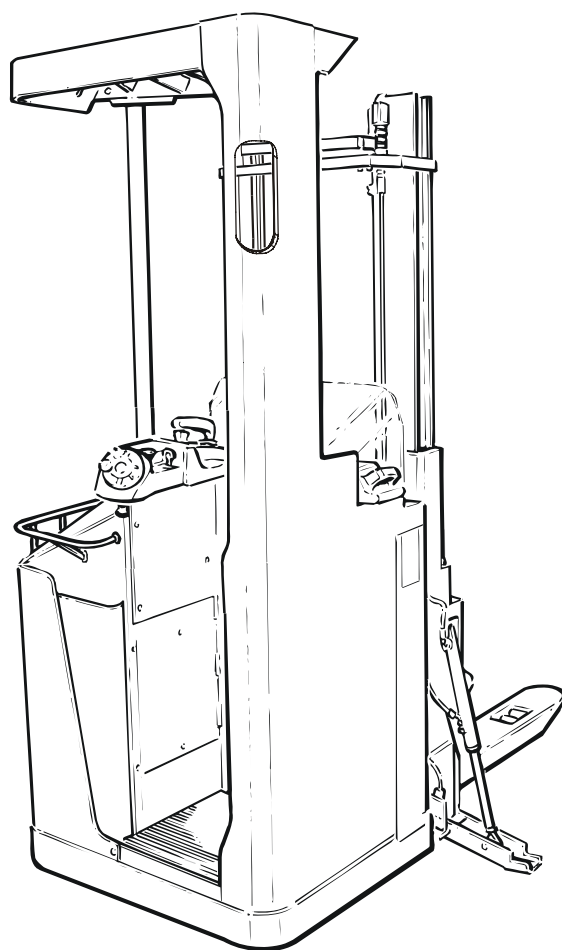


**WARNING!**

Do not use the truck before first reading through the OPERATOR'S MANUAL.

NOTE!

Keep for future reference.



Operator's Manual en

SSE135/SSE160

Valid from serial number: 962872-

Order number: 237077-040

Issued: 2006-10-24 ITS

BT Products AB
S-595 81 MJÖLBY SWEDEN

Valid only for serial number:

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It is important that you read this Operator's Manual for your own safety!

Before you start to use this truck it is of extreme importance that you have **read** the contents of the entire Operator's Manual to be able to use the truck in a **safe** and **efficient** manner.

This Operator's Manual contains information on how you should use the truck, safety regulations and how to keep the truck in a safe condition by following daily service routines.

Only personnel who have been trained on the operation of this type of truck, are permitted to use this truck.

It is your employer's responsibility to ensure that you have sufficient knowledge of how to use your truck safely. Do not hesitate to contact your supervisor if you feel the slightest uncertainty of how to use this truck.

Always follow the warnings given in this Operator's Manual and on the truck to avoid accidents and incidents from occurring.

BT Products AB

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Safety regulations

Warning symbols

Always follow the warnings given in this Operator's Manual and on the truck to avoid accidents and incidents from occurring.

Warning levels

Warning texts regarding safety are given in four levels and provide information on the risks, describe the consequences and instruct how to avoid accidents.



DANGER!

Warns that an accident will occur if you do not follow the instructions.

The consequences are serious personal injury or possibly death and/or extremely large material damage.



WARNING!

Warns that accidents can occur if the instructions are not followed.

The consequences are serious personal injury or possibly death and/or large material damage.



CAUTION!

Warns that accidents can occur if the instructions are not followed.

The consequences are personal injury and/or material damage.

NOTE!

Marks the risk of a crash/breakdown if the instructions are not followed.

Prohibitory symbols



NO SMOKING

If smoking occurs in situations where a restriction against smoking is stated, a serious accident can occur.



NAKED FLAMES PROHIBITED

If naked flames are used in situations where naked flames are prohibited, a serious accident can occur.



GENERAL PROHIBITION

If the prohibition is ignored, a serious accident can occur.

Ordinance symbols



SAFETY SHOES

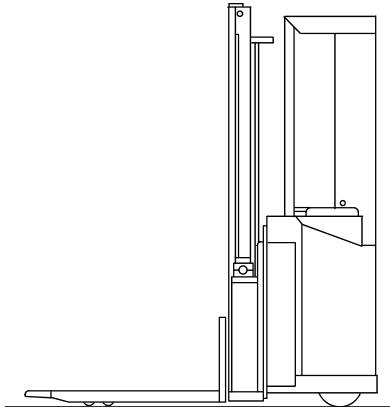
When the directive for safety shoes is given, safety shoes must always be worn to avoid personal injury.



PROTECTIVE GLASSES

When the directive for protective glasses is given, protective glasses must always be worn to avoid personal injury.

General safety regulations

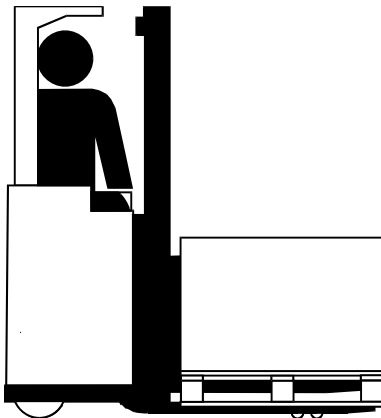


- Always carry out daily service before the truck is used, see chapter *Daily service and function checks*. The working order of all safety equipment, guards and safety switches should be checked before you use the truck. Such safety equipment must not be disengaged or removed.
- Check to make sure that all warning and machine designation plates are clean and undamaged.

The battery must be secured in its intended compartment. The battery shall have a weight that corresponds with the information stated on the truck's identification plate.

The truck must not be used if it is damaged or has faults that affect safety or its safe use. The truck may not be used if it has been repaired, modified or adjusted unless it has been checked and approved by personnel authorised by BT.

Operating the truck



The truck is designed and produced to be your tool when collecting and depositing goods at different heights.

If the truck is to be used in cold storage rooms the truck must be especially built for this type of use.

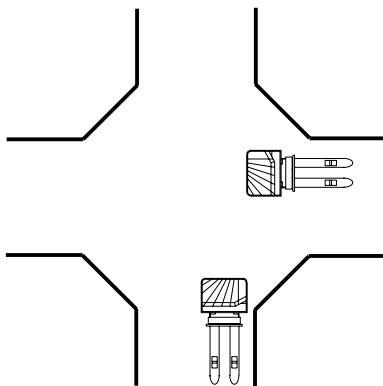
It is **not permitted** to use the truck for purposes that it has not been designed and produced for, e.g. the following applications:

- In areas where the atmosphere contains dust or gases that can cause fires or explosions.
- As a towing truck for trailers.
- To tow other trucks.
- To transport/lift passengers.

Operator's responsibility

- The truck shall only be driven by personnel that have been specially trained and have the management's permission to drive the truck.
- Each country (state) has its own safety regulations. It is the operator's obligation to know and follow these. This also applies to local regulations and for different types of handling. If the recommendations in this manual deviate from your national regulations, the local safety regulations should be followed.
- The truck should be insured in accordance with local directives and laws where the truck is used.
- Any accidents that have caused personal injury or damage to buildings or equipment must be reported to the supervisor. Incidents and faults on the truck shall also be reported.
- The truck shall only be driven with care, good judgement and in a responsible manner.
- Local regulations regarding personal safety equipment shall be followed.
- The truck should **not** be driven with oily hands or oily shoes due to the risk of slipping.

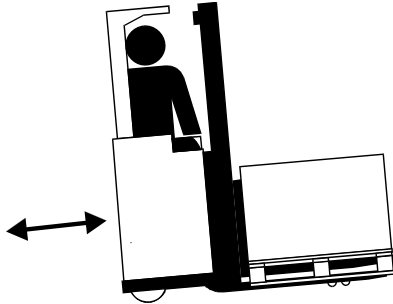
Working area



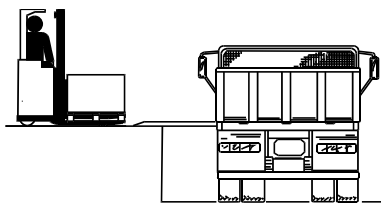
- If there are marked truck routes these shall be used.
- The truck should only be driven on hard and even surfaces, e.g. concrete or asphalt.
- Ensure that the floor where the truck is to be used has sufficient load bearing capacity for the **total weight** of the truck including the maximum load and the weight of the operator.
- Take special care if there are protruding parts from racks, shelves or walls that can cause personal injury or damage to the truck.
- It is **prohibited** for persons to be present in the area around the truck when there is a risk of personal injury, e.g. areas that can be reached by falling goods, lowering load handling devices or in the truck's manoeuvring area.

Driving and conduct while driving

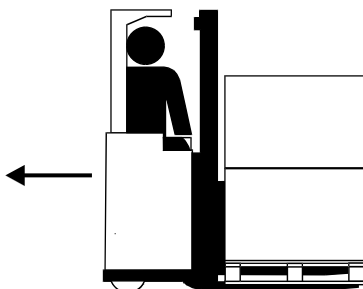
- Always drive the truck from a specified operator position.
- Always drive the truck in a responsible manner and with full control. Sudden starts and braking as well as cornering at high speed should be avoided.
- Drive the truck at a reduced speed on inclines. Always drive with the load uppermost on the incline. Drive straight up and down the incline. It is **not** permitted to turn the truck on an incline.



- Reduce the speed if the surface is slippery to prevent the truck from sliding or overturning.
- Always drive with the forks fully lowered or as low as a load on the support arms will allow, except when collecting or leaving a load.
- Adapt your speed to the driving conditions and pay attention to pedestrians and other trucks in the working area. Reduce speed when the line of vision is limited.
- Pay particular attention to other personnel as well as fixed and moving objects within the working area and thereby avoid accidents.
- Always be prepared to stop if other personnel are in the working area.
- Keep a safe distance from all vehicles ahead.
- Always keep a safe distance from the edges of loading bays and loading ramps. Be attentive to marked risk areas.
- Sound the horn when overtaking and when the attention of other personnel is required.
- Always give way to a loaded truck at junctions and in confined aisles.
- **Never** allow passengers to ride on the truck.
- **Never** drive with any part of your body outside the operator compartment.



- Before the truck is driven on to a loading ramp ensure that the ramp is correctly secured and has the necessary load bearing capacity. Drive slowly and carefully across the ramp.
- When the truck is driven on to another vehicle, make sure the vehicle is stable and that the brakes have been applied correctly.

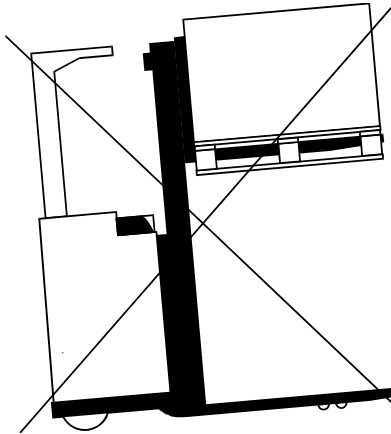


- Before you drive the truck into a lift, ensure that the lift is approved for the total weight of the truck, the load and the operator. Enter with the load first. No other personnel should be in the lift.
- When the load impairs the line of vision, always drive with the load to the rear.

Handling loads

- Drive with care when collecting or depositing a load.
- Only drive the truck with the forks raised when leaving or collecting a load or when transporting two loads, one on the support arms and one on the forks. Keep a safe distance from persons in the immediate area
- Only handle loads that are within the truck's permitted lifting capacity. The length/width of the forks should be adapted to the load's shape and dimensions.
- Only handle loads that are stable and arranged in a safe manner.
- Particular care should be exercised when handling long and high loads.

Parking the truck



- Always park with the load carrier fully lowered and the brake applied.
- Always park in designated areas if available.
- **Never** leave the truck parked with the ignition key still in the ignition.
- **Never** park the truck on an incline.
- **Never** park the truck so that it obstructs emergency exits.
- **Never** park the truck so that it obstructs traffic or work.

Handling the battery

- Always handle the battery and its connections with care. Read and follow the instructions carefully before replacing or charging the battery. See chapter *Battery*.
- Always wear protective glasses when working with the battery.
- Make sure the battery in the truck is of a weight that corresponds with the information on the truck's identification plate.
- Make sure the battery is secured in its compartment.



Maintenance and repair

Maintenance instructions should be followed to prevent faults and accidents, see the *Maintenance chart* in chapter *Maintenance*. Only qualified and BT trained personnel are permitted to maintain, adjust or repair the truck.

All replacement parts shall be BT approved spare parts.

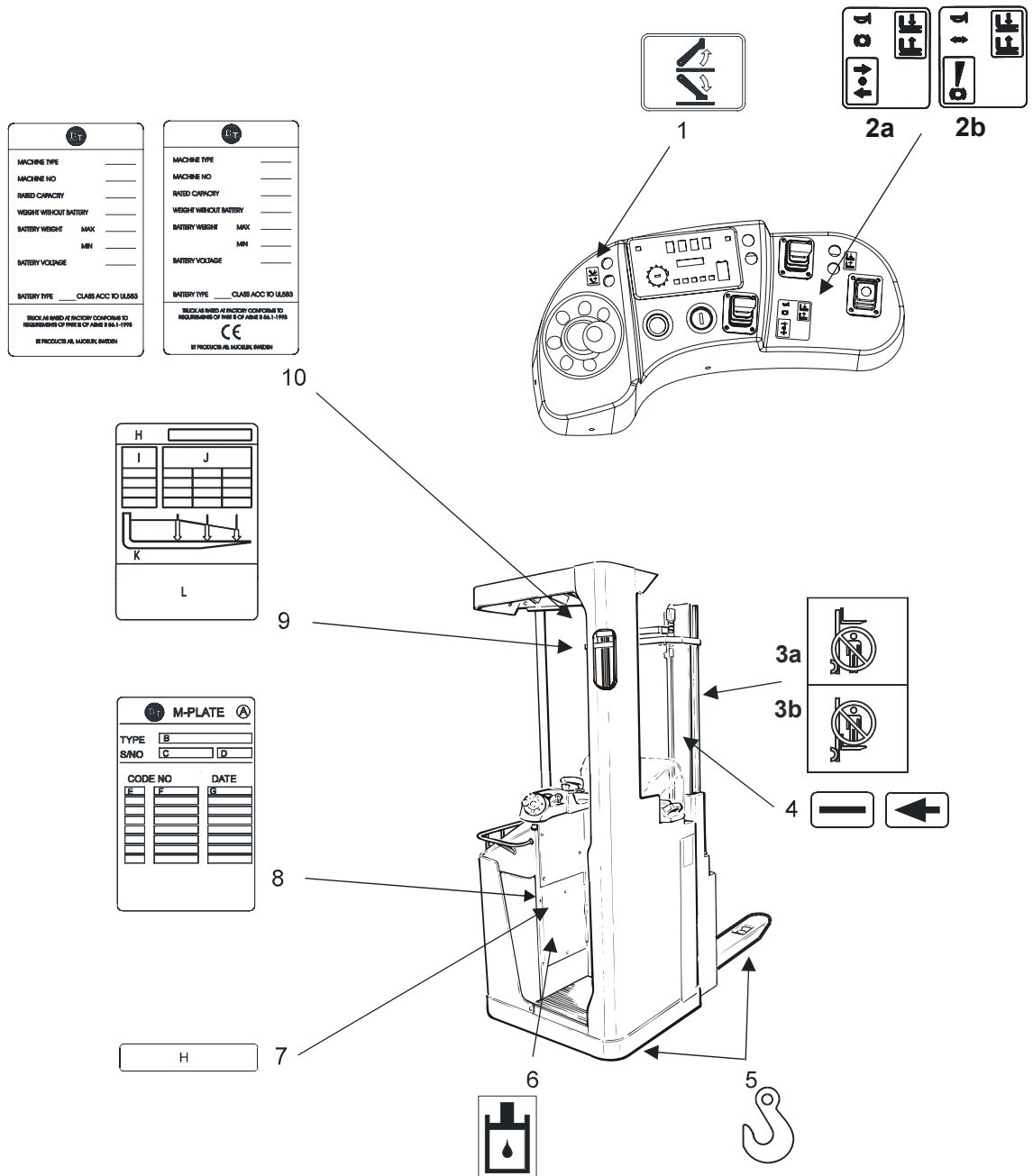
Modifications or conversions to the truck that affect the safe use or function are not permitted.

Warning and information plates and symbols

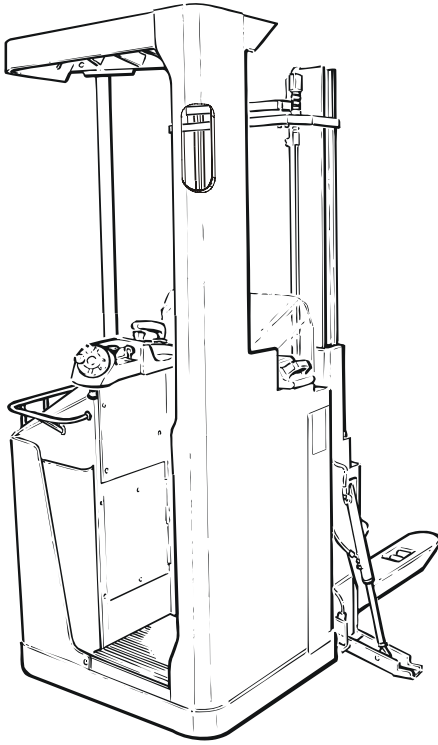
The figure shows the position and significance of the plates and symbols located on the truck.

1. Hydraulic controls: stabilizers
2. A: 180°) Horn,
accelerator, brake button
Hydraulic controls: Lifting/lowering forks
B: 360°) Horn,
accelerator/brake control, travel direction selector
Hydraulic controls: Lifting/lowering forks
3. A) Do not walk under an elevated load
B) Do not stand on the forks
4. Maximum height for rated capacity
5. Lifting points
6. Hydraulic oil filling
7. Serial number
8. Capacity plate
9. Modification plate
10. Identification plate

Warning and information plates and symbols



Presentation of the truck



Good driver ergonomics have a positive influence on productivity and this knowledge has been a guiding star in the development of BT's stand on stacker vehicles.

The truck is equipped with mini-wheel and progressive electrical servo. The overhead guard provides very good safety without impairing vision. The throttle is ergonomically positioned on an adjustable control panel. All the instruments are placed together on a clear display unit which provides the driver with all the necessary information in order to successfully operate the truck, e.g. hour meter, battery indicator and error codes.

The battery is placed on a roller table, easily accessible for inspection, replacement and service. The stand on stacking vehicle's construction is based on the same advanced techniques used for BT's reach trucks, with easy access to components and simple servicing.

Intended application of the truck

The truck is solely designed and manufactured to handle goods. The trucks should be fitted with the appropriate accessories relevant to the application.

Prohibited application of the truck

The truck is designed for handling goods indoors. It is not permitted to use the truck for other purposes including the following:

- In areas that contain dust or gases which can cause fires or explosions
- As a tow-truck for trailers
- To tow other trucks
- To transport/lift passengers
- To drive on gravel or grass

Truck data

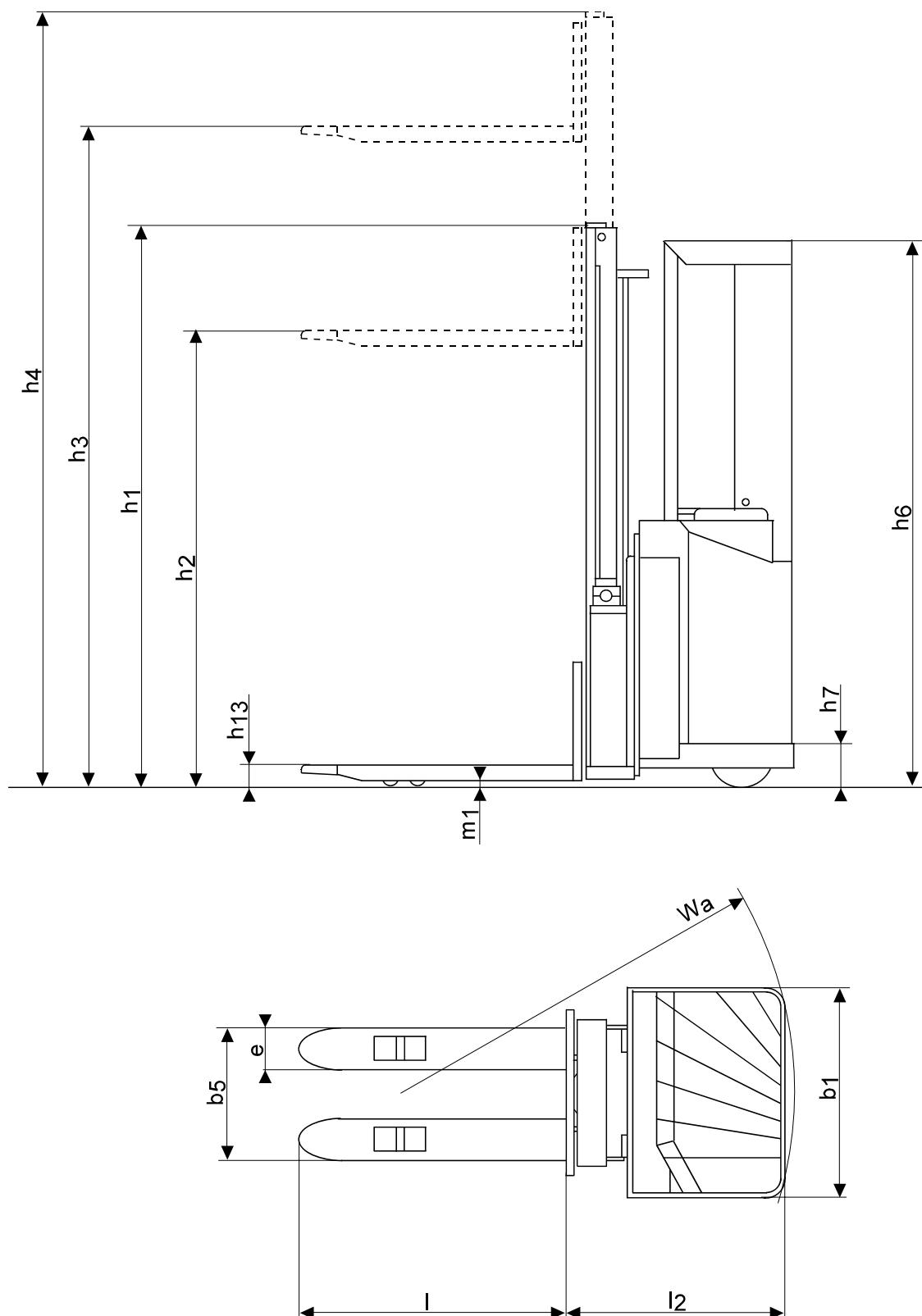
The table provides information regarding some technical data, which is of value with daily use of the truck.

Truck type	SSE135L	SSE160L
Lifting capacity, rated load, kg	1350	1600
Operating speed without load, m/s	9,0	9,0
Operating speed with rated load, m/s	7,6	7,6
Max. operating gradient with rated load, %	16	12
Rate of lifting, without load, m/s	0,30	0,25
Rate of lifting, with rated load, m/s	0,20	0,15
Rate of lowering, without load, m/s	0,30	0,40
Rate of lowering, with rated load, m/s	0,45	0,46
Weight without battery, kg	1140 (Tele h3=3350)	1520 (Tripl. h3=6300)
Battery (5h discharge)	300/360/480/584	300/360/480/484
Weight of battery, kg	278/380/484/493	278/380/484/493
Continuous noise level, dB A	< 70	< 70
Vibration level, m/s ²	0,5	0,5

The truck's lifting capacity, lift height and weight can be found on the truck's identification plate.

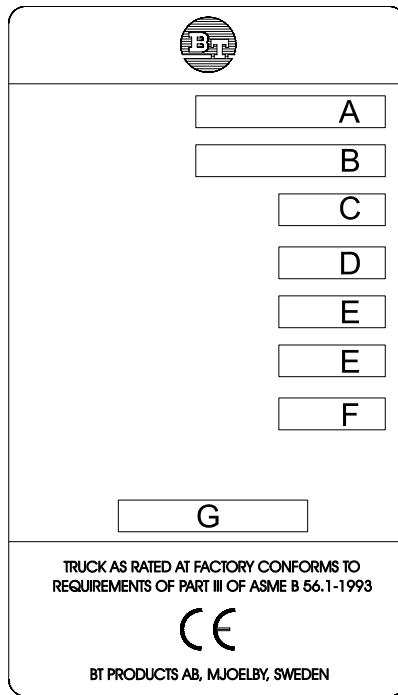
Truck dimensions

The illustration shows external dimensions for the truck in its standard design.



Presentation of the truck

Dimensions (mm)	SSE135	SSE160
b ₁ Chassis width	900	900
b ₁ Chassis width with stabilisers	940	940
b ₅ Width across fork	570	570
e Fork width	180	180
h ₁ Height of mast, min	1937-2622	2013-2708
h ₂ Free lift	1476-2143	1465-2143
h ₃ Lift height	2800-5400	2900-6300
h ₄ Mast height, max	3317-5921	3443-6958
h ₆ Load guard height	2290	2290
h ₇ Instep height	245	245
h ₁₃ Height of lowered fork	90	90
l Fork length	1150	1150
l ₂ Truck length excl. forks Short chassis Dx/Tx Long chassis Dx/Tx	919/938 1033/1052	- / - 1079/1079
m ₁ Floor clearance	28	28
Wa Turning radius short/long chassis	1785/1898	- /1898

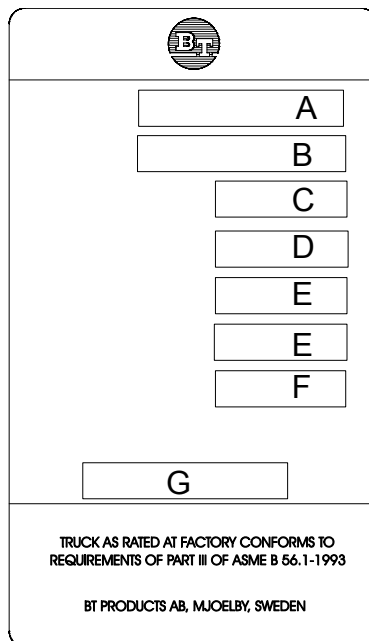


Identification plate for CE-design truck. The plate features a BT logo at the top left. Below it are seven rectangular boxes labeled A through G. Box A is for the model, B for the serial number, C for rated capacity, D for weight without battery, E for battery weight (with MAX and MIN sub-labels), F for battery voltage, and G for battery type. At the bottom, there is a CE mark and the text: 'TRUCK AS RATED AT FACTORY CONFORMS TO REQUIREMENTS OF PART III OF ASME B 56.1-1993' and 'BT PRODUCTS AB, MJOELBY, SWEDEN'.

Identification plate

The illustration shows the identification plate for the truck in CE-design.

Item	Text		Unit
A	MODEL		
B	NO		
C	RATED CAPACITY		kg
D	WEIGHT WITHOUT BATTERY		kg
E	BATTERY WEIGHT	MAX MIN	kg kg
F	BATTERY VOLTAGE		V
G	BATTERY TYPE		



Identification plate for ASME-design truck. The plate features a BT logo at the top left. Below it are seven rectangular boxes labeled A through G. Box A is for the model, B for the serial number, C for rated capacity, D for weight without battery, E for battery weight (with MAX and MIN sub-labels), F for battery voltage, and G for battery type. At the bottom, there is a CE mark and the text: 'TRUCK AS RATED AT FACTORY CONFORMS TO REQUIREMENTS OF PART III OF ASME B 56.1-1993' and 'BT PRODUCTS AB, MJOELBY, SWEDEN'.

The illustration shows the identification plate for the truck in ASME-design.

Item	Text		Unit
A	MODEL		
B	NO		
C	RATED CAPACITY		kg
D	WEIGHT WITHOUT BATTERY		kg
E	BATTERY WEIGHT	MAX MIN	kg kg
F	BATTERY VOLTAGE		V
G	BATTERY TYPE — CLASS ACC TO UL583		

Capacity plate

The illustration shows the capacity plate used on the truck.

Item	Text	Unit
H	NO	
I	LIFT HEIGHT	mm
J	ACTUAL CAPACITY	kg
K	LOAD CENTRE DISTANCE	mm
L	THE TRUCK MUST ALWAYS BE DRIVEN WITH LOWERED FORKS EXCEPT WHEN PLACING OR REMOVING LOAD	

Modification plate

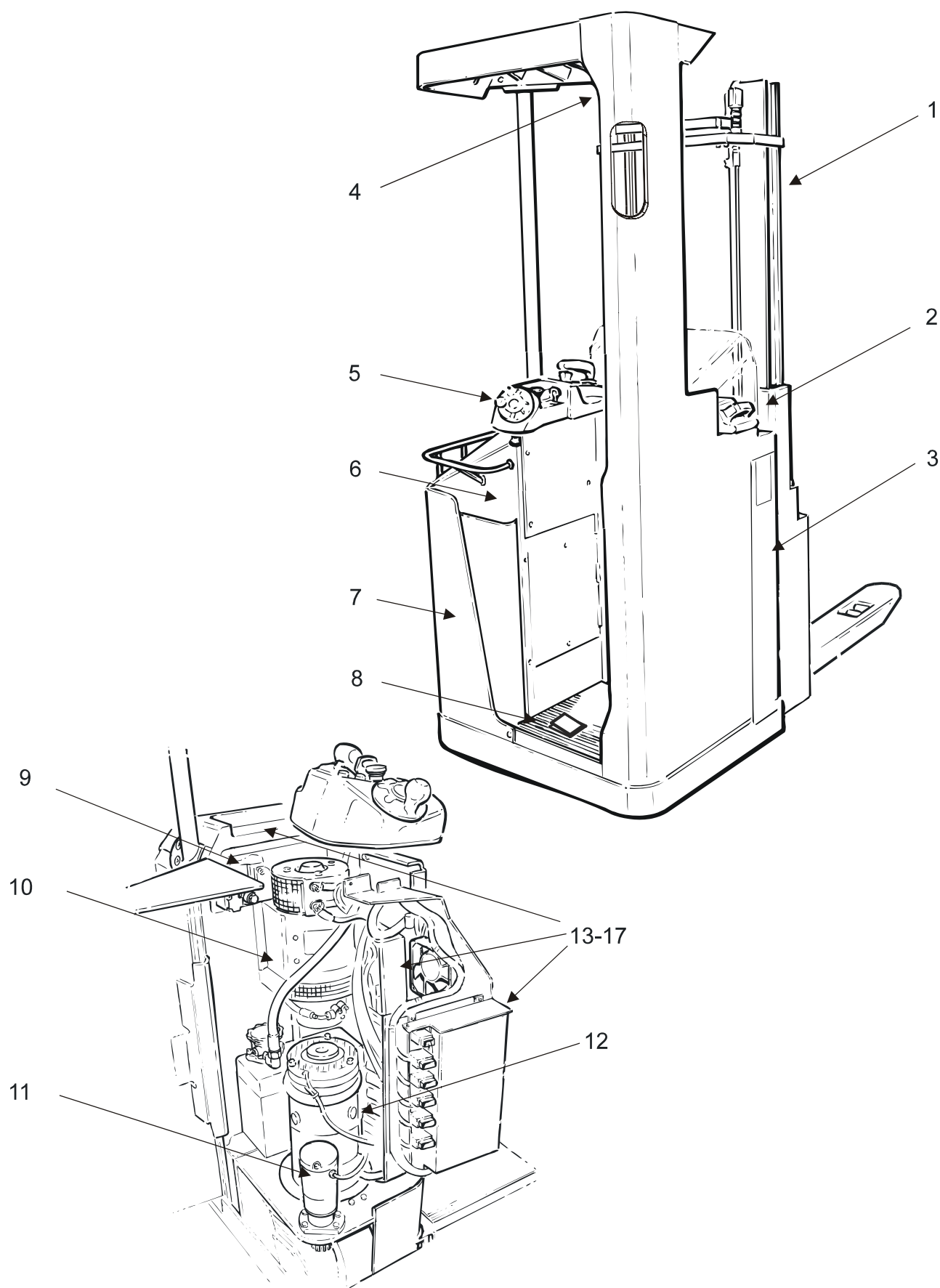
The illustration shows the modification plate which is found on the truck if it is supplied as non-standard or if it has been modified after leaving the manufacturer. The plate includes information according to the table below.

Item	Text
A	Modification plate
B	Type
C	Serial number
D	Place of manufacture
E	Place of manufacture
F	Modification number
G	Date

Main components

- 1. Mast:**
The mast is a clear-view model.
- 2. Recharging connector:**
The battery is recharged via this permanently attached recharging connector.
- 3. Battery:**
24V with different Ah values.
- 4. Identification plate:**
With model designation, serial number, year of manufacture, weight without battery, battery weight, rated capacity, battery voltage and manufacturer.
- 5. Control console:**
The control console is adjustable to the appropriate height and angle, to provide a comfortable operating position. Steering, raise/lower, signal, travel direction, accelerator/brake and any additional hydraulic functions are operated from the control console. The control console also includes the emergency switch off, the ignition key and the display. The display provides information relating to the truck's operating time, error codes, travel direction, parking brake, steering angle and battery charge status, as well as indicating the time of day.
- 6. Serial number:**
The serial number plate fitted to the chassis.
- 7. Cover:**
Easily swivelled to provide good access for servicing.
- 8. Foot pedal:**
With safety switch and automatic parking brake.
- 9. Hydraulic valves:**
The valves are located to provide easy access.
- 10. Hydraulic unit:**
Pump motor, pump and oil tank.
- 11. Electrical steering motor:**
Mounted with the drive gear to provide a compact design.
- 12. Drive unit with brake:**
Drive motor, gears and drive wheel integrated in a compact unit. Steering bearings between the motor and gears.
- 13. Electronics:**
All the electronics are located together in a protected area of the motor.
- 14. Control circuit fuse:**
10A, BT part no. 122308-100.
- 15. Fuse for electrical steering wheel:**
20 A, BT part no. 122308-200.
- 16. Drive motor fuse:**
160 A, BT part no. 29223.
- 17. Pump motor fuse:**
200 A, BT part no. 29673.

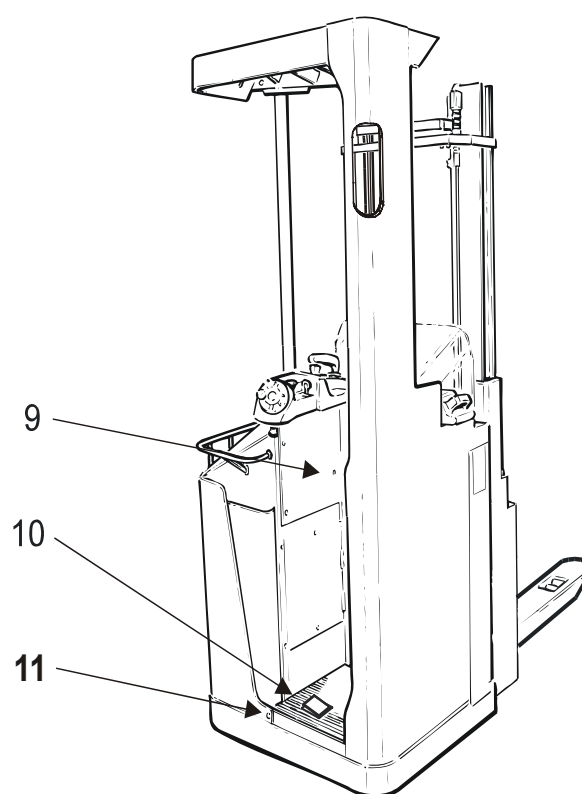
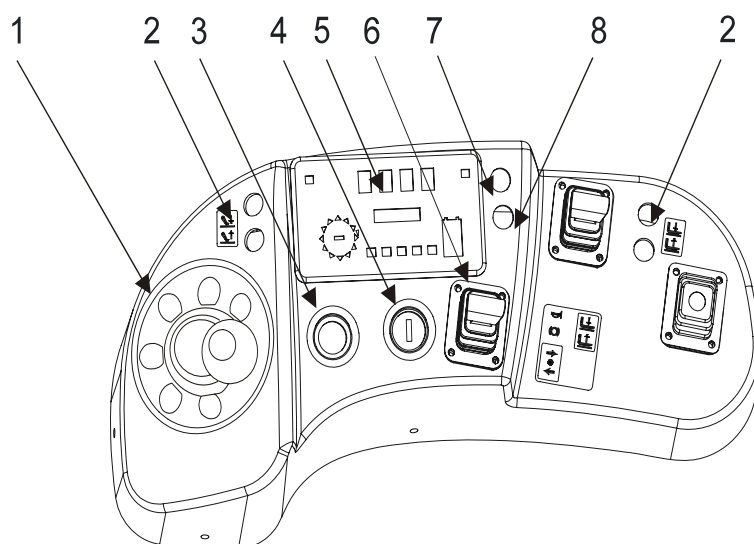
Main components



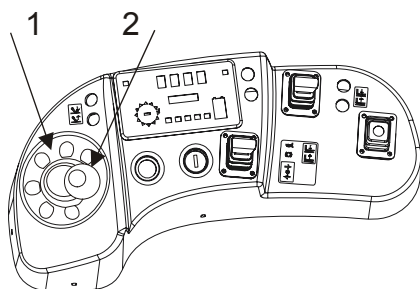
Controls and instruments truck with 360° steering

1. Steering wheel
2. Hydraulic controls
3. Emergency switch off
4. Key switch
5. Display
6. Accelerator/brake control
7. Horn
8. Travel direction selector
9. Controls for control console position
10. Safety pedal
11. Cover lock

Controls and instruments truck with 360° steering



Steering wheel (1)



- When small steering wheel adjustments are required and when driving at high speed, steer the truck with the finger-tips on the steering wheel hub (1). For low speed driving and turning the truck, rotate the wheel faster with the help of the steering wheel spinner (2).

The driving wheel does not incorporate a limit position, this makes it possible to steer around 360°.



WARNING!

Lost stability.

The truck can overturn and loads can fall off when rotating the steering wheel fast at high speed. Steer only with the finger tips on the steering wheel hub when driving at high speed.

NOTE!

Overloading the mounting.

Do not use the steering wheel as a handle when entering the truck. Instead, use the rail on the motor casing.



WARNING!

Loose wheel console.

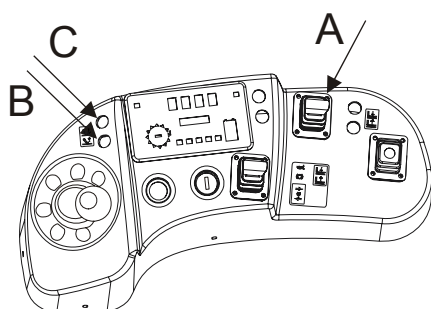
You can lose control of the truck if the wheel console is loose. Tighten the lock handle following adjustment.

Hydraulic controls (2)

There is a maximum of one joystick and two buttons on the control panel with which you can control all the hydraulic functions.

The movement of the lever is processed by the logic card, which then sets the correct oil flow through the proportional valve. Speed changes on the function are obtained by moving the lever forwards or backwards more or less.

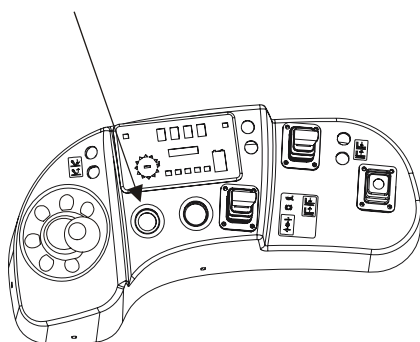
Press the buttons to activate the function.



	Function
Lever A	
+	Lift forks
-	Lower forks
Button B	
+	Project stabiliser (optional)
Button C	
+	Retract stabiliser (optional)

NOTE! When the key is in the **0** position none of the hydraulic functions can be used.

Emergency switch off (3)



- Activate the emergency button (see illustr.) to cut the power supply in the event of:
 - An accident.
 - Emergency situation, risk of an accident.
 - Welding work.

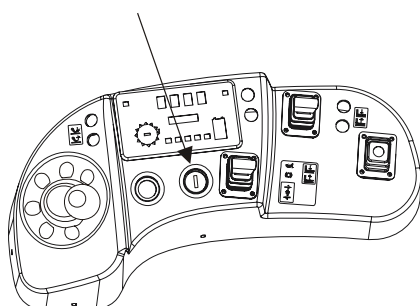
NOTE!

The battery can be damaged.

When welding using an electric power source the welding current can enter the battery.

It is necessary to disconnect the battery.

Key switch (4)



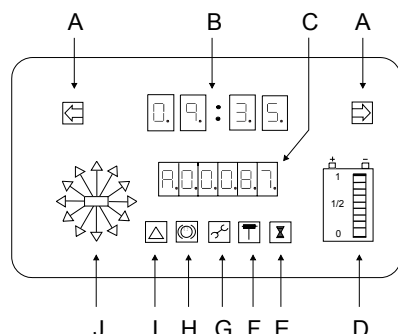
The main power switch for the control current.

- 0** The power is off and the instrument lighting is off .
- 1** The power supply is on. The instrument lighting is on and current is fed to all electronic components.

Display (5)

Direction indicator (A)

When selecting the direction of travel an arrow will light indicating the selected direction.



Display of time (B)

A digital clock indicates the actual time. How to set the time is explained in the section "Display and programming".

Display of hour meter reading/error codes (C)

A character display (C) indicates hours and error codes. When the time meter reading is displayed the **indicator window (E)** is lit. The time displayed is as follows:

Character	Time
	Key time
	Total running time
	Drive motor time
	Pump motor time

When the warning/error codes are displayed the indicating window (G) will be lit. A character E/C will be displayed in the left-hand side of the character window (D) and the error code in the right-hand side. The meaning of the codes is explained in the sections "Warning codes" and "Error codes".

Battery controller (D)

The battery controller shows the actual charge level of the truck's battery.

- 1** Fully-charged battery
- 1/2** Half-charged battery
- 0** Discharged battery

The battery controller has an integrated cut-out function that disconnects the truck's lifting function when a preset charge level is reached. This prevents overloading the battery and increases the running economy of the truck. When the battery has reached a charge level equivalent to 70% discharge a warning signal is given by flashing lamps. A further 10% of the battery's capacity can be used before the battery controller cuts out the lifting function.

The hour meter registers the time the drive motor and/or the pump motor are operating.

Parameter control (F)

When checking the set parameters the indicator window (F) will light. See “Display and programming”.

Parking brake indicator (H)

The indicator window is lit when the parking brake is applied.

Stabiliser Indicator (I)

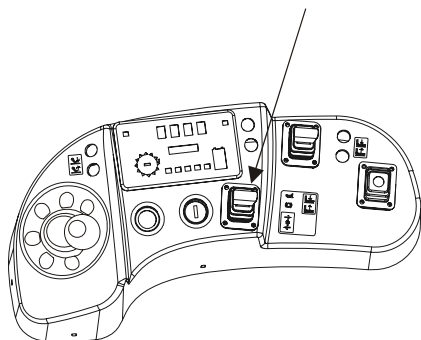
(Option)

The light flashes when the stabilisers have left their inner position.

Drive wheel indicator (J)

(Option)

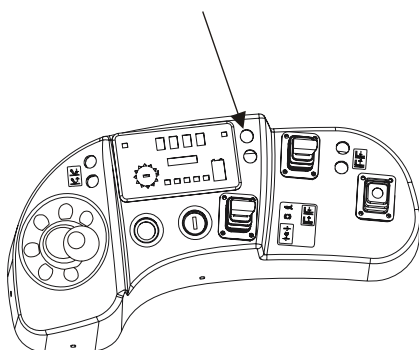
The position of the drive wheel and the truck's direction of travel are indicated by one of the arrows in the diagram. When the opposite direction is selected without changing the position of the drive wheel the opposite arrow will light.



Accelerator/brake control (6)

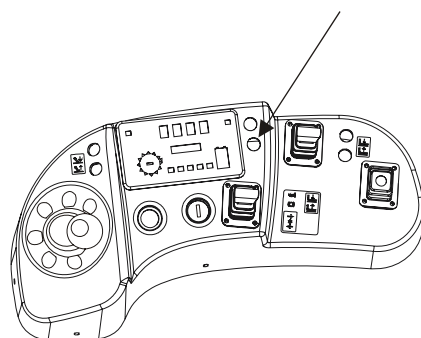
The speed is variably controlled by moving the accelerator/brake lever forwards from the neutral position.

The brakes are applied by moving the accelerator/brake lever backwards from the neutral position. The brakes are applied in two stages, first gentle braking and then after a set delay full braking.



Horn (7)

The horn sounds as long as the button is pressed.



Travel direction selector (8)

- Press button 4 to select the travel direction. If you are unsure of the activated direction of travel see the travel direction indicator (A) on the display (3). Press once to travel in the direction of the forks. Press once more to change the travel direction.

Controls for control console position (9)

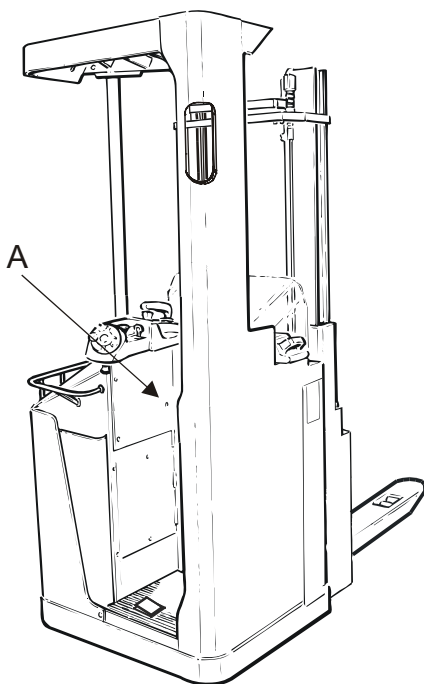
The control console is continuously vertically adjustable to provide a comfortable operating position.

- Loosen knob (A) and the control console can be adjusted to a suitable height.
- Tighten the knob (A) after adjusting.

To obtain a more comfortable operating position, the control console can be adjusted to take into account the selected travel direction. The control console is held in place with a gas spring.

- Turn the control console clockwise when operating in line with the fork direction.
- Turn the control console anti-clockwise when operating in the opposite direction.

Ensure that the operating position is adjusted often in order to reduce the load on the body.



Foot pedal (10)

Place your foot on the foot pedal when you wish to drive the truck. The foot pedal features an integrated automatic parking brake and safety switch. This means the parking brake is activated if you do not stand on the pedal.

WARNING!

Risk of being thrown from the truck.

The parking brake is actuated if you left foot is removed from the foot pedal while driving.

Only move your left foot from the foot pedal if you intend to stop the truck in an emergency.



NOTE!

Risk of crushing.

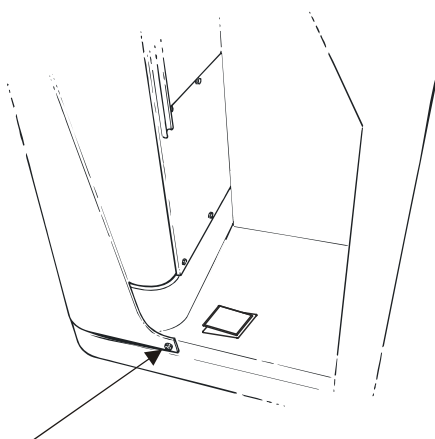
Risk of crushing exists if any part of the body is outside of the operator's cab.

Always ensure that the whole of your body is inside the protective cab.

The parking brake does not release until you have selected a travel direction.

Cover lock (11)

- Loosen the screw and swing out the entire motor casing to inspect the motor.



Display and programming

There is the possibility to look at the machine specific register, but not to reprogram it. However the clock can be programmed, for example, for summer or winter time.

Display

To display the machine specific register proceed as follows:

- Open the motor casing.
- Switch on the ignition key to feed voltage to the electronics.
- Press switch SELECT, on the electronic card.
- To step through the register one step at a time press SELECT once.

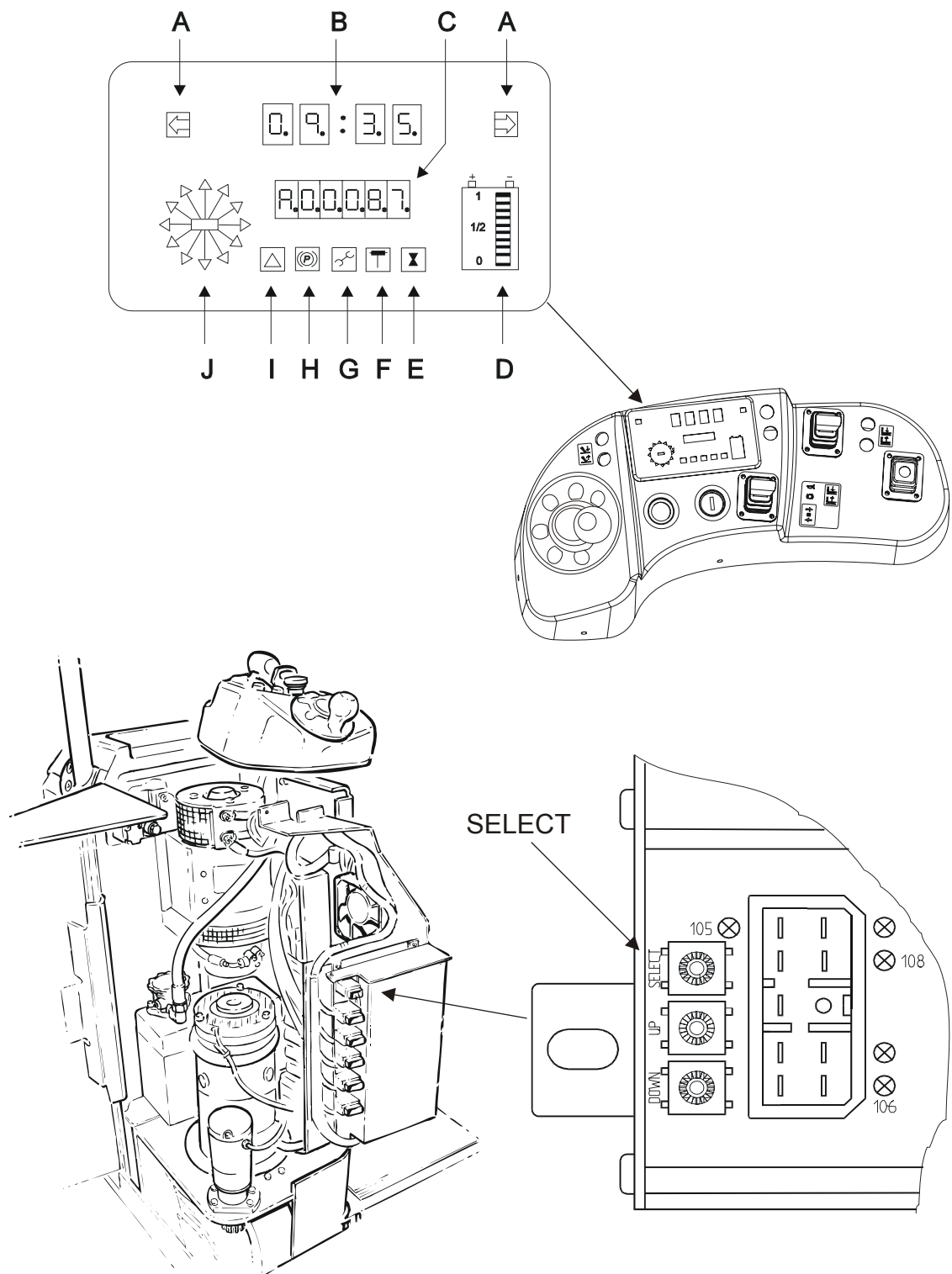
The programmed parameters will be displayed in the character window (C).

- Warning codes and Error codes
- Parameters
- Running time

The address register's "No" will be shown on the left-hand side and "the value" on the right-hand side.

Character window (B) indicates the programmed time of day.

Controls and instruments truck with 360° steering



Programming

When it's possible to program the clock the character window for hours will flash, pressing SELECT once to access the minutes

- Modify by stepping up one step using UP and down one step using DOWN.
- Store the programmed value and displaying the next address by pressing SELECT.

09:35

Function	Value
Hours	09 = 9h
Minutes	35 = 35 min.

When error codes are shown in character window (C) the character box (G) will be lit and when the parameters are displayed in character window (C) the character box (F) will be lit. However, it is not possible to reprogram these parameters from here. If this is necessary please contact a trained service technician.

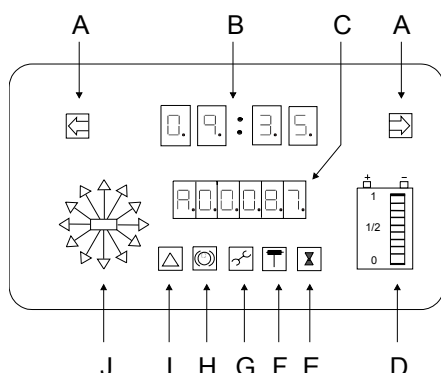
Quit programming by switching the ignition key off and on once. Programming is also stopped if no button is pressed within twenty seconds.

NOTE.

Truck handling.

The handling characteristics of the truck will change if you change any of the truck specific parameters. Do not change any parameters without possessing the necessary know-how.

Warning codes



Character	Error
[]	Warning

When an error occurs a buzzer will sound and a code is displayed, during a 10 second period, on the right-hand side of the character window (C).

If the error remains after 1 minute the warning and buzzer will be reactivated for a further 2 second period.

This process continues until the fault is rectified, however, the truck can be driven with all functions as set out in the table.

The error is also indicated in the indicator window (G).



WARNING!

Ignoring error indications.

Truck safety in jeopardy.

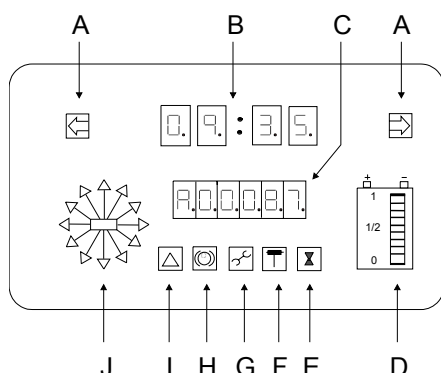
Always contact a service technician before the truck is used again after an error code has been displayed.

Code No.	Error type	Probable cause	Effect on the truck
11	The servo electronics on the steering are too hot.	Jammed steering.	The steering and driving speed is reduced.
13	The height pulse sensor gives no signal when lowering the forks above the fork reference switch.	Faulty pulse sensor or broken cable.	None
18	The battery in the logic box has reached its lowest voltage level.	The battery has run down.	The data stored in the memory will be lost.
19	The truck's parameter values have been lost.		The truck's parameter values are returned to standard.
20	Incorrect zero position signal from potentiometer for travel/brake.	Faulty potentiometer or broken cable or the potentiometer was activated when the ignition was switched on.	Function depending on the cause of the error.
21	Incorrect zero position signal from potentiometer for raise/lower.	Faulty potentiometer or broken cable or the potentiometer was activated when the ignition was switched on.	Function depending on the cause of the error.

Controls and instruments truck with 360° steering

Code No.	Error type	Probable cause	Effect on the truck
22	Faulty connection to steering angle potentiometer	Faulty potentiometer or broken cable.	Steering affected depending on cause of fault
25	Electrical failure or short-circuit on a valve/relay.	Faulty valve/connector or cable.	Function depending on the cause of the error.
26	Electrical failure on the potentiometer for hydraulic functions.	Faulty potentiometer or broken cable.	Function depending on the cause of the error.
27	Incorrect battery supply.	The power supply cables to the battery supply are not connected to the battery.	No effect on the truck. The battery display flashes.
30	Safety pedal switch activated more than 3 minutes whilst the truck has not moved.	Faulty switch or broken cable.	The parking brake comes on.
31	The left-foot pedal is activated for more than 3 minutes without the truck moving.	Faulty switch or broken cable.	The parking brake comes on.
32	By-pass switch for lift height limit activated more than 3 minutes whilst the truck has not moved.	Faulty switch or broken cable.	The parking brake comes on.

Error codes



Character	Error
E	Error

When an error occurs a buzzer will sound at the same time as an error code is displayed on the right-hand side of the character window (C). The error code is shown until the key is turned and the voltage to the truck is cut.

If the error remains when the key is turned on again the buzzer will sound and the error code displayed.

The truck cannot be used with the hydraulic functions listed in the table.

The error is also indicated in the indicator window (G).



WARNING!

Ignoring error indications.

Truck safety in jeopardy.

Always contact a service technician before the truck is used again after an error code has been displayed.

Code No.	Error type	Probable cause	Effect on the truck
102	Error signal from the servo electronics.	Faulty servo unit or the emergency stop is on.	All hydraulic functions except lowering the forks are stopped.
120-121 123 127-140	Fault in the electronics.	Faulty electronics.	All hydraulic functions except lowering the forks are stopped.
122	Too much heat in the servo electronics.	Faulty electronics.	All hydraulic functions except lowering the forks are stopped.
125	Faulty in the steering generator.	Faulty generator or broken cable.	All hydraulic functions except lowering the forks are stopped.
126	Faulty in the steering motor	Faulty motor or broken cable.	All hydraulic functions except lowering the forks are stopped.
100	Brake fault step 1	Faulty brakes or cabling	All hydraulic functions except lowering the forks are stopped.

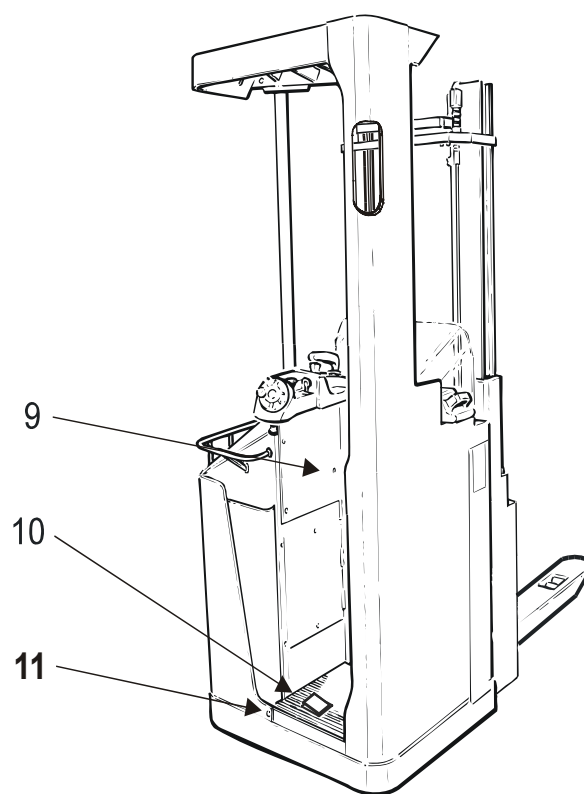
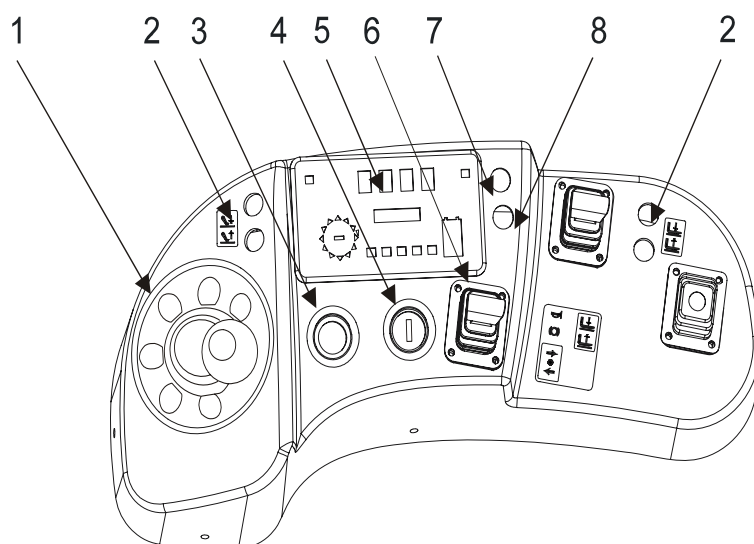
Controls and instruments truck with 360° steering

Code No.	Error type	Probable cause	Effect on the truck
101	Brake fault step 2	Faulty brakes or cabling	All hydraulic functions except lowering the forks are stopped.
141	Faulty setting of 180°/360° selection	Invalid combination of parameter and input	All functions on the truck are stopped

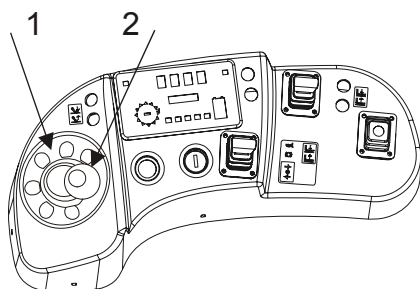
Controls and instruments truck with 180° steering

1. Steering wheel
2. Hydraulic controls
3. Emergency switch off
4. Key switch
5. Display
6. Travel control
7. Horn
8. Brake lever for the travel brake
9. Controls for control console position
10. Safety pedal
11. Cover lock

Controls and instruments truck with 180° steering



Steering wheel (1)



- When small steering wheel adjustments are required and when driving at high speed, steer the truck with the finger-tips on the steering wheel hub (1). For low speed driving and turning the truck, rotate the wheel faster with the help of the steering wheel spinner (2).

The drive wheel can rotate 180° before being stopped mechanically in either direction.



WARNING!

Lost stability.

The truck can overturn and loads can fall off when rotating the steering wheel fast at high speed. Steer only with the finger tips on the steering wheel hub when driving at high speed.

NOTE!

Overloading the mounting.

Do not use the steering wheel as a handle when entering the truck. Instead, use the rail on the motor casing.



WARNING!

Loose wheel console.

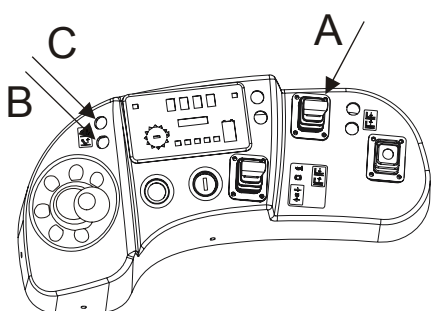
You can lose control of the truck if the wheel console is loose. Tighten the lock handle following adjustment.

Hydraulic controls (2)

There is a maximum of one joystick and two buttons on the control panel with which you can control all the hydraulic functions.

The movement of the lever is processed by the logic card, which then sets the correct oil flow through the proportional valve. Speed changes on the function are obtained by moving the lever forwards or backwards more or less.

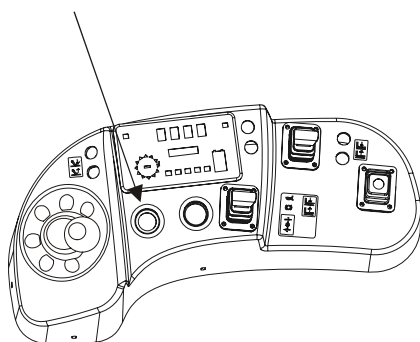
Press the buttons to activate the function.



	Function
Lever A	
+	Lift forks
-	Lower forks
Button B	
+	Project stabiliser (optional)
Button C	
+	Retract stabiliser (optional)

NOTE! When the key is in the **0** position none of the hydraulic functions can be used.

Emergency switch off (3)



- Activate the emergency button (see illustr.) to cut the power supply in the event of:
 - An accident.
 - Emergency situation, risk of an accident.
 - Welding work.

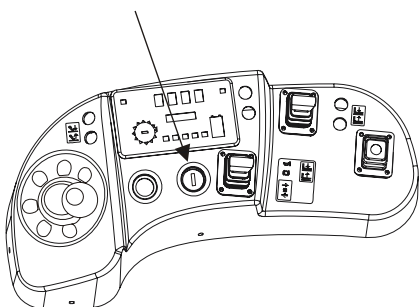
NOTE!

The battery can be damaged.

When welding using an electric power source the welding current can enter the battery.

It is necessary to disconnect the battery.

Key switch (4)



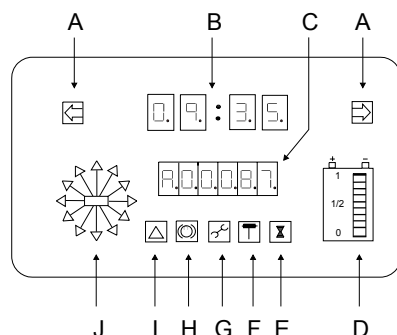
The main power switch for the control current.

- 0** The power is off and the instrument lighting is off .
- 1** The power supply is on. The instrument lighting is on and current is fed to all electronic components.

Display (5)

Direction indicator (A)

When selecting the direction of travel an arrow will light indicating the selected direction.



Display of time (B)

A digital clock indicates the actual time. How to set the time is explained in the section "Display and programming".

Display of hour meter reading/error codes (C)

A character display (C) indicates hours and error codes. When the time meter reading is displayed the **indicator window (E)** is lit. The time displayed is as follows:

Character	Time
	Key time
	Total running time
	Drive motor time
	Pump motor time

When the warning/error codes are displayed the indicating window (G) will be lit. A character E/C will be displayed in the left-hand side of the character window (D) and the error code in the right-hand side. The meaning of the codes is explained in the sections "Warning codes" and "Error codes".

Battery controller (D)

The battery controller shows the actual charge level of the truck's battery.

- 1** Fully-charged battery
- 1/2** Half-charged battery
- 0** Discharged battery

The battery controller has an integrated cut-out function that disconnects the truck's lifting function when a preset charge level is reached. This prevents overloading the battery and increases the running economy of the truck. When the battery has reached a charge level equivalent to 70% discharge a warning signal is given by flashing lamps. A further 10% of the battery's capacity can be used before the battery controller cuts out the lifting function.

The hour meter registers the time the drive motor and/or the pump motor are operating.

Parameter control (F)

When checking the set parameters the indicator window (F) will light. See “Display and programming”.

Parking brake indicator (H)

The indicator window is lit when the parking brake is applied.

Stabiliser Indicator (I)

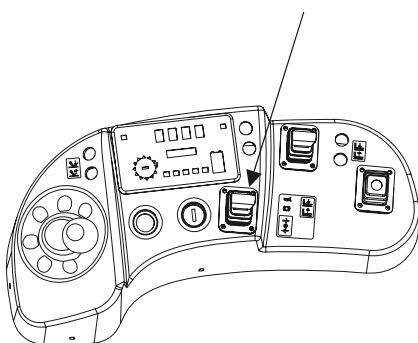
(Option)

The light flashes when the stabilisers have left their inner position.

Drive wheel indicator (J)

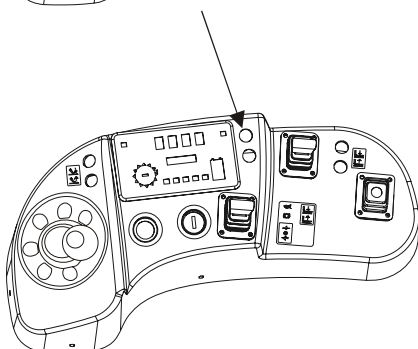
(Option)

The position of the drive wheel and the truck's direction of travel are indicated by one of the arrows in the diagram. When the opposite direction is selected without changing the position of the drive wheel the opposite arrow will light.



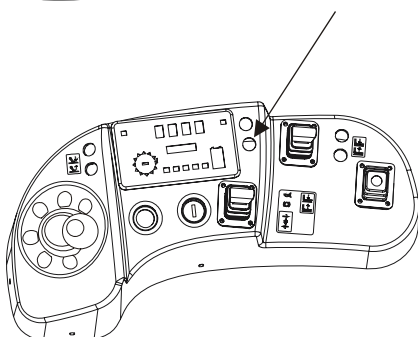
Travel control (6)

- Drive forwards/backwards by moving the travel control forwards/backwards. The travel speed is infinitely variable.



Horn (7)

The horn sounds as long as the button is pressed.



Brake lever for the travel brake (8)

- Brake by pressing the button.
- The brakes are applied in two stages, first gentle braking and then after a set delay full braking.

Controls for control console position (9)

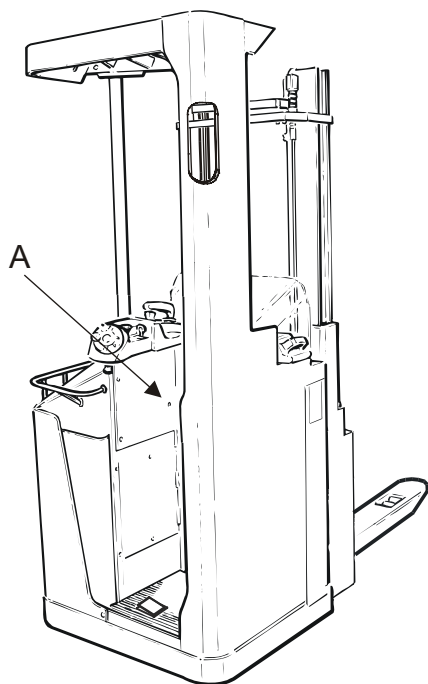
The control console is continuously vertically adjustable to provide a comfortable operating position.

- Loosen knob (A) and the control console can be adjusted to a suitable height.
- Tighten the knob (A) after adjusting.

To obtain a more comfortable operating position, the control console can be adjusted to take into account the selected travel direction. The control console is held in place with a gas spring.

- Turn the control console clockwise when operating in line with the fork direction.
- Turn the control console anti-clockwise when operating in the opposite direction.

Ensure that the operating position is adjusted often in order to reduce the load on the body.



Safety pedal (10)

Place your foot on the foot pedal when you wish to drive the truck. The foot pedal features an integrated automatic parking brake and safety switch. This means the parking brake is activated if you do not stand on the pedal.

WARNING!

Risk of being thrown from the truck.

The parking brake is actuated if you left foot is removed from the foot pedal while driving.

Only move your left foot from the foot pedal if you intend to stop the truck in an emergency.



NOTE!

Risk of crushing.

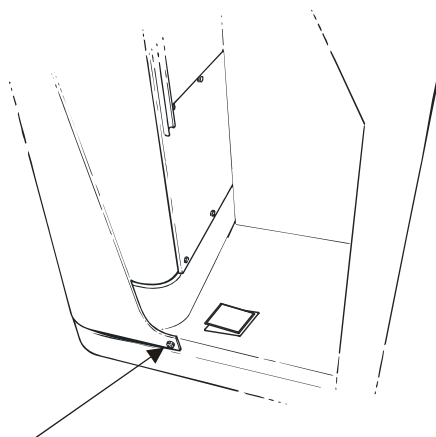
Risk of crushing exists if any part of the body is outside of the operator's cab.

Always ensure that the whole of your body is inside the protective cab.

The parking brake does not release until you have selected a travel direction.

Cover lock (11)

- Loosen the screw and swing out the entire motor casing to inspect the motor.



Display and programming

There is the possibility to look at the machine specific register, but not to reprogram it. However the clock can be programmed, for example, for summer or winter time.

Display

To display the machine specific register proceed as follows:

- Open the motor casing.
- Switch on the ignition key to feed voltage to the electronics.
- Press switch SELECT, on the electronic card.
- To step through the register one step at a time press SELECT once.

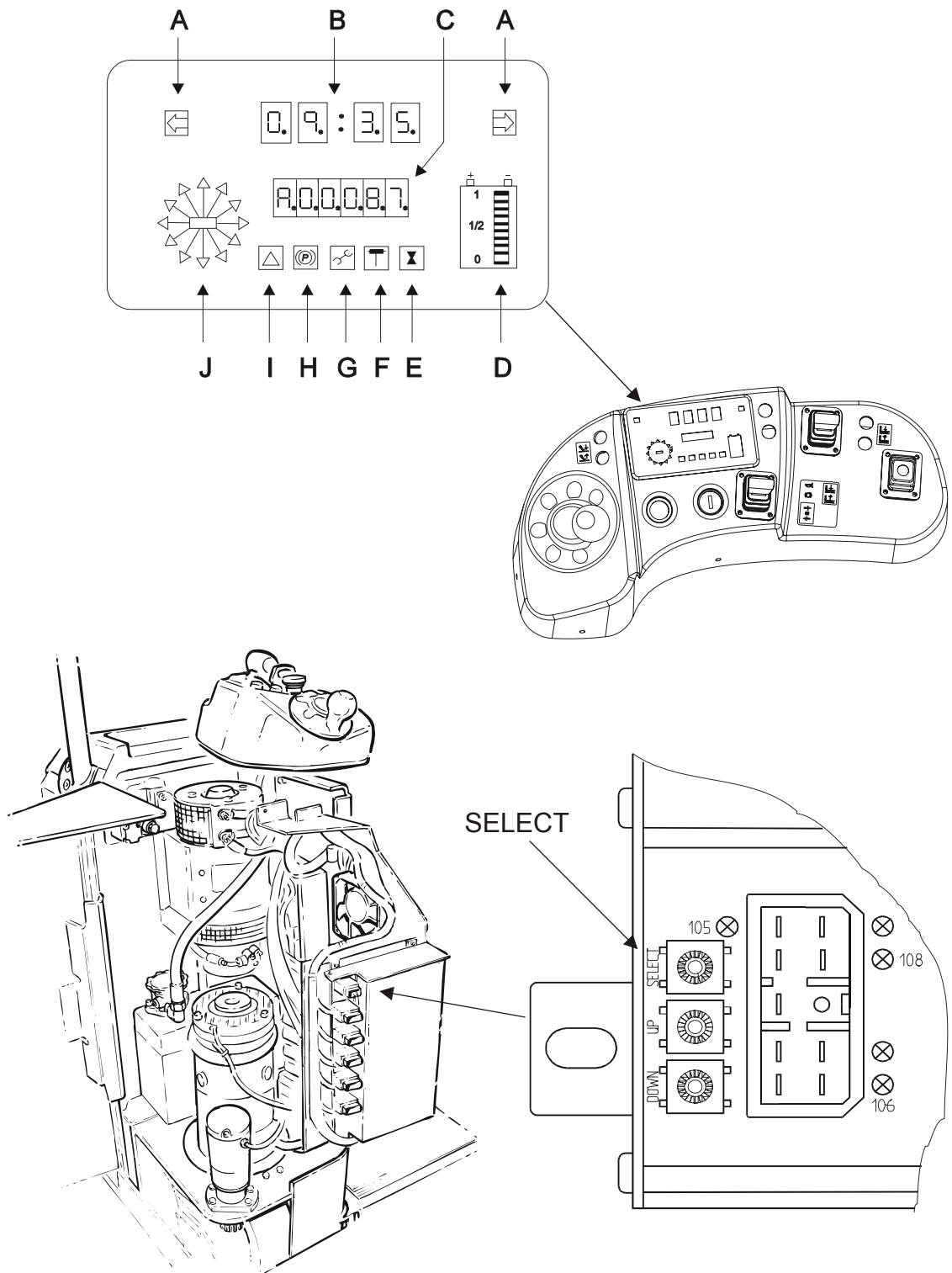
The programmed parameters will be displayed in the character window (C).

- Warning codes and Error codes
- Parameters
- Running time

The address register's "No" will be shown on the left-hand side and "the value" on the right-hand side.

Character window (B) indicates the programmed time of day.

Controls and instruments truck with 180° steering



Programming

When it's possible to program the clock the character window for hours will flash, pressing SELECT once to access the minutes

- Modify by stepping up one step using UP and down one step using DOWN.
- Store the programmed value and displaying the next address by pressing SELECT.

09:35

Function	Value
Hours	09 = 9h
Minutes	35 = 35 min.

When error codes are shown in character window (C) the character box (G) will be lit and when the parameters are displayed in character window (C) the character box (F) will be lit. However, it is not possible to reprogram these parameters from here. If this is necessary please contact a trained service technician.

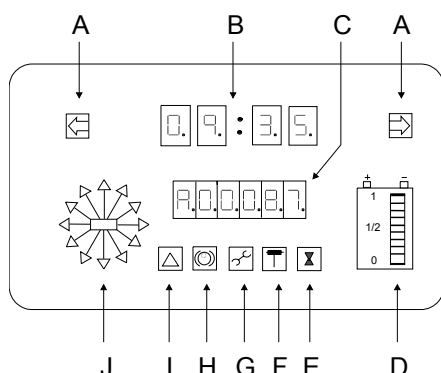
Quit programming by switching the ignition key off and on once. Programming is also stopped if no button is pressed within twenty seconds.

NOTE.

Truck handling.

The handling characteristics of the truck will change if you change any of the truck specific parameters. Do not change any parameters without possessing the necessary know-how.

Warning codes



Character	Error
[]	Warning

When an error occurs a buzzer will sound and a code is displayed, during a 10 second period, on the right-hand side of the character window (C).

If the error remains after 1 minute the warning and buzzer will be reactivated for a further 2 second period.

This process continues until the fault is rectified, however, the truck can be driven with all functions as set out in the table.

The error is also indicated in the indicator window (G).



WARNING!

Ignoring error indications.

Truck safety in jeopardy.

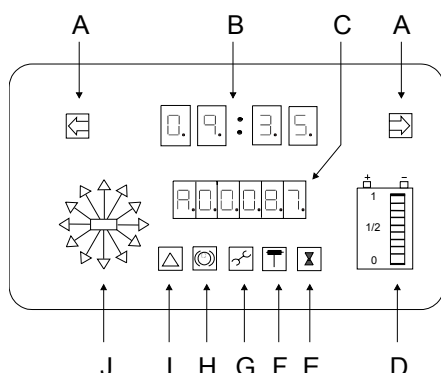
Always contact a service technician before the truck is used again after an error code has been displayed.

Code No.	Error type	Probable cause	Effect on the truck
11	The servo electronics on the steering are too hot.	Jammed steering.	The steering and driving speed is reduced.
13	The height pulse sensor gives no signal when lowering the forks above the fork reference switch.	Faulty pulse sensor or broken cable.	None
18	The battery in the logic box has reached its lowest voltage level.	The battery has run down.	The data stored in the memory will be lost.
19	The truck's parameter values have been lost.		The truck's parameter values are returned to standard.
20	Incorrect zero position signal from potentiometer for travel/brake.	Faulty potentiometer or broken cable or the potentiometer was activated when the ignition was switched on.	Function depending on the cause of the error.
21	Incorrect zero position signal from potentiometer for raise/lower.	Faulty potentiometer or broken cable or the potentiometer was activated when the ignition was switched on.	Function depending on the cause of the error.

Controls and instruments truck with 180° steering

Code No.	Error type	Probable cause	Effect on the truck
22	Faulty connection to steering angle potentiometer	Faulty potentiometer or broken cable.	Steering affected depending on cause of fault
25	Electrical failure or short-circuit on a valve/relay.	Faulty valve/connector or cable.	Function depending on the cause of the error.
26	Electrical failure on the potentiometer for hydraulic functions.	Faulty potentiometer or broken cable.	Function depending on the cause of the error.
27	Incorrect battery supply.	The power supply cables to the battery supply are not connected to the battery.	No effect on the truck. The battery display flashes.
30	Safety pedal switch activated more than 3 minutes whilst the truck has not moved.	Faulty switch or broken cable.	The parking brake comes on.
31	The left-foot pedal is activated for more than 3 minutes without the truck moving.	Faulty switch or broken cable.	The parking brake comes on.
32	By-pass switch for lift height limit activated more than 3 minutes whilst the truck has not moved.	Faulty switch or broken cable.	The parking brake comes on.

Error codes



Character	Error
E	Error

When an error occurs a buzzer will sound at the same time as an error code is displayed on the right-hand side of the character window (C). The error code is shown until the key is turned and the voltage to the truck is cut.

If the error remains when the key is turned on again the buzzer will sound and the error code displayed.

The truck cannot be used with the hydraulic functions listed in the table.

The error is also indicated in the indicator window (G).



WARNING!

Ignoring error indications.

Truck safety in jeopardy.

Always contact a service technician before the truck is used again after an error code has been displayed.

Code No.	Error type	Probable cause	Effect on the truck
102	Error signal from the servo electronics.	Faulty servo unit or the emergency stop is on.	All hydraulic functions except lowering the forks are stopped.
120-121 123 127-140	Fault in the electronics.	Faulty electronics.	All hydraulic functions except lowering the forks are stopped.
122	Too much heat in the servo electronics.	Faulty electronics.	All hydraulic functions except lowering the forks are stopped.
125	Faulty in the steering generator.	Faulty generator or broken cable.	All hydraulic functions except lowering the forks are stopped.
126	Faulty in the steering motor	Faulty motor or broken cable.	All hydraulic functions except lowering the forks are stopped.
100	Brake fault step 1	Faulty brakes or cabling	All hydraulic functions except lowering the forks are stopped.

Controls and instruments truck with 180° steering

Code No.	Error type	Probable cause	Effect on the truck
101	Brake fault step 2	Faulty brakes or cabling	All hydraulic functions except lowering the forks are stopped.
141	Faulty setting of 180°/360° selection	Invalid combination of parameter and input	All functions on the truck are stopped

Accessories

The truck can be fitted with different accessories to increase your safety when using the truck. Accessories can be combined.

Load support

The load support increases the stability of the load when handling high loads. The load support has different heights to suit the height of the load being handled.

Extension forks

The extension forks fit on top of the standard forks and provide the opportunity of transporting longer goods than are possible on the standard forks. Max. length of extension forks = 1.5 x fork length.



WARNING!

Risk for tipping.

The lifting capacity is reduced when the extension forks and longer loads are handled.

Always check the truck's total lifting capacity.

Stabilisers

The stabilisers increase the stability of the truck and in doing so allow an increased lifting capacity and higher lifting heights.

NOTE!

Increased truck width.

The stabilisers can collide with fixed objects.

A truck with extended stabilisers requires more room.



WARNING!

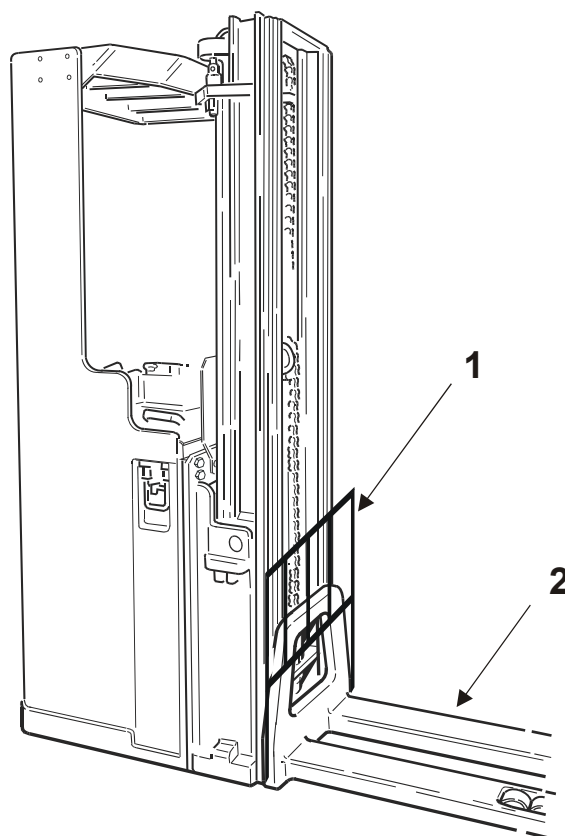
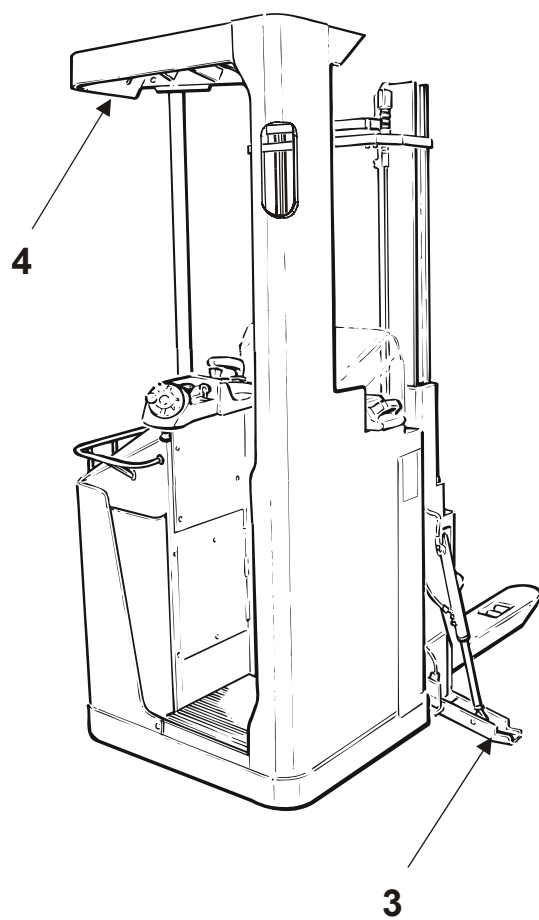
Risk of crushing.

The stabilisers can injure persons outside the truck.

Ensure that nobody is within the truck's operating area.

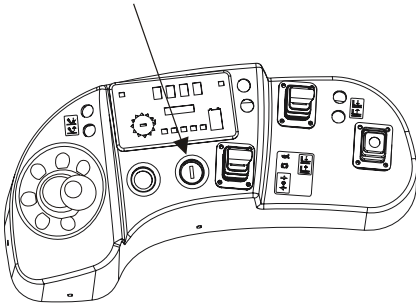
Height indicator

The height indicator shows the forks' actual height within the head lift area. The height is shown digitally on a display.



Driving truck with 360° steering

Starting the truck



- Make sure the emergency switch off is not pressed in.
- Turn the ignition key to position I. The instrument lighting should come on.
- Make sure the battery controller indicates a sufficient charge level (1/2 - 1).

NOTE!

Low charge level.

A low charge level can result in damage to the battery with prolonged operating.

Do not drive without first charging the battery.

- Place the left foot on the safety pedal.

NOTE!

Risk of crushing.

Risk of crushing exists if any part of the body is outside of the operator's cab.

Always ensure that the whole of your body is inside the protective cab.

- Select the travel direction.



WARNING!

Function failure.

Safety can be jeopardised.

Always check the following safety functions before starting the day's work.

- That the horn and emergency switch off function correctly.
 - That the steering functions correctly.
 - That the brakes function correctly.
 - That the hydraulic functions are operational.
- Start gently by accelerating slowly until you reach the desired speed.



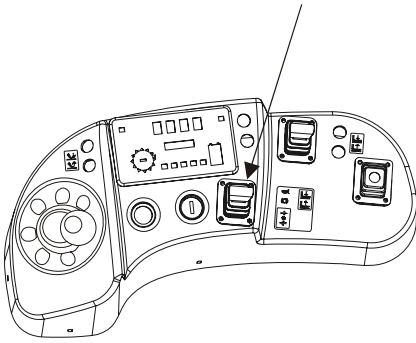
WARNING!

Dangerous driving.

Accidents can occur.

Always drive with care, good judgement and responsibility as set out in the general safety regulations.

Braking



- Brake the truck by moving the accelerator/brake control backwards. Braking occurs in two stages. First gradually, then after a certain time-delay, if braking has not been discontinued, full brakes.

An emergency stop can be performed on the truck by removing your left foot from the foot pedal. This gives full braking force without delay.



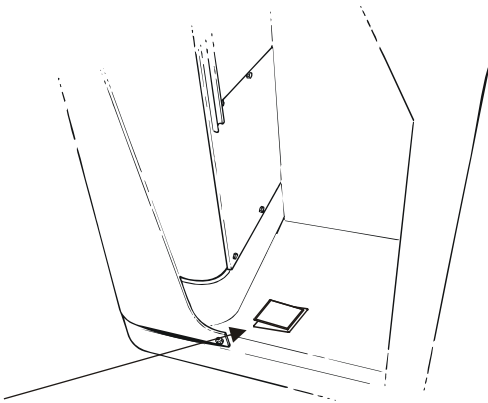
WARNING!

Risk of being thrown from the truck.

The parking brake is actuated if your left foot is removed from the foot pedal while driving.

Only move your left foot from the foot pedal if you intend to stop the truck in an emergency.

Deceleration can take place using the electric drive motor. This is done by actuating the travel direction selector in the opposite travel direction. Deceleration is controlled by moving the travel control forwards.



Steering

The steering impulses are transmitted to an electric steering motor mounted in the motor compartment. The steering motor moves the steered drive wheel by means of a chain drive.

- When small steering wheel adjustments are required and when driving at high speed, steer the truck with the finger-tips on the steering wheel hub. For low speed driving and turning the truck, rotate the wheel faster with the help of the steering wheel spinner.

The control characteristics can be adapted to suit the experience and requirements of the driver. Control sensitivity can be increased or reduced as required. Contact authorised service technicians.



WARNING!

Lost stability.

The truck can overturn and the load fall if you turn the steering quickly at high speed. Only steer with the finger tips on the steering hub when driving at high speed.

- If the truck gets caught against an obstacle, do not use more force to steer than used when steering the truck under normal conditions. If this is the case, try to come free by carefully driving forwards and backwards while carefully moving the steering wheel/tiller arm.



WARNING!

Risk of slipping.

You can lose control of the truck if your hands or shoes are oily. Always dry your hands and shoes before driving.

Parking the truck

- Stop the truck carefully.
- Lower the forks fully to the floor.
- Retract the stabilisers.
- Turn the ignition key to the **0** position (the parking brake is activated automatically).



WARNING!

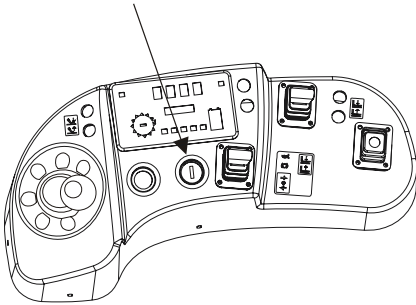
Unauthorised use.

Accidents can happen.

Always remove the ignition key when the truck is left unattended.

Driving truck with 180° steering

Starting the truck



- Make sure the emergency switch off is not pressed in.
- Turn the ignition key to position I. The instrument lighting should come on.
- Make sure the battery controller indicates a sufficient charge level (1/2 - 1).

NOTE!

Low charge level.

A low charge level can result in damage to the battery with prolonged operating.

Do not drive without first charging the battery.

- Place the left foot on the safety pedal.

NOTE!

Risk of crushing.

Risk of crushing exists if any part of the body is outside of the operator's cab.

Always ensure that the whole of your body is inside the protective cab.

- Select the travel direction by carefully moving the travel control forwards/backwards.



WARNING!

Function failure.

Safety can be jeopardised.

Always check the following safety functions before starting the day's work.

- That the horn and emergency switch off function correctly.
- That the steering functions correctly.
- That the brakes function correctly.
- That the hydraulic functions are operational.
- Start gently by carefully activating the travel control until you reach the desired speed.



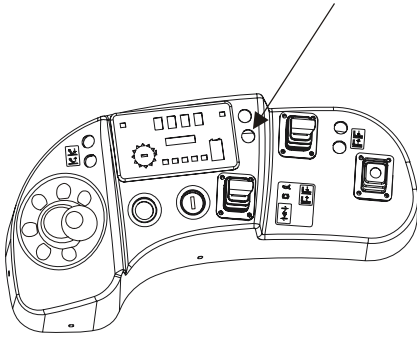
WARNING!

Dangerous driving.

Accidents can occur.

Always drive with care, good judgement and responsibility as set out in the general safety regulations.

Braking



- Brake by pressing the button.
- The brakes are applied in two stages, first gentle braking and then after a set delay full braking.

An emergency stop can be performed on the truck by removing your left foot from the foot pedal. This gives full braking force without delay.



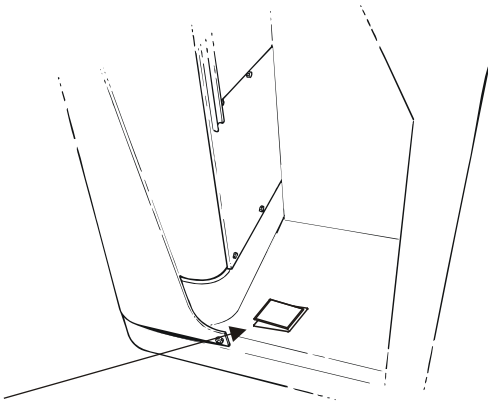
WARNING!

Risk of being thrown from the truck.

The parking brake is actuated if you left foot is removed from the foot pedal while driving.

Only move your left foot from the foot pedal if you intend to stop the truck in an emergency.

Deceleration can take place using the electric drive motor. This is done by actuating the travel direction selector in the opposite travel direction. Deceleration is controlled by moving the travel control forwards.



Steering

The steering impulses are transmitted to an electric steering motor mounted in the motor compartment. The steering motor moves the steered drive wheel by means of a chain drive.

- When small steering wheel adjustments are required and when driving at high speed, steer the truck with the finger-tips on the steering wheel hub. For low speed driving and turning the truck, rotate the wheel faster with the help of the steering wheel spinner.

The control characteristics can be adapted to suit the experience and requirements of the driver. Control sensitivity can be increased or reduced as required. Contact authorised service technicians.



WARNING!

Lost stability.

The truck can overturn and the load fall if you turn the steering quickly at high speed. Only steer with the finger tips on the steering hub when driving at high speed.

- If the truck gets caught against an obstacle, do not use more force to steer than used when steering the truck under normal conditions. If this is the case, try to come free by carefully driving forwards and backwards while carefully moving the steering wheel/tiller arm.



WARNING!

Risk of slipping.

You can lose control of the truck if your hands or shoes are oily. Always dry your hands and shoes before driving.

Parking the truck

- Stop the truck carefully.
- Lower the forks fully to the floor.
- Retract the stabilisers.
- Turn the ignition key to the **0** position (the parking brake is activated automatically).



WARNING!

Unauthorised use.

Accidents can happen.

Always remove the ignition key when the truck is left unattended.

Transporting loads

The weight of the load should be within the truck's permitted lifting capacity. See the truck's identification plate.



WARNING!

Risk of overturning.

The lifting capacity is reduced if additional equipment is attached to the truck.

Always check the truck's overall lifting capacity.

- Only handle loads that are stable and arranged safely. Take particular care when handling high and long loads.
- Always drive with the forks in the transporting position, except when depositing or collecting a load.



WARNING!

Lost stability.

High loads can fall when cornering at high speed.

Drive slowly and carefully when cornering.



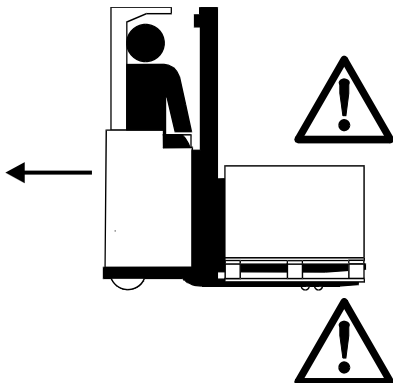
WARNING!

Protruding loads.

The load can collide with personnel, fixed or moving objects.

A truck with a protruding load requires more room when cornering.

- Drive the truck with the load trailing, when the load impairs the line of vision.
- If necessary, when the operator's vision is impaired, ask someone to direct operations so that transportation can take place without the risk of causing personal injury or material damage.
- Drive the truck at a reduced speed when driving on inclines. Always drive with the load uppermost on the incline. Drive straight up and down the incline. It is not permitted to turn the truck on an incline.



WARNING!

Risk of overturning.

A loaded truck can overturn when attempting to turn on an incline.

Never turn a loaded truck on an incline.

WARNING

Increased braking distance.

The braking distance is increased when travelling downhill.

Drive at a reduced speed, use the truck's motor brake.

Transporting loads

- Before you drive the truck into a lift, ensure that the lift is approved for the total weight of the truck, the load and the operator. Enter with the load first. No other personnel should be in the lift.

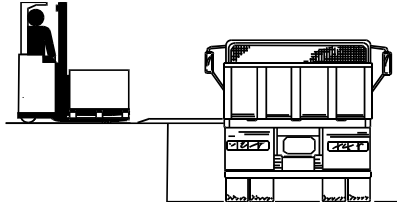


WARNING!

Risk of overloading the lift.

An overloaded lift can fall out of control down the lift shaft.

Always check the capacity of the lift before driving in with the truck.



- Before you drive the truck on a loading ramp, ensure that the ramp is correctly secured and that it has the necessary bearing capacity. The truck should be driven slowly and carefully across the ramp and at a safe distance from the edge.



WARNING!

Risk of tipping.

The truck can tip over.

Always check the ramp's load bearing capacity and that it is secured correctly. Drive at a safe distance from the edge.

Collecting a load



WARNING!

Risk for falling small goods.

Injuries to the driver can occur.

Equip the truck with plexiglass or protective bars on the overhead guard.



WARNING!

Risk of crushing, support.

Carelessness can cause injuries.

Keep your hands on the control when raising/lowering.

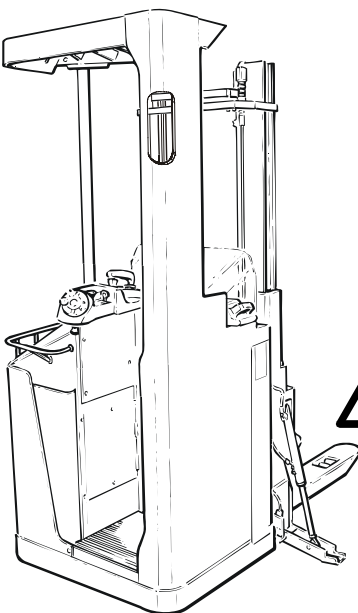
- Slow down and position the truck carefully in front of the rack.
- Lift the forks to the required position.
- Extend the stabilisers if the lift shall occur above the lifting height switch.

NOTE!

Increased truck width.

The stabilisers can collide with fixed objects.

A truck with extended stabilisers requires more room.



WARNING!

Risk of crushing.

The stabilisers can injure people outside the truck.

Ensure that nobody is within the truck's operating area.

- Drive the truck forward so that the forks are positioned as far as possible under the load.
- Lift the forks so that the load is lifted free.

Transporting loads

- Run the truck back so the load is freed from the storage point.
- Lower the load to the transporting position and drive carefully away from the rack.
- Retract the stabilisers when the forks come below the lifting height switch.



CAUTION!

Lost stability.

Lifting a loaded pallet when the truck is still moving can result in the load falling off of the pallet.

Never lift a load if the truck is moving.

- Start slowly and then increase the speed.

Depositing a load



WARNING!

Risk for falling small goods.

Injuries to the driver can occur.

Equip the truck with plexiglass or protective bars on the overhead guard.



WARNING!

Risk of crushing, support.

Carelessness can cause injuries.

Keep your hands on the control when raising/lowering.

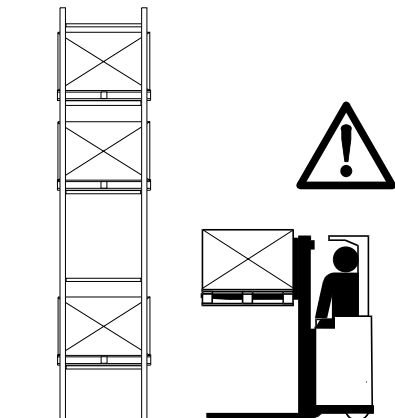
- Slow down and position the truck carefully in front of the rack.
- Lift the forks to the required lifting position.
- Extend the stabilisers if the lift shall occur above the lifting height switch.

NOTE!

Increased truck width.

The stabilisers can collide with fixed objects.

A truck with extended stabilisers requires more room.



WARNING!

Risk of crushing.

The stabilisers can injure people outside the truck.

Ensure that nobody is within the truck's operating area.

- Drive the truck forward so that the load is positioned correctly on the rack.
- Lower the forks so that they clear the load.
- Reverse the truck.
- Lower the forks to the transporting position and drive carefully away from the rack.

Transporting loads

- Retract the stabilisers when the forks come below the lifting height switch.



CAUTION!

Lost stability.

Lowering a loaded pallet when the truck is still moving can result in the load falling off the pallet.

Never lower a load if the truck is moving.

- Start slowly and then increase the speed.

Battery

- Check that the battery in the truck is a 24 V traction battery having a weight within the minimum/maximum values stated on the identification plate.

Replacing the battery

- Only replace the battery with a battery of the same weight as the original. The battery weight affects the truck's stability and its braking capacity. Information on the lowest permitted battery weight can be found on the truck's identification plate.



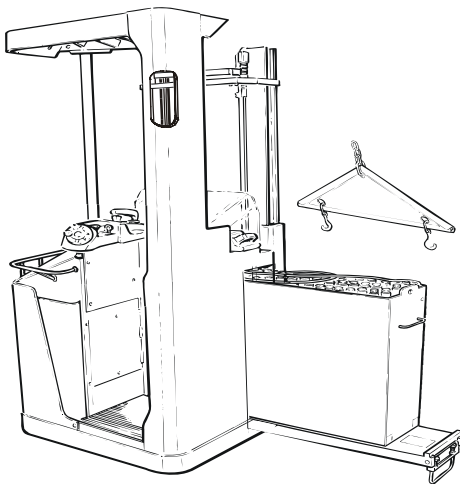
WARNING!

Risk of moving the centre of gravity.

A battery weight that is too low gives impaired stability and braking capacity.

The battery weight must be in accordance with the information on the truck's identification plate.

When changing the battery proceed as follows:



- Press in the emergency switch off.
- Open and drop down the doors to the battery compartment.
- Remove the lock.
- Roll out the dead battery onto the door.
- Disconnect the battery connector from the battery.
- Lift out the discharged/old battery.
- Lift in the new battery.
- Connect the battery connector to the battery
- Roll the new battery into the compartment and mount the safety catch.
- Close the door to the battery compartment and secure it.



WARNING!

Risk of short-circuiting.

The cables can be damaged and cause a short-circuit.

Ensure the battery cables are not crushed.

- Release the emergency switch off.
- Ensure the ignition key is in the 0 position.



WARNING!

Falling battery.

When changing the battery, it can be dropped.

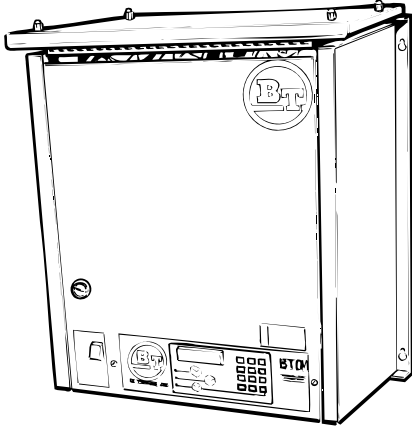
Always lift the battery using an approved lifting device and use a battery yoke intended for the battery.

Charging the battery



GENERAL PROHIBITION

When charging the battery it is absolutely prohibited to smoke or use a naked flame.



Use an automatic battery charger intended for charging traction batteries.

The charger shall have an automatic maintenance charging feature for a certain period after the main charging period has been completed. This eliminates the risk of overcharging the battery and the need to monitor the charging procedure is reduced to a minimum.

The charger shall have a minimum charging current of:

Battery (Ah)	Charger (A)
200 - 300	40 - 60
300 - 450	60 - 80
450 - 600	80 - 110



WARNING!

Corrosive acid.

The battery fluid contains sulphuric acid. Fluid spilt on the skin should be rinsed off immediately. Wash thoroughly with soap and water.

If the fluid has come into contact with the eyes, wash the eyes immediately using an eye shower, contact a doctor.



ALWAYS WEAR PROTECTIVE GLASSES AND PROTECTIVE GLOVES WHEN CHECKING THE BATTERY!

Before charging

- Park the truck in the assigned charging area.
- Ensure nothing prevents ventilation above the battery.
- Turn the ignition key to the **0** position and remove the key.
- Pull out the connector from the battery/recharging socket.
- Make sure the battery charger is switched off.
- Connect the battery charger to the permanently fitted battery connector.
- Start the charging unit.



WARNING!

Risk of EXPLOSION.

During the charging process oxygen and hydrogen gases are always formed in the battery. Short-circuits, naked flames and sparks in the vicinity of the battery can cause an EXPLOSION. Always switch off the charging current BEFORE removing the battery connector.

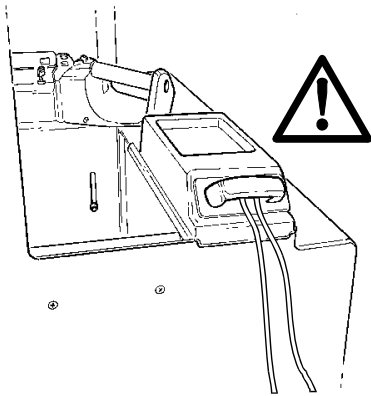
Provide good ventilation, especially if the battery is charged in a confined area.

During charging

- After approximately ten minutes make sure that the ammeter indicates a normal reading and that the control lamp is on.

After charging

- Make sure that the ammeter indicates an insignificant or no reading and that maintenance charge lamp is on, if fitted.
- Switch off the battery charger.
- Disconnect the battery charger from the permanently fitted battery connector.



CAUTION

Risk of short-circuiting.

The terminals can otherwise be damaged inside and result in a subsequent short-circuit.

Do not pull the cables to disconnect from the charger.

Battery maintenance

Carry out battery maintenance after recharging:



WARNING!

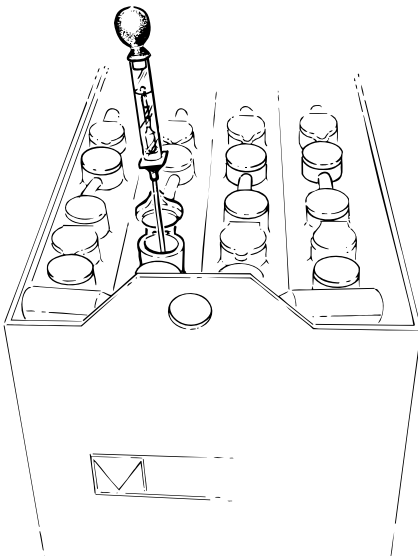
Corrosive acid.

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If the fluid has come into contact with the eyes, wash the eyes immediately using an eye shower, contact a doctor.



ALWAYS WEAR PROTECTIVE GLASSES AND PROTECTIVE GLOVES WHEN CHECKING THE BATTERY!



Each week:

- Remove all cell caps. Note: This does not apply to batteries with level caps or central filling.
- Check the fluid level in the cells and note any cells that consume more than a normal amount of fluid.
- Fill using distilled water. The fluid level should be 10 - 15 mm above the cell plates.
- Refit all of the cell caps.
- Rinse off and dry the battery.
- Suck up the fluid through the pipe that juts out between the cells on the battery.

Each month:

- Measure the temperature in one of the centre cells immediately after charging. The temperature should not exceed 50 °C.
- Measure the density of the battery fluid using an acid tester. Hold the acid tester absolutely vertical and extract sufficient fluid so that the hydrometer float moves freely.

Correct density values at different fluid temperatures for a fully charged battery:

Temperature °C	Density g/cm³
-15	1.31
0	1.30
+15	1.29
+30	1.28
+45	1.27

Daily service and function checks

- The operator is responsible for the daily service and care of the truck.
- Carry out the daily service at the start of the working day or shift, before the truck is used. The daily service is a function control as set out in the checklist below.
- You need no tools to carry out the service checks.
- If you fail to carry out the daily service, the safety and reliability of the truck can be affected.



WARNING!

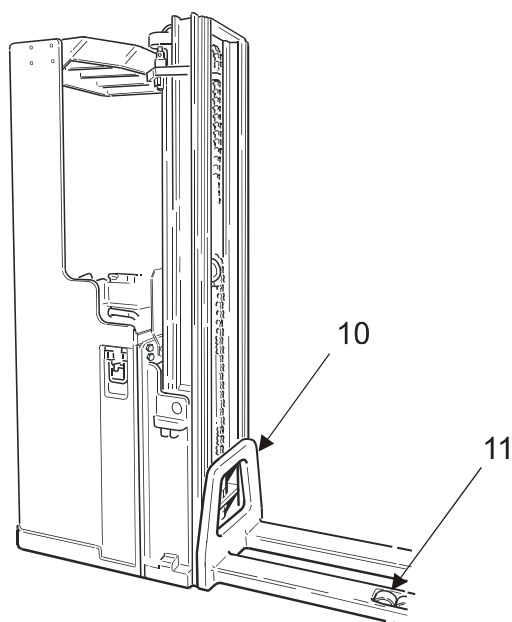
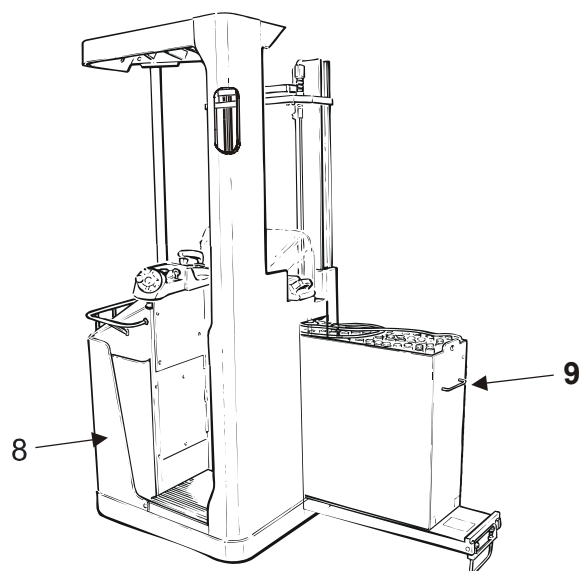
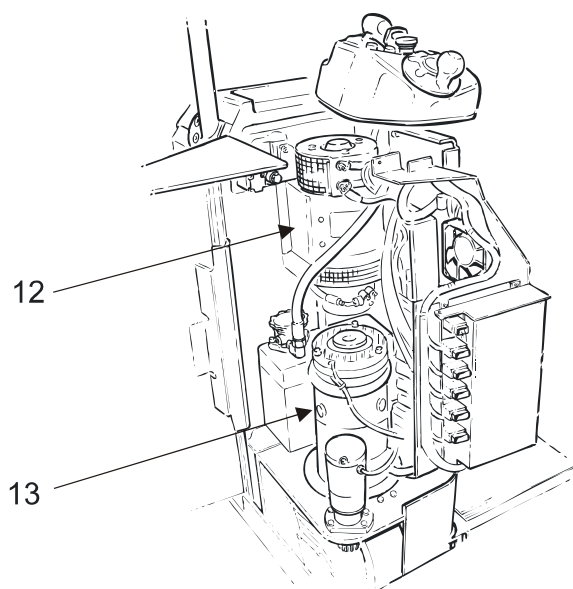
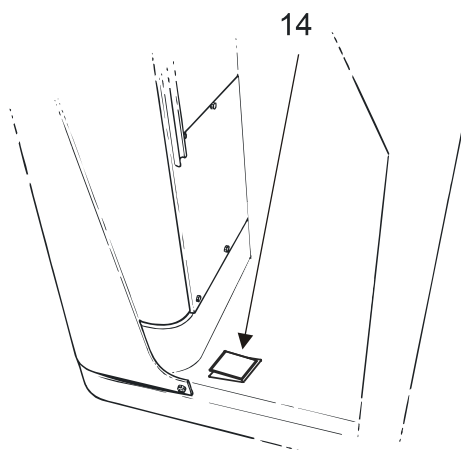
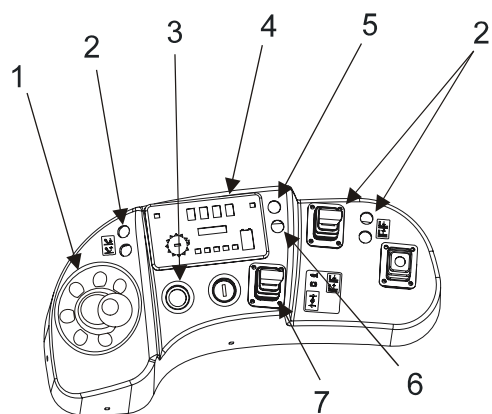
Never neglect the daily service and function checks.

Serious accidents can occur.

Always report any faults or damage to the management without delay. Never use a truck that has faults.

Pos no	Check points	Action
1	Steering wheel	Check its function
2	Hydraulic functions	Check its function
3	Emergency switch off	Check its function
4	Running time	Carry out maintenance as set out in the table in chapter <i>Maintenance</i>
5	Horn	Check its function
6	180°: Travel brake 360°: Travel direction selector	Check its function
7	180°: Speed control/Travel direction selector 360°: Speed control/ Travel brake	Check its function
8	Chassis	Check for damage, remove dirt and the like
9	Battery	Check acid level/charge condition
10	Lifting device	Check for damage, remove dirt and the like
11	Wheels	Check for damage, remove oil, metal chips and the like
12	Hydraulic system	Check the oil level and for oil leakage
13	Drive unit	Inspect abnormal noises and leakage
14	Safety pedal/Parking brake	Check its function

Daily service and function checks



Maintenance

Ensure the truck is given a regular maintenance service after 250 driving hours. The truck's safety, efficiency and service life is dependent on the service and maintenance it is given.

Only use BT approved spare parts when service and repair work are carried out.

BT recommends that you contact your closest BT representative to sign a service and maintenance agreement to ensure the truck's operating economy and safety.

Safety regulations with maintenance work

Only personnel that have been trained in the service and repair of this type of truck are authorised to carry out service and repair work.

- Do not carry out any maintenance work on the truck unless you have the correct training and knowledge to do so.
- Keep the area where you carry out the service clean. Oil or water makes the floor slippery.
- Never wear loose objects or jewellery when working on the truck.



WARNING!

Short-circuiting/Burns.

When working with the truck's electrical system, short-circuiting/burns can occur if a metal object comes into contact with live electrical connections.

Remove watches, rings or other types of metal jewellery.

- Always disconnect the battery by pulling out the emergency disconnecter when carrying out maintenance work on the truck unless otherwise stated in this publication or the Service Manual.
- Always switch off the truck's power supply before opening the covers on the drive unit or electrical system.
- Relieve the system pressure slowly before starting work on the truck's hydraulic system.
- Use paper or a rigid sheet of cardboard when checking for oil leakage. **Never** use your hand.

Maintenance

- Bear in mind that the oil in the transmission or the hydraulic system can be hot.



WARNING!

Chemical reaction.

Prolonged skin contact with hydraulic oil can lead to skin irritation.

Avoid prolonged skin contact with hydraulic oil.



WARNING!

Risk of burns.

Hot transmission and hydraulic oil.

Let the truck cool before replacing the oil.

- Only fill the hydraulic system with new and clean oil.



WARNING!

The hydraulic system can be damaged.

If the oil is contaminated hydraulic components can be damaged.

Always use new and clean oil in the hydraulic system.

- Store and dispose of changed oil in accordance with local directives.
- Do not release solvents and the like, which are used for cleaning/washing, into drains that are not intended for this purpose. Follow the local directives that apply for disposal.
- Disconnect the battery when welding on the truck.

NOTE!

The battery can be damaged.

When welding using an electric power source the welding current can enter the battery.

The battery should therefore be disconnected.

- Remove at least 100 mm (4") of paint around the welding/grinding area through sand-blasting or the use of a paint stripper when welding or grinding on painted surfaces.



CAUTION!

Harmful gases.

Paint that is heated gives off harmful gases.

Remove 100 mm (4") of paint from the work area.

- When working underneath the truck, support the truck on trestle-blocks.



WARNING!

Risk of crushing.

A badly supported truck can fall.

Never work under a truck that is not supported on trestle-blocks and secured by a lifting device.

Maintenance work that is to be carried out by the operator

Daily service and function checks as set out in the checklist in chapter *Daily service and function checks*.

Maintenance points with intervals 1 day, 1 week and 1 month as set out in the maintenance chart may be carried out by the operator.

Other maintenance points as set out in the maintenance chart may only be carried out by personnel who have completed maintenance training for this type of truck.

Maintenance work that may be carried out by trained maintenance personnel

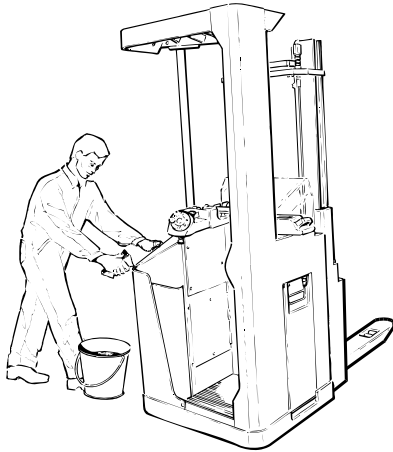
All maintenance points as set out in the maintenance chart.

With uncertainty regarding working procedures, consult the Service Manual for the truck.

Other service and repair work.

In addition to the maintenance points in the maintenance chart, all service and repair work should be carried out by personnel with special training for this type of truck.

Cleaning and washing



Cleaning and washing of the truck is important to ensure the truck's reliability.

- Carry out general cleaning and washing weekly.

NOTE!

Risk of short-circuiting.

The electrical system can be damaged

Disconnect the battery before washing by pulling out the emergency disconnecter.

External cleaning

- Remove rubbish, etc. from the wheels daily.
- Use a well-known degreasing agent, diluted to a suitable concentration.
- Rinse off loose grime using tepid water.

NOTE!

Jamming, corrosion.

Mechanical components can be damaged.

After washing, the truck should be lubricated as set out in the lubrication chart in chapter Maintenance.

Cleaning the motor compartment

- Cover the electric motors, connections and valves before washing.

NOTE!

Risk of short-circuiting.

The electrical system can be damaged.

Electrical components must not be cleaned with a high pressure washing unit.

- Clean the motor compartment using a well-known degreasing agent, diluted to a suitable concentration.
- Rinse off loose grime using tepid water.

Electrical components

- Blow electric motors down using compressed air.
- Clean the electrical panels, electronic boards, contactors, connections, solenoid valves, etc. using a damp cloth and a cleaning agent.

NOTE!

Risk of short-circuiting.

Electrical components can be damaged.

Do not break the guarantee seal on the electronic board.

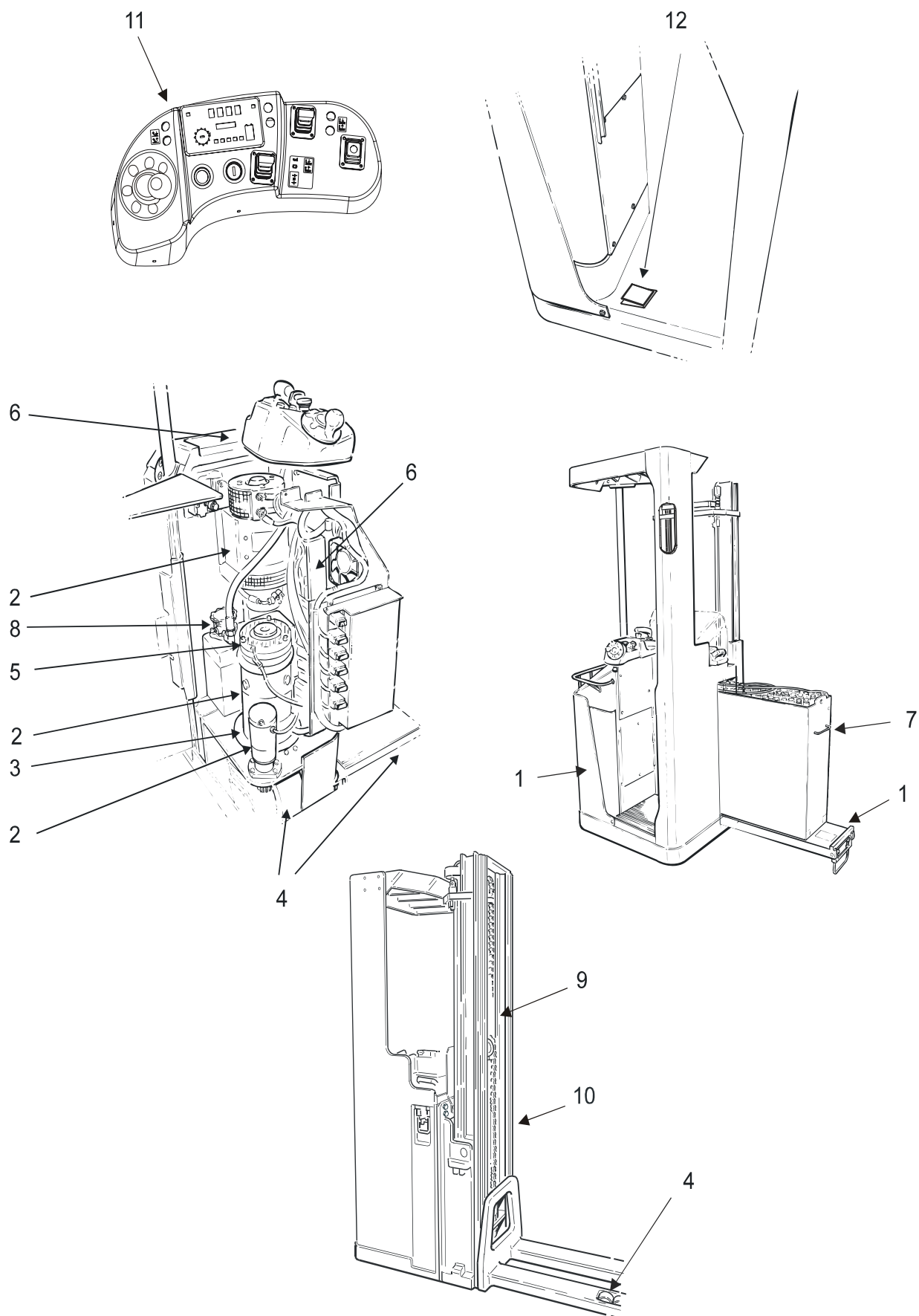
Maintenance chart

Pos. nr.	Work to carry out						
	Intervals in hours	5	20	160	250	500	1000
	Intervals in Days/Weeks/Months	1 d	1 w	2 m	3 m	6 m	12 m
1.0	Chassis.						
1.1	Check the door lock					X	
1.2	Check for wear to the battery lock				X		
1.3	Check for damage and crack formation				X		
1.4	Check all links and locking pins				X		
2.0	Motors						
2.1	Check for loose connections				X		
2.2	Clean the motor				X		
2.3	Check the mounting bolts				X		
2.4	Check for abnormal bearing noise					X	
3.0	Drive unit						
3.1	Check for leakage				X		
3.2	Check the oil level				X		
3.3	Check for noises					X	
3.4	Check the mounting on the support arm				X		
4.0	Wheels						
4.1	Remove string and other rubbish	X					
4.2	Check for drive wheel wear and the bolts				X		
4.3	Check that the link wheel is rotating and can swing freely				X		
4.4	Check for wear and tear on the link wheel and the fork wheels				X		
4.5	Dismantle and grease the fork wheel's bearings						X
5.0	Brakes						
5.1	Clean				X		
5.2	Check the brake discs for wear						X
5.3	Check the play in the released position					X	
6.0	Electrical components						
6.1	Clean and check the mounting				X		
6.2	Tighten cable connections				X		
6.3	Check contactor points				X		
6.4	Check the contactor's movement				X		

Maintenance

Pos. nr.	Work to carry out						
	Intervals in hours	5	20	160	250	500	1000
	Intervals in Days/Weeks/Months	1 d	1 w	2 m	3 m	6 m	12 m
7.0	Battery						
7.1	Check the electrolyte level (10-15 mm above the cell plates)		X				
7.2	Check the connections on the battery, truck and charger		X				
7.3	Check the cell and pole guard.		X				
7.4	Check the fluid density and temperature			X			
8.0	Hydraulic system						
8.1	Check hoses and couplings for leakage				X		
8.2	Check pipes and hoses for wear				X		
8.3	Check the tank for leakage and its mountings				X		
8.5	Check the oil level				X		
8.6	Change oil and filter			X ¹			X
9.0	Cylinders						
9.1	Check for leakage				X		
9.2	Check the mountings				X		
10.0	Mast						
10.1	Check for damage and crack formation				X		
10.2	Tighten the mast mounting				X		
10.3	Check for play on the rollers				X		
10.4	Check the electrical limit function				X		
10.5	Check for wear on the lifting chains and sprockets				X		
10.6	Check hoses and couplings for leakage				X		
10.7	Check for wear to the forks and other lifting devices				X		
11.0	Control console						
11.1	Check the mountings				X		
11.2	Check the microswitches and hydraulic func- tions				X		
11.3	Check the emergency stop.				X		
11.4	Check the gas cartridge's capacity and locking mechanism				X		
12.0	Pedals						
12.1	Check the functioning of the foot pedal	X					

¹⁾ Change filter after 50 - 100 hrs, and then every 1000 hrs.



Lubrication chart

Pos no	Service point	Interval/Running hours			Lubricant
		250h	1000h	3000h	
1	Wheel bearings			L	A
2	Rollers in the fork carriage		L		A
3	Mast beam	L			E
4	Lifting chains	L			D
5	Hydraulic system	C	O ¹⁾		B
6	Hinges		L		A
7	Steering bearings		L		F
8	Drive gear	C		O	C

L= Lubrication

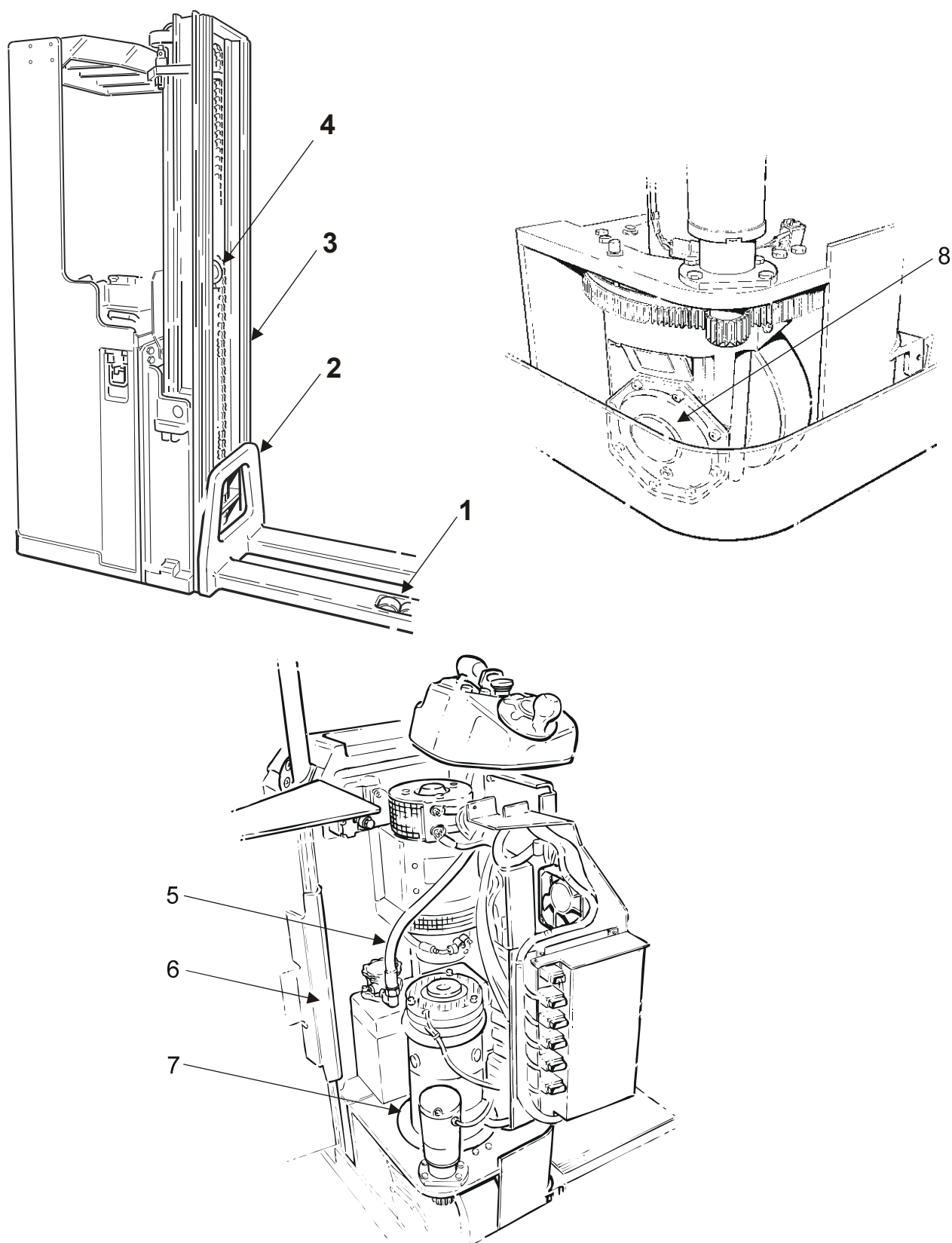
C = Check

O = Oil change

¹⁾ Change filter after 50 - 100 hrs, and then every 1000 hrs.

Oil and grease specification

Lubricant		Specification		Application area
		> - 15°C	< - 15°C	
A	Grease	BT 26777 (Spray)	BT 26777 (Spray)	Bearings and bushings
B	Hydraulic oil	ISO-L-HM32	ISO-L-HV32	Hydraulic system
C	Transmission oil	Hypoid oil SAE 80W/90	Hypoid oil SAE 75W	Gears
D	Grease	BT 26778 (Spray)	BT 26778 (Spray)	Chains and wires
E	Grease	BT 055-70111	BT 055-74320	Side shift forks
F	Grease	Staburags NBU 8EP	Staburags NBU 8EP	Steering bearings



Transporting and storing the truck

The truck's dimensions and weight as standard

NOTE! the truck's dimensions and weight can vary with different accessories.

The truck's dimensions and weight	
Height, truck without mast	mm
	2290
Height, truck with mast	mm
Dependent on the mast height, SSE135	1937 - 2622
Dependent on the mast height, SSE160	2013 - 2708
Width	mm
	900
Length incl. forks (L = 1150 mm).	mm
SSE135 short chassis Dx/Tx	2069/2088
SSE135 long chassis Dx/Tx	2183/2202
SSE160 Dx/Tx	2229/2229
Lowest battery weight	kg
300 Ah	278
360 Ah	380
480 Ah	484
584 Ah	493
Weight without battery	kg
SSE135 (Tele h ₃ = 3350)	1140
SSE160 (Triplex h ₃ = 6300)	1520

Lifting the truck

- Lift the truck from the marked lifting points when using a lifting device.



WARNING!

Risk of overturning.

The truck can overturn if it is lifted from the wrong lifting points.

Always lift the truck from the marked lifting points.

- Lift from the truck's centre of gravity when using another fork lift truck.
- Secure the truck to the lifting truck's forks.
- Lift with the greatest of care.



WARNING!

Risk of overturning.

The truck can overturn if it is lifted incorrectly.

Always lift the truck secured to, and with the centre of gravity between, the lifting truck's forks.

Towing and transporting a defective truck

The towed truck shall always have an operator who can steer and apply the brake when towing using a tow-truck and tow-rope.

Tow or transport a defective truck to a repair station as follows:

Trucks that have a working electrical system:

- Turn the key, activate the safety pedal and select the travel direction. Tow the truck, or push it by hand with the help of another person. The service brake can still be used.



WARNING!

Personal injury.

The truck can start to roll when the parking brake is disconnected.

Never leave the truck with the parking brake disconnected, chock the wheels in a satisfactory manner.

- Tow the truck using a tow-truck and trailer if the truck's drive wheel is jammed. The truck's drive wheel must be lifted off the ground.

Truck that has no electrical power:

- Tow by means of a tow-truck and trailer. The truck's drive wheel must be lifted off the ground.

Storing the truck

Take the following action if the truck is not used for a long period of time:

Battery

- Recharge the batteries fully and carry out usual battery maintenance.
- Maintenance charge the battery every **third month** and check the fluid level.

Hydraulic system

- Change the oil in the hydraulic system when stored for periods longer than **one year**, see the oil specification in the *Lubrication chart* in chapter *Maintenance*.

Drive unit

- Block up the truck's drive section to take the load off the drive wheel, when stored for periods longer than **one week**.

Starting after a period of disuse

Before the truck is put into operation after a period of disuse it should undergo a function and safety check as set out in the chapter *Daily service and function checks*.

- Carry out preventive maintenance as set out in the instructions, 250 hours interval.

Recycling/discarding



Batteries are hazardous to the environment and should be returned to the manufacturer for recycling.

Discarding the battery

When the working life of the battery in the truck is at an end (change to a new battery) or if the entire truck is to be scrapped special regard to environmental risks shall be taken when disposing/recycling batteries.

Spent batteries shall be returned /sent to the manufacturer of the battery or its representatives (see the sign on the battery) for disposal/recycling. You can also return batteries to your local BT-representative who will then take care of returning the battery to the manufacturer.

Scrapping the truck

The truck consists of parts that contain recyclable metals and plastics. Below is a list of those materials used in the truck's sub-systems.

Chassis	
Chassis	Steel
Mast	Steel
Instrument panels	Polypropylene
Cushions	Polyurethane
Drive unit	Steel and cast material
Bushings	Polyamide
Finish	Epoxy-polyester
Wheels	Polyurethane

Recycling/discarding

Hydraulic system

Oil tank	Polythene
Pump unit	Steel and aluminium
Hoses	Rubber and steel
Cylinders	Cast iron and steel

Electrical system

Cables	Copper cores with PVC sheaths
Electronic board	Reinforced glass fibre circuit board laminate Lithium battery
Motors	Steel, copper and aluminium

EC Declaration of Conformity

We,

Declare that the machine:

Make:

Type:

Notified body* - Cert.no.:

Serial no:

As described in attached documentation is in conformity with:

- The Machinery Directive 98/37 by complying to following standards: EN 1726-1, EN 1726-2 and EN 1175-1.
- The Directive Electromagnetic Compatibility 89/336 as amended by Directive 92/31 by complying to following standards; EN 50081-2 and EN 61000-6-2.

The machine shall only be used in industrial environment.

Other information

Eriksson, Lars, V.P. Projects and Product Safety

For deliveries to countries outside the European Union, differences may occur with regard to requirements for documentation in the local language.

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Modification no _____

Place & date of issue

Signature

(Company)

(Clarification of signature)