



X-ECO

4x300W LED

Lighting Tower

USE MANUAL



Dear customer,

We wish to thank you very much for having purchased our product. With proper handling and maintenance, this product will provide dependable, long-term service. Our customer service is always available, might you need it.

This manual is intended for users of the equipment. This manual is compiled from information available and current at time of approval for printing.

Please consider that this manual may refer to controls and optional equipment that are not present on your particular machine.

*It is important that you know your machine and its equipment and how to operate it properly, so **please read the operating instructions carefully and understand them before operating the machine.***

Machine specifications can be modified at any time without any obligation to update this publications. It is recommended to read this manual thoroughly because incorrect operation may result in the warranty being void.

It is also recommended to use only original factory spare parts

Reproduction of this manual is not permitted, unless written approval is obtained from factory.



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SAFETY RULES

SAFETY PRECAUTIONS TO BE OBSERVED

Read this manual and learn the operating characteristics and limitations of the machine before operating it.

The manufacturer declines all liability for injury to persons and damage to components due to not respecting the safety rules.

Report all malfunctions to a maintenance responsible. If there are any repairs to be done, do not operate the equipment. Normal service and maintenance, if performed as required, can prevent unexpected and unnecessary down time. This manual describes standard inspections, operation and servicing with the normal safety precautions required for normal servicing and operating conditions. Operators and maintenance personnel must be safety conscious and alert to recognize potential operating or servicing safety hazards at all times. They should immediately take the necessary precautions to ensure safe operation and servicing of the machine.



- ☐ Be aware of operating risks that may be created by weather changes. Follow the correct procedures in the event of heavy rain or electrical storm.
- ☐ Lower tower when not in use, or if high winds or electrical storms are expected in the area.
- ☐ Use protective clothing and safety equipment: gloves, safety boots, safety hard hat, goggles, ear protection, and dust masks when necessary.
- ☐ Know all side clearances and overhead obstructions for safe operation of the machine.
- ☐ **ALWAYS** make sure area above the tower is open and clear of any kind of obstruction.
- ☐ Position and operate the lighting tower on a firm surface.
- ☐ The machine must be levelled and outriggers extended before raising tower.
- ☐ Keep area around the machine clear of people while raising and lowering the mast.
- ☐ **ALWAYS** handle fuels and lubricants carefully, clean up spills to avoid fire and slipping risks.
- ☐ **NEVER** using the unit if it is in need of repair.
- ☐ The area near the exhaust pipe become hot in use. Be careful if you need to work there.
- ☐ Check that winch cables are in good condition and are centered on each pulley.
- ☐ **DO NOT** use the unit if insulation on the electrical cord is cut or worn through.
- ☐ **DO NOT** permit to untrained personnel to operate the machine.
- ☐ **NEVER** operate a unit if you are tired, not concentrated or under the influence of drugs or alcohol.
- ☐ Keep children and animals away from the machine.

FIRE PRECAUTIONS



- ☐ Clean all dirt, oil and other fluids from components to minimize fire risks and aid in spotting loose or leaking components.
- ☐ Check the engine for oily rags or other debris that could be potential cause of fire before starting the unit.
- ☐ Have a fire extinguisher nearby. Be sure the extinguisher is properly maintained and be familiar with its use.
- ☐ In the event of fire, the following extinction means are appropriated: carbonate anhydride (or carbon dioxide), powder, foam, nebulized water. Avoid to use water jets.
- ☐ In the event of fire, wear a breathing apparatus if there is heavy smoke.

FLAMMABLE FLUID PRECAUTIONS



- ☐ Take due care when working with fuel. Diesel fuel is a health hazard. Be aware that there is also danger of fire and pollution.
- ☐ **DO NOT** clean the unit components using flammable fluids.
- ☐ Check and ensure that all-fluid systems caps, drain, valves, fittings, lines etc., are secure and leak free.
- ☐ **ALWAYS** shut off engine while refueling and be very cautious if engine is still hot.
- ☐ **NEVER** smoke while checking or adding fuel or handling fluid containers.
- ☐ **NEVER** refuel near an open flame
- ☐ **DO NOT** fill the tank completely.
- ☐ **DO NOT** refuel in an enclosed area with poor ventilation.
- ☐ **DO NOT** run engine without the fuel tank cap.
- ☐ **DO NOT** use the machine in areas with risk of explosion or fire.

SAFETY RULES

ELECTRICAL HAZARD



- ☐ **DO NOT** smoke or allow open flames or sparks near the batteries.

- ☐ Before doing repair works, **ALWAYS** disconnect batteries. Disconnect negative terminal first and reconnect last.
- ☐ Before carrying out any welding on the machine, **ALWAYS** make sure to disconnect batteries and alternator leads.
- ☐ The tools must **NOT** come into contact with the battery terminals with the risk of creating an electric arc.
- ☐ Use jumper cables only. Improper use can result in severe damage and safety risk.
- ☐ **NEVER** use the machine if insulation on electrical cord is cut or worn through.
- ☐ **NEVER** operate lights without protective lens cover in place or with a lens cover that is cracked or damaged!

LUBRICATION AND SERVICING



- ☐ Only authorized and trained personnel is allowed to perform the machine maintenance.
Please read the operator's manual and maintenance manual before using or servicing the machine.

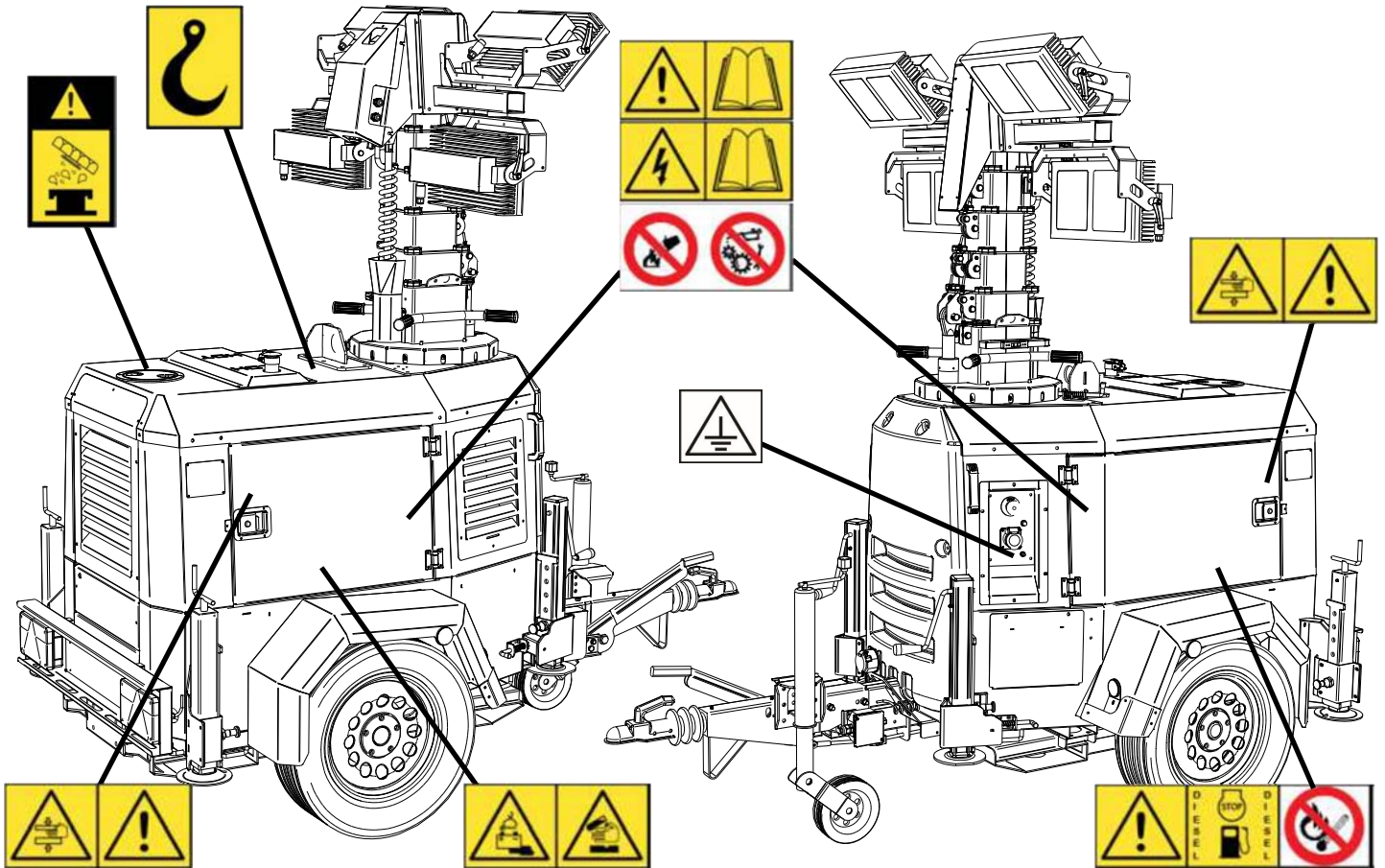
- ☐ **HIGH VOLTAGE!** This equipment utilizes high voltage circuits. Always exercise extreme caution when trouble shooting or repairing any electrical circuit.
- ☐ Only a qualified electrician should troubleshoot or repair electrical problems occurring on the machine.
- ☐ Before servicing the lighting tower, ensure that the engine start switch is turned to OFF.
- ☐ Disconnect electrical power and turn off engine before removing protective covers on high voltage electrical closures.
- ☐ **NEVER** perform even routine service (oil/filter changes, cleaning, etc.) if all electrical components aren't shut down.
- ☐ **NEVER** allow water to accumulate at the base of the machine. If water is present, **DO NOT** service!
- ☐ **DO NOT** service electrical components if your clothing or skin is wet.
- ☐ If the unit is stored outside, check the engine and generator for any moisture. If wet, dry the unit thoroughly before starting.
- ☐ Never wash the unit with a high pressure hose or with any kind of power washer.
- ☐ Open main circuit breaker before disconnecting battery cables.
- ☐ Ensure to always relieve pressure before servicing any pressurized system.
- ☐ Be aware of hot exhaust pipes and engine.
- ☐ **KEEP AWAY** from moving parts on generator and engine. Be aware of the hazard if you wear loose clothing.
- ☐ Check and replace all missing and hard-to-read labels.
- ☐ Make sure slings, chains, hooks, ramps, jacks, and other types of lifting devices are attached securely and have enough weight-bearing capacity to lift or hold the equipment safely.

TOWING SAFETY



- ☐ **Be careful while towing a trailer!** Both the trailer and vehicle must be in good condition and securely fastened to each other.

- ☐ Check that the hitch and coupling on the towing vehicle are adequately dimensioned and rated to the trailer's "gross vehicle weight rating" (GVWR).
- ☐ Do not tow a trailer using defective parts coupling!
- ☐ Check the tires of the trailer: tread wear, tire pressure, general conditions.
- ☐ Connect breakaway safety line securely to towing vehicle.
- ☐ If fitted, connect safety chains in a crossing pattern under the connecting beam.
- ☐ Check that wheel nuts are ALL tight.
- ☐ Check that the road running lights are connected and operating, if applicable.
- ☐ Maximum recommended speed for highway towing is 75 km/h. Recommended maximum off-road towing speed is 15 km/h (less on uneven terrain).
- ☐ When towing, maintain extra space between vehicles and avoid soft shoulders, curbs and sudden lane changes. If you are not experts in tow, to practice in a far from heavy traffic area.



Safety stickers meanings



Attention! Read user's manual before operating the machine.



Attention, high voltage! Read user's manual before operating the machine.



Do not extinguish with water!
Attention, don't touch the moving parts.



Attention! Danger of crushing.



Attention, battery on board.
Contains corrosive liquids.



Attention! Hot liquid under pressure during machine use and immediately after. Pay attention when opening.



Lifting point. Ensure lifting device has enough capacity to handle machine weight.



Attention! Diesel fuel on board. Stop the engine while refueling. Keep anything that could cause sparks, flame or fire at a safety distance from the machine.



Earthing point. The grounding of the machine always needs to be done paying attention on the section of the cable to be used (never to be less than 10 mm2).


| | | | | | |
|----------------------|-----|----|------------|-------|----|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | Type | 4 | |
| 5 | 6 | | Engine | | 7 |
| | | | Alternator | | 8 |
| | V | 10 | Hz | 12 | |
| | KVA | 11 | COS ϕ | 13 | |
| 9 | RPM | | 14 | I.CL. | 15 |
| | | | | IP | 16 |
| Dimensions L x W x H | | | 17 | | |
| Weight | | | 18 | | |
| SERIAL N° | | | 19 | | |


1. Manufacturer's logo
2. Manufacturer's address
3. Manufacture year
4. Machine model
5. CE Logo
6. Generator symbol
7. Engine type
8. Alternator type
9. Single phase machine
10. Rated voltage
11. Rated power
12. Frequency
13. Power factor
14. Engine speed
15. Insulation class
16. Degree of protection
17. Machine dimensions
18. Dry weight
19. Machine serial number


Information regarding the machine model, code and year of production is on the unit serial number plate. Always quote the machine model and serial number when contacting your dealer, the factory and for any spare parts requests. All of our products comply with CE requirements. They are conform to directives and fulfill all the relevant safety requirements.


TECHNICAL SPECIFICATIONS


TECHNICAL DATA

| | | | |
|--|--------------------|-------------------------------------|------|
|  | Floodlights | Type | Led |
| | | Power | 300W |
| | | Floodlight installed | 4 |
| | | Illuminated area (5 lux min.) (sqm) | 4500 |
| | | IP Level | 66 |

| | | | |
|--|-------------|---------------------------|-----------|
|  | Mast | Lifting Method | Hydraulic |
| | | Maximum Height | 8,5 m |
| | | Maximum Wind Speed (km/h) | 110 |
| | | Rotation | 340° |

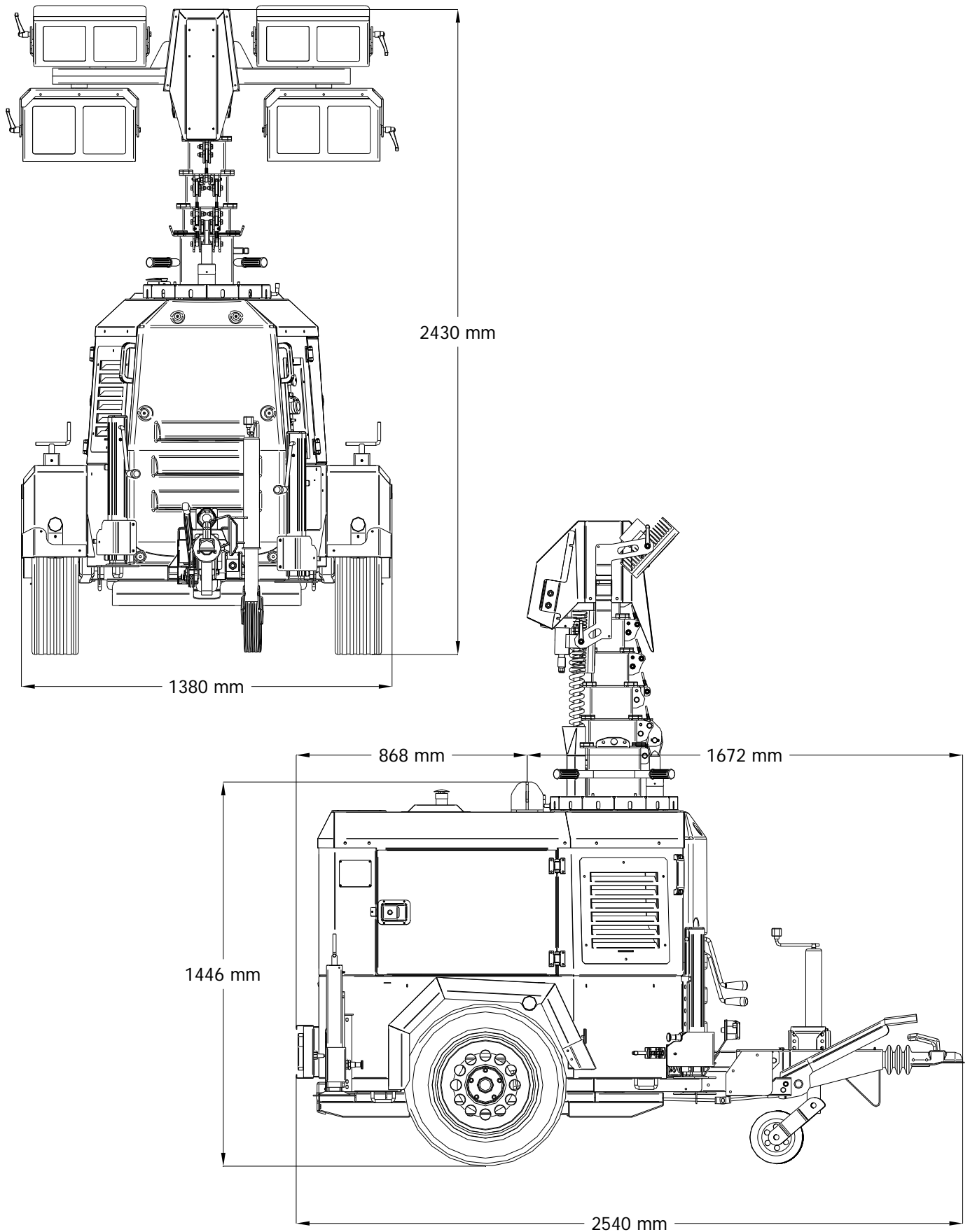
| | | | |
|---|---------------|--------------------------------------|---------------------|
|  | Engine | Model | Kubota Z482 |
| | | Governor | Electronic |
| | | Cylinders number | 2 |
| | | Displacement | 479 cm ³ |
| | | Engine speed (rpm) | 1500 |
| | | Fuel consumption (l/h) | 0,55 l/h |
| | | Average runtime before refueling (h) | 200 |
| | | Cooling system | Liquid |

| | | | |
|--|------------------|-------------------------------------|----------------|
|  | Generator | Model | Linz Alumen SB |
| | | Rated output | 3,5 kVA – 230V |
| | | Power available to auxiliary socket | 1 kVA – 230V |
| | | Rated frequency | 50Hz |

| | | | |
|--|-----------------------------|-------------------------------------|-----------------------|
|  | General informations | Noise level | 65dBA 7m |
| | | Battery | 12 V – 62 Ah |
| | | Fuel tank capacity | 110 l |
| | | Dimensions in transport (L x W x H) | 2540 x 1380 x 2430 mm |
| | | Dimensions in operation (L x W x H) | 2540 x 1550 x 8500 mm |
| | | Dry weight | 936 kg |

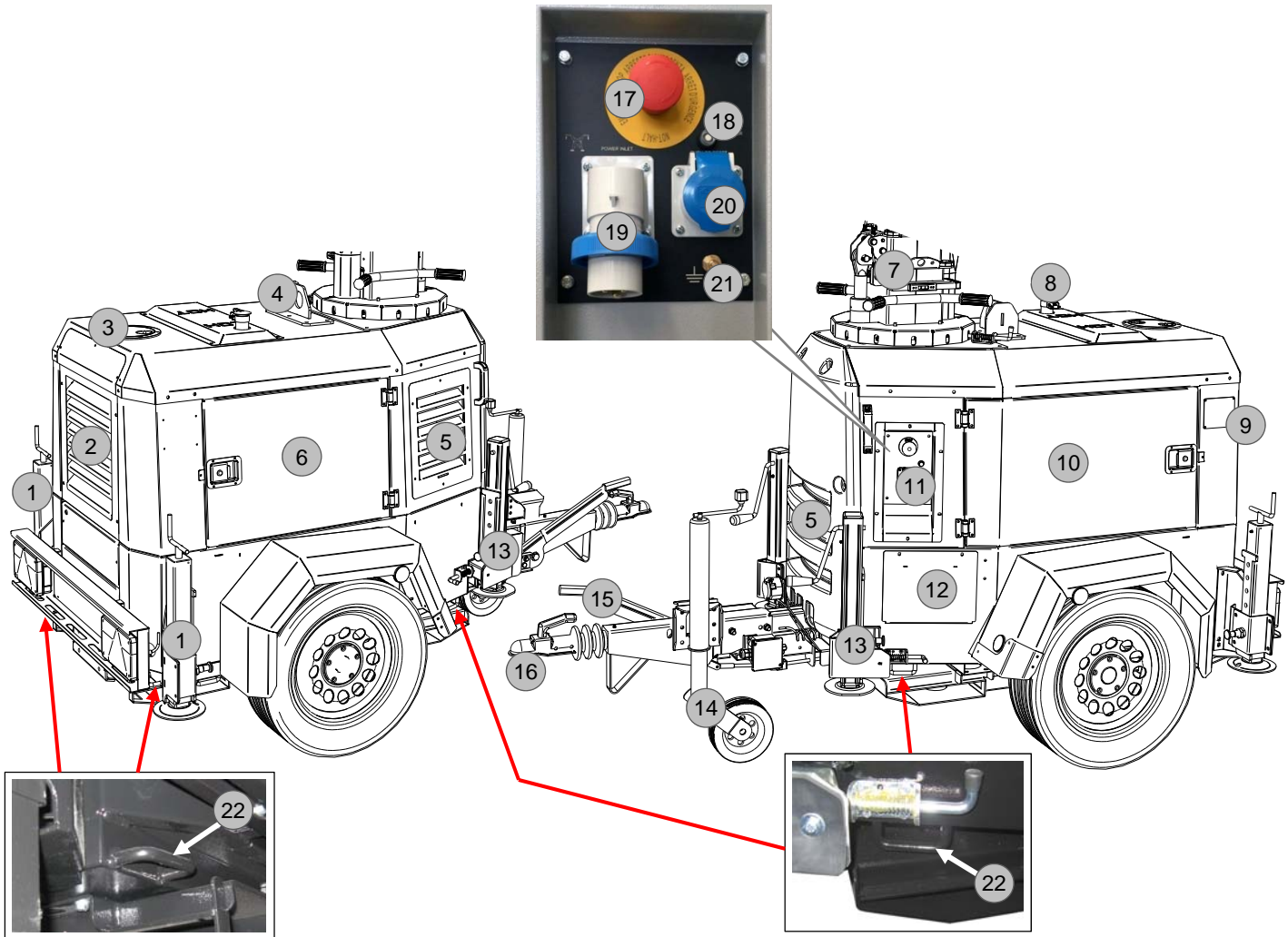
TECHNICAL SPECIFICATIONS

MACHINE LAYOUT



TECHNICAL SPECIFICATIONS

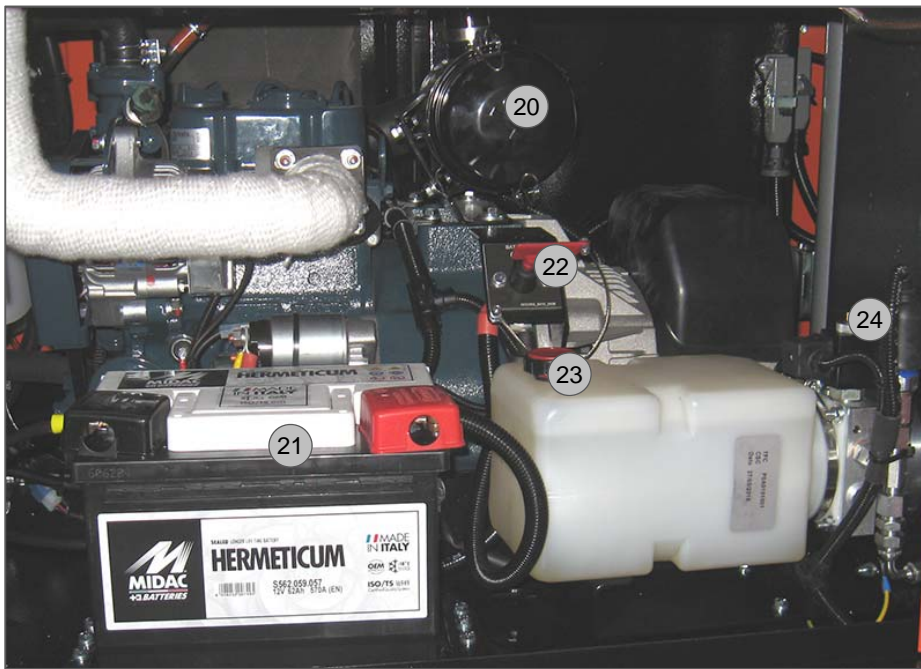
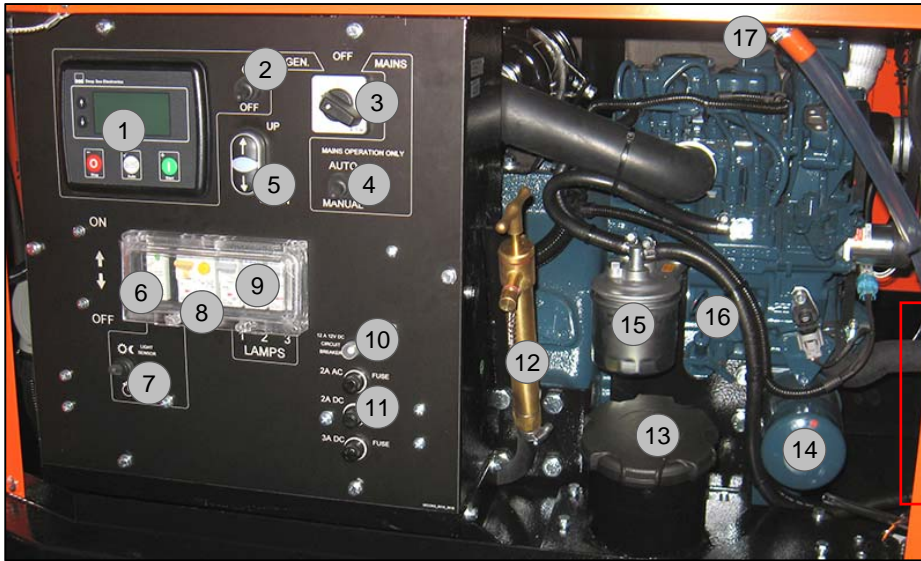
MACHINE COMPONENTS



1. Fixed stabilizers
2. Air output
3. Radiator cap cover
4. Lifting eye
5. Air inlet
6. Inspection door
7. Telescopic mast
8. Exhaust vent
9. Data plate
10. Inspection door
11. External control panel
12. Power supplies cover
13. Extended stabilizers
14. Rudder stabilizer with wheel
15. Handbrake lever
16. Tow hook
17. Emergency stop button
18. 12A circuit breaker
19. 230V 16A mains inlet
20. 230V 16A power outlet
21. Grounding terminal
22. Tie down points

TECHNICAL SPECIFICATIONS

MACHINE COMPONENTS



1. DSE L401 controller
2. Power supply switch
3. Generator / Mains mode selector
4. Auto / Manual switch
5. Mast control buttons
6. Light sensor
7. Light Sensor / Timer mode switch
8. 13A RCD
9. Lamps switches
10. 12Vdc circuit breaker (push to reset)
11. 2A AC/DC fuses
12. Oil drain manual pump
13. Fuel filler cap
14. Oil filter
15. Fuel filter
16. Oil level dipstick
17. Oil filler cap
18. Radiator tank
19. Fuel pre-filter
20. Air filter
21. Battery
22. Battery switch
23. Hydraulic unit cap
24. Mast lowered valve

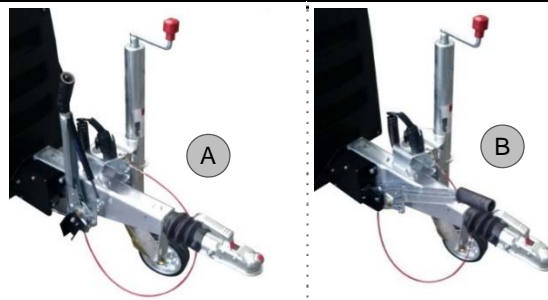
Automatic Mast Operating Safety System

All the **STANDARD** units are fitted with the Automatic Mast Operating Safety System (**AMOSS**). This system will prevent potentially dangerous situations of the trailer being moved while the mast is still in its raised, operational position. The system will lower the mast.

Automatically when the trailer handbrake is released and it will also inhibit the mast from being raised if the handbrake is not applied.

To apply the handbrake, pull the lever upwards **(A)**.

To release the handbrake, press the button at the tip of the lever and lower it **(B)**.



DSE L401 manual & auto start control module

The **DSE L401** is a compact control module that provides a comprehensive range of features for single-set applications. The controller can be used in manual or auto start mode.



Light sensor

The light sensor is a device that automatically activated the illumination when sunlight falls: at dusk, for precisely.



Residual-current device (RCD)

The unit is equipped with an residual-current device (RCD) capable of ensuring user protection in case of accidental contact with live parts or failure of the insulation system of connected users. Press the test button T every month: the earth leakage circuit breaker should trip and de-energise the system. If this would not be the case, then it is advisable not to use the unit and immediately seek technical advice.



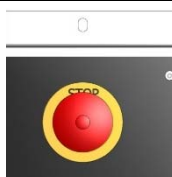
Emergency stop button

The lighting tower is fitted with a emergency stop button as standard. It is located on the external panel.

In case of need, push the emergency button and it will shut off the engine in a few seconds.

The engine will remain off until the emergency stop button is released.

To release the button, twist it in the direction of the arrows on the button (clockwise sense).



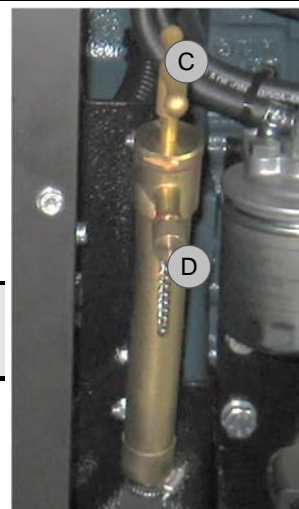
Engine oil drain manual pump

The lighting tower is fitted with a manual pump as standard, to facilitate the operator in the engine oil drain. Proceed as follows:

- ☐ Put under the cap **(D)** a container.
- ☐ Remove the cap **(D)**.
- ☐ Operate the pump by acting to the handle **(C)**.
- ☐ Emptied all the oil replace the cap **(D)**.



Dispose of the oil according to local regulations.



HANDLING AND TRANSPORT

TOWING & MOVING WITH TOWING VEHICLE



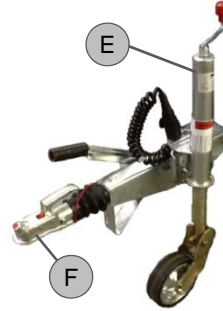
Do not move the trailer with the tower raised!

NEVER release the jokey wheel or the stabilizer (fixed to the rudder of the trailer) while are supporting the unit! The machine would tip forward and could cause damage or personal injury.

Before coupling the unit to a towing vehicle check the tyres and check that all the lights work properly.

Procedure:

- ☐ Turn off the lights and allow time for them to cool.
- ☐ Lower the tower.
- ☐ Ensure that the jokey wheel (E) or the stabilizer (G) are down so the unit will not tip over when the other stabilizer are raised.
- ☐ Raise all the stabilizer and retract the retractable ones.
- ☐ Couple the unit to a towing vehicle between the rudder eye (F).
- ☐ The unit can be now be towed to the new location.



HANDLING AND TRANSPORT WITH CRANE



Handling by crane is allowed only if the machine is connected to the crane through the lifting eye.

- ☐ Ensure that the lifting capacity of the crane and lifting devices is suited to the weight of the machine to move. The weight is specified in the provided documentation (user's manual) and on the data plate.
- ☐ Connect the cable/hook to the lifting eye (H) and tension the cable.
- ☐ Lift the machine for about 10 cm (4 in.).
- ☐ Move slowly and position the machine on the ground or on the vehicle.

HANDLING AND TRANSPORT WITH FORKLIFT

- ☐ Ensure that the lifting capacity of the forklift is suited to the weight of the machine to move. The weight is specified in the provided documentation (user's manual) and on the data plate.
- ☐ Insert the forks into the forklift pockets (transversal (I) or longitudinal (L), depending on machine and your moving requirements).
- ☐ Lift the machine for about 10 cm (4 in.).
- ☐ Move slowly and position the machine where needed.



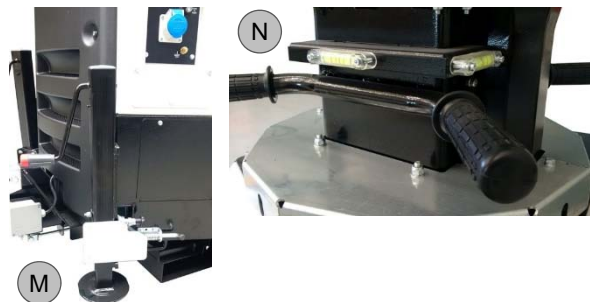
- ☐ All lifting operations must be carried out by qualified personnel, such as fork lift operators, crane operators and slingers. The operator should be deemed responsible for using the correct method of slinging and lifting the generator unit.
- ☐ Never leave the load insecure.
- ☐ When moving and transporting the machine, do not tilt it excessively.
- ☐ When lifting and moving the machine, do not stay or walk within it's proximity.
- ☐ Never leave the machine slung overhead.

LIGHTING TOWER USE

STABILIZING THE UNIT

Jack up the unit as follows. Consider that the stabilizers are extendable (M).

- ☐ Hold the stabilizer with one hand and pull the locking pin to release it. Pull the stabilizer outwards until it's fully extended and ensure that the locking pin locked it in place securely in the extended position.
- ☐ Jack the unit up by rotating the handle on the top of each stabilizer clockwise.
- ☐ Please refer to the bubble levels (N) installed on top of the machine (near the mast) in order to have the machine perfectly leveled and stable before rising the tower.
- ☐ The wheels of the machine have to touch the ground at all times.



DIRECTING THE FLOODLIGHTS

The tower can be rotated up to **340** degrees in order to direct the light as required.

- ☐ Release the rotation locking pin (O) and turn the tower using the rotation handles on the mast in order to direct the lights as needed. Don't forget to lock the rotation afterwards.
- ☐ Additionally to the mast rotation, each of the LEDs can be adjusted on two axes and tilted back and forth. This way the lights can be directed either vertically or horizontally. In order to adjust the light on the vertical axes, the encircled pin (P) needs to be unlocked by pulling it and then turning the floodlight. For any adjustments, the mast must be lowered to allow access.



PRELIMINARY CHECK & STARTING

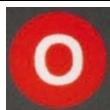
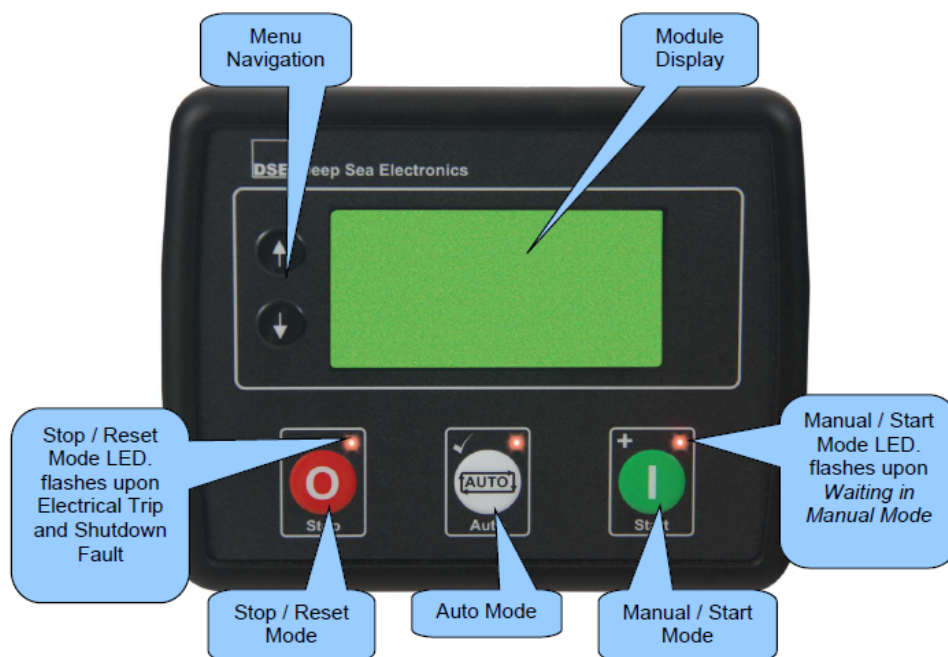
Before starting and operating the unit, we suggest making the following routine checks for improved safety, better efficiency, longer product life and in order to avoid work disruptions.

- ☐ Check that the machine is leveled correctly and stabilized firmly.
- ☐ Check that all the lamp lenses are clean and undamaged.
- ☐ After adjusting the lights, prepare to raise the tower by:
 - Inspecting the cable and replacing it, if damaged.
 - Checking mounting hardware for proper tightness and re-torquing if necessary.
- ☐ Check fuel, engine oil and coolant level. Top them if necessary.
- ☐ Ensure that the fuel lines are undamaged and correctly connected.
- ☐ Ensure that all the electrical cables are undamaged and correctly connected.
- ☐ Check that the main switch and the circuit breakers are in the OFF position.
- ☐ Ensure that all the light switches are turned off in order not to start the engine under load.
- ☐ Drive the earth picket into the ground (earth) following any risk assessment. (*)
- ☐ Check that the grounding cable is securely attached to the unit.
- ☐ Check that the emergency stop button is not pressed. If necessary, rotate the button clockwise to release it.
- ☐ Open the frontal door to access the control panel.

For operators' safety, the grounding of the machine always needs to be done paying attention on the section of the cable to be used (never to be less than 10 mm²). For the connection of the grounding cable, please always use the clip located on the control panel, on the right side of the machine. Always perform grounding operations in compliance with local/international regulations.

DSE L401 CONTROL UNIT: DESCRIPTION OF CONTROLS

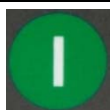
The following section details the function and meaning of the various controls on the module.

**STOP/RESET MODE**

This button places the module into its **Stop/Reset Mode**. This clears any alarm conditions for which the triggering criteria have been removed. If the engine is running and the module is put into Stop mode, the module automatically instructs the generator to unload. The fuel supply de-energises and the engine comes to a standstill. Should any form of **remote start signal** be present while operating in this mode, a start does not occur.

**AUTO MODE**

This button places the module into its **Auto Mode**. This mode allows the module to control the function of the generator automatically. The module monitors the **Remote Start** input once a start request is made, the set is automatically started and placed on load. Upon removal of the starting signal, the module removes the load from the generator and shut the set down observing the Stop Delay timer and Cooling Down timer as necessary. The module then awaits the next start event.

**MANUAL/START MODE**

This button starts the engine and runs it on.

**MENU NAVIGATION**

Used for navigating the instrumentation, event log and configuration screens. For further details, see the more detailed section of Operation elsewhere in this manual.



LIGHTING TOWER USE



















DSE L401 CONTROL UNIT: MODULE DISPLAY



















The module's display contains the following sections. Description of each section are viewed in the sub sections.

| | | | |
|---------------------------|-----------------|------|------------------------|
| Inst. Icon | Instrumentation | Unit | Alarm Icon |
| Active Config | Instrumentation | Unit | |
| Auto Run | Instrumentation | Unit | Mode / FPE Icon |
| Light Output Icons | | | |

DSE L401 CONTROL UNIT: INSTRUMENTATION ICONS

When viewing instrumentation pages, an icon is displayed in the **Inst. Icon** section to indicate what section is currently being displayed.


| Icon | Description |
|---|---|
|  | The default home page which displays generator voltage instrumentation screen |
|  | Generator voltage and frequency instrumentation screen |
|  | Current and load instrumentation screen |
|  | Engine speed instrumentation screen |
|  | Hours run instrumentation screen |
|  | Battery voltage instrumentation screen |
|  | Coolant temperature instrumentation screen |
|  | Oil pressure instrumentation screen |
|  | Fuel level instrumentation screen |
|  | Flexible sensor instrumentation screen |
|  | Oil Filter maintenance timers |
|  | Air Filter maintenance timers |
|  | Fuel Filter maintenance timers |
|  | Current time held in the unit |
|  | Current setting of the scheduler start time and duration |
|  | Appears when the event log is being displayed |
|  | ECU diagnostic trouble codes |
|  | Appears when the main configuration is selected |

| Icon | Description |
|---|--|
|  | Appears when the alternative configuration is selected |
|  | Appears when a remote start input is active |
|  | Appears when a low battery run is active |
|  | Appears when a scheduled run is active |
|  | Appears when the engine is at rest and the unit is in stop mode |
|  | Appears when the engine is at rest and the unit is in auto mode |
|  | Appears when the engine is at rest and the unit is waiting for a manual start |
|  | Appears when a timer is active, for example cranking time, crank rest etc. |
|  | Appears before starting or when the preheat timer is active |
|  | Appears when the warming up timer is active |
|  | Appears when the engine is running, and all timers have expired, either on or off load. The animation speed is reduced when running in idle mode |
|  | Appears when the unit is in the configuration editor |
|  | Appears when the unit is in the operator editor |
|  | Appears when the corresponding light output has been configured and is not active |
|  | Appears when the corresponding light output has been configured and is not active |
|  | Appears when a timer to delay the light output activating or de-activating is in progress |
|  | Appears when a configuration is being written to the module via the USB connection |
|  | Appears if either the configuration file or engine file becomes corrupted |

DSE L401 CONTROL UNIT: ALARM ICONS (PROTECTIONS)

An icon is displayed in the **Alarm Icon** section to indicate the alarm that is current active on the controller.

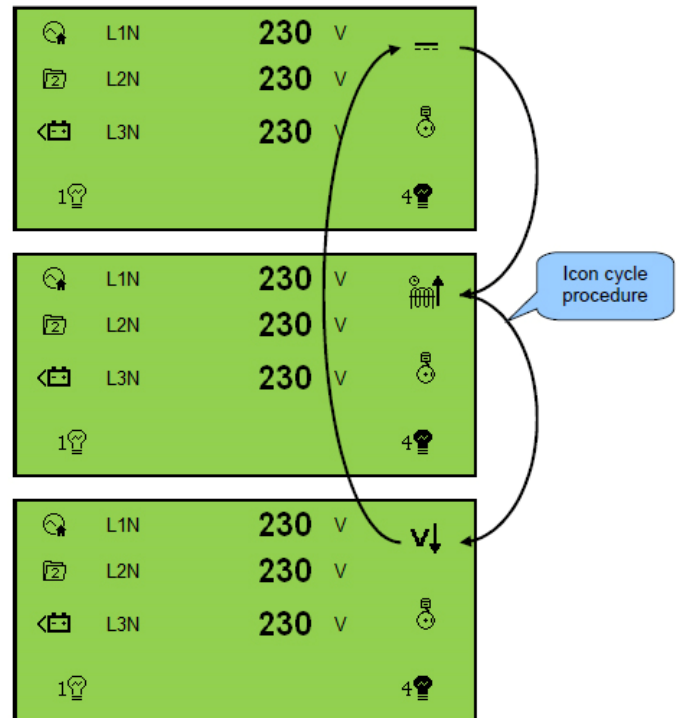
In the event of a warning alarm, the LCD only displays the **Alarm Icon**.
In the event of an electrical

trip or shutdown alarm, the module displays the **Alarm Icon** and the **Stop/Reset Mode**  button LED begins to flash.

If multiple alarms are active at the same time, the **Alarm Icon** automatically cycles through all the appropriate icons to indicate each alarm which is active.




















Example:

If the DSE controller was sensing a charge alternator failure alarm, delay over current alarm and a AC under voltage alarm at the same time, it would cycle through all of the icons to show this.




DSE L401 CONTROL UNIT: WARNING ALARM ICONS














Warnings are non-critical alarm conditions and do not affect the operation of the generator system, they serve to draw the operators attention to an undesirable condition.













| | Description | |
|---|--------------------------------------|--|
|  | Auxiliary Inputs | The module detects that an auxiliary input which has been user configured to create a fault condition has become active. |
|  | Analogue Input Configured As Digital | The module detects that an analogue input configured as a digital input to create a fault condition has become active. |
|  | Fail To Stop | The module has detected a condition that indicates that the engine is running when it has been instructed to stop. NOTE: 'Fail to Stop' could indicate a faulty oil pressure sensor. If engine is at rest check oil sensor wiring and configuration. |
|  | Charge Failure | The auxiliary charge alternator voltage is low as measured from the W/L terminal. |
|  | Low Fuel Level | The level detected by the fuel level sensor is below the low fuel level setting. |
|  | Battery Under Voltage | The DC supply has fallen below or risen above the low volts setting level. |
|  | Battery Over Voltage | The DC supply has risen above the high volts setting level. |
|  | Generator/Mains Under Voltage | The generator output voltage has fallen below the pre-set pre-alarm setting after the Safety On timer has expired. Or, the mains output voltage has fallen below the pre-set pre-alarm setting when the <i>Mains Supply Active</i> is active. |
|  | Generator/Mains Over Voltage | The generator/mains output voltage has risen above the pre-set pre-alarm setting. |
|  | Generator/Mains Under Frequency | The generator output frequency has fallen below the pre-set prealarm setting after the Safety On timer has expired. Or, the mains output frequency has fallen below the pre-set prealarm setting when the <i>Mains Supply Active</i> is active. |
|  | Generator/Mains Over Frequency | The generator/mains output frequency has risen above the pre-set pre-alarm setting. |
|  | CAN ECU Fault | The engine ECU has detected an alarm. |
|  | CAN Data Fail | The module is configured for CAN operation and does not detect data on the engine CAN data link. |
|  | Immediate Over Current | The measured current has risen above the configured trip level. |
|  | Delayed Over Current | The measured current has risen above the configured trip level for a configured duration. |
|  | Low Current | The measured current has fallen below the configured trip level. This is used to detect lamp failure. |
|  | Oil Filter Maintenance Alarm | Maintenance due for oil filter. |
|  | Air Filter Maintenance Alarm | Maintenance due for air filter. |
|  | Fuel Filter Maintenance Alarm | Maintenance due for fuel filter. |

DSE L401 CONTROL UNIT: SHUTDOWN ALARM ICONS

Shutdown alarms are latching and immediately stop the Generator. On initiation of the shutdown condition the module de-energises all the 'Light Output' outputs to remove the load from the generator. Once this has occurred, the module shuts the generator set down immediately to prevent further damage. The alarm must be accepted and cleared, and the fault removed to reset the module.



Shutdowns are latching alarms and to remove the fault, press the **Stop/Reset Mode**  button on the module.

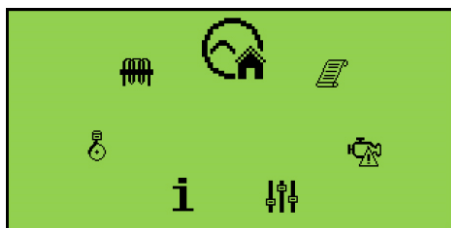
| | Description | |
|---|--------------------------------------|--|
|  | Auxiliary Inputs | The module detects that an auxiliary input which has been user configured to create a fault condition has become active. |
|  | Analogue Input Configured As Digital | The module detects that an analogue input configured as a digital input to create a fault condition has become active. |
|  | Fail To Start | The engine has failed to start after the configured number of start attempts |
|  | Low Oil Pressure | The module detects that the engine oil pressure has fallen below the low oil pressure pre-alarm setting level after the Safety On timer has expired. |
|  | Engine High Coolant Temperature | The module detects that the engine coolant temperature has exceeded the high engine temperature pre-alarm setting level after the Safety On timer has expired. |
|  | Under Speed | The engine speed has fallen below the under speed pre alarm setting |
|  | Over Speed | The engine speed has risen above the over speed pre alarm setting |
|  | Charge Failure | The auxiliary charge alternator voltage is low as measured from the W/L terminal. |
|  | Low Fuel Level | The level detected by the fuel level sensor is below the low fuel level setting. |
|  | Battery Under Voltage | The DC supply has fallen below or risen above the low volts setting level. |
|  | Battery Over Voltage | The DC supply has risen above the high volts setting level. |
|  | Generator/Mains Under Voltage | The generator output voltage has fallen below the pre-set prealarm setting after the Safety On timer has expired. Or, the mains output voltage has fallen below the pre-set pre-alarm setting when the <i>Mains Supply Active</i> is active. |
|  | Generator/Mains Over Voltage | The generator/mains output voltage has risen above the pre-set pre-alarm setting. |



| | Description | |
|---|---|---|
|  | Generator/Mains Under Frequency | The generator output frequency has fallen below the pre-set prealarm setting after the Safety On timer has expired. Or, the mains output frequency has fallen below the pre-set prealarm setting when the <i>Mains Supply Active</i> is active. |
|  | Generator/Mains Over Frequency | The generator/mains output frequency has risen above the pre-set pre-alarm setting. |
|  | CAN ECU Fault | The engine ECU has detected an alarm – CHECK ENGINE LIGHT Contact Engine Manufacturer for support. |
|  | CAN Data Fail | The module is configured for CAN operation and does not detect data on the engine CAN data link. |
|  | Emergency Stop | The emergency stop button has been depressed. This failsafe (normally closed to emergency stop) input and immediately stops the set when the signal be removed. |
|  | Oil Pressure Sensor Open Circuit | The oil pressure sensor has been detected as being open circuit. |
|  | Coolant Temperature Sensor Open Circuit | The coolant temperature sensor has been detected as being open circuit. |
|  | Delayed Over Current | The measured current has risen above the configured trip level for a configured duration. |
|  | Low Current | The measured current has fallen below the configured trip level. This is used to detect lamp failure. |
|  | Oil Filter Maintenance Alarm | Maintenance due for oil filter. |
|  | Air Filter Maintenance Alarm | Maintenance due for air filter. |
|  | Fuel Filter Maintenance Alarm | Maintenance due for fuel filter. |

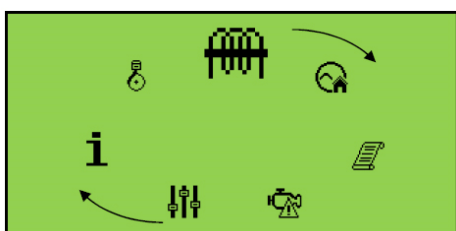
LIGHTING TOWER USE


DSE L401 CONTROL UNIT: NAVIGATION MENU

To enter the navigation menu, press the **Up**  and **Down**  buttons simultaneously.





To select the required icon, press the **Up**  button to cycle right or the **Down**  button to cycle left until the desired instrumentation section is reached.



Once the desired icon is at the top, press the **Auto Mode**  button to enter that instrumentation section.

If the **Auto Mode** button is not pressed, the display automatically returns to the Home page after the configured setting of the **LCD Scroll Timer**.

It is possible to scroll through the display to view different pages of information by repeatedly operating the **Up**  and **Down**  navigation buttons.

Example:










To view one of the instrument pages towards the end of the list, it may be quicker to scroll up through the pages rather than down!

Home Press Generator Press Load

And so on until the last page is reached. A Further press of the **Down** navigation button returns the display to the Home page. Once selected, the page remains on the LCD display until the user selects a different page or, after an extended period of inactivity (*Page Delay Timer*), the module reverts back to the Home page.

NAVIGATION MENU ICONS

| Icon | Description |
|---|---|
|  | Home, generator / mains voltage and frequency instrumentation |
|  | Load current and load instrumentation |
|  | Engine instrumentation |
|  | Module information |
|  | Mast and light control |
|  | Engine DTCs (Diagnostic Trouble Codes) if active |
|  | Event Log |

HOME PAGE

This is the page that is displayed when no other page has been selected and is automatically displayed after a period of inactivity (*Page Delay Timer*) of the module facia buttons. It also contains the voltage reading of the generator (alternator) measured from the module's voltage inputs.

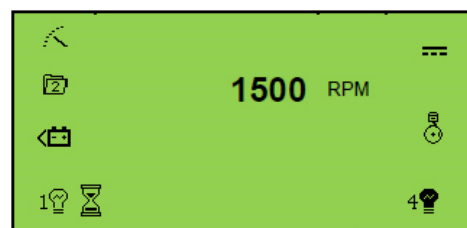
- Generator Voltage (ph-N)
- Generator Voltage (ph-ph)



ENGINE PAGE

These pages contain instrumentation gathered about the engine measured or derived from the module's inputs, some of which may be obtained from the engine ECU.

- Engine Speed
- Engine Fuel Level or Flexible Sensor
- Engine Run Time
- Engine Maintenance Due – Oil
- Engine Battery Volts
- Engine Maintenance Due – Air
- Engine Coolant Temperature
- Engine Maintenance Due – Fuel
- Engine Oil Pressure

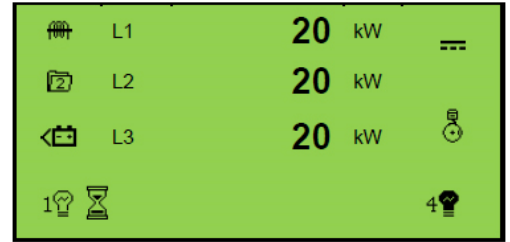


GENERATOR PAGE

NOTE: Generator instrumentation is only displayed when the *Mains Supply Active* digital input is not active. When the *Mains Supply Active* digital input is active, the Generator instrumentation is replaced with Mains instrumentation.

These pages contain electrical values of the generator (alternator), measured or derived from the module's voltage and current inputs.

- Generator Voltage (ph-ph)
- Generator Frequency
- Generator Current
- Generator Load per Phase (kW)
- Generator Total Load (kW)
- Generator Load per Phase (kV A)
- Generator Total Load (kV A)
- Generator Load per Phase (kvar)
- Generator Total Load (kvar)
- Generator Power Factor per Phase
- Generator Power Factor Average
- Generator Accumulated Load (kW h, kVA h, kvar h)

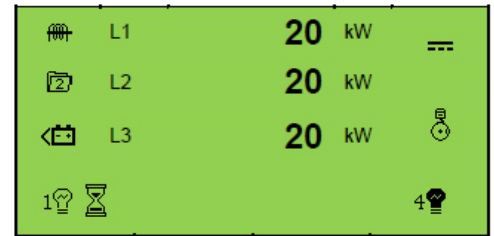


MAINS PAGE

Mains instrumentation is only displayed when the *Mains Supply Active* digital input is active. When the *Mains Supply Active* digital input is not active, the Mains instrumentation is replaced with Generator instrumentation.

These pages contain electrical values of the mains, measured from the module's voltage and current inputs.

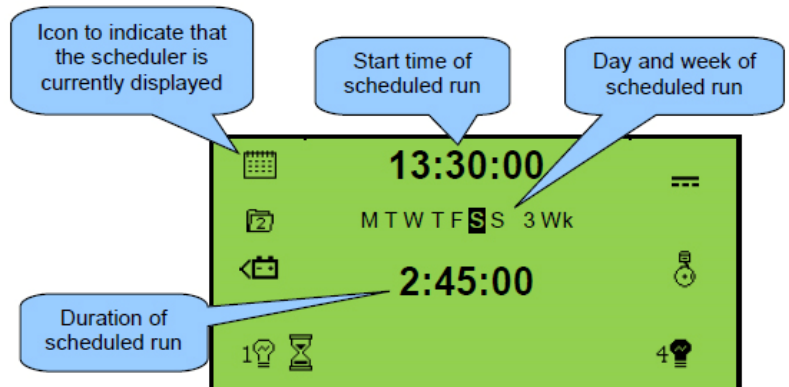
- Mains Voltage (ph-ph)
- Mains Frequency
- Mains Current
- Mains Load per Phase (kW)
- Mains Total Load (kW)
- Mains Load per Phase (kV A)
- Mains Total Load (kV A)
- Mains Load per Phase (kvar)
- Mains Total Load (kvar)
- Mains Power Factor per Phase
- Mains Power Factor Average




INFO PAGE

These pages contain information about the controller.

- Module's date and time
- Scheduler settings
- Product description and USB identification number
- Application and Engine Version



The DSE module allows editing of the scheduler from the instrumentation screen whilst in **Stop/Reset Mode**  without needing to enter the *Front Panel Editor*. This is only possible when *Scheduler Edit From Fascia* is enabled in the module's configuration.


Scheduler Edit From Fascia

Enabling the *Scheduler Enable From Fascia* option in the DSE module configuration adds two pages on the module's display. This allows the user to enable/disable the Scheduler and to select the Schedule period.

Scheduler Enable From Fascia

To access the scheduler editor, navigate to one of the scheduler pages and press and hold the **Stop/Reset Mode** button .

Use the **Stop/Reset Mode**  (-) or **Manual/Start Mode**  (+) buttons to cycle through the editor.



To edit the parameters press the **Auto Mode**  button and then use the **Stop/Reset Mode** (-) or **Manual/Start Mode** (+) buttons to change the value.

The displayed value or icon begins to flash to show it is being edited. Press the **Auto Mode** button to accept the new value. Press and hold **Auto Mode** button to exit the editor and save the changes.

The scheduler pages on the instrumentation screen list the following for 8 scheduled start/stop sequence.

1. Scheduler Enable option, icons detailed below.






| Icon | Description |
|---|--|
|  | Select to disable the <i>Scheduler</i> |
|  | Select to enable the <i>Scheduler</i> |

2. Schedule Period to indicate Weekly, Monthly, or Daily.

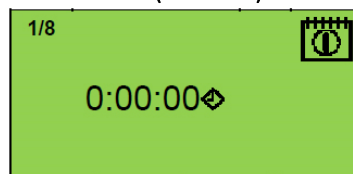


3. Run Mode, icons detailed below.

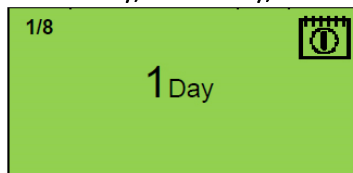


| Icon | Description |
|---|---------------------------------|
|  | Select for <i>Off Load</i> . |
|  | Select for <i>On Load</i> . |
|  | Select for <i>Lights Only</i> . |

4. Start time (00:00:00).



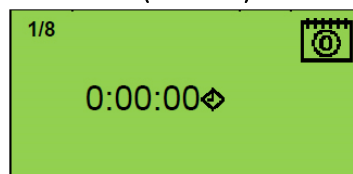
5. Start Day. Select the day of the week (1=Monday, 2=Tuesday, 3=Wednesday, 4=Thursday, 5=Friday, 6=Saturday, 7=Sunday).



6. Start Week. Select the week of month (1,2,3,4).



7. Duration (00:00:00).



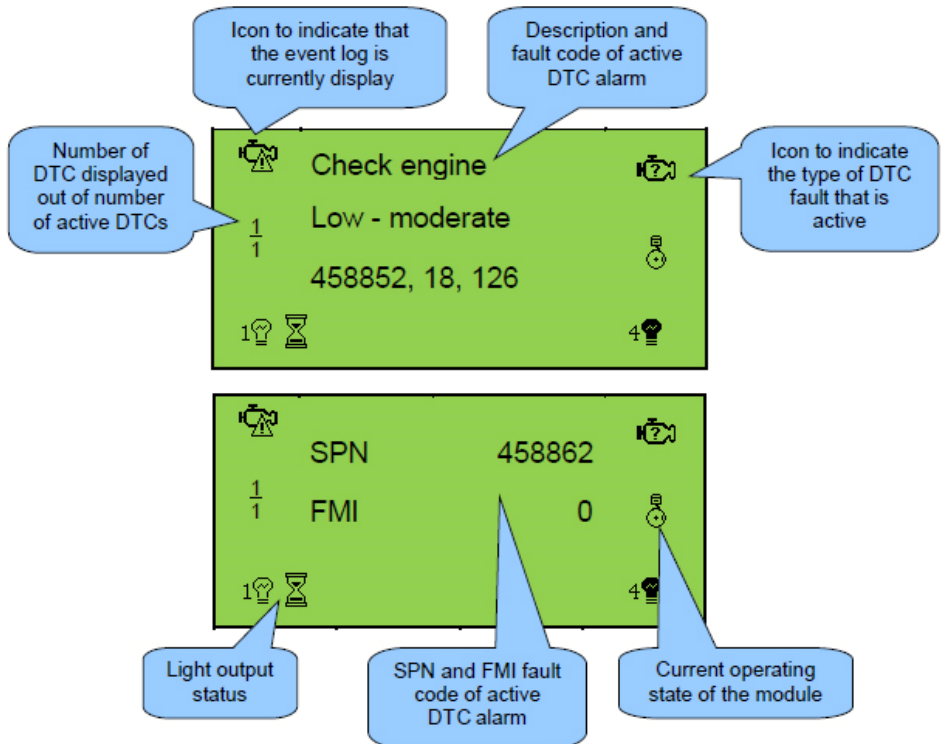
DSE L401 CONTROL UNIT: VIEWING ACTIVE ENGINE DTC

If the DSE module is connected to an ECU, This page contains active *Diagnostic Trouble Codes (DTC)* only if the engine ECU generating a fault code. These are alarm conditions are detected by the engine ECU and displayed by the DSE controller.

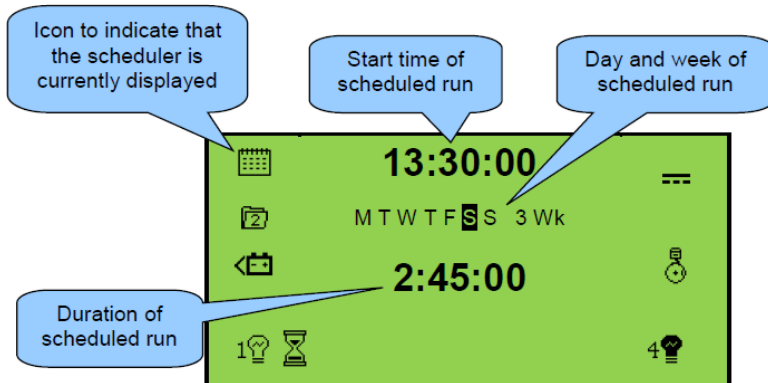
To view the engine DTC(s), press the **Up** and **Down** buttons simultaneously to enter the navigation menu. Once entered, cycle to the **DTC** section using the **Up** or **Down** buttons and press the **Auto Mode** button to enter.

To view the active DTC(s) alarms, repeatedly press **Up** or **Down** buttons until the LCD screen displays the alarm. Continuing to press the **Up** or **Down** buttons cycles through the other DTC alarms.


To exit the active DTC(s) alarm section, press the **Up** or **Down** buttons simultaneously to enter the navigation menu. Once entered, cycle to the desired instrumentation section using the **Up** or **Down** buttons and press the **Auto Mode** button to enter.



These pages contain information about the timer (scheduler).



SCHEDULER EDITING FROM INSTRUMENTATION SCREENS


The DSE module allows editing of the scheduler from the instrumentation screen whilst in **Stop/Reset Mode** .



without needing to enter the *Front Panel Editor*. This is only possible when *Scheduler Edit From Fascia* is enabled in the module's configuration.


To access the scheduler editor, navigate to one of the scheduler pages and press and hold the

Stop/Reset Mode  button.


Use the **Stop/Reset Mode**  (-) or


Manual/Start Mode  (+) buttons to cycle through the editor.

To edit the parameters press the **Auto Mode**  (v) button and then use the **Stop/Reset Mode**  (-) or

Manual/Start Mode  (+) buttons to change the value.

The displayed value or icon begins to flash to show it is being edited.

Press the **Auto Mode**  button to accept the new value.

Press and hold Auto Mode  (v) button to exit the editor and save the changes.

DSE L401 CONTROL UNIT: TIMER

The scheduler pages on the instrumentation screen list the following for 8 scheduled start/stop sequence.

☐ Scheduler Enable option, icons detailed below.



| Icon | Description |
|------|--|
| | Select to disable the <i>Scheduler</i> . |
| | Select to enable the <i>Scheduler</i> . |

☐ Schedule Period to indicate Weekly, Monthly, or Daily.

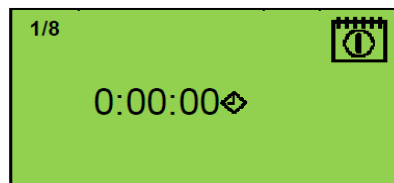


☐ Run Mode, icons detailed below.

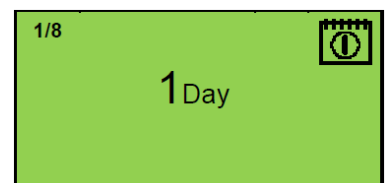


| Icon | Description |
|------|---------------------------------|
| | Select for <i>Off Load</i> . |
| | Select for <i>On Load</i> . |
| | Select for <i>Lights Only</i> . |

☐ Start time (00:00:00).



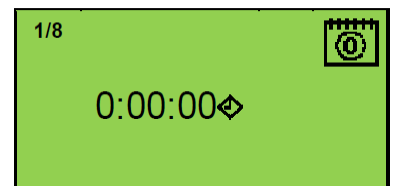
☐ Start Day. Select the day of the week (1=Monday, 2=Tuesday, 3=Wednesday, 4=Thursday, 5=Friday, 6=Saturday, 7=Sunday)



☐ Start Week. Select the week of month (1,2,3,4).

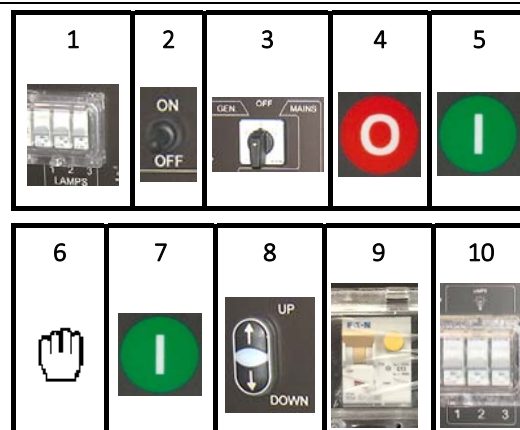



☐ Duration (00:00:00).



MANUAL MODE

1. Ensure that all the lamp switches are to OFF position.
2. Set the ON/OFF switch to ON position.
3. Set the Generator/Mains selector to "Generator" position
4. Manual mode allows the operator to start and stop the set manually, and if required change the state of the load switching devices. Module mode is active when the STOP button is pressed.
5. To begin the starting sequence, press the START button. If 'protected start' is disabled, the start sequence begins immediately.
6. If the display shows the manual mode icon and the corresponding LED flashes, It means that "protected start" is enabled.
7. The START button must be pressed once more to begin the start sequence.
8. Adjust the mast height using the UP/DOWN buttons.
9. Set the RCD protection to ON position.
10. Switch on the floodlights.




Note: the mast can be raised and the lights can be turned on only if the running icon  appears on the display.

NOTE: There is no start delay in this mode of operation.

The fuel relay is energized and the engine is cranked.

NOTE: If the unit has been configured for CAN, compatible ECU's will receive the start command via CAN.

If the engine fails to fire during this cranking attempt then the starter motor is disengaged for the crank rest duration after which the next start attempt is made. Should this sequence continue beyond the set number of attempts, the start sequence will be terminated and the display shows  **Fail to Start.**

When the engine fires, the starter motor is disengaged. Speed detection is factory configured to be derived from the main alternator output frequency but can additionally be measured from a Magnetic Pickup mounted on the flywheel. Additionally, rising oil pressure can be used to disconnect the starter motor (but cannot detect underspeed or overspeed).

NOTE: If the unit has been configured for CAN, speed sensing is via CAN.

After the starter motor has disengaged, the Safety On timer activates, allowing Oil Pressure, High Engine Temperature, Under-speed, Charge Fail and any delayed Auxiliary fault inputs to stabilize without triggering the fault.

MACHINE OPERATION USING THE GENERATOR POWER

LIGHT SENSOR MODE

1. Ensure that all the lamp switches are in OFF position.
2. Set the ON/OFF switch to ON position.
3. Set the Generator/Mains selector to “Generator” position.
4. Set the Light sensor/Timer switch to “Light sensor” position.

ATTENTION!

In LIGHT SENSOR mode the TIMER is also active! Do not set it!

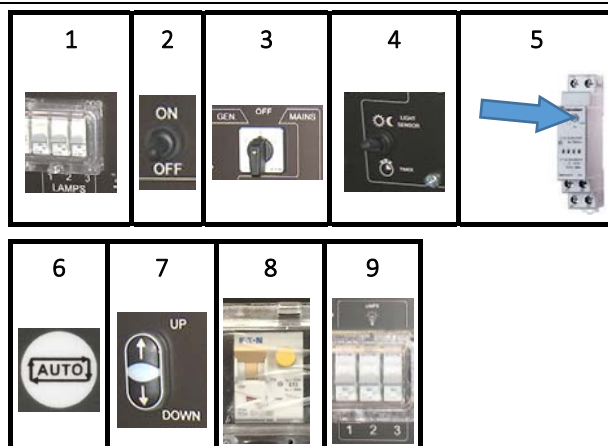
5. If needed, set the light sensor sensitivity through the trimmer on the light sensor.
6. Press the AUTO button.
7. Adjust the mast height using the UP/DOWN buttons.
8. Set the RCD protection to ON position.
9. Switch on the floodlights.

The machine is now ready to start based on the lights sensor signal.

On the light sensor there is a red LED light:

- ☐ if it flashes slowly, there is power, but the sensor is off
- ☐ if it flashes quickly, the timing procedure is ongoing
- ☐ permanent light means that the power is on, the sensor is on, the machine starts and, after the engine has reached the operational temperature, the lamps will be turned on.

When the ambient light is strong enough, the machine will automatically turn off and put itself in stand-by.



TIMER MODE

ATTENTION!

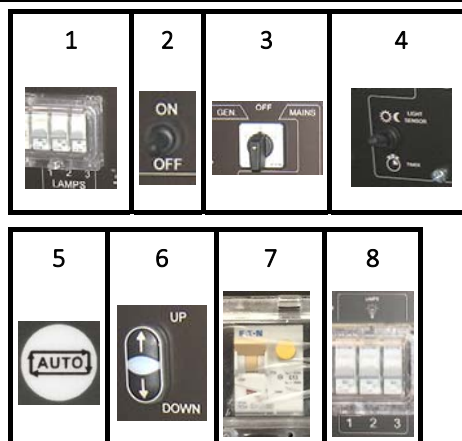
The TIMER is active only in GENERATOR mode

1. Ensure that all the lamp switches are in OFF position.
2. Set the ON/OFF switch to ON position.
3. Set the Generator/Mains selector to “Generator” position.
4. Set the Light sensor/Timer switch to “Timer” position.

ATTENTION!

In TIMER mode the LIGHT SENSOR is automatically excluded!

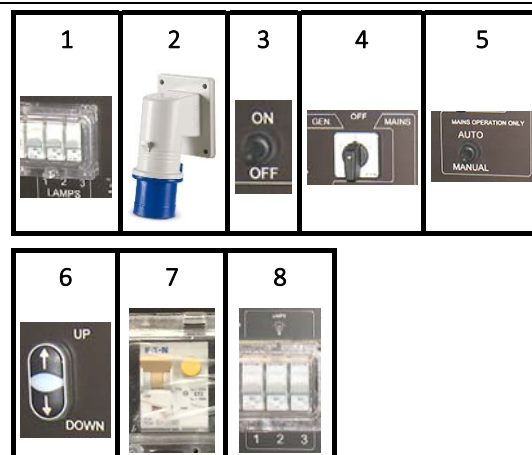
5. Press the AUTO button.
6. Adjust the mast height using the UP/DOWN buttons.
7. Set the RCD protection to ON position.
8. Switch on the floodlights.
9. To setup the timer parameters please see on page 24.



MACHINE OPERATION USING THE MAINS POWER

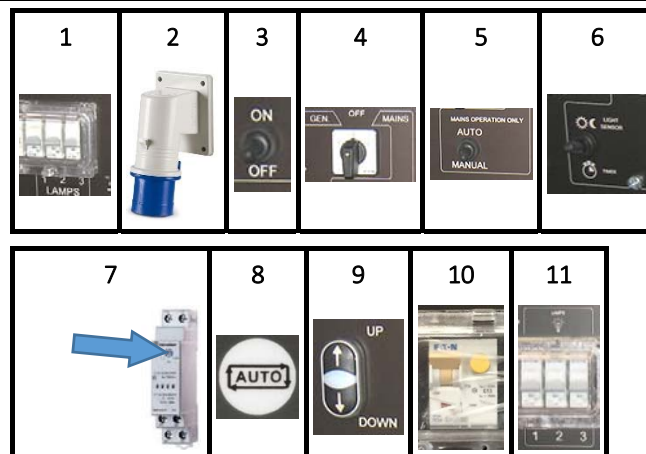
MANUAL MODE

1. Ensure that all the lamp switches are to OFF position.
2. Connect the CEE 16A 230V 50Hz plug to the mains and ensure that the technical characteristics of the power supplied are compatible with the plug. Ensure also that the power grid is adequately protected.
3. Set the ON/OFF switch to ON position.
4. Set the Generator/Mains selector to “Mains” position
5. Set the Auto/Manual switch to “Manual” position
6. Adjust the mast height using the UP/DOWN buttons.
7. Set the RCD protection to ON position.
8. Switch on the floodlights.



LIGHT SENSOR MODE

1. Ensure that all the lamp switches are in OFF position.
2. Connect the CEE 16A 230V 50Hz plug to the mains and ensure that the technical characteristics of the power supplied are compatible with the plug. Ensure also that the power grid is adequately protected.
3. Set the ON/OFF switch to ON position.
4. Set the Generator/Mains selector to “Mains” position.
5. Set the Auto/Manual switch to “Auto” position
6. Set the Light sensor/Timer switch to “Light sensor” position.
7. If needed, set the light sensor sensitivity through the trimmer on the light sensor.
8. Press the AUTO button.
9. Adjust the mast height using the UP/DOWN buttons.
10. Set the RCD protection to ON position.
11. Switch on the floodlights.



The machine is now ready to start based on the lights sensor signal. On the light sensor there is a red LED light:

- ☐ if it flashes slowly, there is power, but the sensor is off
- ☐ if it flashes quickly, the timing procedure is ongoing
- ☐ permanent light means that the power is on, the sensor is on, the machine starts and, after the engine has reached the operational temperature, the lamps will be turned on.

When the ambient light is strong enough, the machine will automatically turn off and put itself in stand-by.

TIMER MODE

ATTENTION!

The TIMER is active only in GENERATOR mode

ROUTINE MAINTENANCE

Poorly maintained equipment can become a safety hazard. In order, for the equipment, to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.

Any kind of maintenance work on the lighting tower must be carried out by Authorized and trained personnel. It should be done in a safe working environment and with the machine well stabilized. The engine must be turned off and let cool down sufficiently before starting to work on it.

- ☐ While performing maintenance work, please use suitable tools and clothes.
- ☐ **If you need to work while the engine is running, pay attention to all moving parts, hot parts and electrical parts which may be unprotected while the machine is open.**
- ☐ DO NOT modify any component if not authorized.

The repairs cannot be considered among the routine maintenance activities. E.g. the replacement of parts that are subject to occasional damage and the replacement of electric and mechanic components that wear with use. This kind of work is not –in fact- covered by warranty.

The periodic maintenance should be performed according to the documentation provided by the engine and alternator manufacturers. Please refer to the relevant manual supplied with the machine and to the hour meter on the machine in order to determine when service is needed.

DISPOSAL AND DECOMMISSIONING

This machine is made of parts that, if not disposed of correctly, can damage the environment and create ecological hazards. The following parts and materials need to be brought to authorized waste treatment sites:

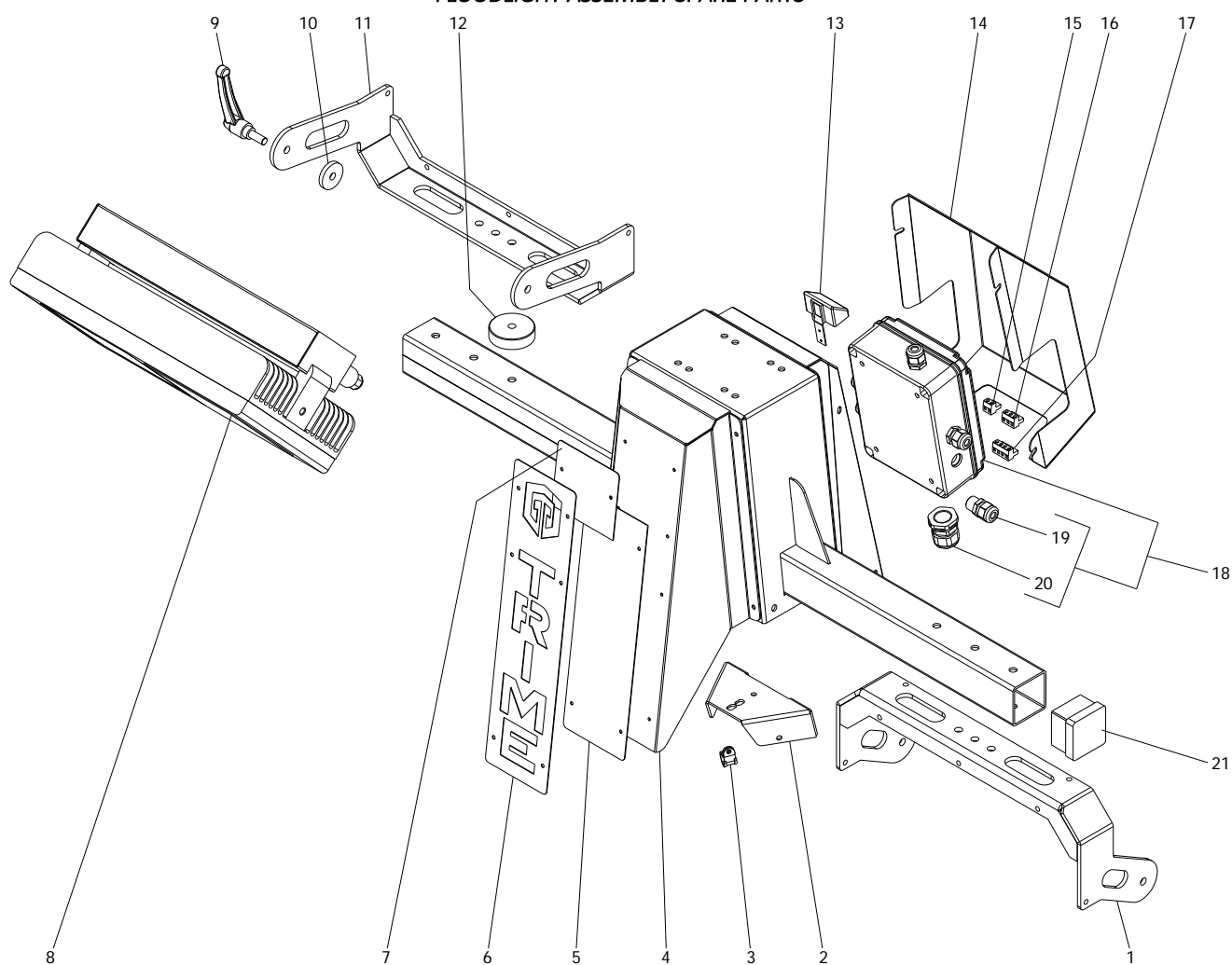
- Metallic structure;
- Batteries;
- Engine and hydraulic oils;
- Cooling liquid;
- Filters;
- Cables.

These components have to be disposed of accordingly to local laws and dispositions. Have qualified personnel disassemble the machine and dispose of parts.

The machine owner is responsible for dismantling and disposal of the machine and its components at the end of its working life.

| Interval | Item |
|--|---|
| Every 50 hours | Check of fuel pipes and clamp bands |
| Every 100 hours | Cleaning of air cleaner element |
| | Cleaning of fuel filter |
| | Check of fuel pre-filter |
| | Check of fan belt tightness |
| | Draining water separator |
| Every 200 hours | Replacement of oil filter cartridge |
| | Check of intake air line |
| | Replacement of fuel pre-filter |
| Every 200 hours of operation or six months | Check of radiator hoses and clamp bands |
| Every 400 hours | Replacement of fuel filter element |
| | Change of engine oil |
| | Cleaning of water separator in fuel tank |
| Every 500 hours | Cleaning of water jacket (radiator interior) |
| | Replacement of fan belt |
| Every year or every 6 cleanings of air cleaner element | Replacement of air cleaner element |
| Every 800 hours | Check of valve clearance |
| Every 1500 hours | Check of fuel injection nozzle injection pressure |
| Every 3000 hours | Check of injection pump |
| Every two years | Replacement of fuel hoses and clamp bands |
| | Replacement of fuel pipes and clamps |
| | Change of radiator coolant (L.L.C.) |
| | Replacement of intake air line |

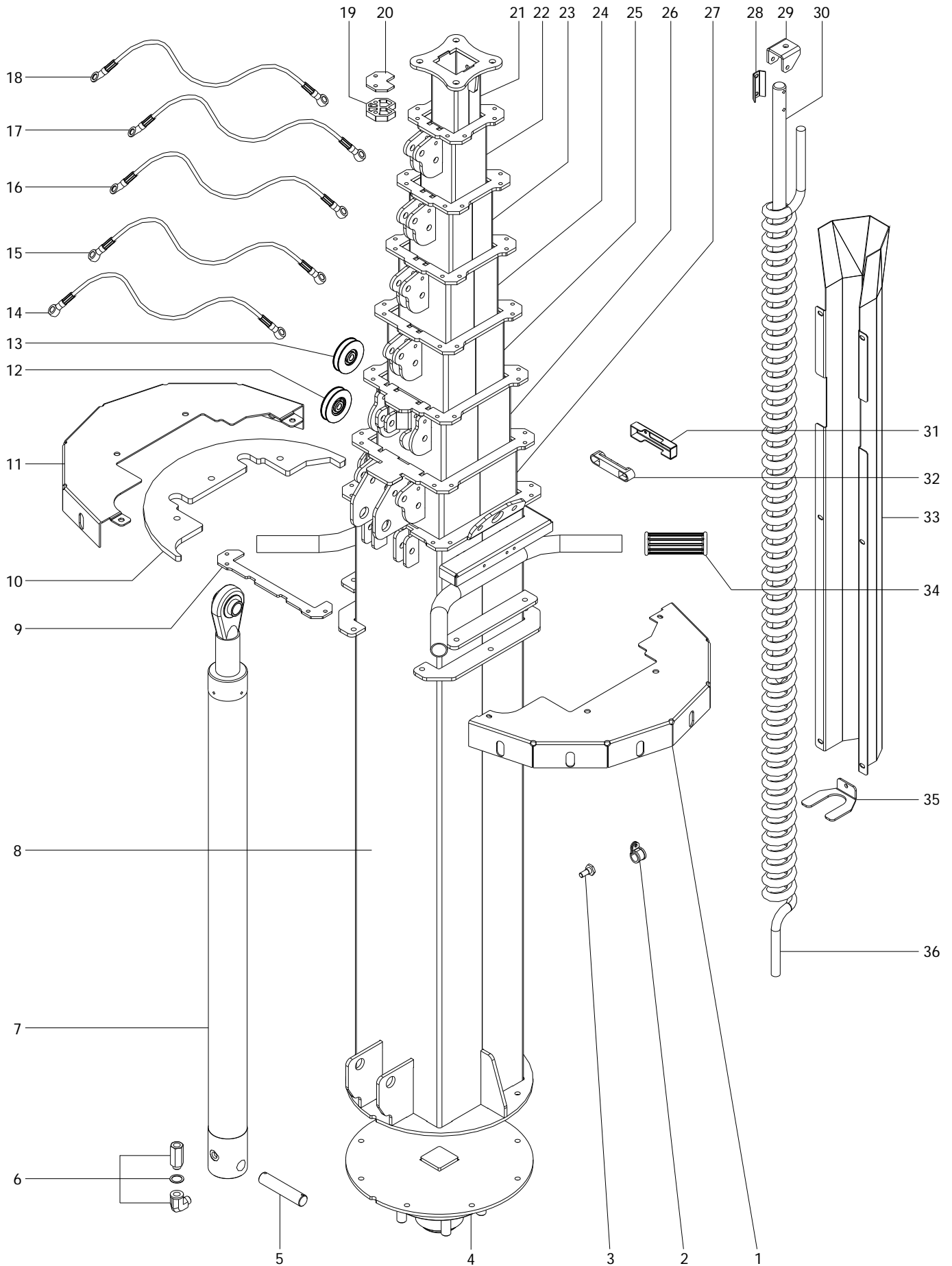
FLOODLIGHT ASSEMBLY SPARE PARTS



| N. | CODE | DESCRIPTION |
|----|------------------|-----------------------------|
| 1 | LED04_C000_011ZN | FLOODLIGHT LOWER SUPPORT |
| 2 | PFM08_C000_038 | CENTERING PLATE |
| 3 | AC000_M038_007 | CLAMP WITH RUBBER |
| 4 | PFM08_C000_042 | CENTRAL SUPPORT |
| 5 | PFM08_C000_071 | WHITE PLATE |
| 6 | PFM08_C000_070 | LOGO PLATE |
| 7 | PFM08_C000_072 | RED PLATE |
| 8 | AC000_E026_019 | FLOODLIGHT |
| 9 | AC000_M000_007 | HANDLE |
| 10 | LED04_C000_012ZN | SPACER WASHER |
| 11 | LED04_C000_014ZN | FLOODLIGHT UPPER SUPPORT |
| 12 | AS000_M023_001 | SPACER |
| 13 | AC000_E006_151 | LIGHT SENSOR ELEMENT |
| 14 | PFM08_C000_045 | JUNCTION BOX COVER |
| 15 | AC000_E006_002 | 2 POSITION ELECTRICAL CLAMP |
| 16 | AC000_E006_003 | 3 POSITION ELECTRICAL CLAMP |
| 17 | AC000_E006_004 | 5 POSITION ELECTRICAL CLAMP |
| 18 | AS000_E006_029 | JUNCTION BOX |
| 19 | AC000_E018_008 | PG11 WIRE HOLDER |
| 20 | AC000_E018_002 | PG21 WIRE HOLDER |
| 21 | AC000_P037_005 | CAP |

SPARE PARTS

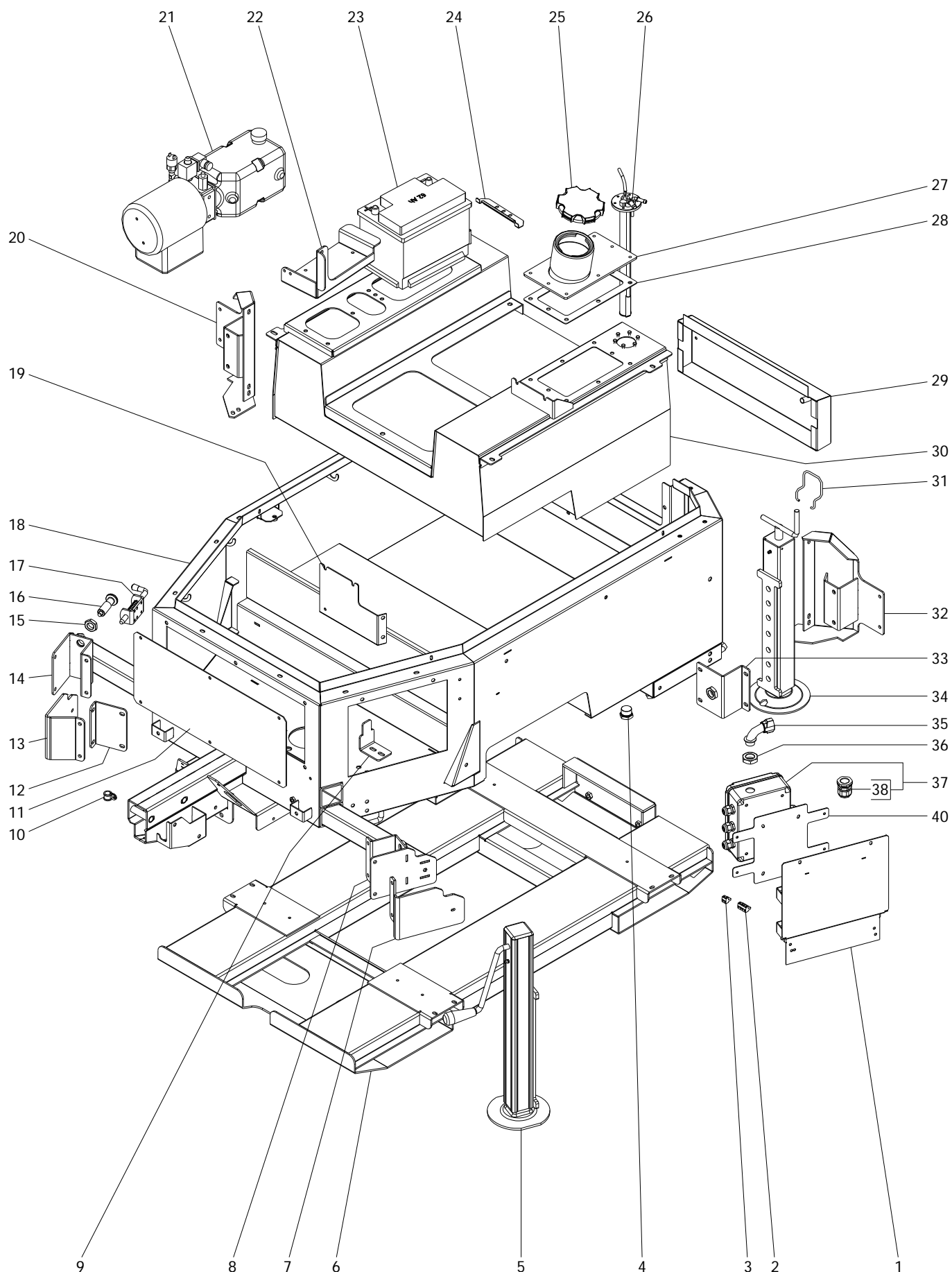
MAST ASSEMBLY SPARE PARTS



SPARE PARTS

| N. | CODE | DESCRIPTION |
|----|------------------|--------------------------------|
| 1 | PFI08_C031_019ZN | MAST POSITIONING PLATE, LEFT |
| 2 | AC000_M038_007 | CLAMP WITH RUBBER |
| 3 | AS000_M000_029 | SCREW |
| 4 | PFI08_C031_011 | MAST SUPPORT |
| 5 | AS000_M023_026ZN | HYDRAULIC PIPE PIN |
| 6 | AC000_G025_001 | HYDRAULIC PIPE KIT |
| 7 | AS000_I025_001 | HYDRAULIC PIPE |
| 8 | PFI08_C031_001ZN | 1° SECTION MAST |
| 9 | PFI08_C031_024ZN | SPACER |
| 10 | PFI08_C031_015 | DRAG FLANGE |
| 11 | PFI08_C031_018ZN | MAST POSITIONING PLATE, RIGHT |
| 12 | AC000_M021_002 | PULLEY D.60 |
| 13 | AC000_M021_008 | PULLEY D.63 |
| 14 | AC000_M021_005 | STEEL ROPE L.1460mm |
| 15 | AC000_M021_012 | STEEL ROPE L.1440mm |
| 16 | AC000_M021_004 | STEEL ROPE L.1440mm |
| 17 | AC000_M021_006 | STEEL ROPE L.1415mm |
| 18 | AC000_M021_007 | STEEL ROPE L.1385mm |
| 19 | AS000_M000_005 | MAST ANGLE GUIDE |
| 20 | PFI08_C031_012ZN | MAST ANGLE GUIDE REINFORCEMENT |
| 21 | PFI08_C031_008ZN | 8° SECTION MAST |
| 22 | PFI08_C031_007ZN | 7° SECTION MAST |
| 23 | PFI08_C031_006ZN | 6° SECTION MAST |
| 24 | PFI08_C031_005ZN | 5° SECTION MAST |
| 25 | PFI08_C031_004ZN | 4° SECTION MAST |
| 26 | PFI08_C031_003ZN | 3° SECTION MAST |
| 27 | PFI08_C031_002ZN | 2° SECTION MAST |
| 28 | PFM07_C000_019 | CENTERING PIN CLAMP |
| 29 | PFI08_C031_017 | CENTERING PIN SUPPORT |
| 30 | PFM07_C000_014 | CENTERING PIN |
| 31 | PFI08_C031_029 | AIR BUBBLE LEVEL PROTECTION |
| 32 | AC000_M016_002 | AIR BUBBLE LEVEL |
| 33 | PFI08_C031_009ZN | COILED CABLE PROTECTION |
| 34 | AC000_P037_001 | RUBBER HANDLE |
| 35 | PFM08_C000_047 | COILED CABLE LOCK |
| 36 | AC000_E006_016 | COILED CABLE |

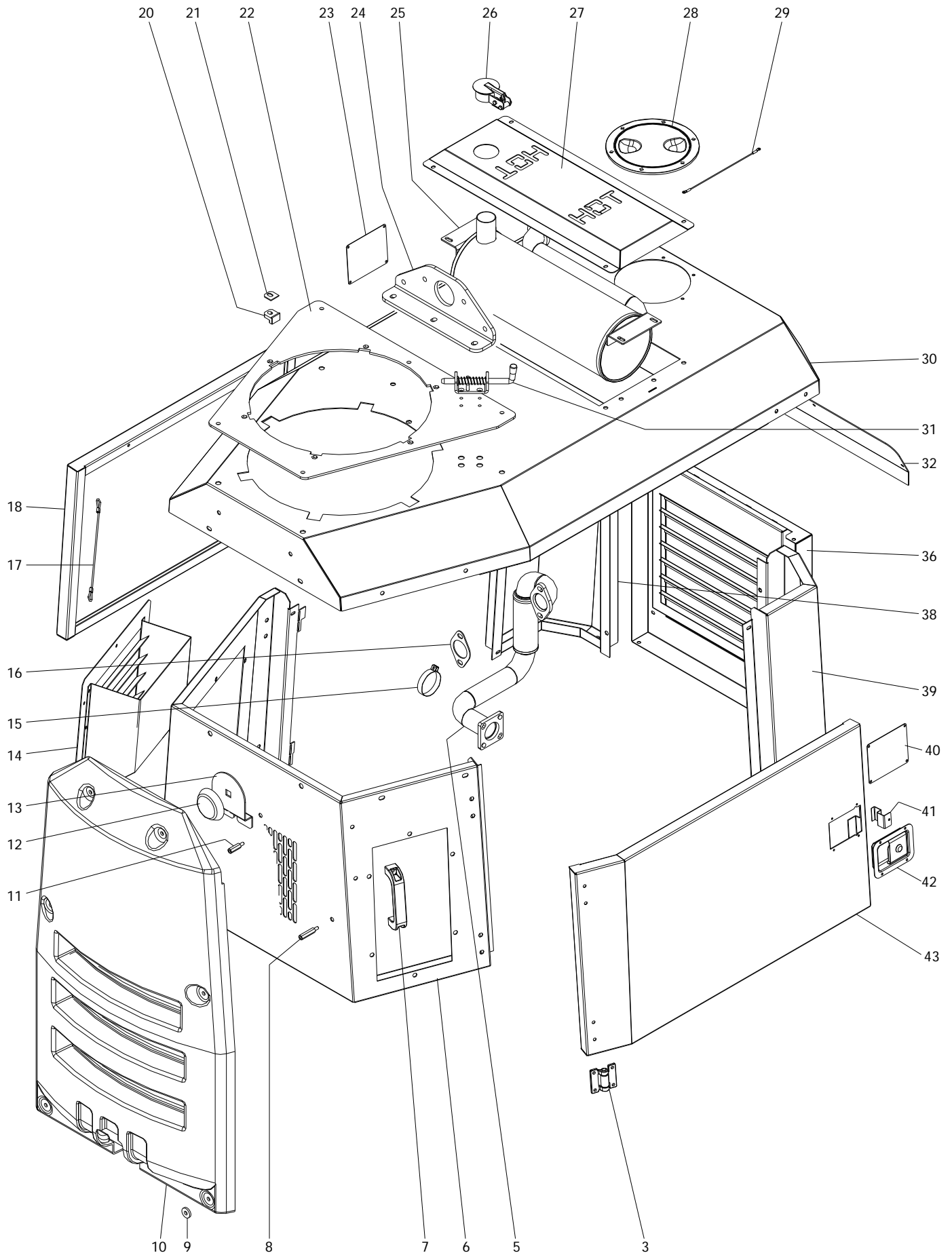
BASE STRUCTURE SPARE PARTS



SPARE PARTS

| N. | CODE | DESCRIPTION |
|----|-------------------|---------------------------------|
| 1 | XECOK2_C006_049 | POWER SUPPLIES SUPPORT |
| 2 | AC000_E006_004 | 4 POLES CLAMP |
| 3 | AC000_E006_002 | 2 POLES CLAMP |
| 4 | AC000_M000_081 | DRAIN CAP |
| 5 | XECOK2_C003_200 | STABILIZER |
| 6 | XECOK2_C000_226 | FRAME FOR FORKLIFT |
| 7 | XECOK2_R008_190 | RUBBER PROTECTION |
| 8 | XECOK2_C000_119ZN | RIGHT STABILIZER BEAM |
| 9 | XRENT_C000_037 | ANTIROTATION PLATE |
| 10 | AC000_M038_007 | RUBBERED CLAMP |
| 11 | XECOK2_C008_036 | MAIN BASE STRUCTURE FRONT COVER |
| 12 | XECOK2_C000_117ZN | STABILIZER LOCK |
| 13 | XECOK2_R008_191 | RUBBER PROTECTION |
| 14 | XECOK2_C000_120ZN | LEFT STABILIZER BEAM |
| 15 | AC000_M038_026 | NUT |
| 16 | AC000_M000_077 | PIN LOCK WITH SPRING |
| 17 | AC000_M000_086 | CLOSING LOCK PIN |
| 18 | XECOK2_C004_128 | MAIN BASE STRUCTURE |
| 19 | XECOK2_C006_111 | CONTROL PANEL SUPPORT |
| 20 | XECOK2_C000_097 | LEFT STABILIZER SUPPORT |
| 21 | AS000_I000_011 | HYDRAULIC UNIT |
| 22 | XECOK2_C000_084 | HYDRAULIC UNIT SUPPORT |
| 23 | AC000_E000_027 | BATTERY |
| 24 | TF8K1_C000_0014 | BATTERY LOCK |
| 25 | AC000_M000_028 | FUEL TANK CAP |
| 26 | AC000_E006_025 | FUEL LEVEL TRANSMITTER |
| 27 | XECOK2_C005_149 | FUEL TANK PLATE |
| 28 | XECOK_AS05_009 | GASKET |
| 29 | XECOK2_C004_034 | MAIN BASE STRUCTURE REAR COVER |
| 30 | XECOK2_C005_235 | FUEL TANK |
| 31 | AC000_M000_062 | STABILIZER SPRING |
| 32 | XECOK2_C000_095 | RIGHT STABILIZER SUPPORT |
| 33 | XECOK2_C000_096 | STABILIZER LOCK |
| 34 | XECOK2_C003_093 | STABILIZER |
| 35 | AC000_E018_017 | CURVED CONNECTOR |
| 36 | AC000_E018_014 | CURVED CONNECTOR NUT |
| 37 | AS000_E006_005 | JUNCTION BOX |
| 38 | AC000_E018_002 | CABLE GLAND PG21 |
| 40 | XECOK2_C006_068 | JUNCTION BOX SUPPORT |

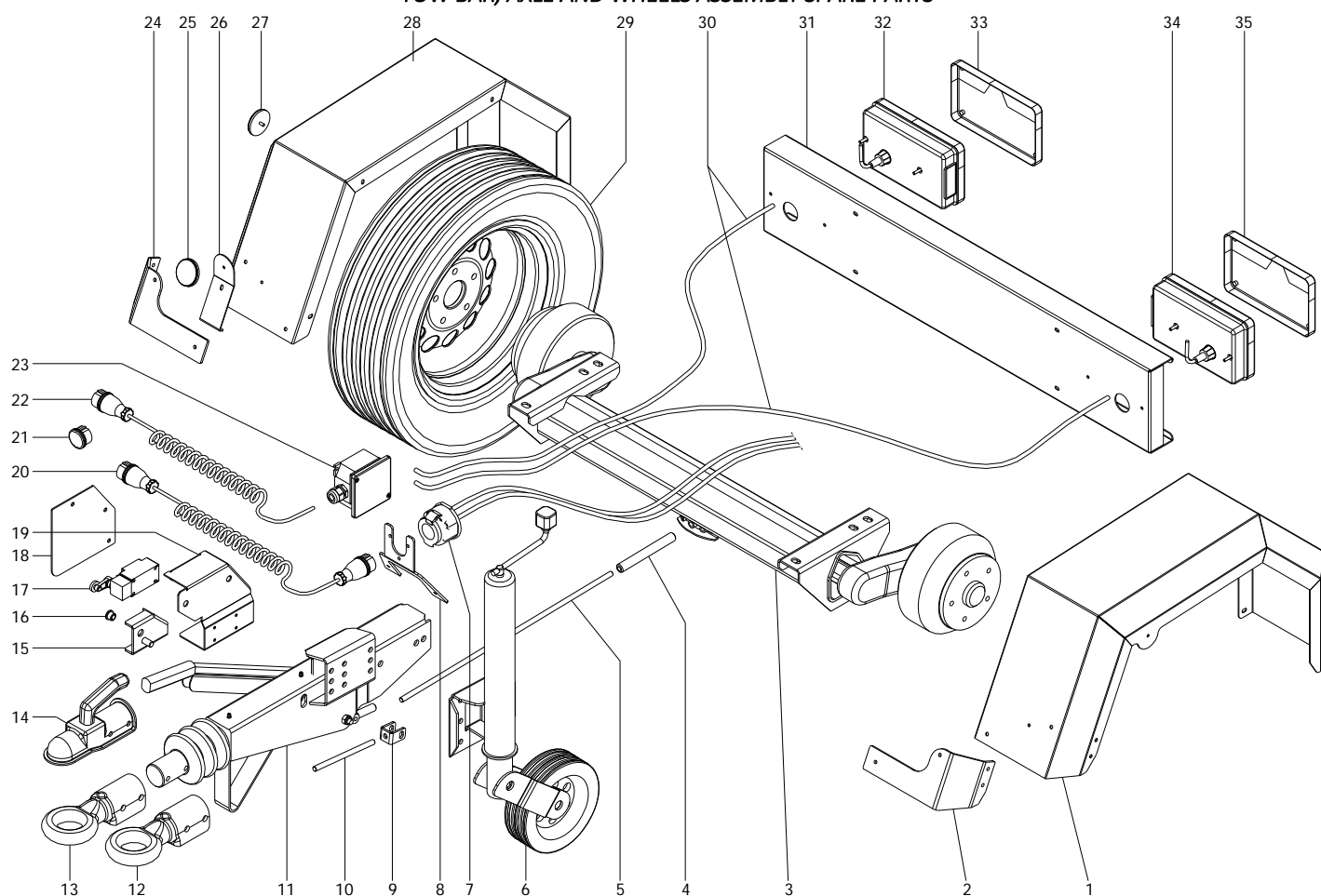
CANOPY ASSEMBLY SPARE PARTS



SPARE PARTS

| N. | CODE | DESCRIPTION |
|----|-------------------|--|
| 3 | AC000_M000_009 | DOOR HINGE |
| 5 | XECOK2_C035_077 | MUFFLER EXTENSION |
| 6 | XECOK2_C007_046 | FRONT PANEL |
| 7 | AC000_M000_005 | HANDLE |
| 8 | AC000_M038_048 | SPACER H.50 |
| 9 | AC000_P037_007 | PLASTIC WASHER |
| 10 | XECO_AS009_058 | PLASTIC COVER |
| 11 | AC000_M038_041 | SPACER H.30 |
| 12 | AC000_E006_018 | GPS ANTENNA |
| 13 | XECOK2_C006_135 | GPS ANTENNA SUPPORT |
| 14 | XRENT_C008_044 | AIR INLET GRID |
| 15 | AC000_M038_009 | CLAMP |
| 16 | AC000_M001_007 | MUFFLER EXTENSION GASKET |
| 17 | XECOK2_M009_161 | DOOR RETENTION ROPE |
| 18 | XECOK2_C008_132 | LEFT DOOR |
| 20 | PFI08_C031_013 | ROTATIONAL SLIDING PLATE |
| 21 | PFI08_C031_014ZN | ROTATIONAL SLIDING PLATE REINFORCEMENT |
| 22 | XECOK2_C000_050ZN | MAST ROTATION GUIDE PLATE |
| 23 | XECOK2_S010_185B | APPROBATION PLATE |
| 24 | XECOK2_C036_386ZN | LIFTING EYE |
| 25 | XECOK_C035_045 | MUFFLER |
| 26 | AC000_M000_080 | RAIN COVER |
| 27 | XECOK_C007_032 | MUFFLER COVER |
| 28 | AC000_M001_035 | RADIATOR CAP COVER |
| 29 | AS000_M036_083 | RADIATOR CAP COVER RETENTION ROPE |
| 30 | XECOK2_C007_129 | TOP CANOPY |
| 31 | AC000_M000_003 | CLOSING LOCK PIN |
| 32 | XECOK2_C007_113 | REAR PLATE |
| 36 | XECOK2_C008_225 | AIR OUTLET GRID |
| 38 | XECOK2_C007_133 | REAR LEFT PANEL |
| 39 | XECOK2_C007_134 | REAR RIGHT PANEL |
| 40 | XECOK2_S010_277B | DATA PLATE |
| 41 | XRENT_C000_040 | LOCK CONTRAST |
| 42 | AC000_M000_017 | DOOR LOCK |
| 43 | XECOK2_C008_131 | RIGHT DOOR |

TOW BAR, AXLE AND WHEELS ASSEMBLY SPARE PARTS



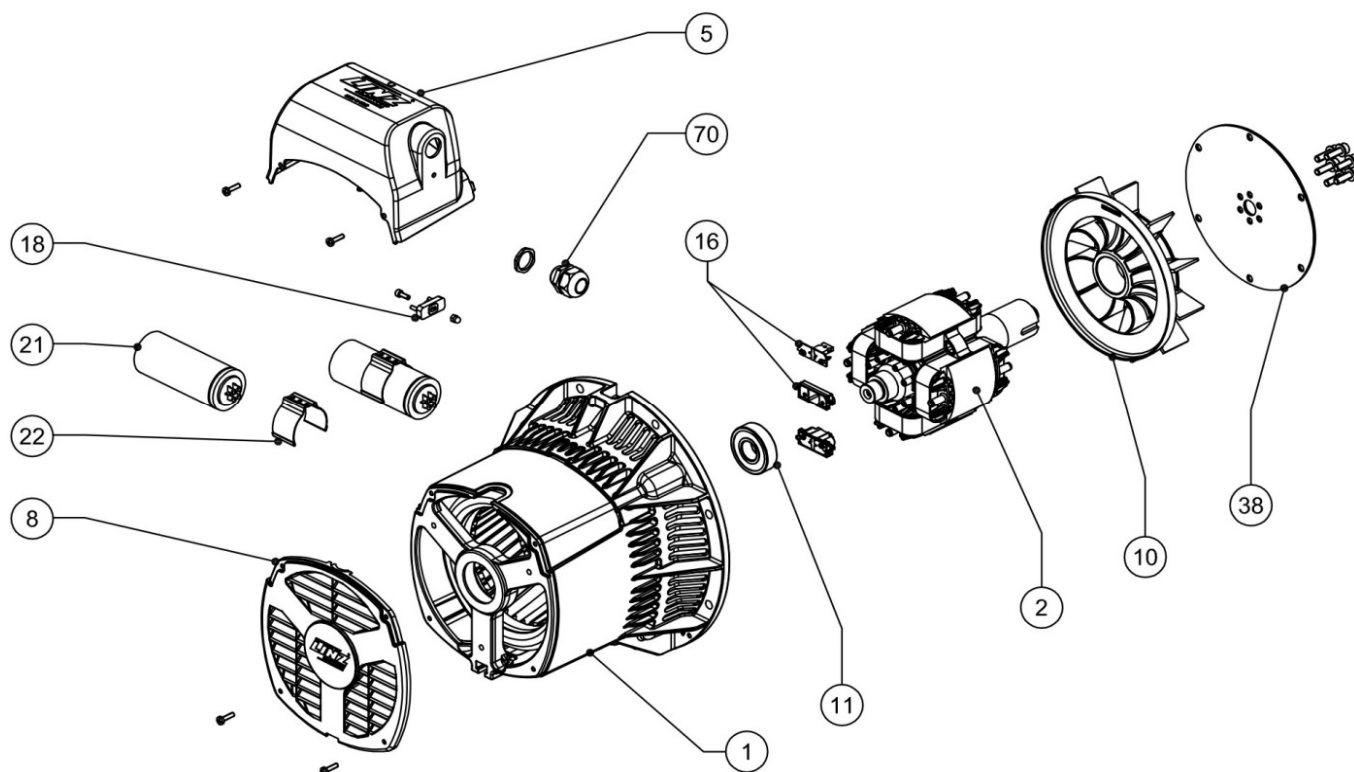
| N. | CODE | DESCRIPTION |
|----|----------------------|-----------------------|
| 1 | XECOK2_C004_069 | RIGHT MUDGUARD |
| 2 | XECOK2_R008_188 | RIGHT MUDGUARD RUBBER |
| 3 | AC000_T003_002 | AXLE |
| 4 | AS000_M000_073 | SLIDE PIN |
| 5 | XECOK2_C005_055ZN | REAR TIE ROD |
| 6 | AC000_T003_003 | JOCKEY WHEEL |
| 7 | AC000_E050_016 | CABLE WITH CONNECTOR |
| 8 | XECOK2_C006_197 | CONNECTOR SUPPORT |
| 9 | XECOK2_C005_186ZN | TIE RODS JUNCTION |
| 10 | XECOK2_C005_059_03ZN | FRONT TIE ROD |
| 11 | AC000_T003_004 | RUDDER |
| 12 | AC000_T003_008 | HOOK EYE D.40 |
| 13 | AC000_T003_016 | HOOK EYE D.50 |
| 14 | AC000_T003_007 | HOOK BALL |
| 15 | XECOK2_C000_098 | LIMIT SWITCHES PLATE |
| 16 | XECOK2_C001_101ZN | ADAPTATION BUSHING |
| 17 | SI000_G006_009 | LIMIT SWITCHES |
| 18 | XECOK2_C000_100 | COVER PLATE |

(*) EUROPEAN VERSION

(**) UK VERSION

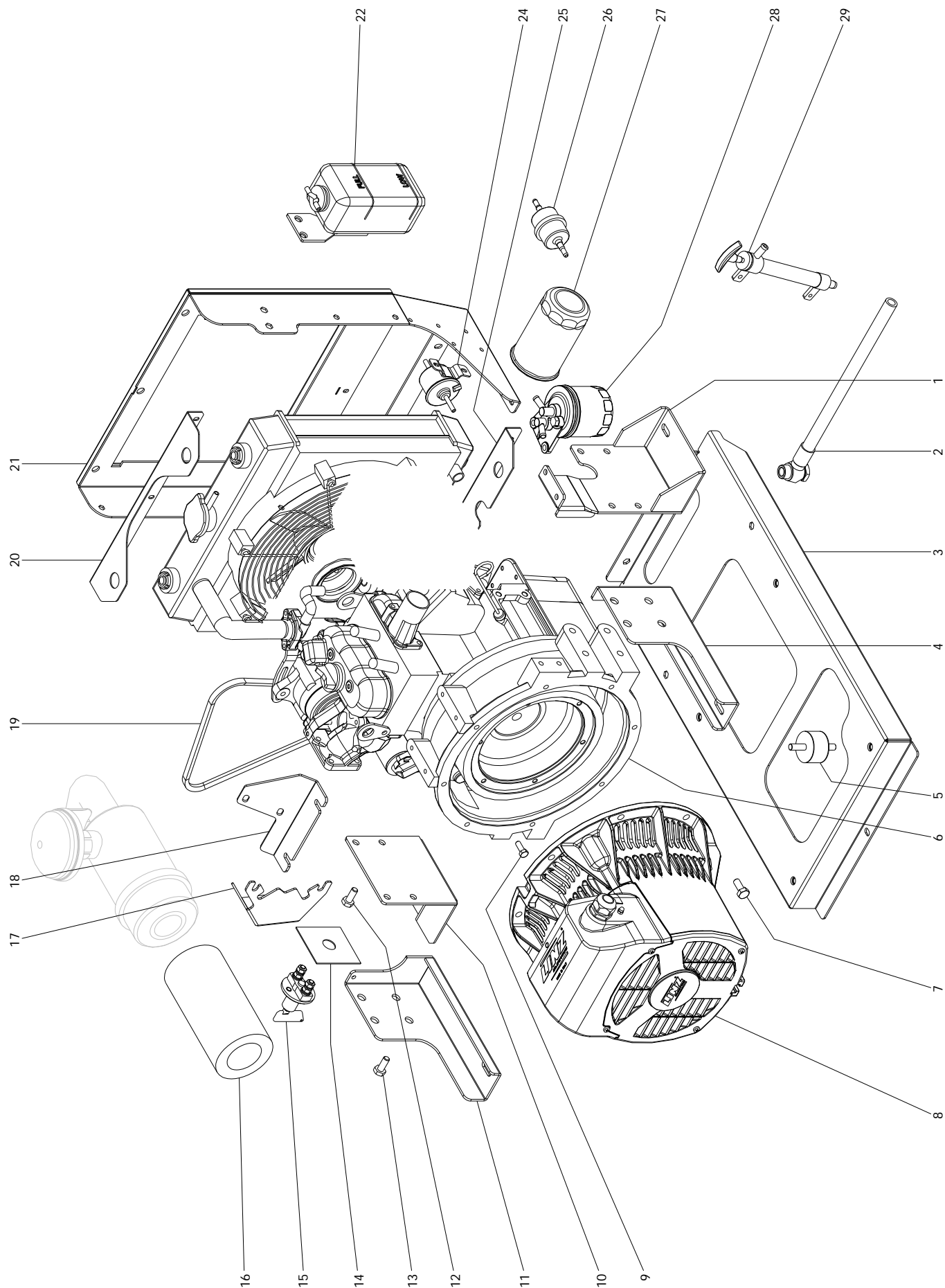
| N. | CODE | DESCRIPTION |
|----|---|--------------------------------|
| 19 | XECOK2_C000_099 | LIMIT SWITCHES SUPPORT |
| 20 | AC000_E050_017 | CABLE WITH PLUGS |
| 21 | AC000_E000_062 | ADAPTER |
| 22 | AC000_E050_096 | CABLE WITH PLUG |
| 23 | AC000_G006_001 | JUNCTION BOX |
| 24 | XECOK2_R008_189 | LEFT MUDGUARD RUBBER |
| 25 | AC000_T013_001 | WHITE REFLECTER |
| 26 | XECOK2_C004_312 | REFLECTER SUPPORT |
| 27 | AC000_T013_002 | ORANGE REFLECTER |
| 28 | XECOK2_C004_070 | LEFT MUDGUARD |
| 29 | AC000_T003_001 | WHEEL |
| 30 | AC000_E050_086 | LIGHTS WIRING |
| 31 | XECOK2_C000_238 | LIGHTS HOLDER BAR |
| 32 | AC000_E013_007 (**) AC000_E013_006 (*) | COMPLETE RIGHT SIDE REAR LIGHT |
| 33 | AC000_E013_009 (**) | LENS FOR RIGHT SIDE REAR LIGHT |
| 34 | AC000_E013_008 (**) AC000_E013_005 (*) | COMPLETE LEFT SIDE REAR LIGHT |
| 35 | AC000_E013_010 (**) | LENS FOR LEFT SIDE REAR LIGHT |

ALTERNATOR ASSEMBLY SPARE PARTS



| N. | CODE | DESCRIPTION |
|-----|-------------------|----------------------------|
| 1 | L-E13CA114AA1 | FRAME WITH STATOR |
| 2 | L-E13RA491B | ROTATING INDUCTOR |
| 5 | L-E13QU068B00-002 | TOP COVER |
| 8 | L-13KA089D | FRONT COVER |
| 10 | L-E13VE000C | FAN |
| 11 | L-EX411465325 | BEARING |
| 16 | L-E13KA045A | WIRED DIODE |
| 18 | ----- | ----- |
| 21 | L-EX541511025 | 25uF 550V CAPACITOR |
| 22A | L-E10KA109A | CAPACITOR CLAMP D. 40 SP10 |
| 22B | ----- | ----- |
| 38 | L-E13GE211A | SAE DISCS 6 ½ |
| 70 | ----- | ----- |

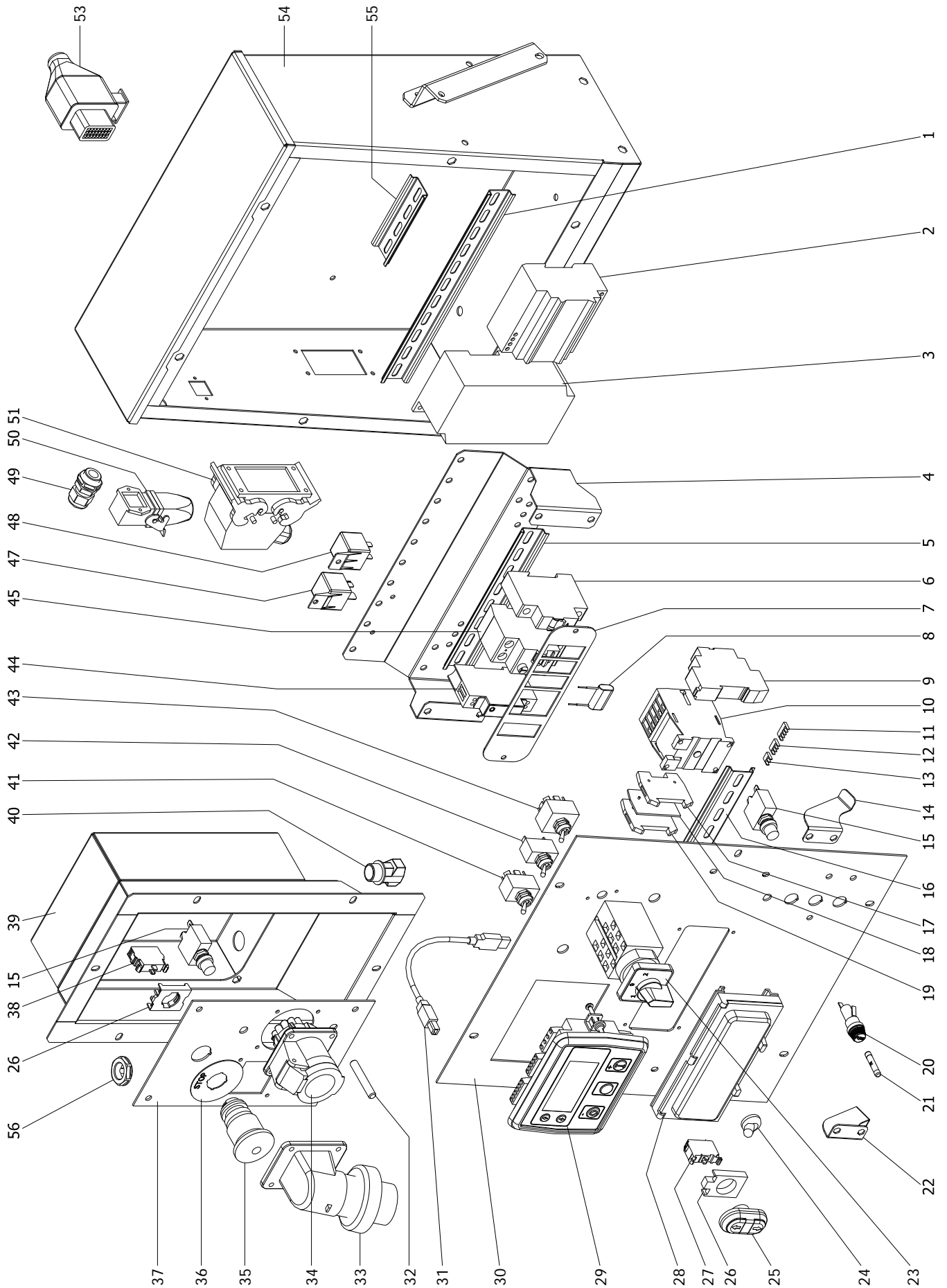
ENGINE ASSEMBLY SPARE PARTS



SPARE PARTS

| N. | CODE | DESCRIPTION |
|----|------------------|--------------------------------|
| 1 | XECOK2_C001_006 | ENGINE REAR RIGHT SUPPORT |
| 2 | AC000_G001_001 | OIL DRAIN PIPE |
| 3 | XECOK2_C001_126 | ENGINE / ALTERNATOR SUPPORT |
| 4 | XECOK2_C001_123 | ENGINE FRONT RIGHT SUPPORT |
| 5 | AC000_M024_054 | SCHOCK ABSORBER |
| 6 | AC000_M033_007 | ENGINE Z482E |
| 7 | AC000_M038_014 | ALTERNATOR FIXING SCREW |
| 8 | AC000_E034_007 | ALTERNATOR |
| 9 | AC000_M038_013 | ENGINE FIXING SCREW |
| 10 | XECOK2_C001_005 | ENGINE REAR LEFT SUPPORT |
| 11 | XECOK2_C001_124 | ENGINE FRONT LEFT SUPPORT |
| 12 | AC000_M038_015 | ENGINE REAR SUPPORTS SCREW |
| 13 | AC000_M038_047 | ENGINE FRONT SUPPORTS SCREW |
| 14 | XECOK2_S010_293B | BATTERY SWITCH ALUMINIUM PLATE |
| 15 | AC000_E000_066 | BATTERY SWITCH |
| 16 | K-1921511220 | AIR FILTER |
| 17 | XECOK2_C006_192 | BATTERY SWITCH SUPPORT |
| 18 | XE48_C001_002 | AIR FILTER SUPPORT |
| 19 | K-1980572530 | ENGINE BELT |
| 20 | XE48_C001_005 | RADIATOR TOP SUPPORT |
| 21 | XECOK2_C001_224 | RADIATOR FRAME |
| 22 | K-1553172402 | RADIATOR TANK |
| 24 | K-R140151352 | ELECTRIC PUMP |
| 25 | XECOK2_C001_236 | RADIATOR INFERIOR SUPPORT |
| 26 | AC000_M001_008 | FUEL PRE-FILTER |
| 27 | K-1542632430 | OIL FILTER |
| 28 | K-1522143170 | FUEL FILTER |
| 29 | AS000_M000_060 | OIL DRAIN MANUAL PUMP |

CONTROL PANELS ASSEMBLY SPARE PARTS



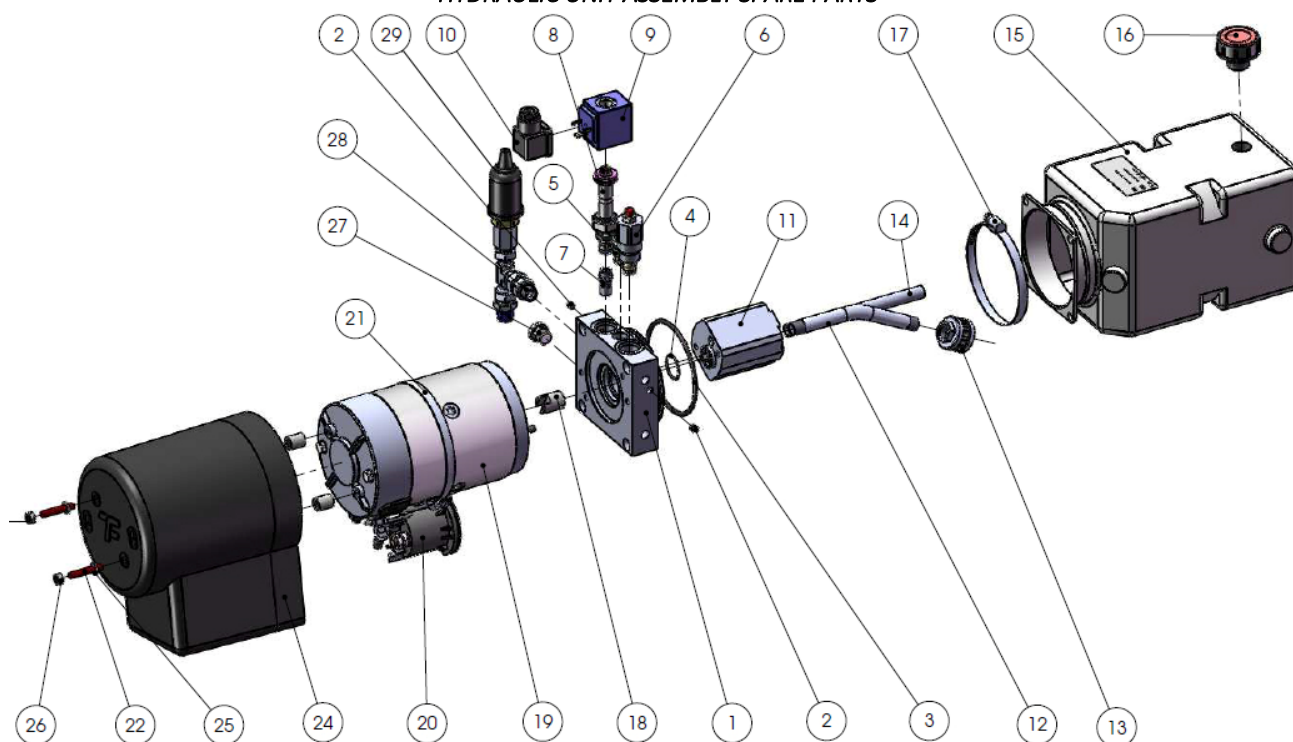
SPARE PARTS

| N. | CODE | DESCRIPTION |
|----|-----------------|----------------------------------|
| 1 | AC000_M038_039 | L275 DIN BAR |
| 2 | AC000_E006_012 | BATTERY CHARGER |
| 3 | AC000_E014_004 | DSE890 GATEWAY |
| 4 | XECOK2_C006_110 | CIRCUIT BREAKERS SUPPORT |
| 5 | AC000_M038_037 | L200 DIN BAR |
| 6 | AC000_E012_027 | LAMP SWITCH |
| 7 | XRENT_C006_229 | CIRCUIT BREAKER FRAME |
| 8 | AC000_E000_070 | CAPACITOR |
| 9 | AC000_E006_038 | CONTACTOR SWITCH |
| 10 | AC000_E006_054 | CONTACTOR SWITCH |
| 11 | AC000_E006_075 | 5 WAYS BRIDGE |
| 12 | AC000_E006_063 | 4 WAYS BRIDGE |
| 13 | AC000_E006_062 | 3 WAYS BRIDGE |
| 14 | XECOK2_C019_232 | RIGHT STOP PLATE |
| 15 | AC000_E012_013 | 12A CIRCUIT BREAKER |
| 16 | AC000_M038_038 | L175 DIN BAR |
| 17 | AC000_E006_021 | TERMINA BOARD ELEMENT |
| 18 | AC000_E006_024 | COVER |
| 19 | AC000_E006_022 | FINAL ELEMENT FOR TERMINAL BOARD |
| 20 | AC000_E012_030 | FUSE HOLDER |
| 21 | AC000_E012_014 | 2A FUSE |
| 22 | XECOK2_C019_233 | LEFT STOP PLATE |
| 23 | AC000_E006_057 | SELECTOR SWITCH |
| 24 | AC000_E000_019 | CIRCUIT BREAKER PROTECTION |
| 25 | AC000_E006_044 | MAST BUTTONS |
| 26 | AC000_E006_043 | CONTACT SUPPORT |
| 27 | AC000_E006_042 | MAST CONTACT |

| N. | CODE | DESCRIPTION |
|----|------------------|---------------------------|
| 28 | AC000_E000_008 | CIRCUIT BREAKERS COVER |
| 29 | AC000_E014_003 | DSE L401 CONTROL MODULE |
| 30 | XECOK2_S010_381B | ALUMINIUM FRONT PANEL |
| 31 | AC000_E000_064 | USB CABLE |
| 32 | AC000_M038_035 | EARTHING TERMINAL |
| 33 | AC000_E011_010 | INLET EEC SOCKET 230V 16A |
| 34 | AC000_E011_007 | OUTLET SOCKET 230V 16A |
| 35 | AC000_E006_051 | STOP BUTTON |
| 36 | AC000_E006_053 | STOP BUTTON RATING PLATE |
| 37 | XECOK2_S010_106B | ALUMINIUM FRONT PANEL |
| 38 | AC000_E006_052 | STOP BUTTON CONTACT |
| 39 | XECOK2_C006_105 | EXTERNAL BOX |
| 40 | AC000_E018_019 | CABLE GLAND |
| 41 | AC000_E000_016 | 2P SWITCH |
| 42 | AC000_E000_009 | 1P SWITCH |
| 43 | AC000_E000_017 | 3P SWITCH |
| 44 | AC000_E016_005 | LIGHT SENSOR |
| 45 | AC000_E012_028 | 13A RCD |
| 47 | AC000_E000_041 | 70A 12Vdc RELAY |
| 48 | AC000_E000_040 | 30A 12Vdc RELAY |
| 49 | AC000_E018_008 | CABLE GLAND |
| 50 | AC000_E000_071 | 5P CONNECTOR |
| 51 | AC000_G006_004 | 10P CONNECTOR |
| 53 | AC000_G006_003 | 24P CONNECTOR |
| 54 | XECOK2_C019_380 | CONTROL BOX |
| 55 | AC000_M038_049 | L100 DIN BAR |
| 56 | AC000_E018_040 | CAP |

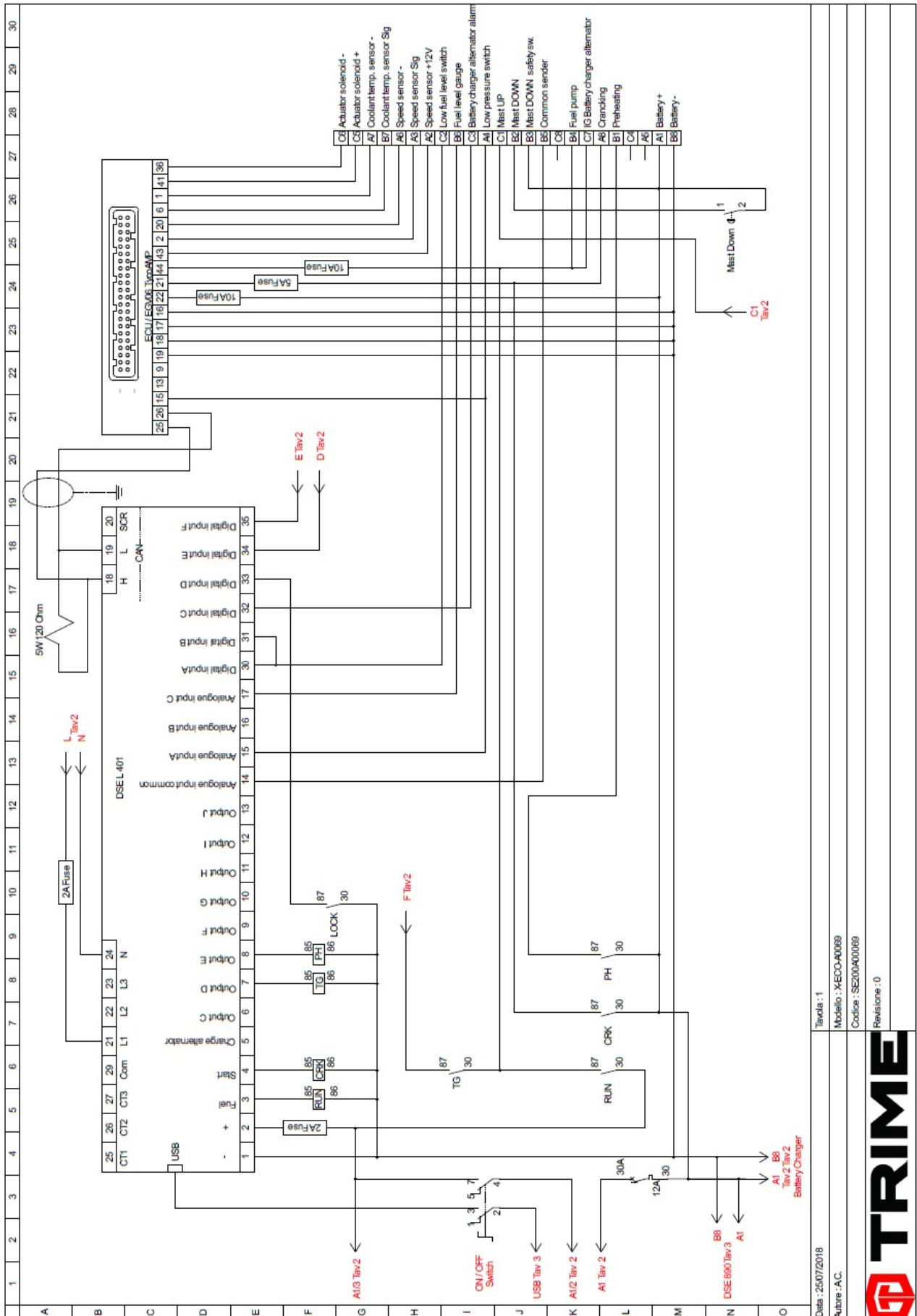
| | |
|-------------|--|
| SPARE PARTS | |
|-------------|--|

HYDRAULIC UNIT ASSEMBLY SPARE PARTS



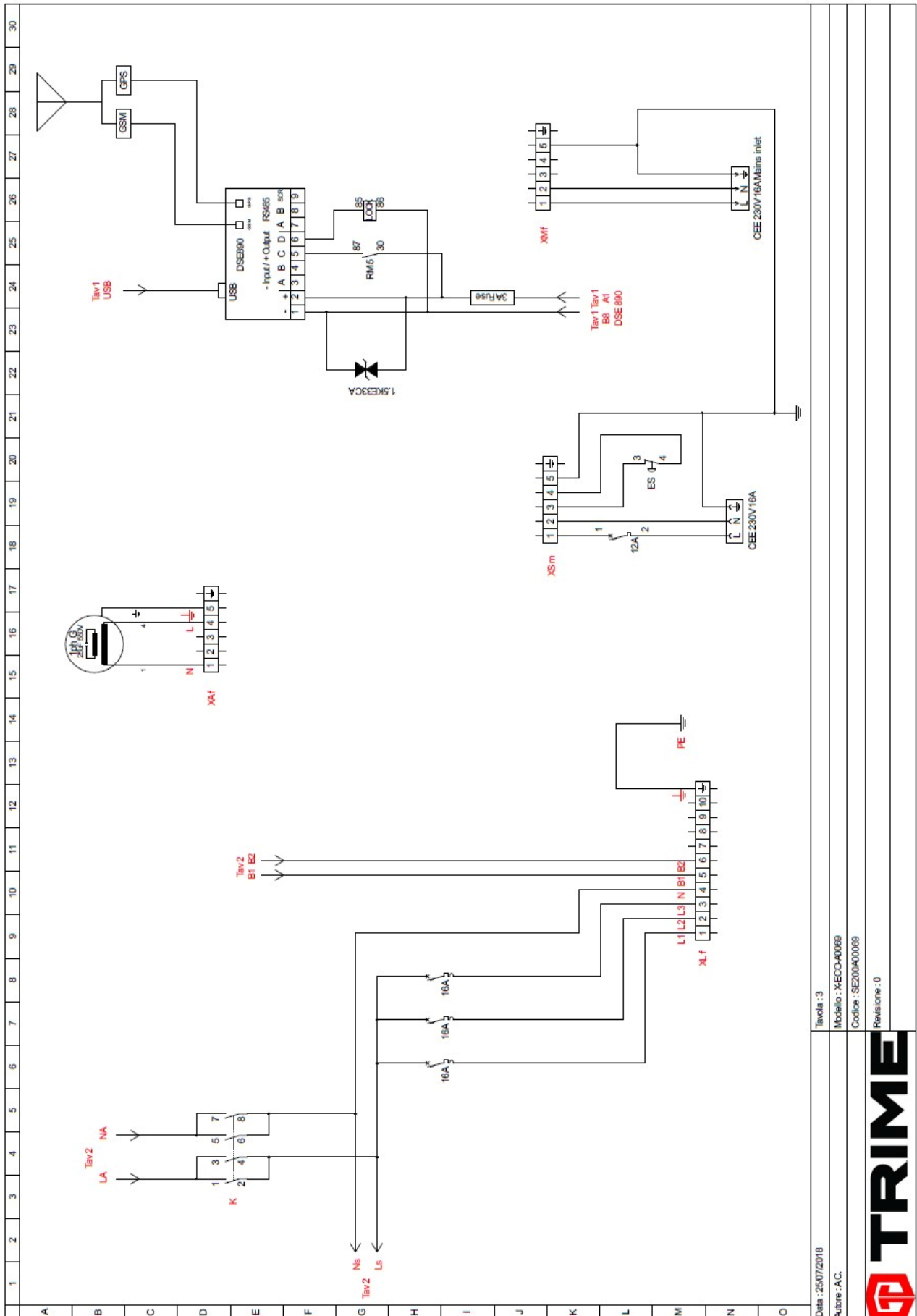
| N. | CODE | DESCRIPTION |
|----|-------------------|------------------------------------|
| 1 | AS-ES516007 | CONNECTOR M2A |
| 2 | AS-EC035M06 | EXPANSION CAP |
| 3 | AS-EC114261 | O-RING |
| 4 | AS-EC114024 | O-RING |
| 5 | AS-F73200114 | VALVE VR14 |
| 6 | AS-F733006250 | VALVE VMC1 250 BAR |
| 7 | AS-F7370212 | VRF12 E-STROZ 5LT |
| 8 | AS-F720002B1 | VALVE VE6-NC-EM 12.7 DC |
| 9 | AS-C1500010A | COIL |
| 10 | AS-EC167002 | CONNECTOR DIN43650 |
| 11 | AS-EC10901.50001 | PUMP 00A1.50X047 |
| 12 | AS-ES524FE009 | PIPE ¼" |
| 13 | AS-ES506FR5.01759 | FILTER |
| 14 | AS-ES52301105 | EXHAUST HOSE PIPE |
| 15 | AS-ES512AA25B | TANK 2.5LT |
| 16 | AS-EC1270112 | CAP + FILTER TMDF ½" |
| 17 | AS-C05609090110 | CLAMP |
| 18 | AS-ES5085320020 | JOINT |
| 19 | AS-EC106115 | ENGINE CC 12V – 1600W |
| 20 | AS-EC108011 | TELERUPTOR 12V-150A |
| 21 | AS-K180A01F | ELECTRIC KIT ENGINE-RELAY 0114-125 |
| 22 | AS-EC008AB0635 | GRAIN |
| 23 | AS-ES427002 | THICKNESS RING |
| 24 | AS-ES513033 | COVER FOR CC ENGINE |
| 25 | AS-EC010002 | RING |
| 26 | AS-EC000BBB06 | BOLT |
| 27 | AS-EC031001 | CAP |
| 28 | AS-CL000008 | FITTINGS KIT |
| 29 | AS-K4TAF1/P1 | PRESSURE SWITCH |

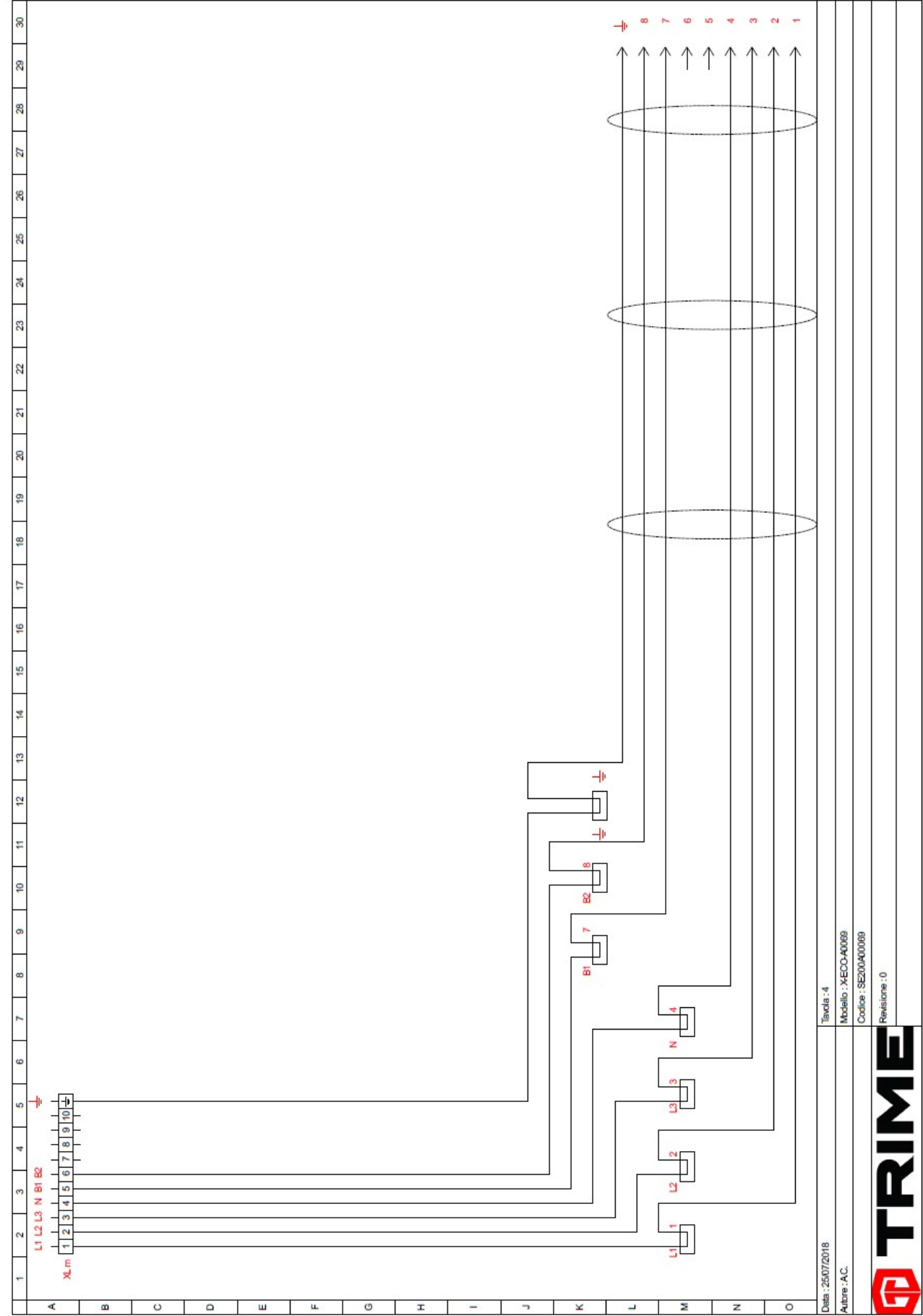
ELECTRICAL DIAGRAM

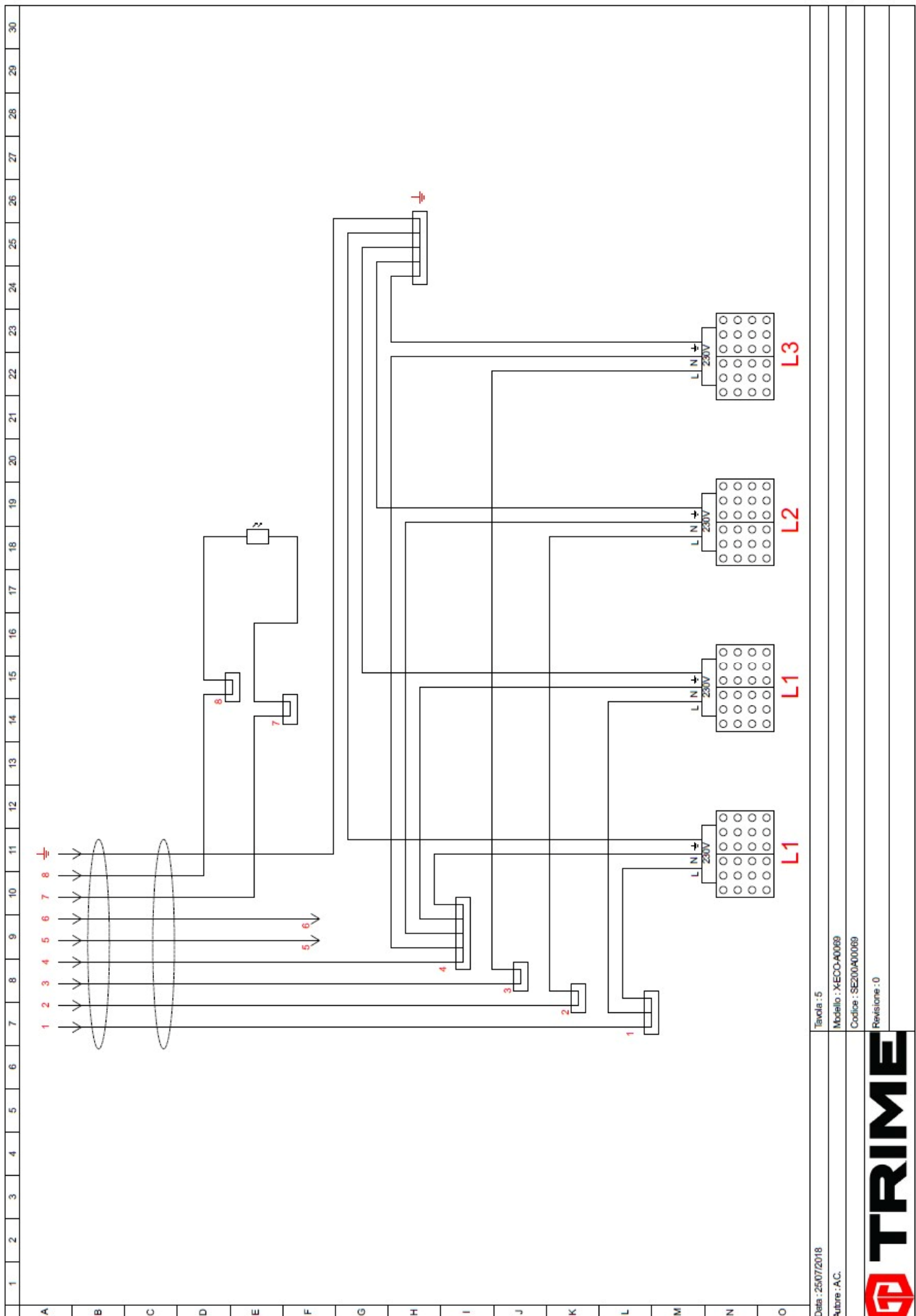


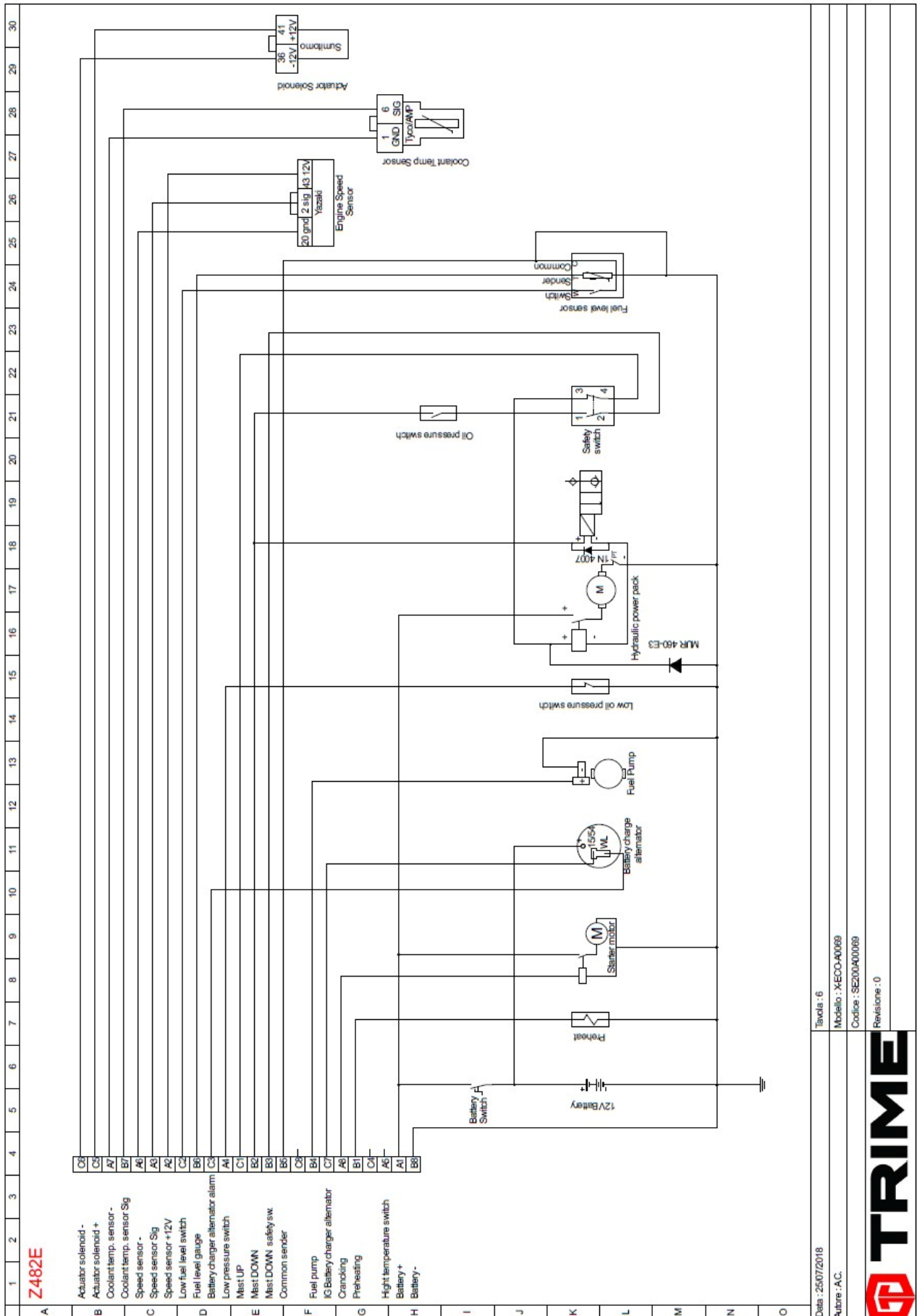


ELECTRICAL DIAGRAM









The warranty period starts on the delivery date to the first purchaser.

The machine is covered by warranty for one year from the above mentioned date.

Only genuine parts should be used to carry out repairs.

Failure to use only genuine parts may invalidate the manufacturer's warranty.

We reserve the right to request the warranty replaced parts back for analysis.

All engine warranty issues must be directed to the engine manufacturer, or the manufacturer's approved engine dealer.

We will not be held responsible if:

- the machine has been used to perform tasks that it has not been designed for;
- the machine has undergone modifications not approved by us;
- conditions of use have been abnormal;
- normal maintenance, compliant to requirements as set out by the manufacturer, have not been adhered to.

No payment or expenses refund should be pretended from us for normal maintenance or servicing nor any materials used to carry out routine servicing. The warranty is intended to cover diagnosis, repair or replacement of the defective part, and actuating the repair, should a problem arise during the warranty period. These operations will be performed free of charge.

We offer service and warranty training for service and maintenance personnel, if required.

Training can be carried out at a our depot or at a venue of your choice.

Don't hesitate to contact us for any further information.