



600  
CC

# OWNER'S HANDBOOK

FOR 4-STROKE MOTORCYCLES 1989

12.88 Art.Nr. 201.51



# INTRODUCTION

Welcome to Team KTM! You have just purchased the finest off-road competition motorcycle available, and we wish you good luck in your riding and racing.

This handbook will provide you with important information on maintenance, adjustment and repair of your new KTM. It has been written to cover the 1989 KTM 4-stroke model with 600 LC4 engine and was established from the newest versions. However, the right to modifications in the interest of technical improvement is reserved without updating the current issue of Owner's Handbook. For more specific information on the engine, an Owner's Technical Repair Manual is available at your KTM Dealer.

We strongly suggest that you read this handbook carefully and completely, before you take your first ride. Also, pay special attention to warnings and notes.

**IMPORTANT:** If you don't follow this point, injuries can occur.

**CAUTION:** If you don't follow these points, parts can be damaged on the motorcycle.

**NOTE:** These points include basic adjustments and useful hints.

Perform maintenance work regularly and professionally. For service work you are not able to do yourself, please see your KTM Dealer.

KTM MOTOR-FAHRZEUGBAU  
Aktiengesellschaft  
A-5230 MATTIGHOFEN

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## IMPORTANT - safety warnings

- Gasoline is highly flammable and poisonous. Extreme caution should be used when working with gasoline. Do not refuel the motorcycle with the engine running. Take special care to not spill gasoline on the engine or exhaust pipe while the motorcycle is hot, wipe up spills promptly. If gasoline is swallowed, inhaled, or splashed into the eyes contact a physician immediately.
- Motorcycle engines produce a great amount of heat while running. The engine, exhaust pipe, muffler, brake rotors, and shock absorbers can become very hot. Do not touch any of these parts after operating the motorcycle, and take care to park it where pedestrians are not likely to touch it and get burned.
- When transporting your KTM keep it upright with tiedowns or other mechanical fasteners and be sure that the fuel petcock is in the off position. If the motorcycle should tip over it is possible for gasoline to leak out of the carburetor or fuel tank.
- Do not start the engine and allow it to idle in a closed area. Exhaust fumes are poisonous and can cause loss of consciousness and death. Always provide adequate ventilation while the engine is running.
- Remember to dress for the ride. Smart KTM riders always wear a helmet, boots, padded riding pants, gloves, jackets and eye protection every time they ride, whether it is a 100-mile enduro or a quick trip through the gears for test purposes.
- If possible check level of cooling liquid when engine is cold. If you have to open the radiator cap when engine is hot, use a rag to cover the cap and open slowly to release pressure.
- Change brake fluid at least once a year. If M/C is being washed very often, change brake fluid more often. Brake fluid has the ability to absorb water; therefore, if the brake fluid is „old“ it will build water bubbles already by low temperature. This will cause the brake system to fail.
- Never mix brake fluid DOT 3 or DOT 4 (alcohol based) with DOT 5 (silicone based). KTM M/C's use DOT 4 brake fluid.
- After mounting the wheels, use the brakes so the brake pads lay against the disc.
- Always actuate the hand brake lever or foot brake pedal after working on the brake system, so that the brake pads lie against the disc and the pressure point is established.

## CAUTION - hints for the motorcycle

- Only use super gasoline ROZ 98.  
Don't use gasoline containing alcohol, methanol types can create engine damage and will not fall under warranty.
- Check engine oil level regularly. If possible for every ride.
- Only use high-grade multi-purpose engine oil for engine lubrication.
- Ride your motorcycle with low but changing load the first 1000 km (625 miles) or 10 hours.
- Don't ride your motorcycle with full load and don't rev engine when cold. Because the piston is warming up faster than the water cooled cylinder, it can cause engine damage.
- Never kick kickstarter if the spark plug/ignition cable is not connected, the ignition system can be damaged.
- Never use toothed lockwashers on the mounting screws only self securing nuts. Teeth washers or spring washers can work themselves into the frame parts and become loose.
- If you remove the rear axle, always grease the axle and alu-nuts to prevent the threads from getting locked.
- Avoid using pressure washer when cleaning M/C. Water can get into carburetor, electricity, etc.
- Everytime you wash your M/C, re-grease the grease nipples, to make sure water which might be trapped inside the pivot get pressed out.
- For the cooling system only use high-grade anti-freeze agent by a premix ratio of 2:1 with water. Using lower-grade anti-freeze agent, it can come to corrosion and building up of foam.
- Don't let brake fluid get in touch with paint, it is an effective paint remover.
- Only use ORIGINAL KTM SPARE PARTS if it is necessary to replace parts.

## Pre-operation instructions

Although your KTM-Motorcycle was inspected after the set up from your dealer, you should go through the following steps before the first use:

### ON ENGINE:

- check oil level
- check oil flow system if proper installed and if oil flow lines are obstructed pinched
- check carburetor and intake manifold if mounted correctly
- check throttle cable for easy movement, and if slide returns to the idling position after letting go of the throttle grip
- check cable adjustments
- check spark plug and plug connector if mounted correctly
- tighten all hose clamps of cooling system
- check coolant level in radiator

### ON CHASSIS:

- check if chain is properly adjusted
- tighten front and rear axle
- check steering head bearing and adjust if necessary
- tighten swing arm bolt
- check to ensure all screws and nuts are tight
- adjust free play of brake levers, and check pressure point of brakes
- check brake fluid level in both reservoirs
- check brakes for proper performance
- airfilter to be checked for proper installation
- correct air pressure of tires
- check damping system of shock absorber
- check damping system of up-side-down fork
- make sure the tank breathing hose is not obstructed or pinched
- check electrical system

### Running in

Run in your motorcycle with low but changing load. NO FULL LOAD RIDES THE FIRST 1000 KM (625 miles) OR 10 HOURS!

## Necessary work after the first use

(after 200 km (125 miles) or approx. 2 hour)

### ON ENGINE:

- change engine oil and oil filter
- re-tighten cylinder head with requested torque
- check valve play
- check oil flow system and engine for leakage
- re-tighten flywheel nut
- adjust ignition/firing point and check ignition adjustment
- check engine case vent hose if properly installed
- check breather hoses of ignition case for correct fit and make sure that the hoses are positioned without buckles.
- adjust idling
- check cooling system for leakage
- check coolant level in radiator
- make sure cooling system hoses are not clogged, obstructed or pinched

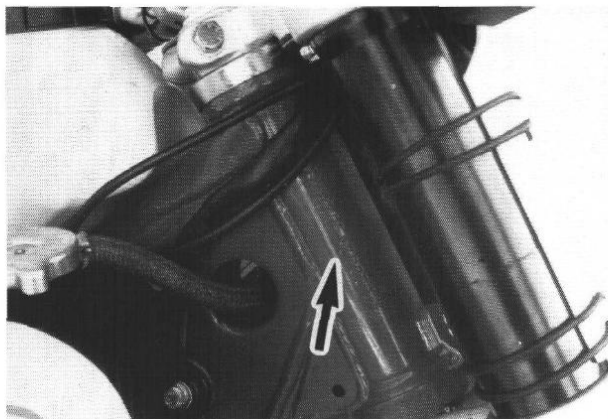
### ON CHASSIS:

- check if chain is properly adjusted and oil chain
- check if all screws and nuts are tight
- tighten all spokes on rear and front wheel
- adjust all cables
- check free-play of steering head bearing
- check silencer packing (MX)
- re-grease grease nipples on swingarm and links
- check brake fluid level in reservoirs
- check brake hoses for proper installment

## Operation instruments

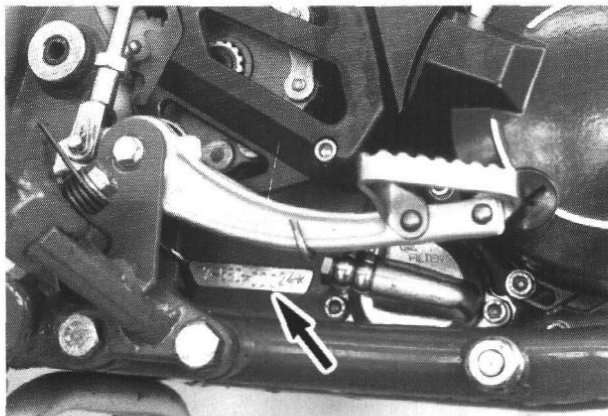
### Frame number

The frame number is stamped on the right side of the steering head tube.



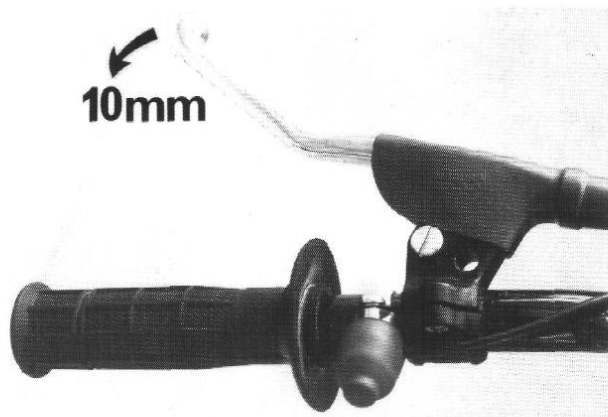
### Engine number, Engine type

The engine number and engine type are stamped on the right hand side of the engine below the chain sprocket.



## Clutch control lever

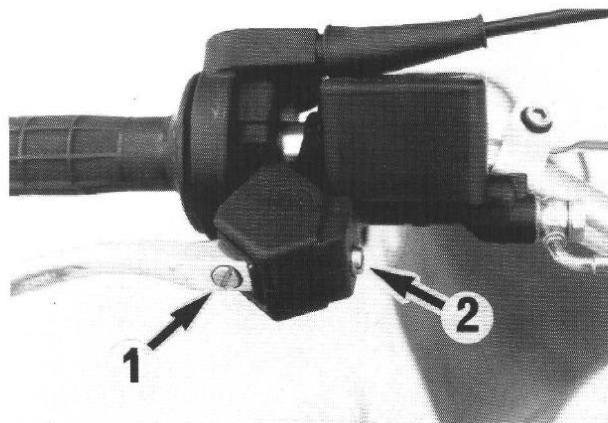
The clutch control lever is fitted on the left hand side of the handle bar. The lever should always exhibit a play of approx. 10 mm (measured at outer edge).



## Setting pressure point at hand brake lever

The hand brake lever is fitted on the right hand side of the handle bar. The basic position of the lever can be adjusted with screw (2). The pressure point can be adjusted by adjustment screw (1).

Under pressure point is to understand the resistance which is felt by pressing the brake pads against the disc. With the adjusting screw (1) the lever movement from start to pressure point can be adjusted. This way the play can be adjusted to fit any size hand.

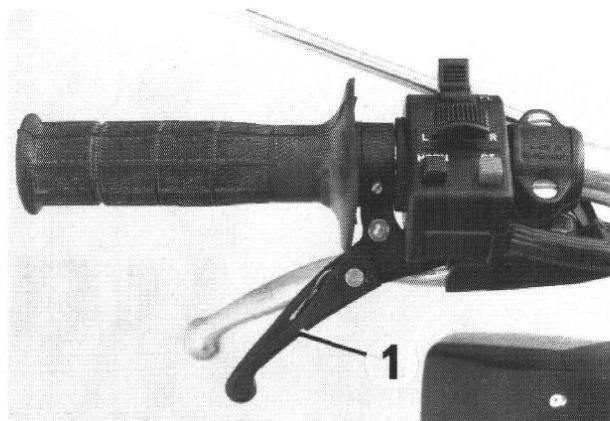


## Decompression lever

The decompression lever (1) helps you to find the optimal position of the piston in order to start the bike. Pull lever fully to its stop.

Depending on the position of the piston the deco-lever gets pulled back into its initial position automatically or takes an in-between position.

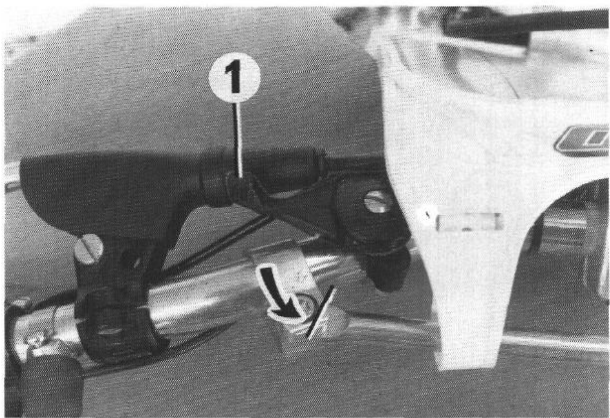
- a) If deco-lever is not pulled back into initial position and keeps an undefined middle position:  
Push kickstarter down slowly to move piston into starting position. Push kickstarter that far down until deco-lever jumps back into its initial position.
- b) If deco-lever gets pulled back into initial position automatically:  
Push kickstarter down until you can feel the resistance of the increasing engine compression, pull deco-lever once again (the lever now doesn't move back into initial position) and move kickstarter that far until deco-lever jumps back into its initial position.



## Choke lever

When the choke lever (1) is turned counterclockwise, a bore is opened in the carburetor which enables the engine to draw in additional fuel. This produces a „rich“ fuel/air mixture necessary for cold start.

If the choke lever is turned clockwise as far as stop, the bore will be closed again. In this position the choke cable must have a play of approx. 2 mm.



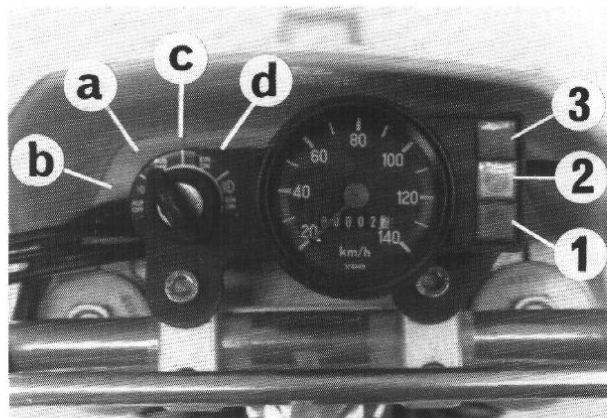
## Ignition lock, control lamp (European Version)

Switch positions of ignition lock:

- a = Ignition off, light off
- b = Ignition off, parking light on (only versions with battery)
- c = Ignition on, light off
- d = Ignition on, headlight on

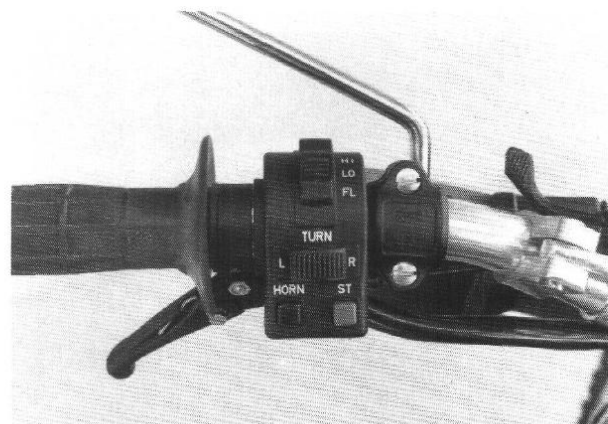
The ignition key can be withdrawn in positions a and b.

- 1 = Temperature control lamp (red) begins to light up once cooling water temperature has reached 110° C (242° F).
- 2 = Indicator control lamp (yellow)
- 3 = High-beam control lamp (blue)



## Combination switch

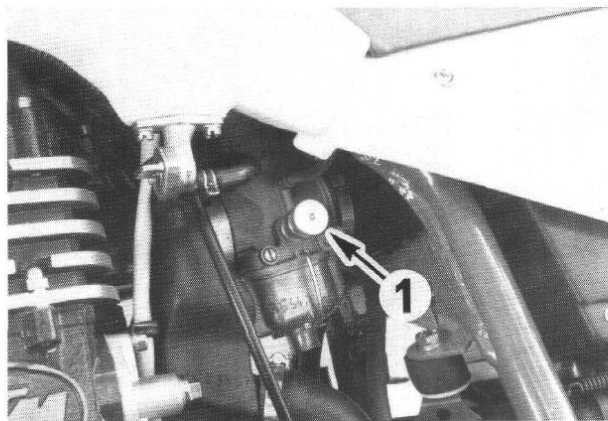
- HI = High-beam light
- LO = Low-beam light
- FL = Flash light
- L = Indicator control lamp left
- R = Indicator control lamp right
- HORN = Horn button
- STOP = Kill button, only to turn off engine in emergency situations.





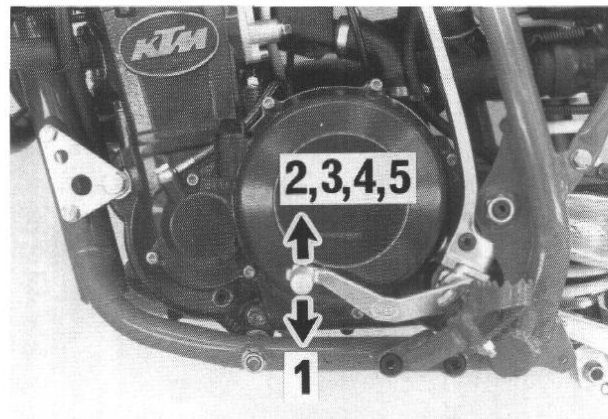
## Warm start device

Dell'Orto and Bing carburetors are equipped with a warm start device which makes it easier to start the engine when warm. Press starter button (1) until it engages. This will slightly lift the throttle valve. The starter button will return to its original position when the throttle is opened.



## Shift lever

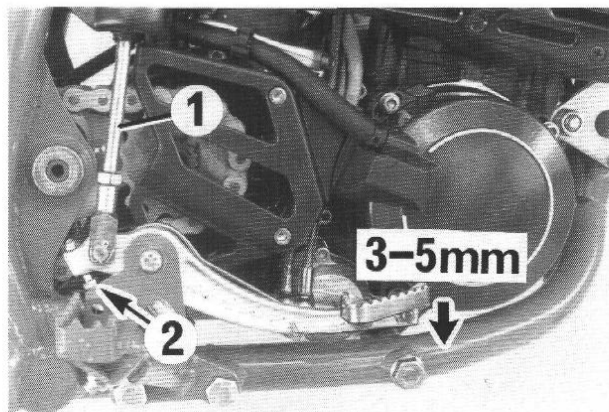
The shift lever is mounted on the left side of the engine. The position of the gears is shown in the illustration.



## Rear brake lever

The rear brake lever is mounted on the right, adjacent to the engine. The free play on the rear brake lever (measured at outer edge), should be 3-5 mm. Only then, the push rod (1) can move the piston in the rear brake cylinder (indicated by increased resistance on rear brake lever). If the free play is not 3-5 mm, pressure will build up in the brake system when engine is running and the back wheel will lock.

By adjusting the push rod and the hexagon screw (2), the basic position of the rear brake lever can be changed.



## Shock absorber compression setting

The shock absorber damping level is infinitely adjustable with the 7-stage ratchet adjuster (1).

Shock absorber position 1 = soft compression

Shock absorber position 7 = hard compression

BASIC SETTING FOR 70 KG (154 lbs.) BODY WEIGHT: SETTING 1



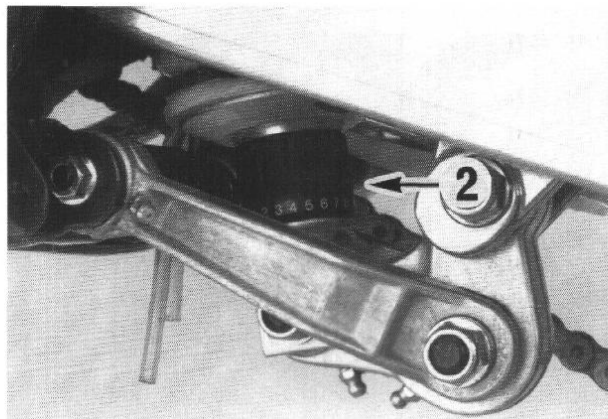
## Shock absorber rebound setting

The shock absorber rebound setting comprises 11 positions. The 11-position ratchet adjuster (2) is located beneath the spring retaining washer. In order to increase central strut tension, the rebound setting must also be set to a „stronger“ level.

Shock absorber position 1 = low setting (fast shock absorber return)

Shock absorber position 11 = high setting (slow shock absorber return)

BASIC ADJUSTMENT FOR 70 KG (154 lbs.) RIDER BODY WEIGHT:  
SETTING 3



## Adjusting the suspension

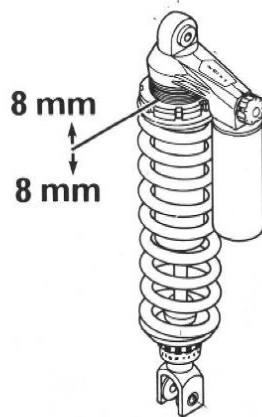
The center is adjusted by trial and error for riders heavier or lighter than 70 kg (154 lbs.)

**Setting procedure:** With the rider normally seated, the rear-wheel suspension is compressed approx. 90 mm (3.5 in.).

To obtain access remove seat, side-panels and exhaust muffler, release carburetor sleeve, remove the 3 securing bolts and pull back the rear of the frame. Using the No. 2 C-spanner from the tool kit, release the setting lock-nut, set as required then lock. Lubricate the thread with molybdenum disulphide grease.

**NOTE:** Before changing the shock preload, measure the spring and write down the length. Only change the preload a maximum of  $\pm 8$  mm from the standard setting, otherwise the suspension performance will decrease.

If in doubt, if standard setting is still given, check as follows: Loosen spring, measure the length and preload 20 mm on spring. After changing the setting, mount removed parts.



## Before starting off

In the interests of riding safety you should get used to checking your motorcycle each time before starting off.

The following checks should be made:

- 1 Check engine oil level.
- 2 Check fuel level in tank and ensure that the tank bleeding hose is free from bends when closing the filler cap.
- 3 Check tension, condition and lubrication of the chain.
- 4 Check tyres for damage, check tread, check tyre pressure.
- 5 Check that brakes are functioning correctly, check brake fluid level in the reservoirs, check brake pads for wear.
- 6 Check that control cables are working smoothly, check play of clutch lever.
- 7 Check coolant level.
- 8 Check that electrical system is in correct order (carry out this check when the motor is running).

### ATTENTION:

- Remember to dress for the ride. Smart KTM riders always wear a helmet, boots, gloves and a jacket whether it's a day trip or just a quick trip down the road.
- Do not start the engine and allow it to idle in a closed area. Exhaust fumes are poisonous and can cause loss of consciousness and death. Always provide adequate ventilation while the engine is running.

## Starting Procedure for Cold Engine

- 1 Turn on fuel cocks
- 2 Switch on ignition (if ignition lock is fitted)
- 3 Actuate choke lever on handle bar
- 4 The deco-lever helps you to find the optimal position of the piston in order to start the bike. Pull lever fully to its stop.  
Depending on the position of the piston the deco-lever gets pulled back into its initial position automatically or takes an in-between position.
  - a) If deco-lever is not pulled back into initial position and keeps an undefined middle position:  
Push kickstarter down slowly to move piston into starting position. Push kickstarter that far down until deco-lever jumps back into its initial position.
  - b) If deco-lever gets pulled back into initial position automatically:  
Push kickstarter down until you can feel the resistance of the increasing engine compression, pull deco-lever once again (the lever now doesn't move back into initial position) and move kickstarter that far until deco-lever jumps back into its initial position.
- 5 Move kickstarter back to upper position, leave throttle closed and kick kickstarter all the way down energetically.
- 6
  - a) If engine starts move choke-lever back a little bit, as soon as the engine tends to shake in idle.
  - b) If the engine fails to start, repeat steps 4. to 6. If your bike is supplied with the Bing 54/38/123 carburetor, you should pay attention to the additional service information on page 48.

## Starting Procedure for Warm Engine

- 1 Open fuel cocks.
- 2 Switch on ignition (if ignition lock is fitted).
- 3 Press warm-start button on carburetor until it engages.
- 4 Set piston to starting position (see above).
- 5 Move kickstarter back to upper position, leave throttle closed and kick kickstarter all the way down energetically.
- 6 If the engine fails to start, repeat steps 3. to 5.

## In case the engine floods

Pull decompression lever, kick the kickstarter 5 to 10 times and start engine as described above.

## By driving on:

Pull clutch lever in, put motorcycle in first gear, let clutch lever go slowly and at the same time give gas.

## Shifting/Riding:

You are now in first gear, referred to as the drive or uphill gear. Depending on the conditions (traffic, hill size, etc.), you can shift to a higher gear. Turn off gas, at the same time pull clutch lever in and shift to the next higher gear. Let clutch lever go again and give gas. If you turned on the choke, make sure you turn it off again as soon as engine is warm.

When you reach full speed through opening the throttle all the way, turn throttle back to 3/4; the speed hardly decreases although the engine will use less gas. Only give as much gas as the engine can handle. Through quick and high revving of throttle, the gas usage increases. By shifting down, use the brakes if necessary and turn off gas at the same time. Pull clutch lever and shift down to the next gear. Let clutch lever go slowly and give gas or shift down again.

### CAUTION:

- Don't ride your motorcycle with full load and don't rev engine when cold. Because the piston is warming up faster than the water cooled cylinder, it can cause engine damage.
- Check mounting screws should abnormal vibrations occur during the ride.

## Braking

Turn off gas and brake with front and rear brake at the same time. In sandy, wet, and slippery conditions, use mainly the rear brake. Brake carefully to avoid locking of the wheels which can lead to spinning of the motorcycle or even crashes.

## Stopping and Parking

Brake motorcycle and put transmission into neutral. Turn off engine ignition switch. Close fuel cocks and lock motorcycle.

### IMPORTANT:

- Gasoline is highly flammable and poisonous. Extreme caution should be used when working with gasoline. Do not refuel the motorcycle with the engine running. Take special care to not spill gasoline on the engine or exhaust pipe while the motorcycle is hot, wipe up spills promptly. If gasoline is swallowed, inhaled, or splashed into the eyes contact a physician immediately.
- Motorcycle engines produce a great amount of heat while running. The engine, exhaust pipe, muffler, brake rotors, and shock absorbers can become very hot. Do not touch any of these parts after operating the motorcycle, and take care to park it where pedestrians are not likely to touch it and get burned.

## Running in

Run in your motorcycle with low but changing load. NO FULL LOAD  
RIDES THE FIRST 1000 KM (625 miles) OR 10 HOURS!

## Maintenance Work on Chassis and Engine

### CAUTION:

This manual gives only a description of the White Power Front Fork without Multi Adjust System.

Motorcycles equipped with WP-forks with Multi Adjust system come with a separate White Power manual.

### WHITE POWER FRONT FORK 4054

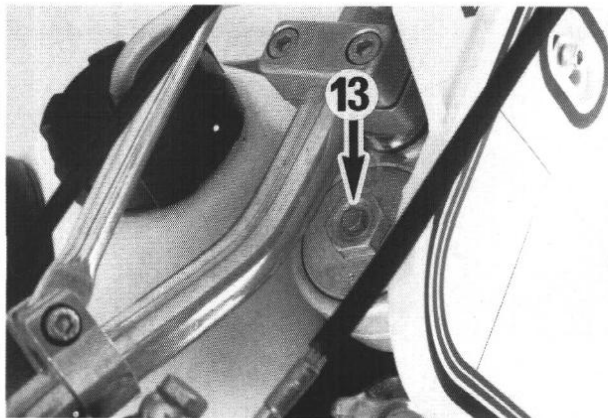
#### without Multi Adjust System

NOTE: The adjustment of the White Power fork can be changed in the following points:

- The **spring preload** can be increased through adding spacers (a max. of 25 mm). At White Power, the springs were measured before mounting and if necessary spacers were already added to level out already existing differences. Therefore, DO NOT MIX original spacers in the fork legs.
- Through the oil level the **damping degree** can be adjusted. The more oil you use, the bigger dimension „A“, the harder the fork will be.

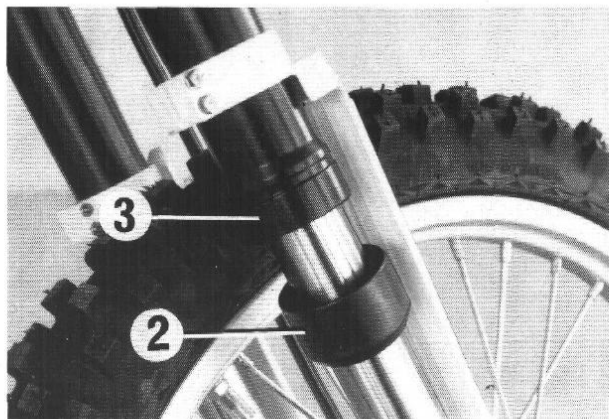
### Airpressure

By riding, airpressure can build up in the fork. To release the airpressure, open the bleeding screw (13) a few turns before every ride. The more the fork seals are worn, the faster pressure can build up.



## Clean dust scrapers

The dust scrapers (2) should at the latest be cleaned after 2 races. Clean more often, if necessary. To do so, remove dust scrapers from the outer tube (3), clean the inside and outside thoroughly, then replace them.



## Check oil level

After 2 races check oil level. Remove handlebar, unscrew top screws (1), compress fork and remove parts 4-7 from the piston rod. Return fork slowly until oil will be pressed upwards from the bottom across the guide (8) of the piston rod (10). Now measure the projecting part (A) of the piston rod.

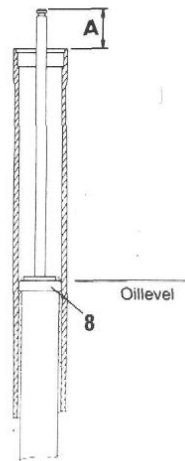
### NOTE:

The oil quantity can influence the dampening on compression stroke. The fork gets the harder the more oil will be filled in or the bigger the dimension A will be.

A = 120 mm	soft
A = 140 mm	middle
A = 160 mm	hard

**BASIC ADJUSTMENT:** A = 140 mm

After measuring the dimension A fit parts 4-7 in correct order and mount cap screws.





## Change fork oil

Change oil after every 4 races. Loosen bolts (1) and remove forks from motorcycle. Remove fork cap, slide upper fork tube (3) down over chrome tube (9) and remove parts 4-7. Put fork in a drain pan upside down and allow oil to run out. Remove bottom cap and spring and drain oil. Let damper rod (10) touch the bottom. pump chrome tube a couple times to push all of the oil out of the damping part.

Let forks stand for a few minutes to make sure all of the oil has run out. Replace spring, spacers, cones and bottom fork cap. Put fork leg in correct position again, pull damper rod out of upper tube (140 mm), add. approx. 640 cc of oil into the tube and depress „one way“ spring loaded valve washer inside of chrome tube internal cap with small wire rod to help oil flow into lower tube. Mount fork cap and pump fork 3 times as far as possible. Remove fork cap, push chrome tube into upper tube about 150 mm and pump with the damping rod to bleed the damping part. After waiting a few minutes, check oil level as described before.

**Fill quantity:** Approx. 640 cc shock oil SAE 10 per fork leg.  
(Best if set to dimension „A“.)

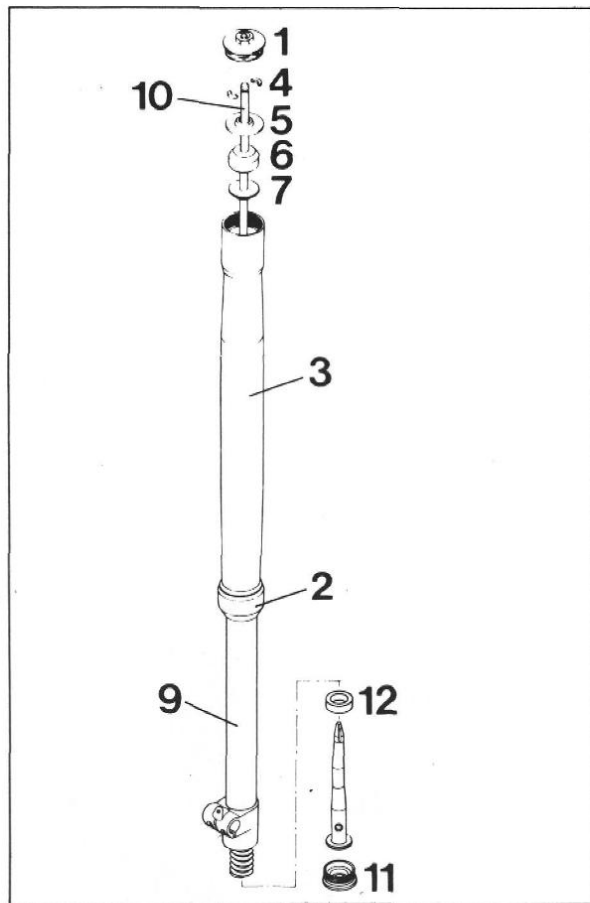
## Change the preload

The preload is increased by adding preload bushes (12). To do so, remove fork legs, turn them upside down, remove lower plugs (11), add preload bush (see illustration) and mount plugs.

BASIC SETTING FOR 70 KG BODY WEIGHT:  
NO PRELOAD BUSHES.

Your KTM-dealer stocks preload bushes.

**CAUTION:** Preload bushes should not exceed a total height of 25 mm, otherwise the absorbtion elements will be damaged on jouncing.

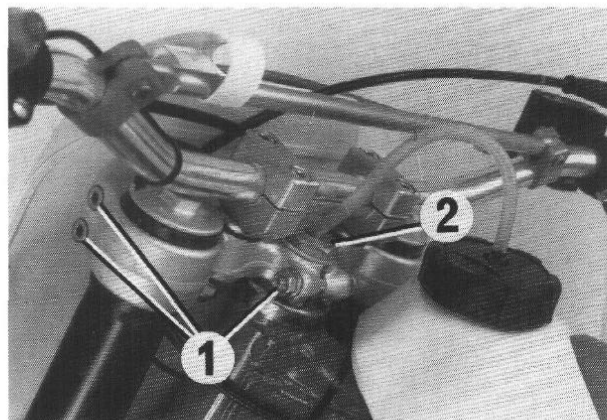


## Check and adjust steering head bearing

Check steering head bearing for play periodically. If the bearing is without play, the pivot or even the bearing race can be damaged.

To check this put motorcycle on stand so that the front wheel is off the ground. Now try to move the fork forward and backward. To adjust, loosen the five pinch bolts (1) of the top triple clamp and turn steering stem bolt clockwise (2) until there is no more play. Don't tighten the steering stem bolt all the way, otherwise the bearings will be damaged. With a plastic hammer, lightly rap on the triple clamp to release tension. Re-tight the five pinch bolts.

At least once a year, the steering head bearings should be smeared with waterproof grease.

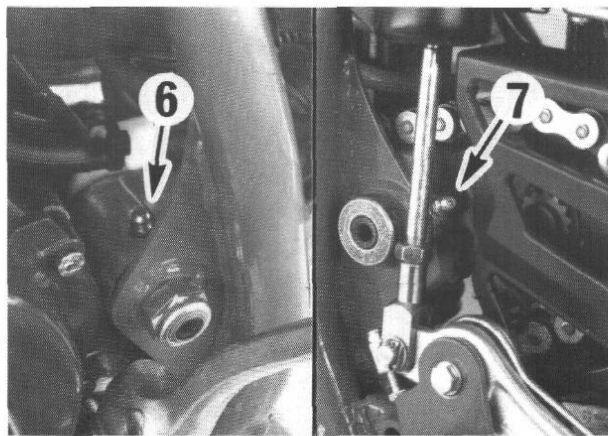
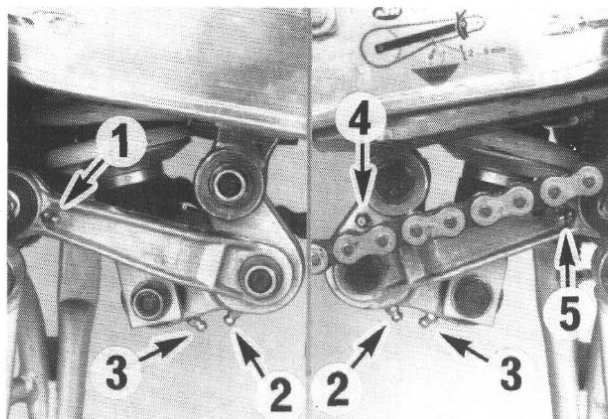


## Grease swingarm pivot and suspension linkage

Grease nipples are mounted on the suspension linkage and swingarm pivot. These fittings must be re-greased periodically to prevent water and dirt from getting into the pivots. To do so, will save expensive repairs in the long run.

### CAUTION:

After each time the motorcycle is washed, it is especially important to grease the fittings to push any water out of the bearing.

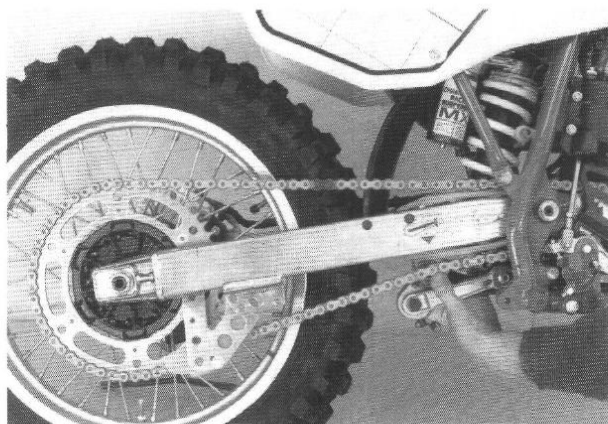


## Chain tension, chain maintenance

The chain should be so loose that when transmission is in neutral the distance between chain and chain guide is 2–5 mm.

In order to tension the chain the axle nut must be loosened using the universal spanner supplied, the counter-nuts of the tension screws loosened and the tension screws left and right turned by the same amount. Check whether the rear wheel is aligned with the front wheel, correct if need be, tighten counter-nuts of the tension screws and axle nut.

For long chain life, good maintenance is very important. Maintenance has been reduced to a minimum for O-ring chains as featured in this motorcycle. The best way to clean O-ring chains is to use lots of water, but never use brushes or cleaning liquids. After allowing the chain to dry, you can use a special O-ring chain spray.

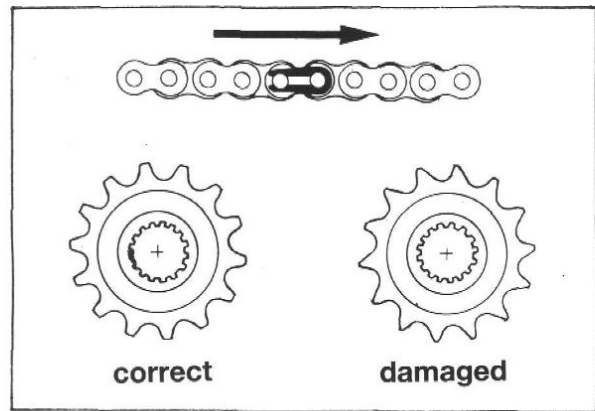


### CAUTION:

When mounting the chain masterlink clip, the closed side of the masterlink clip must point in running direction.

Also check sprockets and chain guides for wear, and replace if necessary.

NOTE: If you mount a new chain, the sprockets should also be replaced. New chains wear faster if used on old used sprockets.



## DISC BRAKES

### In general:

The new brakes uses a „floating“ mount. This means that the brake calipers are not solidly attached to the fork or caliper carrier, which enables it to „float“ for maximum braking contact.

### Usage of the different brake pad types

For normal riding conditions, we suggest using organic brake pads. For very dirty conditions (i.e. water mixed with sand or mud) we recommend using sintered brake pads.

#### IMPORTANT:

- Check the piston to caliper face tolerance (dimension K) at the rear brake caliper periodically.
- Change brake fluid at least once a year. If the motorcycle is being washed very often, change brake fluid more often. Brake fluid has the ability to absorb water; therefore, if the brake fluid is „old“ it will cause the brake system to fail.
- Never mix brake fluid DOT 3 or DOT 4 (alcohol based) with DOT 5 (silicone based). For KTM Motorcycles, you should use DOT 4.
- After mounting the wheels, use the brakes so the brakes pads lay against the disc.
- Always actuate the hand brake lever or foot brake pedal after working on the brake system, so that the brake pads lie against the disc and the pressure point is established.

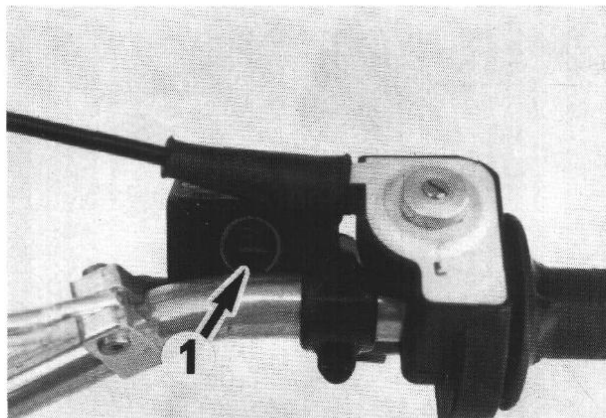
#### CAUTION:

- Don't let brake fluid get in contact with paint, it is an effective paint remover.

## FRONT BRAKE

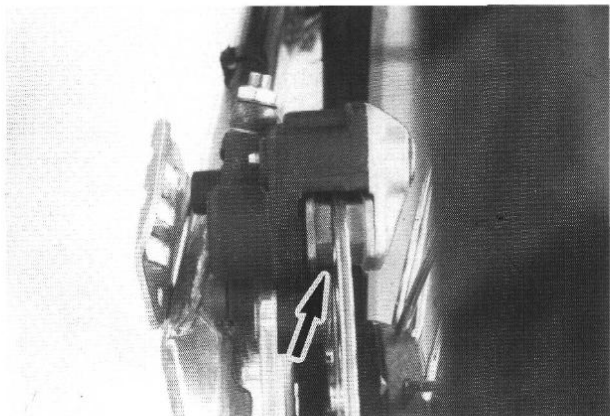
### Checking of brake fluid level

The brake fluid reservoir is linked with the hand brake cylinder at the handlebar and the reservoir is provided with an inspection glass (1). With the reservoir in a horizontal position, the brake fluid level should not go below middle of the glass. The reservoir should be kept completely full at all times for best performance.



## Checking brake pads

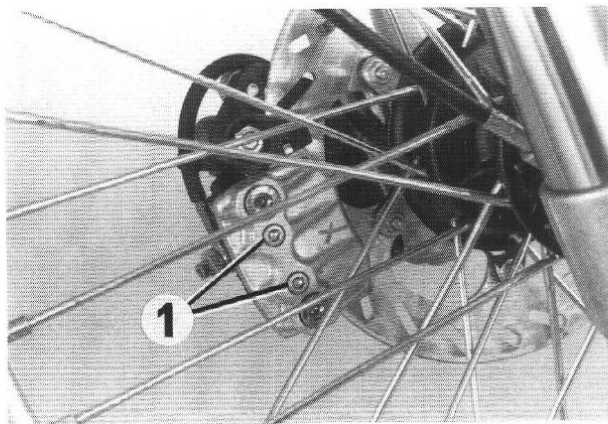
Brake pads can be checked from beneath (front wheel) or from the back (rear wheel). Brake pad thickness should never go below 1 mm.



## Replacing the brake pads

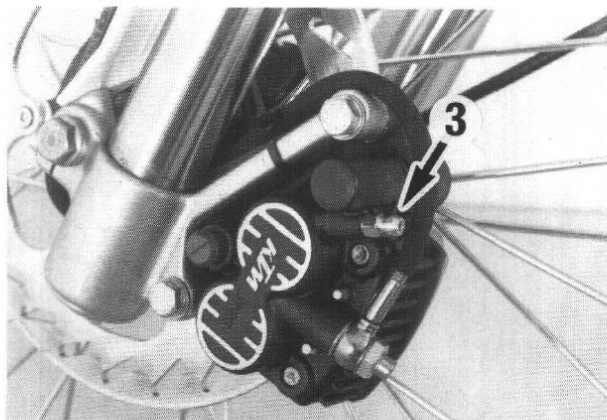
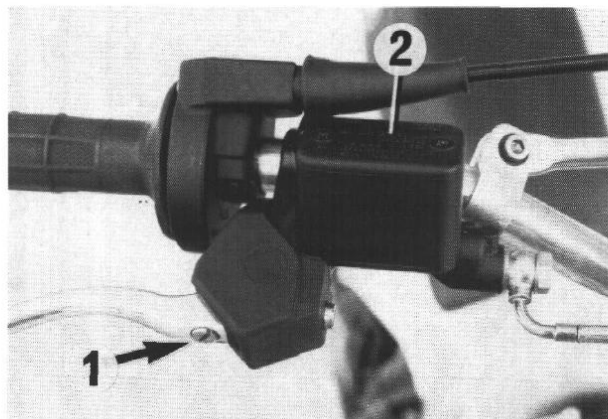
With a 5 mm hexagon pin spanner remove bolts (1) and pull the pads out of the bottom of the caliper. Push pistons in and clean caliper. Check all rubber seals and chatter spring if damaged. Re-install brake pads. **BE SURE THE BRAKE PAD WITH THE HEAT INSULATOR IS MOUNTED ON THE PISTON SIDE.**

Screw bolts back in and through pumping press brake pads against disc.



## Bleeding the front brake

- Turn the lever adjusting screw (1) completely counterclockwise to remove all pressure from the master cylinder piston rod.
- Remove the fluid reservoir cover (2).
- Turn the handlebars so that the fluid reservoir is completely horizontal, and fill it up with DOT 4 brake fluid.
- Attach a length of clear fluid hose (5 mm diameter) to the bleed nipple (3) on the brake caliper, and drop the end of the hose into a container to hold the overflow fluid.
- Pump the brake lever approx. 4 to 5 times, then, while holding pressure against the lever, open the bleed nipple. If there is any air in the system you will see bubbles coming out of the bleed nipple.
- Close the bleed nipple and release the lever and pump it back up again. Do not release the lever unless the bleed nipple is closed.
- Repeat the process of pumping and then opening the bleed nipple until no more air bubbles are visible in the expelled fluid.
- While repeating the bleeding operation, check the fluid level in the reservoir and top up if necessary, to prevent air from getting into the system. **Do not let the reservoir run out of fluid!**
- To check to make sure there is no air trapped behind the caliper pistons, push the pistons in all the way. Remove the brake pads and pump both pistons out approximately 13 mm (0.51 inch).
- Pull the brake lever all the way back to the grip and secure it there with a rubber band to ensure that the master cylinder fluid supply orifice is closed.
- Now put pressure on both pistons, open the bleed nipple, push the pistons in all the way and close bleed nipple again.
- Re-install brake pads, if necessary replace.
- Fill the fluid reservoir and pump the pads against the disc.
- Top the fluid reservoir up right to the edge, and re-install the lid so there is no air in the reservoir.
- Adjust the lever to a comfortable position with adjusting screw.



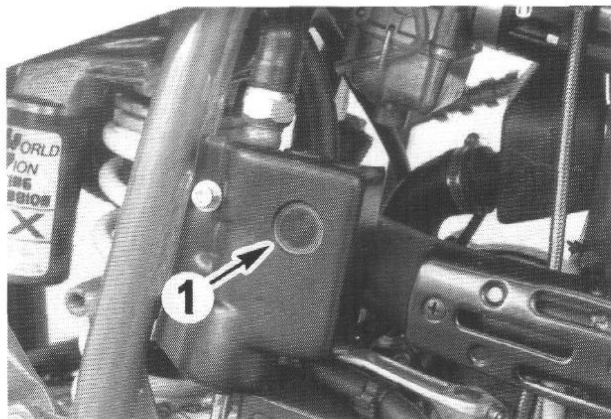


## REAR BRAKE

### Checking of brake fluid level

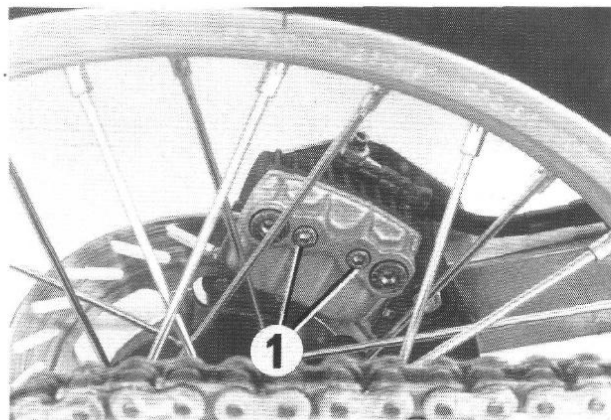
The brake fluid container is linked with the foot brake cylinder and the container is provided with an inspection glass (1). With the container in a vertical position, the brake fluid level should not go below middle of the glass.

### Checking brake pads (see „Front brake“)



### Replacing the brake pads

With a 5 mm Allen wrench remove bolts (1) and pull the pads out of the back of the caliper. Push pistons in and clean caliper. Check all rubber seals and the chatter spring if damaged. Re-install brake pads; BE SURE THE BRAKE PAD WITH THE HEAT INSULATOR IS MOUNTED ON THE PISTON SIDE. Make sure you check the caliper piston to caliper face tolerance (as described) before screwing the bolts back in. Tighten bolts and by pumping, press brake pads against disc.





## Caliper to piston tolerance

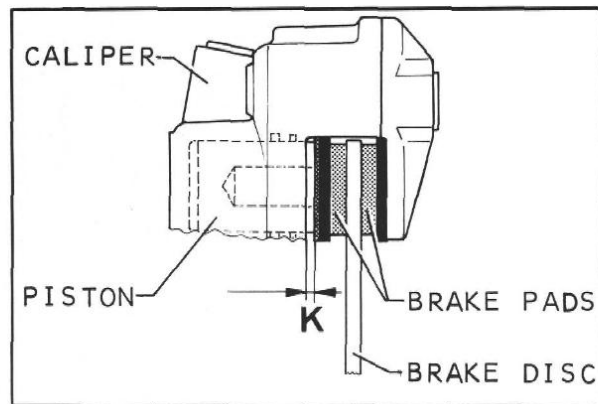
If an inconsistent rear brake application point or double pumping of the brake pedal becomes necessary, you should check the piston to caliper face tolerance. This situation is caused by an excessive caliper piston tolerance and engine vibration at full throttle pushing the caliper pistons back. This vibration effect can be eliminated by maintaining a caliper to piston tolerance (dimension K) of 0.5 to 1.8 mm (0.020 to 0.071 inch) – see ill.

Dimension K increases through wear of the brake pads.

To balance out the wear and to maximize the life of the brake pads, you can add shims (4) which are of the same shape as the brake pads. These shims are available in 1 mm, 2 mm, and 3 mm thickness through KTM Parts Department.

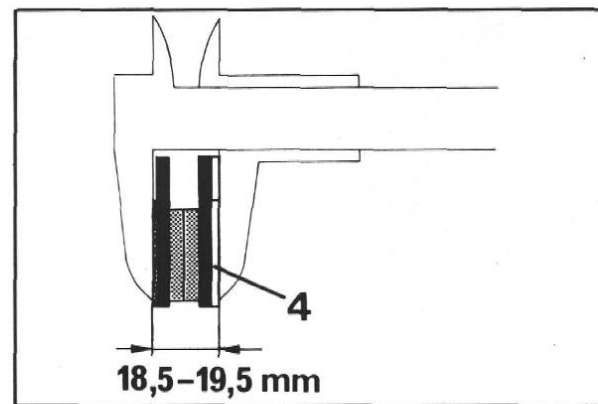
### CAUTION:

The piston to caliper tolerance should never be less than 0.5 mm and not more than 1.8 mm, otherwise the brake will fail.



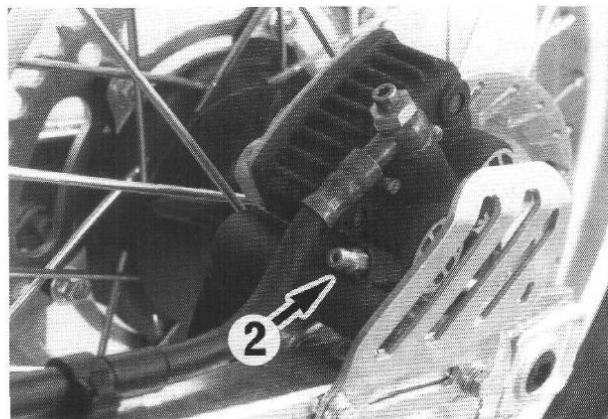
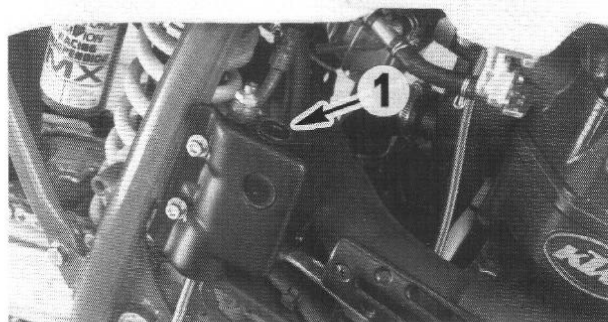
You can also measure the total brake pad thickness (including shims) which should be 18.5 to 19.5 mm (0.73 to 0.77 in.) **NOT MORE.**

The total brake pad thickness (including shims) should be 18.5 to 19.5 mm (0.73 to 0.77 inch) **NOT MORE** (see ill).



## Bleeding the rear brake

- Remove the rear brake fluid reservoir cap (1) and top off the reservoir with DOT 4 brake fluid.
- Attach a length of clear fluid hose (5 mm diameter) to the bleed nipple (2), and drop the end of the hose into a container to hold the overflow fluid.
- Pump the brake lever approx. 4 to 5 times, then, while holding pressure against the lever, open the bleed nipple.
- Close the bleed nipple and release the lever, then pump it back again. **Do not release the lever unless the bleed nipple is closed.**
- Repeat the process of pumping up and then opening the bleed nipple until no more air bubbles are visible in the expelled fluid.
- While repeating the bleeding operation, check the fluid level in the reservoir. Top up if necessary, to prevent air from getting into the system. **Do not let the reservoir run out of fluid!**
- To check to make sure there is no air trapped behind the caliper pistons, push the pistons in all the way. Remove the brake pads and pump the pistons with the foot brake lever out approximately 13 mm (0.51 inch).
- Push the brake lever all the way down and hold it there to ensure that the master cylinder fluid supply orifice is closed.
- Now put pressure on both pistons, open the bleed nipple, push the pistons in all the way and close bleed nipple again.
- Re-install brake pads or replace if necessary and check the piston to caliper face tolerance.
- Fill the fluid reservoir and pump the pads against the disc.
- Fill the reservoir completely, and re-install the cap. Be sure there is absolutely no air in the reservoir.
- Adjust the rear brake lever to a comfortable position.
- Check free play



## Cooling system

The cooling system is filled with approx. 1 Liter (0.22 gal.) cooling liquid. The coolant consists of a 2:1 mixture of antifreeze and water. In addition to frost protection, it ensures good corrosion resistance, and therefore should never be replaced with plain water.

The electrical water pump ensures forced circulation of the coolant. The water pump turns on as soon as the engine starts to run and the generator begins to produce energy.

## Function control of the water pump

Start engine, open radiator cap and check if coolant is coming out of the hose at the rear side of radiator.

Pressure induced by heating of the coolant in the system is controlled by a valve in the radiator cap; a water temperature rising up to 120° C (248° F) is admissible, without fear of problems.

### CAUTION:

For the cooling system, use only high-grade antifreeze agent. Using lower-grade antifreeze agents, can cause corrosion and coolant foaming.

The red control lamp lights up by approx. 110° C (242° F).

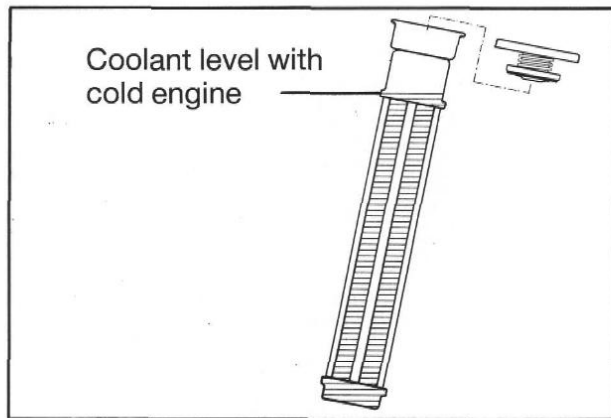
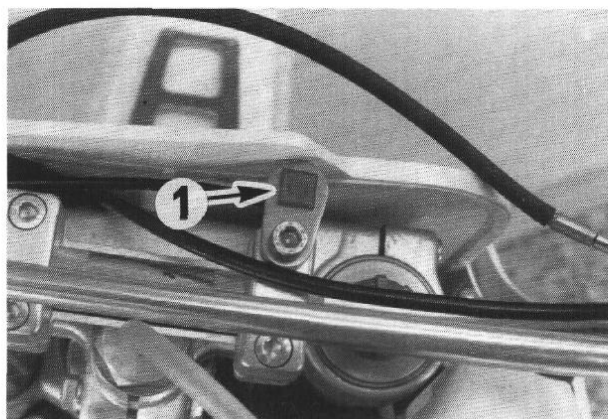
## Coolant level check

The coolant level should be checked both when the engine is running and cold. Please see the coolant level as indicated in the illustration.

In the event of the coolant being drained, always fill the system before hand, then top off while the engine is running.

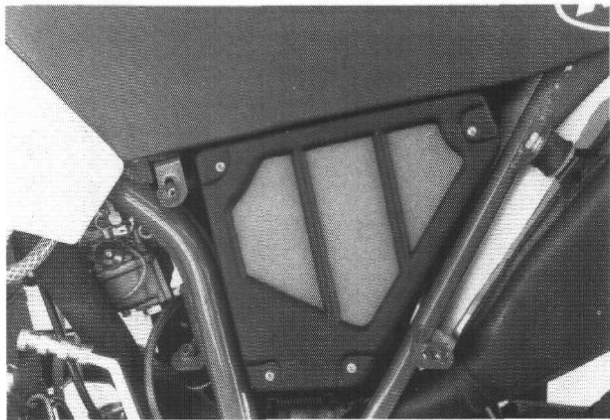
### IMPORTANT:

If possible, always check level of cooling liquid when engine is cold. If you have to open the radiator cap when engine is hot, use a rag to cover the cap and open slowly to release pressure.



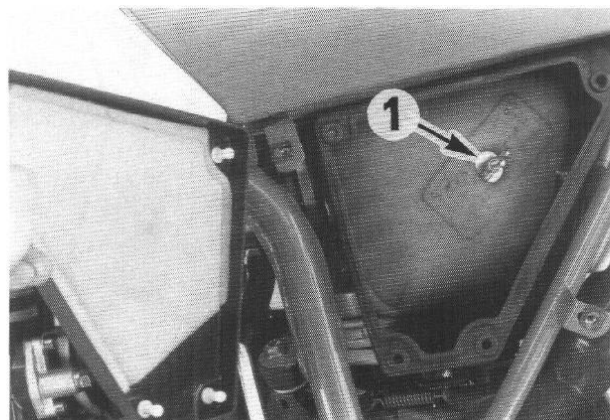
## Cleaning of pre-filter

There is a pre-filter in the airbox cover to keep the air filter free of rough dirt. To clean the pre-filter, remove the side panel and airbox cover. Clean the airbox cover/pre-filter with soap and water and dry thoroughly. Do **not** oil the pre-filter.



## Cleaning of air filter

The air filter must be cleaned after each ride or after riding in heavy dust. To clean the filter, first remove the side cover and the airbox cover. Loosen wing-nut (1) and remove filter and cage from airbox. Foam filter should be cleaned first in solvent and then in warm soapy water, and then dried completely. Re-oil filter with Twin Air foam filter oil or equivalent. Check filter element for cuts or holes; check airboot for cuts or holes and for secure clamps; clean filter box and inspect if drain tube is clean; grease sealing edge of filter element before re-installing.



## Exhaust system (MX)

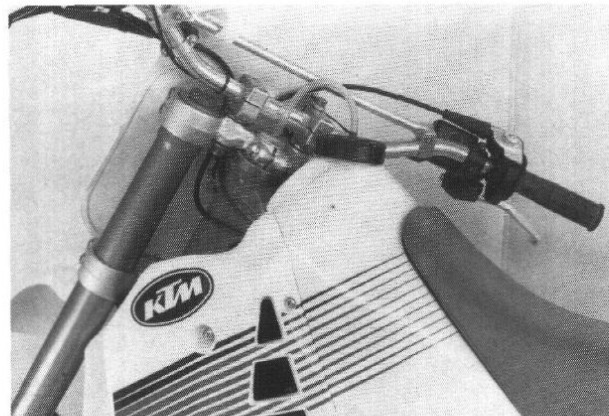
Exhaust systems with removable exhaust end caps are filled with basalt rockwool. The basalt rockwool filling should be checked before every race. Basalt rockwool which is too loose may result in performance loss. If it is packed too loose, repack it with fresh basalt rockwool. The new rockwool should be pushed firmly into the exhaust with a blunt object.

Your KTM-Dealer stocks basalt rockwool in pre-packed sizes.



## Fuel system

Every six months empty the fuel tank, clean the fuel cock and check the fuel line. Check the tank vent and the filler cap gasket. If necessary, clean the carburetor, check components for wear and replace all gaskets. Then readjust the carburetor.



# CARBURETOR

## Adjust idling

Idle adjustment should be carried out only with warm engine.

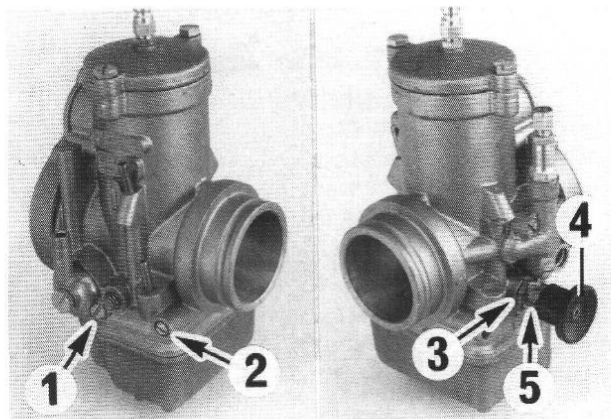
### DELL'ORTO CARBURETOR:

Turn the throttle stop screw (1) so that the engine runs at fast idling speed. Then adjust the mixture control screw (2) until the engine is running as smoothly as possible.

Turn back the throttle stop screw until the engine is just running smoothly without missing (1.200-1.400 rpm).

### BING CARBURETOR:

Unlock nut (6) and turn the throttle stop screw (7), so that the engine runs at fast idling speed. Then adjust the air control screw (8) until the engine is running as smoothly as possible. Turn back the throttle stop screw until the engine is just running smoothly without missing (1.200-1.400 rpm).



## Adjust warm start device

### DELL'ORTO CARBURETOR:

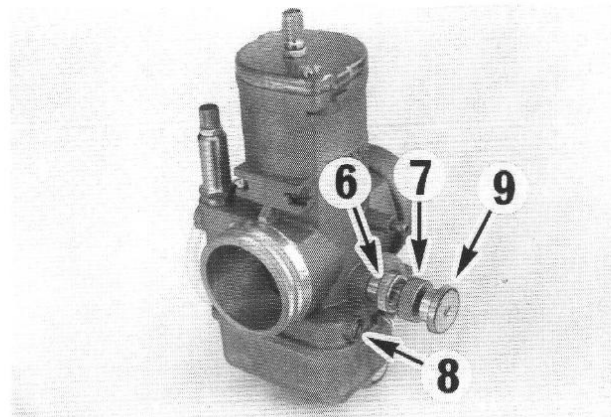
If the warm start button was removed when cleaning the carburetor, re-adjust the warm start device.

Install carburetor and adjust idling as described above. Then unlock nut (3), press in warm start device (4) and adjust engine rev with adjusting screw (5) to 2.000-4.000 rpm.

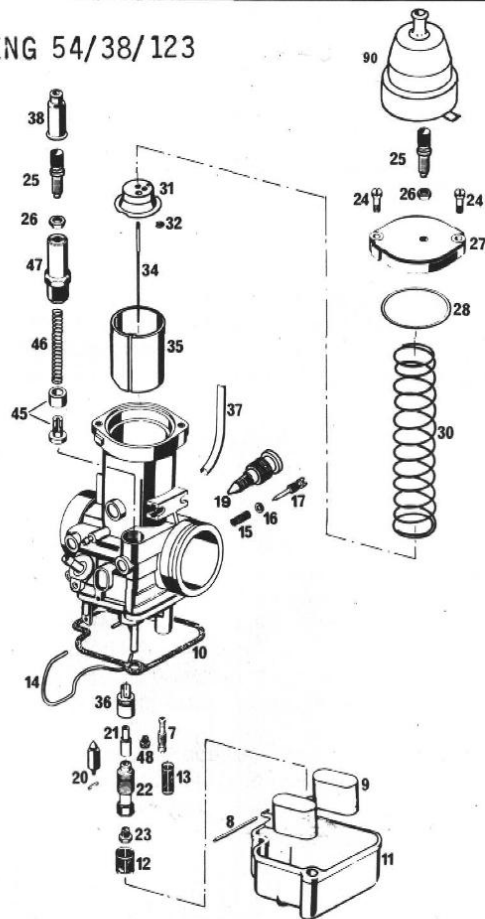
Tighten locking nut.

### BING CARBURETOR:

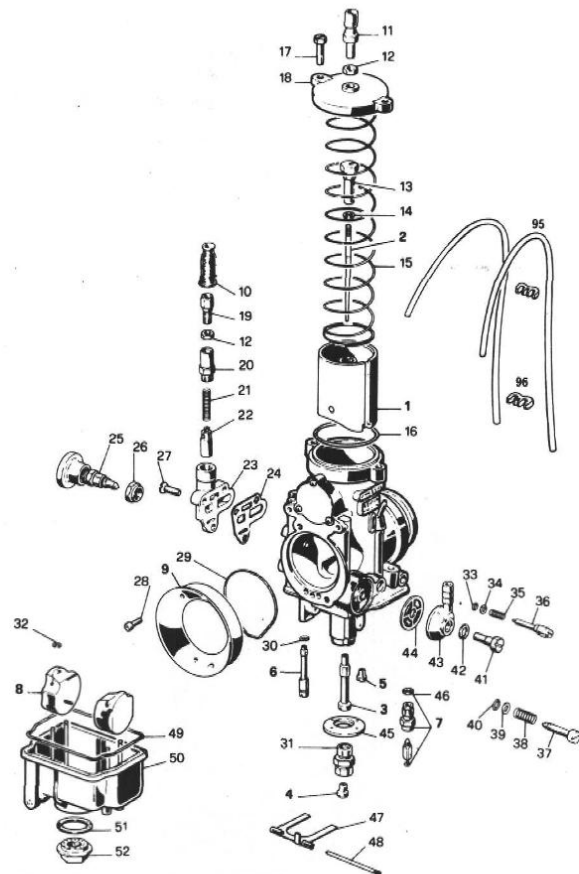
At the Bing carburetor warm start device and throttle stop screw are combined. If engine idling is adjusted as shown above the warm start device is set automatically.



# BING 54/38/123



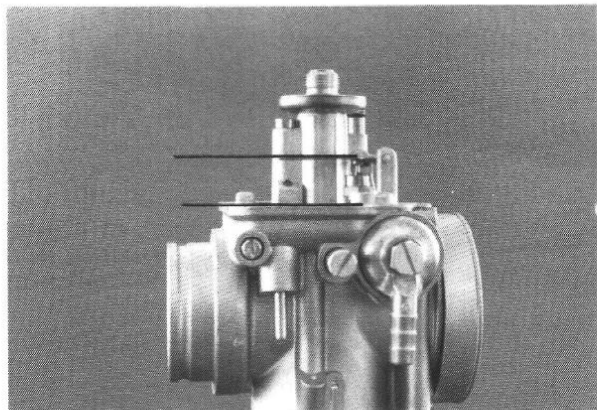
# DEL LORTO PHM 38 SD





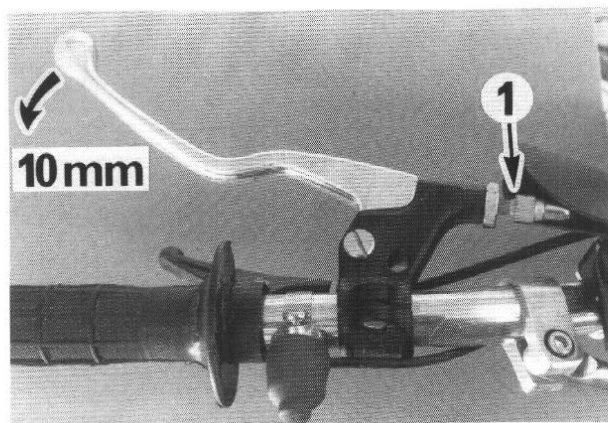
## Checking float level

To check the float level, remove carburetor from engine, then remove float bowl. Hold carburetor in vertical position, as shown in figure. Float arm (Dell-Orto) or float (Bing) should be parallel with the float bowl sealing surface.



## Clutch adjustment

Always check the play on the clutch control lever and adjust with adjusting screw (1) if necessary. The free play at the ball end of the lever should be approx. 10 mm.

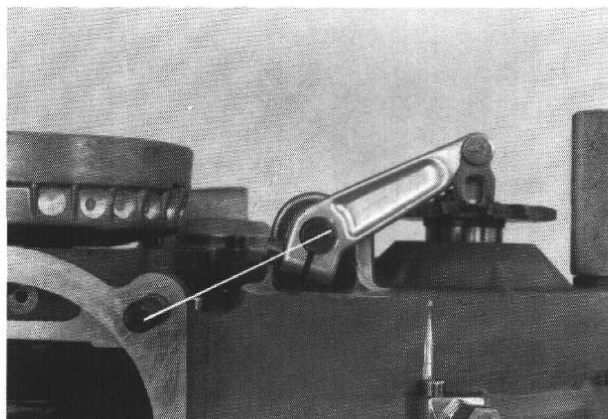




## Checking of clutch disengagement position

In order to obtain complete disengagement of the clutch, the clutch disengagement has to be adjusted correctly. To check the adjustment, unhook the clutch cable.

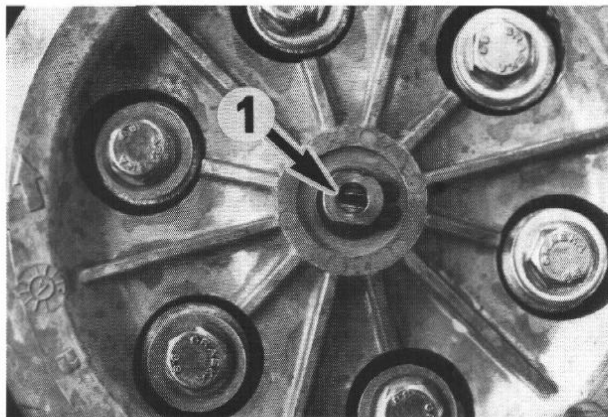
Use a screw driver to turn the clutch release shaft clockwise to the stop. The slot on the upper side of the release shaft should be positioned such that it points towards the rear right stud of the cylinder base (see ill.). If this is not the case adjust clutch disengagement.



## Adjustment of clutch disengagement

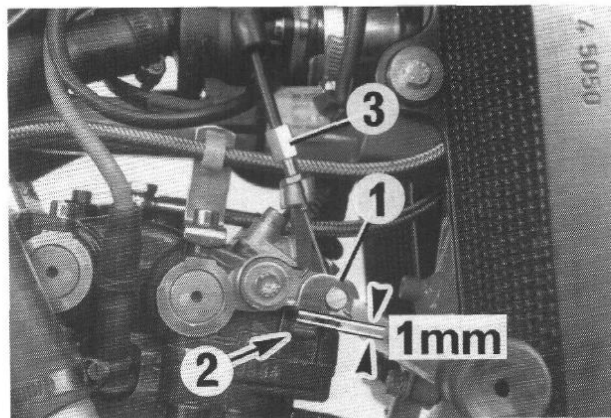
Remove shift lever and kickstarter. Remove oil line mounted on clutch cover. Lay motorcycle on right side and remove clutch cover. Remove split pin at adjustment mechanism and turn push rod (1) of clutch pressure cap to correct the adjustment. (See disengagement position.)

When the adjustment is completed secure push rod with a split pin. Re-install removed parts.



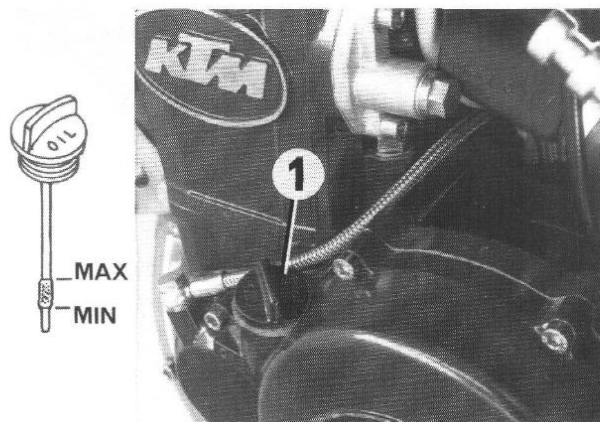
## Checking and correcting the decompression control cable

When the decompression lever on the handlebar is in home position the deco lever at the cylinder head (1) must be 1 mm away from the lever stop (2). If correction is necessary, the side cladding, seat and tank are to be removed. The adjustment can be made by means of the adjustment screw (3).



## Checking engine oil level

Place motorcycle on a level surface. Unscrew filler cap (1) and wipe off oil measure stick. Screw filler cap back in and unscrew again. Check oil level on measure stick. The oil level should be between the two marks; if necessary add fully synthetic engine oil 10W30.



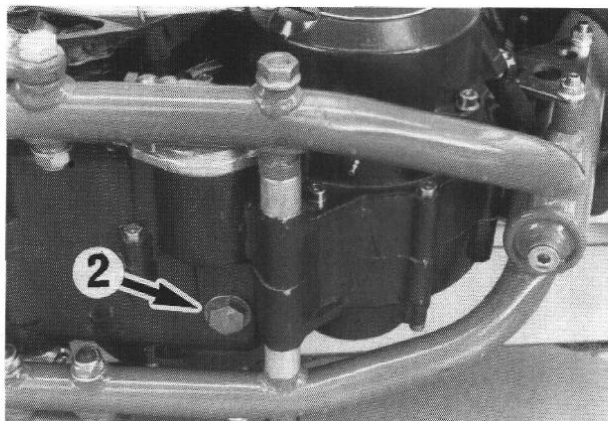
## Changing engine oil

**NOTE:** For better cooling of the engine oil, the front frame down tube is an oil reservoir. If an oil change is necessary, the engine oil should also be drained from the front frame down tube.

Engine oil change is to be performed with a warm engine. Remove drain plug (2) and let oil run into a drain pan. Also remove drain plug (3) on bottom of front down tube. Clean drain plugs (magnetic) and mount again with seal rings.

### **IMPORTANT:**

Pay attention to the information about the oil strainer on next page!

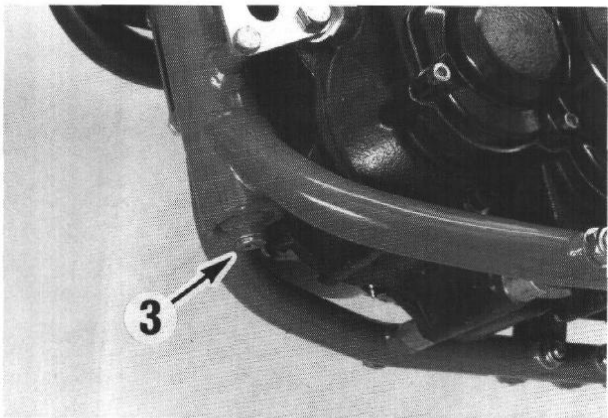


Remove filler cap at clutch cover and add 2.2 Liters (2.3 qts.) full synthetic engine oil 10W30. Start engine and let it run in neutral for approx. 2 minutes, so that the front frame down tube can be refilled with oil. Bleeding the oil system is not necessary.

### **CAUTION:**

Be careful not to rev the engine during the two (2) minute warm-up period. You must allow the frame oil tank to fill and oil to start flowing to all the lubrication points or engine damage will result.

Afterwards check oil system for leakage.

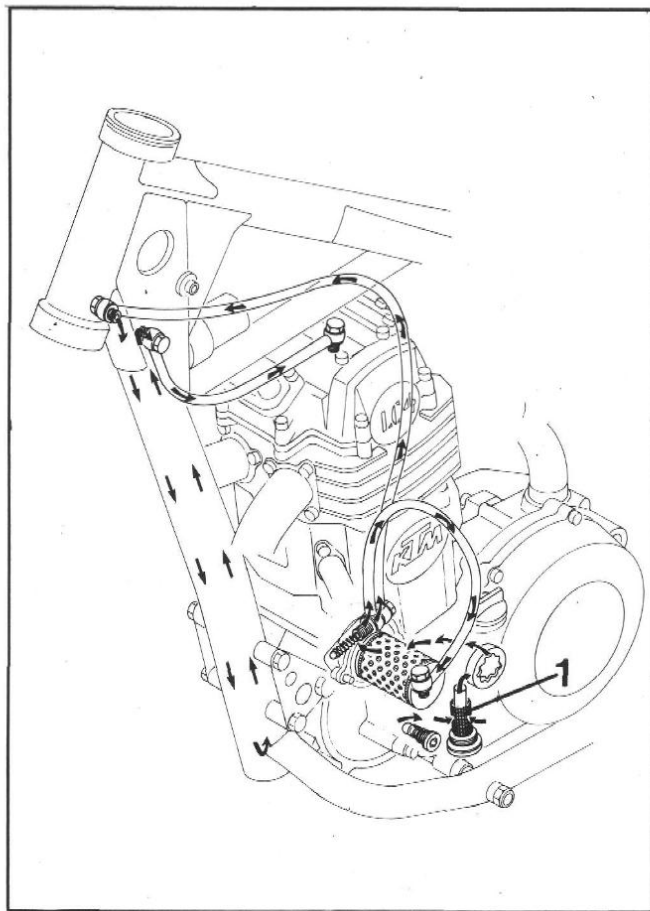


## CAUTION! Important service information!

For proper engine function over a long regular period of time it is absolutely necessary, besides checking engine oil-level in regular periods to clean the oil strainer and the magnet of the oil drain plug (1) periodically. In normal function the oil pump takes engine oil out of the center of the oil strainer and pumps it to several lubrication spots.

In case of a soiled oil-strainer engine oil supply out of the oil reservoir gets interrupted and the engine parts, which have to be lubricated are not supplied with clean engine oil in the proper quantity. This might cause connecting rod damage! To avoid an engine damage clean oil-strainer and magnetic oil drain plug carefully with petrol and compressed air whenever engine oil gets changed!

Oil flow: From oil pump to oil filter to front frame down tube to cylinder head.  
A second oil flow routing connects the oil filter direct with the crankshaft.



## Changing oil filter

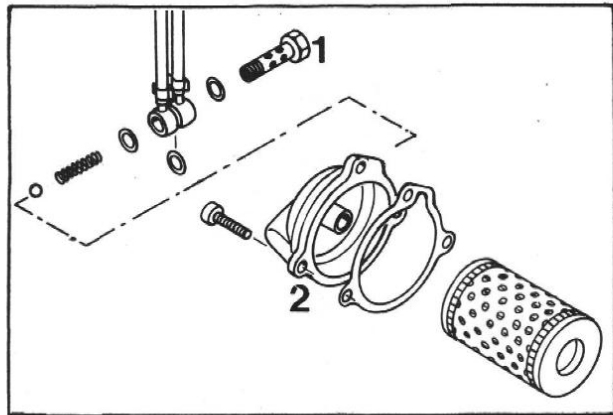
Changing oil filter when changing engine oil.

Remove foot peg holder with brake lever. Remove hollow screw (1) and the three allen head screws. Pay attention to the spring and ball of the by-pass valve in the bore of the hollow screw, when carefully removing oil filter cover (2).

Remove oil filter; clean filter case, oil filter cover, and sealing surfaces. Check oil chanel in oil filter cover if clogged.



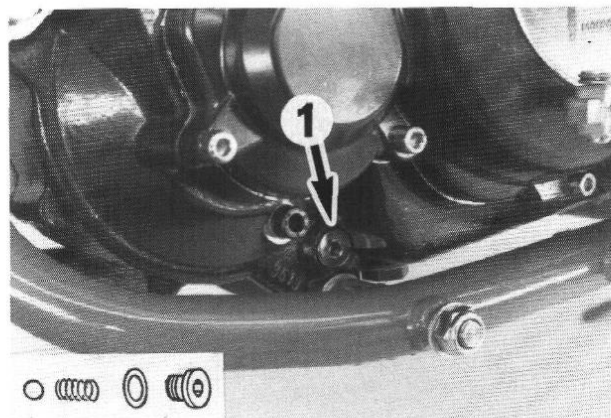
Fit new oil filter with rubber gasket on the fitting in oil filter cover. Mount oil filter cover with new gasket. Start engine and check oil system for leakage. Finally mount foot peg holder and adjust free play of rear brake lever.



## Changing return valve

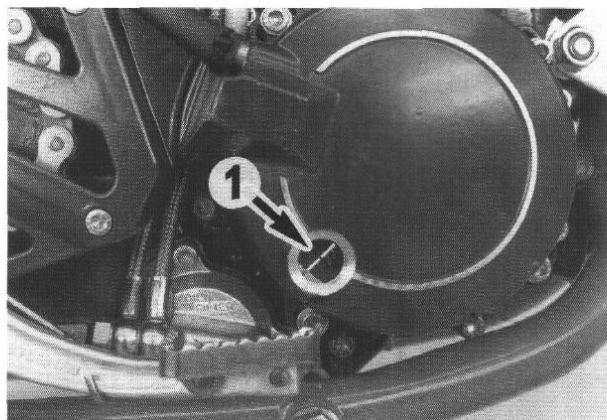
The return valve prevents the engine oil from flowing back into the crankcase. If the oil level in the crankcase is too high, oil consumption increases and the oil starts to foam.

Unscrew screw plug of return valve (1), remove spring and plastic ball from the bore. Clean screw plug (magnetic), insert new plastic ball and spring into the bore and mount screw plug with sealing. Be sure magnet of screw plug is no longer than 4.0 mm maximum. If the magnet is longer than 4 mm, it must be ground shorter or the return valve system will not function.



## Adjust valve play

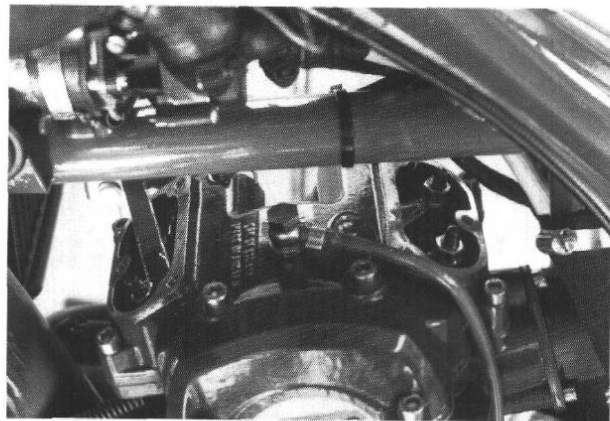
Remove seat, side cover, and gas tank with shrouds. Place motorcycle on stand to remove load from rear wheel. Remove both valve covers, put motorcycle in 5th gear, set piston to compression and remove spark plug. Remove ignition cover view plug and turn crankshaft by turning the rear wheel in running direction until the ignition mark (1) on the fly wheel is visible in the view hole.



The piston is now positioned at TDC and the valves can be adjusted.

Valve play by cold engine:     INTAKE 0.15 mm  
   OUTLET 0.15 mm

After the adjustment re-mount all parts.



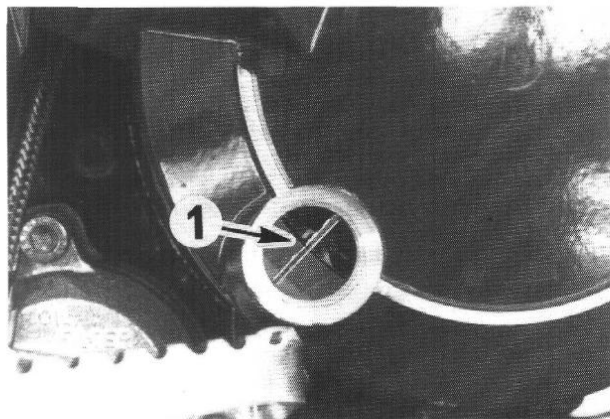
## Check and adjust ignition point

Place motorcycle on stand with rear wheel off ground. Remove spark plug and put motorcycle in 5th gear. Remove ignition cover view plug and turn crankshaft by turning the rear wheel in the running direction until the ignition mark (1) on the fly wheel is visible in view hole.

Unscrew crankshaft locking bolt (2), remove copper seal ring and re-fit locking bolt by hand. If any resistance is felt, lightly move rear wheel back and forth to enable the locking bolt to engage in the recess in the crankshaft.

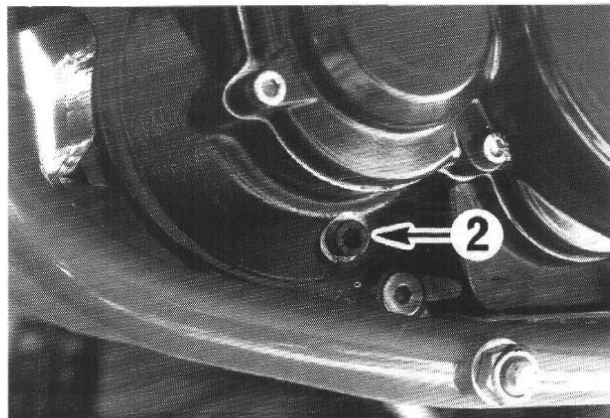
### CAUTION:

Under no circumstances apply force to screw in the locking bolt as **this will damage the crankshaft.**



After installing the crankshaft locking bolt, the ignition marks on the stator and the fly wheel must be aligned.

If necessary, loosen the 4 allen head screws of the ignition cover and rotate so that the two marks are aligned. Re-tighten allen head screw, remove locking bolt and fit copper sealing ring (3 mm thick). Mount spark plug and ignition cover view plug.





## Technical Specifications - Engine

	600 MX, 600 E-XC	600 E-GS
Design	1-cylinder 4-stroke engine, liquid cooled	
Displacement	552,9 cc	552,9 cc
Bore/stroke	95/78 mm	95/78 mm
Ratio	10,5 : 1	9,5 : 1
Power/out put	37 kW (50 HP) 8.000/min	34,5 kW (47 HP) 7.500/min
Max. torque	51 Nm (37,6 lbs/ft) 5.500/min	46 Nm (33,9 lbs/ft) 5.200/min
Fuel	Super ROZ 98 octane	
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain	
Camshaft	249°	
Valve timing by 1 mm valve clearance	IO 10° BTDC IC 59° ABDC EO 52° BBDC EC 17° ATDC	
Valve Diameter	Intake 36 mm (1.42 in.)	Outlet 30 mm (1.18 in.)
Valve play cold	Intake 0.15 mm (0.0059 in.)	Outlet 0.15 mm (0.0059 in.)
Crank shaft bearing	2 Cylinder roller bearing	
Connecting rod bearing	needle bearing	
Top end bearing	bronze bushing	
Piston	Forged aluminium alloy	
Piston ring	1 chromed compression ring, 1 tapered compression piston ring, 1 oil ring	
Engine and transmission lubrication	forced-feed lubrication through Eaton-Oilpump with oil sump filter	
Engine oil	2,2 l full-synthetic engine oil 10W 30	
Primary gear	straight geared spur wheel 30 : 81 teeth	
Clutch	multi disc clutch in oil bath	
Transmission	5-speed claw shifted	
Ignition System	contactless thyristor ignition with electronic advanced system type SEM	
Ignition Timing	basic adjustment: Idling: 0-2° BTDC (1200/rpm) - adjustment from 1700/rpm to max. 30° BTDC 5000/rpm	
Generator	12 V 130 W	
Spark plug	Champion A5 YC	
Spark plug gap	0,6 mm (0.028 in.)	
Cooling system	Liquid cooled, permanent rotation of cooling liquid through electric waterpump	
Cooling liquid	1 Liter, mix rate 2 : 1 - anti freeze mix : water	
Starting procedure	Decompressor hand actuated - Cold and warm start knob on carburator	

## GEAR RATIOS

Primary-ratio	Transmission	Original final drive ratio
30:81	1 <sup>st</sup> gear 14:35	MX 14:52 E-XC 16:50 E-GS 15:45
	2 <sup>nd</sup> gear 15:24	
	3 <sup>rd</sup> gear 18:21	
	4 <sup>th</sup> gear 20:19	
	5 <sup>th</sup> gear 27:20	
	Available chain drive sprockets	Available final drive sprockets
	14 teeth for chain 15 teeth $\frac{5}{8} \times \frac{1}{4}''$ 16 teeth 17 teeth	45 teeth for chain 48 teeth $\frac{5}{8} \times \frac{1}{4}''$ 50 teeth 52 teeth

## BASIC CARBURETOR SETTING

	600 MX 600 E-XC (USA)	600 E-XC 600 E-GS	600 MX 600 E-XC 600 E-GS
Type	PHM 38 SD	PHM 38 SD	BING 54/38/123
Main jet	190	185	150
Needle jet	DR 272	DR 272	268
Idling jet	52	52	50
Jet needle	K 51	K 51	8 L 6
Needle position	3 <sup>rd</sup> from top	2 <sup>nd</sup> from top	2 <sup>nd</sup> from top
Mixture adjusting screw open	1-1,5 turn.	1-1,5 turn	1 turn
Throttle valve	40	40	335
Starting jet	45	45	35 (40/45)

## TOLERANCE, ASSEMBLY CLEARANCE

Piston assembly clearance	0,04–0,05 mm
Piston ring play compression rings oil scrape ring	0,20–0,60 mm 0,30–0,80 mm
Crankshaft end play	0,1–0,3 mm
Crankshaft pin	max. 0,04 mm
Transmission shaft end play	0,1–0,2 mm
Oilpump end play	0,1–0,2 mm

(mm × 0,03937 = in)

## TIGHTENING TORQUES

Hexagon nut at primary gear M20×1,5	100 Nm
Collar nut at left flywheel M12×1	60 Nm
Hexagon nut for clutch carrier M18×1,5	80 Nm
Kickstarter stop screw M12×1,5	70 Nm
Hexagon recess screws at oilpump M6	8 Nm
Hexagon screw at camshaft gear wheel M10	35 Nm
Hexagon screw at upper part of cylinder head M6	8 Nm
Cylinder head screws M10	60 Nm
Collar nuts at cylinder foot M10	40 Nm

(Nm × 0,738 = ft.lbs)

## Technical Specifications - Chassis

	600 MX	600 E-XC	600 E-GS
Frame	Central chrome-moly-steel frame		
Fork	White Power Upside Down		
Wheel travel fr./r.	300/350 mm		
Rear suspension	Central shock absorber with PRO-LEVER linkage to rear swing-arm with needle bearing		
Front brake	Disc brake with carbon-steel brake disc Ø 240 mm, 2-piston brake caliper floated, effective braking surface 30 cm <sup>2</sup>		
Rear brake	Disc brake with carbon-steel brake disc Ø 220 mm, 2-piston brake caliper floated, effective braking surface 30 cm <sup>2</sup>		
Tyres front	90/90-21	3.00-21	3.00-21
Tyres rear	130/80-18	4.50-18, 130/80-18	4.50-18, 130/80-18
Fuel tank capacity	9 Liter		14 Liter
Final drive ratio	14:52 Z	16:50 Z	15:45 Z
Chain	5/8 × 1/4"		
Steering angle	62,5°		
Wheel base	1510 ± 10 mm		
Seat high	920 mm		
Ground clearance	340 mm		
Dry-weight	114 kg	119 kg	127 kg

## Lubrication- and Maintenance-Schedule

	as required	after every ENDURO/MX	after 200 km/124.3 miles	after 2.500 km/1.554 miles	after 5.000 km/3.107 miles	once a year
Check fork function and damping	●	●	●	●		
Check fork seals	●	●	●	●		
Clean dust scraper on forks		●		●		
Change fork oil	●				●	
Check steering head bearing play	●		●		●	
Clean and grease steering head bearings and its seals					●	
Check adjustment and function of shock absorber	●			●		
Grease suspension linkage		●		●		
Grease swingarm pivots		●		●		
Oil or grease all bearings and sliding contact points		●		●		
Check sprockets, chain guide and chain for wear	●	●			●	
Check chain tension	●	●	●			
Clean and lube chain	●	●	●		●	
Check the brake fluid level	●	●	●	●		
Check the condition and correct instalment of brake hoses		●	●	●	●	
Check brake disc	●	●	●		●	
Check brake pad thickness	●	●				
Check caliper to piston tolerance (rear brake)	●					
Check brake freeplay and easy operation of foot brake lever	●				●	
Change brake fluid	●	●	●	●		●
Check cooling system for leakage						
Check cooling liquid level	●	●	●	●		
Check electric system	●		●	●		
Check wiring harness and connections					●	
Check cable for damage and easy working					●	
Lube and adjust cables	●			●	●	
Check all screws, nuts, and hose clamps for tightness			●	●	●	
Check exhaust system			●	●		
Check exhaust muffler packing (MX)	●			●		
Check rubber grommets on exhaust mounting				●		
Check tire air pressure and condition	●	●				
Check tightness of spokes and rim join	●		●		●	
Check wheel bearing play					●	
Clean airfilter, filter box and airfilter boot	●	●		●		
Check breather hoses of engine case, ignition case and gas tank for correct position without buckles.	●			●		
Clean carburetor and adjust the idling	●		●		●	
Clean fuel system						●
Check engine oil	●	●				
Change engine oil			●	●	●	
Clean oil screen at the drain screw			●	●		
Change oil filter unit			●		●	
Change return valve			●		●	
Check oil lines for leakage and proper instalment	●	●	●	●		
Check valve clearance			●		●	
Clean spark plug, adjust spark end gap				●		
Renew spark plug	●				●	
Check ignition control timing	●		●		●	
Tighten cylinder head screws			●			



## 600 LC4 SERVICE-TIP

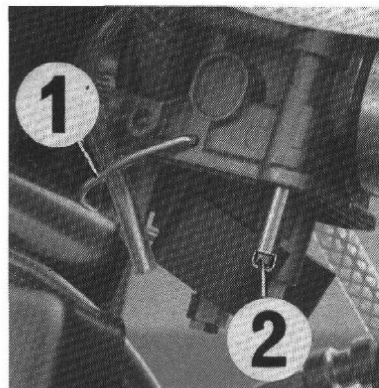
For better starting in cold condition we recommend to replace the standard starting jet 35 with one of the included starting jets 40 or 45.

Starting jet	35	40	45
Temperature	higher than +10° C 50° F	between +10° C ..... -5° C 50° F ..... 23° F	lower than -5° C 23° F

45      40      35

### Basic Carburettor Setting 12.88

Carburettor type	BING 54/38/123
Main jet	150
Idling jet	50
Needle jet	268
Jet needle	8L6
Needle position	2nd from top
Throttle valve	335
Starting jet	35 (40, 45)
Mixture adjustment screw open	1 turn



- Push back spring clamp (1) and remove float chamber
- Replace starting jet (2)
- When remounting the float chamber be careful with both fuel filters

**KTM MOTOR-FAHRZEUGBAU**

AKTIENGESELLSCHAFT

5230 MATTIGHOFEN, AUSTRIA

