

**ROTAX®**  
NEW AGE KARTING



# Repair Manual

for ROTAX® Engine Type

125 MAX  
125 Junior MAX  
125 Mini MAX  
125 Micro MAX



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**TNr. 298061**

# BRP-Powertrain

## REPAIR MANUAL

### 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	<a href="#">Chapter INTRO</a>
List of effective pages	<a href="#">Chapter LEP</a>
Table of amendments	<a href="#">Chapter RV</a>
General note	<a href="#">Chapter 1</a>
Maintenance	<a href="#">Chapter 2</a>
Engine and Gearbox	<a href="#">Chapter 3</a>
Cubic capacity parts	<a href="#">Chapter 4</a>
Crank housing	<a href="#">Chapter 5</a>
Carburetor and Intake silencer	<a href="#">Chapter 6</a>
Centrifugal clutch and Starter gear	<a href="#">Chapter 7</a>
Radiator	<a href="#">Chapter 8</a>
Exhaust system	<a href="#">Chapter 9</a>

# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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# BRP-Powertrain

## REPAIR MANUAL

### Chapter: LEP

### LIST OF EFFECTIVE PAGES

chapter	page	date
INTRO	Title page	
	1	12 01 2010
	2	12 01 2010
LEP	1	12 01 2010
	2	12 01 2010
	3	12 01 2010
	4	12 01 2010
TOA	1	12 01 2010
	2	12 01 2010
1	1	12 01 2010
	2	12 01 2010
	3	12 01 2010
	4	12 01 2010
	5	12 01 2010
	6	12 01 2010
	7	12 01 2010
	8	12 01 2010
	9	12 01 2010
	10	12 01 2010
	11	12 01 2010
	12	12 01 2010
	13	12 01 2010
	14	12 01 2010
2	1	12 01 2010
	2	12 01 2010
	3	12 01 2010
	4	12 01 2010
	5	12 01 2010
	6	12 01 2010
	7	12 01 2010
	8	12 01 2010
	9	12 01 2010
	10	12 01 2010
	11	12 01 2010
	12	12 01 2010

chapter	page	date
3	1	12 01 2010
	2	12 01 2010
	3	12 01 2010
	4	12 01 2010
	5	12 01 2010
	6	12 01 2010
	7	12 01 2010
	8	12 01 2010
	9	12 01 2010
	10	12 01 2010
	11	12 01 2010
	12	12 01 2010
	13	12 01 2010
	14	12 01 2010
	15	12 01 2010
	16	12 01 2010
4	1	12 01 2010
	2	12 01 2010
	3	12 01 2010
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	5	12 01 2010
	6	12 01 2010
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	16	12 01 2010
	17	12 01 2010
	18	12 01 2010
	19	12 01 2010
	20	12 01 2010
	21	12 01 2010
	22	12 01 2010
	23	12 01 2010
	24	12 01 2010
	25	12 01 2010
	26	12 01 2010
	27	12 01 2010
	28	12 01 2010

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# BRP-Powertrain

## REPAIR MANUAL

chapter	page	date
4	29	12 01 2010
	30	12 01 2010
	31	12 01 2010
	32	12 01 2010
	33	12 01 2010
	34	12 01 2010
	35	12 01 2010
	36	12 01 2010
	37	12 01 2010
	38	12 01 2010
5	1	12 01 2010
	2	12 01 2010
	3	12 01 2010
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	29	12 01 2010
	30	12 01 2010
	31	12 01 2010
	32	12 01 2010
	33	12 01 2010
	34	12 01 2010
	35	12 01 2010
	36	12 01 2010
	37	12 01 2010
	38	12 01 2010

chapter	page	date
	39	12 01 2010
	40	12 01 2010
	41	12 01 2010
	42	12 01 2010
6	1	12 01 2010
	2	12 01 2010
	3	12 01 2010
	4	12 01 2010
	5	12 01 2010
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	22	12 01 2010
	23	12 01 2010
	24	12 01 2010
	25	12 01 2010

DK00021.fm

# BRP-Powertrain

## REPAIR MANUAL

chapter	page	date
7	26	12 01 2010
	27	12 01 2010
	28	12 01 2010
	29	12 01 2010
	30	12 01 2010
	31	12 01 2010
	32	12 01 2010
8	1	12 01 2010
	2	12 01 2010
	3	12 01 2010
	4	12 01 2010
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	8	12 01 2010
	9	12 01 2010
	10	12 01 2010
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	2	12 01 2010
	3	12 01 2010
	4	12 01 2010
	5	12 01 2010
	6	12 01 2010
	7	12 01 2010
	8	12 01 2010

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# BRP-Powertrain

## REPAIR MANUAL

### NOTES

DK00021.fm

# BRP-Powertrain

## REPAIR MANUAL

### Chapter: RV

### TABLE OF AMENDMENTS

no.	chapter	page	date of change	date of issue	signature
0	INTRO	all	12 01 2010		
0	LEP	all	12 01 2010		
0	TOA	all	12 01 2010		
0	1	all	12 01 2010		
0	2	all	12 01 2010		
0	3	all	12 01 2010		
0	4	all	12 01 2010		
0	5	all	12 01 2010		
0	6	all	12 01 2010		
0	7	all	12 01 2010		
0	8	all	12 01 2010		
0	9	all	12 01 2010		

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# BRP-Powertrain

## REPAIR MANUAL

### NOTES

# BRP-Powertrain

## REPAIR MANUAL

### 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.

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#### Table of contents

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

Subject	Page
General note	<a href="#">Page 3</a>
Abbreviations and terms used in this Manual	<a href="#">Page 5</a>
Safety notice	<a href="#">Page 7</a>
Safety information	<a href="#">Page 8</a>
Instruction	<a href="#">Page 10</a>
Technical documentation	<a href="#">Page 11</a>
Use for intended purpose	<a href="#">Page 12</a>
Technical data	<a href="#">Page 13</a>

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# BRP-Powertrain

REPAIR MANUAL

NOTES

# BRP-Powertrain

## REPAIR MANUAL

### 1) General note

<b>Purpose</b>	This Repair Manual is based on information and the state-of-knowledge of BRP-Powertrain of the product current at the date of issue.
<b>Documentation</b>	For additional information on engines, maintenance or parts, you can also contact your nearest authorized ROTAX®-Engine distributor.
<b>ROTAX Distributors</b>	ROTAX® Authorized Distributors for Kart Engines. See on the Internet at the official Homepage <a href="http://www.kart-rotax.com">www.kart-rotax.com</a> .
<b>Engine serial number</b>	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 <a href="#">Figure 1</a> .

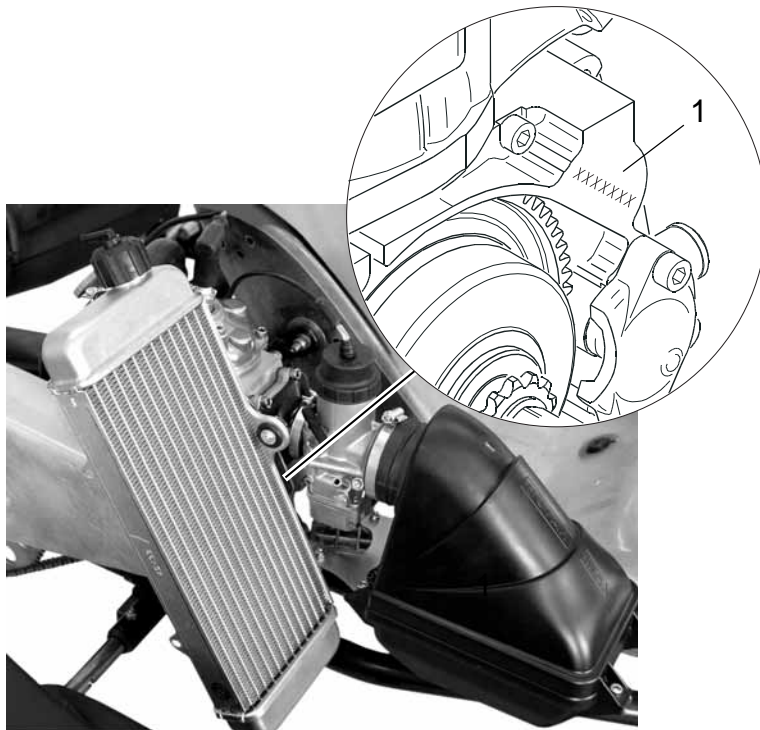


Figure 1

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# BRP-Powertrain

## REPAIR MANUAL

NOTES

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# BRP-Powertrain

## REPAIR MANUAL

### 2) Abbreviations and terms used in this Manual

#### Abbreviations

Abbreviation	Description
°C	Degrees Celsius (Centigrade)
°F	Degrees Fahrenheit
rpm	Revolutions per minute
125 MAX	see Manual (Type designation)
125 Junior MAX	see Manual (Type designation)
125 Mini MAX	see Manual (Type designation)
125 Micro MAX	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

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# BRP-Powertrain

REPAIR MANUAL

NOTES

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### 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.

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**Revision** BRP-Powertrain reserves the right at any time, and without incurring obligation, to remove, replace or discontinue any design, specification, feature or otherwise.

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**Measure** Specifications are given in the SI metric system with the USA equivalent in parenthesis.

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**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.

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### 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.

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#### 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.

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#### 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.

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#### 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.

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#### 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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# BRP-Powertrain

## REPAIR MANUAL

**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.

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**Torque wrench tightening**

**NOTICE**

If not specified otherwise, the threads are not lubricated when fastened.

Torque wrench tightening specifications must be strictly adhered to.

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# BRP-Powertrain

## REPAIR MANUAL

### 3.2) Instruction

<b>General note</b>	<p>Engines require instructions regarding their application, use, operation, maintenance and repair.</p> <p>Technical documentation and directions are useful and necessary complementary elements for personal instructions, but can by no means substitute theoretical and practical instructions.</p> <p>These instructions should cover explanation of the technical context, advice for operation, maintenance, use and operational safety of the engine.</p>
<b>Safety notice</b>	<p>In this technical Manual passages concerning safety are especially marked. Pass on safety warnings to other users!</p>
<b>Modifications</b>	<p>Non-approved modifications to the engine and associated components likewise releases BRP-Powertrain from its warranty obligations.</p>
<b>Accessories</b>	<p>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.</p>
<b>Spare parts</b>	<p><b>NOTICE</b> 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.</p> <p>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).</p>
<b>Tools</b>	<p><b>NOTICE</b> In principle use only tools and appliances which are either cited in the Manual or in the Illustrated Parts Catalog.</p>
<b>Engine</b>	<p>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.</p>

### 3.3) Technical documentation

<b>General note</b>	<p>The information contained is based on data and experience that are considered applicable for skilled mechanics under normal conditions.</p> <p>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.</p> <hr/>
<b>Status</b>	<p>The status of the Manuals can be determined with the aid of the table of amendments. The first column indicates the revision state.</p> <hr/>
<b>Replacement pages</b>	<p>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.</p> <hr/>
<b>Reference</b>	<p>Any reference to a document refers to the latest edition issued by BRP-Powertrain, if not stated otherwise.</p> <hr/>
<b>Illustrations</b>	<p>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.</p> <p>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.</p> <p>                      This number (e.g. 00277) is of no significance for the content.</p> <hr/>

### 3.4) Use for intended purpose

#### Safety note



Non-compliance can result in serious injuries or death!

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#### Use

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

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#### Maintenance and repair conditions

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.

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# BRP-Powertrain

## REPAIR MANUAL

### 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 <sup>3</sup>
Nominal power(max.) 125 MAX 125 Junior MAX 125 Mini MAX 125 Micro MAX	21 kW at 11.500 rpm 15 kW at 8.500 rpm 10 kW at 8.500 rpm 5 kW at 6.500 rpm
Torque (max.) 125 MAX 125 Junior MAX 125 Mini MAX 125 Micro MAX	21 Nm at 8.750 rpm 17 Nm at 8.500 rpm 12 Nm at 7.500 rpm 8 Nm at 5.500 rpm
Idle speed	1.500 rpm at 2000 rpm
Highest permissible speed 125 MAX 125 Junior MAX 125 Mini MAX 125 Micro MAX	13.500 rpm (at operation on the track, under load) 12.200 rpm (at operation on the track, under load) 11.500 rpm 10.500 rpm <b>NOTICE</b> Do not operate the engine without load!
Ignition unit	Contactless, DENSO digital coil ignition
Spark plug	DENSO iW 24 DENSO iW 27 DENSO iW 29 DENSO iW 31, M14x1.25
Electrode gap	0.45 - 0.7 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	0.6 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	0.05 l (= 50 ml) (for plastic AGR) 0.1 l (= 100 ml) (for steel AGR)
Clutch	Centrifugal clutch, in oil-bath
Engagement speed	approx. 4000 rpm

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Effectivity: 125 MAX DD2  
Edition 2 / Rev. 0

# Chapter 1

# BRP-Powertrain

## REPAIR MANUAL

Engine Type	125 MAX/125 Junior MAX/ 125 Mini MAX/125 Micro MAX
Power transmission from centrifugal clutch to the rear axle of the kart	Roller chain
Chain dimension	7.75 x 4.6 x 4.5
Number of teeth of the drive sprocket	11, 12, 13, 14, 15, 16 teeth
Weight (dry)	approx. 12 kg without intake silencer, carburetor, fuel pump, radiator, exhaust and battery.

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# BRP-Powertrain

## REPAIR MANUAL

### 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 aviation mechanic under normal working conditions.

#### Table of contents

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

Subject	Page
Maintenance	<a href="#">Page 3</a>
General note	<a href="#">Page 3</a>
Authorized personnel	<a href="#">Page 4</a>
Procedure notes	<a href="#">Page 5</a>
Consumable materials	<a href="#">Page 7</a>
Special tools	<a href="#">Page 9</a>
Visual inspection and servicing intervals	<a href="#">Page 11</a>



# BRP-Powertrain

REPAIR MANUAL

NOTES

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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.

# BRP-Powertrain

## REPAIR MANUAL

### 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.

#### 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:
<ul style="list-style-type: none"><li>- Type-specific training (for the applicable ROTAX Kart engine) which is approved by the national aviation authority and/or BRP-Powertrain.</li></ul>
<b>or</b>
<ul style="list-style-type: none"><li>- Experience in performing the task <b>and</b></li><li>- Formal instruction from a BRP-Powertrain authorized training facility <b>or</b></li><li>- "On-the-job" instruction by a BRP-Powertrain or authorized BRP-Powertrain Distributor representative.</li></ul>
Including:
<ul style="list-style-type: none"><li>- Suitable work environment to prevent contamination or damage to engine parts or modules.</li><li>- Suitable tools and fixtures as outlined in the ROTAX Repair Manual.</li><li>- Reasonable and prudent maintenance practices are utilized.</li></ul>

#### 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.

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#### 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.
- 

#### 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.

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#### 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.

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#### Tool

**NOTICE**

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

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#### 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.

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#### Cleaning of parts

**NOTICE**

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

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# BRP-Powertrain

## REPAIR MANUAL

<b>Removed parts</b>	<p>Before re-using disassembled parts, clean, check and refit them as per instructions.</p> <p>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.</p> <hr/>
<b>Measurements</b>	<p>When making low tolerance measurements (<math>s &lt; 0.1</math> mm) and in measuring bearing and housing components, the temperature of the components and their surroundings must be in the range 20 °C-25 °C.</p> <hr/>
<b>Nuts</b>	<p>Once loosened, <b>always</b> replace self-securing nuts!</p> <hr/>
<b>Sealing rings, O-rings</b>	<p>At reassembly of the engine, replace all sealing rings, gaskets, securing elements, O-rings and oil seals.</p> <hr/>
<b>Re-assembly</b>	<p>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.</p> <hr/>

# BRP-Powertrain

## REPAIR MANUAL

### 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	<b>LOCTITE 243 blue</b> , medium-duty screw securing agent	10 ml (0.003 gal (US))
2	899788	<b>LOCTITE 648 geen</b> , high strength screw securing agent	5 ml (0.001 gal (US))
3	297434	<b>LOCTITE Anti-Seize 15378</b> , for the prevention of fretting corrosion	50 g (0.11 lb)
4	297433	<b>MOLYKOTE G-N</b> , Lubricating paste	100 g (0.22 lb)
5	897161	<b>MOLYKOTE 111</b> long-term lubricant for shaft seal	100 g (0.22 lb)
6	897330	<b>Lithium-base grease or Dow Corning</b> to prevent leakage current	250 g (0.55 lb)
7	297368	<b>SILASTIC 732</b> , multi-purpose one-component silicon-based sealing compound	100 g (0.22 lb)

# BRP-Powertrain

## REPAIR MANUAL

No.	part no.	Description, Application	Qty.
8	296160	<b>Engine gasket kit</b>	1
-	n.a.	<p><b>Cleaning agents</b></p> <p><b>NOTICE</b> Use only approved cleaning agents (e.g. kerosine, var-sol, etc.) for cleaning all metal parts.</p> <p>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.</p>	

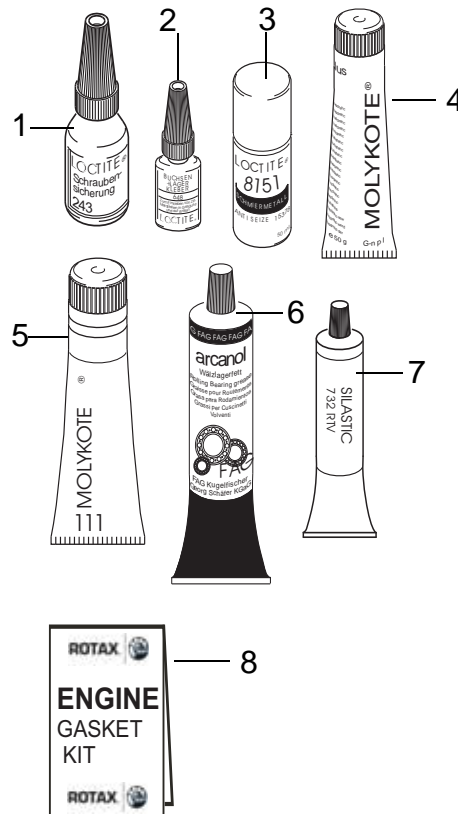
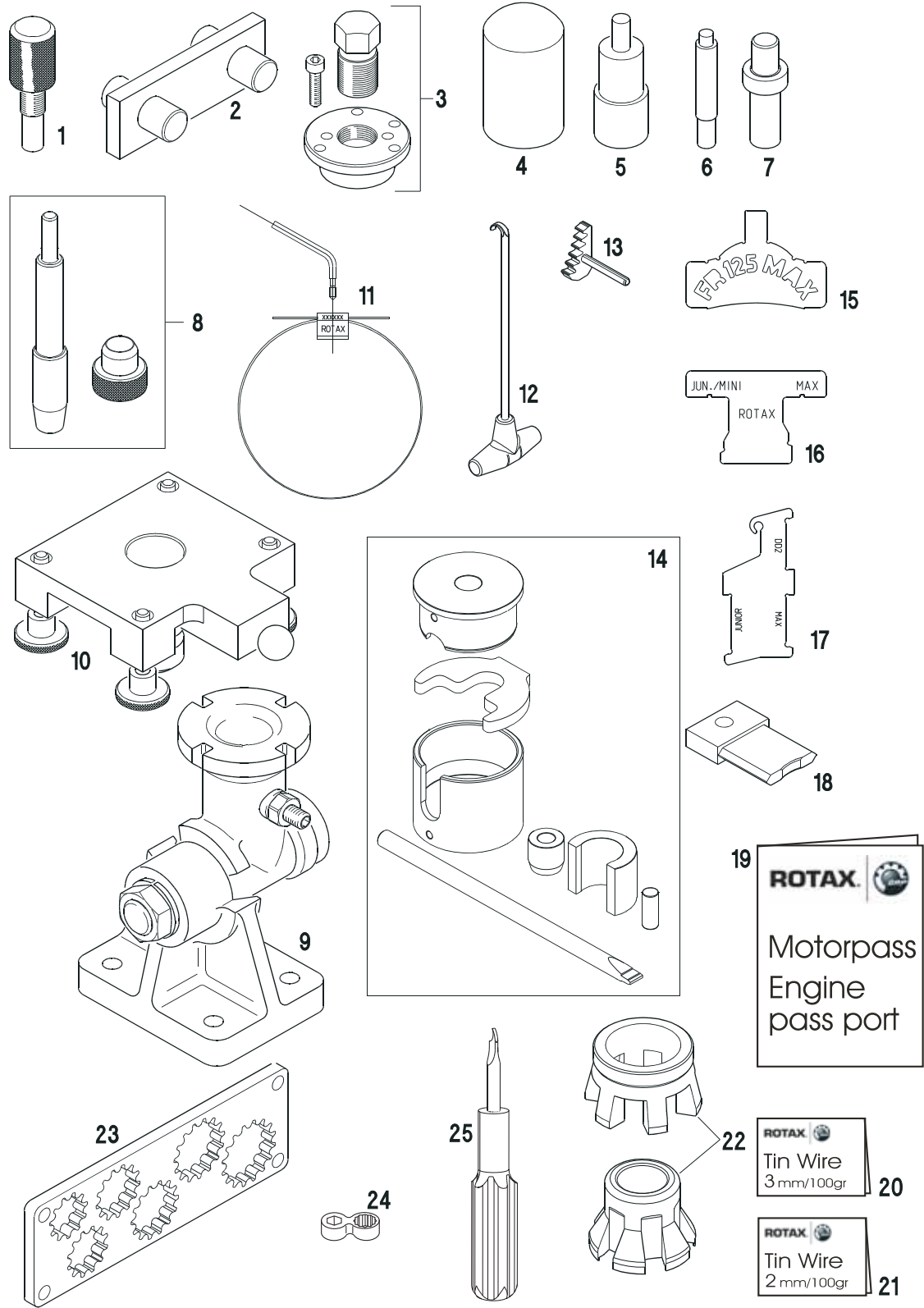


Figure 1

K00003

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1.5) Special tools



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# BRP-Powertrain

## REPAIR MANUAL

No.	part no.	Description
1	277380	Fixation tool for crankshaft
2	277362	Fixation, tool for sprocket
3	276016	Puller assy.
4	676010	Insertion sleeve
5	676021	Insertion jig
6	676030	Insertion jig
7	676040	Insertion jig
8	676035	Insertion tool
9	877930	Trestle support assy.
10	676052	Fixing plate for engine
11	297040	ROTAX-Seal
12	251680	Spring hook
13	676205	Fixation tool assy.
14	276050	Crankshaft repair jig
15	277390	Combustion chamber insert template
16	277395	Exhaust port height template
17	277397	Exhaust port height template
18	277030	Exhaust valve gauge
19	297240	Engine passport
20	580132	Tin wire 3 mm
21	580130	Tin wire 2 mm
22	276070	Assembly tool bellow spring exhaust
23	277364	Fixation, tool for sprocket
24	676110	Wrench adapter 11/8
25	976380	Monohook circlip remover

Figure 2

K00001

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# BRP-Powertrain

## REPAIR MANUAL

### 2) Visual inspection and servicing intervals of the engine components

Safety note



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	
<b>1.) General</b>		
Inspect spark plug, replace if necessary.	Inspect before every operation of vehicle	
Replace spark plug.	Every 25 hours of operation	
<b>2.) Cooling system</b>		
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	
<b>3) Carburetor and intake silencer</b>		
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)	
<b>4) Fuel system</b>		
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	
<b>5) Exhaust system</b>		
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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# BRP-Powertrain

## REPAIR MANUAL

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

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## Chapter: 3

### ENGINE AND GEARBOX

**Contents**

This chapter describes the disassembly and assembly of the engine and gearbox module of the ROTAX 125 MAX engine. The description is divided into sections.

Subject	Page
System description	<a href="#">Page 3</a>
Preparation	<a href="#">Page 5</a>
Dismantling the exhaust system	<a href="#">Page 5</a>
Dismantling the ignition unit	<a href="#">Page 6</a>
Removal of the fuel line	<a href="#">Page 8</a>
Removal of the cable bowden	<a href="#">Page 9</a>
Removal of the engine from the Kart chassis	<a href="#">Page 10</a>
Positioning the engine on the trestle mounting plate	<a href="#">Page 11</a>
Preparation	<a href="#">Page 13</a>
Remove the engine from the trestle mounting plate	<a href="#">Page 13</a>
Installation of the engine in the Kart chassis	<a href="#">Page 13</a>
Installation of the fuel line	<a href="#">Page 14</a>
Installation of the cable bowden	<a href="#">Page 14</a>
Installation of the ignition system	<a href="#">Page 15</a>
Installation of the exhaust system	<a href="#">Page 16</a>
Starting the engine	<a href="#">Page 16</a>

# BRP-Powertrain

## REPAIR MANUAL

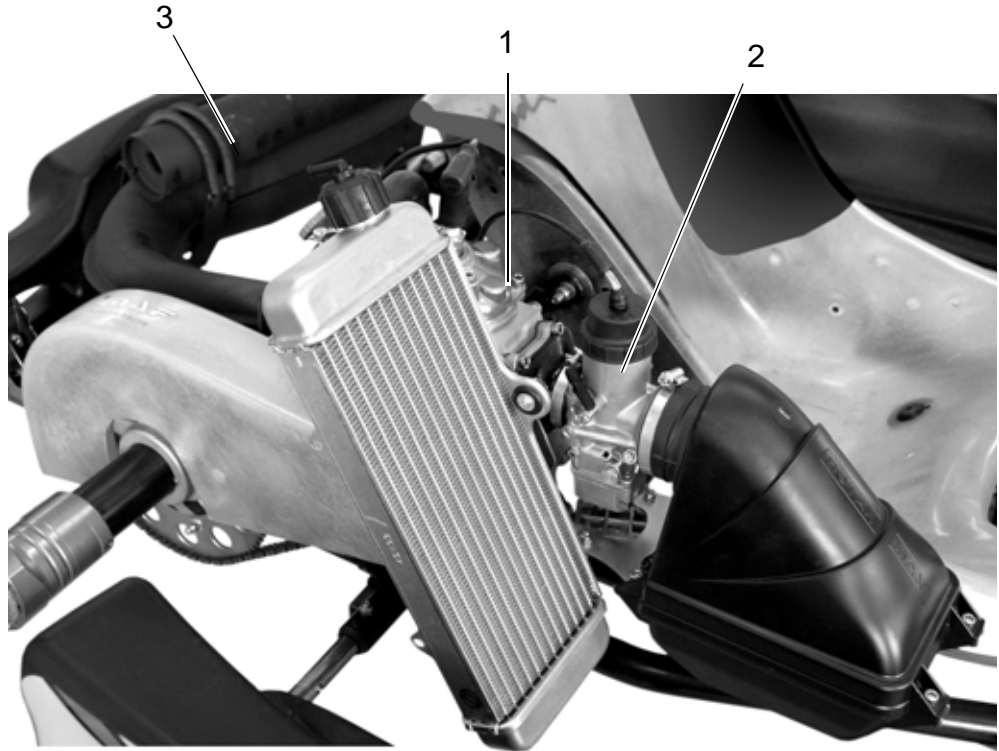
### NOTES

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**1) System description**

Overview

Engine in installed status



Part	Function
1	Engine
2	Carburetor
3	Exhaust system

*Figure 1*

K00128

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# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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## 2) Preparation

### Safety instructions



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



Danger of electric shock!  
Switch off ignition and remove the ignition key. Disconnect the negative battery terminal.

**NOTES:** When disconnecting the battery leads proceed as follows - first disconnect the negative pole, then the positive pole. Remember that the ignition unit is under high voltage (35 kV) during operation, therefore removal of the spark plug lead during operation is not permissible.

### Special tools

The following special tools and equipment are required:

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

## 2.1) Dismantling the exhaust system

### Instructions

See [Figure 2](#).

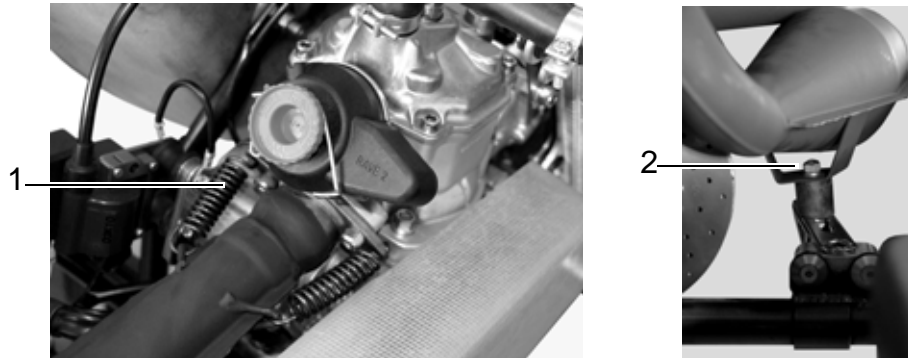
Proceed as follows to dismantle the exhaust system:

Step	Procedure
1	Disconnect tension springs (1) with spring hooks (part no. 251680).
2	Loosen the nuts (2) on the shock mountings and remove the exhaust system.



Graphic

Exhaust system



Part	Function
1	Tension springs
2	Nuts (shock mountings)

Figure 2

K00126, K00127

2.2) Dismantling the ignition unit

General

**NOTICE**

Always pull on the connector, not on the cable.

Instructions

Proceed as follows to dismantle the ignition system:

Step	Procedure
1	Pull the spark plug connector (1) from the spark plug. Minimum removal force 30 Nm.
2	Detach the plug connections on the ignition coil (4), the spark generator (3) and the electric starter (2) by pressing the catch on the wiring harness.
3	Free the ground cable for the pick up (3) at 2 nuts (5).
4	Free the starter ground cable (7) at the locknuts (5) and washer (6).
5	Free the ignition transformer (2) at the locknut (5), washer (6) and 2 round buffers (8).
6	Loosen and remove the starter (4) at the two screws (9).

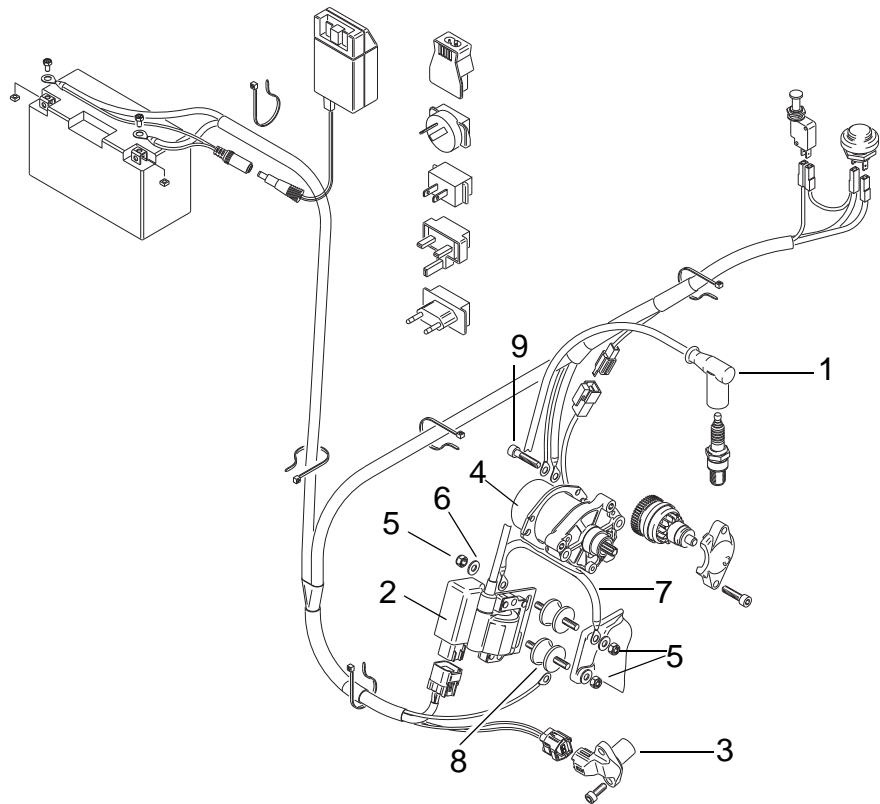
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# BRP-Powertrain

## REPAIR MANUAL

Graphic

Ignition unit



Part	Function
1	Spark plug connector
2	Ignition coil
3	Pick up
4	Starter
5	M6 locknut
6	6.4 washer
7	Ground wire
8	Round buffer
9	Cyl. screw M6x35

Figure 3

K00030

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### 2.3) Removal of the fuel line

**Safety instructions**



Danger of explosion and ignition!  
 Overflowing and spilt 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.

**Instructions**

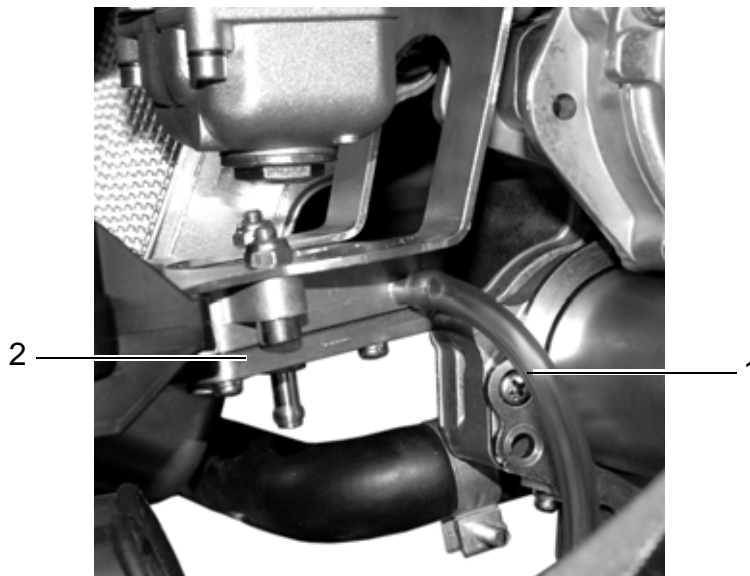
See [Figure 4](#).

Proceed as follows to remove the fuel hose:

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

**Graphic**

Fuel hose



Part	Function
1	Fuel line
2	Fuel pump

Figure 4

K00030

**2.4) Removal of the carburetor cable**

**General**

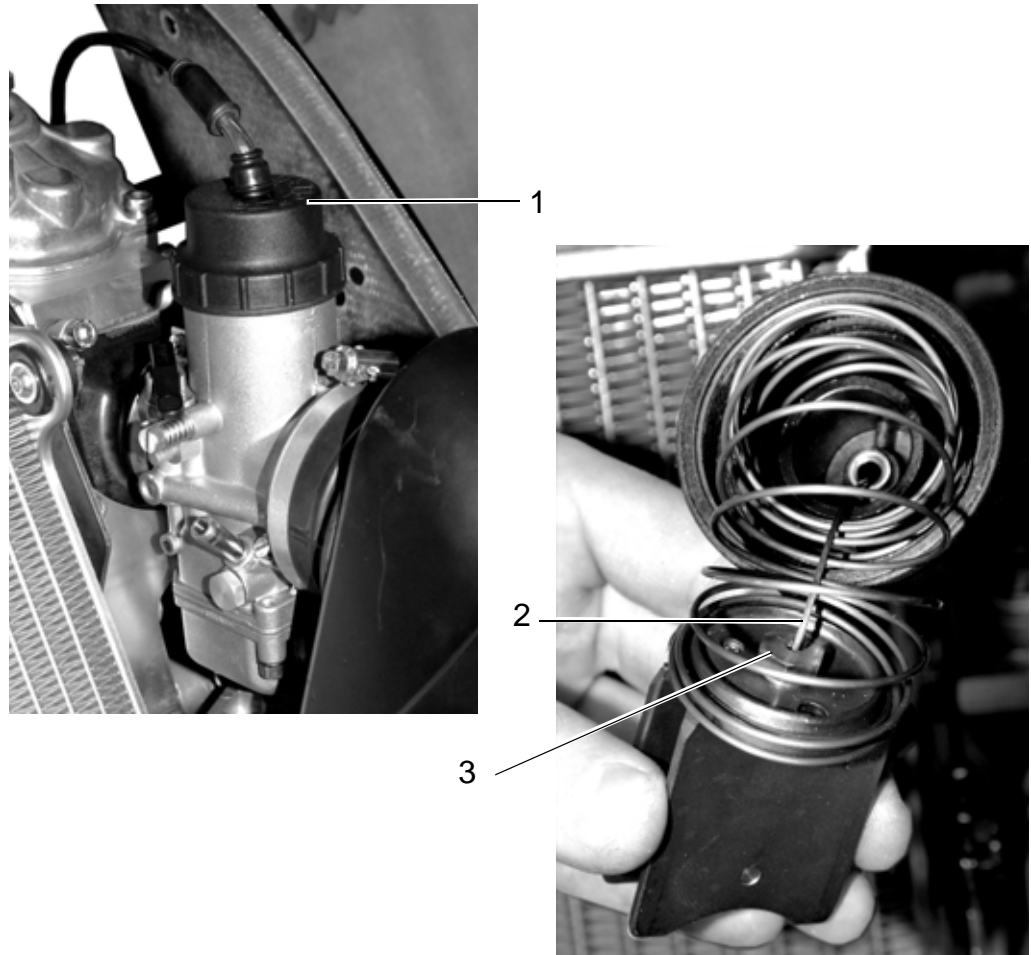
See [Figure 5](#).

Proceed as follows to remove the carburetor cable:

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

**Graphic**

Carburetor cable



Part	Function
1	Carburetor cover
2	Cable bowden
3	Nipple screw

*Figure 5*

K00133, K00134

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# BRP-Powertrain

## REPAIR MANUAL

### 2.5) Removal of the engine from the Kart chassis

#### General

See [Figure 6](#).

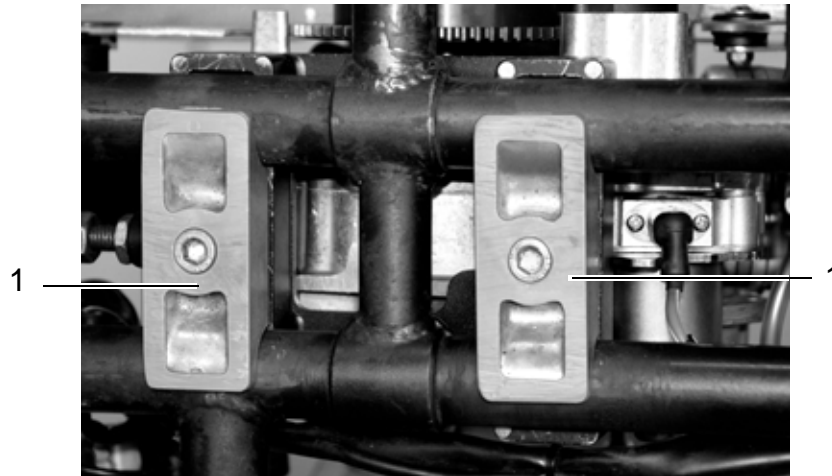
NOTES: Loosen the engine mount clamps (1) following the manufacturer's instructions.

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

- Centrifugal clutch
- Cylinder with combustion chamber insert and cylinder head cover
- Exhaust valve
- Reed valve
- Piston
- Starter

#### Graphic

Engine support



Part	Function
1	Engine mount clamps

*Figure 6*

K00129

## BRP-Powertrain

### REPAIR MANUAL

## 2.6) Positioning the engine on the trestle mounting plate

General See [Figure 7](#).

**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 tools and equipment are required:

Part number	Description	Use
Part no. 877390	Trestle mounting plate (trestle support)	Engine
Part no. 676052	Fixing plate for engine	Engine

Instructions

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

Step	Procedure
1	Unscrew the base plate from the engine, position the engine on the trestle mounting plate (1), and fix it securely with the 4 fixing screws.

Graphic

Trestle mounting plate

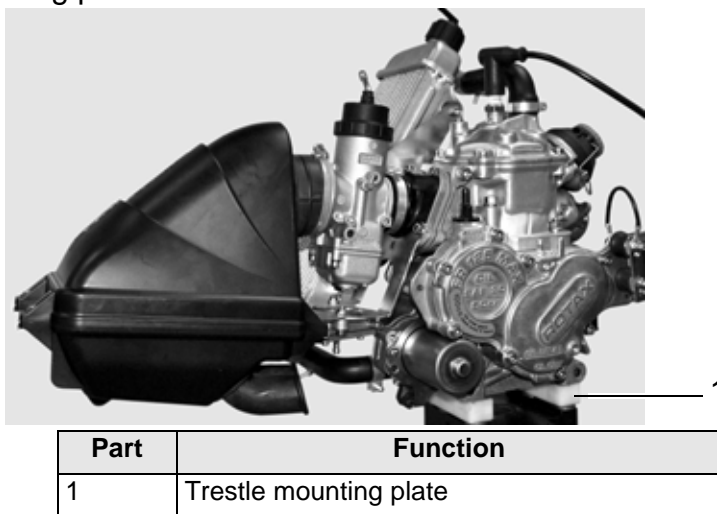


Figure 7

K00108

# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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### 3) Preparation

**Safety instructions**

**NOTICE**

Clean and inspect disassembled parts and assemble them in accordance with the instructions. All screws and nuts must always be clean. Inspect surfaces and threads for damage. In case of doubt use new screws and nuts. See also Chap. 2 Section: 1.3).

---

#### 3.1) Removing the engine from the trestle mounting plate

**Instructions**

Proceed as follows to remove the engine from the trestle mounting plate:

Step	Procedure
1	The engine is removed in reverse order of positioning. See also Chap. 3 Section: 2.6).

---

#### 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 for the engine the installation instructions of the chassis manufacturer must be read and understood.

---



**3.3) Installation of the fuel line****Safety instructions**

Danger of explosion and ignition!  
Overflowing and spilt 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.

**Instructions**

Proceed as follows to install the fuel hose:

Step	Procedure
1	The installment of the fuel line is identical to removal in reverse order. See also Chap. 3 Section: 2.3).

**3.4) Installation of the carburetor cable****Instructions**

Proceed as follows to install the cable bowden:

Step	Procedure
1	The installment of the cable bowden is identical to removal in reverse order. See also Chap. 3 Section: 2.4).

### 3.5) Installation of the ignition system

**General**

See [Figure 8](#).

**NOTES:**

On the sand-cast model the pick up for the ignition unit is fastened to the housing with 2 M6x16 cyl. screws. On the die-cast model the pick up for the ignition unit is fastened to the housing with 2 M6x16 taptite screws (= self-tapping screw).

**NOTES:**

If the two taptite screws are installed in a previously used housing, make sure that the screws are correctly positioned in the previously tapped threads in the housing.

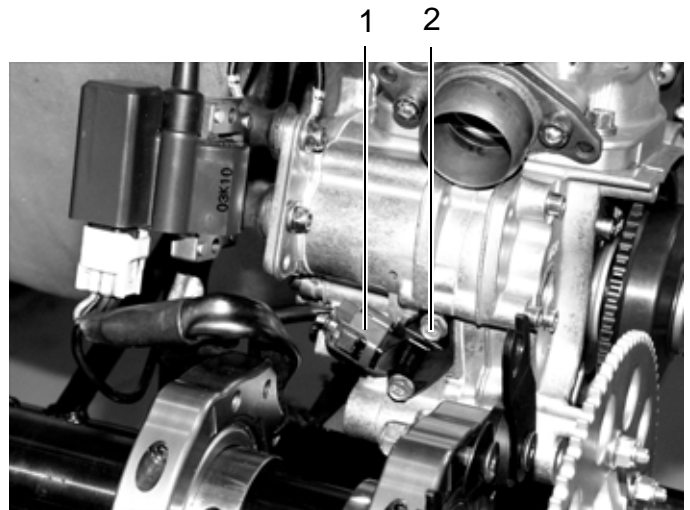
**Instructions**

Proceed as follows to install the ignition system:

Step	Procedure
1	Position the pick up on the housing with the wiring harness terminal pointing in the direction of the gearbox.
2	Fasten the pick up for the ignition system with the two cyl. screws or taptite screws to the specified tightening torque of 10 Nm (90 in.lb).

**Graphic**

Ignition unit



Part	Function
1	Pick up
2	Taptite screw or cyl. screw

Figure 8

K00131, K00130

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### 3.6) Installation of the exhaust system

**Instructions**

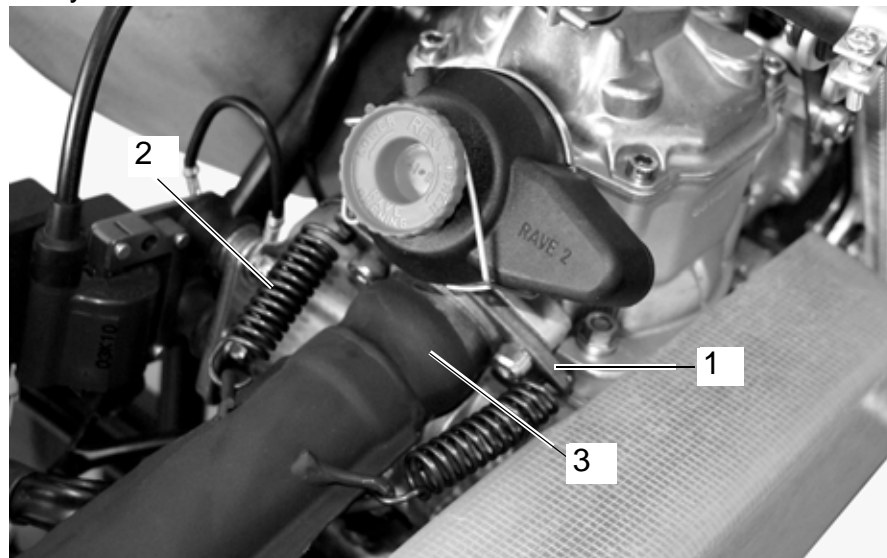
See [Figure 9](#).

Proceed as follows to install the exhaust system:

Step	Procedure
1	Coat the exhaust socket (1) with sealant.
2	Attach springs (2) to the engine exhaust socket (1) with suitable tool (part no. 251680).
3	Attach the exhaust system to the fasteners on the framework of the Kart and use new self-locking nuts.
4	Check that the exhaust (3) for secure attachment on the exhaust socket (1).

**Graphic**

Exhaust system



Part	Function
1	Exhaust socket
2	Spring
3	Exhaust

Figure 9

K00126

### 3.7) Starting the engine

**Safety instructions**



Non-compliance can result in serious injury or death!  
 Before starting the engine, the operating instructions for the engine and the operating instructions of the chassis manufacturer must be read and understood.

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# BRP-Powertrain

## REPAIR MANUAL

### Chapter: 4

## CYLINDER COMPONENTS

#### Contents

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

Subject	Page
System description	<a href="#">Page 3</a>
Cylinder removal	<a href="#">Page 5</a>
Removal of cylinder	<a href="#">Page 5</a>
Dismantling cylinder	<a href="#">Page 6</a>
Removal of spark plug	<a href="#">Page 6</a>
Removal of cylinder head cover	<a href="#">Page 6</a>
Removal of coolant thermostat	<a href="#">Page 6</a>
Removal of combustion chamber insert	<a href="#">Page 6</a>
Removal of exhaust socket	<a href="#">Page 8</a>
Removal of the carburetor socket and reed valve	<a href="#">Page 8</a>
Removal of exhaust valve (125 MAX only)	<a href="#">Page 9</a>
Removal of piston	<a href="#">Page 11</a>
Inspection of cylinder parts	<a href="#">Page 13</a>
Inspection of cylinder	<a href="#">Page 13</a>
Inspection of piston and piston ring	<a href="#">Page 14</a>
Inspection of spark plug	<a href="#">Page 17</a>
Inspection of cylinder head cover	<a href="#">Page 18</a>
Inspection of combustion chamber insert	<a href="#">Page 18</a>
Inspection of exhaust socket	<a href="#">Page 19</a>
Inspection of carburetor flange and reed valve	<a href="#">Page 20</a>
Inspection of exhaust valve (125 MAX only)	<a href="#">Page 21</a>
Cylinder assembly	<a href="#">Page 23</a>
installation of exhaust valve (125 MAX only)	<a href="#">Page 23</a>
Installation of piston	<a href="#">Page 27</a>
Installation of piston pin	<a href="#">Page 27</a>
Cylinder installation	<a href="#">Page 29</a>
Installation of exhaust socket	<a href="#">Page 30</a>
Installation of the reed valve and carburetor socket	<a href="#">Page 31</a>
Installation of combustion chamber insert	<a href="#">Page 33</a>
Installation of cylinder head cover	<a href="#">Page 33</a>
Inspection and adjustment of "squich gap"	<a href="#">Page 35</a>
Installation of the spark plug	<a href="#">Page 37</a>

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# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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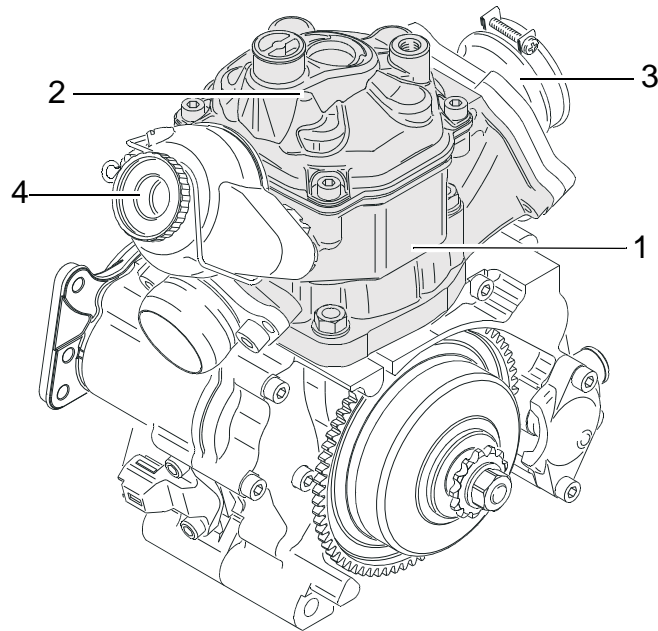
# BRP-Powertrain

## REPAIR MANUAL

### 1) System description

Overview

Position on the engine



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

Figure 1

K00010

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# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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## 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.
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 taptite screws (8) on the thermostat retaining bracket (9).
2	Remove the thermostat from the thermost holder (10).
3	Remove the compression spring (11).

### 2.2.4) Removal of combustion chamber insert

Combustion chamber insert

See [Figure 2](#).

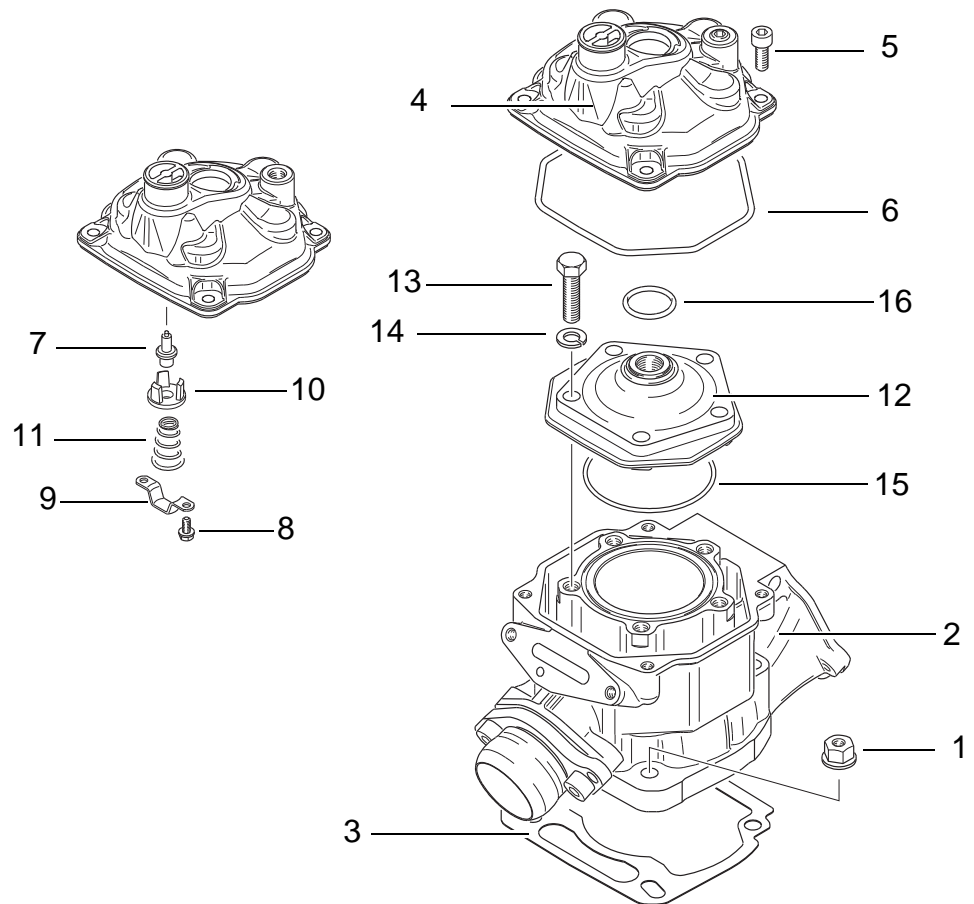
Step	Procedure
1	Remove the combustion chamber insert (12) by unscrewing the 5 hex screws (13) crosswise the lock washer (14).
2	Lift away the combustion chamber insert with lower (15) and upper O-rings (16).

# BRP-Powertrain

## REPAIR MANUAL

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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# BRP-Powertrain

## 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](#).

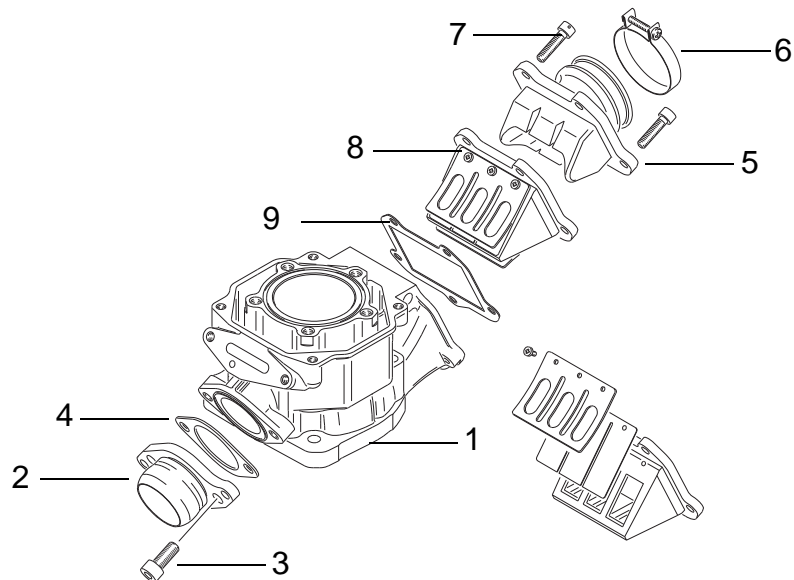
Step	Procedure
1	Remove the exhaust socket (2) from the cylinder (1) by unscrewing the 2 cyl. screws (3).
2	Remove the gasket (4).

### 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



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# BRP-Powertrain

## REPAIR MANUAL

Part	Function
1	Cylinder
2	Exhaust socket
3	Cyl. screw M8x20
4	Gasket
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 (125 MAX only)

#### 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.

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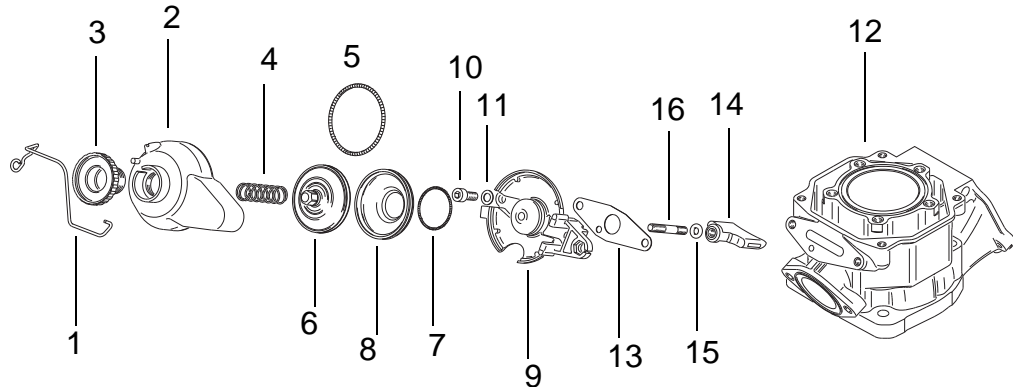
# BRP-Powertrain

## REPAIR MANUAL

Step	Procedure
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

### Removal of exhaust valve (125 MAX only)



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

DK00026.fm

### 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:

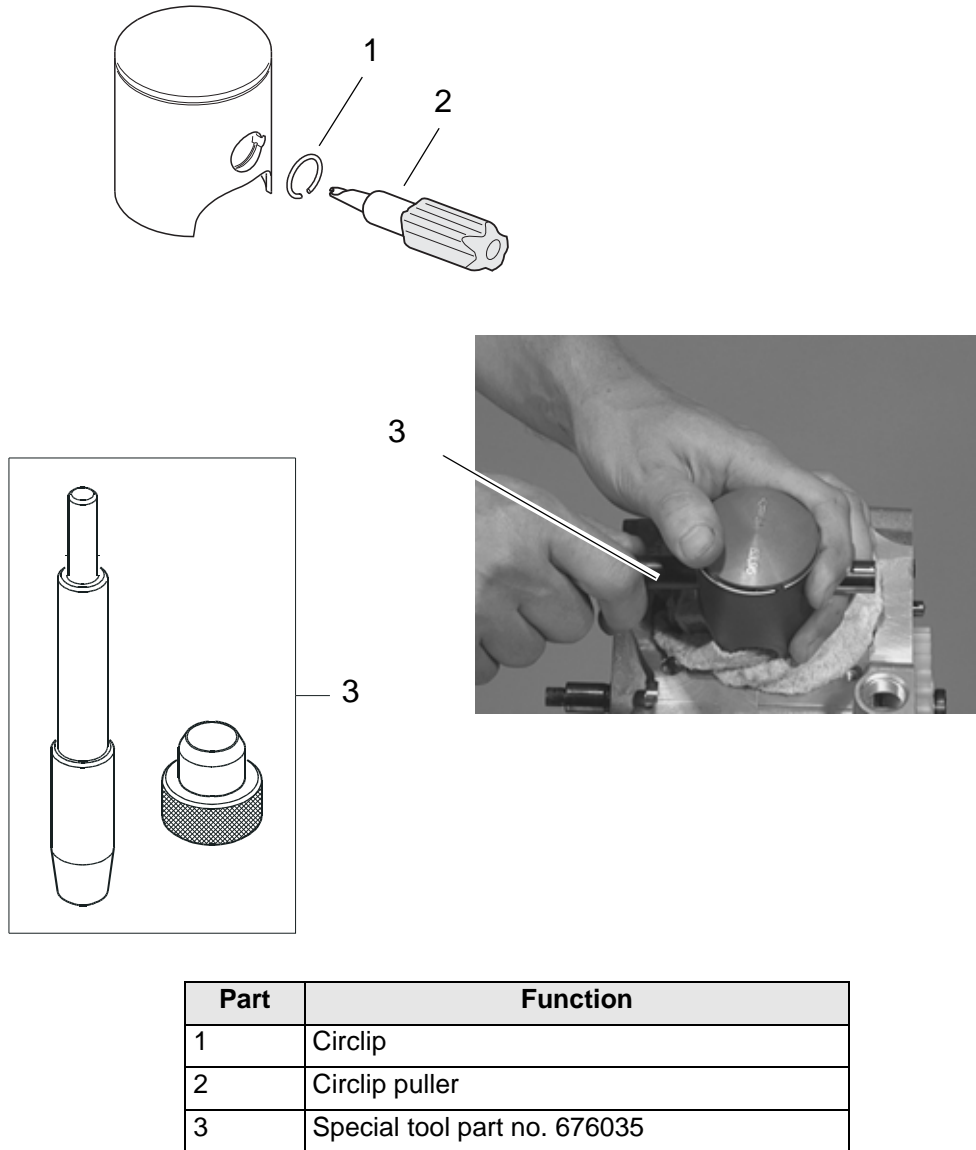
Step	Procedure
1	Pull out the circlip (1) with the circlip puller (3). Use safety glasses!
2	Press the piston rod out of the piston and con rod with the point of the special tool (3).

# BRP-Powertrain

## REPAIR MANUAL

Graphic

Piston



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

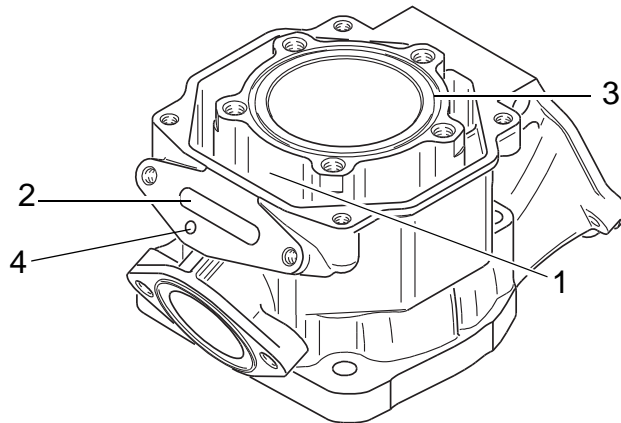
Instructions

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

DK00026.fm



# BRP-Powertrain

## REPAIR MANUAL

### 3.2) Inspection of piston and piston ring

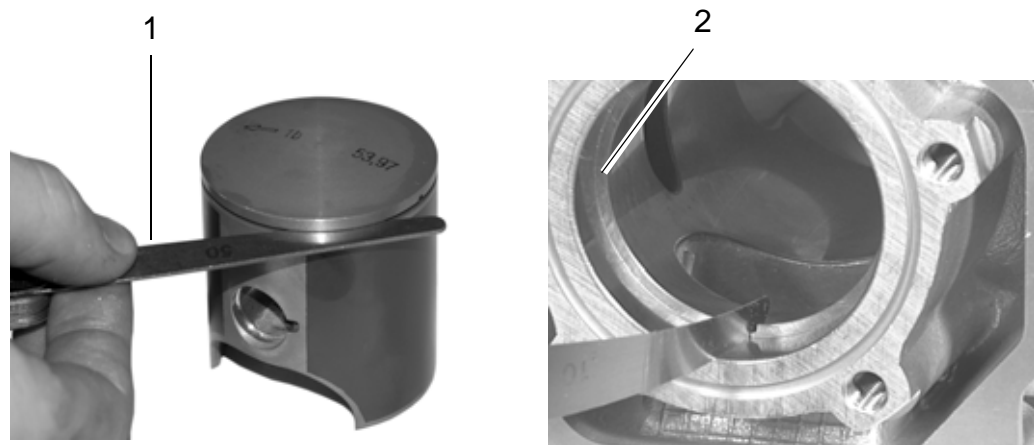
Instructions

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



Part	Function
1	Feeler gauge
2	Piston ring

Figure 7

K00137,K00052

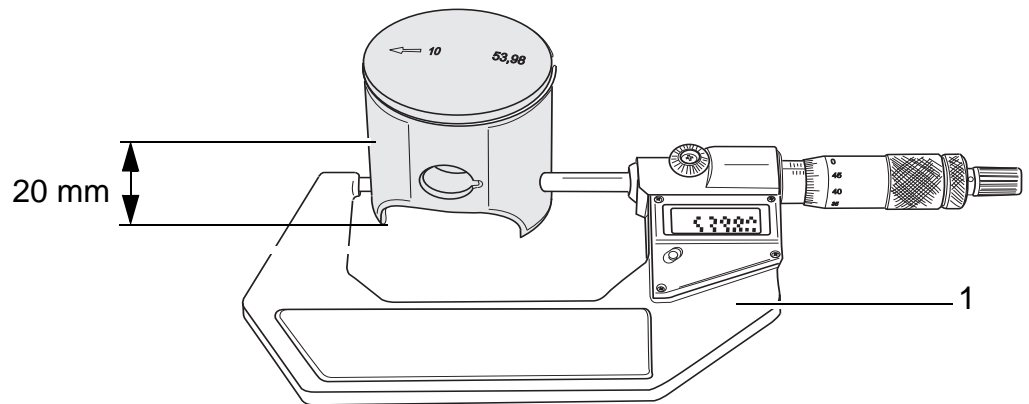
# BRP-Powertrain

## 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

DK00026.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.

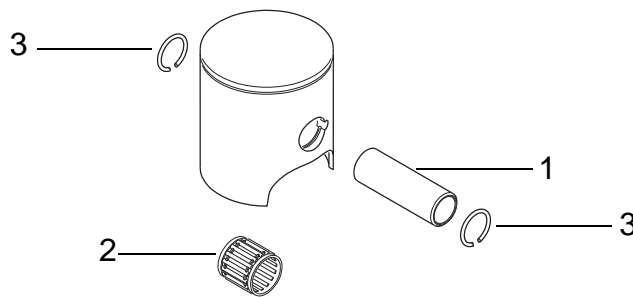
### Piston and cylinder classification

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

DK00026.fm

### 3.3) Inspection of spark plug

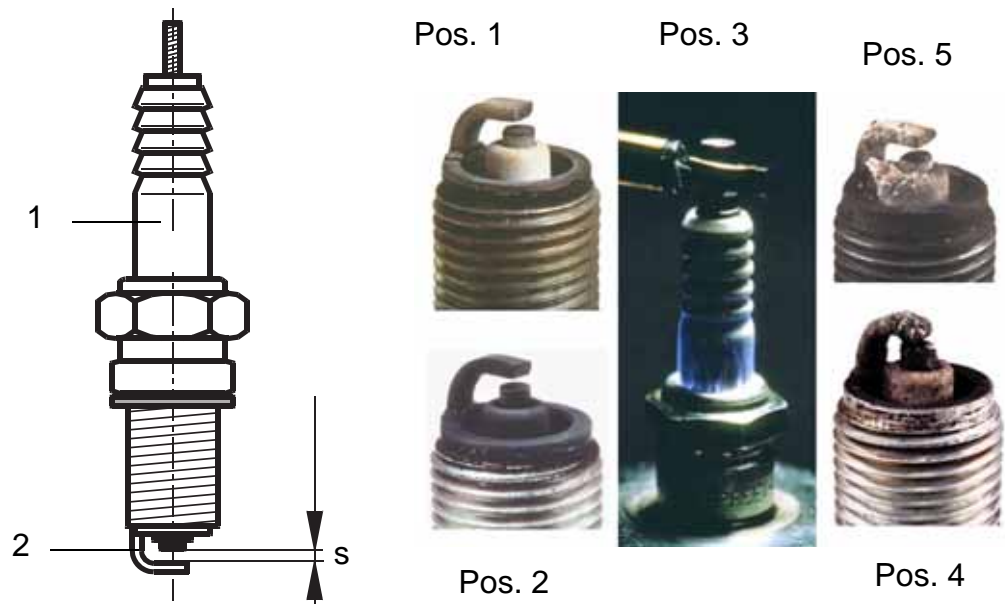
Instructions

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
	<b>NOTICE</b> 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 $0.7 \text{ mm}$ .

Graphic

Spark plug



Part	Function
1	Spark plug
2	Electrode

Figure 10

K00031, K00073

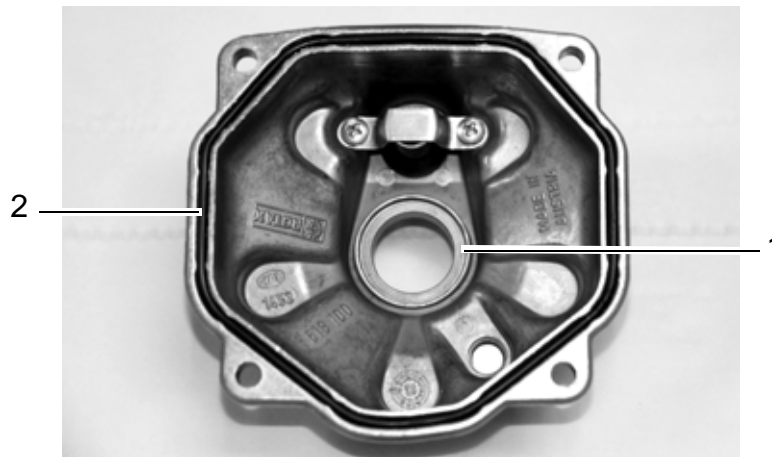
DK00026.fm

### 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

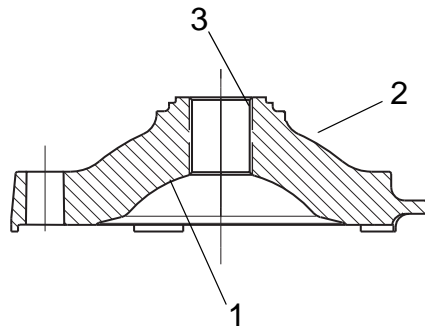
Instructions See [Figure 12](#).

NOTES: The sealing area of the combustion chamber insert is slightly tapered from  $\varnothing$  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.

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Graphic Combustion chamber insert



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

Figure 12

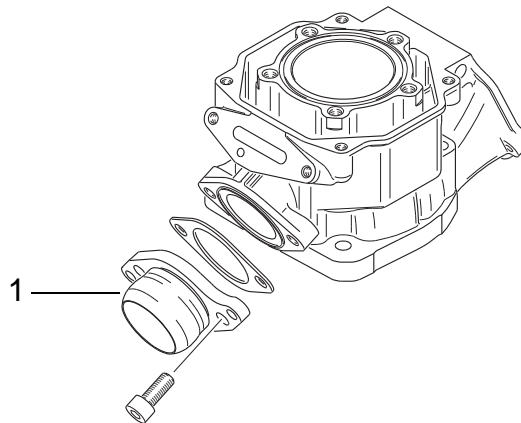
K00029

### 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

DK00026.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).

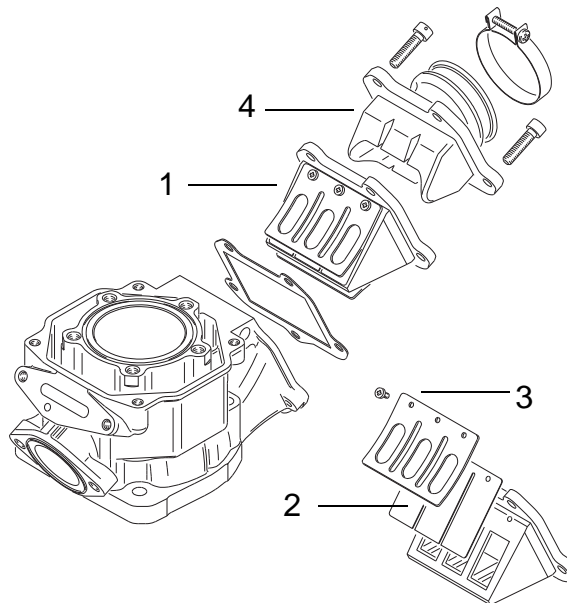
Instructions

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 pental (2) for cracks or damage.
3	Check the reed pental (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

DK00026.fm

# BRP-Powertrain

## REPAIR MANUAL

### 3.8) Inspection of exhaust valve (125 MAX only)

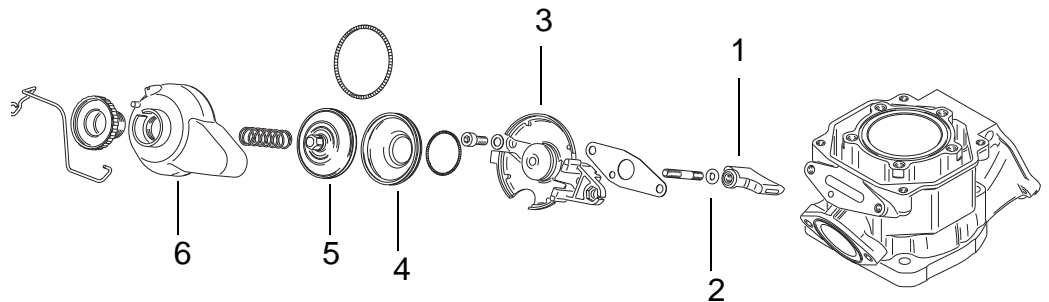
Instructions

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

Removal of exhaust valve (125 MAX only)



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

Figure 15

K00023

DK00026.fm



# BRP-Powertrain

## REPAIR MANUAL

### NOTES

DK00026.fm

4) Cylinder assembly

4.1) Installation of exhaust valve (125 MAX only)

**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

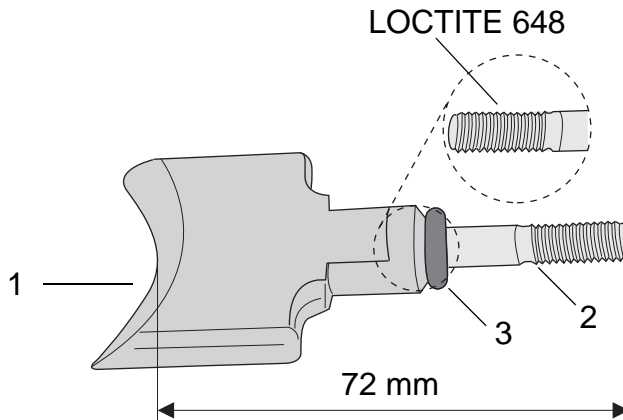
**Exhaust valve** See [Figure 16](#).

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

DK00026.fm

# BRP-Powertrain

## REPAIR MANUAL

Exhaust valve,  
gasket, valve rod  
housing

See [Figure 17](#).

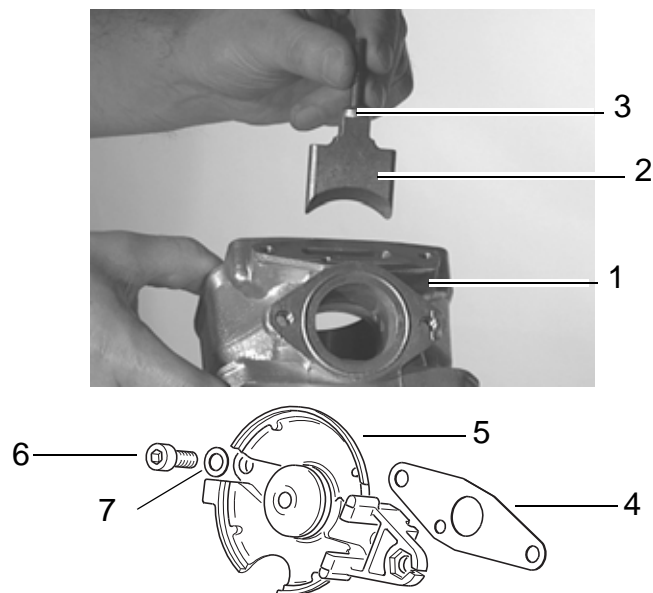
Step	Procedure
4	Insert exhaust valve into the slot in the cylinder (1). Pay attention on the installation direction!
5	Position the gasket (4), making sure that the impulse bore on the cylinder is not covered. Note the installation direction!
6	Insert the valve rod housing (5) with the cutout facing 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

DK00026.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.

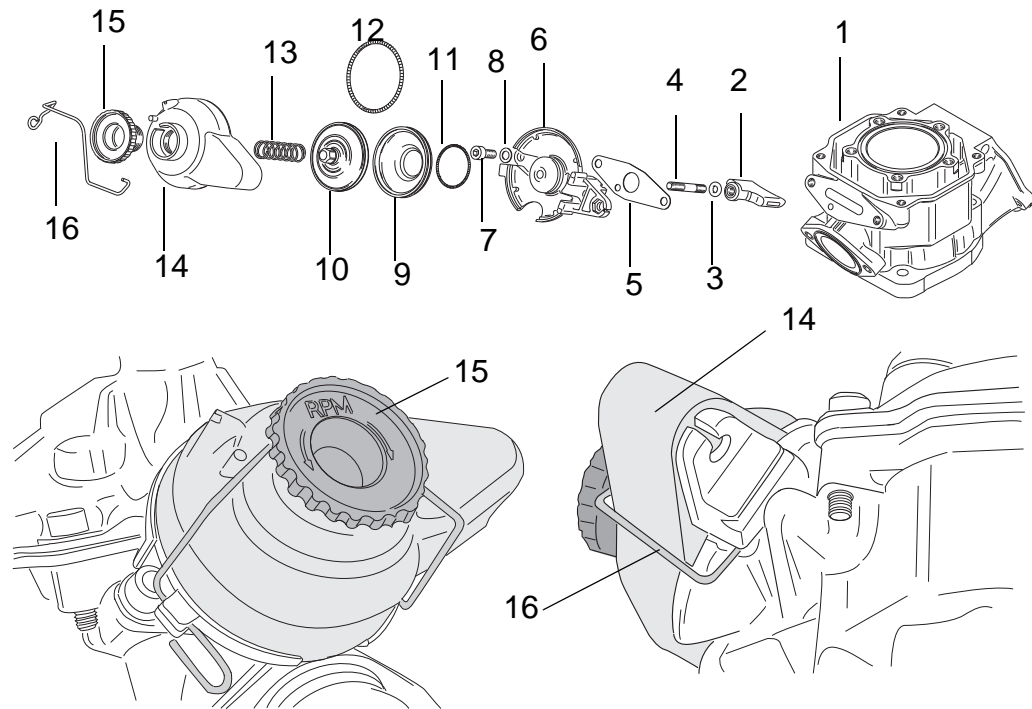
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# BRP-Powertrain

## REPAIR MANUAL

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	Bellows
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

DK00026.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.e.	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	<p><b>NOTICE</b> 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.</p>
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 con rod.
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.

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# BRP-Powertrain

## REPAIR MANUAL

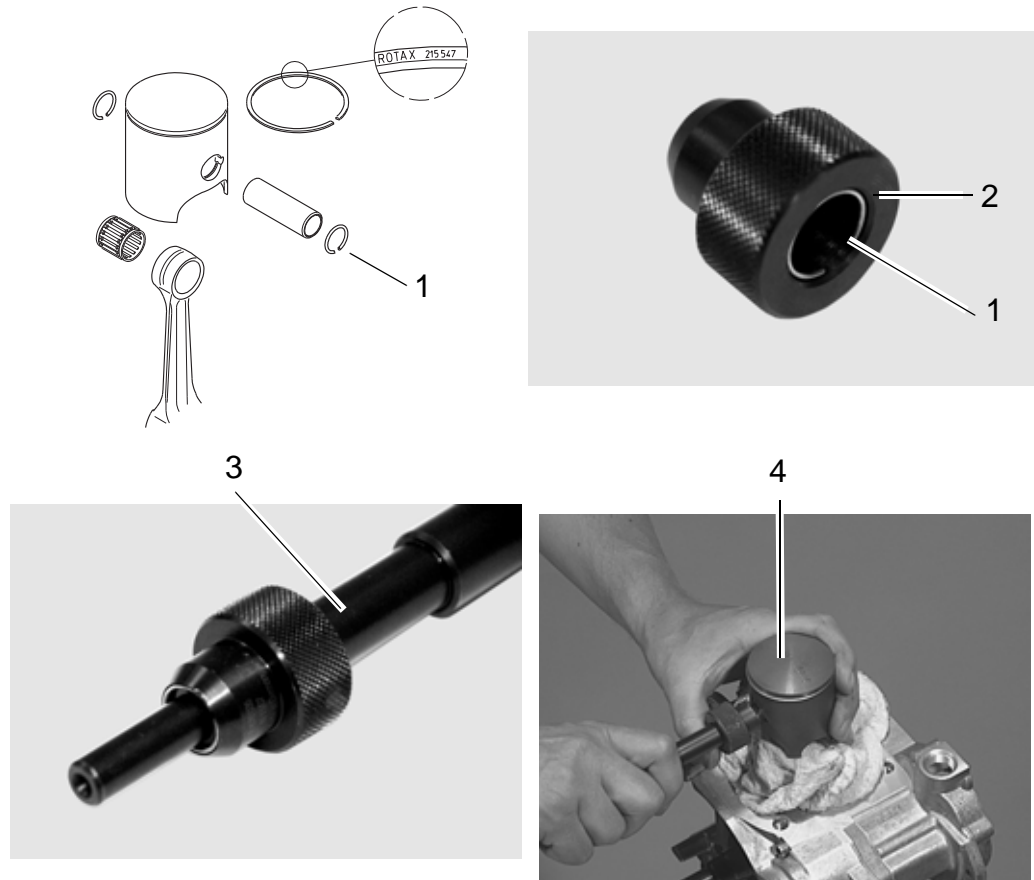
NOTES: The installation tool centers itself in the piston pin.

**NOTICE**

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

Graphic

Piston pin



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

Figure 19

K00028, K00100, K00101, K00059

**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.

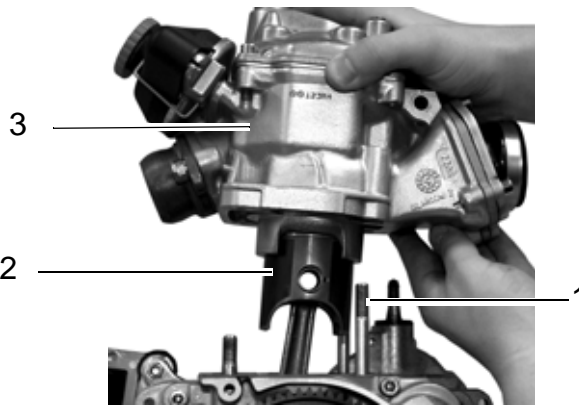
**Special tools** The following special tools and equipment are required:

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	<b>NOTICE</b> 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



Part	Function
1	Stud bolts
2	Piston
3	Cylinder

*Figure 20*

K00102

DK00026.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

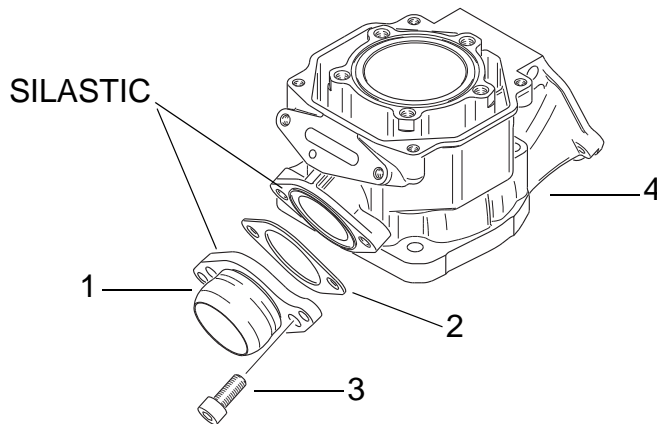
**Instructions**

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.

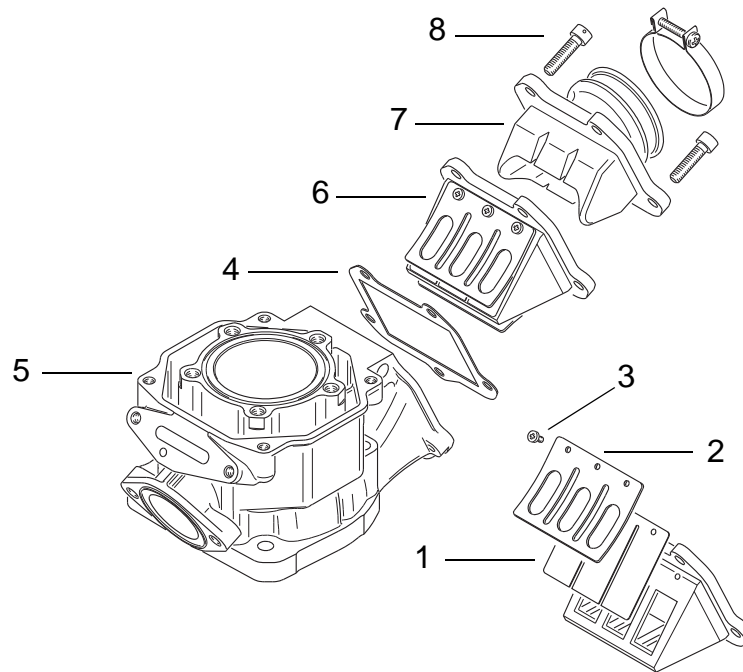
Step	Procedure
1	Attach the reed petal (1) and the valve detent (2) to the valve guide using recessed head screws (3). Use LOCTITE 243 to lock the screws.
2	Position the gasket (4) on the cylinder (5).
3	Position the reed valve (6) and carburetor flange (7) and fasten with 5 fillister screws (8). Tightening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

# BRP-Powertrain

## REPAIR MANUAL

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

# BRP-Powertrain

## REPAIR MANUAL

### 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).

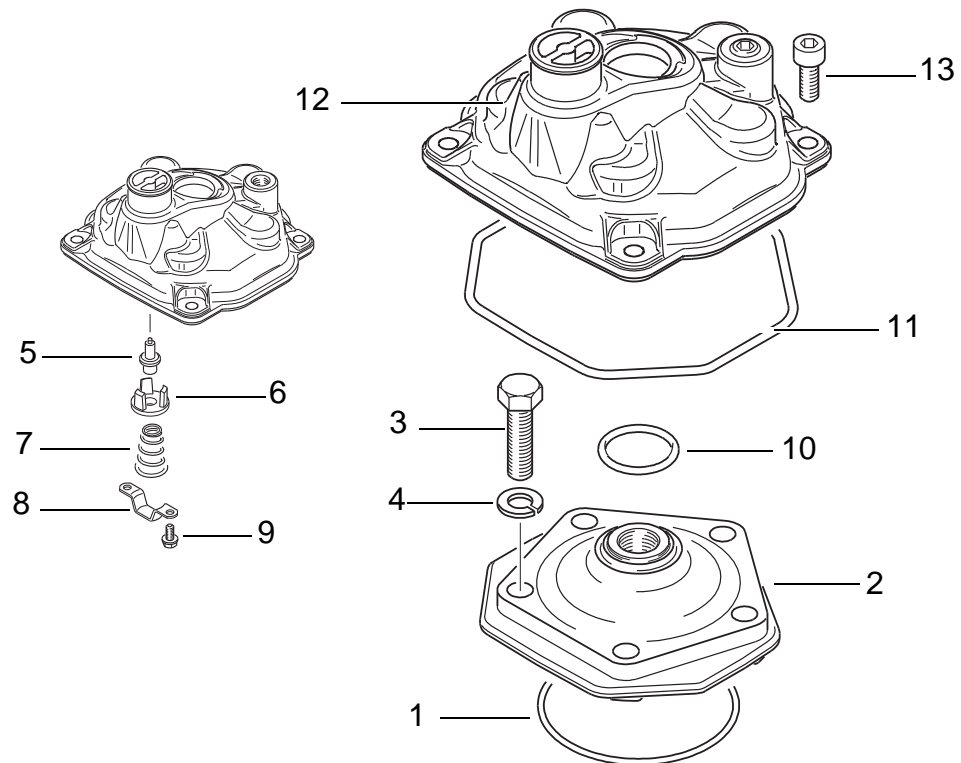
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# BRP-Powertrain

## REPAIR MANUAL

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

DK00026.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	Rotate crankshaft by hand until the piston is approx. 5 mm below TDC.
2	Right thickness of solder 2.0 mm (for 125 MAX only) 3.0 mm (for 125 Junior MAX only) 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.
3	Rotate the starter gear assembly by hand over the TDC position. <b>NOTES:</b> This will crush the solder between the piston and the combustion chamber insert.
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. <b>NOTES:</b> A vernier calliper with an accuracy of 1/100 mm is required for this measurement.
5	<b>NOTICE</b> The squeeze edge must be within the specified tolerance range.  1.05 mm + 0.25 mm (125 MAX only) 1.45 mm + 0.25 mm (125 Junior MAX only)

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

# BRP-Powertrain

## REPAIR MANUAL

**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

#### Engine model: 125 MAX

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

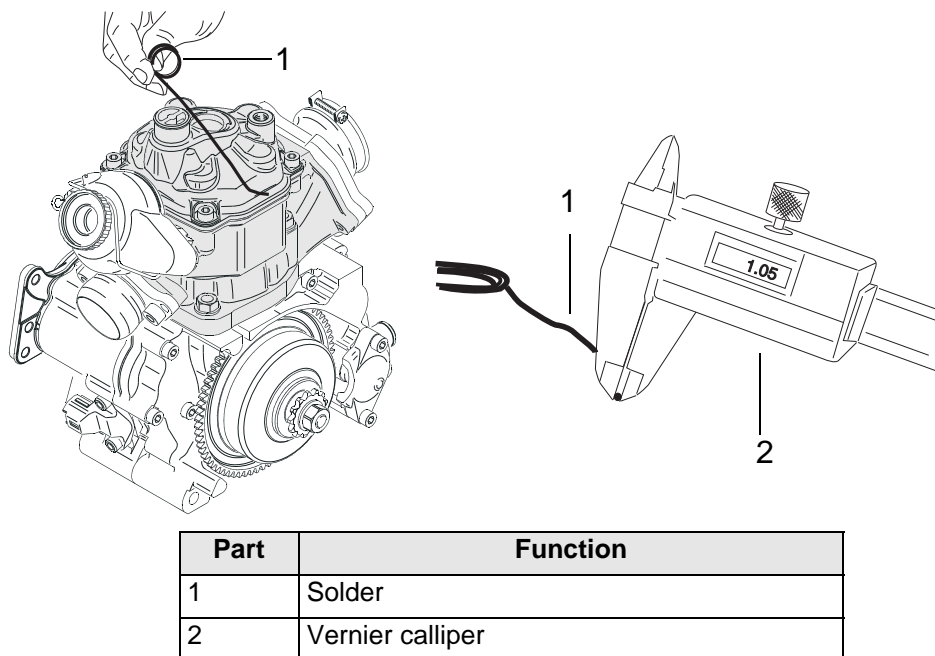


Figure 24

K00075,K00076

# BRP-Powertrain

## REPAIR MANUAL

### 4.9) Installation of the spark plug

#### General

#### NOTES:

The following spark plugs are approved by BRP-Powertrain:

Denso IW 24-31, Denso IW 27 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).

---



# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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# BRP-Powertrain

## REPAIR MANUAL

### Chapter: 5 CRANKCASE

#### Contents

This chapter describes the removal and installation of the crankcase of the ROTAX 125 MAX engine. The description is divided into sections.

Subject	Page
System description	<a href="#">Page 3</a>
Removal of the crankcase	<a href="#">Page 5</a>
Remove water pump and balance gears	<a href="#">Page 5</a>
Disassemble crankcase	<a href="#">Page 7</a>
Remove the crankshaft	<a href="#">Page 9</a>
Remove the bearing and oil seals for shaft	<a href="#">Page 10</a>
Con rod set - Repair set	<a href="#">Page 14</a>
Disassemble crankshaft	<a href="#">Page 14</a>
Inspect crankshaft	<a href="#">Page 18</a>
Crankshaft out of round	<a href="#">Page 20</a>
Assembly of crankshaft	<a href="#">Page 21</a>
Crankcase-inspection of components	<a href="#">Page 25</a>
Inspection of water pump drive	<a href="#">Page 25</a>
Inspection of balance shaft drive	<a href="#">Page 27</a>
Inspection of balance shaft	<a href="#">Page 27</a>
Inspection of crankcase	<a href="#">Page 29</a>
Assembly of crankcase	<a href="#">Page 31</a>
Installation of bearing and oil seal for shaft	<a href="#">Page 31</a>
Assembly of crankshaft, water pump and balance shaft	<a href="#">Page 35</a>
Screw case halves together	<a href="#">Page 36</a>
Installation of crankcase	<a href="#">Page 39</a>
Installation of balance and water-pump shaft drive	<a href="#">Page 39</a>

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# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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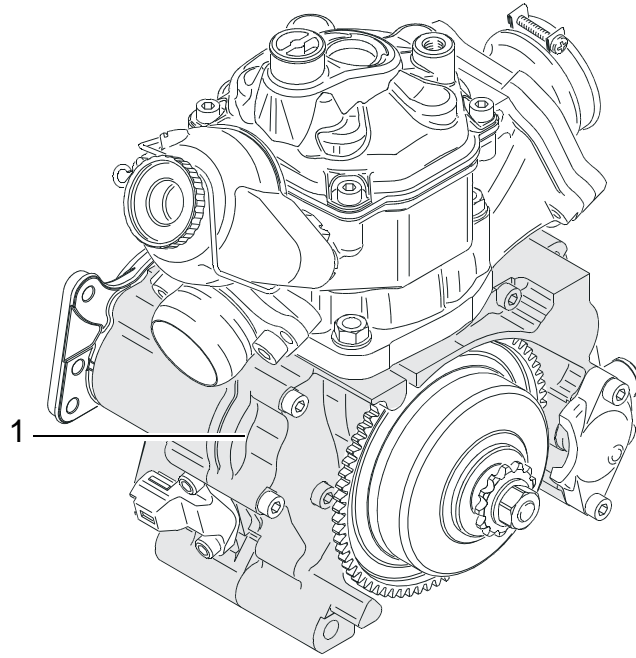
# BRP-Powertrain

## REPAIR MANUAL

### 1) System description

Overview

Position on the engine



Part	Function
1	Crankcase

Figure 1

K00138

DK00027.fm

# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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### 2) Removal of the crankcase

#### Safety instructions



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



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 preparation is required before removal:

Step	Procedure
1	Removal of ignition system. See also Chap. 3).
2	Removal of radiator. See also Chap. 8).
3	Removal of carburetor. See also Chap. 6).
4	Removal of exhaust system. See also Chap. 9).
5	Removal of the fuel line. See also Chap. 3).
6	Drain oil. See also Chap. 7).
7	Removal of starter. See also Chap. 7).
8	Positioning the engine on the trestle mounting plate. See also Chap. 3).
9	Removal of cylinder head. See also Chap. 4).

### 2.1) Remove water pump and compensating wheels

#### Special tools

The following special tools and equipment are required:

Part number	Description	Use
n.e	Circlip pliers	Drive wheel
n.e	Hot-air blower	Compensating wheels

#### Instructions

See [Figure 2](#).

Step	Procedure
1	Unscrew and remove cyl. screws (1).
2	Remove gearbox cover (2) with gasket (3).
3	Remove water-pump pinion (4) and water-pump intermediate wheel (5).
4	Remove needle pins (6) and thrust washer (7) from the water-pump shaft.
5	Remove circlips (8) with circlip pliers.
6	Remove the drive gear (9) from the crankshaft.

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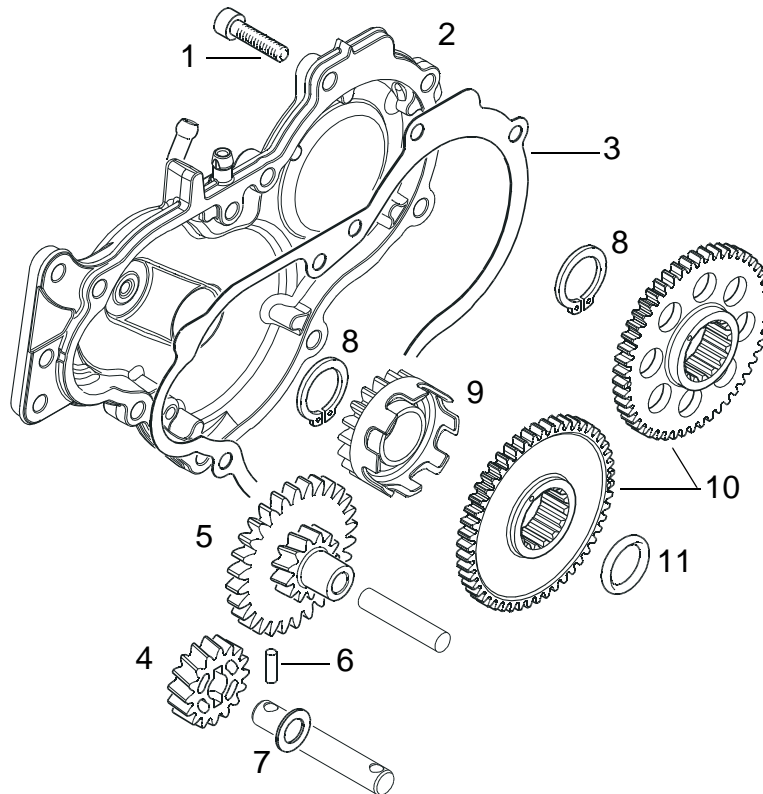
# BRP-Powertrain

## REPAIR MANUAL

Step	Procedure
7	Heat balance gear (10) evenly with hot air if they do not move freely and remove them from crankshaft or balance shaft.
8	Remove O-ring (11) from the crankshaft.

### Graphic

### Water pump and balance shaft



Part	Function
1	Cyl. screw M6x25
2	Gearbox cover
3	Gasket
4	Water-pump pinion
5	Idle gear
6	Needle pin
7	Thrust washer 10.1/17/1
8	Circlip AV 20
9	Drive gear
10	Balance gears
11	O-ring 18x3.5

Figure 2

K00067

DK00027.fm

# BRP-Powertrain

## REPAIR MANUAL

### 3) Disassemble crankcase

**Preparation** The following preparation is required before removal:

Step	Procedure
1	Remove clutch and starter gear assembly. See also Chap. 7).

**Special tools** The following special tools and equipment are required:

Part number	Description	Use
Part no. 276016	Puller assembly	Case halves
n.e	Plastic hammer	Crankshaft

**Instructions** See [Figure 3](#).

**NOTES:** Use two cyl. screws to separate the case halves.

Step	Procedure
1	Unscrew all M6 case bolts and remove them.
2	Remove engine case from trestle mounting plate.
3	Screw cyl. screws (1) evenly into the extraction thread and press the case halves evenly apart.
4	Remove gasket from the case half.
5	Remove water-pump shaft (2).
6	Remove balance shaft (3) from the case.

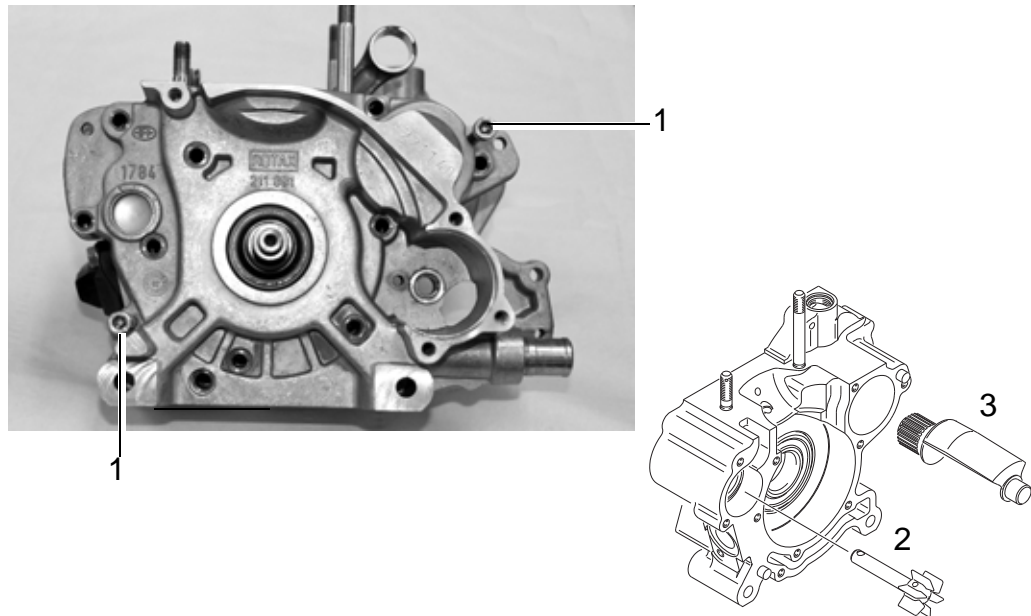


# BRP-Powertrain

## REPAIR MANUAL

Graphic

Crankcase



Part	Function
1	Cyl. screw M6x60
2	Water pump shaft assembly
3	Balance shaft

Figure 3

K00103, K00011

### 3.1) Disassembling crankshaft

**Safety instructions**



Increased danger of injury!  
Be aware of the weight of shafts.

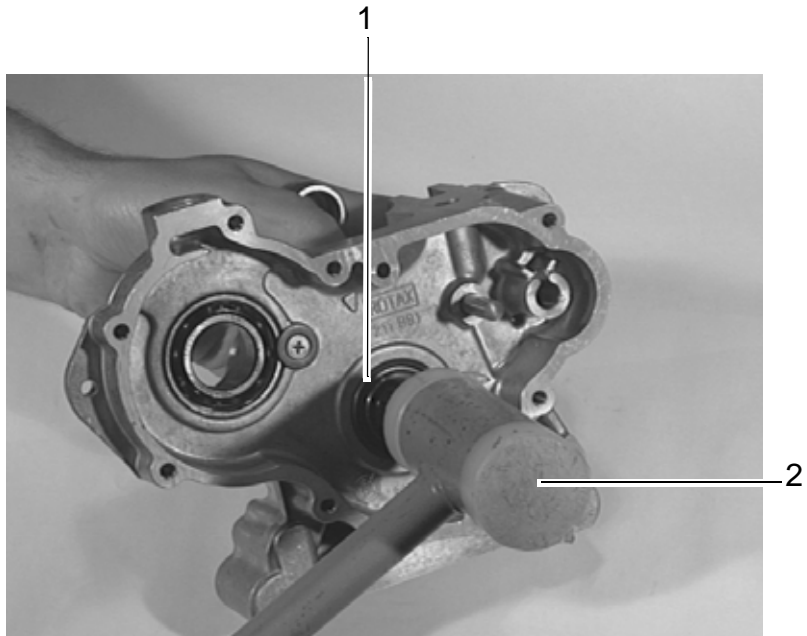
**Instructions**

See [Figure 4](#).

Step	Procedure
1	Gently tap the crankshaft with the plastic hammer (2) to remove the crankshaft from the case half.

**Graphic**

Crankshaft



Part	Function
1	Crankshaft
2	Plastic hammer

Figure 4

K00036

DK00027.fm

# BRP-Powertrain

## REPAIR MANUAL

### 3.2) Removing bearing and oil seal for shaft

#### Safety instructions



Danger of serious burns and scalding!  
Wear safety gloves!

#### Special tools

The following special tools and equipment are required:

Part number	Description	Use
n.e	Convection oven	Case halves
Part no. 676030	Installation tool	Needle bearing

#### Instructions

See [Figure 5](#).

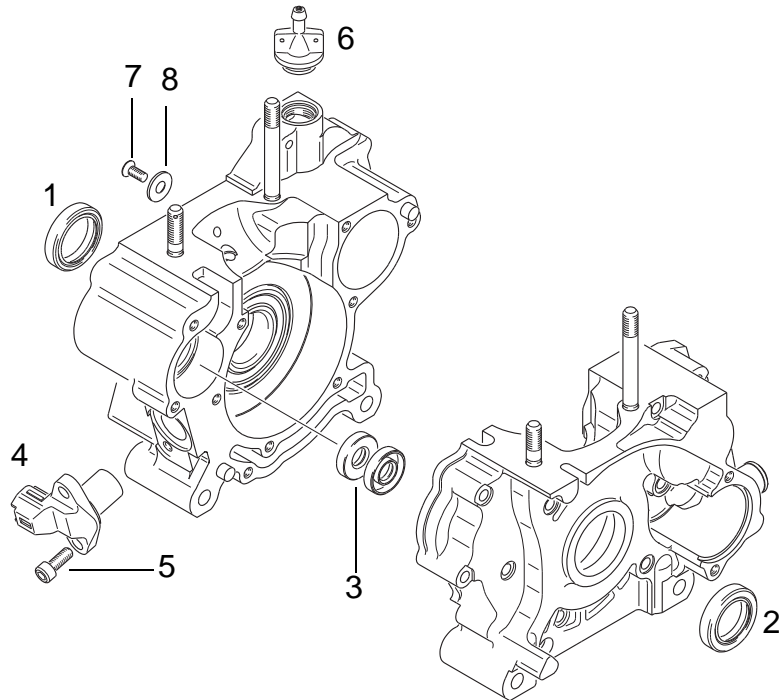
Step	Procedure
1	Remove oil seal (1) and (2) from the two halves with suitable tools.
2	Remove oil seals (3) from water pump with suitable tools.
3	Remove pick up (4) for the ignition system by removing the two cyl. screws (5).
4	Remove air vent screw (6).
5	Remove countersunk screw (7) and thrust washer (8).
6	Heat the two halves of the case to approx. 150 °C in the convection oven until the bearing can be tapped gently out.

# BRP-Powertrain

## REPAIR MANUAL

Graphic

Bearing and oil seal for shaft



Part	Function
1	Oil seal
2	Oil seal
3	Oil seal
4	Pick up
5	Cyl. screw
6	Air vent screw
7	Countersunk screw
8	Thrust washer

Figure 5

K00036

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# BRP-Powertrain

## REPAIR MANUAL

### Safety instructions

See [Figure 6](#).



Danger of serious burns and scalding!  
Wear safety gloves!

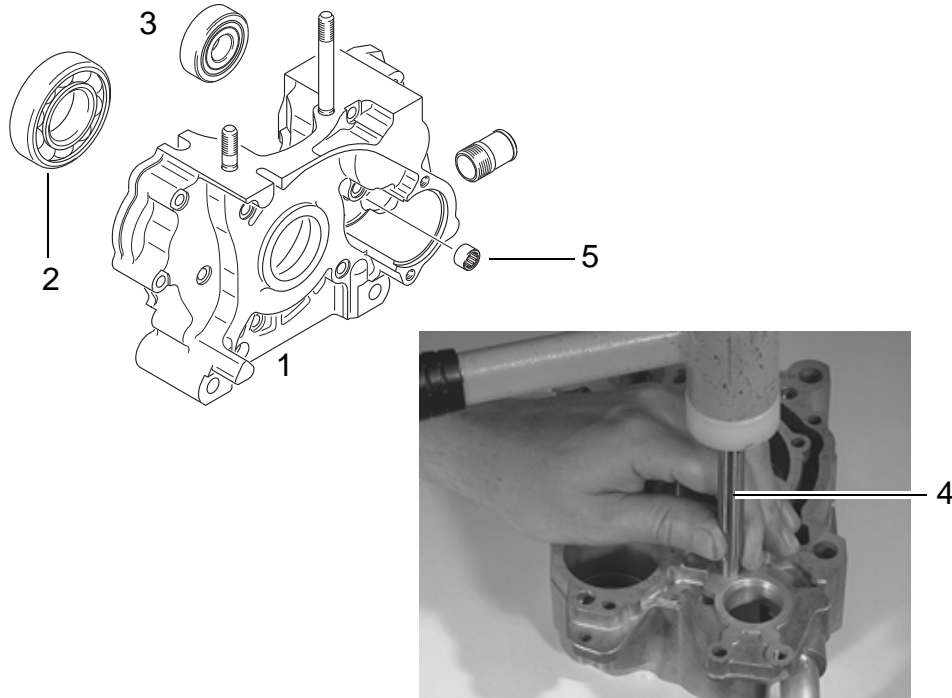
### Instructions

#### Clutch end case half

Step	Procedure
1	Remove case half (1) from the convection oven and drop onto a flat wood board with the case split pane. This releases the ball bearing (2) of the crankshaft and the balance shaft (3) from the case.
2	Invert the case half and drive out the needle bearing (5) with the installation tool (4).

### Graphic

#### Clutch end case half



Part	Function
1	Case half
2	Ball bearing (crankshaft)
3	Ball bearing (balance shaft)
4	Installation tool part no. 676030
5	Needle bearing

Figure 6

K00013, K00039

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# BRP-Powertrain

## REPAIR MANUAL

### Safety instructions

See [Figure 7](#).



Danger of serious burns and scalding!  
Wear safety gloves!

### Ignition end case half

NOTES: A wooden board must have cutouts for the two dowels (1) and the cylindrical pin (2) to form a flat base for the case half.

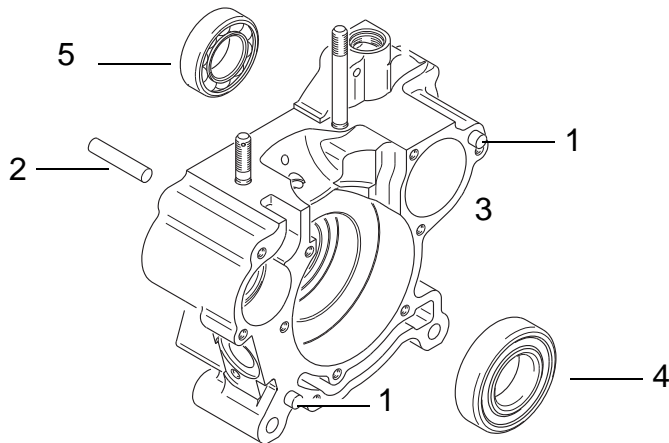
If it is necessary to replace the cylindrical pin (2), it can be removed from the hot case with a pipe wrench.

### Instructions

Step	Procedure
1	Remove case half (3) from the convection oven and drop onto a flat wood board with the case split pane. This removes the ball bearing (4) from the crankshaft and the balance shaft.
2	Allow both crankcase halves to cool to room temperature (20 °C).

### Graphic

Ignition side crankcase



Part	Function
1	Dowels
2	Cylindrical pin
3	Case half
4	Ball bearing (crankshaft)
5	Ball bearing (balance shaft)

Figure 7

K00014

DK00027.fm

### 3.3) Conrod set - Repair set

#### 3.3.1) Disassemble crankshaft

**Safety instructions**

See [Figure 8](#) to [Figure 10](#).

**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:

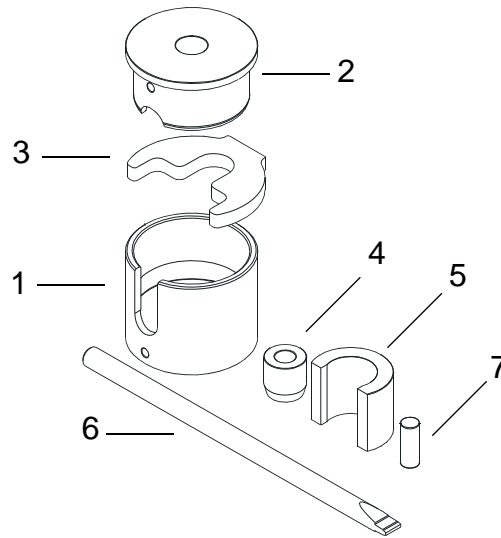
Part number	Description	Use
n.e.	Press	Crankshaft
n.e.	Dial gauge	
Part no. 276050	Repair kit	Crankshaft

# 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 8

K00081

Connecting rod parts

See [Figure 9](#).

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	

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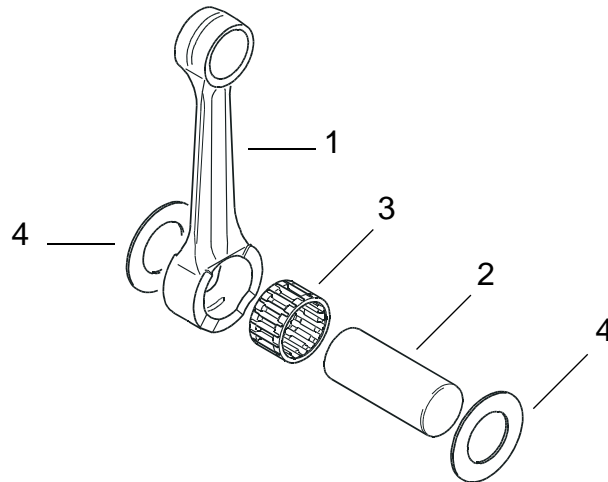


# BRP-Powertrain

## REPAIR MANUAL

### Graphic

### Connecting rod parts



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

Figure 9

K00094

### Instructions

See [Figure 10](#).

#### 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 con rod 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.

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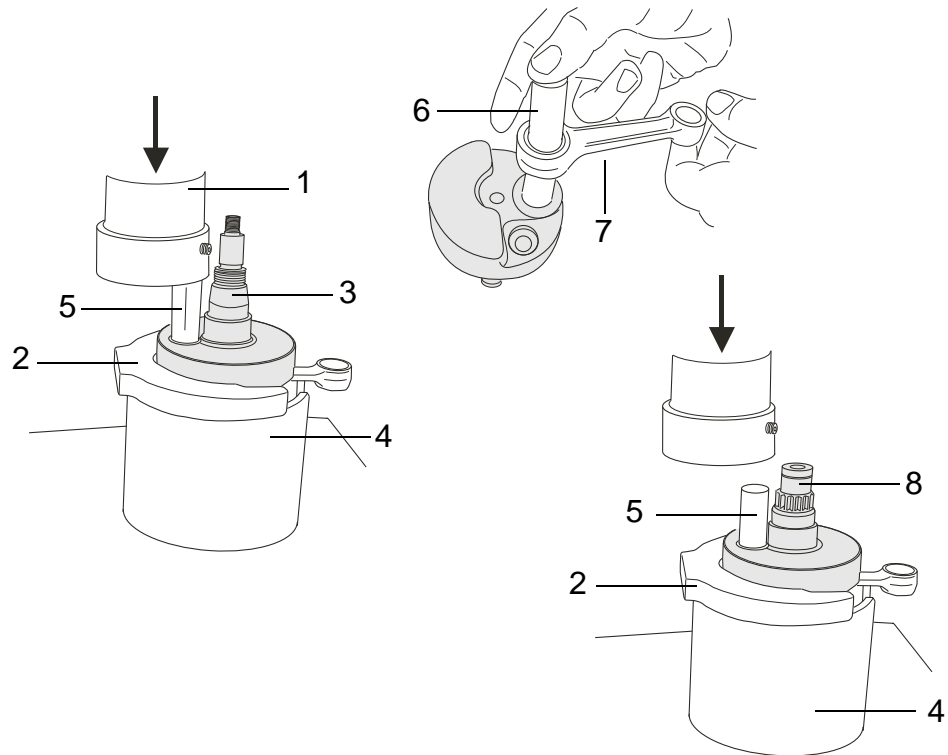
# BRP-Powertrain

## 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 con rod (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	Con rod
8	Drive side crankshaft half

Figure 10

K00082, K00083, K00084

DK00027.fm

# BRP-Powertrain

## REPAIR MANUAL

### 3.3.2) Inspect crankshaft

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

**Instructions** See [Figure 11](#).

Step	Procedure
1	Inspect the crankshaft for visible damage and traces of wear:- <ul style="list-style-type: none"><li>- Cone/centered thread</li><li>- Bearing seats</li><li>- Running surface of the bearing</li><li>- Contact surface of the shaft seals</li><li>- Woodruff key groove.</li></ul>

#### 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).

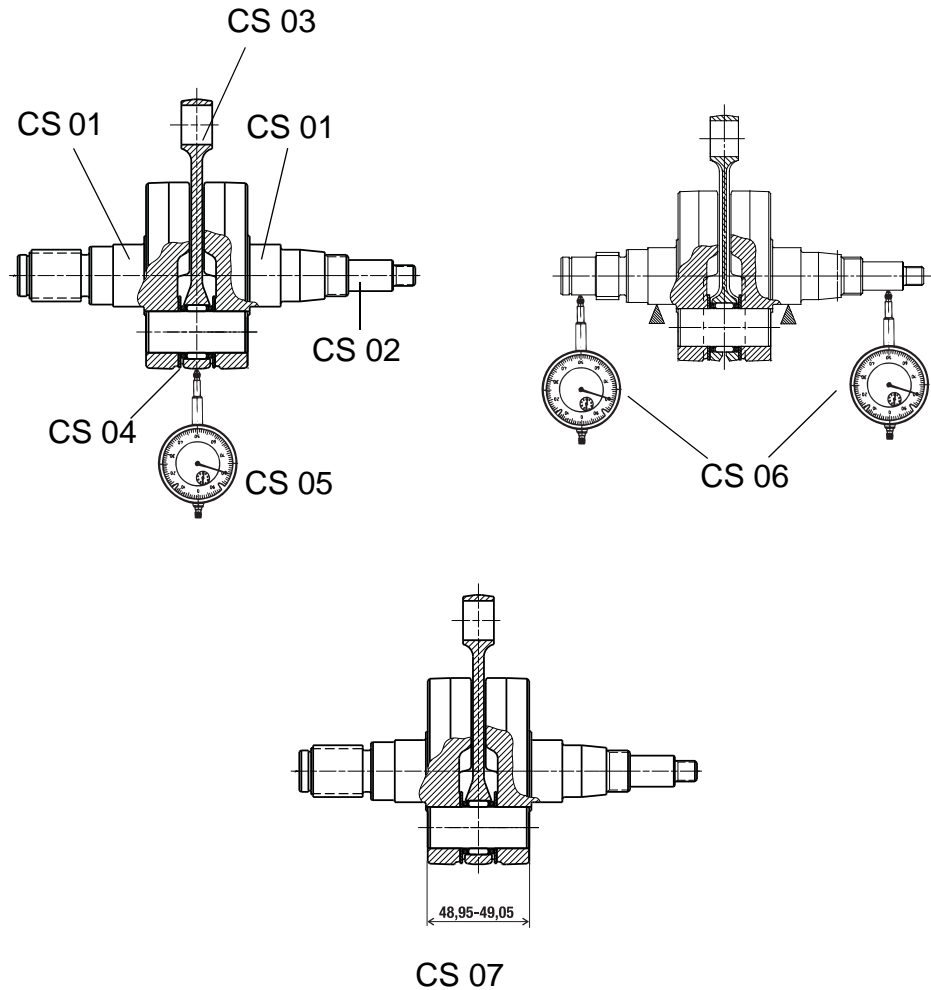
If the maximum approved stroke (CS06) of the crankshaft is exceeded, the crankshaft must be realigned. See also Chap. 5 Section: 3.3.3).

# 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	
Con rod bearing axial play	CS04	1.0 mm	1.3 mm	
Con rod 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 11

K00015, K00016, K00017

DK00027.fm

# BRP-Powertrain

## REPAIR MANUAL

### 3.3.3) Crankshaft out of run

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

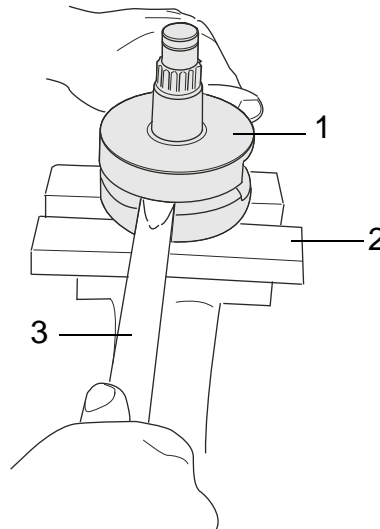
**Special tools** The following special tools and equipment are required:

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

**Instructions** See [Figure 12](#).

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 12

K00092

DK00027.fm

# BRP-Powertrain

## REPAIR MANUAL

### 3.3.4) 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 13](#).

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	Slide 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 con rod (7) assembly with cage from the connecting rod pin (mounting device) onto the pressed-in connecting rod pin (5).

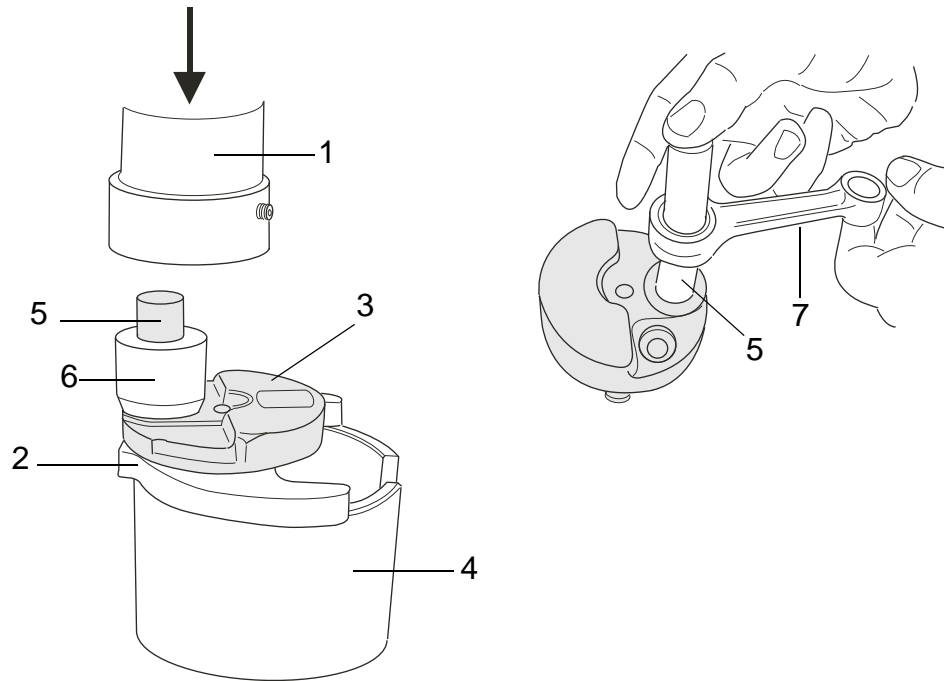
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# BRP-Powertrain

## REPAIR MANUAL

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 13

K00087, K00083

Instructions

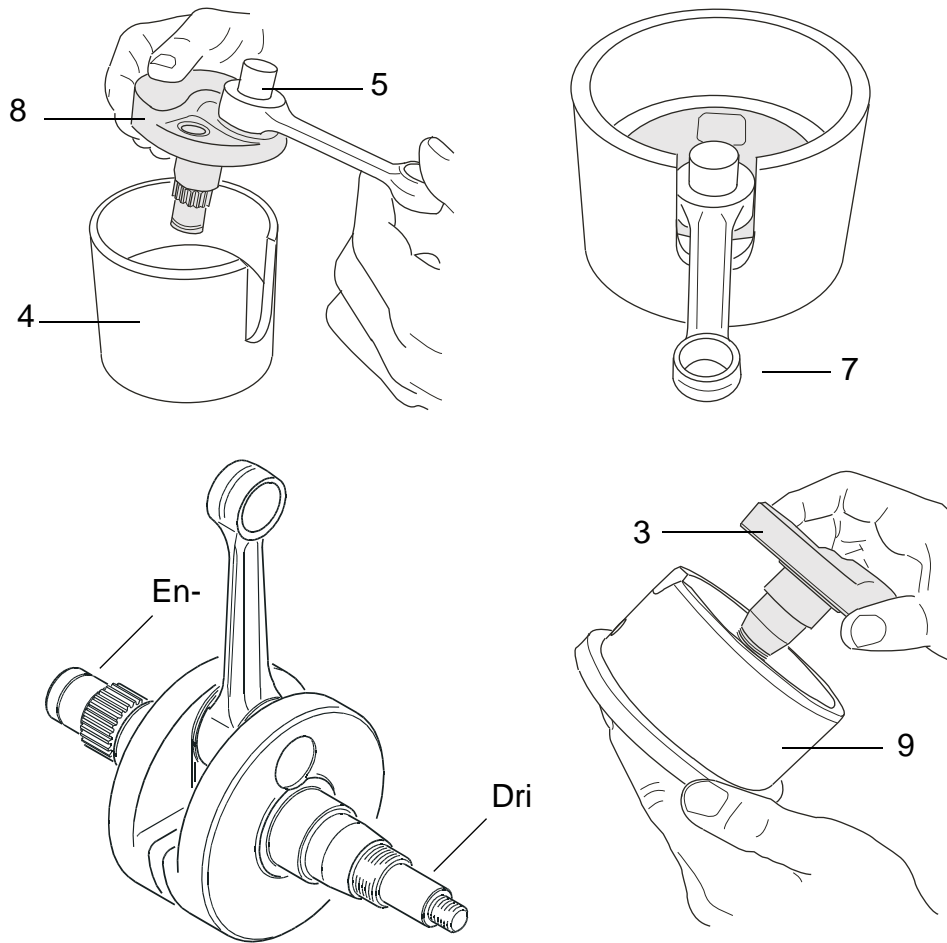
See Figure 14.

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).

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**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 14*

*K00088, K00089, K00095, K00090*

DK00027.fm



# BRP-Powertrain

## REPAIR MANUAL

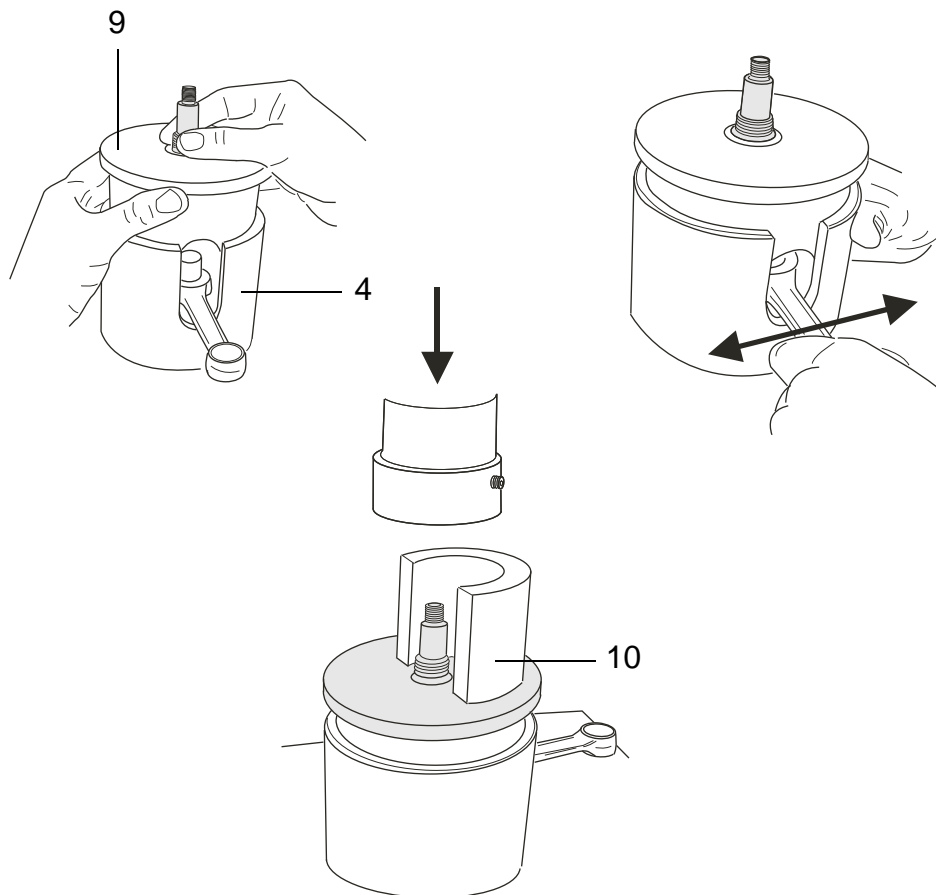
### Instructions

See [Figure 15](#).

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 con rod 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 15

K00093, K00091, K00085

DK00027.fm

## 4) Crankcase-inspection of components

### 4.1) Inspection of water pump drive

**General**                      NOTES:                      If the edges of the idle gear teeth (1) or the water pump pinion (2) show signs of wear, both gears must be replaced.

**Instructions**                      See [Figure 16](#).

Step	Procedure
1	Inspect drive gear (1), idle gear (2) and water pump pinion (3) for cracks (visual inspection).
2	Inspect the teeth of the idle gear (2) and the water pump pinion (3) for wear.
3	Inspect the hole and the two axial surfaces of the idle gear (2) for signs of wear.
4	Check the condition of the cutout for the needle pin (4) in the water pump pinion (3).

#### 4.1.1) Inspect water pump shaft

**Instructions**                      See [Figure 16](#).

Step	Procedure
1	Inspect the water pump shaft (6) in the region of the two oil seals for shaft for increased wear and replace if applicable.
2	Inspect impeller (7) for damage or abnormal deformation and replace if applicable.

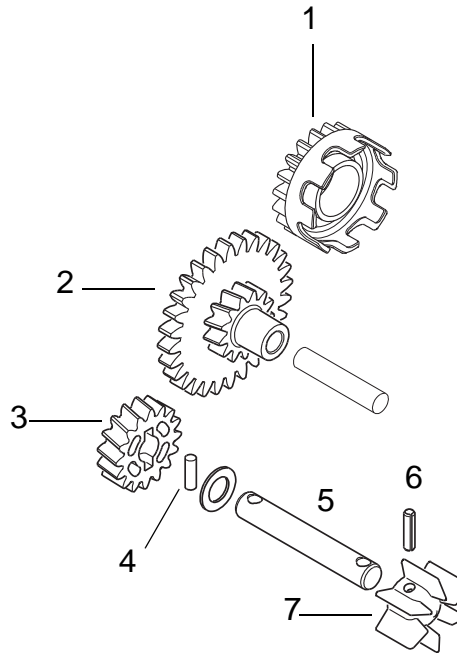
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# BRP-Powertrain

## REPAIR MANUAL

Graphic

Water pump drive



Part	Function
1	Drive gear
2	Idle gear
3	Water-pump pinion
4	Needle pin
5, 6, 7	Water pump shaft assembly

Figure 16

K00019

# BRP-Powertrain

## REPAIR MANUAL

### 4.2) Inspection of balance shaft drive

**General** NOTES: If one of the balance wheels has cracks or if backlash of the balance wheels at the spline can be seen, both balance wheels must be replaced.

**Instructions** See [Figure 17](#).

Step	Procedure
1	Check balance gears (1) for cracks.
2	Place balance gears on the spline, the balance shaft or crankshaft and inspect balance gears for backlash at the spline.
3	Check outer teeth of the two balance gears for signs of wear. If the teeth of one of the balance gears shows signs of wear, both balance gears must be replaced.
4	Inspect condition of O-ring (2). NOTES: The balance gears (1) and the O-ring (2) should be replaced at least every 50 operating hours.

#### 4.2.1) Inspection of balance shaft

**General** NOTES: If one of the wear limits M10 or M11 is reached, the balance shaft must be replaced.

**Instructions** See [Figure 17](#).

Step	Procedure
1	Inspect the groove (3) for the locking ring for damage and wear.
2	Check the diameter of the bearing seats M10 and M11 for wear.

Description	Code	New dimension	Wear limit	Measured value
Bearing seat	M10	14.96 mm - 14.99 mm	14.94 mm	
Bearing seat	M11	24.97 mm - 24.99 mm	24.94 mm	

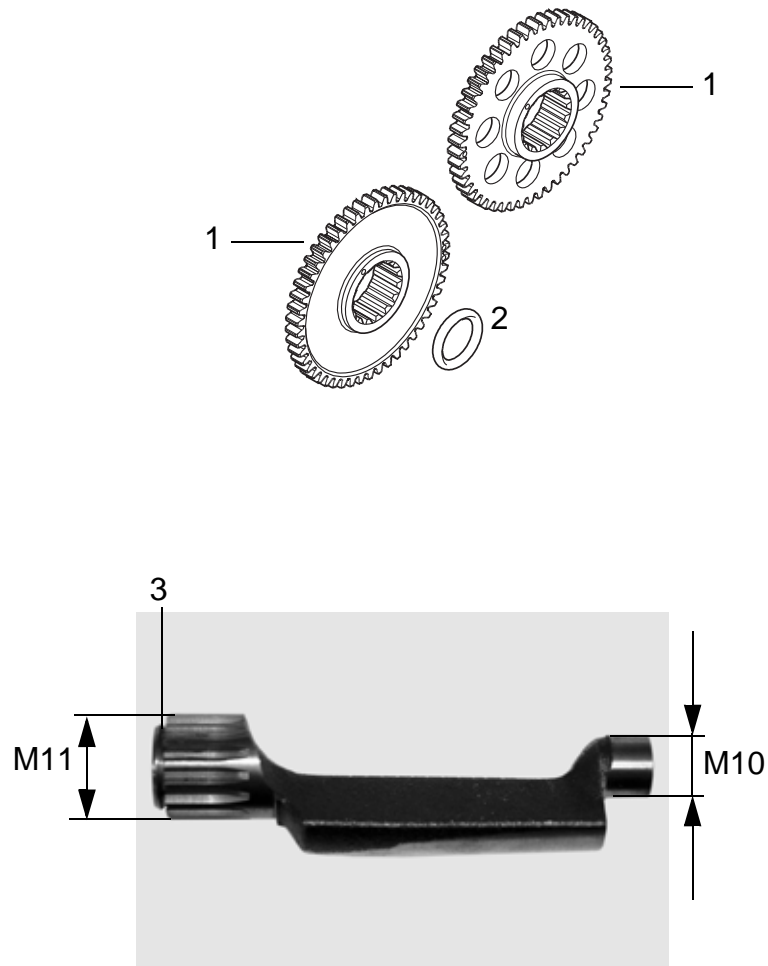
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# BRP-Powertrain

## REPAIR MANUAL

Graphic

Balance gears, balance shaft



Part	Function
1	Balance gears
2	O-ring
3	Groove

Figure 17

K00018, K00105

# BRP-Powertrain

## REPAIR MANUAL

### 4.3) Inspection of crankcase

#### Instructions

See [Figure 18](#).

Step	Procedure
1	Clean both case halves, grooved ball bearings and all bearing seats thoroughly with a standard cleaning agent.
2	Check both halves (1) for cracks and damage (visual inspection).
3	Check sealing surfaces (2) for damage (visual inspection).
4	Check threads (3) for cleanliness and smoothness.
5	Check that main bearing oil holes (4) are open and clean with compressed air as required.
6	Inspect the ball and needle bearings for ease of running and erosion of material (pitting).

NOTES: Oil all grooved ball bearings and the needle bearings with engine oil before inspection. The inside ring of the bearing must rotate freely and easily without pressure and there must not be any noise. Replace the bearing in case of doubt.

If one of the two roller bearings of the crankshaft or balance shaft is defective, both roller bearings must be replaced.

NOTES: If the roller bearings of the crankshaft or balance shaft are replaced, all oil seals for shaft must be replaced.

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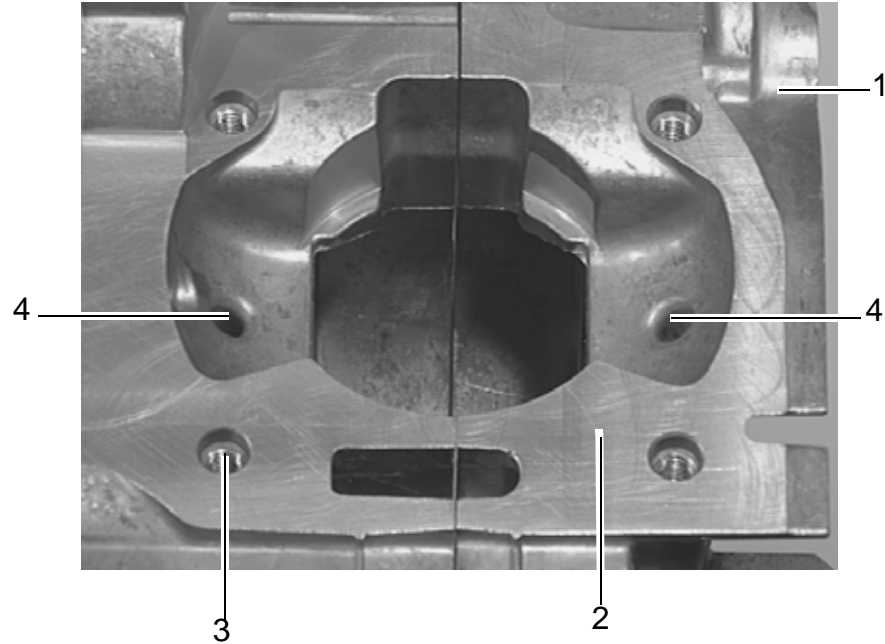
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# BRP-Powertrain

## REPAIR MANUAL

Graphic

Crankcase



Part	Function
1	Case halves
2	Sealing surfaces
3	Thread
4	Main bearing lubrication hole

Figure 18

K00037

## 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.e	Convection oven or hot plate	Case halves
Part no. 676030	Installation tool	Needle bearing
Part no. 676010	Mounting sleeve	Shaft seal
Part no. 676021	Installation tool	
n.e.	2-stroke engine oil	Shaft seal
n.e.	MOLYCOTE 111	Shaft seal

### 5.1) Installation of bearing and oil seal for shaft

#### Safety instructions



Danger of serious burns and scalding!  
Wear safety gloves!

#### Instructions

See [Figure 19](#).

#### Clutch end case half

Step	Procedure
1	Heat both crankcase halves to 150 °C in the convection oven.
2	Remove case half from the convection oven and drop onto a flat wood board with the case split pane.
3	Coat the oil seal for shaft (25x38x7) for the clutch end crankcase half with engine oil in the area between the sealing lip and dust lip.
4	Press in the oil seal for shaft to the stop with the mounting sleeve (part no. 676010) from inside to outside so the open end of the oil seal for shaft is directed inward. NOTES: The oil seal for shaft can also be installed from outside to inside if the crankshaft is installed.
5	Slide the ball bearing (1) of the crankshaft into the crankcase half to the limit stop so the closed side of the cage is facing to the crankshaft.
6	Slide the ball bearing of the balance shaft into the crankcase half to the limit stop so the closed side of the cage is facing to the balance shaft.
7	Press in the needle bearing (2) to the limit stop with the installation tool (3) (part no. 676030) so the label on the needle bearing is facing outwards.
8	Allow the crankcase halves to cool in this position.

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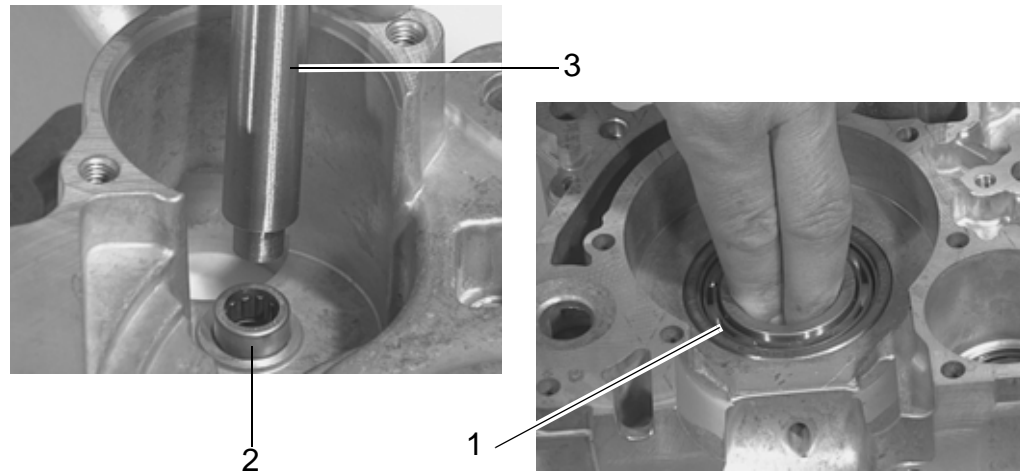


# BRP-Powertrain

## REPAIR MANUAL

### Graphic

### Clutch end case half



Part	Function
1	Ball bearing
2	Needle bearing
3	Installation tool

Figure 19

K00040, K00041

### Instructions

See [Figure 20](#).

### Ignition end case half

Step	Procedure
1	Remove case half from the convection oven and drop onto a flat wood board with the case split pane.
2	Slide the ball bearing (1) of the balance shaft into the crankcase half to the limit stop so the closed side of the cage is facing the balance drive.
3	Install the lock washer (2) and countersunk screw (3) with the phase of the lock washer pointing to the countersunk screw.
4	Coat the oil seal for shaft (25x38x7) for the ignition end crankcase half with oil in the area between the sealing lip and dust lip.
5	Press in the oil seal for shaft (4) to the limit stop with the mounting sleeve (5) (part no. 676010) so the open end of the oil seal for shaft is directed to the balance drive. NOTES: The oil seal for shaft can also be installed from outside to inside if the crankshaft is installed.
6	Rotate crankcase half.
7	Slide the ball bearing (6) of the crankshaft into the crankcase half to the limit stop so the closed side of the cage is facing to the crankshaft.
8	Grease the two oil seals for shaft (10x26x7) with MOLYCOTE 111 in the area of the sealing lip.
9	Press in the first oil seal for shaft to the limit stop with the installation tool (7) (part no. 676021) so the closed end of the oil seal for shaft is visible.

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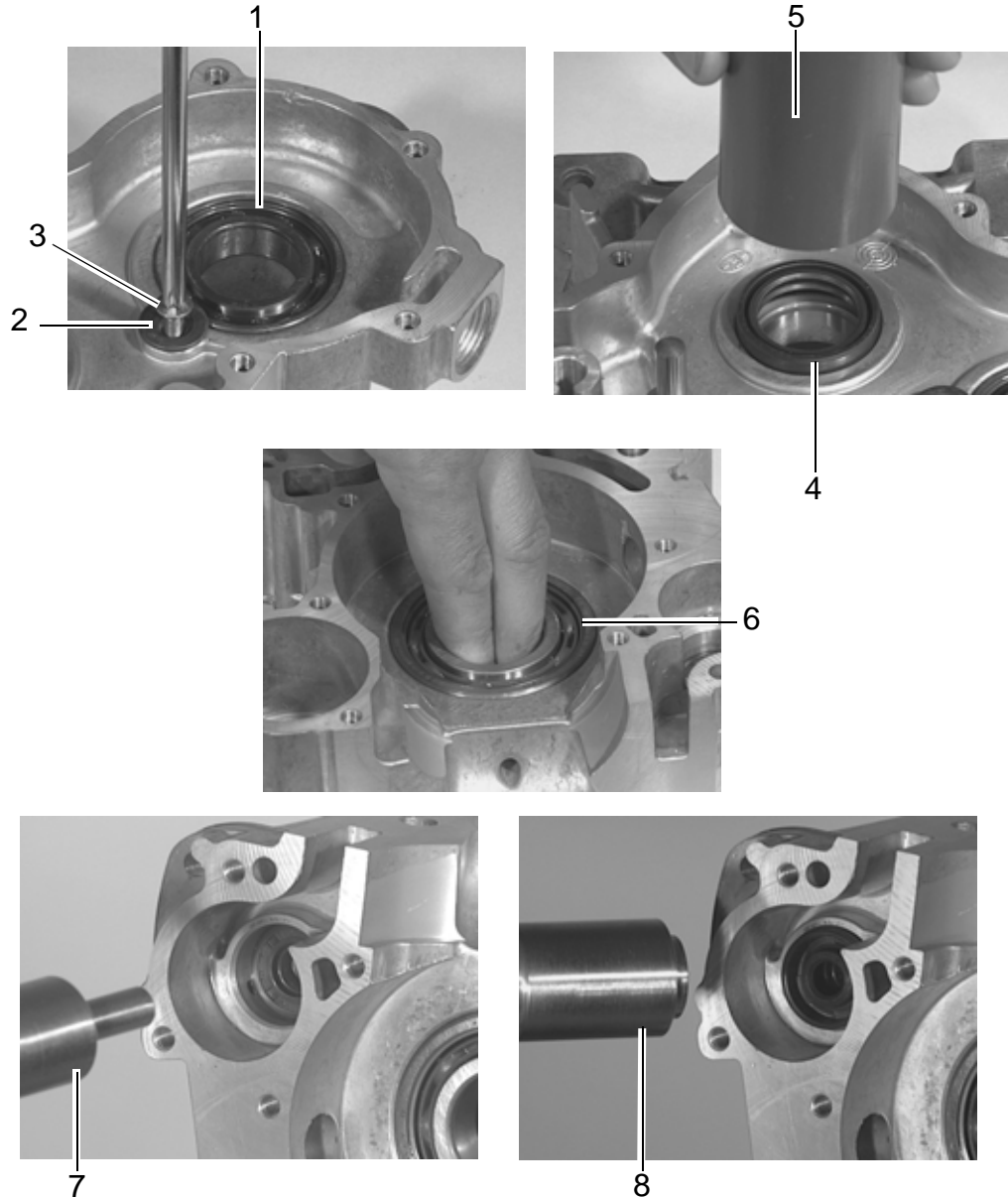
# BRP-Powertrain

## REPAIR MANUAL

Step	Procedure
10	Grease the installed oil seal for shaft with MOLYCOTE 111.
11	Press in the second oil seal for shaft to the limit stop with the installation tool (8) (part no. 676021) so the open end of the oil seal for shaft is visible.
12	Allow the crankcase halves to cool in this position.

### Graphic

#### Ignition end case half



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# BRP-Powertrain

## REPAIR MANUAL

Part	Function
1	Ball bearing (balance shaft)
2	Lock washer
3	Countersunk screw
4	Oil seal M5x12
5	Mounting sleeve
6	Ball bearing (crankshaft)
7	Assembly punch
8	Assembly punch

*Figure 20*

K00042-K00046

## 5.2) Assembly of crankshaft, water pump shaft and balance shaft

**Safety instructions**



Danger of serious burns and scalding!  
Wear safety gloves!

**Special tools**

The following special tools and equipment are required:

Part number	Description	Use
n.e	Convection oven	Case half
Part no. 297434	LOCTITE Anti-Seize	Balance shaft, crankshaft

**Instructions**

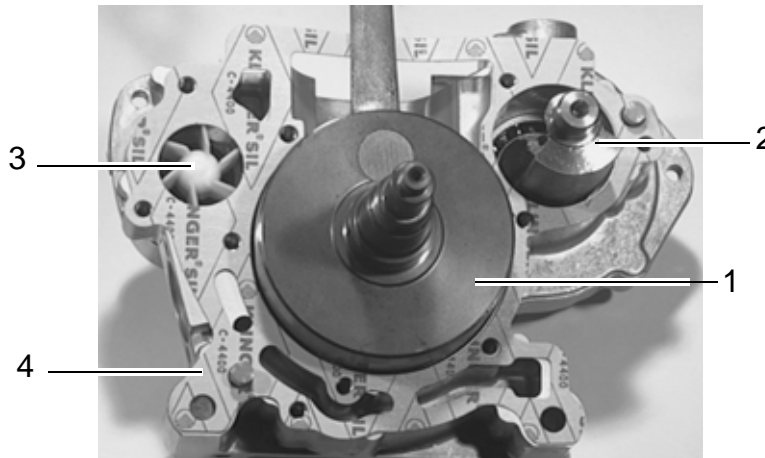
See [Figure 21](#).

Heat both crankcase halves with the bearings with and oil seal for shaft to approx. 50 °C in the convection oven.

### Ignition end case half

Step	Procedure
1	Remove case half from the convection oven and drop onto a flat wood board with the case split pane.
2	Coat main bearing seats of the crankshaft with LOCTITE Anti-Seize.
3	Insert the crankshaft (1) into the ignition end crankcase half to the limit stop.
4	Coat bearing seats of the balance shaft with LOCTITE Anti-Seize.
5	Insert the balance shaft (2) into the ignition end crankcase half to the limit stop.
6	Insert the water pump shaft (3) into the ignition end crankcase half to the limit stop.
7	Position new gasket (4) on the ignition end crankcase half. NOTES: Adjustment of the clearance of the crankshaft is not required.

Graphic Ignition end crankcase half



Part	Function
1	Crankshaft
2	Balance shaft
3	Water pump shaft
4	Gasket

Figure 21

K00054

5.3) Screw case halves together

Safety instructions



Danger of serious burns and scalding!  
Wear safety gloves!

General

NOTES: If the stud bolts for the cylinder are replaced, the long thread end of the stud bolts must be screwed into the case and locked with LOCTITE 243.  
Tightening torque 10 Nm (90 in.lb).

Special tools

The following special tools and equipment are required:

Part number	Description	Use
Part no. 877930	Trestle support assy.	Crankcase
Part no. 676052	Fixing plate for engine	Crankcase

DK00027.fm

# BRP-Powertrain

## REPAIR MANUAL

### Instructions

#### NOTICE

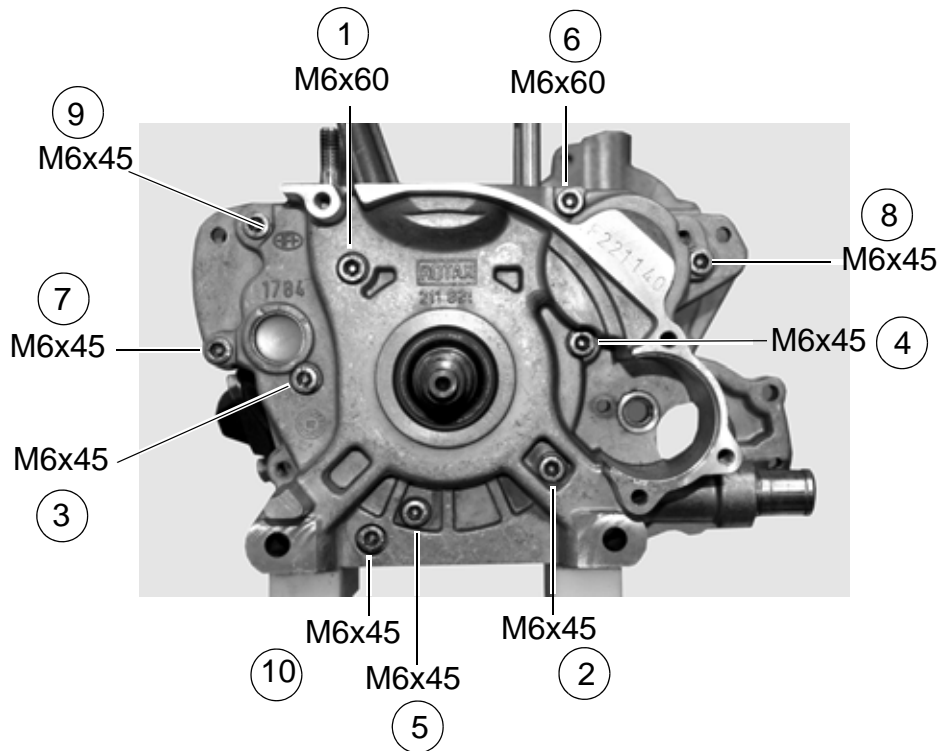
Note the different lengths of the cyl. screws!  
Tighten the cyl. screws crosswise starting in the center of the case in several steps.

See [Figure 22](#).

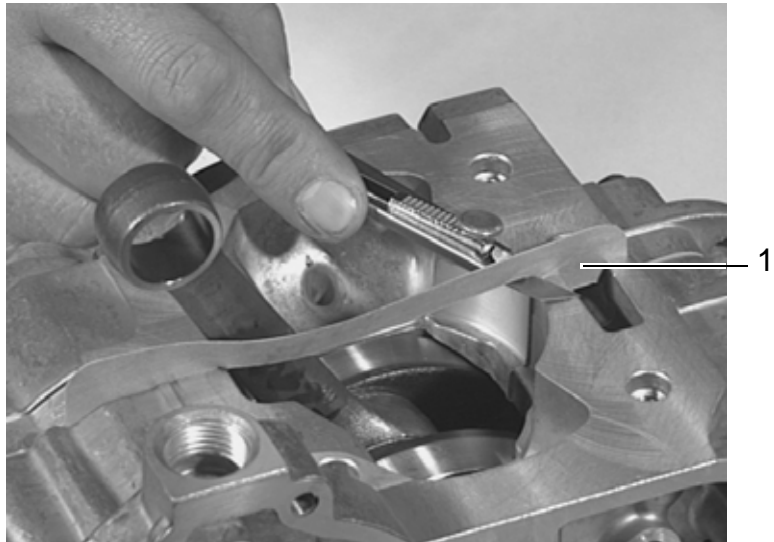
Step	Procedure
1	Remove the clutch end crankcase half from the convection oven and position on the ignition end crankcase half.
2	Fasten both crankcase halves with 10 cyl. screws (see tightening Graphic). Tightening torque 10 Nm (90 in.lb).
3	Allow crankcase to cool.
4	Place crankcase on the trestle support and fasten with 4 fastening screws.
5	Carefully remove protruding parts of the crankcase gasket (1) with a knife in the area of the cylinder flange and the cylinder center without damaging the sealing surface.

### Graphic

Crankcase tightening Graphic 1-10



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Part	Function
1	Crankcase gasket

*Figure 22*

K00104, K00055

DK00027.fm

## 6) Installation of crankcase

### 6.1) Installation of balance and water-pump shaft drive

Safety instructions



Danger of serious burns and scalding!  
Wear safety gloves!

Instructions

See [Figure 23](#).

Step	Procedure
1	Insert the O-ring (1) in the crankshaft groove.
2	Rotate crankshaft to TDC.
3	Slide the balance gear (2) with hub collar outwards on the crankshaft until the markings (4) on the crankshaft and the balance gear match.
4	Slide the balance shaft drive gear(3) with hub collar inwards on the balance shaft until the markings (5) on the balance shaft and the balance gear match.
5	Slide the drive gear (6) onto the crankshaft.
6	<b>NOTICE</b> Do not bend the Seeger ring during installation. Install a new Seeger ring (7) on the balance shaft and crankshaft.
7	Check that the Seeger ring (7) is correctly seated in the grooves of the balance shaft and crankshaft.
8	Install the thrust washer (8), needle pin (9) and water pump pinion (10) on the water-pump shaft.
9	Check the seating of the needle pin in the cutout in the water pump pinion.
10	Install the idle gear (11) on the cylindrical pin in the case.
11	Position new gasket (12) on the case.
12	Screw on gearbox cover (13) with 6 cyl. M6x25 screws (14) and 2 cyl. M6x30 screws. Tightening torque 10 Nm (90 in.lb). NOTES: Use gaskets to seal the oil drainage plug and oil level plug.

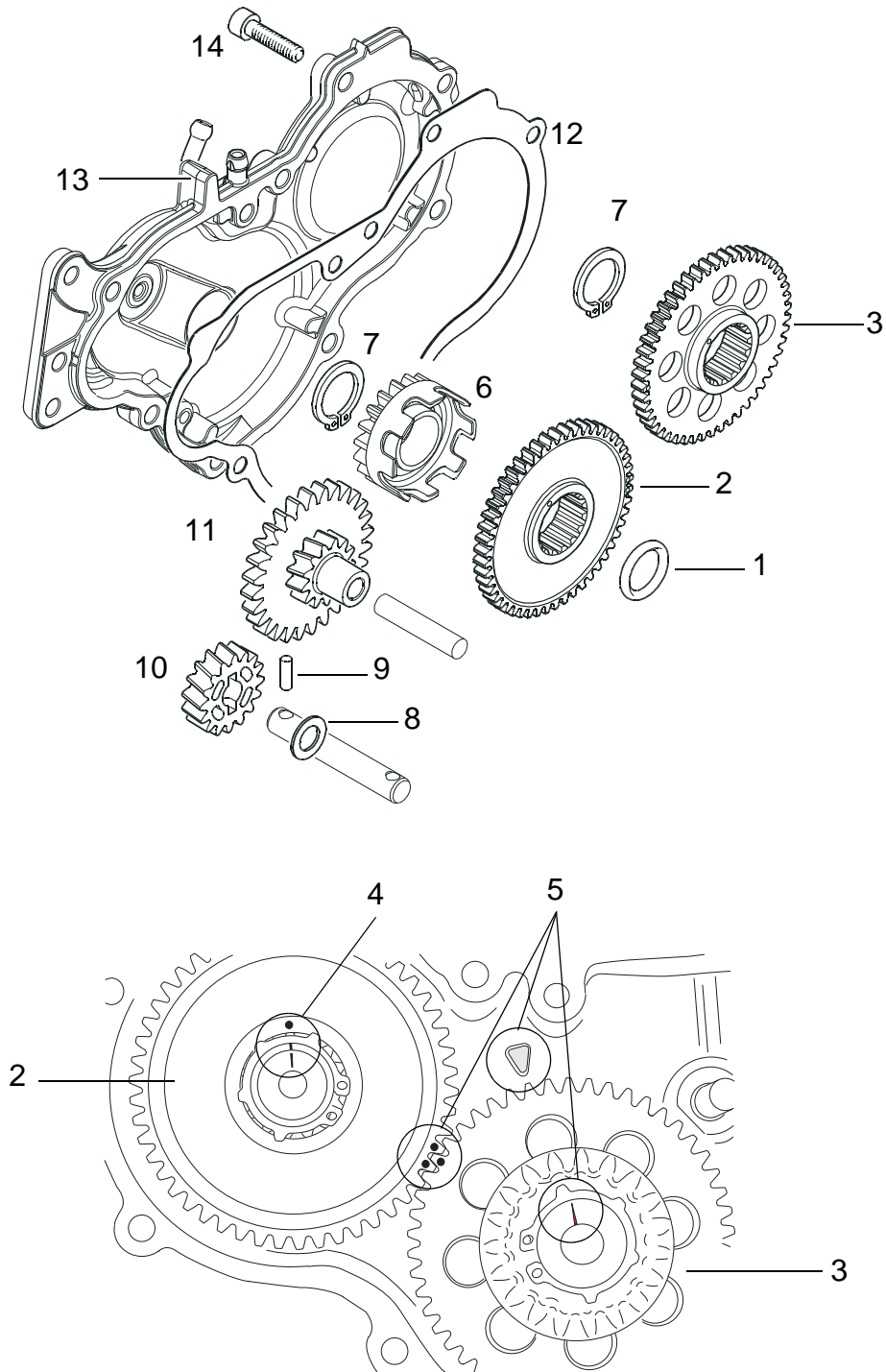


# BRP-Powertrain

## REPAIR MANUAL

Graphic

Crankcase

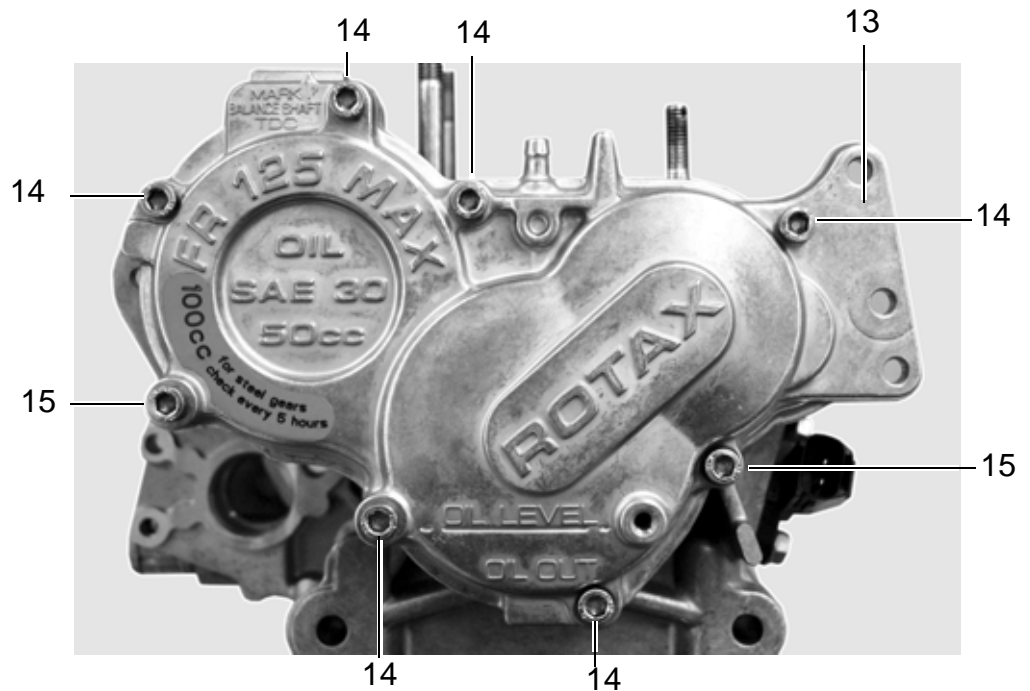


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# BRP-Powertrain

## REPAIR MANUAL

### Crankcase



Part	Function
1	O-ring 18x3.5
2	Balance gear
3	Balance shaft drive gear
4,5	Marking
6	Drive gear
7	Seeger ring AV 20
8	Thrust washer 10.1/17/1
9	Needle pin 4x15.8
10	Water pump pinion 16 Z
11	Idle gear
12	Gasket
13	Gearbox cover
14	Cyl. screw M6x25
15	Cyl. screw M6x30

Figure 23

K00106, K00067, K00107

DK00027.fm

# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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

This chapter describes the disassembly and assembly of the carburetor and intake silencer module of the ROTAX 125 MAX engine. The description is divided into sections.

<b>Subject</b>	<b>Page</b>
System description	<a href="#">Page 3</a>
Removal of carburetor and intake silencer	<a href="#">Page 5</a>
Removal of carburetor and intake silencer	<a href="#">Page 5</a>
Removal of fuel pump	<a href="#">Page 7</a>
Disassembly of carburetor	<a href="#">Page 8</a>
Disassembly of intake silencer	<a href="#">Page 9</a>
Checking components of carburetor and intake silencer	<a href="#">Page 11</a>
Checking carburetor	<a href="#">Page 11</a>
Checking fuel pump	<a href="#">Page 12</a>
Checking intake silencer	<a href="#">Page 13</a>
Installation of carburetor and intake silencer	<a href="#">Page 15</a>
Assembly of carburetor	<a href="#">Page 15</a>
Assembly of float housing	<a href="#">Page 15</a>
Assembly of intake silencer	<a href="#">Page 16</a>
Installation of carburetor and intake silencer	<a href="#">Page 17</a>

# BRP-Powertrain

## REPAIR MANUAL

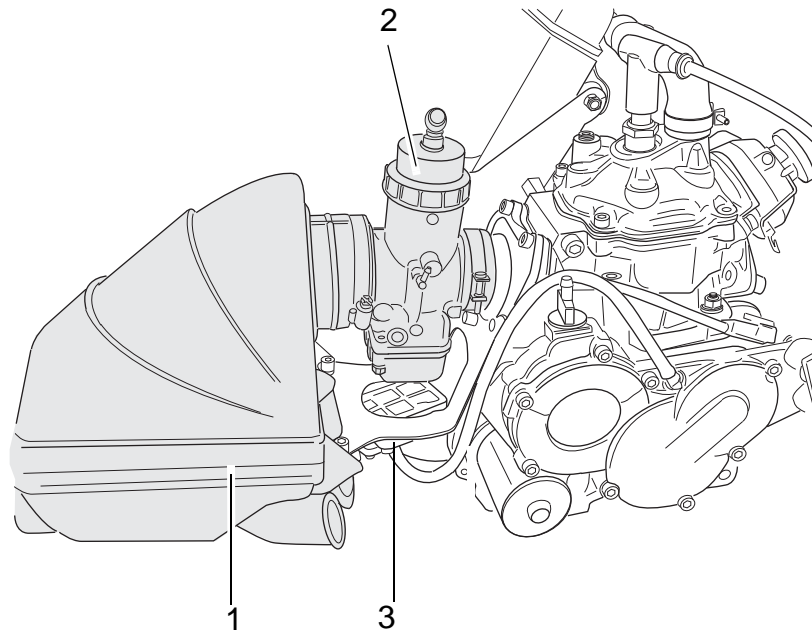
### NOTES

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### 1) System description

Overview

Position on the engine



Part	Function
1	Intake silencer
2	Carburetor
3	Fuel pump

Figure 1

K00141

# BRP-Powertrain

## REPAIR MANUAL

### NOTES

DK00028.fm

## 2) Removal of carburetor and intake silencer

**Safety instructions**



**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.

**Preparation**

The following preparation is required before removal:

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

### 2.1) Removal of carburetor and intake silencer

**Instructions**

See [Figure 2](#).



Fuel may spill out when removing the carburetor.

Proceed as follows to remove the carburetor and intake silencer:

Step	Procedure
1	Pull of fuel line between the fuel pump and carburetor from the carburetor.
2	Pull off the impulse pipe (1) from the impulse connector.
3	Unscrew 3 cyl. screws on the carburetor port (2).
4	Remove carburetor (3) with intake silencer (4) with support bracket (5) and fuel pump (6).

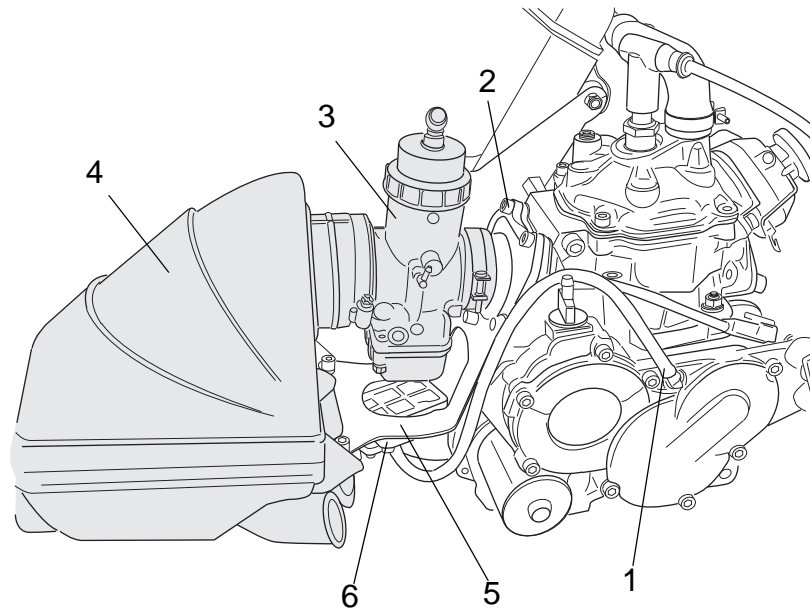


# BRP-Powertrain

## REPAIR MANUAL

Graphic

Carburetor and intake silencer



Part	Function
1	Impulse pipe
2	Cyl. screw
3	Carburetor
4	Intake silencer
5	Support bracket
6	Fuel pump

Figure 2

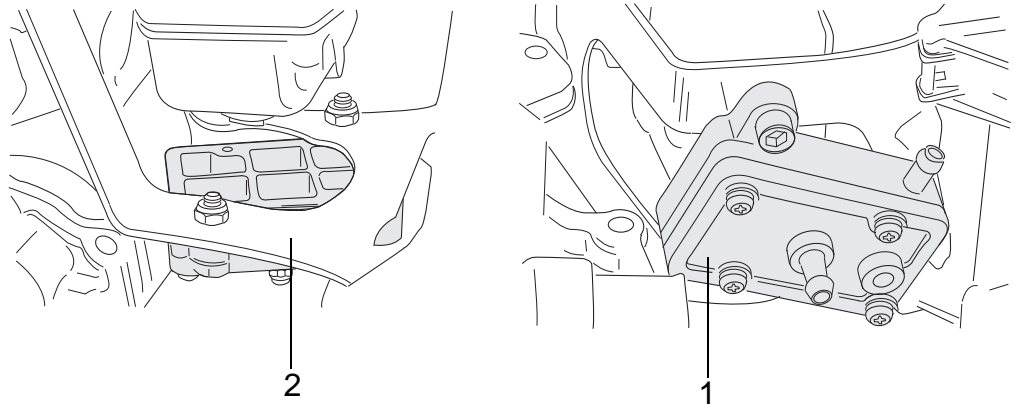
K00141

**2.1.1) Removal of fuel pump**

**Instructions** See [Figure 3](#).

Step	Procedure
1	Remove the fuel pump (1) at the bottom of the support bracket (2) for the intake silencer.

**Graphic** Fuel pump



Part	Function
1	Fuel pump
2	Support bracket

*Figure 3*

K00124

# BRP-Powertrain

## REPAIR MANUAL

### 2.1.2) Disassembly of carburetor

Carburetor See [Figure 4](#).

Step	Procedure
1	Disassemble the carburetor to the parts shown in Figure 4 and clean with fuel.

Graphic Carburetor

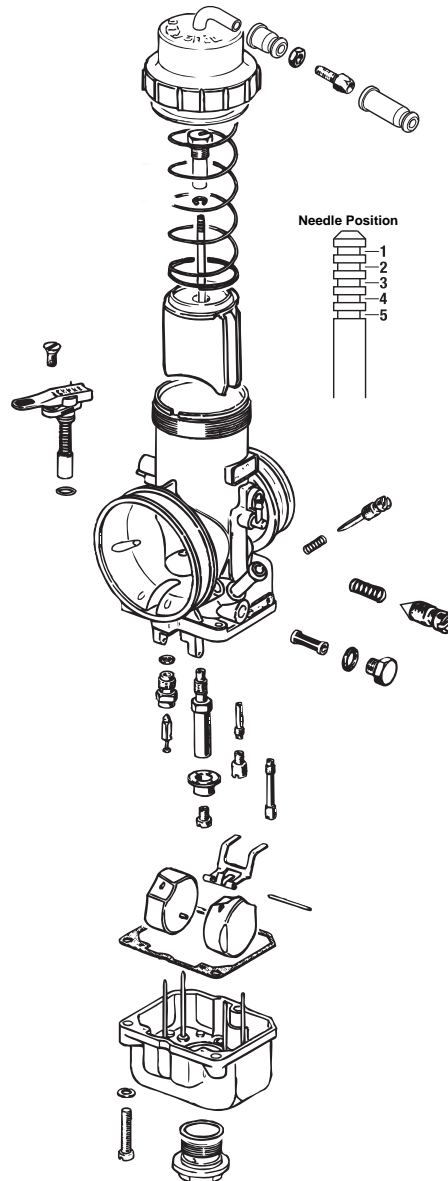


Figure 4

K00064

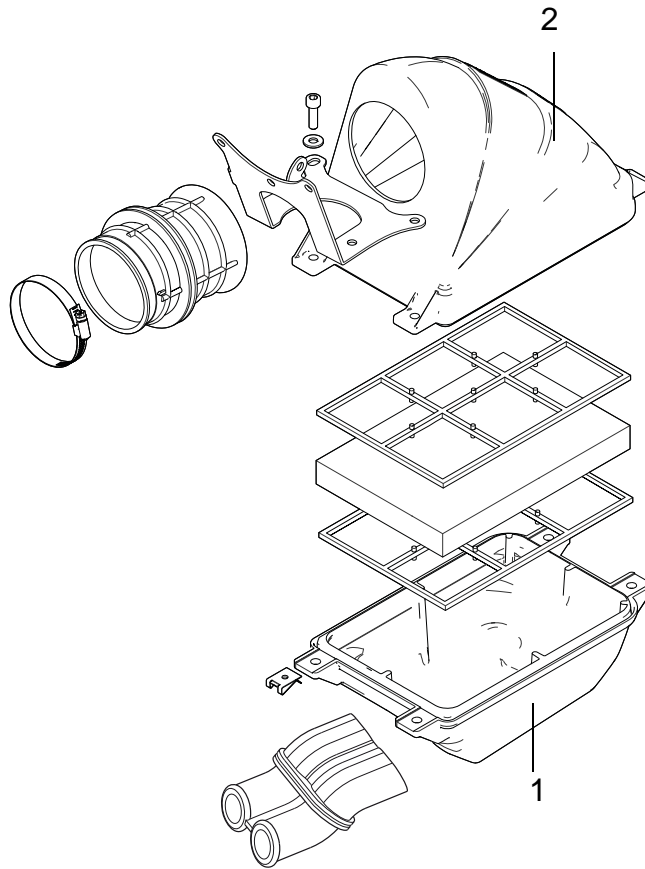
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### 2.1.3) Disassembly of intake silencer

Intake silencer See [Figure 5](#).

Step	Procedure
1	Disassemble the intake silencer to the parts shown in Figure 5.

Graphic Intake silencer



Part	Function
1	Intake silencer case, bottom
2	Intake silencer case, top

Figure 5

K00063

DK00028.fm

# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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# BRP-Powertrain

## REPAIR MANUAL

### 3) Checking components of carburetor and intake silencer

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

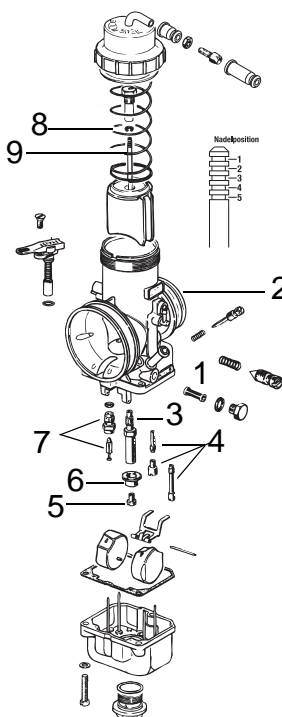
#### 3.1) Checking carburetor

**Instructions** See [Figure 6](#).

Step	Procedure
1	Clean fuel filter (1) and check that it is in good condition.
2	Blow out holes in the carburetor housing (2) and jets (3, 4, 5, 6, and 7) with compressed air 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	Lock washer
9	Jet needle

Figure 6

K00064

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# BRP-Powertrain

## REPAIR MANUAL

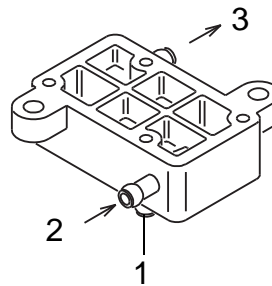
### 3.2) Checking fuel pump

**General**      **NOTES:**      Only the complete membrane and gasket set of the fuel pump can be replaced.  
Fuel pump gasket set: part no. 296165.

**Instructions**      See [Figure 7](#).

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.

**Graphic**      Fuel pump



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

*Figure 7*

K00065

**3.3) Checking intake silencer**

**General**

**NOTES:** If the silencer filter is cracked or shows signs of disintegration, the silencer filter must be replaced.

**NOTICE**

A damaged filter element must be replaced immediately.

**Instructions**

See [Figure 8](#).

Step	Procedure
1	Inspect the silencer housing (1) and silencer cover (2) for cracks.
2	Inspect the intake silencer tube (3) and carburetor socket (4) for cracks or porosity.
3	Clean the silencer filter element (5) with a gasoline-oil mixture.
4	Check the silencer filter element (5) for cracks.
5	Check the support bracket (6) for cracks.

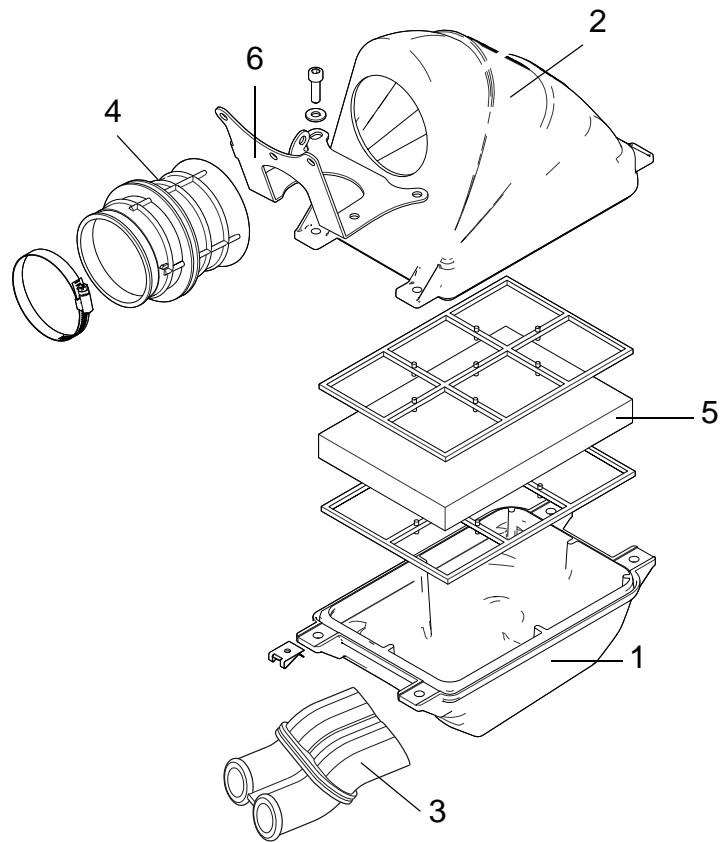


# BRP-Powertrain

## REPAIR MANUAL

Graphic

Intake silencer



Part	Function
1	Intake silencer case, bottom
2	Intake silencer case, top
3	Intake silencer tube
4	Carburetor socket
5	Filter element
6	Support bracket

Figure 8

K00063

## 4) Installation of carburetor and intake silencer

### 4.1) Assembly of carburetor

**Carburetor**      **NOTES:**      Use the gasket set ROTAX Part No. 293834.

Step	Procedure
1	The assembly of the parts is identical to the disassembly in reverse order. See also Chap. 6 Section: 2.1.2).

#### 4.1.1) Assembly of float housing and float

**General**      **NOTES:**      When the carburetor 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 and float chamber should not have been fitted.

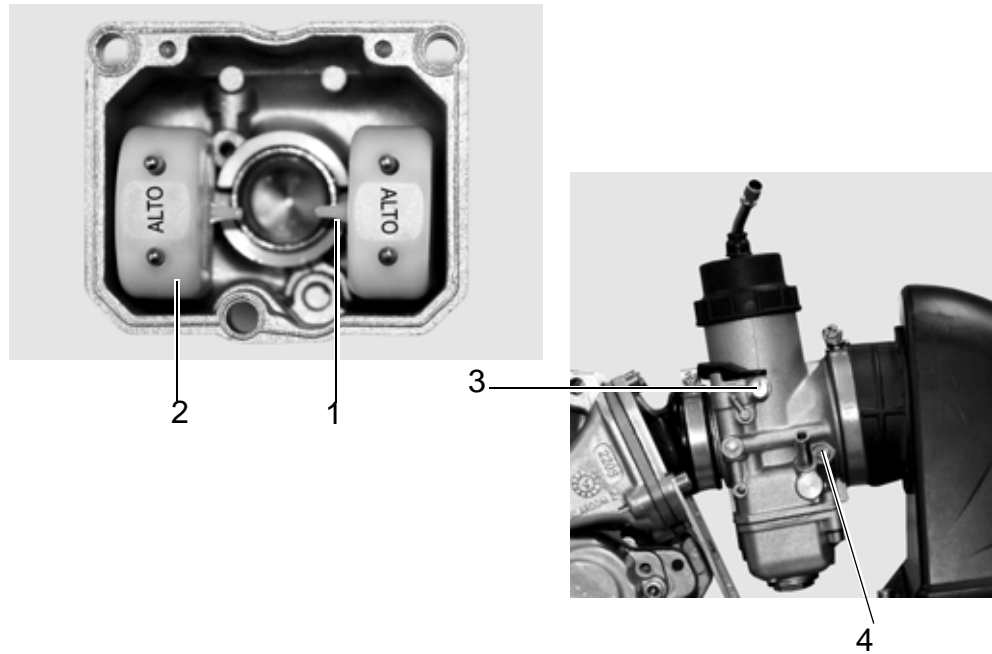
**Instructions**      See [Figure 9](#).

Proceed as follows to install the float housing :

Step	Procedure
1	Check the position of the float attachment (1) when installed.
2	The "ALTO" = top on the float (2) must be visible when they are installed.
3	Install and adjust the Bowden cable for the carburetor piston actuation in accordance with the operating instructions.
4	Set the adjusting screws (3) and (4) in accordance with the operating instructions.

Graphic

Float chamber



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

Figure 9

K00110,K00111

### 4.2) Assembly of intake silencer

General

NOTES: Immerse the filter element in filter oil before assembly and then squeeze out the excess oil.

Special tools

The following special tools and equipment are required:

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

Instructions

Proceed as follows to install the intake silencer:

Step	Procedure
1	The assembly of the parts is identical to the disassembly in reverse order. See also Chap. 6 Section: 2.1.3).

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### 4.3) Installation of carburetor and intake silencer

**Safety instructions**

See [Figure 10](#).



**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.

**NOTES:** On assembly, make sure that all pipes are correctly connected.

**Preparation**

The following preparation is required before installation:

#### Installation of the fuel pump

Step	Procedure
1	Install the fuel pump with 2 cyl. M6x20 screws and new locknuts on the bottom of the bracket for the intake silencer.  NOTE: The fuel pump must be installed to the connection for the impulse points down and the connection for the fuel feed points towards the driver's seat.

**Instructions**

Proceed as follows to install the carburetor and intake silencer:

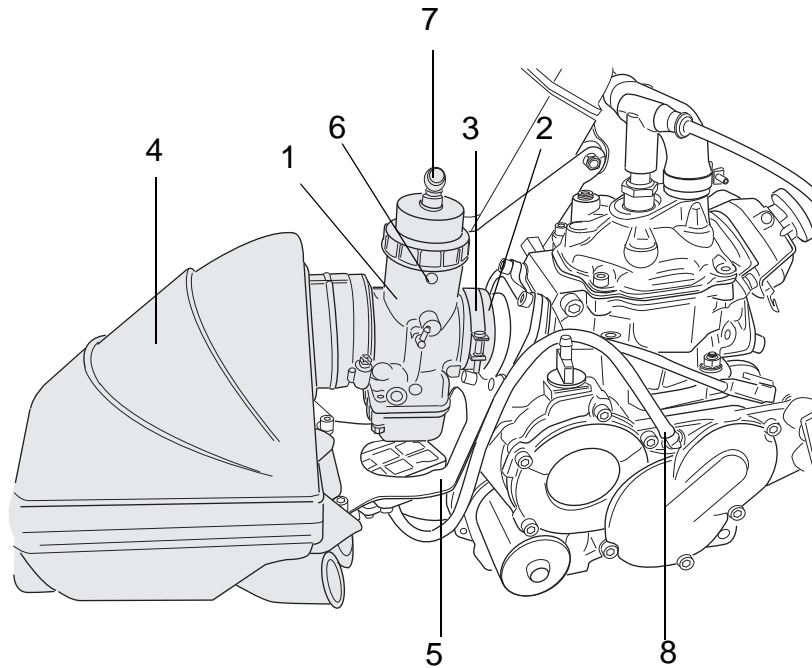
Step	Procedure
1	Position the carburetor (1) on the carburetor flange (2).
2	Pull the hose clamp (3) over the carburetor flange and tighten it.
3	Fasten the intake silencer (4) to the carburetor with the hose clamp.
4	Fasten the intake silencer to the support bracket (5).
5	Check the carburetor cable in the elbow for wear.
6	Connect the fuel feed line (6) and the cable (7) to the carburetor.
7	Connect the impulse pipe (8).

# BRP-Powertrain

## REPAIR MANUAL

Graphic

Carburetor and intake silencer



Part	Function
1	Carburetor
2	Carburetor flange
3	Hose clamp
4	Intake silencer
5	Support bracket
6	Fuel line
7	Carburetor cable
8	Impulse pipe

Figure 10

K00141

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# BRP-Powertrain

## REPAIR MANUAL

### Chapter: 7

## CLUTCH AND STARTER GEAR ASSEMBLY

#### Contents

This chapter describes the disassembly and assembly of the clutch and starter gear assembly module of the ROTAX 125 MAX engine. The description is divided into sections.

Subject	Page
System description	<a href="#">Page 3</a>
Removal of the clutch and starter gear assembly	<a href="#">Page 5</a>
Oil draining	<a href="#">Page 5</a>
Removal of the electric starter	<a href="#">Page 6</a>
Removal of the clutch drum	<a href="#">Page 7</a>
Removal of the sprocket	<a href="#">Page 8</a>
Removal of the clutch and starter gear assembly	<a href="#">Page 10</a>
Checking components of clutch and starter gear assembly	<a href="#">Page 13</a>
Checking the clutch drum	<a href="#">Page 13</a>
Checking the needle cage and sprocket	<a href="#">Page 13</a>
Checking the starter reduction gear assembly	<a href="#">Page 14</a>
Checking the electric starter	<a href="#">Page 15</a>
Electric starter repair kit	<a href="#">Page 16</a>
Checking the clutch and starter gear assembly	<a href="#">Page 19</a>
Installation of clutch and starter gear assembly	<a href="#">Page 21</a>
Installing starter reduction gear assembly	<a href="#">Page 21</a>
Installing starter gear assembly	<a href="#">Page 22</a>
Assembling the clutch drum	<a href="#">Page 25</a>
Installing bearing sleeve	<a href="#">Page 25</a>
Installing sprocket	<a href="#">Page 26</a>
Installing clutch drum	<a href="#">Page 28</a>
Electric starter	<a href="#">Page 30</a>
Filling gearbox with oil	<a href="#">Page 31</a>

# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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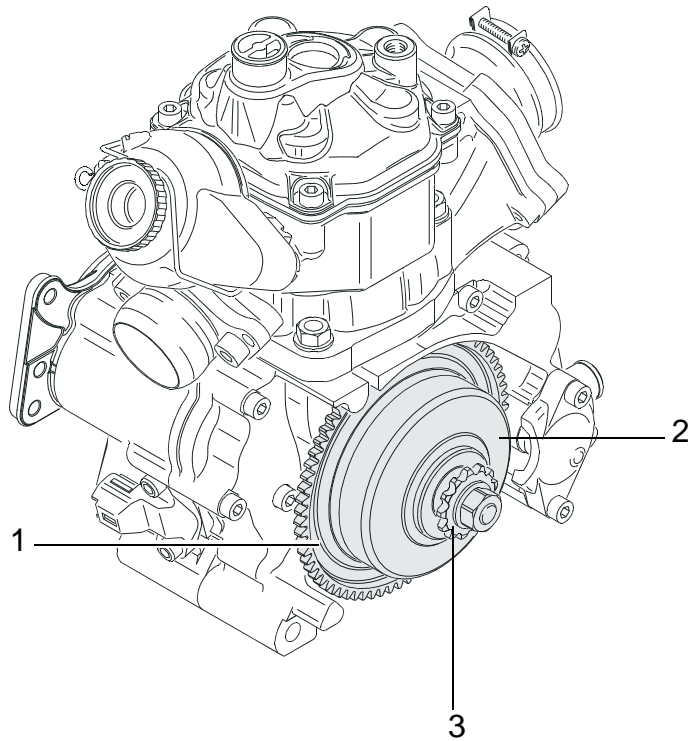
# BRP-Powertrain

## REPAIR MANUAL

### 1) System description

Overview

Position on the engine



Part	Function
1	Starter gear assembly
2	Clutch drum
3	Sprocket

Figure 1

K00140

DK00029.fm



# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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## 2) Removal of the clutch and starter gear assembly

**Safety instructions**



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



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) Oil draining

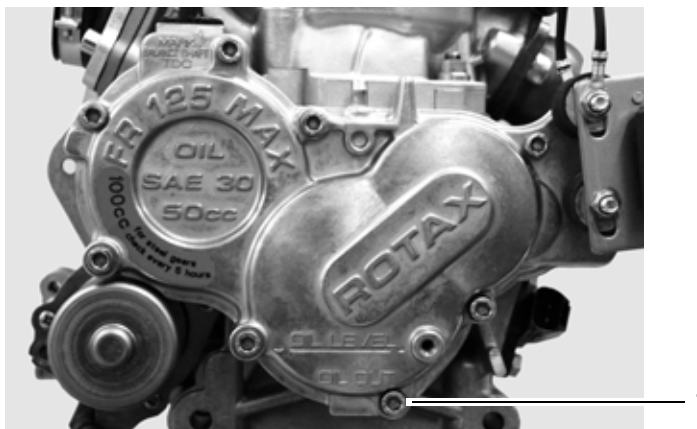
**Instructions**

See [Figure 2](#).

Step	Procedure
1	Remove oil drain plug (1) with gasket from the crankcase and gearbox case.
2	Drain oil into a suitable vessel and dispose of it correctly.

**Graphic**

Oil draining



Part	Function
1	Oil drain plug

Figure 2

K00114

DK00029.fm

# BRP-Powertrain

## REPAIR MANUAL

### 2.2) Removal of the electric starter

#### Instructions

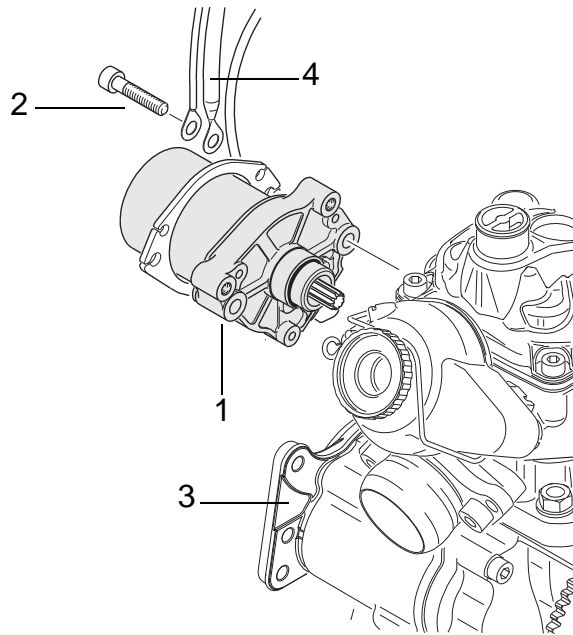
See [Figure 3](#).

Proceed as follows to remove the electric starter :

Step	Procedure
1	Disconnect electrical connection from the starter.
2	Disconnect the ground cable (4) from the housing.
3	Remove the electric starter (1) completely by unscrewing 2 cyl. screws (2) from the crankcase and gearbox case (3).

#### Graphic

Electric starter



Part	Function
1	Electric starter
2	Cyl. screw
3	Gearbox case
4	Ground cable

Figure 3

K00078

#### 2.2.1) Positioning the engine on the trestle mounting plate

See also Chap. 3 Section: 2.6).

DK00029.fm

# BRP-Powertrain

## REPAIR MANUAL

### 2.3) Removal of the clutch drum

**Special tools** The following special tools and equipment are required:

Part number	Description	Use
Part no. 277380	Locking tool	Spark plug thread
Part no. 676205	Fixation tool assembly	Starter gear assembly

**Instructions** See [Figure 4](#).

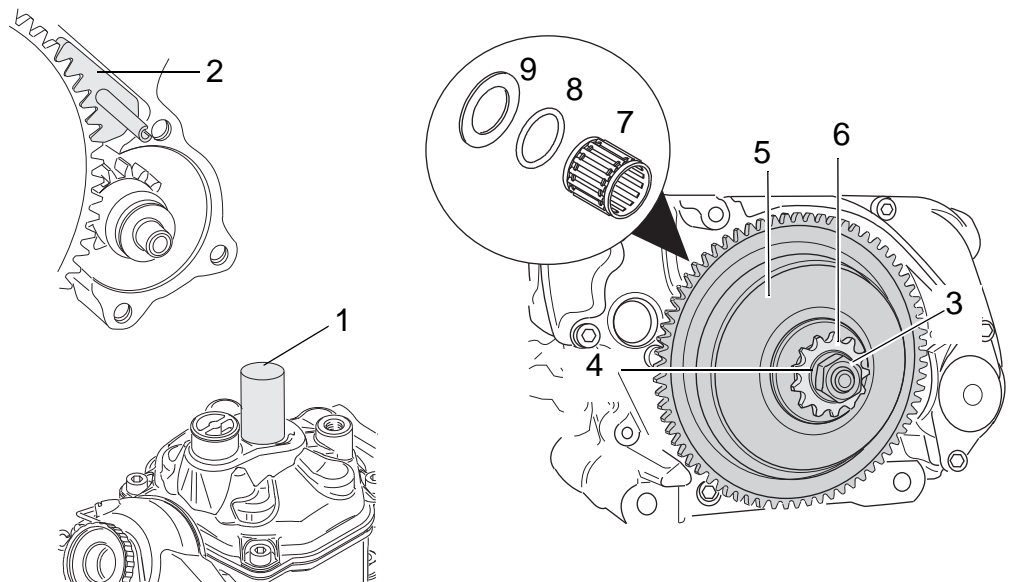
Proceed as follows to remove the clutch drum:

Step	Procedure
1	Remove spark plug.
2	Preferred method 1: screw in fixation tool for crankshaft (1) (part no. 277380) into the spark plug hole to the limit stop.
3	Method 2: insert fixation tool assembly (2) (part no. 676205) in the starter gear assembly.
4	Unscrew and remove hex nut (3).
5	Remove thrust washer (4), clutch drum (5) with sprocket (6), needle cage (7) O-ring (8) and thrust washer (9).

NOTES: With the sprocket with 11 teeth a bearing sleeve is used instead of the needle cage (6). It is pressed into the sprocket.

**Graphic**

Clutch drum



Part	Function
1	Locking tool
2	Fixation tool assembly
3	Hex nut

DK00029.fm

# BRP-Powertrain

## REPAIR MANUAL

Part	Function
4	Thrust washer
5	Clutch drum
6	Sprocket
7	Needle cage
8	O-ring
9	Thrust washer

Figure 4

K00079,K00151,K00112

### 2.3.1) Removal of the sprocket

#### Special tools

The following special tools and equipment are required:

Part number	Description	Use
Part no. 944231	Fixation tool for sprocket (old model)	Clutch drum
Part no. 277362	Fixation tool for sprocket	Clutch drum

#### Instructions

See [Figure 5](#).

Step	Procedure
1	Method 1: fix fixation tool for sprocket (1) (part no. 944231) in a vise in the area of the flat iron.
2	Position the clutch drum (3) with installed sprocket (4) on the centering mandrel of the fixation tool for sprocket so the clutch bell is fixed by the fixation tool.
3	Unscrew the hex nut (5) for the sprocket.
4	Remove the sprocket from the clutch drum.
5	Method 2: fix fixation tool for sprocket (2) (part no. 277362) in a vise.
6	Insert clutch drum (3) with installed sprocket (4) into the corresponding toothed cutout.
7	Unscrew the hex nut (5) for the sprocket.
8	Remove the sprocket from the clutch drum.

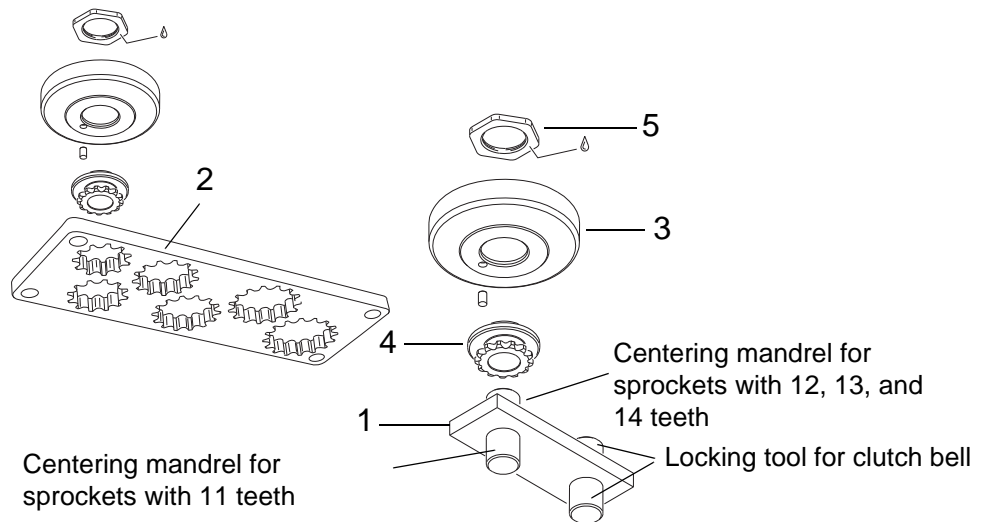
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# BRP-Powertrain

## REPAIR MANUAL

Graphic

Sprocket



Part	Function
1	Fixation tool for sprocket (old model)
2	Locating/locking device
3	Clutch drum
4	Sprocket
5	Hex nut

Figure 5

K00144, K00022

DK00029.fm

# BRP-Powertrain

## REPAIR MANUAL

### 2.4) Removal of the clutch and starter gear assembly

**Special tools** The following special tools and equipment are required:

Part number	Description	Use
Part no. 276016	Puller assembly	Starter gear assembly
Part no. 277380	Locking tool	Spark plug thread
Part no. 676205	Fixation tool assembly	Starter gear assembly

**Instructions**

See [Figure 6](#).

Proceed as follows to remove the starter gear assembly :

Step	Procedure
1	Unscrew the two cyl. screws (1) for fastening the starter drive cover and remove the starter drive cover (2).
2	Method 1: screw in fixation tool for crankshaft (3) (part no. 277380) into the spark plug thread to the limit stop.
3	Method 2: insert fixation tool assembly (4) (part no. 676205) in the starter gear assembly.
4	Remove the clutch (5).
5	Unscrew hex nut (6).
6	Fasten the puller assembly (7) to the starter gear assembly with 3 M6x60 cyl. screws (8). NOTES: Screw cyl. screws into the starter gear assembly until there is 1 mm between the screws and housing.
7	Pull out starter gear assembly.
8	Remove starter reduction gear assembly (9) with the thrust washer (10) below.

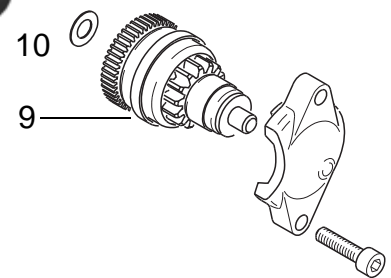
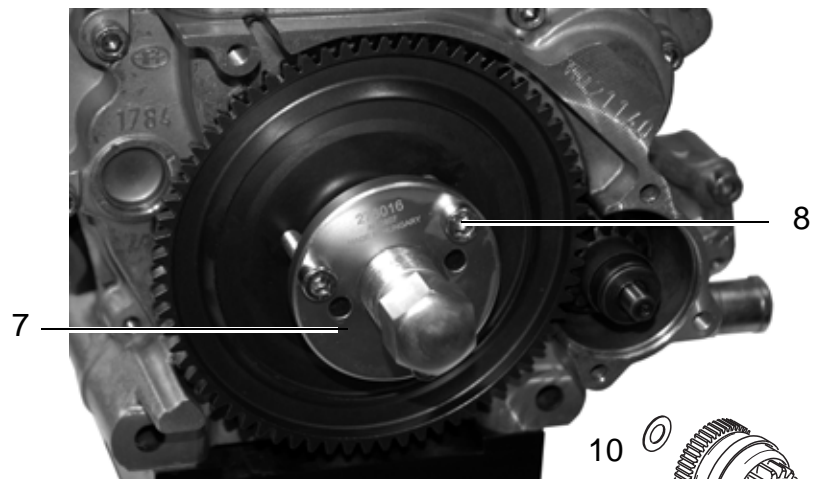
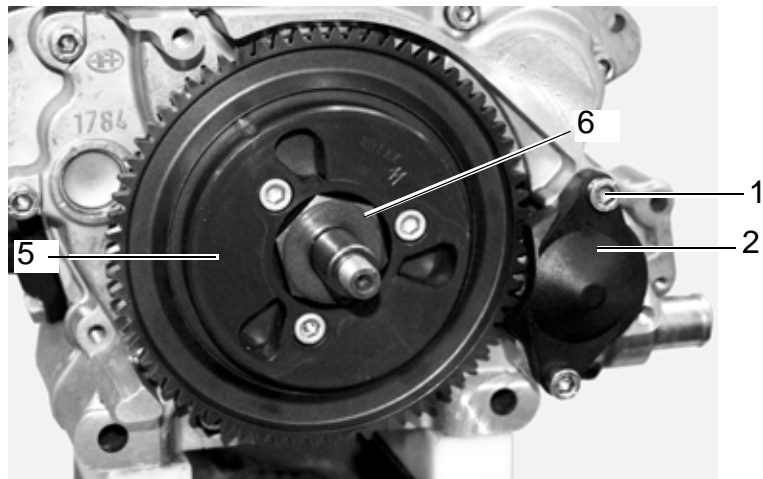
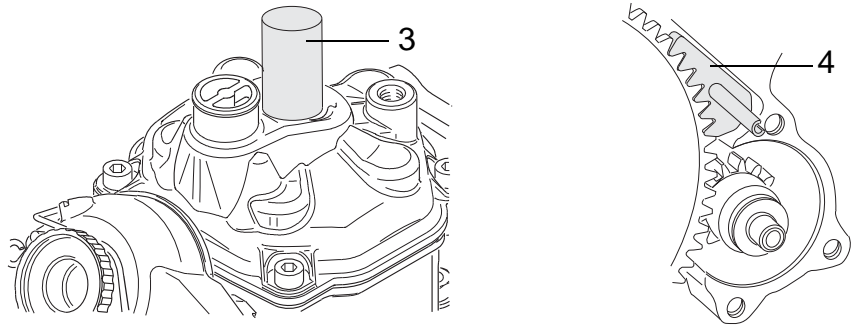
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# BRP-Powertrain

## REPAIR MANUAL

Graphic

### Clutch and starter gear assembly



DK00029.fm



# BRP-Powertrain

## REPAIR MANUAL

Part	Function
1	Cyl. screw
2	Starter drive cover
3	Locking tool
4	Fixation tool assembly
5	Clutch
6	Hex nut
7	Puller assembly
8	Cyl. screw M6x60
9	Starter reduction gear assembly
10	Thrust washer

*Figure 6*

*K00079,K00151,K00145,K00115,K00145,K00006*

DK00029.fm

### 3) Checking components of clutch and starter gear assembly

#### 3.1) Checking the clutch drum

**General** If the clutch drum starts to tumble when the engine is idling with a sprocket with 11 teeth, this is an indication of a worn bearing sleeve. This will cause breakage of the clutch.

**Instructions** See [Figure 7](#).

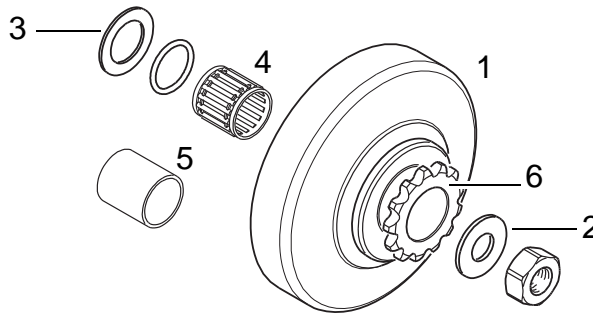
Step	Procedure
1	Check clutch drum (1) for signs of wear and replace if applicable.

#### 3.1.1) Checking the needle cage and sprocket

**Instructions** See [Figure 7](#).

Step	Procedure
1	Inspect the thrust washers (2) and (3) for signs of wear and replace if applicable.
2	Inspect the needle cage (4) for signs of wear and replace if applicable.
3	Inspect the teeth of the sprocket (5) for wear (compare) and replace if applicable.

**Graphic** Clutch drum, needle bearing, sprocket



Part	Function
1	Clutch drum
2, 3	Thrust washer
4	Needle cage
5	Bearing sleeve (only sprocket with 11 teeth)
6	Sprocket

Figure 7

K00005

DK00029.fm

**3.1.2) Checking starter reduction gear assembly**

**General**

**NOTES:** In one direction of rotation the two gear wheels can be rotated together, in the other direction of rotation the two gears move apart and finally lock.

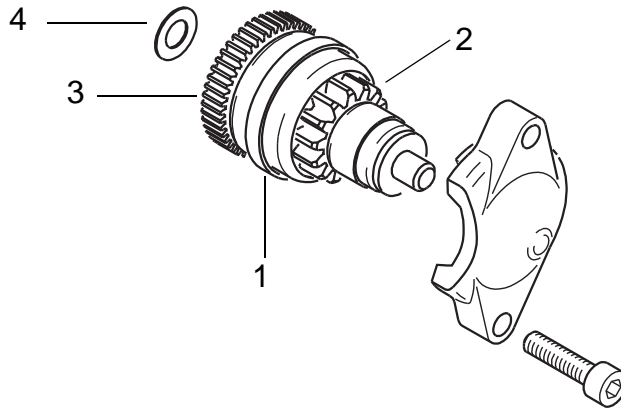
**Instructions**

See [Figure 8](#).

Step	Procedure
1	Cleaning starter reduction gear assembly (1).
2	Check the gear wheels (2) and (3) for wear.
3	Check the operation of the starter reduction gear assembly.

**Graphic**

Starter reduction gear assembly



Part	Function
1	Starter reduction gear assembly
2	Gear wheel
3	Gear wheel
4	Thrust washer

*Figure 8*

K00006

DK00029.fm

**3.1.3) Checking the electric starter**

**General**

**NOTES:**

If the electric starter is malfunctioning, the cause is generally that the two carbon brushes are worn or defective. In this case all parts in the electric starter repair kit must be renewed.

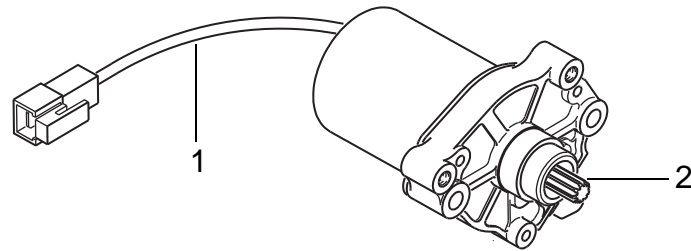
**Instructions**

See [Figure 9](#).

Step	Procedure
1	Check starter cable (1). If the starter cable is faulty, the starter cable assembly can be replaced.
2	Check parts of the electric starter.
3	Check teeth (2) for deformation and wear.

**Graphic**

Electric starter



Part	Function
1	Starter cable
2	Gear (teeth)

*Figure 9*

K00034

DK00029.fm

# BRP-Powertrain

## REPAIR MANUAL

### 3.2) Electric starter repair kit

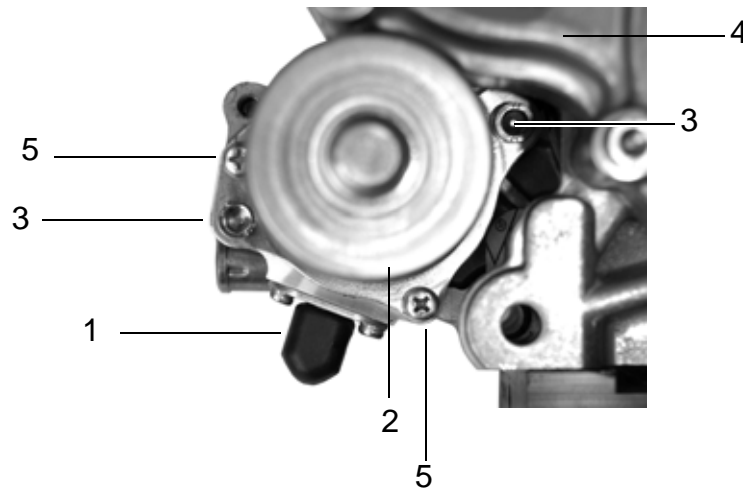
**Special tools** The following special tools and equipment are required:

Part number	Description	Use
Part no. 281261	Electric starter repair kit	Electric starter

**Instructions** See [Figure 10](#).

Step	Procedure
1	Disconnect electrical connection (1) from the starter (2).
2	Remove the ground cable.
3	Remove the starter housing from the crankcase and gearbox case (4) by unscrewing 2 cyl. screws (3).
4	Unscrew the starter housing screws (5).

**Graphic** Electric starter



Part	Function
1	Electrical feed
2	Electric starter
3	Cyl. screw
4	Gearbox case
5	Starter housing screws

Figure 10

K00150

DK00029.fm

**Disassembling electric starter**

**Instructions**

See [Figure 11](#).

**NOTICE**

Take care that the spring-loaded sliding contacts are not lost.

Step	Procedure
1	Secure the rotor shaft with a suitable tool.
2	Pull out solenoid housing .
3	Pull the rotor shaft from the starter motor support.
4	Unscrew the bracket for the positive contact.
5	Press out the rubber grommet.
6	Extract the positive contact by pulling it inwards through the plastic ring.

NOTES: If necessary, unscrew the rubber seal and the ground pole from the starter support and clean them.

**Graphic**

**Electric starter**



*Figure 11*

K00147, K00148, K00149

DK00029.fm

# BRP-Powertrain

## REPAIR MANUAL

### Instructions

### Assembling electric starter

**NOTICE**

The brushes must contact the slip ring correctly.

Step	Procedure
1	Inspect the carbon brushes and replace if necessary with new parts (ROTAX part no. 281261).
2	Insert the plastic ring in the starter motor support so that it does not rotate.
3	Insert the positive contact from inside through the plastic ring and the cutout in the starter motor support.
4	Secure the plastic ring with two Phillips head screws and washers. The fixing provides the ground contact.
5	Install the rubber grommet over the positive contact.
6	Secure the bracket on the starter motor support.
7	Insert the coil springs in the cutouts of the plastic ring, press the brushes against them.
8	Carefully insert the rotor shaft.
9	Fill the starter motor support with LOCTITE 5910 in the region of the positive pole. This protects the fragile carbon brushes from vibration.
10	Insert the O-ring into the starter motor support.
11	Hold the rotor shaft with a suitable tool and secure the solenoid housing on the starter motor support.

### Instructions

### Installation of the electric starter

See also Chap. 07, Section: 4.5).

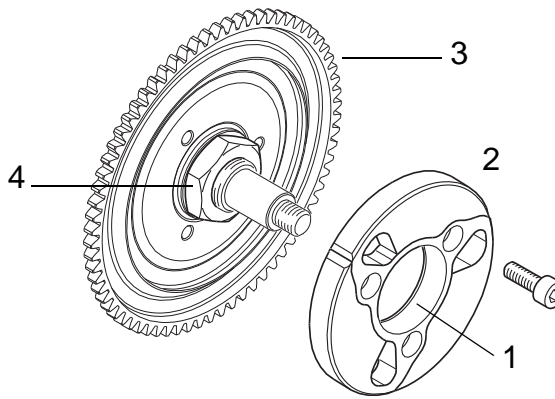
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**3.3) Checking the clutch and starter gear assembly**

Instructions See [Figure 12](#).

Step	Procedure
1	Check the hole (1) in the clutch (2).
2	Inspect the teeth (2) of the starter gear assembly (3) for damage or deformation.
3	Remove LOCTITE residue from the taper (4) of the starter gear assembly.

Graphic Clutch and starter gear assembly



Part	Function
1	Hole (clutch)
2	Clutch
3	Starter gear assembly
4	Taper (starter gear assembly)

Figure 12

K00020



# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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#### 4) Installation of clutch and starter gear assembly

**General**                      **NOTES:**                      Follow the sequence exactly. The starter reduction gear assembly cannot be installed after insertion of the starter gear assembly.

##### 4.1) Installing starter reduction gear assembly

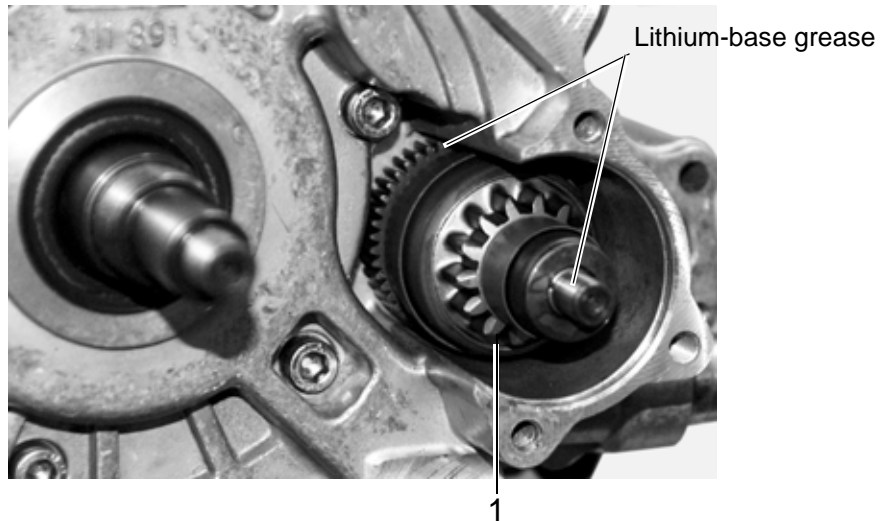
**Special tools**                      The following special tools and equipment are required:

Part number	Description	Use
Part no. 897330	Lithium-base grease	Starter drive

**Instructions**                      See [Figure 13](#).

Step	Procedure
1	Grease starter reduction gear assembly (1) with lithium soap grease in the area of the two bearing seats and the two gears.
2	Slide the thrust washer 8.1/150.5 and starter reduction gear assembly (1) into the bearing seat in the housing together.

**Graphic**                              Starter reduction gear assembly



Part	Function
1	Starter drive

Figure 13

K00117

DK00029.fm

# BRP-Powertrain

## REPAIR MANUAL

### 4.2) Installing starter gear assembly

**Special tools** The following special tools and equipment are required:

Part number	Description	Use
Part no. 277380	Locking tool	Spark plug thread
Part no. 676205	Fixation tool assembly	Starter gear assembly
Part no. 899788	LOCTITE 648	Starter gear assembly
Part no. 897651	LOCTITE 243	Starter drive cover

**Instructions** See [Figure 14](#).

Step	Procedure
1	Preferred version 1: screw in fixation tool for crankshaft (1) into the spark plug thread to the limit stop.
2	Version 2: insert fixation tool assembly (2) into the starter gear assembly.
3	Grease taper of starter gear assembly (3) and taper of crankshaft (4).
4	Coat taper of the starter gear assembly with LOCTITE 648 and install the complete starter gear assembly with the clutch (5) on the taper of the crankshaft. The 3 cyl. screws (6) must be secured with LOCTITE 648.
5	Wipe away the surplus LOCTITE.
6	Screw on hex nut (7). Tightening torque 120 Nm (89 ft.lb).
7	The two cyl. screws (8) for fixing the starter drive cover (9) must be secured with LOCTITE 243. Tightening torque 5 Nm (44.25 in.lb).

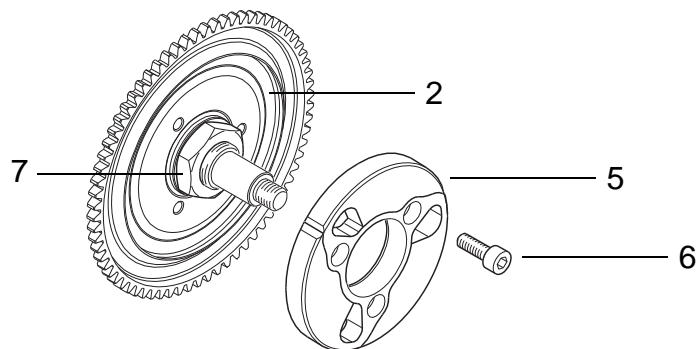
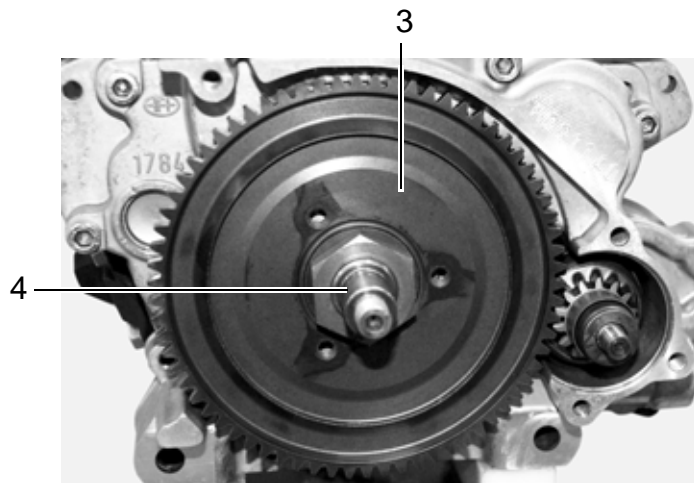
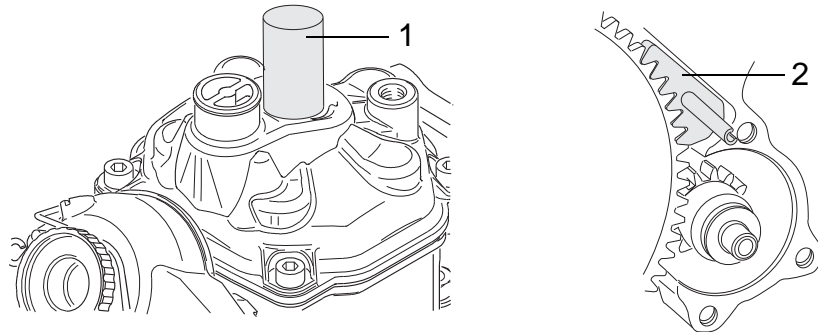
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# BRP-Powertrain

## REPAIR MANUAL

Graphic

Starter gear assembly

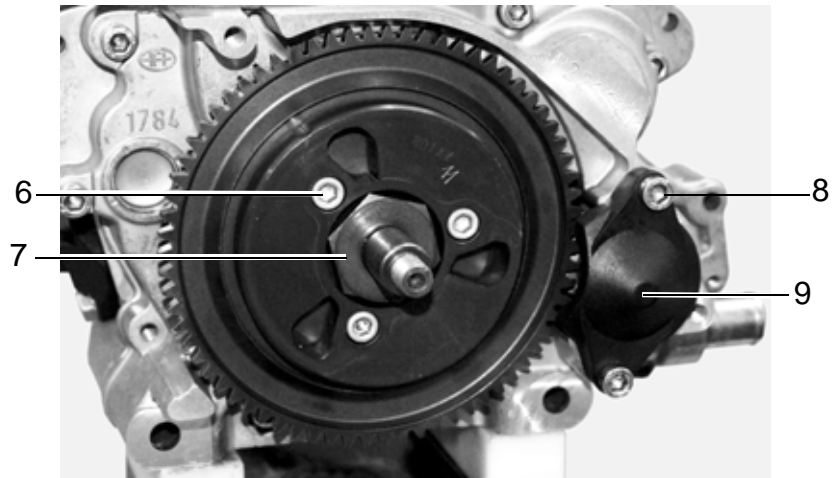


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# BRP-Powertrain

## REPAIR MANUAL

### Starter gear assembly



Part	Function
1	Locking tool
2	Fixation tool assembly
3	Starter gear assembly
4	Crankshaft
5	Clutch
6	Cyl. screw M6x12
7	Hex nut M20x1.5
8	Cyl. screw M6x25
9	Starter drive cover

Figure 14

K00079,K00151,K00116,K00020,K00115

DK00029.fm

**4.3) Assembling the clutch drum**

**4.3.1) Installing bearing sleeve**

**General** NOTES: Use the bearing sleeve for the sprocket with 11 teeth instead of the needle cage.

**Special tools** The following special tools and equipment are required:

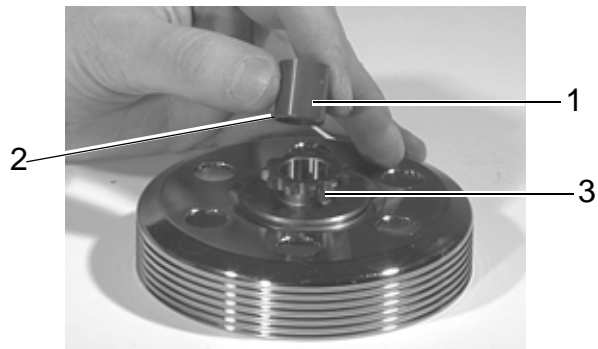
Part number	Description	Use
Part no. 676040	Installation tool	Sprocket
Part no. 277362	Locating/locking device	Clutch drum

**Instructions** See [Figure 15](#).

Proceed as follows to install the bearing sleeve :

Step	Procedure
1	Position the new bearing sleeve (1) with the bevel (2) on the sprocket (with 11 teeth) (3) and press into the stop in the sprocket with the installation tool (part no. 676040).

**Graphic** Installing bearing sleeve



Part	Function
1	Bearing sleeve
2	Bevel
3	Sprocket 11 teeth

*Figure 15*

K00158

# BRP-Powertrain

## REPAIR MANUAL

### 4.3.2) Installing sprocket

**Special tools** The following special tools and equipment are required:

Part number	Description	Use
Part no. 944231	Locating/locking device	Clutch drum
Part no. 277362	Locating/locking device	Clutch drum
Part no. 899788	LOCTITE 648	Hex nut

**Instructions**

See [Figure 16](#).

Proceed as follows to install the sprocket:

Step	Procedure
1	Method 1: fix fixation tool for sprocket (1) in a vise in the area of the flat iron.
2	Remove LOCTITE residue from the clutch drum (3) and the hex nut (4) and degrease.
3	Position new sprocket (5) on the corresponding centering mandrel of the fixation tool for sprocket.
4	Position clutch drum (3) on the sprocket.
5	Secure hex nut (4) with LOCTITE 648 and tighten. Tightening torque 100 Nm (74 ft.lb).
6	Method 2: fix fixation tool for sprocket (2) in a vise.
7	Remove LOCTITE residue from the clutch drum (3) and the hex nut (4) and degrease.
8	Position clutch drum (6) on the sprocket.
9	Secure hex nut (4) with LOCTITE 648 and tighten. Tightening torque 100 Nm (74 ft.lb).

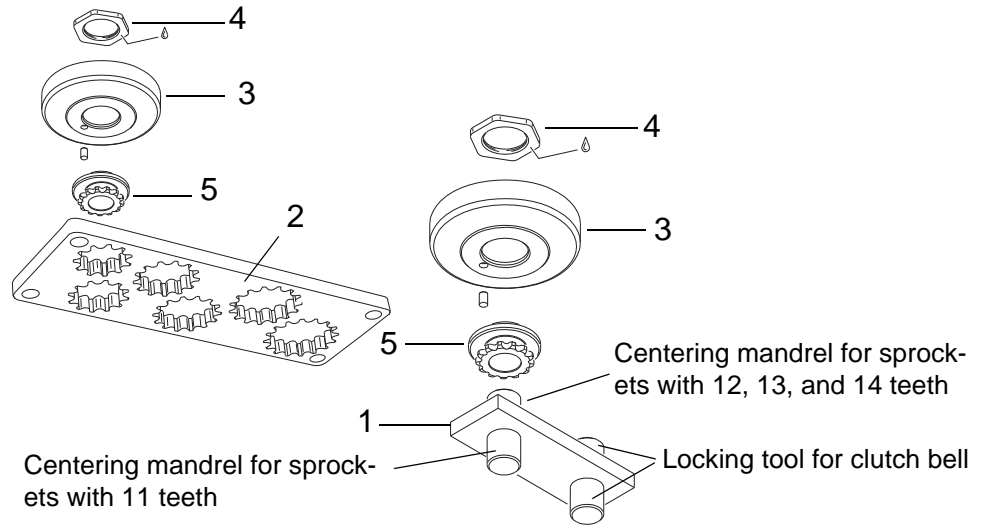
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# BRP-Powertrain

## REPAIR MANUAL

Graphic

### Sprocket and needle cage



Part	Function
1	Fixation tool for sprocket part no. 944231
2	Fixation tool for sprocket part no. 277362
3	Clutch drum
4	Hex nut
5	Installation tool
6	Locating/locking device
7	Clutch drum

Figure 16

K00143, K00144, K00022

DK00029.fm



# BRP-Powertrain

## REPAIR MANUAL

### 4.4) Installing clutch drum

**Special tools** The following special tools and equipment are required:

Part number	Description
Part no. 897651	LOCTITE 243
Part no. 897330	Lithium-base grease

**Instructions** See [Figure 17](#).

Proceed as follows to install the clutch drum :

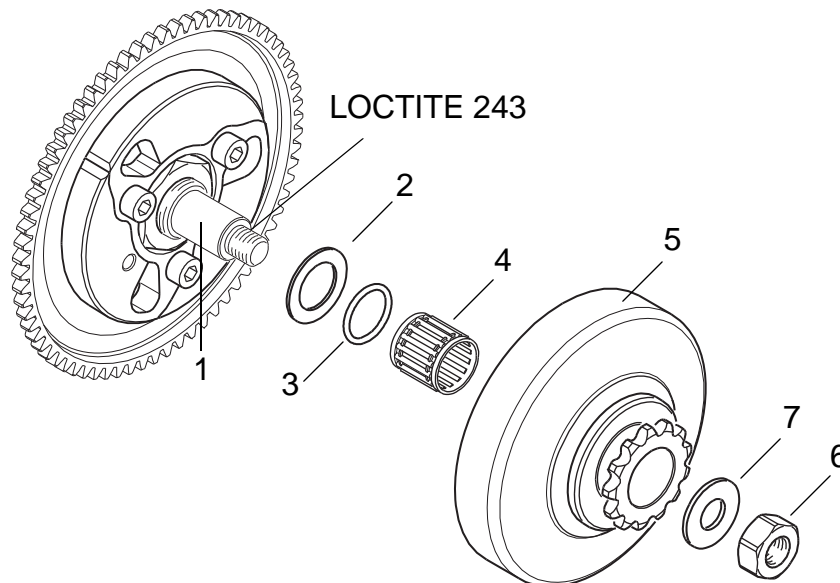
Step	Procedure
1	Grease the crankshaft (1) with lithium soap grease in the running area of the needle cage (4).
2	Position thrust washer (2) and O-ring (3) on the crankshaft (1).
3	Coat the needle cage (4) with lithium soap grease and position on crankshaft.
4	Slide clutch drum (5) onto the crankshaft.
5	Coat the crankshaft (1) with LOCTITE 243 in the area of the hex nuts.
6	Install and tighten hex nuts (6) and thrust washer (7) with machined side towards the clutch drum. Tightening torque 35 Nm (26 ft.lb).
7	Remove fixation tool for crankshaft (8) or fixation tool assembly (9) from the spark plug thread or from the starter gear assembly.
8	Install spark plug. Tightening torque 24 Nm (18 ft.lb).

#### NOTICE

Do not start the engine without the clutch drum; it will not operate.

**Graphic**

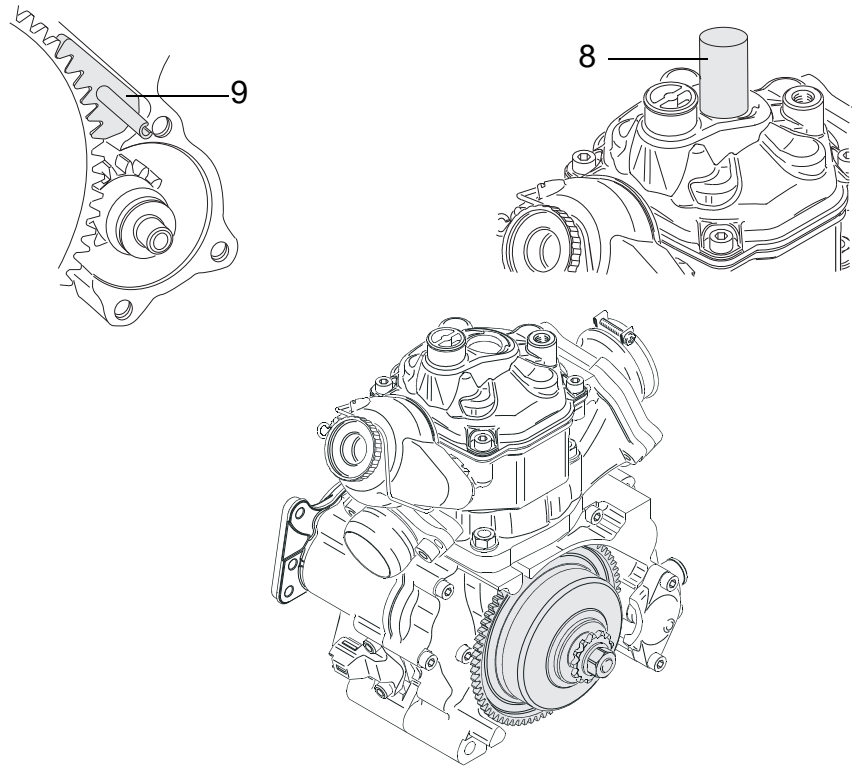
Clutch drum



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# BRP-Powertrain

## REPAIR MANUAL



Part	Function
1	Crankshaft
2	Thrust washer 15.2/25/1
3	O-ring 12x2.5
4	Needle cage 15x19x17
5	Clutch drum
6	Hex nut
7	Thrust washer 10/22/1.5
8	Locking tool
9	Fixation tool assembly

Figure 17

K00159,K00142,K00079,K00151,K00140

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# BRP-Powertrain

## REPAIR MANUAL

### 4.5) Installing electric starter

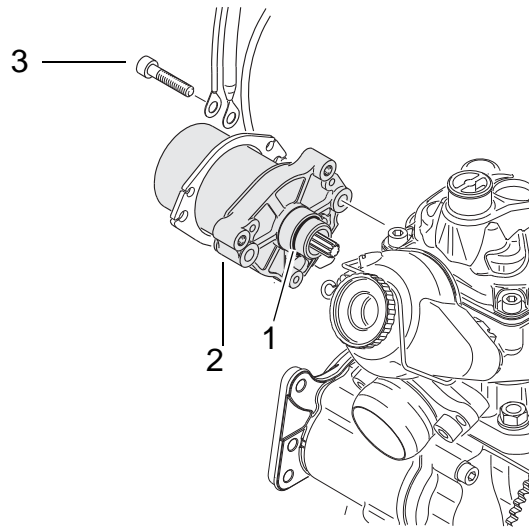
#### Instructions

See [Figure 18](#).

Step	Procedure
1	Grease O-ring (1) on the center of the electric starter.
2	Push the electric starter (1) into the centering of the housing by rotating it back and forth until the teeth of the electric starter are meshed with the teeth of the starter reduction gear assembly.
3	Fasten the electric starter to the housing with 2 cyl. screws (2). Tightening torque 10 Nm (90 in.lb).
4	Connect the electrical and the ground cable to the starter.

#### Graphic

Electric starter



Part	Function
1	O-ring
2	Electric starter
3	Cyl. screw M6x35

Figure 18

K00078

# BRP-Powertrain

## REPAIR MANUAL

### 4.6) Filling gearbox with oil

**General**      **NOTES:**      The cyl. screw (2) functions as an oil level screw. With the engine in a horizontal position (without the engine bracket) add gear oil until it runs out of the cyl. screw (2). This corresponds to the filling volume of 100 cm<sup>3</sup>.

**Special tools**      The following special tools and equipment are required:

Part number	Description	Use
n.e	Gear oil specification SAE 30	Gearbox

**Instructions**      See [Figure 19](#).

Step	Procedure
1	Remove vent screw (1).
2	Add the specified volume of gear oil of 100 cm <sup>3</sup> through the filling hole in the housing.
3	Use gaskets for the cyl. screws (2 = oil level plug) and (3 = oil drain plug).
4	Screw in the vent screw (1) handtight.

**Graphic**      Adding oil.



Part	Function
1	Vent screw
2	Oil level plug
3	Oil drain plug

Figure 19

K00136

DK00029.fm

# BRP-Powertrain

## REPAIR MANUAL

### NOTES

DK00029.fm

**Chapter: 8**  
**WATER RADIATOR**

**Contents**

This chapter describes the removal and installation of the water radiator module of the ROTAX 125 MAX engine. The description is divided into sections.

<b>Subject</b>	<b>Page</b>
System description	<a href="#">Page 3</a>
Removing the water radiator Removal of the cooling water hose	<a href="#">Page 5</a> <a href="#">Page 5</a>
Water radiator -inspection of components	<a href="#">Page 7</a>
Installation of water radiator Installation of the cooling water hose Installation of the water radiator	<a href="#">Page 9</a> <a href="#">Page 9</a> <a href="#">Page 10</a>

# BRP-Powertrain

## REPAIR MANUAL

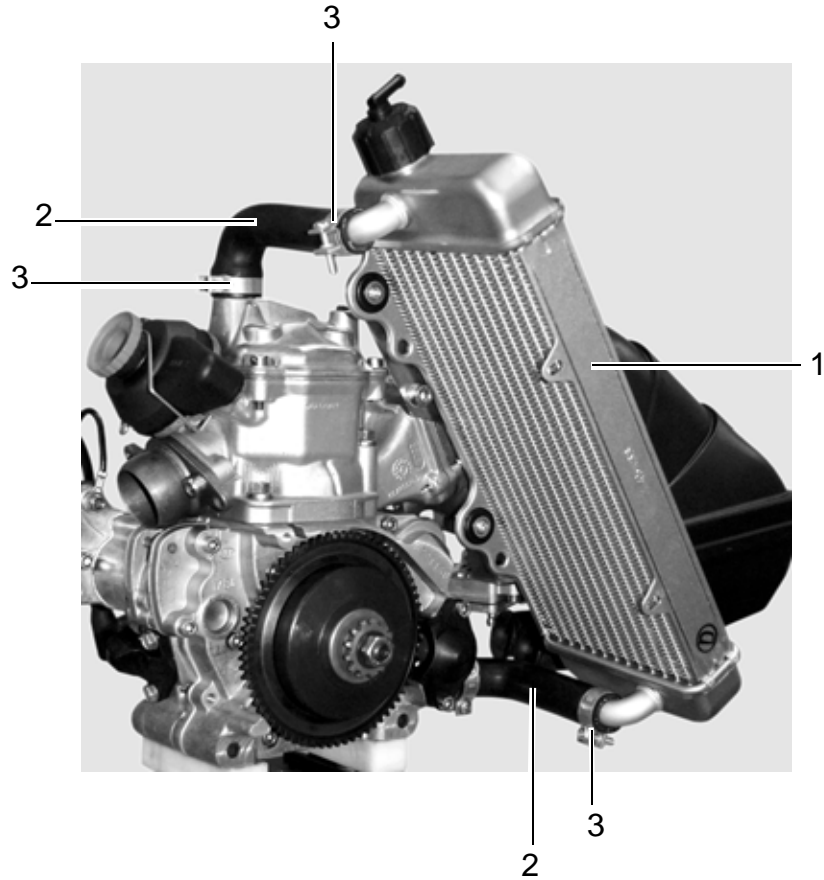
### NOTES

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**1) System description**

Overview

Position on the engine



Part	Function
1	Radiator
2	Cooling water hose
3	Hose clamp

*Figure 1*

K00120

DK00030.fm



# BRP-Powertrain

## REPAIR MANUAL

### NOTES

DK00030.fm

## 2) Removing the water radiator

**Safety instructions**



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	Open water radiator closure.

### 2.1) Removal of the cooling water hose

**General**

NOTES: Collect the coolant in a suitable vessel.

**Instructions**

See [Figure 2](#).

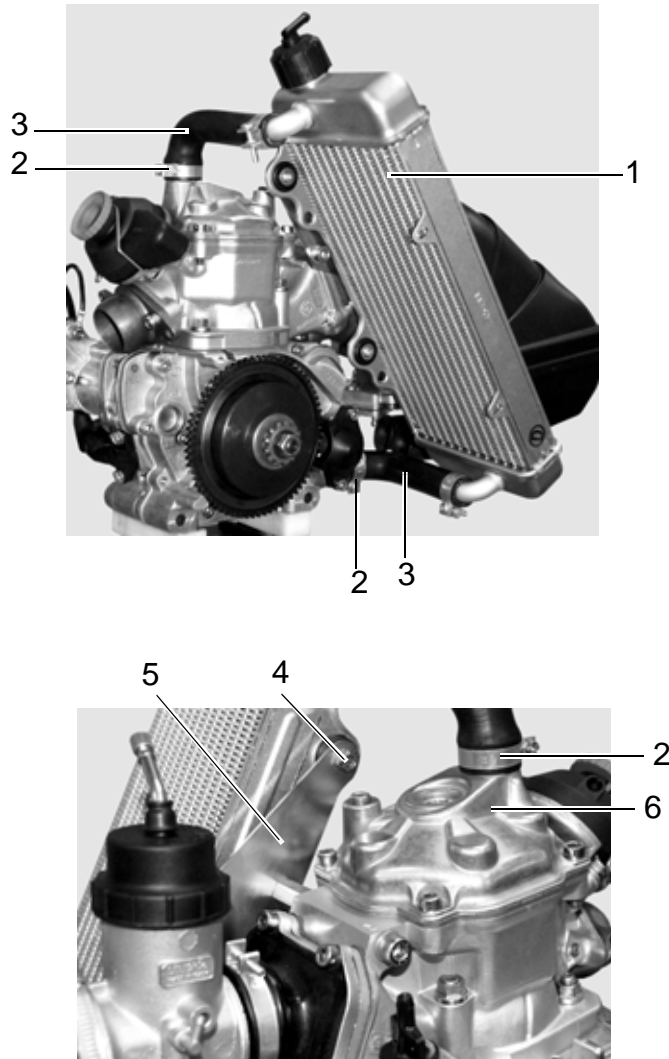
Step	Procedure
1	Loosen the engine side of the hose clamps (2) of the cooling water hose (3).
2	Unscrew locknut (4) on the bracket (5) for the water radiator.
3	Pull off the water radiator (1) with cooling water hose from the bottom 90° elbow and drain coolant.
4	Pull of cooling water hose (3) at the cylinder head cover (6). Unscrew the hose clamp (2) and pull the cooling water hose from the port.

# BRP-Powertrain

## REPAIR MANUAL

Graphic

Cooling water hose



Part	Function
1	Radiator
2	Hose clamp
3	Cooling water hose
4	Locknut
5	Retaining plate
6	Cylinder head cover

Figure 2

K00120, K00121

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# BRP-Powertrain

## REPAIR MANUAL

### 3) Water radiator -inspection of components

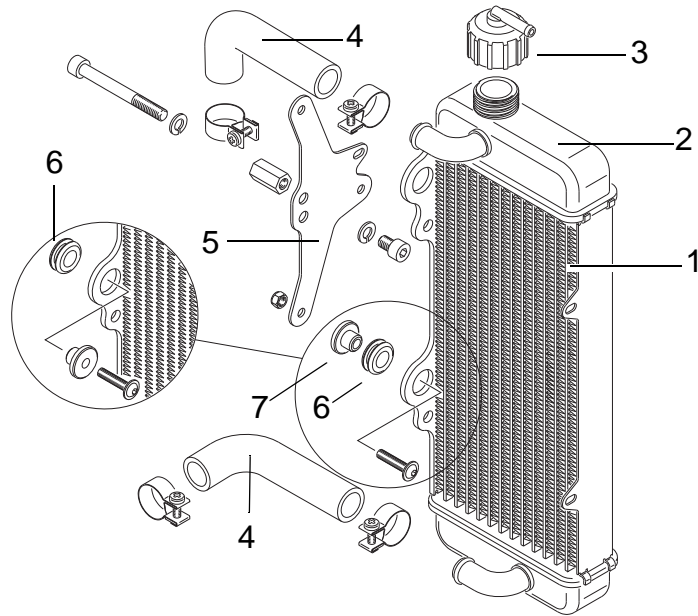
Instructions See [Figure 3](#).

NOTES: If the cooling fins are slightly bent in places, they can be bent back in place to a small degree.

Step	Procedure
1	Clean dirt from the cooling fins (1) of the water radiator with compressed air. Do not use a pressure cleaner.
2	Visually check the water radiator (2) for cracks and damage.
3	Check that the radiator cap gasket (3) is in good condition.
4	Check that the cooling water hose (4) is not porous or leaking.
5	Check the retaining plate (5) for the radiator for cracks (visual inspection).
6	Check that the round buffer (6) and distance sleeve (7) are in good condition.

#### Graphic

#### Radiator



Part	Function
1	Cooling fins
2	Radiator
3	Radiator cap
4	Cooling water hose
5	Retaining plate
6	Rubber grommet
7	Distance sleeve

Figure 3

K00062

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# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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## 4) Installation of water radiator

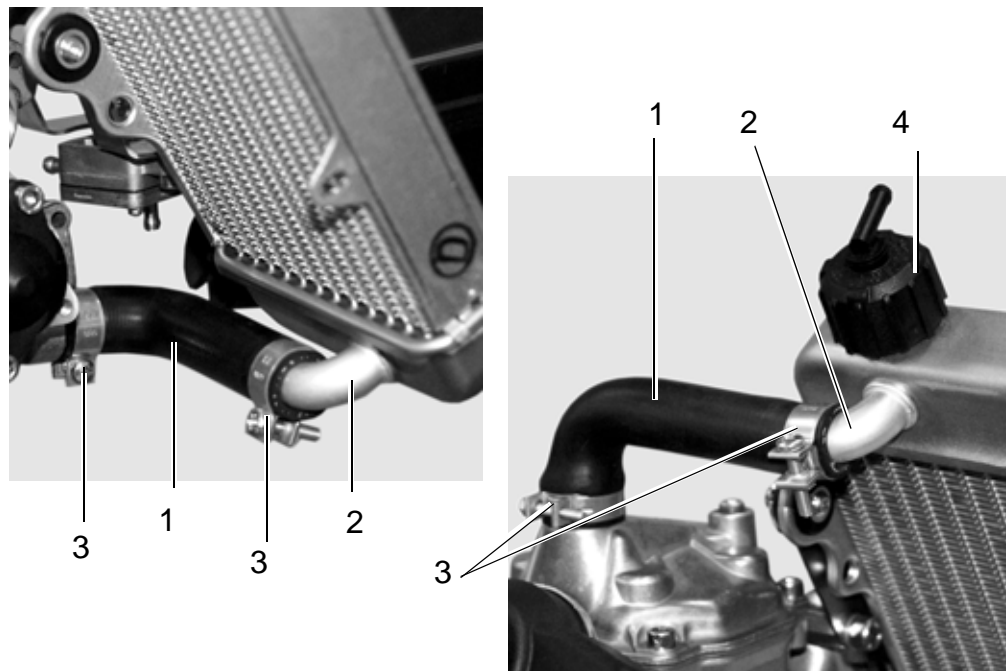
### 4.1) Installation of the cooling water hose

Instructions See [Figure 4](#).

Step	Procedure
1	Fit the cooling water hose (1) to the connection (2) on the water radiator and align with the port on the engine, then tighten the hose clamps (3) to make it watertight.

Graphic

Water cooler elbow



Part	Function
1	Cooling water hose
2	Connection (water radiator)
3	Hose clamps
4	Radiator cap

Figure 4

K00122; k00123

# BRP-Powertrain

## REPAIR MANUAL

### 4.2) Installation of the water radiator

#### Instructions

Step	Procedure
1	The assembly of the parts is identical to the disassembly in reverse order. See Chap. 2
2	Add the specified volume (0.6 liters) of coolant with a funnel into the filler opening (4) of the water radiator.
3	Close the radiator cap.
4	Check the cooling system for leaks by running the engine until it is at operating temperature.

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

**Contents**

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

<b>Subject</b>	<b>Page</b>
System description	<a href="#">Page 3</a>
Removal of the exhaust system	<a href="#">Page 5</a>
Checking the exhaust system	<a href="#">Page 5</a>
Disassembling the exhaust system	<a href="#">Page 5</a>
Assembling the exhaust system	<a href="#">Page 6</a>
Installation of the exhaust system	<a href="#">Page 7</a>



# BRP-Powertrain

## REPAIR MANUAL

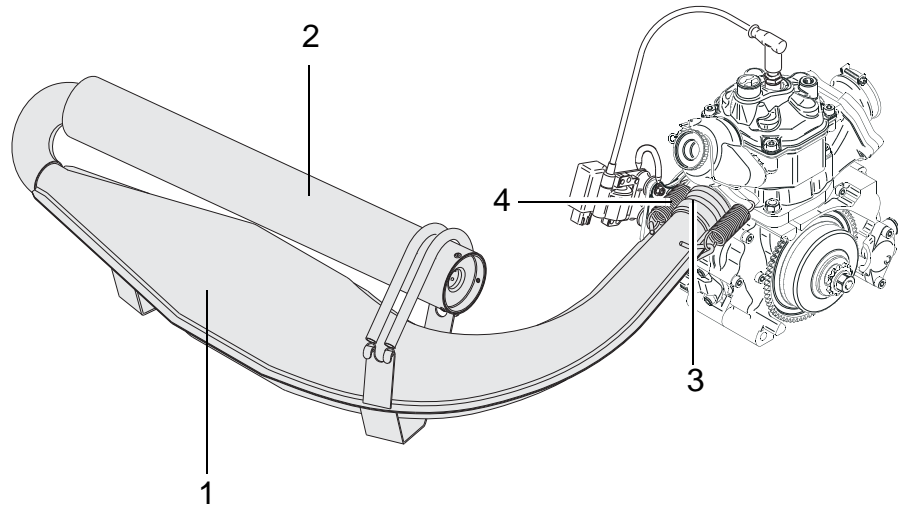
### NOTES

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**1) System description**

Overview

Position on the engine



Part	Function
1	Exhaust muffler
2	After-muffler
3	Ball socket
4	Exhaust spring

*Figure 1*

K00154

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# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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## 2) Removal of the exhaust system

**Safety instructions**



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 exhaust system. See also Chap. 3 Section: 2.1).

### 2.1) Checking the exhaust system

**Instructions**

See [Figure 2](#).

Step	Procedure
1	Check exhaust system (1) for cracks.
2	Clean the ball socket (2) of combustion residue and inspect for wear.
3	Check that the cover rivets (3) 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](#).

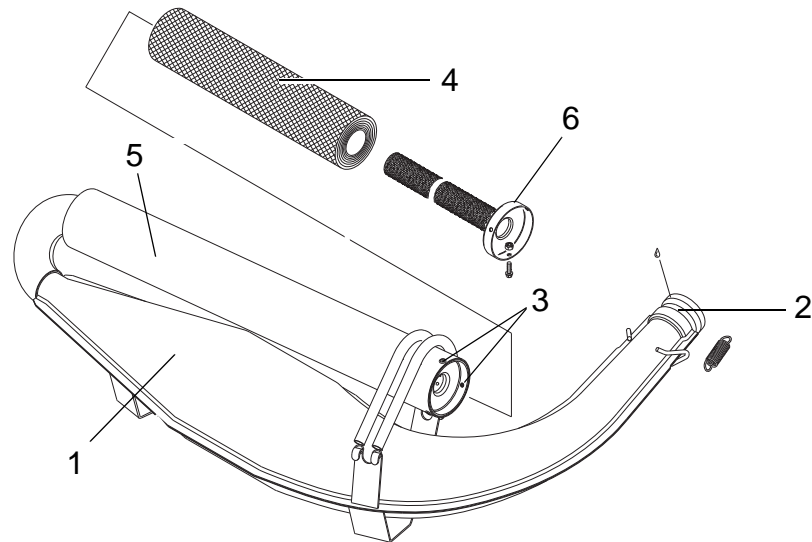
Step	Procedure
1	Drill out the rivets of the cover (3).
2	Remove old silencer baffle mat (4).

# BRP-Powertrain

## REPAIR MANUAL

Graphic

Exhaust system



Part	Function
1	Exhaust system
2	Ball socket
3	Rivets
4	Isolating mat
5	After-muffler
6	Cover

Figure 2

K00152

### 2.3) Assembling the exhaust system

Instructions

See [Figure 2](#).

Step	Procedure
1	Roll up new isolating mat (4) and insert into the after-muffler (5).
2	Install cover (6) and new rivets.

### 3) Installation of the exhaust system

#### 3.1) Installation of the exhaust system

**Instructions**

Step	Procedure
1	The exhaust system is installed in reverse order of removal. See also Chap. 3 Section: 3.6).

# BRP-Powertrain

## REPAIR MANUAL

### NOTES

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