6.4 Troubleshooting Table and Flowchart

6.4.1 Generator output voltage too low

For 50 Hz versions: less than 200 V

Cause	Solution
Generator is overloaded.	Reduce the electrical load (switch off load)
Motor is not reaching the rated rpm.	Refer to "motor faults" section.
Defective capacitor(s).	Check capacitors and replace if necessary.

6.4.2 Generator voltage too high (more than 240 V - 50 Hz

Cause	Solution
Over-energizing due to wrong capacitors.	Check capacitors type and replace if necessary.
Measurering voltage on the VCS circuit board is missing.	Check VCS System, check cable connections.

6.4.3 Generator voltage fluctuates

Cause	Solution
1. Disturbances on the electrical system/user side. 2. Motor disturbances.	1. Check if electrical load is fluctuating. 2. Refer to section: "Motor runs irregular".

6.4.4 Generator not able to start electric motor

Cause	Solution
If the generator is unable to supply enough power to start an electric motor 1-phase, it is usually because the motor draws too much current during starting process.	Check the motor's current draw required for starting (switch to 3-phase, if possible). This could be remedied by providing stronger capacitors or installing an optional "Easy Start Booster Set" (see Appendix). Enquire at your nearest Panda dealer or directly at the manufacturer.

6.4.5 Diesel motor fails to start

Cause	Solution
Starter battery switched "OFF".	Check position of battery switch and switch "ON" (if installed).
Starter battery voltage insufficient (battery too weak).	Inspect battery terminals and cables for a good electrical connection (Inspect against corrosion, tattered wires, etc.).
Starting current disrupted.	During the normal starting process, the battery voltage drops to 11V with a fully charged battery. If the voltage does not drop during starting, the electrical connection is faulty. If the battery voltage drops lower than 11V, then the battery has been discharged.

6.4.6 Starter is turning motor, but fails to start

Cause	Solution
Fuel inlet solenoid valve not opening.	Check wire connections and circuitry to solenoid valve. (ref. DC wiring diagram: Relay K2, Fuse)
Fuel pump not working.	Check fuel-filter and pump: clean if necessary.
Lack of fuel.	Check fuel supply.

Cause	Solution
Glow-plugs not working correctly.	Check glow plugs and heating time.
Too much air in fuel lines.	Test fuel system for leakage. Bleed air from fuel system (refer to section "Bleeding Air from Fuel System").
Fuel-filter blocked.	Replace fuel filter.

6.4.7 Motor does not achieve enough speed during starting process

Cause	Solution
Starter battery voltage insufficient.	Check battery.
Damaged bearing(s) piston (seized).	Repairs need to be carried out by Kubota-Service. (refer to Kubota motor-manual)
Cooling water in combustion chamber.	1. Turn generator "OFF" at control panel. 2. Remove the glow plug (see Kubota-manual). 3. Rotate the motor by hand carefully. 4. Check if there is water in the oil and change both oil and filter if necessary. 5. Determine cause for excess water in the combustion chamber. The excess water can be caused by a defective air vent in the cooling water system, which should be checked and cleaned, or replaced if faulty.

6.4.8 Motor runs unsteady

Cause	Solution
Disruption in the area of the injection systems' automatic advance.	Repair / Check the automatic advance via the motor service.
Air in the fuel system.	Ventilate the fuel system.

6.4.9 Motor speed drops

Cause	Solution
Lack of fuel	Check fuel supply system: - fuel filter, renew if necessary - check fuel pump - check fuel lines (bleed if necessary)
Lack of intake air.	Check air intake paths. Check and clean air filter (and intake muffler if installed).
Generator overloaded by too many load.	Reduce the electrical load (switch off load).
Generator overloaded by over-energizing.	Check that the proper capacitor type is installed and that they are connected correctly.
Defective generator (windings, bearings, or other).	Generator must be sent to manufacturer for repair of damaged bearings or winding.
Damaged engine.	Repair of bearing damage, etc., by Kubota-Service.

6.4.10 Motor runs in off position

Cause	Solution
Fuel inlet solenoid valve or throttle shut solenoid is not switching off.	Check wire connections to solenoid. Check valve functions as in the "Fuel Solenoid Valve" or in the trottle shut off solenoid sections. Replace if necessary.

6.4.11 Motor stops by itself

Cause	Solution
Lack of fuel.	Check fuel supply system.
Excess heat in cooling system (thermo switch tripped)-lack of cooling water. Is indicated on the remote control panel.	Check cooling water system flow: water pump, inlet water filter, extra heat exchanger coolant flow.
Lack of oil (oil pressure sensor tripped). Is indicated on the remote control panel.	Check oil-level and if necessary top up. Check motor's oil-pressure and have repaired by Kubota-Service if necessary.

6.4.12 Sooty, black exhaust

Cause	Solution
Generator is overloaded.	Check electrical load and switch off unnecessary load.
Insufficient intake air.	Check intake air filter; clean if necessary.
Fuel injector faulty.	Replace injector.
Valve clearance incorrect.	Readjust valve clearance to correct value (refer to Farymann-manual).
Poor fuel quality.	Use better quality diesel (recommended: 2-D Diesel).
Poor combustion.	Incorrect AFR (air/fuel ratio) due to motor timing adjustment. Have motor serviced by Kubota.

6.4.13 Generator must be shut off immediately if:

Cause	Solution
- motor rpm suddenly rises or drops - unusual noise comes from genset - exhaust colour suddenly becomes dark - leakage in the cooling water system.	Refer to respective section of manual and if necessary, have repaired by Kubota-Service, or Panda representative.

6.4.14 Troubleshooting for the VCS-Voltage Control

Cause	Solution
No movement of the actuator.	Voltage supply for electronics active? Motor connected? 230 V measurement voltage attached?
Actuator controls in idle speed or full throttle.	Correct or change polarity of the motor. 230 V measurement voltage attached?
If it occurs that all electronic components break down or any other failure emerges, the generator can still be operated when the electronic system is overridden. For this the plug is pulled out and the two cables are tide over it. 1. Loosen the speed lever between motor and injection pump controller and adjust to max. 240 V. OR 2. Loosen connection plus motor VCS-electronic, directly feed the motor with 12 V voltage and adjust to max. 240 V.	

6.4.15 Troubleshooting Flowcharts

Fig. 6.4.15-1: Troubleshooting Flowchart - Page 1

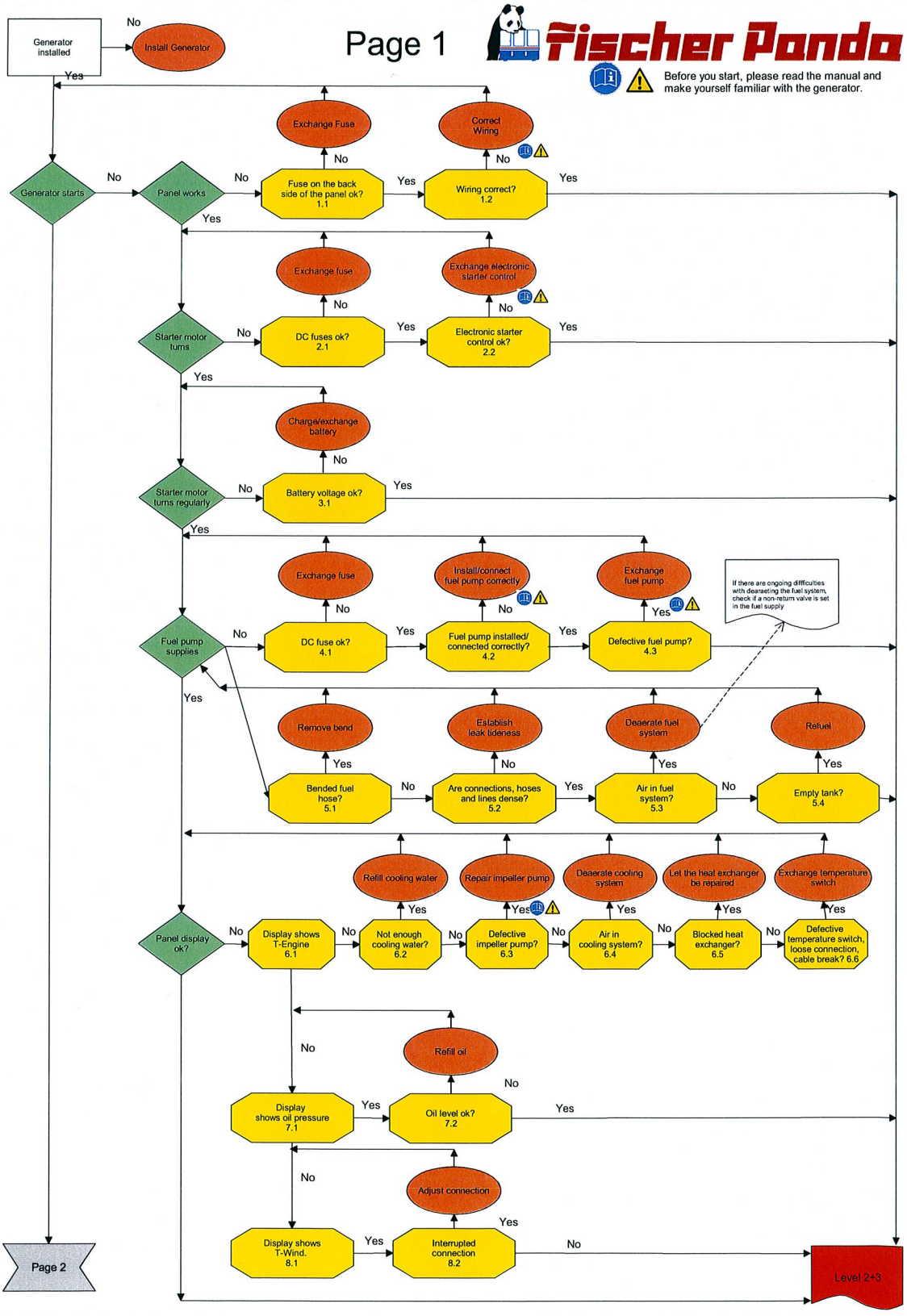
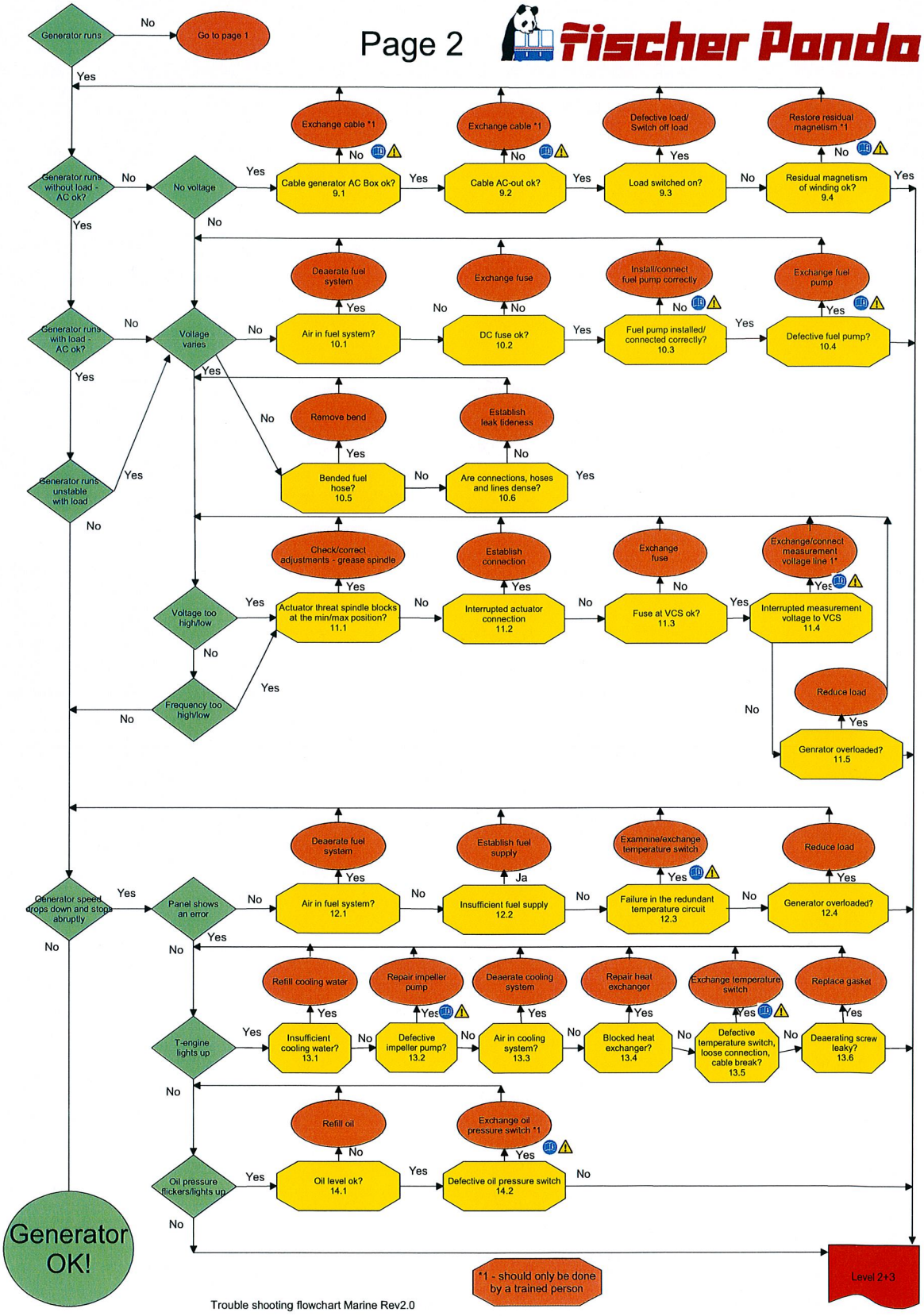


Fig. 6.4.15-2: Troubleshooting Flowchart - Page 2



6.4.15.1 Details and explanations concerning the troubleshooting flowchart

Each failure position in the flowchart above contains a reference number.

With this reference number, the corresponding work steps can be taken from the list below.

1.1 Fuse at the remote control panel.

Execute the fuse exchange as indicated in the data sheet of your remote control panel. Please note that not all remote control panels do have a corresponding fuse.

1.2 Correct the wiring.

Get the wiring of the generator and the wiring of the external components checked according to the installation instructions in this manual and the data sheets, as well as desciptions of the external components and correct them if necessary.

These operations are to be executed by a trained professional only!

Attention: Voltage up to 400V - Danger to life!

2.1 Exchange DC fuse (Fuse for the starter circuit) - see wiring scheme

Exchange the relevant fuses at the generators' terminal block.

A defective fuse is not always visually detectable. Measure the fuse with a multimeter for connecting passage.

2.2 Exchange anti-repeat starter device.

Loosen the connecting plug of the anti-repeat starter device.

Loosen the holding screws of the anti-repeat starter device.

Mount the new anti-repeat starter device in reversed order.

3.1 Charge/exchange starter battery.

Proceed according to battery manufacturer instructions.

4.1 Exchange DC fuse (Fuse for the fuel pump) - see wiring scheme

Exchange the relevant fuses at the generators' terminal block.

A defective fuse is not always visually detectable. Measure the fuse with a multimeter for connecting passage.

4.2 Correct mounting/connection of the fuel pump.

Check the appropriate polarity at the connections and the tight fit of the connections at the fuel pump.

4.3 Exchange fuel pump.

Loosen the electric connections of the fuel pump.

Loosen the holding screws of the fuel pump.

Mount the new fuel pump in reversed order.

5.1 Remove buckling from the fuel hose.

Remove any buckling and improve the installation to avoid further disruptions.

5.2 Sealing the connections.

Seal the system in an appropriate way. The system has to be checked for leakage at frequent intervals.

5.3 Ventilating the fuel system.

Ventilate the fuel system as stated in the chapter 'Installation'. If air keeps entering into the fuel system, this might be an indication for a leaking connection or porose hoses. Then the fuel system should be inspected by a professional.

5.4 Refuelling

Refuel your vehicle/the generator as described in the bord manual.

6.2 Refill cooling water.

Refill the cooling water as described in the chapter 'Maintenance'.

6.3 Defective impeller pump.

Replace the defective impeller as described in the chapter 'Maintenance'.

6.4 Air in the cooling system.

Ventilate the cooling system as described in the chapter 'Maintenance'.

6.5 Heat exchanger blocked.

Get the heat exchanger repaired at a Fischer Panda Servicepoint/Service Center.

6.6 Defective temperature switch, possibly loose contact/cable break.

Get the temperature switch repaired at a Fischer Panda Servicepoint/Service Center.

7.2 Oil level too low.

Refill oil as described in the chapter 'Maintenance'.

8.2 Connection assembly interrupted.

Repair the connection assembly.

9.1 Defective cable to the AC-Box.

Get the cable to the AC-Box exchanged by a Fischer Panda Servicepoint/Service Center.

The operations are to be executed by a trained professional only!

Attention: Voltage up to 400V - Danger to life!

9.2 Defective cable AC out.

Get the cable AC out exchanged by a Fischer Panda Servicepoint/Service Center.

The operations are to be executed by a trained professional only!

Attention: Voltage up to 400V - Danger to life!

9.3 Defective consumer load.

Exchange consumer load/do not operate anymore.

9.4 Missing residual magnetism.

Let the residual magnetism be restored.

The operations are to be executed by a trained professional only!

Attention: Voltage up to 400V - Danger to life!

10.1 Air in the fuel system.

Ventilate the fuel system as described in the chapter 'Installation'.

10.2 Defective DC fuse fuel pump

Exchange the relevant fuses at the generators' terminal block.

A defective fuse is not always visually detectable. Measure the fuse with a multimeter for connecting passage.

10.3 Incorrect attachment of the fuel pump.

Get the installation corrected at a Fischer Panda Servicepoint/Service Center.

10.4 Defective fuel pump.

Get the fuel pump exchanged at a Fischer Panda Servicepoint/Service Center.

10.5 Buckled fuel hose.

Arrange the fuel hose in a way that no buckles can form.

10.6 Leaky connections/pipes.

Seal the connections professionally - Exchange leaky pipes.

11.1 Actuator arbor is jammed.

Check the Max/Min-adjustments and grease the actuator arbor, as described in the chapter 'Geneator Faults'.

11.2 Connection assembly actuator disrupted.

Rebuild connection assembly.

11.3 Defective DC fuse on the VCS.

Get the relevant fuses exchanged at a Fischer Panda Servicepoint/Service Center.

The exchange is described in the chapter 'Generator Faults'.

A defective fuse is not always visually detectable. Measure the fuse with a multimeter for connecting passage.

The operations are to be executed by a trained professional only!

Attention: Voltage up to 400V - Danger to life!

11.4 Disrupted measuring voltage to VCS.

Get the measuring voltage cable connected/exchanged by a Fischer Panda Servicepoint/Service Center.

The operations are to be executed by a trained professional only!.

Attention: Voltage up to 400V - Danger to life!

11.5 Generator is overloaded.

Reduce the load. Ensure that the generator does not get overloaded.

12.1 Air in the fuel system.

See 10.1

12.2 Lack of fuel

Re-assemble the fuel supply.

12.3 Faults in the redundant temperature circuit.

Get the temperature switch as well as the connection assemble and electric cables checked and repaired by a Fischer Panda Servicepoint/Service Center

12.4 Generator is overloaded.

See11.5

13.1 Lack of cooling water.

Refill the cooling water as described in the chapter 'Maintenance'.

13.2 Defective impeller pump.

Replace the defective impeller as described in the chapter 'Maintenance'.

13.3 Air in the cooling system.

Ventilate the cooling system as described in the chapter 'Maintenance'.

13.4 Heat exchanger blocked.

Get the heat exchanger checked and repaired by a Fischer Panda Servicepoint/Service Center.

13.5 Defective temperature switch, possibly loose contact/cable break.

Get the temperature switch checked and repaired by a Fischer Panda Servicepoint/Service Center.

13.6 Leaky ventilation screw.

Renew the ventilation screw sealing.

14.1 Oil level too low.

Refill oil as described in the chapter 'Maintenance'.

14.2 Defective oil pressure switch.

Get the oil pressure switch exchanged by a Fischer Panda Servicepoint/Service Center.