solo

service

Service-manual

For the aircraft engines
2625 01i neo and 2625 02i neo

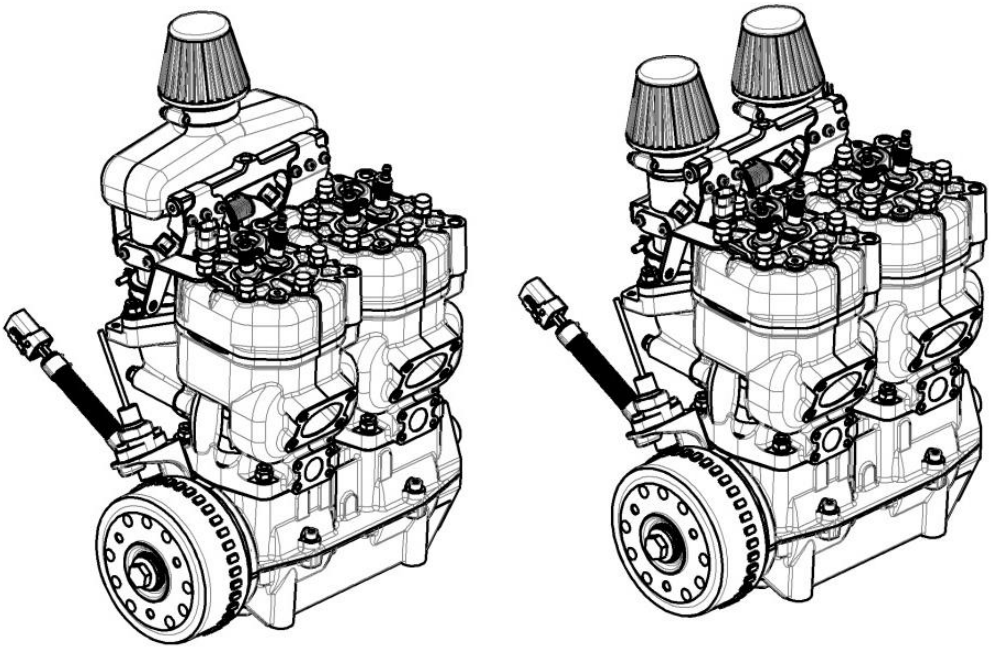

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Table of contents

1 General hints and description of the engines

This service-manual shall give the engine specialist necessary hints for repairs and maintenance of the engine and help him solving specific problems and familiarize him with engine-specific special features. This service-manual is valid together with the engine-manual and the spare-parts-list. General knowledge of two-stroke-engines is required to work on SOLO-aircraft-engines.

! Attention !

Because this engine is used as a certified engine for motor gliders, the national authorizations of the specific certifying staff must be maintained.

2 Description

2.1 Basics

The aircraft engines SOLO 2625 01i neo and 02i neo are water cooled two cylinder two-stroke engines with piston-ports and map-controlled intake-manifold fuel injection and ignition. They are lubricated by a fuel-oil-mixture. They are based on the 2625 01i or 2625 02i.

2.2 Engine electrics overview

Note: Redundant components are underlined in the following overview.

- Sensors:
  - Inductive RPM-sensor and crankshaft position sensor on the rotor of the generator (*redundant sensor unit*)
  - Angle sensor of throttle valve (*redundant sensor unit)*
  - Engine temperature sensor
  - Ambient air temperature sensor
  - 2 fuel pump current sensors (included in the fuel pump electronic unit)
  - Ambient pressure sensor (included in Trijekt bee)
- Actuator:
  - 4 injection valves (two per throttle body, of which one belongs to channel A and one to channel B)
  - 2 fuel pumps (included in the fuel supply unit) with fuel pump relays (included in the fuel pump electronic unit)
  - 2 double ignition coils, of which one ignition line leads to the first and the second cylinder head. 2 ignition drivers (integrated in the ECU).
  - Engine control unit (ECU) Trijekt bee in *redundant design* (ignition- and injection control unit)
- Power supply:
  - Generator
  - Controller SOLO GR 30
  - Capacitor, generator-LED, resistance
  - battery
- Other:
  - Wiring
  - Plug connector
  - Switches, relays
  - Fuses

2.2.1 Working method of the engine control unit (ECU)

The engine control unit continuously records the measured values by the sensors. With the obtained data and the stored maps, the injection quantity and ignition timing are always adjusted during engine operation, so that the engine works optimally. The ECU corrects the injection quantity depending on the current density level. When the engine reaches its maximum permissible speed, it is limited to prevent damage due to overspeeding.

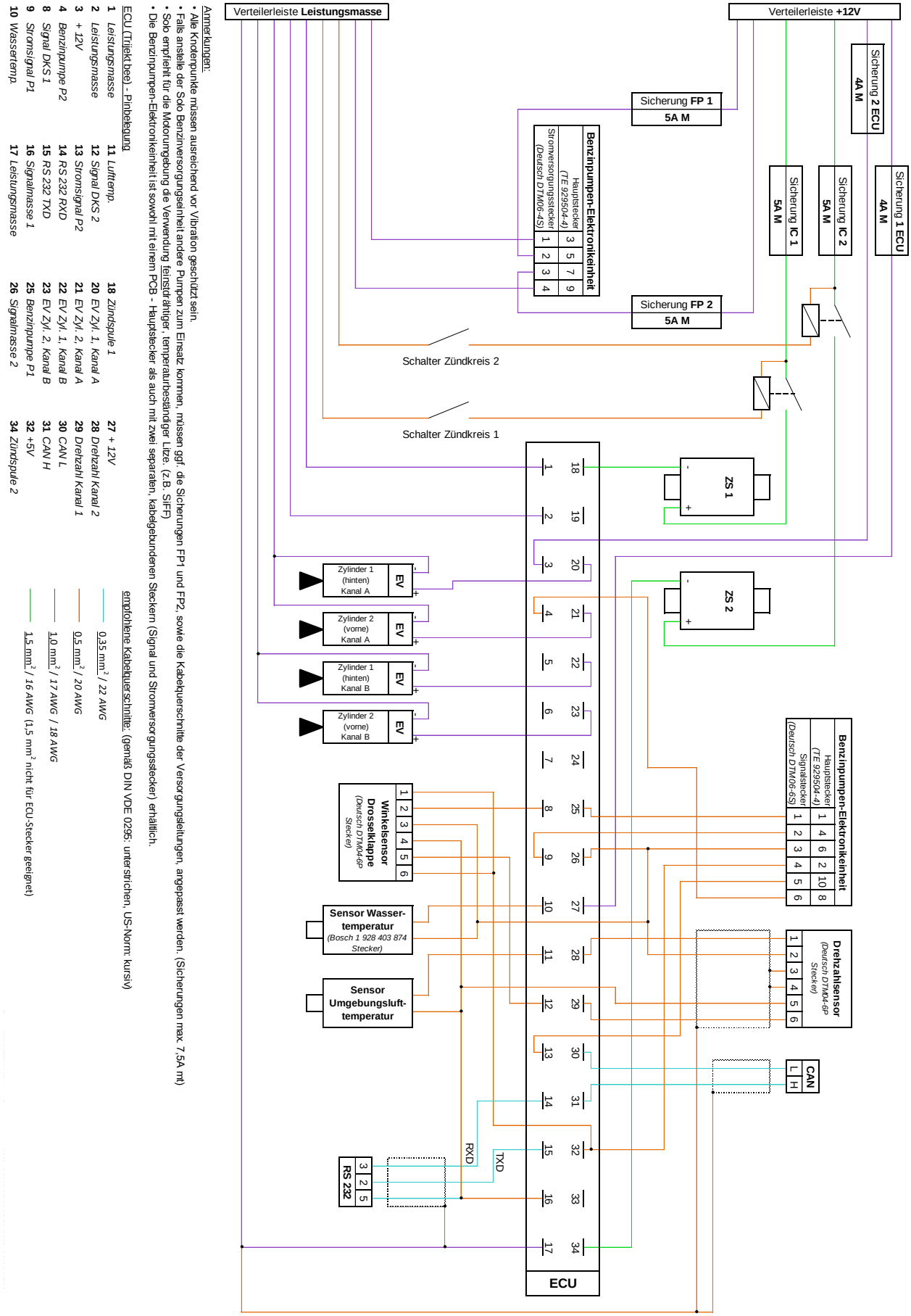
In addition, the engine control system enables the engine to be started quickly and without any problems. This is achieved by firstly activating the fuel pumps for about 3 seconds after switching on the engine to build up fuel pressure and secondly by initially enriching the mixture a little when the engine is cold. The later makes a choke or any other cold start devices superfluous. The engine is always started in idle position.

To facilitate fault diagnosis, the ECU has an integrated fault memory. It contains all faults detected by the engine management system as well as information on whether limit values (e.g. for engine speed or cooling water temperature) were exceeded during operation.

The engine control unit has two digital communication interfaces: RS 232 (serial interface) and CAN. The former allows a computer to be connected to check the status of the engine control unit or read the error memory using the WinTrijekt NEO software, which can be downloaded from the SOLO website https://aircraft.solo.global/de/. Both engine operation data and fault messages can be transmitted via the CAN interface, for example to display them on an engine operation unit. A CAN protocol is available from SOLO on request.

2.2.2 Wire diagrams electrics

Wire diagram control unit



Anmerkungen:
- Alle Knotenpunkte müssen ausreichend vor Vibration geschützt sein.
- Falls anstelle der Solo Benzinversorgungseinheit andere Pumpen zum Einsatz kommen, müssen ggf. die Sicherungen FP1 und FP2, sowie die Kabelquerschnitte der Versorgungsleitungen, angepasst werden. (Sicherungen max. 7,5A mt)
- Solo empfiehlt für die Motorumgebung die Verwendung feinststrähtiger, temperaturbeständiger Litze, (z.B. SiFF)
- Die Benzinpumpen-Elektronikeinheit ist sowohl mit einem PCB - Hauptstecker als auch mit zwei separaten, kabelgebundenen Steckern (Signal und Stromversorgungsstecker) erhältlich.

ECU (Trijekt bee) - Pinbelegung

1	*Leistungsmasse*	**11**	*Lufttemp.*
2	*Leistungsmasse*	**12**	*Signal DKS 2*
3	*+ 12V*	**13**	*Stromsignal P2*
4	*Benzinpumpe P2*	**14**	*RS 232 RXD*
8	*Signal DKS 1*	**15**	*RS 232 TXD*
9	*Stromsignal P1*	**16**	*Signalmasse 1*
10	*Wassertemp.*	**17**	*Leistungsmasse*

18	*Zündspule 1*	**27**	*+ 12V*
20	*EV Zyl. 1, Kanal A*	**28**	*Drehzahl Kanal 2*
21	*EV Zyl. 2, Kanal A*	**29**	*Drehzahl Kanal 1*
22	*EV Zyl. 1, Kanal B*	**30**	*CAN L*
23	*EV Zyl. 2, Kanal B*	**31**	*CAN H*
25	*Benzinpumpe P1*	**32**	*+5V*
26	*Signalmasse 2*	**34**	*Zündspule 2*

empfohlene Kabelquerschnitte: (gemäß DIN VDE 0295: unterstrichen, US-Norm: kursiv)

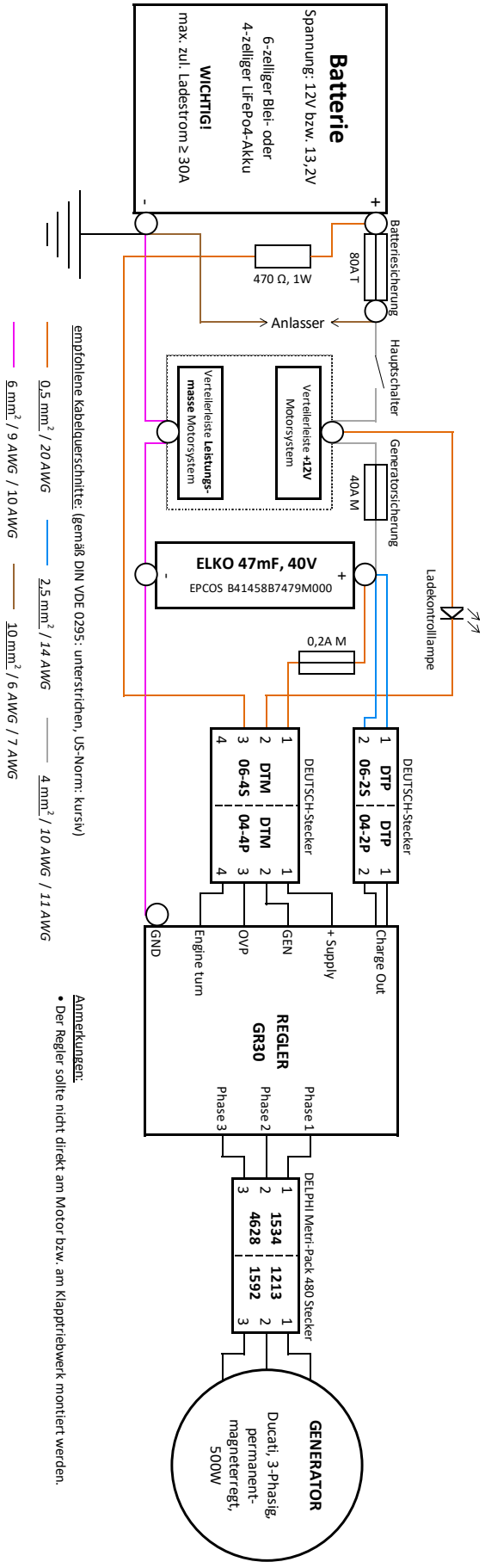
0,35 mm^2 / *22 AWG*

0,5 mm^2 / *20 AWG*

1,0 mm^2 / *17 AWG* / *18 AWG*

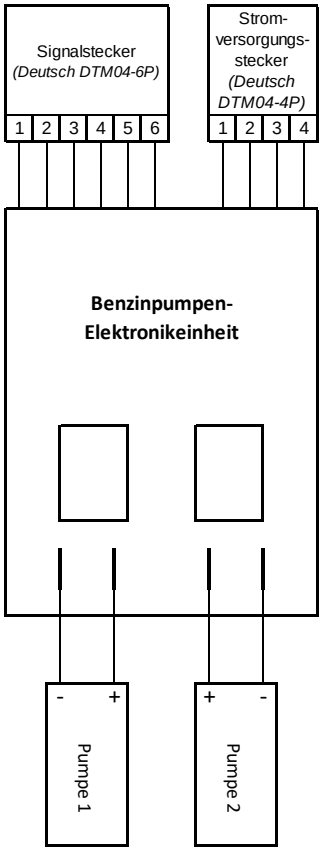
1,5 mm^2 / *16 AWG* (1,5 mm^2 nicht für ECU-Stecker geeignet)

Wire diagram power supply

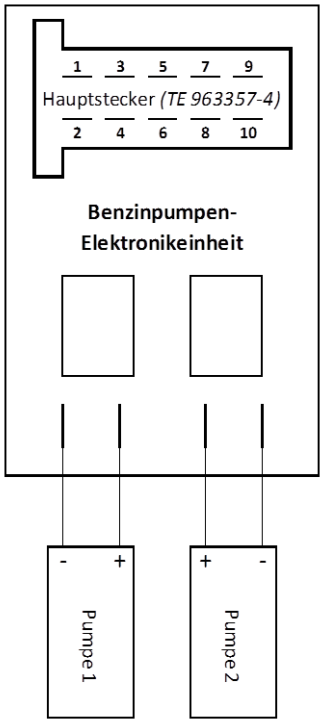


Wire diagram fuel pump electronic unit

a) with signal and power supply connector



b) with main connector

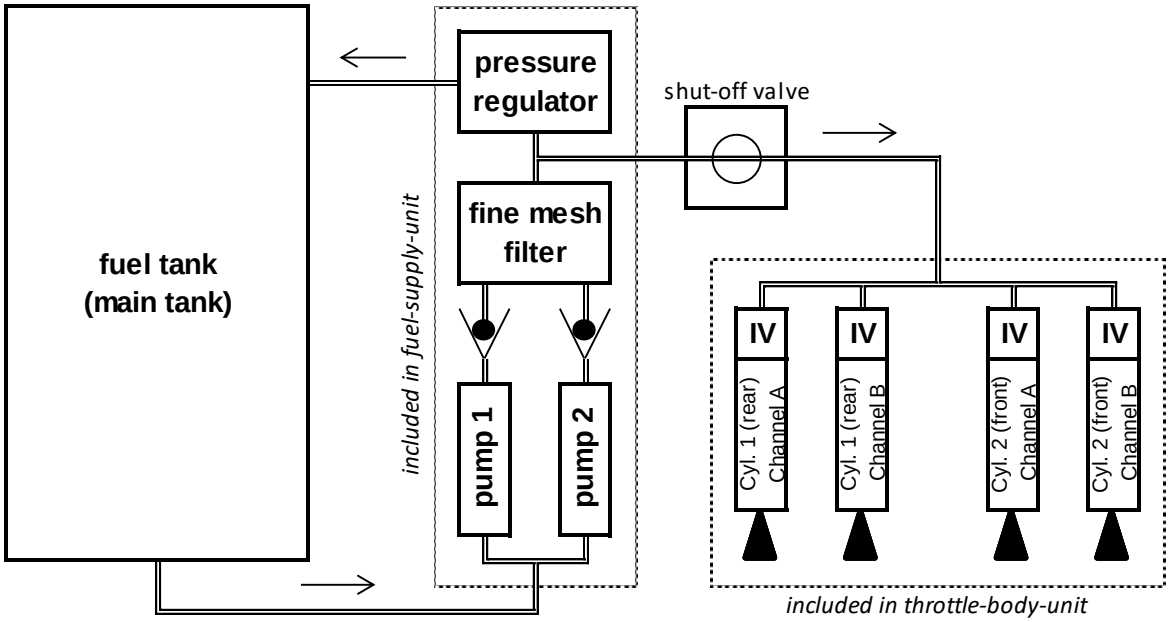


2.3 Fuel supply system

The fuel supply system basically consists of a tank, pipes, a throttle valve system, fuel cock, fuel pumps with check valves, fuel filters and the pressure regulator.
The SOLO fuel supply unit contains fuel pumps, check valves, pressure regulator and fine filter.

2.3.1 Fuel line diagram

The following fuel line diagram shows the fuel system when using the SOLO fuel supply unit (BVE), but without the required tank inlet filter(s). If other fuel pumps are installed, deviations may occur. These are then at the discretion and responsibility of the aircraft manufacturer.



2.4 Redundancy functions

In order to ensure a high degree of operational safety, almost all electrical components essential for engine operation are redundant (see 2.3). The exception is the ECU itself, where redundant electronics have been omitted due to its high reliability. However, all critical pins on the ECU connector are still duplicated. (= “redundant design”)

The special feature of the “neo-engines” is that the engine control unit monitors some components and reacts automatically in case of an error:

Component(s)	Automatic monitoring by the ECU	Error detection, ECU reaction and effects of errors
Engine temp., ambient air temp. and ambient air pressure sensor	While the ECU is turned on	If the signal is outside the acceptance range, a default value is used. The engine is then (restricted) operable. If the engine temperature sensor is defective, the cold start behaviour is bad. If the air pressure or air temperature sensor is faulty, this leads to a loss of performance at higher air temperatures and at higher altitudes.
Fuel pump sensors	none	If a current sensor is defective, the affected pump cannot be monitored. It is possible that an error message concerning the pump is displayed incorrectly.
Angle sensor throttle valve	While ECU is turned on	If the signal of one potentiometer (channel) is outside the acceptance range, only the other is used. In this case the engine can be operated normally. If both signals are within the rejection range, or if they differ too much, a default value of 90° is used. The engine can then only be operated at full throttle.
RPM-sensor and crankshaft position sensor	While the engine rotates	If the signal of a sensor is faulty, the synchronisation of the affected channel is restarted. If only the currently active (primary) channel is affected, the system switches over to the other one. Normally this has no effect to the engine performance. Only if both RPM-sensors fail, the motor cannot be operated anymore.
Injection valves	During full throttle operation	Both in full throttle operation and during starting, the ECU changes the active injection channel at regular intervals. At full throttle the engine speed is monitored. If this speed drops, the ECU switches permanently to the channel with higher speed until the next restart.

Component(s)	Automatic monitoring by the ECU	Error detection, ECU reaction and effects of errors
Fuel pumps	While the fuel pumps are on (for about 3 seconds after switching on the ECU & while the engine is rotating)	Both fuel pumps are operated in parallel and monitored by their power consumption. The engine is supplied with sufficient fuel even if only one of the two fuel pumps is working properly.

The ECU sends a message via CAN for every detected fault (see engine manual and CAN protocol). If the engine rotates, an additional message is stored in the internal error memory.

Redundancy of the power supply:
The engine electrics can be supplied with sufficient energy from the battery as well as from the generator. For the later the smoothing capacitor is required, see wiring diagram supply.

Ignition redundancy:
The dual ignition system consists of two dual ignition coils, two ignition drivers integrated in the engine control unit and four spark plugs. Each cylinder is always ignited twice per revolution simultaneously on both ignition circuits – once near the TDC and once near the BDC. If one ignition circuit fails completely or partially, the engine continues to run with minimal loss of power.

3 Inspections and maintenance intervals

Daily pre-flight check	*Before starting the engine:* – Check fuel supply. – Check the movement of the throttle lever. – Check the external condition of the engine and belt transmission. Check for leaks. – Ignition off. Turn the engine by hand at the propeller and check noises or sluggishness. – Check coolant level. – Read out the error memory of the engine control unit. *Before take-off (with engine running):* – Check if there are already new error messages. – Check ignition circuits individually at idle speed at approx. 2300 rpm. Maximum speed drop 200 rpm.
Check every 25 hours or once a year (the limit that occurs first is decisive)	– General, thorough visual inspection: Look for loose or missing parts and leaks. – Check spark plugs. – Clean engine and air filter. – Lubricate starter gear teeth. – Check all accessible screws and nuts for torque. – Check cable pulls and actuations. – Check cables and electrical connections, especially the ECU power supply. To do so, temporarily pull the ECU fuse 1 and check whether the control unit is still supplied with power. Then repeat the same for ECU fuse 2. – During a test run turn off the main switch of the engine system for a test. The engine must continue running.
Every 100 hours	Replacing the fuel filter of the fuel supply unit.
Every 400 hours	– Special check and general overhaul of the engine at the manufacturer. – We recommend checking the complete engine wiring including connectors.
Engine preservation and storage	If an engine is not operated for more than 2 months, it must be preserved. To do so, inject 2.5ml of two-stroke oil into the intake openings of the throttle valve sockets and turn the engine on the propeller approx. 10 times. Cover the inlet opening at the air filter.

4 Disassembly, check and assembly

4.1 Necessary tools, oil, adhesives and sealants

In order to carry out a professional repair or test, it is necessary to use faultless and functional tools. In addition to the normal tool available in every engine workshop, the following special tools and materials are required:

Pos.	SOLO order No.	Description
1	00 80 594 00 10 140 00 80 588	**Puller for drive side** Cylinder screw M 12 x 50 Pressure piece
2	00 80 530 00 10 140 3 pcs. 00 10 150	**Puller for generator bell** Cylinder screw M 12 x 50 Cylinder screw M 8 x 40
3	00 80 314	**Pressure tester**
4		**Two-stroke oil** Castrol Power 1 Racing 2T, SOLO two-stroke oil or other oils with specification JASO FC or FD
5	00 83 177	**Air filter oil**
6		**Loctite 243**
7		**Loctite 270**
8		**Loctite 574**
9		**Loctite 638**

4.2 Tolerances for tightening torques

All tightening torques specified in this maintenance manual are nominal values. The display deviation of the torque tools used must not exceed ± 5%.

4.3 Engine

4.3.1 Disassembly of the engine

Pos.	Operation	Tools, aid
1	Clean engine before disassembly.	Fuel
2	Remove the injection system from the rubber sockets.	Screwdriver
3	Unscrew exhaust pipe, remove adhering residues and oil.	Allen key 6 mm
4	Loosen the fastening of the generator rotor and pull off the rotor with a suitable puller.	Puller SOLO-No. 00 80 530
5	Remove the stator of the generator completely and unscrew the mounting plate.	
6	Loosen the hub on the drive side seated on the crankshaft and pull it off with a puller.	Socket wrench 19 mm Puller SOLO-No. 00 80 594
7	Loosen nuts on the cylinder head.	Socket wrench 13 mm
8	Lift and remove cylinder head.	
9	Mark cylinder head, cylinder and piston for matching.	
10	Loose cylinder fixing nuts and lift off cylinder.	Open end spanner 12 mm
11	Disassemble the piston-pin lock carefully. Push piston-pin out of the piston by hand.	
12	Unscrew the side screws on the crankcase and carefully disassemble the crankcase without tilting the two halves. Clean both parts of the crankcase.	
13	Remove shaft seals, retaining rings and outer rings of the bearings by hand.	

4.3.2 Check of the individual parts

Cylinder heads

– Carefully remove adhering combustion residues. Fuel can dissolve oil residues. Scrape off stubborn oil carbon residues with a steel brush.
– Check both spark plug threads for damage.
– Clean the sealing surface.

Cylinder

– Visually check the cylinder surface (coating) for damage (scratches, rubbing, scrapers).
– Measure the diameter of the cylinder in the direction of the crankshaft and perpendicular to it:

Dimension	New	Wear limit
10 mm below top	76 mm +/- 0.005	76.01 mm
30 mm below top	76 mm +/- 0.005	76.01 mm
25 mm above bottom	76 mm +0.01	76.02 mm

– Visually check the grooves of the O-rings for the sealing of the cooling water jacket to the cylinder head.
– Check the whole cylinder for cracks and damage to the sealing surfaces.
– Remove oil carbon residues on the coating and in the exhaust port.

Piston and piston rings

– Carefully remove any combustion residues adhering to the piston crown.
– Check piston diameter. Measure the diameter crosswise to the piston pin bore:

Dimension	New	Wear limit
D1 = DN: 22 mm above bottom	76 mm +/- 0.06	75.9 mm
D2: 59.5 mm above bottom	76 mm +/- 0.08	75.8 mm
D3: 69 mm above bottom	76 mm – 0.093	75.7 mm

– Check the piston ring grooves. (vertical play of the piston rings)
  - New 0.05 mm – 0.10 mm
  - Wear limit 0.20 mm
– Wear control of the piston rings.
  - Clearance (when the ring is inserted into the cylinder)
  - New 0.2 – 0.35 mm
  - Wear limit 0.8 mm
– No light gap must be visible when the cylinder with inserted piston ring is held against a light source.

Crankshaft

The crankshaft can only be disassembled by the manufacturer. However, the main bearings (roller bearings) on the output side and on the ignition or generator side can be replaced. For this purpose, the inner rings must be carefully ground down radially at one spot until a maximum wall thickness of 0.3 mm remains. Then blast them with a chisel and push them off the crank leg.
Check concentricity on centring block. The eccentricity at the bearings should not exceed 0.04 mm. If the eccentricity is greater, the shaft must be straightened by the manufacturer. Check the axial play of the lower connecting rod bearings. This must be between 0.35 and 0.5 mm.

4.3.3 Assembly of the engine

The bearings of the crankshaft, as well as piston pin bearings and pistons must be lubricated with two-stroke oil during assembly.

	Operation	Tool, aid
1	Heat the inner rings of the roller bearings to 180°C and push them onto the free ends of the crankshaft. The collar must point towards the crank web.	Heating plate with temperature control
2	Clean the crankcase with clean thinner. If necessary, first remove any residues of the surface seal at the separation point.	
3	Coat the joining surfaces of the crankcase halves with surface sealant and insert the crankshaft into the lower part. Before doing so oil all bearings with two-stroke oil. Insert all circlips as well as the shaft sealing rings.	Surface sealant, Loctite 574, Two-stroke oil
4	Put on the upper part of the crankcase and screw in the 4 screws on the side of the crankcase (with medium strength Loctite) and tighten with a torque spanner.	Torque wrench (12 Nm), Loctite 243
5	Completely assemble the piston with rings and secure with the retaining rings. Push the piston pin in by hand and oil the piston and bearing with two-stroke oil.	Piston ring clamp bent out of spring steel
6	Put on the cylinder and screw on with the nuts M8 so that the cylinder can still be moved.	
7	Screw the exhaust manifold to the gaskets to align cylinders. Then tighten the lower cylinder base nuts.	Torque wrench (20 Nm)
8	Assemble cylinder heads.	Torque wrench (20 Nm)
9	Seal intake and exhaust openings with sheet metal part in the shape of the flanges and with rubber plates (3 mm thick). Check the engine for leaks with a leak tester. Test pressure 0.5 bar. Pressure drop max. 0.1 bar / 5 min.	Pressure tester
10	Mount generator bracket. Secure screws with Loctite.	Torque wrench (12 Nm), Loctite 270
11	Mount the rotor. Degrease the cone with thinner first.	Torque wrench (80 Nm)
12	Mount the injection system on the intake manifold.	
13	Mount air filter.	
14	Leak test of the cooling water jacket for each cylinder individually. Test pressure 1 bar. No pressure drop allowed.	Pressure tester

4.4 Throttle valve system 23 00 891 V1/V2

4.4.1 Hints for disassembly

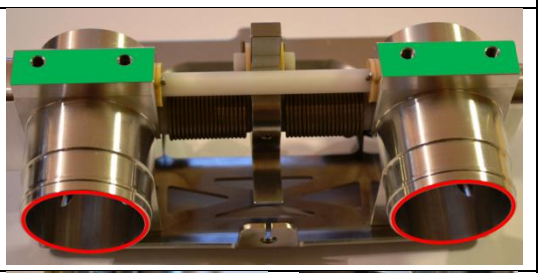
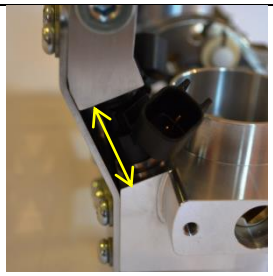
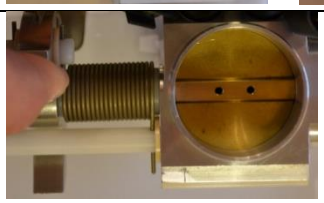
– The throttle valve screws are caulked and must therefore be drilled out.
– The sensor guide bush is best removed by hand using an M12 tap. However, it will be damaged and must be replaced.

4.4.2 Check of the individual parts

Clean all parts and check for wear, cracks, corrosion and other damage. Replace if necessary.
Wear limits:
1) Shaft bearings: Bearing bushings: 8.1mm, shaft: 7.92mm
2) spring wire holes: 1.55mm

4.4.3 Hints for assembly

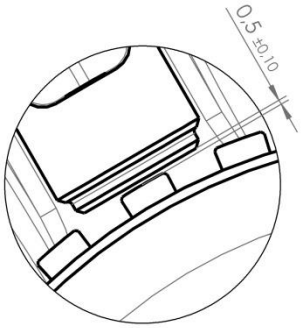
– Aligning of the parts

The two sheet metal parts should be flush at the front and the rear.
The fuel distributor must fit tightly to the flaps of the injector-side metal sheet. 
The axial clearance of the throttle shaft must be between 0.05 and 0.1 mm at room temperature.
Areas of the same colour must be in the same place. 
The distance between the fuel distributor and the throttle bodies must be 26.6 ± 0.1 mm each.  
The throttle valves must not touch or rub against the throttle bodies when fully closed. 

- *Note:* The holes in the sheet metal parts may be drilled out if necessary:
  Through-holes M4 screws: max. 4.9mm, Through-holes M5 screws: max. 5.8mm.
- Thread lockage:
  - All M4 / M5 screws and the plug screws must be secured with Loctite 243.
  - The throttle valve screws must be caulked.
- Tightening torques:
  - All M4 screws: 3.5Nm;
    Exception: mounting screws of the throttle position sensor: 1.8Nm
  - All M5 screws: 6.5Nm, plug screws: 12Nm
  - Throttle valve screws: by hand
- Throttle valve angle sensor: The angle sensor must be aligned so that the signal voltages of both potentiometers in the WinTrijekt status window are 4.56 ± 0.08 V when the throttle valves are fully open.

4.5 RPM sensor

4.5.1 Hints for assembly



- The air gap between the sensor head and the studs on the rotor of the generator must be 0.5 ±0.1 mm. This has to be checked with a feeler gauge after mounting the speed sensor.

4.6 Fuel supply system

4.6.1 Hints for disassembly

- The fuel pumps must be removed before the check valves can be unscrewed with an Allen key 5mm.
- Attention! The spring which holds the fuel filter is tensioned.

4.6.2 Check of the individual parts

- Clean all parts and check for wear, cracks, corrosion and other damage. Replace if necessary.
- It is recommended to replace the O-rings.

4.6.3 Hints for assembly

- Screw in the check valves up to the end of the thread. Apply Loctite only where the valves will later be located.
- Do not install fuel pumps until the check valves have been mounted.
- Make sure that the O-rings are properly seated in the corresponding grooves.
- Do not use tension discs more than once.
- Make sure that the spring sits in the recesses provided for it.
- All screws and screw plugs as well as the check valves must be secured with Loctite 243:
- Tightening torques:
  - Screw plugs: 12Nm
  - Banjo bolts on the fuel pumps: by hand with a screwdriver.
  - Screws M3: 1.4Nm
  - Screws M4: 3.5Nm
  - Screws M5: 6.5Nm

5 Diagnosis and elimination of engine malfunctions

5.1 Basics

5.1.1 Handling with WinTrijekt NEO

To check the status of the ECU or to read the error memory, a computer with WinTrijekt and a serial connection cable (RS 232) are required. If everything is connected correctly, the engine control unit will connect automatically after power-up. Status windows and access to the error memory are freely accessible, but for security reasons the functions for clearing the error memory and changing the settings can only be carried out with a password.

5.1.2 One important rule of thumb …

The vast majority of engine malfunctions are related to faults or defects in the wiring.

5.2 Error memory of the engine control unit

If the cause of the engine malfunction is not clear, the first thing to do is to read out the error memory of the engine control unit. To do this, after establishing the connection, select the menu item *Error => Show error* in the WinTrijekt main window and click on *reload* in the newly opened window. The contents of the error memory are then displayed on the screen.
Below are sone hints for troubleshooting, based on the entries in the error memory.

a) Injection system

Fuel pump 1 defective	• Temporary, irrelevant fault messages concerning the fuel pumps can occur when the tank is (almost) empty. • In unclear cases: During engine operation, observe the current consumption of the corresponding pump via WinTrijekt. Perform a control measurement with a multimeter. If there is no measurement error, please proceed as follows: – Current consumption is OK again (the values in the status window are black during operation): no action required, if the error message does not occur again. – Current consumption 0A: Check wiring and fuse. – Current consumption >0A, but too high or too low (the value in the status window is red): Check fuel pump.
Fuel pump 2 defective	
Injection bench 1 defective	Check injection valves of the channel A and wiring with multimeter. The resistance of one valve is approx. 12 Ohm.
Injection bench 2 defective	Check injection valves of the channel B and wiring with multimeter. The resistance of one valve is approx. 12 Ohm.

b) Sensors

Note: If disturbances of the sensors occur only rarely and for a short time (for a few ms), this is usually not critical. No reaction is then required. In particular, individual speed errors when starting or stopping the engine are normal and no cause for concern. However, if sensor faults occur more frequently or for a longer period of time, the following reaction should be taken:

Air pressure sensor defective	Contact SOLO
Engine temperature defective	Check engine temperature sensor and wiring with multimeter. The sensor has a resistance of 2351 to 2648 Ohm at 20°C.
Air temperature defective	Check air temperature sensor and wiring with multimeter. The sensor has a resistance of 2520 to 2584 Ohm at 20°C.
Throttle valve potentiometer 1 defective	– Check throttle valve sensor and wiring with multimeter. Note: The sensor contains two electrically independent 3k Ohm potentiometers. Pins 1-3 on the sensor connector belong to the first potentiometer, pins 4-6 to the second. Pins 2 and 5 are connected to the wipers. – Check that the angle sensor is correctly aligned or adjusted. The values displayed in the WinTrijekt status window serve as an aid.
Throttle valve potentiometer 2 defective	
RPM detection channel 1 defective	Check speed sensor and wiring with multimeter. At the plug at the sensor the resistance between pin 5 and 6 should be approx. 600 Ohm and between pin 1 and 2 approx. 900 Ohm.
RPM detection channel 2 defective	

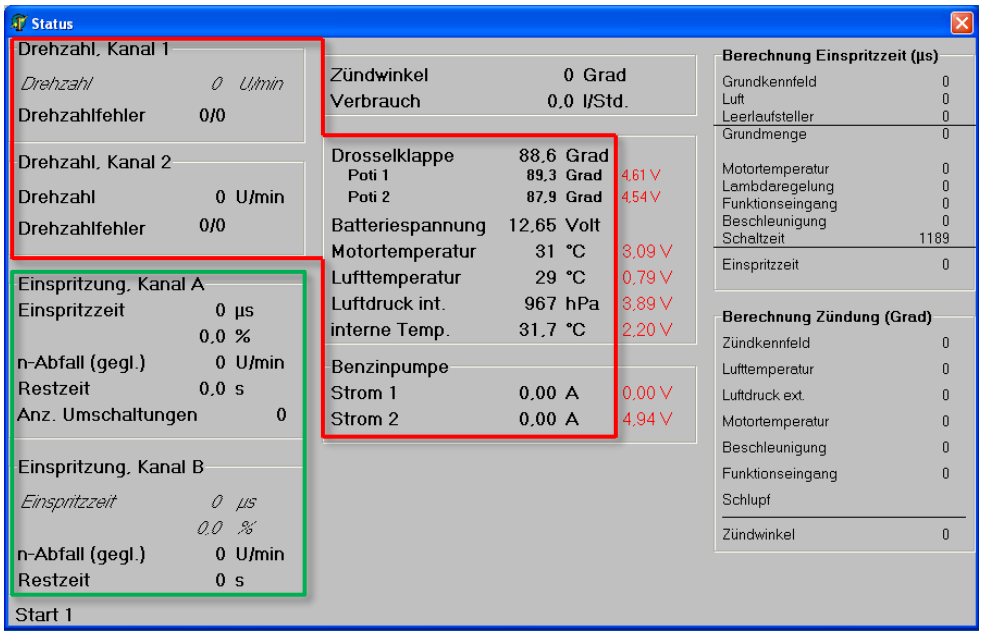
c) Other

Engine temperature (°C) >= 110	The engine was (too) hot. Check cooling system. If the maximum value was over 115°C. the engine must be checked by the manufacturer.

IMPORTANT NOTE: Only when a speed is detected the ECU stores error messages in the error memory.

5.3 Check the status of the engine

Directly after starting WinTrijekt NEO the status window opens automatically. There, a lot of helpful information is displayed when the engine control unit is switched on and connected to the computer:



Sensor values (framed red here):

- *RPM:* The speed of the passive (not primary) channel is written in italics. If speed fault occurs, the speed of the affected channel turns red for the duration of the fault. Individual speed errors during starting or stopping are normal and are no cause for concern. If, on the other hand, the number of speed errors increases continuously during starting or engine running, there is a problem. In this case the inductive sensor and its wiring should be checked first.
- *Fuel pump current:* If the current consumption is too high or too low, the corresponding value becomes red.
- *Throttle valve:* If the signal of a potentiometer (channel) is faulty, the corresponding value for the duration of the fault appears in red letters. (Note: The signal voltages are always shown in red). In idle speed the throttle opening angle should be approx. 10 degrees and at full throttle 87 to 89 degrees.
- *Engine temperature, air temperature, air pressure:* If the signal from a sensor is faulty, the corresponding value for the duration of the fault appears in red letters. (Note: The signal voltages are always shown in red). The values of engine temperature, air temperature, air pressure can be checked with a suitable measuring device if a fault is suspected.

Injection (framed green here):

The injection time, the nozzle opening time, the speed drop and the remaining time of the active injection channel (until the next change-over) are displayed. The injection time of the non-active channel is shown in italics.

5.4 Special cases

5.4.1 Engine will not start

1. Check battery voltage.
2. Check fuel supply.
3. Check if the ECU is supplied with voltage.
4. Ignition off! Crank engine by hand and check compression.
5. Check the starter motor. Does it turn the engine sufficiently fast?
6. Check whether the engine has “flooded”. If so, pull the fuel pump fuses, set the throttle to full throttle and try to start the engine until it “coughs”. Then press the fuel pump fuse again and start the engine.
7. Connect the computer and watch the WinTrijekt status window:
   – A speed must be displayed when the engine is spun by the starter motor. Otherwise there is a defect at the speed sensor.
   – Check if the fuel pumps are running properly by checking the current consumption.
8. Check the ignition system and wiring. As soon as the engine is spun by the starter motor, ignition sparks must be present.
9. Check the function of the injection valves. Is the fuel injected if the engine is spun by the starter motor?

5.4.2 Engine gets hot

Attention! Danger of engine damage!

1. Check cooling system. Is there sufficient cooling water available? Is the coolant pump running? Are hoses disconnected? Is the radiator clogged?
2. Check fuel supply. While the fuel pumps are running, fuel must always flow back to the tank through the return line.

5.4.3 Engine does not achieve full power or power drops

1. Check if the throttle valves open completely. (limit stop)
2. Ignition off! Turn engine by hand and check compression.
3. Check ignition system and wiring. To do this, carry out an ignition test at idle speed and observe the engine speed.
4. Run the engine for at least 30s to automatically check the injection valves. Then read out the error memory of the engine control unit or the engine management system.
5. Clean or replace the air filter.

5.4.4 Generator control lamp lights up while the engine is running

The generator or the charge regulator are not working properly.

6 Notes