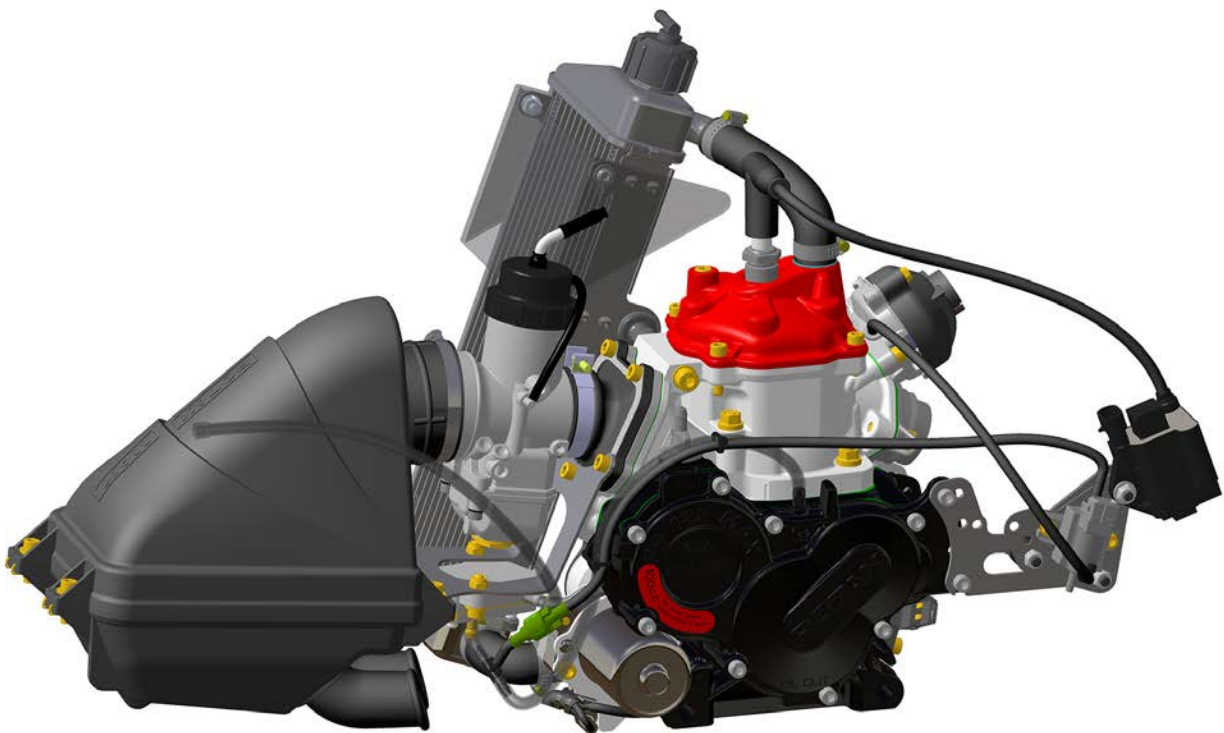


ROTAX[®]
KARTING



Installation instructions and Operator's Manual



for ROTAX[®]-engines type

125 MAX evo

125 JUNIOR MAX evo

125 MINI MAX evo

125 MICRO MAX evo

Part no.: 297732

Edition: 09/2016

General information

BRP-Rotax recommends products of the following companies:



For information regarding the repair of the engines 125 MAX evo/Junior MAX evo/Mini MAX evo/Micro MAX evo contact an authorized service center or consult the workshop manual (available on the internet at www.rotax-kart.com).

We ask to hand over this manual, the engine identity card and the product and service registration document to the new owner in case of a change of ownership.

Preface

This document and all technical data and procedures therein are property of BRP-Rotax GmbH & Co KG and are based on the state of knowledge at the time of publication. The manual has been drawn up to the best of our knowledge. However, we exclude any liability.

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Engine performance may vary depending on, among other things, general conditions, ambient temperature and altitude.

Introduction

Congratulations on choosing the ROTAX engine Type 125 MAX evo / Junior MAX evo / Mini MAX evo / Micro MAX evo.

The ROTAX engine Type 125 MAX evo / Junior MAX evo / Mini MAX evo / Micro MAX evo has been developed exclusively for use in go-karts, which must only be run on specified tracks.

▲ Warning: Before starting with installation and operation of the engine, observe the installation instructions and operator's manual and follow all instructions.

▲ Warning: This engine performs better than comparable products.

Repeating symbols

▲ Warning: Identifies an instruction, which - if not followed - may cause injury or endanger the life of the driver, mechanic or third party.

■ Attention: Denotes an instruction which if not followed may severely damage the engine. Non-compliance might lead to health hazards under certain conditions.

◆ Note: Information useful for better execution and understanding of instructions.

➡ Denotes a working operation

✓ Denotes a checking operation

TIP This information gives you additional advice and tips

End of section:

End of chapter:

**INSTALLATION INSTRUCTIONS FOR ROTAX ENGINE TYPE
125 MAX evo, Junior MAX evo, MINI MAX evo, Micro MAX evo**

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1. **General**

- ▲ **Warning:** For the best possible engine operation, compliance with the following advice regarding installation of engine and equipment is required.
 - ▲ **Warning:** Engine operation is permitted only with equipment supplied by ROTAX.
 - ▲ **Warning:** Modifications to engine or equipment are not allowed.
 - ▲ **Warning:** Besides the engine-specific installation advice, also take note of information of the respective chassis manufacturer.
 - ◆ **Note:** An engine identity card stating date of delivery and company has to be issued for the customer by the authorized service center.
 - ◆ **Note:** The data entered in the engine identity card is required for verification of a warranty claim. Without a completely filled-in engine identity card no warranty claim will be granted.
 - ◆ **Note:** In case of participating in the ROTAX MAX CHALLENGE (RMC), the engine must be verified for conformity with the technical regulations and sealed. The serial number of the seal must be entered in the Engine Identity Card.
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2. Installation and connection of the fuel system

2.1. Installation and connection of the fuel pump

- ➔ The retaining plate, rubber buffers, fuel pump, fuel hose (with 230 mm and 1800 mm length) are already pre-assembled. See Fig. 1.

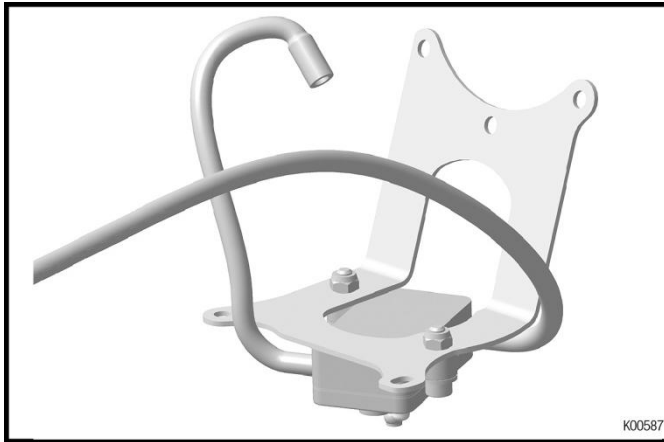


Fig. 1

- ➔ Install the support bracket (pos. 1) with fuel pump on the carburetor socket using 3 screws M6x30 (pos. 2). Tightening torque 6 Nm / 53 lbf in. See Fig. 2.

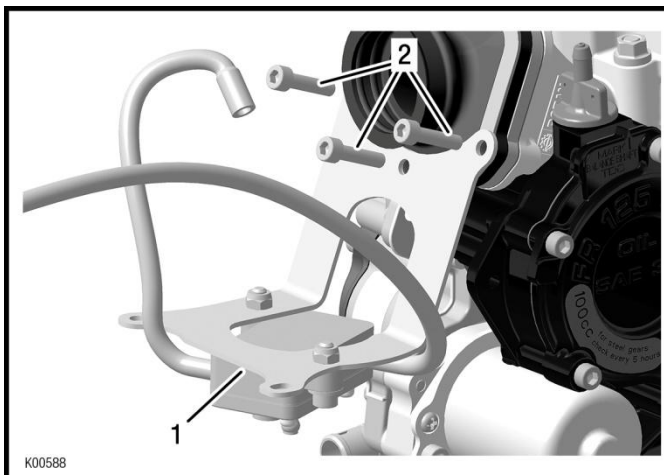


Fig. 2

- ➔ The fuel hose with 230 mm length will be connected later to the carburetor, see carburetor installation in section 3.
- ➔ The larger fuel hose (pos. 1) should be connected to the fuel filter (pos. 2) and furthermore to the fuel tank. See Fig. 3.

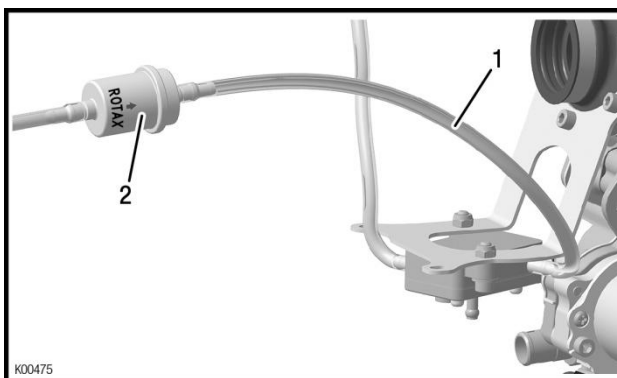


Fig. 3

- TIP:** Facilitate the assembly of fuel hose by slightly widening the hose end with a pair of circlip pliers.

- **Attention:** Fuel hose can be damaged! Avoid excessive widening of the fuel hose.



Fig. 4

2.1.1. Concerns all engines except 125 MAX evo

For engines without exhaust slide, a direct connection (with vacuum hose) between the gearbox and the fuel pump must be installed, see Fig. 5

- ➔ Therefore, cut a 400 mm (15.75 in.) long piece of fuel hose.
- ◆ **Note:** For engines with exhaust slide, see chap. 8.
- ➔ Secure the vacuum line (pos. 2, Fig. 5) on the gearbox housing to prevent disengagement using a tie wrap (pos. 1).

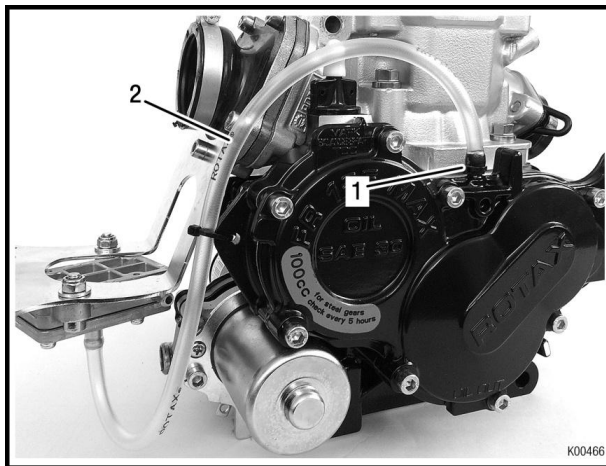


Fig. 5

-
- ➔ Install the connection between the fuel tank and the fuel filter. The length of this line may vary from chassis to chassis.
 - **Attention:** Route the fuel line from the fuel tank to the fuel pump so that it does not touch any moving parts or the track and attach the fuel line onto the top side of the chassis tube.
 - **Attention:** The flow in the impulse hose and fuel lines must not be restricted by the use of tie wraps.
 - **Attention:** The use of an extra fuel filter must not cause further flow resistance in the fuel line between the fuel tank and the fuel pump.
-
-

3. Installation and connection of the carburetor

See Fig. 6.

- ➔ Remove the transport plug from the carburetor.
- ➔ Fit the carburetor (pos. 1) into the carburetor socket and secure with a hose clamp (pos. 2) in vertical position.
- ➔ Connect the outlet hose of the fuel pump with the fuel inlet on the carburetor (pos. 3).

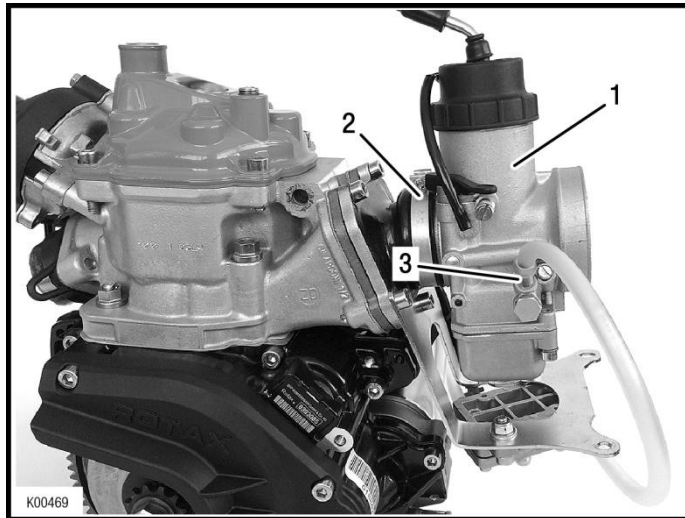
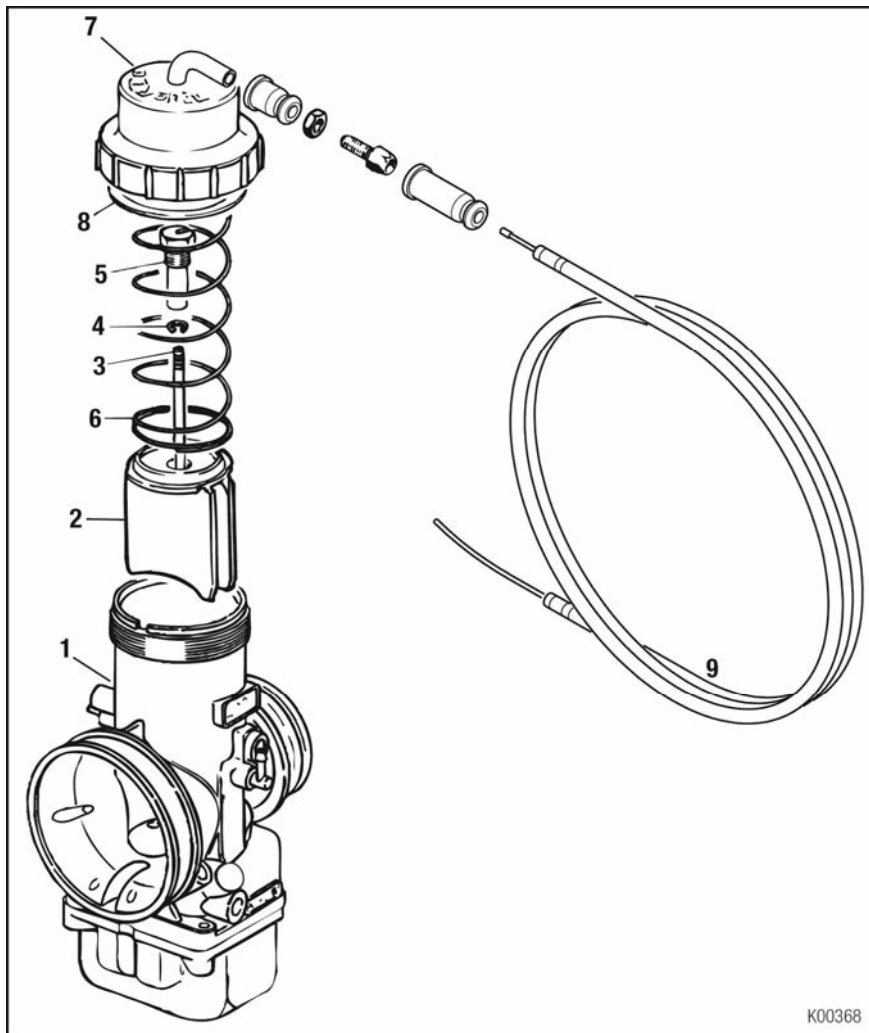


Fig. 6

4. Installation of the Bowden cable for carburetor control

See Fig. 7.

- ➔ Carefully remove the carburetor cover and the rubber ring (pos. 7, 8).
- **Attention:** Reset spring (pos. 6) of carburetor slide presses against carburetor cover and might eject carburetor cover at removal.
- ➔ Remove nipple screw (pos. 5) with A/F 10 wrench from carburetor piston (pos. 2).
- ➔ Engage nipple of Bowden wire (pos. 9) in nipple screw (pos. 5).
- ➔ Fit nipple screw in carburetor piston and tighten with A/F 10 wrench.
- ➔ Insert carburetor slide (pos. 2) into carburetor body with recess of slide towards intake silencer.
- ➔ Pass Bowden wire through compression spring (pos. 6) and through cover with rubber ring (pos. 7, 8) of carburetor.
- ➔ Fit carburetor cover (pos. 7) on carburetor.
- ➔ Thread Bowden wire through Bowden conduit and through adjustment screw on chassis.
- ➔ Connect Bowden cable to throttle pedal.



K00368

Fig. 7

- ◆ **Note:** Shorten Bowden cable as required.

- ➔ Route the carburetor Bowden cable on the top side of the chassis tubes and attach with the tie wraps supplied. Make sure that the Bowden cable does not touch any moving parts or the track.
 - ▲ **Warning:** The carburetor Bowden cable must not be kinked or restricted as the carburetor piston might get stuck in full throttle position.
 - ➔ Set and secure the adjustment screw for Bowden cable on chassis such that the carburetor piston will remain in closed position when throttle pedal is not activated.
 - ➔ Set and secure the stop screw for throttle pedals such that, with pedal completely pressed down, the carburetor piston will be in fully open position. The Bowden cable must not be under full tension when the throttle is in fully open position.
-
-

5. Installation of the radiator

- **Attention:** To warrant the best possible engine cooling, ensure that the air stream covers the complete radiator area.
- ➔ Pre-mount radiator with coolant hoses and radiator support as shown in *Fig. 8*.
- ◆ **Note:** Radiator (Pos. 1) shown in *Fig. 9* fits to engine types 125 MAX evo, Junior MAX evo and Mini MAX evo. The small radiator (Pos. 2) fits to engine type Micro MAX evo. The installation of both radiators is similar.

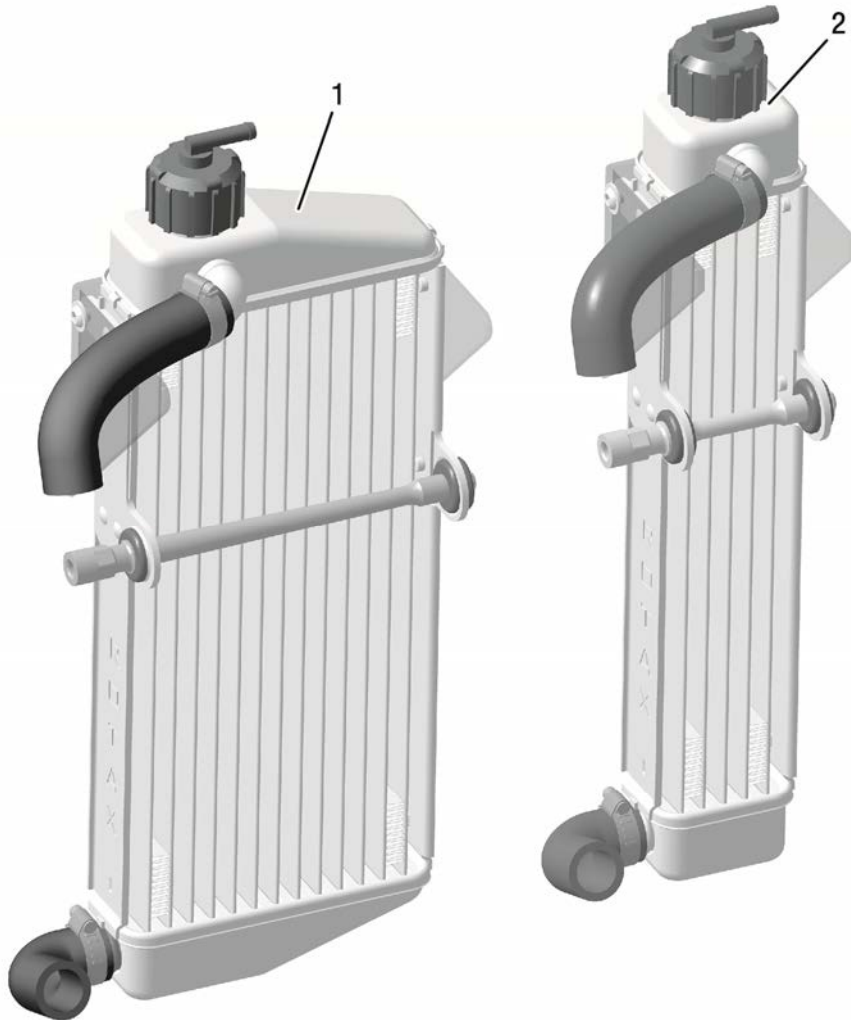


Fig. 8 (K00428)

- ➔ Attach the pre-assembled radiator to the engine with Allen screw M8x75 (pos.1) and washer (pos.2), see *Fig. 9*

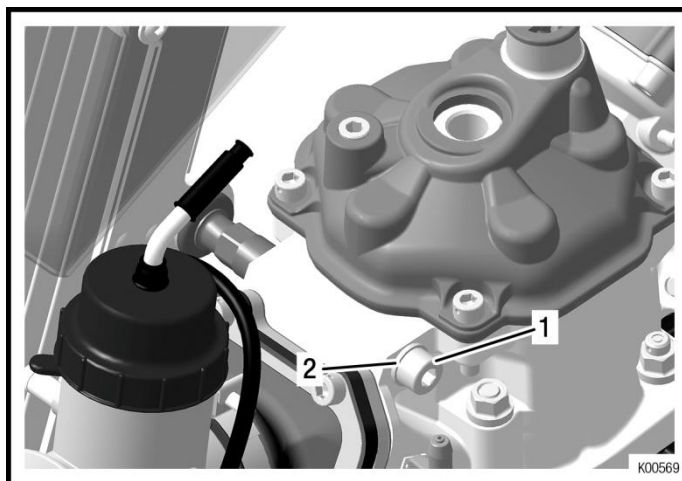


Fig. 9

- ➔ Attach the pre-assembled upper coolant hose to the engine using 1 hose clamp (Pos. 3), see Fig. 10.

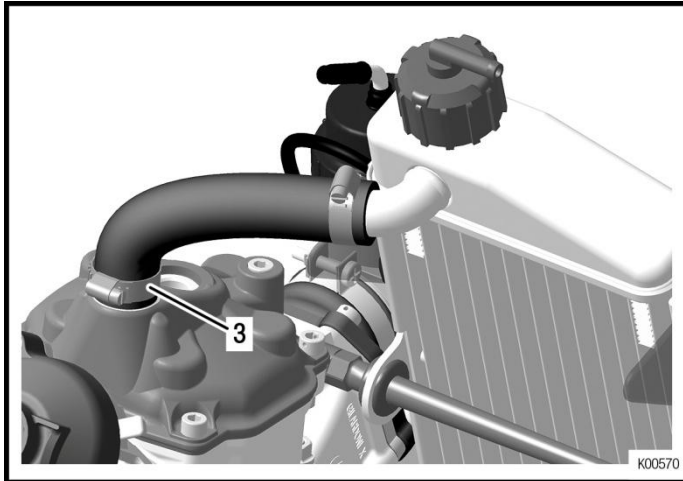


Fig. 10

- ➔ Attach the pre-assembled lower coolant hose to the engine using 1 hose clamp (Pos. 4), see Fig. 11.

◆ **Note:** The length of the upper and bottom hose is supposed to be different, but equal at delivery. Therefore, cut the bottom hose using scissors or a knife.

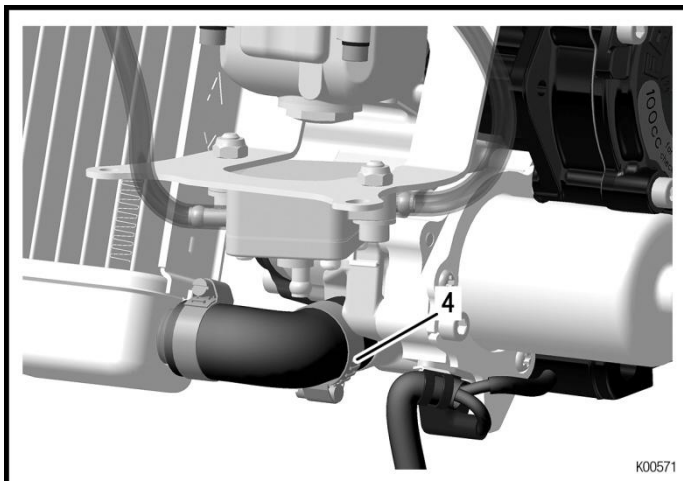


Fig. 11

6. Finalization of mounting plate

- ◆ **Note:** The retaining plate, the mounting plate, the solenoid valve (except engines without exhaust slide, Fig. 12) and the ignition coil are already pre-assembled.

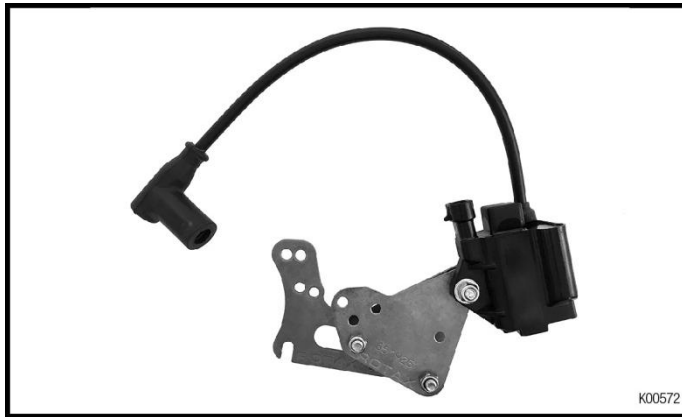


Fig. 12

Variant 1: Engines without exhaust slide

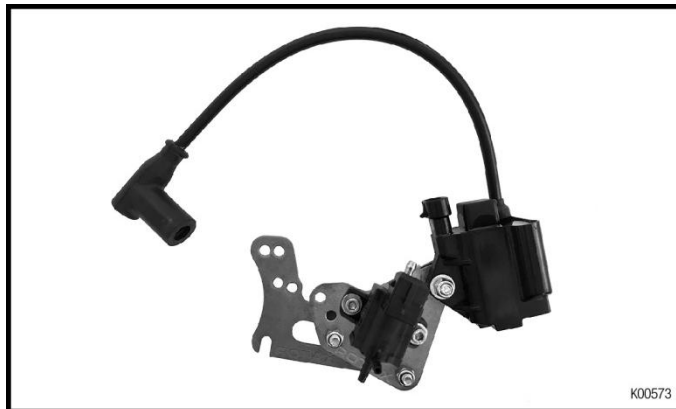


Fig. 13

Variant 2: Engines with exhaust slide

- ➔ Install mounting plate to crankshaft housing (pos. 4) using 2 Allen screws M6x20 (pos. 1), washers (pos. 2) and lock nuts M6 (pos. 3).

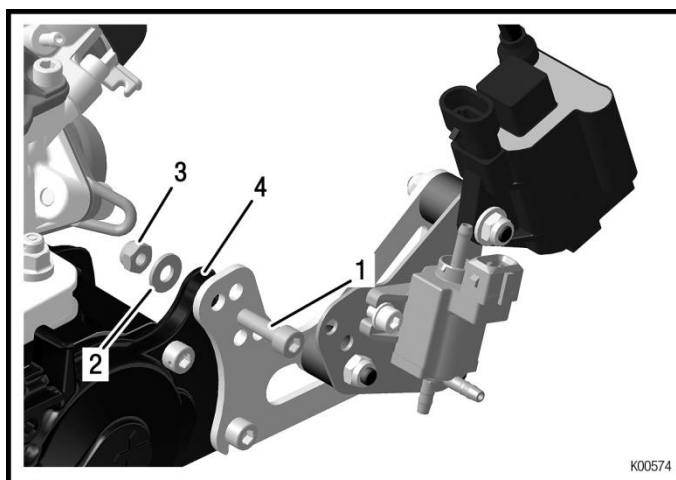


Fig. 14

- ◆ **Note:** The position of the mounting plate may vary (depending on the engine type and position of the seat stay), see Fig. 15.

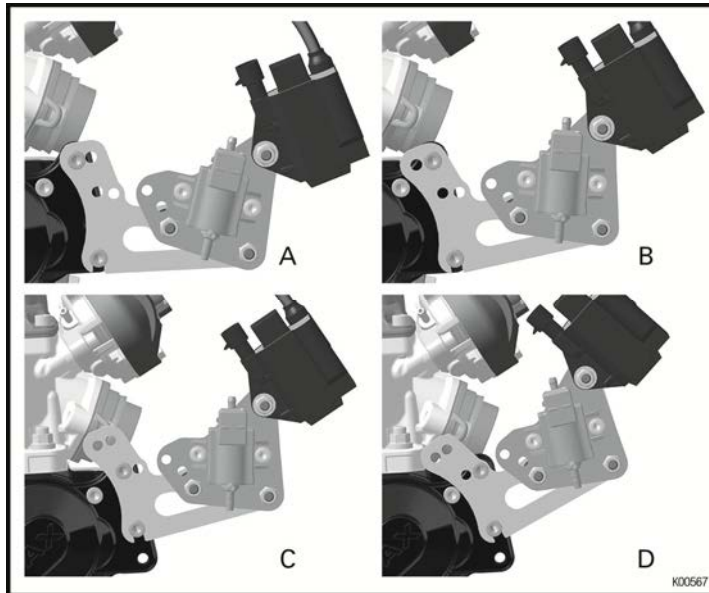


Fig. 15

7. Fitting of the spark plug

See Fig. 16.

The engine will be supplied with a spark plug of the type NGK Iridium.

- ➔ Remove the transport plug from the cylinder head.
- ➔ Check electrode gap of spark plug. Adjust as required.
- ◆ **Note:** The electrode gap of the spark plug should be 0,7 mm (0.027 in) to 0,8 mm wide (0.032 in) (for NGK spark plugs). Only slight bending of the ground electrode is permitted.
- ➔ Fit supplied spark plug (pos. 1) and tighten 25 Nm (221 lbf in) to 27 Nm (239 lbf in).
- ➔ Install the spark plug connector (pos. 2), ensure correct engagement.
- ◆ **Note:** The engine type 125 Micro MAX evo has a special spark plug. It has been designed for this engine exclusively. For more details, have a look at the spare parts manual.

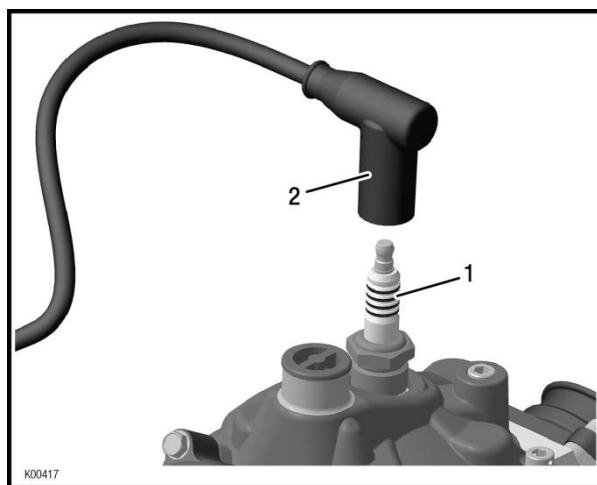


Fig. 16

8. Installation and connection of the RAVE control unit

- ◆ **Note:** The hose package of the RAVE control is already pre-assembled.
- ◆ **Note:** The impulse restrictor is offered optionally.

Insert impulse nozzle (pos. 6) about 25 mm into the 420 mm pressure line (pos. 7) using an Allen key SW4. Pay attention to the mounting direction! It also works without an impulse nozzle, this only serves to delay the opening of the exhaust valve.

- ◆ **Note:** In order to prevent the displacement of the impulse nozzle (pos. 6), a small tie wrap (pos. 8) should be attached to the pressure line directly afterwards. Do not tie up the pressure line completely.

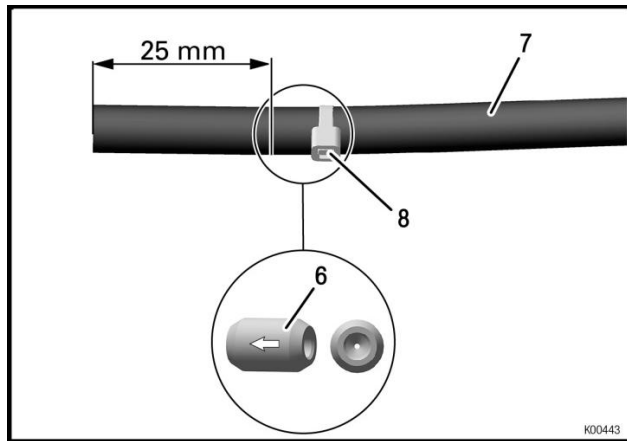


Fig. 17

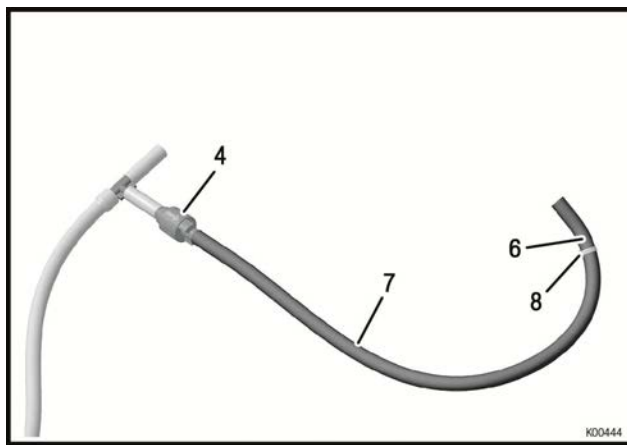


Fig. 18

- ➔ Attach the end of the T-fitting (pos. 1) to the bottom of the fuel pump (pos. 2).

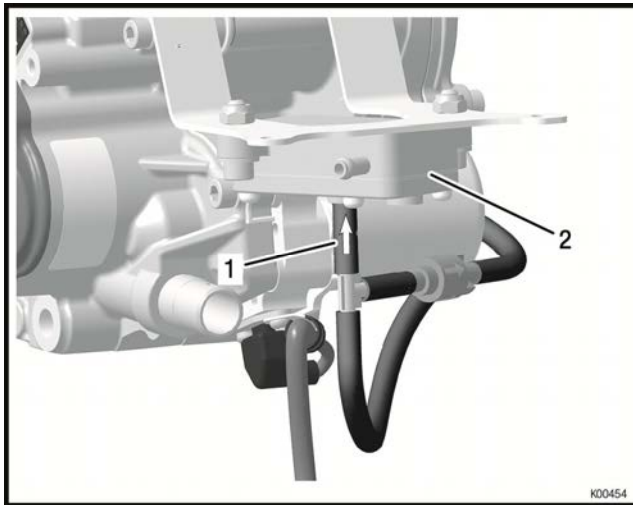


Fig. 19

- ➔ Attach the fuel line (pos. 1) to the impulse nipple on the engine housing and secure the line with tie wrap (small) (pos. 2).

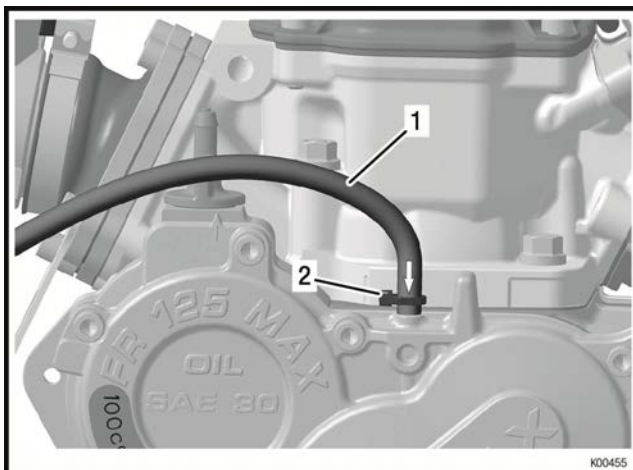


Fig. 20

- ➔ Attach the black hose of the hose package (pos. 1) to the metal connector (pos. 2) of the magnetic valve.

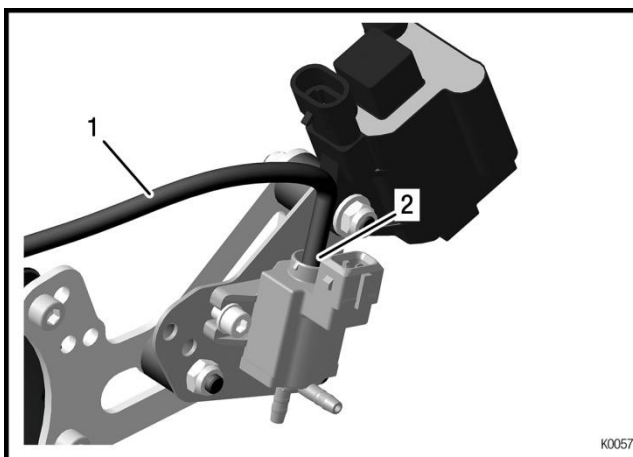


Fig. 21

- ➔ Fix another tie wrap (pos. 1) at the fixing point (bore) on the engine housing. Secure both lines with tie wrap (pos. 3), ensuring that the black hose (pos. 2) is on top. See Fig. 22

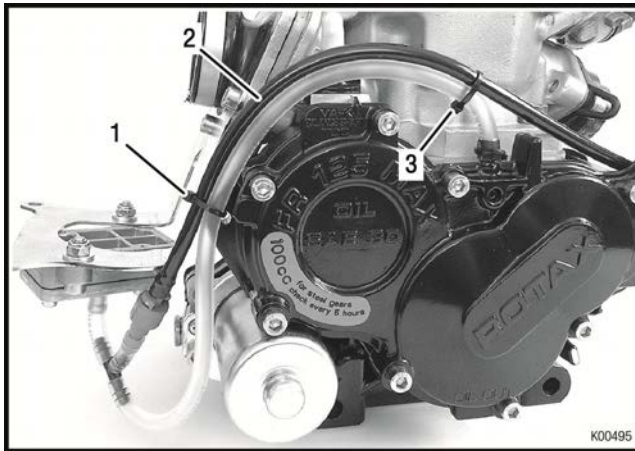


Fig. 22

- ➔ Attach the 280 mm pressure line (pos. 1) to the exhaust valve (pos. 2) and to the magnetic valve (pos. 3). Secure the pressure line on the magnetic valve with a tie wrap (pos. 4).

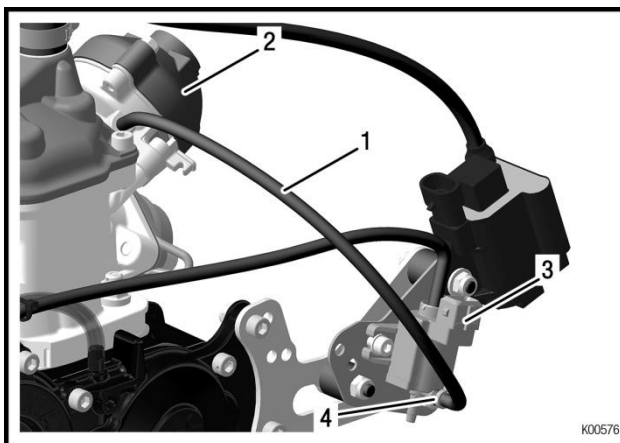


Fig. 23

9. Check oil level in gear box

The gear box is already filled with the appropriate amount of oil 100 cc (0.026 gal) by the engine manufacturer. However, before the engine is installed in the frame, the oil level must be checked or replenished. See *Fig. 38*.

- ➔ Place engine on a horizontal surface and/or assembling trestle.
- ◆ **Note:** To measure the oil level exactly, drain the gear oil and determine it using a measuring cup.
- ➔ Loosen Allen screw (pos. 1) with gasket ring (pos. 2) and absorb the leaking oil in a measuring cup. If necessary, remove the air vent screw (pos. 3) to ensure a better oil drain.
- ➔ Determine the gear oil using the measuring cup.
- ◆ **Note:** Oil capacity at new filling is 100 cc (0.026 gal).
- ◆ **Note:** Specification of gear oil: engine oil SAE 15W-40.
- ➔ Tighten the Allen screw (pos. 1) with new gasket ring (pos. 2). Tightening torque 10 Nm.
- ➔ Replenish new gear oil in the air vent hole.
- ➔ Hand-tighten the air vent screw (pos. 3).

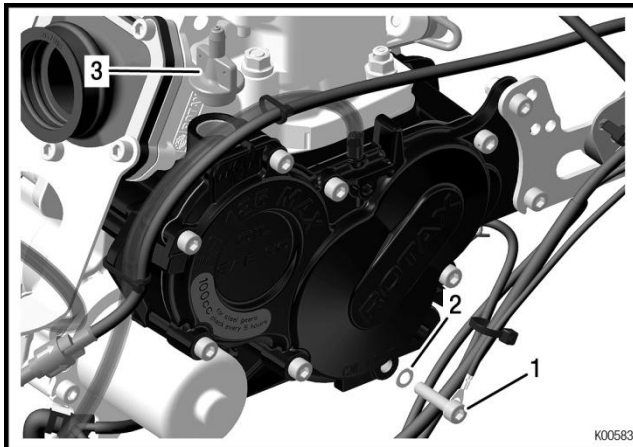


Fig. 38

10. Engine attachment to chassis

10.1. Attachment via engine pedestal

When using an engine pedestal for the ROTAX engine 125 MAX evo/Junior MAX evo Mini MAX evo/Micro MAX evo, the engine is inclined at 0° to 15° in the driving direction.

- ➔ Drill 4 holes (8.5 mm dia / 0.315 in. = drill size) on the coordinates 80 mm x 102 mm / 3.15 in. x 4.016 in. in the top plate of the pedestal suitable for the chassis.

▲ **Warning: When drilling the holes in the pedestal, pay attention to the advice of the chassis manufacturer.**

- ➔ Connect pedestal with engine crankcase with 4 screws M8 (min. strength grade 8.8). Tighten screws to 24 Nm / 212 in. lb.

◆ **Note:** Thread length in crankcase to be between 16 / 5/8 “- 24 mm / 1 in.

▲ **Warning: Pay attention to chain alignment as advised by chassis manufacturer.**

◆ **Note:** Do not fasten engine on chassis until chain is in position and properly aligned and tensioned.

11. Installation of the wiring harness

The wiring harness is delivered partly pre-assembled to facilitate the installation. This means that the relay, the multiple function switch and the battery cover are already pre-assembled and wired.

- ◆ **Note:** The connector assignment is shown on the following pages. Details on the assignment of cables and pins are given in the wiring diagram.
- ◆ **Note:** Cable lugs may break after repeated bending.
- ➔ Place the wiring harness loosely on the chassis.
- ◆ **Note:** Always start the installation at the engine side to work without tension on the wiring harness.
- **Attention:** Strain relief of the plug connections must be ensured.
- ◆ **Note:** Compensate excessive length of wiring harness by routing cables in loops.
- ▲ **Warning:** The wiring harness must not touch moving parts or the track.
- ◆ **Note:** When unplugging connections on ignition pick up and ignition coil, press the integrated catch first.
- ◆ **Note:** Disconnect any electrical plug connection only by pulling against the plugs.
- ➔ Pre-mount the large cable tie (pos.1) through the two holes provided on the mounting plate (pos. 2). See *Fig. 24*.

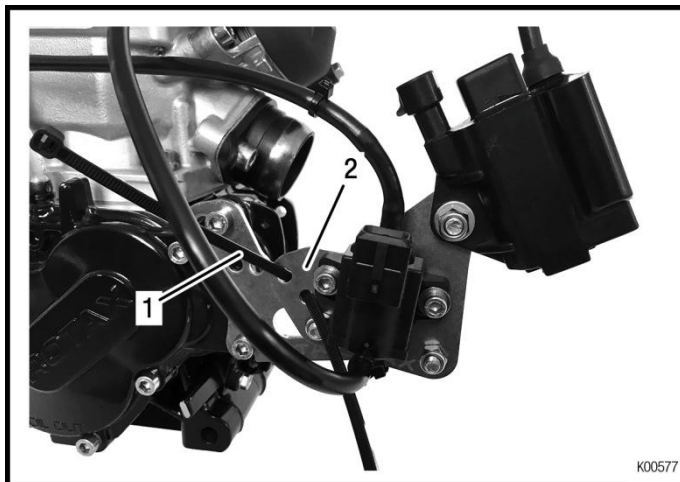


Fig. 24

- ➔ Connect solenoid valve (pos. 1) and ignition coil (pos. 2). Attach both connectors (signed green) (pos. 3) to the two components. See *Fig. 25*

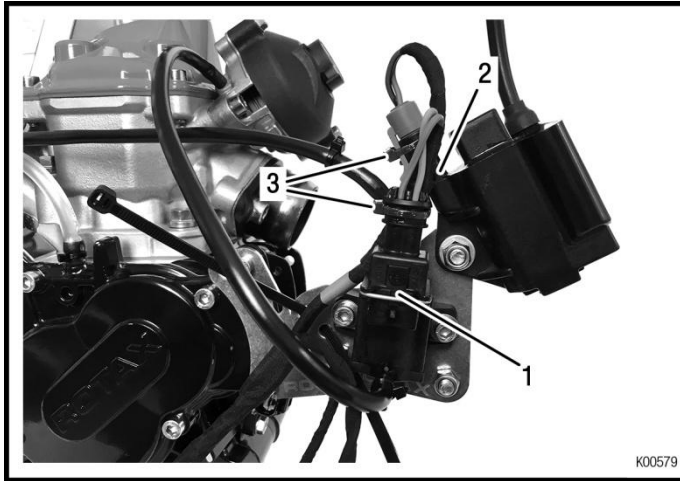


Fig. 25

- ➔ Connect pick-up connector to pick-up sensor (pos. 1). Pay attention to the engagement of the connector.

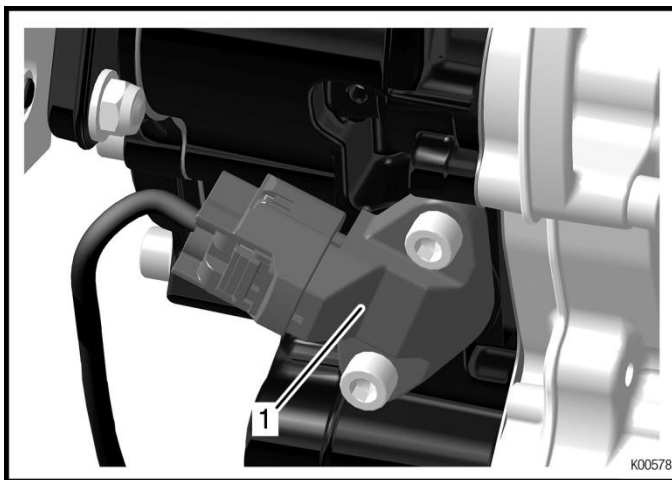


Fig. 26

- ➔ Fix the shift contact cable and the possibly to long cable (pos. 1) of the pick-up sensor (pos. 3) with the pre-mounted tie wrap (pos. 2) onto the mounting plate.

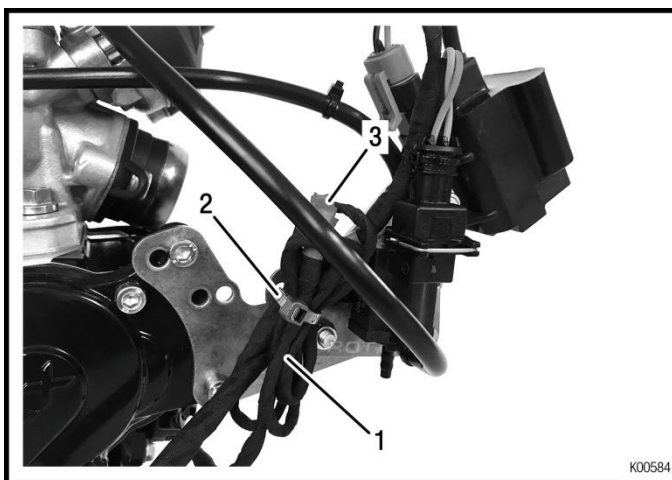


Fig. 27

- ◆ **Note:** The shift contact cable must be isolated, because there is no use on non-gear engines.

11.1. For engines without exhaust slide only:

In the following figure you see the laying of the wiring harness on engines without exhaust slide. Also you see a dummy plug (part no. 666900) as an option, which is not included in the scope of delivery. It can be secured using tie wraps instead of the solenoid valve.

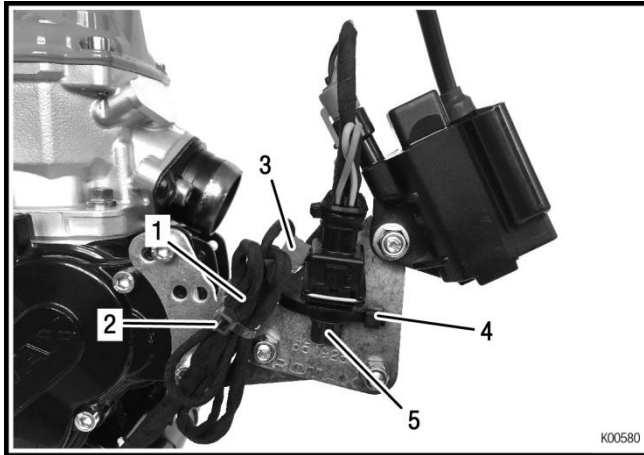


Fig. 28

➔ Attach the ignition cable onto the wiring harness.

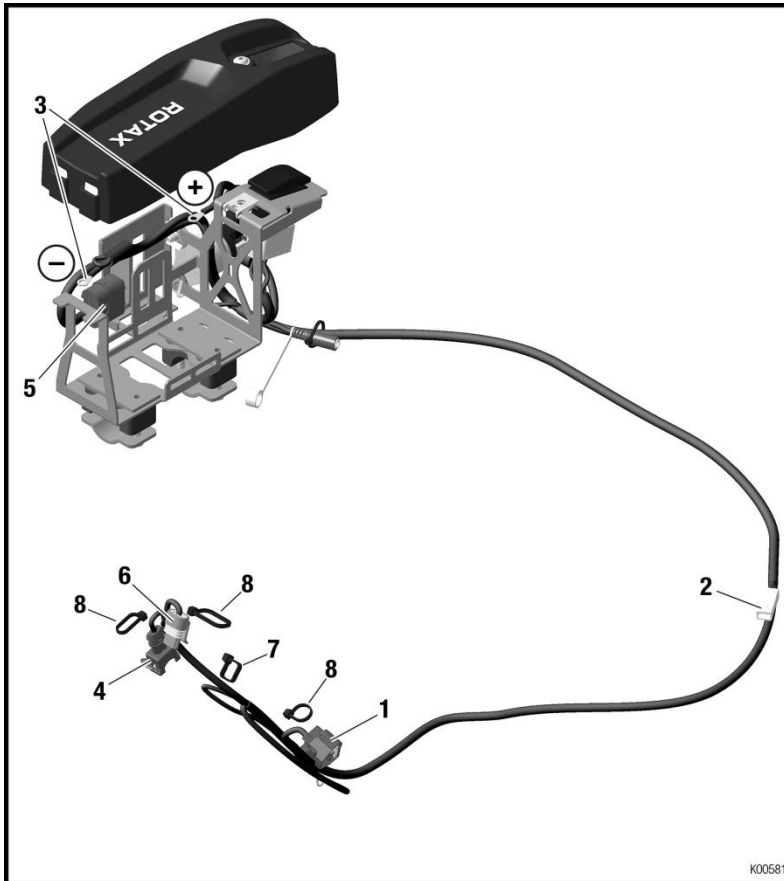


Fig. 29

1. Connector pick-up sensor
2. Connector starter
3. Connector battery
4. Connector RAVE (only applicable 125 MAX evo)
5. Connector ECU
6. Connector ignition coil
7. Tie wrap 250x4.8
8. Tie wrap 142x3.2

12. Installation of the battery and ECU

12.1. Install ECU into the battery holder

- ➔ Prepare two rubber pads (pos. 1) and the control unit (pos. 2) for installation.

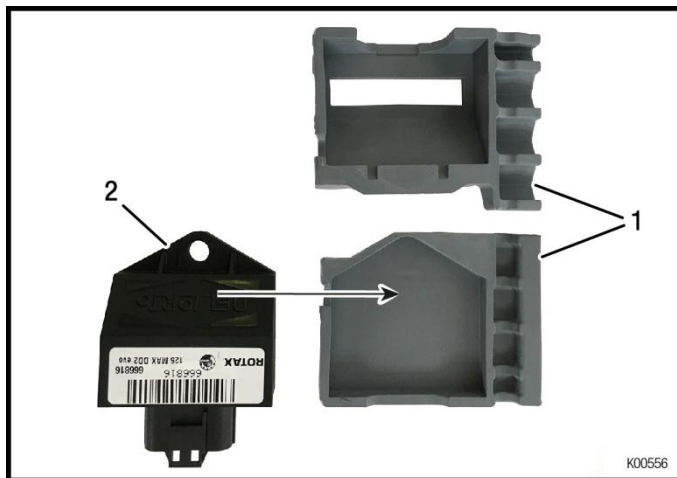


Fig. 30

- ➔ Install the control unit into the respective rubber pad.

TIP: Align at the triangular bottom of the control unit. It fits the rubber pad only in one position.

- ➔ Place the upper rubber pad (pos. 1) onto the control unit.

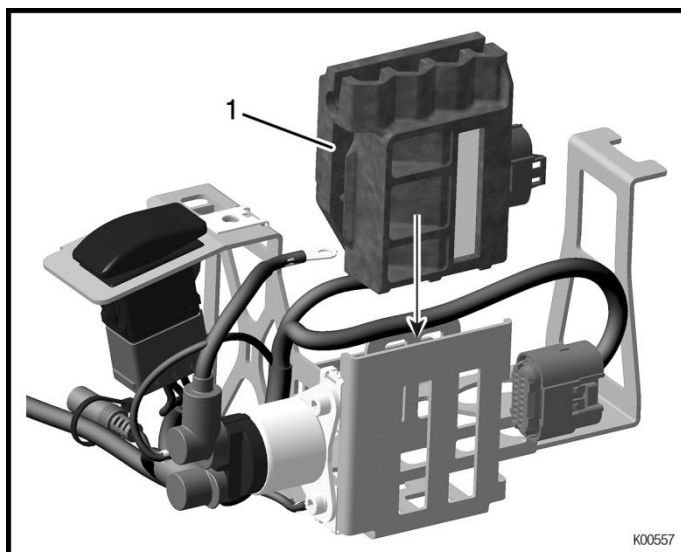
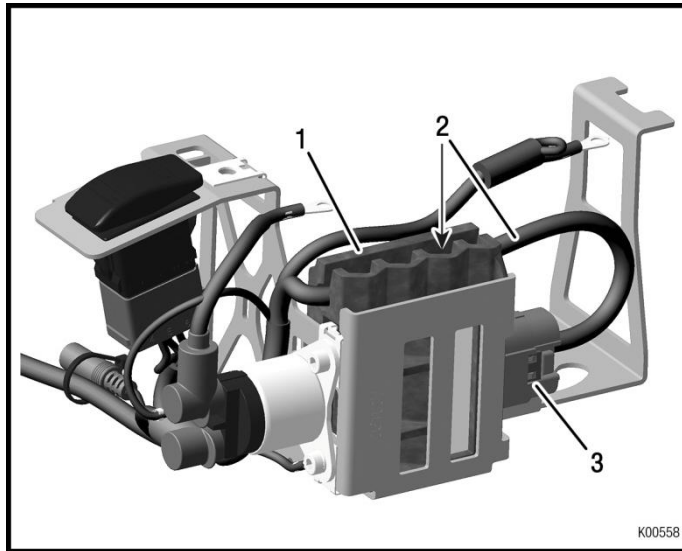


Fig. 31

- ➔ Insert the complete unit into the battery holder.

◆ **Note:** If difficulties during insertion occur, the inside of the battery holder can be easily bent inward so that the distance increases slightly. See Fig. 32. Also, a bit of silicone spray may ease the installation.



K00558

Fig. 32

- **Attention:** Make sure that the connection cable (pos. 2) has been installed between the two pads (pos. 1). The connection of the ECU is on the rear side (against the driving direction).
-

12.2. Installation of the battery

See Fig. 33.

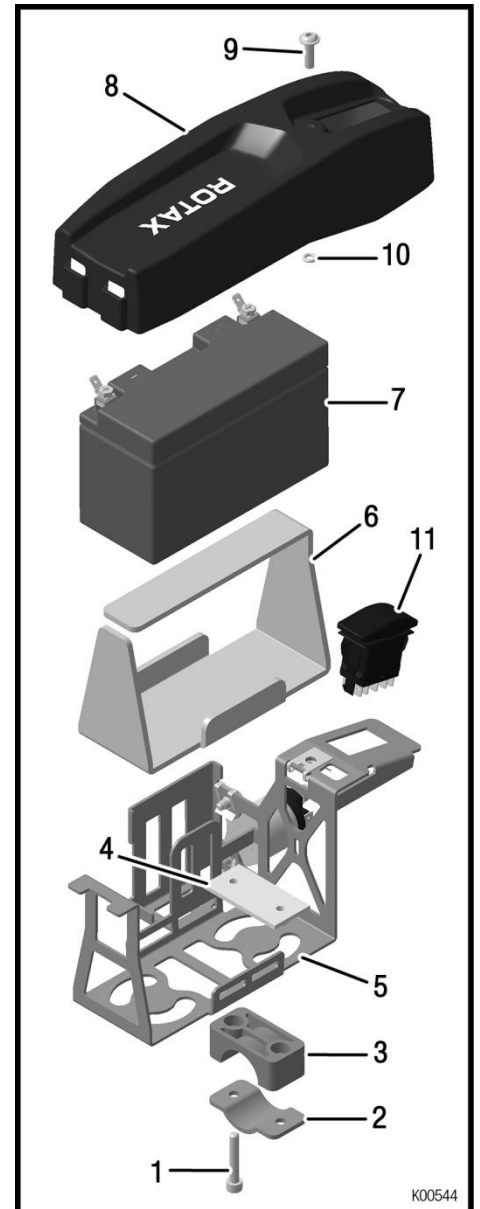
▲ **Warning:** Make absolutely sure to avoid short-circuiting of battery terminals. A short circuit will ruin the battery and could cause an explosion.

➔ Attach the battery fixture (pos. 5) with the two pipe clamps (pos. 1– 4) to the left side box beside the driver's seat.

◆ **Note:** The clamps (pos. 2, 3) are designed for chassis tubes of 30 - 32 mm (1.18 – 1.26 in) dia.

■ **Attention:** Risk of clamp fracture! Do not overtighten the screw (pos. 1) of the pipe clamps (pos. 2, 3).

➔ Install rubber pad (pos. 6) with battery (pos. 7) into the battery holder (pos. 5).



TIP: The battery fixture (pos. 5) can be fixed with one screw to one side of the clamp (pos. 3). See Fig. 34.

Fig. 33

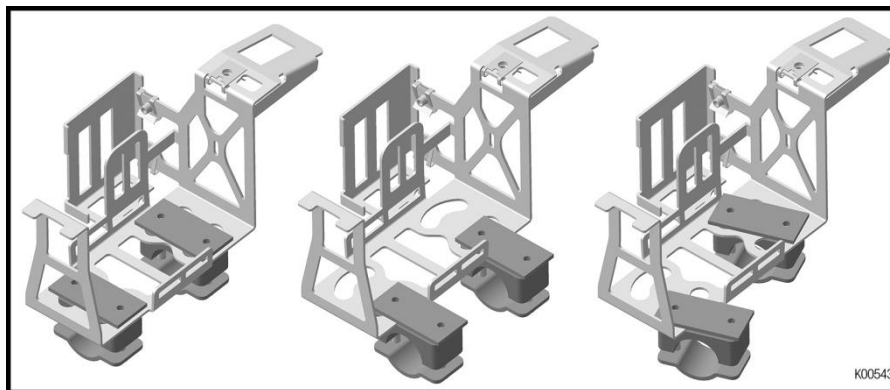


Fig. 34

- ◆ **Note:** The battery terminals (pos. 1) must point in the direction of the control unit. See Fig. 35.

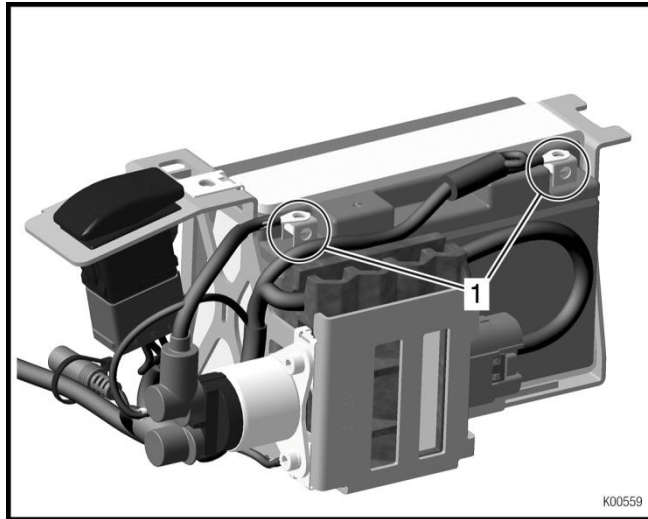


Fig. 35

- ➔ Connect the positive terminal (red) of the battery.
- ➔ Connect the negative terminal (black) of the battery.

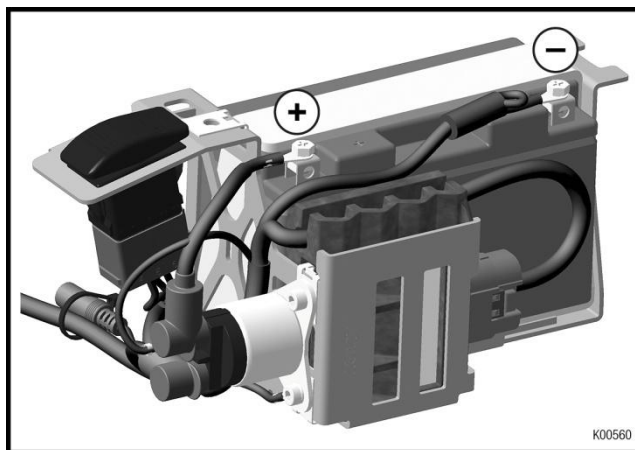


Fig. 36

- ➔ Install the battery cover onto the battery holder.
- ◆ **Note:** Make sure that the two retaining lugs (pos. 1/ Fig. 37) are in the notches of the battery cover!
- ➔ Tighten flange head screw (pos. 2/ Fig. 37) of the battery cover.



Fig. 37

13. Fitting of the drive chain

The required length of the drive chain depends on chassis and transmission ratio and the chain is therefore not included in the engine's scope of supply.

◆ **Note:** BRP-Rotax recommends o-ring drive chains by ROTAX Premium.

- ➔ Use a chain with the length corresponding to the selected transmission ratio of dimension 7.75 x 4.6 x 4.5.
- ➔ Place the chain on the sprocket on the clutch and on the sprocket on rear axle.
- ➔ Verify chain alignment between front and rear chain sprocket with a straight edge. Correct as required by shifting sprocket adapter along rear axle.

▲ **Warning:** Pay attention to instructions of the chassis manufacturer regarding the drive chain alignment.

- ➔ Establish required chain tension (Sag = +/- 5 mm / +/- 0.20 in.) by shifting the engine.
- ➔ Fasten engine on the chassis.

▲ **Warning:** Take note of the advice of the chassis manufacturer regarding engine attachment to chassis.

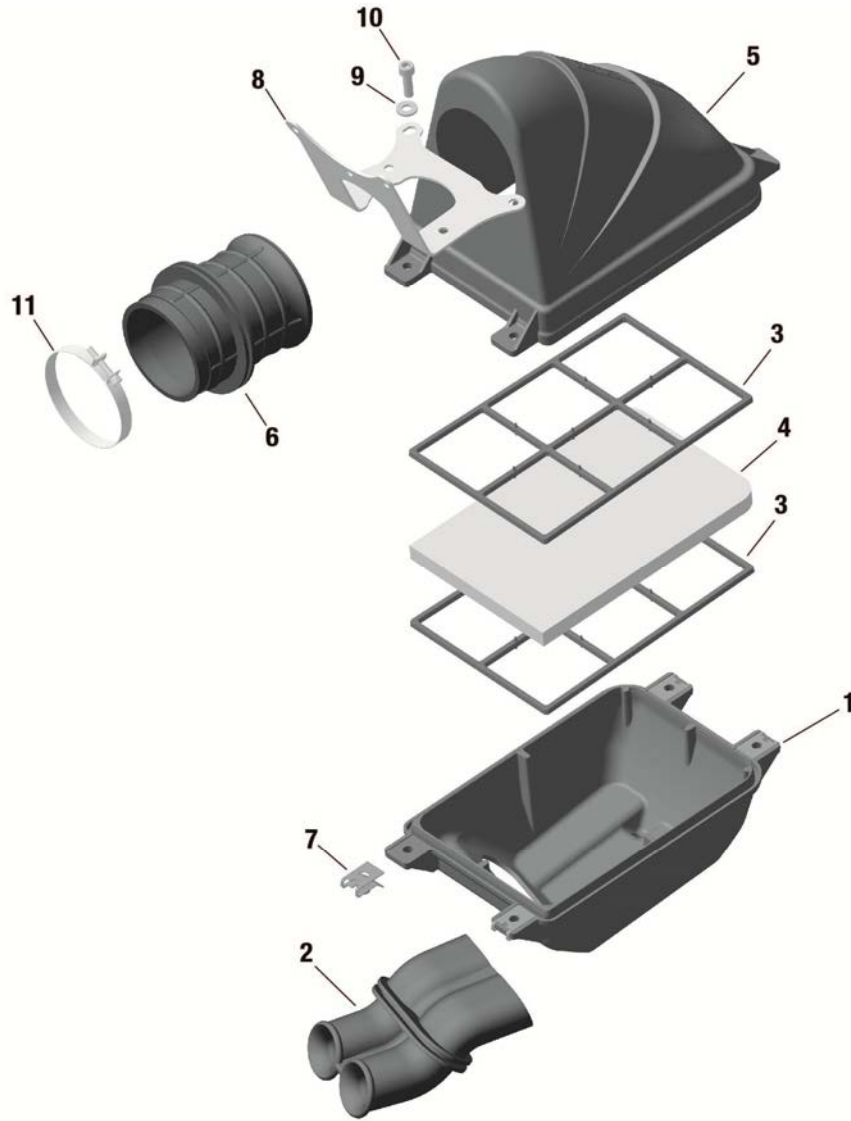
▲ **Warning:** This cover serves merely as splash protection against the grease on the drive chain, but is no protection against contact with the moving parts of the centrifugal clutch and the drive train!

▲ **Warning:** During kart operation, beware of any contact of body or clothing with moving parts of the kart (drive chain, rear axle and wheels). Risk of injury.

14. Installation of the intake silencer with integrated air filter

See Fig. 39.

- ➔ Install rubber intake pipe (pos. 2) in a vertical position in the bottom half of the intake silencer case (pos. 1) so that the rounded intake openings point outwards.
- ➔ Fit the carburetor socket (pos. 6) into the top half of the intake silencer case (pos. 5) so that the arrow on the socket points towards the carburetor.
- ➔ Install the filter element (pos. 4) with holders (pos. 3) into the bottom half of intake silencer case (pos. 1).
- ➔ Assemble bottom half of intake silencer case (pos. 1) with top half (pos. 5) as shown in the following illustration. Make sure that the locking is interlocked properly.
- ➔ Apply "air filter cleaning kit" part no.: 297160 on the filter mat (pos. 3) and squeeze out surplus oil afterwards.
- ➔ Attach the intake silencer with the supplied hose clamp (pos. 4) to the carburetor.
- ◆ **Note:** The carburetor socket (pos. 6) is asymmetrical and can be turned so that the best possible position between carburetor and intake silencer can be achieved.
- ➔ Attach the intake silencer to the support bracket (pos. 8) using 2 Allen screws M6x20 (pos. 10) with washers (pos. 9) and nuts (pos. 7).



K00432 / Fig. 39

15. Installation of the exhaust system

See Fig. 40.

◆ **Note:** On the underside of the exhaust system, two different mounting mechanisms are provided. At the front, the assembly is carried out with rubber buffers (pos. 7) between the retaining plate (pos. 6) and the exhaust system and attached by extension springs (pos. 8). At the rear, the exhaust system is mounted directly using rubber mounts M8 (pos. 9).

■ **Attention:** A rigid suspension of the exhaust system could result in fractures in the exhaust system.

➔ Attach the heat-resistant rubber mounts (pos. 9) to the two support lugs on the underside of the tuned exhaust.

➔ Arrange the chassis-specific supports so that the exhaust system follows the straightest possible course from the exhaust socket on the cylinder to the muffler.

➔ The gasket (Pos. 13) is the only sealing between the engine and the exhaust system. Additional heat-resistant Loctite is not necessary anymore.

◆ **Note:** All engine types have the same gaskets

◆ **Note:** A leakage in the exhaust system may lead to performance loss.

➔ Secure the exhaust system on the ball joint, using two supplied exhaust springs (pos. 14).

◆ **Note:** For easier installation use the special tool "spring hook" part no. 251680.

■ **Attention:** Do not overstress the springs when fitting them.

➔ Attach the exhaust system to the chassis supports such that the sealing of the ball joint between cylinder and exhaust system will not be impaired.

Configuration 125 Micro MAX evo:

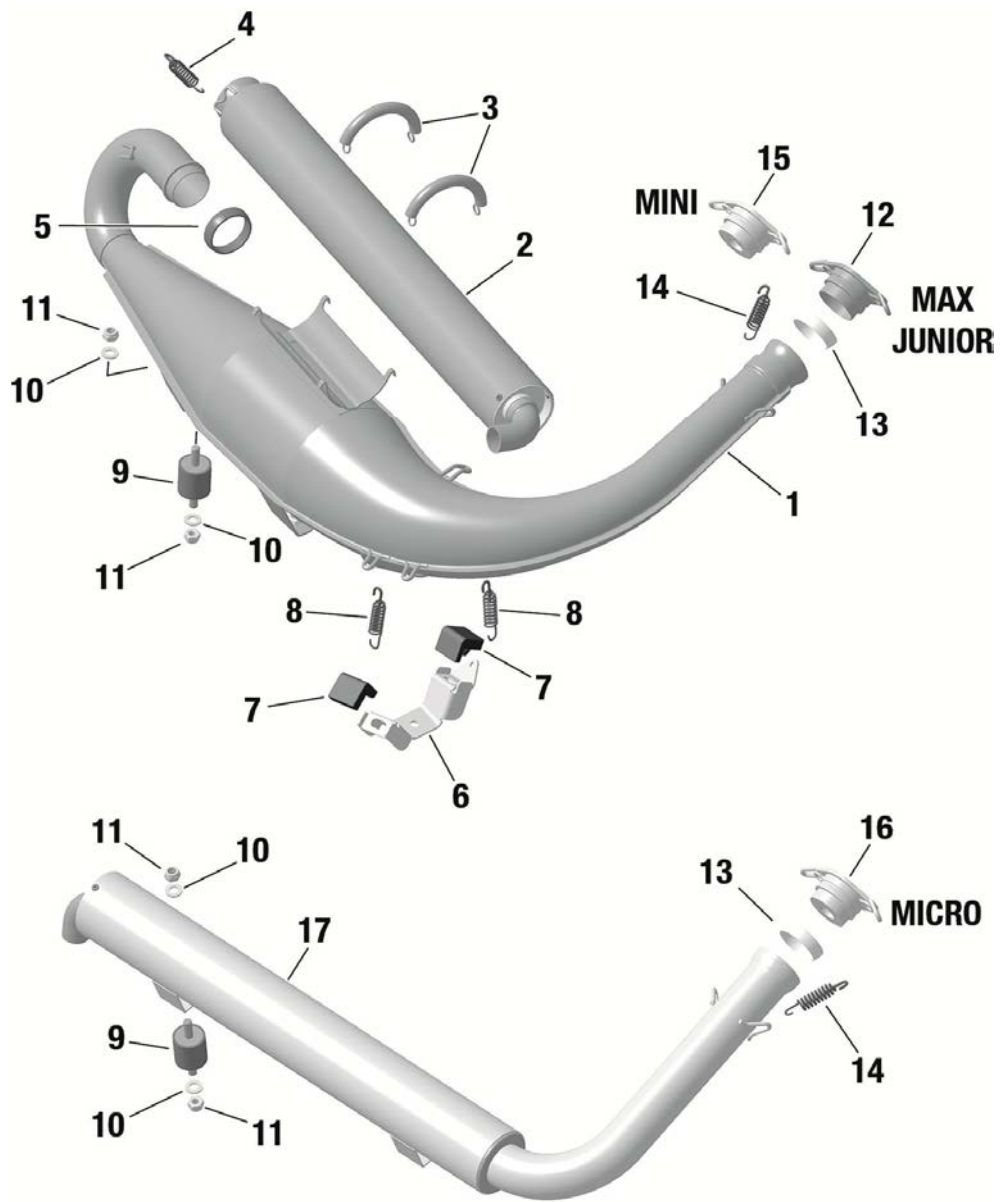
The exhaust system is provided only for the engine type 125 Micro MAX evo. Also the exhaust socket part no. 273192 (Pos. 13) was developed only for the configuration 125 Micro MAX evo.

Engine type	Exhaust socket part no.	Exhaust socket ø
125 Micro MAX evo	273192	Ø 18 mm / 0.71 in.

Configurations 125 MAX evo Junior MAX evo, Mini MAX evo:

The exhaust system (pos. 2) is provided for the engine types 125 MAX evo, Junior MAX evo und Mini MAX evo. Only the exhaust sockets are different:

Engine type	Exhaust socket part no.	Exhaust socket ø
125 MAX evo	273190	Ø 37 mm / 1.46 in.
125 Junior MAX evo	273190	Ø 37 mm / 1.46 in.
125 Mini MAX evo	273194	Ø 20 mm / 0.79 in.



K00433 / Fig. 40

16. Finishing work

To warrant engine operation within the coolant's temperature limits, a thermo-sensor for observation of the coolant temperature is required.

◆ **Note:** Refer to operator's manual (section 3.1) for limits of operation regarding coolant temperature.

16.1. Venting of the gear box

➔ Remove cap from the venting screw.

➔ Establish a connection between the venting screw and a collecting reservoir using a piece of the supplied fuel hose of an appropriate length.

◆ **Note:** The venting hose must not reach all the way to the bottom of the collecting reservoir.

■ **Attention:** Do not attach the venting hose to the bottom of the collecting reservoir, if only one reservoir is in use.

▲Warning: Before engine operation, read the operator's manual.

**OPERATOR'S MANUAL FOR ROTAX ENGINE TYPE
125 MAX evo, Junior MAX evo, Mini MAX evo, Micro MAX**

Table of Contents of Operator's Manual

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1. Design of the ROTAX engine types 125 MAX evo, Junior MAX evo, Mini MAX evo and Micro MAX evo

- 2.1.** Single-cylinder two-stroke engine, reed valve controlled, and 125 cm³ displacement
 - 2.2.** Cooling circuit
 - 2.3.** Balance shaft
 - 2.4.** Ignition unit
 - 2.5.** Electric starter
 - 2.6.** Electro-pneumatically exhaust timing control (125 MAX evo only)
 - 2.7.** Fuel pump
 - 2.8.** Carburetor
 - 2.9.** Intake silencer
 - 2.10.** Exhaust system
-

2. Technical description of the ROTAX engine types 125 MAX evo, Junior MAX evo, Mini MAX evo and Micro MAX evo

2.1. Type of engine

Single-cylinder two-stroke engine with reed valve controlled inlet. The proper mixture lubrication is achieved by adding oil to the gasoline in a specified mixing ratio.

2.2. Cooling circuit

The coolant is pumped from the radiator to the water pump, which is driven by the clutch shaft. The water pump conveys the coolant through the cylinder and the cylinder head back to the radiator.

The cooling circuit is equipped with a thermostat (opening point 45 °C / 113 °F). It assures that the engine reaches its operating temperature quickly and keeps it at a relatively constant level.

The thermostat is integrated in the cylinder head cover.

2.3. Balance shaft

The balance shaft rotates counter-wise to the crankshaft to reduce engine vibration.

2.4. Ignition unit

The control of the ignition system is exercised by the ECU (Engine Control Unit). To calculate the ignition timing, an engine speed sensor is needed, which is installed on the bottom of the engine housing. There is no manual adjustment of the ignition system necessary and/or possible.

If the power button is pressed once, the ignition is activated and the button lights up. To start the engine, it only needs to be pressed once again. To turn off the engine as well as the ignition, proceed in reverse order.

2.5. Electric starter

By pressing the start button, the circuit between the battery and electric starter will be closed by a relay. The electric starter drives the starter gear on the crankshaft via an intermediate gear with free-wheeling, until the engine starts to run. An automatic switch reset from "START" to "ON" is integrated.

2.6. Electro-pneumatical exhaust timing control (125 MAX only)

The engine type 125 MAX evo is equipped with an electro-pneumatic exhaust control. The ERAVE (Electronic ROTAX Adjustable Variable Exhaust) system is controlled by an electro-pneumatic valve via the ECU. The vacuum required is provided by the engine crankcase.

At engine stop, the exhaust valve is in idle mode and therefore in the open position. With the engine running, it closes or opens the electro-pneumatic valve of the exhaust, depending on the speed and therefore, it provides optimum performance characteristics.

2.7. Fuel pump

The fuel pump is actuated by the pulsating pressure changes in the crankcase and the pump transfers the fuel from the fuel tank to the carburetor.

An inline fuel filter (between fuel tank and fuel pump) keeps foreign particles from entering the fuel pump or the carburetor, respectively.

2.8. Carburetor

The carburetor (DELL'ORTO VHSB 34) is a slide type carburetor with float system. The standard main jet is suitable for almost all operating conditions. For extreme operating conditions, the main jet size must be adjusted to the actual conditions according to this manual.

2.9. Intake silencer

The intake silencer incorporates an air filter to clean the intake air. The intake silencer has been designed for optimum reduction of the air intake noise level and represents a tuned system with the engine.

The air filter consists of several layers and has been optimized in the area of air passage and filter to work more effectively. If soiled or during engine maintenance work, clean the filter with biodegradable products.

2.10. Exhaust system

The exhaust system is designed as a resonance system with an after-muffler and represents a tuned system with engine.

3. Media for engine operation

3.1. Coolant

A mixture of distilled water and aluminum-compatible antifreeze has to be used as coolant. Follow the antifreeze specifications to ensure protection against freezing up to a temperature of -20 °C / -4 °F.

- ◆ **Note:** Please follow the local regulations concerning the use of antifreeze on the race track.
- ➔ Open radiator cap and fill the system with coolant (approx. 0.7 liter / 0.185 gal for the complete cooling system).
- ➔ Close radiator cap.
- ▲ **Warning:** The engine temperature should not exceed 85 °C / 185 °F. Exceeding the engine temperature could lead to serious engine failure.

3.2. Battery and battery charging unit

See Fig. 1.

The power for the ignition unit and electric starter is only supplied by the battery. With a fully charged battery of 12 V and 6.5 Ah, the engine can be started approximately one hundred times and operated over a period of approximately five hours. With the battery voltage decreasing to approximately 11 V, the point will be reached where the battery voltage is too low to generate a spark for ignition.

- **Attention:** The lifespan of the battery will be drastically reduced by exhausting the battery completely. Therefore it is recommended to fully re-charge the battery before and after any operation of the kart.
- ◆ **Note:** It is recommended to always carry a charged spare battery. The installed battery should be replaced by a fully charged battery before it is completely exhausted.
- ◆ **Note:** If the spark plug is removed to check if the battery still generates a spark, consider the following: with the spark plug removed it is easier for the electric starter to crank the engine, which reduces current absorption of the electric starter resulting in a battery voltage adequate to generate a spark. If the spark plug is fitted again, it may happen that the engine does not start.
- ◆ **Note:** To charge a battery, the battery charging unit specified by ROTAX and available as an accessory should be utilized (charging unit, part no. 265148). When using the lithium battery available as spare part, the battery charger Optimate Lithium (part no. 581325) is recommended.
- ◆ **Note:** To be able to use the battery charger in your home country, please contact your nearest authorized ROTAX distributor or one of their ROTAX service centers to receive an adapter plug or an adapter cable, respectively.
- ◆ **Note:** This battery charger will switch over automatically to maintenance charge as soon as the target voltage is reached. Therefore overcharging with the result of ruining the battery will be impossible.
- **Attention:** The use of any other battery charger can impair the battery life or may ruin the battery.

When charging the battery, take note of the following:

- ➔ Connect the battery charger to the charging connector (pos. 1).



Fig. 1

- ➔ Connect the battery charging unit to 110-230V, 50-60Hz power supply. During the charging procedure, the charge indicating lamp will light up red.
- ➔ At completion of the charging process, the control lamp will change to green, but the charging current will remain, thus warranting a fully charged battery.
- ➔ The charging time amounts to approx. 12 hours.
- ◆ **Note:** The battery charger may be connected to the battery for a longer period, as the battery takes just the current required to be fully charged.
- ◆ **Note:** A non-extinguishing blinking of the red control lamp, even after 24 hours of charging, indicates that the charging capacity of the battery is diminishing.
- ◆ **Note:** A red/green blinking of the charging control lamp indicates transition from main charging to additional charging and does not signal a faulty battery charger.
- ➔ Unplug power supply to battery charging unit.
- ➔ Remove output wires of the battery charger from the battery.
- ➔ The battery is ready again for use.
- **Attention:** In addition to these directives, follow the advice of the battery charging unit manufacturer.
- ◆ **Note:** When the battery is charged while not mounted on the kart, use the adapter cable (part no. 266022). If needed, contact your authorized distributor or one of their ROTAX service centers.

The charging condition of the battery can be estimated using a commercially available measuring instrument.

3.3. Fuel

For engine operation, a mixture of unleaded gasoline of at least ROZ_{min.} 95 / 91 (RON+MON) / 2 and **fully synthetic** two-stroke oil, mixed at the ratio of 1: 50 (2 % oil) has to be used.

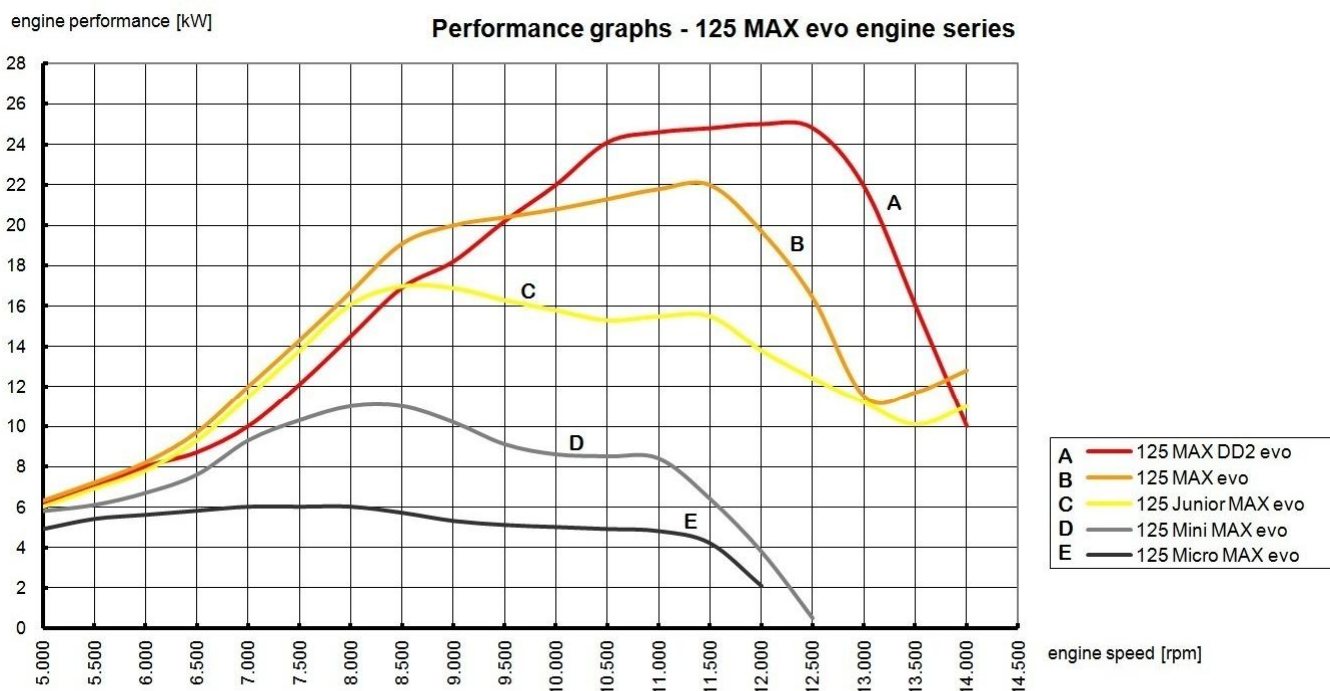
- **Attention:** Carry out a correct running-in procedure. See section 7.3.
 - **Attention:** Too much oil in the fuel mixture (more than 2 %) could lead to engine trouble (e.g. choking of the exhaust valve, piston ring sticking).
 - **Attention:** Insufficient amount of oil in the fuel mixture (less than 2 %) could result in engine trouble (e.g. piston seizure).
 - ▲ **Warning:** **Do not try any different sorts of fuel. This could lead to engine damage and damage to the intake system.**
 - ▲ **Warning:** **When mixing fuel and while fuelling, do not smoke or allow naked flames. Gasoline is highly flammable and explosive under certain conditions.**
 - ▲ **Warning:** **Never perform mixing and fuelling in closed rooms, handle fuel in well-ventilated areas only.**
 - ▲ **Warning:** **Before each fuelling, shake fuel container well to ensure adequate mixing of gasoline and oil.**
 - ▲ **Warning:** **Fuel the kart only when engine is not running and the combination switch is at OFF position.**
 - ▲ **Warning:** **Make sure that the fuel does not splash onto hot engine components or equipment. Risk of fire and explosion!**
 - ▲ **Warning:** **Pay attention to the safety advice of the kart manufacturer!**
 - **Attention:** Do not spill fuel. Absorb spilled fuel with appropriate drying agent and ensure ecological disposal.
 - **Attention:** Ensure that no contamination enters the fuel tank and the carburetor.
 - **Attention:** Unleaded fuel has a limited storage life. Store only the quantity of fuel in a container which will be needed in the near future.
-

4. Engine tuning

Performance graphs

In this diagram, the different performance characteristics of the MAX engines are shown. The vertical Y-axis shows the power in kilowatts (kW). The horizontal X-axis shows the rotational speed in revolutions per minute (rpm).

For more information, please check the performance data sheets on www.rotax-kart.com.



* Leistungsangaben nach ISO 15550 und ISO 4106 / Performance information according to ISO 15550 and ISO 4106

K00414

4.1. Carburetor calibration

The standard carburetor calibration is set for an ambient temperature of 25 °C / 77 °F and 400 m / 1310 ft above sea level. For an operation at different temperatures and altitudes, the main jet of the carburetor has to be changed to optimize engine performance.

- ◆ **Note:** For an engine operation at an ambient temperature below 10 °C / 50 °F, make sure not to demand full power before the coolant temperature has reached 45 °C / 113 °F.
- ◆ **Note:** The warranty granted by BRP-Rotax will no longer apply, if the carburetor calibration is carried out improperly and therefore causes engine damage.

The following application for smartphones shows the individual setting of your ROTAX 125 Max engine:

The Rotax Max Jetting Guide is an app for Android™ and iOS devices, designed to assist users with setting up the recommended main jet based on the ambient conditions and the type of engine. The perfect set up can be calculated in two ways, either automatically - which requires a GPS signal and an internet connection, or manually - which requires certain knowledge about altitude and weather conditions.

Automatical set-up:

1. Click on the white button located at the top of the screen saying "USE GPS POSITION FOR WEATHER DATA". After a short time the app will automatically provide all the necessary information regarding weather and geographical position.



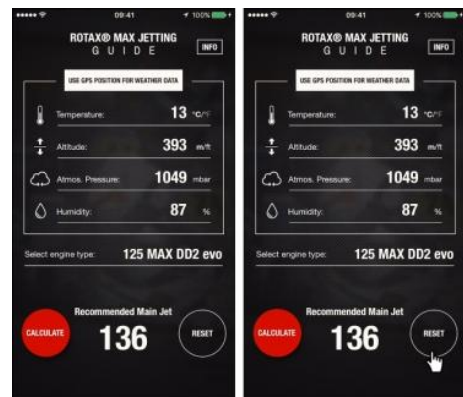
2. As a second step, the engine type of the kart needs to be selected. Therefore, the button underneath the weather data needs to be clicked. The app will automatically show all potential Max evo engines from which one can be selected by clicking on a certain engine type.



3. After all the necessary information has been provided and selected, you only need to click the circular red button saying "CALCULATE" at the bottom of the screen.



4. Now the recommended main jet value will be provided. In case a second calculation needs to be made, you can start over by simply pressing the button saying "RESET" next to the calculated value.

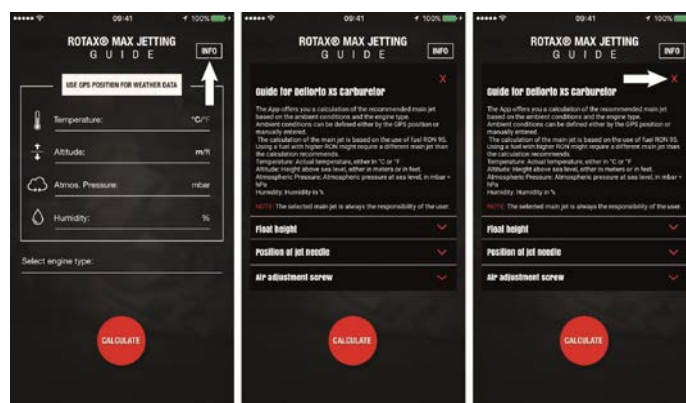


Manual set-up:

1. In case no GPS signal or internet connection is available, the necessary data needs to be added manually, which of course requires knowledge about current weather conditions at the race track as well as the altitude. By clicking on the empty space next to "Temperature", "Altitude", "Atmos. Pressure" and "Humidity", you are able to enter the required information. In terms of "Atmos. Pressure", the atmospheric pressure at sea level has to be entered, usually the barometer shows the actual level.
2. As a second step, the engine type of the kart needs to be selected. Therefore, the button underneath the weather data needs to be clicked. The app will automatically show all potential Max evo engines from which one can be selected by clicking on a certain engine type.
3. After all the necessary information has been provided and selected, you only need to click the circular red button saying "CALCULATE" at the bottom of the screen.
4. Now the recommended main jet value will be provided. In case a second calculation needs to be made, you can start over by simply pressing the button saying "RESET" next to the calculated value.

Additional information

- In case values are being entered manually, the provided numbers will turn from white to red if they are considered to be unrealistic.
- Depending on their preference, users can decide if they would like to use the metric or the imperial system. You can change between Celsius and Fahrenheit by simply clicking on the small °C or °F next to the value for temperature. The same works with feet and meter, where you can just click on the small m or ft located next to the value for altitude in order to change between the systems.
- In the top right corner, you can find a button called "INFO". By clicking this button, additional information about the app as well as setting up the carburetor, like float height, position of the jet needle or the air adjustment screw, can be found. By clicking the small red X underneath the info button, you can return to the home screen.



For further information, a YouTube video is available from the following QR-code:



APP Download

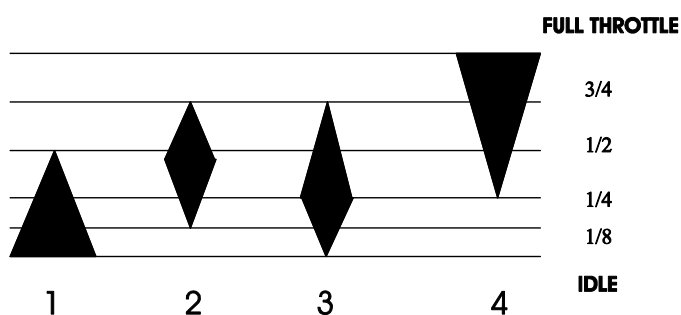
Please scan the following QR-code for your Android phone:



Please scan the following QR-code for your iOS phone:



For better understanding and as help for carburetor adjustment, the following figure describes the effect of the various adjustments, depending on the throttle position.



1 - AIR SCREW AND PILOT JET

2 - TYPE AND POSITION OF JET NEEDLE

3 - TYPE OF NEEDLE JET

4 - MAINJET

K00264

To change the carburetor main jet, proceed as follows:

◆ **Note:** The carburetor must not be removed from the engine in order to change the jetting.

▲ **Warning:** Handle fuel in well-ventilated areas only.

▲ **Warning:** When handling fuel, do not smoke or allow naked flames. Gasoline and gasoline vapor are highly flammable and explosive under certain conditions.

▲ **Warning:** Make absolutely sure that fuel will not splash onto hot engine parts or equipment. Risk of fire and explosion.

■ **Attention:** Do not spill any fuel. If fuel is spilled, apply drying agent and dispose ecologically.

➔ Drain the fuel in the float chamber into a suitable clean tray by removing the plug screw (pos. 27) and gasket ring (pos. 26).

◆ **Note:** The fuel drained from the float chamber may be poured back into the fuel tank.

➔ Remove the main jet (pos. 15) and the main jet cup (pos. 14).

◆ **Note:** The size of the jet is imprinted on the face of the main jet.

➔ Select the appropriate size of main jet refers to Rotax Max Jetting Guide

➔ Install the main jet cup (pos. 14) in position as described in figure 2 and fit the corresponding main jet (see Rotax Max Jetting Guide)

➔ Fit and hand-tighten the plug screw (pos. 27) and gasket ring (pos. 26).

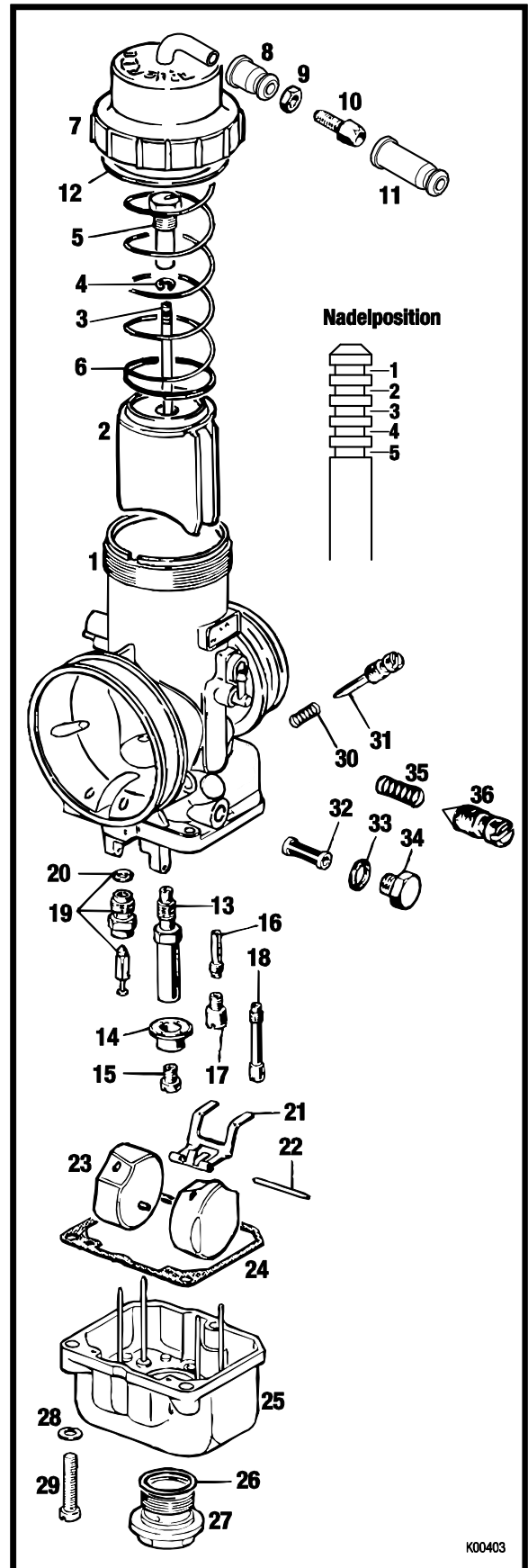


Fig. 2

- ◆ **Note:** In a disassembled carburetor, the position of the jet needle (pos. 3) can be changed. The standard position of the jet needle is 'position 2'. If the clip (pos. 4) is set in 'position 1', the full mixture in part and full-load will become slightly leaner. If the clip (pos. 4) is set into 'position 5', the fuel mixture will become slightly richer in the part and full-load range.
- ◆ **Note:** The fuel filter (pos. 32) is located below the fuel inlet on the carburetor, preventing contamination from entering the carburetor which could impair operation of the carburetor.
- **Attention:** The fuel filter (pos. 32) must be inspected periodically and cleaned as required.
 - ➔ Remove the hex. screw (pos. 34) and gasket ring (pos. 33).
 - ➔ Pull out the fuel filter (pos. 32) and clean the filter and fuel inlet.
 - ➔ Refit the fuel filter (pos. 32), the gasket ring (pos. 33) and hex. screw (pos. 34).
- ◆ **Note:** When trying to start the engine it will take a few seconds for the fuel pump to fill the float chamber and for the engine to start.
- ◆ **Note:** With the adjustment screw (pos. 36), the idle speed of the engine can be adjusted. By turning in the adjustment screw (pos. 36) the idle speed increases and by turning out the screw (pos. 36) the idle speed will be reduced.
- ◆ **Note:** With the adjustment screw (pos. 31), the fuel mixture formation can be adjusted. By screwing in the adjustment screw, the air-fuel mixture will become richer at idling and by screwing out the screw, the air-fuel mixture will become leaner at idling. The default setting of the adjustment screw are two full turns and one quarter of a turn ($2\frac{1}{4}$) from inside to outside.

4.2. Selection of the transmission ratio

The transmission ratio (between chain pinion on the engine and chain sprocket on the rear axle of the kart) has an essential influence on the achievable lap time.

The routing (fluent or non-fluent) and the conditions (high or low tire grip) of the track require a certain transmission ratio to ensure an optimal lap time.

A longer transmission ratio (e.g. $12/72=6$) theoretically results at every rotational speed of the engine in a higher speed of the vehicle, but also in a higher driving resistance than with a shorter transmission ratio (e.g. $12/78=6.5$).

Calculation Example:

Rotational speed 13000 rpm.

Transmission ratio $12/72=6$

Circumference of rear tire 0.85 m

Vehicle speed = $13000 \times 60 : 6 \times 0.85 : 1000 = 110.5 \text{ km/h}$

Rotational speed 13000 rpm.

Transmission ratio $12/82=6.5$

Circumference of rear tire 0.85 m

Vehicle speed = $13000 \times 60 : 6.5 \times 0.85 : 1000 = 102 \text{ km/h}$

In principle, the transmission ratio should be chosen in a way that the engine is mainly operated in a speed range at which the engine performance is well above the driving resistance.

The following chart (125 MAX evo) shows that the difference between the engine performance and the driving resistance constantly increases at a speed range from 5000 to 9000 rpm, remains the same at a speed range from 9000 to 11500 rpm and decreases again at a speed about 11500 rpm onwards.

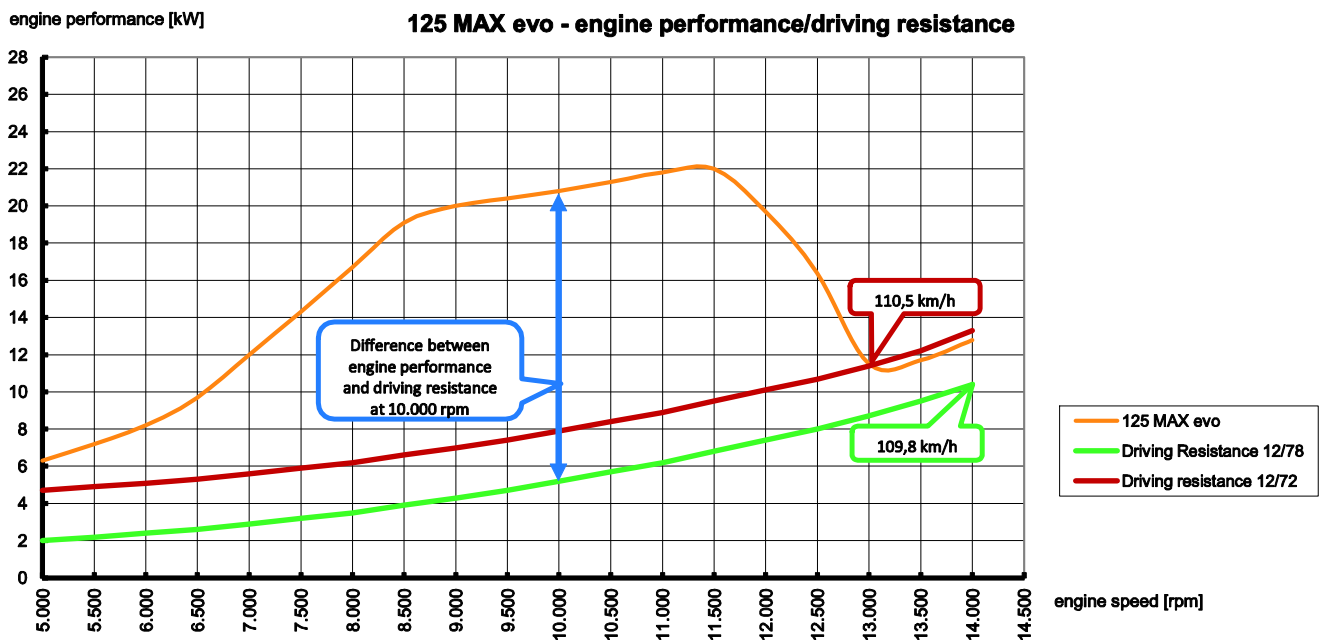
The smaller the difference between the engine performance and the driving resistance gets, the smaller is the excess of power and thus the acceleration potential of the engine.

The intersection between the characteristic of driving resistance of the vehicle and the characteristic of engine performance indicates the peak rotational speed of the engine at the chosen transmission ratio.

With the „longer“ transmission ratio of $12/72=6$, the characteristic of driving resistance of the kart intersects the curve of engine performance at 13000 rpm – with this transmission ratio the engine will achieve a maximum rotational speed of 13000 rpm. This leads to a maximum speed of 110.5 km/h.

With the „shorter“ transmission ratio of $12/78=6,5$ the characteristic of driving resistance of the kart stays below the curve of engine performance over the whole speed range - with this transmission ratio the engine will achieve a maximum rotational speed of 14000 rpm. This leads to a maximum speed of 109.8 km/h.

■ **Attention:** If a transmission ratio is chosen that results in a maximum rotational speed of 14000 rpm, it does not automatically mean that this leads to the best lap time. With a fluent routing, even a “longer” transmission ratio with a lower maximum rotational speed can lead to a better lap time.



K00292

4.3. Exchange of the clutch drum with chain sprocket fitted

- ➔ Remove spark plug connector and spark plug.
- ➔ Fit locking bolt (part no. 277380) right down to stop in spark plug thread.
- ➔ Remove hex. nut (pos. 14) and thrust washer (pos.13). See Fig. 3.
- ➔ Remove clutch drum (pos.7) with fitted chain sprocket.
- ➔ Clear thread of crankshaft and hex. nut (pos.14) from remains of bonding agent and degrease.

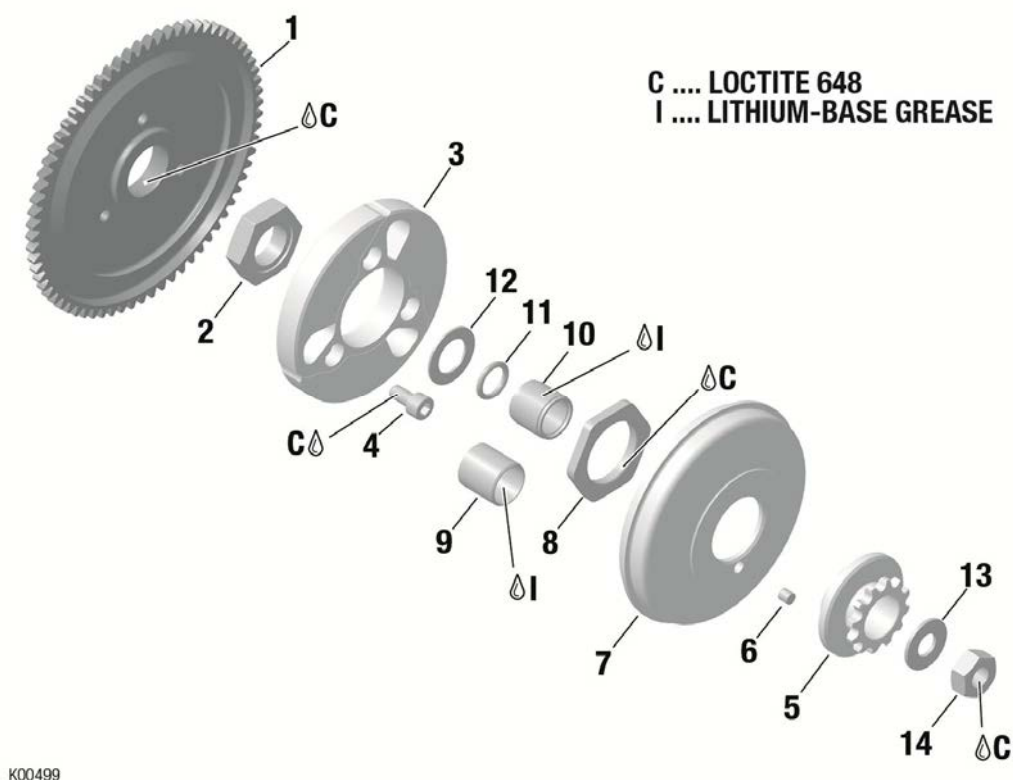


Fig. 3

- ◆ **Note:** Only sprockets with the ROTAX logo are GENUINE ROTAX parts!
 - ◆ **Note:** For the chain sprocket with 11 teeth, use the plain bearing (pos. 9) instead of the needle cage (pos. 10). The plain bearing has to be pressed flush into the bore of the chain sprocket with chamfered end leading.
- If not absolutely necessary on a certain track, try not to use a chain sprocket with 11 teeth because of the heavy wear of the plain bearing (pos. 10) used only with this sprocket.
- ➔ Apply grease on needle cage (pos. 9) when using a chain sprocket with 12, 13 and 14 teeth or on plain bearing (pos. 10) for chain sprocket with 11 teeth.
 - ➔ Fit the assembled clutch drum with the selected number of teeth.
 - ➔ Apply LOCTITE 243 on the thread of hex.nut (pos. 14).

- ◆ **Note:** A smaller thrust washer (pos. 13) is required for the chain sprocket with 11 teeth, in comparison to the use of a chain sprocket with 12, 13 and 14 teeth.
- ➔ Fit thrust washer (pos. 13) and hex. nut (pos. 14) and tighten nut to 60 Nm / 530 in.lb.
- ➔ Remove locking bolt.

5. Changing or renewal of the chain sprocket on the clutch drum

The chain sprocket (pos. 2) is attached to the clutch drum (pos. 4) with a hex. nut (pos. 5) and torque is transmitted by a needle pin (pos. 3) (see Fig. 4). The proper changing or renewal of the chain sprocket is only feasible when using the appropriate fixture (pos. 1, part no. 277364). To change or renew the chain sprocket, proceed as follows:

- ◆ **Note:** The fixture is furnished on one side with a centering pin for the chain sprocket with 11 teeth (17 mm diameter) and on the other side with a centering pin for the chain sprocket with 12, 13 and 14 teeth (19 mm diameter / 0.75 in).

- ◆ **Note:** On the chain sprocket with 11 teeth, the plain bearing must be pressed out first (the plain bearing must be renewed after pressing out).

- ➔ Clamp fixture (pos. 1) for the chain sprocket in a vice.
- ➔ Place the clutch drum with chain sprocket on the respective centering pin so that the clutch drum is secured by the fixation pin.

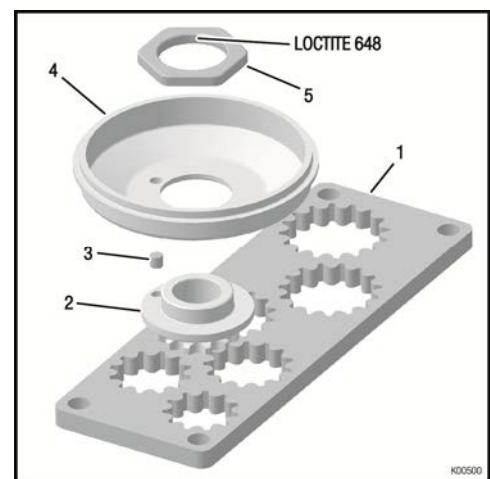


Fig. 4

- ➔ Remove the hex. nut (pos. 5) from the chain sprocket.
- ➔ Clean all remains of the securing agent from the components.
- ➔ Degrease the chain sprocket, the clutch hub and the hex. nut.
- ➔ Place the new chain sprocket or the chain sprocket with required number of teeth on the respective centering pin of the fixture.
- ➔ Place the needle pin (pos. 3) into the relevant bore of the chain sprocket.
- ➔ Apply LOCTITE 243 on the contact face of the chain sprocket and on hex. nut of clutch drum.
- ◆ **Note:** Fit the hex. nut (pos. 5) such that the machined face of the nut points towards the clutch drum.
- ➔ Attach the chain sprocket with the hex. nut (pos. 5) to the clutch drum. Tightening torque 120 Nm / 89 lb ft.
- ➔ Remove surplus securing agent.

6. Operating limits

min. coolant temperature	35 °C / 95 °F
max. coolant temperature	85 °C / 185 °F

▲ Warning: The engine is only allowed to be run at peak performance after reaching the specified operating temperature. Operating the engine at a too low temperature could result in piston seizure.

◆ Note: If the engine does not reach the minimum specified operating temperature due to the low ambient temperature, the cooling efficiency of the radiator must be reduced by partially covering the radiator with adhesive tape.

▲ Warning: The maximum operating temperature of the engine must not be exceeded. If the temperature is too high, it may result in piston seizure.

◆ Note: Dirt must be cleared from the lamination of the radiator at regular intervals to achieve the best cooling performance.

7. Engine start and operation

7.1. Engine start

Prior to engine start, verify the following:

- ✓ Fuel tank full.
- ✓ Battery charged and connected.
- ✓ Battery voltage over 12 V.
- ✓ Carburetor Bowden cable is moving freely and carburetor piston connected in idle position.

At engine start proceed as follows:

- ➔ On a cold engine, pull the choke lever (pos. 1, *Fig. 5*) into a vertical position.

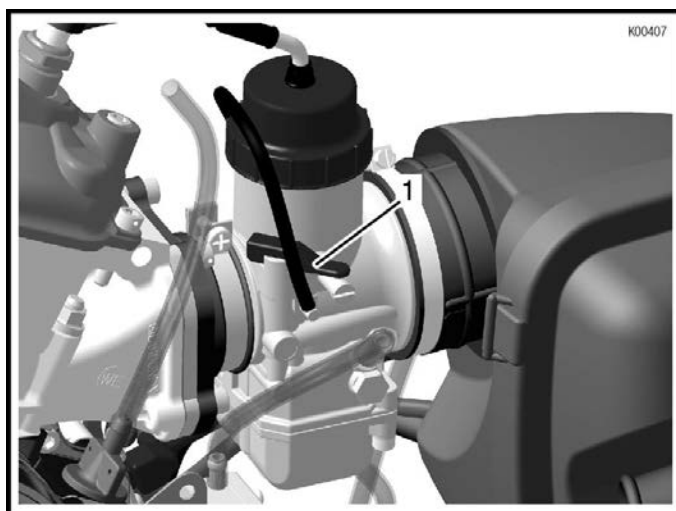


Fig. 5

- ➔ Press the power button once, the electric starter is activated (light turns on). Press the button again until the engine starts (*Fig. 6*).

◆ **Note:** If the engine does not start, repeat the operation after a few seconds in the same manner.

- ➔ After engine start, take choke back slowly until engine idles smoothly without choke.

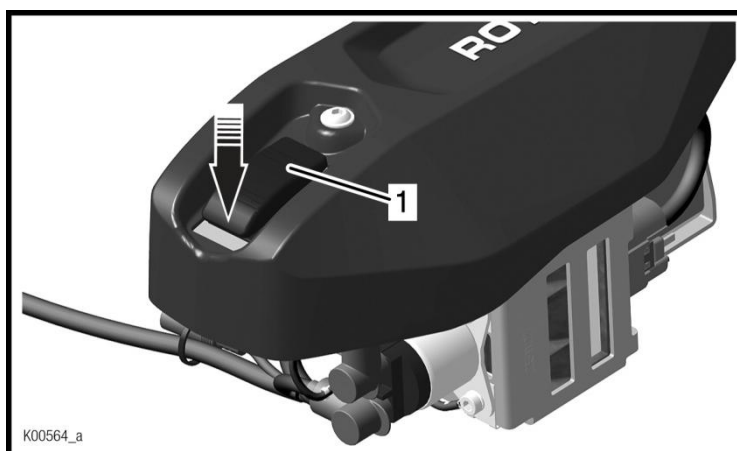


Fig. 6

- ▲ **Warning:** Always wear protective clothing for kart operation (helmet, overall, gloves, shoes, neck and rib guards).
 - ▲ **Warning:** Do not touch the engine, the radiator or the exhaust system during and immediately after kart operation. Risk of burning.
 - ▲ **Warning:** During kart operation, beware of body or clothing contact with moving components of the kart.
 - ▲ **Warning:** Comply with the safety advice of the kart manufacturer.
 - ▲ **Warning:** Inspect any part prone to wear (tires, bearings etc.) before each kart event for good condition in accordance with the directives of the kart manufacturer.
 - ▲ **Warning:** Keep to running-in procedure as directed.
 - ▲ **Warning:** Operate engine only within the specified limits.
 - ▲ **Warning:** Never run the fuel tank empty.
 - ▲ **Warning:** Only get in and out of the kart if engine is not running.
-

7.2. Stopping the engine

See Fig. 7.

- ➔ Press the power button and the engine will stop. Press the button once again to deactivate the electric starter (light turns off).
- **Attention: Danger of corrosion!** After riding in the rain, the RAVE control unit must be checked for moisture. For this purpose, dismantle the black hose from the RAVE control unit and check if there is moisture in the system.
- ◆ **Note:** If the electric starter is activated, the ignition system will consume current. This can cause a deep discharge as well as damage to the battery.

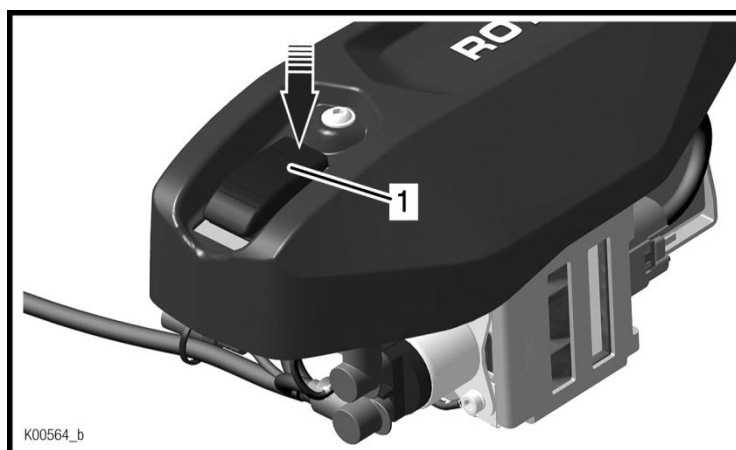


Fig. 7

7.3. Running-in procedure for the engine

■ **Attention:** Pay attention to safety advice of the kart manufacturer.

To ensure that components have the longest possible lifespan, the engine must undergo a defined running-in period at first operation or after a repair of the crankshaft or displacement parts.

◆ **Note:** Cover the radiator with the mounted windshield to reach the operating temperature earlier.

Observe the following issues:

- ✓ Use a two sizes bigger main jet size based on altitude and temperature (see section 4.1.)
- ✓ For the first 10 liters of fuel use a mixing ratio of 1:33 (= 3% or 0.3 liter oil per 10 liters fuel).
- ✓ Make sure that the coolant temperature reaches 35 °C (95 °F).
- ✓ Run the kart for 15 minutes at continuously changing load and engine speed fluctuation up to maximum rotational speed. Rotational speed for max. 2 seconds!
- ✓ Afterwards reduce the main jet size step-by-step until standard size is reached.

After this running-in procedure, the full power of the engine may be used.

■ **Attention:** Use only **fully synthetic** two-stroke oil. BRP-Rotax recommends using XPS Kart-TEC oil.

■ **Attention:** The engine may never be operated without load. Is it operated without load (i.e. on the trolley), rpm. over 13.800 1/min are possible, which shortens the lifetime of components (conrod, big end bearing etc.).

7.4. Setting of the exhaust valve timing (125 MAX evo only)

The opening time of the exhaust valve is set in the ECU and depends on the engine speed. However, the ECU allows two different modes of the exhaust valve opening. These can be selected by connecting an additional cable to the cylinder head cover.

■ **Attention:** The ground wire (pos. 1) must be continuously connected. This is important for the general function of the engine.

Variant 1: Additional cable on battery ground

A:

See *Fig. 8*.

The additional cable is **NOT** attached to the ground wire. The control of the exhaust valve timing is activated at 7900 rpm.

◆ **Note:** Isolate the additional cable with an electrical/insulating tape to the ground wire so that a possible contact with the engine ground does not affect the function.

B:

See Fig. 8.

The additional cable is attached to the ground wire. The control of the exhaust valve timing is activated at 7600 rpm.

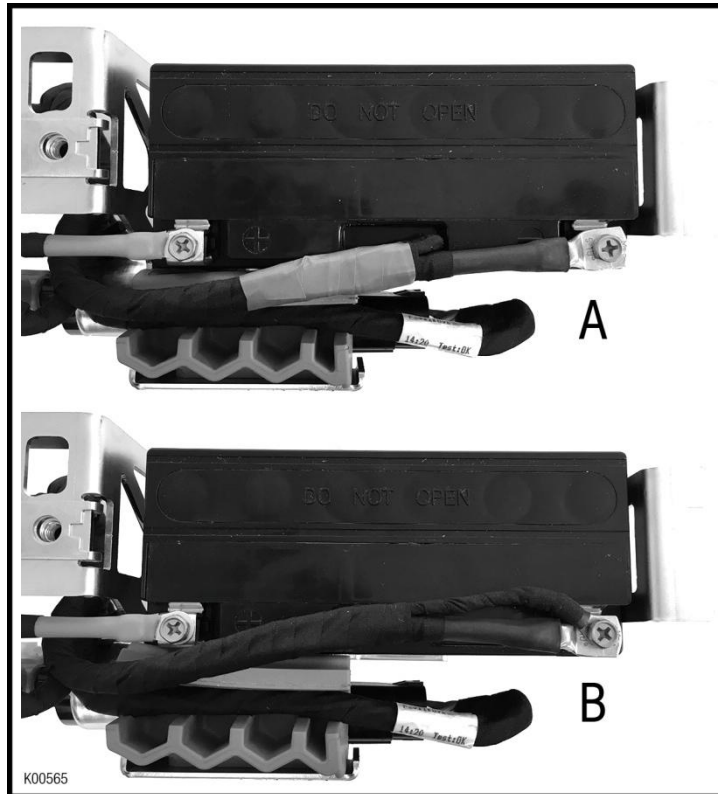


Fig. 8

Variant 2: Additional cable at starter relay

A:

See Fig. 9.

The additional cable is **NOT** attached to the ground wire. The control of the exhaust valve timing is activated at 7900 rpm.

◆ **Note:** Isolate the additional cable with an electrical/insulating tape to the ground wire so that a possible contact with the engine ground does not affect the function.

B:

See Fig. 9

The additional cable is attached to the ground wire. The control of the exhaust valve timing is activated at 7600 rpm.

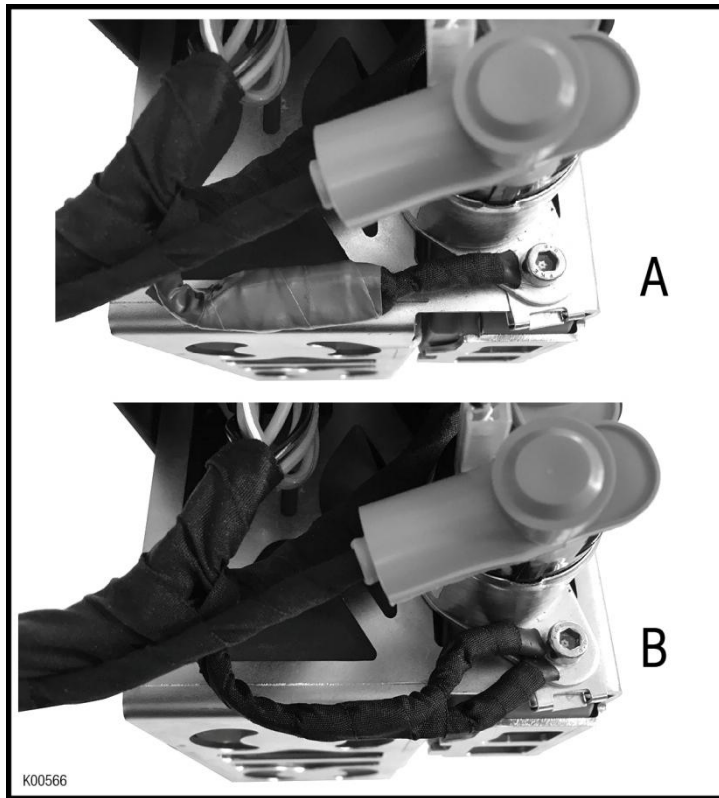


Fig. 9

◆ **Note:** Either variant 1 or variant 2 has been installed in your engine.

8. Maintenance schedule for engine components

▲ **Warning:** Non-compliance with the specified maintenance schedule could result in engine damage.

Component	Inspection or Maintenance Interval	Checking, remedy
chain sprocket	Verification before each kart operation	Inspection for wear and deformation of teeth. Renew as required.
exhaust system	After each kart operation	Lubricate against corrosion
filter element in the intake silencer	After every 10 hours of operation	Clean and apply oil, renew damaged filter elements.
fuel filter	After every 2 hours of operation	Inspect for dirt.
	After every 50 hours of operation or at least once a year	Renew.
water pump	Inspection before each kart operation	Inspect for oil or water on the leakage bore in the crankcase. In case of leakage, have a tear-down inspection conducted by the authorized distributor.
cooling circuit connections	Check before each kart operation	Verify a tight fit and non-leakage. Re-tighten or renew if needed
oil level in the gear compartment	Every 2 hours of operation	Check oil level, replenish as required.
drive gears for balance shaft	Every 10 hours of operation	Inspect for wear, renew as required.
oil in gear compartment	After every 50 hours of operation or at least once a year	Renew.
starter gear	After every 10 hours of operation	Cleaning and greasing of bearing seals.
needle bearing or plain bearing of the clutch drum	Every 2 hours of operation	Cleaning and greasing, renew as required.
friction lining of the fly weights	After every 10 hours of operation	Inspect for wear, renew as required.
damping material in the after-muffler of the exhaust system	After every 10 hours of operation	Renew.

tear-down inspection of engine	Inspection of the following components after every 50 hours of operation: piston, piston pin and piston bearing cage, conrod and conrod bearing, main bearings of crankshaft, drive of balance shaft, sealing of water pump shaft.	Tear-down inspection must be conducted by an authorized distributor. Renew worn parts as required.
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9. Transport of the kart

If the carburetor is still filled with fuel, the kart is only allowed to be transported in a horizontal position.

If the kart is to be transported in a vertical position, the fuel must be drained from the carburetor first.

- ◆ **Note:** If the kart is in a vertical position during transport, the remaining fuel in the carburetor might flow into the crankcase with the result that the engine will not start at the next try.
- ➔ Remove drain screw (pos. 27, Fig. 2 on float chamber of carburetor and collect the fuel in a suitable container.
- ➔ Clean drain screw and refit.

10. Preservation of engine and equipment

For longer periods out of operation (winter time), make sure that the engine will be properly preserved.

- ➔ Detach carburetor, drain fuel from carburetor and close carburetor openings to ensure that no dust or dirt can enter.
 - ➔ If the vehicle is stored at temperatures below freezing, the cooling system must be filled with a mixture of distilled water and an aluminum-compatible antifreeze. The mixture must ensure protection against freezing to a temperature of $-20\text{ }^{\circ}\text{C}$ / $-4\text{ }^{\circ}\text{F}$. Or drain the entire cooling system and clean the cooling circuit with air pressure.
- ▲ **Warning:** **Not following this will lead to engine damage (e.g. breakage of cylinder).**
- ➔ Close intake and exhaust port of engine so that they are airtight with adhesive tape.
 - ➔ Apply oil on exhaust system to prevent corrosion.
 - ➔ Remove battery from the fixture and charge periodically with the specified battery charger.

IMPORTANT INFORMATION (SUMMARY)

IMPORTANT INFORMATION	LITER	GAL.	SPECIFICATION	RECOMMENDED BRANDS
FUEL			Unleaded fuel of minimum octane level of 95 ROZ resp. 91 MOZ	
2-STROKE OIL			Fully synthetic	XPS Kart-Tec
OIL IN FUEL MIXING RATIO			During break-in: 1:33 (= 3% oil) During normal use: 1:50 (= 2% oil)	
COOLING SYSTEM	0,80	0.21	Pure water resp. antifreeze if kart is stored at temperatures below 0 °C / 32 °F	
BALANCE GEARBOX OIL			0,10 liter (100 cc) SAE 15W40	XPS Kart-Tec
SPARK PLUG			see IPC	NGK

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