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INTRODUCTION

AVANT Tecno Oy wants to thank you for purchasing this ***AVANT*** loader. It is the result of Avant's long experience in design and manufacturing of compact loaders.

We ask you that you read and understand the contents of this manual completely before operating the loader. This will improve your operating and maintenance efficiency, help avoid breakdowns and damage and extend your machine's life.

Contact your local ***AVANT*** dealer for advice regarding service, parts and any problems relating to the operation of your ***AVANT***.

AVANT 500 SERIES WARRANTY

This warranty specifically applies to the ***AVANT*** 500 series loaders only and not to any attachments used with this product.

Any repairs or modifications performed without the prior authorisation of ***AVANT*** Tecno Oy will cancel this warranty.

During the first year of operation or first 750 hours (whichever is the soonest) ***AVANT*** Tecno Oy warrants to replace any part or repair any defect which may occur, subject to the terms detailed below:

1) The product has received regular maintenance in accordance with schedules given by the manufacturer.

2) Any damage caused by operation in a negligent manner or exceeding the approved specifications detailed in this manual is excluded.

3) ***AVANT*** Tecno Oy accepts no responsibility for interruption to working or any other consequential losses resulting from any failure of the product.

4) Only ***AVANT*** Tecno Oy approved replacement or original quality parts shall be used during routine maintenance.

5) Any damage caused by the use of incorrect fuel, lubricants, cooling liquid or cleaning solvents is excluded.

6) The Avant Warranty excludes any consumable parts (e.g. tyres, spark plugs, batteries, filters, belts etc.) except where it can be clearly shown that these parts were defective on original supply.

7) Any damage caused resulting from the use of attachments not approved for use with this product is excluded.

8) In the event a fault occurs which is attributable to manufacturing or assembly defect you should arrange to return your ***AVANT*** to your authorised dealer for repair. Travel and freight cost are excluded.

IDENTIFICATION OF THE LOADER

Write down the following information about your loader, it will help you when ordering parts etc.

1. Model: ***AVANT***_____Purchase date:_____

2. Serial number:_____

3. Engine serial number:_____

The serial number and model of the loader are printed on the manufacturer's plate (decal no. 9, see page 6). Location of engine serial number can be found in the operating manual of the engine.

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EC DECLARATION OF CONFORMITY FOR MACHINERY

Manufacturer: AVANT TECNO OY

Address: Ylötie 1, 33470 YLÖJÄRVI, FINLAND

We hereby declare that the machines listed below conform to EC Directives: 98/37/EC (Machinery), 89/336/EEC (EMC) and 2000/14/EC (Noise Emission).

Category: EARTH-MOVING MACHINERY/LOADERS/COMPACT

Models: AVANT 513, 514, 520, 520+, 523+, 528+, 530+

Ylöjärvi, Finland, 07.01.2003

AVANT TECNO OY

Risto Käkelä
Managing Director

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HOW TO WORK SAFELY

An incorrect or careless operation of the loader may be the origin of a serious accident. Before putting the machine into operation, familiarise yourself with the use of the machine and read and understand this Operator's Manual as well as the safety instructions.

THIS SYMBOL INDICATES THE IMPORTANT SAFETY FACTORS.

Understand the limitations of speed, braking, steering and stability as well as loading capacity of the machine before starting operation.

If you have no previous experience of the machine, make sure to do all testing at a safe and open place with no persons in the area of operation.

SAFETY INSTRUCTIONS

Never use the loader without instructions. Read loader signs (decals), and this manual.

Start the operation slowly and carefully.

Do not wear loose clothing, long uncovered hair or jewelry near machine.

When driving be comfortably seated in the driver´s seat, keep your feet in their proper place in the footwell and at least one hand on the steering wheel.

Operate the control levers and the lever of auxiliary hydraulics only when sitting in the driver´s seat.

Operate the control levers with ease and without hesitation.

When coupling the attachment, make sure that the locking pins lock in positively.

Never put any part of the body or let anyone go under the lifted boom.

Do not transport persons in the bucket. The machine is not designed to lift or to transport persons.

Keep hands, feet and clothing away from any moving part and/or hydraulic cylinder.

Never carry passengers. Keep other bystanders away from the work area.

Drive slowly on uneven terrains. Watch out for ditches, manholes and steep gradients.

Do not drive on too steep a gradient. Load, unload, and turn on flat level ground.

Make sure that the ventilation is sufficient when working indoors or otherwise confined area.

Do not use loader in an atmosphere with explosive dust or gases or where exhaust can contact flammable material, explosion or fire can result.

Do not transport the load with the boom lifted. Always carry bucket or attachment as low as possible, and put the load down whenever you leave the machine.

When lifting or lowering the load, do not operate the boom control lever abruptly. Turn the lever smoothly and with care.

Do not exceed rated operating capacity - follow the load diagrams.

Do not park the machine on a surface with a gradient. Should this be necessary, use the parking brake and preferably turn the machine sideways and put down the bucket. If needed, use chocks behind the wheels.

Before leaving driver´s seat:
- Lower the loader boom
- Place attachment flat on ground
- Stop the engine, remove the key
- Engage the parking brake

Never perform any maintenance or repair operation when the engine is running.

Stop and cool the engine before adding fuel.

Never use ether or starting fluid on diesel engines with glow plugs. Use only starting aids as approved by engine manufacturer.

Keep the engine area clean of flammable materials.

Wear eye protection when servicing, and hard hat or other protective equipment as needed.

When connecting a booster battery for "jump" start, always make last connection (negative cable) to engine, never at battery. When removing the "jump" start cable, always remove the negative cable (-) from engine first.

Never charge a frozen battery.

Lead acid batteries produce flammable and explosive gases. Keep arcs, sparks, flames and lighted tobacco away from battery.

Battery acid causes severe burns. In case of acid contact, wash immediately with water for several minutes and get medical attention in case of eye contact.

Use a piece of cardboard to check for hydraulic leaks. Leaking fluids under pressure can enter the skin and cause serious injury. Medical attention is required if hydraulic or other fluids contact skin.

Never modify the loader or add attachments not approved by ***AVANT*** Tecno Oy.

Do not smoke during refueling or driving.

If the loader is transported e.g. on a trailer, make sure that the articulation joint is securely locked by fitting the travel lock (painted red) on the left side. Ensure it is removed before commencing driving again.

When turning with the loader, keep in mind that the driver´s seat extends beyond the turning radius of the wheels (collision risk).

When turning, make sure that no part of your or anyone else´s body gets crushed between the wheel and the hydraulic motor cover.

Read this Operator's Manual carefully, especially if you are unfamiliar with the safe use and operation of the machine.

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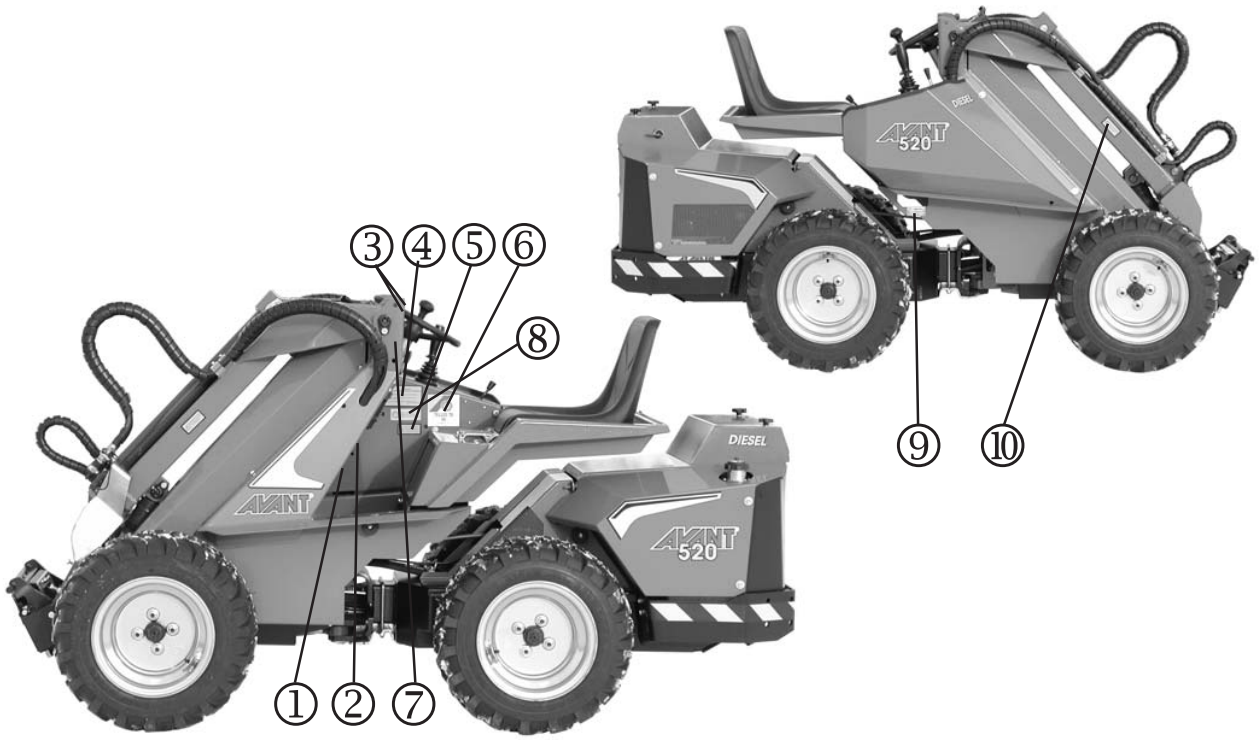
DECAL LOCATIONS

If any of these decals has been removed or is unreadable it should be replaced without delay.



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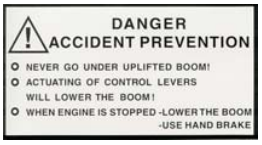
④ 

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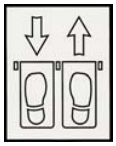
⑦ 

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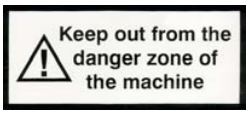
⑩ 

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MAIN PARTS OF THE LOADER

Following picture shows the main parts of the loader:

① Front frame

Front frame is the part of the loader in front of the articulation joint. On the front frame are mounted: driver's seat, operating controls, hydraulic control valves, hydraulic oil tank, auxiliary hydraulics outlet, front wheels, hydraulic motors and the loader boom with attachment coupling plate.

② Back frame

Back frame is the part of the loader behind the articulation joint. On the back frame are mounted: engine with accessories, hydraulic pumps, rear wheels, hydraulic motors, parking brake mechanism, battery disconnect switch, drive release solenoid valve (optional).

③ Articulation joint

Articulation joint connects the front and back frame. The loader is steered hydraulically by the steering cylinder which is mounted between the front and back frames. Hydraulic hoses, electric wires, parking brake wire and drive cable (if the machine has one) are conducted through the articulation joint.

④ Loader boom

Loader boom is mounted on the front frame with two pivot pins. The attachment coupling plate is mounted on the lower end of the boom. There are two types of booms: standard boom with fixed length and the optional telescopic boom which extends 500 mm hydraulically.

⑤ Attachment coupling plate

Attachments are mounted on the attachment coupling plate.

⑥ Auxiliary hydraulics outlet

The hydraulic hoses of hydraulically operated attachments are mounted on this outlet with quick couplers. The outlet is double acting: it has two pressure lines and one return line. It is also possible to install an auxiliary hydraulics outlet in the rear of the machine (optional extra).

⑦ Rear mounting system (optional extra)

If necessary, attachments can also be mounted on the rear of the machine – on a mounting plate or a rear lift device.

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TECHNICAL SPECIFICATION

Model	AVANT 513	AVANT 514	AVANT 520	AVANT 520+ / 523+	AVANT 528+ / 530+
Length	1960 mm	2226 mm	2226 mm	2226 mm	2306 mm
Width	990-1070 mm (depending on tyre size)	990-1070 mm (depending on tyre size)	990-1070 mm (depending on tyre size)	990-1180 mm (depending on tyre size)	990-1180 mm (depending on tyre size)
Standard tyre size Width with std. tyre	23x8.50-12 1020 mm	23x8.50-12 1020 mm	23x8.50-12 1020 mm	23x8.50-12 1020/1070 mm	23x8.50-12 1020/1070 mm
Height	1348 mm	1348 mm	1348 mm	1348 mm	1348 mm
Axle width	1090 mm	1090 mm	1090 mm	1090 mm	1090 mm
Ground clearance	206 mm	206 mm	206 mm	206 mm	206 mm
Weight	650 kg	750 kg	850 kg	880 kg	930 kg
Drive speed	0 – 10 km/h	0 – 10 km/h	0 – 12 km/h	0 – 9 / 0 - 14 0 - 18 km/h	0 – 11 / 0 - 14 0 – 18 km/h
Drive hydraulics	hydrostatic	hydrostatic	hydrostatic	hydrostatic**)	hydrostatic**)
Auxiliary hyraulics flow and pressure	22 l/min 175 bar	22 l/min 175 bar	31 l/min 200 bar	22 + 14 l/min 200 bar	25 + 19 l/min 210 bar
Steering wheel rounds left / right	2,7 / 4,2	2,7 / 4,2	2,7 / 4,2	2,7 / 4,2	2,7 / 4,2
Turning radius inside / outside	880 / 1850 mm	880 / 2000 mm	880 / 2000 mm	880 / 2000 mm	880 / 2020 mm
Lifting height with standard boom	2100 mm	2100 mm	2100 mm	2100 mm	2100 mm
Lifting height with telescopic boom (Option)	2400 mm	2400 mm	2400 mm	2400 mm	2400 mm
Max. pulling force	6000 N	6000 N	8000 N	12000 N/ 8000 N / 6000 N	12000 N/ 9000 N / 7500 N
Max. lifting capacity (hydr.)	7500 N	7700 N	8500 N	8500 N	10000 N
Tipping load*)	600 kg	650 kg	700 kg	700 kg	780 kg
Engine	Honda GX 390 petrol	Kubota Z 482 diesel	Kubota D 722 diesel	Kubota D 722 diesel	Kubota D1105 diesel
Engine output	10 kW (13 hp)	10,5 kW (14 hp)	14 kW (20 hp)	14 kW (20 hp)	21 kW (28.0 hp)

*) with standard lift arm, 80 kg driver and 30 kg extra back weight, on flat even surface.
**) Models 523+ and 530+ have pilot operated drive pump.

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TECHNICAL SPECIFICATION, ENGINES

Engine type	Honda GX390 (petrol)	Kubota Z482 (diesel)	Kubota D 722 (diesel)	Kubota D1105 (diesel)	Kubota DG-750E (LPG)
Function	4 stroke	4 stroke	4 stroke	4 stroke	4 stroke
Cooling system	air	water	water	water	water
Number of cylinders	1	2	3	3	3
Starter	electric / manual	electric	electric	electric	electric
Bore * stroke	88 * 64 mm	67 * 68 mm	67 * 68 mm	78 * 78,4 mm	68 * 68 mm
Displacement	389 cm^3	479 cm^3	719 cm^3	1105 cm^3	740 cm^3
Max. output	10 kW (13 hp)	10,5 kW (14 hp)	14 kW (20 hp)	21 kW (28 hp)	14 kW (20 hp)
Fuel	petrol min. 92 oct.	diesel	diesel	diesel	LPG
Fuel tank capacity	6,5 l	18 l	18 l	18 l	gas bottle
Engine oil capacity	1,1 l	2,5 l	3,8 l	4,1 l	3,8 l
Engine oil type	API SE	API CC	API CC	API CD	API CC
Viscosity	SAE 10W-30	SAE 10W-30	SAE 10W-30	SAE 10W-30	SAE 10W-30
Valve clearance, suction	0,15 mm	0,145 – 0,185 mm	0,145 – 0,185 mm	0,145 – 0,185 mm	0,130 - 0,170 mm
Valve clearance, exhaust	0,20 mm	0,145 – 0,185 mm	0,145 – 0,185 mm	0,145 – 0,185 mm	0,130 - 0,170 mm
Sound pressure level L_{PA}	86 dB (A)	87 dB (A)	89 dB (A)	89 dB (A)	88 dB (A)
Sound output level L_{WA}	101 dB (A)	102 dB (A)	104 dB(A)	104 dB(A)	103 dB(A)

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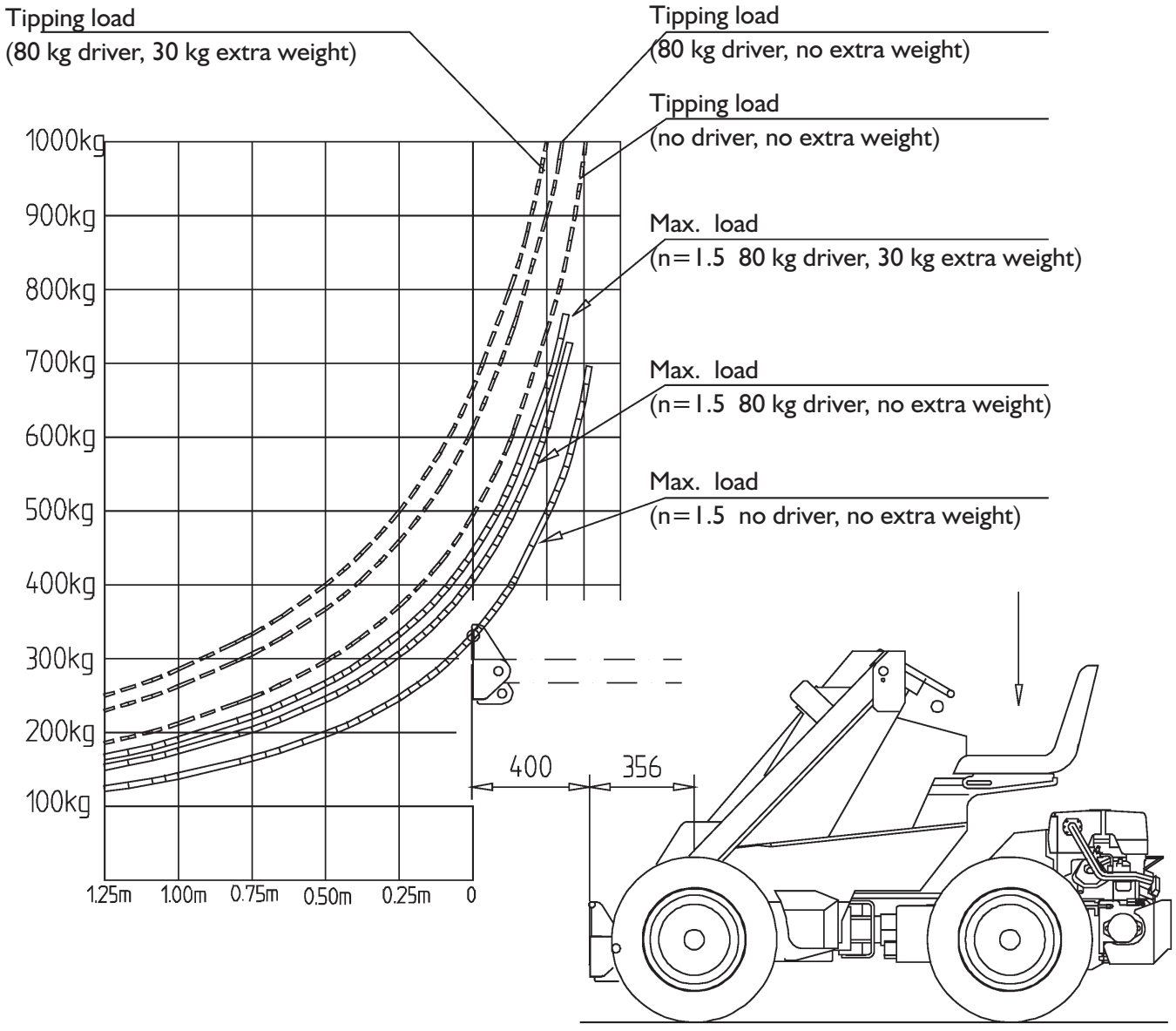
LOAD DIAGRAM

The lifting capacity of the loader is limited by the possibility of tipping around the front axle. The diagram below shows the tipping loads and max. allowed loads in different loading situations on an even level surface with the loader in maximum articulation (i.e. minimum restoring moment).



AVANT 513 PETROL: Load diagram

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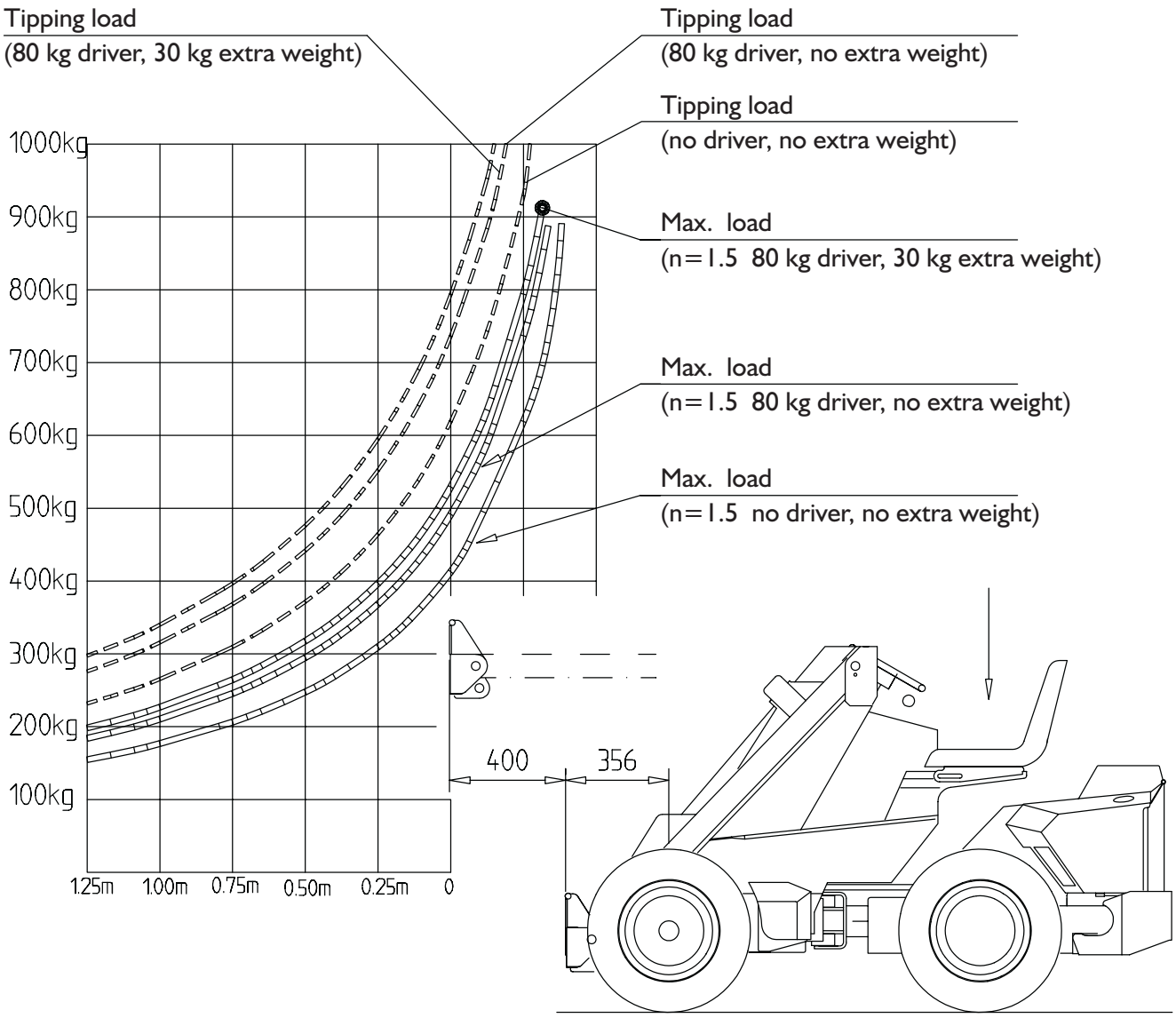

AVANT 500 series DIESEL : Load diagram

The diagram can be interpreted as follows:

- If the load is 25 cm in front of the attachment coupling plate, the max. load of the DIESEL version is 400 kg and the max. load of the PETROL version is 340 kg with a driver weighing 80 kg and with an extra weight of 30 kg in the rear.
- When using the telescopic boom remember that the load is extended an additional 50 cm away from the attachment coupling plate, which means that in the case mentioned above the max. loads are reduced to 260 kg (diesel) and 170 kg (petrol).
- With the load carried at low level max. loads of 650 kg and 550 kg can be transported in the above mentioned case.
- Please note that the diagrams are based on the machine operating on a level even surface. Loads should be significantly reduced when operating on gradients.

⚠ **ALWAYS PUT DOWN THE LOAD BEFORE LEAVING THE MACHINE.**

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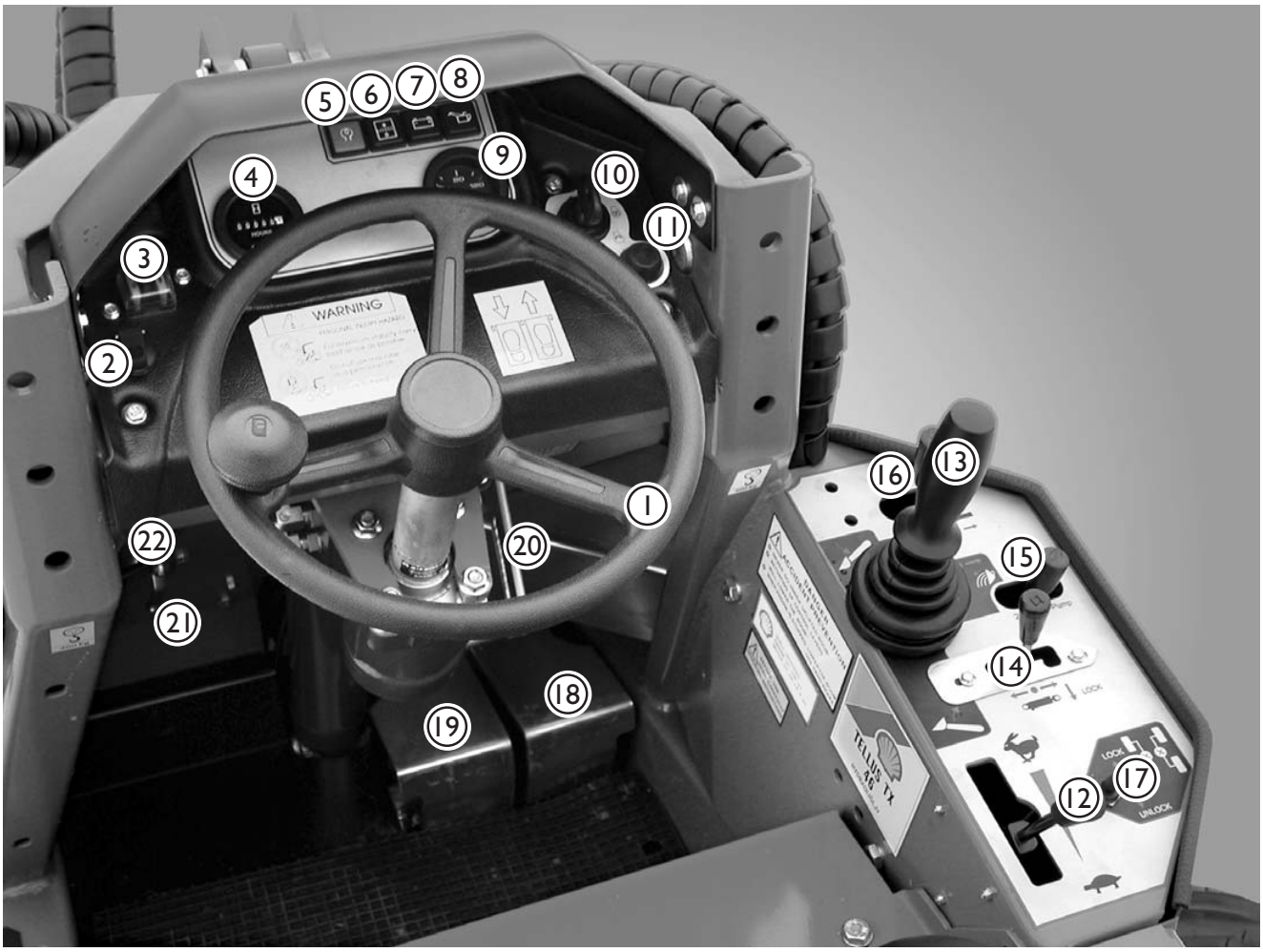
OPERATING CONTROLS

Following picture shows the location of operating controls. The location and function of controls may be slightly different in different models, see following pages.



1. Steering wheel
2. 12 V outlet
3. Fuse box (2 pcs fuses)
4. Hour meter
5. Glow plug indicator (yellow)
6. Oil cooler fan indicator (option)
7. Charge indicator (red)
8. Oil pressure indicator (red)
9. Thermometer
10. Ignition switch
    (positions OFF, ON, GLOW, START)
11. Signal horn
12. Hand throttle lever
13. Control lever of boom and bucket
14. Auxiliary hydraulics control lever
    (may vary in different models)
15. Selection lever of the pumps for auxiliary hydraulics
    (only on Plus models: **520+**, **523+**, **528+** and **530+**)
16. Control lever of telescopic boom (optional extra)
17. Drive circuit release switch (optional extra)
18. Drive pedal, right: drive forward
19. Drive pedal, left: drive backward
20. Parking brake handle
21. Control lever of boom floating system (optional extra)
22. Hour meter (in the footwell in model **513** only)

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CONTROL OF LOADER BOOM, ATTACHMENTS AND OTHER FUNCTIONS

Most of the functions of the loader are controlled at the control panel on the right side of the operator: Boom and bucket movements, auxiliary hydraulics (attachments), engine revs etc. , depending on loader model. Following pictures show the different functions:

Models 513, 514 and 520

Models 520+, 523+, 528+ and 530+

12. Hand throttle lever
- Push forward to increase engine revs
- Pull backward to reduce engine revs

13. Control lever of boom and bucket
- Pull backward to lift the boom
- Push forward to lower the boom
- Push left to raise the tip of the bucket (filling)
- Push right to lower the tip of the bucket (emptying)

14. Control lever of auxiliary hydraulics (hydraulically operated attachments)
- Pull left carefully to test the operating direction of the attachment
- Right + locking position: the attachment operates in reversed direction

15. Selection lever of the pumps for auxiliary hydraulics (only in models 520+, 523+, 528+ and 530+)
- Left: both pumps coupled for auxiliary hydraulics
- Right: one pump coupled for auxiliary hydraulics

16. Control lever of telescopic boom (optional extra)
- Pull left to extend the boom
- Push right to retract the boom

Attention! On the 520+,523+, 528+ and 530+ models this lever can also be used for operating the rear auxiliary hydraulics, where the telescopic boom is operated with the optional electric joystick & solenoid valve

17. Drive circuit release switch (optional extra)
- In normal operation ("unlock" selected) hydraulic oil flows in series from motor to motor. With "lock" selected the hydraulic oil flows in parallel between the hydraulic motors on each side, similar to a differential lock in operation.

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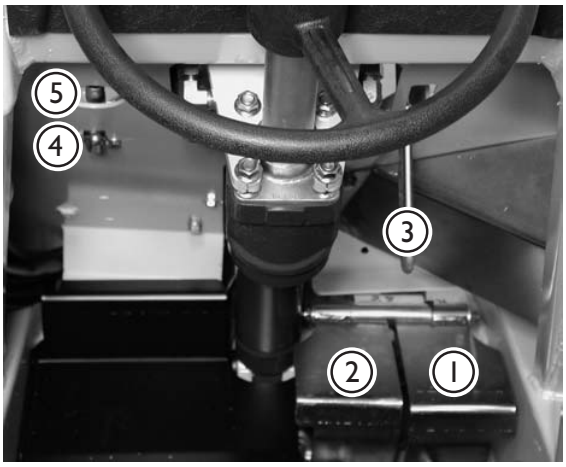
CONTROLS IN THE FOOTWELL



1. **Drive pedal, right:** drive forward
2. **Drive pedal, left:** drive backward
3. **Parking brake handle**
   - locking: pull up and turn right into locking position
   - releasing: turn left and let the handle go down, if necessary make a sharp turn with the steering wheel so that the locking pins unlock in the rear wheels
4. **Control lever of boom floating valve (boom floating is an optional extra)**
   - the floating system releases pressures on the down side of the lift cylinder allowing the attachment to follow the contours of the terrain.
5. **Hour meter (in the footwell on model AVANT 513 only)**

JOYSTICK 8 FUNCTIONS (Option)

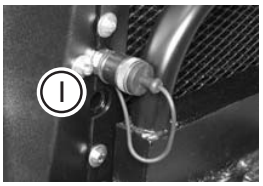
The loader can be equipped, as an option, with a joystick, where the operation of auxiliary hydraulics and telescopic boom is electric.

1. **Auxiliary hydraulics**
   - push the buttons to engage and disengage auxiliary hydraulics
2. **Telescopic boom**
   - with the toggle switch the telescopic boom can be operated steplessly (extension- retraction)
   - on the „plus“ models with two auxiliary hydraulics pumps the speed of the telescoping function depends on the position of the pump selection lever:
     - 1 pump: telescoping slower
     - 2 pump: telescoping faster

TELESCOPIC BOOM (Option)

The optional telescopic boom gives more lifting height and outreach. Length of the telescope is 500 mm and the additional lifting height is 300 mm. Telescopic boom is operated either with the conventional control lever (no. 16 on the control panel, see previous page), or with the toggle switch on the joystick.

AUXILIARY HYDRAULICS IN THE REAR (Option)



The loader can be equipped with an auxiliary hydraulics outlet in the rear of the machine:

1. **Quick couplers in the rear**
   - the quick couplers are located on the left side of the machine
   - the picture on the left shows the single acting rear hydraulics – it is also possible to mount a double acting aux. hydraulics outlet in the rear
2. **Control lever of rear auxiliary hydraulics**
   - single acting rear hydraulics are operated with the normal auxiliary hydraulics control lever (no. 14 on the control panel)
   - double acting rear hydraulics are operated either with a separate valve mounted at the left side on the rear frame, or with the lever shown on the picture (on machines with electric joystick)

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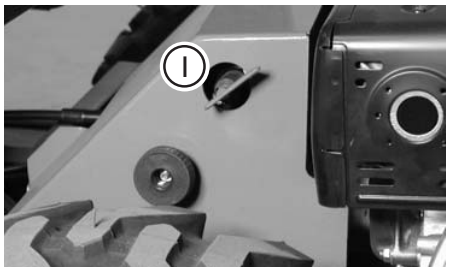
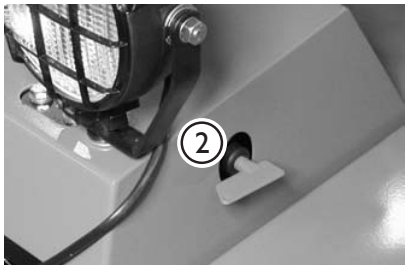
LOCATION OF BATTERY DISCONNECT SWITCH

All **AVANT** loaders are equipped with a battery disconnect switch. Following pictures show the location of this switch.

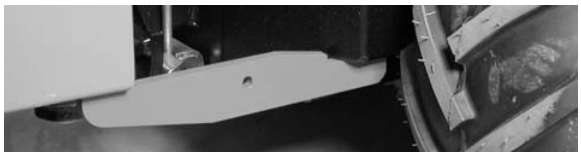


1. AVANT 513
- Back frame, left side, in front of the engine

2. AVANT 514, 520, 520+, 523+, 528+, 530+
- Back frame, right side



FRAME LOCK



The frame of the loader can be locked with the red frame lock (see picture). This way the loader frame stays straight during e.g. transportation. There is a place for the frame lock on the left side of the front frame under the fender.

ENGINE BLOCK HEATER (Option)

Loader with diesel or LPG engine can be equipped, as an option, with an engine block heater.

1. Engine block heater outlet
- the outlet for the heater is on the right side in the rear of the machine.

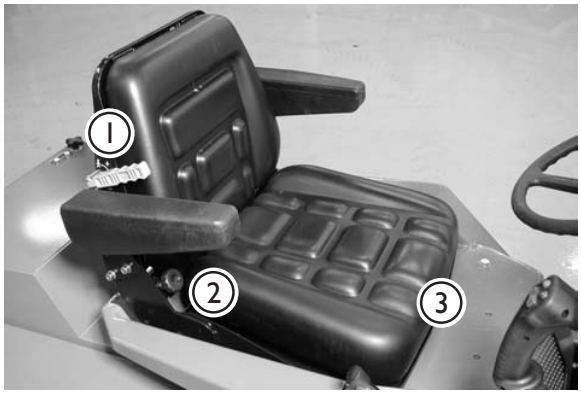
ROPS AND FOPS (Option)

1. ROPS frame
- ROPS frame complies with the ISO 3471 / SAE J1040 standard. Total machine height with ROPS frame is 1990 mm.

1. FOPS canopy, mounts on the ROPS
- FOPS safety canopy exceeds the ISO 3449 Level 1 / SAE J1043 FOPS criteria. Total machine height with FOPS is 2050 mm.

SUSPENSION SEAT (Option)

The optional suspension seat has the following adjustments:



1. Suspension adjustment
- by turning the lever clockwise suspension gets harder, by turning it counterclockwise the suspension gets softer

2. Angle of the back rest
- the angle of the back rest can be adjusted by turning the knob

3. Seat position
- the distance of the seat from the steering wheel can be adjusted with the lever which is located under the front edge of the seat

Suspension seat can be equipped with a seat belt (option)

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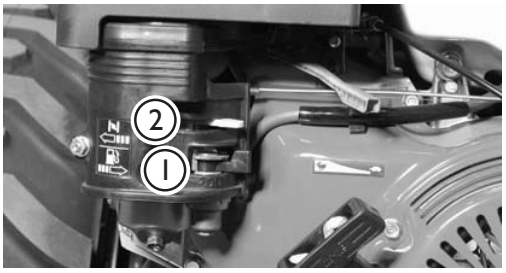
STARTING THE ENGINE

Petrol engine (AVANT 513, see also HONDA Owner's Manual)

- Turn the battery disconnect switch to ON



- Turn the fuel valve to the on ON position (on the left side of the engine, see Honda Owner's Manual) (1)
- Move the choke lever to the left to CLOSE position (above fuel valve, see Honda Owner's Manual) (2)
- **NOTE: Do not use the choke if the engine is warm or the air temperature is high**

- Turn the ignition key to the right until engine starts, then let the key return to ON position
- Reduce choke (move choke lever to the right) as soon as engine has started, move completely to the right when engine has warmed up

Diesel engine

- Turn the battery disconnect switch to ON

- Turn the ignition key to the right until the yellow glow plug indicator lights up, keep the ignition key in this position until the glow plug indicator goes out
- Turn the ignition key further to the right until the engine starts, then let the key return to ON position

THE ENGINE CANNOT START IF THE AUXILIARY HYDRAULICS CONTROL LEVER IS IN LOCKING POSITION, OR THE PUMP SELECTION LEVER (on „plus" models) IS IN THE POSITION „2 PUMP" (when the ambient temperature is low).

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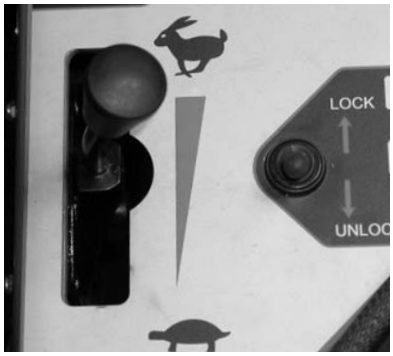
STOPPING THE ENGINE

- Turn the ignition key to the OFF position (to the left)
- Turn the power off with the battery disconnect switch

DRIVE CONTROL



AVANT 500 series loaders are equipped with a hydrostatic drive system, there is a variable displacement hydraulic pump in the drive circuit. The oil flow of this drive pump is steplessly adjusted with the two drive pedals. The drive pedals act in a proportional way to control the drive speed and power available at the drive motors.

This hydrostatic drive system has different operating characteristics to a mechanical drive. To get maximum pushing power push the pedals lightly - for higher travel speed push the pedal harder.

Driving of the machine **is controlled with the drive pedals** as follows:

Select the revs of the engine with the **hand throttle lever** on the control panel. The basic rule is: use lower revs for lighter work and higher revs for hard work.

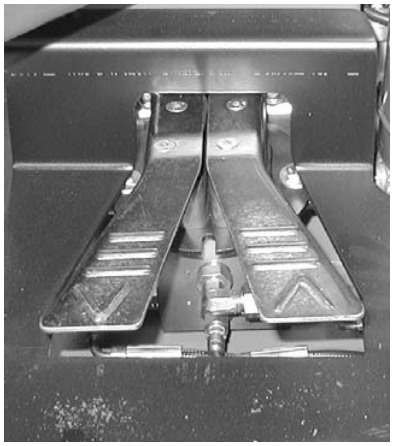
If you want to **drive forward**, press gently on the **right** drive pedal until the machine starts to move slowly. The desired drive speed is selected with the drive pedal: the more the pedal is pressed the faster you will travel.

When you **wish to stop** gently release the pedal by lifting of your foot, and the machine will slow and stop.

Drive backward is controlled with the **left** drive pedal in the same way as drive forward: the more the pedal is pressed the faster you will travel.

When you have learned how to drive on low speed, increase speed gradually and learn how to drive with higher drive speeds.

FUNCTION OF DRIVE PEDALS



When thinking about the function of the two drive pedals, they should be compared to gears, not to a conventional throttle pedal. The **drive pedal** in a way **shifts on a higher gear** the more the pedal is pressed. Therefore you shouldn't press the pedal more when the engine starts to struggle. Pressing the pedal just causes the engine to stop.
Picture on the left shows the drive pedals of the **523+** and **530+** with hydraulically pilot operated drive pump, on the other 500 series models the pedals look different.

When you want to have a high pulling force:
1. Use high engine revs
2. Select a relatively slow drive speed with the drive pedal. That is: press the pedal only lightly (= select a low gear). This way the full output of the hydraulic system and the engine can be taken out.

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STEERING OF THE MACHINE

Steering of the machine is actuated via the steering wheel. The steering wheel is hydraulically powered. A practical way of steering is to steer with your left hand on the knob of the steering wheel. This way your right hand is free to operate other functions. Familiarise yourself with the special drive features and space needs of this articulated loader on a flat, even and open place. Remember that, when turning, the driver´s seat extends beyond the turning radius of the wheels.

NEVER TIP OVER THE LOADER. NEVER USE A HIGH DRIVE SPEED WHEN TURNING.
In particular: when the loader boom is up the stability of the machine is much weaker when turning.

WHEN DRIVING, ALWAYS KEEP THE LOADER BOOM AS LOW AS POSSIBLE. Risk of tipping over increases considerably when there is a heavy load on the loader (a heavy attachment or a big load in the bucket) and the boom is up when driving.

ALWAYS REMEMBER – SAFETY FIRST.

TEST ALL THE FUNCTIONS OF THE LOADER AT AN OPEN AND SAFE PLACE.

MAKE SURE THAT THERE ARE NO PERSONS IN THE OPERATING AREA OF THE MACHINE.

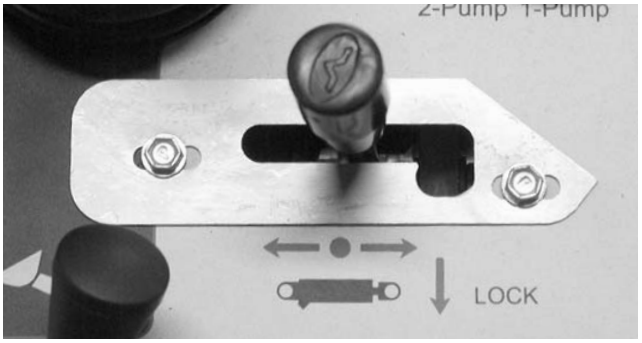
LOADER CONTROL

The loader boom and bucket are controlled with the multi-function lever sideways (tilt) and back & forward (boom up & down).

· Pull backward to lift the boom
· Push forward to lower the boom
· Push left to raise the tip of the bucket (filling)
· Push right to lower the tip of the bucket (emptying)

USING THE AUXILIARY HYDRAULICS

Auxiliary hydraulics (hydraulically operated attachments) are controlled with the lever no. 14 on the control panel.

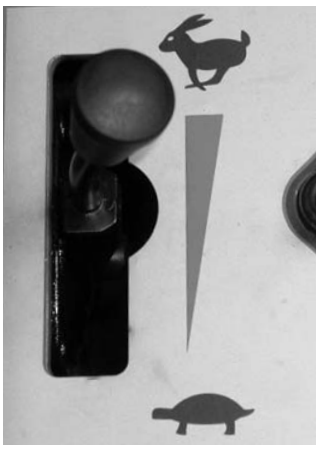


Auxiliary hydraulics control lever locks in the locking position (on the right) which facilitates operation of the attachments that require constant oil flow (rotary broom, backhoe etc.).

NOTICE! THE ENGINE CANNOT START IF THE AUXILIARY HYDRAULICS CONTROL LEVER IS IN THE LOCKING POSITION.

THE OPERATING DIRECTION OF THE ATTACHMENT DEPENDS ON THE COUPLING OF THE ATTACHMENT HOSES. MAKE SURE THAT THERE ARE NO PERSONS IN THE DANGER AREA WHEN TESTING THE OPERATING DIRECTIONS. CHANGE THE COUPLING OF THE HOSES IF NECESSARY.

HAND THROTTLE



When driving, the revolution speed of the engine can be adjusted with the hand throttle lever, if necessary. Do not turn the machine with a high driving travel speed.

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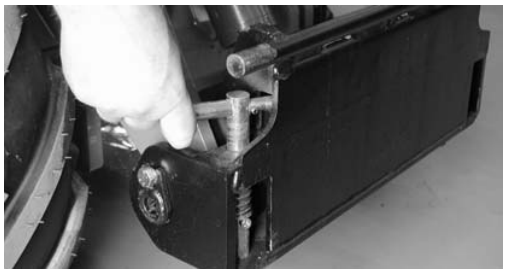
COUPLING THE ATTACHMENTS

Coupling of the attachments into the attachment coupling plate happens as follows:



Stage 1:

- Lift up the two locking pins on either side of the attachment coupling plate and turn them backward so that they remain in the locked up position
- Make sure that the pins remain in the up position, otherwise you cannot couple the attachment properly!

Stage 2:

- Turn the attachment coupling plate with the tilt movement so that the upper edge of the plate leans forward.
- Drive the loader into the attachment

Stage 3:

- Lift the boom a little so that the attachment lifts off of the ground
- Pull the boom control lever to the left so that the lower edge of the attachment coupling plate turns into the attachment

Stage 4:

- Pull the boom control lever more to the left so that attachment coupling plate turns more and the bolts on the boom push the pins down in the holes of the attachment.
- **CAUTION! Make sure that the pins lock properly down in the holes of the attachment.**

Stage 5:

- If the attachment is equipped with hydraulic hoses, make sure to connect the hoses in the quick couplings on the loader
- Engine must be stopped when connecting the hoses. Before connecting the hoses move the auxiliary hydraulics control lever in both directions a couple of times in order to release eventual back pressure.
- Additional information about the coupling is provided in the instruction manual of the attachment.
- **NOTICE! When fitting an attachment, make sure that the hydraulic hoses are not overstretched and are not in a position where they can be trapped during the operation of the machine and attachment.**

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MAINTENANCE SCHEDULE

Following table shows the maintenance and service points and intervals. There are more detailed instructions about each service operation, in numerical order, on the following pages.

LOADER	Every day	Every week	After 25 h	After 50 h	Every 100 h	Every 200 h	Every 400 h	Every 500 h	Every 800 h	Every 1000 h	Every year
1. Clean the machine	■										
2. Check tyre pressure		●									
3. Check battery electrolyte level		●									
4. Check hydraulic oil level		●									
5. Change hydraulic oil filters				●		●					
6. Change hydraulic oil				●			●				
7. Check tightness of bolts, nuts and hydraulic fittings			●								
8. Check pressure of hydraulic system				■							●
9. Adjust pressure of hydraulic system				■							■
10. Grease the machine	■	●									
PETROL ENGINE*)											
11. Check engine oil level		●									
12. Change engine oil					●						
13. Clean air filter	■	●									
14. Clean fuel filter and sediment cup					●						
15. Clean spark arrester					●						
16. Change spark plug					●						
17. Change air cleaner element											●
18. Check and adjust valve clearances											●
DIESEL ENGINE*)											
19. Check engine oil level	●										
20. Change engine oil					●						
21. Clean air filter		●			●						
22. Clean fuel filter and sediment cup					●						
23. Check condition and tightness of alternator belt					●						●
24. Check water hoses and hose clamps						●					
25. Change engine oil filter						●					
26. Change fuel filter							●				
27. Clean fuel tank											●
28. Clean radiator cells	■							■			
29. Change coolant											●
30. Change air cleaner element					■						●
31. Check and adjust valve clearances									●		
32. Check opening pressure of nozzles										●	

● Maintenance operation
■ When necessary
*) More specific engine maintenance instructions can be found in the owner's manual of the engine, supplied with the loader.

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SAFETY INSTRUCTIONS FOR MAINTENANCE

ALWAYS REMEMBER SAFETY DURING MAINTENANCE
DO NOT PERFORM ANY SERVICE OPERATION WHEN THE ENGINE IS RUNNING
USE THE SERVICE SUPPORT ON THE BOOM CYLINDER
DO NOT GO UNDER UNDSUPPORTED BOOM
DO NOT SMOKE DURING SERVICE OPERATIONS
BEWARE POSSIBLE HIGH PRESSURE IN HYDRAULIC CIRCUITS

MOUNTING OF THE SERVICE SUPPORT

Hydraulic oil tank is located on the front axle as a part of the front chassis, so in order to get to the dipstick and return oil filter the boom must be lifted and the front cover plate removed.

Make sure that the boom stays up by putting the service support on the lift cylinder piston rod.

The red service support is located behind the attachment coupling plate, fastened with a bolt

Make sure to secure the service support by locking it on the piston rod by the bolt

SAFETY INSTRUCTIONS WHEN HANDLING THE BATTERY

- **BATTERY CONTAINS CORROSIVE SULFURIC ACID.**
- **AVOID CONTACT WITH SKIN OR CLOTHES. IF ELECTROLYTE GETS ON YOUR SKIN OR CLOTHES, FLUSH WITH A LOT OF WATER.**
- **IN CASE OF CONTACT WITH EYES, FLUSH WITH A LOT OF WATER FOR AT LEAST 15 MINUTES AND CALL A DOCTOR IMMEDIATELY.**
- **WHEN CHARGING THE BATTERY GIVES OFF POTENTIALLY EXPLOSIVE GASES – DO NOT SMOKE WHEN HANDLING THE BATTERY.**
- **IN ORDER TO AVOID SPARK EMISSIONS ALWAYS DISCONNECT THE NEGATIVE (-) CABLE FIRST AND CONNECT IT LAST.**
- **BEFORE CONNECTING THE BATTERY CABLES MAKE SURE THAT THE POLARITY IS CORRECT: FAULTY CONNECTION WILL SERIOUSLY DAMAGE THE ELECTRIC SYSTEM OF THE ENGINE.**

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1. CLEANING OF THE LOADER

Cleanliness of the loader is not only a question of outer appearance. All surfaces, painted and others, will stay in better condition when they are cleaned regularly. A clean machine also lasts longer. A dirty machine will run hotter and will collect dirt into the air cleaner, which is likely to damage the engine. Pay special attention to the cleanliness of the engine, the oil tank cover, the engine compartment and the hydraulic pump compartment. The loader can be washed with a pressure washer.
ATTENTION! If the loader is equipped with a hydraulic oil cooler (standard on models **520+**, **523+**, **528+** and **530+**, optional on other models), which is located under the driver's seat, make sure to clean the oil cooler cell with compressed air every time you are servicing the loader - and even more frequently if the loader is being used in dusty conditions. Take off the driver's seat and the seat base before cleaning the oil cooler.

2. TYRE PRESSURE

Correct tyre pressure means that the tyres last much longer. Wrong tyre pressure increases tyre wear and can be a safety risk when working with the loader. Recommended tyre pressures are:
- 5.00 - 10 tyre 2.8 bar (40.6 PSI)
- 23*8.50-12 tyre 2.5 bar (36.3 PSI)
- 23*10.50-12 tyre 2.0 bar (29.0 PSI)

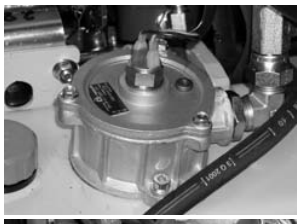
3. BATTERY CHECK

In order to secure the starting and safe operation the battery of the loader must be checked regularly. Checking the electrolyte level of the battery happens by opening the filler caps. **ATTENTION!** Clean the battery before opening the caps so that dirt cannot get in the battery. Check also the contacts and clean if necessary.

4. HYDRAULIC OIL LEVEL

Hydraulic oil level can be checked with the dipstick in the filler. Oil level should be between the two marks in the dipstick. Refill when necessary. Clean the area before checking hydraulic oil level. Do not let any contaminents enter the hydraulic tank during this procedure.

5. CHANGING OF HYDRAULIC OIL FILTERS



The hydraulic oil return filter is located on top of the hydraulic oil tank, under the cover. Take off the cover and replace the oil filter cartridge.
Remember to use the service support.
The hydraulic pressure filter is located in the back frame beside the hydraulic pumps. Unscrew the housing of the filter and replace the filter cartridge.

6. HYDRAULIC OIL CHANGE

When changing hydraulic oil, the oil can be removed with a suction pump or by opening the drain plug on the right side of the front frame, next to the articulation joint. In both cases it is important to clean the magnetic drain plug. Hydraulic oil tank capacity is 30 litres. Use ISO VG-46 certified mineral hydraulic oil (e.g. Shell Tellus TX oil). Use of synthetic hydraulic fluids is not permitted.

7. CHECK AND TIGHTENING OF BOLTS, NUTS AND FITTINGS

Check tightness of bolts, nuts and hydraulic fittings regularly. **ATTENTION! Tighten wheel nuts after first 5 operating hours. Check tightness of wheel nuts regularly. Wheel nuts shall first be tightened to 120 Nm diagonally opposite and finally tightened to 140 Nm.**

8. CHECK PRESSURE OF HYDRAULIC SYSTEM

The table on page 25 shows the correct operating pressures for each loader model. Pressure checking points for different functions are as follows:
Boom lifting/auxiliary hydraulics: Pressure is checked from the mano-meter fitting, which is located under the front cover plate, beside the steering hydraulic motor. Pressure is measured with full engine revs and by turning the auxiliary hydraulics control lever. (On some models the pressure checking point is on top of the hydraulic pumps).

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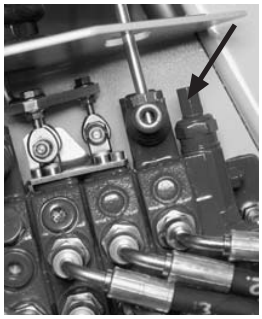
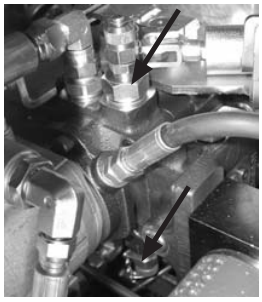
Drive pressure: There are two checking points, on top of the variable displacement pump and under the variable displacement pump. One tells the pressure for forward driving, the other for reverse driving. When checking the pressure the wheels must be locked e.g. with the parking brake, engine must run with full revs when pressing the two drive pedals. On models **520+, 523+, 528+** and **530+** the pressure for boom lifting and auxiliary hydraulics is checked and adjusted separately. Pressure for lifting is checked from the manometer fitting, which is located under the front cover plate, beside the steering hydraulic motor. Auxiliary hydraulics pressure is checked by mounting the manometer in the female auxiliary hydraulics quick coupling, with full revs and by turning the aux. hydraulics control lever. **It is recommended pressures should only be checked by a competent and experienced technician. Call your AVANT dealer if you need assistance.**

9. ADJUST PRESSURE OF HYDRAULIC SYSTEM

If the pressure of hydraulic system does not seem to be correct or pressure check indicates that the pressure is wrong, it can be adjusted. Following table shows pressure adjusting points.



Boom lifting/auxiliary hydraulics: Pressure is adjusted from the pressure relief valve at the main control valve. Pressure relief valve is the first section of the control valve, in front of the first valve block. Adjust by turning the hexagonal head screw which is under the cap.



Drive pressure: Can not be adjusted. If the pressures are clearly wrong one must change the pressure relief cartridges which have fixed pressure setting. They are located beside the pressure checking points. The cartridge on top of the pump is for driving forward, under the pump for reverse driving.

On models **520+, 523+, 528+** and **530+** the pressure for boom lifting is adjusted from the pressure relief valve at the main control valve, in the same way as mentioned above. Pressure for auxiliary hydraulics is adjusted from the shock valve on the valve segment of aux. hydraulics pump selection (1-pump , 2-pump), see picture. The adjustment screw is under the cap, adjustment with hexagonal head key.

NEVER EXCEED THE RECOMMENDED HYDRAULIC PRESSURE SETTINGS. EXCESSIVE HYDRAULIC PRESSURE WILL DAMAGE THE HYDRAULIC PUMPS, CYLINDERS, AND HYDRAULIC MOTORS.

WARRANTY DOES NOT COVER DAMAGES CAUSED BY EXCESSIVE HYDRAULIC PRESSURE.

10. GREASING OF THE MACHINE

Greasing of pivot points is very important in order to avoid wear. Most of the greasing points are on the loader boom. There are 15 grease nipples altogether on a machine with standard boom and 21 grease nipples on a machine with telescopic boom. The picture on page 24 shows the location of grease nipples.

11.-18. SERVICE, PETROL ENGINE

AVANT 513 is equipped with the Honda GX390 petrol engine. Service and maintenance instructions for this engine can be found in the Honda Operator's Manual supplied with the loader.

19.-32. SERVICE, DIESEL ENGINE

Loader models **AVANT 514, 520, 520+, 523+, 528+** and **530+** are equipped with a Kubota diesel engine (see technical specification sheet for the engine type of each model). Service and maintenance instructions for the engines can be found in the Kubota Operator's Manual supplied with the loader.

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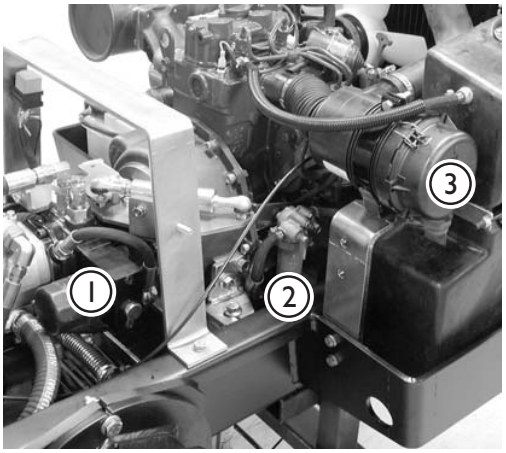
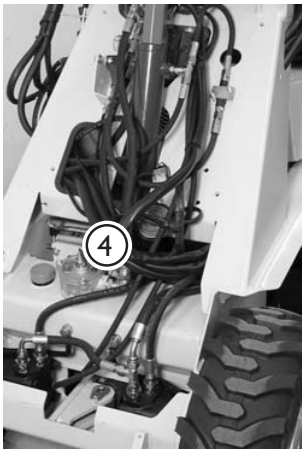
FILTERS

Following pictures and tables show the location and part numbers for the filters.





1. Hydraulic oil filter, pressure
2. Fuel filter
3. Air filter
4. Hydraulic oil filter, return
5. Engine oil filter

A 44738 13 hp petrol	
64217	Air filter
74093	Hydr. oil filter, return
64634	Hydraulic oil filter, pressure
64219	Spark plug

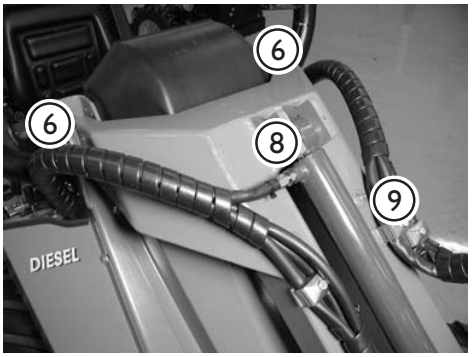
A45854 14 hp and 20 hp diesel models	
64712	Air filter
64220	Fuel filter
64207	Engine oil filter
74093	Hydr. oil filter, return
64634	Hydraulic oil filter, pressure

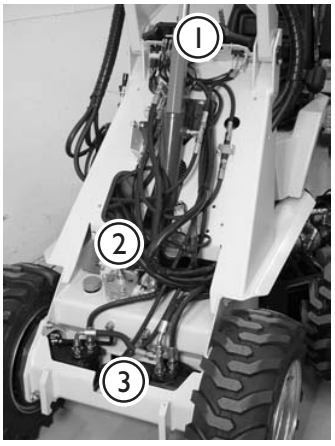
A45853 28 hp diesel models	
64712	Air filter
64626	Fuel filter
64627	Engine oil filter
74093	Hydr. oil filter, return
64634	Hydraulic oil filter, pressure

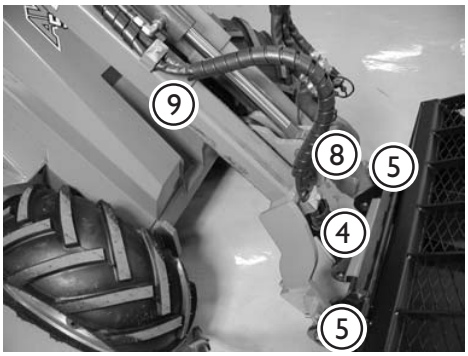
ATTENTION! On older 500 series loaders, manufactured prior to 08/2002, the filters may be different. When ordering filters always check the serial number and manufacturing date of your loader in order to get the correct filters.

GREASING POINTS

Following pictures show the location of greasing points.







1. Lift cylinder, both ends
2. Drive pedals (not on models 523+ and 530+)
3. Steering cylinder, both ends
4. Tilt cylinder, both ends
5. Shot bolts on attachment coupling plate
6. Pivot pins on loader boom
7. Articulation joint
8. Telescopic cylinder, both ends
9. Telescopic boom

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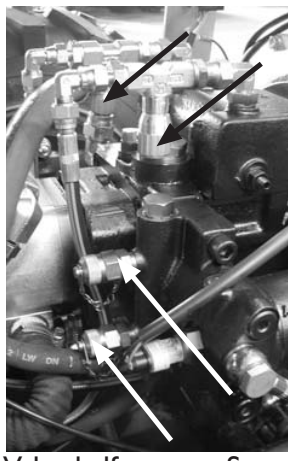
ADJUSTING THE DRIVE CONTROL CABLE

The drive control cable (on models **513, 514, 520** and **520+**) needs to be centered after the cable has been replaced. The cable centering is adjusted from the plate located on top of the variable displacement pump. Loosen the bolts marked with the black arrows (see picture), gently tap the spring holder cylinder of the centering mechanism until the machine does not move, after tighten up the bolts.
It is recommended this work is performed by an experienced technician.

REFUELING

Petrol engine: Check fuel level and fill the tank if necessary. Never use petrol mixed with oil or unclean petrol. Do not let dirt, dust or water get in the fuel tank. Make sure that the filler cap is properly tightened after refueling.
Diesel engine: Check fuel level and fill the tank if necessary. Use diesel fuel only, in accordance with the instructions in the Kubota engine Operator's Manual. Use of other fuels is not allowed, because their quality and properties cannot be guaranteed. Make sure not to let the fuel tank get empty. Should this happen, refuel and restart - the engine is fitted with automatic fuel bleeding

HYDRAULICALLY PILOT OPERATED DRIVE PUMP



The models **AVANT 523+** and **530+** are equipped with a hydraulically pilot operated variable displacement pump for drive. The two drive pedals operate a hydraulic valve which in turn controls the drive pump. Smoothness of forward and backward drive can be adjusted with the two valves on top of the pump (black arrows, see picture):
Valve completely open = Sharp, „on-off" movement
Valve half open = Smooth movements
Drive forward is adjusted with the valve on the left, reverse drive with the valve on the right.

Drive pressure on **523+** and **530+** is checked from the check points on the side of the pump (white arrows, see picture). Pressure for forward drive is checked from the lower checking point, for reverse drive from the upper checking point.

DO NOT SPILL FUEL WHEN REFUELING. SHOULD THIS HAPPEN, WIPE THE FUEL AWAY IMMEDIATELY IN ORDER TO AVOID RISK OF FIRE.

ALWAYS STOP THE ENGINE BEFORE REFUELING.
KEEP THE ENGINE AWAY FROM OPEN FIRE.

HYDRAULIC PRESSURE SETTINGS

Model	Function	Checking point	Adjusting point	Pressure
513	Drive	Fittings on hydr. pump, 2 pcs	Pre-set pressure relief valves on pump 2 pcs	275 bar
	Lift & tilt / Aux. hydr.	Fitting at lift cylind.	Main pressure relief valve in control valve	160 bar
514	Drive	Fittings on hydr. pump, 2 pcs	Pre-set pressure relief valves on pump 2 pcs	275 bar
	Lift & tilt / Aux. hydr.	Fitting at lift cylind.	Main pressure relief valve in control valve	160 bar
520	Drive	Fittings on hydr. pump, 2 pcs	Pre-set pressure relief valves on pump 2 pcs	275 bar
	Lift & tilt / Aux. hydr.	Fitting at lift cylind.	Main pressure relief valve in control valve	175 bar
520+	Drive	Fittings on pump	Pre-set press. relief valves	300 bar
523+	Lift & tilt	Fitting at lift cylind.	Main pressure relief valve	200 bar
	Auxiliary hydraulics	Aux. hydr. coupling	Shock valve in aux. pump selection valve block	175 bar
(optional)	Joystick 8 function	Aux. hydr. coupling	Main pressure relief valve	175 bar
528+	Drive	Fittings on pump	Pre-set press. relief valves	300 bar
530+	Lift & tilt	Fitting at lift cylind.	Main pressure relief valve	200 bar
	Auxiliary hydraulics	Aux. hydr. coupling	Shock valve in aux. pump selection valve block	175 bar
(optional)	Joystick 8 function	Aux. hydr. coupling	Main pressure relief valve	175 bar

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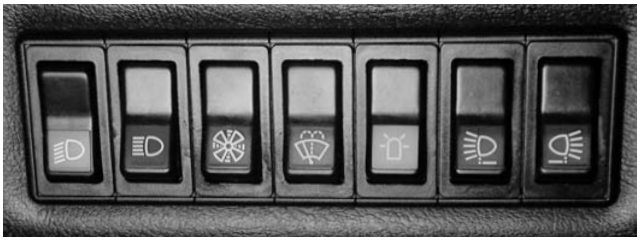
OPERATING INSTRUCTIONS, CAB

AVANT 500 series can be equipped with a cab. Here the operating instructions for the cab:
All the other switches are located in the panel above the windscreen except the on-off switch and the thermostat of the air heater – they are on the right side panel below the fuse box.



Lights, main | Headlight | Fan | Windscreen wiper | Beacon | Work lights, front & rear

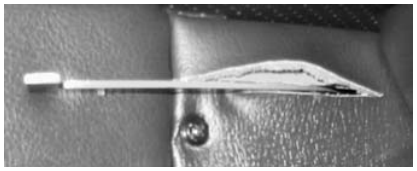
← Blinkers

← Emergency blinker

← Air heater main switch

← thermostat

The fan takes air in both from outside and from inside. The green adjusting lever of outside air intake is located up on the left. When ambient temperature is high the air intake must be completely open (lever to the left, see photo).



The fan has two speeds and it is equipped with a thermal relay which prevents overheating. This thermal relay automatically switches on the faster fan speed when fan temperature rises. This happens only when the air heater is on.

The fan must be switched on first – the heater works only when the fan is on.

When the heater is not on and the fan blows cold air the overheating risk does not exist.

The on-off switch and the thermostat of the air heater are located on the right side panel.

Cab temperature can be adjusted with the thermostat.

Air flow can be directed with the nozzles.

If the heater has been out of use for a longer period of time, there may come some smoke out of the heater when put into operation.

The exhaust of the heater is outside, on the right side of the cab door on the side column.

ATTENTION!
DO NOT COVER THE EXHAUST. RISK OF FIRE.

Do not leave the loader in a place where inflammable materials may come near the exhaust of the heater.

When the heater is switched off the fan still works for about 2 minutes in order to cool down properly.

If the heater does not start to work when switched on again, the current must be switched off from the battery disconnect switch – after that try again.

The air heater can be used even if the engine of the loader is not running. By wet and cold weather it is also advisable to heat the cabin for some time before starting driving.

FUSE BOX

The fuse box is above the air heater control unit on the right side panel.

Fuses, from top to bottom:

1. Cabin light (inside) / Parking light
2. Headlights
3. Windscreen wiper
4. Work lights, front
5. Rear lights / beacon
6. Blinkers / Radio
7. Fan
8. Air heater

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TROUBLESHOOTING

Problem	Cause	Remedy
Hydraulic attachment does not work when the auxiliary hydraulics control lever is moved.	Attachment hoses are not coupled or they are coupled wrongly in the quick couplers.	Make sure that the hoses are properly connected into the quick couplers, change the place of the hoses if necessary. Auxiliary hydraulics have double acting pressure couplers (female) and a return line (male coupler) Operating direction of the attachment depends on how the hoses are connected in the quick couplers.
	Faulty or damaged quick couplers (will restrict or stop oil flow)	Replace quick couplers.
Engine does not start.	No fuel	Fill the tank.
	Auxiliary hydraulics control lever (lever no. 3, page 6) is in locking position.	Turn the lever in center (neutral) position.
Attachment hoses will not go into the quick couplers of the machine.	There is back pressure in the auxiliary hydraulics line.	Release the pressure by moving the auxiliary hydraulics control lever in both directions.
The machine moves after parking brake has been engaged.	The pins of the parking brake mechanism have not locked properly in the wheels.	Drive slowly forward or backward in order to lock the parking brake.When releasing the parking brake do this in opposite order.

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