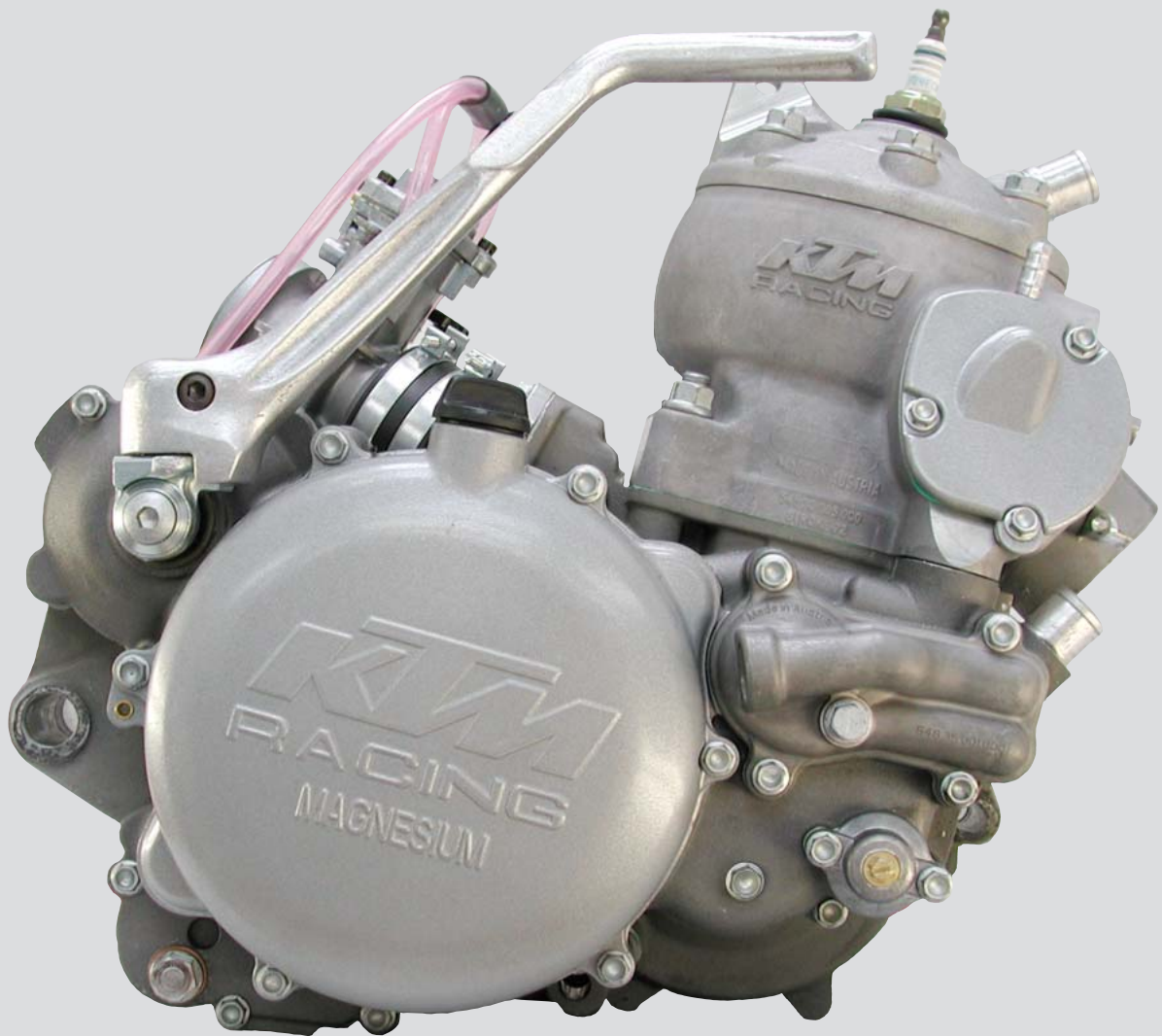


**250 SX**

**KTM**  
SPORTMOTORCYCLES

**REPAIR MANUAL  
ENGINE**



**KTM**  
SPORTMOTORCYCLES

**KTM SPORTMOTORCYCLE AG**  
5230 Mattighofen  
Austria  
[www.ktm.at](http://www.ktm.at)



**250 SX**

**REPAIR  
MANUAL  
ENGINE**

**KTM**  
SPORTMOTORCYCLES





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# IMPORTANT INFORMATION/UPDATING INSTRUCTIONS

## 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

**3206003**      **Repair Manual 250 SX**  
Basicversion Modelyear 2003

**10/2002**



## 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

KTM Austria's certificate of achievement for its quality system ISO 9001 is the beginning of an ongoing total reengineered quality plan for a brighter tomorrow.

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.: **3.210.66-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.: **5-7c**) 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):

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Name mechanic/shop foreman

Company/work shop



# GENERAL INFORMATION

# 2

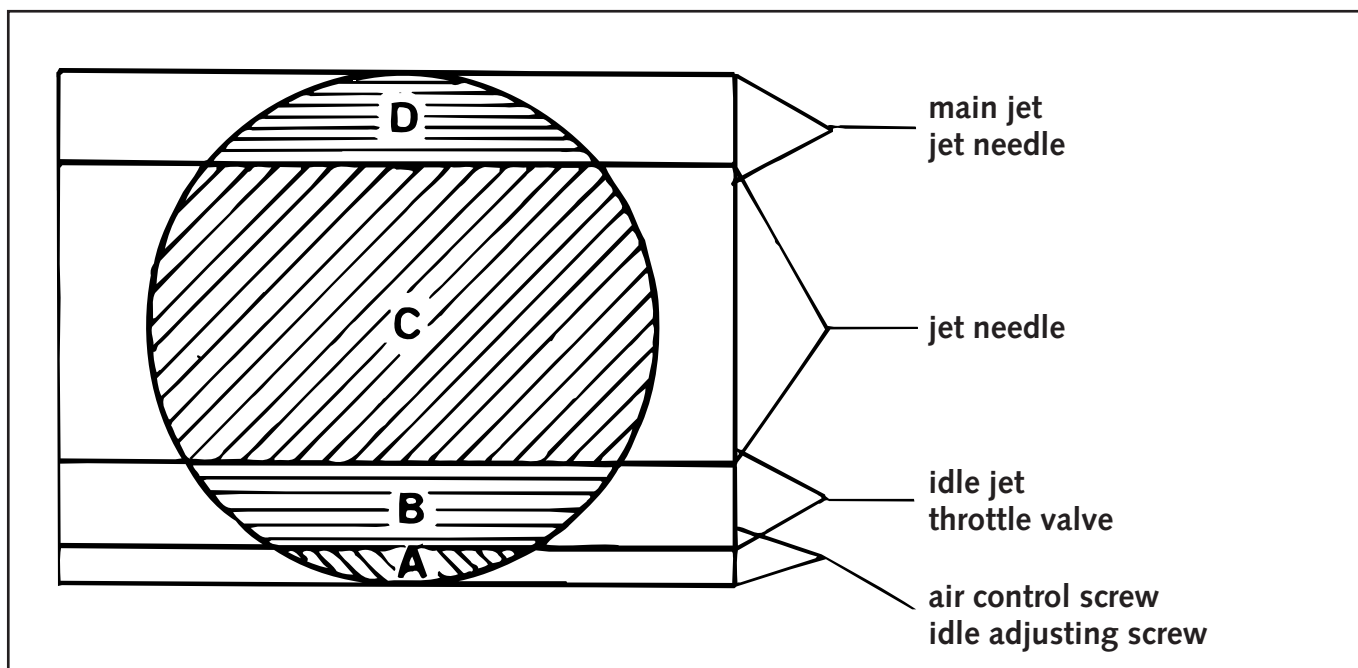
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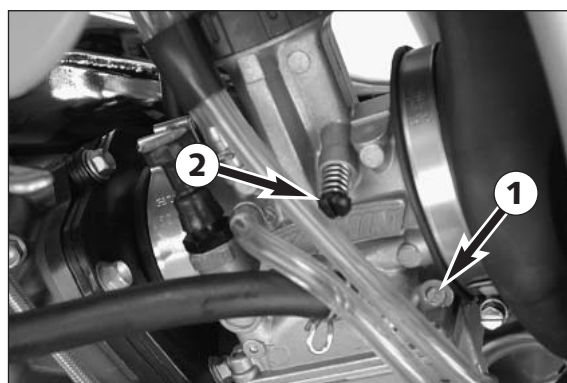


## OPERATING RANGES OF THE CARBURETOR



mixture too lean:  
not enough fuel in proportion to air

mixture too rich:  
too much fuel in proportion to air



### Idling range A

Operation with closed throttle valve. This range is influenced by the position of the air control screw ① and the idle adjusting screw ②. Only make adjustments when the engine is hot.

To this end, slightly increase the idling speed of the engine by means of the idle adjusting screw. Turning it clockwise produces a higher idling speed and turning the screw counterclockwise produces a lower idling speed. Create a round and stable engine speed using the air control screw (basic position of the air control screw = open by 1.5 turns). Then adjust to the normal idling speed by means of the idle adjusting screw.

### Opening up B

Engine behavior when the throttle opens. The idle jet and the shape of the throttle valve influences this range. If, despite good idling-speed and part-throttle setting, the engine sputters and smokes when the throttle is fully opened and develops its full power not smoothly but suddenly at high engine speeds, the mixture to the carburetor will be too rich, the fuel level too high or the float needle is leaking.

### Part-throttle range C

Operation with partly open throttle valve. This range is only influenced by the jet needle (shape and position). The optimum part-throttle setting is controlled by the idling setting in the lower range and by the main jet in the upper range. If the engine runs on a four-stroke cycle or with reduced power when it is accelerated with the throttle partly open, the jet needle must be lowered by one notch. If then the engine pings, especially when accelerating under full power at maximum engine revs, the jet needle should be raised.

If these faults should occur at the lower end of the part throttle range at a four-stroke running, make the idling range leaner; if the engine pings, adjust the idling range richer.

### Full throttle range D

Operation with the throttle fully open (flat out). This range is influenced by the main jet and the jet needle. If the porcelain of the new spark plug is found to have a very bright or white coating or if the engine rings, after a short distance of riding flat out, a larger main jet is required. If the porcelain is dark brown or black with soot the main jet must be replaced by a smaller one.

**Carburetor adjustment**

**Basic information on the original carburetor setting**

The original carburetor setting was adapted for an altitude of approx. 500 meters (1600 ft.) above sea level, and the ambient temperature of approx. 20° C (68° F), mainly for off-road use and central European premium-grade fuel (ROZ 95 MOZ). Mixing ratio 2-stroke motor oil : super fuel 1:40 – 1:60.

**Basic information on a change of the carburetor setting**

Always start out from the original carburetor setting. Essential requirements are a clean air filter system, air-tight exhaust system and an intact carburetor. Experience has shown that adjusting the main jet, the idling jet and the jet needle is sufficient and that changes of other parts of the carburetor will not greatly affect engine performance.

**RULE OF THUMB:**

high altitude or high temperatures → choose leaner carburetor adjustment  
 low altitude or low temperatures → choose richer carburetor adjustment



**WARNING**



- Only use premium-grade gasoline ROZ 95 mixed with high-grade two-stroke engine oil. Other types of gasoline can cause engine failure, and use of same will void your warranty.
- Only use high-grade 2-stroke engine oil of known brands.
- Not enough oil or low-grade oil can cause erosion of the piston. Using too much oil, the engine can start smoking and foul the spark plug.
- In the case of a leaner adjustment of the carburetor proceed cautiously. Always reduce the jet size in steps of one number to avoid overheating and piston seizure.

NOTE: If despite a changed adjustment the engine does not run properly, look for mechanical faults and check the ignition system.

**Basic information on carburetor wear**

As a result of engine vibrations, throttle valve, jet needle, and needle jet are subjected to increased wear. This wear may cause carburetor malfunction (e.g., overly rich mixture). Therefore, these parts should be replaced after 10000 kilometers (6000 miles).

JET NEEDLE TYPE	RANGE OF ACTION	
	RICHER	LEANER
<b>N3CG</b>	←————→	
<b>N3CH</b>	←————→	
<b>N3CW</b>	←————→	

**Explanation of table**

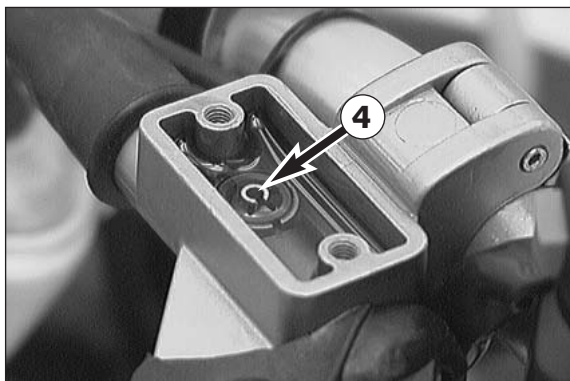
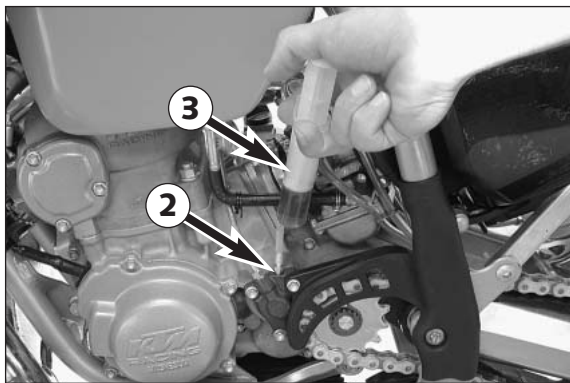
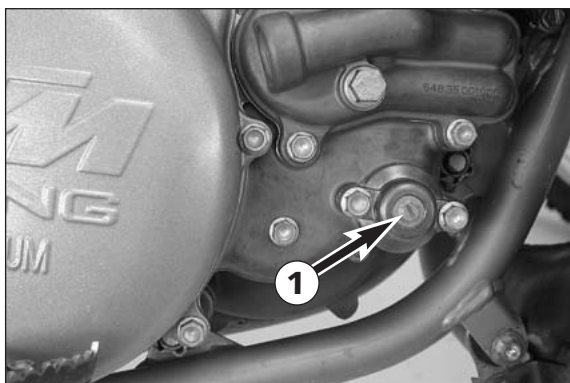
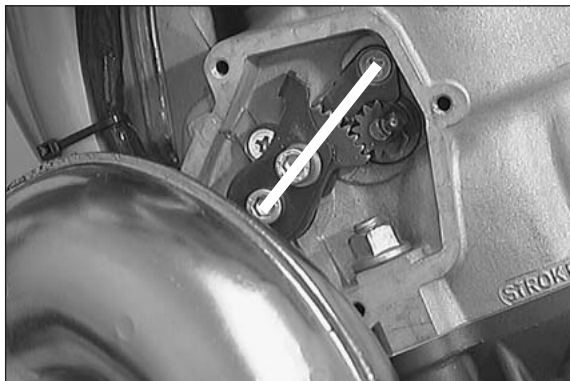
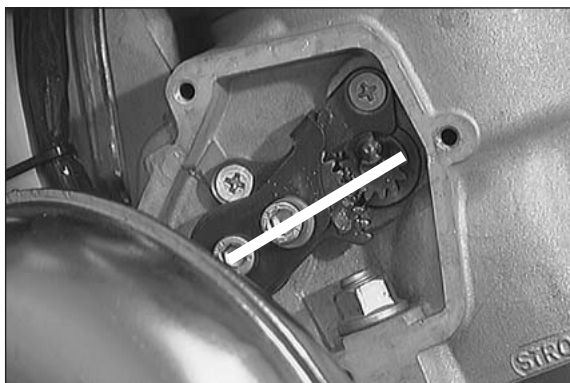
The N3CG jet needle is up to 1/4 throttle richer than the standard N3CH needle in the area around the closed slide. There is no difference in the other areas.



**CAUTION**



PAY ATTENTION TO THE CORRECT NEEDLE DESIGNATION WHEN REPLACING THE JET NEEDLE. MORE DETAILS ON THE NEEDLES FOR YOUR MODEL ARE PROVIDED IN THE CARBURETOR SETTING TABLE IN CHAPTER 8.



### Checking the setting of the TVC system

The function of the TVC system is checked with the engine running. This test checks the start of advance and the end of advance.

- For this, remove the left control cover.
- Connect a rev counter (either to the ignition cable or to the blue/white cable in the electronics box, depending on the rev counter design).
- Start engine, accelerate gently and observe when the TVC system starts to advance (tooth segment creeps upwards).

	start of advance	end of advance
250 SX Model 2003	5200 U/min	7000 U/min

- If necessary, turn the adjusting screw ①.

NOTE: Twisting the adjusting screw in delays the commencement of adjustment by the TVC system, twisting the adjusting screw out means that the TVC system will perform the adjustment earlier.

### Bleeding of the hydraulic clutch

- Take off cover together with rubber bellows.
- At the slave cylinder of the clutch, remove the bleeder nipple ②. In its place, mount the bleeder syringe ③ which is filled with SAE 10 hydraulic oil.

- Refill oil, until oil is discharged from the bore ④ 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.
- KTM USES BIODEGRADABLE HYDRAULIC OIL FOR THE HYDRAULIC CLUTCH CONTROL. NEVER MIX BIODEGRADABLE HYDRAULIC OILS WITH MINERAL OILS.
- ALWAYS USE BIODEGRADABLE HYDRAULIC OIL SAE 10 TO FILL UP THE MASTER CYLINDER. NEVER REFILL WITH MINERAL HYDRAULIC OIL OR BRAKE FLUID.

## SPECIAL TOOLS – ENGINE 250 SX

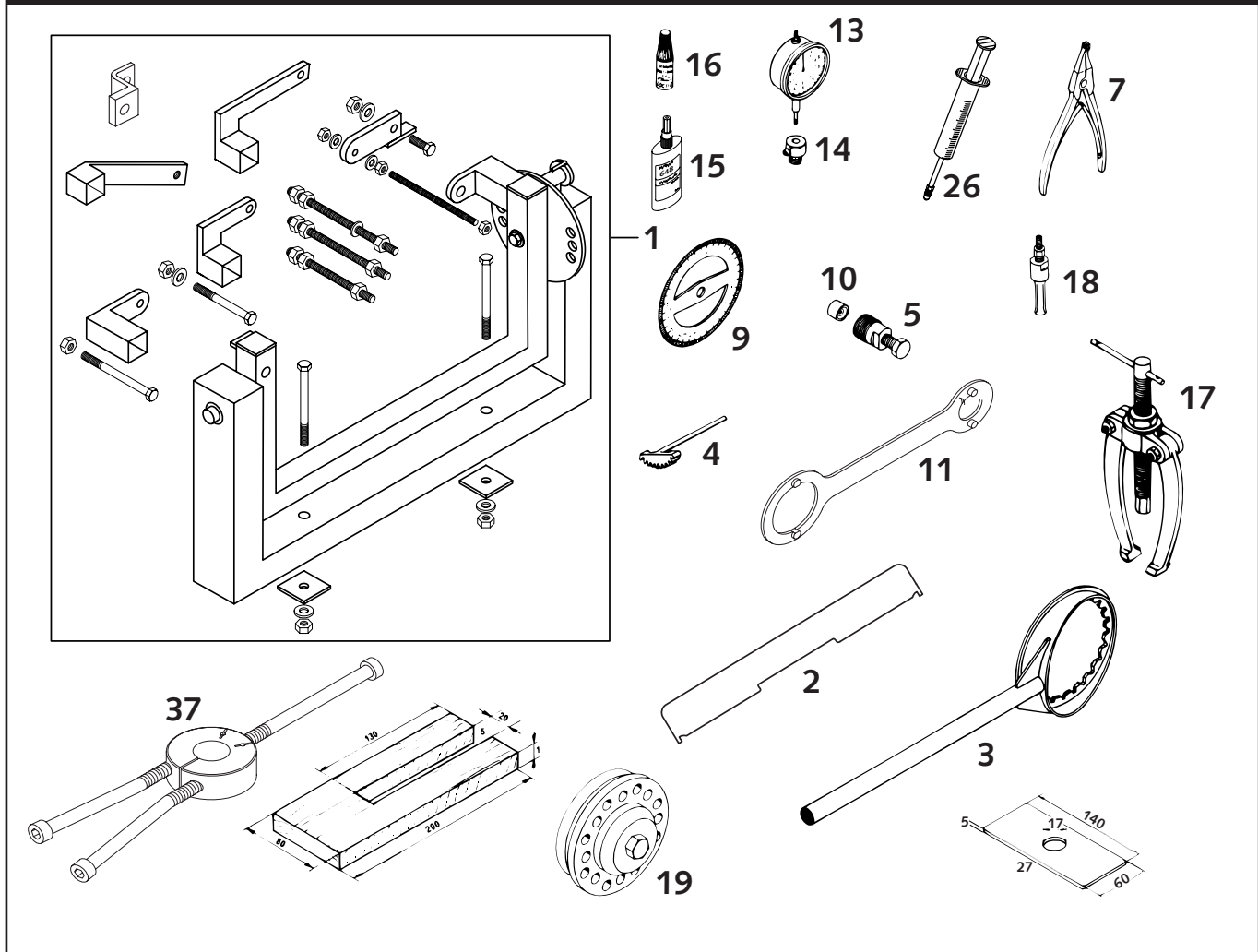


Fig.	Part no.	Description
1	560.12.001.000	Universal engine work stand
2	548.29.001.000	Adjusting plate „dimension X“
3	546.29.003.000	Clutch holder
4	560.12.004.000	Gear wheel segment
5	546.29.009.044	Magneto extractor M 27x1
7	510.12.011.000	Circlip plier
10	510.12.016.000	Protection cap
11	546.29.012.100	Holding spanner for flywheel
13	501.12.013.000	Dial gauge 0-10 mm
14	501.12.030.000	Dial gauge support
15	584.29.059.000	Loctite 648 green 24 ccm
16	6 899 785	Loctite 243 blue 6 ccm
17	151.12.017.000	Bearing puller
18	151.12.018.100	Internal bearing puller 18-23 mm
18	151.12.018.000	Internal bearing puller 12-16 mm
18	151.12.018.200	Internal bearing puller 5-7 mm
19	546.29.027.000	Clutch rivetting tool
26	503.29.050.000	Vent springe for hydraulic clutch
37	584.29.037.043	Mounting tool inner ring NJ 207

## CLEANING

Clean your motorcycle regularly in order to maintain the beauty of its plastic surfaces.

The best manner would be to use warm water that has been mixed with a normal brand-name washing detergent and a sponge. The hard dirt can be removed before washing with the help of a soft water jet.

!

### CAUTION

!

NEVER CLEAN YOUR MOTORCYCLE WITH A HIGH-PRESSURED CLEANER OR A HIGH-PRESSURED WATER JET. THE WATER COULD OTHERWISE RUN INTO THE ELECTRICAL COMPONENTS, CONNECTORS, SHEATHED CABLES, BEARINGS, CARBURETOR, ETC. AND CAUSE DISTURBANCES OR LEAD TO A PREMATURE DESTRUCTION OF THESE PARTS.

- Before cleaning with water, plug the exhaust pipe to prevent water ingress.
- You should use normal brand-name detergents to clean the motorcycle. Especially dirty parts should also be cleaned with the help of a paint brush.
- After the motorcycle has been rinsed with a soft water jet, it should be dried by air pressure and a cloth. Then take a short drive until the engine has reached the working temperature and also use the brakes. By warming these components, the residual water can evaporate from inaccessible parts of the engine and the brakes.
- Slide back the protective covers on the handlebar-mounted instruments so that any water that may have seeped into this part of the motorcycle is allowed to evaporate.
- After the motorcycle has cooled down, oil and grease all the gliding bearing parts. Treat the chain with a chain spray.
- Treat the socket connectors with contact spray to prevent electric malfunctioning.

## STORAGE

Should you wish to make a pause over a longer space of time, please observe the following instructions:

- Clean motorcycle thoroughly (see chapter: CLEANING)
- Change engine oil (old engine oil contains aggressive contaminants).
- Check antifreeze and amount of cooling liquid.
- Let the engine warm up again, close fuel cock and wait until the engine dies off by itself. In this way the carburetor jets are prevented from becoming resin-clogged by the old fuel.
- Remove spark plug and fill in approx. 5 ccm of engine oil into the cylinder through the opening. Actuate kick-starter 10 times in order to distribute the oil onto the cylinder walls and mount the spark plug.
- Let fuel flow out of tank into an appropriate container.
- Correct tire pressure.
- Lubricate bearing points of the control levers, footrests, etc. as well as the chain.
- The storage place should be dry and not be subjected to too big temperature fluctuations.
- Cover the motorcycle with an air permeated tarp or blanket. Do not use non airtight materials as a possible humidity might not be able to escape and thereby cause corrosion.

!

### CAUTION

!

IT WOULD BE VERY BAD TO LET THE ENGINE RUN FOR A SHORT TIME DURING THE STORAGE PERIOD. THE ENGINE WOULD NOT GET WARMED UP ENOUGH AND THE THUS DEVELOPED STEAM WOULD CONDENSE DURING THE COMBUSTION PROCESS AND CAUSE THE VALVES AND EXHAUST TO RUST.

### USE AFTER A PERIOD OF STORAGE

- Fill up the tank with fresh fuel.
- Check the motorcycle as before each start (see driving instructions)
- Take a short, careful test ride first.

NOTE: Before you put your motorcycle away for the winter, you should check all parts for their function and wear. Should any service jobs, repairs, or any refitting be necessary, you should have them carried out during the off-season (lower workload at mechanics' shops). This way, you can avoid the long waiting times at your shop at the beginning of the next biking season.

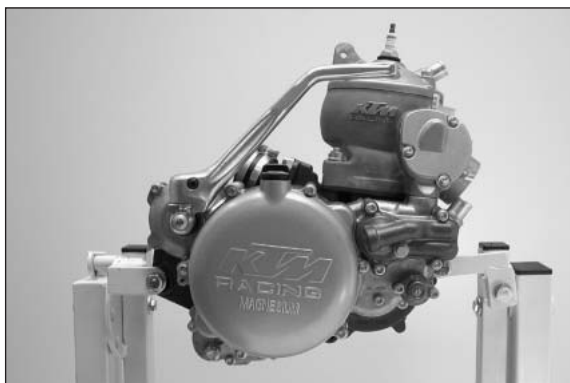
# DISASSEMBLING THE ENGINE

# 3

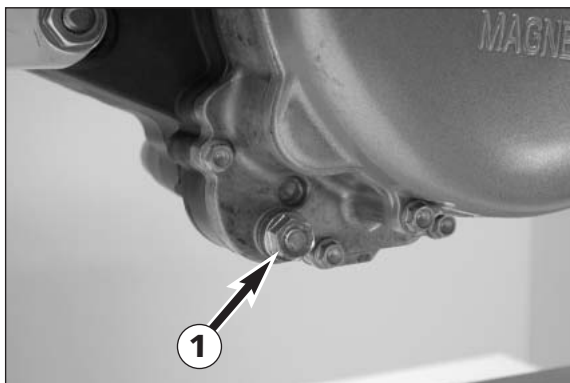
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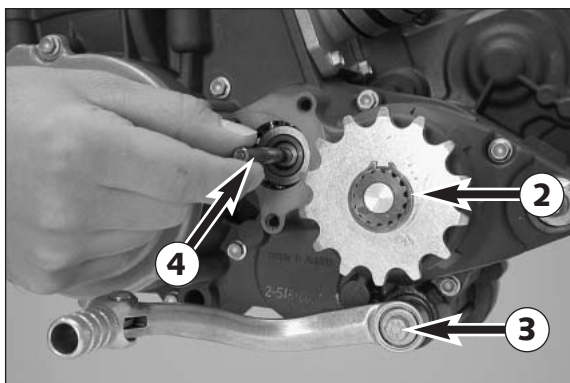
- Cleaning the engine thoroughly.
- Clamp the engine into the workstand.
- Remove the kickstarter.



### Draining gear oil

NOTE: The transmission oil should already be drained when the engine is dismantled. Otherwise, the transmission oil will leak out of the drive shaft following the removal of the slave cylinder of the clutch.

- Unscrew plug ①, allowing oil to drain.



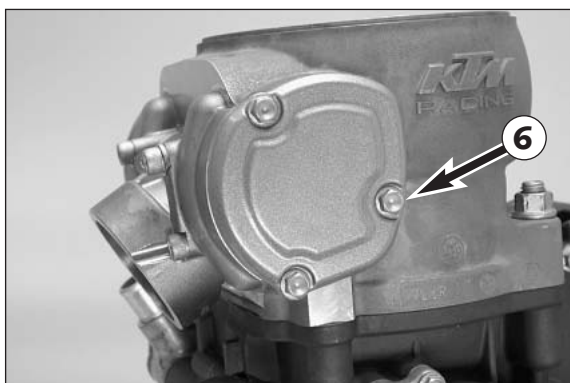
### Dismounting of sprocket and shift lever

- Remove circlip ② from countershaft using circlip pliers. Slide off engine sprocket, distance bushing and O-ring.
- Undo the bolt ③ and remove the shift lever.
- Pull out the clutch push rod ④ from drive shaft.



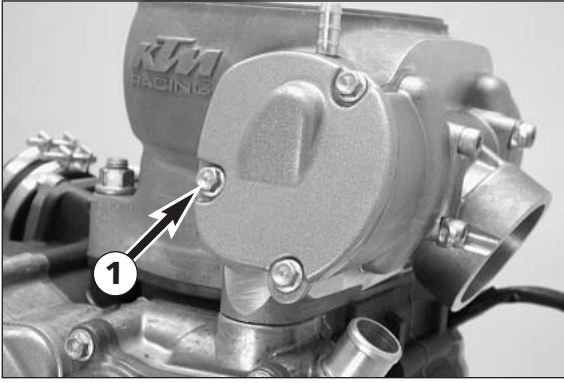
### Dismounting of cylinder head, cylinder and piston

- Unscrew the 6 collar bolts ⑤ and remove cylinder head and the two O-rings.

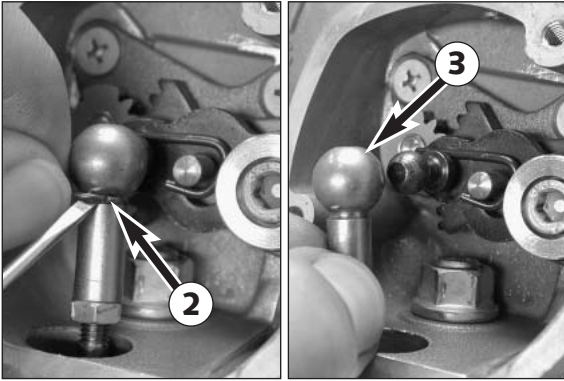


- Undo the bolts ⑥ and remove the left control cover together with the gasket.

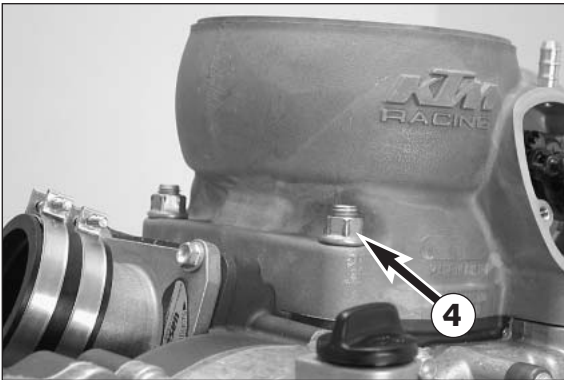




- Undo the bolts **1** and remove the right control cover together with the gasket.



- Remove the securing clip of the ball socket **2** and unhook the ball socket **3** from the adjusting lever.



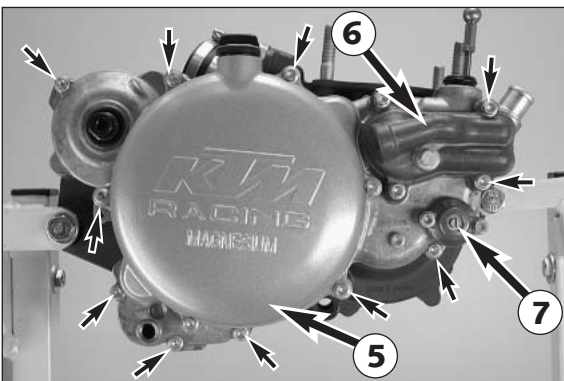
- Remove the 4 collar nuts **4** on cylinder base and remove cylinder.
- Remove the cylinder base gasket.



- Cover the crankcase.
- Place piston on wooden jig and remove both piston pin locking pins.
- Expel piston pin from piston without exerting undue force. Use a suitable mandrel if necessary.
- Remove piston and piston pin needle-bearing from conrod eye.

**! CAUTION !**

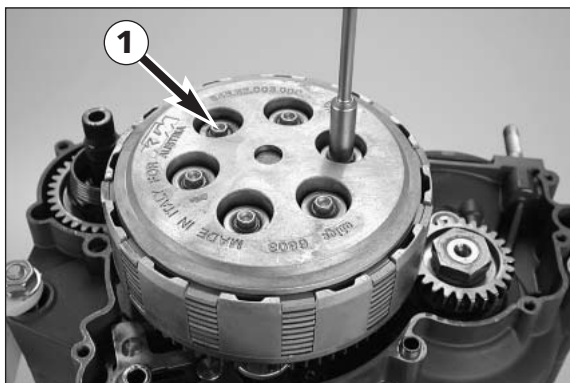
THE PISTON PIN MUST NEVER BE FORCED OUT WITH A PUNCH. THIS WOULD DAMAGE THE CONROD BEARING.



### Dismounting of clutch cover

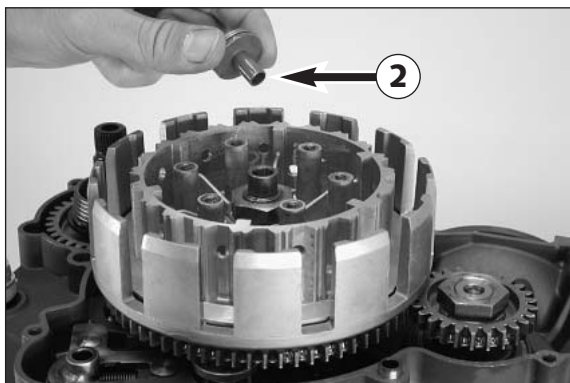
- Remove collar bolts and clutch cover including gasket.

NOTE: The water pump cover **6**, the outer cover **5** and the cover lid **7** do not need to be removed. The water pump and the centrifugal timer remain in the clutch cover.

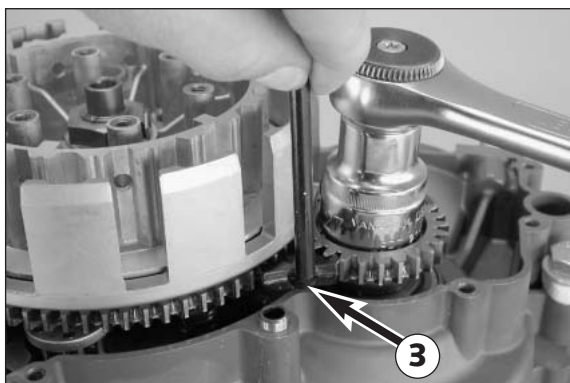


### Dismounting of pressure cap and clutch discs

- Loosen collar bolts ❶ in diagonally opposite sequence to prevent wedging of discs as springs expand.
- Remove collar bolts, springs and spring retainers.

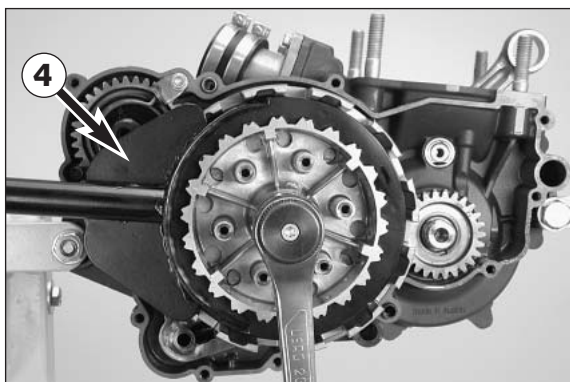


- Take pressure cap and disc package out of outer clutch hub.
- Take thrust bearing ❷ off the drive shaft.

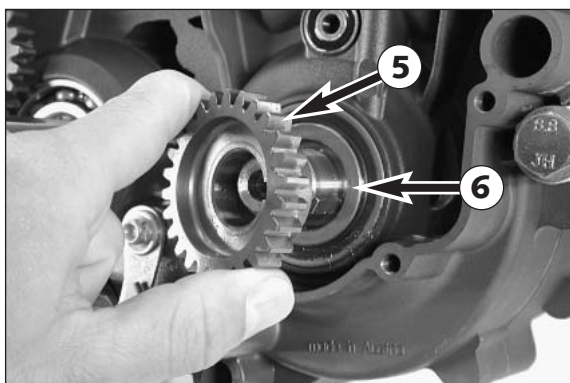


### Dismounting of the primary drive

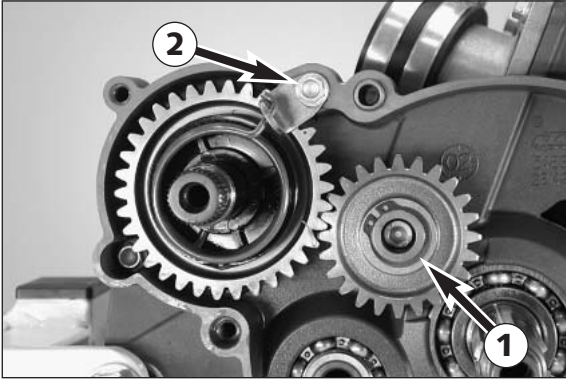
- Block the primary gear with the gear wheel segment ❸ (see illustration).
- Undo the hexagon nut (LH thread) and remove it together with the detent edged ring.



- Release the lock washer of the inner clutch hub.
- Connect clutch holder ❹ to inner clutch hub and loosen hexagon nut (see illustration).
- Remove clutch holder.
- Remove inner clutch hub and outer clutch hub together with bearing from main shaft.



- Pulling the primary gear ❺ and the distance bushing ❻ off the crankshaft.



### Dismounting of kickstarter

- Remove circlip ① and kickstarter intermediate gear.
- Carefully release collar bolt ② kickstarter spring is tensioned, release tension on kickstarter spring and unhook spring hanger.

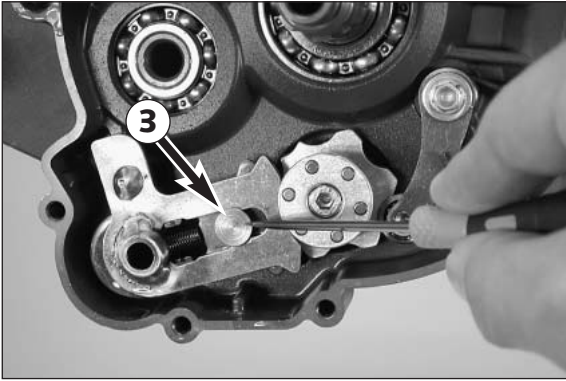
!

**CAUTION**

!

CAREFULLY RELEASE THE KICKSTARTER SPRING! DANGER OF INJURY!

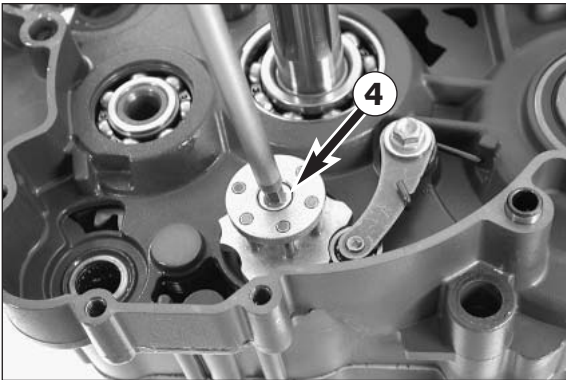
- Pull the kickstarter shaft together with ratchet gear, spring, and disc out of the engine casing.
- Take care of the stop disc, which could stay in the housing.



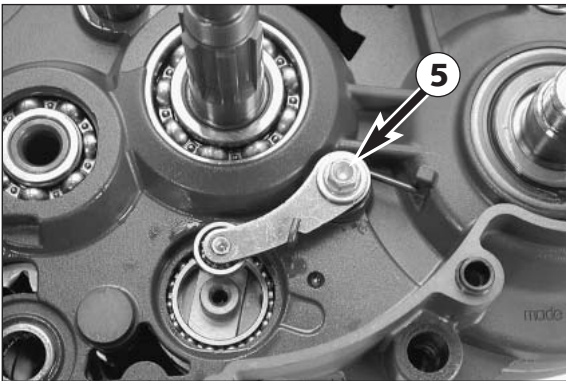
### Dismounting of the shift lock

- Press the sliding plate ③ back with a bolt driver so it no longer engages with the driver for the shaft roller, at the same time remove shift shaft from the housing.

NOTE: Watch the stop disc which remains in the housing.



- Loosen the AH bolt ④ and remove the shift lock.



NOTE: Disassemble locating lever only if the engine case must be replaced.

- Remove bolt ⑤ and locking lever with spring and bush.



### Dismounting of ignition cover

- Undo the 4 bolts and remove the ignition cover together with the gasket.

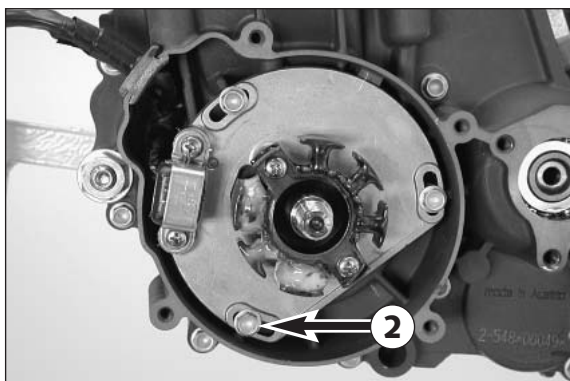


### Dismounting of the ignition

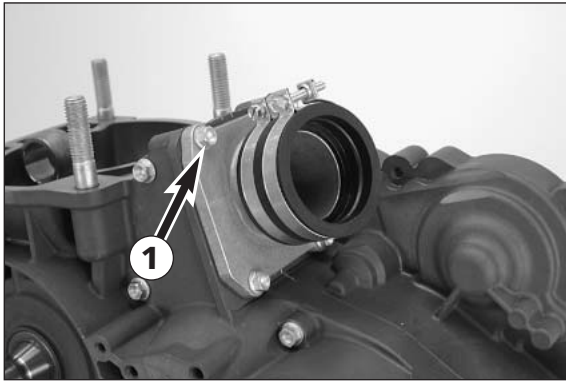
- Apply the holding spanner ❶ and undo the collar nut.
- Remove the collar nut and the locking cant ring.



- Put the protection cover on the crankshaft thread, twist in the flywheel extractor and remove the flywheel.

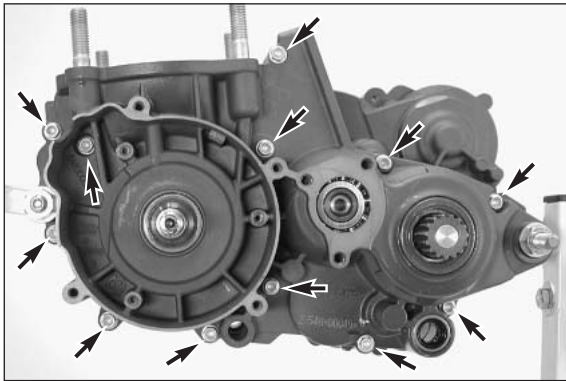


- Undo the 3 bolts ❷ and remove the stator together with the base plate.



### Dismounting of intake flange and reed valve housing

- Remove the 4 collar bolts ❶.
- Remove intake flange and reed valve housing.



### Parting of engine housing halves

- Top ignition-gear upwards and remove all 12 housing bolts.
- Loosen the 2 engine fixtures on the engine work stand.



- Lift left-hand housing half with suitable tools by on the bosses provided, or part with a few light plastic mallet blows against the countershaft from the right-hand housing half.

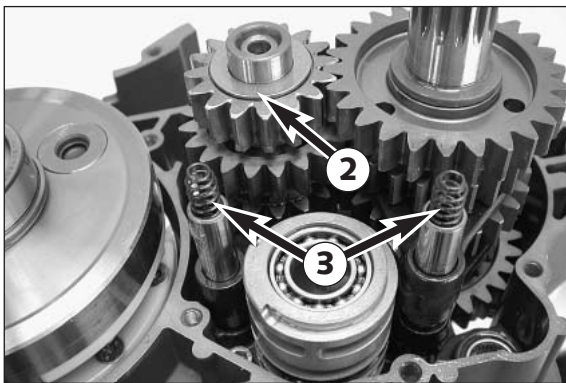
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### ! CAUTION !

---

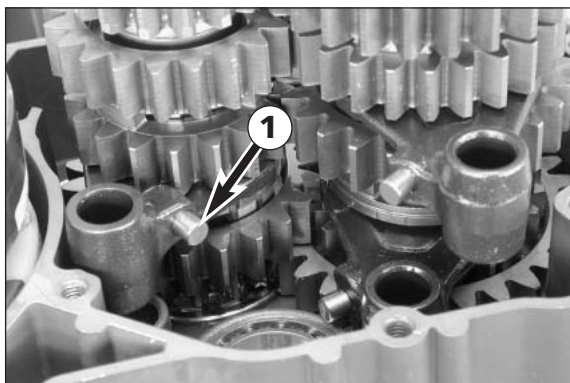
LEVERING APART WITH A SCREW DRIVER OR SIMILAR TOOL MUST BE AVOIDED, SINCE THE SEAL FACES ARE EASILY DAMAGED.

NOTE: Pay attention to stop disk ❷ on the main shaft when separating the engine housing half (it can stick to the inside of the housing).



### Dismounting of gearshift mechanism and transmission

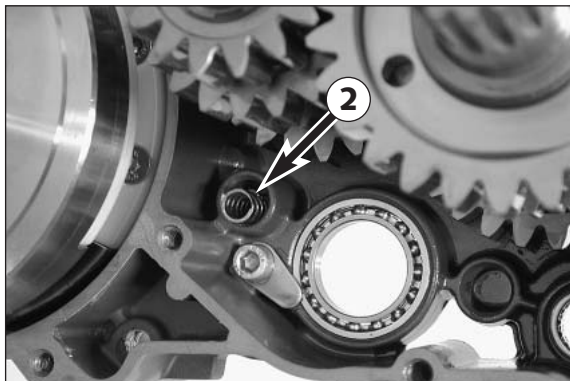
- Remove stop disk ❷ from the main shaft.
- Pull the 2 pressure springs ❸ out of the shift rails.



- Pull out the shift rails and swing the shift forks aside.
- Pull the shift roller out of the bearing seat.
- Remove the shift forks.

NOTE: When dismounting, pay attention to the needle rollers **1**, which could stay behind in the shift drum.

Since the shift forks differ from each other, be sure to mark them accordingly when you remove them.



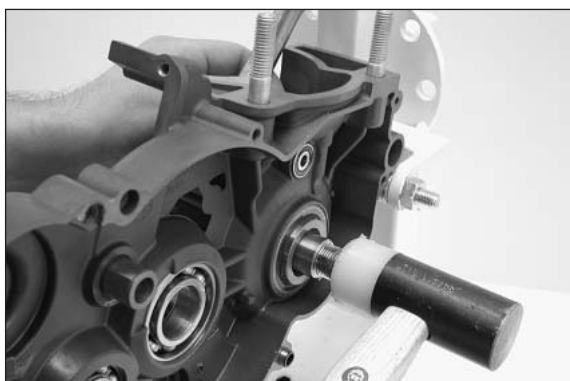
- Remove the pressure spring **2** from the engine case.



- Pull the drive shaft together with the countershaft out of the bearing seats.



- Remove 1<sup>st</sup>-gear idler gear **3** with needle cage and the two stop discs from the engine case.



### Dismounting the crankshaft

- Pull crankshaft from the bearing seat (if necessary, use a plastic hammer and tap carefully on the crankshaft journal).
- Remove O-ring from crankshaft.
- Clean all parts and check for wear, replace if necessary.

NOTE: When an engine is completely overhauled it is recommended that all gaskets, shaft seal rings and O-rings are renewed.

# SERVICING ON INDIVIDUAL COMPONENTS 4

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### IMPORTANT NOTE REGARDS WORKING ON ENGINE HOUSING

Read through the following section before commencing work. Then determine the assembly sequence so that the engine housing halves only need to be heated up once before replacing the bearings.

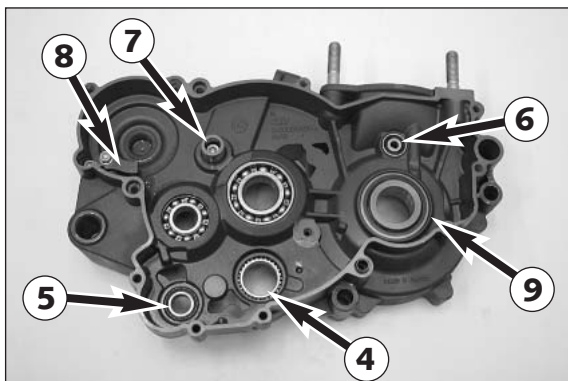
Having first removed the dowels, in order to expel the bearings or remove them with light mallet blows, the housing halves must be placed on a suitably large plane surface, supporting the whole of the sealing surface without damaging it. A wooden panel is best used as a base.

Bearings or shaft seal rings should not be hammered into their seats. If no suitable press is available, use a suitable mandrel and hammer them in with great care. Cold bearings will practically drop into their seats at an engine housing temperature of approx. 150° C.

After cooling, should the bearings fail to lock in the bore, they are bound to rotate after warming. In that event the housing must be replaced.







### Working on the right-hand housing half

Remove all shaft seal rings and use an oven to heat the casing half to approx. 150°C.

The bearings usually fall out of their seat of their own accord by knocking the housing half on a plane piece of wood when the housing has a temperature of 150° C.

Grooved ball bearing of crankshaft **1**.

Press old grooved ball-bearing inwards. Press in new grooved ball bearing from inside up to the stop.

Grooved ball bearing of main shaft **2**

Press in new ball bearing from inside up to the stop.

Grooved ball bearing of countershaft **3**

Press in new grooved ball bearing from downward to the stop.

Grooved ball bearing of the shift roller **4**

Remove bolt **A** and press bearing towards the inside. Press in new ball bearing from inside to the stop and secure retaining bolt with Loctite 243.

Needle bushing of the shift shaft **5**

Press old needle bushing inwards, press in new needle bushing flush from the outside.

Grooved ball bearing of centrifugal timer **6**

Use a self-made "supporting plate" to support the puller to avoid damage to the housing (see illustration).

Pull out the bearing using a  $\varnothing$  5-8 mm inside puller.

Press in new grooved ball bearing to the stop.

Bearing bolt kickstarter intermediate gear **7**

Experience has shown that it is never necessary to replace the bearing bolt. It is not recommended to mount a used bearing bolt in a new housing half, as it is practically impossible to remove it without causing damage.

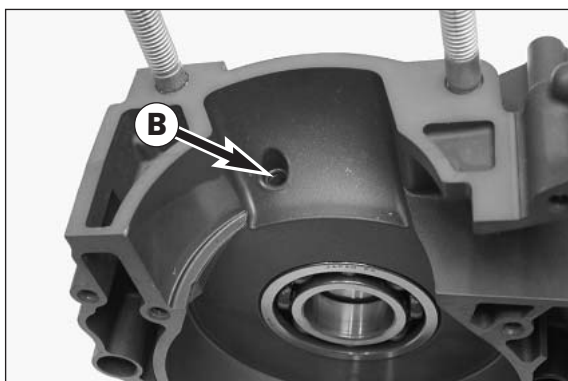
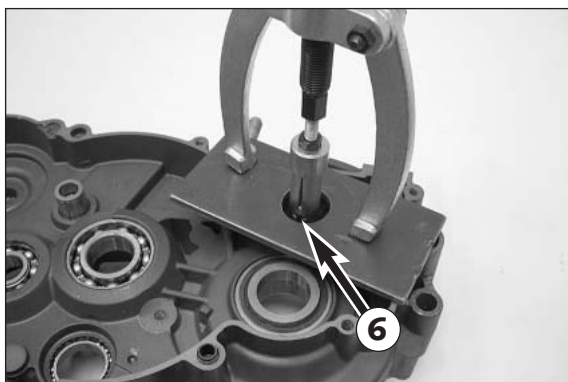
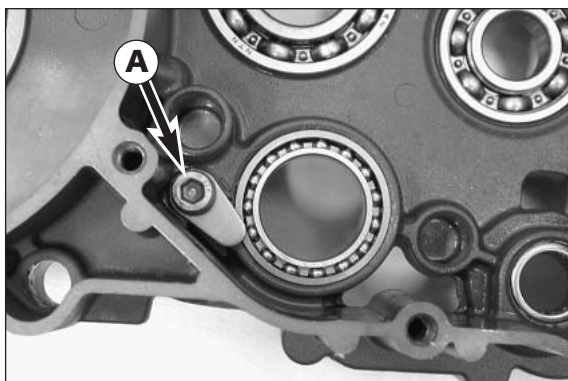
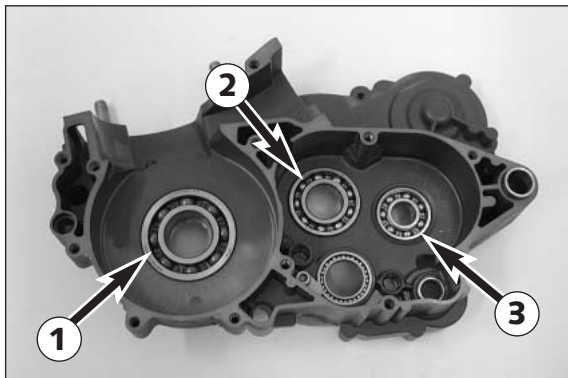
Kickstarter release plate **8**

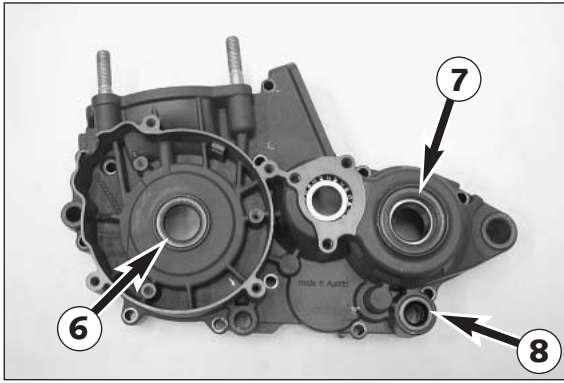
After replacing the release plate, secure the bolt with Loctite 243.

Crankshaft seal ring **9**

Press in new shaft seal ring from the outside, with sealing lip facing inward, until flush.

– Finally check clear passage of the crankshaft ball bearing lubrication bore **B**.





### Working on the left-hand housing half

Remove all shaft seal rings and use an oven to heat the casing half to approx. 150°C.

The bearings usually fall out of their seat of their own accord by knocking the housing half on a plane piece of wood when the housing has a temperature of 150° C.

#### Crankshaft roller bearing ①

Press old roller bearing inwards, press in new ball bearing to the stop with the open side of ball cage downwards (outside). The inner ring on the crankshaft must also be renewed (see paragraph about crankshaft).

#### Needle bearing of drive shaft ②

Press old grooved ball bearing inward, press new grooved ball bearing from the inside up to the stop.

#### Grooved ball bearing of countershaft ③

Press old ball bearing inwards, press in new ball bearing to the stop from inside.

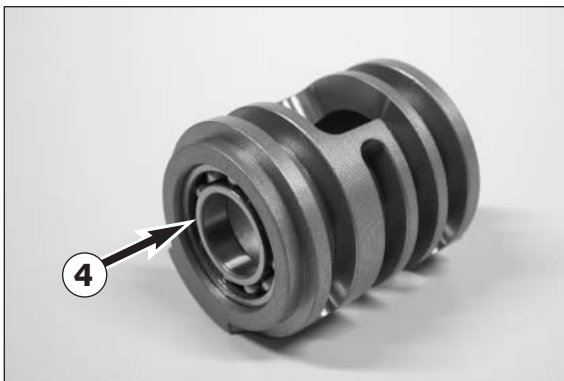
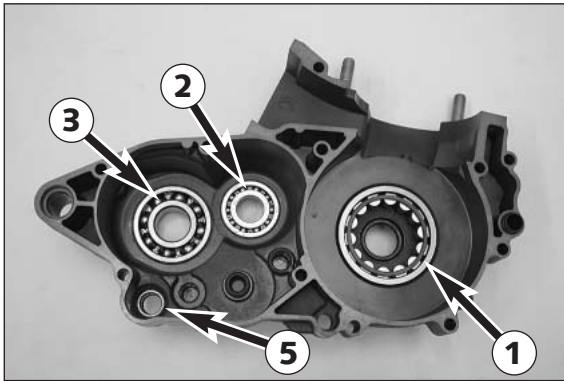
#### Grooved ball bearing of shift roller ④

Heat the shift drum to approx. 150° C.

The grooved ball bearing should fall out of the bearing seat automatically at this temperature.

If necessary, tap the shift drum on a flat wooden surface.

Insert a new grooved ball bearing and press in gently up to the stop.



#### Needle bushing of shift shaft ⑤

Remove shaft seal ring and press old needle bushing inwards. Press in new needle bushing from the outside to the collar ⑩.

#### Crankshaft seal ring ⑥

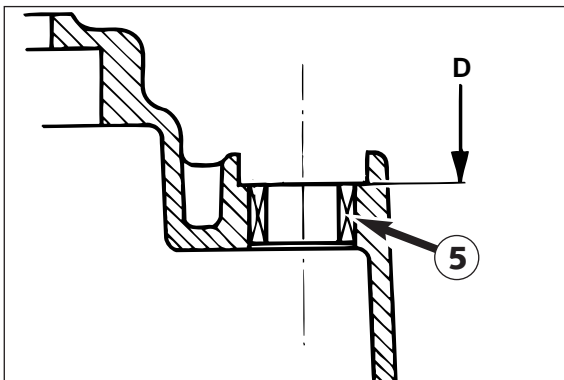
Press in a new shaft seal ring from the outside until the sealing lip is flush with the inner surface.

#### Counter shaft seal ring ⑦

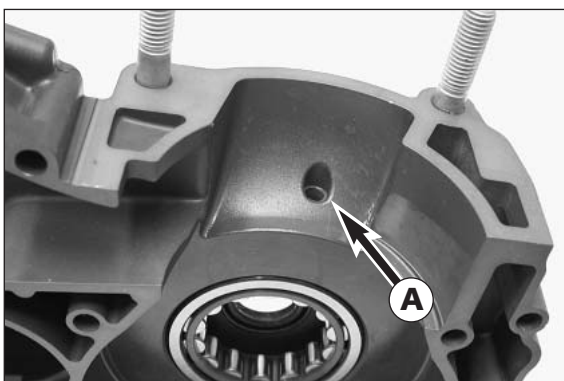
Press in the new shaft seal ring, until it is flush with machined surface.

#### Shift shaft seal ring ⑧

Press in the new shaft seal ring, until it is flush with machined surface.



When housing half has cooled off, check to see that the bearings are tight.



– Finally check clear passage of the crankshaft roller bearing lubrication bore ⑨.



### Crankshaft

- When replacing the roller bearing, the inner crankshaft ring must also be renewed.
- Heat special tool 584.29.037.043 on a heating pad up to approx. 150°C and slip it on the inner ring immediately. Press the special tool together tightly so as to obtain a good heat transfer and pull the inner ring off the crankshaft.
- To mount the new inner ring, heat the special tool again to approx. 150°C, engage the inner ring and slip it on the crankshaft journal immediately.

### ! CAUTION !

NEVER CLAMP THE CRANKSHAFT WITH A STUD OR WEB IN THE VICE, AND NEVER TRY TO KNOCK THE BEARING INNER RING FREE. THE CRANKSHAFT WEBS MAY BE COMPRESSED AND THE CON-ROD PLUG AND BEARING MAY BE DAMAGED, THEREBY MAKING THE CRANKSHAFT UNUSABLE.

NOTE: Distance adjustment of the main bearings is not requested.



### Piston

If a used piston is to remain in service then the following should be checked:

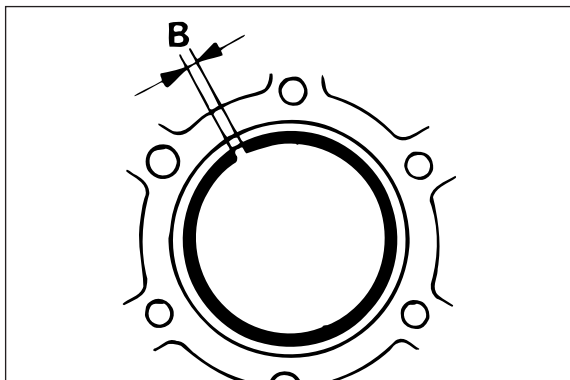
1. Piston running surface: Check for pressure marks (seizing marks) minor friction marks can be removed with a fine abrasive stick.
2. Piston ring groove: The piston ring may not jam in the groove. Use an old piston ring or sandpaper (400 grit) to clean the groove.
3. The piston ring anti-rotation device must fit tightly in the piston and may not be worn.
4. Check piston rings for wear and check end gap.

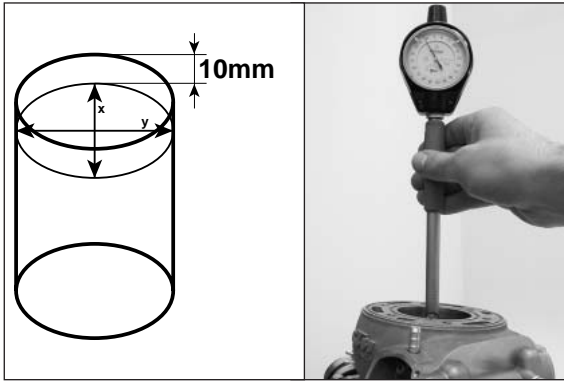
### Piston ring end gap

- Insert piston ring into the cylinder and adjust. Piston ring must be approx. 10 mm (1/2 inch) from top of cylinder.
- The end gap **B** can now be checked with a feeler gauge.

Piston ring end gap: max. 0.40 mm (0.015 in)

NOTE: If the end gap is greater check piston and cylinder for wear. If piston and cylinder wear are within the permitted tolerance limits, replace the piston ring.

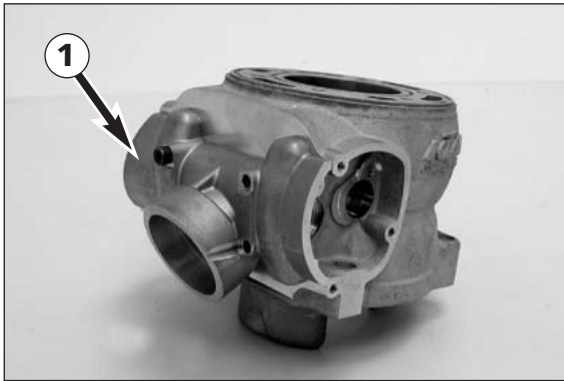




### Checking cylinder for wear

Measure diameter of cylinder approx. 10 mm (0.4 in.) below top of cylinder edge. Check diameter in several corresponding places to see if cylinder is worn oval.

Engine	Cylinder Ø	Piston size
250	67,500 - 67,512	1
	67,513 - 67,525	2



### Recoated cylinder

Note: If the cylinder diameter is greater than 67, 525 mm, the Nikasil cylinder must be reconditioned or replaced. For reconditioning of the old cylinder all exhaust control components must be removed. The intermediate flange ❶ remains with the cylinder. The piston size is stamped into the bottom of the piston.



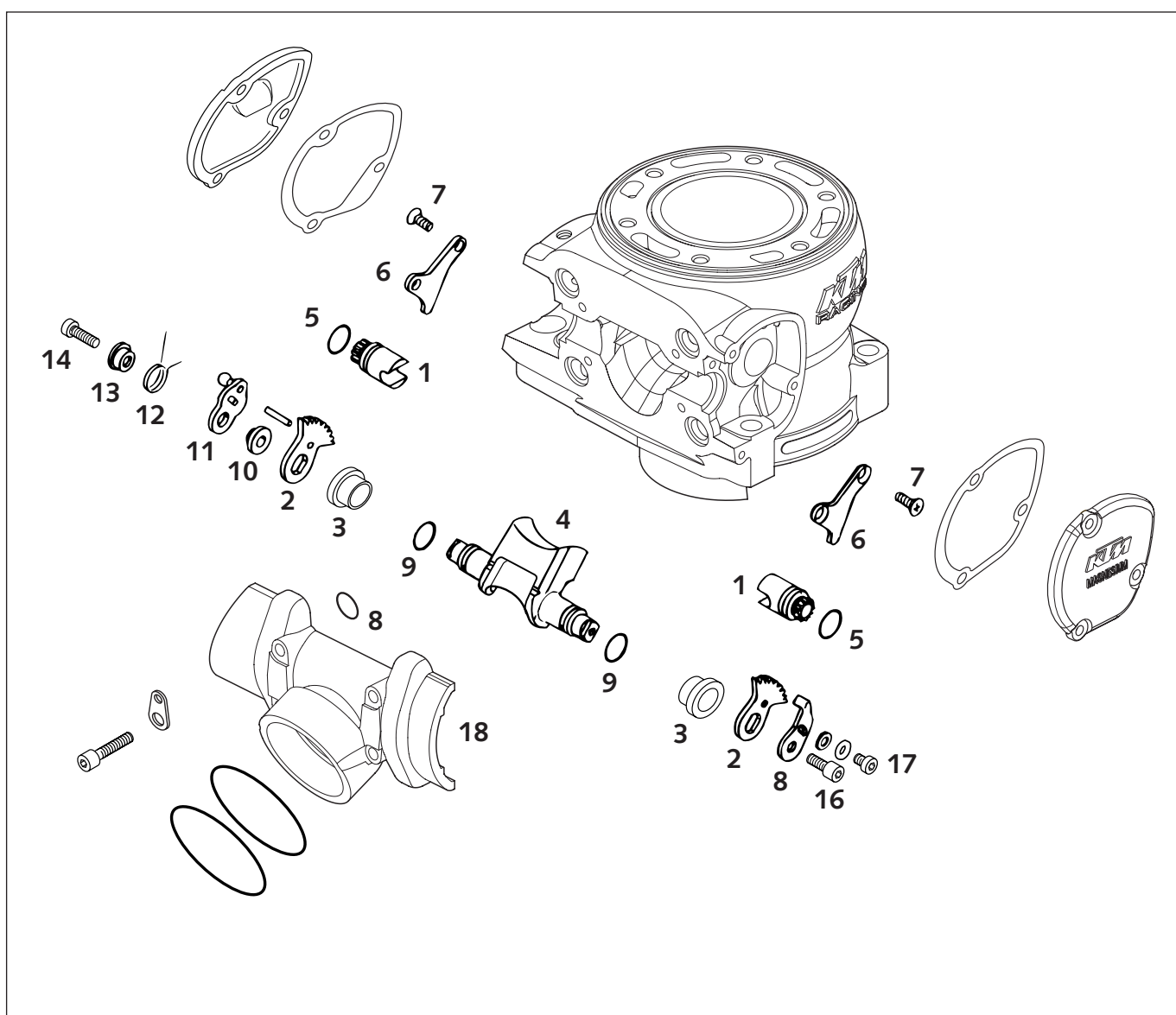
### Nikasil coating of cylinder

Nikasil is the brand name for a cylinder coating process, developed by the piston manufacturer Mahle. The name is derived from the two materials used in this process - a nickel layer into which the particularly hard silicon carbide is inbedded.

The main advantages of the Nikasil coating are:

- excellent heat dissipation and thus better power output
- low wear
- low weight of the cylinder.

NOTE: The worn coating can be regenerated at low cost provided that the cylinders running surface is flawless.



### Cylinder exhaust control system

Dismantle and clean all exhaust control components, check for signs of wear and damage.

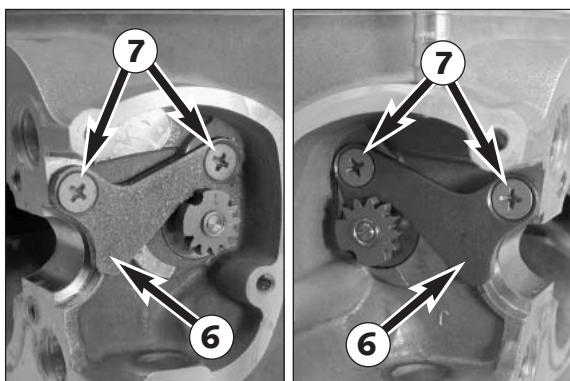
Control rollers ① – Check clearance of bearings. Remove oil-derived deposits. Check tothing of control rollers for signs of wear.

Gear segments ② – Check tothing of gear segments and control rollers for signs of wear.

Bearing sleeves ③ – Check bearing sleeves of the control flap for play and easy operation.

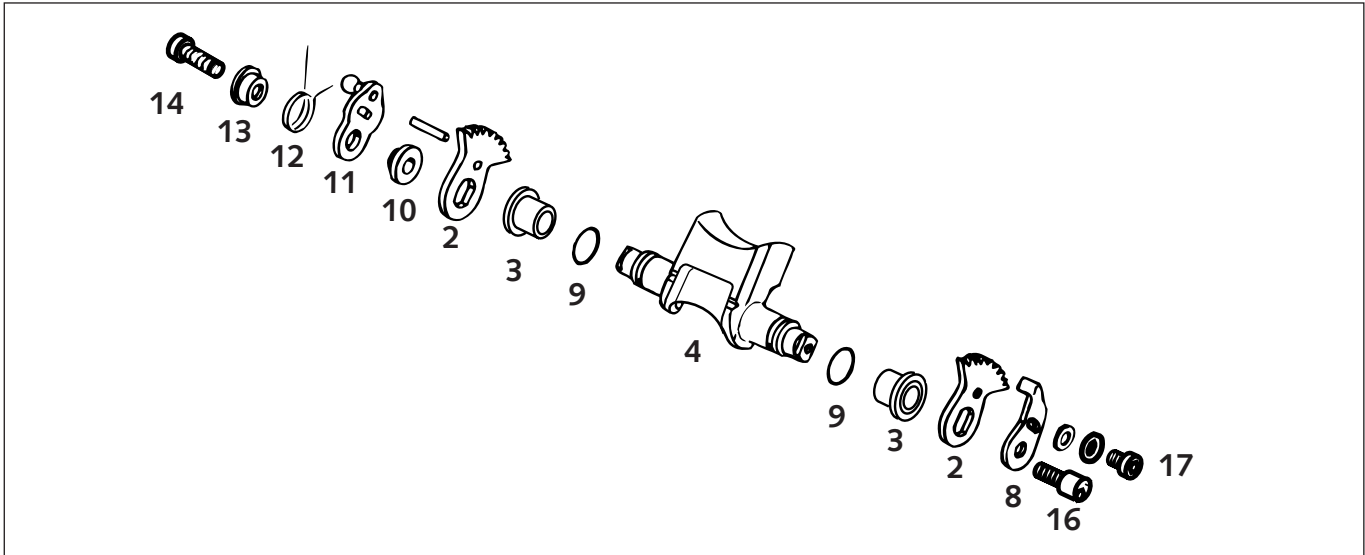
Control flap ④ – Clean the control flap. The control flap must not graze inside the exhaust port.

Silicon O-rings ⑤, ⑧ + ⑨ – Check silicon O-rings of control flap and control rollers for signs of wear. Renew if necessary.

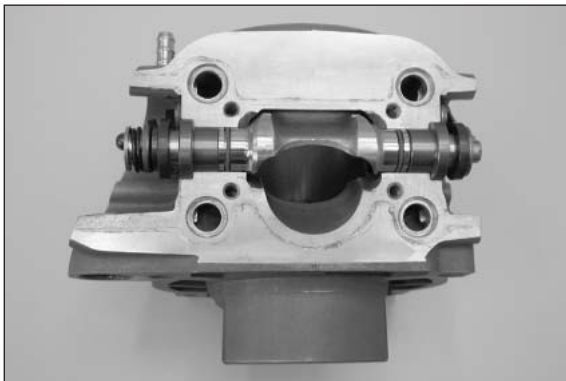


### Cylinder preassembly

- Mount silicon O-rings (16x2 mm) ⑤ on control rollers and grease.
- Place control rollers ① in cylinder and mount retaining brackets ⑥; secure flat-head screws ⑦ with Loctite 243.

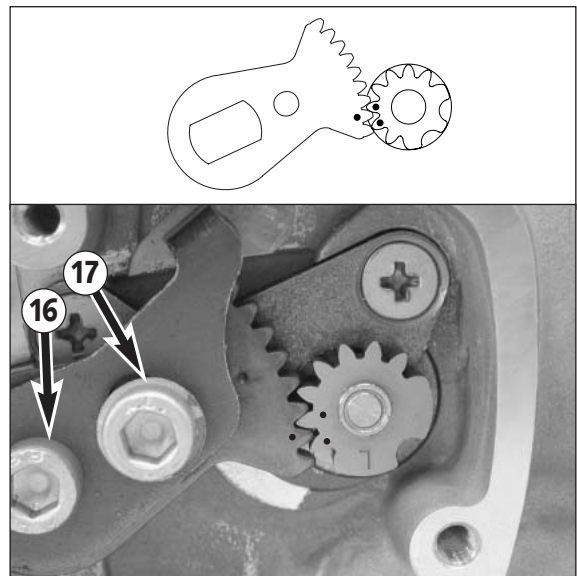
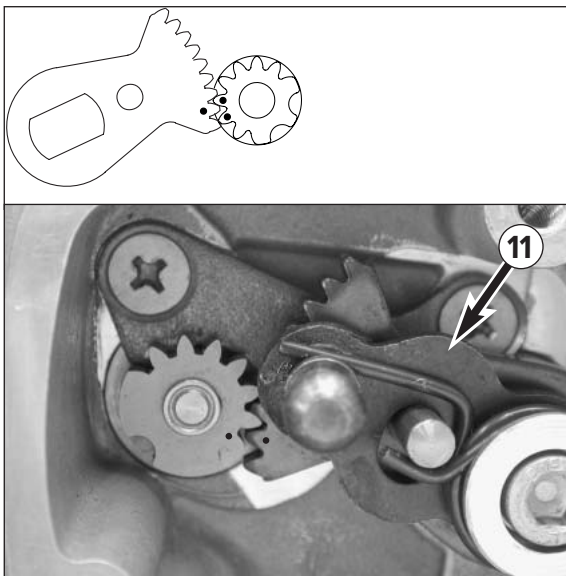


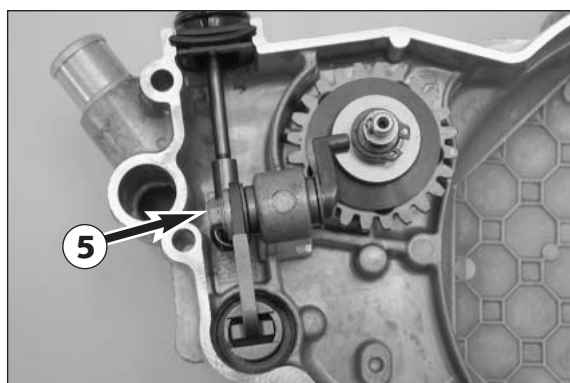
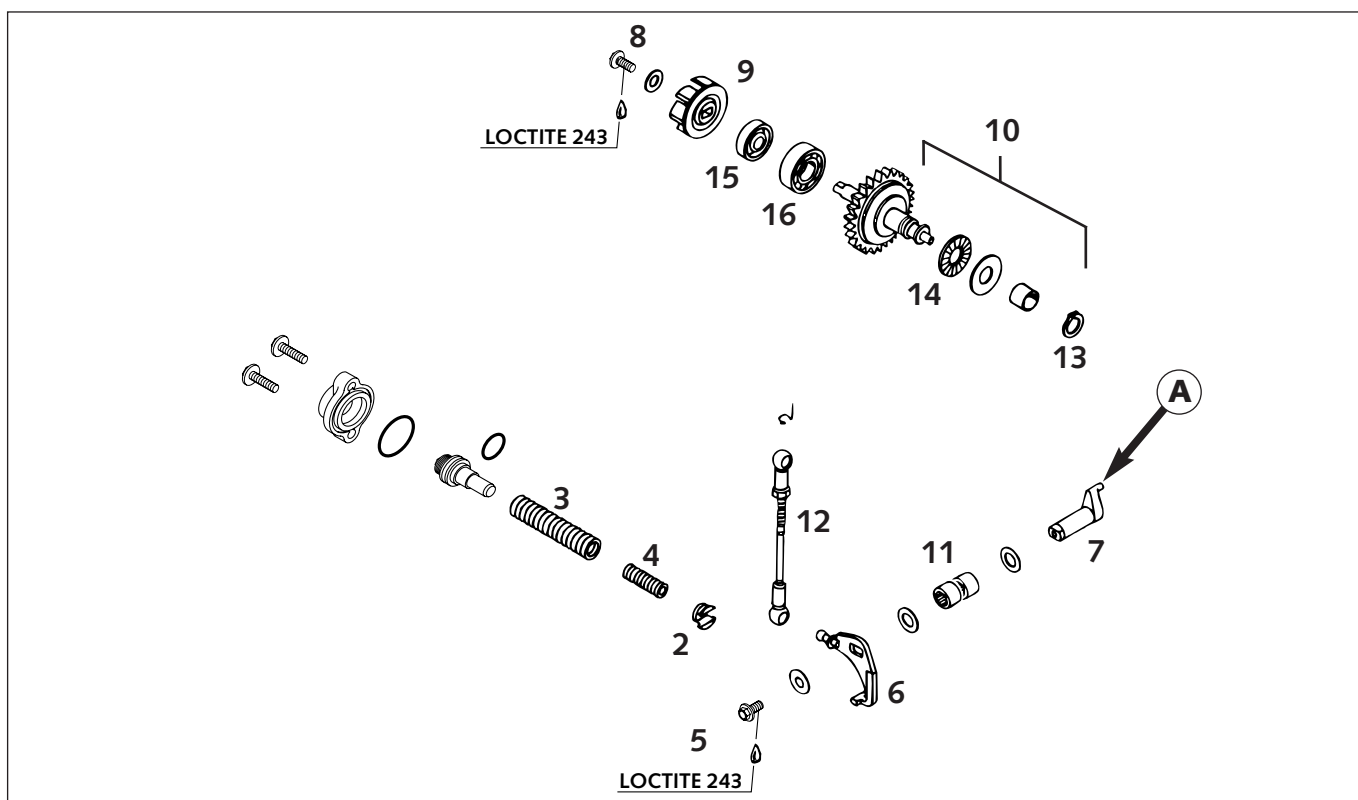
- Mount and grease silicon O-rings (15x1,50 mm) ⑨ on control flap and grease.
- Slightly grease the bearing sleeves ③ and plug them on the control flap.
- Mount toothed segments ② (the toothed segment with the cylindrical pin has to be mounted on the right side).
- On the right-hand side, mount bearing bushing ⑩ with collar outside, adjusting lever ⑪ with ball head on outside, overload spring ⑫ with short leg on outside and spring sleeve ⑬ to control flap.
- Coat allan head bolt ⑭ with Loctite 243 and bolt up about 5 revolutions, hook the short leg of the overload spring on to the cylinder pin (see illustration) and tighten the allan head bolt.
- Mount stop plate ⑧ on the left side. Do not tighten bolts ⑯ + ⑰ yet since they will be used to adjust the exhaust control (measurement Z).
- Turn control rollers ① in cylinder in such a way that ports are completely open and no edges protrude.



- Place preassembled control flap in cylinder, engage gear segments in control rollers in such a manner that, when the control flap is open (pivoted right to the top), the markings of the gear segments and the gear rollers coincide. Please check that the two control rollers do not block the cross-section of the port when the control flap is open.
- Coat sealing surface thinly with silicon and mount intermediate flange ⑮ with 4 O-rings (11,3x2,4 mm).
- Finally check smooth running of exhaust control system.

NOTE: It must be possible to push adjusting lever ⑪ further upwards against the spring force.





#### Exhaust control, clutch cover

- Remove bolts ①, spring insert ②, control spring ③ and auxiliary spring ④ from the clutch cover.
- Remove bolt ⑤ with rocker arm ⑥ and control lever ⑦.
- Take off water pump cover, remove allen head bolt ⑧ and take off water pump wheel ⑨.
- The centrifugal timer ⑩ can be pulled out of the bearing.
- Clean all parts and check for signs of wear.

Check play and easy operatability of the adjusting lever in the bearing ⑪.

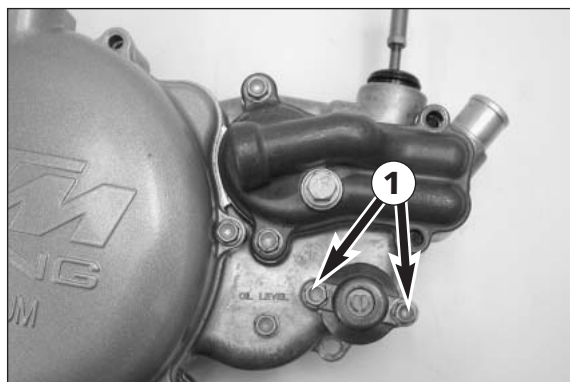
Check pin A of adjusting lever for wear.

Check linkage ball heads ⑫ for clearance.

Remove circlip ⑬ and check axial bearings ⑭ and washers for signs of wear.

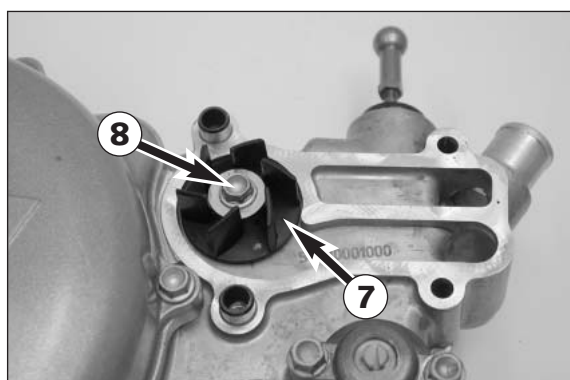
If the water pump shaft seal ring ⑮ is replaced, it should be coated with Loctite 243 on the outside.

Check grooved ball bearing ⑯ for clearance



#### Preassembly of clutch cover

- Grease water pump shaft seal ring ⑮ and mount centrifugal timer ⑩.
- Apply Loctite 243 to bolt ⑤ and mount together with rocker arm ⑥ and control lever ⑦.
- Mount control spring ⑨, auxiliary spring ④ and spring ② insert in the clutch cover and fix with bolts ①.
- Mount water pump wheel ⑨, coat bolt ⑧ with Loctite 243 and mount with washer.
- Mount dowels of the water pump cover.
- Mount a new Form-ring und fix the water pump cover with 2 bolts.



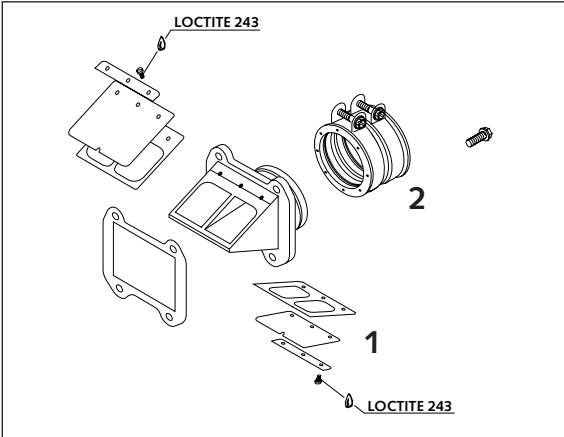


### Reed valve housing, intake flange

NOTE: Reed paddles ① gradually lose tension through operation, resulting in power loss. Damaged or worn reed paddles must be replaced.

**! CAUTION !**

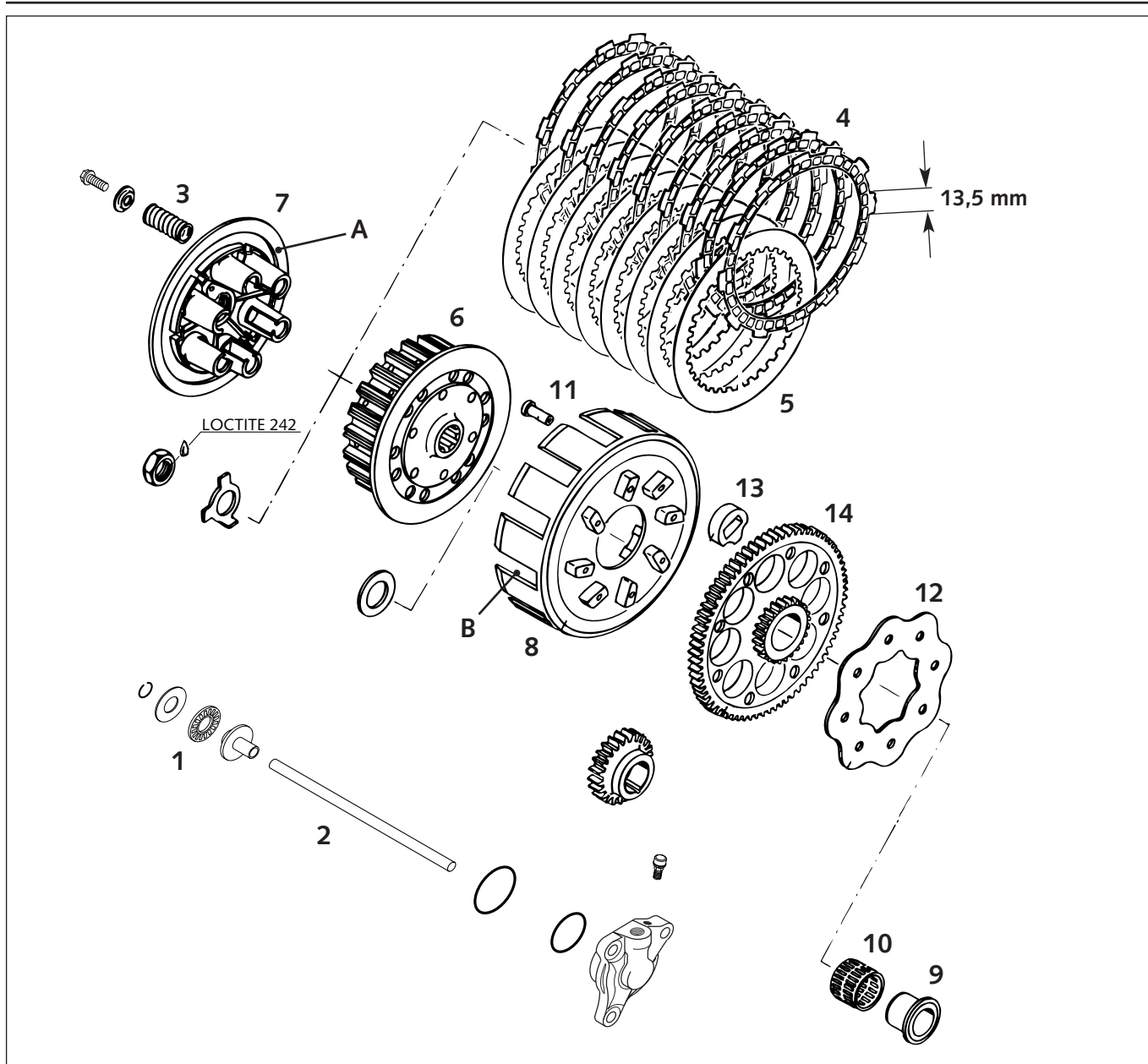
SECURE ALL SCREWS OF THE REED VALVE HOUSING WITH LOCTITE 243.



Rubber sleeve ②

Check for firm mounting and for signs of damage.





## Clutch

Thrust bearing ❶ check for wear

Push rod ❷ Check for wear. Minimum length: 192 mm (new: 192.50 mm)

Clutch springs ❸

New spring length 42 mm / 1.69 in (new 43 mm / 1.73 in). Replace all 6 springs if applicable.

9 Lining discs ❹

Minimum thickness 2.60 mm (0.102 in) / new disc 2.70 mm (0.106 in). Discs must be plane; there must be minimum spacing of 13.50 mm (0.531 in) between starting surfaces.

8 Steel discs ❺

Must be plane, check for mechanical damage.

Inner clutch hub ❻

Check contact surfaces of steel discs on the inner clutch hub, maximum 0.50 mm (0.02 in) indentations.

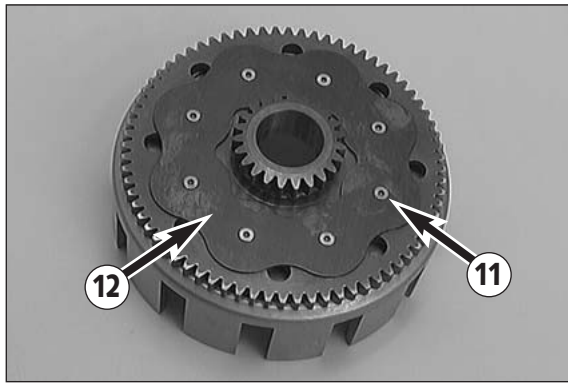
Pressure cap ❼

Check contact surfaces ❶ between lining disc and pressure cap for signs of mechanical damage and score marks.

Outer clutch hub ❽

Check start surfaces ❷ of clutch discs on for wear. If indentations exceed 0.50 mm (0.02 in), replace outer clutch hub (see below).

Check inner ring ❾ and needle cage ❿ for wear.

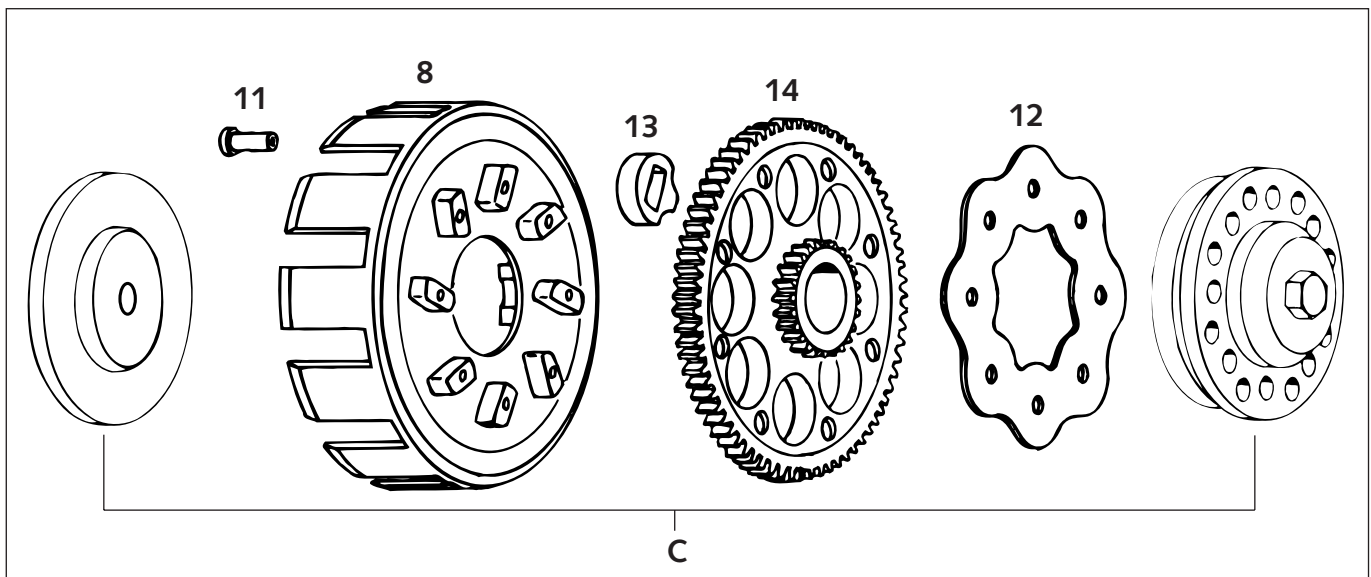
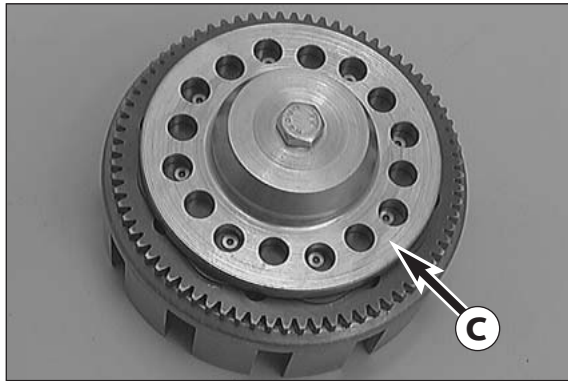


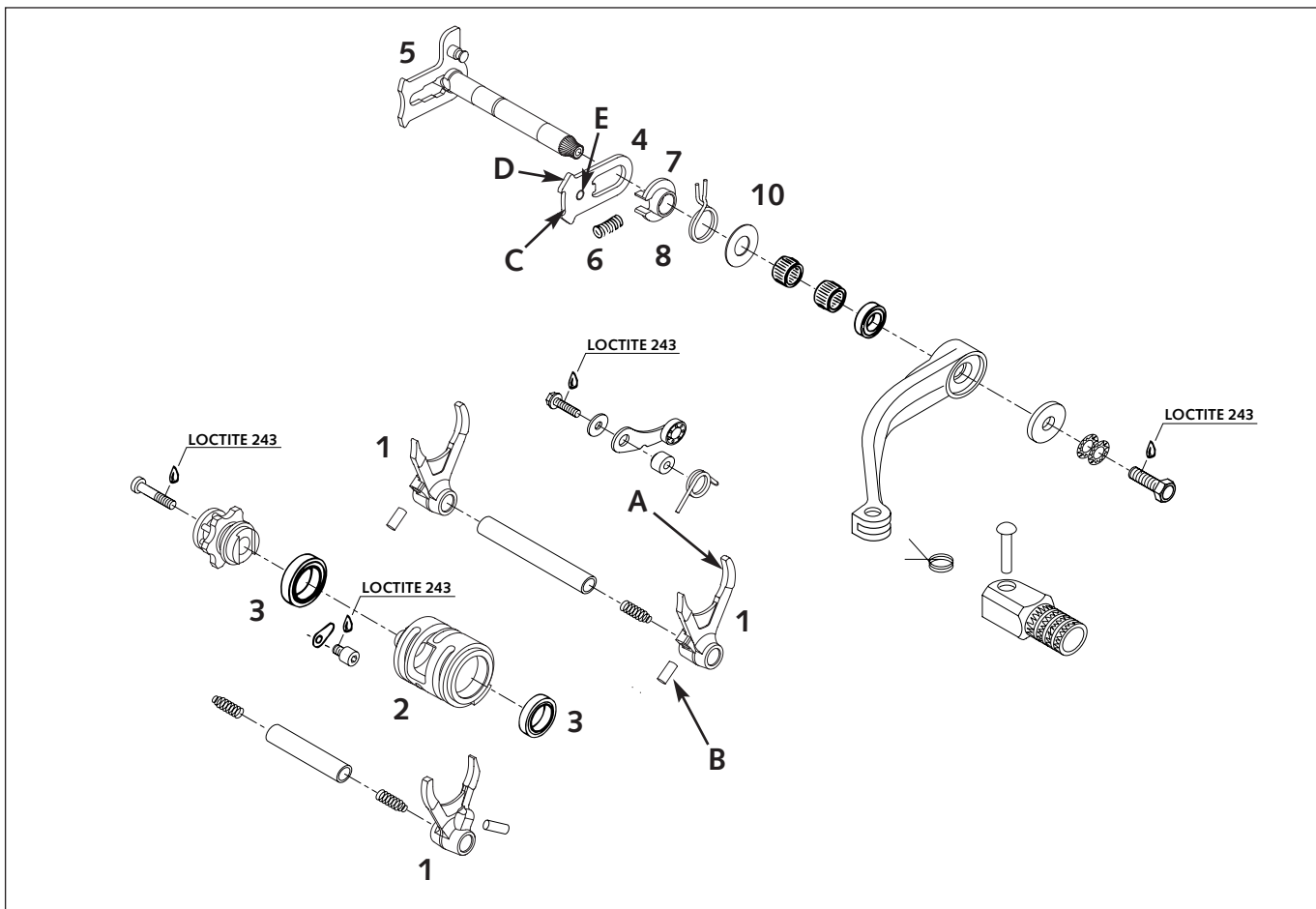
### Replace outer clutch hub

- Drill open the clutch rivets 11 in area of retaining bracket 12 and remove parts.
- Check 8 absorbing elements 13 for signs of mechanical damage, replace all 8 where applicable.

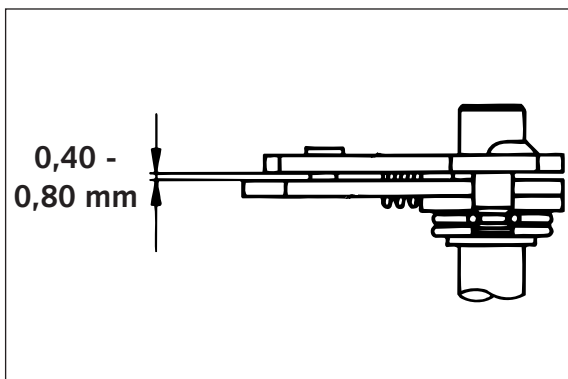
### ! CAUTION !

THE ABSORBING ELEMENTS ARE WIDER THAN THE PRIMARY GEAR CROWN. TO ENSURE THAT THE OUTER CLUTCH HUB 8 AND RETAINING BRACKET ARE POSITIONED DIRECTLY ON THE PRIMARY GEAR CROWN 14, THE PARTS MUST BE HELD IN POSITION UNDER TENSION WITH THE CLUTCH RIVETTING TOOL C WHILE RIVETING.





Art No 3206003



**Shift mechanism**

Shift forks ①  
Check shift fork blades ④ and shift roller driving pin ⑥ for signs of wear.

Shift roller ②  
Check shift grooves for wear.  
Check position of shift roller in grooved ball bearings ③.

Slide plate ④  
Check slide plate at meshing points ⑤ for wear.  
Check return surface ① for wear (renew, if strongly notched).  
Check that guide pin ⑤ is securely fixed and check for wear.

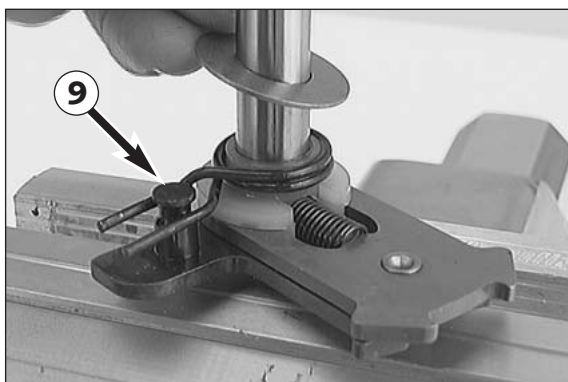
Sliding guides  
Check sliding guides (excess between guide pin and shift quadrant not to be more than 0.7 mm / 0.03 in).

Grooved ball bearings ③  
Check grooved ball bearings for easy movement.

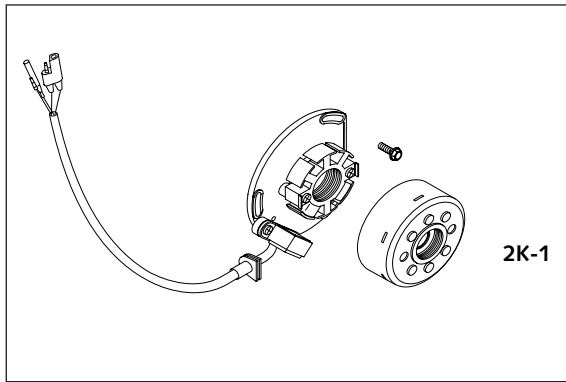
Shift mechanism  
Assemble shift mechanism (see below) and check free play between slide plate ④ and shift quadrant ⑤. Free play should be 0.40 - 0.80 mm (0.016 - 0.032 in).

**Preassembly of shift shaft**

- Fix shift shaft in vice at shorter end (use covered clamps).
- Mount slide plate ④ with guide pins downwards, hook guide pins into shift quadrant ⑤.
- Mount pressure spring ⑥.
- Slide on spring guide ⑦, slide on return spring ⑧ with offset end upwards over the spring guide and lift offset end over bolt ⑨ (see illustration).
- Mount the stop disc ⑩ (14x30x1 mm).



Repair manual KTM 250 SX - E



## Ignition

### General information

The measurements described below will only reveal severe problems. Coil short circuits leading to weak ignition sparks or low generator output, respectively, can only be detected with the help of an ignition test bench. In the case of malfunction always check the cables and the plug and socket connections of the ignition system first. Make sure to select the correct measuring range when performing measurements.

### Spark plug (NGK BR 8 ECM)

- Set the electrode distance.

Electrode distance: 0.60 mm (0.024 in)

### Insulator

Check for cracks and fissures.

**! CAUTION !**

ALWAYS USE A SPARK PLUG WITH RESISTOR. OTHERWISE PROBLEMS CAN OCCUR IN THE CDI UNIT.

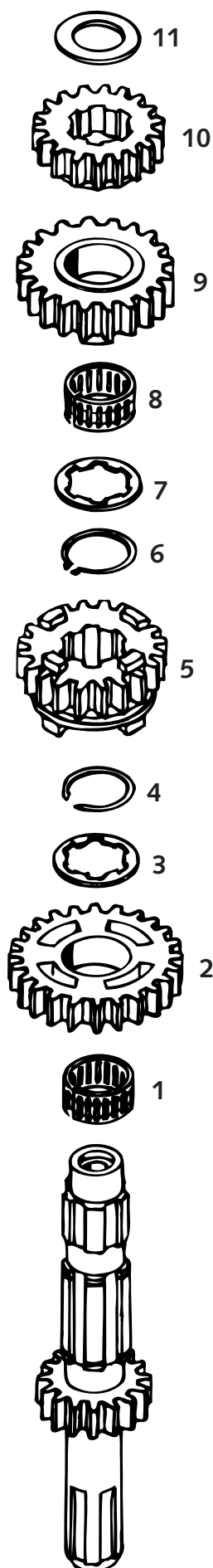


### Check stator and pulse generator (Kokusan)

Use an ohmmeter to perform the following measurements:

Ignition	Measure	Cable colours	Resistance
<b>2K-1</b>	Pulser coil	red – green	100 $\Omega$ $\pm$ 15%
	Exciter	black/red – red/white	24 $\Omega$ $\pm$ 15%

NOTE: The measuring must be performed at a temperature of 20° C. Otherwise significant deviations must be expected. Replace the stator if the measured values deviate significantly from the setpoint values.



## Transmission

Secure mainshaft or countershaft in the vice (using soft jaw-covers).

Remove gears and check the following for wear:

- Needle bearing
- Mainshaft and countershaft pivot points including idler gears
- Shift dogs and gear wheels
- Tooth faces of all gears
- Tooth profile of mainshaft and countershaft and corresponding gears
- Easy operation of gear-change

Carefully clean components and replace damaged components.

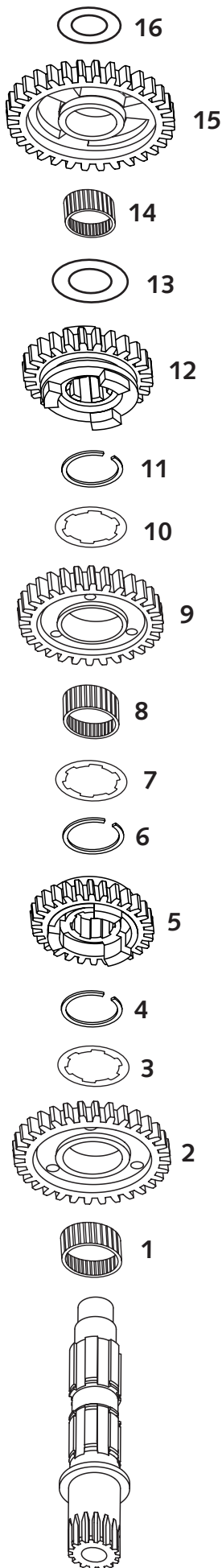
NOTE: Always place circlips with sharp edge facing the components secured, ensuring that they are not overexpanded (use special pliers).

Check that after any repair of the transmission, circlips should axially not move more than 0.20 mm (0.006 in) and must not seize between stop discs.

## Assembly mainshaft

- Fix mainshaft in vice with toothed end upwards (use covered clamps).
- Oil all parts before assembly.
- Mount the split needle cage ① on mainshaft, push 5th idler gear ② over it with collar downwards.
- Place internally toothed stop disc ③ (22.4x25.7x32.0x1.5 mm) in position and mount circlip ④ (25x1.64 mm) with sharp edge upwards.
- Place 3rd sliding gear ⑤ in position with shift groove downwards, mount circlip ⑥ (25x1.64 mm) with sharp edge downwards and internally toothed stop disc ⑦ (22.4x25.7x32.0x1.5 mm)
- Mount the split needle cage ⑧, 4th idler gear ⑨ with shift dogs downwards 2nd gear ⑩ with collar downwards and stop disc ⑪ (20.2x33x1.5 mm).
- Finally check all gears for easy running.





### Transmission

Secure mainshaft or countershaft in the vice (using soft jaw-covers).

Remove gears and check the following for wear:

- Needle bearing
- Mainshaft and countershaft pivot points including idler gears
- Shift dogs and gear wheels
- Tooth faces of all gears
- Tooth profile of mainshaft and countershaft and corresponding gears
- Easy operation of gear-change

Carefully clean components and replace damaged components.

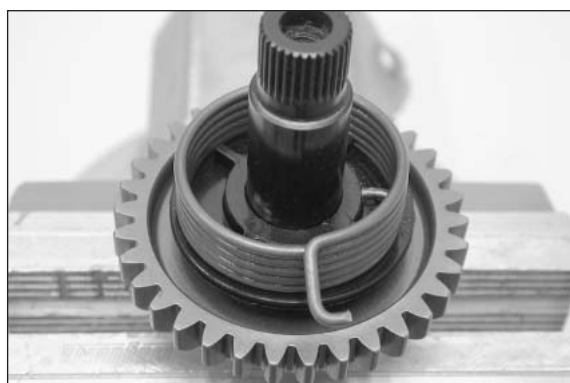
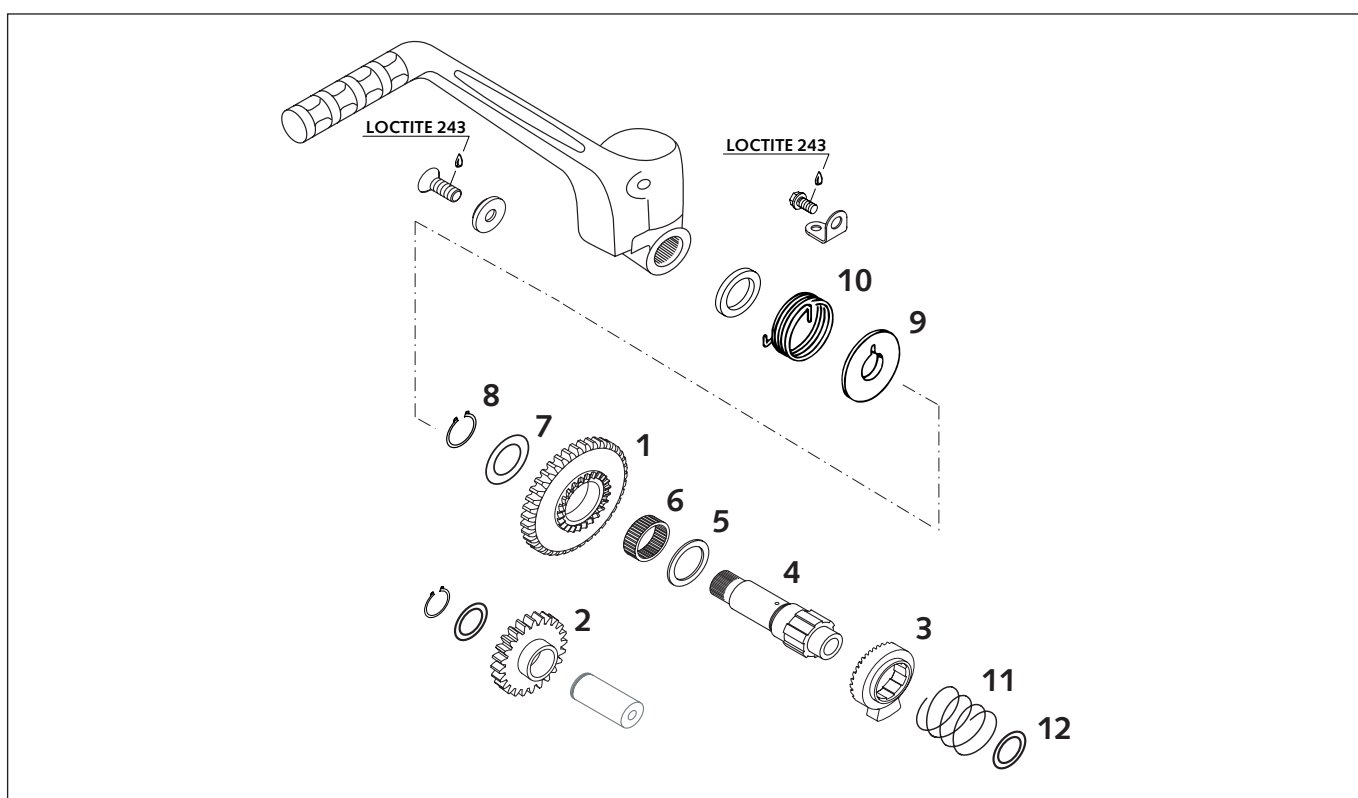
NOTE: Always place circlips with sharp edge facing the components secured, ensuring that they are not overexpanded (use special pliers).

Check that after any repair of the transmission, circlips should axially not move more than 0.20 mm (0.006 in) and must not seize between stop discs.

### Assembly countershaft

- Fix countershaft in vice with toothed end (use covered clamps).
- Oil all parts before assembly.
- Mount the split needle bearing ① on the main shaft and slide the 2nd idler gear ② over the bearing with the collar facing down.
- Mount the internally toothed stop disk ③ (25.2x32x1 mm) and circlip ④ (25x1.64) with the sharp edge facing up.
- Mount the 4th sliding gear ⑤ with the shift groove facing down, mount circlip ⑥ (25x1.64) and stop disk ⑦ (25.2x32x1.5).
- Slide on the split needle bearing ⑧ with the 3rd idler gear ⑨.
- Mount the internally toothed stop disk ⑩ (25.2x32x1.5) over the bearing and mount circlip ⑪ (25x1.64).
- Mount sliding gear 5 ⑫, slide on the stop disk ⑬ (20x32x1) and mount needle bearing ⑭.
- Slide on the 1st idler gear ⑮ with the shift groove facing down and stop disk ⑯ (17.2x30x1).
- Finally check all gears for easy running.





### Checking the kickstarter for wear

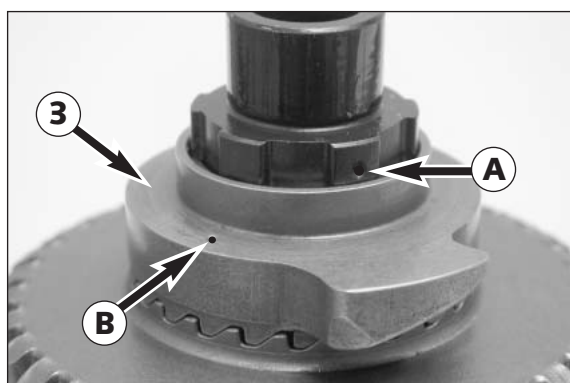
Take all components off the kickstarter shaft and clean them.

**Kickstarter gear ①**  
Check the toothings for wear and the bearing for clearance.

**Kickstarter idler gear ②**  
Check the bearing for clearance and seizing marks. Check the toothings for wear. It is constantly engaged with the outer clutch hub.

**Kickstarter ratchet gear ③**  
Check the inclined surface and the toothings for wear.

**Kickstarter shaft ④**  
Check bearing positions and toothings for wear and damage. Check the oil bore for the kickstarter gear for unobstructed passage.



### Preassembling the kickstarter shaft

- Clamp the kickstarter shaft ④ with the toothed end facing upward into a vise (use protection jaws).
- Mount stop disc ⑤, needle bearing ⑥ and kickstarter gear ① with the locking teeth facing downward.
- Slip on the stop disc ⑦ and mount the circlip ⑧ with the sharp edge facing upward.
- Mount the driving hub ⑨ such that the recess is located above the bore in the kickstarter shaft.
- Mount kickstarter spring ⑩ and hook starter spring leg into kickstarter shaft bore.
- Unclamp the kickstarter shaft.
- Slide the kickstarter ratchet gear ③ on the kickstarter shaft until mark **A** is one tooth behind mark **B** (see illustration).
- Mount the ratchet gear spring ⑪ and the stop disc ⑫ on the kickstarter shaft.

# ASSEMBLING THE ENGINE

# 5

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- Secure the right-hand housing half in the engine work stand.

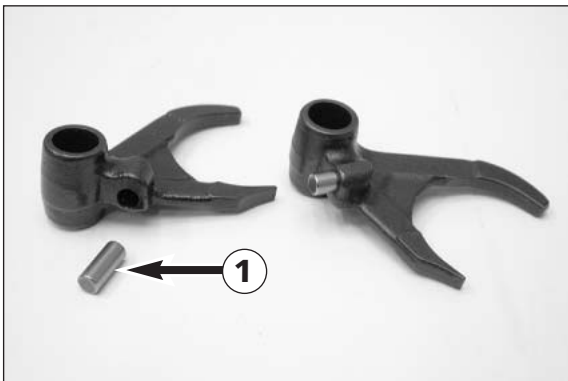
### Crankshaft

- Insert crankshaft from above through grooved ball bearing and push carefully as far as stop.

**! CAUTION !**

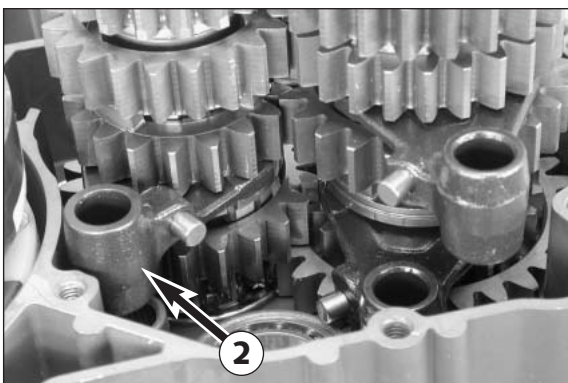
WHEN PUSHING IN CRANKSHAFT, MAKE SURE CONROD IS FACING CYLINDER.

NOTE: To make it easier to mount the crankshaft, heat the crankshaft bearing with a hot air blower.



### Transmission

- Oil driving pin ❶ for the shift forks and mount.
- Fix the lower stop disc on the countershaft with a small amount of grease.
- Mount drive shaft together with countershaft, and insert them into the bearings as far as they will go.
- Oil shift forks prior to mounting.

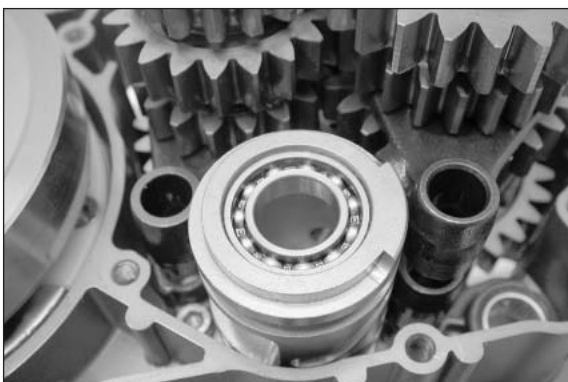


- Shift fork ❷ with the shorter shift dog belongs to the main shaft.
- Mount the two other shift forks at the countershaft, using the marks applied before disassembly for better orientation.

**! CAUTION !**

ALL OF THE SHIFT FORKS ARE DIFFERENT SO GO BY THE MARKS MADE DURING DEMOUNTING WHEN YOU MOUNT THEM AGAIN.

NOTE: If you did not make any marks during demounting, mount the shift forks for the countershaft such that the distance between the shift bolts is the greatest.



- Attach the shift forks to the sliding gears, and insert shift roller into the grooved ball bearing.
- Attach the shift forks to the shift roller.

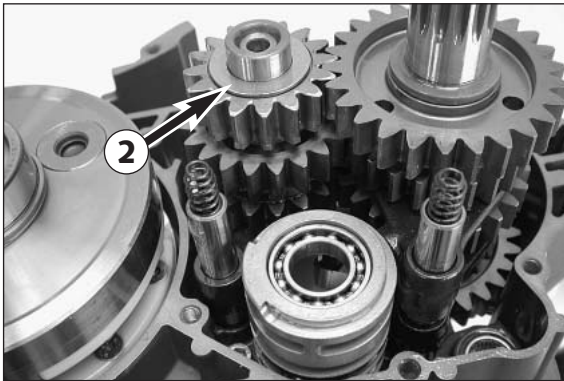
**! CAUTION !**

WHEN INSERTING THE SHIFT FORKS, MAKE SURE THE DRIVING PINS DO NOT FALL OUT OF THE SHIFT FORKS.



- Fix the 3 pressure springs ① with ample amounts of grease in the gearshift rails.

NOTE: The bottom of the longer gearshift rail does not have a spring.



- Oil gearshift rails and insert them into the gearshift forks (short gearshift rail toward drive shaft). Insert gearshift rails into the casing bores as far as they will go.

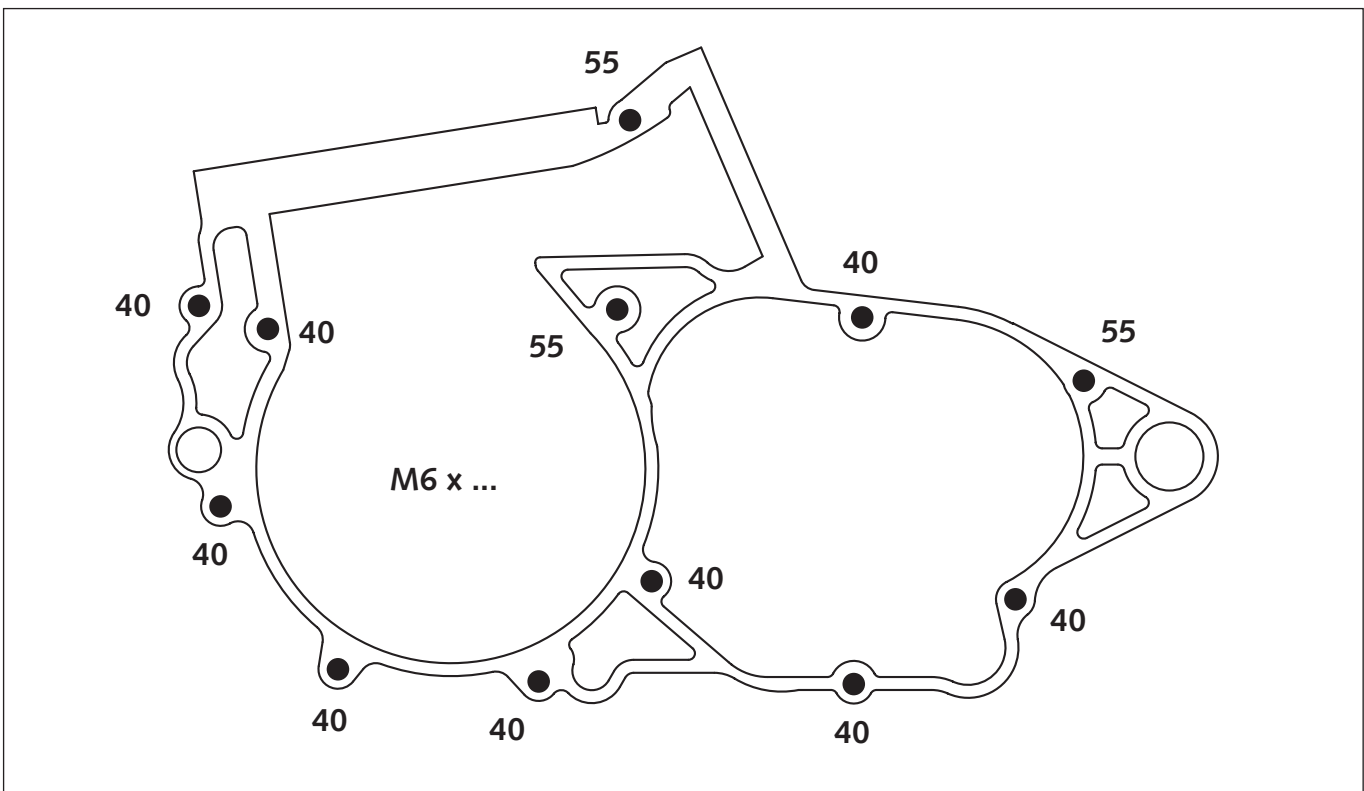
NOTE: It must now be possible to gently turn gear shafts.

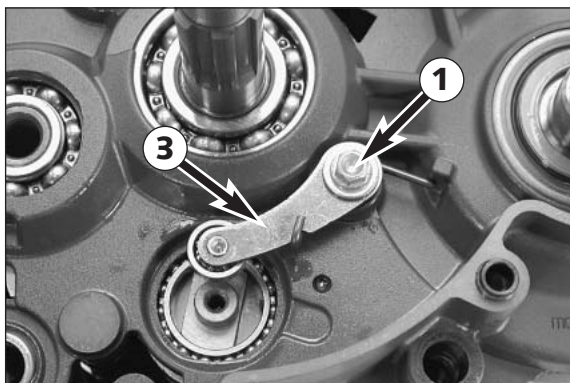
- Mount stop disk ② (20.2x33x1.5 mm) on the main shaft.



### Assembling the engine housing

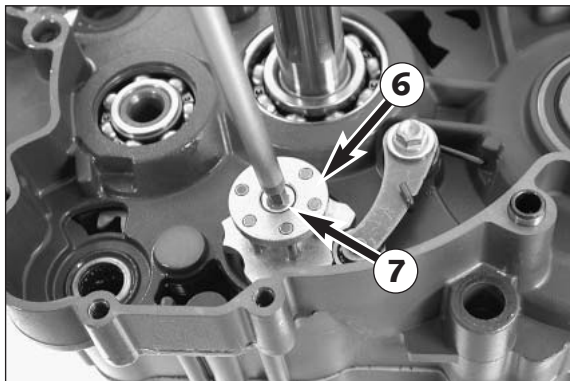
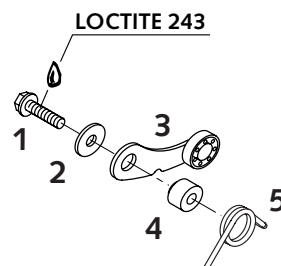
- Remove engine fastener from engine work stand.
- Make sure both dowels are positioned in the right housing half and the stop disk is mounted on the main shaft.
- Apply light coat of grease to sealing surfaces of the housing and position new gasket.
- Grease shaft seal rings in left-hand half and place left-hand half in position.
- Position bolts and tighten with 8 Nm (6 ft.lb).
- Fix engine in work stand.



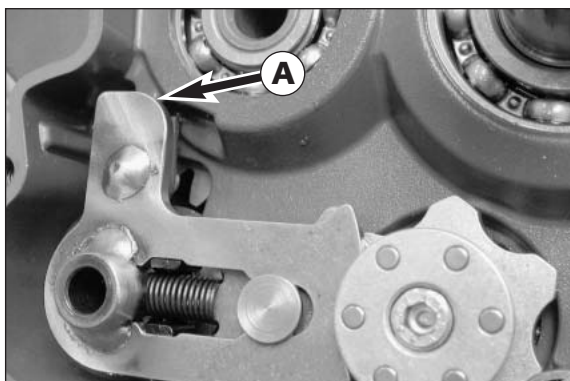


### Mounting shift mechanism

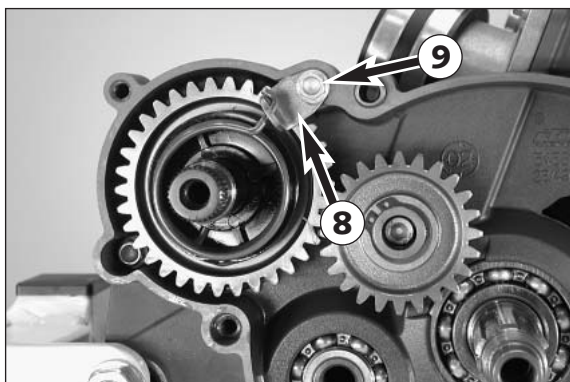
- Slip the disc ②, the locking lever ③, the locking spring sleeve ④ and the locking lever spring ⑤ onto the bolt ① (M5x20).
- Apply Loctite 243 to the thread of bolt ① and mount all parts at the same time.



- Slide the shift locating drum ⑥ onto the shift roller. Please note that the flat portions are eccentric. Here, the locking lever has been drawn away from the shift roller.
- Coat allan head bolt ⑦ with Loctite 243 and mount.



- Grease assembled shift shaft and push into bearings together with stop disc until slide plate contacts driver for shaft roller.
- Now squeeze, and push shift shaft in to the stop.
- Check that legs of return spring surround both left and right side of housing nose A.
- Mount the foot shift lever and shift through all gears. When shifting through the gears, turn the countershaft. Then remove the foot shift lever.



### Mounting kickstarter

- Oil the bearing bore for the kickstarter shaft.
- Insert the preassembled kickstarter shaft into the bearing bore such that the ratchet gear is positioned behind the release plate.
- Hook spring hanger ⑧ to starter spring, coat bolt ⑨ with Loctite 243, tighten starter spring approx. 90° clockwise and fix spring pawl with allan head bolt.
- Adjust starter spring so that the distance to the kickstarter shaft is the same all around.

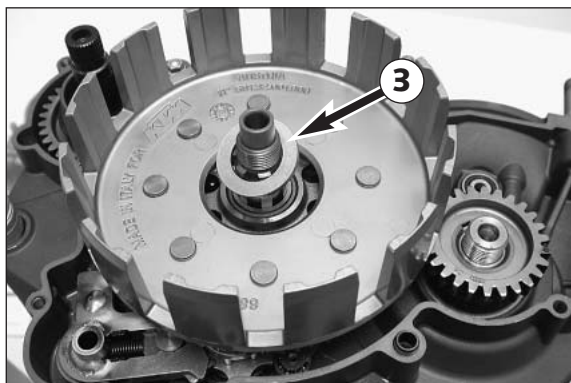


- Oil the starter idler ⑩ on the inside and mount on the journal with the high collar facing the engine housing.
- Slip on stop disc (17.2x25x1 mm) and mount circlip with the sharp edge showing upwards.

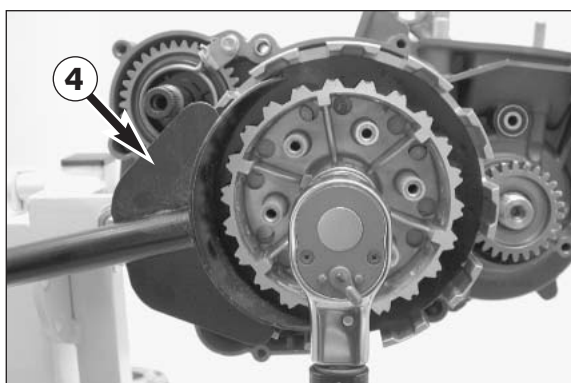


### Mount primary drive and clutch

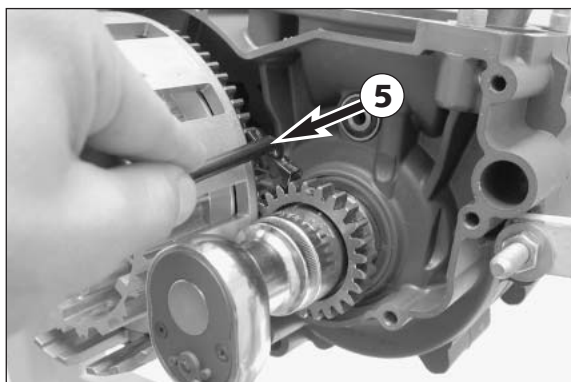
- Grease crankshaft seal ring.
- Put the oiled O-ring (25x1.50 mm) onto the crankshaft and mount the distance bushing with the chamfer facing the crank web.
- Place primary gear ① onto crankshaft with collar downwards.
- Put the inner ring onto the main shaft with the collar facing downwards, then mount the oiled needle cage ②.



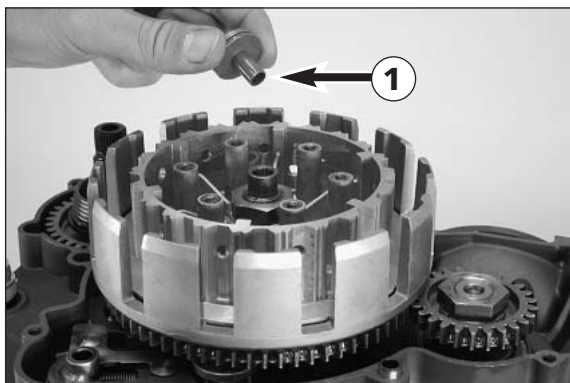
- Mount outer clutch hub and stop disc ③.



- Apply Loctite 243 to the thread of the main shaft.
- Mount inner clutch hub, new lock washer and hexagon nut to main shaft.
- Position clutch holder ④ and tighten hexagon nut with 100 Nm (74 ft.lb.).
- Remove the clutch holder and secure the hexagon nut by bending both brackets of the lock washer upwards.

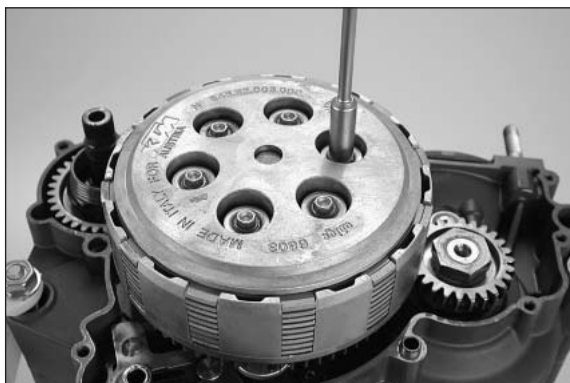


- Apply Loctite 243 to thread of the crankshaft.
- Fit locking washer and hexagon nut (left hand thread) by hand.
- Block primary drive with gear segment ⑤ and tighten primary gear hexagon nut with 150 Nm (110 ft.lb.).
- Remove gear segment and check easy running of primary drive by turning crankshaft.



### Mounting clutch discs and pressure cap

- Oil the thrust bearing ①, and slide it over the drive shaft.



- Oil lining discs before mounting.
- Beginning with one lining disc, mount alternately 9 lining discs ( $\neq 2.70$  mm / 0.10 in) and 8 intermediate discs ( $\neq 1.20$  mm / 0.047 in), with a lining disc forming the final layer upwards.

NOTE: Mount the clutch discs with the sharp edge facing up.

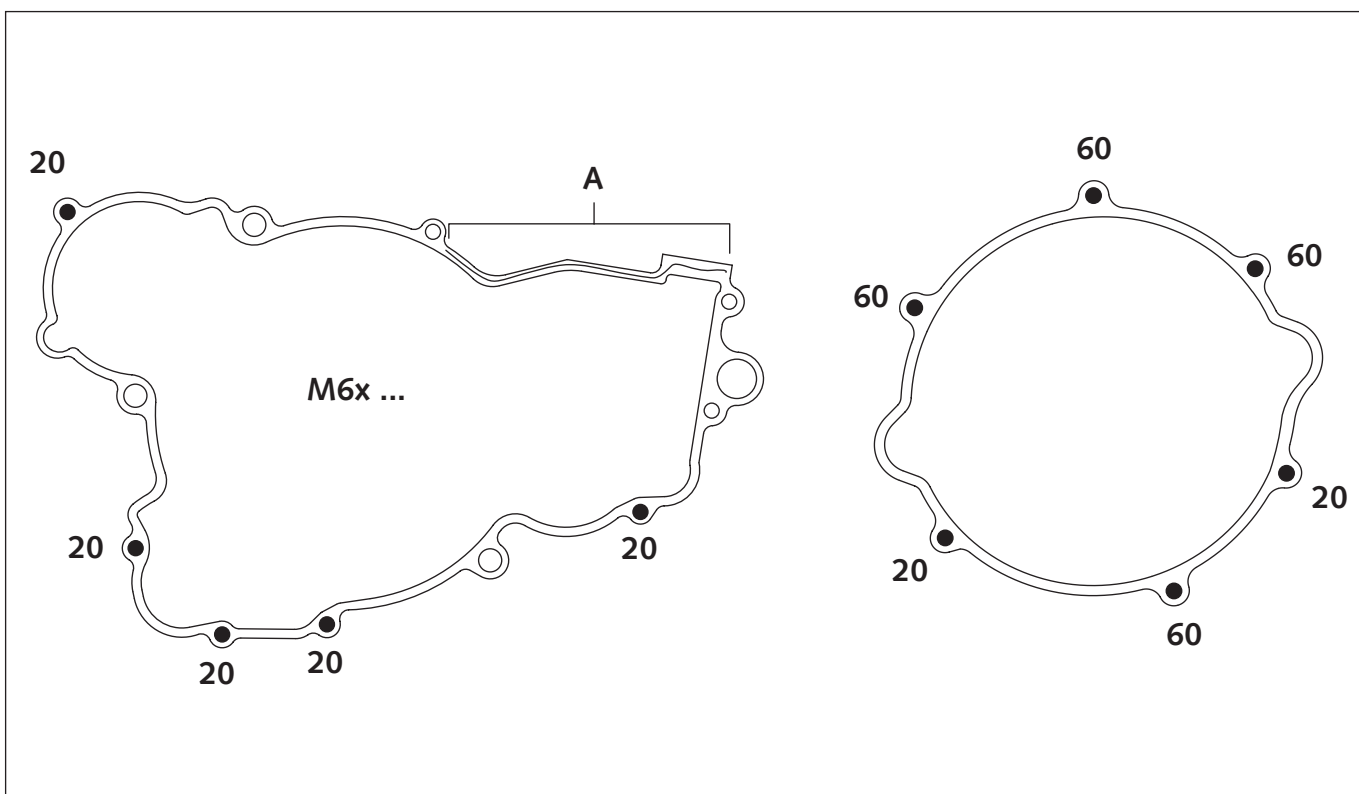
- Place pressure cap into position; fit clutch springs, spring retainer and collar bolts.
- Tighten the collar bolts crosswise. Do not apply more than 6 Nm (4.5 ft.lb.) to prevent damaging of the threads in the inner clutch hub.

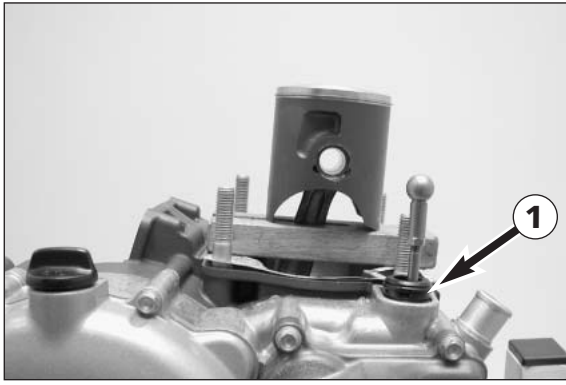


### Mounting clutch cover

- Make sure the 3 dowels are mounted in the engine housing.
- Grease kickstarter shaft seal ring and position clutch cover gasket. Secure gasket with a little grease.
- Apply silicone to area ④ and carefully mount the preassembled clutch cover. Turn the crankshaft slightly to allow the centrifugal timer to engage in the primary pinion.
- Fit collar bolts (see sketch for bolt lengths) and tighten with 8 Nm (6 ft.lb.).
- Then check easy running of all shafts.

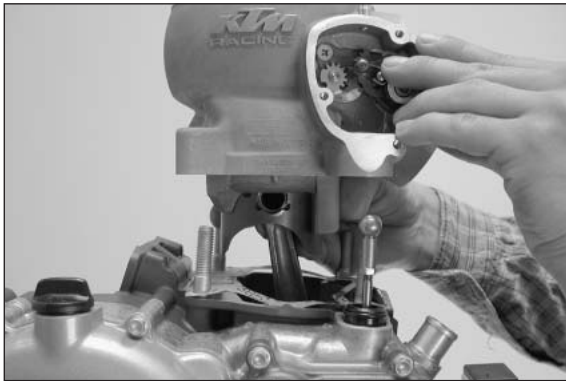
NOTE: If the clutch cover cannot be mounted, verify whether or not the kickstarter spring has been positioned correctly.



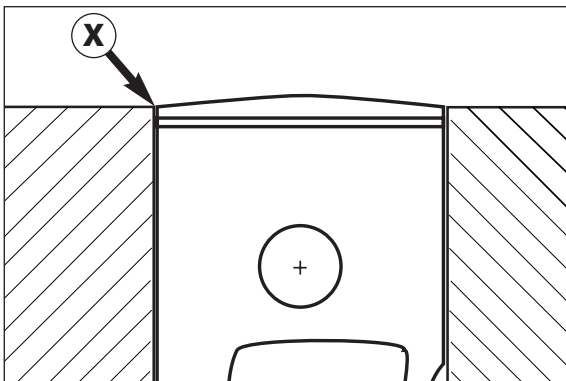


### Mounting piston and cylinder

- Before assembly, oil all parts thoroughly at the sliding points.
- Insert needle bearing in conrod eye, mount piston (arrow on piston head shows direction for exhaust duct).
- Mount piston pin and wire circlips with open side showing downwards (see sketch).
- Mount cylinder base gaskets.
- Place the piston on a self-made wooden stand and adjust the piston ring.
- Oil the sealing element support ❶.



- Place on preassembled cylinder, remove wooden stand and tighten cylinder down crosswise, using two nuts.



### Adjusting dimension „X“

Dimension „X“ is the dimension from upper edge of piston to upper edge of cylinder with cylinder under low tension and piston in TDC position.

The dimension „X“ should be adjusted extremely carefully by inserting cylinder base gaskets of suitable thicknesses.

#### ! CAUTION !

IF THE DIMENSION „X“ IS TOO LARGE, THE COMPRESSION RATIO WILL BE REDUCED AND THE ENGINE LOOSES POWER. ON THE OTHER HAND, IF THE DIMENSION „X“ IS TOO SMALL, THE ENGINE WILL PING AND OVERHEAT.



- Move the piston into the TDC position and place a master gauge across the center of the cylinder traverse to the driving direction. Use a feeler gauge to measure the gap between the upper edge of the piston or cylinder and the master gauge. If correctly adjusted, the master gauge will fit flush against the upper edge of the piston and cylinder.  
Correct by adding or removing cylinder base gaskets.

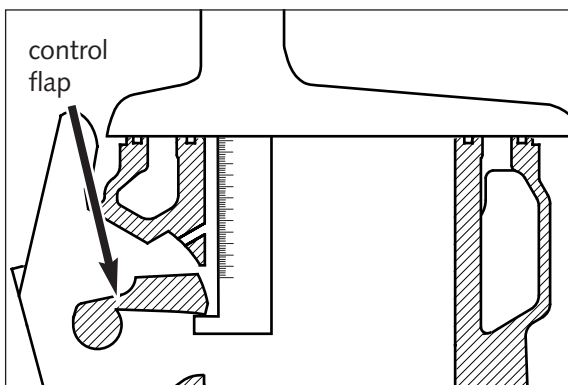
$$\text{Dimension „X“} = 0 \text{ mm}^{+0,1 \text{ mm}}$$

#### ! CAUTION !

THE PISTON MUST NOT PROTRUDE BEYOND THE CYLINDER'S UPPER EDGE.



- Mount the 2 remaining collar nuts at the cylinder base, and tighten each of the 4 collar nuts to 35 Nm (27 ft.lb.).



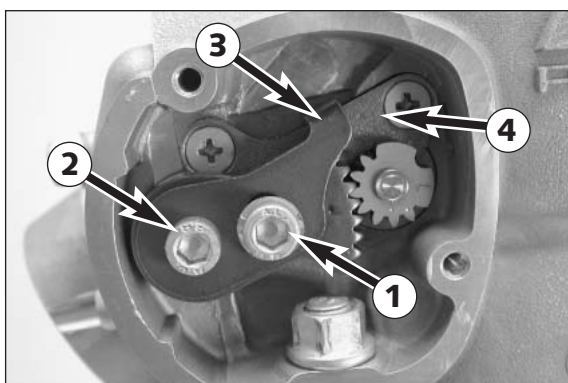
### Adjusting control flap (dimension "Z")

NOTE: Dimension "Z" is the distance from the lower edge of the control flap to the upper edge of the cylinder, as measured in the centre of the exhaust port.

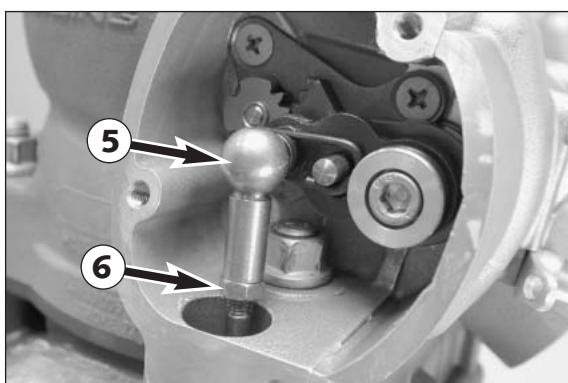
Dimension „Z“ = 48,5 mm  $+0,2 / -0,6$  mm



- Undo the bolts of the stop plate (left side of the cylinder) ① and ② and apply Loctite 243 to the threads. Then mount both bolts but do not tighten them yet.
- Set preselected value on depth gauge and fix.
- Swivel control flap upwards and hold depth gauge into cylinder as shown in the illustration.
- Control flap must rest against depth gauge.



- Allow bump plate ③ to rest against retaining bracket ④.
- Secure bump plate fastening bolts ① and ②.
- Having tightened the bolts ① + ②, you have to check the dimension "Z" again and correct it, if necessary.

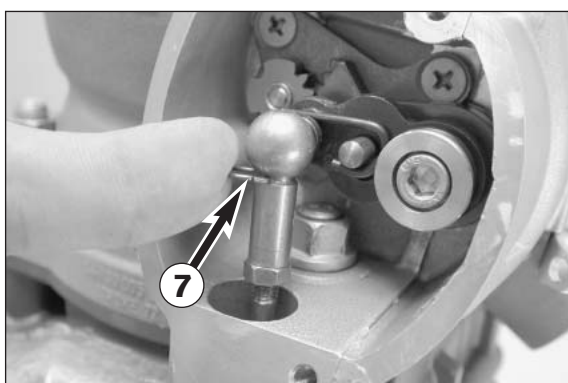


- Press the control flap all the way down and press the ball socket ⑤ onto the ball of the control lever.

When pressing ball socket do not:

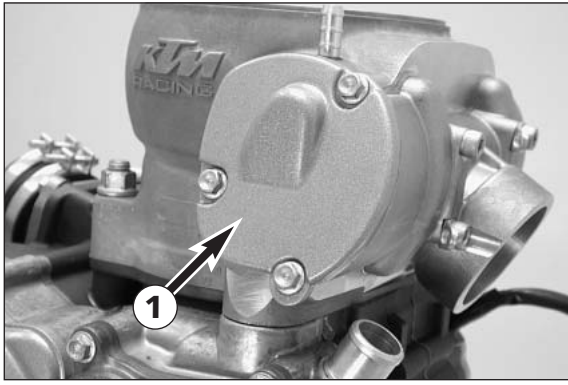
- pull the linkage too far up (max. 1 mm / 0.04 in).
- swivel control flap upwards.

- Adjust linkage length if necessary.
- To do so, loosen counter nut ⑥ and turn ball socket accordingly.
- Retighten counter nut.



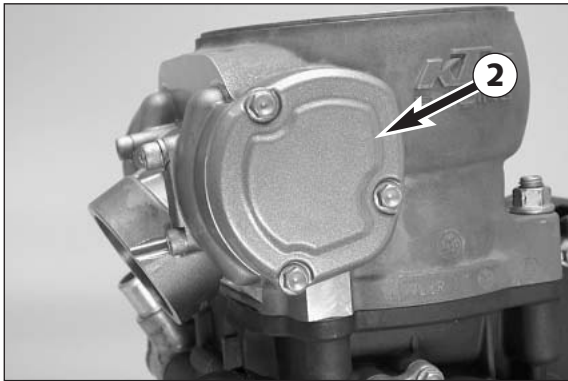
- Refit ball socket and fit safety device ⑦.





### Mounting steering covers

- Mount the right control cover **1** including the gasket and fasten with 3 bolts.

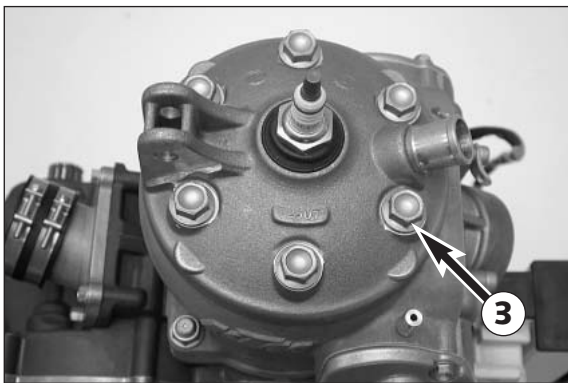


- Place gasket in position and fix left-hand steering cover **2** on cylinder.



### Mounting cylinder head

- Clean cylinder and cylinder head sealing surface, place O-rings in grooves.
- Mount cylinder head with water nozzle on the exhaust side.

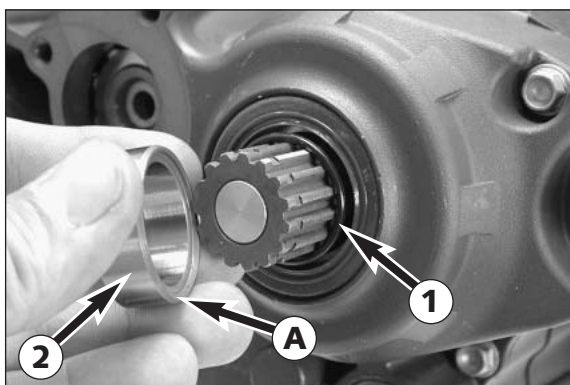


- Oil the collar nuts **3** at threads and contact faces.
- Mount the collar bolts with new copper gaskets and tighten them crosswise, taking three turns to achieve the total tightening torque of 35 Nm (25 ft.lb.).
- In first stage, only tighten until slight resistance is felt.



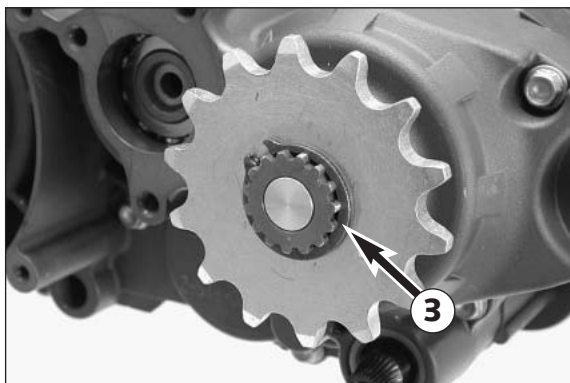
### Mounting reed valve housing and intake flange

- Place reed valve housing with velocity insert in inlet duct and fix intake flange with the 4 collar bolts.

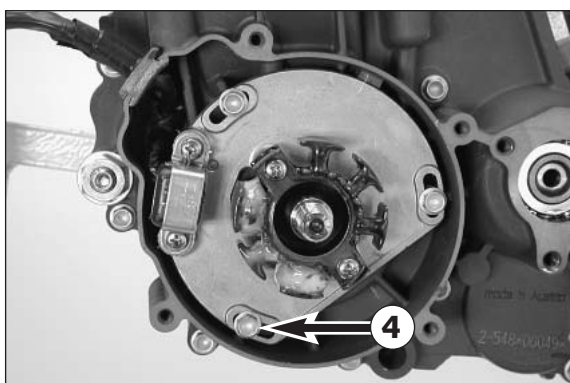


### Mounting engine sprocket

- Lubricate O-ring ① with oil and slide over counter shaft.
- Slide distance bushing ② in position so that O-ring is in correct position ①.

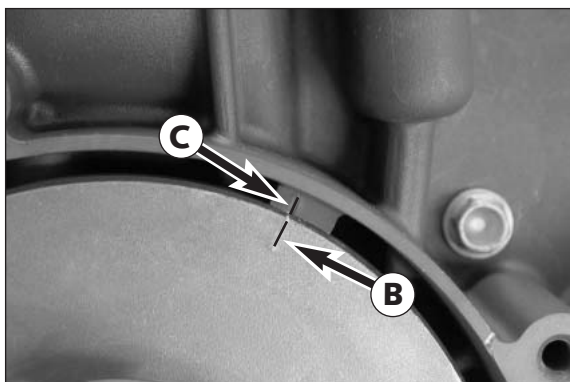


- Slide sprocket onto the countershaft with the collar facing inward, and fix it with the circlip ③ (sharp edge facing outward).



### Mounting the ignition

- Insert the woodruff key into the crankshaft.
- Apply Loctite 243 to 3 bolts ④ and fix the stator (do not yet tighten the 3 bolts all the way).



- Turn the stator until mark ⑥ on the stator coincides with mark ⑦ in the housing.
- Tighten the 3 bolts on the stator.

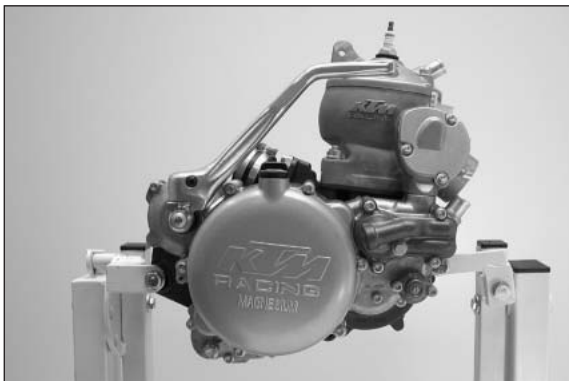


- Mount the rotor.
- Mount the detent edged ring and the nut.
- Hold the rotor with the holding spanner and tighten the nut with 60 Nm (45 ft.lb.).



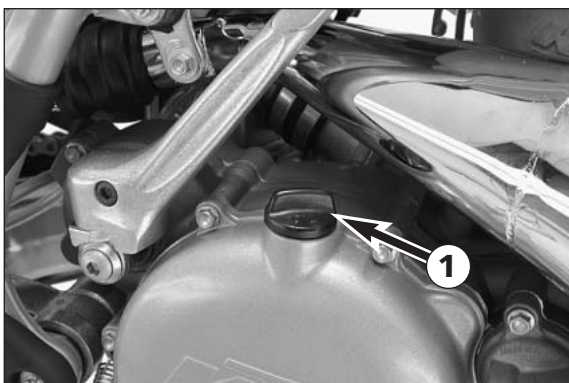
### Mounting ignition cover

- Put on a new gasket, and fix the ignition cover by means of the 4 bolts.



### Mounting starting lever and shift lever

- Mount kickstarter. Secure the bolt of the kickstarter with Loctite 243.
- Mount shift lever. Secure the bolt of the shift lever with Loctite 243.
- Operate the kickstarter a few times and check if the engine turns freely.
- Oil the push rod, and insert it into the drive shaft.
- Mount oil drain plug.



### Fill in transmission oil

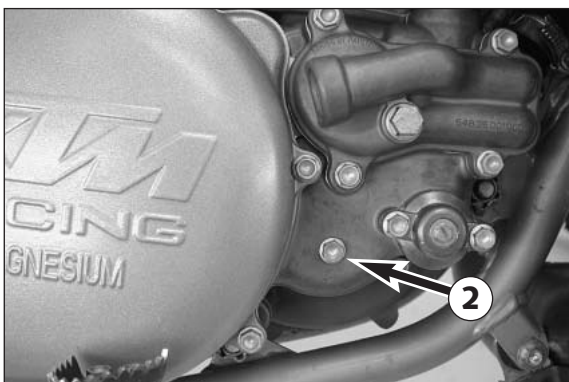
NOTE: The transmission oil should be filled in only after the engine has been mounted. Otherwise, a part of the transmission oil would leak out through the drive shaft.

- Pour in 0.7 litres engine oil (see technical data engine), replace plug **1** and check engine for leaks.

### ! CAUTION !

TRANSMISSION AND CLUTCH WILL BE SUBJECT TO EXCESSIVE WEAR AND TEAR, IF YOU USE TOO LITTLE OR LOW GRADE OIL. USE ONLY HIGH-GRADE OIL (E.G. **MOTOREX TOP SPEED 15W/50**).

Quantity of oil: 0,70 liter



### Check transmission oil level

In order to check the transmission oil level the control bolt **2** is to be removed. Oil should just barely escape from the inspection opening when the motorcycle is in an upright position. If necessary, remove the plug **1** and top up with oil.

# ELECTRICAL

# 6

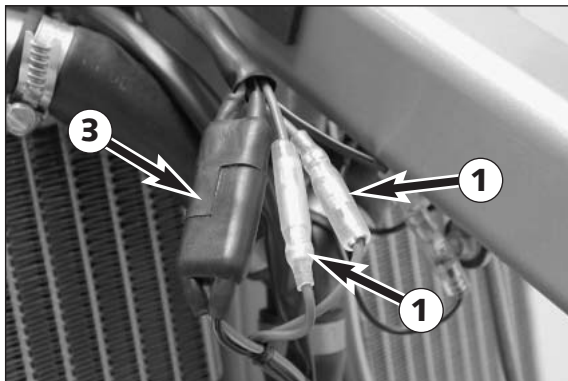
## INDEX

STATIC IGNITION VALUES .....	.6-2
IGNITION COIL .....	.6-2
CDI UNIT .....	.6-2
WIRING DIAGRAM .....	.6-3



**Measuring conditions:**

- cold engine
- seat and tank removed
- all connectors and the ground connection in a non-corroding condition, connectors tightly connected
- spark plug screwed out and spark plug connector attached to ground
- light switch turned off
- the gap between the rotor and pulse generator must be set to 0.75 mm
- kick the kick starter forcefully at least 5 times for each measurement

**Static ignition values 250 SX**

Check the **pulse generator** for an output signal – two-pin connector ❶ with green and red cable colors (also see circuit diagram):

- Apply the red measuring lead of the peak voltage adapter to the green cable and the black measuring lead to the red cable, disconnect both connectors ❶ to disconnect the CDI unit ❷

Multimeter display: 5 volts +/- 1 volt

- Same measurement with CDI unit connected

Multimeter display: 3 volts +/- 0,5 volt

Check the **generator charging coil** for ignition capacitor charge for output voltage – two-pin connector ❸ with black/red and red/white cable colors (also see circuit diagram):

- Apply the red measuring lead of the peak voltage adapter to the black/red cable and the black measuring lead to the red/white cable, disconnect connector ❸ to disconnect the CDI unit ❷

Multimeter display: 40 volts +/- 5 volts

- Same measurement with connectors CDI unit connected

Multimeter display: 220 volts +/- 10 volts

Check the **primary voltage output** ❹ for ignition coil control (also see circuit diagram) for output voltage (blue/white cable color):

- Apply the red measuring lead ❹ of the peak voltage adapter to the black/white cable (ground) and the black measuring lead ❺ to the blue/white cable, CDI unit ❷ and ignition coil ❺ connected

Multimeter display: 210 volts +/- 10 volts

NOTE: the ignition coil does not need to be removed to measure.

**Ignition coil**

- Disconnect all cables and remove the spark plug connector.
- Use an ohmmeter to measure the following values.

NOTE: The indicated setpoint values correspond to a temperature of 20° C. Replace the ignition coil if the measured values deviate significantly from the setpoint values.

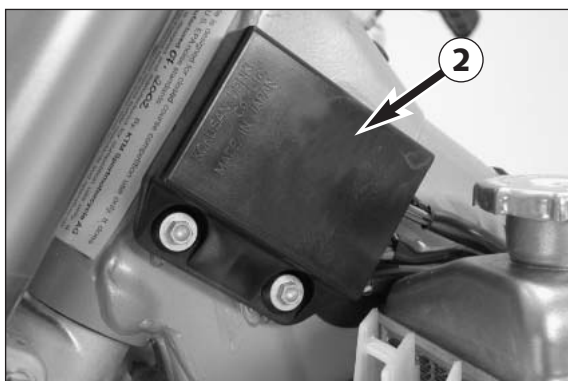
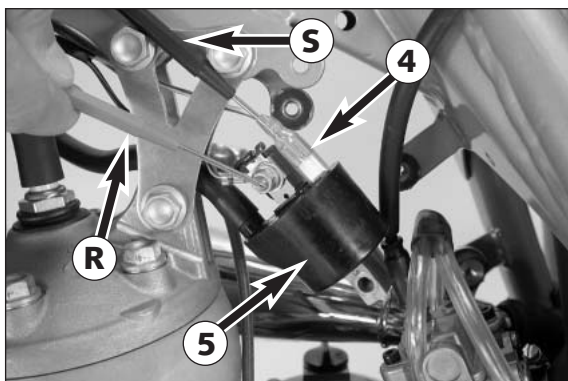
Measurement	Cable colours	Resistance
Primary coil	blue/white – ground	0,425 - 0,575 Ω
Secondary coil	blue/white – ignition wire	10,8 - 16,2 kΩ

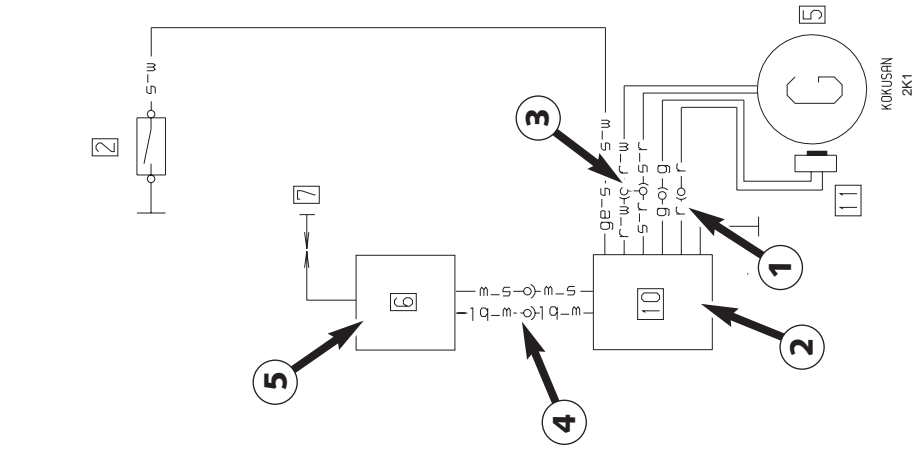
**CDI unit**

Check the cables and plug and socket connections of the CDI unit ❷. The CDI unit function can only be checked on an ignition test bench.

**! CAUTION !**

NEVER USE A COMMERCIAL MEASURING DEVICE TO CHECK THE CDI UNIT. COMMERCIAL MEASURING DEVICES CAN DESTROY HIGHLY SENSITIVE ELECTRONIC COMPONENTS.





Deutsch	Englisch	Italienisch	Französisch
1 bl blau	1 short-circuit button	1 interr. cortocircuito	1 bouton d'arrêt
2 Kurzschlußtaster	2 short-circuit button	2 interr. cortocircuito	2 bouton d'arrêt
3	3	3	3
4	4	4	4
5 Generator	5 generator	5 dinamo	5 generateur
6 Zündspule	6 ignition coil	6 bobina d'accens.	6 bobine d'allumage
7 Zündkerze	7 spark plug	7 candela	7 bougie
8	8	8	8
9	9	9	9
10 CDI-Einheit	10 CDI-unit	10 CDI-seatola	10 CDI-unité
11 Impulsgeber	11 pulser coil	11 distributore	11 generateur d'impuls.
12	12	12	12
bl blau	bl blue	bl blu	bl bleu
br braun	br brown	br marrone	br brun
ge gelb	ge yellow	ge giallo	ge jaune
gr grün	gr grey	gr grigio	gr vert
o orange	o orange	o arancione	o orange
r rot	r red	r rosso	r rouge
s schwarz	s black	s nero	s noir
v violett	v violet	v violetto	v violet
w weiß	w white	w bianco	w blanc

Spanisch	
1	interrupcion de masa
2	interruptor a masa
3	
4	
5	generador
6	bobina de encendido
7	buja
8	
9	
10	unidad cdi
11	generador de impuls.
12	
bl	azul
br	marron
ge	amarillo
gr	gris
o	verde
r	naranja
s	negro
v	violeta
w	bianco

# TROUBLE SHOOTING

# 7

INDEX

TROUBLE SHOOTING 250 SX .....7-2





## TROUBLE SHOOTING

If you let the specified maintenance work on your motorcycle be carried out, disturbances can hardly be expected. Should an error occur nevertheless, we advise you to use the trouble shooting chart in order to find the cause of error.

TROUBLE	CAUSE	REMEDY
Engine fails to start	<p>Operating error</p> <p>Fuel supply interrupted</p> <p>Electrode distance too great</p> <p>Plug fouled by oil, wet or bridged</p> <p>Ignition wire or spark plug connector damaged</p> <p>Kill button wire or short-circuit switch faulty</p> <p>Loose ignition cable connectors</p> <p>Spark too weak</p> <p>Water in the carburetor and jets blocked</p>	<p>Open fuel tap, switch o ignition, replenish fuel, do not use choke</p> <p>Close fuel tap, loosen fuel hose at carburettor, lead into a basin and open fuel tap,            – if fuel leaks out, clean carburettor            – if no fuel leaks out, check tank ventilation, i.e. clean fuel tap</p> <p>Reduce electrode distance (0.60 mm)</p> <p>Clean spark plug or renew</p> <p>Dismount spark plug, connect ignition cable, hold to ground (blank place on engine) and actuate kickstarter, a strong spark must be produced at the spark plug            – If no spark is produced, loosen spark plug cap from ignition cable, hold about 5 mm from ground and actuate kickstarter            – If a spark now occurs, replace spark plug cap            – If no spark is produced, check ignition system</p> <p>Disconnect yellow-black coloured cable from CDI and check ignition spark. If the spark is O.K. repair defective part of cable, ignition lock or ignition switch</p> <p>Inspect cable connectors</p> <p>Examine ignition system</p> <p>Dismantle and clean carburetor</p>
Engine without idle running	<p>Idle adjusting screw out of adjustment</p> <p>Ignition system damaged</p> <p>Wear</p>	<p>Readjust idle running or replace idle adjusting screw</p> <p>Examine ignition system</p> <p>Overhaul engine</p>
Engine has not enough power	<p>Charred glass fiber yarn in silencer</p> <p>Air filter obstructed</p> <p>Control flap does not work</p> <p>Fuel supply partly interrupted or blocked</p> <p>Loss of compression through loose spark plug</p> <p>Exhaust system damaged</p> <p>Engine has not enough preignition</p>	<p>Renew filling</p> <p>Clean or renew airfilter</p> <p>Check control flap, joint rod and centrifugal timer</p> <p>Blow through fuel pipe and clean carburetor</p> <p>Tighten spark plug</p> <p>Check exhaust system for damage</p> <p>Check and adjust ignition</p>

TROUBLE	CAUSE	REMEDY
Engine has not enough power	Reed paddles tensionless or damaged, surface of reed valve housing damaged  Wear  Electronical ignition timing faulty	Replace reed paddles or reed valve housing  Overhaul engine  Check ignition system
Engine revs not high and running with four stroke cycle	Carburetor overflows if level adjust too high, float needle seating is dirty or enlarged  Loose carburetor jets	Clean carburetor, if necessary replace float needle and adjust level  Tighten jets
High rpm misfiring	Incorrect heat range spark plug or low quality spark plug  Incorrect or faulty spark plug connector  Loose, corroded or non conductive ignition socket connector	Refer to technical data section  Test and/or replace spark plug connectors correct type  Check and seal with silicon
Engine splutters into the carburetor	Lack of fuel  Spark plug with incorrect heat value (Ignition by incandescence)  Engine takes air out of control	Clean fuel pipes, examine tank aeration and clean  Fit correct spark plug  Check intake flange and carburettor if firmly setted
Engine overheating	Insufficient liquid in cooling system  Cooling system not or insufficiently bled  Radiator fins clogged  Frothing in cooling system  Pinched or kinked water hoses  Incorrect ignition timing because of loose stator bolts  Incorrect dimension „X“	Top up coolant and bleed cooling system check cooling system for leaks  Bleed cooling system (see operating instructions)  Clean radiator fins with water jet  Renew coolant using branded anti-freeze/anti-corrosive  Replace with correct routed hoses  Readjust to correct ignition timing specifications, secure bolts properly with Loctite 243  Measure and adjust to correct specification
Emission of white smoke (steam)	Cylinder head or O-ring of cylinder head gasket leaks	Check cylinder head, replace O-ring

# TECHNICAL SPECIFICATIONS

# 8

## INDEX

### TECHNICAL SPECIFICATIONS MODEL 250 SX 2003

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TIGHTENING TORQUES CHASSIS .....	.8-4
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## TECHNICAL DATA - ENGINE – MOTOR 250 SX 2003

Engine	<b>250 SX</b>
Design	Liquid-cooled single-cylinder two-stroke engine with <b>KTM Twin Valve Control</b> exhaust system
Piston displacement	249 cm <sup>3</sup>
Bore / stroke	66,4 / 72 mm (2.62 / 2.84 in)
Fuel	unleaded SUPER fuel, research octane no 95, mixed with high-grade, two- stroke oil
Oil / gasolino ratio	1:40 – 1:60 when using high grade, two- stroke oil. When in dout, please contact your importer or use 1:40 mix ratio to be on the safe side
Crankshaft bearing	1 deep-groove ball bearing / 1 cylinder roller bearing
Connecting rod bearing	needle bearing
Piston pin bearing	needle bearing
Piston	cast piston
Piston ring	one plain compression ring
Dimension "X" <small>(upper edge piston - upper edge cylinder)</small>	0 + 0,1 mm (0 + 0.004 in)
Ignition timing	1,9 mm vor OT
Spark plug	BR 8 ECM
Electrode gap	0,60 mm
Dimension "Z" <small>(height of the control flap)</small>	48,5 mm (1.9 in)
TVC start open TVC fully open	5200/min 7000/min
Primary drive	straight cut spur gears, primary ratio 26:72
Clutch	multiple disc clutch in oil bath, hydraulically operated
Transmission	5 speed, claw actuated
Gear ratio	
1 <sup>st</sup> gear	14:28
2 <sup>nd</sup> gea	16:26
3 <sup>rd</sup> gea	18:24
4 <sup>th</sup> gea	21:24
5 <sup>th</sup> gea	22:21
Gear lubrication	0,7 l engine oil 10W-40
Ailable chain sprockets	13Z / 14Z / 15Z für Kette $\frac{5}{8} \times \frac{1}{4}$ " (520)
Coolant	1.3 liters, 40% antifreeze, 60% water, at least -25 °C (-13 °F)
Ignition system	KOKUSAN 2K-1
Generator output	no generator
Carburetor	flat-slide carburetor, carburetor setting see table
Air- filter	wet foam type air filter insert

Art No 3206003

### BASIC CARBURETOR SETTING

	<b>250 SX</b>
Carburetor	Keihin PWK 38-S AG
Carburetor setting number	110202
Main jet	178 (182)
Idling jet	50
Starting jet	85
Jet needle	N3CH(N3CW)
Needle position from top	III
Slide	6,5
Air adjustment screw open	1
Performance restrictor	–
Power jet nozzle	–

Repair manual KTM 250 SX - E

## TECHNICAL SPECIFICATIONS CHASSIS 250 SX 2003

	<b>250 SX</b>
Frame	Central chrome-moly-steel frame
Fork	White Power – Up Side Down 48 MA
Wheel travel front/rear	300/335 mm (11.8/13.2 in)
Rear suspension	WP PDS 5018 (Progressive Damping System) shock absorber, aluminium swingarm
Front brake	Disc brake with carbon-steel brake disc Ø 260 mm (10.2 in), brake caliper floated
Rear brake	Disc brake with carbon-steel brake disc Ø 220 mm (8.7 in), brake caliper floated
Brake discs	Wear limit max. 0,4 mm (0,016in)
Front tires	80/100 - 21" 51M
Air pressure offroad	1,0 bar (14psi)
Rear tires	100/90 - 19" 57M
Air pressure offroad	1,0 bar (14psi)
Fuel tank capacity	7,5 liters (1,98 US Gallons)
Final drive ratio	14:50Z
Chain	5/8 x 1/4"
Available final sprockets	38t, 40t, 42t, 45t, 48t, 50t, 52t
Steering head angle	63°
Wheel base	1475 ± 10 mm (58,1 ± 0,4 in)
Seat height, unloaded	925 mm (36,5 in)
Ground clearance, unloaded	385 mm (15,2 in)

### STANDARD ADJUSTMENT-FORK

	<b>WP 4860 MXMA 1418X726</b>
Compression adjuster	18
Rebound adjuster	19
Spring	4,2 N/mm
Spring preload	5 mm
Air chamber length	90 mm
Fork oil	SAE 5

### STANDARD ADJUSTMENT - SHOCK ABSORBER

	<b>WP 5018 PDS-DCC 1218X758</b>
Compression adjuster	15 LS (low speed) 2 HS (high speed)
Rebound adjuster	26
Spring	76-95/260
Spring preload	6 mm

TIGHTENING TORQUES - ENGINE		
Flange bolts - cylinder-head	M 8	35 Nm (25 ft.lb)
Nuts-cylinder base	M 10	35 Nm (25 ft.lb)
Flywheel collar nut	M 12x1	60 Nm (44 ft.lb)
Flat head bolt release plate kickstarter	M 6x16	Loctite 648 19 Nm (14 ft.lb)
Nut for primary sprocket (LH thread)	M 18x1.5	Loctite 243 150 Nm (110 ft.lb)
Nut for inner clutch hub	M 18x1.5	Loctite 243 100 Nm (74 ft.lb)
Crankcase and cover bolts	M 6	8 Nm (6 ft.lb)
Swingarm pivot	M 14	100 Nm (74 ft.lb)
Other bolts	M 6	10 Nm (7 ft.lb)
	M 8	25 Nm (19 ft.lb)
	M 10	45 Nm (33 ft.lb)

TOLERANCES AND FITTING CLEARANCES	
Piston fitting clearance	0.06 mm
Piston ring end gap	0.3–0.4 mm
Connecting rod bearing - radial clearance	0.018–0.032 mm
Transmission shafts end float	0.1–0.4 mm
Clutch springs - length	∅ 2.5 new = 43 mm, minimum length = 42 mm
Crankshaft web	60 mm ± 0,05 mm

GASKET THICKNESSES	
Crankcase	0.5 mm
Clutch cover	0.8 mm
Cylinder bottom gasket	as required
Available cylinder bottom gaskets	0.2/0.4/0.5/0.75 mm
Cylinder-head gasket	O-rings
Outer clutch cover	Form ring
Water pump cover	Form ring

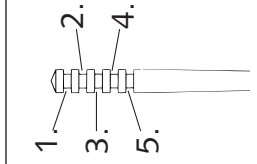
TIGHTENING TORQUES - CHASSIS		
Collar screw, front wheel spindle	M 24x1,5	40 Nm
Brake caliper, front	M 8	Loctite 243 + 25 Nm
Brake disk, front	M 6 10.9	Loctite 243 + 15 Nm
Brake disk, rear	M 6	Loctite 243 + 15 Nm
Clamping bolts, upper fork bridge	M 8	20 Nm
Clamping bolts, lower fork bridge	M 8	15 Nm
Clamping bolts, fork stubs	M 8	10 Nm
Collar nut, rear wheel spindle	M 20x1,5	80 Nm
Hexagon nut, swing arm bolt	M 14x1,5	100 Nm
Hexagon collar bolt, handlebar clamp	M 8	20 Nm
Allan head bolt, handlebar support	M 10	Loctite 243 + 40 Nm
Shock absorber, top	M 12	60 Nm
Shock absorber, bottom	M 12	60 Nm
Sprocket screws	M 8	Loctite 243 + 35 Nm
Ball joint for push rod	M 6	Loctite 243 + 10 Nm
Engine mounting bolt	M 10	45 Nm
Engine brace	M 8	33 Nm
Screw adjusting ring spring preload shock abs.	M6	8 Nm
Spoke nipple	M4,5 /M5	5 Nm
Other bolts on chassis	M 6	10 Nm
	M 8	25 Nm
	M 10	45 Nm
Other collar nuts on chassis	M 6	15 Nm
	M 8	30 Nm
	M 10	50 Nm



**VERGASERREGULIERUNG KTM 250 SX EUR / USA 2003 KEIHIN PWK 38-S AG**  
**CARBURETOR SETTING**

MEERESHÖHE ALTITUDE	TEMPERATUR →	-20°C bis -7°C -2°F to 20°F	-6°C bis 5°C 19°F to 41°F	6°C bis 15°C 42°F to 60°F	16°C bis 24°C 61°F to 78°F	25°C bis 38°C 79°F to 98°F	37°C bis 49°C 99°F to 120°F
3000 m 10000 ft ↑ 2301 m 7501 ft	LSCHR AS LD IJ NADEL NEEDLE POS POS HD MJ	1 50 N3CH 3 178	1 50 N3CH 2 178	1,5 50 N3CH 2 175	1,5 48 N3CW 2 172	2 48 N3CW 2 170	2 45 N3CW 1 170
2300 m 7500 ft ↑ 1501 m 5001 ft	LSCHR AS LD IJ NADEL NEEDLE POS POS HD MJ	1 50 N3CH 3 180	1 50 N3CH 3 178	1 50 N3CH 2 178	1,5 50 N3CH 2 175	1,5 48 N3CW 2 172	2 48 N3CW 2 170
1500 m 5000 ft ↑ 751 m 2501 ft	LSCHR AS LD IJ NADEL NEEDLE POS POS HD MJ	1 50 N3CH 4 180	1 50 N3CH 3 180	1 50 N3CH 3 178	1 50 N3CH 2 178	1,5 50 N3CH 2 175	1,5 48 N3CW 2 172
750 m 2500 ft ↑ 301 m 1001 ft	LSCHR AS LD IJ NADEL NEEDLE POS POS HD MJ	1 52 N3CG 4 182	1 50 N3CH 4 180	1 50 N3CH 3 180	1 50 N3CH 3 178	1 50 N3CH 2 178	1,5 50 N3CH 2 175
300 m 1000 ft ↑ Meersniveau Sea level	LSCHR AS LD IJ NADEL NEEDLE POS POS HD MJ	3/4 55 N3CG 5 185	1 52 N3CG 4 182	1 50 N3CH 3 180	1 50 N3CH 3 178	1 50 N3CH 2 178	1 50 N3CH 2 175

LSCHR = Luftregulierschraube offen  
LD = Leerlaufdüse  
POS = Clip Position von oben  
HD = Hauptdüse  
**Schieber=6,5**  
**Zerstäuber= 5 mm**



AS = Air screw open from fully-seated  
IJ = Idling jet  
POS = Clip position from top  
MJ = Main jet  
**Slide = 6,5**  
**Atomizer= 5 mm**

**NICHT FÜR STRASSENBETRIEB**

Kraftstoff: Euro-Super bleifrei ROZ 95  
NOT FOR HIGHWAY USE

Fuel: Euro-Super unleaded ROZ 95

# LUBRICATION AND MAINTENANCE SCHEDULE 9

## INDEX

### **MODELL 2003**

**LUBRICATION AND MAINTENANCE SCHEDULE 250 SX . . . . .9-2**





## PERIODIC MAINTENANCE SCHEDULE

250 SX

A clean motorcycle can be checked more quickly which saves money!		1st service after 10 hours or 1000 kilometers	after 20 hours or 2000 kilometers	after 4000 kilometer or once a year
ENGINE	Check gear box oil level		●	
	Change gear box oil	●		●
	Check spark plugs, adjust distance between electrodes	●	●	
	Renew spark plugs			●
CARBURETOR	Check the carburetor connection boot for cracks and leaks			●
	Check idle speed setting	●		●
	Check that vent hoses are not damaged or bent	●		●
ADD-ON-PARTS	Check cooling system for leaks, check quantity of antifreeze	●		●
	Check exhaust system for leaks and fitment			●
	Check cables for damage, smooth operation, bends; adjust and lubricate	●		●
	Check oil level of the clutch master cylinder	●	●	●
	Clean air filter and filter box			●
	Check electric wires for damage and bends			●
BRAKES	Check brake fluid level, lining thickness, brake lining	●		●
	Check brake lines for damage and leaks	●		●
	Check/adjust smooth operation and free travel of handbrake/foot brake lever	●		●
	Check tightness of brake system screws	●		●
CHASSIS	Check shock absorber and fork for leaks and function	●		●
	Clean dust bellows			●
	Bleed fork legs			●
	Check swing arm bearings			●
	Check/adjust steering head bearings	●		●
	Check tightness of all chassis screws (triple clamps, fork leg axle passage axle nuts and screws, swing arm bearings, shock absorber)	●		●
WHEELS	Check spoke tension and rim joint			●
	Check tires and air pressure	●		●
	Check chain, rear sprockets and chain guides for wear, fitment and tension	●		●
	Lubricate chain	●		●
	Check clearance of wheel bearings	●		●

### IMPORTANT RECOMMENDED MAINTENANCE WORK THAT CAN BE CARRIED OUT BY EXTRA ORDER

	at least once a year	every 2 years or 20000 km
Check function of exhaust control	●	
Complete maintenance of shock absorber	●	
Complete maintenance of fork		●
Clean and grease steering head bearings and gasket elements	●	
Clean and adjust carburetor	●	
Replace glass fibre- yarn filling of the exhaust main silencer	●	
Treat electric contacts and switches with contact grease	●	
Change hydraulic clutch fluid	●	
Change break fluid	●	

**IF MOTORCYCLE IS USED FOR COMPETITION 4000KM SERVICE SHOULD BE CARRIED OUT AFTER EVERY RACE!  
SERVICE INTERVALS SHOULD NEVER BE EXCEEDED BY MORE THAN 5 HOURS OR 500 KM!  
MAINTENANCE WORK DONE BY KTM AUTHORISED WORKSHOPS IS NOT A SUBSTITUTE FOR CARE AND CHECKS DONE BY THE RIDER!**

**IMPORTANT CHECKS AND MAINTENANCE TO BE CARRIED OUT BY THE RIDER**

	Before each start	After every cleaning	For cross-country use	Once a year
Check gear box oil level	●			
Check brake fluid level	●			
Check brake pads for wear	●			
Lubricate and adjust cables and nipples		●		
Bleed fork legs regularly			●	
Remove and clean dust bellows regularly			●	
Clean and lubricate chain, check tension and adjust if necessary		●	●	
Clean air filter and filter box			●	
Check tires for pressure and wear	●			
Check cooling liquid level	●			
Check fuel lines for leaks	●			
Empty and clean float chamber		●		
Check all control elements for smooth operation	●			
Check brake performance	●	●		
Treat blank metal parts (with the exception of brake and exhaust systems) with wax-based anti corrosion agent		●		
Check tightness of screws, nuts and hose clamps regularly				●

**RECOMMENDED INSPECTION OF THE 250 SX AND ENGINE  
USED FOR COMPETITIONS BY YOUR KTM WORKSHOP  
(ADDITIONAL ORDER FOR THE KTM WORKSHOP)**

	30 hours	45 hours	60 hours	90 hours	120 hours	135 hours
Check the reed-type intake valve for wear	●	●	●	●	●	●
Check the clutch shoes for wear	●	●	●	●	●	●
Check the length of the clutch springs	●	●	●	●	●	●
Check the cylinder and piston for wear	●	●	●	●	●	●
Check the exhaust control for proper functioning and smooth running	●	●	●	●	●	●
Check the eccentricity of the crankshaft journal	●	●	●	●	●	●
Check the radial clearance of the conrod bearings	●		●		●	
Check the radial clearance of the piston pin main bearing	●		●		●	
Check the crankshaft main bearing for wear	●		●		●	
Replace the crankshaft bearings and conrod bearings		●		●		●
Check the entire transmission including roller and bearings for wear		●		●		●

# WIRING DIAGRAM

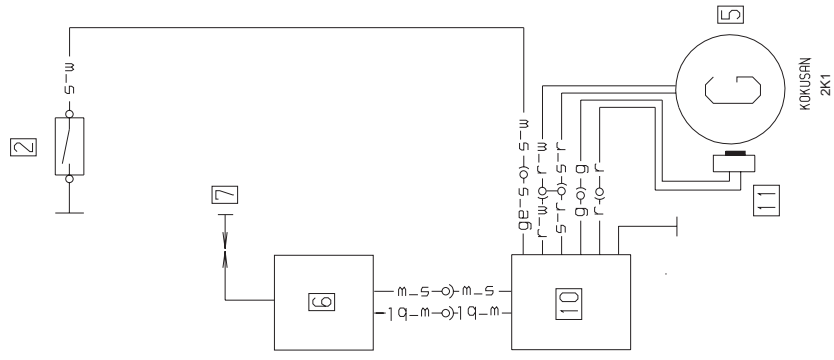
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SERVICE	Model: 250 SX 2003	Kabelstrangnummer:	Land:	Datum, Name:	Zeichnungsnr.:	Dateiname:	Kabelstrangbez.:
		hinten:	EU/USA	22.06.98 KE	250SXUSE	250SXUSE vo.: Anstand: 040902	hi.:



Deutsch	Englisch	Italienisch	Französisch
1 Kurzschlußtaster	1 short-circuit button	1 interr. cortocircuito	1 bouton d'arret
2 Generator	2 generator	2 dinamo	2 bobine d'allumage
3 Zündspule	3 ignition coil	3 bobina d'accens.	3 bobine d'allumage
4 Zündkerze	4 spark plug	4 candela	4 bougie
5 CDI-Einheit	5 CDI-unit	5 CDI-seatola	5 CDI-unit
6 Impulsgeber	6 pulser coil	6 distributore	6 generatore d'impuls.
7 bl blau	7 blue	7 bl blu	7 bl bleu
8 br braun	8 brown	8 br marrone	8 br brun
9 ge gelb	9 yellow	9 ge giallo	9 ge jaune
10 gr grün	10 green	10 gr grigio	10 gr gris
11 o orange	11 orange	11 o arancione	11 o orange
12 r rot	12 red	12 r rosso	12 r rouge
13 s schwarz	13 black	13 s nero	13 s noir
14 v violett	14 violet	14 v violetto	14 v violet
15 w weiß	15 white	15 w bianco	15 w blanc

Spanisch	
1	interruptor o masa
2	generador
3	bobina de encendido
4	bujia
5	generador
6	bobina de encendido
7	bujia
8	
9	
10	unidad cdi
11	generador de impuls.
12	
	bl azul
	br marron
	ge amarillo
	gr gris
	g verde
	o naranja
	r rojo
	s negro
	v violeta
	w blanco