

Linde Material Handling

*Linde*



## Operating Instructions

### Model MT 12

1131 series 11318011540 rv01 US –  
04-2018



## Linde – Your Partner



With over 100,000 fork lift trucks and warehouse machines sold annually, Linde is one of the world's leading manufacturers of material handling equipment. There are many reasons for this success: Linde products are renowned not only for their innovative, cutting-edge technology, but also for their low energy and operating costs, which are up to 40 percent lower than those of their competitors.

The high quality of Linde products is also matched by the quality of our service. With ten production plants worldwide and an extensive network of sales partners, we are at your service around the clock and around the world.

Your local Linde partner can offer you a complete package from a single source; ranging from expert advice on all aspects of sales and service through appropriate finance options.

Linde trucks are sold in North America by:

KION North America Corporation  
2450 West 5th North Street  
Summerville, S.C. 29483  
Phone (843) 875-8000  
FAX (843) 875-8329

## Parts and service

See your Linde dealer for genuine Linde parts (the only factory-authorized replacements), factory-trained service personnel and manuals for your equipment.

## Proposition 65

### **WARNING**

This warning is provided pursuant to **California Health & Safety Code Sections 25249.5 et. seq.**

This product contains and emits chemicals known to the state of California to cause cancer, birth defects and other reproductive harm.

## Copyright and proprietary rights

This manual - and any excerpts thereof - may not be reproduced, translated or transmitted in any form to third parties without the express written permission of the manufacturer.

<b>1</b>	<b>Introduction</b>	
	Scope	2
	Obligations of the Equipment Owner	2
	Operator Responsibilities	3
	Proper use	3
	Hazard messages	3
<b>2</b>	<b>Safety</b>	
	Before Operation	6
	Operator daily checklist	6
	Operating Position	6
	Travel	7
	Inclines, Ramps, Docks, Elevators	7
	Parking	8
	Battery Safety	8
	Safety During Maintenance	9
	Personnel Qualifications	9
	Hazardous Substances	9
	Operator Warning Decals	11
	Data plate	11
	No riding decal	11
	Trained operator warning decal	12



<b>3</b>	<b>Overview</b>	
	Technical Description	14
	Truck Components	15
	Controls	16
	Display Unit	17
	Data Plate	18
	Decal and Data Plate Location	19
	Definition of Directions	20
<b>4</b>	<b>Operation</b>	
	Unloading and Preparing a New Truck for Operation	22
	Turning the Truck On and Off	23
	Driving	24
	Braking	26
	Emergency Stop Button	27
	Steering	28
	Horn	28
	Raising and Lowering the Forks	29
	Charging the Battery	30
	Battery Removal and Installation	32
	Hoisting the Truck	34
<b>5</b>	<b>Maintenance</b>	
	Personnel Qualifications	36
	Cleaning the Truck	36
	Daily Inspection	37
	Daily Inspection Overview	37
	Routine Lubrication and Inspection	39
	Routine Lubrication and Inspection Intervals	39
	Lubrication Points	40
	Scheduled Maintenance	41
	General Maintenance Information	41
	Maintenance Schedule	42

<b>Fluids and Lubricants</b> .....	43
Lubricant Specifications and Capacities .....	43
<b>Troubleshooting</b> .....	44
Fuses .....	44
<b>6 Technical Data</b>	
<b>Specifications</b> .....	46



1

---

# Introduction

## Scope

### Scope

This manual contains operating and periodic maintenance instructions as well as specifications for the industrial truck to which it applies. If this manual applies to a trailer or other towed equipment, then operation or maintenance of the towing vehicle is outside the scope of this manual. Important safety rules and descriptions of some operating hazards and how to avoid them are also included. The manual is intended to assist the owner and operators in maximizing safety and efficiency in material handling while achieving maximum product life. It describes how to correctly and safely operate and maintain the truck and all standard variants available at the time of printing. Special designs, special attachments, or other custom modifications carried out by the manufacturer to meet specialized customer requests are not covered in this manual.

This manual is not a training manual and is not to be used as the basis for formal training. It is intended to supplement such training with information specific to this truck as well as applicable good practices and safety rules which may be general in nature. This manual cannot address every possible hazard or potential accident situation. Ultimately it is

the responsibility of the owner and operator(s) of the equipment to avoid or correct such potential dangers.

To assist in keeping the truck in good operating condition, a separate section devoted to maintenance is included in this manual. This section contains a list of items to be checked daily by the operator. It also has a schedule for maintenance procedures to be performed at regular intervals by those responsible for truck maintenance. All of these procedures are essential for safe operation and maximum service life of the truck. Scheduled maintenance tasks or repairs must only be performed by qualified forklift technicians. Details and instructions for performing such work are outside the scope of this manual. This information is covered in the applicable service manual available from authorized dealers.

The descriptions and specifications included in this manual were in effect at the time of printing. KION North America Corporation reserves the right to make improvements and changes without notice and without incurring obligation. Please check with your authorized dealer for information on possible updates or revisions.

## Obligations of the Equipment Owner

The Occupational Safety and Health Administration (O.S.H.A.) requires employers of industrial truck operators to adhere to a number of regulations regarding operation. These regulations are codified in section 1910.178 of title 29 of the Code of Federal Regulations. This section establishes a number of specific rules pertaining to truck operation, inspection and maintenance, and areas of use. It is up to the owner to ensure that use and maintenance of any powered industrial truck is consistent with these rules.

In addition, 29 CFR 1910.178 describes required operator training in detail. It requires employers to establish and maintain a training program to ensure that all operators of

powered industrial trucks are competent and trained in the safe and proper operation of powered industrial trucks.

Many of the rules set forth in 29 CFR 1910.178 are based on the American National Standards Institute's (ANSI/ITSDF) B56 standards. The owner should be familiar with 29 CFR 1910.178 as well as the ANSI/ITSDF B56 standards. Other federal standards may apply depending on specific industry. Owners should also be aware of any state OSHA rules that may differ from the federal rule. This equipment meets all applicable requirements of the ANSI/ITSDF B56 standards at time of manufacture. 29 CFR 1910.178 prohibits any modifications and/or additions which affect

capacity or safe operation of industrial trucks without prior written approval of the manufacturer. An owner should consult the authorized dealer if the owner's intended application for a truck is inconsistent with the designated performance characteristics of that truck. KION North America Corporation will not assume,

and expressly disclaims, any liability for injuries or damages arising from or caused by unauthorized modification, removal, disconnection or disengagement of any part from any of its trucks. It is recommended that all replacement parts be of OEM (Original Equipment Manufacturer) origin.

## Operator Responsibilities

It is the responsibility of the operator to operate any powered industrial truck in a safe manner. In order to do this, all operators must have completed training in the safe operation of powered industrial trucks. Operators must know and understand all general safety rules as well as any safety information specific to the environment in which they will be working. They must then practice these safe operating procedures whenever using a truck.

In addition, all operators must be familiar with the specific truck they use. Therefore they must be familiar with the procedures for correct and safe operation explained in this

manual. They must understand the potential hazards and safety precautions covered in the manual. This manual however, cannot cover all possible hazards. Operators must be able to identify any hazards that may exist or arise in their work environment and know how to avoid or correct them.

Finally, operators are responsible for identifying and reporting any truck that is in unsafe condition. They must know how to inspect the truck they operate and they must perform this inspection before placing a truck in service each day. Operators must not operate a truck found to be damaged or malfunctioning.

## Proper use

The truck is designed for lifting, transporting, and, if equipped with a mast, stacking of palletized or other stable loads. The maximum load to be lifted is specified on the truck data plate. The truck is not designed or intended to lift or transport personnel.

The truck may be operated outdoors or in buildings only on surfaces that are flat and stable. Transporting of loads on inclines and ramps is permitted if the incline surface is flat and stable. If the truck is equipped with a mast, the carriage must always remain in the fully lowered position during transport on such inclines and ramps. Lifting of loads or transport of elevated loads is prohibited on

inclines and ramps. If the truck is operated on public roads it must be equipped with lights and any other devices as required by state or local law. If the truck is to be operated in refrigerated storage areas, it must be equipped with an optional cold storage package suitable for the specific application. (Not available on all models.) A truck must not be operated in any hazardous environment unless the truck carries the designation appropriate for that environment per 29 CFR 1910.178. It is the responsibility of the owner to ensure the safety of all operating areas and surfaces and to restrict the truck to the uses and areas for which it is designed and rated.

## Hazard messages

Hazard symbols and messages are placed in this manual and on the truck to provide instruc-

tions and identify specific areas where potential hazards exist and special precautions

should be taken. Operators must understand the meaning of these symbols and messages. Damage to the truck, as well as serious injury or death to the operator or others may result if the instructions conveyed by these symbols and messages are not followed.

### CAUTION

Indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury.

### WARNING

Indicates a potentially hazardous situation which if not avoided could result in death or serious injury.

### DANGER

Indicates an imminently hazardous situation which if not avoided will result in death or serious injury.

### NOTE

Indicates further information presented to ensure clarification of a particular item

### ENVIRONMENT NOTE

The information contained herein must be observed, otherwise environmental damage may occur.

2

---

Safety

Before Operation

## Before Operation

Before using the truck, inspect the work area. It should be neat, well lit, adequately ventilated, and free from hazardous material. Aisles and roadways should be unobstructed and well marked.

Operators must know the UL classification for the truck and use the truck only in permissible areas.

Ensure that there are no loose objects on the truck or in the operator compartment, especially on the floor plate where they could interfere with pedal operation (if equipped) or foot room.

Fire extinguishers and other emergency equipment should be visible and easy to reach. Wear safety equipment when required. Don't smoke in "No Smoking" areas, or while charging batteries or refueling combustion engine trucks.

Never operate the truck with greasy hands. This will make the controls slippery and result in loss of truck control.

Any questions or concerns about safety should be brought to the attention of a supervisor. If an accident should occur, it must be reported immediately.

**⚠ WARNING**

Unauthorized modifications to the truck can result in injury or death.

Do not remove, disable or modify any safeguards or other safety devices. These include any alarms, lights, mirrors, overhead guards, and load backrest extensions. If present, an overhead guard is intended to provide protection to the operator from falling objects, but cannot protect from every possible impact.

## Operator daily checklist

At the beginning of each shift, inspect your truck by using the **Linde Operator's Daily Checklist**. If necessary, refer to the Maintenance section of this manual for details on how to carry out this inspection. Check for damage and maintenance problems. Any necessary repairs must be completed before the truck is operated. In addition to daily inspection, scheduled maintenance is vital to safe operation of the truck. Adhere to the inspection, lubrication and maintenance schedule given in the Maintenance section of this manual.

**i NOTE**

*Any repairs or maintenance to the truck must be performed only by trained and authorized technicians.*



## Operating Position

The truck may be operated in either direction while walking. When operating in reverse

(forks leading), always keep both hands on the control handle. When operating forwards

(forks trailing) keep one hand on the controls and, if possible, walk ahead and to the side of the truck.

During operation, always grasp the handle at the travel control. Keep fingers within the protected area of the handle at all times.

#### **⚠ WARNING**

Injury to hands can occur if the handle is grasped incorrectly.

Keep hands and fingers within the protected area of the handle.

When walking with the truck, remain at arm's length from the control handle. Keep feet clear of the truck at all times.

## Travel

The truck is designed for operation on smooth, dry surfaces such as warehouse and factory floors, loading docks or paved areas. Under all travel conditions operate the truck at a speed that will permit it to be brought to a stop in a safe manner. Avoid running over loose objects on the roadway surface.

#### **⚠ WARNING**

Loss of control!

Do not travel at excessive speeds; keep your truck under control at all times.

Always watch for pedestrians. When travelling in reverse (load end leading) be careful of drive end swing. The drive end of the truck will swing out if a turn is made while travelling in

## Inclines, Ramps, Docks, Elevators

If you must travel on an incline, do so with caution. Do not operate truck on a wet incline.

Keep the forks **upgrade** to maintain control when travelling up or down an incline with a **loaded** truck.

Keep the forks **downgrade** when travelling up or down an incline with an **empty** truck.

#### **⚠ WARNING**

Injury can occur if the truck contacts any part of the body.

Remain clear of the truck frame at all times.

Operators must not ride the truck unless it is designed for riding. Trucks designed for riding have a dedicated riding platform as well as a dedicated grab bar, seat, or body support. Always sit in the seat or brace against the body support before riding. If the truck has a grab bar, always grasp it before riding. Maintain contact with the seat, body support, or grab bar throughout riding operation.

Passengers are not permitted.

reverse. Always use caution when turning into an aisle. The load wheels can cut the corner sooner than expected.

Unstable loads are hazardous. Ensure all loads are secure and evenly positioned across both forks. Never lift a load with only one fork. Never carry anything on any part of the truck except the forks unless a specific area has been provided by the manufacturer.

During travel, always watch for overhead obstructions such as lights, wiring, pipes, sprinkler systems, doorways, etc. Never overtake another truck at an intersection, blind spot or other dangerous location. Use the horn at intersections and any location where visibility is limited.

#### **⚠ DANGER**

**Tip-over will occur if you turn while travelling on a ramp or travel at an angle other than straight up or straight down a ramp.**

Never turn on an incline or ramp either loaded or unloaded. Travel straight up or straight down.

Be aware that when descending an incline your stopping distance will be greater than

### Parking

when on a level surface. Reduce your speed, and ensure that there is adequate clear space at the bottom of the ramp to stop and turn.

To avoid hazards associated with a dock, you should personally check that the trailer brakes have been applied, wheel chocks are in place, and that any trailer-to-dock locking systems are being utilized. The impact of moving in and out of a trailer may cause the trailer to creep or move. Confirm that the driver will not move the trailer until you are done.

Do not drive the truck onto an elevator without specific authorization. Verify that the capacity of the elevator exceeds the weight of the truck and the weight of the load. Approach elevators

slowly and ensure that the elevator car is level with the floor before entering. Enter elevators squarely with the load end leading. Ensure that no part of the truck or load contacts any part of the elevator other than the floor. Once on the elevator, neutralize the truck controls, shut off the power, and set the brakes. Any other personnel should leave the elevator before the truck is allowed to enter or leave.

Be especially cautious when driving the truck on ramps or bridge plates. Be sure to maintain a safe distance from each edge. Before driving the truck over a ramp or bridge plate, verify that its position is secured to prevent movement. Never exceed the rated capacity of a ramp or bridge plate.

### Parking

When you are finished with the truck, observe proper shutdown procedures.

- Never park on a grade.
- Always come to a complete stop before leaving truck.
- Place travel controls in neutral.
- Lower forks fully to the floor. If the forks can be tilted, tilt them forward.
- If the truck has a manual parking brake, apply it.
- Turn the truck off.
- If the truck has a key switch and the operator is more than 25 ft (7.5 m) away, or out of sight of the truck, the key should be removed.

#### WARNING

Failure to properly shut down the truck may allow inadvertent movement and result in a collision.

Never park on a grade. Ensure the parking brake is applied and turn the truck off. On trucks with a direction switch, always place it in neutral.

#### WARNING

Improper parking can interfere with emergency response.

Do not block stairways, main passageways or emergency routes. Do not block access to fire or emergency equipment.

### Battery Safety

#### WARNING

Batteries contain dissolved sulfuric acid, which is poisonous and caustic. Batteries also can produce explosive gases.

Remain aware of the following information.

- Wear protective equipment (protective apron and gloves) and protective glasses

when working with battery acid. If clothing, skin or eyes come into contact with battery acid, immediately flush the affected areas with water. If acid contacts the eyes, seek medical attention at once. **Clean spilled**

**battery acid immediately with large amounts of water.**

- Remove any metal rings, bracelets, bands, or other jewelry before working with or near batteries or electrical components.
- Never expose batteries to open flame or sparks.
- Areas in which batteries are stored or charged must be well ventilated to prevent concentration of explosive gases.
- If a battery is charged while installed in the truck, the battery cover must remain

completely open during the entire charging period.

- Shorting of battery terminals can cause burns, electrical shock, or explosion. Do not allow metal parts to contact the top surface of the battery. Make sure all terminal caps are in place and in good condition.
- Batteries may only be charged, serviced, or changed by properly trained personnel. Always follow all instructions provided by the manufacturers of the battery, charger, and forklift truck.

## Safety During Maintenance

### Personnel Qualifications

Only qualified personnel authorized by the owner are permitted to perform maintenance or repair work. All items listed in the Scheduled Maintenance Charts must be performed by qualified forklift technicians only. They must have knowledge and experience sufficient to assess the condition of a forklift truck and the effectiveness of the protective equipment according to established principles for testing forklift trucks. Any evaluation of safety must

be unaffected by operational and economic conditions and must be conducted solely from a safety standpoint.

Daily inspection procedures and simple maintenance checks, e.g. checking the hydraulic oil level or checking the fluid level in the battery, may be performed by operators. This does not require training as described above.

### Hazardous Substances

#### Oils



#### ⚠ WARNING

- Oils are flammable!
- Always comply with applicable legal regulations.
  - Do not allow oil to come into contact with hot engine parts.
  - Do not smoke in areas where oils are used or stored.



#### ⚠ WARNING

Oils are toxic!

- Avoid skin contact, inhalation, or ingestion.
- If oil mist or vapors have been inhaled, seek fresh air.
- If oil comes into contact with the eyes, flush thoroughly (at least 10 minutes) with water and then seek medical assistance.
- If oil is swallowed, do not induce vomiting. Seek medical assistance immediately.


**⚠ WARNING**

Prolonged intensive contact with the skin can result in loss of natural skin oils and irritate the skin.

- Avoid skin contact.
- Wear protective gloves, long sleeves, and eye protection.
- If oil contacts the skin, wash the affected area with soap and water.
- Change oil-soaked shoes or clothing immediately.

**⚠ WARNING**

Spilled oil presents a risk of slipping, particularly when combined with water.

- Immediately treat spilled oil with an oil binding agent, and then dispose of it according to local regulations.


**ENVIRONMENT NOTE**

*All oils are potent contaminants of water.*

- *Recycle used oil if possible.*
- *Always store oil in appropriate containers.*
- *Avoid spills.*
- *Spilled oil should be removed with oil-binding agents at once and disposed of according to local regulations.*
- *If recycling is not possible, dispose of used oil according to local regulations.*

**Pressurized Hydraulic Oil**
**⚠ WARNING**

Like other oils, hydraulic oil is flammable, toxic, and a skin irritant.

- Do not allow hydraulic fluid to come into contact with hot motor parts.
- Avoid inhalation or skin contact of hydraulic oil.
- Refer to the safety information under "Oils".

**⚠ WARNING**

Hydraulic oil is pressurized during operation of the forklift truck and may remain pressurized after shut down. An escaping stream of pressurized hydraulic oil can cause serious injury.

- If pressurized hydraulic oil is found to be escaping from the truck, shut down the truck immediately and have the leak repaired before returning the truck to service.
- Only trained service personnel should attempt to repair any portion of the hydraulic system.
- Do not allow hydraulic fluid to come into contact with the skin.
- Avoid inhaling spray or mist created by escaping hydraulic oil.
- Penetration of pressurized fluids into the skin is particularly dangerous if these fluids escape at high pressure due to leaks in the hydraulic system. In case of such injury, immediate medical assistance is required.
- To help prevent injury, use appropriate personal protective equipment (e.g. protective gloves, long sleeves and industrial goggles).


**ENVIRONMENT NOTE**

*Hydraulic oil is a potent contaminant of water.*

- *Recycle used hydraulic oil if possible.*
- *Always store hydraulic oil in appropriate containers.*
- *Avoid spills.*
- *Spilled hydraulic oil should be removed with oil-binding agents at once and disposed of according to local regulations.*
- *If recycling is not possible, dispose of used hydraulic oil according to local regulations.*

**Battery Acid**

**⚠ WARNING**

Battery acid contains dissolved sulfuric acid. This is toxic.

- Avoid contact and consumption.
- In case of injury, seek medical advice immediately.



**⚠ WARNING**

- Battery acid contains dissolved sulfuric acid. This is corrosive.
- When working with battery acid, always wear protective clothing and eye protection.
  - Do not allow any acid to get onto clothing or skin or into the eyes; if this does happen, rinse immediately with plenty of clean water.
  - In case of injury, seek medical advice immediately.
  - Immediately rinse away spilled battery acid with plenty of water.



**ENVIRONMENT NOTE**

- Dispose of used battery acid according to local regulations.

## Operator Warning Decals

### Data plate

The data plate is designed to inform personnel of truck capacity and other important truck specifications. The operator should locate, read, and understand the data plate prior to using the forklift truck.

**⚠ DANGER**

**Risk of tip-over.**

Never attempt to lift a load greater than the maximum capacity listed on this plate.



MODEL	SERIAL No. / YEAR				
MADE IN	TRUCK WEIGHT (WITHOUT BATTERY (+/- 5%))				
ELECTRICS ONLY	BATTERY VOLTAGE	AMP-HR MAX.	BATTERY TYPE	BATTERY WEIGHT MAX.	BATTERY WEIGHT MIN.
	V	h		kg	lb
BACK TILT	LIFT TYPE		DRIVE TIRES		TRUCK TYPE
ATTACHMENT(S)	A	B	C	D	CAPACITY
	mm	mm	mm	mm	kg
	in	in	in	in	lb
	mm	mm	mm	mm	kg
	in	in	in	in	lb

AS SHIPPED THIS TRUCK MEETS THE APPLICABLE REQUIREMENTS OF ANSI/ISO 506.1  
©2009/1411 KION NORTH AMERICA CORPORATION  
2500 WILLOW CREEK, ST. LOUIS, MO 63114

### No riding decal

This decal warns personnel that riding is not permitted anywhere on the truck. This applies to operators as well as all others.

Some pallet trucks are designed for riding. If so, this decal will not be present.



### Operator Warning Decals

#### Trained operator warning decal

This decal states the requirement that only trained and authorized personnel are to operate truck.



3

---

## Overview



## Technical Description

### General

The 1131 series pallet truck is a "walkie" type electric pallet truck (ITA class 3). It is designed for handling loads up to 2600 pounds. This capacity may be downrated above certain fork lengths. Exact capacity limits for individual vehicles are found on the data plate.

### Drive unit

The drive unit is comprised of a 24-volt DC drive motor mounted transversely to a reduction gear unit. The drive unit pivots in the chassis via the control handle to determine drive wheel direction. An electromagnetic brake is installed at the end of the drive motor for use as a parking brake.

### Travel control

Travel speed and direction is controlled through a butterfly type travel control at the top of the control handle. When the control is released, the truck will decelerate via regenerative braking. More aggressive slowing is available by rotating the travel control in the opposing direction.

### Hydraulic system

The hydraulic system utilizes fluid pressurized by a hydraulic pump driven by a DC pump motor. The pump motor is integrated into a hydraulic pump unit which also contains the pump, a lift and lower solenoid valve, and a hydraulic oil reservoir. During lifting, pressurized hydraulic fluid from the pump is

routed by the solenoid valve to a lift cylinder. The lift cylinder operates the tie bar linkage to elevate the forks. Lowering occurs by gravity, with the weight of the forks (and any load) acting through the linkage to force hydraulic fluid out of the cylinder and back to the reservoir.

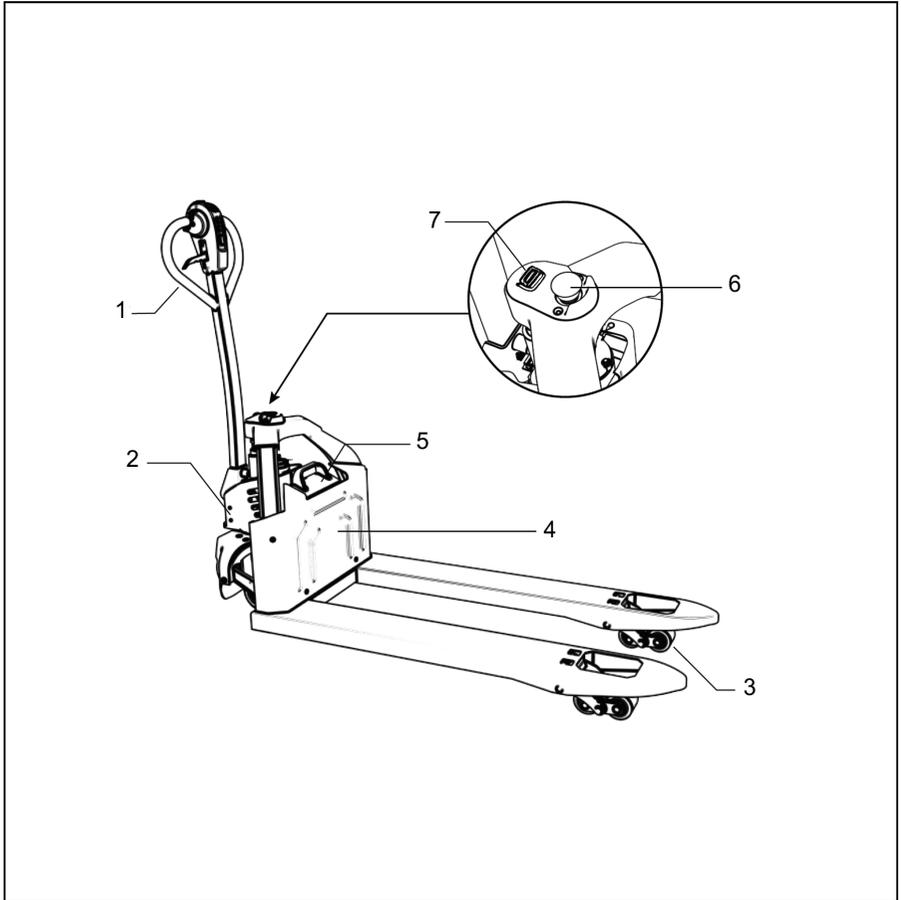
### Load lifting system

Load on the forks is elevated through a hydraulically activated linkage. The linkage consists of a lift shaft at the base of the battery compartment connected through tie bars to toggles at each load wheel. The lift shaft is rotated by the hydraulic lift cylinder described previously. The linkage geometry keeps the forks level throughout the lift range.

### Electrical system

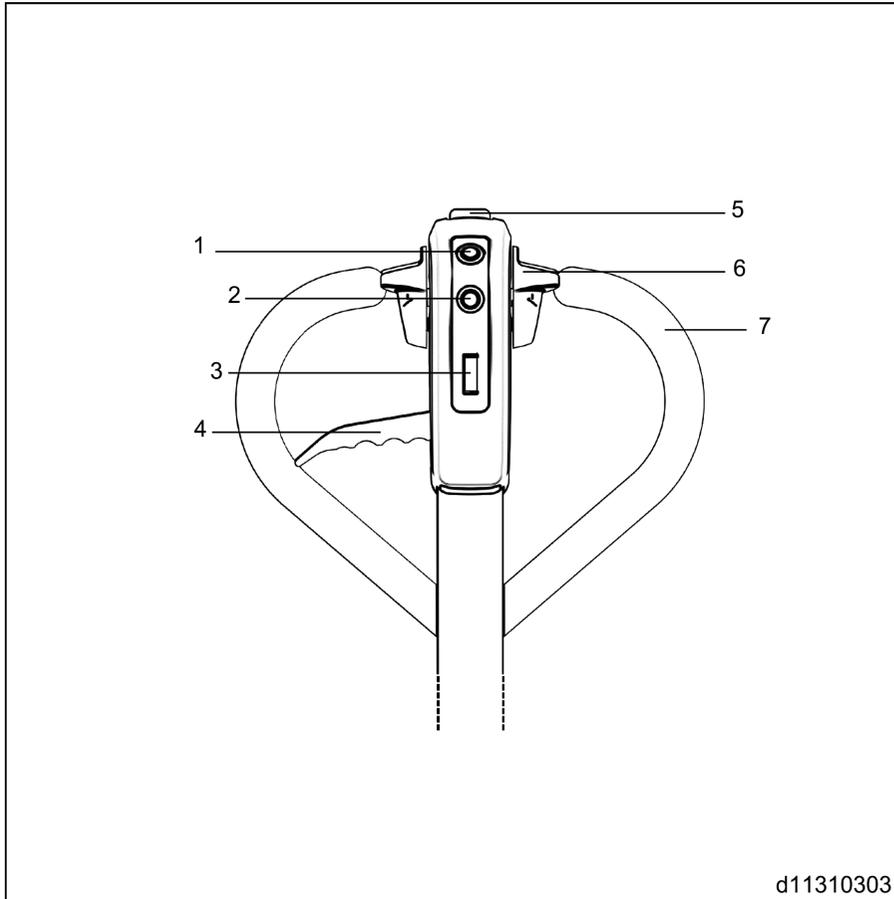
The truck is equipped with a 24-volt electrical system. A line contactor controls power to the system once the key switch is on. All travel and lift function is controlled by a transistorized main controller. The main controller contains both control logic and an array of power transistors for the motors. The control logic processes signals from sensors, interlocks, and operator controls and generates the appropriate release and speed signals to the power transistors to operate the motors. Two fuses are present, one for the power circuit and one for the remainder of the system. A connection port is provided at the controller to connect a laptop computer or programming handset to set vehicle parameters or perform diagnostic operations.

## Truck Components



- 1 Control handle
- 2 Hydraulics cover
- 3 Load wheels
- 4 Load backrest
- 5 Battery
- 6 Emergency stop switch
- 7 Key switch

## Controls

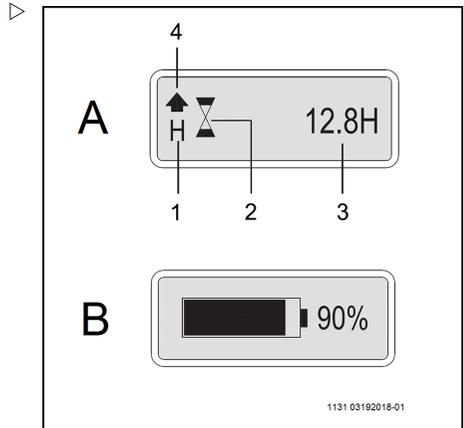


- 1 Horn switch
- 2 Lift switch
- 3 Power display
- 4 Manual lowering handle
- 5 Emergency reverse switch
- 6 Travel control
- 7 Hand grip

## Display Unit

The display unit is located on the handle. If no faults are present, the display will alternate between the truck status screen (A) and the battery status screen (B). The truck status screen has the following icons:

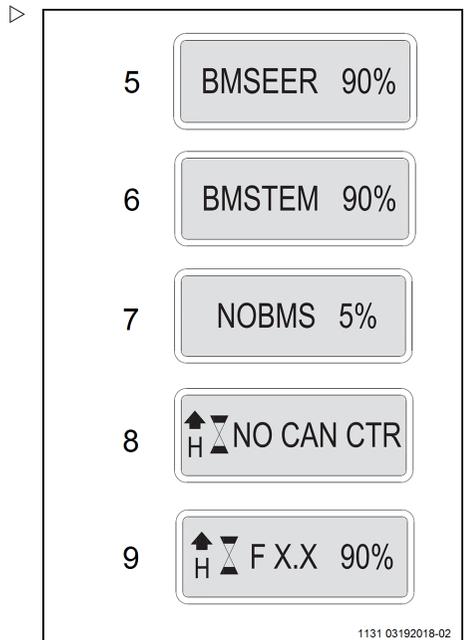
- (1)Horn Switch. Appears when the horn switch is pressed.
- (2)Handle Interlock. Flashes during normal operation; steady if handle out of normal range.
- (3)Hour Display. Displays the accumulated truck hours to the nearest tenth.
- (4)Function Icon. Arrow corresponding to Forward, Reverse, of Lift appears as these functions are used.



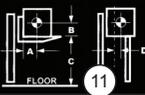
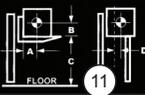
## Fault Display

The display unit can show the following error messages:

- (5)Motor temperature too high
- (6)Battery fault
- (7)Battery CAN signal missing
- (8)Controller CAN signal missing
- (9)Specific fault coded condition (X.X will be the code digits)



## Data Plate

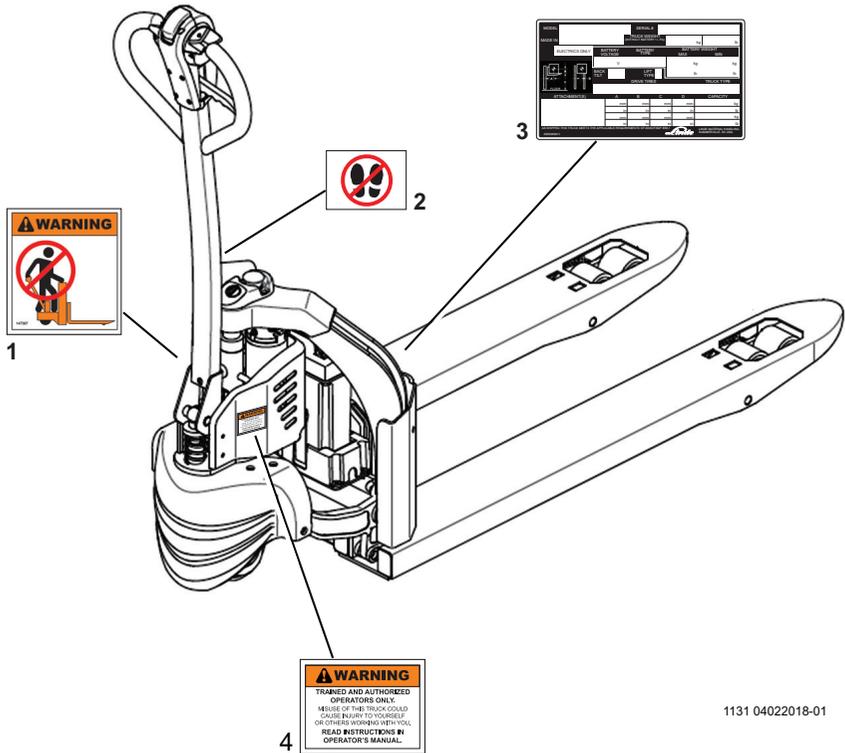
MODEL <b>1</b>		SERIAL No. / YEAR <b>2</b>	
ASSEMBLED IN <b>3</b>		TRUCK WEIGHT WITHOUT BATTERY (+/- 5%) <b>4</b> kg lb	
ELECTRICS ONLY		BATTERY VOLTAGE <b>5</b> V	AMP-HR MAX <b>6</b>
		BATTERY TYPE <b>7</b>	BATTERY WEIGHT MAX <b>8</b> kg
			MIN <b>8</b> lb
		BACK TILT <b>9</b>	LIFT TYPE <b>10</b>
		DRIVE TIRES <b>12</b>	TRUCK TYPE <b>13</b>
ATTACHMENT(S)		CAPACITY	
		A	B
		mm	mm
		in	in
		C	D
		mm	mm
		in	in
		<b>14</b>	
		kg	
		lb	
		kg	
		lb	

AS SHIPPED THIS TRUCK MEETS THE APPLICABLE REQUIREMENTS OF ANSITSDF B56.1  
0009384611

KION NORTH AMERICA CORPORATION  
SUMMERVILLE, SC USA

- (1) **MODEL** – shows the model designation of the truck.
- (2) **SERIAL No./Year** – shows the serial number and year of manufacture of the individual truck.
- (3) **ASSEMBLED IN** – shows the country in which the truck was originally manufactured.
- (4) **TRUCK WEIGHT** – shows the weight of the truck (in pounds and kilograms) with forks. This weight does not include the battery on electric trucks.
- (5) **BATTERY VOLTAGE** – (electric trucks only) – shows the system voltage of the truck.
- (6) **AMP-HR MAX** – (electric trucks only) – shows the maximum current capacity in amp-hrs for any battery to be used in the truck.
- (7) **BATTERY TYPE** – (electric trucks only) – shows the required battery designation, as outlined in ANSI B56.1. A battery of the correct designation must be installed in order for the TRUCK TYPE designation to be valid.
- (8) **BATTERY WEIGHT** – (electric trucks only) – shows the allowable weight range (MAX and MIN) for the battery in pounds and kilograms.
- (9) **BACK TILT** – shows the maximum angle that the mast can be tilted back.
- (10) **LIFT TYPE** – shows a letter corresponding to the type of mast construction as follows:  
S for single masts  
D for double masts  
T for triple masts  
Q for quad masts
- (11) **(Diagram)** – illustrates the dimensions A, B, C, and D used in CAPACITY chart (14).
- (12) **DRIVE TIRES** – shows the required size and type of drive tire.
- (13) **TRUCK TYPE** – shows the designation of the truck with respect to hazardous environments as outlined in 29CFR1910.178. This designation corresponds to the environment(s) in which the truck is approved for use.
- (14) **CAPACITY** – shows the maximum load weight (in pounds and kilograms) that can be safely lifted for the corresponding devices listed under ATTACHMENT(S). In order to achieve a listed capacity safely, the lift height must be kept within the corresponding value shown in column C and the load center of gravity must be within the corresponding values shown in columns A, B, and D.

## Decal and Data Plate Location



1 Warning Decal, No Riders  
2 Decal, No step

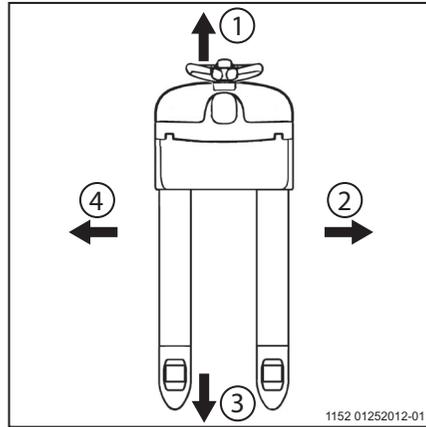
3 Data plate  
4 Warning Decal, Trained Operator

#### Definition of Directions

#### Definition of Directions

- (1) Forward
- (2) Right
- (3) Reverse
- (4) Left

Directions as seen from the driving position;  
the control handle is at the front.



4

---

## Operation

### Unloading and Preparing a New Truck for Operation

## Unloading and Preparing a New Truck for Operation

When unloading a new truck, it may be necessary to lift the truck. See the corresponding sections in this manual for instructions regarding hoisting.

Before placing a new truck into service, perform the Daily Maintenance Inspection as found in the Maintenance section.

Check the drive wheel fasteners for tightness. Drive wheel fasteners must be tightened to 6.9 ft-lbs (9.3 Nm).

The truck can then be operated at full speed immediately upon being placed in service. However, during the first 50 operating hours, avoid subjecting the drive motors or hydraulic system to high continuous loads.

#### **WARNING**

Wheel mounting hardware sometimes requires several cycles of tightening before it fully seats. For this reason, wheel mounting screws or nuts will often work loose in the period immediately following initial tightening.

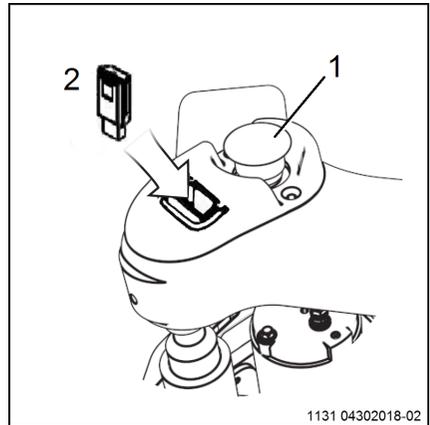
When placing a new truck into service, the wheel mounting screws or nuts must be checked for tightness every 10 hours until no further loosening is detected.

## Turning the Truck On and Off ▷

### Switching the truck on

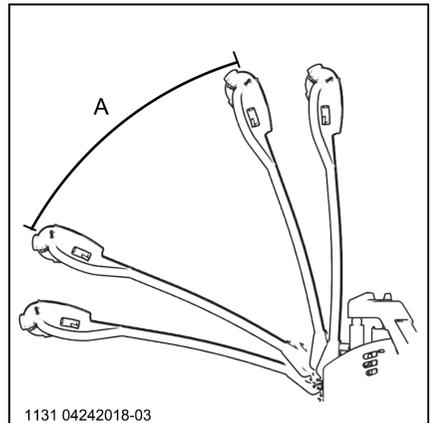
To turn the truck on, make sure the emergency stop button (1) is not pushed in and the control handle is released to its vertical position. Insert the key (2) into its slot. The indicator unit on the handle should begin its display sequence.

The truck is equipped with a static-return-to-neutral function. If the control handle is held in its working range (A) when the truck is turned on, the travel function will not operate. The control handle must then be briefly returned to either end position and then moved back into its working range to enable travel.



### Switching the truck off

To turn the truck off, remove the key from its slot. The indicator unit display will turn off.



## Driving

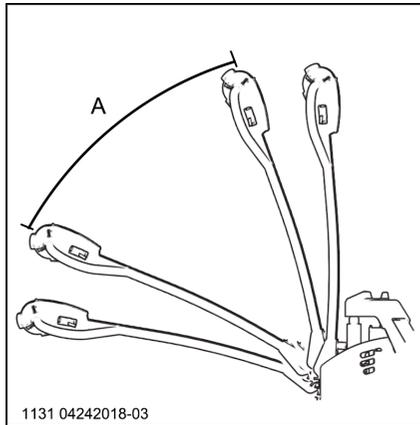
### ⚠ WARNING

Operators must be familiar with all safety procedures that apply to forklift operation before driving.

Read and understand all safety information in Section 2 before operating the truck.

Forward is defined as forks trailing. Reverse is defined as forks leading. See section three if necessary.

- Switch the truck on with the key switch or optional keyless access system. See "Turning the truck on and off" if necessary.
- Raise the fork arms so that any load is clear of the ground.
- Move the control handle into its operating range (A).

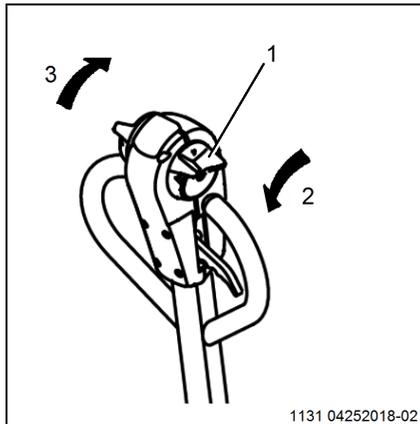


### Forward

- Press the travel control (1) so that it rotates in the direction shown (2).

The truck will move forward. The speed is proportional to both the amount of control rotation and handle position. Remain at arm's length beside the truck during forward motion. Use only the hand nearest the truck to operate the travel control.

The truck is equipped with a static-return-to-neutral feature. If the truck does not move, then the control handle has probably been moved into the operating range (A) too early while switching on the truck. Release the control handle to the vertical position briefly, and then move it back into the operating range. This should enable the travel function.



### Reverse

- With the control handle in the working range, press the travel control so that it rotates in the direction shown (3).

The truck will move in reverse. The speed is again proportional to the amount of control rotation and handle position. Remain in front

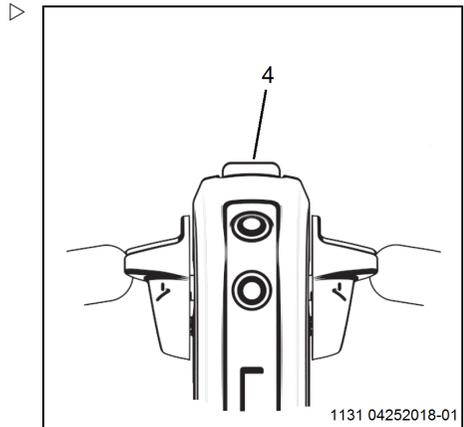
of the truck while operating in reverse. Keep two hands on the control handle.

### Emergency Reverse Function

To protect the operator from becoming pinned against an obstacle by the control handle, an emergency reverse button (4) is provided at the end of the control handle. If this button is pressed during operation, the truck will move off in reverse until the button is released. The mechanical brake will then engage to immediately stop the truck. The travel control must then be returned to neutral before the truck can again be operated.

### Changing Direction

- To change direction at any time during travel, release the travel control and press it in the opposite direction. This can be done while the truck is still moving in the original direction. The truck will be electrically braked to a stop and then begin moving in the new direction.



## Braking

## Braking

The truck has electric braking built in to the motor control equipment and mechanical braking through an electro-magnetic disc brake on the drive unit. Electric braking is controlled by the position of the travel control (1). The mechanical brake is controlled by the position of the control handle and the travel control.

## Electric Braking

There are two modes of electric braking. The first mode activates when the truck is in motion and the travel control (1) is simply released to the neutral position as if coasting. The second mode activates when, after the travel control is released, it is rotated further toward the opposing direction. The braking force is greater with the second mode than with the first. The second mode is sometimes referred to as "plugging". Both modes are regenerative and therefore convert truck momentum back into energy to recharge the battery.

- While travelling, release the travel control (1).

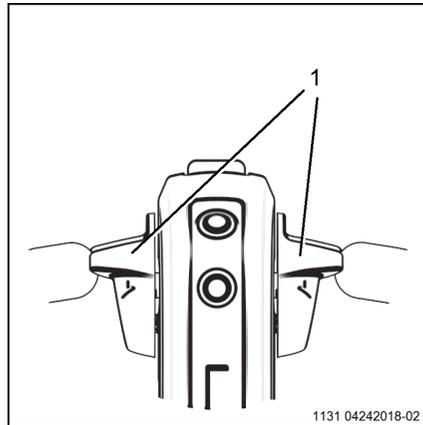
The truck will slow to a stop depending on the setting of the electric brake function.

 NOTE

*Slow or quick release of the travel control into the neutral position allows the braking action to be sensitively controlled, from gentle to hard braking.*

- While travelling, rotate the travel control toward the opposite direction until the truck has been electrically braked to a stop.

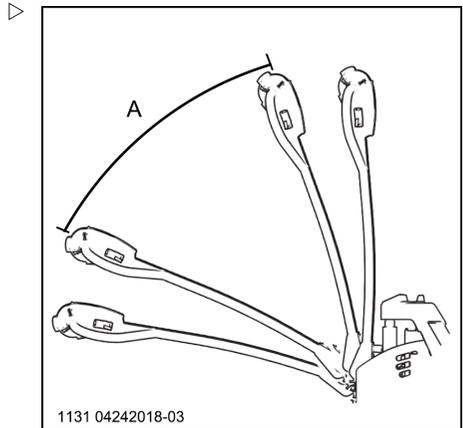
The truck will slow to a stop faster than if the travel control is simply released. After stopping, the truck will accelerate in the new direction unless the travel control is then released.



### Electro-Magnetic Brake

The mechanical brake is applied by spring force acting on the brake disc in the brake assembly. With the control handle in its operating range (A), initial movement of the travel control (1) will apply current to the brake coil. The coil then creates electromagnetic force to overcome the spring force and release the brake. The mechanical brake makes an audible click when engaging or disengaging. Whenever the travel control is released, the brake will engage when truck speed reaches zero. This provides an automatic parking brake.

The brake will also be applied if the handle is moved out of its operating range (A). If the truck is moving, it will immediately stop. Any time the key switch is turned off or the emergency stop handle is pulled, the brake will be applied to stop the truck.

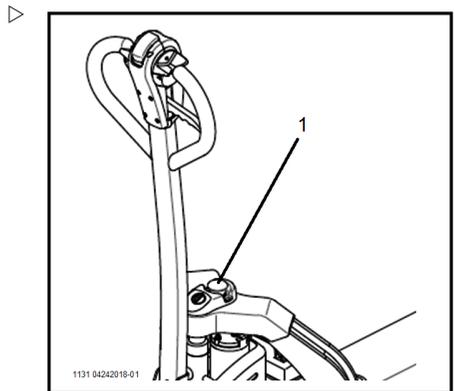


### Emergency Stop Button

Pressing the emergency stop button(1) will shut the truck off at any time. The battery will be disconnected and the electro-magnetic brake will immediately engage. If the truck is moving, it will immediately stop.

- To stop the truck, push the emergency stop button (1) straight down.

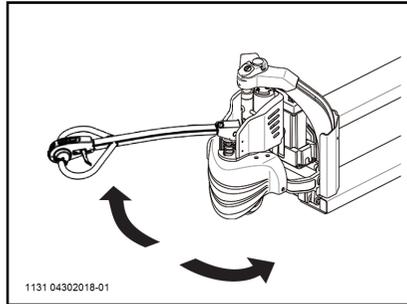
To resume operation, remove the key and twist the button clockwise slightly. It will pop back up into the operating position and the battery will be connected. The truck may then be switched on normally.



### Steering

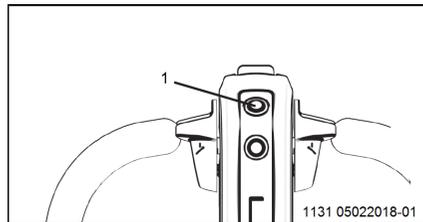
#### Steering

Steering the truck is done using the control handle. Manually moving it to the left or right will swivel the drive wheel. The truck then turns in forward or reverse according to the handle direction.



#### Horn

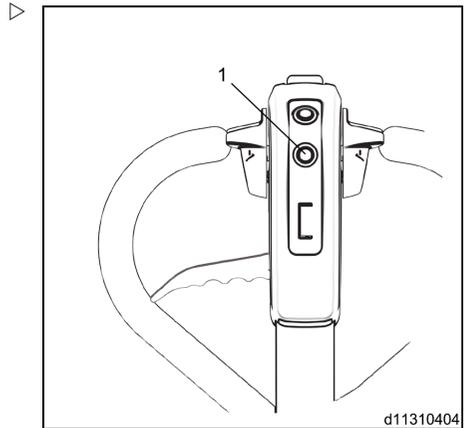
Press the horn button (1) on the control handle to sound the horn.



## Raising and Lowering the Forks

### Lifting

Raising the forks is controlled with a button (1) on the control handle. To raise the forks, press the button (1).



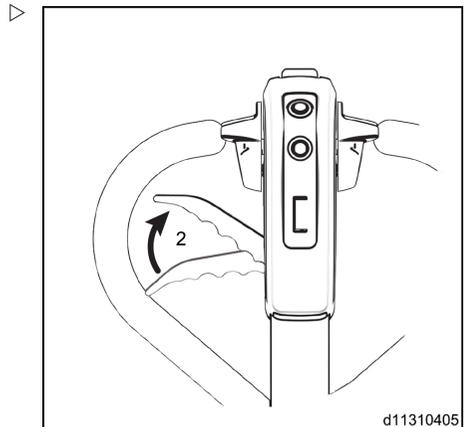
### Lowering

#### WARNING

When lowering the forks, feet can become pinched against the floor.

Make sure all personnel are clear of the forks before lowering them.

Lowering the forks is controlled with a lever (2). To lower the forks, squeeze the lever upward (2).



### Charging the Battery

## Charging the Battery

The truck is supplied with an external charger for the battery.

### ⚠ WARNING

Specialized training is required to handle batteries safely.

Batteries may only be charged by properly trained personnel in accordance with the following procedure.

### Charging Procedure

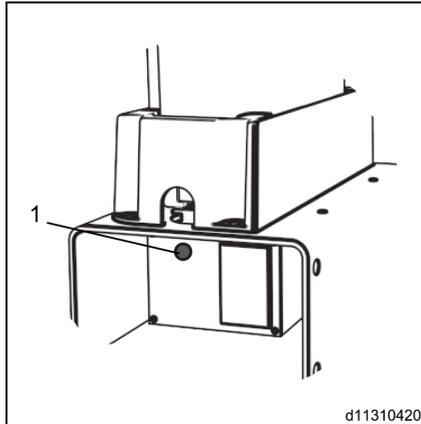
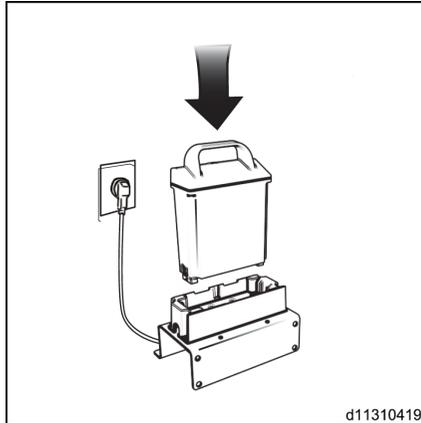
- Ensure the temperature of the area where charging will occur is between -4°F and 140°F (-20 and 60C)
- Plug the charger into a standard 110VAC wall outlet.
- Remove the battery from the truck and insert it into the charger.

### NOTE

*The battery will only go into the charger one way. Note the position of the contacts on the bottom of the battery and align with those on the charger before inserting the battery.*

- Observe the LED (1) on the charger base.

The light should be continuously red to indicate that the battery is charging. The light will turn to green when charging is completed. Charging should require about 2.5 hours. Charging time must not exceed 24 hours.



LED status	Description
Continuous red	Battery is charging
Continuous green	Charging is complete
Continuous yellow	Battery failure. Voltage is less than 22.4V or greater than 29.2V.

Flashing yellow	Charger failure. Output voltage or current is too high or charger temperature is too high
Flashing red	Charger failure. No output.

- Remove the battery from the charger when charging is complete.

** NOTE**

*A fully charged battery will provide approximately 3 hours of continuous use. Capacity will be reduced when used in low-temperature environments.*

- Unplug the charger when not in use.

** NOTE**

*If the battery is not used for an extended period, it must receive a supplementary charge every two months to prevent permanent damage to the battery.*

## Battery Removal and Installation

### Battery Removal and Installation

#### **⚠ WARNING**

Specialized training is required to handle batteries safely.

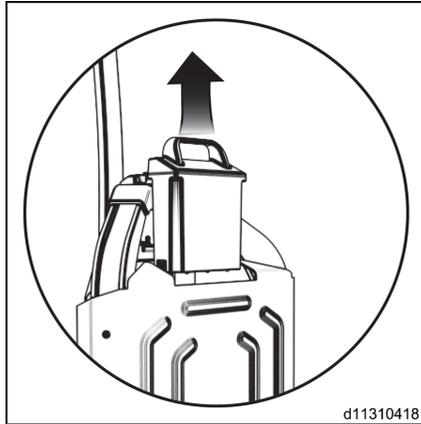
Batteries may only be changed by properly trained personnel in accordance with the instructions of the battery manufacturer and the following procedure.

The truck is equipped with a lithium-ion battery. The battery is easily removed and replaced by hand.

#### **⚠ WARNING**

Shorting of battery terminals can cause burns, electrical shock, or explosion.

Battery terminals are on the bottom of the battery. Do not place the battery on any conductive surface.



d11310418

#### **Battery Removal**

- Switch the truck off by removing the key.
- Press the emergency stop button.
- Grasp the battery handle and pull the battery straight up as shown.
- Store the battery in a dry area away from direct sunlight. Temperature must be above freezing but less than 95°F (35C).



#### **NOTE**

*If the battery is not used for an extended period, it must receive a supplementary charge every two months to prevent permanent damage to the battery.*

#### **Battery Installation**

The battery can only be installed in the truck one way. The arrangement of the contacts on the bottom of the battery must align with the contacts in the battery compartment.

- Ensure that the battery and especially its contact area is clean, dry, and free from damage.
- Ensure that the battery compartment and especially the contact area is clean and dry.

- Ensure that the truck is off and the emergency stop button is pressed.
- Position the battery over the battery compartment with its contacts aligned correctly.
- Lower the battery straight down into the battery compartment until it is firmly seated.
- Twist the emergency stop button slightly until it pops out.
- The truck may now be operated when the key is inserted.

## Hoisting the Truck

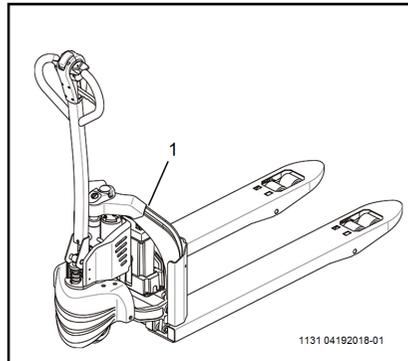
This section explains the attachment of lifting equipment to the truck for the purpose of hoisting. Many methods of rigging to a crane or hoist are possible. Explanation of such methods as well as operation of lifting equipment is outside the scope of this manual. Both the attachment of lifting equipment to the truck and the hoisting operation itself must be performed by personnel experienced in rigging.

### **⚠ WARNING**

Lifting equipment of insufficient capacity can fail and cause severe injury or death.

Ensure that all lifting slings, hardware, or other equipment has sufficient capacity to carry the weight of the truck. Refer to the truck data plate for truck weight. If a battery is installed, its weight must be added to the truck weight listed on the data plate.

- Switch the truck off and press the emergency stop button.
- Attach lifting equipment to each side of the cross member at position (1).
- Attach lifting equipment to the fork tips to keep the truck approximately horizontal as it is lifted.



5

---

## Maintenance

## Personnel Qualifications

Only qualified personnel authorized by the owner are permitted to perform maintenance or repair work. All items listed in the Scheduled Maintenance Charts must be performed by qualified forklift technicians only. They must have knowledge and experience sufficient to assess the condition of a forklift truck and the effectiveness of the protective equipment according to established principles for testing forklift trucks. Any evaluation of safety must

be unaffected by operational and economic conditions and must be conducted solely from a safety standpoint.

Daily inspection procedures and simple maintenance checks, e.g. checking the hydraulic oil level or checking the fluid level in the battery, may be performed by operators. This does not require training as described above.

## Cleaning the Truck

The need for cleaning depends on use of the truck. If highly aggressive media are involved, e.g. salt water, fertilizer, chemicals, cement etc., thorough cleaning is required after finishing the work assignment.

Hot steam or cleaning materials with a powerful degreasing effect should only be used with great caution as this will affect the grease filling of bearings with lifetime lubrication, causing it to escape. As re-lubrication is not possible, the bearings will be irreparably damaged.

When using compressed air for cleaning, remove stubborn soiling with cold cleaner.

During cleaning pay special attention to the oil filler openings and the surrounding areas as well as the lubricating nipples prior to greasing.

Run the truck immediately after cleaning to check operation and to aid in drying in case any motors became exposed to moisture.

### CAUTION

Never wash truck when switched on.

Switch the truck off and disconnect the battery before any cleaning operations.

### CAUTION

When cleaning with a water jet (high-pressure or steam cleaner etc.), it should not be applied directly to the drive unit, any electric or electronic components, connector plugs or insulating material. High pressure water also should not be applied directly to the operator controls on the control handle.

If this is unavoidable, the parts concerned should be covered up beforehand or only cleaned with a dry cloth or clean compressed air.



#### **⚠ WARNING**

To prevent accidents during maintenance activities, the truck must be secured against unintentional movement or start-up.

Before beginning any maintenance, the forks should be fully lowered, and the key switch turned off. The truck must remain in this state throughout the maintenance process except for individual maintenance activities that specifically require otherwise.

#### **Check for Fluid Leakage**

Check the entire truck as well as the surface beneath it for signs of fluid leakage.

#### **Check Forks and Chassis**

Inspect the forks, chassis, and if equipped, the load back rest for deformity, cracks, or other damage.

#### **Check Battery Connector**

Disconnect and reconnect the battery to confirm smooth operation. Inspect the battery connector and its cables for damage.

#### **Check Decal Condition**

Inspect all decals and the data/capacity plate for condition and legibility. Decal locations are given in the Overview section of this manual. Any damaged or unreadable decals must be replaced.

#### **Check Control Handle Pivot**

Check the pivot point where the control handle attaches to the chassis for smooth operation by moving the handle through its entire range.

#### **Check Operating Controls**

##### **Return Spring**

Pull the control handle down into its operating range and release it. It should return to the vertical position under spring tension.

#### **Brake Interlock - Handle**

Operate the truck in forward or reverse. Move the control handle all the way up or down out of the operating range without releasing the travel control. The drive system should switch off and the brake should engage after a delay.

#### **Brake Interlock - Travel Control**

Operate the truck in forward or reverse. Release the travel control without moving the control handle out of its operating range. The truck should slow to a stop using electric braking.

#### **Emergency Reverse Button**

Operate the truck forwards and press the emergency reverse button. The truck should stop and then move in the opposite direction until the button is released.

#### **Perform Operational Check**

Before returning the truck to service, perform an operational check of the following items:

- Electro magnetic brake (audible sound during engage/release)
- Multi-function display/battery discharge indicator
- Horn
- Forward and reverse travel
- Electric braking (plugging)
- Fork lift and lower function (operate through complete range of motion)
- Working lights (if equipped)

#### **⚠ CAUTION**

Excessive noise during hydraulic function operation indicates low hydraulic fluid.

This condition must be checked and corrected immediately to avoid damage to the hydraulic pump.

## Routine Lubrication and Inspection

### Routine Lubrication and Inspection Intervals

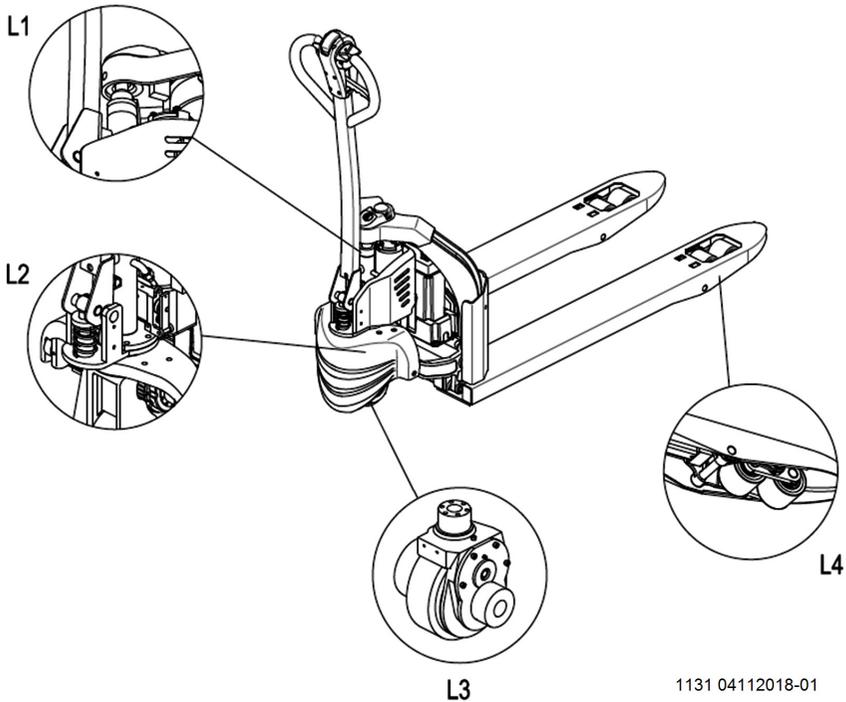
The items in this section must be performed based on usage and environment. They do not need to be performed daily but may require completion more frequently than the major scheduled maintenance intervals. These intervals can often be based on maintenance experience by those familiar with equipment in the given environment. Intervals given herein for specific items however must not be exceeded in any case. Your Linde dealer will be able to provide application-specific interval recommendations if required.

## Routine Lubrication and Inspection

### Lubrication Points

The illustrated components must be lubricated periodically. Grease should be applied by hand or brush.

### Components Requiring Lubrication



L1 Lift cylinder pivot ball  
L2 Steering bearing

L3 Drive wheel bearings  
L4 Load wheel bearings

1131 04112018-01

## Scheduled Maintenance

### General Maintenance Information

This section contains all information required to determine when the truck must be serviced and what must be done. This information is presented as scheduled maintenance charts on the following pages. Be sure to perform maintenance within the time limit given in the maintenance charts. Proper and timely maintenance is essential to obtain the full operability, performance and service life from the truck, and is a prerequisite for any warranty claims.

### Maintenance Intervals

Maintenance intervals are based on operating hours but are also subject to the maximum intervals (based on years in service) listed at the top of each chart.

All lubrication and service intervals must be reduced for dusty conditions, large temperature fluctuations or intensive use.

### Scheduled Maintenance Charts

The scheduled maintenance charts provide a list of maintenance tasks and associated time intervals at which they must be carried out. Tasks listed under successive intervals are not cumulative; only the additional tasks required are listed under successive intervals.

Use only high-quality lubricants or other materials meeting the specifications listed in Fluid and Lubricant Specifications. All work must be performed only by qualified forklift technicians. Custom-fitted equipment is not covered by the scheduled maintenance charts. If such equipment is installed, refer to the manufacturer's documentation for maintenance requirements.

## Scheduled Maintenance

### Maintenance Schedule

<b>Additional servicing work to be performed every 1000 hours or every 6 months.</b>
<b>Functions and controls</b>
Check mounting of controller and contactor.
Check that cables are free from damage and that terminals are firmly attached.
<b>Power and drive system</b>
Check whether battery cables are damaged and replace if necessary.
Check the battery charging connector.
Check battery and battery compartment for damage and liquid ingress.
Check the wheel bearings and their mounting.
Inspect the drive unit support casting for damaged or loose mounting.
Check the gearbox for abnormal sound and leakage.
<b>Hydraulics</b>
Check hoses, pipes and interfaces for damage and ensure their tightness and sealing.
Check lift cylinder for leaks.
Check pump unit for leaks.
Check the hydraulic oil level.
<b>Brake system</b>
Check the electromagnetic brake air gap.
<b>Lifting system</b>
Check link mechanism for wear or damage.
Check whether pin shaft is fixed securely.
Check and lubricate moving parts on link mechanism.
<b>Other</b>
Check connections between nuts and bolts.
Check that labels are clear and complete.
Check covers for cracks.
<b>Additional servicing work to be performed every 2000 hours or every 12 months, in addition to the 1000-hour servicing work:</b>
<b>Functions and controls</b>
Check error message record and operating time.

<b>Additional servicing work to be performed every 2000 hours or every 12 months, in addition to the 1000-hour servicing work:</b>
<b>Power and drive system</b>
Check bearing positions for noise.
Add gearbox grease.
Check driving speeds.
<b>Hydraulics</b>
Check lift cylinder for damage and ensure that they are properly secured.
Change hydraulic oil.
Check overflow pressure.
<b>Brake system</b>
Check braking distance of electromagnetic brakes.
<b>Lifting system</b>
Check lifting and lowering speeds.
<b>Other</b>
Check chassis for cracks or damage.

## Fluids and Lubricants

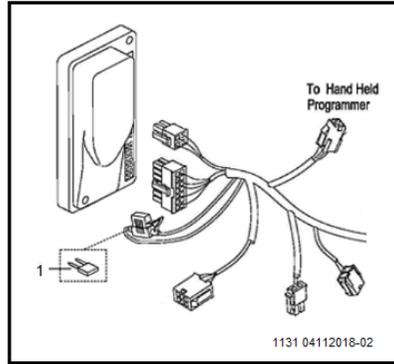
### Lubricant Specifications and Capacities

Fluid or Lubricant	Specification	Capacity	Position used
Antifriction hydraulic oil	L-HM46	0.17-0.19 qt (0.16–0.18 L)	Hydraulics
Antifriction hydraulic oil (cold stores)	L-HV32		
Multi-purpose lubricating grease	Polylub GA352P	As appropriate	Sliding surfaces
Moly lithium grease no. 3	–	35 oz (100 g)	Transmission

# Troubleshooting

## Fuses

A single 5A fuse (1) is located in a fuse holder incorporated into the wiring harness near the truck controller.

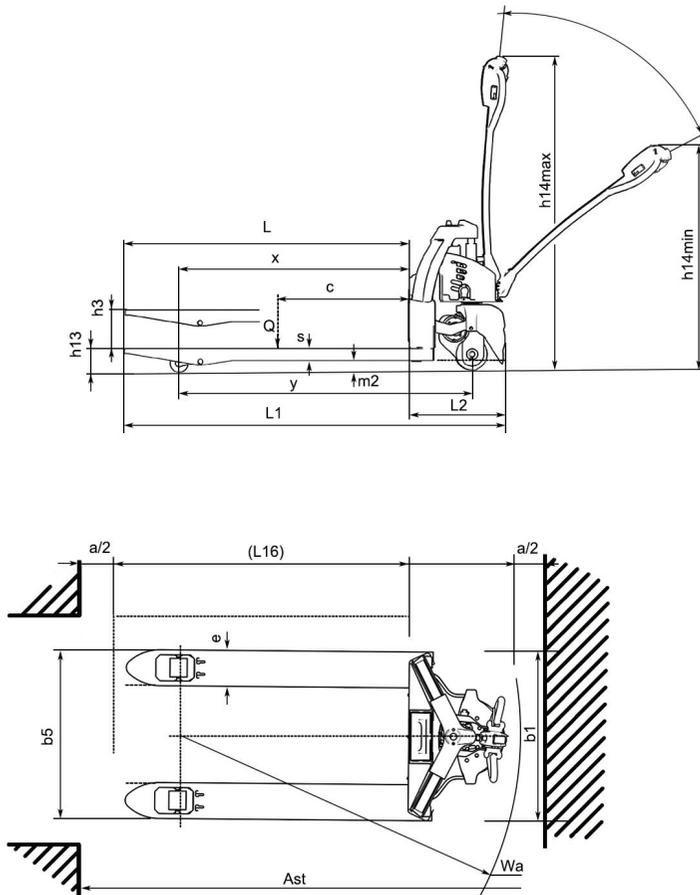


6

---

## Technical Data

# Specifications



d11310601

Description		
1.1	Manufacturer	Linde
1.2	Model	MT12
1.3	Drive type	Electric
1.4	Operation: manual, accompanied, standing, seated, order picking	Accompanied
1.5	Nominal load capacity (Q)	2600 lb (1200 kg)
1.6	Load center (c)	24 in. (600 mm)
1.8	Axle center to fork face (x) (lowered/raised)	37.4 / 34.6 in (950/880 mm)
1.9	Wheelbase (y) (lowered/raised)	46.8 / 44.1 in (1190/1120 mm)

Weight		
2.1	Service weight	Refer to vehicle data plate

Wheels		
3.1	Tire type (drive/load)	poly/poly
3.2	Drive wheel size Ø x w	8.25 x 2.75 in (210 x 70 mm)
3.3	Load wheel size Ø x w	3 x 2.5 in (80 x 60 mm)
3.5	Wheels, number drive/load (x=traction)	1x+4

Dimensions		
4.4	Lift height (h3)	4.3 in (110 mm)
4.9	Handle height, travel position (min./max.) (h14)	31.5/46.8 in (800/1190 mm)
4.15	Fork height, lowered (h13)	3 in (80 mm)
4.19	Overall length (l1)	60.3 in (1540 mm)
4.20	Length to fork face (l2)	15.4 in (390 mm)
4.21	Total width, standard forks (b1)	27 in (685 mm)
4.22	Dimensions of forks (s/e/l)	2x6x45 in (nom) (50x150x1150 mm)
4.25	Fork spread, standard forks (outside of forks) (b5)	27 in (685 mm)
4.32	Ground clearance at centre of wheelbase, with load (m2)	1 in (27 mm)
4.34	Aisle width with 800 x 1200 mm pallet along forks (Ast)	81.2 in (2062 mm)
4.35	Turning radius (Wa)	54.7 in (1390 mm)

## Specifications

Performance data		
5.1	Driving speed, full load/no load	2.5/2.8 mph (4.0/4.5 km/h)
5.2	Lifting speed, full load/no load	3.9/4.9 fpm (0.02/0.025 m/s)
5.3	Lowering speed, full load/no load	11.8/5.9 fpm (0.06/0.03 m/s)
5.8	Maximum climbing ability, with/without load	4/10 %
5.10	Brake type	Electromagnetic

Drive		
6.1	Traction motor rating S2 60 min	0.87 hp (0.65 kW)
6.2	Lifting motor rating at S3 15%	0.67 hp (0.5 kW)
6.3	Battery according to DIN 43531/35/36 A, B, C, no	Lithium battery
6.4	Battery voltage, nominal capacity K5	24 V / 20 Ah
6.5	Battery weight ( $\pm 10\%$ )	Refer to vehicle data plate

Other		
8.1	Drive type	DC
8.4	Noise level at operator's ear	<74 dB(A)

**B**

Battery	
Charging	30
Removal and replacement	32
Battery acid, safety information	10
Before operation	6
Brake system	26

**C**

California Health & Safety Code	II
Capacities, lubricants	43
Capacity, load	
lifting	18
Cleaning the truck	36
Commissioning, new truck	22
Controls	
key switch	23

**D**

Daily maintenance inspection	37
Data plate	11, 18
Description, technical	14
Display	17
Driving	24

**E**

Electric braking	26
Emergency reverse button	25
Emergency stop button	27

**F**

Fuses	44
-------	----

**H**

Hazardous substances	9
Hoisting the truck	34
Horn	28
Hydraulic oil	
safety information	10

**I**

Inclines, Ramps, Docks, Elevators	7
-----------------------------------	---

Initial commissioning, (new truck)	22
------------------------------------	----

**L**

Lifting	29
Lifting capacity	18
Lifting the truck	34
Load capacity	
lifting	18
Lowering the forks	29
Lubricants, specifications and capacities	43
Lubrication, periodic	40

**M**

Maintenance	
general information	41
interval information	41
Maintenance schedule	42
Mechanical brake	27

**N**

New truck, preparing for operation	22
------------------------------------	----

**O**

Oils	
safety information	9

**P**

Parking	8
Personnel qualifications for maintenance	9, 36
Preventive maintenance schedule	42
Proposition 65	II

**Q**

Qualifications for maintenance personnel	9, 36
--	-------

**R**

Raising the forks	29
Regenerative braking	26



<b>S</b>	
Scheduled maintenance (see also Maintenance)	
charts . . . . .	41
general information . . . . .	41
Scheduled maintenance charts . . . . .	42
Shut-down procedure . . . . .	23
	Specifications . . . . . 46
	Lubricants . . . . . 43
	Start-up procedure . . . . . 23
	Static-return-to-neutral . . . . . 23
	Steering . . . . . 28
	<b>W</b>
	Wheel nuts, tightening . . . . . 22



**KION North America Corporation**

1131 series 11318011540 rv01 US – 04-2018