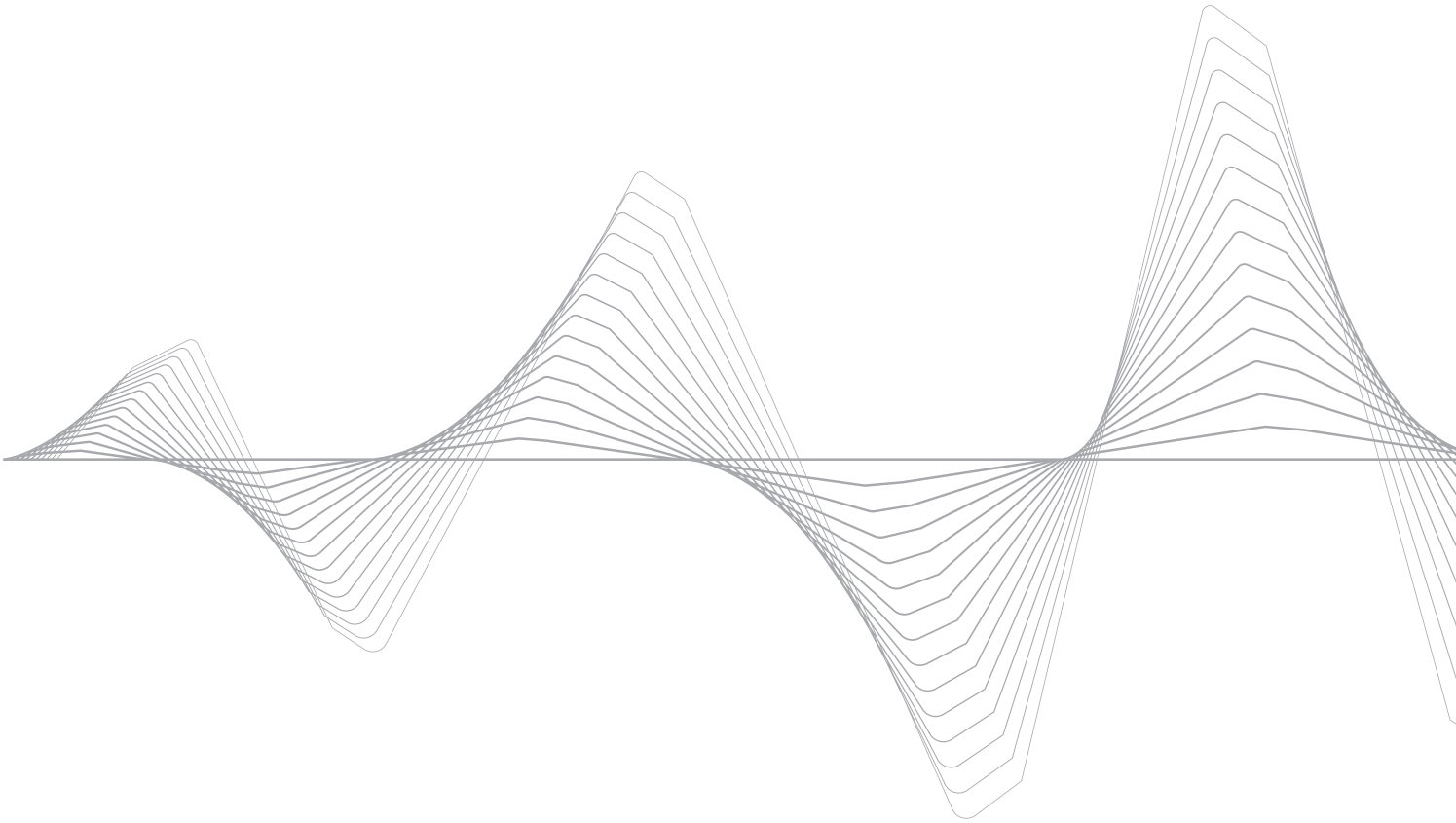
ROTAX®

INSTALLATION MANUAL

125 DD2 MAX EVO



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A BRP BRAND

GENERAL INFORMATION
BRP-ROTAX RECOMMENDS PRODUCTS
OF THE FOLLOWING COMPANIES:

ROTAX®

BRP-Rotax GmbH & Co KG
Rotaxstraße 1
4623 Gunskirchen, Austria

T: + 43 7246 601 - 0
F: + 43 7246 6370
www.rotax-kart.com

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Chapter: INTRO

Preface

For information regarding repair of the engine 125 MAX DD2 evo contact an authorized service center or consult the repair manual (available on internet under **www.rotax-kart.com**).

Also check out our YouTube-Channel:

Figure 1.1: QR code

Make sure 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.

Contents

This Installation Manual contains instructions for all the installation work on the ROTAX®-Engine Type 125 MAX DD2 evo.

General

This document and all technical data and procedures therein are property of BRP-Rotax GmbH & Co KG and based on the state of knowledge at the time of publication The Manual has been drawn up to the best of our knowledge. However, excluding any liability.
We reserve all rights including technical modification and possibility of errors. Reprinting, translation or copies in whole or in part, are authorized only after written permission by BRP-Rotax GmbH & Co KG.
BRP-Rotax GmbH & Co KG reserves the right at any time to discontinue or change specifications, prices, designs, features, models or equipment without incurring obligation. Engine performance may vary depending on, among other things, general conditions, ambient temperature and altitude.

NOTE

The registration document and engine identity card must be provided to the final consumer upon delivery by the authorized service center with handover date and company stamp.

NOTE

The data entered in the registration document and/or engine identity card is required for the 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.

Safety Messages

The types of safety messages, what they look like and how they are used in this guide are explained as follows: The safety alert symbol indicates a potential injury hazard.

⚠ WARNING
Indicates a potential hazard, if not avoided, could result in serious injury or death.

⚠ CAUTION
Indicates a hazard situation which, if not avoided, could result in minor or moderate injury.

ATTENTION
Indicates an instruction which, if not followed, could severely damage vehicle components or other property.

ENVIRONMENTAL NOTE
Environmental notes give you tips on environmental protection.

NOTE

Indicates supplementary information which may be needed to fully complete or understand an instruction.

✓ Denotes a checking operation

TIP This information gives you additional advice and tips

Safety information

⚠ WARNING

Non-compliance can result in serious injuries or death!
For the best possible engine operation, compliance with the following advice regarding installation of engine and equipment is required.

⚠ WARNING

Non-compliance can result in serious injuries or death!
Engine operation is permitted only with equipment supplied by ROTAX®

⚠ WARNING

Non-compliance can result in serious injuries or death!
Besides the engine-specific installation advice, also take note of information from the respective chassis manufacturer.

Introduction

Congratulations on choosing the ROTAX engine Type 125 MAX DD2 evo.
The ROTAX® engine Type 125 MAX DD2 evo has been developed exclusively for use in Go-karts, which must only be run on specified tracks. This product has numerous technical innovations.

⚠ WARNING

Non-compliance can result in serious injuries or death!
Before starting with installation and operation of the engine, observe the installation instructions and Operator's Manual and follow all instructions.

UNBOXING YOUR ROTAX POWERPACK

Congratulations on choosing a ROTAX engine! Your ROTAX kart engine comes delivered in two boxes.

Figure 1.2: Unboxing

Engine box

The engine box contains the assembled block engine pre-filled with gearbox oil.

Accessory box

The accessory box contains all required parts for running the engine. Check integrity of the accessory kit using the table below.

Figure 1.3: Accessory box

Pos.	Description	Check mark
1	Radiator with coolant hoses	O
2	Mounting plate with ignition coil, solenoid valve and spark plug cap	O
3	Battery box and wiring harness	O
4	Battery charger	O
5	Intake silencer	O
6	Fuel pump with fuel hose	O
7	Exhaust system	O
8	Manuals and engine identity card	O
9	Several small parts (spark plug, screws,...)	O
10	Hose package for RAVE control unit	O
11	ECU	O
12	Carburetor	O
13	Paddle shift system	O

ENGINE INFORMATION

Engine serial number

The engine serial number is stamped on the clutch side housing-half.

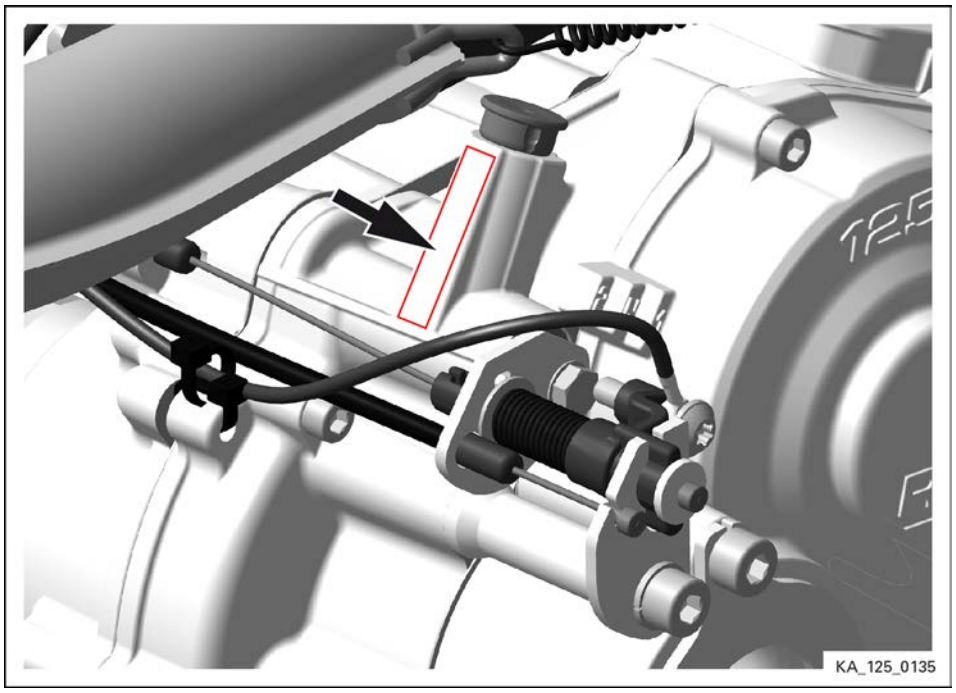


Figure 1.4: Serial number of the engine, TYPICAL

Gear oil and fuel specifications

See the latest Operators Manual.

Equipment and modifications

Modifications to engine and/or equipment are not allowed.

NOTES

Chapter: 1
ENGINE INSTALLATION

TOPICS IN THIS CHAPTER

INSTALLATION OF OVERLOAD CLUTCH AND ENGINE WITH REAR AXLE

NOTE

The overload clutch is the link between the engine and the rear axle of the kart. In case that the rear axle has been blocked by (e.g. breaking), the overload clutch is slipping slightly and is not transferring the peak load from the rear axle to the engine.
The plain bearings (pos. 2) are inside of the overload clutch (pos. 1).

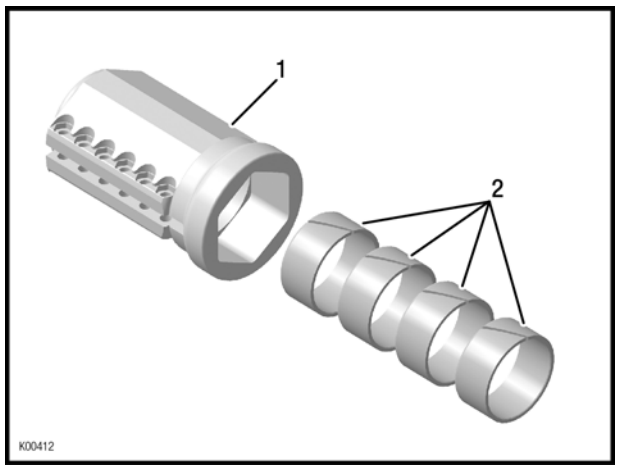


Figure 2.1

1 Overload clutch *2 Plain bearings*

Step	Procedure
1	Slide the clamp ring (pos. 1, following figure) the thrust washer (pos. 2) and the overload clutch (3) to the middle of the rear axle.

NOTE

The rear axle of the kart must have a smooth surface (no grooves for keys) in the area of the 4 plain bearings of the overload clutch.

NOTE

Do not tighten the overload clutch and clamp ring yet (see section Engine attachment with engine brackets).

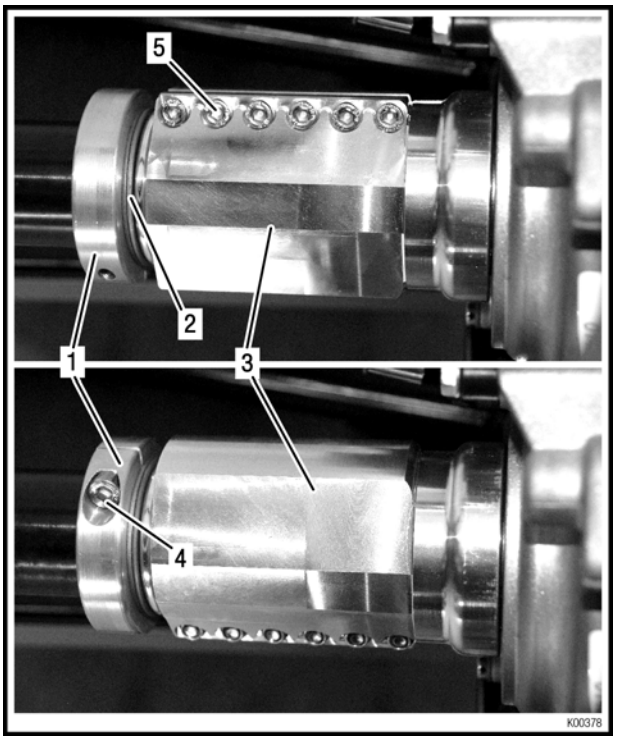


Figure 2.2: Overload clutch

1 Clamping ring *2 Thrust washer*
3 Overload clutch *4 Allen screw M6x25*
5 Allen screw M5x30

ENGINE INSTALLATION WITH ENGINE BRACKETS

Tools required:
• Allen key 8mm • Allen key 5 mm • Allen key 4 mm • Torque wrench

See Figure: Tightening sequence and Engine brackets.

The engine has to be fixed to the chassis by means of 2 engine brackets (pos. 1). Due to different distances of the 2 main rails of various chassis brands, the engine bracket is not included in the scope of supply.

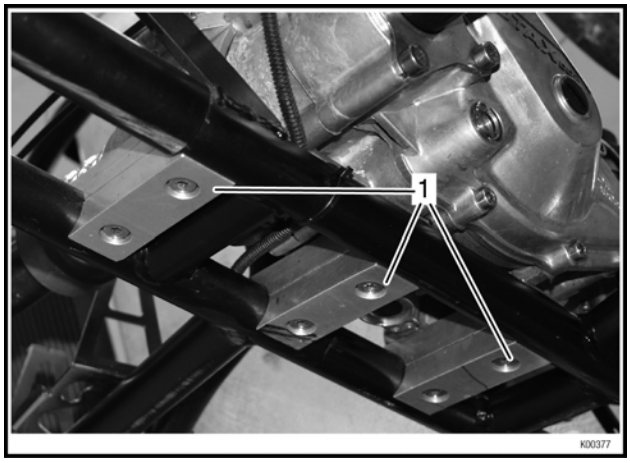


Figure 2.3: Engine brackets

FIGURE SIMILAR

NOTE

The 125 MAX DD2 engine can only be mounted on specially prepared chassis for this engine type.

⚠ WARNING

Non-compliance can result in serious injuries or death!
For engine attachment to the chassis, please follow the instruction of the chassis manufacturer.

Step	Procedure
1	Slide the engine onto the rear axle and align the rear axle and the engine by measuring the distance between the front and the rear axle
2	After engine alignment, tighten the 4 Allen screws M8 x 25 to fix the upper engine bracket to the engine with 28 Nm (20.65 ft. lb). Fix and tighten the lower engine bracket to the upper bracket with 4 Allen screws M8 x 30 with 22 Nm (16.22 ft. lb). **Secure the Allen screws with LOCTITE 243 blue**.

NOTE

The minimum screw in length of the screws fixing the engine brackets onto the crankcase is 16 mm to 20 mm (0.6 - 0.95 in.).

Step	Procedure
3	Slide the overload clutch, thrust washer and clamp ring along the axle to the hollow shaft and then fix to the rear axle. Tighten the screw on the clamping ring with 10 Nm (89 in. lb).
4	Tighten the 6 Allen screws (pos. 1, Figure Tightening sequence) on the overload clutch with 7 - 8 Nm (62 - 71 in. lb). Make sure that every screw is tightened with the right tightening torque, repeat procedure if necessary.

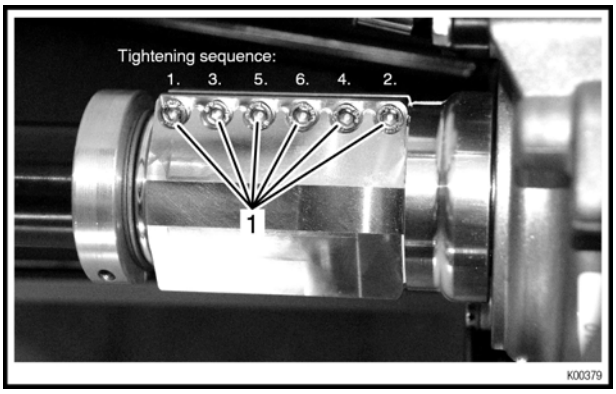


Figure 2.4: Tightening sequence

1 Allen screws

DIRECT ATTACHMENT OF THE ENGINE TO CHASSIS

If the frame of the chassis is specially prepared for installation of the ROTAX® 125 MAX DD2 evo, then 2 sheet metal brackets with holes are welded onto the two frame tubes. The engine is clamped between the two brackets with 4 bolts.

NOTE

The minimum screw in length of the screws fixing the engine brackets onto the crankcase is 16 mm to 20 mm (0.6 - 0.95 in.).

NOTE

Secure bolts with bolt adhesive e.g. LOCTITE 243.

Step	Procedure
1	Mount engine directly on the brackets.

NOTE

Check for easy access to the pick-up sensor (pos. 1). There are two options to install the pick-up sensor. Choose the orientation which gives you the best fit for your chassis installation.

⚠ WARNING

Non-compliance can result in serious injuries or death!
For engine attachment to the chassis, please follow the instruction of the chassis manufacturer.

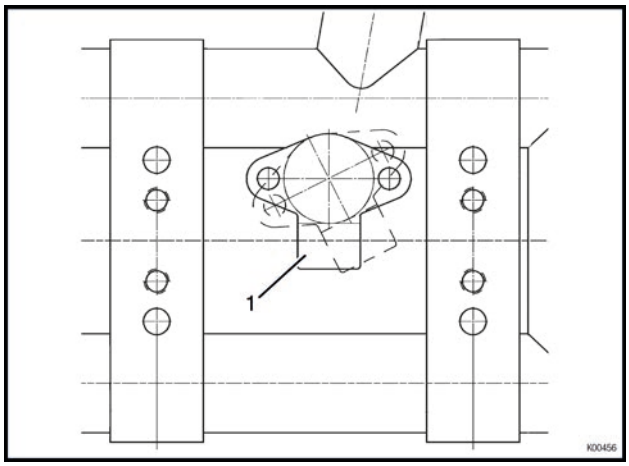


Figure 2.5

1 Pick-up sensor

NOTES

Chapter: 2
FUEL SYSTEM

TOPICS IN THIS CHAPTER

INSTALLATION AND CONNECTION OF THE FUEL PUMP

Tools required:
• Allen key 5 mm • Circlip pliers

Step	Procedure
1	The retaining plate, rubber buffers, fuel pump, fuel hose (with 230 mm and 1800 mm length) is already pre-assembled.

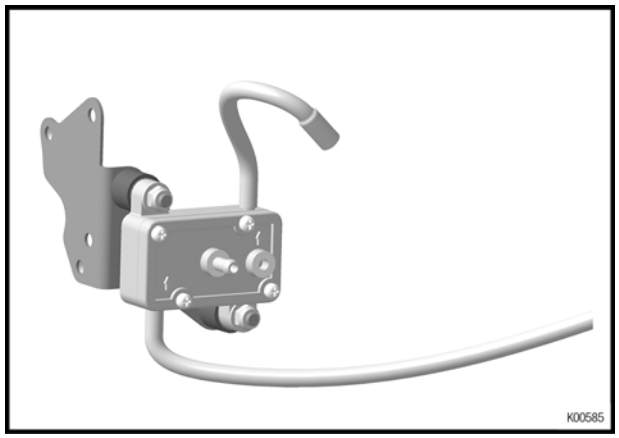


Figure 3.1

Step	Procedure
2	Install the retaining plate with fuel pump (pos. 1) on the gearbox cover by using 2 screws M6x30 (pos. 3) and washers (pos. 2).

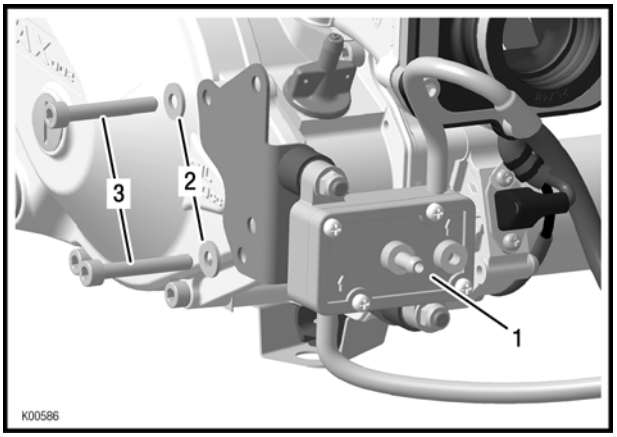


Figure 3.2

1 Fuel pump *2 Washer*
3 Screws M6x30

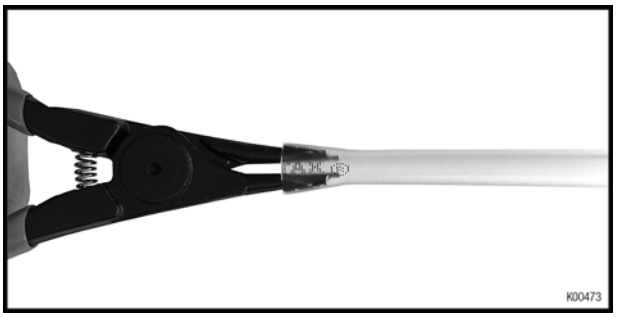


Figure 3.3

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.

Step	Procedure
3	The fuel hose with 230 mm length will be connected later to the carburetor, see carburetor installation.
4	The larger fuel hose (pos. 1) should be connected to the fuel filter (pos. 2) and to the fuel tank.

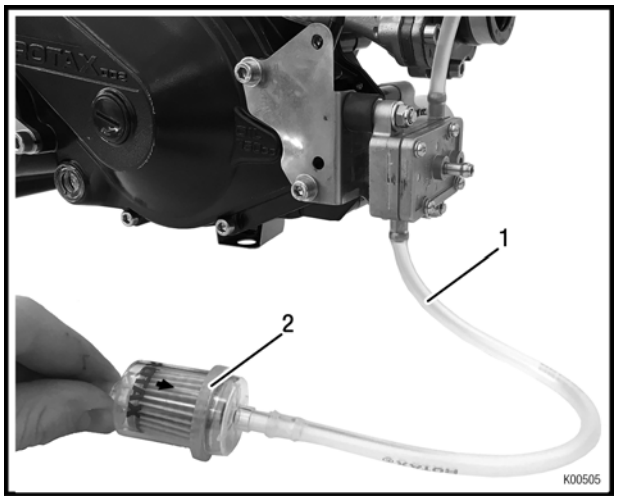


Figure 3.4

1 Large fuel hose *2 Fuel filter*

ATTENTION

Pay attention to the direction of the arrow on the fuel filter.
This must point towards the fuel pump.

⚠ WARNING

Non-compliance can result in serious injuries or death!
Route the fuel line from the fuel tank to the fuel filter so that it does not touch any moving parts of 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 cable ties.

INSTALLATION OF THE BOWDEN CABLE FOR CARBURETOR CONTROL

Tools required:
• Open-end wrench 10 mm

Step	Procedure
1	Carefully remove carburetor cover with rubber ring (pos. 7, 8).

⚠ CAUTION

Reset spring of carb piston presses against carburetor cover and might eject carburetor cover at removal.

Step	Procedure
2	Remove nipple screw (pos. 5) with open-end wrench 10 mm from carburetor piston (pos. 2).
3	Engage nipple of Bowden wire (pos. 9) in nipple screw (pos. 5).
4	Fit nipple screw in carburetor piston and hand tighten with open-end wrench 10 mm.
5	Insert carburetor piston (pos. 2) into carb body with recess of piston towards intake silencer.
6	Pass Bowden wire through compression spring (pos. 6) and through cover with rubber ring (pos. 7, 8) of carburetor.
7	Fit carb cover (pos. 7) on carburetor.
8	Pass Bowden wire through Bowden conduit and through adjustment screw on chassis (throttle pedal).
9	Connect Bowden cable to throttle pedal.

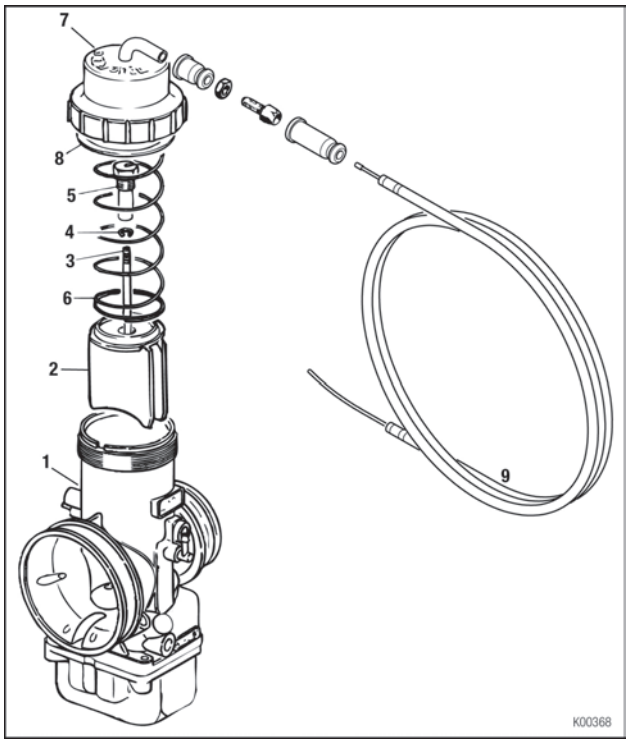


Figure 3.5

1	*Carburetor*	*2*	*Carburetor piston*
3	*Jet needle K57*	*4*	*Clip*
5	*Nipple screw*	*6*	*Compression spring*
7	*Carb cover*	*8*	*Rubber ring*
9	*Bowden cable*		

NOTE

Shorten Bowden cable as required.

Step	Procedure
10	Route carburetor Bowden cable on the top side of the chassis tubes and attach with the cable ties supplied. Make sure that the Bowden cable does not touch any moving parts or the track.

⚠ WARNING

Non-compliance can result in serious injuries or death!
The carburetor Bowden cable must not be kinked or restricted as the carburetor piston might get stuck in full throttle position.

Step	Procedure
11	Set and secure the adjustment screw for Bowden cable on chassis so that the carburetor piston will remain in closed position when throttle pedal is not activated.
12	Set and secure the stop screw for throttle pedal so that, with pedal completely pressed down, the carburetor piston will be in the full open position. The Bowden cable must not be under full tension when the throttle is in fully open position.

INSTALLATION AND CONNECTION OF THE CARBURETOR

Tools required:
• Ratchet wrench with socket 7 mm • Phillips screwdriver

Step	Procedure
1	Fit carburetor (pos. 1) into carburetor socket and secure with hose clamp (pos. 2) in vertical position.
2	Connect the outlet hose of the fuel pump with fuel inlet (pos. 3) on the carburetor.

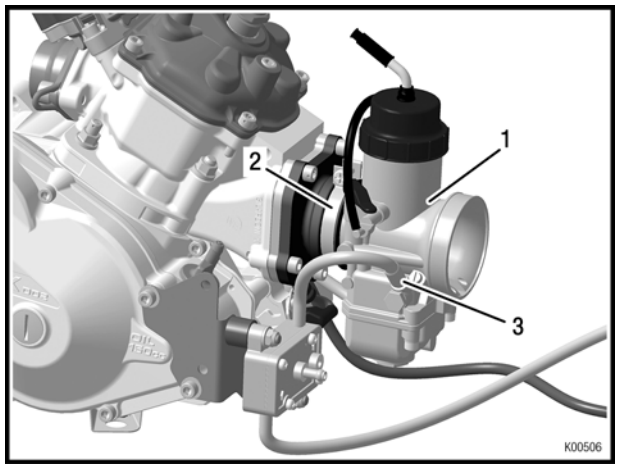


Figure 3.6

1 Carburetor
2 Hose clamp
3 Fuel inlet

Chapter: 3
ELECTRIC SYSTEM

TOPICS IN THIS CHAPTER

ELECTRIC SYSTEM OVERVIEW

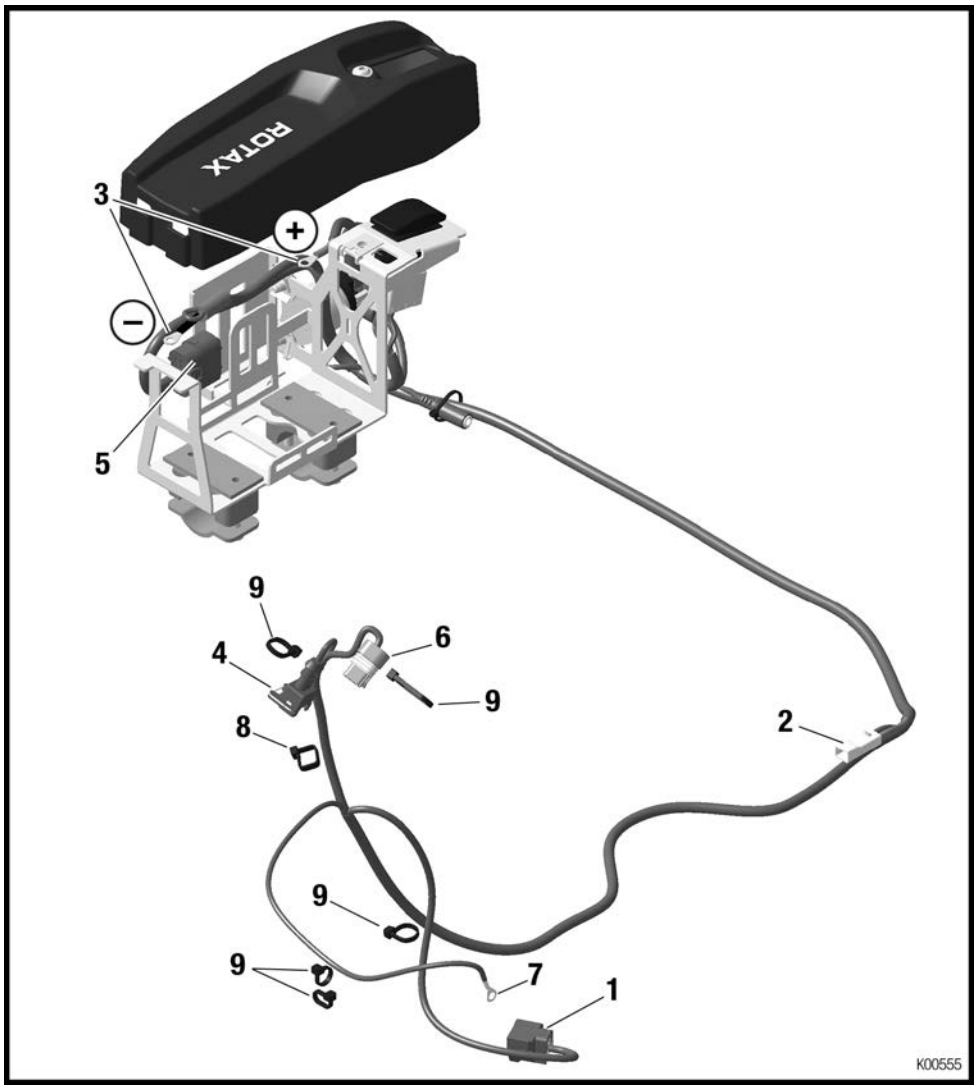


Figure 4.1: TYPICAL

1 *Connector pickup sensor*
2 *Connector starter*
3 *Connector battery*
4 *Connector RAVE (only applicable 125 MAX evo)*
5 *Connector ECU*
6 *Connector ignition coil*
7 *Connector shift contact*
8 *Tie wrap 250x4.8*
9 *Tie wrap 142x3.2*

INSTALLATION ECU INTO THE BATTERY CLAMP ASSY.

Step	Procedure
1	Prepare rubber pad (consists of two halves) (pos. 1) and the ECU (pos. 2) for installation.

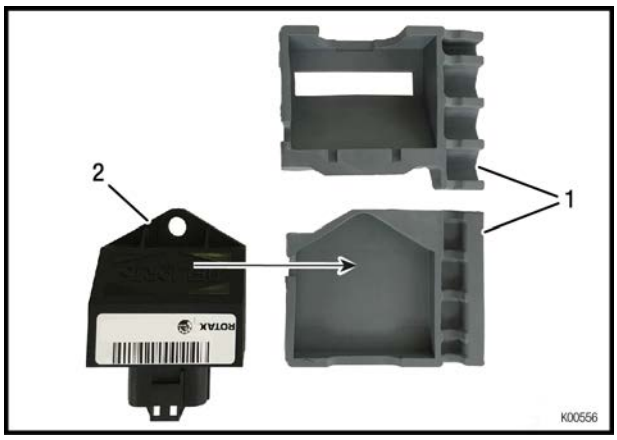


Figure 4.2

1 Rubber pad *2 ECU*

Step	Procedure
2	Install the rubber pad (pos. 1) onto the ECU.

TIP Align at the triangular bottom of the ECU. It fits only in one position to the rubber pad.

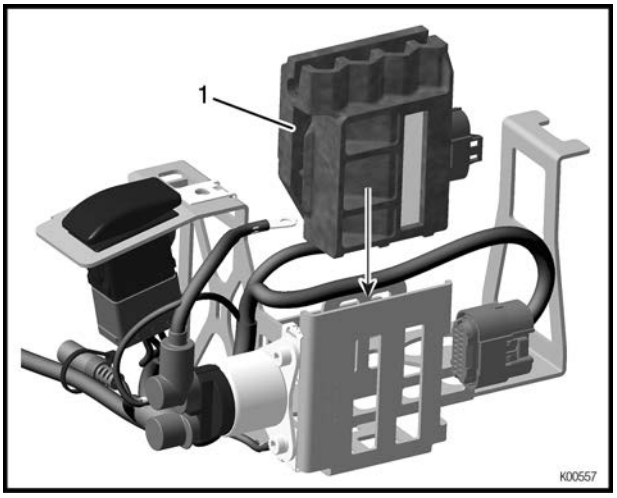


Figure 4.3

1 Rubber pad

Step	Procedure
3	Insert the complete unit into the battery clamp assy..

NOTE

If difficulties at insertion occur, the inside of the battery clamp assy. can be easily bent inward so that the distance increases slightly.

ATTENTION

Make sure that the connection cable has been installed between the two pads.
The connection of the ECU is on the rear side (against the driving direction).

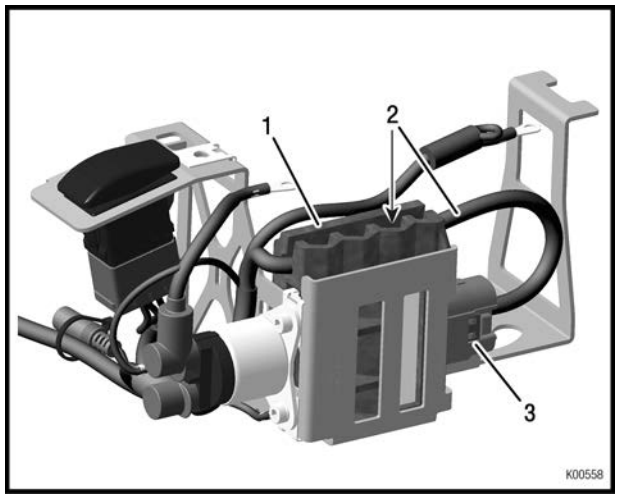


Figure 4.4

1	*Rubber pad*	*2*	*Connection cable*
3	*ECU connector*		

INSTALLATION OF THE BATTERY CLAMP ASSY.

Tools required:
• Allen key 4 mm • Ratchet wrench with socket 8 mm or Phillips screwdriver

⚠ WARNING

Non-compliance can result in serious injuries or death!
Make absolutely sure to avoid short-circuiting of battery terminals. A short circuit will ruin the battery and could cause an explosion.

Step	Procedure
1	Attach the battery fixture (pos. 5) with the two pipe clamps (pos. 1 – 4) on 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) diameter.

ATTENTION

Risk of clamp fracture!
Do not over tighten the screw of the pipe clamps.

Step	Procedure
2	Install rubber pad (pos. 6) with battery (pos. 7) into the battery holder (pos. 5).
3	Put the battery (pos. 7) into the fixture and install the cover (pos. 8) using the Allen screw with rounded flange head (pos. 9). Fix the wiring harness in the P-clamp (12) uswing Allen screw (13).

TIP The battery fixture (pos. 5) can be fixed with one screw on one side of the clamp (pos. 3).

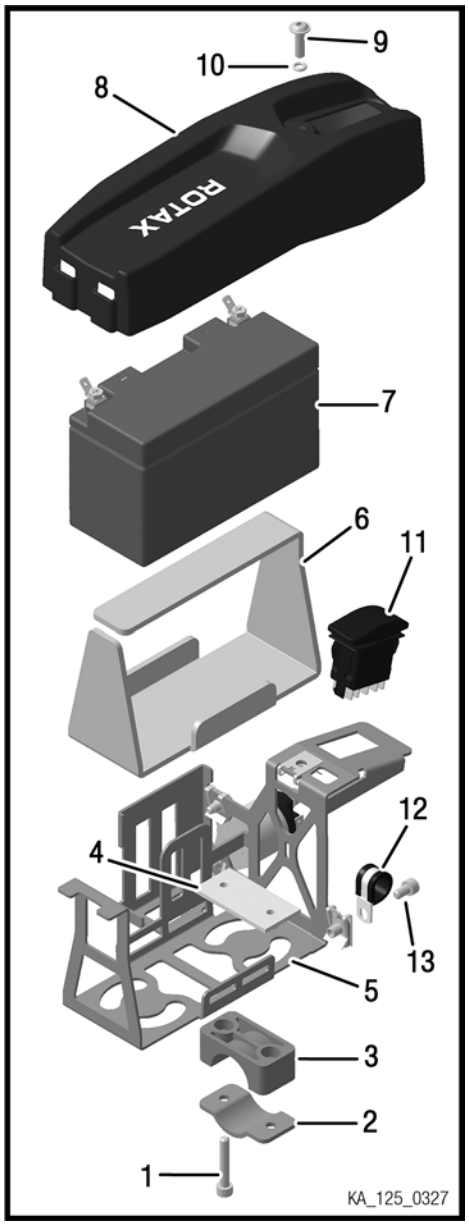


Figure 4.5

1–4	*Pipe clamps*	*5*	*Battery fixture*
6	*Rubber pad*	*7*	*Battery*
8	*Battery cover*	*9*	*Flange head screw*
10	*O-ring*	*11*	*Multiple function switch*
12	*Cable clamp 15/M6*	*13*	*Allen screw M6x10*

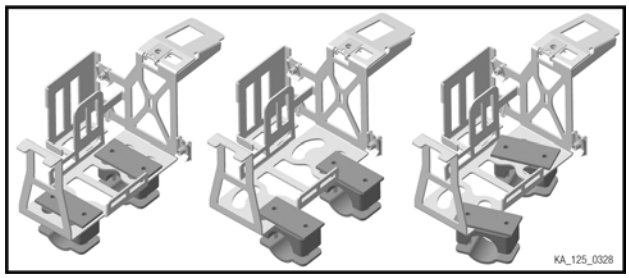


Figure 4.6

NOTE

The battery terminals must point in the direction of the control unit.

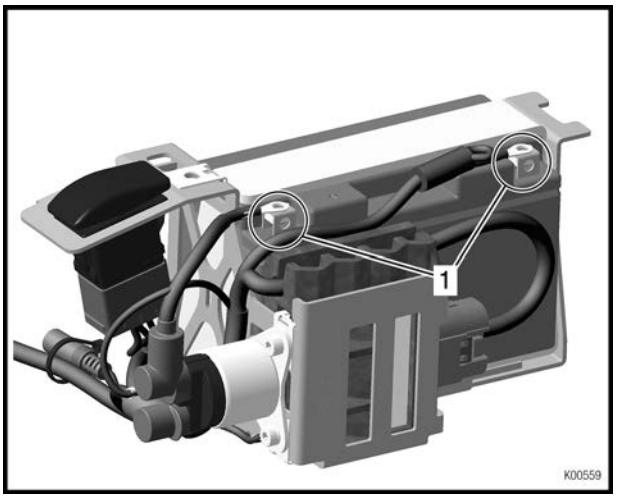


Figure 4.7

1 Battery terminals

Step	Procedure
4	Connect the positive terminal (red) of the battery.
5	Connect the negative terminal (black) of the battery.

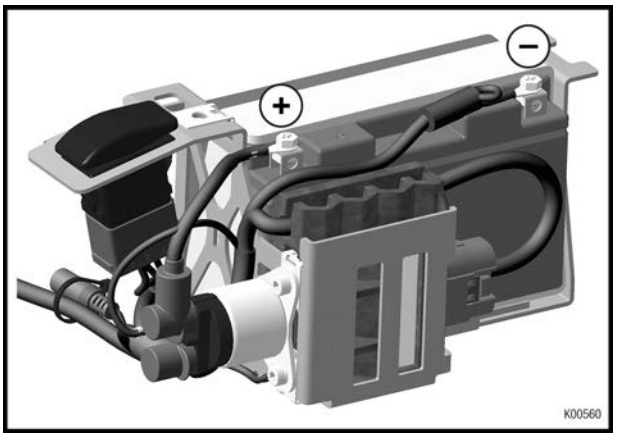


Figure 4.8

Step	Procedure
6	Install the battery cover onto the battery holder.

NOTE

Make sure that the two retaining lugs (pos. 1) are in the notches of the battery cover!

Step	Procedure
7	Tighten flange head screw (pos. 2) of the battery cover.

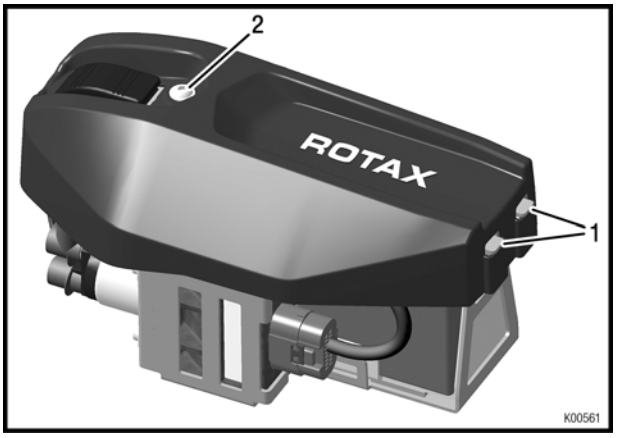


Figure 4.9

1 Retaining lugs *2 Flange head screw*

INSTALLATION OF THE WIRING HARNESS

Tools required:
• Torx screwdriver T30

The wiring harness is delivered partly pre-assembled to facilitate the installation. This means that the relay, the master 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.

Step	Procedure
1	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
Non-compliance can result in serious injuries or death! **The wiring harness must not touch moving parts of 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 on the plugs.

Step	Procedure
2	Pre-mount cable tie large through the two holes provided on the mounting plate.

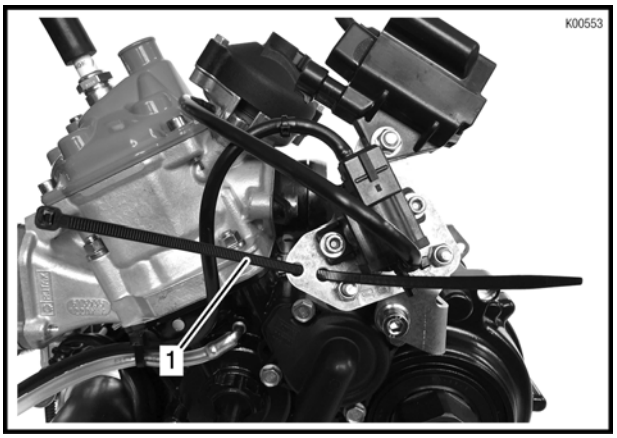


Figure 4.10: Installation

1 Cable tie

Step	Procedure
3	Connect solenoid valve and ignition coil. Attach both connectors (signed green) on the two components.
4	Fasten cables with cable ties on the mounting plate.

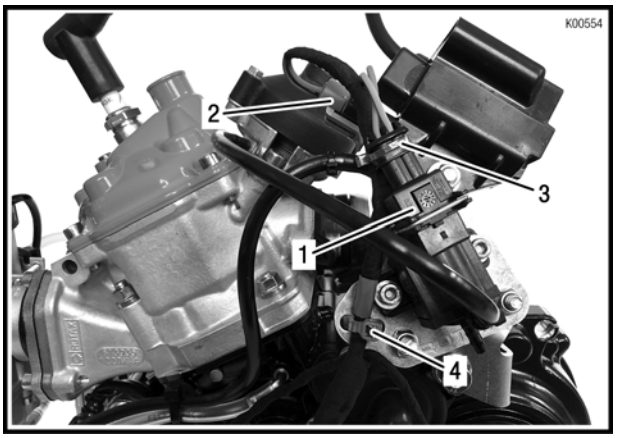


Figure 4.11

1	*Solenoid valve*	*2*	*Ignition coil*
3	*Connectors (signed green)*	*4*	*Cable tie*

Step	Procedure
5	Remove isolation tape from the shift contact wire (pos. 1) and loosely fasten with a tie wrap (pos. 2) (about 130 mm from the cable lug).

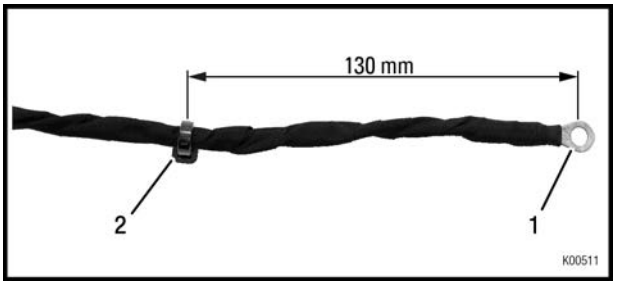


Figure 4.12

1	*Contact wire*	*2*	*Tie wrap*

NOTE

Do not tighten tie wrap yet in order to be able to change its position later on.

Step	Procedure
6	Fasten the cable lug (pos. 3) to the shift contact assy. using the Plastite screw M6x25 (pos. 4). Pay attention to correct sequence of the components! See following Figures. For correct adjusting of the plastite screw find the according section inside the latest Operators Manual.

NOTE

Fasten the cable lug (pos. 3) between the fuel tube 8 mm (pos. 2) and the Plastite screw M6x25 (pos. 4). See following Figure.

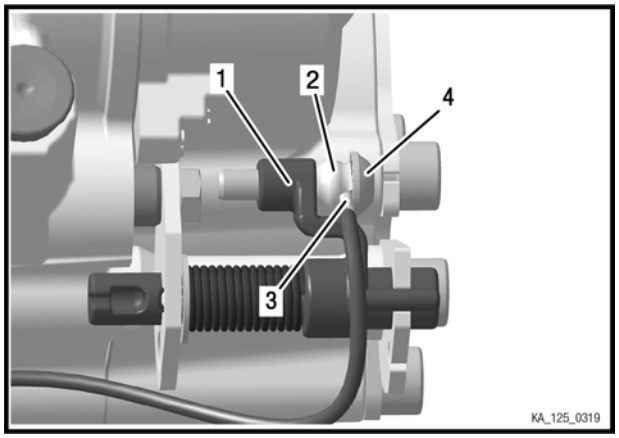


Figure 4.13

1	*Shift contact assy.*	*2*	*Fuel tube*
3	*Cable lug*	*4*	*Plastite screw M6x25*

NOTE

The correct adjustment of the shift contact is described in the Operators Manual, section “Adjustment of gear shifting”.

Step	Procedure
7	Fasten the wire of the shift contact assy. with a tie wrap (pos. 1) on the bottom of the engine.

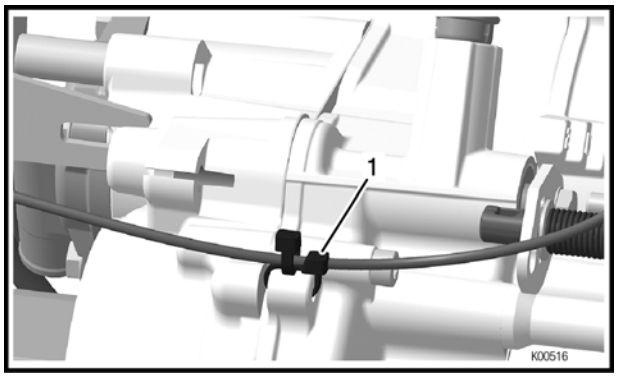


Figure 4.14

1 Tie wrap

Step	Procedure
8	Connect pick up connector to pick up sensor (pos. 1). Pay attention to the engagement of the connector. See also section: Direct attachment of the engine to chassis.

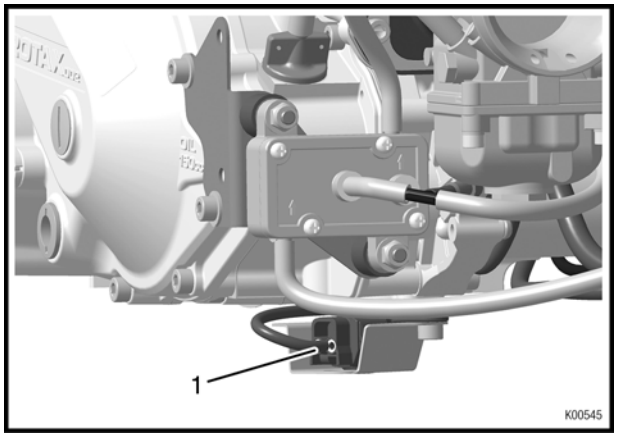


Figure 4.15

1 Pick up sensor

NOTE

If it's not possible to plug in the connector of the pick-up sensor, unscrew the pick-up sensor and change the angle or direction. See also section: Direct attachment of the engine to chassis.

Step	Procedure
9	Attach ignition cables to the spark plug.

NOTES

Chapter: 4
COOLING SYSTEM

TOPICS IN THIS CHAPTER

COOLING SYSTEM OVERVIEW

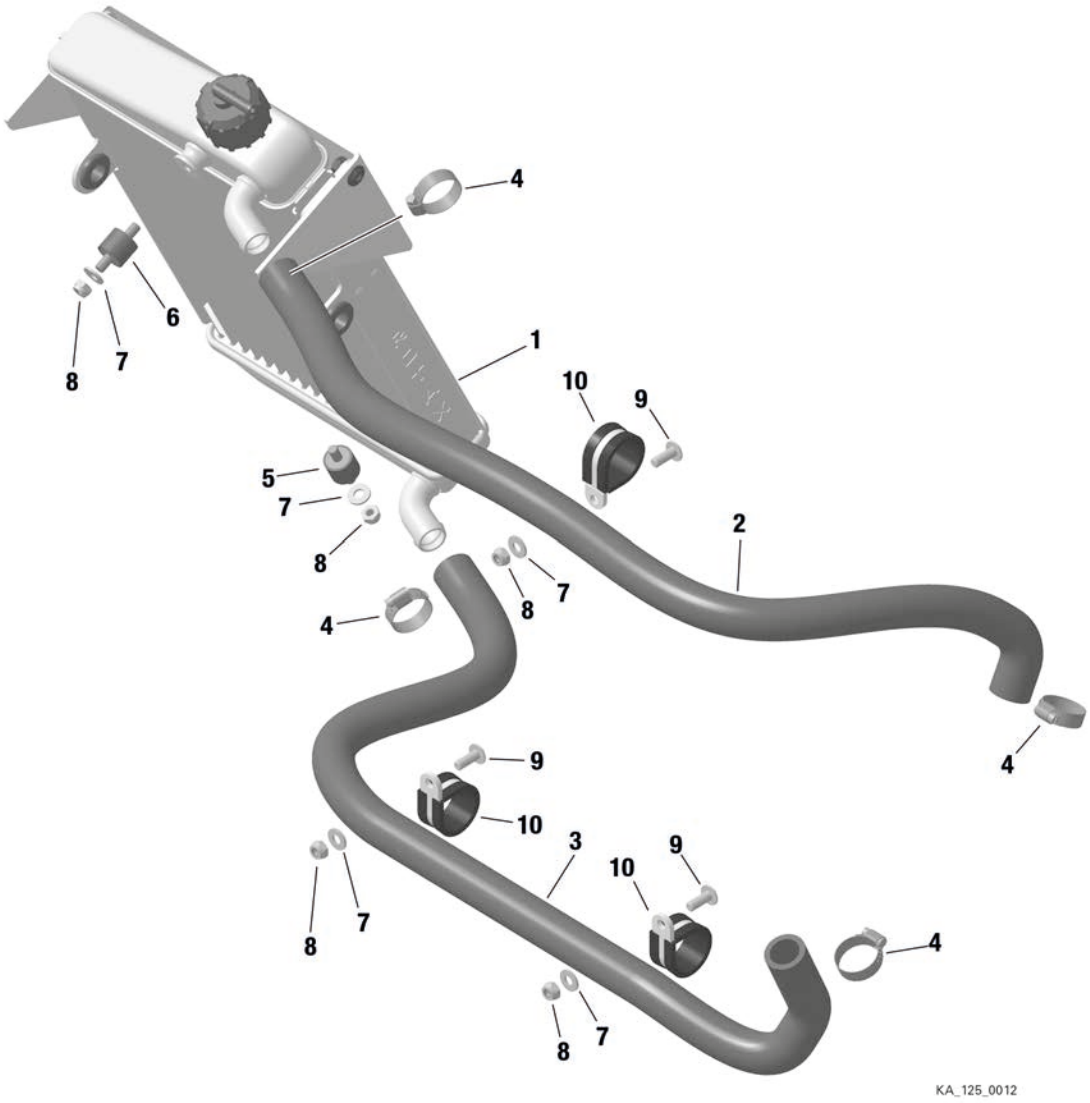


Figure 5.1

1 Radiator	*2 Upper coolant water hose*
3 Lower coolant water hose	*4 Clamp 16–25*
5 Rubber puffer	*6 Rubber puffer*
7 Washer	*8 Lock nut*
9 Allen screw — rounded flange head	*10 Hose clamps*

INSTALLATION OF THE RADIATOR

Tools required:
• Ratchet wrench with socket 7 mm or Phillips screwdriver

Step	Procedure
1	Mount radiator (pos. 1) using the provided rubber buffer (pos. 5) and lock nut (pos. 8) with washer (pos. 7) on the lower support bracket on the chassis.
2	Mount the radiator support with the rubber buffer (pos. 6) and lock nut (pos. 8) with washer (pos. 7) on the upper radiator mount and onto the chassis.

NOTE

For an optimum of cooling efficiency, we recommend to install the radiator in an angle of 25° +/- 5° tilted backwards.

⚠ WARNING

Non-compliance can result in serious injuries or death!
For radiator installation to the chassis, please follow the instruction of the chassis manufacturer.

Step	Procedure
3	Put the four supplied hose clamps (pos. 10) on the coolant hoses.
4	Push the upper coolant water hose (pos. 2) onto the upper socket of the radiator as well onto water socket of the cylinder head cover.
5	Push the lower coolant water hose (pos. 3) onto the lower socket of the radiator as well onto the water socket of the water pump housing.
6	Secure the coolant hoses with the hose clamps (pos. 10).
7	Secure the upper coolant water hose to the driver's seat (pos. 2) using the provided cable tie.

ATTENTION

The coolant water hose between radiator and engine must not rub with the drivers seat.
Arrange the routing of the coolant water hose accordingly.

Step	Procedure
8	Secure the lower coolant water hose (pos. 3) using two of the provided cable ties to the chassis.

⚠ WARNING

Non-compliance can result in serious injuries or death!
Please follow the instruction of the chassis manufacturer for mounting the lower coolant water hose to the chassis.

Step	Procedure
9	Establish connection between overflow socket on radiator filling socket and the overflow bottle with an appropriate piece of hose.

ATTENTION

Warrant the best possible engine cooling.
Ensure that the air stream covers the complete radiator area.

INTAKE SILENCER

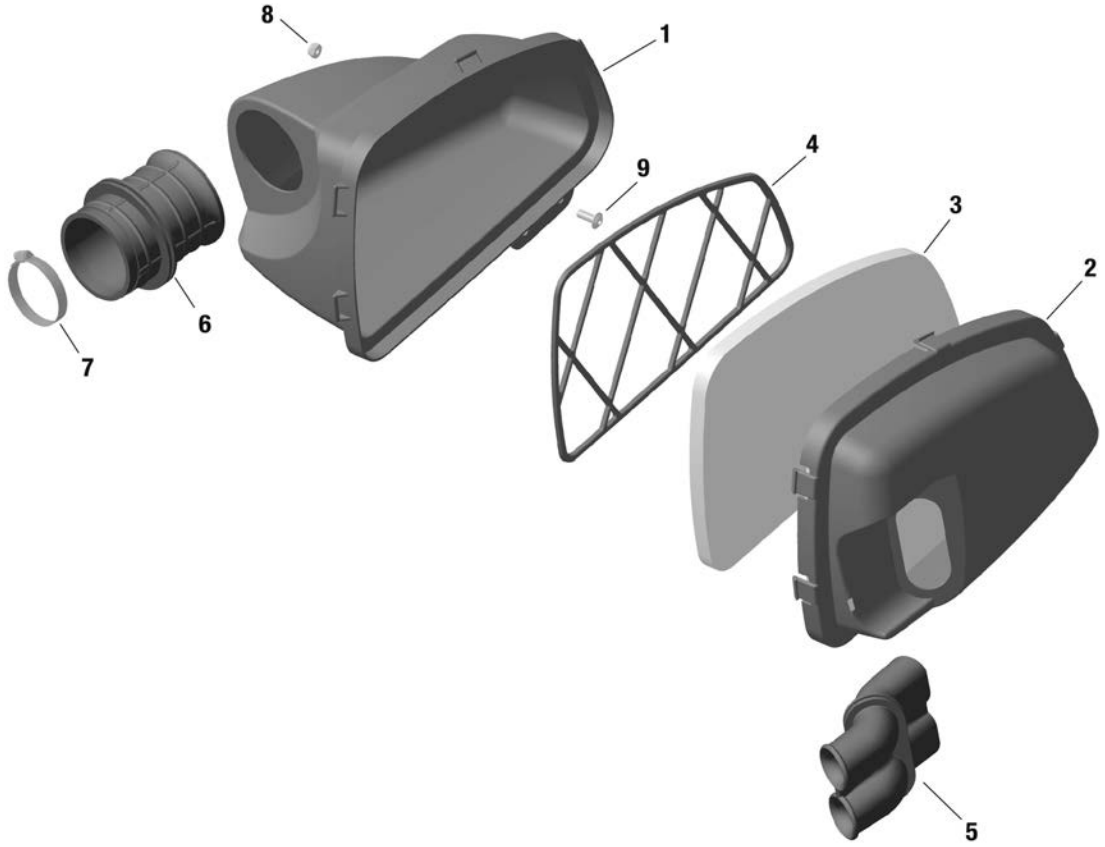


Figure 5.2: Overview

1 Intake silencer case
2 Intake silencer cover
3 Filter element
4 Holder for filter element
5 Intake silencer tube
6 Carburetor socket
7 Clamp 50–70
8 Lock nut M6
9 Allen screw. rounded flange head

INSTALLATION OF THE INTAKE SILENCER WITH INTEGRATED AIRFILTER

Tools required:
• Allen key 4 mm • Ratchet wrench with socket 7 mm or Phillips screwdriver

Step	Procedure
1	Install the rubber intake pipe (pos. 5) in a vertical position into the bottom half (pos. 2) of the intake silencer so that the rounded intake openings point outwards.
2	Fit the carburetor socket (pos. 7) into the inner side half of silencer (pos. 1) so that the arrow on the socket points towards the carburetor.
3	Install the filter element (pos. 3) with holder (pos. 4).
4	Assemble filter box and filter insert as shown in the intake silencer overview figure. Make sure that the locking is interlocked properly.
5	Attach the intake silencer with the supplied hose clamps (pos. 8) to the carburetor.

NOTE

The carburetor socket (pos. 7) is slightly tilted in one direction and can be turned so that the best possible position between carburetor and intake silencer can be achieved.

Step	Procedure
6	Attach the intake silencer on the chassis using the M6 Allen screw with rounded flange head (pos. 10).

NOTES

Chapter: 5
EXHAUST SYSTEM

TOPICS IN THIS CHAPTER

EXHAUST SYSTEM OVERVIEW

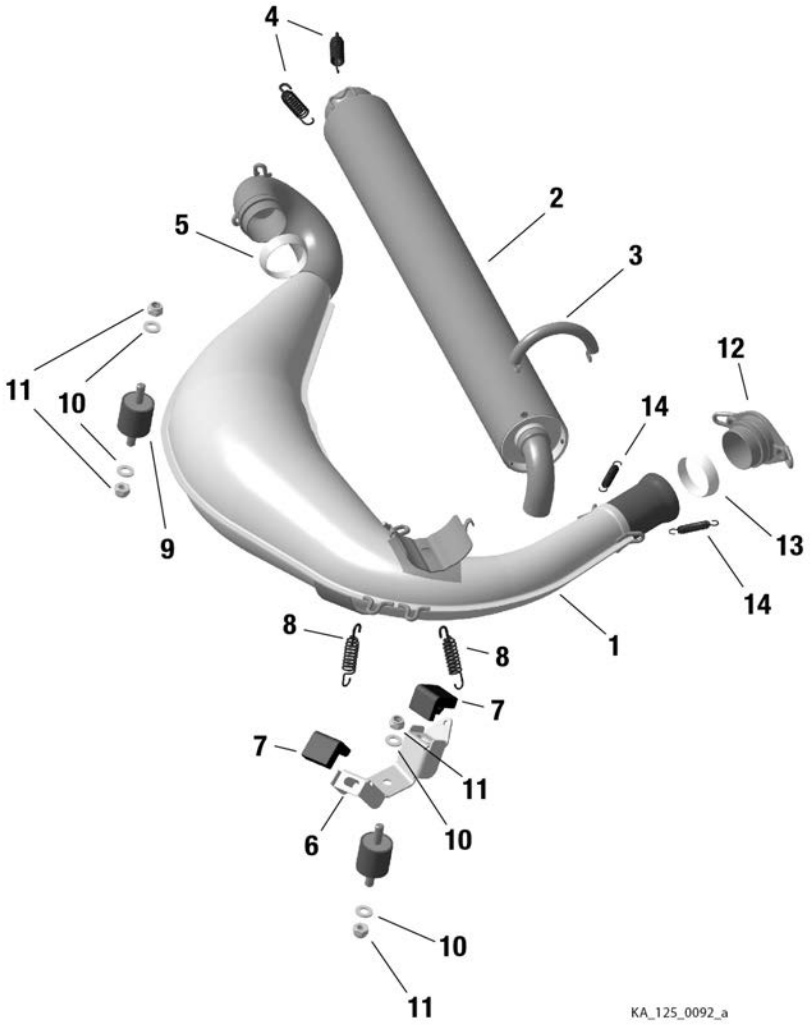


Figure 6.1

1	*Exhaust system*	*2*	*Silencer assy.*
3	*Tension spring*	*4*	*Spring stainless*
5	*Exhaust gasket*	*6*	*Retaining plate*
7	*Rubber buffer*	*8*	*Spring stainless*
9	*Rubber buffer*	*10*	*Washer 8.4*
11	*Lock nut M8*	*12*	*Exhaust socket assy.*
13	*Exhaust gasket*	*14*	*Spring stainless*

INSTALLATION OF THE EXHAUST SYSTEM

Tools required:
• Open-end wrench 13 mm • Spring hook

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 a rubber mount M8 (pos. 9).

ATTENTION
A rigid suspension of the exhaust system could result in fractures in the exhaust system.

Step	Procedure
1	Attach the heat-resistant rubber mount (pos. 9) to the support lug on the underside of the exhaust.
2	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.
3	The gasket (pos. 13) is the only sealing between engine and the exhaust system. Additional heat-resistant LOCTITE is not necessary anymore.

Step	Procedure
4	Secure the exhaust system on the exhaust socket using the two supplied exhaust springs (pos. 14).

NOTE

For easier installation use the special tool "Spring hook" part no. 251680.

ATTENTION
Do not over-stress the springs when fitting them.

Step	Procedure
5	Attach the exhaust system on the chassis supports such that the sealing of the ball joint between cylinder and exhaust system will not be impaired.

NOTES

Chapter: 6
INSTALLATION OF THE ACCESSORIES

TOPICS IN THIS CHAPTER

INSTALLATION OF MOUNTING PLATE

Tools required:
• Allen key 6 mm

Step	Procedure
1	The holding bracket, the mounting plate, the solenoid valve and the ignition coil are already pre-assembled.
2	Install whole bracket kit with Allen screw M8x50 (pos. 2) and distance sleeve 8.2/12/25.5 (pos. 3) onto the engine.

ATTENTION

Slot of mounting plate has to be installed in the correct position.

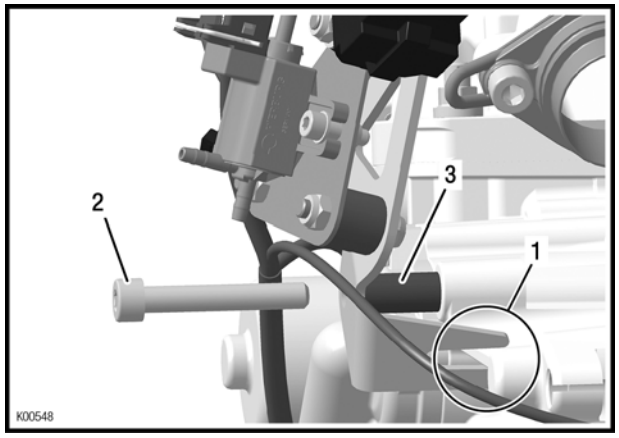


Figure 7.1

1 Slot
2 Allen screw M8x50
3 Distance sleeve 8.2/12/25.5

NOTE

Distance sleeve (pos. 3) has to be install between engine housing and retaining plate. Distance sleeve can be replaced by fitting of an additional seat stay.

FITTING OF THE SPARK PLUG

The engine will be supplied with a spark plug.

Tools required:
• Feeler gauge • Socket 21 mm • Torque wrench

Step	Procedure
1	Remove the transport plug from the cylinder head.
2	Check electrode gap of spark plug. Adjust as required.

NOTE

Check technical regulations to assure conformity when setting the electrode gap.

Step	Procedure
3	Fit supplied spark plug (pos. 1) and tighten 25 Nm (221 lbf in) to 27 Nm (239 lbf in).
4	Install the spark plug connector (pos. 2), ensure correct engagement.

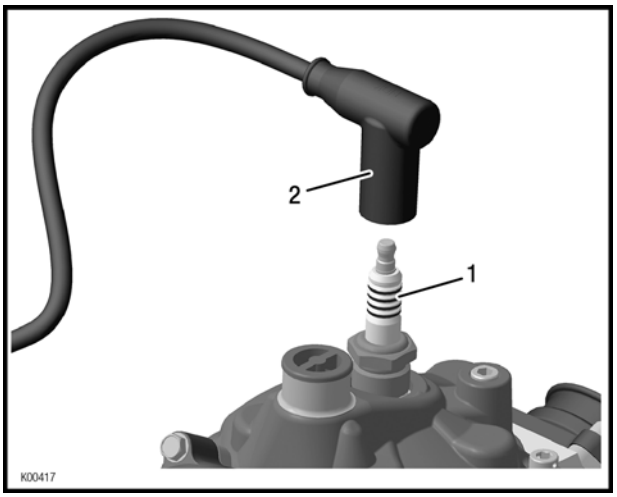


Figure 7.2

1 Spark plug *2 Spark plug connector*

INSTALLATION AND CONNECTION OF THE RAVE CONTROL UNIT

NOTE

The hose package of the RAVE control is already pre-assembled.

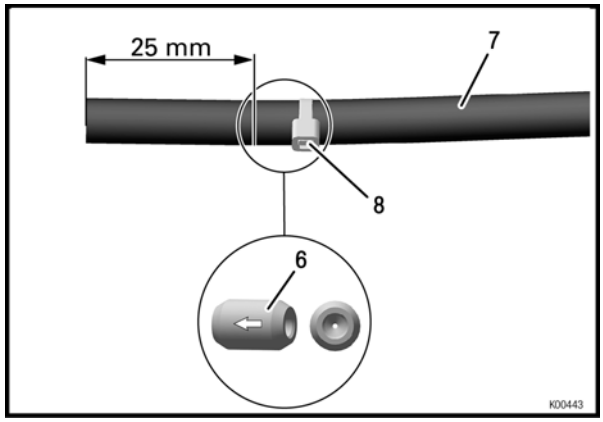
NOTE

The impulse restrictor is offered optionally.

Step	Procedure
1	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 choke the opening of the exhaust valve.

NOTE

In order to prevent the displacement of the impulse nozzle (pos. 6), a small cable tie (pos. 8) should be attached directly afterwards to the pressure line. Do not tie up the pressure line completely!



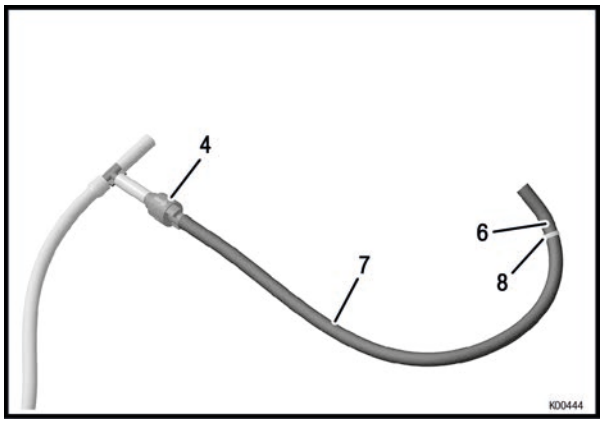


Figure 7.3

4 Check valve *6 Impulse nozzle*

7 Pressure line *8 Tie wrap small*

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

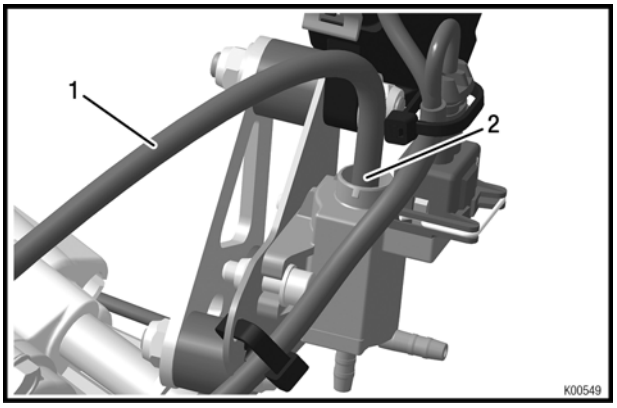


Figure 7.4

1 Hose package *2 Metal connector*

Step	Procedure
3	Attach the other end of the hose package (pos. 1) (short end with T-piece) to the fuel pump.

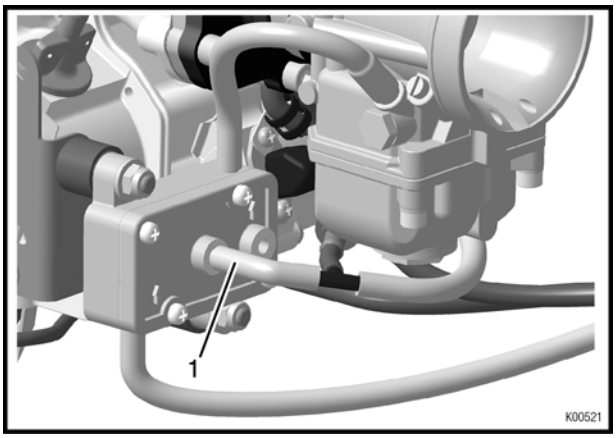


Figure 7.5

1 Hose package

Step	Procedure
4	Attach the fuel line of the hose package (pos. 1) to the impulse nipple on the engine housing..

NOTE

Check that valve is not the lowest point of the impulse circuit to prevent that condensation affects a proper operation.

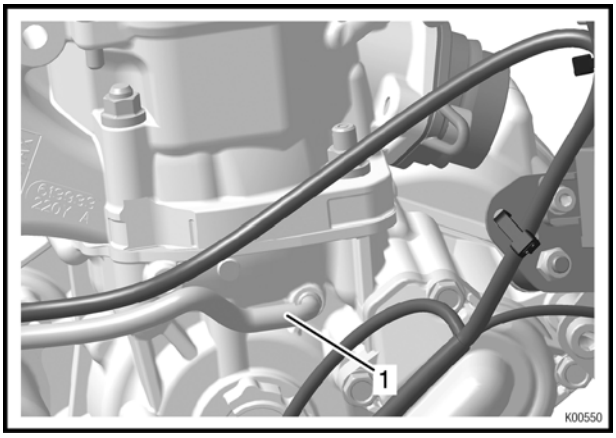


Figure 7.6

1 Hose package

Step	Procedure
5	Attach cable tie with mount (pos. 1) to the housing.

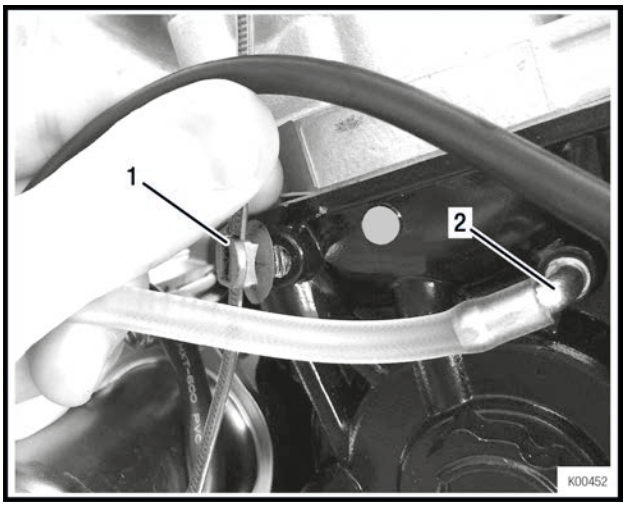


Figure 7.7

1 Cable tie *2 Impulse nipple*

Step	Procedure
6	Secure both lines with cable tie, ensuring that the black hose is on top.

ATTENTION

Do not tighten cable ties too tight, because constricted lines can lead to loss of function.

Step	Procedure
7	Attach an additional cable tie (pos. 3) as shown in figure.

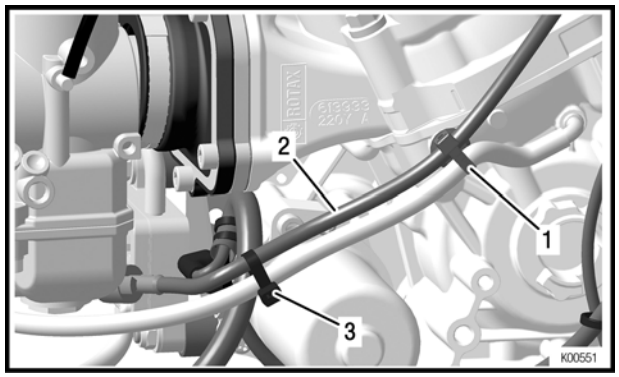


Figure 7.8: Cable tie

1 Cable tie *2 Black hose*

3 Cable tie

Step	Procedure
8	Attach the 220 mm pressure line (pos. 1) to the magnetic valve (pos. 3). Secure the pressure line on the magnetic valve with a tie wrap (pos. 4). Attach the other end of the pressure line to the exhaust valve (pos. 2).

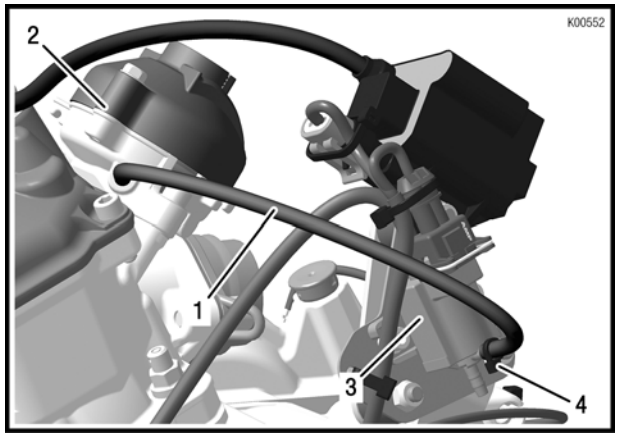


Figure 7.9

1 Pressure line *2 Exhaust valve*

3 Magnetic valve *4 Cable tie*

ASSEMBLY OF PADDLE SHIFT SYSTEM

Tools required:
• Allen key 6 mm • Allen key 5 mm

Step	Procedure
1	Install spacer (pos. 1) into the appropriate bore (pos. 2) of the engine housing.

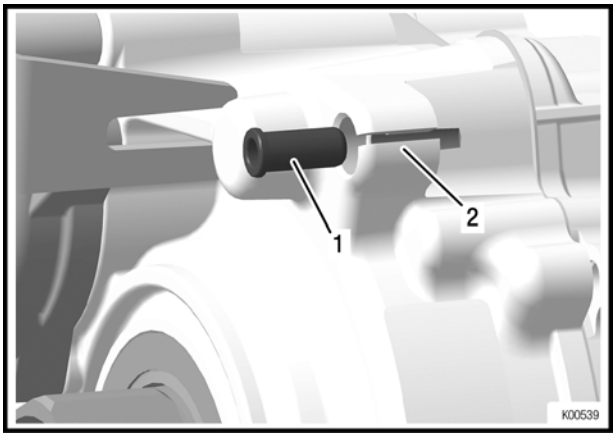


Figure 7.10

1 Spacer *2 Appropriate bore*

Step	Procedure
2	Install washer (pos. 1) on one of the two Bowden cables (pos. 2).

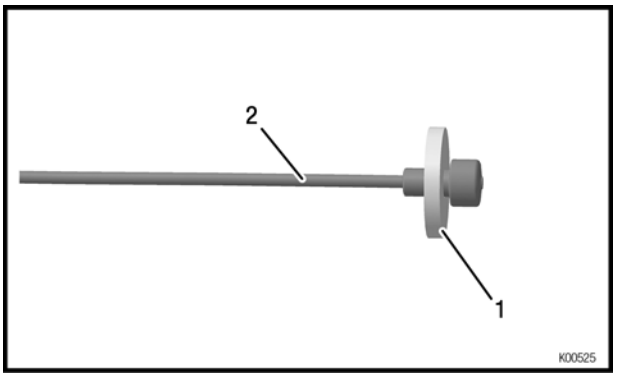


Figure 7.11

1 Washer *2 Bowden cable*

Step	Procedure
3	Mount Bowden cable (pos. 2) with washer (pos. 1) onto the shift contact guidance (pos. 3).

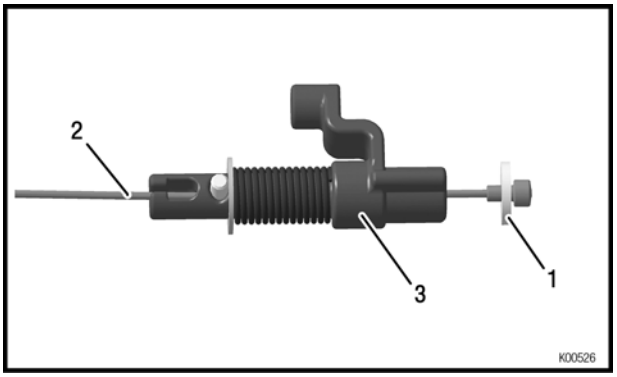


Figure 7.12

1 Washer *2 Bowden cable*

3 Shift contact guidance

Step	Procedure
4	Mount Bowden cable with shift contact guidance (pos. 1) to the retaining plate (pos. 2).

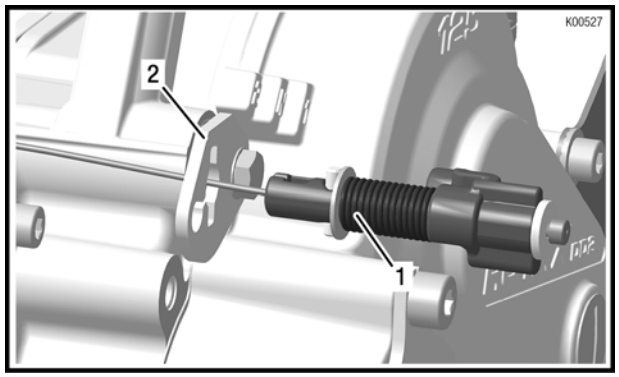


Figure 7.13

1 Shift contact guidance *2 Retaining plate*

Step	Procedure
5	Mount Allen screw (pos. 1), lock washer (pos. 2) and spacer (pos. 3) together with the shift contact guidance (pos. 4) to the engine housing. Tightening torque 22 Nm.

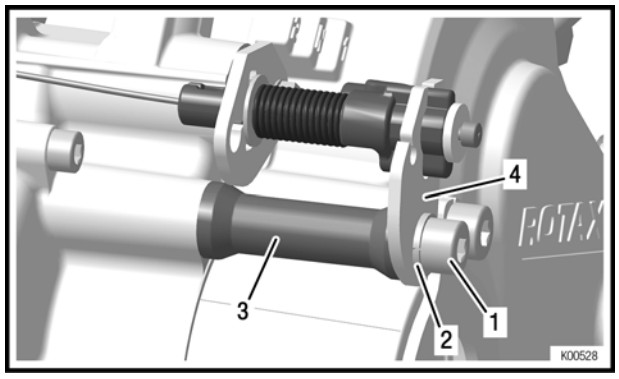


Figure 7.14

1 Allen screw *2 Lock washer*
3 Spacer *4 Shift contact guidance*

Step	Procedure
6	The alignment between point -1- and point -2- must be given. Otherwise it can cause increased friction, which has a negative impact on shifting behavior.

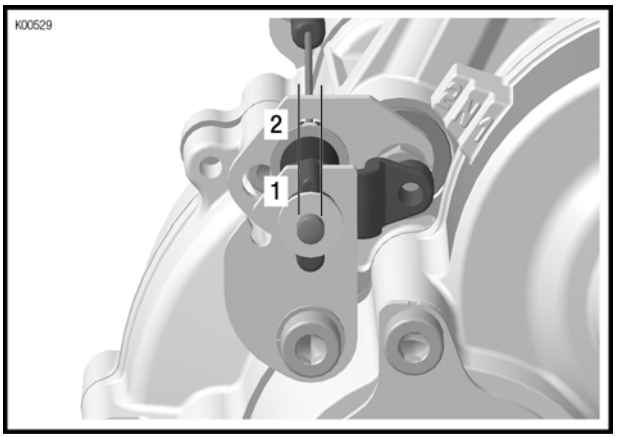


Figure 7.15

1 Point 1 *2 Point 2*

Step	Procedure
7	Mount sleeve (pos. 1) onto the retaining plate (pos. 2).

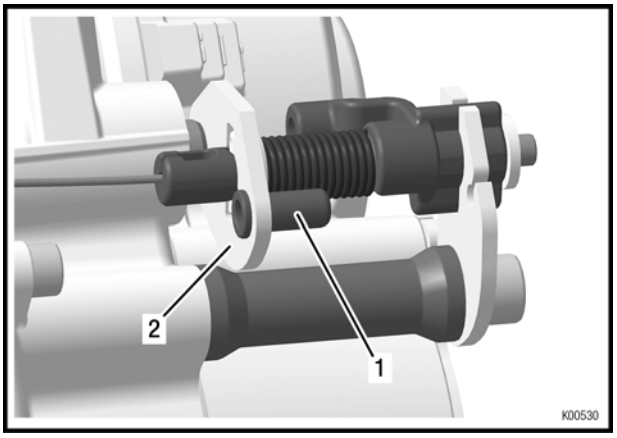


Figure 7.16

1 Mount sleeve *2 Retaining plate*

Step	Procedure
8	Mount second Bowden cable (pos. 1) through shift contact guidance and sleeve onto the retaining plate (pos. 2). No washer is necessary on this Bowden cable.

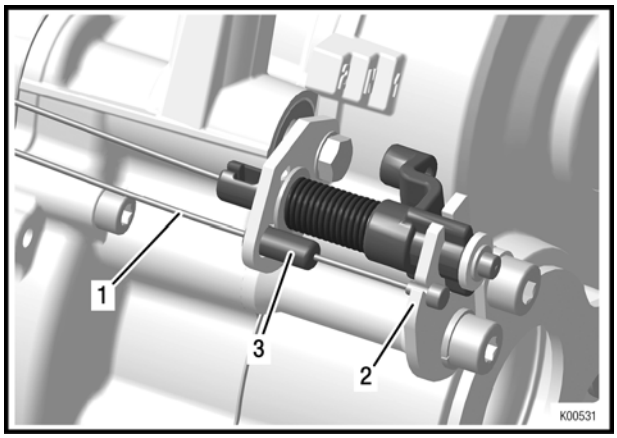


Figure 7.17

1 Bowden cable *2 Retaining plate*

3 Guidance

Step	Procedure
9	Install Bowden cables (pos. 1) into the support on the back of the engine.

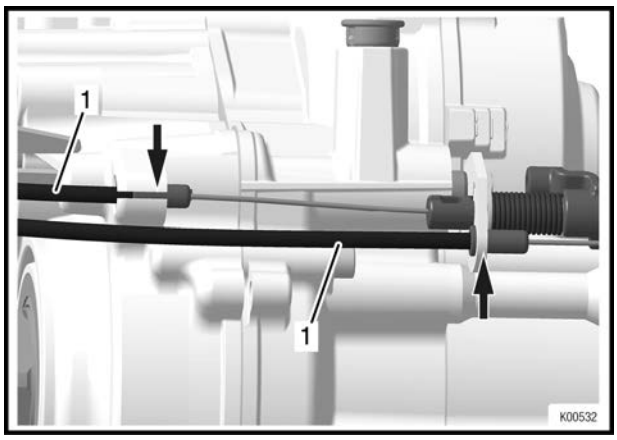


Figure 7.18

1 Bowden cable

Step	Procedure
10	Thread both ends of the Bowden cables (pos. 1) through the cable support (pos. 2). Install the set screw (pos. 3) onto the cable support – just pre-assemble it, do not tighten yet.

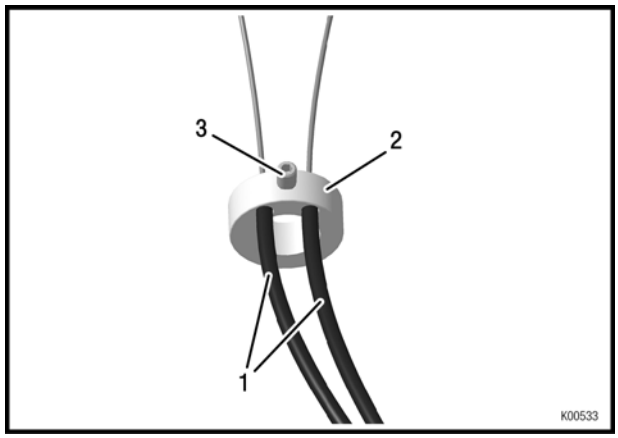


Figure 7.19

1 Bowden cables *2 Cable support*

3 Set screw

Step	Procedure
11	Hand-tighten both Bowden cables (pos. 1) onto the control whip (pos. 2), using M6. Allen screws (pos. 3) and washers (pos. 4). Pay attention to the correct installation of the control whip!

NOTE

The oblique millings (pos. 5) of the control whip serve to guide the cables. The cable ends must look away from the center of the control whip.

The Bowden cables can be attached to the control whip in two different ways:

- Version 1:

Fasten Bowden cable to position 5 inside.
Feature: Shift travel longer, but less effort.

- Version 2

Fasten Bowden cable to position 5 outside.
Feature: Short shift, but higher effort.

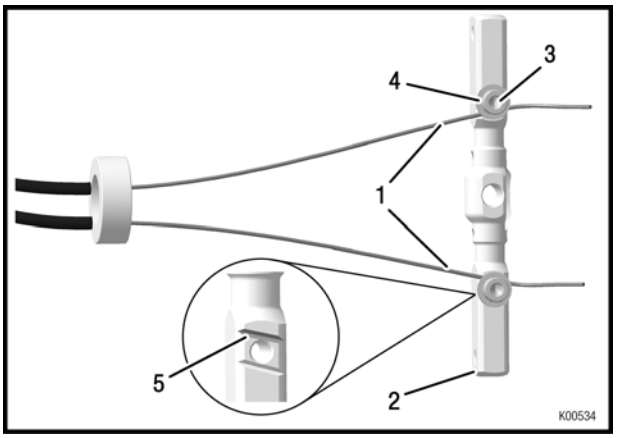


Figure 7.20

1 Bowden cable
2 Control whip
3 Allen screw
4 Washer
5 Oblique millings

Step	Procedure
12	Hand-tighten control lever left and right (pos. 1) onto the control whip (pos. 4), using M6 Allen screws (pos. 2) and washers (pos. 3).

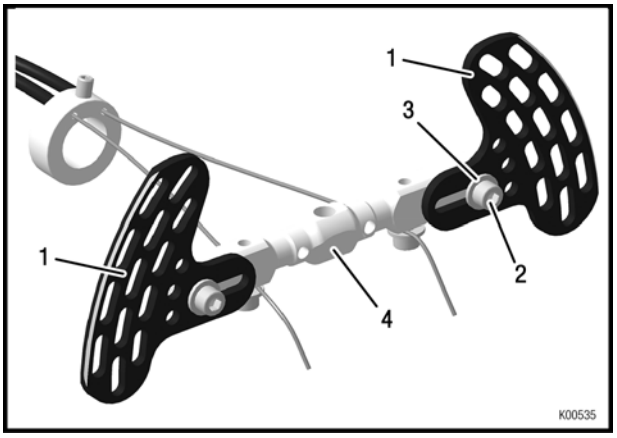


Figure 7.21

1 Control lever
2 Allen screw
3 Washer
4 Control whip

NOTE

The control lever can also be attached on the back, depending on how it is more ergonomic for the driver.

Step	Procedure
13	Install spacer (pos. 1) with washer (pos. 2) onto the bottom side of the control whip (3).

NOTE

The bottom side is, where the screws of the Bowden cables are fixed.

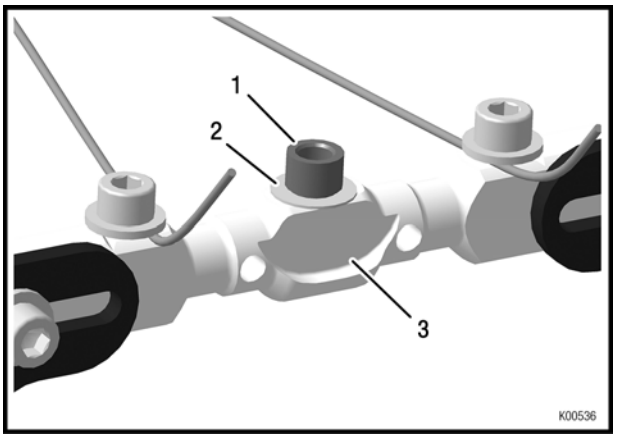


Figure 7.22

1 Spacer
2 Thrust washer
3 Control whip

Step	Procedure
14	Tighten Allen screw M6x60 (pos. 1) and washer (pos. 2) onto the top of the control whip (pos. 3).

NOTE

Top is the opposite side, where the screws of the Bowden cables are attached.

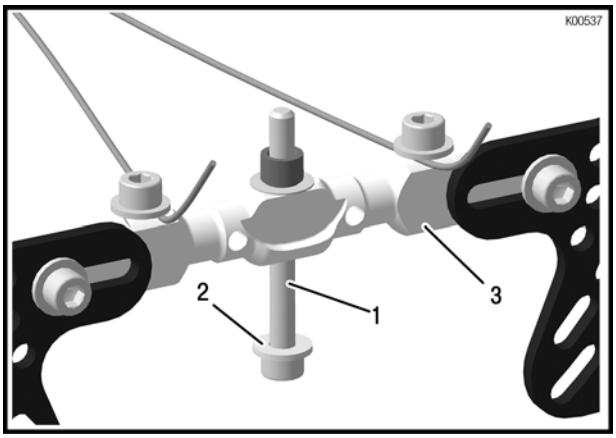


Figure 7.23

1 Allen screw M6x60 *2 Washer*
3 Control whip

Step	Procedure
15	Place the entire shifting unit onto the steering wheel and tighten it using Allen screw M6x 60 (pos. 3), M6 lock nut (pos. 1) with washer (pos. 2).

NOTE

Control whip must run smoothly.

NOTE

Spacer must fit into the bore provided on the steering wheel.

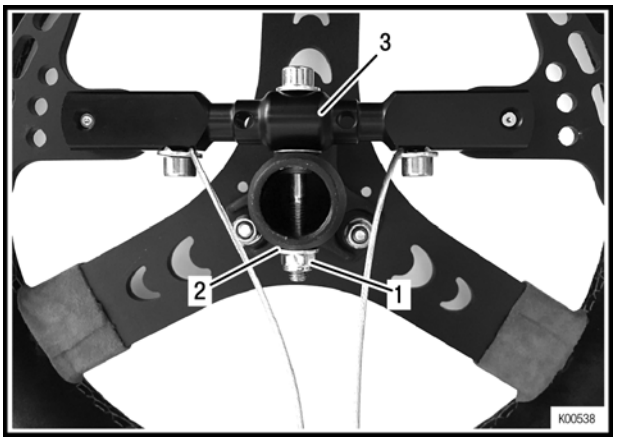


Figure 7.24

1 Lock nut M6 *2 Washer*
3 Allen screw M6x60

Step	Procedure
16	The setting of the shifting is carried out in neutral gear, which means that the control whip must be in horizontal position.
17	Tighten screw (pos. 2) of the cable abutment (pos. 1) and the screws of the Bowden cables on the control whip (pos. 3).

NOTE

At full steering angle, no gear must engage. If a gear engages by itself, the distance between control whip and cable abutment must be adjusted.

Step	Procedure
18	Finally, the length of the Bowden cables can be adjusted so that they do not disturb the driver when shifting.

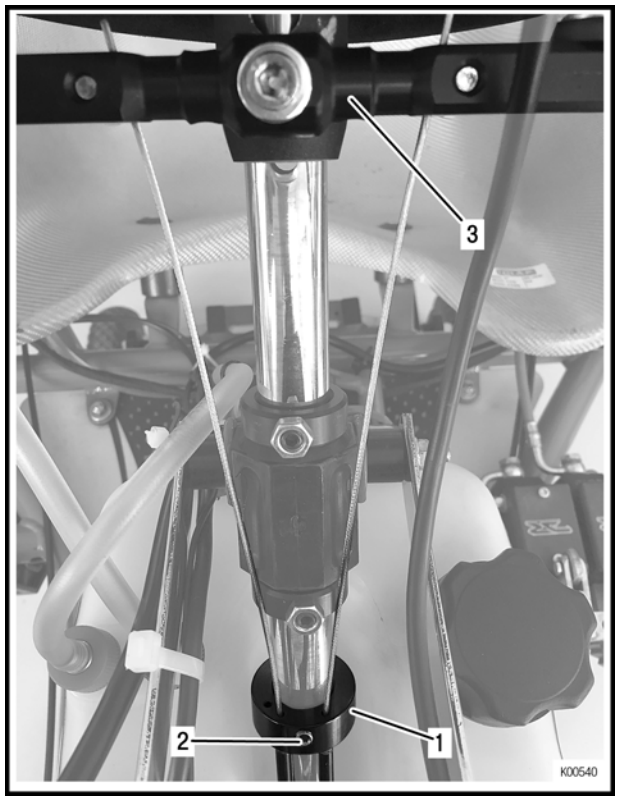


Figure 7.25

1 Cable abutment
2 Screw
3 Control whip

Chapter: 7
FINISHING WORK

TOPICS IN THIS CHAPTER

NOTE

To determine the best possible transmission ratio, the use of a rev-counter is required for observation of the speed limits.

NOTE

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

NOTE

Refer to Operators Manual for operating limits.

CHECK OIL LEVEL IN GEARBOX

The gearbox is already filled with the appropriate amount of oil by the engine manufacturer. However, before the engine is installed in the frame, the oil level must be verified or replenished.

Step	Procedure
1	Place engine on a horizontal surface and/or assembling trestle.

ATTENTION
When placing the engine on a horizontal surface, take care not to damage the crankcase sensor, which is mounted on the bottom of the crankcase.

Step	Procedure
2	The oil level can be checked on inspection glass (pos. 1). It should reach approximately to one-third of the inspection glass, see following figure. If the oil level is not sufficient, replenish oil as described in the following steps.

NOTE

For gearbox oil specifications and oil capacity (total) see the latest Operators Manual.

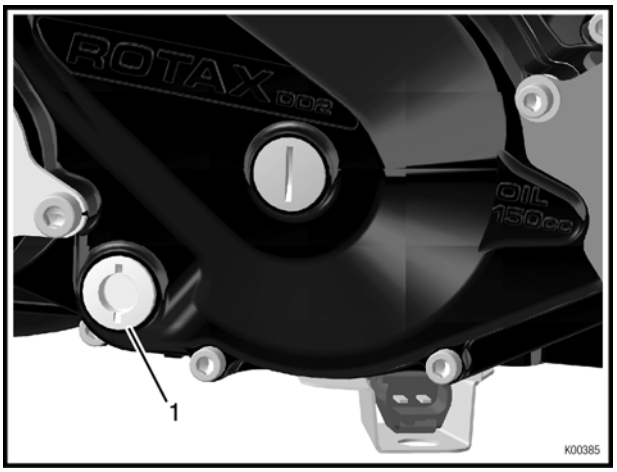


Figure 8.1

1 Inspection glass

Step	Procedure
3	Remove the air vent screw (pos. 1) and slowly fill in oil until oil level is in the middle of the inspection glass.
4	Hand-tighten air vent screw (pos. 1).

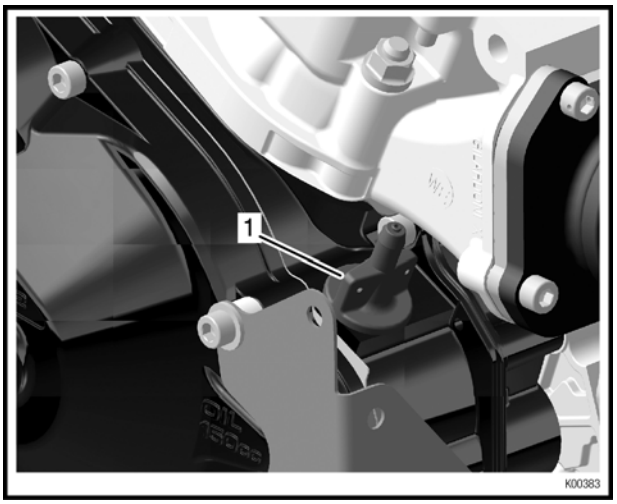


Figure 8.2

1 Air vent screw

NOTE

For draining the oil from the gear case, remove the magnetic oil drain plug (pos. 1) and sealing ring (pos. 2). Clean the oil drain plug before installation. Always use a new sealing ring.

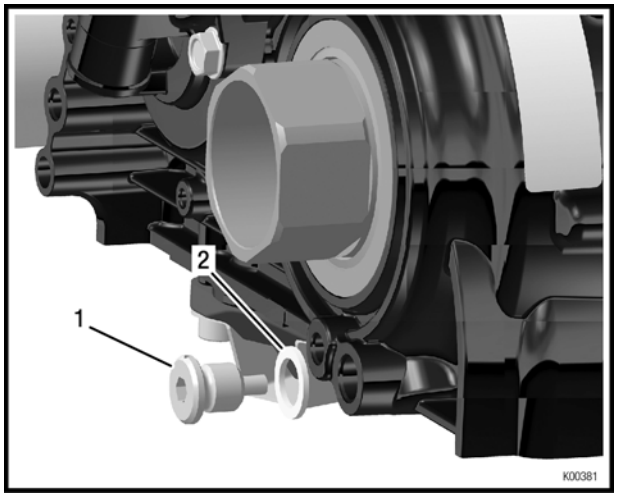


Figure 8.3

1	*Magnetic oil drain plug*	*2*	*Sealing ring*

NOTE

Tighten magnetic oil drain plug (pos. 1) to 20 Nm (177 lbf.in.).

⚠ WARNING

Non-compliance can result in serious injuries or death!
Do not run the engine without gear oil. This will lead to engine failure.

VENTING OF THE GEAR COMPARTMENT

Step	Procedure
1	Remove cap from the venting screw.
2	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 on the bottom of the collecting reservoir, if only one reservoir is in use.

RUN-IN PROCEDURE

⚠ WARNING

Non-compliance may result in serious injuries or death!
Running-in has to be done with a “long” gear ratio and a rich main jet (2 sizes bigger than the recommended main jet based on altitude and temperature.

ATTENTION

For the first 10 liters of fuel use a mixing ratio of 1:33 (= 3% or 0.3 liter oil per 10 liters of fuel).

NOTE

BRP-Rotax recommends to use XPS Kart - Tec oil.

Step	Procedure
1	15 min. up to 10.000 rpm. 15 min. up to 12.000 rpm. 15 min. full load.
2	Reduce the main jet size step by step (e.g. 172 - 170 - 168 ...).

NOTE

Make sure that the coolant temperature reaches a minimum of 55 °C (130 °F).
At cold ambient temperature radiator needs to get partly covered by tape.

NOTES

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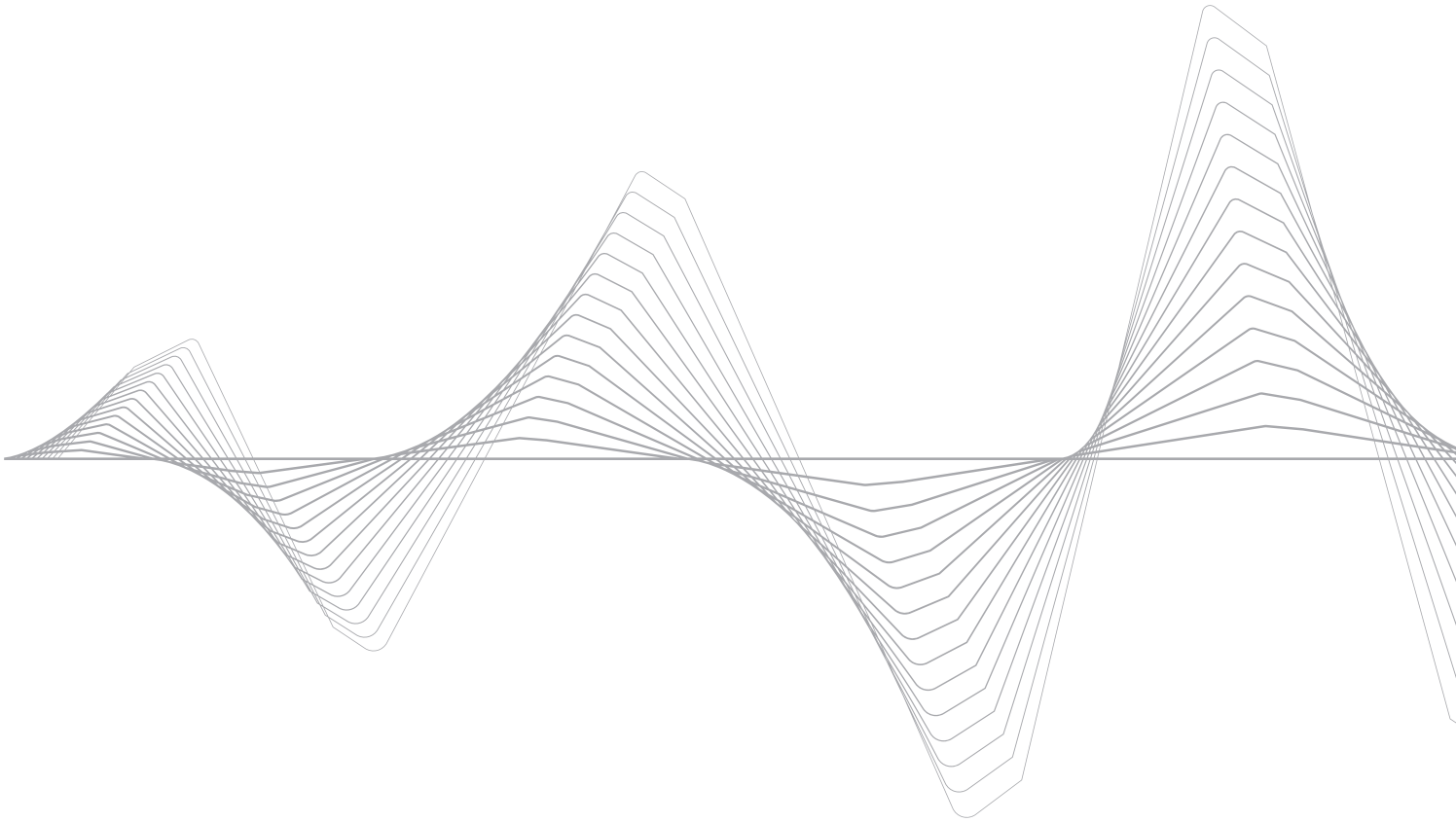

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