PITBULL

Compact Loader X-Series

OPERATING MANUAL

X24 | X27 | X28

2022 version 1.5.0

CONTENTS

1. INTRODUCTION

1.1 PREFACE

We would like to start by congratulating you on purchasing your new Pitbull Compact Loader.
The Pitbull Compact Loader is a unique product with extra attention for safety, quality and power.
The Pitbull Compact Loader is compact and highly manoeuvrable.

Before you start using the Pitbull, it is important that you read this operator's manual carefully and understand the information provided. This contributes to better control and maintenance for an optimal machine service life.

Ensure that the user manual is always present with the Pitbull; this document is an integral part of the machine and must always be present with the machine to provide the correct information about the machine.
The most recent version can be requested from your dealer.

TIP! After use, keep the manual in the storage compartment behind the seat back, to keep it protected from weather conditions.

DANGER! After an accident in which the Pitbull is involved, the Pitbull and/or its surroundings may be unsafe. Do not approach the Pitbull to get the manual, but request it from your dealer or via **peetersgroup.com.**

If you encounter any further questions or problems that this operator's manual does not answer, please contact your dealer or Peeters Landbouwmachines B.V.

1.2 WARRANTY AND LIABILITY

To rule out any misunderstandings, we ask you to please read the entire operator's manual with due care and attention. We have tried to guarantee the machine's functionality and your safety. For this reason, we would like to inform you of a number of points regarding the warranty and liability offered by Peeters Landbouwmachines BV.

Before the product left the factory, great efforts were made to safeguard you against any and all defects in materials and workmanship. If they should occur nonetheless, Peeters Landbouwmachines BV will make all parts that are defective available free of charge for a period of twelve months or 750 working hours, whichever is reached first, after delivery, with the exception of wear parts.

This warranty shall become void if:

- Deviations from the operating and maintenance instructions in this manual are made without the manufacturer's written consent.
- Maintenance is not carried out in accordance with the maintenance schedule indicated in this manual. These maintenance services must be documented in chapter 10. Servicing.
- Non-original parts are used for maintenance and repairs. The original parts that must be used are included in the parts list.
- The user statement below has not been fully completed, signed, scanned and sent to Peeters Landbouwmachines BV by the buyer of the machine.
- Unauthorised changes are made to the machine without the approval of Peeters Landbouwmachines B.V.
- The damage was caused by attachments.
- The machine is resold.

The warranty is limited in all cases to the free delivery of replacement parts, which means that Peeters Landbouwmachines BV cannot be held liable for:

- Loss of revenue caused by malfunctioning of the machine.
- Transport costs incurred to and from a workplace.
- Costs incurred for the required tools.
- Personnel costs incurred for a mechanic.

To make a warranty claim, please contact your dealer. The costs of the parts may first be charged, and will only be reimbursed after inspection by an authorised dealer or by Peeters Landbouwmachines BV.

User statement

Write down the following information about your machine to help you report problems and order spare parts.

1. Model: Pitbull ..... 2. Delivery date .....

3. Serial number of the machine: .....

By signing this user statement, the undersigned confirms that they have fully read this user manual and understand all the information:

Name: .... Signature: .....

1.3 EC DECLARATION OF CONFORMITY

PEETERS GROUP
The Dutch innovators
Munnikenheiweg 47 | 4879 NE Etten-Leur | NL

Technical documentation available at the abovementioned manufacturer's site.

EC DECLARATION OF CONFORMITY

PITBULL

The undersigned hereby declares that the machine:

Brand:	Pitbull
Models:	X24-26v. X24-36, X24-45, X27-26v, X27-36, X27-45, X28-36, X28-45
Category:	Compact wheel loader / articulated loader / shovel / earth-moving machine

Complies with the following guidelines:

- 2006/42/EC (Machinery Directive)
- (EU) 2016/1628 (Emissions Directive)

Place: Etten-Leur
Date: 31-01-2022

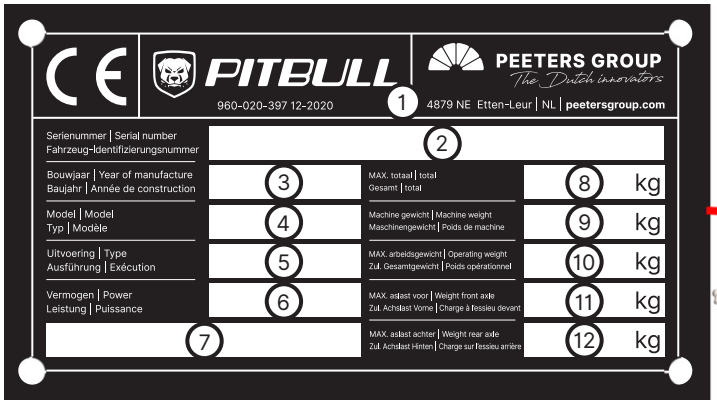
D.P.M. Peeters
Managing Director

1.4 SAFETY INSTRUCTIONS

Incorrect or careless operation of the compact wheel loader can cause an accident. To ensure safe operation and maintenance of the Pitbull, it is important that all instructions contained in this user manual are followed. All persons who use the machine must familiarise themselves with the instructions. Various marking conventions are used in this manual to further clarify safety risks.

Symbol	Meaning
	**WARNING AGAINST DANGER / FATAL HAZARD** You may be seriously injured if you do not carry out the procedures carefully. Fatal hazard: there is a direct risk of your getting killed.
	**CAREFUL** The machine may be damaged if you do not carry out the procedures carefully.
	**NOTE** A remark with additional information; alerts you to possible problems.
	**TIP** Offers suggestions and advice to help you carry out certain work more easily or more handily.

1.5 TYPE DESIGNATION



1	Contact details of manufacturer	7	Reserved for extra details
2	Serial number of the machine	8	Maximum total machine weight
3	Year of manufacture of the machine	9	Weight of the machine
4	Model name of the machine	10	Maximum working weight of the machine
5	Machine version	11	Maximum front axle load
6	Engine power of the machine	12	Maximum rear axle load

2. APPLICATIONS OF THE MACHINE

The Pitbull is suitable for the following operations, among others:

- Lifting and moving loaded pallets with pallet forks or a lifting mast; the mass of the load must not exceed the recommended load in the loading diagrams.
- Lifting loads with a hook arm, jip or hoisting mast.
- Moving and shifting soil and debris with an implement, volume bucket, rubble bucket, multi-purpose bucket and bucket grab.
- Loading soil, debris or feed into another machine with a high-tipping bucket.
- Moving bales with a silage grab, bale fork or bale grab.
- Moving manure with a manure grab, manure fork or manure shovel.
- Moving and distributing feed with a feed dispenser or feed blade.
- Moving tiles with a tile rake or tile grab.
- Removing weeds with a weed brush.
- Sweeping the surface with a sweeper or sweeping broom.
- Mowing grass with a mower.
- Picking up waste with a suction unit.
- Work the substrate with a drill, splitter or cutter.
- Moving trees with a log grab, tree grab or soil grab.
- Trimming hedges with a hedge trimmer.
- Digging with a digging arm.
- Shovelling snow with a snow shovel.
- Towing a load in a trailer.

It is not permitted to use the Pitbull for the following operations:

- Transporting animals.
- Carrying persons other than the driver.
- Transport of (hazardous) substances and products containing (hazardous) substances that are included in the ADR, which has been implemented in the Transport of Dangerous Substances Act and the Regulation on the Land Transport of Dangerous Substances.
- Lifting materials that are heavier than indicated in the loading diagram.
- Operations that are not permitted by law.

Attachments

The Pitbull is suitable for performing various tasks thanks to the wide variety of attachments that can be used. An implement is supplied as standard. Use only undamaged and CE-approved attachments. Your Pitbull may have the option for a different insertion than the standard insertion, so use only attachments that are suitable for your chosen insertion. If your Pitbull has the optional third or third and fourth front hydraulic function, in which case the attachment can be additionally power-assisted. Always read the attachment manual carefully before use and learn to work safely with the attachment.

NOTE! During the operation of the machine, loading diagrams are displayed that apply to the optionally supplied pallet forks. When other attachments are used, the maximum load differs.

Surface

The surface on which the vehicle is being driven affects the stability of the machine. Drive as much as possible on a paved and level surface. Adjust your speed, curve radius and the amount of load to the surface on which you drive. Keep the lifting height about 20 centimetres above the ground while driving.

Legislation

The machine may only travel on public roads if it is equipped with the option package for road admission. In this case, the driver must hold a tractor driving licence (driving licence T). Please pay attention to the following points:

- ▶ The maximum speed is 25km/h.
- ▶ Load must be covered while driving.
- ▶ Protruding parts must be shielded.
- ▶ The attachment must not cause any obstruction of sight or danger to other drivers.
- ▶ Local traffic rules must be observed.
- ▶ Ensure that the machine meets specific national requirements.
- ▶ Be aware of other road users who cannot properly estimate the road handling and risks of the machine.

The machine must be insured by the owner for civil liability according to the Motor Vehicle Liability Insurance Act when it is used on public roads, on private property that is accessible to the public and on private property that is only accessible to a number of authorised persons. This, therefore, applies to the Pitbull both with and without the option package for road admission.

According to the Working Conditions Act, the machine is considered lifting and hoisting equipment, which means that it may only be operated by persons who have specific expertise for this purpose. Insurers may require a certificate of training as a condition of an insurance policy.

NOTE! Always adhere to laws and regulations, which have been drawn up for the safety of the driver, and bystanders and other road users.

Recommended operating and ambient temperature

The recommended operating and ambient temperature is between -25°C and +40°C. If the operating and ambient temperature are outside this range, take into account possible system failures.

Using the system at lower temperatures will lead to accelerated wear to hydraulic gaskets and it will increase the risk of hydraulic hoses being damaged and brittle fractures in the steel structure. If you work at temperatures lower than the recommended temperature, the maximum load is less than what is normally allowed.

Before starting to work at a low temperature, have the oil circulate through the system for some minutes. Slowly repeat all actions several times so that the gaskets will become flexible before being exposed to full pressure.

If working in extremely high temperatures, remember that the hydraulic oil will heat up extremely. If the oil temperature exceeds +80°C, the oil will evaporate and the gaskets will be damaged The electronics may work more slowly because the processor of the controller protects against overheating due to the extreme heat.

3. SAFETY INSTRUCTIONS

To contribute to safety, a number of stickers have been placed on the Pitbull with safety and warning signs. They draw your attention to the risks that are present in and around the machine. Check that all warning indicators are present. If this is not the case, contact the dealer and ensure that the warning signs are renewed where necessary. The stickers consist of an image that depicts the danger in a warning triangle and an image that makes clear how to prevent the danger.

NOTE! To enable all (new) users to work safely, the stickers must always be clean and clearly legible; always replace any stickers that are damaged.
They are available from your dealer.

1. Danger of crushing when approaching the wheel arches. Keep your distance from the space between the wheel and the wheel arch.

4. Make sure to secure for transport.

2. Danger of crushing at the hinged parts of the boom. Keep sufficient distance.

5. Engine compartment.

3. Keep your distance from the exhaust, it may be hot and may cause burns.

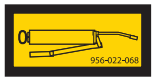
6. Forbidden to come under the load.

7. Danger of crushing when approaching the machine. Stay away from the pivot point of the steering.

10. Side console

8. The combustion engine runs on diesel (B7).
Only use this fuel.

11. Hoisting point



9. Lubrication point
at various locations

12. Make sure that no persons or animals are **within a 4-metre radius** when the machine is moving.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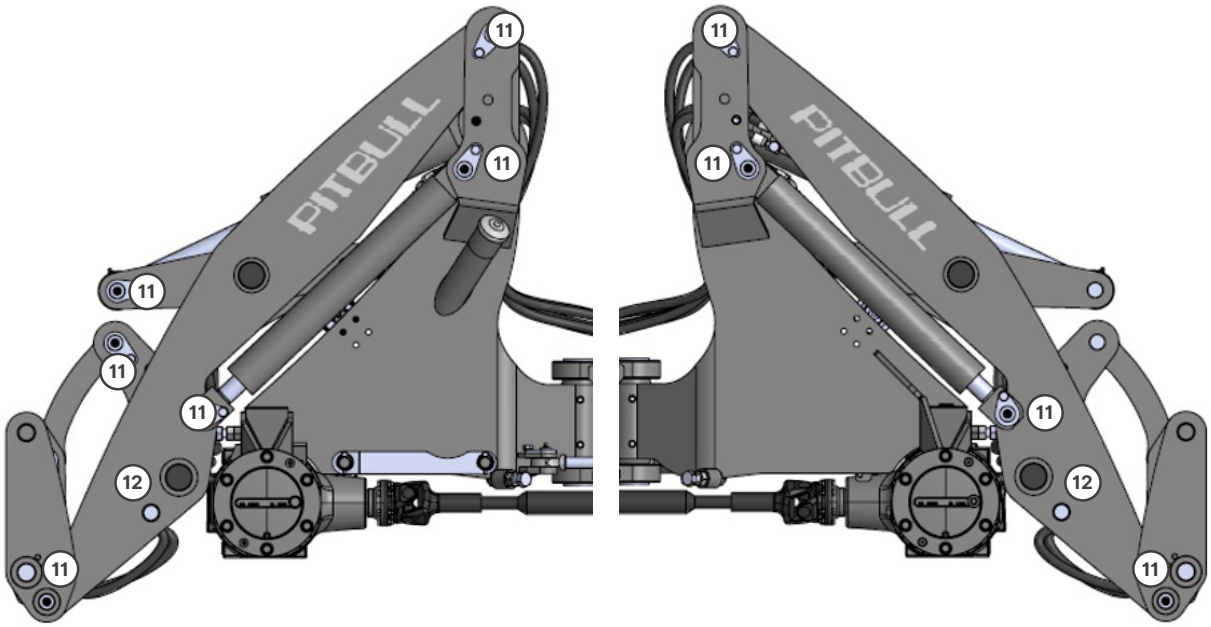
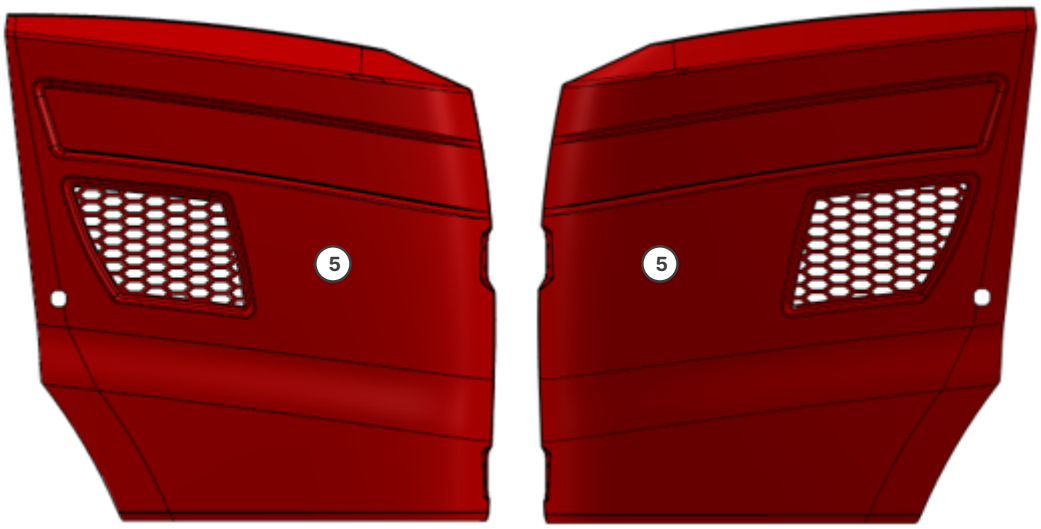
PITBULL
X27-45





Inner sides of bonnets

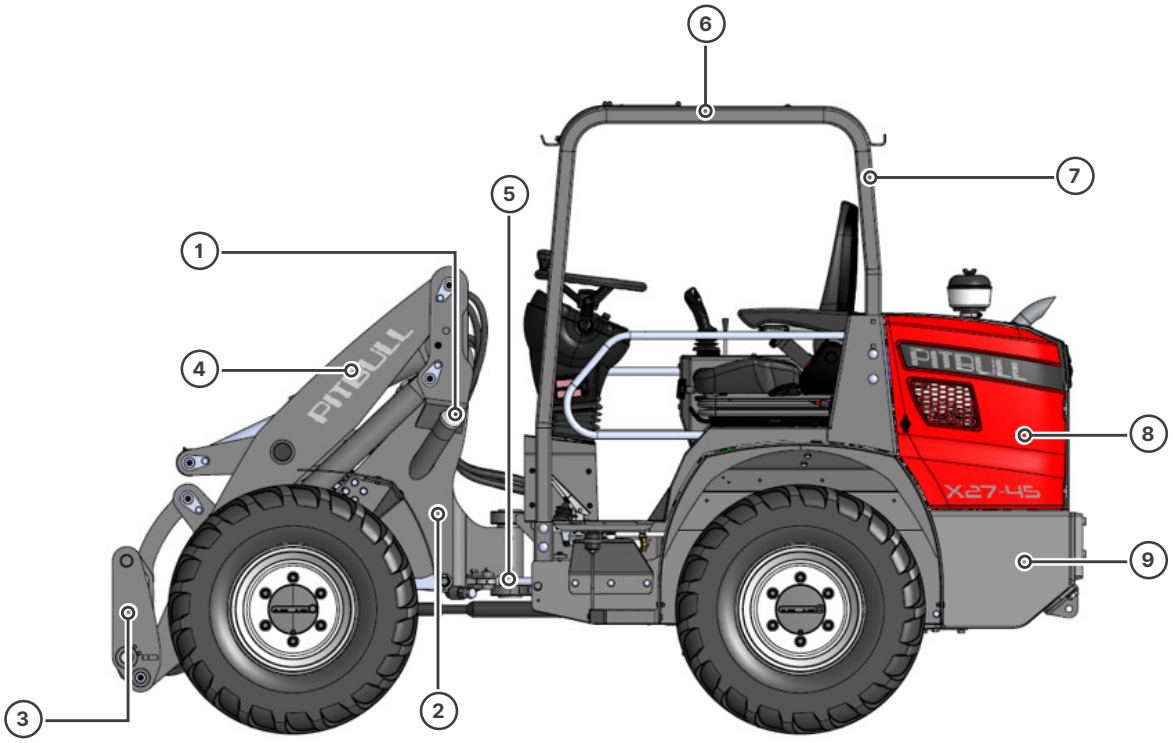
4. FUNCTION OF THE MACHINE

In order to work safely with the machine, it is important to be properly informed about the Pitbull's operation and the machine's specifications. The main elements of the machine are mentioned first. These terms are used more often in the manual. Due to the different options with which the Pitbull can be equipped, the images used may differ slightly.

NOTE! The left, right, front and rear sides used in the text must be seen from the driver's seated position.

4.1 MAIN ELEMENTS

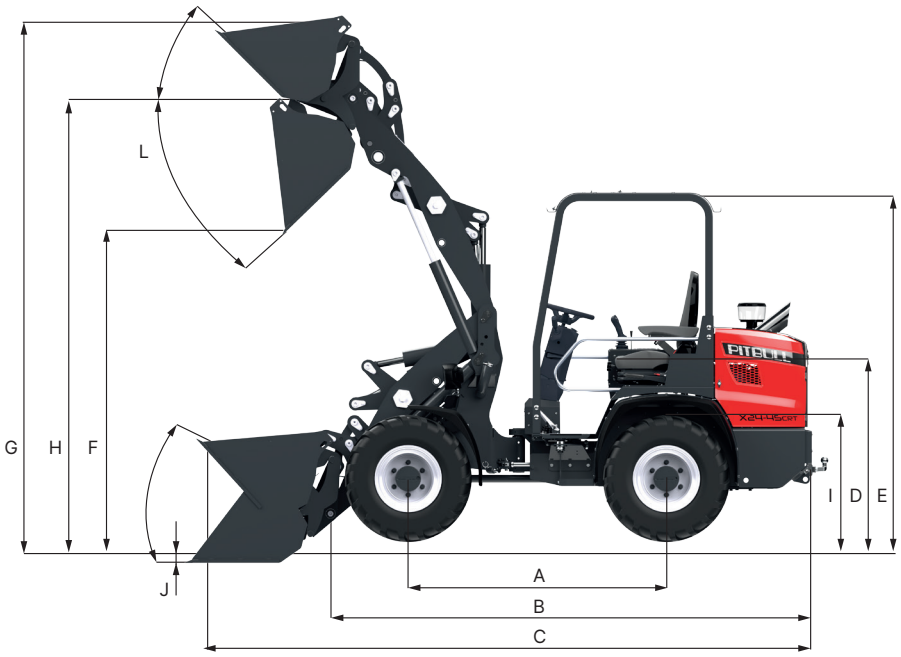
The following image shows the main elements of the Pitbull.



1.	Fuel cap
2.	Front frame
3.	Attachment carrier
4.	Boom
5.	Steering hinge point
6.	FOPS safety roof (in accordance with ISO 3449:1992, protection against falling objects)
7.	ROPS frame (in accordance with ISO 3471:1994, rollover protection)
8.	Engine hood
9.	Rear frame

4.2 TECHNICAL SPECIFICATIONS

The values in the table below are default data, based on the options your Pitbull is equipped with, this may vary.



Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Weight	Lifting capacity	Outside turning radius (without attachment)
Weight x 100kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	°	°	°	mm	kg	kg	mm
Pitbull X24	1624	3100	3620	1240	2140	2250	3270	2830	800	30	50	38	35	1250/ 1500	2400	1800	2600
Pitbull X27	1624	3150	3670	1240	2140	2250	3270	2830	800	30	50	38	35	1250/ 1500	2700	2300	2600
Pitbull X28	1624	3150	3670	1240	2140	2250	3270	2830	800	30	50	38	35	1250/ 1500	2800	2400	2600

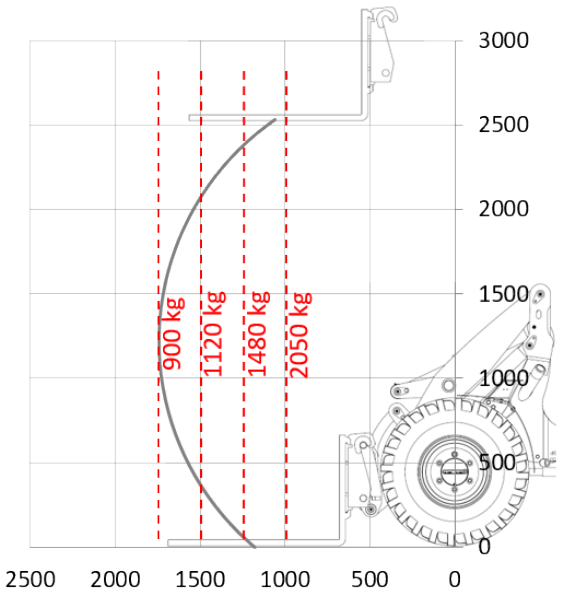
A = Wheelbase
B = Length without implement
C = Length with implement
D = Seat height
E = Total height
F = Maximum dump height
G = Maximum height with implement
H = Height up to the lifting pin
I = Tyre diameter
J = Undercut
K = Hauling angle
L = Tipping angle
M = Maximum ramp angle
N = Machine width

4.3 LOADING DIAGRAMS

WARNING! When the wheels of the machine are steered sidewards, the load capacity decreases. Try to straighten the machine as much as possible when lifting loads, avoid sharp turns and take bends at a moderate speed.

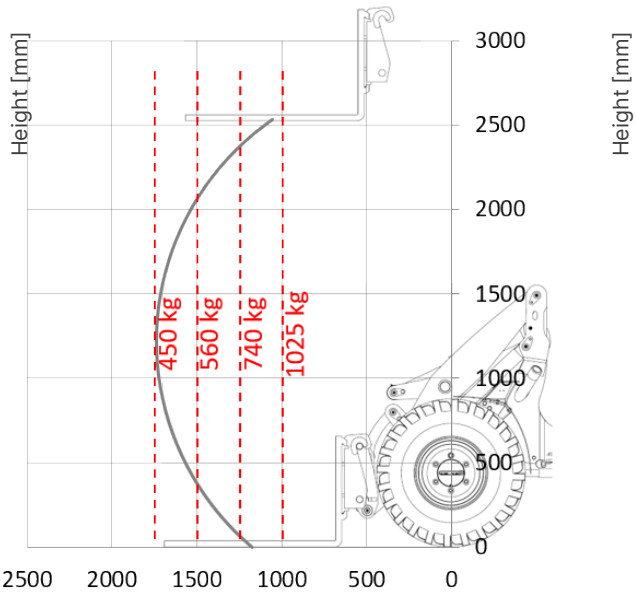
The loading diagrams below have been calculated with the Pitbull positioned straight ahead. The pallet fork is used, which can be ordered optionally with the Pitbull. The spoons of this pallet fork have a length of 1,000 mm. The indicated tipping load and recommended operating capacity are indicated for objects where the centre of gravity rests exactly on the centre of the spoons of the pallet fork.

Tipping load X24



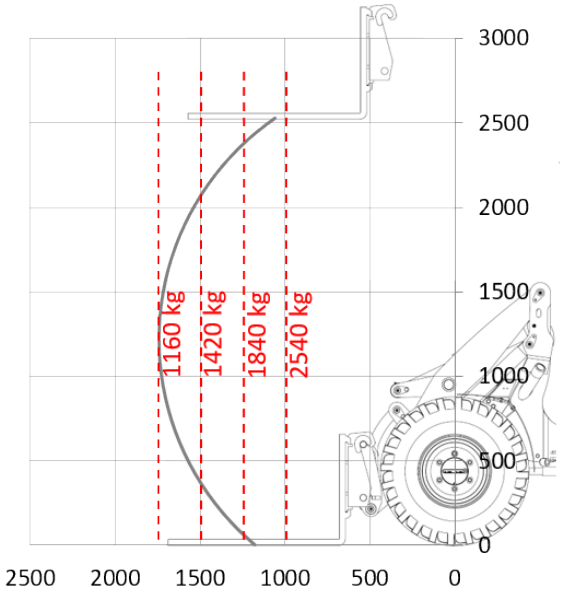
Horizontal distance between load and front axle [mm]

Recommended operating capacity X24



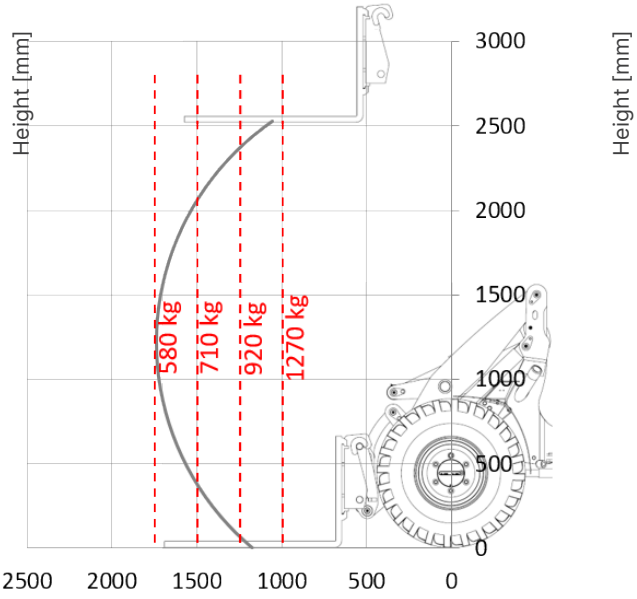
Horizontal distance between load and front axle [mm]

Tipping load X27



Horizontal distance between load and front axle [mm]

Recommended operating capacity X27



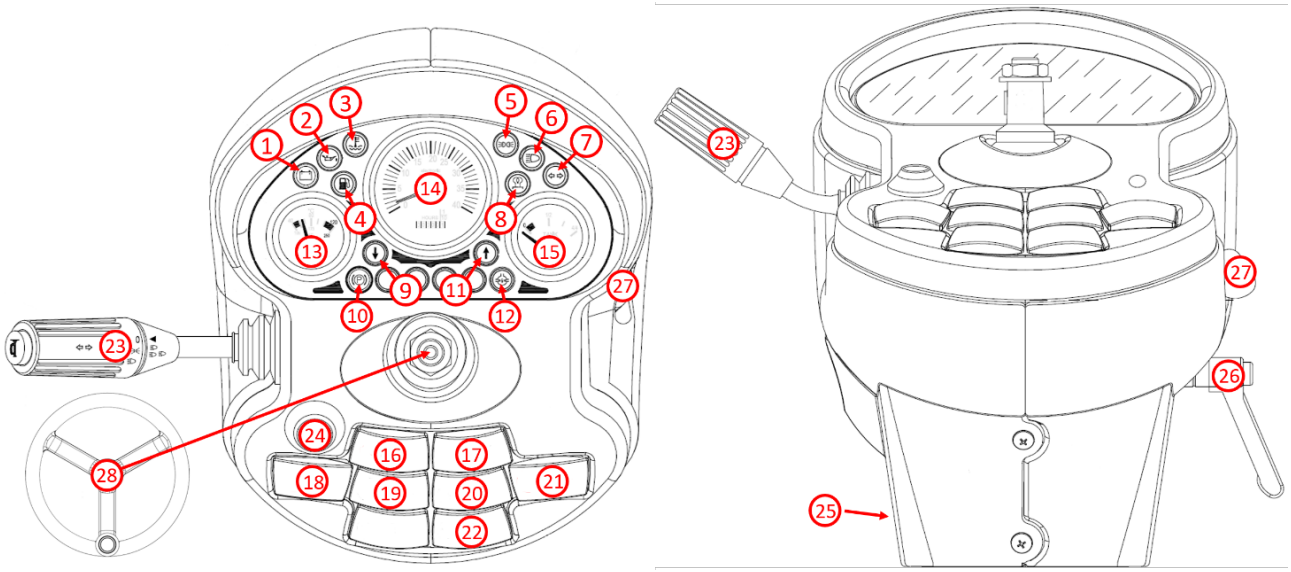
Horizontal distance between load and front axle [mm]

5. OPERATION OF THE MACHINE

In order to work safely and efficiently with the machine, it is important that all users are familiar with the operation of the machine. Due to the different options with which the Pitbull can be equipped, the images used may differ slightly.

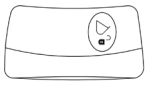
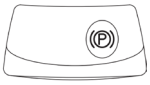
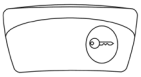
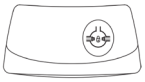
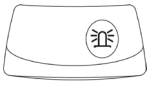
NOTE! Familiarise yourself with the entire machine and all controls before starting to work with the machine! If you have to do this while working, it will be too late.

Wheelhouse with dashboard



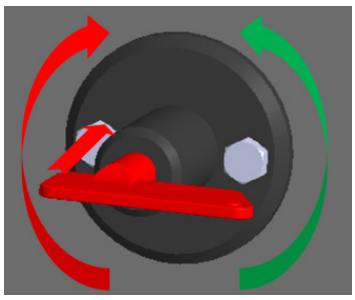
1		Indication: alternator not charging the battery.	7		Indication: indicator and hazard lights.
2		Indication: low oil pressure.	8		Indication: pre-heat.
3		Indication: coolant temperature high.	9		Indication: reverse travel direction.
4		Indication: low fuel level.	10		Indication: parking brake applied.
5		Indication: sidelight.	11		Indication: driving direction windscreen.
6		Indication: high beam.	12		Indication: locking differential.

13		Coolant temperature gauge, runs from cold coolant (left) to overheated coolant (right). 80 degrees Celsius is the optimal temperature. Allow the engine to warm up when the temperature is indicated in the light blue area on the left. Allow the engine to cool when the temperature is indicated in the red area on the right.

14		RPM meter (x100 revolutions per minute) with operating hours counter (1/10 hours).
15		Fuel tank level meter, runs from empty tank (left) to full tank (right). The scale is indicated in red between an empty tank and a quarter filled tank to indicate that refuelling is required. Never empty the tank, this is bad for the fuel filter and fuel pump.
16		Work lights front. Pressing this button switches the front work lights on or off.
17		Work lights rear. Pressing this button switches the rear work lights on or off.
18		Attachment locking. By pressing this button, the position of the attachment can be locked.
19		Electronic handbrake. Pressing this button activates or deactivates the electronic handbrake
20		Drive lock, by pressing this button the drive can be switched on or off.
21		Blocking function. By pressing this button, the front axle is 100% blocked.
22		Rotating beacon, by pressing this button the rotating beacon is switched on or off.
23		Direction indicator with multiple functions. Move away from the driver for right turn signal. Move towards the driver for left turn signal. The button on the end can be pressed to use the horn. By rotating the casing, you can choose between lights off, sidelight and high beam.
24		Button to switch hazard lights on/off when pressed.
25		Fuse holder. See chapter 6. "Making the machine ready for use" for fuse classification.
26		Lever for adjusting the steering. Press the red button and pull the lever towards the driver. Push the steering into the desired angle and push the lever away from the driver again until it clicks into the lock.
27		Ignition switch, position 0 to switch off the machine, position I to switch on the electronics, position II to preheat the engine and position III to start the combustion engine.
28		Steering wheel.

Battery isolator

The battery isolator is positioned to the left of the seat. By turning it counter-clockwise to the stop protection, the electrical system is supplied with power. When it is turned clockwise to the stop protection, all electronic systems are disconnected from the power supply. The Battery isolator clicks inwards.



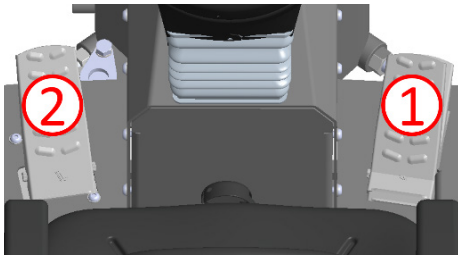
Joystick

The joystick has several functions. The direction of travel can be selected with one of the two push buttons on the front of the joystick. Press the top button (1) with the up arrow on it to drive forward. Press the lower button (2) with the down arrow on it to reverse. With the wheel (3) on the front of the joystick you can choose between a position for more power to the drive (pushing the wheel up) or a position for more power to the working hydraulics (pushing the wheel down). There is a button (4) on the back of the joystick to put the gear in neutral.

To operate the boom, the joystick must first be unlocked by pulling it up. By pulling the joystick towards the driver (5), the boom moves up. When the joystick is pushed away from the driver (6), the boom moves downwards. When the joystick is pushed to the right (7), the attachment tilts downwards; if the joystick is pushed to the left (8), the attachment tilts upwards.

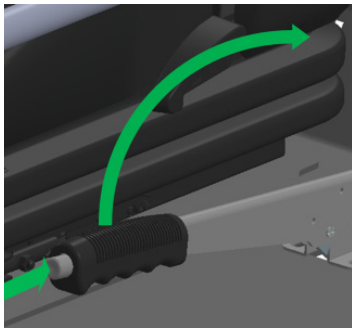
Pedals

The machine has two foot pedals. The right-hand pedal(1) is the accelerator pedal that allows you to accelerate proportionally to control the engine speed. This allows you to control the speed or controls of a hydraulic function. The machine will brake when the pedal is released. The left-hand pedal (2) is the brake pedal. It is a power brake, which means the disc brake on the drive shaft is activated, this way all four wheels are braked. If your Pitbull has the option to lock the front axle 100%, there is no disc brake on the machine but an oil multi-disc brake. For this purpose, the left pedal is also the brake pedal.



Parking brake

When you leave the machine, the parking brake must be applied to prevent it from rolling away. This is activated by pulling up the lever to the left of the seat. When you want to drive again, the button on top of the lever must be pressed and the lever pushed down. If your Pitbull has the option to lock the front axle 100%, there is no lever on the machine. In that case, the parking brake works electronically by pressing the button on the dashboard for switching on and off.



Driver's seat

The driver's seat is equipped with a two-point seat belt. The belt (1) is on the right-hand side of the seat, and the belt holder (2) on the left-hand side. Always attach the belt before unlocking the machine's drive, and only release it when the drive has been locked. There is a sensor in the seat that detects whether the driver is in the seat. If this is not the case, the drive will be interrupted and locked automatically.

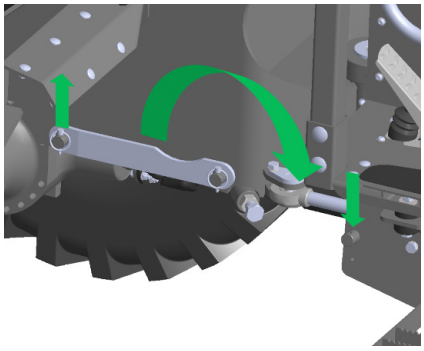
The armrests can be folded up to facilitate getting in and out. On the underside of both armrests there is a grey swivel part (3) to adjust the angle of the armrest upwards or downwards. The angle of the backrest is adjustable. It is tilted backwards at least 10 degrees and can be tilted back 28 degrees further. The backrest angle can be adjusted by lifting the lever on the left-hand side of the seat (4) and then pushing the backrest to the desired angle. When the backrest is not being pushed, it folds completely forward.

The seating position can be adjusted forwards and backwards. Between the front and rear position, the seating position is adjustable over a distance of 18 centimetres. The seat can be adjusted by pulling up the lever at the front of the seat (5), and then pushing the seat over the rails to the desired position.

A mechanical suspension is incorporated in the seat. In order to use this suspension as comfortably as possible, the driver can set their weight. There is a dial on the front of the chair for this purpose. The adjustable weight is 50 kg minimum and 150 kg maximum. By turning the dial (6) clockwise, the adjustable weight can be increased. The centre of the dial is a fold-out part to make it easier to turn the dial.

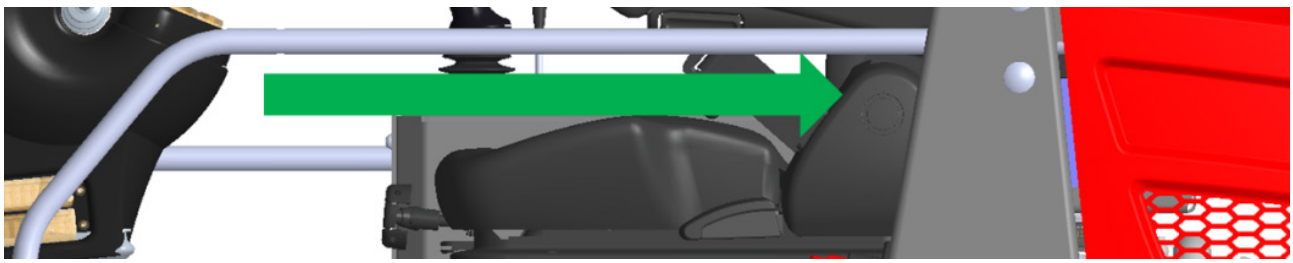
Transport protection

On the left-hand side of the Pitbull, a transport protection device has been installed to block steering movements of the Pitbull. When the Pitbull is driven onto a trailer and during the transport of the Pitbull, the transport protection device must be attached. This transport protection must be positioned along the steering cylinder over the appropriate fixings. This is only possible when the wheels of the Pitbull are positioned straight. There is a recess in the transport protection so that it can be positioned over the adjustment bolt of the steering. Make sure that the transport protection is locked with the appropriate pins.



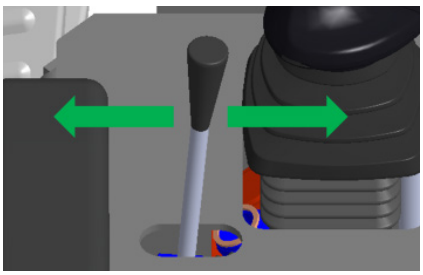
Failure protection

For your own safety, the machine is equipped with failure protection on both sides. It should always be used when sitting in the driver's seat. Before unlocking the machine's drive, the failure protection must be pushed forward. When you want to leave the machine, you must lock the drive and only then slide the failure protection backwards.



Coupling attachments

Just in front of the joystick is a lever that can be moved left and right. This lever controls the quick coupling for coupling attachments. Pushing the lever to the right will move the locking pin outwards to lock the attachment. Pushing the lever to the left will engage the locking pin to unlock the attachment.



Your Pitbull may have options for a third and fourth front hydraulic function to power an attachment hydraulically. Coupling of the hydraulic system can be done via standard 3/8 BSP quick couplings with a ball valve. The machine has female connections. The designations for the different types of liines are indicated by letters on the brackets: pressure line (P), return line (T) and leak line (L). The coupling of the attachment must be pushed into the quick coupling until it clicks. The coupling of the attachment can be loosened by pushing the ring on the coupling of the machine towards the coupling of the machine.

Coupling a trailer or carrier

If your machine has the tow bar (ball) or combination tow bar (ball and pin) option, you can hang a carrier or trailer behind the machine. If your Pitbull has the 12-volt rear connection option for trailer lighting, use a carrier or trailer with lighting. Adjust the speed of the machine to the stability of the trailer or carrier.
Always drive at walking pace on uneven or unpaved surfaces.

The towbar is attached to the rear frame. Ensure that the trailer or carrier always rests on the tow bar. The maximum ball pressure (vertical resting weight) is 210 kg for the tow bar (ball) option and 350 kg for the tow bar (ball and pin) combination option. The maximum trailer weight that can be towed with the tow bar option (bulb) is 2940 kg for the Pitbull X24 and 2830 kg for the Pitbull X27. The maximum trailer weight that can be towed with the optional combination tow bar (ball and pin) is 3840 kg on the Pitbull X24 and 3660 kg on the Pitbull X27.

Make sure that a breakaway cable is attached by an auxiliary coupling and that it lies in a noose around the ball when pulling a trailer.

The 12-volt connection is a standard 7-pin plug for trailers. Insert the plug into the socket and make sure that the plug clicks into the lock so that it will not come loose while driving. Check that all trailer or carrier lighting is working properly.

Your Pitbull may have the option of a hydraulic function on the rear. This can be used to hydraulically power up a trailer or carrier. Coupling of the hydraulic system is possible via standard 3/8 BSP quick couplings with ball valve. The machine has female connections. The designations for the different types of liines are indicated by letters on the brackets: pressure line (P), return line (T) and leak line (L). The coupling of the trailer or carrier must be pushed into the quick coupling until it clicks. The coupling of the trailer or carrier can be loosened by pushing the ring on the coupling of the machine towards the coupling of the machine.

6. MAKING THE MACHINE READY FOR USE

In order to be able to work with the machine correctly, a number of points must be checked and possibly supplemented before the machine is put into operation. This chapter describes what these points of the machine are. When receiving the machine, check it carefully for any transport damage.
If the machine is damaged, you must immediately inform the transporter and the dealer of the machine.

Fuel

The machine must have sufficient fuel in the tank to operate. The dashboard indicates the fuel level in the tank. Both the 36 and 45 hp version of the engine use diesel for fuel, called B7 within the European Union. The tank can be refilled via the fuel cap. This fuel cap is located around the front frame on the left under the start of the boom.
Remove the fuel cap before refilling, and then close the fuel cap properly. If your Pitbull has the option to lock the fuel cap, do not forget to lock the fuel cap.

WARNING! Fire hazard. Cigarettes and naked flames are prohibited when refuelling.
Switch off the engine before refuelling, and make the Pitbull free of flammable substances.

Tyre pressure

The correct tyre pressure is of great importance to minimise tyre wear, optimise fuel consumption and ensuring the correct grip on the surface on which the vehicle is driven. Different types of tyres are available for paved and unpaved terrain. The following tyre pressures are recommended for the following tyres:

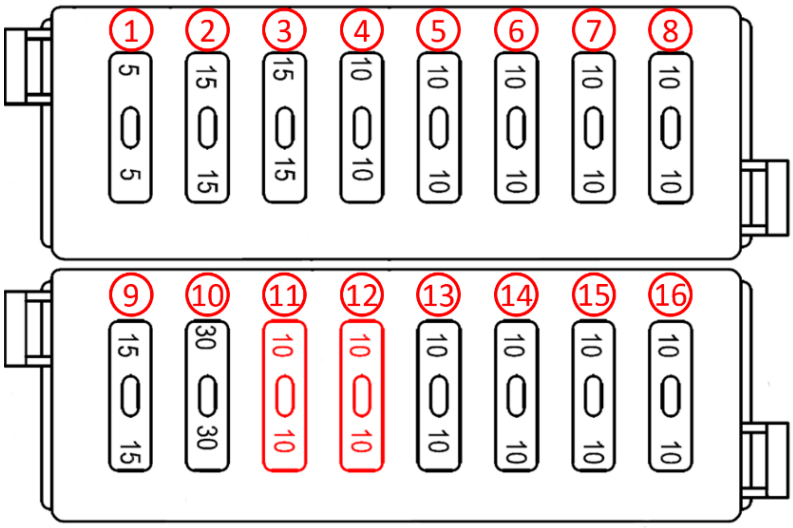
Tyre	Nominal pressure
Alliance 31x15.50 – 15 NHS 221	3.1 bar
Alliance 31x15.50 – 15 NHS 223	3.1 bar
BKT 19.0/45-17 AS504	2.8 bar
Deestone 31x15.50 – 15 NHS	3.1 bar
Mitas 31x15.5 – 15 SK-02	3.1 bar
Mitas 31x15.50 – 15 TR-06	3.0 bar
Mitas 31x15.50 – 15 TR-07	3.0 bar
Mitas 425/55 R17 MPT AC70 G	4.0 bar
Mitas 440/50 R17 IMP AR-04	3.6 bar
Mitas 480 45-17 IMP TR-01	4.0 bar
Trelleborg 400/50-15 T463	3.2 bar
Vredestein 400/60 – 15.5 IMP	3.6 bar

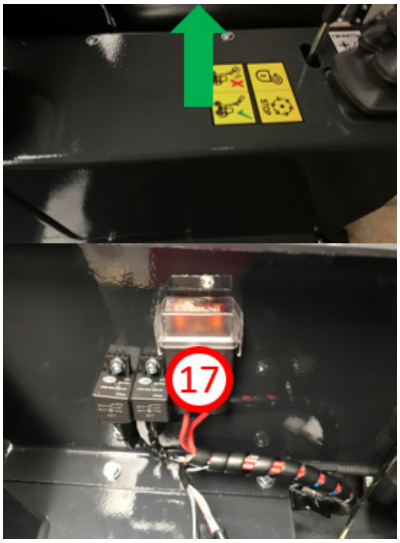
WARNING! When using other tyres, check whether they can be mounted on the rim or, if a rim is supplied, whether the rim fits on the axle. Check with the tyre supplier for the optimum tyre pressure.

TIP! Increase the optimum tyre pressure by 0.5 bar when driving on a slope between 10% and 20%.

Fuse holder

The fuse holder is positioned on the left-hand side of the wheelhouse. The fuses are protected against moisture and dust by a transparent protective cover. When checking or replacing a fuse, this protective cover must be removed. After checking or replacing, the protective cover must be reattached. The type of fuse used in the fuse holder is standard (auto) plug-in fuses type normal (length of 19.1 mm). The main fuse is of the maxi type (length of 29.2 mm). To reach the main fuse, the cover under the joystick must be removed. To do this, four bolts must be loosened, two at the top and two at the front. Next, the post must be released from the ROPS frame on the right front, this can be done by loosening two bolts at the bottom of the post. By pushing these up and sideways, the failure protection can be pushed all the way to the front. The cover can now be lifted off.





WARNING! Switch off the battery isolator if you want to check or replace the fuses.

WARNING! Never install a fuse with a higher amperage, as this will damage electrical components and may cause fire and explosion.

Fuse	Current	Application
1	5 ampere	Power supply indicator lights and meters dashboard.
2	15 ampere	Power supply brake light relays, pressure sensors, stop magnet and diesel pump.
3	15 ampere	Power supply hazard lights.
4	10 ampere	Power supply front work light.
5	10 ampere	Power supply flashing light.
6	10 ampere	Power supply rear work lights.
7	10 ampere	Power supply locking differential.
8	10 ampere	Power supply brake pressure sensor, speed sensor and alternator.
9	15 ampere	Power supply indicators.
10	30 ampere	Power supply controller.
11	10 ampere	Power supply coil handbrake and coil 6/2 valve.
12	10 ampere	Power supply neutral switch.
13	10 ampere	Power supply horn.
14	10 ampere	Power supply sidelight, dashboard and license plate lighting.
15	10 ampere	Power supply low beam.
16	10 ampere	Power supply high beam.
17	40 ampere	Main fuse.

NOTE! In the information below, several fluids are mentioned.
The Pitbull is equipped with these as standard; use only equivalent fluids.
Review the fluid specifications sheet to prevent damage to the machine.
These are shown in chapter 11. Fluids Specification Sheets.

Coolant

The coolant that is used is XLC, which can be used throughout the year in a 50% mixing ratio with water, and thereby provides protection up to -40 degrees Celsius. Check the coolant level only when the engine is cold. The amount of coolant can be checked and topped up via the cap on the right side of the combination cooler. There is a vent valve in the cap to protect the cooling system against overpressure. The maximum level of the coolant is reached if it is visible up to the bottom edge.

Hydraulic oil level

The hydraulic oil used for the drive and working hydraulics is HDZ hydraulic oil.
When cylinders are extended, part of the hydraulic oil of the system will be in the cylinders. It is important that there is always sufficient hydraulic oil in the tank, but it should not overflow when the cylinders are retracted.
To check how much hydraulic oil is in the tank, lift the dipstick at the return filter. This hydraulic oil return filter is located on the left-hand side of the engine compartment.
How to reach it and how to drain and top up hydraulic oil is described in chapter 8.16 Hydraulic oil.

Engine oil level

The engine oil used is 15W40 engine oil. The oil level can be checked with the dipstick.
The dipstick uses dashes to show the minimum and maximum levels for the engine oil level. Make sure that the engine oil level is just below the maximum engine oil level when the machine is put into service. Top up the engine oil or drain the oil according to Chapter 8.10 Engine oil.

Brake fluid

If your Pitbull has the option to lock the front axle 100%, you must not use brake fluid. In this case, the machine's oil multi-disc brake works with ordinary hydraulic oil. The brake fluid used with the standard machine is Mobil Univis HVI 26 (hydraulic oil). The brake fluid can be checked and topped up via the brake fluid reservoir. This reservoir can be reached through the service area under the seat; the reservoir is attached to the left-hand side of the engine compartment against the inside of the wheel arch. Unscrew the green cap for topping up. Fill the reservoir for approximately 60%, the level must not fall below 40%. Check the brake system for leaks and wear if the level drops visibly every week.

Lubrication points

Check the lubrication points indicated in chapter 8.3. Lubrication points. Regularly check the lubrication points according to the maintenance schedule. This prevents wear and high costs. Only use the grease or lubricant specified. The recommended grease type for the Pitbull is EP2 lubricating grease.

Wheel nuts and drive shafts

The wheel nuts used to mount the wheels are size M18x1.5. Ensure that the thread is undamaged and clean before the wheel nuts are loosened or tightened.
The tightening torque of the wheel nuts is 270 Nm. The wheel nuts must be tightened after 1 operating hour after mounting the wheels. Subsequently, they should be checked according to the maintenance schedule. Before commissioning the machine, the bolts and nuts holding the drive shaft to the gearbox and the brake disc or front axle must be tightened to 40 Nm.

7. COMMISSIONING OF THE MACHINE

When the machine is ready for use and the operator is familiar with the controls of the machine, the manual and safety rules, the machine can be used. In this chapter the operation is arranged in order, to facilitate working with the machine.

NOTE! Familiarise yourself with the entire machine and all controls before starting to work with the machine! If you have to do this while working, it will be too late.

Daily inspection

The machine must be serviced regularly according to the maintenance schedule. In addition, a brief daily inspection will be required prior to using the machine. The following points of the machine have to be checked:

- ▶ Check the machine carefully for damage, visible cracks and deformations.
- ▶ Check that all the stickers with safety instructions are present and undamaged.
- ▶ Check that all service hatches and bonnets are properly closed.
- ▶ Check that all the lights are working properly.
- ▶ Check that the dashboard is working properly.
- ▶ Check that the level of all fluids listed in chapter 6. "Making the machine ready for use" is adequate.
- ▶ Check the seat, the step and the floor of the cabin for dirt and slipperiness.

Starting

When starting the machine it is advised to check the following points of attention:

- ▶ Check that the belt is fastened and the failure protection is extended.
- ▶ Adjust the position of the seat to the ideal sitting position for the driver.
- ▶ Make sure that the exhaust fumes are discharged through the outside air or an exhaust system.
- ▶ Check that no load can fall or blow from the attachment.
- ▶ Check that the battery isolator is switched on.
- ▶ If the machine has a blocking position for the third hydraulic function, it must not be in the blocking position when the machine is started.
- ▶ In cold weather, preheat the engine for about 10 seconds by turning the ignition key to position II.
- ▶ Start the engine by turning the ignition key to position III.
- ▶ Allow the engine to reach the ideal operating temperature before it is heavily burdened.

Driving

When the engine has almost reached operating temperature, the machine can be driven.
It is advised to go through the following steps:

- ▶ Check that the carriageway and surroundings are clear and that there is sufficient visibility.
- ▶ Switch on the drive with the button on the wheelhouse with the symbol of a key.
- ▶ Position the lifting height about 20 centimetres above the ground.
- ▶ Select the desired driving direction with the joystick.
- ▶ Select the desired power distribution with the joystick if your machine has the inching option.
- ▶ Disengage the parking brake.
- ▶ Build up the speed slowly as you drive away.
- ▶ Check whether the fuel level is sufficient for the planned work.

WARNING! Never change the desired driving direction with the joystick if the machine is not stationary. This can cause damage to the drive.

DANGER! To prevent hearing damage, the operator of the machine and bystanders who are exposed to the machine noise for long periods must wear hearing protection.

The machine is steered with a hydraulically powered steering wheel. There is a steering wheel button on the steering wheel, making it easier to operate the machine with one hand so that other functions can be operated with the other hand. Keep two hands on the wheel as much as possible when the other functions are not being operated. Keep the following points in mind when steering:

- ▶ Do not steer the machine until the speed is moderate.
- ▶ Make sure that no people, animals or objects are in the turning circle of the machine.
- ▶ Take into account the position of the boom. A higher position reduces the stability of the machine.
- ▶ Make sure that the space around the pivot point of the steering is free.
- ▶ Increase the steering angle evenly while driving.
- ▶ Steer less sharply when driving over uneven or rough surfaces.

NOTE! Avoid steering when the machine is stationary. If you steer when the machine is stationary, the tyres will wear out very quickly.

Boom operation

The boom can be operated with the joystick. A number of points require attention:

- ▶ Take into account the dangers that various attachments and loads can cause.
- ▶ Make sure that no persons, animals or objects are present under the boom when it is raised.
- ▶ Keep the lifting height about 20 centimetres above the ground while driving.
- ▶ Take account of headroom when driving underneath objects.
- ▶ To raise the boom under high loads, the engine speed must be increased. To do this, switch the direction of travel to neutral and switch off the drive.
- ▶ If your machine has the third hydraulic function option, always switch it to the middle position when it is not being used.

WARNING! Familiarise yourself with the attachments you are driving with. Read the accompanying manuals carefully. Take into account protruding parts of the load and the weight of the load while driving.

Parking

Pay attention to the following points when parking and switching off the machine:

- ▶ Only park the machine where it is safe and does not cause any inconvenience.
- ▶ Park the machine in such a way that it can drive forwards.
- ▶ Press and hold down the brake pedal until the parking brake is engaged.
- ▶ Apply the parking brake with the lever or with the button on the wheelhouse with the (P) symbol.
- ▶ Switch the direction of travel to neutral with the button on the rear of the joystick.
- ▶ Lock the drive with the button on the wheelhouse with the symbol of a key.
- ▶ Place the lifting height in the engaged rest position of the cylinders of the boom.
- ▶ If your machine has a third hydraulic function, switch it to the middle position.
- ▶ If your Pitbull has a 45 hp engine, it is equipped with a turbo. Before switching off the engine, allow it to run at idle speed for one minute after intensive use. This allows the turbo to slow down while still being lubricated, and the lubricating oil to remain cooled. This increases the service life of the turbo bearings.
- ▶ To prevent theft, switch off the machine's ignition and do not leave the key in the machine.
- ▶ Retract the failure protection and only release the seat belt once the parking brake has been applied and the drive system has been switched off. Do not jump out of the machine, use the steps.
- ▶ Switch off the battery isolator.
- ▶ Leave the steps and cabin of the machine clean and make sure that if it is damaged it will be repaired.
- ▶ Clean and lubricate the piston rods.
- ▶ If the machine is not going to be used for a few days, lubricate all lubrication points.
- ▶ If the machine is not going to be used for a few months, put the battery onto a trickle charger, lubricate all lubrication points, pump up the tyres and add fuel stabiliser. Park the machine in a covered area or under a carport or cover it with a tarpaulin.

TIP! Allow the internal combustion engine with turbo to idle for one minute after intensive use before turning it off. This increases the service life of the turbo bearings.

8. MAINTENANCE

Timely and correct maintenance of the machine is of great importance for an optimal service life of the machine. Any defects can then be found at an early stage, so as to prevent consequential damage or loss. Peeters Landbouwmachines B.V. does not accept any responsibility for direct or consequential damage or loss resulting from poor maintenance. It is advised to schedule maintenance in accordance with the periodic maintenance schedule, or earlier in case of intensive use. The required precautions to prevent accidents must be taken during all maintenance activities.

Execution of maintenance

- ▶ Ensure that the persons carrying out maintenance and repairs are trained and qualified to carry out this work.
- ▶ When replacing parts, use original parts as listed in the parts book. The parts book can be downloaded via **peetersgroup.com** under 'Support'.
- ▶ Make sure the Pitbull is level and stable during maintenance.
- ▶ Check that the engine is off and the parking brake is engaged.
- ▶ Switch off the battery isolator.
- ▶ Take into account any pressure that may still be present in the hydraulic system.
- ▶ Always wear the correct personal protective equipment and work in a well-organised and clean environment.
- ▶ Only clean the machine with water and do not use aggressive cleaning agents.

Environment

Incorrect maintenance can lead to damage to the environment. Only carry out maintenance in a designated workshop with a solid and impermeable floor. Separate fluid residues, fluid-contaminated parts/tools, filters, batteries and cleaners with chemical waste. In addition, separate other waste as much as possible and take it to recognised waste-processing companies.

8.1 PERIODIC MAINTENANCE SCHEDULE

The following maintenance schedule indicates when periodic maintenance should be carried out.
If the machine is used in extreme conditions or intensively, maintenance must take place earlier than indicated.

- ○ Check and update or replace if necessary.
- ● Preventive replacement.

				Machine hours				
	1x per day	1x per week	1x per year	First 50	Every 250	Every 750	Every 1500	Every 2500
Frame								
Cleaning the entire machine	○			○	○			
Check for cracks, bending and dents	○			○	○			
Check legibility of safety stickers	○			○	○			
Lubricate hinge points		○		○	○			
Check tightening torque for bolts and nuts		○		○	○			

	Machine hours							
	1x per day	1x per week	1x per year	First 50	Every 250	Every 750	Every 1500	Every 2500
Drive								
Check tyre pressure and tyre wear		○		○	○			
Check tightening torque of wheel nuts		○		○	○			
Check tightening torque for drive shaft bolts/nuts			○	○				○
Check level and quality of brake fluid		○			○			
Replace brake fluid							●	
Check handbrake adjustment				○	○			
Check brake disc						○		
Check brake pads						○		
Replace gearbox oil						●		
Replace front axle oil						●		
Replace rear axle oil						●		
Combustion engine								
Check level and quality of engine oil		○						
Change engine oil			●	●	●			
Check level and quality of coolant		○						
Replace coolant			●				●	
Check cyclone filter		○			○			
Replace engine oil filter			●	●	●			
Check combination cooler			○			○		
Check air filter			●			○		
Check fuel filter				●	●			
Check V-belt tension						○		
Check valve position						○		
Check exhaust for rust						○		
Check fuel pump								○
Check turbo charger								○
Hydraulics								
Check level and quality of hydraulic oil		○		○	○			
Replace hydraulic oil						●		
Check tightening torque for the hydraulic couplings			○			○		
Check hydraulic oil return filter				○		●		
Check hydraulic hoses for cracking					○			
Replace hydraulic oil filter for driving motor						●		
Electronics								
Check lighting operation	○							
Check dashboard operation	○							
Check battery voltage			○	○		○		

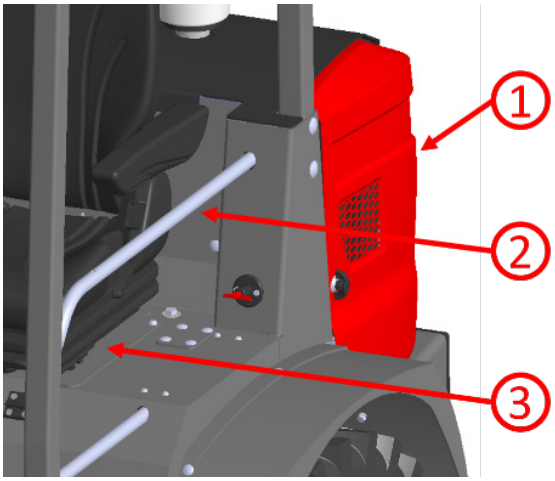
8.2 SERVICE AREAS

WARNING! Always turn off the engine and allow the engine and exhaust system to cool down before opening a service area, making sure all service areas are closed before starting the engine.

To make maintenance of the Pitbull easier, there are three service areas. The most accessible service area is the engine area (1). This is accessible via both the right and left-hand sides of the machine. These can be opened by turning the lock. Your Pitbull may be equipped with the option for locks on hoods. Please note that this service area near the engine compartment may be locked.

To access the battery, there is a service space on the side between the cabin and the engine compartment (2). To open it, the seat backrest must be folded forward by pulling the lever on the left-hand side of the seat upwards. The service hatch can be opened by loosening the four bolts. Always make sure that the battery isolator is off before opening this service area.

The drive can be reached via the service area under the seat (3). To reach it, the bolts on the sides of the seat must be loosened. There is one on each side. Once they are loosened, the entire seat can be folded forward.

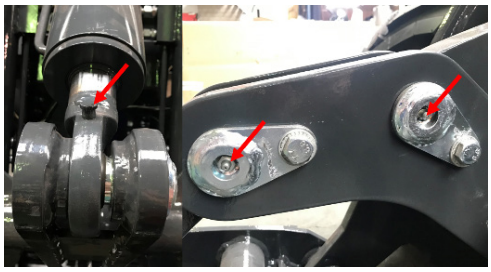


A number of parts can be serviced via the underside of the machine. The underside of the machine is partly open, and under the combustion engine there is a service hatch that can be opened by loosening four bolts. By opening the service hatch at the engine compartment and the service compartment under the seat, much more light enters through the underside of the machine to make servicing easier. When servicing via the underside, pay extra attention that the machine is unable to roll or move.

8.3 LUBRICATION POINTS

The following lubrication points should be lubricated:

- ▶ Boom lifting cylinders
- ▶ Boom breakout cylinder
- ▶ Steering cylinder
- ▶ Hydraulic quick coupling cylinder
- ▶ All hinge points of the boom



8.4 CHASSIS BOLT TIGHTENING TORQUES

Nominal dimensions	Spanner width (mm)	Torque (Nm)
M5	8	6.5
M6	10	11.3
M8	13	27.3
M10	17	54
M12	19	93
M16	24	230
M20	30	464

8.5 TYRES

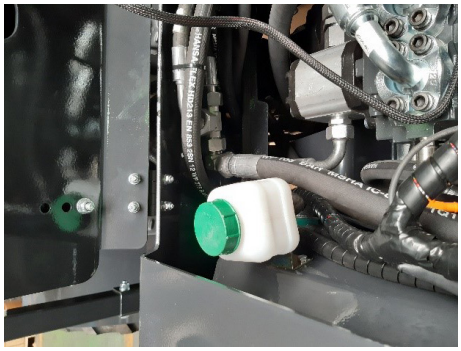
Check tyre pressure every week. The table in chapter 6. "Making the machine ready for use" shows how high the tyre pressure should be. In addition to tyre pressure, check tyre wear. There must not be any cracks in the tyre, and the ridges must be high enough for the terrain in which they are used.

Replace only with tyres that fit the rim, or replace the rims with them. Make sure that these rims fit on the axle. Make sure that the tyres on the left-hand side are the same as the tyres on the right-hand side.

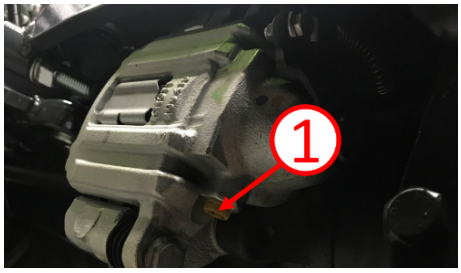
8.6 BRAKE FLUID

The oil multi-disc brake with 100% locking function is maintenance-free.

The brake fluid used in the 45% locking function is Mobil Univis HVI 26 (hydraulic oil). The brake fluid can be topped up or changed via the brake fluid reservoir. This reservoir can be reached through the service area under the seat; the reservoir is attached to the left-hand side of the engine compartment against the inside of the wheel arch. Unscrew the green cap for topping up. Old brake fluid can be replaced by letting it flush through the bleed nipple (1) at the brake caliper. To replace the brake fluid, 0.4 litres of fresh brake fluid is required.

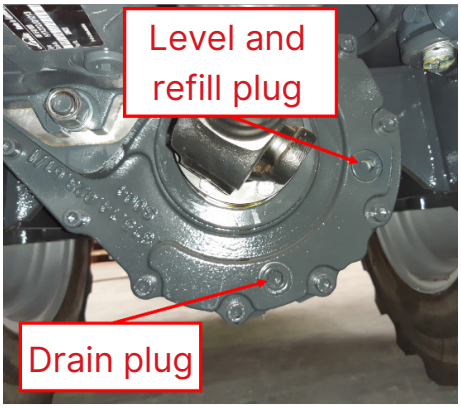


Bleed the brake system after replacing the brake fluid. Unscrew the bleed nipple (1). Depress the brake pedal until no more air bubbles pass through the nipple. Then tighten the bleed nipple spring. Depress the brake pedal several more times before driving the machine to ensure that all brake lines are supplied with brake fluid.



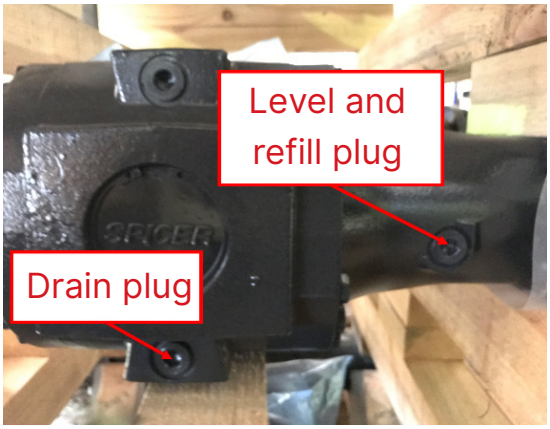
8.7 GEARBOX OIL

The LS 85W-90 lubricating oil of the gearbox can be changed by opening the drain plug. Collect the old oil in a container. Loosen the level and top-up plug to add fresh oil into the gearbox. Flush the gearbox briefly to evacuate all the old oil. Re-tighten the drain plug and fill the gearbox to the level of the level and top-up plug. Then tighten the level and top-up plug. To change the oil of the gearbox, 0.5 liters of fresh oil is required.

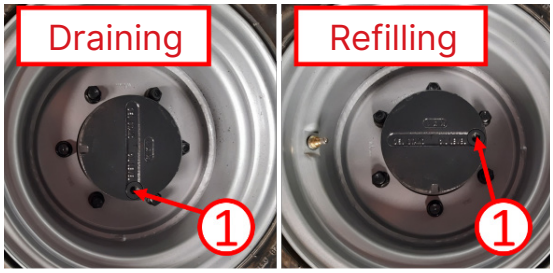


8.8 FRONT AXLE OIL

Changing the oil on the front axle is the same for both the 45% and 100% locking function of the front axle. To change the LS 85W-90 lubricant on the front axle, unscrew the drain plug. Collect the old oil. Then unscrew the level and top-up plug and flush the front axle briefly to evacuate the old oil. Retighten the drain plug to fill the front axle via the level and refill plug until it reaches the level of the level and refill plug. Make sure that the axle is horizontal when changing the oil. To change the oil on the front axle, 1.0 litre of fresh oil is required.

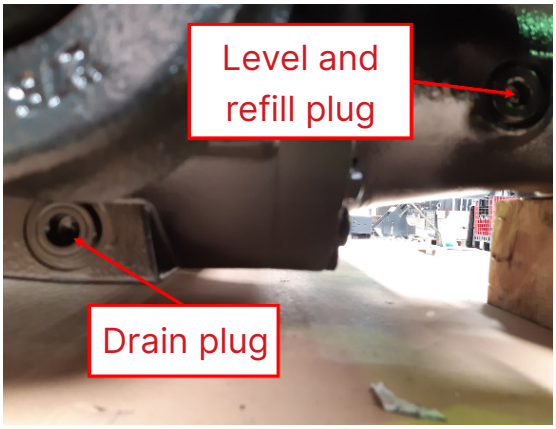


The oil on both the left and right wheel hubs must be replaced by turning the axle until the level plug (1) is in the lowest position. Unscrew the level plug and collect the old oil. Then rotate the axle 90 degrees. Top up the oil until it reaches the level of the level plug. The level plug must then be retightened. To change the oil at the wheel hubs, 1.0 litre of fresh oil is required per wheel hub.

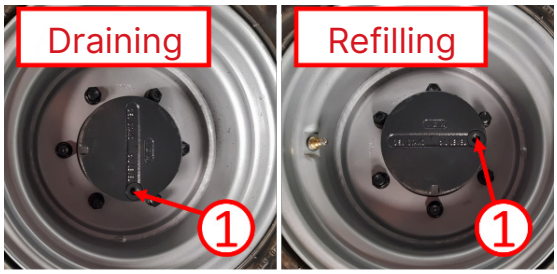


8.9 REAR AXLE OIL

Changing the oil on the rear axle is done in the same way with both the 45% lock function and the open differential on the rear axle. The LS 85W-90 lubricating oil on the rear axle can be changed in the same way as on the front axle. Unscrew the drain plug and collect the used oil. Then unscrew the level and top-up plug and flush the front axle briefly to evacuate the old oil. Retighten the drain plug to fill the front axle via the level and refill plug until it reaches the level of the level and refill plug. Make sure that the axle is horizontal when changing the oil. To change the oil on the rear axle, 1.0 litre of fresh oil is required.

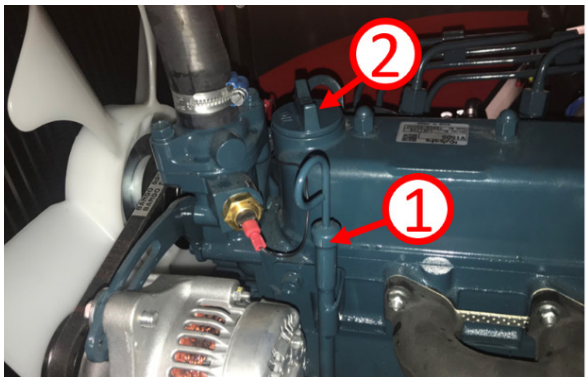


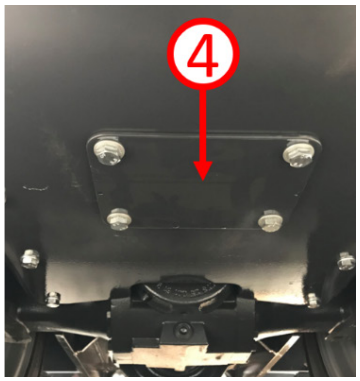
The oil on both the left and right wheel hubs must be replaced by turning the axle until the level plug (1) is in the lowest position. Unscrew the level plug and collect the old oil. Then rotate the axle 90 degrees. Top up the oil until it reaches the level of the level plug. The level plug must then be retightened. To change the oil at the wheel hubs, 1.0 litre of fresh oil is required per wheel hub.



8.10 MOTOR OIL

The engine oil that is suitable for the Pitbull is 15W40 engine oil. The oil level can be checked with the dipstick (1). Check the oil level according to the maintenance schedule. The dipstick uses dashes to show the minimum and maximum levels for the engine oil level. The engine oil can be topped up by unscrewing the filler cap (2). The oil can be drained via the drain plug (3). Collect the oil. The drain plug can be reached by loosening the cover plate (4) on the underside of the machine. Wait 5 to 10 minutes after the engine is switched off before draining the oil; warm oil eases the flow but very hot oil can cause injury. Tighten the drain plug securely before topping up with fresh oil. To change the engine oil, 4.6 litres of fresh oil is required.

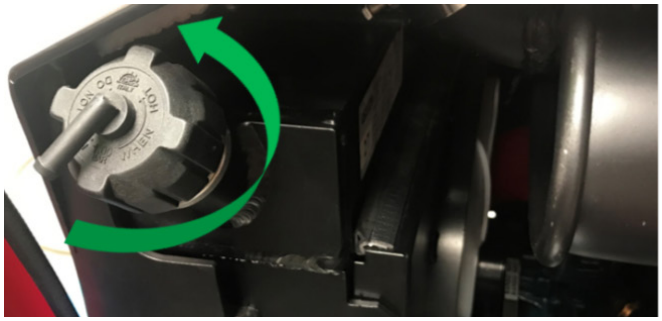


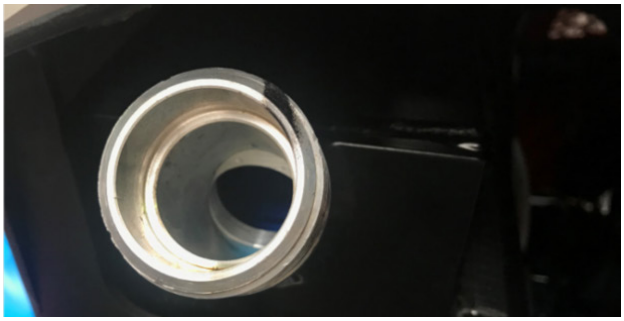


8.11 COOLANT

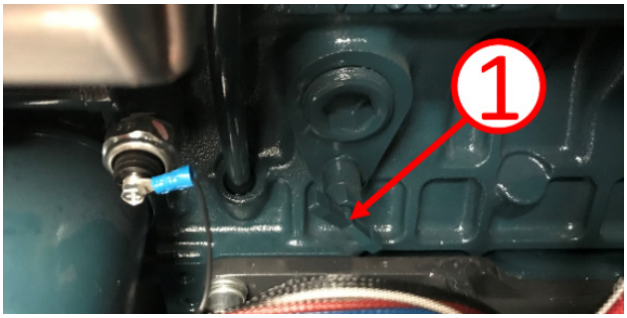
WARNING! Do not open the cap of the combination cooler if the coolant can be hot. Due to the pressure, the hot liquid may escape.

The coolant that is used is XLC, which can be used throughout the year in a 50% mixing ratio with water, and thereby provides protection up to -40 degrees Celsius. Only top up the coolant level when the engine is cold. The amount of coolant can be checked and topped up by loosening the cap on the right-hand side of the combination cooler. There is a vent valve in the cap to protect the cooling system against overpressure. For this reason, the combination cooler must not be filled up to the cap.





To drain old coolant, unscrew the drain plug (1) on the combustion engine. It is located on the right-hand side of the engine, to the right of the engine oil filter. Collect the old coolant and flush the cooling system with fresh coolant so that no dirt is left behind. Re-tighten the drain plug before topping up the coolant. To replace the coolant, 7.5 litres is required.



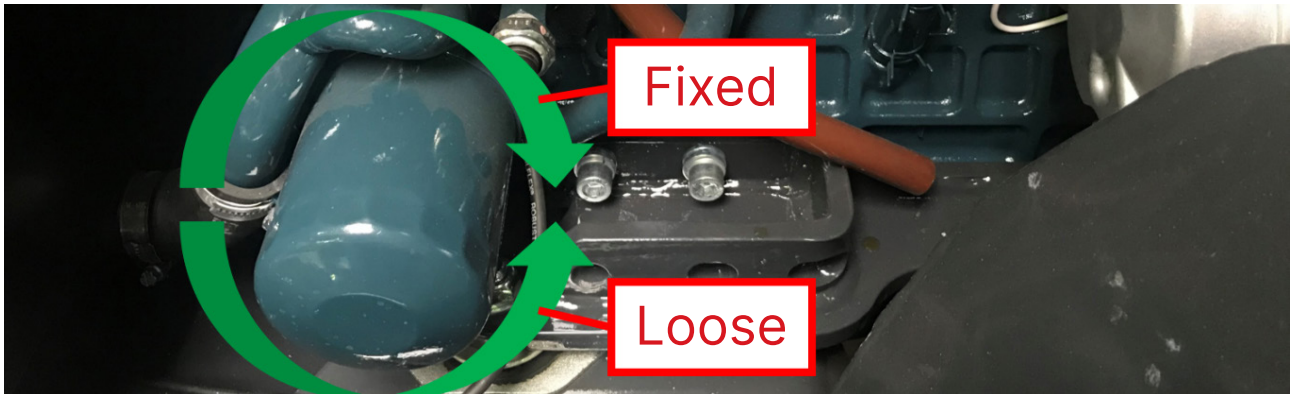
NOTE! To prevent overheating, check that the Pitbull grille and combination cooler fins are completely free of coating and debris.

8.12 CYCLONE FILTER

The cyclone filter is easy to check. It is advised to do this once a week. It is positioned on top of the rear of the machine. Because it is transparent, it can be checked without the need to unscrew anything. The cyclone filter filters the air for the inlet system. It is, therefore, important that the filter is emptied in good time. This is easily done by loosening the wing nut on top, lifting off the protective cap and lifting off the transparent container and emptying it over a waste bin.
When replacing the transparent container and the protective cap, the wing nut must not be over-tightened. This results in high tension on the plastic and may cause cracks. If cracks are visible, the cyclone filter no longer works optimally and the part must be replaced.

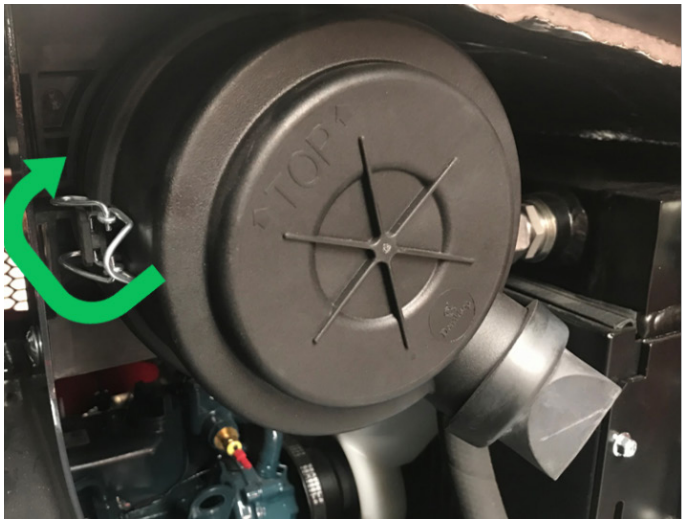
8.13 MOTOR OIL FILTER

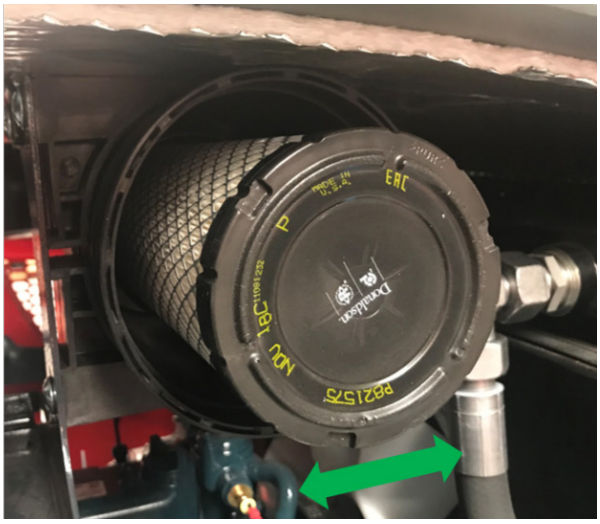
Replace the engine oil filter according to the maintenance schedule, this is necessary to protect the engine against dirt. The engine oil filter is located on the right-hand side of the combustion engine. In addition to the filter, change the engine oil at the same time. Wait 5 to 10 minutes after switching off the engine to allow the oil to cool down. Unscrew the drain plug and ensure that the oil that flows out is collected. The filter itself is threaded, unscrew it counter-clockwise with filter pliers. Clean the thread of the engine block and then tighten the drain plug again, do not over-tighten it as this may cause damage to the engine block. Coat the seal of the new filter with oil and turn the new filter clockwise onto the engine block. Tighten it by hand. Top up the oil via the filler cap, check the oil level after half an hour and top up if necessary.



8.14 AIR FILTER

The air filter is suspended from the top of the engine compartment, on the left-hand side in a plastic holder. The lid can be removed from the holder by releasing two metal locks. The filter can be loosened by gently twisting the filter. Blow the filter clean or replace the filter. Make sure it is properly secured by twisting it. Once the filter has been replaced, the lid can be put back on the holder. Make sure it clicks firmly into the lock.

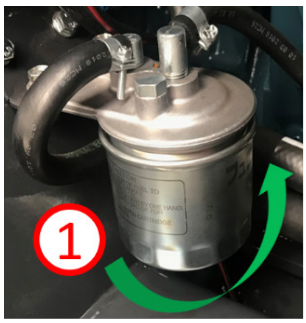


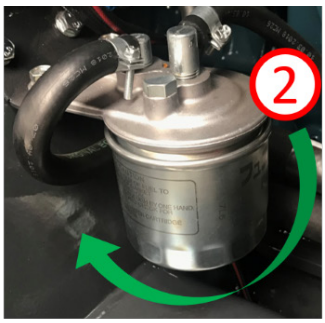


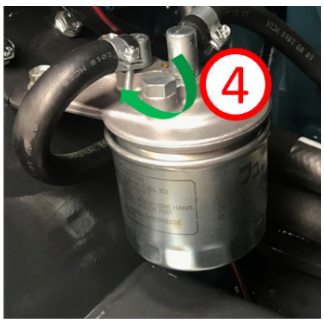
8.15 FUEL FILTER

Change the fuel filter according to the maintenance schedule. The fuel filter is located on the left-hand side of the engine compartment. Unscrew the fuel filter with filter pliers. Lubricate the rubber sealing edge of the new filter with a layer of grease or oil for better sealing. Hand-tighten the new filter and lightly tighten it with filter pliers. The fuel system must now be bled using the following steps:

- ▶ Unscrew the central bolt on the top of the filter housing.
- ▶ Switch on the battery isolator and the ignition.
- ▶ Wait for fuel to pass the bolt and tighten it when the air is running out.
- ▶ Clean the whole and start the machine.







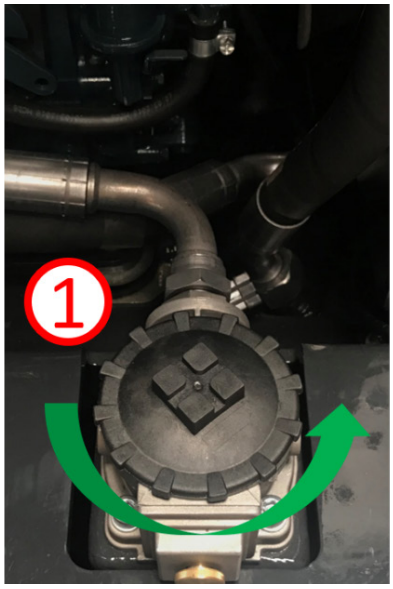
8.16 HYDRAULIC OIL

CAREFUL! Never top up the oil in the oil tank if not all the cylinders have been retracted. Changes in its level might otherwise cause the tank to flow over!

It is important that there is always sufficient hydraulic oil in the tank. This can be checked by lifting the dipstick. There must be at least a visible drop on the dipstick

The following steps must be taken to top up the tank:

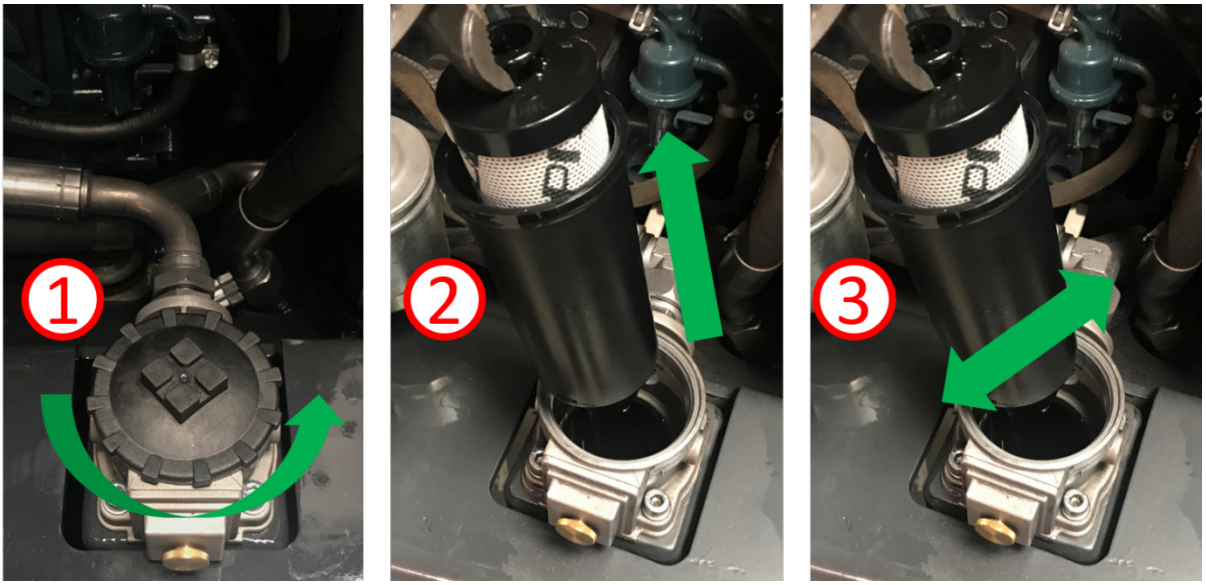
- ▶ Make sure that all cylinders are retracted.
- ▶ Unscrew the cap of the return filter.
- ▶ Remove the hydraulic oil return filter, ensuring that there is a clean drip tray and working environment to prevent contamination in the hydraulic tank and in the filtration system.
- ▶ Check the hydraulic oil level using the dipstick. The maximum level is up to the edge of the filling neck.
- ▶ Reinstall the hydraulic oil return filter and clean it.
- ▶ Start the machine and operate the hydraulic function several times without load; if oil comes out of the vent, this indicates that there is too much hydraulic oil in the system.



If there is excess, wrong or out-of-date hydraulic oil in the tank, it can be drained by loosening a hose coupling on the underside of the tank. Collect this hydraulic oil. Flush the tank briefly with new hydraulic oil to flush out the old hydraulic oil and any dirt. Re-tighten the hose coupling and fill the tank with new Mobil Univis HVI 26. Changing the hydraulic oil requires 55 litres of fresh oil.

8.17 HYDRAULIC OIL FILTERS

Change the hydraulic oil filters according to the maintenance schedule. The return filter is easily accessible via the left-hand side of the engine compartment. Unscrew the plastic cover and the filter can be lifted out. Insert a new filter and tighten the lid firmly by hand. The return filter can be changed without the need to change or drain the hydraulic oil.



The hydraulic oil filter near the drive motor is accessible through the service area under the seat. Make sure the ignition and the battery isolator are switched off; create working space around the filter and clean the area. Go through the next steps:

- ▶ Make sure that the seat cannot fall back onto the service area.
- ▶ Unscrew the filter with filter pliers
- ▶ Clean the contact edge and apply a layer of grease or oil to the contact surface of the new filter.
- ▶ Mount the new filter hand-tight and lightly tighten it with filter pliers.
- ▶ Clean the whole.
- ▶ Check that the service area is properly closed.
- ▶ Start the machine and drive a short distance to check for leaks.

8.18 BATTERY

WARNING! Turn off the battery isolator before opening the battery service compartment. Protect the battery terminals with protective covers.

To reach the battery, there is a service space on the side between the cabin and the engine compartment. The battery used is a 12-Volt lead-acid battery with a capacity of 60Ah. Only replace it with an equivalent battery. Check the battery voltage annually. The best time to do this is at the start of the winter months. If the machine is not used during the winter months, it is best to connect the battery to a trickle charger. Always disconnect the negative pole (-) first, and then the positive pole (+). When replacing the battery terminals, first secure the positive pole and then the negative pole. When the battery is removed from the machine, the strip clamping the battery at the bottom must be removed by loosening the two bolts of the strip. Replace this strip when the battery is replaced in the machine.

8.19 ARTICLE NUMBERS

Article description	Article number
Hydraulic return filter (excl. dipstick)	959-070-049
Hydraulic suction filter driving motor	959-070-061
Dipstick for hydraulic tank	959-094-160
Air filter external	960-010-394
Air filter internal	960-010-395
Motor oil filter	960-010-396
Fuel filter	960-010-397
V-belt	960-010-398

9. DAMAGE AND MALFUNCTIONS

NOTE! After a (near) accident involving the Pitbull, insurers and government bodies may start an investigation. Do not move the Pitbull or repair any damage until the Pitbull has been released, unless this is necessary to secure the safety of people or animals.

9.1 DAMAGE REPAIR

If it becomes apparent that damage needs to be repaired or that a preventive repair is necessary, the component to be repaired must be replaced with an original component included in the parts list. The parts book can be downloaded via **peetersgroup.com** under 'Support'. Any failure to respect this provision will remove any liability as regards such structural change. Disconnect the battery and controller before welding to the chassis.

Damage repairs involve more safety risks than regular maintenance. Have damage repaired only by a damage repairer with the correct qualifications. If you have any questions, please contact the dealer or manufacturer of the machine.

9.2 TOWING

WARNING! It is forbidden to tow the machine. The hydrostatic drive will immediately be irreparably damaged and become very hot, which may cause damage to other parts of the machine.

It is forbidden to tow the machine. The hydrostatic drive will immediately be damaged, and this poses several safety risks to other machine parts and the environment. If the machine can no longer move of its own accord, it will have to be hoisted.

9.3 HOISTING

WARNING! Never lift or hoist the machine above people, animals, or vulnerable / dangerous objects. Keep sufficient distance from the above so that the machine cannot fall against or onto these if a hoisting cable or round sling breaks or tears off.

It is best to lift the machine when it is facing straight ahead. Therefore, if possible, make sure that the machine faces straight ahead, so that the transport lock can be put in place to prevent kinking of the steering. In addition, activate the parking brake.

There are several safety risks when hoisting the machine. Always use lifting eyes and hang them up at the positions indicated with stickers. Attach undamaged hoisting chains or round slings to these lifting eyes that are able to withstand more than sufficient weight. Keep in mind that dirt, attachments and loads make the machine heavier than its own weight. Make sure that the hoisting crane is able to lift the weight. If a mobile crane is used, it must be positioned and stamped in accordance with the mobile crane's instructions.

WARNING! Damaged and weak hoisting equipment can break or tear, as well as weak attachment points. Due to the tension on the cables, chains or slings, both ends may shoot in a certain direction uncontrolled and at high speed. The forces released during this process can cause fatal injuries, just like the machine itself, if it falls uncontrolled.

Ensure a safe and well-organised environment when hoisting. Hoisting is forbidden if people, animals and vulnerable / dangerous objects are nearby. If something goes wrong during hoisting, both the machine and the crane may fall over uncontrollably. Always take into account the height of the crane and the machine, the distance to be covered and the height to which the machine is being hoisted. Limit the distance to be covered as much as possible, and keep the height as close as possible to the ground. Check the regulations of the crane for the wind speeds up to which hoisting is allowed. In addition, nothing must lie loose on the machine, and it must be hoisted horizontally.

CAREFUL! Ensure the correct lengths of the hoisting cables or round sling so that they do not touch the roof. This can damage the roof and the license plate holders.

If the machine is tilted or sagging, it could be that the hoisting chains or slings are touching body parts. Make sure that this is not the case with weak parts, and try to use slings because chains can cause scratching. If the machine is both tilted and sagging, or if for any other reason a lifting chain or round sling cannot be attached to all the specified lifting points, contact your dealer or the manufacturer.

9.4 TROUBLESHOOTING LIST

This troubleshooting list recommends actions to be carried out by the user to remedy a malfunction. Contact your dealer if the malfunction cannot be remedied with the recommended actions.

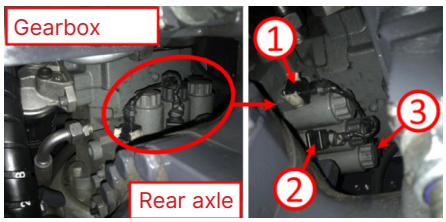
Engine malfunctions

Fault	Possible cause	Possible solution
Starter motor is not running	Battery isolator is off	Turn the battery isolator counter-clockwise.
	Fuse has blown	Replace main fuse (40A).
	Battery voltage is too low	Recharge or replace the battery.
Internal combustion engine does not start or stops immediately	No fuel in tank	Fill the tank with diesel.
	Fuse has blown	Replace fuse number 2 (15A).
	Blockage during injection	Change the fuel filter.
	Wrong fuel	Drain off all fuel and refuel with diesel.
	Fuel filter clogged	Change the fuel filter.
	Engine too cold	Preheat the engine.
Combustion engine gets too hot	Not enough engine oil	Top up the engine oil.
	Wrong engine oil	Drain the engine oil and top it up with the correct engine oil.
	Engine oil pressure too low	Check the engine oil filter and engine oil level.
	Not enough coolant	Top up the coolant.
	Wrong coolant	Drain the coolant and fill the combination cooler with the correct one.
	Coolant too hot	Allow the machine to cool at idle speed and without load, and ensure that the combination cooler is free of dirt or cover.
	Radiator blocked	Free the radiator and grille from cover and dirt.
Reduced power	Fuel filter clogged	Change the fuel filter.
	Air filter clogged	Clean or change the air filter.
	Fuel out of date	Drain the fuel and fill up with fresh fuel.
	Too much engine load	Do not burden hydraulic functions that are not necessary when other hydraulic functions are used.
	Engine temperature too low	Bring the machine up to operating temperature before loading it.
	Engine not properly lubricated	Check the engine oil filter and engine oil level.

Drive malfunctions

Fault	Possible cause	Possible solution
Drive does not switch into forward	Switch coil makes no contact	Clean off any dirt on the three contacts and plugs on the underside of the drive motor and ensure that they snap into place.*
Drive does not switch into neutral	Switch coil makes no contact	Clean off any dirt on the three contacts and plugs on the underside of the drive motor and ensure that they snap into place.*
	Fuse has blown	Replace fuse number 2 (15A) or fuse number 11 (10A).
Drive does not switch into reverse	Switch coil makes no contact	Clean off any dirt on the three contacts and plugs on the underside of the drive motor and ensure that they snap into place.*
The machine is not driving, the engine is running	Parking brake is applied	Release the parking brake.
	Seat sensor does not detect a driver	Check that the driver is properly seated on the seat.
	Brake pedal depressed	Release the brake pedal.
	Fuse has blown	Check all fuses.
	Drive in neutral	Switch to the desired driving direction.
	Drive locked	Unlock the drive.
	Not enough hydraulic oil	Top up the hydraulic oil.
The machine is very noisy	Not enough hydraulic oil	Top up the hydraulic oil.
	Air in the hydraulic system	Move the boom up a little more if it is already at the highest position.
	Wrong hydraulic oil	Drain the hydraulic oil and fill the tank with the correct hydraulic oil.
The machine jolts while driving	Not enough hydraulic oil	Top up the hydraulic oil.
	Air filter dirty and clogged	Change the air filter.
Driving motor gets too hot	Prolonged heavy load	Allow the machine to cool down in between.
	Return oil does not flow away fast enough to the tank	Lower the hydraulic oil level and check the return line.
	Working hydraulics heavily loaded while driving	Reduce travel speed and relieve the strain on the working hydraulics as much as possible.
	Hydraulic oil too hot	Allow the machine to cool at idle speed and without load, and ensure that the combination cooler is free of dirt or cover.
Locking differential does not switch on.	Fuse has blown	Replace fuse number 7 (10A).
The machine brakes insufficiently.	Not enough brake fluid	Top up the brake fluid.
	Air in the brake system	Bleed the brake system.
	Pressure drops in hydrostatic system lines	Top up hydraulic oil.
The machine no longer moves forwards or backwards and continues to flash in standby mode.	Time relay does not switch anymore	Replace time relay
	Relay X36(1) in side console is defective	Replace relay X36(1) in side console

* The plugs on the underside of the drive motor can be reached via the underside of the Pitbull. They are located above the rear axle and the connection is between the rear axle and the gearbox. Make sure the Pitbull is completely locked and cannot be started.



Malfunctions in other hydraulic functions

Fault	Possible cause	Possible solution
Hydraulic systems are not working properly	Not enough hydraulic oil	Top up the hydraulic oil.
	Hydraulic oil too hot	Allow the machine to cool at idle speed and without load, and ensure that the combination cooler is free of dirt or cover.
	Hydraulic oil too cold	Bring the machine up to operating temperature.
	Engine speed too low	Depress the accelerator pedal further.
	Wrong power distribution.	Switch on the correct power distribution with the rotary wheel on the joystick.
	Hydraulic components controlled too much at once	Do not burden hydraulic functions that are not necessary when other hydraulic functions are used.
	Too much resistance of hinge points	Lubricate all lubrication points.
	Hydraulic oil filter dirty	Change the hydraulic oil filter.
	Return filter is dirty	Change the return filter.
	Return does not flow away to the tank fast enough	Lower the hydraulic oil level and check the return line.
Hydraulic oil comes out of the vent	There is too much hydraulic oil in the system.	Make sure all cylinders are retracted and drain the hydraulic oil until the level has dropped to the indicated maximum.

Electronics malfunctions

Fault	Possible cause	Possible solution
Complete electrical system does not work	Battery not connected	Place the battery terminals on the battery.
	Battery defective	Replace the battery.
	Battery isolator off	Turn the battery isolator counter-clockwise.
	Main fuse blown	Replace the 40A main fuse.
Dashboard lighting does not switch on when the ignition is switched on	Fuse blown	Replace fuse number 14 (10A).
	Cabling disconnected	Attach the plugs securely.
Lighting does not come on	Fuse(s) blown	Replace the fuse(s).
	Lamp(s) burned out	Replace bulbs.
	Cabling disconnected	Securely fasten the battery terminals.
Fuel gauge does not work	Fuse blown	Replace fuse number 1 (5A).
Coolant temperature gauge does not work	Fuse blown	Replace fuse number 1 (5A).
Hour meter does not work	Fuse blown	Replace fuse number 8 (10A).
Rev counter does not work	Bad contact / cable break	Have the cables measured and replaced.
	Fuse blown	Replace fuse number 1 (5A).

10. SERVICING

	Date	Hours	Stamp	Remarks
First maintenance after 50 working hours.				
Light maintenance at 250 working hours.				
Light maintenance at 500 working hours.				
Major maintenance at 750 working hours or after 1 year, whichever is reached first.				
Light maintenance at 250 working hours after the last major maintenance.				
Light maintenance at 500 working hours after the last major maintenance.				
Major maintenance at 750 working hours, or 1 year after the last major maintenance.				

	Date	Hours	Stamp	Remarks
Light maintenance at 250 working hours after the last major maintenance.				
Light maintenance at 500 working hours after the last major maintenance.				
Major maintenance at 750 working hours, or 1 year after the last major maintenance.				
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Major maintenance at 750 working hours, or 1 year after the last major maintenance.				
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Major maintenance at 750 working hours, or 1 year after the last major maintenance.					

11. FLUIDS SPECIFICATION SHEETS

Brake fluid

Mobil

Univis HVI Series

Mobil Industrial , United States

Hydraulic Oils

Product Description

Univis HVI is a line of premium performance anti-wear hydraulic oils characterised by their unusually high viscosity indexes. They are engineered to maintain close viscosity control over wide temperature range applications. Because of their resistance to viscosity change, Univis HVI oils are recommended for hydraulic systems that are subject to wide temperature variations. Many of these systems are sensitive to changes in viscosity of the hydraulic oil, since they depend on uniform viscosity for hydraulic accuracy. They exhibit optimum flow characteristics at sub-zero temperatures and the oils are resistant to shearing and viscosity loss so that system efficiency is maintained and internal pump leakage is minimised at high operating temperatures and pressures. These high quality hydraulic oils also provide very good anti-wear protection for high-pressure vane, piston and gear pumps. The Univis HVI oils are designed with excellent oxidation stability reducing deposit formation and improving pump and valve performance. They were developed in conjunction with the major OEM's to meet the stringent requirements of severe hydraulic systems using high pressure, high output pumps as well as handling the critical requirements of other hydraulic system components.

Features and Benefits

Univis HVI oils provide outstanding viscosity control over a wide temperature range. Their excellent oxidation resistance allows extension of oil and filter change intervals while assuring clean systems. Their high level of anti-wear properties and excellent film strength characteristics result in exceptional equipment performance that not only results in fewer breakdowns but helps improve production capacity. Their controlled demulsibility permits the oils to work well in systems contaminated with small amounts of water yet readily separate large amounts of water.

The Univis HVI oils provide the following benefits:

- Unusually high viscosity index and excellent viscosity control characteristics improves machine accuracy and reduces torque
- Very low pour points maintains excellent fluidity conditions at low temperatures
- Suitable for use in hydraulic equipment operating in very cold conditions, such as cold stores and mobile equipment operating in very cold climates
- High performance and smooth hydraulic operations derived from uniform viscosity control, fast air release, very good foam control and good water separability
- Exceptional rust and corrosion protection reduces the negative effects of moisture on system components
- Effective oxidation stability reduces deposits and improves valve performance

Applications

- Hydraulic systems critical to uniform hydraulic oil viscosity over a wide temperature range
- Hydrostatic transmissions and dash pots
- They can also be used in fine instruments and other mechanisms where power input is limited and increases in torque due to the lubricant thickening cannot be tolerated
- To reduce deposit formation in equipment where close clearance servo-valves are used
- Systems where cold start-up and high operating temperatures are typical
- Systems requiring a high degree of load-carrying capability and anti-wear protection
- Applications where rust and corrosion protection are an asset such as systems where small amounts of water are unavoidable

Properties and Specifications

Property	13	26

23.04.2021

Property	13	26
Copper Strip Corrosion, 3 h, 100 C, Rating, ASTM D130	1A	1A
Flash Point, Cleveland Open Cup, °C, DIN EN ISO 2592	>100	>100
Kinematic Viscosity @ -40 C, mm2/s, ASTM D445	371	896
Kinematic Viscosity @ 100 C, mm2/s, ASTM D445	5.3	9.3
Kinematic Viscosity @ 40 C, mm2/s, ASTM D445	13.5	25.8
Pour Point, °C, ASTM D97	-60	-60
Viscosity Index, ASTM D2270	404	376

Health and Safety

Health and Safety recommendations for this product can be found on the Material Safety Data Sheet (MSDS) @ http://www.msds.exxonmobil.com/psims/psims.aspx

09-2020

Exxon Mobil Corporation
22777 Springwoods Village Parkway
Spring TX 77389

1-800-ASK MOBIL (275-6624)

Geartex® LS

High performance automotive transmission oil

Product description

Geartex LS are high performance automotive gear oils formulated for use in limited slip differentials, meeting API service mark GL-5.

Geartex LS is available in the viscosity grades SAE 85W-90 and SAE 85W-140, and is formulated from a mineral base oil combined with an effective additive package that contributes to reliable locking differential performance and protection.

Customer benefits

- High performance friction modifier additive ensures smooth, quiet operation of limited slip differentials
- Powerful EP formulation helps prevent abrasion and wear of components
- Good fluidity at low temperatures ensures fast oil circulation and wear protection during cold starts
- Reliable shear stability ensures stable viscosity and constant system protection over the life of the fluid

Product strengths

- **Smooth, silent operation**
- **Prevents abrasion and wear of parts**
- **Provides reliable wear protection during cold starts**
- **Ensures protection for the life of the liquid**

Selected specification standards include:

API	ZF

Geartex® LS – Follow-up

Applications

- Geartex LS is specifically designed for use in automotive differential lock axles. The special friction improver additive in the formulation is ZF approved for use in their limited slip differential systems.
- Geartex LS can also be used in equipment that requires a standard API GL-5 transmission oil: hypoid drive shafts, steering systems, non-synchronised transmissions and transaxles. Due to its frictional properties Geartex LS is not suitable for use in synchronised transmissions and transaxles, and therefore should not be used for these applications.
- Operating temperatures in excess of +100 °C lead to a significantly reduced service life of the oil. Peak operating temperatures should not exceed +120 °C.
- Geartex LS is not recommended for use in wet brake systems. These applications generally require products with higher friction enhancement and may also generate higher temperatures than Geartex LS can withstand. Use Textran TDH Premium in these applications

Approvals, performance and recommendations

Approvals **Viscosity grade**	**SAE 85W-90**	**SAE 85W-140**
ZF TE-ML 05C	X [2]	X [3]
ZF TE-ML 12C	X [2]	X [3]
ZF TE-ML 16E	X [2]	X [3]
ZF TE-ML 21C	X [2]	X [3]

[1] ZF registration number: ZF000809
[2] ZF registration number: ZF000810
[3] ZF registration number: ZF001686

Performance **Viscosity**	**SAE 85W-90**	**SAE 85W-140**
API GL-5	X	X

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EU v3 05 December 2014
Geartex® LS

Geartex® LS – Follow-up

Typical characteristics			
Test	**Test methods**	**Results**	
Viscosity grade		**85W-90**	**85W-140**
Specific gravity, 15°C, kg/l	ASTM D4053	0,898	0,9087
Flash point COC, °C	ASTM D92	218	222
Pour point, °C	ASTM D97	-34	-24
Kinematic viscosity at 100°C, mm²/s	ASTM D445	16,7	24,9
Kinematic viscosity at 40°C, mm²/s	ASTM D445	170	318
Viscosity index	ASTM D2270	103	100
Viscosity, Brookfield, -26°C, mPa.s	ASTM D2983	12.000	42.000

The information provided in the specific data is not a specification but an indication based on current production and may be affected by permitted production tolerances. The right to make adjustments is reserved. This replaces all previous editions and the information contained therein.

EU v3 05 December 2014
Geartex® LS

Delo® Gold Ultra E SAE 15W-40

Heavy duty engine oil with proven performance

(Replaces Ursa Premium TD SAE 15W-40)

Product description

Delo Gold Ultra E SAE 15W-40 is a heavy duty engine oil with proven performance formulated for stable viscosity retention in Euro I, II, III, IV and V diesel engines.

Delo Gold Ultra E SAE 15W-40 is formulated with ISOSYN® technology, a combination of premium base oil and additives, for optimal protection of diesel engines. This long drain oil protects the engine against soot, dirt deposits and wear in demanding operating conditions.

Delo Gold Ultra E SAE 15W-40 is suitable for use in most engines with Exhaust Gas Recirculation (EGR) systems and after-treatment systems with Selective Catalytic Reduction (SCR), as well as for engines without Diesel Particulate Filter (DPF).

Customer benefits

- Reduces the formation of dirt at low temperatures, prevents oxidation at high temperatures and protects the pistons from dirt deposits
- Detergent and acid control inhibits engine and bearing corrosion, reducing maintenance downtime
- Provides protection against cylinder wear and scuffing for longer engine life and increased uptime
- Improves protection against soot build-up and wear, reducing excessive viscosity build-up and filter clogging

Recommendations may vary from one engine manufacturer to another.
If in doubt, consult the operating manual and/or contact the dealer.

Product Highlights

- **Improves protection against soiling at low and high temperatures**
- **Protects motors and bearings from corrosion**
- **Protects against wear and tear of the cylinders**
- **Protects against dirt deposits and filter clogging**

Selected specification standards include:

ACEA	Allison
API	Caterpillar
Cummins	DAF
Detroit Diesel	Deutz
Global	Iveco
JASO	Mack
MAN	Mercedes Benz
MTU	Renault Trucks
Volvo	

Delo® Gold Ultra E SAE 15W-40 — Follow-up

Applications

- Formulated for use in turbocharged and non-turbocharged diesel engines, with or without intercooling, on trucks, buses, light commercial vehicles, earth moving equipment, construction machinery, agricultural vehicles and ships.
- Designed for efficient performance in most engines with Exhaust Gas Recirculation (EGR) and Selective Catalytic Reduction (SCR) and in engines without Particulate Filter (DPF) aftertreatment systems

Approvals, performance and recommendations

Approvals

- Cummins CES 20078
- Detroit Diesel DDC93K215
- Deutz DQC III-10
- Mack EO-N
- MAN M3275-1
- Mercedes Benz MB-approval 228.3, MB-approval 229.1 (Outdated specification)
- MTU Category 2
- Renault Trucks RLD-2
- Volvo VDS-3

Performances

- ACEA E7, A3/B4
- API CI-4, CH-4
- Allison C4
- Caterpillar ECF-2
- Cummins CES 20076, CES 20077
- JASO DH-1
- Global DHD-1

Recommendations

Delo Gold Ultra E SAE 15W-40 is suitable for use in applications requiring the following specifications:

- Allison TES 439
- API CE, CD, CF, CF-4, CG-4
- Cummins CES 20071, CES 20072
- DAF (Euro II- en III-engines)
- Iveco (Euro IV- en V-engines)
- Renault Trucks RD, RD-2, RLD en Volvo VDS-2

Typical characteristics

Test	Test methods	Results
Viscosity grade		**SAE 15W-40**
Shelf life: 60 months from the filling date indicated on the product label		
Density at 15°C, kg/l	ASTM D4052	0,878
Kinematic viscosity at 40°C, mm2/s	ASTM D445	111,2
Kinematic viscosity at 100 °C, mm2/s	ASTM D445	14,6
Viscosity index	ASTM D2270	134
Pour point, °C	ASTM D5950	-43
Flash point COC, °C	ASTM D92	240
Total base number (TBN), mg KOH/g	ASTM D2896	10,5
Sulphate ash, %wt	ASTM D874	1,5

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EU v7 20 December 2017
Delo® Gold Ultra E SAE 15W-40

Havoline® XLC

Customer benefits

Environmentally friendly protection

Havoline XLC is composed of low-toxic, environment-friendly carboxylic acids, combined with an ethylene glycol-based technology. Designed with patented organic and aliphatic acid additives, Havoline XLC provides maintenance-free long life or full life protection against all types of corrosion of all metal components used in cooling systems.

Havoline XLC provides excellent protection of both ferro-alloys and aluminium as well as high-level corrosion protection on aluminium heat-transfer surfaces in modern engines.
These high heat transfer capacities provide great flexibility in great flexibility in motor design.

The synergistic combination of mono- and di-carboxylic acid acid technologies in Havoline XLC results in maintenance-free protection against freezing overheating and corrosion. In the cooling systems of buses and trucks it provides very reliable protection up to 650,000 km, in the cooling systems of passenger cars up to 250,000 km and finally up to 32,000 hours in the cooling systems of stationary engines. This
This high performance liquid should be replaced every 5 years or at the periods indicated above.

Advanced maintenance-free protection

The synergistic combination of the additive technologies used in Havoline XLC optimises the reliability and service life of the cooling system. Havoline XLC's highly stable corrosion inhibitors provide world-class extended life or full life protection for all the components of the cooling system, including water pumps, thermostats and radiators.

Product summary

Formulated to provide extended or full life, maintenance-free protection, Havoline XLC offers environmentally friendly protection against all types of corrosion of the metal components used in the cooling systems of cars, trucks and other heavy duty equipment.

Havoline® XLC — Follow-up

Thanks to its superior nitrate-free composition, Havoline XLC is resistant to cavitation and contains no silicates or phosphates. Thanks to its highly stable formulation, Havoline XLC is also very stable in hard water solutions.

Applications

- Havoline XLC provides long-life frost and corrosion protection. To obtain good corrosion protection, it is recommended to use at least 33% Havoline XLC in the coolant. This concentration gives frost protection down to -20°C. Typical mix ratios used in Northern Europe are 50% and provide freeze protection down to -40°C. Mixtures containing more than 70% Havoline XLC in water are not recommended. The maximum frost protection (approximately -69°C) is obtained with a mixture of 68% Havoline XLC.
- Havoline XLC can be used in engines manufactured from cast iron, aluminium or combination of these 2 metals, and in cooling systems made from aluminium or copper alloys. Havoline XLC is especially recommended for high-tech engines in which high-temperature protection of aluminium is important. For racing applications, Havoline XLI is recommended, which is an aqueous solution with the same carboxylic acid inhibitors.
- Havoline XLC is compatible with most other ethylene glycol based coolants. However, exclusive use of Havoline XLC is recommended to ensure optimum corrosion protection and prevention of sludge formation. The use of soft water is also preferred when making dilutions. Laboratory tests have shown that acceptable corrosion protection is still obtained with water of 20°dH containing up to 500 ppm chlorides and 500 ppm sulphates.

Approvals, performance and recommendations

• ASTM	D3306/D4656 D 4985
• BRB	BR637
• British Standard	6580
• FVV	Heft R443
• JASO	M325
• JIS	K2234
• KSM	2142
• MIL Belgium	BT-PS-606 A
• MIL France	DCSEA 615/C
• MIL Italy	1415b
• MIL Sweden	FSD 8704
• NATO	S-759
• NFR	15-601
• Önorm	V5123
• SAE	J1034
• UNE	26-361-88/1
• ADE	-
• Behr	-
• DAF	74002
• MB-Approval	325.3
• Detroit Diesel	-
• Deutz	0199-99-1115 (2)
• Deutz/MWM	0199-99-2091 (4)
• Ford	WSS-M97B44-D CMR 8229
• Ulstein Bergen	2.13.01
• GM	6277M (+B040 1065) QL 130100
• Isuzu	-
• Jenbacher	-
• Karosa	-
• Kobelco	-
• Komatsu	07.892 (2001)
• Leyland	DW03245403
• Liebherr	MD1-36-13
• MAK	A4.05.09.01
• MAN	324 Typ SNF
• Mazda	MEZ MN 121 D
• MG Rover	–
• Mitsubishi	–
• MTU	MTL 5048
• Renault	41-01-001/- - S Type D
• Saturn	-
• Scania	TB 1451
• Thermo King	-
• VW	TL-774 D = G 12 TL 774 F = G 12 61-0-0257
• Wärtsilä	DLP799861
• Waukesha	-
• Yanmar	-

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Havoline® XLC —Follow-up

Typical characteristics			
Test	**Test methods**	**Results**	
		Havoline XLC	**ASTM 3306 requirements**
Water content	ASTM D1123	5% w/w max	5% w/w max
Axis content	ASTM D1119	average 1.1% w/w	5% w/w max
Nitrite, amine, phosphate, borate	-	Nil	-
Colour	-	Orange	-
Density, 15°C	ASTM D1122	average 1.116	1.110 till 1.145
Density, 20°C	ASTM D1122	average 1.113	-
Equilibrium boiling point, °C	ASTM D1120	average 180	> 163
Reserve alkalinity (pH 5.5)	ASTM D1121	average 6.2	Report
pH at 20°C	ASTM D1287	average 8.6	-
Refractive index, 20°C	ASTM D1218	average 1.430	-

Typical characteristics					
Test	**Test methods**	**Results**			
		Havoline XLC ASTM 3306 requirements			
Dilution		**33%**	**40%**	**50%**	**ASTM 3306**
pH	ASTM D1287	8.3	8.4	8.6	7.5 till 11.0
Initial crystallisation, °C	ASTM D1177	< -18	< - 24	< - 37	< - 37
Vorstbescherming, °C	-	average - 20	average - 27	average - 40	-
Density, 20 °C	ASTM D1122	average 1.053	average 1.056	average 1.068	-
Reserve alkalinity (pH 5.5)	ASTM D1121	average 2.1	average 2.4	average 3.0	-
Refractive index, 20°C	ASTM D1218	average 1.369	-	average 1.385	-
Equilibrium boiling point, °C	ASTM D1120	average 104	-	average 108	-
Effect on non-metals	GME60 255	no effect	no effect	no effect	-
Discolouration	ASTM D 1882	no effect	-	-	no effect
Hard water stability	VW PV 1426	-	-	no effect	-

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Disclaimer Chevron assumes no responsibility for any loss or damage incurred as a result of using this product for purposes other than those specifically stated in product data sheets.
Health, Safety, Storage, and Environment Based on currently available information, this product is not expected to produce adverse effects on health when used for the intended application and in accordance with the recommendations provided in the Material Safety Data Sheet (MSDS). MSDS's are available upon request through your local sales contact office, or via the Internet. This product should not be used for purposes other than its intended use. Please respect the environment and local regulations when disposing of the used product.

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EU v6 13 September 2012
Havoline® XLC

Mobil

Univis HVI Series

Mobil Industrial , United States

Hydraulic Oils

Product Description

Univis HVI is a line of premium performance anti-wear hydraulic oils characterised by their unusually high viscosity indexes. They are engineered to maintain close viscosity control over wide temperature range applications. Because of their resistance to viscosity change, Univis HVI oils are recommended for hydraulic systems that are subject to wide temperature variations. Many of these systems are sensitive to changes in viscosity of the hydraulic oil, since they depend on uniform viscosity for hydraulic accuracy. They exhibit optimum flow characteristics at sub-zero temperatures and the oils are resistant to shearing and viscosity loss so that system efficiency is maintained and internal pump leakage is minimised at high operating temperatures and pressures. These high quality hydraulic oils also provide very good anti-wear protection for high-pressure vane, piston and gear pumps. The Univis HVI oils are designed with excellent oxidation stability reducing deposit formation and improving pump and valve performance. They were developed in conjunction with the major OEM's to meet the stringent requirements of severe hydraulic systems using high pressure, high output pumps as well as handling the critical requirements of other hydraulic system components.

Features and Benefits

Univis HVI oils provide outstanding viscosity control over a wide temperature range. Their excellent oxidation resistance allows extension of oil and filter change intervals while assuring clean systems. Their high level of anti-wear properties and excellent film strength characteristics result in exceptional equipment performance that not only results in fewer breakdowns but helps improve production capacity. Their controlled demulsibility permits the oils to work well in systems contaminated with small amounts of water yet readily separate large amounts of water.

The Univis HVI oils provide the following benefits:

- Unusually high viscosity index and excellent viscosity control characteristics improves machine accuracy and reduces torque
- Very low pour points maintains excellent fluidity conditions at low temperatures
- Suitable for use in hydraulic equipment operating in very cold conditions, such as cold stores and mobile equipment operating in very cold climates
- High performance and smooth hydraulic operations derived from uniform viscosity control, fast air release, very good foam control and good water separability
- Exceptional rust and corrosion protection reduces the negative effects of moisture on system components
- Effective oxidation stability reduces deposits and improves valve performance

Applications

- Hydraulic systems critical to uniform hydraulic oil viscosity over a wide temperature range
- Hydrostatic transmissions and dash pots
- They can also be used in fine instruments and other mechanisms where power input is limited and increases in torque due to the lubricant thickening cannot be tolerated
- To reduce deposit formation in equipment where close clearance servo-valves are used
- Systems where cold start-up and high operating temperatures are typical
- Systems requiring a high degree of load-carrying capability and anti-wear protection
- Applications where rust and corrosion protection are an asset such as systems where small amounts of water are unavoidable

Properties and Specifications

Property	13	26

23.04.2021

Property	13	26
Copper Strip Corrosion, 3 h, 100 C, Rating, ASTM D130	1A	1A
Flash Point, Cleveland Open Cup, °C, DIN EN ISO 2592	>100	>100
Kinematic Viscosity @ -40 C, mm2/s, ASTM D445	371	896
Kinematic Viscosity @ 100 C, mm2/s, ASTM D445	5.3	9.3
Kinematic Viscosity @ 40 C, mm2/s, ASTM D445	13.5	25.8
Pour Point, °C, ASTM D97	-60	-60
Viscosity Index, ASTM D2270	404	376

Health and Safety

Health and Safety recommendations for this product can be found on the Material Safety Data Sheet (MSDS) @ http://www.msds.exxonmobil.com/psims/psims.aspx

09-2020

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Typical Properties are typical of those obtained with normal production tolerance and do not constitute a specification. Variations that do not affect product performance are to be expected during normal manufacture and at different blending locations. The information contained herein is subject to change without notice. All products may not be available locally. For more information, contact your local ExxonMobil contact or visit www.exxonmobil.com

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Multifak® T EP 2

Multipurpose EP lithium grease

Product description

Multifak T EP 2 is a multipurpose EP lithium lubricating grease formulated with a semi-synthetic 1 base. The semi-synthetic base has a high viscosity for better adhesion and water stability.

Multifak T EP 2 also contains a combination of EP and anti-wear additives with anti-oxidants formulated for reliable equipment protection.

Customer benefits

- Very stable formulation
- Contributes to EP protection
- Offers high resistance to oxidation
- High pressure load-bearing capacity
- Water-resistant
- Helps to reliably protect against corrosion
- High thermal compressive strength
- Good adhesion

Applications

- Multifak T EP 2 is a multi-purpose grease for the lubrication of automobiles, industrial machines and construction machinery.
- Multifak T EP 2 is extremely suitable for bearings that are rarely lubricated due to their difficult accessibility and operation under extreme operating conditions. Due to its smooth structure, this product is easily pumpable.

[1] Mineral oil + polymer

Product strengths

- **Very stable formula**
- **Semi-synthetic base**
- **Contributes to EP protection**
- **Offers high resistance to oxidation**

Selected specification standards include:

DIN	ISO

Multifak® T EP 2 – Follow-up

Approvals, performance and recommendations

Performance

	DIN 51 502	ISO 6743-09	Operating temperature
Multifak T EP 2	KP 2K-20	ISO-L-XBCEB2	-20°C to +130°C with short periods up to 150°C

Typical characteristics

Test	Test methods	Results
NLGI class	**DIN 51 818**	**2**
Product number		**32064**
Appearance	-	Light brown
Soap type	-	Lithium
Penetration after processing, 60x, mm/10	DIN ISO 2137	265-295
Drop point, °C	DIN ISO 2176	Circa 190
Type of base oil	-	Semi-synthetic
Base oil viscosity at 40°C, mm²/s	DIN 51 562	680
Emcor corrosion test	DIN 51 802	0/0
Copper corrosion 24 hours at 120°C	DIN 51 811	1B
Static water resistance	DIN 51 807/1	0-90
Four-cone test EP, N	DIN 51 350/4	2.600

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EU v1 27 April 2010
Multifak® T EP 2

Index

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PITBULL

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