

SCANLIFT^{SL} 185

**MOBILE ELEVATING WORK PLATFORM
(MEWP)**

USER 'S MANUAL

KESLA OY

Metsolantie 2

FIN-59800 KESÄLAHTI

Tel. int +358-13-682841

Telefax. +358-13-6828100

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1.0 INTRODUCTION

SCANLIFT SL 185 is a mobile elevating work platform (MEWP) fitted with its own combustion engine using as fuel petrol (gasoline), liquid petroleum gas (LPG) or, in the diesel version light fuel oil. Due to its 4WD and 4WS SCANLIFT SL 185 is very agile and, driven from the platform, it easily manages to travel in poor shaped terrain.

Because all essential controls are centralized to the platform, the SCANLIFT 185 SL MEWP is in any normal situation controllable from the platform. Analogously the change-over switch and the controls for ground guiding are concentrated to the turntable.

The brakes of the MEWP get automatically locked when the pressure of the driving motors has dropped.

The electrical auxiliary lowering system can be controlled from the turntable and the platform.

Due to its telescope SCANLIFT SL 185 has a wide side reach and the work is not limited by the slew housing, as this rotates without limitation. The jib boom as standard equipment ensures agile movements.

SCANLIFT SL 185 is fitted with many safety improving functions. To achieve good, effective and safe working results their instructions must be well read and memorized.

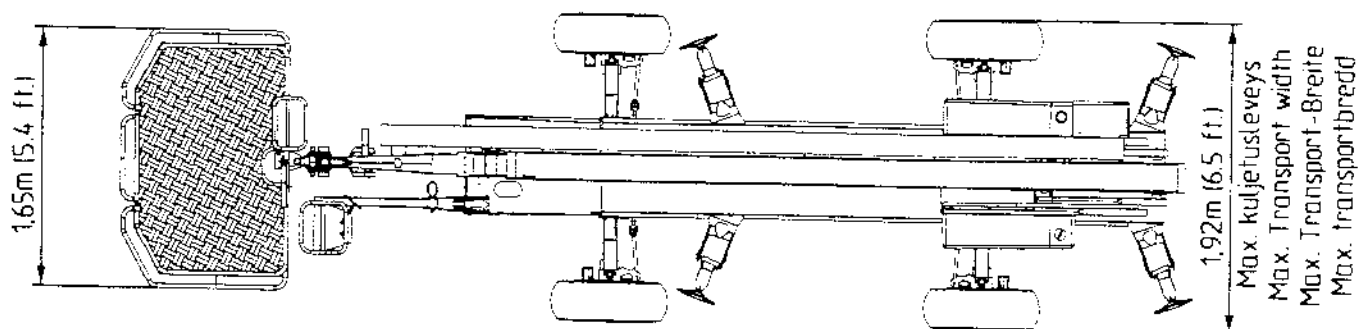
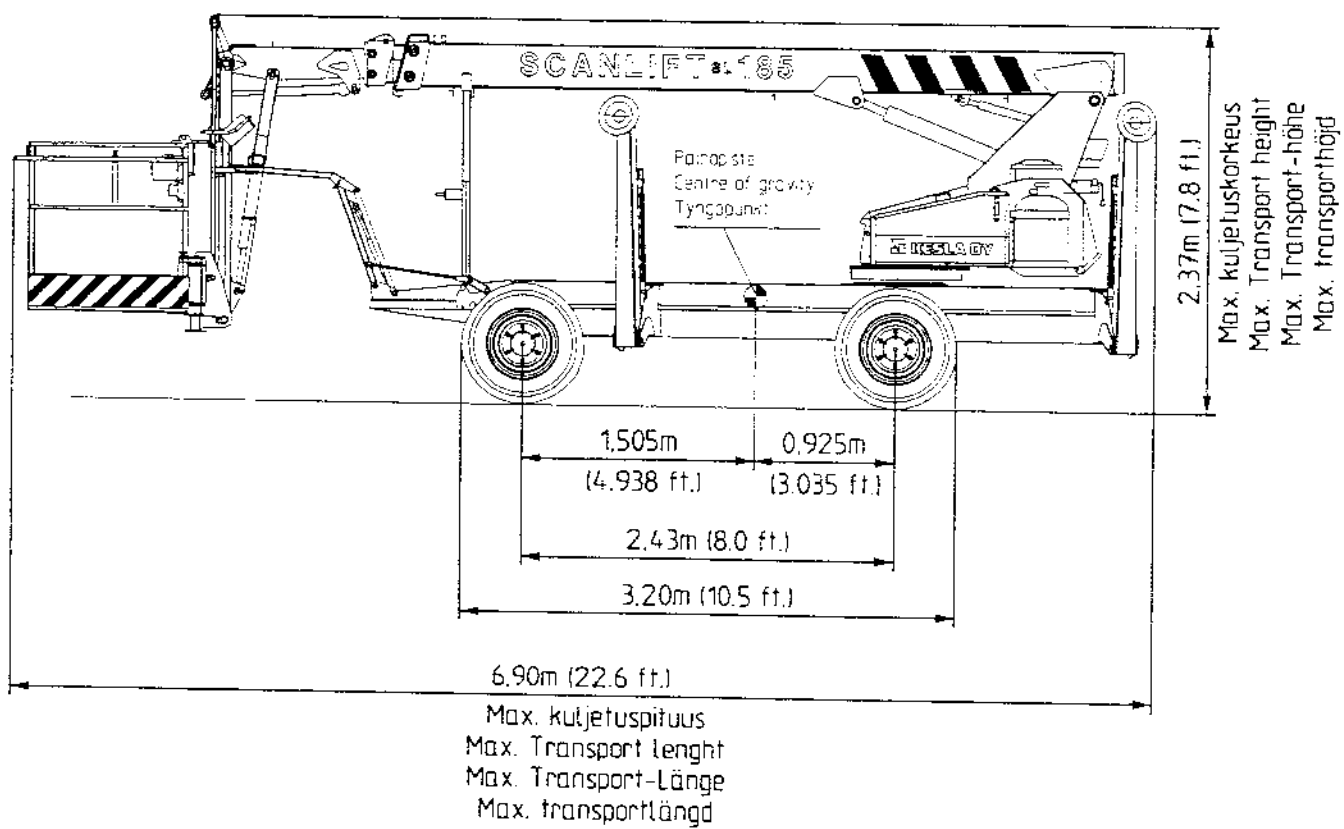
The condition of the MEWP must be examined daily on basis of this manual before starting to work. Do not use the MEWP, if it is not maintained or not in order.

The manufacturer reserves the right of changing the construction, equipment as well as the maintenance instructions of the machine without advance notification.

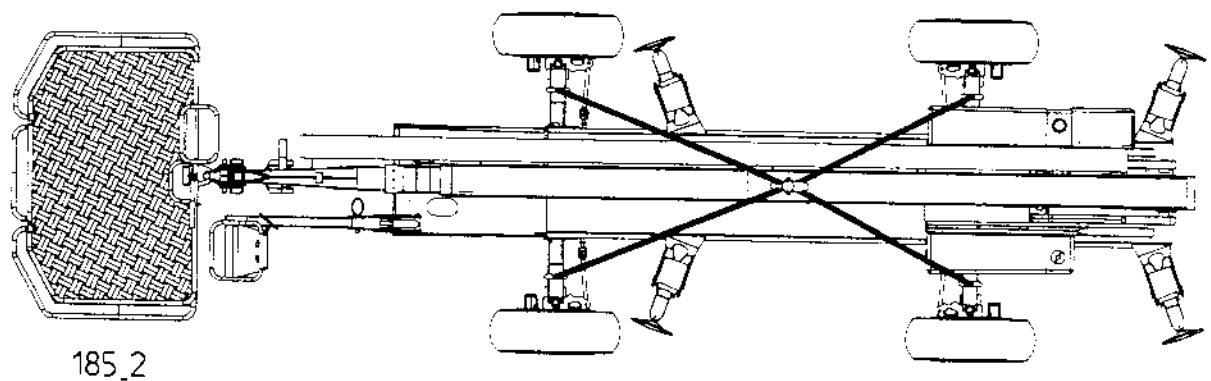
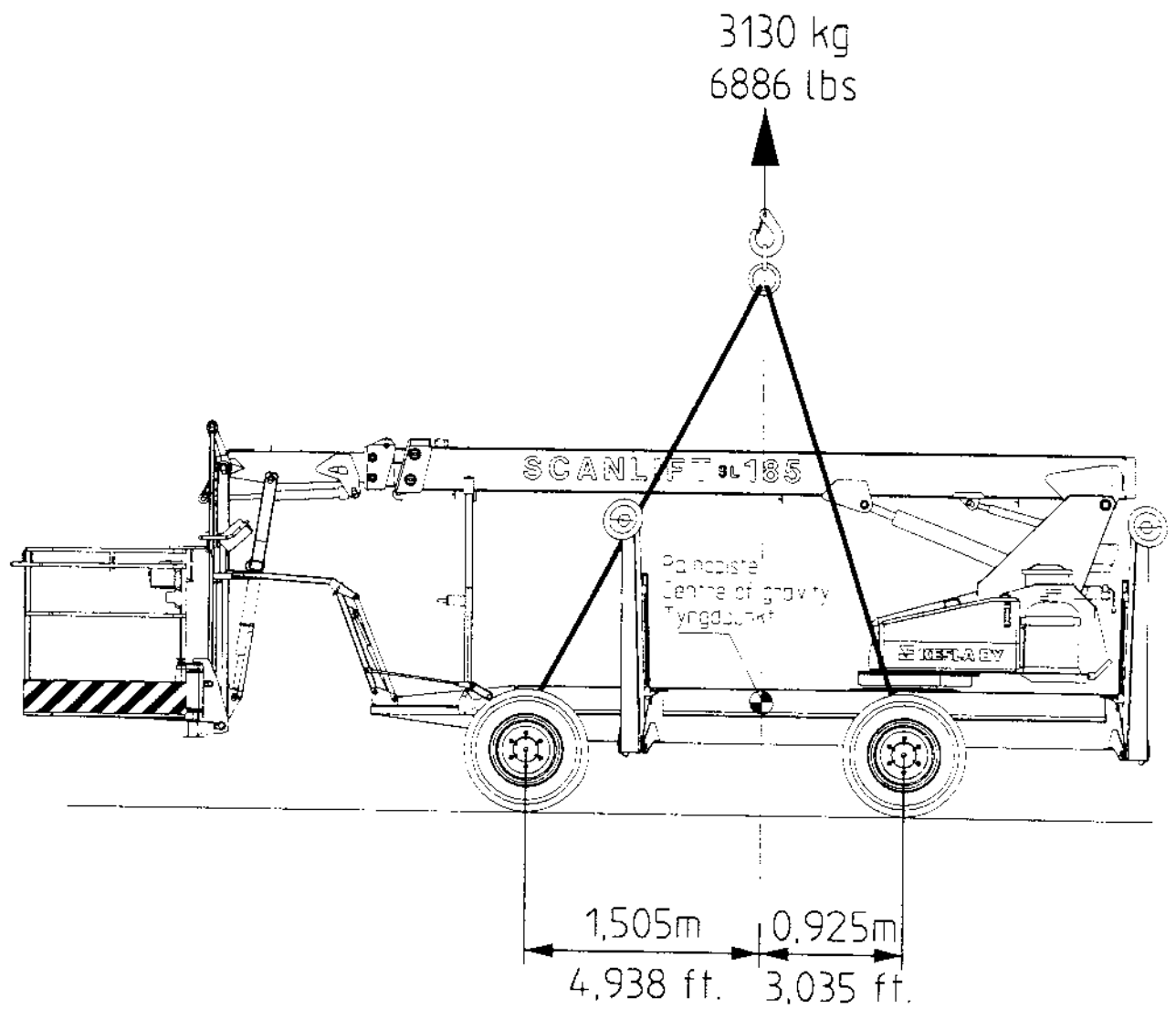
With wishes of elevating success

KESLA OY

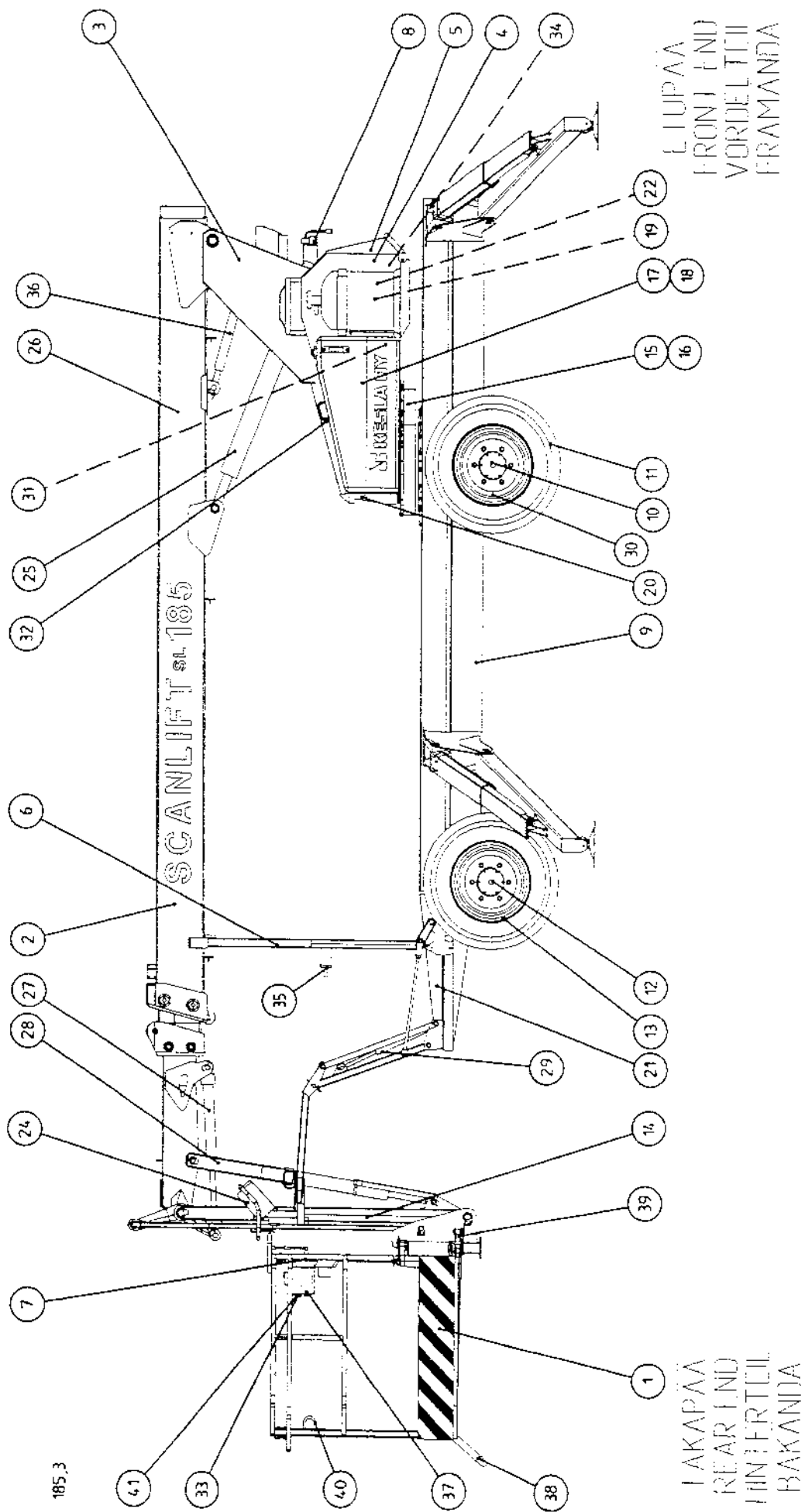
2.0 TRANSPORT DIMENSIONS



2.1 LIFTING THE MEWP WITH CRANE



3.0 SPECIFICATION



3.0 SPECIFICATION

- 1 Platform
- 2 Booms
- 3 Turntable, upper part
- 4 Turntable, lower part
- 5 Combustion engine
- 6 Valve for drive/outrigger, lifting arms and transport support
- 7 Control valve for booms, platform guiding
- 8 Control valve for booms, ground guiding
- 9 Base frame
- 10 Front axle, oscillating
- 11 Front wheel
- 12 Rear axle, dead
- 13 Rear wheel and brakes
- 14 Jib
- 15 Pivot bearing
- 16 Slewing motor, - gear and - brake
- 17 Fuel tank, to the right of the MEWP
- 18 Hydraulic oil tank, to the left of the MEWP
- 19 Battery, to the left of the MEWP
- 20 Change-over switch: guiding the booms from platform or from ground (turntable)
- 21 Equipment case, place for manual
- 22 Gas device, to the left of the MEWP (SL 135 B)
- 23 Main switch, to the left of the MEWP
- 24 Shunt switch
- 25 Lifting cylinder
- 26 Cylinder for telescope
- 27 Stabilizer cylinder for platform
- 28 Jib cylinder
- 29 Control cylinder for lifting arms
- 30 Steering cylinders
- 31 Hydraulic pump
- 32 Limiter device for lifting radius
- 33 Change-over switch BOOM/DRIVE, on platform (192001-193020)
- 34 El. pump for auxiliary lowering system
- 35 Place for spare wheel
- 36 Control cylinder for stabilizer cylinder
- 37 El. control box of drive/outrigger valves, drive selector, driving speed selector and lights of horizontal level indicator lights
- 38 Platform step
- 39 Slewing cylinder of platform
- 40 Fastening hooks for safety harness
- 41 Control switch for auxiliary lowering system

4.0 TECHNICAL DATA

Max. height of platform bottom from ground	16,45 m	54 ft.
Max. working height	18,45 m	60.5 ft.
Min. lifting radius measured from outer brim of platform with max. working height	3,2 m	10.5 ft.
Safe working platform load	230,0 kg	507 lbs
Safe lifting radius:		
- with 230,0 kg (506 lbs) platform load	7,75 m	25.4 ft.
- with 80,0 kg (176 lbs) platform load	9,95 m	32.6 ft.
Dimensions of platform bottom	1,0 x 1,5 m	3.3 x 4.9 ft.
Support distance of outriggers:		
- lengthwise	3920 mm	12.9 ft.
- widthwise	3900 mm	12.8 ft.
Max. supporting force in sole of outrigger	25500 N	5700 lbs.
Max. allowed sloping of the ground	$\pm 7^\circ$	
Max. allowed sloping of the chassis	$\pm 7^\circ$	
Transport length	6,92 m	22.7 ft.
Transport width	1,92 m	6.3 ft.
Transport height	2,37 m	7.8 ft.
Ground clearance under bottom	0,38 m	1.2 ft.
Wheelbase	2,43 m	8.0 ft.
Turning radius: 4WS, outermost wheel side	3,0 m	9.8 ft.
4WS, outermost platform part	5,0 m	16.4 ft.
2WS, outermost wheel side	5,0 m	16.4 ft.
2WS, outermost platform part	6,9 m	22.6 ft.
Oscillation angle of front axle	$\pm 10^\circ$	
Total weight with filled tanks, diesel	3130 kg	6900 lbs.
Total weight with filled tanks, petrol	3080 kg	6790 lbs.
Axle loads with platform load 80 kg (176 lbs):		
- rear axle	1390 kg	3064 lbs.
- front axle, diesel	1820 kg	4012 lbs.
- front axle, petrol	1770 kg	3902 lbs.
Driving speed:		
- slow	1,8 km/h	1.1 mph
- fast	3,6 km/h	2.2 mph
Traction force (oil temp. $-20^\circ\text{C} = +68^\circ\text{F}$):		
- slow	1270 kg	2799 lbs.
- fast	635 kg	1400 lbs.
Hill climbing capacity, slow speed range	19° (35%)	
Terrain tires, tracting pattern	10,0/75-15,3/8 pr	
Output of hydraulic pump at 3000 rpm		
- for booms	9 l/min	2.4 US.gpm
- for drive, diesel	22 l/min	5.8 US.gpm
- for drive, petrol	20 l/min	5.3 US.gpm
Hydraulic pressure: lower turntable and booms	230 bar	3336 psi
driving motors and outriggers	250 bar	3626 psi
Construction of hydraulic pump:		
- axial, adjustable-displacement piston pump		
Volume of hydraulic oil tank	69 l	18 US.gal.
Volume of fuel tank	69 l	18 US.gal.

Combustion motors:

Petrol/gas operated Kohler Command 20

Diesel HATZ SILENT PACK 1D 80C

Diesel Kubota D722-E

KOHLER COMMAND 20

Output, rotation speed of motor 3600 rpm

14,9 kW (20 hp)

Max. rotation speed of motor:

- limited by the manufacturer to 3000 rpm

Max. torque 2500 rpm

32 Nm (23 lbft.)

Fuel, unleaded 95E or liquid petroleum gas (LPG)

Fuel consumption:

- rotation speed 3000 rpm, petrol

3,6-6,5 l/h (1-1,7 gph)

- rotation speed 3000 rpm, LPG

2,5-4,5 kg/h (5,5-10 lbsph)

HATZ SILENT PACK 1D80 C

Output, rotation speed of motor 3000 rpm

11,0 kW (14,7 hp)

Max. torque 1800 rpm

34,5 Nm (25 lbft.)

Fuel, light fuel oil, diesel oil ASTM D 975-1D+2D

Fuel consumption:

- rotation speed 3000 rpm

2,3-3,5 l/h (0,6-0,9 gph)

Battery

12 V 55 Ah

Operating temperature not below

-25 °C (-13 °F)

KUBOTA D722-E:

Output, rotation speed of motor 3000 rpm

15,6 kW (20,9 hp)

Max. torque 2600 rpm

40,6 Nm (31,54 lbft.)

Fuel, light fuel oil, diesel oil ASTM D 975-1D+2D

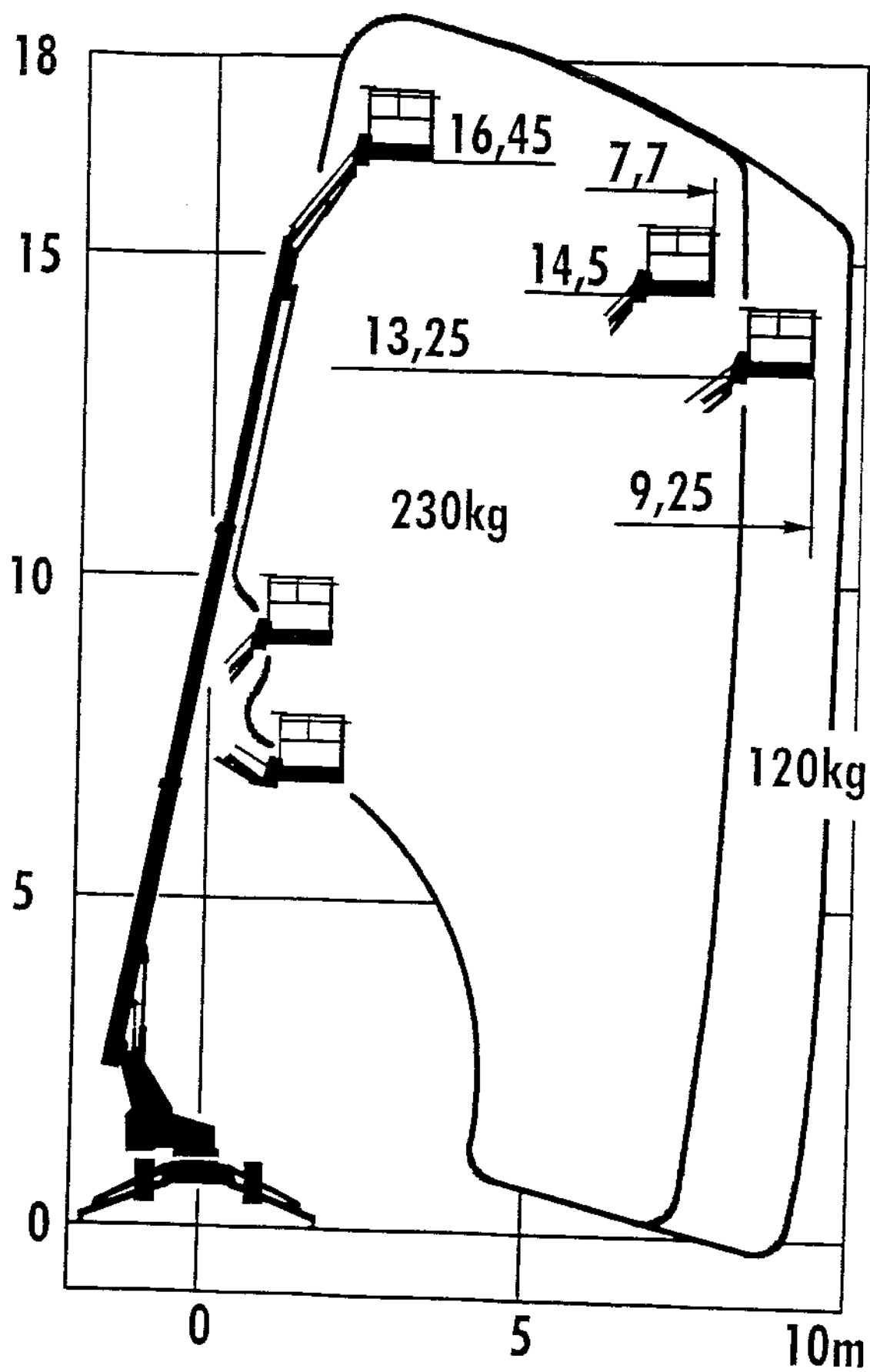
Fuel consumption:

- rotation speed 3000 rpm

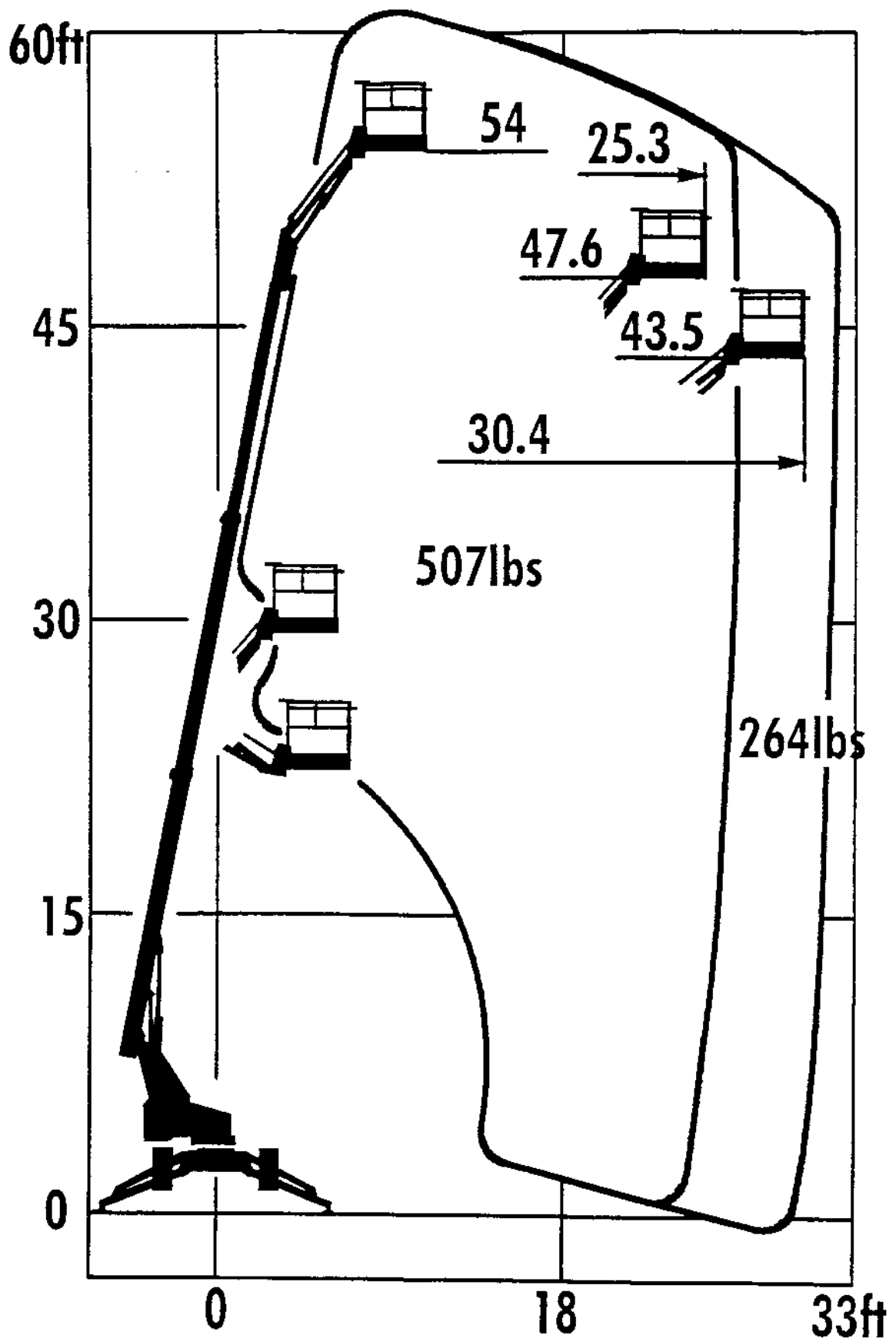
2,0-3,8 l/h (0,5-1,0 gph)

Battery

12 V 55 Ah



BOOM GEOMETRY, SL 185



6.0 GENERAL SAFETY INSTRUCTIONS



1. Read and memorize this owner's manual carefully before commissioning the MEWP. The MEWP shall never be driven by an operator not familiar with the instructions on handling and safety. Store the owner's manual in the equipment case. ALWAYS keep the manual with the MEWP.
2. The operator must be at least 18 years of age and have a reasonable operating experience of MEWPs.
3. SCANLIFT SL 185 is fitted with following fail-safe safety limit switches:
 - Support position of outriggers.
 - Guards for safe lifting radius, separately for raising functions (hydraulic), telescope (hydraulic), jib (electric) and standby switch for lifting radius (electric). Extra limit for MEWPs according to DIN 15120, second chain of telescope.
 - For stowing the booms in transport position, for raising them from horizontal position (electric) and for inclining the jib to the low position (hydraulic).
4. The auxiliary lowering system consists of an el. pump placed in front of the hydraulic oil reservoir, of the booms' control valve for ground guiding on the turntable and on the platform and of a control switch on the turntable. For detailed instructions refer to chapter 18.0 AUXILIARY LOWERING SYSTEM - OPERATION.
5. Avoid using near live electrical conductors. The minimum safe approach distance to different cables with voltage is made known on a plate on the platform.
6. Always use a yellow flashing warning light when working on streets with busy traffic. The zone shall be fenced to avoid risks. Also observe the traffic regulations.
7. When travelling the MEWP the platform shall always be supported in transport position. If the platform cannot be lowered against the transport base or the wafter, the transport support of booms shall always be used during transport.
8. Two (2) persons with tools and equipment are at most allowed on the platform at the same time, provided however that the total load does not exceed 230 kg (507 lbs).

9. The outriggers shall always be well supported when using the MEWP and if needed, extra plates under the outriggers shall be used. Make sure, that the outrigger is not slipping on the surface of the extra plate and that the extra plate withstands the weight of the outrigger. For tightness of different soil types refer to chapter 5.0.

NOTE! Even asphalt can yield.

10. When operating the MEWP, observe trouble caused by wind, rain, temperature, thunder, bad visibility and accumulated snow and ice.

11. Do not take extra load while lifting. *RISK OF TIPPING OVER!*

12. Be aware of the health risk in hot or chilly working environment.

13. Do not increase the the MEWP's wind load with extra cover boards or load thus enlarging the wind plane.

14. Any increase in reach or working height of the platform by using planks, ladders or any other device is prohibited. Do not jump on or swing with the platform.

15. Do not throw down objects from the platform and make sure, that nothing can fall down.

16. Use ear mufflers when operating the MEWP from the ground guiding place, because the sound intensity exceeds 84 db (A). When using the MEWP from the platform the sound intensity will be less than 84 db (A) and the use of mufflers is not obligatory.

17. Always when you operate indoors or in a place with poor ventilation the engine shall only be used for moving the MEWP. Try to intensify the ventilation. *RISK OF INTOXICATION!*

18. Misuse of the MEWP as a crane for transporting goods or persons between different levels or floors is prohibited.

19. Do not ever deactivate the safety device, but repair it or have it repaired by a competent maintenance shop before re-use.

20. Ensure that the area below boom and platform are clear of all personnel and obstruction before lowering the platform.

21. To ensure the safe and trouble-free function of the MEWP, keep it free from snow, ice and other impurities.

22. Be very careful when handling fuels, lubricating and hydraulic oils as well as the lubricating greases of the MEWP. Avoid skin contact with them. *RISK OF EXPOSURE!*

23. Always shut off the MEWP's engine when filling the fuel tank. Beware of splashes. *RISK OF FIRE!*

24. Check and maintain the MEWP regularly or let a maintenance shop, familiar with mobile elevating work platforms, carry out the service and repair works.

25. Do not cause any alteration of the MEWP construction without permission and instruction of the manufacturer.

26. Do not ever open the filling hole of the cooling system, if the engine is warm. RISK OF ACCIDENT!

27. Daily pre-start checks:

- Check the function of outrigger safety limits by using the outriggers in support position (with the wheels above the ground). After engagement and when all four horizontal indicator lights are on, the booms can be operated.

- Drive out the telescope boom with the jib extended straight out and with the boom at horizontal with the ground. Ensure that the platform is absolutely empty during the test. The telescope stops, when the pointed mark of the middle boom becomes visible. So the limiter of the telescope lifting radius is checked.

Analogously check the function of the lifting radius limiter located in the lifting cylinder as follows: raise the platform about 3 m (10 ft.) upwards and extend the telescope about 0,5 m (1,6 ft.). Lower the boom until the limiter of the lifting radius breaks the lowering movement. Check that the lifting radius, which has been reached before the painted mark, has not been exceeded when measuring from the turning centre to the utmost edge of the platform, on ground level. Standing outside the platform, the lifting radius limiter of the jib is checked in the same way by lowering the platform with the jib cylinder almost to the low position and by extending the boom at horizontal about 0,5 m (1,6 ft.). The platform is then straightened with the jib cylinder to the safe lifting radius, measured from the centre of the slew mechanism. Safe lifting radii for different loads are given in the users manual, chapter 5.0 BOOM GEOMETRY. Depending on ways of measuring a certain inaccuracy will occur in the safety limit functions, but exceedings of the lifting radius may not surpass 35 cm (1,1 ft.). If the safe lifting radii are exceeded or not reached, an authorized service workshop must immediately be contacted to have the safety limits adjusted to their correct values. Refer to the user's manual, chapter 13.0 PROCEDURES BEFORE TAKING THE MEWP INTO USE for more information on this.

- Always make an pre-start check of the hydraulic oil, motoroil and fuel quantities.

- Make a pre-start visual inspection of booms, stabilizer arms, hydraulic hoses, cylinders, outriggers, cylinder brackets and chassis. Any malfunctions must be repaired prior to starting the MEWP.

28. Check the function of the standby safety limit for load control RK 10 every week (refer to checking instructions, item 13.5).

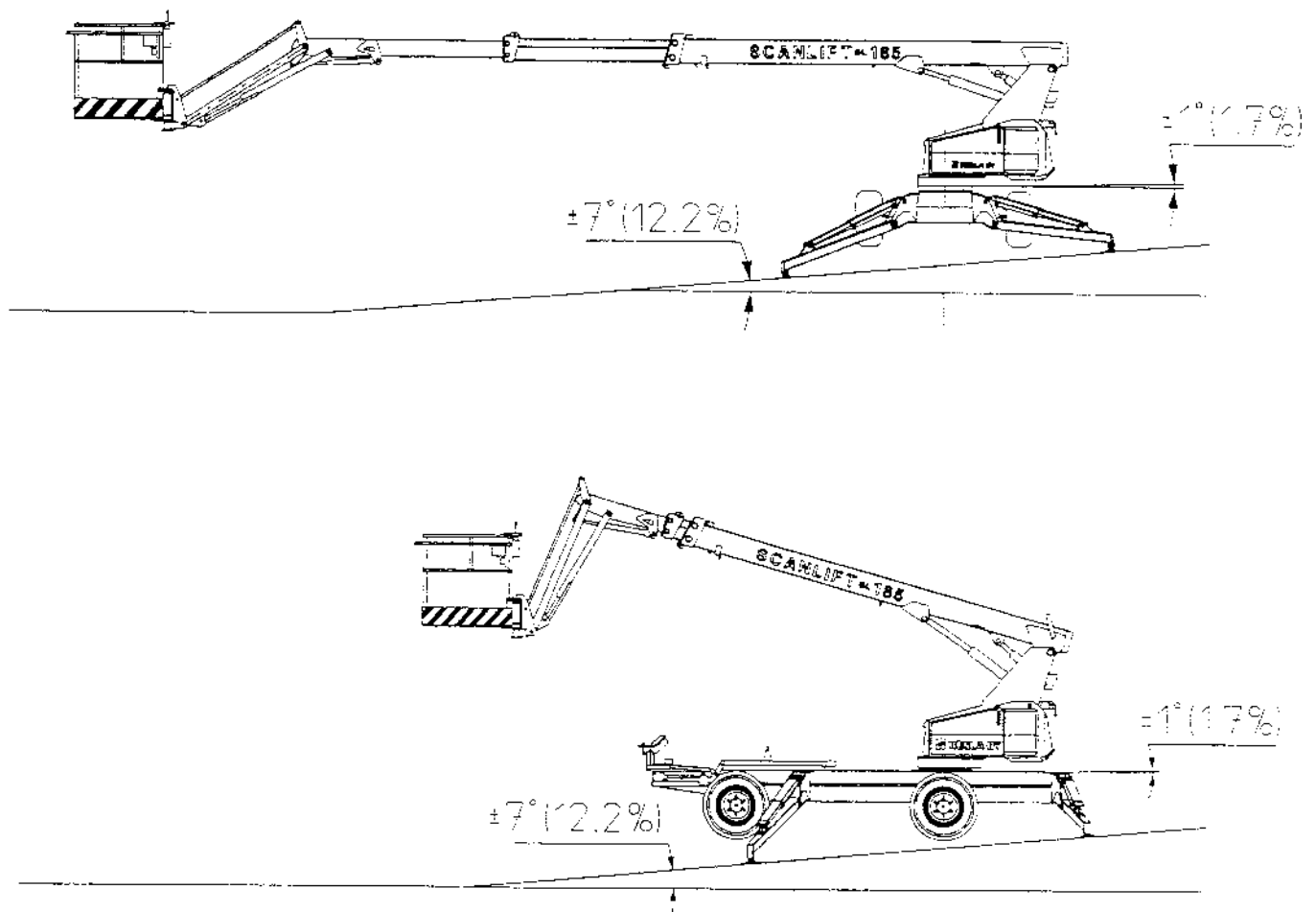
29. The owner of the MEWP shall cause an thorough annual inspection to be performed on the MEWP no later than twelve (12) months from the prior annual inspection and if conditions are hard, even in a shorter time. This inspection shall be performed by a person(s) qualified as a mechanic on this specific make and model of MEWP. The dated record of this inspection shall

always be retained with the MEWP, eg stored in the equipment case, and a second copy in retention of the owner. A model record form is enclosed to this manual.

The re-inspection shall be performed every twelve (12) month, and during the same calendar month as the initial pre-delivery inspection at the factory. Hard conditions, welding of the supporting constructions or any other special reason are making an earlier re-inspection of the MEWP indispensable. Any alteration with eventual safety consequences shall be especially considered, when re-inspecting the construction of the raising equipment, the safety and the general condition. Alterations and repairs, their location on the MEWP and identification of the person(s) involved shall, respectively dated, be entered into inspection records. Keep abreast of the development in the field, check for any retroactive amendment of laws and decrees since the last inspection and take eventual alterations into consideration when re-inspecting. Prior to repairs or alterations of supporting constructions the manufacturer or his authorized representative shall always be contacted.

30. When leaving, always drive the MEWP out of way. Put the booms and outriggers in transport position. As protection against unauthorized use cut the motor, remove the ignition keys from both the platform and the control panel of ground guiding and switch off the main current. Remove all keys and keep them always together on one key ring, also during use.

6.1 MAXIMUM SLOPE



VAROITUS! VARMISTU, ETTÄ KOSTIN EI PÄÄSE LIUKUMAAN KALTEVALLA ALUSTALLA

WARNING! BE SURE THAT MEWP DOESN'T SLIDE WHEN ON ERECTION POSITION.

7.0. DESCRIPTION OF CONTROLS

All controls of SCANLIFT SL 185 are hydraulic except for the electric safety limits. Also the raising safety limits of the telescope and of the booms as well as the lowering safety limits of the jib are hydraulically operated. The speed of movements can be steplessly adjusted with the hydraulic controls.

8.0. CONTROLS ON CHASSIS

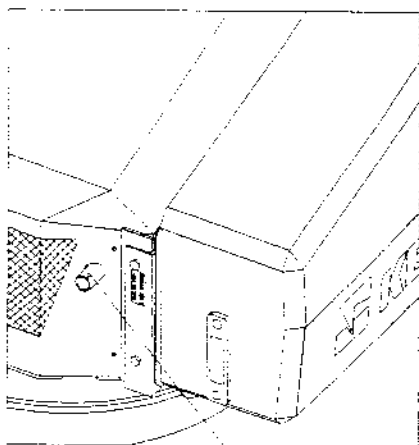
1. The hydraulic change valve 1 for platform/ground guiding is located at the rear edge of the turntable. By using eg a screwdriver as a control key, guiding can be chosen either for the control valve for ground guiding (guiding from the ground) or for the control valve for the booms located on the platform. Both guidings cannot be used at the same time. Only the emergency lowering system is positively guided, independently of choice.

2. The control valve 2 for ground guiding is located on the turntable, above the motor. With outriggers in support position, the current on from below, the motor running and the selector switch from below in guiding position GROUND, it is possible to slew, raise and telescope the boom according to the symbol scheme 3 of drawing, by using the control valve for ground guiding. Also the emergency lowering system functions with this same control valve for ground guiding.

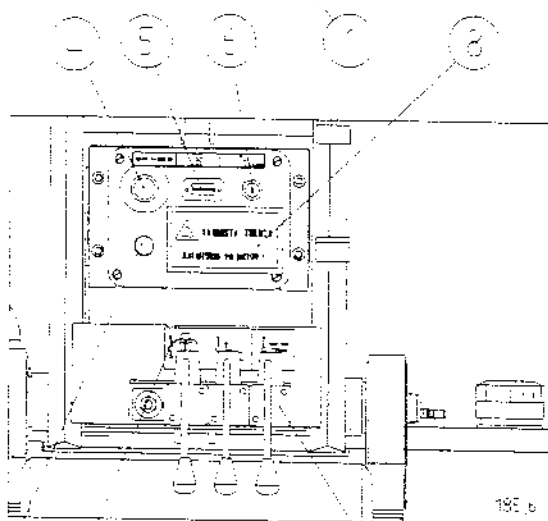
3. The electric controls for ground guiding consist of EMERGENCY STOP push-button 4, operating hour meter 5, ignition lock 6, control switch of the for the pump for auxiliary lowering and support 11, warning plate 8. When the boom is operated from ground, the current must be on from below and the hydraulic change valve 1 for platform/ground guiding in position GROUND. When operating from platform, the ignition key must be removed from below and put in the ignition lock on the platform. The hydraulic change valve 1 must be in position PLATFORM. For more exact locations refer to the drawing

4. The electric controls for ground guiding of the diesel version consist of EMERGENCY STOP push-button 4, hour meter 5, ignition lock 6, glow indicator 7, charge signal light 8, oil pressure signal light 9 and the signal light for the overheating of the coolant 10 (Kubota engine).

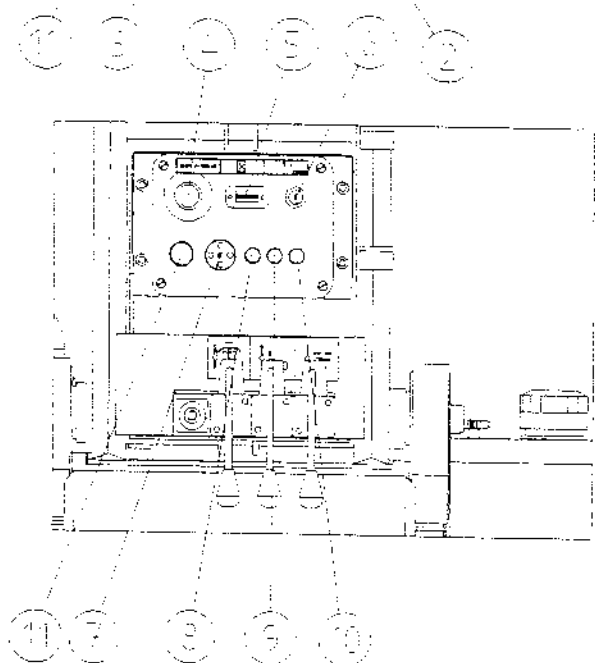
8.0. CONTROLS ON CHASSIS



Location of hydraulic change valve for platform/ground guiding of booms



Controls on chassis of MEWP with petrol motor



Controls on chassis of MEWP with diesel motor

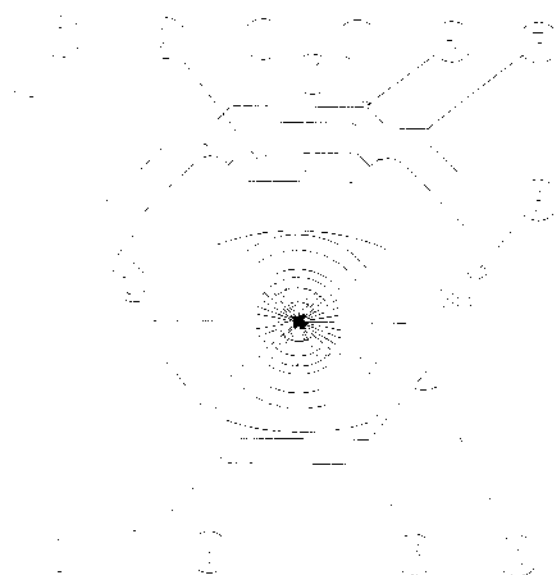
9.0. COMBUSTION ENGINES

Depending on model, the combustion engine is either a Kohler C 20 petrol/gas engine or a Hatz Silent Pack 1D80 C diesel engine.

The max. engine rpm's have been adjusted by the manufacturer to 3000 rpm, which should not be exceeded. The operator can of course reduce the speed of rotation, thus saving fuel, lowering the noise level and prolonging the life of the motor. The max. engine rpm's are needed, when driving in poor shaped terrain. Anyhow, the speed of rotation should not drop below 1500 rpm. Due to the adjustable-displacement hydraulic pump the speed of the boom movements does not change, even if the engine rpm's have been adjusted. In freezing conditions, about -5°C ($+23^{\circ}\text{F}$) or colder, the use of a cold starter to start the engine is recommended. The Hatz diesel engine has an automatic forced feed stopped by the oil pressure of the engine and a glow plug functioning from the ignition lock.

The principal controls of the Command 20 petrol/gas engines:

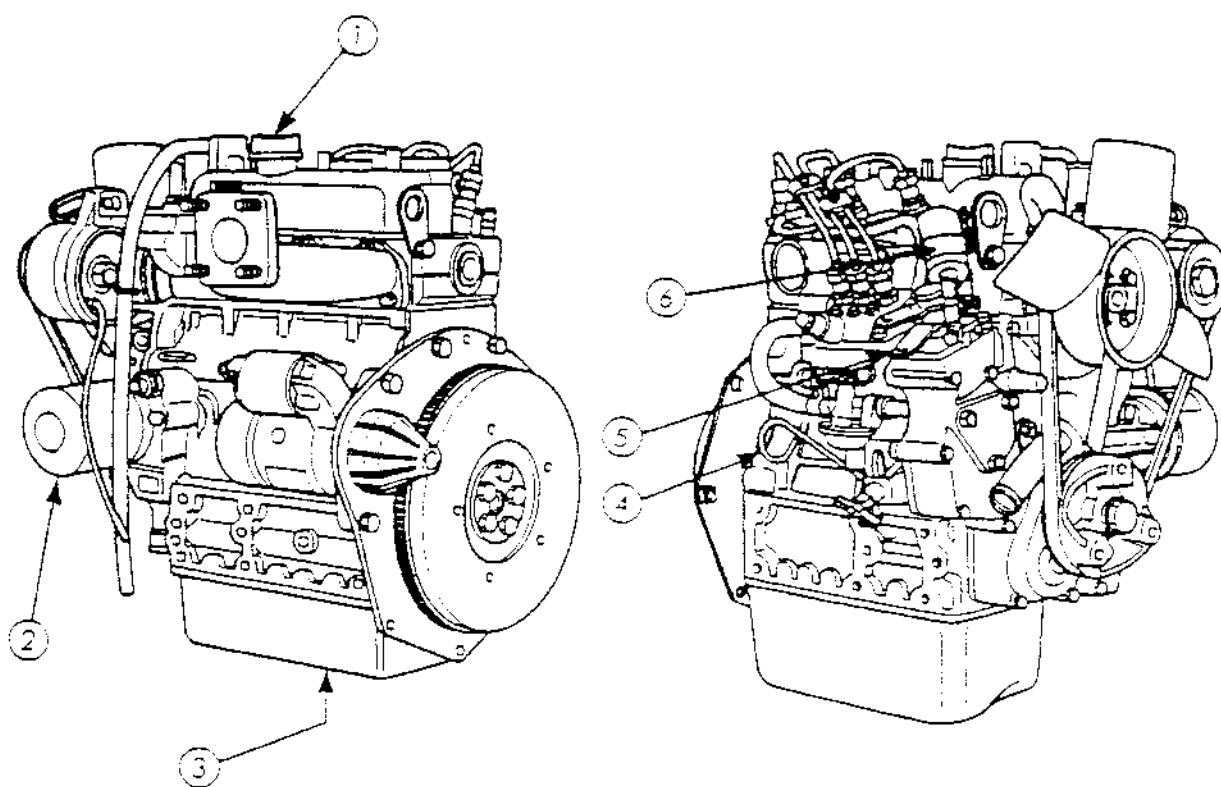
Kohler Command 20



1. Adjusting the speed of rotation
2. Choke
3. Plugs
4. Air filter and carburator
5. Suction strainer for cool. air
6. Dipstick for engine oil
7. Filling cap for engine oil
8. Bleeding tap for engine oil
9. Engine oil filter
10. El. starter
11. Measuring probe for engine oil pressure

Note! Remove the hood when air temperature is $+20^{\circ}\text{C}$ ($+68^{\circ}\text{F}$) or higher so the engine do not over heat.

The principal controls of Kubota D722-E diesel engine:

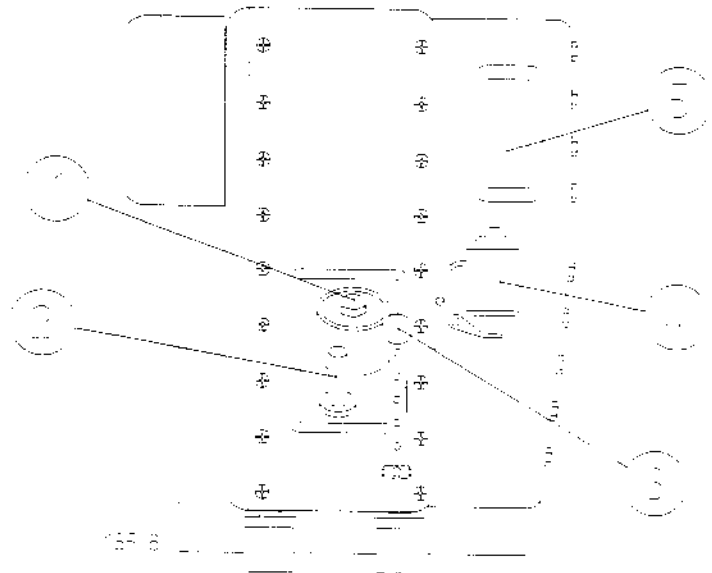


1. Filling cap for engine oil
2. Engine oil filter
3. Bleeding tap for engine oil
4. Oil dipstick
5. Adjusting the speed of rotation
6. Stop solenoid

The principal controls of Hatz Silent Pack 1D80 C diesel engine:

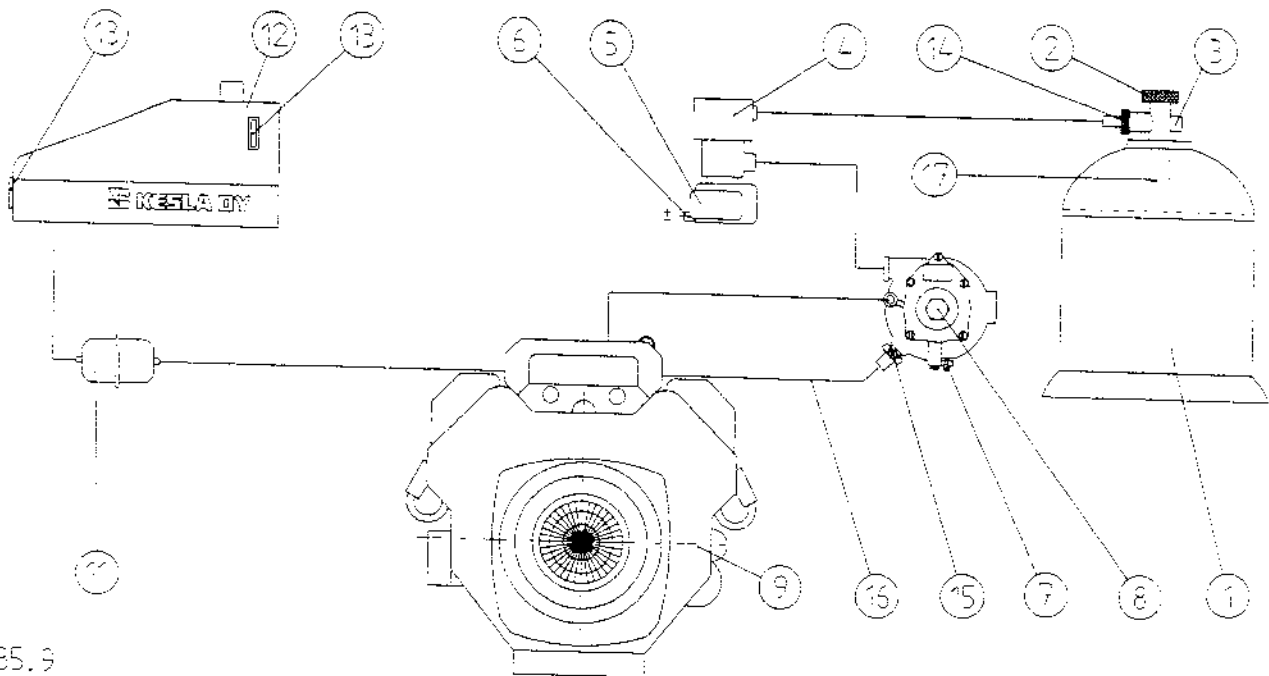
The Hatz Silent Pack 1D80 C is fitted with a complete sound insulating encasing, which effectively prevents the disturbing influence of the engine noise. All controls are concentrated to the same side of the engine. Also the oil dipstick, the filling pipe and the engine oil filter are on the same side.

1. The engine oil filling pipe and filter
2. Oil dipstick
3. Adjusting the speed of rotation
4. Stop solenoid
5. Suction hole for cooling air



1. The speed of rotation is adjusted with the lever on the side of the engine.
2. The start is secured by the automatic forced feed which goes off, when the oil pressure in the engine has risen.
3. The glowing is done with the ignition key in pos. 2 before starting (only from the ground box).
4. The engine stops by turning the ignition key to 0-position.
- Ignition locks are placed both in the electric control box for ground guiding (by steering from ground) and in the electric control box for booms on the platform.
5. The diesel engine is fitted with an automatic air bleeding system. When running out of fuel and when starting with new fuel, do not overheat the starting motor by starting the engine continuously for a too long period. Before trying to start the fuel system must be filled with new fuel up to the injection pump.
6. Always when restarting the diesel engine make sure that the red flashing light at the base of the lifting cylinder is blinking. If restarting before the motor has completely stopped, the electric drive gear of the starting motor will probably be damaged

10.0 OPERATING THE GAS DEVICE



185.9

- | | |
|--|--|
| 1. Standard LPG holder
- small LPG gas holder 11 kg (24 lbs) | 7. Idling regulator screw |
| 2. Turnable closing cock | 8. LPG device |
| 3. Relief guard (always with the holder) | 9. Combustion engine (petrol) |
| 4. Fine filter | 11. Petrol filter |
| 5. Solenoid valve for gas | 12. Petrol tank |
| 6. Solenoid valve 12 V, guided from platform
with control switch and together from the motor
oil pressure with relay | 13. Glass gauge for fuel quantity |
| | 14. Holder adapter VMT9/16-18JIC |
| | 15. Power regulator screw |
| | 16. Feeding hose for gas |
| | 17. Equipment for LPG gas holder (Gas
is taken vaporous from holder.) |

10.1 Starting with gas

Gasoline drive has been used previously.

Turn the gas/gasoline selector switch from position 2 (gasoline) to position 1 (gas). In the middle position 0 the engine will get no fuel.

The engine might run irregularly for a while after engaging the gas drive. Wait until the engine runs smoothly before you load it.

Stopping

Shut off the power. If the engine will be out of operation for a longer period, close the closing cock 2 of the gas holder.

10.2 Principle of operation

The LPG is taken from a gas holder which is in an vertical position. The gas is taken vaporous, but with a holder pressure for the gas device. Check the tightness of the adapters. When opening the closing cock 2 of the LPG holder and turning the selector switch for gas drive on the platform into position GAS 1 and when the engine oil pressure has risen, vaporous LPG will flow to the fine filter 4 and from there via the power regulator 15 to the gas device 8. The primary side of the gas device acts as a pressure regulator.

When starting the engine, a vacuum will occur in the inlet manifold sucking gas into the engine via the feeding hose for gas 16. Behind the big membrane of the secondary side the air pressure is normal and inside a vacuum occurs, which corresponds to that of the running motor.

Consequently the membrane moves inwards and opens the secondary valve.

When the carburator flap is further opened (when the engine output is increased), the vacuum on the secondary side increases. This increases the movement of the membrane, the secondary valve opens up more and the flowing gas quantity increases.

The power range of the gas quantity feeded into the engine is regulated with screw 15 and the idling analogously with screw 7. The easiest and most precise way of regulating is the use of an exhaust gas analyzer. For the ratings refer to the table below. According to information of the Kohler engine manufacturer the CO-values of the exhaust gases are about 8 %, when loaded with different rpm's. In gas drive the power drop is about 10 % compared with petrol drive.

Engine outlet of the gas device - deliverer's recommendation

Reading	Full power	Partial power	Idling
in petrol scale	13,0	14,0-14,5	13,2
in LPG scale	14,4	15,1-15,6	14,4
in power scale	84,0	90,0-94,0	85,0

If an analyzer like this is not available, the regulation can be carried out as follows:

- First run the engine warm. The engine is loaded with the hydraulic pump mentioned above and at full throttle. The power regulator screw 15 is tightened until the revs drop.
- Open the screw carefully until the engine reaches full revs and then lock the regulator screw.
- The idling mixture can analogously be regulated with the idling regulator screw 7. Regulate for idling and without loading the engine.
- The screw is tightened until the engine rpm's drop. Then the regulator screw is opened until the engine runs cleanly, which means that the regulation is in order.

10.4 Operating troubles in gas drive

Starting troubles

- The battery is underpowered. To ignite LPG needs a stronger spark than petrol. When the starting motor is rotating the motor, the jumping space in the air of the spark must be 3 mm (0,118 in) in battery ignition. Check the ignition carefully as in case of petrol engine.
- Due to slower combustion speed the ignition advance must be longer than in case of petrol engine.
- The lubricating oil is too thick. Because the combustion residues of LPG are cleaner than those of petrol, the oil will not become thinner during use. Therefore a thinner and more cold resistant oil must be used than for petrol drive.
- Idling leakage in hoses, in the inlet manifold or the carburator
- Check and adjust the gas regulator according to instructions in chapter 10.5.
- The gas holder is empty.
- The idling mixture is too weak.

Idling troubles

- The idling is misadjusted. The idling screw must have enough of extra adjustment space, so that the mixture can be adjusted to either too rich or too weak. Rich adjustment is recommended.
- The ignition has been adjusted to either too early or very late. The adjustment of the ignition is fixed - do not change it!
- Air leakage in the system.
- The petrol valve does not completely close off the petrol flow.
- Check and adjust the gas regulator according to chapter 10.5.

Fume in the system

- There is fume in the gas regulator. The motor has been overloaded immediately after starting.

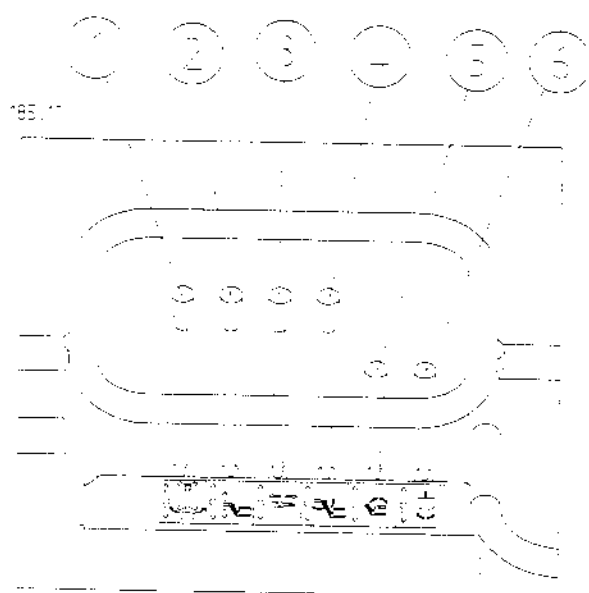
10.5 General

- According to recommendation one grade colder plugs must be used in a LPG motor than in petrol drive.
- The oil bath filter must, according to recommendation, be filled with a thicker oil than in petrol drive.
- The inlet manifold heating device fitted in the exhaust manifold must be disconnected in LPG drive.
- The Kohler Command 20 petrol/gas motor has a fixed electronic ignition system. Any possible adjustment of the ignition advance must be carried out by Kohler's service experts.

11.0 CONTROLS ON PLATFORM

SCANLIFT SL 185 can be completely driven and controlled from the platform. Below the control device functions are described, seen from the driving direction, from control valve for the booms on the left to the drive/outrigger valve on the right.

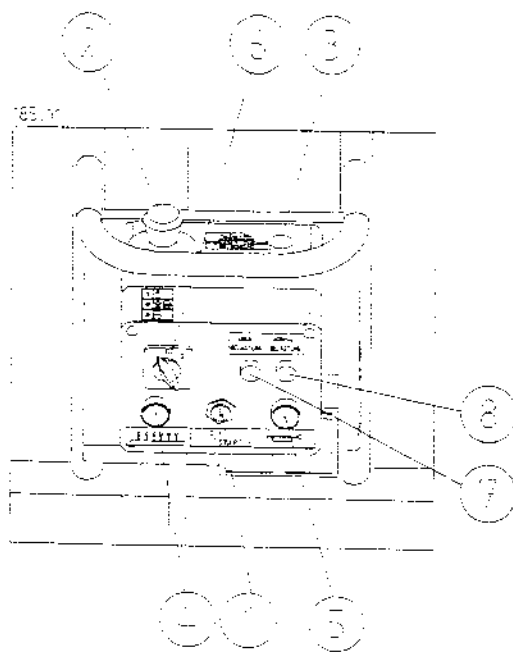
1. Control valve for the booms



Control levers from left to right:

1. Slewing of booms
2. Raising/lowering the booms
3. Telescope in/out
4. Raising/lowering the jib
5. Horizontal adjust. of platform
6. Slewing of platform

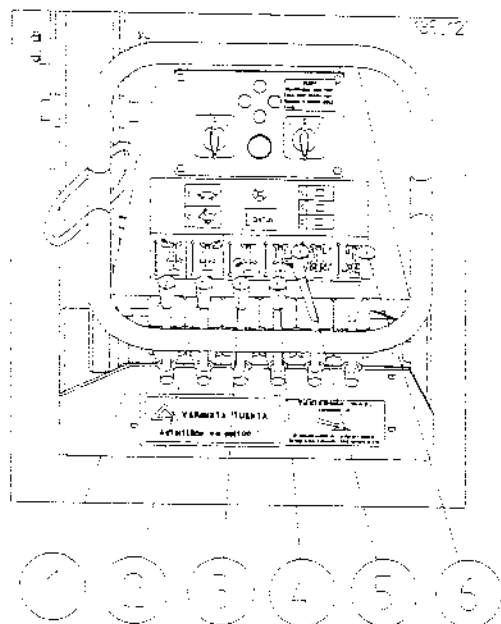
11.2 The electric controls and switch boxes for supply current



1. Ignition lock
2. EMERGENCY STOP
3. Push-button of auxiliary lowering pump
4. Control push-button for steering arm and support
5. Push-button for sound signal
5. Push-button for sound signal
6. Change-over switch for fuel: 1=LPG, 0=0, 2=PETROL (SL 185B)
7. Signal light for normal load (green)
8. Signal light for overload (red)

12.0. DRIVE/OUTRIGGER VALVES

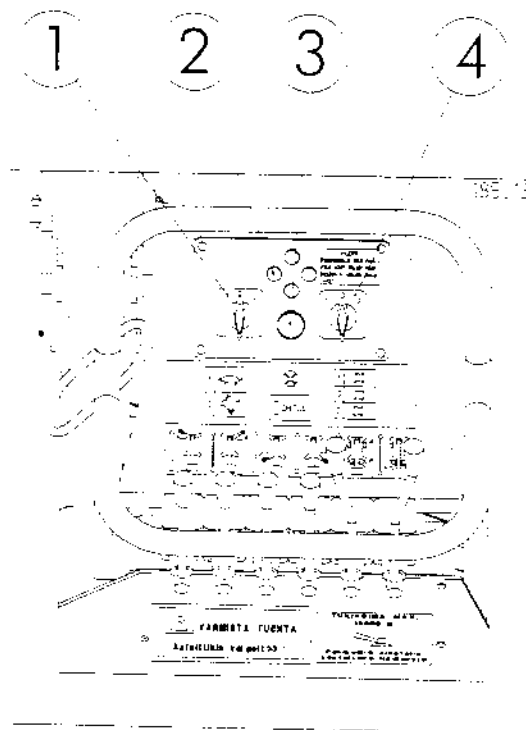
Control levers and function from left to right.



1. Front/left outrigger up/down
2. Front/right outrigger up/down
3. Rear/left outrigger up/down
4. Rear/right outrigger up/down
5. Drive forward/reverse
6. Steering right/left

12.1 The electric control box of drive/outrigger valve

Functions from left to right.



1. Select. switch fast driving 0, slow driving 1
2. Shunt switch, by-passes the limit switches of outriggers, for moving the booms
3. Indicator for horizontal level of support
4. Select. switch
4WS 1
rear wheel steering 0
diagonal steering 2

When the selector switches 1 and 4 are in 0-position, there is no current in their electric coils. The switches must always be left in 0-position after shifting the MEWP. Turn the ignition key into 0- position, if you are cutting the engine. This prevents the battery from going dead unnecessarily.

13.0. PROCEDURES BEFORE TAKING THE MEWP INTO USE

Before using the MEWP or at least once a day check following;

13.1. Check and add, if needed

- motor oil quantity
- hydraulic oil quantity
- fuel quantity
- oil leakages of hydraulics - repair, if needed!
- condition of hydraulic hoses
- tire pressure
- make a visual check of the bolted joints and supporting structures - DO NOT USE A FAULTY MEWP!

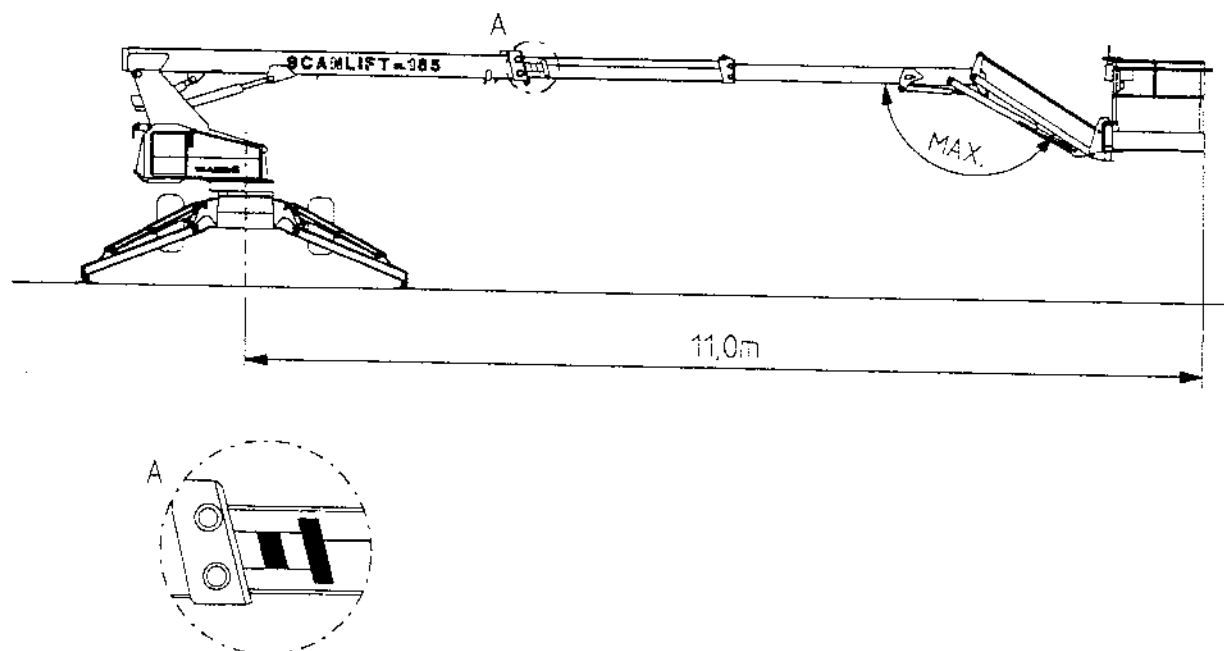
13.2. Testing the safety limits

- Check the function of the outrigger safety limits by trying to move the boom with outriggers up. The booms do not move, if the safety limits are in order. The connection point is reached, when the outrigger has exceeded the horizontal level with 4 degrees, from above towards the support position.
- The outrigger safety limits allow using the booms only, when these are in support position. With the shunt switch in the electric control box of the drive/outrigger valves, the outrigger safety limits can be by-passed for moving the booms during drive.
- The light indicator in the electric control box of the drive/-outrigger valves indicates that the MEWP is correctly supported, when all four lights are on (+ 0,5 - 1,0 degree).

13.3 Check of safe lifting radius



- The limiter of the lifting radius is functioning totally dependent of the platform load and is activated, if the platform load is too heavy from the very beginning, if the telescope or the jib are too far extended or if the raising movement has gone down to the limit. Compare with BOOM GEOMETRY chapter 5.0.

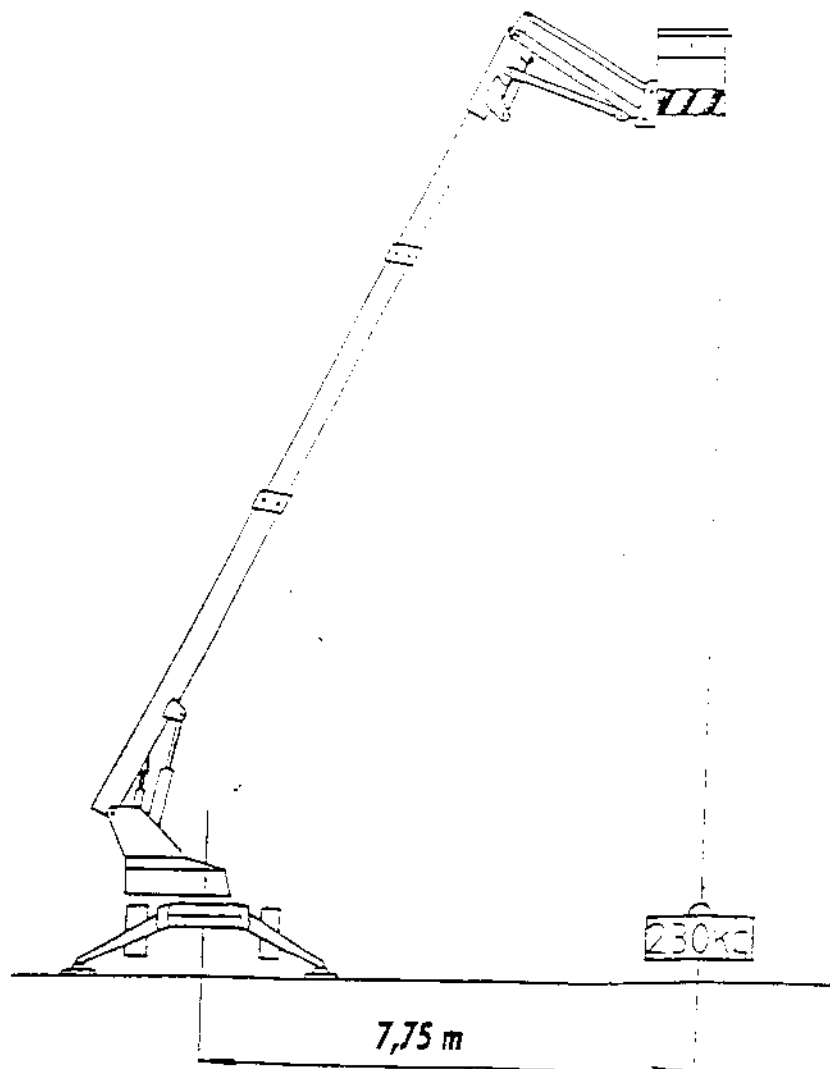


- Check the function of the safety limits of the lifting radius as follows; drive the emptied platform by using the telescope cylinder with a continuous movement and with the jib straight extended, to the painted mark (point A) of the middle boom so, that the booms are at horizontal with the ground. This is the way to find out the function of the safety limit of telescoping and at the same

time the safe lifting radius of the empty platform and the extended jib. The safe lifting radius from the turning centre to the brim of the platform is 11,0 m (36,1 ft).

- The function of the safety limit of raising is checked in the same way by raising the booms to an about 20 degrees angle, and by extending the telescope about 20 cm (8 in) and lowering the boom down to the safety limit. The safety limit will stop the boom at the corresponding safe lifting radius as in case of telescoping. The distance from the slewing centre along the ground to the outmost brim of the platform is 11,0 m (36,1 ft).

- Check the function of the safety limit of the jib boom in the same way by folding down the jib boom almost to the ground, making sure that the safety limit of the stabilizer arms of the jib boom does not close. Then further raise the booms to an angle of about 20 degrees. Now extend the booms with the telescope about 70 cm (2 ft) outwards from the painted mark. Then straighten out the jib boom so far, that the safety limit of the jib boom breaks the movement. The safe lifting radius, measured from the outer brim of the platform to the middle of the slewing centre, is the same as in the cases above. For more exact safe lifting radius refer to separate drawing. The values of the safe lifting radius for platform loads of 120 kg and 230 kg (265 and 507 lbs) are described in chapter 5.0 BOOM GEOMETRY. The adjusting screws for the load control have been sealed with painted marks.



- Along with the hydraulic load control an electric safety limit has been adjusted further out, that is for a greater lifting radius. This limit breaks all movements and is activated, when the hydraulic safety limit is not correctly adjusted or faulty.

The el. extra safety limit is not active in normal conditions. When this safety limit has reacted, the booms must be brought back to normal operating range by using the emergency lowering system. Risk for tipping over does not exist even inside the operating range of the extra safety limit.

- Do not add load to the platform, when the movements of the booms have stopped after the limiter of the lifting radius has intercepted the movements of the boom. Extra load would cause a risk of tipping over and a large extra load could cause overloading of the booms.

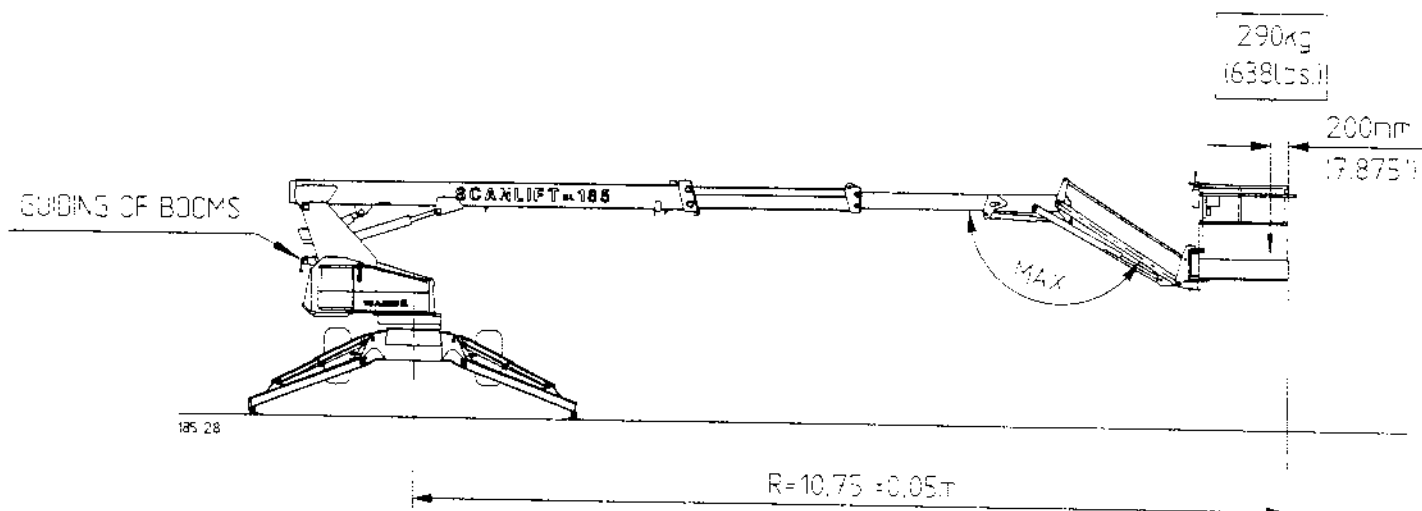
- Do not use the MEWP, if the safety limits or the limiters of the lifting radius are not working. If you are not familiar enough with the maintenance of MEWPs, you have to contact an expert. It is prohibited to shunt the safety device for even a minor job.

- Check, with the booms and the jib slightly raised and the telescope slightly extended, that no movement is 'creeping', that is that the platform does not move downwards, when the control levers are in middle position. Load the platform with a proper extra load during the test. The creeping must be repaired before starting to work.

13.4 Function of the el. standby safety limit

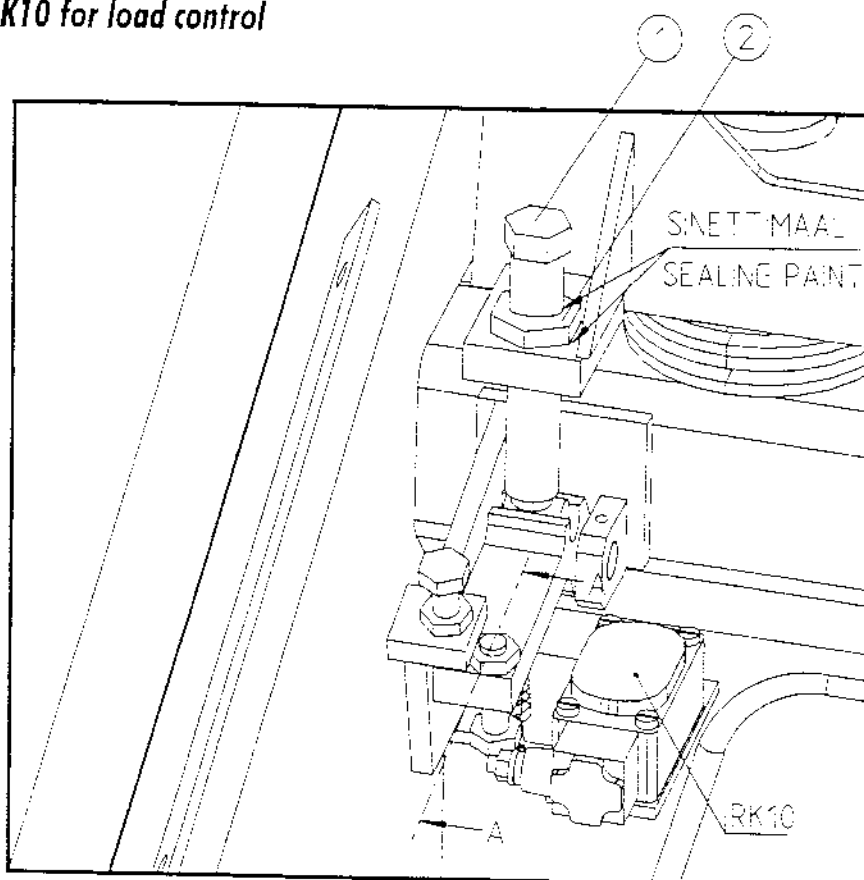
Location according to drawing 1: The actual safety limit switches, the raising, telescope and jib function are located at the right edge of the super structure and they are marked with no 7. The standby safety limit is no 8.

13.5 Check / adjustment of load control safety limit RK10

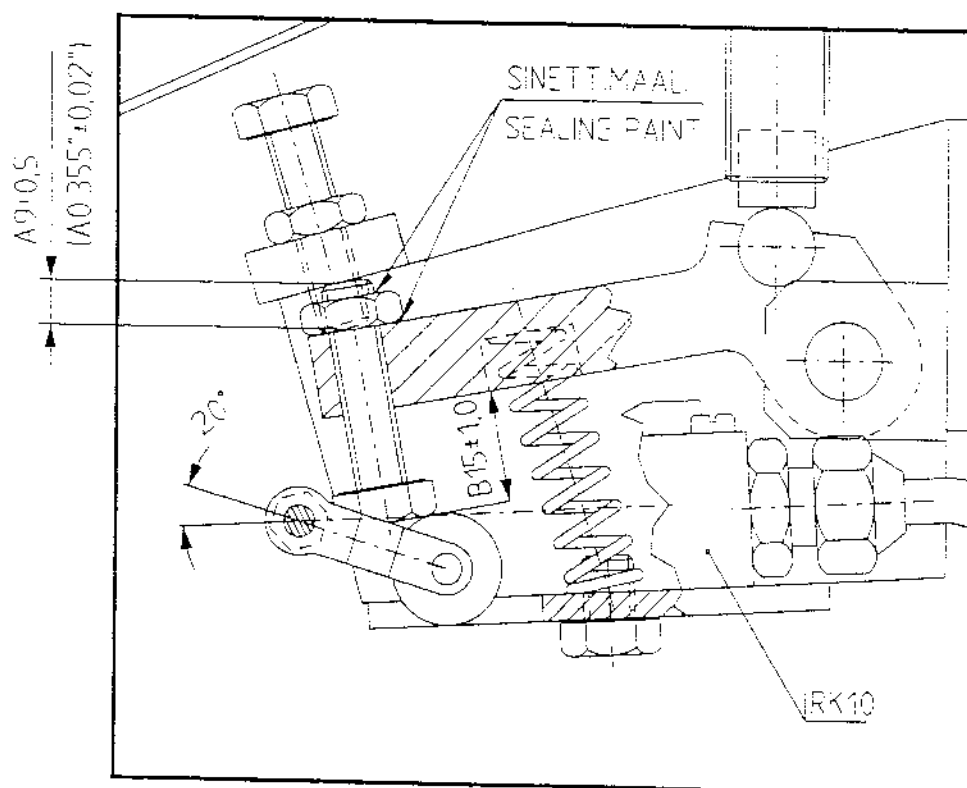


1. Support the MEWP on outriggers (platform empty) with boom horizontal and jib totally out (refer to pict.)
2. Check lenght A = $9,0 \pm 0,5$ mm ($0,355 \pm 0,02$ in.) and lenght B = 15 ± 1 mm ($0,59 \pm 0,04$ in.) and the roller shaft angle = 20° downwards from horizontal level of limit switch (pict. 13.6 SAFETY LIMIT RK 10 OF LOAD CONTROL)
3. Extend the booms to lenght R = 10,75 m (35,2 ft.). Boom guidanse from turntable.
4. Cautiously add a 290 kg (638 lbs) load on platform (refer to pict.)
5. Tighten cautiously screw 1 thus triggering limit switch RK10 and stopping the combustion motor. Lock nut 2.
6. Unladen the platform.
7. Trim limit switch RK10 according to instructions 37.0 and then you can start the combustion motor.
8. Seal targets 1 and 2 (pict. 13.6) with sealing paint marked "KESLA".

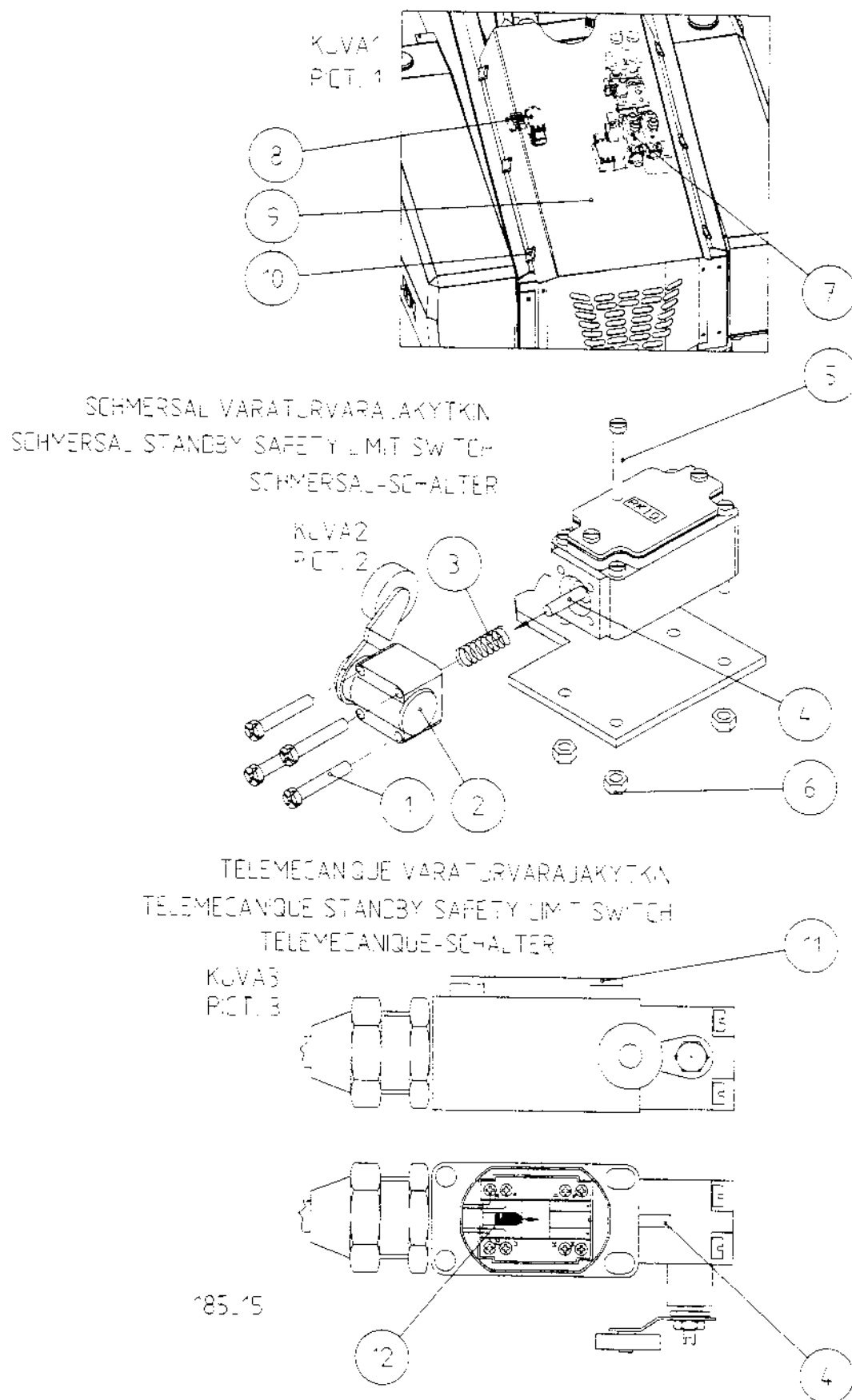
13.6 Safety limit RK10 for load control



LEIKKAUS A-A
PROFILE A-A



13.7 Trimming safety limit RK10



13.7 Trimming safety limit RK10

When the actual safety limit switches get out of order or the safe loading of the booms, that is the safe lifting radius, is exceeded because of a swing of the boom due to an external overload, the standby safety limit will release and cut the combustion motor. Only the emergency lowering system will work.

In a state of overload the spindle 4 of the standby safety limit switch RK 10 will retract. Please observe that the MEWP can be equipped with either a Schmersal- or a Telemecanique switch.

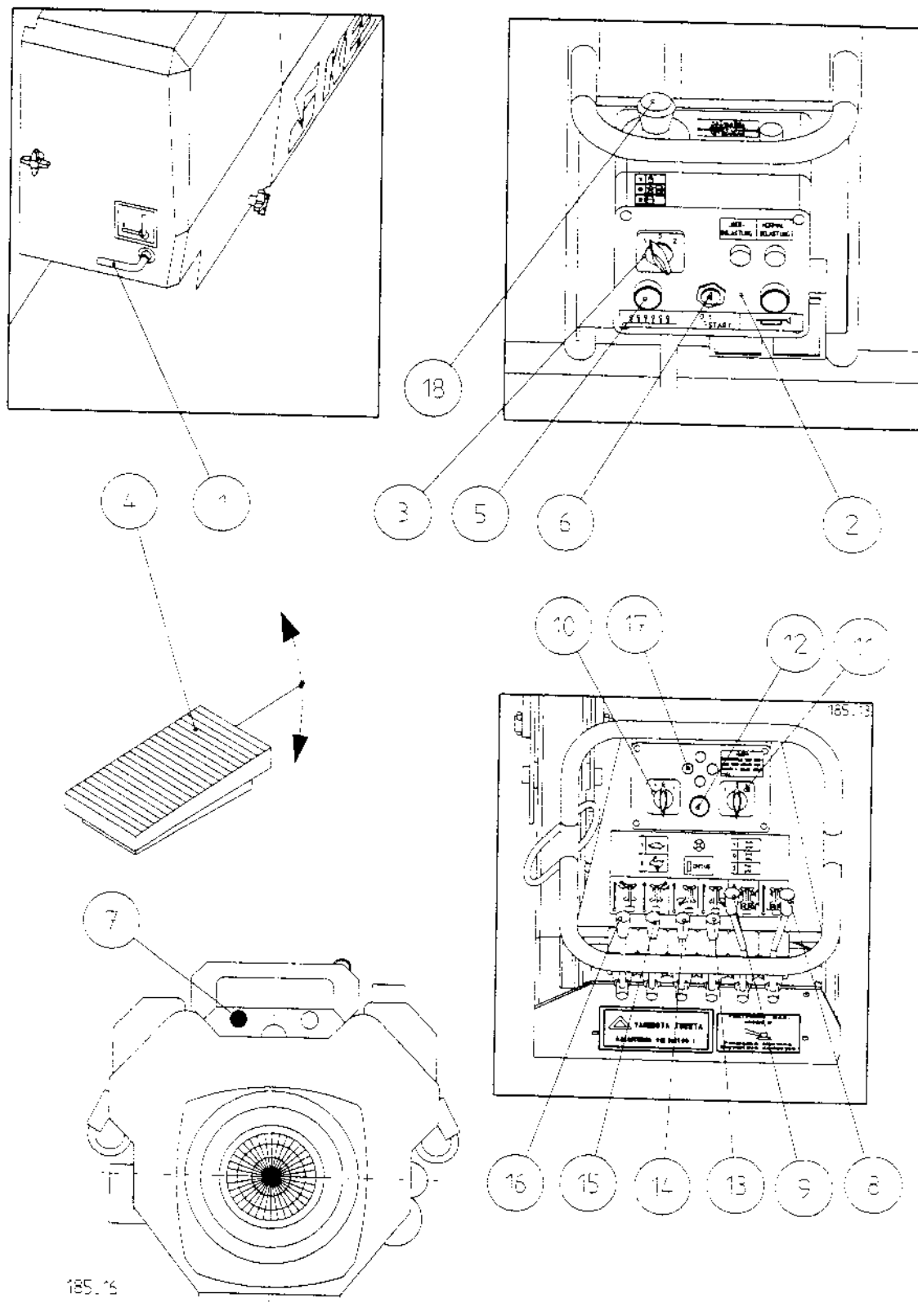
Repairing measures of a released standby safety limit -Schmersal switch

1. Lower the platform to the ground by using the emergency lowering system, if there is personnel on the platform, when the standby switch has been active. Annul the state of overload by using the emergency lowering system. Investigate and repair or let repair the malfunction, which has caused the release of the standby safety limit.
2. Open the top cover 9 of the turntable by opening the 6 knurled-head screws 10 and remove the cover.
3. Open the 4 bolts 5 and lift the standby safety limit switch.
4. Open the 4 screws 1 and pull out the cover 2. Do not lose the spring 3.
5. Pull the spindle 4 carefully outwards so that it will click slightly. If the spindle becomes detached, reassemble it properly and make sure that the spindle 4 will stay in its outer position.
6. Put the spring 3 back and press the roll cover 2 in its place. Hold it there until the screws 1 are tightened. If the spindle 4 should release due to carelessness, the roll cover has to be reopened.
7. Fix the standby safety limit switch in its place with the bolts 5 and nuts 6.

Repairing measures of a released standby safety limit -Telemecanique switch

1. Use the emergency lowering system to bring the platform load to the safe lifting radius and lower the platform to the ground.
2. Open the top cover 9 of the turntable by opening the 6 knurled-head screws 10 and remove the cover.
3. Open the top cover 11 of the standby safety limit switch RK 10 and trim the spindle 4 into operating state by pushing the spindle in the direction of the arrow from the hole 12. After the click the spindle will stay in trimmed state.
4. Close the cover 11 of the standby safety limit and put the top cover 9 in its place. Tighten the knurledhead screws 10.
5. If the standby safety limit RK10 will engage because of any other reason than due to a deliberate external overload, you must call for an expert to examine and repair the MEWP before its next use.

14.0 HOW TO TRAVEL THE MEWP



14.0 HOW TO TRAVEL THE MEWP

SCANLIFT SL 185 is fitted with a hydrostatic transmission and the MEWP can be completely driven and steered from the platform. The transmission is fitted with continuous 4WD and with two driving speed ranges.

The slow driving speed range is 0 - 1,8 km/h (0-1.1 mph) with a traction force of 13500 N (3025 lbs) measured from a machine standing still. The fast speed range covers 0 - 3,6 km/h (0-2.2 mph) with a traction force of 7650 N (1715 lbs).

The brakes are released, when the hydraulic pressure in the drive motors exceeds 30 bar (425 psi) and automatically locked, when the driving pressure drops under above mentioned 30 bar (425 psi). The rear wheels are fitted with disc brakes.

14.1 Start

Switch on the current with the main switch 1. The main current key can be removed also when the current is on.

Always keep the keys on the same ring.

14.2 Engine drive with gas

Engage gas drive with selector switch 3 located in the el. control box 2 on the platform. In position 1 the gas drive is engaged.

14.3 Operating in freezing conditions

In freezing conditions, -10 to -15 °C (14 to 5 °F) or below, a cold starter is used, when starting with petrol. For the petrol motor the enricher 7 is used (under the motor cover) and for diesel - motor use the glow plug (with the ignition key in glow-position).

14.4 Using the drive/outrigger valve

Raise the booms upwards until their angle is some above the horizontal position. Release the platform's pedal switch 4. Raise the drive/outrigger valves and the transport support by pressing the control button 5 located in the control box 2 on the platform. Press down the pedal switch 4 and lower the boom against the transport support by using the control valve of the booms. Lower the platform near the ground by steering the jib with the control valve.

14.5. Using the drive controls

Start the combustion engine with the ignition key 6 and let it run for a while. Steer the MEWP with lever 8 located on the outmost right side of the drive / outrigger valve and drive the MEWP with lever 9, placed on the left side of lever 8. Select the drive speed range with the selector switch 10 FAST / SLOW. The slow range has considerably more traction power than the fast one. Select the way of steering with the selector switch 11 4WS, DIAGONAL STEERING or REAR WHEEL STEERING. To avoid risks the wheels should be centered by selecting 4WS and by directing the front wheels into middle position. In driving speed range FAST the most useful steering way is rear wheel steering. If you have to raise the platform to overcome any obstruction when driving,

press down the pedal switch 4 and press the shunt switch 12 located in the el. control box of the drive / outrigger valve and raise the platform by using the control valve of the booms together with the shunt switch.

Should the outriggers be in the lower position when you start driving, first raise them to the upper position with levers 13, 14, 15 and 16.

14.6 Driving instructions

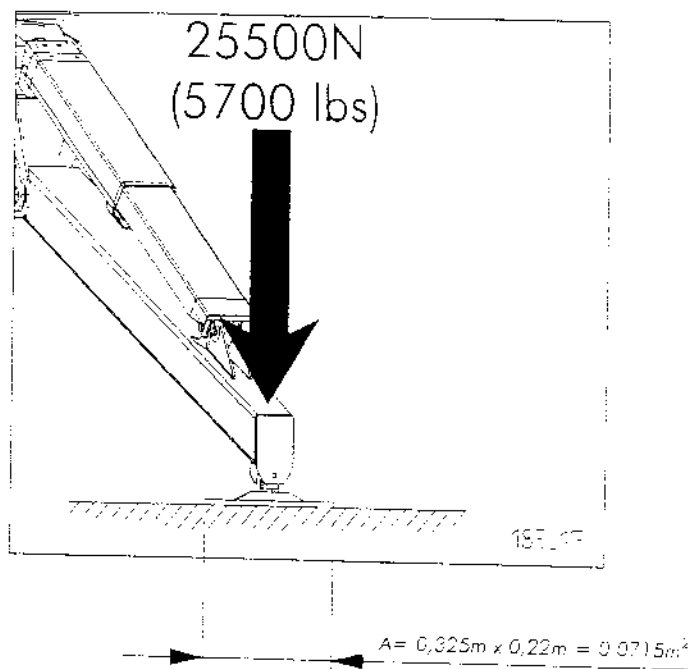


Observe, that reduction of the platform load makes travelling in difficult terrain easier. Because of the danger, do not ever drive the MEWP by walking beside it. With 4WS you can help the travelling in difficult terrain by breaking obstructions in front of the wheels, like sand or snow, with the steering.

14.7 Towing the MEWP

When towing the MEWP, use the pulling points in front of and behind the vehicle. For detailed instructions refer to chapter 20.0 TOWING THE MEWP.

15.0 SOIL TIGHTNESS TABLE



$$P = \frac{25500N}{0,0715m^2} = 357kpa$$

Permissible loads on ground for some soil types

Soil type	Soil tightness	Safe surface pressure Ps kpa		SL 185 pressure
Gravel	Very tight structure	600	>	357
	Middle tight structure	400	>	357
	Loose structure	200	<	357*
Sand	Very tight structure	500	>	357
	Middle tight structure	300	<	357*
	Loose structure	150	<	357*
Fine sand	Very tight structure	400	>	357
	Middle tight structure	200	<	357*
	Loose structure	100	<	357*
Clay & fine silt	Loose (easy conditioned)	25	<	357*
	Tough (hard conditioned)	50	<	357*
	Firm (very hard condit.)	100	<	357*

Note! In items marked with (*) broader extra plates must be used

16.0 HOW TO OPERATE THE MEWP

ALWAYS when stepping into the work platform, fasten wire rope of safety harness to one of the lugs placed sides of platform cage!

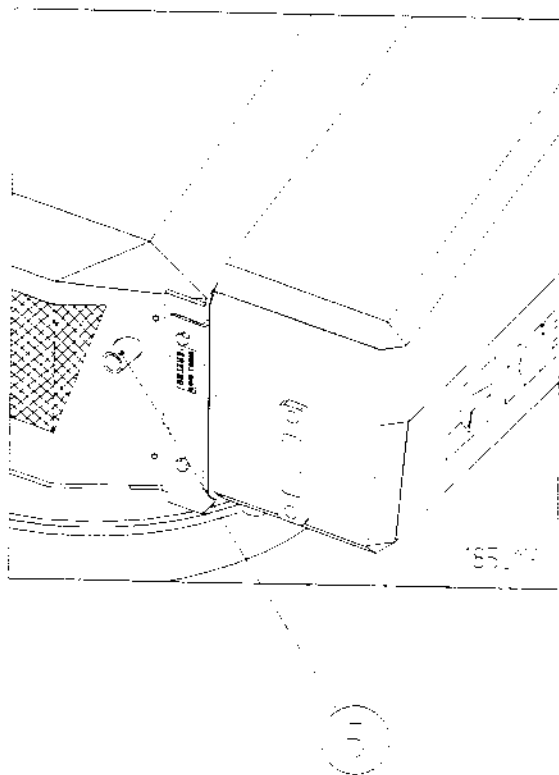
16.1 Check that the surface intended for the MEWP is flat and hard enough, so that the MEWP can be supported steadily and at horizontal to the ground.

16.2 If the ground is soft, use extra plates large and sturdy enough under the outriggers.

16.3 Observe that ice, wind and rain can cause extra need of supporting.

16.4 Examine the working place in advance before driving the MEWP onto it.

16.5 Using the hydraulic change valve, FROM PLATFORM, FROM GROUND



With the hydraulic change valve 5, located on the edge of the turntable, the guiding of oil flow is altered to FROM PLATFORM- position, if not altered before. We recommend the keeping of the change valve in guiding FROM PLATFORM-position. Turn it to the position guiding FROM GROUND only for the moment of using the ground guiding. For example a screwdriver can be used as an operating lever for the change valve. For platform guiding remove the ignition key from the electric control box of the ground guiding. This also goes for the main current key on the platform during drive. The main current key can be removed also when the current is on. Use only one key ring.

16.6 Supporting the MEWP and using the booms

(Drawings in chapter 14.0 HOW TO TRAVEL THE MEWP)

Lower the outriggers 13-16 to support position. The supporting is horizontal when all the 4 lights of the horizontal position indicator 17 are on. Also see to it that all four wheels are raised off the ground and check before rising that the supporting paws are well supported and without any risk of sinking. You can check the steadiness of every paw by driving, from the platform in horizontal position, the booms to every outrigger within the max. permitted lifting radius (limited by the torque guard). Use extra plates, if needed. Lower the lifting arms of the drive / outrigger valve by

pressing the control button 5 of the lifting arms. Press the button continuously, otherwise the movement direction will alter.

Test the function of the EMERGENCY STOP button 18 by raising the boom and at the same time pressing the EMERGENCY STOP button, which shall stop the raising movement. The best way of reaching the work site is to slew and raise the booms in that direction and then driving the platform to the site by extending the telescope.

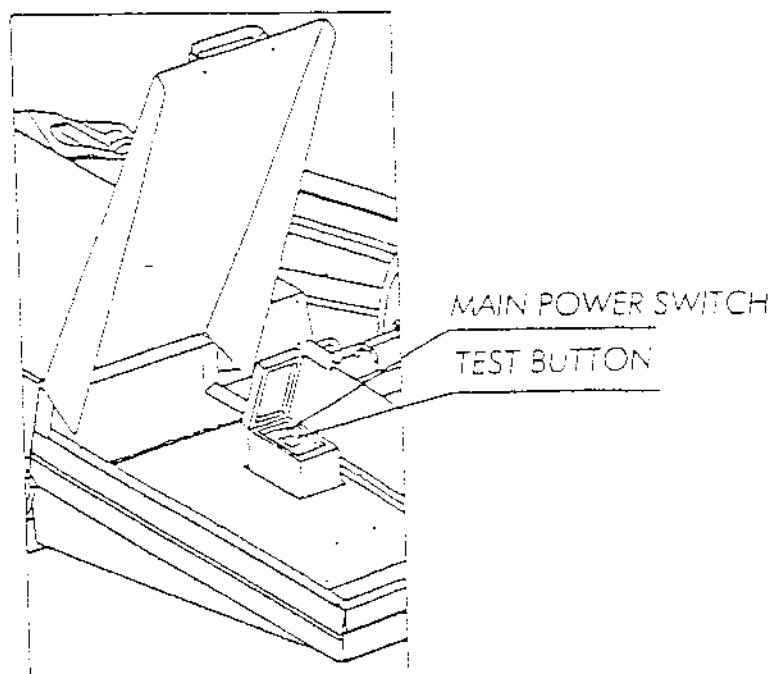
The jib boom is used to cope with possible obstruction. The lowering is done in reversed order. There is a special spool for the raising movement in the control valve of the booms enabling the boom to start and stop smoothly. Also the slew mechanism is fitted with a special spool. When working for a long time at the same spot you shall shut off the engine with ignition key 6 on the platform. Do not restart the engine until you move over to another place with the boom.

16.7 Using supply current on the platform

Connect the supply current 220V / 50 Hz 16 AMP (USA = 110 V.AC/60 Hz/16 AMP) to the outlet on the chassis, beneath the equipment case, by using the jumper cable located in the equipment case. The platform has two earthed outlets for tools. The outlets is fitted with a ground fault circuit interrupter and the electric line is fitted with a slip-ring package inside the pivot bearing.

16.7.1 Testing the ground fault circuit interrupter GFCI

Plug in a device, e.g. a drilling machine, in the outlet on the platform. Engage supply current to the MEWP by using the cable you will find in the equipment case. Press the test button of the GFCI to bottom thus releasing the main power switch, which acts as an automatic fuse. Should this not happen and if the device before that has not functioned on the platform, you have to check that the main power switch is in its power supplying position.



16.8 Operating the booms in freezing conditions



Do not cut the motor during work in freezing conditions ($-5^{\circ}\text{C} = 23^{\circ}\text{F}$ or below), even when working in the same place for a long time, as the hydraulics and the combustion motor will cool unnecessarily. Instead we recommend reducing the rpm's of the motor.

- Check that there is no snow, ice and dirt on the safety limit switches.
- Check that the control valves are functioning and free of ice and snow.
- In very freezing conditions let the combustion motor run for a few minutes and then carry out some warmup movements with the boom. This makes warm oil flow into the cylinders and the function of the control valves will be more reliable.
- Cover the control valves and the platform from snow and ice, when not used.

16.9 To be observed, when moving from one work target to another:



- look out for cables with high voltage
- do not touch uninsulated el. cables
- do not damage the platform or the controls
- do not damage external equipment
- do not throw down or let any objects fall down from the platform
- do not ever reach out from the platform
- do not use ladders or other height-increasing facilities in the platform
- do not jump on or swing with the platform
- make sure that the platform is always in horizontal position.

If the platform tilting exceeds 6 degrees with the boom being raised 75 degrees from the horizontal position, there is a damage risk of the stabilizer equipment!

16.10 Raising by using the ground guiding valve



- do not use the MEWP as an elevator between different floors for transporting persons or goods
- support the MEWP on an even and sturdy surface as described in chapter 16.0
- remove the ignition key from the electric control box on the platform
- turn the hydraulic change valve to position GROUND
- turn the change-over switch located in the el. control box of the platform to position BOOM
- switch on the main current and start the motor from the el. box of ground guiding
- use the hydraulic control valve for the booms, located on the turntable, for driving the boom.

16.11 Platform load



WARNING: If the reach exceeds the values given in BOOM GEOMETRY, chapter 5.0., repair it or have it repaired before next use. The use of a faulty MEWP is prohibited! SWL is 230 kg (507 lbs).

17.0 CONSTRUCTION OF THE AUXILIARY LOWERING SYSTEM

The auxiliary lowering system consists of the pump for auxiliary lowering 3, the control switch of the auxiliary lowering pump 1, the hydraulic change valve 2 of the turntable, the control valve 5 of the platform, the valve for ground guiding 4, the el. system 6 for keeping the safety limits active and a decal with instructions on operating the system fastened on the engine cover.

1. Besides the ordinary hydraulic pump of the hydraulic system also the pump of the auxiliary lowering is continuously ready to feed oil into the system, if the ordinary hydraulic pump should be out of order or the valve of the booms on the platform cannot be used for some reason.
2. From the pump for auxiliary lowering the oil is directed to the control valve of the platform or to the valve for ground guiding.

18.0 HOW TO OPERATE THE AUXILIARY LOWERING SYSTEM

From the platform:

1. The hydraulic change valve 2 of the turntable shall be in position PLATFORM.
2. Press the control switch 1 of the auxiliary lowering to bottom and keep it there during the whole lowering procedure. To lower the platform use the platform control valve 5.
3. Always retract the telescope prior to starting to lower the boom.

From the turntable:

1. The hydraulic change valve of the turntable shall be in position TURNTABLE.
2. Press the control switch 1 of the auxiliary lowering to bottom and keep it there during the whole lowering procedure. To lower the platform use the control valve 4.
3. Always retract the telescope prior to starting to lower the boom.