

Seldén hydraulic system

12 or 24 volts on board?

For boats with hydraulic rig systems Seldén recommends 24 volt DC on board. The prime reason for this is that reefing large sails calls for big effect.

For example:

A hydraulic pump for a 40 to 50-foot sailing boat has a 3-kilowatt electric motor.

$$P = U \times I$$

P = wattage (watt)

U = voltage (volt)

I = current intensity (ampere)

When the wattage $P = 3 \text{ kW} (= 3,000\text{W})$ then:

I = 250 amperes when U = 12 volts.

I = 125 amperes when U = 24 volts.

Current is thus twice as much for a given wattage in a 12-volt system compared to one of 24 volts.

High current on board is a safety risk. It is therefore most important that installation is carried out by a trained technician.

The advantages of 24 volts compared to 12 volts

1. Greater safety.
2. Thinner cables.
3. Considerably lower power loss through possible poor connections.
4. The electric motor for the hydraulics, starter motor, and engine generator have higher efficiency, better effect, and permits longer operating periods.
5. Less brush wear for less maintenance and service.
6. Lower sensitivity to voltage drop.
7. Refrigerators, water pumps, heat exchangers, chargers, and other effect consuming equipment are usually available for 24 volts.

Disadvantages

1. 24 volt starter motors and generators are not usually standard on smaller diesel engines despite the advantages listed above.
2. Instruments and similar equipment are often only available for 12 volts. These require only small effects, and the solution is a 24/12 volts DC converter to serve the 12 volt net work on board.

NB: one should not take out 12V from only one of the 12V batteries that a 24V system is composed of, as this would entail uneven loading of the batteries.

Batteries

12 or 24 volts do not mean any difference in the size of the batteries on board as the energy requirements are the same.