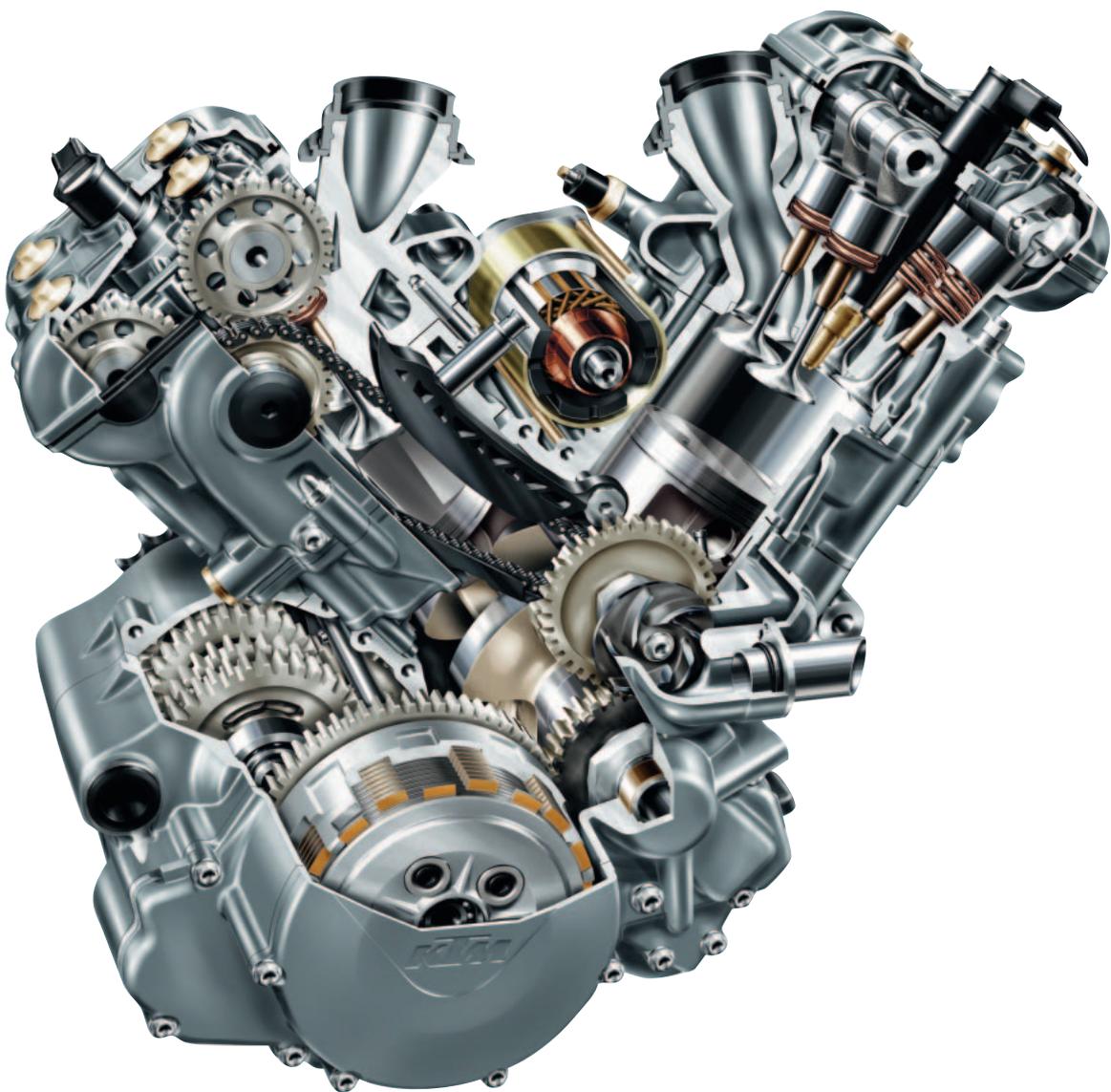


950 ADVENTURE 990 SUPER DUKE

REPARATURANLEITUNG
MANUALE DI RIPARAZIONE
MANUEL DE RÉPARATION
MANUAL DE REPARACIÓN



ART.NR.: 3.206.025-E

Product: 2003-2005 KTM 950 ADVENTURE, 990 SUPER DUKE Motorcycle Service Repair Workshop Manual
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REPAIRMANUAL2003-2005
950 ADVENTURE
990 SUPER DUKE



KTM Group Partner



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2 GENERAL INFORMATION

3 REMOVING AND REFITTING ENGINE

4 DISASSEMBLING ENGINE

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IMPORTANT INFORMATION/UPDATING INSTRUCTIONS

To be able to continue using the existing loose-leaf repair instructions, simply print the following pages and insert them in the existing repair instructions:

**15-25,26,29,33,34,36-45,48,51,53,55-65,70,71,74,80,85-94,99,102,105-147,149,159-162,
165-181,183-273**

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11-1 to 11-8	11-1 to 11-11		
12-1 to 12-16	12-1 to 12-18		
13-1 to 13-29	13-1 to 13-60		

KTM REPAIR MANUAL IN LOOSE-LEAF FORM

STORING THE REPAIR MANUAL IN THE BINDER

- Put the index into the binder.
- Put the front page of the repair manual (210x297 mm) into the transparent pocket provided for this purpose on the outside of the binder.
- Put the spine label (170x45 mm) into the transparent pocket provided for this purpose on the spine of the binder.
- Put the summary list of contents (150x297 mm) into the transparent pocket provided for this purpose on the inside of the binder or insert this page on the beginning of the manual.
- Then insert the individual chapters of the manual between the sheets of the index according to the page number printed in the right bottom corner of each page.
Example: page no. 3-5; 3 = chapter 3; 5 = page 5
All pages with a page number that begins with the digit 3, for example, must be put under the index heading „Chapter 3“.
- Index sheets that have not been marked with a certain chapter are for your personal convenience. The respective headings can be entered in the list of contents.



EXPLANATION - UPDATING

- 3.206.009-E Repair Manual LC8**
Basicversion Modelyear 2003 **4/2003**
- 3.206.016-E Updating of Rep.Manual 3.206.009-E**
Modelyear 2004
(Engine number with first digit "4") **11/2003**
- Modification / Updating:**
technical Details, technical Specifications,
Periodic Maintenance Schedule, Wiring Diagrams
- 3.206.025-E Updating of Rep.Manual 3.206.009-E**
Modelyear 2005
(Engine number with first digit "5") **01/2005**
- 990 Super Duke with fuel injection, technical data, valve clearance,
technical Specifications, wiring diagrams

INTRODUCTION

This repair manual offers extensive repair-instructions and is an up-to-date version that describes the latest models of the series. However, the right to modifications in the interest of technical improvement is reserved without updating the current issue of this manual.

A description of general working modes common in work shops has not been included. Safety rules common in the work shop have also not been listed. We take it for granted that the repairs are made by qualified professionally trained mechanics.

Read through the repair manual before beginning with the repair work.

⚠ WARNING ⚠

**STRICT COMPLIANCE WITH THESE INSTRUCTIONS IS
ESSENTIAL TO AVOID DANGER TO LIFE AND LIMB.**

! CAUTION !

**NON-COMPLIANCE WITH THESE INSTRUCTIONS CAN LEAD TO
DAMAGE OF MOTORCYCLE COMPONENTS OR RENDER MOTORCYCLES
UNFIT FOR TRAFFIC !**

„NOTE” POINTS OUT USEFUL TIPS.

Use only **ORIGINAL KTM SPARE PARTS** when replacing parts.

The KTM high performance engine is only able to meet user expectations if the maintenance work is performed regularly and professionally.



REG.NO. 12 100 6061

In accordance with the international quality management ISO 9001 standard, KTM uses quality assurance processes that lead to the highest possible product quality.

KTM Sportmotorcycle AG reserves the right to modify any equipment, technical specifications, colors, materials, services offered and rendered, and the like so as to adapt them to local conditions without previous announcement and without giving reasons, or to cancel any of the above items without substituting them with others. It shall be acceptable to stop manufacturing a certain model without previous announcement. In the event of such modifications, please ask your local KTM dealer for information.

KTM Sportmotorcycle AG
5230 Mattighofen, Austria

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REPLY FAX FOR REPAIR MANUALS

We have made every effort to make our repair manuals as accurate as possible but it is always possible for a mistake or two to creep in.

To keep improving the quality of our repair manuals, we request mechanics and shop foremen to assist us as follows:

If you find any errors or inaccuracies in one of our repair manual – whether these are technical errors, incorrect or unclear repair procedures, tool problems, missing technical data or torques, inaccurate or incorrect translations or wording, etc. – please enter the error(s) in the table below and fax the completed form to us at 0043/7742/6000/5349.

NOTE to table:

- Enter the complete item no. for the repair manual in column 1 (e.g.: **3.206.025-E**).
You will find the number on the cover page or in the left margin on each right page of the manual.
- Enter the corresponding page number in the repair manual (e.g.: **5-7**) in column 2.
- Enter the current text (inaccurate or incomplete) in column 3 by quoting or describing the respective passage of the text. If your text deviates from the text contained in the repair manual, please write your text in German or English if possible.
- Enter the correct text in column 4.

Your corrections will be reviewed and incorporated in the next issue of our repair manual.

Item no. of repair manual	Page	Current text	Correct text

Additional suggestions, requests or comments on our Repair Manuals (in German or English):

Name mechanic/shop foreman

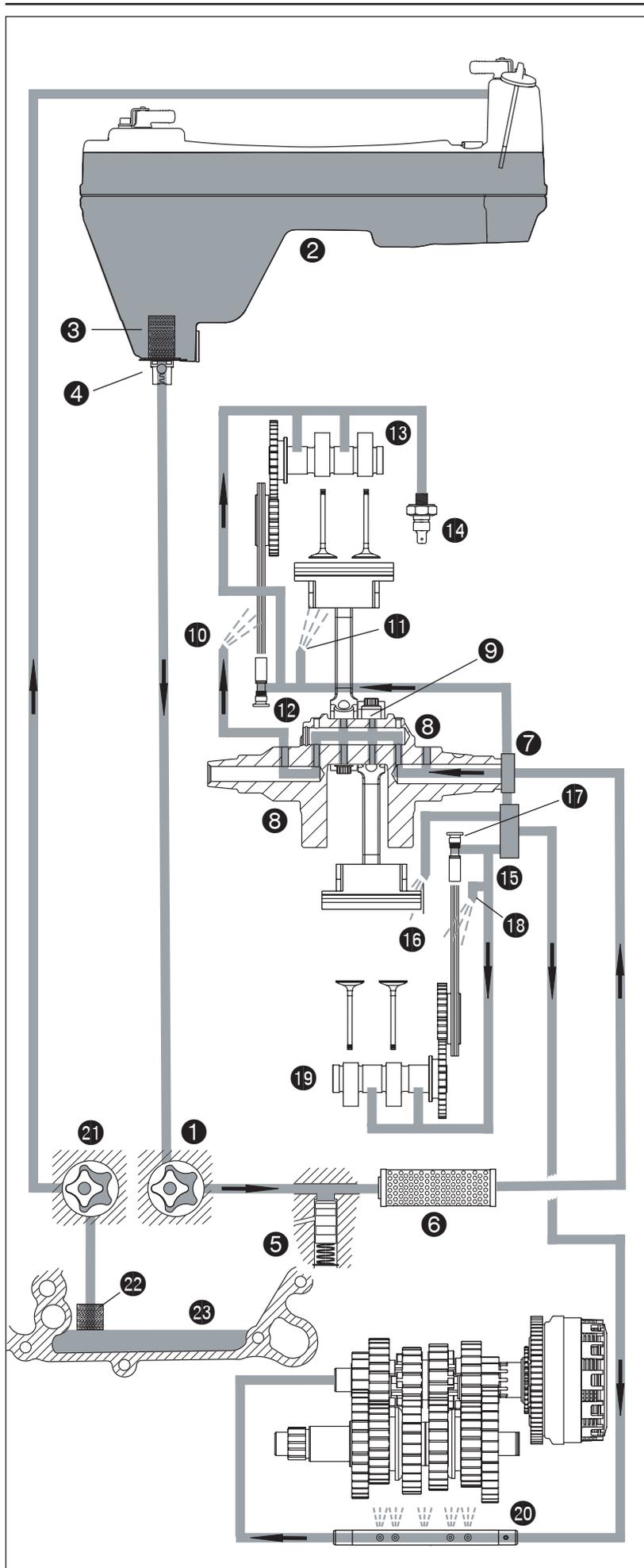
Company/work shop

GENERAL INFORMATION

2

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BLEEDING THE COOLING SYSTEMSEE CHAPTER 12



Oil system

Pressure pump **1** draws engine oil from oil tank **2** through oil filter **3** and the oil return valve **4** and pumps it past the pressure relief valve **5** through the oil filter **6** into the annular groove **7**.

The main bearing **8**, the conrod bearings **9** and the spraying nozzle **10** (front timing chain) are supplied with oil through holes in the crankshaft. An oil duct leads to spraying nozzle **11** (piston cooling), the timing chain tensioner **12**, the camshaft **13** and the oil pressure switch **14** in the front cylinder.

Another oil duct leads from the annular groove to a distributor groove **15** in the clutch cover. From there an oil duct leads to the spraying nozzle **16** (piston cooling). Another oil duct supplies the timing chain tensioner **17**, the spraying nozzle **18** (timing chain) and the camshaft **19** on the rear cylinder with oil.

Another oil duct leads to the oil injection tube **20** which lubricates the transmission gears. Oil is conducted to the pushrod and to the clutch through the injection tube, another oil duct and the reducing jet.

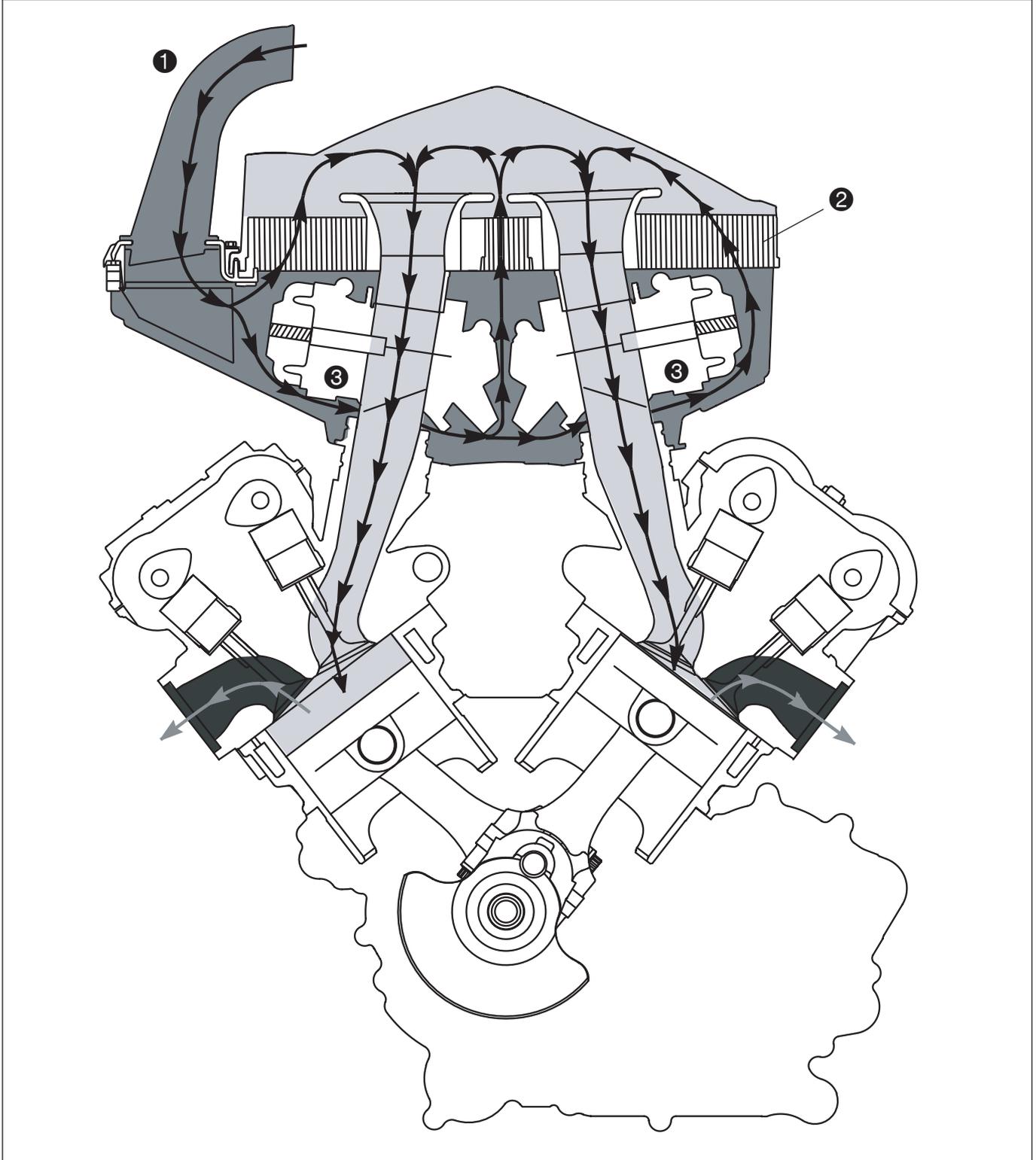
The suction pump **21** draws the oil from the oil sump **23** through the screen **22** into the oil tank **2**.

NOTE: each piston is lubricated and cooled by 2 jets starting with the 2005 model.

Intake system

Fresh air is drawn into the filter box through the intake snorkel ❶, past the carburetors ❷ and through the air filter ❸. The cleaned air is conducted to the combustion chamber through the carburetors and intake ports.

The diagram for the injection engine is similar; the air flows to the intake ports through the throttle body instead of through the carburetor.

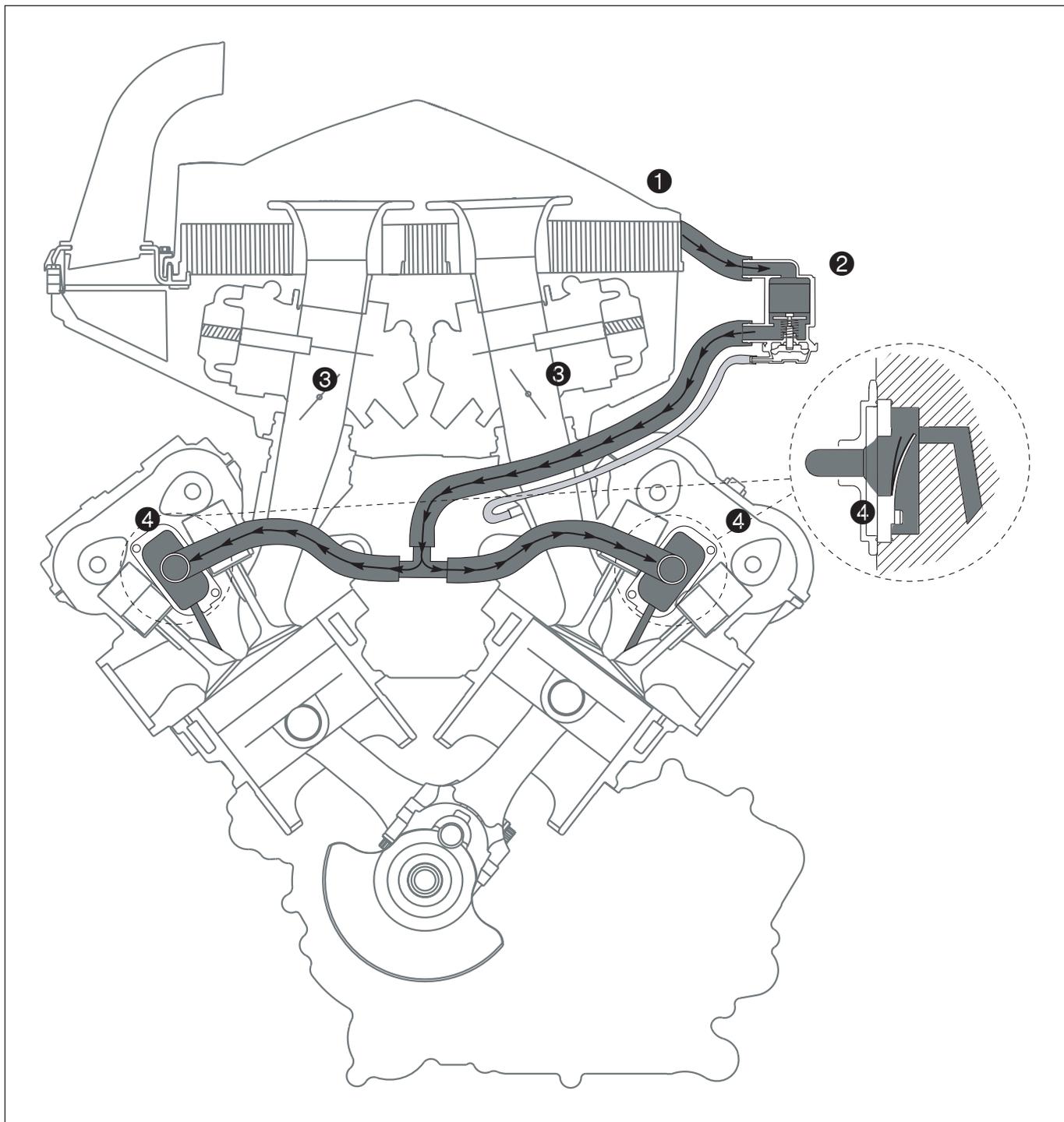


Secondary air system

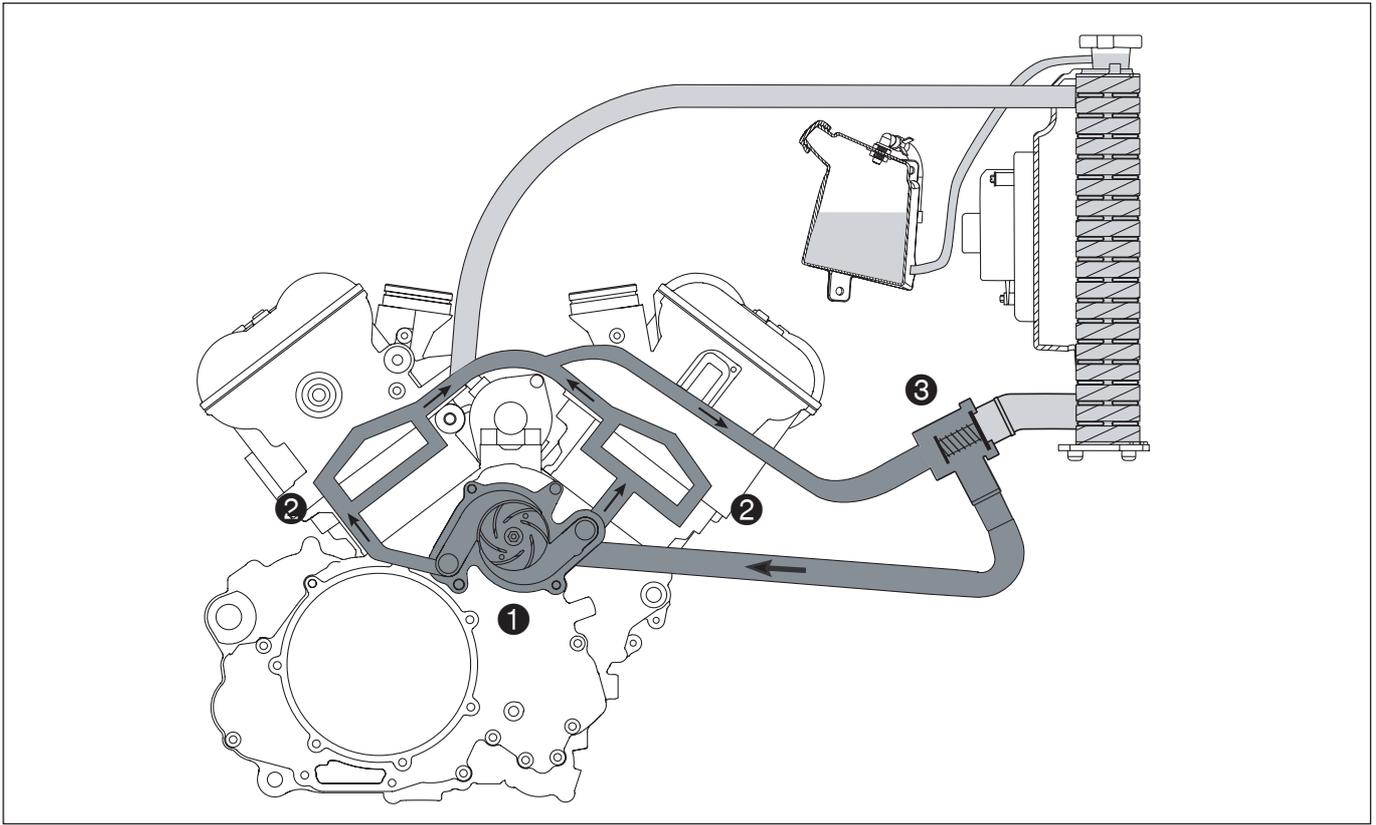
The secondary air system supplies fresh air to the emissions in the exhaust port, resulting in the afterburning (oxidation) of the emissions. A line leads from the filter box ① to the control valve ② which opens as soon as the throttle valves ③ are opened. The line continues to the reed valves ④ in the cylinder heads which are actuated by the pressure pulsation in the exhaust system. As a result, cleansed fresh air arrives in the exhaust port. The oxygen content in the air and the high exhaust gas temperature cause the emissions to oxidize.

If the throttle valves are closed and the engine goes into an overrun condition, the underpressure in the intake port will rise and the control valve will close. This prevents exhaust backfire (combustion of the unburned fuel/air mixture).

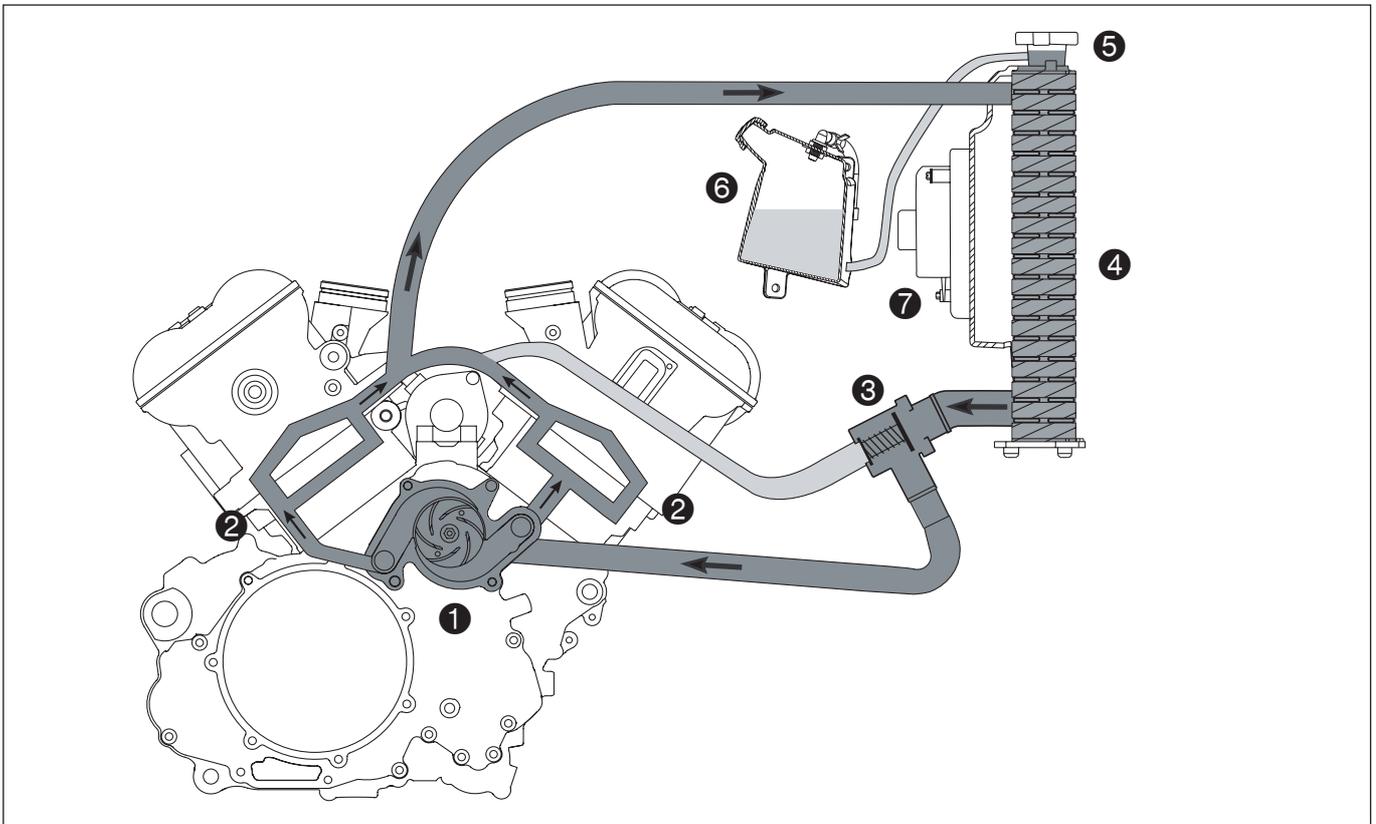
The secondary air system operates in a similar manner in models equipped with an injection engine; a solenoid valve controlled by the control unit is used instead of the control valve.



Cooling system

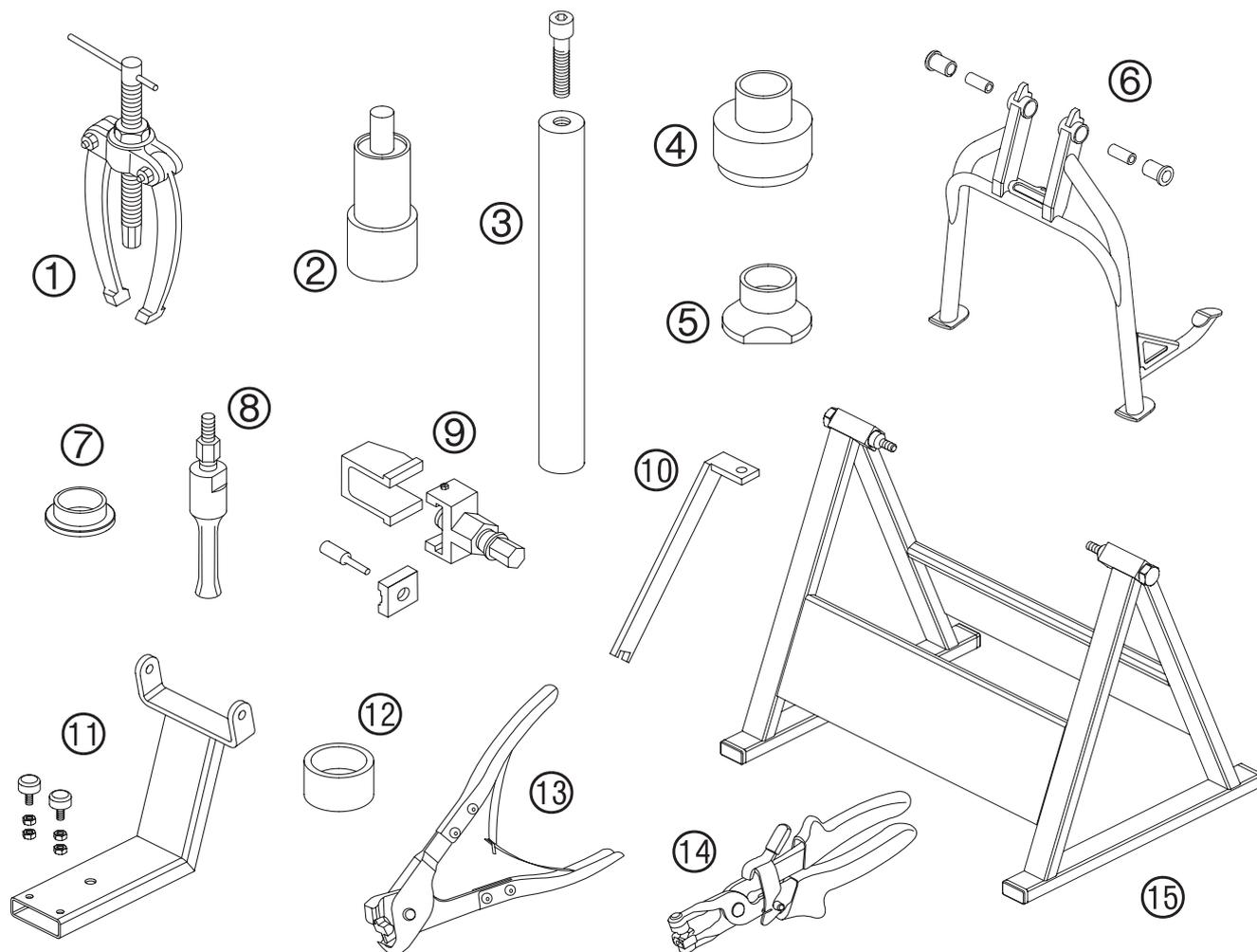
**Closed thermostat**

The thermostat is closed if the temperature of the cooling liquid drops below 75° C. The water pump ① pumps the cooling liquid through the cylinder and cylinder heads ② and the thermostat ③.

**Open thermostat**

The thermostat ③ opens at 75° C. The water pump ① pumps the cooling liquid through the cylinder and cylinder heads ②, the aluminum cooler ④ and the thermostat. The pressure in the cooling system (max. 1.4 bar) is regulated by a valve in the radiator cap ⑤. The cooling liquid level in the compensating tank ⑥ must be between the MIN and MAX marks when the engine is cold. The fan ⑦ switches on at 102° C.

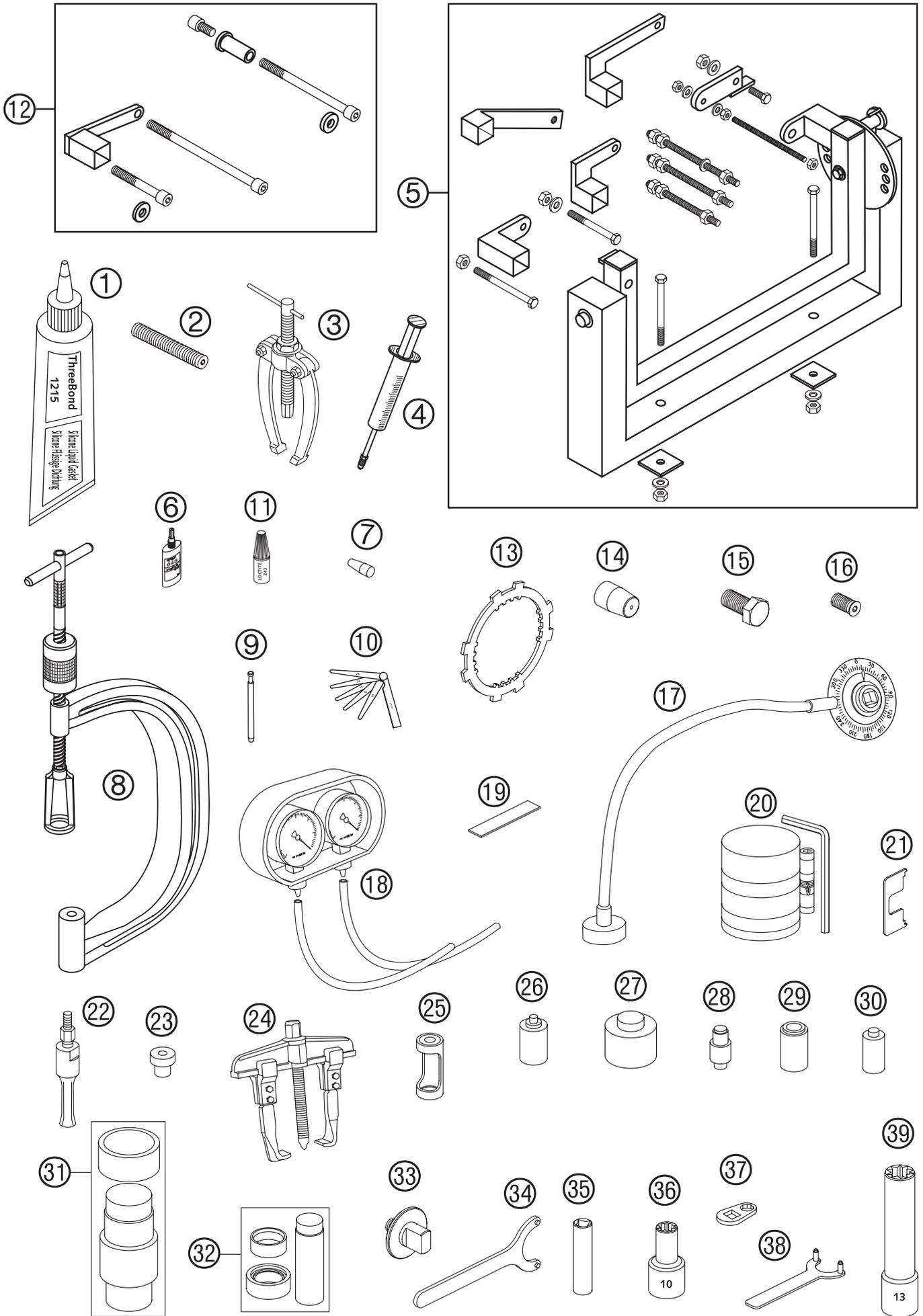
SPECIALTOOLS – CHASSIS



Art.-Nr. 3.206.025-E

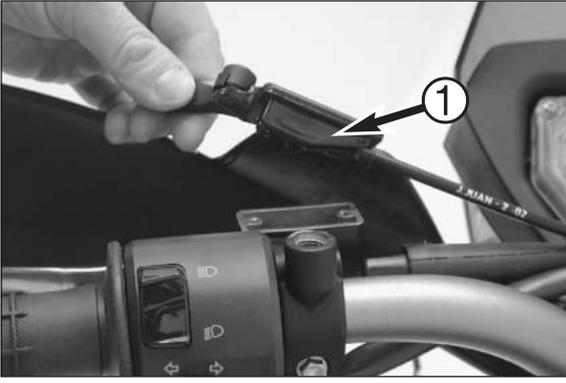
Repair manual KTM LC8

FIG	PART NO	DESCRIPTION
1	151.12.017.000	Gear puller
2	584.29.086.000	Pressing tool for swing arm bearing
3	584.29.089.000	Chassis tool holder
4	584.29.091.000	Press-in tool for bearing seat / rear wheel bearing
5	584.29.092.000	Knock-out tool for bearing seat
6	600.03.022.000	Center stand
7	600.10.013.000	Sleeve for pressing tool for swim arm bearing
8	600.29.018.000	Internal gear puller 28 mm
9	600.29.020.000	Chain rivet tool
10	600.29.055.000	Center stand lock
11	600.29.055.100	Floor jack attachment
12	600.29.056.000	Anvil dolly (for 584.29.086.000)
13	600.29.057.000	Pliers for Öttiker clamps
14	600.29.057.100	Pliers for spring-loaded band-type clamp
15	610.29.055.000	Assembly stand 990 Super Duke



SPECIAL TOOLS – ENGINE

FIG	PART NO	DESCRIPTION
1	309098	Seal Three-Bond
2	0113 080802	Crankshaft locking bolt
3	151.12.017.000	Gear puller
4	503.29.050.000	Bleeding syringe for hydraulic clutch
5	560.12.001.000	Universal-engine work stand
6	584.29.059.000	Loctite 648 green 20 ml
7	585.29.005.000	Protection sleeve for shaft seal ring of water pump
8	590.29.019.000	Valve spring mounter
9	590.29.026.006	Limit plug gauge 6,05 mm
10	590.29.041.000	Feeler gauge for valve clearance
11	6 899 785	Loctite 243 blu 10 ml
12	600.29.002.000	Engine holder for engine work stand
13	600.29.003.000	Clutch holder
14	600.29.005.000	Protection sleeve for shaft seal ring of output shaft
15	600.29.009.000	Magneto extractor
16	600.29.009.010 600.29.009.110	Pressure screw for magneto extractor up to the 2004 model Pressure screw for rotor extractor from the 2005 model
17	600.29.010.000	Degree wheel
18	600.29.011.000	Carburetor synchronisation tool
19	600.29.012.000	Plastigauge-measuring strips
20	600.29.015.000	Piston ring mounting tool
21	600.29.016.000	Setting gauge for float level
22	600.29.018.000	Internal gear puller 28 mm
23	600.29.031.000	Protection sleeve for crankshaft (for pulling of the primary gear)
24	600.29.033.000	Puller for primary gear
25	600.29.041.000	Valve spring mounter insert
26	600.29.043.010	Pressing tool for seal of clutch release shaft
27	600.29.043.020	Pressing tool for seal of output shaft
28	600.29.043.030	Pressing tool for seal and bearing of shifting shaft
29	600.29.043.040	Pressing tool for seal of water pump
30	600.29.043.050 600.29.043.060	Pressing tool for seal of balancer shaft Pressing tool for bearing of water pump
31	600.29.044.050	Pressing tool for main bearings (In/out)
32	600.29.046.028	Pressing tool for supporting bearing (In)
33	600.29.050.000	Pretensioning tool - lower part
34	600.29.051.000	Pretensioning tool - hook wrench
35	600.29.073.000	Spark plug wrench 16 mm
36	600.29.075.000	Special nut for conrod
37	600.29.081.000	Special tool for cylinder head nuts
38	600.29.082.000	Holder for water pump wheel
39	600.29.083.000	Special nut for cylinder head nuts

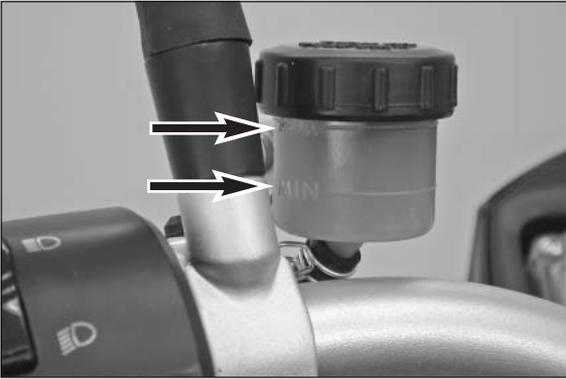


Checking the oil level of the hydraulic clutch

To check the oil level in the master cylinder of the clutch remove the cover. For this purpose, remove bolts and cover together with the rubber boot ①. The oil level in the horizontal-standing master cylinder should be 4 mm below the upper edge. If necessary add SAE 10 biodegradable hydraulic oil (e.g. Motorex Kupplungs-Fluid 75).

! **CAUTION** !

ONLY USE SAE 10 BIODEGRADABLE HYDRAULIC OIL TO REFILL THE MASTER CYLINDER. NEVER USE BRAKE FLUID NOR MIX BIODEGRADABLE HYDRAULIC OILS WITH MINERAL OILS!



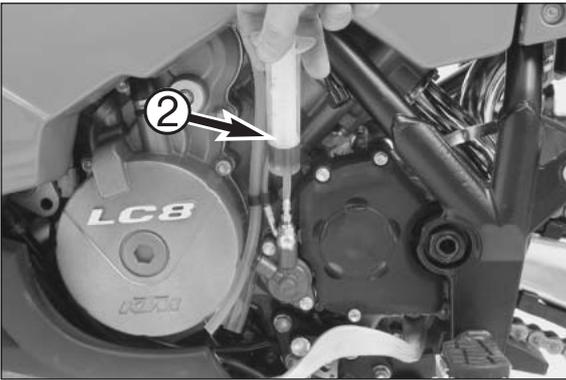
Checking the oil level of the hydraulic clutch - 990 Super Duke

The oil level in the horizontal-standing master cylinder should be between the "MIN" and "MAX" marks.

If necessary, add SAE 10 biodegradable hydraulic oil (Motorex Kupplungsfluid 75).

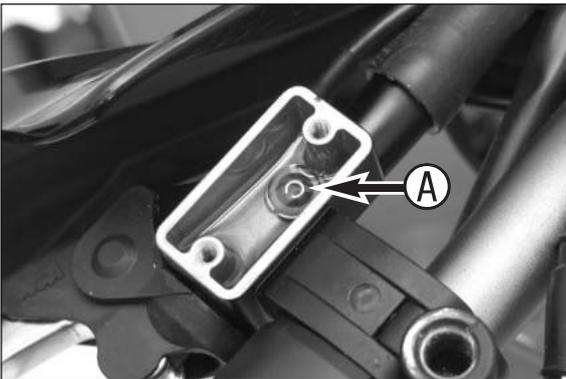
! **CAUTION** !

ONLY USE SAE 10 BIODEGRADABLE HYDRAULIC OIL TO FILL THE MASTER CYLINDER. DO NOT USE BRAKE FLUID AND DO NOT MIX WITH HYDRAULIC MINERAL OIL.



Bleeding of the hydraulic clutch

For bleeding, the cover of the master cylinder of the clutch needs to be removed. For this purpose, remove bolts and take off cover together with rubber bellows ①. At the slave cylinder of the clutch, remove the bleeder nipple. At its place, mount the bleeder syringe ② which is filled with biodegradable hydraulic oil (e.g. Motorex Kupplungs-Fluid 75).



Refill oil, until oil is discharged from the bore ① of the master cylinder in a bubble-free state. Make sure that the oil does not overflow.

! **CAUTION** !

HAVING COMPLETED THE BLEEDING PROCEDURE, YOU HAVE TO VERIFY THAT THE OIL LEVEL IN THE MASTER CYLINDER IS CORRECT. FOR FILLING OF THE MASTER CYLINDER, USE SAE 10 BIODEGRADABLE HYDRAULIC OIL ONLY (EX. MOTOREX KUPPLUNGS-FLUID 75); NEVER USE BRAKE FLUID NOR MIX BIODEGRADABLE HYDRAULIC OILS WITH MINERAL OILS.

REMOVING AND REFITTING ENGINE

3

INDEX

950 ADVENTURE

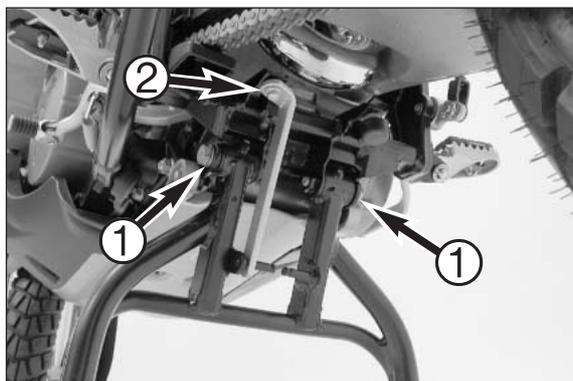
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REFITTING THE ENGINE3-7

990 SUPER DUKE

REMOVING THE ENGINE3-12

REFITTING THE ENGINE3-19

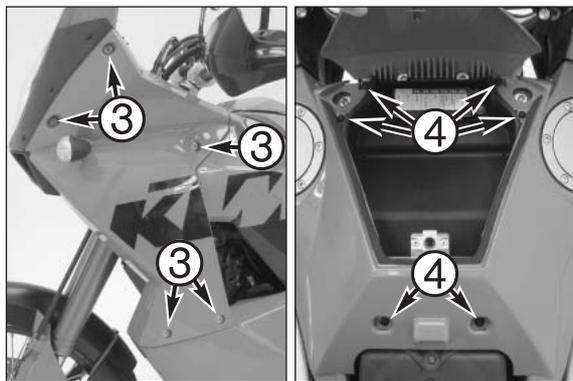


Removing the engine

- Screw the center stand 600.03.022.000 onto the frame **1** and jack up the motorcycle on a firm, even surface.
- Remove the left bump rubber and lock the center stand with the lock 600.29.055.000 **2**.

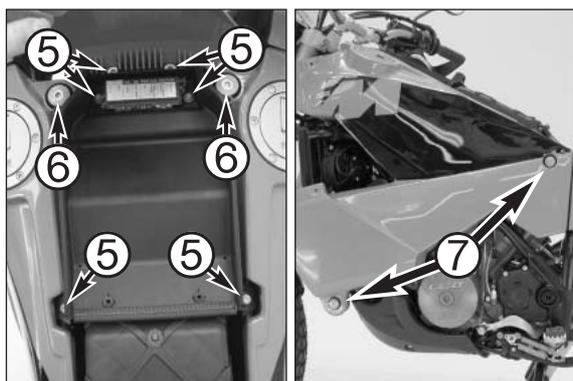
NOTE: if available, use the center stand already on the bike.

- Unlock the seat lock with the ignition key and remove.



- Remove the bolts **3** on the left and right of the front side covers, disconnect the front turn signal, pull the tank vent hoses off of the fuel tank and remove the side covers.

- Open the tank cover, unscrew the fixing bolts **4** and remove the upper tank compartment.

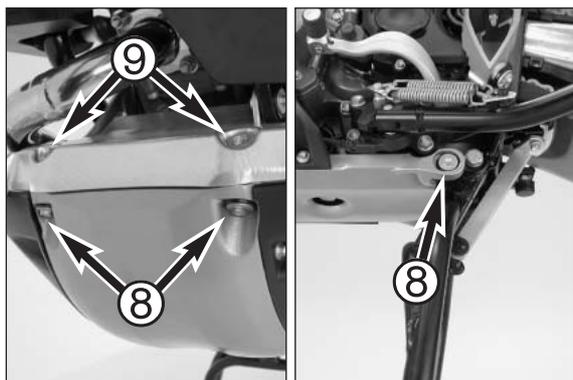


- Remove the bolts **5** on the lower tank compartment and the fuse box, take the cover off the fuse box and dismount the lower tank compartment.

- Close the fuel cocks, disconnect the gasoline hoses, unscrew the upper **6** and lower **7** fixing bolts on both fuel tanks and remove the tanks together with the lower vent hoses.

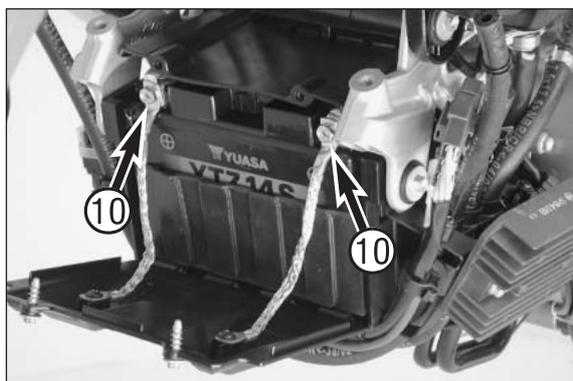
NOTE: it is easier to disconnect the gasoline hoses if you remove the front bolts on the underride protection and fold the engine guard down.

- Drain the engine oil from the oil tank and the engine: see Chapter 12.

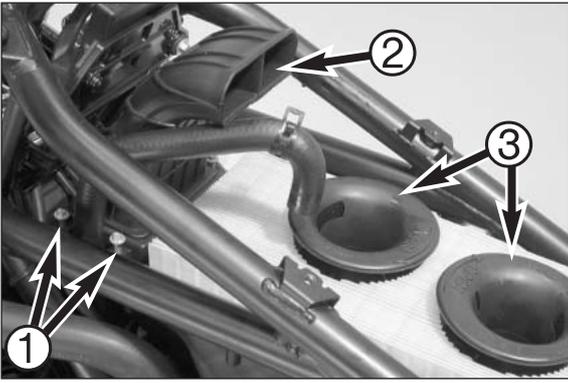


- Remove the 4 bolts **8** on the underride protection and take off the underride protection.

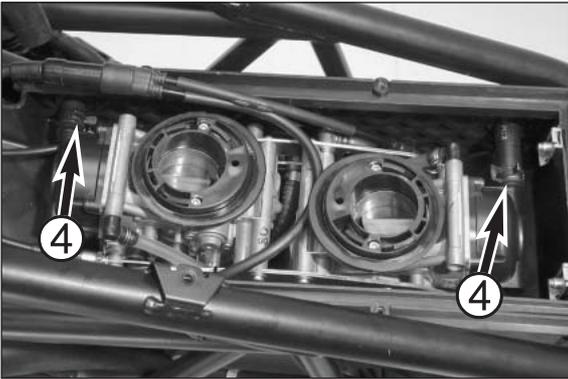
- Remove both bolts **9** on the front cover and take off the cover.



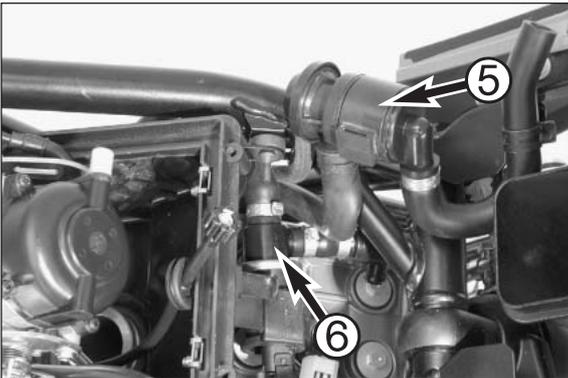
- Open the lid on the battery compartment and disconnect the battery terminals **10** (starting with the negative pole).
- Take out the battery and remove the upper battery cover.



- Unscrew the bolts ① and remove the intake snorkel ② together with the frame from the air filter box.
- Disconnect the vent hose and the EPC hose and remove the upper half of the air filter box.
- Turn the intake trumpet ③ in a clockwise direction and remove. Remove air filter.

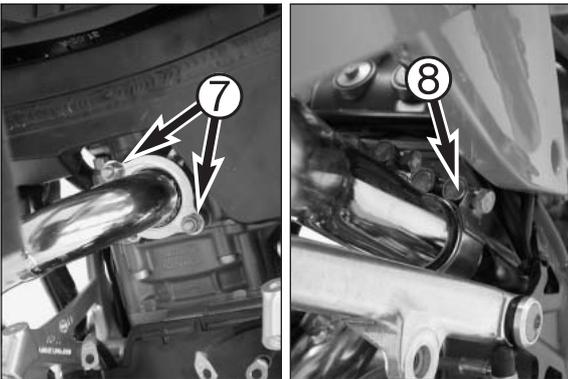


- Unbolt both side covers on the lower air filter box and remove the clamps on the carburetor connection boot.
- Detach the EPC hoses ④ from both carburetors and pull the hoses out of the lower air filter box.
- Remove both vent hoses from the carburetors.
- Lift both carburetors, carefully draw the cable for the idle speed adjustment and the gasoline hose through the openings in the lower air filter box.
- Detach the fuel hoses from the carburetors.
- Pull the carburetor connection boots off of the intake manifolds.

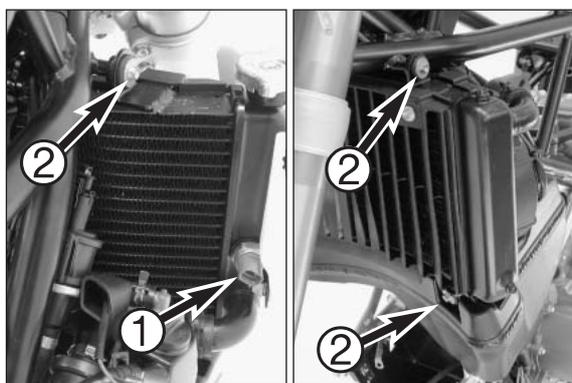


- Detach the SLS valve ⑤ from the lower air filter box, pulling the thin hose from the intake manifold and the thick hose from the valve. Remove the valve.
- Remove the EPC valve ⑥ from the lower air filter box and disconnect.
- Tilt up the carburetors and fasten to the handlebar with a wire or rubber band. They do not need to be completely dismantled.
- Take the lower air filter box out of the frame.

NOTE: cover the intake ports with a cloth to prevent any parts from falling inside.

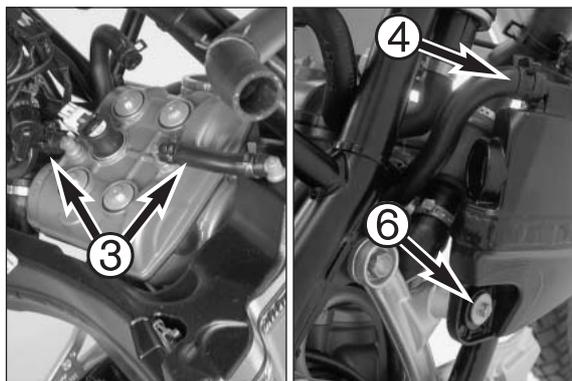


- Unscrew both nuts ⑦ on the front exhaust manifold flange on the cylinder head, loosen the exhaust clamp ⑧ on the front exhaust manifold, pull the front exhaust manifold out of the rear exhaust pipe and remove.
- Unscrew the rear exhaust manifold from the cylinder head.

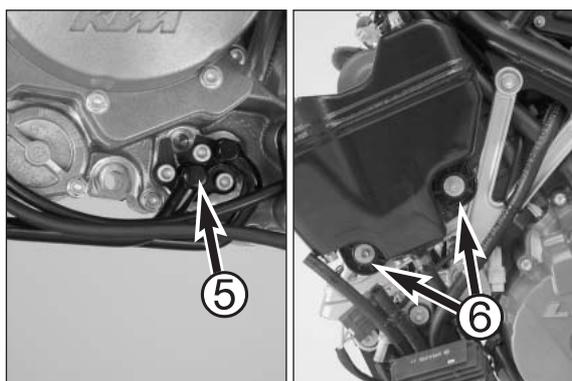


- Disconnect the electric connections from the fan motor and the temperature switch ①.
- Drain the cooling liquid from the radiator and engine: see Chapter 12.
- Detach the water hoses from the radiator (special pliers 600.29.057.100) and unscrew the radiator ②.

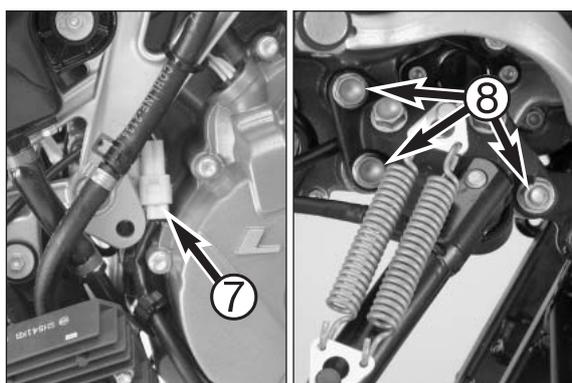
NOTE: fan and radiator shield do not need to be dismantled from the radiator.



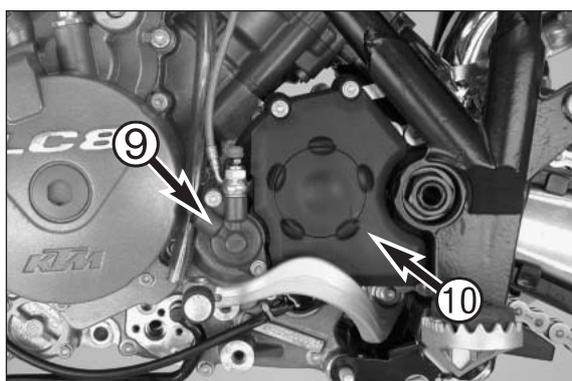
- Pull off the oil lines from the oil tank to the valve covers ③ and the return line ④ (special pliers 600.29.57.100), unscrew the oil lines from the oil terminal ⑤ and pull out. Remove the O-rings.



- Loosen the fixing bolts ⑥ on the oil tank, remove the oil tank and carefully pull out the oil line.



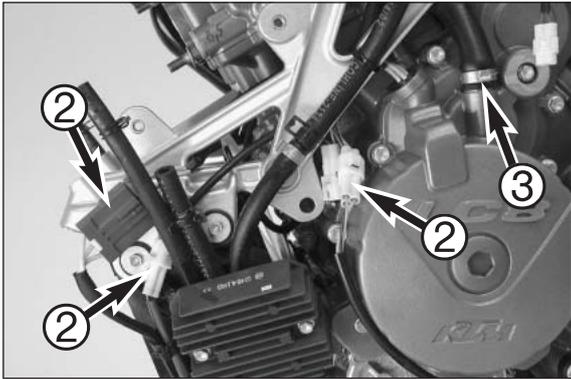
- Disconnect the side stand switch ⑦ and take the cable out of the cable clips.
- Loosen the two bolts and the nut ⑧ and remove the side stand.



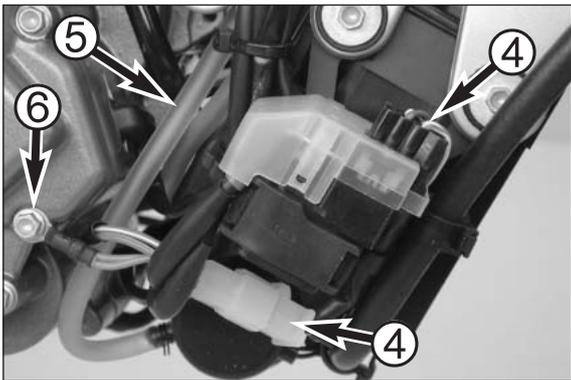
- Unscrew the clutch slave cylinder ⑨ and the chainguard ⑩ and pull the locking pin out of the pushrod.
- Dismount the chain roller and chain securing guide.



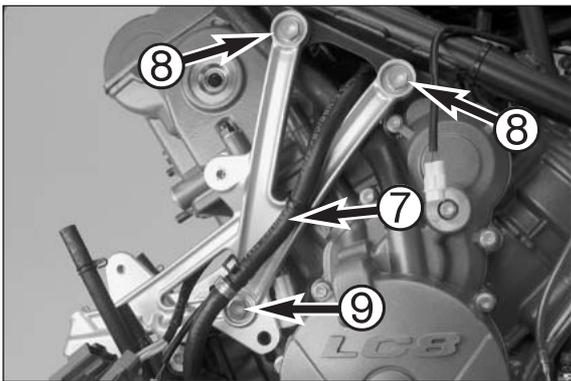
Unscrew the nut on the wheel spindle, pull out the rear wheel sprocket and place over the side of the bracket 1. Remove the chain from the engine sprocket.



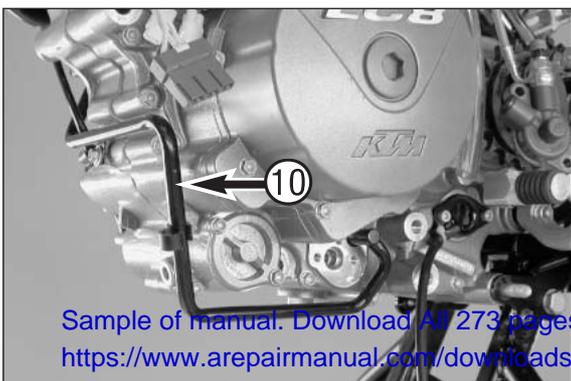
- Detach the connector 2.
- Remove the engine vent hose 3, discarding the hose clamp.



- Unscrew the positive starter engine cable and draw out the wiring harness.
- Detach connector 4 on the starter relay.
- Pull out the gasoline pump vent hose 5 towards the bottom.
- Unscrew the ground connection 6.



- Disconnect the fuel hose 7.
- Loosen the bolts on the side support 8 and the nut on the bolt 9, pull out the bolt and remove support together with the battery case.



- Unscrew the front oil line 10.