OPERATING AND MAINTENANCE INSTRUCTIONS

SCISSOR LIFT
H12 SD / SDX / SDE
H15 SD / SDX / SDE
H18 SDX

242 031 4260 FB Australia E 03 00

Pinguely - Haulotte

La Péronnière BP9 – 42152 L'HORME – France
☎ 04 77 29 24 24 🖷 04 77 31 28 11
E.Mail: haulotte@haulotte.com Web: http://www.haulotte.com

You have just taken delivery of your HAULOTTE self-propelled platform.

Your platform will give you full satisfaction if you carefully follow the operating and maintenance instructions provided.

This manual is designed to help you do this.

It is very important to:

- respect the safety instructions relative to the machine itself, its use and environment,
- use the machine within its performance scope,
- maintain the machine properly, to ensure long service life.

During, and after expiry of, the warranty period, our After-Sales Department is at your disposal to provide any service you may need.

In the case, contact our local Agent or our Factory After-Sales Department, and specify the exact type of machine and its serial number.

Whenever you order consumables or spare parts, use this manual and the "Spare Parts" catalogue to ensure you receive original parts, which are your sole guarantee of interchangeability and optimal operation.

The list of safety instructions and warnings is not exhaustive. It is therefore the responsibility of the company proprietor and of the operator to comply with the health and safety regulations in force in the country of platform use.

Important: This manual is supplied with the machine, and is enclosed with the delivery note.

You are reminded that our machines comply with the provisions of "Machinery Directive" 89/392/CEE of 14 June 1989, modified by directives 91/368/CEE of 21 June 1991, 93/44/CEE of 14 June 1.993, 93/68/CEE of 22 July 1993, 89/336 CEE of 3 May 1989 and with the provisions of the Australian Standards AS 1418.10-1996 and AS 2550.10-1994.

We cannot be held responsible for the technical data contained in this manual, and we reserve the right to make improvements or modifications to the machine without updating this manual.

PLATFORMS H12SD/SDX/SDE
H15SD/SDX/SDE
H18SDX

Ref.: Edition E-03-00

CONTENTS.

1. GENERAL RECOMMENDATIONS.

1.1. GENERAL WARNING.

The present manual is designed to familiarise the operator with HAULOTTE self-propelled platforms, so that he can use them efficiently and in complete safety. However, the manual cannot replace the basic training required by any user of work place equipment.

The site manager is bound to communicate to operators the instructions in the manual.

The site manager is responsible for applying the "user regulations" in force in the country of platform use.

Before using the platform, all these instructions must be read and understood to ensure safe and efficient platform operation.

This manual must be kept available for all operators. The manufacturer will provide additional copies on request.

Ensure that all operators entrusted with the platform are capable of meeting the safety requirements involved in its operation.

Familiarise yourself or the operators with the instructions shown on the plates affixed to the machine.

Prevent uncontrolled work being done on your machine when it is not in use.

Never use a machine that is defective or not in visibly good condition (cracks, hydraulic leaks, cut wires, loose nuts or screws).

Never apply to the machine a load or force greater than its maximum service load. Do not overload.

Never use the machine to perform an operation for which it is not designed.

Avoid any type of work that may jeopardise safety.

Any application that does not comply with the instructions may cause risks and harm to persons and property.

Do not alter the characteristics of the machine or make modifications to it. This may reduce machine safety and stability.

Perform the periodic inspections and monitor the platform to ensure good working order during use.

This manual must be kept by the user throughout the machine's life, including in cases of loan, lease and resale.

Ensure that all plates or signs on the machine relative to safety and to hazards are complete, fully visible and in a legible state.

WARNING.

Only trained operators are allowed to use
Haulotte self-propelled platforms.

AT LEAST TWO PERSONS MUST OPERATE THE MACHINE, SO THAT ONE OF THEM CAN:

- Take fast action if necessary.
- Take over the controls in case of an accident or malfunction.
- Monitor and prevent the presence of vehicles and persons in the vicinity of the machine.
- Guide the platform operator if necessary.

These persons shall be aged over 18, and hold an operating permit issued by their employer after undergoing a medical check and a practical test that prove they are fit to operate the machine.

1.2. GENERAL SAFETY INSTRUCTIONS.

Operators must:

- Wear personal protective equipment suited to working conditions and to the local regulations in force, particularly for work in hazardous areas.
- Use the machine within its performance scope.
- Wipe away any traces of oil or grease on the platform steps, floor and handrails.
- Familiarize themselves with the organisation of work place safety.

Never use the machine:

- On ground that is soft, unstable, congested or has a sideslope or grade greater than 5° (about 9%).
- When wind speed exceeds 45 km/h.
- Near power lines (this machine is not insulated). Check minimum safe approach distances to respect, according to voltage.
- Without putting in place the platform protection bar or closing the entry gate.
- With a congested platform.
- With equipment or objects hanging from the guardrails.
- With items liable to increase wind load (e.g. panels).
- Without a fire extinguisher in the platform: the user must supply it, and know how to use it when required.
- In explosive atmospheres.
- If it exhibits cracks, hydraulic leaks, cut wires or any operating malfunctions.
- In temperatures below -10° (particularly cold rooms). **Consult us if work below -10°C is necessary**.
- By increasing operating reach (ladder, scaffolding, etc...).

The acid contained in the batteries can cause burns: in case of contact with hands or clothing, rinse amply with water.

During normal service, a battery produces oxygen and hydrogen: this mixture may explode in the presence of sparks or flames.

WARNING.

When cleaning with a high pressure jet do not point jet directly at electrical boxes, cabinets and components.

NEVER:

- Disable the limit switches in the safety devices.
- Increase operating reach with ladders or other accessories.
- Use the guardrail as a means of access to climb into or out of the platform. Use the steps.
- Move the speed control handle from one direction to the other with stopping in position "0".
- Alter the machine characteristics and performance.
- Exceed the maximum load or authorised number of occupants in platform (see § 2.6). Spread loads, and if possible position at centre of platform.
- Perform machine servicing operations with the platform up, without first deploying necessary safety equipment (locking bar) and stopping the engine.
- Climb on the guardrails when the platform is up: you risk a serious fall.

HOLD the guardrail firmly when lifting or driving the platform.

AVOID:

- Contact with stationary or moving obstructions.
- Driving the platform at high speed in narrow or congested areas.
- Reversing (poor visibility).
- Towing the machine. It is not designed to be towed. It must be transported on a trailer.
- Perform grinding or welding operations on, or in vicinity of, the machine (if you do, take appropriate precautions).

WARNING.

Allow sufficient stopping distance:
2 metres at high speed and 1 metre at low speed.

Always drive a sufficient distance away from unstable drop-offs or slopes.

Ensure there is no one in immediate vicinity of machine before performing a function or driving.

During normal operation (i.e. using platform controls), the ground panel key must be removed and kept at ground level by a person who is present and trained in rescue manoeuvres.

When the brakes are being adjusted or disengaged, chock the wheels.

RESPECT:

- All safety instructions relative to maintenance work: choice and use of tools, ingredients (hydraulic oil, grease, cleaning products, etc.)
- All instructions from suppliers of maintenance or replacement products.
- Instructions relative to environmental protection: retrieve maintenance products, and worn or defective components. Do not discard carelessly.

1.3. RESIDUAL RISKS (to be assessed by user).

- Overload: risk of tip-over (avoid overloading from above) or equipment damage.
- Unsuitable terrain: risk of tip-over (refer to page giving ground pressure and wheel load values). Be careful of thawing ground in winter.
- Gusting winds: risk of tip-over.
- Collision with ground or aerial obstruction: risk of impact shock or tip-over.
- Collision with live power lines: risk of electrocution.
- Operation on platforms, wharfs, pavements, etc.: risk of tip-over.
- Operation in explosive atmospheres: risk of explosion.
- Persons in machine work area (during machine travel or manoeuvres): risk of crushing.
- Before operation, the operator must always assess ground and aerial risks.
- Steep slopes: risk of machine runaway in high speed mode.
- Prevent sparks or flames near batteries: risk of explosion.

1.4. OPERATING SCOPE.

Do not use the machine:

- With a load greater than authorised.
- With more than four occupants in the platform, or more than two on the extension.
- On ground unable to withstand wheel load and pressure.
- On a sideslope or grade greater than 5° (about 9%).
- With side force in platform greater than 40 DaN.
- If wind speed exceeds 45 km/h.
- In cold rooms.
- In explosive atmospheres.
- During storms (lightning).
- In intense electromagnetic fields (radar, communications transmitters, high currents).
- At night, if it is not fitted with optional floodlight.
- On public roads.
- Do not tow this scissor-lift platform, it is not designed for this purpose. It must be transported on a trailer.

However, in case of breakdown, the platform may be towed for short distances at low speed (see § 4.9).

1.5. CHECKS.

These must comply with the national regulations in force in the country of use.

For Australia: Australian Standard AS 1418.10 – 1996 and AS 2550.10 – 1994.

1.5.1. periodic checks.

Machine must undergo periodic checks. Details of the checks are covered in the relevant sections of this manual.

1.5.2. Examination of machine suitability.

The site supervisor at the location where the machine is placed into service must ensure machine is suitable, i.e. capable of performing the work in complete safety, and in compliance with the instruction manual.

1.5.3. State of Conservation.

Inspect for any deterioration that is liable to cause hazardous situations (check safety devices, load restrictors, tilt sensor, cylinder leaks, deformation, welds, bolt tightness, hoses, electrical connections, tire state, excessive mechanical clearances).

NOTE: If machine is rented, the renter is responsible for carrying out visual inspections of the machine as well as confirming the machine suitability for the work to be performed. Full details of the inspections are covered in the relevant sections of this manual.

1.6. REPAIRS AND ADJUSTMENTS.

Repairs and adjustment including any adjustments to safety systems or device, mechanical, electric or hydraulic must be performed by a competent person. Replacement parts used must be Haulotte standard parts in order to ensure that warranty conditions for the machine are honoured by Haulotte. The use of non-standard parts will void the warranty.

Any modification to the machine must be authorised in writing by and inspected by Haulotte to avoid rejection of any subsequent warranty claim.

1.7. CHECKS BEFORE RETURNING UNIT INTO SERVICE.

To be performed after:

- a major stripping operation,
- a repair concerning critical machine components.
- an accident caused by critical component failure.

It is necessary to perform a “state of conservation” examination, a stability (static overload) test and a functional (dynamic) test. See § 5.4. in the maintenance section of this manual. These tests must be performed by a competent person.

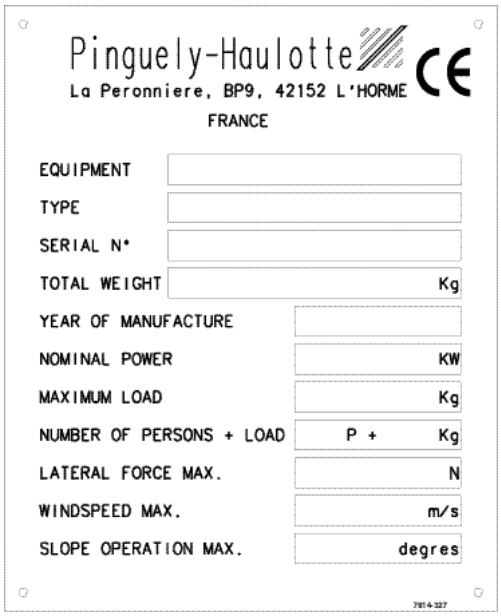
2. PRESENTATION.

Self-propelled platforms are designed for all aerial work, within their performance scope.

The main control panel is on the extension in the platform. The rescue panel and troubleshooting panel are at ground level.

2.1. IDENTIFICATION.

A plate affixed to the frame shows all the (engraved) indications allowing machine identification.



Picture 1 : Idenfication plate.

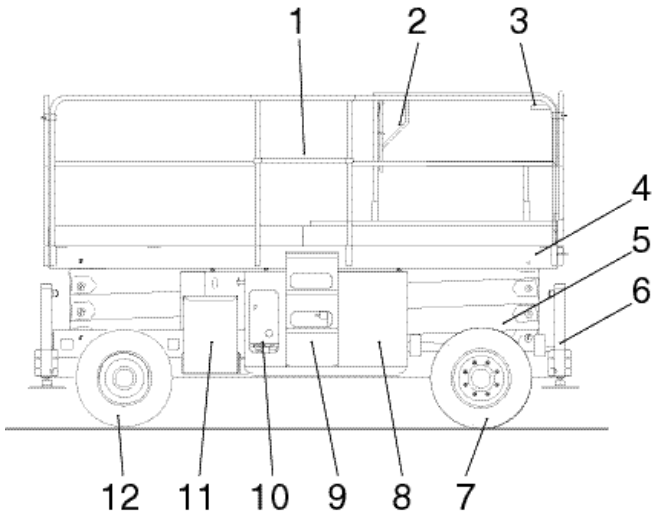
Reminder:

For all requests concerning information, maintenance or spare parts, specify machine type and serial number.

2.2. MAIN COMPONENTS.

See picture 2.

1 - Sliding protection bar
2 - Extension operating handles.
3 - Platform control panel.
4 - Platform.
5 - Scissors.
6 - Stabilisers (option)
7 - Front steer wheels (4x2).
Front steer-drive wheels (4x4).
8 - Engine.
9 - Access ladder.
10 - Ground control panel
11 - Battery box (bi-energy)
12 - Rear drive wheels.



Picture 2 : Main components.

2.3. DESCRIPTION.

The working platforms on HAULOTTE scissor lifts are enclosed by guardrails. The platform may be lifted or lowered using a hydraulic cylinder that acts on scissors of three or four cross-sections, depending on the model, which themselves support the platform.

The frame comprises two steer wheels at the front and two brake-equipped drive wheels at the rear, fitted with puncture-proof, all-terrain tires (filled with polyurethane foam). On the all-terrain models (H12SDX - H15SDX), the front wheels are self-steering.

Each machine is powered by a diesel engine. All the control and power componentry is installed in two side boxes, and comprises:

- hydraulic tank + filters
- air-cooled engine + hydraulic pump
- fuel tank
- the hydraulic distribution circuit
- engine start battery
- electrical controls cabinet
- tilt sensor
- 2 motor pumps + charger (bi-energy option).

The electrical cabinet on the frame controls:

- platform up/down functions
- engine start and stop
- emergency stop for all movements.

The three movement functions(travel, steer and platform lift) are performed hydraulically.

Travel is by proportional control.

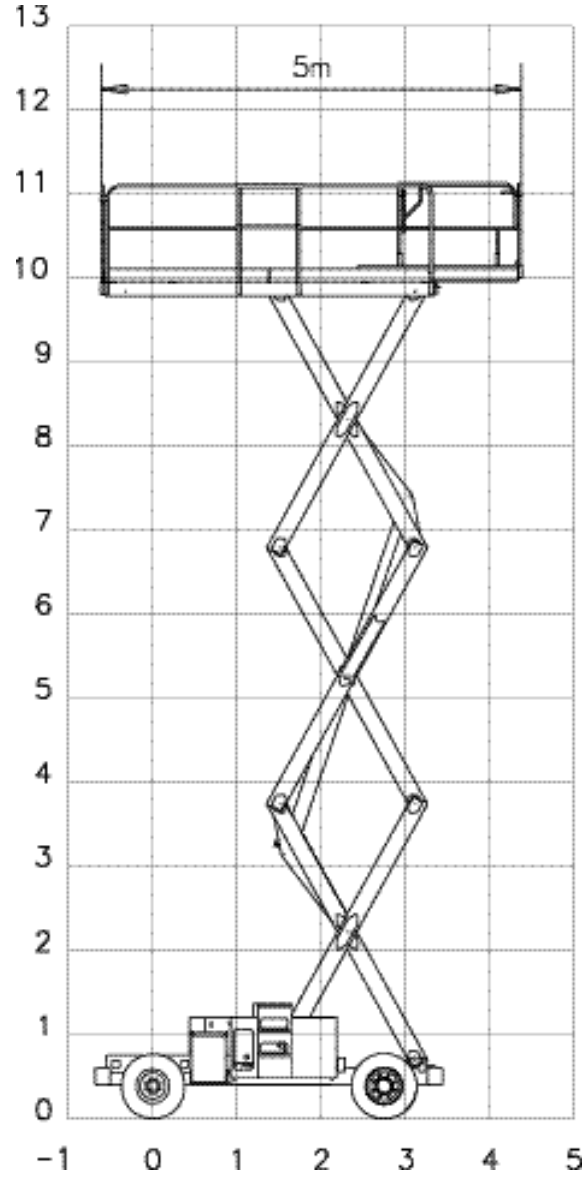
The steer function is actuated by a double-action cylinder.

Options:

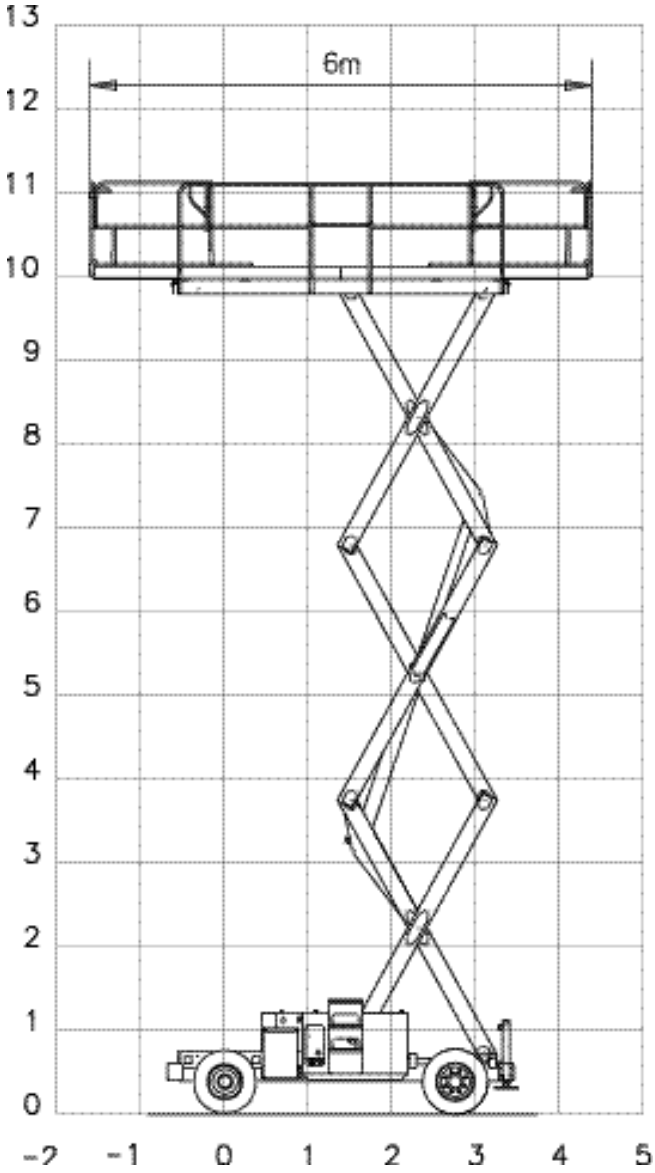
- stabilizers: a set of four thrust cylinders, fixed to the frame and controlled from the platform, increases platform stability.
- second sliding extension: 1000 mm travel.
- Bi-energy: for non-all-terrain models (H12SDE - H15SDE), electrical power is supplied by 24 V DC drive batteries.

2.4. WORK AREA.

2.4.1. H12SD - H12SDX.

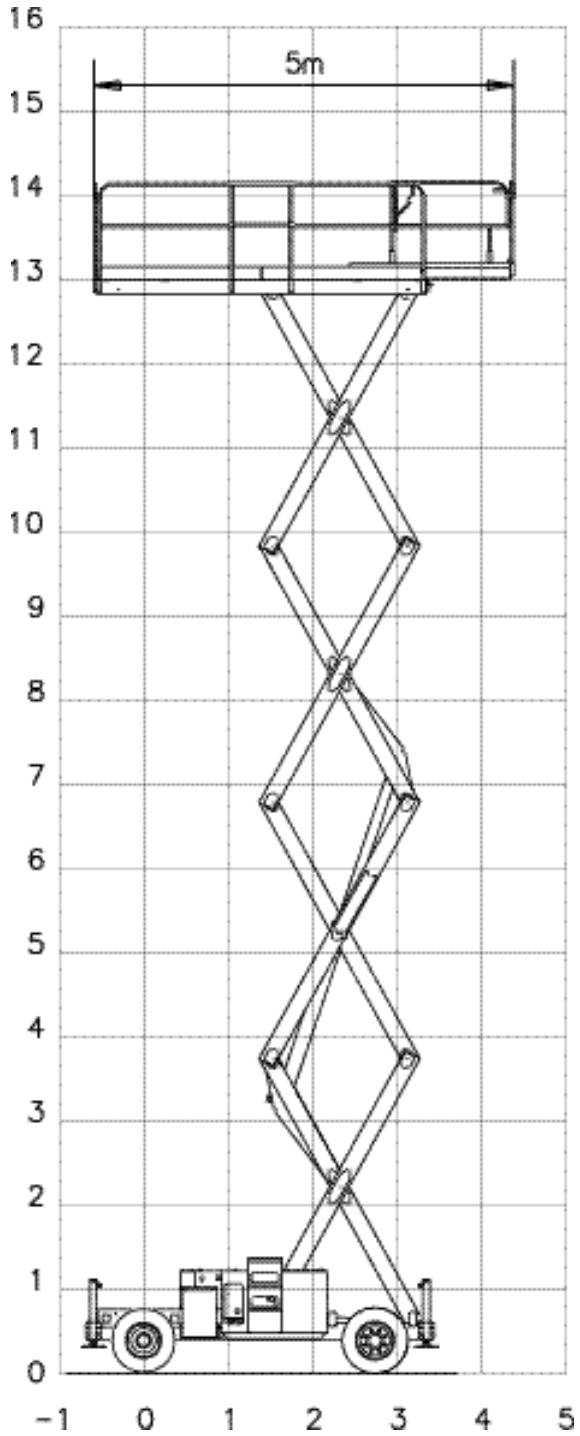


Picture 3 : H12SD Single extension work area.

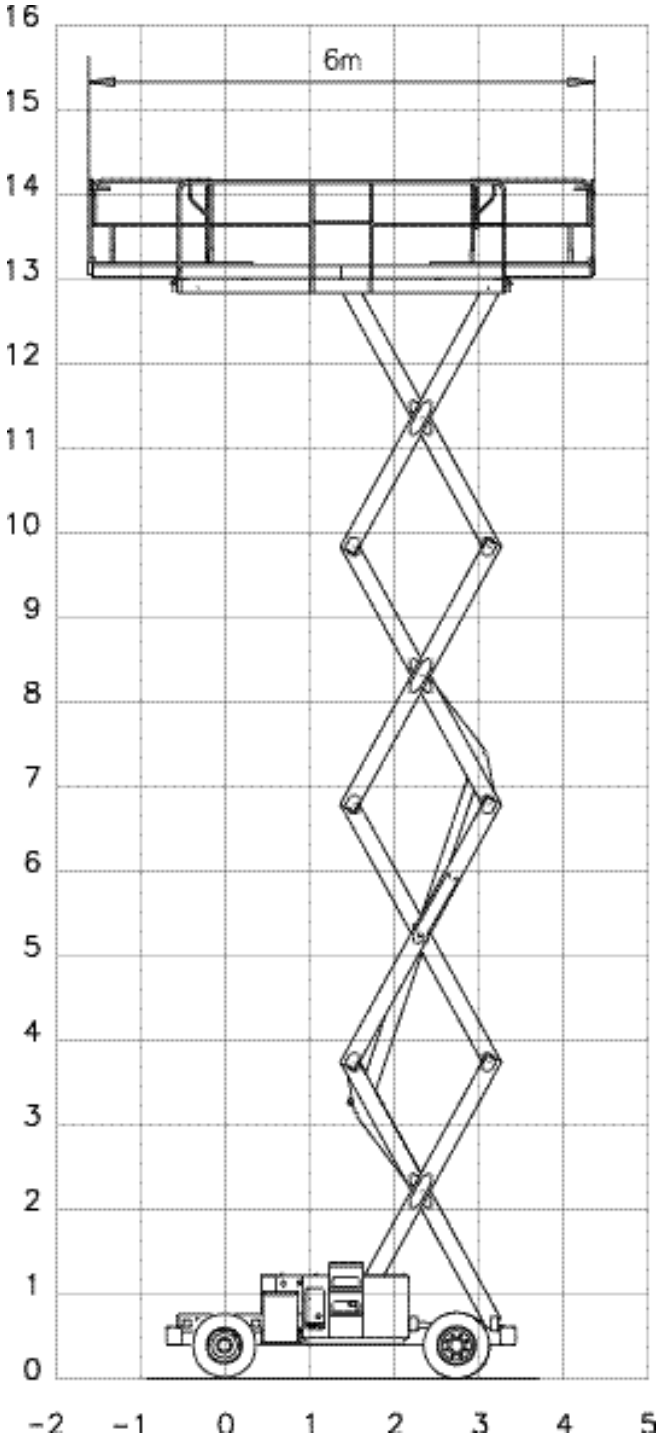


Picture 4 : H12SD Double extension work area.

2.4.2. H15SD – H15SDX.

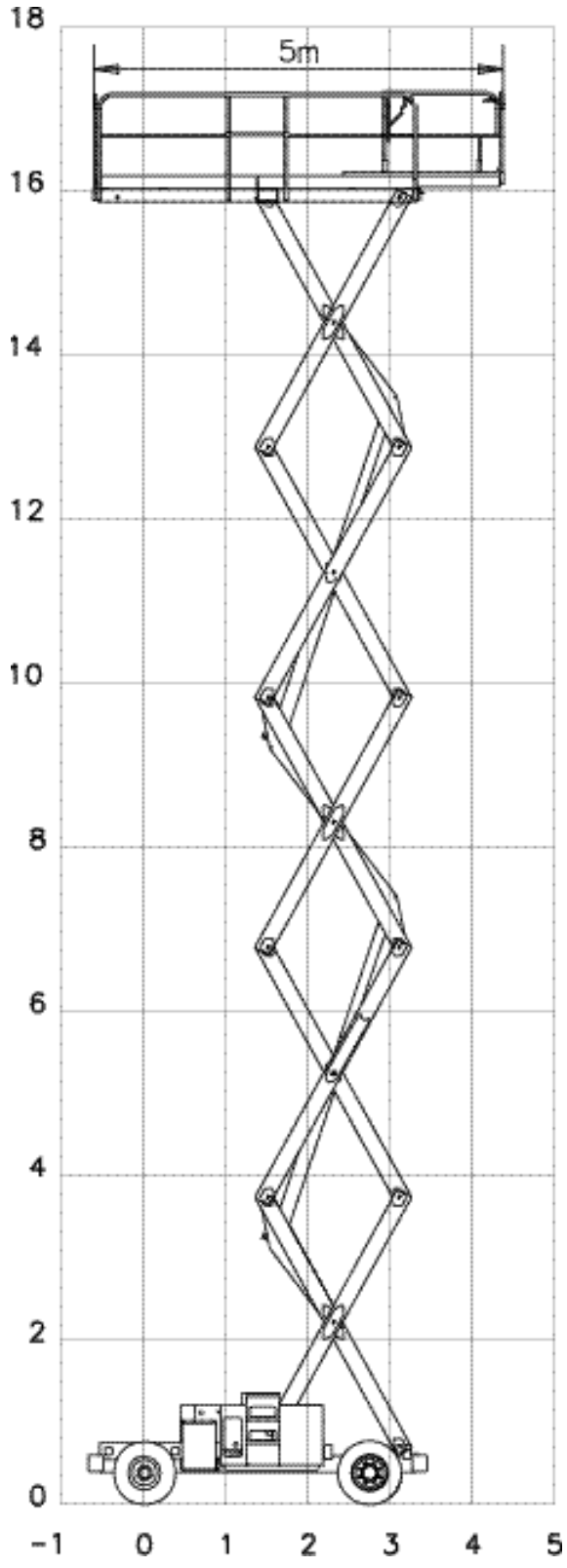


Picture 5 : H15SD Single extension work area.

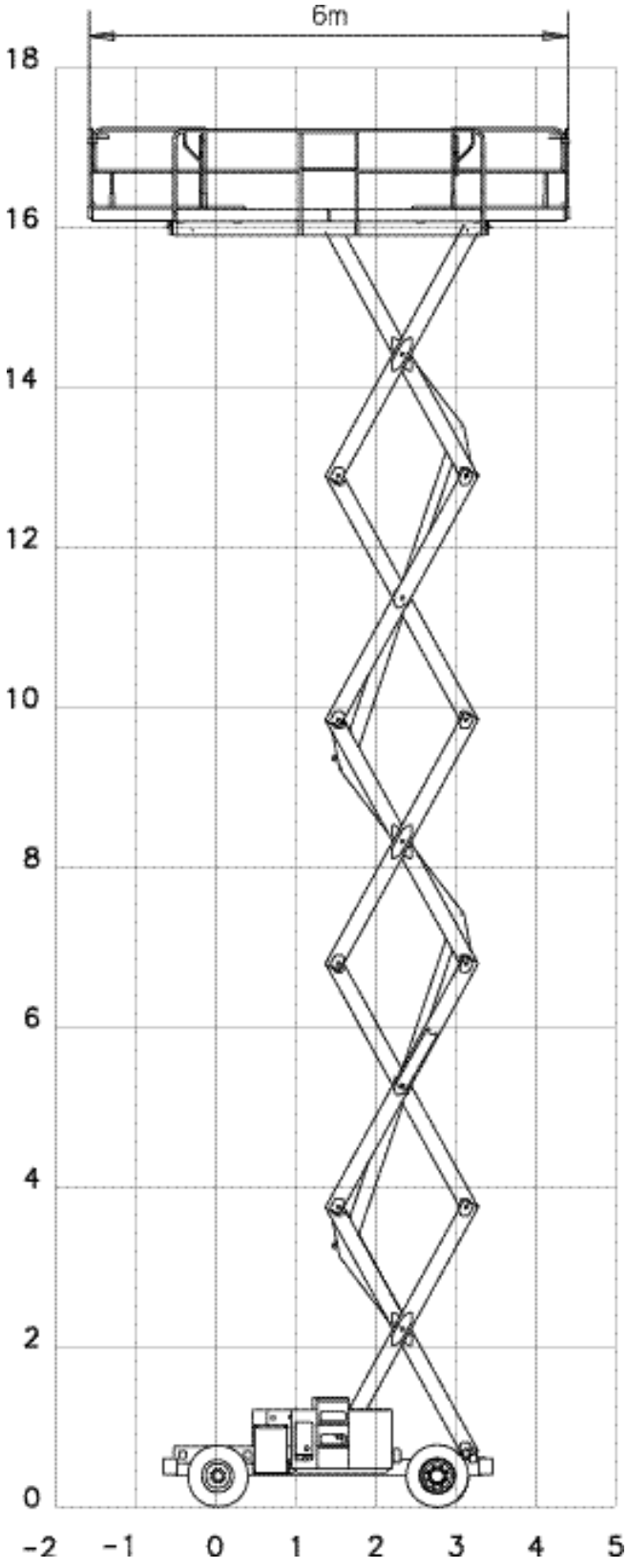


Picture 6 : H15SD Double extension work area.

2.4.3. H18SD – H18SDX.



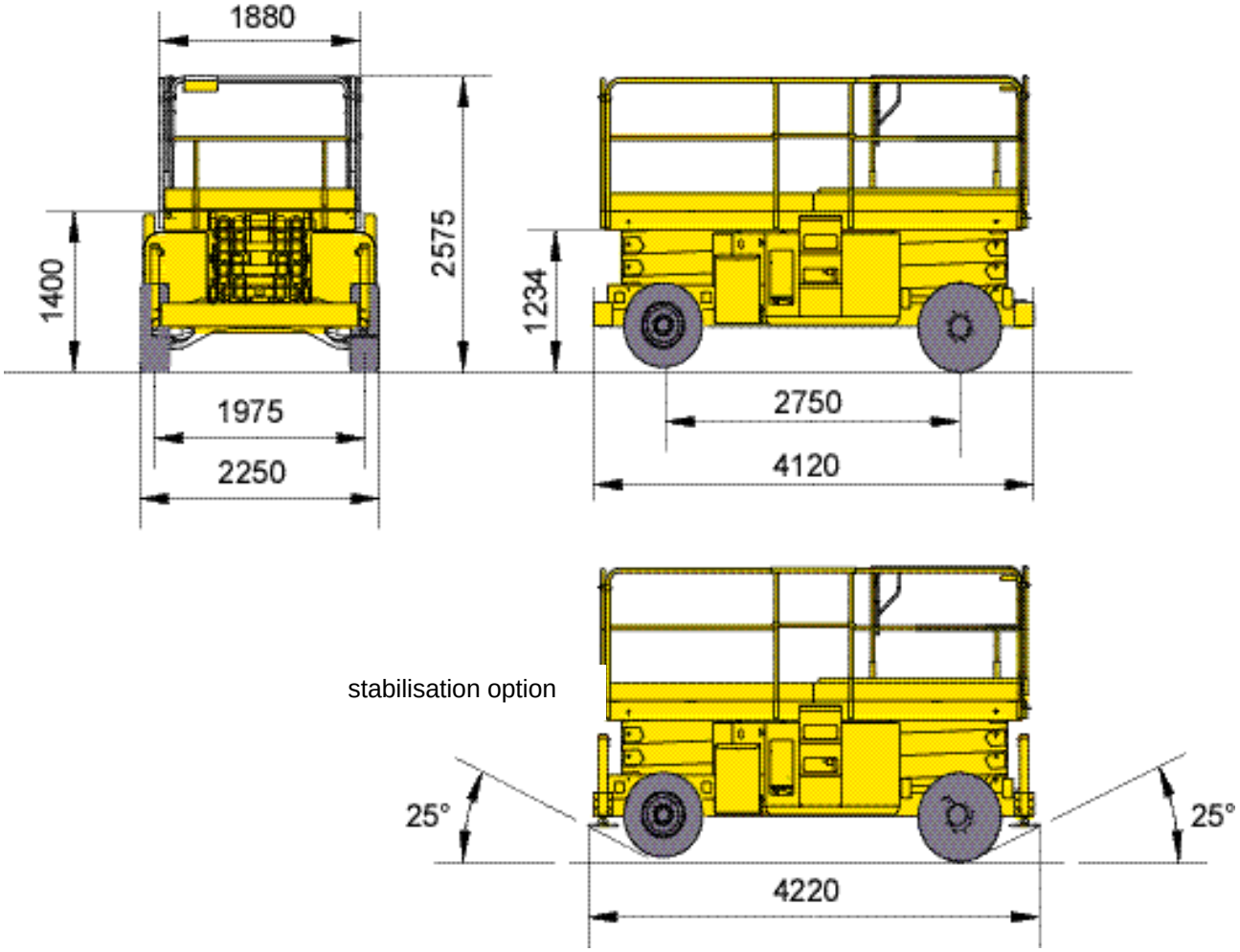
Picture 7 : H18SD Single extension work area.



Picture 8 : H18SD Double extension work area.

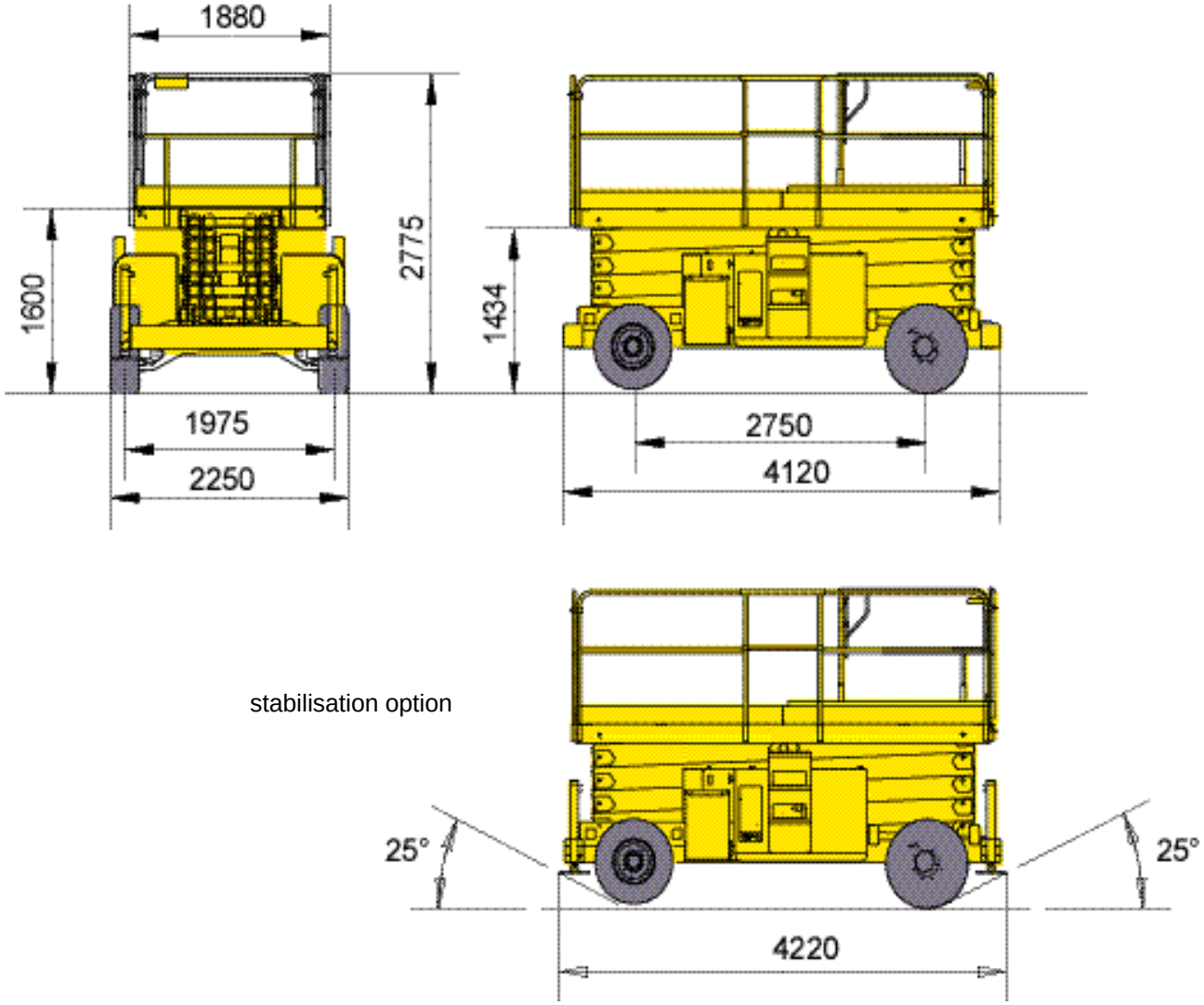
2.5. OVERALL DIMENSIONS.

2.5.1. H12SD - H12SDX.



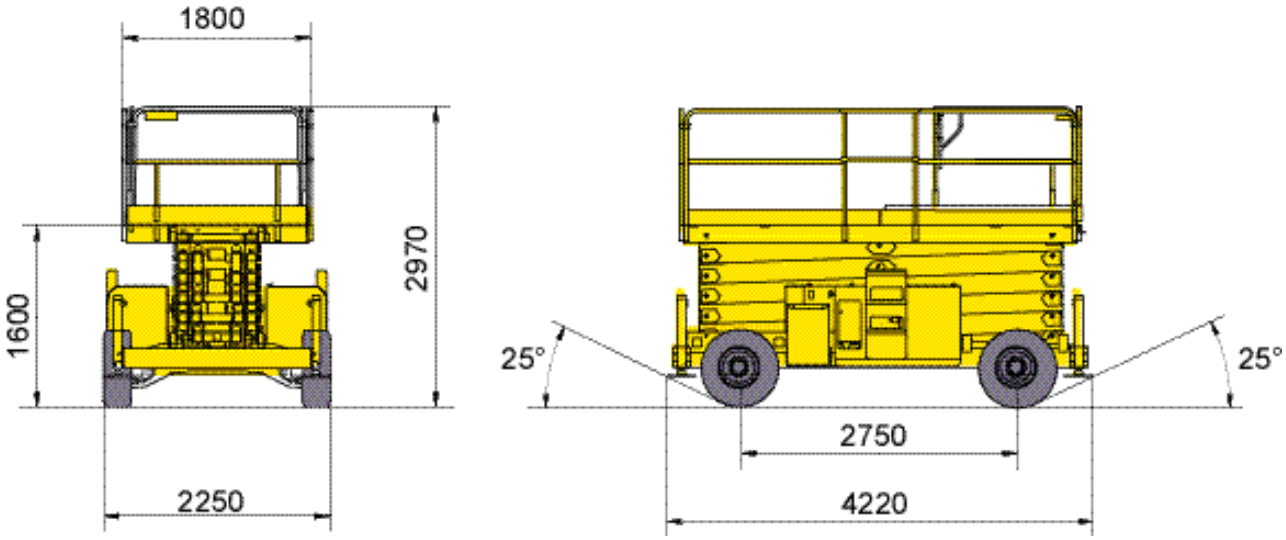
Picture 9 : H12SD overall dimensions.

2.5.2. H15SD - H15SDX.



Picture 10 : H15SD overall dimensions.

2.5.3. H18SD - H18SDX.



Picture 11 : H18SD overall dimensions.

2.6. CHARACTERISTICS.

2.6.1. Common technical characteristics of H12SD - H12SDX.

	H12SD (4x2)	H12SDX (4x4)
Max. working height	12 m	
Max. / min. floor height	10 m / 1.40 m	
Base overall width	2.25 m	
Platform overall width	1.88 m	
Platform dimensions	3.92 m x 1.80 m	
Length, overall	4.12 m	
Length, overall with stabiliser option	4.22 m	
Height, overall	2.575 m	
Ground clearance	0.35 m	
Wheelbase	2.74 m	
Outer turning radius	4.80 m	
Load capacity with single extension	900 kg (4 occupants), of which 200 kg (2 occupants) on extension.	
Load capacity with double extension option	700 kg (4 occupants), of which 200 kg (2 occupants) on each extension	
Max. side force	40 daN	
Max. wind speed	45 km/h	
Tilt sensor with buzzer alarm at	5°	
Lift and travel cut-out when tilt	> 5°	
Travel speeds	1.1 x 6.1 km/h	1.1 x 3 x 6.1 km/h
Gradeability	25%	45%
Lift time	50 s	
Lower time	60 s	
Hydraulic tank capacity	100 l	
Hydraulic pressure setting, general	240 b	
Hydraulic pressure setting, travel	240 b	
Hydraulic pressure setting, lift	180 b	
Hydraulic pump, cubic capacity	23 + 4 cm^3/r	
Flowrate, travel and lift	52 l/m	
Flowrate, steer and stabilise	9 l/m	
Diesel engine, Silent Pack	HATZ - type 2L 41C	
- power	32.6 hp / 24 kW at 2400 rpm	
- power, idling	20.4 hp / 15 kW at 1500 rpm	
- consumption	238 g/kW/h - 175 g/hp/h	
- consumption, idling	232 g/kW/h - 170 g/hp/h	
Fuel tank capacity	65 l	
Number of steer wheels	2	
Number of drive wheels	2	4
Wheel step-down ratio	13.6	
Differential lock	yes	
Hydraulic brakes	yes	
Freewheel enable	yes	
Start batteries	1x12 V - 95 A/H	
Supply voltage	12 V	
Solid tires, dimensions	10 x 16.5''	
Tightening torque, wheel nuts	22 daN.m	
Max. force on one wheel with rated load	2800 daN	
Max. pressure on concrete ground with rated load	....	
Max. pressure on shale ground with rated load	....	
Machine weight, with single extension	5000 kg	5140 kg
Machine weight, with double extension option	5150 kg	5300 kg
Vibration, foot level	< 0.5 m/s^2	
Vibration, hand level	<2.5 m/s^2	
Acoustic pressure level at controls	.....	

2.6.2. Common technical characteristics of H15SD - H15SDX.

	H15SD	H15SDX
Working height	15 m	
Max. / min. floor height.	13 m / 1.60 m	
Base overall width	2.25 m	
Platform overall width	1.88 m	
Platform dimensions	3.92 m x 1.80 m	
Length, overall	4.12 m	
Length overall with stabiliser option	4.22 m	
Height, overall	2.775 m	
Ground clearance	0.35 m	
Wheelbase	2.74 m	
Outer turning radius	4.80 m	
Load capacity with single extension	700 kg (4 occupants), of which 200 kg (2 occupants) on extension	
Load capacity with double extension option	500 kg (4 occupants), of which 200 kg (2 occupants) on each extension	
Max. side force	40 daN	
Max. wind speed	45 km/h	
Tilt sensor with alarm buzzer at	5°	
Lift and travel cut-out when tilt	> 5°	
Travel cut-out at floor height	8 m	
Travel speed	1.1 x 5.7 km/h	1.1 x 2.9 x 5.7 km/h
Gradeability	25%	45%
Lift time	50 s	
Lower time	60 s	
Hydraulic tank capacity	100 l	
Hydraulic pressure setting, general	240 b	
Hydraulic pressure setting, travel	240 b	
Hydraulic pressure setting, lift	180 b	
Hydraulic pump capacity	23 + 4 cm^3/r	
Flowrate, travel and lift	52 l/m	
Flowrate, steer and stabilise	9 l/m	
Diesel engine, Silent Pack	HATZ - type 2L 41C	
- power	32.6 hp / 24 kW at 2400 rpm	
- power, idling	20.4 hp / 15 kW at 1500 rpm	
- consumption	238 g/kW/h - 175 g/hp/h	
- consumption, idling	232 g/kW/h - 170 g/hp/h	
Diesel tank capacity	65 l	
Number of steer wheels	2	
Number of drive wheels	2	4
Wheel step-down ratio	13.6	
Differential lock	yes	
Hydraulic brakes	yes	
Freewheel enable	yes	
Start batteries	1x12 V - 95 A/H	
Supply voltage	12 V	
Solid tires – dimensions	10 x 16.5''	
Tightening torque, wheel nuts	22 daN.m	
Max. force on one wheel with rated load	2800 daN	
Max. pressure on concrete ground with rated load	....	
Max. pressure on shale ground with rated load	....	
Machine weight, with one extension	5850 kg	6000 kg
Machine weight, with double extension option	5990 kg	6140 kg
Vibration, foot level	< 0.5 m/s^2	
Vibration, hand level	<2.5 m/s^2	
Acoustic pressure level at controls	.....	

2.6.3. Common technical characteristics of H18SDX.

	H18SDX
Working height	18 m
Max. / min. floor height.	16 m / 1.80 m
Base overall width	2.25 m
Platform overall width	1.88 m
Platform dimensions	3.92 m x 1.80 m
Length, overall	4.12 m
Length overall with stabiliser option	4.22 m
Height, overall	2.975 m
Ground clearance	0.35 m
Wheelbase	2.74 m
Outer turning radius	4.80 m
Load capacity with single extension	600 kg (4 occupants), of which 200 kg (2 occupants) on extension
Load capacity with double extension option	500 kg (4 occupants), of which 200 kg (2 occupants) on each extension
Max. side force	40 daN
Max. wind speed	45 km/h
Tilt sensor with alarm buzzer at	3°
Lift and travel cut-out when tilt	> 3°
Travel cut-out at floor height	8 m
Travel speed	1.1 x 2.9 x 5.7 km/h
Gradeability	45%
Lift time	60 s
Lower time	60 s
Hydraulic tank capacity	100 l
Hydraulic pressure setting, general	240 b
Hydraulic pressure setting, travel	240 b
Hydraulic pressure setting, lift	180 b
Hydraulic pump capacity	23 + 4 cm^3/r
Flowrate, travel and lift	52 l/m
Flowrate, steer and stabilise	9 l/m
Diesel engine, Silent Pack	HATZ - type 2L 41C
- power	32.6 hp / 24 kW at 2400 rpm
- power, idling	20.4 hp / 15 kW at 1500 rpm
- consumption	238 g/kW/h - 175 g/hp/h
- consumption, idling	232 g/kW/h - 170 g/hp/h
Diesel tank capacity	65 l
Number of steer wheels	2
Number of drive wheels	4
Wheel step-down ratio	13.6
Differential lock	yes
Hydraulic brakes	yes
Freewheel enable	yes
Start batteries	1x12 V - 95 A/H
Supply voltage	12 V
Solid tires – dimensions	10 x 16.5''
Tightening torque, wheel nuts	22 daN.m
Max. force on one wheel with rated load	2800 daN
Max. pressure on concrete ground with rated load	....
Max. pressure on shale ground with rated load	....
Machine weight, with one extension	6850 kg
Machine weight, with double extension option	7000 kg
Vibration, foot level	< 0.5 m/s^2
Vibration, hand level	<2.5 m/s^2
Acoustic pressure level at controls	.....

2.6.4. Available Options.

OPTIONS	H12SD	H12SDX	H15SD	H15SDX	H18SDX
Bi-energy	yes	no	no	no	no
Stabilisers	yes	yes	yes	yes	compulsory
Double manual extension	yes	yes	yes	yes	yes
Catalytic converter	yes	yes	yes	yes	yes
Tires, 12 x 16.5''	yes	yes	yes	yes	yes

2.6.5. Technical characteristics specific to bi-energy option (H12SDE).

	H12SDE
Drive batteries	24 V - 416 Ah
Charger	24 V - 50 A
Battery charge tester	yes
Number of 24 V motor pumps	2
Power per motor pump	3 kW
Cubic capicity per motor pump	4 cm^3/r
Flowrate, travel	2 x 10 l/m (70 bar)
Flowrate, lift	2 x 7.5 l/m (180 bar)
Flowrate, steer	1 x 7 l/m (200 bar)
Flowrate, stabilisers (option)	1 x 7 l/m (200 bar)
Travel speed	1.1 km/h x 2.2 km/h
Lift time	95 s
Stabilising time per cylinder (option)	17 s
Consumption, travel	2 x 70 A
Consumption, lift	2 x 150 A
Consumption, steer	160 A
Consumption, stabilisers (option)	160 A
Machine weight, with single extension	5860 kg
Machine weight, with double extension option	6000 kg
Machine weight with double extension + stabilisers option	6330 kg

3. PRINCIPLE OF OPERATION.

3.1. HYDRAULIC CIRCUIT.

All machine movements, except travel, are performed by hydraulic power.

This power is supplied by an engine-driven gear pump.

In the bi-energy version, the hydraulic power can be provided by two gear pumps powered by drive batteries.

If a fault occurs, the scissors can be lowered by performing a manual emergency action.

A high-pressure filter fitted at the pump discharge protects the circuit from pollution.

3.1.1. Travel, scissors lift.

These functions are performed by all-or-nothing spool valves via a proportional-control spool valve, which allows progressive movement.

Only one movement can be performed at a time.

3.1.2. Steering / stabilisation.

These functions are performed by an all-or-nothing solenoid valve supplied by the small pump stage.

In the bi-energy version, only one motor pump supplies this movement.

3.1.3. Scissors lift cylinder

This is equipped with a flanged check valve on its casing.

WARNING.

ADJUSTMENT MUST ONLY BE PERFORMED BY SPECIALIST PERSONNEL.

Misadjustment may disable the machine's safety devices,
and thus cause a risk of serious accident.

3.1.4. Brake release of reducing gears during travel.

Each time a travel movement is performed, the brake-disengage circuit of the reducing gears mounted on the fixed axle is pressurised.

When the movement stops, or if there is a lack of pressure, the brake is reactuated.

3.1.5. Travel.

	Motors alimentation.
4 x 2 version:	Two hydraulic motors drive the fixed-axle wheels via epicloidal reducing gears. The two speeds (high, low) are controlled by a switch. • High speed - 4 x 2 and bi-energy: The two motors are fed in series: the pump discharge flows into one motor, then the other. • Low speed - 4 x 2 and bi-energy: The two motors are fed in parallel: each receives half the pump flow.
4 x 4 version:	Four hydraulic motors drive the wheels via epicloidal reducing gears. The three speeds (high, medium, low) are controlled by a switch. • High speed - 4 x 4: The two fixed-axle motors are fed in series: the steer axle free-wheels. • Medium speed - 4 x 4: The two fixed-axle motors are fed in parallel: the steer axle free-wheels. • Low speed - 4 x 4: Each axle receives half the pump flow. The motor on each axle is fed in parallel. At low and medium speed, a hydraulic differential lock can be used on each axle.

3.2. ELECTRICAL CIRCUIT.

The electrical power used for the controls and engine ignition is supplied by a 12 V battery.

The electrical power needed to operate the bi-energy motor pumps is supplied by a 24 V drive battery pack. An on-board charger, plugged in to a 16 A domestic socket, can recharge these batteries overnight.

Main safety devices - details

Engine automatic cut-out:

- oil pressure too low.
- air filter clogged.
- alternator or fan belt broken.

3.2.1. Load control.

If the platform load reaches 90% of the maximum allowable load, the buzzer sounds.

When the maximum load is reached, the control circuit cuts out, disabling all movements. The load must reduced to permit reset.

3.2.2. Tilt control.

The tilt sensor emits a sound when the maximum allowable tilt angle is reached.

	Maximum tilt angle
H12SD	5°
H15SD	5°
H18SD	3°

If this state continues, after a time delay of 1 to 2 s, the scissors lower function is disabled; the travel function is also disabled as long as the platform stays up.

To operate the travel function, the scissors must be fully folded.

NOTE: when the platform is stowed, the tilt sensor emits a sound while the slope continues to be over maximum allowable tilt angle, telling the operator that the platform cannot be lifted.

3.2.3. High travel speed.

High travel speed is allowed only when the platform is fully stowed.

When the platform is up, only low speed travel is possible.

3.2.3.1. Hour-meter.

This shows the engine running time.

In the bi-energy version, a meter shows the motor pumps' running time.

3.2.3.2. Charging the drive batteries.

In the bi-energy version, if the drive batteries reach 80% discharge, the only possible movements are machine stowage and travel, in order to reach a recharging point.

4. OPERATION.

4.1. GENERAL INSTRUCTIONS.

Your scissors-lift type platform is mobile.

All movements are controlled from a control panel located on the platform extension.

This is the main control panel. The control panel on the frame is for use in case of accident or malfunction.

WARNING.

THE PLATFORM MUST NOT BE USED IF WINDSPEED EXCEEDS 45 KM/H.

WARNING.

Do not perform manoeuvres before understanding
the instructions in section 4.4.

4.2. SAVETY DEVICES.

To prevent any risk of accident, safety devices to protect the personnel and machine are fitted in case the machine is used beyond its performance scope.

These devices immobilise the machine and disable movements. In this case, poor knowledge of the machine characteristics and operation may cause the operator to diagnose a fault, whereas the safety devices are in fact working properly.

It is therefore essential to understand all instructions in the following sections.

4.2.1. Driving.

Reminder:

The platform is designed for use on hard ground with a slideslope or grade not over maximum allowable tilt angle. If this value is exceeded, the buzzer sounds, but machine travel is possible to reach the work area, or for loading/unloading. (see § 2.4).

To drive the machine, it must not be overloaded. Otherwise, it is immobilised.

Models H12SD - H15SD, with or without the bi-energy option, can be driven forward or in reverse at low or high speed, over short distances, with the platform stowed.

Ditto for models H12DSX - H15DSX and H18SDX at their three travel speeds.

When the platform is up (below 8 metres), the machine can only be driven on hard, flat, level ground with no obstructions or holes. Only low speed is possible.

The travel and platform-lift functions cannot be performed simultaneously.

4.2.2. Overload.

If the platform receives its maximum load when stowed, the lift function is disabled.

If the platform receives its maximum load when up (pressure limiter), the lower function is disabled.

To re-enable all movements, the load must be reduced.

4.2.3. Stabilisation option.

Machine is fitted with 3 safety devices:

- Travel functions are disabled when all 4 cylinders are not fully retracted.
- Platform up/down functions are disabled when all 4 cylinders are not in the same state (fully retracted or extended).
- Stabilisation adjustment can only be performed with the platform stowed. Cylinders extension function is disabled when platform is up.

4.2.4. Battery discharge (bi-energy option).

If the drive battery reaches 80% discharge, the platform lift function is disabled.

For troubleshooting and rescue, see § 4.8.

4.2.5. Procedure for repair or rescue.

WARNING.

As safety devices are potentially disabled during repair or rescue operations, they must be carried out by a competent operator.

4.3. UNLOADING - LOADING – DRIVING.

IMPORTANT: Before performing any function, check that the machine is in good working order, to ensure no damage was caused during shipping. If damage is observed, make the necessary reservations to the carrier in writing.

WARNING.

A false manoeuvre may cause the machine to tip over, resulting in very serious physical and material accidents. Perform unloading manoeuvres on ground that is sufficiently resistant (see ground pressure, § 2.6), flat and uncongested.

4.3.1. Unloading by lifting.

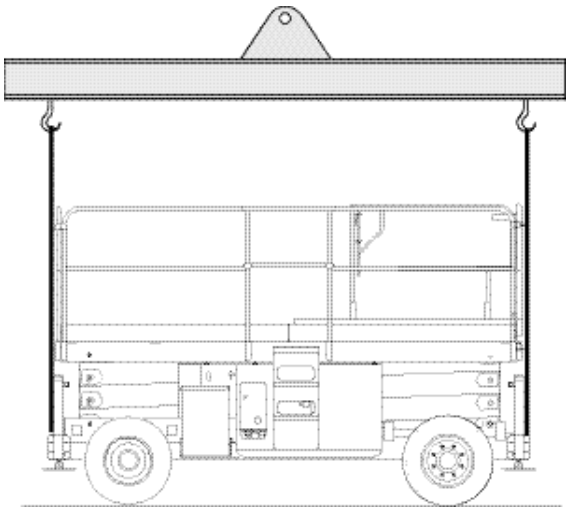
Use a 4-sling hoist.

Precautions: ensure that:

- platform is fully stowed.
- lifting accessories are in good working order and of sufficient capacity.
- sling accessories can withstand 4000 kg load and are not abnormally worn.
- sling lugs are clean and in good condition.
- personnel performing the manoeuvres are authorised to use lifting gear.

Unloading:

- secure four slings to four sling lugs (see drawing 12).
- lift machine slowly, ensuring load is well distributed, then put down machine slowly.



Picture 12 : Loading secure.

WARNING.

Never stand under or too near the machine during manoeuvres.

4.3.2. Unloading with ramps.

Precautions: ensure that:

- platform is fully stowed,
- ramps can withstand load,
- there is sufficient grip to prevent skidding during manoeuvres,
- ramps are properly secured.

IMPORTANT: Because this method requires starting the machine, refer to § 4.3 to prevent any risk of false manoeuvres. Select low travel speed.

NOTE: Because the ramp gradient almost always exceeds the maximum operating gradient (5°), the buzzer sounds, but travel is possible. If the slope exceeds the maximum operating gradient during travel (see § 2.4), also use a draw winch or retaining winch.

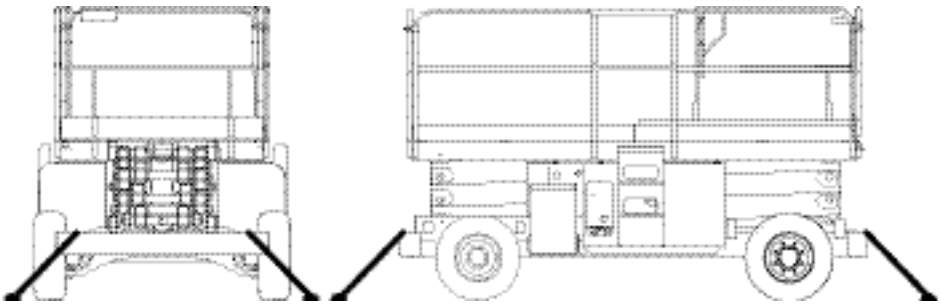
WARNING.

Do not drive down the ramps at high speed.

4.3.3. Loading.

Precautions are identical to those for unloading.

Stow and secure machine as per drawing picture 13.



Picture 13 : Loading secure

To drive up the truck ramps, select low travel speed.

4.3.4. Driving.

Carefully respect regulations or rules for driving in work areas.

If ground is uneven, assess work area before starting aerial work.

When travelling, always stay sufficiently away from unstable drop-offs and embankments.

Before manoeuvring or travelling, ensure there is no one in immediate vicinity of machine. Be particularly vigilant when extension is out, since visibility is reduced.

Reminder: Driving on public roads is prohibited.

4.4. INSTRUCTIONS FOR PUTTING MACHINE INTO SERVICE.

During manufacture, each machine is subject to continuous quality checks. Shipping may cause damage, in which case you must record it in a written complaint to the carrier before first operation.

Reminder: Before use, familiarise yourself with the machine by referring to this manual and to the instructions on the plates.

4.4.1. Ground controls.

See photo 1.

1 - Low oil pressure indicator light.
2 - Low battery charge indicator.
3 - Air filter clogging indicator.
4 - Hour-meter.
5 - Platform up/down control switch.
6 - Beacon control (option).
7 - Battery tester - hour-meter (bi-energy).
8 - Engine start switch.
9 - Emergency stop key button.
10 - Tilt sensor.

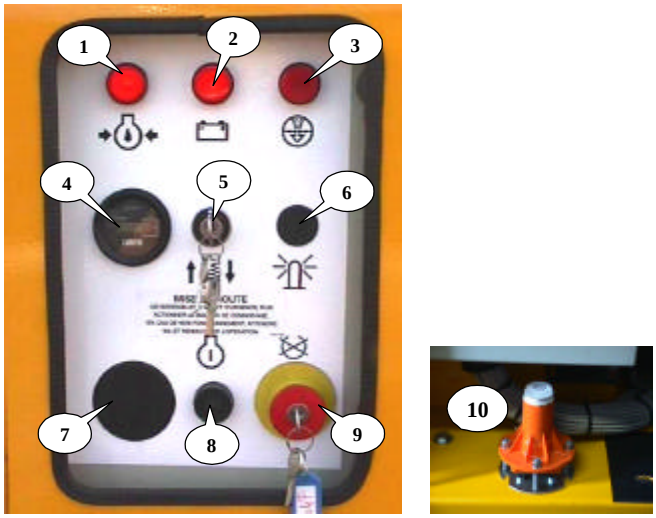


Photo 1 : Ground controls.

4.4.2. Platform controls.

See photo 2.

1 - Stabiliser (4) controls - (option).
2 - Buzzer control.
3 - Speed control.
4 - Platform stow control.
5 - Engine start
6 - Platform up/down or travel select switch
7 - Differential lock
8 - Diesel / electric select switch (bi-energy)
9 - Emergency stop button
10 - Movement control handle

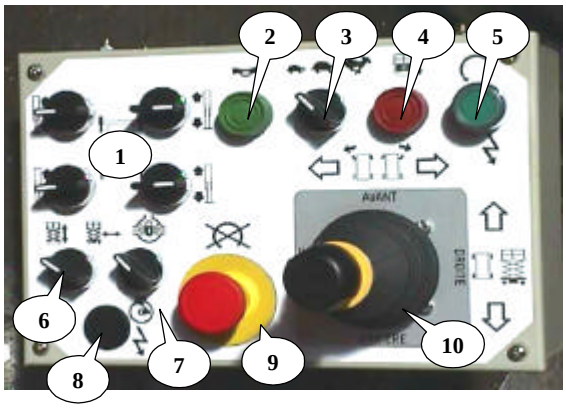


Photo 2 : Platforms controls.

4.4.3. Fitting the guardrails.

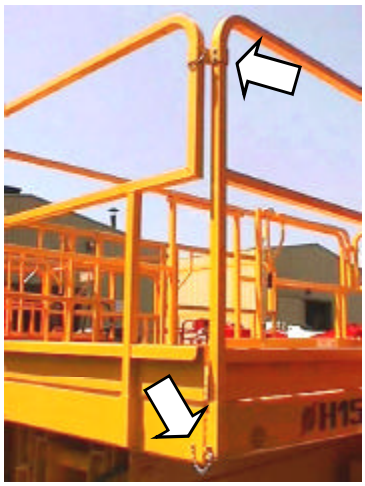


Photo 3 : locking pins.

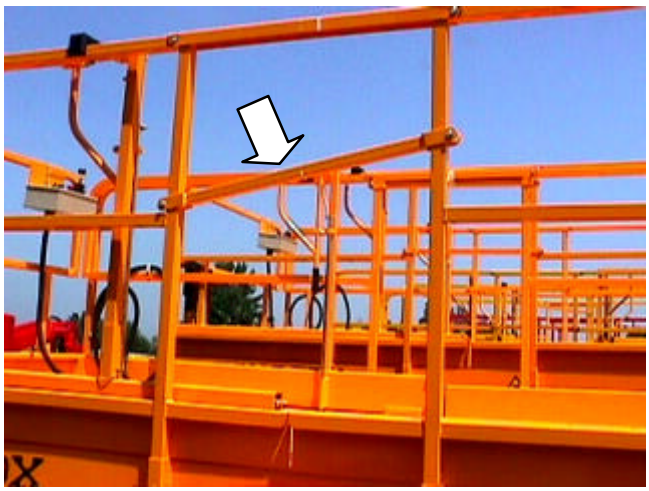


Photo 4 : Safety bar.

The machine is delivered with the guardrails not fitted. They must be installed and locked with pins (arrows, photo 3). Ensure that safety bar (arrow, photo 4) can slide freely to permit access to platform.

4.4.4. Filling the fuel tank.

Before filling the tank, always check the fuel is as specified and has been properly stored to prevent pollution. Do not take fuel from a drum that has not settled, and never use the dregs.

Due to the fire risk when filling the tank, take the following precautions:

- do not smoke.
- stop engine if running.
- stand upwind of fuel to avoid being splashed.
- before pouring, rest the pump spout on the tank hole rim to prevent the risk of sparks from static electricity.
- close the tank plug securely and remove any traces of fuel on outside of tank.

4.4.5. Daily operational inspection.

At the beginning of each working shift, the machine must be given a visual inspection covering the following.

Any faults found must be noted in the machine logbook and the supervisor advised prior to deciding if the machine is suitable for use.

4.4.5.1. General mechanical appearance of machine.

- Loose and missing parts.
- Check wheels and tires: there must be no gashes, abrasion, loose or missing bolts.
- Check lift cylinder: there must be no dents, scratches, rust or foreign bodies on rod.
- Check the steer cylinder: there must be no dents, scratches, rust or foreign bodies on the rods.
- Inspect platform and scissor arms: there must be no visible damage, wear or deformation.
- For excessive movement between moving parts such as the scissors, slew bearing and its connections.
- Check the steer axle: there must be no excessive pivot wear, no loose or missing parts, and no deformations with visible cracks.
- Check that the control panel power cable is in good condition.
- Check presence of decals, warnings, control markings and operating manuals.
- Check guard-rail system and self closing intermediate rail.

4.4.5.2. General conditions.

- Check that a working fire extinguisher is available and within reach.
- Always work on hard ground able to withstand the maximum load per wheel.
- Remove any traces of oil or grease from the platform floor, ladder and guardrails.
- Check working area conditions.
  - Operating area to have stable ground conditions capable of supporting the machine weight (see ground pressure § 2.6)
  - Ensure that the work area at ground level has been cleared of movable obstruction.
  - See “Work Area” sketch (§ 2.4) for maximum acceptable gradients.

4.4.5.3. Hydraulics.

- Check hydraulic pump and unit: there must be no leaks, and parts must be secure.
- Check hydraulic oil level
- Check hydraulic oil level (item 1, photo 5). If necessary remove plug (Item 2, Photo 4) and top up as required. **When filling, use the products specified in the material chapters.**

4.4.5.4. Engine.

- Remove the cover retained by four catches and ensure that fuel prefilter (item 1, photo 6) contains no water or impurities. Otherwise, clean it.
- Check engine oil level (item 2, photo 6): max. marker on gauge.
- Check fuel level through holes below tank plug (item 2, photo 5).

4.4.5.5. Battery.

- Check battery electrolyte level. The fluid level should be approximately 10mm above the plates. If necessary top up with distilled water (see § 4.8).
- Check that battery lugs are clean and tight (loose connections or corrosion cause loss of power).

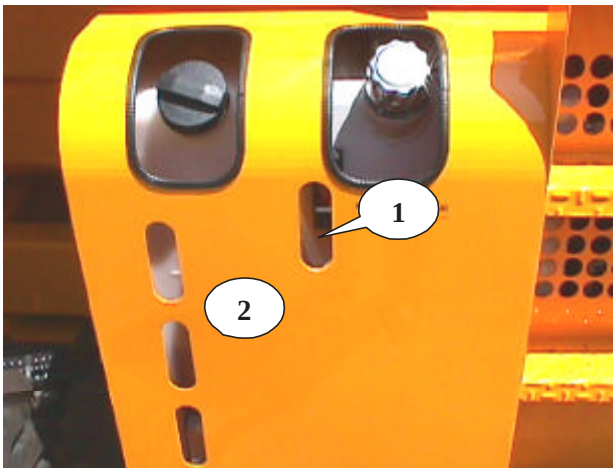


Photo 5

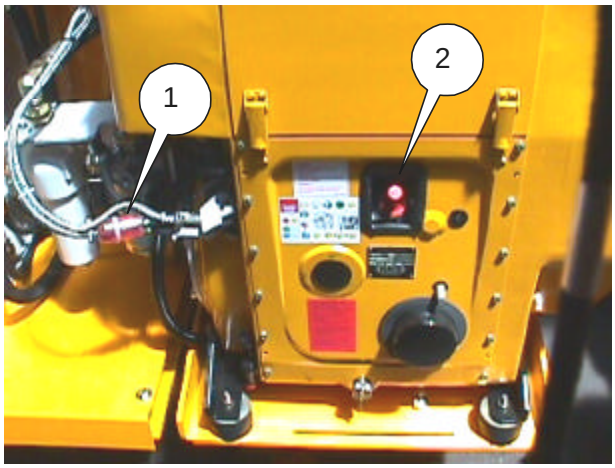


Photo 6

4.4.5.6. Safety devices.

- Check that emergency stops are operating correctly (item 9, photos 1 and 2).
- Check that tilt sensor is working properly (item 10, photo 1) by pushing down on one side (as the red emergency stop button is unlocked, the buzzer should sound when limit angle is reached).
- Check visual and audible alarms.
- Check that the limit switches of the safety devices are not desabled.

- Ensure that no one is in immediate vicinity of machine before lifting or lowering platform.
- Never climb into or out of the platform using the scissors arms as means of access. Use the ladder, and lift the safety bar to reach the platform.
- Hold the guardrail firmly when lifting the platform or driving.
- Never alter machine characteristics or performance scope.
- Never use the machine in temperatures below -10°, particularly in cold rooms.

Extra checks for machines with bi-energy option:

- check the drive batteries' charge level: only the right-hand green diode on the charge tester must be lit.

IMPORTANT.

If the machine has a 220 volt power outlet (bi-energy option),
the extension must obligatorily be connected to a mains outlet protected
by a 30 mA differential breaker.

WARNING.

These machines are not insulated and
must not be used near live power lines.

4.5. OPERATING INSTRUCTIONS.

IMPORTANT: Machine must only be operated when all checks have been completed.

After use, always set cut-out (item 1, photo 7) to OFF.

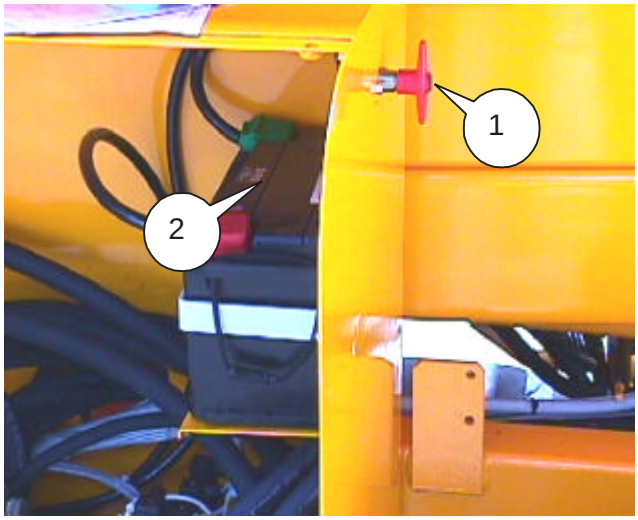


Photo 7 : Engine start battery.

4.5.1. Operation from ground.

Starting the engine

- Check that the battery cut-out is in working position. (photo 7, item 1)
- Check that emergency stop button on ground control panel (item 9, photo 1) is unlocked. If necessary work it using the ignition key.
- Check that emergency stop button on platform control panel (item 9, photo 2) is unlocked. . If necessary work it using the ignition key.
- The three lights (photo 1, items 1-2-3) should come on.
- Press start button (photo 1, item 8). Once the engine is running, release button. the three lights should go out.

NOTICE

Do not use ignition aid products.
Let the engine run for several minutes before loading the platform.

NOTE:

- If the engine does not start, cut the contact and repeat the operation. Check that the two emergency stop buttons are unlocked.
- Never actuate the start button for more than 10-15 seconds.
- Press the emergency stop button to turn the engine off, and disables the platform controls. To use these controls again, unlock the button.
- During platform use, use the platform controls to start and stop the engine.

4.5.2. Operation from platform.

First, check that:

- battery cut-out is in working position. (photo 7, item 1)
- the 4 cylinders are fully extended or retracted (stabilistation option only).
- platform load respects the maximum load allowance and is well distributed.

	Single extension	*Double extension*
PLATFORM H12SD - H12SDX	900 kg - 4 occupants, of which 200 kg (2 occupants) on extension.	700 kg - 4 occupants, of which 200 kg (2 occupants) on each extension.
PLATFORM H15SD - H15SDX	700 kg - 4 occupants, of which 200 kg (2 occupants) on extension.	500 kg - 4 occupants, of which 200 kg (2 occupants) on each extension.
PLATFORM H18SDX	600 kg - 4 occupants, of which 200 kg (2 occupants) on extension.	500 kg - 4 occupants, of which 200 kg (2 occupants) on each extension.

Then, check the safety bar is properly closed, and that the green Power On light (item 4) is lit.

Engine check:

- Ignition: press start button (photo 2, item 5)
- Engine stop: press emergency stop button. When the engine stops, quarter-turn the button to unlock.

WARNING.

The pendant must be secured to the handrail before attempting to operate the machine.

Travel:

- Set the travel/lift select switch (item 6) to travel.
- Select speed (item 3).
- Check buzzer (item 2) is working properly.
- Actuate handle (item 10) in desired direction.

NOTICE.

Move handle slowly:
progressive handle movement = progressive travel

Do not move through neutral without pausing. Any handle movement automatically causes engine speed to increase.

Steering:

The steer function is performed by moving the handle from right to left.

Differential lock:

Turn the switch (item 7) to the right to lock the differential. Release the switch to unlock (return to initial switch position).

NOTE:

- Do not drive far with the differential locked.
- Do not change direction with the differential locked.

Lifting:

Set the travel/lift switch to lift position.

Move the handle in the desired direction.

NOTICE.

Move handle slowly:
progressive handle movement = progressive travel

Do not move through neutral without pausing.

Any handle movement automatically causes engine speed to increase.

Reminder:

In case of overload, the platform up/down functions are disabled.

WARNING.

In the final stage of lowering, an "anti-shear" system prevents any risk of shear when the scissors are stowed.

The platform lower function is controlled mainly by the handle, down to a position where the minimum inter-arm gap is 50 mm. This prevents shear risk. To continue lowering:

- release the handle,
- ensure there are no persons (or obstructions) near the machine,
- press button (item 4) until the platform is fully down. During this time, the buzzer continues to sound for safety purposes.

Stabilisation (option): see § 4.10

Changeover to electrical power (bi-energy option):

- Stop engine using procedure described above.
- Set the fuel select switch (item 8) to electric. The green power-on light should come on.

Return to diesel (bi-energy option)

- Press the emergency stop button.
- Quarter-turn the emergency stop button to unlock.
- Move the fuel select switch to diesel.
- Push down start button and release when engine starts running. The green power-on light should come on.

4.6. BATTERY CHARGE TESTER / HOUR-METER (BI-ENERGY).

This device (item 7, photo 2) contains the following:

- Battery charge indicator
- Hour-meter
- Rest

The tester runs on a lithium battery with a life span of over 15 years.

The tester is protected by a fuse, A 2 A - FU1.

4.6.1. Battery charge indicator.

The battery charge indicator is displayed by 10 LEDs: 2 red, 3 orange, 5 green.

When the battery is properly charged, the far-right green diode lights up. For this, the charger must be unplugged and charging complete.

When the battery discharges, the diodes light up progressively from right to left, one by one.

When the battery is 70% discharged, the first red diode flashes. Battery recharging is advisable.

When the battery is 80% discharged, both red diodes flash. The cut-out limit has been reached, and lift is interrupted. Now the batteries must be recharged.

4.6.2. Hour-Meter.

This runs when the motor pump is running: the "egg timer" flashes.

4.6.3. Reset.

This happens when the battery is correctly recharged.

4.7. USING THE ON-BOARD CHARGER (BI-ENERGY).

WARNING.

Do not use the machine while charging.

4.7.1. Characteristics.

The drive batteries must be charged using the charger provided. DO NOT OVERCHARGE.

- Charger: 24V - 50A
- Power supply: 220V single phase - 50 Hz **protected by a 30 mA differential circuit breaker**.
- Service voltage: 24V
- Charging time: about 12 hours for 70-80% discharged batteries
- Charging curve fully regulated by micro-controller
- Protected against battery polarity inversion by 3 output fuses, 25 A automobile type
- Mains supply: standardized socket: 2 pole + earth 16A - 230V

4.7.2. Starting to charge.

Start-up is automatic when connection to the mains is made. The charger is fitted with two indicator lights

- the green light indicates mains supply
- the yellow light indicates charging is in progress:
  - it comes on when charging starts
  - it flashes quickly once the charger output voltage threshold value reaches 29 V
  - it flashes slowly if overcharging occurs
  - it flashes during the equalising phase
  - it goes off when charging is over, or if the mains supply is cut.
- If a fault occurs during charging, the green light flashes

4.7.3. Top-up charging.

If the charger remains connected to the main for over 48 hours, it starts a new charging cycle every 48 hours after the previous charging finished, to compensate for self-discharging.

4.7.4. Charging interruption.

The charger is stopped by disconnecting the mains supply. If it is necessary to manoeuvre the machine during a charging cycle, the charger must be unplugged. After the manoeuvre, reconnect the charger. If charging was interrupted for over 13 minutes, a full charging cycle is started.

4.7.5. Precautions for use.

Avoid recharging the batteries if the electrolyte temperature is over 40°C. Let it cool down.

Keep the tops of the batteries clean and dry: a faulty connection or corrosion can cause a considerable loss of power.

If new batteries are installed, recharge after 3 or 4 hours' service. Do this three to five times.

The charger was factory-set with the cable fitted to it. If a replacement cable is fitted, be sure it is of the same cross-section and length.

The charger is protected by a time-delayed fuse 2 50V 15A 6,3 x 32 fitted directly on the electronic card. In the event of a fault (charger not working), do not attempt to repair it. Contact PINGUELY-HAULOTTE After-Sales Department.

4.8. BATTERY USE AND MAINTENANCE.

The batteries provide the power for your platform. Here is some advice to obtain optimal performance from them, without risking premature deterioration.

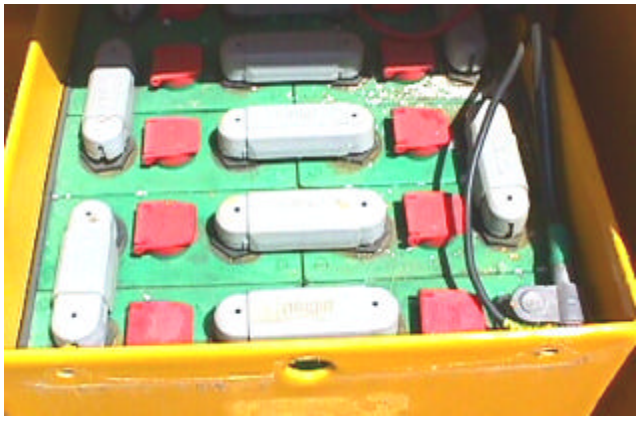


Photo 8 : Batteries for bi-energy option.

4.8.1. First use.

- Check that the electrolyte level is correct.
- Take special care of the batteries during the first cycles. Be sure not to exceed a discharge level of 70% rated capacity (first red LED on tester flashes).
- The batteries perform to full capacity after ten cycles. Do not add electrolyte until after these ten cycles.

4.8.2. Discharging.

- Never discharge the batteries by more than 80% of their capacity in 5 hours (two red LEDs flash on the tester).
- Check that the indicator is working properly.
- Never leave batteries discharged.
- In cold weather, do not postpone recharging as the electroyte may freeze.

4.8.3. Charging.

- The batteries should be charged:
  - when they are discharged by 35-80% of their rated capacity.
  - after a long period of downtime.
- Recharge as follows:
  - check that the mains supply is adapted to charger consumption.
  - if a cell has below the minimum electrolyte level, top up.
  - recharge in a clean, well-ventilated room away from flames.
  - open the box covers.
  - use the charger on board the machine. Its charging rate is suited to the batteries' capacity.
- During charging:
  - do not remove or open the cell plugs.
  - ensure that the temperature of the cells does not exceed 45°C (be careful in summer, or in rooms of high ambient temperature).
- After charging
  - top up with electrolyte if necessary.

4.8.4. Maintenance.

- In normal service, check the electrolyte levels weekly before charging.
- If necessary, top up:
  - with distilled or demineralised water.
  - after charging.
- Never add acid (if acid is spilt, contact S.A.V. HAULOTTE After-Sales Department).
- Never leave batteries discharged
- Avoid spillage
- Clean the batteries to prevent salt formation or current bypass:
  - clean the top without removing the plugs
  - dry with compressed air and clean cloths
  - grease the lugs.
- The battery maintenance operations must be performed safely (wear gloves and protective goggles).

To rapidly assess the condition of your batteries, measure monthly the density of each cell using a hydrometer, as a function of the temperature, using the graphs below (do not measure immediately after filling).

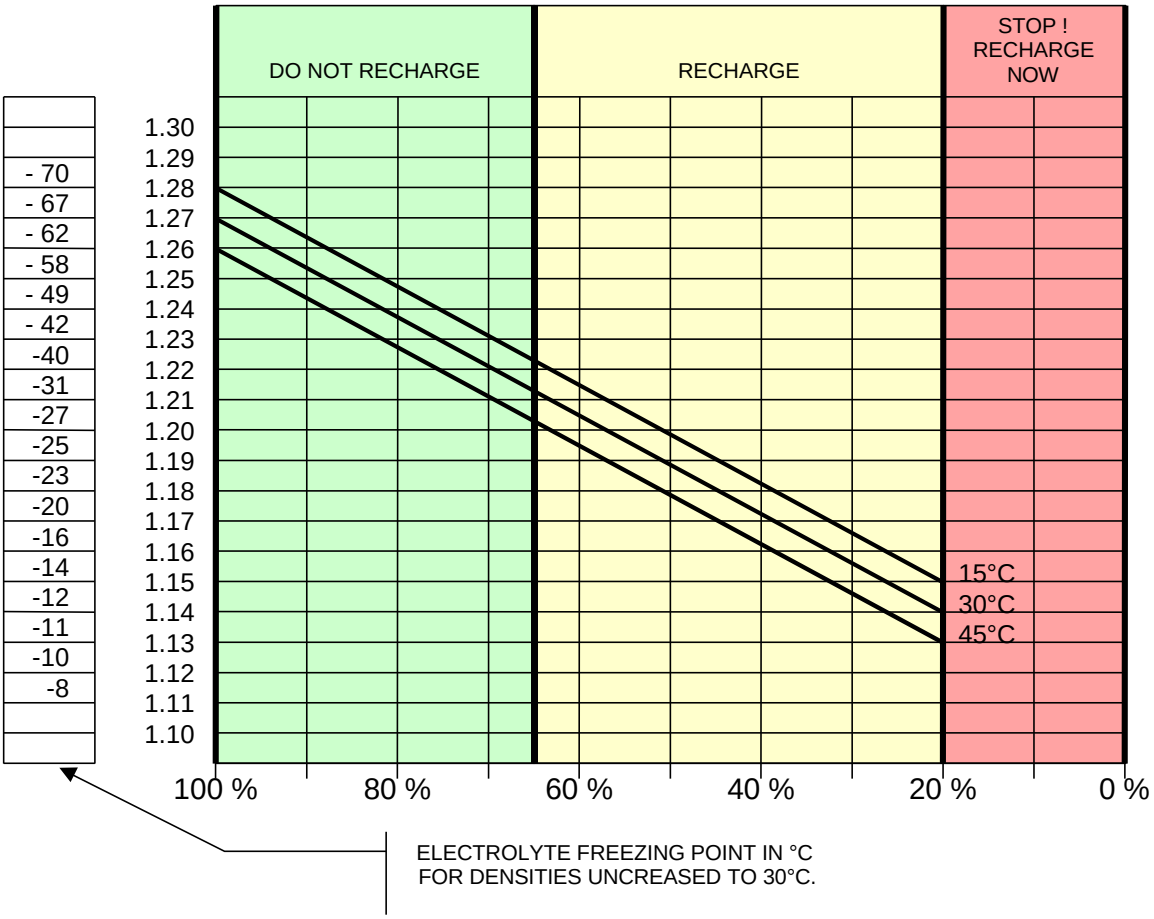


Figure 1 : Charging state of a battery as a function of density and temperature.

WARNING.

Do not electric arc weld on the machine without first disconnecting the batteries.

Never use the batteries to start another machine.

4.9. MANUAL EXTENSIONS.

See photo 9.

The platforms are fitted with one manual extension as standard. The second extension is optional.

Conditions of use

- To extend or retract the extension, take the two handles provided, lift them up to 90° and push them in the desired direction. Lifting the handles by 90° automatically releases the retaining bolts (1) into the extension position.
- During transit on a trailer or vehicle, and during use, the manual extensions must be locked: check that the bolts are well engaged when the handles return to their initial position, to prevent inadvertent in/out movement of the extension.

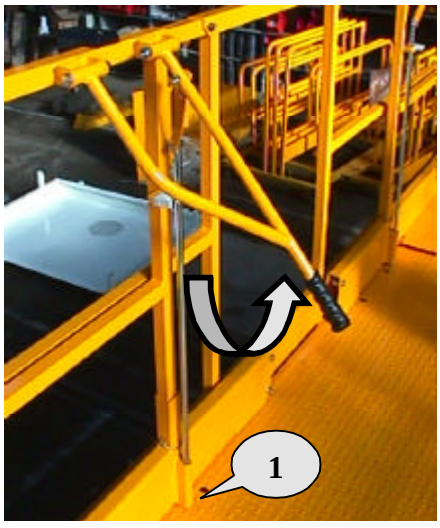


Photo 9 : Manual extension handle.

4.10. EMERGENCY PLATFORM LOWERING AND TROUBLESHOOTING.

Emergency lowering

In case of a malfunction, use the emergency control on the ground control panel.

Emergency manual lowering.

If the emergency control does not work, the platform can be lowered manually.

On H12 SD and H15 SD (See photo 10).

- Pull the handle, and the platform will come down by gravity.
- To stop lowering, release the handle.

Photo 10 : Emergency lowering.

On H18SDX (See photo 11).

- Pull the handle, and the platform will come down by gravity.
- To stop lowering, release the handle.

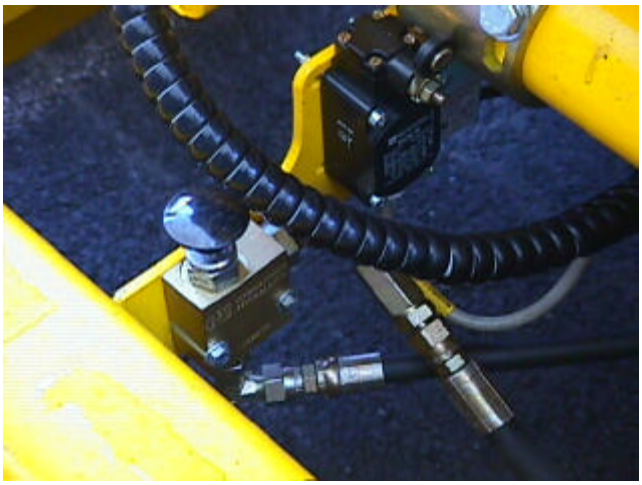


Photo 11 : Emergency lowering.

WARNING.

Lowering an overloaded platform,
using the emergency manual lower function, is prohibited.

WARNING.

When performing emergency manoeuvres from the ground with the extension out, it is essential to ensure there are no obstructions under the platform (wall, cross bar, power line, etc…)

4.11. GEAR DISENGAGEMENT.

The reducing gears on the drive wheels can be disengaged to allow machine towing in case of breakdown. Two models of reducing gear can be factory fitted (photos 11 and 12).

WARNING:

In this configuration the machine brakes are no longer engaged.
To tow the machine, it is essential to use a rigid bar and not to exceed 5 km/h.

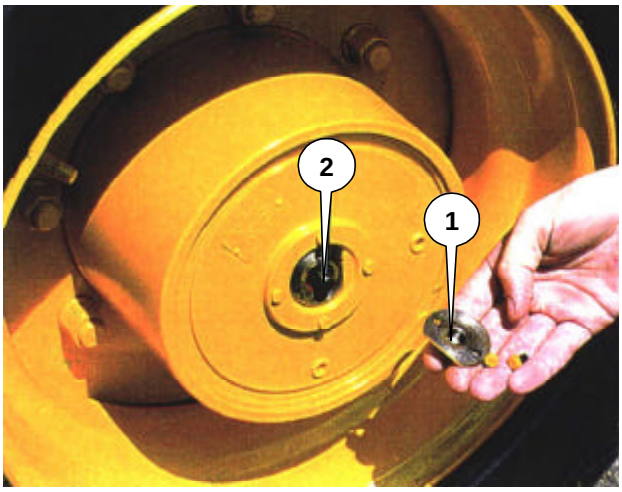


Photo 12 : Reducing gear with screws.

Remove the stop plate (item 1) by unscrewing the two fixing screws.

After moving the machine, perform the operation in reverse to re-engage: Press on the end of the spindle (item 2) and refit the plate (item).

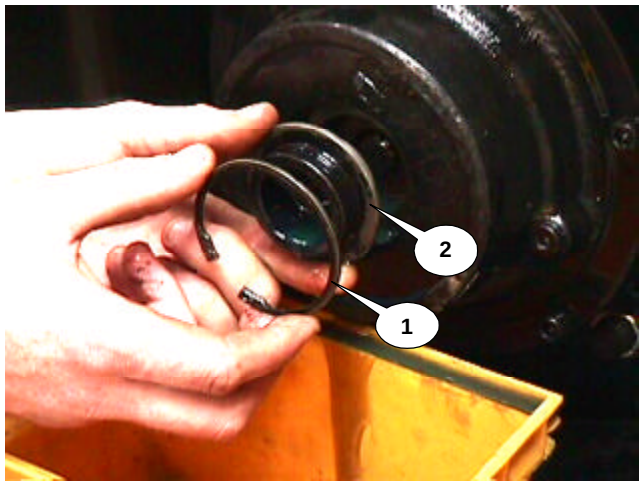


Photo 13 : Reducing gear with circlip.

Remove the circlip (item 1). Return inner element (item 2) and refit the circlip.

To re-engage after moving the machine, perform the operation in reverse

4.12. STABILISATION.

A set of four cylinders, fixed to the frame and controlled from the platform, permit increased machine stability and get horizontal position of the platform..

Four switches (item 1, photo 2) control extension and retraction of the stabilising cylinders. Each cylinder is controlled separately.

WARNING.

Operator must check that all four cylinders are touching the ground before

SERIOUS RISK OF TIP-OVER.

Machine is fitted with 3 safety devices:

- Travel functions are disabled when all 4 cylinders are not fully retracted.
- Platform up/down functions are disabled when all 4 cylinders are not in the same state (fully retracted or extended).
- Stabilisation adjustment can only be performed with the platform stowed. Cylinders extension function is disabled when platform is up.

5. MAINTENANCE.

5.1. GENERAL RECOMMANDATIONS.

The maintenance operations described in this manual are for normal conditions of use.

In harsh conditions (high temperature, high humidity, polluting atmosphere, high altitude, etc.) some operations must be performed more often and special precautions must be taken:

on this subject, consult PINGUELY HAULOTTE After-Sales Department.

Only authorised, competent personnel can maintain the machine, and they must respect the safety instructions relative to personnel and environmental protection.

For engine maintenance, refer to the manufacturer's manual.

Check periodically that the safety devices are working properly:

Tilt: buzzer + stop (travel and lift are cut out).

Platform overload: load > 200 kg causes buzzer + full cut-out of all movements.

WARNING:

- do not use the machine as an earth for welding.
- do not weld without disconnecting the (+) and (-) lugs of the batteries.
- do not start other vehicles with the batteries connected.

5.2. MAINTENANCE CHART.

INGREDIENT	*SPECIFICATION*	*Lubricants used by PINGUELY HAULOTTE*	*ELF*	*TOTAL*
Engine oil	SAE 20 W	ESSO HD x 30	PERFORMANCE XC 30	RUBIA S 30
Housing oil	SAE 90	ESSO EP 80 W 90	TRANSELF EP 80 W 90	TM 80 W/90
Hydraulic oil	AFNOR 48602 ISO VG 46	BP SHF ZS 46	HYDRELF DS 46	EQUIVIS ZS 46
Extreme-pressure lithium grease	ISO - XM - 2			
Lead-free grease	Grade 2 or 3	ESSO GP GREASE	MULTIMOTIVE 2	MULTIS EP 2
Lithium grease	ENS / EP 700			

5.3. OPERATIONS.

5.3.1. Summary chart.

FREQUENCY	OPERATIONS	section
Daily, or before operation	• Check levels: – engine oil – hydraulic oil – diesel – electrical batteries – battery charge, refer to indicator (bi-energy) • Check cleanliness: – diesel pre-filter: replace if water or impurities present – machine (in particular, check leaktightness of couplings and hoses); also check state of tyres, cables and all accessories and equipment. • Check hydraulic oil filter for clogging; if clogging indicator light comes on, change filter cartridge.	 4.3.4 4.3.4 4.3.4 4.3.4 4.4 4.3.4 5.3.2
After first 50 h	• Change the hydraulic filter cartridge (see 250 h frequency) • Drain drive-wheel reducing gears (see 500 h frequency) • Check tightness of: – nuts, bolts and fasteners in general – wheel nuts (tightening torque: 25 daN.m)	5.3.2.4 4.3.4 5.3.2.2
Every 50 h	• Check diesel pre-filter: replace if water or impurities present • Grease wheel pivot pin: 2 x 2 points • Check level of drive-wheel reducing gears	
Every 250 hours	• Engine: see manufacturer's manual • Change hydraulic filter cartridge • Grease: – steer-wheel pivots – rubbing parts of slideways (use a spatula) – battery lugs • Check: – battery charger connection (bi-energy option) – level of batteries	 5.3.2.1 5.3.2.4 5.3.2.5 4.3.4 4.6.4
Every 500 hours	Engine: refer to manufacturer's manual • Drain wheel reducing gears • Fill tank: capacity is 2 x 0.7 l for 4x2 version, 4 x 0.7 l for 4x4 version	5.3.2.2
Every 1000 hours or yearly	Engine: refer to manufacturer's manual • Drain hydraulic oil tank	
Every 2000 hours	Engine: refer to manufacturer's manual • Drain hydraulic oil tank and entire circuit • drain and clean diesel tank	
Every 3000 hours or every 4 years	• Check: – state of slideways – state of electrical cables and hydraulic hoses, etc.	

Reminder:

If the machine is used in harsh conditions, the maintenance frequencies must be shortened. (consult After-Sales Department if necessary).

5.3.2. Procedure.

IMPORTANT:

- For refilling and greasing, use only lubricants specified in the chart in § 5.2.
- Retrieve the drained oils in order not to pollute the environment.

5.3.2.1. Hydraulic oil filter.

See photo 14.

The filter contains a clogging indicator (1).

Change the cartridge (2) if the clogging light in the indicator comes on.

1 - unscrew base nut (3) and remove cartridge.
2 - screw on a new cartridge.

NOTE: the clogging check must be done when the engine is hot; if the engine is cold, the light may come on due to oil viscosity.

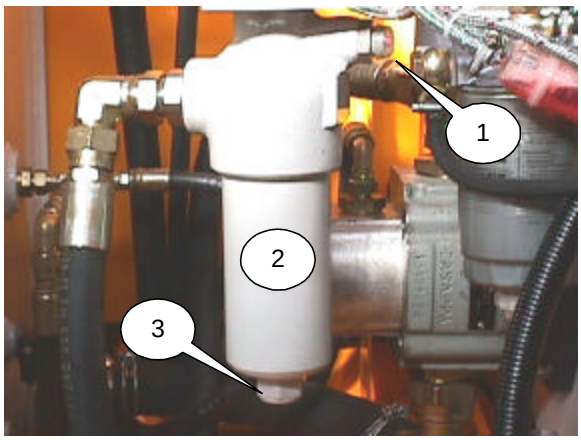


Photo 14 : Hydraulic oil filter.

WARNING.

Before disassembly, ensure that the oil circuit is no longer pressurised and that the oil has cooled sufficiently.

5.3.2.2. Drive-wheel reducing gears.

See photo 15.

Checking and draining require wheel dismounting: to do this, immobilise the machine and lift using a jack or hoist.

- Level check:
  - turn the wheel so that one plug (1) is on a horizontal line and one plug (2) on a vertical line.
  - unscrew the plug (1) and check the level: this must be level with the hole. Top up if necessary.
  - Screw plug back on.
- Draining:
  - With wheel in same position, unscrew the two plugs and let the oil pour out.
  - Refill as described above.
  - Screw plugs back on.

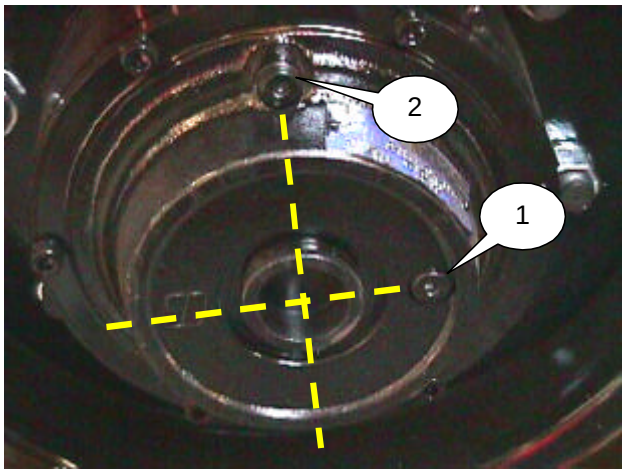


Photo 15 : Drive-wheel reducing gears.

WARNING.

Ensure that the machine is adequately secured, and that the lifting gear is of ample capacity and in good order.

5.3.2.3. Greasing the cylinder joint.

See photo 16.

Grease the joint (item 1) with lead-free grease.

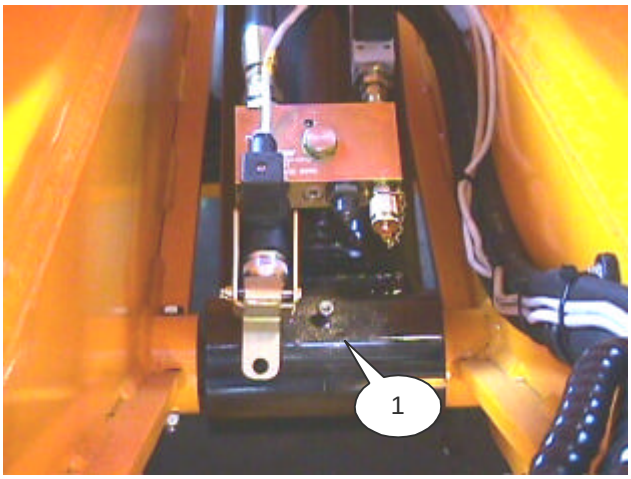


Photo 16 : Cylinder joint.

5.3.2.4. Greasing the steer-wheel pivots

See photo 17.

Grease the pivots (item 1) with lead-free grease.

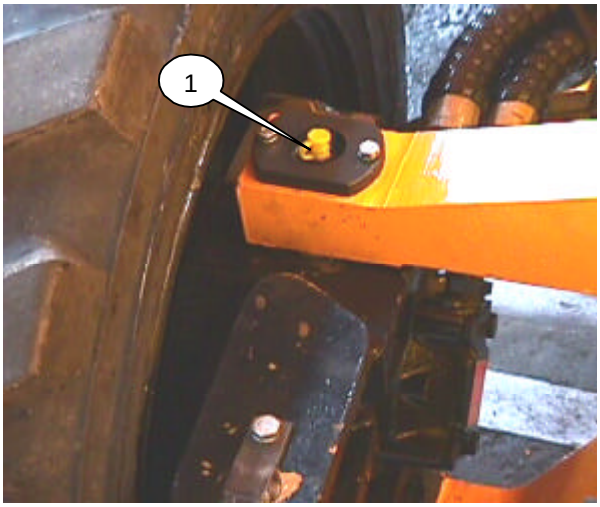


Photo 17 : Steer-wheel pivot.

5.3.2.5. Greasing the Slideways.

See photo 18.

Apply lead-free grease with a spatula on the slideways (item 1).

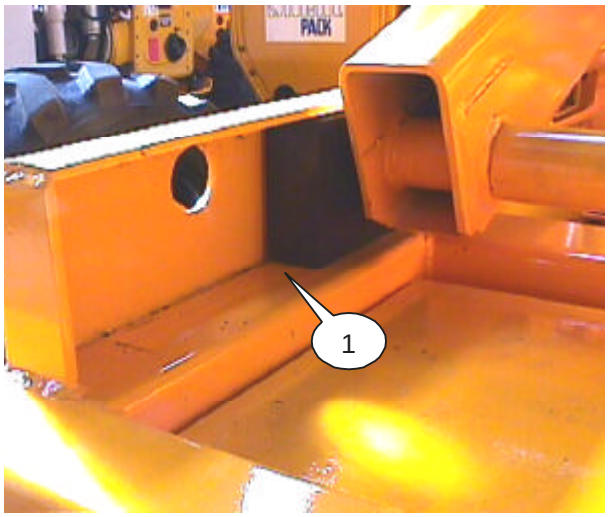


Photo 18 : Slideways.

5.3.3. List of consumables.

- hydraulic oil filter.
- air filter media.
- diesel pre-filter.
- diesel filter - engine oil filter.

5.4. LOAD TESTING.

5.4.1. Overload test.

The structural overload test is 125% of the rated safe working load.

Type	*Rated Safe Working Load*	*Structural Overload*
H12 SD Single extension	900 kg	1125 kg
H12 SD Double extension	700 kg	875 kg
H15 SD Single extension	700 kg	875 kg
H15 SD Double extension	500 kg	625 kg
H18 SDX Single extension	600 kg	750 kg
H18 SDX Double extension	500 kg	625 kg

See § 1.12.3. of AS1418.10-1996 for details of the test.

The machine is to show no signs of permanent deformation.

5.4.2. Functional test.

These tests are to demonstrate that:

- The machine can operate smoothly through all motions whilst carrying the rated safe working load.
- All safety devices are working correctly.
- The maximum permitted operating speeds are not exceeded.

5.4.3. Stability test.

See § 1.12.2 of AS1418.10-1996 for additional testing details. The elevating work platform must come to a stationary condition without overturning.

WARNING:

In order to safeguard the elevating platform against tipping during the stability test, it is imperative that a restraining device such as an anchor block and chain be used to restrain the unit during the stability test.

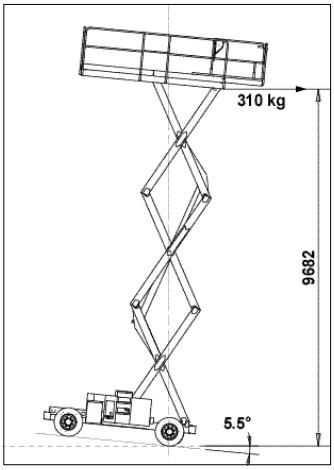
This chain shall not assist in stabilising the platform prior to it reaching a point of tipping should it occur for any reason i.e. uncontrolled application of test load.

5.4.3.1. Stability test on H12SD.

The worst case overturning moment applied representing the least favorable loads and forces combined is:

Single extension:

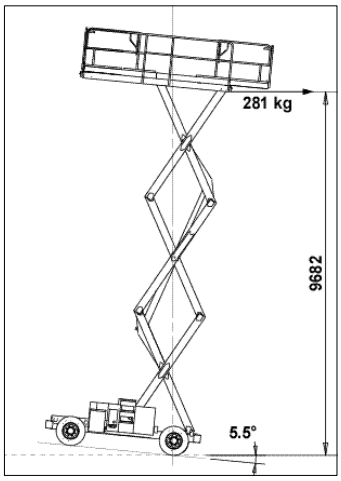
2997 m.daN which is represented by a load of 310 kg applied as shown below with the elevating work platform on a 5.5º side slope.



Picture 14 : Simulation test on H12SD single extension.

Double extension:

2722 m.daN which is represented by a load of 281 kg applied as shown below with the elevating work platform on a 5.5º side slope.



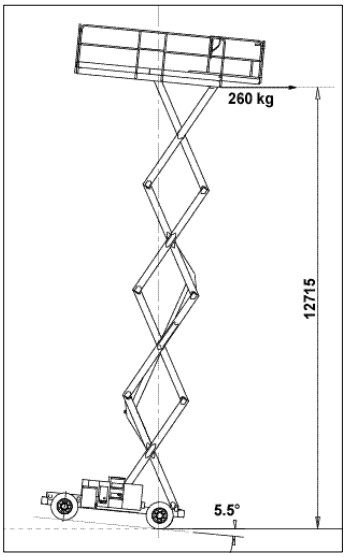
Picture 15 : Simulation test on H12SD double extension.

5.4.3.2. Stability test on H15SD.

The worst case overturning moment applied representing the least favorable loads and forces combined is:

Single extension:

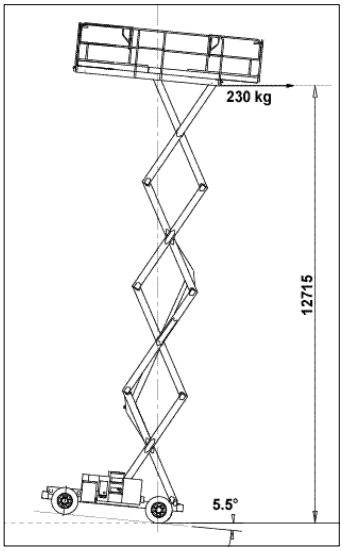
3306 m.daN which is represented by a load of 260 kg applied as shown below with the elevating work platform on a 5.5º side slope.



Picture 16 : Simulation test on H15SD single extension.

Double extension:

2925 m.daN which is represented by a load of 230 kg applied as shown below with the elevating work platform on a 5.5º side slope.



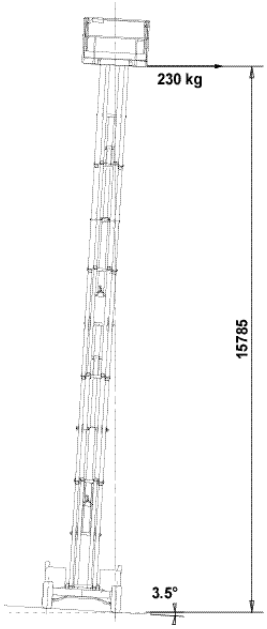
Picture 17 : Simulation test on H15SD double extension.

5.4.3.3. Stability test on H18SDX.

The worst case overturning moment applied representing the least favorable loads and forces combined is:

Single extension:

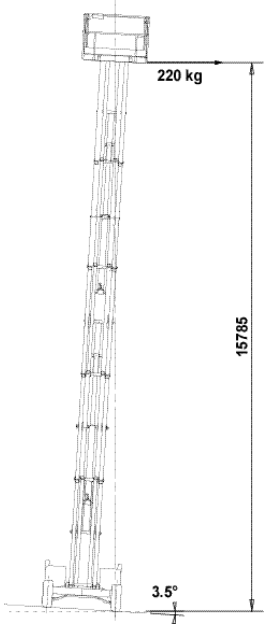
3630 m.daN which is represented by a load of 230 kg applied as shown below with the elevating work platform on a 3.5º side slope.



Picture 18 : Simulation test on H18SD single extension.

Double extension:

3475 m.daN which is represented by a load of 220 kg applied as shown below with the elevating work platform on a 3.5º side slope.



Picture 19 : Simulation test on H18SD double extension.

5.5. INTERVENTION ON SCISSORS.

For any intervention on scissors, the two stops provided must be used:

- Raise the platform in order to get enough clearance to dispose the stops.
- Unlock both security bars and rotate it in the right position.
- Lower platform until upper axis rest on stops fork.
- During entire intervention press in emergency stop button.

Photo 19 : Security bar.

WARNING:

Do not carry out any intervention if the scissors are not locked by both security bars.
No loads on the platform while scissors are locked.

6. TROUBLESHOOTING.

The following pages should help you rectify any operating problems you may experience with your scissor-lift platform. If a problem arises that is not addressed in this chapter or is not rectified by the solutions described below, qualified technical personnel must be consulted before any maintenance is performed. Note also that most of the problems encountered with this machine are due to the hydraulic and electrical systems.

First of all, check that:

- the batteries are charged: the green LED on the right-hand side of the charge tester must be lit.
- the two emergency stop buttons, on the ground and platform control panels, are unlocked.
- the relays in the electrics box are pushed in.
- the battery cut-out is open.

FAULT	CHECK	PROBABLE CAUSE	SOLUTION
Platform lift system			
• ***No movement when lift switch on control panel is operated and handle is engaged.***	• Check if movements are performed when lift switch on ground control panel is actuated.	• Control switch not working.	• Replace switch (After-Sales Dpt)
		• Handle not working.	• Replace handle (After-Sales Dpt)
		• Lack of oil in hydraulic circuit.	• Top up oil level as required.
• ***Platform does not lift.***		• Platform overloaded (occupants or equipment)	• Reduce load.
		• Lack of oil in hydraulic circuit.	• Top up oil level as required.
		• Batteries discharged by over 80%, tester disables lift function.	• Recharge batteries or change to diesel fuel mode.
• ***Platform does not lower.***		• Platform overloaded (occupants or equipment).	• Reduce load.
• ***Platform lifts and lowers with jerky movements.***		• Lack of oil in hydraulic circuit.	• Top up oil level as required.
Travel system			
• ***No movement when handle on platform control panel is actuated, and switch is set to travel position.***		• Handle not working.	• Repair or replace handle (After-Sales Dpt).
		• Lack of oil in hydraulic circuit.	• Top up oil level as required.
• ***Machine runs away when driving downhill.***		• Counterbalance valve misadjusted or not working.	• Reset or replace counterbalance valve (After-Sales Dpt).

FAULT	CHECK	PROBABLE CAUSE	SOLUTION
Steer system			
• ***No movement when handle actuated.***		• Lack of oil in hydraulic circuit.	• Top up oil level as required.
		• Control handle not working.	• Replace handle (After-Sales Dpt).
• ***Hydraulic pump making noise.***		• Lack of oil in tank.	• Top up oil level as required.
• ***Cavitation in hydraulic pump. (Vacuum in pump due to lack of oil)****	• Hydraulic oil becomes cloudy, opaque and turns white (bubbles visible).	• Oil viscosity too high.	• Drain circuit and replace with specified oil.
• ***Hydraulic circuit overheating.***		• Oil viscosity too high.	• Drain circuit and replace with specified oil.
		• Lack of hydraulic oil in tank.	• Top up oil level as required.
• ***System working erratically.***		• Hydraulic oil not at optimal operating temperature.	• Perform a few movements with no load to allow oil to heat up.
• ***Charge tester not working.***		• Check fuse.	• Change fuse.
		• Tester not working properly.	• Repair or replace tester.

*WARNING:

Cavitation = bubbles

Bubbles + pressure = serious fault (oleopneumatic system)

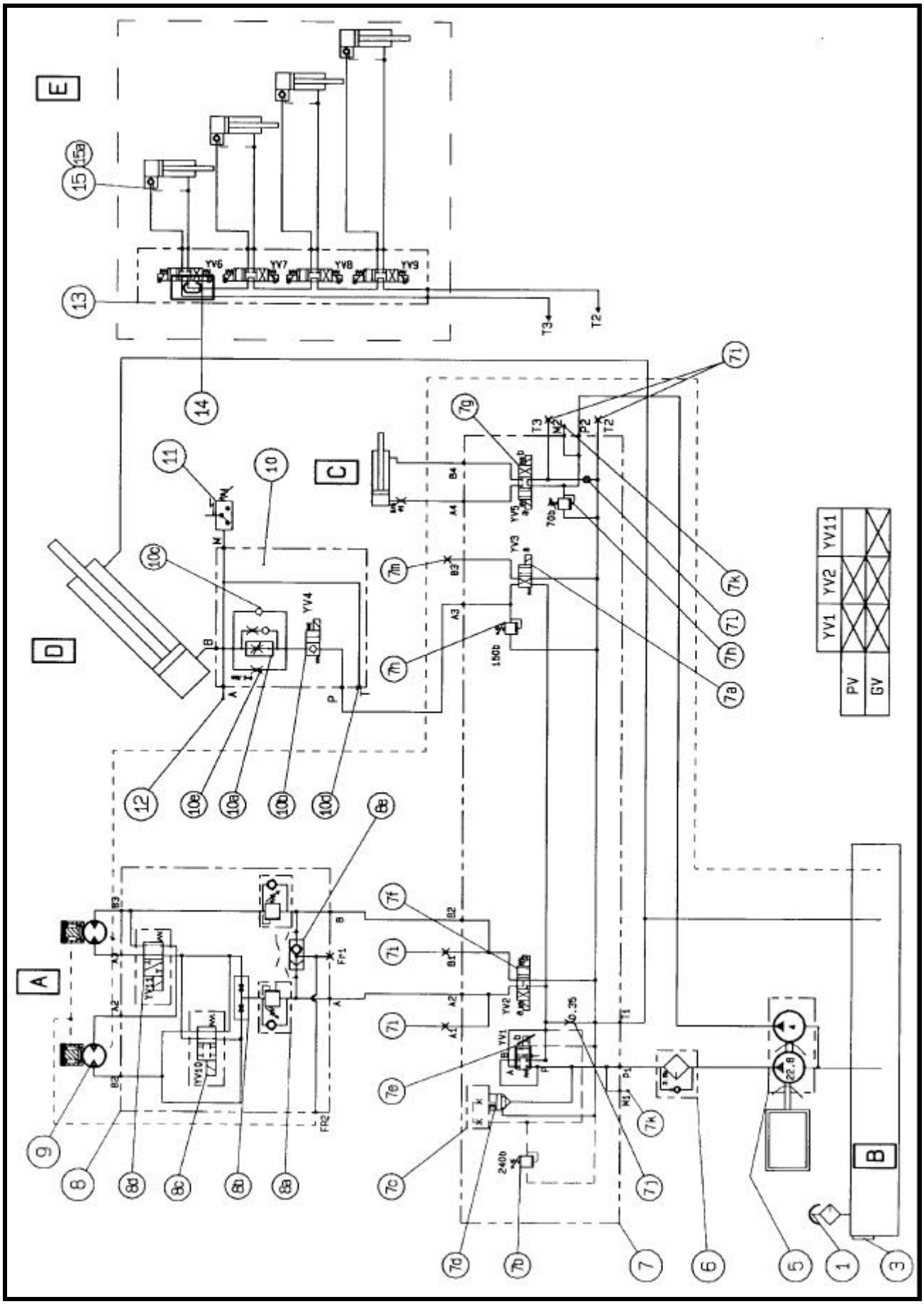
Bubbles + pressure + heat = **unacceptable situation.**

**NOTE: it takes about 4 h for oil emulsified by cavitation to regain its normal appearance.

7. Hydraulic diagrams.

7.1. H12SD/H15SD.

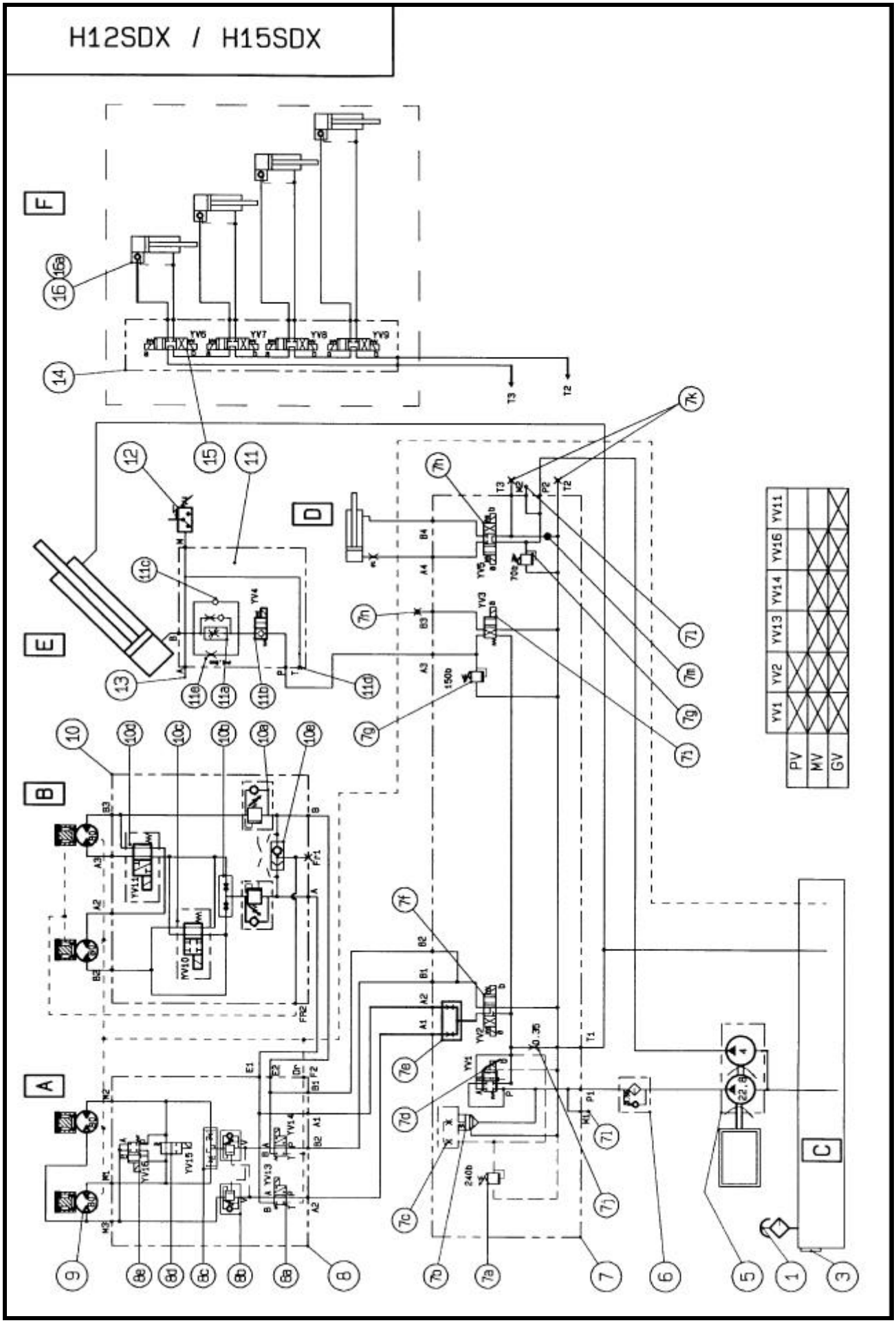
Rep.	Désignation on B15087/b
GV	High speed
PV	Low Speed
E	Stabilisers option
D	Lifting cylinder
C	Direction cylinder
B	Reservoir
A	Motor axle
15a	Block
15	One-way valve
14	Solenoid valve
13	Drilled block
12	minimess Plug
11	Pressure controller
10e	Choke
10d	Screw plug
10c	One-way valve
10b	Solenoid valve
10a	Flow regulator
10	Cutter lowering box
9	Hydraulic motor
8e	Circuit selector
8d	Solenoid valve
8c	Electromagnet
8b	Flow divider
8a	Balancing valve
8	Travel block
7m	Plug
7l	Plug
7k	Minimess plug
7j	Spray nozzle
7i	Plug
7h	Pressure limiter
7g	Solenoid valve
7f	Solenoid valve
7e	Proportional valve
7d	Valve cartridge
7c	Cover
7b	Pressure limiter
7a	Electromagnet
7	Distribution block
6	Filter
5	Pump
3	Oil level
1	Filling plug



Picture 20 : H12SD / H15SD. Diagram B15087/b

7.2. H12SDX / H15SDX.

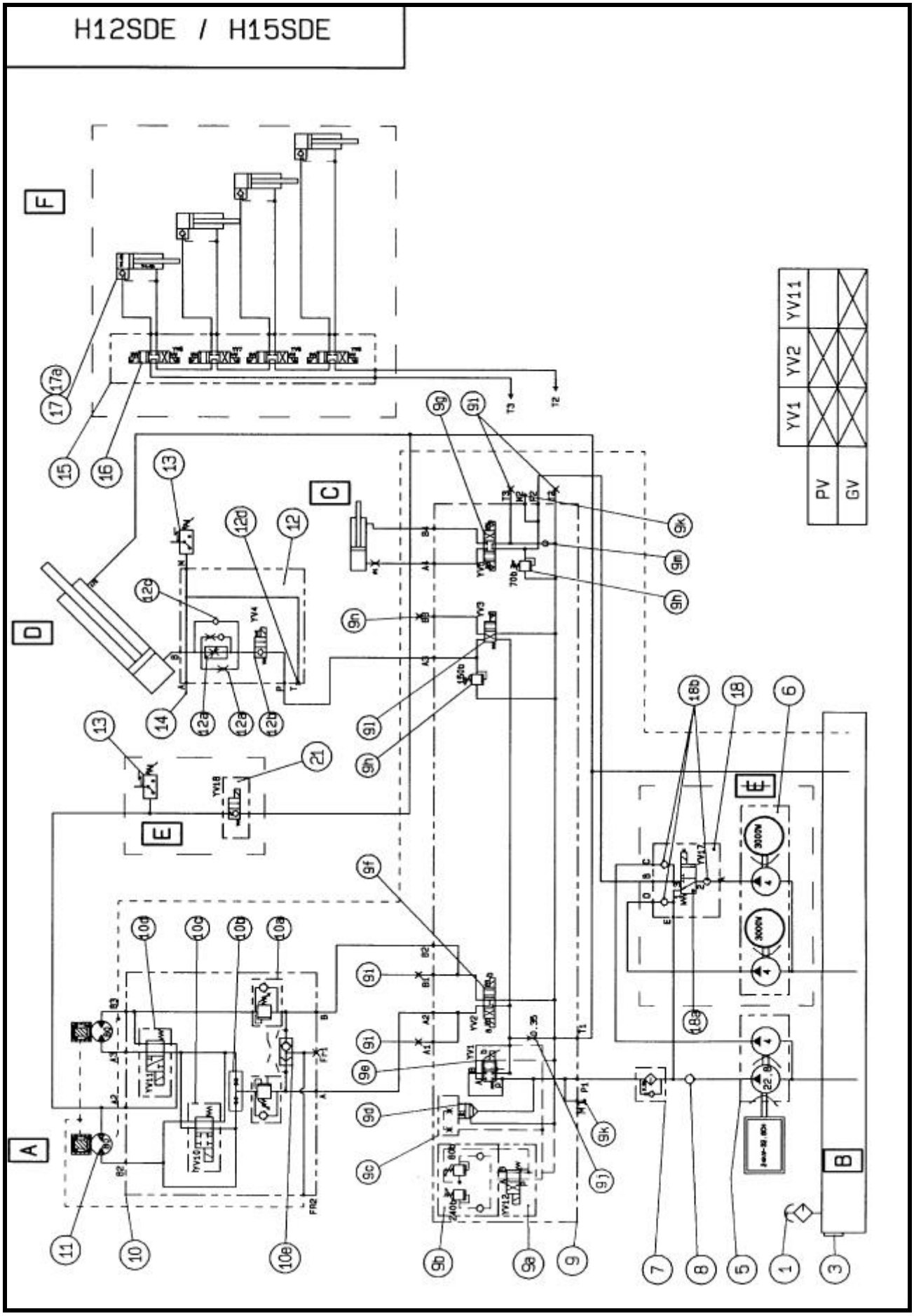
Rep.	Désignation on B15032/b
GV	High speed
MV	Medium speed
PV	Low Speed
F	Stabilisers option
E	Lifting cylinder
D	Direction cylinder
C	Reservoir
B	Motor axle
A	Motor guiding axle
16a	Block
16	One-way valve
15	Solenoid valve
14	Drilled block
13	minimess Plug
12	Pressure controller
11e	Choke
11d	Screw plug
11c	One-way valve
11b	Solenoid valve
11a	Flow regulator
11	Cutter lowering box
10e	Circuit selector
10d	Solenoid valve
10c	Solenoid valve
10b	Flow divider
10a	Balancing valve
10	Travel block
9	Hydraulic motor
8e	Solenoid valve
8d	Solenoid valve
8c	Flow divider
8b	Balancing valve
8a	Solenoid valve
8	Block
7m	Plug
7l	Plug
7k	Minimess plug
7j	Spray nozzle
7i	Solenoid valve
7h	Solenoid valve
7g	Pressure limiter
7f	Solenoid valve
7e	Flow divider
7d	Proportional valve
7c	Cover
7b	Valve cartridge
7a	Pressure limiter
7	Distribution block
6	Filter
5	Pump
3	Oil level
1	Filling plug



Picture 21 : H12SDX / H15SDX : Diagram B15032/b

7.3. H12SDE / H15SDE.

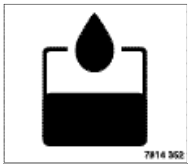
Rep.	Désignation on B15031/b
GV	High speed
PV	Low Speed
F	Stabilisers option
E	Half energy option
D	Lifting cylinder
C	Direction cylinder
B	Reservoir
A	Motor axle
21	Electromagnet
18b	One-way valve
18a	Solenoid valve
18	Output cumulation block
17a	Block
17	One-way valve
16	Solenoid valve
15	Drilled block
14	minimess Plug
13	Pressure controller
12e	Choke
12d	Screw plug
12c	One-way valve
12b	Solenoid valve
12a	Flow regulator
12	Cutter lowering box
11	Hydraulic motor
10e	Circuit selector
10d	Solenoid valve
10c	Solenoid valve
10b	Flow divider
10a	Balancing valve
10	Travel block
9n	Plug
9m	Plug
9l	Solenoid valve
9k	Minimess plug
9j	Spray nozzle
9i	Plug
9h	Pressure limiter
9g	Solenoid valve
9f	Solenoid valve
9e	Proportional valve
9d	Valve cartridge
9c	Cover
9b	Pressure limiter
9a	Solenoid valve
9	Distribution block
8	Solenoid valve
7	Filter
6	Electropump units
5	Pump
3	Oil level
1	Filling plug


H12SDE / H15SDE
YV11
YV2
YV1
PV
GV

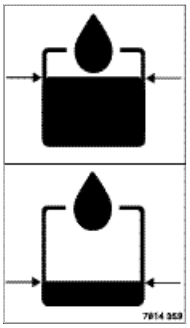
8. LABELS.

8.1. COMMON LABELS.

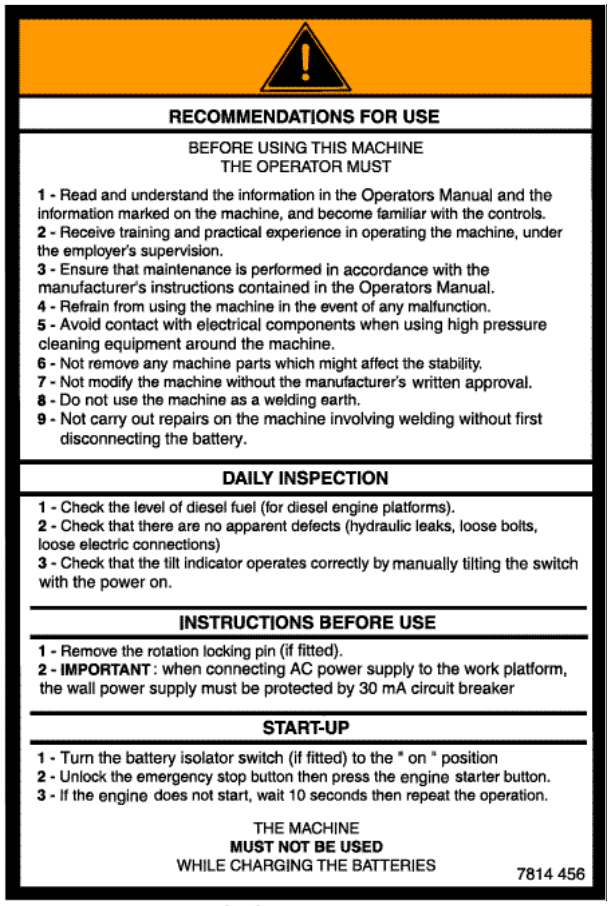
Label 1 : 7814 451



Label 2 : 7814 352

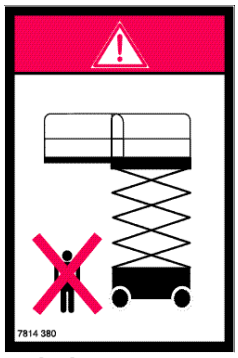


Label 3 : 7814 359

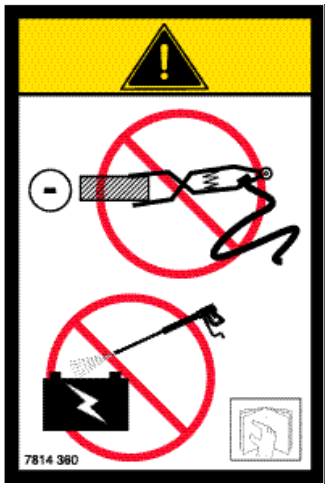


Label 4 : 7814 456

Label 5 : 7814 436



Label 6 : 7814 380

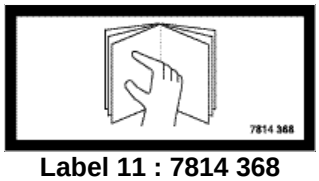


Label 7 : 7814 360

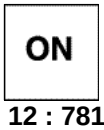
Label 8 : 7814 362

Label 9 : 7814 364

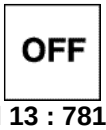
Label 10 : 7814 449



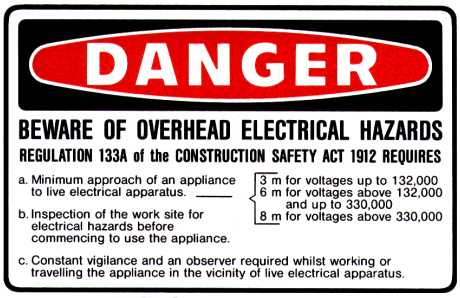
Label 11 : 7814 368



Label 12 : 7814 200



Label 13 : 7814 201

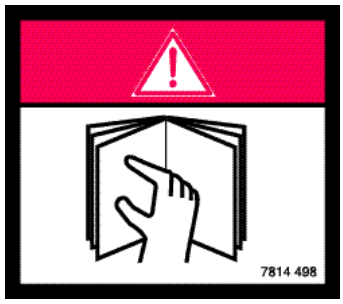


Label 14 : 7814 443

Label 15 : 7814 497

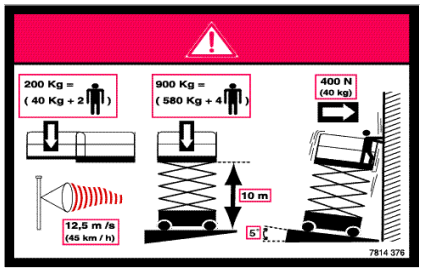
Label 16 : 7814 427

Label 17 : 7814 457

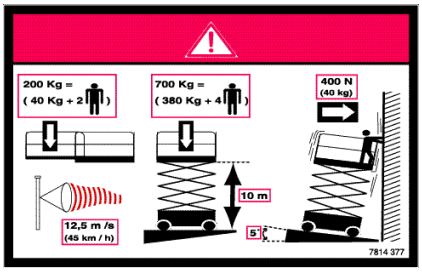


Label 18 : 7814 457

8.2. LABELS SPECIFIC TO H12S.

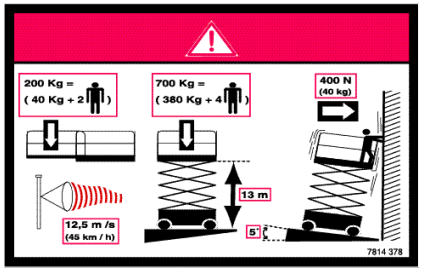


Label 19 : 7814 376

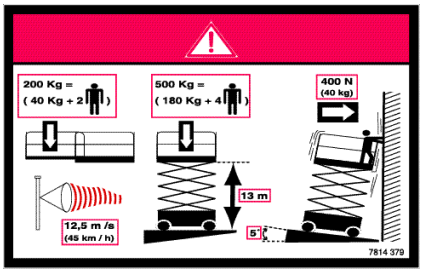


Label 20 : 7814 377

8.3. LABELS SPECIFIC TO H15S.

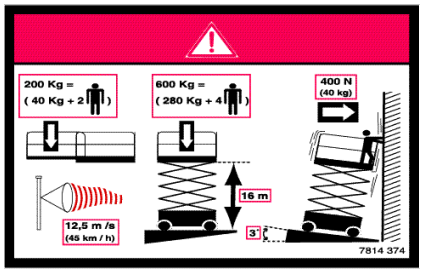


Label 21 : 7814 378

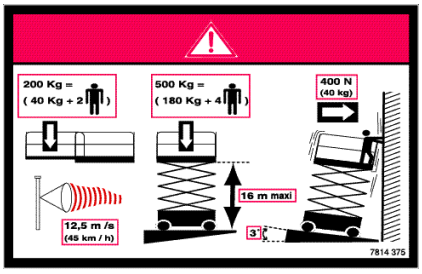


Label 22 : 7814 379

8.4. LABELS SPECIFIC TO H18S.



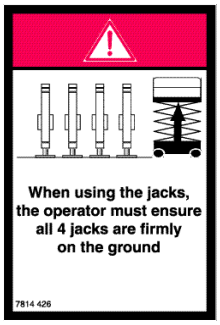
Label 23 : 7814 374



Label 24 : 7814 375

8.5. LABELS SPECIFIC TO OPTIONS.

8.5.1. Stabilisation option.

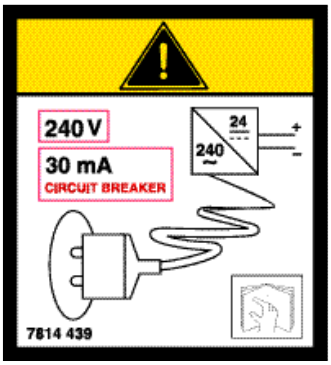


Label 25 : 7814 426

Label 26 : 7814 428

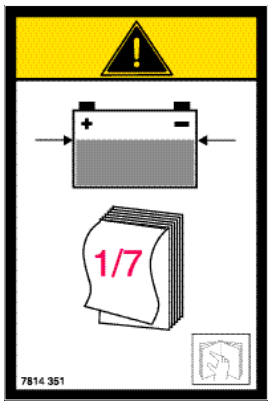
8.5.2. Bi-energy option.

Label 27 : 7814 463



Label 28 : 7814 439

Label 29 : 7814 361



Label 30 : 7814 351