MULTILIFT Ultima Flex & Pro

Hooklift Ultima S / SL Flex & Pro

USER AND MAINTENANCE MANUAL
114060421/US
3/2019

MULTILIFT

Contents

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This manual is a translation from the original operating instructions compiled in Finnish.

MULTILIFT Ultima S / SL Flex & Pro HOOKLIFT

User Manual

This manual concerns the MULTILIFT Ultima S / SL Flex & Pro hooklift equipment.

Information about the equipment.

Type of system:	☐ Ultima ____ S	☐ Ultima ____ SL
	☐ Flex	☐ Pro
Serial number:		
Date of commissioning:		
Owner		
Your Multilift dealer		
Service workshop:		

GENERAL DESCRIPTION

MULTILIFT Ultima hooklift equipment is an exchange container loading and unloading device mounted on a truck chassis. An experience of over 60 years is a proof of the reliability and versatility of the equipment all over the world.

CE Statement of Conformity

Cargotec Finland Oy Multilift has been an ISO 9001 certified company since 1995 and since 2002 the company has complied with the ISO 14001 environmental standard. Multilift guarantees that the equipment contained within this manual conforms with the EC Machine Directive.

Cargotec Finland Oy
Multilift
Raisio
Finland
2019

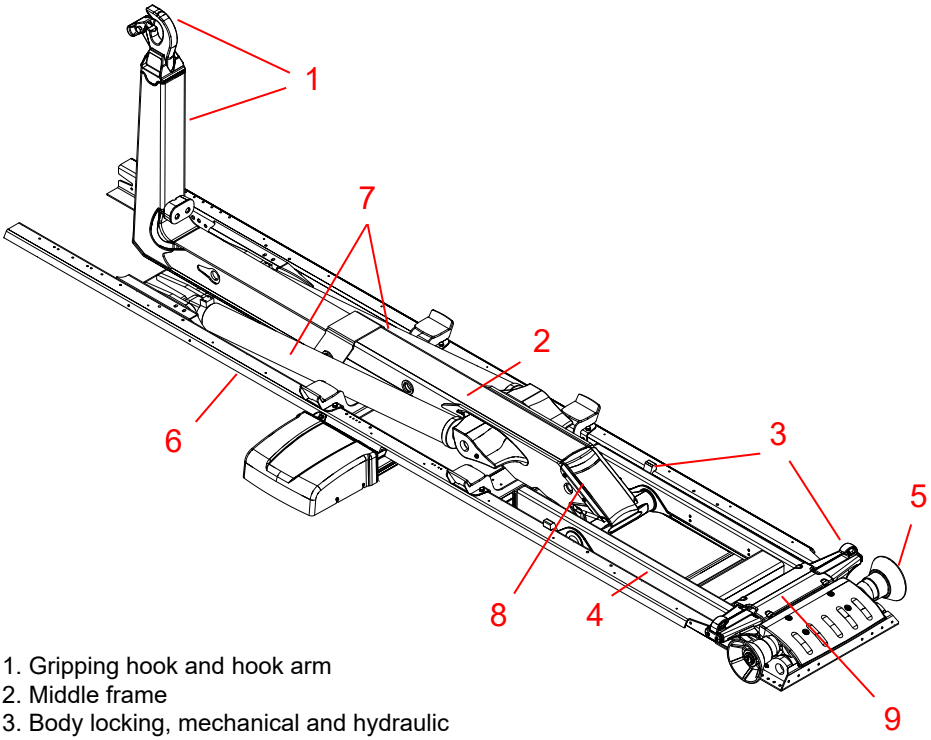
MULTILIFT Ultima 21S hooklift equipment

NOTE!

Cargotec Finland Oy reserves the right to change specifications, equipment, operating and maintenance instructions without prior notice.

Due to continuous product development some picture details may look different when compared to the actual device.

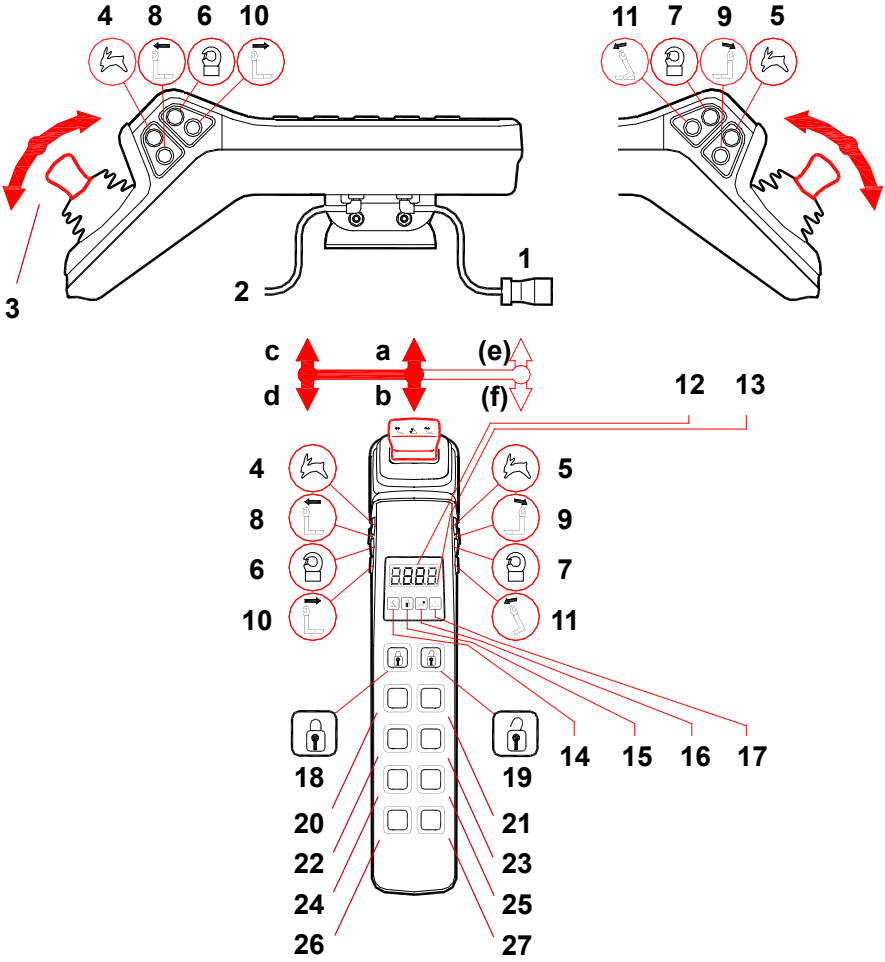
Main components



1. Gripping hook and hook arm
2. Middle frame
3. Body locking, mechanical and hydraulic
4. Rear frame
5. Rear rollers
6. Sub-frame
7. Main cylinders
8. Sliding cylinder
9. Body locking cylinder

CONTROLS

Control unit, Ultima 2GCC (Flex & Pro)



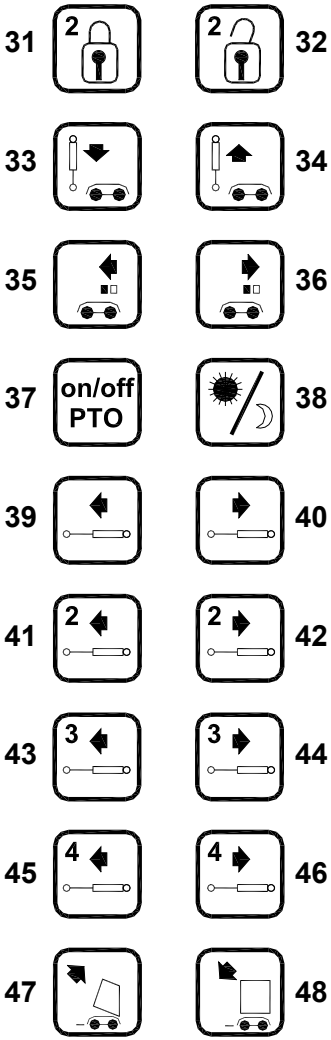
NOTE!
Do not press any control unit button and do not move the control lever while starting up the control unit.

Control unit components and basic functions

Ref.	Component or function
1	**CAN bus cable**
2	**Control panel cable**
3	**Control lever** a = main cylinders forward b = main cylinders backward c = telescopic hook arm (sliding) forward d = telescopic hook arm (sliding) backward (e) = automatic sequence control forward / friction relief (f) = automatic sequence control backward / friction relief
4 & 5	**Button *FAST SPEED *)***
6 & 7	**Button *HOOK SAFETY LOCK***
8 & 9	**Button *TELESCOPIC HOOK ARM FORWARD*** (optional to 3c)
10 & 11	**Button *TELESCOPIC HOOK ARM BACKWARD*** (optional to 3d)
12	**Four digit display**
13	**Point: voltage OK and system OK**
14	**Warning light *FRAME NOT DOWN***
15	**Warning light *HYDRAULIC BODY LOCKS NOT CLOSED***
16	**Warning light *UNDER-RUN BAR RETRACTED / BOGIE BLOCK ENGAGED***
17	**Warning light *AUXILIARY EQUIPMENT***
18	**Button *HYDRAULIC BODY LOCKS CLOSED***
19	**Button *HYDRAULIC BODY LOCKS OPEN***
20 - 27	**Alternative function buttons according to the equipment on the Ultima device** (cf. following pages)

*) Relief of horizontal movement and floating of the main cylinders can temporarily be by-passed by a quick action switch (push button).

Alternative function buttons (items 20 - 27 on the previous page)



Ref.	Function
31	**Hydraulic body locking closed**
32	**Hydraulic body locking open**
33	**Bogie blocking engaged**
34	**Bogie blocking released**
35	**Under run bar retracted**
36	**Under run bar extended**
37	**PTO engagement / release**
38	**Day position / night silence** (turns off outside buzzer)
39	**Additional hydraulics** (cylinder out)
40	**Additional hydraulics** (cylinder in)
41	**Additional hydraulics 2** (cylinder out)
42	**Additional hydraulics 2** (cylinder in)
43	**Additional hydraulics 3** (cylinder out)
44	**Additional hydraulics 3** (cylinder in)
45	**Additional hydraulics 4** (cylinder out)
46	**Additional hydraulics 4** (cylinder in)
47	**Trailer tipping or trailer hydraulics** (cylinder out)
48	**Trailer tipping or trailer hydraulics** (cylinder in)

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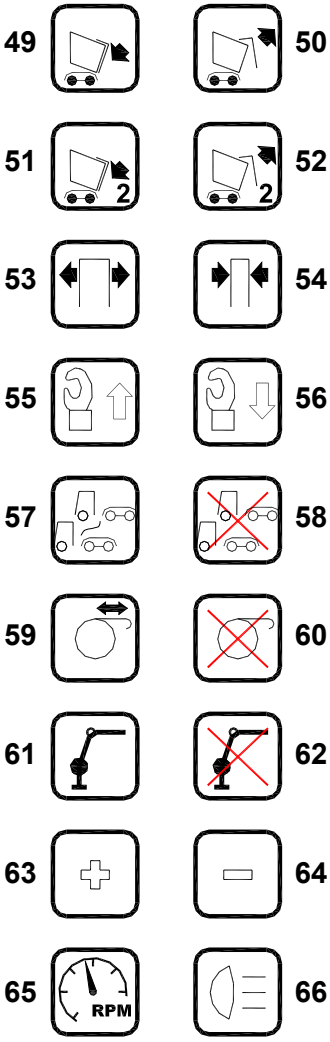
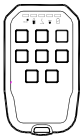
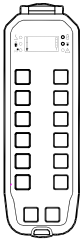


Ref.	Function
49	**Tail gate opener** (gate closed)
50	**Tail gate opener** (gate open)
51	**Tail gate opener 2** (gate closed)
52	**Tail gate opener 2** (gate open)
53	**Load cover system, UK** (arms out)
54	**Load cover system, UK** (arms in)
55	**Hydraulic adjustable hook** (up)
56	**Hydraulic adjustable hook** (down)
57	**Recovery hydraulics** (on)
58	**Recovery hydraulics** (off)
59	**Hoist** (on)
60	**Hoist** (off)
61	**Crane hydraulics** (on)
62	**Crane hydraulics** (off)
63	**Additional electric function** (on)
64	**Additional electric function** (off)
65	**RPM adjustment**
66	**Working lights**

Control unit, 2GMR (Mini-Radio)
see chapter “ADDITIONAL EQUIPMENTS - Mini-Radio”



Radio control unit, 2GRC
see chapter “ADDITIONAL EQUIPMENTS - Radio control”



Use the radio control unit’s buttons which symbols are represented in operating phase images.

Safety instructions and safety rules

MULTILIFT Ultima hooklift equipment was developed for the loading, unloading, tipping and transporting of removable containers/bodies on vehicles. All other use of the Multilift hooklift equipment is strictly forbidden. Multilift accepts no liability whatsoever with regard to such other use.

The hooklift equipment meets all safety and stability standards that apply at the moment of its delivery from the factory. Use the hooklift equipment only if it is in good condition, and only for the purpose for which it was designed and in accordance with the instructions and guidelines specified in this manual.

Cargotec Finland Oy Multilift accepts no liability whatsoever for any loss or damage caused by the failure to strictly adhere to the safety instructions specified in this manual or due to carelessness during the operation, adjustment, maintenance or repair of the hooklift equipment. Depending on the specific working conditions, additional safety instructions may be required. Contact your Multilift dealer immediately if you have encountered an unsafe situation with Ultima hooklift equipment that is not described in this manual.

Safety during use - general

The driver must be familiar with the contents of this manual and should strictly follow the directions and instructions. He must see to it that his Ultima hooklift equipment is technically in perfect condition. Control of the suspension, condition of the tyres, tyre pressures, condition of the container and loading of it, are all his responsibility. The driver must handle the Ultima equipment with care. For example during loading and unloading the front wheels of the truck must not be lifted up from the ground.

The hook equipment control system includes several functions assisting the operator, but it is the operator who is always responsible for the proper and safe use of the equipment.

Ultima hooklift equipment may only be used when sitting on the driver´s seat.

If it is necessary to leave the cabin during loading, unloading or tipping, always engage the parking brake and disengage the power take-off.

In the vicinity of the control units there must be no obstacles or loose objects that might accidentally activate unit´s functions.

If the equipment has not been used for two weeks or longer, all safety functions must be checked before the equipment is used again.

Avoid the unnecessary use of the main pressure relief valve. Heating up of the oil reduces the quality of it and results in shorter life span of retaining rings and gaskets.

In subzero temperatures <32°F (< 0°C) it is recommended to let the pump idle for around 1 minute in order for the hydraulic oil to be warmed up

During the use of the equipment the engine noise will increase due to additional loading. Noise level will also increase if the container is pulled along the ground during loading or unloading of it.
When the equipment is used carefully and in a sensibly planned manner, the noise level can be kept lower.

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Take care that the truck or the hooklift is not overloaded. Observe the factory data for the truck with regard to maximum permissible axle load/GVW. See also the axle load calculations!

Strong winds will have an effect on the operation during loading, unloading or tipping of the container.

If several successive containers switches are performed, the hydraulic oil may overheat >140ºF (60ºC) making it necessary to install an oil cooler to the system.

Ultima Mini-Radio and radio controller

Safety regulations

WARNING!

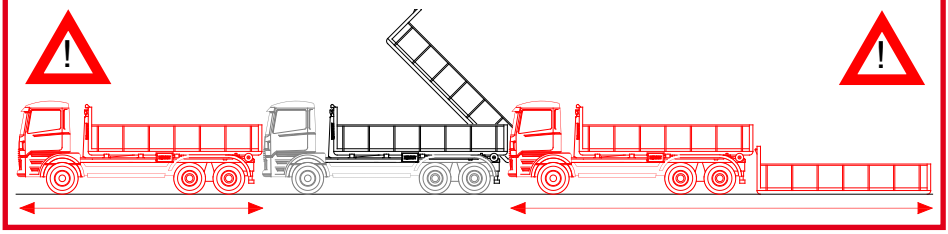
The driver must apply the parking brake before leaving the cabin to manoeuvre the hooklift by radio control. Otherwise the vehicle may start mowing during loading/unloading.

WARNING!

When loading/unloading is done on sloping ground, the driver must sit in the cabin and operate the brakes of the vehicle.

WARNING!

The driver must use great caution when loading/unloading from outside the cabin because he/she may e.g. be standing in the danger zone described above.



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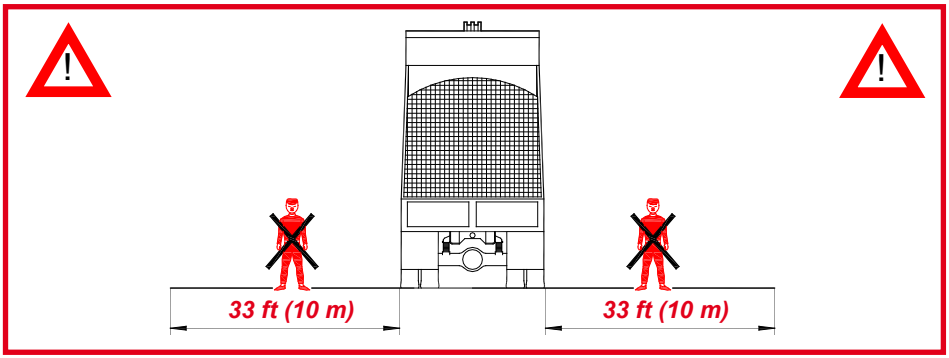
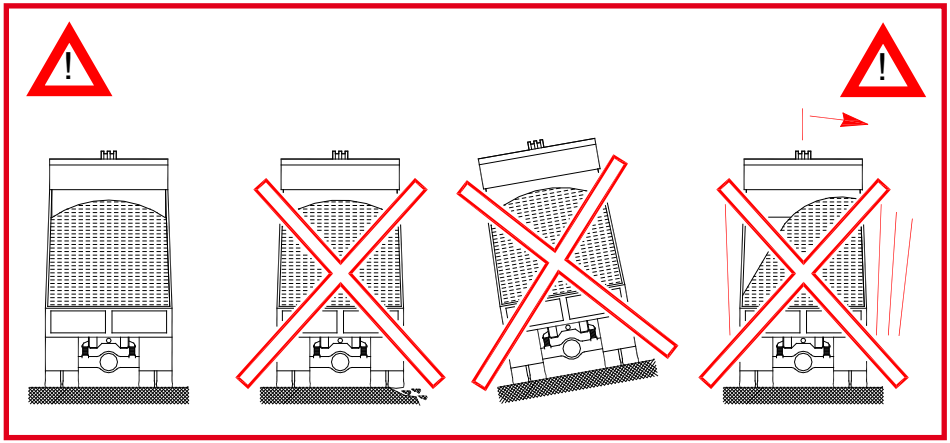


Requirements for the working area ground condition

Before you start loading, unloading or tipping using the Ultima hooklift equipment, you must inspect the following:

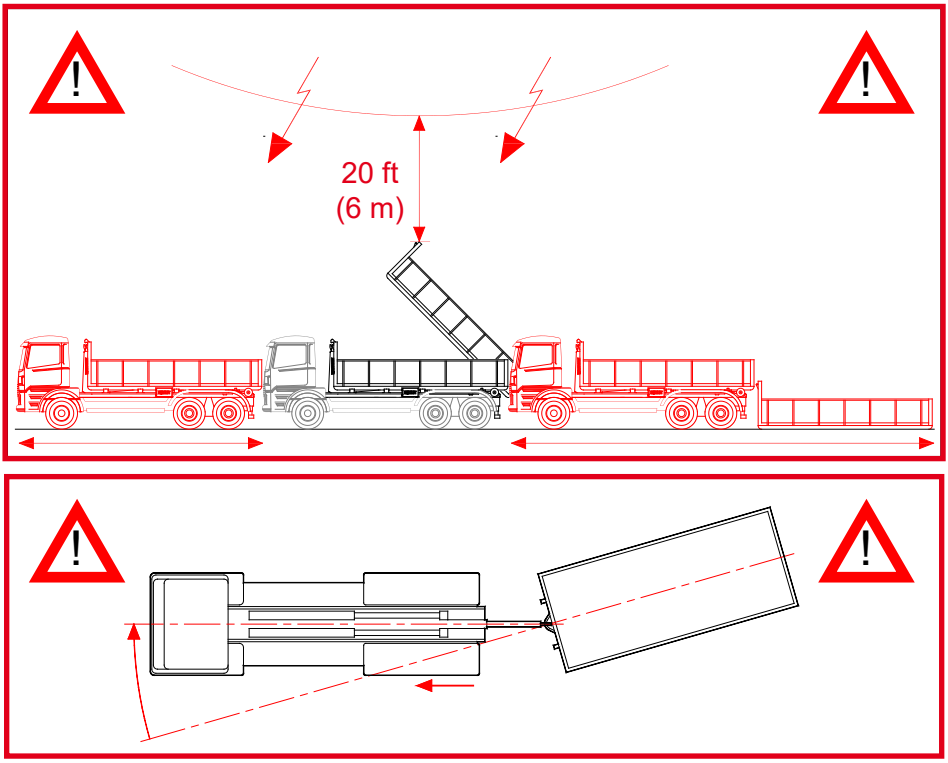
- the ground must be firm and free from potholes into which the truck could move during operation
- the ground must not be slippery
- the ground must be level



Working area

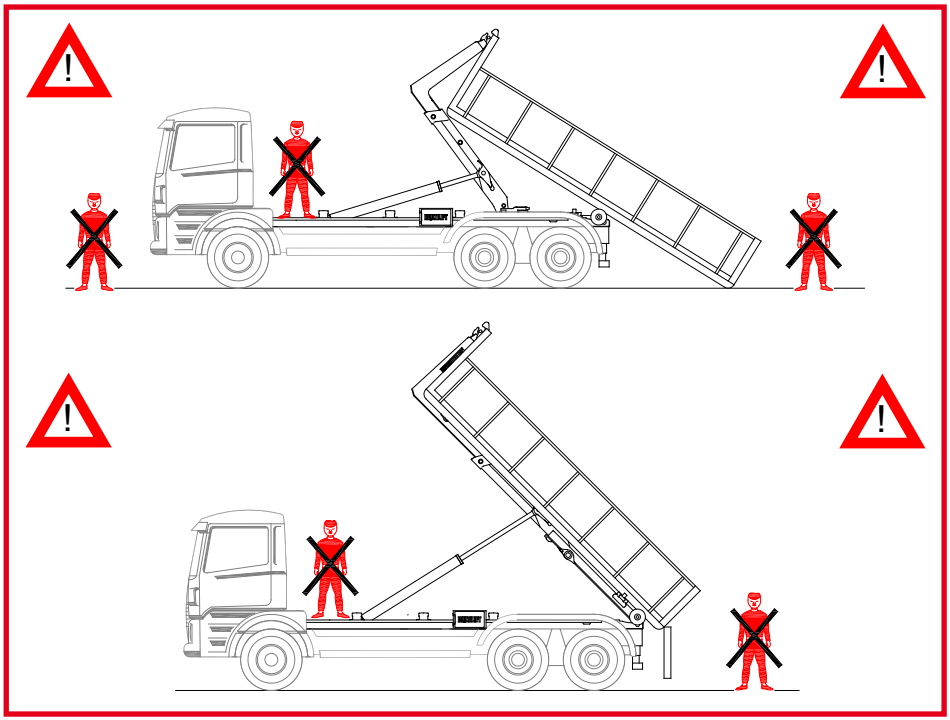
Load or unload only where there is sufficient space; this also applies to free height. **There must be at least 33 ft (10 m) free space at both sides of the vehicle.**

Check the vicinity for possible dangers.



When loading, the container must be placed in line with the driving direction of the truck.

If working in the dark, use working lights shining backwards in addition to the standard truck lights.



It is the responsibility of the driver to ensure that there are or there will be no other persons within the danger zone of the working area. It is strictly forbidden for anybody to be close to the truck or the container.

Tip Mark out the working area, for example, with cones.

Tip Ensure that the warning buzzers are operational (remember the night time limitations)

In case of emergency:
Disengage the clutch and the PTO.

Safety instructions and maintenance

Always follow the maintenance instructions and use only original Multilift spare parts. See chapter **Maintenance.**

Container

The demountable body can be a container, tank, gravel body, body for transporting machinery etc. according to standards (e. g. DIN 30722, SFS 4417, SS 3021 or CHEM).

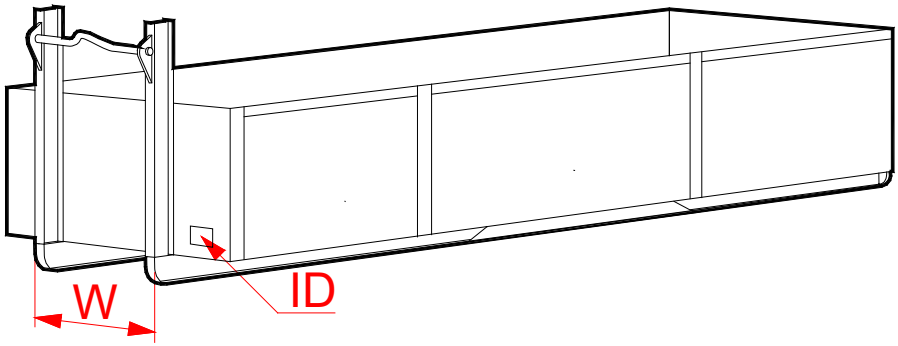
Check to be sure that the container is suitable for the load to be transported. Generally each container has a model plate (ID) on which the length and permissible load are specified.

Before picking up the container, check that the hook height (H), tunnel height (T) and the width (W) correspond with the Ultima hooklift dimensions and that the notches for the body locks are in correct positions.

If there is even the slightest doubt of the container dimensions, measure them first in order to prevent the equipment and the container from being damaged.

Gripping height (H), tunnel height (T) and width (W) of the container can vary from one container to another. Note that they are country specific dimensions. If there is doubt about the origin of the container, the tunnel height and width must be checked in order to ensure that they are compatible with those of the Multilift equipment.

Country specific standard dimension table of the container is on the next page.



Gripping height (H), tunnel height (T) and width (W) of the container can vary from one container to another. Note that they are country specific dimensions. If there is doubt about the origin of the container, the tunnel height and width must be checked in order to ensure that they are compatible with those of the Ultima equipment.

Country specific standard dimension table of the container is on the next page.

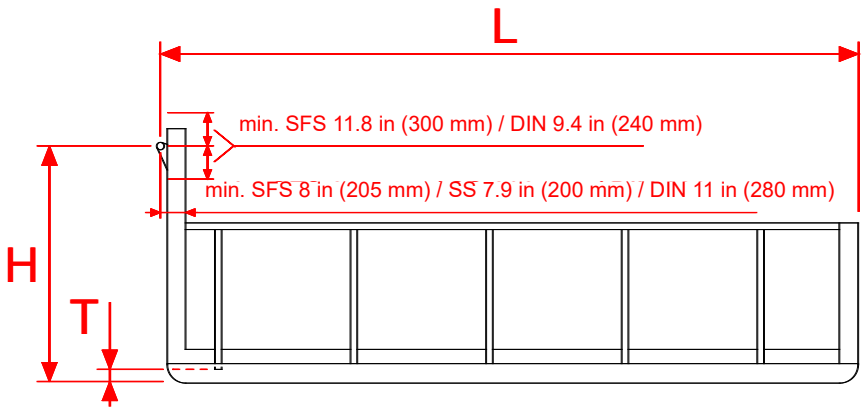
If your country is not mentioned on the list, check the matter in your hooklift equipment technical specifications.

The condition of the container must be checked regularly. Especially if you are going to use a type of container with which you are not familiar. In particular, check the condition of the locking points and the condition and position of the lifting hook.

The maximum allowed wear of the lifting hook is 10 % from its nominal diameter. Nominal diameter must be checked with the hooklift equipment supplier.

The longitudinal rails at the bottom of the container are under heady burden. Carry out daily checks of these components for wear or damage.

If the container is frozen to the ground, do not pull it loose by using the Ultima hooklift equipment.Use, for example, a forklift truck.



Country specific standard dimensions of the container:

Dim.	Value in (mm)	Countries, standard	Countries, not standard
H	55.1 (1400)	BE, NL	
	56.1 (1425)	BE, FR	
	57.1 (1450)	DK, IS, JP, LU, NL, NO, SE IT, PT	AT, AU, BE, DE, FR, ES,
	61.8 (1570)	AT, AU, BG, CA, CH, CN, CZ, DE, EE, ES, FI, GR, IT, LT, LV, MY, PL, PT, RO, RU, SG, SI, SK, US	BE
	62.0 (1575)	GB, IE	
T	1.97 (50)	GB, IE	
	3.94 (100)	AU, DK, IS, NO, SE	AT, ES
	4.92 (125)	EE, FI, LT, LV, RU, SI	NL
	5.51 (140)	GB, IE	
	5.91 (150)	BE, BG, CA, CH, CN, DE, ES, FR, GR, IT, JP, LU, MY, NL, PL, PT, RO, SG, US	
W	34.0 (864)	GB, IE	
	41.7 (1060)	AT, AU, BE, BG, CA, CH, CZ, DE, RO	GB, IE, JP
	41.9 (1065)	DK, EE, ES, FI, FR, GR, IS, IT, LT, LU, LV, NL, NO, PL, PT, RU, SE, SG, SI, SK, US	
	43.7 (1110)	JP	
	45.0 (1143)	GB, IE	
L min	G -31.5 (800)	All countries (G = G dimension of the Multilift equipment)	
L max	G +39.4 (1000)	All countries (see Technical specifications)	

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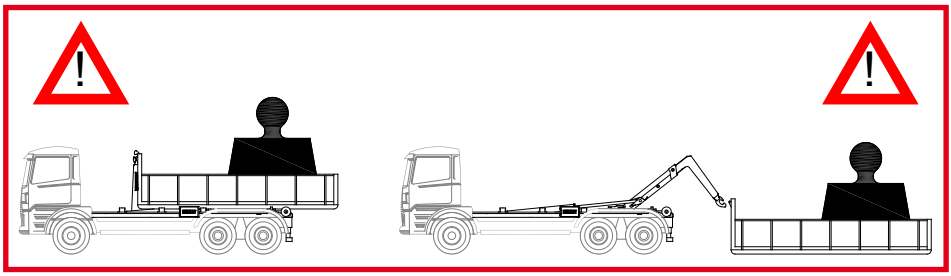
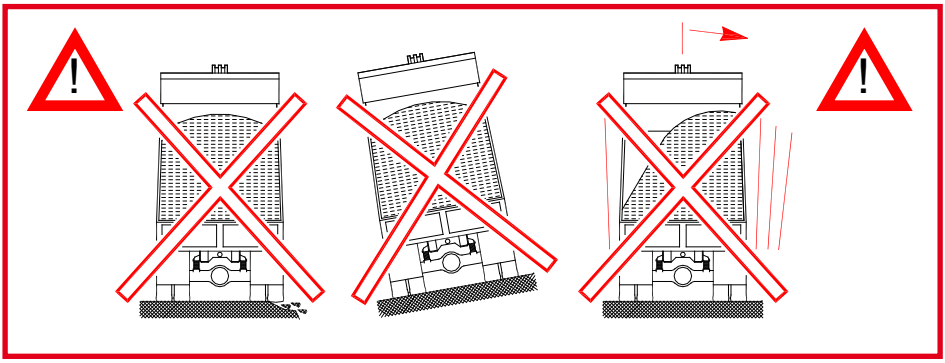
Loading and unloading of a container

Ensure before loading that the length of the container is suitable for your Ultima hooklift equipment



Loading of a balanced container requires special care.



Never load, unload or tip a container when the load is heavier to one side or the ground is sloping.

Ensure that the load´s centre of gravity is as low as possible and that it is in the middle of the container and evenly distributed. If the load must be secured, do this when the container is on the ground.

Ensure before loading or unloading of the container that all the removable equipment are safely fastened and that the load space tail gate, side doors and the load's fastening have been checked.

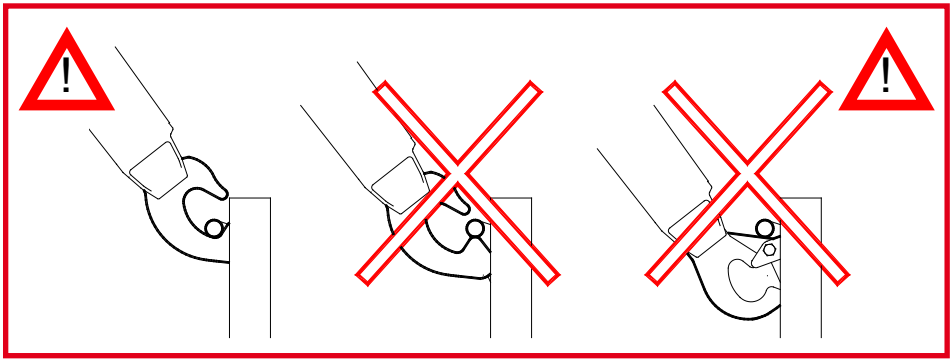
Reverse the truck as slowly as possible to avoid damaging the container, the load or the Ultima hooklift equipment.

If the truck is not in line with the container, position the container in line by lifting the front end of it approx. 3.9 in (10 cm) and pulling it forward by truck. This will prevent the container from being pulled outside the rear rollers, and the hooklift and rear lights being damaged.

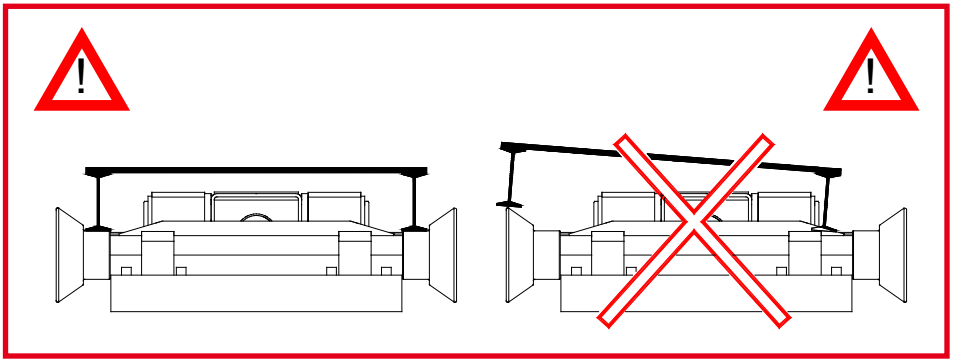
When moving the container to get it in line with the truck, first remove all obstacles in front of the container.

When loading or unloading a container, ensure that the hydraulic body locks are open. The corresponding control unit signal light is lit when the locks are open.

Remember that the maximum permissible speed of the pump = the recommended engine speed. Let the engine run at idle speed while switching the hydraulic body locks on and off. Each movement must begin and end at idle speed of engine and at low speed of the tipping cylinders. In addition the recommended pump speed (= engine speed) must not be exceeded.



Before picking up the container, the gripping bar of the container must be properly inside the lifting hook. In this way you prevent the container from falling. The situation must be checked by lifting the container approx. 3.9 in (10 cm) and after that checking physically and visually that the container gripping bar is inside the lifting hook.



When loading and unloading a container, be sure that it is running in line between the rear rollers.

Stop the movement of the middle frame immediately when the container is on ground. If the hooklift movement is not stopped in time, the truck rear end will be lifted up from the ground, which will cause damaging of the container, truck or the hooklift equipment.

The operation of the hooklift must take place in the correct sequence, one operation at the time.

During the loading operation, the handbrake should not be activated UNTIL THE REAR END OF THE CONTAINER IS LIFTED FROM THE GROUND!

When unloading, the hand brake should be released WHEN THE REAR END OF THE CONTAINER TOUCHES THE GROUND!

When loading, unloading or tipping a container, check that there are no people too close to the operation, and check for any possible unusual or disruptive movements or sounds caused by the container. If you notice anything like this, STOP THE OPERATION, press the clutch pedal, disengage the PTO and activate the handbrake. Find out the reason for this carefully. Do not continue the operation before the cause has been established! Failing to do this could result damaging the container or the Ultima equipment. The disruption must be remedied before the operation is continued.

NEVER LOAD, UNLOAD OR TIP IN DANGEROUS SITUATIONS:

- When the load is heavier to one side of the body
- Illegally heavy load
- Sloping or slippery ground
- Soft or crumbly ground under the truck wheels
- Strong side wind, over 20 m/s [44 mph (70 km/h)]
- Frozen or stuck load

TRUCK PROBLEMS:

- Weak springs on one side
- Poor condition of tyres

Before using the under-run bar, ensure that there is nobody close or under the under-run bar frame.

Tipping

If the container overhang is too much, the rear end of the container will touch the ground when tipping and the container, truck or hooklift equipment will be damaged.

In very cold weather the load might freeze tight on the container. In that case it must be freed before tipping. Note that the load might come out in large chunks!

NEVER TIP UNDER THE FOLLOWING CIRCUMSTANCES:

- Container is top heavy at the front end or at either side.
- Load is frozen or only partially loose
- Ground is slippery or uneven
- Strong side wind, over 20 m/s [44 mph (70 km/h)]

If it is necessary to drive with the tipping device up, pay attention to the vicinity regarding the height of the hooklift equipment / container with respect to the surroundings like bridges, tunnels and overhead power lines! Drive slowly and be extra careful.

If the tipping angle is changed during driving, the gearbox bears an extra burden, and the truck can make unexpected motions on a slippery surface.

Before driving away

Before you drive off, always check the following:

- Mechanical locking devices of the body are fully engaged.
  Check this visually on both sides of the truck.
- Hydraulic body locks must be closed; signal light on the control unit must no longer be lit. The locking hooks must be tight on the container, i.e. on the lower flange of the container frame beams or in the specific notches (if provided).
  Check this on both sides of the truck.
- PTO must be disengaged.
- Check that the container doors are closed.
- Check that the load is secured and covered.
- Air suspension is raised to the normal ride height.
- Adjustable under-run bar is out, if necessary.
- All red container signal lights on the control unit / instrument panel must be out.
- If a signal light on the control unit does not go out when the body locking system is locked, there is a malfunction which must be corrected immediately.
- When there is no container mounted, the Ultima hooklift equipment must be positioned in its transport position on the sub-frame both during driving and parking. Never drive the truck with the hooklift in any position other than the transport position.
  Driving with main cylinders in some other position than transport, will damage the Ultima equipment and/or main cylinders (leaks). Drive speed with the hooklift in the before mentioned position must not exceed 18 mph (30 km/h).

Safety facilities of the Ultima hooklift equipment

To increase safety, the control system has safety features to prevent incorrect movements of the body so that the load can be kept under control.
The hydraulic cylinders are provided with load holding valves that ensure a controlled movement of the Ultima equipment. In addition these valves serve as a safety feature in case of the failure of hydraulic hoses.

The following functions have safety features:

- Hydraulic body locks cannot be opened during tipping.
- Hydraulic body locks cannot be closed during loading and unloading.
- If the body locks are closed, it is not possible to move the hook arm.
- Moving the hook arm is not possible during tipping.
- When tipping, the rear frame and the middle frame are locked together by the tipping lock. The lock operates mechanically.
- Tipping action cannot be initiated if the hydraulic body locks are open.
- Main cylinders will not be able to move if the adjustable under-run bar is out (does not concern the automatic under-run bar).

Hiab shall at all times have the right to:

- install, maintain and dismantle remote diagnostics tools or similar sensor-based connectivity capabilities (“Connectivity”) in and from the Equipment; and
- access, send, receive, collect, store and use any and all information and data gathered through the Connectivity, including but not limited to, information concerning efficiency, availability, downtime, operation, operating environment, movement, condition, logon, location and similar information relating to the Equipment (the “Information”). Such Information may be used for optimizing the Equipment, or any related equipment or services as well as for Hiab's internal business and/or operating purposes. Hiab shall be responsible for complying with applicable laws and regulations related to such Information.

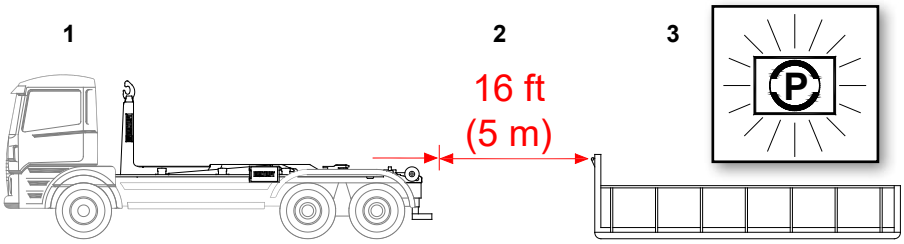
Customer/user shall not in any way remove, disable, or interfere with the Connectivity or the Information. Any intellectual property rights or other right and title in and to the Connectivity features and the Information and all their further developments shall at all times be and remain the exclusive property of Hiab.

USE

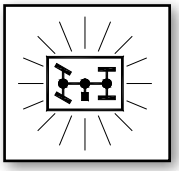
Loading a container

NOTE! If there is a safety code *CXXX* and/or *dXXX* in the display, then see the chapter "Safety codes" after the chapter "Loading a container".

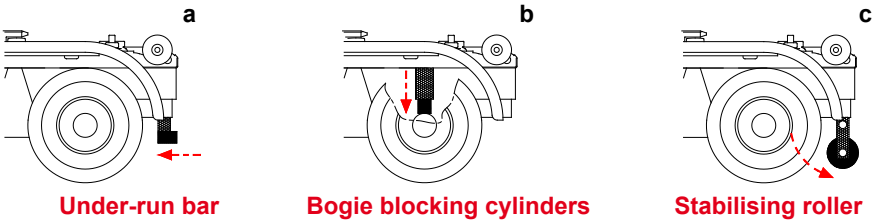
The loading will start in most cases but the reason to the code must be checked and repaired as soon as possible to avoid any risk to injuries or damages.



1. **See the safety instructions before loading.**
2. **Reverse the truck carefully close to the container.**
   Stop it about 16 ft (5 m) from the container gripping bar.
3. **Engage the parking brake.**



4. **Press the clutch pedal and engage the PTO.**

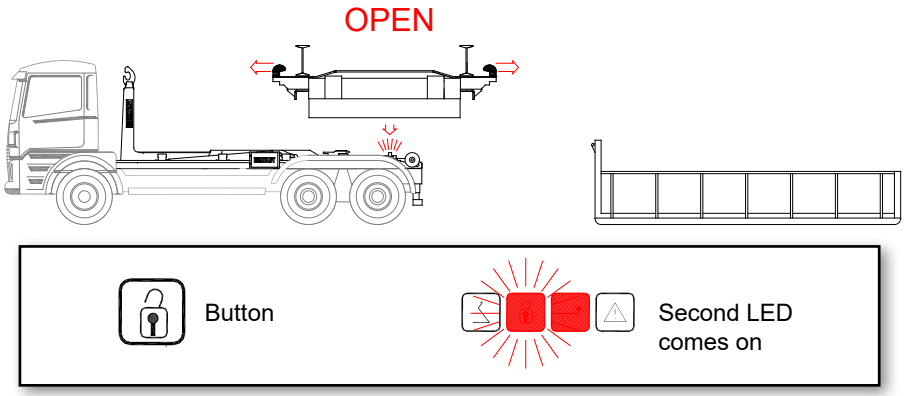


5. **If the truck is equipped with any of the following equipment, then**
   - **a - retract the adjustable under-run bar (mechanical or manual hydraulic)**
   - **b - engage bogie blocking sylinders**
   - **c - land the stabilising roller**

   - press **RETRACT UNDER-RUN BAR** button
   - press **ENGAGE BOGIE BLOCKING** button
   - **UNDER-RUN BAR RETRACTED / BOGIE BLOCKING ENGAGED** indicator light comes on in the control unit.

   If the Ultima equipment has an adjustable under-run bar, the indicator light of the bogie blocking and the stabiliser is the indicator light of the accessory.

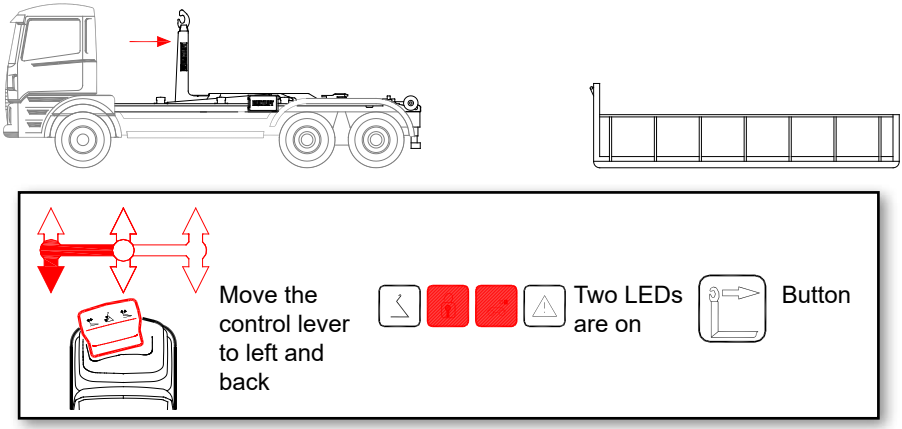
   - deflate the air suspension.



6. **Open the hydraulic body locks**

   - press the **BODY LOCK** button
   - **LOCKS NOT CLOSED** signal light lit on the control unit when the locks are open.

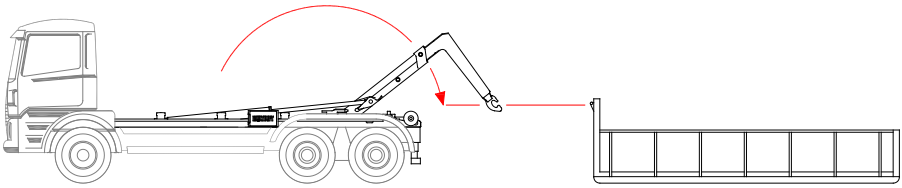
   Open the mechanical or hydraulic front locks (optional).

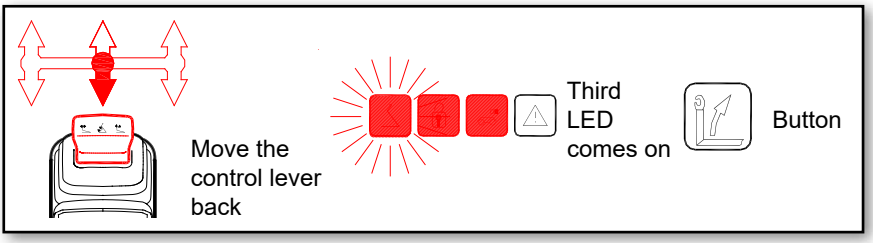


7. **Move the hook arm fully rearward position**

   - move the **CONTROL LEVER** to left and back (2GCC)
   - *press the **HOOK ARM BACK** button (2GMR and 2GRC)*
   - start at idle and increase the engine speed gradually.

   Mechanical tipping lock will be opened in the rear position of the hook arm.

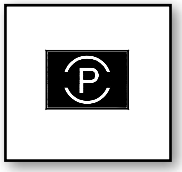




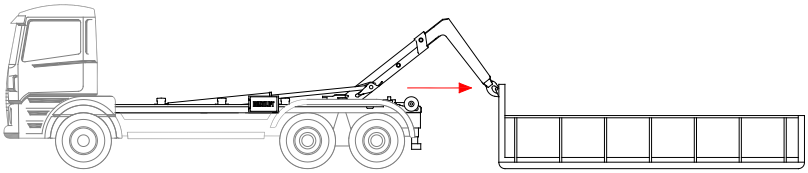
8. **Move the hook arm / middle frame towards the container**

   - move the **CONTROL LEVER** slowly backward (2GCC)
   - *press **MAIN CYLINDERS BACK** button (2GMR and 2GRC)*
   - **FRAME IS NOT DOWN** indicator light comes on when the middle frame rises from the subframe.

9. **Stop the movement by releasing the lever or the button.**
   The hook opening and the container gripping bar must be on the same level.

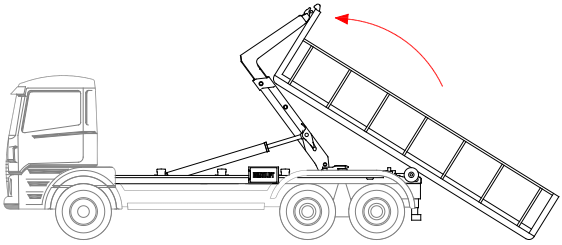


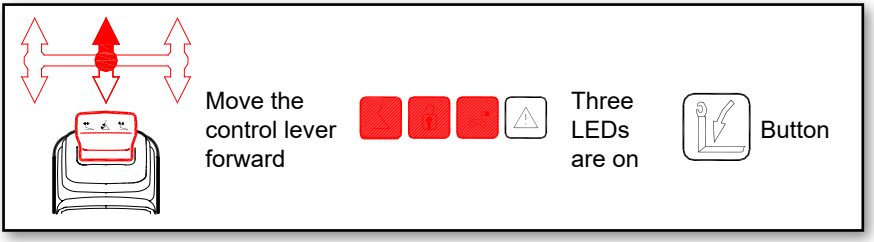
10. **Release the parking brake.**



11. **Reverse the truck slowly**
    The tip of the hook must enter inside the container gripping bar.

12. **Check that the container can be raised without problems**
    The container must pass the truck rear end without hitting it during loading.

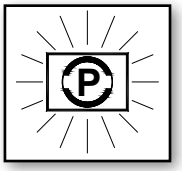




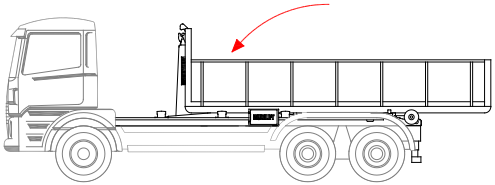
13. **Lift the container up**

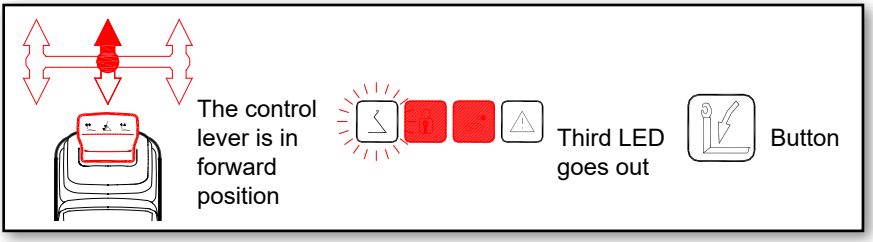
    - move the **CONTROL LEVER** forward (2GCC)
    - *press **MAIN CYLINDERS FORWARD** button (2GMR and 2GRC).*

    Check that the container is raised in line with the rear rollers.
    By steering the truck it is possible to ensure simultaneous contact of the container to both rear rollers.



14. **Engage the parking brake when the container rear end is lifted from the ground.**

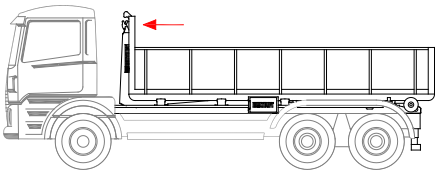


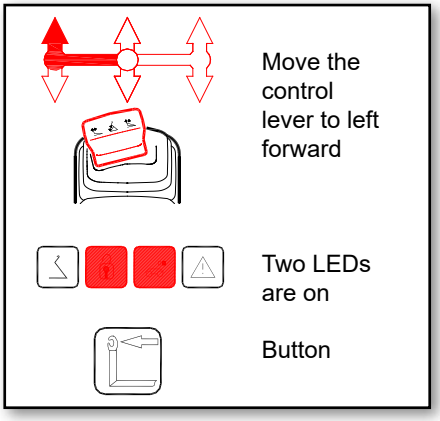


15. **Pull the container fully on the truck chassis**

- **CONTROL LEVER** is in forward position (2GCC)
- *button **MAIN CYLINDERS FORWARD** is pressed (2GMR and 2GRC)*
- **FRAME IS NOT DOWN** indicator light goes out when the middle frame comes down to the subframe.

The container must be in right position between the rear rollers.

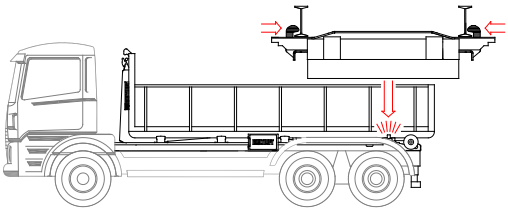


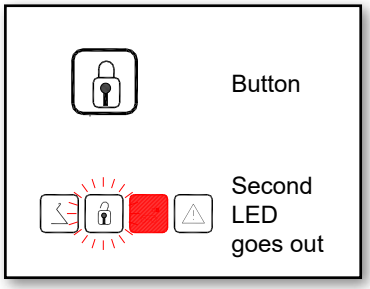


16. **Move the hook arm forward**

- move the **CONTROL LEVER** to left and forward (2GCC)
- *press the **HOOK ARM FORWARD** button (2GMR and 2GRC).*

Continue the movement until the container is in its transport position.
Movement will close also the mechanical tipping lock.

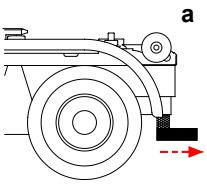




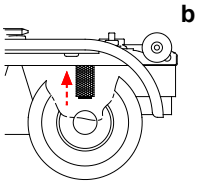
17. **Close the hydraulic body locks**

- press the **BODY LOCKS CLOSED** button.

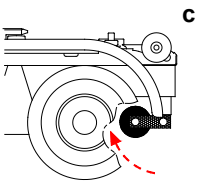
Signal light **LOCKS NOT CLOSED** must go out.
Also close the mechanical or hydraulic front locks (optional).



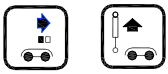
Under-run bar



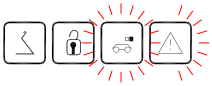
Bogie blocking cylinders



Stabilising roller



Buttons



LED goes out

18. **If the truck is equipped with any of the following equipment, then**
    - a **- expel the adjustable under-run bar (mechanical or manual hydraulic)**
    - b **- release the bogie blocking cylinders**
    - c - **lift up the stabilising roller**

    - press **EXPEL UNDER-RUN BAR** button or
    - press **RELEASE BOGIE BLOCKING** button
    - **UNDER-RUN BAR RETRACTED / BOGIE BLOCKING ENGAGED** indicator goes out in the control unit

    - re-inflate the air suspension.

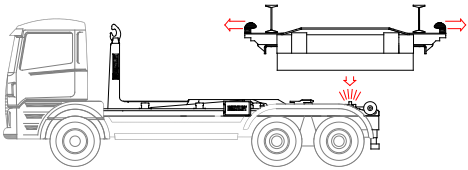
19. **Press the clutch pedal and disengage the PTO.**

20. **Check that all signal lights of the control unit have gone out.**

SAFETY CODES BY LOADING THE CONTAINER

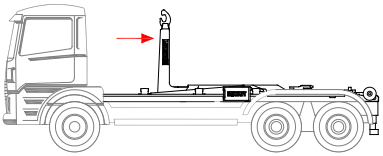
Possible safety codes in the display when starting the loading function

Sensor location, see ”Ultima S / SL SENSORS” in the service chapter



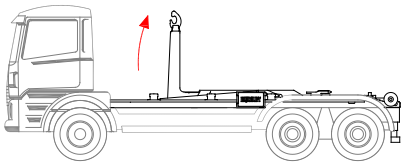
SAFETY CODE	DESCRIPTION	NOTE
C007, d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	LOCKS CAN BE OPENED.
C008	*MIDDLE FRAME NEARLY DOWN* SENSOR (120) IS NOT ACTIVE AND *MIDDLE FRAME DOWN* SENSOR (119) IS ACTIVE. **CHECK THE SENSOR 120 AND THE CABLE.**	LOCKS CAN BE OPENED.
C009	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK WHY SENSOR 317 IS ACTIVE.**	LOCKS CAN BE OPENED.

Possible safety codes in the display when moving the hook arm backwards



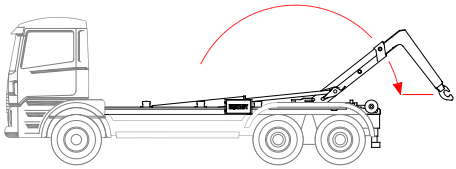
SAFETY CODE	DESCRIPTION	NOTE
C007, d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	HOOK ARM IS NOT MOVING.
C009, d001	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK WHY SENSOR 317 IS ACTIVE.**	HOOK ARM IS MOVING.
d015	*TIPPING LOCK CLOSED* SENSOR (319) AND *HOOK ARM BACK* SENSOR (320) ARE BOTH ACTIVE. **CHECK SENSOR 319 AND CABLE.**	HOOK ARM IS NOT MOVING.
d021	*URB OUT* SENSOR (323) IS ACTIVE. **CHECK THE SENSOR AND CABLE.**	HOOK ARM IS NOT MOVING.
d022	*URB IN* SENSOR (322) AND *URB OUT* SENSOR (323) ARE NOT ACTIVE. **CHECK SENSOR 322 AND CABLE.**	HOOK ARM IS NOT MOVING.

Possible safety codes in the display when moving the main cylinders out



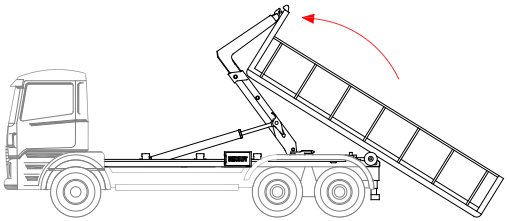
SAFETY CODE	DESCRIPTION	NOTE
C007, d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS NOT MOVING OUT.
C009, d003, d015	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK WHY SENSOR 317 IS ACTIVE.**	MAIN CYLINDERS ARE MOVING OUT.
d003, d015	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE NOT ACTIVE. **CHECK WHY SENSOR 316 IS NOT ACTIVE.**	MAIN CYLINDERS NOT MOVING OUT.
d021	*URB OUT* SENSOR (323) IS ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS NOT MOVING OUT.
d022	*URB IN* SENSOR (322) AND *URB OUT* SENSOR (323) ARE NOT ACTIVE. **CHECK SENSOR 322 AND CABLE.**	MAIN CYLINDERS NOT MOVING OUT.

Possible safety codes in the display when moving the main cylinders out (middle frame up)



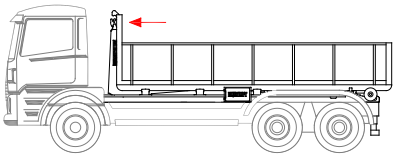
SAFETY CODE	DESCRIPTION	NOTE
C009, d003, d015	*BODY LOCKS CLOSED* SENSOR (317) IS ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS ARE MOVING OUT.
d003, d015	*BODY LOCKS OPEN* SENSOR (316) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS ARE MOVING OUT.
d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS NOT MOVING OUT.
d021	*URB IN* SENSOR (322) AND *URB OUT* SENSOR (323) ARE BOTH ACTIVE. **CHECK WHY SENSOR 323 IS ACTIVE.**	MAIN CYLINDERS ARE MOVING OUT.
d021	*URB OUT* SENSOR (323) IS ACTIVE. **OPERATE URB IN.**	MAIN CYLINDERS NOT MOVING OUT.
d022	*URB IN* SENSOR (322) AND *URB OUT* SENSOR (323) ARE NOT ACTIVE. **CHECK SENSOR 322 AND CABLE.**	MAIN CYLINDERS NOT MOVING OUT.

Possible safety codes in the display when moving main cylinders in



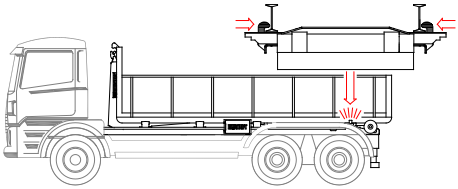
SAFETY CODE	DESCRIPTION	NOTE
d002, d003, d015	*BODY LOCKS OPEN* SENSOR (316) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS ARE MOVING IN.
C009, d003, d015	*BODY LOCKS CLOSED* SENSOR (317) IS ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS ARE MOVING IN.
d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS ARE MOVING IN.

Possible safety codes in the display when moving hook arm front



SAFETY CODE	DESCRIPTION	NOTE
C007, d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	HOOK ARM IS NOT MOVING FRONT.
C008	*MIDDLE FRAME NEARLY DOWN* SENSOR (120) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	HOOK ARM IS MOVING FRONT.
C009, d001	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK WHY SENSOR 317 IS ACTIVE.**	HOOK ARM IS MOVING FRONT.
d001	*BODY LOCKS OPEN* SENSOR (316) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	HOOK ARM IS NOT MOVING FRONT.
d016	*PULL LIMITER* SENSOR (321) IS ACTIVE. **THE CONTAINER IS IN MECHANICAL LOCKS.**	HOOK ARM IS NOT MOVING FRONT.

Possible safety codes in the display when closing the locks



CLOSE

SAFETY CODE	DESCRIPTION	NOTE
C007, d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	LOCKS CAN BE CLOSED.
C008	*MIDDLE FRAME NEARLY DOWN* SENSOR (120) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	LOCKS CAN BE CLOSED.
C009	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK THE SENSORS AND CABLE.**	LOCKS CAN BE CLOSED.

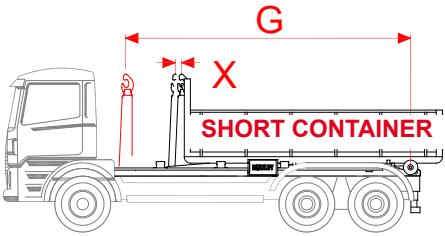
Loading a short container

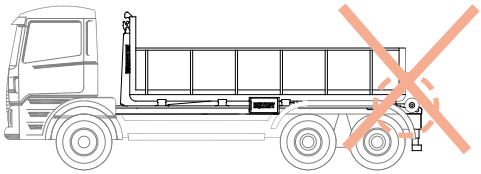
1. **The shortest possible container length to load is equipment length (distance G) - 39 in (1 m).**

2. **The loading of a short container is basically carried out the same way as loading of a container of ”normal” length except that the last movement of the hook arm is left out.**
   However, drive the hookarm approximately 4 in (10 cm) (X) forward so that the locking is closed.

3. **When the container is on the body supports of the equipment, close the lockings.**

4. **If the Ultima equipment has the mechanical lockings, the container can be pulled to the locks if the length of the container so allows.**





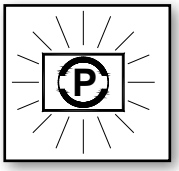
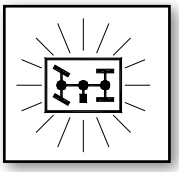
NOTE!

Never let the rear end of the container pass the rear rollers.

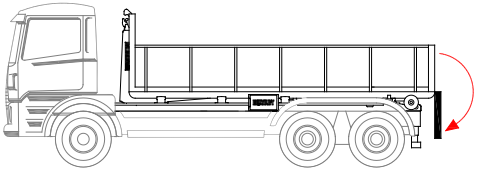
Tipping a container

NOTE! If there is a safety code *CXXX* and/or *dXXX* in the display, then see the chapter ”Safety codes” after the chapter ”Tipping a container”.

The tipping will start in most cases but the reason to the code must be checked and repaired as soon as possible to avoid any risk to injuries or damages.

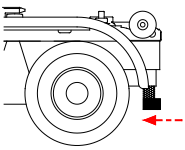
1 **2** **3**  **4** 

1. **See the safety instructions before tipping.**
2. **Drive the truck to the place where the load has to be discharged.**
3. **Engage the parking brake.**
4. **Press the clutch pedal and engage the PTO.**

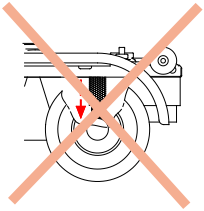


5. **Open the container tail gate**
   - note the container operating instructions
   - stand by the side of the container so that the opening tail gate and discharging load do not hit you.

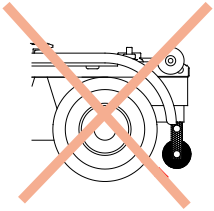
   Open the mechanical or hydraulic front locks (optional).



Under-run bar

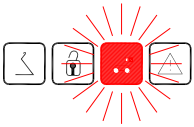


Bogie blocking cylinders



Stabilising roller

Button



LED comes on

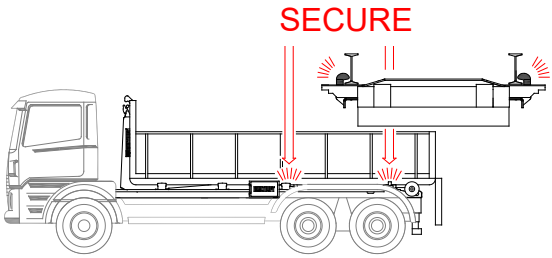
6. **If the truck is equipped with any of the following equipment, do the following:**

   - retract the adjustable under-run bar (mechanical or manual hydraulic)

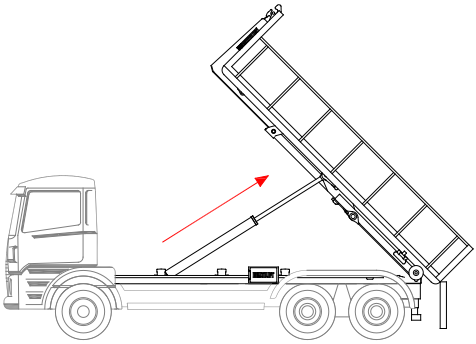
   - press **RETRACT UNDER-RUN BAR** button
   - the indicator light **UNDER RUN BAR RETRACTED** comes on in the control unit

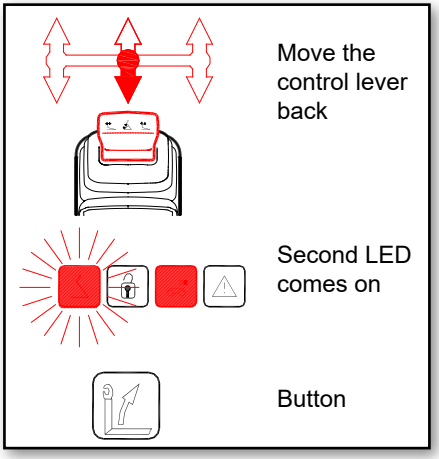
   - deflate the air suspension.

DO NOT USE THE BOGIE BLOCKING CYLINDERS OR THE STABILISING ROLLER.



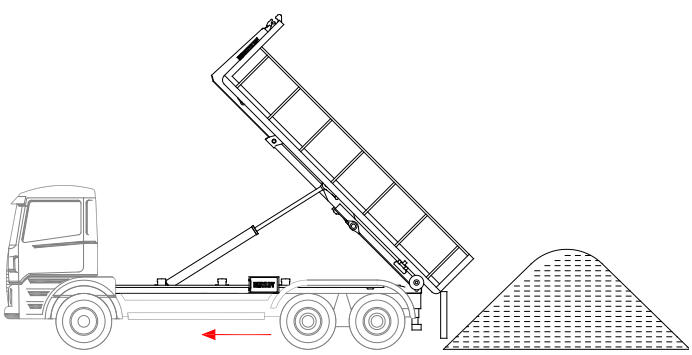
7. **Check that the container is locked**
   - hydraulic or mechanical locks are closed.
   - the middle/rear frame (= tipping lock) must be closed (See. ”Loading a short container”, paragraph 2)
   - **THE SIGNAL LIGHT OF THE CONTAINER LOCKING** must not be lit.

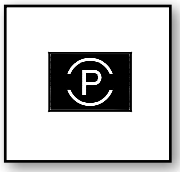


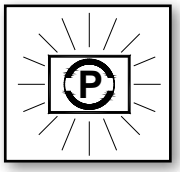


8. **Lift the main cylinders / middle frame together with the rear frame to the desired or maximum tipping angle**
   - move the **CONTROL LEVER** slowly backwards (2GCC)
   - *press **MAIN CYLINDERS BACK** button (2GMR and 2GRC)*
   - the indicator light **FRAME NOT DOWN** comes on as the middle frame is rising from the subframe
   - the container must not touch the rear bumper of the truck or the ground.

9. **Decrease the speed of tipping movement to prevent an abrupt stop during the last tipping phase.**



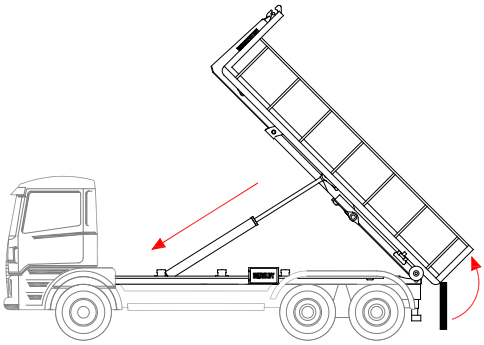


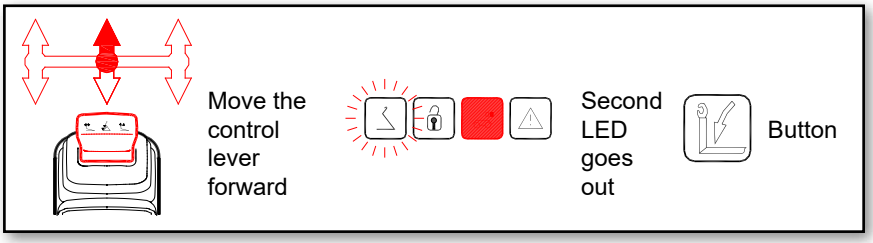


10. **Release the parking brake and drive, if needed, a little forward in order to empty the complete contents of the container.**
    - the PTO can be engaged during this phase.

11. **Engage the parking brake.**

Lowering the tipping device



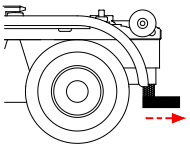


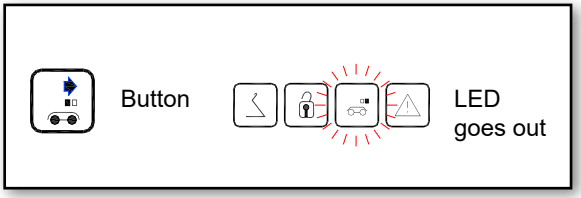
12. **Lower the tipping device**

    - move the **CONTROL LEVER** forwards (2GCC)
    - *press **MAIN CYLINDERS FORWARD** button (2GMR and 2GRC)*
    - the indicator light **FRAME NOT DOWN** goes off as the middle frame is lowering onto the subframe.

13. **Check that the frame of the Ultima equipment and the container are in the lowest position.**

14. **Close the container tail gate.**
    Also close the mechanical or hydraulic front locks (optional).

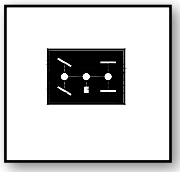




15. **If the truck is equipped with an adjustable underrun bar, do the following:**
    - expel the rear underrun protection (mechanical or manual hydraulic)

    - press **EXPEL UNDER-RUN BAR** button
    - the indicator light **UNDER RUN BAR RETRACTED** goes off in the control unit

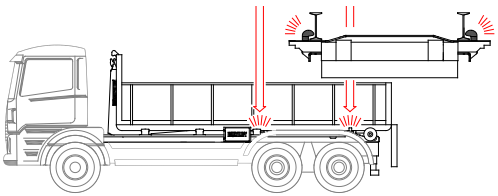
    - re-inflate the air suspension.



16. **Press the clutch pedal and disengage the PTO.**
17. **Check that all signal lights of the control unit have gone out.**

SAFETY CODES BY TIPPING THE CONTAINER

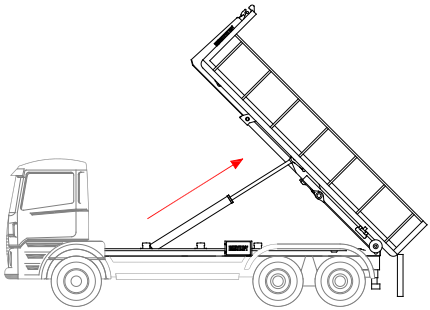
Possible safety codes in the display when starting the tipping function



SECURE

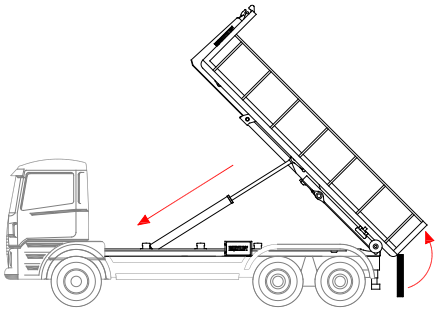
SAFETY CODE	DESCRIPTION	NOTE
C007, d012	*MIDDLE FRAME DOWN* SENSOR (119) IS ACTIVE, BUT *REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	TIPPING IS WORKABLE.
C008	*MIDDLE FRAME NEARLY DOWN* SENSOR (120) IS NOT ACTIVE AND *REAR FRAME DOWN* SENSOR (318) IS ACTIVE. **CHECK THE SENSOR 120 AND THE CABLE.**	TIPPING IS WORKABLE.
C009, d000, d004	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK WHY SENSOR 316 IS ACTIVE.**	TIPPING IS WORKABLE.
d003	*TIPPING LOCK CLOSED* SENSOR (319) HAS LOST SIGNAL. **CHECK THAT TIPPING LOCK IS CLOSED AND SENSOR ACTIVE.**	TIPPING IS PREVENTED.
d004	*BODY LOCKS CLOSED* SENSOR (317) IS NOT ACTIVE.	TIPPING IS PREVENTED.
d015	*HOOK ARM BACK* SENSOR (320) IS ACTIVE. **CHECK THE SENSOR AND CABLE.**	TIPPING IS PREVENTED.
d021	*URB OUT* SENSOR (323) IS ACTIVE OR *URB IN* SENSOR (322) AND *URB OUT* SENSOR (323) ARE BOTH ACTIVE.	TIPPING IS PREVENTED. TIPPING IS WORKABLE.
d022	*URB IN* SENSOR (322) AND *URB OUT* SENSOR (323) ARE NOT ACTIVE.	TIPPING IS WORKABLE.

Possible safety codes in the display when tippin up



SAFETY CODE	DESCRIPTION	NOTE
C007, C008	*MIDDLE FRAME DOWN* SENSOR (119) IS ACTIVE, BUT *REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR 119 AND THE CABLE.**	TIPPING IS WORKABLE.
C009, d012	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK WHY SENSOR 316 IS ACTIVE.**	TIPPING IS WORKABLE.
d012	*BODY LOCKS CLOSED* SENSOR (317) IS NOT ACTIVE. **CHECK WHY THE SENSOR IS NOT ACTIVE.**	TIPPING IS WORKABLE.
d003, d012	*TIPPING LOCK CLOSED* SENSOR (319) HAS LOST SIGNAL. **CHECK THE SENSOR 119 AND THE CABLE.**	TIPPING IS PREVENTED.
d015	*HOOK ARM BACK* SENSOR (320) IS ACTIVE. **CHECK THE SENSOR AND CABLE.**	TIPPING IS PREVENTED.
d021	*URB OUT* SENSOR (323) IS ACTIVE. **CHECK THE SENSOR.**	TIPPING IS PREVENTED.
d022	*URB IN* SENSOR (322) IS ACTIVE. **CHECK THE SENSOR.**	TIPPING IS PREVENTED.

Possible safety codes in the display when lowering down



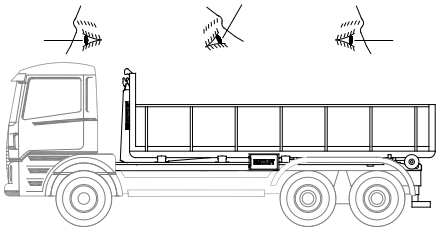
SAFETY CODE	DESCRIPTION	NOTE
C009, d012	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK WHY SENSOR 316 IS ACTIVE.**	LOWERING IS WORKABLE.
d012	*BODY LOCKS CLOSED* SENSOR (317) IS NOT ACTIVE. **CHECK WHY THE SENSOR IS NOT ACTIVE.**	LOWERING IS WORKABLE.
d012	*TIPPING LOCK CLOSED* SENSOR (319) HAS LOST SIGNAL. **CHECK THE SENSOR AND CABLE.**	LOWERING IS WORKABLE.
d015	*HOOK ARM BACK* SENSOR (320) IS ACTIVE. **CHECK THE SENSOR AND CABLE.**	LOWERING IS WORKABLE.

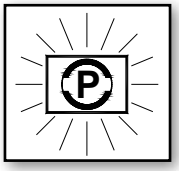
Unloading a container

NOTE! If there is a safety code *CXXX* and/or *dXXX* in the display, then see the chapter ”Safety codes” after the chapter ”Unloading a container”.

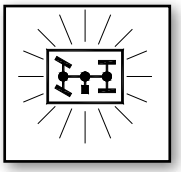
The unloading will start in most cases but the reason to the code must be checked and repaired as soon as possible to avoid any risk to injuries or damages.

1 **2** **3** **4**

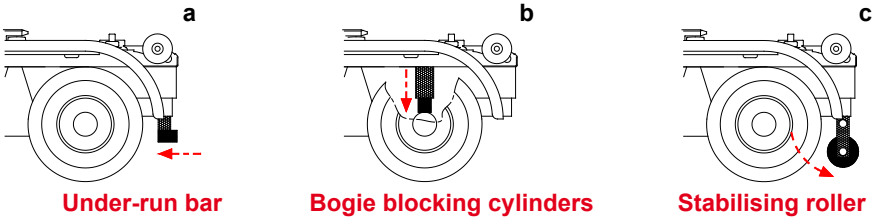


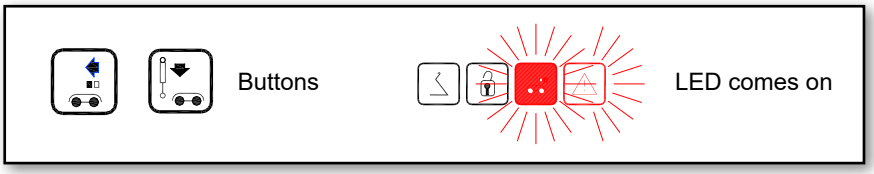


1. **See the safety instructions before unloading.**
2. **Drive the truck to the place where the container has to be unloaded.**
3. **Check the working area**
   - ensure that there is enough space in front, rear and above the truck.
4. **Engage the parking brake.**



5. **Press the clutch pedal and engage the PTO.**





6. **If the truck is equipped with any of the following equipment, then**

   a - retract the adjustable under-run bar (mechanical or manual hydraulic)

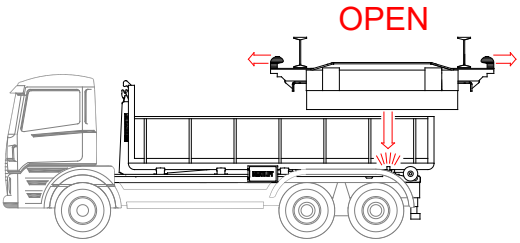
   b - engage the bogie blocking cylinders

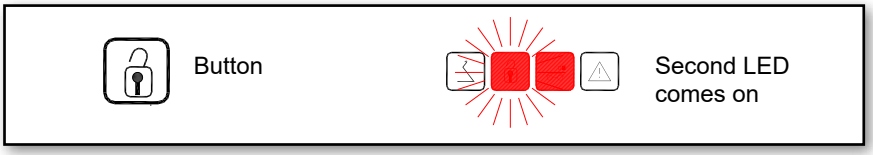
   c - land the stabilising roller

   - press **RETRACT UNDER-RUN BAR** button
   - press **ENGAGE BOGIE BLOCKING** button
   - **UNDER-RUN BAR RETRACTED / BOGIE BLOCKING ENGAGED** indicator light comes on in the control unit.

   If the Ultima equipment has an adjustable under-run bar, the indicator light of the bogie blocking and the stabiliser is the indicator light of the accessory.

   - deflate the air suspension.

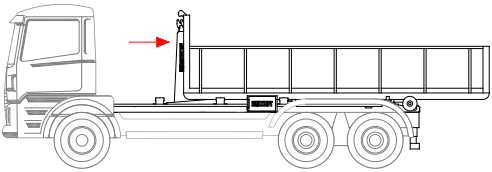


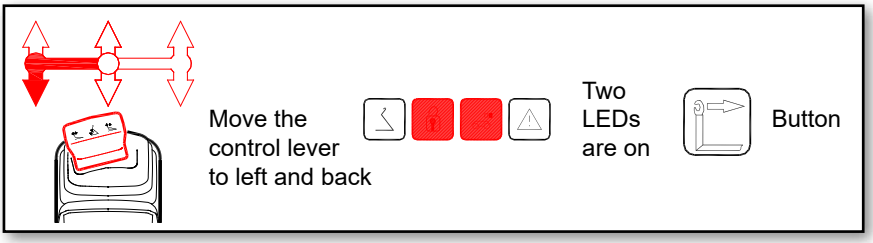


7. **Open the hydraulic body locks**

   - press the **BODY LOCK** button
   - **LOCKS NOT CLOSED** signal light lit on the control unit when the locks are open.

   Open the mechanical or hydraulic front locks (optional).

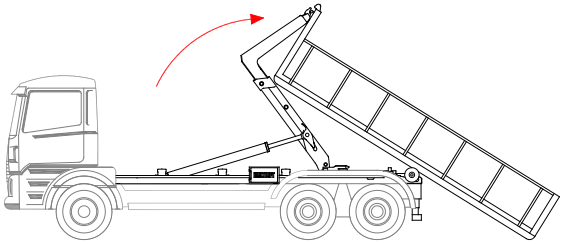


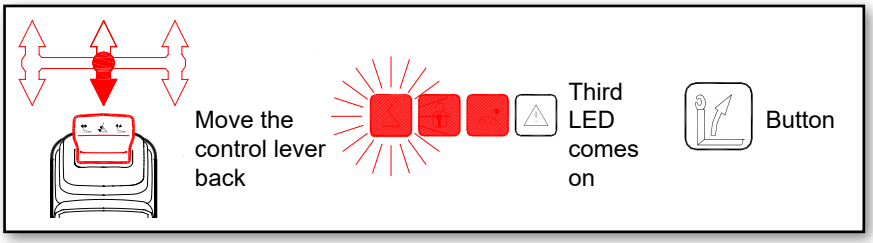


8. **Move the hook arm fully rearward position**

   - move the **CONTROL LEVER** to left and back (2GCC)
   - *press the **HOOK ARM BACK** button (2GMR and 2GRC)*
   - start at idle and increase the engine speed gradually.

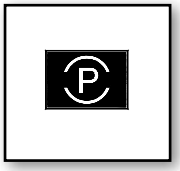
   Mechanical tipping lock will be opened in the rear position of the hook arm.





9. **Move the hook arm / middle frame together with the container to rearmost position**

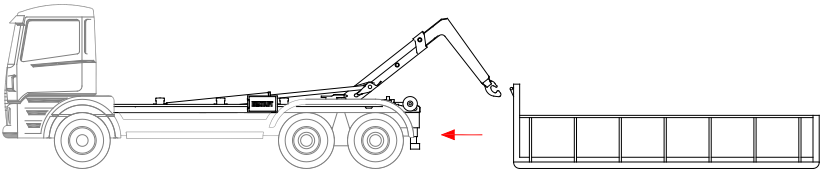
   - move the **CONTROL LEVER** slowly backwards (2GCC)
   - *press **MAIN CYLINDERS BACK** button (2GMR and 2GRC)*
   - the indicator light **FRAME NOT DOWN** comes on as the middle frame is rising from the subframe.



10. **Release the parking brake when the container rear end touches the ground.**
    Only in case the truck is on uphill slope, you may not release the hand brake, as in that case the truck and the container would move backwards.

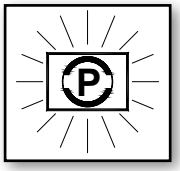
NOTE!

In some cases the container will push the truck forward.
Assist this, if necessary, by steering the truck and simultaneously holding the control lever in backward position.

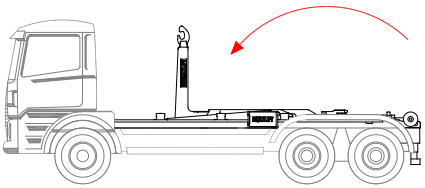


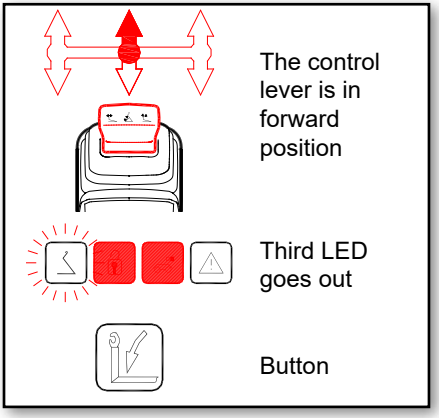
11. **Stop the movement by releasing the lever or the button.**

12. **Lower the middle frame even lower.**
Drive the truck forward so that the hook will be off the container gripping bar.



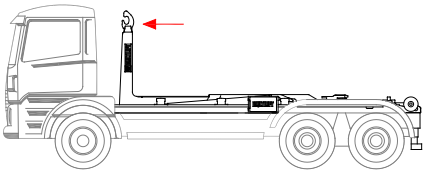
13. **Engage the parking brake.**

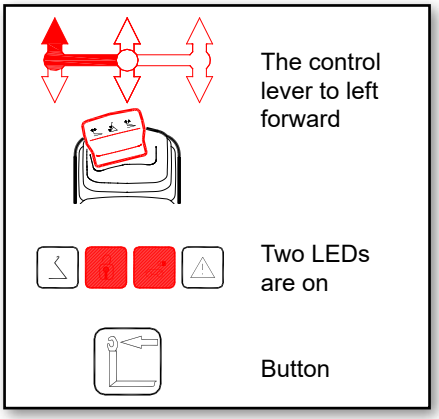




14. **Move the hook arm / middle frame to forward position**

- move the **CONTROL LEVER** forwards (2GCC) or
- *press **MAIN CYLINDERS FORWARD** button (2GMR and 2GRC), until the frame is completely on the subframe*
- the indicator light **FRAME NOT DOWN** goes off as the middle frame is lowering onto the subframe.

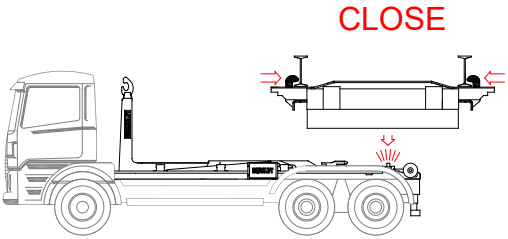


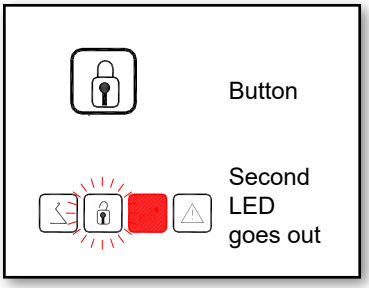


15. **Move the hook arm forward**

- move the **CONTROL LEVER** to left forward (2GCC)
- *press the **HOOK ARM FORWARD** button (2GMR and 2GRC).*

Continue the movement until the frame is in the forward position.
The hooklift equipment is now in transport position.

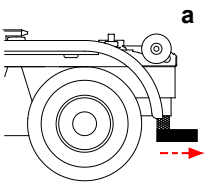




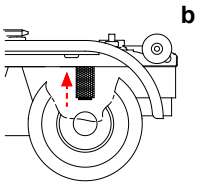
16. **Close the hydraulic body locks**

- press **CLOSE BODY LOCKS** button.

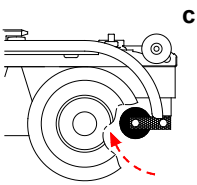
Signal light **LOCKS NOT CLOSED** must go out.
Also close the mechanical or hydraulic front locks (optional).



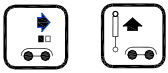
Under-run bar



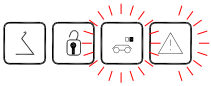
Bogie blocking cylinders



Stabilising roller



Buttons



LED goes out

17. **If the truck is equipped with any of the following equipment, then**
    - **a - expel the adjustable under-run bar (mechanical or manual hydraulic)**
    - b **- release the bogie blocking cylinders**
    - c **- lift up the stabilising roller**

    - press **EXPEL UNDER-RUN BAR** button or
    - press **RELEASE BOGIE BLOCKING** button
    - **UNDER-RUN BAR RETRACTED / BOGIE BLOCKING ENGAGED** indicator light goes out in the control unit

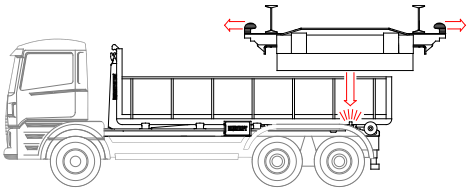
    - re-inflate the air suspension.

18. **Press the clutch pedal and disengage the PTO.**

19. **Check that all signal lights of the control unit have gone out.**

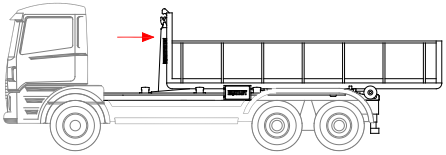
SAFETY CODES BY UNLOADING THE CONTAINER

Possible safety codes in the display when starting the unloading function



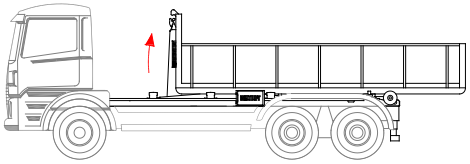
SAFETY CODE	DESCRIPTION	NOTE
C007, d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	LOCKS CAN BE OPENED.
C008	*MIDDLE FRAME NEARLY DOWN* SENSOR (120) IS NOT ACTIVE AND *MIDDLE FRAME DOWN* SENSOR (119) IS ACTIVE. **CHECK THE SENSOR 120 AND THE CABLE.**	LOCKS CAN BE OPENED.
C009	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK WHY SENSOR 317 IS ACTIVE.**	LOCKS CAN BE OPENED.

Possible safety codes in the display when moving the hook arm backwards



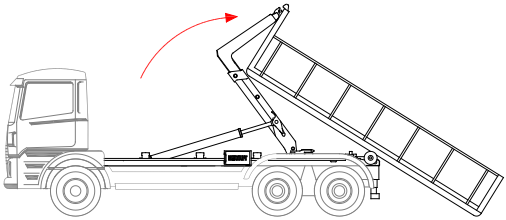
SAFETY CODE	DESCRIPTION	NOTE
C007, d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	HOOK ARM IS NOT MOVING.
C009, d001	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK WHY SENSOR 317 IS ACTIVE.**	HOOK ARM IS MOVING.
d015	*TIPPING LOCK CLOSED* SENSOR (319) AND *HOOK ARM BACK* SENSOR (320) ARE BOTH ACTIVE. **CHECK SENSOR 319 AND CABLE.**	HOOK ARM IS NOT MOVING.
d021	*URB OUT* SENSOR (323) IS ACTIVE. **CHECK THE SENSOR AND CABLE.**	HOOK ARM IS NOT MOVING.
d022	*URB IN* SENSOR (322) AND *URB OUT* SENSOR (323) ARE NOT ACTIVE. **CHECK SENSOR 322 AND CABLE.**	HOOK ARM IS NOT MOVING.

Possible safety codes in the display when moving the main cylinders out



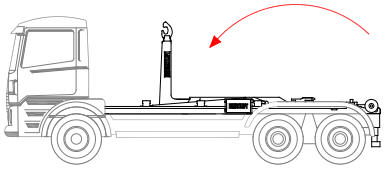
SAFETY CODE	DESCRIPTION	NOTE
C007, d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS NOT MOVING OUT.
C009, d003, d015	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK WHY SENSOR 317 IS ACTIVE.**	MAIN CYLINDERS ARE MOVING OUT.
d003, d015	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE NOT ACTIVE. **CHECK WHY SENSOR 316 IS NOT ACTIVE.**	MAIN CYLINDERS NOT MOVING OUT.
d021	*URB OUT* SENSOR (323) IS ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS NOT MOVING OUT.
d022	*URB IN* SENSOR (322) AND *URB OUT* SENSOR (323) ARE NOT ACTIVE. **CHECK SENSOR 322 AND CABLE.**	MAIN CYLINDERS NOT MOVING OUT.

Possible safety codes in the display when moving the main cylinders out (middle frame up)



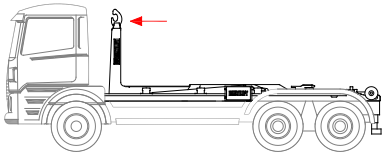
SAFETY CODE	DESCRIPTION	NOTE
C009, d003, d015	*BODY LOCKS CLOSED* SENSOR (317) IS ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS ARE MOVING OUT.
d003, d015	*BODY LOCKS OPEN* SENSOR (316) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS ARE MOVING OUT.
d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS NOT MOVING OUT.
d021	*URB IN* SENSOR (322) AND *URB OUT* SENSOR (323) ARE BOTH ACTIVE. **CHECK WHY SENSOR 323 IS ACTIVE.**	MAIN CYLINDERS ARE MOVING OUT.
d021	*URB OUT* SENSOR (323) IS ACTIVE. **OPERATE URB IN.**	MAIN CYLINDERS NOT MOVING OUT.
d022	*URB IN* SENSOR (322) AND *URB OUT* SENSOR (323) ARE NOT ACTIVE. **CHECK SENSOR 322 AND CABLE.**	MAIN CYLINDERS NOT MOVING OUT.

Possible safety codes in the display when moving main cylinders in



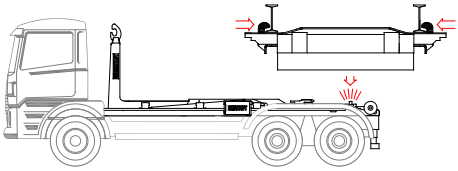
SAFETY CODE	DESCRIPTION	NOTE
d002, d003, d015	*BODY LOCKS OPEN* SENSOR (316) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS ARE MOVING IN.
C009, d003, d015	*BODY LOCKS CLOSED* SENSOR (317) IS ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS ARE MOVING IN.
d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	MAIN CYLINDERS ARE MOVING IN.

Possible safety codes in the display when moving hook arm front



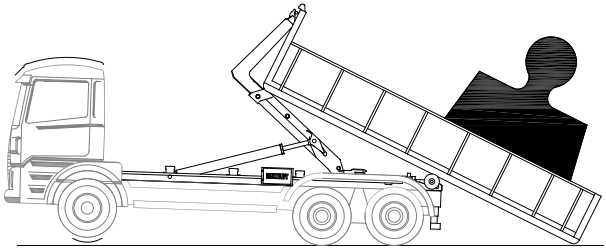
SAFETY CODE	DESCRIPTION	NOTE
C007, d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	HOOK ARM IS NOT MOVING FRONT.
C008	*MIDDLE FRAME NEARLY DOWN* SENSOR (120) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	HOOK ARM IS MOVING FRONT.
C009, d001	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK WHY SENSOR 317 IS ACTIVE.**	HOOK ARM IS MOVING FRONT.
d001	*BODY LOCKS OPEN* SENSOR (316) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	HOOK ARM IS NOT MOVING FRONT.
d016	*PULL LIMITER* SENSOR (321) IS ACTIVE. **CHECK THE SENSOR AND CABLE.**	HOOK ARM IS NOT MOVING FRONT.

Possible safety codes in the display when closing the locks



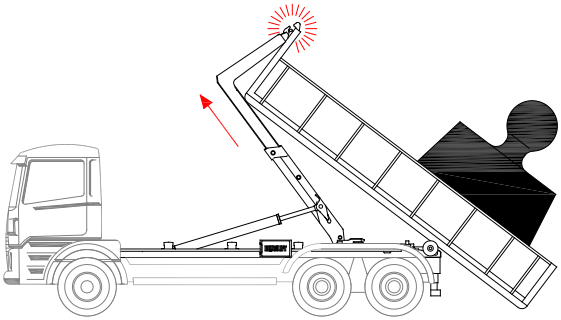
CLOSE

SAFETY CODE	DESCRIPTION	NOTE
C007, d012	*REAR FRAME DOWN* SENSOR (318) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	LOCKS CAN BE CLOSED.
C008	*MIDDLE FRAME NEARLY DOWN* SENSOR (120) IS NOT ACTIVE. **CHECK THE SENSOR AND CABLE.**	LOCKS CAN BE CLOSED.
C009	*BODY LOCKS OPEN* SENSOR (316) AND *BODY LOCKS CLOSED* SENSOR (317) ARE BOTH ACTIVE. **CHECK THE SENSORS AND CABLE.**	LOCKS CAN BE CLOSED.



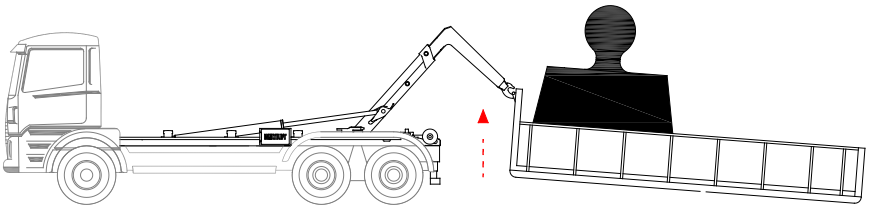
Loading of rear heavy container

A container loaded more heavily at the rear end can cause the truck front wheels to be lifted of the ground. Be extra cautious when this happens. When the container is on rear rollers, move the hook arm forward before lowering the middle frame on the sub-frame. Otherwise there is a danger of the container becoming loose from the hook.



Unloading of a rear heavy container

When unloading a long or rear heavy container to the ground, move the hook arm forward before the container touches the ground. Otherwise there is a danger of the container becoming loose from the hook.



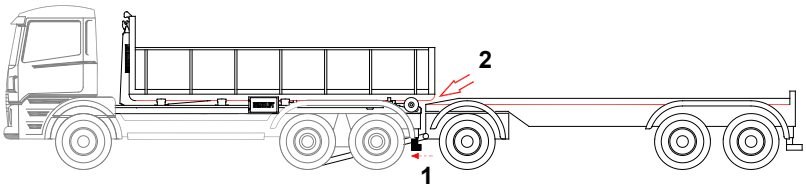
Loading of a front heavy container

When loading a too front heavy container it might happen, that the equipment is not strong enough to carry out the loading, although the total weight of the container and the load would not exceed the maximum allowed. In this case move the load closer to the centre of the container, if possible.

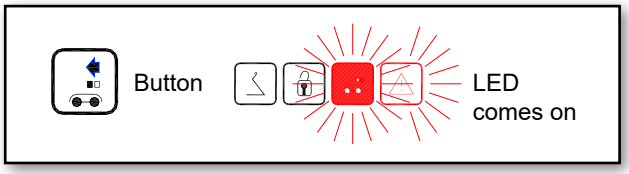
Loading a container onto a trailer or platform

NOTE!

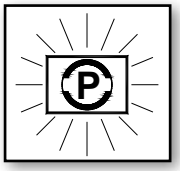
The trailer or platform must be below the sliding level of the hooklift equipment.



1. **If the truck equipment includes an adjustable under-run bar:**
   - retract it.

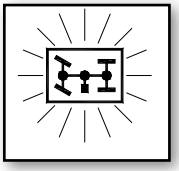


2. **Reverse the truck so that the rear part of the container is above the trailer or the platform.**



3. **Check to be sure that the truck and the trailer/platform are in a straight line.**

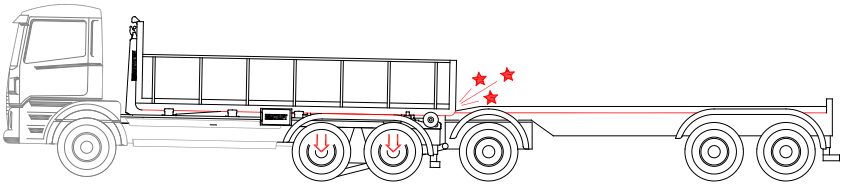
4. **Engage the parking brake.**



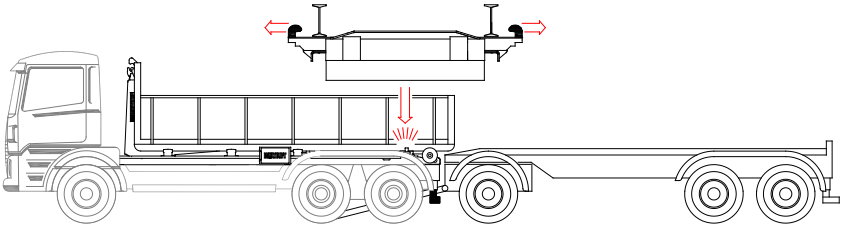
5. **Press the clutch pedal and engage the PTO.**

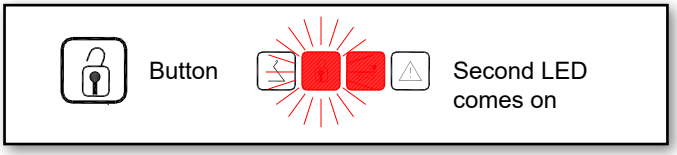
NOTE!

If the vehicle is equipped with automatic air suspension bleeding, then ensure that the sliding level of the hooklift interchangeable body is not below the level of the trailer or the platform.



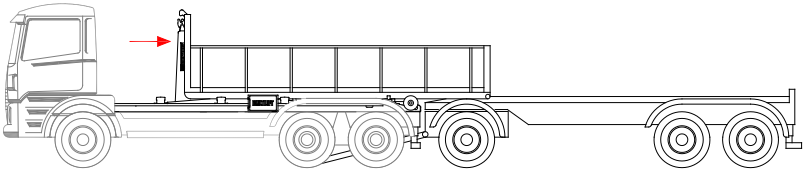
OPEN

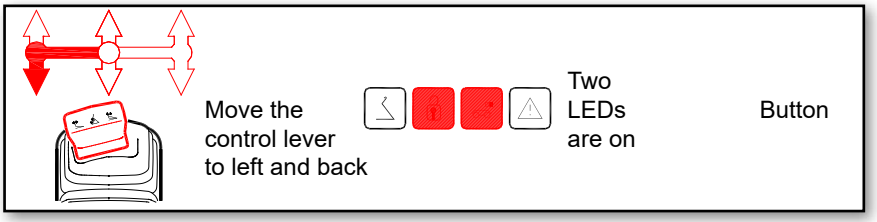




6. **Open the hydraulic body locks**

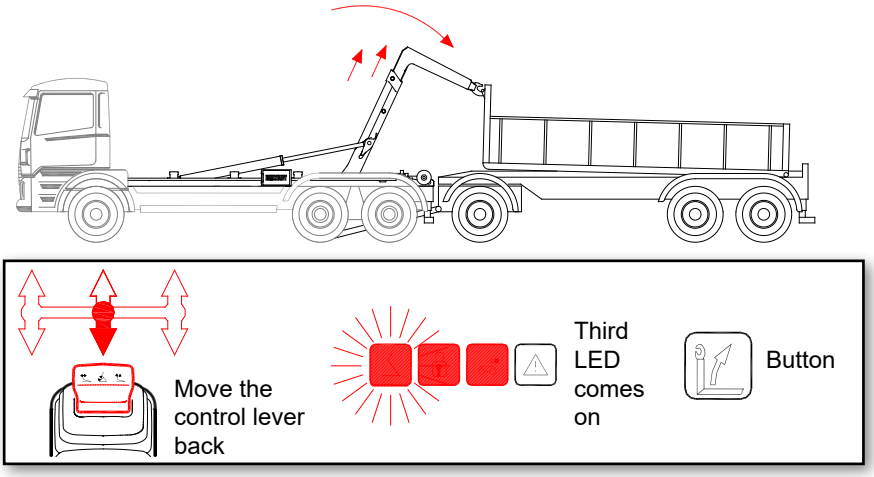
- press **OPEN BODY LOCKS** button
- **LOCKS NOT CLOSED** signal light is lit on the control unit when the locks are open.





7. **Move the hook arm fully rearward position**
   - move the **CONTROL LEVER** to left back (2GCC)
   - *press the **HOOK ARM BACK** button (2GMR and 2GRC).*

   Mechanical tipping lock will be opened in the rear position of the hook arm.



8. **Move the hook arm / middle frame with the container backwards**

   - move the **CONTROL LEVER** slowly backwards (2GCC)
   - *press **MAIN CYLINDERS BACK** button (2GMR and 2GRC)*
   - *the indicator light **FRAME NOT DOWN** comes on as the middle frame is rising from the subframe*
   - continue the movement until the container front end is nearly down.

9. **Move the middle frame still a little, the hook will come loose from the container gripping bar.**

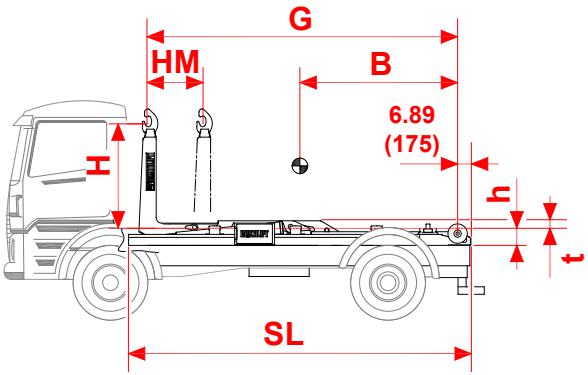
DESIGN DESCRIPTION

Technical specifications Ultima 14S and Ultima 16S

Manufacturer ..... Multilift, Raisio

Equipment type ..... **Ultima**	**14S**	**16S**
Technical performance, max ..... lbs	30800	35200
... (t)	14	16
Tipping angle, max ..... (°)	47 - 52	49 - 52
Working pressure of the hydr. system max psi	4350	4350
... (MPa)	30	30
Recommended oil flow rate ..... gpm	15	20
... (l/min)	60	80
Weight of the assembled equipment ..... lbs	3520 - 4092	3828 - 4422
... (kg)	1600 - 1860	1740 - 2010

Ultima 14S
Ultima 16S
dimensions



Ult. 14S	41	43	46	51	53	56
G in (mm)	160.6 (4080)	168.1 (4270)	180.3 (4580)	200 (5080)	211 (5360)	218.9 (5560)
HM in (mm)	35.4 (900)	35.4 (900)	35.4 (900)	43.3 (1100)	43.3 (1100)	51.2 (1300)
h in (mm)	9.06 (230) [special 9.84 (250)]					
H in (mm)	See table “Container country specific standard dimensions”					
t in (mm)	4.92 (125) [special 4.13 (105)]					
B in (mm)	85.8 (2180)	129.5 (2290)	96.5 (2450)	106.3 (2700)	112.2 (2850)	116.1 (2950)
SL in (mm)	189.3 (4808)	197.2 (5008)	209 (5308)	226.7 (5758)	256.2 (6508)	256.2 (6508)

Ult. 16S	46	51	53	56	59	61
G in (mm)	180.3 (4580)	200 (5080)	211 (5360)	218.9 (5560)	230.7 (5860)	239.4 (6080)
HM in (mm)	35.4 (900)	43.3 (1100)	43.3 (1100)	51.2 (1300)	57.1 (1450)	57.1 (1450)
h in (mm)	9.06 (230) [special 9.84 (250)]					
H in (mm)	See table “Container country specific standard dimensions”					
t in (mm)	4.92 (125) [special 4.13 (105)]					
B in (mm)	96.5 (2450)	106.3 (2700)	112.2 (2850)	116.1 (2950)	118.1 (3000)	124 (3150)
SL in (mm)	209 (5308)	226.7 (5758)	256.2 (6508)	256.2 (6508)	256.2 (6508)	268 (6808)

WARNING!

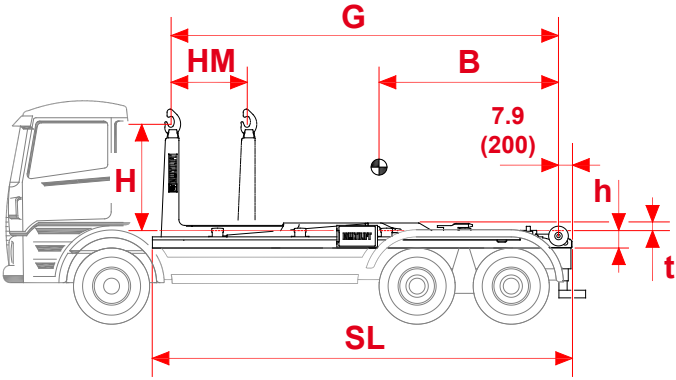
When transporting the container in position HM, the hooklift equipment must have hydraulic body locks.

Technical specifications Ultima 18S and Ultima 21S

Manufacturer ..... Multilift, Raisio

Equipment type ..... **Ultima**	**18S**	**21S**
Technical performance, max ..... lbs	39600	46200
... (t)	18	21
Tipping angle, max ..... (°)	49 - 53	46 - 53
Working pressure of the hydr. system max psi	4350	4350
... (MPa)	30	30
Recommended oil flow rate ..... gpm	20	25
... (l/min)	80	100
Weight of the assembled equipment ..... lbs	3894 - 4488	5038 - 5698
... (kg)	1770 - 2040	2290 - 2590

Ultima 18S
Ultima 21S
dimensions



Ult. 18S	46	51	53	56	59	61
G in (mm)	180.3 (4580)	200 (5080)	211 (5360)	218.9 (5560)	230.7 (5860)	239.4 (6080)
HM in (mm)	35.4 (900)	43.3 (1100)	43.3 (1100)	51.2 (1300)	57.1 (1450)	57.1 (1450)
h in (mm)	9.06 (230) [special 9.84 (250)]				9.84 (250)	
H in (mm)	See table “Container country specific standard dimensions”					
t in (mm)	4.92 (125) [special 4.13 (105)]				4.13 (105)	
B in (mm)	96.5 (2450)	106.3 (2700)	112.2 (2850)	116.1 (2950)	118.1 (3000)	124 (3150)
SL in (mm)	209 (5308)	226.7 (5758)	256.2 (6508)	256.2 (6508)	256.2 (6508)	268 (6808)

Ult. 21S	46	51	53	56	59	61	63
G in (mm)	180.3 (4580)	200 (5080)	211 (5360)	218.9 (5560)	230.7 (5860)	239.4 (6080)	249.2 (6330)
HM in (mm)	35.4 (900)	43.3 (1100)	43.3 (1100)	51.2 (1300)	57.1 (1450)	57.1 (1450)	57.1 (1450)
h in (mm)	9.84 (250) [special 10.63 (270)]						
H in (mm)	See table “Container country specific standard dimensions”						
t in (mm)	4.92 (125) [special 4.13 (105)]						
B in (mm)	96.5 (2450)	106.3 (2700)	112.2 (2850)	116.1 (2950)	118.1 (3000)	124 (3150)	129.9 (3300)
SL in (mm)	210 (5333)	233.6 (5933)	258.4 (6563)	258.4 (6563)	258.4 (6563)	265.1 (6733)	267.1 (6783)

WARNING!

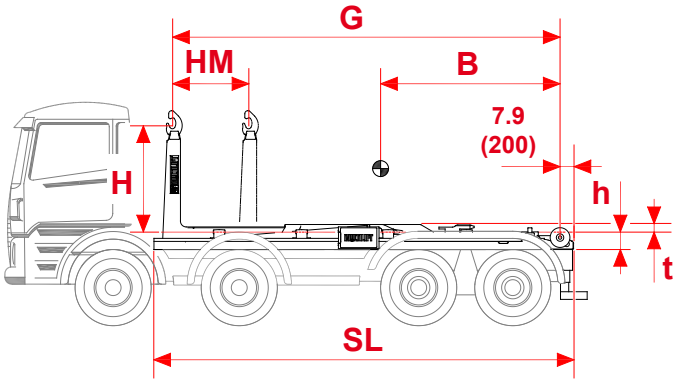
When transporting the container in position HM, the hooklift equipment must have hydraulic body locks.

Technical specifications Ultima 26S and Ultima 30S

Manufacturer ..... Multilift, Raisio

Equipment type ..... **Ultima**	**26S**	**30S**
Technical performance, max ..... lbs	57200	66000
... (t)	26	30
Tipping angle, max ..... (°)	46 - 52	49 - 55
Working pressure of the hydr. system max psi	30	30
... (MPa)	(300)	(300)
Recommended oil flow rate ..... gpm	30	30
... (l/min)	120	120
Weight of the assembled equipment ..... lbs	5610 - 7100	6140 - 6400
... (kg)	2550 - 3230	2790 - 2910

Ultima 26S
Ultima 30S
dimensions



Ult. 26S	51	53	56	59	61	63	70	78
G (in) G (mm)	200 5080	211 5360	218.9 5560	230.7 5860	239.4 6080	248.4 6310	274.8 6980	306.3 7780
HM (in) HM (mm)	43.3 1100	43.3 1100	51.2 1300	57.1 1450	57.1 1450	57.1 1450	57.1 1450	57.1 1450
h in (mm)	10.63 (270) [special 11.42 (290)]							
H in (mm)	See table “Container country specific standard dimensions”							
t in (mm)	4.92 (125) [special 4.13 (105)]							
B in (mm) B in (mm)	106.3 2700	112.2 2850	116.1 2950	118.1 3000	124 3150	129.9 3300	153.5 3900	171.3 4350
SL (in) SL (mm)	233.6 5933	258.4 6563	258.4 6563	258.4 6563	265.1 6733	267.1 6783	306.4 7783	331.5 8419

Ult. 30S	56	59	61	63
G in (mm)	219.7 (5580)	231.5 (5880)	240.2 (6100)	249.2 (6330)
HM in (mm)	51.2 (1300)	57.1 (1450)	57.1 (1450)	57.1 (1450)
h in (mm)	11.42 (290)			
H in (mm)	See table “Container country specific standard dimensions”			
t in (mm)	4.13 (105)			
B in (mm)	118.1 (3000)	122.1 (3100)	128 (3250)	133.9 (3400)
SL in (mm)	258.4 (6563)	258.4 (6563)	259.2 (6583)	267.1 (6783)

WARNING!

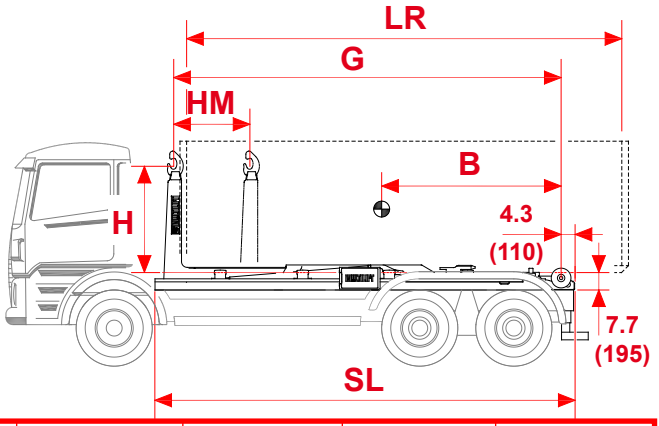
When transporting the container in position HM, the hooklift equipment must have hydraulic body locks.

Technical specifications Ultima 18SL, 21SL, 22SL and 24SL

Manufacturer ..... Multilift, Raisio

Equipment type ..... **Ultima**	**18SL**	**21SL**	**22SL**	**24SL**
Technical performance, max ..... lbs	39600	46200	48400	52800
... (t)	18	21	22	24
Tipping angle, max ..... (°)	52 - 56	52 - 56	55	52
Working pressure of the hydr. system max psi	4060	4350	4350	4350
... (MPa)	28	30	30	30
Recommended oil flow rate ..... gpm	20	20	25	25
... (l/min)	80	80	100	100
Weight of the assembled equipment ..... lbs	4490 - 4840	4490 - 4885	5290 - 5470	5460 - 5610
... (kg)	2040 - 2200	2040 - 2220	2405 - 2485	2480 - 2550

Ultima 18SL
Ultima 21SL
dimensions



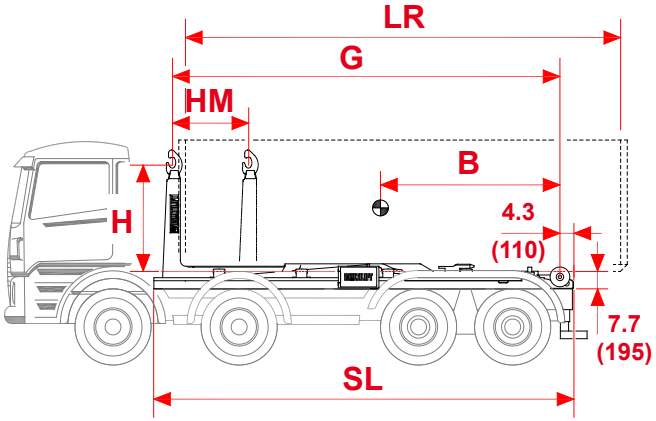
Ult. 18SL	49	51	52	53	56
G in (mm)	191.7 (4870)	200.8 (5100)	206.3 (5240)	211.8 (5380)	220.5 (5600)
HM in (mm)	43.3 (1100)	43.3 (1100)	43.3 (1100)	43.3 (1100)	43.3 (1100)
H in (mm)	See table “Container country specific standard dimensions”				
B in (mm)	113.6 (2885)	118.1 (3000)	120.9 (3070)	124 (3150)	129.9 (3300)
SL in (mm)	218.2 (5543)	230 (5843)	230 (5843)	241.9 (6143)	253.7 (6443)
LR (ft)	13.4 - 19.3	14.1 - 20.0	14.6 - 20.7	15.1 - 21.0	15.7 - 21.6
LR (m)	4.1 - 5.9	4.3 - 6.1	4.5 - 6.3	4.6 - 6.4	4.8 - 6.6

Ult. 21SL	49	51	52	53	56
G in (mm)	191.7 (4870)	200.8 (5100)	206.3 (5240)	211.8 (5380)	220.5 (5600)
HM in (mm)	43.3 (1100)	43.3 (1100)	43.3 (1100)	43.3 (1100)	43.3 (1100)
H in (mm)	See table “Container country specific standard dimensions”				
B in (mm)	113.6 (2885)	118.1 (3000)	120.9 (3070)	124 (3150)	129.9 (3300)
SL in (mm)	218.2 (5543)	230 (5843)	230 (5843)	241.9 (6143)	253.7 (6443)
LR (ft)	13.4 - 19.3	14.1 - 20.0	14.6 - 20.7	15.1 - 21.0	15.7 - 21.6
LR (m)	4.1 - 5.9	4.3 - 6.1	4.5 - 6.3	4.6 - 6.4	4.8 - 6.6

WARNING!

When transporting the container in position HM, the hooklift equipment must have hydraulic body locks.

Ultima 22SL
Ultima 24SL
dimensions



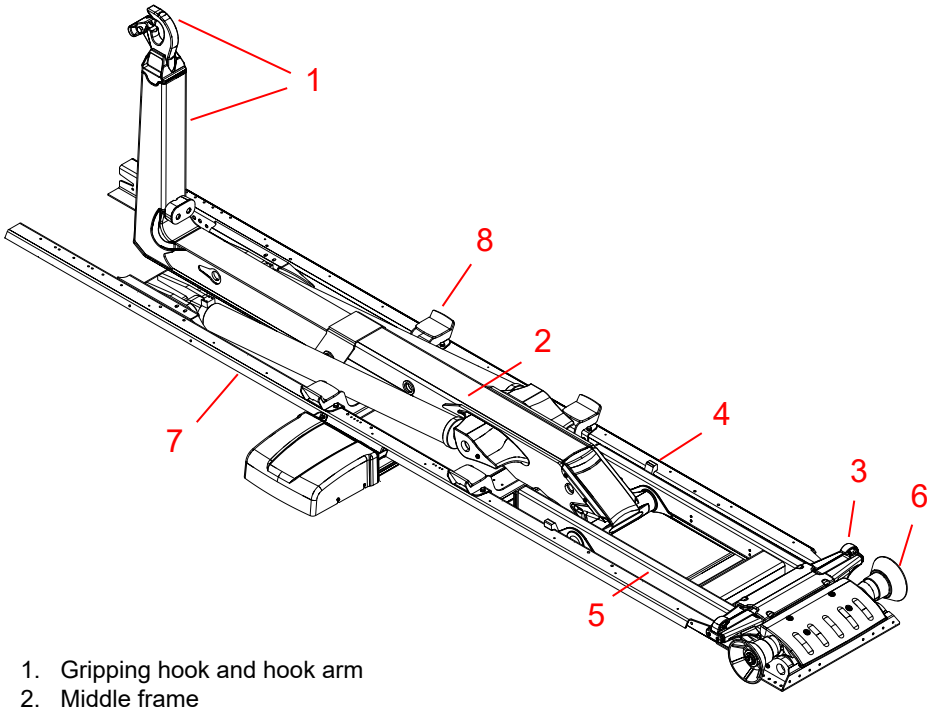
Ult. 22SL	53	56	58	59	61
G in (mm)	211.8 (5380)	220.5 (5600)	228.4 (5800)	232.3 (5900)	240.2 (6100)
HM in (mm)	43.3 (1100)	43.3 (1100)	45.3 (1150)	49.2 (1250)	57.1 (1450)
H in (mm)	See table “Container country specific standard dimensions”				
B in (mm)	124 (3150)	129.9 (3300)	133.9 (3400)	133.9 (3400)	137.8 (3500)
SL in (mm)	241.9 (6143)	253.7 (6443)	253.7 (6443)	253.7 (6443)	259.6 (6593)
LR (ft)	14.6 - 21.0	15.7 - 21.6	16.1 - 22.3	16.1 - 22.6	15.7 - 23.3
LR (m)	4.5 - 6.4	4.8 - 6.6	4.9 - 6.8	4.9 - 6.9	4.8 - 7.1

Ult. 24SL	56	58	59	61
G in (mm)	220.5 (5600)	228.4 (5800)	232.3 (5900)	240.2 (6100)
HM in (mm)	43.3 (1100)	45.3 (1150)	49.2 (1250)	57.1 (1450)
H in (mm)	See table “Container country specific standard dimensions”			
B in (mm)	129.9 (3300)	133.9 (3400)	133.9 (3400)	137.8 (3500)
SL in (mm)	253.7 (6443)	253.7 (6443)	253.7 (6443)	259.6 (6593)
LR (ft)	15.7 - 21.6	16.1 - 22.3	16.1 - 22.6	15.7 - 23.3
LR (m)	4.8 - 6.6	4.9 - 6.8	4.9 - 6.9	4.8 - 7.1

WARNING!

When transporting the container in position HM, the hooklift equipment must have hydraulic body locks.

Main components



1. Gripping hook and hook arm
2. Middle frame
3. Hydraulic locking of the container
4. Mechanical locking of the container
5. Rear frame
6. Rear rollers
7. Sub-frame
8. Container supports

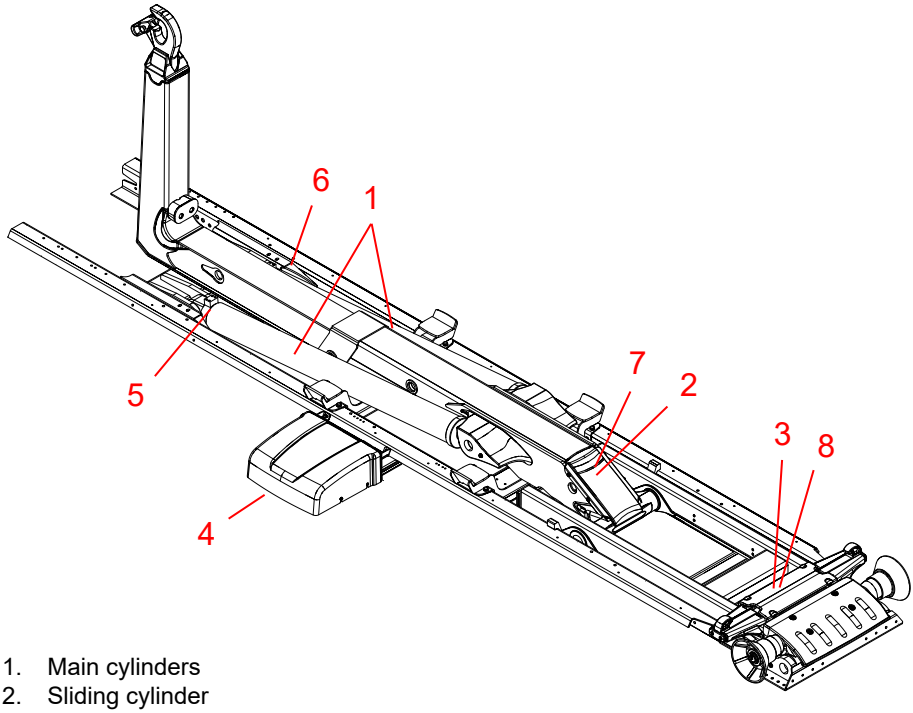
Construction

Ultima S / SL hooklift equipment contains frames joined to each other which enable loading, unloading and tipping of a container. The rear frame hinged to the rear end of the sub-frame, which is fastened to the truck chassis, enables tipping of the container. The middle frame hinged to the rear frame together with the hook arm sliding inside it, enable container loading and unloading.

Container standards, as well as the dimensions defined by them, affect the hooklift construction. The height and shape of the container gripping bar have an effect on the dimensions of the gripping hook; the most common gripping heights are 57.1 in (1450 mm) and 61.8 in (1570 mm). The tunnel height between the container runs defines the height of the hooklift equipment body supports, and the rear rollers, and the distance between the runs, the width of the rear rollers.
The most common tunnel heights are 3.9 in (100 mm), 4.9 in (125 mm) and 5.9 in (150 mm), and the most common width is 41.9 in (1065 mm).

The shape and the position of the hydraulic and mechanical body locks in the hooklift equipment are defined according to the container standards. The used container lengths also have an effect to the position.

Hydraulics



1. Main cylinders
2. Sliding cylinder
3. Body locking cylinder
4. Control valve
5. Load holding valve of the main cylinder
6. Fast speed valve
7. Double check valve of the sliding cylinder
8. Locking cylinder check valve

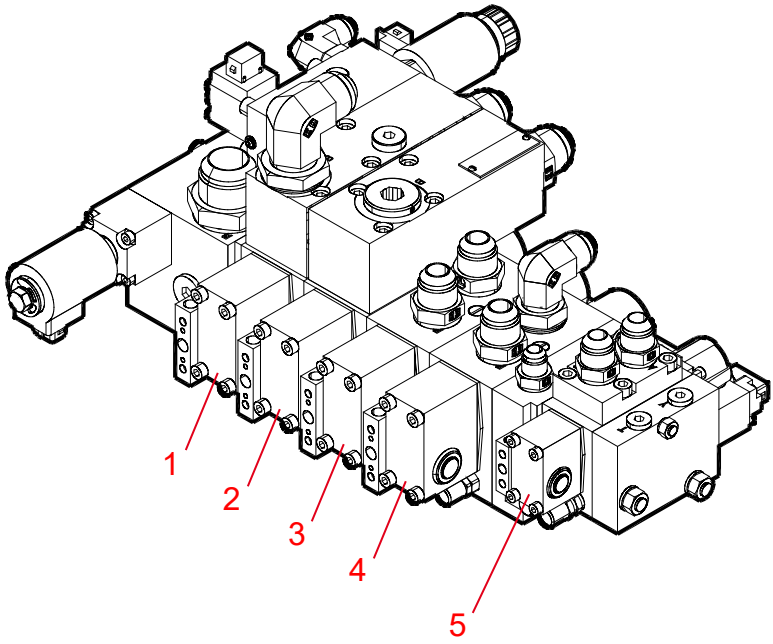
Control valve

The control valve assembly of the hooklift is composed of electrically controlled directional control valves, which divide oil flow for separate cylinders. Control valves are proportionally directed and they enable controlled motions of different operations.

The restriction of main pressure is fixed to 4350 psi (30 MPa), and in addition, for some operations there might have been set lower restriction of pressure.

Hydraulic cylinders

Hydraulic cylinders are dual functional cylinders and they move different frames and operations according to commands of the control system, either one operation at a time or with accessory autopilot. The load control valves or pilot controlled back-pressure valves protect the motions of cylinders.

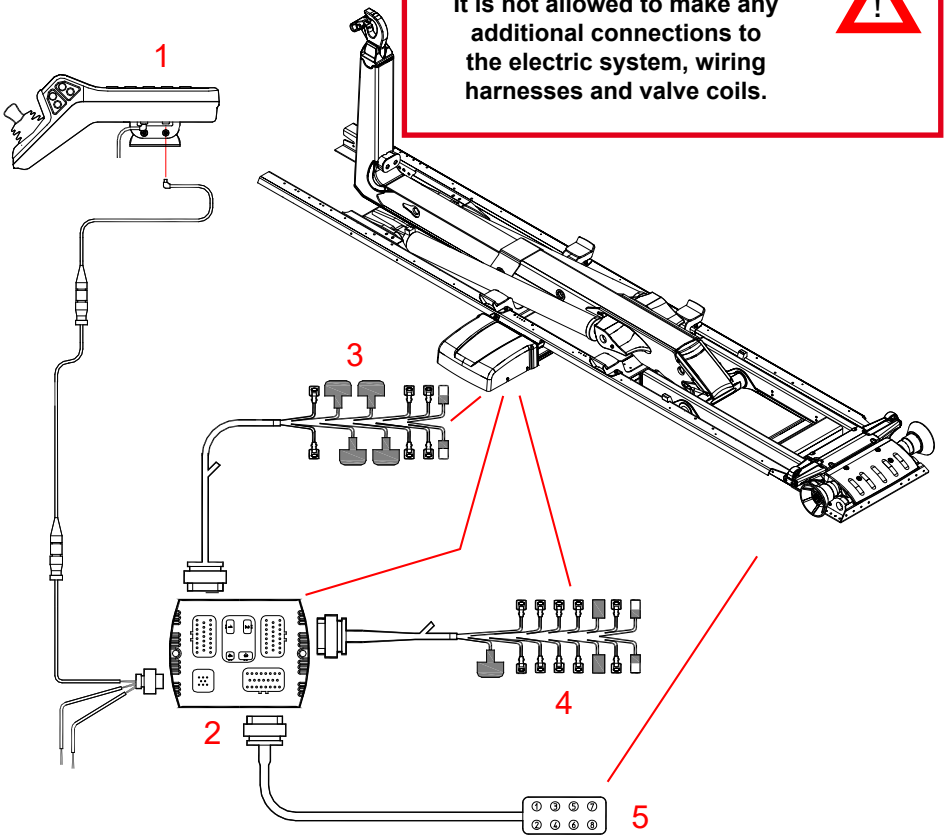


1. Main cylinders section
2. Additional hydraulics section
3. Sliding cylinder section
4. Additional hydraulics section
5. Body locking cylinder section

NOTE!
The order of valve sections is suggestive and can vary due to the hooklift configuration.

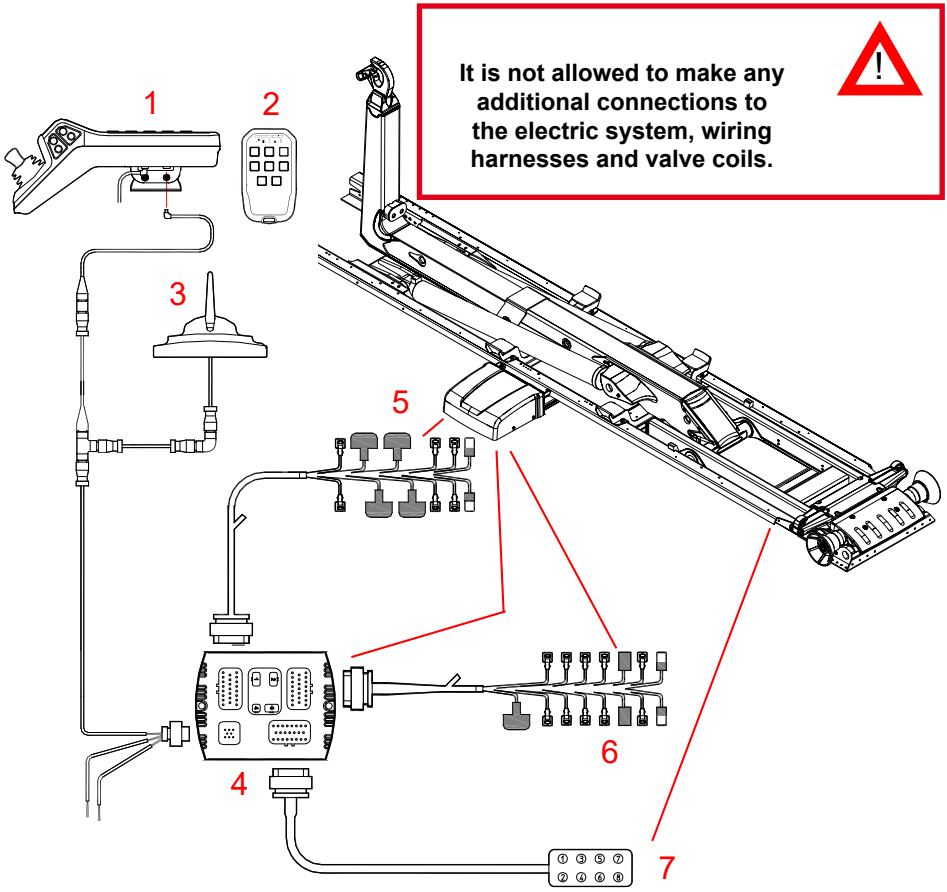
Control devices, Ultima Flex & Pro 2GCC

It is not allowed to make any additional connections to the electric system, wiring harnesses and valve coils.



1. Control unit in the cab
2. I/O module
3. Valve wiring harness
4. Accessory wiring harness
5. Wiring harness of proximity switches

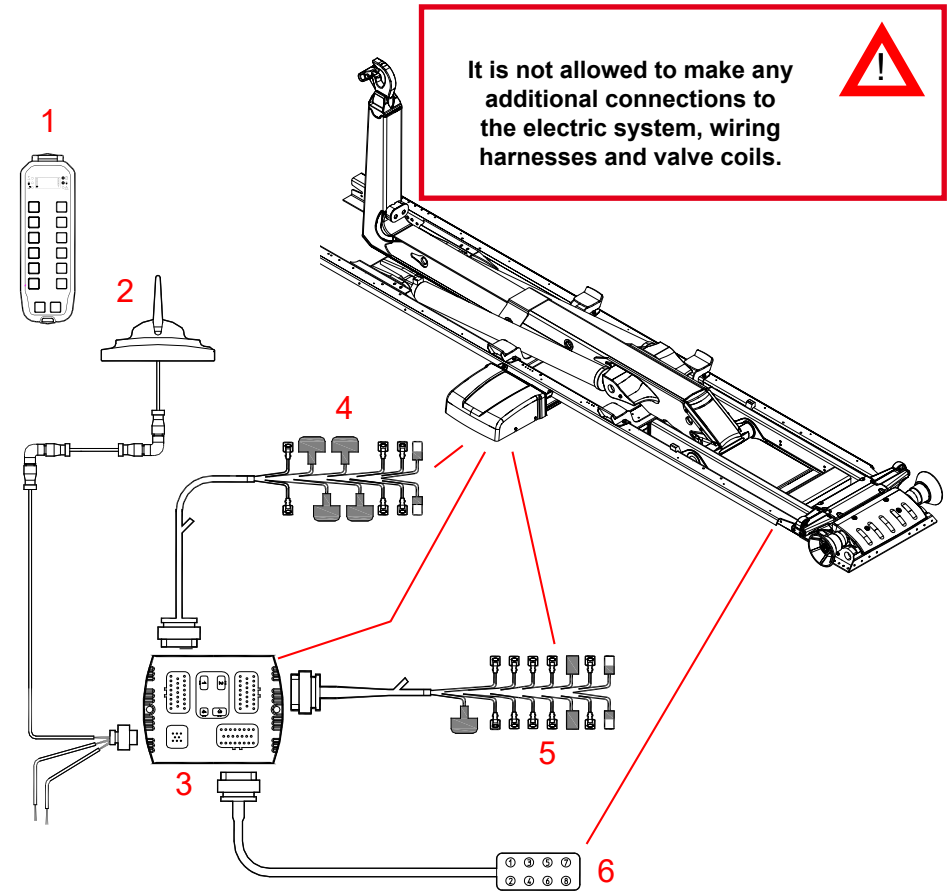
Control devices, Ultima Flex & Pro 2GMR + 2GCC



It is not allowed to make any additional connections to the electric system, wiring harnesses and valve coils.

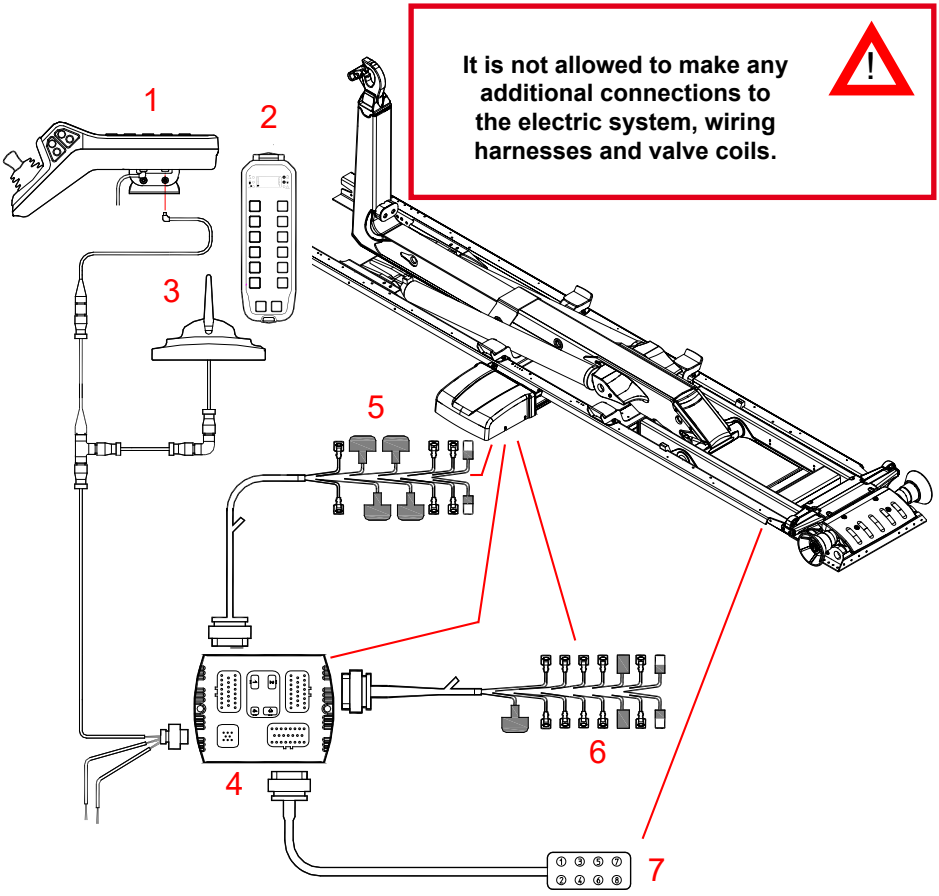
1. Control unit in the cab, 2GCC
2. Control unit, 2GMR
3. Radio receiver
4. I/O module
5. Valve wiring harness
6. Accessory wiring harness
7. Wiring harness of proximity switches

Control devices, Ultima Flex & Pro 2GRC



1. Control unit, 2GRC
2. Radio receiver
3. I/O module
4. Valve wiring harness
5. Accessory wiring harness
6. Wiring harness of proximity switches

Control devices, Ultima Flex & Pro 2GRC + 2GCC

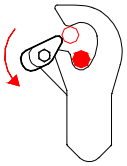


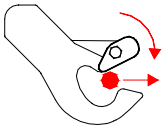
1. Control unit in the cab, 2GCC
2. Control unit, 2GRC
3. Radio receiver
4. I/O module
5. Valve wiring harness
6. Accessory wiring harness
7. Wiring harness of proximity switches

EQUIPMENT

Hook models

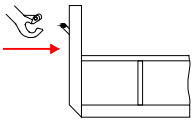
Hook, standard



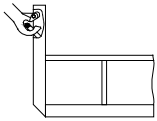


The safety lock on the gripping hook opens and closes by its own weight during the movement of the middle frame.

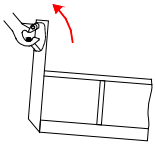
The correct operation of the safety lock must be checked regularly and the surfaces greased every month.



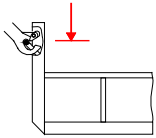
- **Reverse the vehicle so that the gripping bar slides inside the hook.**
  Also see section 11 “loading”.



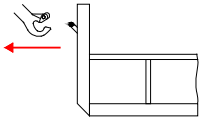
- **Before pulling the container on the vehicle, check that the gripping bar is well inside the hook.**



- **Pull the container on the vehicle.**
  See section 13 “loading”.
- **When unloading, the main cylinder must be stopped as soon as the container reaches the ground.**
  The gripping bar must not be pressed down by the hook.

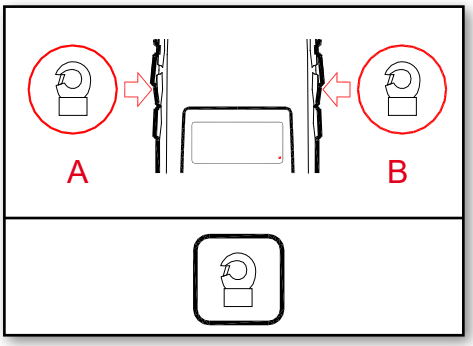


- **Check that the hook opening is level with the gripping bar.**



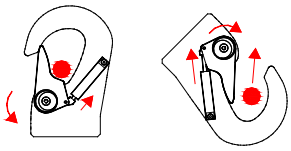
- **Drive the vehicle forward so that the hook is released from the gripping bar.**
  See section 12 “unloading”.

Hook, pneumatic

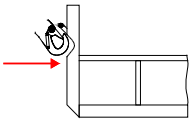


Buttons 2GCC
The safety lock of the gripping hook is opened by pressing the corresponding button on the control unit. Use button A or B.

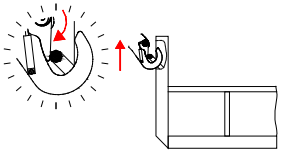
Buttons 2GMR and 2GRC
The safety lock remains open during 1 - 30 secs (adjustable) after the button is pressed and closes by the spring force of the pneumatic cylinder. When the safety lock is open by pneumatic force, a sound is produced by the pneumatic cylinder due to the released air. Press the button again when necessary.



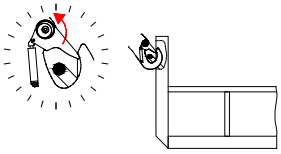
1 - 30 sec.
Delay adjustable



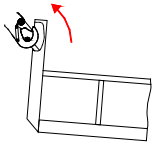
- **Reverse the vehicle so that the hook is below the gripping bar.**
  Also see section 11 “loading”.



- **Lift the hook by a movement of the middle frame so that it grips the gripping bar.**
  The safety lock is opened when the hook presses down on the gripping bar.

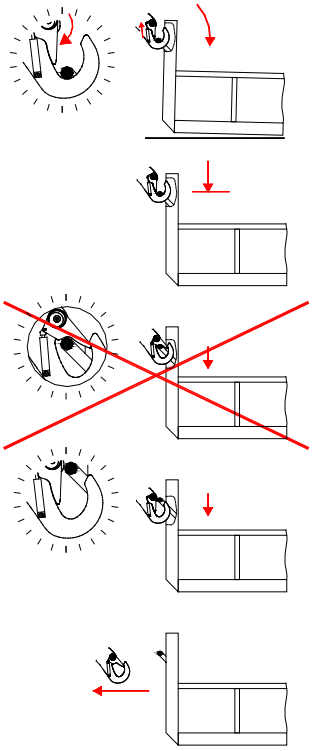


- **Before loading the container, make sure the safety lock is closed.**



- **Pull the container on the vehicle.**
  See section 13 “loading”.

The correct operation of the safety lock must be checked regularly and the shaft nipple greased every month.

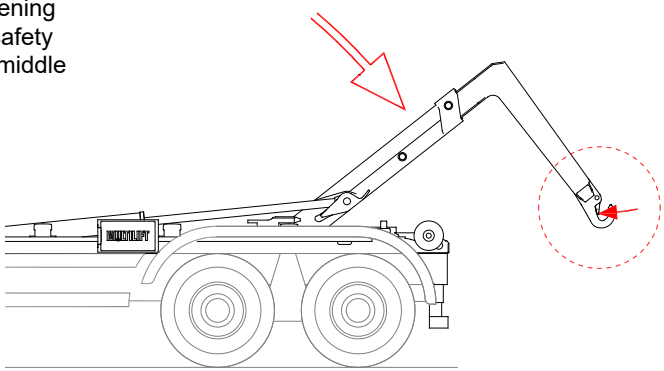


- **Open the safety lock of the gripping hook by pressing button on the control unit immediately before lowering the front end of the container to the ground.**
- **Stop the main cylinder when the container reaches the ground.**
- Check that the safety lock is still open. **If the safety lock has closed, it may cause the safety lock or the gripping bar to be damaged when the hook is pressed down on the gripping bar.**
- **Continue the downward motion of the main cylinders, with the safety lock open, until the hook is released from the gripping bar.**
- **Drive the vehicle forward, away from the container.**
  See section 12 “unloading”.

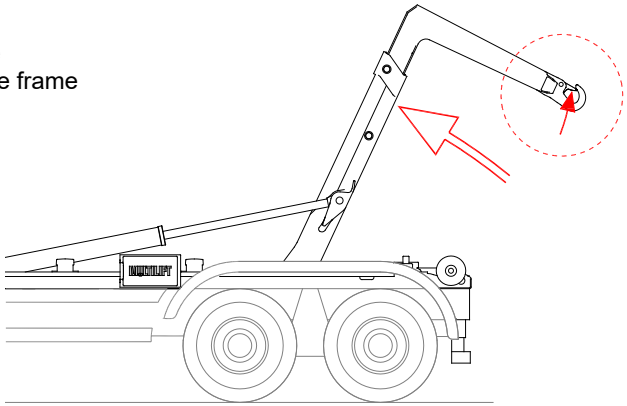
Safety latch automatic opening

Available for Ultima Flex and Ultima Pro

Safety latch automatic opening option opens pneumatic safety latch automatically when middle frame is in back position.



The safety latch will close automatically when middle frame is lifted up.

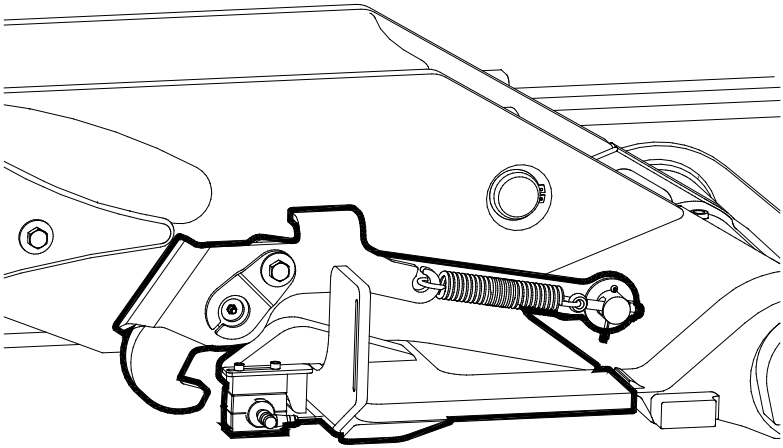


Locking mechanisms of the hook

For safety reasons, the tipping, loading and unloading operations are secured with various locking mechanisms between the frames of the equipment. The container is frontally locked to the equipment by a gripping hook and by means of hydraulic and/or mechanic locks in the rear end.

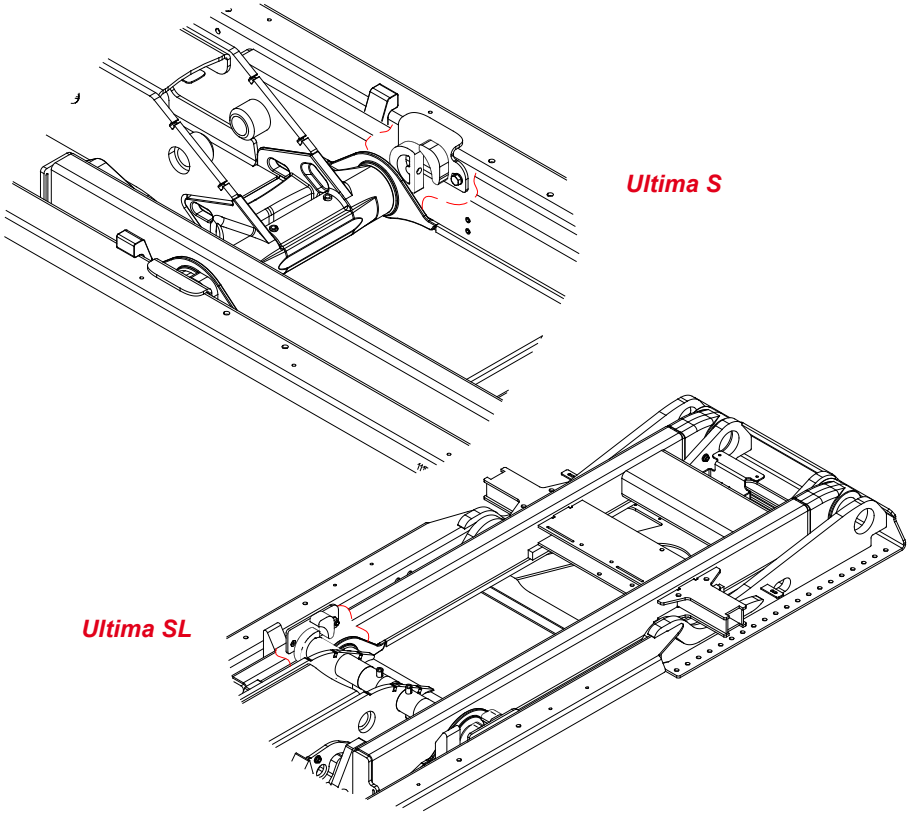
Tipping lock

Mechanical tipping lock (locking rear frame to middle frame)



The mechanical tipping lock is situated between the rear frame and the middle frame and consists of hooks that lock on to lugs. The hooks cannot lock on when the hook arm is in the rear position. They automatically lock on when the hook arm moves forward more than 3.9 in (100 mm). Tipping is not possible when the hook arm is all the way back. During tipping, the middle frame is locked to the rear frame by the tipping lock. The tipping lock operates automatically according to the movements of the hook arm.

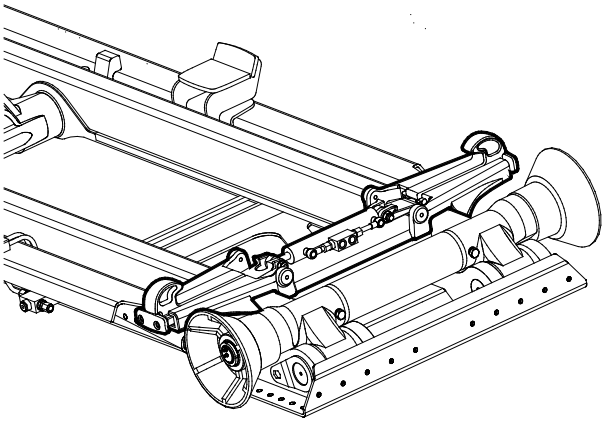
Rear frame lock (locking rear frame to auxiliary frame)



During the lowering of a container, the rear frame is mechanically locked to the auxiliary frame when the middle frame starts to rise. The lock is achieved by the axle tip on the middle frame, which slides under the locking stops in the auxiliary frame.

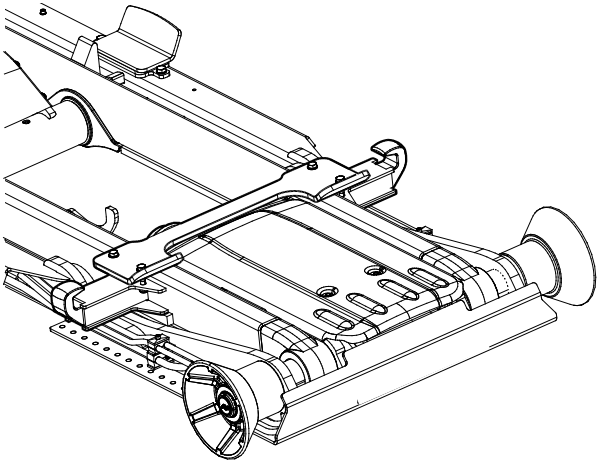
Container locks

Outside hydraulic locks



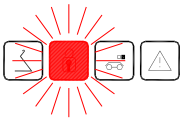
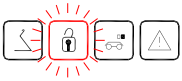
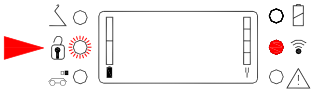
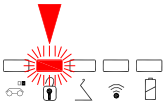
Ultima S

Ultima SL



In the outside hydraulic locks, the hooks lock the container in place from the outside flange.

Switch and signal light of hydraulic body locks

Function	Open body locks LED comes on	Close body locks LED off
LEDs 2GCC		
Display and LEDs 2GRC		
LEDs 2GMR		
Button		

The body locks are opened by pressing the switch in the control unit. A burning lock signal light on the control unit means that the body locks are not fully closed.

The signal light blinks if the lock hooks are between the open and closed positions.

When in traffic, no driving or tipping is to be commenced if the light is on. Remove the element obstructing the locks, or if they are obstructed by the lock pocket in the container frame beam, check that the container is correctly positioned on top of the hook device.

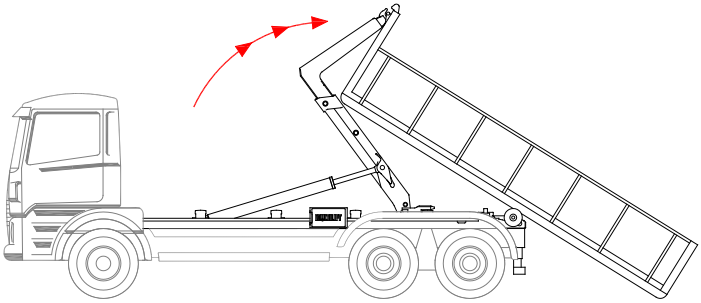
ADDITIONAL EQUIPMENTS

Fast speed

WARNING!

Care must be taken at all times when operating the Fast Speed option. It is recommended to release the ”rabbit” button before the container is completely placed on the ground or before the main cylinders reach their end of stroke.

The fast speed option is the “third” speed setting of the hooklift in addition to the two standard speeds. The fast speed option enables the controlled demounting of empty or lightly loaded containers approximately one third quicker than the standard device.

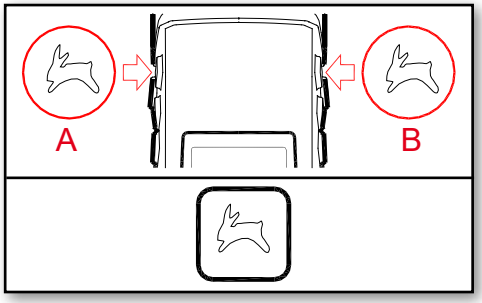


Unloading using the fast speed option

The fast speed option is integrated with the load holding valve, enabling an optimized oil flow when driving the main cylinders outwards. The load holding valve maintains a controlled movement along the entire length of the cylinder.

WARNING!
You may only use the fast speed option for handling empty or lightly loaded containers and controlling the device movements without the container.

The value for the angle of middle frame that will stop the fast movement before the front end of the container reaches the ground can be controlled by using a tilt sensor, which is available as an accessory for the system. After this angle value has been exceeded, unloading continues at the normal speed.



Fast speed buttons

Buttons 2GCC

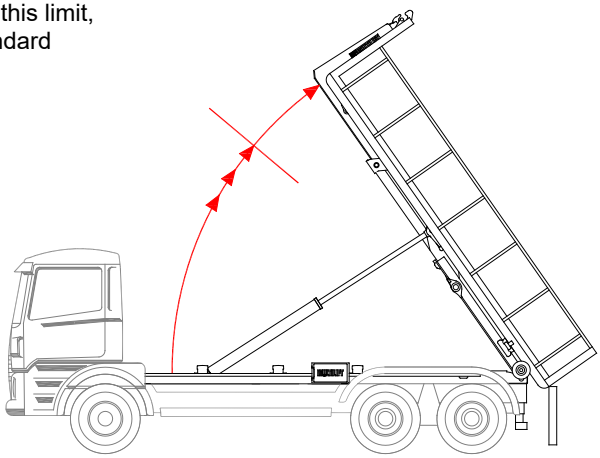
The fast speed function is operated using the push switches A and B of the 2GCC-control unit.

Button 2GMR and 2GRC

NOTE!
The fast speed option only works with the outward movement of the main cylinders, not the inward movement!
Stop the fast speed movement before the front end of the container reaches the ground!
When using the fast speed option with no container, stop the movement before the cylinders reach their maximum length!

Fast speed in tipping
(auxiliary device to Ultima device with fast speed feature)

The fast speed tipping option is an accessory which enables faster tipping of light loads. Fast speed tipping is restricted before the end of the main cylinder stroke. After this limit, the tipping will continue in standard speed.



Fast lowering option of the tipping device

You can use the fast container lowering feature to lower the container faster than normal speed. The speed of the fast lowering is affected by the weight of the empty container and the temperature of the oil; at cold temperatures the speed decreases.

The fast lowering option of the tipping device is primarily designed for lowering an empty or lightly loaded container. **A fully loaded container must be lowered with the normal lowering function.**

2GCC: The fast container lowering feature is switched on by pressing the fast lowering switch and moving the control lever forward.
2GMR ja 2GRC: The fast container lowering feature is switched on by pressing the fast lowering switch and then the “lower body” switch.

The switches and the lever must be kept in this position throughout the lowering process. The container will then freely lower down to a predetermined angle, after which the lowering process will continue at the normal speed. With large tipping angles, the fast lowering speed can be adjusted via the position of the control lever (2GCC), but with small tipping angles the control system determines the speed.

The lowering of the container can be interrupted by freeing the switches. The control lever must be released to the middle position smoothly (not abruptly) (2GCC). If the fast lowering switch is released, the main cylinder drive will switch to normal lowering.

NOTE!

- **Before starting fast lowering make sure**
  - that no-one or nothing is under the container.
- **Do not exit the cockpit during the lowering process.**
- **If the vehicle is moving while the container is being lowered in fast speed mode,**
  - note the height of the hooklift device / container in relation to the surrounding bridges, tunnels and overhead power lines.

Drive carefully and cautiously.

A rear-heavy container, slanted ground and/or cold oil may prevent the fast lowering option from being activated.

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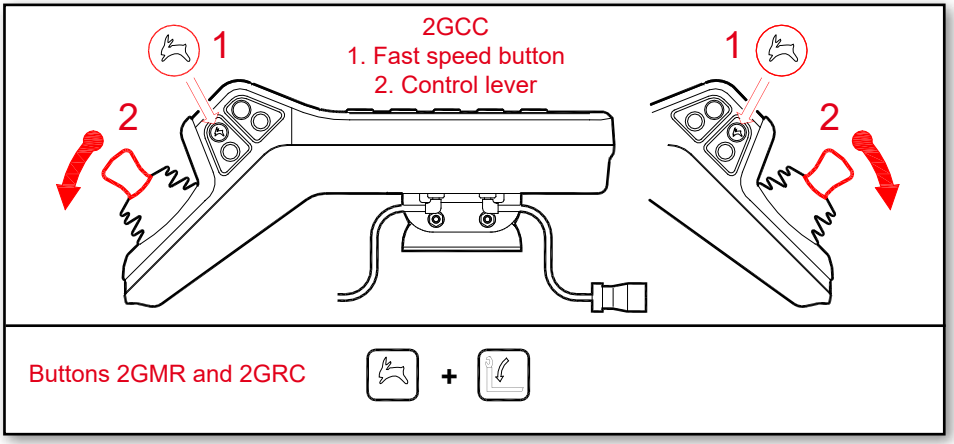
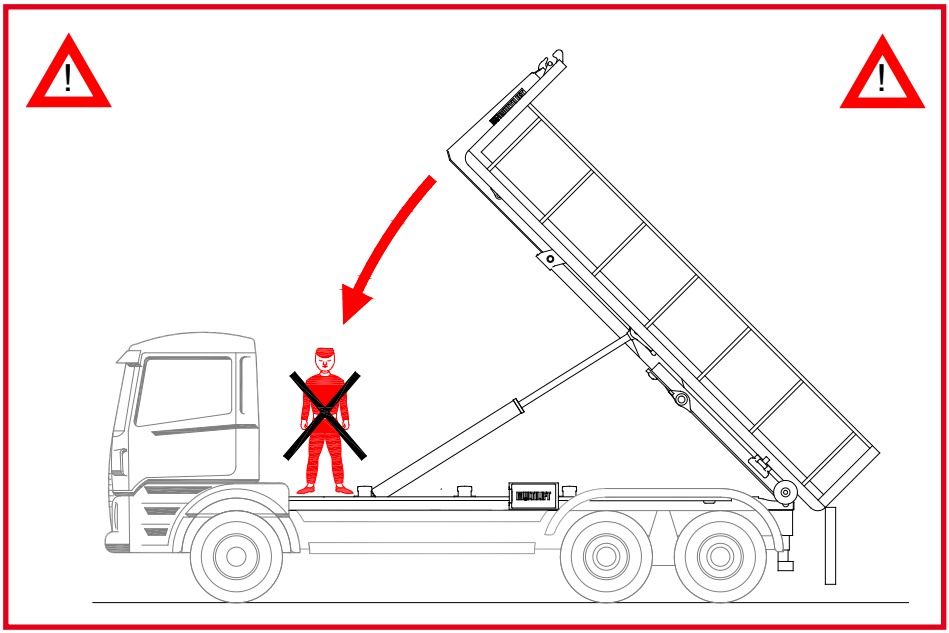
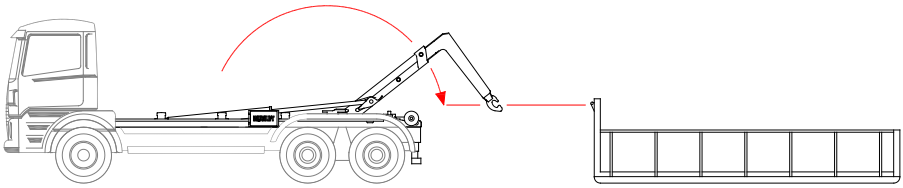

2GCC
1. Fast speed button
2. Control lever
1
2
1
2
Buttons 2GMR and 2GRC
+



Hook height stop

Standard in Pro, optional for Flex

Hook height stop stops the hook in the back on pre-set value, which helps to catch hook bar easily. Movement can be continued after stop.



NOTE!

The hook height stop works with one hook height only. If the hooklift is equipped with 2-height adjustable hook, then the stop works only for one of the height.

Safespeed, End-of-movement damping

Standard in Pro, optional for Flex

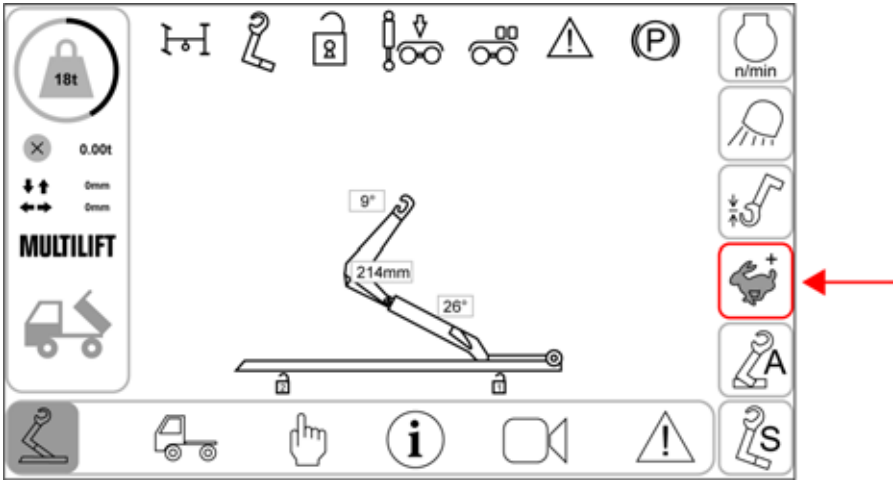
Safespeed, End-of-movement damping option stops the fast speed movement to normal speed before end of the cylinder stroke.

Safespeed+ / LoadBoost™

Standard in Pro, optional for Flex

Safespeed+ / LoadBoost™ option includes adapted speed and protective damping. This option automatically adjusts hooklift speed based on weight of the load, i.e. speed is increased with light loads and slowed down with heavy loads due to the safety. This way operations are always as productive as possible (fast movements always enabled based on load) and safe, because fast functions are enabled and disabled load-based as well as end-of-movement is always smooth and damped.

Option includes also FutureTouch™ Basic display from which the LoadBoost™ can be switched off when e.g light containers need to be handled slowly and with very high accuracy.



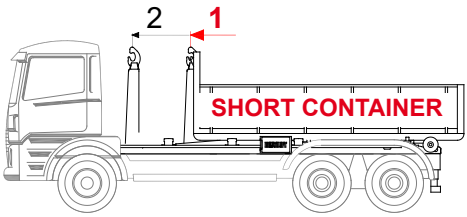
SafePositioning

Short Container loading, semi-automatic

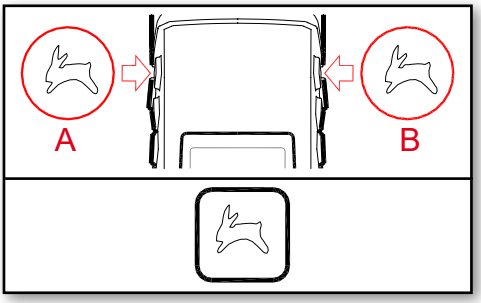
Available for Flex and Pro

Short Container loading, semi-automatic stops sliding movement into pre-set position. This removes the risk of pulling short container too far front and dropping it from rear rollers, or prevents collision with a crane mounted behind cabin.

1. The stop point is set in the control system.



2. After the stop, the sliding movement front can be continued by pressing the fast speed button.



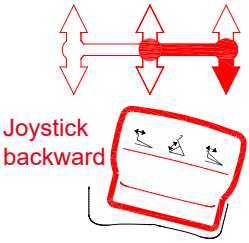
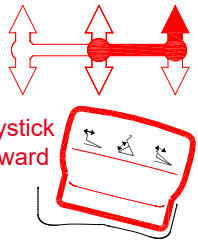
Fast speed buttons

Buttons 2GCC

Button 2GMR and 2GRC

Automatic Sequence Control

The automatic sequence control controls the movements of the equipment, ensuring an easy and safe operation of the container. The automatic sequence control is easily engaged by moving the joystick to the right-hand-side position (2GCC) or by pressing the switch shown on the picture (2GRC and 2GRM).

Function	Unloading	Loading
Joystick 2GCC		
Button 2GRC and 2GMR		

Moving the joystick backward will activate the unloading movement, which is automatically followed by the following operations:

- the hydraulic body locks are opened
- the hook arm moves backwards
- the main cylinders push back the hook arm and middle frame

Remember to stop the movement when the container reaches the ground.

Moving the joystick forward will activate the loading movement, which is automatically followed by the following operations:

- the main cylinders pull the hook arm and middle frame on top of the equipment
- the hook arm moves forward
- the hydraulic body locks are closed when the joystick is released

The switch between automatic and normal control is made by moving the joystick to the central position, where it controls the main cylinders, or to the left where it controls the hook arm by normal steering. The hook arm must be static before the joystick is switched from one position to another.

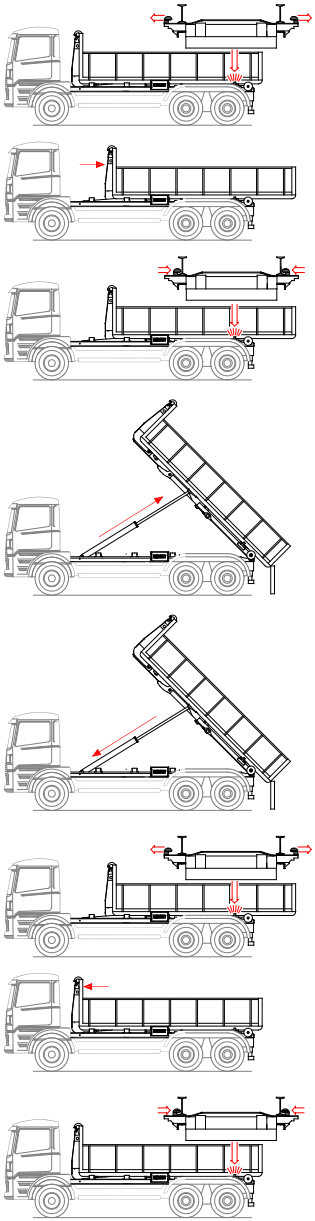
Enhanced automatic sequences

Automatic tipping special

Available for Flex and Pro

Automatic tipping special is automatic tipping mode, which allows driver to tip goods closer to the ground automatically.

Automatic routine is following: open locks, slide container back (pre-set distance), close locks, tip the container, lower container, open locks, slide forward and close locks.

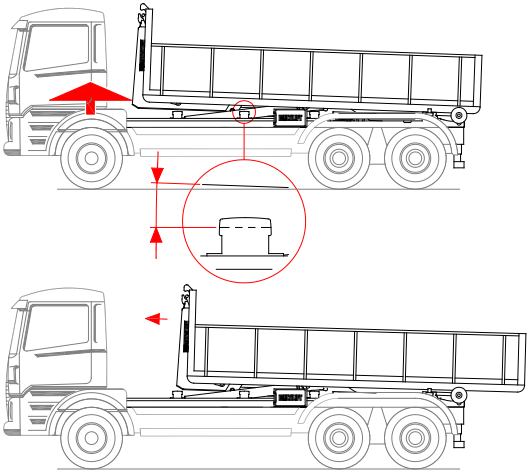


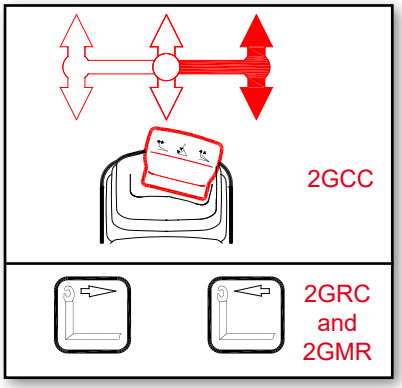
NOTE!

Before tipping make sure that the rear end of container or tail gate does not hit the ground!

Friction relief

The friction relief is an additional function which automatically drives the main cylinders forward just enough for the container to rise from the container supports. This allows the container to move on the middle frame rollers and rear rollers, eliminating the friction between the container and the container supports. The function is activated each time the hook arm is driven forward or backward.



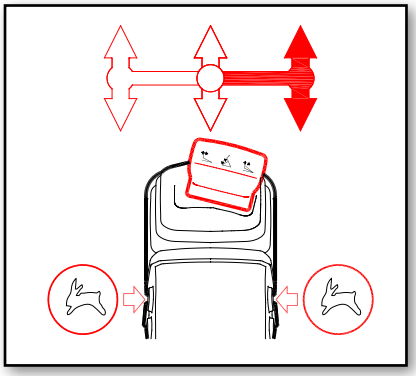


Friction relief

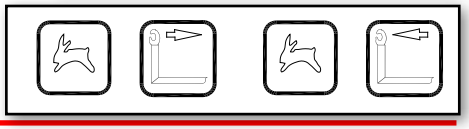
Relief of the horizontal movement

Relief of the horizontal movement can be temporarily by-passed by holding the fast speed switch (push button) pressed during the horizontal movement.

Joystick and fast speed button
by by-passing of the friction relief function
2GCC



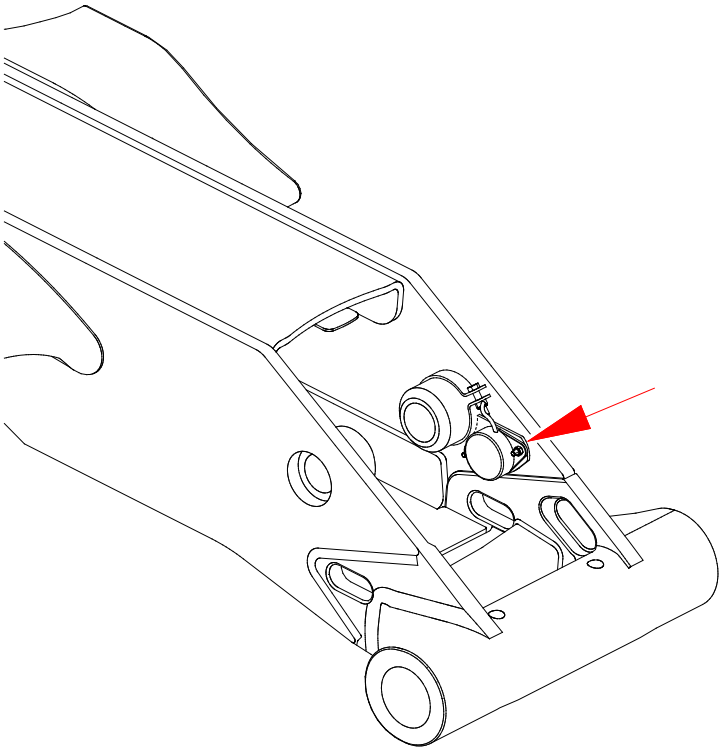
Buttons by by-passing
of the friction relief function
2GRC and 2GMR



Protection of main cylinder

The protection circuit of the main cylinders protects the main cylinder's piston rods from buckling. The protection circuit comprises a tilt indicator and a pressure relief valve. If the tilt is greater than set angle value, the working pressure is restricted to 1595 psi (11 MPa) and the backwards movement of the container may stop.

If this does take place, check that the movement of the platform rearward is free from obstructions.



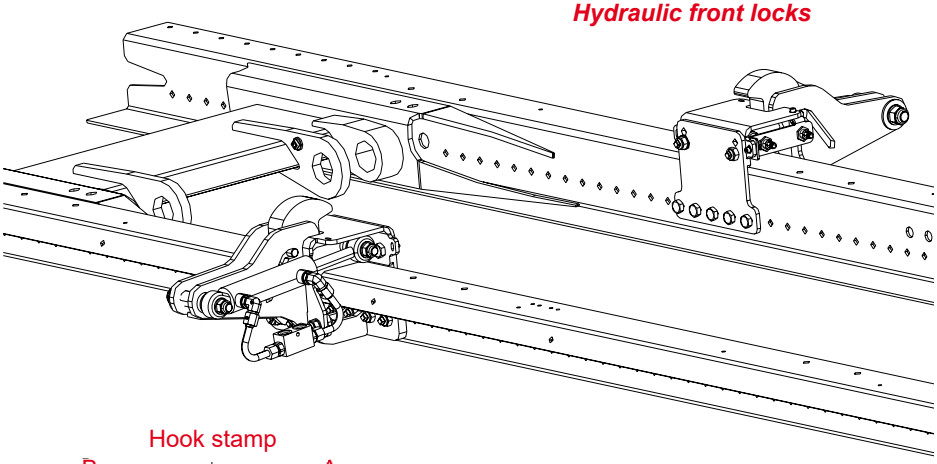
Tilt indicator

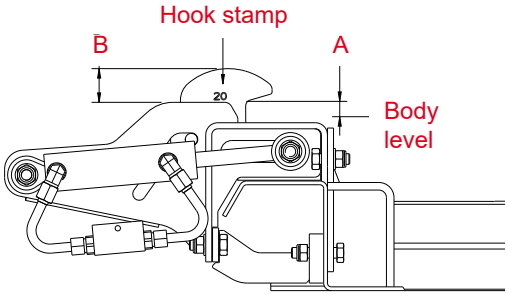
Hydraulic front locks (Ultima S)

The hydraulic front locks are located on the subframe in the front part of the device. They lock the container through the subframe to the chassis of the vehicle.

When the front locks are closed, movements of the main cylinders and the hooking frame are inhibited.

Hydraulic front locks





The inner height of the front lock hook has been determined when ordering the machinery.

Standard height A = 0.55 in (14 mm), low A = 0.39 in (10 mm) and high A = 0.79 in (20 mm).

In the 0.39 in (10 mm) and 0.79 in (20 mm) hooks, the hook's height has been stamped on the inner surface.

	A in (mm)	B in (mm)	**Hook stamp**
Standard	0.55 (14)	1.54 (39)	**none**
Low	0.39 (10)	1.54 (39)	**10**
High	0.79 (20)	1.77 (45)	**20**

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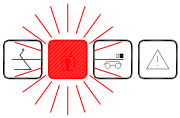
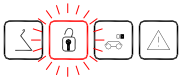
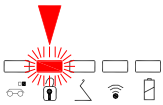
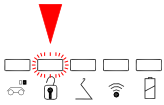
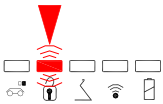
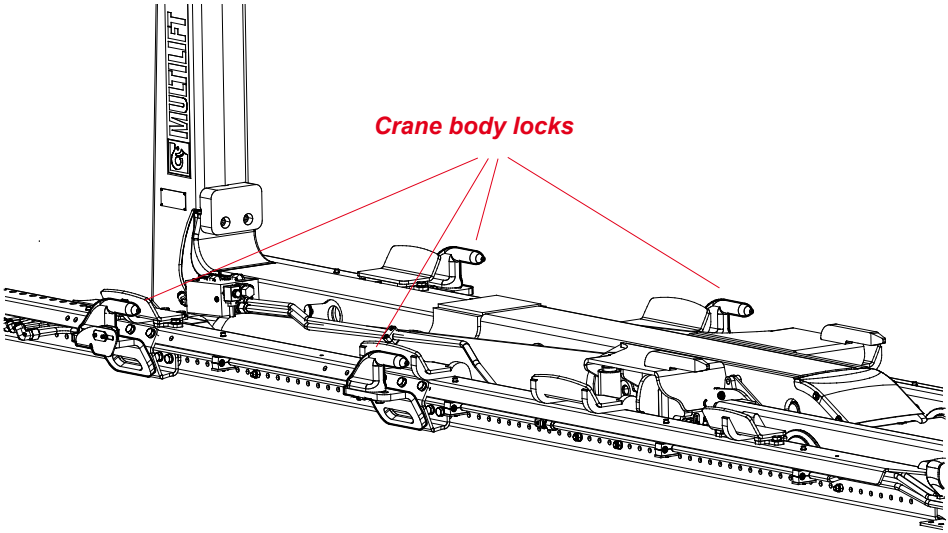
NOTE! Remember to open the front locks before tipping or unloading the container. If the front locks are closed for some reason when the tipping device is in the upper position, codes d018 and/or d019 will be shown on the control display. In this case, open the front locks before lowering the tipping device in order to avoid damage to the front locks.

Function	Open the front locks LED comes on	Close the front locks LED off
LEDs 2GCC		
Display and LEDs 2GRC		
LEDs 2GMR		
Button		

Function	Body locks are closed, front locks are opened LED is slowly flashing	Body locks and front locks are opened LED is burning continuously
LEDs 2GCC		
Display and LEDs 2GRC		
LEDs 2GMR		

Crane body locks (Ultima SL)

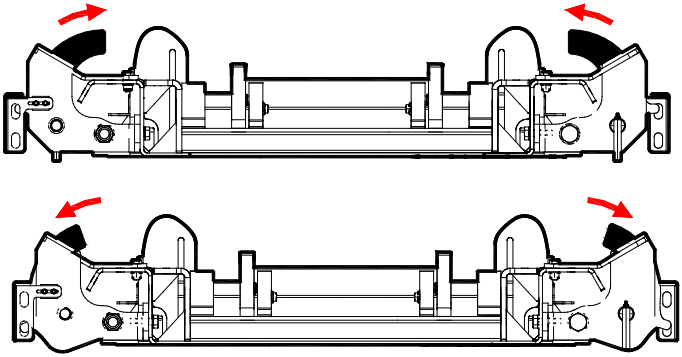
Mechanical crane body locks are located on the equipment subframe by the two first body support pair. Crane body is locked by means of these locking pins via the equipments subframe to the vehicle chassis. There must be counter sleeves on the body for these locks. On the left hand side, in connection with the front lock, there is a proximity switch which prevents tipping of the equipment when the body is in the locks.



NOTE! **Before tipping the body, unlock the hydraulic body locks, drive the hook arm back for approx. 300 mm and lock the hydraulic body locks.**

NOTE! **Before driving the hook arm back and before unloading the crane body, remember to remove the hydraulic hoses between the body and the equipment.**

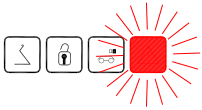
Mechanical locks (Ultima SL)



Mechanical hook locks

The mechanical hook locks attach the container to the hook arm's auxiliary frame and thus also to the frame of the truck. The locks are equipped with proximity switches that allow the use of the hook arm when the locks are open.

The mechanical hook locks must be opened manually on both sides before using the device.

Function	When the hook locks are closed, the LED turns on	When the hook locks are open, the LED turns off
LEDs 2GCC		
Display and LEDs 2GRC		

Bogie blocking

- Optional bogie blocking can be installed on rear axle of the vehicle (6x4 & 8x4). The stabilizer supports the vehicle substantially during loading operation and when unloading to the ground.

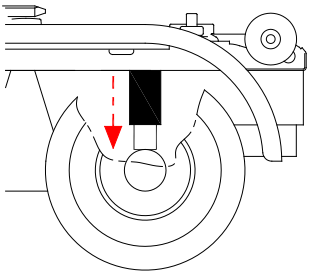
- The stability of vehicles is worse on new vehicles due to lower weight and greater load capacity.

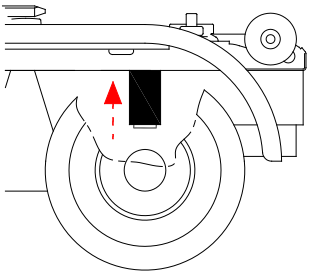
1 The bogie blocking cylinders are used by the control unit switches which control the additional valve installed in the directional valve configuration.

- **Automatic bogie blocking**
  When the body locks are opened, the directional control valve on the bogie blocking cylinders is adjusted to switch on the bogie blocking cylinders; once the body locks are closed, also the bogie blocking cylinders are released.

NOTE! **Bogie blocking should never be used during tipping.**

2 If the Ultima equipment has an adjustable under-run bar, the signal light of additional equipment is used as a signal light of bogie blocking.





Operating the bogie blocking

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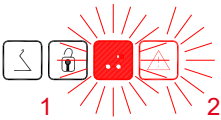
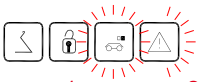
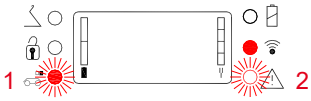
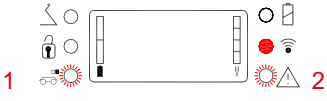
Function	Engage bogie blocking LED comes on	Release bogie blocking LED goes out
LEDs 2GCC		
Display and LEDs 2GRC		
LEDs 2GMR		
Button		

Stabilizer

- Stabilizer or a support roller is available as additional equipment. It improves the stability of vehicle during loading and unloading.
- In new constructions, the circumstances impairing the stability of vehicle are smaller own weight and larger loading capacity.

1 Stabilizers are used with the help of switches located in the cabin, which switches control the additional valves assembled to the directional control valve assembly.

NOTE! **Stabilizers should never be used during tipping.**

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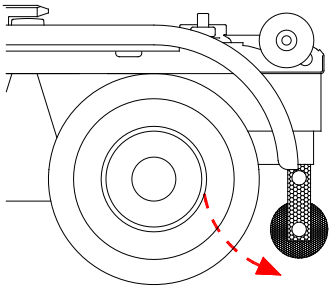
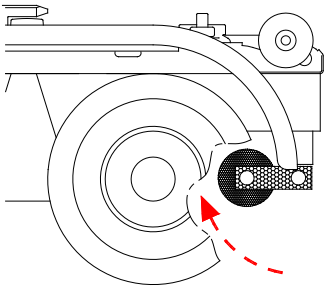
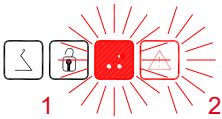
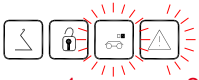
2 If the Ultima equipment has an adjustable under-run bar, the signal light of additional equipment is used as a signal light of stabilizer.



Stabilizer operation



Function	Lower stabilising roller LED comes on	Lift stabilising roller LED goes out
LEDs 2GCC		
Display and LEDs 2GRC		
LEDs 2GMR		
Button		

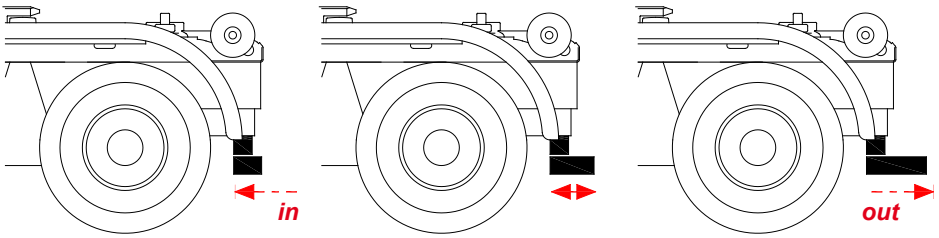
Hydraulic or electric under-run bar

- **Manual operation**
  - under-run bar is driven in and out by a push button
- **Semi-automatic**
  - under-run bar moves automatically in
  - under-run bar is driven out by a push button
- **Automatic**
  - under-run bar moves automatically in and out

NOTE!

- **Before using the under-run bar, ensure:**
  - that there is nobody within the movement area of the under-run bar.
- **ALWAYS before changing container or tipping**
  - move the under-run bar in.

Under-run bar operation



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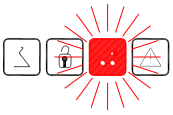
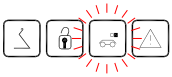
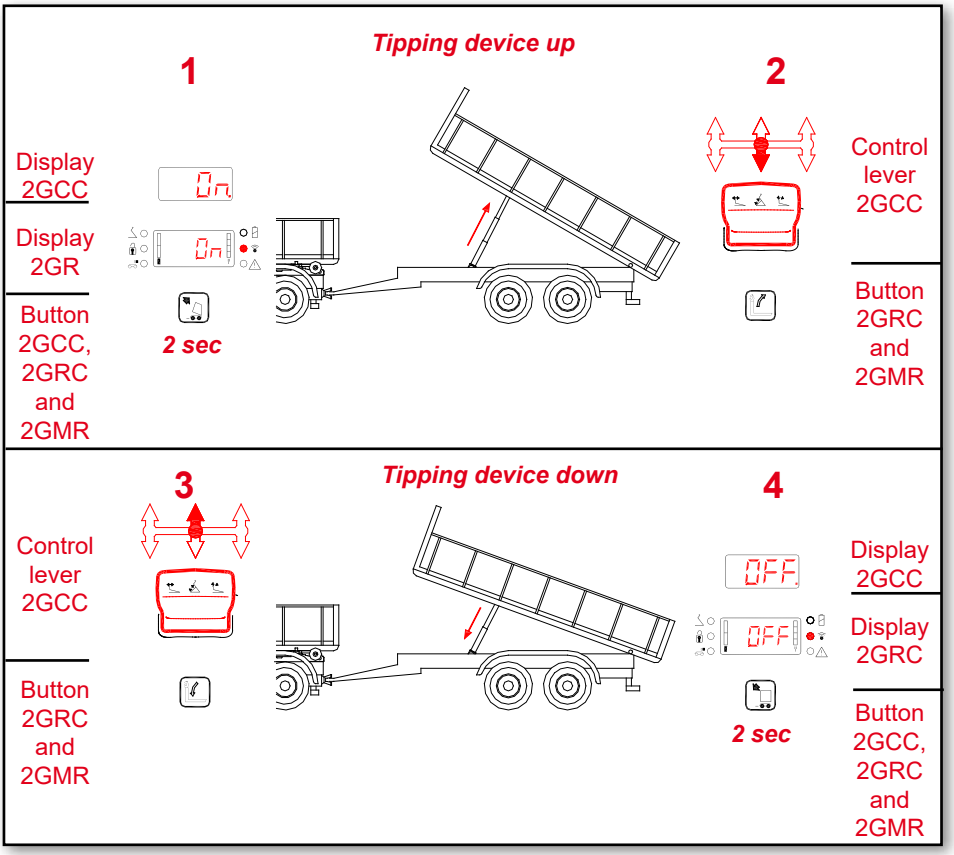
Function	Under-run bar in LED comes on	Intermittent LED	Under-run bar out LED goes out
Display and LEDs 2GCC			
Display and LEDs 2GRC			
LEDs 2GMR			
Button			

When the under-run bar is in intermediate position, the signal light flashes and the hooklift cannot be used. The screen will show the code “**d022**”. In a problem situation, check the functioning of the under-run bar and the proximity switch.

Trailer tipping device

The trailer tipping device is used to control the flow of oil to the trailer hydraulics through the Ultima device control valve. Check the instructions on hydraulic connections and use provided by the trailer hydraulics manufacturer.

Trailer tipping device controls



Additional hydraulics

Auxiliary equipment connected to the Ultima´s own hydraulics, is controlled by the additional hydraulic switch (push button), for example, tail gate, sand spreader, etc.

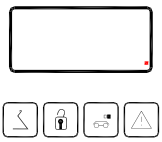
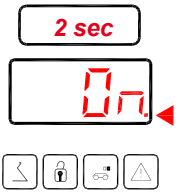
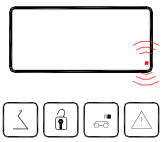
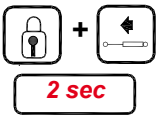
Additional hydraulics can be changed to continuous operation in two ways, depending on settings of the control system:

1. (standard setting) by pushing simultaneously the button **additional hydraulics on** and the button **body locks closed** for 2 seconds.
2. (alternative setting) by pushing the button **additional hydraulics on** for 2 seconds.

When switching on, the display will show text ”**On**” for a moment.

Switching off can be obtained by pressing the **stop the operation of additional hydraulics** and the display will then show text “**OFF**”.

Switching on the function for continuous operation by radio control (2GRC or 2GMR) is blocked up for safety reasons.

Function	Additional hydraulics on	Switch the additional hydraulics to continuous operation mode ”On” appears for approx. 2 seconds LED starts blinking	LED is blinking when the additional hydraulics is in continuous operation mode	Additional hydraulics off ”OFF” appears for approx. 2 seconds LED stops blinking
Display and LEDs 2GCC				
Button				

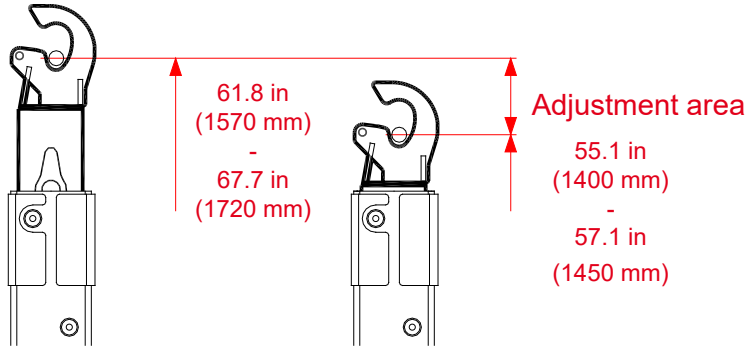
Hydraulically adjustable hook height

With the hydraulically adjustable grabbing hook, the grabbing height can be adjusted between 57.1 in (1450 mm) and 61.8 in (1570 mm) according to the container used.

Before grabbing the container, measure the correct height and drive the grabbing hook to the corresponding height.

The height of the hook should not be altered when loading or lowering the container in order to avoid damage to the container or the Ultima hooklift device.

55.1 in (1400 mm) - 61.8 in (1570 mm)	Ultima 21S - Ultima 26S
57.1 in (1450 mm) - 61.8 in (1570 mm)	Ultima 21S - Ultima 26S
57.1 in (1450 mm) - 67.7 in (1720 mm)	Ultima 21S



Function	Hook up	Hook down
Button		

Emergency operation

Phases

Before switching on the emergency operation

Make sure the fast couplings are locked and correctly connected.

The car has emergency operation/additional hydraulic couplings on the left side of the vehicle, behind the cab, as well as on the rear side of the vehicle, on the right.

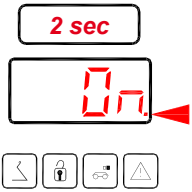
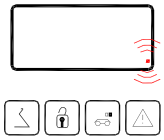
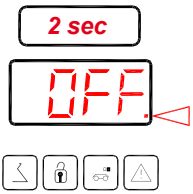
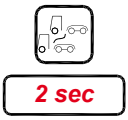
Next

Set the running speed of the *auxiliary* vehicle's motor to 1100 r/min.

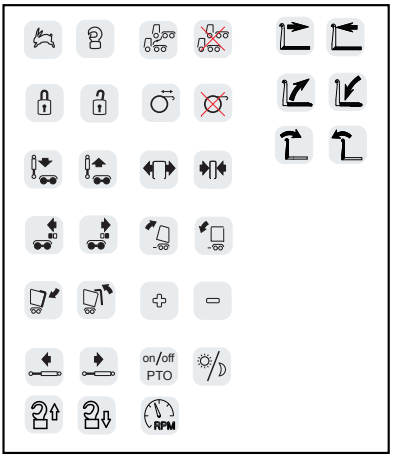
Switch on the *auxiliary* vehicle's emergency operation hydraulics using the control unit membrane switch, by pressing the switch for approx. 2 seconds. The text "**On**" will appear on the display momentarily.

Stop the emergency hydraulics operation through the membrane switch on the *auxiliary* vehicle's hook device control panel. The text "**OFF**" will appear on the display momentarily.

Switching on the function for continuous operation by radio control (2GRCor 2GMR) is blocked up for safety reasons.

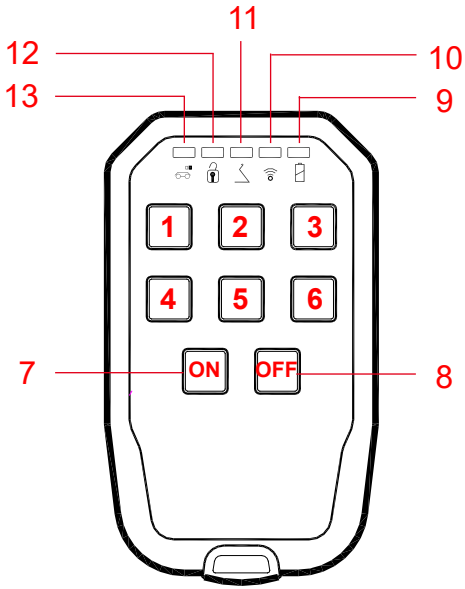
Function	Emergency operation hydraulics ON "ON" appears for approx. 2 seconds LED starts blinking	LED is blinking when the emergency operation hydraulics is in use	Emergency operation hydraulics OFF "OFF" appears for approx. 2 seconds LED stops blinking
Display and LEDs 2GCC			
Button			

Mini-Radio (2GMR)



Symbol Sticker Sheet

Note!
One sticker sheet is spare for future changes.



1 - 6 Function buttons
7 ON switch / Dead man´s switch
8 OFF switch
9 LED: BATTERY CHARGE STATUS
10 LED: CONNECTION
11 LED: FRAME NOT LOWERED
12 LED: HYDRAULIC CONTAINER LOCKS NOT LOCKED
13 LED: UNDER-RUN BAR RETRACTED

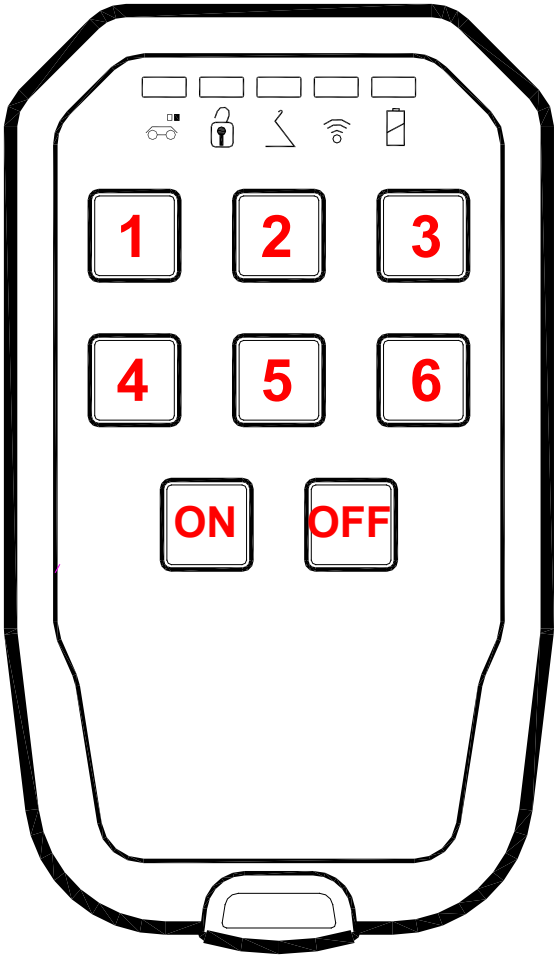
The Mini-Radio uses 3 AAA batteries as a power source.

Mini-Radio may have same functions as the regular control unit of Ultima-device, but other functions are also possible.

After programming, the symbols of corresponding functions from the sticker sheet are attached below the Mini-Radio buttons.

Functions of My Mini-Radio

Mini-Radio functions after programming are the following:



Button	Function	See page
1		
2		
3		
4		
5		
6		

When the Mini-Radio mode is active, the display of the Ultima device's actual control unit will show the text "-C2-".

LED: battery charge status

Not on = OK

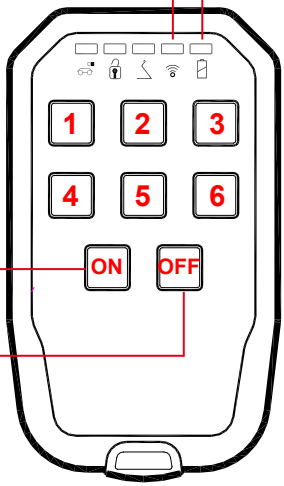
On = battery charge low

LED: connection

Not on = power off

Blinking = no connection

On = connection OK



Activate the Mini-Radio by pressing the Mini-Radio **ON** switch for 2 seconds.

Turn the Mini-Radio off by pressing the Mini-Radio **OFF** switch for 2 seconds or switch it off using the Ultima device's actual controller.

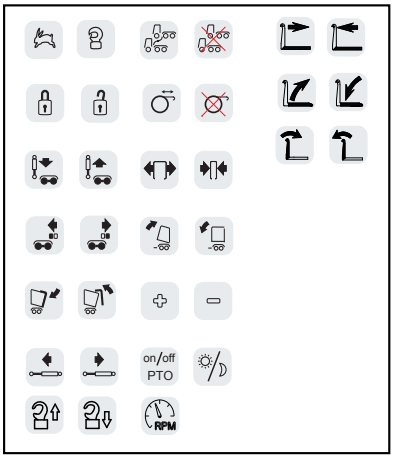
The Ultima equipment function*) is activated by simultaneously pressing the **ON** switch and the button for the **function to be activated** (ON+1, ON+2, ON+3, ON+4, ON+5 ja ON+6).

You do not need to press the **ON** switch if the funtion to be activated on the Mini Radio requires pressing two switches simultaneously.

The Mini-Radio uses 3 AAA (LR3) alkaline batteries as a powers source.

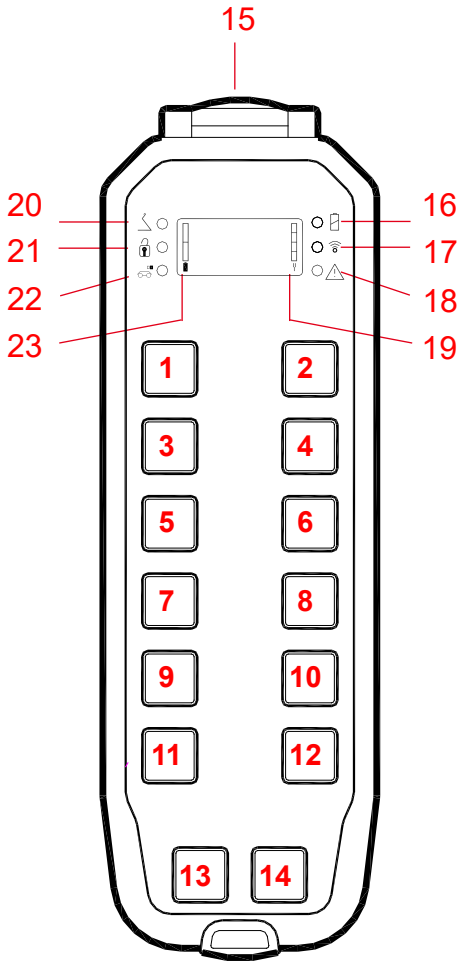
***) Ultima equipment functions: see the USE section of this manual.**

Radio controller (2GRC)



Symbol sticker sheet

Note!
One sticker sheet is meant to be used in case of changes implemented later.



1 - 14 Function buttons
15 ON / OFF and EMERGENCY STOP SWITCH
16 LED: BATTERY CHARGE STATUS (On = battery charge low)
17 LED: CONNECTION (Blinking = no connection)
18 LED: EXTRA EQUIPMENT
19 DISPLAY: CONNECTION
20 LED: FRAME NOT LOWERED
21 LED: HYDRAULIC CONTAINER LOCKS NOT LOCKED
22 LED: UNDER-RUN BAR RETRACTED
23 DISPLAY: BATTERY CHARGE STATUS

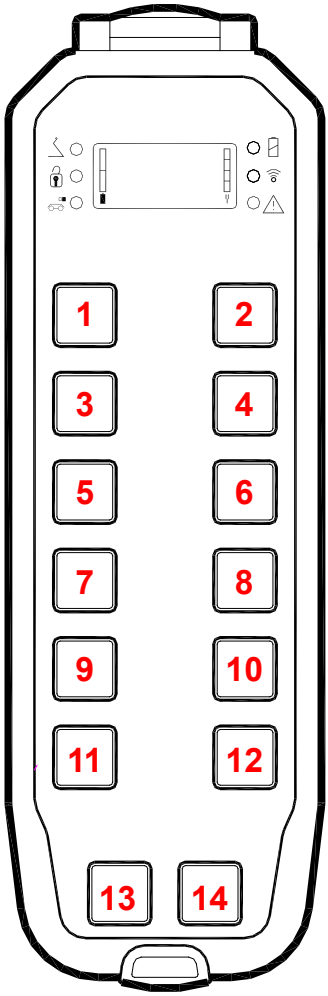
The radio controller uses 3 rechargeable AA batteries (2000 mAh) as its power source.

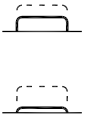
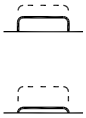
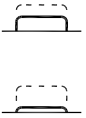
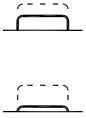
The batteries can be charged at a charging station, which can be attached to a suitable spot in the cabin. The station also acts as a holder for the controller when it's not being used. The radio controller can have the same functions as the Ultima device's actual controller, but it's also possible to have different functions. The controller has 14 different three-position function buttons. Each button can be programmed with two different functions.

After programming the functions, attach the corresponding function symbols (from the sticker sheet) next to the buttons.

The functions in my radio controller

Radio controller functions after programming are as follows:



Button	Function	See page
1 		
2 		
3 		
4 		
5 		
6 		
7 		

>>>

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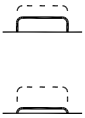
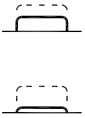
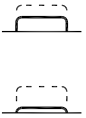
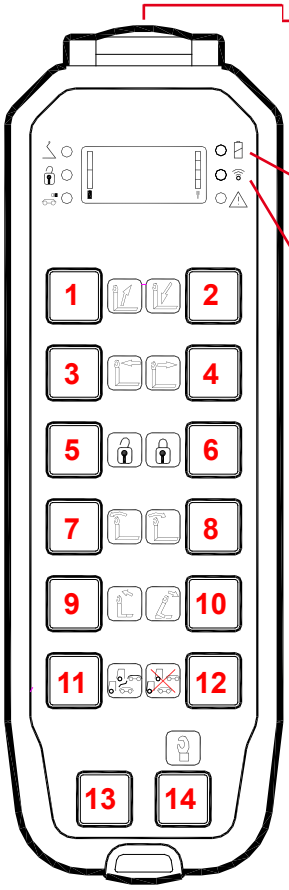
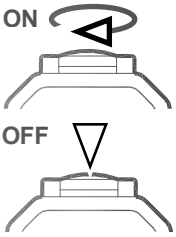
Button	Function	See page
8 		
9 		
10 		
11 		
12 		
13 		
14 		





Activate the radio controller
by turning the **ON / OFF** switch.

Turn the radio controller off
by pressing **ON / OFF** switch.

LED: battery charge status
Not on = OK
On = battery charge low

LED: connection
Not on = power off
Blinking = no connection
On = connection OK

Ultima equipment functions*) are activated by pressing the button for the **function to be activated** (1 - 14).

The radio controller uses 3 rechargeable AA batteries as its powers source.

***) Ultima equipment functions: see the USE section of this manual.**

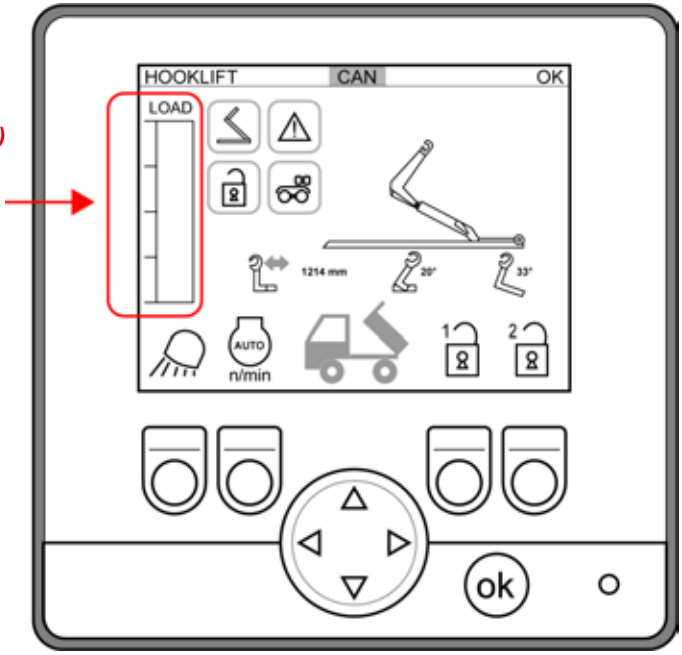
Load indicator

Standard in Pro, optional for Flex

Load indicator tells operator weight of load approximation:

Empty - Light load - Heavy load - Full load/risk of overload

The weight of load and container are calculated in the control system.



Indicative weighing system

Optional for Pro and Flex
Requires FutureTouch™ display

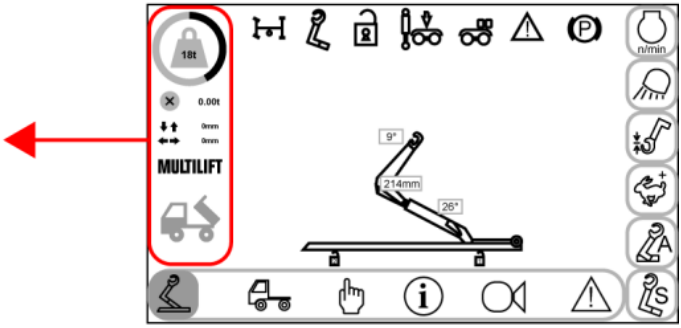
Indicative weighing system gives weight of the load in metric tons with ±2% accuracy *). Option is integrated into hooklift own systems and does not require any 3rd party weighing parts.

Weighing is done automatically during loading cycle. Indicative load is shown visually with a circle. Overload turns circle red. Hooklift nominal capacity is shown in the centre of circle.

The final and accepted result is shown in the green circle next to the calculated weight.

Centre of gravity (COG) horizontally is shown from back of container and vertically from the bottom of container.

*) Weighing result accuracy may be affected by uneven loading conditions, aligned container position, slippery ground. In addition, when using z-model make sure tilting arm is not tilted. Important to make sure that conditions when loading are according to instructions!



FutureTouch™ Basic Display

The system is optional in Flex and standard in Pro.

Multilift FutureTouch™ Basic Display System is an independent add-on feature to Flex & Pro hooklifts control system. Status and control information between the display and the control system is exchanged in hooklift CAN bus (CAN1). The Main Control Module takes care of controlling the hooklift and serves as a gateway to the truck's body builder CAN interface (CAN2).

Indicators

Name	ON	OFF	Description
Locks open / closed	 Green	 Red	General indication for lock status. Indicates status of all available safety related locks combined. If locks are indicated open, the truck shall not be driven.
Hook up / down	 Green	 Red	Indicates the hook down/not down position. When the hook is not down, the truck shall not be driven.

>>>

General warning	 Red	 Grey	Indication (red) that a warning is active or an error has been detected. If grey, no errors in system.
Driving OK	 Green	 Red	Indicates whether driving the truck is OK or not. Green = middle frame down, hook arm front and locks closed.

View modes

Hooklift view mode

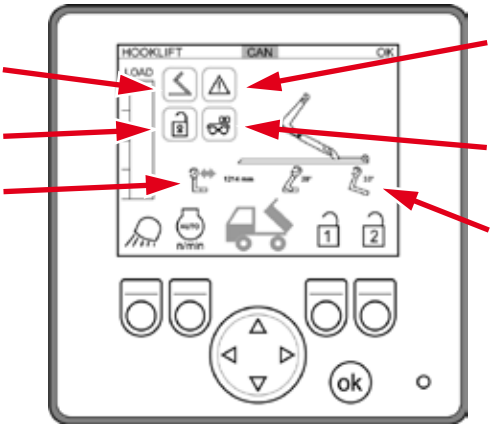
In this mode, the most important hooklift status is clearly visible. The hooklift position is illustrated by a graphical representation of a hooklift, which moves to reflect the actual hooklift position.

Hooklift up / down

Locks open / closed

Slide position (mm)

Tilting angle in degrees (Ultima Z / ZL)



Hooklift error

Bogie blocking ON/OFF

Tipping angle in degrees

Load level indication bar graph is visible on the left hand side of the screen (LOAD). It shows a raw estimate of the available load capacity with current load.

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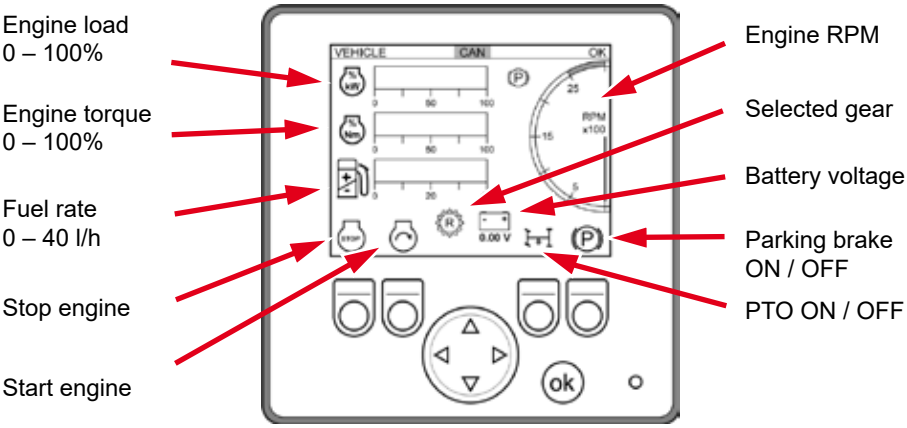
Vehicle view mode

In this mode, the some important information about the vehicle can be monitored. The function buttons can be configured in Function button configuration mode.



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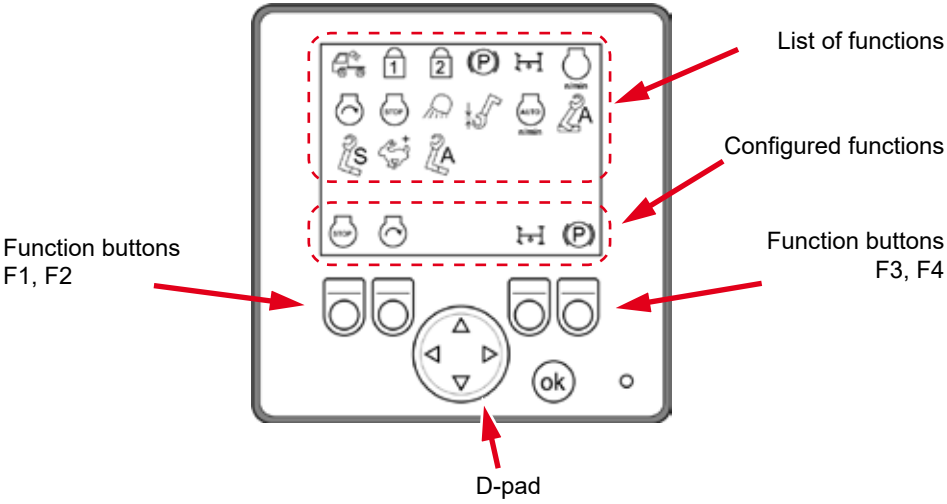
Function button configuration mode

In this mode, the function buttons F1 – F4 can be configured for a control function. The menu is accessed by pressing “ok” and one of the function button simultaneously.

To decide which function button is selected for configuration, the corresponding function button shall be pressed once, after which the selected symbol location is highlighted.

Use the D-pad to select a function from the list and assign the selected function to the selected button by pressing the “ok” button.

After configuring the functions, the mode is exited by pressing the “ok” button for 2 seconds.



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List of functions

	**Loading lights** Switch ON/OFF truck's working lights for the container in the rear of the cabin.
	**Indication for lock 1 status (body locks)** Closed lock is indicated by green colour, open lock is indicated in red.
	**Indication for lock 2 status (front locks)** Closed lock is indicated by green colour, open lock is indicated in red.
	**Parking brake** engaged / disengaged.
	**PTO** engaged / disengaged.
	**RPM pre-set activation** Truck engine RPM can be set to a pre-set level by this control. The control sets an engine RPM level, which can be adjusted in the display settings.
	**Automatic RPM control activation** Sets/resets automatic engine RPM control feature. Engine RPM is automatically controlled by the hooklift control unit by application specific settings.
	**Start engine** Activates engine starting.
	**Stop engine** Activates engine stop.
	**Working lights** Generic control for working lights. Location and purpose of the lights may vary.

>>>

>>>

	**Automatic hook level** Activates automatic hook height setting in loading mode.
	**Automatic tipping special** The slide position is automatically set according to specification.
	**Safe speed+ / LoadBoost** The hooklift movement speed is adjusted automatically according to load.
	**Automatic sequence** Toggles ON / OFF automatic loading/unloading sequence mode.

Status LED

Colour	Status	Description
--	permanently off	no operating voltage
orange	1 x on	initialisation or reset checks
green	5 Hz 2 Hz permanently on	no operating system loaded application is running (RUN) application stopped (STOP)
red	5 Hz permanently on	application stopped due to under voltage system fault (fatal error)

FutureTouch™ Advanced Display

The system is optional both in Flex and in Pro.

Multilift FutureTouch™ Advanced Display is an independent add-on feature to Flex & Pro hooklifts control system. This system utilizes mobile display and camera technology to provide the vehicle operator usable real-time information about the used equipment. In addition to status information and rear-view camera display, it can be used to control and adjust some aspects of the hooklift system.

7” Colour touch display

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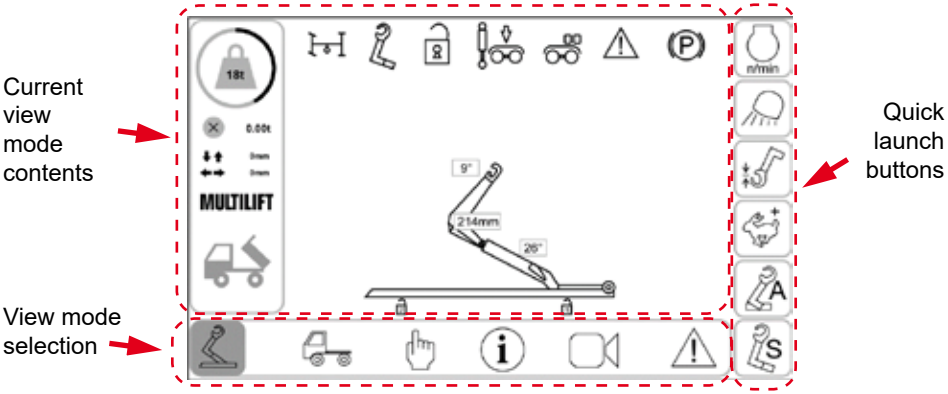
User interface features

The general screen layout is the following:



Current view mode contents
In this area the selected view mode is shown.

View mode selection
The view mode is selected with these controls.

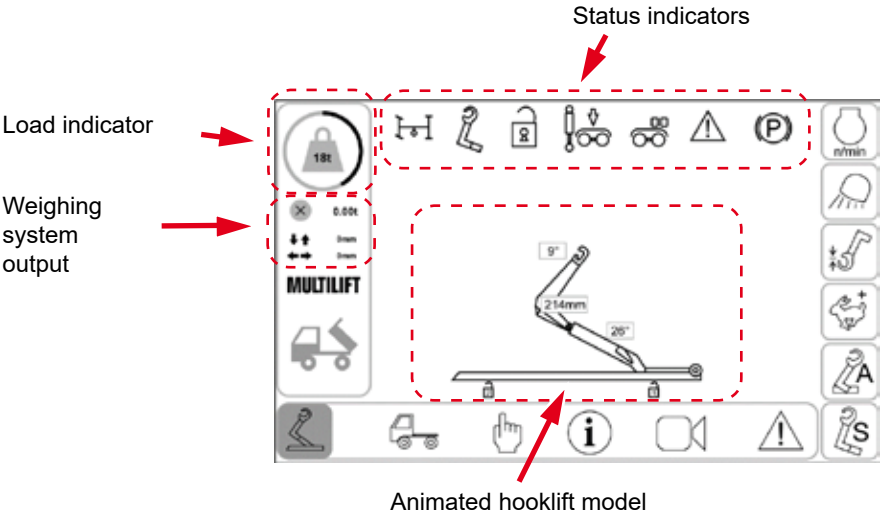
Quick functions
Quick functions are configurable shortcuts for control functions. The button configuration is the same in each view mode.

>>>

>>>

Hooklift status and position

Hooklift position is displayed as an animated hooklift, which moves according to position sensor information sent by hooklift main I/O module.



Weight & Load information

An indicated momentary load is shown as a percentage on the round indicator. If there is overload, the indicator will turn red.

Load OK

Overload

Load symbol

The load symbol shows the maximum capacity of the hooklift, 18 tons in this case. If weighing system is not enabled, the maximum weight is not shown.

If weighing system is enabled in the hooklift, the weighing calculation results will be shown on the left hand side of the screen below the load indication symbol. There are two states for the weighing system: load estimation and weighing calculation done.

>>>

>>>

Load Estimation

When the final load calculation result is not yet ready, a small red 'X' symbol is shown left to the weight reading.

Center of gravity (CoG) of the load is not calculated.

Weighing calculation done

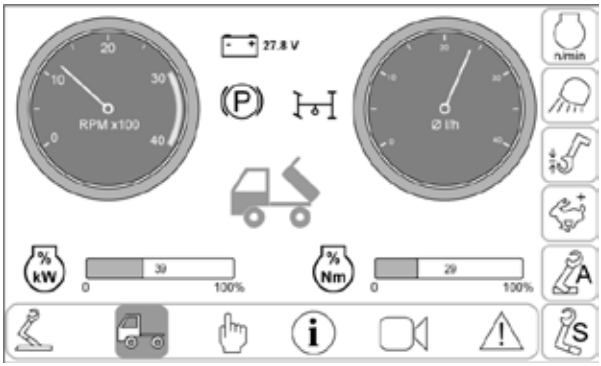
When the final calculation result is ready, there will be a green 'OK' symbol is shown left to the weight reading.

Center of gravity (CoG) of the load is now also shown. Horizontal CoG is measured from the back of the container, vertical CoG from the bottom on the container.

NOTE!
The final calculation result is valid for the container measurements given in the system calibration!

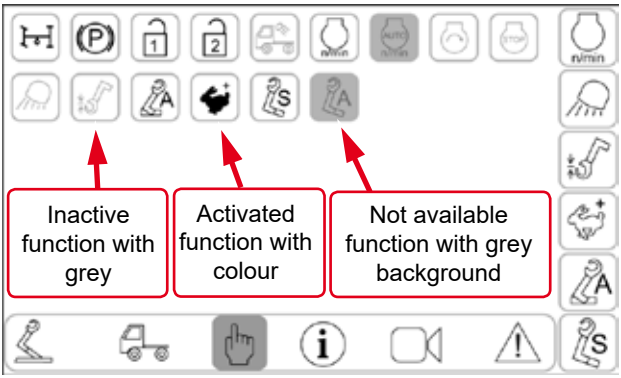
Truck information

If the truck is fitted with a body builder interface to which the hooklift is connected, information about the truck is shown on the display. Some truck related controls are also available, such as PTO on/off switch and RPM control, depending on the truck configuration.



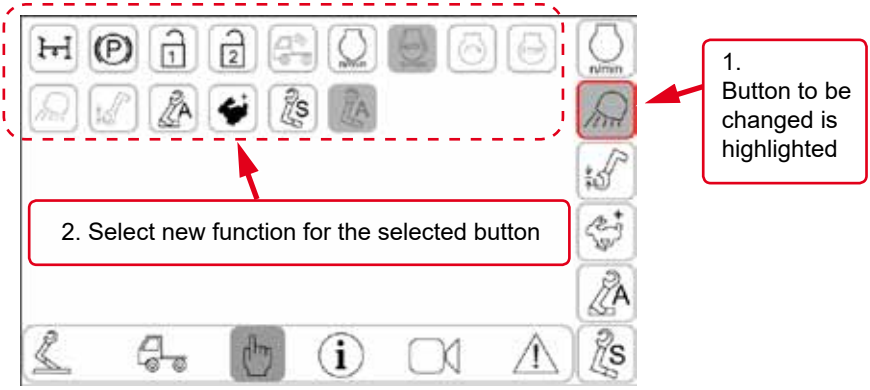
Control functions

A selection of hooklift control functions are available depending the configuration of the hooklift. The functions are activated by pressing the respective icon.



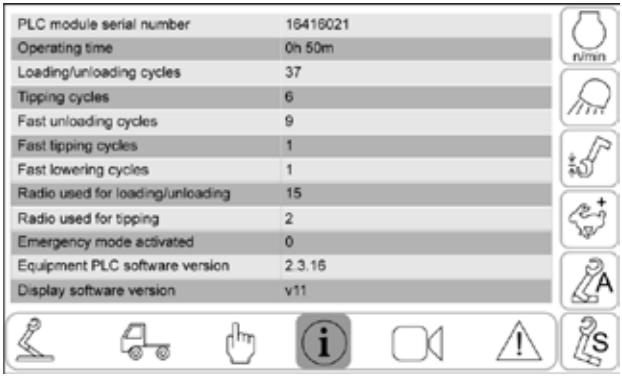
Configuring the Quick Launch Buttons

The functions assigned to the Quick Launch Buttons can be changed by the user. The button, which will be changed, shall be pressed for 3 seconds, after which the button is highlighted. The button is then assigned with a new function by selecting the desired function from the list.



System information

A list of system information, such as cycle counters, operation hours and serial and software version numbers.

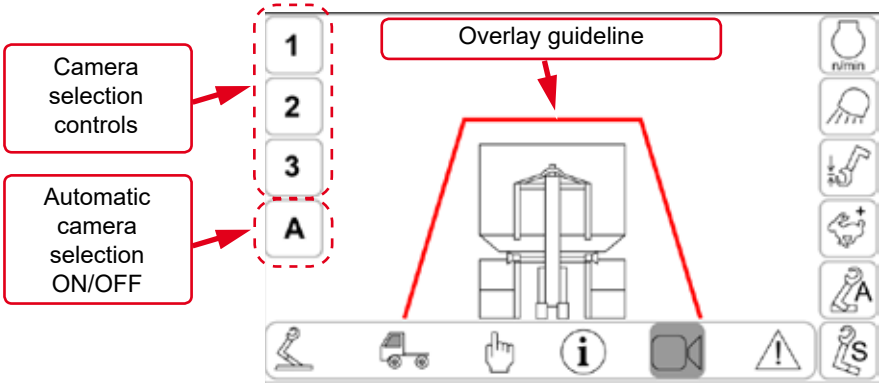


Camera images

The user can select between 3 different camera angles. The camera image can be selected automatically by the 'A' button.

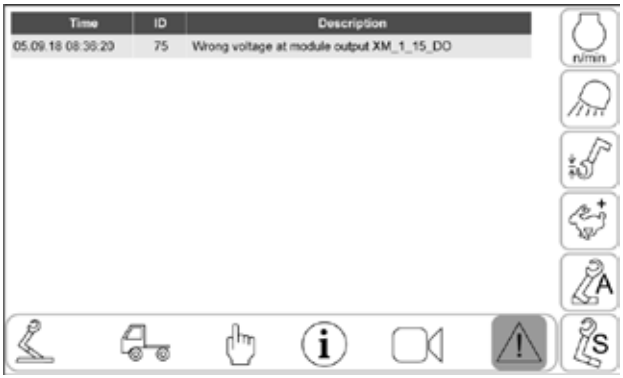
Each camera angle has an individual overlay guideline, which can be toggled ON/OFF by pressing the camera select button while the respective camera is selected.

The guidelines can also be adjusted manually by the user. Guideline edit mode is entered by pressing the camera select button for 2 seconds. In edit mode, the user can adjust the shape and/or position of the guideline by dragging on the touchscreen.



Error / Information messages

Shows a list of errors that have occurred since last boot-up of the system. Currently active errors are shown in a line with red background. Errors, which have occurred since start-up but are no longer active, are shown on the list with a white background.



NOTE!

The camera displays assist the operator and improve the visibility behind the vehicle. However, the operator is always responsible for the safety when reversing the vehicle and operating the hook equipment.

Refer also carefully to the instruction booklet accompanying the cameras.

This manual is a translation from the original maintenance instructions compiled in Finnish.

MAINTENANCE

Service Indicator

The service interval of the MULTILIFT hooklift is approximately 100 operating hours or 2,000 service cycles, depending on which limit is reached first.

The "***SERV***" notification displayed in connection with the start-up indicates imminent service. This notification is shown for approximately 13 operating hours before the service time. Contact your own HIAB service to book the service.

A permanent "***SDUE***" text on the display indicates immediate service. This notification is reset by an authorized HIAB service point in connection with the service.

Regular and correctly timed maintenance will increase the safety, reliability and economy of the hooklift equipment. All accomplished services and replacements of wearing parts are worth while to record.

In connection with the maintenance work, the work safety must be noted and all possible danger elements must be kept in mind by everybody participating. This instruction must be read carefully before commencing any service work.

The equipment operator can carry out the daily, weekly and monthly services described in these instructions. If there appears damages, hydraulic leaks, malfunctions or other problems with the equipment, contact the nearest Multilift service point. Repairs related to these may be carried out only by the professional and trained personnel. Especially the electrical system and the hydraulics are such which require specialised competence.

Wash the equipment carefully with low pressure washer before inspection and service. Dry and check all electrical components after washing.

Safety instructions

Loose, long hair, loose clothing, jewellery etc. are an accident risk.

Use always personal protections and other protective means in service work.

All modifications and additions made to the equipment construction, which might have an effect to the operational safety of the hooklift, are prohibited. In general, all modification and additional work on the equipment must be consulted with the dealer or manufacturer of the equipment. Also a more extensive repair work or welding work to be done on frames must be approved by an authorised service shop or the manufacturer of the equipment.

All the spare parts must conform with the technical requirements of Multilift. The best way to ensure this is to use the original Multilift spare parts.

The safe and easy accomplishment is best achieved by using the correct and sound tools.

Note the service and inspection periods mentioned in this instruction and the replacement needs of parts which have been noted in connection with the equipment inspection.

Wash and clean the equipment regularly before any service work.

Never service an equipment when the truck engine is running or the PTO is engaged.

Each service work must have a named responsible person who is responsible for the vocational skills of the person carrying out the work.

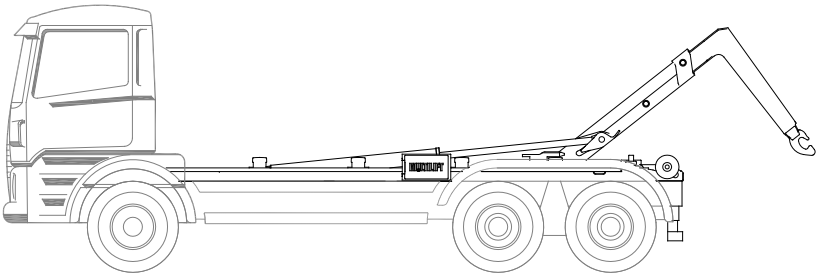
Try always to separate the service area from persons not involved.

Before water wash, cover and protect all the electric components and connections. Do not direct the washing agents to hot points.

High-pressure water jets must not be used when cleaning the device, since they may easily harm sensitive components.

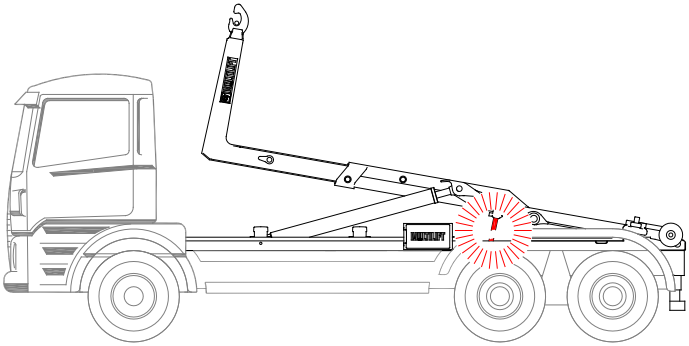
- Inform the equipment operator of the start of the maintenance work.
- If the equipment is damaged or otherwise non-functional, ensure that it cannot be started accidentally before and especially during the service work.
- Remove the truck ignition key and keep it in a safe place. Inform also others, for example, with a warning sign.
- If there are several persons involved in the service work at the same time, the one having the ignition key must inform everybody if, for example, the truck engine is started or the hooklift functions are used.

If the work area is under the tipping frame, the equipment must be moved to loading position.



Hooklift in rear position

If the work is done under the middle frame, the equipment must be moved to loading position and the frames supported with separate tipping support in the correct places. Remember to remove the support after the work has been completed.



Hooklift supported to tipping position

If the work is done under the rear frame, the equipment must be lifted to tipping position and the frames supported with separate tipping support in the correct places. Remember to remove the support after the work has been completed.

NOTE!

Never move the middle frame or the rear frame by means of hydraulics against the tipping support. The equipment cylinders are powerful enough to break the support or the frames and there is a great risk of personal injury. Stop the movement of the main cylinders immediately when the frame reaches the support.

Stop the truck engine always when doing service work under the raised frame and under the container.

Use ladders and working platforms when required.

Do not utilise the hooklift components for climbing up the equipment.

If the work has to be done on top of the equipment, note and prevent the risk of falling.

All ladders, working platforms etc. must be kept clean from oil and grease.

Fasten and tighten all removed components and screw joints after the service.

Dispose of all extra material and oil in an appropriate manner, noting all environmental rules and regulations.

Before commencing any service or repair work, ensure that the vehicle is standing on an even surface with the hand brake engaged.

Remember to follow appropriate work safety and environmental instructions.

Record all service and repair work and any special matters which have appeared during the job.

Service table

Daily

1.1	Check the safety functions
1.2	Check for possible damages and oil leaks
1.3	Check the control and warning lights
1.4	Check the function of the control unit
1.5	Check the load lockings

Weekly

2.1	Check the daily objects
2.2	Check the oil level
2.3	Check all valves, hoses and pipes
2.4	Check the clearance of the rear rollers and shafts
2.5	Check the clearances of other shafts
2.6	Check the central pressure lubrication system Check the amount of lubricant Check the function and connections of the central pressure lubrication system

Monthly

3.1	Check the daily and weekly objects
3.2	Wash the hooklift equipment carefully
3.3	Lubricate all the lubrication points
3.4	Check all the safety functions without a container
3.5	Check all frame constructions for possible damages and ensure their correct functioning
3.6	Check the tightness and condition of all fastening bolts
3.7	Check the gripping hook condition and wear
3.8	Check the condition and deterioration of the container brackets
3.9	Check the whole hydraulic system for leaks and damages
3.10	Check the condition of all warning stickers

Once or twice a year

4.1	Change the hydraulic oil (annually or more often if it is dirty)
4.2	Change the pressure and return filters (twice a year or more often if it is blocked)
4.3	Check and clean/change ventilation plug (annually)
4.4	Calibrate the weighing system at a Hiab service

Hydraulics service

NOTE!

Servicing, repairs and installations of the hydraulic components may be done only by persons trained for the jobs.

Do not carry out any repair if you do not know the item to be repaired.

Never carry out any service or repair on system under pressure.

Stop the truck engine always before tightening or repairing hydraulic connections.

Do not try to locate a hydraulic hose leak with your hands. A leak from a pressurised system can penetrate the skin and cause serious injuries. A leak from a pressurised system can also cause a fire when hitting a hot object.

Avoid skin contact with oil. Protect also your eyes.

Do not carry out work on hydraulic components under a raised frame. Use always a mechanical support.

Do not remove any hydraulic components before supporting the frames and releasing hydraulic system pressure.

Pipe connections, hose lengths and materials must conform with the Multilift requirements. Use original Multilift spare parts or ensure otherwise that the components correspond with the highest working pressure used.

Ensure that the oil corresponds with the requirements and ensure its viscosity and cleanliness when adding oil into the system.

All changes to the recommendations concerning the oil and hydraulics must be verified in writing with Multilift.

NOTE!

Do not touch pressurised hydraulics. Do not remove any hydraulic components before the hooklift equipment has been supported mechanically.

General

- Keep the hydraulic system clean.
- Keep the oil in a clean, locked space. When adding oil, use a funnel which has a fine filter net.
- Keep funnels and containers free of dust.
- Always use clean towels or preferably high quality tissue.
- Before removing the hydraulic system components, clean the surrounding areas carefully with steam or fat removal agent.

Checking the oil level

When the middle frame and the hook arm are in operating position, the oil level should be in the middle of the sight glass.

Checking the return filter

Use a dirt indicator to check how dirty the return filter is. Replace the filter cartridge if the indicator is in the red zone when the pump works and the oil is at operational temperature.

Checking the pressure filter

Check the condition of the pressure filter and clean it or renew the filter cartridge.

Checking the air filter

Check the condition of the air filter. Clean and replace it as necessary.

Checking the condition of the oil

It is possible to examine ageing and deterioration of the quality of oil in the following way:

- dark colour is caused by overheating of oil
- milky and/or frothy oil contains water
- water can also be seen in separated oil
- air bubbles in oil are a sign of too little oil or of a leak in suction line
- solid particles indicate a component damage or old oil
- air is a sign of oil ageing as a result of overheating.

If you notice any of the above symptoms in oil, change it according to the following instructions.

Attention!

Hydraulic oils, especially mineral oils, are hazardous to environment. Therefore, follow all regulations pertaining to collecting and storing oil. Earth material polluted with oil must be processed according to relevant instructions.

If several successive containers switches are performed, the hydraulic oil may overheat (>60ºC) making it necessary to install an oil cooler to the system.

Either the ISO VG 22 mineral oil or the HEES ISO VG 32 biodegradable oil is used at the factory. If biodegradable oil is used, a HEES sticker is attached to the control valve and the oil tank.

Changing the hydraulic oil

1. Check that all piston rods of the cylinders are in retracted position.
2. Completely empty the oil tank via the drain plug.
3. Change the pressure- and return filter.
4. Fill the tank with new oil via the return filter.
5. Check the air filter.

NOTE!

Hydraulic oils and mineral and more environment friendly oils can cause skin irritation and allergic symptoms. Hands and other exposed skin must be protected well. Wash your hands carefully after the oil change.

Hydraulic oil specifications

Quality classes: ISO 6743-4 type HV or
DIN 51524 part 3 type HVLP or
swedish SMR standard for hydraulic oil (SHS) or
biodegradable oil type ISO-L-HEES.

Degree of cleanliness: 16/13 (ISO 4406).

Viscosity:

Ambient temperature °F (°C)					ISO-VG
-13	(-25)	...	50	(+10)	22
5	(-15)	...	68	(+20)	32
23	(-5)	...	86	(+30)	46
59	(+15)	...	122	(+50)	68

Oil qualities

Hydraulic system sets many requirements to the hydraulic oil characteristics. They contain amongst others:

- Lubrication requirements
- Oxidation prevention capability
- Corrosion protection
- Defoaming quality
- High viscosity index, in other words, low change of viscosity when the oil is heated.

In order to meet these requirements and qualities, additives are used in oils. Therefore it is important that the selected oil meets the characteristics for the operating environment in question. A lower ambient temperature is the same as the lowest starting temperature.

NOTE! Vegetable based bio oils are not allowed to be used. Only synthetic environment friendly oils that meet the above mentioned requirements are allowed.

NOTE! Do not mix different oil qualities. Mixing of different oils weakens generally their characteristics. If it is necessary to use an alternative oil, check with the supplier the characteristics and correspondence with the recommended oil.

Changing to biodegradable oil

To obtain the best results, the percentage of the mineral oil left in the system should not exceed 2%. The “Changing to biodegradable oil” –procedure might also apply to new systems because the hooklift is tested with mineral oil at the factory if otherwise noticed.

Safety

- Suitable eye and hand protection must be worn whilst carrying out this operation.
- Ensure suitable containers to hold the amount oil you will be draining are available before starting this operation.

Environment

- Ensure oil waste oil is disposed of safely and in accordance with any local environmental regulations.

NOTE! Ask the oil supplier for instructions. If you do not receive any instructions, follow these recommendations:

Procedure

1. Completely empty the oil tank via the drain plug. Clean the oil tank carefully from oil and contamination. On older systems with heavy contamination, it may be necessary to remove the oil tank and flush out with a suitable flushing agent.
2. Completely empty the hydraulic cylinders, tubes, hoses and the suction hose to the pump.
3. Change the return filter.
4. Fill the tank with new oil via the return filter. Operate all cylinders carefully to ensure that they will be filled with oil. Ensure that the pump is filled all the time. Fill up the tank before it gets empty.
5. Drive for 2 or 3 days.
6. Check that all piston rods of the cylinders are in retracted position. Completely empty the oil tank via the drain plug and change the return filter. Fill up the oil tank with new oil and operate all cylinders carefully to ensure that they will be filled with oil. Ensure that the pump is filled all the time. Check that the oil level in tank remains in correct level.

NOTE! Synthetic esters can dissolve old contamination. If the performance of the hooklift appears to deteriorate before the oil filter change, inspect the filters and change if necessary.

Safety functions

Check the safety functions of all different movements; tipping, loading and unloading. Do the checks first without a container and thereafter with the container.

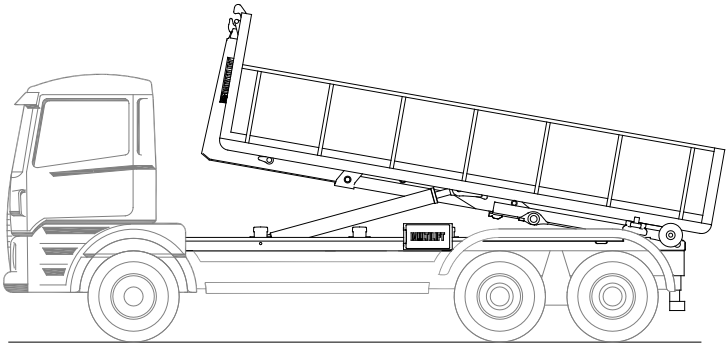
Safety functions

Check that:

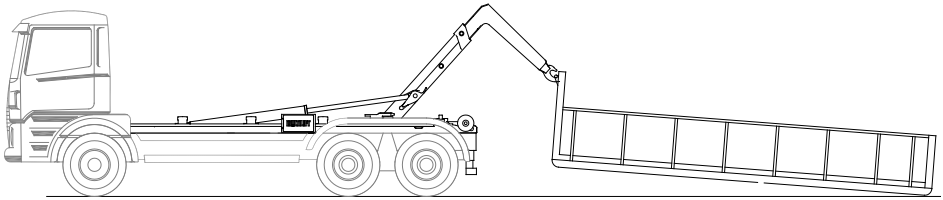
- hydraulic body locks cannot be opened during tipping (tipping device approx. 20 in [0,5 m] raised)
- moving of hook arm is not possible during tipping
- hook arm cannot be moved when the hydraulic body locks are closed
- body locks signal light is lit when the locks are not closed.

Check the functioning of the load holding valves with a loaded container:

- let the hooklift stay with the container raised for 5 minutes and check that the tipping device has not descended by itself (fig. **Tipping device** raised)
- let the hooklift stay in loading position for 5 minutes and check that the container has not descended down (fig. **Loading position**).



Tipping device raised



- Check the functioning of the fast speed valve (accessory) without the container. If the valve makes an unusual noise or the movement does not seem normal, the equipment has to be taken to maintenance and the fast speed option should not be used before it has been checked.

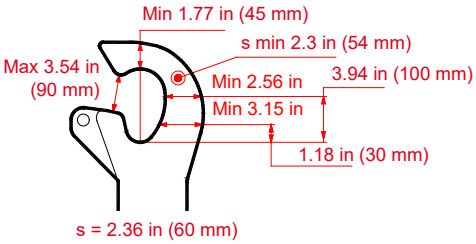
- Check the functioning of the fast lowering option of the tipping device (accessory) with an empty container and on level ground. NOTE! Fast speed might not be activated if you are using cold oil or working on slanted ground. Never change the settings of the sensors, as they have been calibrated separately for each equipment.

General inspection

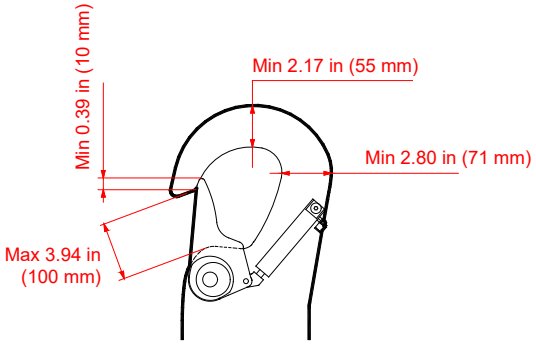
Check:

- steel construction for deformations and breakages
- hooklift fastening to the truck chassis, for breakages and loose bolts
- fastening of the rear rollers. Check the securings of all shafts.
- surfaces of piston rods. If the chromium surface of the rod is damaged, especially if the scratches are longitudinal, the rod or the whole cylinder must be changed.
- wear rate of the gripping hook. The original thickness of the hook must not be worn more than 10 %.
- wear rate of the slide pads. The maximum wear of the slide pads is 0.12 in (3 mm), but already a clearance of over 0.04 in (1 mm) between the hook arm and the middle frame requires adding of space plates or replacement of slide pads.

See the picture on the following pages.

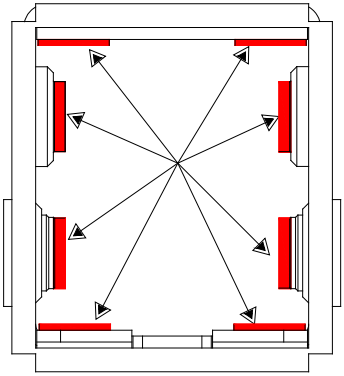


Ultima S std.

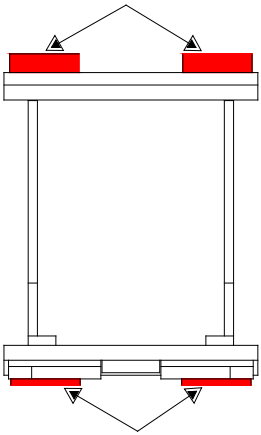


Ultima S pneum.

Hook wear limits



Slide pads in middle frame



Slide pads in hook arm

Welding

Before welding, ensure the material to be welded, method and additives.

Contact Multilift service, if needed.

Welding may only be carried out by a trained welder.

Check from the truck user manual all the electrical connections which need to be disconnected before welding. Remove the hooklift equipment electrical system connection to the truck always before welding.

Connect the earthing cable as close as possible to the spot to be welded. If the welding current flows through bearings, joints and seals, they might get damaged.

Check that the welding and flame cutting sparks do not fly to oily areas. Remember also the protection of the truck cab.

Use always welding protections. Ensure sufficient ventilation. Prevent the risk of fire.

Electric system

Maintenance and repair works in the electrical system may be carried out only by a trained electrician.

All the safety instructions and regulations related to electric work must be noted.

Use always only original electric components.

It is not allowed to make any additional connections to the electric system, wiring harnesses and valve coils.

Repairing Damaged Paint Surface

Ultima hooklift is painted with polyurethane paint in accordance with standard PUR 100/1 FeSa 2 ½. The frame of the device can optionally be coated with a zinc-primer before surface coating, in accordance with standard EPZn®PUR 140/2 FeSa 2 ½.

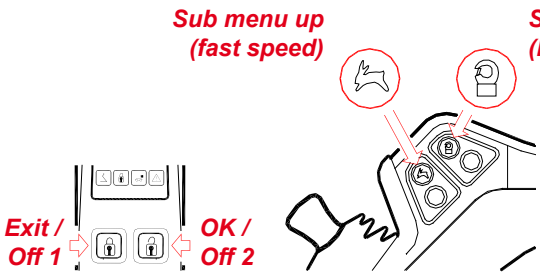
Surface damage occurring during the transport, installation or usage of the device must immediately be repaired to prevent the damage from spreading:

Cover up surfaces near the device, clean up the damaged area and surfaces surrounding it of any impurities and existing paint down to the steel surface, even out the edges of the paint surface. Make sure that the surface is completely free of dust, oil and grease and that it is completely dry for repair painting. Apply a 100 µm coat of primer. It is not recommended to use a primer for the surface coating. Use a pre-shaded acrylic paint for the repair painting and confirm the colour shade and colour code (RAL) before applying the paint. Let the paint dry for 24h indoors before use.

If auxiliary equipment is installed to the device afterwards, the surfaces in contact with the painted area must be protected with suitable protective wax.

How to change the backlight setting of the buttons, 2GCC

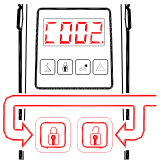
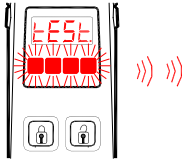
The illumination strength of the backlight is set in the cab controller software. The buttons to access the software and operations in the menu are as follows:



Note: The first two buttons on top of the cab controller are the access buttons to the software.

Normally these buttons are identified as body locks closed and body locks open.

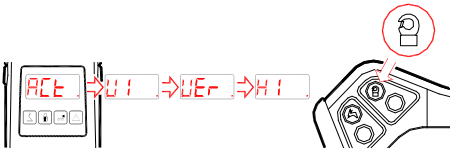
The procedure of setting the illumination strength of the backlight is the following:

1.		Press the first row buttons simultaneously for 10 seconds. "***C002***" can be seen in the display while pressing the buttons.
2,		System will make 2 short beeps and all red LEDs will be shortly lit. A text "***tESt***" is shown in the display.
3.		Press the top button on right (***locks open*** button).

>>>

>>>

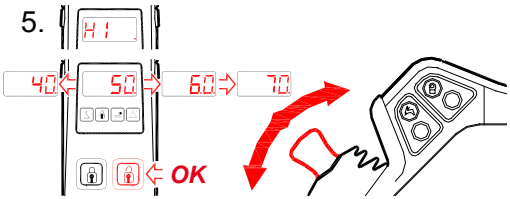
4.



Text "***ACt***" will be shown in the display.

Press the ***hook safety lock*** button to scroll down the menu: ***ACt*** -> ***Ul*** -> ***UEr*** -> ***Hl.***

5.

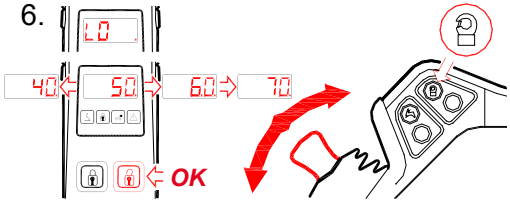


When text "***Hl***" is shown wait until a value is shown.

Move the joystick forwards or backwards to adjust the active illumination strength between 0 - 100 %.

When you have the desired illumination level press the top right button (***locks open***) to save the value.

6.

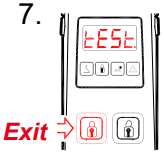


Press the ***hook safety lock*** button to show the "***LO***" in the display and wait until a value is shown.

Move the joystick forwards or backwards to adjust the inactive illumination strength between 0 - 100%.

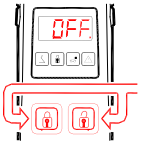
>>>

>>>

7. 

Press the top left button (***locks closed***) to exit from the sub level menu.

Text "***tESt***" will be shown.

8. 

Press both top buttons for 5 seconds to exit the software and return back to normal operation.

The text "***OFF***" will be shown for a couple of seconds in the display.

The backlight illumination will dim after 30 seconds of inactive period and light up when joystick is moved or any button pressed.

If both "***HI***" and "***LO***" are set to same value, there is no difference in the brightness.

FAULT FINDING

MULTILIFT PLC - Diagnostic Codes

The diacnostic codes of Multilift PLC can be seen on the display of control unit and on the service display.

Faults
F000 - F081

Conflicts
C000 - C020

Diagnoses
d000 - d025

Error codes
in the control unit
01.01 -99.00

There are 4 types of codes:

- Faults	F000 - F081	explaining any faults in electronic and electric system
- Conflicts	C000 - C020	explaining any conflicts during use
- Diagnoses	d000 - d025	explaining any illogical operation
- error codes	01.01 -99.00	in the control unit.

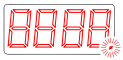
Faults are most critical errors and these usually need more thorough examination on the components or power feed. Usually there is a short circuit causing the error.

Conflicts can be less critical and usually there is a missing signal from a switch causing the error.

Diagnoses are usually caused by fault operation or missing signal from proximity switch.

If there are more than one error code in the system, the display in control unit is showing them in sequence and should be read all before any corrective action is started. The service display will show all errors in same screen.

The error codes will get off after fault is corrected / repaired. All error codes are recorded in a log file of the system memory and can be read afterwards with the service display.

DISPLAY MESSAGE	CAUSE
	DOT IS ON - CONTROL SYSTEM IS OK. THE DOT IS BLINKING DURING HOOKLIFT MOVEMENTS.
	HOUR COUNTER, 0001 OR HIGHER NUMBER APPEARING ABOUT 5 SEC DURING START UP.
	EXTERNAL CONTROLLER, 2GRC, 2GMR, TOP SEAT OR CRANE CONTROLLER IS ACTIVE.
	A STAY-ON HYDRAULICS IS ON. EMERGENCY OPERATION HYDRAULICS ON.
	A STAY-ON HYDRAULICS IS OFF. THE FUNCTION OF TRAILER TIPPING HYDRAULICS IS OFF. EMERGENCY OPERATION HYDRAULICS OFF.
	TRAILER TIPPING IS ON.
	EMERGENCY STOP IS ON.
	SERVICE TOOL ACTIONS ONGOING (SOFTWARE LOADING / DOWNLOADING, ETC.)
	CONFLICT CODE C001 - C020. SEE CODES ON FOLLOWING PAGES, IN THE CHAPTER ”ERROR CODES, CONFLICTS”.
	DIAGNOSTIC CODE D001 - D028. SEE CODES ON FOLLOWING PAGES, IN THE CHAPTER ”ERROR CODES, DIAGNOSES”.
	FAILURE CODE F001 - F081. SEE CODES ON FOLLOWING PAGES, IN THE CHAPTER ”ERROR CODES, FAULTS”.
	CONTROL UNIT ERROR CODE 01.01 - 99.00. SEE CODES ON FOLLOWING PAGES, IN THE CHAPTER ”ERROR CODES, CONTROL UNIT”.
	S = SHORT CIRCUIT, FOLLOWING WITH I/O MODULE PIN NUMBER, E.G. 123 = CONNECTOR XM1 PIN 23.
	N = NO VOLTAGE, FOLLOWING WITH I/O MODULE PIN NUMBER, E.G. 123 = CONNECTOR XM1 PIN 23.
	V = WRONG VOLTAGE, FOLLOWING WITH I/O MODULE PIN NUMBER, E.G. 123 = CONNECTOR XM1 PIN 23.

Diagnostic codes

ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
FAULTS		
-7F-	CAN BUS NOT ABLE TO COMMUNICATE WITH CONTROL BOX	CAN LINKING HARNESS
CAN BUS SIGNAL IS MISSING	CHECK YELLOW AND GREEN WIRE BETWEEN CONTROL UNIT AND 2024 MODULE	TOTAL STOP OF SYSTEM
F000	SUPPLY VOLTAGE IS BELOW 16 VOLTS	TRUCK
LOW POWER	CHARGE TRUCK BATTERY	TOTAL STOP OF SYSTEM
F001	INTERNAL ERROR ON 2024	2024
INTERNAL ERROR 1	REPLACE 2024 IF ERROR REPEATS	
F002	INTERNAL ERROR ON CONTROL BOX	CONTROL BOX
INTERNAL ERROR 2	REPLACE CONTROL BOX IF ERROR REPEATS	
F003	VALUES FROM PRESSURE SENSOR NOT LEGAL	2024
PRESSURE SENSOR	CHECK CONNECTION / REPLACE SENSOR	NO ACTION
F004	INTERNAL PARAMETER ERROR	2024
PARAMETER	CHECK PARAMETERS / REPLACE MAIN BOX	NO ACTION
F005	CAN BUS NOT ABLE TO COMMUNICATE WITH 2024	ANY POSITION
TIME OUT 1	CHECK BOX/CAN BUS WIRE & REPLACE IF NECESSARY	NO ACTION
F006	CAN BUS NOT ABLE TO COMMUNICATE WITH CONTROL BOX	ANY POSITION
TIME OUT 2	CHECK BOX/CAN BUS WIRE & REPLACE IF NECESSARY	NO ACTION
F007	PROGRAM HAS STOPPED RUNNING	2024
NOT RUNNING	POWER OFF/POWER ON TO RESET	NO ACTION
F008	CAN BUS NOT ABLE TO COMMUNICATE WITH ANY BOX	ANY POSITION
CAN BUFFER OVER RUN	CHECK CAN BUS WIRE & REPLACE IF NECESSARY	NO ACTION
F009	not used	

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ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
F010	not used	
F011	(* Main cylinder floating short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F012	(* Main cylinder floating voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F013	(* Main cylinder in 1 short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F014	(* Main cylinder in 1 voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F015	(* Main cylinder in 2 short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F016	(* Main cylinder in 2 voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F017	(* Main cylinder out 1 short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F018	(* Main cylinder out 1 voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F019	(* Main cylinder out 2 short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F020	(* Main cylinder out 2 voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	

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ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
F021	(* Helping ram short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F022	(* Helping ram voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F023	(* Sliding backwards short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F024	(* Sliding backwards voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F025	(* Sliding forwards short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F026	(* Sliding forwards voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F027	(* Fast speed short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F028	(* Fast speed voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F029	(* Free flow short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F030	(* Free flow voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	

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ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
F031	(* Bodylocks In short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F032	(* Bodylocks In voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F033	(* Bodylocks Out short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F034	(* Bodylocks Out voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F035	(* Urb In short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F036	(* Urb In voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F037	(* Urb Out short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F038	(* Urb Out voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F039	(* Trailer tipping down short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F040	(* Trailer tipping down voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	

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ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
F041	(* Trailer tipping up short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F042	(* Trailer tipping up voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F043	(* Tilting Forwards short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F044	(* Tilting Forwards voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F045	(* Tilting Backwards short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F046	(* Tilting Backwards voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F047	(* Bogie Blocking On short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F048	(* Bogie Blocking On voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F049	(* Bogie Blocking Off short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F050	(* Bogie Blocking Off voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	

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ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
F051	(* Additional Hydraulics1 In short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F052	(* Additional Hydraulics1 In voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F053	(* Additional Hydraulics1 Out short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F054	(* Additional Hydraulics1 Out voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F055	(* Hook lock short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F056	(* Hook lock supply voltage	2024
Voltage when not controlled	CHECK THE CABLES	
F057	(* Buzzer short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F058	(* Buzzer supply voltage	2024
Voltage when not controlled	CHECK THE CABLES	
F059	(* PTO short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F060	(* PTO voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	

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ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
F061	(* TGO open short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F062	(* TGO open voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F063	(* Quick Lowering On short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F064	(* Quick Lowering On voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F065	(* Additional Hydraulics2 In short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F066	(* Additional Hydraulics2 In voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F067	(* Additional Hydraulics2 Out short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F068	(* Additional Hydraulics2 Out voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F069	(* Additional Hydraulics3 In short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F070	(* Additional Hydraulics3 In voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F071	(* Add.Hydraulics3 Out short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	

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ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
F072	(* Add.Hydraulics3 Out voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F073	(* Add.Hydraulics4 In short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F074	(* Add.Hydraulics4 In voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F075	(* Add.Hydraulics4 Out short cut	2024
SHORT CIRCUIT	CHECK THE CABLES	
F076	(* Add.Hydraulic4 Out voltage when not controlled	2024
Voltage when not controlled	CHECK THE CABLES	
F077	SUPPLY VOLTAGE FOR CONTROL UNIT SHORT CIRCUIT	2024 - CONTROL UNIT
SHORT CIRCUIT	CHECK POWER WIRES BETWEEN 2024 MODULE AND CONTROL UNIT	
F078	SUPPLY VOLTAGE FOR CONTROL BOX WHEN NOT CONTROLLED	2024
Voltage when not controlled	CHECK THE CABLES	
F079	TILT SENSOR VALUES NOT LEGAL OR NOT CONNECTED	2024
Tilt sensor middle frame out of range	CHECK CONNECTION / REPLACE SENSOR	FAST LOWERING DENIED
F080	TILT SENSOR VALUES NOT LEGAL OR NOT CONNECTED	2024
Tilt sensor subframe out of range	CHECK CONNECTION / REPLACE SENSOR	FAST LOWERING DENIED
F081	PRESSURE SENSOR VALUES NOT LEGAL OR NOT CONNECTED	2024
Pressure sensor main cylinder A out of range	CHECK CONNECTION / REPLACE SENSOR	FAST LOWERING DENIED

ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
CONFLICTS		
C000	NONE OR SEVERAL INPUTS PRESENT AT MODE SWITCH	CONTROL BOX
MODE SWITCH CONFLICT	REPLACE BOX	NO HOOKLIFT FUNCTION
C001	VALUES FROM JOYSTICK NOT LEGAL	CONTROL BOX
JOYSTICK CONFLICT	REPLACE JOYSTICK	NO HOOKLIFT FUNCTION
C002	BOTH INPUTS PRESENT AT CONTROL BOX	CONTROL BOX
ROCKER SWITCH CONFLICT 1	REPLACE ROCKER SWITCH 1	
C003	BOTH INPUTS PRESENT AT CONTROL BOX	CONTROL BOX
ROCKER SWITCH CONFLICT 2	REPLACE ROCKER SWITCH 2	
C004	BOTH INPUTS PRESENT AT CONTROL BOX	CONTROL BOX
ROCKER SWITCH CONFLICT 3	REPLACE ROCKER SWITCH 3	
C005	BOTH INPUTS PRESENT AT CONTROL BOX	CONTROL BOX
ROCKER SWITCH CONFLICT 4	REPLACE ROCKER SWITCH 4	
C006	BOTH INPUTS PRESENT AT CONTROL BOX	CONTROL BOX
ROCKER SWITCH CONFLICT 5	REPLACE ROCKER SWITCH 5	
C007	MIDDLE FRAME DOWN SENSOR IS 1 AND REAR FRAME IS 0	HOOKLIFT
INPUTS CONFLICT 1	CHECK MIDDLE FRAME DOWN & REAR FRAME DOWN SENSORS - REPLACE IF NECESSARY	
C008	MIDDLE FRAME DOWN SENSOR IS 1 AND MIDDLE FRAME NEARLY DOWN IS 0	HOOKLIFT
INPUTS CONFLICT 2	CHECK MIDDLE FRAME DOWN & MIDDLE FRAME NEARLY DOWN SENSORS - REPLACE IF NESSECARY	
C009	BODYLOCKS OPEN IS 1 AND BODYLOCKS CLOSED IS 1	HOOKLIFT
INPUTS CONFLICT 3	CHECK BODYLOCKS OPEN AND BODYLOCKS CLOSED SENSORS - REPLACE IF NECESSARY	

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ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
C010	TIPPING LOCK OPEN IS 1 AND TIPPING LOCK CLOSED IS 1	HOOKLIFT
INPUTS CONFLICT 4	CHECK TIPPING LOCK OPEN AND TIPPING LOCK CLOSED SENSORS - REPLACE IF NECESSARY	
C011	JOYSTICK VALUE TOO SMALL	CONTROL BOX
JOYSTICK CONFLICT	CALIBRATE JOYSTICK - REPLACE IF NECESSARY	
C012	JOYSTICK VALUE TOO BIG	CONTROL BOX
JOYSTICK CONFLICT	CALIBRATE JOYSTICK - REPLACE IF NECESSARY	
C013	JOYSTICK HIGH VALUE WITHOUT DIRECTIONAL SWITCH, CENTER TAPP IN MIDDLE	CONTROL BOX
JOYSTICK CONFLICT	CALIBRATE JOYSTICK, CHECK WIRES - REPLACE IF NECESSARY	
C014	JOYSTICK LOW VALUE WITHOUT DIRECTIONAL SWITCH, CENTER TAPP IN MIDDLE	CONTROL BOX
JOYSTICK CONFLICT	CALIBRATE JOYSTICK, CHECK WIRES - REPLACE IF NECESSARY	
C015	JOYSTICK HIGH VALUE WITHOUT DIRECTIONAL SWITCH, CENTER TAPP NOT IN MIDDLE	CONTROL BOX
JOYSTICK CONFLICT	CALIBRATE JOYSTICK, CHECK WIRES - REPLACE IF NECESSARY	
C016	JOYSTICK LOW VALUE WITHOUT DIRECTIONAL SWITCH, CENTER TAPP NOT IN MIDDLE	CONTROL BOX
JOYSTICK CONFLICT	CALIBRATE JOYSTICK, CHECK WIRES - REPLACE IF NECESSARY	
C017	JOYSTICK VALUE 255	CONTROL BOX
JOYSTICK CONFLICT	CHECK JOYSTICK WIRES (GND) - REPLACE IF NECESSARY	
C018	JOYSTICK VALUE 0	CONTROL BOX
JOYSTICK CONFLICT	CHECK JOYSTICK WIRES (SUPPLY VOLTAGE / SIGNAL) - REPLACE IF NECESSARY	
C019	CENTER TAPP NOT IN MIDDLE	CONTROL BOX
JOYSTICK CONFLICT	CHECK JOYSTICK WIRES (CENTER TAPP) - REPLACE IF NECESSARY	
C020	INPUT PRESENT AT START UP	CONTROL BOX
SWITCH CONFLICT	DO NOT PRESS SWITCHES WHILE CONTROL BOX IS STARTING / CHECK AND REPLACE FAULTY SWITCHES	

ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
DIAGNOSES		
d000	BODYLOCKS ARE OPEN	
BODYLOCKS IN WRONG POSITION	CLOSE THE BODYLOCKS	NO HOOKLIFT FUNCTION
d001	BODYLOCKS ARE CLOSED	
BODYLOCKS IN WRONG POSITION	OPEN THE BODYLOCKS	NO HOOKLIFT FUNCTION
d002	BODYLOCKS ARE IN MIDDLE POSITION	
BODYLOCKS IN WRONG POSITION	OPEN/CLOSE THE BODYLOCKS OR CHECK SENSORS	
d003	TIPPING LOCK IS OPEN	
TIPPING LOCK IN WRONG POSITION	CHECK THE TIPPING LOCK CLOSED SENSOR / OPEN THE LOCKS / SLIDE FWD	NO HOOKLIFT FUNCTION
d004	TIPPING LOCK IS CLOSED	
TIPPING LOCK IN WRONG POSITION	CHECK THE TIPPING LOCK CLOSED SENSOR / CLOSE THE LOCKS / SLIDE BWD	NO HOOKLIFT FUNCTION
d005	TIPPING LOCK IS IN MIDDLE POSITION	
TIPPING LOCK IN WRONG POSITION	CHECK SENSORS	
d006	REAR FRAME IS UP (NOT DOWN)	
TIPPING LOCK IN WRONG POSITION		
d007	TIPPING LOCK IS CLOSED	
TIPPING LOCK IN WRONG POSITION		
d008	MIDDLE FRAME IS UP (NOT DOWN)	
MIDDLE FRAME IN WRONG POSITION		

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ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
d009	MIDDLE FRAME IS UP (NOT NEARLY DOWN)	
MIDDLE FRAME IN WRONG POSITION		
d010	MIDDLE FRAME IS DOWN	
MIDDLE FRAME IN WRONG POSITION		
d011	MIDDLE FRAME IS NEARLY DOWN	
MIDDLE FRAME IN WRONG POSITION		
d012	REAR FRAME IS UP (NOT DOWN)	
REAR FRAME IN WRONG POSITION		
d013	REAR FRAME IS DOWN	
REAR FRAME IN WRONG POSITION		
d014	ARM IS NOT IN BACK POSITION	
TELESCOPIC / TILTING ARM IN WRONG POSITION	SLIDE / TILT BWD OR CHECK THE HORIZONTAL MOVEMENT BACK SENSOR	
d015	ARM IS IN BACK POSITION	
TELESCOPIC / TILTING ARM IN WRONG POSITION		
d016	PULL LIMITER IS ACTIVE	
PULL LIMITER IS ACTIVE	SLIDE / TILT BWD OR CHECK THE PULL LIMITER SENSOR	NO SLIDE FWD
d017	CRANE BODY IS ACTIVE	
CRANE BODY ON IS ACTIVE	SLIDE / TILT BWD OR CHECK THE CRANE BODY SENSOR	NO SLIDE FWD
d018	CATCH LOCKING RIGHT ARE ACTIVE	
CATCH LOCKING RIGHT ARE ACTIVE	OPEN THE RIGHT SIDE CATCH LOCKING / CHECK THE SENSOR	NO HOOKLIFT FUNCTION

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ERROR CODE	COMMENTS / PROBLEM	LOCATION
PROGRAM DESCRIPTION	POSSIBLE ACTION	CONSEQUENCE
d019	CATCH LOCKING LEFT ARE ACTIVE	
CATCH LOCKING LEFT ARE ACTIVE	OPEN THE LEFT SIDE CATCH LOCKING / CHECK THE SENSOR	NO HOOKLIFT FUNCTION
d020	URB IS IN	
URB IN WRONG POSITION		
d021	URB IS OUT	
URB IN WRONG POSITION		
d022	URB IS IN MIDDLE POSITION	
URB IN WRONG POSITION		
d023	Not in use	
d024	Not in use	
d025	Not in use	
d026	EASYCOVER IS IS NOT LOWERED TO LOWEST POSITION	
EASYCOVER IS IS UP	LOWER THE MAST OR CHECK THE SENSOR	
d027	WEIGHING SYSTEM IS ON	
WEIGHING IS ON	SWITCH THE WEIGHING OFF	
d028	MIDDLE FRAME IS NOT MOVED TO REAR POSITION	
HOOK LOCK IS NOT ENABLED	MOVE MIDDLE FRAME TO REAR POSITION OR CHECK THE TILT INDICATOR	

Error codes, control unit

POSSIBLE ERRORS INSIDE CONTROL UNIT

WHEN INTERNAL OR COMMUNICATION ERRORS OCCUR ON CONTROL UNIT FOLLOWING DIFFERENT ERROR CODES ARE DISPLAYED ON THE 7SEGMENT DISPLAYS. THEY ARE DISPLAYED ACCORDING TO THIS SCENARIO: **ERR 1ST -> ERR 2ND**.

ERROR CATEGORIES

1.2	LOW	INFORMATION SHOWN ON DISPLAY AND CORRESPONDING FUNCTION STOPPED.
1.2	MEDIUM	INFORMATION SHOWN ON DISPLAY, AND THEN IS SYSTEM RE-STARTED AUTOMATICALLY TO REINITIATE SYSTEM CORRECTLY.
1.2	SEVERE	INFORMATION SHOWN ON DISPLAY, CAN-BUS DE-ACTIVATED AND SYSTEM LOCKED. **NEEDS POWERCYCLE TO RESTART.**

ERROR CODE 1.2 (CATEGORY)		DESCRIPTION	CAUSE	ACTION
FAULTS				
01.01	MEDIUM	EEPROM FAILURE	ERROR DETECTED ON NON VOLATILE MEMORY	ERROR DISPLAYED ON DISPLAY, CAN MODULE SWITCHED TO PRE-OPERATIONAL STATE AND SYSTEM WILL SELF RESET AUTOMATICALLY. **WAIT, UNTIL THE SYSTEM HAS STARTED.**
01.02	SEVERE	FLASH MEMORY FAILURE	INCORRECT CHECKSUM ON FLASH MEMORY	ERROR DISPLAYED ON DISPLAY, SYSTEM SWITCHED TO ERROR STATE. **SYSTEM MUST BE POWER CYCLED.**
01.03	MEDIUM	STACK MEMORY FAILURE	INCORRECT SIZES IN CAN OPEN PROTOCOL, INCORRECT DATAFLOW, OR STACK OVERFLOW	ERROR DISPLAYED ON DISPLAY, CAN MODULE SWITCHED TO PRE-OPERATIONAL STATE AND SYSTEM WILL SELF RESET AUTOMATICALLY. **WAIT, UNTIL THE SYSTEM HAS STARTED.**
01.04	MEDIUM	RAM MEMORY FAILURE	INCORRECT RAM AND/OR HARDWARE IDENTIFICATION	ERROR DISPLAYED ON DISPLAY, CAN MODULE SWITCHED TO PRE-OPERATIONAL STATE AND SYSTEM WILL SELF RESET AUTOMATICALLY. **WAIT, UNTIL THE SYSTEM HAS STARTED.**

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ERROR CODE 1.2 (CATEGORY)		DESCRIPTION	CAUSE	ACTION
FAULTS				
03.00	LOW	ILLEGAL VOLTAGE DIGITAL OUTPUT (OUTPUT 1 - 4)	DIGITAL OUTPUT (1-4) HAVE ILLEGAL VOLTAGE, EXPECTED LOW DETECTED AS HIGH.	ERROR DISPLAYED ON DISPLAY.
04.00	LOW	SHORT CIRCUIT ON DIGITAL OUTPUT	DIGITAL OUTPUT (1 - 4) SHORT CIRCUITED OR OVERLOADED, CAN BE ANY OF THE 4 OUTPUTS.	ERROR DISPLAYED ON DISPLAY.
08.01	MEDIUM	CAN PASSIVE	CAN BUS IN PASSIVE MODE.	ERROR DISPLAYED ON DISPLAY, CAN MODULE SWITCHED TO PRE-OPERATIONAL STATE AND SYSTEM WILL SELF RESET AUTOMATICALLY. **WAIT, UNTIL THE SYSTEM HAS STARTED.**
08.02	MEDIUM	CAN I/O BUFFER OVERFLOW	CAN OVERRUN; EITHER THE CAN INPUT OR CAN OUTPUT BUFFER ARE FULL.	ERROR DISPLAYED ON DISPLAY, CAN MODULE SWITCHED TO PRE-OPERATIONAL STATE AND SYSTEM WILL SELF RESET AUTOMATICALLY. **WAIT, UNTIL THE SYSTEM HAS STARTED.**
08.03	MEDIUM	CAN PHYSICAL LAYER ERROR	BAD COMMUNICATION / TRANSMISSION.	ERROR DISPLAYED ON DISPLAY, CAN MODULE SWITCHED TO PRE-OPERATIONAL STATE AND SYSTEM WILL SELF RESET AUTOMATICALLY. **WAIT, UNTIL THE SYSTEM HAS STARTED.**
08.04	MEDIUM	CAN MESSAGE LENGTH ERROR	CAN MESSAGE LENGTH IS TOO LONG.	ERROR DISPLAYED ON DISPLAY, CAN MODULE SWITCHED TO PRE-OPERATIONAL STATE AND SYSTEM WILL SELF RESET AUTOMATICALLY. **WAIT, UNTIL THE SYSTEM HAS STARTED.**
08.05	MEDIUM	CAN MESSAGE LENGTH ERROR	CAN MESSAGE LENGTH IS TOO SHORT.	ERROR DISPLAYED ON DISPLAY, CAN MODULE SWITCHED TO PRE-OPERATIONAL STATE AND SYSTEM WILL SELF RESET AUTOMATICALLY. **WAIT, UNTIL THE SYSTEM HAS STARTED.**
08.06	MEDIUM	CAN TRANSMIT COLLISION	TO MANY COLLISIONS ON CAN-BUS.	ERROR DISPLAYED ON DISPLAY, CAN MODULE SWITCHED TO PRE-OPERATIONAL STATE AND SYSTEM WILL SELF RESET AUTOMATICALLY. **WAIT, UNTIL THE SYSTEM HAS STARTED.**

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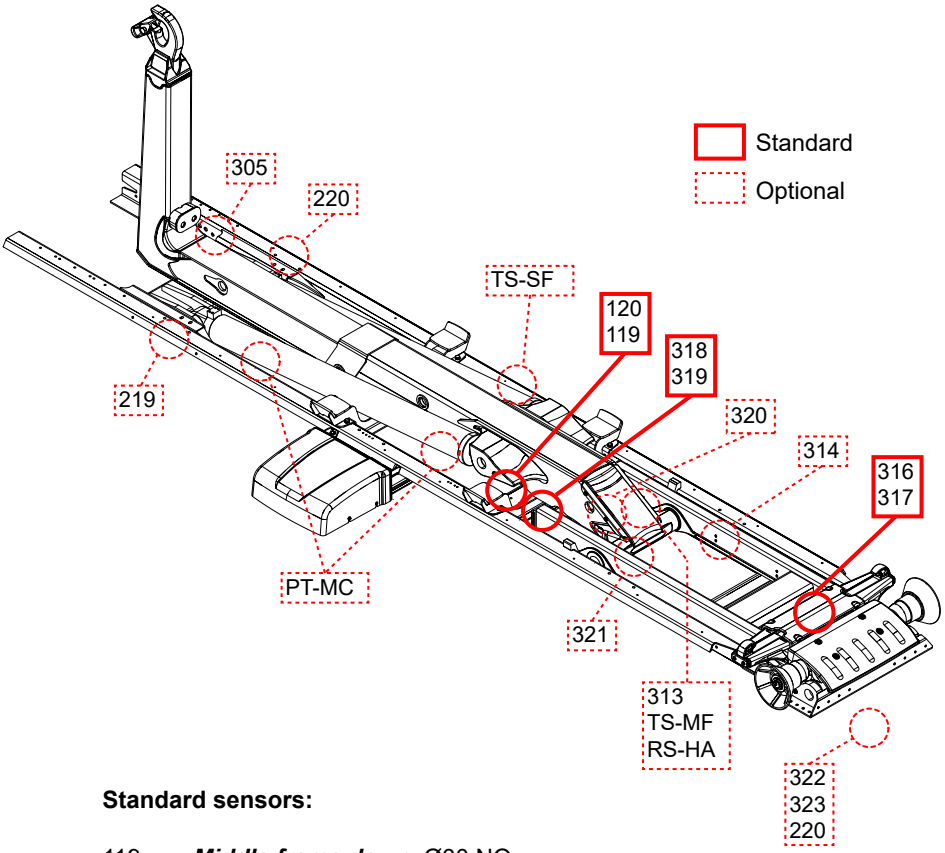
ERROR CODE 1.2 (CATEGORY)		DESCRIPTION	CAUSE	ACTION
FAULTS				
11.00	LOW	ANALOG INPUT ERROR AT START-UP	JOYSTICK NOT IN NEUTRAL POSITION.	ERROR DISPLAYED ON DISPLAY. JOYSTICK FUNCTIONALITY WILL BE REMOVED UNTIL NEXT POWER CYCLE.
12.00	LOW	DIGITAL INPUT ERROR	ERROR DETECTED ON A SWITCH.	ERROR DISPLAYED ON DISPLAY. JOYSTICK FUNCTIONALITY WILL BE REMOVED UNTIL NEXT POWER CYCLE.
13.01	LOW	ANALOG INPUT ERROR, (JOYSTICK FRONT AND BACK MOVEMENT)	ERROR DETECTED ON JOYSTICK.	ERROR DISPLAYED ON DISPLAY. JOYSTICK FUNCTIONALITY WILL BE REMOVED UNTIL NEXT POWER CYCLE.
13.02	LOW	ANALOG INPUT ERROR. (JOYSTICK LEFT TO RIGHT MOVEMENT)	ERROR DETECTED ON JOYSTICK.	ERROR DISPLAYED ON DISPLAY. JOYSTICK FUNCTIONALITY WILL BE REMOVED UNTIL NEXT POWER CYCLE.
17.01	SEVERE	LOW POWER SUPPLY	LOW POWER SUPPLY (BELOW 8,5 VDC).	ERROR DISPLAYED ON DISPLAY, SYSTEM SWITCHED TO ERROR STATE. **SYSTEM MUST BE POWER CYCLED.**
17.02	SEVERE	HIGH POWER SUPPLY	HIGH POWER SUPPLY (ABOVE 36.0 VDC).	ERROR DISPLAYED ON DISPLAY, SYSTEM SWITCHED TO ERROR STATE. **SYSTEM MUST BE POWER CYCLED.**
18.01	SEVERE	SAFE STATE FAILURE	FAILED TO TAKE SYSTEM TO SAFESTATE.	ERROR DISPLAYED ON DISPLAY, SYSTEM SWITCHED TO ERROR STATE. **SYSTEM MUST BE POWER CYCLED.**
99.00	MEDIUM	UNDEFINED ERROR	UNDEFINED ERROR IN CONTROLLER. (SOFTWARE LOGIC IS INCORRECT)	ERROR DISPLAYED ON DISPLAY, CAN MODULE SWITCHED TO PRE-OPERATIONAL STATE AND SYSTEM WILL SELF RESET AUTOMATICALLY. **WAIT, UNTIL THE SYSTEM HAS STARTED.**

Ultima S / SL Flex & Pro SENSORS



Standard sensors:

119	***Middle frame down***, Ø30 NO
120	***Middle frame nearly down***, Ø30 NO
316	***Body locks open***, Ø18 NO
317	***Body locks closed***, Ø18 NO
318	***Rear frame down***, Ø30 NO
319	***Tipping lock closed***, Ø30 NO

>>>

Optional sensors:

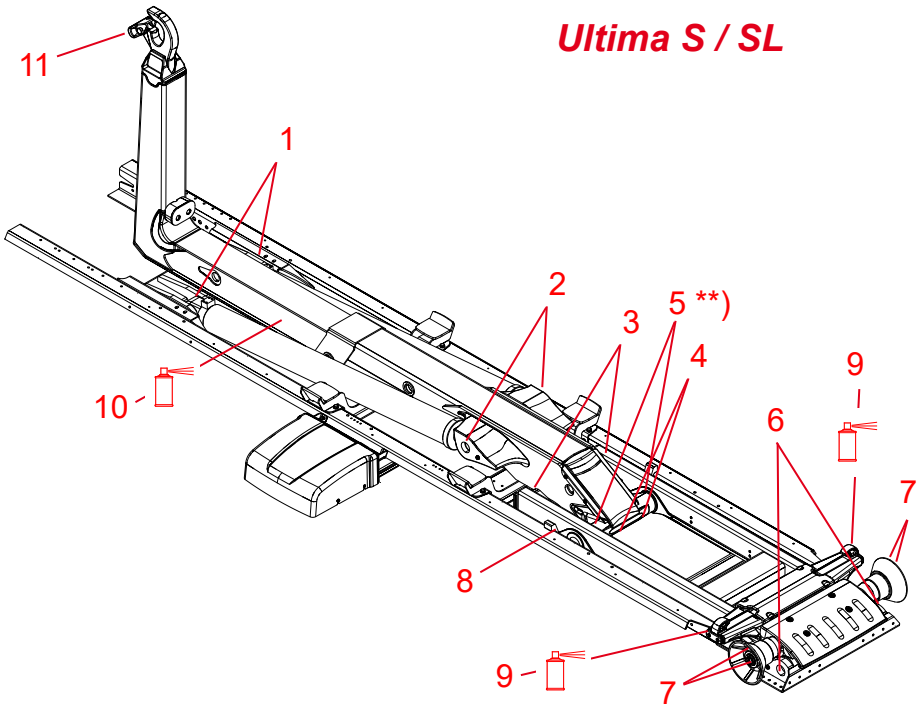
219 ***Crane body on*** / ***Front lock left*** / ***Body on***, Ø18 or Ø30 NO or NC
220 ***Front lock right*** / ***Bogie blocking on,*** Ø18 or Ø30 NO or NC
305 ***Hook arm in front***, Ø18 NO
313 ***Tilt indicator, middle frame***
314 ***Angle switch rear frame***
320 ***Hook arm back***, Ø18 NO
321 ***Pull limiter (DE)*** or ***Locking beam***, Ø18 NO
322 ***URB in***, Ø18 NO
323 ***URB out*** or ***Bogie blocking on***, Ø18 NO
TS-SF ***Tilt indicator, sub-frame***
TS-MF ***Tilt indicator, middle frame***
RS-HA ***Wire sensor, hook frame***
PT-MC ***Pressure transducer, main cylinder***

LUBRICATION

Lubricate all the lubrication points at max 3 month intervals. A more recommended lubrication interval would be 1 month.

NOTE! The hooklift equipment contains plastic surface slide bearings. Use LITHIUM based general lubrication grease (EP2) or biodegradable lubricant NLGI 2. Molybden based lubricant shortens the service life of the bearings.

If the hooklift is equipped with a central lubrication system, this will need to be checked according to the manufacturer's instructions.



Lubrication points

Ultima S / SL

Point	Lubrication point	Number of nipples
1	Main cylinder lower fastening	1 + 1
2	Main cylinder upper fastening as well as lifting rollers (additional equipment)	1 + 1 1 + 1
3	Tipping lock shafts	1 + 1
4	Middle frame bearing (under the rear frame)	1 + 1
5 **)	Middle frame bearing (on the rear tube of the middle frame) Only Ultima 26S and Ultima 30S	1 + 1
6	Rear frame bearing	1 + 1
7	Rear rollers	2 + 2
8	Pull limiting shaft (accessory)	1
9	Hooks of the hydraulic locks (if necessary)	spray (*
10	Hook arm slide tube (if necessary)	spray (*

Total number of nipples Ultima 14S - 21S, 18SL - 24SL	16 (+3)
Total number of nipples Ultima 26S - 30S	18 (+3)

*)	It is recommended to use a drying material, for example teflon or a silicon spray.
1 - 8	Note! Use LITHIUM based general lubrication grease (EP2) or biodegradable lubricant NLGI 2. It is not allowed to use a graphite or molybdensulfide based lubricant.

Periodical Service

The following services are recommended to be done on Ultima devices by an authorised Multilift Service Point:

- delivery service in connection with the commissioning of the device
- first service after 1 - 3 months after commissioning
- annual service:
  at 12 months interval in normal use (0 -15 platform changes a day)
  at 6 months interval in 2-shift use (16 – 30 platform changes a day)
  at 3 months interval in 3-shift use (over 30 platform changes a day)

  As running hours the service should be done at 100 hours interval.

Environmental notice
Appropriate disposal of used oils, lubricants, discarded parts and other used material.

Recycling after service life
When a device is discarded, all of its components shall be recycled and disposed of in accordance with valid decrees and regulations.

Service Card

Services done below on Ultima hook device type Ultima _____

Serial Number _____

Service	Carried out by	Signature	Date
Commissioning inspection			
1st Service			
2nd Service			
3rd Service			
4th Service			
5th Service			
6th Service			
7th Service			
8th Service			

WARRANTY CONDITIONS

To the buyer

You are now the owner of a demountable body system made by the Hiab factory indicated on the manufacturer's plate and sold to you by an authorized Hiab dealer.
With the demountable body system you will receive this Warranty and Maintenance Book, containing service instructions and warranty conditions. Should any problem on service or warranty arise, you should approach the authorized dealer (hereinafter referred to as the "Seller"), who sold you the demountable body system.

The Operator's manual is included in the delivery. The manual contains instructions on operation and maintenance, as well as relevant safety instructions.

The first maintenance should take place no later than three months after the delivery. The second maintenance should be carried out no later than 12 months after the delivery. The following maintenance should be performed every 12 months from the delivery.

Keep in mind that regular maintenance will improve the product reliability and resale value, and thereby will also improve its economical performance.

Information for the buyer/operator

The buyer must be given instructions regarding:

- The operator's manual and its contents.
- The correct method of operating the demountable body system and any extra equipment.
- Safety system and safety equipment.
- Daily inspection and maintenance.
- Lubrication points.
- Filters, their placing and replacement.
- Type of hydraulic oil to be used, oil changes and topping-up.
- Warranty conditions.

- That adjustment of pressure relief valve settings and where applicable load limiting valve settings is prohibited and will invalidate the warranty.
- Miscellaneous
  ……..
  ……..

Owner's Warranty

This Owner's Warranty (hereinafter referred to as the "Warranty") applies to the products listed on the delivery card (hereinafter referred to as the "Products") which accompanies it. This Warranty is issued by the company that has sold the Product (hereinafter referred to as the "Seller"). The Warranty cannot be invoked against any other party than the Seller.

1 Warranty

1.1 The Seller warrants that the Products as listed in the delivery card, with the exceptions stated below, are free from defects in material and manufacture. The Warranty period is twenty-four (24) months from the date of delivery of the Products, [but shall never exceed thirty (30) months from the date of delivery from factory].

- For demountable body systems the Warranty periods shall only apply in normal usage of the Product, meaning in the maximum 4 000 platform changes per 24 months. In case the Product is used more excessively, the duration of the Warranty period must be negotiated separately and if no agreement is entered into the period in this paragraph applies.

Extended Warranty Demountables

An extended Warranty for the period of 5 years or 10 000 platform changes, whichever occurs first, shall apply to structural parts (as defined below), but the period shall never exceed 66 months from the date of delivery from factory. Only the substitute Products shall be refunded. The labour costs shall not be covered during the third, fourth and fifth year.

Parts included in Extended Warranty Demountable body systems

The extended Warranty shall cover the following parts:

- For XR Power, XR Low, Ultima and Optima hooklifts: Sub frame, rear frame, middle frame, sliding frame and hook arm.
- For Futura Flex skip loaders: floor, outer boom and inner boom.

1.2 Expendable items, lubricants and oil are excluded from any Warranty and the Seller accepts no responsibility for defects in such parts.

1.3 If any defect appears, which is covered by the Warranty, the Seller may at its own option repair or replace the Product or defective component. Any defective Products or components are to be repaired by the Seller or a workshop authorized by the manufacturers.

1.4 In order to maintain the rights under this Warranty, the Owner must notify the Seller in writing about the defect immediately after it occurred and in no case later than (15) days after the expiry of the liability period defined in Clause 1.1. The notice shall contain a sufficiently detailed description of the defect. If the owner fails to notify the Seller in writing within the above time limits, the right to make any claim in respect of the defect is void. If there is reason to believe that the defect may cause damage of any type or form, notice shall be given forthwith. If notice is not given forthwith, the Owner loses the right to make any claim based on damage which occurs and which could have been avoided if such notice had been given.

1.5 After receipt of a written notice the Seller shall remedy the defect. Repairs will be carried out within a reasonable time, having regard to the nature of the defect and the difficulties of assessing it, the Owner's need of the Product and the availability of spare parts and repair capacity.

1.6 The warranty does not cover travelling- and/or transportation costs. Transports of Products or components are made at the Owner's risk.

1.7 For spare parts fitted during the products Warranty period the Warranty expires within the products Warranty. Spare parts fitted at the Owner 's expense after the product warranty period has expired has a Warranty period of 6 months from the date of delivery to the customer. Labour costs are not covered. All transport of Products or components is at the Owner's expense. The Owner must also pay the travelling expenses for the Seller's personnel.

1.8 Defective parts, which have been replaced, must be put at the Seller's disposal.

1.9 The Owner must reimburse the Seller for all costs the latter may incur as the result of any Warranty claim in respect of a defect not covered the by Warranty.

1.10 The Warranty does not cover defects due to occurrences after delivery of the Products such as, but not limited to, overloading or incorrect operation, normal wear and tear, insufficient or faulty lubrication or other maintenance, faulty installation or repair or the use of other than original spare parts. The Warranty will not apply if lead seals on valves have been broken, or if the Products have been altered without the Seller's approval in writing. The Owner is solely responsible for his choice of Products as to type and size, and the Seller does not warrant that the Products are suited to their actual use.

1.11 The extended Warranty Period for the frames of hooklifts XR Small, XR Medium and XP, as well as for the frames of skiploaders SL and Futura Basic, shall be 36 months.

2 Limitations of Liability

The Seller is under no circumstances liable for any consequential or indirect damage, such as but not limited to damage to property, standstill costs, loss of revenue, other loss of profits, or any other loss or damage, travel costs or costs relating to measures in connection with other equipment than the Product etc, whether resulting from a defect in a delivered Product, or from an action or omission by the Seller.
The Seller is not liable for defects wholly or partly caused by materials or designs stipulated, specified or provided by the Owner. No other warranties, either direct of implied, are given in relation to the Products than stated in this Warranty.

3 Conditions for Validity of the Warranty

The Warranty as stated in these conditions is not valid unless all of the following conditions have been fulfilled:

- Installation and inspection before delivery has been performed by the Seller or other workshop authorized by Hiab.
- The Products have been serviced in accordance with this Warranty- and service document.
- The Products have been handled in accordance with issued service instructions.
- Any repair and/or change of parts have/has been carried out by the Seller or by a Hiab authorised repair Dealer.
- Only Hiab genuine spare parts have been used.
- Warranty repairs are made only by the Seller or other workshop authorized by Hiab.

This instruction presents a summary of warranty terms. The complete warranty terms and conditions are presented in Hiab Warranty Manual.

EC declaration of conformity
of the machinery
(Directive 2006/42/EC, Annex II, part 1, sub A)

We Cargotec Finland Oy, Multilift
Nesteentie 36
FI-21200 Raisio
Finland

declare on our sole responsibility that the
Ground Level Demountable Equipment

Mark	**Multilift**
Type	**Ultima**
Serial number	
Manufacturing year	

- complies with the provisions of the machinery directive 2006/42/EC.
- also complies with the provisions of the directive on electromagnetic compatibility 2004/108/EC as amended.

Cargotec Finland Oy, Multilift
Nesteentie 36, FI-21200 Raisio

Phone
Int +358 204 55 2399

Telefax
Int +358 204 55 2231

HIAB

DELIVERY CARD

Country	Country code
Distributor	

Multilift Demountables

X	**Hooklift**
	Skiploader
	Other

Customer:
Address:
Contact person:
Tel.:
E-mail:
Body builder / Dealer:

Model **Ultima**	Serial No.	Delivered
Pump model	Oil tank	
Truck model	Chassis No.	Registration No.

Accessories	Part No.	Serial No.

The equipment described above has been received today, assembled and fully serviceable. The operator's manual and warranty conditions accompanying the equipment have been read through as witnessed below.
Product operation instructions and safety instructions have been received.

Purchaser

Installation and delivery service carried out according to the manufacturer's instructions.

Seller / Body builder

To ensure that the warranty applies this delivery card should be received by the manufacturer no later than 30 days after commissioning.

A copy of this page must be sent to the importer and warranty administration.

***Cargotec** improves the efficiency of cargo flows on land and at sea – wherever cargo is on the move. Cargotec's daughter brands, **Hiab**, **Kalmar** and **MacGregor** are recognised leaders in cargo and load handling solutions around the world. Cargotec's global network is positioned close to customers and offers extensive services that ensure the continuous, reliable and sustainable performance of equipment.*

CARGOTEC

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