Linde Material Handling

1101-02 series Electric Pallet Truck

Operating Instructions

Models EW 30, EWR 30, EW 40, EWR 40

1101-02 series EW/EWR –
11018011640 rv02 US - 03/2020

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

1 Introduction

2 Safety

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1

Introduction

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 instructions 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 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

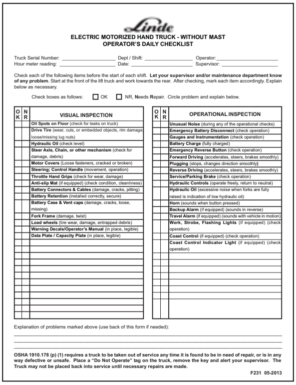
Unauthorized modifications to the truck can result in injury or death.

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.



Linde

ELECTRIC MOTORIZED HAND TRUCK - WITHOUT MAST
OPERATOR’S DAILY CHECKLIST

Truck Serial Number: ____________ Dept / Shift: ____________ Operator: ____________
Hour meter reading: ____________ Date: ____________ Supervisor: ____________

Check each of the following items before the start of each shift. **Let your supervisor and/or maintenance department know of any problem**. Start at the front of the lift truck and work towards the rear. After checking, mark each item accordingly. Explain below as necessary.

Check boxes as follows: ☐ OK ☐ NR, **N**eeds **R**epair. Circle problem and explain below.

OK	NR	VISUAL INSPECTION
		Oil Spots on Floor (check for leaks on truck)
		Drive Tire (wear, cuts, or embedded objects, rim damage, loose/missing lug nuts)
		Hydraulic Oil (check level)
		Steer Axle, Chain, or other mechanism (check for damage, debris)
		Motor Covers (Loose fasteners, cracked or broken)
		Steering; Control Handle (movement, operation)
		Throttle Hand Grips (check for wear, damage)
		Anti-slip Mat (if equipped) (check condition, cleanliness)
		Battery Connectors & Cables (damage, cracks, pitting)
		Battery Retention (installed correctly, secure)
		Battery Case & Vent caps (damage, cracks, loose, missing)
		Fork Frame (damage. twist)
		Load wheels (tire wear, damage, entrapped debris)
		Warning Decals/Operator's Manual (in place, legible)
		Data Plate / Capacity Plate (in place, legible)

OK	NR	OPERATIONAL INSPECTION
		Unusual Noise (during any of the operational checks)
		Emergency Battery Disconnect (check operation)
		Gauges and Instrumentation (check operation)
		Battery Charge (fully charged)
		Emergency Reverse Button (check operation)
		Forward Driving (accelerates, steers, brakes smoothly)
		Plugging (stops, changes direction smoothly)
		Reverse Driving (accelerates, steers, brakes smoothly)
		Service/Parking Brake (check operation)
		Hydraulic Controls (operate freely, return to neutral)
		Hydraulic Oil (excessive noise when forks are fully raised is indication of low hydraulic oil)
		Horn (sounds when button pressed)
		Backup Alarm (if equipped) (sounds in reverse)
		Travel Alarm (if equipped) (sounds with vehicle in motion)
		Work, Strobe, Flashing Lights (if equipped) (check operation)
		Coast Control (if equipped) (check operation)
		Coast Control Indicator Light (if equipped) (check operation)

Explanation of problems marked above (use back of this form if needed):

OSHA 1910.178 (p) (1) requires a truck to be taken out of service any time it is found to be in need of repair, or is in any way defective or unsafe. Place a “Do Not Operate” tag on the truck, remove the key and alert your supervisor. The Truck may not be placed back into service until necessary repairs are made.

F231 05-2013

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.

⚠ 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.

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 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.

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.

⚠ 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 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.

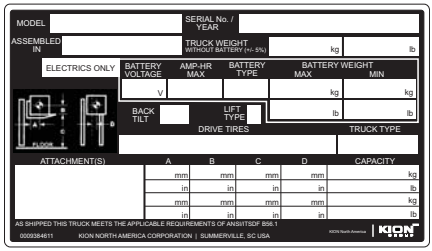
- When working with battery acid, always wear protective clothing and eye protection.
- Do not allow any acid to get onto clothing or skin or into the eyes; if this does happen, rinse immediately with plenty of clean water.
- In case of injury, seek medical advice immediately.
- Immediately rinse away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

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.

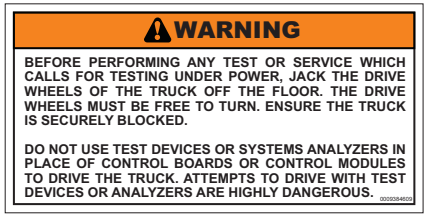
Some pallet trucks are designed for riding. If so, this decal will not be present.

Trained operator warning decal

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

Test or service warning decal

This decal gives important safety information for personnel servicing or testing the truck.



Voltage decal

This decal indicates the proper battery voltage for the truck's electrical system. Using a battery of wrong voltage could damage the truck.

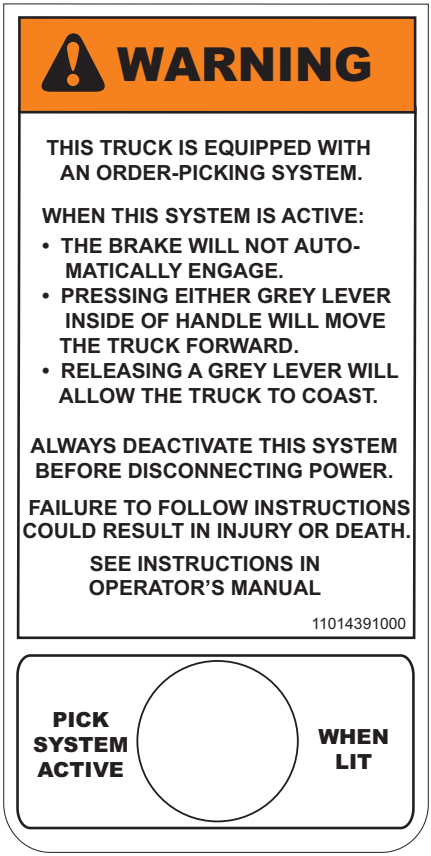
Platform surface warning decal

This decal warns operators not to operate the truck if the anti-slip mat on the riding platform is worn, damaged, or slippery due to contamination from liquids. This decal is only present on models designed for riding.

Operator Warning Decals

Order picking system decal ▷

This decal warns the operator to note characteristics of the optional order picking system. If present, this decal will be located on the control handle. When activated, this order picking system will hold the handle in the operating position and the brake will not automatically engage. The truck may also be jogged forward with the grey levers located on the inside of the control handle grip area. When the light in the center of the decal is on, it indicates that the system is active. If the truck is not equipped with the order picking system, this decal will not be present.



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Overview

Technical Description

General

The 1101 series electric pallet truck is available in both a "walkie" version (EW) and a walk/ride version (EWR). All models are ITA class 3 trucks. They are designed for handling loads up to:

6000 pounds (2.7 metric tons) for EW 30 & EWR 30

8000 pounds (3.6 metric tons) for EW 40 & EWR 40.

This capacity may be downrated in special circumstances. Exact capacity limits for individual vehicles are found on the data plate.

Drive unit

The drive unit is comprised of a 24-volt brushless AC drive motor mounted vertically to a reduction gear unit. The drive unit pivots in the chassis via the control handle to determine drive wheel direction. An electric brake is installed at the top end of the drive motor for use as a parking brake or emergency brake. The brake engages whenever the control handle is released to the vertical position or forced all the way down to the horizontal position.

Travel control

Travel speed and direction is controlled through a twist grip travel control at the top of the control handle. When the travel control is released, the truck will decelerate via regenerative braking. More aggressive slowing is available by rotating the travel control in the opposing direction. The degree of braking for both of these functions is adjustable in the truck control software.

Hydraulic system

The hydraulic system utilizes fluid pressurized by a hydraulic pump driven by a DC pump motor connected to the battery through the truck controller. The pump motor is part of an integrated hydraulic pump unit which also contains the pump, a manifold block, a lowering solenoid valve, and a hydraulic oil reservoir. During lifting, pressurized hydraulic fluid from the pump is routed through a check valve to a lift cylinder. The lift cylinder operates the tie bar linkage to elevate the forks. Lowering occurs by gravity when the lowering solenoid is activated. The weight of the forks (and any load) then acts through the linkage to force hydraulic fluid out of the cylinder and back to the reservoir.

Steering system

Manual or electric steering variants are available.

On manually steered trucks, the control handle is mechanically connected to the drive unit through a solid bar. Manual force is therefore directly applied to pivot the drive wheel.

Electric steering is accomplished through a brushless AC electric motor geared to the drive unit through a ring and pinion. The electric steering motor is controlled by a dedicated transistorized motor controller. The controller compares control handle position to motor position and operates the motor as necessary to track the handle position as it is moved by the operator.

Load lifting system

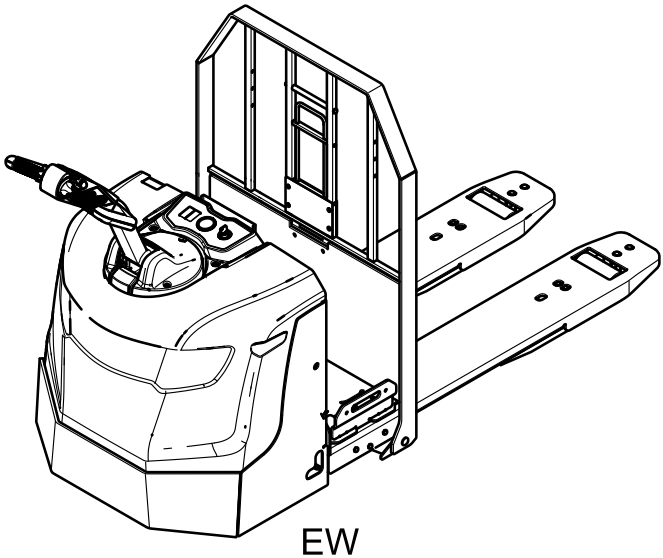
Load on the forks is elevated through a hydraulically activated linkage. The linkage consists of a lift shaft at the base of the battery compartment connected through tie bars to toggles at each load wheel. The lift shaft is rotated by the hydraulic lift cylinder described previously.

Electrical system

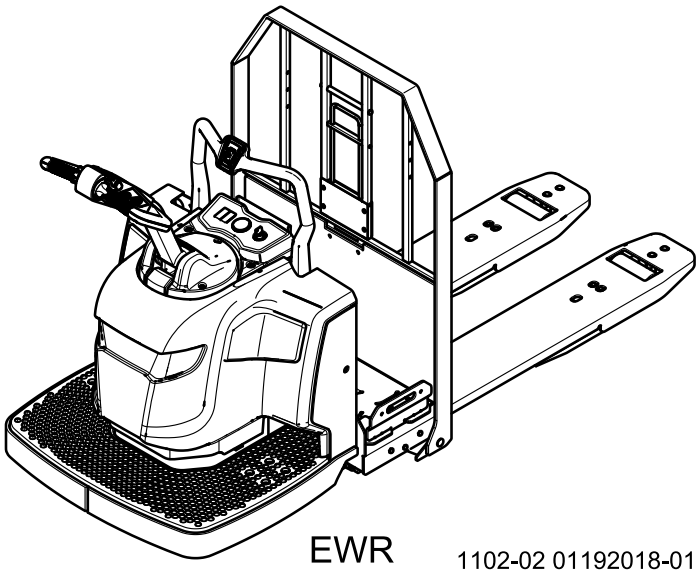
The truck is equipped with a 24-volt electrical system. A single line contactor controls power to the system once the key switch is on. All travel and lift function is controlled by a transistorized main controller. The main controller contains both control logic and an array of power transistors for the drive motor. 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 drive motor. One fuse for the power circuit is present. A number of control fuses are used for the remainder of the system and certain options. A diagnostic connector is provided in the wiring harness to connect a handset or laptop computer to the controller for diagnostics or adjustment of certain performance parameters.

Model Illustrations



EW



EWR

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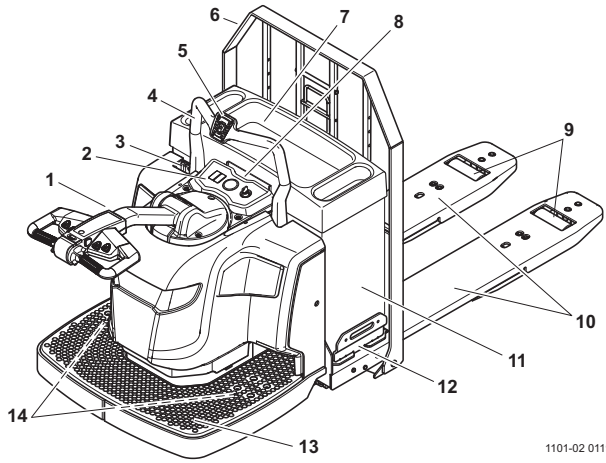
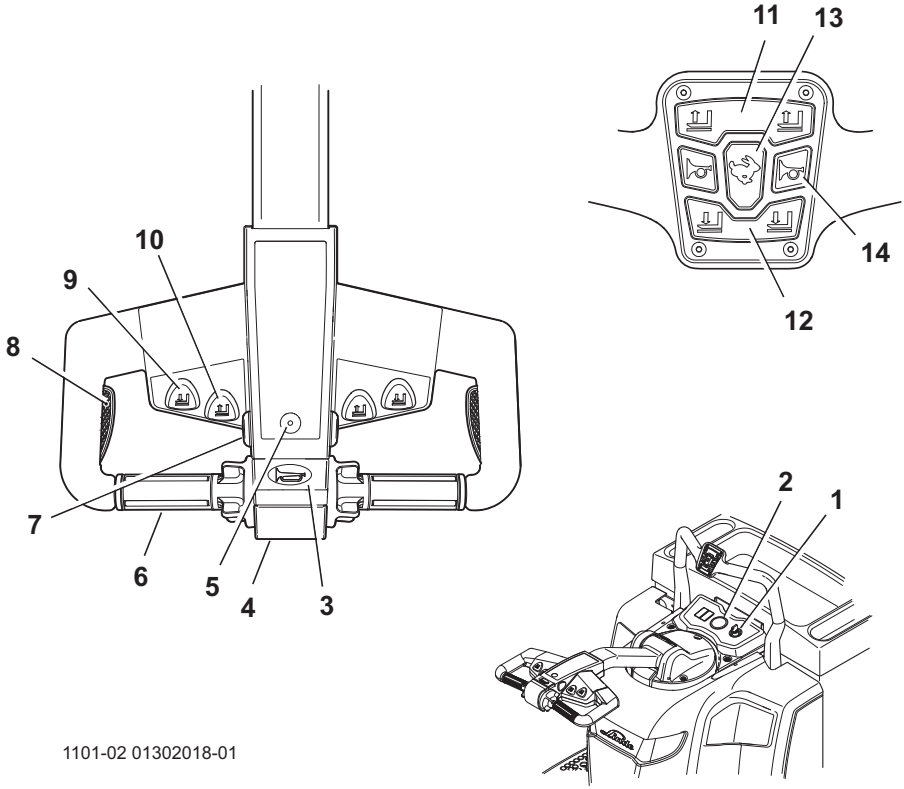
Truck Components



1	Control handle	8	Operator manual storage
2	Dash panel	9	Load wheels
3	Battery connector	10	Forks
4	Grab bar (EWR only)	11	Battery compartment
5	Auxiliary buttons (EWR only)	12	Battery retainer (optional)
6	Load back rest (optional)	13	Riding platform (EWR only)
7	Accessory tray (optional)	14	Casters (standard on EWR; optional on EW)

Controls



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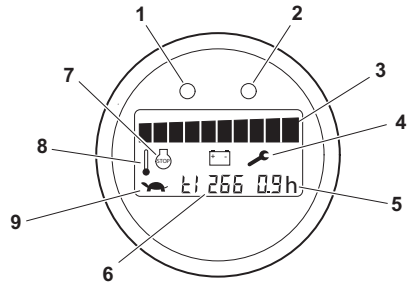
1 Key switch
2 Indicator unit
3 Horn button
4 Emergency reverse button
5 Coast control indicator light (optional)
6 Travel control
7 Order pick activation button (optional)
8 Lever switches for low-speed function (or optional order picking system)
9 Lowering button
10 Lift button
11 Auxiliary lift button (rider trucks only)
12 Auxiliary lowering button (rider trucks only)
13 High speed travel button (rider trucks only)
14 Auxiliary horn button (rider trucks only)

Display Unit



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The indicator unit is located beside the key switch. It displays accumulated hours, battery state of charge, and fault codes. When the key is first switched on, the red fault LED will briefly light. If there are no faults, accumulated hours and battery state of charge are then displayed throughout truck operation.

Fault indicator (red) (1) Lights when a fault is present. (This also occurs when a programmed maintenance interval has been reached.)

Truck On indicator (green) (2) Lights when the truck is switched on.

Battery discharge indicator segments (3) Shows the current charge state of the battery.

The discharge status of the battery is represented by ten segments. These segments go out successively as the battery becomes increasingly discharged. All ten segments are visible if the battery is greater than 90% charged. As the battery discharges, the segments will go out from right to left. The last segment will flash as the battery approaches complete discharge.

Service due icon (4) Appears when the next service interval is within a programmed range. The icon will flash when the next service interval is actually reached. Truck performance may be limited based on preferences set in the truck program.

Operating hours (5) and fault code display (6)

When the key is switched on, the accumulated operating hours are displayed to the nearest tenth. The hour meter accumulates time only when the drive motor or pump motor is operating. The decimal point will flash when the truck is accumulating hours. If a fault is present in the truck, the display will alternate between the associated fault code and the hour meter value. If more than one fault code is active, each fault code will be successively displayed.

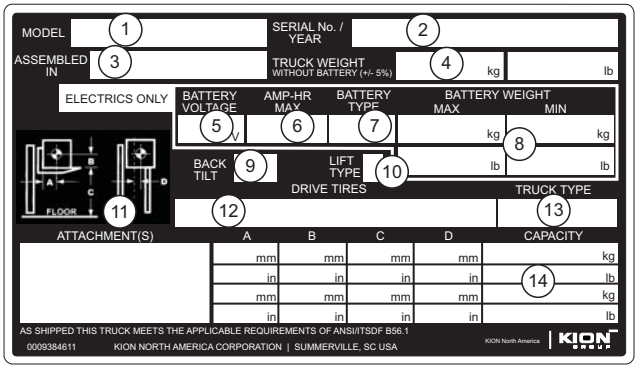
Faults involving the start-up sequence (handle or throttle out of position at start-up) will clear automatically when the handle or throttle is returned to the proper position. Other faults will require the key switch to be turned off and then back on after the fault condition is corrected in order to clear the fault from the display.

Fault code icon (7) Appears whenever a fault is active.

Temperature icon (8) Appears if the truck controller temperature exceeds 185 ºF (85C).

Low Speed icon (9) Appears whenever the low speed (creep) function is active.

Data Plate



(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

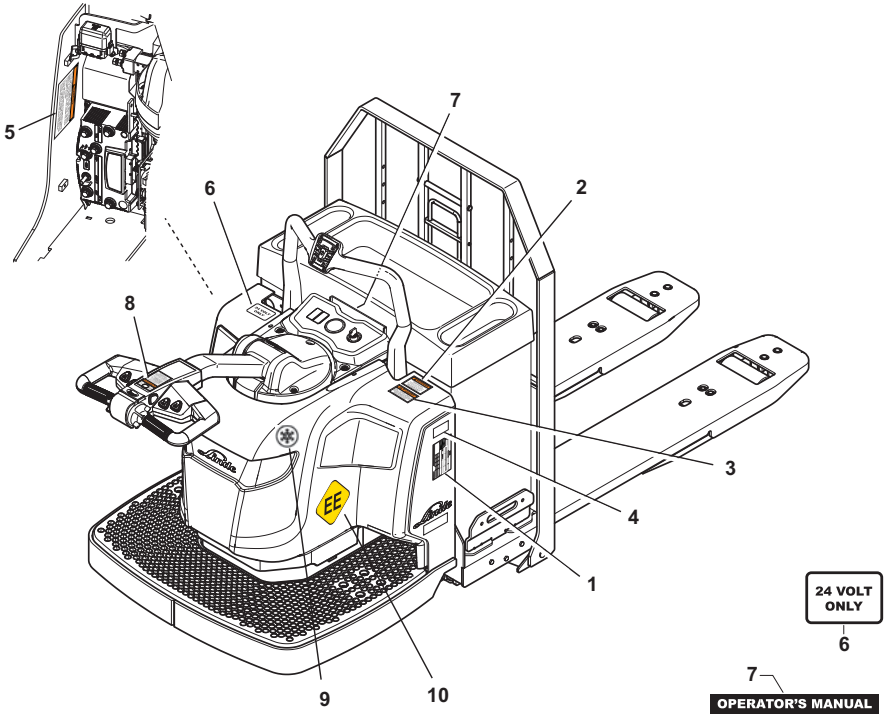
(11) **(Diagram)** – illustrates the dimensions A, B, C, and D used in CAPACITY chart (14).

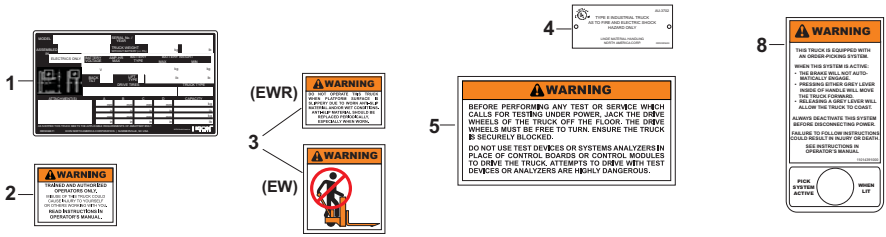
(12) **DRIVE TIRES** – shows the required size and type of drive tire.

(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





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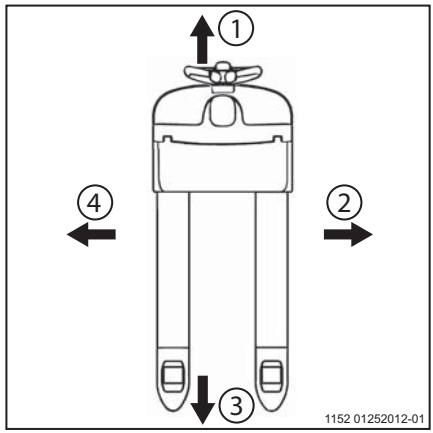
1 Data plate
2 Warning Decal, Trained Operator
3 (EWR) Warning Decal, Platform Surface
3 (EW) Warning Decal, No Riders
4 Plate, UL Classification
5 Warning Decal, Service Work
6 Decal, Voltage
7 Decal, Operator Manual Location
8 Warning Decal, Order Pick System (optional)
9 Cold Storage Decal (optional)
10 EE Designation Decal (optional)

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.

Options

Trucks may be equipped with the following options:

- Load backrest
- Accessory tray
- Battery rollers
- Travel alarm
- Shrink wrap holder
- Various drive tire types
- Caster wheels (standard on EWR)
- Greasable caster wheel axles
- Order pick system
- Wash-down protection
- Cold storage protection
- Electric steer assist

4

Operation

Unloading and Preparing a New Truck for Operation

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

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

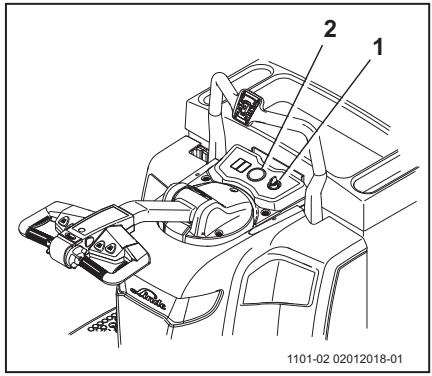
The truck can then be operated at full speed immediately upon being placed in service. However, during the first 50 operating hours, avoid subjecting the drive motors or hydraulic system to high continuous loads.

⚠ 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. See the procedure for checking the drive wheel in the Maintenance section.

Turning the Truck On and Off ▷



Switching the truck on

To turn the truck on, make sure the travel control is released to the neutral position. Turn the key switch (1) clockwise. The green light on the indicator unit (2) should come on. The red light should come on briefly. This is then followed by the battery charge state and the accumulated operating hours on the truck. Battery charge and operating hours are displayed continuously from this point on until the key switch is turned off.

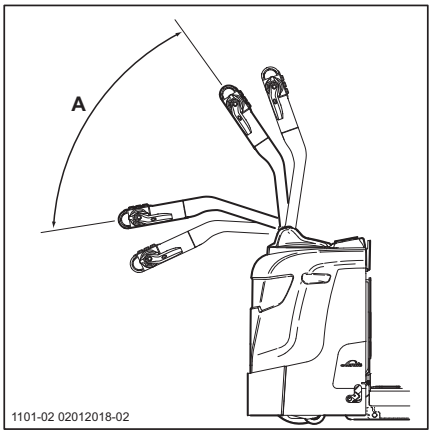
The truck is equipped with a static-return-to-neutral function. If the travel control is out of the neutral position at start-up, fault code t 307 will be displayed and the red fault indicator will come on. This fault may be cleared by releasing the travel control.

Also, if the lift, lower, emergency reverse, or high-speed (rider trucks only) buttons are held in at start-up, then an out-of-sequence fault (and red light) will be displayed depending on which button is causing the fault. Correcting the fault condition will clear the fault unless the emergency reverse button is held in at start-up. In this case, the key switch must be turned off and back on to clear the fault and enable operation.

Switching the truck off

To turn the truck off, turn the key switch counter-clockwise to the vertical position. 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. 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).

NOTE

The travel function is disabled whenever the handle is outside its operating range. When the handle is vertical, a creep-speed feature may be used if desired. This is explained in a separate section.

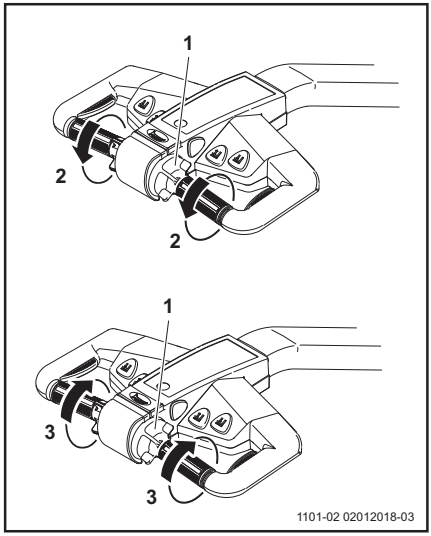
Forward motion

- With the control handle in the working range, press the upper part of the travel control (1) so that it rotates in the direction shown (2).

The truck will move forward. The speed is proportional to the amount of control rotation. Remain at arm's length beside the truck during forward motion unless riding on a rider (EWR) version. Use only the hand nearest the truck to operate the travel control during forward walking operation. Always keep one hand on the grab bar (EWR models only) if riding.

Reverse

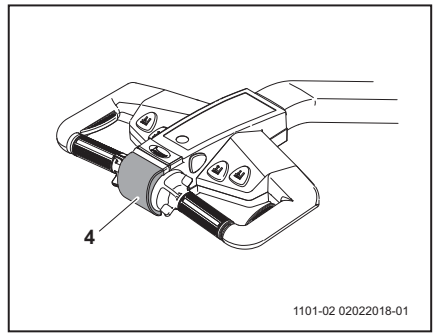
- With the control handle in the working range, press the lower section of the travel control so that it rotates in the direction shown (3).



The truck will move in reverse. The speed is proportional to the amount of control rotation. Remain in front of the truck while operating in reverse unless riding on a rider (EWR) version. Keep two hands on the control handle during reverse walking operation. Always keep one hand on the grab bar (EWR models only) if riding.

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 or 5 seconds elapses. When the button is released, the truck is ready for normal operation again.



Changing direction

➢ To change direction at any time during travel, release the travel control and rotate 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.

Riding ▷

Some models are equipped for riding. These versions have a rigid grab bar (5) to hold while riding. If the truck does not have the grab bar, it is not designed for riding and riding is not permitted. Rider versions also have a dedicated platform to stand on while riding.

⚠ WARNING

Riding trucks without a grab bar and platform can cause injury.

Trucks without a grab bar and platform are not intended for riding. Do not ride any truck that is not equipped with a grab bar and platform.

Rider models are equipped with a high-speed travel button (6) located on the grab bar. This button will allow the truck to reach a higher speed than that used during walking

operation. After the travel control is moved out of neutral, pressing the high-speed travel button will enable the increased speed range. The button does not need to be held in. The high-speed function will latch and remain on as long as the travel control is not released to neutral. Whenever the travel control reaches neutral, the high-speed function is cancelled. If high speed is desired again, the button must be pressed again after moving the travel control out of neutral.

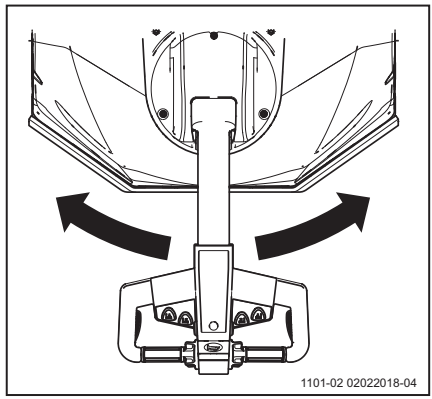
⚠ WARNING

Use of the high-speed function if not in a stable riding position can cause accident and injury.

Always ensure a stable riding position and keep one hand on the grab bar while using the high-speed function. Do not use the high-speed function during walking operation.

Steering

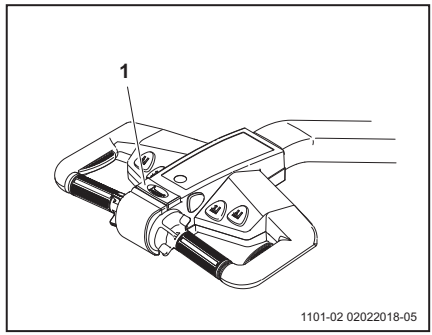
Steering the truck is done using the control handle. Manually moving it to the left or right will swivel the drive wheel. The truck then turns in forward or reverse according to the handle direction.

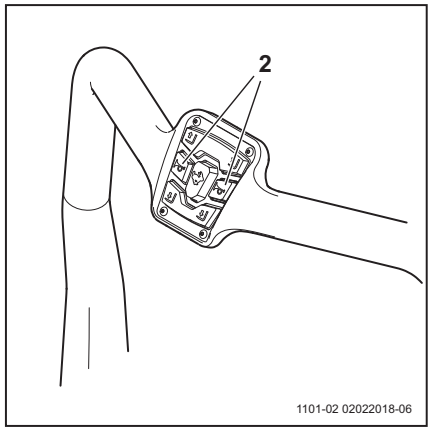


Horn

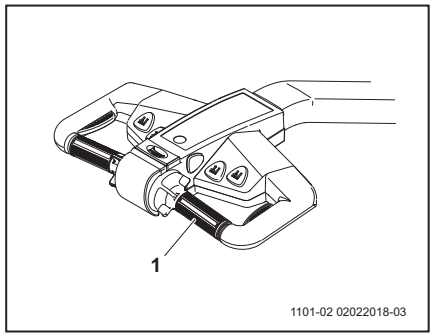
Press the horn button (1) on the control handle to sound the horn.

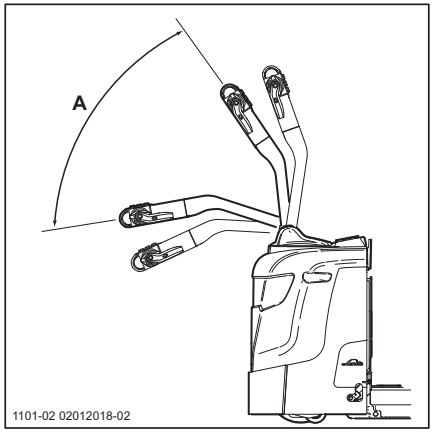
If the truck is a rider model, additional horn buttons (2) are provided on the grab bar. Either button will sound the horn.





Braking





The truck has electric braking built in to the motor control equipment and an electromagnetic parking brake on the drive unit. Electric braking is controlled by the position of the travel control (1). The parking brake is activated separately by the truck controller.

Electric Braking

There are two modes of electric braking. The first mode activates when the travel control is eased towards the neutral position. The second mode activates if the travel control is rotated 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. The amount of braking force that occurs in each of these modes is adjustable in the truck control program.

- 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. This form of braking will also occur if the control handle moves out of its operating range (A).

Parking Brake

Whenever the travel control is released, the parking brake is applied automatically once truck speed drops below a pre-set creep speed for a programmed amount of time. Also, the parking brake is applied immediately whenever power is switched off or lost. For normal operation on flat surfaces, the truck will become stationary before the brake sets. If the truck is on an incline, it will creep down the incline until the time delay expires and sets the brake. Always switch the truck off if it must be stopped on an incline. This will immediately engage the parking brake.

Raising and Lowering the Forks

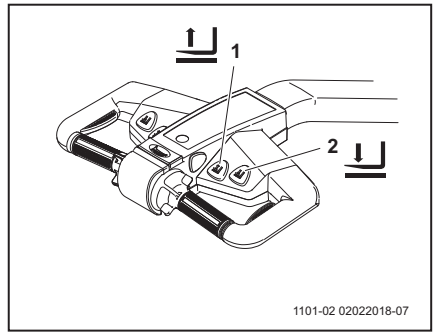
⚠ WARNING

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

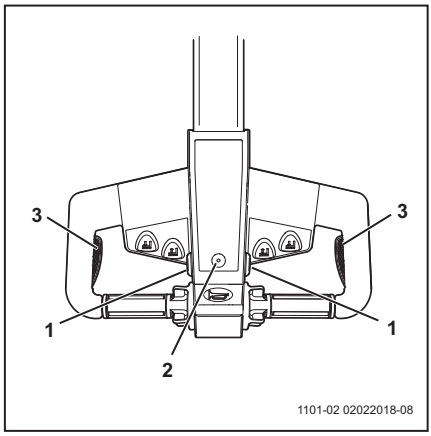
Make sure all personnel are clear of the forks before lowering them.

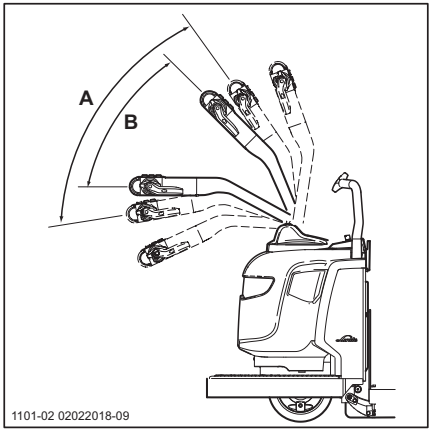
Raising and lowering of the forks is controlled through buttons on either side of the control handle. To raise the forks, press either lift button(1). To lower the forks, press either lowering button (2). Note the symbols on the buttons.

On rider models, additional lift and lower buttons are provided on the grab bar. Their function is identical to the buttons in the control handle.



Order Picking System (Optional equipment) ▷





Rider trucks may be equipped with an optional order picking system. This system is intended to allow efficient movement of the truck for short distances during order picking activities where materials are placed on or removed from the truck. The order picking system provides a band clamp at the control handle pivot to hold the handle in the operating position. The lever switches on each inner side of the control handle can then be used to move the truck forward slightly without having to twist the travel control. Before these features will function, the system must be activated by pushing either of two activation buttons on the control handle. Whenever the system is active, a yellow indicator light on the handle arm will turn on.

- ➢ To use the system, hold the control handle within the order picking range (B) and push the activation button (1). Confirm that the yellow indicator (2) comes on. The order picking handle range is inside the normal operating range (A).
- ➢ Let go of the handle and confirm that it remains in position. Note that the system does not lock the handle into position. It only suppresses the action of the handle return spring. The handle can be moved manually at any time if necessary.

⚠ WARNING

When the lever switch is released, the truck will coast to a stop.

Before moving the truck, ensure that there is adequate room for the truck to coast to a stop.

⚠ WARNING

Allowing the truck to travel unattended can cause injury if personnel or equipment are in its path.

Always remain with the truck until it comes to a complete stop. Watch for personnel or equipment entering the path of the truck. To stop the truck, release the grey lever switch or travel control and move the handle to the full up or down position.

- To move the truck forward, stand to one side of the truck and press either grey lever switch (3) on the inside of the control handle. The truck will move forward as long as the lever is held (up to a programmed time limit). The truck will coast to a stop when the lever is released. If the time limit is reached, the lever must be released and pressed again to continue movement. This operation allows movement of the truck between pick locations with greater convenience than the twist action of the travel control. The travel control will still operate normally and can be used to move the truck in forward or reverse at any time if required. The sides of the handle may be pushed or pulled to steer the truck as necessary.
- When finished with order picking activities, turn the order picking system off by moving the control handle either up or down out of the operating range. Verify that the indicator light goes out. The system may also be turned off by resuming the correct riding position, rotating the travel control and pushing the high-speed button. The system will automatically disengage any time the emergency reverse button is activated or if the truck is turned off with the key switch. When the system is off, the handle will return to vertical if not held and travel using the lever switches is disabled. The activation button (1) will not turn the system off.

⚠ WARNING

Riding the truck with the order picking system engaged can cause accident and injury.

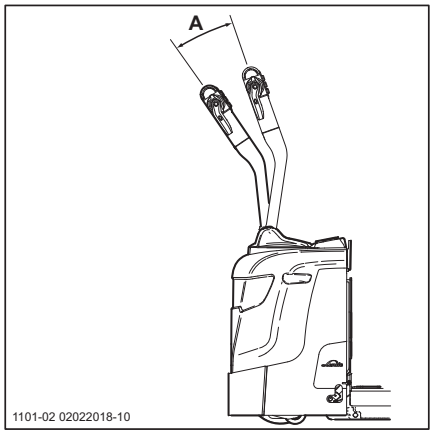
Never ride the truck with the order picking system engaged. Always stop the truck and dismount before engaging the order picking system.

⚠ WARNING

Use of the order picking system on an incline can result in longer coasting distances.

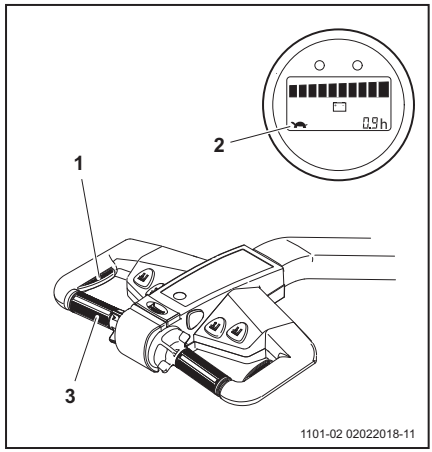
Do not operate the truck on an incline with the order picking system active.

Creep-Speed Function



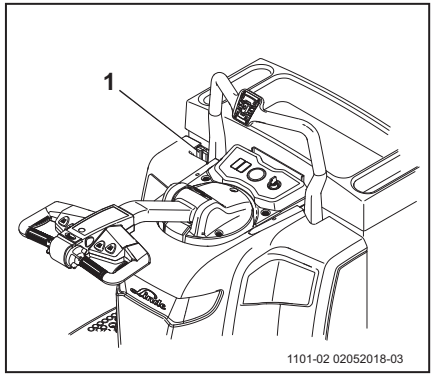
All models are equipped with a creep-speed function. This feature will allow the truck to be moved at low speed while the control handle is in the vertical position. This can be useful when maneuvering in tight spaces.

- To use this system, release the handle to vertical or move it into the creep-speed range (A).
- Press either of the grey lever switches (1) on the inside of the handle. Confirm that the creep-speed icon (2) appears in the lower left corner of the display unit window.
- With the lever switch held, use the other hand to operate the travel control (3). As long as the lever switch is held, the travel control will move the truck as with normal operation, but speed will be limited to a lower value. If the handle is moved out of the creep-speed range (A) or the lever is released during this time, the truck will stop. The creep-speed icon will no longer appear in the display. Once operation is interrupted, the travel control must be returned to neutral, the lever switch released, and the handle returned to the creep-speed range (A) to engage the feature again.



To turn the creep-speed function off, simply release the grey lever switch or move the handle out of the creep-speed range (A). The creep-speed feature will turn off and the creep-speed icon will no longer appear in the display, Release the travel control to neutral and the truck will now operate normally.

Connecting and Disconnecting the Battery



The battery is connected and disconnected at the battery connector (1) on the right-hand side of the chassis. The battery connector also serves as an emergency disconnect if necessary.

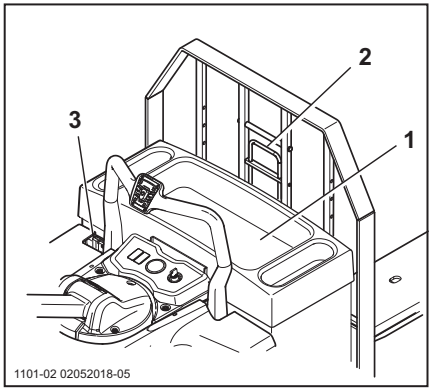
Connecting the Battery

- Ensure the key switch is off.
- Align the battery connector halves and push them together. The battery will be connected and the truck may be switched on.

Disconnecting the Battery

- Turn the key switch off.
- Grasp the battery connector (1) and pull it apart. Place the loose cable on the battery to guard against damage.

Connecting the Battery to an External Charger



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⚠ WARNING

Specialized training is required to charge batteries safely.

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

⚠ WARNING

Explosive gases are released during battery charging.

Charge batteries only in well ventilated areas.

- Park the truck safely.
- Fully lower the forks and turn off the key switch.
- Remove the accessory tray (1) if equipped.
- If the truck is equipped with an optional load backrest, pull the tilt release handle (2) and tilt the load backrest towards the forks.
- Open the battery cover.

⚠ WARNING

Dangerous concentrations of explosive gases can occur during battery charging if the battery cover is not open.

The battery cover must be left completely open during the entire charging period to allow ventilation.

- Unplug the battery connector (3).
- Attach the battery connector on the battery cables to the connector plug of the external battery charger.
- Charge the battery in accordance with the charger manufacturer's instructions.

Changing the Battery ▷

⚠ 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 battery can be changed in various ways:

- Using a crane (taking care to stay within the permissible load carrying capacity of the crane and the lifting gear)
- Using an additional truck (taking care to stay within the permissible load carrying capacity of the truck)
- Using specialized side extraction equipment if the truck is equipped with the optional battery roller tray.

⚠ WARNING

If any lifting equipment (forklift trucks or other lifting equipment) used to change a battery has insufficient load carrying capability and/or forks whose length is too short, there is a risk of accidental injury or death.

Use only equipment of sufficient size and load carrying capability to change batteries.

➢ Park the truck safely.

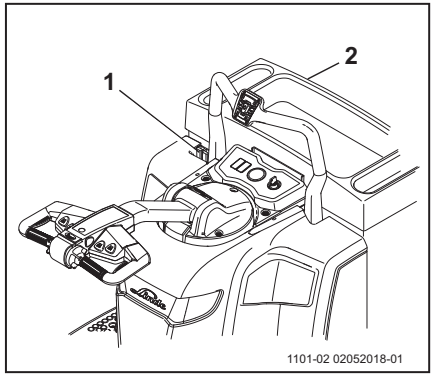
➢ Fully lower the fork carriage and turn off the key switch.

➢ Release the control handle to the full vertical position.

➢ Disconnect the battery at the battery connector (1).

➢ Remove the optional accessory tray (2) if equipped.

➢ If the truck is equipped with an optional load backrest, pull the tilt release handle (3) and tilt the load backrest towards the forks.



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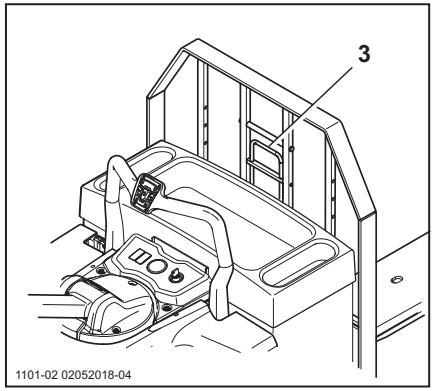

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Changing the Battery

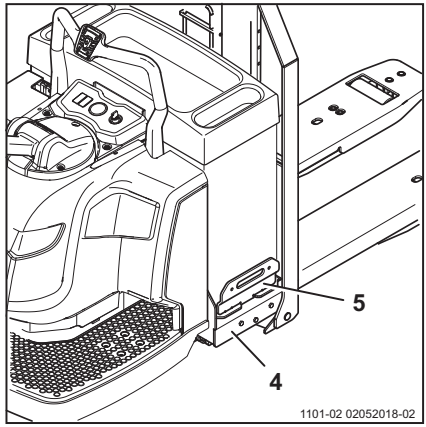
⚠ WARNING

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.

- Using a crane or another truck, carefully move the lifting gear into position over the battery. If using side extraction equipment, position it according to the manufacturer's instructions.
- Insert the hooks of the lifting gear into the openings provided for this purpose in the battery carrier. If using side extraction equipment, attach it according to the manufacturer's instructions.
- Carefully lift the battery until it clears the side wall (4) of the battery compartment and move it slowly out of the truck chassis. If the truck is equipped with the optional battery rollers, remove the battery retainer (5) on the side from which the battery is to be removed. The battery may then be rolled out of the battery compartment without lifting.
- Check the battery for leaking acid, cracked housing or raised plates.
- Check that the battery plug and cable are in good condition and leave the battery in a safe place.

▷



⚠ WARNING

Batteries of incorrect size or weight can reduce traction and braking ability.

Install only batteries whose weight meets the specification listed on the truck data plate.

- Carefully position the replacement battery in the battery box. Disconnect and remove all lifting equipment.
- If the truck is equipped with battery rollers, replace the battery retainer plate.

⚠ WARNING

On trucks equipped with battery rollers, an unsecured battery can roll out of the truck during operation and cause severe injury.

Ensure that both battery retainer plates are in place before operating the truck.

- Plug the battery plug into the battery connector socket (1).
- Tilt the load backrest (if equipped) back into position.
- Replace the accessory tray if equipped.

⚠ WARNING

Batteries produce explosive gases.

Always store batteries in well ventilated areas.

Towing the Truck

⚠ WARNING

When the truck is not in use, the parking brake will remain applied (even when power is on) and the drive wheel will not turn.

To prevent damage from dragging the drive tire, always ensure that it is clear of the ground when towing.

- Remove any load from the forks before towing.
- If the hydraulic system is functional, raise the forks.
- Attach towing equipment to the front bumper of the chassis. Towing equipment must be capable of lifting the front of the truck enough for the drive tire to clear the ground.

⚠ WARNING

The control handle will be damaged if towing equipment is attached to it.

Never tow the truck by the control handle.

- Lift the front of the truck enough for the drive tire to clear the ground but not so much that the fork tips drag. The truck may then be towed.

Hoisting the Truck

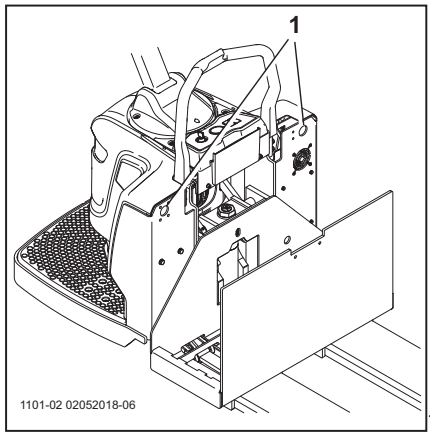
This section explains the attachment of lifting equipment to the truck for the purpose of hoisting. Many methods of rigging to a crane or hoist are possible. Explanation of such methods as well as operation of lifting equipment is outside the scope of this manual. Both the attachment of lifting equipment 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.

- Disconnect the battery.
- Attach lifting equipment to the holes (1) on each upper corner of the frame. Depending on the type of equipment used, it may be necessary to remove the truck cover to avoid damage to the cover.
- Attach lifting equipment to the fork tips to keep the truck approximately horizontal as it is lifted.



Hoisting the Truck

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.

Operator Inspection and Maintenance

Daily Inspection Overview

ELECTRIC MOTORIZED HAND TRUCK - WITHOUT MAST
OPERATOR'S DAILY CHECKLIST

Truck Serial Number: _____ Dept / Shift: _____ Operator: _____
Hour meter reading: _____ Date: _____ Supervisor: _____

Check each of the following items before the start of each shift. **Let your supervisor and/or maintenance department know of any problem.** Start at the front of the lift truck and work towards the rear. After checking, mark each item accordingly. Explain below as necessary.

Check boxes as follows: ☐ OK ☐ NR, **N**eeds **R**epair. Circle problem and explain below.

OK	NR	VISUAL INSPECTION
		Oil Spots on Floor (check for leaks on truck)
		Drive Tire (wear, cuts, or embedded objects, rim damage loose/missing lug nuts)
		Hydraulic Oil (check level)
		Steer Axle, Chain, or other mechanism (check for damage, debris)
		Motor Covers (Loose fasteners, cracked or broken)
		Steering; **Control Handle** (movement, operation)
		Throttle Hand Grips (check for wear, damage)
		Anti-slip Mat (if equipped) (check condition, cleanliness)
		Battery Connectors & Cables (damage, cracks, pitting)
		Battery Retention (installed correctly, secure)
		Battery Case & Vent caps (damage, cracks, loose, missing)
		Fork Frame (damage. twist)
		Load wheels (tire wear, damage, entrapped debris)
		Warning Decals/Operator's Manual (in place, legible)
		Data Plate / Capacity Plate (in place, legible)

OK	NR	OPERATIONAL INSPECTION
		Unusual Noise (during any of the operational checks)
		Emergency Battery Disconnect (check operation)
		Gauges and Instrumentation (check operation)
		Battery Charge (fully charged)
		Emergency Reverse Button (check operation)
		Forward Driving (accelerates, steers, brakes smoothly)
		Plugging (stops, changes direction smoothly)
		Reverse Driving (accelerates, steers, brakes smoothly)
		Service/Parking Brake (check operation)
		Hydraulic Controls (operate freely, return to neutral)
		Hydraulic Oil (excessive noise when forks are fully raised is indication of low hydraulic oil)
		Horn (sounds when button pressed)
		Backup Alarm (if equipped) (sounds in reverse)
		Travel Alarm (if equipped) (sounds with vehicle in motion)
		Work, Strobe, Flashing Lights (if equipped) (check operation)
		Coast Control (if equipped) (check operation)
		Coast Control Indicator Light (if equipped) (check operation)

Explanation of problems marked above (use back of this form if needed):

_____
_____
_____

OSHA 1910.178 (p) (1) requires a truck to be taken out of service any time it is found to be in need of repair, or is in any way defective or unsafe. Place a "Do Not Operate" tag on the truck, remove the key and alert your supervisor. The Truck may not be placed back into service until necessary repairs are made.

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The following inspection tasks in this section should be carried out by the operator or designated service personnel before each shift or at least daily. This inspection is not part of the regularly scheduled maintenance listed elsewhere in this chapter and is not intended to replace any of it. Regularly scheduled maintenance must be performed by a qualified forklift technician at the intervals indicated.

If any problem affecting safety is noted, it must be repaired immediately by a trained forklift technician. The truck must not be operated until such repairs are complete. This list does not cover attachments or other truck modifications not manufactured by Linde. Refer to the respective manufacturer's documentation for maintenance information pertaining to such items.

A checklist such as the one illustrated may be helpful in performing daily inspection. The checklist illustrated is intended for a range of

pallet truck types, so some items may not apply.

⚠ 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.

Minimum Lubrication and Inspection Intervals

Item	At least every:
Check casters (if equipped). Lubricate axles if greasable option is present.	50 hours
Grease the load wheel axles if greasable option is present.	50 hours
Check for gear oil leakage.	200 hours
Check the lift cylinder and lines for leaks.	200 hours
Check the hydraulic oil level.	200 hours
Check wheel fasteners and tighten if necessary.	200 hours
Lubricate the drive unit swivel bearing at its two grease fittings.	200 hours
Lubricate the tie bar linkage.	200 hours
Lubricate the lift cylinder and fork frame pivot pins.	200 hours
Lubricate caster swivel bearings (if equipped).	200 hours
Lubricate the teeth of the steering gear (optional electric steer only).	200 hours

Routine Lubrication and Inspection

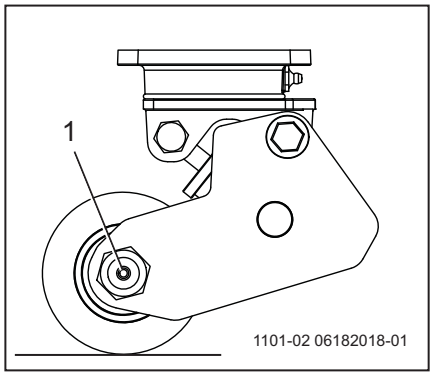
Check Casters

Inspect casters for damge to wheels or excess wobble. Repair as required. Casters are optional on EW models.

NOTE

Do not lubricate the caster swivel bearings at 50 hours. This is done at 200 hours.

Casters may have greaseable axles as an option. If so, lubricate the axles at the grease fitting (1) on the end of each axle. This fitting is not present with standard axles.

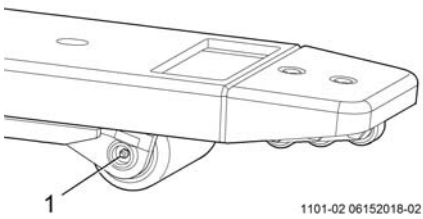


Lubricate Load Wheel Axles

Raise the forks and lubricate the load wheel axles at the axle grease fittings (1).

NOTE

If no grease fittings is present, the truck is equipped with sealed load wheel bearings and lubrication is not required.



Check for Gear Oil Leakage

Examine the drive unit for signs of leakage. Replace seals and check oil level if required.

Check Lift Cylinder and Lines for Leaks

Operate the lift function and observe the lift cylinder and its hose for leakage or loose mounting.

Check Hydraulic Oil Level

Lower the forks completely and verify that there is adequate oil in the reservoir. Level should be approximately 3/4 inch (19 mm) below the bottom of the filler plug opening. Add hydraulic oil as necessary. See the Fluid and

Lubricant Specifications section for oil specifications.

Check Drive Wheel and Fasteners

⚠ WARNING

Uneven wear or excessive damage to the tires can reduce stability as well as brake performance. Reduced stability can cause loss of control. Reduced brake performance can cause collisions.

Have worn or damaged tires changed immediately.

Inspect the drive tire for damage or excessive wear.

Check drive wheel mounting hardware for looseness. This is especially important if a wheel has recently been removed and reinstalled for repairs, replacement, or any other reason. Have any loose wheel mounting hardware tightened to the following torque before operation.

⚠ 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.

Whenever a wheel is removed and replaced for any reason, the wheel mounting screws or nuts must be checked for tightness every 10 hours thereafter until no further loosening is detected.

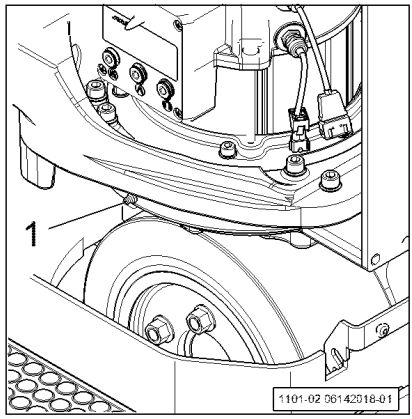
Drive Wheel Fastener Torque
144 ft-lbs (195 Nm)

Routine Lubrication and Inspection

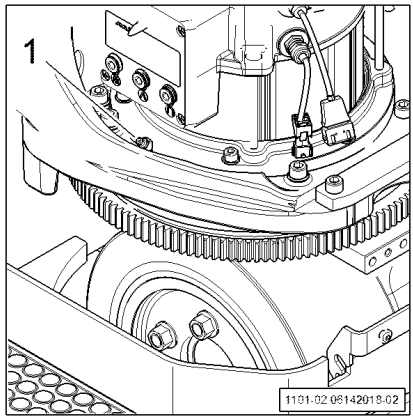
Lubricate Drive Axle Swivel Bearing

Lubricate the bearing at the two grease fittings (1) on either side of the drive motor. Jack up the truck so the drive wheel is clear of the floor and rotate the drive unit as the fittings are lubricated.

➢ Manual Steer ▷



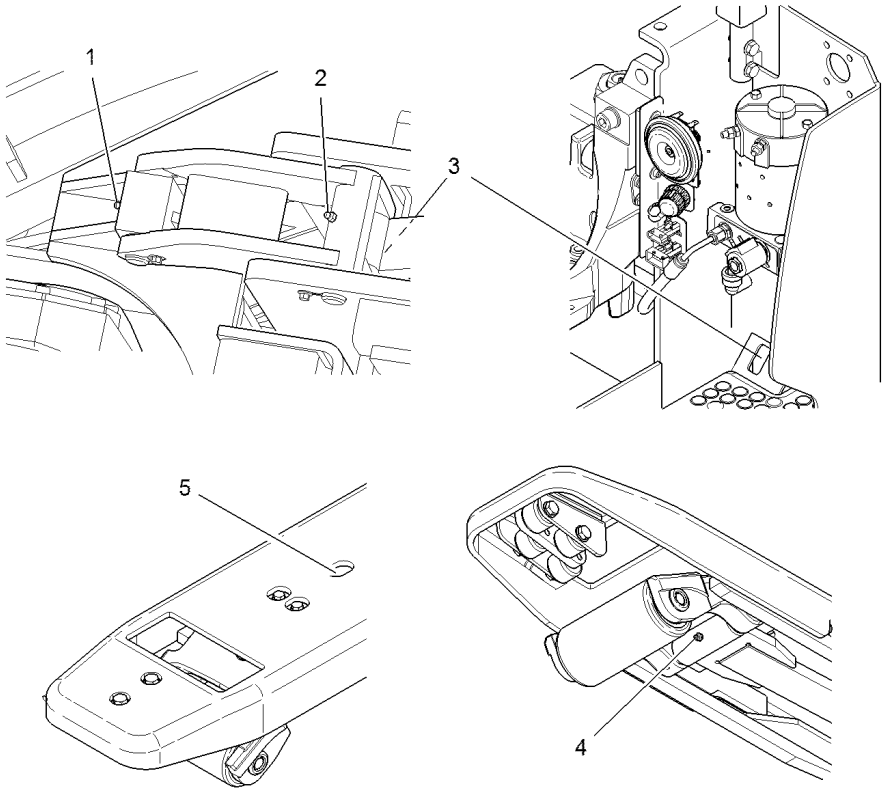
➢ Electric Steer (optional) ▷



Lubricate Tie Bar Linkage

Lubricate the tie bar linkage of each fork at the grease fittings of the toggle pivot (1 and 2), each end of the tie bar (3 and 4), and the shackle pivot (5). Access to 1, 2, and 4 is from beneath.

Tie Bar Lubrication Points



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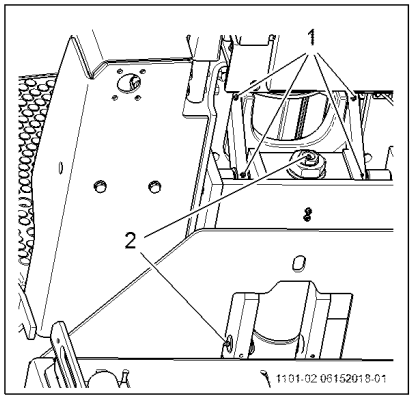
Lubricate Lift Cylinder and Fork Frame Pivots

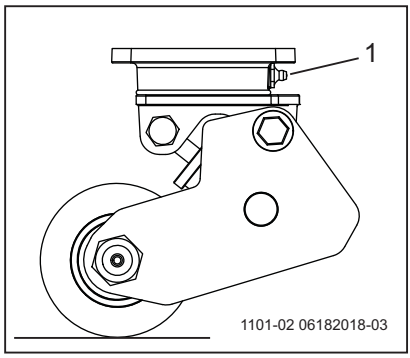
Lubricate the upper fork frame pivots at the four grease fittings (1).

Lubricate the upper and lower lift cylinder pivots at their grease fittings (2).



Lubricate Caster Swivel Bearings

Lubricate the swivel bearing on each caster at the grease fitting (1) on the caster body. (Casters are optional on EW.)



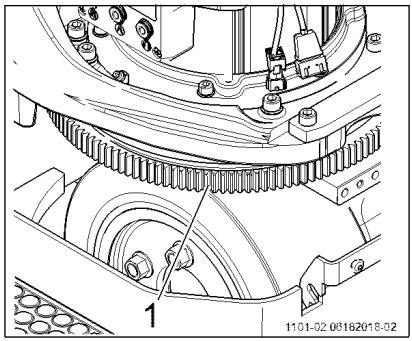
Lubricate Steering Gear (Electric steer only)

On trucks equipped with electric steering, hand lubricate the steering ring gear (1) on the drive unit.

⚠ WARNING

The steer motor can operate suddenly if the truck is switched on and the handle is moved. This will result in a pinch point at the steering motor pinion.

Always switch the truck off and disconnect the battery before working on or around the drive unit or steer motor unit.



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.

Maintenance Schedule

Maintenance every 1000 hours, but at least every 12 months.
Preparations
Clean the truck (as required).
Read and clear the error memory.
Enter the next service interval.
Drive motor
Check that the cables and harnesses are correctly routed and in good condition.
Gear unit
Check the gear oil level.
Chassis
Visually check the general condition of the chassis and forks.
Check tire condition.
Controls
Check the operation of the travel control mechanism.
Electrical system
Clean the electrical panel and controller power terminals with compressed air.
Check tightness of the line contactor power terminals. Check contactor tips and clean or replace as required.
Check condition/secure positioning of cables, wiring, connections and connectors.
Check the battery condition, acid level and acid density.
Check drive motor, gearbox, and control handle mounting.
Hydraulic system
Clean the breather on the hydraulic pump unit. Unscrew the breather, clean with solvent, then dry with compressed air. Reinstall 2-3 turns past finger-tight.
Change the hydraulic oil.
Check the pump unit for noises, leaks, and proper operation.
Check the brush length and condition on the pump unit motor.
Check lift cylinder height adjustment. Verify forks are parallel to ground when lowered.
Fork lifting mechanism
Check lift limit switch by verifying the pump motor stops when forks reach maximum height.
Subsequent tasks
Carry out functional test and test drive.
Attach maintenance sticker.

Maintenance every 2000 hours, but at least every 12 months.
Preparations

Clean the truck (as required).
Read and clear the error memory.
Enter the next service interval.
Gear unit
Change the gear oil.
Subsequent tasks
Carry out functional test and test drive.
Attach maintenance sticker.

Fluids and Lubricants

Fluid and Lubricant Specifications

Hydraulic Oil

Original equipment specification

The following grades of hydraulic oil are supplied from the factory as original equipment:

ISO-L-HM 68 as per ISO 6743-4 for standard trucks
ISO-L-HM 15 as per ISO 6743-4 for freezer trucks
ISO-L-HM 32 as per ISO 6743-4 for cooler trucks

Gear Oil

SAE 80W-90 API GL5, multi-purpose gear oil, MIL-L-2105 or equivalent.

Grease

Lithium-based grease with MoS2.

NOTE

Do not mix non-lithium-based greases with lithium-based greases.

Capacities

Assembly	Fluid or Lubricant	Capacity
Hydraulic system	Hydraulic oil	1.7 qts (1.6 l)
Transmission	Gear oil	1.9 qts (1.8 l)

Troubleshooting

Fuses

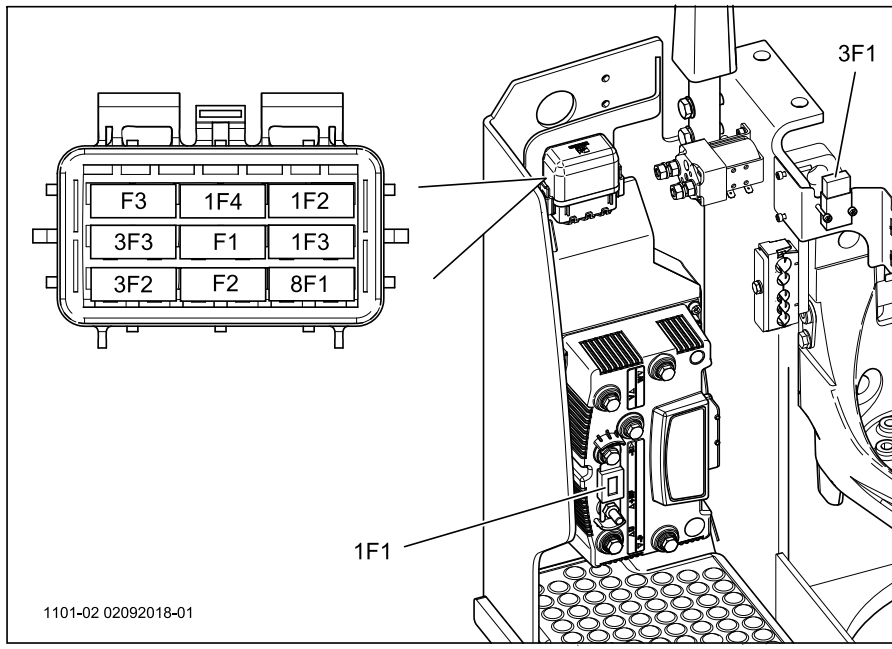
The standard truck has one main power fuse (1F1) mounted directly to the drive motor controller. Control fuses are contained in a housing directly above the controller. Trucks equipped with the optional electric steering system will have an additional fuse (3F1). All fuses are mounted on the right-hand side of the chassis. Fuses are described in the table.

⚠ WARNING

The motor fuse carries very high currents which can cause fire or injury if inappropriately handled or incorrectly installed.

Only trained service personnel should inspect or replace these fuses. The specific installation sequence of cables, hardware, and fuses onto the fuse terminals is vital to proper functioning of the fuses. Incorrect installation sequence of these parts can cause premature fuse failure, overheating, or fire.

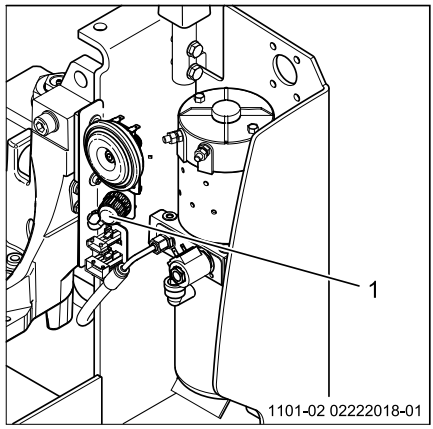
Fuse Location



Main Fuses
1F1 (250A) (300A for EE) Drive motor and the power circuit side of the main control unit
3F1 (40A) (35A for EE) Steering unit (electric steer only)
Control Fuses
F1 (4A) Options at X9
F2 (4A) Speed sensor B1
F3 (4A) Handle angle potentiometer A6
1F2 (4A) Solenoid driver pin 1X1:4 on drive controller
1F3 (15A) Key switched circuits
1F4 (4A) Control buttons; Display unit
3F2 (7.5A) Control voltage to steer unit (electric steer only)
3F3 (4A) Steering input potentiometer A3 (electric steer only)
8F1 (4A) Electro-magnetic brake Y1

Diagnostic Connector

The diagnostic connector (1) is located in a bracket adjacent to the hydraulic pump unit. It provides an interface between the main controller and diagnostic software on a hand programming unit or laptop computer. The software allows review/editing of performance parameters, readout of fault codes, and resetting of maintenance intervals.



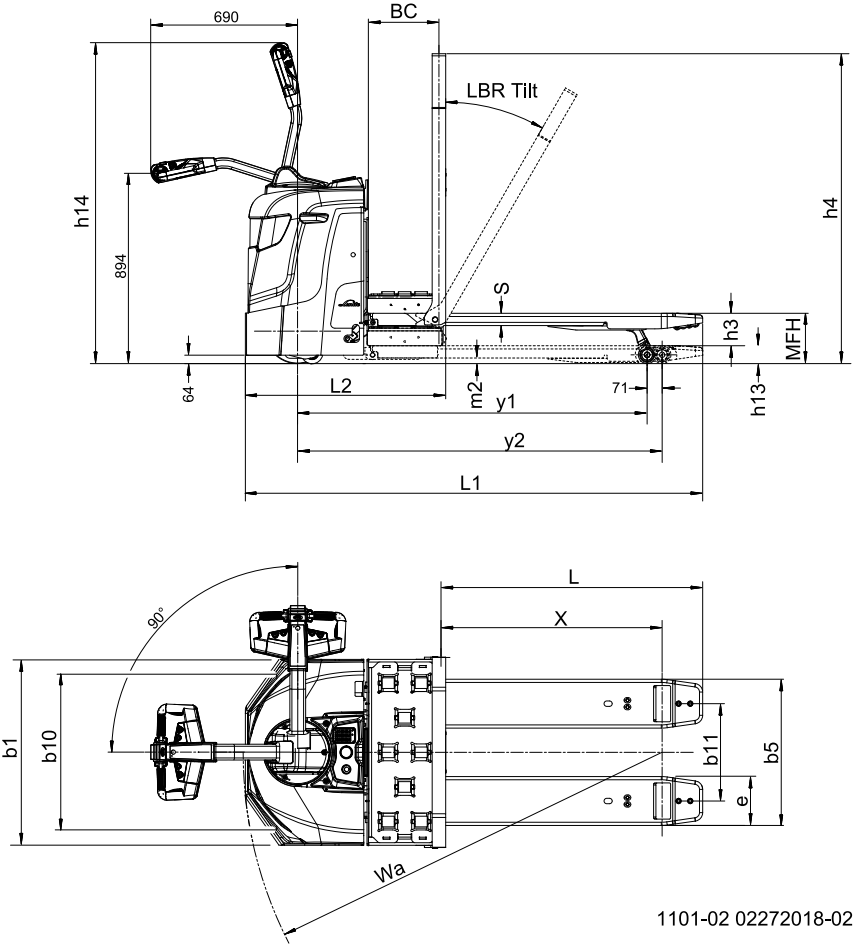
Maintenance Intervals

The truck control system has the capability to store a programmed maintenance interval. When the operating hours on the truck reach this programmed value, the wrench symbol on the indicator unit will begin flashing. When this occurs, the maintenance interval value must be increased to the next desired maintenance interval to clear the fault. This requires connecting a hand held programming unit or a laptop containing the appropriate software to the diagnostic plug and then resetting the value. The procedure is explained in the service manual.

6

Technical Data

Specifications EW



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General	EW30	EW40
Manufacturer	Linde	Linde
Manufacturer's model designation	EW30	EW40
Drive type	Electric	Electric
Operation: manual, accompanied, standing, seated, order picking	Accompanied	Accompanied
Nominal load capacity (May be downrated for certain masts or attachments. Always refer to vehicle data plate.)	6000 lbs (2700 kg)	8000 lbs (3600 kg)
Load distance (x)	See fork table	See fork table
Wheelbase (y)	See fork table	See fork table

Weights	EW30	EW40
Service weight	Refer to vehicle data plate	Refer to vehicle data plate

Wheels and tires	EW30	EW40
Tire type, drive/load/caster	Cushion/ poly/poly	Poly/ poly/poly
Tire size, drive (dia. x width x rim dia.)	12x5x8 in	12x5x8 in
Tire size, load (outside dia.)	3.25 in	3.25 in
Number of wheels, front / rear (x = driven)	1x / 2	1x / 2
Track width, front (if optional casters) (b10)	23.1 in (586 mm)	23.1 in (586 mm)
Track width, rear (load) (b11)l	See Dimensions table	See Dimensions table

Dimensions	EW30	EW40
LBR tilt angle	30°	30°
Fork height, lowered (h13)	3.3 in (84 mm)	3.3 in (84 mm)
Maximum lift height from floor (MFH)	9.3 in (236 mm)	9.3 in (236 mm)
Lift stroke (h3)	6.0 in (152 mm)	6.0 in (152 mm)
Extended height, with 48 in LBR (h4)	57.3 in (1456 mm)	57.3 in (1456 mm)
Handle height, maximum (h14)	59.3 in (1507 mm)	59.3 in (1507 mm)
Ground clearance, mid-fork (m2)	1.03 in (26.2 mm)	1.03 in (26.2 mm)
Fork thickness, mid-fork (s)	2.3 in (57.7 mm)	2.3 in (57.7 mm)
Overall length (l1)	See fork table	See fork table

Specifications EW

Dimensions	EW30	EW40
Load wheel distance (x)	See fork table	See fork table
Wheelbase (y)	See fork table	See fork table
Chassis length (l2)	37.1 in (941 mm)	37.1 in (941 mm)
Overall width, with LBR (b1)	35.4 in (900 mm)/	35.4 in (900 mm)/
Fork spread (b5) standard / optional Add 1 in (25.4 mm) for L .> 60 in	22 / 27 in (559 / 686 mm)	27 / 32 in (686 / 813 mm)
Track width, rear (b11) standard / optional	13 /18 in (329 / 457 mm)	18 / 23 in (457 / 584 mm)
Fork width (e) Add 1 in (25.4 mm) for L .> 60 in	9 in (229 mm)	9 in (229 mm)
Turning radius (Wa)	See fork table	See fork table

Fork Lengths EW30 (Single Load Wheels)				
Fork length (L)	Load wheel distance (X)	Wheelbase (y1/y2) lowered/raised	Turning radius (Wa) lowered/raised	Overall length (L1)
36 in (914 mm)	28.5 in (724 mm)	55.4 / 52.7 in (1408/1338 mm)	65.5 / 62.7 in (1663/1593 mm)	72.6 in (1843 mm)
42 in (1067 mm)	34.5 in (876 mm)	61.5 / 58.7 in (1561/1490 mm)	71.5 / 68.7 in (1816/1745 mm)	78.6 in (1996 mm)
48 in (1219 mm)	40.5 in (1029 mm)	67.4 / 64.6 in (1713/1642 mm)	77.5 / 74.7 in (1968/1897 mm)	84.6 in (2148 mm)
60 in (1524 mm)	52.5 in (1334 mm)	79.5 / 76.7 in (2018/1947 mm)	89.5 / 86.7 in (2273/2202 mm)	96.6 in (2453 mm)

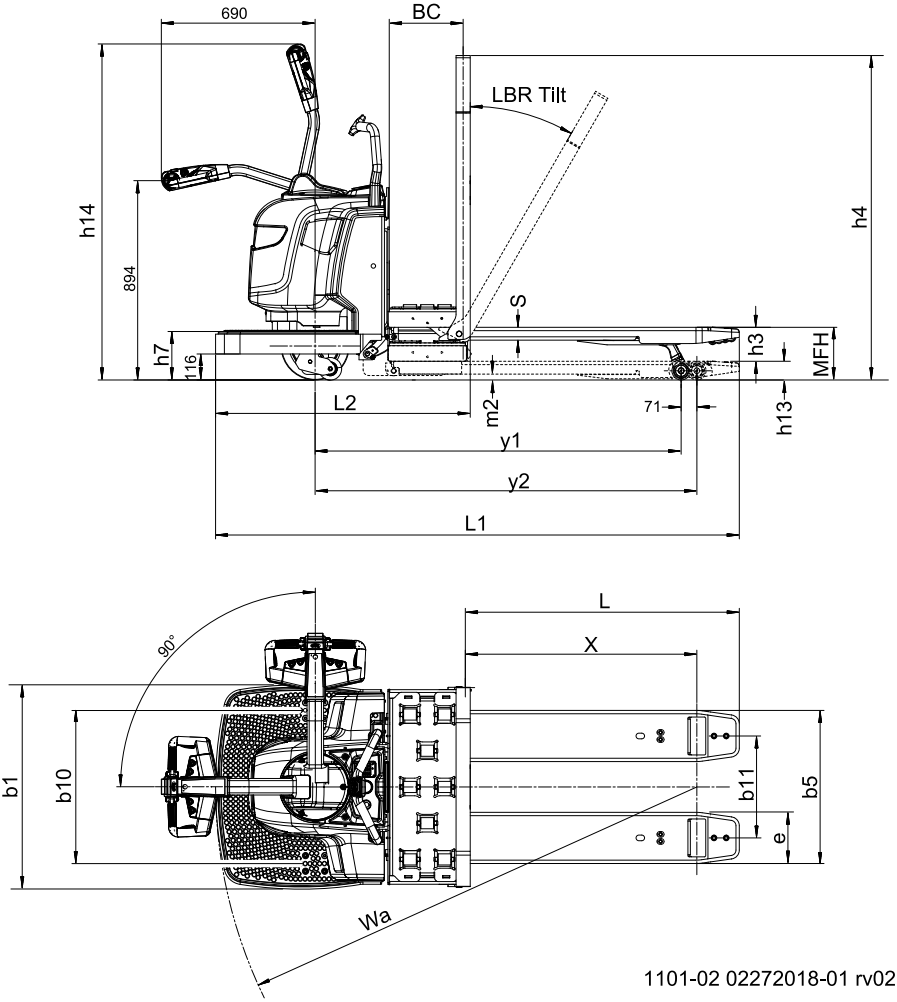
Fork Lengths EW40 (Single Load Wheels)				
Fork length (L)	Load wheel distance (X)	Wheelbase (y1/y2) lowered/raised	Turning radius (Wa) lowered/raised	Overall length (L1)
36 in (914 mm)	28.5 in (724 mm)	55.4 / 52.7 in (1408/1338 mm)	65.5 / 62.7 in (1663/1593 mm)	72.6 in (1843 mm)
42 in (1067 mm)	34.5 in (876 mm)	61.5 / 58.7 in (1561/1490 mm)	71.5 / 68.7 in (1816/1745 mm)	78.6 in (1996 mm)

Fork Lengths EW40 (Single Load Wheels)				
48 in (1219 mm)	40.5 in (1029 mm)	67.4 / 64.6 in (1713/1642 mm)	77.5 / 74.7 in (1968/1897 mm)	84.6 in (2148 mm)
60 in (1524 mm)	52.5 in (1334 mm)	79.5 / 76.7 in (2018/1947 mm)	89.5 / 86.7 in (2273/2202 mm)	96.6 in (2453 mm)
84 in (2133 mm)	61.0 in (1549 mm)	87.9 / 85.2 in (2234/2163 mm)	98.0 / 95.2 in (2489/2418 mm)	120.6 in (3062 mm)
96 in (2437 mm)	61.0 in (1549 mm)	87.9 / 85.2 in (2234/2163 mm)	98.0 / 95.2 in (2489/2418 mm)	132.6 in (3367 mm)
96 in (2437 mm)	88.5 in (2248 mm)	115.4 / 112.7 in (2932/2862 mm)	125.5/122.7 in (3187/3117 mm)	132.6 in (3367 mm)
144 in (3657 mm)	109 in (2769 mm)	135.9 /133.2 in (3453/3382 mm)	146.0/143.2 in (3708/3637 mm)	180.6 in (4586 mm)

Performance data	EW30	EW40
Travel speed, rated load / no load	3.5 / 3.5 mph (5.6 / 5.6 km/h)	3.5 / 3.5 mph (5.6 / 5.6 km/h)
Acceleration, rated load / no load	8 / 7.8 seconds	8 / 7.8 seconds
Gradeability, * rated load / no load	15 / 15%	10/ 15%
Service brake type	electro-magnetic	electro-magnetic
* Gradeability is a measure of tractive ability only. The chassis will not clear a 15% transition.		

Drive Motor and Battery	EW30	EW40
Drive motor power rating (60 min)	5.4 hp (4.0 kW)	5.4 hp (4.0 kW)
Battery voltage	24 V	24 V
Maximum battery capacity (6h)	750 Amp-hr	750 Amp-hr
Battery compartment length (BC)	13.5 in (341 mm)	13.5 in (341 mm)
Battery compartment width (b2)	31.5 in (796 mm)	31.5 in (796 mm)
Minimum battery weight	900 lbs (408.24 kg)	900 lbs (408.24 kg)
Maximum battery weight	1500 lbs (680.4 kg)	1500 lbs (680.4 kg)

Specifications EWR



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General	EWR30	EWR40
Manufacturer	Linde	Linde
Manufacturer's model designation	EWR30	EWR40
Drive type	Electric	Electric
Operation: manual, accompanied, standing, seated, order picking	Accompanied	Accompanied
Nominal load capacity (May be downrated for certain masts or attachments. Always refer to vehicle data plate.)	6000 lbs (2700 kg)	8000 lbs (3600 kg)
Load distance (x)	See fork table	See fork table
Wheelbase (y)	See fork table	See fork table

Weights	EWR30	EWR40
Service weight	Refer to vehicle data plate	Refer to vehicle data plate

Wheels and tires	EWR30	EWR40
Tire type, drive/load/caster	Cushion/ poly/poly	Poly/ poly/poly
Tire size, drive (dia. x width x rim dia.)	12x5x8 in	12x5x8 in
Tire size, load (outside dia.)	3.25 in	3.25 in
Number of wheels, front / rear (x = driven)	1x / 2	1x / 2
Track width, front (casters) (b10)	27 in (686 mm)	27 in (686 mm)
Track width, rear (load) (b11)	See Dimensions table	See Dimensions table

Dimensions	EWR30	EWR40
LBR tilt angle	30°	30°
Fork height, lowered (h13)	3.3 in (84 mm)	3.3 in (84 mm)
Maximum lift height from floor (MFH)	9.3 in (236 mm)	9.3 in (236 mm)
Lift stroke (h3)	6.0 in (152 mm)	6.0 in (152 mm)
Extended height, with 48 in LBR (h4)	57.3 in (1456 mm)	57.3 in (1456 mm)
Handle height, maximum (h14)	59.3 in (1507 mm)	59.3 in (1507 mm)
Platform height (h7)	8.6 in (218 mm)	8.6 in (218 mm)
Ground clearance, mid-fork (m2)	1.03 in (26.2 mm)	1.03 in (26.2 mm)

Specifications EWR

Dimensions	EWR30	EWR40
Fork thickness, mid-fork (s)	2.3 in (57.7 mm)	2.3 in (57.7 mm)
Overall length (l1)	See fork table	See fork table
Load wheel distance (x)	See fork table	See fork table
Wheelbase (y)	See fork table	See fork table
Chassis length (l2)	45.0 in (1142 mm)	45.0 in (1142 mm)
Overall width (b1)	36.1 in (916 mm)/	36.1 in (916 mm)/
Fork spread (b5) standard / optional Add 1 in (25.4 mm) for L .> 60 in	22 / 27 in (559 / 686 mm)	27 / 32 in (686 / 813 mm)
Track width, rear (load) (b11) standard / optional	13 /18 in (329 / 457 mm)	18 / 23 in (457 / 584 mm)
Fork width (e) Add 1 in (25.4 mm) for L .> 60 in	9 in (229 mm)	9 in (229 mm)
Turning radius (Wa)	See fork table	See fork table

Fork Lengths EWR30 (Single Load Wheels)				
Fork length (L)	Load wheel distance (X)	Wheelbase (y1/y2) lowered/raised	Turning radius (Wa) lowered/raised	Overall length (L1)
36 in (914 mm)	28.5 in (724 mm)	55.4 / 52.7 in (1408/1338 mm)	65.5 / 62.7 in (1663/1593 mm)	80.5 in (2044 mm)
42 in (1067 mm)	34.5 in (876 mm)	61.5 / 58.7 in (1561/1490 mm)	71.5 / 68.7 in (1816/1745 mm)	86.5 in (2197 mm)
48 in (1219 mm)	40.5 in (1029 mm)	67.4 / 64.6 in (1713/1642 mm)	77.5 / 74.7 in (1968/1897 mm)	92.5 in (2349 mm)
60 in (1524 mm)	52.5 in (1334 mm)	79.5 / 76.7 in (2018/1947 mm)	89.5 / 86.7 in (2273/2202 mm)	104.5 in (2654 mm)

Fork Lengths EWR40 (Single Load Wheels)				
Fork length (L)	Load wheel distance (X)	Wheelbase (y1/y2) lowered/raised	Turning radius (Wa) lowered/raised	Overall length (L1)
36 in (914 mm)	28.5 in (724 mm)	55.4 / 52.7 in (1408/1338 mm)	65.5 / 62.7 in (1663/1593 mm)	80.5 in (2044 mm)

Fork Lengths EWR40 (Single Load Wheels)				
42 in (1067 mm)	34.5 in (876 mm)	61.5 / 58.7 in (1561/1490 mm)	71.5 / 68.7 in (1816/1745 mm)	86.5 in (2197 mm)
48 in (1219 mm)	40.5 in (1029 mm)	67.4 / 64.6 in (1713/1642 mm)	77.5 / 74.7 in (1968/1897 mm)	92.5 in (2349 mm)
60 in (1524 mm)	52.5 in (1334 mm)	79.5 / 76.7 in (2018/1947 mm)	89.5 / 86.7 in (2273/2202 mm)	104.5 in (2654 mm)
84 in (2133 mm)	61.0 in (1549 mm)	87.9 / 85.2 in (2234/2163 mm)	98.0 / 95.2 in (2489/2418 mm)	128.5 in (3263 mm)
96 in (2437 mm)	61.0 in (1549 mm)	87.9 / 85.2 in (2234/2163 mm)	98.0 / 95.2 in (2489/2418 mm)	140.5 in (3568 mm)
96 in (2437 mm)	88.5 in (2248 mm)	115.4 / 112.7 in (2932/2862 mm)	125.5/122.7 in (3187/3117 mm)	140.5 in (3568 mm)
144 in (3657 mm)	109 in (2769 mm)	135.9 /133.2 in (3453/3382 mm)	146.0/143.2 in (3708/3637 mm)	188.5 in (4787 mm)

Performance data	EWR30	EWR40
Travel speed, rated load / no load	6.4 / 9.5 mph (10.3 / 15.2 km/h)	5.9 / 9.5 mph (9.6 / 15.2 km/h)
Acceleration, rated load / no load	6.4 / 5.1 seconds	6.8 / 5.1 seconds
Gradeability, * rated load / no load	15 / 15%	10/ 15%
Service brake type	electro-magnetic	electro-magnetic
* Gradeability is a measure of tractive ability only. The chassis will not clear a 15% transition.		

Drive Motor and Battery	EWR30	EWR40
Drive motor power rating (60 min)	5.4 hp (4.0 kW)	5.4 hp (4.0 kW)
Battery voltage	24 V	24 V
Maximum battery capacity (6h)	750 Amp-hr	750 Amp-hr
Battery compartment length (BC)	13.5 in (341 mm)	13.5 in (341 mm)
Battery compartment width (b2)	31.5 in (796 mm)	31.5 in (796 mm)
Minimum battery weight	900 lbs (408.24 kg)	900 lbs (408.24 kg)
Maximum battery weight	1500 lbs (680.4 kg)	1500 lbs (680.4 kg)

Specifications EWR

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KION North America Corporation

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