

Operator's manual



TERRI ATD

**Before taking your Terri in use read the manual
carefully and get familiar with the contents**

Foreword

This manual explains how to operate and maintain your new **Terri ATD**. Even if you are already familiar with Terri, there is a lot of information in this manual which you will need to know.

You can carry out lubrication and routine maintenance yourself, but for the other servicing work we strongly advise that the machine should be handed over to your dealer, who has a well-trained workshop staff available.

We reserve the right to alter the specifications and equipment, as well as instructions for maintenance and other service measures, without prior notification.

Manufacturer: **Alcab, THT AB**
Viksdal
744 51 Morgongåva
Tel. +46-224-600 70
Fax +46-224-608 11
Fax +46-224-609 72

Type of machine:
TERRI ATD

Power rating: **24,4 kW** (DIN 70020)

Serial number:

Motor number:

Machine plate:
Placed at the left front of the engine house

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DESCRIPTION

TERRI ATD

Terri ATD is a track drive cross-country vehicle with Ackermann steering system and a loading capacity of 3 tons. *Terri ATD* is a special purpose machine with an extensive and many-sided range of application.

Terri ATD is equipped with a four-cylinder, fluid cooled Lombardini LDW diesel unit engine.

Terri ATD is equipped with a hydrostatic / mechanical steering assembly with sealed hydraulic circuit. An effect limited variable hydraulic pump that is directly coupled to an internal combustion engine operates the system. In the tractor unit a high-speed hydraulic motor is running a 2-speed gearbox of preselection type with a mechanical differential blocking. The gearbox runs the tracks via two gear wheels.

Terri ATD is easy to drive with smooth running characteristics and great tractive force in all situations. The closed hydraulic system is equally effective as a brake as it provides great tractive force.

The driver's cab is spacious and the control components used for work are within convenient reach. The numbers of functions necessary to operate *Terri ATD* are minimised. Therefore both the driving- and working position is comfortable for the driver. The flexible grab loader is either operated via a conventional multiple lever system or via a double lever system, in that case equipped with built-in driving functions. The driver's seat is obtainable with mechanic springs or air springs.

At the front of the machine there is a built-in winch. The winch can be used to pull off the machine or to draw out timber from inaccessible terrain.

LOADING UNIT EQUIPPED WITH HYDRAULIC DRIVE

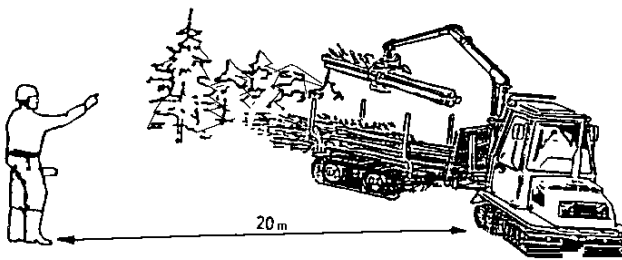
The wagon is equipped with two low speed hydraulic motors that operate the tracks via a gear pinion. The wagon is equipped with an automatic hydraulic differential brake. An electric switch in the cabin switches the wagon operation on and off. When the wagon operation is disconnected the hydraulic motors are balanced at the same time so that the wagon can run free. Maximum transport speed is achieved by disconnecting the wagon operation and putting in the high-speed gear.

The wagon is equipped with a built-in parking brake that is operated via an electric switch in the cabin. When the motor is stopped the wagon is braked automatically.

Remember! Security always depends upon the driver, therefore follow the security instructions carefully.



This symbol means **DANGER, be careful**. Your and other people's security and health are at stake.



GENERAL SECURITY REGULATIONS

Read and try to understand the contents of this chapter. It contains a table of rules that always must be followed when working with Terri.

However, these rules do not excuse the driver from not following statutory or other regulations valid nationally in the field of safety in traffic and occupational security.

As a matter of precaution

It is the driver's duty to be well acquainted with the maintenance instructions and security regulations concerning the machine.

Damages

It is the driver's duty to take immediately care of damages and wear and tear that can be hazardous to security.

Maintenance

Perform regularly the maintenance measures according to the chart. When performing service- and inspection measures, put down the gripping appliance and stop the motor.

Danger-zone

The danger-zone for the machine is 20 m, within this range nobody may loiter when the machine is in operation.

Driver's mates

There are no seats for driver's mates.

Carbon monoxide danger

Never start the motor or let it run indoors. Danger of carbon monoxide poisoning.

Tipping over

If the machine tips over, hold on to the driver's seat or the handles. **DO NOT JUMP!**

Fire extinguisher

The fire extinguisher must always be included when driving Terri. Be familiar with the instructions for the fire extinguisher. Inspect regularly that the manometer needle of the fire extinguisher is within the green field.

Support

Always use the support braces when working with the crane.

Load

Never load higher than the height of the safeguard posts.

Load in the crane

Never drive the machine with load hanging in the loading crane.

Hanging load

Never go or stand under hanging load.



Before driving

Check whether the functions of the driving levers and brake control is all right.

Driving

Never drive the machine merely with wagon operation. This can cause the machine to tip under certain circumstances. The low gear of the tractor unit must always be engaged when wagon operation is engaged. When driving on uphill and downhill slopes the wagon operation must always be engaged.

PRIOR TO leaving the machine

Before you leave the machine: put down the log grips, stop the motor and switch off the main switch.

Fluid levels

When controlling the fluid level or filling the fuel tank or the fluid level of the battery never use open flames.

Terrain

If possible, inspect the terrain where you are to drive, especially during the wintertime when the snow is covering bumps. Pay attention to the angle of inclination and the consequences this will have on the stability of the tractor.

Children

Never allow children in the cabin or in the vicinity of the machine when the motor is running.

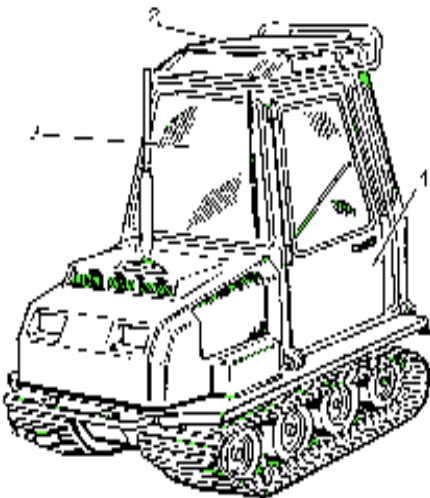
Emergency exits

Get familiar with the emergency exits of the cabin.

1. Side door
2. Roof hatch
3. Windscreen

The security pins of the roof hatch must be withdrawn when driving on an ice-covered lake.

When the windscreen is used as emergency exit, smash first the screen with the hammer, placed inside on the right in the cabin.





Total height

Be aware of the total height of the crane and the load before driving where the height is limited. Be extra careful when driving where there are temporary arrangements, pendulous aerial cables etc. When driving in the forest or on a forest road do remember that it may be difficult to observe aerial lines over the road. Besides, these cables can hang surprisingly low when they are covered with snow and ice.

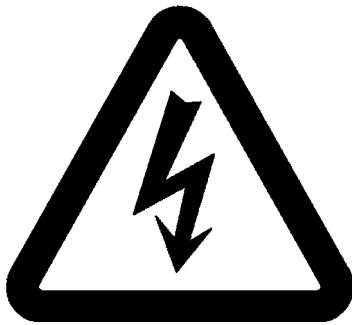
WORKING IN THE VICINITY OF AERIAL LINES

When working in the vicinity of aerial lines no part of the machine or the load is permitted to come nearer the lines than stated below:

Low tension	2 meters
High tension < 40 kV	4 meters
High tension > 40 kV	6 meters

If it is not possible to keep the above security distance, the power station must be contacted with the request to cut off electricity while one is working there. One must under no circumstances rely on good luck when working in the vicinity of aerial lines. If it is not possible to have the power cut off one must try to move the timber by other means before using the crane for loading.

ELECTRICITY NEEDS NO CONTACT. HIGH TENSION "HITS" EVEN AT A GREATER DISTANCE.



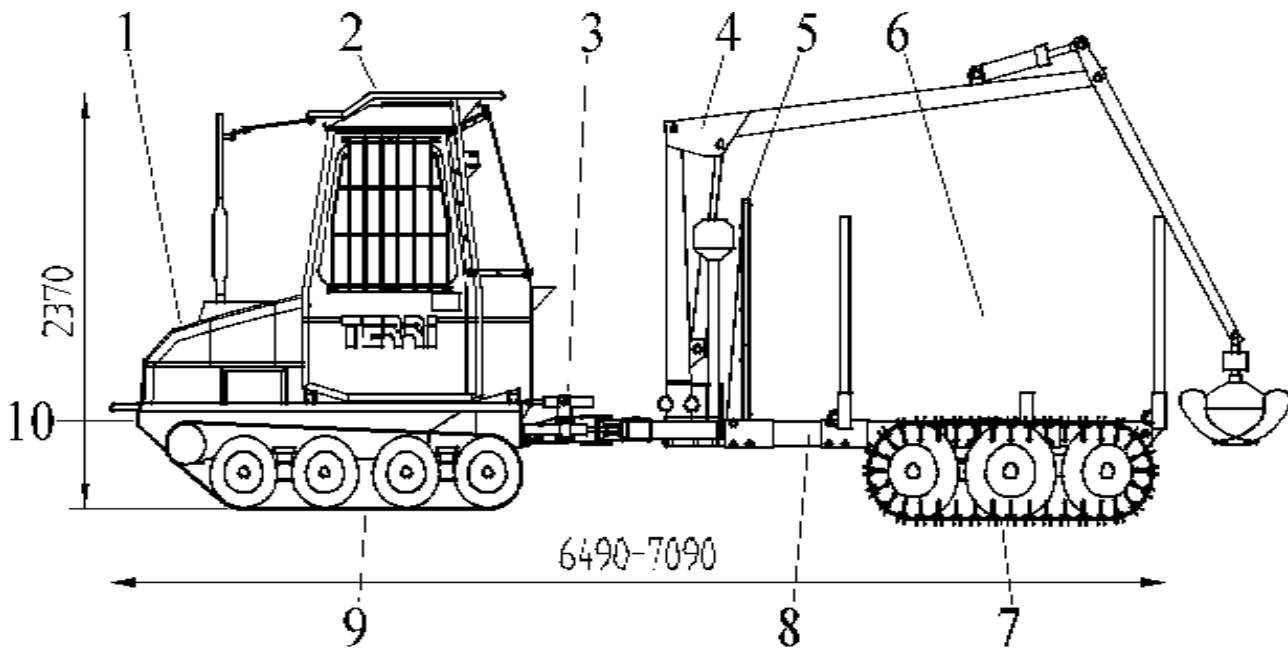
Körning med upplyftad kranarm får ej ske under eller i närheten av elektriska luftledningar.

Vältä työskentelyä sähköisten avojohtojen alapuolella tai läheisyydessä.

Use of the loader under or near open electrical Wires is forbidden.

Der Betrieb des Ladekranes unler oder nahe bei offenen elektrischen Leitungen ist nicht gestattet.

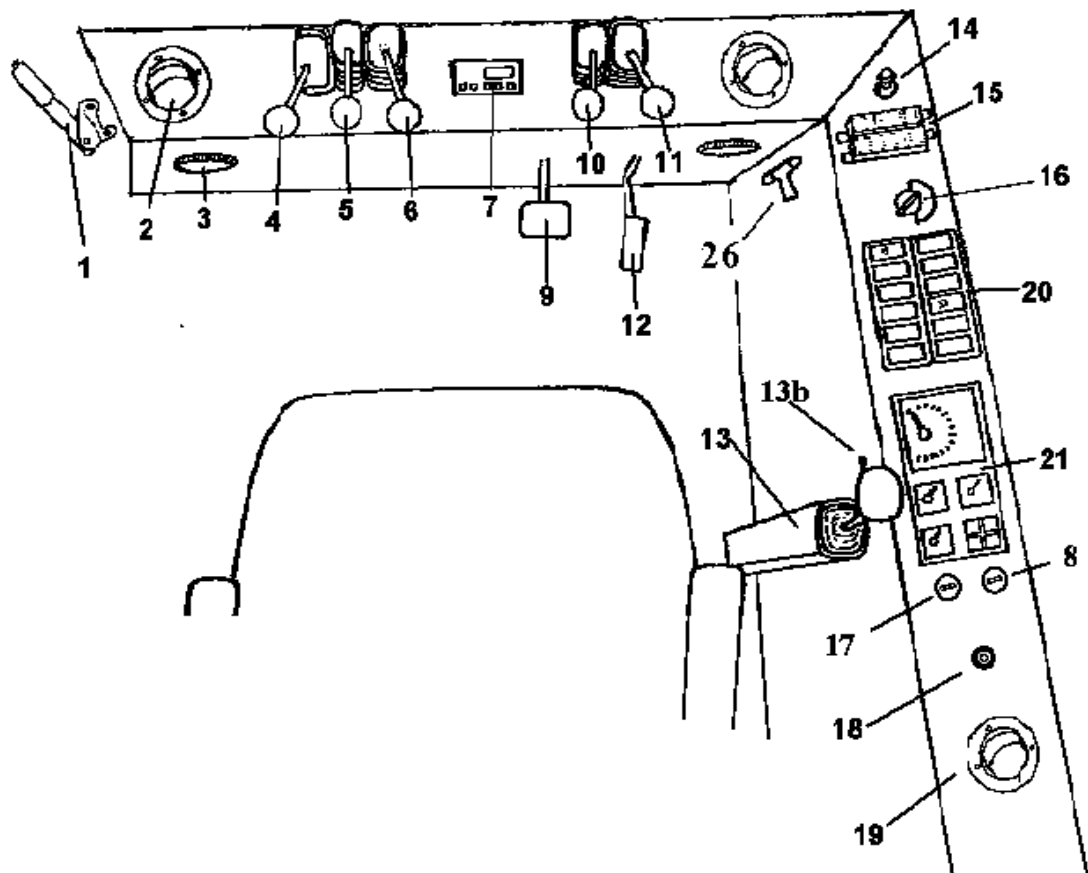
The main parts of Terri ATD

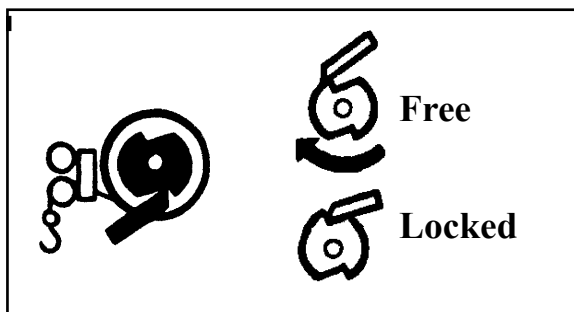
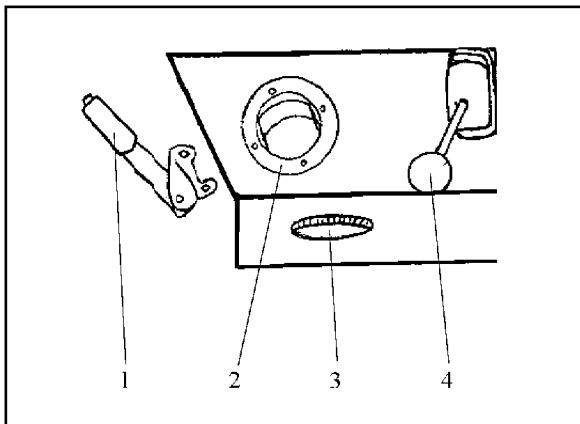


- 1 operation unit
- 2 cabin
- 3 control unit
- 4 grab loader
- 5 safeguard for displacement of load
- 6 loading space
- 7 track operation – bogie system
- 8 wagon
- 9 track operation – bogie system
- 10 winch

Instruments and controls

- 1 parking brake
- 2 air vents
- 3 air vents
- 4 control for winch
- 5 lockcontrol for double action hydraulic cylinder
- 6 differential lock (not for Sweden)
- 7 panel for diesel heater (extra equipment)
- 8 ventilation fan
- 9 brake
- 10 winch control
- 11 gear lever
- 12 throttle pedal forward
- 13 driving lever
- 13b change-direction switch
- 13c flow divider-function
- 14 electrical socket (cigarette lighter)
- 15 fuse boxes
- 16 starter lock
- 17 control for cabin heating
- 18 hand accelerator
- 19 air vents
- 20 switch panel
- 21 instrument panel
- 26 emergency hammer





1. Parking brake

This lever affects a mechanical brake. When the lever is moved backwards the brake is engaged. Via the button on top of the lever the lock is unbolted.

2. Front air vents screen

The air vents regulate the direction of the incoming air. For defroster purposes the air is directed towards the windscreen.

3. Front air vents floor

The air vents regulate the direction of the incoming air.

4. Winch lock

The winch lock prevents the cable from running out completely. The winch lock is controlled via a lever on the left side on the instrument board. The winch lock is released when the lever is in its front position. Release the winch lock and pull the cable out.

Attention! Use protective gloves.

Attention! Never push the driving lever backwards when the winch is in use. This can cause damage to the gearbox.

5. Double action hydraulic cylinder

Via the double action hydraulic cylinder, installed between the tractor unit and the wagon, the position for the front of the tractor unit can be adjusted to different conditions.

Position 1: Operating lever pushed up = the tractor unit “floats” free, i.e. the tractor unit can nobstructedly follow the terrain. This is the normal driving position.

Attention! Spring-loaded locking of the lever in this position.

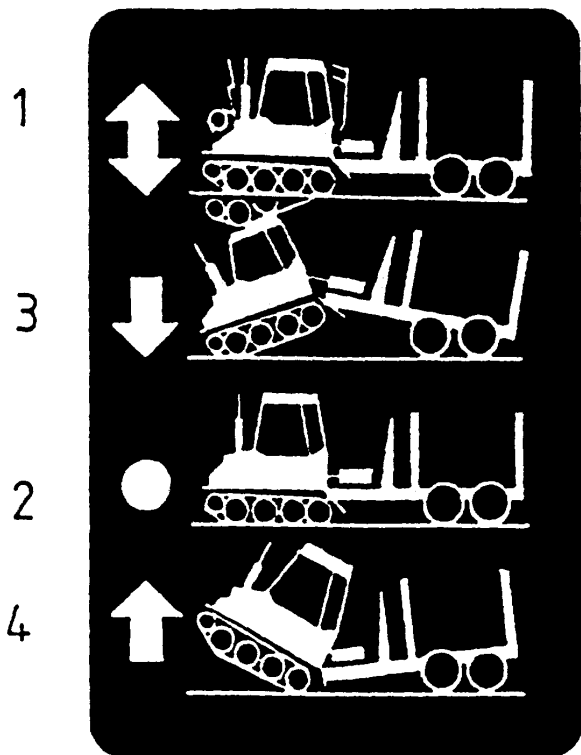
Position 2: Operating lever in centre, with spring-load in centre position = “locked position”.

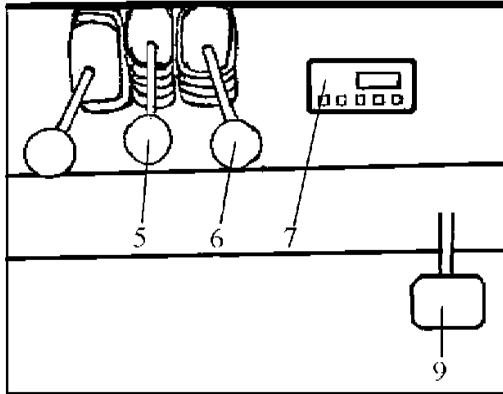
The position of the tractor unit in ration to the wagon is locked. This position is only recommended when driving in light snow without track and when crossing a ditch or other obstacle.

Position 3: By pushing the operating lever forward the front of the tractor unit goes down. The operating lever goes owing to the spring-load back to “locked position” (2) when releasing the lever.

CAUTION! Do not swivel sharply with the machine when the front is down.

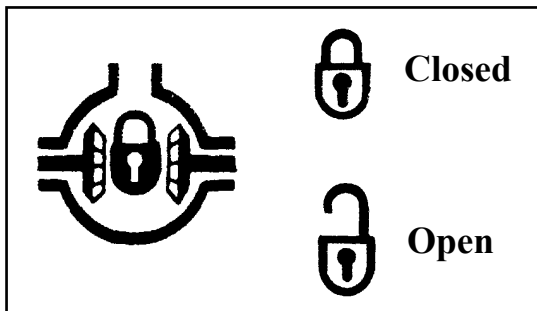
Position 4: By pushing the operating lever downwards the front of the tractor unit goes up. The operation lever goes owing to the spring-load back to “locked position” (2) when the lever is released.





Practical example: Driving over a minor ditch.

- Raise the front somewhat when you approach the ditch.
- Lower the front before the bogie of the tractor unit has wholly crossed the ditch so that the front part of the bogie touches the ground on the other side of the ditch.
- Drive with the double action hydraulic cylinder in locked position until the wheel of the wagon has crossed the ditch.
- Continue driving with the double action hydraulic cylinder in “flowing position” (1)



6. Differential lock (not applicable for Sweden)

The gearbox of the tractor unit is equipped with a mechanical differential lock, controlled via a lever on the instrument board. The differential lock is disengaged when the lever is in its bottom position.

7. Panel for diesel heater (extra equipment)

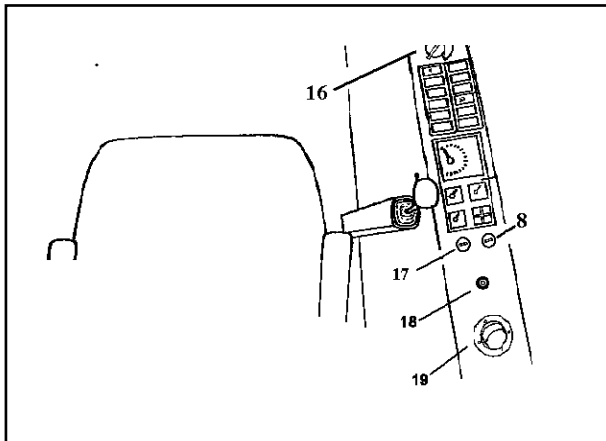
On this panel the diesel heater is controlled. See manual for diesel heater.

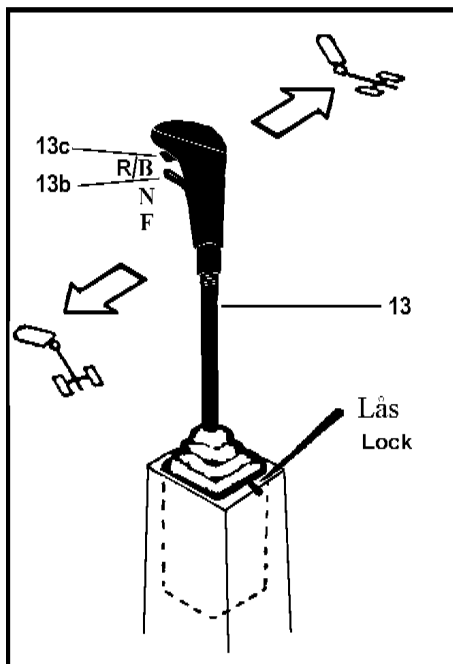
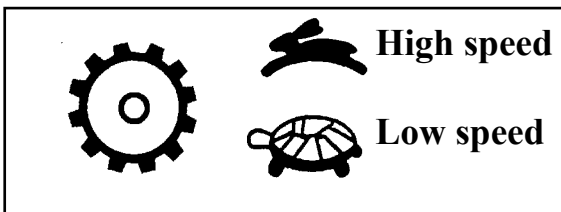
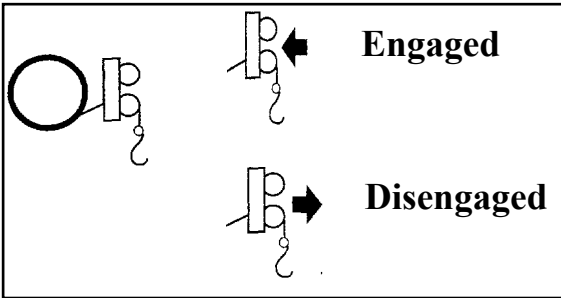
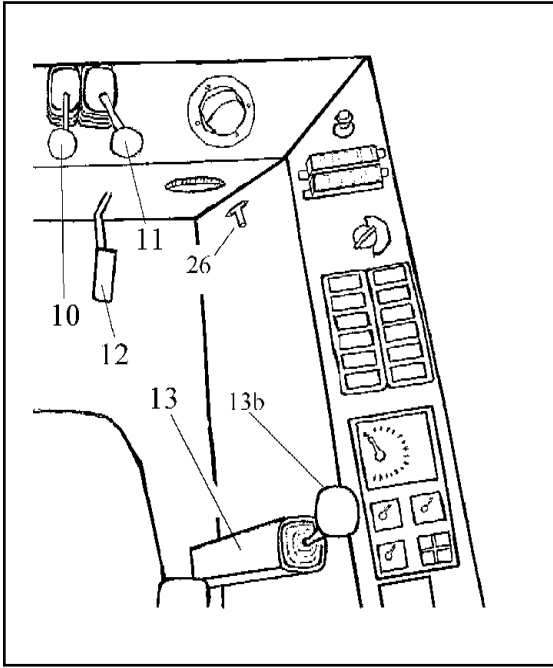
8. Ventilation fan

The control has three positions; OFF-LOW-HIGH.

9. Brake pedal

With the brake pedal the brakes for the machine are applied.





10. Winch

The winch is controlled via a lever on the right side on the instrument board. When one puts the lever into front position, gear (11) into neutral position, wagon operation disengaged, driving lever (13) forward and one presses the throttle pedal down, the winch cable is hoisted in onto the winch cable drum.

CAUTION!

Prior to operating the winch make sure that the cable is not damaged. If a cable breaks during operation it can cause great damage.

Attention! Never move the driving lever backwards when the winch is in use. This causes that the winch cable is rolled up in the wrong direction on the winch cable drum.

11. Gear lever

With the gear lever two gears can be chosen. If the lever is moved forward the high-speed gear is engaged and when the lever is in the rear position the low speed gear is engaged. When the lever is in centre position neutral position is engaged.

CAUTION!

The machine must never be driven with wagon operation only. This can cause the machine to tip under certain circumstances. The low gear of the tractor unit must always be engaged when wagon operation is engaged.

When driving on uphill and downhill slopes the wagon operation must always be engaged.

12. Throttle pedal forward

The throttle pedal controls the engine speed during driving.

13. Driving lever

The driving lever controls steering.

When the lever is moved to the right the machine turns to the right. When the lever is moved to the left the machine turns to the left.

Steering does not automatically return to “forward” but has to be steered back with the driving lever.

Via the lock the driving lever can be locked into neutral position.

13b Change-direction switch

The switch is placed front of the driving lever and has three positions.

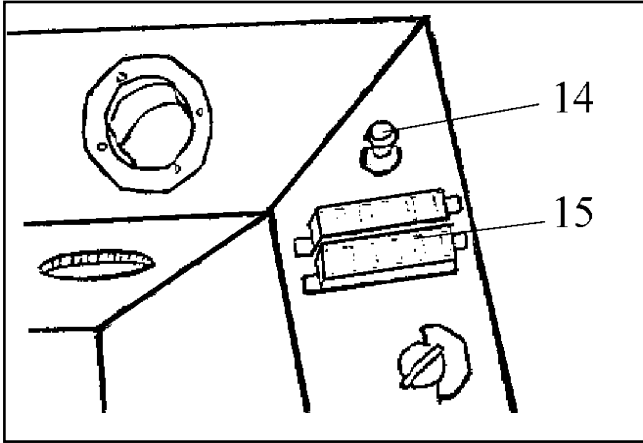
When the switch is downwards the machine moves forward.

When the switch is upwards the machine moves backwards.

The middle positions is neutral position.

13c Flow-devide-function

The engageble flow-devider is installed between the tractor unit and wagons drive engines. When wagon operation is engaged and the switch 13c is pressed down, the hydraulic oil flow is devided between the hydraulic engines in the tractor unit and the wagon. This function increase wagons pulling power even if the wagon is spinning. **Caution ! wagon operation must always be engaged when using flow-devide-function.**



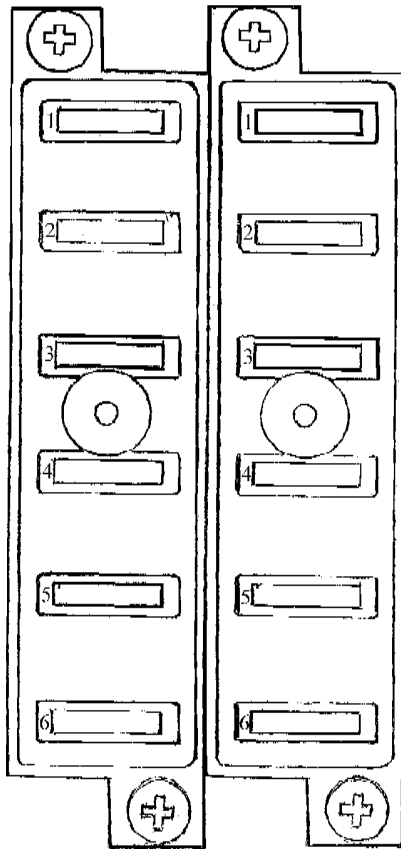
14 Electrical socket (cigarette lighter)

A mobile phone e.g. can be connected to the electrical socket.

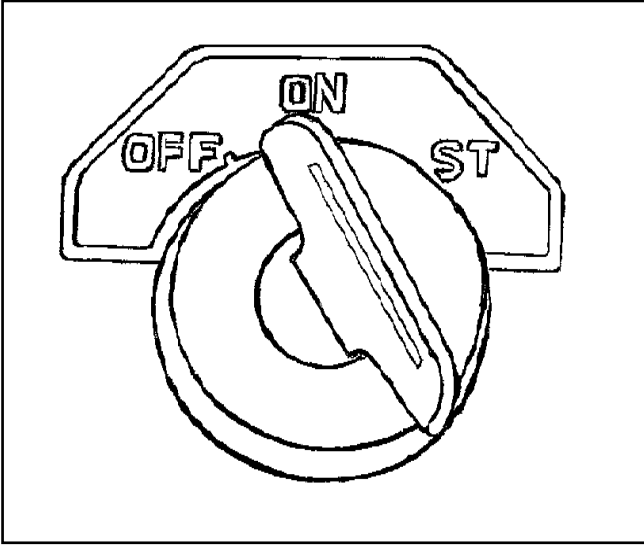
Fuse boxes

Fuses are an overload protection of the electric circuits. The fuse boxes are installed in the front part on the instrument board.

LIST OF FUSES

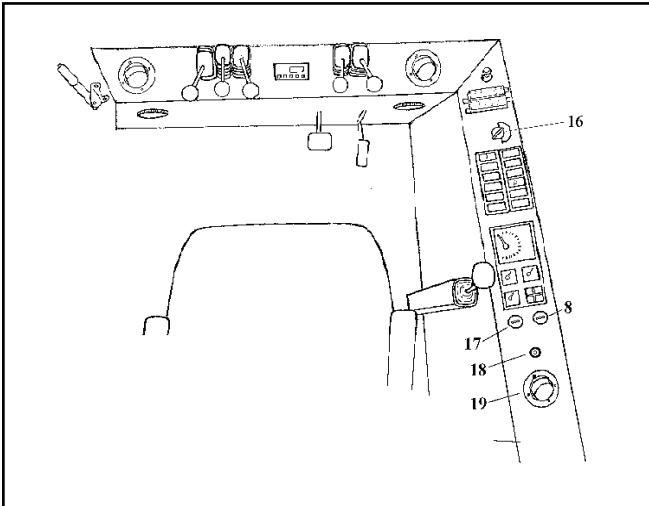


No.	Amp	Consumer unit
VI.	15	Ventilation fan Direction indicators Fuel pump Control lamp oil level Control lamp oil pressure Control lamp oil temperature Fuel gauge Coolant thermometer Cabin lights Stop tail lamp Engine stopping device
V2.	15	Working lights rear, front
V3.	15	Working lights side
V4.	15	Instrument board light Position lights Rear lights
V5.	15	Wagon brake Trailer drive
V6.	15	Glow Engine stopp valve
H1	15	Head lights
H2.	15	Dipped head lights
H3.	15	Windscreen and rear screen wipers Windscreen washer
H4	15	Cigarette lighter Signal horn
H5	15	Radio 2-levers
H6	15	Extra



16. Starter lock

The starter lock has three positions, OFF-ON-ST
 OFF – locked
 ON - unlocked
 ST - start (resilient)



17. Control for cabin heating

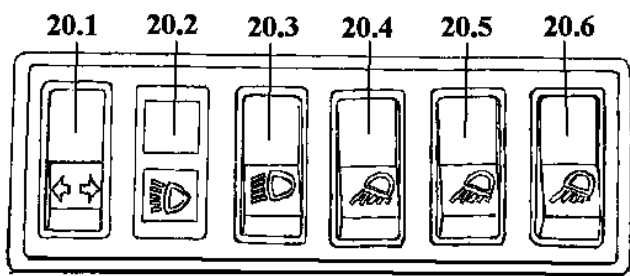
The heat control is step by step operated.
 When the controller is turned to the right the heat is off and
 when the controller is turned to the left one gets maximum
 heat.

18. Hand accelerator

When operating the grab loader the acceleration of the engine can be adjusted. For quick adjustment press the button and pull the controller until required acceleration is attained. For precision adjustment turn the controller until required acceleration is attained.

19. Rear air vent screen

The air vents control the direction of the incoming air. For defroster purposes the air is directed towards the rear window.



20. Switch board

20.1 Control for direction indicators

If the button is pressed downwards the left direction indicator will flash. If the button is pressed upwards the right direction indicator will flash. The control lamp flashes when the direction indicator is engaged.

Attention! If a lamp has fallen out the control lamp is flashing faster.



20.2 Light change over switch

The light change over switch switches the light from head lights to dipped lights. The control lamp is alight when the head lights is engaged.



20.3 Switch for dipped lights

The control lamp is alight when the dipped lights are engaged.



20.4 Switch working light front

Extra equipment. This switch turns the front working lights on. The control lamp is alight when the front working light is engaged.



20.5 Switch working light side

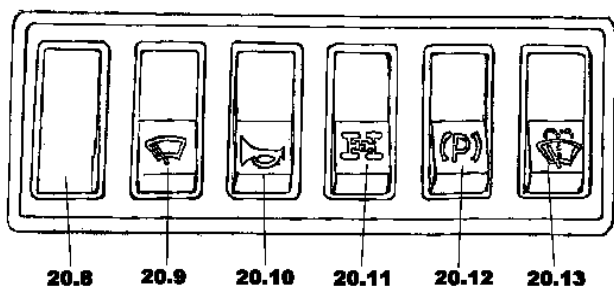
This switch turns the lights on the sides of the machine on. The control lamp is alight when the sidelights are engaged.



20.6 Switch working light rear

This switch turns the rear working lights on. The control lamp is alight when the rear light is engaged.





20.8 Extra switch

Here is a place for an extra switch for accessories can be installed.



20.9 Windscreen wipers

This push button operates the windscreen wipers



20.10 Push button for horn

If the push button is pressed down the horn will sound.



20.11 Wagon operation

This push button engages and disengages the wagon operation. The control lamp is alight when wagon operation is engaged.

Attention! Driving with wagon operation engaged only with low speed gear.



20.12 Trailer brake

The trailer brake is applied and released with the switch. The indicator is alight when the trailer brake is applied. When the oil pressure drops below 10 bar, applies the trailer brake automatically.

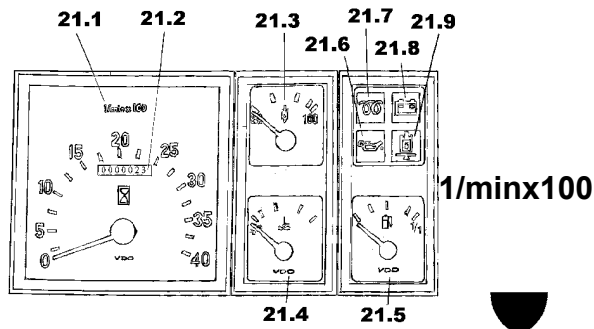
N.B. The trailer brake is a parking brake. Always release the trailer brake when driving the machine; the brake may otherwise be damaged.



20.13 Wiper and washer for rear window

The switch has two positions. The first position starts the wiper and the second, the resilient position starts the washer.

Attention! The rear window has a protective pane being very resistant against knocks and impacts. However it is not as scratch resistant as normal glass. Therefore never engage the wiper on a dry pane. Neither should you clean the pane with a dry cloth.



21 Instrument board

21.1 Revolution indicator

The revolution indicator shows the rotation speed of the engine.

21.2 Working hours indicator

This indicator shows the running hours of the machine. The indicator is engaged when the engine is running.

21.3 Temperature control for hydraulic oil

Shows the temperature of the hydraulic oil

21.4 Engine temperature indicator

The engine temperature indicator shows the temperature of the coolant of the engine. When running normally, with the engine warm, the temperature shown should be 90 – 95 degrees.

21.5 Fuel meter

Registers the fuel level in the tank.

21.6 Control lamp oil pressure engine

The control lamp should be out when the engine is running. However, if the oil pressure of the engine drops below 0.5 bar the control lamp will light up. If this should happen, stop the engine immediately and determine the source of the trouble and take care of it before you start the engine again.

21.7 Glow indicator

The indicator becomes extinct when the glowing process is completed.

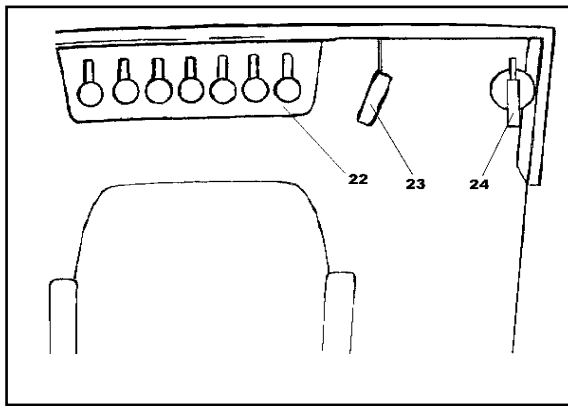
21.8 Charging control lamp

Normally the lamp should be out when the engine is running. If the lamp lights while running this indicates that there is a fault in the electrical system and the source of the trouble must be determined and taken care of.

21.9 Warning lamp for low hydraulic oil level

The warning lamp will light up when the hydraulic oil level drops to the lowest limit.





22. Control for crane

See separate operation instructions

23. Throttle pedal rear

Controls the rotation speed of the engine when engaging the crane.

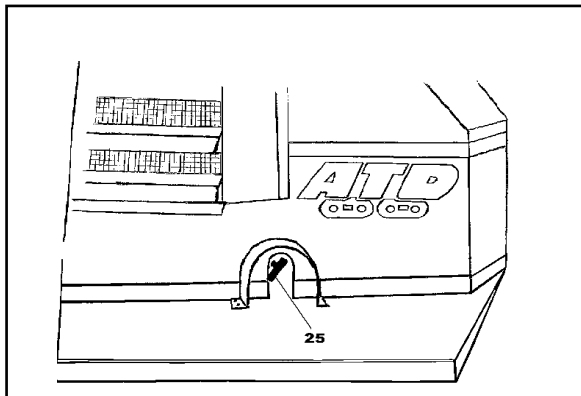
24. Fire-extinguisher

The fire extinguisher is a 2-kilogram powder-extinguisher. For operation see the instructions for the extinguisher.



CAUTION!

Inspect regularly that the manometer needle is within the green field.



25. Main switch

The entire electric supply can be turned off with the main switch.

Attention! Never turn off the main switch while the engine is running.

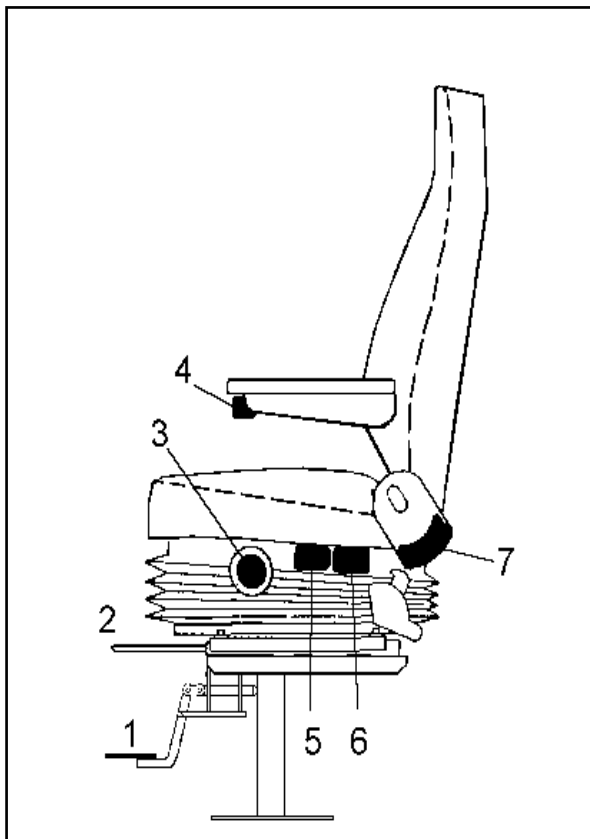


CAUTION!

The main switch must be turned off when carrying out service- and maintenance measures on the machine!

26. Emergency hammer

When the wind screen is used as emergency exit, smash the screen with the hammer, placed inside on the right in the cabin.



Driving seat

The swivelling of the driver's seat

The driving seat can be swivelled and fixed in three positions. Forward for driving, 60 degrees to the left for entering and leaving the machine as well as backwards for operating the grab loader. The seat is detached via foot pedal 1.

Adjustment of the driving seat

Via control 2 the seat can be moved forward – backwards.

Via control 3 the vertical springing of the seat is adjusted.

The springing can be seen on the scale and the set value should correspond to the weight of the driver.

Via knob 4 the height of the armrest is adjusted.

Via control 5 the seat height of the front part of the seat is adjusted.

Via control 6 the seat height of the rear part of the seat is adjusted. By alternately raising and lowering the front and rear part of the seat the height of the seat can be adjusted.

Via control 7 the angle of the backrest of the seat can be adjusted.

STARTING THE ENGINE

Routine measures prior to starting the engine

- Ø See to it that the throttle pedal returns automatically to neutral position

- Ø See to it that the driving lever is in centre position and the winch is disengaged.

Start with cold engine

Turn the ignition key to position driving (ON). Now the glow indicator and the controls for charging and oil pressure will become alight. When the glow indicator lamp becomes extinct turn the key to start position (ST)-

See to it that the ignition key automatically returns to position "driving" (ON) when the engine is running.

During extremely cold weather two "glowings" in succession of 15 seconds may be required. By giving full throttle the injection pump supplies maximum amount of fuel.

Do not run the starter motor continuously for more than 10 seconds at a time. Repeat the glowing prior to the next start attempt.

Engine pre-heater (optional)

During cold weather it is advisable to use an electric or diesel operated engine pre-heater that warms the coolant of the engine.

Warming up

The engine requires about 4 to 5 minutes of warming up time before the machine can be used for full operation.

Start with warm engine

If starting with a warm engine no glowing is necessary. Turn the key directly to start (ST).

Stopping the engine

Let the rotation speed of the engine go down to idling speed and turn the ignition key to position "OFF".

CAUTION!

When you leave the machine:

Put down the grab loader, stop the engine, switch off the main switch and take the ignition key with you when you leave the machine. By doing so you make sure that all current consumers are disengaged and unauthorised persons cannot start the machine.

DRIVING

The gearbox of Terri is of pre-selection type with 2-speed. This implies that changing may only be done when the machine is stationary.

- Ø Release the brakes
- Ø Put the position of the double action hydraulic cylinder to “floating position”
- Ø engage a gear (high/low)
- Ø Chose direction via the change-direction switch 13b.
- Ø Increase the rotation speed of the engine via the throttle pedal.

The rotation speed of the engine regulates the amount of oil getting to the hydraulic motors and thus the speed. The speed can thereafter be controlled with the rotation speed of the engine (throttle).

Stopping the engine

The engine stops if the throttle pedal returns to its idle position or if the driving-direction-switch is put to centre position. If the switch is in centre position the hydraulic circuit is closed and the hydraulic system has a slowing down effect. (See text about brakes).

Driving with wagon operation

Wagon operation may only be engaged when the low speed gear is put in. If the wagon operation is engaged when the high speed gear is engaged the oil flow to the wagon engines is not sufficient with the result that the wagon is slowed down.

Maintenance

The most important maintenance is preventive maintenance and includes lubrication and various checks and adjustments, which can be carried out by you.

Most of these service measures are simple to perform and need no further explanation. However, in certain cases more detailed instructions are necessary, which are given below:



CAUTION!

Prior to maintenance and inspection measures: Put down the gripping appliance, stop the engine and switch off the main switch.

Measures during cold weather

During winter conditions with temperatures below zero the following must be observed:

1. See to it that sufficient anti freezing agent is added to the coolant, according to the instructions on page 25.
2. Use oil recommended for winter use, see page 37.
3. Fill the fuel tank when you have finished working this will prevent that condensation water is formed in the tank.

Engine

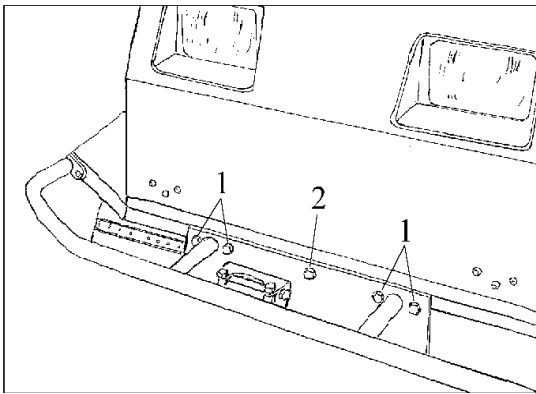
Running-in

During the running-in period the following must be observed:

Change engine oil after 100 hours running and filter after 200 hours running.

When it is cold, never load the machine before the engine and the hydraulic oil is warm.

Check the engine oil level daily. The oil level should be within the marks on the dipstick. Fill if necessary. As for oil quality see page 37.



Change of engine oil

The engine oil should be changed after 100 hours running.

Ø Loosen the screws (1) of the slide board at the bumper and remove the centre screw (2) and lower the slide board that now also will let go of its rear mounting and fall down on the frame.

CAUTION!

Crush injury risk!

Be careful when mounting and demounting the slide board.

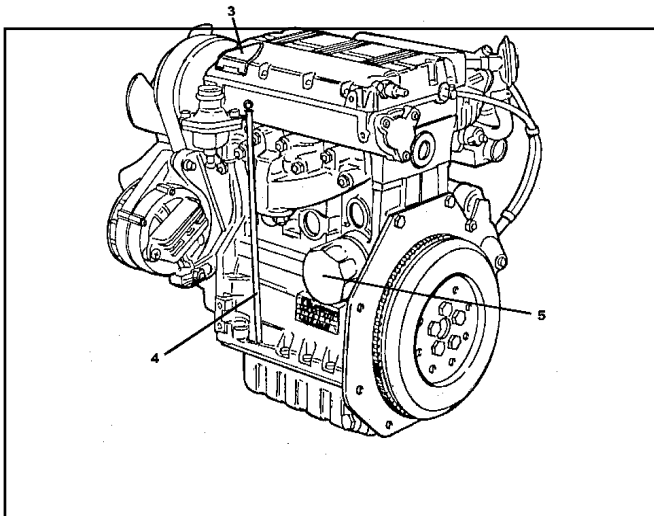
- Ø Insert a suitable vessel between the tracks.
- Ø Take the oil drain hose, which is fitted under the engine, out.
- Ø Remove the plug and drain the oil.
- Ø Replace the plug and fill up with oil through the filling-hole (3). For amount of oil see page 37.
- Ø Check the oil level with the dipstick (4)
- Ø Replace the slide board.

Changing the oil filter

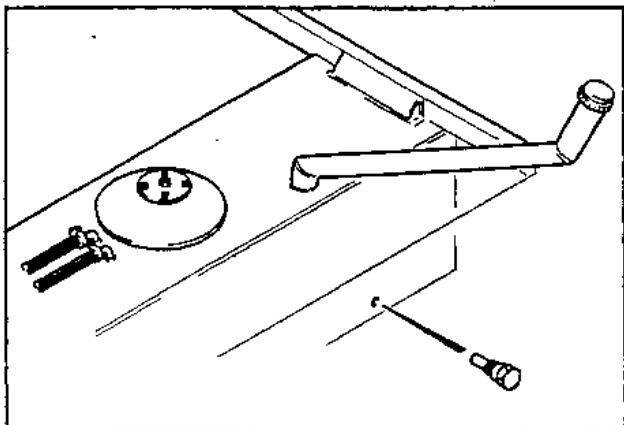
The oil filter (5) should be changed after 200 hours running. Screw off the old oil filter, moisten the gasket of the new filter with engine oil and tighten the filter by hand.

Valve mechanism

Have the valve clearance get inspected after 800 hours running. If required it must be adjusted. Valve adjustment is to be carried out by an authorised workshop.



Fuel tank



In order to avoid that condensation water gets into the injection pump the fuel tank is to be emptied and cleaned once a year.

Tilt the machine to the left and remove the magnetic plug. The magnetic draining plug is placed behind the back part of the bogie axle on the left side of the machine.

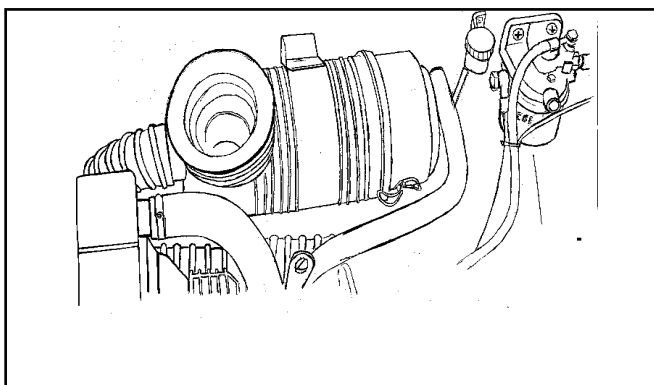
Attention! When carrying out inspection, filling or other tasks on the fuel system, under no circumstances use open lights!

Filling up with fuel

Fill up with diesel fuel at opening A, placed behind the cabin.

Attention!

Be particular with the fuel. See to it that there is no water in the fuel and that no snow gets into the tank. Always strain the fuel to avoid impurities getting into the fuel system. Water as well as impurities can damage the fuel feed pump.

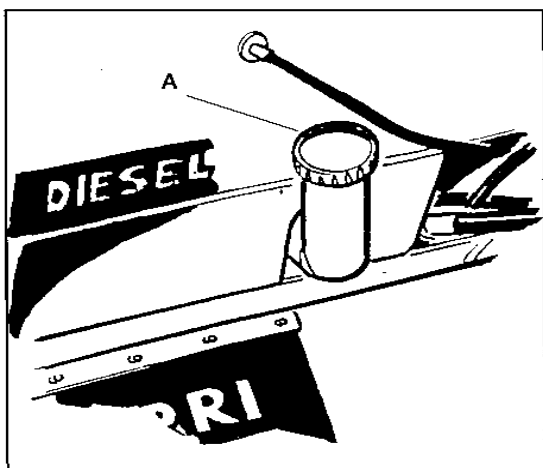


Changing fuel filter I

The pre-filter installed on the fuel hose is of the disposable type and is to be changed at least every autumn before the cold weather sets in.

Changing fuel filter II

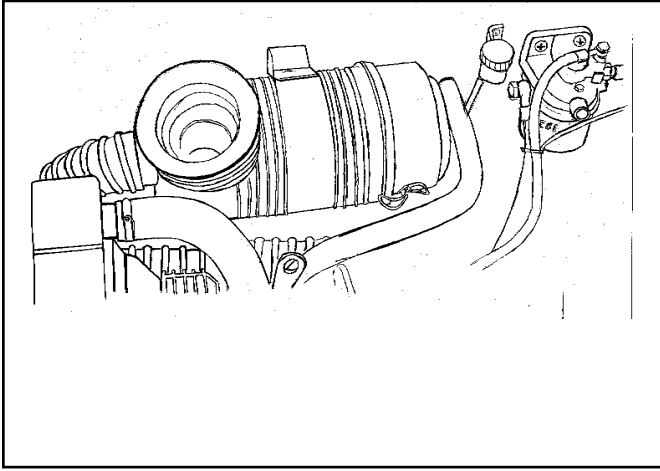
The filter is of the disposable type and is to be changed after 400 hours running.



AIR CLEANERS

The air cleaner is installed on top of the engine. The cleaner is of the dry filter type with a filter insert made of paper.

The air cleaner prevents dust and other impurities to get into the engine. Engine attrition depends to a great extent on the purity of the induction air. Therefore it is very important that the cleaner is inspected regularly and looked well after. Under no circumstances must the engine be run without an air cleaner or a damaged air cleaner. Inspect that the hose connection from the air cleaner to the inlet of the engine is tight.

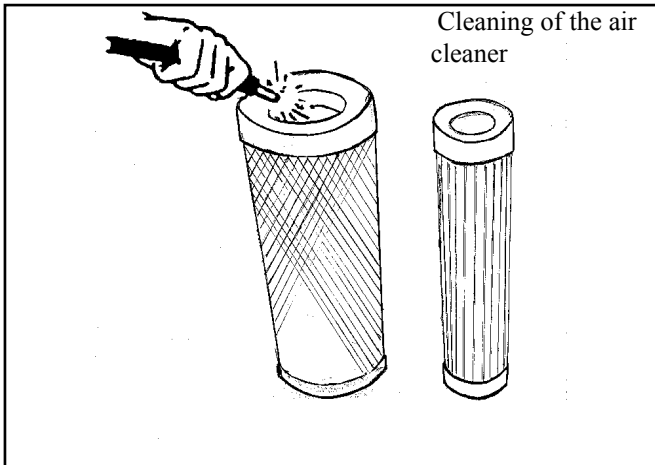


Cleaning and change of air cleaner

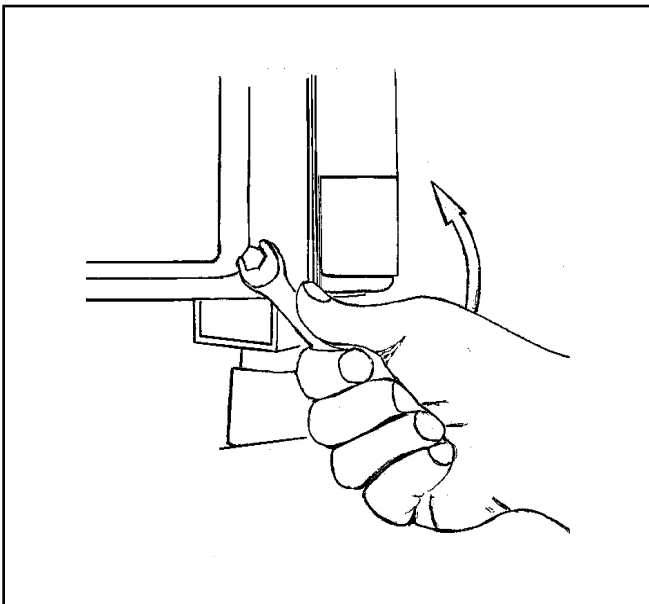
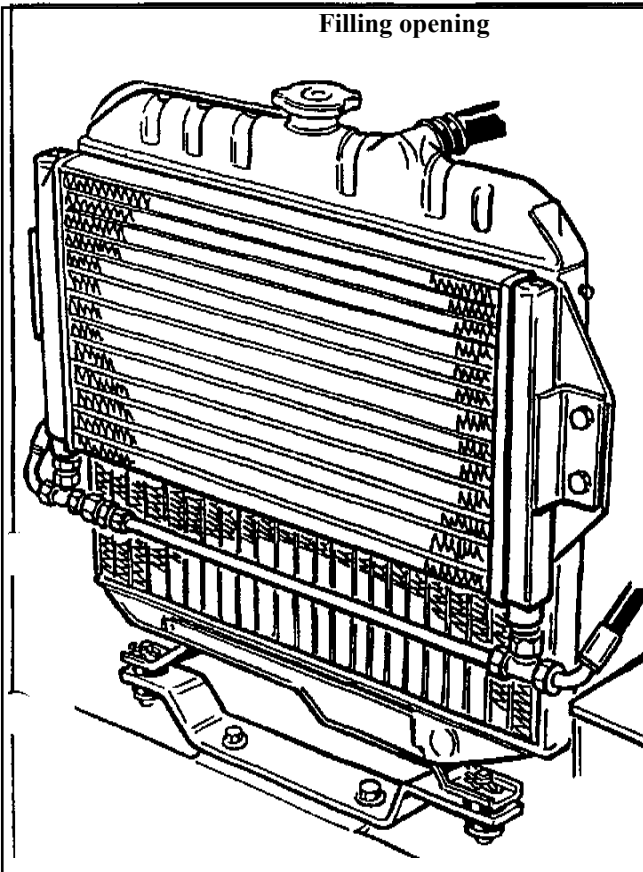
The filter insert is to be cleaned at intervals of 50 hours running time, for example with compressed air, see picture.

The filter inserts are to be changed after 200 hours running.

- Ø Loosen the air cleaner from the support.
- Ø Open the air cleaner and pull out the filter insert, clean or change it.
- Ø Reinstall in reverse order.



Filling opening



COOLING SYSTEM

The cooling system consists of the radiator as well as the radiator fan and air outlet on the right side of the machine, the circulation pump and temperature regulator in the motor and cables and channels. Coolant holding capacity approx. 4 litres.

When delivered from the factory anti-freezing agent is added, making it freeze-proof down to -35 degrees C.

The ability of the anti-freezing agent to prevent rust decreases after some time of use. Therefore, change the coolant with added anti-freezing agent once a year at the beginning of the cold season.

Make sure that the cooling system is given a thorough rinse before filling up new coolant and anti-freezing agent.



CAUTION!

The system works with overpressure. Therefore be careful when opening the radiator filler cap when the engine is warm. Let the overpressure "buzz off" before opening the cap. Otherwise your hands can get burn injuries.

The tension of the fan belt

Make sure that the fan belt is sufficiently tensioned. For instructions see chapter "Electrical system".

Drainage

A drain cock for the system is installed on the rear left-hand side of the radiator.

Filling

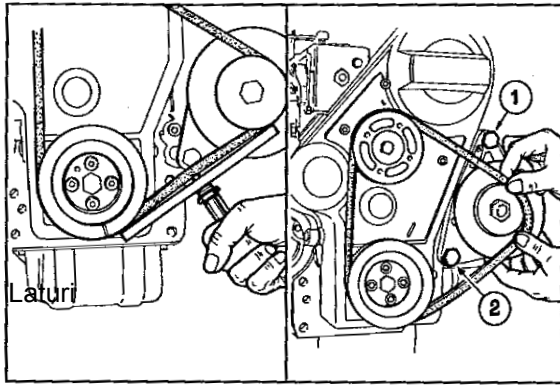
On the upper part of the radiator is a filling opening for the coolant. The system holds approximately 4,0 litres.

The amount of coolant is sufficient when the liquid level is 20 mm below the opening.

Check the coolant level and clean the air inlet on the engine casing and the cells of the radiator daily.

CAUTION

Never fill in cold coolant if the engine is warm.



Electrical system

Terri ATD is equipped with a minus-grounded 12 V electrical system.

Generator

The machine is equipped with an alternating current generator that charges the battery. It is installed on the left side of the engine in the front of the machine. The generator is operated by the fan belt. The fan belt has the right tension if it can be pressed down with a finger 10 mm between the generator and the crank axle (10 kp). Loosening the screws 1 and 2 tightens the belt. Pull out the generator and tighten the screws when the belt has the right tension.

The tension of the fan belt is to be checked once a week or after 50 hours running intervals.

Attention! *When the engine starts running, the charging control lamp should not light any more. If the lamp lights while running the fan belt may not have the right tension.*

Battery

The battery is placed on the right in front of the engine. Check every week that the level of the battery liquid is 10 mm above the plates. If the level is too low fill with distilled water.

Check that the cable clips and connection poles are cleaned, tightened and greased.

The charging condition of the battery is tested with the acid tester.

Especially during wintertime it is very important that the battery does not get discharged as in that case the electrolyte will freeze and the battery become destroyed.



CAUTION!

Never use an open flame when filling liquid into the battery.

Disconnecting the battery

The generator unit is extremely sensitive to faulty connection. Therefore the following must be observed:

Do not break the circuit between the generator and battery when the engine is running. This can damage the generator. Loosen and insulate the two battery cables prior to starting any work on the generator equipment.

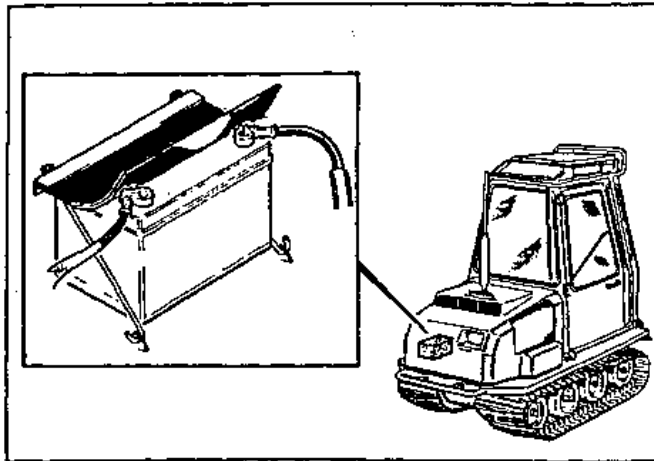
Connecting the battery

On no account must the battery terminals be confused. Each terminal is stamped with a + and a - mark respectively. Incorrect connection will ruin the generator rectifier.

When connecting the battery, always connect the earth terminal last.

Quick-charging

Do not use a quick-charging unit when the generator is connected to the battery. This will ruin the rectifier diodes of the generator.



Start with an auxiliary battery

When using auxiliary batteries for starting observe the following: Make sure that the auxiliary battery has the same voltage as the standard battery on the machine. Allow the battery of Terri to remain connected. Connect via a starter cable the auxiliary battery to Terri's battery with + to + and connect then via the other cable the auxiliary battery to Terri's battery with - to - .

When the engine is running remove first the cable between the +poles and thereafter the cable between the -poles.

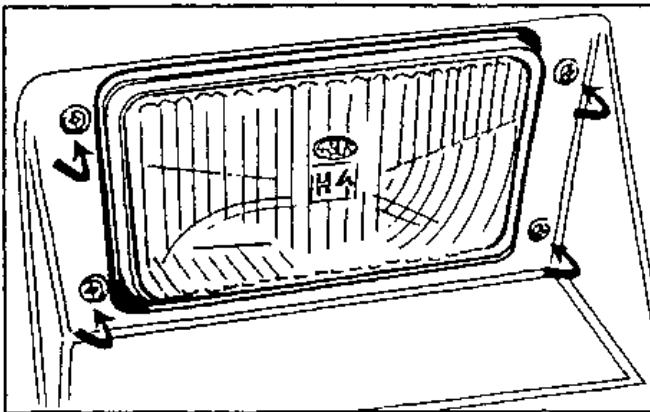


CAUTION

If a charged battery is incorrectly connected to a discharged battery the batteries can blow up on account of surge.

Electric welding

When carrying out electric welding on the machine or on implements connected to the machine, disconnect both battery cables. Connect the return cable of the welding set as closely as possible to the welding point.



Headlamps adjustment

The headlamps are fastened with four screws, also functioning as adjustment screws. If the bottom screws are backed out the light cone is lowered.

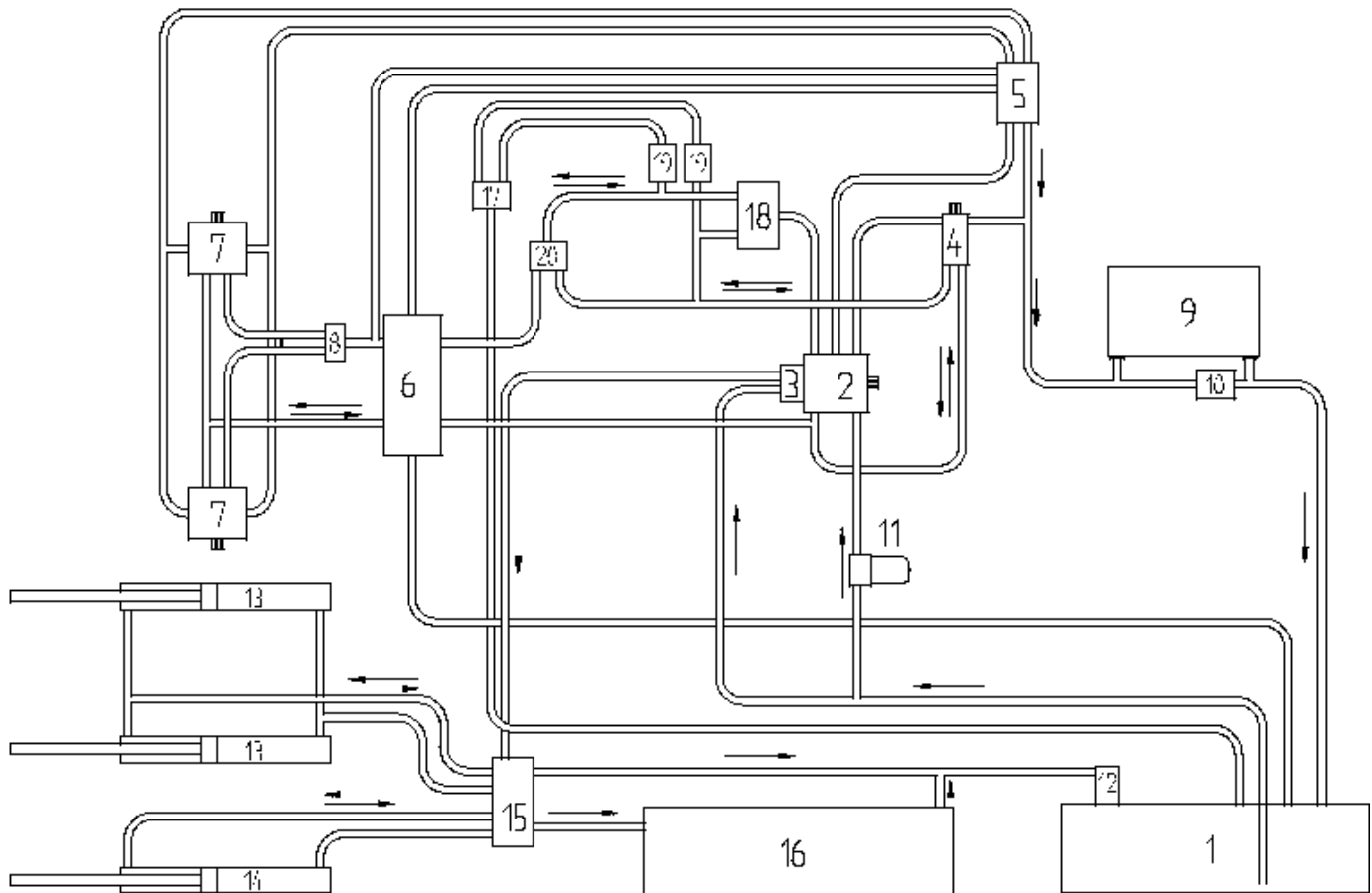
If for example the screws on the left are screwed home, the light cone will turn to the left.

The hydraulic system

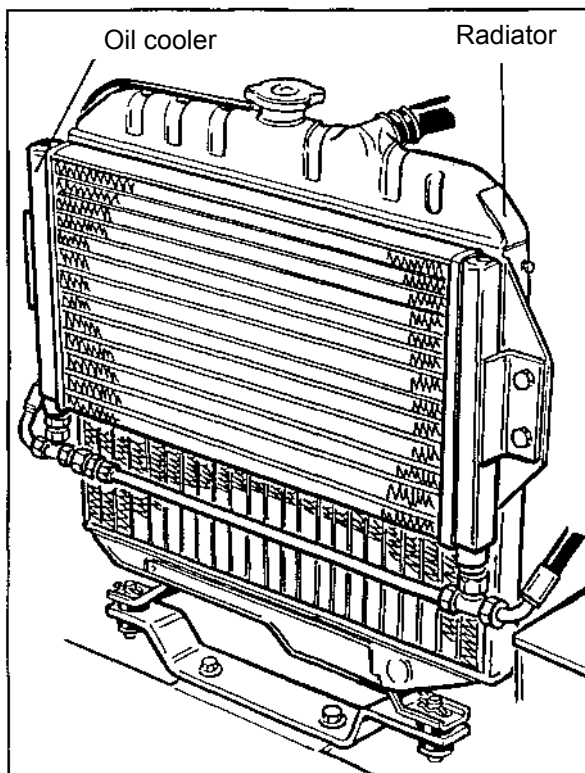
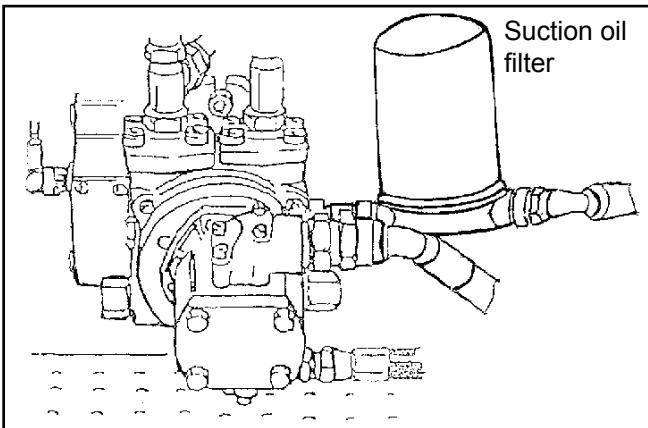
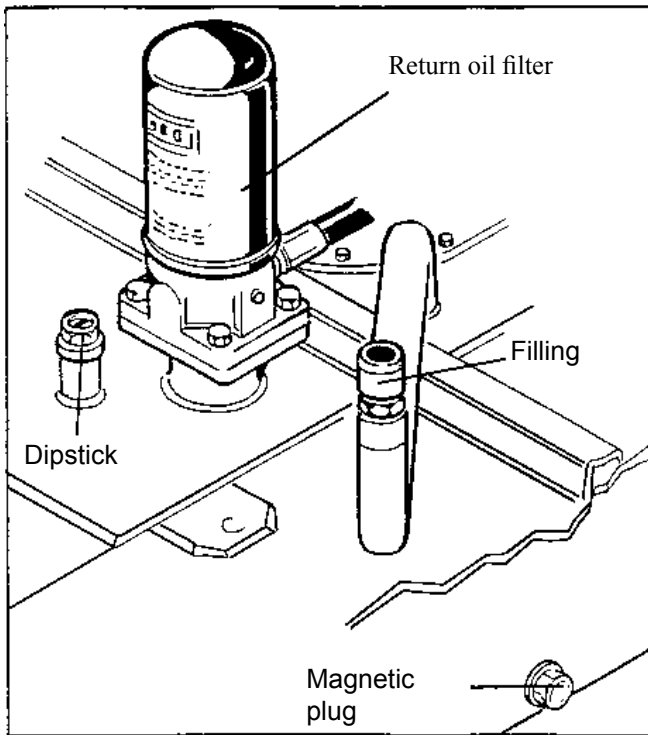
General

The hydraulic equipment plays an important part in the functions of Terri and therefore is regular service and maintenance of great importance. The hydraulic system is sensitive to impurities. Therefore observe the utmost cleanliness when working on the hydraulic system, this includes filling and change of oil. Therefore never loosen a hose or a coupling, only if it is absolutely necessary. These measures prevent faulty function and damages. Do follow the instructions for changing the filter and the oil.

Repair on hydraulic components must be carried out by the staff of an authorised service workshop.



- | | |
|--------------------------------------|---------------------------|
| 1. Hydraulics oil tank | 11. Suction oil filter |
| 2. Hydraulic pump for operation | 12. Return oil filter |
| 3. Hydraulic pump for steering etc | 13. Steering cylinder |
| 4. Hydraulic motor for gear box | 14. Support cylinder |
| 5. Valve block wagon operation brake | 15. Control valve |
| 6. Valve wagon operation | 16. Valve grab loader |
| 7. Hydraulic motor wagon | 17. Overflow valve |
| 8. Flow divider | 18. Rotating flow divider |
| 9. Oil cooler | 19. Non return valve |
| 10. Overflow valve | 20. Reversing valve |



HYDRAULICS OIL TANK

The hydraulics oil tank is installed in the chassis of the machine.

The total oil volume for the hydraulic system is approx. 55 litres.

Attention! The hydraulic tank has an overpressure of 0.5 bar. Therefore the filler cap must be original.

Checking the hydraulic oil level

The oil level should be within the marks on the dipstick. The dipstick is placed between the cabin and the engine. There is a warning lamp for low hydraulic oil level on the instrument board. Refill if necessary. The filling opening is placed between the cabin and the motor. For oil quality see page 37.

Attention! When filling hydraulic oil use a separate filling filter or pre-filtered oil.

Change of oil filter

The return oil filter must be changed every 400th hour running. The return oil filter is installed between engine and cabin. Screw off the filter by turning it counter-clockwise. Moisten the gasket of the new filter with oil and screw it on by hand. Do not tighten too hard.

The suction oil filter is to be changed every 400th hour running. The suction oil filter is installed on the left of the engine house. Change the filter when the machine is cold. Screw off the filter by turning it counter-clockwise. Moisten the gasket of the new filter with oil and screw it on by hand. Do not tighten too hard.

Changing the hydraulic oil

The hydraulic oil is to be changed every 1200th hour running. Tilt the machine to the left and remove the magnetic plug, placed on the left side in front of the front bogie axle. Put the plug back when all the old oil has run out and fill with new oil.

Oil cooler

The oil cooler is placed in front of the cooling water radiator.

Clean the ribs of the radiator regularly.

Hydraulic tap

On the valve at the backside of the cabin is a hydraulic tap installed that is used by the grab loader etc.

The hydraulic tap is equipped with bayonet couplings. The pressure pipe of the tap is equipped with a receptacle. The return pipe of the tap is equipped with a plug.



CAUTION!

If the tap is not used the connection hose must always be hooked-up.

Connected applications must have percolation for hydraulic oil.

If there is no percolation the hydraulic hose will burst on the pressure side of the pump.

TRACK – BOGIE SYSTEM

BOGIE SYSTEM

The bogie system is constructed of movable bogie arms with pneumatic tyres. The tyre pressure should be 640 – 740 kpa (6,5-7,5 kp/cm²).

Tensioning the tracks of the tractor

The tracks have the “right tension” if the upper part of the track only just touches the other bogie wheel while the machine is standing on a plane surface. Moving the rear bogie wheel tensions the tracks. When the straining screw is screwed home (clockwise) the track is tensioned. Lock the straining screw with the locking nut.

Changing the tracks on the tractor

- Ø Move the machine so that the seam of the track is in front between the driving axle and the front bogie wheel.
- Ø Loosen the track tension as much as possible.
- Ø Remove the screws holding the track fittings (3 pieces) in the seam.
- Ø Block up the machine with a trestle table or similar.
- Ø Remove the track and mount the new track.
- Ø In order to facilitate joining use a strap.

Attention! If wide winter tracks are mounted the broader rubber belt must be turned outwards; the track fittings must be turned so that the side of the fittings is pulling when one drives forward. See picture.

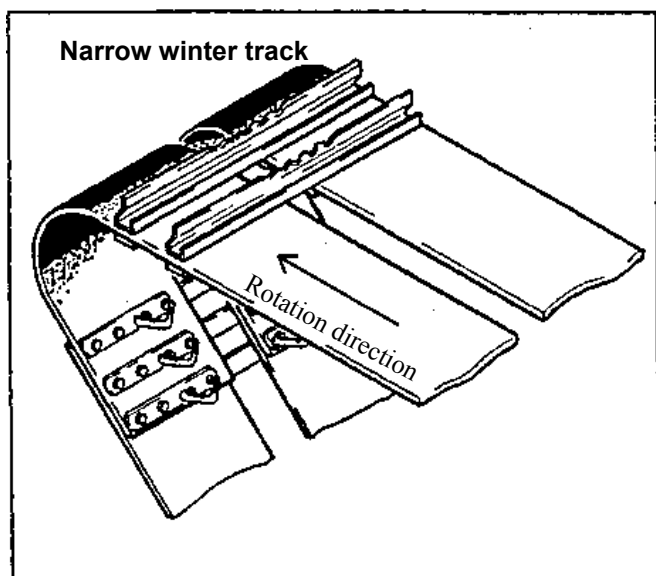
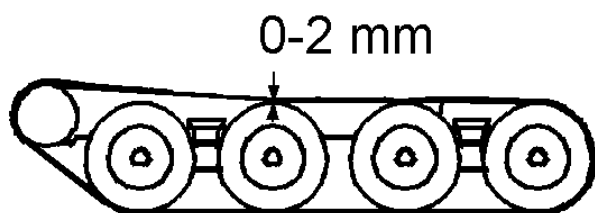
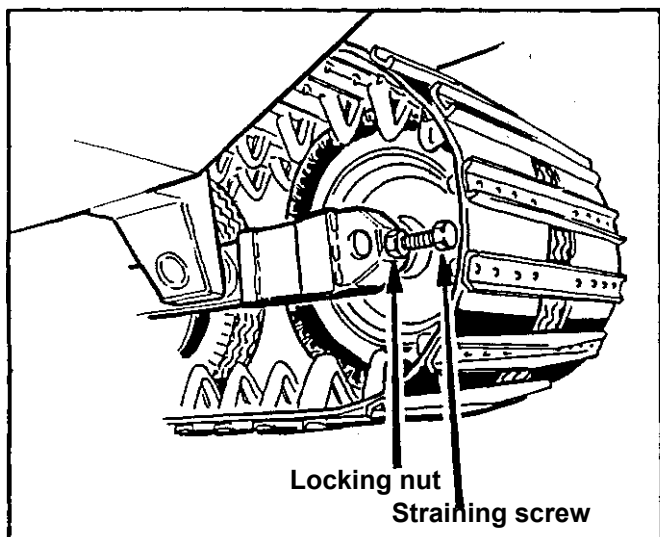
Changing the tracks on the wagon

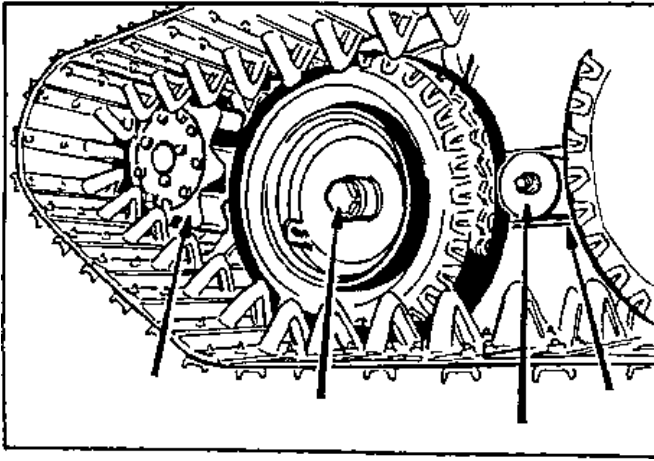
Without dividing the track

- Ø Loosen the nuts on the rear bogie wheel.
- Ø Block up the wagon with a trestle table or similar.
- Ø Remove the rear bogie wheel.
- Ø Remove the track.
- Ø Mount the new track in reverse order.

If the track is divided:

- Ø Move the machine so that the seam of the track is at the top right above the bogie wheel.
- Ø Block up the wagon with a trestle table or similar.
- Ø Remove the three track fittings at the seam.
- Ø Remove the track from the wagon. Mount the new track in reverse order.





Changing the rear bogie wheel on the tractor

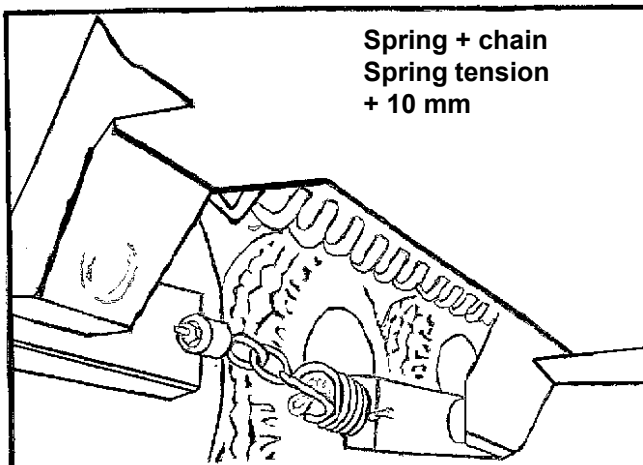
- Ø Move the machine so that the seam of the track is in front between the driving axle and the front bogie wheel.
- Ø Loosen the track tension as much as possible.
- Ø Remove the screws holding the track fittings (3 pieces) in the seam.
- Ø Block up the machine with a trestle table or similar.
- Ø Remove the dust lock. Remove the split pin and the locking nut of the bearing.
- Ø Remounting is done in reverse order. See to it that the bearing is well tensioned, the wheel should move easily without axial play.
- Ø In order to facilitate the joining together of the track use a strap.

Changing the other bogie wheels on the tractor

- Ø Loosen the dust lock.
- Ø Loosen the track tension entirely.
- Ø Block up the machine with a trestle table or similar.
- Ø Put e.g. a piece of wood between the parts of the track of the wheel that is to be changed so that it is wheeling free.
- Ø Remove the dust lock. Remove the split pin and the locking nut of the bearing.
- Ø Remounting is done in reverse order. See to it that the bearing is well tensioned, the wheel should move easily without axial play.

Adjusting the bearing of the bogie wheel

- Ø Tighten the nut so that the bearing race is coming into right position.
- Ø Loosen the nut entirely making the wheel to have too much play.
- Ø Tighten the nut by hand eliminating the excess play.



Changing the bogie wheel on the wagon

- Ø Block up the wagon with a trestle table or similar.
- Ø Remove the 5 wheel screws or nuts.
- Ø Remove the wheel from the hub.
- Ø Remounting is done in reverse order.

Limiting spring

Between the front and the rear bogie are a spring and a chain installed. The spring is hooked, with the opening towards the wheels, into the second link of the chain on both ends. The spring is to hang down about 10 mm when the machine is standing on plane grounds.

Brakes

Hydrostatic brakes (travel brake)

By moving the driving lever to centre position the machine is slowed down and stops.



CAUTION!

The hydrostatic brake is not working if the gear is in idle plane.



CAUTION!

When driving on uphill and downhill slopes the wagon operation must always be engaged.

Hydraulic pedal brake (travel brake)

By hitting the pedal the machine is slowed down.

Mechanic parking brake

The parking brake consists of a mechanic disc brake built together with the gearbox. The brake is operated via a lever in the cabin.

Adjusting the parking brake

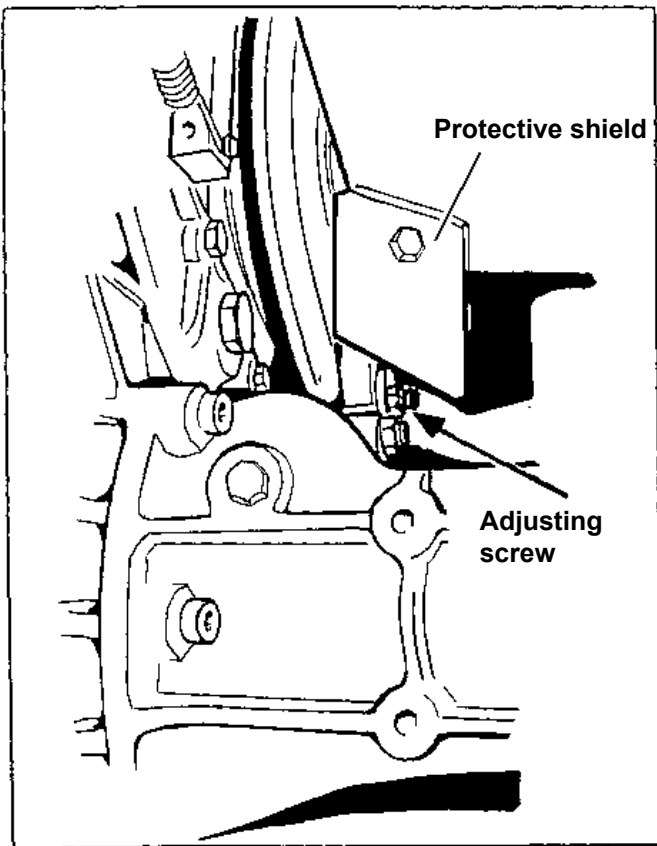
When necessary the parking brake can be adjusted via the adjusting screw on the brake unit. You can get at the adjusting screw behind the left track if the protective shield of the brake unit is dismantled.

Hydraulic multiple-disc brake (reserve/emergency brake) on wagon

The brake of the wagon operation is engaged/disengaged via an electric switch in the cabin. The wagon brake must not be engaged when driving. If the hydraulic pressure decreases below 10 bar the multiple-disc brake will automatically get engaged.

Attention! If the machine has no hydraulic pressure the brakes must be disengaged prior to towing.

See page 36.



WINCH

The winch is operated via a control on the instrument board. There is a separate control on the left of the instrument board for operating the winch lock.



CAUTION!

The purpose of the winch is to pull objects or the machine along the ground. The winch must not be used for lifting goods or people.



CAUTION!

Prior to operating the winch make sure that the cable is not damaged. If the cable breaks under operation it can cause great damage.

Overload protection

The winch has an overload protection. The overload protection cannot be adjusted.

Attention! If the overload protection is released hoisting must be stopped immediately. A log can be fastened at the anchor point and winching continued with double cables in order to half the winching-in power.

The field of application of the winch

Towing of objects

Disengage the lock, pull out the cable and fasten it on the object that is to be towed. Arrest the lock and reverse the machine.

Winching of an object

Disengage the lock, pull out the cable and fasten it on the object to be winched. Put the gear in neutral position and disengage the wagon operation. Pull the parking brake and engage the winch. Put the driving lever forward and press the throttle pedal down. The machine can be anchored if necessary.

Getting the machine off

Disengage the lock, pull out the cable and fasten it on a tree or another anchor point. Put in the low gear and engage the wagon operation. Engage the winch. Put the driving lever forward and press the throttle pedal down.

***Attention!** If the lock of the winch cannot be disengaged after winching put in the gear and put the driving lever forward. Put the lever for the winch lock into neutral position at the same time as you press down the throttle pedal.*

***Attention!** Never reverse with the driving lever while the winch is in use. This can damage the gearbox and the cable.*

***Attention!** The cable speed of the winch is lower than the high speed gear of the machine. See to it that the cable does not get under the machine or fasten in the bogie system of the machine.*

***Attention!** See to it that the cable is in the longitudinal direction of the machine when winching is started. Maximum derivation $\pm 15^\circ$.*

Changing the cable

The cable is to be changed if it shows damages. Disengage the winch lock; pull out the entire cable. Use protective gloves. Screw off the cable from the drum. Replace with the new cable. See to it that the cable is stretched out when pulling it in.

Gearbox

The gearbox is of the 2-speed type with neutral position in the centre. The gearbox is equipped with built-in differential gearing that can be locked when necessary (not for Sweden).

Checking the oil level

The oil level is to be checked daily. The level should be between the marks on the dipstick. Fill in more oil if necessary. As for oil quality see page 37.

Changing the oil

After 50 running hours the oil in the gearbox is to be changed for the first time, thereafter every 400th running hour.

Dismount the slide board (see Changing the engine oil).

Remove the drain plug and drain the oil.

Replace the drain plug and fill up with new oil through the filling hole. The amount of oil is about 11 litres.

Check the oil level with the dipstick.

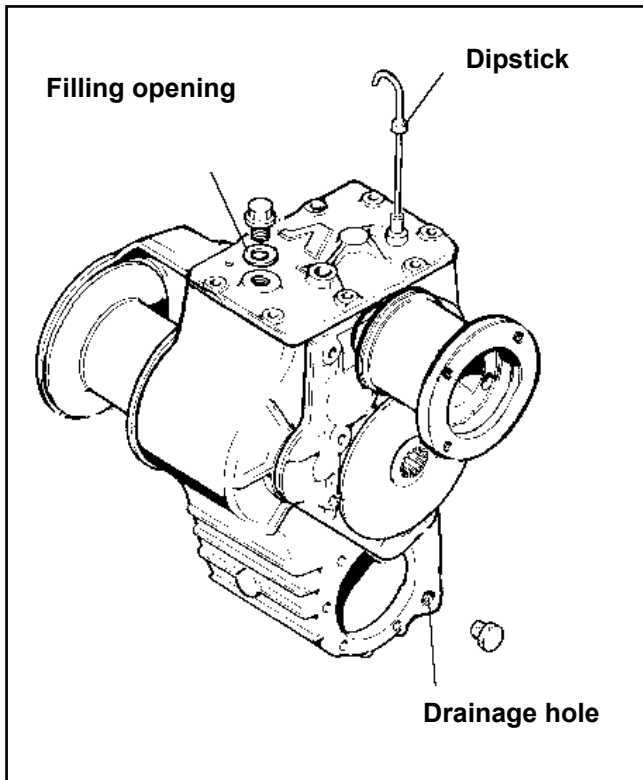
Replace the slide board.

Cabin ventilation

The cabin ventilation is equipped with a filter in the air intake grating. The filter is to be changed when necessary.

Changing the filter

Unscrew the air intake grating on the right side of the cabin (4 screws). Change the filter and remount the grating.



Possibilities to adjust the wagon

Attention! The centre of gravity of the load must always be straight above or just in front of the bogie centre.

Attention: Do not lengthen the posts.

Moving the centre beam

Loosen the tightening screws (8 screws). Disengage the wagon operation and engage the wagon brake. Drive the machine carefully forward or backwards to required position. Tighten the screws.

Attention! Check that the hydraulic hoses do not get caught when moving the beam.

Moving the rear beam

Remove the screw via the central tube. Pull the beam into required position and fit the screw in a new hole.

Moving the front beam

Loosen the tightening screws (4 screws). Pull the beam into required position. Tighten the screws.

Moving the load safeguard

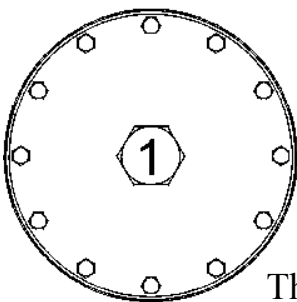
Loosen the tightening screws (4 screws). Pull the load safeguard to required position. Tighten the screws.

Strap eyes

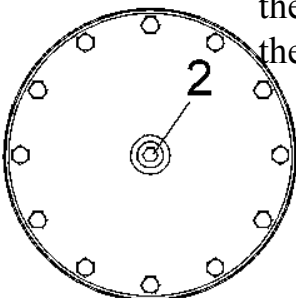
On the post casings are eyes to strap the load.

TOWING

Terri can only be towed a limited distance, because when being towed the motors of the wagon operation do not get oil and can thus get damaged. Disengage the brake discs prior to towing. Remove plug (1). Screw in socket head cap screw M16x30 with plate 17x34x4 into tap hole (2). Tighten then by hand turn one turn.



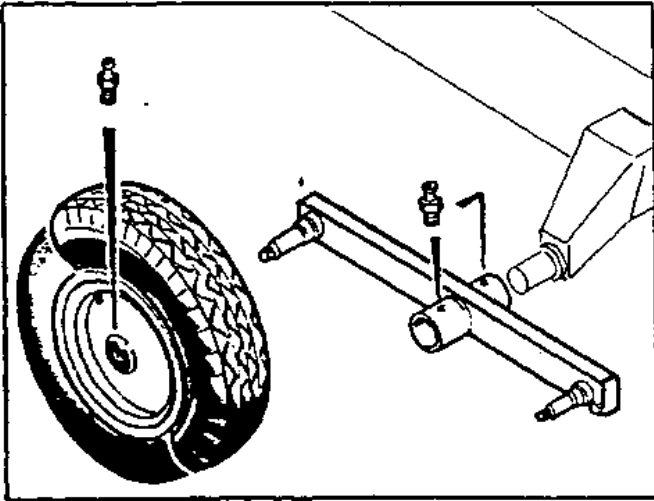
The hydraulic motor of the wagon as seen from the backside



LUBRICATION

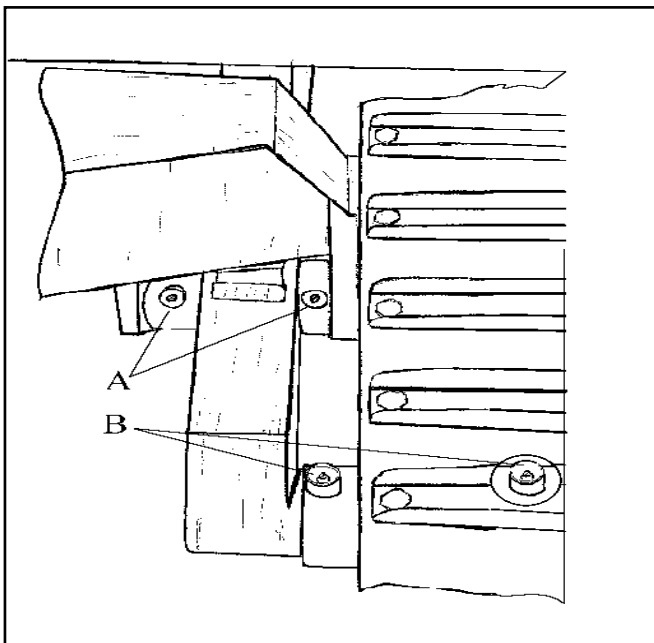
The tractor

Each bogie wheel has a nipple in the hub, lubricate every 100th running hour. The bogie arms, have two nipples in the centre bearing, lubricate every 100th running hour. As lubricant use Castrol APS2 or similar.



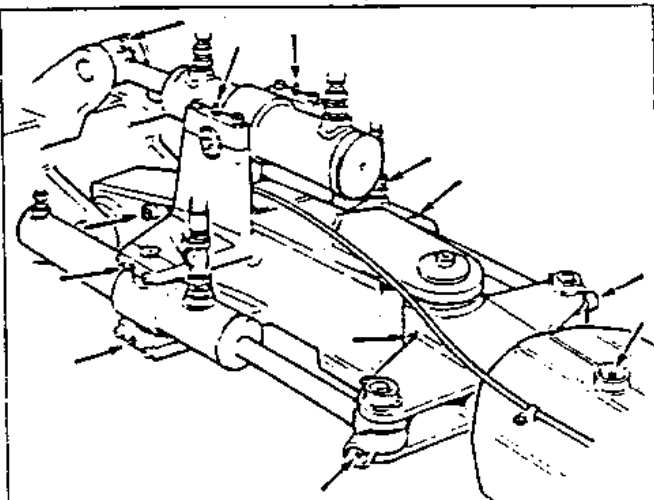
Loading unit

The two front bogie wheels have a nipple in the hub, lubricate every 100th running hour. The front bogie arms have 2 nipples (A) in the centre bearing and the bogie arms have two nipples (B) in the centre bearing, lubricate every 100th running hour. As lubricant use Castrol APS2 or similar.



Traction rod

The traction sleeve in the central rod of the loading unit and the pivot pins of the control unit, the mounting bolts of the control cylinder and the double action hydraulic cylinder and the balls of the rod piston are equipped with nipples (12 nipples). Lubricate daily. As lubricant use Castrol APS2 or similar.



The hinges of the doors and the roof hatch

The hinges of the doors and the roof hatch have nipples (4 nipples) Lubricate with grease gun if required. As lubricant use Castrol APS2 or similar.

Recommended Lubricants

Engine

Engine oil API CD SAE 10W/30
Volume 4,3 litres

Gearbox

Transmission oil SAE 75W/90
Volume 11 litres

Hydraulics

Hydraulic oil Castrol HYPIN SHS 46
Index 250
Volume totally approx. 55 litres
Volume changing oil approx. 45 litres

Brakes

Hydraulic brake fluid SAE J 1703 (70 R 3)

Nipples

Universal grease Castrol APS 2
Dropping point 185 degrees

MAINTENANCE CHART

Measure	Intervals in hours running							Remarks
	Daily	50	100	200	400	800	1200	
<u>Engine</u>								
Engine oil	control		change					See page 23
Oil filter engine				change				See page 23
Valve clearance						control.		Service staff
Spraying nozzle							control	Service staff
<u>Fuel system</u>								
Air filter		clean		change				See page 25
Fuel filter I					change			See page 24
Fuel filter II					change			See page 24
Fuel tank						clean		See page 25
<u>Cooling system</u>								
Coolant	control							Change every 2000:th running hour. Page 26
<u>Electrical system</u>								
Fluid level battery		control						See page 27
Belt tension		control						See page 27
<u>Gear box</u>								
Transmission oil	control				change			See page 35
<u>Hydraulic system</u>								
Hydraulic oil	control						change	See page 30
Return oil filter					change			See page 30
Suction oil filter					change			See page 30
<u>Bogie, tracks and control unit</u>								
Bogie-arm bearing			lubricate					See page 37
Bogie wheel			lubricate					See page 37
Track tension	control							See page 31
Control unit	lubricate							See page 37
<u>Brakes</u>								
Brake fluid level		control						
<u>Winch</u>								
Lubrication winch cable								If necessary
Changing winch cable								If required. Page 34
Door and roof hatch hinges								Grease if necessary. Page 37
Loading unit, bogie and wheel			lubricate					See page 37
Crane								See separate instr.book

Trouble location

<u>Problem</u>	<u>Cause</u>	<u>Measure</u>
The motor does not start	The stopping magnet does not attract Out of fuel Fuel filter silted up Air leakage in the fuel system Injection rod loose or broken Injector faulty Fuel pump not functioning	Control cable to magnet Fill fuel and air-bleed if necessary Change fuel filter Locate and take care of Fasten or change Change injector Check the power supply / change the fuel pump
The engine does not rotate	Start spring of injection pump is damaged. The battery is discharged A battery cable is loose The main switch is off The starter motor is faulty Motor crash	Change/ repair injection pump Charge the battery Fasten battery cable Switch on main switch Repair or change starter motor Repair or change motor
The engine has poor output	The speed regulator functions unsatisfactory The motor is overheated Fuel filter is silted up Air filter is silted up Injector is worn out Injection rod loose or broken Poor compression	Change injection pump Clean the cooling system Change fuel filter Change air filter Repair or change injector Fasten or change Check cylinder head gasket and valves
The rotation speed of the engine varies	Fuel filter is silted up Air in the fuel Injection nipples function poorly Speed regulator functions poorly	Change fuel filter Air-bleed the fuel system Lift reel of injection pump worn Change/repair injection pump
Exhaust gas white or blue	Cylinder head gasket not tight	Change cylinder head gasket
Exhaust gas black	Piston of injection pump worn or the return spring broken Injector jammed or return spring broken Injector heavily silted up Injection pressure too low Air filter silted up	Change/repair injection pump Change injector Clean injector Change injector Change air filter
The motor gets overheated	Temperature regulator not working Fan belt poorly stretched Not sufficient coolant Radiator silted up Fluid in radiator frozen	Change temperature regulator Stretch the fan belt Fill with more coolant Clean radiator Add more glycol
The machine does not move (engine is running)	Gear in neutral position Winch engaged, cable locked The wire of the driving lever defect	Engage gear Disengage winch Adjust or change
The machine does not swivel	No hydraulic oil Control wire of driving lever defect Hydraulic pressure too low	Fill hydraulic oil Adjust or change Check overflow valve

TECHNICAL DATA

Dimensions

Total length (with loading unit)	6490 – 7090 mm
Total width standard and winter track (wagon)	1700 mm
Total width broad winter track (Terri)	1810 mm
Height cabin	2370 mm
Terrain free wheeling track	280 mm
Load area	1,2 m ²

Weights

Service weight, inclusive wagon with tracks and crane	3040 kg
Total weight	6000 kg
Loading capacity	2960 kg
Front bogie pressure (maximum)	2500 kg
Rear bogie pressure (maximum)	4400 kg

Wheels and tracks

Terri	
Standard track	4720mmx480mm
Winter track	4720mmx510mm
Special winter track	4720mmx675mm
Number of bogie wheels	2 x 4 wheels
Tire dimensions	4.00"x8"/8PR
Tyre pressure bogie wheels	640-740 kpa(6.5-7.5kp/cm ²)
Gear wheel	spiral bevel gear diameter 235 mm
Wagon	
Standard track	4506mmx395mm
Number of bogie wheels	2 x 3 wheels
Tire dimensions	560x140-12/8PR
Tyre pressure bogie wheels	640-740kpa (6.5-7.5kp/cm ²)

Internal combustion engine

Make	Lombardini
Type	LDW 1204
Number of cylinders	4 cylinder
Cooling system	fluid-cooled
Maximum output (DIN 6271 NB)	24,4 kW/33,2 hp/3000rpm
Torque	75 Nm/2200 rpm
Stroke volume	1222 cm ³
Fuel	diesel fuel
Compression ratio	22:1

Transmission

Hydrostatic mechanical steering assembly with sealed hydraulic circuit	
Number of mechanical gears	2
Differential lock Terri	hand-operated mechanic
Differential lock wagon	automatic hydraulic
Wagon operation	disengageable

Hydraulics working

Pressure system	180 bar
Pump capacity	33l/min at 3000 rpm

Steering

Hydraulic centre steering	±50°
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Measures of capacity

Fuel tank, volume	35 litres
Hydraulic oil tank volume	45 litres
Engine, oil volume inclusive filter	4,3 litres
Gearbox, oil volume	12 litres
Cooling system, volume	approx. 4 litres

Winch

Type	Built together with gearbox
Capacity	Traction force 1000 kp
Cable	8 mm
Length of cable	30 metres

Electrical system

Battery	12v 88 Ah
Generator	55 A
Starter motor	1.4 kW

Crane

See separate instructions

Tool kit

	pieces
Open end wrench 8 mm	1
Open end wrench 10 – 13 mm	1
Open end wrench 12 mm	1
Open end wrench 17-19 mm	1
Open end wrench 22–24 mm	1
Open end wrench 27 mm	1
Open end wrench 30 mm	1
Open end wrench 36 mm	1
Allen key 3 mm	2
Allen key 8 mm	1
Chisel slot	1
Chisel cross	1
Special wrench dipstick	1
Adjustment wrench parking brake	1
Bogie wheel withdrawing tool	1

Otherwise

Sound level in cabin	84 dB(A)
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