OWNER'S MANUAL (SEA ISUZU FSR/FSD EV)

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Contents

1. Introduction

To ensure you are fully aware of safety and operational information, the following symbols are used throughout this manual;

This type of box contains points of operation to NOTE

Assumes that incorrect handling may cause hazardous conditions, resulting in medium or slight injury, or may cause physical damage only.

Assumes that incorrect handling may cause hazardous conditions, resulting in death or severe injury, or major physical damage.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at any time without notice. No part of this publication may be reproduced or transmitted, in any form by any means; electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the publisher. This includes text, pictures and tables.

To become familiar with the vehicle, it is necessary to read and understand the Owner's Handbook and all additional literature that is part of your vehicle's documentation pack.

It is your responsibility to ensure that all the documentation stays with the vehicle.

2. Safety Notices and Safety Instructions

Never attempt to open a battery pack. This vehicle uses a battery pack that operates at 450 volts DC.

Never attempt to remove, unplug or cut any of the ORANGE marked cables or conduit. Orange marked cable carry high voltage.

Only authorised personnel are allowed to work on electrical power and/or control systems.

DO NOT carry out any welding or other dirty works like grinding, etc. on the vehicle without permission from SEA-Electric. Otherwise serious damage can be caused to the drive train and the electronic control systems.

See Appendix C at the end of manual as Emergency Quick Response Reference.

Electrical Isolation

The SEA-Drive® vehicle is fitted with an automated High Voltage Isolator. The High Voltage Isolator ensures that high voltage power circuits to the drive motor, inverters and battery management system are only enabled when the SEA-Drive® vehicle's ignition switch is in the ON position and EV control system start-ups checks have been completed successfully.

High Voltage Isolation

As an override to the automated High Voltage Isolation system in the SEA-Drive® vehicle, isolating the SEA-Drive® vehicle's low voltage battery system will prevent the EV control system from powering up and ensuring the High Voltage system remains isolated (refer below).

Low Voltage Isolation

The Low Voltage Isolation switch is located next to the low voltage batteries (Position of the batteries is based on the truck chassis).

The power from the **traction batteries** can be **isolated** by following this procedure:

1. Remove the ignition key.
2. Turn the 24V isolator switch to its vertical position.

24V Battery System Isolation Switch

The battery pods will remain charged, even when switched off.

The leads and connectors on the pods will not be live if the pods are switched off.

Loss of Electrical Power during Operation

If the SEA-Drive® vehicle was to lose electrical power while the vehicle is in motion, the steering will become stiff and the vehicle will continue to roll. The regenerative braking system will not assist braking. Use of the park brake will affect braking on the rear wheels only.

IMPORTANT!! The traction battery pods will remain charged, even when switched off!

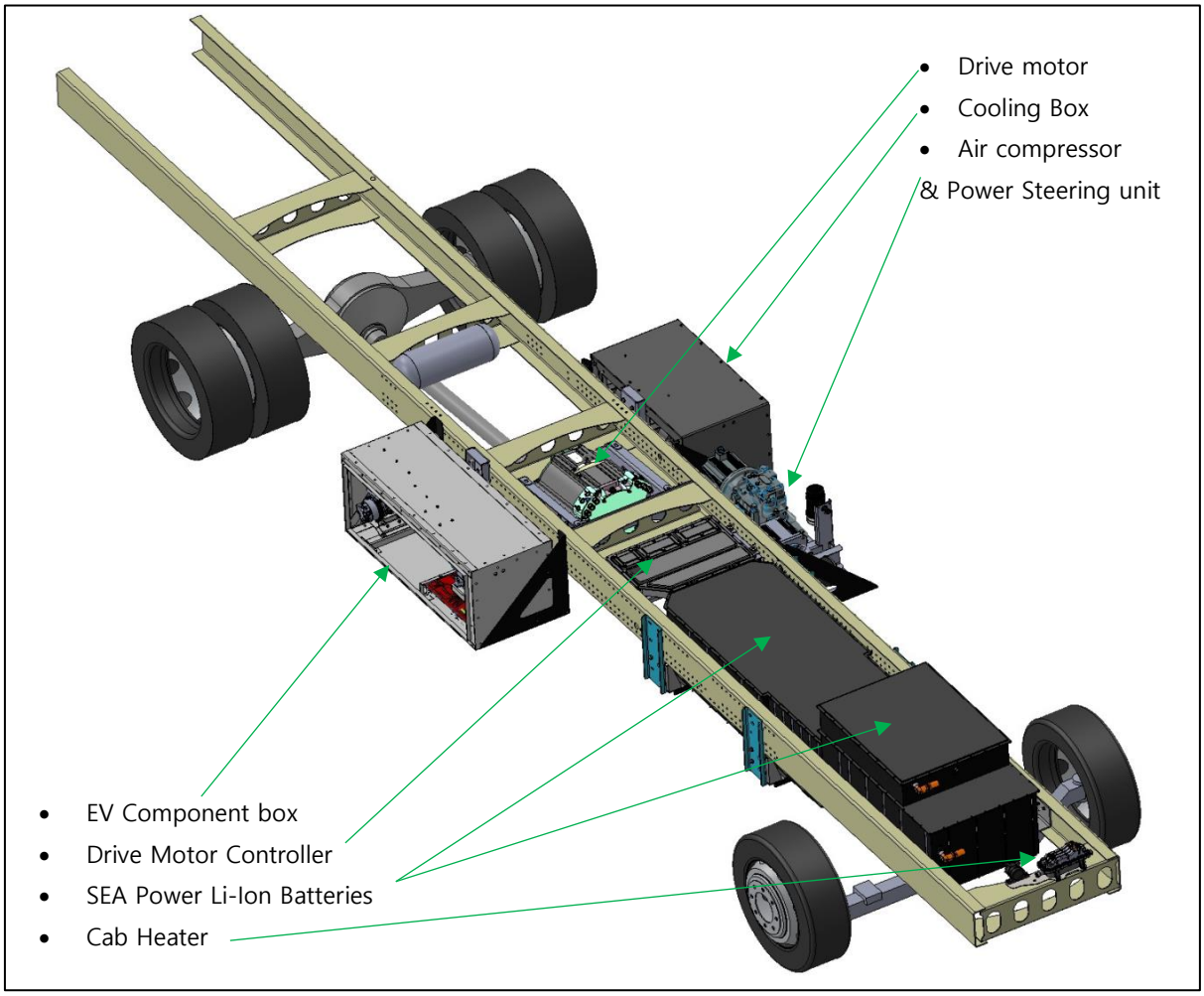
3. Vehicle Layout – Components and Specifications

Motor	**SEA-Drive® 120b,** 150kW Continuous, AC Permanent Magnet Motor.
Controller	Torque control system providing variable speed drive with regenerative braking.
Batteries	136kWh, Lithium Ion NMC
Charger	Fully automatic, on-board 415V, 3-phase, 32A, 22kW maximum charge, approximately 6 hours (IEC 62196 Charging Protocol).
Ancillary Electrics	3kW 24V DCDC Converter
Range	Up to 300km between charges (unladen)

The location and layout of the SEA-Drive® vehicle and its SEA-Drive® components are shown as below.

SEA-Drive® layout and components

Components shown on below figure, may have been modified and improved in position on the chassis based on different variations.



Overall Chassis Layout

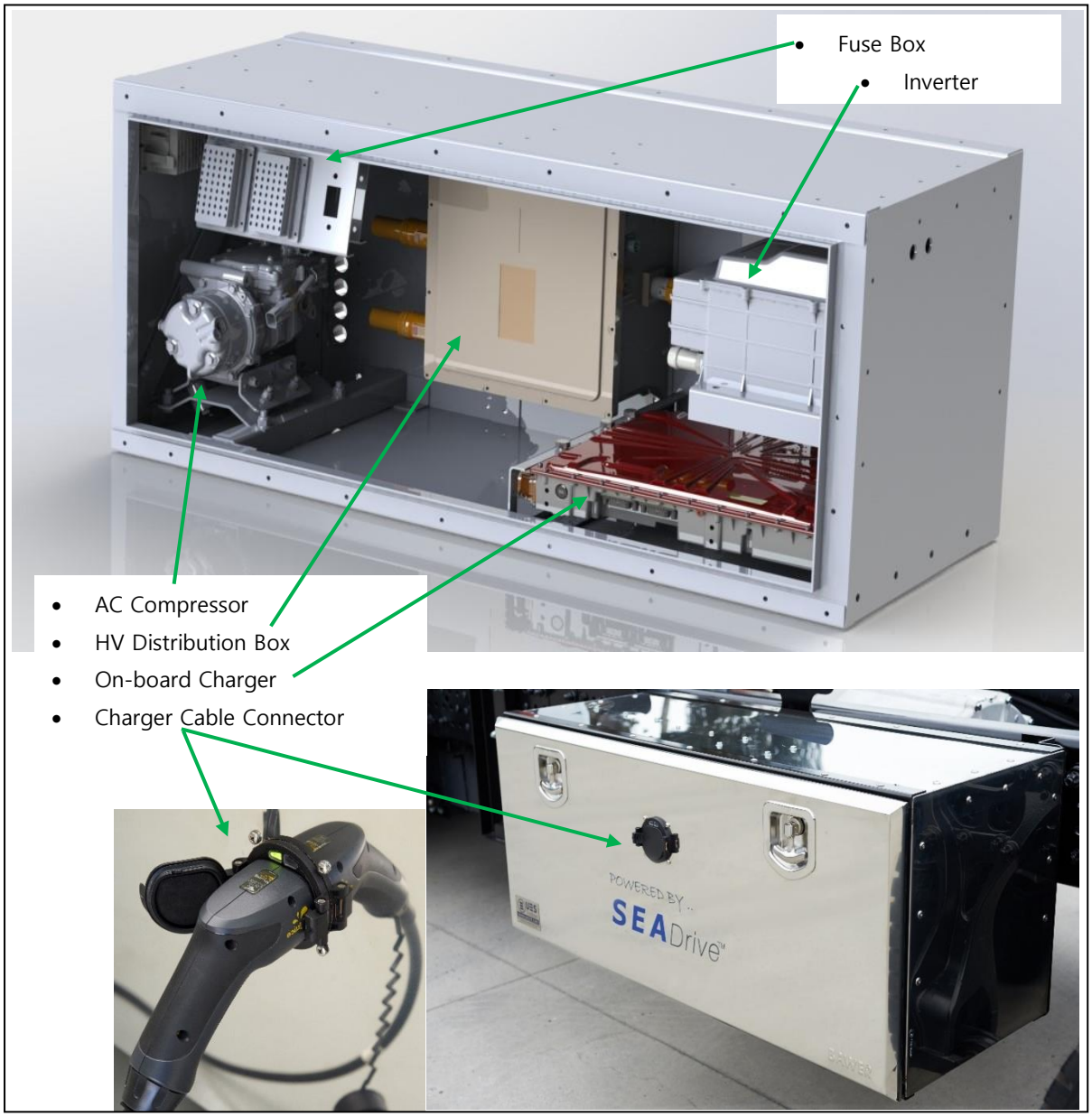
WARNING:
The EV Component Box contains many of the HV Electrical components and wiring for the SEA-Drive® system.

It should only be opened by SEA-Drive® technicians or qualified Electrical tradespersons.

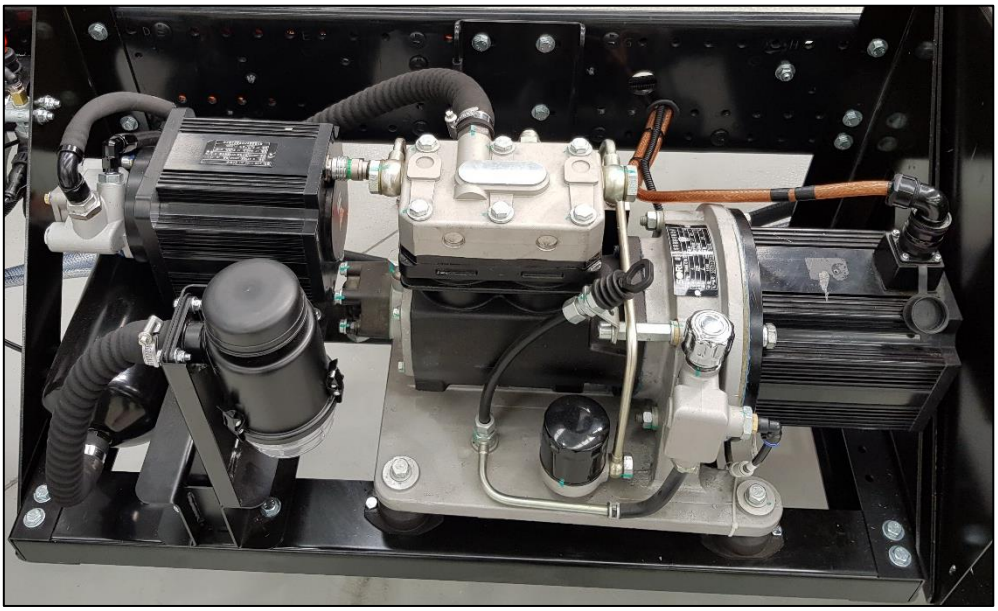
HV Li-Ion Battery Pods

Notice

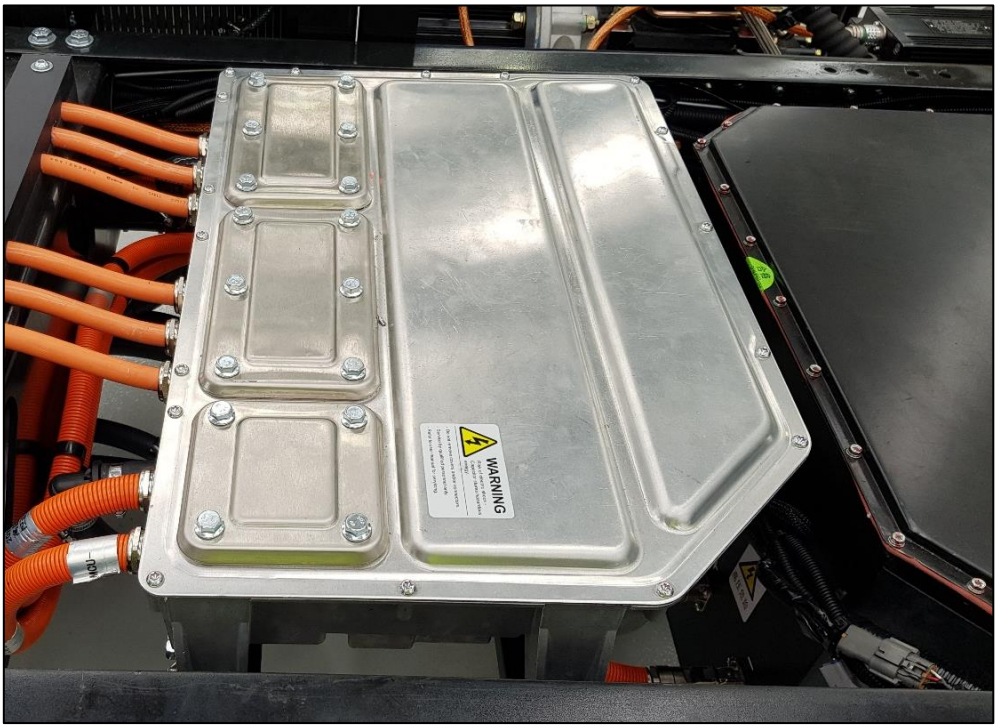
At the end of their useful life, the high voltage batteries will be traded/exchanged with new high voltage batteries, resulting in the depleted high voltage batteries being returned to the manufacturer for secondary use. This process may incur shipping, handling and tax costs, and will be facilitated by SEA Electric at the time of replacement.



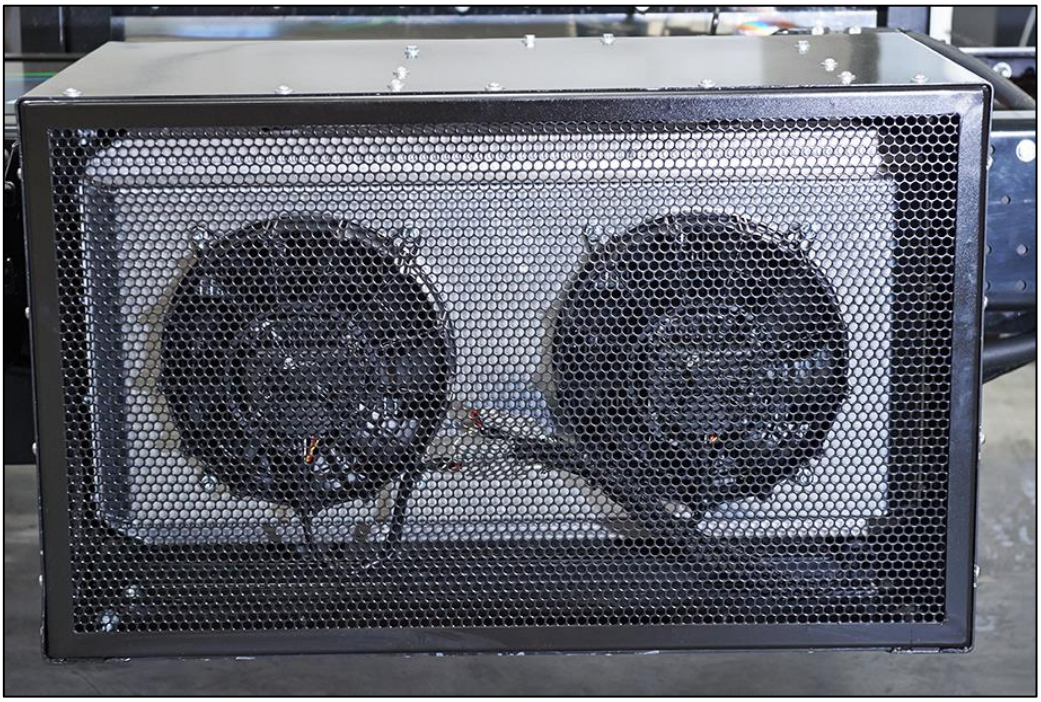
EV Component Box



Air Compressor and Power Steering Systems



Drive Motor Controller



Cooling System

4. Controls and Display

Drive Selector

The vehicle drive mode control in one of the two variations below is located next to the driver's seat in the middle console.

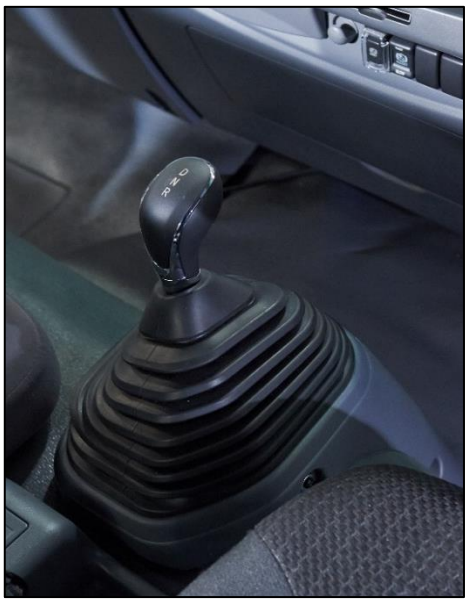
Drive Mode Selector (1)

- 3 position Lever to select Drive mode

- NEUTRAL – Middle Position
- Select when Parking/Stopping
- Vehicle must be in this position to start

- DRIVE – Push Lever forward to select DRIVE
- Select for Forward operating motion

- REVERSE – Pull Lever back to select REVERSE
- Select for Reversing operating motion



Drive Mode Selector

Drive Mode Selector (2)

- 3 position Lever to select Drive mode

- NEUTRAL – Middle Position
- Select when Parking/Stopping
- Vehicle must be in this position to start

- DRIVE – Push Lever back to select DRIVE
- Select for Forward operating motion

- REVERSE – Pull Lever forward to select REVERSE
- Select for Reversing operating motion

Drive Mode Selector

Display

Drive Mode

Battery State of Charge (%SOC)

Indicated by the bar & numerical percentage. Battery percentage is indicative only. Drivers should return to a charge port when vehicle is near 5%

Speedometer

Vehicle speed is shown as a digital read out

Estimated Range

Figure shows estimated travel distance until vehicle is needing to be recharged. Figure is indicative only and driver should not plan trip based on figure. Estimated range remaining will vary depending on many factors such as driving style, geography (hills), temperature and more

ECO Meter

Meter shows the amount of power being drawn or added back into the High Voltage battery. Acceleration will cause meter to ascend in RED. Regenerative Braking will cause the meter to descend in GREEN

Drive Mode

Vehicle State

Indicates if the vehicle is drive ready. Other states are ACC (accessory) and OFF

Selected Gear

Shows if the park brake is active and will turn red if the park brake is on when trying to drive. States shown are D (Drive), N (Neutral), R (Reverse)

Vehicle Fault Indicators

Various Symbols will appear in the event of a system fault/failure. A reference of each fault can be found by tapping the centre of the screen. SEA 24/7 Support is also listed in this menu

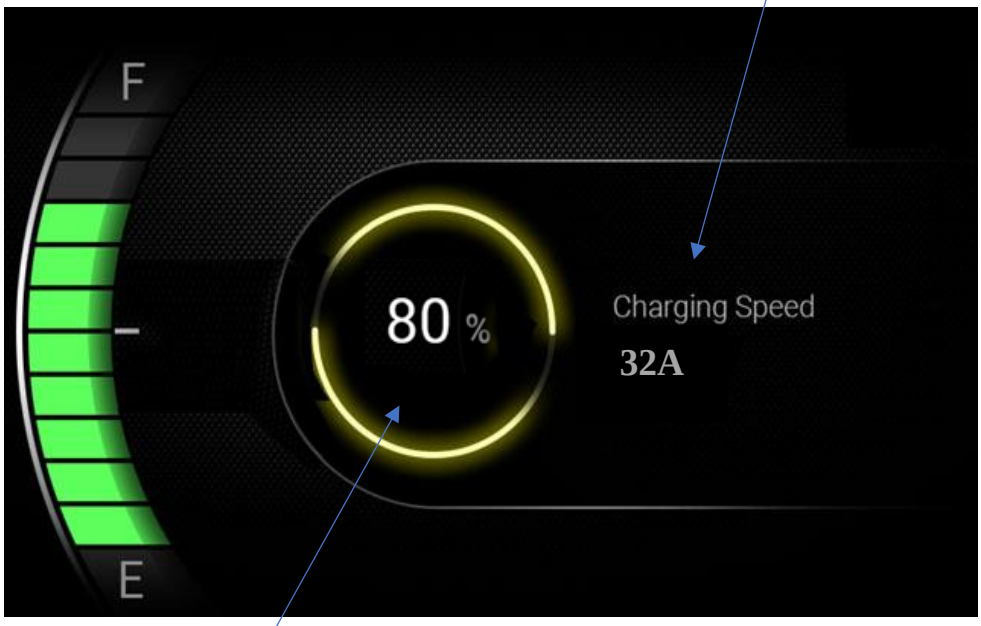
Regen Active

Shows when regenerative braking is available (White) and when Regenerative braking is being applied (Green)

Charging Mode

Charge Speed

Charge current supplied by the in-cord charger



Battery State of Charge (%SOC)

Indicated by the bar & numerical percentage. Battery percentage is indicative only. Drivers should return to a charge port when vehicle is near 5%

5- Charging the Traction Batteries

⚠	Specification of Charge Facility: IEC 62196 Mode 2/3 Charging 32A, 400VAC 3-phase with neutral and earth 22kW

Warning

- Portable charger should not be left somewhere exposed to moisture due to no completely sealing cap on the connector part.
- If moisture remains on the connector of EVSE (Electric Vehicle Supply Equipment), it may cause fuse trip as well as charger damage.
- Charger equipment should be kept into the isolated box or in the CAB.

The SEA-Drive® vehicle is recharged by connecting the approved wall or portable charger to the truck charging point.

See Appendix B at the end of manual as SEA-Drive® wall charger requirements.

- Park the vehicle safely within reach of a wall socket with the above specification.
- Turn the ignition key to the OFF position.
- Connect the charge cable between the vehicle and the EVSE.
- EVSE will switch on automatically and the charger cable will be locked in the charge socket.

- EVSE IEC 62196 equipment maintains a safety circuit between the mains (3-phase) supply and the vehicle.
- If this circuit is broken, the mains supply is automatically isolated at the mains for the protection of all.

EV Charger Connection on Component Box

Vehicle Charger Connection Socket

Vehicle Charger Connection Socket

(Type1)

Type1 – Version1 **(One LED Status Light)**

The SEA-Drive® Electric Vehicle On-Board Charging socket has an LED status light that illuminates when the charge cable is connected. See the following descriptions of the LED Status light for correct operation:

LED Colour	Description
Red	Cable is connected but no mains power supply detected Check Mains Power Supply availability and circuits
Yellow or Light green	Cable is connected SEA-Drive® vehicle is charging
Green	Cable is connected Batteries are fully charged Note: Once full charge is reached, the SEA-Drive® system automatically shuts down to stop any residual load on the battery systems. Green LED is extinguished. SEA-Drive® system periodically checks that battery system charge remains at 100%. If remaining charge is detected as less than 100%, charging system restarts to charge SEA-Drive® batteries to 100%.
Unlit	Cable is not properly connected Check Cable connector is fully engaged in socket

Type1 – Version2 **(Two LED Status Lights)**

The SEA-Drive® Electric Vehicle On-Board Charging socket has two LED status lights that illuminate when the vehicle is plugged in to charge.

The two LED's show different functions of the vehicle:

Left LED: White LED, indicates if the charger is locked in place (Illuminated White when locked).

NOTE: The charger will not activate until the charge inlet is locked. If the charger does not lock properly, check the position and status of the in-cord charger.

Right LED: Multicolour LED, shows the state of the charger.

See the following descriptions of the right LED for correct operation:

Right LED Colour	Description
SOLID Red	Cable is connected but no mains power supply detected. Check Mains Power Supply availability and circuits.
FLASHING Green	Cable is connected. SEA-Drive® vehicle is charging.
SOLID Green	Cable is connected. Batteries are fully charged. Note: Once full charge is reached, the SEA-Drive® system automatically shuts down to stop any residual load on the battery systems. Green LED is extinguished. SEA-Drive® system periodically checks that battery system charge remains at 100%. If remaining charge is detected as less than 100%, charging system restarts to charge SEA-Drive® batteries to 100%.
Unlit (When plugging in)	Cable is not properly connected. Check Cable connector is fully engaged in socket. Charge Cable is not turned on that the wall.
Unlit (After Charge Complete)	Vehicle will deactivate the LED's some time after charge has been completed. This is to prevent any power drain of the low voltage batteries.

Vehicle Charger Connection Socket (Type2)

LED Colour	Description
Red - Solid	**Fault Detected** – Charge system has detected a fault. Disconnect the charger from vehicle using the correct procedure. Contact SEA Electric 24/7 Support
Red - Flashing	**Standby Mode** - Charge cable is detected but no mains power is being supplied. Vehicle is setting up charge mode in this state and may take up to 5 seconds to engage
Green - Flashing	**Charge Mode** – Vehicle has engaged the charging circuits. Vehicle is using power from the wall to charge the high voltage batteries.
Green - Solid	**Charge Complete** – Vehicle charge cycle has been complete. The charge inlet LED will extinguish after some time Note: Once full charge is reached, the SEA Drive system automatically shuts down to stop any residual load on the battery systems. Green LED is extinguished. If SEA-Drive® system remains plugged in after completing charge, the SEA-Drive® charge circuits will periodically energize to battery cells further.
Unlit – Directly after plugging in	Cable is not detected, check the charge cord is properly connected to wall and power is switched on. Check the vehicle is not isolated by inspecting the RED Isolator Switch

NOTE: When the charging cable is plugged into the vehicle, the SEA-Drive® Electric vehicle will be unable to drive. Before attempting to drive, please disconnect the charging cable according to the following procedure.

Disconnecting the Charge Cable

- Once the charge cable is plugged into the charging socket, a safety lock is activated to prevent the cable dislodging.

- To unplug before full charge is reached (during charge), the ignition switch must be turned to ON. This will disconnect the charging circuits and unlock the charging cable from its socket.

- Note that the truck cannot be started while the charging cable is connected to the truck. Turning the ignition switch to ON will stop the charging process but the SEA-Drive® system will not power up until the charge cable is physically disconnected from the truck.

- If for any reason the charge socket will not disengage when the vehicle ignition is activated, the charge socket has an emergency release toggle on the rear. First, the vehicle isolator switch should be disconnected and removed from the vehicle to de-energise all power. The charge cord should also have power disconnected and cord removed from the wall connection. Next, gain access to the rear of the socket and change the red lock lever position to unlock (or pull the metal cable based on the socket model). The charge cord can then be released from the vehicle socket.

See Appendix A at the end of manual as SOP, showing Charging process of the SEA-Drive®.

Kwik Portable Charger

SEA-Drive® vehicle may be equipped with the Kwik portable charger as following details:

Kwik Portable Charger

Overview

The Kwik Portable EV Charger is used to charger the high voltage batteries of the SEA-Drive® System. The charger will provide feedback to the user on the charge status, charge current and even the total energy consumed.

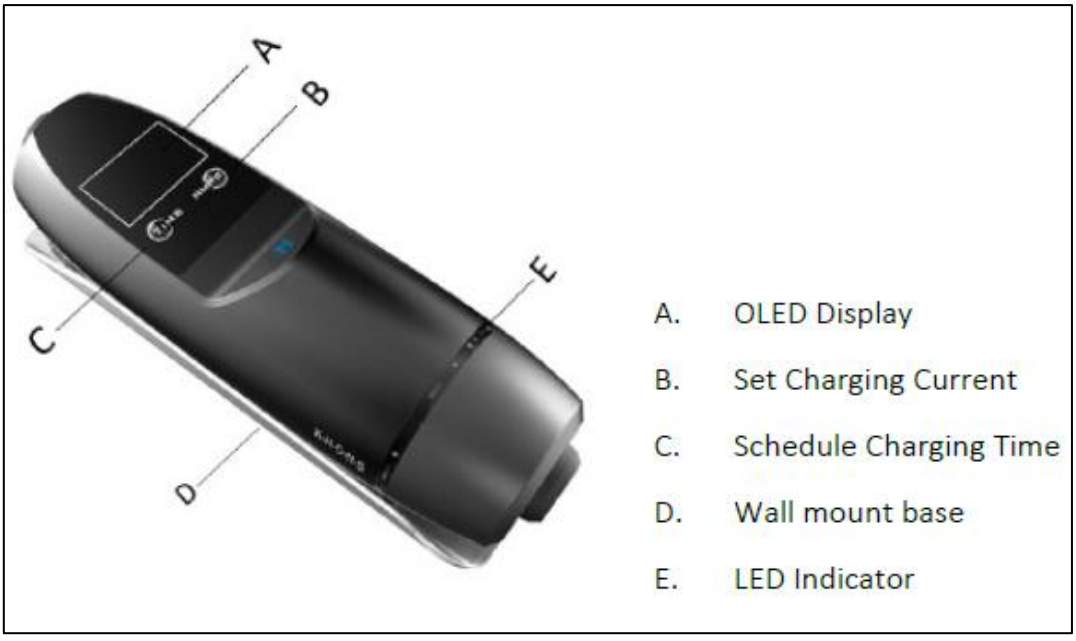
NOTE: The Kwik Portable EV Charger comes with a wall mount base. To ensure the integrity of the charger please ensure the Wall Mount Base is being used at all times. Your warranty will **NOT** be accepted if there is significant damage to the Charger.

Specification

- Input: 415v 6A-32A (3 Phase) AC
- Output: 415v 6A-32A (3 Phase) AC
- Charging Power 2.3 – 22kW (Variable through OLED display)
- Integrated RCD Type B (cost savings in the upstream installation & maximum electrical safety).
- IP Rating: IP65
- Meets Standard: IEC 62752
- CE Approved
- Operating Temperature: -25˚C to +50˚C

To use the EV Charger, plug the orange connector into a 5 pin, 32A wall socket (ensure power if off before plugging in anything). Once plugged in, screw the connector into place so it cannot be removed. Turn on the power to see the OLED display light up. Choose your charge settings and plug into the SEA-Drive® Charge Inlet.

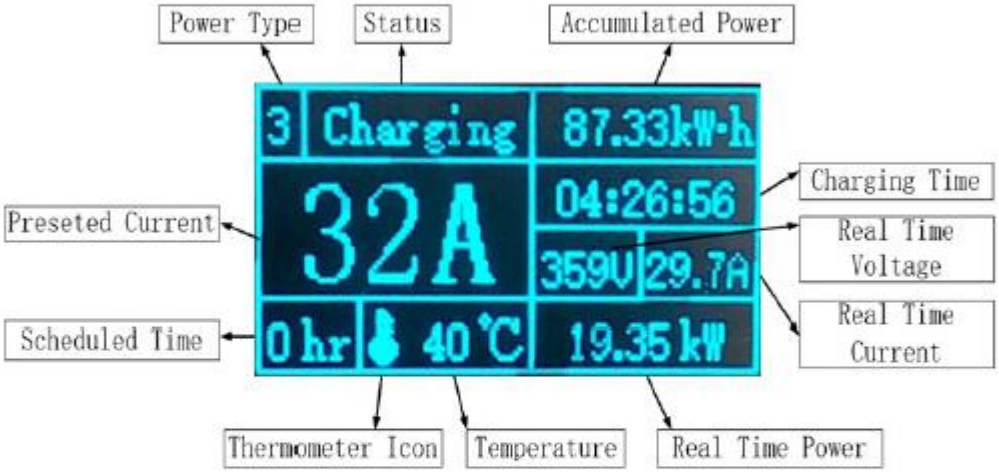
For more detailed instruction, refer to SEA Electric Charging operating procedure



Functions

AMPS Press "AMPS" button to set Charging Current

TIME Press "TIME" to schedule the charging Start Time (Max 6 hrs later)



Warning

1. Make sure the ground wire is available in your wall outlet
2. Do not use if EVSE, plug or cable is damaged
3. Only for charging the compatible electric vehicle
4. Monitor EVSE until OLED display status is "Charging"

Status

The following states show the correct working operating conditions of the EV Charger

Normal Working Status Chart					
"Status" Area	Status Description	"Scheduled Time" Area	Left button for "Time"	Right Button for "Amps"	LED Light Circle
Ready	Ready and not con-nect to EV yet	0-6	Available	Available	Blue light static
Connected	Connected with EV and not start charg-ing	0	Not available	Not available	Blue light slowly flashing
Waiting	Connected with EV and waiting for the	1-6	Not available	Not available	Blue light slowly flashing
Charging	Connected with EV and charging	0	Not available	Not available	Blue light running

Fault Codes

The following states show potential fault codes that may occur during operation. If for any reason the charger reports the Non-Automatic Recovery Fault States, contact SEA Electric 24/7 support

Automatic Recovery Faulty Status Chart				
"Preset Cur-	"Thermomet	LED Light Circle	"Status" Area	Status Description
Normal	Static bright	Red light fast flashing	Err128	CP Signal Faulty
Normal	Static bright	Red light fast flashing	Err112	CP Signal Faulty
Normal	Static bright	Red light fast flashing	Err082	CP Signal Faulty
Normal	Static bright	Red light fast flashing	Err052	CP Signal Faulty
6A	Flashing	Red light fast flashing	Waiting	The temperature of PCB above 85□
6A	Flashing	Normal	Normal	The temperature of PCB above 75□

Non-Automatic Recovery Faulty Status Chart		
LED Light Circle	Full Screen	Status
Red light fast flashing	Power Leak!!!Please Check!!!	Power leakage
Red light fast flashing	Over Current!!!Please Check!!!	Over-current

6- Pre-Start Checks

DO NOT attempt to drive if defects are found during this initial inspection.

Report any defect found to your supervisor/ manager.

Before attempting to drive the vehicle, ensure you know how to bring the vehicle to a controlled stop.

Before attempting to drive the vehicle, ensure that the charger cable is disconnected and stowed.

Before driving the vehicle, carry out the following service and safety checks:

- Take the vehicle off charge.
- Check the Battery Charge level in relation to the planned journey to ensure available adequate charge.
- Complete General vehicle checks:
- Lock and secure cab tilting locks at back of cabin.
- Compressor oil level check (air assist brake vehicles only)
- Power steering fluid check
- Coolant level check at the cooling reservoir
- Tail-lift stowed (if applicable)

7- Driving the Vehicle

1- Switch or leave the drive selector in the neutral position.
2- DO NOT depress the accelerator when attempting to start the vehicle.
3- Never Drive the vehicle with the park brake engaged.

Starting the SEA-Drive® Vehicle

Before attempting to power-up (start) the SEA-Drive® vehicle, please ensure that:

- Park brake must be on
- Drive selector must be in Neutral

- Turn the key from the "LOCK" to the "ON" position

Ignition Switch

- The dashboard indicator lamps will illuminate
- Drive Motor warning light is illuminated.
- Turn the key to the "START" position and hold for 1 second to power up the SEA-Drive® Electric Drive system.
- Let the key return to the "ON" position and the SEA-Drive® commences its power-up sequence:
- Power up sequence is complete in two to three (2-3) seconds.
- Drive Motor warning light extinguishes once powerup is successfully completed.

Driving the SEA-Drive® Vehicle

To drive the SEA-Drive® vehicle, select either Drive or Reverse from the Drive Selector.

Note:

- Brake pedal must be depressed, or the SEA-Drive® will not engage (selector will move).
  Release the parking brake and operate the vehicle using the accelerator and brake as for any other commercial vehicle.

Note:

- Neutral can be selected at any time by moving the selector lever. No foot on brake required.

Regenerative Braking

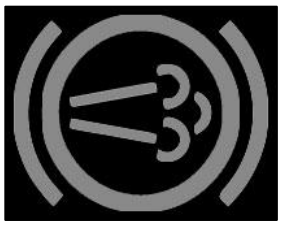
The SEA-Drive® vehicle is fitted with a regenerative braking system that operates automatically.

When driving the SEA-Drive® vehicle, if the driver releases the accelerator without touching the brake pedal, a gentle regenerative braking effort will be applied which slightly retards the forward progress of the vehicle.

Once the driver applies the brakes to slow the vehicle, a more aggressive regenerative braking effort is applied ensuring that maximum energy recovery is achieved for the vehicle.

The SEA-Drive® vehicle also makes uses of the exhaust brake/retarder stalk which can be found on the left side of the steering column (same side as the wiper function). By pulling the stalk down towards the driver, a heavy regenerative brake can be applied without the use of the brake pedal. A green light on the instrument cluster will illuminate when the regenerative brake stalk is active (see pictures below).

Exhaust Brake Active



Exhaust Brake Inactive

Note

Regenerative Braking is limited when the high voltage battery is fully charged.

The regenerative braking function cannot be disabled.

Accelerator & Brake Pedals

8- Parking the Vehicle

Connect the vehicle to a charging socket whenever the vehicle is not being used for extended periods.

- Park the vehicle in a safe suitable area.
- Engage park brake.
- Select "N" (neutral) gear with the drive mode selector
- Turn the ignition key to the "LOCK" position.
- Switch off all lights and radio, when safe to do so.

Park Brake location

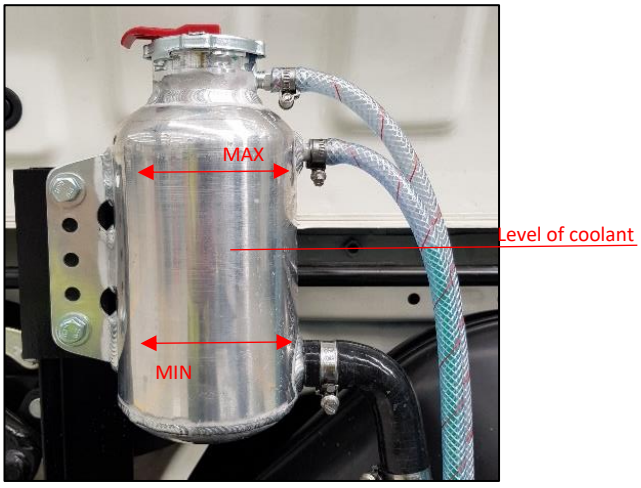
Note

Lights and radio will consume electric energy of the 24V system. The charge of the 24V system batteries should never be below 22V. If less than 22V, the vehicle may not start.

9- Maintenance

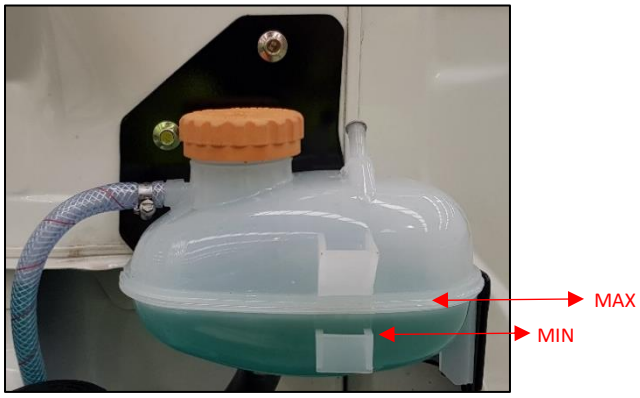
Weekly

- Motor / charger / inverter Coolant
  - Coolant check is completed by observing the coolant hose and cap at the left-hand rear of the truck cabin.
  - Coolant level Should be between MIN & MAX level and it is showed by the level of fluid in the braided hose pointed in the below figure.
  - Check that the coolant level for the drive system meets the "mid-level" as premium.
  - Top up if required with a 50/50 glycol pre-mix.



Coolant Reservoir

- Heater Reservoir
  - Heater fluid check is completed by observing the hose and cap at the right-hand rear of the truck cabin.
  - Fluid level Should be between MIN & MAX level of the reservoir in the below figure.
  - Check the cold level for the heating system meets right under the MAX level as premium.
  - Top up if required with a 50/50 glycol pre-mix.



Heater Reservoir

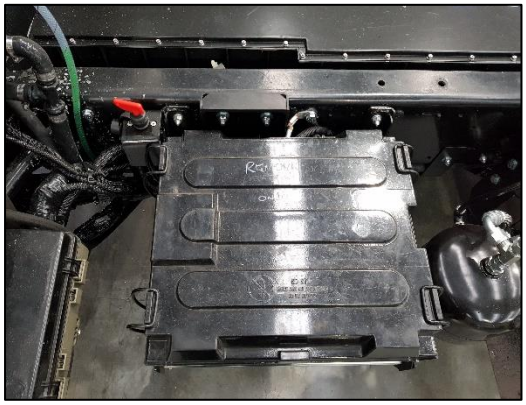
Monthly

- 24V batteries
- Visually check for loose connectors and corrosion.

- Traction batteries
- The Li-ION traction batteries need to be discharged to below 15% once a month, followed by a complete recharge
- This complete discharge / charge cycle will also help prolong the batteries.

Discharge the traction batteries to below 15% monthly, to prolong battery life.

Maintenance-free 24V Battery



Warning

➢ If the product status indicator is white and the Vehicle fails to start up, please stop using the battery and come to the dealer's shop for inspection.

◆Daily inspection

◆For safe use of battery for a long period, inspect the battery as specified below:

➢ Inspect status of battery;
- Inspect product status indicator (electric eye) and inspect the necessary items;
- Even the product status indicator is green (normal status), the Motor may fail to start up (end of battery service life), come to service shop to inspect.

➢ Inspect if the battery is clean;
- Inspect if the terminal is corroded; if so, use iron brush to remove the rust and apply anti-rusting agent.
- Inspect if the top cover of battery is covered by dust, foreign matter and leaked liquid; use wet cloth to remove them.
- Inspect if the air hole is blocked. If so, remove the foreign matter, but do not hurt the exhaust hole.
- Inspect if the tray is corroded. If so, disconnect the battery in specified order and then remove the foreign matters. Then install the battery on the truck. If the battery tray is seriously corroded, the electrolyte may flow out due to damaged battery or abnormal electric system; therefore, inspect if the electrical system is ok.
- If the air hole is blocked, the internal pressure increases and may explode due to gas produced inside the battery.
- Charge the battery where the air ventilation is good and be away from spark.
- Do not remove the connection clamp during charging, because it may cause spark and lead to explosion.
- Please check the charging voltage and battery voltage. Improper charging voltage may over charge the battery and even cause explosion.

Warning

- Do not use dry cloth to clean the battery, because it may produce static electricity and cause explosion.
- Connect the charger with the battery when the power supply is shut off, because it may produce spark and cause explosion.

Notices

- Connect positive pole of charger with positive terminal of battery and the negative pole with negative terminal of battery. Wrong connection may damage the battery.
- The electrolyte may eject from the air hole of battery in case of high charging current and long charging time, which may cause fire and cut short service life of battery.

➢ When is the battery is fully charged (conform to below conditions)

- It has reached the specified charging duration;
- The battery voltage has been detected for 1 hour and it will not increase any more.

➢ Avoid the battery from over discharging. Following condition may cut short service life of battery that cause failure of starting up the drive motor; therefore, users are required to follow below rules:

- Do not use the lights for a long time when the truck is OFF.
- Charge the battery (once per three months) in case the truck has to be shut down for a long period, with the isolator switch OFF.
  If the isolator switch is kept ON, the battery has to be charged once every 4 days.
- When the indicator of product status is dark, do not use the battery any longer. Inspect the battery and charge it.

Fuse Box (FB01)

The SEA-Drive® Fuse Box (FB01) includes miniature automotive fuses according to the position, identifiers and ratings below (shaded areas should be populated):

	A	B	C	D	E	F
1	F1		F11		F21	
2	F2		F12		F22	
3	F3		F13		F23	
4	F4		F14		F24	
5	F5		F15		F25	
6	F6		F16		F26	
7	F7		F17		F27	
8	F8		F18		F28	
9	F9		F19		F29	
10	F10		F20		F30	

SEA-Drive®, Fuse Box (FB01) Layout

Ident	Rating	Description
F1	10A	+24V MCU Unswitched Supply
F2	10A	+24V MCU Switched Supply
F3	15A	+24V Inverter Unswitched Supply
F4	15A	+24V LV DC/DC (+24V to +12V) Unswitched Supply
F6	10A	+24V Air Compressor Cooling Fan Supply
F7	5A	+24V VMU Unswitched Supply
F8	5A	+24V VMU Switched Supply
F13	20A	+24V Radiator Fan 1 Supply
F14	20A	+24V Radiator Fan 2 Supply
F16	10A	+24V BMS Unswitched Supply
F17	3A	+12V HV Heater Switched
F21	2A	+12V HVAC Switched
F22	2A	+12V HVAC Unswitched
F23	10A	+12V DC/DC Supply Output Unswitched
F24	10A	+12V DC/DC Supply Output Switched
F25	5A	+12V HV Charger Unswitched
F29	3A	+12V HVAC Wake-Up

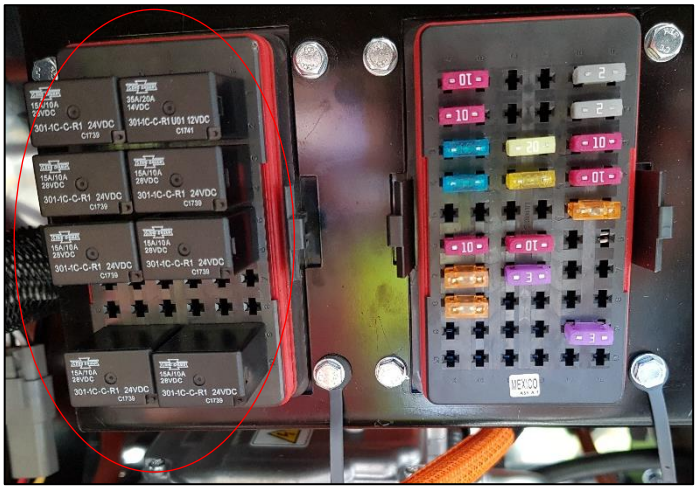
SEA-Drive®, Fuse Ratings and Descriptions

Relay Box (FB02)

The SEA-Drive® Relay Box (FB02) includes relays according to the position and part numbers below (shaded areas should be populated):

	A	B	C	D	E	F
1						
2		R1			R6	
3						
4		R2			R7	
5						
6		R3			R8	
7						
8		R4			R9	
9						
10		R5			R10	

SEA-Drive®, Relay Box (FB02) Layout



Ident	Coil	Part	Description
R1	24V	SEA 025	Reverse Lights
R2	24V	SEA 025	Inverter
R3	24V	SEA 025	Charge Mode for BMS
R5	24V	SEA 025	Pressure Relief Valve
R6	12V	SEA 026	+12V Switched Power, **Caution: 12V Coil**
R7	24V	SEA 025	Heater Pump
R8	24V	SEA 025	Vacuum Pump/Air Compressor Fan
R10	24V	SEA 025	Cooling Pump

SEA-Drive®, Relay Parts and Descriptions

10- Inspection and Service Scheduling

SEA-Drive ® *Scheduled Inspecton Intervals*		***Interval***		
		SE1	**SE2**	**SE3**
km	***Time***			
5,000	or 1 month after delivery (*Peace of mind inspection)*			
30,000	or 6 months after delivery (whichever comes first)	●		
60,000	or 6 months after previous inspection (whichever comes first)		●	
90,000	or 6 months after previous inspection (whichever comes first)	●		
120,000	or 6 months after previous inspection (whichever comes first)			●
150,000	or 6 months after previous inspection (whichever comes first)	●		
180,000	or 6 months after previous inspection (whichever comes first)		●	
210,000	or 6 months after previous inspection (whichever comes first)	●		
240,000	or 6 months after previous inspection (whichever comes first)			●
270,000	or 6 months after previous inspection (whichever comes first)	●		
300,000	or 6 months after previous inspection (whichever comes first)		●	
330,000	or 6 months after previous inspection (whichever comes first)	●		
360,000	or 6 months after previous inspection (whichever comes first)			●
390,000	or 6 months after previous inspection (whichever comes first)	●		
420,000	or 6 months after previous inspection (whichever comes first)		●	
450,000	or 6 months after previous inspection (whichever comes first)	●		
480,000	or 6 months after previous inspection (whichever comes first)			●
510,000	or 6 months after previous inspection (whichever comes first)	●		
540,000	or 6 months after previous inspection (whichever comes first)		●	
570,000	or 6 months after previous inspection (whichever comes first)	●		
600,000	or 6 months after previous inspection (whichever comes first)			●

SEA-Drive® *Scheduled Inspection Intervals*	
General Inspection	
Items to be carried out at every interval	
Fluid Levels	Check/top-up:
	Coolant reservoirs
	Power Steering Fluid
	Brake fluid (If Applicable)
	Brake pump fluid (If Applicable)
24v Lead Acid Batteries	Test battery & check terminal security
Low Voltage Wiring	Check condition of insulation
	Check for water ingress
Charge Port	Flap operation and socket condition
High Voltage Wiring	Check condition of high V cable insulation
	Check terminal security and locking clips
Functional Checks	
HVAC	Heater and A/C system operation
Road Test	Brake and booster performance
	ABS operation
Under Vehicle Checks	
Safety Checks	Inspect mounts for all critical components
	Brake line condition
	Battery pod surface condition
Tail Shaft	Lubricate tail shaft
General Checks	Power steering hose/fitting condition
	A/C Condenser & refrigerant hose condition
	Check cooling system for leaks
	Check coolant hose condition & clamp tension
(A)* Air Compressor	Replace air compressor oil, check for leaks
	Clean/replace compressor silencer and air filter
SE1	
The items below are to be combined with those listed under 'General Inspection'	
Power Steering	Replace hydraulic fluid in power steering system
(B)* Hydraulic Brake Booster	Replace Hydraulic Fluid
SE2	
The items below are to be combined with those listed under 'General Inspection'	
(C)* Brake Fluid	Replace brake fluid and bleed air from system
(A)* Air dryer	Replace air dryer desiccant cartridge
SE3	
The items below are to be combined with those listed under 'General Inspection'	
Cooling System	Replace coolant in primary cooling system and heater system
(C)*Brake Fluid	Replace brake fluid and bleed air from system
(A)* Air dryer	Replace air dryer desiccant cartridge
Legend	
(A) Applies to vehicles with air brakes only	
(B) Applies to vehicles with hydraulic brake booster only	
(C) Applies to vehicles with hydraulic brake booster and vacuum brake booster	

11- Trouble Shooting Guide

Caution:

Under no circumstances are users to carry out work on high voltage components. This must only be done by a SEA-Electric technician.

- The vehicle does not start

Fault diagnosis	Handling methods
12/24v start battery has gone flat	Charge or replace the battery
Isolator switch is in off position	Cycle switch and ensure it is firmly in the 'On' position
Ensure handbrake is on and brake pedal is depressed while attempting to start	If these conditions are met, contact SEA-Electric to arrange diagnostic

- Vehicle has derated (Become sluggish or accelerating poorly)

Fault diagnosis	Handling methods
The coolant level has dropped	Top up cooling system (Refer to section 9)
The radiator fans are not running	Check Low voltage fuse (as per diagram FB01). If fine, check connectors are ok.
The Cooling pump is not running	Check Relay is in correctly (as per diagram FB02) If fine, check connectors are ok.

- Poor braking performance

Fault diagnosis	Handling methods
Vacuum pump failure (For vacuum over hydraulic system only)	Ensure that vacuum pump is running when ignition is turned on Check fuse in FB01
Brake fluid level has dropped (For vacuum over hydraulic system only)	Top up brake fluid level. If OK, Contact SEA-Electric for diagnostic
Air compressor failure (For air brake system only)	Ensure that air filter on compressor is not blocked If OK, Contact SEA-Electric for diagnostic

- Brake deviation

Fault diagnosis	Handling methods
Tyre pressures are not uniform.	Adjust to specified pressure.
Tyre tread wear is uneven	Wheel alignment and tyre replacement required
Unbalanced load	Average the load.
The clearance between the brake drum and the brake shoes uneven.	Refer to OEM for adjustment

- The steering wheel operates heavily

Fault diagnosis	Handling methods
Load unbalanced toward front axle	Average the load.
The power steering fluid level is low	Top up power steering fluid.
Power steering pump is not operating.	Check Inverter Fuse (as per diagram FB01). Check Inverter Relay is located correctly (as per diagram FB02).
The front tire pressures are low.	Adjust to specified pressure.

- Excessive free play in steering

Fault diagnosis	Handling methods
Front tyre pressures are low	Adjust to specified pressure.
Free play in steering box	Refer to OEM for adjustment/replacement
Kingpin bearings are worn	Refer to OEM for replacement
Worn bushes in steering linkage	Refer to OEM for replacement
The ball joints or tie rods are worn.	Refer to OEM for replacement

- The auxiliary/low-voltage battery discharges repeatedly

Fault diagnosis	Handling methods
The battery has reached its service life.	Replace it.

12- Towing Procedure

The vehicle can be recovered by:

- Rear wheels raised and front wheels on the ground. **(Preferred method)**

  Caution
  Release the parking brake and shift the gearshift lever to neutral gear.

- Front wheels raised and rear wheels on the ground.

  Caution
  Ask tow operators to do one of the below methods for your vehicle.
  Alternative1: Disconnect Prop Shaft from diff or completely remove.
  Alternative2: Remove the drive shaft from the diff (Preferred method)
  Release the parking brake and shift the gearshift lever to neutral gear.

The maximum towing speed is 65km/h when the rear wheels are on the ground.

Warning:

Do not tow vehicle with driven wheels

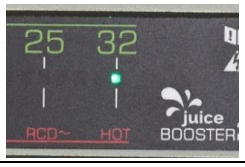
	**WARNING:** The vehicle will not have power steering when not powered up The vehicle will not have air brakes when not powered up

Appendix A: Charging Procedure

SEA-Drive® Charging Procedure					
SOP NO.	SOP-SD-001	**Rev**	1	**Page**	1 / 4
Model	SEA-Drive®	**Variation**	AS/NZ Trucks	**Issue Date**	Aug 2019
In order to ensure maximum efficiency is delivered by your SEA-Drive® system, it is highly recommended that batteries are placed on charge prior to depleting beyond 10% and that they charged to full state of charge.					

Phase	Step	Safe Operating Procedure		Note
		Photo	Instruction	
Charger Plug-in Process	1		Park the vehicle safely next to the charging point. Put the Gear Selector to "N" position and apply Park Brake, to prevent any potential movement.	The vehicle's charging inlet is located on the component box at the side of the vehicle.
	2		Turn the vehicle ignition OFF. Remove the key to secure the vehicle.	
	3		Prepare the charging cable for connection to 3 phase power supply outlet. The charging cable is supplied by SEA Electric as illustrated.	Inspect the charging cable for any damage prior to use: - Cut or chafing - Kinking or swelling issues - Exposed wiring - Damaged pins, plugs, caps - Signs of water intrusion - Signs of shorting
	4		Check that the wall plug is in the OFF position.	Wall plug specification must be: - 3-Phase - 5 pin - 32Amp
	5		Connect the charger (wall-side socket) to the wall plug.	
	6		Ensure that the wall socket is safely locked into the wall plug by rotating the orange locking mechanism.	A clockwise rotation will lock the socket into the plug.

SEA-Drive® Charging Procedure					
SOP NO.	SOP-SD-001	**Rev**	1	**Page**	2 / 4
Model	SEA-Drive®	**Variation**	AS/NZ Trucks	**Issue Date**	Aug 2019

Phase	Step	Safe Operating Procedure		Note
		Photo	Instruction	
Charging Process	7		Turn the wall plug ON.	
	8	 	Once powered ON, check that the juice booster charger is operational by confirming the Green LED is solid below the 32 ampere indicator.	
	9	 	Open the charging inlet flap on the component box. Located at the component box found on the side of the vehicle.	On opening the vehicle charging cap, look for dirt, debris and foreign objects. Clean before connection if needed. NOTE: Charger on the truck component box is never live, just for power input and will not output power.
	10	 	Remove the cap and plug the charging connector (Vehicle-side socket) to the charging inlet. This will lock automatically.	The vehicle side socket will light up RED for 3-5 seconds before it turns YELLOW to indicate charging has commenced.
	11		Confirm that the LED found at the vehicle side socket lights up YELLOW. This shows that the charging process in now underway.	LED colour may be yellow or light green.
	12		Once the charging cycle has been completed and the battery is fully charged (100%), the LED at the vehicle side socket will turn solid GREEN.	Once full charge is reached, the SEA Drive system automatically shuts down to stop any residual load on the battery systems.

SEA-Drive® Charging Procedure

SOP NO.	SOP-SD-001	Rev	1	Page	3 / 4
Model	SEA-Drive®	Variation	AS/NZ Trucks	Issue Date	Aug 2019

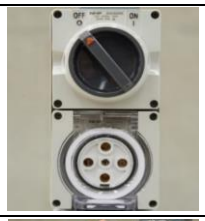
Phase	Step	Safe Operating Procedure		Note
		Photo	Instruction	
Charger unplugging	13		When fully charged, the socket at the vehicle side will automatically release.	If the charging process needs to be interrupted prior to the battery reaching 100% full state, simply turn the ignition key to the ON position and the socket will be released automatically.
	14		Remove the socket from charging inlet of the vehicle.	**IMPORTANT:** The vehicle cannot be started while charging. It means the vehicle physically unable to move until the EVSE (Electric Vehicle Supply Equipment) is completely removed.
	Caution	 Lock  Unlock	In the event of a charging fault and to release the vehicle plug from the vehicle inlet, open the component box and turn the vehicle socket pin to the unlock position. This will then allow you to release the plug from the vehicle.	**WARNING:** Ensure that the wall charger switch is OFF. Failure to do so may result in death or serious injury.
	15		Turn the power OFF at the 3 phase power supply.	
	16	 	Unscrew and remove the socket and charging connector from the 3 phase power supply.	
	17	 Store in the original bag within the cab  OR - in a plastic sealed container	Pack and store the charging connector kit safely in order to reduce the risk of damage. It is recommended to store in a dry place.	

SEA-Drive® Charging Procedure					
SOP NO.	SOP-SD-001	**Rev**	1	**Page**	4 / 4
Model	SEA-Drive®	**Variation**	AS/NZ Trucks	**Issue Date**	Aug 2019

Phase	Colour	Safe Operating Procedure		Note
		Photo	Status	
LED Colour	**Red**		Cable is connected but no mains power supply detected.	Check Mains Power Supply availability and circuits.
	Yellow		Cable is connected.	Vehicle is charging.
	Green		Cable is connected.	Batteries are fully charged.
	Unlit		Cable is not properly connected.	Check that the cable connector is fully engaged in the vehicle side socket.

Charging Procedure (Two-LED Function)

SEA-Drive® Charging Procedure (Two-LED Function)					
SOP NO.	SOP-SD-006	**Rev**	0	**Page**	1 / 4
Model	SEA-Drive®	**Variation**	AS/NZ Trucks	**Issue Date**	Apr 2020
In order to ensure maximum efficiency is delivered by your SEA-Drive® system, it is highly recommended that batteries are placed on charge prior to depleting beyond 10% and that they charged to full state of charge.					

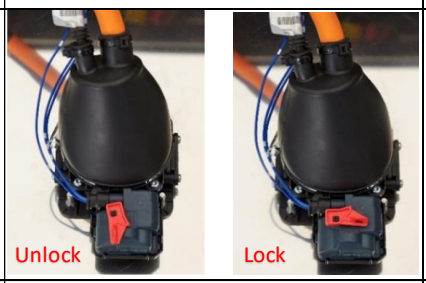
Phase	Step	Safe Operating Procedure		Note
		Photo	Instruction	
Charger Plug-in Process	1		Park the vehicle safely next to the charging point. Put the Gear Selector to "N" position and apply Park Brake, to prevent any potential movement.	The vehicle's charging inlet is located on the component box at the side of the vehicle.
	2		Turn the vehicle ignition OFF. Remove the key to secure the vehicle.	
	3		Prepare the EVSE (Electric Vehicle Supply Equipment) for connection to 3 phase power supply outlet. The EVSE is supplied by SEA Electric as illustrated.	Inspect the charging cable for any damage prior to use: - Cut or chafing - Kinking or swelling issues - Exposed wiring - Damaged pins, plugs, caps - Signs of water intrusion - Signs of shorting
	4		Check that the wall plug is in the OFF position.	Wall plug specification must be: - 3-Phase - 5 pin - 32Amp
	5		Connect the charger (wall-side socket) to the wall plug.	
	6		Ensure that the wall socket is safely locked into the wall plug by rotating the orange locking mechanism.	A clockwise rotation will lock the socket into the plug.
	7		Turn the wall plug ON.	

SEA-Drive® Charging Procedure (Two-LED Function)					
SOP NO.	SOP-SD-006	**Rev**	0	**Page**	2/ 4
Model	SEA-Drive®	**Variation**	AS/NZ Trucks	**Issue Date**	Apr 2020

Phase	Step	Safe Operating Procedure		Note
		Photo	Instruction	
Charging Process	8		Once powered ON, check the EVSE is operational by confirming set to 32 amperes.	
	9		Open the charging inlet flap on the component box. Located at the component box found on the side of the vehicle.	On opening the vehicle charging cap, look for dirt, debris and foreign objects. Clean before connection if needed. NOTE: Charger on the truck component box is never live, just for power input and will not output power.
	10		Remove the cap and plug the charging connector (Vehicle-side socket) to the charging inlet. This will lock automatically.	The vehicle side socket will light up White on the left LED for 1-2 seconds before it turns Flashing Green to indicate charging has commenced.
	11		Confirm that the right LED found at the vehicle side socket lights up Flashing Green. This shows that the charging process in now underway.	
	12		Once the charging cycle has been completed and the battery is fully charged (100%), the right LED at the vehicle side socket will turn to solid GREEN.	Once full charge is reached, the SEA Drive system automatically shuts down to stop any residual load on the battery system.
	13		After the charging process completed (fully charged 100%), the both LED's at the vehicle side socket will turn to Unlit in 5-10 seconds.	LEDs are deactivated to prevent drain on low voltage system.

SEA-Drive® Charging Procedure (Two-LED Function)

SOP NO.	SOP-SD-006	Rev	0	Page	3 / 4
Model	SEA-Drive®	Variation	AS/NZ Trucks	Issue Date	Apr 2020

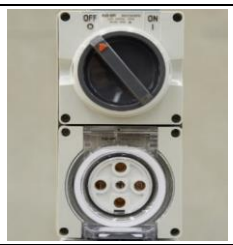
Phase	Step	Safe Operating Procedure		Note
		Photo	Instruction	
Charger unplugging	14		When fully charged, the socket at the vehicle side will automatically release.	If the charging process needs to be interrupted prior to the battery reaching 100% full state, simply turn the ignition key to the ON position and the socket will be released automatically.
	15		Remove the charging cable from the socket at vehicle side.	**IMPORTANT:** The vehicle cannot be started while charging. It means the vehicle physically unable to move until the EVSE is completely removed.
	Caution		In the event of a charging fault and to release the vehicle plug from the vehicle inlet, open the component box and turn the vehicle socket pin to the unlock position. This will then allow you to release the plug from the vehicle.	**WARNING:** Ensure that the wall charger switch is OFF. Failure to do so may result in death or serious injury.
	16		Turn the power OFF at the 3-phase power supply.	
	17		Unscrew and remove the charging connector from the 3-phase power supply.	
	18		Pack and store the EVSE safely in order to reduce the risk of damage. It is recommended to store in a dry place.	Store in the original bag within the cab or a sealed container.

SEA-Drive® Charging Procedure (Two-LED Function)					
SOP NO.	SOP-SD-006	**Rev**	0	**Page**	4/ 4
Model	SEA-Drive®	**Variation**	AS/NZ Trucks	**Issue Date**	Apr 2020

LED Colour				
Left	**Right**	**Safe Operating Procedure**		**Note**
		Photo	**Status**	
White	**Unlit**		Cable is connected but no mains power supply detected. (It will turn to White-Red after 2 seconds which shows an error)	Check Mains Power Supply availability and circuits.
White	**Red**		Cable is connected but no mains power supply detected. (It will turn to Unlit-Red after 5-10 seconds which shows an error)	Check Mains Power Supply availability and circuits.
Unlit	**Red**		Cable is connected but no mains power supply detected. (It may turn to Unlit-Unlit after some time)	Check Mains Power Supply availability and circuits.
White	**Flash Green**		Cable is connected.	Vehicle is charging.
White	**Green**		Cable is connected.	Batteries are fully charged.
Unlit	**Unlit**		Cable is not properly connected.	Check that the cable connector is fully engaged in the vehicle side socket.
			After charge complete: Both LED's turn to Unlit to prevent any power drain of the LV batteries.	Remove the cable from the vehicle side socket.

Charging Procedure (Alternate Mounting)

SEA-Drive® Charging Procedure (Alternate Mounting)					
SOP NO.	SOP-SD-004	**Rev**	0	**Page**	1 / 4
Model	SEA-Drive®	**Variation**	AS/NZ Trucks	**Issue Date**	Sep-19
In order to ensure maximum efficiency is delivered by your SEA-Drive® system, it is highly recommended that batteries are placed on charge prior to depleting beyond 10% and that they charged to full state of charge.					

Phase	Step	Safe Operating Procedure		Note
		Photo	Instruction	
Charger Plug-in Process	1		Park the vehicle safely next to the charging point. Put the Gear Selector to "N" position and apply Park Brake, to prevent any potential movement.	The vehicle's charging inlet location may vary. If you are unsure of your vehicle charging inlet. Contact SEA Electric
	2		Turn the vehicle ignition OFF. Remove the key to secure the vehicle.	
	3		Prepare the charging cable for connection to 3 phase power supply outlet. The charging cable supplied by SEA Electric may vary.	Inspect the charging cable for any damage prior to use: - Cut or chafing - Kinking or swelling issues - Exposed wiring - Damaged pins, plugs, caps - Signs of water intrusion - Signs of shorting
	4		Check that the wall plug is in the OFF position.	Wall plug specification must be: - 3-Phase - 5 pin - 32Amp
	5		Connect the charger (wall-side socket) to the wall plug.	
	6		Ensure that the wall socket is safely locked into the wall plug by rotating the orange locking mechanism.	A clockwise rotation will lock the socket into the plug.

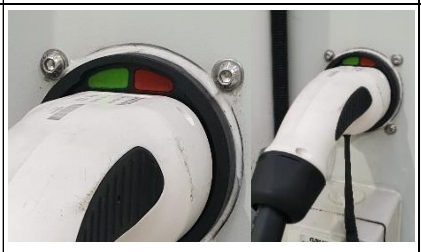
SEA-Drive® Charging Procedure (Alternate Mounting)					
SOP NO.	SOP-SD-004	**Rev**	0	**Page**	2 / 4
Model	SEA-Drive®	**Variation**	AS/NZ Trucks	**Issue Date**	Sep-19

Phase	Step	Safe Operating Procedure		Note
		Photo	Instruction	
Charging Process	7		Turn the wall plug ON.	
	8	 	Once powered ON, check that the in-cord charger is operational by confirming the charging speed is set to 32A	For correct operation of the in cord charging device and selecting charge speed, please refer to the equipment operational manual
	9	 	Remove the charging inlet cover by rotating the cap to the left until the handle is vertical	On opening the vehicle charging cap, look for dirt, debris and foreign objects. Clean before connection if needed. NOTE: Charger on the truck component box is never live, just for power input and will not output power.
	10	 	Remove the cap and plug the charging connector (Vehicle-side socket) to the charging inlet. This will lock automatically.	The vehicle socket will light up RED (Right) for 3-5 seconds before the GREEN LED (left) begins flashing to indicate charging has commenced.
	11		Confirm that the LED found at the vehicle socket is pulsing GREEN every 2 seconds. This shows that the charging process in now underway.	Only flashing indicates charging is working. If the LED is solid GREEN or Unlit, refer to your owners manual
	12		Once the charging cycle has been completed and the battery is fully charged (100%), the LED at the vehicle side socket will turn solid GREEN.	Once full charge is reached, the SEA Drive system automatically shuts down to stop any residual load on the battery systems.

SEA-Drive® Charging Procedure (Alternate Mounting)					
SOP NO.	SOP-SD-004	**Rev**	0	**Page**	3 / 4
Model	SEA-Drive®	**Variation**	AS/NZ Trucks	**Issue Date**	Sep-19

Phase	Step	Safe Operating Procedure		Note
		Photo	Instruction	
Charger unplugging	13		When fully charged, the socket at the vehicle side will automatically release.	If the charging process needs to be interrupted prior to the battery reaching 100% full state, simply turn the ignition key to the ON position and the socket will be released automatically.
	14		Remove the socket from charging inlet of the vehicle.	**IMPORTANT:** The vehicle cannot be started while charging. It means the vehicle physically unable to move until the EVSE (Electric Vehicle Supply Equipment) is completely removed.
	Caution		In the event of an emergency and to release the vehicle plug from the vehicle inlet, locate the release cable to the unlock position. This will then allow you to release the plug from the vehicle.	**WARNING:** Ensure that the wall charger switch is OFF. Failure to do so may result in death or serious injury.
	15		Turn the power OFF at the 3 phase power supply.	
	16		Unscrew and remove the socket and charging connector from the 3 phase power supply.	
	17	 Store in the original bag within the cab  OR - in a plastic sealed container	Pack and store the charging connector kit safely in order to reduce the risk of damage. It is recommended to store in a dry place.	

SEA-Drive® Charging Procedure (Alternate Mounting)					
SOP NO.	SOP-SD-004	**Rev**	0	**Page**	4 / 4
Model	SEA-Drive®	**Variation**	AS/NZ Trucks	**Issue Date**	Sep-19

Phase	Colour	Safe Operating Procedure		Note
		Photo	Status	
LED Colour	**Solid Red**		Cable is connected but no mains power supply applied. System fault occurred	Contact SEA Electric
	Flashing Red		Cable is connected, mains power not yet applied. System initializing	Vehicle is charging.
	Flashing Green		Cable is connected.	Vehicle is charging.
	Solid Green		Cable is connected.	Batteries are fully charged.
	Unlit		Cable is not properly connected.	Check that the cable connector is fully engaged in the vehicle side socket.

Appendix B: Wall Charger Specs

Wall Charger Specs

- Input Current

400V 6-32A 3-phase AC

Wall Inlet				
Switching Poles	Voltage Rating	AC 23 Rating	Rated Current	Number of Pins
3*	500	20	20	5
3*	500	32	32	5

32A, 3phase, 5 pin Wall Switch

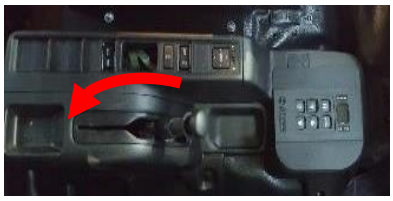
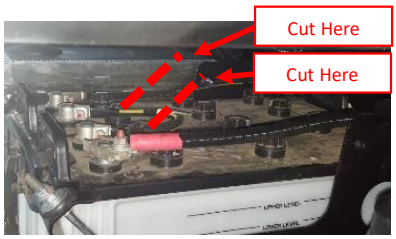
20A 3phase 5 pin Wall Switch

Wall Plug	
Matching Plug Straight	Matching Plug Angle
ISOPS520P	ISOPA520P
ISOPS532P	ISOPA532P

*Refer to AS/NZS3000:2018 for wall inlet cable sizing and safety equipment
*Refer to New Zealand Worksafe Guidelines for safe electric vehicle charging

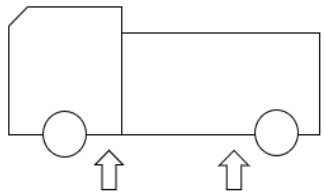
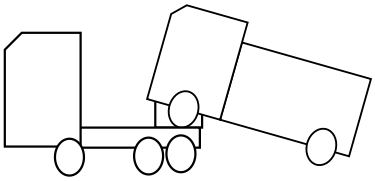
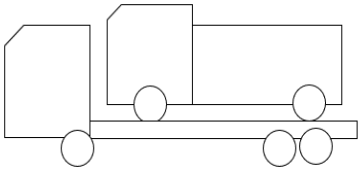
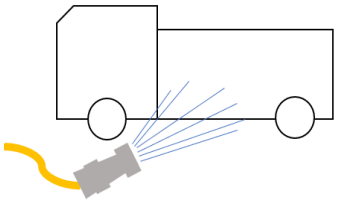
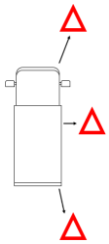
https://worksafe.govt.nz/laws-and-regulations/regulations/electrical-regulations/regulatory-guidance-notes/electric-vehicle-charging-safety-guidelines/

Appendix C: Emergency Quick Response

SEA-Drive® Emergency Quick Response Reference				
WARNING **This is an electric vehicle; high voltage cable is identified by orange insulation or orange sheath.** **Do not cut though these cables as that could result in severe injury, major physical damage or death.**				
Background	This is a quick response sheet to be used in case where the vehicle has been in a crash or damaged and can not be safely moved on its own power.			
Phase	**Step**	**Safe Operating Instruction**		**Note**
		Photo	**Instruction**	
Power Down	**1**		Engage the hand brakes and put the vehicle in Neutral.	
	2		Turn the vehicle ignition OFF. Remove the key to secure the vehicle.	
Battery Disconnect	**3**		To disconnect the grounded low voltage battery, cut the cable between both the 12 voltage batteries on the side of the vehicle. If time allows this cable can be removed by loosening bolts with a spanner and removing by hand.	
	4		NOTE: The isolation switch only isolates power to the VMU which is used to restart the system. In an emergency do not rely on this switch to disconnect power to all systems.	
High Voltage Disconnect	**5**		Manual service disconnect can be found on all generation 4 battery pods, on older models this may be missing. In this case, removal of the 12/24V battery should open the high voltage connectors.	Only remove the manual service disconnect if step 1 and 2 have been done, and wait 5 sec after step 2 before removing.

SEA-Drive® Emergency Quick Response Reference

WARNING
This is an electric vehicle; high voltage cable is identified by orange insulation or orange sheath.
Do not cut though these cables as that could result in severe injury, major physical damage or death.

Phase	Step	Safe Operating Instruction		Note
		Photo	Instruction	
Jacking point	6		Refer to vehicles cab chassis owner's manual	
Towing	7a		Front wheels raised and rear wheels on the ground. Disconnect Prop Shaft from differential or motor or completely remove.	The maximum towing speed is 65km/h when the rear wheels are on the ground.
	7b		Else place vehicle onto a flat bed tow truck.	
Firefighting	8		Use water to fight a high voltage battery pack fire. Continuously use large amount of water on high voltage battery pack until, no heat can been seen coming from the battery pack with a thermal camara. There should be no heat, fire or smoke present in the battery or vehicle for at least an hour after.	Battery can reignite after smoke, fire and heat is gone. Always ensure that persons handling the battery are informed about this.
Warnings and Notes	9		Warning triangle - always ensure that you have placed warning triangles infront, behid and on the side of the vehicle to warn other road users.	Alway follow the national or local laws and regulations when being a first or second responder.
	NOTE	If possible, always try to stop the vehicle away from other vehicles, people and dangers.		