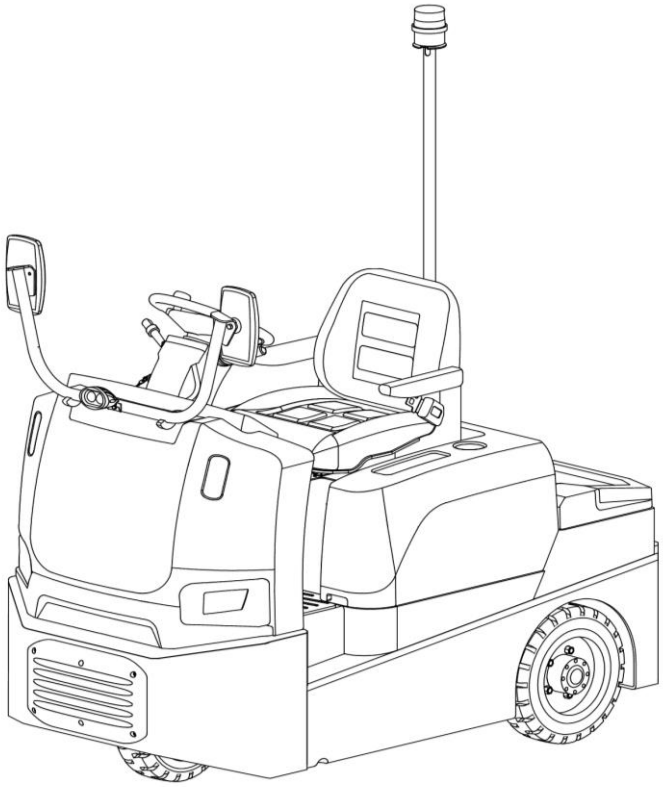
NOBLELIFT

INSTRUCTION MANUAL

Sit-on Tow Tractor

T30Q/T66Q and T60Q/T130Q



WARNING

Do not operate the tow tractor before reading and understanding the instructions of this manual.

NOTE:

- **Please check product type and parameters of your truck in this manual as well as on the ID-plate.**
- **Keep this manual for future reference.**

Version 08/2023

T30Q-T60Q-SMS-003-EN

FOREWORD

Before operating the tow tractor, please read this instruction manual carefully and understand the usage of the truck completely, improper operation will cause danger. All instructions in this manual should be seriously followed, otherwise warranty will be invalid by default, and our company shall not be liable for any losses arising therefrom. If the customer or a third party modifies the tow tractor without manufacturer's permission, the warranty will be invalid by default, and our company shall not be liable for any loss arising therefrom.

This manual describes the usage of different sit-on tow tractors. When operating and servicing the tow tractor, make sure that apply correct instructions to your truck.

Our products are subject to ongoing developments, so the company reserves the right to modify the appearance, configuration and function of the products, therefore please have understanding, that any claims on performance shall not be derived from this manual.

Keep this manual for future reference. If this manual and the warning/ caution stickers are lost or damaged, please contact your local dealer for replacement.

This tow tractor complies with the requirements according to EN ISO 3691-1 (Industrial trucks- safety requirements and verification, part 1), EN 12895 (Industrial trucks- electromagnetic compatibility), EN 12053 (Safety of industrial trucks- test methods for measuring noise emissions), EN 1175-1 (Industrial truck safety–electrical requirements), ensured the truck is used according to the described purposes.

The noise level for this machine is 69 dB(A) according to EN 12053.

The vibration is 0.85 m/s^2 according to EN 13059 (for truck with pedal).

ATTENTION:

- Environmentally hazardous waste, such as batteries, oil and electronics, will cause negative effect to the environment or health, if handled incorrectly.
- The waste packages should be sorted and put into solid dustbins according to the materials and be collected disposal by local special environment protection bureau. To avoid pollution, it's forbidden to throw away the wastes randomly.
- To avoid leaks during the use of the products, the user should prepare some absorbable materials (scraps of wooden or dry duster cloth) to absorb the leaking oil in time. To avoid second pollution to the environment, the used absorbable materials should be handed in to specific departments in terms of local authorities.
- Our products are subject to ongoing developments. This manual is only for the purpose of operating /servicing the tow tractor, therefore please have understanding that there is no guarantee out of particular features out of this manual.

The following graphics indicate safety instructions and important explanations.

⚠ Failure to comply with this instruction will cause personal injury and material damage.

● Indicates standard equipment.

○ Indicates optional equipment.

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1. CORRECT USE AND APPLICATION

a. General

The tow tractor described in this manual is a equipment suitable for towing trailer loads.
The tow tractor must be used, operated and serviced in accordance with the present operating instructions. Any other type of application is considered improper use and may result in injuries to personnel and damage to the tow tractor or other property.

b. Correct application

The maximum load is indicated on the identification plate and must not be exceeded.
Load must be attached by using a trailer coupling or attachments approved by the manufacturer.
— Towing the load.
— Pushing the load is not allowed.

c. Approved application conditions

The area and point loads allowed by the road for travel must not be exceeded.
When the visibility is obstructed, the operator need work in cooperation with a guider.
The driver must ensure that the loading /unloading platform is not removed or released during loading or unloading.

- It is applicable to industrial and commercial environments.
- The allowable temperature is 5°C to 50°C, and it is forbidden to run the tractor in the cold storage.
- It can only be used on fixed even ground with sufficient load-bearing capacity in accordance with DIN15185.
- It can only be used on roads with good visibility and the permission of the owner of the equipment.
- The maximum gradeability for unladen tow tractor is 15%.
- Do not drive laterally or diagonally when going downhill.
- Operate the tow tractor in areas open to the public.

When using this tow tractor in extreme environments, additional special equipment must be installed and the manufacturer's approval must be obtained.
Operating this tow tractor in explosion-proof areas is not allowed.
Do not operate this tractor outdoors or in hazardous areas during inclement weather (storms, lightning).

d. Proprietor responsibilities

For the purposes of the present operating instructions, the "operating company" is defined as any natural or legal person who either uses the tow tractor himself, or on whose behalf it is used. In special cases (e.g. leasing or renting), the operating company is considered to be the person who is to carry out the specified operational duties in accordance with existing contractual agreements between the owner and operator of the industrial truck.

The operating company must ensure that the tow tractor is used only for its intended purpose and that dangers to the health and safety of the operator and third parties are prevented. Furthermore, accident prevention regulations, safety regulations and operating, servicing and repair guidelines must be followed.

The tractor may only be operated by persons who have received the relevant special training. The operating company must ensure that all operators have read and understood these operating instructions.

Failure to comply with the operating instructions shall invalidate the warranty. The same applies if improper work is carried out on the truck by the customer or third parties without the permission of the manufacturer.

e. Adding attachments and/or optional equipment

The mounting or installation of additional equipment which affects or extends the functionality of the tow tractor requires prior permission in writing from the manufacturer. Local-authority approval may also need to be obtained.

Local authority approval, however, cannot take the place of the manufacturer's approval.

2. Truck Description

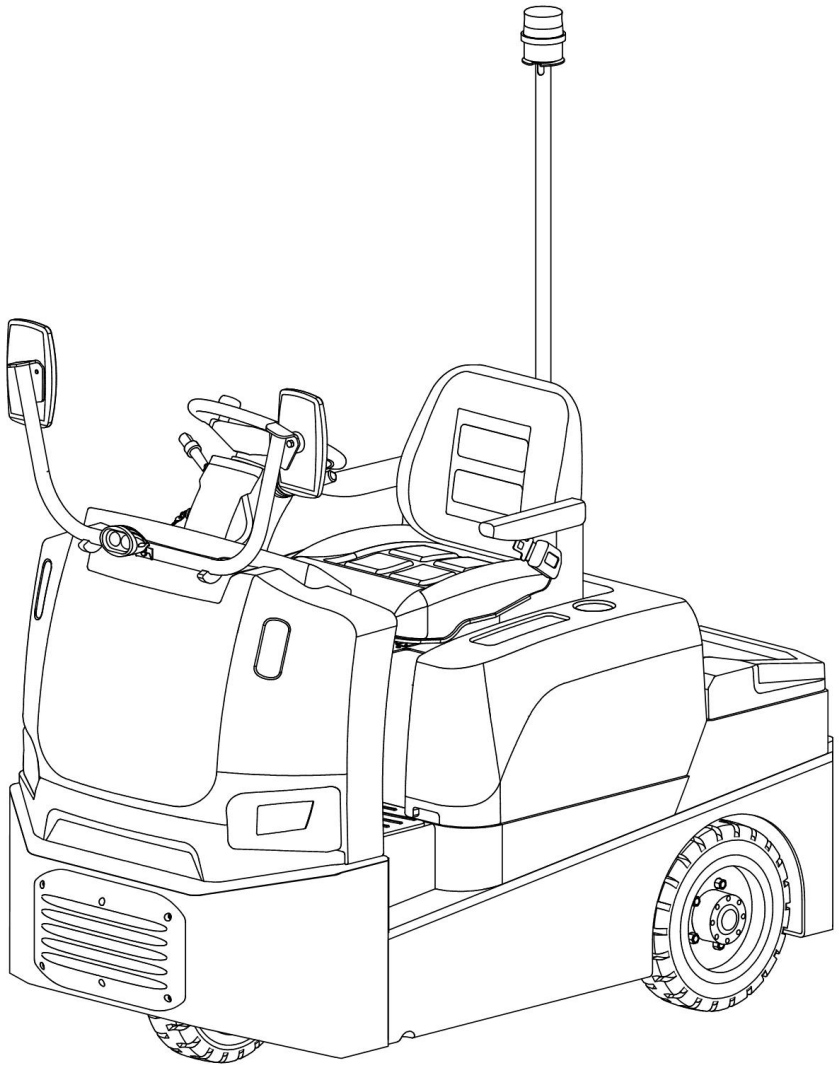
a. Application

This tow tractor is a rear-drive electrically controlled industrial truck and a load tractor for traction.

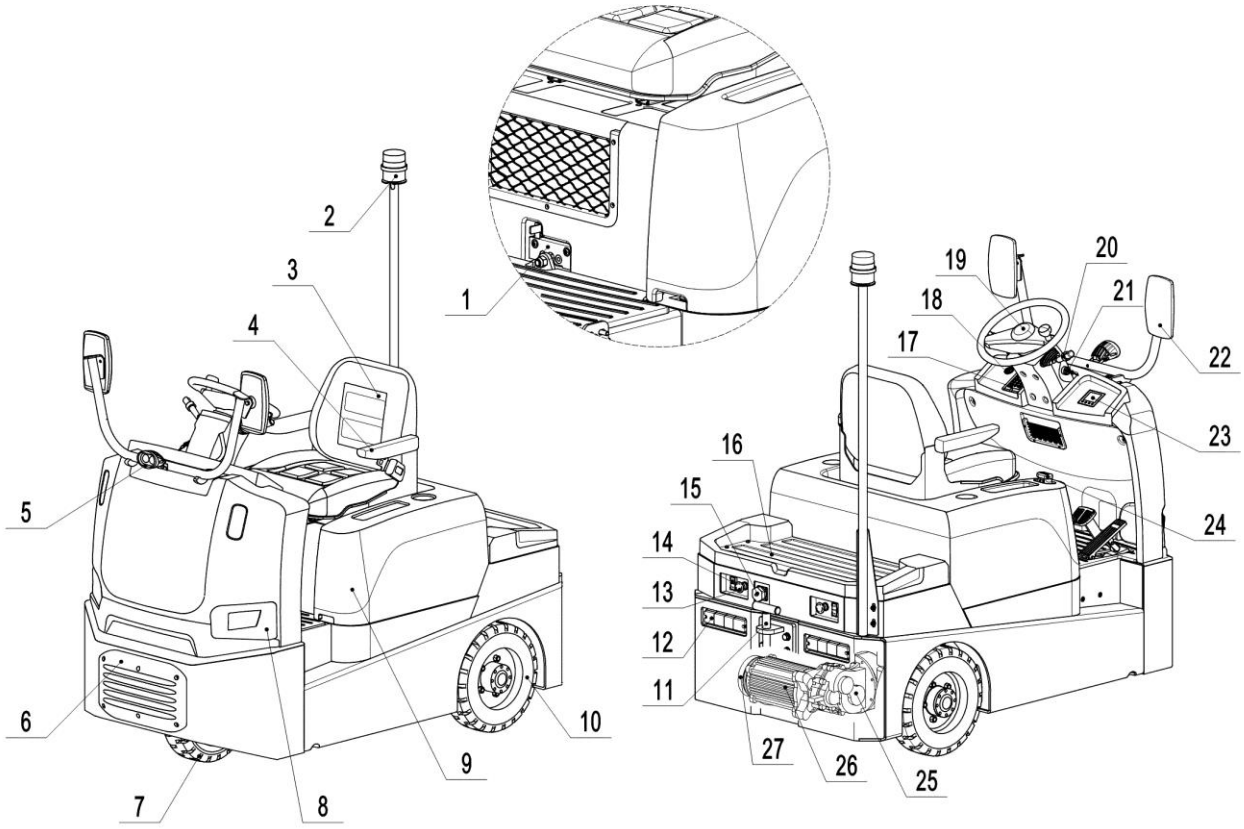
This tow tractor is intended for indoor or outdoor use. Generally, it is not necessary to replace the battery, but if it is used intensively, the battery should be replaced (see "Battery - Servicing, Recharging, Replacement" in Chapter 4).

It is not allowed to operate the tow tractor in road transport enterprises.

The rated capacity is indicated on the ID-plate.



b. Assembly Overview



Item		Description	Item		Description
1	●	Battery panel latch	15	○	Aviation connector (trailer running socket)
2	○	Warning lamp	16	●	Storage table (load capacity 25kg)
3	●	Seat (with seat switch and safety belt)	17	○	Pin-code lock
4	○	Arm rest	18	●	USB access
5	●	Blue-ray light	19	●	Steering wheel
6	●	Bumper rubber	20	●	Combined switches (turn signal, driving direction)
7	●	Steering front caster	21	●	Key switch
8	●	Front lights (main lamp, turn signal)	22	●	Rear-view mirror
9	●	Battery panel	23	●	Display
10	●	Drive wheel	24	●	Emergency switch
11	●	Coupling	25	●	Drive axle assembly
12	●	Rear lights (brake light, turn signal)	26	●	Drive motor assembly
13	●	Sideways control (emergency stopping)	27	●	Electromagnetic brake assembly
14	●	Sideways control (FW./ BW.)			
●: standard equipment ○: optional equipment					

b.1 Functional Description

Overview

The chassis is of steel structure, and the steps on both sides of the tractor are low. The battery panel can be flipped over, tilt it back when changing and servicing the batteries. The trailer coupling has 3 layers and comes with a trailer connector. The driver's seat is equipped with a seat switch to assist start driving.

Load capacity of storage table for standard specification is up to 25kg.

The drive axle is an elastic suspension structure, and the steering axle is also suspended, which improves the driver's operating comfort.

For the steering system, the steering wheel transmits the steering force via the chain. The chain is adjustable and lubricated. The steering transmission is completed through the steering shaft and steering chain.

Drive system

The drive unit equips with an AC motor (5kW, 48V). The drive system controls rotation speed to prevent the tractor from sliding down when stopped on a slope.

Lights

Lights of the tow tractor includes:

- Two main lamps (combination of main lamp and turn signal)
- Two rear lights (combination of brake light, reverse light and turn signal)
- Warning flasher
- Blue-ray light

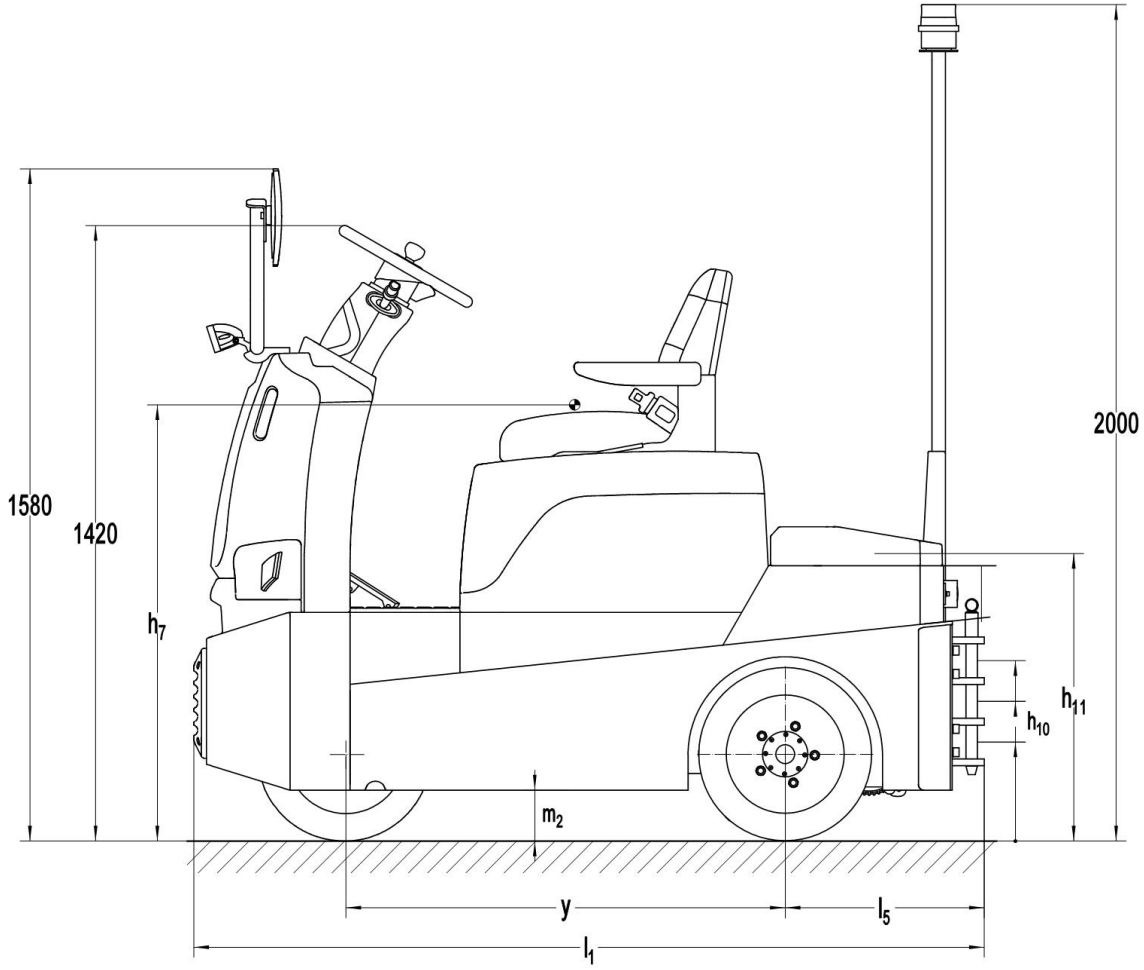
Braking System

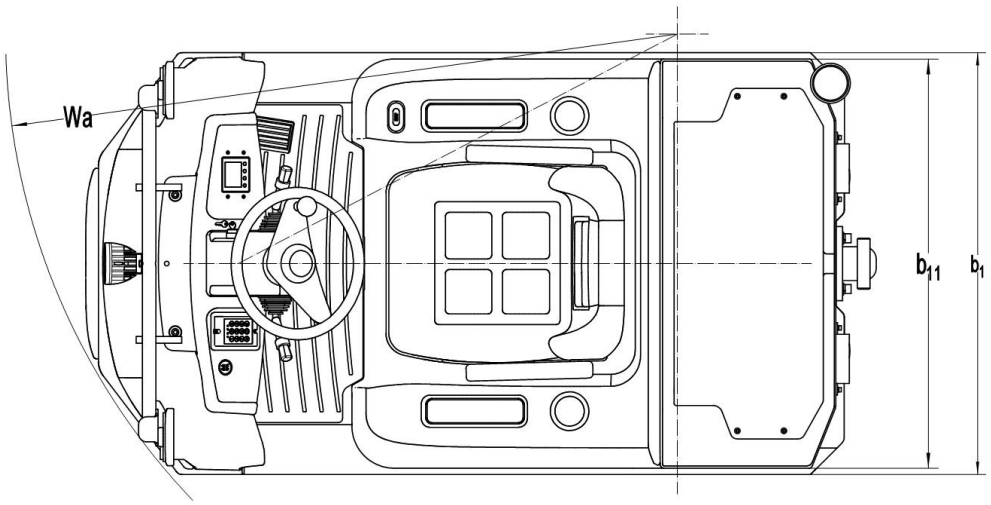
The service brake is a hydraulic drum brake that act on both drive wheels. The brake pressure sensor monitors the brake pressure and controls the brake lights. When the tractor comes to a standstill or the driver leaves the seat, the electronically automatically controlled electromagnetic brake is activated immediately. Pressing down the accelerator pedal automatically releases the electromagnetic brake.

Parking brake

The electromagnetic brake is activated immediately after the tractor comes to a standstill. When parking on a slope, the tractor will be electrically controlled to stop until the electromagnetic brake is activated. When driving again, before releasing the electromagnetic brake, the traction motor will generate sufficient torque to prevent the towing tractor from rolling down.

c. Technical data





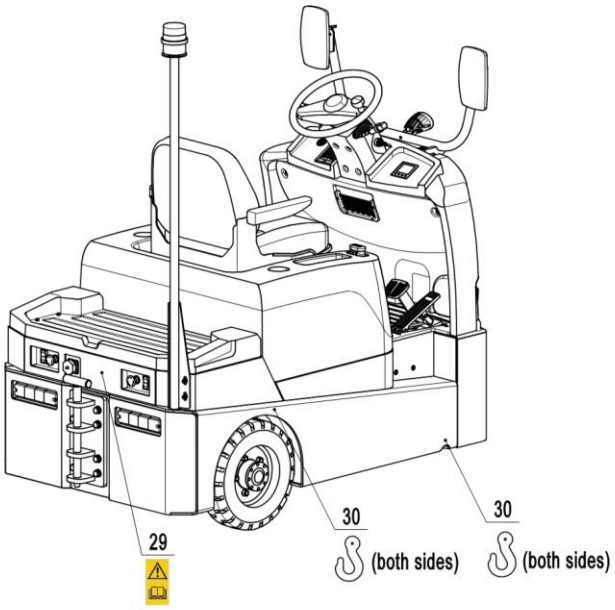
The technical data given below are in accordance with the VDI2198 standard. Our company reserves the right to make technical changes and supplements.

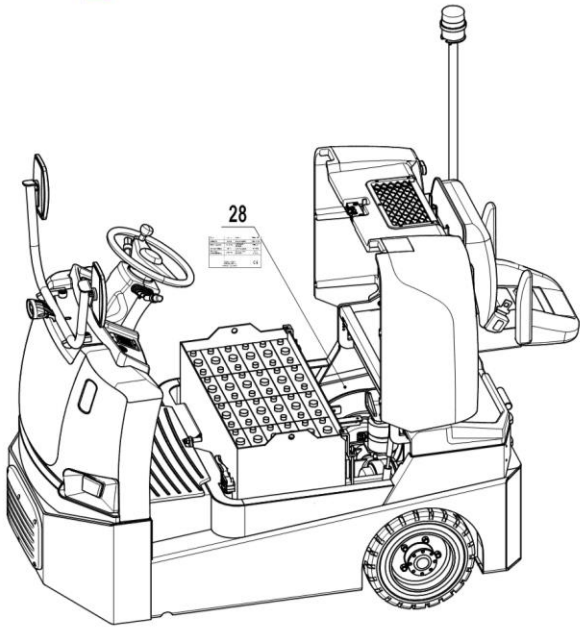
Main technical data for standard version

Type sheet for industrial truck acc. to VDI 2198					
Distinguishing mark	1.2	Manufacturer's type designation		T30Q	T60Q
	1.3	Drive: electric (battery type, mains, ...), diesel, petrol, fuel gas		Electric	Electric
	1.4	Operator type: hand, pedestrian, standing, seated, order-picker		Seated	Seated
	1.5	Rated capacity/ rated load	Q (t)	3.0	6.0
	1.7	Rated drawbar pull	F (N)	750	1500
	1.9	Wheelbase	y (mm)	1040	1150
Weight	2.1	Service weight (with battery)	kg	1080	1245
	2.3	Axle loading, unladen front/ rear	kg	440/640	495/750
Tyres/ chassis	3.1	Tires		Solid rubber wheel	Solid rubber wheel
	3.2	Tire size, front		4.00-8	4.00-8
	3.3	Tire size, rear		4.00-8	4.00-8
	3.5	Wheels, number front/ rear (x=driven wheels)		1 / 2x	1 / 2x
	3.6	Tread, front	b_{10} (mm)	0	0
	3.7	Tread, rear	b_{11} (mm)	878	878
Dimensions	4.8	Seat height relating to SIP/ stand height	h_7 (mm)	980	980
	4.12	Coupling height	h_{10} (mm)	230/330/420	230/330/420
	4.13	Loading height, unladen	h_{11} (mm)	680	680
	4.19	Overall length	l_1 (mm)	1870	2020
	4.21	Overall width	b_1 (mm)	996	996
	4.32	Ground clearance, centre of wheelbase	m_2 (mm)	120	120
	4.35	Turning radius	W_a (mm)	1590	1680
Performance	5.1	Travel speed, laden/ unladen	km/h	8 /14	7/14
	5.5	Drawbar pull, laden/ unladen	N	750	1500
	5.6	Max. drawbar pull, laden/ unladen	N	3000	6000
	5.10	Service brake		Hydraulic + Electromagnetic	Hydraulic + Electromagnetic
Electric-engine	6.1	Drive motor rating S2 60min	kW	5.0	6.0
	6.3	Battery acc. to DIN 43531/35/36 A, B, C, no		DIN	DIN
	6.4	Battery voltage/ nominal capacity K_5	(V)/(Ah)	48/240; 48/270; 48/300	48/320；48/360；48/400
	6.5	Battery weight (+/-5%)	kg	420/470/520	530/580/630
Addition data	8.1	Type of drive unit		CFET-DRV, AC drive unit	CFET-DRV, AC drive unit
	10.7	Sound pressure level at driver's seat	dB (A)	＜70	＜70

d. Description of identification plate, safety and warning labels

Keep the safety and warning labels and the identification plate intact and legible. Replace if necessary.





Item	Description
28	Identification plate
29	Notice label: “Observe the instructions manual”
30	Attachment points for loading by crane

d.1 Identification plate

Type	XXXX		
Serial Number	XXXX	Manufacture date	XXXX
Rated drawbar pull	XXX N	Max. drawbar pull	XXX N
System voltage	XX V	Rated power	XXX kW
Service weight (without battery)	XXX kg	Battery mass, min./max.	XX/XX kg
Rated capacity	XXX kg		
XXXXXXXXX **XXXXXXXXXX**			CE

When inquiring about the tow tractor or ordering spare parts, always quote the serial number.

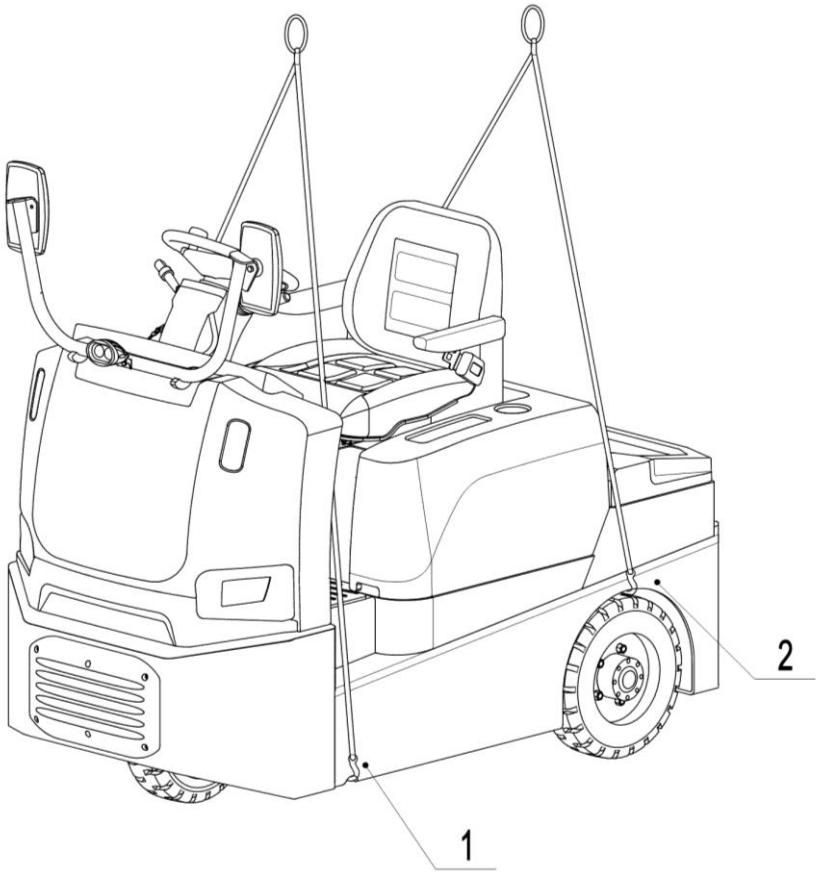
3. Transport and Commissioning

a. Lifting by crane

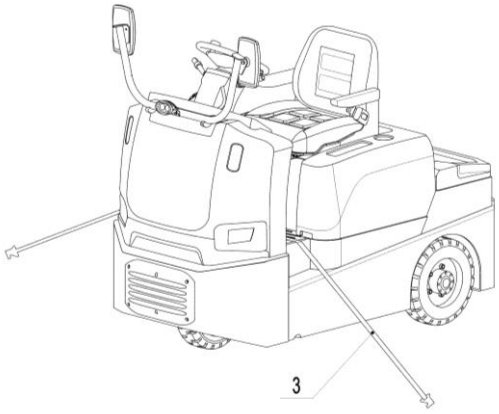
Incorrect crane loading and unloading procedures can result in accidents. Improper use or use of unsuitable lifting equipment can cause the truck to crash when being loaded by crane.

- Prevent the truck from hitting other objects during lifting, and avoid uncontrolled movements. If necessary, secure the truck with guide ropes.
- The tractor should be loaded/ unloaded only by people who are trained in using fixing accessories and lifting equipment.
- Wear personal protective equipment (e.g. safety shoes) when loading/ unloading by crane.
- Do not stand under lifted loads.
- Do not walk into or stand in a hazardous area.
- Always use lifting equipment with sufficient capacity (check the ID plate for truck weight).
- Always attach the crane lifting equipment to the specified attachment points and prevent them from slipping.
- Use the lifting accessories only in the specified load direction.
- Crane lifting equipment must be fastened in such a way that it does not come into contact with any attachments when lifting.

Park the tractor securely and attach the crane lifting gear to the attachment points (1 and 2) according to the figure below.



b. Transport



The truck must be securely fastened when transported on a lorry or a trailer. The lorry or trailer must have fixing plate.
Tighten the lashing strap (3) for fixing the tractor and fix it on the fixing plate.
Loading and unloading should be carried out by specially trained staff. Effective measures must be determined according to the specific case to ensure the correctness and security of measurement and loading and unloading operations.

c. Using the truck for the first time

The tractor must only be operated with battery power. Rectified AC current will damage the electrical components. The battery connection cable length (towing) shall not exceed 6 meters.

After receiving/ transporting the tow tractor, please perform the following checks before (firstly) operating the tractor:

- Check the tractor for completeness and normal status.
- Install the battery if necessary. Do not damage the battery cables.
- Check the battery status (see chapter 4).
- Start the tractor according to the instructions (see chapter 5).

If the tractor has been parked for a long period, the wheel surfaces may tend to flatten. Once the tractor has covered a certain distance, the flattening will disappear automatically.

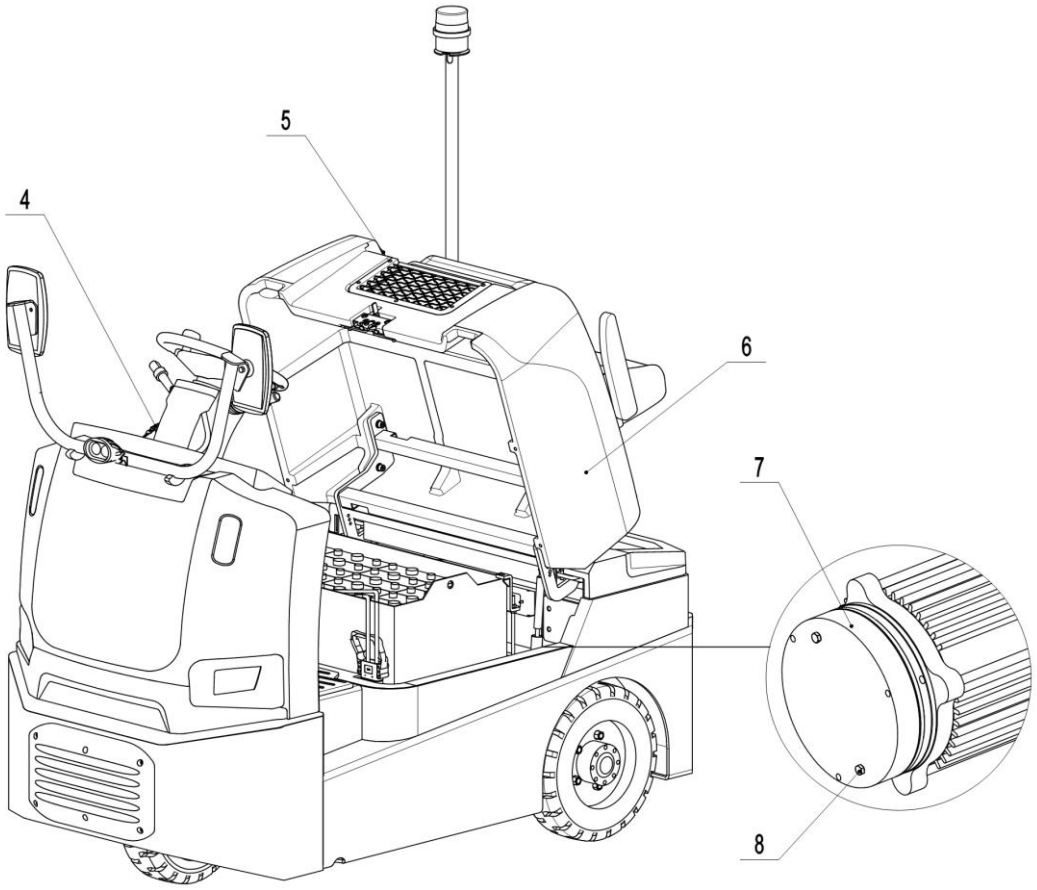
d. Move the tractor without the tractor's own drive system

If the tractor breaks down and affects normal driving but must be moved, follow the steps below:

- Activate the emergency switch (5) by pressing the button.
- Operate the key switch (4) to "off" position and remove the key.
- Place the tractor in a fixed position to prevent accidental movement.
- Open the battery panel (6) (refer to Chapter 4).
- Screw two bolts (8) into the brake (7) to tighten the fixing plate. The tractor can now be moved.
- Unscrew the bolts (8).

At this moment, the brake has been restored.

- Close the battery panel (6).



Towing the tractor

- Fix the coupling bar or rope on the tow eye of the tow truck and the towed truck respectively.
- Unplug the battery connector (refer to chapter 4).
- Disengage the electromagnetic brake: screw two bolts (8) into the brake (7) to tighten the fixing plate.
- There must be an authorized driver sitting in the driving position of the towed truck to control the direction of travel of the towed truck. Step speed must be used when towing!

4. Battery - Servicing, Recharging, Replacement

a. Safety regulations for handling of lead-acid batteries

Before working on the battery, park the towing tractor properly (see Chapter 5).

Maintenance personnel: Batteries may only be charged, serviced or replaced by trained personnel. These operating instructions and the manufacturer's instructions concerning batteries and charging stations must be observed when carrying out the work.

Fire protection: Do not smoke and avoid open flames when around the batteries. When the tractor is parked for charging there must be no inflammable material or equipment that causes sparks within a distance of at least 2 m in the surrounding area. The room must be ventilated. Fire protection equipment must be available.

Battery maintenance: The battery cap must be kept dry and clean. Terminals and cable lugs must be kept tight and clean, and a small amount of special grease should be applied. If the electrodes of the battery are not insulated, they must be covered with a non-slip insulating mat.

Battery disposal: Batteries may only be disposed of in accordance with national environmental protection regulations or disposal laws. The manufacturer's disposal instructions must be observed.

Before closing the battery panel, make sure that the battery cables are not damaged.

Risk of accidents and injuries when handling batteries

Batteries contain dissolved acid which is toxic and caustic.

- Always wear protective clothing and goggles when performing any operation on the battery.
- Avoid direct contact with battery acid.
- Do not let battery acid come into contact with skin, clothing or eyes. If necessary, rinse with plenty of clean water.
- In the event of physical injury (e.g.skin or eye contact with battery acid), go to a doctor immediately.
- Spilled battery acid should be neutralized immediately with plenty of water.
- Batteries can only be used when the battery panel is closed.
- Follow the relevant legislation and regulations.

The use of unsuitable batteries can be hazardous

The weight and dimensions of the battery have a considerable effect on the operational stability of the tow tractor. The use of unsuitable batteries must be approved by our company. The mass of battery is indicated on the identification plate.

Failure to follow the below requirements may cause damage to your property, cause injuries or death.

Measures to prevent ignition

- It is forbidden to work at temperatures over 60 ℃.
- It is forbidden to place it beside heat sources, such as stoves, fireplaces, etc.
- Direct sunlight must be avoided.
- It is forbidden to place batteries near inflammable and explosive substances.

Measures to prevent explosion

- Do not hit the battery, no impacts are allowed.
- Exclude penetration of objects through battery case or damages to battery case
- DO not throw products into the fire or water.

Measures to prevent electric leakage

- Do not disassemble.
- Do not contact by wet hands.
- Do not expose it to moisture or liquids.
- Do not place batteries in a place of easy access by children or animals.

Measures to preventing damage to battery systems

- It is forbidden to contact liquids or corrosive chemicals.
- Do not expose batteries to high temperature and/or high pressure.
- No trampling, disassembly or smashing.
- Do not attempt charging from discharge terminals and discharging from charging terminals.

Installation environment

- In order to ensure the best operating performance, the battery need to be kept under normal working conditions: between 0 and 40 degrees Celsius and normal humidity. Avoid excessive temperature difference on both sides of the battery (more than 5℃)

Emergency management

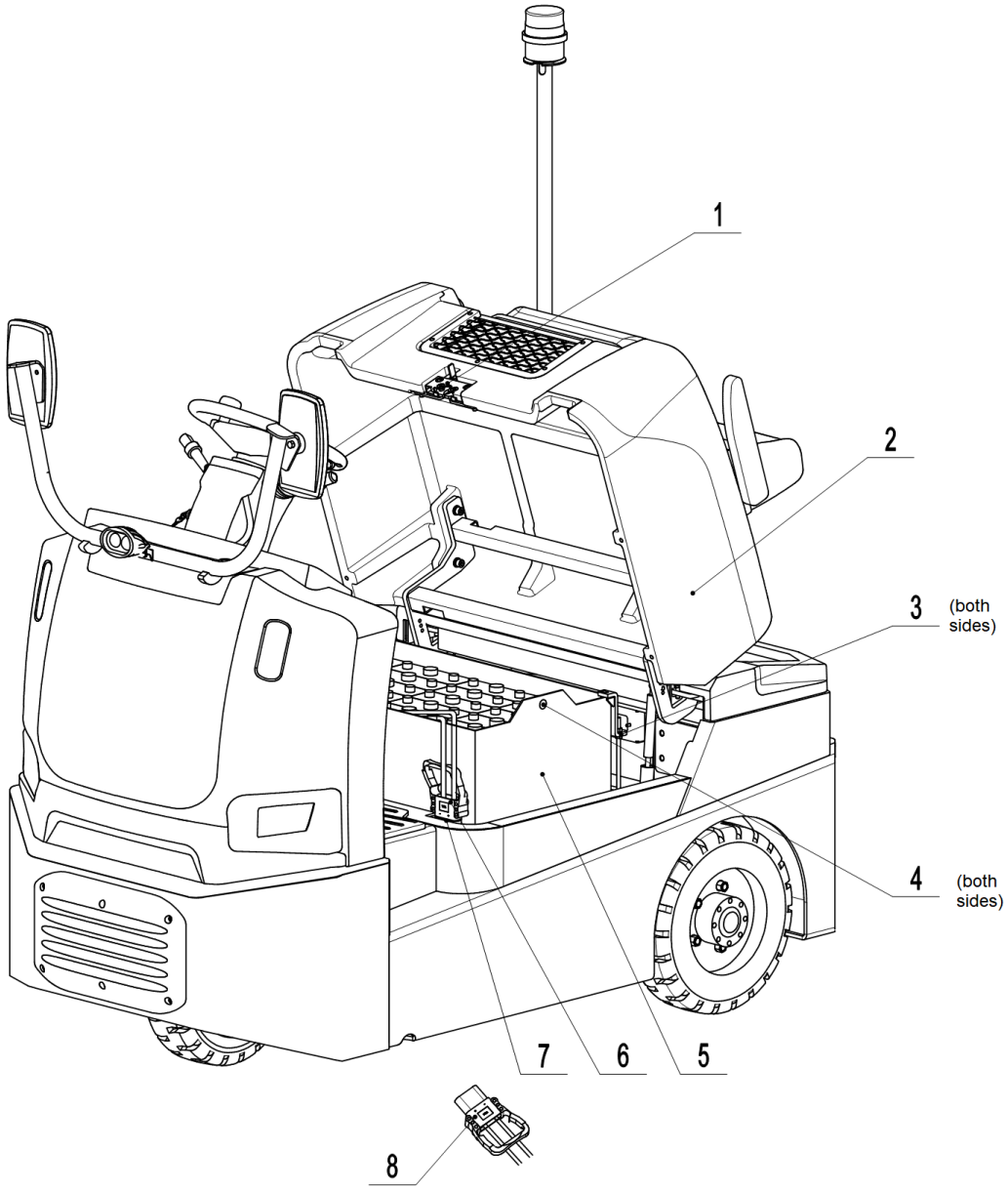
Below are examples of several ways to deal with possible emergencies:

- In case of Smoke or Ignition: stop to use equipment immediately, take appropriate actions according to working instructions and stay away from the scene.
- In case battery is immersed in water: stop to use equipment immediately, take appropriate actions according to working instructions and stay away from the scene.
- Products produce smell: stop to use equipment immediately, remove the battery and take appropriate actions according to working instructions and stay away from the scene. Avoid contact with any leaking liquids or gases out of the battery (in case of contact clean immediately).

Necessary safety equipment

- Self-contained breathing apparatus and personal protective equipment.
- Sevofluoropropane fire extinguishing system.

b. Battery overview



Item	Description
1	Battery panel latch
2	Battery panel
3	Battery fixture
4	Battery lifting hole
5	Battery
6	Battery connector
7	Battery connector holder
8	Charging cable of battery charging station

c. Battery types

Tractor model	Battery type
T30Q/T66Q	48V 3PzS 240
	48V 3PzS 270
	48V 3PzS 300
T60Q/T130Q	48V 3PzS 320
	48V 3PzS 360
	48V 3PzS 400
Li Battery	Li Battery48V200Ah1HR-3
	Li Battery48V300Ah1HR-14

When replacing or installing the battery, pay attention to the fixed position of the battery in the battery box of the tractor.

d. Charging the battery

The gases produced during charging can cause explosions

The battery produces a mixture of nitrogen and hydrogen (detonating gas) during charging. Gassing is a chemical process. This gas mixture is highly explosive and must not be ignited.

- Switch the charging station and truck off first before connecting/ disconnecting the charging cable of the battery charging station and the battery connector.
- The charger must be adapted to the battery in terms of voltage and charge capacity.
- Before charging, check all cables and connectors for visible damage.
- Ventilate the room in which the truck is being charged.
- The battery panel must be open and the battery cell surfaces must be exposed during charging to ensure adequate ventilation.
- Do not smoke and avoid open flames when handling batteries.
- Within a distance of at least 2 m around the tractor that is parked for charging, no flammable materials and working equipment that may cause sparks shall be placed.
- Fire protection equipment must be prepared.
- Do not lay any metallic objects on battery.
- The safety regulations of the battery and charging station manufacturers must be strictly observed.

Procedures to charge the battery

- Unlock the battery panel latch (1), and open the battery panel (2) until it is supported by the gas spring sheath.
- Remove the battery connector (6) from the connector holder (7).
- Connect the charging cable of battery charging station (8) to the battery connector (6).
- Turn on the charger.

Equalizing charge

Under normal circumstances, although all the battery cells of the battery pack are running under the same condition, it may cause imbalance of the battery pack for some reason. In this case, the equalizing

charge should be used to eliminate the difference between the batteries, to achieve the balance of the whole batteries. The equalizing charge is simple and can be operated according to the charger manual.

The battery in normal use needs to apply equalizing charge every 2 ~ 3months.
Batteries that have not been used for a long time should apply equalizing charge before use.

e. Battery removal and installation

There is risk of accident when removing and installing the battery.

Battery weight and battery acid may cause crushing and corrosion when removing and installing the batteries.

- Pay attention to the " safety regulations for handling of lead-acid batteries" in this chapter.
- Wear safety shoes when removing and installing batteries.
- Do not put your hands between the battery and the towing tractor.
- Only use batteries with insulated battery cells and electrode connectors.
- Cover the exposed electrodes or connectors on the battery with a rubber insulating pad.
- Park the tractor horizontally to avoid the battery slipping.
- Only use a lifting equipment with sufficient capacity to replace the battery.
- The pulling force of the lifting equipment must be in vertical direction to avoid damage and deformation to the battery box.
- Pay attention to the fixing direction of the lifting hook, prevent it from falling on the surface of the battery when the lifting equipment is released.
- Use only the specified battery replacement equipment (battery replacement station, etc.).
- The battery should be firmly fixed in the tractor battery compartment.
- When removing the battery, avoid lifting the battery at the battery panel or tilting the tractor.

Procedures to remove the battery

- Unlock the battery panel latch (1), and open the battery panel (2) until it is supported by the gas spring sheath.
- Remove the battery connector (6) from the battery connector holder (7).
- Unlock the battery fixture (3).
- Carefully lift the battery (5) from the tractor by means of the lifting equipment.

Procedures to install the battery

- Park the tractor according to instructions (refer to Chapter 5).
- Carefully lift the battery (5) and place it in the tractor by using the lifting equipment.
- Fix the battery, lock the battery fixture (3).
- Connect the battery connector (6) and the battery connector holder (7).
- Close the battery panel.

After installing a new battery, check all cable connections and connectors for obvious damage.

The battery must be securely fastened in the towing tractor to prevent damage to the battery from accidental movement. After each replacement, make sure that the battery will not slip.

The battery panel must be securely closed and fixed.

f. Description of the lithium-ion batteryn

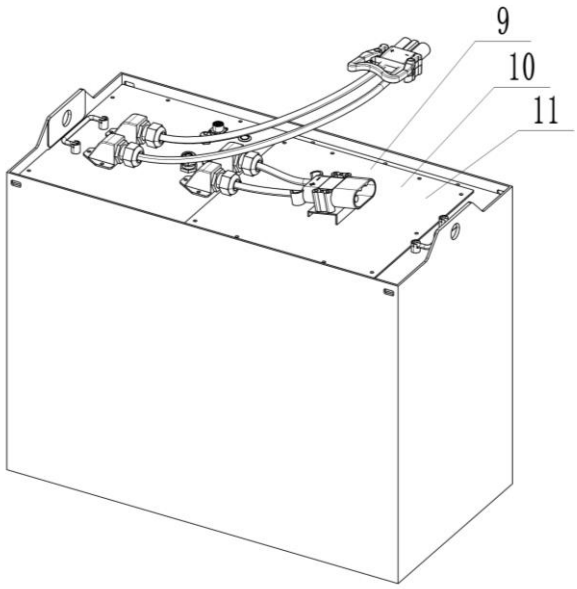
The lithium-ion battery is a battery with rechargeable cells, the battery is designed for industrial trucks and can withstand related vibrations during operation. The battery is equipped with special connections for charging and discharging operations. Do not try to install or connect improper connectors to the battery.

The battery is equipped with BMS – battery management system, which performs the control of battery condition and implements related safety protocols to protect the battery and cells from damages caused by operation or environmental conditions. The BMS controls the following safety functions and conditions: voltage, temperature, undervoltage, overvoltage, overtemperature, overcurrent, short circuit, etc. The internal resistance of lithium battery is generally low, which minimizes heat generation and maximizes the available power of the truck.

Temperature range for using the battery is from +5°C to +40°C. Low temperatures reduce the effective battery capacity, high temperatures reduce the battery's life time. The temperature difference between the two sides of the battery shall not exceed 5°C.

Only approved battery chargers must be used to charge the lithium battery.

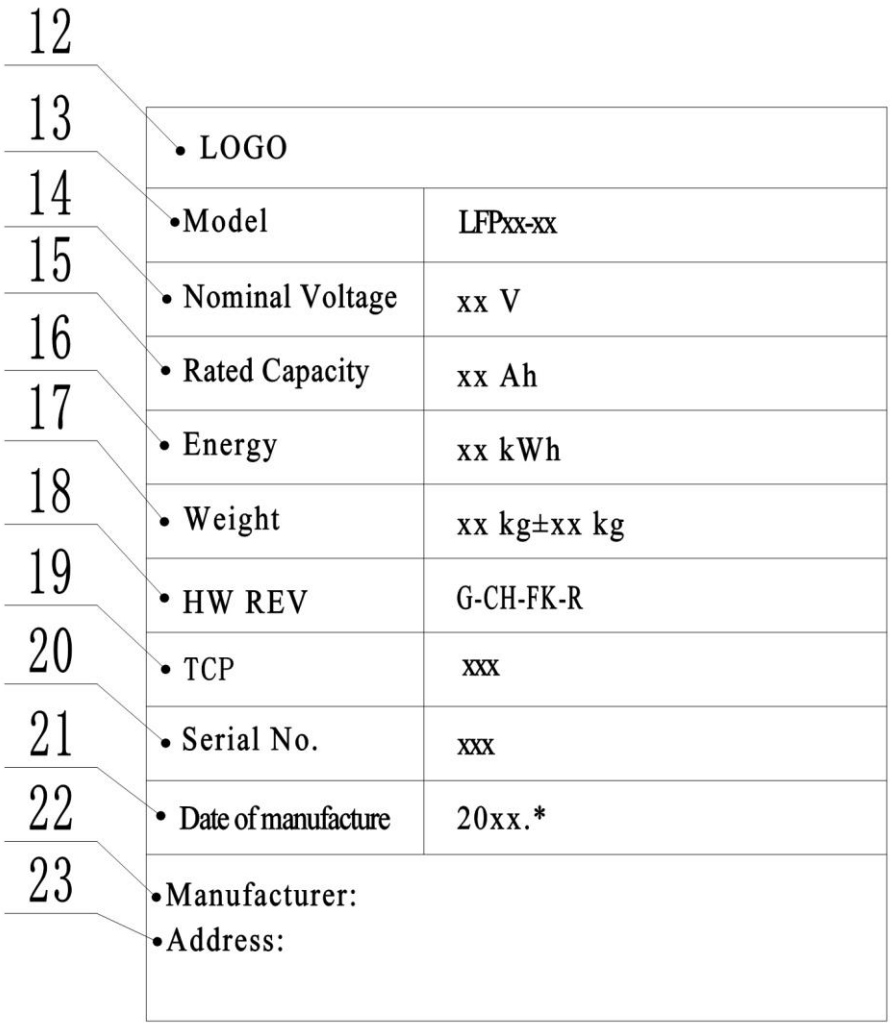
g. Li Battery Decals



Battery Decals

Item	Description
9	Identification plate
10	Battery information by 2D code
11	Safety information

Battery identification plate



Battery data plate

Item	Description	Item	Description
12	Manufacturer logo	18	Configuration of battery
13	Battery model	19	Protocol version of battery
14	Nominal voltage of battery	20	Production serial No.
15	Rated capacity of battery	21	Production date
16	Battery energy of battery	22	Name of manufacturer
17	Weight of battery	23	Manufacturer's address

Service mass is indicated on the battery data plate, the center of gravity is located approximately at middle of the battery case

h. Safety Instructions, Warning Indications and other Notes

h.1 Safety regulations for handling lithium-ion batteries

Do not try to make any repairs or servicing of lithium batteries. Replacement of parts is not assumed.

Risk of electric shock and burning

The battery's charging and discharging connectors have open terminals, avoid any body contacts, contamination or direct contacts with objects which can cause short circuit connection of terminals. Use necessary pre-cautions and protective caps to secure the open terminals. The connectors should be maintained in clean and dry conditions.

Use only batteries designed and approved by the manufacturer for the truck.
Do not try to modify or alter the battery.

Any damage or defects to the charger can result in accidents. Use only charger approved by the manufacturer of the truck, which is suitable for used battery.

In case charger has any damages or defects, exclude the charger from operation and contact your service provider. Do not modify or try to repair the charger.

Improper use of charger or use of wrong charger can cause damages to a battery or charger. Follow the required charger specifications; If the operation voltage of the charger is out of the applicable voltage range, the charger or battery may be damaged causing serious safety risks. The charger in use must be approved by the battery (truck) manufacturer.

Reversed connection of charging plug is prohibited. Follow the instruction for correct connection. For disconnection of charging plug use dedicated grip and never pull out the plug by means of cable.

Stop charging immediately if any abnormalities are detected, e.g. severe temperature increase, deformation of battery case, smoke, noise etc.

Intermediate charging

Lithium batteries support so called opportunity charging. The lithium battery, which is not fully discharged can be charged in any time. However, frequent opportunity charging not to the full charging state and stop of charging process before the appearance of corresponding indication of charger may result in dis-balance voltage of cells which increases the battery BMS calculation error. In order to effectively deal with this phenomenon, charge the battery in full allowing the automotive balancing process to be completed at least once a week.

Do not charge a fully charged battery

Note that in order to prevent the battery from continuing restart of charging under fully charged condition causing reduction of battery lifetime, the BMS has a protection function that prohibits recharging of fully charged battery. The charger will not work while battery is fully charged.

h.2 Potential hazards

If equipment is used according to its design purpose, following the correct operations procedures, there are no hazards anticipated.

The following hazards can arise in the event of improper use:

- Physical damage to the battery in case a battery falls or is deformed through impacts. Mechanical damages can cause leakages of harmful materials, fire or battery explosion.
- Short circuits may be caused by short connection of battery terminals, for instance, by water or other intentional/unintentional short connections.
- Temperature damages caused by placing of batteries in overheated environment conditions or being exposed to impact of fire, open sunlight etc. can cause leakages of harmful materials, fire or battery explosion.

In order to avoid fire, explosion and/or leakage of harmful materials, a safe place for storing non-functional or damaged batteries until the service arrives on site must satisfy the following criteria:

- Do not store in places where personnel is located.
- Do not store in places with valuable objects and close to valuable objects.
- A Class D fire extinguisher must be available on demand.
- There should not be any fire or smoke detectors in the storage area in order to ensure that an automatic fire detection system is only activated in the event of actual danger (e.g. flames).
- No ventilation intake pipes should be in the facility to exclude spreading of discharged content within a building.

Examples of where to store a non-functional battery:

- Roofed outdoor position.
- Ventilated container.

Covered fire resistant box with pressure and smoke discharge option.

h.3 Symbols - Safety and Warnings

	Used lithium-ion batteries must be treated as hazardous waste. Lithium-ion batteries marked with the recycling symbol and the sign showing a crossed-out waste bin must not be disposed of with ordinary household waste.
	Avoid fire and short circuits causing overheating. Do not ignite or locate batteries close to open flame, heat sources or sparks. Keep lithium-ion batteries away from heat sources.
	Caution! Battery short-circuit is prohibited.
	Protect the lithium-ion battery from solar radiation or other forms of heat radiation. Do not expose the lithium-ion battery to heat sources.

Explosion and fire hazard

Physical damage, thermal impacts or incorrect storage in the event of a defect can result in explosions or fire. The battery materials can be flammable.

Particular hazard from combustion products

The lithium batteries may be damaged by a fire. When extinguishing a lithium battery fire, the following information must be taken into consideration.

Contact with combustion products can be hazardous

Fire produces combustion products, which can occur in the form of smoke, through leaking fluids, escaping gases, debris as well decomposition products of certain chemicals. These combustion products are substances that enter the body through the respiratory tract and/or the skin, can produce and adverse effects such as choking.

Avoid contact with combustion products.
Use protective equipment.

Special firefighting protective equipment

Use self-contained breathing apparatus.
Wear protective equipment.

Additional firefighting instructions

To prevent secondary fires, the lithium-ion battery must be cooled from the outside.

Suitable extinguishing agents

- Carbon dioxide extinguisher (CO2)
- Water (not on mechanically opened or damaged batteries)

Unsuitable extinguishing agents

- Foam
- Grease fire extinguishing agents
- Powder extinguishers
- Metal fire extinguishers (PM 12i extinguishers)
- Metal fire powder PL-9/78 (DIN EN 3SP-44/95)
- Dry sand

Instructions for cooling an overheated, non-physically damaged battery

This type of damage may be caused by a short circuit inside the battery, which may result in leakage of harmful materials, fire or battery explosion.

h.4 Material discharge

Battery electrolyte fluid can be hazardous

Electrolyte fluid can be discharged if the battery is physically damaged. Avoid its contact with skin or eyes. If the contact happened:

- Rinse the affected parts with big amount of water and request for medical assistance immediately.
- In case of skin irritation or if any substances are breathed in request the medical assistance immediately.

Precautionary measures for personnel

- Keep personnel away, avoid any contact with smoke or discharged materials.
- Block off the affected area and ensure its reasonable ventilation.
- Wear personal protective equipment. If vapors, dust or aerosols are presented use self-contained breathing apparatus.

Precautionary measures for the environment

Do not allow spilled fluids to enter the water system, drainage system or the underground water.

Cleaning measures

The leaked fluid must be removed professionally following the related protocols.

h.5 Battery lifetime, maintenance and storage

The lithium-ion batteries are maintenance-free.

Deep discharge can damage the battery

Self-discharge without periodical recharge can lead the battery to fully discharged state. Full discharge shortens the service life of the battery and can cause deep discharge and activation of related safety protocols when battery will not be able to be charged anymore.

Before a long period of inactivity, the battery must be charged to 40%~60%.
Control the level of battery charge at least every 12 weeks and re-charge if necessary.
The temperature range for storing of the battery should be within the range of 0°C to 30°C.

If the battery is deeply discharged or if the battery temperature is below the permissible level, the battery cannot be charged. Deeply discharged batteries can never be charged. Due to the risk of condensate formation, batteries that have been stored at 0°C or below must only be charged after natural warming up to at least +5°C, forced heating is forbidden.

h.6 Instructions for safe handling of batteries

- Do not modify the battery.
- Do not open, damage, drop, penetrate or deform the battery.
- Do not throw the battery into a fire.
- Protect the battery from overheating.
- Protect the battery from direct sun light.
- Follow storage and charging procedures
- Protect the battery from water damages and other impacts

Failure to comply with these safety instructions can result in fire and explosion or the leakage of harmful materials.

Pre-shift checks before the system is put into operation

Check that the battery is in its normal condition, has no evidence of damages, leakages, abnormal findings, e.g. high temperature, smell, smoke etc. The surface of the battery should be clean and dry, without evidence of water damages, marks of rust on terminals and housing (if applicable). Connecting cables and plugs are in good condition.

Faults

If any damage is found to the battery or battery charger contact the service provider immediately.
Do not open the battery or attempt to repair it.

h.7 Disposal and transport of a lithium-ion battery

Instructions for disposal

Lithium-ion batteries must be disposed in accordance with the relevant national environmental protection regulations. Batteries must be treated as hazardous waste. Batteries must not be disposed with ordinary waste.

Shipping information

The lithium-ion battery is a hazardous material. The applicable regulations must be fulfilled during transportation.

Shipping functional batteries

Functioning batteries can be shipped in accordance with the related regulations

Shipping faulty batteries

To transport faulty lithium-ion batteries, contact the service provider. Faulty lithium batteries require following of special transporting procedures.

h.8 Charging the Battery with External Charger

Maintenance personnel

Batteries may only be charged, serviced or replaced by trained personnel. These operating instructions and the battery manufacturer's instructions must be observed when performing these operations.
Park the truck securely before carrying out any work on the batteries.

General information

- The charge status of the battery is indicated by LEDs on the battery charger.
- The charging time depends on the battery charge status. The time it takes to charge an almost fully depleted battery depends both on the battery capacity and the charge current. The approximate duration can be calculated as follows:
  Charging time = capacity of battery / charge current of battery charger.
- The lithium-ion battery can also be used when not fully charged. In this case, the remaining operating time is reduced.
- Charging continues automatically after a mains failure is restored. Charging can be interrupted by pulling out the mains connector and considered as a partial charge.

The battery temperature rises by approx. 13°C during charging. Battery charging should only start when the battery temperature is below 40°C. The battery temperature before charging should be at least 5°C.

Status of the LEDs on the battery charger

When the battery charger is connected to the battery and to the power supply, the LEDs on the charger indicate the following:

LED lit	Status
Green	The battery is fully charged
Red	Battery is charging

If the green LED does not light up or if the red LED lights up permanently or not at all, this indicates a fault.

5. Truck Operation

a. Safety regulations for the operation of the tow tractor

Driver authorization: The tractor may only be used by trained personnel, who have demonstrated to the proprietor or his representative that they can drive and handle loads and have been authorized to operate the tractor by the proprietor or his representative.

Operator's rights, responsibilities and rules of conduct: The driver must be informed of his duties and responsibilities and be instructed in the operation of the tractor and shall be familiar with the operating instructions. The operator must be authorized to operate the tractor by the proprietor.

If the operator needs to walk with the tractor when operating the tractor, safety shoes must be worn.

Do not reach your body or hands out of the tractor. During operation, the driver must remain within the driver's seat.

Unauthorized use of truck: The operator is responsible for the tractor during the time it is in use. The operator must prevent unauthorized persons from driving or operating the tractor. Do not carry passengers or lift other people.

Damage and defects: The supervisor must be informed immediately of any damage or faults to the tractor or attachment. Tractors which are unsafe for operation (e.g. wheel or brake problems) must not be used until they have been repaired.

Repairs: The operator must not carry out any repairs or alterations to the tractor without authorization and the necessary training. The operator must never disable or adjust safety mechanisms or switches.

Hazardous area: A hazardous area is defined as the area in which people are at risk due to the service weight of the tractor, its load handler (e.g. trailer) or travel of the laden truck. This also includes the area within reach of falling loads or disengagement of the trailer.

Instruct unauthorized persons to leave the hazardous area. Warning signs must be prepared in hazardous areas. If unauthorized persons are still within the hazardous area, stop the tractor immediately.

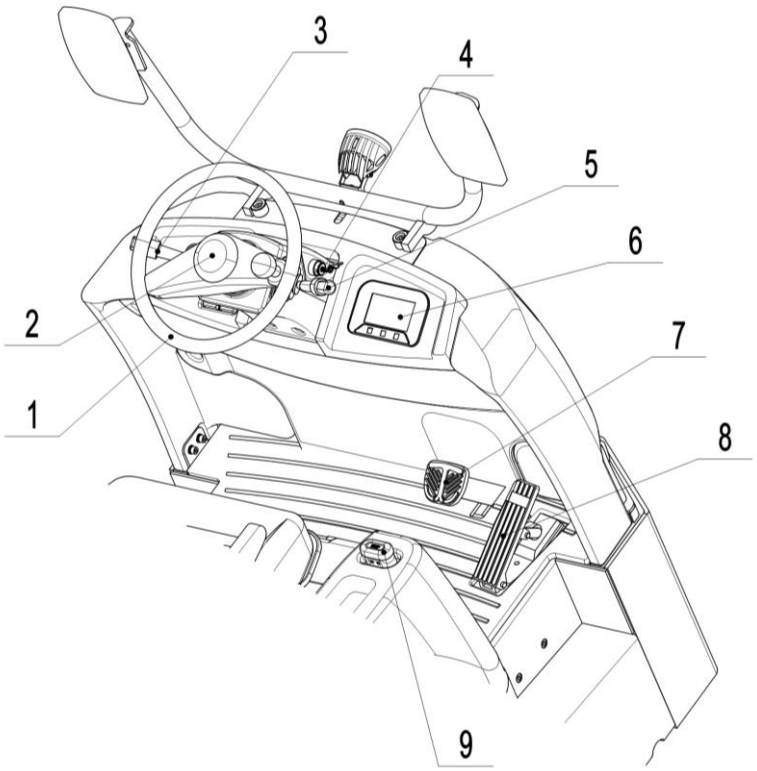
Safety devices, warning labels and warning instructions: All safety devices, warning labels and warning instructions of this manual must be strictly observed.

Risk of accident due to removal or deactivation of safety devices

Removing or disabling safety devices (e.g. emergency switches, brake pedal, alarm, warning lights, covers, etc.) may result in accidents and personal injury.

- The supervisor must be informed immediately of any identified deficiencies.
- Mark and stop the defective tractor.
- Restart the tractor only after confirming that the fault has been rectified.

b. Controls and operations



Item	Description	Function
1	Steering wheel	Steer the tractor.
2	Horn button	Activate an audible warning signal.
3	Travel switch	Control the travel direction (forward/ backward).
4	Key switch	Switch on and off the control current. Ensures that the tractor will not start accidentally after removing the key.
5	Lights switch	Control the turn signal and the main light for traveling.
6	Display unit	Display main truck data: driving parameters, alarm information, battery discharge status and operating hours, etc.
7	Brake pedal	Brake the tractor.
8	Accelerator pedal	Control the traveling speed of the tractor, which adapts step-less speed regulation.
9	Emergency switch	Stops all electrical functions and activates the electromagnetic brake.

The warning light comes on as soon as the key switch (4) is on. The blue ray light comes on when traveling forward. Control the knob switch (5) to control the main lamp. Rotate the knob switch (5), the main lamp is on. The brake light turns on when the service brake pedal (7) is activated. When the lever of switch (5) is turned to “turn signal” mode, by operating the lever of switch (5) to control the turn signal. Turn signal of the corresponding turning direction of the tractor will flash.

Operating instructions for the turn signal: Push the lever of the switch (5) forward, the left turn signal flashes. When the lever of the switch (5) in the neutral position, turn signal will not be on. Pull the lever of the switch (5) backward, the right turn signal flashes.

c. Display unit

LDB80S04 can display the battery charge, truck speed, height, steering angle, operating hours, low battery alarm, and monitored controller working parameters on its screen.

Description of key functions of the panel (as shown above):

Item	Description	Function
1	UP	Fast speed mode/ current parameter +1
2	DOWN	Slow speed mode/ current parameter -1
3	LEFT	Normal speed mode/ Left toggle
4	RIGHT	Backlight adjustment/ Right toggle
5	QUIT	Reset timer/ Exit
6	OK	SHIFT/ Save

c.1 Operating instructions for the display unit

Function of the buttons on the display: Only when the display is in working interface, long press the "UP" key for more than 3s, set the current mode to fast speed mode, the rabbit icon on the screen will be always on; long press the "DOWN" key for more than 3s, set the current mode to slow speed mode, the turtle icon on the screen will be always on; long press the "LEFT" key for more than 3s to set the current mode to normal speed mode, and the turtle and rabbit icons on the screen will be off.

Backlight adjustment: When the display is in working interface, press and hold the "OK" key and "RIGHT" key simultaneously for more than 3s, until the truck icon flashes at a frequency of 1Hz, and the display enter the backlight adjustment mode. The backlight brightness is divided into 10 levels from off to the brightest level. Adjust the backlight brightness by pressing “UP” key and "DOWN" key. Press "UP" key to increase the brightness and press "Down" key to decrease the brightness. The backlight brightness settings will be automatically saved. Press "QUIT" key to return to the working interface.

Hour meter and service timer: The minimum unit of the hour meter is 0.1h, and it can time up to 99999.9h under normal circumstances, if the data is exceeded the maximum value, the hour meter only displays a integer and the maximum value is 999999h. The service timer is used to remind the operator

when scheduled maintenance is required. The original SVC value is 999h, when the SVC value is reduced to 0h, it will not change and the service symbol will be always on. After carry out the truck maintenance, press “QUIT” key to reset the service timer.

Zero the hour meter: Disconnect the KSI switch and the display enters standby mode, the screen backlight is off and only the hour meter is displayed. In the standby state, press and hold "OK" key and "QUIT" key simultaneously for more than 3s until the “h” symbol (hour meter) flashes, and then press "OK" key to zero the hour meter.

Travel speed: Display the real-time travel speed, the minimum unit of speed is 0.1Km/h.

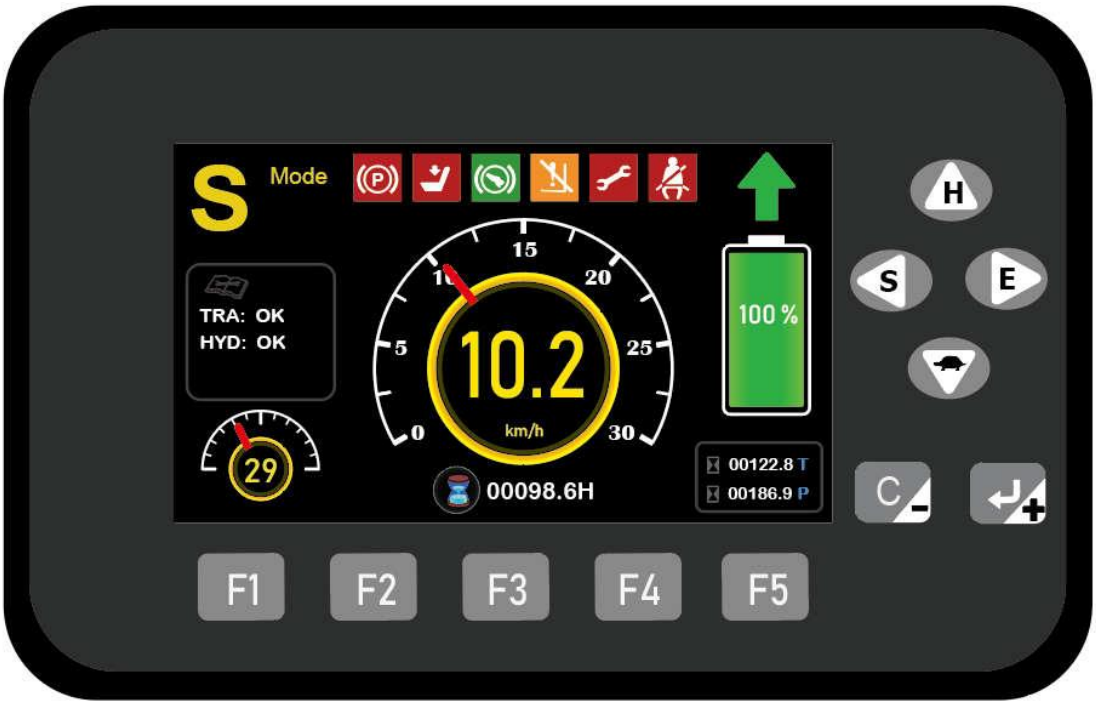
Operation hours timer: Once the accelerator pedal is engaged, it starts counting the operating hours.

c.2 Battery indicator

Battery indicator: The battery charge status is displayed in 10 increments. Each is represented by a rectangle that corresponds to 10% of the battery charge, when battery charge is 100%, 10 rectangles are displayed on the screen. The rectangles gradually disappear as the battery discharges. When the battery charge is 20%, the indicator displays a fault code 41 to remind the operator that the charging is required. If the battery continues to discharge and the battery charge reduces to 15%, the indicator displays a fault code 42 to remind the operator that the charging is required and the speed is limited to 20% of the full speed.

c.3 Curtis 3401T-5002 display (〇)

The Curtis 3401T-5002 display is powerful, easily configurable HMIs suitable for demanding, cost sensitive applications. The HMIs utilize high-bright color displays, allowing operators to clearly view diverse information in any lighting condition.



c.4 Key functions of Curtis 3401T-5002 display (○)

F1: Enters/exits the 3401T-5002 Operation Menu Screen; F1 key specifies the number "1" in the Password Screen;
F2: Enters/exits the 3401T-5002 Display Menu Screen; F2 key specifies the number "2" in the Password Screen;
F3: Enters/exits the Controller Menu Screen; F3 key specifies the number "3" in the Password Screen;
F4: Enters/exits the Controller Monitoring Menu Screen; F4 key specifies the number "4" in the Password Screen; When the 3401T-5002 display is in the Menu Screen, if the current menu options have writable parameters, press F4 key to change the selected parameter's value by steps sizes of the units, tens, hundreds, thousands or ten thousand digits respectively.
▲: Specifies the high performance mode; when the display is in the Password Screen, it specifies whether the password is for the User or OEM access level; when the display is in the Menu Screen, press the key to scroll up to the previous menu item on the screen.
▼: Specifies the turtle speed mode; when the display is in the Password Screen, it specifies whether the password is for the User or OEM access level; when the display is in the Menu Screen, press the key to scroll down to the next menu item on the screen.
◀: Specifies the standard performance mode; when the display is in the Password Screen, it specifies whether the password is for the User or OEM access level; when the display is in the Menu Screen, press the key to the previous menu.
▶: Specifies the energy efficient performance mode; when the display is in the Password Screen, it specifies whether the password is for the User or OEM access level; when the display is in the Menu Screen, press the key to enter the selected menu.
C/-: If password characters have been entered, it clears the last number when the display is in the Password Screen; If the display is in the Menu Screen, it decreases the selected writable parameter value or when a menu is selected, it navigates to the previous menu.
↵/+: Enters the Fault Name Screen; When the display is in the Password Screen, it verifies the entered password ; if the display is in the Menu Screen, it increases the selected writable parameter value or when a menu is selected, it enters the menu.
The discharge status is displayed as a percentage, when it is less than 20%, the truck speed will be limited to 20% of the full speed and the truck need to be charged.
"TRA" indicates the status of the traction controller, and the code indicates a controller failure.

d. Putting the tractor into operation

Before starting up the tractor or towing a trailer, the operator must ensure that no other persons remain in the hazardous area.

d.1 Checks and operations to be performed before starting daily operation

Before starting operating the tractor, the operator must ensure that the tractor is in good operating condition and without safety hazards.

Before operation, make sure that:

- Visually inspect the entire tractor.
- Check the battery attachment and cable connections for damage and make sure they are fixed firmly.
- Check whether the battery plug is firmly connected.

- Inspect the trailer coupling for visible damage.
- Check the drive wheel and load wheels for damage and freedom of movement.

Safety functions

The operator must ensure that the traveling speed matches the actual conditions of the road, working area and loading/ unloading requirements!
Before driving the tractor, make sure all moveable covers/ panels of the tractor are securely locked.
Keep the road clear.
If necessary, activate the required tractor lights.

d.2 Getting on and off the tractor

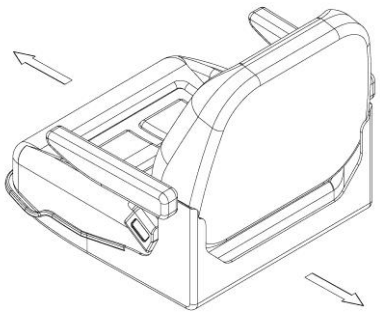
Hold the steering wheel and seat when getting on and off the tractor.
Getting in and out of the tractor via stage of the tractor.

Do not step on the accelerator pedal when getting on and off the tractor.

d.3 Adjusting the seat

Adjust the seat position until ti suits the operator's physique through the seat adjustment handle.
Pull the handle to the right to unlock the fixation. When the seat is adjusted to the proper position, release the handle and slightly move the seat back and forth to confirm whether it is securely locked.
The position adjustment range of the seat: the total adjustable range in front and rear is 120mm.

Do not adjust the seat while driving!



d.4 Seat belt

Fasten your seat belt before driving the tractor.
In the event of an accident, the seat belt can protect the operator!

Clean the seat belt regularly to avoid getting dirty (e.g. cover the belt when the tractor is not in use).

Do not make any modifications to the seat belts!
Otherwise, it could result in danger due to malfunctions.

The seat belt must be replaced after the accident.

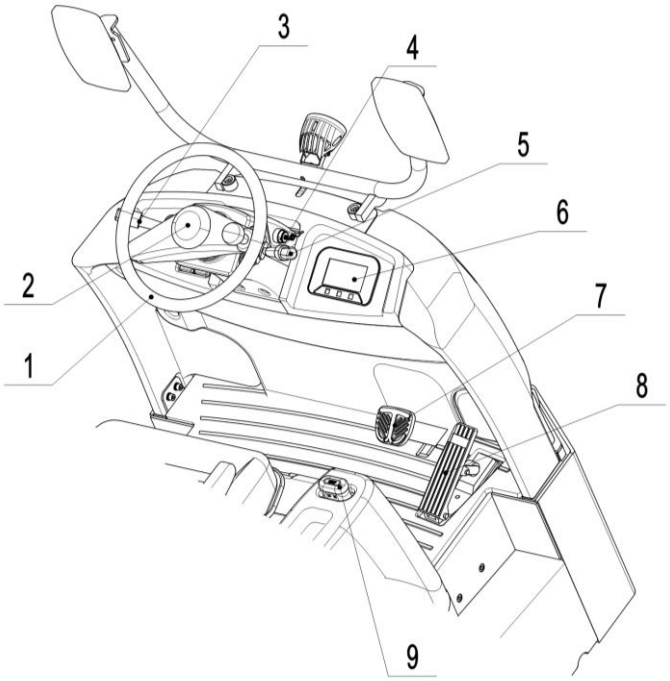
Original spare parts must be used during assembly and maintenance.

Damaged or malfunctioning seat belt must be replaced by an authorized dealer or manufacturer's branch.

Measures taken in a dangerous situation

When the tractor is in risk of tipping over. It is strictly forbidden to unfasten the seat belt and jump out of the tractor to escape.
Jumping off the tractor can lead to more serious physical injury!

d.5 Preparing the tractor for operation



- Deactivate the emergency switch (9) by pulling out the red button next to the seat.
- Insert the key into the key switch (4) and turn it to the right to "I" position to start the tractor.
- Check the function of the horn button (2).
- Check the function of the parking brake and hydraulic brake.
- Check the function of the accelerator pedal.

As soon as the operator leaves the seat, the parking brake is activated and keeps in the last traveling direction. Once the operator is back in his seat, the operator can drive in the original direction immediately. Depressing the brake pedal automatically releases the service brakes.

Press the brake pedal (7) to disengage the hydraulic brake. The brake only works when the brake pedal is depressed.

The tractor enters the ready- to-run state. The battery charge is indicated on the display (6) screen.

d.6 Parking the tractor securely

Make sure that the tractor is parked securely before leaving.

- The tractor travels on a level surface.
- Turn the steering wheel to the straight-ahead position.
- Turn the key switch (4) to "0" position.
- Remove the key from the key switch (4).
- Activate the emergency switch (9) by pressing the button.

e. Operating the tractor

e.1 Safety regulations for traveling operation

Travel routes and work areas: Only drive the tractor on specified lanes and routes. Unauthorized personnel must stay away from work areas. The load may only be stored in the designated locations. It is forbidden to place the load in the lanes and emergency exits that need to be used at any time, as well as in front of safety devices and running devices.

The tractor must be operated in work areas with sufficient light to avoid danger to person and materials.

The area and point loads allowed by the road for travel must not be exceeded. When the visibility is affected, a second person is required to conduct. The operator must ensure that the loading platform/ loading table is not removed or released during loading and unloading.

Precautions during traveling: The driver must master the driving speed according to the situation on site. Drive slowly e.g. on corners and in narrow spaces, when driving through swinging doors, in blind spots and where visibility is affected. The operator must always keep an adequate braking distance between the tractor and the vehicle in front, and control the tractor at all times. Abrupt stopping (except in emergencies), rapid U turns and overtaking at dangerous or blind spots are not permitted. Do not reach your body or hands out of the tractor.

Travel visibility: The operator must look in the direction of travel and must always have a clear view of the route of travel. If the tractor is carrying loads at the rear and it is necessary to adjust the driving route or state, the driver must make sure that there is enough room for adjustment. If the visibility is affected, a second person is required to conduct the route to ensure adequate adjustment space.

Traveling on slopes and incline: The operator must follow the prescribed route to travel on slopes and incline. The slopes and inclines must be clean, have a non-slip surface, and be safe and reliable within the technical specifications of the tractor. The tractor must not be turned, operated at an angle or parked on inclines or slopes. Traveling downhill at slow speed with the driver ready to brake at any moment.

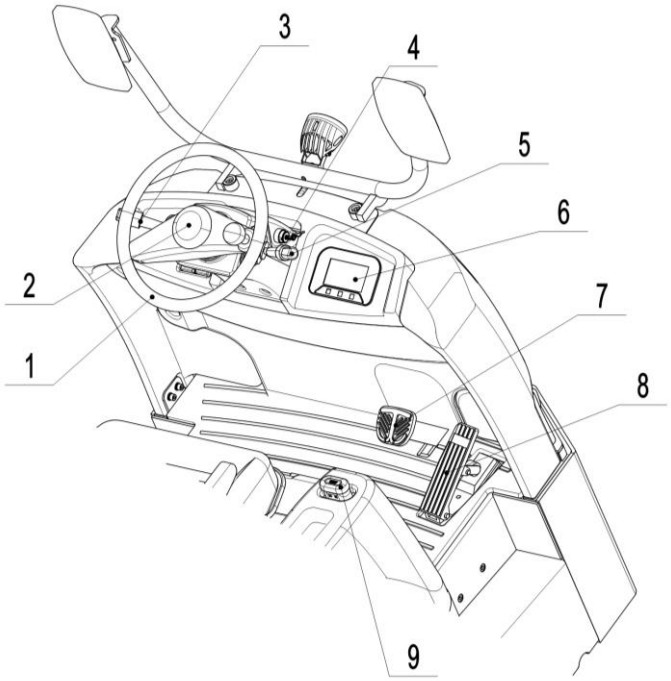
Towing a trailer: Do not exceed the maximum load capacity of the trailer when towing a trailer with or without brake. Loads on the trailer must be fixed in accordance with the regulations, and its specifications must not exceed the allowed dimensions. After connecting the trailer, the operator must secure the trailer coupling connection before starting the tractor. When driving a tow tractor ahead, ensure that the trailer can travel and brake safely and smoothly in all conditions.

Type of loads to be carried on storage table: The operator must carefully check the loads and make sure that the load is in a satisfactory condition without risk. Loads must always be positioned safely and

carefully before transporting. Use suitable precautions to prevent the loads from tipping or falling down (e.g. fixing rings).

Malfunction: If the electromagnetic field exceeds the permissible limit value during traveling, it may cause uncontrolled movement of the tractor. Immediately apply the service brake and press the emergency switch to stop the tractor and activate the parking brake. Check the cause of the malfunction and, if necessary, contact the manufacturer's service department.

e.2 Emergency stop, traveling, steering, braking



Emergency stop

There must be no objects near the emergency switch, so as not to affect its operation function.

Activate the emergency switch: Press the emergency switch (9).
Deactivate the emergency switch: Pull out the emergency switch (9).

Traveling

Sit on the seat, activate the emergency switch and start the tractor, operate the travel switch (3) control the travel direction, push the travel switch tractor forward, the tractor moves forward; pull the travel switch tractor backward, the tractor moves backward.

Make sure there is no obstacle in traveling area.
Turn the travel switch (3) to the desired direction.
Slowly press the accelerator pedal (8) until the desired travel speed is reached.

Steering

Turn right: Turn the steering wheel (1) clockwise to the required angle of the turn.
Turn left: Turn the steering wheel (1) counterclockwise to the required angle of the turn.

Braking

The braking performance of a tractor depends to a large extent on the conditions of the road surface. The operator must take this into account when driving the tractor. Take extra care when braking to avoid the load from slipping.
When towing load, it should be noted that the braking distance will be extended.

There are three braking methods available:

Service brake

Press the brake pedal (7) until sufficient brake pressure is generated.
The service brakes can brake the drive wheel hydraulically.

Regenerative brake

Release the accelerator pedal (8), the tractor will be regeneratively rolled to stop by the travel current controller. Press the brake pedal lightly if necessary.
This braking method can reduce energy consumption.

Reversing brake

During traveling, switch the travel switch (3) to the opposite traveling direction.

The tractor will be regeneratively braked by the travel current controller and begin traveling in the opposite direction.

e.3 Activating the lights

Travel light	Control the knob switch (5) to control the main lamp.
Turn signal	Move the lever of lights switch (5) back and forth to control the turn signal.
Warning light	It turns on automatically when the key switch (4) is activated.
Brake light	It turns on automatically when braking.
Blue ray light	It turns on automatically when the travel switch (5) is activated.

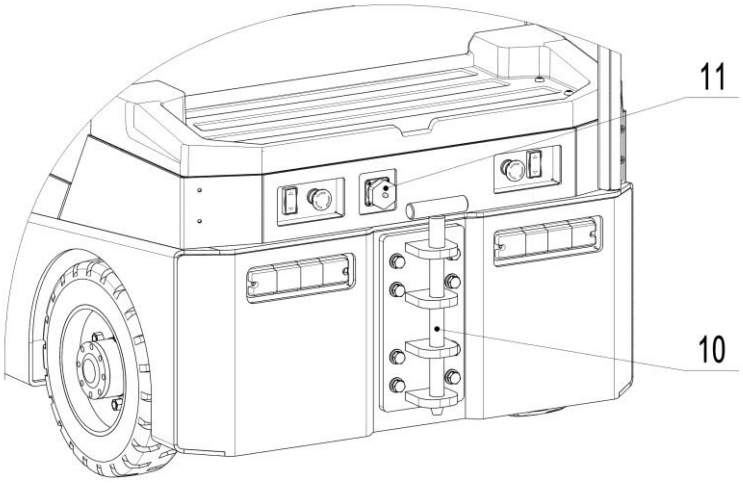
e.4 Load operation

When connecting or uncoupling the tractor and trailer, care must be taken that these two vehicles should be in a plane of equal height. All operating elements must be in the zero position. To prevent tampering, the coupling and trailer must be securely fastened.

Watch out for pinching! When attaching a trailer, be careful not to put your hands between these two vehicles.

Plug-in coupling

The plug-in coupling allows the trailer to be attached at three different heights.



Attaching the trailer

Pull out the bolt pin (10) from the trailer coupling.
Attach the trailer tow eye to the trailer coupling.
Put the bolt pin (10) through the hole of the trailer coupling from the upper.

Uncoupling the trailer

Check and confirm that the trailer has not moved.
Pull out the bolt pin (10) from the trailer coupling.
Detach the trailer tow eye from the trailer coupling from the side.
Reinsert the bolt pin (10) into the trailer coupling hole.

Aviation connector (○)

The tractor can be equipped with an optional aviation connector (11).

e.5 Travel with trailer

In special, tough work environments (e.g. inclines, slippery ground, or slides), note that the trailer must be reduced in weight to ensure safe braking in the event of an accident. The maximum permissible load is only for trailers traveling on a level surface (a loadable and non-slip surface).
If the trailer weighs more than 2000kg and travels on inclines (≥ 6%), it is recommended to use the trailer brake.

When towing a trailer, only traveling forward is allowed.
It is important to note that when the trailer is long and it is turning, the visibility will be affected.

When starting the tractor, secure the braking system and the steering of the trailer.

Wind loads

When transporting loads with a large area, the stability of the tractor is affected by the wind. Light loads must be particularly secured when they are subject to wind. In the following two cases, the operation should be adjusted.

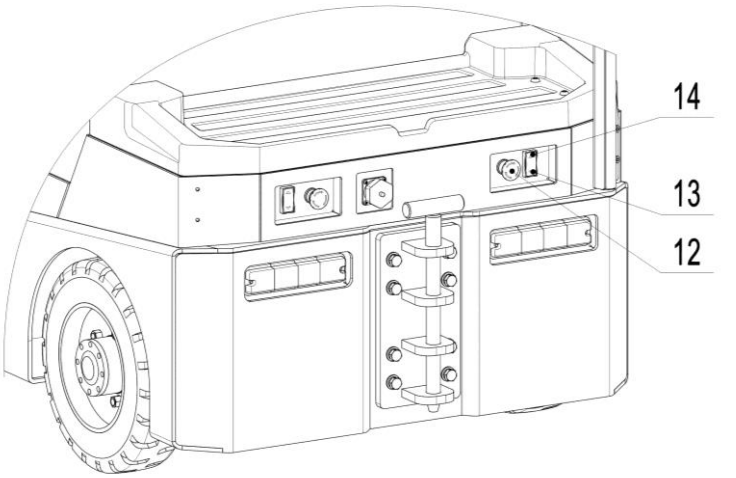
Driving with a trailer attached

Drive slowly until the trailer coupling is tightened.
Be careful when accelerating.

Parking with a trailer attached

When the trailer slows down or stops during towing operation, reduce the speed of tractor gradually.
Pay attention to the safety brake.

e.6 Side controls operation



There is a risk of pinching from the tow tractor.

The steering system is in the straight driving position.
For side controls operation to the tractor, the operator must walk beside the tractor.
No one should stay between the tractor and the obstacle.

When apply the side controls operation, a pulsed operation is generated at the rear of the tractor, and this operation is used to operate the tractor from the side. Then the speed of the tractor is 2.5km/h and is controlled via the "travel forward button" (14, slow travel) and the "travel backward button" (13, slow travel). The electromagnetic brake is activated as soon as the side controls are released or the emergency button (12) is pressed.

Side controls operation makes it easier to attach the trailer smoothly.

During side controls operation: Sitting in the driver's seat is not allowed. The tractor will travel forward or backward at a pre-set speed (2.5km/h).

Tractor braking

Press the "emergency button" (12), the tractor brakes to a halt.

f. Operating instructions for pin-code lock (○)

f.1 Description of the pin-code lock

Access code ignition switch (hereinafter referred to as "pin-code lock"), the truck will not be allowed to start until the authorized access code is entered. The main function of the pin-code lock is to prevent unauthorized access. In addition to being easy to use, this product is also of great help to the anti-theft and safety of the truck.

Main parameters:

Working voltage: 12V-60V
Working environment temperature: -40℃ to +90℃
Protection class: IP65

Main functions and access code:

The pin-code lock supports up to 5 RFID cards and 1 set of access code. Each set of access code is mainly composed of four numbers (0-9).

Please see separate manual for administrator access code. The truck is delivered with the access code "1234", please refer to the separate manual for changing the access code.

Procedures:

ID card operation
Approach the RFID card to the pin-code lock panel, if the RFID card is valid, the pin-code lock will emit a short beep, and then the blue indicator light is always on, indicating that the pin-code lock is working normally, that is, the electric lock switch signal output is normal. The red indicator light will flash if you fail in RFID card access.

Access code operation
Enter the access code and press the "√" key. The truck can be started with the correct access code.
Press and release the “×” key on the panel, the truck will be turned off.
Enter the access code again if you want to operate the truck again.

Pin-code lock indicators

Indicator light	Indication
Red	Fault
Yellow	Waiting
Blue	Status
Green	Power

f.2 Starting up the truck

After completing the daily inspection, activate the emergency switch and the truck enters the power-on standby state. Enter the correct access code and press the "√" key of the pin-code lock panel, after the buzzer beeps, the green indicator lights up, which indicates the truck is started up. Or approach the ID card to the pin-code lock panel, after the buzzer of the buzzer beeps, the green indicator light is on, and the truck is ready for operation.

g. Trouble shooting

This chapter is intended to help users identify and troubleshoot simple faults or problems caused by operating errors. Please check step by step in the sequence of operations in the table below to determine the specific cause of the malfunctions.

TROUBLE	CAUSE	REMEDY
The tractor does not move	Battery connector is not well-connected.	Check the battery connector and connect it well if necessary.
	Emergency switch is activated/ pressed.	Unlock the emergency switch.
	The key switch is turned to "0" position.	Turn the key switch to "I" position.
	Traveling direction is not selected.	Set the traveling direction via the travel switch.
	Battery charge is too low.	Check the battery charge, charge the battery if necessary.
	Fuse is defective.	Check the fuse, replace if necessary.
The tractor travels slowly	Battery charge is less than 20%.	Charge the battery.
	Turtle speed mode is activated.	Deactivate the turtle speed mode.
Drive wheel slides	The towing mass exceeds the rated towing capacity.	Remove the load that exceeds rated towing capacity.
	Stains on the floor.	Clean the floor.
	Potholes in the floor.	Remove the trailer and drive out of pothole.

If the above remedial actions are carried out and the tractor cannot be restored to operational condition, please contact the local dealers or manufacturer’s service for further troubleshooting.

In order to respond quickly and specifically to the fault, please offer the the following essential information to the local dealers or manufacturer’s service:

- Serial number of the tractor
- Fault code on the display screen (if present)
- Error description
- Current location of the tractor
- Your contact information.

g.1 Fault codes of LDB80S04 display unit

Fault code	Fault description	Possible causes and approaches
1	Over-speed.	Controller failure, contact manufacturer.
2	Kernel run error.	Controller failure, contact manufacturer.
3	Controller and motor have been overloaded for a long time.	Check whether the controller matches the motor and whether the controller is not suitable.
5	The position command change after the electronic gear ratio exceeds the maximum motor rotation speed.	Controller failure, contact manufacturer.

6	In speed mode, the speed command exceeds the maximum motor rotation speed.	Controller failure, contact manufacturer.
7	In torque mode, the torque command exceeds the maximum motor torque.	Controller failure, contact manufacturer.
8	Lost speed sensor	No speed feedback detected. Approaches: Check the wiring between the speed sensor and the controller; Check whether the signal of the speed sensor is normal; Check the detection circuit of the controller.
9	Speed sensor orientation error	The orientation of the AB phase of the speed sensor does not match the orientation of the motor UVW. Approaches (any one of the methods below): Modify the parameters P3.0 encoder orientation; or exchange position of the any two-phase of the controller UVW; or exchange the wiring of AB phase of the speed sensor.
11	2 min maximum current protection of motor	Motor current have exceeded the 2min permissible current for more than 2 min. The motor is blocked; check whether the brake is disengaged and whether there is any objects stuck in the drive mechanism. The controller parameters are not set properly, see Motor Parameters for details.
12	Controller over-current	The controller is selected incorrectly; or controller defect, contact the manufacturer.
13	Main capacitor charging fault	Controller failure, contact manufacturer.
14	Main contactor connection failure	Check if the contactor is connected properly.
15	Electromagnetic brake connection failure	Check whether the electromagnetic brake is properly connected.
16	Battery voltage is too low	Check the battery voltage; or battery voltage level setting of the controller is incorrectly.
17	Battery voltage is too high	Check the battery voltage; or battery voltage level setting of the controller is set incorrectly.
18	Over-temperature of power board	Controller protection, stop using.
19	Over-temperature of the motor	Controller protection, stop using.
20	Abnormal accelerator/ brake pedal input	The accelerator pedal or brake pedal input signal is abnormal. Approaches: 1) Check the wiring connection between the pedal and the controller; 2) Check whether the pedal is damaged; 3) Check the controller parameter settings for the pedal, especially the settings for pedal type.

		(P91, P101).
21	Main contactor contacts fused	Check whether the main contactor is damaged and replace the main contactor.
22	5V output failure	Motor encoder short circuit; or other 5V external device short circuit; or it's controller failure, contact the manufacturer.
23	MACID detection failed	The controller CAN network ID setting is repeated, reset it.
24	Main contactor drive failure	Check whether the main contactor is damaged and replace the main contactor.
25	Power module failure	Controller failure, contact manufacturer.
26	CAN node lost	The controller is configured in parameter P1 and the interlock check is enabled in parameter P2. In actual operation, the corresponding module were not found. Check the wiring between each module and the working status of the modules.
29	Abnormal temperature measurement circuit inside the controller	Controller failure, contact manufacturer.
31	The battery voltage is slightly low	Low battery, charge the battery as soon as possible.
32	Slight over-temperature of the power board	Reduce the load.
33	Under-temperature of the power board	Ambient temperature is too low.
34	Slight over-temperature of the motor	Reduce the load.
35	12V output failure	The power supply of the handheld device is short-circuited; or it's controller failure, contact the manufacturer.
36	Drive3 connection failure	Check Drive3 connection.
37	Drive4 connection failure	Check Drive4 connection.
38	EEPROM read/ write parameter error	Controller failure, contact manufacturer
39	Parameters overrun error	Parameter settings failure, contact the manufacturer
40	Operation timing error	After reset, key signals are not in their original position (throttle switch, travel switch, lift/lower, safety switch). Reset the signal and the alarm is automatically eliminated.
41	Remaining battery charge 20% alarm	Charge the battery.
42	Remaining battery charge 15% alarm	Charge the battery.

g.2 Fault codes of Curtis 3401T - 5002 display unit (○)

Fault code	Fault description	Possible causes and approaches
12	**Controller Overcurrent** Fault Type(s):	1. External short of phase U, V, or W motor connections.

	1 = Controller Over Current Phase U 2 = Controller Over Current Phase W 3 = Controller Over Current Phase V 4 = Irms > 135 % Current Limit	2. Motor encoder signal is interfered. 3. Motor parameters are mistuned. 4. Controller defective.
13	**Current Sensor** Fault Type(s): 1	1. Leakage to vehicle frame from phase U, V, or W (short in motor stator). 2. Controller defective. Clear: Replace the controller.
14	**Precharge Failed** Fault Type(s): 1 = Abort. 2 = Energy Limit Exceeded 3 = Time Limit Exceeded	1. An external load on the capacitor bank (B+ connection terminal) that prevents the capacitor bank from charging. 2. See Programmer\ System Monitor Menu\ Controller\ Capacitor Voltage. Clear: Replace the controller.
15	**Controller Severe Undertemp**	1. Controller is operating in an extreme environment. 2. See Programmer\ System Monitor Menu\ Controller\ Controller Temperature. Clear: When the temperature rises above -40°C, Cycle KSI or interlock switch, if not, replace the controller.
16	**Controller Severe Overtemp**	1. Controller is operating in an extreme environment. 2. Excessive load on vehicle. 3. Improper mounting of controller. 4. See Programmer\ System Monitor Menu\ Controller\ Controller Temperature.
17	**Severe B+ Undervoltage**	1. Non-controller system drain on battery. 2. Battery resistance too high. 3. Battery disconnected while driving. 4. Blown B+ fuse or main contactor did not close. 5. Battery parameters are misadjusted. 6. See Programmer\ System Monitor Menu\ Controller\ Capacitor Voltage.
	Severe KSI Undervoltage	1. Non-controller system drain on battery. 2. Resistance in KSI input circuit is too high. 3. KSI disconnected while driving. 4. Blown fuse. 5. See Programmer\ System Monitor Menu\ Controller\ Key switch Voltage.
18	**Severe B+ Overvoltage**	1. Battery parameters are misadjusted. 2. Battery resistance too high for given regen

		current. 3. Battery disconnected while regen braking. 4. See Programmer\ System Monitor Menu\ Controller\ Capacitor Voltage.
	Severe KSI Overvoltage	1. Battery-voltage applied to KSI (pin 1) exceeds the Severe Overvoltage limit. 2. See Programmer\ System Monitor Menu\ Controller\ Key switch Voltage.
19	**Speed Limit Supervision**	1. Motor speed detected that exceeds the limit set by the Max Speed Supervision parameter. 2. Misadjusted Max Speed Supervision parameters. 3. See: Programmer\ Application Setup\ Max Speed Supervision menu.
1A	**Motor Not Stopped** Fault Type(s): 1 = The motor moved more revolutions than the parameter, Motor_ Not_ Stopped_ Position_ Error setting. 2 = The motor moved faster than the parameter, Motor_ Not_ Stopped_ Speed_ Error (RPM) for 160ms. 3 = The three-phase drive has applied an electrical frequency greater than the Motor_ Not_ Stopped_ Max_ Frequency parameter, and applied an RMS current greater than the Motor_ Not_ Stopped_ Max_ Current parameter for 64ms.	1. Misadjusted Motor Not Stopped parameters. 2. See: Programmer » Application Setup » Motor Not Stopped menu. 3. Internal Controller fault or conflict allowing the motor to rotate when in the stopped state.
1B	**Critical OS General** Fault Type(s): (<100) Internal Fault. Contact Curtis support. (>100) An ill-formed or corrupted application package was loaded into controller.	1. (<100) Internal Fault. 2. (>100) CIT version is too old to fully support the FOS version.
1C	**OS General 2** Fault Type(s): (<100) Internal Fault. Contact Curtis support. (>100) An ill-formed or corrupted application package was loaded into controller.	1. (<100) Internal Fault. 2. (>100) CIT version is too old to fully support the FOS version.
1D	**Reset Rejected**	Clear: Cycle KSI.
1F	**Motor Short**	Clear: Reset controller.
22	**Controller Overtemp Cutback**	1. Controller is operating in an extreme environment. 2. Excessive load on vehicle. 3. Improper mounting of controller which is preventing controller cooling. 4. Controller is performance-limited at this

		temperature. 5. See Programmer\ System Monitor Menu\ Controller\ Controller Temperature. Clear: Bring heatsink temperature below 85°C. Cycle KSI or interlock switch, or replace the controller.
23	**Undervoltage Cutback**	1. Batteries need recharging. Controller is performance limited at this voltage. 2. Battery parameters are misadjusted. 3. Non-controller system-drain on battery. 4. Battery resistance too high. 5. Battery disconnected while driving. 6. Blown B+ fuse or main contactor did not close. 7. See Programmer\ System Monitor Menu\ Controller\ Currents\ UndervoltageCutback. 8. See Programmer\ System Monitor Menu\ Controller\ Capacitor Voltage.
24	**Overvoltage Cutback**	1. Normal operation. Fault shows that regen braking currents elevated the battery voltage during regen braking. Controller is performance limited at this voltage. 2. Battery parameters are misadjusted. 3. Battery resistance too high for given regen current. 4. Battery disconnected while regen braking. 5. See Programmer\ System Monitor Menu\ Controller\ Currents\ OvervoltageCutback. 6. See Programmer\ System Monitor Menu\ Controller\ Capacitor Voltage.
25	**Ext 5V Supply Failure** Fault Type(s): 1 = 5V Supply's voltage is out□of-range 2 = 5V Supply's current is out□of-range	1. External load impedance on the +5V supply is too low (pin 16). 2. See Programmer\ System Monitor Menu\ Outputs: External_5V_Supply, Ext_5V_Current.
26	**1Ext 12V Supply Failure** Fault Type(s): 1 = 12V Supply's voltage is out-of-range 2 = 12V Supply's current is out-of-range	1. External load impedance on the +12V supply is too low. 2. See Programmer\ System Monitor Menu\ Outputs: External_12V_Supply, Ext_12V_Current.
28	**Motor Temp Hot Cutback**	1. Motor temperature is at or above the programmed Temperature Hot setting—resulting in a reduction of controller drive current. 2. The motor temperature and sensor control parameters are misadjusted.

		3. See Programmer\ AC Motor Setup\ Temperature Sensor.
29	**Motor Temp Sensor**	1. Motor thermistor is not connected properly. 2. Sensor polarity (between Pin 8 and Pin 18) is incorrect. 3. The motor temperature and sensor parameters are misadjusted. 4. See Programmer\ System Monitor Menu\ AC Motor\ Temperature.
31	**MAIN DRIVER** Fault Type(s): 1 = Driver short circuit 2 = Driver overcurrent 3 = Open/short circuit (high detected, should be low) 4 = Open/ Short circuit (low detected, should be high) 5 = Disconnection	1. Open or short on driver load. 2. Dirty connector pins at controller or contactor coil. 3. Bad connector crimps or faulty wiring.
32	**EM Brake Driver Fault** Fault Type(s): 1 = Driver short circuit 2 = Driver overcurrent 3 = Open/ short circuit (high detected, should be low) 4 = Open/ Short circuit (low detected, should be high) 5 = Disconnection	1. Open or short on driver load. 2. Dirty connector pins at controller or contactor coil. 3. Bad connector crimps or faulty wiring.
34	**Load Hold Diver Fault**	Same as Driver 1 Fault
35	**Lower Driver Fault**	Same as Driver 1 Fault
36	**Encoder Fault** Fault Type(s): 1 = Check loss 2 = Overcurrent causes pulse loss 3 = Speed pulse signal loss 4 = Motor matching 5 = Faulty power supply of the encoder	1. Motor encoder failure. 2. Bad crimps or faulty wiring. 3. See Programmer\ System Monitor Menu\ AC Motor\ Motor RPM. 4. See Programmer\ AC Motor Setup\ Quadrature Encoder\ Encoder Fault Setup. 5. See Programmer\ System Monitor menu\ Hardware Inputs: Analog 3 and 4.
37	**Motor Open**	1. Motor phase is open. 2. Bad crimps or faulty wiring.
38	**Main Contactor Welded**	1. Main contactor tips are welded closed. 2. Motor phase U or V is disconnected or open. 3. An alternate voltage path (such as an external circuit to B+ connection terminal of the controller.
39	**Main Contactor Did Not Close** Fault Type(s):	Type 1: 1. Main contactor did not close.

	1 = Main did not close when commanded. 2 = Main disconnected during operation.	2. Main contactor tips are defective (oxidized, burned, or not making good contact). 3. An external load on the capacitor bank (B+ connection terminal) is preventing the capacitor bank from charging. 4. Blown B+ fuse. 5. Main Contactor parameters mistuned. Type 2: 1. Main contactor opened during operation (while commanded closed). 2. Contactor's coil disconnected. 3. Contactor/coil defective.
42	**Throttle Input** Fault Type(s): * 1 = Outside the Low or High parameter.	1. Throttle voltage exceeded the Analog Low or Analog High parameters for the analog input defined for the throttle input. 2. See Programmer\ Controller Setup\ Analog Inputs\ Analog 1 Type. 3. See Programmer\ Controller Setup\ Analog Inputs\ Configure.
44	**Brake Input**	*Triggered by the respective fault diagnostic associated with the brake input source (assigned analogX input). Note: Input fault diagnosis can be input voltage out of range.
46	**NV Memory Failure** Fault Type(s): 1 = Invalid checksum. 2 = NV write failed. 3 = NV read failed. 4 = NV write did not complete during power down.	1. Failure to read or write to nonvolatile (NV) memory. 2. Internal controller fault.
47	**HPD Sequencing**	1. Incorrect sequence in application of Keyswitch, Interlock, Direction, or Throttle. 2. Faulty wiring, crimps, or switches at KSI, Interlock, Direction, or Throttle. 3. Moisture in above-noted digital input switches (Keyswitch, Interlock, Direction, or Throttle) causing invalid (real) On/Off state. 4. Verify Programmer\ System Monitor Menu\ Inputs\ Switch Status 5. Verify Programmer\ System Monitor Menu\ Inputs\ Throttle Command
	EMR Rev HPD	Emergency Reverse operation has concluded, but the throttle, forward and reverse, and interlock inputs have not been returned to neutral.
	Pump HPD	Incorrect lifting/ lowering throttle input conditions

	Fault Type(s): 1 = Lifting only 2 = Lowering only 3 = Lifting and lowering	(>25%) Parameter setting error: 1. Hydraulic suppression type 2. HPD/SRO judgment time 3. Pump throttle hardware fault
49	**Parameter Change** Fault Type(s): Reports the CAN Object ID of parameter.	While the Interlock was On, a safety based parameter was changed. Parameters with this property are marked with a [PCF] (Parameter Change Fault) in the Parameter menu listings.
4A	**EMR Switch Redundancy**	1. Either or both Emergency Reverse input switches are inoperative, resulting in an invalid state. 2. Ingress of dirt or moisture in switch(es).
51	**Pedal Switch Short**	Check the pedal.
53	**VCL HPD Fault 2**	Throttle signal first, operate in a correct sequence.
54	**VCL HPD Fault**	Throttle signal works when it is switched on.
55	**VCL SRO Fault**	Throttle signal first, operate in a correct sequence.
56	**Display Config Fault**	Check the configuration.
57	**BMS Fault Grade NonZero**	Check the battery.
58	**Remote pdo timeout**	Clear the communication faults with controller (configuring, protocol, circuit, etc.)
59	**Steering Wheel Angle Change**	Switch 180/360 angle mode, restart KSI after rectifying the fault and switch to the corresponding angle mode.
62	**PDO Timeout BMS**	Check the battery and communication.
63	**BMS Temp High fault**	Check the battery.
64	**BMS low AH**	Charge the battery.
65	**BMS voltage difference**）	Check the battery.
66	**BMS Severe Overvoltage**	Check the battery.
67	**BMS Undervoltage**	Check the battery.
5A	**BMS Temp LOW fault**	Check the battery.
5B	**Redundance Check Fault**	
5C	**Battery type mismatch**	Use the correct battery.
5D	**Wrong 3401 Model**	Use the correct display.
5E	**Not Curtis Display**	Check the display.
68	**VCL Run Time Error**	1. Runtime errors are defined using the VCL Error Module and VCL Error. See the System Information file. 2. Using driver control commands in VCL can lead to VCL runtime errors if the VCL command and the driver assignment do not match.

71	**OS General**	Clear: Reset Controller.
72	**CAN PDO Timeout**	1. The time between CAN PDO messages received exceeded the PDO Timeout Period as defined by the Event Timer parameter. 2. Adjust PDO Settings. See Programmer/ Application Setup/ CAN Interface/ PDO Setups.
73	**Stall Detected**	1. Stalled motor. 2. Motor encoder failure. 3. Bad crimps or faulty wiring. 4. Problems with power supply for the motor encoder. 5. See Programmer\ System Monitor Menu\ AC Motor\ Motor RPM.
77	**Supervision** Fault Type(s): Curtis supervision code.	Internal controller fault.
79	**Supervision Input Check**	Internal controller fault.
82	**PDO Mapping Error**	1. The PDO Map has too many data bytes assigned or has objects mapped that are not compatible. 2. Adjust PDO Settings. See Programmer/ Application Setup/ CAN Interface/ PDO Setups
83	**Internal Hardware** Fault Type(s): Curtis hardware code.	Internal controller fault detected.
84	**Motor Braking Impaired**	Battery overcharged, excessive motor or controller heating, or misadjusted parameters. Clear: Reset interlock .
87	**Motor Characterization Error** Fault Type(s): 71 Memory RAM write failed. 72 Temp sensor fault 73 Motor hot 74 Controller temperature cutback 76 Undervoltage cutback 77 Overvoltage cutback 78 Encoder not reading properly 79 Current Regulator Tuning out of range 80 Current Regulator Tuning out of range 81 Encoder signal seen but step size not auto-detected, it must be set manually. 82 Aborted commissioning 90/98 PMAC motor feedback sine/cosine signal cannot be detected 91 PMAC motor not rotating or motor type incorrect	Motor characterization failed during characterization process. The fault type indicates the cause.

	92 PMAC Motor not accelerating. Low acceleration 94-97 PMAC lag compensation out of range 99 PMAC Motor rotating when matching starts 102 PMAC motor temp sensor fault 103 PMAC motor temp hot cutback 104 PMAC controller temp cutback 106 PMAC Undervoltage cutback 107 PMAC overvoltage cutback	
88	**Encoder Pulse Error**	1. Encoder Steps parameter does not match the actual motor encoder. 2. Verify parameter settings: Programmer\ AC Motor Setup\ Quadrature Encoder\ Encoder Steps 3. Motor loses IFO control and motor accelerating without accelerator signal input.
89	**Parameter Out of Range** Fault Type(s): Reports the CAN Object ID of parameter.	1. Parameter value detected outside of the limits. 2. Use CIT or the 1313HHP to view the parameter's range and adjust the parameter's value.
91	**Bad Firmware**	The firmware in the controller is incorrect. 1. The CRC of the application or OS does not match. 2. The application was built with an incompatible OS version.
92	**EM Brake Failed to Set**	1. Vehicle movement sensed after the EM Brake has been commanded to set. 2. EM Brake will not hold the motor from rotating.
93	**Encoder LOS**	1. Limited Operating Strategy (LOS) control mode has been activated as a result of either an Encoder Fault (flash code 3-6) or a Stall Detected fault (flash code 7-3). 2. Motor encoder failure. 3. Bad crimps or faulty wiring. 4. Vehicle has stalled.
94	**Emer Rev Timeout**	1. Emergency Reverse was activated and concluded because the EMR Timeout timer had expired. 2. The emergency reverse input is stuck On.
96	**Pump BDI**	1. The BDI is below the Lift_BDI_Lockout setting. 2. BDI parameters are mistuned.
99	**Parameter Mismatch**	1. Incorrect position feedback type chosen for

	Fault type: 1. Dual drive enabled in torque mode. 2. SPMSM motor feedback selects the encoder. 3. AC induction motor feedback selects sine cosine.	motor technology in use. 2. Dual drive is enabled in torque mode. 3. Dual drive enabled on only one controller.
9A	**Interlock Braking Supervision** Fault Type(s): 1. Motor speed out of of interlock brake supervision limit. 2. Interlock is disconnected, and EM brake is not set within the set time. 3. Interlock is disconnected, the EM brake is not set to brake, and the rotor position exceeds the RPM position limit.	1. During interlock braking, motor speed exceeds the parameters set under Interlock Braking Supervision 2. Check Programmer/ Application Setup/ Interlock Braking/ Supervision Enable. 3. Check Programmer/ Application Setup/ Interlock Braking/ Interlock Braking Supervision
9B	**EMR Supervision**	1. During an EMR event, the motor speed exceeded the limit set by the Emergency Reverse Supervision parameters. 2. See Programmer/ Application Setup/ Emergency Reverse/ Emergency Reverse Supervision.
A1	**Driver 1 Fault** Fault Type(s): 1 = Driver short circuit 2 = Driver over-current 3 = Driver open/ short circuit (voltage measured high, should be low) 4 = Driver open/ short circuit (voltage measured low, should be high) 5 = Wiring damaged 6 = Output limit no current Fault types 3-5 are only checked if driver checks are enabled.	1. Open or short on driver load. 2. Dirty connector pins at controller or contactor coil. 3. Bad connector crimps or faulty wiring. 4. Driver overcurrent, as set by the Driver 1 Overcurrent parameter. 5. See Programmer/ Controller Setup/ Outputs/ Driver 1/ Driver 1 Overcurrent.
A2	**Driver 2 Fault** Fault Type(s): 1 = Driver short circuit 2 = Driver over-current 3 = Driver open/ short circuit (voltage measured high, should be low) 4 = Driver open/ short circuit (voltage measured low, should be high) 5 = Wiring damaged 6 = Output limit no current Fault types 3-5 are only checked if driver checks are enabled.	1. Open or short on driver load. 2. Dirty connector pins at controller or contactor coil. 3. Bad connector crimps or faulty wiring. 4. Driver overcurrent, as set by the Driver 2 Overcurrent parameter. 5. See Programmer/ Controller Setup/ Outputs/ Driver 2/ Driver 2 Overcurrent.
A3	**Driver 3 Fault**	1. Open or short on driver load.

	Fault Type(s): 1 = Driver short circuit 2 = Driver over-current 3 = Driver open/ short circuit (voltage measured high, should be low) 4 = Driver open/ short circuit (voltage measured low, should be high) 5 = Wiring damaged 6 = Output limit no current Fault types 3-5 are only checked if driver checks are enabled.	2. Dirty connector pins at controller or contactor coil. 3. Bad connector crimps or faulty wiring. 4. Driver overcurrent, as set by the Driver 3 Overcurrent parameter. 5. See Programmer/ Controller Setup/ Outputs/ Driver 3/ Driver 3 Overcurrent.
A4	**Driver 4 Fault** Fault Type(s): 1 = Driver short circuit 2 = Driver over-current 3 = Driver open/ short circuit (voltage measured high, should be low) 4 = Driver open/ short circuit (voltage measured low, should be high) 5 = Wiring damaged 6 = Output limit no current Fault types 3-5 are only checked if driver checks are enabled.	1. Open or short on driver load. 2. Dirty connector pins at controller or contactor coil. 3. Bad connector crimps or faulty wiring. 4. Driver overcurrent, as set by the Driver 4 Overcurrent parameter. 5. See Programmer/ Controller Setup/ Outputs/ Driver 4/ Driver 4 Overcurrent.
A5	**Driver 5 Fault** Fault Type(s): 1 = Driver short circuit 2 = Driver over-current 3 = Driver open/ short circuit (voltage measured high, should be low) 4 = Driver open/ short circuit (voltage measured low, should be high) 5 = Wiring damaged 6 = Output limit no current Fault types 3-5 are only checked if driver checks are enabled.	1. Open or short on driver load. 2. Dirty connector pins at controller or contactor coil. 3. Bad connector crimps or faulty wiring. 4. Driver overcurrent, as set by the Driver 5 Overcurrent parameter. 5. See Programmer/ Controller Setup/ Outputs/ Driver 5/ Driver 5 Overcurrent.
A6	**Driver 6 Fault** Fault Type(s): 1 = Driver short circuit 2 = Driver over-current 3 = Driver open/ short circuit (voltage measured high, should be low) 4 = Driver open/ short circuit (voltage measured low, should be high) 5 = Wiring damaged 6 = Output limit no current Fault types 3-5 are only checked if driver	1. Open or short on driver load. 2. Dirty connector pins at controller or contactor coil. 3. Bad connector crimps or faulty wiring. 4. Driver overcurrent, as set by the Driver 6 Overcurrent parameter. 5. See Programmer/ Controller Setup/ Outputs/ Driver 6/ Driver 6 Overcurrent.

	checks are enabled.	
A7	**Driver 7 Fault** Fault Type(s): 1 = Driver short circuit 2 = Driver over-current 3 = Driver open/ short circuit (voltage measured high, should be low) 4 = Driver open/ short circuit (voltage measured low, should be high) 5 = Wiring damaged 6 = Output limit no current Fault types 3-5 are only checked if driver checks are enabled.	1. Open or short on driver load. 2. Dirty connector pins at controller or contactor coil. 3. Bad connector crimps or faulty wiring. 4. Driver overcurrent, as set by the Driver 7 Overcurrent parameter. 5. See Programmer/ Controller Setup/ Outputs/ Driver 7/ Driver 7 Overcurrent.
A8	**Driver Assignment** Fault Type(s): 5 Driver number that caused the fault.	1. A Driver Output is used for two or more functions. 2. See Programmer/ Controller Setup/ IO Assignments/ Coil Drivers: Main Contactor Driver, EM Brake Driver, Hydraulic Contactor Driver.
A9	**Coil Supply Fault** Fault Type(s): 1 = Short to B- or hardware fault. 2 = Driver internal short circuit, cause the Coil Supply disconnected. 3 = Coil Supply startup enable check failed. 4 = Coil Supply startup disable check failed.	1. Short on driver loads. 2. Dirty connector pins at controller or contactor coil. 3. Bad connector crimps or faulty wiring. 4. Controller is defective.
B1	**Analog 1 Out of Range** Fault Type(s): 1 = Above High limit. 2 = Below Low limit.	1. Analog 1 input voltage is above the parameter setting of Analog 1 High. 2. Analog 1 input voltage is below the parameter setting of Analog 1 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 1. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 1 Low/ Analog 1 High.
B2	**Analog 2 Out of Range** Fault Type(s): 1 = Above High limit. 2 = Below Low limit.	1. Analog 2 input voltage is above the parameter setting of Analog 2 High. 2. Analog 2 input voltage is below the parameter setting of Analog 2 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 2. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 2 Low/ Analog 2 High.
B3	**Analog 3 Out of Range** Fault Type(s): 1 = Above High limit.	1. Analog 3 input voltage is above the parameter setting of Analog 3 High. 2. Analog 3 input voltage is below the parameter

	2 = Below Low limit.	setting of Analog 3 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 3. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 3 Low/ Analog 3 High.
B4	**Analog 4 Out of Range** Fault Type(s): 1 = Above High limit. 2 = Below Low limit.	1. Analog 4 input voltage is above the parameter setting of Analog 4 High. 2. Analog 4 input voltage is below the parameter setting of Analog 4 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 4. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 4 Low/ Analog 4 High.
B5	**Analog 5 Out of Range** Fault Type(s): 1 = Above High limit. 2 = Below Low limit.	1. Analog 5 input voltage is above the parameter setting of Analog 5 High. 2. Analog 5 input voltage is below the parameter setting of Analog 5 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 5. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 5 Low/ Analog 5 High.
B6	**Analog 6 Out of Range** Fault Type(s): 1 = Above High limit. 2 = Below Low limit.	1. Analog 6 input voltage is above the parameter setting of Analog 6 High. 2. Analog 6 input voltage is below the parameter setting of Analog 6 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 6. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 6 Low/ Analog 6 High.
B7	**Analog 7 Out of Range** Fault Type(s): 1 = Above High limit. 2 = Below Low limit.	1. Analog 7 input voltage is above the parameter setting of Analog 7 High. 2. Analog 7 input voltage is below the parameter setting of Analog 7 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 7. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 7 Low/ Analog 7 High.
B8	**Analog 8 Out of Range** Fault Type(s): 1 = Above High limit. 2 = Below Low limit.	1. Analog 8 input voltage is above the parameter setting of Analog 8 High. 2. Analog 8 input voltage is below the parameter setting of Analog 8 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 8. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 8 Low/ Analog 8 High.
B9	**Analog 9 Out of Range**	1. Analog 9 input voltage is above the parameter

	Fault Type(s): 1 = Above High limit. 2 = Below Low limit.	setting of Analog 9 High. 2. Analog 9 input voltage is below the parameter setting of Analog 9 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 9. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 9 Low/ Analog 9 High.
BB	**Analog 14 Out of Range** Fault Type(s): 1 = Above High limit. 2 = Below Low limit.	1. Analog 14 input voltage is above the parameter setting of Analog 14 High. 2. Analog 14 input voltage is below the parameter setting of Analog 14 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 14. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 14 Low/ Analog 14 High.
BC	**Analog Assignment** Fault Type(s): 9 Analog Input number that caused the fault.	1. An Analog input is used for two or more functions. 2. An Analog input is outside the range of analog inputs. 3. See Programmer/ Controller Setup/ IO Assignments/ Controls.
BD	**Analog 18 Out of Range** Fault Type(s): 1 = Above High limit. 2 = Below Low limit.	1. Analog 18 input voltage is above the parameter setting of Analog 18 High. 2. Analog 18 input voltage is below the parameter setting of Analog 18 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 18. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 18 Low/ Analog 18 High.
BE	**Analog 19 Out of Range** Fault Type(s): 1 = Above High limit. 2 = Below Low limit.	1. Analog 19 input voltage is above the parameter setting of Analog 19 High. 2. Analog 19 input voltage is below the parameter setting of Analog 19 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 19. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 19 Low/ Analog 19 High.
C1	**Branding Error**	1. Software and hardware branding mismatch. 2. For technical support on this fault, contact the Curtis distributor where you obtained your controller or the Curtis sales-support office in your region.
C2	**BMS Cutback**	A cutback based on cell loading has occurred.

	Fault Type(s): 1 = Battery Current Cutback. 2 = Low Cell Cutback. 3 = High Cell Cutback.	Clear: Resolve battery or battery cell issue.
C5	**PWM Input 10 Out of Range**	Reset the controller by restoring the voltage to the allowable range
C7	**Analog 31 Out of Range** Fault Type(s): 1 = Above High limit. 2 = Below Low limit.	1. Analog 31 input voltage is above the parameter setting of Analog 31 High. 2. Analog 31 input voltage is below the parameter setting of Analog 31 Low. 3. See Programmer/ Controller Setup/ Analog Inputs/ Analog 31. 4. See Programmer/ Controller Setup/ Analog Inputs/ Configure/ Analog 31 Low/ Analog 31 High.
C8	**Invalid_CAN_Port**	1. Mistuned Dual Drive CAN parameters. 2. Conflicting CAN Node IDs for Dual Drive.
C9	**VCL Watchdog**	Clear: Kick_Watchdog(). Start and reset the specified watchdog timer.
CB	**PWM Input 28 Out of Range** Fault Type(s): 1 = The input is disconnected. 2 = The measured input frequency is below the (PWM_Input_28_Low_Frequency) – (PWM_Input_28_Frequency_Fault_Tolerance). 3 = The measured input frequency is above the (PWM_Input_28_High_Frequency) + (PWM_Input_28_Frequency_Fault_Tolerance). 4 = The measured duty cycle is below set limits, (PWM_Input_28_Low_Duty_Cycle) – (PWM_Input_28_Duty_Cycle_Fault_Tolerance). 5 = The measured duty cycle is above set limits, (PWM_Input_28_High_Duty_Cycle) + (PWM_Input_28_Duty_Cycle_Fault_Tolerance).	1. This fault diagnostic execution cycles every 4msec. The input is considered disconnected if no PWM signal occurs for 16msec or the measurements are not updated every 16msec. 2. Mistuned parameters. 3. Faulty wiring.
CC	**PWM Input 29 Out of Range** Fault Type(s): 1 = The input is disconnected. 2 = The measured input frequency is below the (PWM_Input_29_Low_Frequency)– (PWM_Input_29_Frequency_Fault_Tolerance). 3 = The measured input frequency is above	1. This fault diagnostic execution cycles every 4msec. The input is considered disconnected if no PWM signal occurs for 16msec or the measurements are not updated every 16msec. 2. Mistuned parameters. 3. Faulty wiring.

	the (PWM_Input_29_High_Frequency) +(PWM_Input_29_Frequency_Fault_Tolerance). 4 = The measured duty cycle is below set limits, (PWM_Input_29_Low_Duty_Cycle) –(PWM_Input_29_Duty_Cycle_Fault_Tolerance). 5 = The measured duty cycle is above set limits, (PWM_Input_29_High_Duty_Cycle) +(PWM_Input_29_Duty_Cycle_Fault_Tolerance).	
CD	**Primary State Error** Fault Type(s): These are internal issues either occurring during startup, parameter initialization, secondary micro update or other runtime issues. 1=PRIMARY_DEVICE_STARTUP = 0, 2=PRIMARY_WAIT_KSI_STABLE, 3=PRIMARY_DEVICE_STARTUP_VALID, 4=PRIMARY_INITIALIZE_PARAMETERS, 5=PRIMARY_WAIT_FOR_FIRST_ SIGNALS, 6=PRIMARY_WAIT_FOR_SUPERVISOR, 7=PRIMARY_RESTORE_PARAMETER_FAIL, 8=PRIMARY_SUPERVISOR_FIRST_SIGNALS_ERROR, 9=PRIMARY_SUPERVISOR_STARTUP_ERROR, 10= PRIMARY_STARTUP_TIMER_ FAILURE, 11=PRIMARY_WAIT_CAN_HANDSHAKING_DONE, 12 = PRIMARY_RUNNING	Set: Internal error with the controller. Kindly reset controller. Clear: Reset controller
D1	**Lift Input Fault**	The associated fault diagnostic with the assigned lift-input source triggers this fault. For example: If the Lift_Input_Source is an analog input, then any faults detected by the respective Input fault diagnostics are cascaded and reported within this fault code. Clear: Resolve any input assignment conflict, or out of range faults, then Reset Controller.
D2	**Phase PWM Mismatch** Fault Type(s):	Set: The difference between the commanded phase PWM duty cycle and the measured is

	0 = U phase. 1 = V phase. 2 = W phase.	greater than allowed. Clear: Reset Controller.
D3	**Hardware Compatibility**	The OS (device profile, .cdev file) is incompatible with the controller. The loaded software (.cdev) is not compatible with the controller hardware.
D4	**Lower Input Fault**	The associated fault diagnostic with the assigned lower-input source triggers this fault. For example: If the Lower_Input_Source is an analog input, then any faults detected by the respective Input fault diagnostics are cascaded and reported within this fault code. Clear: Resolve any input assignment conflict, or out-of range faults, then Reset Controller.
D6	**Hazardous Movement** Fault Type(s): 1 = The motor speed is in the opposite direction of the speed request and the motor fails to accelerate in the correct direction for a programmed time. In the event of a change to neutral, this hazard will be detected if the motor fails to accelerate toward zero speed for a programmed time. 2 = The acceleration is in the opposite direction of the difference between the operator speed request and the motor speed. The speed in the commanded direction is greater than the commanded speed by more than a parameter (Hazardous_Speed) for a programmed time (Hazardous_Throttle_ Response_Time).	Set: This fault detects hazardous movement when the motor is requested to be moving. The first hazard is a motor that is not able to slow down if the throttle goes to zero or the direction switch is not in the direction of travel. The second hazard is a motor that accelerates the wrong way or goes too fast. Note: This fault only occurs when the Control Mode Select is in Speed_Mode, Speed_Mode_Express, or Servo_Mode. Clear: Reset Controller. Setting Hazardous_Direction_Response_Time = 0 will disable these checks
DD	**IMU Failure** Fault Type(s): 1 = SPI Communication Failure 2 = Curtis Factory Self Test Failure 3 = Run Time Check Failure, bad data received from the IMU 4 = Gyro Cal out of range, maximum calibration offset exceeded.	Check if configured correctly or the vehicle is moving when calibrating. Clear: Cycle KSI.

6. TRUCK MAINTENANCE

a. Operational safety and environmental protection

The inspections and maintenance tasks listed in chapter "Maintenance checklist" must be performed according to the defined service intervals.

Risk of accidents and component damage
Any modification to the truck, in particular the safety mechanisms, is prohibited. Never change the working speed of the tractor.

Only original spare parts are subject to the manufacturer's quality control. To ensure safe and reliable operation, use only the manufacturer's spare parts. Aging components and replaced liquid must be disposed of in accordance with current environmental regulations. If you need to change the oil, you can contact customer service department of our company.

After inspection and maintenance, carry out the operations listed in the section "recommissioning the truck".

b. Maintenance safety regulations

Maintenance and repair personnel

Truck maintenance and repair work must only be carried out by specialist personnel of our company. The company's service department has a group of specialist personnel responsible for field work. These personnel are specially trained in the use of the truck and are able to carry out maintenance and repairs independently.

The manufacturer has a customer service department specially trained for these tasks. A maintenance contract with the manufacturer will ensure trouble-free operation.

b.1 Lifting and jacking up the truck

Lifting and jacking up the truck safely

To lift the truck, the lifting gear must only be secured to the points specially provided for this purpose.
If it is required to work under a lifted load unit/ tractor, it must be secured with a sufficiently strong chain or safety pin. In order to lift and jack up the truck safely, proceed as follows:

- Jack up the truck only on a level surface and prevent it from moving accidentally.
- Always use a jack with sufficient capacity. When jacking up the tractor, take appropriate measures to prevent it from slipping or tipping over (e.g. wedges, wooden blocks, etc.).
- In order to lift the truck, the lifting accessories must only be secured to the points specially provided for this purpose (check chapter 2 for “warning labels”).

b.2 Cleaning

Fire hazard

Do not use flammable liquids to clean the tractor.

Always disconnect the battery (by removing the battery connector) before starting cleaning work.
Carry out all necessary safety measures to prevent sparking before cleaning (e.g. by short-circuiting).

Risk of electrical system damage

Cleaning the electronic components with water can damage the electrical system. It is forbidden to clean electrical system with water.

Do not clean the electrical system with water.
Clean the electrical system with weak suction or compressed air (use a compressor with a water trap) and a non-conductive, anti-static brush.

Risk of component damage when cleaning

Before cleaning the tractor with a high-pressure cleaner, carefully cover all assemblies of the electrical system and electronic components. Otherwise, the components may be affected by moisture and cause malfunctions. Do not clean the tractor with a steam jet.

After cleaning work, carry out the operations listed in the section "recommissioning the truck".

b.3 Operating the electrical system

Risk of accidents

The operation related to the electrical system must be carried out by specialists who have been trained in electrical technology.
Before starting the operation, the operator must take all necessary measures to prevent electrical accidents.
Disconnect the battery (by removing the battery connector) before starting work.

Risk of accidents due to electrical current

Work on electrical system must only be carried out with the voltage switched off. Before carrying out maintenance work on electrical system:

Park the tractor according to requirements (check chapter 5 for "parking the tractor securely").
Activate the emergency switch.
Disconnect the battery (by removing the battery connector).
Before working on electrical assemblies, remove objects such as rings, metal watches, etc.

Liquid dielectrics and aging parts

Liquid dielectrics and aging components can cause hazard to the environment, and must be disposed of in accordance with current environmental regulations. If you need to change the oil, contact the company's specially trained customer service personnel.

Please pay attention to safety regulations when using these items.

Welding operation

Before the welding operation, the electrical and electronic components of the tow tractor must be removed to prevent accidental damage to these components during operation.

Set value

When repairing and replacing hydraulic parts, electrical and electronic components, the specified parameters related to the tractor must be observed.

b.4 Tractor wheels

Risk of accident due to the use of wheels that do not meet our specifications
The quality of the wheels directly affects the stability and drivability of the truck.
When the wear of the wheels is uneven, the stability of the tractor is reduced and the braking distance is extended.

Note that the tractor must not tilt when replacing the wheel.
Wheels must always be replaced in pairs at the same time.
If the tires assembled before delivery need to be replaced, the original spare parts provided by our company must be used to meet the specifications of the company.

c. Maintenance and Inspection

Thorough and standardized maintenance is one of the most important prerequisites to ensure stable and reliable operation of the tractor. Neglecting regular maintenance may lead to tractor failure and malfunctions, and a potential threat to personnel and operational safety.

The maintenance intervals specified in the maintenance checklist are for single-shift duty and normal operating conditions only. If the intensity of the operating conditions is higher than normal, such as high dust, large temperature fluctuations, or the implementation of a shift work system, the maintenance interval must be appropriately shortened.

In the maintenance checklist below, specific maintenance operations and intervals are listed. The specific definitions of maintenance intervals are as follows:
W = every 50 operating hours, at least once a week
A = every 200 operating hours, at least once a month
B = every 600 operating hours, at least once every 3 months
C = every 1200 operating hours, at least once every 6 months

When the tractor is in the running-in stage (after approximately 100 operating hours). The operator of the truck should check the fixing condition of the wheel nuts and bolts, and re-tighten them if necessary.

c.1 Maintenance checklist

Maintenance Interval			W	A	B	C
Braking system	**1.1**	Check the performance of the service brake and electromagnetic brakes, make adjustment if necessary.	•			

	1.2	Check the brake fluid level, refill if necessary.	•			
	1.3	Change the brake fluid every 3000h, or every 2 years, and vent if necessary.				
	1.4	Check for tightness of connectors and wires.	•			
	1.5	Check brake pad for wear.		•		
Electrical system	**2.1**	Check the warning and safety devices.	•			
	2.2	Check cables and motor for secure fit and damage.	•			
	2.3	Functionality of switches, display and controls.	•			
	2.4	Functionality of the lights.	•			
	2.5	Functionality of the switch settings.	•			
	2.6	Check contactors and relays.			•	
	2.7	Check whether the fuse ratings are correct.				•
	2.8	Check frame connections.			•	
	2.9	Check cables for damage and whether terminals are fixed.	•			
Power supply	**3.1**	Check the battery by inspection.	•			
	3.2	Check battery cables connection are secure, grease the electrodes if necessary.	•			
	3.3	Check acid concentration, level and battery voltage.			•	
Driving	**4.1**	Check travel switch mechanism. Readjust and grease if necessary.		•		
	4.2	Check the function of the motor.			•	
	4.3	Replace expired gear oil (6000h or every three years).				
	4.4	Check the gearbox for abnormal noise or leaks.		•		
	4.5	Check wheel bearings and wheel fixation.		•		
	4.6	Check wheels for wear and damage, replace if necessary.		•		
Chassis and structure	**5.1**	Check the chassis and bolt connections for damage.		•		
	5.2	Check the towing and coupling equipment.	•			
	5.3	Check labels and decals.	•			
	5.4	Check the driver's seat.	•			
	5.5	Check attachments such as mirrors are functioning properly.		•		
Steering system	**6.1**	Check steering bearing, steering clearance and steering engagement and steering chain. Lubricate the steering chain.		•		
	6.2	Check the mechanical parts of the steering column.		•		
Additional precautions	**7.1**	Carry out the test run with rated load.		•		
	7.2	Perform a test run after completing the maintenance.		•		
	7.3	Lubricate the tractor according to the lubrication diagram.		•		

c.2 Liquid dielectrics

Secure use and handling of liquid dielectrics

Use and handling of liquid dielectrics: When using and handling liquid dielectrics, follow the relevant operating instructions of the manufacturer.

Improper operation will cause hazards to the health and life of the operator and the surroundings.

Liquid dielectrics are flammable.

- Keep the liquid dielectrics away from high temperature parts or open flames.
- Only store liquid dielectrics in the specified containers.
- The liquid dielectrics can only be poured into a clean container.
- Liquid dielectrics of different quality shall not be mixed (except that there are clear provisions for mixing operating instructions).

Slip hazards and environmental hazards due to spilled liquid dielectrics

Spilled liquid dielectrics will cause slip hazards. If there is water, the danger increases.

- Do not spill the liquid dielectrics.
- The spilled or flowed liquid dielectrics must be removed with appropriate adsorbent immediately.
- Dispose of the mixture of adsorbent and liquid dielectrics in accordance with the current regulations.

Oil is toxic and flammable.

- Dispose of waste oil in accordance with regulations. Waste oil must be carefully stored until it is disposed of according to regulations. Never spill oil.
- Legal regulations must be followed when using oil.
- Protective gloves must be worn when using oil.
- Keep the oil away from the high temperature motor parts.
- No smoking when using oil.
- Avoid direct contact and consumption. In the case of accidental ingestion, if it cannot be solved by vomiting, go to the hospital for treatment immediately.
- If you inhale oil mist or vapor, you need to breathe fresh air immediately.
- If you accidentally make the oil come into contact with the skin, rinse with water immediately.
- If the oil accidentally splashes into the eyes, rinse with water and go to the hospital immediately.
- Soaked clothes and shoes should be replaced immediately.

d. Lubrication diagram

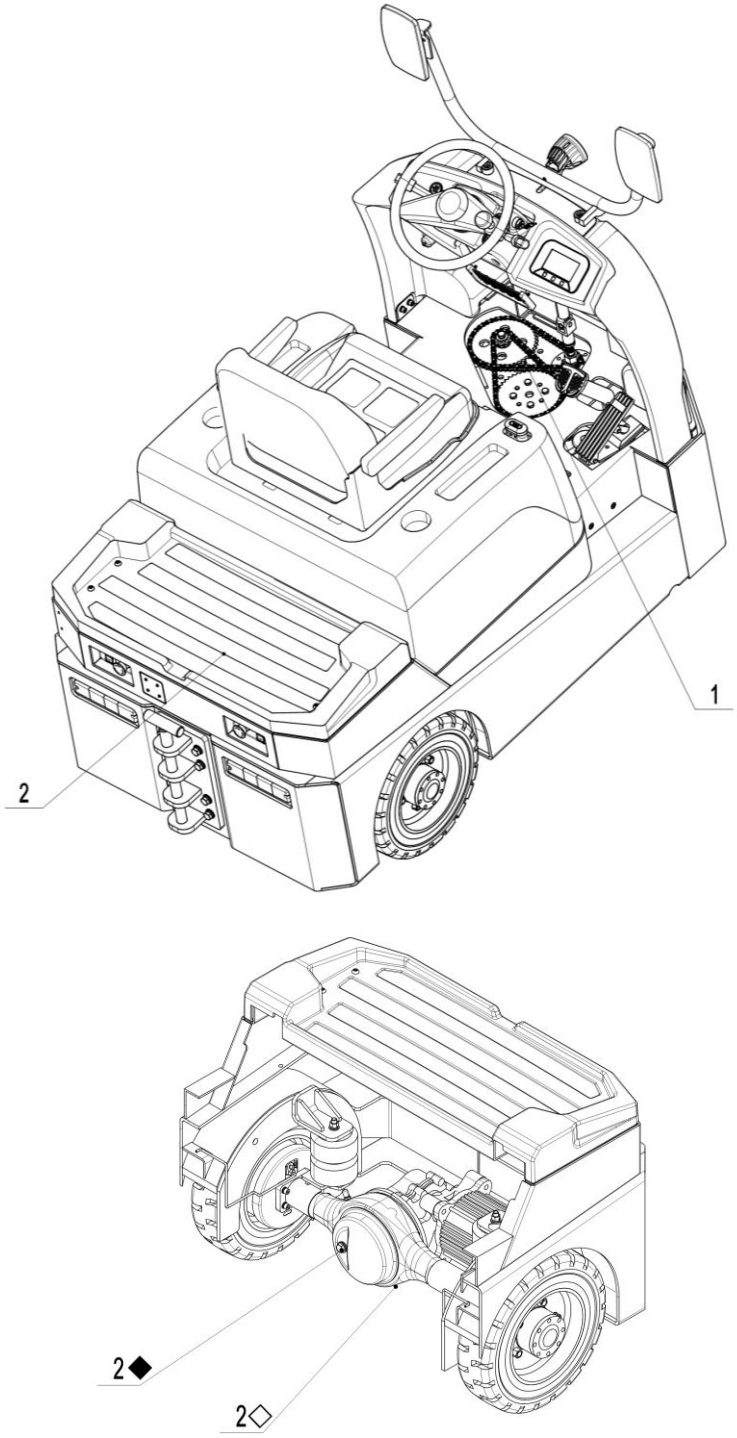
Lubricate the marked points according to the maintenance checklist.

(1) Sprockets and chains: apply CRC Lithium General Purpose Grease.

(2) Gear oil: AFT DEXRONⅡ, T30Q/T66Q oil volume ≥ 1.5L; T60Q/T130Q oil volume ≥ 2.5L.

2 ◆ --- Gear oil filling port

2 ◇ --- Gear oil filling port



e. Maintenance instructions

e.1 Preparations for completing maintenance operations

In order to avoid accidents during maintenance, please take all necessary safety measures. The following must be done carefully:

- Park the tractor securely as required (see "Operation" in the previous chapter).
- Remove the battery plug to prevent accidental starting of the tractor (see "Battery Maintenance, Charging and Replacement" in the previous chapter).

Risk of accident when working under load-carrying parts, battery cover and towing tractor

- When working under the lifted load-carrying parts or tractor, effective measures must be taken to prevent accidents (e.g. falling, tipping, or sliding).
- When lifting the tractor, instructions listed in the previous chapter "Transportation and Operation" must be followed. When operating the parking brake, take measures (e.g. wedges) to prevent the tractor from unintentional movement.
- If the brake system needs to be repaired or maintained, it is necessary to take effective measures to prevent the tractor from unexpected slipping.

e.2 Tighten the wheel hub nuts and bolts

Periodically inspect and re-tighten the drive wheel hub nuts and steer wheel hub bolts at the service intervals specified in the Maintenance Checklist.

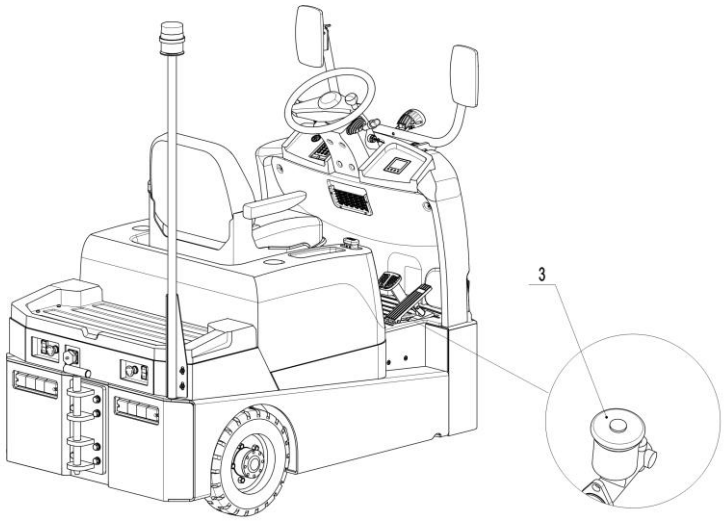
- Park the truck securely as required (see "Operation" in the previous chapter).
- Jack the tractor up.
- Take appropriate measures to prevent the tractor from slipping or tipping over (e.g. wooden blocks).
- Adjust the position of the wheels.
- Use the torque wrench to cross-tighten the wheel hub bolts and nuts.

Tightening torque

Drive wheel: MA = (150 ± 10) N·m
Steering wheel: MA = (150 ± 10) N·m

Remove the socket wrench after tightening the bolts and nuts!

e.3 Brake fluid



Check brake fluid level

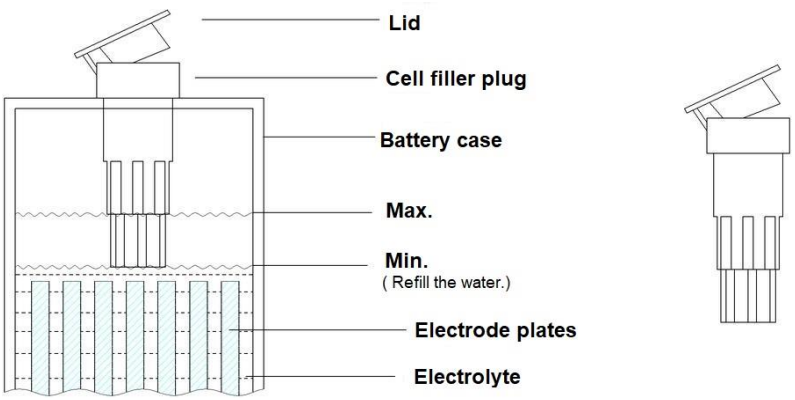
- Complete the preparations before the maintenance operation.

- Lift off the rubber pedal pad.
- Check the brake fluid level. Brake fluid level shall be in the middle of the minimum and maximum marks, and be filled if necessary.

Fill brake fluid

- Unscrew the cap (3) from the brake fluid container.
- Fill brake fluid.
- Close the cap (3).

e.4 Refill with distilled water

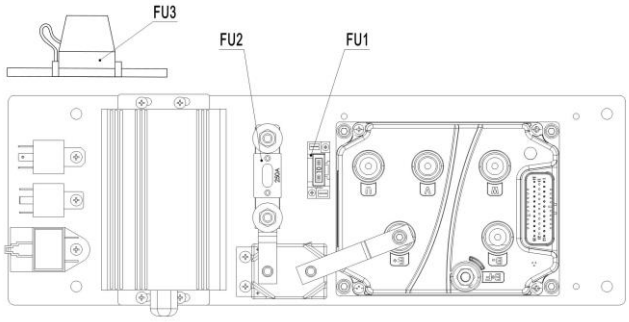


If the electrolyte level is not enough, do not blindly add acid (the specific gravity should be tested after fully charged). The battery replenisher must be distilled water.

- When an individual battery fails, the cause of the failure and the failed unit should be quickly identified and repaired, replaced the battery if it cannot be repaired. Regularly monitor the specific gravity of sulfuric acid in each cell of the battery with a hydrometer (the specific gravity of H2SO4 is 1.27-1.29, when fully charged).
- The electrolyte in the battery is corrosive. No matter under any circumstances to maintain the battery, you must wear work clothes and protective goggles to avoid direct contact with the electrolyte of the battery.
- If the acid solution comes into contact with the skin by accident, rinse immediately with clean water; if the acid solution accidentally splashes into the eyes, rinse with clean water and go to the hospital for treatment immediately; soaked clothes and shoes should be replaced immediately. Spilled acid must be neutralized immediately.
- Scrap batteries must be recycled in accordance with the relevant laws and regulations of the local region, and must be stored in the specified environmental protection area or the specified waste disposal area, these work must be carried out by a qualified professional company.

e.5 Check electrical fuses

Open the rear panel, the fuses are located as shown in the figure below.



Fuse	QT	Curtis
FU1	10A	10A
FU2	250A	300A
FU3	10A	10A

e.6 Servicing the seat belt

Pull out the seat belt completely and check the wear of the fiber surface.

Check the function of the belt buckle and whether the seat belt retractor can properly tighten the seat belt.

Check the automatic lock of the seat belt

- Park the tractor horizontally.
- Pull the seat belt out quickly.

At this time, the automatic lock must be able to lock the seat belt.

e.7 Recommissioning the truck

After cleaning or maintenance, perform the following operations before recommissioning the tractor.

- Check the function of the alarm.
- Check the function of the emergency switch.
- Check the function of the brake.
- Lubricate the tractor according to the lubrication diagram.

f. Decommissioning and storing the tractor

If the tractor has been out of use for more than 2 months, the tractor must be stored in a frost-free and dry room. Operations must be performed before storage, after storage and during storage are detailed in the following sections.

If the storage time exceeds 6 months, the user must contact the service department of the company to determine other operational measures that need to be taken.

f.1 Precautions before storage

- Completely clean the tractor.
- Check the brakes.
- Apply a thin layer of lubricating oil or grease on all mechanical parts without coating treatment.
- Lubricate the tractor according to the lubrication diagram (see "Maintenance" in Chapter 6).
- Charge the battery (see "Battery Maintenance, Charging and Replacement" in Chapter 4).
- Remove the terminals on the battery, clean the battery and apply special grease to electrode bolts. Please also observe the relevant operating instructions and regulations of the battery manufacturer.
- Spray a suitable contact spray on all exposed contact surfaces.

f.2 Precautions during storage

The battery must be charged regularly (once a month), otherwise, after the battery automatically discharges to a certain level, it will lead to insufficient battery charge, resulting in vulcanization of the battery, thus making the battery scrapped.

f.3 Recommissioning after storage

- Completely clean the tractor.
- Lubricate the tractor according to the lubrication diagram (see "Maintenance" in Chapter 6).
- Clean the battery, apply special grease on the electrode bolts, fix the terminals on the battery.
- Charge the battery (see "Battery Maintenance, Charging and Replacement" in Chapter 4).
- Put the tractor into service (see "Operation" in Chapter 5)

If the switching operation of the electrical system is difficult, the contact spray should be sprayed on the exposed contact surface, and the oxide layer on the contact surface of the operating element should be removed by repeating the switching operation several times.

After put the tractor into service, the driver should immediately repeat the test of braking performance.

g. Carry out safety inspections of the tractor regularly or in the event of an abnormal situation

Conduct safety inspections in accordance with the relevant laws and regulations of the country where the user is located.

The tractor must be inspected by a professional inspector at least once a year or after abnormal conditions have occurred. The inspector must objectively and accurately identify and evaluate the performance and status of the tractor based on operational safety. The inspector must have sufficient professional knowledge and work experience, and be able to identify the condition of the tractor and the normal performance of the protective equipment according to the current technical regulations and the inspection criteria of the tractor.

A comprehensive inspection must be carried out specifically for the safety and technical performance of the tractor in the event of an accident. In addition, the tractor must be thoroughly inspected for damage

caused by improper use. The inspector must carefully record the inspection process and related data. The inspection results must be retained at least until the next inspection operation.

The truck user must take necessary measures to solve the discovered problems in time.

On the tractor that has been inspected, the inspection label will be affixed as an identification mark. The year and month in which the next safety inspection will be performed are noted on the label.

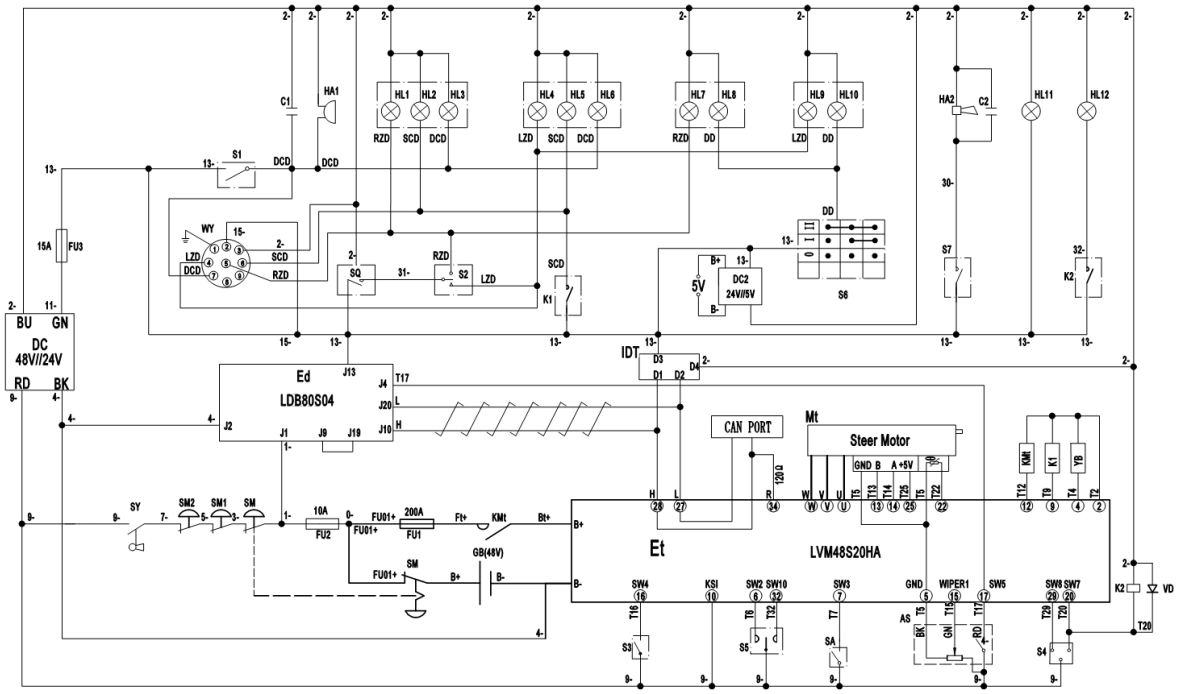
h. Scrap and disposal

The tractor must be scrapped and disposed of in accordance with the current laws and regulations of the country. Particular attention should also be paid to regulations regarding the disposal of used batteries, electronics and electrical equipment.

7. WIRING/ CIRCUIT DIAGRAM

a. Electrical diagram

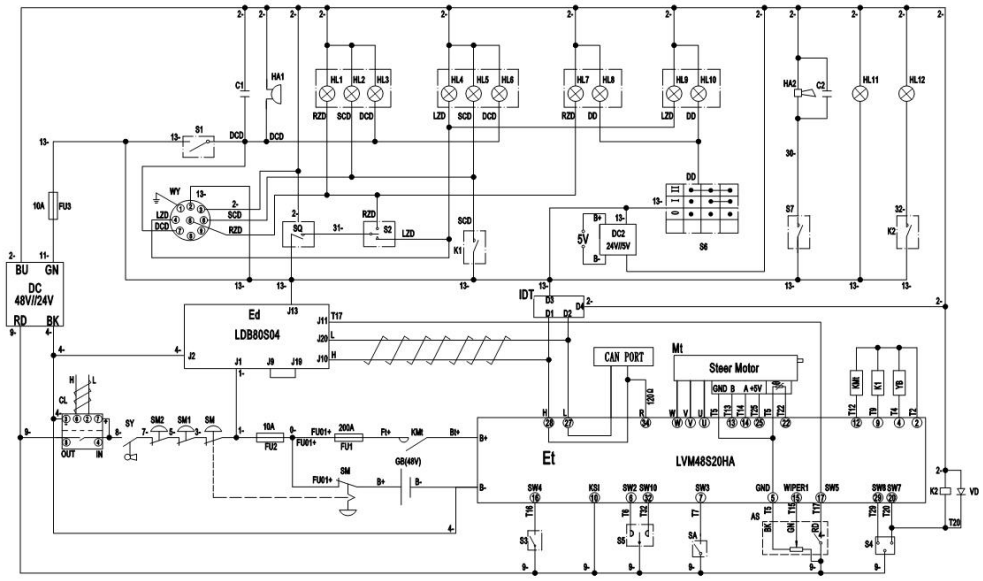
a.1 T30Q/T66Q Electrical diagram (QT controller)



Description of electrical diagram

No.	Code	Item	No.	Code	Item
1	GB	Battery	19	S5	Jog switch
2	SM	Emergency switch	20	S6	Combined switches
3	Et	Traction controller	21	S7	Horn switch
4	KMt	Contactor	22	YB	Electromagnetic brake
5	FU1	Fuse	23	K1	Brake relay
6	FU2	Fuse	24	HA1	Reversing buzzer
7	FU3	Fuse	25	HA2	Horn
8	SQ	Flasher	26	HL1, HL7	Right turn signal
9	AS	Accelerator	27	HL2, HL5	Brake light
10	SY	Key switch	28	HL3, HL6	Reverse light
11	Ed	Display	29	HL4, HL9	Left turn signal
12	DC	DC/ DC converter	30	HL8, HL10	Main lamp
13	WY	Aviation plug	31	HL11	Warning light
14	Mt	Traction motor	32	HL12	Blue ray light
15	S1	Reverse light switch	33	SA	Seat sensor
16	S2	Turn signal switch	34	VD	Diode
17	S3	Brake switch	35	IDT	Telematics module
18	S4	Travel direction switch			

a.2 T30Q/T66Q Electrical diagram for (QT controller) with pin-code lock



Description of electrical diagram

No.	Code	Item	No.	Code	Item
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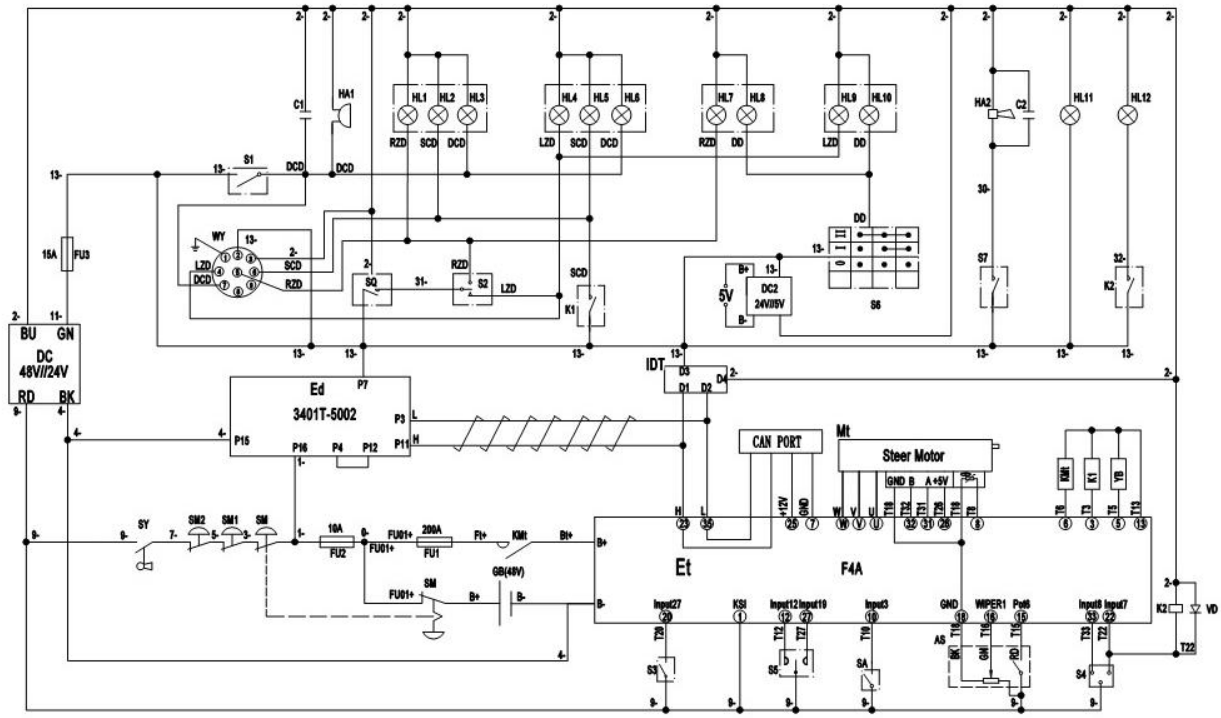
7	FU3	Fuse	25	HA2	Horn
8	SQ	Flasher	26	HL1, HL7	Right turn signal
9	AS	Accelerator	27	HL2, HL5	Brake light
10	SY	Key switch	28	HL3, HL6	Reverse light
11	Ed	Display	29	HL4, HL9	Left turn signal
12	DC	DC/ DC converter	30	HL8, HL10	Main lamp
13	WY	Aviation plug	31	HL11	Warning light
14	Mt	Traction motor	32	HL12	Blue ray light
15	S1	Reverse light switch	33	SA	Seat sensor
16	S2	Turn signal switch	34	VD	Diode
17	S3	Brake switch	35	IDT	Telematics module
18	S4	Travel direction switch	36	CL	Pin-code lock

a.3 T30Q/T66Q Electrical diagram for (Curtis controller)



Description of electrical diagram

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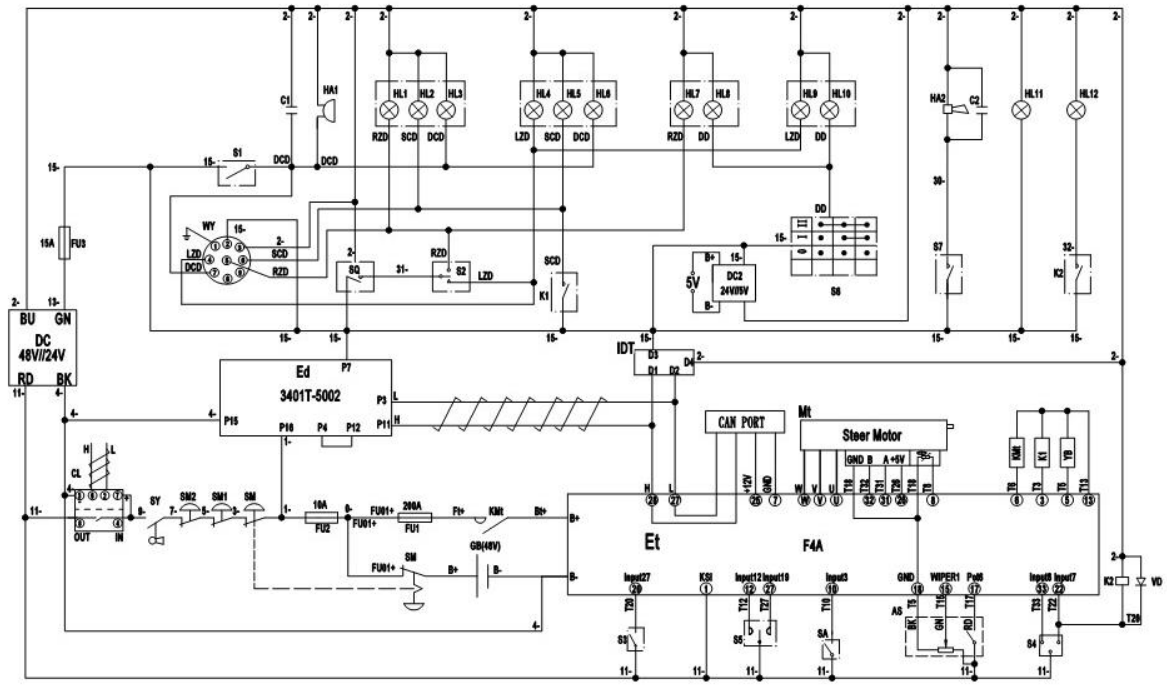
15	S1	Reverse light switch	33	SA	Seat sensor
16	S2	Turn signal switch	34	VD	Diode
17	S3	Brake switch	35	IDT	Telematics module
18	S4	Travel direction switch			

a.4 T30Q/T66Q Electrical diagram for (Curtis controller) with pin-code lock



Description of electrical diagram

No.	Code	Item	No.	Code	Item
1	GB	Battery	19	S5	Jog switch
2	SM	Emergency switch	20	S6	Combined switches
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11	Ed	Display	29	HL4, HL9	Left turn signal
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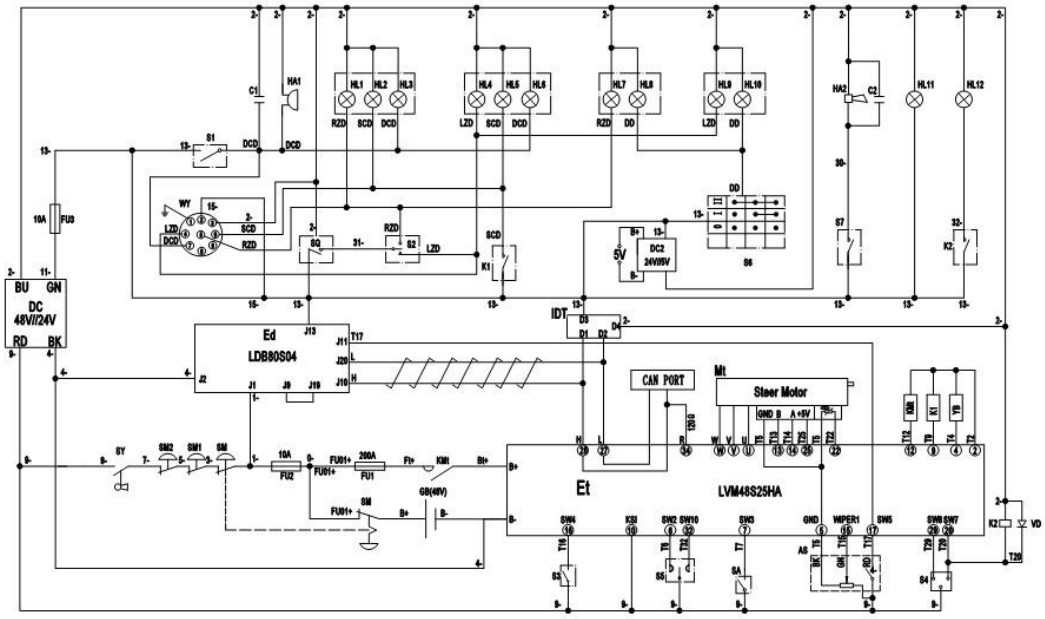
14	Mt	Traction motor	32	HL12	Blue ray light
15	S1	Reverse light switch	33	SA	Seat sensor
16	S2	Turn signal switch	34	VD	Diode
17	S3	Brake switch	35	IDT	Telematics module
18	S4	Travel direction switch	36	CL	Pin-code lock

a.5 T60Q/T130Q Electrical diagram (QT controller)



Description of electrical diagram

No.	Code	Item	No.	Code	Item
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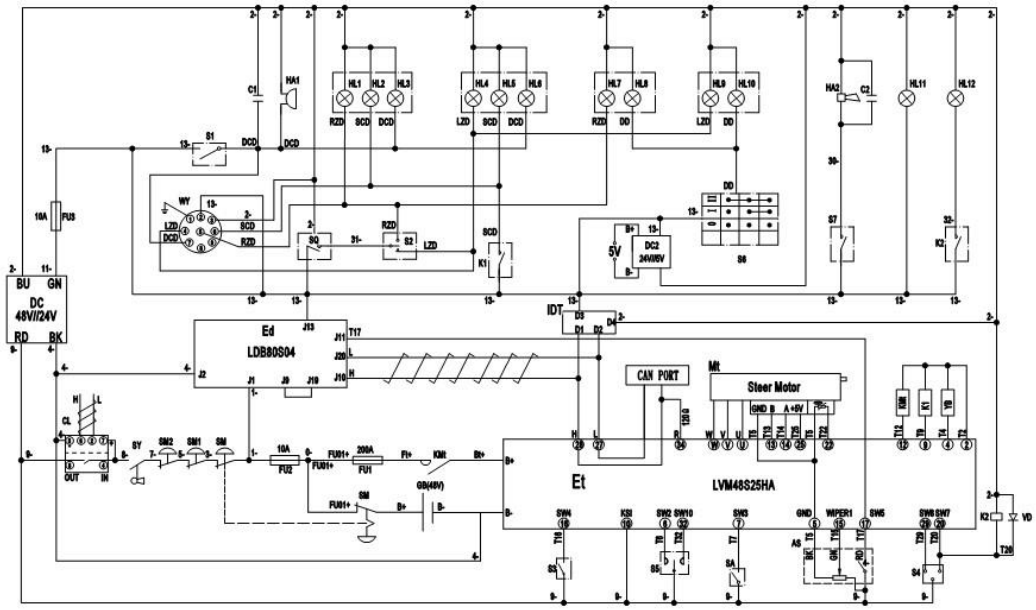
8	SQ	Flasher	26	HL1, HL7	Right turn signal
9	AS	Accelerator	27	HL2, HL5	Brake light
10	SY	Key switch	28	HL3, HL6	Reverse light
11	Ed	Display	29	HL4, HL9	Left turn signal
12	DC	DC/ DC converter	30	HL8, HL10	Main lamp
13	WY	Aviation plug	31	HL11	Warning light
14	Mt	Traction motor	32	HL12	Blue ray light
15	S1	Reverse light switch	33	SA	Seat sensor
16	S2	Turn signal switch	34	VD	Diode
17	S3	Brake switch	35	IDT	Telematics module
18	S4	Travel direction switch			

a.6 T60Q/T130Q Electrical diagram for (QT controller) with pin-code lock



Description of electrical diagram

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8	SQ	Flasher	26	HL1, HL7	Right turn signal
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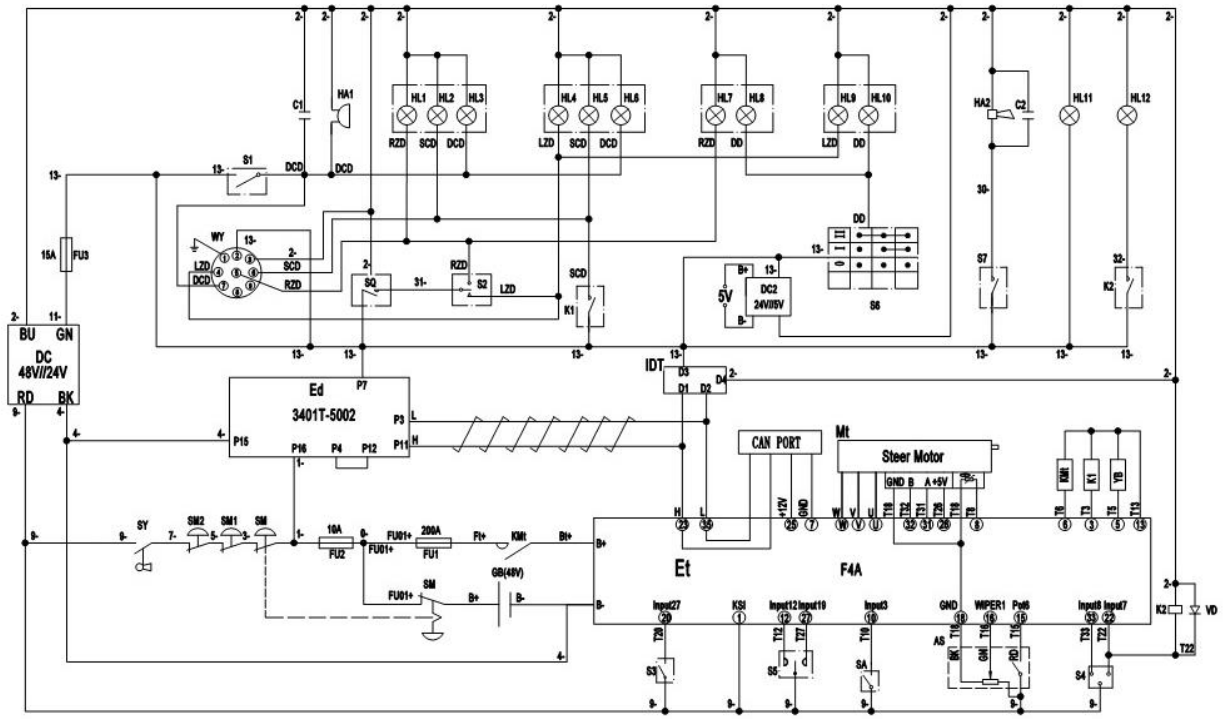
15	S1	Reverse light switch	33	SA	Seat sensor
16	S2	Turn signal switch	34	VD	Diode
17	S3	Brake switch	35	IDT	Telematics module
18	S4	Travel direction switch	36	CL	Pin-code lock

a.7 T60Q/T130Q Electrical diagram for (Curtis controller)



Description of electrical diagram

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16	S2	Turn signal switch	34	VD	Diode
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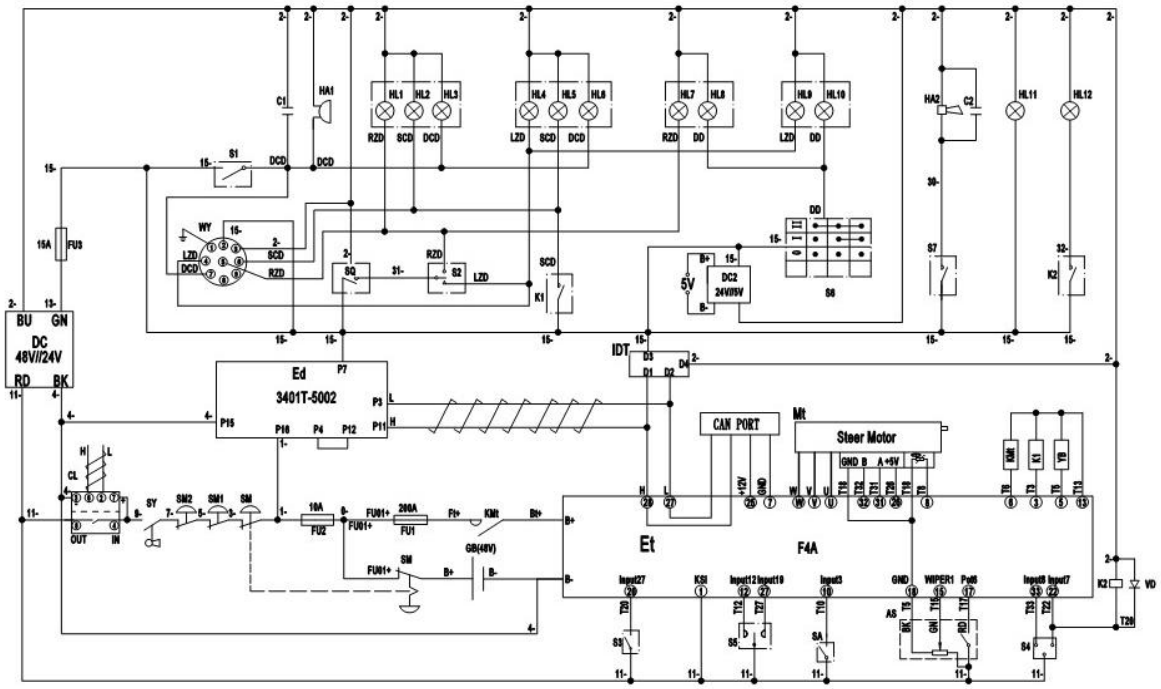
18	S4	Travel direction switch			

a.8 T60Q/T130Q Electrical diagram for (Curtis controller) with pin-code lock



Description of electrical diagram

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16	S2	Turn signal switch	34	VD	Diode
17	S3	Brake switch	35	IDT	Telematics module
18	S4	Travel direction switch	36	CL	Pin-code lock

8. SPECIALIZED STIPULATIONS FOR US- AMERICAN MARKET

a. Foreword/ Compliance

Operating this truck requires knowledge which can be acquired from this instructions manual. This manual must be kept available throughout the entire period of use of this tractor.

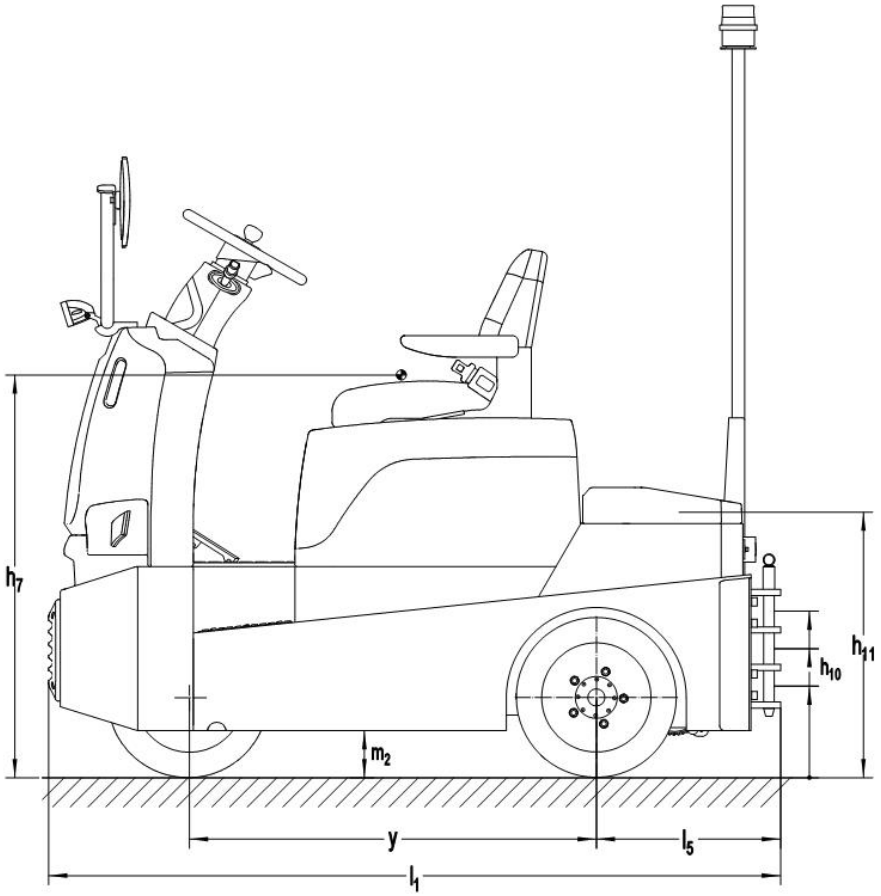
IT IS LAW; YOU MUST BE TRAINED AND CERTIFIED TO OPERATE THIS TRUCK! READ AND OBEY ALL WARNINGS AND INSTRUCTIONS IN THIS MANUAL AND ON THE TRUCK!

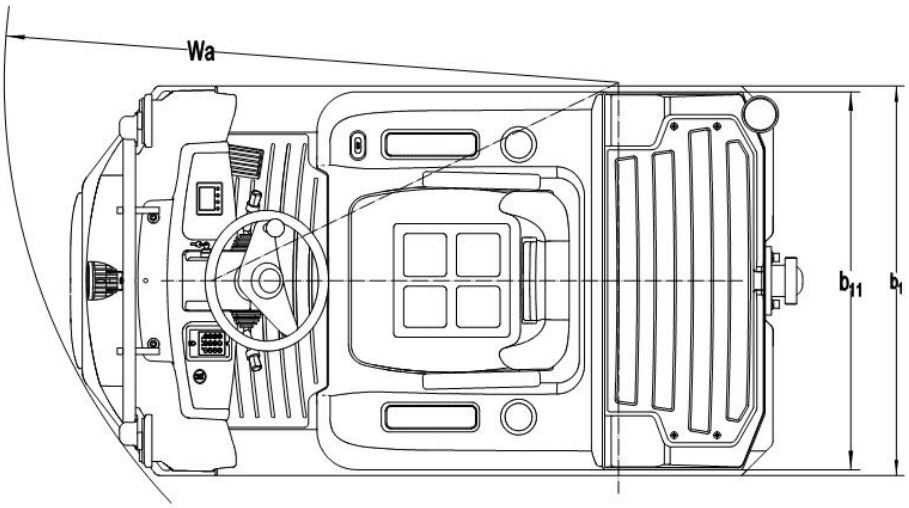
Only properly trained operators are allowed to operate a powered industrial truck. Your employer must train you and certify, that you are qualified to operate this truck (required by OSHA § 1910.178). The training must satisfy OSHA requirements and as minimum the topics mentioned in this manual. Depending on the context in this operating manual, the user can refer to several people, including the owner of the truck, anyone who leases or borrows this truck.

Please pay attention to the section in ANSI/ ITSDF B56.9 concerning the operator. In this standard, it is defined that the safe operation is the responsibility of the operator. You and others can be seriously injured or even killed if you don’t use this truck correctly. Before operating your truck, inspect the truck and ensure that it is in correct working order. This truck is designed and built to current industry and government standards. For more information see following:

- OSHA §1910.178 (Occupational Safety and Health Act)
- UL 583 (Underwriters Laboratories)
- ANSI Z535.4 (American National Standards Institute)
- ANSI/ ITSDF B56.9 (American National Standards Institute)

b. Technical data for US market





Main technical data for standard version (US market)

Type sheet for industrial truck					
Distinguishing mark	1.2	Manufacturer's type designation		T66Q	T130Q
	1.3	Drive: electric (battery type, mains, ...), diesel, petrol, fuel gas		Electric (48V battery)	Electric (48V battery)
	1.4	Operator type: hand, pedestrian, standing, seated, order-picker		Seated	Seated
	1.5	Rated capacity/ rated load	Q ((lbs)	6600	13200
	1.7	Rated drawbar pull	F (N)	750	1500
	1.9	Wheelbase	y (inch)	41	46.5
Weight	2.1	Service weight (with battery)	lbs	2380	2745
	2.3	Axle loading, unladen front/ rear	lbs	970/1410	1090/1655
Tyres/ chassis	3.1	Tires		Solid rubber wheel	Solid rubber wheel
	3.2	Tire size, front	inch	16x4	16x4
	3.3	Tire size, rear	inch	16x4	16x4
	3.5	Wheels, number front/ rear (x=driven wheels)		1 / 2x	1 / 2x
	3.6	Tread, front	b_{10} (inch)	0	0
	3.7	Tread, rear	b_{11} (inch)	34.5	34.5
Dimensions	4.8	Seat height relating to SIP/ stand height	h_7 (inch)	38.5	38.5
	4.12	Coupling height	h_{10} (inch)	9/13/16.5	9/13/16.5
	4.13	Loading height, unladen	h_{11} (inch)	27	27
	4.19	Overall length	l_1 (inch)	73.6	79.5
	4.21	Overall width	b_1 (inch)	39.2	39.2
	4.32	Ground clearance, centre of wheelbase	m_2 (inch)	4.7	4.7
	4.35	Turning radius	W_a (inch)	62.6	66
Performance	5.1	Travel speed, laden/ unladen	mph	5/8.7	4.35/8.7
	5.5	Drawbar pull, laden/ unladen	N	750	1500
	5.6	Max. drawbar pull, laden/ unladen	N	3000	6000
	5.10	Service brake		Hydraulic + Electromagnetic	Hydraulic + Electromagnetic
Electric-engine	6.1	Drive motor rating S2 60min	Hp	6.7	8
	6.3	Battery acc. to DIN 43531/35/36 A, B, C, no		DIN	DIN
	6.4	Battery voltage/ nominal capacity K_5	(V)/(Ah)	48/240; 48/270; 48/300	48/320;48/360 48/400
	6.5	Battery weight (+/-5%)	lbs	926/1036/1146	1168/1278/1389
Addition data	8.1	Type of drive unit		CFET-DRV, AC drive unit	CFET-DRV, AC drive unit
	10.7	Sound pressure level at driver's seat	dB (A)	＜70	＜70

9. DECLARATION OF CONFORMITY (valid, if sold within EU)

[GB] Original CE Declaration of conformity
The signatory hereby declares that the specified machine conforms to the EC Directive 2006/42/EC (Machine Directive), and 2014/30/EU (Electro-Magnetic Compatibility, EMC) including their amendments as translated into national legislation of the member countries. The signatory is individually authorized to compile the technical documents and declares that the following standards, including the normative procedures contained therein, have been applied:

[D] Original EG- Konformitätserklärung
Der Unterzeichner erklärt hiermit, dass die angegebene Maschine den EG-Richtlinien 2006/42/EG (Maschinenrichtlinie) und 2014/30/EU (Elektromagnetische Verträglichkeit, EMV) einschließlich ihrer Änderungen in der Umsetzung in die nationale Gesetzgebung der Mitgliedsländer entspricht. Der Unterzeichner ist zur Zusammenstellung der technischen Unterlagen einzeln befugt und erklärt, dass folgende Normen, einschließlich der darin enthaltenen normativen Verfahren, angewendet wurden:

[E] Original DECLARACIóN DE CONFORMIDAD CE
El signatario declara por la presente que la máquina especificada cumple con la Directiva CE 2006/42/EC (Directiva de Máquinas) y 2014/30/EU (Compatibilidad Electromagnética, EMC) incluidas sus enmiendas traducidas a la legislación nacional de los países miembros. El firmante está autorizado individualmente para compilar los documentos técnicos y declara que se han aplicado los siguientes estándares, incluidos los procedimientos normativos contenidos en ellos:

[F] Originale DECLARATION DE CONFORMITE CE
Le signataire déclare par la présente que la machine spécifiée est conforme à la directive CE 2006/42/CE (directive machine) et 2014/30/UE (compatibilité électromagnétique, CEM), y compris leurs modifications telles que traduites dans la législation nationale des pays membres. Le signataire est individuellement autorisé à compiler les documents techniques et déclare que les normes suivantes, y compris les procédures normatives qu'elles contiennent, ont été appliquées:

[NL] Origineel EG-CONFORMITEITSVERKLARING
De ondertekenaar verklaart hierbij dat de gespecificeerde machine voldoet aan de EG-richtlijnen 2006/42/EG (machinerichtlijn) en 2014/30/EU (elektromagnetische compatibiliteit, EMC) inclusief hun amendementen zoals vertaald in de nationale wetgeving van de aangesloten landen. De ondertekenaar is individueel gemachtigd om de technische documenten samen te stellen en verklaart dat de volgende normen, inclusief de normatieve procedures die daarin zijn opgenomen, zijn toegepast:

[P] Original DECLARAÇÃO DE CONFORMIDADE CE
O signatário declara que a máquina especificada está em conformidade com a Diretiva EC 2006/42/EC (Diretiva de Máquinas) e 2014/30/EU (Compatibilidade Eletromagnética, EMC), incluindo suas emendas traduzidas para a legislação nacional dos países membros. O signatário está individualmente autorizado a compilar os documentos técnicos e declara que as seguintes normas, incluindo os procedimentos normativos neles contidos, foram aplicadas:

[I] Originale DICHIARAZIONE DI CONFORMITÀ CE
Il firmatario dichiara che la macchina specificata è conforme alla Direttiva CE 2006/42/CE (Direttiva macchine) e 2014/30/UE (Compatibilità elettromagnetica, EMC) compresi i relativi emendamenti tradotti nella legislazione nazionale dei paesi membri. Il firmatario è autorizzato individualmente alla compilazione dei documenti tecnici e dichiara che sono state applicate le seguenti norme, comprese le procedure normative ivi contenute:

[BG] Оригинален ЕВРОПЕЙСКА ОБЩНОСТ - ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ
С настоящото подписалото лице декларира, че посочената машина отговаря на Директива на ЕО 2006/42/ЕС (Директива за машини) и 2014/30/ЕU (Електромагнитна съвместимост, ЕМС), включително техните изменения, преведени в националното законодателство на страните-членки. Подписалото лице е лично упълномощено да съставя техническите документи и декларира, че са приложени следните стандарти, включително съдържащите се в тях нормативни процедури:

[CZ] Originál EG - PROHLÁŠENÍ OSHODĚ
Signatář tímto prohlašuje, že uvedený stroj je ve shodě se směrnicí ES 2006/42/ES (Směrnice o strojích) a 2014/30/EU (Elektromagnetická kompatibilita, EMC) včetně jejich změn ve znění přeložené do národní legislativy členských zemí. Podepisující osoba je samostatně oprávněna sestavit technické dokumenty a prohlašuje, že byly použity následující normy, včetně normativních postupů v nich obsažených:

[DK] Original EF-OVERENSSTEMMELSESERKLÆRING
Underskriveren erklærer hermed, at den specificerede maskine er i overensstemmelse med EF-direktivet 2006/42/EC (maskindirektivet) og 2014/30/EU (elektro-magnetisk kompatibilitet, EMC) inklusive deres ændringer som oversat til national lovgivning i medlemslandene. Underskriveren er individuelt bemyndiget til at udarbejde de tekniske dokumenter og erklærer, at følgende standarder, inklusive de normative procedurer indeholdt deri, er blevet anvendt:

[EST] Originaal EL vastavusavaldus
Allakirjutanu kinnitab käesolevaga, et nimetatud masin vastab EÜ direktiivile 2006/42/EÜ (masinadirektiiv) ja 2014/30/EL (elektromagnetiline ühilduvus, EMC), sealhulgas nende muudatustele, nagu on tõlgitud liikmesriikide siseriiklikesse õigusaktidesse. Allakirjutanul on individuaalselt õigus koostada tehnilisi dokumente ja ta kinnitab, et on kohaldatud järgmisi standardeid, sealhulgas neis sisalduvaid normatiivprotseduure:

[FIN] Alkuperäinen EU-YHDENMUKAISUUSSELOSTUS
Allekirjoittaja vakuuttaa täten, että määriteтty kone on EY-direktiivin 2006/42/EY (konedirektiivi) ja 2014/30/EU (sähkömagneettinen yhteensopivuus, EMC) mukainen, mukaan lukien niiden muutokset, sellaisina kuin ne on käännetty jäsenmaiden kansalliseen lainsäädäntöön. Allekirjoittaja on henkilökohtaisesti valtuutettu kokoamaan tekniset asiakirjat ja vakuuttaa, että seuraavia standardeja, mukaan lukien niihin sisältyvät normatiiviset menettelyt, on sovellettu:

[GR] Πρωτότυπο ΔΗΛΩΣΗΣΥΜΜΟΡΦΩΣΗΣΕΟΚ
Ο υπογράφοντος δηλώνει με το παρόν ότι το συγκεκριμένο μηχάνημα συμμορφώνεται με την Οδηγία 2006/42/ΕΚ (Οδηγία Μηχανών) και 2014/30/ΕΕ (Ηλεκτρομαγνητική Συμβατότητα, ΕΜC) συμπεριλαμβανομένων των τροποποιήσεών τους όπως έχουν μεταφραστεί στην εθνική νομοθεσία των χωρών μελών. Ο υπογράφοντος είναι ατομικά εξουσιοδοτημένος να συντάξει τα τεχνικά έγγραφα και δηλώνει ότι έχουν εφαρμοστεί τα ακόλουθα πρότυπα συμπεριλαμβανομένων των κανονιστικών διαδικασιών που περιέχονται σε αυτά:

[H] Eredeti EU KONFORMITÁSI NYILATKOZAT
Az aláíró ezennel kijelenti, hogy a megadott gép megfelel a 2006/42/EC (gépirányelv) és a 2014/30/EU (elektromágneses összeférhetőség, EMC) irányelveknek, beleértve azok módosításait a tagországok nemzeti jogszabályaiba lefordítva. Az aláíró egyénileg jogosult a műszaki dokumentumok összeállítására, és kijelenti, hogy a következő szabványokat, beleértve az abban foglalt normatív eljárásokat, alkalmazták:

[LT] Originalus ES atitikimo deklaracija
Pasirašęs asmuo pareiškia, kad nurodyta mašina atitinka EB direktyvą 2006/42/EB (mašinų direktyvą) ir 2014/30/ES (elektromagnetinį suderinamumą, EMC), įskaitant jų pakeitimus, išverstus į šalių narių nacionalinius teisės aktus. Pasirašęs asmuo yra individualiai įgaliotas rengti techninius dokumentus ir pareiškia, kad buvo taikomi šie standartai, įskaitant juose nurodytas normines procedūras:

[LV] Oriģināls ES atbilstības deklarācija
Parakstītājs ar šo apliecina, ka norādītā iekārta atbilst EK Direktīvai 2006/42/EK (Mašīnu direktīva) un 2014/30/ES (Elektromagnētiskā saderība, EMC), ieskaitot to grozījumus, kas ir tulkoti dalībvalstu nacionālajos tiesību aktos. Parakstītājs ir individuāli pilnvarots sastādīt tehniskos dokumentus un apliecina, ka ir piemēroti šādi standarti, tostarp tajos ietvertās normatīvās procedūras:

[N] Opprinnelig EU-KONFORMITETSERKLÆRING
Underskriveren erklærer herved at den spesifiserte maskinen er i samsvar med EC-direktivet 2006/42/EC (maskindirektivet), og 2014/30/EU (elektromagnetisk kompatibilitet, EMC) inkludert deres endringer som oversatt til nasjonal lovgivning i medlemslandene. Underskriveren er individuelt autorisert til å sammenstille de tekniske dokumentene og erklærer at følgende standarder, inkludert de normative prosedyrene som finnes deri, er brukt:

[PL] Oryginalny DEKLARACJA ZGODNOŚCI WE

Sygnatariusz niniejszym oświadcza, że określona maszyna jest zgodna z dyrektywą WE 2006/42/WE (dyrektywa maszynowa) i 2014/30/UE (kompatybilność elektromagnetyczna, EMC) wraz z ich poprawkami w tłumaczeniu na ustawodawstwo krajowe krajów członkowskich. Sygnatariusz jest indywidualnie upoważniony do sporządzania dokumentacji technicznej i oświadcza, że zastosowano następujące normy, w tym zawarte w nich procedury normatywne:

[RO] Original DECLARAŢIE DE CONFORMITATE CE

Semnatarul declară prin prezenta că maşina specificată este conformă cu Directiva CE 2006/42/CE (Directiva Maşini) şi 2014/30/UE (Compatibilitate electro-magnetică, EMC), inclusiv amendamentele acestora, astfel cum au fost traduse în legislaţia naţională a ţărilor membre. Semnatarul este autorizat individual să întocmească documentele tehnice şi declară că au fost aplicate următoarele standarde, inclusiv procedurile normative cuprinse în acestea:

[RUS] Оригинал Декларация соответствия стандартам ЕС

Настоящим подписывающая сторона заявляет, что указанная машина соответствует Директиве ЕС 2006/42/ЕС (Директива по машинам) и 2014/30/ЕС (Электромагнитная совместимость, ЭМС), включая их поправки, переведенные в национальное законодательство стран-членов. Подписавшаяся сторона имеет индивидуальное право на составление технических документов и заявляет, что были применены следующие стандарты, включая содержащиеся в них нормативные процедуры:

[S] Original EG-KONFORMITETSFÖRKLARING

Undertecknaren intygar härmed att den specificerade maskinen överensstämmer med EG-direktivet 2006/42/EC (maskindirektivet) och 2014/30/EU (elektromagnetisk kompatibilitet, EMC) inklusive deras tillägg som översatts till nationell lagstiftning i medlemsländerna. Undertecknaren är individuellt behörig att sammanställa de tekniska dokumenten och förklarar att följande standarder, inklusive de normativa procedurerna som finns däri, har tillämpats:

[SK] Originál vyhlásenie o zhode

Signatár týmto vyhlasuje, že špecifikovaný stroj je v súlade so Smernicou ES 2006/42/EC (Smernica o strojoch) a 2014/30/EU (Elektromagnetická kompatibilita, EMC) vrátane ich dodatkov preložených do národnej legislatívy členských krajín. Signatár je individuálne oprávnený zostavovať technické dokumenty a vyhlasuje, že boli aplikované nasledujúce normy vrátane normatívnych postupov v nich obsiahnutých:

[SLO] Original EU IZJAVA O SKLADNOSTI

Podpisnik s tem izjavlja, da je navedeni stroj v skladu z Direktivo ES 2006/42/ES (Direktiva o strojih) in 2014/30/EU (Electro-Magnetic Compatibility, EMC), vključno z njunimi spremembami, kot so prevedene v nacionalno zakonodajo držav članic. Podpisnik je posamično pooblaščen za sestavo tehnične dokumentacije in izjavlja, da so bili uporabljeni naslednji standardi, vključno z normativnimi postopki, ki jih vsebuje:

[TR] Orijinal AB Uygunluk Açıklaması

İmza sahibi, belirtilen makinenin AB Direktifi 2006/42/EC (Makine Direktifi) ve 2014/30/EU (Elektro-Manyetik Uyumluluk, EMC) ve bunların üye ülkelerin ulusal mevzuatına tercüme edilen değişiklikleri ile uyumlu olduğunu beyan eder. İmza sahibi, teknik belgeleri derlemeye bireysel olarak yetkilidir ve burada yer alan normatif prosedürler dahil olmak üzere aşağıdaki standartların uygulandığını beyan eder:

<the applied standards have to be shown here>

(1) Type: **XX XX– Self-propelled industrial truck**

(2) Serial No: **XXXXXXXX**

(3) Year of constr.: **YYYY**

(4) Manufacturer: Noblelift Intelligent Equipment Co., Ltd.
528 Changzhou Road, Taihu Sub-district, Changxing, 313100, PR China

(5) Responsible for compiling the technical documentation: <Company name>,
<Company Address>

(6) Date: <Place>, **YYYY.MM.DD**

(7) Authorized signatory: <Position> **Mr. Sample**

(1) Type/ Typ/ Tipo/ Modello/ Tyyppi/ Tipo / ΤΥΠΟΣ/ Típus/ Tip/ Тип/ Tips/ Tipas/ Tüüp:
(2) Serial No./ Serien-Nr./ N°. de série/ Serienummer/ Nº de serie/ Numero di serie/ Serienr./ Sarjanro/ αυξάνωναριθμός/ Seriové číslo/ Szériaszám/ Nr.Seryjny/ Serijska številka/ Výrobné číslo/ Серийныйномер/ Seri No./ Seerianr./ Sērijas Nr./ Serijos numeris:
(3) Year of constr./ Baujahr/ Année de constr./ Bouwjaar/ Año de constr./ Anno di costruzione/ Produktionsår/ Byggeår/ Tillverkningsår/ Valmistusvuosi / Ano de fabrico / έτοςκατασκευής/ Rokvýroby/ Gyártásiév/ Rokprodukcji / Letnik / Годизготовления / Üretimyılı / Väljalaskeaasta / Izgatavošanas gads / Gamybosmetai
(4) Manufacturer/ Hersteller/ Fabricante/ Fabricant/ Fabrikant/ Fabricante/ Produttore/ производител/ Výrobce/ Fabrikant/ Tootja/ Valmistaja/ Κατασκευαστής/ Gyártó/ Gamintojas/ Ražotājs/ Produsent/ Producent/ Producător/ Производитель/ Tillverkare/ Výrobca/ Proizvajalec/ Üretici firma
(5) Responsible for compiling the technical documentiton/ Verantwortlich für die Zusammenstellung der technischen Dokumentation/ Responsable de compilar la documentación técnica/ Responsable de la compilation de la documentation technique/ Verantwoordelijk voor het samenstellen van de technische documentatie/ Responsável pela compilação da documentação técnica/ Responsabile della compilazione della documentazione tecnica/ Отговаря за съставянето на техническата документация/ Zodpovídá za sestavení technické dokumentace/ Ansvarlig for udarbejdelse af den tekniske documentation/ Vastutab tehnilise dokumentatsiooni koostamise eest/ Vastaa teknisen dokumentaation laatimisesta/ Υπεύθυνος για τη σύνταξη της τεχνικής τεκμηρίωσης/ Felelős a műszaki dokumentáció összeállításáért/ Atsakingas už techninės dokumentacijos sudarymą/ Atbildīgs par tehniskās dokumentācijas sastādīšanu/ Ansvarlig for sammenstilling av teknisk dokumentasjon/ Odpowiedzialny za kompletowanie dokumentacji technicznej/ Responsabil cu intocmirea documentatiei tehnice/ Ответственный за составление технической документации/ Ansvarig för att sammanställa den tekniska dokumentationen/ Zodpovedá za zostavenie technickej dokumentácie/ Odgovoren za pripravo tehnične dokumentacije/ Teknik dokümantasyonun derlenmesinden sorumlu
(6) Date/ Datum/ Data/ Fecha/ datum/ Dato/ päiväys/ Kuupäev/ Datums/дата/ Dátum/ dátum/ tarih/ ημερομηνία
(7) Authorised signatory/ ImAuftrag/ pour ordre/ Incaricato/ Por orden de/ por procuração/ op last van/ påvegneaf/ påuppdrag/ Etteroppdrag/ psta./ Ülesandel / pavedus / v.i. / Попоручению / megbízásából /длъжностнолице / z pověření / z poverenia / po nalogu / napolecenie / din sarcina / adına / θαη' ελληνή