

ROTAX
NEW AGE KARTING



REPAIR MANUAL

ROTAX ENGINE 125 MAX DD2



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part. no. 298063

WARNING

Before starting any maintenance work, please read the Repair Manual, as it contains important safety relevant information. Failure to do so may result in personal injuries including death. Consult the original equipment manufacturers handbook for additional instructions!

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Approval of translation has been done to best knowledge and judgement - in any case the original text in german language is authoritative.

Chapter: INTRO**GENERAL NOTE****Foreword**

Before carrying out repair work on the engine, read the Repair Manual carefully.

If any passages of the Manual are not clearly understood or if you have questions, please contact an authorized Distribution or Service Center for ROTAX-kart engines.

Chapter structure

The Repair Manual is subdivided into the following chapters:

Subject	Chapter
Introduction	Chapter INTRO
List of effective pages	Chapter LEP
Table of amendments	Chapter RV
General note	Chapter 1
Maintenance	Chapter 2
Engine	Chapter 3
Cubic capacity parts	Chapter 4
Crank and gearbox housing	Chapter 5
Carburetor and Intake silencer	Chapter 6
Centrifugal clutch and Starter gear	Chapter 7
Radiator	Chapter 8
Exhaust system	Chapter 9

BRP-Powertrain empfiehlt Produkte der Marken:
BRP-Powertrain recommends products of following brands:



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Chapter: LEP

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Chapter: RV

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Chapter: 1**GENERAL NOTE****Contents**

This Repair Manual contains instructions for all the necessary repair and maintenance work on the ROTAX-Engine Type 125 MAX DD2.

Table of contents

This chapter of the Repair Manual contains general and safety information concerning the operation of the kart engines.

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REPAIR MANUAL

1) General note

Purpose	This Repair Manual is based on information and the state-of-knowledge of BRP-Powertrain of the product current at the date of issue.
Documentation	For additional information on engines, maintenance or parts, you can also contact your nearest authorized ROTAX®-Engine distributor.
ROTAX Distributors	ROTAX® Authorized Distributors for Kart Engines. See on the Internet at the official Homepage www.kart-rotax.com .
Engine serial number	When making inquiries or ordering parts, always indicate the engine serial number, as the manufacturer makes modifications to the engine for product improvement. The engine number (1) is stamped on the clutch side housing half. See Figure 1 .



Figure 1

K00212

2) Abbreviations and terms used in this Manual

Abbreviations

Abbreviation	Description
°C	Degrees Celsius (Centigrade)
°F	Degrees Fahrenheit
rpm	Revolutions per minute
125 MAX DD2	see Manual (Type designation)
INTRO	Introduction
IPC	Illustrated Parts Catalog
hr.	hours
OM	Operators Manual
kg	kilograms
MON	motor octane number
nB	as necessary
n.a.	not available
Nm	newton meter
Rev.	Revision
ROTAX	is a trade mark of BRP-Powertrain GmbH & Co KG
RON	Research Octane Number
RM	Repair Manual
S/N	Serial Number
SI	Service Instruction
SL	Service Letter
TOA	Table of amendments
part no.	Part number
V	Volt
LEP	List of Effective Pages

3) Safety notice

General note	Although the reading of such information does not eliminate the hazard, understanding the information will promote its correct use. Always use common workshop safety practice. The information and components-/system descriptions contained in this Manual are correct at the time of publication. BRP-Powertrain, however, maintains a policy of continuous improvement of its products without imposing upon itself any obligation to install them on its products previously manufactured.
Revision	BRP-Powertrain reserves the right at any time, and without incurring obligation, to remove, replace or discontinue any design, specification, feature or otherwise.
Measure	Specifications are given in the SI metric system with the USA equivalent in parenthesis.
Symbols used	This Manual uses the following symbols to emphasize particular information. This information is important and must be observed.  WARNING Identifies an instruction which, if not followed, may cause serious injury including the possibility of death.  CAUTION Identifies an instruction which, if not followed, may cause minor or moderate injury. NOTICE Denotes an instruction which, if not followed, may severely damage the engine or other component. NOTES: Indicates supplementary information which may be needed to fully complete or understand an instruction. A revision bar outside of the page margin indicates a change to text or graphic.

3.1) Safety notice

General note



Non-compliance can result in serious injuries or death!

This information relates to the preparation and use of ROTAX Kart engines and has been utilized safely and effectively by BRP-Powertrain. However, BRP-Powertrain disclaims liability for all damage and/or injuries resulting from the improper use of the contents. BRP-Powertrain strongly recommend that any service be carried out and/or verified by a highly skilled professional mechanic.

Manual

This Manual has been prepared as a guide to correctly service and maintain all ROTAX Kart engines.

This Manual uses technical terms which may be slightly different from the ones used in the Illustrated Parts Catalog.

It is understood that this Manual may be translated into another language. In the event of any discrepancy the German version prevails.

Warning

It is your responsibility to be completely familiar with the safety instructions including warnings and cautions described in this Manual. These warnings and cautions advise of specific operating and servicing methods that, if not observed, can cause a serious engine malfunction or cause the engine to lose power in flight which can result in loss of life, injury or damage to equipment.

It is, however, important to understand that these warnings and cautions are not exhaustive. BRP-Powertrain could not possibly know, evaluate and advise the user of all conceivable ways in which service might be done or of the possible hazardous consequences of each way.

Safety instruction

In addition to observing the instructions in our Manual, general safety and accident preventative measures, legal regulations and regulations of any aeronautical authority must be observed.

Where differences exist between this Manual and regulations provided by any authority, the more stringent regulation should be applied.

Illustration

The content depicts parts and/or procedures applicable to the particular product at its time of manufacture. It does not include dealer modifications, whether authorized or not by BRP-Powertrain, after manufacturing the product.

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Locking devices Locking devices (e.g. locking tab, self-locking fasteners, etc.) must be installed or replaced with new ones, where specified. If the efficiency of a locking device is impaired, it must be replaced.

Torque wrench tightening **NOTICE** If not specified otherwise, the threads are not lubricated when fastened.

Torque wrench tightening specifications must be strictly adhered to.

3.2) Instruction

General note Engines require instructions regarding their application, use, operation, maintenance and repair.

Technical documentation and directions are useful and necessary complementary elements for personal instructions, but can by no means substitute theoretical and practical instructions.

These instructions should cover explanation of the technical context, advice for operation, maintenance, use and operational safety of the engine.

Safety notice In this technical Manual passages concerning safety are especially marked. Pass on safety warnings to other users!

Modifications Non-approved modifications to the engine and associated components likewise releases BRP-Powertrain from its warranty obligations.

Accessories This engine must only be operated with accessories supplied, recommended and released by BRP-Powertrain. Modifications are only allowed after consent by the engine manufacturer.

Spare parts **NOTICE** Spare parts must meet with the requirements defined by the engine manufacturer. This is only warranted by use of GENUINE ROTAX spare parts and/or accessories (see IPC) or suitable equivalent in the manufacturer's opinion otherwise, any limited warranty by BRP-Powertrain is null and void (see Warranty Conditions). Spare parts are available at the authorized ROTAX Distribution- and Service Center.

Any warranty by BRP-Powertrain becomes null and void if spare parts and or accessories other than GENUINE ROTAX spare parts and/or accessories are used (see latest Warranty Conditions).

Tools

NOTICE

In principle use only tools and appliances which are either cited in the Manual or in the Illustrated Parts Catalog.

Engine

A fundamental requirement is that on removal of the engine for repair or maintenance purposes it should be secured on the Special Tools part no. 877930 (Trestle support) and part no. 676052 (Trestle adapter) obtainable from BRP-Powertrain.

3.3) Technical documentation

General note

The information contained is based on data and experience that are considered applicable for skilled mechanics under normal conditions.

Due to the fast technical progress and fulfilment of particular specifications of the customers it may occur that existing laws, safety prescriptions, constructional and operational regulations cannot be transferred completely to the object bought, in particular for special constructions, or may not be sufficient.

Status

The status of the Manuals can be determined with the aid of the table of amendments. The first column indicates the revision state.

Replacement pages

Furthermore the Manual is constructed in such a way that single pages can be replaced instead of the complete document. The list of effective pages is given in the chapter LEP. The particular edition and revision number is given on the footer of each page.

Reference

Any reference to a document refers to the latest edition issued by BRP-Powertrain, if not stated otherwise.

Illustrations

The illustrations in this Manual are mere sketches and show a typical arrangement. They may not represent in full detail or the exact shape of the parts which have the same or similar function. Therefore deduction of dimensions or other details from illustrations is not permitted.

NOTES:

The Illustrations and Documents in this Manual are stored in a document data file/graphic data file and are provided with a consecutive irrelevant number.

This number (e.g. 00277) is of no significance for the content.

3.4) Use for intended purpose

Safety note



WARNING

Non-compliance can result in serious injuries or death!

Use

The ROTAX Engine Type 125 MAX DD2 has been designed and developed exclusively for use in a Kart. Any other use renders the BRP-Powertrain factory limited warranty null and void.

**Maintenance
and repair con-
ditions**

Use for intended purpose also includes observation of the operational, maintenance and repair conditions prescribed by the manufacturer. This is a crucial factor concerning the reliability of the engine and can increase the durability of the engine.

4) Technical data

Engine Type	125 MAX/125 Junior MAX/ 125 Mini MAX/125 Micro MAX
Bore/stroke	54.0 mm/54.5 mm
Displacement	125.0 cm ³
Nominal power(max.)	24 kW at 12.500 rpm
Torque (max.)	21 Nm at 10.500 rpm
Idle speed	1.500 rpm
Highest permissible speed	13.800 rpm (at operation on the track, under load) NOTICE Do not operate the engine without load!
Ignition unit	Contactless, DENSO digital coil ignition
Spark plug	DENSO iW 31, M14x1.25
Electrode gap	0.4 - 0.6 mm (DENSO)
Fuel	SUPER unleaded fuel
RON (min.)	Min. 95 Octane
Cooling	Liquid cooling: Cooling circuit with integrated coolant pump
Injection quantity of the coolant pump	approx. 22 Litres at 11.000 rpm.
Coolant mixture	50 % Water (distilled) 50 % Anti-freeze. Observe the condition from the operator of Kart!
Coolant capacity	0.9 Litres
Engine lubrication	Oil-in-gasoline lubrication, synthetic 2 Stroke oil (ROTAX XPS KART-TEC Oil part no. 29460 recommended).
Mixture ratio	1:50 (2 % Oil)
Lubrication of the differential drive	SAE Engine oil 15W-40
Engine oil capacity	150 ml
Clutch	Centrifugal clutch, in oil-bath
Engagement speed	approx. 4000 rpm
Power transmission from centrifugal clutch to the rear axle of the kart	unsynchronized two speed gearbox
Weight (dry)	approx. 16.5 kg without intake silencer, carburetor, fuel pump, radiator, exhaust and battery.

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Chapter: 2

MAINTENANCE

Contents

The information given in the Repair Manual is based on data and experience which are considered to be applicable for a skilled mechanic under normal working conditions.

Table of contents

In this chapter the repair of engine ROTAX 125 MAX DD2 is described. Some overlapping maintenance instructions are treated as generally valid information at the beginning of this section.

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1) Maintenance

1.1) General note

Safety notice



Non-compliance can result in serious injuries or death!

Besides our instructions in the documentation supplied, also respect the generally valid safety and accident preventive directives and legal regulations.

Procedures and limits

The procedures and limits in this Manual constitute the manufacturers official recommendation for engine maintenance and operation.

Instruction

The guidelines given in the Repair Manual are useful and necessary supplements to training. They, however, cannot substitute competent theoretical and practical personal instruction.

Modifications

Non-authorized modifications as well as the use of components and auxiliary components not corresponding to the installation instructions exclude any liability of the engine manufacturer.

Parts and accessories

We particularly emphasize that parts and accessories not supplied as genuine BRP-Powertrain parts are not verified for suitability by BRP-Powertrain and thus are not authorized for use. Installation and/or use of such products may possibly change or negatively influence the constructive characteristics of the engine. For damages resulting from use of non-genuine parts and accessories manufacturer refuses any liability.

Special tools

Maintenance of engines and systems requires special knowledge and special tools. Use only the special tools recommended by BRP-Powertrain when disassembling and assembling the engine.

1.2) Authorized personnel

General note

It is a requirement that all organizations or individuals possess the required special tooling, training or experience to perform all tasks outlined.

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Type-specific training

Any task outlined herein may be performed if the organization or individual has met the following conditions:

Requisite knowledge of the task as a result of:
- Type-specific training (for the applicable ROTAX Kart engine) which is approved by the national aviation authority and/or BRP-Powertrain.
or
- Experience in performing the task and - Formal instruction from a BRP-Powertrain authorized training facility or - "On-the-job" instruction by a BRP-Powertrain or authorized BRP-Powertrain Distributor representative.
Including:
- Suitable work environment to prevent contamination or damage to engine parts or modules. - Suitable tools and fixtures as outlined in the ROTAX Repair Manual. - Reasonable and prudent maintenance practices are utilized.

Information

Maintenance organizations and individuals are encouraged to contact BRP-Powertrain through its worldwide distribution network for information and guidance on any of the tasks outlined herein.

1.3) Procedure notes

Safety note



WARNING

Non-compliance can result in serious injuries or death!

When carrying out maintenance and service work, respect without fail the safety regulations.

Ignition "OFF"



WARNING

Non-compliance can result in serious injuries or death!

This precautionary measure serves to avoid any injuries in case of an unintentional start of the engine.

Principally ensure the following at **each maintenance event**

- Ignition "**OFF**" and system grounded,
 - Disconnect battery
- and secure engine against unintentional operation.

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Handling of operating fluids



WARNING

Failure to comply with this instruction may cause severe burns or scalding!

Hot engine parts!

Always allow the engine to cool down to ambient temperature before starting work.

At maintenance of cooling-, lubricating and fuel system take care without fail that no contamination, metal chips, foreign material and/or dirt enters the system.

Disassembly

At disassembly of the engine, mark the components as necessary to avoid any mix-up. Take care of these marks, don't ruin them.

Tool

NOTICE

In order to avoid mechanical damages, never loosen or tighten screws and nuts with pliers but only with the specified tools.

Safety wiring

NOTICE

If during disassembling/reassembling the removal of a safety item (e.g. safety wiring, self-locking fastener, etc.) should be necessary, it must be always replaced by a new one.

Cleaning of parts

NOTICE

All metal and synthetic parts are generally washed with suitable cleaning agents. Before using new and unknown cleaning agents check the compatibility of materials.

Removed parts

Before re-using disassembled parts, clean, check and refit them as per instructions.

Use clean screws and nuts only and inspect face of nuts and thread for damage. Check the contact faces and threads for damages. In case of doubt, use new screws and nuts.

Measurements

When making low tolerance measurements ($s < 0.1 \text{ mm}$) and in measuring bearing and housing components, the temperature of the components and their surroundings must be in the range $20 \text{ }^{\circ}\text{C}$ - $25 \text{ }^{\circ}\text{C}$.

Nuts

Once loosened, **always** replace self-securing nuts!

Sealing rings, O-rings

At reassembly of the engine, replace all sealing rings, gaskets, securing elements, O-rings and oil seals.

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Re-assembly

Before re-assembly check components whether parts are missing. Only use adhesives, lubricants, cleaning agents and solvents indicated in the maintenance instructions. If not respected, damage may be the consequence.

1.4) Consumable Materials

General note

NOTICE

Use only the specified or **technically equivalent** materials from BRP-Powertrain for all maintenance work. When handling chemicals, comply with all the customary regulations and specifications of the producer, including the expiry date and instruction.

NOTES: To some extent product descriptions deviate in spite of equivalent technical properties, i.e.: LOCTITE 221 and LOCTITE 222. If necessary contact the manufacturer concerning the comparability. In some cases information can be obtained from the local authorized distributors and service partners for ROTAX engines.

NOTES: Respect the manufacturers instruction concerning the curing time and the expire date of the particular surface sealing compound.

The materials specified have been tested for a long time and are suitable for all operating conditions indicated by the manufacturer.

No.	part no.	Description, Application	Qty.
1	897651	LOCTITE 243 blue , medium-duty screw securing agent	10 ml (0.003 gal (US))
2	899788	LOCTITE 648 geen , high strength screw securing agent	5 ml (0.001 gal (US))
3	297434	LOCTITE Anti-Seize 15378 , for the prevention of fretting corrosion	50 g (0.11 lb)
4	897161	MOLYKOTE 111 , long-term lubricant for shaft seal	100 g (0.22 lb)
5	297368	SILASTIC 732 , multi-purpose one-component silicon-based sealing compound	100 g (0.22 lb)
6	897330	Lithium-base grease or Dow Corning , to prevent leakage current	250 g (0.55 lb)
7	25474	KART TEC gear oil , for the simple change of oil.	150 ml

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No.	part no.	Description, Application	Qty.
8	296162	Engine gasket kit	1
-	n.a.	Cleaning agents NOTICE Use only approved cleaning agents (e.g. kerosine, var-sol, etc.) for cleaning all metal parts. Do not use lye-based cold cleaner or degreasing agents. Do not clean coolant or oil hoses with aggressive solutions. Clean off sealing compound residue with sealant remover. Soak combustion chamber, piston and cylinder head with cleaning agent and remove combustion residues with a bronze brush. Very good results have been achieved with "Clenvex 2000". It is a solvent-cold cleaner, free of halogen, on the basis of selected fuel fractions with tensides and is biologically disposable. Never use caustic or corrosive cleaning agents.	

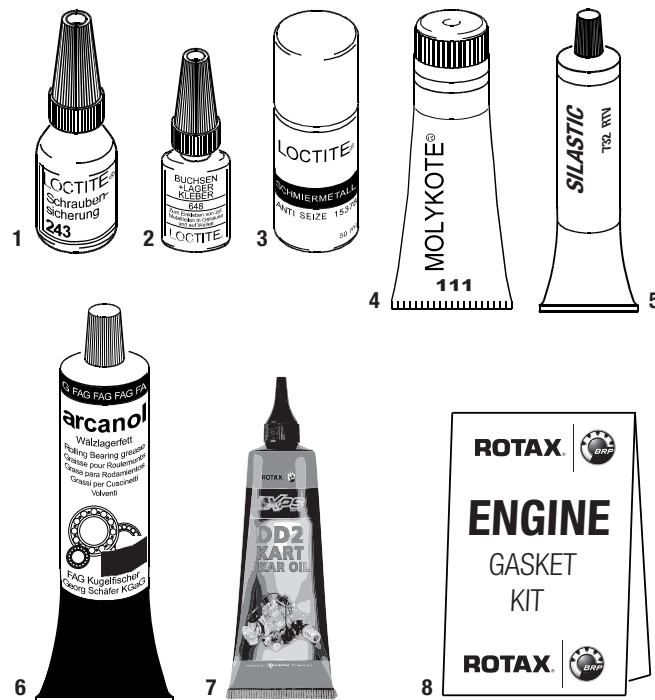
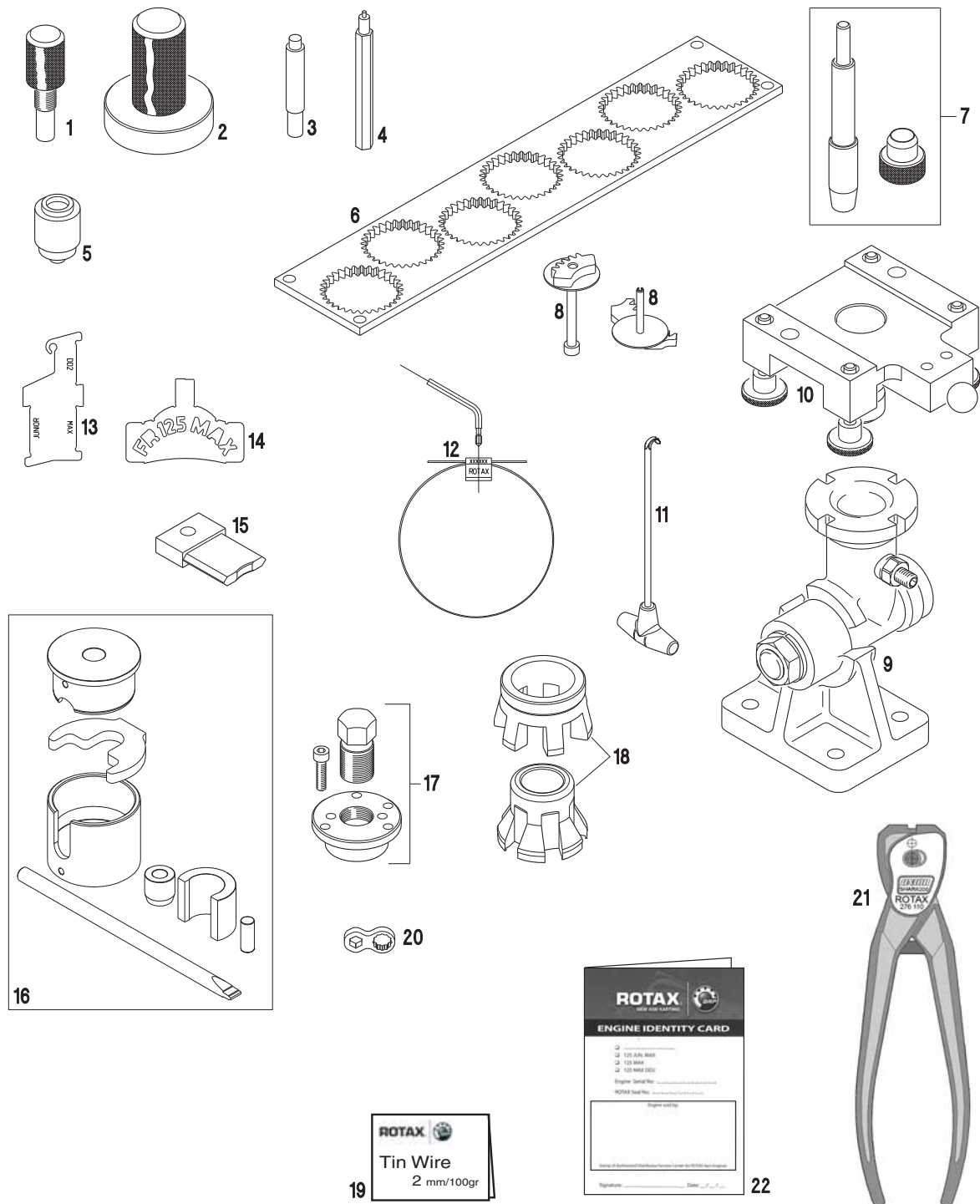


Figure 1

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1.5) Special tools



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No.	part no.	Description
1	277380	Fixation tool for crankshaft
2	676022	Insertion jig
3	676030	Insertion jig
4	676032	Insertion jig
5	676021	Insertion jig
6	676192	Fixation tool
7	676035	Insertion tool
8	676202	Fixation tool assy.
9	877930	Trestle support assy.
10	676052	Fixing plate for engine
11	251680	Spring hook
12	297041	ROTAX-seal
13	277397	Exhaust port height template
14	277390	Combustion chamber insert template
15	277030	Exhaust valve gauge
16	276050	Crankshaft repair jig
17	276016	Puller assy.
18	276070	Assembly tool bellow spring exhaust
19	580130	Tin wire 2 mm
20	676110	Wrench adapter 11/8
21	276110	ROTAX-seal calliper
22	297240	Engine identity card

Figure 2

K00161

2) Visual inspection and servicing intervals of the engine components

Safety note



WARNING

Non-compliance can result in serious injuries or death!

All repair and maintenance work must only be carried out by a qualified technician.

Points of Inspection	Interval Operating hours	Chapter Reference
Inspection, Remedial action	as indicated	
1.) General		
Inspect spark plug, replace if necessary.	Inspect before every operation of vehicle	
Replace spark plug.	Every 25 hours of operation	
2.) Cooling system		
Check coolant level.	Inspect before every operation of vehicle	
Inspect water pump for sealing, in the event of egress of oil or coolant from the overflow orifice, have the pump repaired by an authorised service center.	Inspect before every operation of vehicle	
Inspect the cooling water connections on the cooler housing and cylinder head cover for tightness and sealing.	Inspect before every operation of vehicle	
Inspect the radiator hoses and hose clamps on the engine and radiator for tightness and sealing.	Inspect before every operation of vehicle	
3) Carburetor and intake silencer		
Inspect the carburetor connections to the engine and to the intake silencer for tightness.	Immediately after every collision	
Clean the filter element in the intake silencer and lubricate with oil, replace damaged filter element.	Every 10 hours ((Depending on the conditions of use)	
4) Fuel system		
Inspect fuel filter for dirt, replace if required.	Inspect before every operation of vehicle	
Inspect fuel filter from the carburetor.	Every 10 hours of operation	
5) Exhaust system		
Inspect exhaust system for sealing and tightness, lubricate with oil to prevent corrosion.	Inspect before every operation of vehicle	
Replace the baffle in the exhaust system silencer.	Every 10 hours of operation	

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Points of Inspection	Interval Operating hours	Chapter Reference
Inspection, Remedial action	as indicated	
6) Outlet control		
Clean the outlet slider and check for free movement.	Every 10 hours of operation	
7) Gearbox		
Check the oil level, top up if necessary.	Every 2 hours of operation	
Renew gear oil.	Every 5 hours of operation	
8) Starter drive		
Inspect for wear, replace if necessary.	Every 50 hours of operation (Depending on the conditions of use)	
9) Clutch		
Inspect clutch drum needle bearing for wear, replace if necessary.	Every 10 hours of operation	
Clean the soiling groove in the starter gear assy.	Every 10 hours of operation	
10) Engine inspection		
Engine inspection by authorized service center, replace defective parts.	Every 50 hours of operation	

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Chapter: 3**ENGINE****Contents**

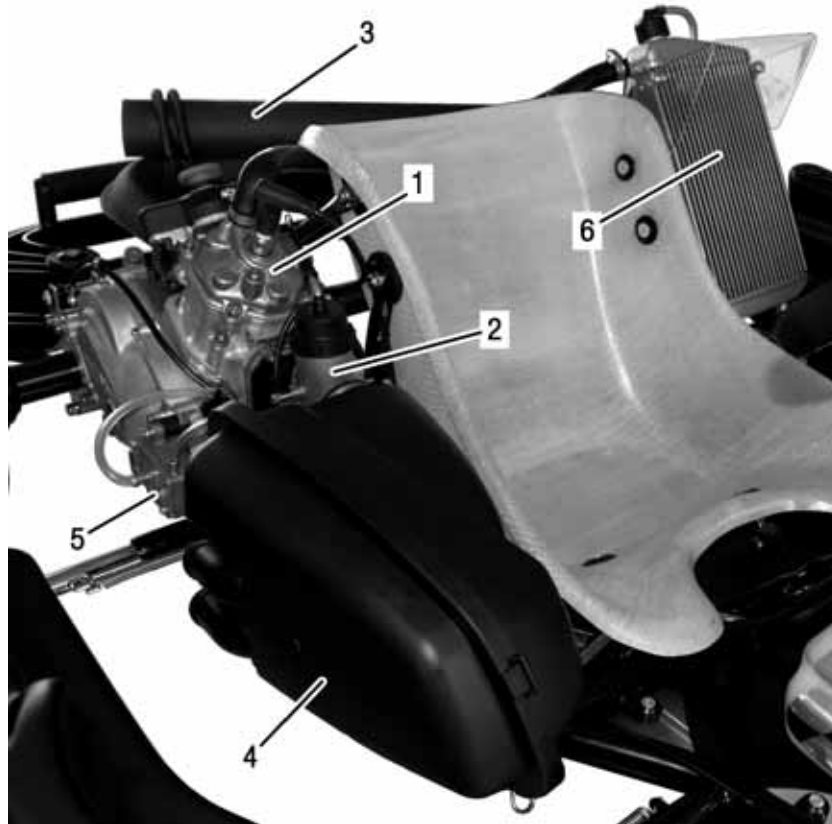
This chapter describes the disassembly and assembly of the ROTAX 125 MAX DD2 kart engine. The description is divided into subsections.

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1) System description

Overview

Engine when installed



Part	Function
1	Engine
2	Carburetor
3	Exhaust system
4	Intake silencer
5	Fuel pump
6	Radiator

Figure 1

K00213

2) Preparation

Safety instructions


WARNING

Danger of serious burns and scalding
Allow engine to cool to ambient temperature before starting work.


WARNING

Danger of electric shock.
Switch off ignition. Disconnect the negative battery terminal

NOTE: When disconnecting the battery be sure to always disconnect the negative terminal before the positive terminal. Remember that when the engine is running the ignition system has a high voltage of 35 kV; the spark plug therefore must not be removed with the engine running.

Special tools

The following special tools and equipment are required:

Part number	Description	Use
Part no. 251680	Spring hook	Tension spring

2.1) Removal of exhaust system

Instruction

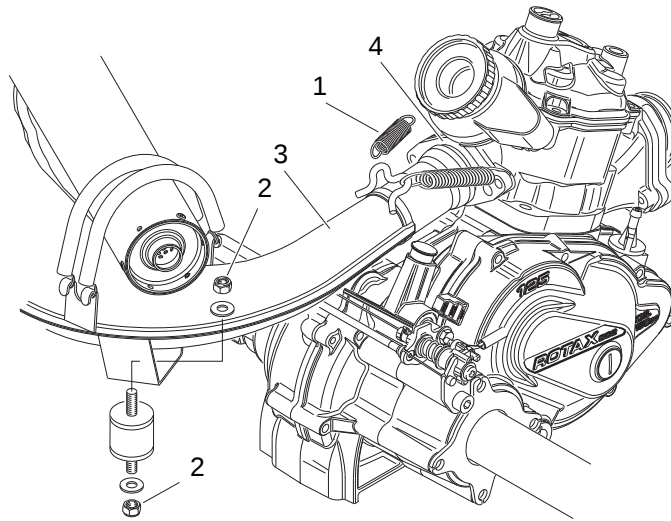
See [Figure 2](#).

Proceed as follows to dismantle the exhaust system:

Step	Procedure
1	Disconnect tension springs (1) with spring hooks (part non. 251680).
2	Loosen the nuts M8 on the shockmountings and remove the exhaust system.

Graphic

Exhaust system



Part	Function
1	Tension springs
2	Nuts M8
3	Exhaust system
4	Exhaust flange

Figure 2

K00210

2.2) Removal of the ignition system

General

NOTICE

Always pull on the connector, not on the cable.

Instruction

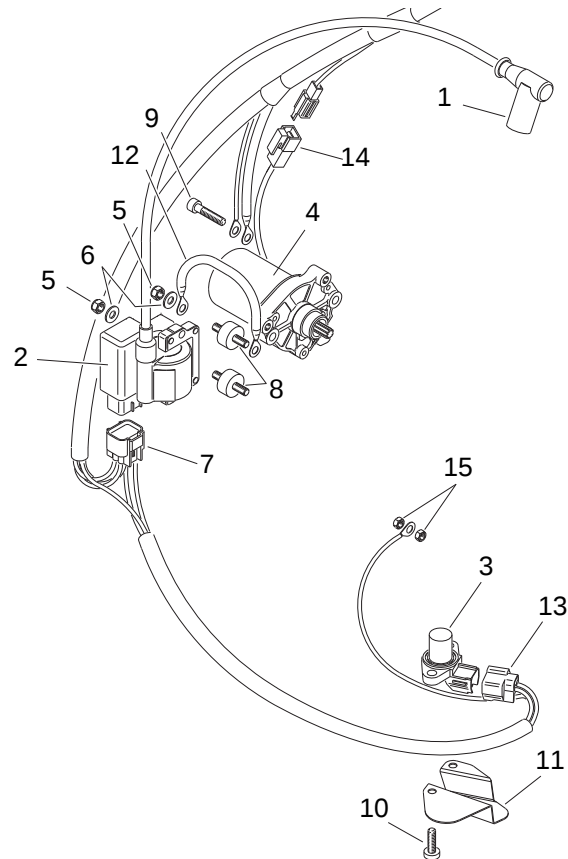
Proceed as follows to remove the ignition system:

Step	Procedure
1	Pull the spark plug connector (1) off the spark plug. Minimum removal force 30 Nm.
2	Disconnect the plug connections on the ignition coil (7), the ignition pick up (13) and the electric starter (14) by pressing the relevant detent pin on the wiring harness.
3	Loosen the 2 nuts (15) to release earth cable from the ignition pick up.
4	Loosen the lock nuts M6 (5) and washer 6,4 (6) to detach the earth cable from the starter (12).
5	Loosen the lock nut (5), washer (6) and 2 rubber buffers (8) to release and remove the ignition coil (2).
6	Loosen 2 allen screws with rounded flange heads M6x20 (10) to release the protection shield (11) from the ignition pick up (3).

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Graphic

Ignition system



Part	Function
1	Spark plug connector
2	Ignition coil
3	Ignition pick up
4	Electric starter
5	Lock nut M6
6	Washer 6,4
7	Plug connection to the ignition coil
8	Rubber buffer
9	Allen screw M6x30
10	Allen screw w. rounded flange head M6x20
11	Protection shield
12	Earth cable to the starter
13	Plug connection on the ignition pick up
14	Plug connection on the electric starter
15	2 nuts on earth cable for ignition pick up

Figure 3

K00160

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2.3) Removal of the battery

General

NOTICE

Danger of short circuit.

Always switch off the ignition when changing the battery.

Check cable insulation for damage.

NOTE: Recommended practice is to always keep a fully-charged battery to hand in case the battery needs to be changed. The installed battery should be swapped over before it becomes completely flat (=deeply discharged).

Instruction

Proceed as follows to remove the battery:

Step	Procedure
1	Disconnect battery.

Graphic

Battery



Part	Function
1	Rubber pad
2	Battery terminal
3	Cable clamp
4	Battery clamp

Figure 4

K00225

Step	Procedure
2	Loosen the 2 M6 screws on the battery clamp and remove the battery cover
3	Remove the battery from the battery clamp.

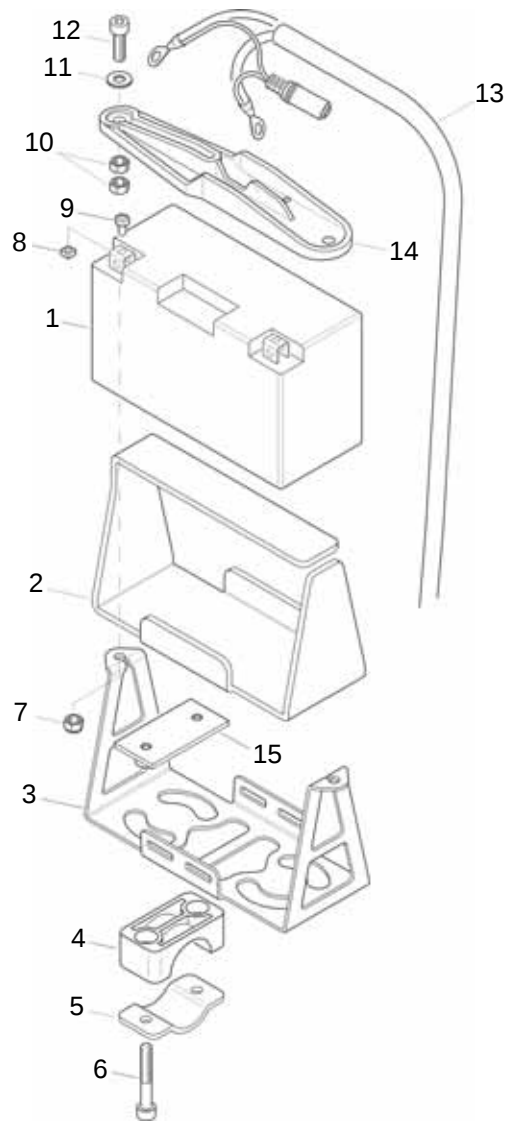
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Graphic

Battery



Part	Function
1	Battery
2	Rubber pad
3	Battery clamp
4-6	Pipe clamp set
7	Lock nut M6
8	Nut M5
9	Screw M5
10	Hex nut M6
11	Washer 6,4
12	Allen screw M6x30

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REPAIR MANUAL

Part	Function
13	Wiring harness
14	Battery cover
15	Pipe clamp set

Figure 5

K00224

2.4) Removal of the fuel line

Safety instruction



WARNING

Danger of explosion and ignition!
Overflowing and split gasoline must be absorbed immediately with a binding agent and correctly disposed of. Do not work with open flames and sources of ignition. Fuel must not be allowed to come into contact with hot engine parts and components.

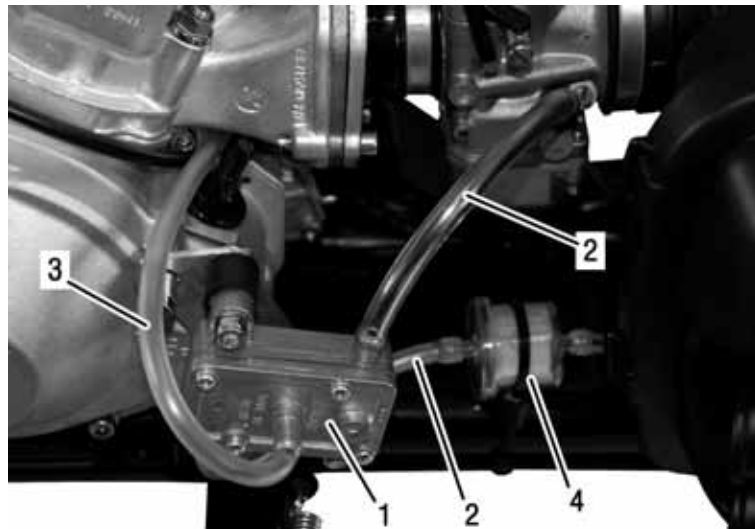
Instruction

See [Figure 6](#).

Proceed as follows to remove the fuel line:

Step	Procedure
1	Pull off fuel line (2) between fuel tank and fuel pump from the fuel pump.

Graphic



Part	Function
1	Fuel pump
2	Fuel line
3	Impulse line
4	Fuel filter

Figure 6

K00132

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2.5) Removal of the carburator cable

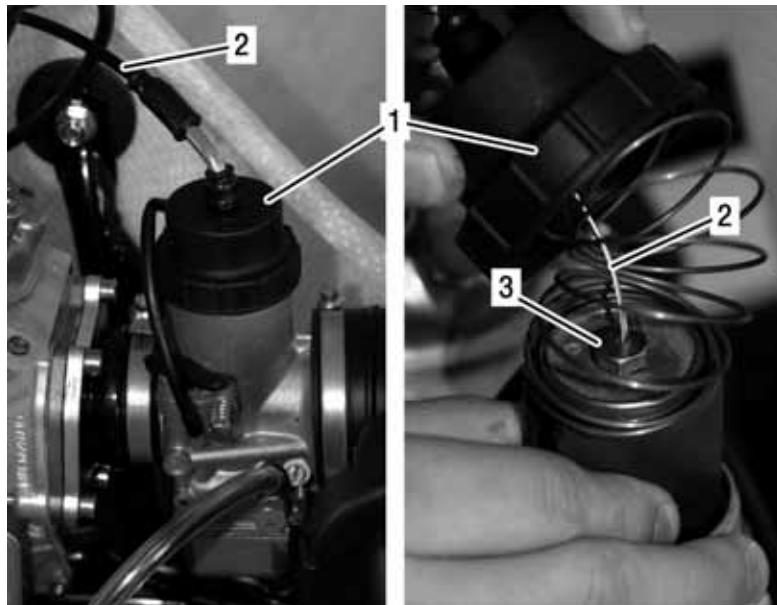
General

See [Figure 7](#).

Proceed as follows to remove the carburator cable:

Step	Procedure
1	Remove the carburator cover (1).
2	Release the nipple screw from the slide.
3	Disconnect the cable bowden (2) from the nipple screw (3).

Graphic



Part	Function
1	Carburator cover
2	Accelerator cable
3	Nipple screw

Figure 7

K00216

2.6) Removal of the overload clutch

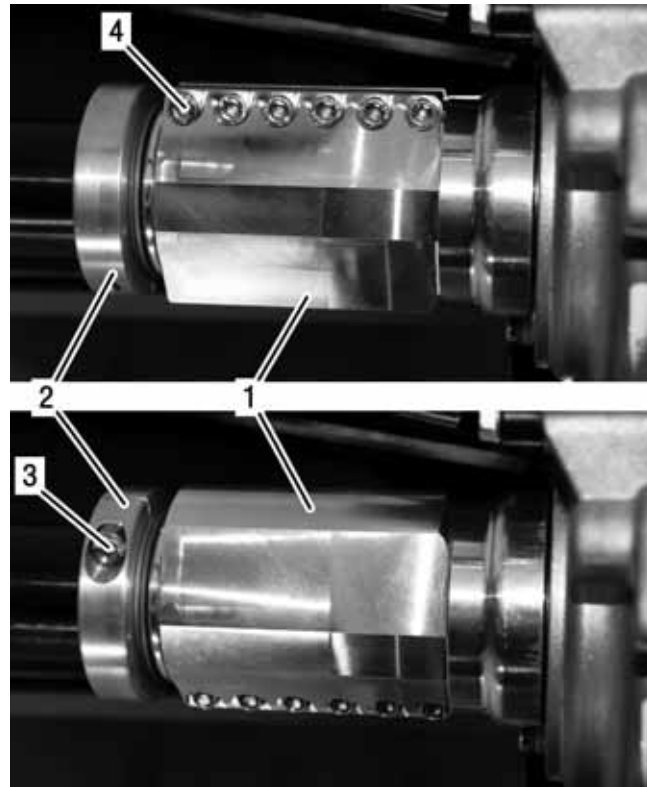
General

See [Figure 8](#).

Step	Procedure
1	Release the wheel-side clamping ring.
2	Loosen the 6 allen screws M5x25 evenly and remove the coupling flange assy.

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Graphic



Part	Function
1	Coupling flange assy.
2	Clamping ring
3	Allen screw M6x25
4	Allen screw M5x25

Figure 8

K00215

2.7) Removal of the gears

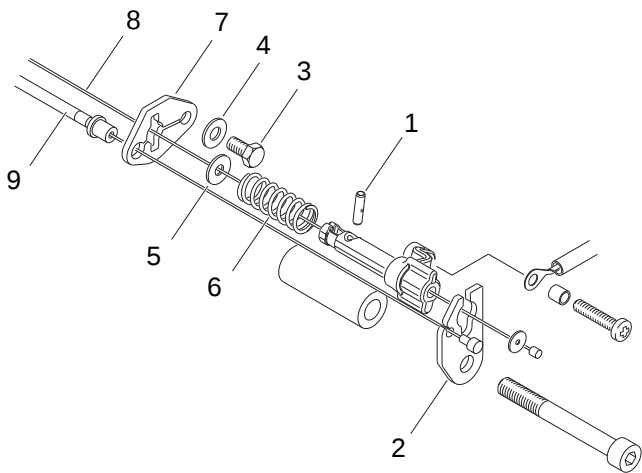
General

See [Figure 9](#).

Step	Procedure
1	Push out the locating pin and release the bowden cables from the shift contact guidance.
2	Remove spring-loaded shift actuator.
3	Loosen the hex screw M6x12 on the windshield and remove along with the spring washer.
4	Set the thrust washers and spiral spring to one side.

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Graphic

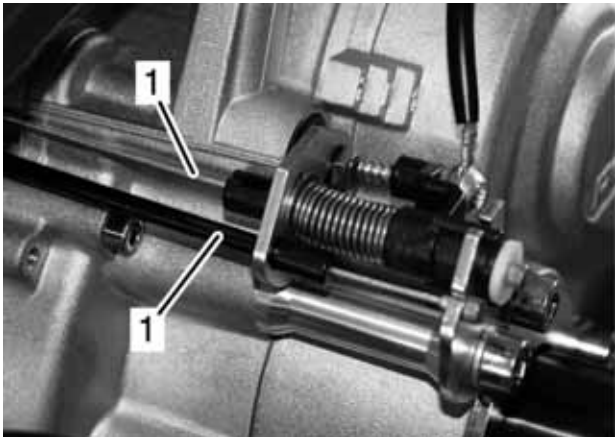


Part	Function
1	Locating pin
2	Shift contact guidance
3	Hex screw M6x12
4	Spring washer B6
5	Thrust washer
6	Spiral spring
7	Windshield
8	Bowden cable
9	Cable bowden assy.

Figure 9

K00182

Graphic



Part	Function
9	Cable bowden assy.

Figure 10

K00226

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2.8) Removal of the engine from the kart chassis

General

See Figure 11.

NOTE: Loosen the engine mount clamps (1) in accordance with the kart manufacturer's instructions.

NOTE: The engine **must not** be removed from the chassis to repair the following parts:

- Centrifugal clutch
- Cylinder w. combustion chamber and cylinder head cover
- Exhaust valve
- Reed valve
- Piston
- Electric starter

Graphic

Engine clamp



Illustration similar!

Part	Function
1	Engine clamp

Figure 11

K00129

2.9) Positioning the engine on the trestle mounting plate.**General**See [Figure 12](#).**NOTICE**

Do not use flammable liquids and aggressive cleaning agents to clean the engine.

NOTICE

Cleaning the engine removes fuel and oil residues and other environmentally damaging substances. The waste liquid must be caught and disposed of by an environmentally compatible method.

Step	Procedure
1	Engine cleaning

Special tools

The following special tool and equipment are required:

Part number	Description	Use
Part no. 876762	Trestle mounting plate (trestle support assy.)	Engine
Part no. 676052	Fixing plate for engine	Engine

Instruction

Proceed as follows to position the engine on the trestle mounting plate:

Step	Procedure
1	Loosen the fastening screws on the pick up and remove the pick up from the engine housing.
2	Unscrew the engine block from the engine, place the engine on the trestle mounting plate stand and secure it with 4 set screws.

Graphic

Trestle mounting plate



Part	Function
1	Trestle mounting plate
2	Set screws

Figure 12

K00218

3) Preparation

Safety instructions

NOTICE

Dismantled parts should be cleaned, inspected and re-assembled according to the instructions before being reused.

All bolts and nuts must always be clean. Contact surfaces and threads must always be inspected for damage. If in doubt, new bolts and nuts should be used. See Chapt. 2 Section 1.3).

3.1) Removing the engine from the trestle mounting plate

Instruction

The following steps are required to take the engine off the assembly stand:

Step	Procedure
1	The procedure for taking the engine off the stand is similar to that for putting it on. See Chapt. 3 Section: 2.8).

3.2) Installation of the engine in the kart chassis

Safety instructions

⚠ WARNING

Non-compliance can result in serious injury or death! Before installing the engine on the chassis the installation instructions of the chassis manufacturer must be read and understood.

3.3) Installation of gears

Instruction

The following steps are required to install the gears:

Step	Procedure
1	The procedure for installing the gears is similar to that for their removal. See Chapt. 3 Section: 2.6).

3.4) Installation of overload clutch

General

See [Figure 13](#).

NOTE:

The overload clutch is the connection between the engine and the rear axle. In case that the rear axle has been blocked by breaking, the overload clutch is slipping shortly and is not transferring the peak load from the rear axle to the engine. The overload clutch absorbs the forces, thereby preventing overloading of the engine and gearbox components.

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Preparation

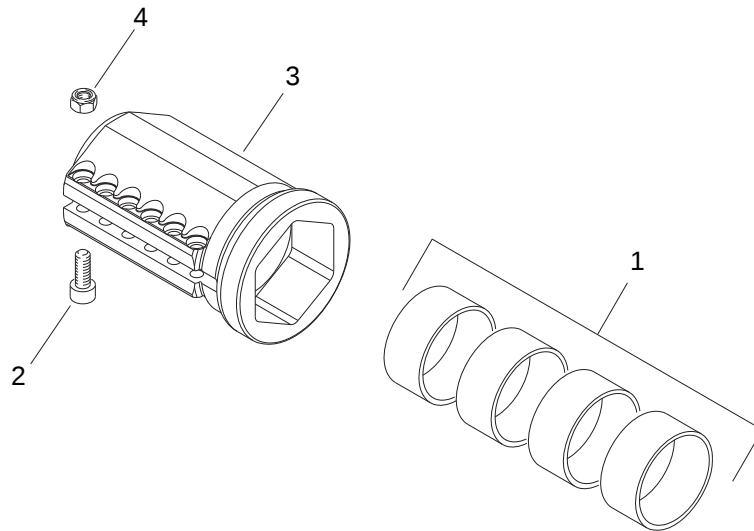
- Check plastic bearings and thrust washers for wear and replace them as necessary.

Instruction

Proceed as follows to install the overload clutch:

Step	Procedure
1	Insert the clamping ring and wheel-side thrust washer onto the rear axle.
2	Insert the overload clutch with the 4 plastic bearings onto the hollow shaft and secure it evenly using 6 allen screws M5x25 and 6 lock nuts M5. Tightening torque 7 Nm.

Graphic



Part	Function
1	Plastic bearing
2	Allen screw M5x25
3	Coupling flange assy.
4	Lock nut M5

Figure 13

K00183

3.5) Installation of fuel line

Safety instructions



Danger of explosion and ignition!

In the event that any fuel escapes or overflows it must be mopped up immediately with binding agent and disposed of in the correct way. Do not work with open flames and sources of ignition. Fuel must not be allowed to come into contact with hot engine parts and components.

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Instruction The following steps are required to install the fuel line:

Step	Procedure
1	The procedure for installing the fuel line is similar to that for its removal. See Chapt. 3 Section: 2.4).

3.6) Installation of accelerator cable

Instruction The following steps are required to install the accelerator cable:

Step	Procedure
1	The procedure for installing the accelerator cable is similar to that for its removal. See Chapt. 3 Section: 2.5).

3.7) Installation of battery

Instruction The following steps are required to install the battery:

Step	Procedure
1	The procedure for installing the battery is similar to that for its removal. See Chapt. 3 Section: 2.3).

3.8) Installation of ignition system

General See [Figure 14](#).

NOTE: The ignition timing is digitally controlled. The information is supplied by a pick up on the crank and gearbox housing and by electronics integrated in the ignition coil. Adjustment of the ignition system is therefore neither possible nor necessary.

Instruction The following steps are required to install the ignition system:

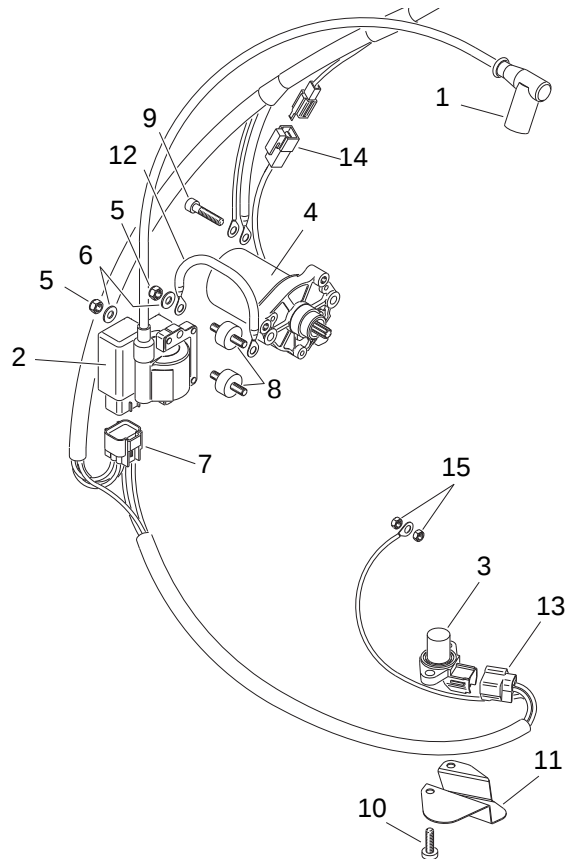
Step	Procedure
1	The procedure for installing the ignition system is similar to that for its removal. See Chapt. 3 Section: 2.2). NOTE: Secure the pick up for the ignition system with 2 taptite screws. Tightening torque 10 Nm.

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REPAIR MANUAL

Graphic

Ignition system



Part	Function
1	Spark plug connector
2	Ignition coil
3	Ignition pick up
4	Electric starter
5	Lock nut M6
6	Washer 6,4
7	Plug connection to the ignition coil
8	Rubber buffer
9	Allen screw M6x30
10	Allen screw w. rounded flange head M6x20
11	Protection shield
12	Earth cable to the starter
13	Plug connection on the ignition pick up
14	Plug connection on the electric starter
15	2 nuts on earth cable for ignition pick up

Figure 14

K00160

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3.9) Installation of exhaust system

Instruction

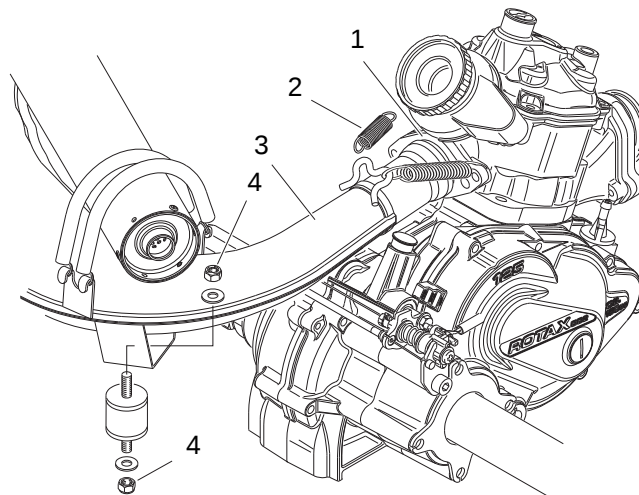
See [Figure 15](#).

The following steps are required to install the exhaust system:

Step	Procedure
1	Lubricate sealant on the exhaust flange (1).
2	Using a suitable tool (part no. 251680), attach tension springs (2) to the engine's exhaust flange.
3	Fit the exhaust system to the mountings on the kart's chassis and use new self-locking nuts.
4	Check that the exhaust system (3) is firmly seated on the exhaust flange (1).

Graphic

Exhaust system



Part	Function
1	Exhaust flange
2	Tension springs
3	Exhaust system
4	Lock nut M8

Figure 15

K00210

3.10) Starting the engine

Safety instructions



Non-compliance can result in serious injury or death!
Before installing the engine on the chassis the installation instructions of the chassis manufacturer must be read and understood.

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REPAIR MANUAL

NOTES

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Chapter: 4**CYLINDER COMPONENTS****Contents**

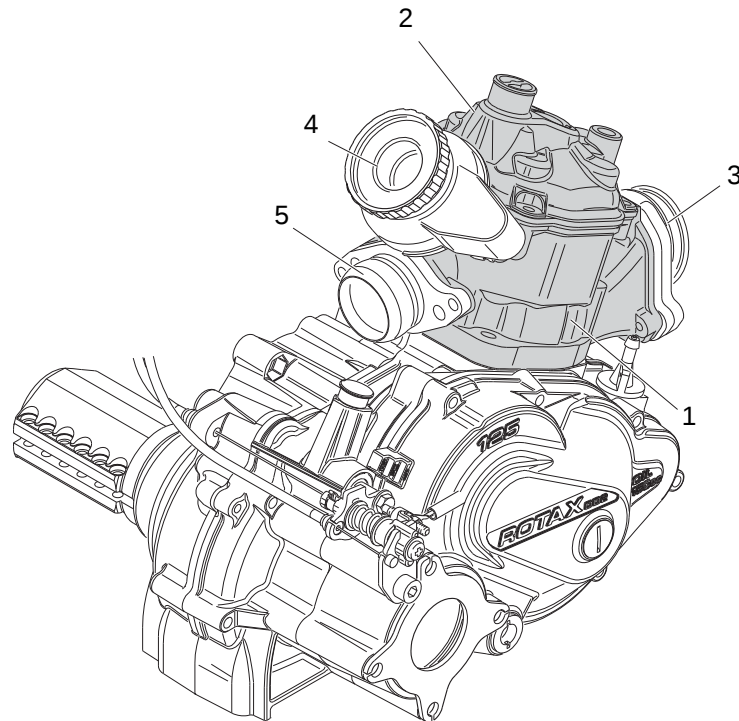
This chapter describes the disassembly and assembly of the cylinder components of the ROTAX 125 MAX DD2. The description is divided into sections.

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1) System description

Overview

Position on the engine



Part	Function
1	Cylinder
2	Cylinder head cover
3	Carburetor flange
4	Exhaust valve

Figure 1

K00164

2) Cylinder removal

Safety instructions


WARNING

Danger of serious burns and scalding!
Allow engine to cool to ambient temperature before starting work.

Preparation

The following preparation is required before removal:

Step	Procedure
1	Removal of the radiator and radiator hoses. See also Chap. 8).
2	Removal of the carburetor and intake silencer. See also Chap. 6).
3	Removal of the exhaust system. See also Chap. 3).

2.1) Removal of cylinder

Instructions

See [Figure 2](#).

NOTICE

Drain the coolant from the cylinder and invert the engine to prevent entry of water into the crankcase.

NOTICE

Do not damage the piston, piston ring and wall when dismantling these components.

Special tools

The following special tools and equipment are required:

Part number	Description	Use
Part no. 676110	Socket set	Cylinder

Proceed as follows to remove the cylinder:

Step	Procedure
1	Remove the cylinder with the socket set by unscrewing the four M8 collar nuts (1) from the crankcase.
2	Remove the cylinder (2) from the crankcase.
3	Remove the cylinder base gasket (3).

2.2) Dismantling cylinder

General

See [Figure 2](#).

NOTES:

If only the components in the crankcase are to be replaced or inspected, then the cylinder can be removed complete with the peripheral components. The exhaust socket, carburetor flange and exhaust valve remain installed.

Proceed as follows to disassemble the cylinder:

2.2.1) Removal of spark plug

Spark plug

Step	Procedure
1	Remove the spark plug connector (minimum removal force 30 Nm (22 ft.lb)).
2	Remove the spark plug with the spark plug socket.

2.2.2) Removal of cylinder head cover

Cylinder head cover

See [Figure 2](#).

Step	Procedure
1	Remove the cylinder head cover (4) by removing the 4 cyl. screws (5) from the cylinder. NOTES
2	Lift away the cylinder head cover complete with the O-ring (6).

2.2.3) Removal of the thermostat

Thermostat

See [Figure 2](#).

Step	Procedure
1	Remove the coolant thermostat (7) from the cylinder head cover by removing the 2 tapite screws (8) on the thermostat retaining bracket (9).
2	Remove the thermostat from the thermostat holder (10).
3	Remove the compression spring (11).

2.2.4) Removal of combustion chamber insert

Combustion chamber insert

See [Figure 2](#).

Step	Procedure
1	Remove the combustion chamber insert (12) by unscrewing the 5 hex screws (13) crosswise the lock washer (14).
2	Lift away the combustion chamber insert with lower (15) and upper O-rings (16).

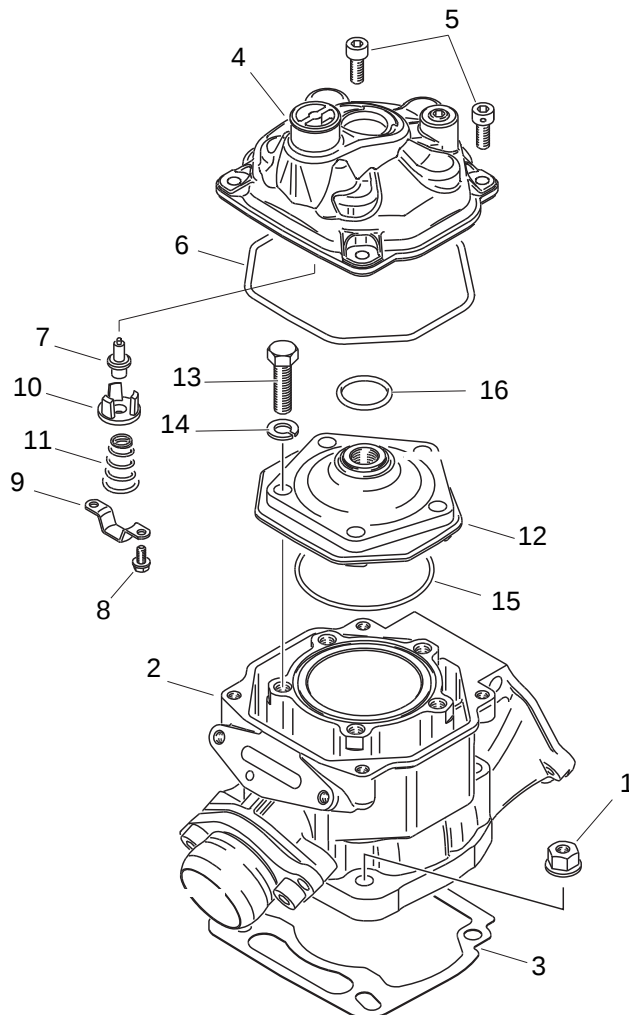
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Graphic

Cylinder



Part	Function
1	M8 locknuts
2	Cylinder
3	Cylinder base gasket
4	Cylinder head cover
5	Cyl. screw M6x16
6	O-ring 105x2.5
7	Coolant thermostat
8	Taptite screw M4x8
9	Thermostat retaining bracket
10	Thermostat holder
11	Compression spring
12	Combustion chamber insert
13	Hex screw M8x30

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REPAIR MANUAL

Part	Function
14	Lock washer A8
15	O-ring 64x2
16	O-ring 23.3x2.4

Figure 2

K00007, K00074

2.2.5) Removal of exhaust socket

Exhaust socket See [Figure 3](#).

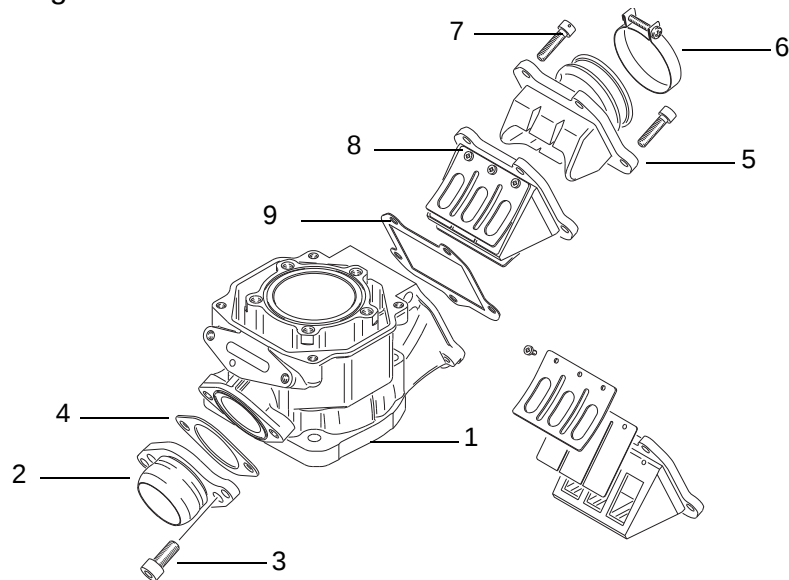
Step	Procedure
1	Remove the exhaust socket (2) by unscrewing the 2 cyl. screws (3).
2	Remove the gasket.

2.2.6) Removal of the carburetor flange and reed valve

Carburetor flange See [Figure 3](#).

Step	Procedure
1	Remove the carburetor flange (5) with hose clamp (6) from the cylinder with the 5 cyl. screws (7).
2	Remove the reed valve (8) and gasket (9) from the cylinder.

Graphic Carburetor flange



Part	Function
1	Cylinder
2	Exhaust socket
3	Cyl. screw M8x20
4	Gasket

Chapter 4

Part	Function
5	Carburetor flange
6	Hose clamp 51
7	Cyl. screw M6x25
8	Reed valve
9	Gasket

Figure 3

K00026

2.2.7) Removal of exhaust valve

General

The engine has a pneumatic exhaust outlet control to optimize the performance characteristics. The exhaust pressure controls the valve bellows via the impulse bore. The exhaust valve piston pulls up the exhaust valve and thus provides a longer outlet control time. This increases the filling of the cylinder and increases the power.

Adjustment to determine the optimum opening of the exhaust valve can only take place under load - on the track, during actual operation. The exhaust gas temperature and exhaust pressure have a decisive influence on the opening behavior of the exhaust valve. The temperature curves during driving operation are completely different to those obtained on the engine test stand and during idling. Therefore the adjustment and changes to the adjustment of the exhaust valve during idling are not suitable for predicting performance behavior during actual driving operation.

Exhaust valve

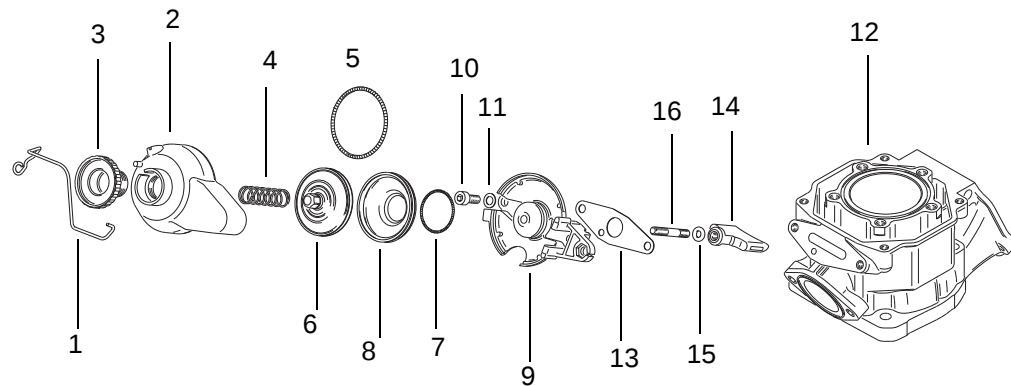
See [Figure 4](#).

Proceed as follows to remove the exhaust valve:

Step	Procedure
1	Release the spring clip (1).
2	Remove the valve cover (2) with adjustment screw (3) and the pressure spring (4).
3	Lift away the outer hose spring (5).
4	Unscrew the exhaust valve piston (6).
5	Remove the inner hose spring (7) from the bellows (8), push out the valve bellows from the valve piston.
6	Release the valve rod housing (9) from the cylinder (12) with the 2 cyl. screws (10) with spring washers (11). Remove the gasket (13).
7	Remove the exhaust valve (14) with O-ring (15) and stud (16).

Graphic

Exhaust valve



Part	Function
1	Spring clip
2	Valve cover
3	Adjustment screw
4	Compression spring
5	Hose spring
6	Exhaust valve piston
7	Hose spring
8	Bellow
9	Valve rod housing
10	Cyl. screw M6x16
11	Spring washer
12	Cylinder
13	Gasket
14	Exhaust valve
15	O-ring
16	Stud

Figure 4

K00023

2.2.8) Removal of piston

General

See [Figure 5](#).

NOTICE

In order to protect the piston pin circlip from unintentional loss in the crankcase, a suitable clean cloth should be used to cover the open cylinder bore.

NOTICE

Always support the piston with the hand in order to avoid a bending moment.

Special tools

The following special tools and equipment are required:

Part number	Description	Use
Part no. 676035	Insertion tool	Piston
Part no. 976380	Circlip puller	Circlip

Instructions

Proceed as follows to remove the piston:

Step	Procedure
1	Pull out the circlip (1) with the circlip puller (3). Use safety glasses!
2	Press the piston rod out of the piston and conrod with the point of the special tool (3).

Graphic

Piston

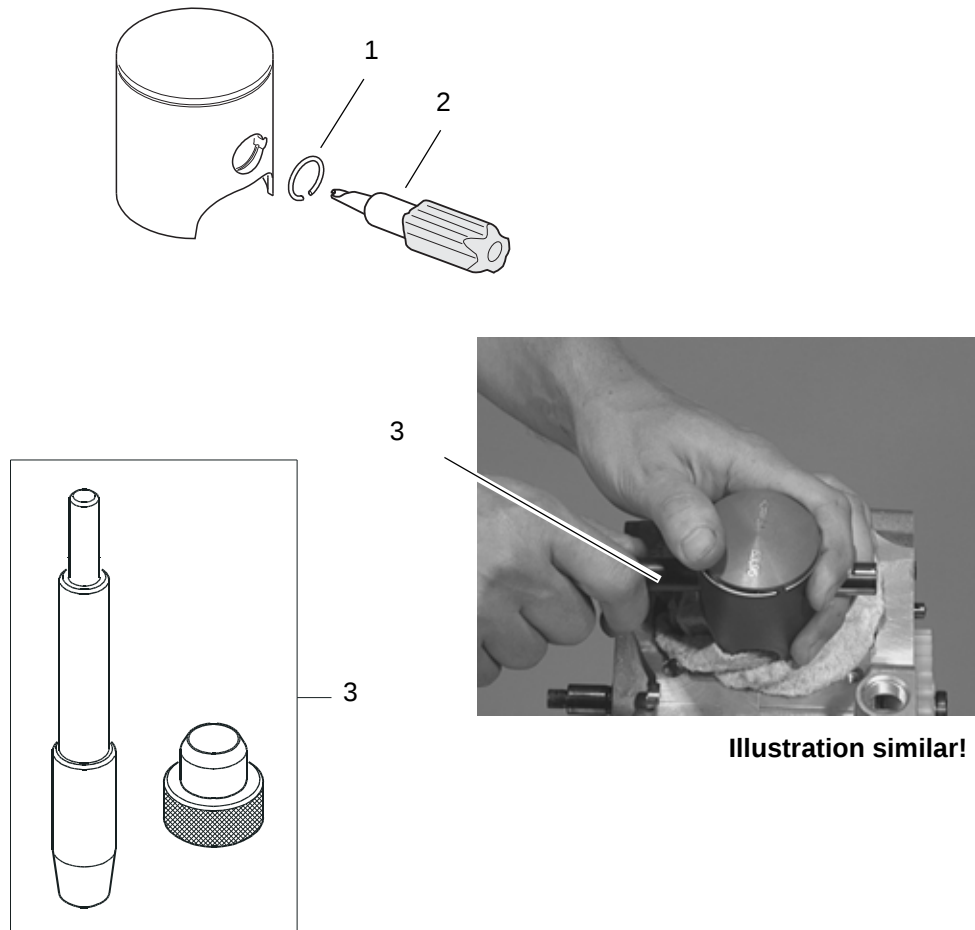


Illustration similar!

Part	Function
1	Circlip
2	Circlip puller
3	Special tool part no. 676035

Figure 5

K00035, K00153

3) Inspection of cylinder parts

General

NOTICE

Components, which have reached or exceeded their wear limits, must be replaced. Components, which are found to be defective in the context of the visual inspection and might influence the engine's performance, must also be replaced.

3.1) Inspection of cylinder

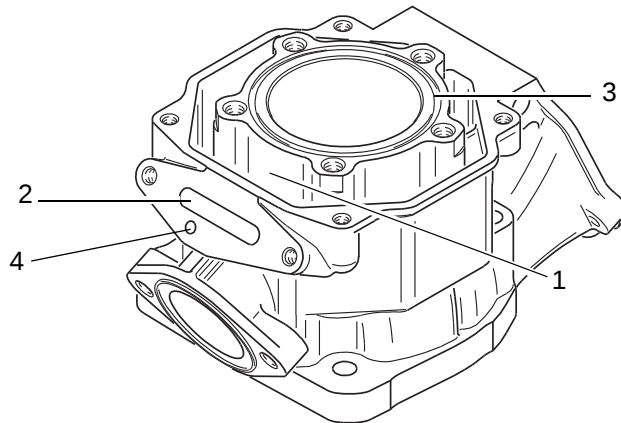
Instructions

See [Figure 6](#).

Step	Procedure
1	Remove lime deposits (1) from the water cooling of the cylinder.
2	Clean combustion residues from the exhaust valve and slider duct (2).
3	Clean O-ring groove (3).
4	Inspect all threads.
5	All sealing surfaces must be clean and smooth.
6	Inspect the cylinder bore for abnormal wear.
7	Inspect the impulse bore.

Graphic

Cylinder



Part	Function
1	Possible lime deposits
2	Slider duct
3	Groove for O-ring
4	Impulse bore

Figure 6

K00027

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3.2) Inspection of piston and piston ring

Instructions

See [Figure 7](#).

Step	Procedure
1	Inspect the piston for cracks and signs of piston seizure.
2	Inspect the bore of the piston pin for damage and wear.
3	Inspect the piston pin circlip groove for defects.
4	Check free of movement of the piston ring in the ring groove. NOTES: If carbon prevents free movement of the piston ring, the ring groove can be cleaned out with a discarded piston ring.
5	Measure the piston ring clearance in the ring groove with a feeler gauge (1). NOTES: If the piston ring clearance has reached the wear limit of 0.1 mm, the piston must be replaced.
6	Remove the piston ring and insert a feeler gauge into the cylinder parallel to the head sealing surface (approx. 10 mm from the top of the cylinder).
7	Measure clearance with a feeler gauge. NOTES: If the wear limit of 0.8 mm has been reached the piston ring must be replaced.
8	Check the piston ring locking pin for wear.

Graphic

Piston and piston ring

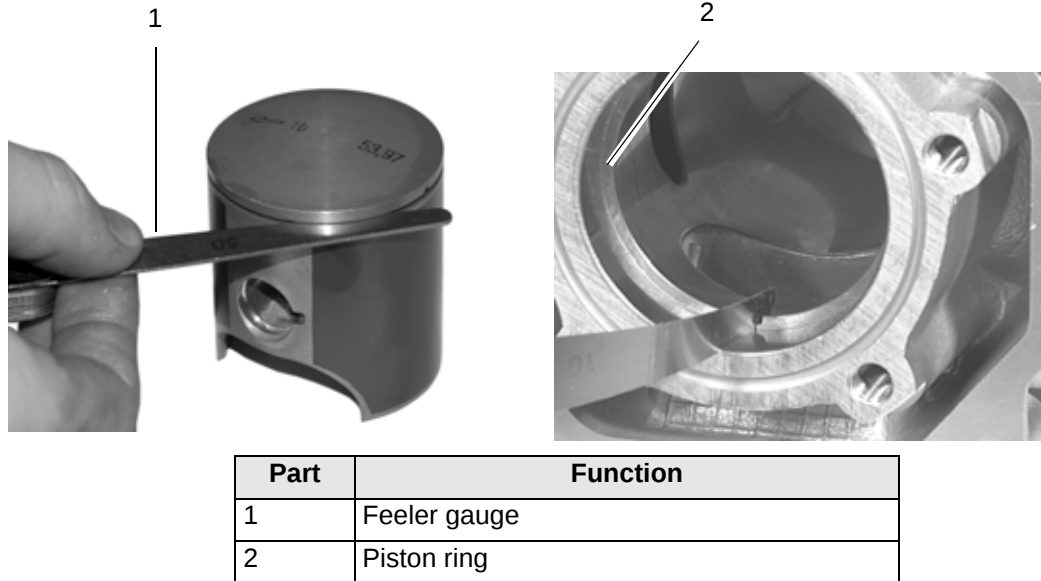


Figure 7

K00137,K00052

DK00051.fm

BRP-Powertrain

REPAIR MANUAL

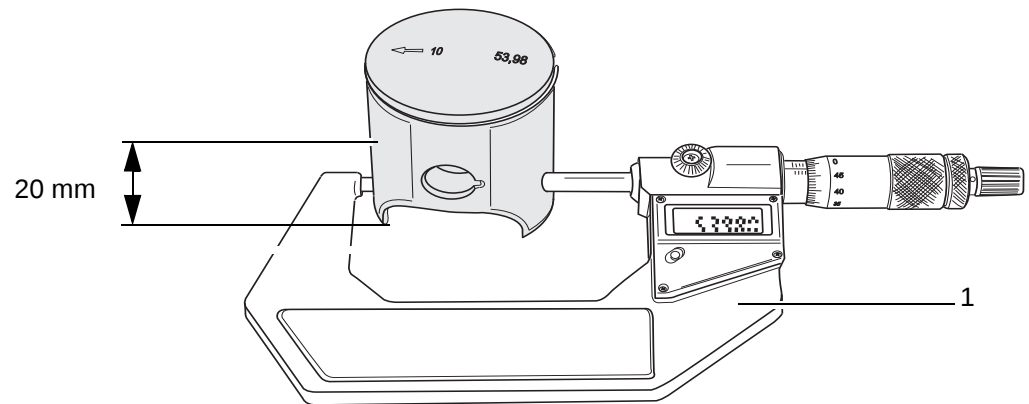
Piston diameter

See [Figure 8](#).

Step	Procedure
1	Measure the piston diameter with a micrometer (1). Conditions of measurement: room temperature = 20 °C, measuring point 20 mm from the lower edge of the piston, at right angles to the piston pin.
2	Determine the piston clearance. The wear limit is 0.08 mm. NOTES: The piston clearance of a new piston/cylinder pairing should be 0.04 - 0.05 mm.

Graphic

Piston diameter



Part	Function
1	Micrometer

Figure 8

K00096

DK00051.fm

BRP-Powertrain

REPAIR MANUAL

Piston and cylinder sizing

NOTES: A new piston has the size classification stamped on the piston skirt.

NOTES: On new cylinders the size classification (A, AB, B) is stamped on the top.

Measuring the cylinder diameter:

Step	Procedure
1	Now measure the cylinder diameter 10 mm below the upper edge of the cylinder. This dimension dictates the selection of the matching piston. If the dimension has reached the wear limit of 54.045 mm, the cylinder must be replaced.

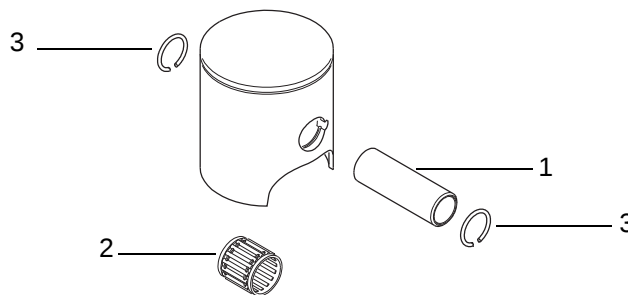
Piston and cylinder classification

Marking, cylinder	Cylinder dimension	Marking, piston	Piston dimension
Cylinder dimension A	54.000 - 54.010 mm	53.97 mm	53.965 - 53.975 mm (standard)
Cylinder dimension AB	54.010 - 54.015 mm	53.98 mm	53.975 - 53.985 mm (standard)
Cylinder dimension B	54.015 - 54.025 mm	53.99 mm	53.985 - 53.995 mm

Piston pin, piston pin circlip

See [Figure 9](#).

Step	Procedure
1	Inspect the piston pin (1) for wear and discoloration.
2	Check the needle cage (2) for cracks and abrasion.
3	The circlips (3) are replaced at every repair.



Part	Function
1	Piston pin
2	Needle cage
3	Circlip

Figure 9

K00008

DK00051.fm

3.3) Inspection of spark plug

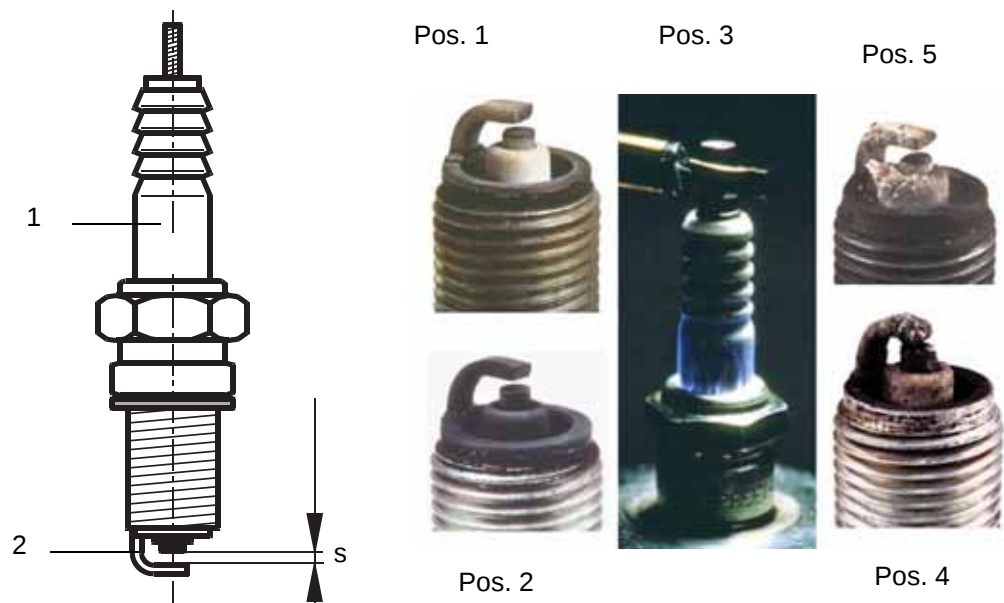
Instructions

See [Figure 10](#).

Step	Procedure
1	Visual inspection of the spark plug for carbonization, oil fouling and discoloration of the electrode. 1 = normal 2 = fouled 3 = insulator breakage 4 = melted electrode 5 = oil carbon / deposits
	NOTICE The ground electrode can be bent only by a minimal amount.
2	Check the electrode gap of the spark plug with a feeler gauge and adjust if required to $s = 0.45 \text{ mm}$ to 0.7 mm .

Graphic

Spark plug



Part	Function
1	Spark plug
2	Electrode

Figure 10

K00031, K00073

DK00051.fm

3.4) Inspection of cylinder head cover

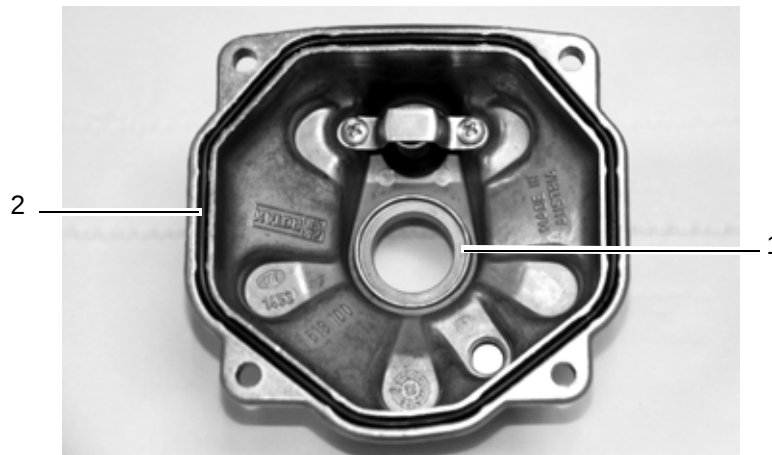
Instructions

 See [Figure 11](#).

Step	Procedure
1	Inspect cylinder head cover for cracks (visual inspection).
2	Inspect the contact surfaces of the two O-rings (1 and 2) for good condition (max. depth of wear 0.05 mm).

Graphic

Cylinder head cover



Part	Function
1, 2	O-ring contact area

Figure 11

K00097

3.5) Inspection of combustion chamber insert

Instructions

 See [Figure 12](#).

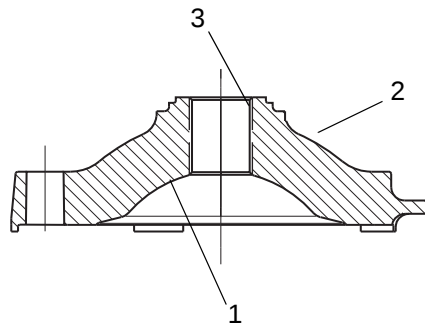
NOTES: The sealing area of the combustion chamber insert is slightly tapered from Ø 63 mm.

Step	Procedure
1	Clean combustion residues and lime deposits from the outer area (1) of the combustion chamber.
2	Inspect combustion chamber insert for cracks (visual inspection).
3	Check that spark plug thread (3) is in good condition.
4	Inspect sealing surfaces for flatness and damage.

DK00051.fm

Graphic

Combustion chamber insert



Part	Function
1	Combustion chamber
2	Outside area
3	Spark plug thread

Figure 12

K00029

3.6) Inspection of exhaust socket

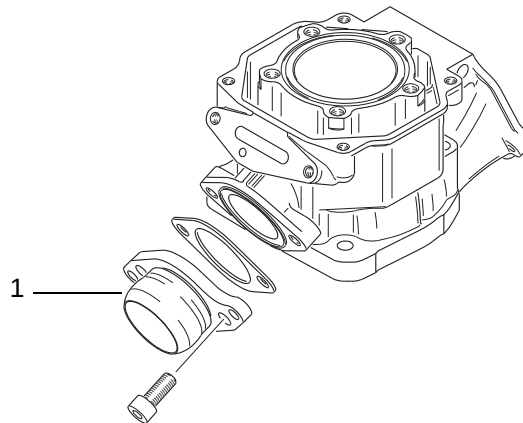
Instructions

See [Figure 13](#).

Step	Procedure
1	Inspect ball (1) of exhaust socket for wear and replace if applicable (wear depth max. 0.4 mm).

Graphic

Exhaust socket



Part	Function
1	Exhaust socket (ball)

Figure 13

K00024

DK00051.fm

3.7) Inspection of carburetor flange and reed valve

General

NOTICE

The reed petal (2) should be completely on the valve guide with a little initial tension (a gap should not be visible when held against the light). If applicable adjust reed valves more precisely by releasing the fastening (3).

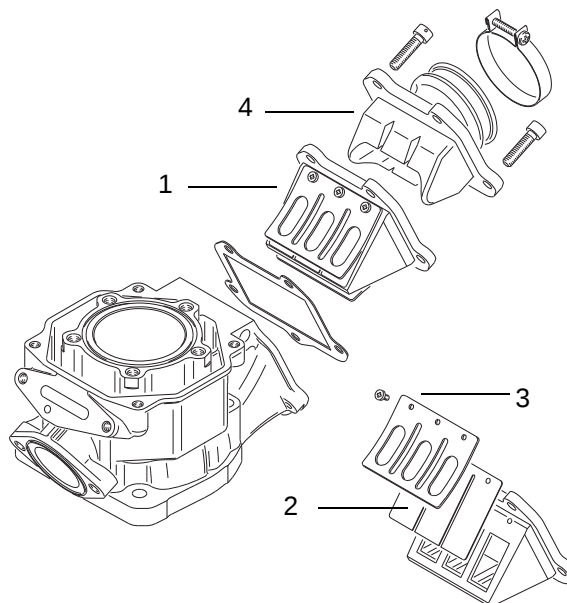
Instructions

See [Figure 14](#).

Step	Procedure
1	Inspect rubber lining of reed valves (1) for perishing (if applicable replace complete reed valve).
2	Check the two reed petal (2) for cracks or damage.
3	Check the reed petal (3) for secure seating (3).
4	Inspect carburetor flange (4) for cracks, porosity or swelling and replace if applicable.

Graphic

Carburetor port and valve guide



Part	Function
1	Reed valves
2	Reed petal
3	Fastening
4	Carburetor flange

Figure 14

K00025

DK00051.fm

3.8) Inspection of exhaust valve

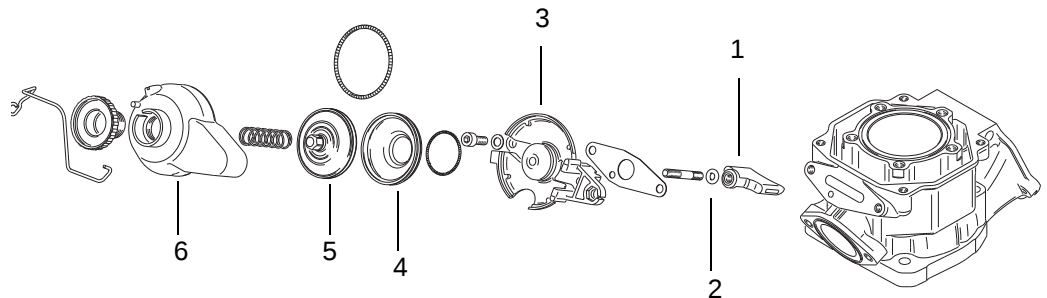
Instructions

See [Figure 15](#).

Step	Procedure
1	Clean oil or oil deposits from all parts with a suitable cleaning agent.
2	Check the smooth movement of the exhaust valve (1) in the cylinder, if applicable remove carbon deposits on the outlet valve and in the cylinder.
3	Inspect condition of O-ring (2).
4	Check that the impulse bore in the valve rod housing (3) is open.
5	Inspect bellows (4) for cracks or porous areas and replace if applicable.
6	Inspect exhaust valve piston (5) for cracks or deformation by caused overheating and replace if applicable. NOTES: Overheating may be caused by leaks.
7	Inspect valve cover (6) for cracks or deformation caused by overheating.

Graphic

Exhaust valve



Part	Function
1	Exhaust valve
2	O-ring
3	Valve rod housing
4	Bellow
5	Exhaust valve piston
6	Valve cover

Figure 15

K00023

4) Cylinder assembly

4.1) Installation of exhaust valve

General NOTES: Make sure that the components are in their correct positions.

Special tools The following special tools and equipment are required:

Part number	Description	Use
Part no. 899788	LOCTITE 648	Stud bolt
Part no. 276070	Installation tool	Valve bellows spring

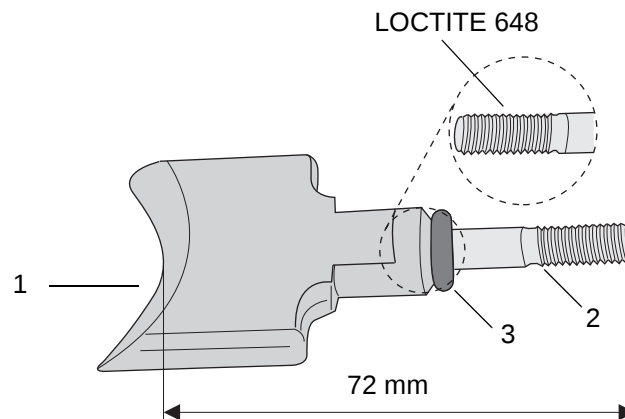
Exhaust valve See [Figure 16](#).

Proceed as follows to install the exhaust valve:

NOTES: If the exhaust valve or the stud bolt is replaced, the stud bolt must be secured with LOCTITE 648 in the exhaust valve.

Step	Procedure
1	Lock exhaust valve (1) and stud bolt (2) with LOCTITE 648. Note the length screwed in!
2	Wipe away the surplus LOCTITE.
3	Tighten O-ring 6x3.

Graphic Outlet valve



Part	Function
1	Exhaust valve
2	Stud bolt
3	O-ring 6x3

Figure 16

K00155

DK00051.fm

BRP-Powertrain

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Exhaust valve,
gasket, valve rod
housing

See [Figure 17](#).

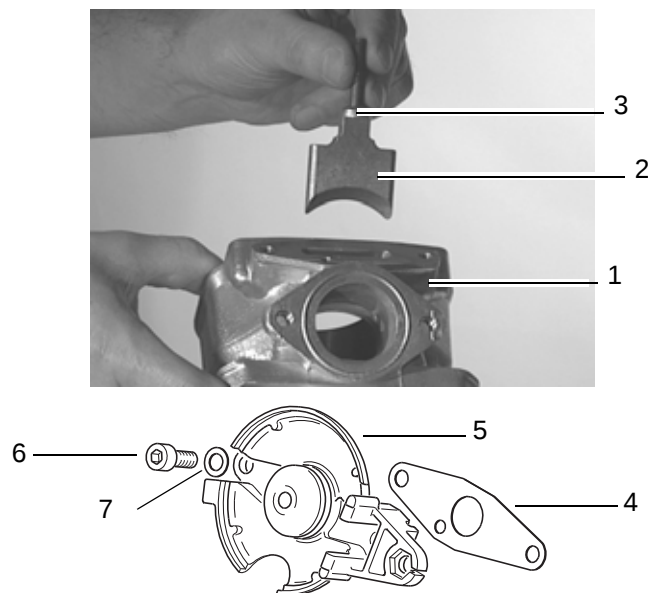
Step	Procedure
4	Insert exhaust valve into the slot in the cylinder (1). Pay attention on the installation direction!
5	Position the gasket (4), making sure that the impulse bore on the cylinder is not covered. Note the installation direction!
6	Insert the valve rod housing (5) with the cutout facing to the exhaust socket. Screw in 2 cyl. screws M6x16 (6) and spring washers (7) onto the cylinder (2) and tighten.
7	Check the movement of the exhaust valve.
8	Tighten cyl. screws. Tightening torque 10 Nm (90 in.lb).

NOTICE

If the exhaust valve does not move freely or is jammed, the valve rod housing must be removed and reinstalled.

Graphic

Installation direction of exhaust valve



Part	Function
1	Cylinder
2	Exhaust valve
3	O-ring
4	Gasket
5	Valve rod housing
6	Cyl. screws M6x16
7	Spring washers

Figure 17

K00048, K00157

DK00051.fm

BRP-Powertrain

REPAIR MANUAL

Exhaust valve piston, cover

See [Figure 18](#).

Proceed as follows to install the exhaust valve piston and cover:

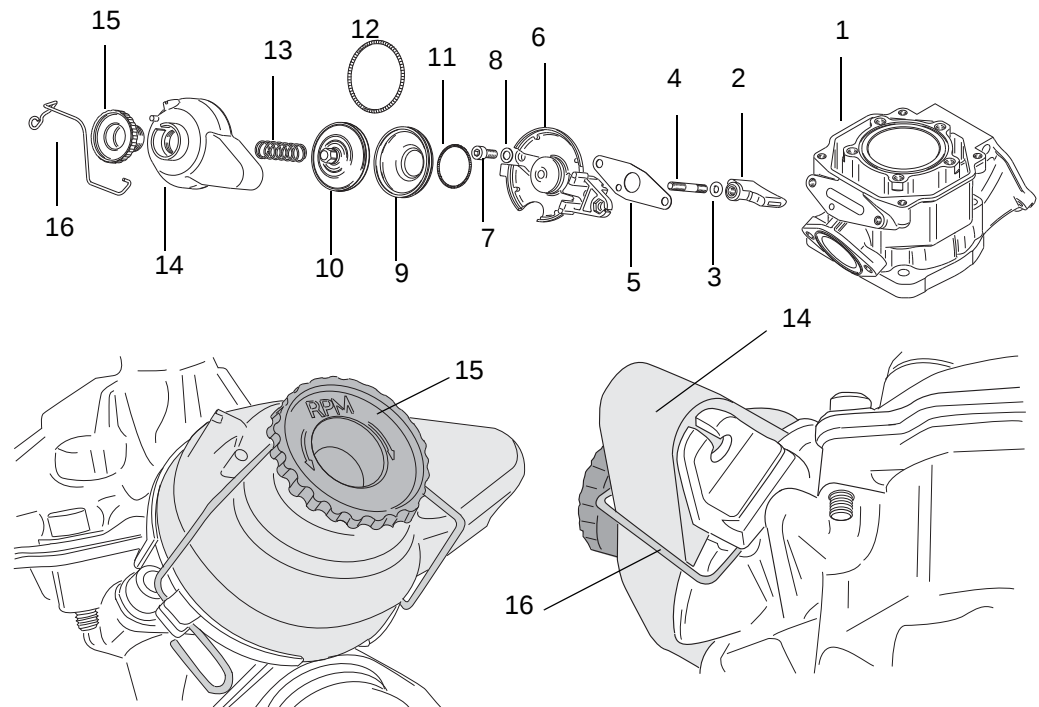
Step	Procedure
1	Degrease the valve rod housing (6), bellows (9) and exhaust valve piston (10).
2	Pull the small hose spring (11) over the bellows.
3	Fit the bellows over the valve rod housing (6). The bead of the bellows must engage in the groove in the valve rod housing.
4	Coat the exhaust valve piston (10) with LOCTITE 648 with a cloth and fix it to the valve rod. Tightening torque 3-4 Nm (27 in.lb - 35 in.lb).
5	Tension the large hose spring (12) with installation tool part no. 276070.
6	Insert compression spring (13).
7	Position valve cover (14) and adjustment screw (15).
8	Fix spring clip (16) to cylinder.
9	Fasten the spring clip over the cover and adjuster and into the groove in the valve housing.

NOTES: Turn the adjustment screw (15) into the valve cover (14) (13 clicks from inside) - this is the standard adjustment.

DK00051.fm

Graphic

Exhaust valve



Part	Function
1	Cylinder
2	Exhaust valve
3	O-ring
4	Stud bolt
5	Gasket
6	Valve rod housing
7	Cyl. screw M6x16
8	Spring washer B6
9	Bellow
10	Exhaust valve piston
11	Hose spring 70
12	Hose spring 134
13	Compression spring
14	Valve cover
15	Adjustment screw
16	Spring clip

Figure 18

K00048, K00023, K00098, K00099

DK00051.fm

4.2) Installation of piston

General

See [Figure 19](#).

NOTICE

In order to protect the piston pin circlip from unintentional loss in the crankcase, a suitable clean cloth should be used to cover the open cylinder bore.

4.2.1) Installation of piston pin

Special tools

The following special tools and equipment are required:

Part number	Description	Use
Part no. 676035	Installation tool	Piston
n.a.	Engine oil	Piston pin

Instructions

See [Figure 19](#).

Proceed as follows to install the piston pin:

NOTICE

Mount the piston with the locking pin of the piston ring facing the intake port.

NOTICE

The piston pin is fixed in the piston with two circlips (groove at bottom).

Step	Procedure
1	NOTICE Always use new circlips. Used or previously installed circlips have too little tangential tension, and they may twist and work their way out of the groove in the piston. For easier installation we recommend installing one circlip before installing the piston.
2	Coat the piston pin retainer with engine oil.
3	Insert the piston pin retainer into the upper connecting rod eye.
4	Mount the piston and piston pin on the conrod.
5	Place the new circlip (1) flat on a level surface.
6	Push the mounting sleeve (2) with the circlip over it.
7	Push the circlip deeper into the mounting sleeve with the tapered side of the installation tool (3).
8	Rotate the installation tool and continue to push the mounting sleeve until the circlip locks into the mounting sleeve groove.
9	Place the installation tool with the cutout of the circlip down on the piston (4).
10	Protect the piston with your hand and press into the piston with the hook ring.

DK00051.fm

NOTES: The installation tool centers itself in the piston pin.

NOTICE

Check that the circlip is correctly seated in the piston groove.

Graphic

Piston pin

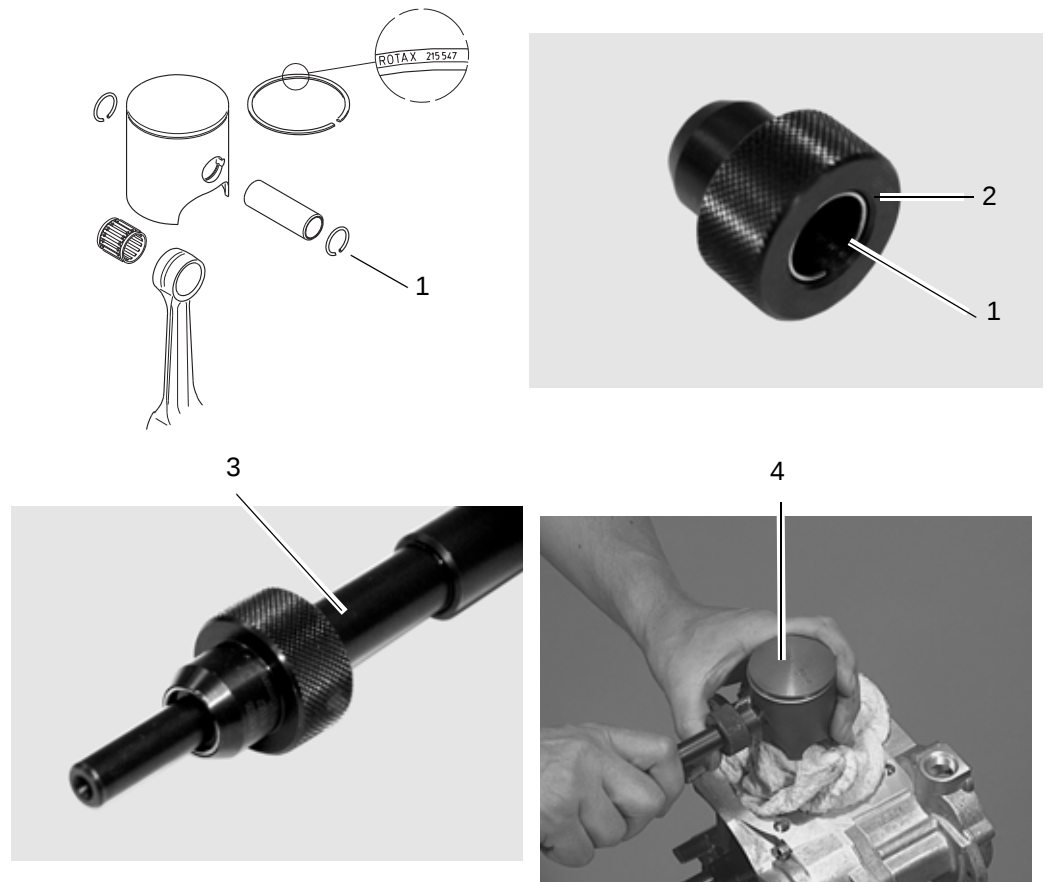


Illustration similar!

Part	Function
1	Circlip
2	Mounting sleeve
3	Installation tool
4	Piston

Figure 19

K00028, K00100, K00101, K00059

DK00051.fm

4.3) Cylinder installation

General

See [Figure 20](#).

NOTICE

Use only the piston/cylinder pairings specified by the table in Chapter 4 Section 3.2. All other combinations may lead to engine damage.

Special tools

The following special tools and equipment are required:

Part number	Description	Use
Part no. 897651	LOCTITE 243	Stud bolts

Instructions

Proceed as follows to install the cylinder head:

Step	Procedure
1	NOTES: Coat the stud bolts (1) on the longer thread end with LOCTITE 243 and screw into the crankcase. Tightening torque 5 Nm (44.25 in.lb).
2	Position new cylinder base gasket (0.5 mm).
3	Coat cylinder bore and piston (2) with engine oil.
4	Press piston ring into the piston with two fingers.
5	NOTICE Do not damage the gasket. Position the cylinder (3) over the piston.
6	Screw cylinder crosswise to the crankcase with the four studs. Tightening torque 24 Nm (18 ft.lb).

Graphic

Cylinder head

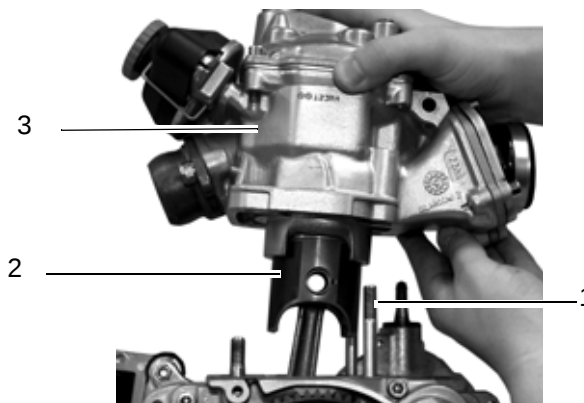


Illustration similar!

Part	Function
1	Stud bolts
2	Piston
3	Cylinder

Figure 20

K00102

DK00051.fm

4.4) Installation of exhaust socket

See [Figure 21](#).

Special tools

The following special tools and equipment are required:

Part number	Description	Use
Part no. 297386	SILASTIC 732	Gasket

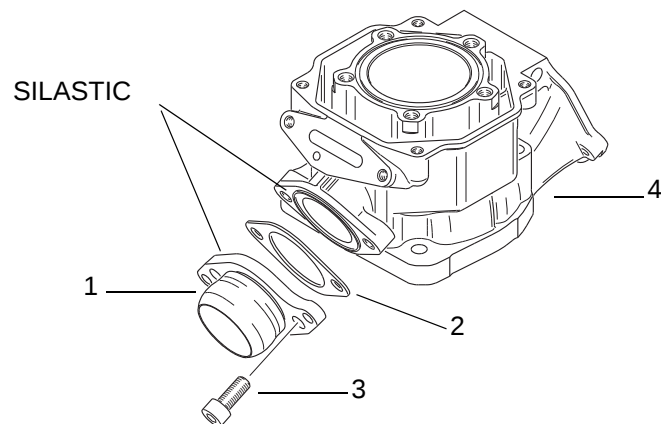
Instructions

Proceed as follows to install the exhaust socket:

Step	Procedure
1	Coat both sides of the gasket with SILASTIC.
2	Fasten the exhaust socket (1) to the cylinder (4) with a new gasket (2) by means of 2 cyl. screws (3). Tightening torque 20 Nm (177 in.lb).
3	Check that the exhaust port is tightly seated on the cylinder.

Graphic

Exhaust socket



Part	Function
1	Exhaust socket
2	Gasket
3	Cyl. screws M8x20
4	Cylinder

Figure 21

K00024

4.5) Installation of the reed valve and carburetor flange

General

See [Figure 22](#).

Special tools

The following special tools and equipment are required:

Part number	Description	Use
Part no. 897651	LOCTITE 243	Screw locking

Instructions

Proceed as follows to install the reed valve and carburetor flange:

NOTICE

The reed petal mounted on the reed valve must be fixed in precisely the correct installation position. Incorrect positioning of this valve leads to disturbed running of the engine due to incomplete combustion.

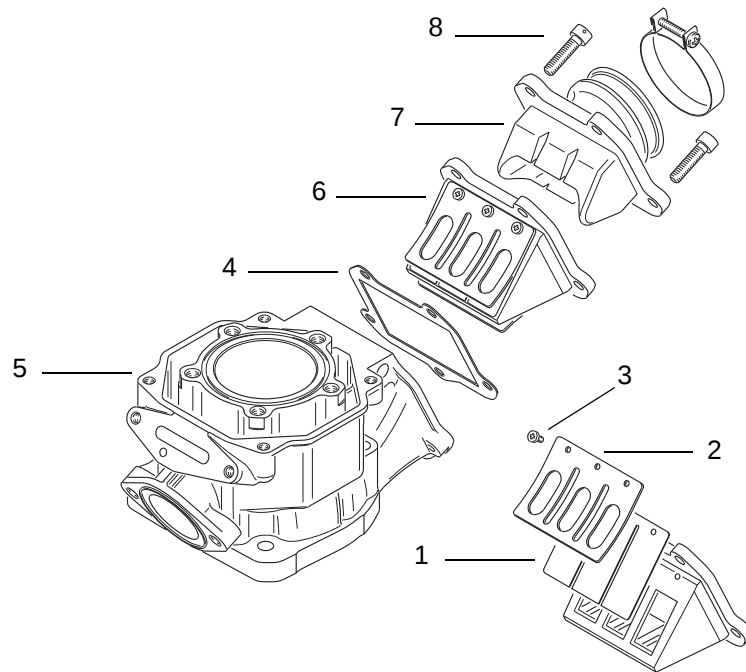
NOTICE

The reed petal is bent, not flat. It must be fixed with the concave facing the valve guide. If the valve guide with the correctly fitted reed valve is held up to the light, it must not be possible to see through it.

Step	Procedure
1	Attach the reed petal (1) and the valve detent (2) to the valve guide using recessed head screws (3). Use LOCTITE 243 to lock the screws.
2	Position the gasket (4) on the cylinder (5).
3	Position the reed valve (6) and carburetor flange (7) and fasten with 5 fillister screws (8). Tightening torque 6 Nm (55 in.lb).

Graphic

reed valve and carburetor flange



Part	Function
1	Reed petal
2	Valve detent
3	Oval head screw M3x6
4	Gasket
5	Cylinder
6	Reed valve
7	Carburetor flange
8	Cyl. screw M6x25

Figure 22

K00025

4.6) Installation of combustion chamber insert

General

See [Figure 23](#).

NOTES:

Note the installation position of the combustion chamber insert (2) - "Made in Austria" points to the exhaust port.

Instructions

Proceed as follows to install the combustion chamber insert and cylinder head cover:

Step	Procedure
1	Position O-ring (1) in the groove of the cylinder.
2	Tighten combustion chamber insert (2) crosswise with 5 hex screws (3) and with lock washers (4) to 5 Nm initially, ensuring that the O-ring (1) is not crushed. Tighten to tightening torque 30 Nm (22 ft.lb).

4.7) Installation of cylinder head cover

Preparation

The following preparation is required before installation:

Installation of coolant thermostat:

Special tools

The following special tools and equipment are required:

Part number	Description	Use
Part no. 897651	LOCTITE 243	Screw locking

See [Figure 23](#).

Step	Procedure
1	Install thermostat (5) with thermostat holder (6), compression spring (7) and thermostat retaining bracket (8) with 2 screws (9). Lock screws with LOCTITE 243.

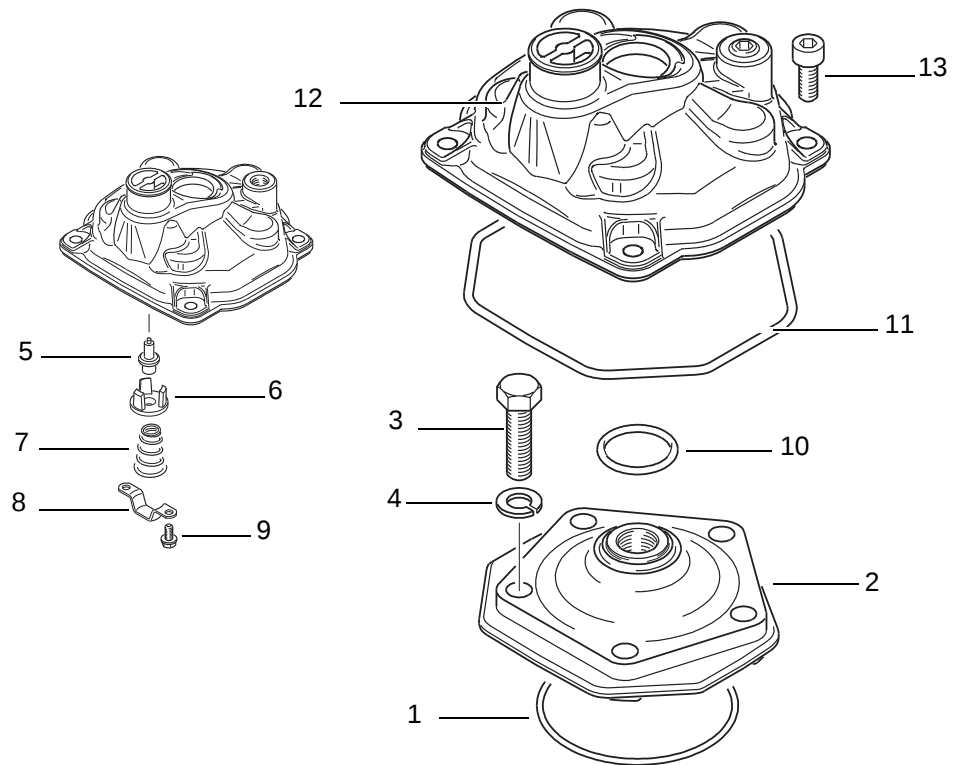
Instructions

Proceed as follows to install the cylinder head cover:

Step	Procedure
1	Position O-ring (10) on the combustion chamber insert.
2	Grease the O-ring (11) lightly to ensure that it adheres better to the groove of the cylinder head cover, otherwise fix it with sealant (Silastic). Insert O-ring (11) into the groove of the cylinder head cover (12).
3	Tighten the cylinder head cover (12) crosswise with 4 cyl. screws (13). Tightening torque 10 Nm (90 in.lb).

Graphic

Combustion chamber insert



Part	Function
1	O-ring 64x2
2	Combustion chamber insert
3	Hex screw M8x30
4	Lock washer A8
5	Thermostat
6	Thermostat holder
7	Compression spring
8	Thermostat retaining bracket
9	Taptite screw M6x16
10	O-ring 23.3x2.4
11	O-ring 105x2.5
12	Cylinder head cover
13	Cyl. screw M6x16

Figure 23

K00074,K00068

DK00051.fm

4.8) Inspection and adjustment of “squish gap”

General

NOTES: The gap between the piston (at the TDC of the piston) and the combustion chamber insert (= “squish gap”) is partly responsible for the power and the power characteristics of the engine.

NOTES: The smaller the squish gap the higher the engine compression. This means that the engine response to the feed from the carburetor becomes more critical under changing operating conditions (temperature, air pressure, humidity).

Special tools

The following special tools and equipment are required:

Part number	Description	Use
Part no. 580130	Solder 2 mm	Combustion chamber
Part no. 580132	Solder 3 mm	Combustion chamber
n.e	Vernier calliper	Solder

Instructions

See [Figure 24](#).

Step	Procedure
1	Use a coin to remove plug screw M18x1.5 together with the O-ring.
2	Screw a M8 bolt into crankshaft and rotate it by hand until the piston is approx. 5 mm below TDC.

Graphic



Part	Function
1	Crankcase
2	Coin

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Step	Procedure
3	Bend as shown in the picture and insert through the spark plug thread into the combustion chamber until the solder is in contact with the cylinder bore. The squeeze edge must always be measured in the direction of the axis of the piston pin. The result of a measurement of the squeeze edge in the direction of the exhaust port will be falsified by the tilt of the piston and is not approved.
4	Remove the solder from the combustion chamber and measure the thickness (= "squish gap") of the crushed end of the solder with a vernier calliper. NOTES: A vernier calliper with an accuracy of 1/100 mm is required for this measurement.
5	NOTICE The squeeze edge must be within the specified tolerance range. min. 0.9 mm (0.0354 in.)- max. 1.3 mm (0.0511 in.)

NOTES: We recommend setting a squish gap in the upper tolerance range of the relevant model.

NOTES: The squish gap can be set to a different thickness with cylinder foot seals. Cylinder foot seals are available 0.2 mm, 0.3 mm, 0.4 mm, 0.5 mm and 0.8 mm thick.

NOTICE

Ensure that the cylinder seal is not damaged during installation.

Example

A cylinder base gasket 0.5 mm thick has been installed. With this cylinder base gasket a squish gap of 0.8 mm was measured. A cylinder base gasket 0.8 mm thick is required to set the required value, e.g. 1.1 mm. Of course a 0.5 mm and a 0.3 mm seal can be installed.

If it is necessary to install a cylinder base gasket with a different thickness, the cylinder can be completely removed by unscrewing the four studs. Follow the directions in the "Installation of the cylinder" chapter for installation of the cylinder.

Graphic

Squish gap measurement

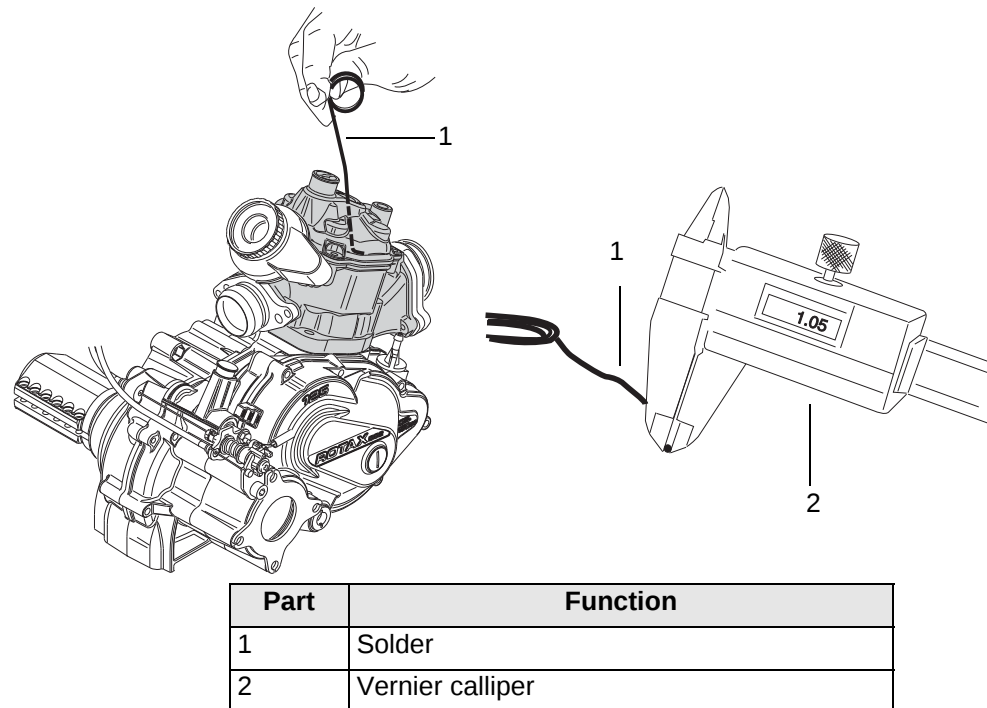


Figure 24

K00166, K00076

4.9) Installation of the spark plug

General

NOTES:

The following spark plugs are approved by BRP-Powertrain:

Denso IW 29-34, Denso IW 31 is installed as standard.

Instructions

Proceed as follows to install the spark plug:

Step	Procedure
1	Screw in spark plug hand-tight and use tightening torque 27 Nm (20 ft.lb).

DK00051.fm

Chapter: 5

CRANKCASE

Contents

This chapter describes the disassembly and assembly of the crankcase of the ROTAX 125 MAX DD2 kart engine. The description is divided into sections.

Subject	Page
System description	Page 2
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Disassemble crankcase	Page 6
Conrod set - Repair set	Page 9
Disassemble crankshaft	Page 9
Inspect crankshaft	Page 13
Crankshaft out of round	Page 15
Assembly of crankshaft	Page 16
Crankcase-inspection of components	Page 20
Inspection of the housing halves	Page 20
Inspection of the gear wheels	Page 21
Assembly of crankcase	Page 22
Installation of bearing and oil seal for shaft	Page 22
Installation of shafts and wheels	Page 27
Assembly of housing halves	Page 28
Final tasks	Page 30

1) System description

Overview

Position on the engine

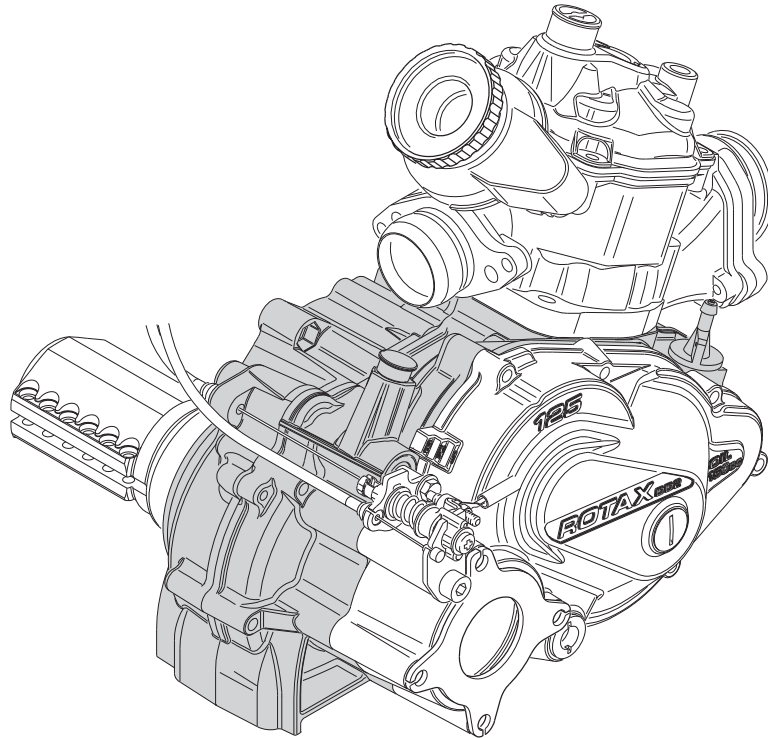


Figure 1

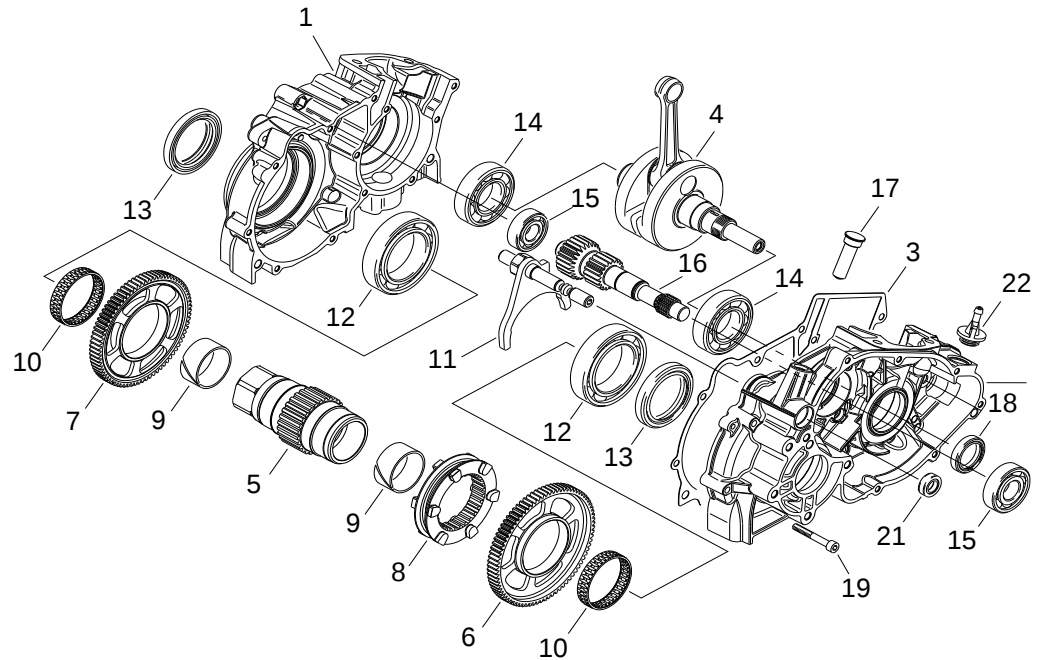
K00192

BRP-Powertrain

REPAIR MANUAL

Overview

Components of crankcase



Part	Function
1	Crankcase assy.
2	Gasket
3	Crankshaft assy.
4	Hollow shaft
5	Idle gear 81 T.
6	Idle gear 77 T.
7	Shifting sleeve
8	Plain bearing
9	Needle bearing
10	Shift fork
11	Ball bearing 6010 C3 50-80-16
12	Oil seal ASL 50x68x8 NBR
13	Ball bearing 6206 TVH C4M 30-62-16
14	Ball bearing 6203 C3 17-40-12
15	Primary shaft
16	Shift rail detent pin
17	Oil seal AS 30x42x7/7,5 NBR
18	Allen screw M6x45 DIN 912
19	Pin 8x12 DIN 5402

DK00052.fm

BRP-Powertrain

REPAIR MANUAL

Part	Function
20	Oil seal AS 12x22x7 NBR
21	Air vent screw M18x1,5

Figure 2

K00191

2) Removal of the crankcase

Safety instructions



WARNING

Danger of serious burns and scalding!
Allow engine to cool down to ambient temperature before starting work.



WARNING

Danger of explosion and ignition!
Overflowing and split gasoline must be absorbed immediately with a binding agent and correctly disposed of. Do not work with open flames and sources of ignition. Fuel must not be allowed to come into contact with hot engine parts and components.

NOTICE

Increased risk of injury from slipping!
Do not damage the sealing surface of housing with the tool.

Preparation

The following preparation is required before removal:

Step	Procedure
1	Remove the ignition system. See Chap. 3).
2	Remove the cooling-water hoses. See Chap. 8).
3	Remove the water pump. See Chap. 8).
4	Remove the carburator and air filter. See Chap. 6).
5	Remove the exhaust system. See Chap. 9).
6	Remove the fuel line. See Chap. 3).
7	Drain oil. See Chap. 7).
8	Remove the engine from kart chassis. See Chap. 3).
9	Positioning the engine on the trestle mounting plate. See Chap. 3).
10	Remove the balance drive and centrifugal clutch. See Chap. 7).
11	Remove the cylinder assy. See Chap. 4).

BRP-Powertrain

REPAIR MANUAL

3) Disassemble crankcase

Special tools

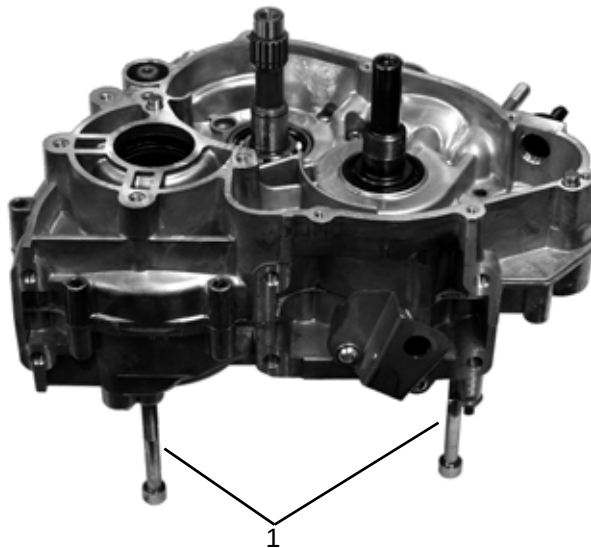
The following special tools and equipment are required:

Part number	Description	Use
n.a.	Convection oven (if required)	Crankshaft
n.a.	Plastic hammer	Housing halves, hollow shaft

Instructions

Step	Procedure
1	Unscrew all M6 bolts and remove them.
2	Remove engine housing from trestle mounting plate.
3	Screw cyl. screws M8x70 evenly into the extraction thread and use them as pedestal. NOTES: Put the housing (ignition-side) on the work bench!

Graphic



Part	Function
1	Cyl. screw M8x70

Figure 3

K00195

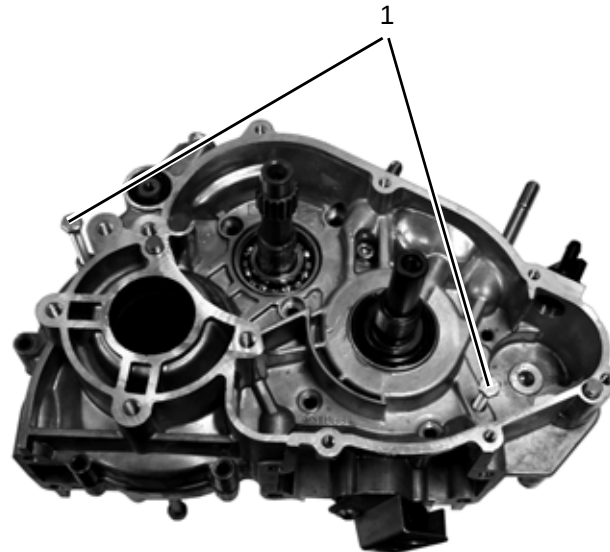
Step	Procedure
4	Screw jack screws M6x60 evenly into the thread.
5	Separate the housing halves by specific strokes with a plastic hammer.

BRP-Powertrain

REPAIR MANUAL

Step	Procedure
6	Lay the gearbox housing aside, remove the gasket and the components out of the crankcase in the following order (see Fig. 5): - Remove the idle gear 1.gear (81 T.). - Pull the shifting sleeve from hollow shaft and the shift fork out of the crankcase. - Pull or knock the hollow shaft carefully out of the ball bearings. NOTES: Do not damage the shaft seal, otherwise it must be renewed! - Remove the idle gear 2.gear (77 T.). - Remove needle bearings and plain bearings of the idle gears from the hollow shaft. - Pull the crankshaft assy. out of the ball bearings. - Pull or knock the primary shaft carefully out of the ball bearings.

Graphic



Part	Function
1	Allen screw M6x60 (jack screw)

Figure 4

K00196

DK00052.fm

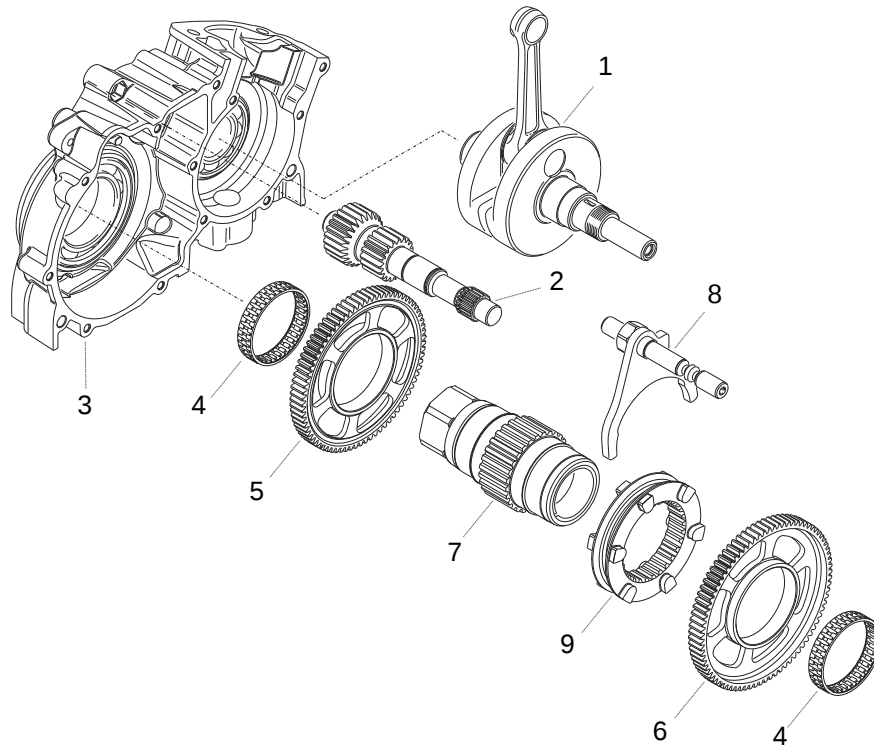
REPAIR MANUAL

NOTES:

If the shafts are difficult to expand, it is advisable to heat the crankcase to 150 °C and then pull out the crankshaft and the primary shaft.

Be sure to use heat resistant gloves!

Graphic



Part	Function
1	Crankshaft assy.
2	Primary shaft
3	Crankcase assy.
4	Needle bearing 52x57x12
5	Idle gear 2. gear (77 T.)
6	Idle gear 1.gear (81 T.)
7	Hollow shaft
8	Shift fork
9	Shifting sleeve

Figure 5

K00203

3.1) Conrod set - Crankshaft repair set

3.1.1) Disassemble crankshaft

Safety instructions

See [Figure 6](#) to [Figure 8](#).

WARNING

Non-compliance can result in serious injury or death! Be particularly careful when working with a tool such as a press, and also observe the directions of the manufacturer of the tool.

NOTICE

Repair of the crankshaft requires a special tool and must only be carried out by workshops with the appropriate experience and equipment.

NOTICE

The parts in the repair set are paired together and must therefore be exclusively used together.

NOTES: Before disassembly clean the crankshaft thoroughly with a cleaning agent (grease-free).

Special tools

The following special tools and equipment are required:

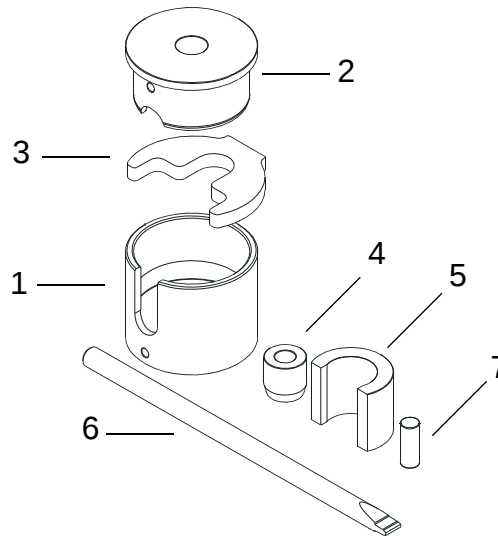
Part number	Description	Use
n.e.	Press	Crankshaft
n.e.	Dial gauge	
Part no. 276050	Repair kit	Crankshaft

BRP-Powertrain

REPAIR MANUAL

Graphic

Repair kit part no. 276050



Part	Part no.	Function
1	276050_R01	Bottom section of tool
2	276050_R02	Top section of tool
3	276050_R03	Thrust plate
4	276050_R04	Sleeve
5	276050_R05	Thrust ring
6	276050_R06	Crowbar
7	221122	Thrust pin

Figure 6

K00081

Connecting rod parts

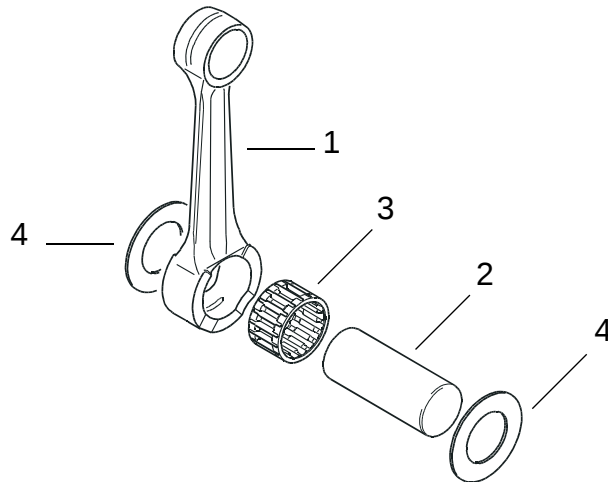
See [Figure 7](#).

Parts are installed but are not included in repair kit part no. 276050.

Part number	Description	Use
Part no. 295879	Crankshaft repair kit	Connecting rod
	Thrust washers	
	Connecting rod	
	Needle bearing	
	Connecting rod pin	

Graphic

Connecting rod parts



Part	Function
1	Connecting rod
2	Connecting rod pin
3	Needle bearing
4	Thrust washer

Figure 7

K00094

Instructions

See [Figure 8](#).**NOTICE**

If the connecting rod pin is not centered on the center hole of the bottom section of the tool (4), the connecting rod pin, the crankshaft half and the bottom section may be damaged.

NOTICE

The conrod must fit flush into the cutout in the bottom section of the tool (4) (otherwise the connecting rod may be damaged).

Step	Procedure
1	Push thrust plate (2) between the two halves of the crankshaft.
2	Position crankshaft (3) with the thrust plate on bottom section of the tool (4) and make sure that the connecting rod pin is above the center hold of the bottom section.

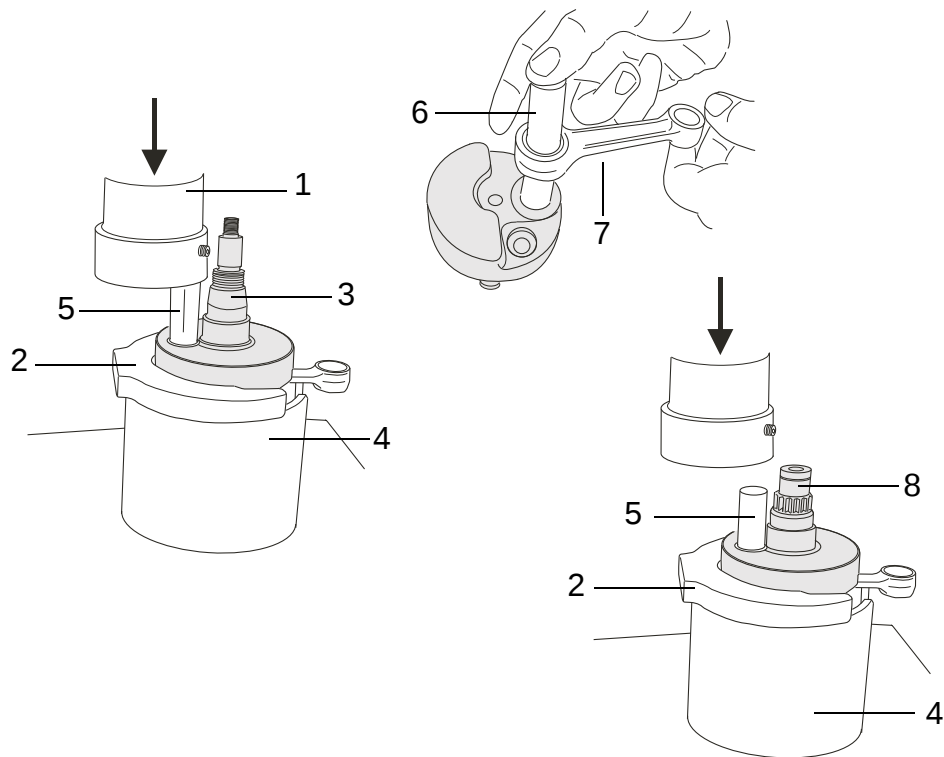
BRP-Powertrain

REPAIR MANUAL

Step	Procedure
3	Position the thrust pin (5) on the connecting rod pin and press the crankshaft apart. NOTES: Take an available connecting rod pin (6) and push the old conrod (7) with needle bearing and thrust washer onto the connecting rod pin. This procedure is only required if the old part will be re-used. Note the installation direction.
4	Take the gearbox-end crankshaft half (8) and repeat the above procedure.

Graphic

Disassemble crankshaft



Part	Function
1	Press
2	Thrust plate
3	Drive end crankshaft half
4	Bottom section of tool
5	Thrust pin
6	Connecting rod pin
7	Conrod
8	Drive side crankshaft half

Figure 8

K00082, K00083, K00084

DK00052.fm

3.1.2) Inspect crankshaft

General

- Thoroughly clean the crankshaft.
- Clean the residues of the securing medium from the conical starter crown wheel.

Instructions

See [Figure 9](#).

Step	Procedure
1	Inspect the crankshaft for visible damage and traces of wear:- - Cone/centered thread - Bearing seats - Running surface of the bearing - Contact surface of the shaft seals - Woodruff key groove.

Measuring the crankshaft

Step	Procedure
2	Measure values for the two main bearing seats (CS01), the bearing surface of the clutch (CS02) and of the piston pin (CS03).
3	Determine the axial play of the connecting rod bearing (CS04) using a feeler gauge.
4	Check the specific dimension (CS07).
5	Determine the radial clearance of the connecting rod bearing (CS05).
6	Check the run out of the crankshaft (CS06).

NOTES: If one of the wear limits CS01 or CS02 is reached, the complete crankshaft must be replaced.

If one of the wear limits CS03, CS04 or CS05 is reached, BRP-Powertrain recommends use of the applicable repair kit. See also Chap. 5 Section: 3.3).

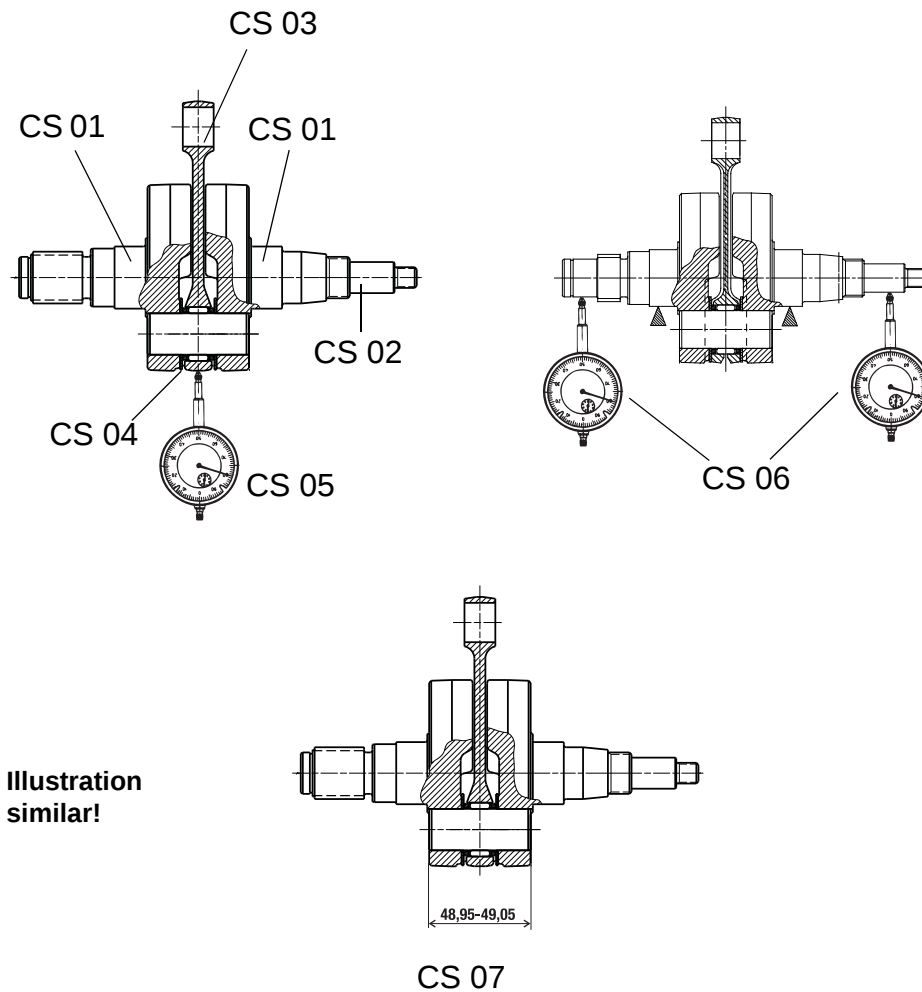
If the maximum approved stroke (CS06) of the crankshaft is exceeded, the crankshaft must be realigned. See also Chap. 5 Section: 3.3.3).

BRP-Powertrain

REPAIR MANUAL

Graphic

Crankshaft



Description	Code	New dimension	Wear limit	Measured value
Main bearing seat	CS01	29.99 mm - 30.005 mm	29.94 mm	
Clutch bearing seat	CS02	14.98 mm - 15.003 mm	14.95 mm	
Piston pin bearing seat	CS03	18.99 mm - 19.005 mm	19.015 mm	
Conrod bearing axial play	CS04	1.0 mm	1.3 mm	
Conrod bearing radial play	CS05	0.05 mm	0.08 mm	
Stroke of crankshaft	CS06	0.0 mm - 0.015 mm	0.03 mm	
Distance of crank webs	CS07	48.95 mm - 49.05 mm	49.05 mm	
Thrust washer		1.0 mm	0.85 mm	

Figure 9

K00015, K00016, K00017

DK00052.fm

3.1.3) Crankshaft out of run

General NOTES: If the out of run of the crankshaft exceeds the tolerance, the crankshaft must be re-aligned.

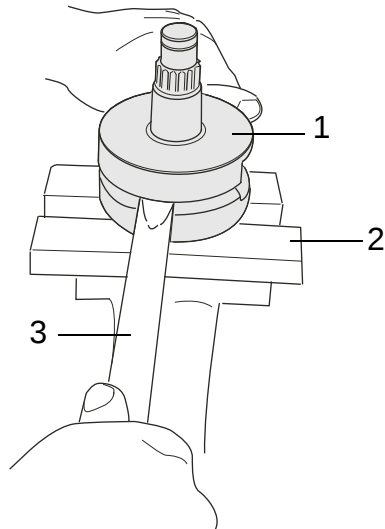
Special tools The following special tools and equipment are required:

Part number	Description	Use
Part no. 276050	Repair kit	Crankshaft
n.e.	Vise	

Instructions See [Figure 10](#).

Step	Procedure
1	To align the crankshaft, clamp the drive end or engine end of the crankshaft half (1) in a vise (2).
2	Press with lever (3) in the correct area.
3	The crankshaft can be aligned to the external diameter of the crankshaft webs with target strokes of an aluminum hammer.

Graphic Aligning the crankshaft



Part	Function
1	Crankshaft half
2	Vise
3	Lever

Figure 10

K00092

3.1.4) Assembly of crankshaft**General**

NOTES: Clean the hole for the connecting rod pins of the gearbox-side crankshaft half with a cleaning agent (grease-free).

Special tools

The following special tools and equipment are required:

Part number	Description	Use
n.e.	Press	Crankshaft
Part no. 276050	Repair kit	Crankshaft
Part no. 899788	LOCTITE 648	Connecting rod pin

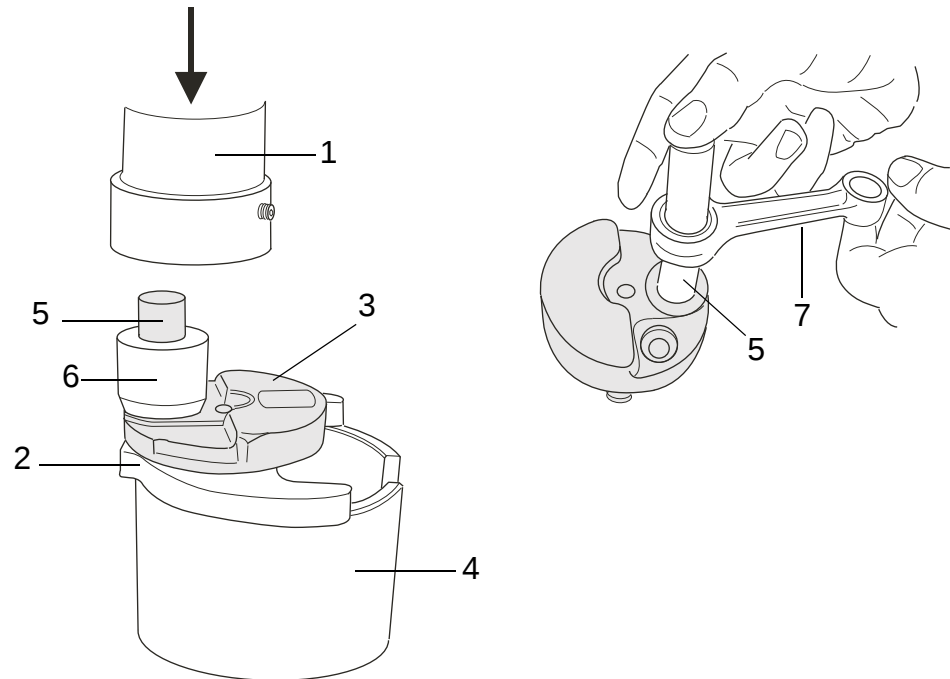
Instructions

See [Figure 11](#).

Step	Procedure
1	Apply LOCTITE 648 to the inside of the connecting rod pin web hole. NOTES: Remove excess LOCTITE after pressing in, otherwise adjacent parts may be damaged.
2	Insert the new connecting rod pin (5) into the crankshaft hole.
3	Insert the sleeve (6) (mounting sleeve) over it. NOTES: Replace the new connecting rod pin from the crankshaft repair kit with a spare connecting rod pin (note the installation position) by sliding the new connecting rod with the needle bearing onto the spare connecting rod pin (spare connecting rod pin is intended as an installation aid only)
4	Position the drive end crankshaft half on the thrust plate and press the new connecting rod pin into the crankshaft until the connecting rod pin stops moving, then remove the sleeve.
5	NOTES: Before positioning the connecting rod on the pressed-in connecting rod pin note the following: - no corrosion damage - no dirt - check that all needle bearings are present Slide the new conrod (7) assembly with cage from the connecting rod pin (mounting device) onto the pressed-in connecting rod pin (5).

Graphic

Assembly of crankshaft



Part	Function
1	Press
2	Thrust plate
3	Drive end crankshaft half
4	Bottom section of tool
5	Connecting rod pin
6	Sleeve
7	Connecting rod

Figure 11

K00087, K00083

Instructions

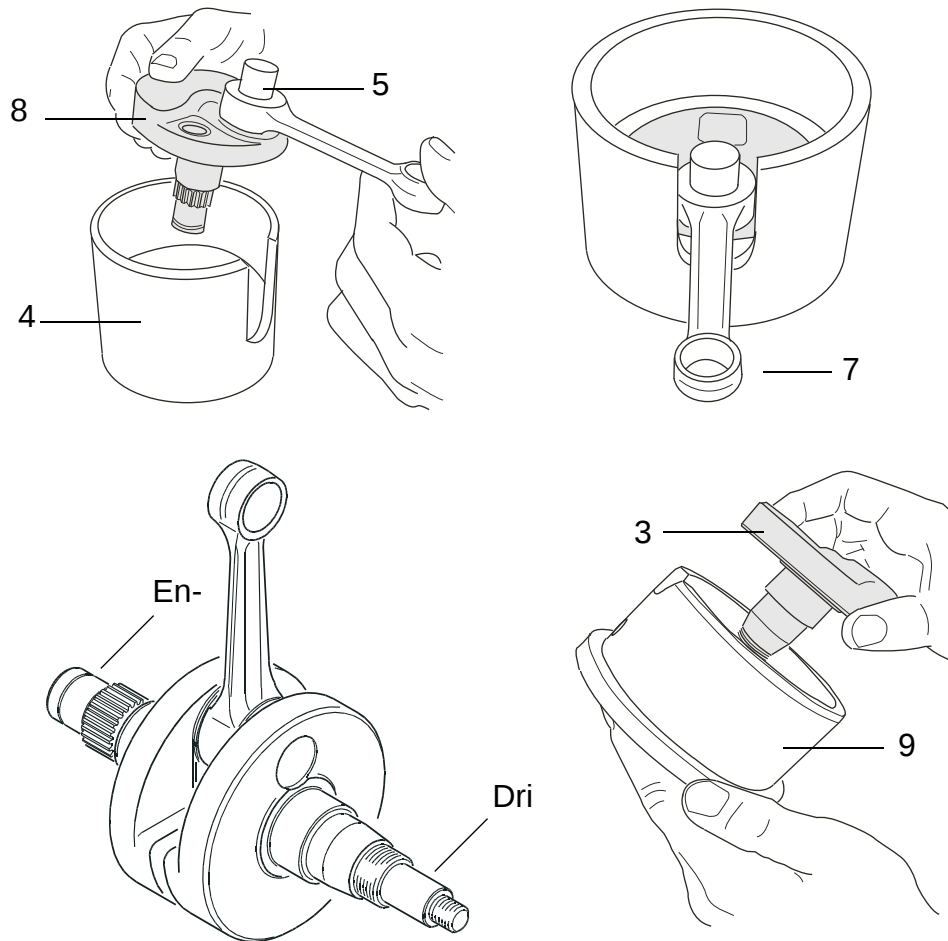
See [Figure 12](#).

Step	Procedure
6	Slide the gearbox-end crankshaft half (8) into the bottom section of the tool (4).
7	Clean the drive end crankshaft web hole with cleaning agent (grease-free).
8	Coat the hole with LOCTITE 648. NOTES: Remove excess LOCTITE, otherwise the connecting rod may be damaged.
9	Slide the drive-end crankshaft half (3) into the top section of the tool (9).

DK00052.fm

Graphic

Assembly of crankshaft



Part	Function
3	Clutch end crankshaft half (drive end)
4	Bottom section of tool
5	Connecting rod pin
7	Connecting rod
8	Gearbox end crankshaft half (engine end)
9	Top section of tool

Figure 12

K00088, K00089, K00095, K00090

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REPAIR MANUAL

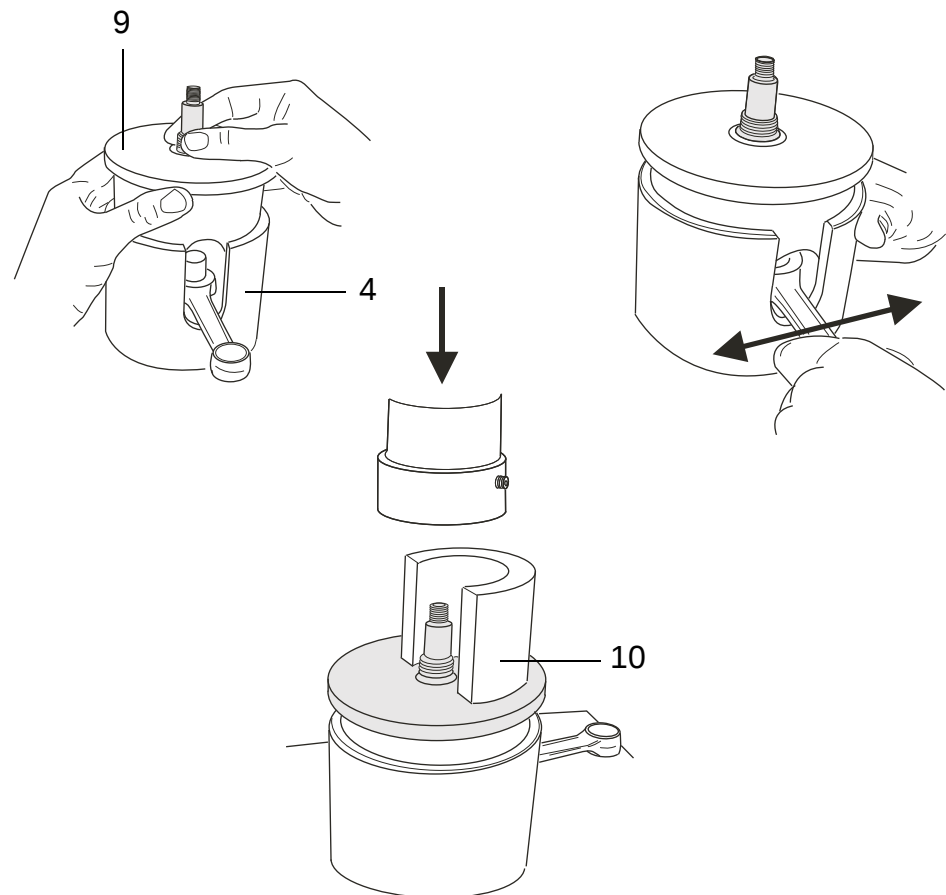
Instructions

See [Figure 13](#).

Step	Procedure
10	Hold the crankshaft half as shown in Figure 13 and push the top section of the tool (9) into the bottom section of the tool (4). NOTES: A rotary movement of the conrod makes it easy to align the web hole with the connecting rod pin.
11	Position the press-out ring (10) on the web half (position over the area of the connecting rod pin) and press the two crankshaft halves together (until the crankpin is flush with the crankshaft web).

Graphic

Assembly of crankshaft



Part	Function
4	Bottom section of tool
9	Top section of tool
10	Press-out ring

Figure 13

K00093, K00091, K00085

DK00052.fm

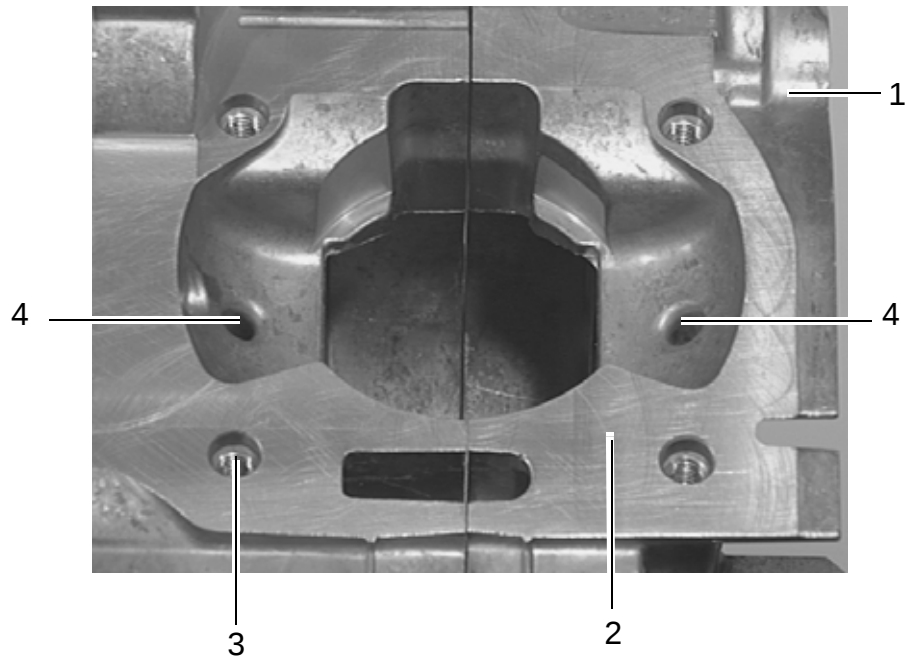
4) Crankcase-inspection of components

4.1) Inspection of the housing halves

Instructions See [Figure 14](#).

Step	Procedure
1	Clean both housing halves with commercial detergents.
2	Inspect both housing halves for cracks and damage (visual check).
3	Check sealing surfaces for damage (visual check).
4	Check thread for cleanliness and clearance.
5	Check lubrication holes of main bearings for continuity, if necessary clean them with compressed air.

Graphic



Part	Function
1	Housing halves
2	Sealing surface
3	Thread
4	Main bearing lubrication hole

Figure 14

K00019

DK00052.fm

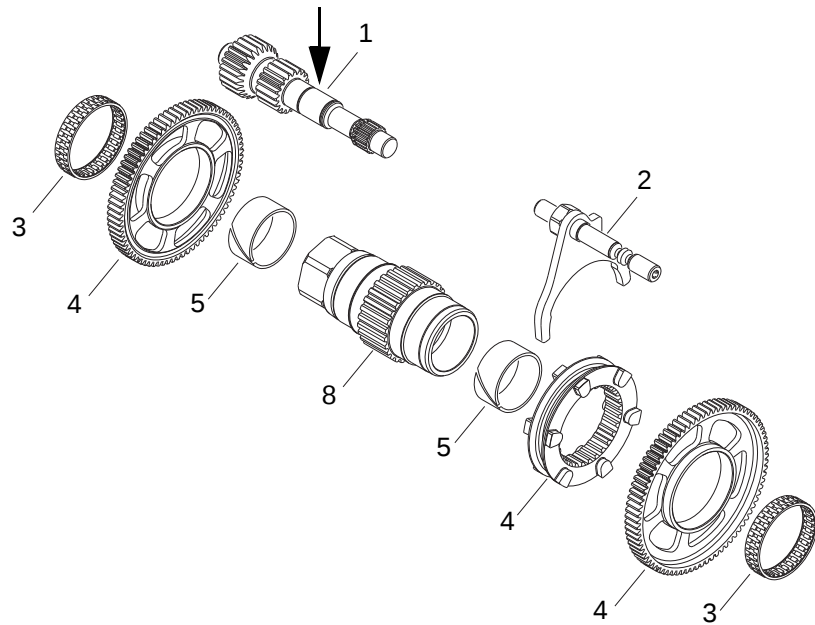
4.2) Inspection of the gear wheels

Instructions

See [Figure 15](#).

Step	Procedure
1	Check the following gearbox components in the context of a revision of the engine for corrosion, damage or wear: - Gear wheels of primary shaft (see arrow at Fig.15) - Idle gears - Shifting sleeve and shift fork - Plain bearings - Hollow shaft
2	Check for discoloration of components, in addition inspect the gearing for pitting.

Graphic



Part	Function
1	Primary shaft
2	Shift fork
3	Needle bearing 52x57x12
4	Idle gear 2.gear (77 T.)
5	Plain bearing 40x44x20
6	Shifting sleeve
7	Idle gear 1.gear (81 T.)
8	Hollow shaft

Figure 15

K00204

DK00052.fm

5) Assembly of crankcase

General

NOTICE

Removed gaskets, circlips, O-rings and oil seals for shaft must always be replaced during an engine overhaul.

Special tools

The following special tools and equipment are required:

Part number	Description	Use
n.a.	Convection oven (if required)	Crankshaft
n.a.	Plastic hammer	Housing halves
Part no. 676022	Installation tool	Shaft seal

5.1) Installation of bearing and oil seal for shaft

Safety instructions


WARNING

Danger of serious burns and scalding!
Wear safety gloves!

Special tools

The following special tools and equipment are required:

Part number	Description	Use
n.a.	Convection oven (if required)	Crankshaft
Part no. 676030	Installation tool	Needle bearing
Part no. 676021	Installation tool	Shaft seal, water pump

5.1.1) Replace sealings

General

Replace sealings if:

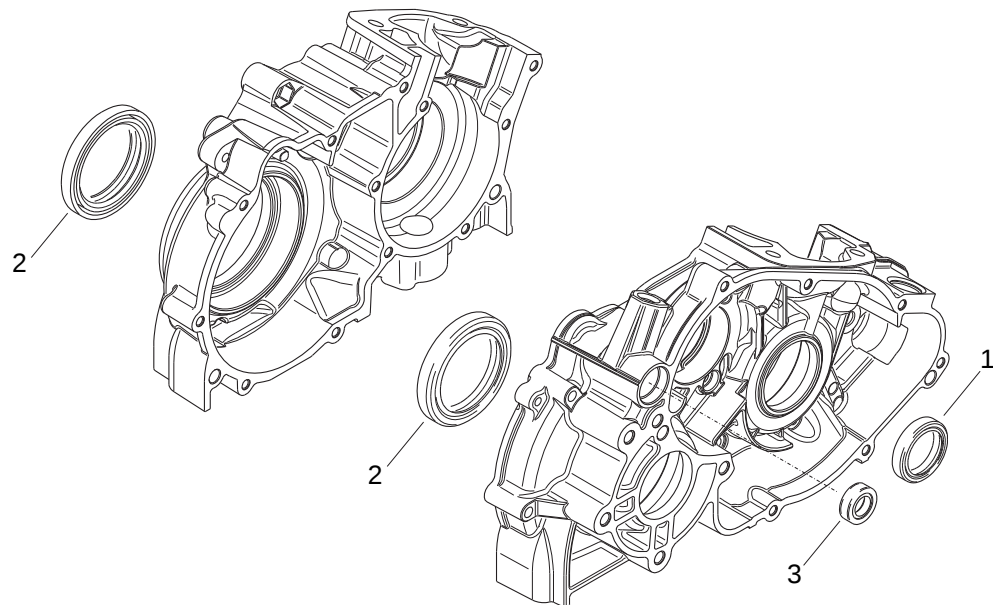
- they are damaged or leaking
- directly adjacent bearings must be renewed
- as part of an overhaul

Instructions

See [Figure 16](#).

Step	Procedure
1	Pull out the sealings from the bearing seats of the crankshaft, hollow shaft and shift fork/sleeve with a suitable tool.
2	Grease the new oil seal with Molykote 111 in the area of the sealing lip and install it with a suitable installation tool.

Graphics



Part	Function
1	Oil seal (crankshaft) AS 30x42x7/7,5
2	Oil seal (hollow shaft) ASL 50x68x8
3	Oil seal (shift fork) AS 12x22x7

Figure 16

K00211

5.1.2) Check bearings

General

NOTES: Before the inspection, lubricate the bearing with engine oil. The inner ring must be easy and free to turn. The bearing must not be "noisy". In case of doubt, the bearings have to be replaced.

If the bearing on one side is damaged, always replace both bearings.

NOTES: If one of the bearings has to be replaced, then replace the shaft seal also.

Instructions

See [Figure 17](#).

Step	Procedure
1	Turn the inner ring of the bearing (by hand/finger), it must be easy and free to turn. The bearing must not be "noisy".

DK00052.fm

Graphic

Check of bearing

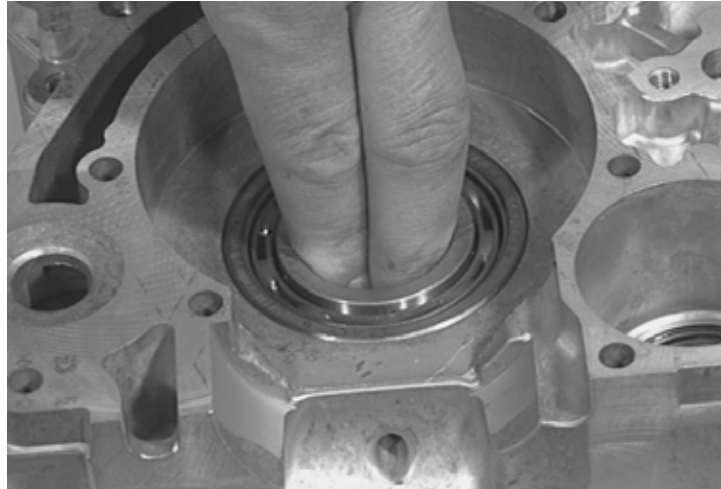


Figure 17

K00041

5.1.3) Replace of bearing

General

**WARNING**

Danger of serious burns and scalding!
Wear safety gloves!

NOTICE

If the dimension of press fit is below normal, the housing halves must be renewed.

NOTES: Remove the remaining components on the housing in order to avoid damage during heating.

NOTES: When the housing half has dowel pins, drill corresponding cutouts in the wood or plastic plate to accommodate the pins.

Instructions

See [Figure 19](#).

Step	Procedure
1	Heat up the housing halves with the defective ball bearings one after the other for 10 minutes at 150 °C.
2	Take one housing half out of the oven in correct position and swing it lightly onto a flat surface, preferably of wood. NOTES: In most cases it will be sufficient to unseat the ball bearings.
3	Clean the bearing seats carefully.

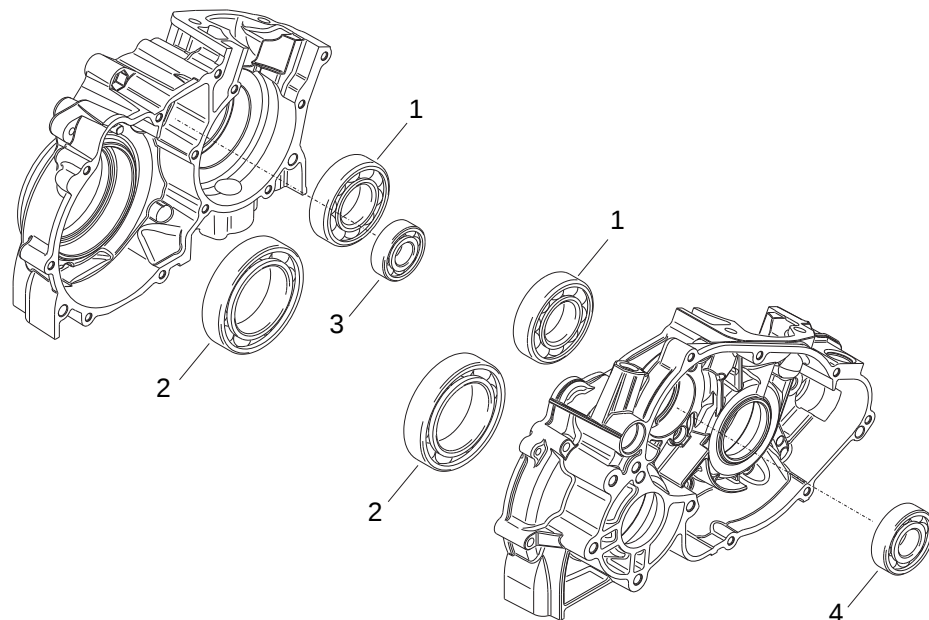
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BRP-Powertrain

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Step	Procedure
4	Measure the bearing seat and the outer diameter of the bearing. The interference fit between the ball bearing and the bearing seat must be at least $s = 0,01 \text{ mm}$. NOTES: Components must have cooled to room temperature (20 °C). Otherwise let cool down.
5	Heat up the housing halves again to 150 °C for 10 minutes.
6	Lay a housing half on a flat surface, lubricate bearing area with lithium-based grease.
7	Lubricate the ball bearings with engine oil and insert them into the bearing seats. HINWEIS: Crankshaft main bearing: The closed cage side faces the crank web! See Figure 19 and Figure 20 .

Graphic



Part	Function
1	Ball bearing (crankshaft) 6206 TVH C4M
2	Ball bearing (hollow shaft) 6010 C3
3	Ball bearing (primary shaft) 6203 C3
4	Ball bearing (primary shaft) 6204 C3

Figure 18

K00205

DK00052.fm

Graphic

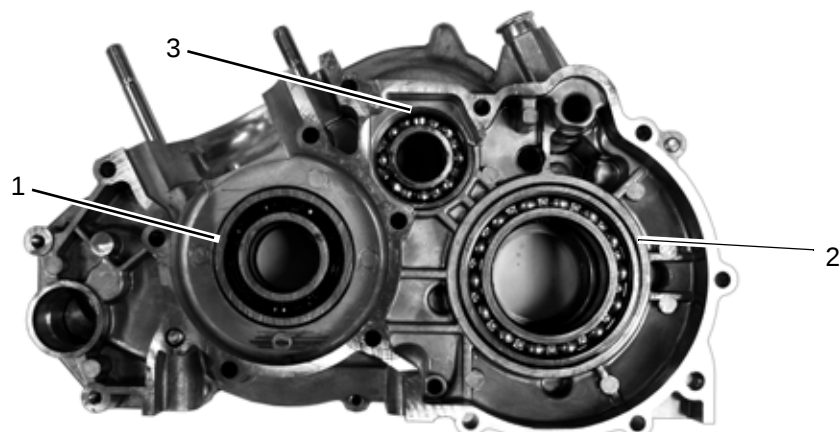


Part	Function
1	Ball bearing (crankshaft) 6206 TVH C4M
2	Ball bearing (hollow shaft) 6010 C3
3	Ball bearing (primary shaft) 6203 C3

Figure 19

K00197

Graphic



Part	Function
1	Ball bearing (crankshaft) 6206 TVH C4M
2	Ball bearing (hollow shaft) 6010 C3
3	Ball bearing (primary shaft) 6204 C3

Figure 20

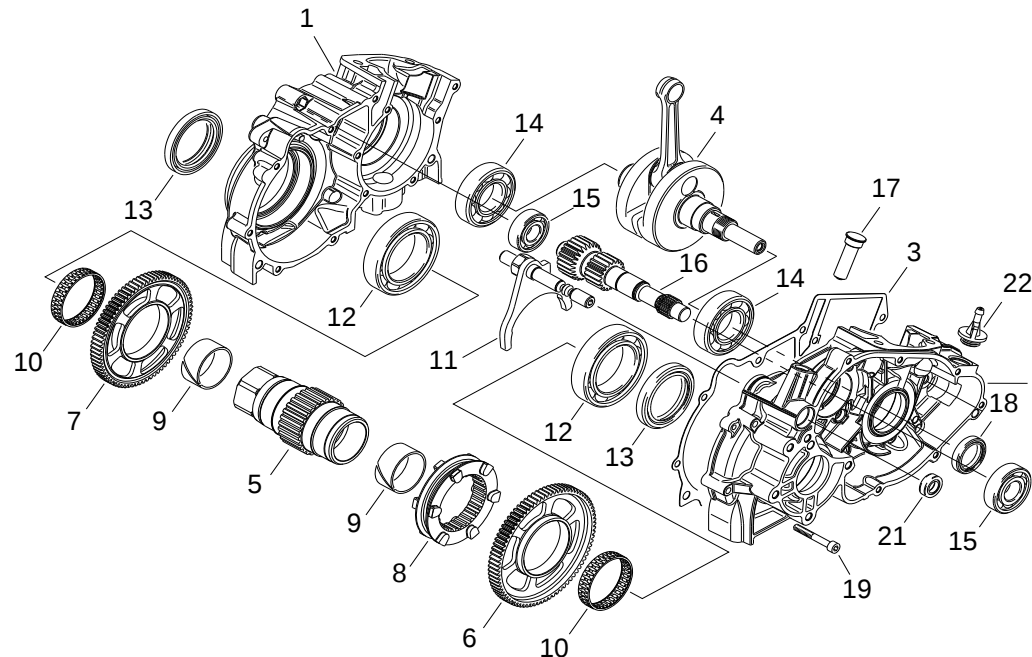
K00198

5.2) Installing of shafts and wheels

See [Figure 21](#).

Step	Procedure
1	Install the crankshaft into the ball bearing from the gearbox housing.
2	Install the primary shaft into the ball bearing from the gearbox housing.
3	Assemble the hollow shaft with bearing sleeves, needle bearings, shifting sleeve, shift fork, idle gears and install it into the gearbox housing. - First install the hollow shaft with the hex. connection into the ball bearing of the gearbox housing - Avoid possible damage to the shaft seal! - Pay attention to order and direction by installing the idle gears: First install the idle gear (1.gear) onto the hollow shaft, then install the idle gear (2.gear). Both idle gears indicate with the flat side to the shifting sleeve!
4	Assemble the housing halves. See Section 5.3)

Components of crankcase



Part	Function
1	Crankcase assy.
2	Gasket
3	Crankshaft assy.
4	Hollow shaft
5	Idle gear 81 T.

DK00052.fm

BRP-Powertrain

REPAIR MANUAL

Part	Function
6	Idle gear 77 T.
7	Shifting sleeve
8	Plain bearing
9	Needle bearing
10	Shift fork
11	Ball bearing 6010 C3 50-80-16
12	Oil seal ASL 50x68x8 NBR
13	Ball bearing 6206 TVH C4M 30-62-16
14	Ball bearing 6203 C3 17-40-12
15	Primary shaft
16	Shift rail detent pin
17	Oil seal AS 30x42x7/7,5 NBR
18	Allen screw M6x45 DIN 912
19	Pin 8x12 DIN 5402
20	Oil seal AS 12x22x7 NBR
21	Air vent screw M18x1,5

Figure 21

K00191

5.3) Assembly of housing halves

General

NOTES: When using new studs for the assembly of the cylinder, first screw the long side of the threaded studs into the housing and secure them with LOCTITE 243.
Tightening torque 10 Nm.

When using new housing halves insert new dowel pins!
When using the old housing halves unscrew the set bolts.

Instructions

NOTICE

Pay attention on the different lengths of the cyl. screws!
Tighten the cyl. screws crosswise, start in the middle of the housing.

Step	Procedure
1	Insert a new housing gasket part no. 630522.
2	Mount both housing halves with 12 cyl. screws M6x45 (see mounting plan) together. Tightening torque 10 Nm.

DK00052.fm

BRP-Powertrain

REPAIR MANUAL

Step	Procedure
3	Crankcase assy. - cool down.
4	Attach the crankcase assy. on trestle mounting plate with 4 attachment screws.

Graphic

Mounting plan 1-12

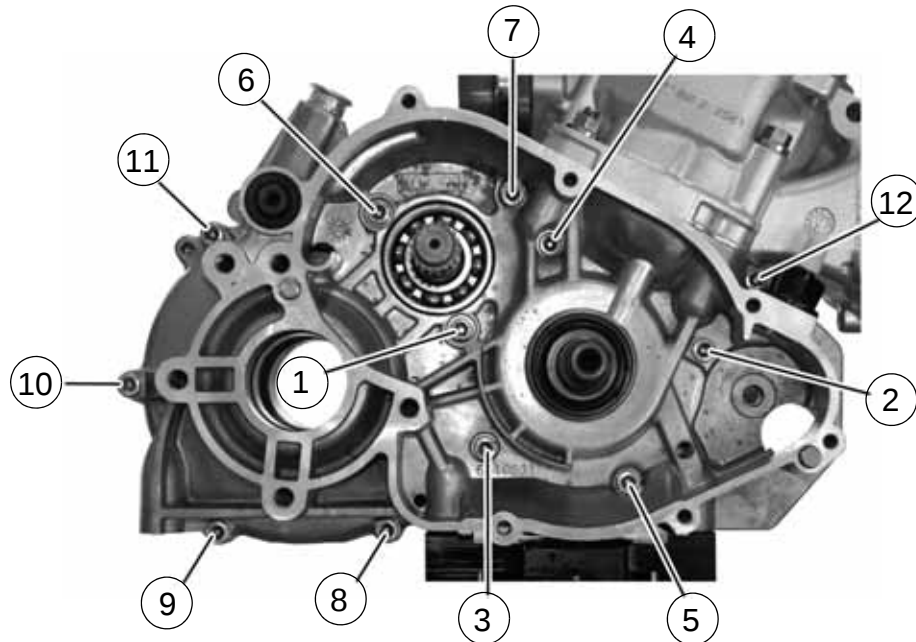


Figure 22

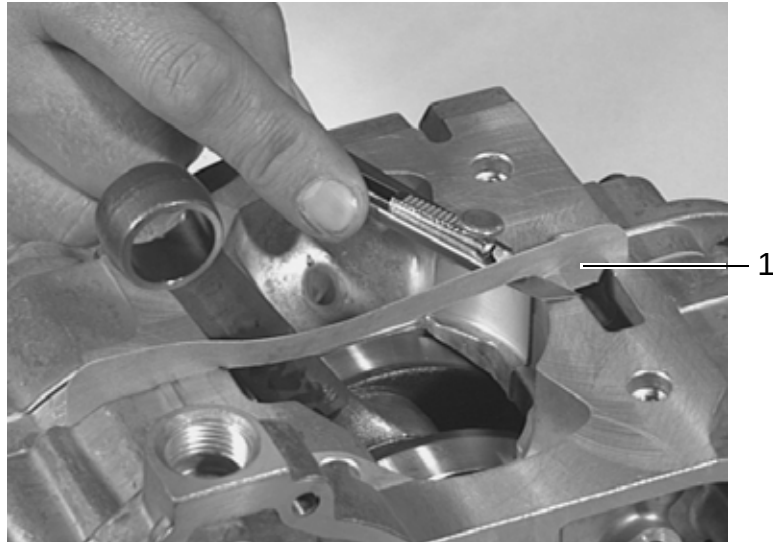
K00219

Step	Procedure
5	Cut off the overlapping gasket in the area of the cylinder base seal carefully with a knife without damaging the surface. Optionally smooth the surface with a grinding stone.

DK00052.fm

Graphic

Illustration similar!



Part	Function
1	Gasket

Figure 23

K00055

6) Installation of crankcase assy.

Final
tasks

Step	Procedure
1	Install cylinder assy. See Chapt. 4).
2	Install balance drive and centrifugal clutch. See Chapt. 7).
3	Take the engine off the assembly stand. See Chapt. 3).
4	Install the engine in the kart chassis. See Chapt. 3).
5	Check oil level, if needed refill.
6	Install the fuel line. See Chapt. 3).
7	Install the exhaust system. See Chapt. 9).
8	Install the carburator and air filter. See Chapt. 6).
9	Install the cooling-water hoses. See Chapt. 8).
10	Install the ignition system. See Chapt. 3).

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Chapter: 6**CARBURATOR AND INTAKE SILENCER****Contents**

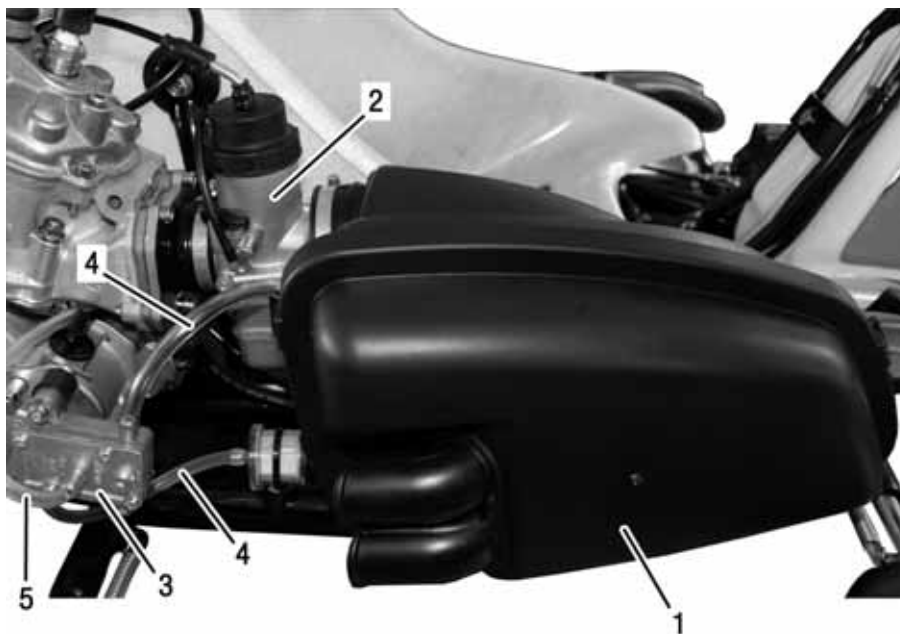
This chapter describes the removal and installation of the carburetor and intake silencer assembly group for the ROTAX 125 MAX DD2 kart engine. The description is divided into subsections.

Subject	Page
System description	Page 2
Removal of the carburetor and intake silencer	Page 3
Removal of the carburetor, intake silencer and fuel pump	Page 3
Disassembly of the carburetor	Page 5
Disassembly of the intake silencer	Page 6
Carburetor and intake silencer - inspection of components	Page 7
Inspection of carburetor	Page 7
Inspection of fuel pump	Page 8
Inspection of intake silencer	Page 8
Installing the carburetor and intake silencer	Page 10
Assembly of carburetor	Page 10
Assembly of float housing	Page 10
Assembly of intake silencer	Page 11
Installation of carburetor, intake silencer and fuel pump	Page 12

1) System description

Overview

Position on engine



Part	Function
1	Intake silencer
2	Carburetor
3	Fuel pump
4	Fuel line
5	Impulse line

Figure 1

K00220

2) Removal of the carburetor and intake silencer

Safety instructions



Danger of explosion and ignition!
Overflowing and split gasoline must be absorbed immediately with a binding agent and correctly disposed of. Do not work with open flames and sources of ignition. Fuel must not be allowed to come into contact with hot engine parts and components.

Preparation

The following preparations should be carried out before removing the components:

Step	Procedure
1	Pull off fuel line between the fuel tank and fuel pump from the fuel pump and seal it.
2	Remove the bowden cable. See also Chapt. 3).

2.1) Removal of the carburetor, intake silencer and fuel pump

Instruction

See [Figure 2](#).

NOTICE

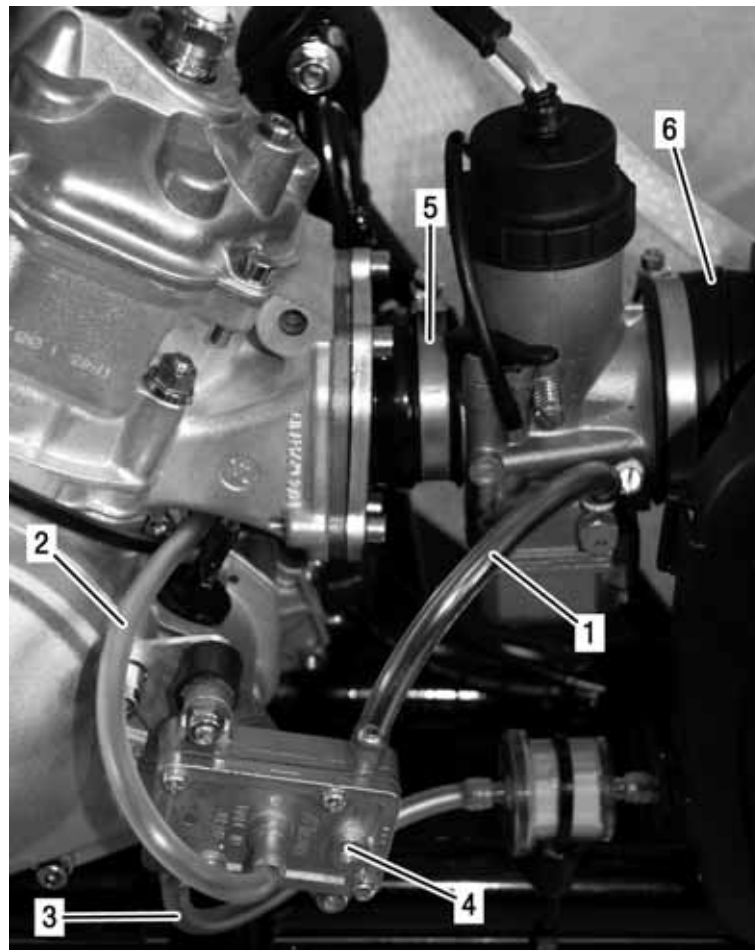
Fuel may spill out when removing the carburetor.

To remove the carburetor and intake silencer the following steps are required:

Step	Procedure
1	Pull off fuel line (1) between the fuel pump and the carburetor from the carburetor.
2	Loosen the hose clamp (5).
3	Remove the carburetor along with the intake silencer (6) and fuel pump (4).

Graphic

Carburator and intake silencer



Part	Function
1	Hose (fuel line) to the carburator
2	Impulse line
3	Hose (fuel line) from tank
4	Fuel pump
5	Hose clamp
6	Intake silencer

Figure 2

K00221

2.1.1) Disassembly of the carburetor

Instruction See [Figure 3](#).

Step	Procedure
1	Disassemble the carburetor to the parts shown in Fig. 3 and clean them with fuel.

Graphic Carburetor

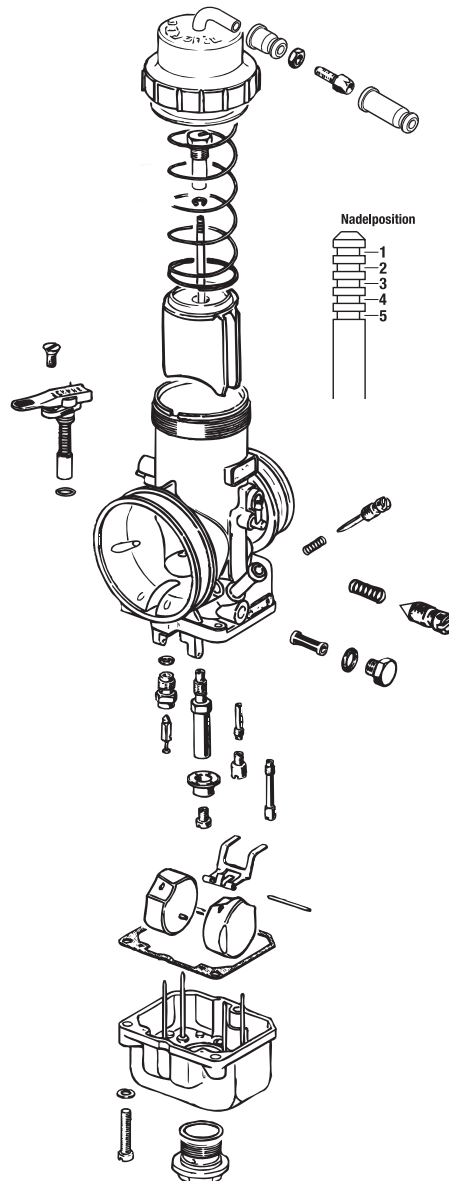


Figure 3

K00064

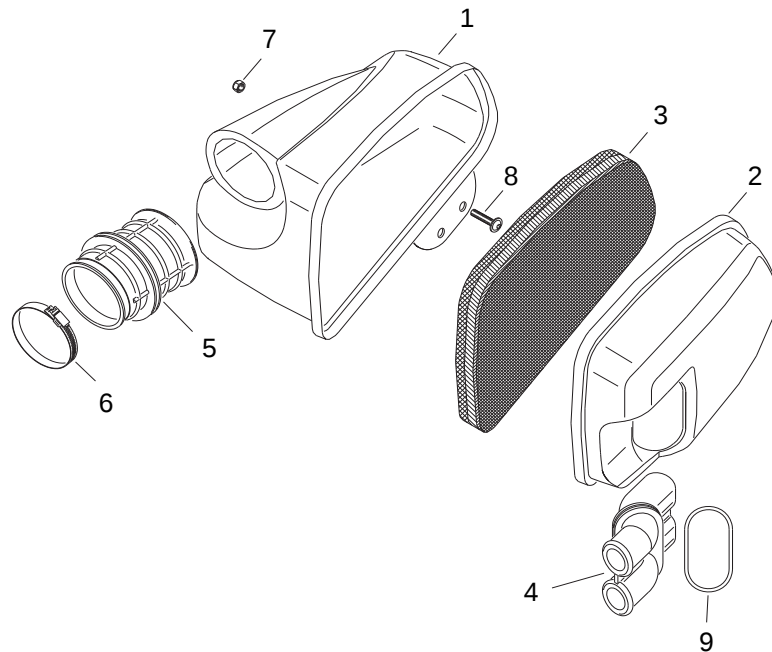
DK00053.fm

2.1.2) Disassembly of the intake silencer

Intake silencer See [Figure 4](#).

Step	Procedure
1	Disassemble the intake silencer to the parts shown in Fig. 4.

Graphic Intake silencer



Part	Function
1	Silencer housing
2	Silencer cover
3	Filter element
4	Intake silencer tube
5	Carburetor socket
6	Clamp
7	Lock nut M6
8	Allen screw w. rounded flange head M6x16
9	O-ring 59,52x2,62 NBR 70

Figure 4

K00167

3) Carburetor and intake silencer - inspection of components

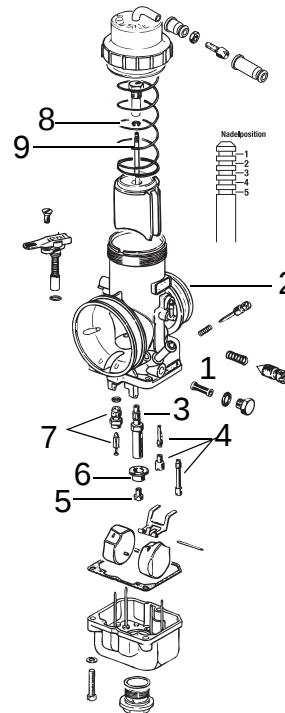
General In the case of problems with the fuel supply the carburetor should first be cleaned and specific components inspected.

3.1) Inspection of carburetor

Instruction See [Figure 5](#).

Step	Procedure
1	Clean the fuel filter (1) and check that it is in good condition.
2	Blow compressed air through the holes in the carburetor housing (2) and the jets (3, 4, 5, 6 and 7) and check that they are open.
3	Check that the locking ring (8) is tightly seated on the jet needle (9).
4	Check the tip of the needle valve (7).

Graphic Carburetor



Part	Function
1	Fuel filter
2	Carburetor
3,4,5,6,7	Jets
8	Locking washer
9	Jet needle

Figure 5

K00064

DK00053.fm

General

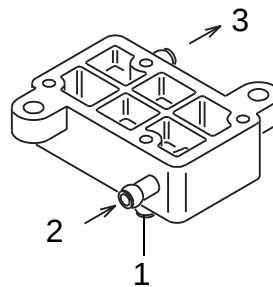
See [Figure 6](#).

Instruction

Step	Procedure
1	Check the condition of the impulse pipe (1), fuel line (2) and fuel overflow line (3) and in case of doubt replace them.

Graphic

Fuel pump



Part	Function
1	Impulse pipe
2	Fuel line
3	Fuel overflow line

Figure 6

K00065

General

NOTICE

A damaged filter element must be replaced immediately.

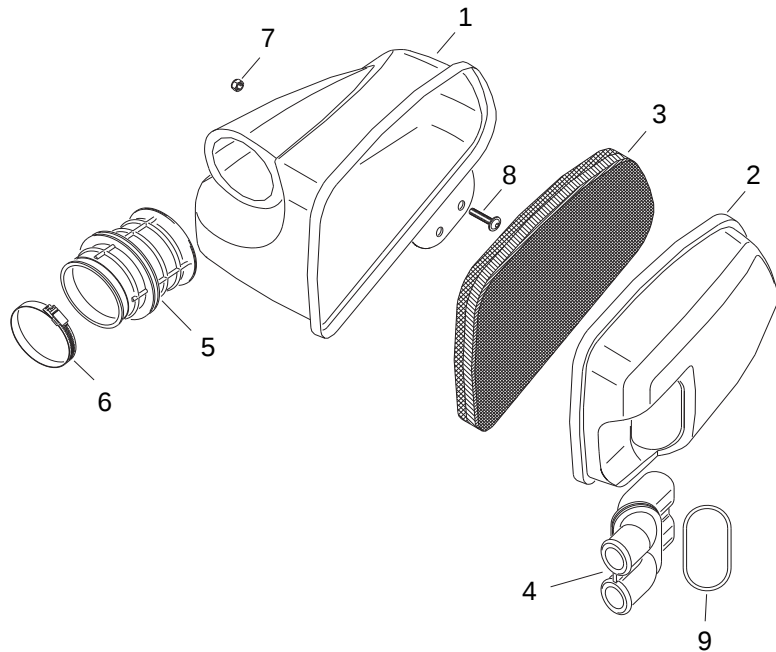
Instruction

See [Figure 7](#).

Step	Procedure
1	Inspect the silencer housing (1) and silencer cover (2) for cracks.
2	Inspect the intake silencer tube (3) and carburator socket (4) for cracks or porosity.
3	Clean the filter element (5) with a gasoline-oil mixture .
4	Inspect the filter element (5) for cracks.

Graphic

Intake silencer



Part	Function
1	Silencer housing
2	Silencer cover
3	Filter element
4	Intake silencer tube
5	Carburetor socket
6	Clamp
7	Lock nut M6
8	Allen screw w. rounded flange head M6x16
9	O-ring 59,52x2,62 NBR 70

Figure 7

K00167

4) Installing the carburator and intake silencer

4.1) Assembly of carburator

Instruction **NOTE:** Use ROTAX gasket set, part no. 293834.

Step	Procedure
1	Assemble the components in the same way you disassembled them. See also Chapt. 6 Section: 2.1.2).

4.1.1) Assembly of Float housing

General **NOTE:** When the carburator is held upside down, the float bracket must take up a horizontal attitude when free from load. The tips of the bracket must be at the same height. Adjust them if necessary. In this check the float chamber should not have been fitted.

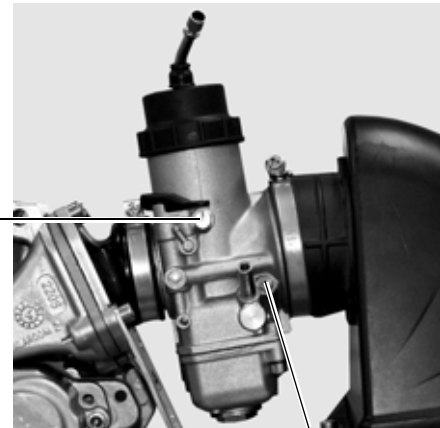
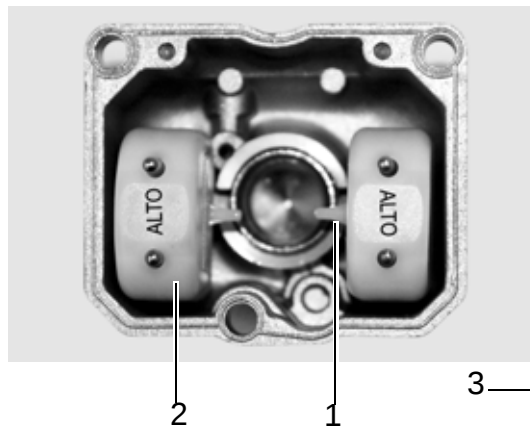
Instruction See [Figure 8](#).

The following steps are required to install the float housing:

Step	Procedure
1	Check the position of the float bracket (1) in its installed state.
2	When the floats (2) are inserted you should be able to see the word "ALTO" on their top surfaces.
3	Install and adjust the bowden cable in accordance with the operating instructions.
4	Set the idle adjuster screw (3) and adjustment screw (4) in accordance with the operating instructions.

Graphic

Float chamber



Similar to Figure!

Part	Function
1	Float attachment
2	Float
3	Adjustment screw
4	Adjustment screw kit

Figure 8

K00110,K00111

4.2) Assembly of intake silencer

General

NOTE: Before assembly, first immerse the filter element in filter oil then squeeze out excess oil.

Special tools

The following special tools/equipment are required:

Part number	Designation	Use
Part no. 297160	Filter oil	Filter element

Instruction

The following steps are required to install the intake silencer:

Step	Procedure
1	Assemble the components in the same way you disassembled them. See also Chapt. 6 Section: 2.1.3).

DK00053.fm

4.3) Installation of carburator, intake silencer and fuel pump

Safety instructions

See [Figure 9](#).



WARNING

Danger of explosion and ignition!
Overflowing and split gasoline must be absorbed immediately with a binding agent and correctly disposed of. Do not work with open flames and sources of ignition. Fuel must not be allowed to come into contact with hot engine parts and components.

NOTE: When assembling the parts make sure that the pipes are connected correctly.

Preparation

The following preparations should be carried out before installing the components:

Installation of fuel pump

Step	Procedure
1	Install the fuel pump in accordance with the installation instructions of the chassis manufacturer.

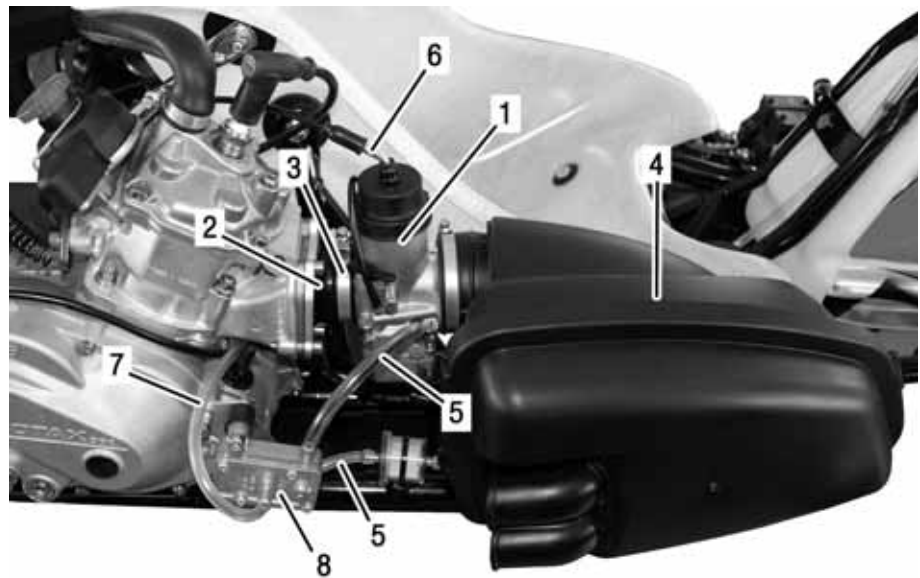
Instruction

To install the carburator and intake silencer the following steps are required:

Step	Procedure
1	Push the carburator (1) onto the carburator socket (2).
2	Pull the hose clamp (3) over the carburator socket and fasten it.
3	Secure the intake silencer (4) with the hose clamp on the carburator.
4	Secure the intake silencer on the retaining bracket (5).
5	Check the bowden cable for wear, especially where it bends.
6	Connect the fuel supply line (6) and bowden cable (7) to the carburator.
7	Connect the impulse line (8).

Graphic

Carburator and intake silencer



Part	Function
1	Carburator
2	Carburator socket
3	Hose clamp
4	Intake silencer
5	Fuel feed tube
6	Bowden cable
7	Impulse line
8	Fuel pump

Figure 9

K00222

BRP-Powertrain

REPAIR MANUAL

NOTES

DK00053.fm

Chapter: 7

CENTRIFUGAL CLUTCH, PRIMARY AND BALANCE DRIVE

Contents

This chapter describes the disassembly and assembly of the centrifugal clutch and the primary and balance drive for the ROTAX 125 MAX DD2 kart engine. The description is broken down into subsections.

Subject	Page
System description	Page 2
Centrifugal clutch assy. - removal	Page 5
Drain oil	Page 5
Removal of centrifugal clutch, primary and balance drive	Page 6
Centrifugal clutch assy. - inspection	Page 11
Inspection of clutch drum	Page 11
Inspection of thrust washers, O-rings and needle cage	Page 11
Inspection of starter reduction gear	Page 12
Inspection of clutch and starter gear	Page 13
Centrifugal clutch assy. - installation	Page 15
Installation of starter reduction gear	Page 15
Installation of balance gear, starter gear and clutch plate	Page 16
Installation of clutch drum and secondary gear	Page 19
Installation of support plate and clutch cover	Page 20
Filling the gear housing with oil	Page 21

1) System description

Overview

Position on engine

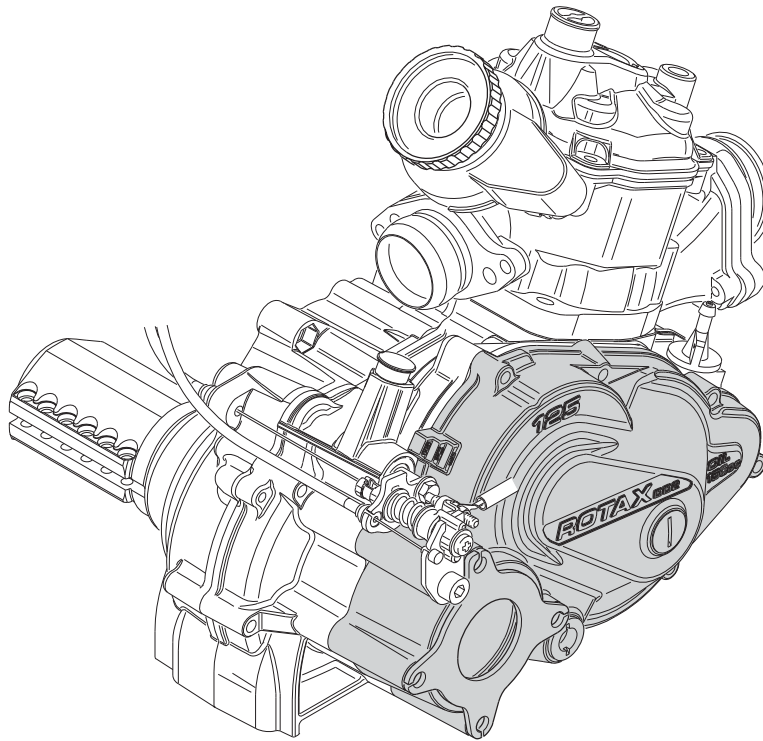


Figure 1

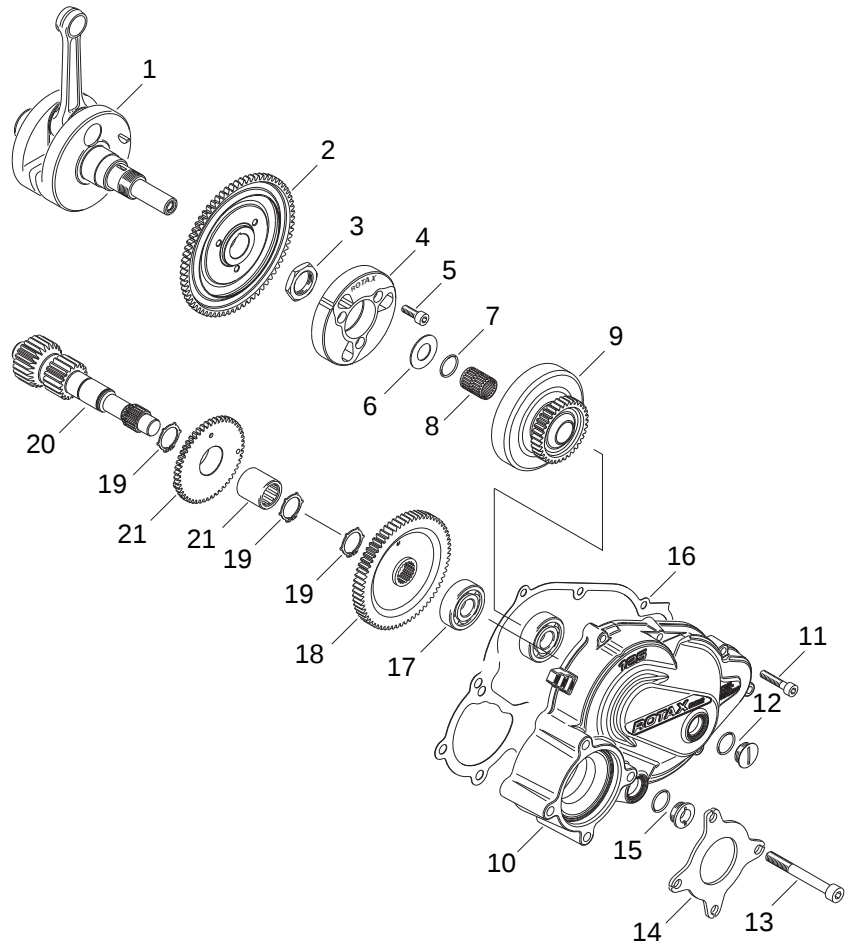
K00171

BRP-Powertrain

REPAIR MANUAL

Overview

Components



Part	Function
1	Crankshaft assy.
2	Starter gear
3	Hex nut M22x1.5
4	Clutch plate
5	Allen screw M6x16
6	Thrust washer
7	O-ring
8	Needle cage
9	Clutch drum
10	Clutch cover
11	Allen screw M6x30
12	Plug screw with O-ring
13	Allen screw M8x70
14	Support plate
15	Oil level screw M18x1.5 with O-ring

DK00054.fm

BRP-Powertrain

REPAIR MANUAL

Part	Function
16	Gasket
17	Ball bearing
18	Secondary gear
19	Shaft retaining ring
20	Primary shaft
21	Balance gear

Figure 2

K00172

2) Centrifugal clutch assy. - removal

Safety instructions


WARNING

Danger of serious burns and scalds.
Allow engine to cool down to the ambient temperature before starting work.


WARNING

Danger of explosion and ignition!
Overflowing and split gasoline must be absorbed immediately with a binding agent and correctly disposed of. Do not work with open flames and sources of ignition. Fuel must not be allowed to come into contact with hot engine parts and components.

2.1) Drain oil

Instruction

See [Figure 3](#).

Step	Procedure
1	Remove the oil drain screw with gasket from the crankcase and gearbox housing.
2	Drain the oil into a suitable vessel and dispose of it in the proper manner.

Graphic

Drain oil



Part	Function
1	Oil drain screw

Figure 3

K00185

2.2) Removal of centrifugal clutch, primary and balance drive

Special tools

The following special tools/equipment are required:

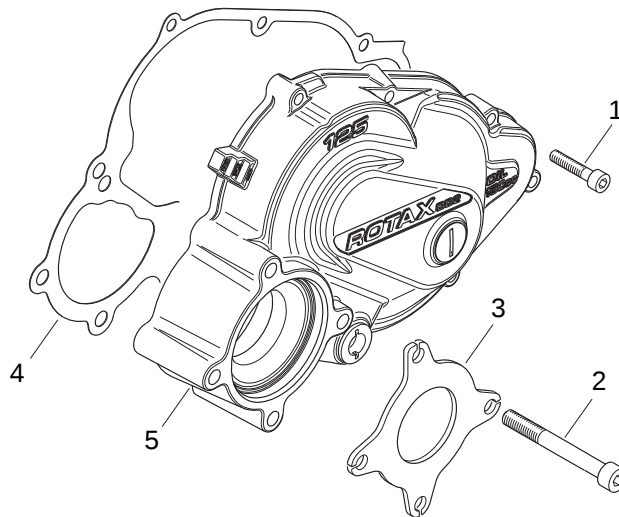
Part number	Designation	Use
Part no. 276016	Puller assy.	Starter gear
Part no. 676202	Fixation tool	Starter gear

Instruction

See [Figure 4](#).

Step	Procedure
1	Loosen the 6 allen screws M6x30 on the clutch cover.
2	Loosen the 4 allen screws M8x70 and remove them along with the support plate.
3	Remove the clutch cover.
4	Remove the gasket.

Graphic



Part	Function
1	Allen screw M6x30
2	Allen screw M8x70
3	Support plate
4	Gasket
5	Clutch cover

Figure 4

K00173

BRP-Powertrain

REPAIR MANUAL

Instruction

See [Figure 5](#).

Step	Procedure
5	Remove the secondary gear and clutch drum

Graphic



Part	Function
1	Secondary gear
2	Shaft retaining ring

Figure 5

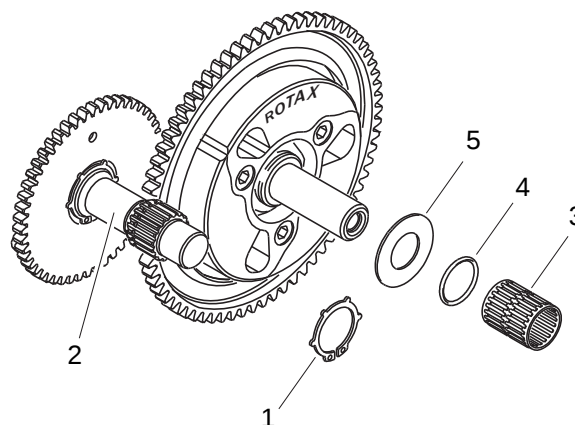
K00186

Instruction

See [Figure 6](#).

Step	Procedure
6	Remove the outer shaft retaining ring from the primary shaft using circlip pliers.
7	Remove the needle cage along with the O-ring and thrust washer from the crankshaft.

Graphic



Part	Function
1	Shaft retaining ring
2	Primary shaft

DK00054.fm

BRP-Powertrain

REPAIR MANUAL

Part	Function
3	Needle cage
4	O-ring
5	Thrust washer

Figure 6

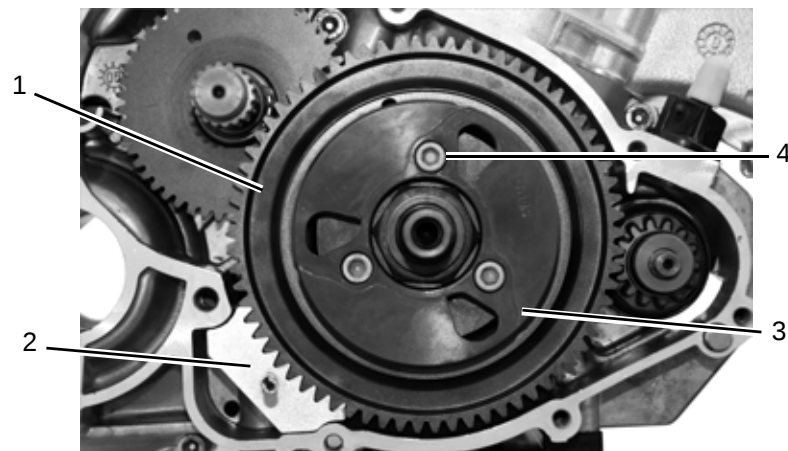
K00174

Instruction

See [Figure 7](#).

Step	Procedure
8	Block the starter gear using the fixation tool part no. 676202.
9	Loosen the 3 allen screws M6x16 and release the clutch plate using a flat-head screwdriver. NOTE: Screws are stuck in with LOCTITE 648, and must therefore first be heated with a heat gun.

Graphic



Part	Function
1	Starter gear
2	Fixation tool
3	Clutch plate
4	Allen screw M6x16

Figure 7

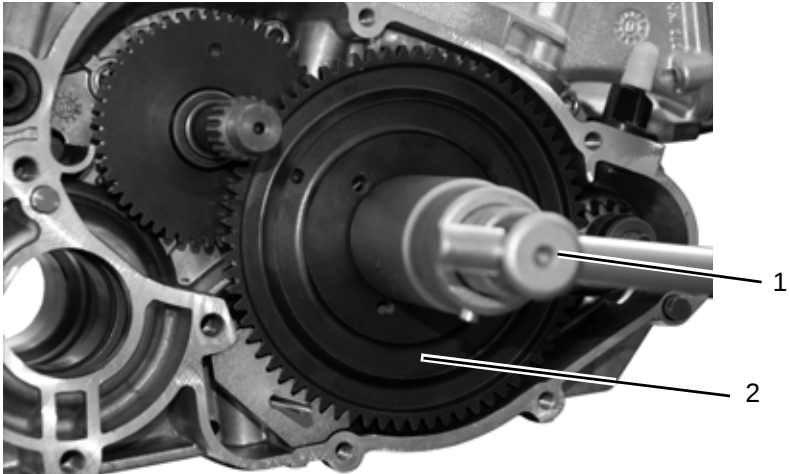
K00201

Instruction

See [Figure 8](#).

Step	Procedure
10	Loosen the hex nut M22x1.5 using a suitable tool. NOTE: The hex nut is stuck in with LOCTITE 648, and must therefore first be heated with a heat gun.

Graphic



Part	Function
1	Tool
2	Starter gear

Figure 8

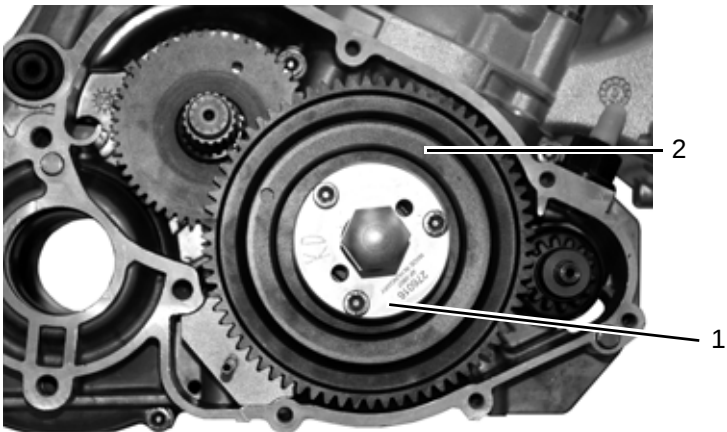
K00200

Instruction

See [Figure 9](#).

Step	Procedure
11	Pull the starter gear off the crankshaft using the special tool part no. 276016

Graphic



Part	Function
1	Special tool part no. 276016
2	Starter gear

Figure 9

K00199

Instruction

See [Figure 10](#).

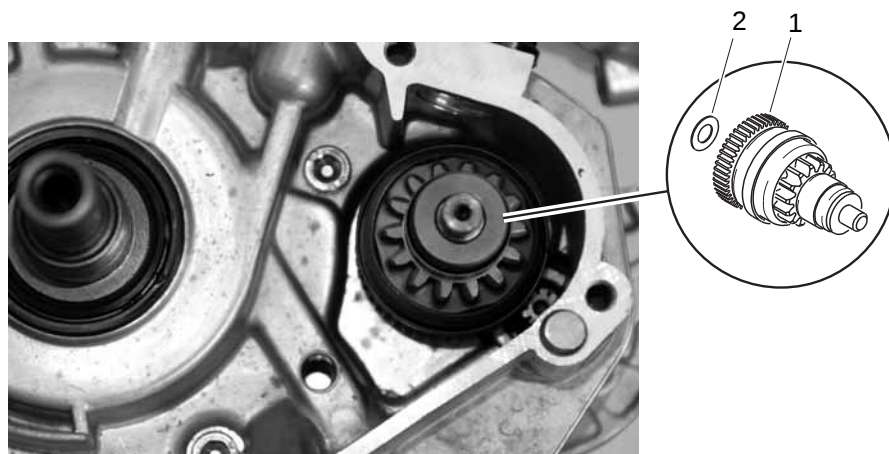
Step	Procedure
12	Remove the starter reduction gear along with the thrust washer.

DK00054.fm

BRP-Powertrain

REPAIR MANUAL

Graphic



Part	Function
1	Starter reduction gear
2	Thrust washer

Figure 10

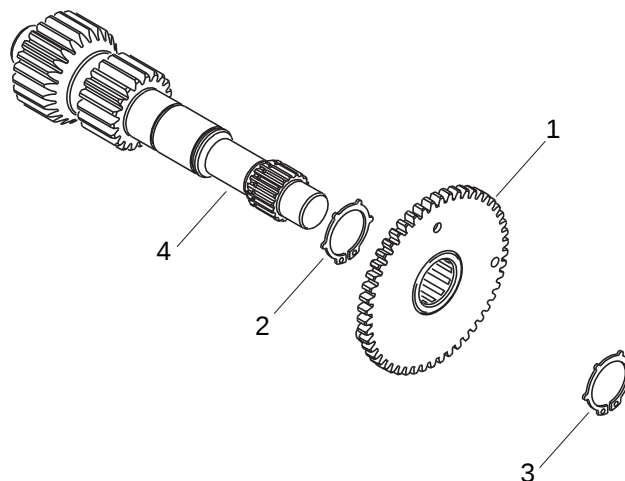
K00187

Instruction

See [Figure 11](#).

Step	Procedure
13	Remove the shaft retaining ring from the balance gear using circlip pliers.
14	Remove the balance gear.
15	Remove the third shaft retaining ring from the primary shaft.

Graphic



Part	Function
1	Balance gear
2	Shaft retaining ring 2
3	Shaft retaining ring 3
4	Primary shaft

Figure 11

K00188

DK00054.fm

3) Centrifugal clutch assy. - inspection

3.1) Inspection of clutch drum

Preparation

Step	Procedure
1	Clean all parts carefully, removing any adhesive residues. NOTE: Wear limit: d = 84.90 mm

Instruction

See [Figure 12](#).

Step	Procedure
1	Check the clutch drum for any signs of wear and replace it if necessary.

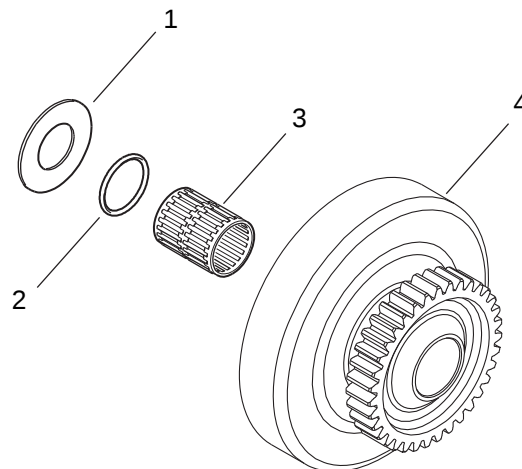
3.1.1) Check the thrust washers, O-rings and needle cage

Instruction

See [Figure 12](#).

Step	Procedure
1	Inspect the thrust washers and O-rings for signs of wear and replace them if necessary.
2	Inspect the needle cage for sign of wear and replace if necessary.

Graphic



Part	Function
1	O-ring
2	Thrust washer
3	Needle cage
4	Clutch drum

Figure 12

K00175

DK00054.fm

3.2) Inspection of starter reduction gear

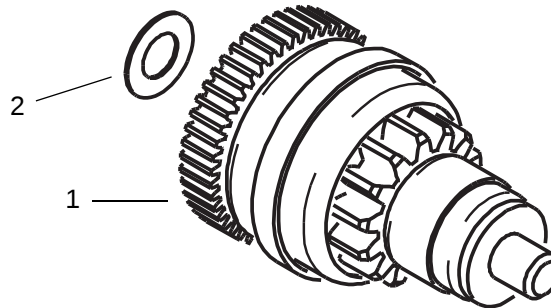
Instruction

 See [Figure 13](#).

Step	Procedure
1	Clean the starter reduction gear.
2	Checking that the starter reduction gear can move freely.

Graphic

Starter reduction gear



Part	Function
1	Starter reduction gear
2	Thrust washer

Figure 13

K00180

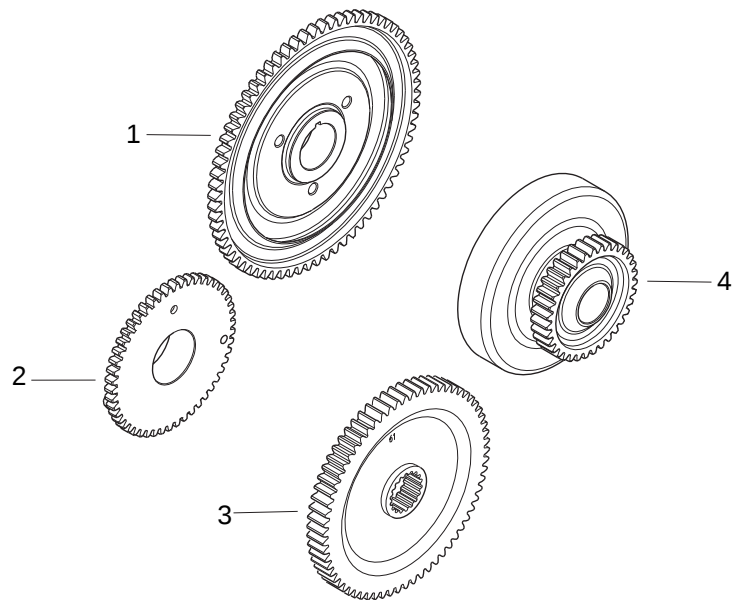
3.3) Inspection of gears

Instruction

 See [Figure 14](#).

Step	Procedure
1	Check the teeth on the illustrated components for damage, pitting and deformation.

Graphic



Part	Function
1	Starter gear
2	Balance gear
3	Secondary gear
4	Clutch drum with drive gear

Figure 14

K00179

3.4) Inspection of clutch and starter gear

Instruction

See [Figure 15](#).

Step	Procedure
1	Check the clutch plate. NOTE: Thickness of clutch arm - 24.10 mm Thickness of clutch plate - min. 14.45 mm
2	Check the teeth on the starter gear for damage. See 3.3).
3	Remove any residue of LOCTITE adhesive from the starter gear.

DK00054.fm

Graphic

Clutch plate

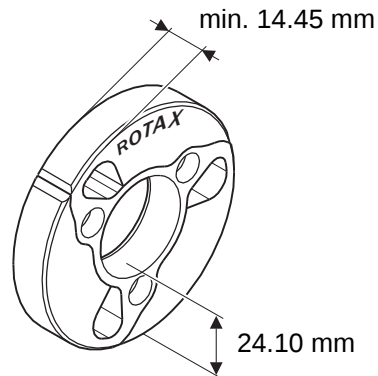


Figure 15

K00176

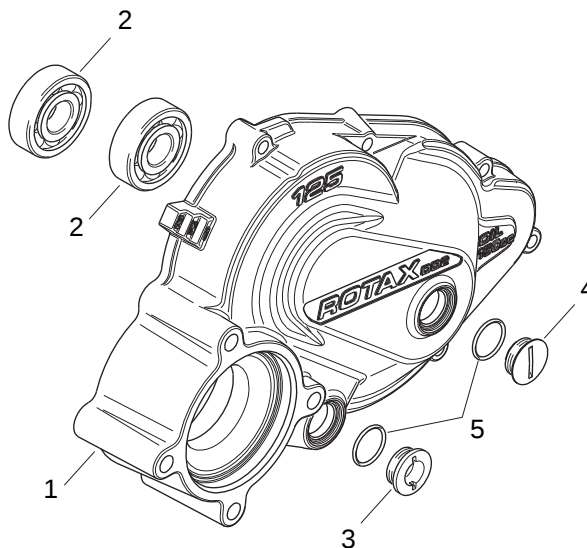
3.5) Inspection of clutch cover

Instruction

See [Figure 16](#).

Step	Procedure
1	See Chapt. 5 - proceed initially as in Section 5.2) Check the halves of the housing, then 4.2) Check the bearings and if necessary 4.3) Replace the bearings.

Graphic



Part	Function
1	Clutch cover
2	Ball bearing
3	Oil level screw M18x1.5
4	Plug screw M18x1.5
5	O-ring 17x1.5

Figure 16

K00181

4) Centrifugal clutch assy. - installation

General **NOTE:** The correct sequence **MUST** be followed. Once the starter gear has been installed it is no longer possible to install the starter reduction gear.

4.1) Installation of starter reduction gear

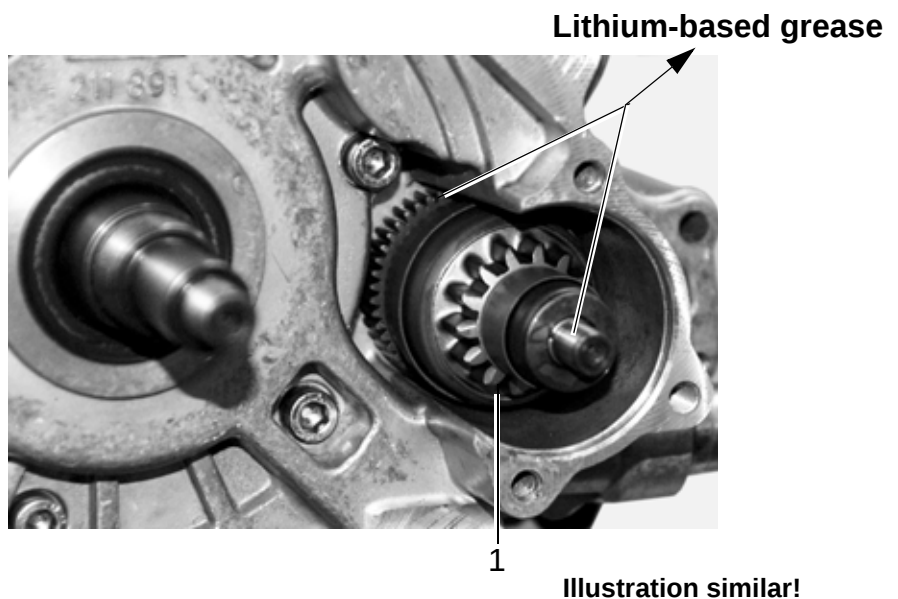
Special tools The following special tools/equipment are required:

Part number	Designation	Use
Part no. 897330	Lithium-based grease	Starter reduction gear

Instruction See [Figure 17](#).

Step	Procedure
1	Insert the thrust washer along with the starter reduction gear into the bearing point of the housing.
2	Grease the starter reduction gear with lithium-based grease in the area around the bearing points.

Graphic Starter reduction gear



Part	Function
1	Starter reduction gear

Figure 17

K00117

DK00054.fm

4.2) Installation of balance gear, starter gear and clutch plate

Special tools The following special tools/equipment are required:

Part number	Designation	Use
n.a.	Circlip pliers	Shaft retaining rings
Part no. 676202	Fixation tool	Starter gear
Part no. 899788	LOCTITE 648	Starter gear

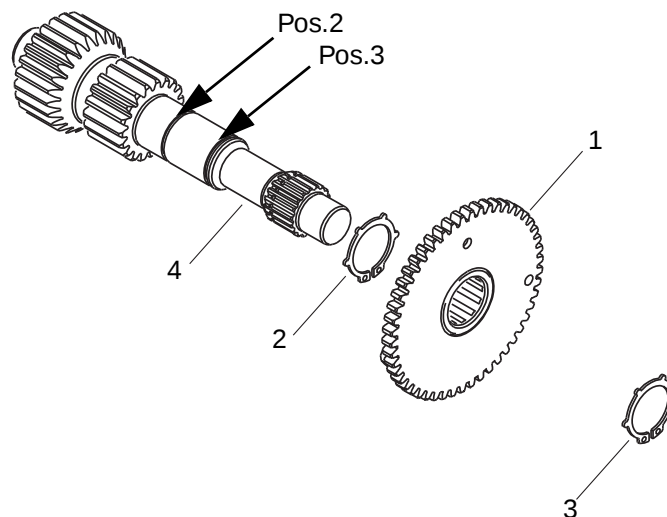
4.2.1) Installation of balance gear

Instruction See [Figure 18](#).

Step	Procedure
1	Fit the shaft retaining ring 2 on position 2 using the circlip pliers.
2	Insert the balance gear onto the primary shaft.
3	Fit the outer shaft retaining ring (shaft retaining ring 3) on position 3 using the circlip pliers.

Graphic

Balance gear



Part	Function
1	Balance gear
2	Shaft retaining ring 2
3	Shaft retaining ring 3
4	Primary shaft

Figure 18

K00188

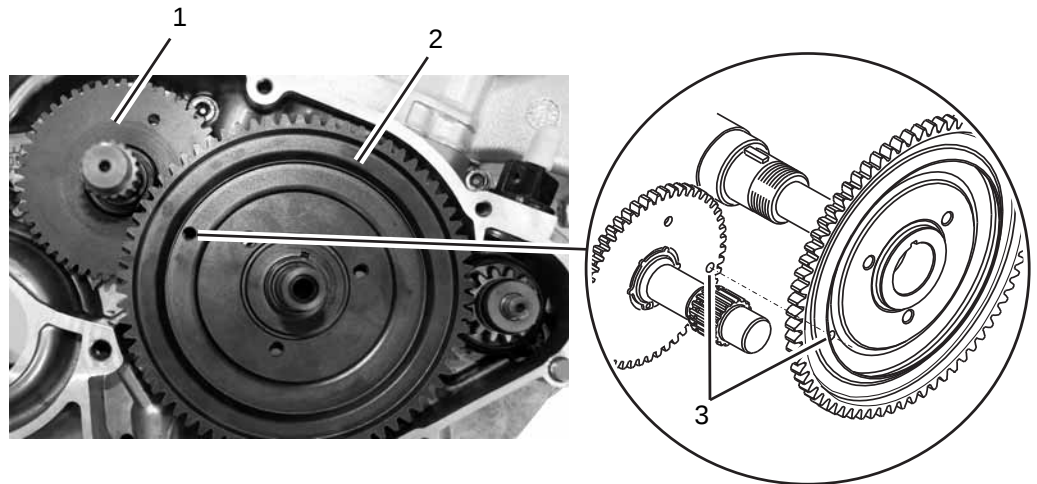
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4.2.2) Installation of starter gear

Instruction See [Figure 19](#).

Step	Procedure
1	Insert the starter gear onto the crankshaft, take care to position it correctly in relation to the balance gear. NOTE: Both of these components have a through-hole as a marker.

Graphic



Part	Function
1	Balance gear
2	Starter gear
3	Markers

Figure 19

K00189

Instruction See [Figure 20](#).

Step	Procedure
2	Block the starter gear using the fixation tool, part no. 676202.
3	Lubricate LOCTITE 648 on the hex nut M22x1.5 and fit it using a suitable tool. Tightening torque 180 Nm.
4	Remove excess LOCTITE.

Graphic

Fixation tool

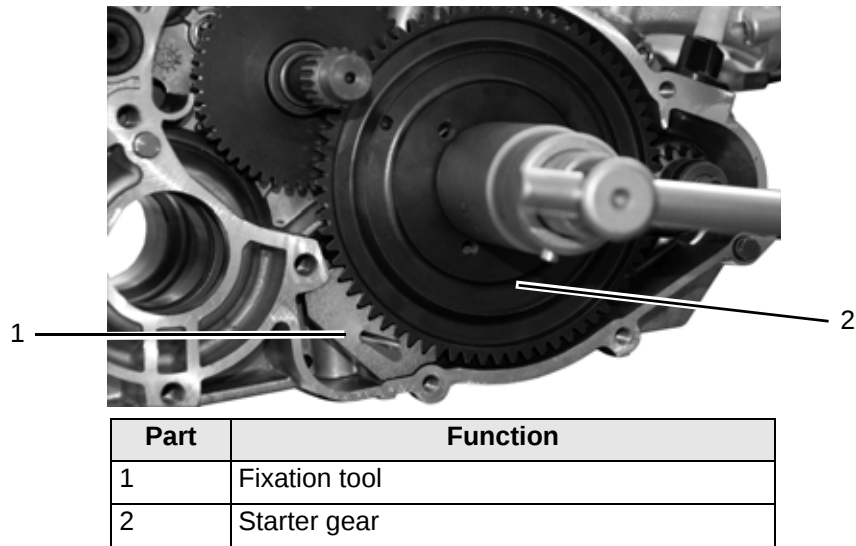


Figure 20

K00200

4.2.3) Installation of clutch plate

Instruction

See [Figure 21](#).

Step	Procedure
1	Lubricate LOCTITE 648 on the new allen screws M6x16.
2	Insert the clutch plate on and secure it with 3 allen keys M6x16. Tightening torque 20 Nm. NOTE: Strength class of screws: 12.9!
3	Remove excess LOCTITE.

Graphic

Clutch plate

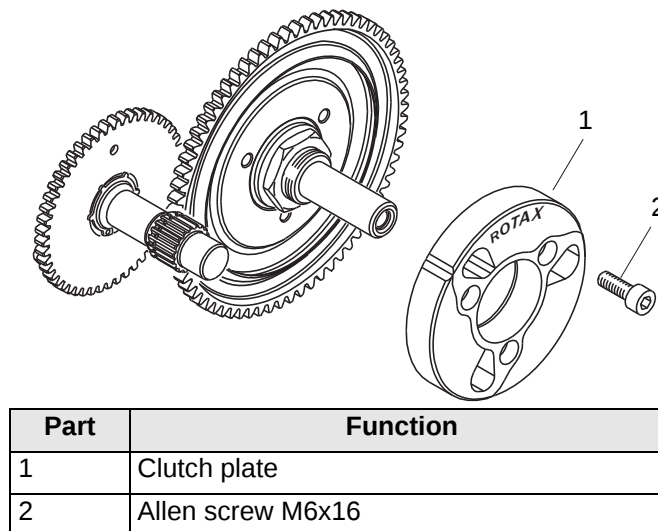


Figure 21

K00178

DK00054.fm

4.3) Installation of clutch drum and secondary gear

Special tools The following special tools/equipment are required:

Part number	Designation
Part no. 897330	Lithium-based grease

Instruction See [Figure 22](#).

Step	Procedure
1	Slide the thrust washer and O-ring onto the crankshaft.
2	Lubricate lithium-based grease on the needle cage and slide it onto the crankshaft.
3	Slide the clutch drum onto the crankshaft.
4	Fit the outer shaft retaining ring on the primary shaft. See also 2.2) Figure 5 .
5	Engage the secondary gear with the teeth on the primary shaft.

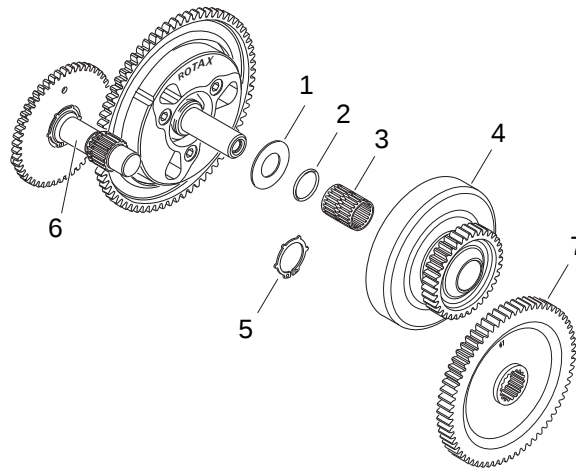


WARNING

Risk of fatal injury.

The engine must not be started without a clutch drum.

Graphic



Part	Function
1	Thrust washer
2	O-ring
3	Needle cage
4	Clutch drum
5	Shaft retaining ring
6	Primary shaft
7	Secondary gear

Figure 22

K00177

DK00054.fm

4.4) Installation of support plate and clutch cover

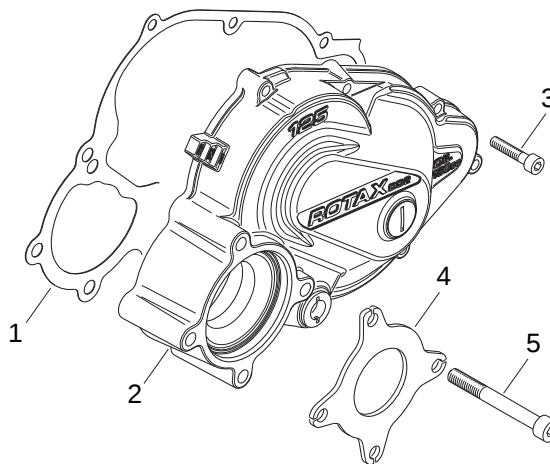
Special tools The following special tools/equipment are required:

Part number	Designation	Use
n.a.	Torque wrench	Clutch cover

Instruction See [Figure 23](#).

Step	Procedure
1	Fit new gasket.
2	Fit the support plate using 4 allen screws M8x70. Tightening torque 22 Nm.
3	Use 6 allen screws M6x30 to secure the clutch cover. Tightening torque 10 Nm.

Graphic Clutch cover, support plate



Part	Function
1	Gasket
2	Clutch cover
3	Allen screw M6x30
4	Support plate
5	Allen screw M8x70

Figure 23

K00173

4.5) Filling the gear housing with oil

General NOTE: With the engine in a horizontal position pour in 150 ml of gear oil.

Special tools The following special tools/equipment are required:

Part number	Designation	Use
25474	Gear oil specification 15W 50	Gears

Instruction See [Figure 24](#).

Step	Procedure
1	Install the oil drain screw with a new gasket. See Figure 3 .
2	Install the oil level screw with a new gasket.
3	Remove the plug screw.
4	Add the specified quantity (150 ml) of gear oil through the opening in the housing.
5	Replace the plug screw.

Graphic Add oil.



Part	Function
1	Plug screw (air vent screw)
2	Oil level screw

Figure 24

K00190

BRP-Powertrain

REPAIR MANUAL

NOTES

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Chapter: 8

COOLING SYSTEM

Contents

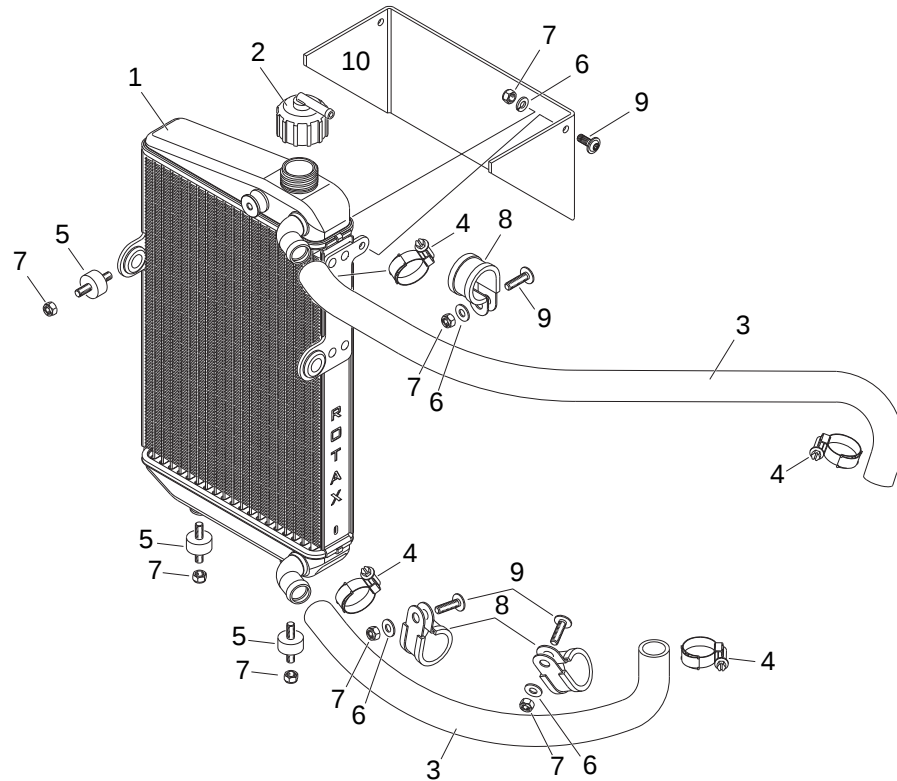
This chapter describes the removal and installation of the cooling system for the ROTAX 125 MAX DD2 kart engine. The description is broken down into subsections.

Subject	Page
System description	Page 2
Removal of radiator	Page 4
Removal of radiator with cap assy.	Page 4
Removal of water pump shaft	Page 5
Radiator - inspection of components	Page 7
Inspection of water pump shaft	Page 8
Installation of radiator	Page 9
Installation of radiator with cap assy.	Page 9
Installation of water pump shaft	Page 11
Replacing the oil seals on the water pump	Page 11
Installation of water pump shaft	Page 11
Final tasks	Page 12

1) System description

Overview

Radiator



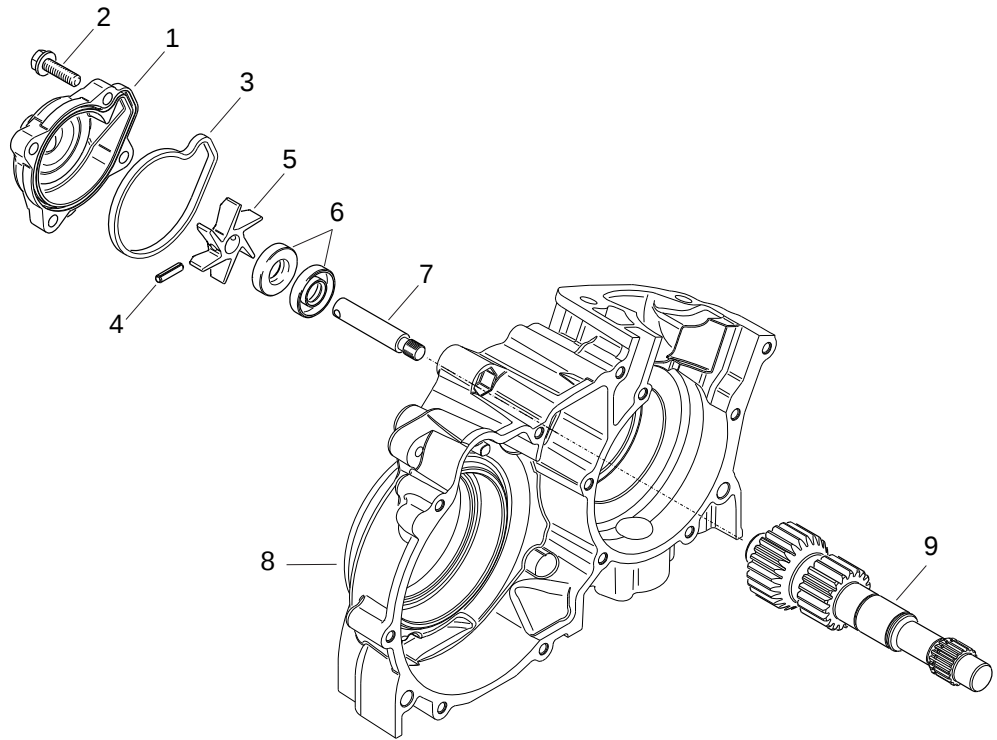
Part	Function
1	Radiator with cap assy.
2	Radiator cap with gasket
3	Cooling water hose
4	Clamp 27/9
5	Rubber buffer 18x15xM6
6	Washer 6,4
7	Lock nut M6 DIN985
8	Pipe clamps
9	Allen screw w. rounded flange head M6x16
10	Windshield

Figure 1

K00168

Overview

Water pump



Part	Function
1	Water pump housing
2	Taptite screw M6x20
3	Rubber ring 61.5x1.5x3.5
4	Slotted spring pin 4x16
5	Impeller
6	Oil seals
7	Water pump shaft
8	Crank housing assy.
9	Primary shaft

Figure 2

K00193

2) Removal of radiator

Safety instructions


WARNING

Danger of serious burns and scalds.
Allow engine to cool down to the ambient temperature before starting work.

Preparation

The following preparations should be carried out before removing the components:

Step	Procedure
1	Open the radiator cap.

2.1) Removal of radiator with cap assy.

General

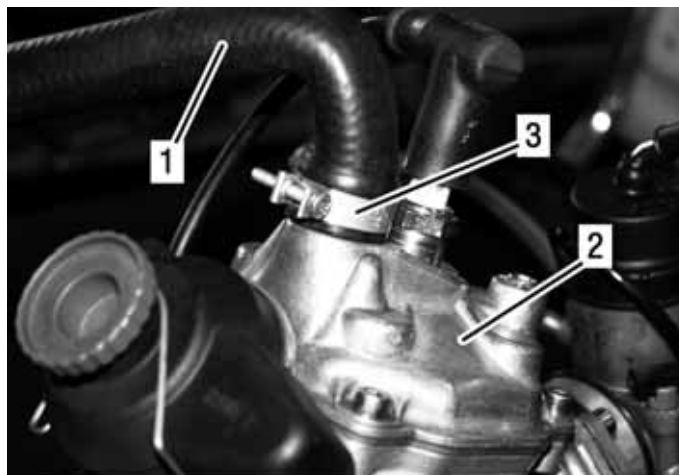
NOTE: Collect the coolant in a suitable container.

Instruction

See [Figure 2](#).

Step	Procedure
1	Remove 3 rubber buffers and 2 pipe clamps from the kart frame.
2	Pull off the cooling water hoses. This is done by unscrewing the hose clamp and pulling the cooling water manifold off the socket.
3	Remove the radiator with cap assy.

Graphic



Part	Function
1	Cooling water hose
2	Cylinder head
3	Hose clamp

Figure 3

K00223

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3) Removal of water pump shaft

General NOTE: Collect the coolant in a suitable vessel.

Instruction See [Figure 4](#).

Step	Procedure
1	Remove the cooling water hose.
2	Release and remove the water pump flange and moulded gasket from the housing via 4 taptite screws.
3	Unscrew the water pump to the right, it is very important to hold up the primary shaft against this movement.

Graphic

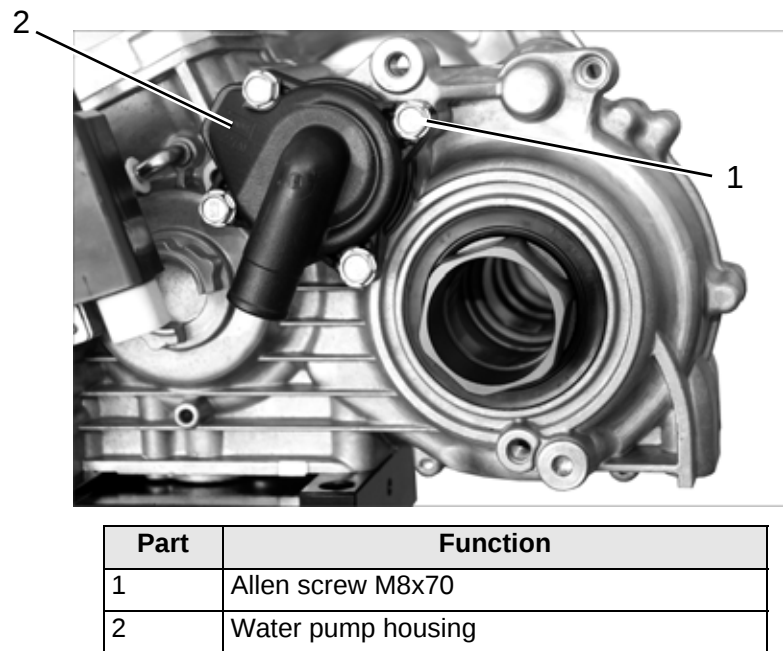


Figure 4

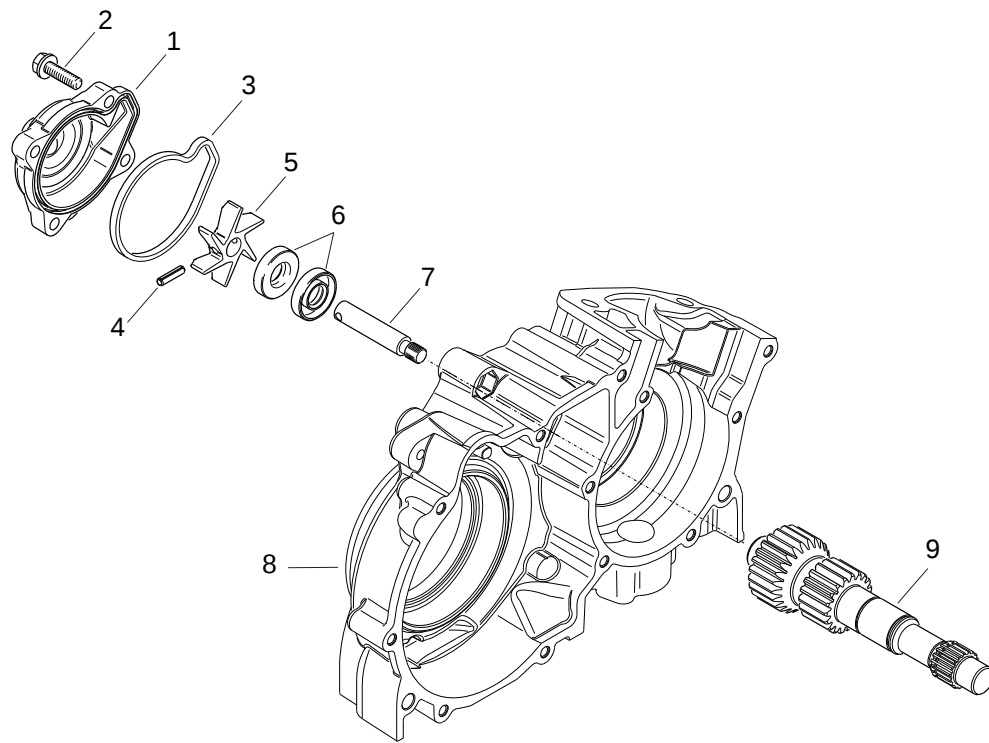
K00194

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REPAIR MANUAL

Graphic

Water pump



Part	Function
1	Water pump housing
2	Taptite screw M6x20
3	Rubber ring 61.5x1.5x3.5
4	Slotted spring pin 4x16
5	Impeller
6	Oil seals
7	Water pump shaft
8	Crank housing assy.
9	Primary shaft

Figure 5

K00193

4) Inspection of cooling system

4.1) Radiator - inspection of components

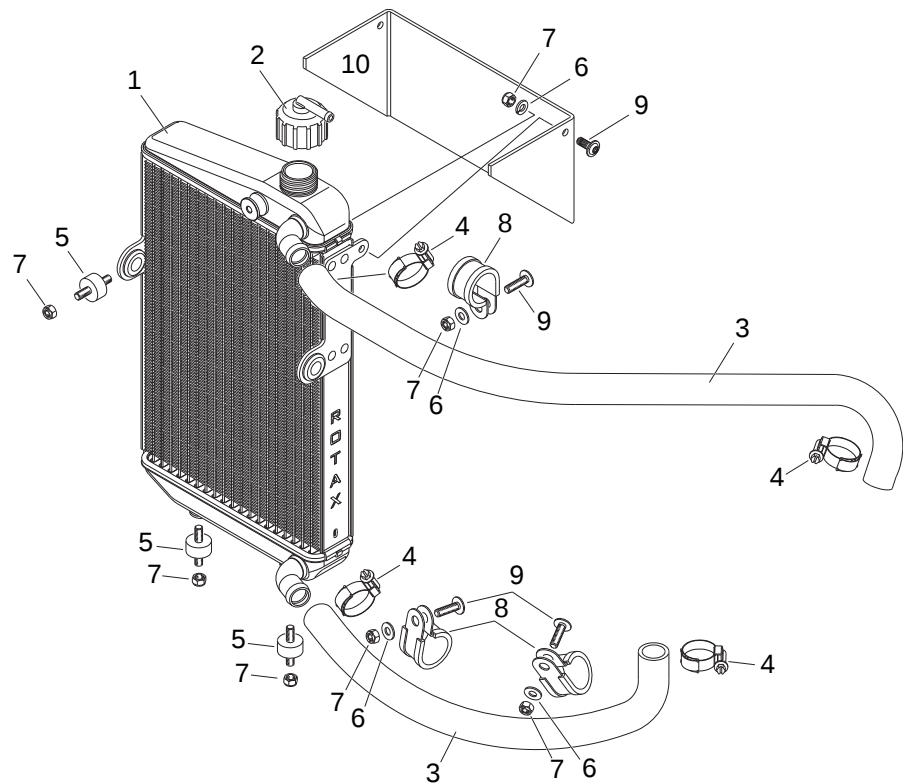
Instruction See [Figure 6](#).

NOTE: If some of the cooling fins are slightly bent, they may be gently bent back into shape.

Step	Procedure
1	Use compressed air to remove dirt from the cooling ribs on the radiator. Never use a high-pressure cleaner.
2	Visually check of the radiator for any cracks or other damage.
3	Check that the radiator cap gasket is in perfect condition.
4	Check that the cooling water manifold is not porous or leaking.
5	Check the radiator's windshield for cracks (visual check).
6	Check the rubber buffer for wear and cracks.

Graphic

Radiator



Part	Function
1	Radiator with cap assy.
2	Radiator cap with gasket
3	Cooling water hose
4	Clamp 27/9

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Part	Function
5	Rubber buffer 18x15xM6
6	Washer 6,4
7	Lock nut M6 DIN985
8	Pipe clamps
9	Allen screw w. rounded flange head M6x16
10	Windshield

Figure 6

K00168

4.2) Inspection of water pump shaft

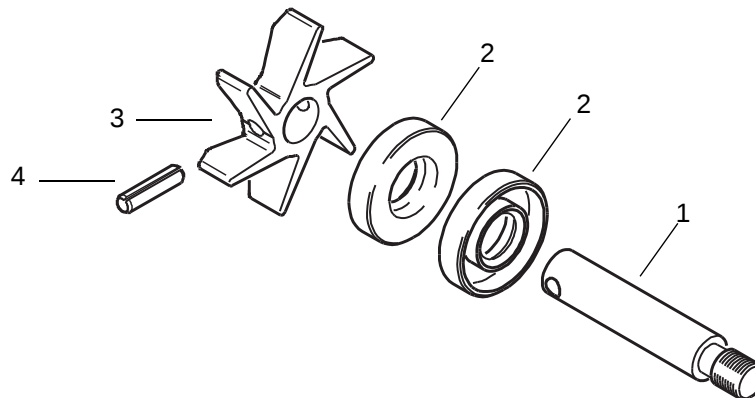
Instruction

See [Figure 7](#).

Step	Procedure
1	Check the water pump shaft in the areas around the two shaft seal rings; if it is excessively worn it must be replaced.
2	Check the impeller for damage and/or any abnormal deformation, and replace it if necessary.

Graphic

Water pump shaft



Part	Function
1	Water pump shaft
2	Oil seals
3	Impeller
4	Slotted spring pin 4x16

Figure 7

K00202

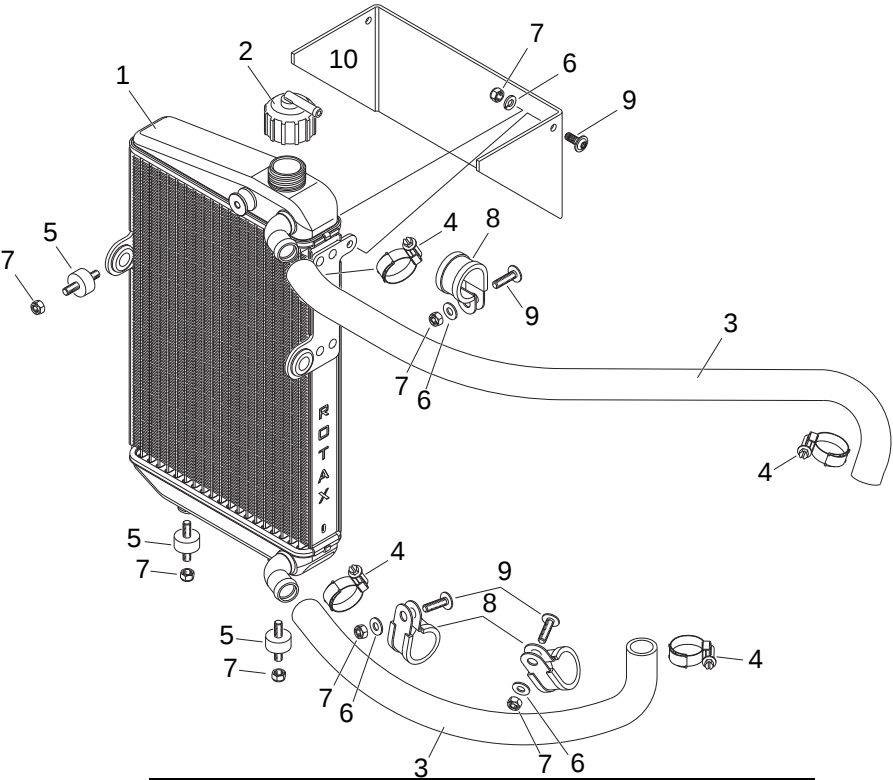
5) Installing the radiator

5.1) Installation of radiator with cap assy.

Instruction SeeFigure 8.

Step	Procedure
1	Secure the radiator with cap assy. to the kart frame with 3 rubber buffers, windshield with panhead screws and washers using lock nuts M6. Tightening torque 10 Nm. NOTE: Take care to ensure that the radiator is installed in the correct position. New lock nuts must be used. Use washers on the kart frame.
2	Place the radiator hoses on the sockets on the radiator and align them with the sockets on the engine; then tighten them with the hose clamps to make a watertight connection.
3	Place 3 pipe clamps over the radiator hoses (two below, one above) and secure them to the frame with allen screws w. rounded flange heads.

Graphic Radiator



Part	Function
1	Radiator with cap assy.
2	Radiator cap with gasket
3	Cooling water hose
4	Clamp 27/9
5	Rubber buffer 18x15xM6

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REPAIR MANUAL

Part	Function
6	Washer 6,4
7	Lock nut M6 DIN985
8	Pipe clamps
9	Allen screw w. rounded flange head M6x16
10	Windshield

Figure 8

K00168

6) Installing the water pump shaft

6.1) Replacing the oil seals on the water pump

Instruction See [Figure 9](#).

Step	Procedure
1	Remove the oil seals that are to be replaced from water pump with a suitable tool.
2	Grease the new oil seals with Molycote 111 near the sealing lip and use an insertion jig to press them back in. NOTE: Take care to install them in the correct position. The hose spring on the outer oil seal must face "outwards", and the hose spring on the inner oil seal should not be visible.

Graphic Shaft seal rings - water pump



Part	Function
1	"Outer" oil seal
2	"Inner" oil seal

Figure 9

K00208, K00209

6.2) Installation of water pump shaft

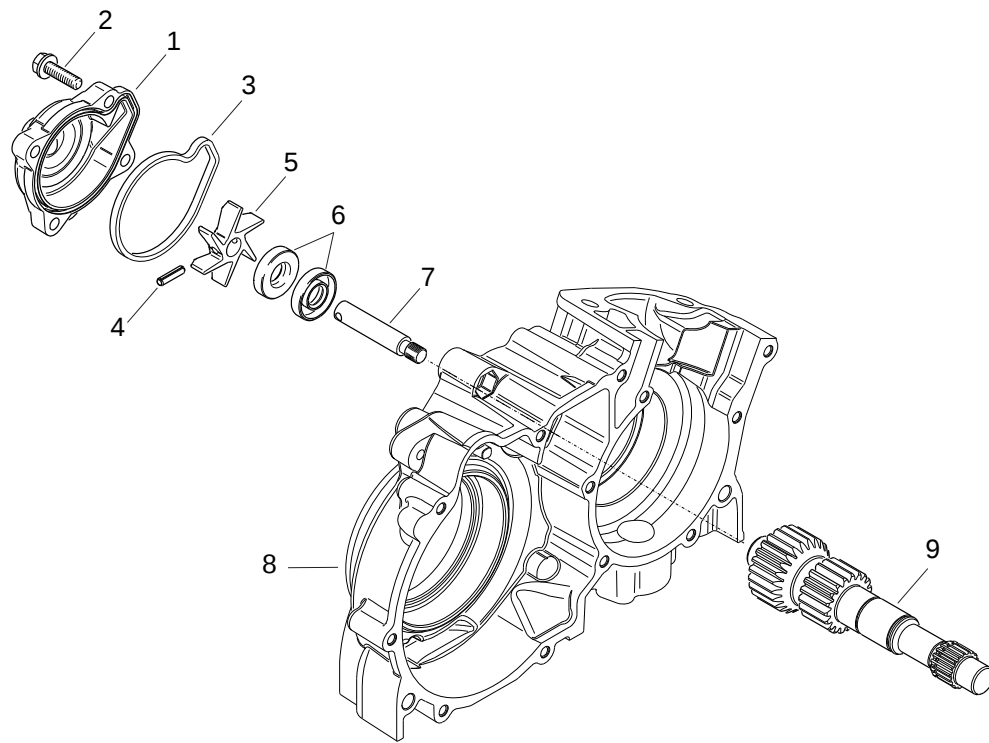
Instruction See [Figure 10](#).

Step	Procedure
1	Secure the impeller of the water pump assy. with spring pin 4x16.
2	Turn the water pump shaft to the left, move it in and secure it with LOCTITE 221.
3	Secure the water pump housing and shaped sealing ring to the housing using 4 tapite screws and LOCTITE 243. NOTE: Use only the special tapite screws as specified. These are self-tapping. Other types of screw may destroy the threads in the housing, thus resulting in leaks.
4	Assemble the cooling water hose.

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Graphic

Water pump



Part	Function
1	Water pump housing
2	Taptite screw M6x20
3	Rubber ring 61.5x1.5x3.5
4	Slotted spring pin 4x16
5	Impeller
6	Oil seals
7	Water pump shaft
8	Crank housing assy.
9	Primary shaft

Figure 10

K00193

7) Final tasks

Instruction

Step	Procedure
1	Using a funnel, pour the specified amount (0.9 litres) of coolant into the filling opening on the radiator.
2	Close the radiator cap.
3	Check that the cooling system is leak-free by warming up the engine.

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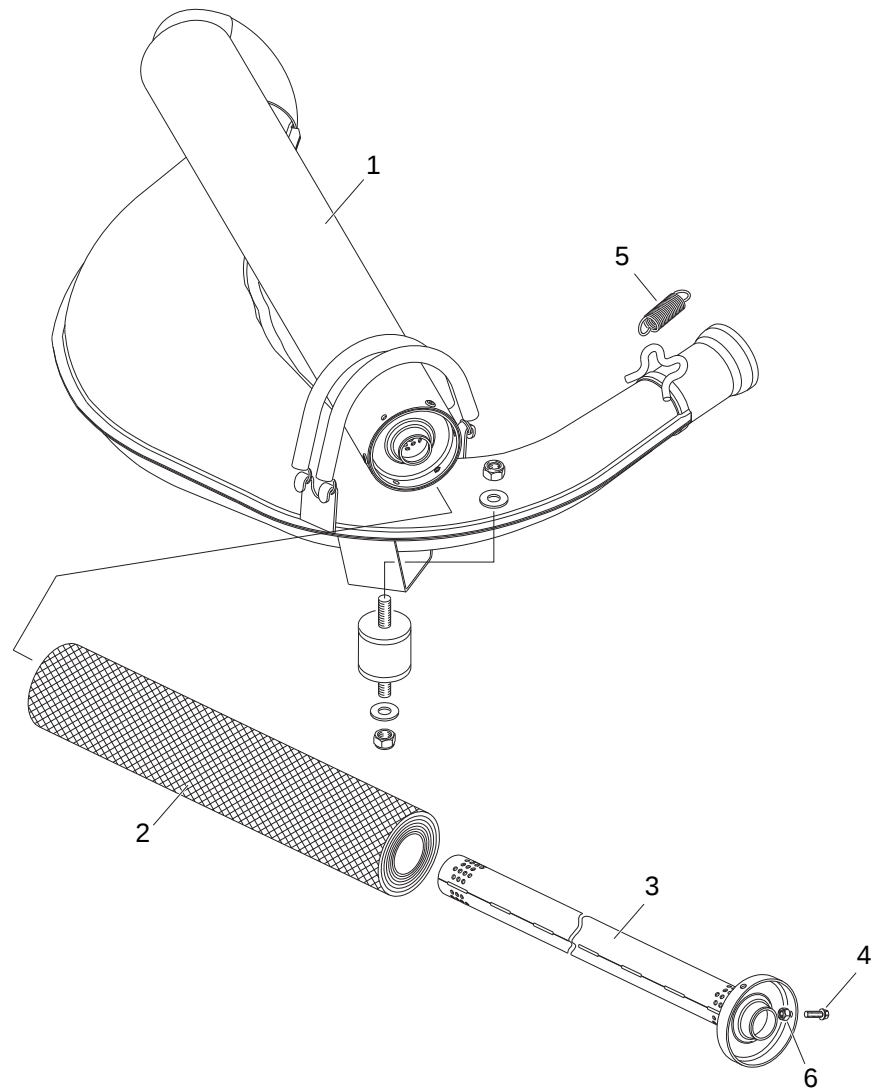
Chapter: 9**EXHAUST SYSTEM****Contents**

This chapter describes the removal and installation of the exhaust system module of the ROTAX 125 MAX DD2. The description is divided into sections.

Subject	Page
System description	Page 2
Removal of the exhaust system	Page 3
Checking the exhaust system	Page 3
Disassembling the exhaust system	Page 3
Assembly of exhaust system	Page 3
Installation of the exhaust system	Page 5

1) System description

Overview



Part	Function
1	Exhaust system
2	Isolating mat
3	Inside exhaust pipe
4	Hex. collar screw M4x12
5	Exhaust spring
6	Locknut M4

Figure 1

K00169

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2) Removal of the exhaust system

Safety instructions


WARNING

Danger of serious burns and scalding!
Allow engine to cool to ambient temperature before starting work. 1

Preparation

The following preparation is required before removal:

Step	Procedure
1	Removal of the exhaust system. See also Chap. 3 Section: 2.1).

2.1) Checking the exhaust system

NOTICE

A worn isolating mat has a major engine damage as result!

Instructions

See [Figure 2](#).

Step	Procedure
1	Check exhaust system for cracks.
2	Clean the ball socket of combustion residue and inspect for wear.
3	Check that the cover rivets are tightly seated.

2.2) Disassembling the exhaust system

General

NOTES: If the exhaust system noise increases, then the silencer baffle mat should be replaced.

Instructions

See [Figure 2](#).

Step	Procedure
1	Remove hex. collar screw M4x12 with lock nut.
2	Remove old isolating mat.

2.3) Assembling the exhaust system

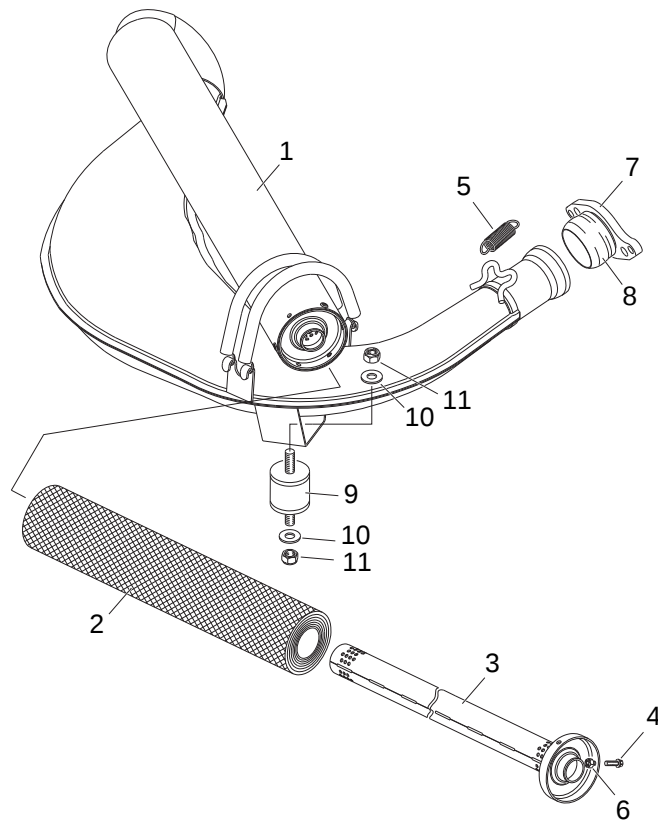
Instructions

See [Figure 2](#).

Step	Procedure
1	Roll up new isolating mat on the inside exhaust pipe.
2	Put both into the exhaust system.
3	Install cover with hex. collar screw M4x12 and new lock nut M4.

Graphic

Exhaust system



Part	Function
1	Exhaust system
2	Isolating mat
3	Inside exhaust pipe
4	Hex. collar screw M4x12
5	Exhaust spring
6	Cover
7	Exhaust flange
8	Exhaust inlet

Figure 2

K00170

3) Installation of the exhaust system

3.1) Assembly of exhaust system

Instructions

Step	Procedure
1	Tighten new self-locking nuts to the specified torque of 10 Nm on the exhaust system at the fastenings on the frame of the kart.
2	Lubricate the exhaust inlet with sealant.
3	Mount the exhaust springs on the engine exhaust flange with a suitable tool. NOTE: Check tightness of the exhaust pipe to the exhaust flange!

Graphic

Exhaust system

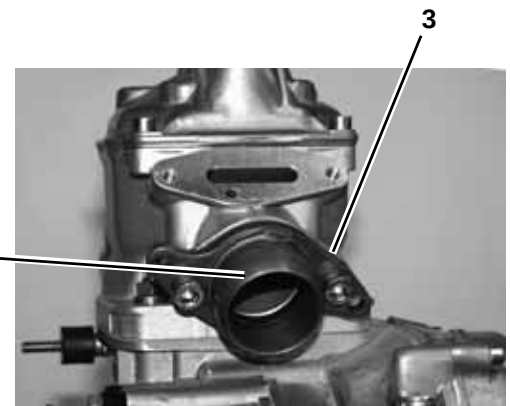
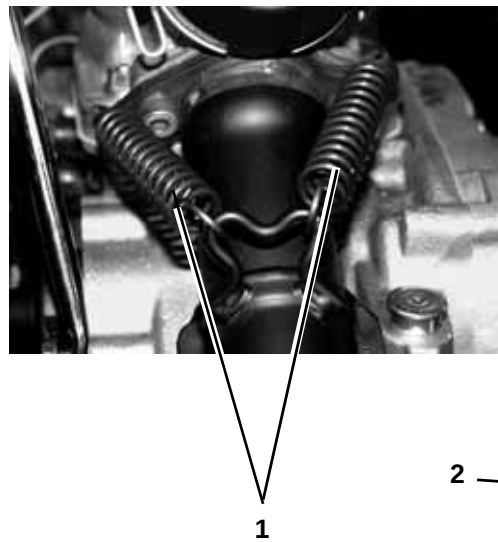


Illustration similar!

Teil	Funktion
1	Exhaust springs
2	Exhaust inlet
3	Exhaust flange

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