre-filter	4812310306	5		1	1	1	3
Oil-water separator filter	4812310251	2			1	1	2
Air filter, main	4812310309	2			1	1	2
Air filter, safety	4812310310	1				1	1
Hydraulic oil filter	4700372229	2		1		1	2
Engine oil (4L)	DYNAPAC550	22	17L/once	1	1	1	3
Rear axle gear oil (4L)	DYNAPAC100	11	21L/once	1		1	2
Drum gear box oil (4L)	DYNAPAC100	2	3.5LX1/once	1		1	2
Drum oil (4L)	4812270282	2	2.2LX2/once,	1		1	2
Hydraulic oil (18L)	4812313760	0	52 L X 1 /once				0

CA55/CA65/CA70 T3 2nd year (1000 h) service kit				2nd year		
item	P/N	QTY	fluid volume	1500	2000	2nd year
Oil filter	4812310250	4		1	1	2
Fuel filter	4812310252	4		1	1	2
Fuel pre-filter	4812310306	4		1	1	2
Oil-water separator filter	4812310251	2		1	1	2
Air filter, main	4812310309	2		1	1	2
Air filter, safety	4812310310	1			1	1
Hydraulic oil filter	4700372229	1			1	1
Engine oil (4L)	DYNAPAC550	17	17L/once	1	1	2
Rear axle gear oil (4L)	DYNAPAC100	6	21L/once		1	1
Drum gear box oil (4L)	DYNAPAC100	1	3.5LX1/once		1	1
Drum oil (4L)	4812270282	2	2.2LX2/once,		1	1
Hydraulic oil (18L)	4812313760	3	52 L X 1 /once		1	1

CA55/CA65/CA70 T3 3rd year (1000 h) service kit				3rd year		
item	P/N	QTY	fluid volume	2500	3000	3rd year
Oil filter	4812310250	4		1	1	2
Fuel filter	4812310252	4		1	1	2
Fuel pre-filter	4812310306	4		1	1	2
Oil-water separator filter	4812310251	2		1	1	2
Air filter, main	4812310309	2		1	1	2
Air filter, safety	4812310310	1			1	1
Hydraulic oil filter	4700372229	1			1	1
Engine oil (4L)	DYNAPAC550	17	17L/once	1	1	2
Rear axle gear oil (4L)	DYNAPAC100	6	21L/once		1	1
Drum gear box oil (4L)	DYNAPAC100	1	3.5LX1/once		1	1
Drum oil (4L)	4812270282	2	2.2LX2/once,		1	1
Hydraulic oil (18L)	4812313760	0	52 L X 1 /once			0

Maintenance Schedule: CA50

CA50 T3 1st year (1000 h) service kit				1st year			
Item	P/N	QTY	fluid volume	50	500	1000	1st year
Oil filter	4812310250	5		1	1	1	3
Fuel filter	4812310275	5		1	1	1	3
Fuel pre-filter	4812310382	5		1	1	1	3
Air filter, main	4700390995	2			1	1	2
Air filter, safety	4700390994	1				1	1
Hydraulic oil filter	4700372229	2		1		1	2
Engine oil (4L)	DYNAPAC550	14	9 L/once	1	1	1	3
Rear axle gear oil (4L)	DYNAPAC100	11	21 L/once	1		1	2
Drum gear box oil (4L)	DYNAPAC100	3	2.5 LX1/once	1		1	2
Drum oil (4L)	4812270282	2	2.2 LX2/once,	1		1	2
Hydraulic oil (18L)	4812313760	0	52 L X 1 /once				0

CA50 T3 2nd year (1000 h) service kit				2nd year		
item	P/N	QTY	fluid volume	1500	2000	2nd year
Oil filter	4812310250	4		1	1	2
Fuel filter	4812310275	4		1	1	2
Fuel pre-filter	4812310382	4		1	1	2
Air filter, main	4700390995	2		1	1	2
Air filter, safety	4700390994	1			1	1
Hydraulic oil filter	4700372229	1			1	1
Engine oil (4L)	DYNAPAC550	9	9 L/once	1	1	2
Rear axle gear oil (4L)	DYNAPAC100	6	21 L/once		1	1
Drum gear box oil (4L)	DYNAPAC100	2	2.5 LX1/once		1	1
Drum oil (4L)	4812270282	2	2.2 LX2/once,		1	1
Hydraulic oil (18L)	4812313760	3	52 L X 1 /once		1	1

CA50 T3 3rd year (1000 h) service kit				3rd year		
item	P/N	QTY	fluid volume	2500	3000	3rd year
Oil filter	4812310250	4		1	1	2
Fuel filter	4812310275	4		1	1	2
Fuel pre-filter	4812310382	4		1	1	2
Air filter, main	4700390995	2		1	1	2
Air filter, safety	4700390994	1			1	1
Hydraulic oil filter	4700372229	1			1	1
Engine oil (4L)	DYNAPAC550	9	9 L/once	1	1	2
Rear axle gear oil (4L)	DYNAPAC100	6	21 L/once		1	1
Drum gear box oil (4L)	DYNAPAC100	2	2.5 LX1/once		1	1
Drum oil (4L)	4812270282	2	2.2 LX2/once,		1	1
Hydraulic oil (18L)	4812313760	0	52 L X 1 /once			0

Maintenance – Planned maintenance

Service and inspection points

Carefully read this section of the manual before performing any maintenance service or lubrication of the machine.

Get in the habit of examining the areas around and under the equipment. It is a common and easy way to detect leaks in the early stages and possible abnormalities.

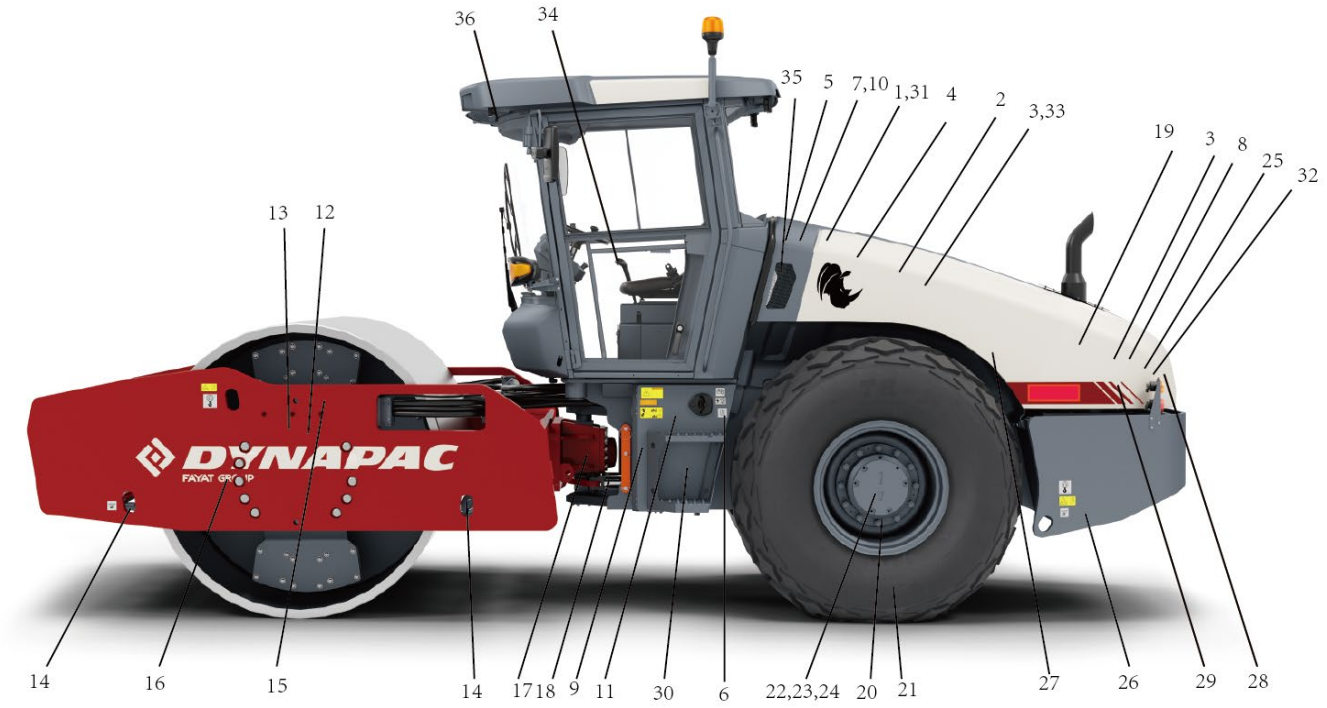


Fig. Service and inspection points

1. Radiator grille
2. Engine oil level plug
3. Fuel filter, fuel filter 2nd
4. Air filter
5. Engine hood
6. Hydraulic oil tank level plug
7. Hydraulic oil tank vent filter
8. Hydraulic oil filter
9. Hydraulic oil tank drain port generator
10. Hydraulic oil filling
11. Fuse box
12. drum oil filling, x2

*Optional equipment

13. drum gearbox
14. Scraper
15. drum oil, level plug, x2
16. Damping rubber and fastenings
17. Steering joint
18. Steering cylinder, x2
19 Clutch, hydraulic pump
20. wheel nut
21. Tire and air pressure

22. Rear axle, differential
23. Rear axle, planetary gear.
24. Rear axle installation, both sides

25. Engine oil filter
26. Fuel tank drain port
27. Diesel engine installation, x4
28. release brake pump
29. Diesel engine, refuel
30. Battery
31. Radiator
32. oil-water separator filter
33. Engine belt, cooling, and AC

34. Forward/reverse gear lever
35. Coolant in expansion tank
36. Air conditioning*

Scheduled maintenance and lubrication

The maintenance and lubrication services should be performed firstly based on the number of operation hours, and secondly, based on periods of time such as days, weeks, etc.

Always clean around covers, caps, fittings or plugs before opening them or applying grease.

Respect and follow the engine manufacturer's instructions. Refer to the engine manual for detailed instructions.

Park the roller on a flat surface.

Always turn off the engine and confirm that the forward/reverse lever is in "neutral" position before inspecting and adjusting the machine.

When the engine is on in enclosed spaces, make sure that there is enough air coming in to avoid carbon monoxide poisoning.

Service and maintenance point

Check the Dobbs meter on the machine to know what type of maintenance is needed.

Every 10 hours of operation (Daily)

Refer to the contents to find the page number of the sections referred to !

Pos. in fig	Action	Comment
	Before starting up for the first time on that day	
13	Check the scraper setting	
1	Check for free circulation of cooling air	
35	Check coolant level	Refer to the engine manual
3	Check the engine oil level	Refer to the engine manual
28	Refuel	
5	Check the hydraulic reservoir level	
	Test the brakes	

Every 50 hours of operation (Weekly)

Refer to the contents to find the page number of the sections referred to!

Pos. in fig	Action	Comment
	Check that hoses and couplings are not leaking	
4	Inspect/clean the filter element in the air cleaner	Replace as required
17	Lubricate the articulation / steering Joint	
19	Check the wheel-nuts are tightened	
20	Check the tire pressure	
	Check the air conditioning	Optional

After the FIRST 50 hours of operation

Refer to the contents to find the page number of the sections referred to !

Pos. in fig	Action	Comment
8	Change the hydraulic fluid filter	
22	Change oil in rear axle differential	
23	Change oil in the rear axle planetary gearing	

2,25	Change the Engine Oil & Oil filter	Refer to the engine manual
3	Change the fuel filter & pre fuel filter	Refer to the engine manual
13	Change the oil in the drum gearbox	
15	Change the oil in the drum	

Every 500 / 1500 hours of operation (Every three months)

Refer to the contents to find the page number of the sections referred to !

Pos. in fig	Action	Comment
3	Change the fuel filter & pre fuel filter	Refer to the engine manual
6	Check bleeder filter on hydraulic reservoir	
2,25	Change the Engine Oil & Oil filter	Refer to the engine manual
32	Change the water separator	Refer to the engine manual
4	Change the air cleaner's main filter	
15	Cleaning the ventilation screws in the drum cartridges	

Every 1000 hours of operation (Every six months)

Refer to the contents to find the page number of the sections referred to !

Pos. in fig	Action	Comment
4	Replace the air cleaner's main filter and backup filter	
7	Change the hydraulic fluid filter	
8	Drain the condensate from hydraulic reservoir	
25	Drain condensate from fuel tank	
22	Change oil in rear axle differential	
23	Change oil in the rear axle planetary gearing	
13	Change the oil in the drum gearbox	
15	Change the oil in the drum	
	Check engine valve clearances	Refer to the engine manual
33	Check belt tension for Engine drive system	Refer to the engine manual
2,25	Change the Engine Oil & Oil filter	Refer to the engine manual
3	Change the Fuel filter & pre fuel filter	Refer to the engine manual
32	Change the water separator	Refer to the engine manual
15	Cleaning the ventilation screws in the drum cartridges	
36	Change the AC air filter element	According to the specific working conditions can also shorten the replacement cycle to 6M

Every 2000 hours of operation (Yearly)

Refer to the contents to find the page number of the sections referred to !

Pos. in fig	Action	Comment
7	Change the hydraulic fluid filter	
8, 9	Change the hydraulic fluid	
15	Change the oil in the drum	
	Overhaul air conditioning	Optional
2,25	Change the Engine Oil & Oil filter	Refer to the engine manual
3	Change the Fuel filter & Pre fuel filter	Refer to the engine manual
32	Change the water separator	Refer to the engine manual
13	Change the oil in the Drum Gear box	
22	Change oil in rear axle differential	
23	Change oil in the rear axle planetary gearing	
4	Replace the air cleaner's main filter and backup filter	
33	Check belt tension for Engine drive system	Refer to the engine manual
15	Cleaning the ventilation screws in the drum cartridges	
15	Drum cartridge – oil level glass change	
35	Change the coolant from radiator	Refer to the engine manual

Maintenance, 10h

Every 10 hours of operation (Daily)

Park the roller on a level surface.
When checking and making adjustments, the engine should be switched off and the emergency/parking brake should be applied, if not otherwise specified.

Ensure that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.

Scrapers – Check adjustment

It is important to remember that the drum moves when the machine turns. If adjustment is made closer than the indicated values, the scrapers may get damaged or cause an increased wear of the drum.

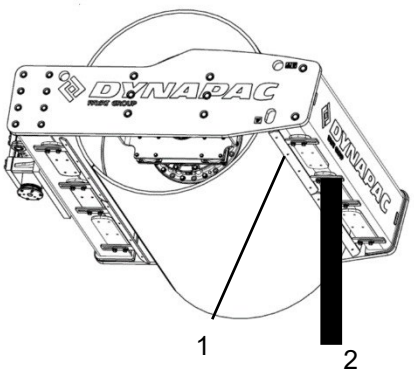


Fig. Smooth drum scraper
1. *Scraper blade*
2. *Screws*

Smooth drum

If necessary, adjust distance to the drum as follows:

Loosen the screws (2) on the scraper attachment.

Then, adjust the scraper beam (1) to 20 mm from the drum.

Tighten the screws (2).

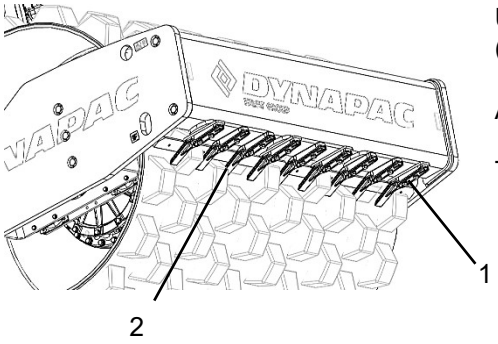


Fig. Padfoot drum scraper
1. *Screws*
2. *Scraper bar (x18)*

Padfoot drum

Undo the screws (1), then adjust each scraper bar (2) to 25 mm (1.0 in) between scraper bar and drum.

Align each scraper bar (2) between the pads.

Tighten the screws (1).

Air circulation

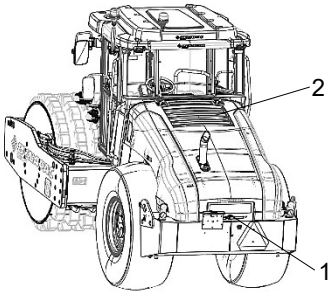


Fig. Engine compartment cover
1. *Hood latch*
2. *Protection grille*

Ensure that the engine has free circulation of cooling air through the protective grille in the hood.

To open the engine hood, turn the hood latch (1) upward. Raise the hood to its fully open position, checking that the red safety catch on the left gas spring is latched.

If the engine's gas-springs are out of action and the hood is put at its upper position – block the hood so that it cannot fall.

Check fluid levels

Coolant level – Check

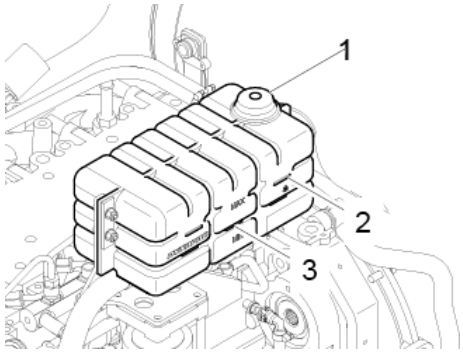


Fig. Coolant tank
1. *Filler cap*
2. *Max. level*
3. *Min. level*

The coolant tank is located inside the hood above cooler package and is seen easiest from the right side of the machine. The filler cap (1) can be accessed after opening the engine hood.
Check the coolant level with the engine stopped and cold. Check that level of the coolant is between the max. (2)and min. marks. (3).

When at working temperature, the coolant is hot and pressurised
the vapour may cause injuries. Open the filler cap carefully to release the pressure. Wear protective goggles and protective gloves.

Fill with a coolant mixture of 50% water and 50% antifreeze. See instructions for lubricant and symbols.

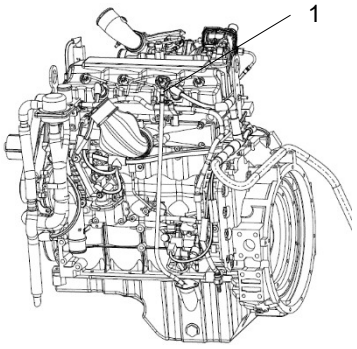


Fig. 1 – Dipstick

Engine oil level

Take care not to come in contact with the parts

The dipstick is located on the Right side of the machine and it can be accessed from the opening in the fender.

Pull up the dipstick (1) and check that the oil level is between the upper and lower marks.
For further details, refer to the engine's instruction manual.

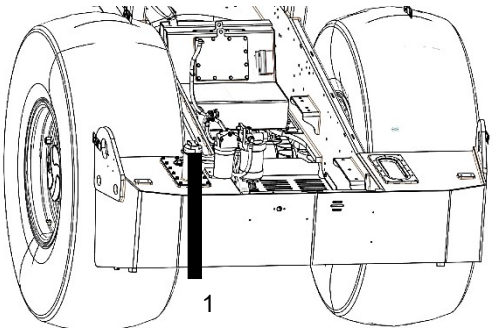


Fig. Rear left
1. Refuelling pipe

Fuel tank – Filling

Refuel daily with diesel fuel up to the lower edge of the filler pipe (1). Follow the engine manufacturer's specifications with respect to fuel quality.

Stop the engine. Short-circuit the filler gun against a non-insulated part of the machine before refuelling, and against the filler pipe (1) while refuelling.

Never refuel while the engine is running. Do not smoke and avoid spilling fuel.

Check the tank capacity in the "Technical specifications – Weights and volumes" section.

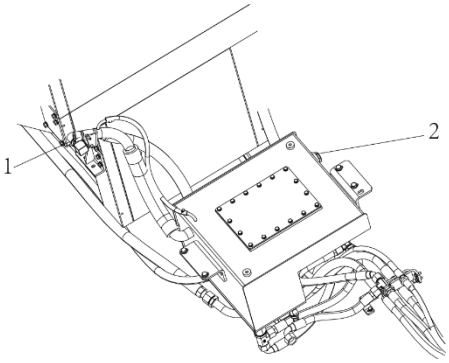


Fig. Hydraulic fluid tank sight glass
2. Level glass

Hydraulic fluid reservoir – Check fluid level

The sight glass is located on the left-hand side and front side of cooler package below platform.
See the slight glass pen the battery cabin door located at left side beside the platform.

Place the machine on a flat surface and check the fluid level in the sight glass. If the level is too low, top up with the type of hydraulic fluid specified in the lubricant specification.

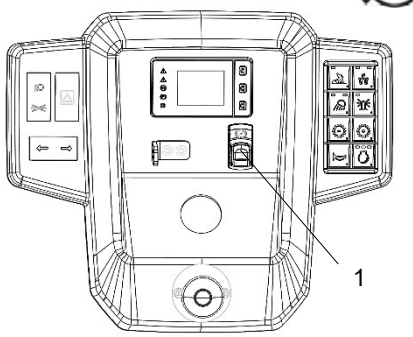


Fig. Control panel
1. Parking brake switch

Check functioning of the breaks

Parking Brake

Drive the machine slowly forward. Hold the steering wheel firmly and brace yourself for a sudden stop.
Press the parking brake button (1). The machine should stop abruptly with the engine running.
After testing the brakes, set the forward/reverse lever in neutral.
Reactivate the parking brake switch (1).
The machine is ready for operation.

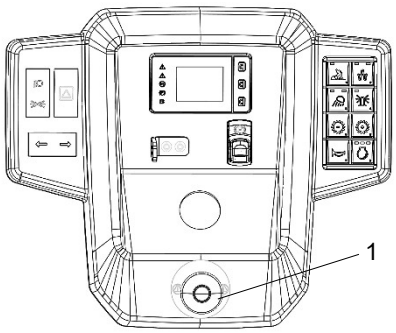


Fig. Control panel
1. Emergency Stop

Emergency stop

Drive the machine slowly forward. Hold the steering wheel firmly and brace yourself for a sudden stop.
Press the emergency stop (1). The machine will stop abruptly and the engine will be switched off.
After testing the brakes, set the forward/reverse lever in neutral.
Pull out the emergency stop (1).
Turn on the engine.
The machine is ready for operation.

Articulated/Steering joint – Lubrication

Presence of people near the steering articulation when the engine is running is not permitted. Danger of being crushed when steering is operated. Apply the emergency/parking brake before lubricating.

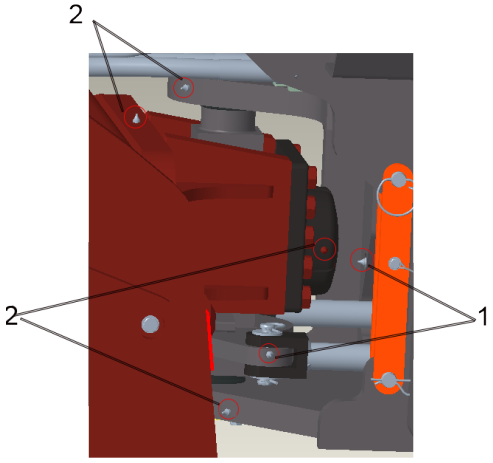


Fig. Steering joint and cylinder lubrication
1. Points of cylinder lubrication (2 points) (X 2)
2. Points of joint lubrication (4 points)

Clean the dirt and grease from the lubrication points.

Use the lubrication grease according to lubricant specifications.

Use specific grease on the articulated joint.

Apply the lubrication grease (5 strokes) in each lubrication point
Make sure that grease penetrates into the bearings.

If grease does not penetrate the bearings, it may be necessary to relieve the articulation joint with a hydraulic jack while repeating the greasing process.

Maintenance - 50h

Every 50 hours of operation (Weekly)

Park the roller on a level surface.
When checking and making adjustments, the engine should be switched off and the emergency/parking brake should be applied, if not otherwise specified.

Ensure that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.

Air cleaner

Checking - the main air filter

Change the air cleaner main filter when the warning lamp on the control panel comes on when the engine is running at maximum speed.

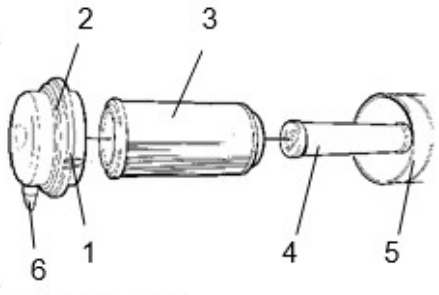


Fig. Air cleaner
1. Clips
2. Cover
3. Main filter
4. Backup filter
5. Filter housing
6. Dust valve

Release the clips (1), pull off the cover (2), and pull out the main filter (3).

Do not remove the backup filter (4).

Clean the air cleaner if necessary, see section Air cleaner - Cleaning.

When replacing the main filter (3), insert a new filter and refit the air cleaner in the reverse order.

Check the condition of the dust valve (6); replace if necessary.
When refitting the cover, make sure that the dust valve is positioned downwards

Back up filter change

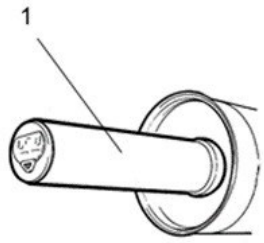


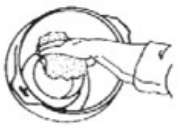
Fig. Air filter
1. Backup filter

Change the back up filter with new filter after every third replacement of the main filter

To change the back up filter (1), Pull the old filter out of its holder, insert a new filter and reassemble the air cleaner in the reverse order.

Clean the air cleaner if necessary, see section air cleaner – Cleaning.

Clean the both side of exit tube



Inner face of the outlet pipe

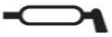
Outer face of the outlet pipe

Air cleaner – Cleaning

Wipe the inside of the cover and filter housing.

Wipe also both surfaces of the outlet pipe.

Check that the hose clamps between the filter housing and the suction hose are tight and that the hoses are intact. Check the whole hose system up to the engine.



Articulated / Steering Joint– Lubrication

Use specific grease on the articulated joint.

Apply the lubrication grease (5 strokes) in each lubrication point
Make sure that grease penetrates into the bearings.

If grease does not penetrate the bearings, it may be necessary to relieve the articulation joint with a hydraulic jack while repeating the greasing process.

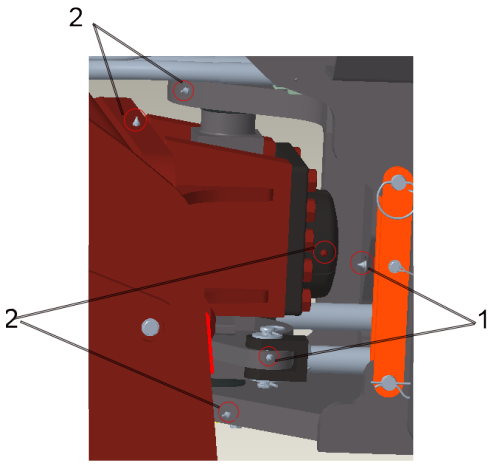


Fig. Steering joint and cylinder lubrication

1. ***Points of cylinder lubrication (2 points) (X 2)***
2. ***Points of joint lubrication (4 points)***

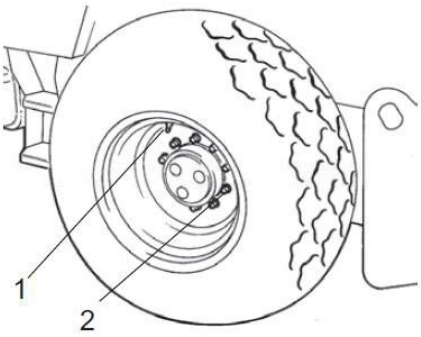


Fig. Wheels
1. *Air valve*
2. *Wheel nuts*

Tires – Air pressure – Wheel nuts – Tightening

Check the tire pressures using a pressure gauge.
When the tire is filled with fluid, the valve (1) should be positioned at “12 o’clock”, once the specified pressure is reached.
Recommended pressure: See Technical Specifications.
Check the tire pressure.

When changing the tires it is important that both of them have the same rolling radius. This is necessary to ensure proper functioning of the anti-slip in the rear axle.

Check the tightening torque on the wheel nuts (2) with 630 Nm (64 kgf.m).

Check both wheels and all the nuts (this only applies to a new machine or newly fitted wheels).

Check the safety manual that accompanies the machine before filling with air.

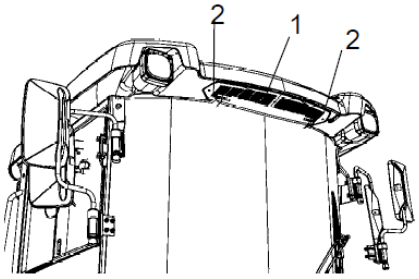


Fig. Cab
1. *Filters (2x)*
2. *Screws (3x)*

Air conditioning (optional) – Cleaning/Filter change

The filter is in the front of the cab.
Remove the three screws and the protective plastic.
Perform the cleaning or replace with new filters
It may be necessary to replace at shorter intervals if the machine is operated in an environment with a lot of dust.

Maintenance – First 50h

Park the roller on a level surface.
When checking and making adjustments, the engine should be switched off and the emergency/parking brake should be applied, if not otherwise specified.

Ensure that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.

Change the hydraulic fluid filter

Fig. Engine hood rear left side
1.Hydraulic fluid filter.

Always wear protective goggles when working with compressed air.

Carefully clean around the hydraulic filter.

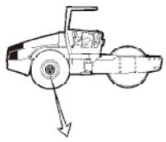
Remove the filter (1) and take to an environmentally-compliant waste disposal station. The filter is of the disposable type and cannot be cleaned.

Make sure that the old seal is not left on the filter head. Otherwise, there will be a leak between new and used seals. Thoroughly clean the sealing surface of the filter holder. Apply a thin coat of fresh hydraulic fluid on the new filter seal.

Tighten the filter until its seal is in contact with the filter holder. Right after that, turn an additional half revolution. Do not tighten the filter too hard as this could damage the seal.

Start the engine and check that there is no leakage of hydraulic fluid from the filter. Check level of fluid in the sight glass and top up as required. Test.

Rear axle differential – Change oil level



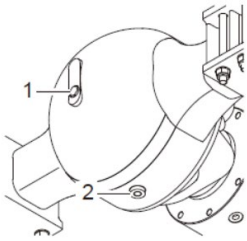


Fig. Rear axle
1. Level/Filler plug
2. Drain plugs

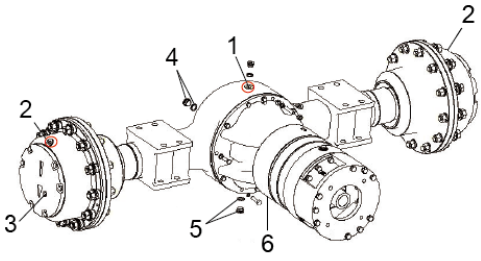
Do not work under the roller with the engine running. Park on a level surface.

Clean and remove the filler/level plugs(1) and the drain plugs (2). The filler/level plugs are located in the front and back of the axle and the drain plugs are located on the lower and back part. Empty the oil into a container. The volume is approx. 14 litres (14.7 qts).

Collect the oil and dispose in an appropriate manner

Place the drainage plugs and top up with fresh oil until the correct level is reached. Place the level/filler plug. Use transmission oil. See lubricant specification.

Rear axle planetary gear - Oil change



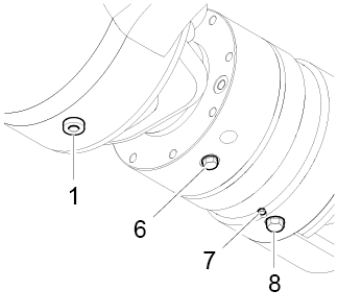


Fig. Planetary gear/filling/drainage position
1. Plug
2. Plug
3. Level hole
4. Level hole
5. Drainage plug
6. Drainage plug
7. Checking hole
8. Option port

The plug at 12 o'clock- filling position
The plug at 6 o'clock - drainage position

Oil can be filled through plug (2) at 12 o'clock (filling position) with suitable volume for each side. And oil level can be checked through oil level hole (3).
Wipe clean, unscrew the plug (2) (when the plug is at 6 o'clock) and drain the oil into a suitable receptacle.

Plug (1) which for central oil filling, oil level can be shown from oil level hole (4), unscrew drainage plug (5) to drain the oil.
The plug (6) on the central reducer at 6 o'clock is for oil drainage.

After filling three filling portals. Oil arrives at all gear meshing position by oil transmission.

Fill with oil to lower edge of level hole. Use transmission oil. See the lubrication specification.

Clean and refit the plug.

Check the fluid level in the same way on the rear axle's other planetary gear.

Oil should be taken to your local waste disposal station.

Check the brake cylinder through checking hole (7).

To release brake by using option port (8).

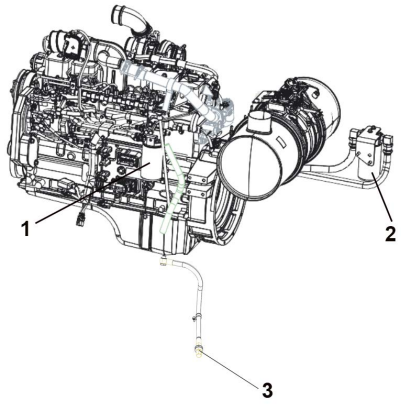


Fig. Left side of engine:
2.Engine oil filter
3.Drain plug;

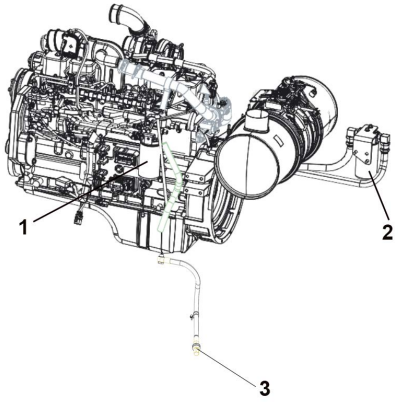
Diesel engine – Oil and filter change

Take great care when draining fluid and oil at high temperatures. Wear protective gloves and goggles.

It need to lay down to handle the oil drain plug (3) from under the right rear frame. Drain the oil when the engine is warm. Place a receptacle that holds at least 17 litres under the drain plug.

Change the oil filter (2). Please read the instruction manual for the engine.

Dispose of the drained oil and filter separately in the right manner.



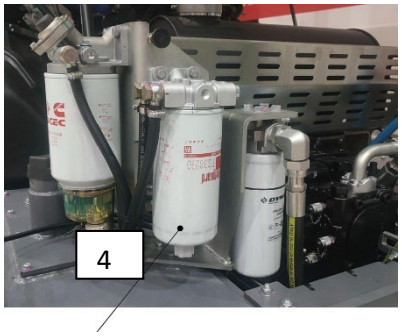


Fig. 1. Fuel filter
4. Pre-Fuel filter (NOTE: CA50 W/O)

Fuel filter and Pre-Fuel filter replacement

Remove the threaded fuel filter using the filter wrench.

Lubricate the O ring with clean lubricating oil.

Do not prefill the engine fuel filter.

Install the filter on the filter head. Press the filter until the seal touches the surface of the filter head. Press the fuel filter another 3/4 of a revolution after contact.
The air needs to be removed from the fuel system after fuel filter installation.

Check the procedure for removing the air in the engine manual.

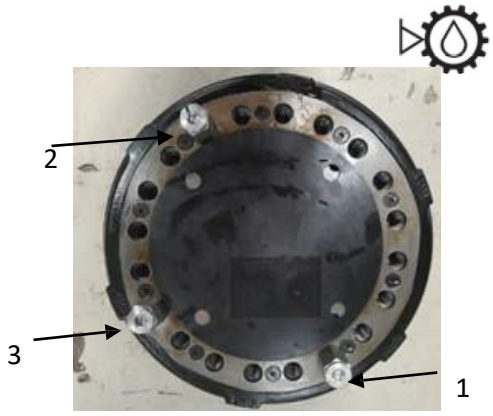


Fig. Check oil level – drum gearbox
1. *Drain plug*
2. *Filler plug*
3. *Level plug*

Drum gearbox (D/PD) – Changing the oil

Wipe clean, unscrew the plugs (1, 2 and 3) and drain the oil into a suitable receptacle with a capacity of about 5.0 litres (5.3 qts).

Refit the drainage plug (1) and top up with oil up to the level plug (3).

Ensure that the oil level reaches up to the lower edge of the plug opening.

Replenish the oil to the right level if the level is low. Use transmission oil (see lubricant specifications).

Clean and refit the plugs.

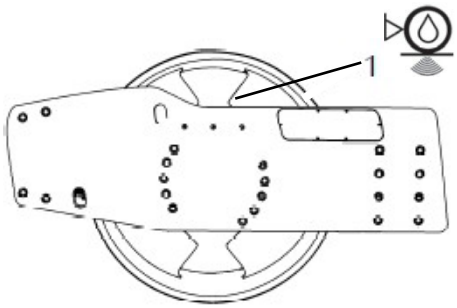


Fig. Cylinder, left side
1. *Drain/Fill plug*

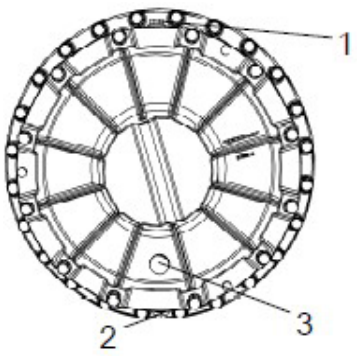


Fig. Cylinder, left side
1.Fill plug
2.Drain Plug
3.Sight Glass

Drum – Checking the oil level

Place the roller on a level surface so that the plug (1) and the drum's number plate are visible on the right side.

The oil level should now reach the sight glass (3).

If necessary, remove the plug (1) and fill to halfway up the sight glass.

Clean any metal residue from the magnetic plug (1) before reinstalling it.

See the lubrication specification for the correct oil grade.

Do not overfill with oil – risk for overheating.

Maintenance – 500/1500h

Park the roller on a level surface.
When checking and making adjustments, the engine should be switched off and the emergency/parking brake should be applied, if not otherwise specified.

Ensure that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.

Fuel filter and Pre-Fuel filter replacement

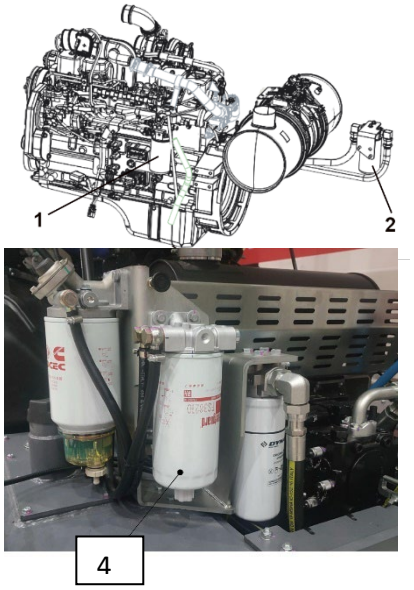


Fig. 1. Fuel filter
4. Pre-Fuel filter (NOTE: CA50 W/O)

Remove the threaded fuel filter using the filter wrench.

Lubricate the O ring with clean lubricating oil.

Do not prefill the engine fuel filter.

Install the filter on the filter head. Press the filter until the seal touches the surface of the filter head. Press the fuel filter another 3/4 of a revolution after contact.
The air needs to be removed from the fuel system after fuel filter installation.

Check the procedure for removing the air in the engine manual.

Water Separator Replacement

Fig. 5. Water Separator

Remove the threaded water separator using the filter wrench.

Lubricate the O ring with clean lubricating oil.

Do not prefill the engine water separator.

Install the water separator on the filter head. Rotate the water separator until the seal touches the surface of the filter head. Rotate the fuel filter another 3/4 of a revolution after contact.
The air needs to be removed from the fuel system after water separator installation.

Check the procedure for removing the air in the engine manual.

Hydraulic reservoir – bleeder filter check

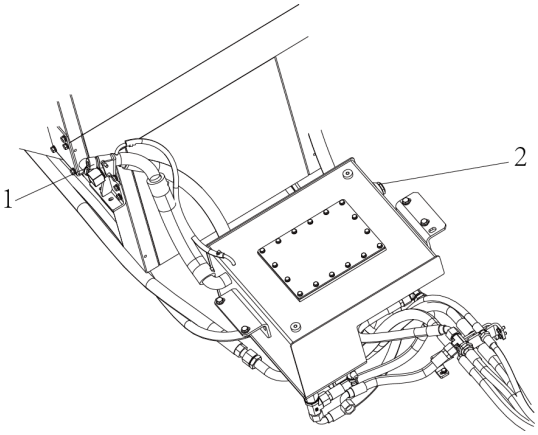


Fig. Hydraulic fluid tank
1. Filer cap/air filter.
2. Oil sight glass.

If passage in either direction is blocked, clean the filter with a little diesel oil and blow through with compressed air until the block is removed, or replace the cap with a new one.

Always wear protective goggles when working with compressed air.

Check that the bleeder filter (1) is not clogged. Air should be able to pass through the cap unobstructed in the both directions.

Start the engine and check that there is no leakage of the hydraulic fluid from the filter. Check level of fluid in the slight glass (2) and top up as required.

Diesel engine – Oil and filter change

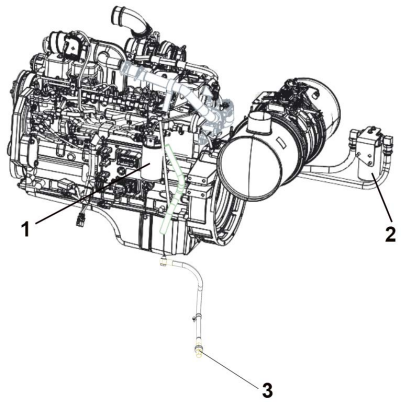


Fig. Left side of engine:
2. Engine oil filter
3. Drain plug;

Take great care when draining fluid and oil at high temperatures. Wear protective gloves and goggles.

It need to lay down to handle the oil drain plug (3) from under the right rear frame. Drain the oil when the engine is warm. Place a receptacle that holds at least 17 litres under the drain plug.

Change the oil filter(2). Please read the instruction manual for the engine.

Dispose of the drained oil and filter separately in the right manner.

Drum cartridge - Cleaning the ventilation screw

Fig. Drum
1. Ventilation screw

Clean the drum's ventilation hole and ventilation screw (1). The hole is required to eliminate excess pressure inside the drum.

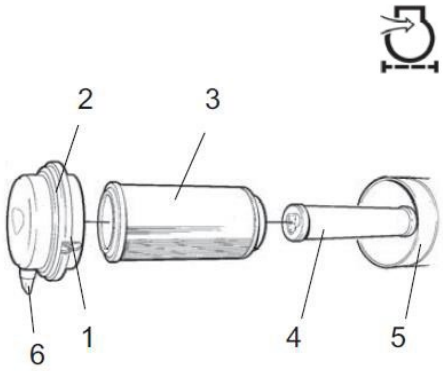


Fig. Air cleaner

1. *Clamps*
2. *Cover*
3. *Main filter*
4. *Backup filter*
5. *Filter housing*
6. *Dust valve*

Replacing the main air filter

Replace the main air filter element when the warning lamp on the control panel comes on when the engine is running at maximum speed.

Release the clamps (1), pull off the cover (2), and pull out the main filter (3).
Do not remove the backup filter (4).
Clean the air filter if necessary, see section Air filter – Cleaning. When replacing the main filter (3), insert a new filter and refit the air cleaner in the reverse order.
Check the condition of the dust valve (6); replace if necessary.

When refitting the cover, make sure that the dust valve is positioned downwards.

Maintenance - 1000h

Park the roller on a level surface.
When checking and making adjustments, the engine should be switched off and the emergency/parking brake should be applied, if not otherwise specified.

Ensure that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.

Replacing the main air filter

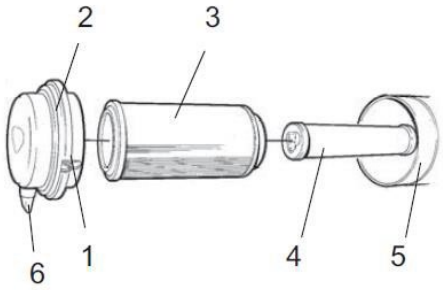


Fig. Air cleaner
1. *Clamps*
2. *Cover*
3. *Main filter*
4. *Backup filter*
5. *Filter housing*
6. *Dust valve*

Replace the main air filter element when the warning lamp on the control panel comes on when the engine is running at maximum speed.

Release the clamps (1), pull off the cover (2), and pull out the main filter (3).
Do not remove the backup filter (4).
Clean the air filter if necessary, see section Air filter – Cleaning.
When replacing the main filter (3), insert a new filter and refit the air cleaner in the reverse order.
Check the condition of the dust valve (6); replace if necessary.

When refitting the cover, make sure that the dust valve is positioned downwards.

Change the hydraulic fluid filter

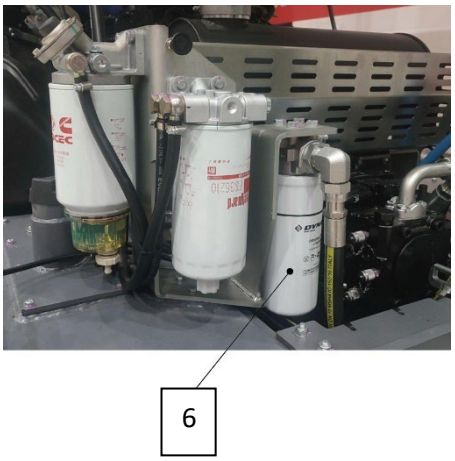


Fig. Engine compartment:
6. *Hydraulic fluid filter.*

Always wear protective goggles when working with compressed air.

Carefully clean around the hydraulic filter.

Remove the filter (6) and take to an environmentally-compliant waste disposal station. The filter is of the disposable type and cannot be cleaned.

Make sure that the old seal is not left on the filter head. Otherwise, there will be a leak between new and used seals.
Thoroughly clean the sealing surface of the filter holder.
Apply a thin coat of fresh hydraulic fluid on the new filter seal.

Tighten the filter until its seal is in contact with the filter holder. Right after that, turn an additional half revolution. Do not tighten the filter too hard as this could damage the seal.

Start the engine and check that there is no leakage of hydraulic fluid from the filter. Check level of fluid in the sight glass (3) and top up as required test.

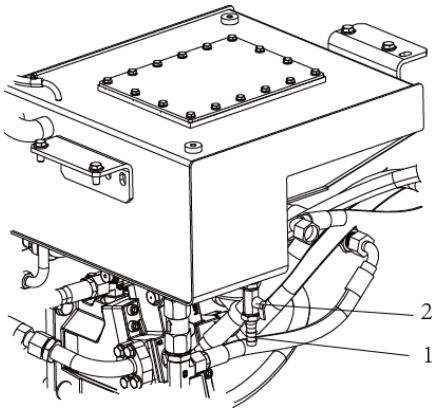


Fig. Hydraulic fluid tank, bottom:
2. Drainage knob
1. Adapter for drain hose.

Draining the hydraulic fluid tank

Condensate in the hydraulic tank is drained via the adapter (1). Drainage must be performed when the machine has been stationary for an extended period, e.g. overnight.
Drain as follows:

-Insert drain hose on the adapter (1);

-Place an empty container under the Knob;

-Open the Knob (2);

-Remove the condensate;

- Close the drainage tap and remove the drain hose.

Deliver the drained oil for environmentally-compliant disposal.

Be extremely cautious when draining the oil. Wear protective gloves and goggles.

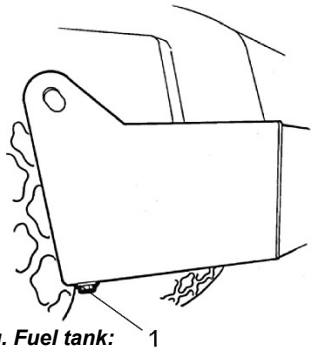


Fig. Fuel tank:
1. Drain plug.

Fuel tank drainage

Water and sediment in the fuel tank are removed via the drainage plug (1) in the bottom of the fuel tank.

Be careful during drainage. Do not drop the plug or else the fuel will flow out.

Drainage must be performed when the machine has been stationary for an extended period, e.g. overnight. The fuel level should be the minimum possible.

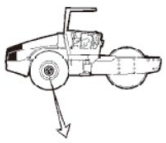
The machine should preferably have been standing with this side somewhat lower, so that water and sediment gathered near the drainage plug (1).

Drain as follows:

- Place an empty container under the tap;
- Remove the plug (1);
- Drain out the condensate and sediment until only pure fuel emerges at the plug.
- Refit the plug.

Save the condensate and sediment and hand it in to an environment-compliant waste disposal station.

Rear axle differential – Change oil level



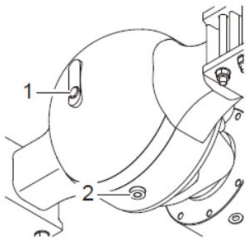


Fig. Rear axle
1. Level/Filler plug
2. Drain plugs

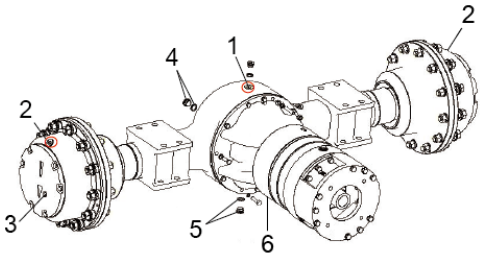
Do not work under the roller with the engine running. Park on a level surface.

Clean and remove the filler/level plugs(1) and the drain plugs (2). The filler/level plugs are located in the front and back of the axle and the drain plugs are located on the lower and back part. Empty the oil into a container. The volume is approx. 14 litres (14.7 qts).

Collect the oil and dispose in an appropriate manner

Place the drainage plugs and top up with fresh oil until the correct level is reached. Place the level/filler plug. Use transmission oil. See lubricant specification.

Rear axle planetary gear - Oil change



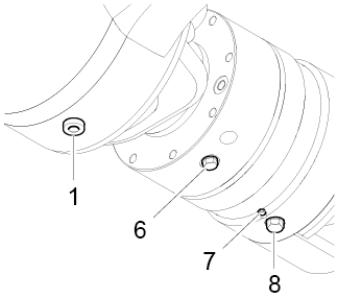


Fig. Planetary gear/filling/drainage position
1. Plug
2. Plug
3. Level hole
4. Level hole
5. Drainage plug
6. Drainage plug
7. Checking hole
8. Option port

The plug at 12 o'clock- filling position
The plug at 6 o'clock - drainage position

Oil can be filled through plug (2) at 12 o'clock (filling position) with suitable volume for each side. And oil level can be checked through oil level hole (3).
Wipe clean, unscrew the plug (2) (when the plug is at 6 o'clock) and drain the oil into a suitable receptacle.

Plug (1) which for central oil filling, oil level can be shown from oil level hole (4), unscrew drainage plug (5) to drain the oil.
The plug (6) on the central reducer at 6 o'clock is for oil drainage.

After filling three filling portals. Oil arrives at all gear meshing position by oil transmission.

Fill with oil to lower edge of level hole. Use transmission oil. See the lubrication specification.

Clean and refit the plug.

Check the fluid level in the same way on the rear axle's other planetary gear.

Oil should be taken to your local waste disposal station.

Check the brake cylinder through checking hole (7). To release brake by using option port (8).

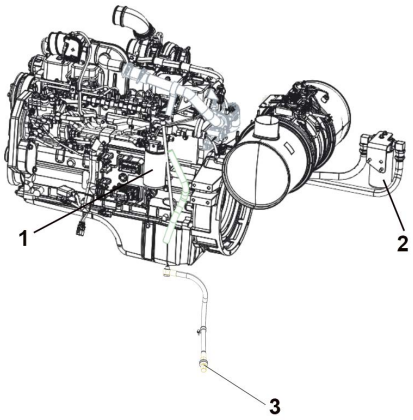


Fig. Left side of engine:
3. Drain plug;
2. Engine oil filter

Diesel engine – Oil and filter change

Take great care when draining fluid and oil at high temperatures. Wear protective gloves and goggles.

It need to lay down to handle the oil drain plug (3) from under the right rear frame. Drain the oil when the engine is warm. Place a receptacle that holds at least 17 litres under the drain plug.

Change the oil filter(2). Please read the instruction manual for the engine.

Dispose of the drained oil and filter separately in the right manner.

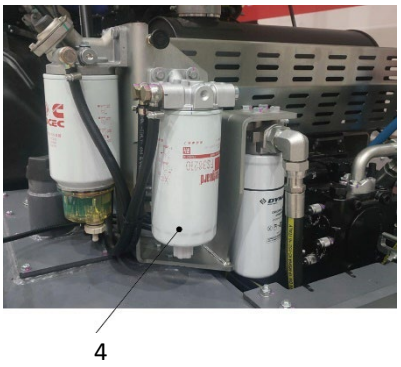


Fig. 1. Fuel filter
4. Pre-Fuel filter (NOTE: CA50 W/O)

Fuel filter and Pre-Fuel filter replacement

Remove the threaded fuel filter (1) using the filter wrench.

Lubricate the O ring with clean lubricating oil.

Do not prefill the engine fuel filter.

Install the filter on the filter head. Press the filter until the seal touches the surface of the filter head. Press the fuel filter another 3/4 of a revolution after contact.
The air needs to be removed from the fuel system after fuel filter installation.

Check the procedure for removing the air in the engine manual.

Fig. 5. Water Separator

Water Separator Replacement

Remove the threaded water separator (5) using the filter wrench.

Lubricate the O ring with clean lubricating oil.

Do not prefill the engine water separator.

Install the water separator on the filter head. Rotate the water separator until the seal touches the surface of the filter head. Rotate the fuel filter another 3/4 of a revolution after contact. The air needs to be removed from the fuel system after water separator installation.

Check the procedure for removing the air in the engine manual.

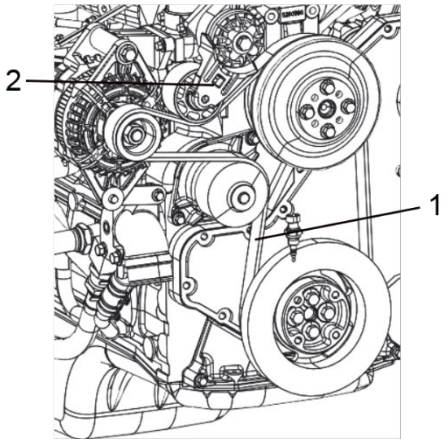


Fig. Motor:
1. *Belt;*
2. *Tensioner*

Check the engine belt tension

Check positioning of the belt on the tensioner, which should be centred, and if the belt shows signs of too much wear, it should be replaced.

Check the engine manual for more information.

Fig. Drum
1. Ventilation screw

Drum cartridge - Cleaning the ventilation screw

Clean the drum's ventilation hole and ventilation screw (1). The hole is required to eliminate excess pressure inside the drum.

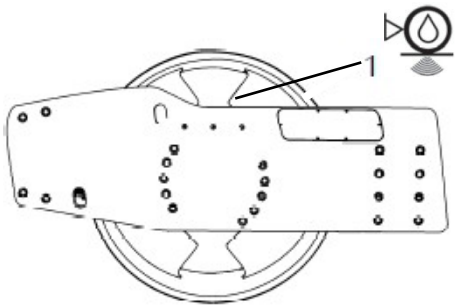


Fig. Cylinder, left side
1. *Drain/Fill plug*

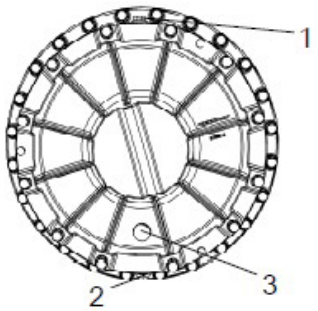


Fig. Cylinder, left side
1.Fill plug
2.Drain Plug
3.Sight Glass

Drum – Checking the oil level

Place the roller on a level surface so that the plug (1) and the drum's number plate are visible on the right side.

The oil level should now reach the sight glass (3).

If necessary, remove the plug (1) and fill to halfway up the sight glass.

Clean any metal residue from the magnetic plug (1) before reinstalling it.

See the lubrication specification for the correct oil grade.

Do not overfill with oil – risk for overheating.

Maintenance - 2000h

Park the roller on a level surface.
When checking and making adjustments, the engine should be switched off and the emergency/parking brake should be applied, if not otherwise specified.

Ensure that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.

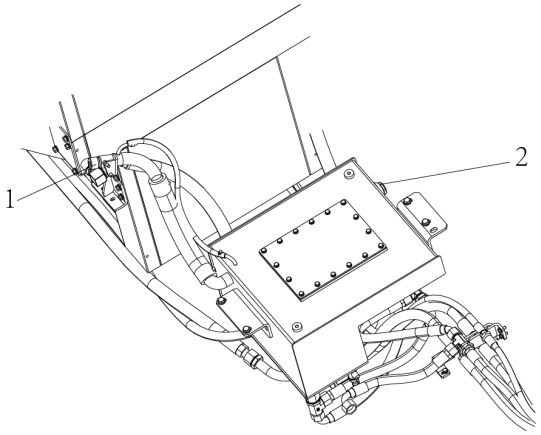


Fig. Hydraulic fluid tank
1. Refill cap;
2. Oil sight glass.

Hydraulic reservoir – Fluid change

Fill with new hydraulic fluid (1). Refer to the lubricant specifications for grade information.
Activate the diesel engine and test hydraulic functions.
Check the level in the reservoir (2) and top off as required.

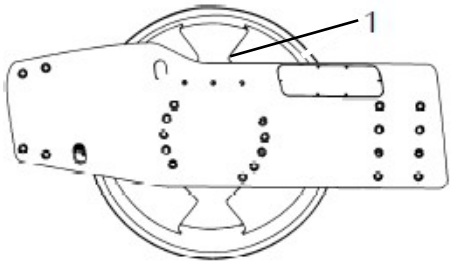


Fig. Drum, left side
1. Filling plug

Drum - Oil change

Place the machine on a level surface so that the filling plug (1) is perpendicular.
Place a receptacle with a capacity of about 5 litres underneath the drain plug (2).

Take great care when draining fluid and oil at high temperatures. Wear protective gloves and goggles.

Collect the oil and dispose in an appropriate manner.

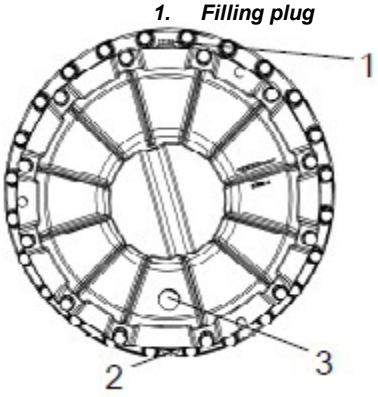


Fig. Cylinder, left side
1. Refill plug
2. Drain plug
3. Level glass

Clean and unscrew the filler plug (1) and the drain plug (2).

Allow all the oil to drain out. Fill with new lubricating oil.

Refer to the lubricant specifications for grade information.

Replacing the main air filter

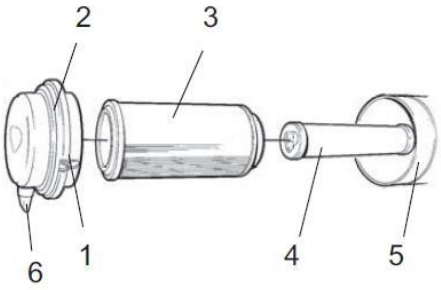


Fig. Air cleaner
1. *Clamps*
2. *Cover*
3. *Main filter*
4. *Backup filter*
5. *Filter housing*
6. *Dust valve*

Replace the main air filter element when the warning lamp on the control panel comes on when the engine is running at maximum speed.

Release the clamps (1), pull off the cover (2), and pull out the main filter (3).
Do not remove the backup filter (4).
Clean the air filter if necessary, see section Air filter – Cleaning.
When replacing the main filter (3), insert a new filter and refit the air cleaner in the reverse order.
Check the condition of the dust valve (6); replace if necessary.

When refitting the cover, make sure that the dust valve is positioned downwards.

Automatic Climate Control

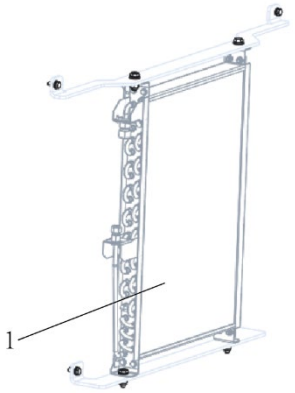


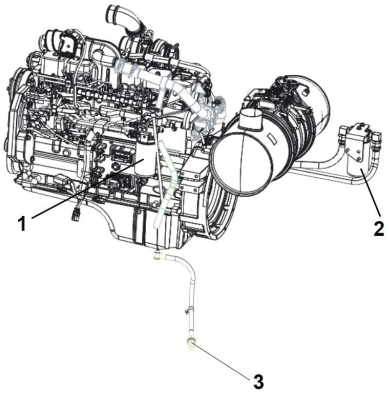
Fig. Engine Compartment
1.Condenser element.

Condenser locates in the front of radiator. Regular inspection and maintenance are necessary to ensure satisfactory long-term operation.
Clean all Dust from condenser element (1) using compressed air. Blow from underneath.

The air jet can damage the element flanges if it is too powerful.

Wear protective goggles when working with compressed air.

Diesel engine – Oil and filter change



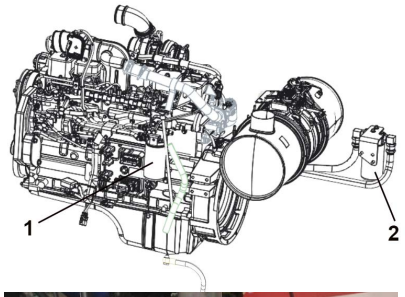
3.Drain plug;
2.Engine oil filter

Take great care when draining fluid and oil at high temperatures. Wear protective gloves and goggles.

It need to lay down to handle the oil drain plug (1) from under the right rear frame. Drain the oil when the engine is warm. Place a receptacle that holds at least 17 litres under the drain plug.

Change the oil filter. Please read the instruction manual for the engine.

Dispose of the drained oil and filter separately in the right manner.



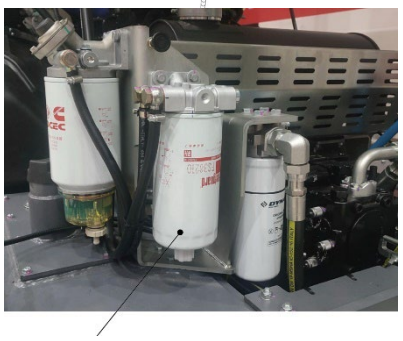


Fig. 1. Fuel filter
4. Pre-Fuel filter (NOTE: CA50 W/O)

Fuel filter and Pre-Fuel filter replacement

Remove the threaded fuel filter (1) using the filter wrench.

Lubricate the O ring with clean lubricating oil.

Do not prefill the engine fuel filter.

Install the filter on the filter head. Press the filter until the seal touches the surface of the filter head. Press the fuel filter another 3/4 of a revolution after contact.
The air needs to be removed from the fuel system after fuel filter installation.

Check the procedure for removing the air in the engine manual.

Fig. 5. water Separator.

Water Separator Replacement

Remove the threaded water separator (1) using the filter wrench.

Lubricate the O ring with clean lubricating oil.

Do not prefill the engine water separator.

Install the water separator on the filter head. Rotate the water separator until the seal touches the surface of the filter head. Rotate the fuel filter another 3/4 of a revolution after contact.
The air needs to be removed from the fuel system after water separator installation.

Check the procedure for removing the air in the engine manual.

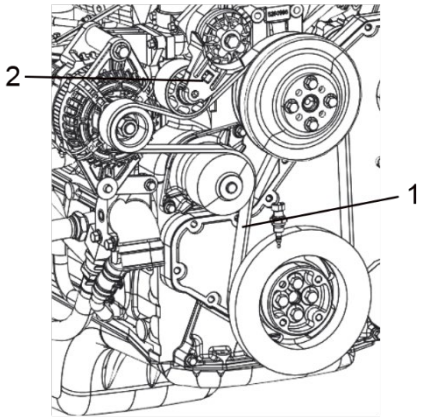


Fig. Motor:
1. Belt;
2. Tensioner

Check the engine belt tension

Check positioning of the belt on the tensioner, which should be centred, and if the belt shows signs of too much wear, it should be replaced.

Check the engine manual for more information.

Fig. Engine compartment:
1. Hydraulic fluid filter.

Change the hydraulic fluid filter

Always wear protective goggles when working with compressed air.

Carefully clean around the hydraulic filter.

Remove the filter (1) and take to an environmentally-compliant waste disposal station. The filter is of the disposable type and cannot be cleaned.

Make sure that the old seal is not left on the filter head. Otherwise, there will be a leak between new and used seals. Thoroughly clean the sealing surface of the filter holder. Apply a thin coat of fresh hydraulic fluid on the new filter seal.

Tighten the filter until its seal is in contact with the filter holder. Right after that, turn an additional half revolution. Do not tighten the filter too hard as this could damage the seal.

Start the engine and check that there is no leakage of hydraulic fluid from the filter. Check level of fluid in the sight glass and top up as required test.

Drum gearbox (D/PD) – Changing the oil

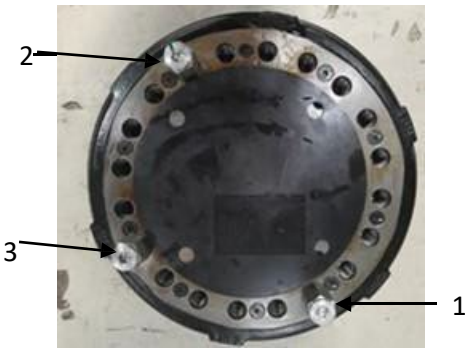


Fig. Check oil level – drum gearbox
1. Drain plug
2. Filler plug
3. Level plug

Wipe clean, unscrew the plugs (1, 2 and 3) and drain the oil into a suitable receptacle with a capacity of about 5.0 litres (5.3 qts).

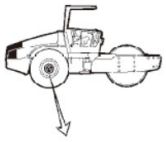
Refit the drainage plug (1) and top up with oil up to the level plug (3).

Ensure that the oil level reaches up to the lower edge of the plug opening.

Replenish the oil to the right level if the level is low. Use transmission oil (see lubricant specifications).

Clean and refit the plugs.

Rear axle differential – Change oil level



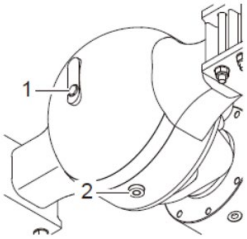


Fig. Rear axle
1. Level/Filler plug
2. Drain plugs

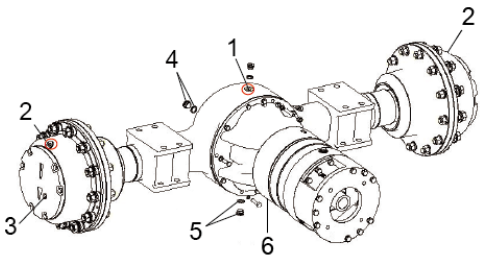
Do not work under the roller with the engine running. Park on a level surface.

Clean and remove the filler/level plugs(1) and the drain plugs (2). The filler/level plugs are located in the front and back of the axle and the drain plugs are located on the lower and back part. Empty the oil into a container. The volume is approx. 14 litres (14.7 qts).

Collect the oil and dispose in an appropriate manner

Place the drainage plugs and top up with fresh oil until the correct level is reached. Place the level/filler plug. Use transmission oil. See lubricant specification.

Rear axle planetary gear - Oil change



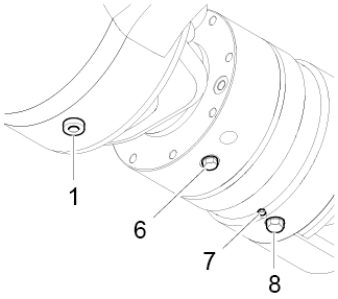


Fig. Planetary gear/filling/drainage position
1. Plug
2. Plug
3. Level hole
4. Level hole
5. Drainage plug
6. Drainage plug
7. Checking hole
8. Option port

The plug at 12 o'clock- filling position
The plug at 6 o'clock - drainage position

Oil can be filled through plug (2) at 12 o'clock (filling position) with suitable volume for each side. And oil level can be checked through oil level hole (3).
Wipe clean, unscrew the plug (2) (when the plug is at 6 o'clock) and drain the oil into a suitable receptacle.

Plug (1) which for central oil filling, oil level can be shown from oil level hole (4), unscrew drainage plug (5) to drain the oil.
The plug (6) on the central reducer at 6 o'clock is for oil drainage.

After filling three filling portals. Oil arrives at all gear meshing position by oil transmission.

Fill with oil to lower edge of level hole. Use transmission oil. See the lubrication specification.

Clean and refit the plug.

Check the fluid level in the same way on the rear axle's other planetary gear.

Oil should be taken to your local waste disposal station.

Check the brake cylinder through checking hole (7).

To release brake by using option port (8).

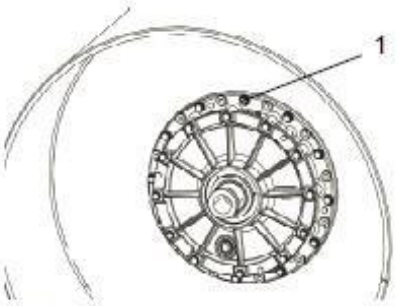


Fig. Drum
1. Ventilation screw

Drum cartridge - Cleaning the ventilation screw

Clean the drum's ventilation hole and ventilation screw (1). The hole is required to eliminate excess pressure inside the drum.

Fig. Drum
1. Oil level glass

Drum cartridge - Oil level glass

Check on both drum cartridges.

Inspect the oil level glass, in case of damage, change to a new one.

At service 2000h, it should be replaced if no change has been made before.

Change the coolant from radiator

The coolant drain plug(blue in the middle) is under the backside of frame, Place a receptacle that holds 30 liters under the drain plug,

Unscrew the plug then drain, and re-fill new coolant.

Refer Engine Manual for replacement.

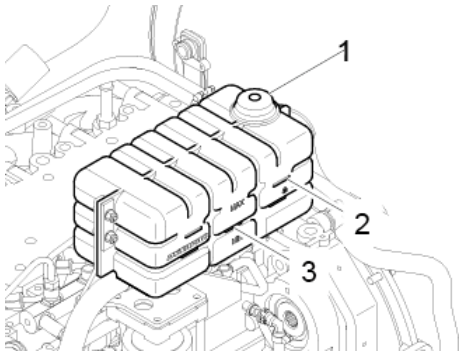


Fig. Coolant tank

1. ***Filler cap***
2. ***Max. level***
3. ***Min. level***

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