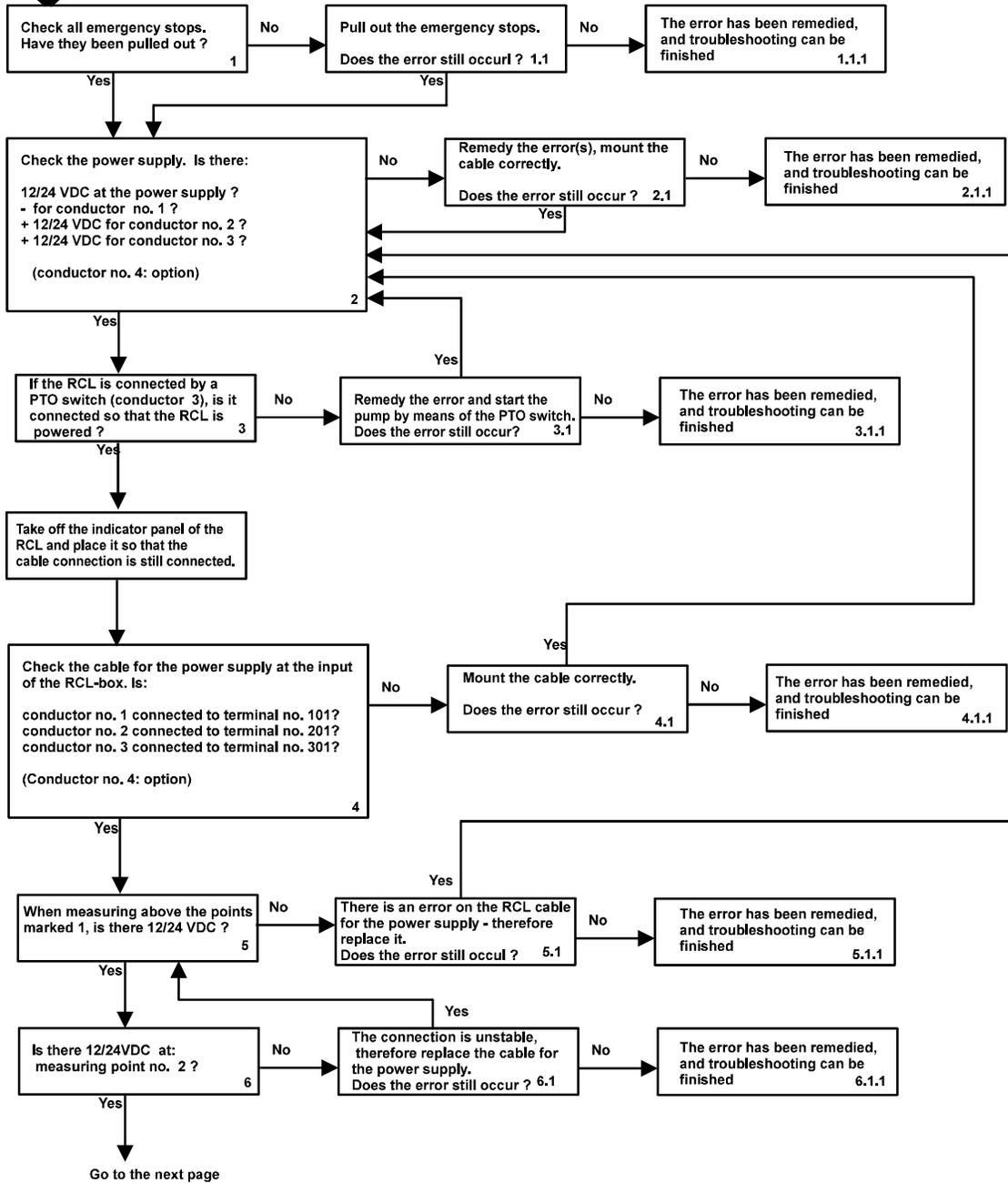


START


13. Troubleshooting - Scanreco-IRC

The troubleshooting process comprises the following error types:

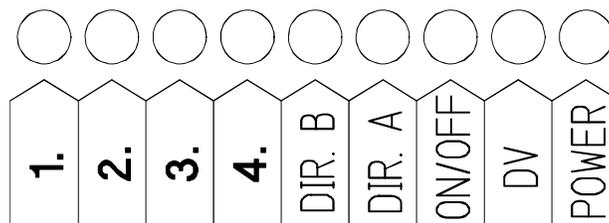
1. The IRC-system does not start up
2. The IRC-system works, but the loader does not
3. The IRC-system falls out during operation (loader stop)
4. One or more of the loader functions fall periodically out
5. The IRC-system operates by itself (uncontrolled command)

When troubleshooting the individual items, the process should be followed in the right order. So, after having troubleshot one item without finding any error and if the IRC-system still does not work, troubleshoot the next item.

1. The IRC-system does not start up

- 1.1 Are all stop buttons pulled out (RCL, ECT, IRC-remote control box)?
- 1.2 Is the POWER-diode lit on the electronic box? If not:
 - 1.2.1 Check if the terminals K208 (RCL 5100) or K215 (RCL 5200) and K32 show a voltage in the power box (EJB 5080).
 - 1.2.2 Are the fuses + (plus) and ÷ (minus) of the electronic box intact?
 - 1.2.3 Remove the EX-cable from the electronic box ON/OFF socket.
 - 1.2.4 Remove the cables (sockets) from the PVG 32 electric activations one by one.
 - 1.2.5 Check the socket and the cables to the PVG 32 electric activations for errors.
- 1.3 Check the diodes on the electronic box according to the table on next page:

Diodes on the electric box





Flashing diodes (repeated sequency)	Type of error	Remedy
1. - pause - 2.	Overload/short circuit in an ON/OFF output	Dismantle the ON/OFF outputs to the engine control one by one, until the indication of error stops. Check the wire/socket for faults or moisture.
1. - pause - 2. and 4.	Overload/short circuit in the wire connection from the dump valve output (DV) in the electronic box to the RCL controller	Check the wire security signal (cable DV) according to item 1.7.5
1. - pause - 2. and 3.	Overload/short circuit in an electric activation on the control valve or in the wire connection/socket-outlet and plug for the electric activation	Remove the sockets one by one on the electric activations, until the indication of error stops. Check the wire/socket for faults or moisture.
1. - pause -3. and 4.	Overload/short circuit in the regulation signal from the electronic box to an electric activation on the control valve	Remove the sockets one by one on the electric activations, until the indication of error stops. Check the wire/socket for faults or moisture
1. - pause - 2., 3. and 4.	Wrong voltage from the RCL to the dump valve output (DV) in the electronic box	When the wire security system (EX conductor 1 in the DV wire) is dismantled at the K23 terminal in the power box, this terminal should be free of any voltage.
1. - pause -4.	Check sum error	Contact your HMF importer
4. - pause - 2	Incorrect or missing ID-code (the remote control box has been mixed up with another one)	Transfer a new ID-code from the remote control box to the electronic box. See item 1.6.2

Other indication of the diode	Type of error	Remedy
The diode 1 flashes or is constantly lit	There is no contact to the microprocessor in the electronic box	The electronic box is defective.
The diode POWER is constantly lit and the diode 4 flashes	There is no radio connection	Troubleshoot following the items 1.5 and 1.6

1.4 Check the diodes on the electronic box according to the table. When the IRC-system works correctly, the diodes indicate the following:

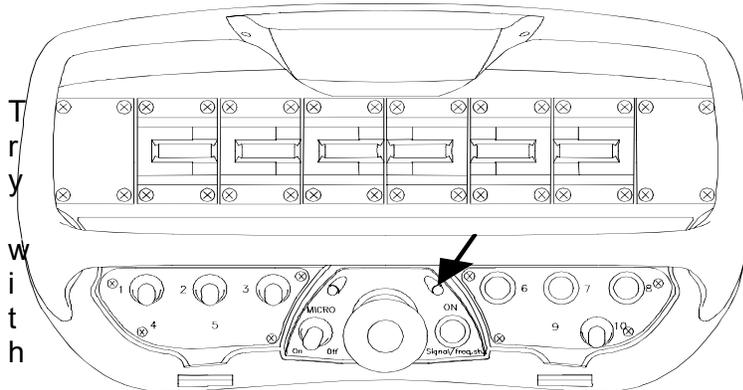
Radio remote control		Cable remote control	
Diode	Colour	Diode	Colour
POWER	Green	POWER	Green
DV	Red	DV	Red
3.	Red	4.	Yellow
2.	Green	3.	Red
		2.	Green

1.5 POWER is lit and 4 flashes (without cable)

1.5.1 Is the IRC-system started up on the remote control box?

1.5.2 Is the battery charged (the red diode on the remote control box should be lit and not flash)?

1.5.3 Try
with



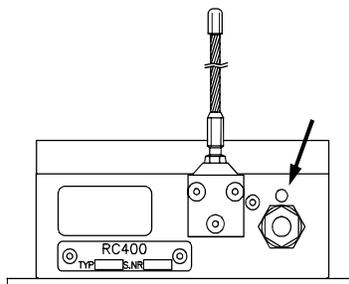
a new charged battery. Even if a normal voltage of 7.2 volts is measured on the battery, it may not have the sufficient capacity.

1.5.4 Check the connection of the battery: it should be inserted against the springs, and the springs should not be bent. Check the same on the battery charger.

1.5.5 Does the IRC-system work with cable?

1.6 The IRC-system works with cable, but there is no radio signal

1.6.1 Is the green diode of the radio receiver lit? If not, check the wire and socket connection to the electronic box.

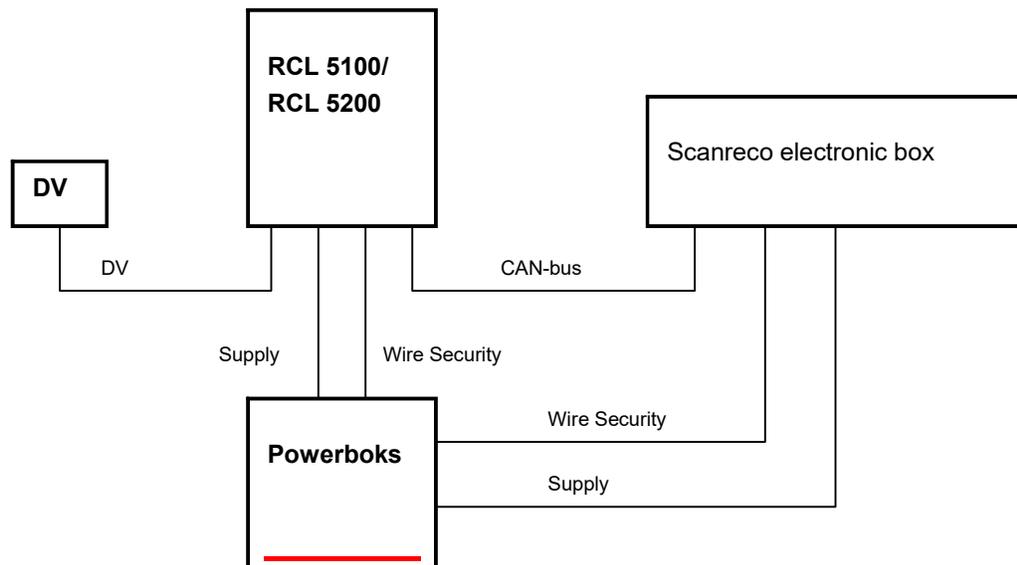


1.6.2 Try to transfer a new ID-code from the remote control box to the electronic box according to the following procedure: Remove the battery, press/pull all stop buttons, keep the start button ON down for about 10 sec. Brief signals from the buzzer indicate that the ID-code is read. Remove the cable, insert the battery and try to activate the loader with the radio remote control.

- 1.6.3 Check if the IRC-system works with another identical remote control box (remember to transfer the ID-code).
- 1.6.4 Check that a battery voltage of 7.2 volts is applied to the printed card.
- 1.6.5 Mount a new electronic circuit card in the remote control box (remember to transfer the ID-code).
- 1.6.6 Mount a new printed card in the remote control box. The buzzer beeping 10 times indicates such types of errors on the printed card.

1.7 The IRC-system does not work with cable

- 1.7.1 The levers of the remote control box should be in neutral position, otherwise the IRC-system will not start up. If a lever is a little bit out of neutral position (e.g. because of a defective lever or dirt in the swivel joint) when you try to start the system, the buzzer signals the error. If the first lever from the left is out of neutral position, the buzzer beeps once during start-up. If the second lever from the left is out of neutral position, the buzzer beeps twice during start-up, etc.
- 1.7.2 The remote control box should be in **test mode** when you troubleshoot the levers. Press/pull the stop button and push the start button ON 10 times quickly. The red diode flashes quickly, which indicates that the remote control box is in test mode. The buzzer signals each activation of the levers. The more the lever is activated, the quicker the buzzer beeps. If the buzzer does not indicate the activation of a lever normally, the lever, the pins of the lever, or the printed card is defective. To test a defective lever, just switch with an intact lever. Press/pull the stop button to set the remote control box back in **normal mode**.
- 1.7.3 While starting the IRC-system up from the remote control box, the following communication between the RCL-controller, the power box, the electronic box and the dump valve takes place.





- a) When all stop buttons are pulled out, the power box and the electronic box are powered (supply).
 - b) Press the start button ON on the remote control box.
 - c) When the green button on the remote control box is pushed, the CAN-bus communication starts between the RCL and the electronic box (both directions). When the CAN-bus signals are acknowledged in the RCL and in the electronic box, the electronic box sends a wire security signal (system voltage) to the RCL, and the DV diode is lit on the electronic box.
 - d) When a lever is activated on the remote control box, CAN-bus signals indicating the activation (spool sensing) are sent from the remote control box to the RCL. A system voltage is sent from the RCL to the dump valve (DV), which closes itself and activates the corresponding loader function.
- 1.7.4 Check the CAN-bus signal (see description under 1.7.3) between the RCL and the electronic box. It should be possible to read the same voltage – about 2.5 volts, depending on the signal intensity – between CAN-high and minus and between CAN-low and minus. Furthermore, it should be possible to measure 120 ohm (plus or minus 5 ohm) between the CAN-high and CAN-low signals. If not, there is an error in the electronic box.
- 1.7.5 Check the wire security signal (cable DV) between the electronic box, the power box and the RCL. Remove the wire security cable from the terminal K23 in the power box. If it is not possible to measure a system voltage on the removed cable, the electronic box is defective. If the wire security cable shows a system voltage, remount it on the terminal K23. Read the voltage on terminals K23A and K30B (in RCL 5100) or K316 (in RCL 5200).
- 1.7.6 Troubleshoot the RCL-components. Check the buttons of the RCL or ECT 5020 indicator panel with the ECT 5050 service terminal. If a press button is activated, the IRC-system will not start up. Test the system with a new RCL indicator panel.

2. The IRC-system works, but the loader does not

When the IRC-system is working, the POWER, 2, 3 and DV diodes should be constantly lit, as well as DIR.A or DIR.B when a lever is activated on the remote control box.

- 2.1 The mechanical levers of the PVG 32 control valve are moving.
 - 2.1.1 If the RUN diode and the RCL indicator panel flash, troubleshoot the RCL-system.
 - 2.1.2 If the loader works when the button on the dump valve is manually pressed, troubleshoot the dump valve.
 - 2.1.3 Is there a system voltage in the socket to the dump valve?
 - 2.1.4 Check the solenoid of the dump valve. The ohmic resistance should be 35-37 ohm in a 26 volt solenoid, and 10-12 ohm in a 12 volt solenoid.
 - 2.1.5 If the dump valve has got a shock, the cartridge might be bent, and does consequently not retain the oil pressure completely.

- 2.2 The mechanical levers of the PVG 32 control valve are not moving.
 - 2.2.1 If the loader does not work with the manual levers of the PVG 32 control valve (emergency operation), troubleshoot the hydraulic system.
 - 2.2.2 If a loader function is operated manually (emergency operation), troubleshoot the cable and socket to the relevant electric activation.
 - 2.2.3 Troubleshoot the electric activation. If you switch the socket of the electric activation (defective operation) with a socket of a nearby electric activation (normal operation), and the error remains on the same function, the electric activation is defective.

3. The IRC-system falls out during operation (loader stop)

- 3.1 The system failure can be due to interferences of the radio signal, possibly from a nearby radio remote control system. Try to change the radio channel by pressing the ON button on the remote control box twice quickly. If necessary, try to change the radio channel several times.
- 3.2 After the loader stop, check if the green diode of the radio receiver is lit.
- 3.3 After the loader stop, check the diodes on the electronic box according to the table under 1.3.
- 3.4 If the diode 4 on the electronic box flashes, check if the system also falls out when a cable is connected between the electronic box and the remote control box (see also under 3.6).
- 3.5 Try to transfer a new ID-code from the remote control box to the electronic box (see under 1.6.2).
- 3.6 In case of system failure only under radio operation, check the following:
 - 3.6.1 Check the connection of the battery: it should be inserted against the springs, and the springs should not be bent. Check the same on the battery charger.
 - 3.6.2 If necessary, try to insert a full charged battery.
 - 3.6.3 Check that a battery voltage of 7.2 volts is applied to the printed card. The socket of the battery should make a stable connection to the pins of the card (paint on the pins gives a bad connection).
 - 3.6.4 Check the wire/socket connection between the electronic box and the radio receiver.
 - 3.6.5 Mount a new electronic circuit card in the remote control box (remember to read the ID-code).
 - 3.6.6 Mount a new printed card in the remote control box.
 - 3.6.7 Try with another remote control box (remember to read the ID-code).
 - 3.6.8 Try with another radio receiver box (remember to read the ID-code).
 - 3.6.9 The system error can be due to an error in the electronic box. Please see the table (item 1.3): The diode 1 flashes or is constantly lit.



4. One or more of the loader functions fall periodically out

- 4.1 Remove a lever from the remote control box and check if the pins are defective.
- 4.2 Try to switch a lever (regular defective operation) with a nearby lever (normal operation) and check if the error follows the lever. If it is the case, the lever is defective.
- 4.3 Please see item 3.6 also.

5. The IRC-system operates by itself (uncontrolled command)

- 5.1 Pull the stop button out, and start the IRC-system up again (carefully).
- 5.2 Check what the diodes on the electronic box indicate.
- 5.3 Check if there is moisture or water in the electronic box.
- 5.4 If a loader function operates itself, switch the socket of the electric activation (on the relevant defective loader function) with the socket of a nearby electric activation (on a loader function which works normally). If the same function still operates itself, there is an error in the electric activation.